ADDENDUM to WORKSHEET FILE FORMAT Document (2-19-85):

The following supplements the discussion of the FORMULA record
type in the Worksheet File Format document.

_____

_____

     Formula Record Type

          byte 0 = format
                  byte 1 & 2 = column
                  byte 3 & 4 = row
                  byte 5-12 = formula numeric value (IEEE
long real)
                  byte 13 & 14 = formula size (bytes)
                  byte 15 & above = formula code, compiled
Reverse-Polish

                              Internal Notation; max
of 2048 bytes

        Opcode   Explanation
        ------   ------------

        0   push constant...followed by 8 byte #
        1   push variable...followed by 4 byte
column,row...a
                    relative coordinate has its most
significant bit set
        2   push range...followed by 8 byte begin/
end column,row
        3   end of formula
        4   parentheses
        5   integer constant...followed by 2 byte
integer
        6   push string...followed by null
terminated string
        7   unused
        8   unary -

```
 9          binary +
10          binary -

11          *
12          /
13          ^
14          =
15          <>
16          <=
17          >=
18          <
19          >
20          #AND#

21          #OR#
22          #NOT#
23          unary +
24          &
25..30      unused

31          @na
32          @err
33          @abs
34          @int
35          @sqrt
36          @log
37          @ln
38          @pi
39          @sin
40          @cos

41          @tan
42          @atan2
43          @atan
44          @asin
45          @acos
46          @exp
47          @mod
48          @sel
49          @isna
50          @iserr
```

```
51          @false
52          @true
53          @rand
54          @date
55          @now
56          @pmt
57          @pv
58          @fv
59          @if
60          @day

61          @month
62          @year
63          @round
64          @time
65          @hour
66          @minute
67          @second
68          @isnumber
69          @isstring
70          @length

71          @value
72          @fixed
73          @mid
74          @chr
75          @ascii
76          @find
77          @datevalue
78          @timevalue
79          @cell pointer
80          @sum..followed by 1 byte >>> # of args

81          @avg..same as above
82          @cnt.. "     "     "
83          @min.. "     "     "
84          @max.. "     "     "
85          @vlookup
86          @npv
87          @var
```

88	@std
89	@irr
90	@hlookup
91	@dsum
92	@davg
93	@dcnt
94	@dmin
95	@dmax
96	@dvar
97	@dstd
98	@index
99	@cols
100	@rows
101	@repeat
102	@upper
103	@lower
104	@left
105	@right
106	@replace
107	@proper
108	@cell
109	@trim
110	@clean
111	@s
112	@v
113	@streq
114	@call
115	@indirect