

# GnuCOBOL Sample Programs

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For Version 3.0 rc2 [06Dec2018]

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This manual documents GnuCOBOL 3.0 rc2, 06Dec2018 build.

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## 1. FileStat-Msgs

The FileStat-Msgs.cpy copybook contains an EVALUATE statement to translate the two-digit file status codes that may be generated by file I/O statements.

The copybook assumes that the file status data item name is "STATUS" and the error message data item is named "MSG". By using the COPY statement's REPLACING clause, however, you may use the data names you wish, as follows:

```
COPY FileStat-Msgs
    REPLACING STATUS BY file-status-data-item-name
                MSG    BY error-message-data-item-name
```

Here's the FileStat-Msgs.cpy copybook:

```
EVALUATE STATUS
    WHEN 00 MOVE 'SUCCESS' TO MSG
    WHEN 02 MOVE 'SUCCESS DUPLICATE' TO MSG
    WHEN 04 MOVE 'SUCCESS INCOMPLETE' TO MSG
    WHEN 05 MOVE 'SUCCESS OPTIONAL' TO MSG
    WHEN 07 MOVE 'SUCCESS NO UNIT' TO MSG
    WHEN 10 MOVE 'END OF FILE' TO MSG
    WHEN 14 MOVE 'OUT OF KEY RANGE' TO MSG
    WHEN 21 MOVE 'KEY INVALID' TO MSG
    WHEN 22 MOVE 'KEY EXISTS' TO MSG
    WHEN 23 MOVE 'KEY NOT EXISTS' TO MSG
    WHEN 30 MOVE 'PERMANENT ERROR' TO MSG
    WHEN 31 MOVE 'INCONSISTENT FILENAME' TO MSG
    WHEN 34 MOVE 'BOUNDARY VIOLATION' TO MSG
    WHEN 35 MOVE 'FILE NOT FOUND' TO MSG
    WHEN 37 MOVE 'PERMISSION DENIED' TO MSG
    WHEN 38 MOVE 'CLOSED WITH LOCK' TO MSG
    WHEN 39 MOVE 'CONFLICT ATTRIBUTE' TO MSG
    WHEN 41 MOVE 'ALREADY OPEN' TO MSG
    WHEN 42 MOVE 'NOT OPEN' TO MSG
    WHEN 43 MOVE 'READ NOT DONE' TO MSG
    WHEN 44 MOVE 'RECORD OVERFLOW' TO MSG
    WHEN 46 MOVE 'READ ERROR' TO MSG
    WHEN 47 MOVE 'INPUT DENIED' TO MSG
    WHEN 48 MOVE 'OUTPUT DENIED' TO MSG
    WHEN 49 MOVE 'I/O DENIED' TO MSG
    WHEN 51 MOVE 'RECORD LOCKED' TO MSG
    WHEN 52 MOVE 'END-OF-PAGE' TO MSG
    WHEN 57 MOVE 'I/O LINAGE' TO MSG
    WHEN 61 MOVE 'FILE SHARING FAILURE' TO MSG
    WHEN 91 MOVE 'FILE NOT AVAILABLE' TO MSG
END-EVALUATE.
```



## 2. COBDUMP

COBDUMP is a useful little utility subroutine to produce a formatted hexadecimal and character dump of the data area passed to it.

If you follow the GnuCOBOL forums, you've undoubtedly heard about the CBL\_OC\_DUMP subroutine that was the winning entry in a GnuCOBOL programming contest. It's a great tool for producing data dumps, and it's now included in the official GnuCOBOL distributions.

For now though, I'll keep using my good ol' "COBDUMP" routine. It's been my travelling companion from COBOL job to COBOL job since 1971. Here it is, all tuned up for GnuCOBOL, with new tires and a fresh coat of paint.

In addition to general GnuCOBOL concepts, this program provides a useful demonstration of the following:

- Coding a GnuCOBOL subroutine
- Using "USAGE POINTER" data items
- Using the "ANY LENGTH" data item attribute
- Coding for an "OPTIONAL" subprogram argument
- Using the "NUMBER-OF-CALL-PARAMETERS" special register
- Using the "C\$PRINTABLE" built-in system subroutine

The program source and cross-reference listing, produced using the GnuCOBOL Interactive Compiler front-end (GCic.cbl, one of the sample programs included here), begins on the next page.

GNU COBOL 2.1 23NOV2013 Source Listing

2014/03/27

C:/Users/tda010/Documents/Programs/Samples/COBDUMP.cbl

Line Statement

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```

=====
1      >>SOURCE FORMAT IS FIXED
2      IDENTIFICATION DIVISION.
3      PROGRAM-ID.    COBDUMP.
4      *>*****
5      *> This is an OpenCOBOL subroutine that will generate a      **
6      *> formatted Hex/Char dump of a storage area. To use this  **
7      *> subroutine, simply CALL it as follows:                  **
8      *>                                                         **
9      *> CALL "COBDUMP" USING <data-item>                        **
10     *> [ <length> ]                                           **
11     *>                                                         **
12     *> If specified, the <length> argument specifies how many  **
13     *> bytes of <data-item> are to be dumped. If absent, all of **
14     *> <data-item> will be dumped (i.e. LENGTH(<data-item>) will **
15     *> be assumed for <length>).                               **
16     *>                                                         **
17     *> >>> Note that the subroutine name MUST be specified in  <<< **
18     *> >>> UPPERCASE                                           <<< **
19     *>                                                         **
20     *> The dump is generated to STDERR, so you may pipe it to a **
21     *> file when you execute your program using "2> file".    **
22     *>                                                         **
23     *> AUTHOR:          GARY L. CUTLER                          **
24     *>                                                         **
25     *> NOTE:           The author has a sentimental attachment to **
26     *>                 this subroutine - it's been around since 1971 **
27     *>                 and it's been converted to and run on 10 dif- **
28     *>                 ferent operating system/compiler environments **
29     *>                                                         **
30     *> DATE-WRITTEN: October 14, 1971                          **
31     *>                                                         **
32     *>*****
33     *> DATE  CHANGE DESCRIPTION                                **
34     *> ===== **
35     *> GC1071 Initial coding - Univac Dept. of Defense COBOL '68 **
36     *> GC0577 Converted to Univac ASCII COBOL (ACOB) - COBOL '74 **
37     *> GC1182 Converted to Univac UTS4000 COBOL - COBOL '74 w/  **
38     *> SCREEN SECTION enhancements                             **
39     *> GC0883 Converted to Honeywell/Bull COBOL - COBOL '74    **
40     *> GC0983 Converted to IBM VS COBOL - COBOL '74           **
41     *> GC0887 Converted to IBM VS COBOL II - COBOL '85         **
42     *> GC1294 Converted to Micro Focus COBOL V3.0 - COBOL '85 w/ **
43     *> extensions                                              **
44     *> GC0703 Converted to Unisys Universal Compiling System (UCS) **
45     *> COBOL (UCOB) - COBOL '85                                **
46     *> GC1204 Converted to Unisys Object COBOL (OCOB) - COBOL 2002 **
47     *> GC0609 Converted to OpenCOBOL 1.1 - COBOL '85 w/ some COBOL **
48     *> 2002 features                                           **
49     *> GC0410 Enhanced to make 2nd argument (buffer length)  **
=====

```

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2014/03/27

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Line Statement

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```

=====
50      *>          optional                      **
51      *> GC0211 Ported to IBM Enterprise COBOL      **
52      *> GC0612 Updated for OpenCOBOL 2.0          **
53      *>*****
54      ENVIRONMENT DIVISION.
55      CONFIGURATION SECTION.
56      REPOSITORY.
57          FUNCTION ALL INTRINSIC.
58      DATA DIVISION.
59      WORKING-STORAGE SECTION.
60      01  WS-Addr-PTR                      USAGE POINTER.
61      01  WS-Addr-NUM REDEFINES WS-Addr-PTR
62                                     USAGE BINARY-LONG.
63
64      01  WS-Addr-SUB                      USAGE BINARY-CHAR.
65
66      01  WS-Addr-Value-NUM                USAGE BINARY-LONG.
67
68      01  WS-Buffer-Byte-CHR.
69          05 WS-Buffer-Byte-NUM            USAGE BINARY-CHAR.
70
71      01  WS-Buffer-Length-NUM             USAGE BINARY-LONG.
72
73      01  WS-Buffer-SUB                    PIC 9(4) COMP-5.
74
75      01  WS-Hex-Digit-TXT VALUE '0123456789ABCDEF'.
76          05 WS-Hex-Digit-CHR              OCCURS 16 TIMES
77                                     PIC X(1).
78
79      01  WS-Nibble-SUB                    PIC 9(1) COMP-5.
80
81      01  WS-Nibble-Left-SUB                PIC 9(1) COMP-5.
82
83      01  WS-Nibble-Right-SUB               PIC 9(1) COMP-5.
84
85      01  WS-Output-Detail-TXT.
86          05 WS-OD-Addr-TXT.
87              10 WS-OD-Addr-Hex-CHR        OCCURS 8 TIMES PIC X.
88              05 FILLER                     PIC X(1).
89              05 WS-OD-Relative-Byte-NUM    PIC Z(3)9.
90              05 FILLER                     PIC X(1).
91              05 WS-OD-Hex-TXT              OCCURS 16 TIMES.
92                  10 WS-OD-Hex-1-CHR        PIC X.
93                  10 WS-OD-Hex-2-CHR        PIC X.
94                  10 FILLER                 PIC X.
95          05 WS-OD-ASCII-Data-TXT.
96              10 WS-OD-ASCII-CHR            OCCURS 16 TIMES
97                                     PIC X.
98
=====

```

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GNU COBOL 2.1 23NOV2013 Source Listing

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Line Statement

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```

=====
 99      01 WS-Output-SUB                                PIC 9(2) COMP-5.
100
101      >>SOURCE FORMAT IS FREE
102      01 WS-Output-Header-1-TXT.
103          05 VALUE '<-Addr-> Byte <----- Hexadecimal '-----> <---
- Char ---->' PIC X(80).
104
105      01 WS-Output-Header-2-TXT.
106          05 VALUE '===== ====='
=====
          PIC X(80).
107      >>SOURCE FORMAT IS FIXED
108
109      LINKAGE SECTION.
110      01 L-Buffer-TXT                                PIC X ANY LENGTH.
111
112      01 L-Buffer-Length-NUM                          USAGE BINARY-LONG.
113
114      PROCEDURE DIVISION USING L-Buffer-TXT,
115                                OPTIONAL L-Buffer-Length-NUM.
116      000-Main SECTION.
117          IF NUMBER-OF-CALL-PARAMETERS = 1
118              MOVE LENGTH(L-Buffer-TXT) TO WS-Buffer-Length-NUM
119          ELSE
120              MOVE L-Buffer-Length-NUM TO WS-Buffer-Length-NUM
121          END-IF
122          MOVE SPACES TO WS-Output-Detail-TXT
123          SET WS-Addr-PTR TO ADDRESS OF L-Buffer-TXT
124          PERFORM 100-Generate-Address
125          MOVE 0 TO WS-Output-SUB
126          DISPLAY WS-Output-Header-1-TXT UPON SYSERR
127          DISPLAY WS-Output-Header-2-TXT UPON SYSERR
128          PERFORM VARYING WS-Buffer-SUB FROM 1 BY 1
129              UNTIL WS-Buffer-SUB > WS-Buffer-Length-NUM
130              ADD 1 TO WS-Output-SUB
131              IF WS-Output-SUB = 1
132                  MOVE WS-Buffer-SUB TO WS-OD-Relative-Byte-NUM
133              END-IF
134              MOVE L-Buffer-TXT (WS-Buffer-SUB : 1)
135                  TO WS-OD-ASCII-CHR (WS-Output-SUB)
136                  WS-Buffer-Byte-CHR
137              DIVIDE WS-Buffer-Byte-NUM BY 16
138                  GIVING WS-Nibble-Left-SUB
139                  REMAINDER WS-Nibble-Right-SUB
140              ADD 1 TO WS-Nibble-Left-SUB
141                  WS-Nibble-Right-SUB
142              MOVE WS-Hex-Digit-CHR (WS-Nibble-Left-SUB)
143                  TO WS-OD-Hex-1-CHR (WS-Output-SUB)
144              MOVE WS-Hex-Digit-CHR (WS-Nibble-Right-SUB)
145                  TO WS-OD-Hex-2-CHR (WS-Output-SUB)
=====

```

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```

=====
146             IF WS-Output-SUB = 16
147                 CALL "C$PRINTABLE" USING WS-OD-ASCII-Data-TXT
148                 DISPLAY WS-Output-Detail-TXT UPON SYSERR
149                 MOVE SPACES TO WS-Output-Detail-TXT
150                 MOVE 0 TO WS-Output-SUB
151                 SET WS-Addr-PTR UP BY 16
152                 PERFORM 100-Generate-Address
153             END-IF
154         END-PERFORM
155     IF WS-Output-SUB > 0
156         CALL "C$PRINTABLE" USING WS-OD-ASCII-Data-TXT
157         DISPLAY WS-Output-Detail-TXT UPON SYSERR
158     END-IF
159     EXIT PROGRAM
160     .
161 100-Generate-Address SECTION.
162     MOVE 8 TO WS-Addr-SUB
163     MOVE WS-Addr-NUM TO WS-Addr-Value-NUM
164     MOVE ALL '0' TO WS-OD-Addr-TXT
165     PERFORM WITH TEST BEFORE UNTIL WS-Addr-Value-NUM = 0
166         DIVIDE WS-Addr-Value-NUM BY 16
167             GIVING WS-Addr-Value-NUM
168             REMAINDER WS-Nibble-SUB
169     ADD 1 TO WS-Nibble-SUB
170     MOVE WS-Hex-Digit-CHR (WS-Nibble-SUB)
171         TO WS-OD-Addr-Hex-CHR (WS-Addr-SUB)
172     SUBTRACT 1 FROM WS-Addr-SUB
173     END-PERFORM
174     .
=====

```

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GNU COBOL 2.1 23NOV2013 Cross-Reference Listing					2014/03/27		
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PROGRAM-ID	Identifier/Register/Function	Defn	Where Defined	References			
COBDUMP	000-Main	116	PROCEDURE				
COBDUMP	100-Generate-Address	161	PROCEDURE	124	152		
COBDUMP	L-Buffer-Length-NUM	112	LINKAGE	115	120		
COBDUMP	L-Buffer-TXT	110	LINKAGE	114	118	123	
				134			
COBDUMP	NUMBER-OF-CALL-PARAMETERS		PROCEDURE	117			
COBDUMP	WS-Addr-NUM	61	WORKING-STORAGE	163			
COBDUMP	WS-Addr-PTR	60	WORKING-STORAGE	61	123*	151*	
COBDUMP	WS-Addr-SUB	64	WORKING-STORAGE	162*	171	172	
COBDUMP	WS-Addr-Value-NUM	66	WORKING-STORAGE	163*	165	166	
				167*			
COBDUMP	WS-Buffer-Byte-CHR	68	WORKING-STORAGE	136			
COBDUMP	WS-Buffer-Byte-NUM	69	WORKING-STORAGE	137			
COBDUMP	WS-Buffer-Length-NUM	71	WORKING-STORAGE	118*	120*	129	
COBDUMP	WS-Buffer-SUB	73	WORKING-STORAGE	128*	129	132	
				134			
COBDUMP	WS-Hex-Digit-CHR	76	WORKING-STORAGE	142	144	170	
COBDUMP	WS-Hex-Digit-TXT	75	WORKING-STORAGE				
COBDUMP	WS-Nibble-Left-SUB	81	WORKING-STORAGE	138*	140*	142	
COBDUMP	WS-Nibble-Right-SUB	83	WORKING-STORAGE	139*	141*	144	
COBDUMP	WS-Nibble-SUB	79	WORKING-STORAGE	168*	169*	170	
COBDUMP	WS-OD-Addr-Hex-CHR	87	WORKING-STORAGE	171*			
COBDUMP	WS-OD-Addr-TXT	86	WORKING-STORAGE	164*			
COBDUMP	WS-OD-ASCII-CHR	96	WORKING-STORAGE	135*			
COBDUMP	WS-OD-ASCII-Data-TXT	95	WORKING-STORAGE	147C	156C		
COBDUMP	WS-OD-Hex-1-CHR	92	WORKING-STORAGE	143*			
COBDUMP	WS-OD-Hex-2-CHR	93	WORKING-STORAGE	145*			
COBDUMP	WS-OD-Hex-TXT	91	WORKING-STORAGE				
COBDUMP	WS-OD-Relative-Byte-NUM	89	WORKING-STORAGE	132*			
COBDUMP	WS-Output-Detail-TXT	85	WORKING-STORAGE	122*	148	149*	
				157			
COBDUMP	WS-Output-Header-1-TXT	102	WORKING-STORAGE	126			
COBDUMP	WS-Output-Header-2-TXT	105	WORKING-STORAGE	127			
COBDUMP	WS-Output-SUB	99	WORKING-STORAGE	125*	130*	131	
				135	143	145	
				146	150*	155	

### 3. Colors

Colors is a handy little GnuCOBOL utility program that will produce a screen showing all possible combinations of:

- FOREGROUND-COLOR
- BACKGROUND-COLOR
- BLINKING (or absence of BLINKING)
- HIGHLIGHT, LOWLIGHT or absence of either (i.e. "Normal")
- REVERSE-VIDEO

Here is a sample of the screen generated by this program:



The program source and cross-reference listing, produced using the GnuCOBOL Interactive Compiler front-end (GCic.cbl, one of the sample programs included here), begins on the next page.

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2014/03/27

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Line Statement Page: 1

```

=====
1          >>SOURCE FREE
2 IDENTIFICATION DIVISION.
3 PROGRAM-ID. colors.
4 DATA DIVISION.
5 SCREEN SECTION.
6 01 S-COLORTST-SCR BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 BLANK SCREEN.
7 05 LINE 01.
8 10 COL 1 VALUE ' LOWLIGHT ----- HIGHLIGHT LOWLIGHT ----- HIGHLIGHT'.
9 05 LINE + 1.
10 10 COL 1 VALUE ' ----- ----- ----- ----- -----'.
11 05 LINE + 1.
12 10 COL 1 VALUE ' ----- ----- ----- REVERSE REVERSE REVERSE'.
13 05 LINE + 1.
14 10 COL 1 VALUE ' 01234567 01234567 01234567 01234567 01234567 01234567'.
15 05 LINE + 1.
16 10 COL 1 VALUE '0          0          0          0          0          0          '.
17 05 LINE + 1.
18 10 COL 1 VALUE '1          1          1          1          1          1          '.
19 05 LINE + 1.
20 10 COL 1 VALUE '2          2          2          2          2          2          '.
21 05 LINE + 1.
22 10 COL 1 VALUE '3      1      3      2      3      3      3      4      3      5      3      6      '.
23 05 LINE + 1.
24 10 COL 1 VALUE '4          4          4          4          4          4          '.
25 05 LINE + 1.
26 10 COL 1 VALUE '5          5          5          5          5          5          '.
27 05 LINE + 1.
28 10 COL 1 VALUE '6          6          6          6          6          6          '.
29 05 LINE + 1.
30 10 COL 1 VALUE '7          7          7          7          7          7          '.
31 05 LINE + 1.
32 10 COL 1 VALUE ' LOWLIGHT ----- HIGHLIGHT LOWLIGHT ----- HIGHLIGHT'.
33 05 LINE + 1.
34 10 COL 1 VALUE '          BLINK          BLINK          BLINK          BLINK          BLINK          BLINK'.
35 05 LINE + 1.
36 10 COL 1 VALUE ' ----- ----- ----- REVERSE REVERSE REVERSE'.
37 05 LINE + 1.
38 10 COL 1 VALUE ' 01234567 01234567 01234567 01234567 01234567 01234567'.
39 05 LINE + 1.
40 10 COL 1 VALUE '0          0          0          0          0          0          '.
41 05 LINE + 1.
42 10 COL 1 VALUE '1          1          1          1          1          1          '.
43 05 LINE + 1.
44 10 COL 1 VALUE '2          2          2          2          2          2          '.
45 05 LINE + 1.
46 10 COL 1 VALUE '3      7      3      8      3      9      3      10      3      11      3      12      '.
47 05 LINE + 1.
48 10 COL 1 VALUE '4          4          4          4          4          4          '.
49 05 LINE + 1.
=====

```

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Line Statement

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```

=====
50 10 COL 1 VALUE '5          5          5          5          5          5          '.
51 05 LINE + 1.
52 10 COL 1 VALUE '6          6          6          6          6          6          '.
53 05 LINE + 1.
54 10 COL 1 VALUE '7          7          7          7          7          7          '.
55 *> #1
56 05 LINE 05.
57 10 COL 2  BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 LOWLIGHT VALUE 'X'.
58 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 LOWLIGHT VALUE 'X'.
59 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 LOWLIGHT VALUE 'X'.
60 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 LOWLIGHT VALUE 'X'.
61 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 LOWLIGHT VALUE 'X'.
62 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 LOWLIGHT VALUE 'X'.
63 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 LOWLIGHT VALUE 'X'.
64 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 LOWLIGHT VALUE 'X'.
65 05 LINE + 1.
66 10 COL 2  BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 LOWLIGHT VALUE 'X'.
67 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 LOWLIGHT VALUE 'X'.
68 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 LOWLIGHT VALUE 'X'.
69 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 LOWLIGHT VALUE 'X'.
70 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 LOWLIGHT VALUE 'X'.
71 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 LOWLIGHT VALUE 'X'.
72 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 LOWLIGHT VALUE 'X'.
73 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 LOWLIGHT VALUE 'X'.
74 05 LINE + 1.
75 10 COL 2  BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 LOWLIGHT VALUE 'X'.
76 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 LOWLIGHT VALUE 'X'.
77 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 LOWLIGHT VALUE 'X'.
78 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 LOWLIGHT VALUE 'X'.
79 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 LOWLIGHT VALUE 'X'.
80 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 LOWLIGHT VALUE 'X'.
81 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 LOWLIGHT VALUE 'X'.
82 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 LOWLIGHT VALUE 'X'.
83 05 LINE + 1.
84 10 COL 2  BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 LOWLIGHT VALUE 'X'.
85 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 LOWLIGHT VALUE 'X'.
86 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 LOWLIGHT VALUE 'X'.
87 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 LOWLIGHT VALUE 'X'.
88 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 LOWLIGHT VALUE 'X'.
89 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 LOWLIGHT VALUE 'X'.
90 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 LOWLIGHT VALUE 'X'.
91 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 LOWLIGHT VALUE 'X'.
92 05 LINE + 1.
93 10 COL 2  BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 LOWLIGHT VALUE 'X'.
94 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 LOWLIGHT VALUE 'X'.
95 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 LOWLIGHT VALUE 'X'.
96 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 LOWLIGHT VALUE 'X'.
97 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 LOWLIGHT VALUE 'X'.
98 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 LOWLIGHT VALUE 'X'.
=====

```

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Line Statement

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```

=====
  99 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 LOWLIGHT VALUE 'X'.
 100 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 LOWLIGHT VALUE 'X'.
 101 05 LINE + 1.
 102 10 COL 2 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 LOWLIGHT VALUE 'X'.
 103 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 LOWLIGHT VALUE 'X'.
 104 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 LOWLIGHT VALUE 'X'.
 105 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 LOWLIGHT VALUE 'X'.
 106 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 LOWLIGHT VALUE 'X'.
 107 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 LOWLIGHT VALUE 'X'.
 108 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 LOWLIGHT VALUE 'X'.
 109 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 LOWLIGHT VALUE 'X'.
 110 05 LINE + 1.
 111 10 COL 2 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 LOWLIGHT VALUE 'X'.
 112 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 LOWLIGHT VALUE 'X'.
 113 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 LOWLIGHT VALUE 'X'.
 114 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 LOWLIGHT VALUE 'X'.
 115 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 LOWLIGHT VALUE 'X'.
 116 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 LOWLIGHT VALUE 'X'.
 117 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 LOWLIGHT VALUE 'X'.
 118 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 LOWLIGHT VALUE 'X'.
 119 05 LINE + 1.
 120 10 COL 2 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 LOWLIGHT VALUE 'X'.
 121 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 LOWLIGHT VALUE 'X'.
 122 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 LOWLIGHT VALUE 'X'.
 123 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 LOWLIGHT VALUE 'X'.
 124 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 LOWLIGHT VALUE 'X'.
 125 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 LOWLIGHT VALUE 'X'.
 126 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 LOWLIGHT VALUE 'X'.
 127 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 LOWLIGHT VALUE 'X'.
 128 *> #2
 129 05 LINE 05.
 130 10 COL 12 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 VALUE 'X'.
 131 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 VALUE 'X'.
 132 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 VALUE 'X'.
 133 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 VALUE 'X'.
 134 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 VALUE 'X'.
 135 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 VALUE 'X'.
 136 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 VALUE 'X'.
 137 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 VALUE 'X'.
 138 05 LINE + 1.
 139 10 COL 12 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 VALUE 'X'.
 140 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 VALUE 'X'.
 141 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 VALUE 'X'.
 142 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 VALUE 'X'.
 143 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 VALUE 'X'.
 144 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 VALUE 'X'.
 145 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 VALUE 'X'.
 146 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 VALUE 'X'.
 147 05 LINE + 1.
=====

