Intel® Fortran Libraries Reference

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About This Manual

This manual describes the Intel® Fortran library routines. The routines and their descriptions apply to all platforms unless otherwise noted. Architectural differences, if any, are also noted.

For details on managing and linking libraries with the Intel Fortran compiler, see Volume I of your user's guide.

This manual is intended for experienced applications programmers who have a basic understanding of Fortran concepts and the Fortran 95/90 language, and are using Intel Fortran in either a single-platform or multiplatform environment.

Some familiarity with programming concepts and your operating system is helpful. This manual is not a Fortran or programming tutorial.

This manual is organized as follows:

- Chapter 1, "Overview of the Libraries"
- Chapter 2, "Descriptions of the Library Routines"

Product Website and Support

Intel® Fortran provides a product web site that offers timely and comprehensive product information, including product features, white papers, and technical articles. For the latest information, visit:

http://developer.intel.com/software/products/

Intel also provides a support web site that contains a rich repository of self help information, including getting started tips, known product issues, product errata, license information, user forums, and more.

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- Submit issues and review their status.

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To register your product, contact Intel, or seek product support, please visit:

http://www.intel.com/software/products/support

Related Publications

The following is an alphabetical list of some commercially published documents that provide reference or tutorial information on Fortran 95 and Fortran 90:

- *Compaq Visual Fortran* by N. Lawrence; published by Digital Press* (Butterworth-Heinemann), ISBN: 1-55558-249-4.
- *Digital Visual Fortran Programmer's Guide* by M. Etzel and K. Dickinson; published by Digital Press* (Butterworth-Heinemann), ISBN: 1-55558-218-4.
- *Fortran 90 Explained* by M. Metcalf and J. Reid; published by Oxford University Press, ISBN 0-19-853772-7.
- *Fortran 90/95 Explained* by M. Metcalf and J. Reid; published by Oxford University Press, ISBN 0-19-851888-9.
- *Fortran 90/95 for Scientists and Engineers* by S. Chapman; published by McGraw-Hill, ISBN 0-07-011938-4.
- *Fortran 90 Handbook* by J. Adams, W. Brainerd, J. Martin, B. Smith, and J. Wagener; published by Intertext Publications (McGraw-Hill), ISBN 0-07-000406-4.
- *Fortran 90 Programming* by T. Ellis, I. Philips, and T. Lahey; published by Addison-Wesley, ISBN 0201-54446-6.
- *Introduction to Fortran 90/95* by Stephen J. Chapman; published by WCB McGraw-Hill, ISBN 0-07-011969-4.
- *Programmer's Guide to Fortran 90, Second Edition* by W. Brainerd, C. Goldberg, and J. Adams; published by Unicomp, ISBN 0-07-000248-7.

Intel® does not endorse these books or recommend them over other books on the same subjects.

The following copyrighted standard and specification documents contain precise descriptions of many of the features found in Intel® Fortran:

- American National Standard Programming Language FORTRAN, ANSI X3.9-1978
- American National Standard Programming Language Fortran 90, ANSI X3.198-1992

  This Standard is equivalent to: International Standards Organization Programming Language Fortran, ISO/IEC 1539:1991 (E).
- American National Standard Programming Language Fortran 95, ANSI X3J3/96-007

  This Standard is equivalent to: International Standards Organization Programming Language Fortran, ISO/IEC 1539-1:1997 (E).

- High Performance Fortran Language Specification, Version 1.1, Technical Report CRPC-TR-92225

Information about the target architecture is available from Intel and from most technical bookstores. Most Intel documents are available from the Intel Corporation web site at:

http://www.intel.com

Some helpful titles are:

- *Intel® Fortran Language Reference*
- *Intel® Fortran Libraries Reference*
- *Intel® Fortran Compiler Installing and Getting Started*
- Intel® Array Visualizer online help reference
- Intel® Array Viewer online help reference
- *Using the Intel® License Manager for FLEXlm**
- *Intel® C++ Compiler User's Guide*
- VTune™ Performance Analyzer online help
- Enhanced Debugger online help
- *Intel® Architecture Software Developer's Manual*
  - Vol. 1: Basic Architecture, Intel Corporation, doc. number 243190
  - Vol. 2: Instruction Set Reference Manual, Intel Corporation, doc. number 243191
  - Vol. 3: System Programming, Intel Corporation, doc. number 243192
- *Pentium® Processor Family Developer's Manual*
- *Intel® Processor Identification with the CPUID Instruction*, Intel Corporation, doc. number 241618
- *Intel® Itanium® Architecture* Manuals
- *Intel® Itanium® Architecture Software Conventions & Runtime Architecture Guide*
- *Intel® Itanium® Assembler User's Guide*
- *Intel® Itanium® Architecture Assembly Language Reference Guide*

For more developer's manuals on Intel processors, refer to the Intel's Literature Center.

The following sources might be useful in helping you understand basic optimization and vectorization terminology and technology:

- *Intel® Architecture Optimization Reference Manual*
- *Dependence Analysis*, Utpal Banerjee (A Book Series on Loop Transformations for Restructuring Compilers). Kluwer Academic Publishers. 1997.
- *The Structure of Computers and Computation: Volume I*, David J. Kuck. John Wiley and Sons, New York, 1978.

- *Loop Transformations for Restructuring Compilers: The Foundations*, Utpal Banerjee (A Book Series on Loop Transformations for Restructuring Compilers). Kluwer Academic Publishers. 1993.
- *Loop parallelization*, Utpal Banerjee (A Book Series on Loop Transformations for Restructuring Compilers). Kluwer Academic Publishers. 1994.
- *High Performance Compilers for Parallel Computers*, Michael J. Wolfe. Addison-Wesley, Redwood City. 1996.
- *Supercompilers for Parallel and Vector Computers*, H. Zima. ACM Press, New York, 1990.
- *An Auto-vectorizing Compiler for the Intel® Architecture*, Aart Bik, Paul Grey, Milind Girkar, and Xinmin Tian. Submitted for publication
- *Efficient Exploitation of Parallelism on Pentium® III and Pentium® 4 Processor-Based Systems*, Aart Bik, Milind Girkar, Paul Grey, and Xinmin Tian.

Conventions

The following table describes the typographic and terminology conventions used in this manual:

Typographic Conventions	
Extensions to Fortran 95	This color indicates extensions to the Fortran 95 Standard. These extensions may or may not be implemented by other compilers that conform to the language standard.
AUTOMATIC, INTRINSIC, WRITE	Uppercase letters indicate Fortran95/90 statements, data types, directives, and other syntax keywords. Examples of statement keywords are WRITE, INTEGER, DO, and OPEN.
option, *option*	This italic type indicates an keyword arguments in syntax, new terms, emphasized text, or a book title. Most new terms are defined in the Glossary of the *Language Reference*.
`USE IFQWIN`	This courier type indicates a code example, a program name, a derived type name, or a pathname.
CTRL	Small capital letters indicate the names of keys and key sequences, such as CTRL+C. A plus indicates a combination of keys. For example, CTRL+E means to hold down the CTRL key while pressing the E key.
{*choice1* | *choice2*}	Braces and vertical bars indicate a choice of items. You can usually only choose one of the items in the braces.
[optional item]	In syntax, single square brackets indicate items that are optional. In code examples, they are used to show arrays.

s[, s]…	A horizontal ellipsis (three dots in a row) following an item indicates that the item preceding the ellipsis can be repeated. In code examples, a horizontal ellipsis means that not all of the statements are shown.
Adobe Acrobat*	An asterisk at the end of a word or name indicates it is a third-party product trademark.

Terminology Conventions

compiler option	This term refers to Linux* options and Windows* options that can be used on the compiler command line.
`cat(1)`	This format refers to an online reference page; the section number of the page is shown in parentheses. For example, a reference to `cat(1)` indicates that you can find the material on the `cat` command in Section 1 of the reference pages. To read online reference pages, use the `man` command. Your operating system documentation also includes reference page descriptions.
Intel Fortran	This term refers to the name of the common compiler language supported by the Intel® Visual Fortran Compiler for Windows* and Intel® Fortran Compiler for Linux* products. For more information on these compilers, see http://developer.intel.com/software/products/.
Fortran	This term refers to language information that is common to ANSI FORTRAN 77, ANSI/ISO Fortran 95/90, and Intel Fortran.
Fortran 95/90	This term refers to language information that is common to ANSI/ISO Fortran 95 and ANSI/ISO Fortran 90.
Fortran 95	This term refers to language features of ANSI/ISO Fortran 95.
Fortran 90	This term refers to language features of ANSI/ISO Fortran 90.
Windows systems	This term refers to all supported Microsoft* Windows operating systems. (See also "Platform Labels".)
Linux systems	This term refers to all supported Linux operating systems. (See also "Platform Labels".)
integer	This term refers to the INTEGER(KIND=1), INTEGER(KIND=2), INTEGER (INTEGER(KIND=4)), and INTEGER(KIND=8) data types as a group.
real	This term refers to the REAL (REAL(KIND=4)), DOUBLE PRECISION (REAL(KIND=8)), and REAL(KIND=16) data types as a group.
REAL	This term refers to the default data type of objects declared to be REAL. REAL is equivalent to REAL(KIND=4), unless a compiler option specifies otherwise.
complex	This term refers to the COMPLEX (COMPLEX(KIND=4)), DOUBLE COMPLEX (COMPLEX(KIND=8)), and COMPLEX(KIND=16) data types as a group.

logical	This term refers to the LOGICAL(KIND=1), LOGICAL(KIND=2), LOGICAL (LOGICAL(KIND=4)), and LOGICAL(KIND=8) data types as a group.
Compatibility	This term introduces a list of the projects or libraries that are compatible with the library routine.
<Tab>	This symbol indicates a nonprinting tab character.
Δ	This symbol indicates a nonprinting blank character.

The following example shows how this manual's typographic conventions are used to indicate the syntax of the CHMOD portability function:

result = CHMOD (name, mode)

This syntax shows that when you use this routine, you must specify the following:

- The keyword CHMOD.
- A left parenthesis.
- The arguments name and mode, where name is the name of a file and mode is the file permission.
- A terminating right parenthesis.

The syntax is shown in teal color, which indicates the the function is a language extension to Fortran 95.

Platform Labels

A *platform* is a combination of operating system and central processing unit (CPU) that provides a distinct environment in which to use a product (in this case, a language). This manual contains information for the following language platforms:

	Platform	
Language	**Operating System**	**CPU**
Intel® Fortran	Linux	IA-32
	Linux	Intel® Itanium®
	Microsoft* Windows* 2000	IA-32
	Microsoft Windows NT* 4.0	IA-32
	Microsoft Windows XP*	IA-32
	Microsoft Windows XP	Intel Itanium

In this manual, information applies to *all* supported platforms unless it is otherwise labeled for a specific platform, as follows:

L*X	Applies to Linux* on Intel® IA-32 processors and Intel® Itanium® processors.
L*X32	Applies to Linux on Intel IA-32 processors.
L*X64	Applies to Linux on Intel Itanium processors.
W*32	Applies to Microsoft Windows* 2000, Windows XP, and Windows NT* 4.0 on Intel IA-32 processors.
W*64	Applies to Microsoft Windows XP operating systems on Intel Itanium processors.
i32	Applies to 32-bit operating systems on Intel IA-32 processors.
i64	Applies to 64-bit operating systems on Intel Itanium processors.

For example, the IOFOCUS specifier (for an OPEN statement) is labeled "(W*32, W*64)", so this specifier is valid only on Windows operating systems.

Overview of the Libraries

1

This chapter provides an overview of the various Intel® Fortran library routines:

- "Portability Routines"
- "National Language Support Routines (W*32, W*64)"
- "POSIX* Routines"
- "QuickWin and Graphics Routines (W*32, W*64)"
- "Dialog Routines (W*32)"
- "COM and AUTO Routines (W*32)"
- "Miscellaneous Run-Time Routines"

When you include the statement USE *module-name* in your program, these library routines are automatically linked to your program if called.

You can restrict what is accessed from a USE module by adding ONLY clauses to the USE statement. For more information on the USE statement, see the *Language Reference*.

All the library routines are language extensions to Fortran 95.

In Chapter 2 of this book, all the library routines are listed alphabetically and described in detail.

NOTE. *Intrinsic procedures are described in the Language Reference.*

See Also

- The USE statement in the *Language Reference*
- The section on portability routines in "Using Libraries" in Volume I of your user's guide

Portability Routines

The portability routines help you port your programs to or from other systems, or help you perform basic I/O to serial ports on Windows* IA-32 systems.

To use these routines, add the following statement to the program unit containing the routine:

```
USE IFPORT
```

Table 1-1 summarizes portability routines.

Table 1-1 Summary of Portability Routines

Name	Description
Information Retrieval:	
FSTAT	Returns information about a logical file unit.
GETENV	Searches the environment for a given string and returns its value if found.
GETGID	Returns the group ID of the user.
GETLOG	Returns the user's login name.
GETPID	Returns the process ID of the process.
GETUID	Returns the user ID of the user of the process.
HOSTNAM[1]	Returns the name of the user's host.
ISATTY	Checks whether a logical unit number is a terminal.
RENAME	Renames a file.
STAT, LSTAT	Returns information about a named file.
UNLINK	Deletes the file given by path.
Process Control:	
ABORT	Stops execution of the current process, clears I/O buffers, and writes a string to external unit 0.
ALARM	Executes an external subroutine after waiting a specified number of seconds.
KILL	Sends a signal code to the process given by ID.
SIGNAL	Changes the action for signal.
SLEEP	Suspends program execution for a specified number of seconds.
SYSTEM	Executes a command in a separate shell.
Numeric Values and Conversion:	
BESJ0, BESJ1, BESJN, BESY0, BESY1, BESYN	Return single-precision values of Bessel functions of the first and second kind of orders 1, 2, and n, respectively.
BIC, BIS, BIT	Perform bit level clear, set, and test for integers.

Table 1-1 Summary of Portability Routines

Name	Description
CDFLOAT	Converts a COMPLEX(4) argument to DOUBLE PRECISION type.
COMPLINT, COMPLREAL, COMPLLOG	Return a BIT-WISE complement or logical .NOT. of the argument.
CSMG	Performs an effective BIT-WISE store under mask.
DBESJ0, DBESJ1, DBESJN, DBESY0, DBESY1, DBESYN	Return double-precision values of Bessel functions of the first and second kind of orders 1, 2, and n, respectively.
DFLOATI, DFLOATJ, DFLOATK	Convert an integer to double-precision real type.
DRAND, DRANDM	Return double-precision random values in the range 0 through 1.0.
DRANSET	Sets the seed for the random number generator
IDFLOAT	Converts an INTEGER(4) argument to double-precision real type.
IFLOATI, IFLOATJ	Convert an integer to single-precision real type.
INMAX	Returns the maximum positive value for an integer.
INTC	Converts an INTEGER(4) argument to INTEGER(2) type.
IRAND, IRANDM	Return a positive integer in the range 0 through 2**31-1 or 2**15-1 if called without an argument.
IRANGET	Returns the current seed.
IRANSET	Sets the seed for the random number generator.
JABS	Computes an absolute value.
LONG	Converts an INTEGER(2) argument to INTEGER(4) type.
QRANSET	Sets the seed for a sequence of pseudo-random numbers.
RAND, RANDOM[2]	Return random values in the range 0 through 1.0.
RANF	Generates a random number between 0.0 and RAND_MAX.
RANGET	Returns the current seed.
RANSET	Sets the seed for the random number generator.
SEED	Changes the starting point of the random number generator.
SHORT	Converts an INTEGER(4) argument to INTEGER(2) type.
SRAND	Seeds the random number generator used with IRAND and RAND.
Input and Output:	
ACCESS	Checks a file for accessibility according to mode.
CHMOD	Changes file attributes.
FGETC	Reads a character from an external unit.
FLUSH	Flushes the buffer for an external unit to its associated file.

Table 1-1 Summary of Portability Routines

Name	Description
FPUTC	Writes a character to an external unit.
FSEEK	Repositions a file on an external unit.
FTELL, FTELLI8	Return the offset, in bytes, from the beginning of the file.
GETC	Reads a character from unit 5.
GETPOS, GETPOSI8	Return the offset, in bytes, from the beginning of the file.
PUTC	Writes a character to unit 6.
Date and Time:	
CLOCK	Returns current time in "hh:mm:ss" format using a 24-hour clock.
CLOCKX	Returns the processor clock to the nearest microsecond.
CTIME	Converts a system time to a 24-character ASCII string.
DATE	Returns the current system date.
DATE4	Returns the current system date.
DCLOCK	Returns the elapsed time in seconds since the start of the current process.
DTIME	Returns CPU time since later of (1) start of program, or (2) most recent call to DTIME.
ETIME	Returns elapsed CPU time since the start of program execution.
FDATE	Returns the current date and time as an ASCII string.
GETDAT	Returns the date.
GETTIM	Returns the time.
GMTIME	Returns Greenwich Mean Time as a 9-element integer array.
IDATE	Returns the date either as one 3-element array or three scalar parameters (month, day, year).
IDATE4	Returns the date either as one 3-element array or three scalar parameters (month, day, year).
ITIME	Returns current time as a 3-element array (hour, minute, second).
JDATE	Returns current date as an 8-character string with the Julian date.
JDATE4	Returns current date as a 10-character string with the Julian date.
LTIME	Returns local time as a 9-element integer array.
RTC	Returns number of seconds since 00:00:00 GMT, Jan 1, 1970.
SECNDS	Returns number of seconds since midnight, less the value of its argument.
SETDAT	Sets the date.
SETTIM	Sets the time.

Table 1-1 Summary of Portability Routines

Name	Description
TIME	As a subroutine, returns time formatted as HH:MM:SS; as a function, returns time in seconds since 00:00:00 GMT, Jan 1, 1970.
TIMEF	Returns the number of seconds since the first time this function was called (or zero).
Error Handling:	
GETLASTERROR	Returns the last error set.
GETLASTERRORQQ	Returns the last error set by a run-time function or subroutine.
IERRNO	Returns the last code error.
SETERRORMODEQQ	Sets the mode for handling critical errors.
Program Call and Control:	
RAISEQQ	Sends an interrupt to the executing program, simulating an interrupt from the operating system.
RUNQQ	Calls another program and waits for it to execute.
SIGNALQQ	Controls signal handling.
SLEEPQQ	Delays execution of the program for a specified time.
System, Drive, or Directory Control and Inquiry:	
CHDIR	Changes the current working directory.
CHANGEDIRQQ	Makes the specified directory the current (default) directory.
CHANGEDRIVEQQ	Makes the specified drive the current drive.
DELDIRQQ	Deletes a specified directory.
GETDRIVEDIRQQ	Returns the current drive and directory path.
GETDRIVESIZEQQ	Returns the size of the specified drive.
GETDRIVESQQ	Returns the drives available to the system.
GETENVQQ	Returns a value from the current environment.
MAKEDIRQQ	Creates a directory with the specified directory name.
SETENVQQ	Adds a new environment variable or sets the value of an existing one.
SYSTEMQQ	Executes a command by passing a command string to the operating system's command interpreter.
Speakers:	
BEEPQQ	Sounds the speaker for a specified duration in milliseconds at a specified frequency in Hertz.

Table 1-1 Summary of Portability Routines

Name	Description
File Management:	
DELFILESQQ	Deletes the specified files in a specified directory.
FINDFILEQQ	Searches for a file in the directories specified in the PATH environment variable.
FULLPATHQQ	Returns the full path for a specified file or directory.
GETFILEINFOQQ	Returns information about files with names that match a request string.
PACKTIMEQQ	Packs time values for use by SETFILETIMEQQ.
RENAMEFILEQQ	Renames a file.
SETFILEACCESSQQ	Sets file-access mode for the specified file.
SETFILETIMEQQ	Sets modification time for the specified file.
SPLITPATHQQ	Breaks a full path into four components.
UNPACKTIMEQQ	Unpacks a file's packed time and date value into its component parts.
Arrays:	
BSEARCHQQ	Performs a binary search for a specified element on a sorted one-dimensional array of intrinsic type.
SORTQQ	Sorts a one-dimensional array of intrinsic type.
Floating-Point Inquiry and Control:	
CLEARSTATUSFPQQ	Clears the exception flags in the floating-point processor status word.
GETCONTROLFPQQ	Returns the value of the floating-point processor control word.
GETSTATUSFPQQ	Returns the value of the floating-point processor status word.
LCWRQQ	Same as SETCONTROLFPQQ.
SCWRQQ	Same as GETCONTROLFPQQ.
SETCONTROLFPQQ	Sets the value of the floating-point processor control word.
SSWRQQ	Same as GETSTATUSFPQQ.
IEEE* Functionality:	
IEEE_FLAGS	Sets, gets, or clears IEEE flags.
IEEE_HANDLER	Establishes a handler for IEEE exceptions.
Serial Port I/O: [3]	
SPORT_CANCEL_IO	Cancels any I/O in progress to the specified port.
SPORT_CONNECT	Establishes the connection to a serial port.
SPORT_GET_HANDLE	Returns the WIN32* handle associated with the communications port.

Table 1-1 Summary of Portability Routines

Name	Description
SPORT_GET_STATE	Returns the baud rate, parity, data bits setting, and stop bits setting of the communications port.
SPORT_GET_TIMEOUTS	Returns the user selectable timeouts for the serial port.
SPORT_PEEK_DATA	Returns information about the availability of input data.
SPORT_PEEK_LINE	Returns information about the availability of input records.
SPORT_PURGE	Executes a purge function on the specified port.
SPORT_READ_DATA	Reads available data from the port specified.
SPORT_READ_LINE	Reads a record from the port specified.
SPORT_RELEASE	Releases a serial port that has previously been connected.
SPORT_SET_STATE	Sets the baud rate, parity, data bits setting, and stop bits setting of the communications port.
SPORT_SET_TIMEOUTS	Sets the user selectable timeouts for the serial port.
SPORT_SHOW_STATE	Displays the state of a port.
SPORT_SPECIAL_FUNC	Executes a communications function on a specified port.
SPORT_WRITE_DATA	Outputs data to a specified port.
SPORT_WRITE_LINE	Outputs data to a specified port and follows it with a record terminator.
Miscellaneous:	
LNBLNK	Returns the index of the last non-blank character in a string.
QSORT	Returns a sorted version of a one-dimensional array of a specified number of elements of a named size.
RINDEX	Returns the index of the last occurrence of a substring in a string.
SCANENV	Scans the environment for the value of an environment variable.
TTYNAM	Checks whether a logical unit is a terminal.

1. This routine can also be specified as HOSTNM.
2. There is a RANDOM function and a RANDOM subroutine in the portability library.
3. W*32 only

For more information, see the section on portability routines in "Using Libraries" in Volume I of your user's guide.

National Language Support Routines (W*32, W*64)

The National Language Support (NLS) routines provide language localization and a multibyte character set (MBCS) to let you write applications in different languages.

To use an NLS routine, add the following statement to the program unit containing the routine:

```
USE IFNLS
```

Table 1-2 summarizes the NLS routines. Routine names are shown in mixed case to make the names easier to understand. When writing your applications, you can use any case.

Table 1-2 Summary of NLS Routines (W*32, W*64)

Name	Description
Locale Setting and Inquiry:	
NLSEnumCodepages	Returns all the supported codepages on the system.
NLSEnumLocales	Returns all the languages and country combinations supported by the system.
NLSGetEnvironmentCodepage	Returns the codepage number for the system codepage or the console codepage.
NLSGetLocale	Returns the current language, country, and codepage.
NLSGetLocaleInfo	Returns requested information about the current local code set.
NLSSetEnvironmentCodepage	Changes the codepage for the current console.
NLSSetLocale	Sets the language, country, and codepage.
Formatting:	
NLSFormatCurrency	Formats a number string and returns the correct currency string for the current locale.
NLSFormatDate	Returns a correctly formatted string containing the date for the current locale.
NLSFormatNumber	Formats a number string and returns the correct number string for the current locale.
NLSFormatTime	Returns a correctly formatted string containing the time for the current locale.
MBCS Inquiry:	
MBCharLen	Returns the length of the first multibyte character in a string.
MBCurMax	Returns the longest possible multibyte character for the current codepage.
MBLead	Determines whether a given character is the first byte of a multibyte character.
MBLen	Returns the number of multibyte characters in a string, including trailing spaces.
MBLen_Trim	Returns the number of multibyte characters in a string, not including trailing spaces.

Table 1-2 Summary of NLS Routines (W*32, W*64)

Name	Description
MBNext	Returns the string position of the first byte of the multibyte character immediately after the given string position.
MBPrev	Returns the string position of the first byte of the multibyte character immediately before the given string position.
MBStrLead	Performs a context sensitive test to determine whether a given byte in a character string is a lead byte.
MBCS Conversion:	
MBConvertMBToUnicode	Converts a character string from a multibyte codepage to a Unicode string.
MBConvertUnicodeToMB	Converts a Unicode string to a multibyte character string of the current codepage.
MBJISTToJMS	Converts a Japan Industry Standard (JIS) character to a Microsoft* Kanji (Shift JIS or JMS) character.
MBJMSTToJIS	Converts a Microsoft Kanji (Shift JIS or JMS) character to a Japan Industry Standard (JIS) character.
MBCS Fortran Equivalent:	
MBINCHARQQ	Same as INCHARQQ except that it can read a single multibyte character at once and returns the number of bytes read.
MBINDEX	Same as INDEX except that multibyte characters can be included in its arguments.
MBLGE, MBLGT, MBLLE, MBLLT, MBLEQ, MBLNE	Same as LGE, LGT, LLE, LLT, and the operators .EQ. and .NE. except that multibyte characters can be included in their arguments.
MBSCAN	Same as SCAN except that multibyte characters can be included in its arguments.
MBVERIFY	Same as VERIFY except that multibyte characters can be included in its arguments.

For more information, see the section on National Language Support routines in "Using Libraries" in Volume I of your user's guide.

NLS Date and Time Format (W*32, W*64)

When NLSGetLocaleInfo (*type*, *outstr*) returns information about the date and time formats of the current locale, the value returned in *outstr* can be interpreted according to the following tables. Any text returned within a date and time string that is enclosed within single quotes should be left in the string in its exact form; that is, do not change the text or the location within the string.

Day

The day can be displayed in one of four formats using the letter "d". The following table shows the four variations:

d	Day of the month as digits without leading zeros for single-digit days
dd	Day of the month as digits with leading zeros for single-digit days
ddd	Day of the week as a three-letter abbreviation (SABBREVDAYNAME)
dddd	Day of the week as its full name (SDAYNAME)

Month

The month can be displayed in one of four formats using the letter "M". The uppercase "M" distinguishes months from minutes. The following table shows the four variations:

M	Month as digits without leading zeros for single-digit months
MM	Month as digits with leading zeros for single-digit months
MMM	Month as a three-letter abbreviation (SABBREVMONTHNAME)
MMMM	Month as its full name (SMONTHNAME)

Year

The year can be displayed in one of three formats using the letter "y". The following table shows the three variations:

y	Year represented by only the last digit
yy	Year represented by only the last two digits
yyyy	Year represented by the full 4 digits

Period/Era

The period/era string is displayed in a single format using the letters "gg".

gg	Period/Era string

Time

The time can be displayed in one of many formats using the letter "h" or "H" to denote hours, the letter "m" to denote minutes, the letter "s" to denote seconds and the letter "t" to denote the time marker. The following table shows the numerous variations of the time format. Lowercase "h" denotes the 12 hour clock and uppercase "H" denotes the 24 hour clock. The lowercase "m" distinguishes minutes from months.

h	Hours without leading zeros for single-digit hours (12 hour clock)
hh	Hours with leading zeros for single-digit hours (12 hour clock)
H	Hours without leading zeros for single-digit hours (24 hour clock)
HH	Hours with leading zeros for single-digit hours (24 hour clock)
m	Minutes without leading zeros for single-digit minutes
mm	Minutes with leading zeros for single-digit minutes
s	Seconds without leading zeros for single-digit seconds
ss	Seconds with leading zeros for single-digit seconds
t	One-character time marker string
tt	Multicharacter time marker string

See Also: "NLSGetLocaleInfo"

Example

```
USE IFNLS
INTEGER(4) strlen
CHARACTER(40) str
strlen = NLSGetLocaleInfo(NLS$LI_SDAYNAME1, str)
print *, str    ! prints Monday if language is English
strlen = NLSGetLocaleInfo(NLS$LI_SDAYNAME2, str)
print *, str    ! prints Tuesday if language is English
```

POSIX* Routines

The POSIX routines help you write Fortran programs that comply with the POSIX Standard. They implement the IEEE POSIX FORTRAN-77 language bindings.

To use a POSIX routine, add the following statement to the program unit containing the routine:

USE IFPOSIX

Table 1-3 summarizes the Intel Fortran POSIX library routines.

Table 1-3 Summary of POSIX Routines

Name	Description
IPXFARGC	Returns the index of the last command-line argument.
IPXFCONST	Returns the value associated with a constant defined in the C POSIX standard.
IPXFLENTRIM	Returns the index of the last non-blank character in an input string.
IPXFWEXITSTATUS[1]	Returns the exit code of a child process.
IPXFWSTOPSIG[1]	Returns the number of the signal that caused a child process to stop.
IPXFWTERMSIG[1]	Returns the number of the signal that caused a child process to terminate.
PXF<TYPE>GET	Gets the value stored in a component (or field) of a structure.
PXF<TYPE>SET	Sets the value of a component (or field) of a structure.
PXFA<TYPE>GET	Gets the array values stored in a component (or field) of a structure.
PXFA<TYPE>SET	Sets the value of an array component (or field) of a structure.
PXFACCESS	Determines the accessibility of a file.
PXFALARM	Schedules an alarm.
PXFCALLSUBHANDLE	Calls the associated subroutine.
PXFCFGETISPEED[1]	Returns the input baud rate from a termios structure.
PXFCFGETOSPEED[1]	Returns the output baud rate from a termios structure.
PXFCFSETISPEED[1]	Sets the input baud rate in a termios structure.
PXFCFSETOSPEED[1]	Sets the output baud rate in a termios structure.
PXFCHDIR	Changes the current working directory.
PXFCHMOD	Changes the ownership mode of the file.
PXFCHOWN[1]	Changes the owner and group of a file.
PXFCLEARENV	Clears the process environment.
PXFCLOSE	Closes the file associated with the descriptor.
PXFCLOSEDIR	Closes the directory stream.
PXFCONST	Returns the value associated with a constant.
PXFCNTL[1]	Manipulates an open file descriptor.
PXFCREAT	Creates a new file or rewrites an existing file.
PXFCTERMID[1]	Generates a terminal pathname.
PXFDUP, PXFDUP2	Duplicates an existing file descriptor.
PXFE<TYPE>GET	Gets the value stored in an array element component (or field) of a structure.
PXFE<TYPE>SET	Sets the value of an array element component (or field) of a structure.

Table 1-3 Summary of POSIX Routines

Name	Description
PXFEXECV, PXFEXECVE, PXFEXECVP	Execute a new process by passing command-line arguments.
PXFEXIT, PXFFASTEXIT	Exits from a process.
PXFFDOPEN	Opens an external unit.
PXFFFLUSH	Flushes a file directly to disk.
PXFFGETC	Reads a character from a file.
PXFFILENO	Returns the file descriptor associated with a specified unit.
PXFFORK[1]	Creates a child process that differs from the parent process only in its PID.
PXFFPATHCONF	Gets the value for a configuration option of an opened file.
PXFFPUTC	Writes a character to a file.
PXFFSEEK	Modifies a file position.
PXFFSTAT	Gets a file's status information.
PXFFTELL	Returns the relative position in bytes from the beginning of the file.
PXFGETARG	Gets the specified command-line argument.
PXFGETATTY	Tests whether a file descriptor is connected to a terminal.
PXFGETC	Reads a character from standard input unit 5.
PXFGETCWD	Returns the path of the current working directory.
PXFGETEGID[1]	Gets the effective group ID of the current process.
PXFGETENV	Gets the setting of an environment variable.
PXFGETEUID[1]	Gets the effective user ID of the current process.
PXFGETGID[1]	Gets the real group ID of the current process.
PXFGETGRGID[1]	Gets group information for the specified GID.
PXFGETGRNAM[1]	Gets group information for the named group.
PXFGETGROUPS[1]	Gets supplementary group IDs.
PXFGETLOGIN	Gets the name of the user.
PXFGETPGRP[1]	Gets the process group ID of the calling process.
PXFGETPID	Gets the process ID of the calling process.
PXFGETPPID	Gets the process ID of the parent of the calling process.
PXFGETPWNAM[1]	Gets password information for a specified name.
PXFGETPWUID[1]	Gets password information for a specified UID.

Table 1-3 Summary of POSIX Routines

Name	Description
PXFGETSUBHANDLE	Returns a handle for a subroutine.
PXFGETUID[1]	Gets the real user ID of the current process.
PXFISBLK	Tests for a block special file.
PXFISCHR	Tests for a character file.
PXFISCONST	Tests whether a string is a valid constant name.
PXFISDIR	Tests whether a file is a directory.
PXFISFIFO	Tests whether a file is a special FIFO file.
PXFISREG	Tests whether a file is a regular file.
PXFKILL	Sends a signal to a specified process.
PXFLINK	Creates a link to a file or directory.
PXFLOCALTIME	Converts a given elapsed time in seconds to local time.
PXFLSEEK	Positions a file a specified distance in bytes.
PXFMKDIR	Creates a new directory.
PXFMKFIFO[1]	Creates a new FIFO.
PXFOPEN	Opens or creates a file.
PXFOPENDIR	Opens a directory and associates a stream with it.
PXFPATHCONF	Gets the value for a configuration option of an opened file.
PXFPAUSE	Suspends process execution.
PXFPIPE	Creates a communications pipe between two processes.
PXFPOSIXIO	Sets the current value of the POSIX I/O flag.
PXFPUTC	Outputs a character to logical unit 6 (stdout).
PXFREAD	Reads from a file.
PXFREADDIR	Reads the current directory entry.
PXFRENAME	Changes the name of a file.
PXFREWINDDIR	Resets the position of the stream to the beginning of the directory.
PXFRMDIR	Removes a directory.
PXFSETENV	Adds a new environment variable or sets the value of an environment variable.
PXFSETGID[1]	Sets the effective group ID of the current process.
PXFSETPGID[1]	Sets the process group ID.
PXFSETSID[1]	Creates a session and sets the process group ID.
PXFSETUID[1]	Sets the effective user ID of the current process.

Table 1-3 Summary of POSIX Routines

Name	Description
PXFSIGACTION	Changes the action associated with a specific signal.
PXFSIGADDSET[1]	Adds a signal to a signal set.
PXFSIGDELSET[1]	Deletes a signal from a signal set.
PXFSIGEMPTYSET[1]	Empties a signal set.
PXFSIGFILLSET[1]	Fills a signal set.
PXFSIGISMEMBER[1]	Tests whether a signal is a member of a signal set.
PXFSIGPENDING[1]	Examines pending signals.
PXFSIGPROCMASK[1]	Changes the list of currently blocked signals.
PXFSIGSUSPEND[1]	Suspends the process until a signal is received.
PXFSLEEP	Forces the process to sleep.
PXFSTAT	Gets the status of a file.
PXFSTRUCTCOPY	Copies the contents of one structure to another.
PXFSTRUCTCREATE	Creates an instance of the specified structure.
PXFSTRUCTFREE	Deletes the instance of a structure.
PXFSYSCONF	Gets values for system limits or options.
PXFTCDRAIN[1]	Waits until all output written has been transmitted.
PXFTCFLOW[1]	Suspends the transmission or reception of data.
PXFTCFLUSH[1]	Discards terminal input data, output data, or both.
PXFTCGETATTR[1]	Reads current terminal settings.
PXFTCGETPGRP[1]	Gets the foreground process group ID associated with the terminal.
PXFTCSENDBREAK[1]	Sends a break to the terminal.
PXFTCSETATTR[1]	Writes new terminal settings.
PXFTCSETPGRP[1]	Sets the foreground process group associated with the terminal.
PXFTIME	Gets the system time.
PXFTIMES	Gets process times.
PXFTTYNAM[1]	Gets the terminal pathname.
PXFUCOMPARE	Compares two unsigned integers.
PXFUMASK	Sets a new file creation mask and gets the previous one.
PXFUNAME	Gets the operation system name.
PXFUNLINK	Removes a directory entry.
PXFUTIME	Sets file access and modification times.

Table 1-3 Summary of POSIX Routines

Name	Description
PXFWAIT[1]	Waits for a child process.
PXFWAITPID[1]	Waits for a specific PID.
PXFWIFEXITED[1]	Determines if a child process has exited.
PXFWIFSIGNALED[1]	Determines if a child process has exited because of a signal.
PXFWIFSTOPPED[1]	Determines if a child process has stopped.
PXFWRITE	Writes to a file.

1. L*X only

QuickWin and Graphics Routines (W*32, W*64)

QuickWin routines help you turn graphics programs into simple Windows* applications.

The graphics routines can be used in Standard Graphics applications and in Quickwin applications. They can also be used in QuickWin applications.

To use a Quickwin or graphics routine, add the following statement to the program unit containing the routine:

```
USE IFQWIN
```

For graphics routines, you must also choose the QuickWin Graphics or Standard Graphics program type.

Table 1-4 summarizes the QuickWin routines.

Table 1-4 Summary of QuickWin Routines (W*32, W*64)

Name	Description
Window Control and Inquiry:	
FOCUSQQ	Sets focus to specified window.
GETACTIVEQQ	Returns the unit number of the currently active child.
GETHWNDQQ	Converts the unit number into a Windows handle for functions that require it.
GETUNITQQ	Returns the unit number corresponding to the specified Windows handle.
GETWINDOWCONFIG	Returns current window properties.
GETWSIZEQQ	Returns the size and position of a window.
INQFOCUSQQ	Determines which window has focus.
SETACTIVEQQ	Makes a child window active, but does not give it focus.
SETWINDOWCONFIG	Sets current window properties.

Table 1-4 Summary of QuickWin Routines (W*32, W*64)

Name	Description
SETWSIZEQQ	Sets the size and position of a window.
QuickWin Application Enhancement:	
ABOUTBOXQQ	Adds an About Box with customized text.
APPENDMENUQQ	Appends a menu item.
CLICKMENUQQ	Simulates the effect of clicking or selecting a menu item.
DELETEMENUQQ	Deletes a menu item.
GETEXITQQ	Returns the setting for a QuickWin application's exit behavior.
INCHARQQ	Reads a single character input from the keyboard and returns the ASCII value of that character without any buffering.
INITIALSETTINGS	Controls initial menu settings and initial frame window.
INSERTMENUQQ	Inserts a menu item.
MESSAGEBOXQQ	Displays a message box.
MODIFYMENUFLAGSQQ	Modifies a menu item's state.
MODIFYMENUROUTINEQQ	Modifies a menu item's callback routine.
MODIFYMENUSTRINGQQ	Modifies a menu item's text string.
PASSDIRKEYSQQ	Determines the behavior of direction and page keys.
REGISTERMOUSEEVENT	Registers the application defined routines to be called on mouse events.
SETEXITQQ	Sets a QuickWin application's exit behavior.
SETMESSAGEQQ	Changes any QuickWin message, including status bar messages, state messages, and dialog box messages.
SETMOUSECURSOR	Sets the mouse cursor for the window in focus.
SETWINDOWMENUQQ	Sets the menu to which a list of current child window names are appended.
UNREGISTERMOUSEEVENT	Removes the routine registered by REGISTERMOUSEEVENT.
WAITONMOUSEEVENT	Blocks a return until a mouse event occurs.
Color Conversion:	
INTEGERTORGB	Converts an RGB color value to its red, green, and blue components.
RGBTOINTEGER	Converts integers specifying red, green, and blue color into an RGB integer (for use in RGB routines).

For more information, see the section on using QuickWin in "Using Windows* Features" in Volume I of your user’s guide.

Table 1-5 summarizes the graphics routines.

Table 1-5 Summary of Graphics Routines (W*32, W*64)

Name	Description
Color Control or Inquiry:[1]	
FLOODFILL	Fills an area using the current index and fill mask; fill starting point uses viewport coordinates.
FLOODFILL_W	Fills an area using the current index and fill mask; fill starting point uses window coordinates.
FLOODFILLRGB	Fills an area using the current RGB color and fill mask; fill starting point uses viewport coordinates.
FLOODFILLRGB_W	Fills an area using the current RGB color and fill mask; fill starting point uses viewport coordinates.
GETBKCOLOR	Returns current background color index for both text and graphics.
GETBKCOLORRGB	Returns current background RGB color value for both text and graphics.
GETCOLOR	Returns the current graphics color index.
GETCOLORRGB	Returns the current graphics color RGB value.
GETPIXEL	Returns the color index of a pixel; pixel is located using viewport coordinates.
GETPIXEL_W	Returns the color index of a pixel; pixel is located using window coordinates.
GETPIXELRGB	Returns the RGB color value of a pixel; pixel is located using viewport coordinates.
GETPIXELRGB_W	Returns the RGB color value of a pixel; pixel is located using window coordinates.
GETPIXELS	Returns the color indexes of multiple pixels.
GETPIXELSRGB	Returns the RGB color values of multiple pixels.
GETTEXTCOLOR	Returns the current text color index.
GETTEXTCOLORRGB	Returns the RGB color value of the current text.
REMAPALLPALETTERGB	Remaps an entire palette to an RGB color.
REMAPPALETTERGB	Remaps one color index to an RGB color.
SETBKCOLOR	Sets current background color index for both text and graphics.
SETBKCOLORRGB	Sets current background RGB color value for both text and graphics.
SETCOLOR	Sets the current graphics color index.
SETCOLORRGB	Sets the current graphics color to an RGB value.

Table 1-5 Summary of Graphics Routines (W*32, W*64)

Name	Description
SETPIXEL	Sets a pixel to the current graphics color index; pixel is located using viewport coordinates.
SETPIXEL_W	Sets a pixel to the current graphics color index; pixel is located using window coordinates.
SETPIXELRGB	Sets a pixel to an RGB color value; pixel is located using viewport coordinates.
SETPIXELRGB_W	Sets a pixel to an RGB color value; pixel is located using window coordinates.
SETPIXELS	Sets the color indexes of multiple pixels.
SETPIXELSRGB	Sets multiple pixels to an RGB color.
SETTEXTCOLOR	Sets the current text color index.
SETTEXTCOLORRGB	Sets the current text color to an RGB value.
Figure Characteristics:	
GETFILLMASK	Returns the current fill mask.
GETLINESTYLE	Returns the current line style.
GETWRITEMODE	Returns the logical write mode used when drawing lines.
SETCLIPRGN	Masks part of the screen; it does not change the viewport coordinates.
SETFILLMASK	Sets the current fill mask.
SETLINESTYLE	Sets the current line style.
SETWRITEMODE	Sets the logical write mode used when drawing lines.
Coordinate Conversion and Settings:	
GETPHYSCOORD	Converts viewpoint coordinates to physical coordinates.
GETVIEWCOORD	Converts physical coordinates to viewport coordinates.
GETVIEWCOORD_W	Converts window coordinates to viewport coordinates.
GETWINDOWCOORD	Converts viewport coordinates to window coordinates.
SETVIEWORG	Moves the viewport coordinate origin (0,0) to a specified physical point.
SETVIEWPORT	Redefines viewport bounds to the specified limits and sets the viewport coordinate origin to the upper-left corner of this region.
SETWINDOW	Defines a window bound by specified window coordinates.
Graphics Drawing:	
ARC	Draws an arc using viewport coordinates.
ARC_W	Draws an arc using window coordinates.
CLEARSCREEN	Clears the screen, viewport, or text window.

Table 1-5 Summary of Graphics Routines (W*32, W*64)

Name	Description
ELLIPSE	Draws an ellipse or circle using viewport coordinates.
ELLIPSE_W	Draws an ellipse or circle using window coordinates.
GETARCINFO	Returns the endpoints of the most recently drawn arc or pie.
GETCURRENTPOSITION	Returns the viewport coordinates of the current graphics-output position.
GETCURRENTPOSITION_W	Returns the window coordinates of the current graphics-output position.
GRSTATUS	Returns the status (success or failure) of the most recently called graphics routine.
LINETO	Draws a line from the current graphics-output position to a specified point using viewport coordinates.
LINETO_W	Draws a line from the current graphics-output position to a specified point using window coordinates.
LINETOAR	Draws a line between points in one array and corresponding points in another array.
LINETOAREX	Similar to LINETOAR, but also lets you specify color and line style.
MOVETO	Moves the current graphics-output position to a specified point using viewport coordinates.
MOVETO_W	Moves the current graphics-output position to a specified point using window coordinates.
PIE	Draws a pie-slice-shaped figure using viewport coordinates.
PIE_W	Draws a pie-slice-shaped figure using window coordinates.
POLYBEZIER	Draws a Bezier curve using viewport coordinates.
POLYBEZIER_W	Draws a Bezier curve using window coordinates.
POLYBEZIERTO	Draws a Bezier curve using viewport coordinates.
POLYBEZIERTO_W	Draws a Bezier curve using window coordinates.
POLYGON	Draws a polygon using viewport coordinates.
POLYGON_W	Draws a polygon using window coordinates.
POLYLINEQQ	Draws a line between successive points in an array.
RECTANGLE	Draws a rectangle using viewport coordinates.
RECTANGLE_W	Draws a rectangle using window coordinates.
Character-Based Text Display:	
DISPLAYCURSOR	Sets the cursor on or off.
GETTEXTPOSITION	Returns the current text-output position.

Table 1-5 Summary of Graphics Routines (W*32, W*64)

Name	Description
GETTEXTWINDOW	Returns the boundaries of the current text window.
OUTTEXT	Sends text to the screen at the current position.
SCROLLTEXTWINDOW	Scrolls the contents of a text window.
SETTEXTCURSOR	Sets the height and width of the text cursor for the window in focus.
SETTEXTPOSITION	Sets the current text-output position.
SETTEXTWINDOW	Sets the boundaries of the current text window.
WRAPON	Turns line wrapping on or off.
Font-Based Character Display:	
GETFONTINFO	Returns the current font characteristics.
GETGTEXTEXTENT	Returns the width of specified text in the current font.
GETGTEXTROTATION	Returns the current orientation of the font text output by OUTGTEXT.
INITIALIZEFONTS	Initializes the font library.
OUTGTEXT	Sends text in the current font to the screen at the current position.[2]
SETFONT	Finds one font that matches a specified set of characteristics and makes it the current font used by OUTGTEXT.
SETGTEXTROTATION	Sets the orientation angle of font text output in degrees.
Image Transfers in Memory:	
GETIMAGE	Stores a screen image using viewport coordinates.
GETIMAGE_W	Stores a screen image using window coordinates.
IMAGESIZE	Returns a viewport-coordinate image size in bytes.
IMAGESIZE_W	Returns a window-coordinate image size in bytes.
PUTIMAGE	Retrieves a viewport-coordinate image from memory and displays it.
PUTIMAGE_W	Retrieves a window-coordinate image from memory and displays it.
Image Loading and Saving:	
LOADIMAGE	Reads a Windows bitmap file (.BMP) from disk and displays it as specified viewport coordinates.
LOADIMAGE_W	Reads a Windows bitmap file (.BMP) from disk and displays it as specified window coordinates.
SAVEIMAGE	Saves an image from a specified part of the screen and saves it as a Windows bitmap file; screen location is specified using viewport coordinates.

Table 1-5 Summary of Graphics Routines (W*32, W*64)

Name	Description
SAVEIMAGE_W	Saves an image from a specified part of the screen and saves it as a Windows bitmap file; screen location is specified using window coordinates.

1. RGB is Red-Green-Blue
2. OUTGTEXT allows use of special fonts; OUTTEXT does not

For more information, see the sections on using QuickWin and drawing graphics in "Using Windows* Features" in Volume I of your user's guide.

Dialog Routines (W*32)

The dialog routines let you add dialog boxes to Windows*, QuickWin, and console applications. To activate a dialog box, add the following statement to the application's relevant program unit:

```
USE IFLOGM
```

Table 1-6 summarizes the dialog routines.

Table 1-6 Summary of Dialog Routines (W*32)

Name	Description
DLGEXIT	Closes an open dialog box.
DLGFLUSH	Updates the display of a dialog box.
DLGGET	Returns the value of a control variable.
DLGGETCHAR	Returns the value of a character control variable.
DLGGETINT	Returns the value of an integer control variable.
DLGGETLOG	Returns the value of a logical control variable.
DLGINIT	Initializes a dialog box.
DLGINITWITHRESOURCEHANDLE	Initializes a dialog box.
DLGISDLGMESSAGE	Determines whether a message is intended for a modeless dialog box.
DLGISDLGMESSAGEWITHDLG	Determines whether a message is intended for a specific modeless dialog box.
DLGMODAL	Displays a dialog box.
DLGMODALWITHPARENT	Displays a dialog box and indicates the parent window.
DLGMODELESS	Displays a modeless dialog box.
DLGSENDCTRLMESSAGE	Sends a message to a dialog box control.

Table 1-6 Summary of Dialog Routines (W*32)

Name	Description
DLGSET	Assigns a value to a control variable.
DLGSETCHAR	Assigns a value to a character control variable.
DLGSETCTRLEVENTHANDLER	Assigns user-written event handlers to ActiveX* controls in a dialog box.
DLGSETINT	Assigns a value to an integer control variable.
DLGSETLOG	Assigns a value to a logical control variable.
DLGSETRETURN	Sets the return value for DLGMODAL.
DLGSETSUB	Assigns a defined callback routine to a control.
DLGSETTITLE	Sets the title of a dialog box.
DLGUNINIT	Deallocates memory for an initialized dialog box.

For more information, see the section on using dialogs in "Using Windows* Features" in Volume I of your user's guide.

COM and AUTO Routines (W*32)

The COM and Auto routines help you write programs that use Component Object Model (COM) and Automation servers.

To use a COM routine, add the following statement to the program unit containing the routine:

```
USE IFCOM
```

To use an AUTO routine, add the following statement to the program unit containing the routine:

```
USE IFAUTO
```

Some of the routines may also require the statement USE IFWINTY.

Table 1-7 summarizes the COM routines. Routine names are shown in mixed case to make the names easier to understand. When writing your applications, you can use any case.

Table 1-7 Summary of COM Routines (W*32)

Name	Description
COMAddObjectReference	Adds a reference to an object's interface.
COMCLSIDFromProgID	Passes a programmatic identifier and returns the corresponding class identifier.
COMCLSIDFromString	Passes a class identifier string and returns the corresponding class identifier.

Table 1-7 Summary of COM Routines (W*32)

Name	Description
COMCreateObjectByGUID	Passes a class identifier, creates an instance of an object, and returns a pointer to the object's interface.
COMCreateObjectByProgID	Passes a programmatic identifier, creates an instance of an object, and returns a pointer to the object's IDispatch interface.
COMGetActiveObjectByGUID	Passes a class identifier and returns a pointer to the interface of a currently active object.
COMGetActiveObjectByProgID	Passes a programmatic identifier and returns a pointer to the IDispatch interface of a currently active object.
COMGetFileObject	Passes a file name and returns a pointer to the IDispatch interface of an automation object that can manipulate the file.
COMInitialize	Initializes the COM library.
COMIsEqualGUID	Determines whether two globally unique identifiers (GUIDs) are the same.
COMQueryInterface	Passes an interface identifier and returns a pointer to an object's interface.
COMReleaseObject	Indicates that the program is done with a reference to an object's interface.
COMStringFromGUID	Passes a globally unique identifier (GUID) and returns a string of printable characters.
COMUninitialize	Uninitializes the COM library.

Table 1-8 summarizes the AUTO routines. Routine names are shown in mixed case to make the names easier to understand. When writing your applications, you can use any case.

Table 1-8 Summary of AUTO Routines (W*32)

Name	Description
AUTOAddArg	Passes an argument name and value and adds the argument to the argument list data structure.
AUTOAllocateInvokeArgs	Allocates an argument list data structure that holds the arguments to be passed to AUTOInvoke.
AUTODeallocateInvokeArgs	Deallocates an argument list data structure.
AUTOGetExceptInfo	Retrieves the exception information when a method has returned an exception status.
AUTOGetProperty	Passes the name or identifier of the property and gets the value of the automation object's property.

Table 1-8 Summary of AUTO Routines (W*32)

Name	Description
AUTOGetPropertyByID	Passes the member ID of the property and gets the value of the automation object's property into the argument list's first argument.
AUTOGetPropertyInvokeArgs	Passes an argument list data structure and gets the value of the automation object's property specified in the argument list's first argument.
AUTOInvoke	Passes the name or identifier of an object's method and an argument list data structure and invokes the method with the passed arguments.
AUTOSetProperty	Passes the name or identifier of the property and a value, and sets the value of the automation object's property.
AUTOSetPropertyByID	Passes the member ID of the property and sets the value of the automation object's property, using the argument list's first argument.
AUTOSetPropertyInvokeArgs	Passes an argument list data structure and sets the value of the automation object's property specified in the argument list's first argument.

Miscellaneous Run-Time Routines

These routines help you write programs for applications. To use for_rtl_init_ and for_rtl_finish_, you must call them from a main program written in C. To use the other routines, add the following statement to the program unit containing the routine:

```
USE IFCORE
```

Table 1-9 summarizes these run-time routines:

Table 1-9 Summary of Miscellaneous Run-Time Routines

Name	Description
Keyboards and Speakers:	
GETCHARQQ	Returns the next keyboard keystroke.
GETSTRQQ	Reads a character string from the keyboard using buffered input.
PEEKCHARQQ	Checks the buffer to see if a keystroke is waiting.
File Management:	
COMMITQQ	Executes any pending write operations for the file associated with the specified unit to the file's physical device.

Table 1-9 Summary of Miscellaneous Run-Time Routines

Name	Description
Error Handling:	
GERROR	Returns the IERRNO error code as a string variable.
PERROR	Returns an error message, preceded by a string, for the last error detected.
Run-Time Environment:	
for_rtl_finish_	Cleans up the Fortran run-time environment.
for_rtl_init_	Initializes the Fortran run-time environment.
Floating-Point Inquiry and Control:	
FOR_GET_FPE	Returns the current settings of floating-point exception flags.
FOR_SET_FPE	Sets the floating-point exception flags.
GETEXCEPTIONPTRSQQ[1]	Returns a pointer to C run-time exception information pointers appropriate for use in signal handlers established with SIGNALQQ or direct calls to the C rtl signal( ) routine.
Reentrancy Mode Control:	
FOR_SET_REENTRANCY	Controls the type of reentrancy protection that the Run-Time Library exhibits.
Traceback:	
TRACEBACKQQ	Generates a stack trace.
Memory assignment:	
FOR_DESCRIPTOR_ASSIGN[1]	Creates an array descriptor in memory.

1. W*32, W*64

For more information on traceback, see the section on using traceback information in Volume I of your user's guide.

Descriptions of the Library Routines

2

This chapter contains the descriptions of Intel® Fortran library routines listed in alphabetical order. They are all language extensions to Fortran 95.

Modules must be included in programs that contain the following routines:

- Portability routines

  These routines require a USE IFPORT statement to access the portability library.
- POSIX* routines

  These routines require a USE IFPOSIX statement to access the POSIX library.
- NLS routines

  These routines require a USE IFNLS statement to access he NLS library. These routines are only available on Windows* systems.
- QuickWin and graphics routines

  These routines require a USE IFQWIN statement to access the Visual Fortran library and graphics modules. These routines are only available on Windows* systems.
- Serial port I/O routines

  These routines require a USE IFPORT statement to access the portability library. These routines are only available on Windows* systems on IA-32 processors.
- Dialog routines

  These routines require a USE IFLOGM statement to access the dialog library. These routines are only available on Windows* systems on IA-32 processors.
- Component Object Module (COM) server routines

  These routines require a USE IFCOM statement to access the COM library. These routines are only available on Windows* systems on IA-32 processors.
- Automation server routines

  These routines require a USE IFAUTO statement to access the AUTO library. These routines are only available on Windows* systems on IA-32 processors.

- "Miscellaneous Run-Time Routines"
  Most of these routines require a USE IFCORE statement to obtain the proper interfaces.

Required USE statements are prominent in the routine descriptions.

In addition to the appropriate USE statement, for some routines you must specify the types of libraries to be used when linking. For more information, see the following sections in Volume I of your user's guide:

- "Specifying Path, Library, and Include Directories"
- "Libraries Options"

Also see "Understanding Errors During the Build Process" in Volume I of your user's guide.

In the description of routines, pointers and handles are INTEGER(4) on IA-32 processors; INTEGER(8) on Intel® Itanium® processors.

ABORT

Portability Subroutine: Flushes and closes I/O buffers, and terminates program execution.

Module: USE IFPORT

Syntax

CALL ABORT [*string*]

string

(Input; optional) Character*(*). Allows you to specify an abort message at program termination. When ABORT is called, "abort:" is written to external unit 0, followed by *string*. If omitted, the default message written to external unit 0 is "abort: Fortran Abort Called."

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS LIB`

See Also: the EXIT and STOP statements in the *Language Reference*

Example

```
USE IFPORT
! The following prints "abort: Fortran Abort Called"
  CALL ABORT
! The following prints "abort: Out of here!"
  Call ABORT ("Out of here!")
```

ABOUTBOXQQ

QuickWin Function: Specifies the information displayed in the message box that appears when the user selects the About command from a QuickWin application's Help menu. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = ABOUTBOXQQ (*cstring*)

cstring

(Input; output) Character*(*). Null-terminated C string.

Results:

The value of the result is INTEGER(4). It is zero if successful; otherwise, nonzero.

If your program does not call ABOUTBOXQQ, the QuickWin run-time library supplies a default string. For further discussion, see "Using QuickWin" in your user's guide.

Compatibility

`QUICKWIN GRAPHICS  LIB`

Example

Consider the following:

```
    USE IFQWIN
    INTEGER(4) dummy
! Set the About box message
    dummy = ABOUTBOXQQ ('Matrix Multiplier\r      Version 1.0'C)
```

ACCESS

Portability Function: Determines if a file exists and how it can be accessed.

Module: USE IFPORT

Syntax

result = ACCESS (*name*, *mode*)

name

(Input) Character*(*). Name of the file whose accessibility is to be determined.

mode

(Input) Character*(*). Modes of accessibility to check for. Must be a character string of length one or greater containing only the characters "r", "w", "x", or "" (a blank). These characters are interpreted as follows.

Character	Meaning
r	Tests for read permission
w	Tests for write permission
x	Tests for execute permission. On Windows* systems, the extension of *name* must be .COM, .EXE, .BAT, .CMD, .PL, .KSH, or .CSH.
(blank)	Tests for existence

The characters within *mode* can appear in any order or combination. For example, wrx and r are legal forms of *mode* and represent the same set of inquiries.

Results:

The value of the result is INTEGER(4). It is zero if all inquiries specified by *mode* are true. If either argument is invalid, or if the file cannot be accessed in all of the modes specified, one of the following error codes is returned:

- EACCES: Access denied; the file's permission setting does not allow the specified access.
- EINVAL: The mode argument is invalid.
- ENOENT: File or path not found.

For a list of error codes, see "IERRNO".

The *name* argument can contain either forward or backward slashes for path separators.

On Windows* systems, all files are readable. A test for read permission always returns 0.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "GETFILEINFOQQ", the INQUIRE statement in the *Language Reference*

Example

```
USE IFPORT
! checks for read and write permission on the file "DATAFILE.TXT"
J = ACCESS ("DATAFILE.TXT", "rw")
PRINT *, J
! checks whether "DATAFILE.TXT" is executable. It is not, since
! it does not end in .COM, .EXE, .BAT, or .CMD
```

```
J = ACCESS ("DATAFILE.TXT","x")
PRINT *, J
```

ALARM

Portability Function: Causes a subroutine to begin execution after a specified amount of time has elapsed.

Module: USE IFPORT

Syntax

result = ALARM (*time*, *proc*)

time

(Input) Integer. Specifies the time delay, in seconds, between the call to ALARM and the time when *proc* is to begin execution. If *time* is 0, the alarm is turned off and no routine is called.

proc

(Input) Name of the procedure to call. The procedure takes no arguments and must be declared EXTERNAL.

Results:

The return value is INTEGER(4). It is zero if no alarm is pending. If an alarm is pending (has already been set by a previous call to ALARM), it returns the number of seconds remaining until the previously set alarm is to go off, rounded up to the nearest second.

After ALARM is called and the timer starts, the calling program continues for *time* seconds. The calling program then suspends and calls *proc*, which runs in another thread. When *proc* finishes, the alarm thread terminates, the original thread resumes, and the calling program resets the alarm. Once the alarm goes off, it is disabled until set again.

If *proc* performs I/O or otherwise uses the Fortran library, you need to compile it with one of the multithread libraries. For more information on multithreading, see "Creating Multithread Applications" in your user's guide.

The thread that *proc* runs in has a higher priority than any other thread in the process. All other threads are essentially suspended until *proc* terminates, or is blocked on some other event, such as I/O.

No alarms can occur after the main process ends. If the main program finishes or any thread executes an EXIT call, than any pending alarm is deactivated before it has a chance to run.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "RUNQQ"

Example

```
USE IFPORT
INTEGER(4) numsec, istat
EXTERNAL subprog
numsec = 4
write *, "subprog will begin in ", numsec, " seconds"
ISTAT = ALARM (numsec, subprog)
```

APPENDMENUQQ

QuickWin Function: Appends a menu item to the end of a menu and registers its callback subroutine. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = APPENDMENUQQ (*menuID*, *flags*, *text*, *routine*)

menuID

(Input) INTEGER(4). Identifies the menu to which the item is appended, starting with 1 as the leftmost menu.

flags

(Input) INTEGER(4). Constant indicating the menu state. Flags can be combined with an inclusive OR (see Results below). The following constants are available:

- $MENUGRAYED – Disables and grays out the menu item.
- $MENUDISABLED – Disables but does not gray out the menu item.
- $MENUENABLED – Enables the menu item.
- $MENUSEPARATOR – Draws a separator bar.
- $MENUCHECKED – Puts a check by the menu item.
- $MENUUNCHECKED – Removes the check by the menu item.

text

(Input) Character*(*). Menu item name. Must be a null-terminated C string, for example, 'WORDS OF TEXT'C.

routine

(Input) EXTERNAL. Callback subroutine that is called if the menu item is selected. All routines take a single LOGICAL parameter that indicates whether the menu item is checked or not. You can assign the following predefined routines to menus:

- WINPRINT – Prints the program.

- WINSAVE – Saves the program.
- WINEXIT – Terminates the program.
- WINSELECTTEXT – Selects text from the current window.
- WINSELECTGRAPHICS – Selects graphics from the current window.
- WINSELECTALL – Selects the entire contents of the current window.
- WININPUT – Brings to the top the child window requesting input and makes it the current window.
- WINCOPY – Copies the selected text and/or graphics from the current window to the Clipboard.
- WINPASTE – Allows the user to paste Clipboard contents (text only) to the current text window of the active window during a READ.
- WINCLEARPASTE – Clears the paste buffer.
- WINSIZETOFIT – Sizes output to fit window.
- WINFULLSCREEN – Displays output in full screen.
- WINSTATE – Toggles between pause and resume states of text output.
- WINCASCADE – Cascades active windows.
- WINTILE – Tiles active windows.
- WINARRANGE – Arranges icons.
- WINSTATUS – Enables a status bar.
- WININDEX – Displays the index for QuickWin help.
- WINUSING – Displays information on how to use Help.
- WINABOUT – Displays information about the current QuickWin application.
- NUL – No callback routine.

Results:

The result type is logical. It is .TRUE. if successful; otherwise, .FALSE..

You do not need to specify a menu item number, because APPENDMENUQQ always adds the new item to the bottom of the menu list. If there is no item yet for a menu, your appended item is treated as the top-level menu item (shown on the menu bar), and *text* becomes the menu title. APPENDMENUQQ ignores the callback routine for a top-level menu item if there are any other menu items in the menu. In this case, you can set *routine* to NUL.

If you want to insert a menu item into a menu rather than append to the bottom of the menu list, use INSERTMENUQQ.

The constants available for flags can be combined with an inclusive OR where reasonable, for example $MENUCHECKED .OR. $MENUENABLED. Some combinations do not make sense, such as $MENUENABLED and $MENUDISABLED, and lead to undefined behavior.

You can create quick-access keys in the text strings you pass to APPENDMENUQQ as *text* by placing an ampersand (&) before the letter you want underlined. For example, to add a Print menu item with the r underlined, *text* should be "P&rint". Quick-access keys allow users of your program to activate that menu item with the key combination `ALT+QUICK-ACCESS-KEY` (`ALT+R` in the example) as an alternative to selecting the item with the mouse.

For more information about customizing QuickWin menus, see "Using QuickWin" in your user's guide.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "INSERTMENUQQ", "DELETEMENUQQ", "MODIFYMENUFLAGSQQ", "MODIFYMENUROUTINEQQ", "MODIFYMENUSTRINGQQ"

Example

```
    USE IFQWIN
    LOGICAL(4) result
    CHARACTER(25) str
     ...
! Append two items to the bottom of the first (FILE) menu
    str    = '&Add to File Menu'C ! 'A' is a quick-access key
    result = APPENDMENUQQ(1, $MENUENABLED, str, WINSTATUS)
    str    = 'Menu Item &2b'C ! '2' is a quick-access key
    result = APPENDMENUQQ(1, $MENUENABLED, str, WINCASCADE)
! Append an item to the bottom of the second (EDIT) menu
    str    = 'Add to Second &Menu'C ! 'M' is a quick-access key
    result = APPENDMENUQQ(2, $MENUENABLED, str, WINTILE)
```

ARC, ARC_W

Graphics Functions: Draw elliptical arcs using the current graphics color. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = ARC (*x1*, *y1*, *x2*, *y2*, *x3*, *y3*, *x4*, *y4*)

result = ARC_W (*wx1*, *wy1*, *wx2*, *wy2*, *wx3*, *wy3*, *wx4*, *wy4*)

x1, *y1*

(Input) INTEGER(2). Viewport coordinates for upper-left corner of bounding rectangle.

wx1, *y2*

(Input) INTEGER(2). Viewport coordinates for lower-right corner of bounding rectangle.

x3, *y3*

(Input) INTEGER(2). Viewport coordinates of start vector.

x4, *y4*

(Input) INTEGER(2). Viewport coordinates of end vector.

wx1,*wy1*

(Input) REAL(8). Window coordinates for upper-left corner of bounding rectangle.

wx2,*wy2*

(Input) REAL(8). Window coordinates for lower-right corner of bounding rectangle.

wx3,*wy3*

(Input) REAL(8). Window coordinates of start vector.

wx4,*wy4*

(Input) REAL(8). Window coordinates of end vector.

Results:

The result type is INTEGER(2). It is nonzero if successful; otherwise, 0. If the arc is clipped or partially out of bounds, the arc is considered successfully drawn and the return is 1. If the arc is drawn completely out of bounds, the return is 0.

The center of the arc is the center of the bounding rectangle defined by the points (*x1*, *y1*) and (*x2*, *y2*) for ARC and (*wx1*, *wy1*) and (*wx2*, *wy2*) for ARC_W.

The arc starts where it intersects an imaginary line extending from the center of the arc through (*x3*, *y3*) for ARC and (*wx3*, *wy3*) for ARC_W. It is drawn counterclockwise about the center of the arc, ending where it intersects an imaginary line extending from the center of the arc through (*x4*, *y4*) for ARC and (*wx4*, *wy4*) for ARC_W.

ARC uses the view-coordinate system. ARC_W uses the window-coordinate system. In each case, the arc is drawn using the current color.

NOTE. *The* ARC *routine described here is a QuickWin graphics routine. If you are trying to use the Win32* SDK version of the Arc routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$Arc. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

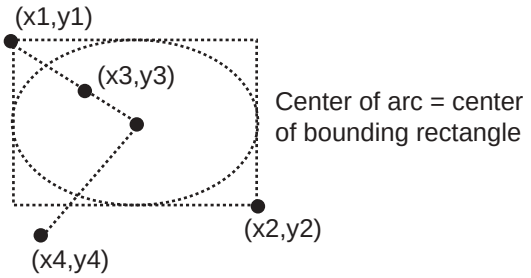
STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

Example

This program draws the arc shown below.

```
USE IFQWIN
INTEGER(2) status, x1, y1, x2, y2, x3, y3, x4, y4

x1 = 80; y1 = 50
x2 = 240; y2 = 150
x3 = 120; y3 = 75
x4 = 90; y4 = 180
status = ARC( x1, y1, x2, y2, x3, y3, x4, y4 )
END
```



AUTOAddArg

AUTO Subroutine: Passes an argument name and value and adds the argument to the argument list data structure. This subroutine is only available on Windows* systems on IA-32 processors.

Modules: USE IFAUTO, USE IFWINTY

Syntax

CALL AUTOAddArg (*invoke_args*, *name*, *value* [, *intent_arg*] [, *type*])

invoke_args

The argument list data structure. Must be of type INTEGER(4).

name

The argument's name of type CHARACTER*(*).

value

The argument's value. Must be of type INTEGER(2), INTEGER(4), REAL(4), REAL(8), LOGICAL(2), LOGICAL(4), CHARACTER*(*), or a single dimension array of one of these types. Can also be of type VARIANT, which is defined in the IFWINTY module.

intent_arg

Indicates the intended use of the argument by the called method. Must be one of the following constants defined in the IFAUTO module:

- AUTO_ARG_IN: The argument's value is read by the called method, but not written. This is the default value if *intent_arg* is not specified.
- AUTO_ARG_OUT: The argument's value is written by the called method, but not read.
- AUTO_ARG_INOUT: The argument's value is read and written by the called method.

When the value of *intent_arg* is AUTO_ARG_OUT or AUTO_ARG_INOUT, the variable used in the *value* parameter should be declared using the VOLATILE attribute. This is because the value of the variable will be changed by the subsequent call to AUTOInvoke. The compiler's global optimizations need to know that the value can change unexpectedly.

type

The variant type of the argument. Must be one of the following constants defined in the IFWINTY module:

VARIANT Type	Value Type
VT_I2	INTEGER(2)
VT_I4	INTEGER(4)
VT_R4	REAL(4)
VT_R8	REAL(8)
VT_CY	REAL(8)
VT_DATE	REAL(8)
VT_BSTR	CHARACTER*(*)
VT_DISPATCH	INTEGER(4)
VT_ERROR	INTEGER(4)
VT_BOOL	LOGICAL(2)
VT_VARIANT	TYPE(VARIANT)
VT_UNKNOWN	INTEGER(4)

See Also: "AUTOInvoke", the VOLATILE attribute in the *Language Reference*

Example

See the example in "COMInitialize".

AUTOAllocateInvokeArgs

AUTO Function: Allocates an argument list data structure that holds the arguments to be passed to AUTOInvoke. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFAUTO

Syntax

```
result = AUTOAllocateInvokeArgs( )
```

Results:

The value returned is an argument list data structure of type INTEGER(4).

See Also: "AUTOInvoke"

Example

See the example in "COMInitialize".

AUTODeallocateInvokeArgs

AUTO Subroutine: Deallocates an argument list data structure. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFAUTO

Syntax

```
CALL AUTODeallocateInvokeArgs (invoke_args)
```

invoke_args

The argument list data structure. Must be of type INTEGER(4).

Example

See the example in "COMInitialize".

AUTOGetExceptInfo

AUTO Subroutine: Retrieves the exception information when a method has returned an exception status. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFAUTO

Syntax

CALL AUTOGetExceptInfo (*invoke_args*, *code*, *source*, *description*, *h_file*, *h_context*, *scode*)

invoke_args

The argument list data structure. Must be of type INTEGER(4).

code

An output argument that returns the error code. Must be of type INTEGER(2).

source

An output argument that returns a human-readable name of the source of the exception. Must be of type CHARACTER*(*).

description

An output argument that returns a human-readable description of the error. Must be of type CHARACTER*(*).

h_file

An output argument that returns the fully qualified path of a Help file with more information about the error. Must be of type CHARACTER*(*).

h_context

An output argument that returns the Help context of the topic within the Help file. Must be of type INTEGER(4).

scode

An output argument that returns an SCODE describing the error. Must be of type INTEGER(4).

AUTOGetProperty

AUTO Function: Passes the name or identifier of the property and gets the value of the automation object's property. This function is only available on Windows* systems on IA-32 processors.

Modules: USE IFAUTO, USE IFWINTY

Syntax

result = AUTOGetProperty (*idispatch*, *id*, *value* [, *type*])

idispatch

The object's IDispatch interface pointer. Must be of type INTEGER(4).

id

The argument's name of type CHARACTER*(*), or its member ID of type INTEGER(4).

value

An output argument that returns the argument's value. Must be of type INTEGER(2), INTEGER(4), REAL(4), REAL(8), LOGICAL(2), LOGICAL(4), CHARACTER*(*), or a single dimension array of one of these types.

type

The variant type of the requested argument. Must be one of the following constants defined in the IFWINTY module:

VARIANT Type	Value Type
VT_I2	INTEGER(2)
VT_I4	INTEGER(4)
VT_R4	REAL(4)
VT_R8	REAL(8)
VT_CY	REAL(8)
VT_DATE	REAL(8)
VT_BSTR	CHARACTER*(*)
VT_DISPATCH	INTEGER(4)
VT_ERROR	INTEGER(4)
VT_BOOL	LOGICAL(2)
VT_UNKNOWN	INTEGER(4)

Results:

Returns an HRESULT describing the status of the operation. Must be of type INTEGER(4).

AUTOGetPropertyByID

AUTO Function: Passes the member ID of the property and gets the value of the automation object's property into the argument list's first argument. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFAUTO

Syntax

result = AUTOGetPropertyByID (*idispatch*, *memid*, *invoke_args*)

idispatch

The object's IDispatch interface pointer. Must be of type INTEGER(4).

memid

Member ID of the property. Must be of type INTEGER(4).

invoke_args

The argument list data structure. Must be of type INTEGER(4).

Results:

Returns an HRESULT describing the status of the operation. Must be of type INTEGER(4).

AUTOGetPropertyInvokeArgs

AUTO Function: Passes an argument list data structure and gets the value of the automation object's property specified in the argument list's first argument. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFAUTO

Syntax

result = AUTOGetPropertyInvokeArgs (*idispatch*, *invoke_args*)

idispatch

The object’s IDispatch interface pointer. Must be of type INTEGER(4).

invoke_args

The argument list data structure. Must be of type INTEGER(4).

Results:

Returns an HRESULT describing the status of the operation. Must be of type INTEGER(4).

AUTOInvoke

AUTO Function: Passes the name or identifier of an object's method and an argument list data structure and invokes the method with the passed arguments. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFAUTO

Syntax

result = AUTOInvoke (*idispatch*, *id*, *invoke_args*)

idispatch

The object’s IDispatch interface pointer. Must be of type INTEGER(4).

id

The argument's name of type CHARACTER*(*), or its member ID of type INTEGER(4).

invoke_args

The argument list data structure. Must be of type INTEGER(4).

Results:

Returns an HRESULT describing the status of the operation. Must be of type INTEGER(4).

Example

See the example in "COMInitialize".

AUTOSetProperty

AUTO Function: Passes the name or identifier of the property and a value, and sets the value of the automation object's property. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFAUTO, USE IFWINTY

Syntax

result = AUTOSetProperty (*idispatch*, *id*, *value* [, *type*])

idispatch

The object's IDispatch interface pointer. Must be of type INTEGER(4).

id

The argument's name of type CHARACTER*(*), or its member ID of type INTEGER(4).

value

The argument's value. Must be of type INTEGER(2), INTEGER(4), REAL(4), REAL(8), LOGICAL(2), LOGICAL(4), CHARACTER*(*), or a single dimension array of one of these types.

type

The variant type of the argument. Must be one of the following constants defined in the IFWINTY module:

VARIANT Type	Value Type
VT_I2	INTEGER(2)
VT_I4	INTEGER(4)
VT_R4	REAL(4)

VARIANT Type	Value Type
VT_R8	REAL(8)
VT_CY	REAL(8)
VT_DATE	REAL(8)
VT_BSTR	CHARACTER*(*)
VT_DISPATCH	INTEGER(4)
VT_ERROR	INTEGER(4)
VT_BOOL	LOGICAL(2)
VT_UNKNOWN	INTEGER(4)

Results:

Returns an HRESULT describing the status of the operation. Must be of type INTEGER(4).

AUTOSetPropertyByID

AUTO Function: Passes the member ID of the property and sets the value of the automation object's property into the argument list's first argument. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFAUTO

Syntax

result = AUTOSetPropertyByID (*idispatch*, *memid*, *invoke_args*)

idispatch

The object's IDispatch interface pointer. Must be of type INTEGER(4).

memid

Member ID of the property. Must be of type INTEGER(4).

invoke_args

The argument list data structure. Must be of type INTEGER(4).

Results:

Returns an HRESULT describing the status of the operation. Must be of type INTEGER(4).

AUTOSetPropertyInvokeArgs

AUTO Function: Passes an argument list data structure and sets the value of the automation object's property specified in the argument list's first argument. This function is only available on Windows* systems on IA-32 processors..

Module: USE IFAUTO

Syntax

result = AUTOSetPropertyInvokeArgs (*idispatch*, *invoke_args*)

idispatch

The object's IDispatch interface pointer. Must be of type INTEGER(4).

invoke_args

The argument list data structure. Must be of type INTEGER(4).

Results:

Returns an HRESULT describing the status of the operation. Must be of type INTEGER(4).

BEEPQQ

Portability Subroutine: Sounds the speaker at the specified frequency for the specified duration in milliseconds.

Module: USE IFPORT

Syntax

CALL BEEPQQ (*frequency*, *duration*)

frequency

(Input) INTEGER(4). Frequency of the tone in Hz.

duration

(Input) INTEGER(4). Length of the beep in milliseconds.

BEEPQQ does not return until the sound terminates.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "SLEEPQQ"

Example

```
USE IFPORT
INTEGER(4) frequency, duration
frequency = 4000
```

```
duration  = 1000
CALL BEEPQQ(frequency, duration)
```

BESJ0, BESJ1, BESJN, BESY0, BESY1, BESYN

Portability Functions: Compute the single-precision values of Bessel functions of the first and second kinds.

Module: USE IFPORT

Syntax

result = BESJ0 (*posvalue*)
result = BESJ1 (*posvalue*)
result = BESJN (*n*, *posvalue*)
result = BESY0 (*posvalue*)
result = BESY1 (*posvalue*)
result = BESYN (*n*, *posvalue*)

posvalue

(Input) REAL(4). Independent variable for a Bessel function. Must be greater than or equal to zero.

n

(Input) INTEGER(4). Specifies the order of the selected Bessel function computation.

Results:

BESJ0, BESJ1, and BESJN return Bessel functions of the first kind, orders 0, 1, and *n*, respectively, with the independent variable *posvalue*.

BESY0, BESY1, and BESYN return Bessel functions of the second kind, orders 0, 1, and *n*, respectively, with the independent variable *posvalue*.

Negative arguments cause BESY0, BESY1, and BESYN to return QNAN.

Bessel functions are explained more fully in most mathematics reference books, such as the *Handbook of Mathematical Functions* (Abramowitz and Stegun. Washington: U.S. Government Printing Office, 1964). These functions are commonly used in the mathematics of electromagnetic wave theory.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DBESJ0, DBESJ1, DBESJN, DBESY0, DBESY1, DBESYN"

BIC, BIS

Portability Subroutines: Perform a bit-level set and clear for integers.

Module: USE IFPORT

Syntax

CALL BIC (*bitnum*, *target*)
CALL BIS (*bitnum*, *target*)

bitnum

(Input) INTEGER(4). Bit number to set. Must be in the range 0 (least significant bit) to 31 (most significant bit) if *target* is INTEGER(4). If *target* is INTEGER(8), *bitnum* must be in range 0 to 63.

target

(Input; output) INTEGER(4) or INTEGER(8). Variable whose bit is to be set.

BIC sets bit *bitnum* of *target* to 0; BIS sets bit *bitnum* to 1.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "BIT"

Example

Consider the following:

```
USE IFPORT
integer(4) bitnum, target_i4
integer(8) target_i8
target_i4 = Z'AAAA'
bitnum = 1
call BIC(bitnum, target_i4)
target_i8 = Z'FFFFFFFF00000000'
bitnum = 40
call BIC(bitnum, target_i8)
bitnum = 0
call BIS(bitnum, target_i4)
bitnum = 1
call BIS(bitnum, target_i8)
print '(" integer*4 result ",Z)', target_i4
print '(" integer*8 result ",Z)', target_i8
end
```

BIT

Portability Function: Performs a bit-level test for integers.

Module: USE IFPORT

Syntax

result = BIT (*bitnum*, *source*)

bitnum

(Input) INTEGER(4). Bit number to test. Must be in the range 0 (least significant bit) to 31 (most significant bit).

source

(Input) INTEGER(4) or INTEGER(8). Variable being tested.

Results:

The result type is logical. It is .TRUE. if bit *bitnum* of *source* is 1; otherwise, .FALSE..

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "BIC, BIS"

BSEARCHQQ

Portability Function: Performs a binary search of a sorted one-dimensional array for a specified element. The array elements cannot be derived types or structures.

Module: USE IFPORT

Syntax

result = BSEARCHQQ (*adrkey*, *adrarray*, *length*, *size*)

adrkey

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. Address of the variable containing the element to be found (returned by LOC).

adrarray

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. Address of the array (returned by LOC).

length

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. Number of elements in the array.

size

(Input) INTEGER(4). Positive constant less than 32,767 that specifies the kind of array to be sorted. The following constants, defined in `IFPORT.F90`, specify type and kind for numeric arrays:

Constant	Type of array
SRT$INTEGER1	INTEGER(1)
SRT$INTEGER2	INTEGER(2) or equivalent
SRT$INTEGER4	INTEGER(4) or equivalent
SRT$REAL4	REAL(4) or equivalent
SRT$REAL8	REAL(8) or equivalent

If the value provided in *size* is not a symbolic constant and is less than 32,767, the array is assumed to be a character array with *size* characters per element.

Results:

The result type is INTEGER(4). It is an array index of the matched entry, or 0 if the entry is not found.

The array must be sorted in ascending order before being searched.

