Apple III Pascal

Programmer's Manual Errata

A Word About Floating-Point Arithmetic

Apple's commitment to the proposed standard for binary
floating-point arithmetic, draft 8.0 of IEEE task P754, was
made when the manual was in final draft stage. Appendix E
reflects the commitment in detail. Many of the errata reported
here result from a need to bring the body of the manual to full
conformity to the standard.

Volume 1 Errata

Format of a REAL Constant

Page 11

A real constant contains either a decimal point (period) or an
"exponent part," or both. An example of a real constant that
doesn't contain a decimal point is

    31459E-4

Substitute the first sentence above for the first
sentence on page 11, and add the example to the list of valid
real constants representing the same numerical value.

The REAL Type

Page 13

Delete the parenthetical remark, "(depending on the
actual value)".

TRANSCEND Unit Requires REALMODES Unit

To use the transcendental functions, your program must have a
USES declaration containing both REALMODES and TRANSCEND.
Since the TRANSCEND unit uses the REALMODES unit, REALMODES
must appear in the USES declaration before TRANSCEND.

Page 30

The USES declaration following paragraph 2 should read

    USES REALMODES, TRANSCEND, APPLESTUFF;

The ROUND Function

Page 49

The ROUND function takes a real value as its parameter and
returns an integer value, which is obtained by rounding the
real value to the nearest integer. If the parameter is halfway
between two integers, then it is rounded to the even integer.
(Rounding algorithms are discussed in detail in Appendix E.
This appendix also describes how programmable switches can be
used to change the rounding method.)

Change "away from zero" to "to the even integer" in the
third paragraph on page 49. Add the underlined sentence above
to the parenthetical comment in the same paragraph. Add the
following example to the list of examples:

    ROUND(42.5) is 42

Library Functions: The TRANSCEND and REALMODES Units

Page 50

A set of trigonometric and exponential functions is provided as
a library unit called TRANSCEND, which is described in
Appendix A.

A set of functions and procedures for controlling and
diagnosing the results of real arithmetic, for taking square
roots and real remainders, and for analyzing and constructing
real values, is provided as a library unit called REALMODES,
which is described in Appendix A and Appendix E.

Replace the section on "Library Functions" at the bottom
of page 5Ø with the above paragraphs.

REWRITE and RESET With Subdirectory Files

Page 164

Insert the following section before the section entitled "The CLOSE Procedure" on the bottom of page 164.

Subdirectory files can be created using REWRITE to open them and read using RESET to open them. Writing to a subdirectory file is not permitted at any time.

To create a subdirectory, place the directory-specifier character (!) after the file name in the REWRITE statement. The file name you specify is actually the subdirectory name. For example,

```
REWRITE (OUTFILE,'/WORK/SUB![2]')
CLOSE (OUTFILE,LOCK)
```

creates a 2-block subdirectory file named /WORK/SUB on a volume named /WORK. You can then make use of the subdirectory in subsequent file specifications; for example

```
REWRITE (NEWFILE,'/WORK/SUB/MYFILE.DATA')
...
CLOSE (NEWFILE,LOCK)
```

These statements cause the Pascal operating system to make an entry in the /WORK/SUB subdirectory file pointing to a file called MYFILE.DATA on the volume /WORK.

To read the contents of the subdirectory file, open it with the RESET procedure; for example

```
RESET (INFILE,'/WORK/SUB')
```

If you open a volume name with RESET using the SOS pathname format

```
RESET (INFILE,'/WORK')
```

the result will be to open the root directory as a file. If you want to perform device I/O on a volume using the BLOCKREAD function, you must specify an Apple II format volume name when you open the volume; for example

```
RESET (INFILE,'WORK:')
```

REWRITE of a volume name using the SOS pathname format is
not allowed because the form

        REWRITE (OUTFILE,'/WORK')

instructs the Pascal operating system to open the root
directory of /WORK for write access. If you want to
perform device I/O on a volume using the BLOCKWRITE
function, you must specify an Apple II format volume name
when you open the volume; for example

        REWRITE (OUTFILE,'WORK:')

READ With a REAL Variable

Page 189

There is no practical limit to the number of digits that can be
read for a REAL variable. The actual limit is in the low
hundreds of characters. All of the digits read will contribute
correctly to the conversion, although it will be rare for more
than 9 digits to be significant. The upper limit on the
magnitude of a REAL exponent is in the low thousands.

Substitute the paragraph above for the first item at the
"hand" symbol on page 189.

Reading a NaN From a File

Page 190

READ will accept 'NaN' (any combination of upper- and
lower-case characters <u>with an optional leading sign</u>) as a REAL
value which is "not a number".

In the first paragraph, replace '.NaN.' with 'NaN' and
add the underlined text.

WRITE With a REAL Variable

The rules for writing REAL values using the WRITE procedure are the same as those for INTEGER values, except for the "decimal places expression".

Page 192

In the last paragraph on the page, insert "or REAL" after "When an INTEGER".

Page 193

For writing REAL values, the "width expression" governs the number of significant digits to which the "value expression" is rounded. Only enough digits are written to fill the specified width unless a "decimal places expression" overrides the specified width.