```

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```

=====
148 10 COL 12 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 VALUE 'X'.
149 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 VALUE 'X'.
150 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 VALUE 'X'.
151 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 VALUE 'X'.
152 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 VALUE 'X'.
153 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 VALUE 'X'.
154 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 VALUE 'X'.
155 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 VALUE 'X'.
156 05 LINE + 1.
157 10 COL 12 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 VALUE 'X'.
158 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 VALUE 'X'.
159 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 VALUE 'X'.
160 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 VALUE 'X'.
161 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 VALUE 'X'.
162 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 VALUE 'X'.
163 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 VALUE 'X'.
164 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 VALUE 'X'.
165 05 LINE + 1.
166 10 COL 12 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 VALUE 'X'.
167 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 VALUE 'X'.
168 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 VALUE 'X'.
169 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 VALUE 'X'.
170 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 VALUE 'X'.
171 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 VALUE 'X'.
172 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 VALUE 'X'.
173 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 VALUE 'X'.
174 05 LINE + 1.
175 10 COL 12 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 VALUE 'X'.
176 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 VALUE 'X'.
177 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 VALUE 'X'.
178 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 VALUE 'X'.
179 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 VALUE 'X'.
180 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 VALUE 'X'.
181 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 VALUE 'X'.
182 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 VALUE 'X'.
183 05 LINE + 1.
184 10 COL 12 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 VALUE 'X'.
185 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 VALUE 'X'.
186 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 VALUE 'X'.
187 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 VALUE 'X'.
188 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 VALUE 'X'.
189 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 VALUE 'X'.
190 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 VALUE 'X'.
191 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 VALUE 'X'.
192 05 LINE + 1.
193 10 COL 12 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 VALUE 'X'.
194 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 VALUE 'X'.
195 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 VALUE 'X'.
196 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 VALUE 'X'.
=====

```

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=====
197 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 VALUE 'X'.
198 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 VALUE 'X'.
199 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 VALUE 'X'.
200 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 VALUE 'X'.
201 *> #3
202 05 LINE 05.
203 10 COL 22 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 HIGHLIGHT VALUE 'X'.
204 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 HIGHLIGHT VALUE 'X'.
205 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 HIGHLIGHT VALUE 'X'.
206 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 HIGHLIGHT VALUE 'X'.
207 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 HIGHLIGHT VALUE 'X'.
208 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 HIGHLIGHT VALUE 'X'.
209 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 HIGHLIGHT VALUE 'X'.
210 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 HIGHLIGHT VALUE 'X'.
211 05 LINE + 1.
212 10 COL 22 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 HIGHLIGHT VALUE 'X'.
213 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 HIGHLIGHT VALUE 'X'.
214 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 HIGHLIGHT VALUE 'X'.
215 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 HIGHLIGHT VALUE 'X'.
216 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 HIGHLIGHT VALUE 'X'.
217 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 HIGHLIGHT VALUE 'X'.
218 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 HIGHLIGHT VALUE 'X'.
219 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 HIGHLIGHT VALUE 'X'.
220 05 LINE + 1.
221 10 COL 22 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 HIGHLIGHT VALUE 'X'.
222 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 HIGHLIGHT VALUE 'X'.
223 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 HIGHLIGHT VALUE 'X'.
224 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 HIGHLIGHT VALUE 'X'.
225 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 HIGHLIGHT VALUE 'X'.
226 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 HIGHLIGHT VALUE 'X'.
227 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 HIGHLIGHT VALUE 'X'.
228 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 HIGHLIGHT VALUE 'X'.
229 05 LINE + 1.
230 10 COL 22 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 HIGHLIGHT VALUE 'X'.
231 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 HIGHLIGHT VALUE 'X'.
232 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 HIGHLIGHT VALUE 'X'.
233 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 HIGHLIGHT VALUE 'X'.
234 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 HIGHLIGHT VALUE 'X'.
235 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 HIGHLIGHT VALUE 'X'.
236 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 HIGHLIGHT VALUE 'X'.
237 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 HIGHLIGHT VALUE 'X'.
238 05 LINE + 1.
239 10 COL 22 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 HIGHLIGHT VALUE 'X'.
240 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 HIGHLIGHT VALUE 'X'.
241 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 HIGHLIGHT VALUE 'X'.
242 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 HIGHLIGHT VALUE 'X'.
243 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 HIGHLIGHT VALUE 'X'.
244 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 HIGHLIGHT VALUE 'X'.
245 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 HIGHLIGHT VALUE 'X'.
=====

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=====
246 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 HIGHLIGHT VALUE 'X'.
247 05 LINE + 1.
248 10 COL 22 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 HIGHLIGHT VALUE 'X'.
249 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 HIGHLIGHT VALUE 'X'.
250 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 HIGHLIGHT VALUE 'X'.
251 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 HIGHLIGHT VALUE 'X'.
252 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 HIGHLIGHT VALUE 'X'.
253 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 HIGHLIGHT VALUE 'X'.
254 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 HIGHLIGHT VALUE 'X'.
255 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 HIGHLIGHT VALUE 'X'.
256 05 LINE + 1.
257 10 COL 22 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 HIGHLIGHT VALUE 'X'.
258 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 HIGHLIGHT VALUE 'X'.
259 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 HIGHLIGHT VALUE 'X'.
260 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 HIGHLIGHT VALUE 'X'.
261 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 HIGHLIGHT VALUE 'X'.
262 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 HIGHLIGHT VALUE 'X'.
263 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 HIGHLIGHT VALUE 'X'.
264 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 HIGHLIGHT VALUE 'X'.
265 05 LINE + 1.
266 10 COL 22 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 HIGHLIGHT VALUE 'X'.
267 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 HIGHLIGHT VALUE 'X'.
268 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 HIGHLIGHT VALUE 'X'.
269 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 HIGHLIGHT VALUE 'X'.
270 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 HIGHLIGHT VALUE 'X'.
271 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 HIGHLIGHT VALUE 'X'.
272 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 HIGHLIGHT VALUE 'X'.
273 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 HIGHLIGHT VALUE 'X'.
274 *> #4
275 05 LINE 05.
276 10 COL 32 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
277 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
278 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
279 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
280 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
281 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
282 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
283 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
284 05 LINE + 1.
285 10 COL 32 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
286 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
287 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
288 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
289 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
290 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
291 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
292 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
293 05 LINE + 1.
294 10 COL 32 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
=====

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=====
295 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
296 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
297 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
298 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
299 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
300 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
301 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
302 05 LINE + 1.
303 10 COL 32 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
304 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
305 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
306 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
307 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
308 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
309 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
310 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
311 05 LINE + 1.
312 10 COL 32 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
313 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
314 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
315 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
316 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
317 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
318 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
319 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
320 05 LINE + 1.
321 10 COL 32 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
322 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
323 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
324 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
325 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
326 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
327 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
328 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
329 05 LINE + 1.
330 10 COL 32 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
331 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
332 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
333 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
334 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
335 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
336 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
337 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
338 05 LINE + 1.
339 10 COL 32 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
340 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
341 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
342 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
343 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
=====

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```

=====
344 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
345 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
346 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 LOWLIGHT REVERSE-VIDEO VALUE 'X'.
347 *> #5
348 05 LINE 05.
349 10 COL 42 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 REVERSE-VIDEO VALUE 'X'.
350 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 REVERSE-VIDEO VALUE 'X'.
351 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 REVERSE-VIDEO VALUE 'X'.
352 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 REVERSE-VIDEO VALUE 'X'.
353 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 REVERSE-VIDEO VALUE 'X'.
354 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 REVERSE-VIDEO VALUE 'X'.
355 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 REVERSE-VIDEO VALUE 'X'.
356 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 REVERSE-VIDEO VALUE 'X'.
357 05 LINE + 1.
358 10 COL 42 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 REVERSE-VIDEO VALUE 'X'.
359 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 REVERSE-VIDEO VALUE 'X'.
360 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 REVERSE-VIDEO VALUE 'X'.
361 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 REVERSE-VIDEO VALUE 'X'.
362 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 REVERSE-VIDEO VALUE 'X'.
363 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 REVERSE-VIDEO VALUE 'X'.
364 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 REVERSE-VIDEO VALUE 'X'.
365 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 REVERSE-VIDEO VALUE 'X'.
366 05 LINE + 1.
367 10 COL 42 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 REVERSE-VIDEO VALUE 'X'.
368 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 REVERSE-VIDEO VALUE 'X'.
369 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 REVERSE-VIDEO VALUE 'X'.
370 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 REVERSE-VIDEO VALUE 'X'.
371 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 REVERSE-VIDEO VALUE 'X'.
372 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 REVERSE-VIDEO VALUE 'X'.
373 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 REVERSE-VIDEO VALUE 'X'.
374 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 REVERSE-VIDEO VALUE 'X'.
375 05 LINE + 1.
376 10 COL 42 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 REVERSE-VIDEO VALUE 'X'.
377 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 REVERSE-VIDEO VALUE 'X'.
378 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 REVERSE-VIDEO VALUE 'X'.
379 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 REVERSE-VIDEO VALUE 'X'.
380 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 REVERSE-VIDEO VALUE 'X'.
381 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 REVERSE-VIDEO VALUE 'X'.
382 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 REVERSE-VIDEO VALUE 'X'.
383 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 REVERSE-VIDEO VALUE 'X'.
384 05 LINE + 1.
385 10 COL 42 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 REVERSE-VIDEO VALUE 'X'.
386 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 REVERSE-VIDEO VALUE 'X'.
387 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 REVERSE-VIDEO VALUE 'X'.
388 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 REVERSE-VIDEO VALUE 'X'.
389 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 REVERSE-VIDEO VALUE 'X'.
390 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 REVERSE-VIDEO VALUE 'X'.
391 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 REVERSE-VIDEO VALUE 'X'.
392 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 REVERSE-VIDEO VALUE 'X'.
=====

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=====
393 05 LINE + 1.
394 10 COL 42 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 REVERSE-VIDEO VALUE 'X'.
395 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 REVERSE-VIDEO VALUE 'X'.
396 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 REVERSE-VIDEO VALUE 'X'.
397 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 REVERSE-VIDEO VALUE 'X'.
398 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 REVERSE-VIDEO VALUE 'X'.
399 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 REVERSE-VIDEO VALUE 'X'.
400 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 REVERSE-VIDEO VALUE 'X'.
401 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 REVERSE-VIDEO VALUE 'X'.
402 05 LINE + 1.
403 10 COL 42 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 REVERSE-VIDEO VALUE 'X'.
404 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 REVERSE-VIDEO VALUE 'X'.
405 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 REVERSE-VIDEO VALUE 'X'.
406 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 REVERSE-VIDEO VALUE 'X'.
407 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 REVERSE-VIDEO VALUE 'X'.
408 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 REVERSE-VIDEO VALUE 'X'.
409 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 REVERSE-VIDEO VALUE 'X'.
410 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 REVERSE-VIDEO VALUE 'X'.
411 05 LINE + 1.
412 10 COL 42 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 REVERSE-VIDEO VALUE 'X'.
413 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 REVERSE-VIDEO VALUE 'X'.
414 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 REVERSE-VIDEO VALUE 'X'.
415 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 REVERSE-VIDEO VALUE 'X'.
416 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 REVERSE-VIDEO VALUE 'X'.
417 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 REVERSE-VIDEO VALUE 'X'.
418 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 REVERSE-VIDEO VALUE 'X'.
419 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 REVERSE-VIDEO VALUE 'X'.
420 *> #6
421 05 LINE 05.
422 10 COL 52 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
423 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
424 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
425 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
426 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
427 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
428 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
429 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
430 05 LINE + 1.
431 10 COL 52 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
432 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
433 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
434 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
435 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
436 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
437 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
438 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
439 05 LINE + 1.
440 10 COL 52 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
441 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
=====

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=====
442 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
443 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
444 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
445 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
446 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
447 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
448 05 LINE + 1.
449 10 COL 52 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
450 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
451 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
452 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
453 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
454 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
455 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
456 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
457 05 LINE + 1.
458 10 COL 52 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
459 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
460 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
461 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
462 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
463 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
464 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
465 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
466 05 LINE + 1.
467 10 COL 52 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
468 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
469 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
470 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
471 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
472 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
473 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
474 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
475 05 LINE + 1.
476 10 COL 52 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
477 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
478 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
479 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
480 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
481 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
482 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
483 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
484 05 LINE + 1.
485 10 COL 52 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
486 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
487 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
488 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
489 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
490 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
=====

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=====
491 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
492 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 HIGHLIGHT REVERSE-VIDEO VALUE 'X'.
493 *> #7
494 05 LINE 17.
495 10 COL 02 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 LOWLIGHT BLINK VALUE 'X'.
496 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 LOWLIGHT BLINK VALUE 'X'.
497 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 LOWLIGHT BLINK VALUE 'X'.
498 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 LOWLIGHT BLINK VALUE 'X'.
499 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 LOWLIGHT BLINK VALUE 'X'.
500 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 LOWLIGHT BLINK VALUE 'X'.
501 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 LOWLIGHT BLINK VALUE 'X'.
502 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 LOWLIGHT BLINK VALUE 'X'.
503 05 LINE + 1.
504 10 COL 02 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 LOWLIGHT BLINK VALUE 'X'.
505 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 LOWLIGHT BLINK VALUE 'X'.
506 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 LOWLIGHT BLINK VALUE 'X'.
507 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 LOWLIGHT BLINK VALUE 'X'.
508 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 LOWLIGHT BLINK VALUE 'X'.
509 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 LOWLIGHT BLINK VALUE 'X'.
510 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 LOWLIGHT BLINK VALUE 'X'.
511 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 LOWLIGHT BLINK VALUE 'X'.
512 05 LINE + 1.
513 10 COL 02 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 LOWLIGHT BLINK VALUE 'X'.
514 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 LOWLIGHT BLINK VALUE 'X'.
515 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 LOWLIGHT BLINK VALUE 'X'.
516 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 LOWLIGHT BLINK VALUE 'X'.
517 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 LOWLIGHT BLINK VALUE 'X'.
518 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 LOWLIGHT BLINK VALUE 'X'.
519 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 LOWLIGHT BLINK VALUE 'X'.
520 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 LOWLIGHT BLINK VALUE 'X'.
521 05 LINE + 1.
522 10 COL 02 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 LOWLIGHT BLINK VALUE 'X'.
523 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 LOWLIGHT BLINK VALUE 'X'.
524 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 LOWLIGHT BLINK VALUE 'X'.
525 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 LOWLIGHT BLINK VALUE 'X'.
526 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 LOWLIGHT BLINK VALUE 'X'.
527 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 LOWLIGHT BLINK VALUE 'X'.
528 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 LOWLIGHT BLINK VALUE 'X'.
529 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 LOWLIGHT BLINK VALUE 'X'.
530 05 LINE + 1.
531 10 COL 02 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 LOWLIGHT BLINK VALUE 'X'.
532 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 LOWLIGHT BLINK VALUE 'X'.
533 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 LOWLIGHT BLINK VALUE 'X'.
534 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 LOWLIGHT BLINK VALUE 'X'.
535 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 LOWLIGHT BLINK VALUE 'X'.
536 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 LOWLIGHT BLINK VALUE 'X'.
537 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 LOWLIGHT BLINK VALUE 'X'.
538 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 LOWLIGHT BLINK VALUE 'X'.
539 05 LINE + 1.
=====

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=====
540 10 COL 02 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 LOWLIGHT BLINK VALUE 'X'.
541 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 LOWLIGHT BLINK VALUE 'X'.
542 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 LOWLIGHT BLINK VALUE 'X'.
543 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 LOWLIGHT BLINK VALUE 'X'.
544 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 LOWLIGHT BLINK VALUE 'X'.
545 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 LOWLIGHT BLINK VALUE 'X'.
546 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 LOWLIGHT BLINK VALUE 'X'.
547 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 LOWLIGHT BLINK VALUE 'X'.
548 05 LINE + 1.
549 10 COL 02 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 LOWLIGHT BLINK VALUE 'X'.
550 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 LOWLIGHT BLINK VALUE 'X'.
551 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 LOWLIGHT BLINK VALUE 'X'.
552 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 LOWLIGHT BLINK VALUE 'X'.
553 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 LOWLIGHT BLINK VALUE 'X'.
554 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 LOWLIGHT BLINK VALUE 'X'.
555 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 LOWLIGHT BLINK VALUE 'X'.
556 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 LOWLIGHT BLINK VALUE 'X'.
557 05 LINE + 1.
558 10 COL 02 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 LOWLIGHT BLINK VALUE 'X'.
559 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 LOWLIGHT BLINK VALUE 'X'.
560 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 LOWLIGHT BLINK VALUE 'X'.
561 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 LOWLIGHT BLINK VALUE 'X'.
562 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 LOWLIGHT BLINK VALUE 'X'.
563 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 LOWLIGHT BLINK VALUE 'X'.
564 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 LOWLIGHT BLINK VALUE 'X'.
565 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 LOWLIGHT BLINK VALUE 'X'.
566 *> #8
567 05 LINE 17.
568 10 COL 12 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 BLINK VALUE 'X'.
569 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 BLINK VALUE 'X'.
570 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 BLINK VALUE 'X'.
571 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 BLINK VALUE 'X'.
572 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 BLINK VALUE 'X'.
573 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 BLINK VALUE 'X'.
574 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 BLINK VALUE 'X'.
575 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 BLINK VALUE 'X'.
576 05 LINE + 1.
577 10 COL 12 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 BLINK VALUE 'X'.
578 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 BLINK VALUE 'X'.
579 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 BLINK VALUE 'X'.
580 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 BLINK VALUE 'X'.
581 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 BLINK VALUE 'X'.
582 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 BLINK VALUE 'X'.
583 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 BLINK VALUE 'X'.
584 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 BLINK VALUE 'X'.
585 05 LINE + 1.
586 10 COL 12 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 BLINK VALUE 'X'.
587 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 BLINK VALUE 'X'.
588 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 BLINK VALUE 'X'.
=====

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=====
589 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 BLINK VALUE 'X'.
590 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 BLINK VALUE 'X'.
591 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 BLINK VALUE 'X'.
592 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 BLINK VALUE 'X'.
593 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 BLINK VALUE 'X'.
594 05 LINE + 1.
595 10 COL 12 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 BLINK VALUE 'X'.
596 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 BLINK VALUE 'X'.
597 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 BLINK VALUE 'X'.
598 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 BLINK VALUE 'X'.
599 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 BLINK VALUE 'X'.
600 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 BLINK VALUE 'X'.
601 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 BLINK VALUE 'X'.
602 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 BLINK VALUE 'X'.
603 05 LINE + 1.
604 10 COL 12 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 BLINK VALUE 'X'.
605 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 BLINK VALUE 'X'.
606 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 BLINK VALUE 'X'.
607 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 BLINK VALUE 'X'.
608 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 BLINK VALUE 'X'.
609 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 BLINK VALUE 'X'.
610 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 BLINK VALUE 'X'.
611 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 BLINK VALUE 'X'.
612 05 LINE + 1.
613 10 COL 12 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 BLINK VALUE 'X'.
614 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 BLINK VALUE 'X'.
615 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 BLINK VALUE 'X'.
616 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 BLINK VALUE 'X'.
617 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 BLINK VALUE 'X'.
618 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 BLINK VALUE 'X'.
619 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 BLINK VALUE 'X'.
620 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 BLINK VALUE 'X'.
621 05 LINE + 1.
622 10 COL 12 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 BLINK VALUE 'X'.
623 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 BLINK VALUE 'X'.
624 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 BLINK VALUE 'X'.
625 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 BLINK VALUE 'X'.
626 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 BLINK VALUE 'X'.
627 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 BLINK VALUE 'X'.
628 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 BLINK VALUE 'X'.
629 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 BLINK VALUE 'X'.
630 05 LINE + 1.
631 10 COL 12 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 BLINK VALUE 'X'.
632 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 BLINK VALUE 'X'.
633 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 BLINK VALUE 'X'.
634 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 BLINK VALUE 'X'.
635 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 BLINK VALUE 'X'.
636 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 BLINK VALUE 'X'.
637 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 BLINK VALUE 'X'.
=====

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=====
638 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 BLINK VALUE 'X'.
639 *> #9
640 05 LINE 17.
641 10 COL 22 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 HIGHLIGHT BLINK VALUE 'X'.
642 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 HIGHLIGHT BLINK VALUE 'X'.
643 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 HIGHLIGHT BLINK VALUE 'X'.
644 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 HIGHLIGHT BLINK VALUE 'X'.
645 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 HIGHLIGHT BLINK VALUE 'X'.
646 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 HIGHLIGHT BLINK VALUE 'X'.
647 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 HIGHLIGHT BLINK VALUE 'X'.
648 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 HIGHLIGHT BLINK VALUE 'X'.
649 05 LINE + 1.
650 10 COL 22 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 HIGHLIGHT BLINK VALUE 'X'.
651 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 HIGHLIGHT BLINK VALUE 'X'.
652 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 HIGHLIGHT BLINK VALUE 'X'.
653 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 HIGHLIGHT BLINK VALUE 'X'.
654 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 HIGHLIGHT BLINK VALUE 'X'.
655 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 HIGHLIGHT BLINK VALUE 'X'.
656 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 HIGHLIGHT BLINK VALUE 'X'.
657 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 HIGHLIGHT BLINK VALUE 'X'.
658 05 LINE + 1.
659 10 COL 22 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 HIGHLIGHT BLINK VALUE 'X'.
660 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 HIGHLIGHT BLINK VALUE 'X'.
661 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 HIGHLIGHT BLINK VALUE 'X'.
662 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 HIGHLIGHT BLINK VALUE 'X'.
663 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 HIGHLIGHT BLINK VALUE 'X'.
664 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 HIGHLIGHT BLINK VALUE 'X'.
665 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 HIGHLIGHT BLINK VALUE 'X'.
666 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 HIGHLIGHT BLINK VALUE 'X'.
667 05 LINE + 1.
668 10 COL 22 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 HIGHLIGHT BLINK VALUE 'X'.
669 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 HIGHLIGHT BLINK VALUE 'X'.
670 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 HIGHLIGHT BLINK VALUE 'X'.
671 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 HIGHLIGHT BLINK VALUE 'X'.
672 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 HIGHLIGHT BLINK VALUE 'X'.
673 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 HIGHLIGHT BLINK VALUE 'X'.
674 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 HIGHLIGHT BLINK VALUE 'X'.
675 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 HIGHLIGHT BLINK VALUE 'X'.
676 05 LINE + 1.
677 10 COL 22 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 HIGHLIGHT BLINK VALUE 'X'.
678 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 HIGHLIGHT BLINK VALUE 'X'.
679 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 HIGHLIGHT BLINK VALUE 'X'.
680 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 HIGHLIGHT BLINK VALUE 'X'.
681 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 HIGHLIGHT BLINK VALUE 'X'.
682 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 HIGHLIGHT BLINK VALUE 'X'.
683 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 HIGHLIGHT BLINK VALUE 'X'.
684 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 HIGHLIGHT BLINK VALUE 'X'.
685 05 LINE + 1.
686 10 COL 22 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 HIGHLIGHT BLINK VALUE 'X'.
=====

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=====
687 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 HIGHLIGHT BLINK VALUE 'X'.
688 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 HIGHLIGHT BLINK VALUE 'X'.
689 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 HIGHLIGHT BLINK VALUE 'X'.
690 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 HIGHLIGHT BLINK VALUE 'X'.
691 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 HIGHLIGHT BLINK VALUE 'X'.
692 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 HIGHLIGHT BLINK VALUE 'X'.
693 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 HIGHLIGHT BLINK VALUE 'X'.
694 05 LINE + 1.
695 10 COL 22 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 HIGHLIGHT BLINK VALUE 'X'.
696 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 HIGHLIGHT BLINK VALUE 'X'.
697 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 HIGHLIGHT BLINK VALUE 'X'.
698 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 HIGHLIGHT BLINK VALUE 'X'.
699 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 HIGHLIGHT BLINK VALUE 'X'.
700 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 HIGHLIGHT BLINK VALUE 'X'.
701 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 HIGHLIGHT BLINK VALUE 'X'.
702 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 HIGHLIGHT BLINK VALUE 'X'.
703 05 LINE + 1.
704 10 COL 22 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 HIGHLIGHT BLINK VALUE 'X'.
705 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 HIGHLIGHT BLINK VALUE 'X'.
706 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 HIGHLIGHT BLINK VALUE 'X'.
707 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 HIGHLIGHT BLINK VALUE 'X'.
708 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 HIGHLIGHT BLINK VALUE 'X'.
709 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 HIGHLIGHT BLINK VALUE 'X'.
710 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 HIGHLIGHT BLINK VALUE 'X'.
711 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 HIGHLIGHT BLINK VALUE 'X'.
712 *> #10
713 05 LINE 17.
714 10 COL 32 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
715 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
716 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
717 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
718 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
719 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
720 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
721 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
722 05 LINE + 1.
723 10 COL 32 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
724 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
725 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
726 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
727 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
728 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
729 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
730 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
731 05 LINE + 1.
732 10 COL 32 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
733 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
734 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
735 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
=====