CAUTION. *The location of the array and the element to be found must both be passed by address using the* LOC *function. This defeats Fortran type checking, so you must make certain that the length and size arguments are correct, and that size is the same for the element to be found and the array searched.*

If you pass invalid arguments, BSEARCHQQ *attempts to search random parts of memory. If the memory it attempts to search is not allocated to the current process, the program is halted, and you receive a General Protection Violation message.*

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "SORTQQ", the LOC intrinsic function in the *Language Reference*

Example

```
USE IFPORT
INTEGER(4) array(10), length
```

```
INTEGER(4) result, target
length = SIZE(array)
...
result = BSEARCHQQ(LOC(target),LOC(array),length,SRT$INTEGER4)
```

CDFLOAT

Portability Function: Converts a COMPLEX(4) argument to double-precision real type.

Module: USE IFPORT

Syntax

result = CDFLOAT (*input*)

input

(Input) COMPLEX(4). The value to be converted.

Results:

The result type is REAL(8).

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

CHANGEDIRQQ

Portability Function: Makes the specified directory the current, default directory.

Module: USE IFPORT

Syntax

result = CHANGEDIRQQ (*dir*)

dir

(Input) Character*(*). Directory to be made the current directory.

Results:

The result type is LOGICAL(4). It is .TRUE. if successful; otherwise, .FALSE..

If you do not specify a drive in the *dir* string, the named directory on the current drive becomes the current directory. If you specify a drive in *dir*, the named directory on the specified drive becomes the current directory.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "GETDRIVEDIRQQ", "MAKEDIRQQ", "DELDIRQQ", "CHANGEDRIVEQQ"

Example

```
USE IFPORT
LOGICAL(4) status
status = CHANGEDIRQQ('d:\fps90\bin\bessel')
```

CHANGEDRIVEQQ

Portability Function: Makes the specified drive the current, default drive.

Module: USE IFPORT

Syntax

result = CHANGEDRIVEQQ (*drive*)

drive

(Input) Character*(*). String beginning with the drive letter.

Results:

The result type is LOGICAL(4). On Windows* systems, the result is .TRUE. if successful; otherwise, .FALSE. On Linux* systems, the result is always .FALSE..

Because drives are identified by a single alphabetic character, CHANGEDRIVEQQ examines only the first character of *drive*. The drive letter can be uppercase or lowercase.

CHANGEDRIVEQQ changes only the current drive. The current directory on the specified drive becomes the new current directory. If no current directory has been established on that drive, the root directory of the specified drive becomes the new current directory.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "GETDRIVESQQ", "GETDRIVESIZEQQ", "GETDRIVEDIRQQ", "CHANGEDIRQQ"

Examples

```
USE IFPORT
LOGICAL(4) status
status = CHANGEDRIVEQQ('d')
```

Consider the following:

```
USE IFPORT
LOGICAL(4) CHANGEDIT
CHANGEDIT = CHANGEDRIVEQQ('d')
IF (CHANGEDIT) THEN
  PRINT *,'CHANGEDRIVEQQ SUCCESSFUL'
```

```
ELSE
  PRINT *,'Drive could not be changed'
ENDIF
END
```

CHDIR

Portability Function: Changes the default directory.

Module: USE IFPORT

Syntax

result = CHDIR (*dir_name*)

dir_name

(Input) Character*(*). Name of a directory to become the default directory.

Results:

The result type is INTEGER(4). It returns zero if the directory was changed successfully; otherwise, an error code. Possible error codes are:

- ENOENT: The named directory does not exist.
- ENOTDIR: The *dir_name* parameter is not a directory.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "CHANGEDIRQQ"

Examples

```
     use ifport
     integer(4) istatus, enoent, enotdir
     character(255)  newdir
     character(300)  prompt, errmsg

     prompt = 'Please enter directory name: '
10   write(*,*)  TRIM(prompt)
     read *, newdir
     ISTATUS = CHDIR(newdir)
     select case (istatus)
       case (2)  ! ENOENT
         errmsg = 'The directory '//TRIM(newdir)//' does not exist'
       case (20) ! ENOTDIR
         errmsg = TRIM(newdir)//' is not a directory'
```

```
        case (0) ! NO error
          goto 40
        case default
          write (errmsg,*) 'Error with code ', istatus
      end select

      write(*,*)  TRIM(errmsg)
      goto 10

40    write(*,*) 'Default directory successfully changed.'
end
```

The following shows another example:

```
USE IFPORT
CHARACTER(LEN=16) NEW_DIRECTORY
LOGICAL(4) CHANGEDIT
NEW_DIRECTORY='c:\program files'
CHANGEDIT=CHDIR(NEW_DIRECTORY)
IF (CHANGEDIT)  THEN
    PRINT *, 'CHDIR SUCCESSFUL'
ELSE
    PRINT *,'Directory could not be changed'
ENDIF
END
```

CHMOD

Portability Function: Changes the access mode of a file.

Module: USE IFPORT

Syntax

result = CHMOD (*name*, *mode*)

name

(Input) Character*(*). Name of the file whose access mode is to be changed. Must have a single path.

mode

(Input) Character*(*). File permission: either Read, Write, or Execute. The *mode* parameter can be either symbolic or absolute. An absolute mode is specified with an octal number, consisting of any combination of the following permission bits ORed together:

Permission Bit	Description	Action
4000	Set user ID on execution	W*32, W*64: Ignored; never true L*X: Settable
2000	Set group ID on execution	W*32, W*64: Ignored; never true L*X: Settable
1000	Sticky bit	W*32, W*64: Ignored; never true L*X: Settable
0400	Read by owner	W*32, W*64: Ignored; always true L*X: Settable
0200	Write by owner	Settable
0100	Execute by owner	W*32, W*64: Ignored; based on file name extension L*X: Settable
0040, 0020, 0010	Read, Write, Execute by group	W*32, W*64: Ignored; assumes owner permissions L*X: Settable
0004, 0002, 0001	Read, Write, Execute by others	W*32, W*64: Ignored; assumes owner permissions L*X: Settable

The following regular expression represents a symbolic mode:

```
[ugoa]*[+-=] [rwxXst]*
```

"[ugoa]*" is ignored on Windows* systems. On Linux* systems, a combination of the letters "ugoa" control which users' access to the file will be changed:

u	The user who owns the file
g	Other users in the group that owns the file
o	Other users *not* in the group that owns the file
a	All users

"[+ - =]" indicates the operation to carry out:

+	Add the permission
–	Remove the permission
=	Absolutely set the permission

"[rwxXst]*" indicates the permission to add, subtract, or set. On Windows systems, only "w" is significant and affects write permission; all other letters are ignored. On Linux systems, all letters are significant.

Results:

The result type is INTEGER(4). The result is zero if the mode was changed successfully; otherwise, an error code. Possible error codes are:

- ENOENT: The specified file was not found.
- EINVAL: The mode argument is invalid.
- EPERM: Permission denied; the file's mode cannot be changed.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "SETFILEACCESSQQ"

Example

```
USE IFPORT
integer(4) I,Istatus
I = ACCESS ("DATAFILE.TXT", "w")
if (i) then
   ISTATUS = CHMOD ("datafile.txt", "[+w]")
end if
I = ACCESS ("DATAFILE.TXT","w")
print *, i
```

CLEARSCREEN

Graphics Subroutine: Erases the target area and fills it with the current background color. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL CLEARSCREEN (*area*)

area

(Input) INTEGER(4). Identifies the target area. Must be one of the following symbolic constants (defined in `IFQWIN.F90`):

- $GCLEARSCREEN - Clears the entire screen.
- $GVIEWPORT - Clears only the current viewport.
- $GWINDOW - Clears only the current text window (set with SETTEXTWINDOW).

All pixels in the target area are set to the color specified with SETBKCOLORRGB. The default color is black.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETBKCOLORRGB", "SETBKCOLORRGB", "SETTEXTWINDOW", "SETVIEWPORT"

Example

```
USE IFQWIN
CALL CLEARSCREEN ($GCLEARSCREEN)
```

CLEARSTATUSFPQQ

Portability Subroutine: Clears the exception flags in the floating-point processor status word.

Module: USE IFPORT

Syntax

CALL CLEARSTATUSFPQQ ( )

The floating-point status word indicates which floating-point exception conditions have occurred. Intel® Visual Fortran initially clears (sets to 0) all floating-point status flags, but as exceptions occur, the status flags accumulate until the program clears the flags again. CLEARSTATUSFPQQ will clear the flags.

CLEARSTATUSFPQQ is appropriate for use in applications that poll the floating-point status register as the method for detecting a floating-point exception has occurred.

For a full description of the floating-point status word, exceptions, and error handling, see "The Floating Point Environment" in your user's guide.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETSTATUSFPQQ", "SETCONTROLFPQQ", "GETCONTROLFPQQ", "SIGNALQQ"

Example

```
! Program to demonstrate CLEARSTATUSFPQQ.
! This program uses polling to detect that a
! floating-point exception has occurred.
! So, build this console application with the default
! floating-point exception behavior, fpe3.
  PROGRAM CLEARFP
  USE IFPORT
```

```
      REAL*4 A,B,C
      INTEGER*2 STS

      A = 2.0E0
      B = 0.0E0

! Poll and display initial floating point status
      CALL GETSTATUSFPQQ(STS)
      WRITE(*,'(1X,A,Z4.4)') 'Initial fp status = ',STS

! Cause a divide-by-zero exception
! Poll and display the new floating point status
      C = A/B
      CALL GETSTATUSFPQQ(STS)
      WRITE(*,'(1X,A,Z4.4)') 'After div-by-zero fp status = ',STS

! If a divide by zero error occurred, clear the floating point
! status register so future exceptions can be detected.
      IF ((STS .AND. FPSW$ZERODIVIDE) > 0) THEN
        CALL CLEARSTATUSFPQQ()
        CALL GETSTATUSFPQQ(STS)
        WRITE(*,'(1X,A,Z4.4)') 'After CLEARSTATUSFPQQ fp status = ',STS
      ENDIF
      END
```

CLICKMENUQQ

QuickWin Function: Simulates the effect of clicking or selecting a menu command. The QuickWin application responds as though the user had clicked or selected the command. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = CLICKMENUQQ (*item*)

item

(Input) INTEGER(4). Constant that represents the command selected from the Window menu. Must be one of the following symbolic constants (defined in `IFQWIN.F90`):

- QWIN$STATUS - Status command
- QWIN$TILE - Tile command

- QWIN$CASCADE - Cascade command
- QWIN$ARRANGE - Arrange Icons command

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, nonzero.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "REGISTERMOUSEEVENT", "UNREGISTERMOUSEEVENT", "WAITONMOUSEEVENT", "Using QuickWin" in your user's guide

CLOCK

Portability Function: Converts a system time into an 8-character ASCII string.

Module: USE IFPORT

Syntax

result = CLOCK ( )

Results:

The result type is character with a length of 8. The result is the current time in the form hh:mm:ss, using a 24-hour clock.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: the DATE_AND_TIME intrinsic procedure in the *Language Reference*

Example

```
USE IFPORT
character(8) whatimeisit
whatimeisit = CLOCK ()
print *, 'The current time is ',whatimeisit
```

CLOCKX

Portability Subroutine: Returns the processor clock to the nearest microsecond.

Module: USE IFPORT

Syntax

CALL CLOCKX (*clock*)

clock

(Input) REAL(8). The current time.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

COMAddObjectReference

COM Function: Adds a reference to an object's interface. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFCOM

Syntax

result = COMAddObjectReference (*iunknown*)

iunknown

An IUnKnown interface pointer. Must be of type INTEGER(4).

Results:

The result type is INTEGER(4). It is the object's current reference count.

COMCLSIDFromProgID

COM Subroutine: Passes a programmatic identifier and returns the corresponding class identifier. This subroutine is only available on Windows* systems on IA-32 processors.

Modules: USE IFCOM, USE IFWINTY

Syntax

CALL COMCLSIDFromProgID (*prog_id*, *clsid*, *status*)

prog_id

The programmatic identifier of type CHARACTER*(*).

clsid

The class identifier corresponding to the programmatic identifier. Must be of type GUID, which is defined in the IFWINTY module.

status

The status of the operation. It can be any status returned by CLSIDFromProgID (see the Win32* SDK). Must be of type INTEGER(4).

COMCLSIDFromString

COM Subroutine: Passes a class identifier string and returns the corresponding class identifier. This subroutine is only available on Windows* systems on systems on IA-32 processors.

Modules: USE IFCOM, USE IFWINTY

Syntax

CALL COMCLSIDFromString (*string*, *clsid*, *status*)

string

The class identifier string of type CHARACTER*(*).

clsid

The class identifier corresponding to the identifier string. Must be of type GUID, which is defined in the IFWINTY module.

status

The status of the operation. It can be any status returned by CLSIDFromString (see the Win32* SDK). Must be of type INTEGER(4).

COMCreateObjectByGUID

COM Subroutine: Passes a class identifier, creates an instance of an object, and returns a pointer to the object's interface. This subroutine is only available on Windows* systems on systems on IA-32 processors.

Modules: USE IFCOM, USE IFWINTY

Syntax

CALL COMCreateObjectByGUID (*clsid*, *clsctx*, *iid*, *interface*, *status*)

clsid

The class identifier of the class of object to be created. Must be of type GUID, which is defined in the IFWINTY module.

clsctx

Lets you restrict the types of servers used for the object. Must be of type INTEGER(4). Must be one of the CLSCTX_* constants defined in the IFWINTY module.

iid

The interface identifier of the interface being requested. Must be of type GUID, which is defined in the IFWINTY module.

interface

An output argument that returns the object's interface pointer. Must be of type INTEGER(4).

status

The status of the operation. It can be any status returned by CoCreateInstance (see the Win32* SDK). Must be of type INTEGER(4).

COMCreateObjectByProgID

COM Subroutine: Passes a programmatic identifier, creates an instance of an object, and returns a pointer to the object's IDispatch interface. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFCOM

Syntax

CALL COMCreateObjectByProgID (*prog_id*, *idispatch*, *status*)

prog_id

The programmatic identifier of type CHARACTER*(*).

idispatch

An output argument that returns the object's IDispatch interface pointer. Must be of type INTEGER(4.

status

The status of the operation. It can be any status returned by CLSIDFromProgID or CoCreateInstance (see the Win32* SDK). Must be of type INTEGER(4).

COMGetActiveObjectByGUID

COM Subroutine: Passes a class identifier and returns a pointer to the interface of a currently active object. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFCOM, USE IFWINTY

Syntax

CALL COMGetActiveObjectByGUID (*clsid*, *iid*, *interface*, *status*)

clsid

The class identifier of the class of object to be found. Must be of type GUID, which is defined in the IFWINTY module.

iid

The interface identifier of the interface being requested. Must be of type GUID, which is defined in the IFWINTY module.

interface

An output argument that returns the object's interface pointer. Must be of type INTEGER(4).

status

The status of the operation. It can be any status returned by GetActiveObject (see the Win32* SDK). Must be of type INTEGER(4).

COMGetActiveObjectByProgID

COM Subroutine: Passes a programmatic identifier and returns a pointer to the IDispatch interface of a currently active object. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFCOM

Syntax

CALL COMGetActiveObjectByProgID (*prog_id*, *idispatch*, *status*)

prog_id

The programmatic identifier of type CHARACTER*(*).

idispatch

An output argument that returns the object's IDispatch interface pointer. Must be of type INTEGER(4).

status

The status of the operation. It can be any status returned by CLSIDFromProgID or GetActiveObject (see the Win32* SDK). Must be of type INTEGER(4).

Example

See the example in "COMInitialize".

COMGetFileObject

COM Subroutine: Passes a file name and returns a pointer to the IDispatch interface of an automation object that can manipulate the file. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFCOM

Syntax

CALL COMGetFileObject (*filename*, *idispatch*, *status*)

filename

The path of the file of type CHARACTER*(*).

idispatch

An output argument that returns the object's IDispatch interface pointer. Must be of type INTEGER(4).

status

The status of the operation. It can be any status returned by the CreateBindCtx or MkParseDisplayName routines, or the IMoniker::BindToObject method (see the Win32* SDK). Must be of type INTEGER(4).

COMInitialize

COM Subroutine: Initializes the COM library. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFCOM

Syntax

CALL COMInitialize (*status*)

status

The status of the operation. It can be any status returned by OleInitialize (see the Win32* SDK). Must be of type INTEGER(4).

You must use this routine to initialize the COM library before calling any other COM or AUTO routine.

Example

```
  program COMExample

use ifwin
use ifcom
use ifauto

  implicit none

  ! Variables
integer(4) word_app
integer(4) status
```

```
integer(4) invoke_args

call COMInitialize(status)

  ! Call GetActiveObject to get a reference to a running MS WORD
  ! application
  call COMGetActiveObjectByProgID("Word.Application", word_app, status)
if (status >= 0) then
       ! Print the active document
       invoke_args = AutoAllocateInvokeArgs()
       call AutoAddArg(invoke_args, "Copies", 2)
       status = AutoInvoke(word_app, "PrintOut", invoke_args)
       call AutoDeallocateInvokeArgs(invoke_args)
   ! Release the reference
     status = COMReleaseObject(word_app)
end if

call COMUninitialize()

  end program
```

COMIsEqualGUID

COM Function: Determines whether two globally unique identifiers (GUIDs) are the same. This function is only available on Windows* systems on IA-32 processors.

Modules: USE IFCOM, USE IFWINTY

Syntax

result = COMIsEqualGUID (*guid1*, *guid2*)

guid1

The first GUID. Must be of type GUID, which is defined in the IFWINTY module. It can be any type of GUID, including a class identifier (CLSID), or an interface identifier (IID).

guid2

The second GUID, which will be compared to *guid1*. It must be the same type of GUID as *guid1*. For example, if *guid1* is a CLSID, *guid2* must also be a CLSID.

Results:

The result type is LOGICAL(4). The result is .TRUE. if the two GUIDs are the same; otherwise, .FALSE.

COMMITQQ

Run-time Function: Forces the operating system to execute any pending write operations for the file associated with a specified unit to the file's physical device.

Module: USE IFCORE

Syntax

result = COMMITQQ (*unit*)

unit

(Input) INTEGER(4). A Fortran logical unit attached to a file to be flushed from cache memory to a physical device.

Results:

The result type is LOGICAL(4). If an open unit number is supplied, .TRUE. is returned and uncommitted records (if any) are written. If an unopened unit number is supplied, .FALSE. is returned.

Data written to files on physical devices is often initially written into operating-system buffers and then written to the device when the operating system is ready. Data in the buffer is automatically flushed to disk when the file is closed. However, if the program or the computer crashes before the data is transferred from buffers, the data can be lost. COMMITQQ tells the operating system to write any cached data intended for a file on a physical device to that device immediately. This is called flushing the file.

COMMITQQ is most useful when you want to be certain that no loss of data occurs at a critical point in your program; for example, after a long calculation has concluded and you have written the results to a file, or after the user has entered a group of data items, or if you are on a network with more than one program sharing the same file. Flushing a file to disk provides the benefits of closing and reopening the file without the delay.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: the PRINT and WRITE statements in the *Language Reference*

Example

```
USE IFCORE
INTEGER unit / 10 /
INTEGER len
CHARACTER(80) stuff
OPEN(unit, FILE='COMMITQQ.TST', ACCESS='Sequential')
DO WHILE (.TRUE.)
   WRITE (*, '(A, \)') 'Enter some data (Hit RETURN to &
```

```
                        exit): '
   len = GETSTRQQ (stuff)
   IF (len .EQ. 0) EXIT
   WRITE (unit, *) stuff
   IF (.NOT. COMMITQQ(unit)) WRITE (*,*) 'Failed'
END DO
CLOSE (unit)
END
```

COMPLINT, COMPLREAL, COMPLLOG

Portability Functions: Return a BIT-WISE complement or logical .NOT. of the argument.

Module: USE IFPORT

Syntax

result = COMPLINT (*intval*)
result = COMPLREAL (*realval*)
result = COMPLLOG (*logval*)

intval

(Input) INTEGER(4).

realval

(Input) REAL(4).

logval

(Input) LOGICAL(4).

Results:

If the argument is logical, the result is logical. Otherwise, the result is Boolean (a CRAY* bitset).

With a Boolean result, use a BIT-WISE complement. For the logical COMPLLOG, just toggle 1<-->0.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

COMQueryInterface

COM Subroutine: Passes an interface identifier and returns a pointer to an object's interface. This subroutine is only available on Windows* systems on IA-32 processors.

Modules: USE IFCOM, USE IFWINTY

Syntax

CALL COMQueryInterface (*iunknown*, *iid*, *interface*, *status*)

iunknown

An IUnknown interface pointer. Must be of type INTEGER(4).

iid

The interface identifier of the interface being requested. Must be of type GUID, which is defined in the IFWINTY module.

interface

An output argument that returns the object's interface pointer. Must be of type INTEGER(4).

status

The status of the operation. It can be any status returned by the IUnknown method QueryInterface (see the Win32* SDK). Must be of type INTEGER(4).

COMReleaseObject

COM Function: Indicates that the program is done with a reference to an object's interface. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFCOM

Syntax

result = COMReleaseObject (*iunknown*)

iunknown

An IUnknown interface pointer. Must be of type INTEGER(4).

Results:

The result type is INTEGER(4). It is the object's current reference count.

Example

See the example in "COMInitialize".

COMStringFromGUID

COM Subroutine: Passes a globally unique identifier (GUID) and returns a string of printable characters. This subroutine is only available on Windows* systems on IA-32 processors.

Modules: USE IFCOM, USE IFWINTY

Syntax

CALL COMStringFromGUID (*guid*, *string*, *status*)

guid

The GUID to be converted. Must be of type GUID, which is defined in the IFWINTY module. It can be any type of GUID, including a class identifier (CLSID), or an interface identifier (IID).

string

A character variable of type CHARACTER*(*) that receives the string representation of the GUID. The length of the character variable should be at least 38.

status

The status of the operation. If the string is too small to contain the string representation of the GUID, the value is zero. Otherwise, the value is the number of characters in the string representation of the GUID. Must be of type INTEGER(4).

The string representation of a GUID has a format like that of the following:

```
[c200e360-38c5-11ce-ae62-08002b2b79ef]
```

where the successive fields break the GUID into the form DWORD-WORD-WORD-WORD-WORD.DWORD covering the 128-bit GUID. The string includes enclosing braces, which are an OLE convention.

COMUninitialize

COM Subroutine: Uninitializes the COM library. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFCOM

Syntax

CALL COMUninitialize ( )

When using COM routines, this must be the last routine called.

Example

See the example in "COMInitialize".

CSMG

Portability Function: Performs an effective BIT-WISE store under mask.

Module: USE IFPORT

Syntax

result = CSMG (*x*, *y*, *z*)

x, *y*, *z*

(Input) INTEGER(4).

Results:

The result type is INTEGER(4). The result is equal to the following expression:

```
(x & z) | (y & ~z )
```

where "&" is a bitwise AND operation, | - bitwise OR, ~ - bitwise NOT.

The function returns the value based on the following rule: when a bit in *z* is 1, the output bit is taken from *x*. When a bit in *z* is zero, the corresponding output bit is taken from *y*.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

CTIME

Portability Function: Converts a system time into a 24-character ASCII string.

Module: USE IFPORT

Syntax

result = CTIME (*stime*)

stime

(Input) INTEGER(4). An elapsed time in seconds since 00:00:00 Greenwich mean time, January 1, 1970.

Results:

The result is a value in the form Mon Jan 31 04:37:23 1994. Hours are expressed using a 24-hour clock.

The value of *stime* can be determined by calling the TIME function. CTIME(TIME( )) returns the current time and date.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: the DATE_AND_TIME intrinsic procedure in the *Language Reference*

Example

```
USE IFPORT
character (24) systime
```

```
systime = CTIME (TIME( ))
print *, 'Current date and time is ',systime
```

DATE

Portability Function or Subroutine: Returns the current system date.

Module: USE IFPORT

Function Syntax:

result = DATE ( )

Subroutine Syntax:

CALL DATE (*string*)

string

(Output) CHARACTER. Variable or array containing at least nine bytes of storage.

DATE in its function form returns a CHARACTER string of length 8 in the form mm/dd/yy, where mm, dd, and yy are two-digit representations of the month, day, and year, respectively.

DATE in its subroutine form returns *string* in the form dd-mmm-yy, where dd is a two-digit representation of the current day of the month, mmm is a three-character abbreviation for the current month (for example, Jan) and yy are the last two digits of the current year.

NOTE. DATE *is an intrinsic procedure unless you specify* USE IFPORT.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: the DATE subroutine in the *Language Reference*

Example

```
USE IFPORT
!If today's date is March 02, 2000, the following
!code prints "02-Mar-00"
CHARACTER(9) TODAY
CALL DATE(TODAY)
PRINT *, TODAY
!The next line prints "03/02/00"
PRINT *, DATE( )
```

DATE4

Portability Subroutine: Returns the current system date.

Module: USE IFPORT

Syntax

CALL DATE4 (*datestr*)

datestr

(Output) CHARACTER.

This subroutine returns *datestr* in the form dd-mmm-yyyy, where dd is a two-digit representation of the current day of the month, mmm is a three-character abbreviation for the current month (for example, Jan) and yyyy are the four digits of the current year.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

DBESJ0, DBESJ1, DBESJN, DBESY0, DBESY1, DBESYN

Portability Functions: Compute the double-precision values of Bessel functions of the first and second kinds.

Module: USE IFPORT

Syntax

result = DBESJ0 (*posvalue*)
result = DBESJ1 (*posvalue*)
result = DBESJN (*n*, *posvalue*)
result = DBESY0 (*posvalue*)
result = DBESY1 (*posvalue*)
result = DBESYN (*n*, *posvalue*)

posvalue

(Input) REAL(8). Independent variable for a Bessel function. Must be greater than or equal to zero.

n

(Input) Integer. Specifies the order of the selected Bessel function computation.

Results:

DBESJ0, DBESJ1, and DBESJN return Bessel functions of the first kind, orders 0, 1, and *n*, respectively, with the independent variable *posvalue*.

DBESY0, DBESY1, and DBESYN return Bessel functions of the second kind, orders 0, 1, and *n*, respectively, with the independent variable *posvalue*.

Negative arguments cause DBESY0, DBESY1, and DBESYN to return a huge negative value.

Bessel functions are explained more fully in most mathematics reference books, such as the *Handbook of Mathematical Functions* (Abramowitz and Stegun. Washington: U.S. Government Printing Office, 1964). These functions are commonly used in the mathematics of electromagnetic wave theory.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "BESJ0, BESJ1, BESJN, BESY0, BESY1, BESYN"

Example

```
    USE IFPORT
    real(8) besnum, besout
10  read *, besnum
    besout = dbesj0(besnum)
    print *, 'result is ',besout
    goto 10
    end
```

DCLOCK

Portability Function: Returns the elapsed time in seconds since the start of the current process.

Module: USE IFPORT

Syntax

result = DCLOCK ( )

Results:

The result type is REAL(8). This routine provides accurate timing to the nearest microsecond, taking into account the frequency of the processor where the current process is running. You can obtain equivalent results using standard Fortran by using the CPU_TIME intrinsic subroutine.

Note that the first call to DCLOCK performs calibration.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: the DATE_AND_TIME and CPU_TIME subroutines in the *Language Reference*

Example

```
USE IFPORT
```

```
DOUBLE PRECISION START_TIME, STOP_TIME, DCLOCK
EXTERNAL DCLOCK
START_CLOCK = DCLOCK()
CALL FOO()
STOP_CLOCK = DCLOCK()
PRINT *, 'foo took:', STOP_CLOCK - START_CLOCK, 'seconds.'
```

DELDIRQQ

Portability Function: Deletes a specified directory.

Module: USE IFPORT

Syntax

result = DELDIRQQ (*dir*)

dir

(Input) Character*(*). String containing the path of the directory to be deleted.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

The directory to be deleted must be empty. It cannot be the current directory, the root directory, or a directory currently in use by another process.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "GETDRIVEDIRQQ", "MAKEDIRQQ", "CHANGEDIRQQ", "CHANGEDRIVEQQ", "UNLINK"

DELETEMENUQQ

QuickWin Function: Deletes a menu item from a QuickWin menu. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = DELETEMENUQQ (*menuID*, *itemID*)

menuID

(Input) INTEGER(4). Identifies the menu that contains the menu item to be deleted, starting with 1 as the leftmost menu.

itemID

(Input) INTEGER(4). Identifies the menu item to be deleted, starting with 0 as the top menu item.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

Compatibility

QUICKWIN GRAPHICS LIB

See Also: "APPENDMENUQQ", "INSERTMENUQQ", "MODIFYMENUFLAGSQQ", "MODIFYMENUROUTINEQQ", "MODIFYMENUSTRINGQQ", "Using QuickWin" in your user's guide

Example

```
USE IFQWIN
LOGICAL(4) result
CHARACTER(25) str
str = 'Add to EDIT Menu'C   ! Append to 2nd menu
result = APPENDMENUQQ(2, $MENUENABLED, str, WINSTATUS)
! Delete third item (EXIT) from menu 1 (FILE)
result = DELETEMENUQQ(1, 3)
! Delete entire fifth menu (WINDOW)
result = DELETEMENUQQ(5,0)
END
```

DELFILESQQ

Portability Function: Deletes all files matching the name specification, which can contain wildcards (* and ?).

Module: USE IFPORT

Syntax

result = DELFILESQQ (*files*)

files

(Input) Character*(*). Files to be deleted. Can contain wildcards (* and ?).

Results:

The result type is INTEGER(2). The result is the number of files deleted.

You can use wildcards to delete more than one file at a time. DELFILESQQ does not delete directories or system, hidden, or read-only files. Use this function with caution because it can delete many files at once. If a file is in use by another process (for example, if it is open in another process), it cannot be deleted.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "FINDFILEQQ"

Example

```
USE IFPORT
USE IFCORE
INTEGER(4) len, count
CHARACTER(80) file
CHARACTER(1) ch
WRITE(*,*) "Enter names of files to delete: "
len = GETSTRQQ(file)
IF (file(1:len) .EQ. '*.*') THEN
   WRITE(*,*) "Are you sure (Y/N)?"
   ch = GETCHARQQ()
   IF ((ch .NE. 'Y') .AND. (ch .NE. 'y')) STOP
END IF
count = DELFILESQQ(file)
WRITE(*,*) "Deleted ", count, " files."
END
```

DFLOATI, DFLOATJ, DFLOATK

Portability Functions: Convert an integer to double-precision real type.

Module: USE IFPORT

Syntax

result = DFLOATI (*i*)
result = DFLOATJ (*j*)
result = DFLOATK (*k*)

i

(Input) Must be of type INTEGER(2).

j

(Input) Must be of type INTEGER(4).

k

(Input) Must be of type INTEGER(8).

Results:

The result type is double-precision real (REAL(8) or REAL*8).

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: the DFLOAT intrinsic function in the *Language Reference*

DISPLAYCURSOR

Graphics Function: Controls cursor visibility. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = DISPLAYCURSOR (*toggle*)

toggle

(Input) INTEGER(2). Constant that defines the cursor state. Has two possible values:

- $GCURSOROFF - Makes the cursor invisible regardless of its current shape and mode.
- $GCURSORON - Makes the cursor always visible in graphics mode.

Results:

The result type is INTEGER(2). The result is the previous value of *toggle*.

Cursor settings hold only for the currently active child window. You need to call DISPLAYCURSOR for each window in which you want the cursor to be visible.

A call to SETWINDOWCONFIG turns off the cursor.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "SETTEXTCURSOR", "SETWINDOWCONFIG"

DLGEXIT

Dialog Subroutine: Closes an open dialog box. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

CALL DLGEXIT (*dlg*)

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

If you want to exit a dialog box on a condition other than the user selecting the OK or Cancel button, you need to include a call to DLGEXIT from within your callback routine. DLGEXIT saves the data associated with the dialog box controls and then closes the dialog box. The dialog box is exited after DLGEXIT has returned control back to the dialog manager, not immediately after the call to DLGEXIT.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DLGSETRETURN", "DLGINIT, DLGINITWITHRESOURCEHANDLE", "DLGMODAL, DLGMODALWITHPARENT", "DLGMODELESS"

Example

```
SUBROUTINE EXITSUB (dlg, exit_button_id, callbacktype)
USE IFLOGM
TYPE (DIALOG) dlg
INTEGER exit_button_id, callbacktype
...
  CALL DLGEXIT (dlg)
```

DLGFLUSH

Dialog Subroutine: Updates the display of a dialog box. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

CALL DLGFLUSH (*dlg* [, *flushall*])

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

flushall

(Input; optional) Logical. If .FALSE. (the default), then only the controls that the dialog routines have marked as changed are updated. If .TRUE., all controls are updated with the state of the controls as known by the dialog routines. Normally, you would not set *flushall* to .TRUE..

When your application calls DLGSET to change a property of a control in a dialog box, the change is not immediately reflected in the displayed dialog box. Changes are applied when the dialog box is first displayed, and then after every dialog callback to the user's code.

This design expects that, after a call to DLGMODAL or DLGMODELESS, every call to DLGSET will be made from within a callback routine, and that the callback routine finishes quickly. This is true most of the time.

However, there may be cases where you want to change a control outside of a dialog callback, or from within a loop in a dialog callback.

In these cases, DLGFLUSH is required, but is not always sufficient, to update the dialog display. DLGFLUSH sends pending Windows system messages to the dialog box and the controls that it contains. However, many display changes do not appear until after the program reads and processes these messages. A loop that processes the pending messages may be required; for example:

```
use IFWINTY
use IFLOGM
use USER32
logical lNotQuit, lret
integer iret
TYPE (T_MSG) mesg
lNotQuit = .TRUE.
do while (lNotQuit .AND. (PeekMessage(mesg, 0, 0, 0, PM_NOREMOVE) <> 0))
  lNotQuit = GetMessage(mesg, NULL, 0, 0)
    if (lNotQuit) then
      if (DLGISDLGMESSAGE(mesg) .EQV. .FALSE) then
         lret = TranslateMessage(mesg)
         iret = DispatchMessage(mesg)
      end if
    end if
end do
```

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "DLGINIT, DLGINITWITHRESOURCEHANDLE", "DLGMODAL, DLGMODALWITHPARENT", "DLGMODELESS", "DLGSET, DLGSETINT, DLGSETLOG, DLGSETCHAR", "DLGSETSUB"

DLGGET, DLGGETINT, DLGGETLOG, DLGGETCHAR

Dialog Functions: Return the state of the dialog control variable. These functions are only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

result = DLGGET (*dlg*, *controlid*, *value* [, *index*])

result = DLGGETINT (*dlg*, *controlid*, *value* [, *index*])

result = DLGGETLOG (*dlg*, *controlid*, *value* [, *index*])

result = DLGGETCHAR (*dlg*, *controlid*, *value* [, *index*])

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

controlid

(Input) Integer. Specifies the identifier of a control within the dialog box. Can be either the symbolic name for the control or the identifier number, both listed in the Include file (with extension .FD).

value

(Output) Integer, logical, or character. The value of the control's variable.

index

(Input; optional) Integer. Specifies the control variable whose value is returned. Necessary if the control has more than one variable of the same data type and you do not want to get the value of the default for that type.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, the result is .FALSE..

Use the DLGGET functions to return the values of variables associated with your dialog box controls. Each control has at least one of the integer, logical, or character variable associated with it, but not necessarily all. The control variables are listed in the table in "Control Indexes" in your user's guide. The types of controls they are associated with are listed in the table in "Available Indexes for Each Dialog Control" in your user's guide.

You can use DLGGET to return the value of any variable. You can also use DLGGETINT to return an integer value, or DLGGETLOG and DLGGETCHAR to return logical and character values, respectively. If you use DLGGET, you do not have to worry about matching the function to the variable type. If you use the wrong function type for a variable or try to return a variable type that is not available, the DLGGET functions return .FALSE..

If two or more controls have the same *controlid*, you cannot use these controls in a DLGGET operation. In this case the function returns .FALSE..

The dialog box does not need to be open to access its control variables.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DLGSET, DLGSETINT, DLGSETLOG, DLGSETCHAR", "DLGSETSUB", "DLGINIT, DLGINITWITHRESOURCEHANDLE", "DLGMODAL, DLGMODALWITHPARENT", "DLGMODELESS", "Using Dialogs" and "Dialog Controls" in your user's guide

Example

```
USE IFLOGM
INCLUDE "THISDLG.FD"
TYPE (DIALOG)  dlg
INTEGER        val
LOGICAL        retlog, is_checked
CHARACTER(256) text
...
retlog = DLGGET (dlg, IDC_CHECKBOX1, is_checked, dlg_status)
retlog = DLGGET (dlg, IDC_SCROLLBAR2, val, dlg_range)
retlog = DLGGET (dlg, IDC_STATIC_TEXT1, text, dlg_title)
...
```

DLGINIT, DLGINITWITHRESOURCEHANDLE

Dialog Functions: Initialize a dialog box. These functions are only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

result = DLGINIT (*id*, *dlg*)

result = DLGINITWITHRESOURCEHANDLE (*id*, *hinst*, *dlg*)

id

(Input) INTEGER(4). Dialog identifier. Can be either the symbolic name for the dialog or the identifier number, both listed in the Include file (with extension .FD).

dlg

(Output) Derived type `dialog`. Contains dialog box parameters.

hinst

(Input) INTEGER(4). Module instance handle in which the dialog resource can be found.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, the result is .FALSE..

DLGINIT must be called to initialize a dialog box before it can be used with DLGMODAL, DLGMODELESS, or any other dialog function.

DLGINIT will only search for the dialog box resource in the main application. For example, it will not find a dialog box resource that has been built into a dynamic link library.

DLGINITWITHRESOURCEHANDLE can be used when the dialog resource is not in the main application. If the dialog resource is in a dynamic link library (DLL), *hinst* must be the value passed as the first argument to the `DLLMAIN` procedure.

Dialogs can be used from any application, including console, QuickWin, and Windows applications.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DLGEXIT", "DLGMODAL, DLGMODALWITHPARENT", "DLGMODELESS", "DLGUNINIT"

Example

```
USE IFLOGM
INCLUDE 'DLG1.FD'
LOGICAL retlog
TYPE (DIALOG) thisdlg
...
retlog = DLGINIT (IDD_DLG3, thisdlg)
IF (.not. retlog) THEN
```

```
  WRITE (*,*) 'ERROR: dialog not found'
ELSE
...
```

DLGISDLGMESSAGE, DLGISDLGMESSAGEWITHDLG

Dialog Functions: Determine whether the specified message is intended for one of the currently displayed modeless dialog boxes, or a specific dialog box. These functions are only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

result = DLGISDLGMESSAGE (*mesg*)

result = DLGISDLGMESSAGEWITHDLG (*mesg*, *dlg*)

mesg

(Input) Derived type `T_MSG`. Contains a Windows message.

dlg

(Input) Derived type `dialog` Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

Results:

The result type is LOGICAL(4). The result is .TRUE. if the message is processed by the dialog box. Otherwise, the result is .FALSE. and the message should be further processed.

DLGISDLGMESSAGE must be called in the message loop of Windows applications that display a modeless dialog box using DLGMODELESS. DLGISDGMESSAGE determines whether the message is intended for one of the currently displayed modeless dialog boxes. If it is, it passes the message to the dialog box to be processed.

DLGISDLGMESSAGEWITHDLG specifies a particular dialog box to check. Use DLGISDLGMESSAGEWITHDLG when the message loop is in a main application and the currently active modeless dialog box was created by a DLL.

Compatibility

`WINDOWS`

See Also: "DLGMODELESS", "Using a Modeless Dialog Routine" in your user's guide

Example

```
use IFLOGM
include 'resource.fd'
```

```
type (DIALOG)  dlg
type (T_MSG)   mesg
integer*4  ret
logical*4  ret
...
! Create the main dialog box and set up the controls and callbacks
lret = DlgInit(IDD_THERM_DIALOG, dlg)
lret = DlgSetSub(dlg, IDD_THERM_DIALOG, ThermSub)
...
lret = DlgModeless(dlg, nCmdShow)
...
! Read and process messsages
do while( GetMessage (mesg, NULL, 0, 0) )
   ! Note that DlgIsDlgMessage must be called in order to give
   ! the dialog box first chance at the message.
   if ( DlgIsDlgMessage(mesg) .EQV. .FALSE. ) then
       lret = TranslateMessage( mesg )
       ret  = DispatchMessage( mesg )
   end if
end do
! Cleanup dialog box memory and exit the application
call DlgUninit(dlg)
WinMain = mesg%wParam
return
```

DLGMODAL, DLGMODALWITHPARENT

Dialog Functions: Display a dialog box and process user control selections made within the box. These functions are only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

result = DLGMODAL (*dlg*)

result = DLGMODALWITHPARENT (*dlg*, *hwndParent*)

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

hwndParent

(Input) Integer. Specifies the parent window for the dialog box. If omitted, the value is determined in this order:

1. If DLGMODAL is called from the callback of a modal or modeless dialog box, then that dialog box is the parent window.
2. If it is a QuickWin or Standard Graphics application, then the frame window is the parent window.
3. The Windows desktop window is the parent window.

Results:

The result type is INTEGER(4). By default, if successful, it returns the identifier of the control that caused the dialog to exit; otherwise, it returns –1. The return value can be changed with the DLGSETRETURN subroutine.

During execution, DLGMODAL displays a dialog box and then waits for user control selections. When a control selection is made, the callback routine, if any, of the selected control (set with DLGSETSUB) is called.

The dialog remains active until an exit control is executed: either the default exit associated with the OK and Cancel buttons, or DLGEXIT within your own control callbacks. DLGMODAL does not return a value until the dialog box is exited.

The default return value for DLGMODAL is the identifier of the control that caused it to exit (for example, IDOK for the OK button and IDCANCEL for the Cancel button). You can specify your own return value with DLGSETRETURN from within one of your dialog control callback routines. You should not specify –1 as your return value, because this is the error value DLGMODAL returns if it cannot open the dialog.

Use DLGMODALWITHPARENT when you want the parent window to be other than the default value (see the definition of *hwndParent* above). In particular, in an SDI or MDI Windows application, you may want the parent window to be the main application window. The parent window is disabled for user input while the modal dialog box is displayed.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DLGSETRETURN", "DLGSETSUB", "DLGEXIT", "DLGINIT, DLGINITWITHRESOURCEHANDLE"

Example

```
USE IFLOGM
INCLUDE "MYDLG.FD"
INTEGER return
TYPE (DIALOG) mydialog
```

```
...
return = DLGMODAL (mydialog)
...
```

DLGMODELESS

Dialog Function: Displays a modeless dialog box. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

result = DLGMODELESS (*dlg* [, *nCmdShow*, *hwndParent*])

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user. The variable passed to this function must remain in memory for the duration of the dialog box, that is from the DLGINIT call through the DLGUNINIT call.

The variable can be declared as global data in a module, as a variable with the STATIC attribute, or in a calling procedure that is active for the duration of the dialog box. It must not be an AUTOMATIC variable in the procedure that calls DLGMODELESS.

nCmdShow

(Input) Integer. Specifies how the dialog box is to be shown. It must be one of the following values:

Value	Description
SW_HIDE	Hides the dialog box.
SW_MINIMIZE	Minimizes the dialog box.
SW_RESTORE	Activates and displays the dialog box. If the dialog box is minimized or maximized, the Windows system restores it to its original size and position.
SW_SHOW	Activates the dialog box and displays it in its current size and position.
SW_SHOWMAXIMIZED	Activates the dialog box and displays it as a maximized window.
SW_SHOWMINIMIZED	Activates the dialog box and displays it as an icon.
SW_SHOWMINNOACTIVE	Displays the dialog box as an icon. The window that is currently active remains active.

Value	Description
SW_SHOWNA	Displays the dialog box in its current state. The window that is currently active remains active.
SW_SHOWNOACTIVATE	Displays the dialog box in its most recent size and position. The window that is currently active remains active.
SW_SHOWNORMAL	Activates and displays the dialog box. If the dialog box is minimized or maximized, the Windows system restores it to its original size and position.

The default value is SW_SHOWNORMAL.

hwndParent

(Input) Integer. Specifies the parent window for the dialog box. The default value is determined in this order:

1. If DLGMODELESS is called from a callback of a modeless dialog box, then that dialog box is the parent window.
2. The Windows desktop window is the parent window.

Results:

The result type is LOGICAL(4). The value is .TRUE. if the function successfully displays the dialog box. Otherwise the result is .FALSE..

During execution, DLGMODELESS displays a modeless dialog box and returns control to the calling application. The dialog box remains active until DLGEXIT is called, either explicitly or as the result of the invocation of a default button callback.

DLGMODELESS is typically used in a Windows application. The application must contain a message loop that processes Windows messages. The message loop must call DLGISDLGMESSAGE for each message (see the example below). Multiple modeless dialog boxes can be displayed at the same time. A modal dialog box can be displayed from a modeless dialog box by calling DLGMODAL from a modeless dialog callback. However, DLGMODELESS cannot be called from a modal dialog box callback.

DLGMODELESS also can be used in a Console, DLL, or LIB project. However, the requirements remain that the application must contain a message loop and must call DLGISDLGMESSAGE for each message. For an example of calling DLGMODELESS in a DLL project, see the Dllprgrs sample in the `...\SAMPLES\DIALOG` folder.

Use the DLG_INIT callback with DLGSETSUB to perform processing immediately after the dialog box is created and before it is displayed, and to perform processing immediately before the dialog box is destroyed.

Compatibility

`WINDOWS  CONSOLE  DLL  LIB`

See Also: "DLGSETSUB", "DLGINIT, DLGINITWITHRESOURCEHANDLE", "DLGEXIT", "DLGISDLGMESSAGE, DLGISDLGMESSAGEWITHDLG", "Using a Modeless Dialog Routine" in your user's guide

Example

```
use IFLOGM
include 'resource.fd'
type (DIALOG)   dlg
type (T_MSG)    mesg
integer*4   ret
logical*4   lret
...
! Create the main dialog box and set up the controls and callbacks
lret = DlgInit(IDD_THERM_DIALOG, dlg)
lret = DlgSetSub(dlg, IDD_THERM_DIALOG, ThermSub)
...
lret = DlgModeless(dlg, nCmdShow)
...
! Read and process messsages
do while( GetMessage (mesg, NULL, 0, 0) )
   ! Note that DlgIsDlgMessage must be called in order to give
   ! the dialog box first chance at the message.
   if ( DlgIsDlgMessage(mesg) .EQV. .FALSE. ) then
      lret = TranslateMessage( mesg )
      ret  = DispatchMessage( mesg )
   end if
end do
   ! Cleanup dialog box memory and exit the application
call DlgUninit(dlg)
WinMain = mesg%wParam
return
```

DLGSENDCTRLMESSAGE

Dialog Function: Sends a Windows* message to a dialog box control. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

result = DLGSENDCTRLMESSAGE (*dlg*, *controlid*, *msg*, *wparam*, *lparam*)

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

controlid

(Input) Integer. Specifies the identifier of the control within the dialog box. Can be either the symbolic name for the control or the identifier number, both listed in the Include file (with extension .FD).

msg

(Input) Integer. Derived type `T_MSG.` Specifies the message to be sent.

wparam

(Input) Integer. Specifies additional message specific information.

lparam

(Input) Integer. Specifies additional message specific information.

Results:

The result type is INTEGER(4). The value specifies the result of the message processing and depends upon the message sent.

The dialog box must be currently active by a call to DLGMODAL or DLGMODELESS. This function does not return until the message has been processed by the control.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DLGINIT, DLGINITWITHRESOURCEHANDLE", "DLGSETSUB", "DLGMODAL, DLGMODALWITHPARENT", "DLGMODELESS"

Example

```
use IFLOGM
include 'resource.fd'
type (dialog)  dlg
integer        callbacktype
integer        cref
integer        iret

if (callbacktype == dlg_init) then
 ! Change the color of the Progress bar to red
```

```
 ! NOTE:  The following message succeeds only if Internet Explorer 4.0
 !        or later is installed
 cref = Z'FF'    ! Red
 iret = DlgSendCtrlMessage(dlg, IDC_PROGRESS1, PBM_SETBARCOLOR, 0, cref)
endif
```

DLGSET, DLGSETINT, DLGSETLOG, DLGSETCHAR

Dialog Functions: Set the values of dialog control variables. These functions are only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

result = DLGSET (*dlg*, *controlid*, *value* [, *index*])

result = DLGSETINT (*dlg*, *controlid*, *value* [, *index*])

result = DLGSETLOG (*dlg*, *controlid*, *value* [, *index*])

result = DLGSETCHAR (*dlg*, *controlid*, *value* [, *index*])

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

controlid

(Input) Integer. Specifies the identifier of a control within the dialog box. Can be either the symbolic name for the control or the identifier number, both listed in the Include file (with extension .FD).

value

(Input) Integer, logical, or character. The value of the control's variable.

index

(Input; optional) Integer. Specifies the control variable whose value is set. Necessary if the control has more than one variable of the same data type and you do not want to set the value of the default for that type.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, the result is .FALSE..

Use the DLGSET functions to set the values of variables associated with your dialog box controls. Each control has at least one of the integer, logical, or character variables associated with it, but not necessarily all. The control variables are listed in the table in "Control Indexes" in your user's guide. The types of controls they are associated with are listed in the table in "Available Indexes for Each Dialog Control" in your user's guide.

You can use DLGSET to set any control variable. You can also use DLGSETINT to set an integer variable, or DLGSETLOG and DLGSETCHAR to set logical and character values, respectively. If you use DLGSET, you do not have to worry about matching the function to the variable type. If you use the wrong function type for a variable or try to set a variable type that is not available, the DLGSET functions return .FALSE..

Calling DLGSET does not cause a callback routine to be called for the changing value of a control. In particular, when inside a callback, performing a DLGSET on a control does not cause the associated callback for that control to be called. Callbacks are invoked automatically only by user action on the controls in the dialog box. If the callback routine needs to be called, you can call it manually after the DLGSET is executed.

If two or more controls have the same *controlid*, you cannot use these controls in a DLGSET operation. In this case the function returns .FALSE..

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DLGSETSUB", "DLGGET, DLGGETINT, DLGGETLOG, DLGGETCHAR", "Using Dialogs", "Dialog Functions", and "Dialog Controls" in your user's guide

Example

```
USE IFLOGM
INCLUDE "DLGRADAR.FD"
TYPE (DIALOG)  dlg
LOGICAL        retlog
...
retlog = DLGSET (dlg, IDC_SCROLLBAR1, 400, dlg_range)
retlog = DLGSET (dlg, IDC_CHECKBOX1, .FALSE., dlg_status)
retlog = DLGSET (dlg, IDC_RADIOBUTTON1, "Hot Button", dlg_title)
...
```

DLGSETCTRLEVENTHANDLER

Dialog Function: Assigns user-written event handlers to ActiveX* controls in a dialog box. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

result = DLGSETCTRLEVENTHANDLER (*dlg*, *controlid*, *handler*, *dispid* [, *iid*])

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type DIALOG are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

controlid

(Input) Integer. Specifies the identifier of a control within the dialog box. Can be the symbolic name for the control or the identifier number, both listed in the include (with extension .FD) file.

handler

(Input) Name of the routine to be called when the event occurs. It must be declared EXTERNAL.

dispid

(Input) Integer. Specifies the member id of the method in the event interface that identifies the event.

iid

(Input; optional) Derived type `GUID`, which is defined in the IFWINTY module. Specifies the interface identifier of the source (event) interface. If omitted, the default source interface of the ActiveX control is used.

Results:

The result type is INTEGER(4). The result is an HRESULT describing the status of the operation.

When the ActiveX control event occurs, the handler associated with the event is called. You call DLGSETCTRLEVENTHANDLER to specify the handler to be called.

The events supported by an ActiveX control and the interfaces of the handlers are determined by the ActiveX control.

You can find this information in one of the following ways:

- By reading the documentation of the ActiveX control.
- By using a tool that lets you examine the type information of the ActiveX control, The OLE-COM Object Viewer in the Intel® Visual Fortran folder is one such tool.
- By using the Fortran Module Wizard to generate a module that contains Fortran interfaces to the ActiveX control, and examining the generated module.

The handler that you define in your application must have the interface that the ActiveX control expects, including calling convention and parameter passing mechanisms. Otherwise, your application will likely crash in unexpected ways because of the application's stack getting corrupted.

Note that an object is always the first parameter in an event handler. This object value is a pointer to the control's source (event) interface, *not* the IDispatch pointer of the control. You can use DLGGET with the DLG_IDISPATCH index to retrieve the control's IDispatch pointer.

For more information, see "Using ActiveX Controls" in your user's guide.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DLGINIT, DLGINITWITHRESOURCEHANDLE", "DLGGET, DLGGETINT, DLGGETLOG, DLGGETCHAR", "DLGMODAL, DLGMODALWITHPARENT", "DLGMODELESS", "DLGSETSUB"

Example

```
USE IFLOGM
ret = DlgSetCtrlEventHandler(            &
      dlg,                          &
      IDC_ACTIVEMOVIECONTROL1,      & ! Identifies the control
     ReadyStateChange,            & ! Name of the event handling routine
      -609,                         & ! Member id of the ActiveMovie's
                                    & !  control ReadyStateChange event.
     IID_DActiveMovieEvents2 )         ! Identifer of the source (event)
                                        !    interface.
```

DLGSETRETURN

Dialog Subroutine: Sets the return value for the DLGMODAL function from within a callback subroutine. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

CALL DLGSETRETURN (*dlg*, *retval*)

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

retval

(Input) Integer. Specifies the return value for DLGMODAL upon exiting.

DLGSETRETURN overrides the default return value with *retval*. You can set your own value as a means of determining the condition under which the dialog box was closed. The default return value for an error condition is –1, so you should not use –1 as your return value.

DLGSETRETURN should be called from within a callback routine, and is generally used with DLGEXIT, which causes the dialog box to be exited from a control callback rather than the user selecting the OK or Cancel button.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "DLGEXIT", "DLGMODAL, DLGMODALWITHPARENT"

Example

```
SUBROUTINE SETRETSUB (dlg, button_id, callbacktype)
USE IFLOGM
INCLUDE "MYDLG.FD"
TYPE (DIALOG) dlg
LOGICAL     is_checked, retlog
INTEGER     return, button_id, callbacktype
...
retlog = DLGGET(dlg, IDC_CHECKBOX4, is_checked, dlg_state)
IF (is_checked) THEN
   return = 999 ELSE    return = -999
END IF
CALL DLGSETRETURN (dlg, return)
CALL DLGEXIT (dlg)
END SUBROUTINE SETRETSUB
```

DLGSETSUB

Dialog Function: Assigns your own callback subroutines to dialog controls and to the dialog box. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

result = DLGSETSUB (*dlg*, *controlid*, *value* [, *index*])

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

controlid

(Input) Integer. Specifies the identifier of a control within the dialog box. Can be the symbolic name for the control or the identifier number, both listed in the include (with extension .FD) file, or it can be the identifier of the dialog box.

value

(Input) EXTERNAL. Name of the routine to be called when the callback event occurs.

index

(Input; optional) Integer. Specifies which callback routine is executed when the callback event occurs. Necessary if the control has more than one callback routine.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

When a callback event occurs (for example, when you select a check box), the callback routine associated with that callback event is called. You use DLGSETSUB to specify the subroutine to be called. All callback routines should have the following interface:

SUBROUTINE *callbackname* (*dlg*, *controlid*, *callbacktype*)
!DEC$ ATTRIBUTES DEFAULT :: *callbackname*

callbackname

Is the name of the callback routine.

dlg

Refers to the dialog box and allows the callback to change values of the dialog controls.

controlid

Is the name of the control that caused the callback.

callbacktype

Indicates what callback is occurring (for example, DLG_CLICKED, DLG_CHANGE, or DLG_DBLCLICK).

The *controlid* and *callbacktype* parameters let you write a single subroutine that can be used with multiple callbacks from more than one control. Typically, you do this for controls comprising a logical group. You can also associate more than one callback routine with the same control, but you must use then use *index* parameter to indicate which callback routine to use.

The *controlid* can also be the identifier of the dialog box. The dialog box supports two *callbacktype*s, DLG_INIT and DLG_SIZECHANGE. The DLG_INIT callback is executed immediately after the dialog box is created with *callbacktype* DLG_INIT, and immediately before the dialog box is destroyed with *callbacktype* DLG_DESTROY. DLG_SIZECHANGE is called when the size of a dialog is changed.

Callback routines for a control are called after the value of the control has been updated based on the user's action.

If two or more controls have the same *controlid*, you cannot use these controls in a DLGSETSUB operation. In this case, the function returns .FALSE..

For more information, see "Dialog Callback Routines" in your user's guide.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "DLGSET, DLGSETINT, DLGSETLOG, DLGSETCHAR", "DLGGET, DLGGETINT, DLGGETLOG, DLGGETCHAR"

Example

```
PROGRAM DLGPROG
USE IFLOGM
INCLUDE "MYDLG.FD"
TYPE (dialog) mydialog
LOGICAL retlog
INTEGER return
EXTERNAL RADIOSUB
retlog = DLGINIT(IDD_mydlg, dlg)
retlog = DLGSETSUB (mydialog, IDC_RADIO_BUTTON1, RADIOSUB)
retlog = DLGSETSUB (mydialog, IDC_RADIO_BUTTON2, RADIOSUB)
return = DLGMODAL(dlg)
END
SUBROUTINE RADIOSUB( dlg, id, callbacktype )
!DEC$ ATTRIBUTES DEFAULT :: callbackname
  USE IFLOGM
  TYPE (dialog) dlg
  INTEGER id, callbacktype
  INCLUDE 'MYDLG.FD'
  CHARACTER(256) text
  INTEGER cel, far, retint
  LOGICAL retlog
  SELECT CASE (id)
   CASE (IDC_RADIO_BUTTON1)
    ! Radio button 1 selected by user so
    ! change text accordingly
      text = 'Statistics Package A'
```

```
      retlog = DLGSET( dlg, IDC_STATICTEXT1, text )
    CASE (IDC_RADIO_BUTTON2)
    ! Radio button 2 selected by user so
    ! change text accordingly
      text = 'Statistics Package B'
      retlog = DLGSET( dlg, IDC_STATICTEXT1, text )
  END SELECT
END SUBROUTINE RADIOSUB
```

DLGSETTITLE

Dialog Subroutine: Sets the title of a dialog box. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

CALL DLGSETTITLE (*dlg*, *title*)

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

title

(Input) Character*(*). Specifies text to be the title of the dialog box.

Use this routine when you want to specify the title for a dialog box.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DLGINIT, DLGINITWITHRESOURCEHANDLE", "DLGMODAL, DLGMODALWITHPARENT", "DLGMODELESS"

Example

```
USE IFLOGM
INCLUDE "MYDLG.FD"
TYPE (DIALOG) mydialog
LOGICAL retlog
...
retlog = DLGINIT(IDD_mydlg, mydialog)
...
```

```
CALL DLGSETTITLE(mydialog, "New Title")
...
```

DLGUNINIT

Dialog Subroutine: Deallocates memory associated with an initialized dialog. This subroutine is only available on Windows* systems on IA-32 processors.

Module: USE IFLOGM

Syntax

CALL DLGUNINIT (*dlg*)

dlg

(Input) Derived type `dialog`. Contains dialog box parameters. The components of the type `dialog` are defined with the PRIVATE attribute, and cannot be changed or individually accessed by the user.

You should call DLGUNINIT when a dialog that was successfully initialized by DLGINIT is no longer needed. DLGUNINIT should only be called on a dialog initialized with DLGINIT. If it is called on an uninitialized dialog or one that has already been deallocated with DLGUNINIT, the result is undefined.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DLGINIT, DLGINITWITHRESOURCEHANDLE", "DLGMODAL, DLGMODALWITHPARENT", "DLGMODELESS", "DLGEXIT"

Example

```
USE IFLOGM
INCLUDE "MYDLG.FD"
TYPE (DIALOG)  mydialog
LOGICAL        retlog
...
retlog = DLGINIT(IDD_mydlg, mydialog)
...
CALL DLGUNINIT (mydialog)
END
```

DRAND, DRANDM

Portability Functions: Return double-precision random numbers in the range 0.0 through 1.0.

Module: USE IFPORT

Syntax

result = DRAND (*iflag*)
result = DRANDM (*iflag*)

iflag

(Input) INTEGER(4). Controls the way the random number is selected.

Results:

The result type is REAL(8). Return values are:

Value of *iflag*	Selection process
1	The generator is restarted and the first random value is selected.
0	The next random number in the sequence is selected.
Otherwise	The generator is reseeded using *iflag*, then restarted, and the first random value is selected.

There is no difference between DRAND and DRANDM. Both functions are included to insure portability of existing code that references one or both of them.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: the RANDOM_NUMBER and RANDOM_SEED intrinsic procedures in the *Language Reference*

Example

```
USE IFPORT
REAL(8) num
INTEGER(4) f
f=1
CALL print_rand
f=0
CALL print_rand
f=22
CALL print_rand
CONTAINS
  SUBROUTINE print_rand
    num = drand(f)
    print *, 'f= ',f,':',num
```

```
  END SUBROUTINE
END
```

DRANSET

Portability Subroutine: Sets the seed for the random number generator.

Module: USE IFPORT

Syntax

CALL DRANSET (*seed*)

seed

(Input) REAL(8). The reset value for the seed.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "RANGET"

DTIME

Portability Function: Returns the elapsed CPU time since the start of program execution when first called, and the elapsed execution time since the last call to DTIME thereafter.

Module: USE IFPORT

Syntax

result = DTIME (*tarray*)

tarray

(Output) REAL(4). A rank one array with two elements:

- *tarray*(1) – Elapsed user time, which is time spent executing user code. This value includes time running protected Windows subsystem code.
- *tarray*(2) – Elapsed system time, which is time spent executing privileged code (code in the Windows Executive).

Results:

The result type is REAL(4). The result is the total CPU time, which is the sum of *tarray*(1) and *tarray*(2). If an error occurs, –1 is returned.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: the DATE_AND_TIME and CPU_TIME intrinsic procedures in the *Language Reference*

Example

```
 USE IFPORT
 REAL(4) I, TA(2)
 I = DTIME(TA)
 write(*,*) 'Program has been running for', I, 'seconds.'
 write(*,*) ' This includes', TA(1), 'seconds of user time and', &
& TA(2), 'seconds of system time.'
```

ELLIPSE, ELLIPSE_W

Graphics Functions: Draw a circle or an ellipse using the current graphics color. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = ELLIPSE (*control*, *x1*, *y1*, *x2*, *y2*)

result = ELLIPSE_W (*control*, *wx1*, *wy1*, *wx2*, *wy2*)

control

(Input) INTEGER(2). Fill flag. Can be one of the following symbolic constants:

- $GFILLINTERIOR - Fills the figure using the current color and fill mask.
- $GBORDER - Does not fill the figure.

x1, *y1*

(Input) INTEGER(2). Viewport coordinates for upper-left corner of bounding rectangle.

x2, *y2*

(Input) INTEGER(2). Viewport coordinates for lower-right corner of bounding rectangle.

wx1, *wy1*

(Input) REAL(8). Window coordinates for upper-left corner of bounding rectangle.

wx2, *wy2*

(Input) REAL(8). Window coordinates for lower-right corner of bounding rectangle.

Results:

The result type is INTEGER(2). The result is nonzero if successful; otherwise, 0. If the ellipse is clipped or partially out of bounds, the ellipse is considered successfully drawn, and the return is 1. If the ellipse is drawn completely out of bounds, the return is 0.

The border is drawn in the current color and line style.

When you use ELLIPSE, the center of the ellipse is the center of the bounding rectangle defined by the viewport-coordinate points (*x1*, *y1*) and (*x2*, *y2*). When you use ELLIPSE_W, the center of the ellipse is the center of the bounding rectangle defined by the window-coordinate points (*wx1*, *wy1*) and (*wx2*, *wy2*). If the bounding-rectangle arguments define a point or a vertical or horizontal line, no figure is drawn.

The control option given by $GFILLINTERIOR is equivalent to a subsequent call to the FLOODFILLRGB function using the center of the ellipse as the start point and the current color (set by SETCOLORRGB) as the boundary color.

NOTE. *The* ELLIPSE *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the Ellipse routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$Ellipse. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

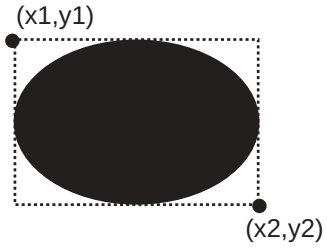
STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "FLOODFILLRGB, FLOODFILLRGB_W", "GRSTATUS", "SETCOLORRGB", "SETFILLMASK"

Example

This program draws the shape shown below.

```
! compile as QuickWin or Standard Graphics application
USE IFQWIN
INTEGER(2) dummy, x1, y1, x2, y2
x1 = 80;  y1 = 50
x2 = 240; y2 = 150
dummy = ELLIPSE( $GFILLINTERIOR, x1, y1, x2, y2 )
END
```



ETIME

Portability Function: Returns the elapsed CPU time, in seconds, of the process that calls it.

Module: USE IFPORT

Syntax

result = ETIME (*array*)

tarray

(Output) REAL(4). Must be a rank one array with two elements:

- *array*(1) – Elapsed user time, which is time spent executing user code. This value includes time running protected Windows subsystem code.
- *array*(2) – Elapsed system time, which is time spent executing privileged code (code in the Windows Executive).

Results:

The result type is REAL(4). The result is the total CPU time, which is the sum of *array*(1) and *array*(2). If an error occurs, –1 is returned.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: the DATE_AND_TIME and CPU_TIME intrinsic procedures in the *Language Reference*

Example

```
USE IFPORT
REAL(4) I, TA(2)
I = ETIME(TA)
write(*,*) 'Program has used', I, 'seconds of CPU time.'
write(*,*) '  This includes', TA(1), 'seconds of user time and',  &
```

```
& TA(2), 'seconds of system time.'
```

FDATE

Portability Function or Subroutine: Returns the current date and time as an ASCII string.

Module: USE IFPORT

Function Syntax:

result = FDATE ( )

Subroutine Syntax:

CALL FDATE (*string*)

string

(Optional; Output) Character*(*). It is returned as a 24-character string in the form:

```
Mon Jan 31 04:37:23 2001
```

Any value in string before the call is destroyed.

Results:

The result of the function FDATE and the value of *string* returned by the subroutine FDATE(*string*) are identical. Newline and NULL are not included in the string.

When you use FDATE as a function, declare it as:

```
CHARACTER*24 FDATE
```

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: the DATE_AND_TIME intrinsic procedure in the *Language Reference*

Example

```
USE IFPORT
CHARACTER*24 today
!
CALL FDATE(today)
write (*,*), 'Today is ', today
!
write (*,*), 'Today is ', fdate()
```

FGETC

Portability Function: Reads the next available character from a file specified by a Fortran unit number.

Module: USE IFPORT

Syntax

result = FGETC (*lunit*, *char*)

lunit

(Input) INTEGER(4). Unit number of a file. Must be currently connected to a file when the function is called.

char

(Output) CHARACTER*1. Next available character in the file. If *lunit* is connected to a console device, then no characters are returned until the Enter key is pressed.

Results:

The result type is INTEGER(4). The result is zero if the read is successful, or –1 if an end-of-file is detected. A positive value is either a system error code or a Fortran I/O error code, such as:

EINVAL: The specified unit is invalid (either not already open, or an invalid unit number).

If you use WRITE, READ, or any other Fortran I/O statements with *lunit*, be sure to read "Input and Output With Portability Routines" in your user's guide.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "GETCHARQQ", the READ statement in the *Language Reference*

Example

```
USE IFPORT
CHARACTER inchar
INTEGER istatus
istatus = FGETC(5,inchar)
PRINT *, inchar
END
```

FINDFILEQQ

Portability Function: Searches for a specified file in the directories listed in the path contained in the environment variable.

Module: USE IFPORT

Syntax

result = FINDFILEQQ (*filename*, *varname*, *pathbuf*)

filename

(Input) Character*(*). Name of the file to be found.

varname

(Input) Character*(*). Name of an environment variable containing the path to be searched.

pathbuf

(Output) Character*(*). Buffer to receive the full path of the file found.

Results:

The result type is INTEGER(4). The result is the length of the string containing the full path of the found file returned in *pathbuf*, or 0 if no file is found.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "FULLPATHQQ", "GETFILEINFOQQ", "SPLITPATHQQ"

Example

```
USE IFPORT
CHARACTER(256) pathname
INTEGER(4) pathlen
pathlen = FINDFILEQQ("libfmt.lib", "LIB", pathname)
WRITE (*,*) pathname
END
```

FLOODFILL, FLOODFILL_W

Graphics Functions: Fill an area using the current color index and fill mask. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = FLOODFILL (*x*, *y*, *bcolor*)
result = FLOODFILL_W (*wx*, *wy*, *bcolor*)

x, *y*

(Input) INTEGER(2). Viewport coordinates for fill starting point.

bcolor

(Input) INTEGER(2). Color index of the boundary color.

wx, *wy*

(Input) REAL(8). Window coordinates for fill starting point.

Results:

The result type is INTEGER(2). The result is a nonzero value if successful; otherwise, 0 (occurs if the fill could not be completed, or if the starting point lies on a pixel with the boundary color *bcolor*, or if the starting point lies outside the clipping region).

FLOODFILL begins filling at the viewport-coordinate point (*x*, *y*). FLOODFILL_W begins filling at the window-coordinate point (*wx*, *wy*). The fill color used by FLOODFILL and FLOODFILL_W is set by SETCOLOR. You can obtain the current fill color index by calling GETCOLOR. These functions allow access only to the colors in the palette (256 or less). To access all available colors on a VGA (262,144 colors) or a true color system, use the RGB functions FLOODFILLRGB and FLOODFILLRGB_W.

If the starting point lies inside a figure, the interior is filled; if it lies outside a figure, the background is filled. In both cases, the fill color is the current graphics color index set by SETCOLOR. The starting point must be inside or outside the figure, not on the figure boundary itself. Filling occurs in all directions, stopping at pixels of the boundary color *bcolor.*

NOTE. *The* FLOODFILL *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the FloodFill routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$FloodFill. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "FLOODFILLRGB, FLOODFILLRGB_W", "ELLIPSE, ELLIPSE_W", "GETCOLOR", "GETFILLMASK", "GRSTATUS", "PIE, PIE_W", "SETCLIPRGN", "SETCOLOR", "SETFILLMASK"

Example

```
USE IFQWIN
INTEGER(2) status, bcolor, red, blue
INTEGER(2) x1, y1, x2, y2, xinterior, yinterior
x1 = 80; y1 = 50
x2 = 240; y2 = 150
red = 4
blue = 1
```

```
status = SETCOLOR(red)
status = RECTANGLE( $GBORDER, x1, y1, x2, y2 )
bcolor = GETCOLOR()
status = SETCOLOR (blue)
xinterior = 160; yinterior = 100
status = FLOODFILL (xinterior, yinterior, bcolor)
END
```

FLOODFILLRGB, FLOODFILLRGB_W

Graphics Functions: Fill an area using the current Red-Green-Blue (RGB) color and fill mask. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = FLOODFILLRGB (*x*, *y*, *color*)

result = FLOODFILLRGB_W (*wx*, *wy*, *color*)

x, *y*

(Input) INTEGER(2). Viewport coordinates for fill starting point.

color

(Input) INTEGER(4). RGB value of the boundary color.

wx, *wy*

(Input) REAL(8). Window coordinates for fill starting point.

Results:

The result type is INTEGER(4). The result is a nonzero value if successful; otherwise, 0 (occurs if the fill could not be completed, or if the starting point lies on a pixel with the boundary color *color*, or if the starting point lies outside the clipping region).

FLOODFILLRGB begins filling at the viewport-coordinate point (*x*, *y*). FLOODFILLRGB_W begins filling at the window-coordinate point (*wx*, *wy*). The fill color used by FLOODFILLRGB and FLOODFILLRGB_W is set by SETCOLORRGB. You can obtain the current fill color by calling GETCOLORRGB.

If the starting point lies inside a figure, the interior is filled; if it lies outside a figure, the background is filled. In both cases, the fill color is the current color set by SETCOLORRGB. The starting point must be inside or outside the figure, not on the figure boundary itself. Filling occurs in all directions, stopping at pixels of the boundary color *color*.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "ELLIPSE, ELLIPSE_W", "FLOODFILL, FLOODFILL_W", "GETCOLORRGB", "GETFILLMASK", "GRSTATUS", "PIE, PIE_W", "SETCLIPRGN", "SETCOLORRGB", "SETFILLMASK"

Example

```
! Build as a QuickWin or Standard Graphics App.
USE IFQWIN
INTEGER(2) status
INTEGER(4) result, bcolor
INTEGER(2) x1, y1, x2, y2, xinterior, yinterior
x1 = 80; y1 = 50
x2 = 240; y2 = 150
result = SETCOLORRGB(Z'008080') ! red
status = RECTANGLE( $GBORDER, x1, y1, x2, y2 )
bcolor = GETCOLORRGB( )
result = SETCOLORRGB (Z'FF0000') ! blue
xinterior = 160; yinterior = 100
result = FLOODFILLRGB (xinterior, yinterior, bcolor)
END
```

FLUSH

Portability Subroutine: Flushes the contents of an external unit buffer into its associated file.

Module: USE IFPORT

Syntax

CALL FLUSH (*lunit*)

lunit

(Input) INTEGER(4). Number of the external unit to be flushed. Must be currently connected to a file when the subroutine is called. This routine is thread-safe, and locks the associated stream before I/O is performed.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "COMMITQQ"

FOCUSQQ

QuickWin Function: Sets focus to the window with the specified unit number. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = FOCUSQQ (*iunit*)

iunit

(Input) INTEGER(4). Unit number of the window to which the focus is set. Unit numbers 0, 5, and 6 refer to the default startup window.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, nonzero.

Units 0, 5, and 6 refer to the default window only if the program does not specifically open them. If these units have been opened and connected to windows, they are automatically reconnected to the console once they are closed.

Unlike SETACTIVEQQ, FOCUSQQ brings the specified unit to the foreground. Note that the window with the focus is not necessarily the active window (the one that receives graphical output). A window can be made active without getting the focus by calling SETACTIVEQQ.

A window has focus when it is given the focus by FOCUSQQ, when it is selected by a mouse click, or when an I/O operation other than a graphics operation is performed on it, unless the window was opened with IOFOCUS=.FALSE.. The IOFOCUS specifier determines whether a window receives focus when on I/O statement is executed on that unit. For example:

```
OPEN (UNIT = 10, FILE = 'USER', IOFOCUS = .TRUE.)
```

By default IOFOCUS=.TRUE., except for child windows opened with as unit *. If IOFOCUS=.TRUE., the child window receives focus prior to each READ, WRITE, PRINT, or OUTTEXT. Calls to graphics functions (such as OUTGTEXT and ARC) do not cause the focus to shift.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "SETACTIVEQQ", "INQFOCUSQQ", "Using QuickWin" in your user's guide

FOR_DESCRIPTOR_ASSIGN

Run-time Subroutine: Creates an array descriptor in memory. This subroutine is only available on Windows* systems.

Module: USE IFCORE

Syntax

CALL FOR_DESCRIPTOR_ASSIGN (*dp*, *base*, *size*, *reserved*, *rank*, *dims_info*)

dp

(Input) A Fortran 95/90 pointer to an array; the array can be of any data type.

base

(Input) INTEGER(4) or INTEGER(8). The base address of the data being described by *dp*.

Note that a Fortran 95/90 pointer describes both the location and type of the data item.

size

(Input) INTEGER(4). The size of the data type; for example, 4 for INTEGER(4).

reserved

(Input) INTEGER(4). A combination (using bitwise OR) of the following symbolic constants, which are defined in `IFCORE.F90`:

- FOR_DESCRIPTOR_ARRAY_DEFINED – Specifies whether the array pointed to has been allocated or associated. If the bit is set, the array has been allocated or associated.
- FOR_DESCRIPTOR_ARRAY_NODEALLOC – Specifies whether the array points to something that can be deallocated by a call to DEALLOCATE, or whether it points to something that cannot be deallocated. For example:

  ```
  integer, pointer :: p(:)
  integer, target :: t
  p => t   ! t cannot be deallocated
  allocate(p(10)) ! t can be deallocated
  ```

  If the bit is set, the array cannot be deallocated.
- FOR_DESCRIPTOR_ARRAY_CONTIGUOUS – Specifies whether the array pointed to is completely contiguous in memory or whether it is a slice that is not contiguous. If the bit is set, the array is contiguous.

rank

(Input) INTEGER(4). The rank of the array pointed to.

dims_info

(Input) An array of derived type `FOR_DIMS_INFO`; you must specify a rank for this array. The derived type `FOR_DIMS_INFO` is defined in IFCORE.F90 as follows:

```
TYPE FOR_DIMS_INFO
  INTEGER(4) LOWERBOUND  !Lower bound for the dimension
  INTEGER(4) UPPERBOUND  !Upper bound for the dimension
  INTEGER(4) STRIDE      !Stride for the dimension
```

```
END TYPE FOR_DIMS_INFO
```

The FOR_DESCRIPTOR_ASSIGN routine is similar to a Fortran 95/90 pointer assignment, but gives you more control over the assignment, allowing, for example, assignment to any location in memory.

You can also use this routine to create an array that can be used from both Fortran or C.

See Also: the POINTER Attribute and Statement in the *Language Reference*

Example

```
use IFCORE
common/c_array/ array
real(8) array(5,5)
external  init_array
external  c_print_array
real(8),pointer :: p_array(:,:)
type(FOR_DIMS_INFO) dims_info(2)

 call init_array()

 do i=1,5
   do j=1,5
      print *,i,j, array(i,j)
   end do
 end do

 dims_info(1)%LOWERBOUND = 11
 dims_info(1)%UPPERBOUND = 15
 dims_info(1)%STRIDE = 1

 dims_info(2)%LOWERBOUND = -5
 dims_info(2)%UPPERBOUND = -1
 dims_info(2)%STRIDE = 1

 call FOR_DESCRIPTOR_ASSIGN(p_array, &
   LOC(array), &
   SIZEOF(array(1,1)), &
   FOR_DESCRIPTOR_ARRAY_DEFINED .or. &
   FOR_DESCRIPTOR_ARRAY_NODEALLOC .or. &
   FOR_DESCRIPTOR_ARRAY_CONTIGUOUS,  &
   2, &
   dims_info )
```

```
p_array = p_array + 1

call c_print_array()
end
```

The following shows the C program containing init_array and c_print_array:

```
#include <stdio.h>

#if !defined(_WIN32) && !defined(_WIN64)
#define C_ARRAY c_array_
#define INIT_ARRAY init_array_
#define C_PRINT_ARRAY c_print_array_
#endif

double C_ARRAY[5][5];
void INIT_ARRAY(void);
void C_PRINT_ARRAY(void);

void INIT_ARRAY(void)
{
  int i,j;
  for(i=0;i<5;i++)
    for(j=0;j<5;j++)
       C_ARRAY[i][j] = j + 10*i;
}

void C_PRINT_ARRAY(void)
{
   int i,j;

   for(i=0;i<5;i++){
     for(j=0;j<5;j++)
         printf("%f ", C_ARRAY[i][j]);
     printf("\n");
   }
}
```

FOR_GET_FPE

Run-time Function: Returns the current settings of floating-point exception flags. This routine can be called from a C or Fortran program.

Module: USE IFCORE

Syntax

result = FOR_GET_FPE ( )

Results:

The result type is INTEGER(4). The return value represents the settings of the current floating-point exception flags. The meanings of the bits are defined in the IFQWIN module file.

To set floating-point exception flags after program initialization, use "FOR_SET_FPE".

Example

```
USE IFCORE
INTEGER*4 FPE_FLAGS
FPE_FLAGS = FOR_GET_FPE ( )
```

for_rtl_finish_

Run-Time Function: Cleans up the Fortran run-time environment; for example, flushing buffers and closing files. It also issues messages about floating-point exceptions, if any occur.

This routine should be called from a C main program; it is invoked by default from a Fortran main program.

Syntax

result = for_rtl_finish_ ( )

Results:

The result is an I/O status value. For information on these status values, see "Using the IOSTAT Value and Fortran Exit Codes" in your user's guide.

To initialize the Fortran run-time environment, use "for_rtl_init_".

Example

Consider the following C code:

```
int io_status;
int for_rtl_finish_ ( );
io_status = for_rtl_finish_ ( );
```

for_rtl_init_

Run-Time Subroutine: Initializes the Fortran run-time environment. It establishes handlers and floating-point exception handling, so Fortran subroutines behave the same as when called from a Fortran main program.

This routine should be called from a C main program; it is invoked by default from a Fortran main program.

Syntax

CALL for_rtl_init_ (*argcount*, *actarg*)

argcount

Is a command-line parameter describing the argument count.

actarg

Is a command-line parameter describing the actual arguments.

To clean up the Fortran run-time environment, use "for_rtl_finish_".

Example

Consider the following C code:

```
int argc;
char **argv;
void for_rtl_init_ (int *, char **);
for_rtl_init_ (&argc, argv);
```

FOR_SET_FPE

Run-time Function: Sets the floating-point exception flags. This routine can be called from a C or Fortran program.

Module: USE IFCORE

Syntax

result = FOR_SET_FPE (*a*)

a

Must be of type INTEGER(4). It contains bit flags controlling floating-point exception trapping, reporting, and result handling.

Results:

The result type is INTEGER(4). The return value represents the previous settings of the floating-point exception flags. The meanings of the bits are defined in the IFCORE module file.

To get the current settings of the floating-point exception flags, use "FOR_GET_FPE".

Example

```
USE IFCORE
INTEGER*4 OLD_FPE_FLAGS, NEW_FPE_FLAGS
OLD_FPE_FLAGS = FOR_SET_FPE (NEW_FPE_FLAGS)
```

FOR_SET_REENTRANCY

Run-Time Function: Controls the type of reentrancy protection that the Fortran Run-Time Library (RTL) exhibits. This routine can be called from a C or Fortran program.