Substitute the paragraph above for the first paragraph on page 193. In the fifth paragraph, replace the clause "If the number of decimal places is not specified " with "If neither the number of decimal places nor the width is specified for a REAL number". Delete the sixth paragraph and the entire "hand" symbol section.

NOLOAD and RESIDENT Compiler Options

The Compiler's NOLOAD and RESIDENT options (see Chapter 15 and Appendix F) provide control over the way regular and intrinsic units are loaded for execution.

Page 235

In the "hand" symbol paragraph, change "intrinsic units" to "regular and intrinsic units".

Volume 2 Errata

The REALMODES Unit

Page 2

The REALMODES unit contains the remainder and square root
functions. (See Appendix A.) It also contains functions and
procedures for controlling and diagnosing the results of real
arithmetic, and for analyzing and constructing real values.
(See Appendix E.)

Add the underlined sentences above to the third
paragraph.

Page 76

In the first paragraph, delete the reference to
Appendix A. (All of the functions and procedures listed
beneath the first paragraph are described in Appendix E.)

Page 80

In the last paragraph, add the following sentence: "For
a description of the remainder and square root functions, see
Appendix A."

Nans

Page 5

In the paragraph on NaNs, replace the word "trapping" on line 5
with the word "signalling".

The Remainder Function

Page 5

The REM(x,y) function, which is always calculated exactly, is
defined by the following relation:

$$REM(x,y) = x - y * n$$

where n is the integer nearest x/y. When the fractional part
of x/y is exactly 1/2, then n is the even integer nearest x/y.
(For example, if x/y = 3.5, then n = 4; if x/y = 6.5, then
n = 6.) The relation holds except when

  y is zero;
  x is infinite; or
  y is denormalized and Warning mode is set.

For any of these exceptions, the Invalid Operation Signal will
be set. If the Halt on Invalid switch is not set, a diagnostic
(NaN) will be returned.

Replace the entire section entitled "The Remainder (REM)
Function" on pages 5 and 6 with the above paragraphs.

Reading From the Graphics Driver

Page 36

Successive reads from the graphics driver return the color of
the pixel at the current cursor location.

The sentence above replaces the next-to-last paragraph.

Input/Output Conversions

Page 74

The textual representation of the number to be read by the READ
procedure may not exceed 3ØØ characters, and the absolute value
of its exponent must be less than 25ØØ. Since these limits
generously exceed the bounds of the internal storage format and

the precision of the arithmetic, you should never encounter them.

Insert the preceding paragraph after the second paragraph on page 74.

Page 74

The decimal-to-binary conversion signals underflow whenever a nonzero input produces a zero or denormalized result. It signals overflow whenever a finite input exceeds the largest representable number. <u>It signals inexact whenever the conversion is not exact.</u>

Insert the underlined sentence after the second sentence in the second paragraph on page 74.

Page 75

The binary-to-decimal conversion signals inexact if the conversion is not exact. The rounding mode governs the decimal output. The directed roundings "round up" and "round down" guarantee that the decimal number returned is an upper or lower bound, respectively, of the floating-point number which is output.

Insert the above paragraph before the section entitled "Expert's Corner" on page 75.

The SYSTEM.SYNTAX Error Message File

The error message file SYSTEM.SYNTAX is supplied to you on a system diskette, but you need not keep it there. It can be used on any diskette in any drive, or you can remove it from the system entirely in order to save diskette space. In that case, error messages will be reported by number only; no error description will appear on your screen.

Page 92

Delete the phrase "on your backup copies" in the last paragraph on page 92. (Although you may wish to remove

SYSTEM.SYNTAX from your online system configuration, you will
probably want to keep a copy of it on some backup diskette.)

Page 159

In the first paragraph, delete the words "system
diskette" from the second sentence and delete the word
"diskette" from the third sentence. In the second paragraph,
change the words "system diskette" to "online diskettes" in the
second sentence.

The SETC Compiler Option

When the Compiler is skipping source text during a conditional
compilation, the SETC option is ignored.

Page 108

Delete the two references to the SETC option.

Special Techniques

Page 123

The sample program REALBITS is provided for illustrative
purposes only. To analyze and construct real values, you
should use the special functions COPYSIGN, NEXTAFTER, LOGB,
and SCALB, which are provided in the library unit REALMODES for
this purpose. (See Appendix E for details.)

Insert the above paragraph before "PROGRAM REALBITS" in
the middle of page 123.

Table 1: Execution Errors

Page 154

Remove error numbers 7, 14, and 15 from the list. Note
that for Stack Overflow (error number 4), segment number,
procedure number, and byte number are not displayed.

Table 2: I/O Errors

Page 155

Add:	1	Out of filename storage space
Add:	4	Illegal directory spec
Replace:	15	Wrong disk format
		(replaces "Ring buffer overflow")
Delete:	19	Too many files open for system to handle

Printer-Like Drivers

If there is a printer-like driver present (e.g., .SILENTYPE) and
no .PRINTER, the printer-like driver is assigned the Pascal unit
name PRINTER: and its unit number is 6.

Page 165

Change "drive" to "driver" in the sixth line from the bottom of
page 165.