```

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```

=====
736 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
737 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
738 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
739 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
740 05 LINE + 1.
741 10 COL 32 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
742 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
743 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
744 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
745 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
746 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
747 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
748 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
749 05 LINE + 1.
750 10 COL 32 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
751 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
752 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
753 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
754 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
755 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
756 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
757 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
758 05 LINE + 1.
759 10 COL 32 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
760 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
761 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
762 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
763 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
764 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
765 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
766 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
767 05 LINE + 1.
768 10 COL 32 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
769 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
770 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
771 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
772 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
773 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
774 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
775 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
776 05 LINE + 1.
777 10 COL 32 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
778 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
779 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
780 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
781 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
782 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
783 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
784 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 LOWLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
=====

```

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```

=====
785 *> #11
786 05 LINE 17.
787 10 COL 42 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 BLINK REVERSE-VIDEO VALUE 'X'.
788 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 BLINK REVERSE-VIDEO VALUE 'X'.
789 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 BLINK REVERSE-VIDEO VALUE 'X'.
790 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 BLINK REVERSE-VIDEO VALUE 'X'.
791 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 BLINK REVERSE-VIDEO VALUE 'X'.
792 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 BLINK REVERSE-VIDEO VALUE 'X'.
793 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 BLINK REVERSE-VIDEO VALUE 'X'.
794 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 BLINK REVERSE-VIDEO VALUE 'X'.
795 05 LINE + 1.
796 10 COL 42 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 BLINK REVERSE-VIDEO VALUE 'X'.
797 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 BLINK REVERSE-VIDEO VALUE 'X'.
798 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 BLINK REVERSE-VIDEO VALUE 'X'.
799 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 BLINK REVERSE-VIDEO VALUE 'X'.
800 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 BLINK REVERSE-VIDEO VALUE 'X'.
801 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 BLINK REVERSE-VIDEO VALUE 'X'.
802 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 BLINK REVERSE-VIDEO VALUE 'X'.
803 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 BLINK REVERSE-VIDEO VALUE 'X'.
804 05 LINE + 1.
805 10 COL 42 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 BLINK REVERSE-VIDEO VALUE 'X'.
806 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 BLINK REVERSE-VIDEO VALUE 'X'.
807 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 BLINK REVERSE-VIDEO VALUE 'X'.
808 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 BLINK REVERSE-VIDEO VALUE 'X'.
809 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 BLINK REVERSE-VIDEO VALUE 'X'.
810 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 BLINK REVERSE-VIDEO VALUE 'X'.
811 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 BLINK REVERSE-VIDEO VALUE 'X'.
812 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 BLINK REVERSE-VIDEO VALUE 'X'.
813 05 LINE + 1.
814 10 COL 42 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 BLINK REVERSE-VIDEO VALUE 'X'.
815 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 BLINK REVERSE-VIDEO VALUE 'X'.
816 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 BLINK REVERSE-VIDEO VALUE 'X'.
817 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 BLINK REVERSE-VIDEO VALUE 'X'.
818 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 BLINK REVERSE-VIDEO VALUE 'X'.
819 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 BLINK REVERSE-VIDEO VALUE 'X'.
820 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 BLINK REVERSE-VIDEO VALUE 'X'.
821 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 BLINK REVERSE-VIDEO VALUE 'X'.
822 05 LINE + 1.
823 10 COL 42 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 BLINK REVERSE-VIDEO VALUE 'X'.
824 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 BLINK REVERSE-VIDEO VALUE 'X'.
825 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 BLINK REVERSE-VIDEO VALUE 'X'.
826 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 BLINK REVERSE-VIDEO VALUE 'X'.
827 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 BLINK REVERSE-VIDEO VALUE 'X'.
828 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 BLINK REVERSE-VIDEO VALUE 'X'.
829 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 BLINK REVERSE-VIDEO VALUE 'X'.
830 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 BLINK REVERSE-VIDEO VALUE 'X'.
831 05 LINE + 1.
832 10 COL 42 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 BLINK REVERSE-VIDEO VALUE 'X'.
833 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 BLINK REVERSE-VIDEO VALUE 'X'.
=====

```

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```

=====
834 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 BLINK REVERSE-VIDEO VALUE 'X'.
835 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 BLINK REVERSE-VIDEO VALUE 'X'.
836 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 BLINK REVERSE-VIDEO VALUE 'X'.
837 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 BLINK REVERSE-VIDEO VALUE 'X'.
838 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 BLINK REVERSE-VIDEO VALUE 'X'.
839 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 BLINK REVERSE-VIDEO VALUE 'X'.
840 05 LINE + 1.
841 10 COL 42 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 BLINK REVERSE-VIDEO VALUE 'X'.
842 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 BLINK REVERSE-VIDEO VALUE 'X'.
843 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 BLINK REVERSE-VIDEO VALUE 'X'.
844 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 BLINK REVERSE-VIDEO VALUE 'X'.
845 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 BLINK REVERSE-VIDEO VALUE 'X'.
846 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 BLINK REVERSE-VIDEO VALUE 'X'.
847 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 BLINK REVERSE-VIDEO VALUE 'X'.
848 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 BLINK REVERSE-VIDEO VALUE 'X'.
849 05 LINE + 1.
850 10 COL 42 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 BLINK REVERSE-VIDEO VALUE 'X'.
851 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 BLINK REVERSE-VIDEO VALUE 'X'.
852 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 BLINK REVERSE-VIDEO VALUE 'X'.
853 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 BLINK REVERSE-VIDEO VALUE 'X'.
854 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 BLINK REVERSE-VIDEO VALUE 'X'.
855 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 BLINK REVERSE-VIDEO VALUE 'X'.
856 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 BLINK REVERSE-VIDEO VALUE 'X'.
857 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 BLINK REVERSE-VIDEO VALUE 'X'.
858 *> #12
859 05 LINE 17.
860 10 COL 52 BACKGROUND-COLOR 0 FOREGROUND-COLOR 0 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
861 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 1 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
862 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 2 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
863 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 3 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
864 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 4 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
865 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 5 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
866 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 6 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
867 10 COL + 1 BACKGROUND-COLOR 0 FOREGROUND-COLOR 7 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
868 05 LINE + 1.
869 10 COL 52 BACKGROUND-COLOR 1 FOREGROUND-COLOR 0 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
870 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 1 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
871 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 2 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
872 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 3 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
873 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 4 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
874 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 5 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
875 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 6 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
876 10 COL + 1 BACKGROUND-COLOR 1 FOREGROUND-COLOR 7 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
877 05 LINE + 1.
878 10 COL 52 BACKGROUND-COLOR 2 FOREGROUND-COLOR 0 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
879 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 1 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
880 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 2 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
881 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 3 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
882 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 4 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
=====

```

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```

=====
883 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 5 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
884 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 6 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
885 10 COL + 1 BACKGROUND-COLOR 2 FOREGROUND-COLOR 7 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
886 05 LINE + 1.
887 10 COL 52 BACKGROUND-COLOR 3 FOREGROUND-COLOR 0 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
888 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 1 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
889 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 2 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
890 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 3 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
891 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 4 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
892 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 5 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
893 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 6 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
894 10 COL + 1 BACKGROUND-COLOR 3 FOREGROUND-COLOR 7 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
895 05 LINE + 1.
896 10 COL 52 BACKGROUND-COLOR 4 FOREGROUND-COLOR 0 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
897 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 1 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
898 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 2 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
899 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 3 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
900 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 4 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
901 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 5 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
902 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 6 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
903 10 COL + 1 BACKGROUND-COLOR 4 FOREGROUND-COLOR 7 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
904 05 LINE + 1.
905 10 COL 52 BACKGROUND-COLOR 5 FOREGROUND-COLOR 0 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
906 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 1 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
907 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 2 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
908 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 3 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
909 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 4 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
910 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 5 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
911 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 6 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
912 10 COL + 1 BACKGROUND-COLOR 5 FOREGROUND-COLOR 7 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
913 05 LINE + 1.
914 10 COL 52 BACKGROUND-COLOR 6 FOREGROUND-COLOR 0 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
915 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 1 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
916 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 2 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
917 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 3 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
918 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 4 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
919 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 5 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
920 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 6 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
921 10 COL + 1 BACKGROUND-COLOR 6 FOREGROUND-COLOR 7 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
922 05 LINE + 1.
923 10 COL 52 BACKGROUND-COLOR 7 FOREGROUND-COLOR 0 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
924 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 1 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
925 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 2 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
926 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 3 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
927 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 4 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
928 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 5 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
929 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 6 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
930 10 COL + 1 BACKGROUND-COLOR 7 FOREGROUND-COLOR 7 HIGHLIGHT BLINK REVERSE-VIDEO VALUE 'X'.
931 PROCEDURE DIVISION.
=====

```

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```
=====
932 000-Main SECTION.
933 DISPLAY S-COLORTST-SCR
934 STOP RUN
935 .
```

```
=====
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```

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```

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                                                                 C:/Users/tda010/Documents/Programs/Samples/colors.cbl
PROGRAM-ID      Identifier/Register/Function      Defn  Where Defined  References      Page: 21
=====
colors          000-Main                          932  PROCEDURE
colors          S-COLORTST-SCR                      6  SCREEN          933

```

## 4. DAY-FROM-DATE

DAY-FROM-DATE is a user-defined function that accepts a single numeric "USAGE DISPLAY" argument –æ either a 7-digit Julian date in the form *yyyyddd* or an 8-digit Gregorian date in the form *yyyymmdd*. This argument may be supplied either as a PIC 9(n) USAGE DISPLAY data item (n=7 or 8) or as a 7- or 8-digit numeric literal.

The subroutine will determine if the supplied date is a valid date in the year range 0000 through 9999 and what day of the week that date fell on.

The value returned will be zero if the date argument was invalid or an integer in the range 1-7, representing Sunday through Saturday.

In addition to general GnuCOBOL concepts, this program provides a useful demonstration of the following:

- Coding a GnuCOBOL user-defined function
- Using the "ANY LENGTH" data item attribute
- Using the "RETURNING" option in a subprogram
- Using the "DATE-OF-INTEGER" intrinsic function
- Using the "C\$PARAMSIZE" built-in system subroutine

The program source and cross-reference listing, produced using the GnuCOBOL Interactive Compiler front-end (GCic.cbl, one of the sample programs included here), begins on the next page.

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```

=====
1      >>SOURCE FORMAT IS FIXED
2      IDENTIFICATION DIVISION.
3      FUNCTION-ID. DAY-FROM-DATE.
4      *>*****
5      *> This GNU COBOL user-defined function converts a Gregorian or **
6      *> Julian date into a numeric day of the week.                **
7      *>*****
8      *> Arguments:                                                  **
9      *>                                                              **
10     *> Calendar-Date      A PIC 9 data item or numeric literal which **
11     *>                                                              **
12     *>                                                              **
13     *>                                                              **
14     *>                      7-digit value: Interpreted as a Julian date **
15     *>                                                              **
16     *>                      8-digit value: Interpreted as a Gregorian **
17     *>                                                              **
18     *>                      date in the form yyyymmdd                **
19     *> The result returned will be one of the following:          **
20     *>                                                              **
21     *> 0:  The supplied date is invalid                            **
22     *> 1:  The supplied date is a Sunday                          **
23     *> 2:  The supplied date is a Monday                          **
24     *> .                                                              **
25     *> .                                                              **
26     *> .                                                              **
27     *> 7:  The supplied date is a Saturday                        **
28     *>*****
29     ENVIRONMENT DIVISION.
30     CONFIGURATION SECTION.
31     REPOSITORY.
32     FUNCTION ALL INTRINSIC.
33     DATA DIVISION.
34     WORKING-STORAGE SECTION.
35     01 WS-Input-Date-DT.
36         05 WS-ID-YYYY-NUM                PIC 9(4).
37         05 WS-ID-MM-NUM                   PIC 9(2).
38         05 WS-ID-DD-NUM                   PIC 9(2).
39     01 WS-Y-NUM                           BINARY-LONG.
40     01 WS-M-NUM                           BINARY-LONG.
41     01 WS-Temp-NUM                        BINARY-LONG.
42     LINKAGE SECTION.
43     01 L-Input-Date-DT                    PIC 9 ANY LENGTH.
44     01 L-Output-Day-NUM                   USAGE BINARY-LONG
45                                         SIGNED.
46     PROCEDURE DIVISION USING L-Input-Date-DT
47         RETURNING L-Output-Day-NUM.
48     000-Main SECTION.
49     CALL "C$PARAMSIZE" USING 1
=====

```

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```

=====
50      EVALUATE RETURN-CODE
51      WHEN 7
52          IF TEST-DAY-YYYYDDD(L-Input-Date-DT) > 0
53              MOVE 0 TO L-Output-Day-NUM
54              GOBACK
55          END-IF
56          MOVE DATE-OF-INTEGGER(INTEGER-OF-DAY(L-Input-Date-DT))
57              TO WS-Input-Date-DT
58      WHEN 8
59          IF TEST-DATE-YYYYMMDD(L-Input-Date-DT) > 0
60              MOVE 0 TO L-Output-Day-NUM
61              GOBACK
62          END-IF
63          MOVE L-Input-Date-DT TO WS-Input-Date-DT
64      WHEN OTHER
65          MOVE 0 TO L-Output-Day-NUM
66          GOBACK
67      END-EVALUATE
68      *> IF january OR february
69      *>     y = year - 1
70      *>     m = month + 10
71      *> ELSE
72      *>     y = year
73      *>     m = month - 2
74      *> END-IF
75      *> For Gregorian calendar:
76      *>     result = (day + y + y/4 - y/100 + y/400 + (31*m)/12) mod 7
77      *> (All divisions are integer divisions, discarding any remainder)
78      IF WS-ID-MM-NUM = 1 OR 2
79          SUBTRACT 1 FROM WS-ID-YYYY-NUM GIVING WS-Y-NUM
80          ADD WS-ID-MM-NUM, 10 GIVING WS-M-NUM
81      ELSE
82          MOVE WS-ID-YYYY-NUM TO WS-Y-NUM
83          SUBTRACT 2 FROM WS-ID-MM-NUM GIVING WS-M-NUM
84      END-IF
85      COMPUTE L-Output-Day-NUM =
86          WS-ID-DD-NUM
87          + WS-Y-NUM
88          + INTEGER(WS-Y-NUM/4)
89          - INTEGER(WS-Y-NUM/100)
90          + INTEGER(WS-Y-NUM/400)
91          + INTEGER((31*WS-M-NUM)/12)
92      DIVIDE L-Output-Day-NUM BY 7
93          GIVING WS-Temp-NUM
94          REMAINDER L-Output-Day-NUM
95      ADD 1 TO L-Output-Day-NUM
96      GOBACK
97      .
98
=====

```

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GNU COBOL 2.1 23NOV2013 Cross-Reference Listing					2014/03/27	
C:/Users/tda010/Documents/Programs/Samples/DAY-FROM-DATE.cbl						
PROGRAM-ID	Identifier/Register/Function	Defn	Where Defined	References	Page: 3	
=====	=====	=====	=====	=====	=====	
DAY-FROM-DATE	000-Main	48	PROCEDURE			
DAY-FROM-DATE	L-Input-Date-DT	43	LINKAGE	46	52	56
				59	63	
DAY-FROM-DATE	L-Output-Day-NUM	44	LINKAGE	47	53*	60*
				65*	85*	92
				94*	95*	
DAY-FROM-DATE	RETURN-CODE		PROCEDURE	50		
DAY-FROM-DATE	WS-ID-DD-NUM	38	WORKING-STORAGE	86		
DAY-FROM-DATE	WS-ID-MM-NUM	37	WORKING-STORAGE	78	80	83
DAY-FROM-DATE	WS-ID-YYYY-NUM	36	WORKING-STORAGE	79	82	
DAY-FROM-DATE	WS-Input-Date-DT	35	WORKING-STORAGE	57*	63*	
DAY-FROM-DATE	WS-M-NUM	40	WORKING-STORAGE	80*	83*	91
DAY-FROM-DATE	WS-Temp-NUM	41	WORKING-STORAGE	93*		
DAY-FROM-DATE	WS-Y-NUM	39	WORKING-STORAGE	79*	82*	87
				88	89	90

## 5. GCic

This is MUCH more than a mere demonstration program – it's also a very practical utility! The "GCic" (GnuCOBOL Interactive Compiler) is a TUI (Textual User Interface) program that may be used as a full-screen interface to the "cobc" compiler. In addition, GCic can produce neat, concise and useful cross-reference listings of GnuCOBOL programs, showing not only where user-defined names and built-in registers and intrinsic functions are referenced, but also where user-defined data items ARE MODIFIED by program code!

The program is well documented (IMHO) and you should find it fairly easy to follow. The GCic.cbl program was written to work with a native Windows or Windows/MinGW build of GnuCOBOL as well as a Windows/Cygwin, UNIX or OS X build.

Source listings generated by GCic will show the original source code of your programs, with all indentation and comments preserved. Additionally, any COPYed code will be included in the listing immediately (in compressed form) following the COPY statement that triggered its inclusion into your program.

Cross-reference listings will show all user-defined data items and procedures as well as intrinsic function and special register references. In addition to showing the line numbers at which items were defined and referenced, those references that MODIFY the contents of the data item will have an asterisk appended to them.

In addition to general GnuCOBOL concepts, this program provides a useful demonstration of the following:

- Creating a GnuCOBOL compilation unit that consists of multiple programs
- Using CDF conditional compilation facilities
- Using the "SCREEN SECTION" and associated "ACCEPT" and "DISPLAY" statements
- Using "DECLARATIVES" to trap file I/O errors
- Using "FILE-STATUS"
- Using the "REPLACING" clause on a CDF "COPY" statement
- Using the following statements:
  - o "ACCEPT FROM COMMAND-LINE" statement
  - o "ACCEPT FROM DATE/TIME" statement
  - o "ACCEPT FROM ENVIRONMENT" statement
  - o "EXIT PERFORM" statement
  - o "EXIT SECTION" statement
  - o "INSPECT" statement
  - o "PERFORM FOREVER" statement
  - o "SEARCH ALL" statement
  - o "SET ENVIRONMENT" statement
  - o "SORT" statement
  - o "STRING" statement

- o "UNSTRING" statement
- Using the following built-in subroutines:
  - o "C\$JUSTIFY" built-in system subroutine
  - o "C\$SLEEP" built-in system subroutine
  - o "CBL\_CHANGE\_DIR" built-in system subroutine
  - o "CBL\_CHECK\_FILE\_EXIST" built-in system subroutine
  - o "CBL\_DELETE\_FILE" built-in system subroutine
  - o "SYSTEM" built-in system subroutine
- Using the following intrinsic functions:
  - o "CONCATENATE" intrinsic function
  - o "LENGTH" intrinsic function
  - o "LOWER-CASE" intrinsic function
  - o "NUMVAL" intrinsic function
  - o "TRIM" intrinsic function
  - o "UPPER-CASE" intrinsic function
- Using the "COB-CRT-STATUS,Special Registers" special register
- Programmatically producing a report destined for either portrait or landscape printing



Here is a sample of the screen generated by this program:

```

GNU COBOL Compiler
GCic (2013/12/26 10:16) GNU COBOL 2.1 23NOV2013 Interactive Compilation

Filename: mathtest.cbl
Folder:   E:\Programs\Samples

Set/Clr Switches Via F1-F9; Set Config Via F12; ENTER Key Compiles; ESC Quits

F1 Assume WITH DEBUGGING MODE  F6 >"FUNCTION" Is Optional   Current
F2 Procedure+Statement Trace   F7 >Enable All Warnings      Config:
F3 Make a Library (DLL)        F8 Source Is Free-Format     DEFAULT
F4 Execute If Compilation OK   F9 >No COMP/BINARY Truncation
F5 Produce Full Listing

Extra "cobc" Switches, If Any ("-save-temps=xxx" Prevents Listings):

Program Execution Arguments, If Any:

GCic for Windows/MinGW Copyright (C) 2009-2013, Gary L. Cutler, GPL

```

The program source and cross-reference listing, produced using this program, begins on the next page.

GNUCOBOL 3.0 24DEC2017 Source Listing

2017/12/24

/home/vince/cobolsrc/Cobol-Tools/ocic/GCic.cbl

Line Statement

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```

=====
1      >>SOURCE FORMAT IS FIXED
2      *> CONFIGURATION SETTINGS: Set these switches before compiling:
3      *>
4      *> LINEDRAW Set to:
5      *>    0    To use spaces (no lines)
6      *>    1    To use the line-drawing character set (PC codepage 437)
7      *>    2    To use conventional ASCII characters (+, -, |)
8      *>
9      *>          OSX USERS - To use the linedrawing character set,
10     *>          set your 'terminal' font to 'Lucida Console'
11     *>
12     *> OS      Set to one of the following:
13     *>          'CYGWIN'   For a Windows/Cygwin version
14     *>          'MINGW'    For a Windows/MinGW version
15     *>          'OSX'      For a Macintosh OSX version
16     *>          'UNIX'     For a Unix/Linux version
17     *>          'WINDOWS'  For a Native Windows version
18     *>
19     *> SELCHAR Set to the desired single character to be used as the red
20     *>          'feature selected' character on the screen.
21     *>          SUGGESTIONS: '>', '*', '=', '+'
22     *>
23     *> LPP      Set to maximum printable lines per page when the listing
24     *>          should be generated for LANDSCAPE orientation (can be over-
25     *>          ridden at execution time using the GCXREF_LINES environment
26     *>          variable.
27     *>
28     *> LPPP     Set to maximum printable lines per page when the listing
29     *>          should be generated for PORTRAIT orientation (can be over-
30     *>          ridden at execution time using the GCXREF_LINES_PORT
31     *>          environment variable.
32     *>
33     *>*****
34     *>*** Change the settings in the copy book const-set-1.cpy to reflect
35     *> your system set up. This notes are also present there.
36     *> This is to reduce the need to amend these every time a update
37     *> for GCic occurs.
38     *>*****
39     *>
40     *> copy "const-set-1.cpy".
41     *>
42     *> -----
43     *> END CONFIGURATION SETTINGS
=====

```

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GNUCOBOL 3.0 24DEC2017 Source Listing

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/home/vince/cobolsrc/Cobol-Tools/ocic/GCic.cbl

Line Statement

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```

=====
45      IDENTIFICATION DIVISION.
46      PROGRAM-ID. GCic.
47      *>*****
48      *>      >NOTE<      >NOTE<      >NOTE<      >NOTE<      >NOTE<      >NOTE<      **
49      *>                                                              **
50      *> If this program is compiled with '-fdebugging-line', you      **
51      *> will need to pipe SYSERR to a text file when executing GCic **
52      *> (by adding the text '> filename' to the end of the GCic      **
53      *> command). You may also need to press the ENTER key when      **
54      *> GCic is finished.                                          **
55      *>*****
56      *> This program provides a Textual User Interface (TUI) to the **
57      *> process of compiling and (optionally) executing a GNU COBOL **
58      *> program.                                                    **
59      *>                                                              **
60      *> This programs execution syntax is as follows:              **
61      *>                                                              **
62      *> GCic <program-path-and-filename> [ <switch>... ]          **
63      *>                                                              **
64      *> Once executed, a display screen will be presented showing **
65      *> the compilation options that will be used. The user will **
66      *> have the opportunity to change options, specify new ones **
67      *> and specify any program execution arguments to be used if **
68      *> you select the 'Execute' option. When you press the Enter **
69      *> key the program will be compiled.                          **
70      *>                                                              **
71      *> The SCREEN SECTION contains an image of the screen.        **
72      *>                                                              **
73      *> The '010-Parse-Args' section in the PROCEDURE DIVISION has **
74      *> documentation on switches and their function.              **
75      *>*****
76      *>                                                              **
77      *> AUTHOR:      GARY L. CUTLER                                  **
78      *>      Copyright (C) 2009-2017, Gary L. Cutler, GPL          **
79      *>                                                              **
80      *> DATE-WRITTEN: June 14, 2009                                  **
81      *>                                                              **
82      *>*****
83      *> DATE CHANGE DESCRIPTION                                     **
84      *> ===== **
85      *> GC0609 Don't display compiler messages file if compilation **
86      *> GLC Is successful. Also don't display messages if the      **
87      *> output file is busy (just put a message on the              **
88      *> screen, leave the OC screen up & let the user fix            **
89      *> the problem & resubmit.                                       **
90      *> GC0709 When 'EXECUTE' is selected, a 'FILE BUSY' error will **
91      *> CLC still cause the (old) executable to be launched.        **
92      *> Also, the 'EXTRA SWITCHES' field is being ignored.          **
93      *> Changed the title bar to lowlighted reverse video &         **
94      *> the message area to highlighted reverse-video.              **
95      *> GC0809 Add a SPACE in front of command-line args when      **
96      *> GLC executing users program. Add a SPACE after the          **
=====

```

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GNUCOBOL 3.0 24DEC2017 Source Listing

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/home/vince/cobolsrc/Cobol-Tools/ocic/GCic.cbl

Line Statement

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```

=====
 97      *>      -ftraceall switch when building cobc command.      **
 98      *> GC0909 Convert to work on Cygwin/Linux as well as MinGW  **
 99      *> GC0310 Virtualized the key codes for S-F1 thru S-F7 as they **
100      *> GLC   differ depending upon whether PDCurses or NCurses is **
101      *>        being used.                                         **
102      *> GC0410 Introduced the cross-reference and source listing  **
103      *> GLC   features. Also fixed a bug in EXTRA switch proces- **
104      *>        sing where garbage will result if more than the     **
105      *>        EXTRA switch is specified.                          **
106      *> GC1010 Corrected several problems reported by Vince Coen: **
107      *> GLC   1) Listing/Xref wouldn't work if '-I' additional    **
108      *>        cobc switch specified.                               **
109      *>        2) Programs coded with lowercase reserved words did **
110      *>        not get parsed properly when generating listing     **
111      *>        and/or xref reports.                                  **
112      *>        3) Reliance on a TEMP environment variable caused   **
113      *>        non-recoverable errors when generating listing     **
114      *>        and/or xref reports in a session that lacks a      **
115      *>        TEMP variable.                                       **
116      *>        As a result of this change, GCic no longer runs a   **
117      *>        second 'cobc' when generating listing and/or xref    **
118      *>        reports. A '-save-temps' (without 'dir') specified **
119      *>        in the EXTRA options field will be ignored. A      **
120      *>        '-save-temps=dir' specified in the EXTRA options   **
121      *>        field will negate both the XREF and SOURCE opts,    **
122      *>        if specified.                                         **
123      *> GC0711 Tailored for 29APR2011 version of GNU COBOL 2.0    **
124      *> GC0712 Replaced all switches with configuration settings;  **
125      *> GLC   Tailored for 11FEB2012 version of GNU COBOL 2.0;    **
126      *>        Reformatted screen layout to fit a 24x80 screen     **
127      *>        rather than a 25x81 screen and to accommodate shell  **
128      *>        environments having only F1-F12 (like 'terminal' in   **
129      *>        OSX); Fully tested under OSX (required a few altera-   **
130      *>        tions); Expanded both extra-options and runtime-      **
131      *>        arguments areas to TWO lines (152 chars total) each; **
132      *>        Added support for MF/IBM/BS2000 listing-control      **
133      *>        directives EJECT,SKIP1,SKIP2,SKIP3 (any of these in  **
134      *>        copybooks will be ignored)                               **
135      *> GC0313 Expand the source code record from 80 chars to 256  **
136      *> GLC   to facilitate looking for "LINKAGE SECTION" in a     **
137      *>        free-format file.                                         **
138      *> GC1113 Edited to support the change of "OpenCOBOL" to "GNU  **
139      *> GLC   COBOL"                                                    **
140      *> GC1213 Updated for 23NOV2013 version of GNU COBOL 2.1      **
141      *> GC0114 Introduce a "Press ENTER to Close" action after run- **
142      *> GLC   ning the compiled program in the compiler window (F4) **
143      *> VC0617 Remove the Blinking in meny screen as uncomfortable  **
144      *> VBC   Update version printed to 2.2 30JUN2017.              **
145      *>        Move the system constant settings to a copy file    **
146      *>        const-set-1.cpy in case GCic is updated.              **
147      *>        Added SET ENVIRONMENT "COB_EXIT_WAIT" TO "0" to     **
148      *>        100-Initialization section.                             **
149      *> VC0717 Replaced compile param intrinsic=all with          **
=====