Module: USE IFCORE

Syntax

result = FOR_SET_REENTRANCY (*mode*)

mode

Must be of type INTEGER(4) and contain one of the following options:

- FOR_K_REENTRANCY_NONE

  Tells the Fortran RTL to perform simple locking around critical sections of RTL code. This type of reentrancy should be used when the Fortran RTL will *not* be reentered due to asynchronous system traps (ASTs) or threads within the application.
- FOR_K_REENTRANCY_ASYNCH

  Tells the Fortran RTL to perform simple locking and disables ASTs around critical sections of RTL code. This type of reentrancy should be used when the application contains AST handlers that call the Fortran RTL.
- FOR_K_REENTRANCY_THREADED

  Tells the Fortran RTL to perform thread locking. This type of reentrancy should be used in multithreaded applications.
- FOR_K_REENTRANCY_INFO

  Tells the Fortran RTL to return the current reentrancy mode.

Results:

The result type is INTEGER(4). The return value represents the previous setting of the Fortran Run-Time Library reentrancy mode, unless the argument is FOR_K_REENTRANCY_INFO, in which case the return value represents the current setting.

You must be using an RTL that supports the level of reentrancy you desire. For example, FOR_SET_REENTRANCY ignores a request for thread protection (FOR_K_REENTRANCY_THREADED) if you do not build your program with the thread-safe RTL.

Example

```
PROGRAM SETREENT
USE IFCORE

INTEGER*4    MODE
CHARACTER*10 REENT_TXT(3) /'NONE    ','ASYNCH  ','THREADED'/
```

```
PRINT*,'Setting Reentrancy mode to ',REENT_TXT(MODE+1)
MODE = FOR_SET_REENTRANCY(FOR_K_REENTRANCY_NONE)
PRINT*,'Previous Reentrancy mode was ',REENT_TXT(MODE+1)

MODE = FOR_SET_REENTRANCY(FOR_K_REENTRANCY_INFO)
PRINT*,'Current Reentrancy mode is ',REENT_TXT(MODE+1)

END
```

FPUTC

Portability Function: Writes a character to the file specified by a Fortran external unit, bypassing normal Fortran input/output.

Module: USE IFPORT

Syntax

result = FPUTC (*lunit*, *char*)

lunit

(Input) INTEGER(4). Unit number of a file.

char

(Output) Character*(*). Variable whose value is to be written to the file corresponding to *lunit*.

Results:

The result type is INTEGER(4). The result is zero if the write was successful; otherwise, an error code, such as:

EINVAL - The specified unit is invalid (either not already open, or an invalid unit number)

If you use WRITE, READ, or any other Fortran I/O statements with *lunit*, be sure to read "Input and Output With Portability Routines" in your user's guide.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "I/O Formatting" in the *Language Reference*, "Files, Devices, and Input/Output Hardware" in your user's guide

Example

```
use IFPORT
integer*4 lunit, i4
character*26 string
character*1 char1
lunit = 1
```

```
open (lunit,file = 'fputc.dat')
do i = 1,26
  char1 = char(123-i)
  i4 = fputc(1,char1)        !make valid writes
  if (i4.ne.0) iflag = 1
enddo
rewind (1)
read (1,'(a)') string
print *, string
```

FSEEK

Portability Function: Repositions a file specified by a Fortran external unit.

Module: USE IFPORT

Syntax

result = FSEEK (*lunit*, *offset*, *from*)

lunit

(Input) INTEGER(4). External unit number of a file.

offset

(Input) INTEGER(4) or INTEGER(8). Offset in bytes, relative to *from*, that is to be the new location of the file marker.

from

(Input) INTEGER(4). A position in the file. It must be one of the following:

Value	Variable	Position
0	SEEK_SET	Positions the file relative to the beginning of the file.
1	SEEK_CUR	Positions the file relative to the current position.
2	SEEK_END	Positions the file relative to the end of the file.

Results:

The result type is INTEGER(4). The result is zero if the repositioning was successful; otherwise, an error code, such as:

EINVAL: The specified unit is invalid (either not already open, or an invalid unit number), or the *from* parameter is invalid.

The file specified in *lunit* must be open.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

Example

```
USE IFPORT
integer(4) istat, offset, ipos
character ichar
OPEN (unit=1,file='datfile.dat')
offset = 5
ipos = 0
istat=fseek(1,offset,ipos)
if (.NOT. stat) then
  istat=fgetc(1,ichar)
  print *, 'data is ',ichar
end if
```

FSTAT

Portability Function: Returns detailed information about a file specified by a external unit number.

Module: USE IFPORT

Syntax

result = FSTAT (*lunit*, *statb*)

lunit

(Input) INTEGER(4). External unit number of the file to examine.

statb

(Output) INTEGER(4) or INTEGER(8). One-dimensional array of size 12; where the system information is stored. The elements of *statb* contain the following values:

Element	Description	Values or Notes
statb(1)	Device the file resides on	W*32, W*64: Always 0 L*X: System dependent
statb(2)	File inode number	W*32, W*64: Always 0 L*X: System dependent
statb(3)	Access mode of the file	See the table in Results
statb(4)	Number of hard links to the file	W*32, W*64: Always 1 L*X: System dependent

Element	Description	Values or Notes
statb(5)	User ID of owner	W*32, W*64: Always 1 L*X: System dependent
statb(6)	Group ID of owner	W*32, W*64: Always 1 L*X: System dependent
statb(7)	Raw device the file resides on	W*32, W*64: Always 0 L*X: System dependent
statb(8)	Size of the file	
statb(9)	Time when the file was last accessed [1]	W*32, W*64: Only available on non-FAT file systems; undefined on FAT systems L*X: System dependent
statb(10)	Time when the file was last modified [1]	
statb(11)	Time of last file status change [1]	W*32, W*64: Same as stat(10) L*X: System dependent
statb(12)	Blocksize for file system I/O operations	W*32, W*64: Always 1 L*X: System dependent

1. Times are in the same format returned by the TIME function (number of seconds since 00:00:00 Greenwich mean time, January 1, 1970).

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, returns an error code equal to EINVAL (*lunit* is not a valid unit number, or is not open).

The access mode (the third element of *statb*) is a bitmap consisting of an IOR of the following constants:

Symbolic name	Constant	Description	Notes
S_IFMT	O'0170000'	Type of file	
S_IFDIR	O'0040000'	Directory	
S_IFCHR	O'0020000'	Character special	Never set on Windows* systems
S_IFBLK	O'0060000'	Block special	Never set on Windows systems
S_IFREG	O'0100000'	Regular	
S_IFLNK	O'0120000'	Symbolic link	Never set on Windows systems
S_IFSOCK	O'0140000'	Socket	Never set on Windows systems
S_ISUID	O'0004000'	Set user ID on execution	Never set on Windows systems
S_ISGID	O'0002000'	Set group ID on execution	Never set on Windows systems
S_ISVTX	O'0001000'	Save swapped text	Never set on Windows systems

Symbolic name	Constant	Description	Notes
S_IRWXU	O'0000700'	Owner's file permissions	
S_IRUSR, S_IREAD	O'0000400'	Owner's read permission	Always true on Windows systems
S_IWUSR, S_IWRITE	O'0000200'	Owner's write permission	
S_IXUSR, S_IEXEC	O'0000100'	Owner's execute permission	Based on file extension (.EXE, .COM, .CMD, or .BAT)
S_IRWXG	O'0000070'	Group's file permissions	Same as S_IRWXU on Windows systems
S_IRGRP	O'0000040'	Group's read permission	Same as S_IRUSR on Windows systems
S_IWGRP	O'0000020'	Group's write permission	Same as S_IWUSR on Windows systems
S_IXGRP	O'0000010'	Group's execute permission	Same as S_IXUSR on Windows systems
S_IRWXO	O'0000007'	Other's file permissions	Same as S_IRWXU on Windows systems
S_IROTH	O'0000004'	Other's read permission	Same as S_IRUSR on Windows systems
S_IWOTH	O'0000002'	Other's write permission	Same as S_IWUSR on Windows systems
S_IXOTH	O'0000001'	Other's execute permission	Same as S_IXUSR on Windows systems

STAT returns the same information as FSTAT, but accesses files by name instead of external unit number.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: the INQUIRE statement in the *Language Reference*, "STAT"

Example

```
USE IFPORT
integer(4) statarray(12), istat
OPEN (unit=1,file='datfile.dat')
ISTAT = FSTAT (1, statarray)
if (.NOT. istat) then
   print *, statarray
end if
```

FTELL, FTELLI8

Portability Functions: Return the current position of a file.

Module: USE IFPORT

Syntax

result = FTELL (*lunit*)
result = FTELLI8 (*lunit*)

lunit

(Input) INTEGER(4). External unit number of a file.

Results:

The result type is INTEGER(4) for FTELL; INTEGER(8) for FTELLI8. The result is the offset, in bytes, from the beginning of the file. A negative value indicates an error, which is the negation of the IERRNO error code. The following is an example of an error code:

EINVAL: *lunit* is not a valid unit number, or is not open.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

FULLPATHQQ

Portability Function: Returns the full path for a specified file or directory.

Module: USE IFPORT

Syntax

result = FULLPATHQQ (*name*, *pathbuf*)

name

(Input) Character*(*). Item for which you want the full path. Can be the name of a file in the current directory, a relative directory or file name, or a network uniform naming convention (UNC) path.

pathbuf

(Output) Character*(*). Buffer to receive full path of the item specified in *name*.

Results:

The result type is INTEGER(4). The result is the length of the full path in bytes, or 0 if the function fails (usually for an invalid name).

The length of the full path depends upon how deeply the directories are nested on the drive you are using. If the full path is longer than the character buffer provided to return it (*pathbuf*), FULLPATHQQ returns only that portion of the path that fits into the buffer.

Check the length of the path before using the string returned in *pathbuf*. If the longest full path you are likely to encounter does not fit into the buffer you are using, allocate a larger character buffer. You can allocate the largest possible path buffer with the following statements:

```
USE IFPORT
CHARACTER($MAXPATH) pathbuf
```

$MAXPATH is a symbolic constant defined in `IFQWIN.F90` as 260.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "SPLITPATHQQ"

Example

```
USE IFPORT
USE IFCORE
CHARACTER($MAXPATH) buf
CHARACTER(3)        drive
CHARACTER(256)      dir
CHARACTER(256)      name
CHARACTER(256)      ext
CHARACTER(256)      file

INTEGER(4)          len

DO WHILE (.TRUE.)
  WRITE (*,*)
  WRITE (*,'(A, \)') ' Enter filename (Hit &
                      RETURN to exit): '
  len = GETSTRQQ(file)
  IF (len .EQ. 0) EXIT
  len = FULLPATHQQ(file, buf)
  IF (len .GT. 0) THEN
    WRITE (*,*) buf(:len)
  ELSE
    WRITE (*,*) 'Can''t get full path'
    EXIT
  END IF
```

```
!     Split path
      WRITE (*,*)
      len = SPLITPATHQQ(buf, drive, dir, name, ext)
      IF (len .NE. 0) THEN
        WRITE (*, 900) ' Drive: ', drive
        WRITE (*, 900) ' Directory: ', dir(1:len)
        WRITE (*, 900) ' Name: ', name
        WRITE (*, 900) ' Extension: ', ext
      ELSE
       WRITE (*, *) 'Can''t split path'
      END IF
     END DO
900  FORMAT (A, A)
     END
```

GERROR

Run-Time Subroutine: Returns a message for the last error detected by a Fortran run-time routine.

Module: USE IFCORE

Syntax

CALL GERROR (*string*)

string

(Output) Character*(*). Message corresponding to the last detected error.

The last detected error does not necessarily correspond to the most recent function call. The compiler resets *string* only when another error occurs.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "PERROR", "IERRNO"

Example

```
USE IFCORE
character*40 errtext
character char1
integer*4 iflag, i4
. . .!Open unit 1 here
i4=fgetc(1,char1) if (i4) then
```

```
  iflag = 1
  Call GERROR (errtext)
  print *, errtext
end if
```

GETACTIVEQQ

QuickWin Function: Returns the unit number of the currently active child window. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETACTIVEQQ ( )

Results:

The result type is INTEGER(4). The result is the unit number of the currently active window. If no child window is active, it returns the parameter QWIN$NOACTIVEWINDOW (defined in `IFQWIN.F90`).

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "SETACTIVEQQ", "GETHWNDQQ", "Using QuickWin" in your user's guide

GETARCINFO

Graphics Function: Determines the endpoints (in viewport coordinates) of the most recently drawn arc or pie. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETARCINFO (*pstart*, *pend*, *ppaint*)

pstart

(Output) Derived type `xycoord`. Viewport coordinates of the starting point of the arc.

pend

(Output) Derived type `xycoord`. Viewport coordinates of the end point of the arc.

ppaint

(Output) Derived type `xycoord`. Viewport coordinates of the point at which the fill begins.

Results:

The result type is INTEGER(2). The result is nonzero if successful. The result is zero if neither the ARC nor the PIE function has been successfully called since the last time CLEARSCREEN or SETWINDOWCONFIG was successfully called, or since a new viewport was selected.

GETARCINFO updates the *pstart* and *pend* `xycoord` derived types to contain the endpoints (in viewport coordinates) of the arc drawn by the most recent call to the ARC or PIE functions. The `xycoord` derived type, defined in `IFQWIN.F90`, is:

```
TYPE xycoord
  INTEGER(2) xcoord
  INTEGER(2) ycoord
END TYPE xycoord
```

The returned value in *ppaint* specifies a point from which a pie can be filled. You can use this to fill a pie in a color different from the border color. After a call to GETARCINFO, change colors using SETCOLORRGB. Use the new color, along with the coordinates in *ppaint*, as arguments for the FLOODFILLRGB function.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "ARC, ARC_W", "FLOODFILLRGB, FLOODFILLRGB_W", "GETCOLORRGB", "GRSTATUS", "PIE, PIE_W", "SETCOLORRGB"

Example

```
USE IFQWIN
INTEGER(2) status, x1, y1, x2, y2, x3, y3, x4, y4
TYPE (xycoord) xystart, xyend, xyfillpt
x1 = 80; y1 = 50
x2 = 240; y2 = 150
x3 = 120; y3 = 80
x4 = 90; y4 = 180
status = ARC(x1, y1, x2, y2, x3, y3, x4, y4)
status = GETARCINFO(xystart, xyend, xyfillpt)
END
```

GETBKCOLOR

Graphics Function: Returns the current background color index for both text and graphics output. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETBKCOLOR ( )

Results:

The result type is INTEGER(4). The result is the current background color index.

GETBKCOLOR returns the current background color index for both text and graphics, as set with SETBKCOLOR. The color index of text over the background color is set with SETTEXTCOLOR and returned with GETTEXTCOLOR. The color index of graphics over the background color is set with SETCOLOR and returned with GETCOLOR. These non-RGB color functions use color indexes, not true color values, and limit the user to colors in the palette, at most 256. For access to all system colors, use SETBKCOLORRGB, SETCOLORRGB, and SETTEXTCOLORRGB.

Generally, INTEGER(4) color arguments refer to color values and INTEGER(2) color arguments refer to color indexes. The two exceptions are GETBKCOLOR and SETBKCOLOR. The default background index is 0, which is associated with black unless the user remaps the palette with REMAPPALETTERGB.

NOTE. *The* GETBKCOLOR *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the GetBkColor routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$GetBkColor. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETBKCOLORRGB", "SETBKCOLOR", "GETCOLOR", "GETTEXTCOLOR", "REMAPALLPALETTERGB", "REMAPPALETTERGB"

Example

```
USE IFQWIN
INTEGER(4) bcindex
bcindex = GETBKCOLOR()
```

GETBKCOLORRGB

Graphics Function: Returns the current background Red-Green-Blue (RGB) color value for both text and graphics. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETBKCOLORRGB ( )

Results:

The result type is INTEGER(4). The result is the RGB value of the current background color for both text and graphics.

In each RGB color value, each of the three colors, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the value you retrieve with GETBKCOLORRGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 1111111 (hex FF) the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

GETBKCOLORRGB returns the RGB color value of the current background for both text and graphics, set with SETBKCOLORRGB. The RGB color value of text over the background color (used by text functions such as OUTTEXT, WRITE, and PRINT) is set with SETTEXTCOLORRGB and returned with GETTEXTCOLORRGB. The RGB color value of graphics over the background color (used by graphics functions such as ARC, OUTGTEXT, and FLOODFILLRGB) is set with SETCOLORRGB and returned with GETCOLORRGB.

SETBKCOLORRGB (and the other RGB color selection functions SETCOLORRGB and SETTEXTCOLORRGB) sets the color to a value chosen from the entire available range. The non-RGB color functions (SETBKCOLOR, SETCOLOR, and SETTEXTCOLOR) use color indexes rather than true color values. If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit RGB value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETCOLORRGB", "GETTEXTCOLORRGB", "SETBKCOLORRGB", "GETBKCOLOR"

Example

```
! Build as a QuickWin or Standard Graphics App.
```

```
USE IFQWIN
INTEGER(4) back, fore, oldcolor
INTEGER(2) status, x1, y1, x2, y2
x1 = 80; y1 = 50
x2 = 240; y2 = 150
oldcolor = SETCOLORRGB(Z'FF') ! red
! reverse the screen
back = GETBKCOLORRGB()
fore = GETCOLORRGB()
oldcolor = SETBKCOLORRGB(fore)
oldcolor = SETCOLORRGB(back)
CALL CLEARSCREEN ($GCLEARSCREEN)
status = ELLIPSE($GBORDER, x1, y1, x2, y2)
END
```

GETC

Portability Function: Reads the next available character from external unit 5, which is normally connected to the console.

Module: USE IFPORT

Syntax

result = GETC (*char*)

char

(Output) Character*(*). The first character typed at the keyboard after the call to GETC. If unit 5 is connected to a console device, then no characters are returned until the Enter key is pressed.

Results:

The result is of type INTEGER(4). The result is zero if successful, or –1 if an end-of-file was detected.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAHICS WINDOWS LIB

See Also: "GETCHARQQ", "GETSTRQQ"

Example

```
use IFPORT
character ans,errtxt*40
print *, 'Enter a character: '
ISTAT = GETC (ans)
```

```
if (istat) then
  call gerror(errtxt)
end if
```

GETCHARQQ

Run-Time Function: Returns the next keystroke.

Module: USE IFCORE

Syntax

result = GETCHARQQ ( )

Results:

The result type is character with length 1. The result is the character representing the key that was pressed. The value can be any ASCII character.

If the key pressed is represented by a single ASCII character, GETCHARQQ returns the character. If the key pressed is a function or direction key, a hex Z'00' or Z'E0' is returned. If you need to know which function or direction was pressed, call GETCHARQQ a second time to get the extended code for the key.

If there is no keystroke waiting in the keyboard buffer, GETCHARQQ waits until there is one, and then returns it. Compare this to the function PEEKCHARQQ, which returns .TRUE. if there is a character waiting in the keyboard buffer, and .FALSE. if not. You can use PEEKCHARQQ to determine if GETCHARQQ should be called. This can prevent a program from hanging while GETCHARQQ waits for a keystroke that isn't there. Note that PEEKCHARQQ is only supported in console applications.

If your application is a QuickWin or Standard Graphics application, you may want to put a call to PASSDIRKEYSQQ in your program. This will enable the program to get characters that would otherwise be trapped. These extra characters are described in PASSDIRKEYSQQ.

Note that the GETCHARQQ routine used in a console application is a different routine than the one used in a QuickWin or Standard Graphics application.

The GETCHARQQ used with a console application does not trap characters that are used in QuickWin for a special purpose, such as scrolling. Console applications do not need, and cannot use PASSDIRKEYSQQ.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS LIB`

See Also: "PASSDIRKEYSQQ", "PEEKCHARQQ", "GETCHARQQ", "GETSTRQQ", "INCHARQQ", "MBINCHARQQ", "GETC", "FGETC"

Example

```
!  Program to demonstrate GETCHARQQ
USE IFCORE
CHARACTER(1) key / 'A' /
PARAMETER (ESC = 27)
PARAMETER (NOREP = 0)
WRITE (*,*) ' Type a key: (or q to quit)'
!  Read keys until ESC or q is pressed
DO WHILE (ICHAR (key) .NE. ESC)
   key = GETCHARQQ()
!  Some extended keys have no ASCII representation
   IF(ICHAR(key) .EQ. NOREP) THEN
     key = GETCHARQQ()
     WRITE (*, 900) 'Not ASCII. Char = NA'
     WRITE (*,*)
!  Otherwise, there is only one key
   ELSE
     WRITE (*,900) 'ASCII. Char = '
     WRITE (*,901) key
   END IF
   IF (key .EQ. 'q' ) THEN
     EXIT
   END IF
   END DO
900   FORMAT (1X, A, \)
901   FORMAT (A)
END
```

GETCOLOR

Graphics Function: Returns the current graphics color index. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETCOLOR ( )

Results:

The result type is INTEGER(2). The result is the current color index, if successful; otherwise, –1.

GETCOLOR returns the current color index used for graphics over the background color as set with SETCOLOR. The background color index is set with SETBKCOLOR and returned with GETBKCOLOR. The color index of text over the background color is set with SETTEXTCOLOR and returned with GETTEXTCOLOR. These non-RGB color functions use color indexes, not true color values, and limit the user to colors in the palette, at most 256. For access to all system colors, use SETCOLORRGB, SETBKCOLORRGB, and SETTEXTCOLORRGB.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETCOLORRGB", "GETBKCOLOR", "GETTEXTCOLOR", "SETCOLOR"

Example

```
!  Program to demonstrate GETCOLOR
PROGRAM COLORS
USE IFQWIN
INTEGER(2) loop, loop1, status, color
LOGICAL(4) winstat
REAL rnd1, rnd2, xnum, ynum
type (windowconfig) wc
status = SETCOLOR(INT2(0))
!  Color random pixels with 15 different colors
DO loop1 = 1, 15
   color = INT2(MOD(GETCOLOR() +1, 16))
   status = SETCOLOR (color) ! Set to next color
   DO loop = 1, 75
!  Set color of random spot, normalized to be on screen
     CALL RANDOM(rnd1)
     CALL RANDOM(rnd2)
     winstat = GETWINDOWCONFIG(wc)
     xnum = wc%numxpixels
     ynum = wc%numypixels
     status = &
     SETPIXEL(INT2(rnd1*xnum+1),INT2(rnd2*ynum))
     status = &
     SETPIXEL(INT2(rnd1*xnum),INT2(rnd2*ynum+1))
     status = &
     SETPIXEL(INT2(rnd1*xnum-1),INT2( rnd2*ynum))
```

```
      status = &
      SETPIXEL(INT2(rnd1*xnum),INT2( rnd2*ynum-1))
    END DO
  END DO
  END
```

GETCOLORRGB

Graphics Function: Returns the current graphics color Red-Green-Blue (RGB) value (used by graphics functions such as ARC, ELLIPSE, and FLOODFILLRGB). This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETCOLORRGB ( )

Results:

The result type is INTEGER(4). The result is the RGB value of the current graphics color.

In each RGB color value, each of the three colors, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the value you retrieve with GETCOLORRGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 1111111 (hex FF) the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

GETCOLORRGB returns the RGB color value of graphics over the background color (used by graphics functions such as ARC, ELLIPSE, and FLOODFILLRGB), set with SETCOLORRGB. GETBKCOLORRGB returns the RGB color value of the current background for both text and graphics, set with SETBKCOLORRGB. GETTEXTCOLORRGB returns the RGB color value of text over the background color (used by text functions such as OUTTEXT, WRITE, and PRINT), set with SETTEXTCOLORRGB.

SETCOLORRGB (and the other RGB color selection functions SETBKCOLORRGB and SETTEXTCOLORRGB) sets the color to a value chosen from the entire available range. The non-RGB color functions (SETCOLOR, SETBKCOLOR, and SETTEXTCOLOR) use color

indexes rather than true color values. If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit RGB value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETBKCOLORRGB", "GETTEXTCOLORRGB", "SETCOLORRGB", "GETCOLOR"

Example

```
! Build as a QuickWin or Standard Graphics App.
USE IFQWIN
INTEGER(2) numfonts
INTEGER(4) fore, oldcolor

numfonts = INITIALIZEFONTS ( )
oldcolor = SETCOLORRGB(Z'FF')   ! set graphics
                                !  color to red
fore = GETCOLORRGB()
oldcolor = SETBKCOLORRGB(fore)  ! set background
                                !  to graphics color
CALL CLEARSCREEN($GCLEARSCREEN)
oldcolor = SETCOLORRGB (Z'FF0000') ! set graphics
                                   !  color to blue
CALL OUTGTEXT("hello, world")
END
```

GETCONTROLFPQQ

Portability Subroutine: Returns the floating-point processor control word.

Module: USE IFPORT

Syntax

CALL GETCONTROLFPQQ (*controlword*)

controlword

(Output) INTEGER(2). Floating-point processor control word.

The floating-point control word is a bit flag that controls various modes of the floating-point coprocessor.

The control word can be any of the following constants (defined in `IFPORT.F90`):

Parameter name	Hex value	Description
FPCW$MCW_IC	Z'1000'	**Infinity control mask**
FPCW$AFFINE	Z'1000'	Affine infinity
FPCW$PROJECTIVE	Z'0000'	Projective infinity
FPCW$MCW_PC	Z'0300'	**Precision control mask**
FPCW$64	Z'0300'	64-bit precision
FPCW$53	Z'0200'	53-bit precision
FPCW$24	Z'0000'	24-bit precision
FPCW$MCW_RC	Z'0C00'	**Rounding control mask**
FPCW$CHOP	Z'0C00'	Truncate
FPCW$UP	Z'0800'	Round up
FPCW$DOWN	Z'0400'	Round down
FPCW$NEAR	Z'0000'	Round to nearest
FPCW$MCW_EM	Z'003F'	**Exception mask**
FPCW$INVALID	Z'0001'	Allow invalid numbers
FPCW$DENORMAL	Z'0002'	Allow denormals (very small numbers)
FPCW$ZERODIVIDE	Z'0004'	Allow divide by zero
FPCW$OVERFLOW	Z'0008'	Allow overflow
FPCW$UNDERFLOW	Z'0010'	Allow underflow
FPCW$INEXACT	Z'0020'	Allow inexact precision

The defaults for the floating-point control word are 53-bit precision, round to nearest, and the denormal, underflow and inexact precision exceptions disabled. An exception is disabled if its flag is set to 1 and enabled if its flag is cleared to 0. Exceptions can be disabled by setting the flags to 1 with SETCONTROLFPQQ.

If an exception is disabled, it does not cause an interrupt when it occurs. Instead, floating-point processes generate an appropriate special value (NaN or signed infinity), but the program continues.

You can find out which exceptions (if any) occurred by calling GETSTATUSFPQQ. If errors on floating-point exceptions are enabled (by clearing the flags to 0 with SETCONTROLFPQQ), the operating system generates an interrupt when the exception occurs. By default, these interrupts cause run-time errors, but you can capture the interrupts with SIGNALQQ and branch to your own error-handling routines.

You can use GETCONTROLFPQQ to retrieve the current control word and SETCONTROLFPQQ to change the control word. Most users do not need to change the default settings. For a full discussion of the floating-point control word, exceptions, and error handling, see "The Floating-Point Environment" in your user's guide.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "SETCONTROLFPQQ", "GETSTATUSFPQQ", "SIGNALQQ", "CLEARSTATUSFPQQ"

Example

```
USE IFPORT
INTEGER(2) control
CALL GETCONTROLFPQQ (control)
    !if not rounding down
IF (IAND(control, FPCW$DOWN) .NE. FPCW$DOWN) THEN
  control = IAND(control, NOT(FPCW$MCW_RC)) ! clear all
                                            !  rounding
  control = IOR(control, FPCW$DOWN)         !  set to
                                            !  round down
  CALL SETCONTROLFPQQ(control)
END IF
END
```

GETCURRENTPOSITION, GETCURRENTPOSITION_W

Graphics Subroutines: Return the coordinates of the current graphics position. These subroutines are only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL GETCURRENTPOSITION (*t*)
CALL GETCURRENTPOSITION_W (*wt*)

t

(Output) Derived type `xycoord`. Viewport coordinates of current graphics position. The derived type `xycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE xycoord
  INTEGER(2) xcoord   ! x-coordinate
  INTEGER(2) ycoord   ! y-coordinate
END TYPE xycoord
```

wt

(Output) Derived type `wxycoord`. Window coordinates of current graphics position. The derived type `wxycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE wxycoord
  REAL(8) wx    ! x-coordinate
  REAL(8) wy    ! y-coordinate
END TYPE wxycoord
```

LINETO, MOVETO, and OUTGTEXT all change the current graphics position. It is in the center of the screen when a window is created.

Graphics output starts at the current graphics position returned by GETCURRENTPOSITION or GETCURRENTPOSITION_W. This position is not related to normal text output (from OUTTEXT or WRITE, for example), which begins at the current text position (see SETTEXTPOSITION). It does, however, affect graphics text output from OUTGTEXT.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "LINETO, LINETO_W", "MOVETO, MOVETO_W", "OUTGTEXT", "SETTEXTPOSITION", "GETTEXTPOSITION"

Example

```
! Program to demonstrate GETCURRENTPOSITION
USE IFQWIN
TYPE (xycoord) position
INTEGER(2)     result
result = LINETO(INT2(300), INT2(200))
CALL GETCURRENTPOSITION( position )
IF (position%xcoord .GT. 50) THEN
  CALL MOVETO(INT2(50), position%ycoord, position)
  WRITE(*,*) "Text unaffected by graphics position"
END IF
```

```
result = LINETO(INT2(300), INT2(200))
END
```

GETCWD

Portability Function: Returns the path of the current working directory.

Module: USE IFPORT

Syntax

result = GETCWD (*dirname*)

dirname

(Output) Character *(*). Name of the current working directory path, including drive letter.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, an error code.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "GETDRIVEDIRQQ"

Example

```
    use ifport
    character*30 dirname
!   variable dirname must be long enough to hold entire string
    integer(4) istat
    ISTAT = GETCWD (dirname)
    IF (ISTAT == 0) write *, 'Current directory is ',dirname
```

GETDAT

Portability Subroutine: Returns the date.

Module: USE IFPORT

Syntax

CALL GETDAT (*iyr*, *imon*, *iday*)

iyr

(Output) INTEGER(4) or INTEGER(2). Year (*xxxx* AD).

imon

(Output) INTEGER(4) or INTEGER(2). Month (1-12).

iday

(Output) INTEGER(4) or INTEGER(2). Day of the month (1-31).

This subroutine is thread-safe.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS DLL LIB

See Also: "GETTIM", "SETDAT", "SETTIM", "FDATE", "IDATE4", "JDATE"

Example

```
! Program to demonstrate GETDAT and GETTIM
USE IFPORT
INTEGER(4) tmpday, tmpmonth, tmpyear
INTEGER(4) tmphour, tmpminute, tmpsecond, tmphund
CHARACTER(1) mer

CALL GETDAT(tmpyear, tmpmonth, tmpday)
CALL GETTIM(tmphour, tmpminute, tmpsecond, tmphund)
IF (tmphour .GT. 12) THEN
  mer = 'p'
  tmphour = tmphour - 12
ELSE
  mer = 'a'
END IF
WRITE (*, 900) tmpmonth, tmpday, tmpyear
900  FORMAT(I2, '/', I2.2, '/', I4.4)
WRITE (*, 901) tmphour,tmpminute,tmpsecond,tmphund,mer
901  FORMAT(I2, ':', I2.2, ':', I2.2, ':', I2.2, ' ',&
            A, 'm')
END
```

GETDRIVEDIRQQ

Portability Function: Returns the path of the current working directory on a specified drive.

Module: USE IFPORT

Syntax

result = GETDRIVEDIRQQ (*drivedir*)

drivedir

(Input; output) Character*(*). On input, drive whose current working directory path is to be returned. On output, string containing the current directory on that drive in the form `d:\dir`.

Results:

The result type is INTEGER(4). The result is the length (in bytes) of the full path of the directory on the specified drive. Zero is returned if the path is longer than the size of the character buffer *drivedir*.

You specify the drive from which to return the current working directory by putting the drive letter into *drivedir* before calling GETDRIVEDIRQQ. To make sure you get information about the current drive, put the symbolic constant FILE$CURDRIVE (defined in `IFPORT.F90`) into *drivedir*.

Because drives are identified by a single alphabetic character, GETDRIVEDIRQQ examines only the first letter of *drivedir*. For instance, if *drivedir* contains the path `c:\fps90\bin`, GETDRIVEDIRQQ (*drivedir*) returns the current working directory on drive C and disregards the rest of the path. The drive letter can be uppercase or lowercase.

The length of the path returned depends on how deeply the directories are nested on the drive specified in *drivedir*. If the full path is longer than the length of *drivedir*, GETDRIVEDIRQQ returns only the portion of the path that fits into *drivedir*. If you are likely to encounter a long path, allocate a buffer of size $MAXPATH ($MAXPATH = 260).

On Linux* systems, the function gets a path only when symbolic constant FILE$CURDRIVE has been applied to *drivedir*.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS DLL LIB`

See Also: "CHANGEDRIVEQQ", "CHANGEDIRQQ", "GETDRIVESIZEQQ", "GETDRIVESQQ", "GETLASTERRORQQ", "SPLITPATHQQ"

Example

```
!  Program to demonstrate GETDRIVEDIRQQ
USE IFPORT
CHARACTER($MAXPATH) dir
INTEGER(4) length
!  Get current directory
dir = FILE$CURDRIVE
length = GETDRIVEDIRQQ(dir)
IF (length .GT. 0) THEN
  WRITE (*,*) 'Current directory is: '
  WRITE (*,*) dir
```

```
ELSE
  WRITE (*,*) 'Failed to get current directory'
END IF
END
```

GETDRIVESIZEQQ

Portability Function: Returns the total size of the specified drive and space available on it.

Module: USE IFPORT

Syntax

result = GETDRIVESIZEQQ (*drive*, *total*, *avail*)

drive

(Input) Character*(*). String containing the letter of the drive to get information about.

total

(Output) INTEGER(4) or INTEGER(4),DIMENSION(2) or INTEGER(8). Total number of bytes on the drive.

avail

(Output) INTEGER(4) or INTEGER(4),DIMENSION(2) or INTEGER(8). Number of bytes of available space on the drive.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

The data types and dimension (if any) specified for the *total* and *avail* arguments must be the same. Specifying an array of two INTEGER(4) elements, or an INTEGER(8) argument, allows drive sizes larger than 2147483647 to be returned.

If an array of two INTEGER(4) elements is specified, the least-significant 32 bits are returned in the first element, the most-significant 32 bits in the second element. If an INTEGER(4) scalar is specified, the least-significant 32 bits are returned.

Because drives are identified by a single alphabetic character, GETDRIVESIZEQQ examines only the first letter of *drive*. The drive letter can be uppercase or lowercase. You can use the constant FILE$CURDRIVE (defined in `IFPORT.F90`) to get the size of the current drive.

If GETDRIVESIZEQQ fails, use GETLASTERRORQQ to determine the reason.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "GETLASTERRORQQ", "GETDRIVESQQ", "GETDRIVEDIRQQ", "CHANGEDRIVEQQ","CHANGEDIRQQ"

Example

```
! Program to demonstrate GETDRIVESQQ and GETDRIVESIZEQQ
USE IFPORT
CHARACTER(26) drives
CHARACTER(1) adrive
LOGICAL(4) status
INTEGER(4) total, avail
INTEGER(2) i
! Get the list of drives
drives = GETDRIVESQQ()
WRITE (*,'(A, A)') ' Drives available: ', drives
!
!Cycle through them for free space and write to console
DO i = 1, 26
  adrive = drives(i:i)
  status = .FALSE.
 WRITE (*,'(A, A, A, \)') ' Drive ', CHAR(i + 64), ':'
  IF (adrive .NE. ' ') THEN
     status = GETDRIVESIZEQQ(adrive, total, avail)
  END IF
  IF (status) THEN
     WRITE (*,*) avail, ' of ', total, ' bytes free.'
  ELSE
     WRITE (*,*) 'Not available'
  END IF
END DO
END
```

GETDRIVESQQ

Portability Function: Reports which drives are available to the system.

Module: USE IFPORT

Syntax

result = GETDRIVESQQ ( )

Results:

The result type is character with length 26. It is the positional character string containing the letters of the drives available in the system.

The returned string contains letters for drives that are available, and blanks for drives that are not available. For example, on a system with A, C, and D drives, the string 'A CD ' is returned.

On Linux* systems, the function returns a string filled with spaces.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS DLL LIB`

See Also: "GETDRIVEDIRQQ", "GETDRIVESIZEQQ", "CHANGEDRIVEQQ"

Example

See the example for "GETDRIVESIZEQQ".

GETENV

Portability Subroutine: Returns the value of an environment variable.

Module: USE IFPORT

Syntax

CALL GETENV (*ename*, *evalue*)

ename

(Input) Character*(*). Environment variable to search for.

evalue

(Output) Character*(*). Value found for *ename*. Blank if *ename* is not found.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "GETENVQQ"

Example

```
use IFPORT
character*40 libname
CALL GETENV ("LIB",libname)
TYPE *, "The LIB variable points to ",libname
```

GETENVQQ

Portability Function: Returns the value of an environment variable.

Module: USE IFPORT

Syntax

result = GETENVQQ (*varname*, *value*)

varname

(Input) Character*(*). Name of environment variable.

value

(Output) Character*(*). Value of the specified environment variable, in uppercase.

Results:

The result type is INTEGER(4). The result is the length of the string returned in *value*. Zero is returned if the given variable is not defined.

GETENVQQ searches the list of environment variables for an entry corresponding to *varname*. Environment variables define the environment in which a process executes. For example, the LIB environment variable defines the default search path for libraries to be linked with a program.

Note that some environment variables may exist only on a per-process basis and may not be present at the command-line level.

GETENVQQ uses the C runtime routine getenv and SETENVQQ uses the C runtime routine _putenv. From the C documentation:

> getenv and _putenv use the copy of the environment pointed to by the global variable _environ to access the environment. getenv operates only on the data structures accessible to the run-time library and not on the environment segment created for the process by the operating system.
>
> In a program that uses the main function, _environ is initialized at program startup to settings taken from the operating system's environment.

Changes made outside the program by the console SET command, for example, SET MY_VAR=ABCDE, will be reflected by GETENVQQ.

GETENVQQ and SETENVQQ will not work properly with the Win32* APIs GetEnvironmentVariable and SetEnvironmentVariable.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS  DLL  LIB`

See Also: "SETENVQQ", "GETLASTERRORQQ"

Example

```
!  Program to demonstrate GETENVQQ and SETENVQQ
USE IFPORT
USE IFCORE
```

```
INTEGER(4) lenv, lval
CHARACTER(80) env, val, enval
WRITE (*,900) ' Enter environment variable name to create, &
                modify, or delete: '
lenv = GETSTRQQ(env)
IF (lenv .EQ. 0) STOP
WRITE (*,900) ' Value of variable (ENTER to delete): '
lval = GETSTRQQ(val)
IF (lval .EQ. 0) val = ' '
enval = env(1:lenv) // '=' // val(1:lval)
IF (SETENVQQ(enval)) THEN
  lval = GETENVQQ(env(1:lenv), val)
  IF (lval .EQ. 0) THEN
    WRITE (*,*) 'Can''t get environment variable'
  ELSE IF (lval .GT. LEN(val)) THEN
    WRITE (*,*) 'Buffer too small'
  ELSE
    WRITE (*,*) env(:lenv), ': ', val(:lval)
    WRITE (*,*) 'Length: ', lval
  END IF
ELSE
  WRITE (*,*) 'Can''t set environment variable'
END IF
900  FORMAT (A, \)
END
```

GETEXCEPTIONPTRSQQ

Run-Time Function: Returns a pointer to C run-time exception information pointers appropriate for use in signal handlers established with SIGNALQQ or direct calls to the C rtl signal( ) routine. This function is only available on Windows* systems.

Module: USE IFCORE

Syntax

result = GETEXCEPTIONPTRSQQ ( )

Results:

The result type is INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The return value is the address of a data structure whose members are pointers to exception information captured by the C runtime at the time of an exception. This result value can then be used as the EPTR argument to routine TRACEBACKQQ to generate a stack trace from a user-defined handler or to inspect the exception context record directly.

Calling GETEXCEPTIONPTRSQQ is only valid within a user-defined handler that was established with SIGNALQQ or a direct call to the C rtl signal( ) function.

For a full description of exceptions and error handling, see "The Floating Point Environment" in your user's guide.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS DLL LIB

See Also: "TRACEBACKQQ", "GETSTATUSFPQQ", "CLEARSTATUSFPQQ", "SETCONTROLFPQQ", "GETCONTROLFPQQ", "SIGNALQQ"

Example

```
PROGRAM SIGTEST
USE IFCORE
...
R3 = 0.0E0
STS = SIGNALQQ(MY_HANDLER)
! Cause a divide by zero exception
R1 = 3.0E0/R3
...
END

INTEGER(4) FUNCTION MY_HANDLER(SIGNUM,EXCNUM)
USE IFCORE
...
EPTRS = GETEXCEPTIONPTRSQQ()
...
CALL TRACEBACKQQ("Application SIGFPE  error!",USER_EXIT_CODE=-1,EPTR=EPTRS)
...
MY_HANDLER = 1
END
```

A complete working example can be found in the online samples.

GETEXITQQ

QuickWin Function: Returns the setting for a QuickWin application's exit behavior. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETEXITQQ ( )

Results:

The result type is INTEGER(4). The result is exit mode with one of the following constants (defined in `IFQWIN.F90`):

- QWIN$EXITPROMPT - Displays a message box that reads "Program exited with exit status *n*. Exit Window?", where *n* is the exit status from the program.

  If you choose Yes, the application closes the window and terminates. If you choose No, the dialog box disappears and you can manipulate the window as usual. You must then close the window manually.
- QWIN$EXITNOPERSIST - Terminates the application without displaying a message box.
- QWIN$EXITPERSIST - Leaves the application open without displaying a message box.

The default for both QuickWin and Console Graphics applications is QWIN$EXITPROMPT.

Compatibility

`STANDARD GRAPHICS QUICKWIN.EXE LIB`

See Also: "SETEXITQQ", "Using QuickWin" in your user's guide

Example

```
!  Program to demonstrate GETEXITQQ
     USE IFQWIN
     INTEGER i
     i = GETEXITQQ()
     SELECT CASE (i)
       CASE (QWIN$EXITPROMPT)
         WRITE(*, *) "Prompt on exit."
       CASE (QWIN$EXITNOPERSIST)
         WRITE(*,*) "Exit and close."
       CASE (QWIN$EXITPERSIST)
         WRITE(*,*) "Exit and leave open."
     END SELECT
     END
```

GETFILEINFOQQ

Portability Function: Returns information about the specified file. File names can contain wildcards (* and ?).

Module: USE IFPORT

Syntax

result = GETFILEINFOQQ (*files*, *buffer*, *handle*)

files

(Input) Character*(*). Name or pattern of files you are searching for. Can include a full path and wildcards (* and ?).

buffer

(Output) Derived type `FILE$INFO` or derived type `FILE$INFOI8`. Information about a file that matches the search criteria in *files*. The derived type `FILE$INFO` is defined in `IFPORT.F90` as follows:

```
TYPE FILE$INFO
  INTEGER(4) CREATION             ! CREATION TIME (-1 ON FAT)
  INTEGER(4) LASTWRITE            ! LAST WRITE TO FILE
  INTEGER(4) LASTACCESS           ! LAST ACCESS (-1 ON FAT)
  INTEGER(4) LENGTH               ! LENGTH OF FILE
  INTEGER(4) PERMIT               ! FILE ACCESS MODE
  CHARACTER(255) NAME             ! FILE NAME
END TYPE FILE$INFO
```

The derived type `FILE$INFOI8` is defined in `IFPORT.F90` as follows:

```
TYPE FILE$INFO
  INTEGER(4) CREATION             ! CREATION TIME (-1 on FAT)
  INTEGER(4) LASTWRITE            ! LAST WRITE TO FILE
  INTEGER(4) LASTACCESS           ! LAST ACCESS (-1 ON FAT)
  INTEGER(8) LENGTH               ! LENGTH OF FILE
  INTEGER(4) PERMIT               ! FILE ACCESS MODE
  CHARACTER(255) NAME             ! FILE NAME
END TYPE FILE$INFO
```

handle

(Input; output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. Control mechanism. One of the following constants, defined in `IFPORT.F90`:

- FILE$FIRST – First matching file found.
- FILE$LAST – Previous file was the last valid file.

- FILE$ERROR – No matching file found.

Results:

The result type is INTEGER(4). The result is the nonblank length of the file name if a match was found, or 0 if no matching files were found.

To get information about one or more files, set the handle to FILE$FIRST and call GETFILEINFOQQ. This will return information about the first file which matches the name and return a handle. If the program wants more files, it should call GETFILEINFOQQ with the handle. GETFILEINFOQQ must be called with the handle until GETFILEINFOQQ sets handle to FILE$LAST, or system resources may be lost.

The derived-type element variables FILE$INFO%CREATION, FILE$INFO%LASTWRITE, and FILE$INFO%LASTACCESS contain packed date and time information that indicates when the file was created, last written to, and last accessed, respectively. To break the time and date into component parts, call UNPACKTIMEQQ. FILE$INFO%LENGTH contains the length of the file in bytes. FILE$INFO%PERMIT contains a set of bit flags describing access information about the file as follows:

Bit flag	Access information for the file
FILE$ARCHIVE	Marked as having been copied to a backup device.
FILE$DIR	A subdirectory of the current directory. Each MS-DOS* directory contains two special files, "." and "..". These are directory aliases created by MS-DOS for use in relative directory notation. The first refers to the current directory, and the second refers to the current directory's parent directory.
FILE$HIDDEN	Hidden. It does not appear in the directory list you request from the command line, the Microsoft* visual development environment browser, or File Manager.
FILE$READONLY	Write-protected. You can read the file, but you cannot make changes to it.
FILE$SYSTEM	Used by the operating system.
FILE$VOLUME	A logical volume, or partition, on a physical disk drive. This type of file appears only in the root directory of a physical device.

You can use the constant FILE$NORMAL to check that all bit flags are set to 0. If the derived-type element variable FILE$INFO%PERMIT is equal to FILE$NORMAL, the file has no special attributes. The variable FILE$INFO%NAME contains the short name of the file, not the full path of the file.

If an error occurs, call GETLASTERRORQQ to retrieve the error message, such as:

- ERR$NOENT: The file or path specified was not found.

- ERR$NOMEM: Not enough memory is available to execute the command, the available memory has been corrupted, or an invalid block exists, indicating that the process making the call was not allocated properly.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS DLL LIB

See Also: "SETFILEACCESSQQ", "SETFILETIMEQQ", "UNPACKTIMEQQ"

Example

```
USE IFPORT
USE IFCORE
  CALL SHOWPERMISSION( )
END

! SUBROUTINE to demonstrate GETFILEINFOQQ
SUBROUTINE SHOWPERMISSION( )
USE IFPORT
  CHARACTER(80) files
  INTEGER(KIND=INT_PTR_KIND( )) handle
  INTEGER(4) length
  CHARACTER(5) permit
  TYPE (FILE$INFO) info
    WRITE (*, 900) ' Enter wildcard of files to view: '
    900 FORMAT (A, \)

    length = GETSTRQQ(files)
    handle = FILE$FIRST

    DO WHILE (.TRUE.)
      length = GETFILEINFOQQ(files, info, handle)
      IF ((handle .EQ. FILE$LAST) .OR. &
          (handle .EQ. FILE$ERROR)) THEN
         SELECT CASE (GETLASTERRORQQ( ))
           CASE (ERR$NOMEM)
             WRITE (*,*) 'Out of memory'
           CASE (ERR$NOENT)
             EXIT
           CASE DEFAULT
             WRITE (*,*) 'Invalid file or path name'
         END SELECT
```

```
      END IF

      permit = ' '
      IF ((info%permit .AND. FILE$HIDDEN) .NE. 0) &
         permit(1:1) = 'H'
      IF ((info%permit .AND. FILE$SYSTEM) .NE. 0) &
         permit(2:2) = 'S'
      IF ((info%permit .AND. FILE$READONLY) .NE. 0) &
         permit(3:3) = 'R'
      IF ((info%permit .AND. FILE$ARCHIVE) .NE. 0) &
         permit(4:4) = 'A'
      IF ((info%permit .AND. FILE$DIR) .NE. 0) &
         permit(5:5) = 'D'

      WRITE (*, 9000) info%name, info%length, permit
      9000 FORMAT (1X, A5, I9, ' ',A6)
    END DO
END SUBROUTINE
```

GETFILLMASK

Graphics Subroutine: Returns the current pattern used to fill shapes. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL GETFILLMASK (*mask*)

mask

(Output) INTEGER(1). One-dimensional array of length 8.

There are 8 bytes in *mask*, and each of the 8 bits in each byte represents a pixel, creating an 8x8 pattern. The first element (byte) of *mask* becomes the top 8 bits of the pattern, and the eighth element (byte) of *mask* becomes the bottom 8 bits.

During a fill operation, pixels with a bit value of 1 are set to the current graphics color, while pixels with a bit value of 0 are unchanged. The current graphics color is set with SETCOLORRGB or SETCOLOR. The 8-byte mask is replicated over the entire fill area. If no fill mask is set (with SETFILLMASK), or if the mask is all ones, solid current color is used in fill operations.

The fill mask controls the fill pattern for graphics routines (FLOODFILLRGB, PIE, ELLIPSE, POLYGON, and RECTANGLE).

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "ELLIPSE, ELLIPSE_W", "FLOODFILLRGB, FLOODFILLRGB_W", "PIE, PIE_W", "POLYGON, POLYGON_W", "RECTANGLE, RECTANGLE_W", "SETFILLMASK"

Example

```
!  Build as QuickWin or Standard Graphics
USE IFQWIN
INTEGER(1) style(8). array(8)
INTEGER(2) i
style = 0
style(1) = Z'F'
style(3) = Z'F'
style(5) = Z'F'
style(7) = Z'F'
CALL SETFILLMASK (style)
...
CALL GETFILLMASK (array)
WRITE (*, *) 'Fill mask in bits: '
DO i = 1, 8
  WRITE (*, '(B8)') array(i)
END DO
END
```

GETFONTINFO

Graphics Function: Returns the current font characteristics. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETFONTINFO (*font*)

font

(Output) Derived type `FONTINFO`. Set of characteristics of the current font. The `FONTINFO` derived type is defined in `IFQWIN.F90` as follows:

```
TYPE FONTINFO
  INTEGER(4) type           ! 1 = truetype, 0 = bit map
```

```
  INTEGER(4) ascent          ! Pixel distance from top to
                             !   baseline
  INTEGER(4) pixwidth        ! Character width in pixels,
                             !   0=proportional
  INTEGER(4) pixheight       ! Character height in pixels
  INTEGER(4) avgwidth        ! Average character width in
                             !   pixels
  CHARACTER(81) filename     ! File name including path
  CHARACTER(32) facename     ! Font name
  LOGICAL(1) italic          ! .TRUE. if current font
                             !   formatted italic
  LOGICAL(1) emphasized      ! .TRUE. if current font
                             !   formatted bold
  LOGICAL(1) underline       ! .TRUE. if current font
                             !   formatted underlined
END TYPE FONTINFO
```

Results:

The result type is INTEGER(2). The result is zero if successful; otherwise, –1.

You must initialize fonts with INITIALIZEFONTS before calling any font-related function, including GETFONTINFO.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: “GETGTEXTEXTENT”, “GETGTEXTROTATION”, “GRSTATUS”, “OUTGTEXT”, “INITIALIZEFONTS”, “SETFONT”,"Using Fonts from the Graphics Library" in your user’s guide

Example

```
! Build as QuickWin or Standard Graphics
USE IFQWIN
TYPE (FONTINFO) info
INTEGER(2)      numfonts, return, line_spacing
numfonts = INITIALIZEFONTS ( )
return = GETFONTINFO(info)
line_spacing = info%pixheight + 2
END
```

GETGID

Portability Function: Returns the group ID of the user of a process.

Module: USE IFPORT

Syntax

result = GETGID ( )

Results:

The result type is INTEGER(4). The result corresponds to the primary group of the user under whose identity the program is running. The result is returned as follows:

- On Windows* systems, this function returns the last subauthority of the security identifier for the process. This is unique on a local machine and unique within a domain for domain accounts.

  Note that on Windows systems, domain accounts and local accounts can overlap.
- On Linux* systems, this function returns the group identity for the current process.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

Example

```
USE IFPORT
ISTAT = GETGID( )
```

GETGTEXTEXTENT

Graphics Function: Returns the width in pixels that would be required to print a given string of text (including any trailing blanks) with OUTGTEXT using the current font. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETGTEXTEXTENT (*text*)

text

(Input) Character*(*). Text to be analyzed.

Results:

The result type is INTEGER(2). The result is the width of *text* in pixels if successful; otherwise, –1 (for example, if fonts have not been initialized with INITIALIZEFONTS).

This function is useful for determining the size of text that uses proportionally spaced fonts. You must initialize fonts with INITIALIZEFONTS before calling any font-related function, including GETGTEXTEXTENT.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETFONTINFO", "OUTGTEXT", "SETFONT", "INITIALIZEFONTS", "GETGTEXTROTATION"

Example

```
! Build as QuickWin or Standard Graphics
USE IFQWIN
INTEGER(2) status, pwidth
CHARACTER(80) text
status= INITIALIZEFONTS( )
status= SETFONT('t''Arial''h22w10')
pwidth= GETGTEXTEXTENT('How many pixels wide is this?')
WRITE(*,*) pwidth
END
```

GETGTEXTROTATION

Graphics Function: Returns the current orientation of the font text output by OUTGTEXT. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETGTEXTROTATION ( )

Results:

The result is of type INTEGER(4). It is the current orientation of the font text output in tenths of degrees. Horizontal is 0°, and angles increase counterclockwise so that 900 tenths of degrees (90°) is straight up, 1800 tenths of degrees (180°) is upside-down and left, 2700 tenths of degrees (270°) is straight down, and so forth.

The orientation for text output with OUTGTEXT is set with SETGTEXTROTATION.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "OUTGTEXT", "SETFONT", "SETGTEXTROTATION"

Example

```
! Build as QuickWin or Standard Graphics
USE IFQWIN
INTEGER ang
REAL rang
ang = GETGTEXTROTATION( )
rang = FLOAT(ang)/10.0
WRITE(*,*) "Text tilt in degrees is: ", rang
END
```

GETHWNDQQ

QuickWin Function: Converts a window unit number into a Windows* handle. This function is only available on Windows systems.

Module: USE IFQWIN

Syntax

result = GETHWNDQQ (*unit*)

unit

(Input) INTEGER(4). The window unit number. If *unit* is set to QWIN$FRAMEWINDOW (defined in `IFQWIN.F90`), the handle of the frame window is returned.

Results:

The result type is INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The result is a true Windows handle to the window. If *unit* is not open, it returns –1.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "GETACTIVEQQ", "GETUNITQQ", "SETACTIVEQQ", "Using QuickWin" in your user's guide

GETIMAGE, GETIMAGE_W

Graphics Subroutines: Store the screen image defined by a specified bounding rectangle. These subroutines are only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL GETIMAGE (*x1*, *y1*, *x2*, *y2*, *image*)
CALL GETIMAGE_W (*wx1*, *wy1*, *wx2*, *wy2*, *image*)

x1, *y1*

(Input) INTEGER(2). Viewport coordinates for upper-left corner of bounding rectangle.

x2, *y2*

(Input) INTEGER(2). Viewport coordinates for lower-right corner of bounding rectangle.

wx1, *wy1*

(Input) REAL(8). Window coordinates for upper-left corner of bounding rectangle.

wx2, *wy2*

(Input) REAL(8). Window coordinates for lower-right corner of bounding rectangle.

image

(Output) INTEGER(1). Array of single-byte integers. Stored image buffer.

GETIMAGE defines the bounding rectangle in viewport-coordinate points (*x1*, *y1*) and (*x2*, *y2*). GETIMAGE_W defines the bounding rectangle in window-coordinate points (*wx1*, *wy1*) and (*wx2*, *wy2*).

The buffer used to store the image must be large enough to hold it. You can determine the image size by calling IMAGESIZE at run time, or by using the formula described under IMAGESIZE. After you have determined the image size, you can dimension the buffer accordingly.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "IMAGESIZE, IMAGESIZE_W", "PUTIMAGE, PUTIMAGE_W"

Example

```
!  Build as QuickWin or Standard Graphics
USE IFQWIN
INTEGER(1), ALLOCATABLE:: buffer (:)
INTEGER(2) status, x, y, error
INTEGER(4) imsize
x = 50
y = 30
status = ELLIPSE ($GFILLINTERIOR, INT2(x-15), &
                 INT2(y-15), INT2( x+15), INT2(y+15))
imsize = IMAGESIZE (INT2(x-16), INT2(y-16), &
                  INT2( x+16), INT2(y+16))
```

```
ALLOCATE(buffer (imsize), STAT = error)
IF (error .NE. 0) THEN
  STOP 'ERROR: Insufficient memory'
END IF
CALL GETIMAGE (INT2(x-16), INT2(y-16), &
                 INT2( x+16), INT2(y+16), buffer)
END
```

GETLASTERROR

Portability Function: Returns the last error set.

Module: USE IFPORT

Syntax

result = GETLASTERROR ( )

Results:

The result type is INTEGER(4). The result is the integer corresponding to the last run-time error value that was set.

For example, if you use an ERR= specifier in an I/O statement, your program will not abort if an error occurs. GETLASTERROR provides a way to determine what the error condition was, with a better degree of certainty than just examining `errno`. Your application can then take appropriate action based upon the error number.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS DLL LIB`

GETLASTERRORQQ

Portability Function: Returns the last error set by a run-time procedure.

Module: USE IFPORT

Syntax

result = GETLASTERRORQQ ( )

Results:

The result type is INTEGER(4). The result is the most recent error code generated by a run-time procedure.

Library functions that return a logical or integer value sometimes also provide an error code that identifies the cause of errors. GETLASTERRORQQ retrieves the most recent error message. The error constants are in `IFPORT.F90`. The following table shows some library routines and the errors each routine produces:

Library routine	Errors produced
BEEPQQ	no error
BSEARCHQQ	ERR$INVAL
CHANGEDIRQQ	ERR$NOMEM, ERR$NOENT
CHANGEDRIVEQQ	ERR$INVAL, ERR$NOENT
COMMITQQ	ERR$BADF
DELDIRQQ	ERR$NOMEM, ERR$ACCES, ERR$NOENT
DELFILESQQ	ERR$NOMEM, ERR$ACCES, ERR$NOENT, ERR$INVAL
FINDFILEQQ	ERR$NOMEM, ERR$NOENT
FULLPATHQQ	ERR$NOMEM, ERR$INVAL
GETCHARQQ	no error
GETDRIVEDIRQQ	ERR$NOMEM, ERR$RANGE
GETDRIVESIZEQQ	ERR$INVAL, ERR$NOENT
GETDRIVESQQ	no error
GETENVQQ	ERR$NOMEM, ERR$NOENT
GETFILEINFOQQ	ERR$NOMEM, ERR$NOENT, ERR$INVAL
GETLASTERRORQQ	no error
GETSTRQQ	no error
MAKEDIRQQ	ERR$NOMEM, ERR$ACCES, ERR$EXIST, ERR$NOENT
PACKTIMEQQ	no error
PEEKCHARQQ	no error
RENAMEFILEQQ	ERR$NOMEM, ERR$ACCES, ERR$NOENT, ERR$XDEV
RUNQQ	ERR$NOMEM, ERR$2BIG, ERR$INVAL, ERR$NOENT, ERR$NOEXEC
SETERRORMODEQQ	no error
SETENVQQ	ERR$NOMEM, ERR$INVAL
SETFILEACCESSQQ	ERR$NOMEM, ERR$INVAL, ERR$ACCES
SETFILETIMEQQ	ERR$NOMEM, ERR$ACCES, ERR$INVAL, ERR$MFILE, ERR$NOENT
SLEEPQQ	no error
SORTQQ	ERR$INVAL

Library routine	Errors produced
SPLITPATHQQ	ERR$NOMEM, ERR$INVAL
SYSTEMQQ	ERR$NOMEM, ERR$2BIG, ERR$NOENT, ERR$NOEXEC
UNPACKTIMEQQ	no error

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS DLL LIB

GETLINESTYLE

Graphics Function: Returns the current graphics line style. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETLINESTYLE ( )

Results:

The result type is INTEGER(2). The result is the current line style.

GETLINESTYLE retrieves the mask (line style) used for line drawing. The mask is a 16-bit number, where each bit represents a pixel in the line being drawn.

If a bit is 1, the corresponding pixel is colored according to the current graphics color and logical write mode; if a bit is 0, the corresponding pixel is left unchanged. The mask is repeated for the entire length of the line. The default mask is Z'FFFF' (a solid line). A dashed line can be represented by Z'FF00' (long dashes) or Z'F0F0' (short dashes).

The line style is set with SETLINESTYLE. The current graphics color is set with SETCOLORRGB or SETCOLOR. SETWRITEMODE affects how the line is displayed.

The line style retrieved by GETLINESTYLE affects the drawing of straight lines as in LINETO, POLYGON and RECTANGLE, but not the drawing of curved lines as in ARC, ELLIPSE or PIE.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "LINETO, LINETO_W", "POLYGON, POLYGON_W", "RECTANGLE, RECTANGLE_W", "SETCOLORRGB", "SETFILLMASK", "SETLINESTYLE", "SETWRITEMODE"

Example

```
!  Build as Graphics
     USE IFQWIN
```

```
      INTEGER(2) lstyle
      lstyle = GETLINESTYLE()
      WRITE (*, 100) lstyle, lstyle
100   FORMAT (1X, 'Line mask in Hex ', Z4, ' and binary ', B16)
      END
```

GETLOG

Portability Subroutine: Returns the user's login name.

Module: USE IFPORT

Syntax

CALL GETLOG (*name*)

name

(Output) Character*(*). User's login name.

The login name must be less than or equal to 64 characters. If the login name is longer than 64 characters, it is truncated. The actual parameter corresponding to *name* should be long enough to hold the login name. If the supplied actual parameter is too short to hold the login name, the login name is truncated.

If the login name is shorter than the actual parameter corresponding to *name*, the login name is padded with blanks at the end, until it reaches the length of the actual parameter.

If the login name cannot be determined, all blanks are returned.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

Example

```
use IFPORT
character*20 username
CALL GETLOG (username)
print *, "You logged in as ",username
```

GETPHYSCOORD

Graphics Subroutine: Translates viewport coordinates to physical coordinates. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL GETPHYSCOORD (*x*, *y*, *t*)

x, *y*

(Input) INTEGER(2). Viewport coordinates to be translated to physical coordinates.

t

(Output) Derived type `xycoord`. Physical coordinates of the input viewport position. The `xycoord` derived type is defined in `IFQWIN.F90` as follows:

```
TYPE xycoord
  INTEGER(2) xcoord   ! x-coordinate
  INTEGER(2) ycoord   ! y-coordinate
END TYPE xycoord
```

Physical coordinates refer to the physical screen. Viewport coordinates refer to an area of the screen defined as the viewport with SETVIEWPORT. Both take integer coordinate values. Window coordinates refer to a window sized with SETWINDOW or SETWSIZEQQ. Window coordinates are floating-point values and allow easy scaling of data to the window area. For a more complete discussion of coordinate systems, see "Understanding Coordinate Systems" in your user's guide.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETVIEWCOORD, GETVIEWCOORD_W", "GETWINDOWCOORD", "SETCLIPRGN", "SETVIEWPORT"

Example

```
!  Program to demonstrate GETPHYSCOORD, GETVIEWCOORD,
!  and GETWINDOWCOORD. Build as QuickWin or Standard
!  Graphics
USE IFQWIN
TYPE (xycoord)  viewxy, physxy
TYPE (wxycoord) windxy
CALL SETVIEWPORT(INT2(80), INT2(50), &
                 INT2(240), INT2(150))
!  Get viewport equivalent of point (100, 90)
CALL GETVIEWCOORD (INT2(100), INT2(90), viewxy)
!  Get physical equivalent of viewport coordinates
CALL GETPHYSCOORD (viewxy%xcoord, viewxy%ycoord, &
                   physxy)
!  Get physical equivalent of viewport coordinates
```

```
CALL GETWINDOWCOORD (viewxy%xcoord, viewxy%ycoord, &
                     windxy)
!  Write viewport coordinates
WRITE (*,*) viewxy%xcoord, viewxy%ycoord
!  Write physical coordinates
WRITE (*,*) physxy%xcoord, physxy%ycoord
!  Write window coordinates
WRITE (*,*) windxy%wx, windxy%wy
END
```

GETPID

Portability Function: Returns the process ID of the current process.

Module: USE IFPORT

Syntax

result = GETPID ( )

Results:

The result type is INTEGER(4). The result is the process ID number of the current process.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

Example

```
USE IFPORT
INTEGER(4) istat
istat = GETPID()
```

GETPIXEL, GETPIXEL_W

Graphics Functions: Return the color index of the pixel at a specified location. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETPIXEL (*x*, *y*)
result = GETPIXEL_W (*wx*, *wy*)

x, *y*

(Input) INTEGER(2). Viewport coordinates for pixel position.

wx, wy

(Input) REAL(8). Window coordinates for pixel position.

Results:

The result type is INTEGER(2). The result is the pixel color index if successful; otherwise, –1 (for example, if the pixel lies outside the clipping region).

Color routines without the RGB suffix, such as GETPIXEL, use color indexes, not true color values, and limit you to colors in the palette, at most 256. To access all system colors, use SETPIXELRGB to specify an explicit Red-Green-Blue value and retrieve the value with GETPIXELRGB.

NOTE. *The* GETPIXEL *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the GetPixel routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$GetPixel. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETPIXELRGB, GETPIXELRGB_W", "GRSTATUS", "REMAPPALETTERGB", "REMAPALLPALETTERGB", "SETCOLOR", "GETPIXELS", "SETPIXEL, SETPIXEL_W"

GETPIXELRGB, GETPIXELRGB_W

Graphics Functions: Return the Red-Green-Blue (RGB) color value of the pixel at a specified location. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETPIXELRGB (*x*, *y*)

result = GETPIXELRGB_W (*wx*, *wy*)

x, *y*

(Input) INTEGER(2). Viewport coordinates for pixel position.

wx, *wy*

(Input) REAL(8). Window coordinates for pixel position.

Results:

The result type is INTEGER(4). The result is the pixel's current RGB color value.

In each RGB color value, each of the three colors, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the value you retrieve with GETPIXELRGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 1111111 (hex Z'FF') the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF0' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

GETPIXELRGB returns the true color value of the pixel, set with SETPIXELRGB, SETCOLORRGB, SETBKCOLORRGB, or SETTEXTCOLORRGB, depending on the pixel's position and the current configuration of the screen.

SETPIXELRGB (and the other RGB color selection functions SETCOLORRGB, SETBKCOLORRGB, and SETTEXTCOLORRGB) sets colors to a color value chosen from the entire available range. The non-RGB color functions (SETPIXELS, SETCOLOR, SETBKCOLOR, and SETTEXTCOLOR) use color indexes rather than true color values. If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit Red-Green-Blue (RGB) value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "SETPIXELRGB, SETPIXELRGB_W", "GETPIXELSRGB", "SETPIXELSRGB", "GETPIXEL, GETPIXEL_W"

Example

```
!  Build as QuickWin or Standard Graphics
USE IFQWIN
INTEGER(4) pixcolor, rseed
INTEGER(2) status
REAL rnd1, rnd2
LOGICAL(4) winstat
TYPE (windowconfig) wc
```

```
CALL GETTIM (status, status, status, INT2(rseed))
CALL SEED (rseed)
CALL RANDOM (rnd1)
CALL RANDOM (rnd2)
!  Get the color index of a random pixel, normalized to
!    be in the window. Then set current color to that
!    pixel color.
winstat = GETWINDOWCONFIG(wc)
xnum = wc%numxpixels
ynum = wc%numypixels
pixcolor = GETPIXELRGB( INT2( rnd1*xnum ), INT2( rnd2*ynum ))
status = SETCOLORRGB (pixcolor)
END
```

GETPIXELS

Graphics Subroutine: Returns the color indexes of multiple pixels. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL GETPIXELS (*n*, *x*, *y*, *color*)

n

(Input) INTEGER(4). Number of pixels to get. Sets the number of elements in the other arguments.

x, *y*

(Input) INTEGER(2). Parallel arrays containing viewport coordinates of pixels to get.

color

(Output) INTEGER(2). Array to be filled with the color indexes of the pixels at *x* and *y*.

GETPIXELS fills in the array *color* with color indexes of the pixels specified by the two input arrays *x* and *y*. These arrays are parallel: the first element in each of the three arrays refers to a single pixel, the second element refers to the next pixel, and so on.

If the pixel is outside the clipping region, the value placed in the *color* array is undefined. Calls to GETPIXELS with *n* less than 1 are ignored. GETPIXELS is a much faster way to acquire multiple pixel color indexes than individual calls to GETPIXEL.

The range of possible pixel color index values is determined by the current video mode and palette, at most 256 colors. To access all system colors you need to specify an explicit Red-Green-Blue (RGB) value with an RGB color function such as SETPIXELSRGB and retrieve the value with GETPIXELSRGB, rather than a palette index with a non-RGB color function.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETPIXELSRGB", "SETPIXELSRGB", "GETPIXEL, GETPIXEL_W", "SETPIXELS"

GETPIXELSRGB

Graphics Subroutine: Returns the Red-Green-Blue (RGB) color values of multiple pixels. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL GETPIXELSRGB (*n*, *x*, *y*, *color*)

n

(Input) INTEGER(4). Number of pixels to get. Sets the number of elements in the other argument arrays.

x, *y*

(Input) INTEGER(2). Parallel arrays containing viewport coordinates of pixels.

color

(Output) INTEGER(4). Array to be filled with RGB color values of the pixels at *x* and *y*.

GETPIXELS fills in the array *color* with the RGB color values of the pixels specified by the two input arrays *x* and *y*. These arrays are parallel: the first element in each of the three arrays refers to a single pixel, the second element refers to the next pixel, and so on.

In each RGB color value, each of the three colors, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the values you retrieve with GETPIXELSRGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 11111111 (hex Z'FF') the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

GETPIXELSRGB is a much faster way to acquire multiple pixel RGB colors than individual calls to GETPIXELRGB. GETPIXELSRGB returns an array of true color values of multiple pixels, set with SETPIXELSRGB, SETCOLORRGB, SETBKCOLORRGB, or SETTEXTCOLORRGB, depending on the pixels' positions and the current configuration of the screen.

SETPIXELSRGB (and the other RGB color selection functions SETCOLORRGB, SETBKCOLORRGB, and SETTEXTCOLORRGB) sets colors to a color value chosen from the entire available range. The non-RGB color functions (SETPIXELS, SETCOLOR, SETBKCOLOR, and SETTEXTCOLOR) use color indexes rather than true color values. If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit RGB value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "SETPIXELSRGB", "GETPIXELRGB, GETPIXELRGB_W", "GETPIXELS", "SETPIXELS"

Example

```
!  Build as QuickWin or Standard Graphics
USE IFQWIN
INTEGER(4) color(50), result
INTEGER(2) x(50), y(50), status
TYPE (xycoord) pos

result = SETCOLORRGB(Z'FF')
CALL MOVETO(INT2(0), INT2(0), pos)
status = LINETO(INT2(100), INT2(200))

!  Get 50 pixels at line 30 in viewport
DO i = 1, 50
  x(i) = i-1
  y(i) = 30
END DO
CALL GETPIXELSRGB(300, x, y, color)
!  Move down 30 pixels and redisplay pixels
```

```
DO i = 1, 50
  y(i) = y(i) + 30
END DO
CALL SETPIXELSRGB (50, x, y, color)
END
```

GETPOS, GETPOSI8

Portability Functions: Return the current position of a file.

Module: USE IFPORT

Syntax

result = GETPOS (*lunit*)

result = GETPOSI8 (*lunit*)

lunit

(Input) INTEGER(4). External unit number of a file. The value must be in the range 0 to 100 and the file must be connected.

Results:

The result type is INTEGER(4) for GETPOS; INTEGER(8) for GETPOSI8. The result is the offset, in bytes, from the beginning of the file. If an error occurs, the result value is –1 and the following error code is returned in `errno`:

EINVAL: *lunit* is not a valid unit number, or is not open.

These functions are equivalent to "FTELL, FTELLI8".

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

GETSTATUSFPQQ

Portability Subroutine: Returns the floating-point processor status word.

Module: USE IFPORT

Syntax

CALL GETSTATUSFPQQ (*status*)

status

(Output) INTEGER(2). Floating-point processor status word.

The floating-point status word shows whether various floating-point exception conditions have occurred. Intel® Visual Fortran initially clears (sets to 0) all status flags, but after an exception occurs it does not reset the flags before performing additional floating-point operations. A status flag with a value of one thus shows there has been at least one occurrence of the corresponding exception. The following table lists the status flags and their values:

Parameter name	Hex value	Description
FPSW$MSW_EM	Z'003F'	Status Mask (set all flags to 1)
FPSW$INVALID	Z'0001'	An invalid result occurred
FPSW$DENORMAL	Z'0002'	A denormal (very small number) occurred
FPSW$ZERODIVIDE	Z'0004'	A divide by zero occurred
FPSW$OVERFLOW	Z'0008'	An overflow occurred
FPSW$UNDERFLOW	Z'0010'	An underflow occurred
FPSW$INEXACT	Z'0020'	Inexact precision occurred

You can use a logical comparison on the status word returned by GETSTATUSFPQQ to determine which of the six floating-point exceptions listed in the table has occurred.

An exception is disabled if its flag is set to 1 and enabled if its flag is cleared to 0. By default, the denormal, underflow and inexact precision exceptions are disabled, and the invalid, overflow and divide-by-zero exceptions are enabled. Exceptions can be enabled and disabled by clearing and setting the flags with SETCONTROLFPQQ. You can use GETCONTROLFPQQ to determine which exceptions are currently enabled and disabled.

If an exception is disabled, it does not cause an interrupt when it occurs. Instead, floating-point processes generate an appropriate special value (NaN or signed infinity), but the program continues. You can find out which exceptions (if any) occurred by calling GETSTATUSFPQQ.

If errors on floating-point exceptions are enabled (by clearing the flags to 0 with SETCONTROLFPQQ), the operating system generates an interrupt when the exception occurs. By default, these interrupts cause run-time errors, but you can capture the interrupts with SIGNALQQ and branch to your own error-handling routines.

For a full discussion of the floating-point status word, exceptions, and error handling, see "The Floating-Point Environment" in your user's guide.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS  DLL  LIB`

See Also: "SETCONTROLFPQQ", "GETCONTROLFPQQ", "SIGNALQQ", "CLEARSTATUSFPQQ"

Example

```
!  Program to demonstrate GETSTATUSFPQQ
  USE IFPORT
  INTEGER(2) status
  CALL GETSTATUSFPQQ(status)
!  check for divide by zero
  IF (IAND(status, FPSW$ZERODIVIDE) .NE. 0) THEN
    WRITE (*,*) 'Divide by zero occurred. Look    &
    for NaN or signed infinity in resultant data.'
  END IF
END
```

GETSTRQQ

Run-time Function: Reads a character string from the keyboard using buffered input.

Module: USE IFCORE

Syntax

result = GETSTRQQ (*buffer*)

buffer

(Output) Character*(*). Character string returned from keyboard, padded on the right with blanks.

Results:

The result type is INTEGER(4). The result is the number of characters placed in *buffer*.

The function does not complete until you press Return or Enter.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "GETCHARQQ", "PEEKCHARQQ", the READ statement in the *Language Reference*

Example

```
!  Program to demonstrate GETSTRQQ
  USE IFCORE
  USE IFPORT
  INTEGER(4) length, result
  CHARACTER(80) prog, args
  WRITE (*, '(A, \)') ' Enter program to run: '
  length = GETSTRQQ (prog)
  WRITE (*, '(A, \)') ' Enter arguments: '
```

```
length = GETSTRQQ (args)
result = RUNQQ (prog, args)
IF (result .EQ. -1) THEN
  WRITE (*,*) 'Couldn''t run program'  ELSE
  WRITE (*, '(A, Z4, A)') 'Return code : ', result, 'h'
END IF
END
```

GETTEXTCOLOR

Graphics Function: Returns the current text color index. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETTEXTCOLOR( )

Results:

The result type is INTEGER(2). It is the current text color index.

GETTEXTCOLOR returns the text color index set by SETTEXTCOLOR. SETTEXTCOLOR affects text output with OUTTEXT, WRITE, and PRINT. The background color index is set with SETBKCOLOR and returned with GETBKCOLOR. The color index of graphics over the background color is set with SETCOLOR and returned with GETCOLOR. These non-RGB color functions use color indexes, not true color values, and limit the user to colors in the palette, at most 256. To access all system colors, use SETTEXTCOLORRGB, SETBKCOLORRGB, and SETCOLORRGB.

The default text color index is 15, which is associated with white unless the user remaps the palette.

NOTE. *The* GETTEXTCOLOR *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the GetTextColor routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$GetTextColor. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "OUTTEXT", "REMAPPALETTERGB", "SETCOLOR", "SETTEXTCOLOR"

GETTEXTCOLORRGB

Graphics Function: Returns the Red-Green-Blue (RGB) value of the current text color (used with OUTTEXT, WRITE and PRINT). This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETTEXTCOLORRGB ( )

Results:

The result type is INTEGER(4). It is the RGB value of the current text color.

In each RGB color value, each of the three colors, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the value you retrieve with GETTEXTCOLORRGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary (hex Z'FF') the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

GETTEXTCOLORRGB returns the RGB color value of text over the background color (used by text functions such as OUTTEXT, WRITE, and PRINT), set with SETTEXTCOLORRGB. The RGB color value used for graphics is set and returned with SETCOLORRGB and GETCOLORRGB. SETCOLORRGB controls the color used by the graphics function OUTGTEXT, while SETTEXTCOLORRGB controls the color used by all other text output functions. The RGB background color value for both text and graphics is set and returned with SETBKCOLORRGB and GETBKCOLORRGB.

SETTEXTCOLORRGB (and the other RGB color selection functions SETBKCOLORRGB, and SETCOLORRGB) sets the color to a color value chosen from the entire available range. The non-RGB color functions (SETTEXTCOLOR, SETBKCOLOR, and SETCOLOR) use color indexes rather than true color values. If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of

creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit RGB value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "SETTEXTCOLORRGB", "GETBKCOLORRGB", "GETCOLORRGB", "GETTEXTCOLOR"

Example

```
!  Build as QuickWin or Standard Graphics
USE IFQWIN
INTEGER(4) oldtextc, oldbackc, temp
TYPE (rccoord) curpos
!  Save color settings
oldtextc = GETTEXTCOLORRGB()
oldbackc = GETBKCOLORRGB()
CALL CLEARSCREEN( $GCLEARSCREEN )
!  Reset colors
temp = SETTEXTCOLORRGB(Z'00FFFF')  ! full red + full green
                                   !  = full yellow text
temp = SETBKCOLORRGB(Z'FF0000')    ! blue background
CALL SETTEXTPOSITION( INT2(4), INT2(15), curpos)
CALL OUTTEXT( 'Hello, world')
!  Restore colors
temp = SETTEXTCOLORRGB(oldtextc)
temp = SETBKCOLORRGB(oldbackc)
END
```

GETTEXTPOSITION

Graphics Subroutine: Returns the current text position. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL GETTEXTPOSITION (*t*)

t

(Output) Derived type `rccord`. Current text position. The derived type `rccord` is defined in `IFQWIN.F90` as follows:

```
TYPE rccoord
   INTEGER(2) row   ! Row coordinate
   INTEGER(2) col   ! Column coordinate
END TYPE rccoord
```

The text position given by coordinates (1, 1) is defined as the upper-left corner of the text window. Text output from the OUTTEXT function (and WRITE and PRINT statements) begins at the current text position. Font text is not affected by the current text position. Graphics output, including OUTGTEXT output, begins at the current graphics output position, which is a separate position returned by GETCURRENTPOSITION.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "SETTEXTPOSITION", "OUTTEXT", "GETCURRENTPOSITION, GETCURRENTPOSITION_W", "SETTEXTWINDOW", the WRITE statement in the *Language Reference*

Example

```
!  Build as QuickWin or Standard Graphics
     USE IFQWIN
     TYPE (rccoord) textpos
     CALL GETTEXTPOSITION (textpos)
     END
```

GETTEXTWINDOW

Graphics Subroutine: Finds the boundaries of the current text window. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL GETTEXTWINDOW (*r1*, *c1*, *r2*, *c2*)

r1, *c1*

(Output) INTEGER(2). Row and column coordinates for upper-left corner of the text window.

r2, *c2*

(Output) INTEGER(2). Row and column coordinates for lower-right corner of the text window.

Output from OUTTEXT and WRITE is limited to the text window. By default, this is the entire window, unless the text window is redefined by SETTEXTWINDOW.

The window defined by SETTEXTWINDOW has no effect on output from OUTGTEXT.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETTEXTPOSITION", "OUTTEXT", "SCROLLTEXTWINDOW", "SETTEXTPOSITION", "SETTEXTWINDOW", "WRAPON", the WRITE statement in the *Language Reference*

Example

```
!  Build as QuickWin or Standard Graphics
USE IFQWIN
INTEGER(2) top, left, bottom, right
DO i = 1, 10
  WRITE(*,*) "Hello, world"
END DO
!  Save text window position
 CALL GETTEXTWINDOW (top, left, bottom, right)
!  Scroll text window down seven lines
 CALL SCROLLTEXTWINDOW (INT2(-7))
!  Restore text window
 CALL SETTEXTWINDOW (top, left, bottom, right)
 WRITE(*,*) "At beginning again"
 END
```

GETTIM

Portability Subroutine: Returns the time.

Module: USE IFPORT

Syntax

CALL GETTIM (*ihr*, *imin*, *isec*, *i100th*)

ihr

(Output) INTEGER(4) or INTEGER(2). Hour (0-23).

imin

(Output) INTEGER(4) or INTEGER(2). Minute (0-59).

isec

(Output) INTEGER(4) or INTEGER(2). Second (0-59).

i100th

(Output) INTEGER(4) or INTEGER(2). Hundredths of a second (0-99).