```

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/home/vince/cobolsrc/Cobol-Tools/ocic/GCic.cbl

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```

=====
150      *>  VBC    intrinstics=ALL. Changed mod detail inits for Gary  **
151      *>      from GCL to GLC.                                     **
152      *>      Update version printed to 2.2 20JUL2017.             **
153      *>      Should really get this from the compiler if avail?   **
154      *>  VC1217 Update compiler version to v3.0 24DEC2017.         **
155      *>      and copyright to 2018 (in 3 places).                 **
156      *>*****
157      *>
158      ENVIRONMENT DIVISION.
159      CONFIGURATION SECTION.
160      REPOSITORY.
161          FUNCTION ALL INTRINSIC.
162      INPUT-OUTPUT SECTION.
163      FILE-CONTROL.
164  GC1010      SELECT F-Cobc-Output-FILE ASSIGN TO WS-Listing-Filename-TXT
165                                     ORGANIZATION IS LINE SEQUENTIAL.
166
167          SELECT F-Source-Code-FILE ASSIGN TO WS-File-Name-TXT
168                                     ORGANIZATION IS LINE SEQUENTIAL
169                                     FILE STATUS IS WS-FSM-Status-CD.
=====

```

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/home/vince/cobolsrc/Cobol-Tools/ocic/GCic.cbl

Line Statement

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=====

```

171      DATA DIVISION.
172      FILE SECTION.
173      FD  F-Cobc-Output-FILE.
174      01  F-Cobc-Output-REC          PIC X(256).
175
176      FD  F-Source-Code-FILE.
177 GC0313 01  F-Source-Code-REC      PIC X(256).
178
179      WORKING-STORAGE SECTION.
180      >>source free
181      COPY screenio.
      78 COB-COLOR-BLACK VALUE 0.
      78 COB-COLOR-BLUE VALUE 1.
      78 COB-COLOR-GREEN VALUE 2.
      78 COB-COLOR-CYAN VALUE 3.
      78 COB-COLOR-RED VALUE 4.
      78 COB-COLOR-MAGENTA VALUE 5.
      78 COB-COLOR-YELLOW VALUE 6.
      78 COB-COLOR-WHITE VALUE 7.
      78 COB-SCR-OK VALUE 0.
      78 COB-SCR-F1 VALUE 1001.
      78 COB-SCR-F2 VALUE 1002.
      78 COB-SCR-F3 VALUE 1003.
      78 COB-SCR-F4 VALUE 1004.
      78 COB-SCR-F5 VALUE 1005.
      78 COB-SCR-F6 VALUE 1006.
      78 COB-SCR-F7 VALUE 1007.
      78 COB-SCR-F8 VALUE 1008.
      78 COB-SCR-F9 VALUE 1009.
      78 COB-SCR-F10 VALUE 1010.
      78 COB-SCR-F11 VALUE 1011.
      78 COB-SCR-F12 VALUE 1012.
      78 COB-SCR-F13 VALUE 1013.
      78 COB-SCR-F14 VALUE 1014.
      78 COB-SCR-F15 VALUE 1015.
      78 COB-SCR-F16 VALUE 1016.
      78 COB-SCR-F17 VALUE 1017.
      78 COB-SCR-F18 VALUE 1018.
      78 COB-SCR-F19 VALUE 1019.
      78 COB-SCR-F20 VALUE 1020.
      78 COB-SCR-F21 VALUE 1021.
      78 COB-SCR-F22 VALUE 1022.
      78 COB-SCR-F23 VALUE 1023.
      78 COB-SCR-F24 VALUE 1024.
      78 COB-SCR-F25 VALUE 1025.
      78 COB-SCR-F26 VALUE 1026.
      78 COB-SCR-F27 VALUE 1027.
      78 COB-SCR-F28 VALUE 1028.
      78 COB-SCR-F29 VALUE 1029.
      78 COB-SCR-F30 VALUE 1030.
      78 COB-SCR-F31 VALUE 1031.
      78 COB-SCR-F32 VALUE 1032.

```

=====
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/home/vince/cobolsrc/Cobol-Tools/ocic/GCic.cbl

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```

=====
78 COB-SCR-F33 VALUE 1033.
78 COB-SCR-F34 VALUE 1034.
78 COB-SCR-F35 VALUE 1035.
78 COB-SCR-F36 VALUE 1036.
78 COB-SCR-F37 VALUE 1037.
78 COB-SCR-F38 VALUE 1038.
78 COB-SCR-F39 VALUE 1039.
78 COB-SCR-F40 VALUE 1040.
78 COB-SCR-F41 VALUE 1041.
78 COB-SCR-F42 VALUE 1042.
78 COB-SCR-F43 VALUE 1043.
78 COB-SCR-F44 VALUE 1044.
78 COB-SCR-F45 VALUE 1045.
78 COB-SCR-F46 VALUE 1046.
78 COB-SCR-F47 VALUE 1047.
78 COB-SCR-F48 VALUE 1048.
78 COB-SCR-F49 VALUE 1049.
78 COB-SCR-F50 VALUE 1050.
78 COB-SCR-F51 VALUE 1051.
78 COB-SCR-F52 VALUE 1052.
78 COB-SCR-F53 VALUE 1053.
78 COB-SCR-F54 VALUE 1054.
78 COB-SCR-F55 VALUE 1055.
78 COB-SCR-F56 VALUE 1056.
78 COB-SCR-F57 VALUE 1057.
78 COB-SCR-F58 VALUE 1058.
78 COB-SCR-F59 VALUE 1059.
78 COB-SCR-F60 VALUE 1060.
78 COB-SCR-F61 VALUE 1061.
78 COB-SCR-F62 VALUE 1062.
78 COB-SCR-F63 VALUE 1063.
78 COB-SCR-F64 VALUE 1064.
78 COB-SCR-PAGE-UP VALUE 2001.
78 Cob-Scr-Page_Up value 2001.
78 COB-SCR-PAGE-DOWN VALUE 2002.
78 Cob-Scr-Page_Down value 2002.
78 COB-SCR-KEY-UP VALUE 2003.
78 COB-SCR-KEY_UP VALUE 2003.
78 COB-SCR-KEY-DOWN VALUE 2004.
78 COB-SCR-KEY_DOWN VALUE 2004.
78 COB-SCR-ESC VALUE 2005.
78 COB-SCR-PRINT VALUE 2006.
78 COB-SCR-TAB VALUE 2007.
78 COB-SCR-BACK-TAB VALUE 2008.
78 COB-SCR-KEY-LEFT VALUE 2009.
78 COB-SCR-KEY-RIGHT VALUE 2010.
78 COB-SCR-INSERT VALUE 2011.
78 COB-SCR-DELETE VALUE 2012.
78 COB-SCR-BACKSPACE VALUE 2013.
78 COB-SCR-KEY-HOME VALUE 2014.
78 COB-SCR-KEY-END VALUE 2015.
78 COB-SCR-NO-FIELD VALUE 8000.
78 COB-SCR-TIME-OUT VALUE 8001.
=====

```

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/home/vince/cobolsrc/Cobol-Tools/ocic/GCic.cbl

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```

=====
  78 COB-SCR-FATAL VALUE 9000.
  78 COB-SCR-MAX-FIELD VALUE 9001.
182      >>source fixed
183 GC0712 01  WS-Compilation-Switches-TXT.
184 GC0712      05 WS-CS-Args-TXT VALUE SPACES.
185 GC0712          10 WS-CS-Arg-H1-TXT          PIC X(76).
186 GC0712          10 WS-CS-Arg-H2-TXT          PIC X(76).
187 GC0712      05 WS-CS-Filenames-TXT.
188 GC0712          10 VALUE 'BS2000'          PIC X(9).
189 GC0712          10 VALUE 'COBOL85'          PIC X(9).
190 GC0712          10 VALUE 'COBOL2002'          PIC X(9).
191 GC0712          10 VALUE 'DEFAULT'          PIC X(9).
192 GC0712          10 VALUE 'IBM'          PIC X(9).
193 GC0712          10 VALUE 'MF'          PIC X(9).
194 GC0712          10 VALUE 'MVS'          PIC X(9).
195 GC0712      05 WS-CS-Filenames-Table-TXT REDEFINES WS-CS-Filenames-TXT.
196 GC0712          10 WS-CS-Filename-TXT OCCURS 7 TIMES
197 GC0712          PIC X(9).
198 GC0712 >>IF F12 < 1
199 GC0712      05 WS-CS-Config-NUM VALUE 4 PIC 9(1).
200 GC0712 >>ELIF F12 > 7
201 GC0712      05 WS-CS-Config-NUM VALUE 4 PIC 9(1).
202 GC0712 >>ELSE
203 GC0712      05 WS-CS-Config-NUM VALUE F12 PIC 9(1).
204 GC0712 >>END-IF
205 GC0712      05 WS-CS-Extra-TXT VALUE SPACES.
206 GC0712          10 WS-CS-Extra-H1-TXT          PIC X(76).
207 GC0712          10 WS-CS-Extra-H2-TXT          PIC X(76).
208 GC0712      05 WS-CS-Switch-Defaults-TXT.
209 GC0712          10 VALUE F1          PIC 9(1). *> WS-CS-DEBUG-CHR
210 GC0712          10 VALUE F4          PIC 9(1). *> WS-CS-EXECUTE-CHR
211 GC0712          10 VALUE F8          PIC 9(1). *> WS-CS-FREE-CHR
212 GC0712          10 VALUE F3          PIC 9(1). *> WS-CS-LIBRARY-CHR
213 GC0712          10 VALUE F5          PIC 9(1). *> WS-CS-LISTING-CHR
214 GC0712          10 VALUE F6          PIC 9(1). *> WS-CS-NOFUNC-CHR
215 GC0712          10 VALUE F9          PIC 9(1). *> WS-CS-NOTRUNC-CHR
216 GC0712          10 VALUE F2          PIC 9(1). *> WS-CS-TRACEALL-CHR
217 GC0712          10 VALUE F7          PIC 9(1). *> WS-CS-WARNALL-CHR
218 GC0712      05 WS-CS-All-Switches-TXT REDEFINES
219 GC0712          WS-CS-Switch-Defaults-TXT.
220 GC0712          10 WS-CS-DEBUG-CHR          PIC X(1).
221 GC0712          10 WS-CS-EXECUTE-CHR          PIC X(1).
222 GC0712          10 WS-CS-FREE-CHR          PIC X(1).
223 GC0712          10 WS-CS-LIBRARY-CHR          PIC X(1).
224 GC0712          10 WS-CS-LISTING-CHR          PIC X(1).
225 GC0712          10 WS-CS-NOFUNC-CHR          PIC X(1).
226 GC0712          10 WS-CS-NOTRUNC-CHR          PIC X(1).
227 GC0712          10 WS-CS-TRACEALL-CHR          PIC X(1).
228 GC0712          10 WS-CS-WARNALL-CHR          PIC X(1).
229
230 GC0909 01  WS-Cmd-TXT          PIC X(512).
231
232 GC0712 01  WS-Cmd-Args-TXT          PIC X(256).
=====

```

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```

=====
233
234 GC0712 01  WS-Cmd-End-Quote-CHR          PIC X(1).
235
236 GC0712 01  WS-Cmd-SUB                     USAGE BINARY-LONG.
237
238          01  WS-Cobc-Cmd-TXT              PIC X(256).
239
240          01  WS-Config-Fn-TXT              PIC X(12).
241
242 GC1113 01  WS-Delete-Fn-TXT               PIC X(256).
243
244          01  WS-File-Name-TXT.
245              05 WS-FN-CHR                 OCCURS 256 TIMES
246                  PIC X(1).
247
248          01  WS-File-Status-Message-TXT.
249              05 VALUE 'Status Code: '     PIC X(13).
250              05 WS-FSM-Status-CD          PIC 9(2).
251              05 VALUE ', Meaning: '       PIC X(11).
252              05 WS-FSM-Msg-TXT            PIC X(25).
253
254 GC0909 01  WS-Horizontal-Line-TXT         PIC X(80).
255 GC0909
256          01  WS-I-SUB                     USAGE BINARY-LONG.
257
258          01  WS-J-SUB                     USAGE BINARY-LONG.
259
260 GC1213 01  WS-Listing-CD VALUE F5         PIC 9(1).
261
262 GC0712 01  WS-Listing-Filename-TXT        PIC X(256).
263
264 GC1213 01  WS-Listing-TXT VALUE SPACES    PIC X(27).
265
266          01  WS-OC-Compile-DT             PIC XXXX/XX/XXBXX/XX.
267
268 GC0712 >>IF OS = 'CYGWIN'
269 GC0712 01  WS-OS-Dir-CHR                  VALUE '/'          PIC X(1).
270 GC0712 78  WS-OS-Exe-Ext-CONST           VALUE '.exe'.
271 GC0712 78  WS-OS-Lib-Ext-CONST           VALUE '.dll'.
272 GC0712 78  WS-OS-Lib-Type-CONST          VALUE 'DLL)'.
273 GC0712 01  WS-OS-Type-CD                 VALUE 2          PIC 9(1).
274 GC0712 >>ELIF OS = 'MINGW'
275 GC0712 01  WS-OS-Dir-CHR                  VALUE '\'.
276 GC0712 78  WS-OS-Exe-Ext-CONST           VALUE '.exe'.
277 GC0712 78  WS-OS-Lib-Ext-CONST           VALUE '.dll'.
278 GC0712 78  WS-OS-Lib-Type-CONST          VALUE 'DLL)'.
279 GC0712 01  WS-OS-Type-CD                 VALUE 5          PIC 9(1).
280 GC0712 >>ELIF OS = 'OSX'
281 GC0712 01  WS-OS-Dir-CHR                  VALUE '/'.
282 GC0712 78  WS-OS-Exe-Ext-CONST           VALUE '.dylib'.
283 GC0712 78  WS-OS-Lib-Ext-CONST           VALUE 'DYLIB)'.
284 GC0712 78  WS-OS-Lib-Type-CONST          VALUE 'DYLIB)'.
285 GC0712 01  WS-OS-Type-CD                 VALUE 4          PIC 9(1).
=====

```

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```

=====
286 GC0712 >>ELIF OS = 'UNIX'
287 GC0712 01 WS-OS-Dir-CHR          VALUE '/'          PIC X(1).
288 GC0712 78 WS-OS-Exe-Ext-CONST   VALUE ' '          PIC X(1).
289 GC0712 78 WS-OS-Lib-Ext-CONST   VALUE '.so'         PIC X(1).
290 GC0712 78 WS-OS-Lib-Type-CONST   VALUE 'SO)'         PIC X(1).
291 GC0712 01 WS-OS-Type-CD          VALUE 3            PIC 9(1).
292 GC0712 >>ELIF OS = 'WINDOWS'
293 GC0712 01 WS-OS-Dir-CHR          VALUE '\'          PIC X(1).
294 GC0712 78 WS-OS-Exe-Ext-CONST   VALUE '.exe'        PIC X(1).
295 GC0712 78 WS-OS-Lib-Ext-CONST   VALUE '.dll'        PIC X(1).
296 GC0712 78 WS-OS-Lib-Type-CONST   VALUE 'DLL)'        PIC X(1).
297 GC0712 01 WS-OS-Type-CD          VALUE 1            PIC 9(1).
298 GC0712 >>END-IF
299 GC0909      88 WS-OS-Windows-BOOL VALUE 1, 5.
300 GC0909      88 WS-OS-Cygwin-BOOL  VALUE 2.
301 GC0712      88 WS-OS-UNIX-BOOL    VALUE 3, 4.
302 GC0712      88 WS-OS-OSX-BOOL     VALUE 4.
303
304      01 WS-OS-Type-FILLER-TXT.
305          05 VALUE 'Windows'          PIC X(14).
306          05 VALUE 'Windows/Cygwin'   PIC X(14).
307          05 VALUE 'UNIX/Linux'       PIC X(14).
308          05 VALUE 'OSX'               PIC X(14).
309          05 VALUE 'Windows/MinGW'     PIC X(14).
310      01 WS-OS-Types-TXT REDEFINES WS-OS-Type-FILLER-TXT.
311          05 WS-OS-Type-TXT            OCCURS 5 TIMES
312              PIC X(14).
313
314      01 WS-Output-Msg-TXT              PIC X(80).
315
316      01 WS-Path-Delimiter-CHR          PIC X(1).
317
318      01 WS-Prog-Extension-TXT          PIC X(256).
319
320      01 WS-Prog-Folder-TXT             PIC X(256).
321
322 GC0712 01 WS-Prog-File-Name-TXT.
323 GC0712      05 WS-PFN-CHR              OCCURS 256 TIMES
324 GC0712          PIC X(1).
325
326 GC0712 01 WS-Pgm-Nm-TXT               PIC X(31).
327
328      01 WS-Runtime-Switches-TXT.
329          05 WS-RS-Compile-OK-CHR       PIC X(1).
330              88 WS-RS-Compile-OK-BOOL   VALUE 'Y'.
331 GC0909          88 WS-RS-Compile-OK-Warn-BOOL VALUE 'W'.
332              88 WS-RS-Compile-Failed-BOOL VALUE 'N'.
333 GC0609      05 WS-RS-Complete-CHR      PIC X(1).
334 GC0609          88 WS-RS-Complete-BOOL   VALUE 'Y'.
335 GC0609          88 WS-RS-Not-Complete-BOOL VALUE 'N'.
336 GC0712      05 WS-RS-Quote-CHR         PIC X(1).
337 GC0712          88 WS-RS-Double-Quote-Used-BOOL VALUE 'Y' FALSE 'N'.
338 GC0809      05 WS-RS-IDENT-DIV-CHR     PIC X(1).
=====

```

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```

=====
339 GC0809      88 WS-RS-1st-Prog-Complete-BOOL  VALUE 'Y'.
340 GC0809      88 WS-RS-More-To-1st-Prog-BOOL   VALUE 'N'.
341             05 WS-RS-No-Switch-Chgs-CHR       PIC X(1).
342             88 WS-RS-No-Switch-Changes-BOOL    VALUE 'Y'.
343             88 WS-RS-Switch-Changes-BOOL        VALUE 'N'.
344 GC0709      05 WS-RS-Output-File-Busy-CHR      PIC X(1).
345 GC0709      88 WS-RS-Output-File-Busy-BOOL     VALUE 'Y'.
346 GC0709      88 WS-RS-Output-File-Avail-BOOL    VALUE 'N'.
347 GC0809      05 WS-RS-Source-Record-Type-CHR    PIC X(1).
348 GC0809      88 WS-RS-Source-Rec-Linkage-BOOL   VALUE 'L'.
349 GC0809      88 WS-RS-Source-Rec-Ident-BOOL     VALUE 'I'.
350 GC0712      88 WS-RS-Source-Rec-Ignored-BOOL   VALUE ' '.
351             05 WS-RS-Switch-Error-CHR          PIC X(1).
352             88 WS-RS-Switch-Is-Bad-BOOL         VALUE 'Y'.
353             88 WS-RS-Switch-Is-Good-BOOL        VALUE 'N'.
354
355             01 WS-Tally-QTY                     USAGE BINARY-LONG.
=====

```

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```

=====
357      SCREEN SECTION.
358      *>
359      *> Here is the layout of the GCic screen.
360      *>
361      *> The sample screen below shows how the screen would look if the LINEDRAW
362      *> configuration setting is set to a value of 2
363      *>
364      *> The following sample screen layout shows how the screen looks with line-drawing
365      *> characters disabled.
366      *>
367      *>          1          2          3          4          5          6          7          8
368      *>1234567890123456789012345678901234567890123456789012345678901234567890
369      *>=====
370 01 *> GCic (2017/12/24 08:52) - GNU COBOL V3.0 24DEC2017 Interactive Compilation
371 02 *>-----+
372 03 *>| Folder:      E:\GNU COBOL\Samples                                |
373 04 *>| Filename:   GCic.cbl                                           |
374 05 *>+-----+
375 06 *> Set/Clr Switches Via F1-F9; Set Config Via F12; ENTER Key Compiles; ESC Quits
376 07 *>+-----+
377 08 *>| F1  Assume WITH DEBUGGING MODE  F6  "FUNCTION" Is Optional      | Current |
378 09 *>| F2  Procedure+Statement Trace    F7  Enable All Warnings        | Config: |
379 10 *>| F3  Make A Library (DLL)         F8  Source Is Free-Format      | XXXXXXXX|
380 11 *>| F4  Execute If Compilation OK    F9  No COMP/BINARY Truncation  |         |
381 12 *>| F5  >Produce Listing (Landscape)|                             |         |
382 13 *>+-----+
383 14 *> Extra "cobc" Switches, If Any ("-save-temps=xxx" Prevents Listings):
384 15 *>+-----+
385 16 *>| _____|
386 17 *>| _____|
387 18 *>+-----+
388 19 *> Program Execution Arguments, If Any:
389 20 *>+-----+
390 21 *>| _____|
391 22 *>| _____|
392 23 *>+-----+
393 24 *> GCic Copyright (C) 2009-2018, Gary L. Cutler, GPL
394 25 *>=====
395 26 *>1234567890123456789012345678901234567890123456789012345678901234567890
396 27 *>          1          2          3          4          5          6          7          8
397 28 *>
398 29 *> If this program is run on Windows, it must run with codepage 437 activated to
399 30 *> display the line-drawing characters.  With a native Windows build or a
400 31 *> Windows/MinGW build, one could use the command 'chcp 437' to set that codepage
401 32 *> for display within a Windows console window (that should be the default though).
402 33 *> With a Windows/Cygwin build, set the environment variable CYGWIN to a value of
403 34 *> 'codepage:oem' (this cannot be done from within the program though - you will
404 35 *> have to use the 'Computer/Advanced System Settings/Environment Variables' (Vista
405 36 *> or Windows 7) function to define the variable.  XP Users: use 'My Computer/
406 37 *> Properties/Advanced/Environment Variables'.
407 38 *>
408 39 *> OSX users may use line drawing characters in this and any GNU COBOL program
=====

```

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```

=====
409      *> simply by setting their 'terminal' application's font to "Lucida Console".
410      *>
411      >>IF LINEDRAW IS EQUAL TO 0
412          78 LD-UL-Corner                VALUE ' '.
413          78 LD-LL-Corner                VALUE ' '.
414          78 LD-UR-Corner                VALUE ' '.
415          78 LD-LR-Corner                VALUE ' '.
416          78 LD-Upper-T                 VALUE ' '.
417          78 LD-Lower-T                 VALUE ' '.
418          78 LD-Horiz-Line              VALUE ' '.
419          78 LD-Vert-Line               VALUE ' '.
420      >>ELIF LINEDRAW IS EQUAL TO 1
421          78 LD-UL-Corner                VALUE X'DA'.
422          78 LD-LL-Corner                VALUE X'CO'.
423          78 LD-UR-Corner                VALUE X'BF'.
424          78 LD-LR-Corner                VALUE X'D9'.
425          78 LD-Upper-T                 VALUE X'C2'.
426          78 LD-Lower-T                 VALUE X'C1'.
427          78 LD-Horiz-Line              VALUE X'C4'.
428          78 LD-Vert-Line               VALUE X'B3'.
429      >>ELSE
430          78 LD-UL-Corner                VALUE '+'.
431          78 LD-LL-Corner                VALUE '+'.
432          78 LD-UR-Corner                VALUE '+'.
433          78 LD-LR-Corner                VALUE '+'.
434          78 LD-Upper-T                 VALUE '+'.
435          78 LD-Lower-T                 VALUE '+'.
436          78 LD-Horiz-Line              VALUE '-'.
437          78 LD-Vert-Line               VALUE '|'.
438      >>END-IF
439
440      01 S-Blank-SCR LINE 1 COLUMN 1 BLANK SCREEN.
441
442      01 S-Switches-SCR BACKGROUND-COLOR COB-COLOR-BLACK
443                      FOREGROUND-COLOR COB-COLOR-WHITE AUTO.
444      *>
445      *> GENERAL SCREEN FRAMEWORK
446      *>
447          03 BACKGROUND-COLOR COB-COLOR-BLACK
448                      FOREGROUND-COLOR COB-COLOR-GREEN HIGHLIGHT.
449 GC0712      05 LINE 02 COL 01                VALUE LD-UL-Corner.
450 GC0712      05                COL 02 PIC X(78) FROM WS-Horizontal-Line-TXT.
451                05                COL 80                VALUE LD-UR-Corner.
452
453 GC0712      05 LINE 03 COL 01                VALUE LD-Vert-Line.
454                05                COL 80                VALUE LD-Vert-Line.
455
456 GC0712      05 LINE 04 COL 01                VALUE LD-Vert-Line.
457                05                COL 80                VALUE LD-Vert-Line.
458
459 GC0712      05 LINE 05 COL 01                VALUE LD-LL-Corner.
460 GC0712      05                COL 02 PIC X(78) FROM WS-Horizontal-Line-TXT.
461                05                COL 80                VALUE LD-LR-Corner.
=====

```

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```

=====
462
463 GC0712      05 LINE 07 COL 01      VALUE LD-UL-Corner.
464 GC0712      05          COL 02 PIC X(65) FROM WS-Horizontal-Line-TXT.
465 GC0712      05          COL 67      VALUE LD-Upper-T.
466 GC0712      05          COL 68 PIC X(12) FROM WS-Horizontal-Line-TXT.
467            05          COL 80      VALUE LD-UR-Corner.
468
469 GC0712      05 LINE 08 COL 01      VALUE LD-Vert-Line.
470 GC0712      05          COL 67      VALUE LD-Vert-Line.
471            05          COL 80      VALUE LD-Vert-Line.
472
473 GC0712      05 LINE 09 COL 01      VALUE LD-Vert-Line.
474 GC0712      05          COL 67      VALUE LD-Vert-Line.
475            05          COL 80      VALUE LD-Vert-Line.
476
477 GC0712      05 LINE 10 COL 01      VALUE LD-Vert-Line.
478 GC0712      05          COL 67      VALUE LD-Vert-Line.
479            05          COL 80      VALUE LD-Vert-Line.
480
481 GC0712      05 LINE 11 COL 01      VALUE LD-Vert-Line.
482 GC0712      05          COL 67      VALUE LD-Vert-Line.
483            05          COL 80      VALUE LD-Vert-Line.
484
485 GC0712      05 LINE 12 COL 01      VALUE LD-Vert-Line.
486 GC0712      05          COL 67      VALUE LD-Vert-Line.
487            05          COL 80      VALUE LD-Vert-Line.
488
489 GC0712      05 LINE 13 COL 01      VALUE LD-LL-Corner.
490 GC0712      05          COL 02 PIC X(65) FROM WS-Horizontal-Line-TXT.
491 GC0712      05          COL 67      VALUE LD-Lower-T.
492 GC0712      05          COL 68 PIC X(12) FROM WS-Horizontal-Line-TXT.
493            05          COL 80      VALUE LD-LR-Corner.
494
495 GC0712      05 LINE 15 COL 01      VALUE LD-UL-Corner.
496 GC0712      05          COL 02 PIC X(78) FROM WS-Horizontal-Line-TXT.
497            05          COL 80      VALUE LD-UR-Corner.
498
499 GC0712      05 LINE 16 COL 01      VALUE LD-Vert-Line.
500            05          COL 80      VALUE LD-Vert-Line.
501
502 GC0712      05 LINE 17 COL 01      VALUE LD-Vert-Line.
503            05          COL 80      VALUE LD-Vert-Line.
504
505 GC0712      05 LINE 18 COL 01      VALUE LD-LL-Corner.
506 GC0712      05          COL 02 PIC X(78) FROM WS-Horizontal-Line-TXT.
507            05          COL 80      VALUE LD-LR-Corner.
508
509 GC0712      05 LINE 20 COL 01      VALUE LD-UL-Corner.
510 GC0712      05          COL 02 PIC X(78) FROM WS-Horizontal-Line-TXT.
511            05          COL 80      VALUE LD-UR-Corner.
512
513 GC0712      05 LINE 21 COL 01      VALUE LD-Vert-Line.
514            05          COL 80      VALUE LD-Vert-Line.
=====

```

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@end smallformat

@page

@smallformat

@verbatim

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```

=====
515
516 GC0712      05 LINE 22 COL 01      VALUE LD-Vert-Line.
517            05          COL 80      VALUE LD-Vert-Line.
518
519 GC0712      05 LINE 23 COL 01      VALUE LD-LL-Corner.
520 GC0712      05          COL 02 PIC X(78) FROM WS-Horizontal-Line-TXT.
521            05          COL 80      VALUE LD-LR-Corner.
522            *>
523            *> TOP AND BOTTOM LINES
524            *>
525 GC0712      03 BACKGROUND-COLOR COB-COLOR-BLUE
526            FOREGROUND-COLOR COB-COLOR-WHITE HIGHLIGHT.
527 GC0410      05 LINE 01 COL 01 VALUE ' GCic ('.
528 GC0410      05          COL 08 PIC X(16) FROM WS-OC-Compile-DT.
529 GC1213      05          COL 24 VALUE ') GNUCOBOL 3.0 24DEC2017 ' &
530 GC0410            'Interactive Compilation          '.
531 VC0617      03 BACKGROUND-COLOR COB-COLOR-RED
532 GC0712      FOREGROUND-COLOR COB-COLOR-WHITE HIGHLIGHT.
533 GC0712      05 LINE 24 COL 01 PIC X(80) FROM WS-Output-Msg-TXT.
534            *>
535            *> LABELS
536            *>
537            03 BACKGROUND-COLOR COB-COLOR-BLACK
538            FOREGROUND-COLOR COB-COLOR-CYAN  HIGHLIGHT.
539 GC0712      05 LINE 06 COL 02 VALUE 'Set/Clr Switches Via F1-F9; ' &
540 GC0712            'Set Config Via F12; Enter Key ' &
541 GC0712            'Compiles; Esc Quits'.
542 GC0712      05 LINE 14 COL 02 VALUE 'Extra "cobc" Switches, If Any ' &
543 GC0712            '("-save-temps=xxx" Prevents ' &
544 GC0712            'Listings):'.
545 GC0712      05 LINE 19 COL 02 VALUE 'Program Execution Arguments, ' &
546 GC0712            'If Any:'.
547 GC0712      03 BACKGROUND-COLOR COB-COLOR-BLACK
548 GC0712      FOREGROUND-COLOR COB-COLOR-WHITE HIGHLIGHT.
549 GC0712      05 LINE 06 COL 23 VALUE 'F1'.
550 GC0712      05          COL 26 VALUE 'F9'.
551 GC0712      05          COL 45 VALUE 'F12'.
552 GC0712      05          COL 50 VALUE 'ENTER'.
553 GC0712      05          COL 70 VALUE 'ESC'.
554            *>
555            *> TOP SECTION BACKGROUND
556            *>
557            03 BACKGROUND-COLOR COB-COLOR-BLACK
558            FOREGROUND-COLOR COB-COLOR-WHITE HIGHLIGHT.
559 GC0712      05 LINE 03 COL 62 VALUE 'Enter'.
560 GC0712      05 LINE 04 COL 62 VALUE 'Esc'.
561
562            03 BACKGROUND-COLOR COB-COLOR-BLACK
563            FOREGROUND-COLOR COB-COLOR-GREEN HIGHLIGHT.
564 GC0712      05 LINE 04 COL 03 VALUE 'Folder:  '.
565 GC0712      05 LINE 03 COL 03 VALUE 'Filename: '.
566
567 GC0712      05 LINE 03 COL 67 VALUE ': Compile  '.
=====

```

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```

=====
568 GC0712      05 LINE 04 COL 65 VALUE ': Quit      '.
569          *>
570          *> TOP SECTION PROGRAM INFO
571          *>
572          03 BACKGROUND-COLOR COB-COLOR-BLACK
573          FOREGROUND-COLOR COB-COLOR-WHITE HIGHLIGHT.
574 GC0712      05 LINE 03 COL 13 PIC X(66) FROM WS-Prog-File-Name-TXT.
575 GC0712      05 LINE 04 COL 13 PIC X(66) FROM WS-Prog-Folder-TXT.
576          *>
577          *> MIDDLE LEFT SECTION F-KEYS
578          *>
579          03 BACKGROUND-COLOR COB-COLOR-BLACK
580          FOREGROUND-COLOR COB-COLOR-WHITE HIGHLIGHT.
581 GC0712      05 LINE 08 COL 03 VALUE 'F1'.
582 GC0712      05 LINE 09 COL 03 VALUE 'F2'.
583 GC0712      05 LINE 10 COL 03 VALUE 'F3'.
584 GC0712      05 LINE 11 COL 03 VALUE 'F4'.
585 GC0712      05 LINE 12 COL 03 VALUE 'F5'.
586
587 GC0712      05 LINE 08 COL 35 VALUE 'F6'.
588 GC0712      05 LINE 09 COL 35 VALUE 'F7'.
589 GC0712      05 LINE 10 COL 35 VALUE 'F8'.
590 GC0712      05 LINE 11 COL 35 VALUE 'F9'.
591          *>
592          *> MIDDLE LEFT SECTION SWITCHES
593          *>
594          03 BACKGROUND-COLOR COB-COLOR-BLACK
595          FOREGROUND-COLOR COB-COLOR-RED HIGHLIGHT.
596 GC0712      05 LINE 08 COL 06 PIC X(1) FROM WS-CS-DEBUG-CHR.
597 GC0712      05 LINE 09 COL 06 PIC X(1) FROM WS-CS-TRACEALL-CHR.
598 GC0712      05 LINE 10 COL 06 PIC X(1) FROM WS-CS-LIBRARY-CHR.
599 GC0712      05 LINE 11 COL 06 PIC X(1) FROM WS-CS-EXECUTE-CHR.
600 GC0712      05 LINE 12 COL 06 PIC X(1) FROM WS-CS-LISTING-CHR.
601
602 GC0712      05 LINE 08 COL 38 PIC X(1) FROM WS-CS-NOFUNC-CHR.
603 GC0712      05 LINE 09 COL 38 PIC X(1) FROM WS-CS-WARNALL-CHR.
604 GC0712      05 LINE 10 COL 38 PIC X(1) FROM WS-CS-FREE-CHR.
605 GC0712      05 LINE 11 COL 38 PIC X(1) FROM WS-CS-NOTRUNC-CHR.
606          *>
607          *> MIDDLE LEFT SECTION BACKGROUND
608          *>
609          03 BACKGROUND-COLOR COB-COLOR-BLACK
610          FOREGROUND-COLOR COB-COLOR-GREEN HIGHLIGHT.
611 GC0712      05 LINE 08 COL 07 VALUE 'Assume WITH DEBUGGING MODE'.
612 GC0712      05 LINE 09 COL 07 VALUE 'Procedure+Statement Trace '.
613 GC0712      05 LINE 10 COL 07 VALUE 'Make a Library ('.
614 GC0712      05 COL 23 VALUE WS-OS-Lib-Type-CONST.
615 GC0712      05 LINE 11 COL 07 VALUE 'Execute If Compilation OK '.
616 GC1213      05 LINE 12 COL 07 FROM WS-Listing-TXT.
617
618 GC0712      05 LINE 08 COL 39 VALUE '"FUNCTION" Is Optional '.
619 GC0712      05 LINE 09 COL 39 VALUE 'Enable All Warnings '.
620 GC0712      05 LINE 10 COL 39 VALUE 'Source Is Free-Format '.
=====

```

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```

=====
621 GC0712      05 LINE 11 COL 39 VALUE 'No COMP/BINARY Truncation '.
622      *>
623      *> MIDDLE RIGHT SECTION Text
624      *>
625      03 BACKGROUND-COLOR COB-COLOR-BLACK
626      FOREGROUND-COLOR COB-COLOR-GREEN HIGHLIGHT.
627 GC0712      05 LINE 08 COL 69 VALUE 'Current'.
628 GC0712      05 LINE 09 COL 69 VALUE 'Config:'.
629      *>
630      *> MIDDLE RIGHT SECTION CONFIG FILE
631      *>
632      03 BACKGROUND-COLOR COB-COLOR-BLACK
633      FOREGROUND-COLOR COB-COLOR-WHITE HIGHLIGHT.
634 GC0712      05 LINE 10 COL 69 PIC X(10)
635 GC0712      FROM WS-CS-Filename-TXT (WS-CS-Config-NUM).
636      *>
637      *> FREE-FORM OPTIONS FIELDS
638      *>
639      03 BACKGROUND-COLOR COB-COLOR-BLACK
640      FOREGROUND-COLOR COB-COLOR-WHITE HIGHLIGHT.
641 GC0712      05 LINE 16 COL 03 PIC X(76) USING WS-CS-Extra-H1-TXT.
642 GC0712      05 LINE 17 COL 03 PIC X(76) USING WS-CS-Extra-H2-TXT.
643 GC0712      05 LINE 21 COL 03 PIC X(76) USING WS-CS-Arg-H1-TXT.
644 GC0712      05 LINE 22 COL 03 PIC X(76) USING WS-CS-Arg-H2-TXT.
=====

```

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```

=====
646      PROCEDURE DIVISION.
647      *>*****
648      *> Legend to procedure names:                **
649      *>                                           **
650      *> 00x-xxx  All MAIN driver procedures        **
651      *> 0xx-xxx  All GLOBAL UTILITY procedures    **
652      *> 1xx-xxx  All INITIALIZATION procedures     **
653      *> 2xx-xxx  All CORE PROCESSING procedures    **
654      *> 9xx-xxx  All TERMINATION procedures        **
655      *>*****
656      DECLARATIVES.
657      000-File-Error SECTION.
658          USE AFTER STANDARD ERROR PROCEDURE ON F-Source-Code-FILE.
659          COPY FileStat-Msgs
660              REPLACING STATUS BY WS-FSM-Status-CD
661                  MSG      BY WS-FSM-Msg-TXT.
EVALUATE WS-FSM-Status-CD
WHEN 00 MOVE 'SUCCESS'                ' TO WS-FSM-Msg-TXT
WHEN 02 MOVE 'SUCCESS DUPLICATE'      ' TO WS-FSM-Msg-TXT
WHEN 04 MOVE 'SUCCESS INCOMPLETE'     ' TO WS-FSM-Msg-TXT
WHEN 05 MOVE 'SUCCESS OPTIONAL'       ' TO WS-FSM-Msg-TXT
WHEN 07 MOVE 'SUCCESS NO UNIT'        ' TO WS-FSM-Msg-TXT
WHEN 10 MOVE 'END OF FILE'            ' TO WS-FSM-Msg-TXT
WHEN 14 MOVE 'OUT OF KEY RANGE'       ' TO WS-FSM-Msg-TXT
WHEN 21 MOVE 'KEY INVALID'            ' TO WS-FSM-Msg-TXT
WHEN 22 MOVE 'KEY EXISTS'             ' TO WS-FSM-Msg-TXT
WHEN 23 MOVE 'KEY NOT EXISTS'         ' TO WS-FSM-Msg-TXT
WHEN 30 MOVE 'PERMANENT ERROR'        ' TO WS-FSM-Msg-TXT
WHEN 31 MOVE 'INCONSISTENT FILENAME'  ' TO WS-FSM-Msg-TXT
WHEN 34 MOVE 'BOUNDARY VIOLATION'     ' TO WS-FSM-Msg-TXT
WHEN 35 MOVE 'FILE NOT FOUND'        ' TO WS-FSM-Msg-TXT
WHEN 37 MOVE 'PERMISSION DENIED'      ' TO WS-FSM-Msg-TXT
WHEN 38 MOVE 'CLOSED WITH LOCK'       ' TO WS-FSM-Msg-TXT
WHEN 39 MOVE 'CONFLICT ATTRIBUTE'     ' TO WS-FSM-Msg-TXT
WHEN 41 MOVE 'ALREADY OPEN'           ' TO WS-FSM-Msg-TXT
WHEN 42 MOVE 'NOT OPEN'               ' TO WS-FSM-Msg-TXT
WHEN 43 MOVE 'READ NOT DONE'          ' TO WS-FSM-Msg-TXT
WHEN 44 MOVE 'RECORD OVERFLOW'       ' TO WS-FSM-Msg-TXT
WHEN 46 MOVE 'READ ERROR'             ' TO WS-FSM-Msg-TXT
WHEN 47 MOVE 'INPUT DENIED'           ' TO WS-FSM-Msg-TXT
WHEN 48 MOVE 'OUTPUT DENIED'          ' TO WS-FSM-Msg-TXT
WHEN 49 MOVE 'I/O DENIED'             ' TO WS-FSM-Msg-TXT
WHEN 51 MOVE 'RECORD LOCKED'          ' TO WS-FSM-Msg-TXT
WHEN 52 MOVE 'END-OF-PAGE'            ' TO WS-FSM-Msg-TXT
WHEN 57 MOVE 'I/O LINAGE'             ' TO WS-FSM-Msg-TXT
WHEN 61 MOVE 'FILE SHARING FAILURE'   ' TO WS-FSM-Msg-TXT
WHEN 91 MOVE 'FILE NOT AVAILABLE'     ' TO WS-FSM-Msg-TXT
END-EVALUATE.
662      MOVE SPACES TO WS-Output-Msg-TXT
663      IF WS-FSM-Status-CD = 35
664          DISPLAY
665              'File not found: ''
=====

```

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```

=====
666          TRIM(WS-File-Name-TXT,TRAILING)
667          ' '
668      ELSE
669          DISPLAY
670          'Error accessing file: '
671          TRIM(WS-File-Name-TXT,TRAILING)
672          ' '
673      END-IF
674      GOBACK
675      .
676  END DECLARATIVES.
677
678  000-Main SECTION.
679      PERFORM 100-Initialization
680 GC0609      SET WS-RS-Not-Complete-BOOL TO TRUE
681 GC0609      PERFORM UNTIL WS-RS-Complete-BOOL
682 GC0609          PERFORM 200-Let-User-Set-Switches
683 GC0609          PERFORM 210-Run-Compiler
684 GC0410          IF (WS-RS-Compile-OK-BOOL OR WS-RS-Compile-OK-Warn-BOOL)
685 GC0712              AND (WS-CS-LISTING-CHR > SPACE)
686 GC0712                  DISPLAY S-Blank-SCR
687 GC0410                  PERFORM 220-Make-Listing
688 GC0410          END-IF
689 GC0709          IF (WS-CS-EXECUTE-CHR NOT = SPACES)
690 GC0709              AND (WS-RS-Output-File-Avail-BOOL)
691 GC0609                  PERFORM 230-Run-Program
692 GC0609          END-IF
693 GC0712          PERFORM 250-Autoload-Listing
694 GC0609      END-PERFORM
695      PERFORM 900-Terminate
696      * -- Control will NOT return
697      .
=====

```

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```

=====
699      *>*****
700      *> Perform all program-wide initialization operations      **
701      *>*****
702      100-Initialization SECTION.
703      *>*****
704      *> Make sure full screen-handling is in effect          **
705      *>*****
706      SET ENVIRONMENT 'COB_SCREEN_EXCEPTIONS' TO 'Y'
707      SET ENVIRONMENT 'COB_SCREEN_ESC' TO 'Y'
708 VC0617 SET ENVIRONMENT "COB_EXIT_WAIT" TO "0".
709      *>*****
710      *> Get GCic Compilation Date/Time                        **
711      *>*****
712      MOVE WHEN-COMPILED (1:12) TO WS-OC-Compile-DT
713      INSPECT WS-OC-Compile-DT
714          REPLACING ALL '/' BY ':'
715          AFTER INITIAL SPACE
716      *>*****
717      *> Convert WS-CS-All-Switches-TXT to Needed Alphanumeric Values**
718      *>*****
719      INSPECT WS-CS-All-Switches-TXT
720          REPLACING ALL '0' BY SPACE
721          ALL '1' BY SELCHAR
722 GC1213 ALL '2' BY SELCHAR
723      *>*****
724      *> Process filename (the only command-line argument)    **
725      *>*****
726 GC0712 ACCEPT WS-Cmd-Args-TXT FROM COMMAND-LINE
727 GC0712 MOVE 1 TO WS-Cmd-SUB
728 GC0712 IF WS-Cmd-Args-TXT(WS-Cmd-SUB:1) = '"' OR "'"
729 GC0712     MOVE WS-Cmd-Args-TXT(WS-Cmd-SUB:1)
730 GC0712     TO WS-Cmd-End-Quote-CHR
731 GC0712     ADD 1 TO WS-Cmd-SUB
732 GC0712     UNSTRING WS-Cmd-Args-TXT
733 GC0712     DELIMITED BY WS-Cmd-End-Quote-CHR
734 GC0712     INTO WS-File-Name-TXT
735 GC0712     WITH POINTER WS-Cmd-SUB
736 GC0712 ELSE
737 GC0712     UNSTRING WS-Cmd-Args-TXT
738 GC0712     DELIMITED BY ALL SPACES
739 GC0712     INTO WS-File-Name-TXT
740 GC0712     WITH POINTER WS-Cmd-SUB
741 GC0712 END-IF
742     IF WS-File-Name-TXT = SPACES
743 GC0712     DISPLAY 'No program filename was specified'
744     PERFORM 900-Terminate
745     * ----- Control will NOT return
746     END-IF
747     *>*****
748     *> Determine if 'Make A Library' feature should be forced 'ON' **
749     *>*****
750     PERFORM 240-Find-LINKAGE-SECTION
=====

```

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```

=====
751      *>*****
752      *> Split 'WS-File-Name-TXT' into 'WS-Prog-Folder-TXT' and      **
753      *> 'WS-Prog-File-Name-TXT'                                     **
754      *>*****
755 GC0909      IF WS-OS-Cygwin-BOOL AND WS-File-Name-TXT (2:1) = ':'
756 GC0712          MOVE '\' TO WS-OS-Dir-CHR
757 GC0909      END-IF
758 GC0712          MOVE LENGTH(WS-File-Name-TXT) TO WS-I-SUB
759 GC0712          PERFORM UNTIL WS-I-SUB = 0
760 GC0712              OR WS-FN-CHR (WS-I-SUB) = WS-OS-Dir-CHR
761                  SUBTRACT 1 FROM WS-I-SUB
762          END-PERFORM
763          IF WS-I-SUB = 0
764              MOVE SPACES      TO WS-Prog-Folder-TXT
765              MOVE WS-File-Name-TXT TO WS-Prog-File-Name-TXT
766          ELSE
767              MOVE '*' TO WS-FN-CHR (WS-I-SUB)
768              UNSTRING WS-File-Name-TXT DELIMITED BY '*'
769                  INTO WS-Prog-Folder-TXT
770                      WS-Prog-File-Name-TXT
771 GC0712          MOVE WS-OS-Dir-CHR TO WS-FN-CHR (WS-I-SUB)
772          END-IF
773          IF WS-Prog-Folder-TXT = SPACES
774              ACCEPT WS-Prog-Folder-TXT FROM ENVIRONMENT 'CD'
775 GC0909      ELSE
776 GC0909          CALL 'CBL_CHANGE_DIR'
777 GC0909              USING TRIM(WS-Prog-Folder-TXT,TRAILING)
778          END-IF
779 GC0909      IF WS-OS-Cygwin-BOOL AND WS-File-Name-TXT (2:1) = ':'
780 GC0712          MOVE '/' TO WS-OS-Dir-CHR
781 GC0909      END-IF
782      *>*****
783      *> Split 'WS-Prog-File-Name-TXT' into 'WS-Pgm-Nm-TXT' &      **
784      *> 'WS-Prog-Extension-TXT'                                     **
785      *>*****
786 GC0712          MOVE LENGTH(WS-Prog-File-Name-TXT) TO WS-I-SUB
787 GC0712          PERFORM UNTIL WS-I-SUB = 0
788 GC0712              OR WS-PFN-CHR (WS-I-SUB) = '.'
789 GC0712              SUBTRACT 1 FROM WS-I-SUB
790 GC0712          END-PERFORM
791 GC0712          IF WS-I-SUB = 0
792 GC0712              MOVE WS-Prog-File-Name-TXT TO WS-Pgm-Nm-TXT
793 GC0712              MOVE SPACES      TO WS-Prog-Extension-TXT
794 GC0712          ELSE
795 GC0712              MOVE '*' TO WS-PFN-CHR (WS-I-SUB)
796 GC0712              UNSTRING WS-Prog-File-Name-TXT DELIMITED BY '*'
797                  INTO WS-Pgm-Nm-TXT
798                  WS-Prog-Extension-TXT
799 GC0712              MOVE '.' TO WS-PFN-CHR (WS-I-SUB)
800 GC0712          END-IF
801      *>*****
802      *> Build initial Line 24 Message                                **
803      *>*****
=====