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS  DLL  LIB`

See Also: "GETDAT", "SETDAT", "SETTIM"

Example

See the example in "GETDAT".

GETTIMEOFDAY

Portability Subroutine: Returns seconds and microseconds since 00:00 Jan 1, 1970.

Module: USE IFPORT

Syntax

CALL GETTIMEOFDAY (*ret*, *err*)

ret

(Output) INTEGER(4). One-dimensional array with 2 elements used to contain numeric time data. The elements of *ret* are returned as follows:

Element	Value
ret(1)	Seconds
ret(2)	Microseconds

err

(Output) INTEGER(4).

If an error occurs, *err* contains a value equal to –1 and array *ret* contains zeros.

On Windows* systems, this subroutine has millisecond precision, and the last three digits of the returned value are not significant.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

GETUID

Portability Function: Returns the user ID of the calling process.

Module: USE IFPORT

Syntax

result = GETUID( )

Results:

The result type is INTEGER(4). The result corresponds to the user identity under which the program is running. The result is returned as follows:

- On Windows* systems, this function returns the last subauthority of the security identifier for the process. This is unique on a local machine and unique within a domain for domain accounts.

  Note that on Windows systems, domain accounts and local accounts can overlap.
- On Linux* systems, this function returns the user identity for the current process.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

Example

```
USE IFPORT
integer(4) istat
ISTAT = GETUID( )
```

GETUNITQQ

QuickWin Function: Returns the unit number corresponding to the specified Windows* handle. This function is only available on Windows systems.

Module: USE IFQWIN

Syntax

result = GETUNITQQ (*whandle*)

whandle

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The Windows handle to the window; this is a unique ID.

Results:

The result type is INTEGER(4). The result is the unit number corresponding to the specified Windows handle. If *whandle* does not exist, it returns –1.

This routine is the inverse of GETHWNDQQ.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "GETHWNDQQ", "Using QuickWin" in your user's guide

GETVIEWCOORD, GETVIEWCOORD_W

Graphics Subroutines: Translate physical coordinates or window coordinates to viewport coordinates. These subroutines are only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL GETVIEWCOORD (*x*, *y*, *t*)
CALL GETVIEWCOORD_W (*wx*, *wy*, *wt*)

x, *y*

(Input) INTEGER(2). Physical coordinates to be converted to viewport coordinates.

t

(Output) Derived type `xycoord`. Viewport coordinates. The `xycoord` derived type is defined in `IFQWIN.F90` as follows:

```
TYPE xycoord
  INTEGER(2) xcoord   ! x-coordinate
  INTEGER(2) ycoord   ! y-coordinate
END TYPE xycoord
```

wx, *wy*

(Input) REAL(8). Window coordinates to be converted to viewport coordinates.

wt

(Output) Derived type `wxycoord`. Window coordinates. The derived type `wxycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE wxycoord
  REAL(8) wx    ! x-coordinate
  REAL(8) wy    ! y-coordinate
END TYPE wxycoord
```

Viewport coordinates refer to an area of the screen defined as the viewport with SETVIEWPORT. Physical coordinates refer to the whole screen. Both take integer coordinate values. Window coordinates refer to a window sized with SETWINDOW or SETWSIZEQQ. Window coordinates are floating-point values and allow easy scaling of data to the window area. For a more complete discussion of coordinate systems, see "Understanding Coordinate Systems" in your user's guide.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETPHYSCOORD", "GETWINDOWCOORD"

Example

See the example program in "GETPHYSCOORD".

GETWINDOWCONFIG

QuickWin Function: Returns the properties of the current window. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETWINDOWCONFIG (*wc*)

wc

(Output) Derived type `windowconfig`. Contains window properties. The `windowconfig` derived type is defined in `IFQWIN.F90` as follows:

```
TYPE windowconfig
  INTEGER(2) numxpixels             ! Number of pixels on x-axis
  INTEGER(2) numypixels             ! Number of pixels on y-axis
  INTEGER(2) numtextcols            ! Number of text columns available
  INTEGER(2) numtextrows            ! Number of text rows available
  INTEGER(4) numcolors              ! Number of color indexes
  INTEGER(4) fontsize           ! Size of default font. Set to
                                !   QWIN$EXTENDFONT when specifying
                                !   extended attributes, in which
                                !   case extendfontsize sets the
                                !   font size
  CHARACTER(80) title               ! The window title
  INTEGER(2) bitsperpixel           ! The number of bits per pixel
  INTEGER(2) numvideopages          ! Unused
  INTEGER(2) mode                   ! Controls scrolling mode
  INTEGER(2) adapter                ! Unused
  INTEGER(2) monitor                ! Unused
  INTEGER(2) memory                 ! Unused
  INTEGER(2) environment            ! Unused
!
```

```
! The next three parameters provide extended font attributes.
!
  CHARACTER(32) extendfontname      ! The name of the desired font
  INTEGER(4) extendfontsize         ! Takes the same values as fontsize,
                                    !   when fontsize is set to
                                    !   QWIN$EXTENDFONT
  INTEGER(4) extendfontattributes   ! Font attributes such as bold
                                    !   and italic
END TYPE windowconfig
```

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE. (for example, if there is no active child window).

GETWINDOWCONFIG returns information about the active child window. If you have not set the window properties with SETWINDOWCONFIG, GETWINDOWCONFIG returns default window values.

A typical set of values would be 1024 *x* pixels, 768 *y* pixels, 128 text columns, 48 text rows, and a font size of 8x16 pixels. The resolution of the display and the assumed font size of 8x16 pixels generates the number of text rows and text columns.

The resolution (in this case, 1024 *x* pixels by 768 *y* pixels) is the size of the *virtual* window. To get the size of the *physical* window visible on the screen, use GETWSIZEQQ. In this case, GETWSIZEQQ returned the following values: (0,0) for the x and y position of the physical window, 25 for the height or number of rows, and 71 for the width or number of columns.

The number of colors returned depends on the video drive. The window title defaults to "Graphic1" for the default window. All of these values can be changed with SETWINDOWCONFIG.

Note that the bitsperpixel field in the `windowconfig` derived type is an output field only, while the other fields return output values to GETWINDOWCONFIG and accept input values from SETWINDOWCONFIG.

Compatibility

`STANDARD GRAPHICS QUICKWIN GRAPHICS LIB`

See Also: "GETWSIZEQQ", "SETWINDOWCONFIG", "SETACTIVEQQ", "Using QuickWin" in your user's guide

Example

```
!Build as QuickWin or Standard Graphics App.
USE IFQWIN
LOGICAL(4) status
```

```
TYPE (windowconfig) wc
status = GETWINDOWCONFIG(wc)
IF(wc%numtextrows .LT. 10) THEN
  wc%numtextrows = 10
  status = SETWINDOWCONFIG(wc)
  IF(.NOT. status ) THEN  ! if setwindowconfig error
    status = SETWINDOWCONFIG(wc)   ! reset
             ! setwindowconfig with corrected values
    status = GETWINDOWCONFIG(wc)
    IF(wc%numtextrows .NE. 10) THEN
       WRITE(*,*) 'Error: Cannot increase text rows to 10'
    END IF
  END IF
END IF
END
```

GETWINDOWCOORD

Graphics Subroutine: Converts viewport coordinates to window coordinates. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL GETWINDOWCOORD (*x*, *y*, *wt*)

x, *y*

(Input) INTEGER(2). Viewport coordinates to be converted to window coordinates.

wt

(Output) Derived type `wxycoord`. Window coordinates. The `wxycoord` derived type is defined in `IFQWIN.F90` as follows:

```
TYPE wxycoord
  REAL(8) wx   ! x-coordinate
  REAL(8) wy   ! y-coordinate
END TYPE wxycoord
```

Physical coordinates refer to the physical screen. Viewport coordinates refer to an area of the screen defined as the viewport with SETVIEWPORT. Both take integer coordinate values. Window coordinates refer to a window sized with SETWINDOW or SETWSIZEQQ. Window

coordinates are floating-point values and allow easy scaling of data to the window area. For a more complete discussion of coordinate systems, see "Understanding Coordinate Systems" in your user's guide.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETCURRENTPOSITION, GETCURRENTPOSITION_W", "GETPHYSCOORD", "GETVIEWCOORD, GETVIEWCOORD_W", "MOVETO, MOVETO_W", "SETVIEWPORT", "SETWINDOW"

Example

See the example program in "GETPHYSCOORD".

GETWRITEMODE

Graphics Function: Returns the current logical write mode, which is used when drawing lines with the LINETO, POLYGON, and RECTANGLE functions. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETWRITEMODE ( )

Results:

The result type is INTEGER(2). The result is the current write mode. Possible return values are:

- $GPSET– Causes lines to be drawn in the current graphics color. (default)
- $GAND – Causes lines to be drawn in the color that is the logical AND of the current graphics color and the current background color.
- $GOR – Causes lines to be drawn in the color that is the logical OR of the current graphics color and the current background color.
- $GPRESET – Causes lines to be drawn in the color that is the logical NOT of the current graphics color.
- $GXOR – Causes lines to be drawn in the color that is the logical exclusive OR (XOR) of the current graphics color and the current background color.

The default value is $GPSET. These constants are defined in `IFQWIN.F90`.

The write mode is set with SETWRITEMODE.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "SETWRITEMODE", "SETLINESTYLE", "LINETO, LINETO_W", "POLYGON, POLYGON_W", "PUTIMAGE, PUTIMAGE_W", "RECTANGLE, RECTANGLE_W", "SETCOLORRGB", "SETFILLMASK", "GRSTATUS"

Example

```
! Build as QuickWin or Standard Graphics App.
   USE IFQWIN
   INTEGER(2) mode
   mode = GETWRITEMODE()
   END
```

GETWSIZEQQ

QuickWin Function: Returns the size and position of a window. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GETWSIZEQQ (*unit*, *ireq*, *winfo*)

unit

(Input) INTEGER(4). Specifies the window unit. Unit numbers 0, 5 and 6 refer to the default startup window only if you have not explicitly opened them with the OPEN statement. To access information about the frame window (as opposed to a child window), set *unit* to the symbolic constant QWIN$FRAMEWINDOW, defined in `IFQWIN.F90`.

ireq

(Input) INTEGER(4). Specifies what information is obtained. The following symbolic constants, defined in `IFQWIN.F90`, are available:

- QWIN$SIZEMAX – Gets information about the maximum window size.
- QWIN$SIZECURR – Gets information about the current window size.

winfo

(Output) Derived type `qwinfo`. Physical coordinates of the window's upper-left corner, and the current or maximum height and width of the window's client area (the area within the frame). The derived type `qwinfo` is defined in `IFQWIN.F90` as follows:

```
TYPE QWINFO
  INTEGER(2) TYPE  ! request type (controls
                   !  SETWSIZEQQ)
  INTEGER(2) X     ! x coordinate for upper left
  INTEGER(2) Y     ! y coordinate for upper left
```

```
  INTEGER(2) H     ! window height
  INTEGER(2) W     ! window width
END TYPE QWINFO
```

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, nonzero.

The position and dimensions of child windows are expressed in units of character height and width. The position and dimensions of the frame window are expressed in screen pixels.

The height and width returned for a frame window reflects the size in pixels of the client area *excluding* any borders, menus, and status bar at the bottom of the frame window. You should adjust the values used in SETWSIZEQQ to take this into account.

The client area is the area actually available to place child windows.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "GETWINDOWCONFIG", "SETWSIZEQQ", "Using QuickWin" in your user's guide

GMTIME

Portability Subroutine: Returns the Greenwich mean time in an array of time elements.

Module: USE IFPORT

Syntax

CALL GMTIME (*stime*, *tarray*)

stime

(Input) INTEGER(4). Numeric time data to be formatted. Number of seconds since 00:00:00 Greenwich mean time, January 1, 1970.

tarray

(Output) INTEGER(4). One-dimensional array with 9 elements used to contain numeric time data. The elements of *tarray* are returned as follows:

Element	Value
tarray(1)	Seconds (0-59)
tarray(2)	Minutes (0-59)
tarray(3)	Hours (0-23)
tarray(4)	Day of month (1-31)
tarray(5)	Month (0-11)

Element	Value
tarray(6)	Number of years since 1900
tarray(7)	Day of week (0-6, where 0 is Sunday)
tarray(8)	Day of year (0-365)
tarray(9)	Daylight saving flag (0 if standard time, 1 if daylight saving time)

CAUTION. *This subroutine may cause problems with the year 2000. Use the* DATE_AND_TIME *intrinsic subroutine instead (see the Language Reference).*

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

Example

```
use IFPORT
integer(4) stime, timearray(9)
! initialize stime to number of seconds since
!   00:00:00 GMT January 1, 1970
stime = time()
CALL GMTIME (stime, timearray)
print *, timearray
end
```

GRSTATUS

Graphics Function: Returns the status of the most recently used graphics routine. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = GRSTATUS ( )

Results:

The result type is INTEGER(2). The result is the status of the most recently used graphics function.

Use GRSTATUS immediately following a call to a graphics routine to determine if errors or warnings were generated. Return values less than 0 are errors, and values greater than 0 are warnings.

The following symbolic constants are defined in the `IFQWIN.F90` module file for use with GRSTATUS:

Constant	Meaning
$GRFILEWRITEERROR	Error writing bitmap file
$GRFILEOPENERROR	Error opening bitmap file
$GRIMAGEREADERROR	Error reading image
$GRBITMAPDISPLAYERROR	Error displaying bitmap
$GRBITMAPTOOLARGE	Bitmap too large
$GRIMPROPERBITMAPFORMAT	Improper format for bitmap file
$GRFILEREADERROR	Error reading file
$GRNOBITMAPFILE	No bitmap file
$GRINVALIDIMAGEBUFFER	Image buffer data inconsistent
$GRINSUFFICIENTMEMORY	Not enough memory to allocate buffer or to complete a fill operation
$GRINVALIDPARAMETER	One or more parameters invalid
$GRMODENOTSUPPORTED	Requested video mode not supported
$GRERROR	Graphics error
$GROK	Success
$GRNOOUTPUT	No action taken
$GRCLIPPED	Output was clipped to viewport
$GRPARAMETERALTERED	One or more input parameters was altered to be within range, or pairs of parameters were interchanged to be in the proper order

After a graphics call, compare the return value of GRSTATUS to $GROK. to determine if an error has occurred. For example:

```
IF ( GRSTATUS .LT. $GROK ) THEN
! Code to handle graphics error goes here
ENDIF
```

The following routines cannot give errors, and they all set GRSTATUS to $GROK:

DISPLAYCURSOR	GETCOLORRGB	GETTEXTWINDOW

GETBKCOLOR	GETTEXTCOLOR	OUTTEXT
GETBKCOLORRGB	GETTEXTCOLORRGB	WRAPON
GETCOLOR	GETTEXTPOSITION	

The following table lists some other routines with the error or warning messages they produce for GRSTATUS:

Function	Possible GRSTATUS error codes	Possible GRSTATUS warning codes
ARC, ARC_W	$GRINVALIDPARAMETER	$GRNOOUTPUT
CLEARSCREEN	$GRINVALIDPARAMETER	
ELLIPSE, ELLIPSE_W	$GRINVALIDPARAMETE, $GRINSUFFICIENTMEMORY	$GRNOOUTPUT
FLOODFILLRGB	$GRINVALIDPARAMETE, $GRINSUFFICIENTMEMORY	$GRNOOUTPUT
GETARCINFO	$GRERROR	
GETFILLMASK	$GRERROR, $GRINVALIDPARAMETER	
GETFONTINFO	$GRERROR	
GETGTEXTEXTENT	$GRERROR	
GETIMAGE	$GRINSUFFICIENTMEMORY	$GRPARAMETERALTERED
GETPIXEL	$GRBITMAPTOOLARGE	
GETPIXELRGB	$GRBITMAPTOOLARGE	
LINETO, LINETO_W		$GRNOOUTPUT, $GRCLIPPED
LOADIMAGE	$GRFILEOPENERROR, $GRNOBITMAPFILE, $GRALEREADERROR, $GRIMPROPERBITMAPFORMAT, $GRBITMAPTOOLARGE, $GRIMAGEREADERROR	
OUTGTEXT		$GRNOOUTPUT, $GRCLIPPED
PIE, PIE_W	$GRINVALIDPARAMETE, $GRINSUFFICIENTMEMORY	$GRNOOUTPUT
POLYGON, POLYGON_W	$GRINVALIDPARAMETER, $GRINSUFFICIENTMEMORY	$GRNOOUTPUT, $GRCLIPPED

Function	Possible GRSTATUS error codes	Possible GRSTATUS warning codes
PUTIMAGE, PUTIMAGE_W	$GRERROR, $GRINVALIDPARAMETER, $GRINVALIDIMAGEBUFFER $GRBITMAPDISPLAYERROR	$GRPARAMETERALTERED, $GRNOOUTPUT
RECTANGLE, RECTANGLE_W	$GRINVALIDPARAMETER, $GRINSUFFICIENTMEMORY	$GRNOOUTPUT, $GRCLIPPED
REMAPPALETTERGB	$GRERROR, $GRINVALIDPARAMETER	
SAVEIMAGE	$GRFILEOPENERROR	
SCROLLTEXTWINDOW		$GRNOOUTPUT
SETBKCOLOR	$GRINVALIDPARAMETER	$GRPARAMETERALTERED
SETBKCOLORRGB	$GRINVALIDPARAMETER	$GRPARAMETERALTERED
SETCLIPRGN		$GRPARAMETERALTERED
SETCOLOR		$GRPARAMETERALTERED
SETCOLORRGB		$GRPARAMETERALTERED
SETFONT	$GRERROR, $GRINSUFFICIENTMEMORY	$GRPARAMETERALTERED
SETPIXEL, SETPIXEL_W		$GRNOOUTPUT
SETPIXELRGB, SETPIXELRGB_W		$GRNOOUTPUT
SETTEXTCOLOR		$GRPARAMETERALTERED
SETTEXTCOLORRGB		$GRPARAMETERALTERED
SETTEXTPOSITION		$GRPARAMETERALTERED
SETTEXTWINDOW		$GRPARAMETERALTERED
SETVIEWPORT		$GRPARAMETERALTERED
SETWINDOW	$GRINVALIDPARAMETER	$GRPARAMETERALTERED
SETWRITEMODE	$GRINVALIDPARAMETER	

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

HOSTNAM

Portability Function: Returns the current host computer name. This function can also be specified as HOSTNM.

Module: USE IFPORT

Syntax

result = HOSTNAM (*name*)

name

(Output) Character*(*). Name of the current host. Should be at least as long as MAX_HOSTNAM_LENGTH + 1. MAX_HOSTNAM_LENGTH is defined in the IFPORT module.

Results:

The result type is INTEGER(4). The result is zero if successful. If *name* is not long enough to contain all of the host name, the function truncates the host name and returns –1.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

Example

```
use IFPORT
character(MAX_HOSTNAM_LENGTH + 1) hostnam
integer(4) istat
ISTAT = HOSTNAM (hostname)
```

IDATE

Portability Subroutine: Returns the month, day, and year of the current system.

Module: USE IFPORT

Syntax

CALL IDATE (*i*, *j*, *k*)

–or–

CALL IDATE (*iarray*)

i

(Output) INTEGER(4). The current system month.

j

(Output) INTEGER(4). The current system day.

k

(Output) INTEGER(4). The current system year as an offset from 1900.

iarray

(Output) INTEGER(4). Three-element array that holds day as element 1, month as element 2, and year as element 3. The month is between 1 and 12. The year is greater than or equal to 1969 and is returned as 2 digits.

NOTE. IDATE *is an intrinsic procedure unless you specify* USE IFPORT.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: "DATE", "GETDAT", the DATE_AND_TIME and IDATE subroutines in the *Language Reference*

Example

```
    use IFPORT
    integer(4) imonth, iday, iyear, datarray(3)
! If the date is July 11, 1999:
    CALL IDATE(IMONTH, IDAY, IYEAR)
! sets IMONTH to 7, IDAY to 11 and IYEAR to 99.
    CALL IDATE (DATARRAY)
! datarray is (/11,7,99/)
```

IDATE4

Portability Subroutine: Returns the month, day, and year of the current system.

Module: USE IFPORT

Syntax

CALL IDATE4 (*i*, *j*, *k*)

–or–

CALL IDATE4 (*iarray*)

i

(Output) INTEGER(4). The current system month.

j

(Output) INTEGER(4). The current system day.

k

(Output) INTEGER(4). The current system year as an offset from 1900.

iarray

(Output) INTEGER(4). A three-element array that holds day as element 1, month as element 2, and year as element 3. The month is between 1 and 12. The year is returned as an offset from 1900, if the year is less than 2000. For years greater than or equal to 2000, this element simply returns the integer year, such as 2003.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

IDFLOAT

Portability Function: Converts an INTEGER(4) variable to double-precision real type.

Module: USE IFPORT

Syntax

result = IDFLOAT (*i*)

i

(Input) Must be of type INTEGER(4).

Results:

The result type is double-precision real (REAL(8) or REAL*8).

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: the intrinsic function DFLOAT in the *Language Reference*

IEEE_FLAGS

Portability Function: Gets, sets or clears IEEE* flags for rounding direction and precision as well as queries or controls exception status. This function provides easy access to the modes and status required to use the features of IEEE Standard 754-1985 arithmetic in a Fortran program.

Module: USE IFPORT

Syntax

result = IEEE_FLAGS (*action*, *mode*, *in*, *out*)

action

(Input) Character*(*). One of the following literal values: 'GET', 'SET', 'CLEAR', or 'CLEARALL'.

mode

(Input) Character*(*). One of the following literal values: 'direction', 'precision', or 'exception'. The value 'precision' is only allowed on IA-32 systems.

in

(Input) Character*(*). One of the following literal values: 'inexact', 'division', 'underflow', 'overflow', 'invalid', 'all', 'common', 'nearest', 'tozero', 'negative', 'positive', 'extended', 'double', 'single', or ' ', which represents an unused (null) value.

out

(Output) Must be at least CHARACTER*9. One of the literal values listed for *in*.

The descriptions for the values allowed for *in* and *out* can be summarized as follows:

Value	Description
'nearest' 'tozero' 'negative' 'positive'	Rounding direction flags
'single' 'double' 'extended'	Rounding precision flags
'inexact' 'underflow' 'overflow' 'division' 'invalid'	Math exception flags
'all'	All five math exception flags above
'common'	The math exception flags: 'invalid', 'division', 'overflow', and 'underflow'

The values for *in* and *out* depend on the *action* and *mode* they are used with. The interaction of the parameters can be summarized as follows:

action	*mode*	*in*	*out*	**Description**
GET	'direction'	Null (' ')	One of 'nearest', 'tozero', 'negative', or 'positive'	Tests rounding direction settings. Returns the current setting, or 'not available'.
	'exception'	Null (' ')	One of 'inexact', 'division', 'underflow', 'overflow', 'invalid', 'all', or 'common'	Tests math exception settings. Returns the current setting, or 0.
	'precision'	Null (' ')	One of 'single ', 'double ', or 'extended'	Tests rounding precision settings. Returns the current setting, or 'not available'.
SET	'direction'	One of 'nearest', 'tozero', 'negative', or 'positive'	Null (' ')	Sets a rounding direction.
	'exception'	One of 'inexact', 'division', 'underflow', 'overflow', 'invalid', 'all', or 'common'	Null (' ')	Sets a floating-point math exception.
	'precision'	One of 'single ', 'double ', or 'extended'	Null (' ')	Sets a rounding precision.
CLEAR	'direction'	Null (' ')	Null (' ')	Clears the *mode*. Sets rounding to 'nearest'. Returns 0 if successful.
	'exception'	One of 'inexact', 'division', 'underflow', 'overflow', 'invalid', 'all', or 'common'	Null (' ')	Clears the *mode*. Returns 0 if successful.
	'precision'	Null (' ')	Null (' ')	Clears the *mode*. Sets precision to 'double' (W*32, W*64) or 'extended' (L*X). Returns 0 if successful.

action	*mode*	*in*	*out*	Description
CLEARALL	Null (' ')	Null (' ')	Null (' ')	Clears all flags. Sets rounding to 'nearest', sets precision to 'double' (W*32, W*64*) or 'extended' (L*X), and sets all exception flags to 0. Returns 0 if successful.

Results

IEEE_FLAGS is an elemental, integer-valued function that sets IEEE flags for GET, SET, CLEAR, or CLEARALL procedures. It lets you control rounding direction and rounding precision, query exception status, and control exception enabling or disabling by using the SET or CLEAR procedures, respectively.

The flags information is returned as a set of 1-bit flags.

Examples

The following example gets the highest priority exception that has a flag raised. It passes the input argument *in* as a null string:

```
USE IFPORT
INTEGER*4 iflag
CHARACTER*9 out
iflag = ieee_flags('get', 'exception', '', out)
PRINT *, out, ' flag raised'
```

The following example sets the rounding direction to round toward zero, unless the hardware does not support directed rounding modes:

```
USE IFPORT
INTEGER*4 iflag
CHARACTER*1 mode, out, in
iflag = ieee_flags('set', 'direction', 'tozero', out)
```

The following example sets the rounding direction to the default ('nearest'):

```
USE IFPORT
INTEGER*4 iflag
CHARACTER*1 out, in
iflag = ieee_flags('clear','direction', '', '' )
```

The following example clears all exceptions:

```
USE IFPORT
INTEGER*4 iflag
CHARACTER*10 out
```

```
iflag = ieee_flags('clear','exception', 'all', '' )
```

The following example restores default direction and precision settings, and sets all exception flags to 0:

```
USE IFPORT
INTEGER*4 iflag
CHARACTER*10 mode, out, in
iflag = ieee_flags('clearall', '', '', '')
```

The following example detects an underflow exception:

```
USE IFPORT
CHARACTER*20 out, in
excep_detect = ieee_flags('get', 'exception', 'underflow', out)
if (out .eq.'underflow') stop 'underflow'
```

IEEE_HANDLER

Portability Function: Establishes a handler for IEEE exceptions.

Module: USE IFPORT

Syntax

result = IEEE_HANDLER (*action*, *exception*, *handler*)

action

(Input) Character*(*). One of the following IEEE actions: 'GET', 'SET', or 'CLEAR'. For more details on these actions, see IEEE_FLAGS.

exception

(Input) Character*(*). One of the following IEEE exception flags: 'inexact', 'underflow', 'overflow', 'division', 'invalid', 'all' (which equals the previous five flags), or 'common' (which equals 'invalid', 'overflow', 'underflow', and 'division'). The flags 'all' or 'common' should only be used for *action*s SET or CLEAR. For more details on these flags, see IEEE_FLAGS.

handler

(Input) The address of an external signal-handling routine.

Results:

The result type is INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The result is 0 if successful; otherwise, 1.

IEEE_HANDLER calls a signal-handling routine to establish a handler for IEEE exceptions. It also enables an FPU trap corresponding to the required exception.

The state of the FPU is not defined in the handler routine. When the FPU trap occurs, the program invokes the handler routine. After the handler routine is executed, the program terminates.

The handler routine gets the exception code in the SIGINFO argument. SIGNO is the number of the system signal. The meaning of the SIGINFO constants appear in the following table (defined in the IFPORT module):

FPE$INVALID	Invalid operation
FPE$ZERODIVIDE	Divide-by-zero
FPE$OVERFLOW	Numeric overflow
FPE$UNDERFLOW	Numeric underflow
FPE$INEXACT	Inexact result (precision)

'GET' returns the location of the current handler routine for *exception* cast to an INTEGER.

See Also: "IEEE_FLAGS"

Example

The following example creates a handler routine and sets it to trap divide-by-zero:

```
PROGRAM TEST_IEEE
 REAL :: X, Y, Z
 CALL FPE_SETUP
 X = 0.
 Y = 1.
 Z = Y / X
END PROGRAM

SUBROUTINE FPE_SETUP
USE IFPORT
IMPLICIT NONE
 INTERFACE
   SUBROUTINE FPE_HANDLER(SIGNO, SIGINFO)
     INTEGER(4), INTENT(IN) :: SIGNO, SIGINFO
   END SUBROUTINE
 END INTERFACE
 INTEGER IR
 IR = IEEE_HANDLER('set','division',FPE_HANDLER)
END SUBROUTINE FPE_SETUP
```

```
SUBROUTINE FPE_HANDLER(SIG, CODE)
 USE IFPORT
 IMPLICIT NONE
 INTEGER SIG, CODE
 IF(CODE.EQ.FPE$ZERODIVIDE) PRINT *,'Occurred divide by zero.'
 CALL ABORT
END SUBROUTINE FPE_HANDLER
```

IERRNO

Portability Function: Returns the number of the last detected error from any routines in the IFPORT module that return error codes.

Module: USE IFPORT

Syntax

result = IERRNO ( )

Results:

The result type is INTEGER(4). The result value is the last error code from any portability routines that return error codes. These error codes are analogous to `errno` on a Linux* system. The module `IFPORT.F90` provides parameter definitions for the following `errno` names (typically found in errno.h on Linux systems):

Symbolic name	Number	Description
EPERM	1	Insufficient permission for operation
ENOENT	2	No such file or directory
ESRCH	3	No such process
EIO	5	I/O error
E2BIG	7	Argument list too long
ENOEXEC	8	File is not executable
ENOMEM	12	Not enough resources
EACCES	13	Permission denied
EXDEV	18	Cross-device link
ENOTDIR	20	Not a directory
EINVAL	22	Invalid argument

The value returned by IERRNO is updated only when an error occurs. For example, if an error occurs on a GETLOG call and then two CHMOD calls succeed, a subsequent call to IERRNO returns the error for the GETLOG call.

Examine IERRNO immediately after returning from a portability routine. Other Fortran routines, as well as any Win32* APIs, can also change the error code to an undefined value. IERRNO is set on a per thread basis.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

Example

```
USE IFPORT
CHARACTER*20 username
INTEGER(4) ierrval
ierrval=0 !initialize return value
CALL GETLOG(username)
IF (IERRNO( ) == ierrval) then
  print *, 'User name is ',username
  exit
ELSE
  ierrval = ierrno()
  print *, 'Error is ',ierrval
END IF
```

IFLOATI, IFLOATJ

Portability Functions: Convert an integer to single-precision real type.

Module: USE IFPORT

Syntax

result = IFLOATI (*i*)
result = IFLOATJ (*j*)

i

(Input) Must be of type INTEGER(2).

j

(Input) Must be of type INTEGER(4).

Results:

The result type is single-precision real (REAL(4) or REAL*4).

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: the DFLOAT intrinsic function in the *Language Reference*

IMAGESIZE, IMAGESIZE_W

Graphics Functions: Return the number of bytes needed to store the image inside the specified bounding rectangle. IMAGESIZE is useful for determining how much memory is needed for a call to GETIMAGE. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = IMAGESIZE (*x1*, *y1*, *x2*, *y2*)

result = IMAGESIZE_W (*wx1*, *wy1*, *wx2*, *wy2*)

x1, *y1*

(Input) INTEGER(2). Viewport coordinates for upper-left corner of image.

x2, *y2*

(Input) INTEGER(2). Viewport coordinates for lower-right corner of image.

wx1, *wy1*

(Input) REAL(8). Window coordinates for upper-left corner of image.

wx2, *wy2*

(Input) REAL(8). Window coordinates for lower-right corner of image.

Results:

The result type is INTEGER(4). The result is the storage size of an image in bytes.

IMAGESIZE defines the bounding rectangle in viewport-coordinate points (*x1*, *y1*) and (*x2*, *y2*). IMAGESIZE_W defines the bounding rectangle in window-coordinate points (*wx1*, *wy1*) and (*wx2*, *wy2*).

IMAGESIZE_W defines the bounding rectangle in terms of window-coordinate points (*wx1*, *wy1*) and (*wx2*, *wy2*).

Compatibility

`STANDARD GRAPHICS QUICKWIN GRAPHICS LIB`

See Also: "GETIMAGE, GETIMAGE_W", "GRSTATUS", "PUTIMAGE, PUTIMAGE_W"

Example

See the example in "GETIMAGE, GETIMAGE_W".

INCHARQQ

QuickWin Function: Reads a single character input from the keyboard and returns the ASCII value of that character without any buffering. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = INCHARQQ ( )

Results:

The result type is INTEGER(2). The result is the ASCII key code.

The keystroke is read from the child window that currently has the focus. You must call INCHARQQ before the keystroke is made (INCHARQQ does not read the keyboard buffer). This function does not echo its input. For function keys, INCHARQQ returns 0xE0 as the upper 8 bits, and the ASCII code as the lower 8 bits.

For direction keys, INCHARQQ returns 0xF0 as the upper 8 bits, and the ASCII code as the lower 8 bits. To allow direction keys to be read, you must use the PASSDIRKEYSQQ function. The escape characters (the upper 8 bits) are different from those of GETCHARQQ. Note that console applications do not need, and cannot use PASSDIRKEYSQQ.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETCHARQQ", "MBINCHARQQ", "GETC", "PASSDIRKEYSQQ", the READ statement in the *Language Reference*, "Using QuickWin" in your user's guide

Example

```
use IFQWIN
integer*4 res
integer*2 exchar
character*1 ch, ch1

Print *,"Type X to exit, S to scroll, D to pass Direction keys"
123 continue
exchar = incharqq()
! check for escapes
! 0xE0 0x?? is a function key
! 0xF0 0x?? is a direction key
ch = char(rshift(exchar,8) .and. Z'00FF')
ch1= char(exchar .and. Z'00FF')
if (ichar(ch) .eq. 224) then
```

```
  print *,"function key  = ",ichar(ch), " ",ichar(ch1)," ",ch1
  goto 123
endif
if (ichar(ch) .eq. 240) then
  print *,"direction key = ",ichar(ch), " ",ichar(ch1)," ",ch1
  goto 123
endif
print *,"other key  = ",ichar(ch)," ",ichar(ch1)," ",ch1
if(ch1 .eq. 'S') then
  res = passdirkeysqq(.false.)
  print *, "Entering Scroll mode"
endif
if(ch1 .eq. 'D')  then
  res = passdirkeysqq(.true.)
  print *, "Entering Direction keys mode"
endif
if(ch1 .ne. 'X')
  go to 123
end
```

INITIALIZEFONTS

Graphics Function: Initializes Windows* fonts. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = INITIALIZEFONTS ( )

Results:

The result type is INTEGER(2). The result is the number of fonts initialized.

All fonts on Windows systems become available after a call to INITIALIZEFONTS. Fonts must be initialized with INITIALIZEFONTS before any other font-related library function (such as GETFONTINFO, GETGTEXTEXTENT, SETFONT, OUTGTEXT) can be used. For more information, see "Using Fonts from the Graphics Library" in your user's guide.

The font functions affect the output of OUTGTEXT only. They do not affect other Fortran I/O functions (such as WRITE) or graphics output functions (such as OUTTEXT).

For each window you open, you must call INITIALIZEFONTS before calling SETFONT. INITIALIZEFONTS needs to be executed after each new child window is opened in order for a subsequent SETFONT call to be successful.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "SETFONT", "OUTGTEXT", "Using QuickWin" in your user's guide

Example

```
! build as a QuickWin or Standard Graphics App.
USE IFQWIN
INTEGER(2) numfonts
numfonts = INITIALIZEFONTS() WRITE (*,*) numfonts
END
```

INITIALSETTINGS

QuickWin Function: Initializes QuickWin. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = INITIALSETTINGS ( )

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

You can change the initial appearance of an application's default frame window and menus by defining an INITIALSETTINGS function. Do not use INITIALSETTINGS to open or size child windows.

If no user-defined INITIALSETTINGS function is supplied, QuickWin calls a predefined INITIALSETTINGS routine to control the default frame window and menu appearance. You do not need to call INITIALSETTINGS if you define it, since it will be called automatically during initialization.

For more information, see "Controlling the Initial Menu and Frame Window" in your user's guide.

Compatibility

QUICKWIN GRAPHICS WINDOWS LIB

See Also: "APPENDMENUQQ", "INSERTMENUQQ", "DELETEMENUQQ", "SETWSIZEQQ", "Using QuickWin" in your user's guide

INMAX

Portability Function: Returns the maximum positive value for an integer.

Module: USE IFPORT

Syntax

result = INMAX (*i*)

i

(Input) INTEGER(4).

Results:

The result type is INTEGER(4). The result is the maximum 4-byte signed integer value for the argument.

INQFOCUSQQ

QuickWin Function: Determines which window has the focus. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = INQFOCUSQQ (*unit*)

unit

(Output) INTEGER(4). Unit number of the window that has the I/O focus.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, nonzero. The function fails if the window with the focus is associated with a closed unit.

Unit numbers 0, 5, and 6 refer to the default window only if the program has not specifically opened them. If these units have been opened and connected to windows, they are automatically reconnected to the console once they are closed.

The window with focus is always in the foreground. Note that the window with the focus is not necessarily the active window (the one that receives graphical output). A window can be made active without getting the focus by calling SETACTIVEQQ.

A window has focus when it is given the focus by FOCUSQQ, when it is selected by a mouse click, or when an I/O operation other than a graphics operation is performed on it, unless the window was opened with IOFOCUS=.FALSE.. The IOFOCUS specifier determines whether a window receives focus when an I/O statement is executed on that unit. For example:

```
OPEN (UNIT = 10, FILE = 'USER', IOFOCUS = .TRUE.)
```

By default IOFOCUS=.TRUE., except for child windows opened with as unit *. If IOFOCUS=.TRUE., the child window receives focus prior to each READ, WRITE, PRINT, or OUTTEXT. Calls to graphics functions (such as OUTGTEXT and ARC) do not cause the focus to shift.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "FOCUSQQ", "Using QuickWin" in your user's guide

INSERTMENUQQ

QuickWin Function: Inserts a menu item into a QuickWin menu and registers its callback routine. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = INSERTMENUQQ (*menuID*, *itemID*, *flag*, *text*, *routine*)

menuID

(Input) INTEGER(4). Identifies the menu in which the item is inserted, starting with 1 as the leftmost menu.

itemID

(Input) INTEGER(4). Identifies the position in the menu where the item is inserted, starting with 0 as the top menu item.

flag

(Input) INTEGER(4). Constant indicating the menu state. Flags can be combined with an inclusive OR (see Results section below). The following constants are available:

- $MENUGRAYED - Disables and grays out the menu item.
- $MENUDISABLED - Disables but does not gray out the menu item.
- $MENUENABLED - Enables the menu item.
- $MENUSEPARATOR - Draws a separator bar.
- $MENUCHECKED - Puts a check by the menu item.
- $MENUUNCHECKED - Removes the check by the menu item.

text

(Input) Character*(*). Menu item name. Must be a null-terminated C string, for example, words of text'C.

routine

(Input) EXERNAL. Callback subroutine that is called if the menu item is selected. All routines must take a single LOGICAL parameter that indicates whether the menu item is checked or not. You can assign the following predefined routines to menus:

- WINPRINT – Prints the program.
- WINSAVE – Saves the program.
- WINEXIT – Terminates the program.
- WINSELECTTEXT – Selects text from the current window.
- WINSELECTGRAPHICS – Selects graphics from the current window.
- WINSELECTALL – Selects the entire contents of the current window.
- WININPUT – Brings to the top the child window requesting input and makes it the current window.
- WINCOPY – Copies the selected text and/or graphics from the current window to the Clipboard.
- WINPASTE – Allows the user to paste Clipboard contents (text only) to the current text window of the active window during a READ.
- WINCLEARPASTE – Clears the paste buffer.
- WINSIZETOFIT – Sizes output to fit window.
- WINFULLSCREEN – Displays output in full screen.
- WINSTATE – Toggles between pause and resume states of text output.
- WINCASCADE – Cascades active windows.
- WINTILE – Tiles active windows.
- WINARRANGE – Arranges icons.
- WINSTATUS – Enables a status bar.
- WININDEX – Displays the index for QuickWin help.
- WINUSING – Displays information on how to use Help.
- WINABOUT – Displays information about the current QuickWin application.
- NUL – No callback routine.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE.

Menus and menu items must be defined in order from left to right and top to bottom. For example, INSERTMENUQQ fails if you try to insert menu item 7 when 5 and 6 are not defined yet. For a top-level menu item, the callback routine is ignored if there are subitems under it.

The constants available for flags can be combined with an inclusive OR where reasonable, for example $MENUCHECKED .OR. $MENUENABLED. Some combinations do not make sense, such as $MENUENABLED and $MENUDISABLED, and lead to undefined behavior.

You can create quick-access keys in the text strings you pass to INSERTMENUQQ as *text* by placing an ampersand (&) before the letter you want underlined. For example, to add a Print menu item with the r underlined, *text* should be "P&rint". Quick-access keys allow users of your program to activate that menu item with the key combination `ALT+QUICK-ACCESS-KEY` (`ALT+R` in the example) as an alternative to selecting the item with the mouse.

For more information on customizing QuickWin menus, see "Using QuickWin" in your user's guide.

Compatibility

`QUICKWIN GRAPHICS  LIB`

See Also: "APPENDMENUQQ", "DELETEMENUQQ", "MODIFYMENUFLAGSQQ", "MODIFYMENUROUTINEQQ", "MODIFYMENUSTRINGQQ"

Example

```
! build as a QuickWin App.
USE IFQWIN
LOGICAL(4) status
! insert new item into Menu 5 (Window)
status= INSERTMENUQQ(5, 5, $MENUCHECKED, 'New Item'C, &
                     WINSTATUS)
! insert new menu in position 2
status= INSERTMENUQQ(2, 0, $MENUENABLED, 'New Menu'C, &
                     WINSAVE)
END
```

INTC

Portability Function: Converts an INTEGER(4) argument to INTEGER(2) type.

Module: USE IFPORT

Syntax

result = INTC (*i*)

i

(Input) INTEGER(4). A value or expression.

Results:

The result type is INTEGER(2). The result is the value of *i* with type INTEGER(2). Overflow is ignored.

INTEGERTORGB

QuickWin Subroutine: Converts an RGB color value into its red, green, and blue components. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL INTEGERTORGB (*rgb*, *red*, *green*, *blue*)

rgb

(Input) INTEGER(4). RGB color value whose red, green, and blue components are to be returned.

red

(Output) INTEGER(4). Intensity of the red component of the RGB color value.

green

(Output) INTEGER(4). Intensity of the green component of the RGB color value.

blue

(Output) INTEGER(4). Intensity of the blue component of the RGB color value.

INTEGERTORGB separates the four-byte RGB color value into the three components as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Compatibility

QUICKWIN GRAPHICS WINDOWS LIB

See Also: "RGBTOINTEGER", "GETCOLORRGB", "GETBKCOLORRGB", "GETPIXELRGB, GETPIXELRGB_W", "GETPIXELSRGB", "GETTEXTCOLORRGB", "Using QuickWin" in your user's guide

Example

```
! build as a QuickWin App.
USE IFQWIN
INTEGER(4) r, g, b
```

```
CALL INTEGERTORGB(2456, r, g, b)
write(*,*) r, g, b
END
```

IPXFARGC

POSIX Function: Returns the index of the last command-line argument.

Module: USE IFPOSIX

Syntax

result = IPXFARGC ( )

Results:

The result type is INTEGER(4). The result value is the number of command-line arguments, excluding the command name, in the command used to invoke the executing program. A return value of zero indicates there are no command-line arguments other than the command name itself.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFGETARG"

IPXFCONST

POSIX Function: Returns the value associated with a constant defined in the C POSIX standard.

Module: USE IFPOSIX

Syntax

result = IPXFCONST (*constname*)

constname

(Input) Character. The name of a C POSIX standard constant.

Results:

The result type is INTEGER(4). If *constname* corresponds to a defined constant in the C POSIX standard, the result value is the integer that is associated with the constant. Otherwise, the result value is –1.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFGETARG", "PXFCONST"

IPXFLENTRIM

POSIX Function: Returns the index of the last non-blank character in an input string.

Module: USE IFPOSIX

Syntax

result = IPXFLENTRIM (*string*)

string

(Input) Character. A character string.

Results:

The result type is INTEGER(4). The result value is the index of the last non-blank character in the input argument *string*, or zero if all characters in *string* are blank characters.

Compatibility

`CONSOLE` `STANDARD GRAPHICS` `QUICKWIN GRAPHICS` `WINDOWS` `DLL` `LIB`

IPXFWEXITSTATUS

POSIX Function: Returns the exit code of a child process. This function is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

result = IPXFWEXITSTATUS (*istat*)

istat

(Input) INTEGER(4). The value of output argument *istat* from PXFWAIT or PXFWAITPID.

Results:

The result type is INTEGER(4). The result is the low-order eight bits of the output argument of PXFWAIT or PXFWAITPID.

The IPXFWEXITSTATUS function should only be used if PXFWIFEXITED returns TRUE.

See Also: "PXFWAIT", "PXFWAITPID", "PXFWIFEXITED"

Example

```
program t1
use ifposix
integer(4) ipid, istat, ierror, ipid_ret, istat_ret
  print *," the child process will be born"
  call PXFFORK(IPID, IERROR)
```

```
  call PXFGETPID(IPID_RET,IERROR)
  if(IPID.EQ.0) then
     print *," I am a child process"
     print *," My child's pid is", IPID_RET
     call PXFGETPPID(IPID_RET,IERROR)
     print *," The pid of my parent is",IPID_RET
     print *," Now I have exited with code 0xABCD"
     call PXFEXIT(Z'ABCD')
  else
     print *," I am a parent process"
     print *," My parent pid is ", IPID_RET
     print *," I am creating the process with pid", IPID
     print *," Now I am waiting for the end of the child process"
     call PXFWAIT(ISTAT, IPID_RET, IERROR)
     print *," The child with pid ", IPID_RET," has exited"
     if( PXFWIFEXITED(ISTAT) ) then
       print *, " The child exited normally"
       istat_ret = IPXFWEXITSTATUS(ISTAT)
       print 10," The low byte of the child exit code is", istat_ret
     end if
  end if
10 FORMAT (A,Z)
end program
```

IPXFWSTOPSIG

POSIX Function: Returns the number of the signal that caused a child process to stop. This function is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

result = IPXFWSTOPSIG (*istat*)

istat

(Input) INTEGER(4). The value of output argument *istat* from PXFWAIT or PXFWAITPID.

Results:

The result type is INTEGER(4). The result is the number of the signal that caused the child process to stop.

The IPXFWSTOPSIG function should only be used if PXFWIFSTOPPED returns TRUE.

See Also: "PXFWAIT", "PXFWAITPID", "PXFWIFSTOPPED"

IPXFWTERMSIG

POSIX Function: Returns the number of the signal that caused a child process to terminate.This function is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

result = IPXFWTERMSIG (*istat*)

istat

(Input) INTEGER(4). The value of output argument *istat* from PXFWAIT or PXFWAITPID.

Results:

The result type is INTEGER(4). The result is the number of the signal that caused the child process to terminate.

The IPXFWTERMSIG function should only be used if PXFWIFSIGNALED returns TRUE.

See Also: "PXFWAIT", "PXFWAITPID", "PXFWIFSIGNALED"

IRAND, IRANDM

Portability Functions: Return random numbers in the range 0 through (2**31)–1, or 0 through (2**15)–1 if called without an argument.

Module: USE IFPORT

Syntax

result = IRAND ([*iflag*])
result = IRANDM (*iflag*)

iflag

(Input) INTEGER(4). Optional for IRAND. Controls the way the returned random number is chosen. If *iflag* is omitted, it is assumed to be 0, and the return range is 0 through (2**15)–1 (inclusive).

Results:

The result type is INTEGER(4). If *iflag* is 1, the generator is restarted and the first random value is returned. If *iflag* is 0, the next random number in the sequence is returned. If *iflag* is neither zero nor 1, it is used as a new seed for the random number generator, and the functions return the first new random value.

IRAND and IRANDM are equivalent and return the same random numbers. Both functions are included to ensure portability of existing code that references one or both of them.

You can use SRAND to restart the pseudorandom number generator used by these functions.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "SRAND", the RANDOM_NUMBER and RANDOM_SEED intrinsic routines in the *Language Reference*

Example

```
USE IFPORT
INTEGER(4) istat, flag_value, r_nums(20)
flag_value=1
r_nums(1) = IRAND (flag_value)
flag_value=0
do istat=2,20
    r_nums(istat) = irand(flag_value)
end do
```

IRANGET

Portability Subroutine: Returns the current seed.

Module: USE IFPORT

Syntax

CALL IRANGET (*seed*)

seed

(Output) INTEGER(4). The current seed value.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "IRANSET"

IRANSET

Portability Subroutine: Sets the seed for the random number generator.

Module: USE IFPORT

Syntax

CALL IRANSET (*seed*)

seed

(Input) INTEGER(4). The reset value for the seed.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "IRANGET"

ISATTY

Portability Function: Checks whether a logical unit number is a terminal.

Module: USE IFPORT

Syntax

result = ISATTY (*lunit*)

lunit

(Input) INTEGER(4). An integer expression corresponding to a Fortran logical unit number. Must be in the range 0 to 100 and must be connected.

Results:

The result type is LOGICAL(4). The result is .TRUE. if the specified logical unit is connected to a terminal device; otherwise, .FALSE..

If *lunit* is out of range or is not connected, zero is returned.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

ITIME

Portability Subroutine: Returns the time in numeric form.

Module: USE IFPORT

Syntax

CALL ITIME (*array*)

array

(Output) INTEGER(4). A rank one array with three elements used to store numeric time data:

- *array*(1) – the hour
- *array*(2) – the minute
- *array*(3) – the second

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: the DATE_AND_TIME intrinsic procedure in the *Language Reference*

Example

```
USE IFPORT
 INTEGER(4) time_array(3)
 CALL ITIME (time_array)
 write(*,10) time_array
 10 format (1X,I2,':',I2,':',I2)
 END
```

JABS

Portability Function: Returns an absolute value.

Module: USE IFPORT

Syntax

result = JABS (*i*)

i

(Input) INTEGER(4). A value.

Results:

The result type is INTEGER(4). The value of the result is | *i* |.

JDATE

Portability Function: Returns an 8-character string with the Julian date in the form "yyddd". Three spaces terminate this string.

Module: USE IFPORT

Syntax

result = JDATE ( )

Results:

The result type is character with length 8. The result is the Julian date, in the form YYDDD, followed by three spaces.

The Julian date is a five-digit number whose first two digits are the last two digits of the year, and whose final three digits represent the day of the year (1 for January 1, 366 for December 31 of a leap year, and so on). For example, the Julian date for February 1, 1999 is 99032.

CAUTION. *The two-digit year return value may cause problems with the year 2000. Use the* DATE_AND_TIME *intrinsic subroutine instead (see the Language Reference).*

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: the DATE_AND_TIME intrinsic procedure in the *Language Reference*

Example

```
! Sets julian to today's julian date
    USE IFPORT
    CHARACTER*8 julian
    julian = JDATE( )
```

JDATE4

Portability Function: Returns a 10-character string with the Julian date in the form "yyyyddd". Three spaces terminate this string.

Module: USE IFPORT

Syntax

result = JDATE4 ( )

Results:

The result type is character with length 10. The result is the Julian date, in the form YYYYDDD, followed by three spaces.

The Julian date is a seven-digit number whose first four digits are the year, and whose final three digits represent the day of the year (1 for January 1, 366 for December 31 of a leap year, and so on). For example, the Julian date for February 1, 1999 is 1999032.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: the DATE_AND_TIME intrinsic procedure in the *Language Reference*

KILL

Portability Function: Sends a signal to the process given by ID.

Module: USE IFPORT

Syntax

result = KILL (*pid*, *signum*)

pid

(Input) INTEGER(4). ID of a process to be signaled.

signum

(Input) INTEGER(4). A signal value. For the definition of signal values, see the "SIGNAL" function.

Results:

The result type is INTEGER(4). The result is zero if the call was successful; otherwise, an error code. Possible error codes are:

- EINVAL: The *signum* is not a valid signal number, or PID is not the same as getpid( ) and *signum* does not equal SIGKILL.
- ESRCH: The given PID could not be found.
- EPERM: The current process does not have permission to send a signal to the process given by PID.

On Windows* systems, arbitrary signals can be sent only to the calling process (where *pid* = getpid( )). Other processes can send only the SIGKILL signal (*signum* = 9), and only if the calling process has permission.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "RAISEQQ", "SIGNALQQ"

Example

```
USE IFPORT
integer(4) id_number, sig_val, istat
id_number=getpid( )
ISTAT = KILL (id_number, sig_val)
```

LCWRQQ

Portability Subroutine: Sets the value of the floating-point processor control word.

Module: USE IFPORT

Syntax

CALL LCWRQQ (*controlword*)

controlword

(Input) INTEGER(2). Floating-point processor control word.

LCWRQQ performs the same function as the run-time subroutine SETCONTROLFPQQ and is provided for compatibility.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SETCONTROLFPQQ"

Example

```
USE IFPORT
INTEGER(2) control
CALL SCWRQQ(control) ! get control word
!  Set control word to make processor round up
control = control .AND. (.NOT. FPCW$MCW_RC)  ! Clear
                                            !  control word with inverse
                                              !  of rounding control mask
control = control .OR. FPCW$UP  ! Set control word
                                !  to round up
CALL LCWRQQ(control)
WRITE (*, 9000) 'Control word: ', control
9000 FORMAT (1X, A, Z4)
END
```

LINETO, LINETO_W

Graphics Function: Draws a line from the current graphics position up to and including the end point. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = LINETO (*x*, *y*)
result = LINETO_W (*wx*, *wy*)

x, *y*

(Input) INTEGER(2). Viewport coordinates of end point.

wx, *wy*

(Input) REAL(8). Window coordinates of end point.

Results:

The result type is INTEGER(2). The result is a nonzero value if successful; otherwise, 0.

The line is drawn using the current graphics color, logical write mode, and line style. The graphics color is set with SETCOLORRGB, the write mode with SETWRITEMODE, and the line style with SETLINESTYLE.

If no error occurs, LINETO sets the current graphics position to the viewport point (*x*, *y*), and LINETO_W sets the current graphics position to the window point (*wx*, *wy*).

If you use FLOODFILLRGB to fill in a closed figure drawn with LINETO, the figure must be drawn with a solid line style. Line style is solid by default and can be changed with SETLINESTYLE.

NOTE. *The* LINETO *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the LineTo routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$LineTo. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

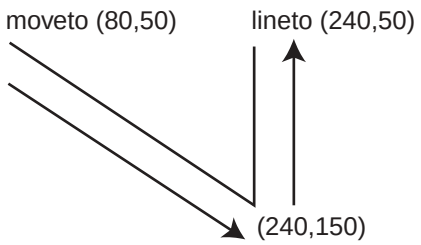
STANDARD GRAPHICS QUICKWIN GRAPHICS

See Also: "GETCURRENTPOSITION, GETCURRENTPOSITION_W", "GETLINESTYLE", "GRSTATUS", "MOVETO, MOVETO_W", "POLYGON, POLYGON_W", "POLYLINEQQ", "SETLINESTYLE", "SETWRITEMODE"

Example

This program draws the figure shown below.

```
! Build as QuickWin or Standard Graphics
USE IFQWIN
INTEGER(2) status
TYPE (xycoord) xy
CALL MOVETO(INT2(80), INT2(50), xy)
status = LINETO(INT2(240), INT2(150))
status = LINETO(INT2(240), INT2(50))
END
```



LINETOAR

Graphics Function: Draws a line between each x,y point in the from-array to each corresponding x,y point in the to-array. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = LINETOAR (loc(*fx*), loc(*fy*), loc(*tx*) loc(*ty*), *cnt*)

fx

(Input) INTEGER(2). From x viewport coordinate array.

fy

(Input) INTEGER(2). From y viewport coordinate array.

tx

(Input) INTEGER(2). To x viewport coordinate array.

ty

(Input) INTEGER(2). To y viewport coordinate array.

cnt

(Input) INTEGER(4). Length of each coordinate array; all should be the same size.

Results:

The result is of type INTEGER(2). The result is a nonzero value if successful; otherwise, zero.

The lines are drawn using the current graphics color, logical write mode, and line style. The graphics color is set with SETCOLORRGB, the write mode with SETWRITEMODE, and the line style with SETLINESTYLE.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS`

See Also: "LINETO, LINETO_W", "LINETOAREX", "SETCOLORRGB", "SETLINESTYLE", "SETWRITEMODE", the LOC intrinsic function in the *Language Reference*

Example

```
! Build for QuickWin or Standard Graphics
USE IFQWIN
integer(2) fx(3),fy(3),tx(3),ty(3),result
integer(4) cnt, i
! load the points
do i = 1,3
    !from here
    fx(i) =20*i
    fy(i) =10
    !to there
    tx(i) =20*i
    ty(i) =60
end do
! draw the lines all at once
! 3 white vertical lines in upper left corner
result = LINETOAR(loc(fx),loc(fy),loc(tx),loc(ty), 3)
end
```

LINETOAREX

Graphics Function: Draws a line between each x,y point in the from-array to each corresponding x,y point in the to-array. Each line is drawn with the specified graphics color and line style. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = LINETOAREX (loc(*fx*), loc(*fy*), loc(*tx*) loc(*ty*), loc(*C*), loc(*S*), *cnt*)

fx

(Input) INTEGER(2). From x viewport coordinate array.

fy

(Input) INTEGER(2). From y viewport coordinate array.

tx

(Input) INTEGER(2). To x viewport coordinate array.

ty

(Input) INTEGER(2). To y viewport coordinate array.

C

(Input) INTEGER(4). Color array.

S

(Input) INTEGER(4). Style array.

cnt

(Input) INTEGER(4). Length of each coordinate array; also the length of the color array and style array. All of the arrays should be the same size.

Results:

The result is of type INTEGER(2). The result is a nonzero value if successful; otherwise, zero.

The lines are drawn using the specified graphics colors and line styles, and with the current write mode. The current write mode is set with SETWRITEMODE.

If the color has the Z'80000000' bit set, the color is an RGB color; otherwise, the color is a palette color.

The styles are as follows from `wingdi.h`:

```
SOLID           0
DASH            1       /* -------  */
DOT             2       /* .......  */
DASHDOT         3       /* _._._._  */
DASHDOTDOT      4       /* _.._.._  */
NULL            5
```

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS`

See Also: "LINETO, LINETO_W", "LINETOAR", "POLYLINEQQ", "SETWRITEMODE", the LOC intrinsic function in the *Language Reference*

Example

```
! Build for QuickWin or Standard Graphics
USE IFQWIN
integer(2) fx(3),fy(3),tx(3),ty(3),result
integer(4) C(3),S(3),cnt,i,color

color = Z'000000FF'
! load the points
do i = 1,3
```

```
     S(i) = 0  ! all lines solid
     C(i) = IOR(Z'80000000',color)
     color = color*256 ! pick another of RGB
     if(IAND(color,Z'00FFFFFF').eq.0) color = Z'000000FF'
     !from here
     fx(i) =20*i
     fy(i) =10
     !to there
     tx(i) =20*i
     ty(i) =60
end do
! draw the lines all at once
! 3 vertical lines in upper left corner, Red, Green, and Blue
result = LINETOAREX(loc(fx),loc(fy),loc(tx),loc(ty),loc(C),loc(S),3)
end
```

LNBLNK

Portability Function: Locates the position of the last nonblank character in a string.

Module: USE IFPORT

Syntax

result = LNBLNK (*string*)

string

(Input) Character*(*). String to be searched. Cannot be an array.

Results:

The result type is INTEGER(4). The result is the index of the last nonblank character in *string*.

LNBLNK is very similar to the intrinsic function LEN_TRIM, except that *string* cannot be an array.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: the LEN_TRIM intrinsic function in the *Language Reference*

Example

```
USE IFPORT
integer(4) p
p = LNBLNK(’ GOOD DAY ’) ! returns 9
```

```
p = LNBLNK(' ')          ! returns 0
```

LOADIMAGE, LOADIMAGE_W

Graphics Functions: Read an image from a Windows bitmap file and display it at a specified location. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = LOADIMAGE (*filename*, *xcoord*, *ycoord*)

result = LOADIMAGE_W (*filename*, *wxcoord*, *wycoord*)

filename

(Input) Character*(*). Path of the bitmap file.

xcoord, *ycoord*

(Input) INTEGER(4). Viewport coordinates for upper-left corner of image display.

wxcoord, *wycoord*

(Input) REAL(8). Window coordinates for upper-left corner of image display.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a negative value.

The image is displayed with the colors in the bitmap file. If the color palette in the bitmap file is different from the current system palette, the current palette is discarded and the bitmap's palette is loaded.

LOADIMAGE specifies the screen placement of the image in viewport coordinates. LOADIMAGE_W specifies the screen placement of the image in window coordinates.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "SAVEIMAGE, SAVEIMAGE_W"

LONG

Portability Function: Converts an INTEGER(2) argument to INTEGER(4) type.

Module: USE IFPORT

Syntax

result = LONG (*int2*)

int2

(Input) INTEGER(2). Value to be converted.

Results:

The result type is INTEGER(4). The result is the value of *int2* with type INTEGER(4). The upper 16 bits of the result are zeros and the lower 16 are equal to *int2*.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: the INT and KIND intrinsic functions in the *Language Reference*

LSTAT

Portability Function: Returns detailed information about a file.

Module: USE IFPORT

Syntax

result = LSTAT (*name*, *statb*)

name

(Input) Character*(*). Name of the file to examine.

statb

(Output) INTEGER(4) or INTEGER(8). One-dimensional array of size 12; where the system information is stored. See "STAT" for the possible values returned in *statb*.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, an error code (see "IERRNO").

LSTAT returns detailed information about the file named in *name*.

On Linux* systems, if the file denoted by *name* is a link, LSTAT provides information on the link, while STAT provides information on the file at the destination of the link.

On Windows* systems, LSTAT returns exactly the same information as STAT (because there are no symbolic links on these systems). STAT is the preferred function.

The INQUIRE statement also provides information about file properties.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "GETFILEINFOQQ", "STAT", "FSTAT" the INQUIRE statement in the *Language Reference*

Example

```
USE IFPORT
INTEGER(4) info_array(12), istatus
character*20 file_name
print *, "Enter name of file to examime: "
read *, file_name
ISTATUS = LSTAT (file_name, info_array)
if (.NOT. ISTATUS) then
   print *, info_array
else
   print *, 'Error ',istatus
end if
```

LTIME

Portability Subroutine: Returns the components of the local time zone time in a nine-element array.

Module: USE IFPORT

Syntax

CALL LTIME (*time*, *array*)

time

(Input) INTEGER(4). An elapsed time in seconds since 00:00:00 Greenwich mean time, January 1, 1970.

array

(Output) INTEGER(4). One-dimensional array with 9 elements to contain local date and time data derived from *time*.

The elements of *array* are returned as follows:

Element	Value
array(1)	Seconds (0 - 59)
array(2)	Minutes (0 - 59)
array(3)	Hours (0 - 23)
array(4)	Day of month (1 - 31)
array(5)	Month (0 - 11)
array(6)	Years since 1900

Element	Value
array(7)	Day of week (0 - 6, where 0 is Sunday)
array(8)	Day of year (1 - 365)
array(9)	1 if daylight saving time is in effect; otherwise, 0.

CAUTION. *This subroutine is not year-2000 compliant, use the* DATE_AND_TIME *intrinsic subroutine instead (see the Language Reference).*

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: the DATE_AND_TIME intrinsic procedure in the *Language Reference*

Example

```
USE IFPORT
INTEGER(4) input_time, time_array(9)
!   find number of seconds since 1/1/70
input_time=TIME()
!   convert number of seconds to time array
CALL LTIME (input_time, time_array)
PRINT *, time_array
```

MAKEDIRQQ

Portability Function: Creates a new directory with a specified name.

Module: USE IFPORT

Syntax

result = MAKEDIRQQ (*dirname*)

dirname

(Input) Character*(*). Name of directory to be created.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

MAKEDIRQQ can create only one directory at a time. You cannot create a new directory and a subdirectory below it in a single command. MAKEDIRQQ does not translate path delimiters. You can use either slash (/) or backslash (\) as valid delimiters.

If an error occurs, call GETLASTERRORQQ to retrieve the error message. Possible errors include:

- ERR$ACCES - Permission denied. The file's (or directory's) permission setting does not allow the specified access.
- ERR$EXIST - The directory already exists.
- ERR$NOENT - The file or path specified was not found.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "DELDIRQQ", "CHANGEDIRQQ", "GETLASTERRORQQ"

Example

```
USE IFPORT
LOGICAL(4) result
result = MAKEDIRQQ('mynewdir')
IF (result) THEN
   WRITE (*,*) 'New subdirectory successfully created'
ELSE
   WRITE (*,*) 'Failed to create subdirectory'
END IF
END
```

MBCharLen

NLS Function: Returns the length, in bytes, of the first character in a multibyte-character string. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBCharLen (*string*)

string

(Input) Character*(*). String containing the character whose length is to be determined. Can contain multibyte characters.

Results:

The result type is INTEGER(4). The result is the number of bytes in the first character contained in *string*. The function returns 0 if *string* has no characters (is length 0).

MBCharLen does not test for multibyte character validity.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBCurMax", "MBLead", "MBLen", "MBLen_Trim"

MBConvertMBToUnicode

NLS Function: Converts a multibyte-character string from the current codepage to a Unicode string. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBConvertMBToUnicode (*mbstr*, *unicodestr* [, *flags*])

mbstr

(Input) Character*(*). Multibyte codepage string to be converted.

unicodestr

(Output) INTEGER(2). Array of integers that is the translation of the input string into Unicode.

flags

(Optional; input) INTEGER(4). If specified, modifies the string conversion. If *flags* is omitted, the value NLS$Precomposed is used. Available values (defined in `IFNLS.F90`) are:

- NLS$Precomposed: Use precomposed characters always. This is the default.
- NLS$Composite: Use composite wide characters always.
- NLS$UseGlyphChars: Use glyph characters instead of control characters.
- NLS$ErrorOnInvalidChars: Returns –1 if an invalid input character is encountered.

The flags NLS$Precomposed and NLS$Composite are mutually exclusive. You can combine NLS$UseGlyphChars with either NLS$Precomposed or NLS$Composite using an inclusive OR (IOR or OR).

Results:

The result type is INTEGER(4). If no error occurs, the result is the number of bytes written to *unicodestr* (bytes are counted, not characters), or the number of bytes required to hold the output string if *unicodestr* has zero size. If the *unicodestr* array is bigger than needed to hold the translation, the extra elements are set to space characters. If *unicodestr* has zero size, the function returns the number of bytes required to hold the translation and nothing is written to *unicodestr*.

If an error occurs, one of the following negative values is returned:

- NLS$ErrorInsufficentBuffer: The *unicodestr* argument is too small, but not zero size so that the needed number of bytes would be returned.
- NLS$ErrorInvalidFlags: The *flags* argument has an illegal value.
- NLS$ErrorInvalidCharacter: A character with no Unicode translation was encountered in *mbstr*. This error can occur only if the NLS$InvalidCharsError flag was used in *flags*.

NOTE. *By default, or if flags is set to NLS$Precomposed, the function* MBConvertMBToUnicode *attempts to translate the multibyte codepage string to a precomposed Unicode string. If a precomposed form does not exist, the function attempts to translate the codepage string to a composite form.*

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBConvertUnicodeToMB"

MBConvertUnicodeToMB

NLS Function: Converts a Unicode string to a multibyte-character string from the current codepage. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBConvertUnicodeToMB (*unicodestr*, *mbstr* [, *flags*])

unicodestr

(Input) INTEGER(2). Array of integers holding the Unicode string to be translated.

mbstr

(Output) Character*(*). Translation of Unicode string into multibyte character string from the current codepage.

flags

(Optional; input) INTEGER(4). If specified, argument to modify the string conversion. If *flags* is omitted, no extra checking of the conversion takes place. Available values (defined in `IFNLS.F90`) are:

- NLS$CompositeCheck: Convert composite characters to precomposed.
- NLS$SepChars: Generate separate characters.
- NLS$DiscardDns: Discard nonspacing characters.
- NLS$DefaultChars: Replace exceptions with default character.

The last three flags (NLS$SepChars, NLS$DiscardDns, and NLS$DefaultChars) are mutually exclusive and can be used only if NLS$CompositeCheck is set, in which case one (and only one) of them is combined with NLS$CompositeCheck using an inclusive OR (IOR or OR). These flags determine what translation to make when there is no precomposed mapping for a base character/nonspace character combination in the Unicode wide character string. The default (IOR(NLS$CompositeCheck, NLS$SepChars)) is to generate separate characters.

Results:

The result type is INTEGER(4). If no error occurs, returns the number of bytes written to *mbstr* (bytes are counted, not characters), or the number of bytes required to hold the output string if *mbstr* has zero length. If *mbstr* is longer than the translation, it is blank-padded. If *mbstr* is zero length, the function returns the number of bytes required to hold the translation and nothing is written to *mbstr*.

If an error occurs, one of the following negative values is returned:

- NLS$ErrorInsufficentBuffer: The *mbstr* argument is too small, but not zero length so that the needed number of bytes is returned.
- NLS$ErrorInvalidFlags: The *flags* argument has an illegal value.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "MBConvertMBToUnicode"

MBCurMax

NLS Function: Returns the longest possible multibyte character length, in bytes, for the current codepage. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBCurMax ( )

Results:

The result type is INTEGER(4). The result is the longest possible multibyte character, in bytes, for the current codepage.

The MBLenMax parameter, defined in the module `IFNLS.F90`, is the longest length, in bytes, of any character in any codepage installed on the system.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBCharLen"

MBINCHARQQ

NLS Function: Performs the same function as INCHARQQ except that it can read a single multibyte character at once, and it returns the number of bytes read as well as the character. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBINCHARQQ (*string*)

string

(Output) CHARACTER(MBLenMax). String containing the read characters, padded with blanks up to the length MBLenMax. The MBLenMax parameter, defined in the module `IFNLS.F90`, is the longest length, in bytes, of any character in any codepage installed on the system.

Results:

The result type is INTEGER(4). The result is the number of characters read.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "INCHARQQ", "MBCurMax", "MBCharLen", "MBLead"

MBINDEX

NLS Function: Performs the same function as the INDEX intrinsic function except that the strings manipulated can contain multibyte characters. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBINDEX (*string*, *substring* [, *back*])

string

(Input) CHARACTER*(*). String to be searched for the presence of *substring*. Can contain multibyte characters.

substring

(Input) CHARACTER*(*). Substring whose position within *string* is to be determined. Can contain multibyte characters.

back

(Optional; input) LOGICAL(4). If specified, determines direction of the search. If *back* is .FALSE. or is omitted, the search starts at the beginning of *string* and moves toward the end. If *back* is .TRUE., the search starts end of *string* and moves toward the beginning.

Results:

The result type is INTEGER(4). If *back* is omitted or is .FALSE., returns the leftmost position in *string* that contains the start of *substring*. If *back* is .TRUE., returns the rightmost position in *string* which contains the start of *substring*. If *string* does not contain *substring*, returns 0. If *substring* occurs more than once, returns the starting position of the first occurrence ("first" is determined by the presence and value of *back*).

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBSCAN", "MBVERIFY", the INDEX intrinsic function in the *Language Reference*

MBJISToJMS, MBJMSToJIS

NLS Functions: Converts Japan Industry Standard (JIS) characters to Microsoft Kanji (JMS) characters, or converts JMS characters to JIS characters. These functions are only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBJISToJMS (*char*)
result = MBJMSToJIS (*char*)

char

(Input) CHARACTER(2). JIS or JMS character to be converted.

A JIS character is converted only if the lead and trail bytes are in the hexadecimal range 21 through 7E.

A JMS character is converted only if the lead byte is in the hexadecimal range 81 through 9F or E0 through FC, and the trail byte is in the hexadecimal range 40 through 7E or 80 through FC.

Results:

The result type is character with length 2. MBJISToJMS returns a Microsoft Kanji (Shift JIS or JMS) character. MBJMSToJIS returns a Japan Industry Standard (JIS) character.

Only computers with Japanese installed as one of the available languages can use the MBJISToJMS and MBJMSToJIS conversion functions.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "NLSEnumLocales", "NLSEnumCodepages", "NLSGetLocale", "NLSSetLocale"

MBLead

NLS Function: Determines whether a given character is the lead (first) byte of a multibyte character sequence. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBLead (*char*)

char

(Input) CHARACTER(1). Character to be tested for lead status.

Results:

The result type is LOGICAL(4). The result is .TRUE. if *char* is the first character of a multibyte character sequence; otherwise, .FALSE..

MBLead only works stepping forward through a whole multibyte character string. For example:

```
       DO i = 1, LEN(str)  ! LEN returns the number of bytes, not the
                           !  number of characters in str
         WRITE(*, 100) MBLead (str(i:i))
       END DO
 100   FORMAT (L2, \)
```

MBLead is passed only one character at a time and must start on a lead byte and step through a string to establish context for the character. MBLead does not correctly identify a nonlead byte if it is passed only the second byte of a multibyte character because the status of lead byte or trail byte depends on context.

The function MBStrLead is passed a whole string and can identify any byte within the string as a lead or trail byte because it performs a context-sensitive test, scanning all the way back to the beginning of a string if necessary to establish context. So, MBStrLead can be much slower than MBLead (up to *n* times slower, where *n* is the length of the string).

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBStrLead", "MBCharLen"

MBLen

NLS Function: Returns the number of characters in a multibyte-character string, including trailing blanks. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBLen (*string*)

string

(Input) CHARACTER*(*). String whose characters are to be counted. Can contain multibyte characters.

Results:

The result type is INTEGER(4). The result is the number of characters in *string*.

MBLen recognizes multibyte-character sequences according to the multibyte codepage currently in use. It does not test for multibyte-character validity.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBLen_Trim", "MBStrLead"

MBLen_Trim

NLS Function: Returns the number of characters in a multibyte-character string, not including trailing blanks. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBLen_Trim (*string*)

string

(Input) Character*(*). String whose characters are to be counted. Can contain multibyte characters.

Results:

The result type is INTEGER(4). The result is the number of characters in *string* minus any trailing blanks (blanks are bytes containing character 32 (hex 20) in the ASCII collating sequence).

MBLen_Trim recognizes multibyte-character sequences according to the multibyte codepage currently in use. It does not test for multibyte-character validity.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBLen", "MBStrLead"

MBLGE, MBLGT, MBLLE, MBLLT, MBLEQ, MBLNE

NLS Functions: Perform the same functions as the LGE, LGT, LLE, and LLT intrinsic functions and the logical operators .EQ. and .NE. except that the strings being compared can include multibyte characters, and optional flags can modify the comparison. These functions are only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBLGE (*string_a*, *string_b*, [*flags*])
result = MBLGT (*string_a*, *string_b*, [*flags*])
result = MBLLE (*string_a*, *string_b*, [*flags*])
result = MBLLT (*string_a*, *string_b*, [*flags*])
result = MBLEQ (*string_a*, *string_b*, [*flags*])
result = MBLNE (*string_a*, *string_b*, [*flags*])

string_a, *string_b*

(Input) Character*(*). Strings to be compared. Can contain multibyte characters.

flags

(Optional; input) INTEGER(4). If specified, determines which character traits to use or ignore when comparing strings. You can combine several flags using an inclusive OR (IOR or OR). There are no illegal combinations of flags, and the functions may be used without flags, in which case all flag options are turned off. The available values (defined in `IFNLS.F90`) are:

- NLS$MB_IgnoreCase - Ignore case.
- NLS$MB_IgnoreNonspace - Ignore nonspacing characters (this flag removes Japanese accent characters if they exist).
- NLS$MB_IgnoreSymbols - Ignore symbols.

- NLS$MB_IgnoreKanaType - Do not differentiate between Japanese Hiragana and Katakana characters (corresponding Hiragana and Katakana characters will compare as equal).
- NLS$MB_IgnoreWidth - Do not differentiate between a single-byte character and the same character as a double byte.
- NLS$MB_StringSort - Sort all symbols at the beginning, including the apostrophe and hyphen (see the Note below).

Results:

The result type is LOGICAL(4). Comparisons are made using the current locale, not the current codepage. The codepage used is the default for the language/country combination of the current locale.

The results of these functions are as follows:

- MBLGE returns .TRUE. if the strings are equal or *string_a* comes last in the collating sequence; otherwise, .FALSE..
- MBLGT returns .TRUE. if *string_a* comes last in the collating sequence; otherwise, .FALSE..
- MBLLE returns .TRUE. if the strings are equal or *string_a* comes first in the collating sequence; otherwise, .FALSE..
- MBLLT returns .TRUE. if *string_a* comes first in the collating sequence; otherwise, .FALSE..
- MBLEQ returns .TRUE. if the strings are equal in the collating sequence; otherwise, .FALSE..
- MBLNE returns .TRUE. if the strings are not equal in the collating sequence; otherwise, .FALSE..

If the two strings are of different lengths, they are compared up to the length of the shortest one. If they are equal to that point, then the return value indicates that the longer string is greater.

If *flags* is invalid, the functions return .FALSE..

If the strings supplied contain Arabic Kashidas, the Kashidas are ignored during the comparison. Therefore, if the two strings are identical except for Kashidas within the strings, the functions return a value indicating they are "equal" in the collation sense, though not necessarily identical.

NOTE. *When not using the* NLS$MB_StringSort *flag, the hyphen and apostrophe are special symbols and are treated differently than others. This is to ensure that words like coop and co-op stay together within a list.*

All symbols, except the hyphen and apostrophe, sort before any other alphanumeric character. If you specify the NLS$MB_StringSort *flag, hyphen and apostrophe sort at the beginning also.*

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: the LGE, LGT, LLE, and LLT intrinsic functions in the *Language Reference*

MBNext

NLS Function: Returns the position of the first lead byte or single-byte character immediately following the given position in a multibyte-character string. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBNext (*string*, *position*)

string

(Input) Character*(*). String to be searched for the first lead byte or single-byte character after the current position. Can contain multibyte characters.

position

(Input) INTEGER(4). Position in *string* to search from. Must be the position of a lead byte or a single-byte character. Cannot be the position of a trail (second) byte of a multibyte character.

Results:

The result type is INTEGER(4). The result is the position of the first lead byte or single-byte character in *string* immediately following the position given in *position*, or 0 if no following first byte is found in *string*.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBPrev"

MBPrev

NLS Function: Returns the position of the first lead byte or single-byte character immediately preceding the given string position in a multibyte-character string. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBPrev (*string*, *position*)

string

(Input) Character*(*). String to be searched for the first lead byte or single-byte character before the current position. Can contain multibyte characters.

position

(Input) INTEGER(4). Position in *string* to search from. Must be the position of a lead byte or single-byte character. Cannot be the position of the trail (second) byte of a multibyte character.

Results:

The result type is INTEGER(4). The result is the position of the first lead byte or single-byte character in *string* immediately preceding the position given in *position*, or 0 if no preceding first byte is found in *string*.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBNext"

MBSCAN

NLS Function: Performs the same function as the SCAN intrinsic function except that the strings manipulated can contain multibyte characters. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBSCAN (*string*, *set* [, *back*])

string

(Input) Character*(*). String to be searched for the presence of any character in *set*.

set

(Input) Character*(*). Characters to search for.

back

(Optional; input) LOGICAL(4). If specified, determines direction of the search. If *back* is .FALSE. or is omitted, the search starts at the beginning of *string* and moves toward the end. If *back* is .TRUE., the search starts end of *string* and moves toward the beginning.

Results:

The result type is INTEGER(4). If *back* is .FALSE. or is omitted, it returns the position of the leftmost character in *string* that is in *set*. If *back* is .TRUE., it returns the rightmost character in *string* that is in *set*. If no characters in *string* are in *set*, it returns 0.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBINDEX", "MBVERIFY", the SCAN intrinsic function in the *Language Reference*

MBStrLead

NLS Function: Performs a context-sensitive test to determine whether a given character byte in a string is a multibyte-character lead byte. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBStrLead (*string*, *position*)

string

(Input) Character*(*). String containing the character byte to be tested for lead status.

position

(Input) INTEGER(4). Position in *string* of the character byte in the string to be tested.

Results:

The result type is LOGICAL(4). The result is .TRUE. if the character byte in *position* of *string* is a lead byte; otherwise, .FALSE..

MBStrLead is passed a whole string and can identify any byte within the string as a lead or trail byte because it performs a context-sensitive test, scanning all the way back to the beginning of a string if necessary to establish context.

MBLead is passed only one character at a time and must start on a lead byte and step through a string one character at a time to establish context for the character. So, MBStrLead can be much slower than MBLead (up to *n* times slower, where *n* is the length of the string).

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBLead"

MBVERIFY

NLS Function: Performs the same function as the VERIFY intrinsic function except that the strings manipulated can contain multibyte characters. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = MBVERIFY (*string*, *set* [, *back*])

string

(Input) Character*(*). String to be searched for presence of any character not in *set*.

set

(Input) Character*(*). Set of characters tested to verify that it includes all the characters in *string*.

back

(Optional; input) LOGICAL(4). If specified, determines direction of the search. If *back* is .FALSE. or is omitted, the search starts at the beginning of *string* and moves toward the end. If *back* is .TRUE., the search starts end of *string* and moves toward the beginning.

Results:

The result type is INTEGER(4). If *back* is .FALSE. or is omitted, it returns the position of the leftmost character in *string* that is not in *set*. If *back* is .TRUE., it returns the rightmost character in *string* that is not in *set*. If all the characters in *string* are in *set*, it returns 0.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "MBINDEX", "MBSCAN", the VERIFY intrinsic function in the *Language Reference*

MESSAGEBOXQQ

QuickWin Function: Displays a message box in a QuickWin window. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = MESSAGEBOXQQ (*msg*, *caption*, *mtype*)

msg

(Input) Character*(*). Null-terminated C string. Message the box displays.

caption

(Input) Character*(*). Null-terminated C string. Caption that appears in the title bar.

mtype

(Input) INTEGER(4). Symbolic constant that determines the objects (buttons and icons) and properties of the message box. You can combine several constants (defined in `IFQWIN.F90`) using an inclusive OR (IOR or OR). The symbolic constants and their associated objects or properties are as follows:

- MB$ABORTRETRYIGNORE – The Abort, Retry, and Ignore buttons.
- MB$DEFBUTTON1 – The first button is the default.
- MB$DEFBUTTON2 – The second button is the default.
- MB$DEFBUTTON3 – The third button is the default.
- MB$ICONASTERISK, MB$ICONINFORMATION – Lowercase *i* in blue circle icon.
- MB$ICONEXCLAMATION – The exclamation-mark icon.
- MB$ICONHAND, MB$ICONSTOP – The stop-sign icon.
- MB$ICONQUESTION – The question-mark icon.
- MB$OK – The OK button.
- MB$OKCANCEL – The OK and Cancel buttons.
- MB$RETRYCANCEL – The Retry and Cancel buttons.
- MB$SYSTEMMODAL – Box is system-modal: all applications are suspended until the user responds.
- MB$YESNO – The Yes and No buttons.
- MB$YESNOCANCEL – The Yes, No, and Cancel buttons.

Results:

The result type is INTEGER(4). The result is zero if memory is not sufficient for displaying the message box. Otherwise, the result is one of the following values, indicating the user's response to the message box:

- MB$IDABORT – The Abort button was pressed.
- MB$IDCANCEL – The Cancel button was pressed.
- MB$IDIGNORE – The Ignore button was pressed.
- MB$IDNO – The No button was pressed.
- MB$IDOK – The OK button was pressed.
- MB$IDRETRY – The Retry button was pressed.
- MB$IDYES – The Yes button was pressed.

Compatibility

`QUICKWIN GRAPHICS  LIB`

See Also: "ABOUTBOXQQ", "SETMESSAGEQQ", "Using QuickWin" in your user's guide

Example