```

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```

=====
804 GC0909      MOVE ALL LD-Horiz-Line TO WS-Horizontal-Line-TXT.
805 GC0410      MOVE CONCATENATE(' GCic for '
806 GC0410                        TRIM(WS-OS-Type-TXT(WS-OS-Type-CD),Trailing)
807 GC1213                        ' Copyright (C) 2009-2018, Gary L. '
808 GC0410                        'Cutler, GPL')
809 GC0410      TO WS-Output-Msg-TXT.
810 GC0909

```

```

=====
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```

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```

=====
812      *>*****
813      *> Show the user the current switch settings and allow them to **
814      *> be changed.                                          **
815      *>*****
816      200-Let-User-Set-Switches SECTION.
817          SET WS-RS-Switch-Changes-BOOL TO TRUE
818          PERFORM UNTIL WS-RS-No-Switch-Changes-BOOL
819 GC1213      EVALUATE WS-Listing-CD
820 GC1213      WHEN 0
821 GC1213          MOVE 'Listing Off'          TO WS-Listing-TXT
822 GC1213          MOVE SPACE                  TO WS-CS-LISTING-CHR
823 GC1213      WHEN 1
824 GC1213          MOVE 'Listing On (Landscape)' TO WS-Listing-TXT
825 GC1213          MOVE SELCHAR                TO WS-CS-LISTING-CHR
826 GC1213      WHEN 2
827 GC1213          MOVE 'Listing On (Portrait)' TO WS-Listing-TXT
828 GC1213          MOVE SELCHAR                TO WS-CS-LISTING-CHR
829 GC1213      END-EVALUATE
830      ACCEPT S-Switches-SCR
831      IF COB-CRT-STATUS > 0
832          EVALUATE COB-CRT-STATUS
833              WHEN COB-SCR-F1
834                  IF WS-CS-DEBUG-CHR = SPACE
835 GC0712      MOVE SELCHAR TO WS-CS-DEBUG-CHR
836                  ELSE
837                      MOVE ' ' TO WS-CS-DEBUG-CHR
838                  END-IF
839 GC0712      WHEN COB-SCR-F2
840 GC0712          IF WS-CS-TRACEALL-CHR = SPACE
841 GC0712      MOVE SELCHAR TO WS-CS-TRACEALL-CHR
842 GC0712          ELSE
843 GC0712      MOVE ' ' TO WS-CS-TRACEALL-CHR
844 GC0712          END-IF
845 GC0712      WHEN COB-SCR-F3
846 GC0712          IF WS-CS-LIBRARY-CHR = SPACE
847 GC0712      MOVE SELCHAR TO WS-CS-LIBRARY-CHR
848          ELSE
849 GC0712      MOVE ' ' TO WS-CS-LIBRARY-CHR
850          END-IF
851 GC0712      WHEN COB-SCR-F4
852          IF WS-CS-EXECUTE-CHR = SPACE
853 GC0712      MOVE SELCHAR TO WS-CS-EXECUTE-CHR
854          ELSE
855          MOVE ' ' TO WS-CS-EXECUTE-CHR
856          END-IF
857 GC0712      WHEN COB-SCR-F5
858 GC1213      ADD 1 TO WS-Listing-CD
859 GC1213      IF WS-Listing-CD > 2
860 GC1213      MOVE 0 TO WS-Listing-CD
861 GC1213      END-IF
862 GC0712      WHEN COB-SCR-F6
863 GC0712      IF WS-CS-NOFUNC-CHR = SPACE

```

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```

=====
864 GC0712          MOVE SELCHAR TO WS-CS-NOFUNC-CHR
865 GC0712          ELSE
866 GC0712          MOVE ' ' TO WS-CS-NOFUNC-CHR
867 GC0712          END-IF
868 GC0712          WHEN COB-SCR-F7
869 GC0712          IF WS-CS-WARNALL-CHR = SPACE
870 GC0712          MOVE SELCHAR TO WS-CS-WARNALL-CHR
871 GC0712          ELSE
872 GC0712          MOVE ' ' TO WS-CS-WARNALL-CHR
873 GC0712          END-IF
874 GC0712          WHEN COB-SCR-F8
875 GC0712          IF WS-CS-FREE-CHR = SPACE
876 GC0712          MOVE SELCHAR TO WS-CS-FREE-CHR
877 GC0712          ELSE
878 GC0712          MOVE ' ' TO WS-CS-FREE-CHR
879 GC0712          END-IF
880 GC0712          WHEN COB-SCR-F9
881 GC0712          IF WS-CS-NOTRUNC-CHR = SPACE
882 GC0712          MOVE SELCHAR TO WS-CS-NOTRUNC-CHR
883 GC0712          ELSE
884 GC0712          MOVE ' ' TO WS-CS-NOTRUNC-CHR
885 GC0712          END-IF
886 GC0712          WHEN COB-SCR-ESC
887 GC0712          PERFORM 900-Terminate
888 GC0712          * ----- Control will NOT return
889 GC0712          WHEN COB-SCR-F12
890 GC0712          ADD 1 TO WS-CS-Config-NUM
891 GC0712          IF WS-CS-Config-NUM > 7
892 GC0712          MOVE 1 TO WS-CS-Config-NUM
893 GC0712          END-IF
894 GC0712          WHEN OTHER
895 GC0712          MOVE 'An unsupported key was pressed'
896 GC0712          TO WS-Output-Msg-TXT
897 GC0712          END-EVALUATE
898 GC0712          ELSE
899 GC0712          SET WS-RS-No-Switch-Changes-BOOL TO TRUE
900 GC0712          END-IF
901 GC0712          END-PERFORM
902 GC0712          .
=====

```

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```

=====
904      *>*****
905      *> Run the compiler using the switch settings we've prepared.  **
906      *>*****
907      210-Run-Compiler SECTION.
908          MOVE SPACES TO WS-Cmd-TXT
909              WS-Cobc-Cmd-TXT
910              WS-Output-Msg-TXT
911      DISPLAY S-Switches-SCR
912      MOVE 1 TO WS-I-SUB
913 GC0712      MOVE LOWER-CASE(WS-CS-Filename-TXT (WS-CS-Config-NUM))
914 GC0712      TO WS-Config-Fn-TXT
915      *>*****
916      *> Build the 'cobc' command **
917      *>*****
918 GC0909      MOVE SPACES TO WS-Cobc-Cmd-TXT
919 GC0909      STRING 'cobc -v -std='
920 GC0909          TRIM(WS-Config-Fn-TXT,TRAILING)
921 GC0909          ' '
922 GC0909          INTO WS-Cobc-Cmd-TXT
923 GC0909          WITH POINTER WS-I-SUB
924      IF WS-CS-LIBRARY-CHR NOT = ' '
925          STRING '-m '
926              DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
927              WITH POINTER WS-I-SUB
928      ELSE
929          STRING '-x '
930              DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
931              WITH POINTER WS-I-SUB
932      END-IF
933      IF WS-CS-DEBUG-CHR NOT = ' '
934          STRING '-fdebugging-line '
935              DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
936              WITH POINTER WS-I-SUB
937      END-IF
938      IF WS-CS-NOTRUNC-CHR NOT = ' '
939          STRING '-fnotrunc '
940              DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
941              WITH POINTER WS-I-SUB
942      END-IF
943      IF WS-CS-TRACEALL-CHR NOT = ' '
944 GC0809      STRING '-ftraceall '
945              DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
946              WITH POINTER WS-I-SUB
947      END-IF
948      IF WS-CS-NOFUNC-CHR NOT = ' '
949 GC0717      STRING '-fintrinsics=ALL '
950 GC0712      DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
951 GC0712      WITH POINTER WS-I-SUB
952 GC0712      END-IF
953 GC0712      IF WS-CS-WARNALL-CHR NOT = ' '
954 GC0712      STRING '-Wall '
955 GC0712      DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
=====

```

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```

=====
956 GC0712          WITH POINTER WS-I-SUB
957 GC0712      END-IF
958 GC0712      IF WS-CS-FREE-CHR NOT = ' '
959 GC0712          STRING '-free '
960 GC0712          DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
961 GC0712          WITH POINTER WS-I-SUB
962 GC0712      ELSE
963 GC0712          STRING '-fixed '
964 GC0712          DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
965 GC0712          WITH POINTER WS-I-SUB
966 GC0712      END-IF
967
968 GC0712      MOVE 0 TO WS-Tally-QTY
969 GC0712      INSPECT WS-CS-Extra-TXT
970 GC0712          TALLYING WS-Tally-QTY FOR ALL '-save-temps'
971 GC0712      IF WS-CS-LISTING-CHR > SPACE
972 GC0712          AND WS-Tally-QTY > 0
973 GC0712          MOVE SPACE TO WS-CS-LISTING-CHR *> Can't generate listing if -save-temps u
          sed
974 GC0712      END-IF
975 GC0712      IF WS-CS-LISTING-CHR > SPACE
976 GC1010          STRING '-save-temps '
977 GC1010          DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
978 GC1010          WITH POINTER WS-I-SUB
979 GC1010      END-IF
980
981 GC0709      IF WS-CS-Extra-TXT > SPACES
982 GC0709          STRING ' '
983 GC0709          TRIM(WS-CS-Extra-TXT,TRAILING)
984 GC0709          ' '
985 GC0709          DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
986 GC0709          WITH POINTER WS-I-SUB
987 GC0709      END-IF
988 GC0909      STRING TRIM(WS-Prog-File-Name-TXT,TRAILING)
989 GC0909          DELIMITED SIZE INTO WS-Cobc-Cmd-TXT
990 GC0909          WITH POINTER WS-I-SUB
991      *>*****
992      *> Prepare the compilation listing file **
993      *>*****
994 GC1113      MOVE CONCATENATE(TRIM(WS-Pgm-Nm-TXT,Trailing),'.gclst')
995 GC0712          TO WS-Listing-Filename-TXT
996 GC0712      CALL 'CBL_DELETE_FILE' USING WS-Listing-Filename-TXT
997      *>*****
998      *> Now execute the 'cobc' command **
999      *>*****
1000 GC0410      MOVE ' Compiling...' TO WS-Output-Msg-TXT
1001 GC0410      DISPLAY S-Switches-SCR
1002 GC0609      SET WS-RS-Output-File-Avail-BOOL TO TRUE
1003      MOVE SPACES TO WS-Cmd-TXT
1004      STRING TRIM(WS-Cobc-Cmd-TXT,TRAILING)
1005 GC0712          ' >' WS-Listing-Filename-TXT
1006 GC0712          ' 2>&1'
1007      DELIMITED SIZE
=====

```

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```

=====
1008          INTO WS-Cmd-TXT
1009 DEBUG D   DISPLAY WS-Cmd-TXT UPON SYSERR
1010          CALL 'SYSTEM' USING TRIM(WS-Cmd-TXT,TRAILING)
1011 GC0712     OPEN EXTEND F-Cobc-Output-FILE
1012 GC0712     WRITE F-Cobc-Output-REC FROM SPACES
1013 GC0712     IF RETURN-CODE = 0
1014 GC0712         SET WS-RS-Compile-OK-BOOL TO TRUE
1015 GC0712         MOVE ' Compilation Was Successful' TO WS-Output-Msg-TXT
1016 GC0712         MOVE CONCATENATE('GNU COBOL',WS-Output-Msg-TXT)
1017 GC0712             TO F-Cobc-Output-REC
1018 GC0712         WRITE F-Cobc-Output-REC
1019 GC0712         SET WS-RS-Complete-BOOL TO TRUE
1020 GC0712     ELSE
1021 GC0712         SET WS-RS-Compile-Failed-BOOL TO TRUE
1022 GC0712         MOVE CONCATENATE(' Compilation Failed - See ',
1023 GC0712             TRIM(WS-Listing-Filename-TXT,Trailing))
1024 GC0712             TO WS-Output-Msg-TXT
1025 GC0712         MOVE 'GNU COBOL Compilation HAS FAILED - See Above'
1026 GC0712             TO F-Cobc-Output-REC
1027 GC0712         WRITE F-Cobc-Output-REC
1028 GC0712     END-IF
1029 GC0712     CLOSE F-Cobc-Output-FILE
1030 GC0712     DISPLAY S-Switches-SCR
1031 GC0712     CALL 'C$SLEEP' USING 2
1032 GC0712     MOVE SPACES TO WS-Output-Msg-TXT
1033     IF WS-RS-Compile-Failed-BOOL
1034 GC0712         PERFORM 250-Autoload-Listing
1035         PERFORM 900-Terminate
1036     *> ----- Control will not return
1037     END-IF
1038     .
=====

```

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```

=====
1040      *>*****
1041      *> Generate a source + xref listing using 'LISTING' subroutine **
1042      *>*****
1043 GC0410 220-Make-Listing SECTION.
1044 GC0410      MOVE ' Generating listing...' TO WS-Output-Msg-TXT
1045 GC0410      DISPLAY S-Switches-SCR
1046 GC0410      MOVE 0 TO RETURN-CODE
1047      *>*****
1048      *> Create the listing **
1049      *>*****
1050 GC0410      MOVE SPACES TO WS-Output-Msg-TXT
1051 GC0410      CALL 'LISTING' USING WS-Listing-Filename-TXT
1052 GC0712      WS-File-Name-TXT
1053 GC0712      WS-OS-Type-CD
1054 GC1213      LPP
1055 GC1213      LPPP
1056 GC1213      WS-Listing-CD
1057 GC0410      ON EXCEPTION
1058 GC0410      MOVE ' LISTING module is not available'
1059 GC0410      TO WS-Output-Msg-TXT
1060 GC0410      MOVE 1 TO RETURN-CODE
1061 GC0410      END-CALL
1062 GC0410      IF RETURN-CODE = 0
1063 GC0712      MOVE ' Source+Xref listing generated '
1064 GC0712      TO WS-Output-Msg-TXT
1065 GC0410      END-IF
1066 GC0712      DISPLAY S-Switches-SCR
1067 GC0712      CALL 'C$SLEEP' USING 2
1068 GC0712      PERFORM 250-Autoload-Listing
1069 GC0410      .
=====

```

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```

=====
1071      *>*****
1072      *> Run the compiled program                      **
1073      *>*****
1074      230-Run-Program SECTION.
1075 GC0114      MOVE ' Preparing to run program ... press ENTER to close '
1076 GC0114      TO WS-Output-Msg-TXT
1077 GC0114      DISPLAY S-Switches-SCR
1078 GC0114      CALL 'C$SLEEP' USING 3
1079 GC0909      MOVE SPACES TO WS-Cmd-TXT
1080 GC0909      MOVE 1 TO WS-I-SUB
1081      *>*****
1082      *> If necessary, start with 'cobcrun' command      **
1083      *>*****
1084 GC0712      IF WS-CS-LIBRARY-CHR NOT = ' '
1085              STRING 'cobcrun ' DELIMITED SIZE
1086              INTO WS-Cmd-TXT
1087              WITH POINTER WS-I-SUB
1088      END-IF
1089      *>*****
1090      *> Add any necessary path prefix                    **
1091      *>*****
1092 GC0712      SET WS-RS-Double-Quote-Used-BOOL TO FALSE
1093      IF WS-Prog-Folder-TXT NOT = SPACES
1094 GC0909      IF WS-OS-Cygwin-BOOL AND WS-Prog-Folder-TXT (2:1) = ':'
1095 GC0909      STRING '/cygdrive/'
1096 GC0909      INTO WS-Cmd-TXT
1097 GC0909      WITH POINTER WS-I-SUB
1098 GC0909      STRING LOWER-CASE(WS-Prog-Folder-TXT (1:1))
1099 GC0909      INTO WS-Cmd-TXT
1100 GC0909      WITH POINTER WS-I-SUB
1101 GC0909      PERFORM
1102 GC0909      VARYING WS-J-SUB FROM 3 BY 1
1103 GC0909      UNTIL WS-J-SUB > LENGTH(TRIM(WS-Prog-Folder-TXT))
1104 GC0909      IF WS-Prog-Folder-TXT (WS-J-SUB:1) = '\'
1105 GC0909      STRING '/'
1106 GC0909      INTO WS-Cmd-TXT
1107 GC0909      WITH POINTER WS-I-SUB
1108 GC0909      ELSE
1109 GC0909      STRING WS-Prog-Folder-TXT (WS-J-SUB:1)
1110 GC0909      INTO WS-Cmd-TXT
1111 GC0909      WITH POINTER WS-I-SUB
1112 GC0909      END-IF
1113 GC0909      END-PERFORM
1114 GC0909      ELSE
1115 GC0410      STRING '' TRIM(WS-Prog-Folder-TXT,TRAILING)
1116 GC0909      INTO WS-Cmd-TXT
1117 GC0909      WITH POINTER WS-I-SUB
1118 GC0712      SET WS-RS-Double-Quote-Used-BOOL TO TRUE
1119 GC0909      END-IF
1120 GC0712      STRING WS-OS-Dir-CHR
1121 GC0909      INTO WS-Cmd-TXT
1122 GC0909      WITH POINTER WS-I-SUB
=====

```

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```

=====
1123 GC0909      ELSE
1124 GC0909          IF WS-OS-Cygwin-BOOL OR WS-OS-UNIX-BOOL
1125 GC0909              STRING './'
1126 GC0909              INTO WS-Cmd-TXT
1127 GC0909              WITH POINTER WS-I-SUB
1128 GC0909      END-IF
1129      END-IF
1130      *>*****
1131      *> Insert program filename **
1132      *>*****
1133 GC0909      STRING TRIM(WS-Pgm-Nm-TXT,TRAILING)
1134 GC0909          INTO WS-Cmd-TXT
1135 GC0909          WITH POINTER WS-I-SUB
1136      *>*****
1137      *> Insert proper extension **
1138      *>*****
1139 GC0712      IF WS-CS-LIBRARY-CHR = ' '
1140 GC0712          IF WS-OS-Exe-Ext-CONST > ' '
1141 GC0712              STRING WS-OS-Exe-Ext-CONST DELIMITED SPACE
1142 GC0712              INTO WS-Cmd-TXT
1143 GC0712              WITH POINTER WS-I-SUB
1144 GC0712          END-IF
1145 GC0712      ELSE
1146 GC0712          IF WS-OS-Lib-Ext-CONST > ' '
1147 GC0712              STRING WS-OS-Lib-Ext-CONST DELIMITED SPACE
1148 GC0712              INTO WS-Cmd-TXT
1149 GC0712              WITH POINTER WS-I-SUB
1150 GC0712          END-IF
1151 GC0712      END-IF
1152 GC0712      IF WS-RS-Double-Quote-Used-BOOL
1153 GC0712          STRING ''' DELIMITED SIZE
1154 GC0712          INTO WS-Cmd-TXT
1155 GC0712          WITH POINTER WS-I-SUB
1156 GC0712      END-IF
1157      IF WS-CS-Args-TXT NOT = SPACES
1158 GC0809          STRING ' ' TRIM(WS-CS-Args-TXT,TRAILING)
1159          INTO WS-Cmd-TXT
1160          WITH POINTER WS-I-SUB
1161      END-IF
1162      *>*****
1163      *> Run the program **
1164      *>*****
1165 GC0114      CALL X'E4'
1166          CALL 'SYSTEM' USING TRIM(WS-Cmd-TXT,TRAILING)
1167 GC0712      MOVE SPACES TO WS-Output-Msg-TXT
1168 GC0114      ACCEPT WS-Output-Msg-TXT(1:1) AT 0101
1169          PERFORM 900-Terminate
1170      * -- Control will NOT return
1171      .
=====

```

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```

=====
1173      *>*****
1174      *> Determine if the program being compiled is a MAIN program  **
1175      *>*****
1176      240-Find-LINKAGE-SECTION SECTION.
1177      OPEN INPUT F-Source-Code-FILE
1178 GC0712  MOVE ' ' TO WS-CS-LIBRARY-CHR
1179      SET WS-RS-More-To-1st-Prog-BOOL TO TRUE
1180      PERFORM UNTIL WS-RS-1st-Prog-Complete-BOOL
1181          READ F-Source-Code-FILE AT END
1182          CLOSE F-Source-Code-FILE
1183          EXIT SECTION
1184      END-READ
1185 GC0712  CALL 'CHECKSRC'
1186 GC0712      USING BY CONTENT F-Source-Code-REC
1187 GC0712      BY REFERENCE WS-RS-Source-Record-Type-CHR
1188      IF WS-RS-Source-Rec-Ident-BOOL
1189          SET WS-RS-1st-Prog-Complete-BOOL TO TRUE
1190      END-IF
1191  END-PERFORM
1192 GC0712  SET WS-RS-Source-Rec-Ignored-BOOL TO TRUE
1193  PERFORM UNTIL WS-RS-Source-Rec-Linkage-BOOL
1194      OR WS-RS-Source-Rec-Ident-BOOL
1195      READ F-Source-Code-FILE AT END
1196      CLOSE F-Source-Code-FILE
1197      EXIT SECTION
1198  END-READ
1199 GC0712  CALL 'CHECKSRC'
1200 GC0712      USING BY CONTENT F-Source-Code-REC
1201 GC0712      BY REFERENCE WS-RS-Source-Record-Type-CHR
1202  END-PERFORM
1203  CLOSE F-Source-Code-FILE
1204  IF WS-RS-Source-Rec-Linkage-BOOL
1205 GC0712  MOVE SELCHAR TO WS-CS-LIBRARY-CHR
1206  END-IF
1207  .
=====

```

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```

1209 GC0712*>*****
1210 GC0712*> Attempt to open the listing file as a command. This will - **
1211 GC1113*> if the user has associated filetype/extension 'gclst' with **
1212 GC0712*> an application - invoke the appropriate application to **
1213 GC0712*> allow the user to view the listing. **
1214 GC0712*>*****
1215 GC0712 250-Autoload-Listing SECTION.
1216 GC0712     EVALUATE TRUE
1217 GC0712         WHEN WS-OS-Windows-BOOL OR WS-OS-Cygwin-BOOL
1218 GC0712             MOVE SPACES TO WS-Cmd-TXT
1219 GC0712             STRING
1220 GC0712                 'cmd /c '
1221 GC0712                 TRIM(WS-Listing-Filename-TXT,TRAILING)
1222 GC0712                 DELIMITED SIZE INTO WS-Cmd-TXT
1223 GC0712             CALL 'SYSTEM' USING TRIM(WS-Cmd-TXT,TRAILING)
1224 GC0712         WHEN WS-OS-OSX-BOOL
1225 GC0712             MOVE SPACES TO WS-Cmd-TXT
1226 GC0712             STRING
1227 GC0712                 'open -t '
1228 GC0712                 TRIM(WS-Listing-Filename-TXT,TRAILING)
1229 GC0712                 DELIMITED SIZE INTO WS-Cmd-TXT
1230 GC0712             CALL 'SYSTEM' USING TRIM(WS-Cmd-TXT,TRAILING)
1231 GC0712     END-EVALUATE
1232 GC0712*> *****
1233 GC0712*> ** Since we had to do our own '-save-temps' when we **
1234 GC0712*> ** compiled (in order to generate the cross-reference **
1235 GC0712*> ** listing) we now need to clean up after ourselves. **
1236 GC0712*> *****
1237 GC1112 DISPLAY S-Blank-SCR
1238 GC0712 IF WS-OS-Windows-BOOL
1239 GC0712     MOVE CONCATENATE('del ',TRIM(WS-Pgm-Nm-TXT,TRAILING))
1240 GC0712     TO WS-Cmd-TXT
1241 GC0712 ELSE
1242 GC0712     MOVE CONCATENATE('rm ',TRIM(WS-Pgm-Nm-TXT,TRAILING))
1243 GC0712     TO WS-Cmd-TXT
1244 GC0712 END-IF
1245 GC0712 CALL 'SYSTEM'
1246 GC0712     USING CONCATENATE(TRIM(WS-Cmd-TXT,TRAILING),'.c')
1247 GC0712 CALL 'SYSTEM'
1248 GC0712     USING CONCATENATE(TRIM(WS-Cmd-TXT,TRAILING),'.c.h')
1249 GC0712 CALL 'SYSTEM'
1250 GC0712     USING CONCATENATE(TRIM(WS-Cmd-TXT,TRAILING),'.c.l*.h')
1251 GC0712 CALL 'SYSTEM'
1252 GC0712     USING CONCATENATE(TRIM(WS-Cmd-TXT,TRAILING),'.i')
1253 GC0712 CALL 'SYSTEM'
1254 GC0712     USING CONCATENATE(TRIM(WS-Cmd-TXT,TRAILING),'.o')
1255
1256 GC0712 .

```

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```
=====
1258      *>*****
1259      *> Display a message and halt the program      **
1260      *>*****
1261      900-Terminate SECTION.
1262 GC0909      IF WS-Output-Msg-TXT > SPACES
1263 GC0909          DISPLAY S-Switches-SCR
1264 GC0909          CALL 'C$SLEEP' USING 2
1265 GC0909      END-IF
1266      DISPLAY S-Blank-SCR
1267      STOP RUN
1268      .
1269
1270      END PROGRAM GCic.
```

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```

=====
1272      IDENTIFICATION DIVISION.
1273      PROGRAM-ID. CHECKSRC.
1274      *>*****
1275      *> This subprogram will scan a line of source code it is given **
1276      *> looking for 'LINKAGE SECTION' or 'IDENTIFICATION DIVISION'. **
1277      *> **
1278      *> ****NOTE**** ****NOTE**** ****NOTE**** ****NOTE**** **
1279      *> **
1280      *> These two strings must be found IN THEIR ENTIRETY within **
1281      *> the 1st 80 columns of program source records, and cannot **
1282      *> follow either a '>' sequence OR a '*' in col 7. **
1283      *>*****
1284      *> DATE CHANGE DESCRIPTION **
1285      *> ===== **
1286      *> GC0809 Initial coding. **
1287      *>*****
1288      ENVIRONMENT DIVISION.
1289      CONFIGURATION SECTION.
1290      REPOSITORY.
1291          FUNCTION ALL INTRINSIC.
1292      DATA DIVISION.
1293      WORKING-STORAGE SECTION.
1294      01 WS-Compressed-Src-TXT.
1295          05 WS-CS-CHR OCCURS 80 TIMES
1296                      PIC X(1).
1297
1298      01 WS-Runtime-Switches-TXT.
1299          05 WS-RS-Found-SPACE-CHR PIC X(1).
1300              88 WS-RS-Skipping-SPACE-BOOL VALUE 'Y'.
1301              88 WS-RS-Not-Skipping-SPACE-BOOL VALUE 'N'.
1302
1303      01 WS-I-SUB USAGE BINARY-CHAR.
1304
1305      01 WS-J-SUB USAGE BINARY-CHAR.
1306      LINKAGE SECTION.
1307      01 L-Argument-1-TXT.
1308          02 L-A1-CHR OCCURS 80 TIMES
1309                      PIC X(1).
1310
1311      01 L-Argument-2-CHR PIC X(1).
1312          88 L-A2-LINKAGE-SECTION-BOOL VALUE 'L'.
1313          88 L-A2-IDENT-DIVISION-BOOL VALUE 'I'.
1314          88 L-A2-Nothing-Special-BOOL VALUE ' '.
=====

```

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```

=====
1316 GC0712 PROCEDURE DIVISION USING BY VALUE      L-Argument-1-TXT
1317 GC0712                                     BY REFERENCE L-Argument-2-CHR.
1318      000-Main SECTION.
1319          SET L-A2-Nothing-Special-BOOL TO TRUE
1320          IF L-A1-CHR (7) = '*'
1321              GOBACK
1322          END-IF
1323      .
1324      *>
1325      *> Compress multiple consecutive spaces
1326      *>
1327          SET WS-RS-Not-Skipping-SPACE-BOOL TO TRUE
1328          MOVE 0 TO WS-J-SUB
1329          MOVE SPACES TO WS-Compressed-Src-TXT
1330          PERFORM VARYING WS-I-SUB FROM 1 BY 1
1331              UNTIL WS-I-SUB > 80
1332              IF L-A1-CHR (WS-I-SUB) = SPACE
1333                  IF WS-RS-Not-Skipping-SPACE-BOOL
1334                      ADD 1 TO WS-J-SUB
1335                      MOVE UPPER-CASE(L-A1-CHR (WS-I-SUB))
1336                          TO WS-CS-CHR (WS-J-SUB)
1337                      SET WS-RS-Skipping-SPACE-BOOL TO TRUE
1338                  END-IF
1339              ELSE
1340                  SET WS-RS-Not-Skipping-SPACE-BOOL TO TRUE
1341                  ADD 1 TO WS-J-SUB
1342                  MOVE L-A1-CHR (WS-I-SUB) TO WS-CS-CHR (WS-J-SUB)
1343              END-IF
1344          END-PERFORM
1345      *>
1346      *> Scan the compressed source line
1347      *>
1348          PERFORM VARYING WS-I-SUB FROM 1 BY 1
1349              UNTIL WS-I-SUB > 66
1350          EVALUATE TRUE
1351              WHEN WS-CS-CHR (WS-I-SUB) = '*'
1352                  IF WS-Compressed-Src-TXT (WS-I-SUB : 2) = '*>'
1353                      GOBACK
1354                  END-IF
1355              WHEN (WS-CS-CHR (WS-I-SUB) = 'L') AND (WS-I-SUB < 66)
1356                  IF WS-Compressed-Src-TXT (WS-I-SUB : 15)
1357                      = 'LINKAGE SECTION'
1358                      SET L-A2-LINKAGE-SECTION-BOOL TO TRUE
1359                      GOBACK
1360                  END-IF
1361              WHEN (WS-CS-CHR (WS-I-SUB) = 'I') AND (WS-I-SUB < 58)
1362                  IF WS-Compressed-Src-TXT (WS-I-SUB : 23)
1363                      = 'IDENTIFICATION DIVISION'
1364                      SET L-A2-IDENT-DIVISION-BOOL TO TRUE
1365                      GOBACK
1366                  END-IF
1367          END-EVALUATE
=====

```

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```

=====
1368             END-PERFORM
1369             *>
1370             *> If we get to here, we never found anything!
1371             *>
1372 +             GOBACK
1373             .
1374             END PROGRAM CHECKSRC.
1375
1376             IDENTIFICATION DIVISION.
1377             PROGRAM-ID. LISTING.
1378             *>*****
1379             *> This subprogram generates a cross-reference listing of an **
1380             *> GNU COBOL program. **
1381             *>*****
1382             *> **
1383             *> AUTHOR:          GARY L. CUTLER **
1384             *>                Copyright (C) 2010, Gary L. Cutler, GPL **
1385             *> **
1386             *> DATE-WRITTEN: April 1, 2010 **
1387             *> **
1388             *>*****
1389             *> DATE CHANGE DESCRIPTION **
1390             *> ===== **
1391             *> GC0410 Initial coding **
1392             *> GC0711 Updates to accommodate the 12MAR2010 version of OC **
1393             *> GC0710 Handle duplicate data names (i.e. 'CORRESPONDING' or **
1394             *>                qualified items) better; ignore 'END PROGRAM' recs **
1395             *>                so program name doesn't appear in listing. **
1396             *> GC0313 Fix problem where the first procedure name defined **
1397             *>                in the PROCEDURE DIVISION lacks a "Defined" line **
1398             *>                number. **
1399             *> GC1213 Updated for 23NOV2013 version of GNU COBOL 2.1; Stop **
1400             *>                showing functions as if they were identifiers in the **
1401             *>                xref listing; Flag all CALL argument references with **
1402             *>                a "C" rather than "*" because they aren't necessari- **
1403             *>                ly altered; Fixed assorted formatting bugs; DOWN- **
1404             *>                WARD COMPATIBLE WITH GNU COBOL 2.0 SYNTAX **
1405             *> GC0314 Fix problem where 1st char of 1st token on a line is **
1406             *>                lost if >>SOURCE MODE IS FREE is in effect and the **
1407             *>                1st character is non-blank. **
1408             *> VC1217 Updated compiler version & date to v3.0 & 24DEC2017. **
1409             *>*****
1410             ENVIRONMENT DIVISION.
1411             CONFIGURATION SECTION.
1412             REPOSITORY.
1413             FUNCTION ALL INTRINSIC.
1414             INPUT-OUTPUT SECTION.
1415             FILE-CONTROL.
1416             SELECT F-Expanded-Src-FILE ASSIGN TO WS-Expanded-Src-Fn-TXT
1417             ORGANIZATION IS LINE SEQUENTIAL.
1418 GC0712     SELECT F-Listing-FILE      ASSIGN TO L-Listing-Fn-TXT
1419             ORGANIZATION IS LINE SEQUENTIAL.
1420             SELECT F-Original-Src-FILE ASSIGN TO L-Src-Fn-TXT
=====

```

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```

=====
1421                                ORGANIZATION IS LINE SEQUENTIAL.
1422                SELECT F-Sort-Work-FILE    ASSIGN TO DISK.
1423                DATA DIVISION.
1424                FILE SECTION.
1425                FD  F-Expanded-Src-FILE.
1426                01  F-Expanded-Src-REC.
1427                    05 F-ES-1-CHR                      PIC X.
1428                    05 F-ES-2-256-TXT-256              PIC X(256).
1429 GC0712 01  F-Expanded-Src2-REC.
1430 GC0712    05 F-ES-1-7-TXT                      PIC X(7).
1431 GC0712    05 F-ES-8-256-TXT                    PIC X(249).
1432
1433 GC0712 FD  F-Listing-FILE.
1434 GC1213 01  F-Listing-96-REC                      PIC X(96).
1435 GC1213 01  F-Listing-135-REC                     PIC X(135).
1436        01  F-Listing-REC                        PIC X(135).
1437
1438        FD  F-Original-Src-FILE.
1439        01  F-Original-Src-REC.
1440 GC0410    05 F-OS-1-128-TXT.
1441 GC0410        10 FILLER                          PIC X(6).
1442 GC0410        10 F-OS-7-CHR                        PIC X(1).
1443 GC0712        10 F-OS-8-72-TXT                     PIC X(65).
1444 GC0712        10 FILLER                          PIC X(56).
1445        05 F-OS-129-256-TXT                       PIC X(128).
1446
1447        SD  F-Sort-Work-FILE.
1448        01  F-Sort-Work-REC.
1449            05 F-SW-Prog-ID-TXT                      PIC X(15).
1450            05 F-SW-Token-Uc-TXT                     PIC X(32).
1451            05 F-SW-Token-TXT                        PIC X(32).
1452            05 F-SW-Section-TXT                      PIC X(15).
1453            05 F-SW-Def-Line-NUM                     PIC 9(6).
1454            05 F-SW-Reference-TXT.
1455                10 F-SW-Ref-Line-NUM                 PIC 9(6).
1456                10 F-SW-Ref-Flag-CHR                 PIC X(1).
1457
1458                WORKING-STORAGE SECTION.
1459 GC1213 01  WS-Copyright-TXT                      PIC X(86).
1460
1461        01  WS-Curr-CHR                          PIC X(1).
1462            88 WS-Curr-Char-Is-Punct-BOOL          VALUE '=' , '(' , ')' ,
1463                '*' , '/' , '&' ,
1464                ';' , ',' , '<' ,
1465                '>' , ':' .
1466            88 WS-Curr-Char-Is-Quote-BOOL          VALUE '"' , "'" .
1467            88 WS-Curr-Char-Is-X-BOOL              VALUE 'x' , 'X' .
1468            88 WS-Curr-Char-Is-Z-BOOL              VALUE 'z' , 'Z' .
1469
1470        01  WS-Curr-Division-TXT                  PIC X(1).
1471 GC1010    88 WS-CD-In-IDENT-DIV-BOOL             VALUE 'i' , 'I' , '?.
1472 GC1010    88 WS-CD-In-ENV-DIV-BOOL              VALUE 'e' , 'E' .
1473 GC1010    88 WS-CD-In-DATA-DIV-BOOL             VALUE 'd' , 'D' .
=====

```

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```

=====
1474 GC1010      88 WS-CD-In-PROC-DIV-BOOL      VALUE 'p', 'P'.
1475
1476           01 WS-Curr-Line-NUM              PIC 9(6).
1477
1478           01 WS-Curr-Prog-ID-TXT.
1479               05 FILLER                      PIC X(12).
1480               05 WS-CPI-13-15-TXT            PIC X(3).
1481 GC0712       05 WS-CPI-16-CHR                PIC X(1).
1482
1483           01 WS-Curr-Section-TXT.
1484               05 WS-CS-1-CHR                  PIC X(1).
1485               05 WS-CS-2-14-TXT.
1486                   10 FILLER                  PIC X(10).
1487                   10 WS-CS-11-14-TXT          PIC X(3).
1488               05 WS-CS-15-CHR                PIC X(1).
1489
1490           01 WS-Curr-Verb-TXT                PIC X(12).
1491
1492           01 WS-Delim-TXT                    PIC X(2).
1493
1494           01 WS-Dummy-TXT                    PIC X(1).
1495
1496           01 WS-Expanded-Src-Fn-TXT          PIC X(256).
1497
1498           01 WS-Filename-TXT                 PIC X(256).
1499
1500 GC1213 01 WS-Flags-TXT.
1501 GC1213       05 WS-Suppress-FF-CHR          PIC X(1).
1502
1503 GC1213 01 WS-Formatted-DT                   PIC 9999/99/99.
1504
1505           01 WS-Group-Indicators-TXT.
1506               05 WS-GI-Prog-ID-TXT          PIC X(15).
1507               05 WS-GI-Token-TXT            PIC X(32).
1508
1509           01 WS-Held-Reference-TXT           PIC X(100).
1510
1511           01 WS-I-SUB                        USAGE BINARY-LONG.
1512
1513           01 WS-J-SUB                        USAGE BINARY-LONG.
1514
1515           01 WS-Lines-Left-NUM               USAGE BINARY-LONG.
1516
1517           01 WS-Lines-Per-Page-NUM           USAGE BINARY-LONG.
1518
1519           01 WS-Lines-Per-Page-Env-TXT       PIC X(256).
1520
1521 GC1010 01 WS-Main-Module-Name-TXT           PIC X(256).
1522
1523           01 WS-Next-CHR                     PIC X(1).
1524               88 WS-Next-Char-Is-Quote-BOOL  VALUE '''', '"'.
1525
1526           01 WS-OS-Type-FILLER-TXT.
=====