```
! Build as QuickWin app
USE IFQWIN
message = MESSAGEBOXQQ('Do you want to continue?'C,    &
          'Matrix'C,   &
```

```
            MB$ICONQUESTION.OR.MB$YESNO.OR.MB$DEFBUTTON1)
END
```

MODIFYMENUFLAGSQQ

QuickWin Function: Modifies a menu item's state. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = MODIFYMENUFLAGSQQ (*menuID*, *itemID*, *flag*)

menuID

(Input) INTEGER(4). Identifies the menu containing the item whose state is to be modified, starting with 1 as the leftmost menu.

itemID

(Input) INTEGER(4). Identifies the menu item whose state is to be modified, starting with 0 as the top item.

flag

(Input) INTEGER(4). Constant indicating the menu state. Flags can be combined with an inclusive OR (see the Results section below). The following constants are available:

- $MENUGRAYED – Disables and grays out the menu item.
- $MENUDISABLED – Disables but does not gray out the menu item.
- $MENUENABLED – Enables the menu item.
- $MENUSEPARATOR – Draws a separator bar.
- $MENUCHECKED – Puts a check by the menu item.
- $MENUUNCHECKED – Removes the check by the menu item.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

The constants available for flags can be combined with an inclusive OR where reasonable, for example $MENUCHECKED .OR. $MENUENABLED. Some combinations do not make sense, such as $MENUENABLED and $MENUDISABLED, and lead to undefined behavior.

Compatibility

QUICKWIN GRAPHICS LIB

See Also: "APPENDMENUQQ", "DELETEMENUQQ", "INSERTMENUQQ", "MODIFYMENUROUTINEQQ", "MODIFYMENUSTRINGQQ", "Using QuickWin" in your user's guide

Example

```
USE IFQWIN
LOGICAL(4)    result
CHARACTER(20) str

 ! Append item to the bottom of the first (FILE) menu
str = '&Add to File Menu'C
result = APPENDMENUQQ(1, $MENUENABLED, str, WINSTATUS)
! Gray out and disable the first two menu items in the
!  first (FILE) menu
result = MODIFYMENUFLAGSQQ (1, 1, $MENUGRAYED)
result = MODIFYMENUFLAGSQQ (1, 2, $MENUGRAYED)
END
```

MODIFYMENUROUTINEQQ

QuickWin Function: Changes a menu item's callback routine. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = MODIFYMENUROUTINEQQ (*menuIdD*, *itemID*, *routine*)

menuIdD

(Input) INTEGER(4). Identifies the menu that contains the item whose callback routine is be changed, starting with 1 as the leftmost menu.

itemID

(Input) INTEGER(4). Identifies the menu item whose callback routine is to be changed, starting with 0 as the top item.

routine

(Input) EXTERNAL. Callback subroutine called if the menu item is selected. All routines take a single LOGICAL parameter that indicates whether the menu item is checked or not. You can assign the following predefined routines to menus:

- WINPRINT – Prints the program.
- WINSAVE – Saves the program.
- WINEXIT – Terminates the program.
- WINSELECTTEXT – Selects text from the current window.
- WINSELECTGRAPHICS – Selects graphics from the current window.

- WINSELECTALL – Selects the entire contents of the current window.
- WININPUT – Brings to the top the child window requesting input and makes it the current window.
- WINCOPY – Copies the selected text and/or graphics from the current window to the Clipboard.
- WINPASTE – Allows the user to paste Clipboard contents (text only) to the current text window of the active window during a READ.
- WINCLEARPASTE – Clears the paste buffer.
- WINSIZETOFIT – Sizes output to fit window.
- WINFULLSCREEN – Displays output in full screen.
- WINSTATE – Toggles between pause and resume states of text output.
- WINCASCADE – Cascades active windows.
- WINTILE – Tiles active windows.
- WINARRANGE – Arranges icons.
- WINSTATUS – Enables a status bar.
- WININDEX – Displays the index for QuickWin help.
- WINUSING – Displays information on how to use Help.
- WINABOUT – Displays information about the current QuickWin application.
- NUL – No callback routine.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "APPENDMENUQQ", "DELETEMENUQQ", "INSERTMENUQQ", "MODIFYMENUFLAGSQQ", "MODIFYMENUSTRINGQQ", "Using QuickWin" in your user's guide

MODIFYMENUSTRINGQQ

QuickWin Function: Changes a menu item's text string. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = MODIFYMENUSTRINGQQ (*menuID*, *itemID*, *text*)

menuID

(Input) INTEGER(4). Identifies the menu containing the item whose text string is to be changed, starting with 1 as the leftmost item.

itemID

(Input) INTEGER(4). Identifies the menu item whose text string is to be changed, starting with 0 as the top menu item.

text

(Input) Character*(*). Menu item name. Must be a null-terminated C string. For example, words of text'C.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

You can add access keys in your text strings by placing an ampersand (&) before the letter you want underlined. For example, to add a Print menu item with the r underlined, use "P&rint"C as *text*.

Compatibility

QUICKWIN GRAPHICS LIB

See Also: “APPENDMENUQQ”, “DELETEMENUQQ”, “INSERTMENUQQ”, “SETMESSAGEQQ”, “MODIFYMENUFLAGSQQ”, “MODIFYMENUROUTINEQQ”, "Using QuickWin" in your user’s guide

Example

```
USE IFQWIN
LOGICAL(4) result
CHARACTER(25) str

! Append item to the bottom of the first (FILE) menu
str = '&Add to File Menu'C
result = APPENDMENUQQ(1, $MENUENABLED, str, WINSTATUS)
! Change the name of the first item in the first menu
str ='&Browse'C
result = MODIFYMENUSTRINGQQ (1, 1, str)
END
```

MOVETO, MOVETO_W

Graphics Subroutines: Move the current graphics position to a specified point. No drawing occurs. These subroutines are only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL MOVETO (*x*, *y*, *t*)
CALL MOVETO_W (*wx*, *wy*, *wt*)

x, *y*

(Input) INTEGER(2). Viewport coordinates of the new graphics position.

t

(Output) Derived type `xycoord`. Viewport coordinates of the previous graphics position. The derived type `xycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE xycoord
   INTEGER(2) xcoord  ! x coordinate
   INTEGER(2) ycoord  ! y coordinate
END TYPE xycoord
```

wx, *wy*

(Input) REAL(8). Window coordinates of the new graphics position.

wt

(Output) Derived type `wxycoord`. Window coordinates of the previous graphics position. The derived type `wxycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE wxycoord
   REAL(8) wx  ! x window coordinate
   REAL(8) wy  ! y window coordinate
END TYPE wxycoord
```

MOVETO sets the current graphics position to the viewport coordinate (*x*, *y*). MOVETO_W sets the current graphics position to the window coordinate (*wx*, *wy*).

MOVETO and MOVETO_W assign the coordinates of the previous position to *t* and *wt*, respectively.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETCURRENTPOSITION, GETCURRENTPOSITION_W", "LINETO, LINETO_W", "OUTGTEXT"

Example

```
! Build as QuickWin or Standard Graphics ap.
USE IFQWIN
INTEGER(2) status, x, y
```

```
INTEGER(4) result
TYPE (xycoord) xy
RESULT = SETCOLORRGB(Z'FF0000') ! blue
x = 60
! Draw a series of lines
DO y = 50, 92, 3
   CALL MOVETO(x, y, xy)
   status = LINETO(INT2(x + 20), y)
END DO
END
```

NLSEnumCodepages

NLS Function: Returns an array containing the codepages supported by the system, with each array element describing one valid codepage. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

ptr => NLSEnumCodepages ( )

Results:

The result is a pointer to an array of codepages, with each element describing one supported codepage.

NOTE. *After use, the pointer returned by* NLSEnumCodepages *should be deallocated with the* DEALLOCATE *statement.*

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "NLSEnumLocales", the DEALLOCATE statement in the *Language Reference*

NLSEnumLocales

NLS Function: Returns an array containing the language and country combinations supported by the system, in which each array element describes one valid combination. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

ptr => NLSEnumLocales ( )

Results:

The result is a pointer to an array of locales, in which each array element describes one supported language and country combination. Each element has the following structure:

```
TYPE NLS$EnumLocale
  CHARACTER*(NLS$MaxLanguageLen)  Language
  CHARACTER*(NLS$MaxCountryLen)   Country
  INTEGER(4)                      DefaultWindowsCodepage
  INTEGER(4)                      DefaultConsoleCodepage
END TYPE
```

If the application is a Windows or QuickWin application, NLS$DefaultWindowsCodepage is the codepage used by default for the given language and country combination. If the application is a console application, NLS$DefaultConsoleCodepage is the codepage used by default for the given language and country combination.

NOTE. *After use, the pointer returned by* NLSEnumLocales *should be deallocated with the* DEALLOCATE *statement.*

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "NLSEnumCodepages", the DEALLOCATE statement in the *Language Reference*

NLSFormatCurrency

NLS Function: Returns a correctly formatted currency string for the current locale. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = NLSFormatCurrency (*outstr*, *instr* [, *flags*])

outstr

(Output) Character*(*). String containing the correctly formatted currency for the current locale. If *outstr* is longer than the formatted currency, it is blank-padded.

instr

(Input) Character*(*). Number string to be formatted. Can contain only the characters '0' through '9', one decimal point (a period) if a floating-point value, and a minus sign in the first position if negative. All other characters are invalid and cause the function to return an error.

flags

(Optional; input) INTEGER(4). If specified, modifies the currency conversion. If you omit *flags*, the flag NLS$Normal is used. Available values (defined in `IFNLS.F90`) are:

- NLS$Normal – No special formatting
- NLS$NoUserOverride – Do not use user overrides

Results:

The result type is INTEGER(4). The result is the number of characters written to *outstr* (bytes are counted, not multibyte characters). If an error occurs, the result is one of the following negative values:

- NLS$ErrorInsufficentBuffer – *outstr* buffer is too small
- NLS$ErrorInvalidFlags – *flags* has an illegal value
- NLS$ErrorInvalidInput – *instr* has an illegal value

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "NLSFormatNumber", "NLSFormatDate", "NLSFormatTime"

Example

```
USE IFNLS
CHARACTER(40) str
INTEGER(4) i
i = NLSFormatCurrency(str, "1.23")
print *, str                              ! prints $1.23
i = NLSFormatCurrency(str, "1000000.99")
print *, str                              ! prints $1,000,000.99
i = NLSSetLocale("Spanish", "Spain")
i = NLSFormatCurrency(str, "1.23")
print *, str                              ! prints 1 Pts
i = NLSFormatCurrency(str, "1000000.99")
print *, str                              ! prints 1.000.001 Pts
```

NLSFormatDate

NLS Function: Returns a correctly formatted string containing the date for the current locale. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = NLSFormatDate (*outstr* [, *intime*] [, *flags*])

outstr

(Output) Character*(*). String containing the correctly formatted date for the current locale. If *outstr* is longer than the formatted date, it is blank-padded.

intime

(Optional; input) INTEGER(4). If specified, date to be formatted for the current locale. Must be an integer date such as the packed time created with PACKTIMEQQ. If you omit *intime*, the current system date is formatted and returned in *outstr*.

flags

(Optional; input) INTEGER(4). If specified, modifies the date conversion. If you omit *flags*, the flag NLS$Normal is used. Available values (defined in `IFNLS.F90`) are:

- NLS$Normal – No special formatting
- NLS$NoUserOverride – Do not use user overrides
- NLS$UseAltCalendar – Use the locale's alternate calendar
- NLS$LongDate – Use local long date format
- NLS$ShortDate – Use local short date format

Results:

The result type is INTEGER(4). The result is the number of characters written to *outstr* (bytes are counted, not multibyte characters). If an error occurs, the result is one of the following negative values:

- NLS$ErrorInsufficentBuffer – *outstr* buffer is too small
- NLS$ErrorInvalidFlags – *flags* has an illegal value
- NLS$ErrorInvalidInput – *intime* has an illegal value

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "NLSFormatTime", "NLSFormatCurrency", "NLSFormatNumber"

Example

```
USE IFNLS
```

```
INTEGER(4) i
CHARACTER(40) str
i = NLSFORMATDATE(str, NLS$NORMAL)           ! 8/1/99
i = NLSFORMATDATE(str, NLS$USEALTCALENDAR)   ! 8/1/99
i = NLSFORMATDATE(str, NLS$LONGDATE)         ! Monday, August 1, 1999
i = NLSFORMATDATE(str, NLS$SHORTDATE)        ! 8/1/99
END
```

NLSFormatNumber

NLS Function: Returns a correctly formatted number string for the current locale. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = NLSFormatNumber (*outstr*, *instr* [, *flags*])

outstr

(Output) Character*(*). String containing the correctly formatted number for the current locale. If *outstr* is longer than the formatted number, it is blank-padded.

instr

(Input) Character*(*). Number string to be formatted. Can only contain the characters '0' through '9', one decimal point (a period) if a floating-point value, and a minus sign in the first position if negative. All other characters are invalid and cause the function to return an error.

flags

(Optional; input) INTEGER(4). If specified, modifies the number conversion. If you omit *flags*, the flag NLS$Normal is used. Available values (defined in `IFNLS.F90`) are:

- NLS$Normal – No special formatting
- NLS$NoUserOverride – Do not use user overrides

Results:

The result type is INTEGER(4). The result is the number of characters written to *outstr* (bytes are counted, not multibyte characters). If an error occurs, the result is one of the following negative values:

- NLS$ErrorInsufficentBuffer – *outstr* buffer is too small
- NLS$ErrorInvalidFlags – *flags* has an illegal value
- NLS$ErrorInvalidInput – *instr* has an illegal value

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "NLSFormatTime", "NLSFormatCurrency", "NLSFormatDate"

Example

```
USE IFNLS
CHARACTER(40) str
INTEGER(4) i
i = NLSFormatNumber(str, "1.23")
print *, str                            ! prints 1.23
i = NLSFormatNumber(str, "1000000.99")
print *, str                            ! prints 1,000,000.99
i = NLSSetLocale("Spanish", "Spain")
i = NLSFormatNumber(str, "1.23")
print *, str                            ! prints 1,23
i = NLSFormatNumber(str, "1000000.99")
print *, str                            ! prints 1.000.000,99
```

NLSFormatTime

NLS Function: Returns a correctly formatted string containing the time for the current locale. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = NLSFormatTime (*outstr* [, *intime*] [, *flags*])

outstr

(Output) Character*(*). String containing the correctly formatted time for the current locale. If *outstr* is longer than the formatted time, it is blank-padded.

intime

(Optional; input) INTEGER(4). If specified, time to be formatted for the current locale. Must be an integer time such as the packed time created with PACKTIMEQQ. If you omit *intime*, the current system time is formatted and returned in *outstr*.

flags

(Optional; input) INTEGER(4). If specified, modifies the time conversion. If you omit *flags*, the flag NLS$Normal is used. Available values (defined in `IFNLS.F90`) are:

- NLS$Normal – No special formatting

- NLS$NoUserOverride – Do not use user overrides
- NLS$NoMinutesOrSeconds – Do not return minutes or seconds
- NLS$NoSeconds – Do not return seconds
- NLS$NoTimeMarker – Do not add a time marker string
- NLS$Force24HourFormat – Return string in 24 hour format

Results:

The result type is INTEGER(4). The result is the number of characters written to *outstr* (bytes are counted, not multibyte characters). If an error occurs, the result is one of the following negative values:

- NLS$ErrorInsufficentBuffer – *outstr* buffer is too small
- NLS$ErrorInvalidFlags – *flags* has an illegal value
- NLS$ErrorInvalidInput – *intime* has an illegal value

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "NLSFormatCurrency", "NLSFormatDate", "NLSFormatNumber"

Example

```
USE IFNLS
INTEGER(4) i
CHARACTER(20) str
i = NLSFORMATTIME(str, NLS$NORMAL)              ! 11:38:28 PM
i = NLSFORMATTIME(str, NLS$NOMINUTESORSECONDS)  ! 11 PM
i = NLSFORMATTIME(str, NLS$NOTIMEMARKER)        ! 11:38:28 PM
i = NLSFORMATTIME(str, IOR(NLS$FORCE24HOURFORMAT,               &
&                      NLS$NOSECONDS))          ! 23:38 PM
END
```

NLSGetEnvironmentCodepage

NLS Function: Returns the codepage number for the system (Window) codepage or the console codepage. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = NLSGetEnvironmentCodepage (*flags*)

flags

(Input) INTEGER(4). Tells the function which codepage number to return. Available values (defined in `IFNLS.F90`) are:

- NLS$ConsoleEnvironmentCodepage – Gets the codepage for the console
- NLS$WindowsEnvironmentCodepage – Gets the current Windows codepage

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, it returns one of the following error codes:

- NLS$ErrorInvalidFlags – *flags* has an illegal value
- NLS$ErrorNoConsole – There is no console associated with the given application; so, operations with the console codepage are not possible

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "NLSSetEnvironmentCodepage"

NLSGetLocale

NLS Subroutine: Returns the current language, country, or codepage. This subroutine is only available on Windows* systems.

Module: USE IFNLS

Syntax

CALL NLSGetLocale ([*language*] [, *country*] [, *codepage*])

language

(Optional; output) Character*(*). Current language.

country

(Optional; output) Character*(*). Current country.

codepage

(Optional; output) INTEGER(4). Current codepage.

NLSGetLocale returns a valid codepage in *codepage*. It does not return one of the NLS$... symbolic constants that can be used with NLSSetLocale.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "NLSSetLocale"

Example

```
USE IFNLS
CHARACTER(50) cntry, lang
INTEGER(4)    code
CALL NLSGetLocale (lang, cntry, code)    ! get all three
CALL NLSGetLocale (CODEPAGE = code)      ! get the codepage
CALL NLSGetLocale (COUNTRY=cntry, CODEPAGE=code) ! get country and codepage
```

NLSGetLocaleInfo

NLS Function: Returns information about the current locale. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = NLSGetLocaleInfo (*type*, *outstr*)

type

(Input) INTEGER(4). NLS parameter requested. A list of parameter names is given in the Table 2-1.

outstr

(Output) Character*(*). Parameter setting for the current locale. All parameter settings placed in *outstr* are character strings, even numbers. If a parameter setting is numeric, the ASCII representation of the number is used. If the requested parameter is a date or time string, an explanation of how to interpret the format in *outstr* is given in "NLS Date and Time Format (W*32, W*64)".

Results:

The result type is INTEGER(4). The result is the number of characters written to *outstr* if successful, or if *outstr* has 0 length, the number of characters required to hold the requested information. Otherwise, the result is one of the following error codes (defined in `IFNLS.F90`):

- NLS$ErrorInvalidLIType – The given is invalid
- NLS$ErrorInsufficientBuffer – The *outstr* buffer was too small, but was not 0 (so that the needed size would be returned)

The NLS$LI parameters are used for the argument and select the locale information returned by NLSGetLocaleInfo in *outstr*. You can perform an inclusive OR with NLS$NoUserOverride and any NLS$LI parameter. This causes NLSGetLocaleInfo to bypass any user overrides and always return the system default value.

Table 2-1 lists and briefly describes the NLS$LI parameters.

Table 2-1 NLS LocaleInfo Parameters (W*32, W*64)

Parameter	Description
NLS$LI_ILANGUAGE	An ID indicating the language.
NLS$LI_SLANGUAGE	The full localized name of the language.
NLS$LI_SENGLANGUAGE	The full English name of the language from the ISO Standard 639. This will always be restricted to characters that map into the ASCII 127 character subset.
NLS$LI_SABBREVLANGNAME	The abbreviated name of the language, created by taking the 2-letter language abbreviation as found in ISO Standard 639 and adding a third letter as appropriate to indicate the sublanguage.
NLS$LI_SNATIVELANGNAME	The native name of the language.
NLS$LI_ICOUNTRY	The country code, based on international phone codes, also referred to as IBM country codes.
NLS$LI_SCOUNTRY	The full localized name of the country.
NLS$LI_SENGCOUNTRY	The full English name of the country. This will always be restricted to characters that map into the ASCII 127 character subset.
NLS$LI_SABBREVCTRYNAME	The abbreviated name of the country as per ISO Standard 3166.
NLS$LI_SNATIVECTRYNAME	The native name of the country.
NLS$LI_IDEFAULTLANGUAGE	Language ID for the principal language spoken in this locale. This is provided so that partially specified locales can be completed with default values.
NLS$LI_IDEFAULTCOUNTRY	Country code for the principal country in this locale. This is provided so that partially specified locales can be completed with default values.
NLS$LI_IDEFAULTANSICODEPAGE	ANSI code page associated with this locale.
NLS$LI_IDEFAULTOEMCODEPAGE	OEM code page associated with the locale.
NLS$LI_SLIST	Character(s) used to separate list items, for example, comma in many locales.
NLS$LI_IMEASURE	This value is 0 if the metric system (S.I.) is used and 1 for the U.S. system of measurements.
NLS$LI_SDECIMAL	The character(s) used as decimal separator. This is restricted such that it cannot be set to digits 0 - 9.
NLS$LI_STHOUSAND	The character(s) used as separator between groups of digits left of the decimal. This is restricted such that it cannot be set to digits 0 - 9.

Table 2-1 NLS LocaleInfo Parameters (W*32, W*64)

Parameter	Description
NLS$LI_SGROUPING	Sizes for each group of digits to the left of the decimal. An explicit size is needed for each group; sizes are separated by semicolons. If the last value is 0 the preceding value is repeated. To group thousands, specify "3;0".
NLS$LI_IDIGITS	The number of decimal digits.
NLS$LI_ILZERO	Determines whether to use leading zeros in decimal fields: 0 - Use no leading zeros 1 - Use leading zeros
NLS$LI_INEGNUMBER	Determines how negative numbers are represented: 0 - Puts negative numbers in parentheses: (1.1) 1 - Puts a minus sign in front: –1.1 2 - Puts a minus sign followed by a space in front: – 1.1 3 - Puts a minus sign after: 1.1– 4 - Puts a space then a minus sign after: 1.1 –
NLS$LI_SNATIVEDIGITS	The ten characters that are the native equivalent to the ASCII 0-9.
NLS$LI_SCURRENCY	The string used as the local monetary symbol. Cannot be set to digits 0-9.
NLS$LI_SINTLSYMBOL	Three characters of the International monetary symbol specified in ISO 4217 "Codes for the Representation of Currencies and Funds", followed by the character separating this string from the amount.
NLS$LI_SMONDECIMALSEP	The character(s) used as monetary decimal separator. This is restricted such that it cannot be set to digits 0-9.
NLS$LI_SMONTHOUSANDSEP	The character(s) used as monetary separator between groups of digits left of the decimal. Cannot be set to digits 0-9.
NLS$LI_SMONGROUPING	Sizes for each group of monetary digits to the left of the decimal. If the last value is 0, the preceding value is repeated. To group thousands, specify "3;0".
NLS$LI_ICURRDIGITS	Number of decimal digits for the local monetary format.
NLS$LI_IINTLCURRDIGITS	Number of decimal digits for the international monetary format.
NLS$LI_SPOSITIVESIGN	String value for the positive sign. Cannot be set to digits 0-9.
NLS$LI_SNEGATIVESIGN	String value for the negative sign. Cannot be set to digits 0-9.
NLS$LI_ICURRENCY	Determines how positive currency is represented: 0 - Puts currency symbol in front with no separation: $1.1 1 - Puts currency symbol in back with no separation: 1.1$ 2 - Puts currency symbol in front with single space after: $ 1.1 3 - Puts currency symbol in back with single space before: 1.1

Table 2-1 NLS LocaleInfo Parameters (W*32, W*64)

Parameter	Description
NLS$LI_IPOSSIGNPOSN	Determines the formatting index for positive values: 0 - Parenthesis surround the amount and the monetary symbol 1 - The sign string precedes the amount and the monetary symbol 2 - The sign string follows the amount and the monetary symbol 3 - The sign string immediately precedes the monetary symbol 4 - The sign string immediately follows the monetary symbol
NLS$LI_INEGSIGNPOSN	Determines the formatting index for negative values. Same values as for NLS$LI_IPOSSIGNPOSN.
NLS$LI_INEGCURR	Determines how negative currency is represented: 0 ($1.1) 1 –$1.1 2 $–1.1 3 $1.1– 4 (1.1$) 5 –1.1$ 6 1.1–$ 7 1.1$– 8 –1.1 $ (space before $) 9 –$ 1.1 (space after $) 10 1.1 $– (space before $) 11 $ 1.1– (space after $) 12 $–1.1 (space after $) 13 1.1– $ (space before $) 14 ($ 1.1) (space after $) 15 (1.1 $) (space before $)
NLS$LI_IPOSSYMPRECEDES	1 if the monetary symbol precedes, 0 if it follows a positive amount.
NLS$LI_IPOSSEPBYSPACE	1 if the monetary symbol is separated by a space from a positive amount; otherwise, 0.
NLS$LI_INEGSYMPRECEDES	1 if the monetary symbol precedes, 0 if it follows a negative amount.
NLS$LI_INEGSEPBYSPACE	1 if the monetary symbol is separated by a space from a negative amount; otherwise, 0.
NLS$LI_STIMEFORMAT	Time formatting string. See "NLS Date and Time Format (W*32, W*64)" for explanations of the valid strings.
NLS$LI_STIME	Character(s) for the time separator. Cannot be set to digits 0-9.
NLS$LI_ITIME	Time format: 0 - Use 12-hour format 1 - Use 24-hour format

Table 2-1 NLS LocaleInfo Parameters (W*32, W*64)

Parameter	Description
NLS$LI_ITLZERO	Determines whether to use leading zeros in time fields: 0 - Use no leading zeros 1 - Use leading zeros for hours
NLS$LI_S1159	String for the AM designator.
NLS$LI_S2359	String for the PM designator.
NLS$LI_SSHORTDATE	Short Date formatting string for this locale. The d, M and y should have the day, month, and year substituted, respectively. See "NLS Date and Time Format (W*32, W*64)" for explanations of the valid strings.
NLS$LI_SDATE	Character(s) for the date separator. Cannot be set to digits 0-9.
NLS$LI_IDATE	Short Date format ordering: 0 - Month-Day-Year 1 - Day-Month-Year 2 - Year-Month-Day
NLS$LI_ICENTURY	Specifies whether to use full 4-digit century for the short date only: 0 - Two-digit year 1 - Full century
NLS$LI_IDAYLZERO	Specifies whether to use leading zeros in day fields for the short date only: 0 - Use no leading zeros 1 - Use leading zeros
NLS$LI_IMONLZERO	Specifies whether to use leading zeros in month fields for the short date only: 0 - Use no leading zeros 1 - Use leading zeros
NLS$LI_SLONGDATE	Long Date formatting string for this locale. The string returned may contain a string within single quotes (' '). Any characters within single quotes should be left as is. The d, M and y should have the day, month, and year substituted, respectively.
NLS$LI_ILDATE	Long Date format ordering: 0 - Month-Day-Year 1 - Day-Month-Year 2 - Year-Month-Day
NLS$LI_ICALENDARTYPE	Specifies which type of calendar is currently being used: 1 - Gregorian (as in United States) 2 - Gregorian (English strings always) 3 - Era: Year of the Emperor (Japan) 4 - Era: Year of the Republic of China 5 - Tangun Era (Korea)

Table 2-1 NLS LocaleInfo Parameters (W*32, W*64)

Parameter	Description
NLS$LI_IOPTIONALCALENDAR	Specifies which additional calendar types are valid and available for this locale. This can be a null separated list of all valid optional calendars: 0 - No additional types valid 1 - Gregorian (localized) 2 - Gregorian (English strings always) 3 - Era: Year of the Emperor (Japan) 4 - Era: Year of the Republic of China 5 - Tangun Era (Korea)
NLS$LI_IFIRSTDAYOFWEEK	Specifies which day is considered first in a week: 0 - SDAYNAME1 1 - SDAYNAME2 2 - SDAYNAME3 3 - SDAYNAME4 4 - SDAYNAME5 5 - SDAYNAME6 6 - SDAYNAME7
NLS$LI_IFIRSTWEEKOFYEAR	Specifies which week of the year is considered first: 0 - Week containing 1/1 1 - First full week following 1/1 2 - First week containing at least 4 days
NLS$LI_SDAYNAME1 - NLS$LI_SDAYNAME7	Native name for each day of the week. 1 = Monday, 2 = Tuesday, etc.
NLS$LI_SABBREVDAYNAME1 - NLS$LI_SABBREVDAYNAME7	Native abbreviated name for each day of the week. 1 = Mon, 2 = Tue, etc.
NLS$LI_SMONTHNAME1 - NLS$LI_SMONTHNAME13	Native name for each month. 1 = January, 2 = February, etc. 13 = the 13th month, if it exists in the locale.
NLS$LI_SABBREVMONTHNAME1 - NLS$LI_SABBREVMONTHNAME13	Native abbreviated name for each month. 1 = Jan, 2 = Feb, etc. 13 = the 13th month, if it exists in the locale.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

NLSSetEnvironmentCodepage

NLS Function: Sets the codepage for the current console. The specified codepage affects the current console program and any other programs launched from the same console. It does not affect other open consoles or any consoles opened later. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = NLSSetEnvironmentCodepage (*codepage*, *flags*)

codepage

(Input) INTEGER(4). Number of the codepage to set as the console codepage.

flags

(Input) INTEGER(4). Must be set to NLS$ConsoleEnvironmentCodepage.

Results:

The result type is INTEGER(4). The result is zero if successful. Otherwise, returns one of the following error codes (defined in `IFNLS.F90`):

- NLS$ErrorInvalidCodepage – *codepage* is invalid or not installed on the system
- NLS$ErrorInvalidFlags – *flags* is not valid
- NLS$ErrorNoConsole – There is no console associated with the given application; so operations, with the console codepage are not possible

The *flags* argument must be NLS$ConsoleEnvironmentCodepage; it *cannot* be NLS$WindowsEnvironmentCodepage. NLSSetEnvironmentCodepage does not affect the Windows* codepage.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "NLSGetEnvironmentCodepage"

NLSSetLocale

NLS Function: Sets the current language, country, or codepage. This function is only available on Windows* systems.

Module: USE IFNLS

Syntax

result = NLSSetLocale (*language* [, *country*] [, *codepage*])

language

(Input) Character*(*). One of the languages supported by the Win32* NLS APIs.

country

(Optional; input) Character*(*). If specified, characterizes the language further. If omitted, the default country for the language is set.

codepage

(Optional; input) INTEGER(4). If specified, codepage to use for all character-oriented NLS functions. Can be any valid supported codepage or one of the following predefined values (defined in `IFNLS.F90`):

- NLS$CurrentCodepage – The codepage is not changed. Only the language and country settings are altered by the function.
- NLS$ConsoleEnvironmentCodepage – The codepage is changed to the default environment codepage currently in effect for console programs.
- NLS$ConsoleLanguageCodepage – The codepage is changed to the default console codepage for the language and country combination specified.
- NLS$WindowsEnvironmentCodepage – The codepage is changed to the default environment codepage currently in effect for Windows programs.
- NLS$WindowsLanguageCodepage – The codepage is changed to the default Windows* codepage for the language and country combination specified.

If you omit *codepage*, it defaults to NLS$WindowsLanguageCodepage. At program startup, NLS$WindowsEnvironmentCodepage is used to set the codepage.

Results:

The result type is INTEGER(4). The result is zero if successful. Otherwise, one of the following error codes (defined in `IFNLS.F90`) may be returned:

- NLS$ErrorInvalidLanguage – *language* is invalid or not supported
- NLS$ErrorInvalidCountry – *country* is invalid or is not valid with the language specified
- NLS$ErrorInvalidCodepage – *codepage* is invalid or not installed on the system

NOTE. NLSSetLocale *works on installed locales only. Windows systems support many locales, but they must be installed through the system Control Panel/International menu.*

When doing mixed-language programming with Fortran and C, calling NLSSetLocale with a codepage other than the default environment Windows codepage causes the codepage in the C run-time library to change by calling C's setmbcp( ) routine with the new codepage. Conversely, changing the C run-time library codepage does not change the codepage in the Fortran NLS library.

Calling NLSSetLocale has no effect on the locale used by C programs. The locale set with C's setlocale( ) routine is independent of NLSSetLocale.

Calling NLSSetLocale with the default environment console codepage, NLS$ConsoleEnvironmentCodepage, causes an implicit call to the Win32 API SetFileApisToOEM( ). Calling NLSSetLocale with any other codepage causes a call to SetFileApisToANSI( ).

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "NLSGetLocale"

OUTGTEXT

Graphics Subroutine: In graphics mode, sends a string of text to the screen, including any trailing blanks. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL OUTGTEXT (*text*)

text

(Input) Character*(*). String to be displayed.

Text output begins at the current graphics position, using the current font set with SETFONT and the current color set with SETCOLORRGB or SETCOLOR. No formatting is provided. After it outputs the text, OUTGTEXT updates the current graphics position.

Before you call OUTGTEXT, you must call the INITIALIZEFONTS function.

Because OUTGTEXT is a graphics function, the color of text is affected by the SETCOLORRGB function, not by SETTEXTCOLORRGB.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETFONTINFO", "GETGTEXTEXTENT", "INITIALIZEFONTS", "MOVETO, MOVETO_W", "SETCOLORRGB", "SETFONT", "SETGTEXTROTATION"

Example

```
! build as a QuickWin App.
USE IFQWIN
INTEGER(2) result
INTEGER(4) i
TYPE (xycoord) xys

result = INITIALIZEFONTS()
result = SETFONT('t''Arial''h18w10pvib')
```

```
do i=1,6
    CALL MOVETO(INT2(0),INT2(30*(i-1)),xys)
    grstat=SETCOLOR(INT2(i))
    CALL OUTGTEXT('This should be ')
    SELECT CASE (i)
      CASE (1)
        CALL OUTGTEXT('Blue')
      CASE (2)
        CALL OUTGTEXT('Green')
      CASE (3)
        CALL OUTGTEXT('Cyan')
      CASE (4)
        CALL OUTGTEXT('Red')
      CASE (5)
        CALL OUTGTEXT('Magenta')
      CASE (6)
        CALL OUTGTEXT('Orange')
    END SELECT
end do
END
```

OUTTEXT

Graphics Subroutine: In text or graphics mode, sends a string of text to the screen, including any trailing blanks. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL OUTTEXT (*text*)

text

(Input) Character*(*). String to be displayed.

Text output begins at the current text position in the color set with SETTEXTCOLORRGB or SETTEXTCOLOR. No formatting is provided. After it outputs the text, OUTTEXT updates the current text position.

To output text using special fonts, you must use the OUTGTEXT subroutine.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "OUTGTEXT", "SETTEXTPOSITION", "SETTEXTCOLORRGB", the WRITE statement in the *Language Reference*

Example

```
USE IFQWIN
INTEGER(2) oldcolor
TYPE (rccoord) rc

CALL CLEARSCREEN($GCLEARSCREEN)
CALL SETTEXTPOSITION (INT2(1), INT2(5), rc)
oldcolor = SETTEXTCOLOR(INT2(4))
CALL OUTTEXT ('Hello, everyone')
END
```

PACKTIMEQQ

Portability Subroutine: Packs time and date values.

Module: USE IFPORT

Syntax

CALL PACKTIMEQQ (*timedate*, *iyr*, *imon*, *iday*, *ihr*, *imin*, *isec*)

timedate

(Output) INTEGER(4). Packed time and date information.

iyr

(Input) INTEGER(2). Year (*xxxx* AD).

imon

(Input) INTEGER(2). Month (1 – 12).

iday

(Input) INTEGER(2). Day (1 – 31)

ihr

(Input) INTEGER(2). Hour (0 – 23)

imin

(Input) INTEGER(2). Minute (0 – 59)

isec

(Input) INTEGER(2). Second (0 – 59)

The packed time is the number of seconds since 00:00:00 Greenwich mean time, January 1, 1970. Because packed time values can be numerically compared, you can use PACKTIMEQQ to work with relative date and time values. Use UNPACKTIMEQQ to unpack time information. SETFILETIMEQQ uses packed time.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS  DLL  LIB`

See Also: "UNPACKTIMEQQ", "SETFILETIMEQQ", "GETFILEINFOQQ", "TIMEF"

Example

```
USE IFPORT
INTEGER(2) year, month, day, hour, minute, second,   &
           hund
INTEGER(4) timedate

CALL GETDAT (year, month, day)
CALL GETTIM (hour, minute, second, hund)
CALL PACKTIMEQQ (timedate, year, month, day, hour,   &
                 minute, second)
END
```

PASSDIRKEYSQQ

QuickWin Function: Determines the behavior of direction and page keys in a QuickWin application. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = PASSDIRKEYSQQ (*val*)

val

(Input) INTEGER(4) or LOGICAL(4).

A value of .TRUE. causes direction and page keys to be input as normal characters (the PassDirKeys flag is turned on). A value of .FALSE. causes direction and page keys to be used for scrolling.

The following constants, defined in `IFQWIN.F90`, can be used as integer arguments:

- PASS_DIR_FALSE – Turns off any special handling of direction keys. They are not passed to the program by GETCHARQQ.
- PASS_DIR_TRUE – Turns on special handling of direction keys. That is, they are passed to the program by GETCHARQQ.

- PASS_DIR_INSDEL – INSERT and DELETE are also passed to the program by GETCHARQQ
- PASS_DIR_CNTRLC – Only needed for a QuickWin application, but harmless if used with a Standard Graphics application that already passes CTRL+C.

  This value allows CTRL+C to be passed to a QuickWin program by GETCHARQQ if the following is true: the program must have removed the File menu EXIT item by using DELETEMENUQQ.

  This value also passes direction keys and INSERT and DELETE.

Results:

The return value indicates the previous setting of the PassDirKeys flag.

The return data type is the same as the data type of *val*; that is, either INTEGER(4) or LOGICAL(4).

When the PassDirKeys flag is turned on, the mouse must be used for scrolling since the direction and page keys are treated as normal input characters.

The PASSDIRKEYSQQ function is meant to be used primarily with the GETCHARQQ and INCHARQQ functions. Do not use normal input statements (such as READ) with the PassDirKeys flag turned on, unless your program is prepared to interpret direction and page keys.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETCHARQQ", "INCHARQQ"

Examples

```
use IFQWIN
logical*4 res
character*1 ch, ch1
Print *,"Type X to exit, S to scroll, D to pass Direction keys"
123 continue
ch = getcharqq( )
! check for escapes
! 0x00 0x?? is a function key
! 0xE0 0x?? is a direction key
if (ichar(ch) .eq. 0) then
  ch1 = getcharqq()
  print *,"function key follows escape = ",ichar(ch), "  ",ichar(ch1),"  ",ch1
  goto 123
else if (ichar(ch) .eq. 224) then
  ch1 = getcharqq()
```

```
  print *,"direction key follows escape = ",ichar(ch),"  ",ichar(ch1),"  ",ch1
  goto 123
else
  print *,ichar(ch),"  ",ch
  if(ch .eq. 'S') then
    res = passdirkeysqq(.false.)
    print *, "Entering Scroll mode ",res
  endif
  if(ch .eq. 'D')  then
    res = passdirkeysqq(.true.)
    print *, "Entering Direction keys mode ",res
  endif
  if(ch .ne. 'X')  go to 123
endif
end
```

The following example uses an integer constant as an argument to PASSDIRKEYSQQ:

```
c=========================================================================
c
c dirkeys4.for
c
c=========================================================================
c
c       Compile/Load Input Line for Standard Graphics Full Screen Window
c
c       ifort /libs:qwins dirkeys4.for
c
c       Compile/Load Input Line for QuickWin Graphics
c
c       ifort /libs:qwin dirkeys4.for
c
c  Program to illustrate how to get almost every character
c  from the keyboard in QuickWin or Standard Graphics mode.
c  Comment out the deletemenu line for Standard Graphics mode.
c
c  If you are doing a standard graphics application,
c  control C will come in as a Z'03' without further
c  effort.
```

```
c
c  In a QuickWin application,  The File menu Exit item must
c  be deleted, and PassDirKeysQQ called with PASS_DIR_CNTRLC
c  to get control C.
c
c=========================================================================
      use IFQWIN
      integer(4) status
      character*1 key1,key2,ch1
      write(*,*) 'Initializing'
c-----don't do this for a Standard Grapics application
c     remove File menu Exit item.
      status = deletemenuqq(1,3) ! stop QuickWin from getting control C
c-----set up to pass all keys to window including control c.
      status  = passdirkeysqq(PASS_DIR_CNTRLC)
c==============================================================
c
c     read and print characters
c
c==============================================================
   10 key1 = getcharqq()
c-----first check for control+c
      if(ichar(key1) .eq. 3) then
        write(*,*) 'Control C Received'
        write(*,*) "Really want to quit?"
        write(*,*) "Type Y <cr> to exit, or any other char <cr> to continue."
        read(*,*) ch1
        if(ch1.eq."y" .or. ch1.eq."Y") goto 30
        goto 10
      endif

      if(ichar(key1).eq.0) then ! function key?
      key2 = getcharqq()
      write(*,15) ichar(key1),ichar(key2),key2
   15 format(1x,2i12,1x,a1,' function key')
      else
      if(ichar(key1).eq.224) then ! direction key?
      key2 = getcharqq()
```

```
   write(*,16) ichar(key1),ichar(key2),key2
16 format(1x,2i12,1x,a1,' direction key')
   else
   write(*,20) key1,ichar(key1)  ! normal key
20 format(1x,a1,i11)
   endif
   endif
   go to 10
30 stop
   end
```

PEEKCHARQQ

Run-time Function: Checks the keystroke buffer for a recent console keystroke and returns .TRUE. if there is a character in the buffer or .FALSE. if there is not.

Module: USE IFCORE

Syntax

result = PEEKCHARQQ ( )

Results:

The result type is LOGICAL(4). The result is .TRUE. if there is a character waiting in the keyboard buffer; otherwise, .FALSE..

To find out the value of the key in the buffer, call GETCHARQQ. If there is no character waiting in the buffer when you call GETCHARQQ, GETCHARQQ waits until there is a character in the buffer. If you call PEEKCHARQQ first, you prevent GETCHARQQ from halting your process while it waits for a keystroke. If there is a keystroke, GETCHARQQ returns it and resets PEEKCHARQQ to .FALSE..

Compatibility

CONSOLE DLL LIB

See Also: "GETCHARQQ", "GETSTRQQ", "FGETC", "GETC"

Example

```
USE IFCORE
LOGICAL(4) pressed / .FALSE. /

DO WHILE (.NOT. pressed)
   WRITE(*,*) ' Press any key'
   pressed = PEEKCHARQQ ( )
```

```
END DO
END
```

PERROR

Run-Time Subroutine: Sends a message to the standard error stream, preceded by a specified string, for the last detected error.

Module: USE IFCORE

Syntax

CALL PERROR (*string*)

string

(Input) Character*(*). Message to precede the standard error message.

The string sent is the same as that given by GERROR.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "GERROR", "IERRNO"

Example

```
USE IFCORE
character*24 errtext
errtext = 'In my opinion, '
. . .
! any error message generated by errtext is
! preceded by 'In my opinion, '
Call PERROR (errtext)
```

PIE, PIE_W

Graphics Functions: Draw a pie-shaped wedge in the current graphics color. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = PIE (*i*, *x1*, *y1*, *x2*, *y2*, *x3*, *y3*, *x4*, *y4*)

result = PIE_W (*i*, *wx1*, *wy1*, *wx2*, *wy2*, *wx3*, *wy3*, *wx4*, *wy4*)

i

(Input) INTEGER(2). Fill flag. One of the following symbolic constants (defined in `IFQWIN.F90`):

- $GFILLINTERIOR – Fills the figure using the current color and fill mask.
- $GBORDER – Does not fill the figure.

x1, *y1*

(Input) INTEGER(2). Viewport coordinates for upper-left corner of bounding rectangle.

x2, *y2*

(Input) INTEGER(2). Viewport coordinates for lower-right corner of bounding rectangle.

x3, *y3*

(Input) INTEGER(2). Viewport coordinates of start vector.

x4, *y4*

(Input) INTEGER(2). Viewport coordinates of end vector.

wx1, *wy1*

(Input) REAL(8). Window coordinates for upper-left corner of bounding rectangle.

wx2, *wy2*

(Input) REAL(8). Window coordinates for lower-right corner of bounding rectangle.

wx3, *wy3*

(Input) REAL(8). Window coordinates of start vector.

wx4, *wy4*

(Input) REAL(8). Window coordinates of end vector.

Results:

The result type is INTEGER(2). The result is nonzero if successful; otherwise, 0. If the pie is clipped or partially out of bounds, the pie is considered successfully drawn and the return is 1. If the pie is drawn completely out of bounds, the return is 0.

The border of the pie wedge is drawn in the current color set by SETCOLORRGB.

The PIE function uses the viewport-coordinate system. The center of the arc is the center of the bounding rectangle, which is specified by the viewport-coordinate points (*x1*, *y1*) and (*x2*, *y2*). The arc starts where it intersects an imaginary line extending from the center of the arc through (*x3*, *y3*). It is drawn counterclockwise about the center of the arc, ending where it intersects an imaginary line extending from the center of the arc through (*x4*, *y4*).

The PIE_W function uses the window-coordinate system. The center of the arc is the center of the bounding rectangle specified by the window-coordinate points (*wx1*, *wy1*) and (*wx2*, *wy2*). The arc starts where it intersects an imaginary line extending from the center of the arc through (*wx3*, *wy3*). It is drawn counterclockwise about the center of the arc, ending where it intersects an imaginary line extending from the center of the arc through (*wx4*, *wy4*).

The fill flag option $GFILLINTERIOR is equivalent to a subsequent call to FLOODFILLRGB using the center of the pie as the starting point and the current graphics color (set by SETCOLORRGB) as the fill color. If you want a fill color different from the boundary color, you cannot use the $GFILLINTERIOR option. Instead, after you have drawn the pie wedge, change the current color with SETCOLORRGB and then call FLOODFILLRGB. You must supply FLOODFILLRGB with an interior point in the figure you want to fill. You can get this point for the last drawn pie or arc by calling GETARCINFO.

If you fill the pie with FLOODFILLRGB, the pie must be bordered by a solid line style. Line style is solid by default and can be changed with SETLINESTYLE.

NOTE. *The* PIE *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the Pie routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$Pie. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

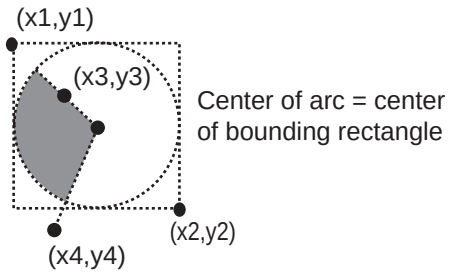
See Also: "SETCOLORRGB", "SETFILLMASK", "SETLINESTYLE", "FLOODFILLRGB, FLOODFILLRGB_W", "GETARCINFO", "ARC, ARC_W", "ELLIPSE, ELLIPSE_W", "GRSTATUS", "LINETO, LINETO_W", "POLYGON, POLYGON_W", "RECTANGLE, RECTANGLE_W"

Example

```
! build as Graphics App.
USE IFQWIN
INTEGER(2) status, dummy
INTEGER(2) x1, y1, x2, y2, x3, y3, x4, y4
x1 = 80; y1 = 50
x2 = 180; y2 = 150
x3 = 110; y3 = 80
x4 = 90; y4 = 180
status = SETCOLOR(INT2(4))
```

```
dummy = PIE ($GFILLINTERIOR, x1, y1, x2, y2, &
                             x3, y3, x4, y4)
END
```

The following figure shows the coordinates used to define PIE and PIE_W:



POLYBEZIER, POLYBEZIER_W

Graphics Functions: Draw one or more Bezier curves. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = POLYBEZIER (*ppoints*, *cpoints*)

result = POLYBEZIER_W (*wppoints*, *cpoints*)

ppoints

(Input) Derived type `xycoord`. Array of derived types defining the endpoints and the control points for each Bezier curve. The derived type `xycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE xycoord
   INTEGER(2) xcoord
   INTEGER(2) ycoord
END TYPE xycoord
```

cpoints

(Input) INTEGER(2). Number of points in *ppoints* or *wppoints*.

wppoints

(Input) Derived type `wxycoord`. Array of derived types defining the endpoints and the control points for each Bezier curve. The derived type `wxycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE wxycoord
   REAL(8) wx
   REAL(8) wy
 END TYPE wxycoord
```

Results:

The result type is INTEGER(2). The result is nonzero if anything is drawn; otherwise, 0.

A Bezier curve is based on fitting a cubic curve to four points. The first point is the starting point, the next two points are control points, and last point is the ending point. The starting point must be given for the first curve; subsequent curves use the ending point of the previous curve as their starting point. So, *cpoints* should contain 4 for one curve, 7 for 2 curves, 10 for 3 curves, and so forth.

POLYBEZIER does not use or change the current graphics position.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "POLYBEZIERTO, POLYBEZIERTO_W"

Example

```
Program Bezier
use IFQWIN

! Shows how to use POLYBEZIER, POLYBEZIER_W,
! POLYBEZIERTO, and POLYBEZIERTO_W,

TYPE(xycoord)  lppoints(31)
TYPE(wxycoord) wlppoints(31)
TYPE(xycoord)  xy
TYPE(wxycoord) wxy

integer(4) i
integer(2) istat, orgx, orgy
real(8) worgx, worgy

i = setcolorrgb(Z'00FFFFFF') ! graphic to black
i = settextcolorrgb(Z'00FFFFFF') ! text to black
i = setbkcolorrgb(Z'00000000') ! background to white
call clearscreen($GCLEARSCREEN)

orgx = 20
orgy = 20
```

```
lppoints(1).xcoord = 1+orgx
lppoints(1).ycoord = 1+orgy

lppoints(2).xcoord = 30+orgx
lppoints(2).ycoord = 120+orgy

lppoints(3).xcoord = 150+orgx
lppoints(3).ycoord = 60+orgy

lppoints(4).xcoord = 180+orgx
lppoints(4).ycoord = 180+orgy

istat = PolyBezier(lppoints, 4)

! Show tangent lines
! A bezier curve is tangent to the line
! from the begin point to the first control
! point.   It is also tangent to the line from
! the second control point to the end point.
do i = 1,4,2
call moveto(lppoints(i).xcoord,lppoints(i).ycoord,xy)
istat = lineto(lppoints(i+1).xcoord,lppoints(i+1).ycoord)
end do

read(*,*)

worgx = 50.0
worgy = 50.0

wlppoints(1).wx = 1.0+worgx
wlppoints(1).wy = 1.0+worgy

wlppoints(2).wx = 30.0+worgx
wlppoints(2).wy = 120.0+worgy

wlppoints(3).wx = 150.0+worgx
wlppoints(3).wy = 60.0+worgy

wlppoints(4).wx = 180.0+worgx
wlppoints(4).wy = 180.0+worgy

i = setcolorrgb(Z'000000FF') ! graphic to red
istat = PolyBezier_W(wlppoints, 4)
```

```
! Show tangent lines
! A bezier curve is tangent to the line
! from the begin point to the first control
! point.   It is also tangent to the line from
! the second control point to the end point.
do i = 1,4,2
call moveto_w(wlppoints(i).wx,wlppoints(i).wy,wxy)
istat = lineto_w(wlppoints(i+1).wx,wlppoints(i+1).wy)
end do

read(*,*)

orgx = 80
orgy = 80

! POLYBEZIERTO uses the current graphics position
! as its initial starting point so we start the
! array with the first first control point.

! lppoints(1).xcoord = 1+orgx ! need to move to this
! lppoints(1).ycoord = 1+orgy

lppoints(1).xcoord = 30+orgx
lppoints(1).ycoord = 120+orgy

lppoints(2).xcoord = 150+orgx
lppoints(2).ycoord = 60+orgy

lppoints(3).xcoord = 180+orgx
lppoints(3).ycoord = 180+orgy

i = setcolorrgb(Z'0000FF00') ! graphic to green
call moveto(1+orgx,1+orgy,xy)
istat = PolyBezierTo(lppoints, 3)

! Show tangent lines
! A bezier curve is tangent to the line
! from the begin point to the first control
! point.   It is also tangent to the line from
! the second control point to the end point.
call moveto(1+orgx,1+orgy,xy)
istat = lineto(lppoints(1).xcoord,lppoints(1).ycoord)
```

```
call moveto(lppoints(2).xcoord,lppoints(2).ycoord,xy)
istat = lineto(lppoints(3).xcoord,lppoints(3).ycoord)

read(*,*)

worgx = 110.0
worgy = 110.0

! wlppoints(1).wx = 1.0+worgx
! wlppoints(1).wy = 1.0+worgy

wlppoints(1).wx = 30.0+worgx
wlppoints(1).wy = 120.0+worgy

wlppoints(2).wx = 150.0+worgx
wlppoints(2).wy = 60.0+worgy

wlppoints(3).wx = 180.0+worgx
wlppoints(3).wy = 180.0+worgy

call moveto_w(1.0+worgx,1.0+worgy,wxy)
i = setcolorrgb(Z'00FF0000') ! graphic to blue
istat = PolyBezierTo_W(wlppoints, 3)

! Show tangent lines
! A bezier curve is tangent to the line
! from the begin point to the first control
! point.   It is also tangent to the line from
! the second control point to the end point.
call moveto_w(1.0+worgx,1.0+worgy,wxy)
istat = lineto_w(wlppoints(1).wx,wlppoints(1).wy)
call moveto_w(wlppoints(2).wx,wlppoints(2).wy,wxy)
istat = lineto_w(wlppoints(3).wx,wlppoints(3).wy)

read(*,*)

END PROGRAM Bezier
```

POLYBEZIERTO, POLYBEZIERTO_W

Graphics Functions: Draw one or more Bezier curves. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = POLYBEZIERTO (*ppoints*, *cpoints*)
result = POLYBEZIERTO_W (*wppoints*, *cpoints*)

ppoints

(Input) Derived type `xycoord`. Array of derived types defining the endpoints and the control points for each Bezier curve. The derived type `xycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE xycoord
   INTEGER(2) xcoord
   INTEGER(2) ycoord
END TYPE xycoord
```

cpoints

(Input) INTEGER(2). Number of points in *ppoints* or *wppoints*.

wppoints

(Input) Derived type `wxycoord`. Array of derived types defining the endpoints and the control points for each Bezier curve. The derived type `wxycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE wxycoord
   REAL(8) wx
   REAL(8) wy
END TYPE wxycoord
```

Results:

The result type is INTEGER(2). The result is nonzero if anything is drawn; otherwise, 0.

A Bezier curve is based on fitting a cubic curve to four points. The first point is the starting point, the next two points are control points, and last point is the ending point. The starting point is the current graphics position as set by MOVETO for the first curve; subsequent curves use the ending point of the previous curve as their starting point. So, *cpoints* should contain 3 for one curve, 6 for 2 curves, 9 for 3 curves, and so forth.

POLYBEZIERTO moves the current graphics position to the ending point of the last curve drawn.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "POLYBEZIER, POLYBEZIER_W", "MOVETO, MOVETO_W"

Example

See the example in "POLYBEZIER, POLYBEZIER_W".

POLYGON, POLYGON_W

Graphics Functions: Draw a polygon using the current graphics color, logical write mode, and line style. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = POLYGON (*control*, *ppoints*, *cpoints*)

result = POLYGON_W (*control*, *wppoints*, *cpoints*)

control

(Input) INTEGER(2). Fill flag. One of the following symbolic constants (defined in `IFQWIN.F90`):

- $GFILLINTERIOR – Draws a solid polygon using the current color and fill mask.
- $GBORDER – Draws the border of a polygon using the current color and line style.

ppoints

(Input) Derived type `xycoord`. Array of derived types defining the polygon vertices in viewport coordinates. The derived type `xycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE xycoord
   INTEGER(2) xcoord
   INTEGER(2) ycoord
END TYPE xycoord
```

cpoints

(Input) INTEGER(2). Number of polygon vertices.

wppoints

(Input) Derived type `wxycoord`. Array of derived types defining the polygon vertices in window coordinates. The derived type `wxycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE wxycoord
   REAL(8) wx
   REAL(8) wy
END TYPE wxycoord
```

Results:

The result type is INTEGER(2). The result is nonzero if anything is drawn; otherwise, 0.

The border of the polygon is drawn in the current graphics color, logical write mode, and line style, set with SETCOLORRGB, SETWRITEMODE, and SETLINESTYLE, respectively. The POLYGON routine uses the viewport-coordinate system (expressed in `xycoord` derived types), and the POLYGON_W routine uses real-valued window coordinates (expressed in `wxycoord` types).

The arguments *ppoints* and *wppoints* are arrays whose elements are `xycoord` or `wxycoord` derived types. Each element specifies one of the polygon's vertices. The argument *cpoints* is the number of elements (the number of vertices) in the *ppoints* or *wppoints* array.

Note that POLYGON draws between the vertices in their order in the array. Therefore, when drawing outlines, skeletal figures, or any other figure that is not filled, you need to be careful about the order of the vertices. If you don't want lines between some vertices, you may need to repeat vertices to make the drawing backtrack and go to another vertex to avoid drawing across your figure. Also, POLYGON draws a line from the last specified vertex back to the first vertex.

If you fill the polygon using FLOODFILLRGB, the polygon must be bordered by a solid line style. Line style is solid by default and can be changed with SETLINESTYLE.

NOTE. *The* POLYGON *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the Polygon routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$Polygon. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "SETCOLORRGB", "SETFILLMASK", "SETLINESTYLE", "FLOODFILLRGB, FLOODFILLRGB_W", "GRSTATUS", "LINETO, LINETO_W", "RECTANGLE, RECTANGLE_W", "SETWRITEMODE"

Example

```
! Build as a Graphics App.
!
! Draw a skeletal box
    USE IFQWIN
    INTEGER(2) status
    TYPE (xycoord) poly(12)
! Set up box vertices in order they will be drawn, &
! repeating some to avoid unwanted lines across box
```

```
poly(1)%xcoord = 50
poly(1)%ycoord = 80
poly(2)%xcoord = 85
poly(2)%ycoord = 35
poly(3)%xcoord = 185
poly(3)%ycoord = 35
poly(4)%xcoord = 150
poly(4)%ycoord = 80
poly(5)%xcoord = 50
poly(5)%ycoord = 80
poly(6)%xcoord = 50
poly(6)%ycoord = 180
poly(7)%xcoord = 150
poly(7)%ycoord = 180
poly(8)%xcoord = 185
poly(8)%ycoord = 135
poly(9)%xcoord = 185
poly(9)%ycoord = 35
poly(10)%xcoord = 150
poly(10)%ycoord = 80
poly(11)%xcoord = 150
poly(11)%ycoord = 180
poly(12)%xcoord = 150
poly(12)%ycoord = 80
status = SETCOLORRGB(Z'0000FF')
status = POLYGON($GBORDER, poly, INT2(12))
END
```

POLYLINEQQ

Graphics Function: Draws a line between each successive x, y point in a given array. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = POLYLINEQQ (*points*, *cnt*)

points

(Input) An array of DF_POINT objects. The derived type DF_POINT is defined in IFQWIN.F90 as:

```
type DF_POINT
  sequence
  integer(4) x
  integer(4) y
end type DF_POINT
```

cnt

(Input) INTEGER(4). Number of elements in the *points* array.

Results:

The result type is INTEGER(4). The result is a nonzero value if successful; otherwise, zero.

POLYLINEQQ uses the viewport-coordinate system.

The lines are drawn using the current graphics color, logical write mode, and line style. The graphics color is set with SETCOLORRGB, the write mode with SETWRITEMODE, and the line style with SETLINESTYLE.

The current graphics position is not used or changed as it is in the LINETO function.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS

See Also: "LINETO, LINETO_W", "LINETOAREX", "SETCOLORRGB", "SETLINESTYLE", "SETWRITEMODE"

Example

```
! Build for QuickWin or Standard Graphics
USE IFQWIN
TYPE(DF_POINT) points(12)
integer(4) result
integer(4) cnt, i
! load the points
do i = 1,12,2
   points(i).x =20*i
   points(i).y =10
    points(i+1).x =20*i
    points(i+1).y =60
end do
! A sawtooth pattern will appear in the upper left corner
```

```
result = POLYLINEQQ(points, 12)
end
```

PUTC

Portability Function: Writes a character to Fortran external unit 6.

Module: USE IFPORT

Syntax

result = PUTC (*char*)

char

(Input) Character. Character to be written to external unit 6.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, an error code.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "GETC", "FPUTC", WRITE and PRINT in the *Language Reference*

Example

```
use IFPORT
integer(4) i4
character*1 char1
do i = 1,26
  char1 = char(123-i)
  i4 = putc(char1)
  if (i4.ne.0) iflag = 1
enddo
```

PUTIMAGE, PUTIMAGE_W

Graphics Subroutines: Transfer the image stored in memory to the screen. These subroutines are only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL PUTIMAGE (*x*, *y*, *image*, *action*)
CALL PUTIMAGE_W (*wx*, *wy*, *image*, *action*)

x, y

(Input) INTEGER(2). Viewport coordinates for upper-left corner of the image when placed on the screen.

wx, wy

(Input) REAL(8). Window coordinates for upper-left corner of the image when placed on the screen.

image

(Input) INTEGER(1). Array of single-byte integers. Stored image buffer.

action

(Input) INTEGER(2). Interaction of the stored image with the existing screen image. One of the following symbolic constants (defined in `IFQWIN.F90`):

- $GAND – Forms a new screen display as the logical AND of the stored image and the existing screen display. Points that have the same color in both the existing screen image and the stored image remain the same color, while points that have different colors are joined by a logical AND.
- $GOR – Superimposes the stored image onto the existing screen display. The resulting image is the logical OR of the image.
- $GPRESET – Transfers the data point-by-point onto the screen. Each point has the inverse of the color attribute it had when it was taken from the screen by GETIMAGE, producing a negative image.
- $GPSET – Transfers the data point-by-point onto the screen. Each point has the exact color attribute it had when it was taken from the screen by GETIMAGE.
- $GXOR – Causes points in the existing screen image to be inverted wherever a point exists in the stored image. This behavior is like that of a cursor. If you perform an exclusive OR of an image with the background twice, the background is restored unchanged. This allows you to move an object around without erasing the background. The $GXOR constant is a special mode often used for animation.
- In addition, the following ternary raster operation constants can be used (described in the online documentation for the Win32* API BitBlt):
  - $GSRCCOPY (same as $GPSET)
  - $GSRCPAINT (same as $GOR)
  - $GSRCAND (same as $GAND)
  - $GSRCINVERT (same as $GXOR)
  - $GSRCERASE
  - $GNOTSRCCOPY (same as $GPRESET)
  - $GNOTSRCERASE

— $GMERGECOPY
— $GMERGEPAINT
— $GPATCOPY
— $GPATPAINT
— $GPATINVERT
— $GDSTINVERT
— $GBLACKNESS
— $GWHITENESS

PUTIMAGE places the upper-left corner of the image at the viewport coordinates (*x*, *y*).
PUTIMAGE_W places the upper-left corner of the image at the window coordinates (*wx*, *wy*).

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETIMAGE, GETIMAGE_W", "GRSTATUS", "IMAGESIZE, IMAGESIZE_W"

Example

```
! Build as a Graphics App.
USE IFQWIN
INTEGER(1), ALLOCATABLE :: buffer(:)
INTEGER(2) status, x
INTEGER(4) imsize

status = SETCOLOR(INT2(4))
! draw a circle
status = ELLIPSE($GFILLINTERIOR,INT2(40),INT2(55), &
                 INT2(70),INT2(85))
imsize = IMAGESIZE (INT2(39),INT2(54),INT2(71), &
                    INT2(86))
ALLOCATE (buffer(imsize))
CALL GETIMAGE(INT2(39),INT2(54),INT2(71),INT2(86),    &
              buffer)
! copy a row of circles beneath it
DO x = 5 , 395, 35
   CALL PUTIMAGE(x, INT2(90), buffer, $GPSET)
END DO
DEALLOCATE(buffer)
END
```

PXF<TYPE>GET

POSIX Subroutine: Gets the value stored in a component (or field) of a structure.

Module: USE IFPOSIX

Syntax

CALL PXF<TYPE>GET (*jhandle*, *compname*, *value*, *ierror*)

CALL PXF<TYPE>GET (*jhandle*, *compname*, *value*, *ilen*, *ierror*) `!when <TYPE> is STR`

<TYPE>

A placeholder for one of the following values:

Value	Data Type	Routine Name
INT	INTEGER(4)	PXFINTGET
REAL	REAL(4)	PXFREALGET
LGCL	LOGICAL(4)	PXFLGCLGET
STR	CHARACTER*(*)	PXFSTRGET
CHAR	CHARACTER(1)	PXFCHARGET
DBL	REAL(8)	PXFDBLGET
INT8	INTEGER(8)	PXFINT8GET

jhandle

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of a structure.

compname

(Input) Character. The name of the component (or field) of the structure to retrieve data from.

value

(Output) A variable, whose data type depends on the value of <TYPE>. See the table above for the data types for each value; for example, if the value for <TYPE> is INT, the data type is INTEGER(4). Stores the value of the component (or field).

ilen

(Output) INTEGER(4). This argument can only be used when <TYPE> is STR (PXFSTRGET). Stores the length of the returned string.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXF<TYPE>GET subroutines retrieve the value from component (or field) *compname* of the structure associated with handle *jhandle* into variable *value*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXF<TYPE>SET"

Example

See the example in "PXFTIMES" (which demonstrates PXFINTGET and PXFINT8GET)

PXF<TYPE>SET

POSIX Subroutine: Sets the value of a component (or field) of a structure.

Module: USE IFPOSIX

Syntax

CALL PXF<TYPE>SET (*jhandle*, *compname*, *value*, *ierror*)

CALL PXF<TYPE>SET (*jhandle*, *compname*, *value*, *ilen*, *ierror*) `!when <TYPE> is STR`

<TYPE>

A placeholder for one of the following values:

Value	Data Type	Routine Name
INT	INTEGER(4)	PXFINTSET
REAL	REAL(4)	PXFREALSET
LGCL	LOGICAL(4)	PXFLGCLSET
STR	CHARACTER*(*)	PXFSTRSET
CHAR	CHARACTER(1)	PXFCHARSET
DBL	REAL(8)	PXFDBLSET
INT8	INTEGER(8)	PXFINT8SET

jhandle

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of a structure.

compname

(Input) Character. The name of the component (or field) of the structure to write data to.

value

(Input) A variable, whose data type depends on the value of <TYPE>. See the table above for the data types for each value; for example, if the value for <TYPE> is INT, the data type is INTEGER(4). The value for the component (or field).

ilen

(Input) INTEGER(4). This argument can only be used when <TYPE> is STR (PXFSTRSET). The length of the string in *value*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXF<TYPE>SET subroutines set or modify the value in component (or field) *compname* of the structure associated with handle *jhandle* from variable *value*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXF<TYPE>GET"

Example

See the example in "PXFSTRUCTCREATE" (which demonstrates PXFSTRSET).

PXFA<TYPE>GET

POSIX Subroutine: Gets the array values stored in a component (or field) of a structure.

Module: USE IFPOSIX

Syntax

CALL PXFA<TYPE>GET (*jhandle*, *compname*, *value*, *ialen*, *ierror*)

CALL PXFA<TYPE>GET (*jhandle*, *compname*, *value*, *ialen*, *ilen*, *ierror*) ! when <TYPE> is STR

<TYPE>

A placeholder for one of the following values:

Value	Data Type	Routine Name
INT	INTEGER(4)	PXAFINTGET
REAL	REAL(4)	PXFAREALGET
LGCL	LOGICAL(4)	PXFALGCLGET
STR	CHARACTER*(*)	PXFASTRGET
CHAR	CHARACTER(1)	PXFACHARGET

Value	Data Type	Routine Name
DBL	REAL(8)	PXFADBLGET
INT8	INTEGER(8)	PXFAINT8GET

jhandle

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of a structure.

compname

(Input) Character. The name of the component (or field) of the structure to retrieve data from.

value

(Output) An array, whose data type depends on the value of <TYPE>. See the table above for the data types for each value; for example, if the value for <TYPE> is INT, the data type of the array is INTEGER(4). Stores the value of the component (or field).

ialen

(Input) INTEGER(4). The size of array *value*.

ilen

(Output) INTEGER(4). This argument can only be used when <TYPE> is STR (PXFASTRGET). An array that stores the lengths of elements of array *value*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFA<TYPE>GET subroutines are similar to the PXF<TYPE>GET subroutines, but they should be used when the component (or field) of the structure is an array.

When the PXFA<TYPE>GET subroutines are used, the entire array is accessed (read from the component or field) as a unit.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFA<TYPE>SET", "PXF<TYPE>GET"

PXFA<TYPE>SET

POSIX Subroutine: Sets the value of an array component (or field) of a structure.

Module: USE IFPOSIX

Syntax

CALL PXFA<TYPE>SET (*jhandle*, *compname*, *value*, *ialen*, *ierror*)

CALL PXFA<TYPE>SET (*jhandle*, *compname*, *value*, *ialen*, *ilen*, *ierror*) ! when <TYPE> is STR

<TYPE>

A placeholder for one of the following values:

Value	Data Type	Routine Name
INT	INTEGER(4)	PXAFINTSET
REAL	REAL(4)	PXFAREALSET
LGCL	LOGICAL(4)	PXFALGCLSET
STR	CHARACTER*(*)	PXFASTRSET
CHAR	CHARACTER(1)	PXFACHARSET
DBL	REAL(8)	PXFADBLSET
INT8	INTEGER(8)	PXFAINT8SET

jhandle

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of a structure.

compname

(Input) Character. The name of the component (or field) of the structure to write data to.

value

(Input) An array, whose data type depends on the value of <TYPE>. See the table above for the data types for each value; for example, if the value for <TYPE> is INT, the data type of the array is INTEGER(4). The value for the component (or field).

ialen

(Input) INTEGER(4). The size of array *value*.

ilen

(Input) INTEGER(4). This argument can only be used when <TYPE> is STR (PXFASTRSET). An array that specifies the lengths of elements of array *value*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFA<TYPE>SET subroutines are similar to the PXF<TYPE>SET subroutines, but they should be used when the component (or field) of the structure is an array.

When the PXFA<TYPE>SET subroutines are used, the entire array is accessed (written to the component or field) as a unit.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFA<TYPE>GET", "PXF<TYPE>SET"

PXFACCESS

POSIX Subroutine: Determines the accessibility of a file.

Module: USE IFPOSIX

Syntax

CALL PXFACCESS (*path*, *ilen*, *iamode*, *ierror*)

path

(Input) Character. The name of the file.

ilen

(Input) INTEGER(4). The length of the *path* string.

iamode

(Input) INTEGER(4). One or more of the following:

0	Checks for existence of the file.
1[1]	Checks for execute permission.
2	Checks for write access.
4	Checks for read access.
6	Checks for read/write access.

1. L*X only

ierror

(Output) INTEGER(4). The error status.

If access is permitted, the result value is zero; otherwise, an error code. Possible error codes are:

- –1: A bad parameter was passed.
- ENOENT: The named directory does not exist.
- EACCES: Access requested was denied.

On Windows* systems, if the name given is a directory name, the function only checks for existence. All directories have read/write access on Windows systems.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFALARM

POSIX Subroutine: Schedules an alarm.

Module: USE IFPOSIX

Syntax

CALL PXFALARM (*iseconds*, *isecleft*, *ierror*)

iseconds

(Input) INTEGER(4). The number of seconds before the alarm signal should be delivered.

isecleft

(Output) INTEGER(4). The number of seconds remaining until any previously scheduled alarm signal is due to be delivered. It is set to zero if there was no previously scheduled alarm signal.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFALARM subroutine arranges for a SIGALRM signal to be delivered to the process in seconds *iseconds*.

On Linux* systems, SIGALRM is a reserved defined constant that is equal to 14. You can use any other routine to install the signal handler. You can get SIGALRM and other signal values by using PXFCONST or IPXFCONST.

On Windows* systems, the SIGALRM feature is not supported, but the POSIX library has an implementation you can use. You can provide a signal handler for SIGALRM by using PXFSIGACTION.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFCONST", "IPXFCONST", "PXFSIGACTION"

PXFCALLSUBHANDLE

POSIX Subroutine: Calls the associated subroutine.

Module: USE IFPOSIX

Syntax

CALL PXFCALLSUBHANDLE (*jhandle2*, *ival*, *ierror*)

jhandle2

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle to the subroutine.

ival

(Input) INTEGER(4). The argument to the subroutine.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFCALLSUBHANDLE subroutine, when given a subroutine handle, calls the associated subroutine.

PXFGETSUBHANDLE should be used to obtain a subroutine handle.

NOTE. *The subroutine cannot be a function, an intrinsic, or an entry point, and must be defined with exactly one integer argument.*

Compatibility

`CONSOLE` `STANDARD GRAPHICS` `QUICKWIN GRAPHICS` `WINDOWS` `DLL` `LIB`

See Also: "PXFGETSUBHANDLE"

PXFCFGETISPEED

POSIX Subroutine: Returns the input baud rate from a `termios` structure. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFCFGETISPEED (*jtermios*, *iospeed*, *ierror*)

jtermios

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `termios`.

iospeed

(Output) INTEGER(4). The returned value of the input baud rate from the structure associated with handle *jtermios*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

NOTE. *To get a handle for an instance of the* `termios` *structure, use* PXFSTRUCTCREATE *with the string* 'termios' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFCFSETISPEED"

PXFCFGETOSPEED

POSIX Subroutine: Returns the output baud rate from a `termios` structure. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFCFGETOSPEED (*jtermios*, *iospeed*, *ierror*)

jtermios

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `termios`.

iospeed

(Output) INTEGER(4). The returned value of the output baud rate from the structure associated with handle *jtermios*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

NOTE. *To get a handle for an instance of the* `termios` *structure, use* PXFSTRUCTCREATE *with the string* 'termios' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFCFSETOSPEED"

PXFCFSETISPEED

POSIX Subroutine: Sets the input baud rate in a `termios` structure. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFCFSETISPEED (*jtermios*, *ispeed*, *ierror*)

jtermios

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `termios`.

ispeed

(Input) INTEGER(4). The value of the input baud rate for the structure associated with handle *jtermios*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

NOTE. *To get a handle for an instance of the* `termios` *structure, use* PXFSTRUCTCREATE *with the string* 'termios' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFCFGETISPEED"

PXFCFSETOSPEED

POSIX Subroutine: Sets the output baud rate in a `termios` structure. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFCFSETOSPEED (*jtermios*, *ispeed*, *ierror*)

jtermios

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `termios`.

ispeed

(Input) INTEGER(4). The value of the output baud rate for the structure associated with handle *jtermios*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

NOTE. *To get a handle for an instance of the* `termios` *structure, use* PXFSTRUCTCREATE *with the string* 'termios' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFCFGETOSPEED"

PXFCHDIR

POSIX Subroutine: Changes the current working directory.

Module: USE IFPOSIX

Syntax

CALL PXFCHDIR (*path*, *ilen*, *ierror*)

path

(Input) Character. The directory to be changed to.

ilen

(Input) INTEGER(4). The length of the *path* string.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

CONSOLE	STANDARD GRAPHICS	QUICKWIN GRAPHICS	WINDOWS	DLL	LIB

See Also: "PXFMKDIR"

PXFCHMOD

POSIX Subroutine: Changes the ownership mode of the file.

Module: USE IFPOSIX

Syntax

CALL PXFCHMOD (*path*, *ilen*, *imode*, *ierror*)

path

(Input) Character. The path to the file.

ilen

(Input) INTEGER(4). The length of the *path* string.

imode

(Input) INTEGER(4). The ownership mode of the file. On Windows* systems, see your Microsoft* Visual C++* Installation in the `/include` directory under `sys/stat.h` for the values of *imode*. On Linux* systems, use octal file-access mode.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

NOTE. *On Linux systems, you must have sufficient ownership permissions, such as being the owner of the file or having read/write access of the file.*

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFCHOWN

POSIX Subroutine: Changes the owner and group of a file. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFCHOWN (*path*, *ilen*, *iowner*, *igroup*, *ierror*)

path

(Input) Character. The file or directory name.

ilen

(Input) INTEGER(4). The length of the *path* string.

iowner

(Input) INTEGER(4). The owner UID.

igroup

(Input) INTEGER(4). The group GID.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

PXFCLEARENV

POSIX Subroutine: Clears the process environment.

Module: USE IFPOSIX

Syntax

CALL PXFCLEARENV (*ierror*)

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

After a call to PXFCLEARENV, no environment variables are defined.

Compatibility

`CONSOLE` `STANDARD GRAPHICS` `QUICKWIN GRAPHICS` `WINDOWS` `DLL` `LIB`

PXFCLOSE

POSIX Subroutine: Closes the file associated with the descriptor.

Module: USE IFPOSIX

Syntax

CALL PXFCLOSE (*fd*, *ierror*)

fd

(Input) INTEGER(4). A file descriptor.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFOPEN"

PXFCLOSEDIR

POSIX Subroutine: Closes the directory stream.

Module: USE IFPOSIX

Syntax

CALL PXFCLOSEDIR (*idirid*, *ierror*)

idirid

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The directory ID obtained from PXFOPENDIR.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFCLOSEDIR subroutine closes the directory associated with *idirid*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFOPENDIR"

PXFCNTL

POSIX Subroutine: Manipulates an open file descriptor. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFCNTL (*ifildes*, *icmd*, *iargin*, *iargout*, *ierror*)

ifildes

(Input) INTEGER(4). A file descriptor.

icmd

(Input) INTEGER(4). Defines an action for the file descriptor.

iargin

(Input; output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. Interpretation of this argument depends on the value of *icmd*.

iargout

(Output) INTEGER(4). Interpretation of this argument depends on the value of *icmd*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

PXFFCNTL is a multi-purpose subroutine that causes an action to be performed on a file descriptor. The action, defined in *icmd*, can be obtained by using the values of predefined macros in C header fcntl.h, or by using PXFCONST or IPXFCONST with one of the following constant names:

Constant	Action
F_DUPFD	Returns into *iargout* the lowest available unopened file descriptor greater than or equal to *iargin*. The new file descriptor refers to the same open file as *ifildes* and shares any locks. The system flag FD_CLOEXEC for the new file descriptor is cleared so the new descriptor will not be closed on a call to PXFEXEC subroutine.
F_GETFD	Returns into *iargout* the value of system flag FD_CLOEXEC associated with *ifildes*. In this case, *iargin* is ignored.
F_SETFD	Sets or clears the system flag FD_CLOEXEC for file descriptor *ifildes*. The PXFEXEC family of functions will close all file descriptors with the FD_CLOEXEC flag set. The value for FD_CLOEXEC is obtained from argument *iargin*.
F_GETFL	Returns the file status flags for file descriptor *ifildes*. Unlike F_GETFD, these flags are associated with the file and shared by all descriptors. A combination of the following flags, which are symbolic names for PXFCONST or IPXFCONST, can be returned: • O_APPEND – Specifies the file is opened in append mode. • O_NONBLOCK – Specifies when the file is opened, it does not block waiting for data to become available. • O_RDONLY – Specifies the file is opened for reading only. • O_RDWR – Specifies the file is opened for both reading and writing. • O_WRONLY – Specifies the file is opened for writing only.
F_SETFL	Sets the file status flags from *iargin* for file descriptor *ifildes*. Only O_APPEND or O_NONBLOCK flags can be modified. In this case, *iargout* is ignored.

Constant	Action
F_GETLK	Gets information about a lock. Argument *iargin* must be a handle of structure `flock`. This structure is taken as the description of a lock for the file. If there is a lock already in place that would prevent this lock from being locked, it is returned to the structure associated with handle *iargin*. If there are no locks in place that would prevent the lock from being locked, field l_type in the structure is set to the value of the constant with symbolic name F_UNLCK.
F_SETLK	Sets or clears a lock. Argument *iargin* must be a handle of structure `flock`. The lock is set or cleared according to the value of structure field l_type. If the lock is busy, an error is returned.
F_SETLKW	Sets or clears a lock, but causes the process to wait if the lock is busy. Argument *iargin* must be a handle of structure `flock`. The lock is set or cleared according to the value of structure field l_type. If the lock is busy, PXFCNTL waits for an unlock.

NOTE. *To get a handle for an instance of the* `flock` *structure, use* PXFSTRUCTCREATE *with the string* 'flock' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "IPXFCONST", "PXFCONST"

PXFCONST

POSIX Subroutine: Returns the value associated with a constant.

Module: USE IFPOSIX

Syntax

CALL PXFCONST (*constname*, *ival*, *ierror*)

constname

(Input) Character. The name of one of the following constants:

- STDIN_UNIT
- STDOUT_UNIT
- STDERR_UNIT
- EINVAL
- ENONAME
- ENOHANDLE
- EARRAYLEN

The constants beginning with E signify various error values for the system variable `errno`.

ival

(Output) INTEGER(4). The returned value of the constant.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

For more information on these constants, see your Microsoft Visual C++ documentation (Windows* systems) or the errno.h file (Linux* systems).

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFISCONST"

PXFCREAT

POSIX Subroutine: Creates a new file or rewrites an existing file.

Module: USE IFPOSIX

Syntax

CALL PXFCREAT (*path*, *ilen*, *imode*, *ifildes*, *ierror*)

path

(Input) Character. The pathname of the file.

ilen

(Input) INTEGER(4). The length of *path* string.

imode

(Input) INTEGER(4). The mode of the newly created file. On Windows* systems, see your Microsoft* Visual C++ documentation for permitted mode values. On Linux* systems, use octal file-access mode.

ifildes

(Output) INTEGER(4). The file descriptor.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFCTERMID

POSIX Subroutine: Generates a terminal pathname. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFCTERMID (*s*, *ilen*, *ierror*)

s

(Output) Character. The returned pathname of the terminal.

ilen

(Output) INTEGER(4). The length of the returned value in the *s* string.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

This subroutine returns a string that refers to the current controlling terminal for the current process.

PXFDUP, PXFDUP2

POSIX Subroutine: Duplicates an existing file descriptor.

Module: USE IFPOSIX

Syntax

CALL PXFDUP (*ifildes*, *ifid*, *ierror*)
CALL PXFDUP2 (*ifildes*, *ifildes*2, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor to duplicate.

ifid

(Output) INTEGER(4). The returned new duplicated file descriptor.

*ifildes*2

(Output) INTEGER(4). The number for the new file descriptor.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFDUP subroutine creates a second file descriptor for an opened file.

The PXFDUP2 subroutine copies the file descriptor associated with *ifildes*. Integer number *ifildes2* becomes associated with this new file descriptor, but the value of *ifildes2* is not changed.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFE<TYPE>GET

POSIX Subroutine: Gets the value stored in an array element component (or field) of a structure.

Module: USE IFPOSIX

Syntax

CALL PXFE<TYPE>GET (*jhandle*, *compname*, *index*, *value*, *ierror*)

CALL PXFE<TYPE>GET (*jhandle*, *compname*, *index*, *value*, *ilen*, *ierror*) ! when <TYPE> is STR

<TYPE>

A placeholder for one of the following values:

Value	Data Type	Routine Name
INT	INTEGER(4)	PXEFINTGET
REAL	REAL(4)	PXFEREALGET
LGCL	LOGICAL(4)	PXFELGCLGET
STR	CHARACTER*(*)	PXFESTRGET
CHAR	CHARACTER(1)	PXFECHARGET
DBL	REAL(8)	PXFEDBLGET
INT8	INTEGER(8)	PXFEINT8GET

jhandle

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of a structure.

compname

(Input) Character. The name of the component (or field) of the structure to retrieve data from.

index

(Input) INTEGER(4). The index of the array element to get data for.

value

(Output) A variable, whose data type depends on the value of <TYPE>. See the table above for the data types for each value; for example, if the value for <TYPE> is INT, the data type is INTEGER(4). Stores the value of the component (or field).

ilen

(Output) INTEGER(4). This argument can only be used when <TYPE> is STR (PXFESTRGET). Stores the length of the returned string.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFE<TYPE>GET subroutines are similar to the PXF<TYPE>GET subroutines, but they should be used when the component (or field) of the structure is an array.

When the PXFE<TYPE>GET subroutines are used, the array element with index *index* is accessed (read from the component or field).

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFE<TYPE>SET", "PXF<TYPE>GET"

PXFE<TYPE>SET

POSIX Subroutine: Sets the value of an array element component (or field) of a structure.

Module: USE IFPOSIX

Syntax

CALL PXFE<TYPE>SET (*jhandle*, *compname*, *index*, *value*, *ierror*)

CALL PXFE<TYPE>SET (*jhandle*, *compname*, *index*, *value*, *ilen*, *ierror*) ! when <TYPE> is STR

<TYPE>

A placeholder for one of the following values:

Value	Data Type	Routine Name
INT	INTEGER(4)	PXEFINTSET
REAL	REAL(4)	PXFEREALSET
LGCL	LOGICAL(4)	PXFELGCLSET
STR	CHARACTER*(*)	PXFESTRSET
CHAR	CHARACTER(1)	PXFECHARSET

Value	Data Type	Routine Name
DBL	REAL(8)	PXFEDBLSET
INT8	INTEGER(8)	PXFEINT8SET

jhandle

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of a structure.

compname

(Input) Character. The name of the component (or field) of the structure to write data to.

index

(Input) INTEGER(4). The index of the array element to write data to.

value

(Input) A variable, whose data type depends on the value of <TYPE>. See the table above for the data types for each value; for example, if the value for <TYPE> is INT, the data type is INTEGER(4). The value for the component (or field).

ilen

(Input) INTEGER(4). This argument can only be used when <TYPE> is STR (PXFESTRSET). The length of the string *value*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFE<TYPE>SET subroutines are similar to the PXF<TYPE>SET subroutines, but they should be used when the component (or field) of the structure is an array.

When the PXFE<TYPE>SET subroutines are used, the array element with index *index* is accessed (written to the component or field).

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFE<TYPE>GET", "PXF<TYPE>SET"

PXFEXECV

POSIX Subroutine: Executes a new process by passing command-line arguments.

Module: USE IFPOSIX

Syntax

CALL PXFEXECV (*path*, *lenpath*, *argv*, *lenargv*, *iargc*, *ierror*)

path

(Input) Character. The path to the new executable process.

lenpath

(Input) INTEGER(4). The length of *path* string.

argv

(Input) An array of character strings. Contains the command-line arguments to be passed to the new process.

lenargv

(Input) INTEGER(4). An array that contains the lengths for each corresponding character string in *argv.*

iargc

(Input) INTEGER(4). The number of command-line arguments.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFEXECV subroutine executes a new executable process (file) by passing command-line arguments specified in the *argv* array. If execution is successful, no return is made to the calling process.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "PXFEXECVE", "PXFEXECVP"

PXFEXECVE

POSIX Subroutine: Executes a new process by passing command-line arguments.

Module: USE IFPOSIX

Syntax

CALL PXFEXECVE (*path*, *lenpath*, *argv*, *lenargv*, *iargc*, *env*, *lenenv*, *ienvc*, *ierror*)

path

(Input) Character. The path to the new executable process.

lenpath

(Input) INTEGER(4). The length of *path* string.

argv

(Input) An array of character strings. Contains the command-line arguments to be passed to the new process.

lenargv

(Input) INTEGER(4). An array that contains the lengths for each corresponding character string in *argv.*

iargc

(Input) INTEGER(4). The number of command-line arguments.

env

(Input) An array of character strings. Contains the environment settings for the new process.

lenenv

(Input) INTEGER(4). An array that contains the lengths for each corresponding character string in *env.*

ienvc

(Input) INTEGER(4). The number of environment settings in *env.*

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFEXECVE subroutine executes a new executable process (file) by passing command-line arguments specified in the *argv* array and environment settings specified in the *env* array.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFEXECV", "PXFEXECVP"

PXFEXECVP

POSIX Subroutine: Executes a new process by passing command-line arguments.

Module: USE IFPOSIX

Syntax

CALL PXFEXECVP (*file*, *lenfile*, *argv*, *lenargv*, *iargc*, *ierror*)

file

(Input) Character. The filename of the new executable process.

lenfile

(Input) INTEGER(4). The length of *file* string.

argv

(Input) An array of character strings. Contains the command-line arguments to be passed to the new process.

lenargv

(Input) INTEGER(4). An array that contains the lengths for each corresponding character string in *argv.*

iargc

(Input) INTEGER(4). The number of command-line arguments.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFEXECVP subroutine executes a new executable process (file) by passing command-line arguments specified in the *argv* array. It uses the PATH environment variable to find the file to execute.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFEXECV", "PXFEXECVE"

PXFEXIT, PXFFASTEXIT

POSIX Subroutine: Exits from a process.

Module: USE IFPOSIX

Syntax

CALL PXFEXIT (*istatus*)
CALL PXFFASTEXIT (*istatus*)

istatus

(Input) INTEGER(4). The exit value.

The PXFEXIT subroutine terminates the calling process. It calls, in last-in-first-out (LIFO) order, the functions registered by C runtime functions `atexit` and `onexit`, and flushes all file buffers before terminating the process. The *istatus* value is typically set to zero to indicate a normal exit and some other value to indicate an error.

The PXFFASTEXIT subroutine terminates the calling process without processing `atexit` or `onexit`, and without flushing stream buffers.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

Example

```
program t1
use ifposix
integer(4) ipid, istat, ierror, ipid_ret, istat_ret
  print *," the child process will be born"
  call PXFFORK(IPID, IERROR)
  call PXFGETPID(IPID_RET,IERROR)
  if(IPID.EQ.0) then
     print *," I am a child process"
     print *," My child's pid is", IPID_RET
     call PXFGETPPID(IPID_RET,IERROR)
     print *," The pid of my parent is",IPID_RET
     print *," Now I have exited with code 0xABCD"
     call PXFEXIT(Z'ABCD')
  else
     print *," I am a parent process"
     print *," My parent pid is ", IPID_RET
     print *," I am creating the process with pid", IPID
     print *," Now I am waiting for the end of the child process"
     call PXFWAIT(ISTAT, IPID_RET, IERROR)
     print *," The child with pid ", IPID_RET," has exited"
     if( PXFWIFEXITED(ISTAT) ) then
       print *, " The child exited normally"
       istat_ret = IPXFWEXITSTATUS(ISTAT)
       print 10," The low byte of the child exit code is", istat_ret
     end if
  end if
10 FORMAT (A,Z)
end program
```

PXFFDOPEN

POSIX Subroutine: Opens an external unit.

Module: USE IFPOSIX

Syntax

CALL PXFFDOPEN (*ifildes*, *iunit*, *access*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor of the opened file.

iunit

(Input) INTEGER(4). The Fortran logical unit to connect to file descriptor *ifildes*.

access

(Input) Character. A character string that specifies the attributes for the Fortran unit. The string must consist of one or more of the following keyword/value pairs. Keyword/value pairs should be separated by a comma, and blanks are ignored.

Keyword	Possible Values	Description	Default
'NEWLINE'	'YES' or 'NO'	I/O type	'YES'
'BLANK'	'NULL' or 'ZERO'	Interpretation of blanks	'NULL'
'STATUS'	'OLD', 'SCRATCH', or 'UNKNOWN'	File status at open	'UNKNOWN'
'FORM'	'FORMATTED' or 'UNFORMATTED'	Format type	'FORMATTED'

Keywords should be separated from their values by the equals ('=') character; for example:

```
call PXFDOPEN (IFILDES, IUNIT, 'BLANK=NULL, STATUS=UNKNOWN', IERROR)
```

ierror

(Output) INTEGER(4). The error status.

The PXFFDOPEN subroutine connects an external unit identified by *iunit* to a file descriptor *ifildes*. If the unit is already connected to a file, the file should be closed before using PXFFDOPEN.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFFLUSH

POSIX Subroutine: Flushes a file directly to disk.

Module: USE IFPOSIX

Syntax

CALL PXFFFLUSH (*lunit*, *ierror*)

lunit

(Input) INTEGER(4). A Fortran logical unit.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFFFLUSH subroutine writes any buffered output to the file connected to unit *lunit*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFFGETC

POSIX Subroutine: Reads a character from a file.

Module: USE IFPOSIX

Syntax

CALL PXFFGETC (*lunit*, *char*, *ierror*)

lunit

(Input) INTEGER(4). A Fortran logical unit.

char

(Input) Character. The character to be read.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFFGETC subroutine reads a character from a file connected to unit *lunit*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFFPUTC"

PXFFILENO

POSIX Subroutine: Returns the file descriptor associated with a specified unit.

Module: USE IFPOSIX

Syntax

CALL PXFFILENO (*lunit*, *fd*, *ierror*)

lunit

(Input) INTEGER(4). A Fortran logical unit.

fd

(Output) INTEGER(4). The returned file descriptor.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code. Possible error codes are:

- EINVAL: *lunit* is not an open unit.
- EBADF: *lunit* is not connected with a file descriptor.

The PXFFILENO subroutine returns in *fd* the file descriptor associated with *lunit*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFFORK

POSIX Subroutine: Creates a child process that differs from the parent process only in its PID. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFFORK (*ipid*, *ierror*)

ipid

(Output) INTEGER(4). The returned PID of the new child process.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFFORK subroutine creates a child process that differs from the parent process only in its PID. If successful, the PID of the child process is returned in the parent's thread of execution, and a zero is returned in the child's thread of execution. Otherwise, a –1 is returned in the parent's context and no child process is created.

See Also: "IPXFWEXITSTATUS"

Example

```
program t1
use ifposix
integer(4) ipid, istat, ierror, ipid_ret, istat_ret
  print *," the child process will be born"
  call PXFFORK(IPID, IERROR)
  call PXFGETPID(IPID_RET,IERROR)
  if(IPID.EQ.0) then
     print *," I am a child process"
     print *," My child's pid is", IPID_RET
     call PXFGETPPID(IPID_RET,IERROR)
     print *," The pid of my parent is",IPID_RET
     print *," Now I have exited with code 0xABCD"
     call PXFEXIT(Z'ABCD')
  else
     print *," I am a parent process"
     print *," My parent pid is ", IPID_RET
     print *," I am creating the process with pid", IPID
     print *," Now I am waiting for the end of the child process"
     call PXFWAIT(ISTAT, IPID_RET, IERROR)
     print *," The child with pid ", IPID_RET," has exited"
     if( PXFWIFEXITED(ISTAT) ) then
       print *, " The child exited normally"
       istat_ret = IPXFWEXITSTATUS(ISTAT)
       print 10," The low byte of the child exit code is", istat_ret
     end if
  end if
10 FORMAT (A,Z)
end program
```

PXFFPATHCONF

POSIX Subroutine: Gets the value for a configuration option of an opened file.

Module: USE IFPOSIX

Syntax

CALL PXFFPATHCONF (*ifildes*, *name*, *ival*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor of the opened file.

name

(Input) INTEGER(4). The configurable option.

ival

(Output) INTEGER(4). The value of the configurable option.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFFPATHCONF subroutine gets a value for the configuration option named for the opened file with descriptor *ifildes*.

The configuration option, defined in *name*, can be obtained by using PXFCONST or IPXFCONST with one of the following constant names:

Constant	Action
_PC_LINK_MAX	Returns the maximum number of links to the file. If *ifildes* refers to a directory, then the value applies to the whole directory.
_PC_MAX_CANON[1]	Returns the maximum length of a formatted input line; the file descriptor *ifildes* must refer to a terminal.
_PC_MAX_INPUT[1]	Returns the maximum length of an input line; the file descriptor *ifildes* must refer to a terminal.
_PC_NAME_MAX	Returns the maximum length of a filename in *ifildes* that the process is allowed to create.
_PC_PATH_MAX	Returns the maximum length of a relative pathname when *ifildes* is the current working directory.
_PC_PIPE_BUF	Returns the size of the pipe buffer; the file descriptor *ifildes* must refer to a pipe or FIFO.
_PC_CHOWN_RESTRICTED[1]	Returns nonzero if PXFCHOWN may not be used on this file. If *ifildes* refers to a directory, then this applies to all files in that directory.
_PC_NO_TRUNC[1]	Returns nonzero if accessing filenames longer than _POSIX_NAME_MAX will generate an error.
_PC_VDISABLE[1]	Returns nonzero if special character processing can be disabled; the file descriptor *ifildes* must refer to a terminal.

1. L*X only

On Linux* systems, the corresponding macros are defined in <unistd.h>. The values for *name* can be obtained by using PXFCONST or IPXFCONST when passing the string names of predefined macros in <unistd.h>. The following table shows the corresponding macro names for the above constants:

Constant	Corresponding Macro
_PC_LINK_MAX	_POSIX_LINK_MAX
_PC_MAX_CANON	_POSIX_MAX_CANON
_PC_MAX_INPUT	_POSIX_MAX_INPUT
_PC_NAME_MAX	_POSIX_NAME_MAX
_PC_PATH_MAX	_POSIX_PATH_MAX
_PC_PIPE_BUF	_POSIX_PIPE_BUF
_PC_CHOWN_RESTRICTED	_POSIX_CHOWN_RESTRICTED
_PC_NO_TRUNC	_POSIX_NO_TRUNC
_PC_VDISABLE	_POSIX_VDISABLE

See Also: "IPXFCONST", "PXFCONST", "PXFPATHCONF"

PXFFPUTC

POSIX Subroutine: Writes a character to a file.

Module: USE IFPOSIX

Syntax

CALL PXFFPUTC (*lunit*, *char*, *ierror*)

lunit

(Input) INTEGER(4). A Fortran logical unit.

char

(Input) Character. The character to be written.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code. A possible error code is EEND if the end of the file has been reached.

The PXFFPUTC subroutine writes a character to the file connected to unit *lunit*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFFGETC"

PXFFSEEK

POSIX Subroutine: Modifies a file position.

Module: USE IFPOSIX

Syntax

CALL PXFFSEEK (*lunit*, *ioffset*, *iwhence*, *ierror*)

lunit

(Input) INTEGER(4). A Fortran logical unit.

ioffset

(Input) INTEGER(4). The number of bytes away from *iwhence* to place the pointer.

iwhence

(Input) INTEGER(4). The position within the file. The value must be one of the following constants (defined in `stdio.h`):

- SEEK_SET = 0
  Offset from the beginning of the file.
- SEEK_CUR = 1
  Offset from the current position of the file pointer.
- SEEK_END = 2
  Offset from the end of the file.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code. Possible error codes are:

- EINVAL: No file is connected to *lunit*, *iwhence* is not a proper value, or the resulting offset is invalid.
- ESPIPE: *lunit* is a pipe or FIFO.
- EEND: The end of the file has been reached.

The PXFFSEEK subroutine modifies the position of the file connected to unit *lunit*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFFSTAT

POSIX Subroutine: Gets a file's status information.

Module: USE IFPOSIX

Syntax

CALL PXFFSTAT (*ifildes*, *jstat*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor for an opened file.

jstat

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `stat`.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFFSTAT subroutine puts the status information for the file associated with *ifildes* into the structure associated with handle *jstat*.

NOTE. *To get a handle for an instance of the* `stat` *structure, use* PXFSTRUCTCREATE *with the string* 'stat' *for the structure name.*

Compatibility

`CONSOLE` `STANDARD GRAPHICS` `QUICKWIN GRAPHICS` `WINDOWS` `DLL` `LIB`

See Also: "PXFSTRUCTCREATE"

PXFFTELL

POSIX Subroutine: Returns the relative position in bytes from the beginning of the file.

Module: USE IFPOSIX

Syntax

CALL PXFFTELL (*lunit*, *ioffset*, *ierror*)

lunit

(Input) INTEGER(4). A Fortran logical unit.

ioffset

(Output) INTEGER(4). The returned relative position in bytes from the beginning of the file.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFGETARG

POSIX Subroutine: Gets the specified command-line argument.

Module: USE IFPOSIX

Syntax

CALL PXFGETARG (*argnum*, *str*, *istr*, *ierror*)

argnum

(Input) INTEGER(4). The number of the command-line argument.

str

(Output) Character. The returned string value.

istr

(Output) INTEGER(4). The length of the returned string; it is zero if an error occurs.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFGETARG subroutine places the command-line argument with number *argnum* into character string *str*. If *argnum* is equal to zero, the value of the argument returned is the command name of the executable file.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "IPXFARGC"

PXFGETATTY

POSIX Subroutine: Tests whether a file descriptor is connected to a terminal.

Module: USE IFPOSIX

Syntax

CALL PXFGETATTY (*ifildes*, *isatty*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor.

isatty

(Output) LOGICAL(4). The returned value.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

If file descriptor *ifildes* is open and connected to a terminal, *isatty* returns .TRUE.; otherwise, .FALSE..

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFGETC

POSIX Subroutine: Reads a character from standard input unit 5.

Module: USE IFPOSIX

Syntax

CALL PXFGETC (*nextcar*, *ierror*)

nextcar

(Output) Character. The returned character that was read.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFPUTC"

PXFGETCWD

POSIX Subroutine: Returns the path of the current working directory.

Module: USE IFPOSIX

Syntax

CALL PXFGETCWD (*buf*, *ilen*, *ierror*)

buf

(Output) Character. The returned pathname of the current working directory.

ilen

(Output) INTEGER(4). The length of the returned pathname.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code. A possible error code is EINVAL if the size of *buf* is insufficient.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFGETEGID

POSIX Subroutine: Gets the effective group ID of the current process. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFGETEGID (*iegid*, *ierror*)

iegid

(Output) INTEGER(4). The returned effective group ID.

ierror

(Output) INTEGER(4). The error status.

If successful, ierror is set to zero; otherwise, an error code.

The effective ID corresponds to the set ID bit on the file being executed.

PXFGETENV

POSIX Subroutine: Gets the setting of an environment variable.

Module: USE IFPOSIX

Syntax

CALL PXFGETENV (*name*, *lenname*, *value*, *lenvalue*, *ierror*)

name

(Input) Character. The name of the environment variable.

lenname

(Input) INTEGER(4). The length of *name*.

value

(Output) Character. The returned value of the environment variable.

lenvalue

(Output) INTEGER(4). The returned length of *value*. If an error occurs, it returns zero.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE` `STANDARD GRAPHICS` `QUICKWIN GRAPHICS` `WINDOWS` `DLL` `LIB`

See Also: "PXFSETENV"

PXFGETEUID

POSIX Subroutine: Gets the effective user ID of the current process. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFGETEUID (*ieuid*, *ierror*)

ieuid

(Output) INTEGER(4). The returned effective user ID.

ierror

(Output) INTEGER(4). The error status.

If successful, ierror is set to zero; otherwise, an error code.

The effective ID corresponds to the set ID bit on the file being executed.

PXFGETGID

POSIX Subroutine: Gets the real group ID of the current process. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFGETGID (*igid*, *ierror*)

igid

(Output) INTEGER(4). The returned real group ID.

ierror

(Output) INTEGER(4). The error status.

If successful, ierror is set to zero; otherwise, an error code.

The real ID corresponds to the ID of the calling process.

See Also: "PXFSETGID"

Example

See the example in "PXFGETGROUPS".

PXFGETGRGID

POSIX Subroutine: Gets group information for the specified GID. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFGETGRGID (*jgid*, *jgroup*, *ierror*)

jgid

(Input) INTEGER(4). The group ID to retrieve information about.

jgroup

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `group`.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is not changed; otherwise, an error code.

The PXFGETGRGID subroutine stores the group information from `/etc/group` for the entry that matches the group GID *jgid* in the structure associated with handle *jgroup*.

NOTE. *To get a handle for an instance of the* `group` *structure, use* PXFSTRUCTCREATE *with the string* 'group' *for the structure name.*

See Also: "PXFSTRUCTCREATE"

Example

See the example in "PXFGETGROUPS".

PXFGETGRNAM

POSIX Subroutine: Gets group information for the named group. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFGETGRNAM (*name*, *ilen*, *jgroup*, *ierror*)

name

(Input) Character. The name of the group to retrieve information about.

ilen

(Input) INTEGER(4). The length of the *name* string.

jgroup

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `group`.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is not changed; otherwise, an error code.

The PXFGETGRNAM subroutine stores the group information from `/etc/group` for the entry that matches the group name *name* in the structure associated with handle *jgroup*.

NOTE. *To get a handle for an instance of the* `group` *structure, use* PXFSTRUCTCREATE *with the string* 'group' *for the structure name.*

See Also: "PXFSTRUCTCREATE"

PXFGETGROUPS

POSIX Subroutine: Gets supplementary group IDs. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFGETGROUPS (*igidsetsize*, *igrouplist*, *ngroups*, *ierror*)

igidsetsize

(Input) INTEGER(4). The number of elements in the *igrouplist* array.

igrouplist

(Output) INTEGER(4). The array that has the returned supplementary group IDs.

ngroups

(Output) INTEGER(4). The total number of supplementary group IDs for the process.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFGETGROUPS subroutine returns, up to size *igidsetsize*, the supplementary group IDs in array *igrouplist*. It is unspecified whether the effective group ID of the calling process is included in the returned list. If the size is zero, the list is not modified, but the total number of supplementary group IDs for the process is returned.

Example

```
program test5
  use ifposix
  implicit none
  integer(4) number_of_groups, ierror, isize,i, igid
  integer(4),allocatable,dimension(:):: igrouplist
  integer(JHANDLE_SIZE) jgroup

  ! Get total number of groups in system
  ! call PXFGETGROUPS with 0
  call PXFGETGROUPS(0, igrouplist, number_of_groups, ierror)
  if(ierror.NE.0) STOP 'Error: first call of PXFGETGROUPS fails'
  print *," The number of groups in system ", number_of_groups
```

```
! Get Group IDs
isize = number_of_groups
ALLOCATE( igrouplist(isize))
call PXFGETGROUPS(isize, igrouplist, number_of_groups, ierror)
if(ierror.NE.0) then
  DEALLOCATE(igrouplist)
  STOP 'Error: first call of PXFGETGROUPS fails'
end if

print *," Create an instance for structure 'group' "
call PXFSTRUCTCREATE("group",jgroup, ierror)
if(ierror.NE.0) then
  DEALLOCATE(igrouplist)
  STOP 'Error: PXFSTRUCTCREATE failed to create an instance of group'
end if

do i=1,  number_of_groups
  call PXFGETGRGID( igrouplist(i), jgroup, ierror)
  if(ierror.NE.0) then
    DEALLOCATE(igrouplist)
    call PXFSTRUCTFREE(jgroup, ierror)
    print *,'Error: PXFGETGRGID failed for i=',i," gid=", igrouplist(i)
    STOP 'Abnormal termination'
  end if
  call PRINT_GROUP_INFO(jgroup)
end do

call PXFGETGID(igid,ierror)
if(ierror.NE.0) then
  DEALLOCATE(igrouplist)
  call PXFSTRUCTFREE(jgroup, ierror)
  print *,'Error: PXFGETGID failed'
  STOP 'Abnormal termination'
end if
call PXFGETGRGID( igid, jgroup, ierror)
if(ierror.NE.0) then
  DEALLOCATE(igrouplist)
  call PXFSTRUCTFREE(jgroup, ierror)
  print *,"Error: PXFGETGRGID failed for  gid=", igid
```

```
    STOP 'Abnormal termination'
  end if

  call PRINT_GROUP_INFO(jgroup)
  DEALLOCATE(igrouplist)
  call PXFSTRUCTFREE(jgroup, ierror)
  print *," Program will normal terminated"
  call PXFEXIT(0)
end
```

PXFGETLOGIN

POSIX Subroutine: Gets the name of the user.

Module: USE IFPOSIX

Syntax

CALL PXFGETLOGIN (*s*, *ilen*, *ierror*)

s

(Output) Character. The returned user name.

ilen

(Output) INTEGER(4). The length of the string stored in *s*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero, otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFGETPGRP

POSIX Subroutine: Gets the process group ID of the calling process. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFGETPGRP (*ipgrp*, *ierror*)

ipgrp

(Output) INTEGER(4). The returned process group ID.

ierror

(Output) INTEGER(4). The error status.

If successful, ierror is set to zero; otherwise, an error code.

Each process group is a member of a session and each process is a member of the session in which its process group is a member.

PXFGETPID

POSIX Subroutine: Gets the process ID of the calling process.

Module: USE IFPOSIX

Syntax

CALL PXFGETPID (*ipid*, *ierror*)

ipid

(Output) INTEGER(4). The returned process ID.

ierror

(Output) INTEGER(4). The error status.

If successful, ierror is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: the example in "PXFWAIT"

PXFGETPPID

POSIX Subroutine: Gets the process ID of the parent of the calling process.

Module: USE IFPOSIX

Syntax

CALL PXFGETPPID (*ippid*, *ierror*)

ippid

(Output) INTEGER(4). The returned process ID.

ierror

(Output) INTEGER(4). The error status.

If successful, ierror is set to zero; otherwise, an error code.

Compatibility

`CONSOLE` `STANDARD GRAPHICS` `QUICKWIN GRAPHICS` `WINDOWS` `DLL` `LIB`

See Also: the example in "PXFWAIT"

PXFGETPWNAM

POSIX Subroutine: Gets password information for a specified name. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFGETPWNAM (*name*, *ilen*, *jpasswd*, *ierror*)

name

(Input) Character. The login name of the user to retrieve information about. For example, a login name might be "jsmith", while the actual name is "John Smith".

ilen

(Input) INTEGER(4). The length of the *name* string.

jpasswd

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `compnam`.

ierror

(Output) INTEGER(4). The error status.

If successful, ierror is set to zero; otherwise, an error code.

The PXFGETPWNAM subroutine stores the user information from `/etc/passwd` for the entry that matches the user name *name* in the structure associated with handle *jpasswd*.

NOTE. *To get a handle for an instance of the* `compnam` *structure, use* PXFSTRUCTCREATE *with the string* 'compnam' *for the structure name.*

See Also: "PXFSTRUCTCREATE"

PXFGETPWUID

POSIX Subroutine: Gets password information for a specified UID. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFGETPWUID (*iuid*, *jpasswd*, *ierror*)

iuid

(Input) INTEGER(4). The user ID to retrieve information about..

jpasswd

(Input)INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `compnam`.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFGETPWUID subroutine stores the user information from `/etc/passwd` for the entry that matches the user ID *iuid* in the structure associated with handle *jpasswd*.

NOTE. *To get a handle for an instance of the* `compnam` *structure, use* PXFSTRUCTCREATE *with the string* 'compnam' *for the structure name*.

See Also: "PXFSTRUCTCREATE"

PXFGETSUBHANDLE

POSIX Subroutine: Returns a handle for a subroutine.

Module: USE IFPOSIX

Syntax

CALL PXFGETSUBHANDLE (*sub*, *jhandle1*, *ierror*)

sub

(Input) The Fortran subroutine to get a handle for.

jhandle1

(Output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The returned handle for the subroutine.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

NOTE. *The argument "sub" cannot be a function, an intrinsic, or an entry point, and must be defined with exactly one integer argument.*

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFGETUID

POSIX Subroutine: Gets the real user ID of the current process. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFGETUID (*iuid*, *ierror*)

iuid

(Output) INTEGER(4). The returned real user ID.

ierror

(Output) INTEGER(4). The error status.

If successful, ierror is set to zero; otherwise, an error code.

The real ID corresponds to the ID of the calling process.

See Also: "PXFSETUID"

PXFISBLK

POSIX Function: Tests for a block special file.

Module: USE IFPOSIX

Syntax

result = PXFISBLK (*m*)

m

(Input) INTEGER(4). The value of the `st_mode` component (field) in the structure `stat`.

Results:

The result type is logical. If the file is a block special file, the result value is .TRUE.; otherwise, .FALSE..

Compatibility

`CONSOLE` `STANDARD GRAPHICS` `QUICKWIN GRAPHICS` `WINDOWS` `DLL` `LIB`

See Also: "PXFISCHR"

PXFISCHR

POSIX Function: Tests for a character file.

Module: USE IFPOSIX

Syntax

result = PXFISCHR (*m*)

m

(Input) INTEGER(4). The value of the `st_mode` component (field) in the structure `stat`.

Results:

The result type is logical. If the file is a character file, the result value is .TRUE.; otherwise, .FALSE..

Compatibility

`CONSOLE` `STANDARD GRAPHICS` `QUICKWIN GRAPHICS` `WINDOWS` `DLL` `LIB`

See Also: "PXFISBLK"

PXFISCONST

POSIX Function: Tests whether a string is a valid constant name.

Module: USE IFPOSIX

Syntax

result = PXFISCONST (*s*)

s

(Input) Character. The name of the constant to test.

Results:

The result type is logical. The PXFISCONST function confirms whether the argument is a valid constant name that can be passed to functions PXFCONST and IPXFCONST. It returns .TRUE. only if IPXFCONST will return a valid value for name *s*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "IPXFCONST", "PXFCONST"

PXFISDIR

POSIX Function: Tests whether a file is a directory.

Module: USE IFPOSIX

Syntax

result = PXFISDIR (*m*)

m

(Input) INTEGER(4). The value of the `st_mode` component (field) in the structure `stat`.

Results:

The result type is logical. If the file is a directory, the result value is .TRUE.; otherwise, .FALSE..

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFISFIFO

POSIX Function: Tests whether a file is a special FIFO file.

Module: USE IFPOSIX

Syntax

result = PXFISFIFO (*m*)

m

(Input) INTEGER(4). The value of the `st_mode` component (field) in the structure `stat`.

Results:

The result type is logical.

The PXFISFIFO function tests whether the file is a special FIFO file created by PXFMKFIFO. If the file is a special FIFO file, the result value is .TRUE.; otherwise, .FALSE..

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFISREG", "PXFMKFIFO"

PXFISREG

POSIX Function: Tests whether a file is a regular file.

Module: USE IFPOSIX

Syntax

result = PXFISREG (*m*)

m

(Input) INTEGER(4). The value of the `st_mode` component (field) in the structure `stat`.

Results:

The result type is logical. If the file is a regular file, the result value is .TRUE.; otherwise, .FALSE..

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFISFIFO", "PXFMKFIFO"

PXFKILL

POSIX Subroutine: Sends a signal to a specified process.

Module: USE IFPOSIX

Syntax

CALL PXFKILL (*ipid*, *isig*, *ierror*)

ipid

(Input) INTEGER(4). The process to kill. It is determined by one of the following values:

> 0	Kills the specific process.
< 0	Kills all processes in the group.
== 0	Kills all processes in the group except special processes.
== pid_t–1	Kills all processes.

isig

(Input) INTEGER(4). The value of the signal to be sent.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFKILL subroutine sends a signal with value *isig* to a specified process. On Windows* systems, only the *ipid* for the current process can be used.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFLINK

POSIX Subroutine: Creates a link to a file or directory.

Module: USE IFPOSIX

Syntax

CALL PXFLINK (*existing*, *lenexist*, *new*, *lennew*, *ierror*)

existing

(Input) Character. The path to the file or directory you want to link to.

lenexist

(Input) INTEGER(4). The length of the *existing* string.

new

(Input) Character. The name of the new link file.

lennew

(Input) INTEGER(4). The length of the *new* string.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFLINK subroutine creates a new link (also known as a hard link) to an existing file. This new name can be used exactly as the old one for any operation. Both names refer to the same file (so they have the same permissions and ownership) and it is impossible to tell which name was the "original".

NOTE. *On Windows* systems, this subroutine is only valid for NTFS file systems; for FAT systems, it returns an error.*

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFLOCALTIME

POSIX Subroutine: Converts a given elapsed time in seconds to local time.

Module: USE IFPOSIX

Syntax

CALL PXFLOCALTIME (*isecnds*, *iatime*, *ierror*)

isecnds

(Input) INTEGER(4). The elapsed time in seconds since 00:00:00 Greenwich Mean Time, January 1, 1970.

iatime

(Output) INTEGER(4). One-dimensional array with 9 elements used to contain numeric time data. The elements of *iatime* are returned as follows:

Element	Value
iatime(1)	Seconds (0-59)
iatime(2)	Minutes (0-59)
iatime(3)	Hours (0-23)
iatime(4)	Day of month (1-31)
iatime(5)	Month (1-12)
iatime(6)	Gregorian year (for example, 1990)
iatime(7)	Day of week (0-6, where 0 is Sunday)
iatime(8)	Day of year (1-366)
iatime(9)	Daylight savings flag (1 if daylight savings time is in effect; otherwise, 0)

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFLOCALTIME subroutine converts the time (in seconds since epoch) in the *isecnds* argument to the local date and time as described by the array *iatime* above.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFLSEEK

POSIX Subroutine: Positions a file a specified distance in bytes.

Module: USE IFPOSIX

Syntax

CALL PXFLSEEK (*ifildes*, *ioffset*, *iwhence*, *iposition*, *ierror*)

ifildes

(Input) INTEGER(4). A file descriptor.

ioffset

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The number of bytes to move.

iwhence

(Input) INTEGER(4). The starting position. The value must be one of the following:

- SEEK_SET = 0
  Sets the offset to *ioffset* bytes.
- SEEK_CUR = 1
  Sets the offset to its current location plus *ioffset* bytes.
- SEEK_END = 2
  Sets the offset to the size of the file plus *ioffset* bytes.

iposition

(Output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The ending position; the resulting offset location as measured in bytes from the beginning of the file.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFLSEEK subroutine repositions the offset of file descriptor *ifildes* to the argument *ioffset* according to the value of argument *iwhence*.

PXFLSEEK allows the file offset to be set beyond the end of the existing end-of-file. If data is later written at this point, subsequent reads of the data in the gap return bytes of zeros (until data is actually written into the gap).

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFMKDIR

POSIX Subroutine: Creates a new directory.

Module: USE IFPOSIX

Syntax

CALL PXFMKDIR (*path*, *ilen*, *imode*, *ierror*)

path

(Input) Character. The path for the new directory.

ilen

(Input) INTEGER(4). The length of *path* string.

imode (L*X only)

(Input) INTEGER(4). The mode mask. Octal file-access mode.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFRMDIR", "PXFCHDIR"

PXFMKFIFO

POSIX Subroutine: Creates a new FIFO. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFMKFIFO (*path*, *ilen*, *imode*, *ierror*)

path

(Input) Character. The path for the new FIFO.

ilen

(Input) INTEGER(4). The length of *path* string.

imode

(Input) INTEGER(4). The mode mask; specifies the FIFO's permissions. Octal file-access mode.

ierror

(Output) INTEGER(4). The error status.

If successful *ierror* is set to zero; otherwise, an error code.

The PXFMKFIFO subroutine creates a FIFO special file with name *path*. A FIFO special file is similar to a pipe, except that it is created in a different way. Once a FIFO special file is created, any process can open it for reading or writing in the same way as an ordinary file.

However, the FIFO file has to be open at both ends simultaneously before you can proceed to do any input or output operations on it. Opening a FIFO for reading normally blocks it until some other process opens the same FIFO for writing, and vice versa.

See Also: "PXFISFIFO"

PXFOPEN

POSIX Subroutine: Opens or creates a file.

Module: USE IFPOSIX

Syntax

CALL PXFOPEN (*path*, *ilen*, *iopenflag*, *imode*, *ifildes*, *ierror*)

path

(Input) Character. The path of the file to be opened or created.

ilen

(Input) INTEGER(4). The length of *path* string.

iopenflag

(Input) INTEGER(4). The flags for the file. (For possible constant names that can be passed to PXFCONST or IPXFCONST, see below.)

imode

(Input) INTEGER(4). The permissions for a new file. This argument should always be specified when *iopenflag* = O_CREAT; otherwise, it is ignored. (For possible permissions, see below.)

ifildes

(Output) INTEGER(4). The returned file descriptor for the opened or created file.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

For *iopenflag*, you should specify one of the following constant values:

- O_RDONLY (read only)
- O_WRONLY (write only)
- O_RDWR (read and write)

In addition, you can also specify one of the following constant values by using a bitwise inclusive OR (IOR):

Value	Action
O_CREAT	Creates and opens a file if the file does not exist.
O_EXCL	When used with O_CREAT, it causes the open to fail if the file already exists. In this case, a symbolic link exists, regardless of where it points to.
O_NOCTTY	If *path* refers to a terminal device, it prevents it from becoming the process's controlling terminal even if the process does not have one.
O_TRUNC	If the file already exists, it is a regular file, and *imode* allows writing (its value is O_RDWR or O_WRONLY), it causes the file to be truncated to length 0.
O_APPEND	Opens the file in append mode. Before each write, the file pointer is positioned at the end of the file, as if with PXFLSEEK.
O_NONBLOCK (or O_NDELAY)[1]	When possible, opens the file in non-blocking mode. Neither the open nor any subsequent operations on the file descriptor that is returned will cause the calling process to wait. This mode need not have any effect on files other than FIFOs.
O_SYNC	Opens the file for synchronous I/O. Any writes on the resulting file descriptor will block the calling process until the data has been physically written to the underlying hardware.
O_NOFOLLOW[1]	If *path* is a symbolic link, it causes the open to fail.
O_DIRECTORY[1]	If *path* is not a directory, it causes the open to fail.
O_LARGEFILE[1]	On 32-bit systems that support the Large Files System, it allows files whose sizes cannot be represented in 31 bits to be opened.
O_BINARY[2]	Opens the file in binary (untranslated) mode.
O_SHORT_LIVED[2]	Creates the file as temporary. If possible, it does not flush to the disk.
O_TEMPORARY[2]	Creates the file as temporary. The file is deleted when last file handle is closed.
O_RANDOM[2]	Specifies primarily random access from the disk.
O_SEQUENTIAL[2]	Specifies primarily sequential access from the disk.
O_TEXT[2]	Opens the file in text (translated) mode.[3]

1. L*X only
2. W*32, W*64
3. For more information, see "Text and Binary Modes" in the Visual C++* programmer's guide.

Argument *imode* specifies the permissions to use if a new file is created. The permissions only apply to future accesses of the newly created file. The value for *imode* can be any of the following constant values (which can be obtained by using PXFCONST or IPXFCONST):

Value	Description
S_IRWXU	00700 user (file owner) has read, write and execute permission.
S_IRUSR, S_IREAD	00400 user has read permission.
S_IWUSR, S_IWRITE	00200 user has write permission.
S_IXUSR, S_IEXEC	00100 user has execute permission.
S_IRWXG[1]	00070 group has read, write and execute permission.
S_IRGRP[1]	00040 group has read permission.
S_IWGRP[1]	00020 group has write permission.
S_IXGRP[1]	00010 group has execute permission
S_IRWXO[1]	00007 others have read, write and execute permission.
S_IROTH[1]	00004 others have read permission.
S_IWOTH[1]	00002 others have write permission.
S_IXOTH[1]	00001 others have execute permission.

1. L*X only

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "PXFCLOSE", "IPXFCONST", "PXFCONST"

Example

```
call PXFOPEN( "OPEN.OUT", &
              8, &
              IOR( IPXFCONST(O_WRONLY), IPXFCONST(O_CREAT) ), &
              IOR( IPXFCONST(S_IREAD), IPXFCONST(S_IWRITE) ) )
```

PXFOPENDIR

POSIX Subroutine: Opens a directory and associates a stream with it.

Module: USE IFPOSIX

Syntax

CALL PXFOPENDIR (*dirname*, *lendirname*, *opendirid*, *ierror*)

dirname

(Input) Character. The directory name.

lendirname

(Input) INTEGER(4). The length of *dirname* string.

opendirid

(Output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The returned ID for the directory.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFOPENDIR subroutine opens a directory pointed to by the *dirname* argument and returns the ID of the directory into *opendirid*. After the call, this ID can be used by functions PXFREADDIR, PXFREWINDDIR, PXFCLOSEDIR.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFCLOSEDIR", "PXFREADDIR", "PXFREWINDDIR"

PXFPATHCONF

POSIX Subroutine: Gets the value for a configuration option of an opened file.

Module: USE IFPOSIX

Syntax

CALL PXFPATHCONF (*path*, *ilen*, *name*, *ival*, *ierror*)

path

(Input) Character. The path to the opened file.

ilen

(Input) INTEGER(4). The length of *path*.

name

(Input) INTEGER(4). The configurable option.

ival

(Input) INTEGER(4). The value of the configurable option.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFPATHCONF subroutine gets a value for the configuration option named for the opened file with path *path*.

The configuration option, defined in *name*, can be obtained by using PXFCONST or IPXFCONST with one of the following constant names:

Constant	Action
_PC_LINK_MAX	Returns the maximum number of links to the file. If *path* refers to a directory, then the value applies to the whole directory.
_PC_MAX_CANON[1]	Returns the maximum length of a formatted input line; the *path* must refer to a terminal
_PC_MAX_INPUT[1]	Returns the maximum length of an input line; the *path* must refer to a terminal.
_PC_NAME_MAX	Returns the maximum length of a filename in *path* that the process is allowed to create.
_PC_PATH_MAX	Returns the maximum length of a relative pathname when *path* is the current working directory.
_PC_PIPE_BUF	Returns the size of the pipe buffer; the *path* must refer to a FIFO.
_PC_CHOWN_RESTRICTED[1]	Returns nonzero if PXFCHOWN may not be used on this file. If *path* refers to a directory, then this applies to all files in that directory.
_PC_NO_TRUNC[1]	Returns nonzero if accessing filenames longer than _POSIX_NAME_MAX will generate an error.
_PC_VDISABLE[1]	Returns nonzero if special character processing can be disabled; the *path* must refer to a terminal.

1. L*X only

On Linux* systems, the corresponding macros are defined in <unistd.h>. The values for *name* can be obtained by using PXFCONST or IPXFCONST when passing the string names of predefined macros in <unistd.h>. The following table shows the corresponding macro names for the above constants:

Constant	Corresponding Macro
_PC_LINK_MAX	_POSIX_LINK_MAX
_PC_MAX_CANON	_POSIX_MAX_CANON
_PC_MAX_INPUT	_POSIX_MAX_INPUT
_PC_NAME_MAX	_POSIX_NAME_MAX
_PC_PATH_MAX	_POSIX_PATH_MAX
_PC_PIPE_BUF	_POSIX_PIPE_BUF

Constant	Corresponding Macro
_PC_CHOWN_RESTRICTED	_POSIX_CHOWN_RESTRICTED
_PC_NO_TRUNC	_POSIX_NO_TRUNC
_PC_VDISABLE	_POSIX_VDISABLE

See Also: "IPXFCONST", "PXFCONST", "PXFFPATHCONF"

PXFPAUSE

POSIX Subroutine: Suspends process execution.

Module: USE IFPOSIX

Syntax

CALL PXFPAUSE (*ierror*)

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFPAUSE subroutine causes the invoking process (or thread) to sleep until a signal is received that either terminates it or causes it to call a signal-catching function.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFPIPE

POSIX Subroutine: Creates a communications pipe between two processes.

Module: USE IFPOSIX

Syntax

CALL PXFPIPE (*ireadfd*, *iwritefd*, *ierror*)

ireadfd

(Output) INTEGER(4). The file descriptor for reading.

iwritefd

(Output) INTEGER(4). The file descriptor for writing.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code. The PXFPIPE subroutine returns a pair of file descriptors, pointing to a pipe inode, and places them into *ireadfd* for reading and into *iwritefd* for writing.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFPOSIXIO

POSIX Subroutine: Sets the current value of the POSIX I/O flag.

Module: USE IFPOSIX

Syntax

CALL PXFPOSIXIO (*new*, *old*, *ierror*)

new

(Input) INTEGER(4). The new value for the POSIX I/O flag.

old

(Output) INTEGER(4). The previous value of the POSIX I/O flag.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

This subroutine sets the current value of the Fortran POSIX I/O flag and returns the previous value of the flag. The initial state of the POSIX I/O flag is unspecified.

If a file is opened with a Fortran OPEN statement when the value of the POSIX I/O flag is 1, the unit is accessed as if the records are newline delimited, even if the file does not contain records that are delimited by a new line character.

If a file is opened with a Fortran OPEN statement when the value of the POSIX I/O flag is zero, a connection to a file descriptor is not assumed and the records in the file are not required to be accessed as if they are newline delimited.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFPUTC

POSIX Subroutine: Outputs a character to logical unit 6 (stdout).

Module: USE IFPOSIX

Syntax

CALL PXFPUTC (*ch*, *ierror*)

ch

(Input) Character. The character to be written.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code. A possible error code is EEND if the end of the file has been reached.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFGETC"

PXFREAD

POSIX Subroutine: Reads from a file.

Module: USE IFPOSIX

Syntax

CALL PXFREAD (*ifildes*, *buf*, *nbyte*, *nread*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor of the file to be read from.

buf

(Output) Character. The buffer that stores the data read from the file.

nbyte

(Input) INTEGER(4). The number of bytes to read.

nread

(Output) INTEGER(4). The number of bytes that were read.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFREAD subroutine reads *nbyte* bytes from the file specified by *ifildes* into memory in *buf*. The subroutine returns the total number of bytes read into *nread*. If no error occurs, the value of *nread* will equal the value of *nbyte*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFWRITE"

PXFREADDIR

POSIX Subroutine: Reads the current directory entry.

Module: USE IFPOSIX

Syntax

CALL PXFREADDIR (*idirid*, *jdirent*, *ierror*)

idirid

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The ID of a directory obtained from PXFOPENDIR.

jdirent

(Output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `dirent`.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFREADDIR subroutine reads the entry of the directory associated with *idirid* into the structure associated with handle *jdirent*.

NOTE. *To get a handle for an instance of the* `dirent` *structure, use* PXFSTRUCTCREATE *with the string* 'dirent' *for the structure name.*

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFOPENDIR", "PXFREWINDDIR"

PXFRENAME

POSIX Subroutine: Changes the name of a file.

Module: USE IFPOSIX

Syntax

CALL PXFRENAME (*old*, *lenold*, *new*, *lennew*, *ierror*)

old

(Input) Character. The name of the file to be renamed.

lenold

(Input) INTEGER(4). The length of *old* string.

new

(Input) Character. The new file name.

lennew

(Input) INTEGER(4). The length of *new* string.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFREWINDDIR

POSIX Subroutine: Resets the position of the stream to the beginning of the directory.

Module: USE IFPOSIX

Syntax

CALL PXFREWINDDIR (*idirid*, *ierror*)

idirid

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The ID of a directory obtained from PXFOPENDIR.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFRMDIR

POSIX Subroutine: Removes a directory.

Module: USE IFPOSIX

Syntax

CALL PXFRMDIR (*path*, *ilen*, *ierror*)

path

(Input) Character. The directory to be removed. It must be empty.

ilen

(Input) INTEGER(4). The length of *path* string.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFMKDIR", "PXFCHDIR"

PXFSETENV

POSIX Subroutine: Adds a new environment variable or sets the value of an environment variable.

Module: USE IFPOSIX

Syntax

CALL PXFSETENV (*name*, *lenname*, *new*, *lennew*, *ioverwrite*, *ierror*)

name

(Input) Character. The name of the environment variable.

lenname

(Input) INTEGER(4). The length of *name*.

new

(Input) Character. The value of the environment variable.

lennew

(Input) INTEGER(4). The length of *new*.

ioverwrite

(Input) INTEGER(4). A flag indicating whether to change the value of the environment variable if it exists.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

If *name* does not exist, PXFSETENV adds it with value *new*.

If *name* exists, PXFSETENV sets it's value to *new* if *ioverwrite* is a nonzero number. If *ioverwrite* is zero, the value of *name* is not changed.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "PXFGETENV"

Example

```
program test2
use ifposix
character*10 name, new
integer lenname, lennew, ioverwrite, ierror
name = "FOR_NEW"
lenname = 7
new = "ON"
lennew = 2
ioverwrite = 1

CALL PXFSETENV (name, lenname, new, lennew, ioverwrite, ierror)
print *, "name= ", name
print *, "lenname= ", lenname
print *, "new= ", lenname
print *, "lennew= ", lenname
print *, "ierror= ", ierror
end
```

PXFSETGID

POSIX Subroutine: Sets the effective group ID of the current process. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSETGID (*igid*, *ierror*)

igid

(Input) INTEGER(4). The group ID.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

If the caller is the superuser, the real and saved group ID's are also set. This feature allows a program other than root to drop all of its group privileges, do some un-privileged work, and then re-engage the original effective group ID in a secure manner.

CAUTION. *If the user is root then special care must be taken.* PXFSETGID *checks the effective gid of the caller. If it is the superuser, all process-related group ID's are set to gid. After this has occurred, it is impossible for the program to regain root privileges.*

See Also: "PXFGETGID"

PXFSETPGID

POSIX Subroutine: Sets the process group ID. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSETPGID (*ipid*, *ipgid*, *ierror*)

ipid

(Input) INTEGER(4). The process group ID to change.

ipgid

(Input) INTEGER(4). The new process group ID.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFSETPGID subroutine sets the process group ID of the process specified by *ipid* to *ipgid*.

If *ipid* is zero, the process ID of the current process is used. If *ipgid* is zero, the process ID of the process specified by *ipid* is used.

PXFSETPGID can be used to move a process from one process group to another, but both process groups must be part of the same session. In this case, *ipgid* specifies an existing process group to be joined and the session ID of that group must match the session ID of the joining process.

PXFSETSID

POSIX Subroutine: Creates a session and sets the process group ID. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSETSID (*isid*, *ierror*)

isid

(Output) INTEGER(4). The session ID.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFSETSID subroutine creates a new session if the calling process is not a process group leader.

The calling process is the leader of the new session and the process group leader for the new process group. The calling process has no controlling terminal.

The process group ID and session ID of the calling process are set to the PID of the calling process. The calling process will be the only process in this new process group and in this new session.

PXFSETUID

POSIX Subroutine: Sets the effective user ID of the current process. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSETUID (*iuid*, *ierror*)

iuid

(Output) INTEGER(4). The session ID.

ierror

(Output) INTEGER(4). The user status.

If successful, *ierror* is set to zero; otherwise, an error code.

If the effective user ID of the caller is root, the real and saved user ID's are also set. This feature allows a program other than root to drop all of its user privileges, do some un-privileged work, and then re-engage the original effective user ID in a secure manner.

CAUTION. *If the user is root then special care must be taken.* PXFSETUID *checks the effective uid of the caller. If it is the superuser, all process-related user ID's are set to uid. After this has occurred, it is impossible for the program to regain root privileges.*

See Also: "PXFGETUID"

PXFSIGACTION

POSIX Subroutine: Changes the action associated with a specific signal. It can also be used to examine the action of a signal.

Module: USE IFPOSIX

Syntax

CALL PXFSIGACTION (*isig*, *jsigact*, *josigact*, *ierror*)

isig

(Input) INTEGER(4). The signal number whose action should be changed.

jsigact

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigaction`. Specifies the new action for signal *isig*.

josigact

(Output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigaction`. Stores the previous action for signal *isig*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The signal specified in *isig* can be any valid signal except SIGKILL and SIGSTOP.

If *jsigact* is nonzero, the new action for signal *isig* is installed from the structure associated with handle *jsigact*. If *josigact* is nonzero, the previous action of the specified signal is saved in the structure associated with handle *josigact* where it can be examined.

On Windows* systems, PXFSIGACTION ignores the fields sa_mask and sa_flags in structure `sigaction`.

NOTE. *To get a handle for an instance of the* `sigaction` *structure, use* PXFSTRUCTCREATE *with the string* 'sigaction' *for the structure name.*

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

See Also: "PXFSTRUCTCREATE"

PXFSIGADDSET

POSIX Subroutine: Adds a signal to the signal set. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSIGADDSET (*jsigset*, *isigno*, *ierror*)

jsigset

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigset`. This is the set to add the signal to.

isigno

(Input) INTEGER(4). The signal number to add to the set.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFSIGADDSET subroutine adds signal number *isigno* to the set of signals associated with handle *jsigset*. This set of signals is used by PXFSIGACTION as field sa_mask in structure `sigaction`. It defines the set of signals that will be blocked during execution of the signal handler function (the field sa_handler in structure `sigaction`).

On Windows* systems, PXFSIGACTION ignores the field sa_mask in structure `sigaction`.

NOTE. *To get a handle for an instance of the* `sigset` *structure, use* PXFSTRUCTCREATE *with the string* 'sigset' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFSIGDELSET", "PXFSIGACTION"

PXFSIGDELSET

POSIX Subroutine: Deletes a signal from the signal set. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSIGDELSET (*jsigset*, *isigno*, *ierror*)

jsigset

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigset`. This is the set to delete the signal from.

isigno

(Input) INTEGER(4). The signal number to delete from the set.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFSIGDELSET subroutine removes signal number *isigno* from the set of signals associated with handle *jsigset*. This set of signals is used by PXFSIGACTION as field sa_mask in structure `sigaction`. It defines the set of signals that will be blocked during execution of the signal handler function (the field sa_handler in structure `sigaction`).

On Windows* systems, PXFSIGACTION ignores the field sa_mask in structure `sigaction`.

NOTE. *To get a handle for an instance of the* `sigset` *structure, use* PXFSTRUCTCREATE *with the string* 'sigset' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFSIGADDSET", "PXFSIGACTION"

PXFSIGEMPTYSET

POSIX Subroutine: Empties a signal set. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSIGEMPTYSET (*jsigset*, *ierror*)

jsigset

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigset`. This is the set to empty.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, nonzero.

The PXFSIGEMPTYSET subroutine initializes the signal set associated with handle *jsigset* to empty; all signals are excluded from the set. This set of signals is used by PXFSIGACTION as field sa_mask in structure `sigaction`. It defines the set of signals that will be blocked during execution of the signal handler function (the field sa_handler in structure `sigaction`).

On Windows* systems, PXFSIGACTION ignores the field sa_mask in structure `sigaction`.

NOTE. *To get a handle for an instance of the* `sigset` *structure, use* PXFSTRUCTCREATE *with the string* 'sigset' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFSIGFILLSET", "PXFSIGACTION"

PXFSIGFILLSET

POSIX Subroutine: Fills a signal set. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSIGFILLSET (*jsigset*, *ierror*)

jsigset

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigset`. This is the set to fill.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFSIGFILLSET subroutine initializes the signal set associated with handle *jsigset* to full; all signals are included into the set. This set of signals is used by PXFSIGACTION as field sa_mask in structure `sigaction`. It defines the set of signals that will be blocked during execution of the signal handler function (the field sa_handler in structure `sigaction`).

On Windows* systems, PXFSIGACTION ignores the field sa_mask in structure `sigaction`.

NOTE. *To get a handle for an instance of the* `sigset` *structure, use* PXFSTRUCTCREATE *with the string* 'sigset' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFSIGEMPTYSET", "PXFSIGACTION"

PXFSIGISMEMBER

POSIX Subroutine: Tests whether a signal is a member of a signal set. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSIGISMEMBER (*jsigset*, *isigno*, *ismember*, *ierror*)

jsigset

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigset`. This is the set the signal will be tested in.

isigno

(Input) INTEGER(4). The signal number to test for membership.

ismember

(Output) Logical. The returned result.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFSIGISMEMBER subroutine tests whether *isigno* is a member of the set associated with handle *jsigset*. If the signal is a member of the set, *ismember* is set to .TRUE.; otherwise, .FALSE.. This set of signals is used by PXFSIGACTION as field sa_mask in structure `sigaction`. It defines the set of signals that will be blocked during execution of the signal handler function (the field sa_handler in structure `sigaction`).

On Windows* systems, PXFSIGACTION ignores the field sa_mask in structure `sigaction`.

NOTE. *To get a handle for an instance of the* `sigset` *structure, use* PXFSTRUCTCREATE *with the string* 'sigset' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFSIGACTION"

PXFSIGPENDING

POSIX Subroutine: Examines pending signals. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSIGPENDING (*jsigset*, *ierror*)

jsigset

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigaction`. The signals to examine.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFSIGPENDING subroutine is used to examine pending signals (ones that have been raised while blocked). The signal mask of the pending signals is stored in the signal set associated with handle *jsigset*.

PXFSIGPROCMASK

POSIX Subroutine: Changes the list of currently blocked signals. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSIGPROCMASK (*ihow*, *jsigset*, *josigset*, *ierror*)

ihow

(Input) INTEGER(4). Defines the action for *jsigset*.

jsigset

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigset`. The signals to examine.

josigset

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigset`. Stores the previous mask of blocked signals.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The argument *ihow* indicates the way in which the set is to be changed, and consists of one of the following constant names:

Constant[1]	Action
SIG_BLOCK	The resulting set of blocked signals will be the union of the current signal set and the *jsigset* signal set.
SIG_UNBLOCK	The resulting set of blocked signals will be the current set of blocked signals with the signals in *jsigset* removed. It is legal to attempt to unblock a signal that is not blocked.
SIG_SETMASK	The resulting set of blocked signals will be the *jsigset* signal set.

1. These names can be used in PXFCONST or IPXFCONST.

If *josigset* is non-zero, the previous value of the signal mask is stored in the structure associated with handle *josigset*.

See Also: "IPXFCONST", "PXFCONST"

PXFSIGSUSPEND

POSIX Subroutine: Suspends the process until a signal is received. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFSIGSUSPEND (*jsigset*, *ierror*)

jsigset

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `sigset`. Specifies a set of signals.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

PXFSIGSUSPEND temporarily replaces the signal mask for the process with that given by the structure associated with the *jsigset* handle; it then suspends the process until a signal is received.

PXFSLEEP

POSIX Subroutine: Forces the process to sleep.

Module: USE IFPOSIX

Syntax

CALL PXFSLEEP (*iseconds*, *isecleft*, *ierror*)

iseconds

(Input) INTEGER(4). The number of seconds to sleep.

isecleft

(Output) INTEGER(4). The number of seconds left to sleep.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFSLEEP subroutine forces the current process to sleep until seconds *iseconds* have elapsed or a signal arrives that cannot be ignored.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFSTAT

POSIX Subroutine: Gets a file's status information.

Module: USE IFPOSIX

Syntax

CALL PXFSTAT (*path*, *ilen*, *jstat*, *ierror*)

path

(Input) Character. The path to the file.

ilen

(Input) INTEGER(4). The length of *path* string.

jstat

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `stat`.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFSTAT subroutine puts the status information for the file specified by *path* into the structure associated with handle *jstat*.

NOTE. *To get a handle for an instance of the* `stat` *structure, use* PXFSTRUCTCREATE *with the string* 'stat' *for the structure name*.

Compatibility

`CONSOLE` `STANDARD GRAPHICS` `QUICKWIN GRAPHICS` `WINDOWS` `DLL` `LIB`

See Also: "PXFSTRUCTCREATE"

PXFSTRUCTCOPY

POSIX Subroutine: Copies the contents of one structure to another.

Module: USE IFPOSIX

Syntax

CALL PXFSTRUCTCOPY (*structname*, *jhandle1*, *jhandle2*, *ierror*)

structname

(Input) Character. The name of the structure.

jhandle1

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle to the structure to be copied.

jhandle2

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle to the structure that will receive the copy.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

Example

See the example in "PXFSTRUCTCREATE".

PXFSTRUCTCREATE

POSIX Subroutine: Creates an instance of the specified structure.

Module: USE IFPOSIX

Syntax

CALL PXFSTRUCTCREATE (*structname*, *jhandle*, *ierror*)

structname

(Input) Character. The name of the structure.

As for any character string, the name must be specified in single or double quotes; for example, the structure `sigaction` would be specified as 'sigaction'. (For more information on available structures, see the table below.)

jhandle

(Output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The handle of the newly-created structure.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

If your application passes information to the system, you should call one of the PXF<TYPE>SET subroutines. If your application needs to get information from the structure, you should call one of the PXF<TYPE>GET subroutines.

The following table shows:

- The structures that are available in the Fortran POSIX library
- The fields within each structure
- The subroutines you must use to access the structure fields

The subroutine needed to access the field may depend on whether you are using an IA-32 processor or Intel Itanium processor. In these cases, the subroutine is labeled as i32 or i64, respectively, in the table:

Structure Name	Field Name	Subroutines for Access	
sigset[1]	Fields are hidden.	PXFSIGEMPTYSET[1], PXFSIGFILLSET[1], PXFSIGADDSET[1], or PXFSIGDELSET[1]	
sigaction	sa_handler	i32: PXFINTGET or PXFINTSET	i64: PXFINT8GET or PXFINT8SET
	sa_mask	i32: PXFINTGET or PXFINTSET	i64: PXFINT8GET or PXFINT8GET
	sa_flags	PXFINTGET or PXFINTSET	
utsname	sysname	For all fields:	
	nodename	PXFSTRGET	
	release		
	version		
	machine		
tms	tms_utime	For all fields:	
	tms_stime	i32: PXFINTGET	i64:PXFINT8GET
	tms_cutime		
	tms_cstime		
dirent	d_name	PXFSTRGET	
stat	st_mode	PXFINTGET	
	st_ino	i32: PXFINTGET	i64: PXFINT8GET
	st_dev	i32: PXFINTGET	i64: PXFINT8GET
	st_nlink	PXFINTGET	
	st_uid	PXFINTGET	
	st_gid	PXFINTGET	
	st_size	i32: PXFINTGET	i64: PXFINT8GET
	st_atime	i32: PXFINTGET	i64: PXFINT8GET
	st_mtime	i32: PXFINTGET	i64: PXFINT8GET
	st_ctime	i32: PXFINTGET	i64: PXFINT8GET
utimbuf	actime	For all fields:	
	modtime	i32: PXFINTSET	i64:PXFINT8SET

Structure Name	Field Name	Subroutines for Access
flock[1]	l_type	PXFINTGET or PXFINTSET
	l_whence	PXFINTGET or PXFINTSET
	l_start	i32: PXFINTGET or PXFINTSET i64: PXFINT8GET or PXFINT8SET
	l_len	i32: PXFINTGET or PXFINTSET i64: PXFINT8GET or PXFINT8GET
	l_pid	PXFINTGET or PXFINTSET
termios[1]	c_iflag	PXFINTGET or PXFINTSET
	c_oflag	PXFINTGET or PXFINTSET
	c_cflag	PXFINTGET or PXFINTSET
	c_lflag	PXFINTGET or PXFINTSET
	c_cc	PXFAINTGET, PXAFINTSET, PXFEINTGET, or PXFEINTSET
group[1]	gr_name	PXFSTRGET
	gr_gid	PXFINTGET
	gr_nmem	PXFINTGET
	gr_mem	PXFESTRGET
passwd[1]	pw_name	PXFSTRGET
	pw_uid	PXFINTGET
	pw_gid	PXFINTGET
	pw_dir	PXFSTRGET
	pw_shell	PXFSTRGET

1. L*X only

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "PXFSTRUCTFREE", the example in "PXFTIMES"

Example

```
program test4
use ifposix
implicit none
integer(jhandle_size) jhandle1,jhandle2
integer(4) ierror,ilen1

print *," Create a first instance for structure 'utsname' "
call PXFSTRUCTCREATE("utsname",jhandle1,ierror)
if(ierror.NE.0) STOP 'Error: cannot create structure for jhandle1'

print *," Create a second instance for structure 'utsname' "
call PXFSTRUCTCREATE("utsname",jhandle2,ierror)
if(ierror.NE.0) then
```

```
  call PXFSTRUCTFREE(jhandle1,ierror)
  STOP 'test failed - cannot create structure for jhandle2'
end if

print *,"Fill the structure associated with jhandle1 with arbitrary data"
call PXFSTRSET(jhandle1,"sysname","00000000000000",14,ierror)
if(ierror.NE.0) call Error('Error: can't set component sysname for jhandle1')

call PXFSTRSET(jhandle1,"Nodename","11111111111111",14,ierror)
if(ierror.NE.0) call Error('Error: can't set component nodename for jhandle1')

call PXFSTRSET(jhandle1,"RELEASE","22222222222222",14,ierror)
if(ierror.NE.0) call Error('Error: can't set component release for jhandle1')

call PXFSTRSET(jhandle1,"verSION","33333333333333",14,ierror)
if(ierror.NE.0) call Error('Error: can't set component version for jhandle1')

call PXFSTRSET(jhandle1,"machine","44444444444444",14,ierror)
if(ierror.NE.0) call Error('Error: can't set component machine for jhandle1')

print *,"Fill the structure associated with jhandle2 with arbitary data"
call PXFSTRSET(jhandle2,"sysname","aaaaaaaaa",7,ierror)
if(ierror.NE.0) call Error('Error: can't set component sysname for jhandle2')

call PXFSTRSET(jhandle2,"Nodename","BBBBBBBBB  BBB",14,ierror)
if(ierror.NE.0) call Error('Error: can't set component nodename for jhandle2')

call PXFSTRSET(jhandle2,"RELEASE","cCCC cc-cccnc",12,ierror)
if(ierror.NE.0) call Error('Error: can't set component release for jhandle2')

call PXFSTRSET(jhandle2,"verSION","ddddd",1,ierror)
if(ierror.NE.0) call Error('Error: can't set component version for jhandle2')

call PXFSTRSET(jhandle2,"machine","eeeeeee",6,ierror)
if(ierror.NE.0) call Error('Error: can't set component machine for jhandle2')

print *,"Print contents of the structure associated with jhandle1"
call PRINT_UTSNAME(jhandle1)

print *,"Print contents of the structure associated with jhandle2"
call PRINT_UTSNAME(jhandle2)

print *,"Get operating system info into structure associated with jhandle1"
call PXFUNAME(jhandle1,ierror)
```

```
if(ierror.NE.0) call Error('Error: call to PXFUNAME has failed')

print *,"Print contents of the structure associated with jhandle1"
print*,"  returned from PXFUNAME"
call PRINT_UTSNAME(jhandle1)

print *,"Copy the contents of the structure associated with jhandle1"
print *,"  into the structure associated with jhandle2"
call PXFSTRUCTCOPY("utsname",jhandle1,jhandle2,ierror)
if(ierror.NE.0) call Error('Error: can't copy jhandle1 contents into jhandle2')

print *,"Print the contents of the structure associated with jhandle2."
print *,"  It should be the same after copying."
call PRINT_UTSNAME(jhandle2)

print *,"Free memory for instance of structure associated with jhandle1"
call PXFSTRUCTFREE(jhandle1,ierror)
if(ierror.NE.0) STOP 'Error: can't free instance of structure for jhandle1'

print *,"Free memory for instance of structure associated with jhandle2"
call PXFSTRUCTFREE(jhandle2,ierror)
if(ierror.NE.0) STOP 'Error: can't free instance of structure for jhandle2'

print *,"Program terminated normally"
call PXFEXIT(0)
end
```

PXFSTRUCTFREE

POSIX Subroutine: Deletes the instance of a structure.

Module: USE IFPOSIX

Syntax

CALL PXFSTRUCTFREE (*jhandle*, *ierror*)

jhandle

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of a structure.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFSTRUCTFREE subroutine deletes the instance of the structure associated with handle *jhandle*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

Example

See the example in "PXFSTRUCTCREATE", the example in "PXFTIMES"

PXFSYSCONF

POSIX Subroutine: Gets values for system limits or options.

Module: USE IFPOSIX

Syntax

CALL PXFSYSCONF (*name*, *ival*, *ierror*)

name

(Input) INTEGER(4). The system option you want information about.

ival

(Output) INTEGER(4). The returned value.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

PXFSYSCONF lets you determine values for system limits or system options at runtime.

The value for *name* can be any of the following constants:

Constant	Description
_SC_ARG_MAX[1]	Indicates the maximum length of the arguments to the PXFEXEC family of routines.
_SC_CHILD_MAX[1]	Indicates the number of simultaneous processes per user ID.
_SC_CLK_TCK	Indicates the number of clock ticks per second.
_SC_STREAM_MAX[2]	Indicates the maximum number of streams that a process can have open at any time.
_SC_TZNAME_MAX	Indicates the maximum number of bytes in a timezone name.
_SC_OPEN_MAX	Indicates the maximum number of files that a process can have open at any time.
_SC_JOB_CONTROL[1]	Indicates whether POSIX-style job control is supported.

Constant	Description
_SC_SAVED_IDS[1]	Indicates whether a process has a saved set-user-ID and a saved set-group-ID.
_SC_VERSION[1]	Indicates the year and month the POSIX.1 standard was approved in the format YYYYMML; the value 199009L indicates the most recent revision, 1990.
_SC_BC_BASE_MAX[1]	Indicates the maximum obase value accepted by the bc(1) utility.
_SC_BC_DIM_MAX[1]	Indicates the maximum value of elements that bc(1) permits in an array.
_SC_BC_SCALE_MAX[1]	Indicates the maximum scale value allowed by bc(1).
_SC_BC_STRING_MAX[1]	Indicates the maximum length of a string accepted by bc(1).
_SC_COLL_WEIGHTS_MAX[1]	Indicates the maximum numbers of weights that can be assigned to an entry of the LC_COLLATE order keyword in the locale definition file.
_SC_EXPR_NEST_MAX[1,3]	Indicates the maximum number of expressions that can be nested within parentheses by expr(1).
_SC_LINE_MAX[1]	Indicates the maximum length of a utility's input line length, either from standard input or from a file. This includes the length for a trailing newline.
_SC_RE_DUP_MAX[1]	Indicates the maximum number of repeated occurrences of a regular expression when the interval notation \{m,n\} is used.
_SC_2_VERSION[1]	Indicates the version of the POSIX.2 standard; it is in the format YYYYMML.
_SC_2_DEV[1]	Indicates whether the POSIX.2 C language development facilities are supported.
_SC_2_FORT_DEV[1]	Indicates whether the POSIX.2 FORTRAN language development utilities are supported.
_SC_2_FORT_RUN[1]	Indicates whether the POSIX.2 FORTRAN runtime utilities are supported.
_SC_2_LOCALEDEF[1]	Indicates whether the POSIX.2 creation of locates via localedef(1) is supported.
_SC_2_SW_DEV[1]	Indicates whether the POSIX.2 software development utilities option is supported.
_SC_PAGESIZE (or _SC_PAGE_SIZE)	Indicates the size of a page (in bytes).
_SC_PHYS_PAGES	Indicates the number of pages of physical memory. Note that it is possible for the product of this value and the value of _SC_PAGE_SIZE to overflow.

Constant	Description
_SC_AVPHYS_PAGES	Indicates the number of currently available pages of physical memory.

1. L*X only
2. The corresponding POSIX macro is STREAM_MAX.
3. The corresponding POSIX macro is EXPR_NEST_MAX.

On Linux* systems, the corresponding macros are defined in <unistd.h>. The values for argument *name* can be obtained by using PXFCONST or IPXFCONST when passing the string names of predefined macros in <unistd.h>.

See Also: "IPXFCONST", "PXFCONST"

PXFTCDRAIN

POSIX Subroutine: Waits until all output written has been transmitted. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFTCDRAIN (*ifildes*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor associated with the terminal.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

PXFTCFLOW

POSIX Subroutine: Suspends the transmission or reception of data. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFTCFLOW (*ifildes*, *iaction*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor associated with the terminal.

iaction

(Input) INTEGER(4). The action to perform.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFTCFLOW subroutine suspends or resumes transmission or reception of data from the terminal referred to by *ifildes*. The action performed depends on the value of *iaction*, which must be one of the following constant names:

Constant[1]	Action
TCOOFF	Output is suspended.
TCOON	Output is resumed.
TCIOFF	A STOP character is transmitted. This should cause the terminal to stop transmitting data to the system.
TCION	A START character is transmitted. This should cause the terminal to resume transmitting data to the system.

1. These names can be used in PXFCONST or IPXFCONST.

See Also: "IPXFCONST", "PXFCONST"

PXFTCFLUSH

POSIX Subroutine: Discards terminal input data, output data, or both. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFTCFLUSH (*ifildes*, *iaction*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor associated with the terminal.

iaction

(Input) INTEGER(4). The action to perform.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The action performed depends on the value of *iaction*, which must be one of the following constant names:

Constant[1]	Action
TCIFLUSH	Discards all data that has been received but not read.
TCOFLUSH	Discards all data that has been written but not transmitted.
TCIOFLUSH	Discards both data received but not read and data written but not transmitted. (Performs TCIFLUSH and TCOFLUSH actions.)

1. These names can be used in PXFCONST or IPXFCONST.

See Also: "IPXFCONST", "PXFCONST"

PXFTCGETATTR

POSIX Subroutine: Returns current terminal settings. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFTCGETATTR (*ifildes*, *jtermios*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor associated with the terminal.

jtermios

(Output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle for structure `termios`. Stores the terminal settings.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

NOTE. *To get a handle for an instance of the* `termios` *structure, use* PXFSTRUCTCREATE *with the string* 'termios' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFTCSETATTR"

PXFTCGETPGRP

POSIX Subroutine: Gets the foreground process group ID associated with the terminal. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFTCGETPGRP (*ifildes*, *ipgid*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor associated with the terminal.

ipgid

(Output) INTEGER(4). The returned process group ID.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

See Also: "PXFTCSETPGRP"

PXFTCSENDBREAK

POSIX Subroutine: Sends a break to the terminal. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFTCSENDBREAK (*ifildes*, *iduration*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor associated with the terminal.

iduration

(Input) INTEGER(4). Indicates how long the break should be.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFTCSENDBREAK subroutine sends a break (a '\0' with a framing error) to the terminal associated with *ifildes*.

PXFTCSETATTR

POSIX Subroutine: Creates new terminal settings. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFTCSETATTR (*ifildes*, *ioptacts*, *jtermios*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor associated with the terminal.

ioptacts

(Input) INTEGER(4). Specifies when the terminal changes take effect.

jtermios

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle for structure `termios`. Contains the new terminal settings.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFTCSETATTR subroutine copies all terminal parameters from structure `termios` into the terminal associated with *ifildes*. When the terminal settings will change depends on the value of *ioptacts*, which must be one of the following constant names:

Constant[1]	Action
TCSANOW	The changes occur immediately.
TCSADRAIN	The changes occur after all output written to *ifildes* has been transmitted.
TCSAFLUSH	The changes occur after all output written to *ifildes* has been transmitted, and all input that had been received but not read has been discarded.

1. These names can be used in PXFCONST or IPXFCONST.

NOTE. *To get a handle for an instance of the* `termios` *structure, use* PXFSTRUCTCREATE *with the string* 'termios' *for the structure name.*

See Also: "PXFSTRUCTCREATE", "PXFTCGETATTR"

PXFTCSETPGRP

POSIX Subroutine: Sets the foreground process group ID associated with the terminal. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFTCSETPGRP (*ifildes*, *ipgid*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor associated with the terminal.

ipgid

(Input) INTEGER(4). The foreground process group ID for *ifildes*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

See Also: "PXFTCGETPGRP"

PXFTIME

POSIX Subroutine: Returns the current system time.

Module: USE IFPOSIX

Syntax

CALL PXFTIME (*itime*, *ierror*)

itime

(Output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The returned system time.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFTIME subroutine returns the number of seconds since Epoch (00:00:00 UTC, January 1, 1970).

Compatibility

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Example

See the example in "PXFTIMES".

PXFTIMES

POSIX Subroutine: Returns process times.

Module: USE IFPOSIX

Syntax

CALL PXFTIMES (*jtms*, *itime*, *ierror*)

jtms

(Output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `tms`.

itime

(Output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The returned time since system startup.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFTIMES subroutine fills the fields of structure `tms` associated with handle *jtms* with components of time that was spent by the current process. The structure fields are:

- tms_utime – User CPU time
- tms_stime – System CPU time
- tms_cutime – User time of child process
- tms_cstime – System time of child process

All members are measured in system clocks. The values can be converted to seconds by dividing by value *ival* returned from the following call:

```
PXFSYSCONF(IPXFCONST('_SC_CLK_TCK'), ival, ierror)
```

User time is the time charged for the execution of user instructions of the calling process. System time is the time charged for execution by the system on behalf of the calling process.

NOTE. *To get a handle for an instance of the* `tms` *structure, use* PXFSTRUCTCREATE *with the string* 'tms' *for the structure name.*

Compatibility

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See Also: "PXFSTRUCTCREATE", "PXFTIME"

Example

```
program test_uname
  use ifposix
  implicit none
  integer(jhandle_size) jtms1, jtms2
  integer(4) ierror,i
  integer(4),parameter :: n=10000000
  integer(SIZEOF_CLOCK_T) itime,time1,time2, user_time1,user_time2
  integer(SIZEOF_CLOCK_T) system_time1,system_time2
  integer(4) clocks_per_sec, iname
  real(8) s, PI
  real(8) seconds_user, seconds_system

  print *,"Create a first instance for structure 'tms'"
  call PXFSTRUCTCREATE("tms",jtms1,ierror)
  if(ierror.NE.0) STOP 'Error: cannot create structure for handle jtms1'
  print *,"Create a second instance for structure 'tms'"
  call PXFSTRUCTCREATE("tms",jtms2,ierror)
  if(ierror.NE.0) then
     call PXFSTRUCTFREE(jtms1,ierror)
     STOP 'Error: cannot create structure for handle jtms2'
  end if

  print *, 'Do some calculations'
  call PXFTIMES(jtms1, itime,ierror)
  if(ierror.NE.0) then
     call PXFSTRUCTFREE(jtms1,ierror)
     call PXFSTRUCTFREE(jtms2,ierror)
     STOP 'Error: the first call of PXFTIMES fails'
  end if

  call PXFTIME(time1, ierror)
  if(ierror.NE.0) then
     call PXFSTRUCTFREE(jtms1,ierror)
     call PXFSTRUCTFREE(jtms2,ierror)
```

```
      STOP 'Error: the first call of PXFTIME fails'
   end if

   s = 0._8
   PI = atan(1._8)*4
   do i=0, n
     s = s + cos(i*PI/n)*sin(i*PI/n)
   end do
   print *," s=",s

   call PXFTIMES(jtms2, itime,ierror)
   if(ierror.NE.0) then
      call PXFSTRUCTFREE(jtms1,ierror)
      call PXFSTRUCTFREE(jtms2,ierror)
      STOP 'Error: the second call of PXFTIMES fails'
   end if
   call PXFTIME(time2, ierror)
   if(ierror.NE.0) then
      call PXFSTRUCTFREE(jtms1,ierror)
      call PXFSTRUCTFREE(jtms2,ierror)
      STOP 'Error: the second call of PXFTIME fails'
   end if
!DEC$ IF DEFINED(_M_IA64)
      call PXFINT8GET(jtms1,"tms_utime",user_time1,ierror)
      call PXFINT8GET(jtms1,"tms_stime",system_time1,ierror)
      call PXFINT8GET(jtms2,"tms_utime",user_time2,ierror)
      call PXFINT8GET(jtms2,"tms_stime",system_time2,ierror)
!DEC$ ELSE
      call PXFINTGET(jtms1,"tms_utime",user_time1,ierror)
      call PXFINTGET(jtms1,"tms_stime",system_time1,ierror)
      call PXFINTGET(jtms2,"tms_utime",user_time2,ierror)
      call PXFINTGET(jtms2,"tms_stime",system_time2,ierror)
!DEC$ ENDIF

   iname = IPXFCONST("_SC_CLK_TCK")
   call PXFSYSCONF(iname,clocks_per_sec, ierror)
   if(ierror.NE.0) then
      call PXFSTRUCTFREE(jtms1,ierror)
      call PXFSTRUCTFREE(jtms2,ierror)
```

```
      STOP 'Error: the call of PXFSYSCONF fails'
  end if

  seconds_user = (user_time2 - user_time1)/DBLE(clocks_per_sec)
  seconds_system = (system_time2 - system_time1)/DBLE(clocks_per_sec)
  print *," The processor time of calculations:"
  print *," User code execution(in seconds):", seconds_user
  print *," Kernal code execution(in seconds):", seconds_system
  print *," Total processor time(in seconds):", seconds_user +
seconds_system
  print *," Elapsed wall clock time(in seconds):", time2 - time1

  print *,"Free memory for instance of structure associated with jtms"
  call PXFSTRUCTFREE(jtms1,ierror)
  call PXFSTRUCTFREE(jtms2,ierror)
end program
```

PXFTTYNAM

POSIX Subroutine: Gets the terminal pathname. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFTTYNAM (*ifildes*, *s*, *ilen*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor associated with the terminal.

s

(Output) Character. The returned terminal pathname.

ilen

(Output) INTEGER(4). The length of the string stored in *s*.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero, otherwise, an error code.

PXFUCOMPARE

POSIX Subroutine: Compares two unsigned integers.

Module: USE IFPOSIX

Syntax

CALL PXFUCOMPARE (*i1*, *i2*, *icmpr*, *idiff*)

i1, *i2*

(Input) INTEGER(4). The two unsigned integers to compare.

icmpr

(Output) INTEGER(4). The result of the comparison; one of the following values:

–1	If *i1* < *i2*
0	If *i1* = *i2*
1	If *i1* > *i2*

idiff

(Output) INTEGER(4). The absolute value of the difference.

The PXFUCOMPARE subroutine compares two unsigned integers and returns the absolute value of their difference into *idiff*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFUMASK

POSIX Subroutine: Sets a new file creation mask and gets the previous one.

Module: USE IFPOSIX

Syntax

CALL PXFUMASK (*icmask*, *iprevcmask*, *ierror*)

icmask

(Input) INTEGER(4). The new file creation mask.

iprevcmask

(Output) INTEGER(4). The previous file creation mask.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFUNAME

POSIX Subroutine: Gets the operation system name.

Module: USE IFPOSIX

Syntax

CALL PXFUNAME (*jutsname*, *ierror*)

jutsname

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `utsname`.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFUNAME subroutine provides information about the operation system. The information is stored in the structure associated with handle *jutsname*.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

Example

See the example in "PXFSTRUCTCREATE"

PXFUNLINK

POSIX Subroutine: Removes a directory entry.

Module: USE IFPOSIX

Syntax

CALL PXFUNLINK (*path*, *ilen*, *ierror*)

path

(Input) Character. The name of the directory entry to remove.

ilen

(Input) INTEGER(4). The length of *path* string.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFUTIME

POSIX Subroutine: Sets file access and modification times.

Module: USE IFPOSIX

Syntax

CALL PXFUTIME (*path*, *ilen*, *jutimbuf*, *ierror*)

path

(Input) Character. The path to the file.

ilen

(Input) INTEGER(4). The length of *path* string.

jutimbuf

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. A handle of structure `utimbuf`.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFUTIME subroutine sets access and modification times for the file pointed to by *path*. The time values are retrieved from structure `utimbuf`.

Compatibility

`CONSOLE  STANDARD GRAPHICS  QUICKWIN GRAPHICS  WINDOWS  DLL  LIB`

PXFWAIT

POSIX Subroutine: Waits for a child process. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFWAIT (*istat*, *iretpid*, *ierror*)

istat

(Output) INTEGER(4). The returned status of the child process.

iretpid

(Output) INTEGER(4). The process ID of the stopped child process.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFWAIT subroutine suspends execution of the current process until a child has exited, or until a signal is delivered whose action terminates the current process or calls a signal handling routine. If the child has already exited by the time of the call (a "zombie" process), a return is immediately made. Any system resources used by the child are freed.

The subroutine returns in *iretpid* the value of the process ID of the child that exited, or zero if no child was available. The returned value in *istat* can be used in subroutines IPXFWEXITSTATUS, IPXFWSTOPSIG, IPXFWTERMSIG, PXFWIFEXITED, PXFWIFSIGNALLED, and PXFWIFSTOPPED.

See Also: "PXFWAITPID", "IPXFWEXITSTATUS", "IPXFWSTOPSIG", "IPXFWTERMSIG", "PXFWIFEXITED", "PXFWIFSIGNALED", "PXFWIFSTOPPED"

Example

```
program t1
use ifposix
integer(4) ipid, istat, ierror, ipid_ret, istat_ret
  print *," the child process will be born"
  call PXFFORK(IPID, IERROR)
  call PXFGETPID(IPID_RET,IERROR)
  if(IPID.EQ.0) then
     print *," I am a child process"
     print *," My child's pid is", IPID_RET
     call PXFGETPPID(IPID_RET,IERROR)
     print *," The pid of my parent is",IPID_RET
     print *," Now I have exited with code 0xABCD"
     call PXFEXIT(Z'ABCD')
  else
     print *," I am a parent process"
```

```
      print *," My parent pid is ", IPID_RET
      print *," I am creating the process with pid", IPID
      print *," Now I am waiting for the end of the child process"
      call PXFWAIT(ISTAT, IPID_RET, IERROR)
      print *," The child with pid ", IPID_RET," has exited"
      if( PXFWIFEXITED(ISTAT) ) then
        print *, " The child exited normally"
        istat_ret = IPXFWEXITSTATUS(ISTAT)
        print 10," The low byte of the child exit code is", istat_ret
      end if
  end if
10 FORMAT (A,Z)
end program
```

PXFWAITPID

POSIX Subroutine: Waits for a specific PID. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

CALL PXFWAITPID (*ipid*, *istat*, *ioptions*, *iretpid*, *ierror*)

ipid

(Input) INTEGER(4). The PID to wait for. One of the following values:

Value	Action
< –1	Specifies to wait for any child process whose process group ID is equal to the absolute value of *ipid*.
–1	Specifies to wait for any child process; this is the same behavior as PXFWAIT.
0	Specifies to wait for any child process whose process group ID is equal to that of the calling process.
> 0	Specifies to wait for the child whose process ID is equal to the value of *ipid*.

istat

(Output) INTEGER(4). The returned status of the child process.

ioptions

(Input) INTEGER(4). One or more of the following constant values (which can be passed to PXFCONST or IPXFCONST):

Value	Action
WNOHANG	Specifies to return immediately if no child process has exited.
WUNTRACED	Specifies to return for child processes that have stopped, and whose status has not been reported.

iretpid

(Output) INTEGER(4). The PID of the stopped child process.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFWAITPID subroutine suspends execution of the current process until the child specified by *ipid* has exited, or until a signal is delivered whose action terminates the current process or calls a signal handling routine. If the child specified by *ipid* has already exited by the time of the call (a "zombie" process), a return is immediately made. Any system resources used by the child are freed.

The returned value in *istat* can be used in subroutines IPXFWEXITSTATUS, IPXFWSTOPSIG, IPXFWTERMSIG, PXFWIFEXITED, PXFWIFSIGNALLED, and PXFWIFSTOPPED.

See Also: "PXFWAIT", "IPXFWEXITSTATUS", "IPXFWSTOPSIG", "IPXFWTERMSIG", "PXFWIFEXITED", "PXFWIFSIGNALED", "PXFWIFSTOPPED"

PXFWIFEXITED

POSIX Function: Determines if a child process has exited. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

result = PXFWIFEXITED (*istat*)

istat

(Output) INTEGER(4). The status of the child process (obtained from PXFWAIT or PXFWAITPID).

Results:

The result type is logical. The result value is .TRUE. if the child process has exited normally; otherwise, .FALSE..

See Also: "PXFWIFSIGNALED", "PXFWIFSTOPPED"

Example

```
program t1
use ifposix
integer(4) ipid, istat, ierror, ipid_ret, istat_ret
  print *," the child process will be born"
  call PXFFORK(IPID, IERROR)
  call PXFGETPID(IPID_RET,IERROR)
  if(IPID.EQ.0) then
     print *," I am a child process"
     print *," My child's pid is", IPID_RET
     call PXFGETPPID(IPID_RET,IERROR)
     print *," The pid of my parent is",IPID_RET
     print *," Now I have exited with code 0xABCD"
     call PXFEXIT(Z'ABCD')
  else
     print *," I am a parent process"
     print *," My parent pid is ", IPID_RET
     print *," I am creating the process with pid", IPID
     print *," Now I am waiting for the end of the child process"
     call PXFWAIT(ISTAT, IPID_RET, IERROR)
     print *," The child with pid ", IPID_RET," has exited"
     if( PXFWIFEXITED(ISTAT) ) then
       print *, " The child exited normally"
       istat_ret = IPXFWEXITSTATUS(ISTAT)
       print 10," The low byte of the child exit code is", istat_ret
     end if
  end if
10 FORMAT (A,Z)
end program
```

PXFWIFSIGNALED

POSIX Function: Determines if a child process has exited because of a signal. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

result = PXFWIFSIGNALED (*istat*)

istat

(Output) INTEGER(4). The status of the child process (obtained from PXFWAIT or PXFWAITPID).

Results:

The result type is logical. The result value is .TRUE. if the child process has exited because of a signal that was not caught; otherwise, .FALSE..

See Also: "PXFWIFEXITED", "PXFWIFSTOPPED"

PXFWIFSTOPPED

POSIX Function: Determines if a child process has stopped. This subroutine is only available on Linux* systems.

Module: USE IFPOSIX

Syntax

result = PXFWIFSTOPPED (*istat*)

istat

(Output) INTEGER(4). The status of the child process (obtained from PXFWAIT or PXFWAITPID).

Results:

The result type is logical. The result value is .TRUE. if the child process has stopped; otherwise, .FALSE..

See Also: "PXFWIFEXITED", "PXFWIFSIGNALED"

PXFWRITE

POSIX Subroutine: Writes to a file.

Module: USE IFPOSIX

Syntax

CALL PXFWRITE (*ifildes*, *buf*, *nbyte*, *nwritten*, *ierror*)

ifildes

(Input) INTEGER(4). The file descriptor to be written to.

buf

(Input) Character. The buffer that contains the data to write into the file.

nbyte

(Input) INTEGER(4). The number of bytes to write.

nwritten

(Output) INTEGER(4). The returned number of bytes written.

ierror

(Output) INTEGER(4). The error status.

If successful, *ierror* is set to zero; otherwise, an error code.

The PXFWRITE subroutine writes *nbyte* bytes from the storage *buf* into a file specified by file descriptor *ifildes*. The subroutine returns the total number of bytes read into *nwritten*. If no error occurs, the value of *nwritten* will equal the value of *nbyte*.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "PXFREAD"

QRANSET

Portability Subroutine: Sets the seed for a sequence of pseudo-random numbers.

Module: USE IFPORT

Syntax

CALL QRANSET (*rseed*)

rseed

(Input) INTEGER(4). The reset value for the seed.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

QSORT

Portability Subroutine: Performs a quick sort on an array of rank one.

Module: USE IFPORT

Syntax

CALL QSORT (*array*, *len*, *isize*, *compar*)

array

(Input) Any type. One-dimensional array to be sorted.

If the data type does not conform to one of the predefined interfaces for QSORT, you may have to create a new interface (see the Note below).

len

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. Number of elements in *array.*

isize

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. Size, in bytes, of a single element of *array*:

- 4 if *array* is of type REAL(4)
- 8 if *array* is REAL(8) or complex
- 16 if *array* is COMPLEX(8)

compar

(Input) INTEGER(2). Name of a user-defined ordering function that determines sort order. The type declaration of *compar* takes the form:

INTEGER(2) FUNCTION *compar* (*arg1*, *arg2*)

where *arg1* and *arg2* have the same type as *array* (above). Once you have created an ordering scheme, implement your sorting function so that it returns the following:

- Negative if *arg1* should precede *arg2*
- Zero if *arg1* is equivalent to *arg2*
- Positive if *arg1* should follow *arg2*

Dummy argument *compar* must be declared as external.

In place of an INTEGER kind, you can specify the constant SIZEOF_SIZE_T, defined in `IFPORT.F90`, for argument *len* or *isize*. Use of this constant ensures correct compilation.

NOTE. *If you use* QSORT *with different data types, your program must have a* USE IFPORT *statement so that all the calls work correctly. In addition, if you wish to use* QSORT *with a derived type or a type that is not in the predefined interfaces, you must include an overload for the generic subroutine* QSORT. *Examples of how to do this are in the portability module's source file,* `IFPORT.F90`.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

Example

```
PROGRAM SORTQ
    USE IFPORT
    integer(2), external :: cmp_function
    integer(2) insort(26), i
    integer (SIZEOF_SIZE_T) array_len, array_size
    array_len = 26
    array_size = 2
    do i=90,65,-1
      insort(i-64)=91 - i
    end do
    print *, "Before: "
    print *,insort
    CALL qsort(insort,array_len,array_size,cmp_function)
    print *, 'After: '
    print *, insort
END
!
    integer(2) function cmp_function(a1, a2)
    integer(2) a1, a2
    cmp_function=a1-a2
    end function
```

RAISEQQ

Portability Function: Sends a signal to the executing program.

Module: USE IFPORT

Syntax

result = RAISEQQ (*sig*)

sig

(Input) INTEGER(4). Signal to raise. One of the following constants (defined in `IFPORT.F90`):

- SIG$ABORT – Abnormal termination
- SIG$FPE – Floating-point error
- SIG$ILL – Illegal instruction
- SIG$INT – CTRL+C signal
- SIG$SEGV – Illegal storage access
- SIG$TERM -– Termination request

If you do not install a signal handler (with SIGNALQQ, for example), when a signal occurs the system by default terminates the program with exit code 3.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, nonzero.

If a signal-handling routine for *sig* has been installed by a prior call to SIGNALQQ, RAISEQQ causes that routine to be executed. If no handler routine has been installed, the system terminates the program (the default action).

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "SIGNALQQ", "SIGNAL", "KILL"

Example

See the example in "SIGNALQQ".

RAND, RANDOM

Portability Functions: Return real random numbers in the range 0.0 through 1.0.

Module: USE IFPORT

Syntax

result = RAND ([*iflag*])
result = RANDOM (*iflag*)

iflag

(Input) INTEGER(4). Optional for RAND. Controls the way the random number is selected.

Results:

The result type is REAL(4). RAND and RANDOM return random numbers in the range 0.0 through 1.0.

Value of *iflag*	Selection Process
1	The generator is restarted and the first random value is selected.
0	The next random number in the sequence is selected.
Otherwise	The generator is reseeded using *iflag*, restarted, and the first random value is selected.

When RAND is called without an argument, *iflag* is assumed to be 0.

There is no difference between RAND and RANDOM. Both functions are included to ensure portability of existing code that references one or both of them. The intrinsic functions RANDOM_NUMBER and RANDOM_SEED provide the same functionality.

You can use SRAND to restart the pseudorandom number generator used by RAND.

NOTE. RANDOM *is available as a function or subroutine.*

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "RANDOM", "SRAND", the RANDOM_NUMBER and RANDOM_SEED intrinsic subroutines in the *Language Reference*

Example

The following example shows how to use both the RANDOM function and the RANDOM subroutine:

```
use ifport
real(4) ranval
!from libifcore.lib
call seed(1995)     ! initialize
!also from for_m_irand.c in libfor
call random(ranval) ! get next random number
print *,ranval

!from libifport.lib
ranval = random(1)  ! initialize
! same
```

```
ranval = random(0)  ! get next random number

print *,ranval
end
```

RANDOM

Portability Subroutine: Returns a pseudorandom number greater than or equal to zero and less than one from the uniform distribution.

Module: USE IFPORT

Syntax

CALL RANDOM (*ranval*)

ranval

(Output) REAL(4). Pseudorandom number, $0 \leq ranval < 1$, from the uniform distribution.

A given seed always produces the same sequence of values from RANDOM.

If SEED is not called before the first call to RANDOM, RANDOM begins with a seed value of one. If a program must have a different pseudorandom sequence each time it runs, pass the constant RND$TIMESEED (defined in `IFQWIN.F90`) to SEED before the first call to RANDOM.

The portability routines DRAND, DRANDM, IRAND, IRANDM, RAN, RAND, and the RANDOM portability function and subroutine use the same algorithms and thus return the same answers. They are all compatible and can be used interchangeably. The algorithm used is a "Prime Modulus M Multiplicative Linear Congruential Generator," a modified version of the random number generator by Park and Miller in "Random Number Generators: Good Ones Are Hard to Find," CACM, October 1988, Vol. 31, No. 10.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "SEED", "DRAND, DRANDM", "IRAND, IRANDM", "RAND, RANDOM", the RANDOM_NUMBER intrinsic subroutine in the *Language Reference*

Example

```
USE IFPORT
REAL(4) ran
CALL SEED(1995)
CALL RANDOM(ran)
```

See also the second example in "RAND, RANDOM", which shows how to use both the RANDOM function and the RANDOM subroutine.

RANF

Portability Function: Generates a random number between 0.0 and RAND_MAX.

Module: USE IFPORT

Syntax

result = RANF ( )

Results:

The result type is REAL(4). The result value is a single-precision pseudo-random number between 0.0 and RAND_MAX as defined in the C library, normally 0x7FFF 215–1.

The initial seed is set by the following:

```
CALL SRAND(ISEED)
```

where ISEED is type INTEGER(4).

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

RANGET

Portability Subroutine: Returns the current seed.

Module: USE IFPORT

Syntax

CALL RANGET (*seed*)

seed

(Output) INTEGER(4). The current seed value.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "DRANSET", "RANSET"

RANSET

Portability Subroutine: Sets the seed for the random number generator.

Module: USE IFPORT

Syntax

CALL RANSET (*seed*)

seed

(Input) REAL(4). The reset value for the seed.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "RANGET"

RECTANGLE, RECTANGLE_W

Graphics Functions: Draw a rectangle using the current graphics color, logical write mode, and line style. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = RECTANGLE (*control*, *x1*, *y1*, *x2*, *y2*)

result = RECTANGLE_W (*control*, *wx1*, *wy1*, *wx2*, *wy2*)

control

(Input) INTEGER(2). Fill flag. One of the following symbolic constants (defined in `IFQWIN.F90`):

- $GFILLINTERIOR – Draws a solid figure using the current color and fill mask.
- $GBORDER – Draws the border of a rectangle using the current color and line style.

x1, *y1*

(Input) INTEGER(2). Viewport coordinates for upper-left corner of rectangle.

x2, *y2*

(Input) INTEGER(2). Viewport coordinates for lower-right corner of rectangle.

wx1, *wy1*

(Input) REAL(8). Window coordinates for upper-left corner of rectangle.

wx2, *wy2*

(Input) REAL(8). Window coordinates for lower-right corner of rectangle.

Results:

The result type is INTEGER(2). The result is nonzero if successful; otherwise, 0.

The RECTANGLE function uses the viewport-coordinate system. The viewport coordinates (*x1*, *y1*) and (*x2*, *y2*) are the diagonally opposed corners of the rectangle.

The RECTANGLE_W function uses the window-coordinate system. The window coordinates (*wx1*, *wy1*) and (*wx2*, *wy2*) are the diagonally opposed corners of the rectangle.

SETCOLORRGB sets the current graphics color. SETFILLMASK sets the current fill mask. By default, filled graphic shapes are filled solid with the current color.

If you fill the rectangle using FLOODFILLRGB, the rectangle must be bordered by a solid line style. Line style is solid by default and can be changed with SETLINESTYLE.

NOTE. *The* RECTANGLE *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the Rectangle routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$Rectangle. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

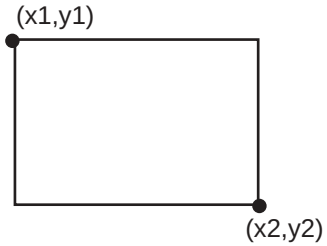
STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "SETFILLMASK", "GRSTATUS", "LINETO, LINETO_W", "POLYGON, POLYGON_W", "FLOODFILLRGB, FLOODFILLRGB_W", "SETLINESTYLE", "SETCOLOR", "SETWRITEMODE"

Example

This program draws the rectangle shown below.

```
! Build as a QuickWin or Standard Graphics App.
USE IFQWIN
INTEGER(2) dummy, x1, y1, x2, y2
x1 = 80; y1 = 50
x2 = 240; y2 = 150
dummy = RECTANGLE( $GBORDER, x1, y1, x2, y2 )
END
```



REGISTERMOUSEEVENT

QuickWin Function: Registers the application-supplied callback routine to be called when a specified mouse event occurs in a specified window. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = REGISTERMOUSEEVENT (*unit*, *mouseevents*, *callbackroutine*)

unit

(Input) INTEGER(4). Unit number of the window whose callback routine on mouse events is to be registered.

mouseevents

(Input) INTEGER(4). One or more mouse events to be handled by the callback routine to be registered. Symbolic constants (defined in `IFQWIN.F90`) for the possible mouse events are:

- MOUSE$LBUTTONDOWN – Left mouse button down
- MOUSE$LBUTTONUP – Left mouse button up
- MOUSE$LBUTTONDBLCLK – Left mouse button double-click
- MOUSE$RBUTTONDOWN – Right mouse button down
- MOUSE$RBUTTONUP – Right mouse button up
- MOUSE$RBUTTONDBLCLK – Right mouse button double-click
- MOUSE$MOVE – Mouse moved

callbackroutine

(Input) Routine to be called on the specified mouse event in the specified window. It must be declared EXTERNAL. For a prototype mouse callback routine, see "Using QuickWin" in your user's guide.

Results:

The result type is INTEGER(4). The result is zero or a positive integer if successful; otherwise, a negative integer that can be one of the following:

- MOUSE$BADUNIT – The unit specified is not open, or is not associated with a QuickWin window.
- MOUSE$BADEVENT – The event specified is not supported.

For every BUTTONDOWN or BUTTONDBLCLK event there is an associated BUTTONUP event. When the user double clicks, four events happen: BUTTONDOWN and BUTTONUP for the first click, and BUTTONDBLCLK and BUTTONUP for the second click. The difference

between getting BUTTONDBLCLK and BUTTONDOWN for the second click depends on whether the second click occurs in the double click interval, set in the system's CONTROL PANEL/MOUSE.

Compatibility

QUICKWIN GRAPHICS LIB

See Also: "UNREGISTERMOUSEEVENT", "WAITONMOUSEEVENT", "Using QuickWin" in your user's guide

Example

The following example registers the routine CALCULATE, to be called when the user double-clicks the left mouse button while the mouse cursor is in the child window opened as unit 4:

```
USE IFQWIN
INTEGER(4) result
OPEN (4, FILE= 'USER')
...
result = REGISTERMOUSEEVENT (4, MOUSE$LBUTTONDBLCLK, CALCULATE)
```

REMAPALLPALETTERGB

Graphics Function: Remaps a set of Red-Green-Blue (RGB) color values to indexes recognized by the video hardware. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = REMAPALLPALETTERGB (*colors*)

colors

(Input) INTEGER(4). Ordered array of RGB color values to be mapped in order to indexes. Must hold 0–255 elements.

Results:

The result type is INTEGER(4). The result is 0 if successful; otherwise, –1.

The REMAPALLPALETTERGB function remaps all of the available color indexes simultaneously (up to 236; 20 indexes are reserved by the operating system). The *colors* argument points to an array of RGB color values. The default mapping between the first 16 indexes and color values is shown in the following table. The 16 default colors are provided with symbolic constants in `IFQWIN.F90`.

Index	Color	Index	Color
0	$BLACK	8	$GRAY
1	$BLUE	9	$LIGHTBLUE
2	$GREEN	10	$LIGHTGREEN
3	$CYAN	11	$LIGHTCYAN
4	$RED	12	$LIGHTRED
5	$MAGENTA	13	$LIGHTMAGENTA
6	$BROWN	14	$YELLOW
7	$WHITE	15	$BRIGHTWHITE

The number of colors mapped can be fewer than 236 if the number of colors supported by the current video mode is fewer, but at most 236 colors can be mapped by REMAPALLPALETTERGB. Most Windows graphics drivers support a palette of 256K colors or more, of which only a few can be mapped into the 236 palette indexes at a time. To access and use all colors on the system, bypass the palette and use direct RGB color functions such as such as SETCOLORRGB and SETPIXELSRGB.

Any RGB colors can be mapped into the 236 palette indexes. Thus, you could specify a palette with 236 shades of red. For further details on using different color procedures see "Adding Color" in your user's guide.

In each RGB color value, each of the three colors, red, green and blue, is represented by an eight-bit value (2 hex digits). In the values you specify with REMAPALLPALETTERGB or REMAPPALETTERGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 11111111 (hex FF) the maximum for each of the three components. For example, Z'008080' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "REMAPPALETTERGB", "SETBKCOLORRGB", "SETCOLORRGB", "SETBKCOLOR", "SETCOLOR"

Example

```
! Build as QuickWin or Standard Graphics App.
USE IFQWIN
INTEGER(4) colors(3)
INTEGER(2) status
colors(1) = Z'00FFFF' ! yellow
colors(2) = Z'FFFFFF' ! bright white
colors(3) = 0       ! black
status = REMAPALLPALETTERGB(colors)
status = REMAPPALETTERGB(INT2(47), Z'45A315')
END
```

REMAPPALETTERGB

Graphics Function: Remaps one color index to an RGB color value. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = REMAPPALETTERGB (*index*, *color*)

index

(Input) INTEGER(4). Color index to be reassigned an RGB color.

color

(Input) INTEGER(4). RGB color value to assign to a color index.

Results:

The result type is INTEGER(4). The result value is the previous color assigned to the index.

The REMAPPALETTERGB function remaps one of the available color indexes (up to 236; 20 indexes are reserved by the operating system). The *color* argument is the RGB color value to assign. The default mapping between the first 16 indexes and color values is shown in the following table. The 16 default colors are provided with symbolic constants in `IFQWIN.F90`.

Index	Color	Index	Color
0	$BLACK	8	$GRAY
1	$BLUE	9	$LIGHTBLUE

Index	Color	Index	Color
2	$GREEN	10	$LIGHTGREEN
3	$CYAN	11	$LIGHTCYAN
4	$RED	12	$LIGHTRED
5	$MAGENTA	13	$LIGHTMAGENTA
6	$BROWN	14	$YELLOW
7	$WHITE	15	$BRIGHTWHITE

The number of colors mapped can be fewer than 236 if the number of colors supported by the current video mode is fewer, but at most 236 colors can be mapped by REMAPALLPALETTERGB. Most Windows graphics drivers support a palette of 256K colors or more, of which only a few can be mapped into the 236 palette indexes at a time. To access and use all colors on the system, bypass the palette and use direct RGB color functions such as such as SETCOLORRGB and SETPIXELSRGB.

Any RGB colors can be mapped into the 236 palette indexes. Thus, you could specify a palette with 236 shades of red. For further details on using different color procedures see "Adding Color" in your user's guide.

In each RGB color value, each of the three colors, red, green and blue, is represented by an eight-bit value (2 hex digits). In the values you specify with REMAPALLPALETTERGB or REMAPPALETTERGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 11111111 (hex FF) the maximum for each of the three components. For example, Z'008080' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "REMAPALLPALETTERGB", "SETBKCOLORRGB", "SETCOLORRGB", "SETBKCOLOR", "SETCOLOR"

Example

See the example in "REMAPALLPALETTERGB".

RENAME

Portability Function: Renames a file.

Module: USE IFPORT

Syntax

result = RENAME (*from*, *to*)

from

(Input) Character*(*). Path of an existing file.

to

(Input) Character*(*). The new path for the file (see Caution note below).

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, an error code, such as:

- EACCES – The file or directory specified by *to* could not be created (invalid path). This error is also returned if the drive specified is not currently connected to a device.
- ENOENT – The file or path specified by *from* could not be found.
- EXDEV – Attempt to move a file to a different device.

CAUTION. *This routine can cause data to be lost. If the file specified in "to" already exists,* RENAME *deletes the pre-existing file.*

It is possible to rename a file to itself without error.

The paths can use forward (/) or backward (\) slashes as path separators and can include drive letters (if permitted by your operating system).

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "RENAMEFILEQQ"

RENAMEFILEQQ

Portability Function: Renames a file.

Module: USE IFPORT

Syntax

result = RENAMEFILEQQ (*oldname*, *newname*)

oldname

(Input) Character*(*). Current name of the file to be renamed.

newname

(Input) Character*(*). New name of the file to be renamed.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

You can use RENAMEFILEQQ to move a file from one directory to another on the same drive by giving a different path in the *newname* parameter.

If the function fails, call GETLASTERRORQQ to determine the reason. One of the following errors can be returned:

- ERR$ACCES – Permission denied. The file's permission setting does not allow the specified access.
- ERR$EXIST – The file already exists.
- ERR$NOENT – File or path specified by *oldname* not found.
- ERR$XDEV – Attempt to move a file to a different device.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "FINDFILEQQ", "RENAME", "GETLASTERRORQQ"

Example

```
USE IFPORT
USE IFCORE
INTEGER(4) len
CHARACTER(80) oldname, newname
LOGICAL(4) result

WRITE(*,'(A, \)') ' Enter old name: '
len = GETSTRQQ(oldname)
WRITE(*,'(A, \)') ' Enter new name: '
len = GETSTRQQ(newname)
result = RENAMEFILEQQ(oldname, newname)
END
```

RGBTOINTEGER

QuickWin Function: Converts three integers specifying red, green, and blue color intensities into a four-byte RGB integer for use with RGB functions and subroutines. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = RGBTOINTEGER (*red*, *green*, *blue*)

red

(Input) INTEGER(4). Intensity of the red component of the RGB color value. Only the lower 8 bits of *red* are used.

green

(Input) INTEGER(4). Intensity of the green component of the RGB color value. Only the lower 8 bits of *green* are used.

blue

(Input) INTEGER(4). Intensity of the blue component of the RGB color value. Only the lower 8 bits of *blue* are used.

Results:

The result type is INTEGER(4). The result is the combined RGB color value.

In each RGB color value, each of the three colors, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the value returned with RGBTOINTEGER, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 1111111 (hex Z'FF') the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "INTEGERTORGB", "SETCOLORRGB", "SETBKCOLORRGB", "SETPIXELRGB, SETPIXELRGB_W", "SETPIXELSRGB", "SETTEXTCOLORRGB", "Using QuickWin" in your user's guide

Example

```
! Build as a QuickWin App.
USE IFQWIN
INTEGER r, g, b, rgb, result
INTEGER(2) status
r = Z'F0'
g = Z'F0'
b = 0
rgb = RGBTOINTEGER(r, g, b)
result = SETCOLORRGB(rgb)
status = ELLIPSE($GFILLINTERIOR,INT2(40), INT2(55), &
                 INT2(90), INT2(85))
END
```

RINDEX

Portability Function: Locates the index of the last occurrence of a substring within a string.

Module: USE IFPORT

Syntax

result = RINDEX (*string*, *substr*)

string

(Input) Character*(*). Original string to search.

substr

(Input) Character*(*). String to search for.

Results:

The result type is INTEGER(4). The result is the starting position of the final occurrence of *substr* in *string*. The result is zero if *substr* does not occur in *string*.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: the INDEX intrinsic function in the *Language Reference*

Example

```
USE IFPORT
```

```
character*80 mainstring
character*4 shortstr
integer(4) where
mainstring="Hello Hello Hello Hello There There There"
shortstr="Hello"
where=rindex(mainstring,shortstr)
! where is 19
```

RTC

Portability Function: Returns the number of seconds elapsed since a specific Greenwich mean time.

Module: USE IFPORT

Syntax

result = RTC ( )

Results:

The result type is REAL(8). The result is the number of seconds elapsed since 00:00:00 Greenwich mean time, January 1, 1970.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "TIMEF", the DATE_AND_TIME intrinsic procedure in the *Language Reference*

Example

```
USE IFPORT
real(8) s, s1, time_spent
INTEGER(4) i, j
s = RTC( )
call sleep(4)
s1 = RTC( )  t
ime_spent = s1 - s
PRINT *, 'It took ',time_spent, 'seconds to run.'
```

RUNQQ

Portability Function: Executes another program and waits for it to complete.

Module: USE IFPORT

Syntax

result = RUNQQ (*filename*, *commandline*)

filename

(Input) Character*(*). File name of a program to be executed.

commandline

(Input) Character*(*). Command-line arguments passed to the program to be executed.

Results:

The result type is INTEGER(2). If the program executed with RUNQQ terminates normally, the exit code of that program is returned to the program that launched it. If the program fails, –1 is returned.

The RUNQQ function executes a new process for the operating system using the same path, environment, and resources as the process that launched it. The launching process is suspended until execution of the launched process is complete.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "SYSTEM", "NLSEnumCodepages"

Example

```
USE IFPORT
INTEGER(2) result
result = RUNQQ('myprog', '-c -r')
END
```

See also the example in "NLSEnumCodepages".

SAVEIMAGE, SAVEIMAGE_W

Graphics Functions: Save an image from a specified portion of the screen into a Windows bitmap file. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SAVEIMAGE (*filename*, *ulxcoord*, *ulycoord*, *lrxcoord*, *lrycoord*)

result = SAVEIMAGE_W (*filename*, *ulwxcoord*, *ulwycoord*, *lrwxcoord*, *lrwycoord*)

filename

(Input) Character*(*). Path of the bitmap file.

ulxcoord, ulycoord

(Input) INTEGER(4). Viewport coordinates for upper-left corner of the screen image to be captured.

lrxcoord, lrycoord

(Input) INTEGER(4). Viewport coordinates for lower-right corner of the screen image to be captured.

ulwxcoord, ulwycoord

(Input) REAL(8). Window coordinates for upper-left corner of the screen image to be captured.

lrwxcoord, lrwycoord

(Input) REAL(8). Window coordinates for lower-right corner of the screen image to be captured.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a negative value.

The SAVEIMAGE function captures the screen image within a rectangle defined by the upper-left and lower-right screen coordinates and stores the image as a Windows bitmap file specified by *filename*. The image is stored with a palette containing the colors displayed on the screen.

SAVEIMAGE defines the bounding rectangle in viewport coordinates. SAVEIMAGE_W defines the bounding rectangle in window coordinates.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETIMAGE, GETIMAGE_W", "IMAGESIZE, IMAGESIZE_W", "LOADIMAGE, LOADIMAGE_W", "PUTIMAGE, PUTIMAGE_W"

SCANENV

Portability Subroutine: Scans the environment for the value of an environment variable.

Module: USE IFPORT

Syntax

CALL SCANENV (*envname*, *envtext*, *envvalue*)

envname

(Input) Character*(*). Contains the name of an environment variable you need to find the value for.

envtext

(Output) Character*(*). Set to the full text of the environment variable if found, or to ' ' if nothing is found.

envvalue

(Output) Character*(*). Set to the value associated with the environment variable if found or to ' ' if nothing is found.

SCANENV scans for an environment variable that matches *envname* and returns the value or string it is set to.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

SCROLLTEXTWINDOW

Graphics Subroutine: Scrolls the contents of a text window. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SCROLLTEXTWINDOW (*rows*)

rows

(Input) INTEGER(2). Number of rows to scroll.

The SCROLLTEXTWINDOW subroutine scrolls the text in a text window (previously defined by SETTEXTWINDOW). The default text window is the entire window.

The *rows* argument specifies the number of lines to scroll. A positive value for *rows* scrolls the window up (the usual direction); a negative value scrolls the window down. Specifying a number larger than the height of the current text window is equivalent to calling CLEARSCREEN ($GWINDOW). A value of 0 for *rows* has no effect.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "CLEARSCREEN", "GETTEXTPOSITION", "GETTEXTWINDOW", "GRSTATUS", "OUTTEXT", "SETTEXTPOSITION", "SETTEXTWINDOW", "WRAPON"

Example

```
!  Build as QuickWin or Standard Graphics app.
USE IFQWIN
INTEGER(2) row, istat
CHARACTER(18) string
TYPE (rccoord) oldpos

CALL SETTEXTWINDOW (INT2(1), INT2(0), &
                    INT2(25), INT2(80))
```

```
CALL CLEARSCREEN ( $GCLEARSCREEN )

CALL SETTEXTPOSITION (INT2(1), INT2(1), oldpos)
DO row = 1, 6
   string = 'Hello, World # '
   CALL SETTEXTPOSITION( row, INT2(1), oldpos )
   WRITE(string(15:16), '(I2)') row
   CALL OUTTEXT( string )
END DO
istat  = displaycursor($GCURSORON)
WRITE(*,'(1x,A\)') 'Hit ENTER'
READ (*,*) ! wait for ENTER
!  Scroll window down 4 lines
CALL SCROLLTEXTWINDOW(INT2( -4) )
CALL SETTEXTPOSITION (INT2(10), INT2(18), oldpos)
WRITE(*,'(2X,A\)') "Hit ENTER"
READ( *,* ) ! wait for ENTER
!  Scroll window up 5 lines
CALL SCROLLTEXTWINDOW( INT2(5 ))
END
```

SCWRQQ

Portability Subroutine: Returns the floating-point processor control word.

Module: USE IFPORT

Syntax

CALL SCWRQQ (*control*)

control

(Output) INTEGER(2). Floating-point processor control word.

SCRWQQ performs the same function as the run-time subroutine GETCONTROLFPQQ, and is provided for compatibility.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "GETCONTROLFPQQ", "LCWRQQ"

Example

See the example in "LCWRQQ".

SECNDS

Portability Function: Returns the number of seconds that have elapsed since midnight, less the value of its argument.

Module: USE IFPORT

Syntax:

result = SECNDS (*r*)

r

(Input) REAL(4). Number of seconds, precise to a hundredth of a second (0.01), to be subtracted.

Results:

The result type is REAL(4). The result value is the number of seconds that have elapsed since midnight, minus *r*, with a precision of a hundredth of a second (0.01).

To start the timing clock, call SECNDS with 0.0, and save the result in a local variable. To get the elapsed time since the last call to SECNDS, pass the local variable to SECNDS on the next call.

NOTE. SECNDS *is an intrinsic procedure unless you specify* USE IFPORT.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB

See Also: "RTC", "TIME", the DATE_AND_TIME and SYSTEM_CLOCK subroutines and the SECNDS function in the *Language Reference*

Example

```
USE IFPORT
REAL(4) s
INTEGER(4) i, j
s = SECNDS(0.0)
DO I = 1, 100000
   J = J + 1
END DO
s = SECNDS(s)
PRINT *, 'It took ',s, 'seconds to run.'
```

SEED

Portability Subroutine: Changes the starting point of the pseudorandom number generator.

Module: USE IFPORT

Syntax

CALL SEED (*iseed*)

iseed

(Input) INTEGER(4). Starting point for RANDOM.

SEED uses *iseed* to establish the starting point of the pseudorandom number generator. A given seed always produces the same sequence of values from RANDOM.

If SEED is not called before the first call to RANDOM, RANDOM always begins with a seed value of one. If a program must have a different pseudorandom sequence each time it runs, pass the constant RND$TIMESEED (defined in `IFPORT.F90`) to the SEED routine before the first call to RANDOM.

This routine is not thread-safe.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "RANDOM", the RANDOM_SEED and RANDOM_NUMBER intrinsic subroutines in the *Language Reference*

Example

```
USE IFPORT
REAL rand
CALL SEED(7531)
CALL RANDOM(rand)
```

SETACTIVEQQ

QuickWin Function: Makes a child window active, but does *not* give it focus. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETACTIVEQQ (*unit*)

unit

(Input) INTEGER(4). Unit number of the child window to be made active.

Results:

The result type is INTEGER(4). The result is 1 if successful; otherwise, 0.

When a window is made active, it receives graphics output (from ARC, LINETO and OUTGTEXT, for example) but is not brought to the foreground and does not have the focus. If a window needs to be brought to the foreground, it must be given the focus. A window is given focus with FOCUSQQ, by clicking it with the mouse, or by performing I/O other than graphics on it, unless the window was opened with IOFOCUS='.FALSE.'. By default, IOFOCUS='.TRUE.', except for child windows opened as unit '*'.

The window that has the focus is always on top, and all other windows have their title bars grayed out. A window can have the focus and yet not be active and not have graphics output directed to it. Graphical output is independent of focus.

If IOFOCUS='.TRUE.', the child window receives focus prior to each READ, WRITE, PRINT, or OUTTEXT. Calls to graphics functions (such as OUTGTEXT and ARC) do not cause the focus to shift.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "GETACTIVEQQ", "FOCUSQQ", "INQFOCUSQQ", "Using QuickWin" in your user's guide

SETBKCOLOR

Graphics Function: Sets the current background color index for both text and graphics. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETBKCOLOR (*color*)

color

(Input) INTEGER(4). Color index to set the background color to.

Results:

The result type is INTEGER(4). The result is the previous background color index.

SETBKCOLOR changes the background color index for both text and graphics. The color index of text over the background color is set with SETTEXTCOLOR. The color index of graphics over the background color (used by drawing functions such as FLOODFILL and ELLIPSE) is set with SETCOLOR. These non-RGB color functions use color indexes, not true color values, and limit the user to colors in the palette, at most 256. For access to all system colors, use SETBKCOLORRGB, SETCOLORRGB, and SETTEXTCOLORRGB.

Changing the background color index does not change the screen immediately. The change becomes effective when CLEARSCREEN is executed or when doing text input or output, such as with READ, WRITE, or OUTTEXT. The graphics output function OUTGTEXT does not affect the color of the background.

Generally, INTEGER(4) color arguments refer to color values and INTEGER(2) color arguments refer to color indexes. The two exceptions are GETBKCOLOR and SETBKCOLOR. The default background color index is 0, which is associated with black unless the user remaps the palette with REMAPPALETTERGB.

NOTE. *The* SETBKCOLOR *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the SetBkColor routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$SetBkColor. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "SETBKCOLORRGB", "GETBKCOLOR", "REMAPALLPALETTERGB", "REMAPPALETTERGB", "SETCOLOR", "SETTEXTCOLOR"

Example

```
USE IFQWIN
INTEGER(4) i
i = SETBKCOLOR(14)
```

SETBKCOLORRGB

Graphics Function: Sets the current background color to the given Red-Green-Blue (RGB) value. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETBKCOLORRGB (*color*)

color

(Input) INTEGER(4). RGB color value to set the background color to. Range and result depend on the system's display adapter.

Results:

The result type is INTEGER(4). The result is the previous background RGB color value.

In each RGB color value, each of the three colors, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the value you specify with SETBKCOLORRGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 1111111 (hex Z'FF') the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

The default background color is value 0, which is black. Changing the background color value does not change the screen immediately, but becomes effective when CLEARSCREEN is executed or when doing text input or output such as READ, WRITE, or OUTTEXT. The graphics output function OUTGTEXT does not affect the color of the background.

SETBKCOLORRGB sets the RGB color value of the current background for both text and graphics. The RGB color value of text over the background color (used by text functions such as OUTTEXT, WRITE, and PRINT) is set with SETTEXTCOLORRGB. The RGB color value of graphics over the background color (used by graphics functions such as ARC, OUTGTEXT, and FLOODFILLRGB) is set with SETCOLORRGB.

SETBKCOLORRGB (and the other RGB color selection functions SETCOLORRGB, and SETTEXTCOLORRGB) sets the color to a value chosen from the entire available range. The non-RGB color functions (SETCOLOR, SETBKCOLOR, and SETTEXTCOLOR) use color indexes rather than true color values. If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit RGB value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETBKCOLORRGB" "SETCOLORRGB", "SETTEXTCOLORRGB", "SETPIXELRGB, SETPIXELRGB_W", "SETPIXELSRGB", "SETBKCOLOR"

Example

```
! Build as a QuickWin or Standard Graphics App.
```

```
USE IFQWIN
INTEGER(4) oldcolor
INTEGER(2) status, x1, y1, x2, y2
x1 = 80; y1 = 50
x2 = 240; y2 = 150
oldcolor = SETBKCOLORRGB(Z'FF0000') !blue
oldcolor = SETCOLORRGB(Z'FF') ! red
CALL CLEARSCREEN ($GCLEARSCREEN)
status = ELLIPSE($GBORDER, x1, y1, x2, y2)
END
```

SETCLIPRGN

Graphics Subroutine: Limits graphics output to part of the screen. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETCLIPRGN (*x1*, *y1*, *x2*, *y2*)

x1, *y1*

(Input) INTEGER(2). Physical coordinates for upper-left corner of clipping region.

x2, *y2*

(Input) INTEGER(2). Physical coordinates for lower-right corner of clipping region.

The SETCLIPRGN function limits the display of subsequent graphics output and font text output to that which fits within a designated area of the screen (the "clipping region"). The physical coordinates (*x1*, *y1*) and (*x2*, *y2*) are the upper-left and lower-right corners of the rectangle that defines the clipping region. The SETCLIPRGN function does not change the viewport-coordinate system; it merely masks graphics output to the screen.

SETCLIPRGN affects graphics and font text output only, such as OUTGTEXT. To mask the screen for text output using OUTTEXT, use SETTEXTWINDOW.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

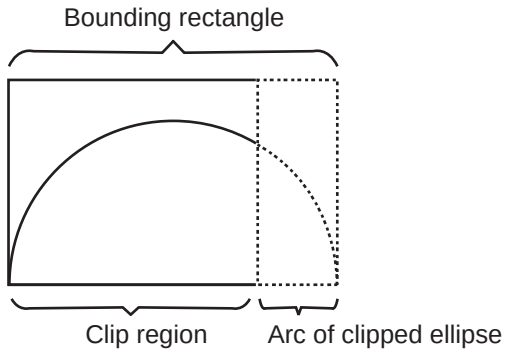
See Also: "GETPHYSCOORD", "GRSTATUS", "SETTEXTWINDOW", "SETVIEWORG", "SETVIEWPORT", "SETWINDOW"

Example

This program draws an ellipse lying partly within a clipping region, as shown below.

```
! Build as QuickWin or Standard Graphics ap.
USE IFQWIN
INTEGER(2) status, x1, y1, x2, y2
INTEGER(4) oldcolor
x1 = 10;  y1 = 50
x2 = 170; y2 = 150
! Draw full ellipse in white
status = ELLIPSE($GBORDER, x1, y1, x2, y2)
oldcolor = SETCOLORRGB(Z'FF0000') !blue
WRITE(*,*) "Hit enter"
READ(*,*)
CALL CLEARSCREEN($GCLEARSCREEN) ! clear screen
CALL SETCLIPRGN( INT2(0), INT2(0), &
                 INT2(150), INT2(125))
! only part of ellipse inside clip region drawn now
status = ELLIPSE($GBORDER, x1, y1, x2, y2)
END
```

The following figure shows the output of this program.



SETCOLOR

Graphics Function: Sets the current graphics color index. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETCOLOR (*color*)

color

(Input) INTEGER(2). Color index to set the current graphics color to.

Results:

The result type is INTEGER(2). The result is the previous color index if successful; otherwise, –1.

The SETCOLOR function sets the current graphics color index, which is used by graphics functions such as ELLIPSE. The background color index is set with SETBKCOLOR. The color index of text over the background color is set with SETTEXTCOLOR. These non-RGB color functions use color indexes, not true color values, and limit the user to colors in the palette, at most 256. For access to all system colors, use SETCOLORRGB, SETBKCOLORRGB, and SETTEXTCOLORRGB.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "SETCOLORRGB", "GETCOLOR", "REMAPPALETTERGB", "SETBKCOLOR", "SETTEXTCOLOR", "SETPIXEL, SETPIXEL_W", "SETPIXELS"

Example

```
USE IFQWIN
INTEGER(2) color, oldcolor
LOGICAL status
TYPE (windowconfig) wc

status = GETWINDOWCONFIG(wc)
color = wc%numcolors - 1
oldcolor = SETCOLOR(color)
END
```

SETCOLORRGB

Graphics Function: Sets the current graphics color to the specified Red-Green-Blue (RGB) value. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETCOLORRGB (*color*)

color

(Input) INTEGER(4). RGB color value to set the current graphics color to. Range and result depend on the system's display adapter.

Results:

The result type is INTEGER(4). The result is the previous RGB color value.

In each RGB color value, each of the three colors, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the value you specify with SETCOLORRGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 1111111 (hex Z'FF') the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

SETCOLORRGB sets the RGB color value of graphics over the background color, used by the following graphics functions: ARC, ELLIPSE, FLOODFILL, LINETO, OUTGTEXT, PIE, POLYGON, RECTANGLE, and SETPIXEL. SETBKCOLORRGB sets the RGB color value of the current background for both text and graphics. SETTEXTCOLORRGB sets the RGB color value of text over the background color (used by text functions such as OUTTEXT, WRITE, and PRINT).

SETCOLORRGB (and the other RGB color selection functions SETBKCOLORRGB, and SETTEXTCOLORRGB) sets the color to a value chosen from the entire available range. The non-RGB color functions (SETCOLOR, SETBKCOLOR, and SETTEXTCOLOR) use color indexes rather than true color values. If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit RGB value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "SETBKCOLORRGB", "SETTEXTCOLORRGB", "FLOODFILLRGB, FLOODFILLRGB_W", "SETCOLOR", "REMAPPALETTERGB", "SETPIXELRGB, SETPIXELRGB_W", "SETPIXELSRGB"

Example

```
! Build as a QuickWin or Standard Graphics App.
USE IFQWIN
INTEGER(2) numfonts
INTEGER(4) oldcolor
TYPE (xycoord) xy
numfonts = INITIALIZEFONTS( )
oldcolor = SETCOLORRGB(Z'0000FF')   ! red
oldcolor = SETBKCOLORRGB(Z'00FF00') ! green
CALL MOVETO(INT2(200), INT2(100), xy)
CALL OUTGTEXT("hello, world")
END
```

SETCONTROLFPQQ

Portability Subroutine: Sets the value of the floating-point processor control word.

Module: USE IFPORT

Syntax

CALL SETCONTROLFPQQ (*controlword*)

controlword

(Input) INTEGER(2). Floating-point processor control word.

The floating-point control word specifies how various exception conditions are handled by the floating-point math coprocessor, sets the floating-point precision, and specifies the floating-point rounding mechanism used.

The control word can be any of the following constants (defined in `IFPORT.F90`):

Parameter name	Hex value	Description
FPCW$MCW_IC	Z'1000'	**Infinity control mask**
FPCW$AFFINE	Z'1000'	Affine infinity
FPCW$PROJECTIVE	Z'0000'	Projective infinity
FPCW$MCW_PC	Z'0300'	**Precision control mask**
FPCW$64	Z'0300'	64-bit precision
FPCW$53	Z'0200'	53-bit precision
FPCW$24	Z'0000'	24-bit precision
FPCW$MCW_RC	Z'0C00'	**Rounding control mask**

Parameter name	Hex value	Description
FPCW$CHOP	Z'0C00'	Truncate
FPCW$UP	Z'0800'	Round up
FPCW$DOWN	Z'0400'	Round down
FPCW$NEAR	Z'0000'	Round to nearest
FPCW$MCW_EM	Z'003F'	**Exception mask**
FPCW$INVALID	Z'0001'	Allow invalid numbers
FPCW$DENORMAL	Z'0002'	Allow denormals (very small numbers)
FPCW$ZERODIVIDE	Z'0004'	Allow divide by zero
FPCW$OVERFLOW	Z'0008'	Allow overflow
FPCW$UNDERFLOW	Z'0010'	Allow underflow
FPCW$INEXACT	Z'0020'	Allow inexact precision

The defaults for the floating-point control word are 53-bit precision, round to nearest, and the denormal, underflow and inexact precision exceptions disabled. An exception is disabled if its flag is set to 1 and enabled if its flag is cleared to 0.

Setting the floating-point precision and rounding mechanism can be useful if you are reusing old code that is sensitive to the floating-point precision standard used and you want to get the same results as on the old machine.

You can use GETCONTROLFPQQ to retrieve the current control word and SETCONTROLFPQQ to change the control word. Most users do not need to change the default settings. If you need to change the control word, always use SETCONTROLFPQQ to make sure that special routines handling floating-point stack exceptions and abnormal propagation work correctly.

For a full discussion of the floating-point control word, exceptions, and error handling, see "The Floating-Point Environment" in your user's guide.

NOTE. *The Intel® Visual Fortran exception handler allows for software masking of invalid operations, but does not allow the math chip to mask them. If you choose to use the software masking, be aware that this can affect program performance if you compile code written for Visual Fortran with another compiler.*

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL LIB`

See Also: "GETCONTROLFPQQ", "GETSTATUSFPQQ", "LCWRQQ", "SCWRQQ", "CLEARSTATUSFPQQ"

Example

```
USE IFPORT
INTEGER(2) status, control, controlo

CALL GETCONTROLFPQQ(control)
WRITE (*, 9000) 'Control word: ', control
!     Save old control word
controlo = control
!     Clear all flags
control = control .AND. Z'0000'
!     Set new control to round up
control = control .OR. FPCW$UP
CALL SETCONTROLFPQQ(control)
CALL GETCONTROLFPQQ(control)
WRITE (*, 9000) 'Control word: ', control
9000 FORMAT (1X, A, Z4)
END
```

SETDAT

Portability Function: Sets the system date.

Module: USE IFPORT

Syntax

result = SETDAT (*iyr*, *imon*, *iday*)

iyr

(Input) INTEGER(2) or INTEGER(4). Year (*xxxx* AD).

imon

(Input) INTEGER(2) or INTEGER(4). Month (1-12).

iday

(Input) INTEGER(2) or INTEGER(4). Day of the month (1-31).

Results:

The result type is LOGICAL(4). The result is .TRUE. if the system date is changed; .FALSE. if no change is made.

Actual arguments of the function SETDAT can be any valid INTEGER(2) or INTEGER(4) expression.

Refer to your operating system documentation for the range of permitted dates.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "GETDAT", "GETTIM", "SETTIM"

Example

```
USE IFPORT
LOGICAL(4) success
success = SETDAT(INT2(1997+1), INT2(2*3), INT2(30))
END
```

SETENVQQ

Portability Function: Sets the value of an existing environment variable, or adds and sets a new environment variable.

Module: USE IFPORT

Syntax

result = SETENVQQ (*varname* = *value*)

varname = *value*

(Input) Character*(*). String containing both the name and the value of the variable to be added or modified. Must be in the form: *varname* = *value*, where *varname* is the name of an environment variable and *value* is the value being assigned to it.

Results:

The result is of type LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

Environment variables define the environment in which a program executes. For example, the LIB environment variable defines the default search path for libraries to be linked with a program.

SETENVQQ deletes any terminating blanks in the string. Although the equal sign (=) is an illegal character within an environment value, you can use it to terminate *value* so that trailing blanks are preserved. For example, the string `PATH=  =` sets *value* to `''`.

You can use SETENVQQ to remove an existing variable by giving a variable name followed by an equal sign with no value. For example, LIB= removes the variable LIB from the list of environment variables. If you specify a value for a variable that already exists, its value is changed. If the variable does not exist, it is created.

SETENVQQ affects only the environment that is local to the current process. You cannot use it to modify the command-level environment. When the current process terminates, the environment reverts to the level of the parent process. In most cases, this is the operating system level. However, you can pass the environment modified by SETENVQQ to any child process created by RUNQQ. These child processes get new variables and/or values added by SETENVQQ.

SETENVQQ uses the C runtime routine _putenv and GETENVQQ uses the C runtime routine getenv. From the C documentation:

> getenv and _putenv use the copy of the environment pointed to by the global variable _environ to access the environment. getenv operates only on the data structures accessible to the run-time library and not on the environment segment created for the process by the operating system.

SETENVQQ and GETENVQQ will not work properly with the Win32* APIs SetEnvironmentVariable and GetEnvironmentVariable.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL LIB`

See Also: "GETENVQQ", "RUNQQ"

Example

```
USE IFPORT
LOGICAL(4) success
success = SETENVQQ("PATH=c:\mydir\tmp")
success = &
SETENVQQ("LIB=c:\mylib\bessel.lib;c:\math\difq.lib")
END
```

SETERRORMODEQQ

Portability Subroutine: Sets the prompt mode for critical errors that by default generate system prompts.

Module: USE IFPORT

Syntax

CALL SETERRORMODEQQ (*pmode*)

pmode

(Input) LOGICAL(4). Flag that determines whether a prompt is displayed when a critical error occurs.

Certain I/O errors cause the system to display an error prompt. For example, attempting to write to a disk drive with the drive door open generates an "Abort, Retry, Ignore" message. When the system starts up, system error prompting is enabled by default (*pmode* = .TRUE.). You can also enable system error prompts by calling SETERRORMODEQQ with *pmode* set to ERR$HARDPROMPT (defined in `IFPORT.F90`).

If prompt mode is turned off, critical errors that normally cause a system prompt are silent. Errors in I/O statements such as OPEN, READ, and WRITE fail immediately instead of being interrupted with prompts. This gives you more direct control over what happens when an error occurs. For example, you can use the ERR= specifier to designate an executable statement to branch to for error handling. You can also take a different action than that requested by the system prompt, such as opening a temporary file, giving a more informative error message, or exiting.

You can turn off prompt mode by setting *pmode* to .FALSE. or to the constant ERR$HARDFAIL (defined in `IFPORT.F90`).

SETERRORMODEQQ affects only errors that generate a system prompt. It does not affect other I/O errors, such as writing to a nonexistent file or attempting to open a nonexistent file with STATUS='OLD'.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL LIB`

Example

```
!PROGRAM 1
!  DRIVE B door open
OPEN (10, FILE = 'B:\NOFILE.DAT', ERR = 100)
!  Generates a system prompt error here and waits for the user
!  to respond to the prompt before continuing
100   WRITE(*,*) ' Continuing'
END
```

```
! PROGRAM 2
!  DRIVE B door open
 USE IFPORT
 CALL SETERRORMODEQQ(.FALSE.)
 OPEN (10, FILE = 'B:\NOFILE.DAT', ERR = 100)
!  Causes the statement at label 100 to execute
!  without system prompt
100   WRITE(*,*) ' Drive B: not available, opening      &
                    &alternative drive.'
 OPEN (10, FILE = 'C:\NOFILE.DAT')
 END
```

SETEXITQQ

QuickWin Function: Sets a QuickWin application's exit behavior. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETEXITQQ (*exitmode*)

exitmode

(Input) INTEGER(4). Determines the program exit behavior. The following exit parameters are defined in `IFQWIN.F90`:

- QWIN$EXITPROMPT – Displays the following message box:
  `"Program exited with exit status X. Exit Window?"`
  where X is the exit status from the program.
  If Yes is entered, the application closes the window and terminates. If No is entered, the dialog box disappears and you can manipulate the windows as usual. You must then close the window manually.
- QWIN$EXITNOPERSIST – Terminates the application without displaying a message box.
- QWIN$EXITPERSIST – Leaves the application open without displaying a message box.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a negative value.

The default for both QuickWin and Standard Graphics applications is QWIN$EXITPROMPT.

Compatibility

`STANDARD GRAPHICS QUICKWIN GRAPHICS LIB`

See Also: "GETEXITQQ", "Using QuickWin" in your user's guide

Example

```
! Build as QuickWin Ap
USE IFQWIN
INTEGER(4) exmode, result
WRITE(*,'(1X,A,/)') 'Please enter the exit mode 1, 2   &
                     or 3 '
READ(*,*) exmode
SELECT CASE (exmode)
   CASE (1)
     result = SETEXITQQ(QWIN$EXITPROMPT)
   CASE (2)
```

```
      result = SETEXITQQ(QWIN$EXITNOPERSIST)
    CASE (3)
      result = SETEXITQQ(QWIN$EXITPERSIST)
    CASE DEFAULT
      WRITE(*,*) 'Invalid option - checking for bad     &
                  return'
      IF(SETEXITQQ( exmode ) .NE. -1) THEN
        WRITE(*,*) 'Error not returned'
      ELSE
        WRITE(*,*) 'Error code returned'
      ENDIF
END SELECT
END
```

SETFILEACCESSQQ

Portability Function: Sets the file access mode for a specified file.

Module: USE IFPORT

Syntax

result = SETFILEACCESSQQ (*filename*, *access*)

filename

(Input) Character*(*). Name of a file to set access for.

access

(Input) INTEGER(4). Constant that sets the access. Can be any combination of the following flags, combined by an inclusive OR (such as IOR or OR):

- FILE$ARCHIVE – Marked as having been copied to a backup device.
- FILE$HIDDEN – Hidden. The file does not appear in the directory list that you can request from the command console.
- FILE$NORMAL – No special attributes (default).
- FILE$READONLY – Write-protected. You can read the file, but you cannot make changes to it.
- FILE$SYSTEM – Used by the operating system.

The flags are defined in module `IFPORT.F90`.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

To set the access value for a file, add the constants representing the appropriate access.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "GETFILEINFOQQ"

Example

```
USE IFPORT
INTEGER(4) permit
LOGICAL(4) result

permit = 0   ! clear permit
permit = IOR(FILE$READONLY, FILE$HIDDEN)
result = SETFILEACCESSQQ ('formula.f90', permit)
END
```

SETFILETIMEQQ

Portability Function: Sets the modification time for a specified file.

Module: USE IFPORT

Syntax

result = SETFILETIMEQQ (*filename*, *timedate*)

filename

(Input) Character*(*). Name of a file.

timedate

(Input) INTEGER(4). Time and date information, as packed by PACKTIMEQQ.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

The modification time is the time the file was last modified and is useful for keeping track of different versions of the file. The process that calls SETFILETIMEQQ must have write access to the file; otherwise, the time cannot be changed. If you set *timedate* to FILE$CURTIME (defined in `IFPORT.F90`), SETFILETIMEQQ sets the modification time to the current system time.

If the function fails, call GETLASTERRORQQ to determine the reason. It can be one of the following:

- ERR$ACCES – Permission denied. The file's (or directory's) permission setting does not allow the specified access.
- ERR$INVAL – Invalid argument; the *timedate* argument is invalid.

- ERR$MFILE – Too many open files (the file must be opened to change its modification time).
- ERR$NOENT – File or path not found.
- ERR$NOMEM – Not enough memory is available to execute the command; or the available memory has been corrupted; or an invalid block exists, indicating that the process making the call was not allocated properly.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "PACKTIMEQQ", "UNPACKTIMEQQ", "GETLASTERRORQQ"

Example

```
USE IFPORT
INTEGER(2) day, month, year
INTEGER(2) hour, minute, second, hund
INTEGER(4) timedate
LOGICAL(4) result

CALL GETDAT(year, month, day)
CALL GETTIM(hour, minute, second, hund)
CALL PACKTIMEQQ (timedate, year, month, day,    &
                 hour, minute, second)
result = SETFILETIMEQQ('myfile.dat', timedate)
END
```

SETFILLMASK

Graphics Subroutine: Sets the current fill mask to a new pattern. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETFILLMASK (*mask*)

mask

(Input) INTEGER(1). One-dimensional array of length 8.

There are 8 bytes in *mask*, and each of the 8 bits in each byte represents a pixel, creating an 8x8 pattern. The first element (byte) of *mask* becomes the top 8 bits of the pattern, and the eighth element (byte) of *mask* becomes the bottom 8 bits.

During a fill operation, pixels with a bit value of 1 are set to the current graphics color, while pixels with a bit value of zero are set to the current background color. The current graphics color is set with SETCOLORRGB or SETCOLOR. The 8-byte mask is replicated over the entire fill area. If no fill mask is set (with SETFILLMASK), or if the mask is all ones, solid current color is used in fill operations.

The fill mask controls the fill pattern for graphics routines (FLOODFILLRGB, PIE, ELLIPSE, POLYGON, and RECTANGLE).

To change the current fill mask, determine the array of bytes that corresponds to the desired bit pattern and set the pattern with SETFILLMASK, as in the following example.

Bit pattern									Value In mask
	●	○	○	●	○	○	●	●	mask(1) = Z'93'
	●	●	○	○	●	○	○	●	mask(2) = Z'C9'
	○	●	●	○	○	●	○	○	mask(3) = Z'64'
	●	○	●	●	○	○	●	○	mask(4) = Z'B2'
	○	●	○	●	●	○	○	●	mask(5) = Z'59'
	○	○	●	○	●	●	○	○	mask(6) = Z'2C'
	●	○	○	●	○	●	●	○	mask(7) = Z'96'
	○	●	○	○	●	○	●	●	mask(8) = Z'4B'
bit	7	6	5	4	3	2	1	0	

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "ELLIPSE, ELLIPSE_W", "FLOODFILLRGB, FLOODFILLRGB_W", "GETFILLMASK", "PIE, PIE_W", "POLYGON, POLYGON_W", "RECTANGLE, RECTANGLE_W"

Example

This program draws six rectangles, each with a different fill mask, as shown below.

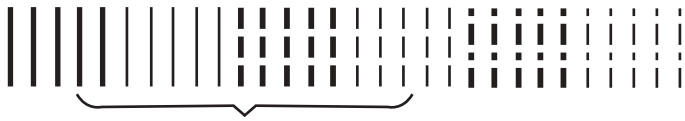
```
! Build as QuickWin or Standard Graphics Ap.
USE IFQWIN
INTEGER(1), TARGET :: style1(8) &
             /Z'18',Z'18',Z'18',Z'18',Z'18',Z'18',Z'18',Z'18'/
INTEGER(1), TARGET :: style2(8) &
             /Z'08',Z'08',Z'08',Z'08',Z'08',Z'08',Z'08',Z'08'/
INTEGER(1), TARGET :: style3(8) &
```

```
             /Z'18',Z'00',Z'18',Z'18',Z'18',Z'00',Z'18',Z'18'/
INTEGER(1), TARGET :: style4(8) &
             /Z'00',Z'08',Z'00',Z'08',Z'08',Z'08',Z'08',Z'08'/
INTEGER(1), TARGET :: style5(8) &
             /Z'18',Z'18',Z'00',Z'18',Z'18',Z'00',Z'18',Z'18'/
INTEGER(1), TARGET :: style6(8) &
             /Z'08',Z'00',Z'08',Z'00',Z'08',Z'00',Z'08',Z'00'/
INTEGER(1) oldstyle(8) ! Placeholder for old style
INTEGER loop
INTEGER(1), POINTER :: ptr(:)

CALL GETFILLMASK( oldstyle )  ! Make 6 rectangles, each with a different
fill
DO loop = 1, 6
   SELECT CASE (loop)
     CASE (1)
       ptr => style1
     CASE (2)
       ptr => style2
     CASE (3)
       ptr => style3
     CASE (4)
       ptr => style4
     CASE (5)
       ptr => style5
     CASE (6)
      ptr => style6
   END SELECT
   CALL SETFILLMASK( ptr)
   status = RECTANGLE($GFILLINTERIOR,INT2(loop*40+5), &
                INT2(90),INT2((loop+1)*40), INT2(110))
END DO

CALL SETFILLMASK( oldstyle )  ! Restore old style
READ (*,*)                    ! Wait for ENTER to be
                              !   pressed
END
```

The following shows the output of this program.



Typical fill masks for rectangle

SETFONT

Graphics Function: Finds a single font that matches a specified set of characteristics and makes it the current font used by the OUTGTEXT function. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETFONT (*options*)

options

(Input) Character*(*). String describing font characteristics (see below for details).

Results:

The result type is INTEGER(2). The result is the index number (*x* as used in the n*x* option) of the font if successful; otherwise, –1.

The SETFONT function searches the list of available fonts for a font matching the characteristics specified in *options*. If a font matching the characteristics is found, it becomes the current font. The current font is used in all subsequent calls to the OUTGTEXT function. There can be only one current font.

The *options* argument consists of letter codes, as follows, that describe the desired font. The *options* parameter is neither case sensitive nor position sensitive.

t'*fontname*'	Name of the desired typeface. It can be any installed font.
h*y*	Character height, where *y* is the number of pixels.
w*x*	Select character width, where *x* is the number of pixels.
f	Select only a fixed-space font (do not use with the p characteristic).
p	Select only a proportional-space font (do not use with the f characteristic).
v	Select only a vector-mapped font (do not use with the r characteristic). Roman, Modern, and Script are examples of vector-mapped fonts, also called plotter fonts. True Type fonts (for example, Arial, Symbol, and Times New Roman) are not vector-mapped.

r	Select only a raster-mapped (bitmapped) font (do not use with the v characteristic). Courier, Helvetica, and Palatino are examples of raster-mapped fonts, also called screen fonts. True Type fonts are not raster-mapped.
e	Select the bold text format. This parameter is ignored if the font does not allow the bold format.
u	Select the underline text format. This parameter is ignored if the font does not allow underlining.
i	Select the italic text format. This parameter is ignored if the font does not allow italics.
b	Select the font that best fits the other parameters specified.
n*x*	Select font number *x*, where *x* is less than or equal to the value returned by the INTIALIZEFONTS function.

You can specify as many options as you want, except with n*x*, which should be used alone. If you specify options that are mutually exclusive (such as the pairs f/p or r/v), the SETFONT function ignores them. There is no error detection for incompatible parameters used with n*x*.

If the b option is specified and at least one font is initialized, SETFONT sets a font and returns 0 to indicate success.

In selecting a font, the SETFONT routine uses the following criteria, rated from highest precedence to lowest:

1. Pixel height
2. Typeface
3. Pixel width
4. Fixed or proportional font

You can also specify a pixel width and height for fonts. If you choose a nonexistent value for either and specify the b option, SETFONT chooses the closest match.

A smaller font size has precedence over a larger size. If you request Arial 12 with best fit, and only Arial 10 and Arial 14 are available, SETFONT selects Arial 10.

If you choose a nonexistent value for pixel height and width, the SETFONT function applies a magnification factor to a vector-mapped font to obtain a suitable font size. This automatic magnification does not apply if you specify the r option (raster-mapped font), or if you request a specific typeface and do not specify the b option (best-fit).

If you specify the n*x* parameter, SETFONT ignores any other specified options and supplies only the font number corresponding to *x*.

If a height is given, but not a width, SETFONT computes the a width to preserve the correct font proportions.

If a width is given, but not a height, SETFONT uses a default height, which may vary from font type to font type. This may lead to characters that appear distorted, particularly when a very wide width is specified. This behavior is the same as that of the Win32* API CreateFontIndirect. The second example below shows how to calculate the correct height for a given width.

The font functions affect only OUTGTEXT and the current graphics position; no other Fortran Graphics Library output functions are affected by font usage.

For each window you open, you must call INITIALIZEFONTS before calling SETFONT. INITIALIZEFONTS needs to be executed after each new child window is opened in order for a subsequent SETFONT call to be successful.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETFONTINFO", "GETGTEXTEXTENT", "GRSTATUS", "OUTGTEXT", "INITIALIZEFONTS", "SETGTEXTROTATION"

Example

```
!  Build as a Graphics ap.
USE IFQWIN
INTEGER(2) fontnum, numfonts
TYPE (xycoord) pos
numfonts = INITIALIZEFONTS ( )
!  Set typeface to Arial, character height to 18,
!    character width to 10, and italic
fontnum = SETFONT ('t''Arial''h18w10i')
CALL MOVETO (INT2(10), INT2(30), pos)
CALL OUTGTEXT('Demo text')
END
```

Another example follows:

```
! The following program shows you how to compute
!   an appropriate font height for a given font width
!
!  Build as a Graphics ap.
USE IFQWIN
INTEGER(2) fontnum, numfonts
TYPE (xycoord) pos
TYPE (rccoord) rcc
TYPE (FONTINFO) info
CHARACTER*11 str, str1
```

```
CHARACTER*22 str2
real rh
integer h, inw
str = "t'Arial'bih"
str1= " "
numfonts = INITIALIZEFONTS ( )
! Default both height and width.  This seems to work
! properly.  From this setting get the ratio between
! height and width.
fontnum = SETFONT ("t'Arial'")
ireturn = GETFONTINFO(info)
rh =  real(info%pixheight)/real(info%avgwidth)

! Now calculate the height for a width of 40
write(*,*) 'Input desired width:'
read(*,*) inw
h =int(inw*rh)
write(str1,'(I3.3)') h
str2 = str//str1
print *,str2
fontnum = SETFONT (str2)
CALL MOVETO (INT2(10), INT2(50), pos)
CALL OUTGTEXT('ABCDEFGabcdefg12345!@#$%')
CALL MOVETO (INT2(10), INT2(50+10+h), pos)
CALL OUTGTEXT('123456789012345678901234')
ireturn = GETFONTINFO(info)
call settextposition(4,1, rcc)
print *,  info%avgwidth, info%pixheight
END
```

SETGTEXTROTATION

Graphics Subroutine: Sets the orientation angle of the font text output in degrees. The current orientation is used in calls to OUTGTEXT. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETGTEXTROTATION (*degree-tenths*)

degree-tenths

(Input) INTEGER(4). Angle of orientation, in tenths of degrees, of the font text output.

The orientation of the font text output is set in tenths of degrees. Horizontal is 0°, and angles increase counterclockwise so that 900 (90°) is straight up, 1800 (180°) is upside down and left, 2700 (270°) is straight down, and so forth. If the user specifies a value greater than 3600 (360°), the subroutine takes a value equal to:

```
MODULO (user-specified tenths of degrees, 3600)
```

Although SETGTEXTROTATION accepts arguments in tenths of degrees, only increments of one full degree differ visually from each other on the screen.

Bitmap fonts cannot be rotated; TruType fonts should be used instead.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETGTEXTROTATION"

Example

```
! Build as a Graphics ap.
USE IFQWIN
INTEGER(2) fontnum, numfonts
INTEGER(4) oldcolor, deg
TYPE (xycoord) pos
numfonts = INITIALIZEFONTS ( )
fontnum = SETFONT ('t''Arial''h18w10i')
CALL MOVETO (INT2(10), INT2(30), pos)
CALL OUTGTEXT('Straight text')
deg = -1370
CALL SETGTEXTROTATION(deg)
oldcolor = SETCOLORRGB(Z'008080')
CALL OUTGTEXT('Slanted text')
END
```

SETLINESTYLE

Graphics Subroutine: Sets the current line style to a new line style. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETLINESTYLE (*mask*)

mask

(Input) INTEGER(2). Desired Quickwin line-style mask. (See the table below.)

The mask is mapped to the style that most closely equivalences the percentage of the bits in the mask that are set. The style produces lines that cover a certain percentage of the pixels in that line.

SETLINESTYLE sets the style used in drawing a line. You can choose from the following styles:

QuickWin Mask	Internal Windows Style	Selection Criteria	Appearance
0xFFFF	PS_SOLID	16 bits on	_____
0xEEEE	PS_DASH	11 to 15 bits on	----------
0xECEC	PS_DASHDOT	10 bits on	-.-.-.-.-.-.-.-.-.-.-.
0xECCC	PS_DASHDOTDOT	9 bits on	-..-..-..-..-..-..-..-..
0xAAAA	PS_DOT	1 to 8 bits on	.....
0x0000	PS_NULL	0 bits on	

SETLINESTYLE affects the drawing of straight lines as in LINETO, POLYGON, and RECTANGLE, but not the drawing of curved lines as in ARC, ELLIPSE, or PIE.

The current graphics color is set with SETCOLORRGB or SETCOLOR. SETWRITEMODE affects how the line is displayed.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETLINESTYLE", "GRSTATUS", "LINETO, LINETO_W", "POLYGON, POLYGON_W", "RECTANGLE, RECTANGLE_W", "SETCOLOR", "SETWRITEMODE"

Example

```
! Build as a Graphics ap.
USE IFQWIN
INTEGER(2)     status, style
TYPE (xycoord) xy
style = Z'FFFF'
CALL SETLINESTYLE(style)
CALL MOVETO(INT2(50), INT2(50), xy )
status = LINETO(INT2(300), INT2(300))
END
```

SETMESSAGEQQ

QuickWin Subroutine: Changes QuickWin status messages, state messages, and dialog box messages. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETMESSAGEQQ (*msg*, *id*)

msg

(Input) Character*(*). Message to be displayed. Must be a regular Fortran string, not a C string. Can include multibyte characters.

id

(Input) INTEGER(4). Identifier of the message to be changed. The following table shows the messages that can be changed and their identifiers:

Id	Message
QWIN$MSG_TERM	"Program terminated with exit code"
QWIN$MSG_EXITQ	"\nExit Window?"
QWIN$MSG_FINISHED	"Finished"
QWIN$MSG_PAUSED	"Paused"
QWIN$MSG_RUNNING	"Running"
QWIN$MSG_FILEOPENDLG	"Text Files(*.txt), *.txt; Data Files(*.dat), *.dat; All Files(*.*), *.*;"
QWIN$MSG_BMPSAVEDLG	"Bitmap Files(*.bmp), *.bmp; All Files(*.*), *.*;"
QWIN$MSG_INPUTPEND	"Input pending in"
QWIN$MSG_PASTEINPUTPEND	"Paste input pending"
QWIN$MSG_MOUSEINPUTPEND	"Mouse input pending in"
QWIN$MSG_SELECTTEXT	"Select Text in"
QWIN$MSG_SELECTGRAPHICS	"Select Graphics in"
QWIN$MSG_PRINTABORT	"Error! Printing Aborted."
QWIN$MSG_PRINTLOAD	"Error loading printer driver"
QWIN$MSG_PRINTNODEFAULT	"No Default Printer."
QWIN$MSG_PRINTDRIVER	"No Printer Driver."
QWIN$MSG_PRINTINGERROR	"Print: Printing Error."
QWIN$MSG_PRINTING	"Printing"
QWIN$MSG_PRINTCANCEL	"Cancel"

Id	Message
QWIN$MSG_PRINTINPROGRESS	"Printing in progress..."
QWIN$MSG_HELPNOTAVAIL	"Help Not Available for Menu Item"
QWIN$MSG_TITLETEXT	"Graphic"

QWIN$MSG_FILEOPENDLG and QWIN$MSG_BMPSAVEDLG control the text in file choosing dialog boxes and have the following syntax:

```
"file description, file designation"
```

You can change any string produced by QuickWin by calling SETMESSAGEQQ with the appropriate *id*. This includes status messages displayed at the bottom of a QuickWin application, state messages (such as "Paused"), and dialog box messages. These messages can include multibyte characters. (For more information on multibyte characters, see "Using National Language Support Routines" in your user's guide.) To change menu messages, use MODIFYMENUSTRINGQQ.

Compatibility

QUICKWIN GRAPHICS LIB

See Also: "MODIFYMENUSTRINGQQ"

Example

```
USE IFQWIN
print*, "Hello"
CALL SETMESSAGEQQ('Changed exit text', QWIN$MSG_EXITQ)
```

SETMOUSECURSOR

Quickwin Function: Sets the shape of the mouse cursor for the window in focus. This function is only available on Windows* systems.

Modules: USE IFQWIN, USE IFWIN

Syntax

oldcursor = SETMOUSECURSOR (*newcursor*)

newcursor

(Input) INTEGER(4). A Windows HCURSOR value. For many predefined shapes, LoadCursor(0, shape) is a convenient way to get a legitimate value. See the list of predefined shapes in the table shown below in Results.

A value of zero causes the cursor not to be displayed.

Results:

The result type is INTEGER(4). This is also an HCURSOR Value. The result is the previous cursor value.

The window in focus at the time SETMOUSECURSOR is called has its cursor changed to the specified value. Once changed, the cursor retains its shape until another call to SETMOUSECURSOR.

In Standard Graphics applications, units 5 and 6 (the default screen input and output units) are always considered to be in focus.

The following predefined values for cursor shapes are available:

Predefined Value	Cursor Shape
IDC_APPSTARTING	Standard arrow and small hourglass
IDC_ARROW	Standard arrow
IDC_CROSS	Crosshair
IDC_IBEAM	Text I-beam
IDC_ICON	Obsolete value
IDC_NO	Slashed circle
IDC_SIZE	Obsolete value; use IDC_SIZEALL
IDC_SIZEALL	Four-pointed arrow
IDC_SIZENESW	Double-pointed arrow pointing northeast and southwest
IDC_SIZENS	Double-pointed arrow pointing north and south
IDC_SIZENWSE	Double-pointed arrow pointing northwest and southeast
IDC_SIZEWE	Double-pointed arrow pointing west and east
IDC_UPARROW	Vertical arrow
IDC_WAIT	Hour glass

A LoadCursor must be done on these values before they can be used by SETMOUSECURSOR.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

Example:

```
! Build as Standard Graphics or QuickWin
    use IFQWIN

    integer*4  cursor, oldcursor
    write(6,*) 'The cursor will now be changed to an hour glass shape'
```

```
    write(6,*) 'Hit <return> to see the next change'
    cursor = LoadCursor(0, IDC_WAIT)
    oldcursor = SetMouseCursor(cursor)
    read(5,*)

    write(6,*) 'The cursor will now be changed to a cross-hair shape'
    write(6,*) 'Hit <return> to see the next change'
    cursor = LoadCursor(0, IDC_CROSS)
    oldcursor = SetMouseCursor(cursor)
    read(5,*)

    write(6,*) 'The cursor will now be turned off'
    write(6,*) 'Hit <return> to see the next change'
    oldcursor = SetMouseCursor(0)
    read(5,*)

    write(6,*) 'The cursor will now be turned on'
    write(6,*) 'Hit <return> to see the next change'
    oldcursor = SetMouseCursor(oldcursor)
    read(5,*)

  stop
  end
```

SETPIXEL, SETPIXEL_W

Graphics Functions: Set a pixel at a specified location to the current graphics color index. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETPIXEL (*x*, *y*)

result = SETPIXEL_W (*wx*, *wy*)

x, *y*

(Input) INTEGER(2). Viewport coordinates for target pixel.

wx, *wy*

(Input) REAL(8). Window coordinates for target pixel.

Results:

The result type is INTEGER(2). The result is the previous color index of the target pixel if successful; otherwise, –1 (for example, if the pixel lies outside the clipping region).

SETPIXEL sets the specified pixel to the current graphics color index. The current graphics color index is set with SETCOLOR and retrieved with GETCOLOR. The non-RGB color functions (such as SETCOLOR and SETPIXELS) use color indexes rather than true color values.

If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit Red-Green-Blue (RGB) value with an RGB color function, rather than a palette index with a non-RGB color function. SETPIXELRGB and SETPIXELRGB_W give access to the full color capacity of the system by using direct color values rather than indexes to a palette.

NOTE. *The* SETPIXEL *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the SetPixel routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$SetPixel. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "SETPIXELRGB, SETPIXELRGB_W", "GETPIXEL, GETPIXEL_W", "SETPIXELS", "GETPIXELS", "GETCOLOR", "SETCOLOR"

Example

```
! Build as a Graphics ap.
USE IFQWIN
INTEGER(2) status, x, y
status = SETCOLOR(INT2(2))
x = 10
! Draw pixels.
DO y = 50, 389, 3
   status = SETPIXEL( x, y )
   x = x + 2
END DO
READ (*,*) ! Wait for ENTER to be pressed
END
```

SETPIXELRGB, SETPIXELRGB_W

Graphics Functions: Set a pixel at a specified location to the specified Red-Green-Blue (RGB) color value. These functions are only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETPIXELRGB (*x*, *y*, *color*)
result = SETPIXELRGB_W (*wx*, *wy*, *color*)

x, *y*

(Input) INTEGER(2). Viewport coordinates for target pixel.

wx, *wy*

(Input) REAL(8). Window coordinates for target pixel.

color

(Input) INTEGER(4). RGB color value to set the pixel to. Range and result depend on the system's display adapter.

Results:

The result type is INTEGER(4). The result is the previous RGB color value of the pixel.

In each RGB color value, each of the three colors, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the value you specify with SETPIXELRGB or SETPIXELRGB_W, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 1111111 (hex Z'FF') the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

If any of the pixels are outside the clipping region, those pixels are ignored.

SETPIXELRGB (and the other RGB color selection functions such as SETPIXELSRGB, SETCOLORRGB) sets the color to a value chosen from the entire available range. The non-RGB color functions (such as SETPIXELS and SETCOLOR) use color indexes rather than true color values.

If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit RGB value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETPIXELRGB, GETPIXELRGB_W", "GETPIXELSRGB", "SETCOLORRGB", "SETPIXELSRGB"

Example

```
! Build as a Graphics ap.
USE IFQWIN
INTEGER(2) x, y
INTEGER(4) color
DO i = 10, 30, 10
  SELECT CASE (i)
     CASE(10)
       color = Z'0000FF'
     CASE(20)
       color = Z'00FF00'
     CASE (30)
       color = Z'FF0000'
  END SELECT
! Draw pixels.
   DO y = 50, 180, 2
     status = SETPIXELRGB( x, y, color )
     x      = x + 2
   END DO
END DO
READ (*,*) ! Wait for ENTER to be pressed
END
```

SETPIXELS

Graphics Subroutine: Sets the color indexes of multiple pixels. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETPIXELS (*n*, *x*, *y*, *color*)

n

(Input) INTEGER(4). Number of pixels to set. Sets the number of elements in the other arguments.

x, *y*

(Input) INTEGER(2). Parallel arrays containing viewport coordinates of pixels to set.

color

(Input) INTEGER(2). Array containing color indexes to set the pixels to.

SETPIXELS sets the pixels specified in the arrays *x* and *y* to the color indexes in *color*. These arrays are parallel: the first element in each of the three arrays refers to a single pixel, the second element refers to the next pixel, and so on.

If any of the pixels are outside the clipping region, those pixels are ignored. Calls to SETPIXELS with n less than 1 are also ignored. SETPIXELS is a much faster way to set multiple pixel color indexes than individual calls to SETPIXEL.

Unlike SETPIXELS, SETPIXELSRGB gives access to the full color capacity of the system by using direct color values rather than indexes to a palette. The non-RGB color functions (such as SETPIXELS and SETCOLOR) use color indexes rather than true color values.

If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit RGB value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETPIXELS", "SETPIXEL, SETPIXEL_W", "SETPIXELSRGB"

Example

```
! Build as a Graphics ap.
USE IFQWIN
INTEGER(2) color(9)
INTEGER(2) x(9), y(9), i
DO i = 1, 9
   x(i) = 20 * i
   y(i) = 10 * i
   color(i) = INT2(i)
END DO
```

```
CALL SETPIXELS(9, x, y, color)
END
```

SETPIXELSRGB

Graphics Subroutine: Sets multiple pixels to the given Red-Green-Blue (RGB) color. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETPIXELSRGB (*n*, *x*, *y*, *color*)

n

(Input) INTEGER(4). Number of pixels to be changed. Determines the number of elements in arrays *x* and *y*.

x, *y*

(Input) INTEGER(2). Parallel arrays containing viewport coordinates of the pixels to set.

color

(Input) INTEGER(4). Array containing the RGB color values to set the pixels to. Range and result depend on the system's display adapter.

SETPIXELSRGB sets the pixels specified in the arrays *x* and *y* to the RGB color values in *color*. These arrays are parallel: the first element in each of the three arrays refers to a single pixel, the second element refers to the next pixel, and so on.

In each RGB color value, each of the three color values, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the value you set with SETPIXELSRGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 1111111 (hex Z'FF') the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

A good use for SETPIXELSRGB is as a buffering form of SETPIXELRGB, which can improve performance substantially. The example code shows how to do this.

If any of the pixels are outside the clipping region, those pixels are ignored. Calls to SETPIXELSRGB with *n* less than 1 are also ignored.

SETPIXELSRGB (and the other RGB color selection functions such as SETPIXELRGB and SETCOLORRGB) sets colors to values chosen from the entire available range. The non-RGB color functions (such as SETPIXELS and SETCOLOR) use color indexes rather than true color values.

If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit RGB value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETPIXELSRGB", "SETPIXELRGB, SETPIXELRGB_W", "GETPIXELRGB, GETPIXELRGB_W", "SETPIXELS"

Example

```
! Buffering replacement for SetPixelRGB and
! SetPixelRGB_W. This can improve performance by
! doing batches of pixels together.

USE IFQWIN
PARAMETER (I$SIZE = 200)
INTEGER(4) bn, bc(I$SIZE), status
INTEGER(2) bx(I$SIZE),by(I$SIZE)

bn = 0
DO i = 1, I$SIZE
   bn = bn + 1
   bx(bn) = i
   by(bn) = i
   bc(bn) = GETCOLORRGB()
   status = SETCOLORRGB(bc(bn)+1)
END DO
CALL SETPIXELSRGB(bn,bx,by,bc)
END
```

SETTEXTCOLOR

Graphics Function: Sets the current text color index. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETTEXTCOLOR (*index*)

index

(Input) INTEGER(2). Color index to set the text color to.

Results:

The result type is INTEGER(2). The result is the previous text color index.

SETTEXTCOLOR sets the current text color index. The default value is 15, which is associated with white unless the user remaps the palette. GETTEXTCOLOR returns the text color index set by SETTEXTCOLOR. SETTEXTCOLOR affects text output with OUTTEXT, WRITE, and PRINT.

The background color index is set with SETBKCOLOR and returned with GETBKCOLOR. The color index of graphics over the background color is set with SETCOLOR and returned with GETCOLOR. These non-RGB color functions use color indexes, not true color values, and limit the user to colors in the palette, at most 256. To access all system colors, use SETTEXTCOLORRGB, SETBKCOLORRGB, and SETCOLORRGB.

NOTE. *The* SETTEXTCOLOR *routine described here is a QuickWin routine. If you are trying to use the Win32* SDK version of the SetTextColor routine by including the IFWIN module, you need to specify the routine name as* MSFWIN$SetTextColor. *For more information, see "Special Naming Convention for Certain QuickWin and Win32 Graphics Routines" in your user's guide.*

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETTEXTCOLOR", "REMAPPALETTERGB", "SETCOLOR", "SETTEXTCOLORRGB"

Example

```
! Build as a Graphics ap.
USE IFQWIN
```

```
INTEGER(2) oldtc
oldtc = SETTEXTCOLOR(INT2(2)) ! green
WRITE(*,*) "hello, world"
END
```

SETTEXTCOLORRGB

Graphics Function: Sets the current text color to the specified Red-Green-Blue (RGB) value. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETTEXTCOLORRGB (*color*)

color

(Input) INTEGER(4). RGB color value to set the text color to. Range and result depend on the system's display adapter.

Results:

The result type is INTEGER(4). The result is the previous text RGB color value.

In each RGB color value, each of the three colors, red, green, and blue, is represented by an eight-bit value (2 hex digits). In the value you specify with SETTEXTCOLORRGB, red is the rightmost byte, followed by green and blue. The RGB value's internal structure is as follows:

Bit	31 (MSB) 24	23 16	15 8	7 0
RGB	O O O O O O O O	B B B B B B B B	G G G G G G G G	R R R R R R R R

Larger numbers correspond to stronger color intensity with binary 1111111 (hex Z'FF') the maximum for each of the three components. For example, Z'0000FF' yields full-intensity red, Z'00FF00' full-intensity green, Z'FF0000' full-intensity blue, and Z'FFFFFF' full-intensity for all three, resulting in bright white.

SETTEXTCOLORRGB sets the current text RGB color. The default value is Z'00FFFFFF', which is full-intensity white. SETTEXTCOLORRGB sets the color used by OUTTEXT, WRITE, and PRINT. It does not affect the color of text output with the OUTGTEXT font routine. Use SETCOLORRGB to change the color of font output.

SETBKCOLORRGB sets the RGB color value of the current background for both text and graphics. SETCOLORRGB sets the RGB color value of graphics over the background color, used by the graphics functions such as ARC, FLOODFILLRGB, and OUTGTEXT.

SETTEXTCOLORRGB (and the other RGB color selection functions SETBKCOLORRGB and SETCOLORRGB) sets the color to a value chosen from the entire available range. The non-RGB color functions (SETTEXTCOLOR, SETBKCOLOR, and SETCOLOR) use color indexes rather than true color values.

If you use color indexes, you are restricted to the colors available in the palette, at most 256. Some display adapters (SVGA and true color) are capable of creating 262,144 (256K) colors or more. To access any available color, you need to specify an explicit RGB value with an RGB color function, rather than a palette index with a non-RGB color function.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "SETBKCOLORRGB", "SETCOLORRGB", "GETTEXTCOLORRGB", "GETWINDOWCONFIG", "OUTTEXT"

Example

```
! Build as a Graphics ap.
USE IFQWIN
INTEGER(4) oldtc

oldtc = SETTEXTCOLORRGB(Z'000000FF')
WRITE(*,*) 'I am red'
oldtc = SETTEXTCOLORRGB(Z'0000FF00')
CALL OUTTEXT ('I am green'//CHAR(13)//CHAR(10))
oldtc = SETTEXTCOLORRGB(Z'00FF0000')
PRINT *, 'I am blue'
END
```

SETTEXTCURSOR

Graphics Function: Sets the height and width of the text cursor (the caret) for the window in focus. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETTEXTCURSOR (*newcursor*)

newcursor

(Input) INTEGER(2). The leftmost 8 bits specify the width of the cursor, and the rightmost 8 bits specify the height of the cursor. These dimensions can range from 1 to 8, and represent a fraction of the current character cell size. For example:

- Z'0808' – Specifies the full character cell; this is the default size.

- Z'0108' – Specifies 1/8th of the character cell width, and 8/8th (or all) of the character cell height.

If either of these dimensions is outside the range 1 to 8, it is forced to 8.

Results:

The result type is INTEGER(2); it is the previous text cursor value in the same format as *newcursor*.

NOTE. *After calling* SETTEXTCURSOR, *you must call* DISPLAYCURSOR($GCURSORON) *to actually see the cursor.*

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "DISPLAYCURSOR"

Example

```
use IFQWIN
integer(2) oldcur
integer(2) istat
type(rccoord) rc
open(10,file='user')
istat  = displaycursor($GCURSORON)
write(10,*) 'Text cursor is now character cell size, the default.'
read(10,*)
write(10,*) 'Setting text cursor to wide and low.'
oldcur = settextcursor(Z'0801')
istat  = displaycursor($GCURSORON)
read(10,*)
write(10,*) 'Setting text cursor to high and narrow.'
oldcur = settextcursor(Z'0108')
istat  = displaycursor($GCURSORON)
read(10,*)
write(10,*) 'Setting text cursor to a dot.'
oldcur = settextcursor(Z'0101')
istat  = displaycursor($GCURSORON)
read(10,*)
end
```

SETTEXTPOSITION

Graphics Subroutine: Sets the current text position to a specified position relative to the current text window. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETTEXTPOSITION (*row*, *column*, *t*)

row

(Input) INTEGER(2). New text row position.

column

(Input) INTEGER(2). New text column position.

t

(Output) Derived type `rccoord`. Previous text position. The derived type `rccoord` is defined in `IFQWIN.F90` as follows:

```
TYPE rccoord
  INTEGER(2) row ! Row coordinate
  INTEGER(2) col ! Column coordinate
END TYPE rccoord
```

Subsequent text output with the OUTTEXT function (as well as standard console I/O statements, such as PRINT and WRITE) begins at the point (*row*, *column*).

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "CLEARSCREEN", "GETTEXTPOSITION", "OUTTEXT", "SCROLLTEXTWINDOW", "SETTEXTWINDOW", "WRAPON"

Example

```
USE IFQWIN
TYPE (rccoord) curpos

WRITE(*,*) "Original text position"
CALL SETTEXTPOSITION (INT2(6), INT2(5), curpos)
WRITE (*,*) 'New text position'
END
```

SETTEXTWINDOW

Graphics Subroutine: Sets the current text window. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETTEXTWINDOW (*r1*, *c1*, *r2*, *c2*)

r1, *c1*

(Input) INTEGER(2). Row and column coordinates for upper-left corner of the text window.

r2, *c2*

(Input) INTEGER(2). Row and column coordinates for lower-right corner of the text window.

SETTEXTWINDOW specifies a window in row and column coordinates where text output to the screen using OUTTEXT, WRITE, or PRINT will be displayed. You set the text location within this window with SETTEXTPOSITION.

Text is output from the top of the window down. When the window is full, successive lines overwrite the last line.

SETTEXTWINDOW does not affect the output of the graphics text routine OUTGTEXT. Use the SETVIEWPORT function to control the display area for graphics output.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETTEXTPOSITION", "GETTEXTWINDOW", "GRSTATUS", "OUTTEXT", "SCROLLTEXTWINDOW", "SETTEXTPOSITION", "SETVIEWPORT", "WRAPON"

Example

```
USE IFQWIN
TYPE (rccoord) curpos

CALL SETTEXTWINDOW(INT2(5), INT2(1), INT2(7), &
                   INT2(40))
CALL SETTEXTPOSITION (INT2(5), INT2(5), curpos)
WRITE(*,*) "Only two lines in this text window"
WRITE(*,*) "so this line will be overwritten"
WRITE(*,*) "by this line"
END
```

SETTIM

Portability Function: Sets the system time in your programs.

Module: USE IFPORT

Syntax

result = SETTIM (*ihr*, *imin*, *isec*, *i100th*)

ihr

(Input) INTEGER(4) or INTEGER(2). Hour (0-23).

imin

(Input) INTEGER(4) or INTEGER(2). Minute (0-59).

isec

(Input) INTEGER(4) or INTEGER(2). Second (0-59).

i100th

(Input) INTEGER(4) or INTEGER(2). Hundredth of a second (0-99).

Results:

The result type is LOGICAL(4). The result is .TRUE. if the system time is changed; .FALSE. if no change is made.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "GETDAT", "GETTIM", "SETDAT"

Example

```
USE IFPORT
LOGICAL(4) success
success = SETTIM(INT2(21),INT2(53+3),&
                 INT2(14*2),INT2(88))
END
```

SETVIEWORG

Graphics Subroutine: Moves the viewport-coordinate origin (0, 0) to the specified physical point. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETVIEWORG (*x*, *y*, *t*)

x, y

(Input) INTEGER(2). Physical coordinates of new viewport origin.

t

(Output) Derived type `xycoord`. Physical coordinates of the previous viewport origin. The derived type `xycoord` is defined in `IFQWIN.F90` as follows:

```
TYPE xycoord
   INTEGER(2) xcoord ! x-coordinate
   INTEGER(2) ycoord ! y-coordinate
END TYPE xycoord
```

The `xycoord` type variable *t*, defined in `IFQWIN.F90`, returns the physical coordinates of the previous viewport origin.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETCURRENTPOSITION, GETCURRENTPOSITION_W", "GETPHYSCOORD", "GETVIEWCOORD, GETVIEWCOORD_W", "GETWINDOWCOORD", "GRSTATUS", "SETCLIPRGN", "SETVIEWPORT"

Example

```
USE IFQWIN
TYPE (xycoord) xy

CALL SETVIEWORG(INT2(30), INT2(30), xy)
```

SETVIEWPORT

Graphics Subroutine: Redefines the graphics viewport by defining a clipping region in the same manner as SETCLIPRGN and then setting the viewport-coordinate origin to the upper-left corner of the region. This subroutine is only available on Windows* systems.

Module: USE IFQWIN

Syntax

CALL SETVIEWPORT (*x1, y1, x2, y2*)

x1, y1

(Input) INTEGER(2). Physical coordinates for upper-left corner of viewport.

x2, y2

(Input) INTEGER(2). Physical coordinates for lower-right corner of viewport.

The physical coordinates (*x1*, *y1*) and (*x2*, *y2*) are the upper-left and lower-right corners of the rectangular clipping region. Any window transformation done with the SETWINDOW function is relative to the viewport, not the entire screen.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETVIEWCOORD, GETVIEWCOORD_W", "GETPHYSCOORD", "GRSTATUS", "SETCLIPRGN", "SETVIEWORG", "SETWINDOW"

Example

```
USE IFQWIN
INTEGER(2) upx, upy
INTEGER(2) downx, downy

upx = 0
upy = 30
downx= 250
downy = 100
CALL SETVIEWPORT(upx, upy, downx, downy)
```

SETWINDOW

Graphics Function: Defines a window bound by the specified coordinates. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETWINDOW (*finvert*, *wx1*, *wy1*, *wx2*, *wy2*)

finvert

(Input) LOGICAL(2). Direction of increase of the y-axis. If *finvert* is .TRUE., the y-axis increases from the window bottom to the window top (as Cartesian coordinates). If *finvert* is .FALSE., the y-axis increases from the window top to the window bottom (as pixel coordinates).

wx1, *wy1*

(Input) REAL(8). Window coordinates for upper-left corner of window.

wx2, *wy2*

(Input) REAL(8). Window coordinates for lower-right corner of window.

Results:

The result type is INTEGER(2). The result is nonzero if successful; otherwise, 0 (for example, if the program that calls SETWINDOW is not in a graphics mode).

The SETWINDOW function determines the coordinate system used by all window-relative graphics routines. Any graphics routines that end in _W (such as ARC_W, RECTANGLE_W, and LINETO_W) use the coordinate system set by SETWINDOW.

Any window transformation done with the SETWINDOW function is relative to the viewport, not the entire screen.

An arc drawn using inverted window coordinates is not an upside-down version of an arc drawn with the same parameters in a noninverted window. The arc is still drawn counterclockwise, but the points that define where the arc begins and ends are inverted.

If *wx1* equals *wx2* or *wy1* equals *wy2*, SETWINDOW fails.

Compatibility

`STANDARD GRAPHICS  QUICKWIN GRAPHICS  LIB`

See Also: "GETWINDOWCOORD", "SETCLIPRGN", "SETVIEWORG", "SETVIEWPORT", "GRSTATUS"

Example

```
USE IFQWIN
INTEGER(2) status
LOGICAL(2) invert /.TRUE./
REAL(8) upx /0.0/, upy /0.0/
REAL(8) downx /1000.0/, downy /1000.0/
status = SETWINDOW(invert, upx, upy, downx, downy)
```

SETWINDOWCONFIG

QuickWin Function: Sets the properties of a child window. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETWINDOWCONFIG (*wc*)

wc

(Input) Derived type `windowconfig`. Contains window properties. The `windowconfig` derived type is defined in `IFQWIN.F90` as follows:

```
TYPE windowconfig
  INTEGER(2) numxpixels             ! Number of pixels on x-axis.
  INTEGER(2) numypixels             ! Number of pixels on y-axis.
  INTEGER(2) numtextcols        ! Number of text columns available.
  INTEGER(2) numtextrows        ! Number of text rows available.
  INTEGER(2) numcolors              ! Number of color indexes.
  INTEGER(4) fontsize           ! Size of default font. Set to
                                ! QWIN$EXTENDFONT when specifying
                                ! extended attributes, in which
                                ! case extendfontsize sets the
                                ! font size.
  CHARACTER(80) title              ! The window title.
  INTEGER(2) bitsperpixel       ! The number of bits per pixel.
  INTEGER(2) numvideopages         ! Unused.
  INTEGER(2) mode               ! Controls scrolling mode (see
                                ! wc%mode below).
  INTEGER(2) adapter               ! Unused.
  INTEGER(2) monitor               ! Unused.
  INTEGER(2) memory                ! Unused.
  INTEGER(2) environment           ! Unused.
! The next three parameters provide extended font
! attributes.
  CHARACTER(32) extendfontname     ! The name of the desired font.
  INTEGER(4) extendfontsize     ! Takes the same values as fontsize,
                                ! when fontsize is set to
                                ! QWIN$EXTENDFONT.
  INTEGER(4) extendfontattributes   ! Font attributes such as bold
                                    ! and italic.
END TYPE windowconfig
```

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

The following value can be used to configure a QuickWin window so that it will show the last line written and the text cursor (if it is on):

```
wc%mode = QWIN$SCROLLDOWN
```

Be aware that if you scroll the window to another position, you will have to scroll back to the last line to see your input.

The following values can be used with SETWINDOWCONFIG extended fonts:

Style:	
QWIN$EXTENDFONT_NORMAL	Gives no underline, no italic, and a font weight of 400 out of 1000.
QWIN$EXTENDFONT_UNDERLINE	Gives underlined characters.
QWIN$EXTENDFONT_BOLD	Gives a font weight of 700 out of 1000.
QWIN$EXTENDFONT_ITALIC	Gives italic characters.
Pitch:	
QWIN$EXTENDFONT_FIXED_PITCH	QuickWin default. Equal character widths.
QWIN$EXTENDFONT_VARIABLE_PITCH	Variable character widths.
Font Families:	
QWIN$EXTENDFONT_FF_ROMAN	Variable stroke width, serifed. Times Roman, Century Schoolbook, etc.
QWIN$EXTENDFONT_FF_SWISS	Variable stroke width, sans-serifed. Helvetica, Swiss, etc.
QWIN$EXTENDFONT_FF_MODERN	QuickWin default. Constant stroke width, serifed or sans-serifed. Pica, Elite, Courier, etc.
QWIN$EXTENDFONT_FF_SCRIPT	Cursive, etc.
QWIN$EXTENDFONT_FF_DECORATIVE	Old English, etc.
Character Sets:	
QWIN$EXTENDFONT_ANSI_CHARSET	QuickWin default.
QWIN$EXTENDFONT_OEM_CHARSET	Use this to get Microsoft* LineDraw.

Using QWIN$EXTENDFONT_OEM_CHARSET with the font name 'MS LineDraw'C will get the old DOS-style character set with symbols that can be used to draw lines and boxes. The pitch and font family items can be specified to help guide the font matching algorithms used by CreateFontIndirect, the Win32* API used by SETWINDOWCONFIG.

If you use SETWINDOWCONFIG to set the variables in `windowconfig` to –1, the function sets the highest resolution possible for your system, given the other fields you specify, if any. You can set the actual size of the window by specifying parameters that influence the window size: the number of x and y pixels, the number of rows and columns, and the font size. If you do not call SETWINDOWCONFIG, the window defaults to the best possible resolution and a font size of 8x16. The number of colors available depends on the video driver used.

If you use SETWINDOWCONFIG, you should specify a value for each field (–1 or your own value for the numeric fields and a C string for the title, for example, "words of text"C). Using SETWINDOWCONFIG with only some fields specified can result in useless values for the unspecified fields.

If you request a configuration that cannot be set, SETWINDOWCONFIG returns .FALSE. and calculates parameter values that will work and are as close as possible to the requested configuration. A second call to SETWINDOWCONFIG establishes the adjusted values; for example:

```
status = SETWINDOWCONFIG(wc)
if (.NOT.status) status = SETWINDOWCONFIG(wc)
```

If you specify values for all four of the size parameters, *numxpixels*, *numypixel*, *numtextcols*, and *numtextrows*, the font size is calculated by dividing these values.The default font is Courier New and the default font size is 8x16. There is no restriction on font size, except that the window must be large enough to hold it.

Under Standard Graphics, the application attempts to start in Full Screen mode with no window decoration (window decoration includes scroll bars, menu bar, title bar, and message bar) so that the maximum resolution can be fully used. Otherwise, the application starts in a window. You can use `ALT+ENTER` at any time to toggle between the two modes.

If you are in Full Screen mode and the resolution of the window does not match the resolution of the video driver, graphics output will be slow compared to drawing in a window.

NOTE. *You must call* DISPLAYCURSOR($GCURSORON) *to make the cursor visible after calling* SETWINDOWCONFIG.

Compatibility

`STANDARD GRAPHICS QUICKWIN GRAPHICS LIB`

See Also: "GETWINDOWCONFIG", "DISPLAYCURSOR", "Using QuickWin" in your user's guide

Example

```
USE IFQWIN
TYPE (windowconfig) wc
LOGICAL status /.FALSE./
! Set the x & y pixels to 800X600 and font size to 8x12
wc%numxpixels  = 800
wc%numypixels  = 600
wc%numtextcols = -1
```

```
wc%numtextrows = -1
wc%numcolors   = -1
wc%title= "This is a test"C
wc%fontsize = Z'0008000C'
status = SETWINDOWCONFIG(wc)  ! attempt to set configuration with above values
     ! if attempt fails, set with system estimated values
if (.NOT.status) status = SETWINDOWCONFIG(wc)
```

SETWINDOWMENUQQ

QuickWin Function: Sets a top-level menu as the menu to which a list of current child window names is appended. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETWINDOWMENUQQ (*menuID*)

menuID

(Input) INTEGER(4). Identifies the menu to hold the child window names, starting with 1 as the leftmost menu.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

The list of current child window names can appear in only one menu at a time. If the list of windows is currently in a menu, it is removed from that menu. By default, the list of child windows appears at the end of the Window menu.

Compatibility

QUICKWIN GRAPHICS LIB

See Also: "APPENDMENUQQ", "Using QuickWin" and "Customizing QuickWin Applications" in your user's guide,

Example

```
USE IFQWIN
TYPE (windowconfig) wc
LOGICAL(4) result, status /.FALSE./
! Set title for child window
wc%numxpixels  = -1
wc%numypixels  = -1
wc%numtextcols = -1
```

```
wc%numtextrows = -1
wc%numcolors   = -1
wc%fontsize    = -1
wc%title= "I am child window name"C
if (.NOT.status) status = SETWINDOWCONFIG(wc)

! put child window list under menu 3 (View)
result = SETWINDOWMENUQQ(3)
END
```

SETWRITEMODE

Graphics Function: Sets the current logical write mode, which is used when drawing lines with the LINETO, POLYGON, and RECTANGLE functions. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETWRITEMODE (*wmode*)

wmode

(Input) INTEGER(2). Write mode to be set. One of the following symbolic constants (defined in `IFQWIN.F90`):

- $GPSET – Causes lines to be drawn in the current graphics color. (Default)
- $GAND – Causes lines to be drawn in the color that is the logical AND of the current graphics color and the current background color.
- $GOR – Causes lines to be drawn in the color that is the logical OR of the current graphics color and the current background color.
- $GPRESET – Causes lines to be drawn in the color that is the logical NOT of the current graphics color.
- $GXOR – Causes lines to be drawn in the color that is the logical exclusive OR (XOR) of the current graphics color and the current background color.

In addition, one of the following binary raster operation constants can be used (described in the online documentation for the Win32* API SetROP2):

- $GR2_BLACK
- $GR2_NOTMERGEPEN
- $GR2_MASKNOTPEN
- $GR2_NOTCOPYPEN (same as $GPRESET)
- $GR2_MASKPENNOT

- $GR2_NOT
- $GR2_XORPEN (same as $GXOR)
- $GR2_NOTMASKPEN
- $GR2_MASKPEN (same as $GAND)
- $GR2_NOTXORPEN
- $GR2_NOP
- $GR2_MERGENOTPEN
- $GR2_COPYPEN (same as $GPSET)
- $GR2_MERGEPENNOT
- $GR2_MERGEPEN (same as $GOR)
- $GR2_WHITE

Results:

The result type is INTEGER(2). The result is the previous write mode if successful; otherwise, -1.

The current graphics color is set with SETCOLORRGB (or SETCOLOR) and the current background color is set with SETBKCOLORRGB (or SETBKCOLOR). As an example, suppose you set the background color to yellow (Z'00FFFF') and the graphics color to purple (Z'FF00FF') with the following commands:

```
oldcolor = SETBKCOLORRGB(Z'00FFFF')
CALL CLEARSCREEN($GCLEARSCREEN)
oldcolor = SETCOLORRGB(Z'FF00FF')
```

If you then set the write mode with the $GAND option, lines are drawn in red (Z'0000FF'); with the $GOR option, lines are drawn in white (Z'FFFFFF'); with the $GXOR option, lines are drawn in turquoise (Z'FFFF00'); and with the $GPRESET option, lines are drawn in green (Z'00FF00'). Setting the write mode to $GPSET causes lines to be drawn in the graphics color.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "GETWRITEMODE", "GRSTATUS", "LINETO, LINETO_W", "POLYGON, POLYGON_W", "PUTIMAGE, PUTIMAGE_W", "RECTANGLE, RECTANGLE_W", "SETCOLOR", "SETLINESTYLE"

Example

```
! Build as a Graphics ap.
USE IFQWIN
INTEGER(2) result, oldmode
INTEGER(4) oldcolor
TYPE (xycoord) xy
```

```
oldcolor = SETBKCOLORRGB(Z'00FFFF')
CALL CLEARSCREEN ($GCLEARSCREEN)
oldcolor = SETCOLORRGB(Z'FF00FF')
CALL MOVETO(INT2(0), INT2(0), xy)
result = LINETO(INT2(200), INT2(200)) ! purple

oldmode = SETWRITEMODE( $GAND)
CALL MOVETO(INT2(50), INT2(0), xy)
result = LINETO(INT2(250), INT2(200)) ! red
END
```

SETWSIZEQQ

QuickWin Function: Sets the size and position of a window. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = SETWSIZEQQ (*unit*, *winfo*)

unit

(Input) INTEGER(4). Specifies the window unit. Unit numbers 0, 5, and 6 refer to the default startup window only if the program does not explicitly open them with the OPEN statement. To set the size of the frame window (as opposed to a child window), set *unit* to the symbolic constant QWIN$FRAMEWINDOW (defined in `IFQWIN.F90`).

When called from INITIALSETTINGS, SETWSIZEQQ behaves slightly differently than when called from a user routine after initialization. See below under Results.

winfo

(Input) Derived type `qwinfo`. Physical coordinates of the window's upper-left corner, and the current or maximum height and width of the window's client area (the area within the frame). The derived type `qwinfo` is defined in `IFQWIN.F90` as follows:

```
TYPE QWINFO
  INTEGER(2) TYPE  ! request type
  INTEGER(2) X     ! x coordinate for upper left
  INTEGER(2) Y     ! y coordinate for upper left
  INTEGER(2) H     ! window height
  INTEGER(2) W     ! window width
END TYPE QWINFO
```

This function's behavior depends on the value of `QWINFO%TYPE`, which can be any of the following:

- QWIN$MIN – Minimizes the window.
- QWIN$MAX – Maximizes the window.
- QWIN$RESTORE – Restores the minimized window to its previous size.
- QWIN$SET – Sets the window's position and size according to the other values in `qwinfo`.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, nonzero (unless called from INITIALSETTINGS). If called from INITIALSETTINGS, the following occurs:

- SETWSIZEQQ always returns –1.
- Only QWIN$SET will work.

The position and dimensions of child windows are expressed in units of character height and width. The position and dimensions of the frame window are expressed in screen pixels.

The height and width specified for a frame window reflects the actual size in pixels of the frame window *including* any borders, menus, and status bar at the bottom.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "GETWSIZEQQ", "INITIALSETTINGS", "Using QuickWin" in your user's guide

Example

```
USE IFQWIN
LOGICAL(4)     result
INTEGER(2)     numfonts, fontnum
TYPE (qwinfo)  winfo
TYPE (xycoord) pos
! Maximize frame window
winfo%TYPE = QWIN$MAX
result =     SETWSIZEQQ(QWIN$FRAMEWINDOW, winfo)
! Maximize child window
result =   SETWSIZEQQ(0, winfo)
numfonts = INITIALIZEFONTS( )
fontnum =  SETFONT ('t''Arial''h50w34i')
CALL MOVETO (INT2(10), INT2(30), pos)
CALL OUTGTEXT("BIG Window")
END
```

SHORT

Portability Function: Converts an INTEGER(4) argument to INTEGER(2) type.

Module: USE IFPORT

Syntax

result = SHORT (*int4*)

int4

(Input) INTEGER(4). Value to be converted.

Results:

The result type is INTEGER(2). The result is equal to the lower 16 bits of *int4*. If the *int4* value is greater than 32,767, the converted INTEGER(2) value is not equal to the original.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: the INT intrinsic function and the TYPE statement in the *Language Reference*

Example

```
     USE IFPORT
     INTEGER(4) THIS_ONE
     INTEGER(2) THAT_ONE
     READ(*,*) THIS_ONE
     THAT_ONE = SHORT(THIS_ONE)
     WRITE(*,10) THIS_ONE, THAT_ONE
10   FORMAT (X," Long integer: ", I16, " Short integer: ", I16)
     END
```

SIGNAL

Portability Function: Controls interrupt signal handling. Changes the action for a specified signal.

Module: USE IFPORT

Syntax

result = SIGNAL (*signum*, *proc*, *flag*)

signum

(Input) INTEGER(4). Number of the signal to change. The numbers and symbolic names for the signals are listed in a table below.

proc

(Input) Name of a signal-processing routine. It must be declared EXTERNAL. This routine is called only if *flag* is negative.

flag

(Input) INTEGER(4). If negative, the user's *proc* routine is called. If 0, the signal retains its default action; if 1, the signal should be ignored.

Results:

The result type is INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The result is the previous value of *proc* associated with the specified signal. For example, if the previous value of *proc* was SIG_IGN, the return value is also SIG_IGN. You can use this return value in subsequent calls to SIGNAL if the signal number supplied is invalid, if the flag value is greater than 1, or to restore a previous action definition.

A return value of SIG_ERR indicates an error, in which case a call to IERRNO returns EINVAL. If the signal number supplied is invalid, or if the flag value is greater than 1, SIGNAL returns –(EINVAL) and a call to IERRNO returns EINVAL.

An initial signal handler is in place at startup for SIGFPE (signal 8); its address is returned the first time SIGNAL is called for SIGFPE. No other signals have initial signal handlers.

Be careful when you use SIGNALQQ or the C signal function to set a handler, and then use the Portability SIGNAL function to retrieve its value. If SIGNAL returns an address that was not previously set by a call to SIGNAL, you cannot use that address with either SIGNALQQ or C's signal function, nor can you call it directly. You can, however, use the return value from SIGNAL in a subsequent call to SIGNAL. This allows you to restore a signal handler, no matter how the original signal handler was set.

All signal handlers are called with a single integer argument, that of the signal number actually received. Usually, when a process receives a signal, it terminates. With the SIGNAL function, a user procedure is called instead. The signal handler routine must accept the signal number integer argument, even if it does not use it. If the routine does not accept the signal number argument, the stack will not be properly restored after the signal handler has executed.

Because signal-handler routines are usually called asynchronously when an interrupt occurs, it is possible that your signal-handler function will get control when a run-time operation is incomplete and in an unknown state. You cannot use the following kinds of signal-handler routines:

- Routines that perform low-level (such as FGETC) or high-level (such as READ) I/O.
- Heap routines or any routine that uses the heap routines (such as MALLOC and ALLOCATE).
- Functions that generate a system call (such as TIME).

The following table lists signal names and values:

Symbolic Name	Number	Description
SIGABRT	6	Abnormal termination
SIGFPE	8	Floating-point error
SIGKILL[1]	9	Kill process
SIGILL	4	Illegal instruction
SIGINT	2	CTRL+C signal
SIGSEGV	11	Illegal storage access
SIGTERM	15	Termination request

1. SIGKILL can be neither caught nor ignored.

The default action for all signals is to terminate the program with exit code.

ABORT does not assert the SIGABRT signal. The only way to assert SIGABRT or SIGTERM is to use KILL.

SIGNAL can be used to catch SIGFPE exceptions, but it cannot be used to access the error code that caused the SIGFPE. To do this, use SIGNALQQ instead.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SIGNALQQ"

Example

```
   USE IFPORT
   EXTERNAL h_abort
   INTEGER(4) iret1, iret2, procnum
   iret1 = SIGNAL(SIGABRT, h_abort, -1)
   WRITE(*,*) 'Set signal handler. Return = ', iret1

   iret2 = KILL(procnum, SIGABRT)
   WRITE(*,*) 'Raised signal. Return = ', iret2
   END
!
!  Signal handler routine
!
   INTEGER(4) FUNCTION h_abort (sig_num)
   INTEGER(4) sig_num

   WRITE(*,*) 'In signal handler for SIG$ABORT'
```

```
WRITE(*,*) 'signum = ', sig_num
h_abort = 1
END
```

SIGNALQQ

Portability Function: Registers the function to be called if an interrupt signal occurs.

Module: USE IFPORT

Syntax

result = SIGNALQQ (*sig*, *func*)

sig

(Input) INTEGER(2). Interrupt type. One of the following constants, defined in `IFPORT.F90`:

- SIG$ABORT - Abnormal termination
- SIG$FPE - Floating-point error
- SIG$ILL - Illegal instruction
- SIG$INT - CTRL+C SIGNAL
- SIG$SEGV - Illegal storage access
- SIG$TERM - Termination request

func

(Input) Function to be executed on interrupt. It must be declared EXTERNAL.

Results:

The result type is INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. The result is a positive integer if successful; otherwise, –1 (SIG$ERR).

SIGNALQQ installs the function *func* as the handler for a signal of the type specified by *sig*. If you do not install a handler, the system by default terminates the program with exit code 3 when an interrupt signal occurs.

The argument *func* is the name of a function and must be declared with either the EXTERNAL or IMPLICIT statements, or have an explicit interface. A function described in an INTERFACE block is EXTERNAL by default, and does not need to be declared EXTERNAL.

NOTE. *All signal-handler functions must be declared with the* cDEC$ ATTRIBUTES C *option.*

When an interrupt occurs, except a SIG$FPE interrupt, the *sig* argument SIG$INT is passed to *func*, and then *func* is executed.

When a SIG$FPE interrupt occurs, the function *func* is passed two arguments: SIG$FPE and the floating-point error code (for example, FPE$ZERODIVIDE or FPE$OVERFLOW) which identifies the type of floating-point exception that occurred. The floating-point error codes begin with the prefix FPE$ and are defined in `IFPORT.F90`. Floating-point exceptions are described and discussed in "The Floating-Point Environment" in your user's guide.

If *func* returns, the calling process resumes execution immediately after the point at which it received the interrupt signal. This is true regardless of the type of interrupt or operating mode.

Because signal-handler routines are normally called asynchronously when an interrupt occurs, it is possible that your signal-handler function will get control when a run-time operation is incomplete and in an unknown state. Therefore, do not call heap routines or any routine that uses the heap routines (for example, I/O routines, ALLOCATE, and DEALLOCATE).

To test your signal handler routine you can generate interrupt signals by calling RAISEQQ, which causes your program either to branch to the signal handlers set with SIGNALQQ, or to perform the system default behavior if SIGNALQQ has set no signal handler.

The example below demonstrates a signal handler for SIG$ABORT. A sample signal handler for SIG$FPE is given in "Handling Floating-Point Exceptions" in your user's guide.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "RAISEQQ", "SIGNAL", "KILL", "GETEXCEPTIONPTRSQQ"

Example

```
!  This program shows a signal handler for
!    SIG$ABORT
USE IFPORT
INTERFACE
  FUNCTION h_abort (signum)
    !DEC$ ATTRIBUTES C :: h_abort
    INTEGER(4) h_abort
    INTEGER(2) signum
  END FUNCTION
END INTERFACE

INTEGER(2) i2ret
INTEGER(4) i4ret
```

```
i4ret = SIGNALQQ(SIG$ABORT, h_abort)
WRITE(*,*) 'Set signal handler. Return = ', i4ret

i2ret = RAISEQQ(SIG$ABORT)
WRITE(*,*) 'Raised signal. Return = ', i2ret
END
!
!  Signal handler routine
!
INTEGER(4) FUNCTION h_abort (signum)
  !DEC$ ATTRIBUTES C :: h_abort
  INTEGER(2) signum
  WRITE(*,*) 'In signal handler for SIG$ABORT'
  WRITE(*,*) 'signum = ', signum
  h_abort = 1
END
```

SLEEP

Portability Subroutine: Suspends the execution of a process for a specified interval.

Module: USE IFPORT

Syntax

CALL SLEEP (*time*)

time

(Input) INTEGER(4). Length of time, in seconds, to suspend the calling process.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SLEEPQQ"

Example

```
USE IFPORT
integer(4) hold_time
hold_time = 1 !lets the loop execute
DO WHILE (hold_time .NE. 0)
  write(*,'(A)') "Enter the number of seconds to suspend"
  read(*,*) hold_time
  CALL SLEEP (hold_time)
```

```
END DO
END
```

SLEEPQQ

Portability Subroutine: Delays execution of the program for a specified duration.

Module: USE IFPORT

Syntax

CALL SLEEPQQ (*duration*)

duration

(Input) INTEGER(4). Number of milliseconds the program is to sleep (delay program execution).

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

Example

```
USE IFPORT
INTEGER(4) delay, freq, duration
delay    = 2000
freq     = 4000
duration = 1000
CALL SLEEPQQ(delay)
CALL BEEPQQ(freq, duration)
END
```

SORTQQ

Portability Subroutine: Sorts a one-dimensional array. The array elements cannot be derived types or record structures.

Module: USE IFPORT

Syntax

CALL SORTQQ (*adrarray*, *count*, *size*)

adrarray

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. Address of the array (returned by LOC).

count

(Input; output) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. On input, number of elements in the array to be sorted. On output, number of elements actually sorted.

size

(Input) INTEGER(4). Positive constant less than 32,767 that specifies the kind of array to be sorted. The following constants, defined in `IFPORT.F90`, specify type and kind for numeric arrays:

Constant	Type of Array
SRT$INTEGER1	INTEGER(1)
SRT$INTEGER2	INTEGER(2) or equivalent
SRT$INTEGER4	INTEGER(4) or equivalent
SRT$REAL4	REAL(4) or equivalent
SRT$REAL8	REAL(8) or equivalent

If the value provided in *size* is not a symbolic constant and is less than 32,767, the array is assumed to be a character array with *size* characters per element.

To be certain that SORTQQ is successful, compare the value returned in *count* to the value you provided. If they are the same, then SORTQQ sorted the correct number of elements.

CAUTION. *The location of the array must be passed by address using the* LOC *intrinsic function. This defeats Fortran type-checking, so you must make certain that the count and size arguments are correct.*

If you pass invalid arguments, SORTQQ *attempts to sort random parts of memory. If the memory it attempts to sort is allocated to the current process, that memory is sorted; otherwise, the operating system intervenes, the program is halted, and you get a General Protection Violation message.*

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "BSEARCHQQ", the LOC intrinsic function in the *Language Reference*

Example

```
!    Sort a 1-D array
!
```

```
USE IFPORT
INTEGER(2) array(10)
INTEGER(2) i
DATA ARRAY /143, 99, 612, 61, 712, 9112, 6, 555, 2223, 67/
!    Sort the array
Call SORTQQ (LOC(array), 10, SRT$INTEGER2)
!    Display the sorted array
DO i = 1, 10
   WRITE (*, 9000) i, array (i)
9000 FORMAT(1X, ' Array(',I2, '): ', I5)
END DO
END
```

SPLITPATHQQ

Portability Function: Breaks a file path or directory path into its components.

Module: USE IFPORT

Syntax

result = SPLITPATHQQ (*path*, *drive*, *dir*, *name*, *ext*)

path

(Input) Character*(*). Path to be broken into components. Forward slashes (/), backslashes (\), or both can be present in *path*.

drive

(Output) Character*(*). Drive letter followed by a colon.

dir

(Output) Character*(*). Path of directories, including the trailing slash.

name

(Output) Character*(*). Name of file or, if no file is specified in *path*, name of the lowest directory. A file name must not include an extension.

ext

(Output) Character*(*). File name extension, if any, including the leading period (.).

Results:

The result type is INTEGER(4). The result is the length of *dir*.

The *path* parameter can be a complete or partial file specification.

$MAXPATH is a symbolic constant defined in module `IFPORT.F90` as 260.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "FULLPATHQQ"

Example

```
USE IFPORT
CHARACTER($MAXPATH) buf
CHARACTER(3)        drive
CHARACTER(256)      dir
CHARACTER(256)      name
CHARACTER(256)      ext
CHARACTER(256)      file

INTEGER(4)          length

buf = 'b:\fortran\test\runtime\tsplit.for'
length = SPLITPATHQQ(buf, drive, dir, name, ext)
WRITE(*,*) drive, dir, name, ext
file = 'partial.f90'
length = SPLITPATHQQ(file, drive, dir, name, ext)
WRITE(*,*) drive, dir, name, ext

END
```

SPORT_CANCEL_IO

Serial Port I/O Function: Cancels any I/O in progress to the specified port. This function is only available on Windows* systems.

Module: USE IFPORT

Syntax

result = SPORT_CANCEL_IO (*port*)

port

(Input) Integer. The port number.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

NOTE. *This call also kills the thread that keeps an outstanding read operation to the serial port. This call must be done before any of the port characteristics are modified.*

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB "

See Also: "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
iresult = SPORT_CANCEL_IO( 2 )
END
```

SPORT_CONNECT

Serial Port I/O Function: Establishes the connection to a serial port and defines certain usage parameters. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_CONNECT (*port* [, *options*])

port

(Input) Integer. The port number of connection. The routine will open COM*n*, where *n* is the port number specified.

options

(Optional; input) Integer. Defines the connection options. These options define how the *nnn*_LINE routines will work and also effect the data that is passed to the user. If more than one option is specified, the operator .OR. should be used between each option. Options are as follows:

Option	Description
DL_TOSS_CR	Removes carriage return (CR) characters on input.

Option	Description
DL_TOSS_LF	Removes linefeed (LF) characters on input.
DL_OUT_CR	Causes SPORT_WRITE_LINE to add a CR to each record written.
DL_OUT_LF	Causes SPORT_WRITE_LINE to add a LF to each record written.
DL_TERM_CR	Causes SPORT_READ_LINE to terminate READ when a CR is encountered.
DL_TERM_LF	Causes SPORT_READ_LINE to terminate READ when a LF is encountered.
DL_TERM_CRLF	Causes SPORT_READ_LINE to terminate READ when CR+LF is encountered.

If *options* is not specified, the following occurs by default:

```
(DL_OUT_CR .OR. DL_TERM_CR .OR. DL_TOSS_CR .OR. DL_TOSS_LF)
```

This specifies to remove carriage returns and linefeeds on input, to follow output lines with a carriage return, and to return input lines when a carriage return is encountered.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "SPORT_RELEASE", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
iresult =  SPORT_CONNECT( 2 )
END
```

SPORT_GET_HANDLE

Serial Port I/O Function: Returns the Win32* handle associated with the communications port. This is the handle that was returned by the Win32 API CreateFile. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_GET_HANDLE (*port*, *handle*)

port

(Input) Integer. The port number.

handle

(Output) INTEGER(4). The Win32 handle that was returned from CreatFile( ) on the serial port. This handle can be used with other Win32 functions to set non-standard parameters for the communications port.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32 error value.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
INTEGER(4) handle
iresult =  SPORT_GET_HANDLE( 2, handle )
END
```

SPORT_GET_STATE

Serial Port I/O Function: Returns the baud rate, parity, data bits setting, and stop bits setting of the communications port. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_GET_STATE (*port* [, *baud*] [, *parity*] [, *dbits*] [, *sbits*])

port

(Input) Integer. The port number.

baud

(Optional; output) Integer. The baud rate of the port.

parity

(Optional; output) Integer. The parity setting of the port (0 - 4 = no, odd, even, mark, space).

dbits

(Optional; output) Integer. The data bits for the port.

sbits

(Optional; output) Integer. The stop bits for the port (0, 1, 2 = 1, 1.5, 2).

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SPORT_SET_STATE", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
INTEGER    baud
INTEGER    parity
INTEGER    dbits
INTEGER    sbits

iresult =  SPORT_GET_STATE( 2, baud, parity, dbits, sbits )
END
```

SPORT_GET_TIMEOUTS

Serial Port I/O Function: Returns the user selectable timeouts for the serial port. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_GET_TIMEOUTS (*port* [, *rx_int*] [, *tx_tot_mult*] [, *tx_tot_const*])

port

(Input) Integer. The port number.

rx_int

(Optional; output) INTEGER(4). The receive interval timeout value.

tx_tot_mult

(Optional; output) INTEGER(4). The transmit multiplier part of the timeout value.

tx_tot_const

(Optional; output) INTEGER(4). The transmit constant part of the timeout value.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SPORT_SET_TIMEOUTS", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
INTEGER*4  rx_int
INTEGER*4  tx_tot_mult
INTEGER*4  tx_tot_const

iresult =  SPORT_GET_TIMEOUTS( 2, rx_int, tx_tot_mult, tx_tot_const )
END
```

SPORT_PEEK_DATA

Serial Port I/O Function: Returns information about the availability of input data. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_PEEK_DATA (*port* [, *present*] [, *count*])

port

(Input) Integer. The port number.

present

(Optional; output) Integer. 1 if data is present, 0 if no data has been read.

count

(Optional; output) Integer. The count of characters that will be returned by SPORT_READ_DATA.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

NOTE. *CR and LF characters may not be returned depending on the mode specified in the* SPORT_CONNECT( ) *call.*

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SPORT_CONNECT", "SPORT_READ_DATA", "SPORT_PEEK_LINE", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
INTEGER    present
INTEGER    count

iresult =  SPORT_PEEK_DATA( 2, present, count )
END
```

SPORT_PEEK_LINE

Serial Port I/O Function: Returns information about the availability of input records. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_PEEK_LINE (*port* [, *present*] [, *count*])

port

(Input) Integer. The port number.

present

(Optional; output) Integer. 1 if data is present, 0 if no data has been read.

count

(Optional; output) Integer. The count of characters that will be returned by SPORT_READ_DATA.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

This routine will only return when a line terminator has been seen - as defined by the mode specified in the SPORT_CONNECT( ) call.

NOTE. *CR and LF characters may not be returned depending on the mode specified in the* SPORT_CONNECT( ) *call.*

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "SPORT_CONNECT", "SPORT_READ_DATA", "SPORT_PEEK_DATA", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
INTEGER    present
INTEGER    count

iresult =  SPORT_PEEK_LINE( 2, present, count )
END
```

SPORT_PURGE

Serial Port I/O Function: Executes the Win32* API communications function PurgeComm on the specified port. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_PURGE (*port*, *function*)

port

(Input) Integer. The port number.

function

(Input) INTEGER(4). The function for PurgeComm (see the Win32 documentation).

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32 error value.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFWINTY
USE IFPORT
INTEGER(4) iresult
iresult =  SPORT_PURGE( 2, (PURGE_TXABORT .or. PURGE_RXABORT) )
END
```

SPORT_READ_DATA

Serial Port I/O Function: Reads available data from the specified port. This routine stalls until at least one character has been read. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_READ_DATA (*port*, *buffer* [, *count*])

port

(Input) Integer. The port number.

buffer

(Output) Character*(*). The data that was read.

count

(Optional; output) Integer. The count of bytes read.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

NOTE. *CR and LF characters may not be returned depending on the mode specified in the* SPORT_CONNECT( ) *call.*

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SPORT_CONNECT", "SPORT_PEEK_DATA", "SPORT_READ_LINE", "SPORT_WRITE_DATA", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4)      iresult
INTEGER         count
CHARACTER*1024  rbuff

iresult = SPORT_READ_DATA( 2, rbuff, count )
END
```

SPORT_READ_LINE

Serial Port I/O Function: Reads a record from the specified port. This routine stalls until at least one record has been read. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_READ_LINE (*port*, *buffer* [, *count*])

port

(Input) Integer. The port number.

buffer

(Output) Character*(*). The data that was read.

count

(Optional; output) Integer. The count of bytes read.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

This routine will only return when a line terminator has been seen – as defined by the mode specified in the SPORT_CONNECT( ) call.

NOTE. *CR and LF characters may not be returned depending on the mode specified in the* SPORT_CONNECT( ) *call.*

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SPORT_CONNECT", "SPORT_PEEK_LINE", "SPORT_READ_DATA", "SPORT_WRITE_LINE", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4)      iresult
INTEGER         count
CHARACTER*1024  rbuff

iresult = SPORT_READ_LINE( 2, rbuff, count )
END
```

SPORT_RELEASE

Serial Port I/O Function: Releases a serial port that was previously connected to (by using SPORT_CONNECT). This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_RELEASE (*port*)

port

(Input) Integer. The port number.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SPORT_CONNECT", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
iresult =  SPORT_RELEASE( 2 )
END
```

SPORT_SET_STATE

Serial Port I/O Function: Sets the baud rate, parity, data bits setting, and stop bits setting of the communications port. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_SET_STATE (*port* [, *baud*] [, *parity*] [, *dbits*] [, *sbits*])

port

(Input) Integer. The port number.

baud

(Optional; input) Integer. The baud rate of the port.

parity

(Optional; input) Integer. The parity setting of the port (0 – 4 = no, odd, even, mark, space).

dbits

(Optional; input) Integer. The data bits for the port.

sbits

(Optional; input) Integer. The stop bits for the port (0, 1, 2 = 1, 1.5, 2).

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

The following restrictions apply:

- The number of data bits must be 5 to 8 bits.
- The use of 5 data bits with 2 stop bits is an invalid combination, as is 6, 7, or 8 data bits with 1.5 stop bits.

NOTE. *This routine must not be used when any I/O is pending. Since a read operation is always pending after any I/O has been started, you must first call* SPORT_CANCEL_IO *before port parameters can be changed.*

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SPORT_CANCEL_IO", "SPORT_GET_STATE", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
iresult =  SPORT_SET_STATE( 2, 9600, 0, 7, 1 )
END
```

SPORT_SET_TIMEOUTS

Serial Port I/O Function: Sets the user selectable timeouts for the serial port. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_SET_TIMEOUTS (*port* [, *rx_int*] [, *tx_tot_mult*] [, *tx_tot_const*])

port

(Input) Integer. The port number.

rx_int

(Optional; input) INTEGER(4). The receive interval timeout value.

tx_tot_mult

(Optional; input) INTEGER(4). The transmit multiplier part of the timeout value.

tx_tot_const

(Optional; input) INTEGER(4). The transmit constant part of the timeout value.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

NOTE. *This routine must not be used when any I/O is pending. Since a read operation is always pending after any I/O has been started, you must first call* SPORT_CANCEL_IO *before port parameters can be changed.*

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL  LIB`

See Also: "SPORT_CANCEL_IO", "SPORT_GET_TIMEOUTS", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
iresult =  SPORT_SET_TIMEOUTS( 2, 100, 0, 1000 )
END
```

SPORT_SHOW_STATE

Serial Port I/O Function: Displays the state of a port to standard output. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_SHOW_STATE (*port*, *level*)

port

(Input) Integer. The port number.

level

(Input) Integer. Controls the level of detail displayed as follows:

0	Basic one line display
1	Basic information
2	Add modem signal control flow information
3	Add XON/XOFF information

4	Add event character information
11	Add timeout information
901	Add debug information

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

NOTE. *This routine must not be used when any I/O is pending. Since a read operation is always pending after any I/O has been started, you must first call* SPORT_CANCEL_IO *before port parameters can be changed.*

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "SPORT_CANCEL_IO", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
iresult =  SPORT_SHOW_STATE( 2, 0 )
END
```

SPORT_SPECIAL_FUNC

Serial Port I/O Function: Executes the Win32* API communications function EscapeCommFunction on the specified port. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_SPECIAL_FUNC (*port*, *function*)

port

(Input) Integer. The port number.

function

(Input) INTEGER(4). The function to perform.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32 error value.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
iresult =  SPORT_SPECIAL_FUNC( 2, ? )
END
```

SPORT_WRITE_DATA

Serial Port I/O Function: Outputs data to the specified port. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_WRITE_DATA (*port*, *data* [, *count*])

port

(Input) Integer. The port number.

data

(Input) Character*(*). The data to be output.

count

(Optional; input) Integer. The count of bytes to write. If the value is zero, this number is computed by scanning the data backwards looking for a non-blank character.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SPORT_WRITE_LINE", "SPORT_READ_DATA", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
iresult =  SPORT_WRITE_DATA( 2, 'ATZ'//CHAR(13), 0 )
END
```

SPORT_WRITE_LINE

Serial Port I/O Function: Outputs data, followed by a record terminator, to the specified port. This function is only available on Windows* systems on IA-32 processors.

Module: USE IFPORT

Syntax

result = SPORT_WRITE_LINE (*port*, *data* [, *count*])

port

(Input) Integer. The port number.

data

(Input) Character*(*). The data to be output.

count

(Optional; input) Integer. The count of bytes to write. If the value is zero, this number is computed by scanning the data backwards looking for a non-blank character.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, a Win32* error value.

After the data is output, a line terminator character is added based on the mode used during the SPORT_CONNECT( ) call.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SPORT_CONNECT", "SPORT_WRITE_DATA", "SPORT_READ_DATA", "Using the Serial I/O Port Routines" in your user's guide, "Communications and "Communications Functions" in the Win32 SDK

Example

```
USE IFPORT
INTEGER(4) iresult
iresult = SPORT_WRITE_LINE( 2, 'ATZ', 0 )
END
```

SRAND

Portability Subroutine: Seeds the random number generator used with IRAND and RAND.

Module: USE IFPORT

Syntax

CALL SRAND (*iseed*)

iseed

(Input) INTEGER(4). Any value. The default value is 1.

SRAND seeds the random number generator used with IRAND and RAND. Calling SRAND is equivalent to calling IRAND or RAND with a new seed.

The same value for *iseed* generates the same sequence of random numbers. To vary the sequence, call SRAND with a different *iseed* value each time the program is executed.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "RAND, RANDOM", "IRAND, IRANDM", the RANDOM_NUMBER and RANDOM_SEED intrinsic subroutines in the *Language Reference*

Example

```
!  How many random numbers out of 100 will be between .5 and .6?
    USE IFPORT
    ICOUNT = 0
    CALL SRAND(123)
    DO I = 1, 100
      X = RAND(0)
      IF ((X > .5).AND.(X < .6)) ICOUNT = ICOUNT + 1
    END DO
    WRITE(*,*) ICOUNT, "numbers between .5 and .6!"
    END
```

SSWRQQ

Portability Subroutine: Returns the floating-point processor status word. .

Module: USE IFPORT

Syntax

CALL SSWRQQ (*status*)

status

(Output) INTEGER(2). Floating-point processor status word.

SSWRQQ performs the same function as the run-time subroutine GETSTATUSFPQQ and is provided for compatibility.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "LCWRQQ", "GETSTATUSFPQQ"

Example

```
USE IFPORT
INTEGER(2) status
CALL SSWRQQ (status)
```

STAT

Portability Function: Returns detailed information about a file.

Module: USE IFPORT

Syntax

result = STAT (*name*, *statb*)

name

(Input) Character*(*). Name of the file to examine.

statb

(Output) INTEGER(4) or INTEGER(8). One-dimensional array of size 12; where the system information is stored. The elements of *statb* contain the following values:

Element	Description	Values or Notes
statb(1)	Device the file resides on	W*32, W*64: Always 0 L*X: System dependent
statb(2)	File inode number	W*32, W*64: Always 0 L*X: System dependent
statb(3)	Access mode of the file	See the table in Results
statb(4)	Number of hard links to the file	W*32, W*64: Always 1 L*X: System dependent
statb(5)	User ID of owner	W*32, W*64: Always 1 L*X: System dependent

Element	Description	Values or Notes
statb(6)	Group ID of owner	W*32, W*64: Always 1 L*X: System dependent
statb(7)	Raw device the file resides on	W*32, W*64: Always 0 L*X: System dependent
statb(8)	Size of the file	
statb(9)	Time when the file was last accessed [1]	W*32, W*64: Only available on non-FAT file systems; undefined on FAT systems L*X: System dependent
statb(10)	Time when the file was last modified [1]	
statb(11)	Time of last file status change [1]	W*32, W*64: Same as stat(10) L*X: System dependent
statb(12)	Blocksize for file system I/O operations	W*32, W*64: Always 1 L*X: System dependent

1. Times are in the same format returned by the TIME function (number of seconds since 00:00:00 Greenwich mean time, January 1, 1970).

Results:

The result type is INTEGER(4).

On Windows* systems, the result is zero if the inquiry was successful; otherwise, the error code ENOENT (the specified file could not be found). On Linux* systems, the file inquired about must be currently connected to a logical unit and must already exist when STAT is called; if STAT fails, errno is set.

For a list of other error codes, see "IERRNO".

The access mode (the third element of *statb*) is a bitmap consisting of an IOR of the following constants:

Symbolic name	Constant	Description	Notes
S_IFMT	O'0170000'	Type of file	
S_IFDIR	O'0040000'	Directory	
S_IFCHR	O'0020000'	Character special	Never set on Windows* systems
S_IFBLK	O'0060000'	Block special	Never set on Windows systems
S_IFREG	O'0100000'	Regular	
S_IFLNK	O'0120000'	Symbolic link	Never set on Windows systems
S_IFSOCK	O'0140000'	Socket	Never set on Windows systems
S_ISUID	O'0004000'	Set user ID on execution	Never set on Windows systems

Symbolic name	Constant	Description	Notes
S_ISGID	O'0002000'	Set group ID on execution	Never set on Windows systems
S_ISVTX	O'0001000'	Save swapped text	Never set on Windows systems
S_IRWXU	O'0000700'	Owner's file permissions	
S_IRUSR, S_IREAD	O'0000400'	Owner's read permission	Always true on Windows systems
S_IWUSR, S_IWRITE	O'0000200'	Owner's write permission	
S_IXUSR, S_IEXEC	O'0000100'	Owner's execute permission	Based on file extension (.EXE, .COM, .CMD, or .BAT)
S_IRWXG	O'0000070'	Group's file permissions	Same as S_IRWXU on Windows systems
S_IRGRP	O'0000040'	Group's read permission	Same as S_IRUSR on Windows systems
S_IWGRP	O'0000020'	Group's write permission	Same as S_IWUSR on Windows systems
S_IXGRP	O'0000010'	Group's execute permission	Same as S_IXUSR on Windows systems
S_IRWXO	O'0000007'	Other's file permissions	Same as S_IRWXU on Windows systems
S_IROTH	O'0000004'	Other's read permission	Same as S_IRUSR on Windows systems
S_IWOTH	O'0000002'	Other's write permission	Same as S_IWUSR on Windows systems
S_IXOTH	O'0000001'	Other's execute permission	Same as S_IXUSR on Windows systems

STAT returns the same information as FSTAT, but accesses files by name instead of external unit number.

On Windows systems, LSTAT returns exactly the same information as STAT. On Linux systems, if the file denoted by *name* is a link, LSTAT provides information on the link, while STAT provides information on the file at the destination of the link.

You can also use the INQUIRE statement to get information about file properties.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "GETFILEINFOQQ", the INQUIRE statement in the *Language Reference*

Example

```
USE IFPORT
```

```
CHARACTER*12 file_name
INTEGER(4) info_array(12)
print *, 'Enter file to examine: '
read *, file_name
ISTATUS = STAT (file_name, info_array)
if (.not. istatus) then
   print *, info_array
else
  print *, 'Error = ',istatus
end if
end
```

SYSTEM

Portability Function: Sends a command to the shell as if it had been typed at the command line.

Module: USE IFPORT

Syntax

result = SYSTEM (*string*)

string

(Input) Character*(*). Operating system command.

Results:

The result type is INTEGER(4). The result is the exit status of the shell command. If –1, use "IERRNO" to retrieve the error. Errors can be one of the following:

- E2BIG – The argument list is too long.
- ENOENT – The command interpreter cannot be found.
- ENOEXEC – The command interpreter file has an invalid format and is not executable.
- ENOMEM – Not enough system resources are available to execute the command.

On Windows* systems, the calling process waits until the command terminates. To insure compatibility and consistent behavior, an image can be invoked directly by using the Win32* API CreateProcess( ) in your Fortran code.

Commands run with the SYSTEM routine are run in a separate shell. Defaults set with the SYSTEM function, such as current working directory or environment variables, do not affect the environment the calling program runs in.

The command line character limit for the SYSTEM function is the same limit that your operating system command interpreter accepts.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

See Also: "SYSTEMQQ"

Example

```
USE IFPORT
INTEGER(4) I, errnum
I = SYSTEM("dir > file.lst")
If (I .eq. -1) then
     errnum = ierrno( )
     print *, 'Error ', errnum
end if
END
```

SYSTEMQQ

Portability Function: Executes a system command by passing a command string to the operating system's command interpreter.

Module: USE IFPORT

Syntax

result = SYSTEMQQ (*commandline*)

commandline

(Input) Character*(*). Command to be passed to the operating system.

Results:

The result type is LOGICAL(4). The result is .TRUE. if successful; otherwise, .FALSE..

The SYSTEMQQ function lets you pass operating-system commands as well as programs. SYSTEMQQ refers to the COMSPEC and PATH environment variables that locate the command interpreter file (usually named COMMAND.COM).

On Windows* systems, the calling process waits until the command terminates. To insure compatibility and consistent behavior, an image can be invoked directly by using the Win32* API CreateProcess( ) in your Fortran code.

If the function fails, call "GETLASTERRORQQ" to determine the reason. One of the following errors can be returned:

- ERR$2BIG – The argument list exceeds 128 bytes, or the space required for the environment formation exceeds 32K.
- ERR$NOINT – The command interpreter cannot be found.

- ERR$NOEXEC – The command interpreter file has an invalid format and is not executable.
- ERR$NOMEM – Not enough memory is available to execute the command; or the available memory has been corrupted; or an invalid block exists, indicating that the process making the call was not allocated properly.

The command line character limit for the SYSTEMQQ function is the same limit that your operating system command interpreter accepts.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL LIB`

See Also: "SYSTEM"

Example

```
USE IFPORT
LOGICAL(4) result
result = SYSTEMQQ('copy c:\bin\fmath.dat &
                       c:\dat\fmath2.dat')
```

TIME

Portability Function or Subroutine: The function returns the system time, in seconds, since 00:00:00 Greenwich mean time, January 1, 1970. The subroutine fills a parameter with the current time as a string in the format hh:mm:ss.

Module: USE IFPORT

Function Syntax:

result = TIME ( )

Subroutine Syntax:

CALL TIME (*string*)

string

(Output) Character*(*). Current time, based on a 24-hour clock, in the form hh:mm:ss, where hh, mm, and ss are two-digit representations of the current hour, minutes past the hour, and seconds past the minute, respectively.

Results:

The result type is INTEGER(4). The result value is the number of seconds that have elapsed since 00:00:00 Greenwich mean time, January 1, 1970.

The value returned by this routine can be used as input to other portability date and time functions.

NOTE. TIME *is an intrinsic procedure unless you specify* USE IFPORT.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS LIB`

See Also: the TIME subroutine in the *Language Reference*

Example

```
USE IFPORT
INTEGER(4) int_time
character*8 char_time
int_time = TIME( )
call TIME(char_time)
print *, 'Integer: ', int_time, 'time: ', char_time
END
```

TIMEF

Portability Function: Returns the number of seconds since the first time it is called, or zero.

Module: USE IFPORT

Syntax

result = TIMEF ( )

Results:

The result type is REAL(4). The result value is the number of seconds that have elapsed since the first time TIMEF was called.

The first TIMEF it is called, it returns 0.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

Example

```
USE IFPORT
INTEGER i, j
REAL(8) elapsed_time
elapsed_time = TIMEF( )
```

```
DO i = 1, 100000
    j = j + 1
END DO
elapsed_time = TIMEF( )
PRINT *, elapsed_time
END
```

TRACEBACKQQ

Run-Time Subroutine: Provides traceback information. Uses the Intel® Visual Fortran run-time library traceback facility to generate a stack trace showing the program call stack as it appeared at the time of the call to TRACEBACKQQ( ).

Module: USE IFCORE

Syntax

CALL TRACEBACKQQ ([*string*] [, *user_exit_code*] [, *status*] [, *eptr*])

string

(Optional; input) CHARACTER*(*). A message string to precede the traceback output. It is recommended that the string be no more than 80 characters (one line) since that length appears better on output. However, this limit is not a restriction and it is not enforced. The string is output exactly as specified; no formatting or interpretation is done.

If this argument is omitted, no header message string is produced.

user_exit_code

(Optional; input) INTEGER(4). An exit code. Two values are predefined:

- A value of –1 causes the run-time system to return execution to the caller after producing traceback.
- A value of zero (the default) causes the application to abort execution.

Any other specified value causes the application to abort execution and return the specified value to the operating system.

status

(Optional; input) INTEGER(4). A status value. If specified, the run-time system returns the status value to the caller indicating that the traceback process was successful. The default is not to return status.

Note that a returned status value is only an indication that the "attempt" to trace the call stack was completed successfully, not that it produced a useful result.

You can include the file `iosdef.for` in your program to obtain symbolic definitions for the possible return values. A return value of FOR$IOS_SUCCESS (0) indicates success.

eptr

(Optional; input) Cray pointer. It is required if calling from a user-specified exception filter. If omitted, the default in null.

To trace the stack after an exception has occurred, the runtime support needs access to the exception information supplied to the filter by the operating system.

The *eptr* argument is a pointer to T_EXCEPTION_POINTERS, returned by the Win32* API GetExceptionInformation( ), which is usually passed to a C try/except filter function. This argument *must* be null if you are not passing a valid pointer to T_EXCEPTION_POINTERS. For more information, see "Obtaining Traceback Information with TRACEBACKQQ" in your user's guide.

The TRACEBACKQQ routine provides a standard way for an application to initiate a stack trace. It can be used to report application detected errors, debugging, and so forth. It uses the stack trace support in the Intel Visual Fortran run-time library, and produces the same output that the run-time library produces for unhandled errors and exceptions.

The error message string normally included by the run-time system is replaced with the user-supplied message text, or omitted if no string is specified. Traceback output is directed to the target destination appropriate for the application type, just as it is when traceback is initiated internally by the run-time system.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "GETEXCEPTIONPTRSQQ", and "Obtaining Traceback Information with TRACEBACKQQ", "Using Traceback Information", and "Run-Time Message Display and Format" in your user's guide

Examples

The following example generates a traceback report with no leading header message, from wherever the call site is, and aborts execution:

```
USE IFCORE
CALL TRACEBACKQQ( )
```

The following example generates a traceback report with the user-supplied string as the header, and aborts execution.:

```
USE IFCORE
CALL TRACEBACKQQ("My application message string")
```

The following example generates a traceback report with the user-supplied string as the header, and aborts execution, returning a status code of 123 to the operating system:

```
USE IFCORE
CALL TRACEBACKQQ(STRING="Bad value for TEMP",USER_EXIT_CODE=123)
```

Consider the following:

```
...
USE IFCORE
INTEGER(4) RTN_STS
INCLUDE 'IOSDEF.FOR'
...
CALL TRACEBACKQQ(USER_EXIT_CODE=-1,STATUS=RTN_STS)
IF (RTN_STS .EQ. FOR$IOS_SUCCESS) THEN
  PRINT *,'TRACEBACK WAS SUCCESSFUL'
END IF
...
```

This example generates a traceback report with no header string, and returns to the caller to continue execution of the application. If the traceback process succeeds, a status will be returned in variable RTN_STS.

For more examples, including one showing a Cray pointer, see "Obtaining Traceback Information with TRACEBACKQQ" in your user's guide.

TTYNAM

Portability Function: Checks whether a logical unit is a terminal.

Module: USE IFPORT

Syntax

result = TTYNAM (*lunit*)

lunit

(Input) INTEGER(4). A Fortran logical unit number.

Results:

The result type is character. The result is a string indicating the device name for the terminal, all blanks if not a terminal, or an error code.

TTYNAM determines whether a particular logical unit is connected to a terminal (TTY) display device.

Compatibility

CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB

UNLINK

Portability Function: Deletes the file given by path.

Module: USE IFPORT

Syntax

result = UNLINK (*name*)

name

(Input) Character*(*). Path of the file to delete. The path can use forward (/) or backward (\) slashes as path separators and can contain drive letters.

Results:

The result type is INTEGER(4). The result is zero if successful; otherwise, an error code. Errors can be one of the following:

- ENOENT: The specified file could not be found.
- EACCES: The specified file is read-only.

You must have adequate permission to delete the file.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS DLL LIB`

See Also: "SYSTEM", "DELDIRQQ"

Example

```
USE IFPORT
INTEGER(4) ISTATUS
CHARACTER*20 dirname
READ *, dirname
ISTATUS = UNLINK (dirname)
IF (ISTATUS) then
    print *, 'Error ', ISTATUS
END IF
END
```

UNPACKTIMEQQ

Portability Subroutine: Unpacks a packed time and date value into its component parts.

Module: USE IFPORT

Syntax

CALL UNPACKTIMEQQ (*timedate*, *iyr*, *imon*, *iday*, *ihr*, *imin*, *isec*)

timedate

(Input) INTEGER(4). Packed time and date information.

iyr

(Output) INTEGER(2). Year (*xxxx* AD).

imon

(Output) INTEGER(2). Month (1 - 12).

iday

(Output) INTEGER(2). Day (1 - 31).

ihr

(Output) INTEGER(2). Hour (0 - 23).

imin

(Output) INTEGER(2). Minute (0 - 59).

isec

(Output) INTEGER(2). Second (0 - 59).

GETFILEINFOQQ returns time and date in a packed format. You can use UNPACKTIMEQQ to unpack these values. Use PACKTIMEQQ to repack times for passing to SETFILETIMEQQ. Packed times can be compared using relational operators.

Compatibility

`CONSOLE STANDARD GRAPHICS QUICKWIN GRAPHICS WINDOWS  DLL LIB`

See Also: "PACKTIMEQQ", "GETFILEINFOQQ"

Example

```
USE IFPORT
CHARACTER(80)    file
TYPE (FILE$INFO) info
INTEGER(4) handle, result
INTEGER(2) iyr, imon, iday, ihr, imin, isec

file = 'd:\f90ps\bin\t???.*'
handle = FILE$FIRST
result = GETFILEINFOQQ(file, info, handle)
CALL UNPACKTIMEQQ(info%lastwrite, iyr, imon,&
                  iday, ihr, imin, isec)
WRITE(*,*) iyr, imon, iday
WRITE(*,*) ihr, imin, isec
```

```
END
```

UNREGISTERMOUSEEVENT

QuickWin Function: Removes the callback routine registered for a specified window by an earlier call to REGISTERMOUSEEVENT. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = UNREGISTERMOUSEEVENT (*unit*, *mouseevents*)

unit

(Input) INTEGER(4) on IA-32 processors; INTEGER(8) on Intel Itanium processors. Unit number of the window whose callback routine on mouse events is to be unregistered.

mouseevents

(Input) INTEGER(4). One or more mouse events handled by the callback routine to be unregistered. Symbolic constants (defined in `IFQWIN.F90`) for the possible mouse events are:

- MOUSE$LBUTTONDOWN – Left mouse button down
- MOUSE$LBUTTONUP – Left mouse button up
- MOUSE$LBUTTONDBLCLK – Left mouse button double-click
- MOUSE$RBUTTONDOWN – Right mouse button down
- MOUSE$RBUTTONUP – Right mouse button up
- MOUSE$RBUTTONDBLCLK – Right mouse button double-click
- MOUSE$MOVE – Mouse moved

Results:

The result type is INTEGER(4). The result is zero or a positive integer if successful; otherwise, a negative integer that can be one of the following:

- MOUSE$BADUNIT – The unit specified is not open, or is not associated with a QuickWin window.
- MOUSE$BADEVENT – The event specified is not supported.

Once you call UNREGISTERMOUSEEVENT, QuickWin no longer calls the callback routine specified earlier for the window when mouse events occur. Calling UNREGISTERMOUSEEVENT when no callback routine is registered for the window has no effect.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "REGISTERMOUSEEVENT", "WAITONMOUSEEVENT", "Using QuickWin" in your user's guide

WAITONMOUSEEVENT

QuickWin Function: Waits for the specified mouse input from the user. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = WAITONMOUSEEVENT (*mouseevents*, *keystate*, *x*, *y*)

mouseevents

(Input) INTEGER(4). One or more mouse events that must occur before the function returns. Symbolic constants for the possible mouse events are:

- MOUSE$LBUTTONDOWN – Left mouse button down
- MOUSE$LBUTTONUP – Left mouse button up
- MOUSE$LBUTTONDBLCLK – Left mouse button double-click
- MOUSE$RBUTTONDOWN – Right mouse button down
- MOUSE$RBUTTONUP – Right mouse button up
- MOUSE$RBUTTONDBLCLK – Right mouse button double-click
- MOUSE$MOVE – Mouse moved

keystate

(Output) INTEGER(4). Bitwise inclusive OR of the state of the mouse during the event. The value returned in *keystate* can be any or all of the following symbolic constants:

- MOUSE$KS_LBUTTON - Left mouse button down during event
- MOUSE$KS_RBUTTON - Right mouse button down during event
- MOUSE$KS_SHIFT - SHIFT key held down during event
- MOUSE$KS_CONTROL - CTRL key held down during event

x

(Output) INTEGER(4). X position of the mouse when the event occurred.

y

(Output) INTEGER(4). Y position of the mouse when the event occurred.

Results:

The result type is INTEGER(4). The result is the symbolic constant associated with the mouse event that occurred if successful. If the function fails, it returns the constant MOUSE$BADEVENT, meaning the event specified is not supported.

WAITONMOUSEEVENT does not return until the specified mouse input is received from the user. While waiting for a mouse event to occur, the status bar changes to read "Mouse input pending in XXX", where XXX is the name of the window. When a mouse event occurs, the status bar returns to its previous value.

A mouse event must happen in the window that had focus when WAITONMOUSEEVENT was initially called. Mouse events in other windows will not end the wait. Mouse events in other windows cause callbacks to be called for the other windows, if callbacks were previously registered for those windows.

For every BUTTONDOWN or BUTTONDBLCLK event there is an associated BUTTONUP event. When the user double clicks, four events happen: BUTTONDOWN and BUTTONUP for the first click, and BUTTONDBLCLK and BUTTONUP for the second click. The difference between getting BUTTONDBLCLK and BUTTONDOWN for the second click depends on whether the second click occurs in the double click interval, set in the system's CONTROL PANEL/MOUSE.

Compatibility

`QUICKWIN GRAPHICS LIB`

See Also: "REGISTERMOUSEEVENT", "UNREGISTERMOUSEEVENT", "Using QuickWin" in your user's guide

Example

```
  USE IFQWIN
  INTEGER(4) mouseevent, keystate, x, y, result
  ...
  mouseevent = MOUSE$RBUTTONDOWN .OR. MOUSE$LBUTTONDOWN
  result = WAITONMOUSEEVENT (mouseevent, keystate, x , y)
!
! Wait until right or left mouse button clicked, then check the keystate
! with the following:
!
  if ((MOUSE$KS_SHIFT .AND. keystate) == MOUSE$KS_SHIFT) then      &
 & write (*,*) 'Shift key was down'
  if ((MOUSE$KS_CONTROL .AND. keystate) == MOUSE$KS_CONTROL) then  &
 & write (*,*) 'Ctrl key was down'
```

WRAPON

Graphics Function: Controls whether text output is wrapped. This function is only available on Windows* systems.

Module: USE IFQWIN

Syntax

result = WRAPON (*option*)

option

(Input) INTEGER(2). Wrap mode. One of the following symbolic constants:

- $GWRAPOFF – Truncates lines at right edge of window border.
- $GWRAPON – Wraps lines at window border, scrolling if necessary.

Results:

The result type is INTEGER(2). The result is the previous value of *option*.

WRAPON controls whether text output with the OUTTEXT function wraps to a new line or is truncated when the text output reaches the edge of the defined text window.

WRAPON does not affect font routines such as OUTGTEXT.

Compatibility

STANDARD GRAPHICS QUICKWIN GRAPHICS LIB

See Also: "OUTTEXT", "SCROLLTEXTWINDOW", "SETTEXTPOSITION", "SETTEXTWINDOW"

Example

```
USE IFQWIN
INTEGER(2) row, status2
INTEGER(4) status4
TYPE ( rccoord ) curpos
TYPE ( windowconfig ) wc
LOGICAL status

status = GETWINDOWCONFIG( wc )
wc%numtextcols = 80
wc%numxpixels  = -1
wc%numypixels  = -1
wc%numtextrows = -1
wc%numcolors   = -1
wc%fontsize    = -1
wc%title = "This is a test"C
```

```
wc%bitsperpixel = -1
status = SETWINDOWCONFIG( wc )
status4= SETBKCOLORRGB(#FF0000 )
CALL CLEARSCREEN( $GCLEARSCREEN )

!  Display wrapped and unwrapped text in text windows.
CALL SETTEXTWINDOW( INT2(1),INT2(1),INT2(5),INT2(25))
CALL SETTEXTPOSITION(INT2(1),INT2(1), curpos )
status2 = WRAPON( $GWRAPON )
status4 = SETTEXTCOLORRGB(#00FF00)
DO i = 1, 5
    CALL OUTTEXT( 'Here text does wrap. ')
END DO
CALL SETTEXTWINDOW(INT2(7),INT2(10),INT2(11),INT2(40))
CALL SETTEXTPOSITION(INT2(1),INT2(1),curpos)
status2 = WRAPON( $GWRAPOFF )
status4 = SETTEXTCOLORRGB(#008080)
DO row = 1, 5
    CALL SETTEXTPOSITION(INT2(row), INT2(1), curpos )
    CALL OUTTEXT('Here text does not wrap. ')
    CALL OUTTEXT('Here text does not wrap.')
END DO
READ (*,*) ! Wait for ENTER to be pressed
END
```

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