```

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=====
1527          05 VALUE 'Windows' PIC X(14).
1528          05 VALUE 'Windows/Cygwin' PIC X(14).
1529          05 VALUE 'UNIX/Linux' PIC X(14).
1530          05 VALUE 'OSX' PIC X(14).
1531          05 VALUE 'Windows/MinGW' PIC X(14).
1532      01 WS-OS-Types-TXT REDEFINES WS-OS-Type-FILLER-TXT.
1533          05 WS-OS-Type-TXT PIC X(14)
1534                                OCCURS 5 TIMES .
1535
1536 GC0712 01 WS-Page-NUM USAGE BINARY-LONG.
1537
1538 GC0712 01 WS-Page-No-TXT.
1539 GC0712          05 WS-PN-Literal-TXT PIC X(6).
1540 GC0712          05 WS-PN-Page-NUM PIC Z(3)9.
1541
1542 GC1213 01 WS-Program-Path-TXT PIC X(135).
1543
1544      01 WS-Reserved-Words-TXT.
1545          05 VALUE ' ' PIC X(33).
1546 GC1213          05 VALUE 'FABS' PIC X(33).
1547          05 VALUE 'VACCEPT' PIC X(33).
1548          05 VALUE 'ACCESS' PIC X(33).
1549 GC1213          05 VALUE 'FACOS' PIC X(33).
1550          05 VALUE 'ACTIVE-CLASS' PIC X(33). UNIMPLEMENTED
1551          05 VALUE 'VADD' PIC X(33).
1552          05 VALUE 'ADDRESS' PIC X(33).
1553          05 VALUE 'ADVANCING' PIC X(33).
1554          05 VALUE 'KAFTER' PIC X(33).
1555          05 VALUE 'ALIGNED' PIC X(33). UNIMPLEMENTED
1556          05 VALUE 'ALL' PIC X(33).
1557          05 VALUE 'VALLOCATE' PIC X(33).
1558          05 VALUE 'ALPHABET' PIC X(33).
1559          05 VALUE 'ALPHABETIC' PIC X(33).
1560          05 VALUE 'ALPHABETIC-LOWER' PIC X(33).
1561          05 VALUE 'ALPHABETIC-UPPER' PIC X(33).
1562          05 VALUE 'ALPHANUMERIC' PIC X(33).
1563          05 VALUE 'ALPHANUMERIC-EDITED' PIC X(33).
1564          05 VALUE 'ALSO' PIC X(33).
1565          05 VALUE 'VALTER' PIC X(33).
1566          05 VALUE 'ALTERNATE' PIC X(33).
1567          05 VALUE 'AND' PIC X(33).
1568 GC1213          05 VALUE 'FANNUITY' PIC X(33).
1569          05 VALUE 'ANY' PIC X(33).
1570          05 VALUE 'ANYCASE' PIC X(33). UNIMPLEMENTED
1571          05 VALUE 'ARE' PIC X(33).
1572          05 VALUE 'AREA' PIC X(33).
1573          05 VALUE 'AREAS' PIC X(33).
1574          05 VALUE 'ARGUMENT-NUMBER' PIC X(33).
1575          05 VALUE 'ARGUMENT-VALUE' PIC X(33).
1576          05 VALUE 'ARITHMETIC' PIC X(33). UNIMPLEMENTED
1577          05 VALUE 'AS' PIC X(33).
1578          05 VALUE 'ASCENDING' PIC X(33).
1579          05 VALUE 'ASCII' PIC X(33).
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=====
1580 GC1213      05 VALUE 'FASIN                ' PIC X(33).
1581              05 VALUE ' ASSIGN              ' PIC X(33).
1582              05 VALUE ' AT                  ' PIC X(33).
1583 GC1213      05 VALUE 'FATAN                ' PIC X(33).
1584 GC0711      05 VALUE ' ATTRIBUTE            ' PIC X(33).
1585              05 VALUE ' AUTHOR              ' PIC X(33).      OBSOLETE
1586              05 VALUE ' AUTO                ' PIC X(33).
1587              05 VALUE ' AUTO-SKIP            ' PIC X(33).
1588              05 VALUE ' AUTOMATIC            ' PIC X(33).
1589              05 VALUE ' AUTOTERMINATE        ' PIC X(33).
1590              05 VALUE ' AWAY-FROM-ZERO        ' PIC X(33).
1591              05 VALUE ' B-AND                ' PIC X(33).      UNIMPLEMENTED
1592              05 VALUE ' B-NOT                ' PIC X(33).      UNIMPLEMENTED
1593              05 VALUE ' B-OR                ' PIC X(33).      UNIMPLEMENTED
1594              05 VALUE ' B-XOR                ' PIC X(33).      UNIMPLEMENTED
1595              05 VALUE ' BACKGROUND-COLOR      ' PIC X(33).
1596              05 VALUE ' BACKGROUND-COLOUR    ' PIC X(33).
1597              05 VALUE ' BASED                ' PIC X(33).
1598              05 VALUE ' BEEP                ' PIC X(33).
1599              05 VALUE ' BEFORE              ' PIC X(33).
1600              05 VALUE ' BELL                ' PIC X(33).
1601              05 VALUE ' BINARY              ' PIC X(33).
1602              05 VALUE ' BINARY-C-LONG        ' PIC X(33).
1603              05 VALUE ' BINARY-CHAR          ' PIC X(33).
1604              05 VALUE ' BINARY-DOUBLE        ' PIC X(33).
1605              05 VALUE ' BINARY-INT           ' PIC X(33).
1606              05 VALUE ' BINARY-LONG          ' PIC X(33).
1607              05 VALUE ' BINARY-LONG-LONG     ' PIC X(33).
1608              05 VALUE ' BINARY-SHORT         ' PIC X(33).
1609              05 VALUE ' BIT                  ' PIC X(33).      UNIMPLEMENTED
1610              05 VALUE ' BLANK                ' PIC X(33).
1611              05 VALUE ' BLINK                ' PIC X(33).
1612              05 VALUE ' BLOCK                ' PIC X(33).
1613              05 VALUE ' BOOLEAN              ' PIC X(33).      UNIMPLEMENTED
1614 GC1213      05 VALUE 'FBOOLEAN-OF-INTEGER    ' PIC X(33).      UNIMPLEMENTED
1615              05 VALUE ' BOTTOM              ' PIC X(33).
1616              05 VALUE ' YBY                  ' PIC X(33).
1617 GC1213      05 VALUE 'FBYTE-LENGTH          ' PIC X(33).
1618              05 VALUE ' MC01                 ' PIC X(33).
1619              05 VALUE ' MC02                 ' PIC X(33).
1620              05 VALUE ' MC03                 ' PIC X(33).
1621              05 VALUE ' MC04                 ' PIC X(33).
1622              05 VALUE ' MC05                 ' PIC X(33).
1623              05 VALUE ' MC06                 ' PIC X(33).
1624              05 VALUE ' MC07                 ' PIC X(33).
1625              05 VALUE ' MC08                 ' PIC X(33).
1626              05 VALUE ' MC09                 ' PIC X(33).
1627              05 VALUE ' MC10                 ' PIC X(33).
1628              05 VALUE ' MC11                 ' PIC X(33).
1629              05 VALUE ' MC12                 ' PIC X(33).
1630              05 VALUE ' VCALL                ' PIC X(33).
1631              05 VALUE ' MCALL-CONVENTION      ' PIC X(33).
1632              05 VALUE ' VCANCEL              ' PIC X(33).
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=====
1633          05 VALUE ' CAPACITY          ' PIC X(33).      UNIMPLEMENTED
1634          05 VALUE ' CD                ' PIC X(33).      OBSOLETE
1635          05 VALUE ' CENTER             ' PIC X(33).      UNIMPLEMENTED
1636          05 VALUE ' CF                 ' PIC X(33).
1637          05 VALUE ' CH                 ' PIC X(33).
1638          05 VALUE ' CHAIN               ' PIC X(33).      UNIMPLEMENTED
1639          05 VALUE ' CHAINING            ' PIC X(33).
1640 GC1213     05 VALUE ' FCHAR             ' PIC X(33).
1641 GC1213     05 VALUE ' FCHAR-NATIONAL    ' PIC X(33).      UNIMPLEMENTED
1642          05 VALUE ' CHARACTER          ' PIC X(33).
1643          05 VALUE ' CHARACTERS          ' PIC X(33).
1644          05 VALUE ' CLASS               ' PIC X(33).
1645          05 VALUE ' CLASS-ID            ' PIC X(33).      UNIMPLEMENTED
1646 GC0711     05 VALUE ' CLASSIFICATION    ' PIC X(33).
1647          05 VALUE ' VCLOSE              ' PIC X(33).
1648 GC1213     05 VALUE ' FCOB-CRT-STATUS   ' PIC X(33).
1649          05 VALUE ' CODE                ' PIC X(33).
1650          05 VALUE ' CODE-SET            ' PIC X(33).
1651          05 VALUE ' COL                 ' PIC X(33).
1652          05 VALUE ' COLLATING           ' PIC X(33).
1653          05 VALUE ' COLS                ' PIC X(33).
1654          05 VALUE ' COLUMN              ' PIC X(33).
1655          05 VALUE ' COLUMNS             ' PIC X(33).
1656 GC1213     05 VALUE ' FCOMBINED-DATETIME ' PIC X(33).
1657          05 VALUE ' COMMA              ' PIC X(33).
1658          05 VALUE ' COMMAND-LINE        ' PIC X(33).
1659          05 VALUE ' VCOMMIT             ' PIC X(33).
1660          05 VALUE ' COMMON              ' PIC X(33).
1661          05 VALUE ' COMMUNICATION       ' PIC X(33).      OBSOLETE
1662          05 VALUE ' COMP                 ' PIC X(33).
1663          05 VALUE ' COMP-1               ' PIC X(33).
1664          05 VALUE ' COMP-2               ' PIC X(33).
1665          05 VALUE ' COMP-3               ' PIC X(33).
1666          05 VALUE ' COMP-4               ' PIC X(33).
1667          05 VALUE ' COMP-5               ' PIC X(33).
1668          05 VALUE ' COMP-6               ' PIC X(33).
1669          05 VALUE ' COMP-X               ' PIC X(33).
1670          05 VALUE ' COMPUTATIONAL        ' PIC X(33).
1671          05 VALUE ' COMPUTATIONAL-1      ' PIC X(33).
1672          05 VALUE ' COMPUTATIONAL-2      ' PIC X(33).
1673          05 VALUE ' COMPUTATIONAL-3      ' PIC X(33).
1674          05 VALUE ' COMPUTATIONAL-4      ' PIC X(33).
1675          05 VALUE ' COMPUTATIONAL-5      ' PIC X(33).
1676          05 VALUE ' COMPUTATIONAL-X      ' PIC X(33).
1677          05 VALUE ' VCOMPUTE             ' PIC X(33).
1678 GC1213     05 VALUE ' FCONCATENATE       ' PIC X(33).
1679 GC0712     05 VALUE ' CONDITION          ' PIC X(33).
1680          05 VALUE ' KCONFIGURATION       ' PIC X(33).
1681          05 VALUE ' MCONSOLE             ' PIC X(33).
1682          05 VALUE ' CONSTANT             ' PIC X(33).
1683          05 VALUE ' CONTAINS             ' PIC X(33).
1684 GC0712     05 VALUE ' ACONTENT          ' PIC X(33).
1685          05 VALUE ' VCONTINUE           ' PIC X(33).
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1686          05 VALUE ' CONTROL          ' PIC X(33).
1687          05 VALUE ' CONTROLS         ' PIC X(33).
1688 GC0711    05 VALUE ' CONVERSION       ' PIC X(33).
1689          05 VALUE ' KCONVERTING       ' PIC X(33).
1690          05 VALUE ' COPY              ' PIC X(33).
1691          05 VALUE ' CORR               ' PIC X(33).
1692          05 VALUE ' CORRESPONDING      ' PIC X(33).
1693 GC1213    05 VALUE ' FCOS              ' PIC X(33).
1694          05 VALUE ' KCOUNT           ' PIC X(33).
1695          05 VALUE ' CRT               ' PIC X(33).
1696          05 VALUE ' CRT-UNDER          ' PIC X(33).
1697          05 VALUE ' MCSP              ' PIC X(33).
1698          05 VALUE ' CURRENCY           ' PIC X(33).
1699 GC1213    05 VALUE ' FCURRENCY-SYMBOL   ' PIC X(33).
1700 GC1213    05 VALUE ' FCURRENT-DATE     ' PIC X(33).
1701          05 VALUE ' CURSOR            ' PIC X(33).
1702          05 VALUE ' CYCLE              ' PIC X(33).
1703          05 VALUE ' KDATA             ' PIC X(33).
1704          05 VALUE ' DATA-POINTER      ' PIC X(33).      UNIMPLEMENTED
1705          05 VALUE ' DATE              ' PIC X(33).
1706          05 VALUE ' DATE-COMPILED      ' PIC X(33).      OBSOLETE
1707          05 VALUE ' DATE-MODIFIED      ' PIC X(33).      OBSOLETE
1708 GC1213    05 VALUE ' FDATE-OF-INTEGER   ' PIC X(33).
1709 GC1213    05 VALUE ' FDATE-TO-YYYYMMDD ' PIC X(33).
1710          05 VALUE ' DATE-WRITTEN       ' PIC X(33).      OBSOLETE
1711          05 VALUE ' DAY                ' PIC X(33).
1712 GC1213    05 VALUE ' FDAY-OF-INTEGER    ' PIC X(33).
1713          05 VALUE ' DAY-OF-WEEK        ' PIC X(33).
1714 GC1213    05 VALUE ' IDAY-TO-YYYYDDD   ' PIC X(33).
1715          05 VALUE ' DE                 ' PIC X(33).
1716 GC0712    05 VALUE ' IDEBUG-CONTENTS    ' PIC X(33).
1717 GC0712    05 VALUE ' IDEBUG-ITEM       ' PIC X(33).
1718 GC0712    05 VALUE ' IDEBUG-LINE       ' PIC X(33).
1719 GC0712    05 VALUE ' IDEBUG-NAME       ' PIC X(33).
1720 GC0712    05 VALUE ' IDEBUG-SUB-1      ' PIC X(33).
1721 GC0712    05 VALUE ' IDEBUG-SUB-2      ' PIC X(33).
1722 GC0712    05 VALUE ' IDEBUG-SUB-3      ' PIC X(33).
1723          05 VALUE ' DEBUGGING          ' PIC X(33).
1724          05 VALUE ' DECIMAL-POINT      ' PIC X(33).
1725          05 VALUE ' DECLARATIVES      ' PIC X(33).
1726          05 VALUE ' DEFAULT            ' PIC X(33).
1727          05 VALUE ' VDELETE            ' PIC X(33).
1728          05 VALUE ' DELIMITED          ' PIC X(33).
1729          05 VALUE ' KDELIMITER         ' PIC X(33).
1730          05 VALUE ' DEPENDING          ' PIC X(33).
1731          05 VALUE ' DESCENDING          ' PIC X(33).
1732          05 VALUE ' DESTINATION         ' PIC X(33).      UNIMPLEMENTED
1733          05 VALUE ' DETAIL             ' PIC X(33).
1734 GC0711    05 VALUE ' DISC              ' PIC X(33).
1735          05 VALUE ' DISK               ' PIC X(33).
1736          05 VALUE ' VDISPLAY           ' PIC X(33).
1737 GC1213    05 VALUE ' FDISPLAY-OF       ' PIC X(33).      UNIMPLEMENTED
1738          05 VALUE ' VDIVIDE            ' PIC X(33).
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1739          05 VALUE 'KDIVISION          ' PIC X(33).
1740          05 VALUE 'KDOWN            ' PIC X(33).
1741          05 VALUE ' DUPLICATES        ' PIC X(33).
1742          05 VALUE ' DYNAMIC            ' PIC X(33).
1743 GC1213     05 VALUE 'FE                ' PIC X(33).
1744          05 VALUE ' EBCDIC              ' PIC X(33).
1745 GC0712     05 VALUE ' EC                ' PIC X(33).
1746          05 VALUE ' EGI                 ' PIC X(33).      OBSOLETE
1747          05 VALUE ' VELSE              ' PIC X(33).
1748          05 VALUE ' EMI                 ' PIC X(33).      OBSOLETE
1749          05 VALUE ' EMPTY-CHECK        ' PIC X(33).
1750          05 VALUE ' VENABLE             ' PIC X(33).      OBSOLETE
1751 GC0710     05 VALUE 'KEND              ' PIC X(33).
1752          05 VALUE ' END-ACCEPT          ' PIC X(33).
1753          05 VALUE ' END-ADD             ' PIC X(33).
1754          05 VALUE ' END-CALL           ' PIC X(33).
1755          05 VALUE ' END-CHAIN          ' PIC X(33).      UNIMPLEMENTED
1756          05 VALUE ' END-COMPUTE        ' PIC X(33).
1757          05 VALUE ' END-DELETE          ' PIC X(33).
1758          05 VALUE ' END-DISPLAY        ' PIC X(33).
1759          05 VALUE ' END-DIVIDE         ' PIC X(33).
1760          05 VALUE ' END-EVALUATE        ' PIC X(33).
1761          05 VALUE ' END-IF             ' PIC X(33).
1762          05 VALUE ' END-MULTIPLY        ' PIC X(33).
1763          05 VALUE ' END-OF-PAGE         ' PIC X(33).
1764          05 VALUE ' END-PERFORM         ' PIC X(33).
1765          05 VALUE ' END-READ           ' PIC X(33).
1766          05 VALUE ' END-RECEIVE        ' PIC X(33).      OBSOLETE
1767          05 VALUE ' END-RETURN         ' PIC X(33).
1768          05 VALUE ' END-REWRITE        ' PIC X(33).
1769          05 VALUE ' END-SEARCH         ' PIC X(33).
1770          05 VALUE ' END-START          ' PIC X(33).
1771          05 VALUE ' END-STRING         ' PIC X(33).
1772          05 VALUE ' END-SUBTRACT        ' PIC X(33).
1773          05 VALUE ' END-UNSTRING       ' PIC X(33).
1774          05 VALUE ' END-WRITE          ' PIC X(33).
1775          05 VALUE ' VENTRY             ' PIC X(33).
1776          05 VALUE ' ENTRY-CONVENTION    ' PIC X(33).      UNIMPLEMENTED
1777          05 VALUE ' KENVIRONMENT        ' PIC X(33).
1778          05 VALUE ' ENVIRONMENT-NAME    ' PIC X(33).
1779          05 VALUE ' ENVIRONMENT-VALUE   ' PIC X(33).
1780          05 VALUE ' EO                 ' PIC X(33).      UNIMPLEMENTED
1781          05 VALUE ' EOL                ' PIC X(33).
1782          05 VALUE ' EOP                ' PIC X(33).
1783          05 VALUE ' EOS                ' PIC X(33).
1784          05 VALUE ' EQUAL              ' PIC X(33).
1785          05 VALUE ' KEQUALS            ' PIC X(33).
1786          05 VALUE ' ERASE              ' PIC X(33).
1787          05 VALUE ' ERROR              ' PIC X(33).
1788          05 VALUE ' ESCAPE             ' PIC X(33).
1789          05 VALUE ' ESI                ' PIC X(33).      OBSOLETE
1790          05 VALUE ' VEEVALUATE         ' PIC X(33).
1791          05 VALUE ' EXCEPTION          ' PIC X(33).
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1792 GC1213      05 VALUE 'FEXCEPTION-FILE          ' PIC X(33).
1793 GC1213      05 VALUE 'FEXCEPTION-FILE-N        ' PIC X(33).      UNIMPLEMENTED
1794 GC1213      05 VALUE 'FEXCEPTION-LOCATION        ' PIC X(33).
1795 GC1213      05 VALUE 'FEXCEPTION-LOCATION-N      ' PIC X(33).      UNIMPLEMENTED
1796              05 VALUE ' EXCEPTION-OBJECT       ' PIC X(33).      UNIMPLEMENTED
1797 GC1213      05 VALUE 'FEXCEPTION-STATEMENT      ' PIC X(33).
1798 GC1213      05 VALUE 'FEXCEPTION-STATUS        ' PIC X(33).
1799              05 VALUE ' EXCLUSIVE                ' PIC X(33).
1800              05 VALUE ' VEXIT                    ' PIC X(33).
1801 GC1213      05 VALUE 'FEXP                      ' PIC X(33).
1802 GC1213      05 VALUE 'FEXP10                    ' PIC X(33).
1803              05 VALUE ' EXPANDS                  ' PIC X(33).      UNIMPLEMENTED
1804              05 VALUE ' EXTEND                   ' PIC X(33).
1805              05 VALUE ' EXTERNAL                 ' PIC X(33).
1806 GC1213      05 VALUE 'FFACTORIAL                 ' PIC X(33).
1807              05 VALUE ' FACTORY                  ' PIC X(33).      UNIMPLEMENTED
1808              05 VALUE ' FALSE                    ' PIC X(33).
1809              05 VALUE ' KFD                      ' PIC X(33).
1810              05 VALUE ' KFILE                    ' PIC X(33).
1811              05 VALUE ' FILE-CONTROL              ' PIC X(33).
1812              05 VALUE ' FILE-ID                  ' PIC X(33).
1813 GC1113      05 VALUE ' FILLER                    ' PIC X(33).
1814              05 VALUE ' FINAL                    ' PIC X(33).
1815              05 VALUE ' FIRST                    ' PIC X(33).
1816 GC0712      05 VALUE ' FLOAT-BINARY-128          ' PIC X(33).      UNIMPLEMENTED
1817 GC0712      05 VALUE ' FLOAT-BINARY-32          ' PIC X(33).      UNIMPLEMENTED
1818 GC0712      05 VALUE ' FLOAT-BINARY-64          ' PIC X(33).      UNIMPLEMENTED
1819              05 VALUE ' FLOAT-DECIMAL-16        ' PIC X(33).
1820              05 VALUE ' FLOAT-DECIMAL-34        ' PIC X(33).
1821              05 VALUE ' FLOAT-EXTENDED           ' PIC X(33).      UNIMPLEMENTED
1822 GC0712      05 VALUE ' FLOAT-INFINITY            ' PIC X(33).      UNIMPLEMENTED
1823              05 VALUE ' FLOAT-LONG               ' PIC X(33).
1824 GC0712      05 VALUE ' FLOAT-NOT-A-NUMBER        ' PIC X(33).      UNIMPLEMENTED
1825              05 VALUE ' FLOAT-SHORT             ' PIC X(33).
1826              05 VALUE ' FOOTING                  ' PIC X(33).
1827              05 VALUE ' FOR                     ' PIC X(33).
1828              05 VALUE ' FOREGROUND-COLOR         ' PIC X(33).
1829              05 VALUE ' FOREGROUND-COLOUR        ' PIC X(33).
1830 GC0711      05 VALUE ' FOREVER                    ' PIC X(33).
1831              05 VALUE ' FORMAT                   ' PIC X(33).      UNIMPLEMENTED
1832 GC1213      05 VALUE 'FFORMATTED-CURRENT-DATE     ' PIC X(33).      UNIMPLEMENTED
1833 GC1213      05 VALUE 'FFORMATTED-DATE            ' PIC X(33).      UNIMPLEMENTED
1834 GC1213      05 VALUE 'FFORMATTED-DATETIME       ' PIC X(33).      UNIMPLEMENTED
1835 GC1213      05 VALUE 'FFORMATTED-TIME            ' PIC X(33).      UNIMPLEMENTED
1836              05 VALUE 'MFORMFEED                ' PIC X(33).
1837 GC1213      05 VALUE 'FFRACTION-PART             ' PIC X(33).
1838              05 VALUE ' VFREE                    ' PIC X(33).
1839              05 VALUE ' FROM                     ' PIC X(33).
1840              05 VALUE ' FULL                     ' PIC X(33).
1841              05 VALUE ' FUNCTION                  ' PIC X(33).
1842 GC0712      05 VALUE 'KFUNCTION-ID                ' PIC X(33).
1843              05 VALUE ' FUNCTION-POINTER         ' PIC X(33).      UNIMPLEMENTED
1844              05 VALUE ' VGENERATE                ' PIC X(33).
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1845          05 VALUE ' GET                                ' PIC X(33).      UNIMPLEMENTED
1846          05 VALUE 'KGIVING                            ' PIC X(33).
1847          05 VALUE ' GLOBAL                              ' PIC X(33).
1848          05 VALUE ' VGO                                  ' PIC X(33).
1849          05 VALUE ' VGOBACK                             ' PIC X(33).
1850          05 VALUE ' GREATER                              ' PIC X(33).
1851          05 VALUE ' GROUP                                ' PIC X(33).
1852          05 VALUE ' GROUP-USAGE                          ' PIC X(33).      UNIMPLEMENTED
1853          05 VALUE ' HEADING                              ' PIC X(33).
1854          05 VALUE ' HIGH-VALUE                          ' PIC X(33).
1855          05 VALUE ' HIGH-VALUES                          ' PIC X(33).
1856 GC1213    05 VALUE ' FHIGHEST-ALGEBRAIC                ' PIC X(33).
1857          05 VALUE ' HIGHLIGHT                            ' PIC X(33).
1858          05 VALUE ' I-O                                  ' PIC X(33).
1859          05 VALUE ' I-O-CONTROL                          ' PIC X(33).
1860          05 VALUE ' KID                                    ' PIC X(33).
1861          05 VALUE ' KIDENTIFICATION                      ' PIC X(33).
1862          05 VALUE ' VIF                                    ' PIC X(33).
1863          05 VALUE ' IGNORE                                ' PIC X(33).
1864          05 VALUE ' IGNORING                              ' PIC X(33).
1865          05 VALUE ' IMPLEMENTS                           ' PIC X(33).      UNIMPLEMENTED
1866          05 VALUE ' IN                                    ' PIC X(33).
1867          05 VALUE ' INDEX                                ' PIC X(33).
1868          05 VALUE ' KINDEXED                              ' PIC X(33).
1869          05 VALUE ' INDICATE                              ' PIC X(33).
1870          05 VALUE ' INDIRECT                              ' PIC X(33).      UNIMPLEMENTED
1871          05 VALUE ' INHERITS                              ' PIC X(33).      UNIMPLEMENTED
1872          05 VALUE ' INITIAL                              ' PIC X(33).
1873          05 VALUE ' VINITIALISE                          ' PIC X(33).
1874          05 VALUE ' INITIALISED                          ' PIC X(33).
1875          05 VALUE ' VINITIALIZE                          ' PIC X(33).
1876          05 VALUE ' INITIALIZED                          ' PIC X(33).
1877          05 VALUE ' VINITIATE                            ' PIC X(33).
1878          05 VALUE ' INPUT                                  ' PIC X(33).
1879          05 VALUE ' KINPUT-OUTPUT                        ' PIC X(33).
1880          05 VALUE ' VINSPECT                              ' PIC X(33).
1881          05 VALUE ' INSTALLATION                         ' PIC X(33).      OBSOLETE
1882 GC1213    05 VALUE ' FINTEGER                            ' PIC X(33).
1883 GC1213    05 VALUE ' FINTEGER-OF-BOOLEAN                 ' PIC X(33).      UNIMPLEMENTED
1884 GC1213    05 VALUE ' FINTEGER-OF-DATE                   ' PIC X(33).
1885 GC1213    05 VALUE ' FINTEGER-OF-DAY                     ' PIC X(33).
1886 GC1213    05 VALUE ' FINTEGER-OF-FORMATTED-DATE         ' PIC X(33).      UNIMPLEMENTED
1887 GC1213    05 VALUE ' FINTEGER-PART                       ' PIC X(33).
1888          05 VALUE ' INTERFACE                            ' PIC X(33).      UNIMPLEMENTED
1889          05 VALUE ' INTERFACE-ID                          ' PIC X(33).      UNIMPLEMENTED
1890          05 VALUE ' INTERMEDIATE                          ' PIC X(33).      UNIMPLEMENTED
1891          05 VALUE ' KINTO                                  ' PIC X(33).
1892          05 VALUE ' INTRINSIC                             ' PIC X(33).
1893          05 VALUE ' INVALID                               ' PIC X(33).
1894          05 VALUE ' INVOKE                                ' PIC X(33).      UNIMPLEMENTED
1895          05 VALUE ' IS                                    ' PIC X(33).
1896          05 VALUE ' JUST                                  ' PIC X(33).
1897          05 VALUE ' JUSTIFIED                             ' PIC X(33).
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=====
1898          05 VALUE ' KEPT                ' PIC X(33).
1899          05 VALUE ' KEY                  ' PIC X(33).
1900          05 VALUE ' KEYBOARD              ' PIC X(33).
1901          05 VALUE ' LABEL                 ' PIC X(33).
1902          05 VALUE ' LAST                   ' PIC X(33).
1903          05 VALUE ' LC_ALL                 ' PIC X(33).      UNIMPLEMENTED
1904          05 VALUE ' LC_COLLATE             ' PIC X(33).      UNIMPLEMENTED
1905          05 VALUE ' LC_CTYPE               ' PIC X(33).      UNIMPLEMENTED
1906          05 VALUE ' LC_MESSAGES            ' PIC X(33).      UNIMPLEMENTED
1907          05 VALUE ' LC_MONETARY            ' PIC X(33).      UNIMPLEMENTED
1908          05 VALUE ' LC_NUMERIC              ' PIC X(33).      UNIMPLEMENTED
1909          05 VALUE ' LC_TIME                 ' PIC X(33).      UNIMPLEMENTED
1910          05 VALUE ' LEADING                 ' PIC X(33).
1911          05 VALUE ' LEFT                    ' PIC X(33).
1912          05 VALUE ' LEFT-JUSTIFY            ' PIC X(33).      UNIMPLEMENTED
1913          05 VALUE ' LEFTLINE                ' PIC X(33).
1914 GC1213    05 VALUE ' FLENGTH               ' PIC X(33).
1915 GC1213    05 VALUE ' FLENGTH-AN            ' PIC X(33).
1916          05 VALUE ' LENGTH-CHECK           ' PIC X(33).
1917          05 VALUE ' LESS                    ' PIC X(33).
1918          05 VALUE ' LIMIT                   ' PIC X(33).
1919          05 VALUE ' LIMITS                   ' PIC X(33).
1920          05 VALUE ' LINAGE                   ' PIC X(33).
1921          05 VALUE ' ILINAGE-COUNTER          ' PIC X(33).
1922          05 VALUE ' LINE                     ' PIC X(33).
1923 GC1213    05 VALUE ' ILINE-COUNTER          ' PIC X(33).
1924          05 VALUE ' LINES                    ' PIC X(33).
1925          05 VALUE ' KLINKAGE                ' PIC X(33).
1926          05 VALUE ' KLOCAL-STORAGE          ' PIC X(33).
1927          05 VALUE ' LOCALE                   ' PIC X(33).
1928 GC1213    05 VALUE ' FLOCALE-COMPARE        ' PIC X(33).
1929 GC1213    05 VALUE ' FLOCALE-DATE           ' PIC X(33).
1930 GC1213    05 VALUE ' FLOCALE-TIME           ' PIC X(33).
1931 GC1213    05 VALUE ' FLOCALE-TIME-FROM-SECONDS ' PIC X(33).
1932          05 VALUE ' LOCK                     ' PIC X(33).
1933 GC1213    05 VALUE ' FLOG                    ' PIC X(33).
1934 GC1213    05 VALUE ' FLOG10                  ' PIC X(33).
1935          05 VALUE ' LOW-VALUE                ' PIC X(33).
1936          05 VALUE ' LOW-VALUES               ' PIC X(33).
1937          05 VALUE ' LOWER                    ' PIC X(33).
1938 GC1213    05 VALUE ' FLOWER-CASE             ' PIC X(33).
1939 GC1213    05 VALUE ' FLOWEST-ALGEBRAIC       ' PIC X(33).
1940          05 VALUE ' LOWLIGHT                 ' PIC X(33).
1941          05 VALUE ' MANUAL                    ' PIC X(33).
1942 GC1213    05 VALUE ' FMAX                     ' PIC X(33).
1943 GC1213    05 VALUE ' FMEAN                    ' PIC X(33).
1944 GC1213    05 VALUE ' FMEDIAN                  ' PIC X(33).
1945          05 VALUE ' MEMORY                    ' PIC X(33).
1946          05 VALUE ' VMERGE                     ' PIC X(33).
1947          05 VALUE ' MESSAGE                   ' PIC X(33).      OBSOLETE
1948          05 VALUE ' METHOD                     ' PIC X(33).      UNIMPLEMENTED
1949          05 VALUE ' METHOD-ID                  ' PIC X(33).      UNIMPLEMENTED
1950 GC1213    05 VALUE ' FMIDRANGE                ' PIC X(33).
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1951 GC1213      05 VALUE 'FMIN                ' PIC X(33).
1952              05 VALUE ' MINUS              ' PIC X(33).
1953 GC1213      05 VALUE 'FMOD                ' PIC X(33).
1954              05 VALUE ' MODE                ' PIC X(33).
1955 GC1213      05 VALUE 'FMODULE-CALLER-ID    ' PIC X(33).
1956 GC1213      05 VALUE 'FMODULE-DATE        ' PIC X(33).
1957 GC1213      05 VALUE 'FMODULE-FORMATTED-DATE ' PIC X(33).
1958 GC1213      05 VALUE 'FMODULE-ID          ' PIC X(33).
1959 GC1213      05 VALUE 'FMODULE-PATH        ' PIC X(33).
1960 GC1213      05 VALUE 'FMODULE-SOURCE      ' PIC X(33).
1961 GC1213      05 VALUE 'FMODULE-TIME        ' PIC X(33).
1962 GC1213      05 VALUE 'FMONETARY-DECIMAL-POINT ' PIC X(33).
1963 GC1213      05 VALUE 'FMONETARY-THOUSANDS-SEPARATOR ' PIC X(33).
1964              05 VALUE 'VMOVE              ' PIC X(33).
1965              05 VALUE ' MULTIPLE            ' PIC X(33).
1966              05 VALUE 'VMULTIPLY           ' PIC X(33).
1967 GC0711      05 VALUE ' NAME                ' PIC X(33).
1968              05 VALUE ' NATIONAL            ' PIC X(33).
1969              05 VALUE ' NATIONAL-EDITED     ' PIC X(33).
1970 GC1213      05 VALUE 'FNATIONAL-OF         ' PIC X(33).      UNIMPLEMENTED
1971              05 VALUE ' NATIVE              ' PIC X(33).
1972              05 VALUE ' NEAREST-AWAY-FROM-ZERO ' PIC X(33).
1973              05 VALUE ' NEAREST-EVEN        ' PIC X(33).
1974              05 VALUE ' NEAREST-TOWARD-ZERO ' PIC X(33).
1975              05 VALUE ' NEGATIVE            ' PIC X(33).
1976              05 VALUE ' NESTED              ' PIC X(33).      UNIMPLEMENTED
1977              05 VALUE 'VNEXT                ' PIC X(33).
1978              05 VALUE ' NO                  ' PIC X(33).
1979              05 VALUE ' NO-ECHO             ' PIC X(33).
1980              05 VALUE ' NONE                ' PIC X(33).      UNIMPLEMENTED
1981              05 VALUE ' NORMAL              ' PIC X(33).
1982              05 VALUE ' NOT                 ' PIC X(33).
1983              05 VALUE ' NULL               ' PIC X(33).
1984              05 VALUE ' NULLS              ' PIC X(33).
1985              05 VALUE ' NUMBER              ' PIC X(33).
1986              05 VALUE ' INUMBER-OF-CALL-PARAMETERS ' PIC X(33).
1987              05 VALUE ' NUMBERS             ' PIC X(33).
1988              05 VALUE ' NUMERIC             ' PIC X(33).
1989 GC1213      05 VALUE 'FNUMERIC-DECIMAL-POINT ' PIC X(33).
1990              05 VALUE ' NUMERIC-EDITED     ' PIC X(33).
1991 GC1213      05 VALUE 'FNUMERIC-THOUSANDS-SEPARATOR ' PIC X(33).
1992 GC1213      05 VALUE 'FNUMVAL              ' PIC X(33).
1993 GC1213      05 VALUE 'FNUMVAL-C            ' PIC X(33).
1994 GC1213      05 VALUE 'FNUMVAL-F           ' PIC X(33).
1995              05 VALUE ' OBJECT              ' PIC X(33).      UNIMPLEMENTED
1996              05 VALUE ' OBJECT-COMPUTER     ' PIC X(33).
1997              05 VALUE ' OBJECT-REFERENCE    ' PIC X(33).      UNIMPLEMENTED
1998              05 VALUE ' OCCURS              ' PIC X(33).
1999              05 VALUE ' OF                 ' PIC X(33).
2000              05 VALUE ' OFF                ' PIC X(33).
2001              05 VALUE ' OMITTED             ' PIC X(33).
2002              05 VALUE ' ON                 ' PIC X(33).
2003              05 VALUE ' ONLY                ' PIC X(33).
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2004          05 VALUE 'VOPEN'                ' PIC X(33).
2005          05 VALUE ' OPTIONAL'            ' PIC X(33).
2006          05 VALUE ' OPTIONS'              ' PIC X(33).      UNIMPLEMENTED
2007          05 VALUE ' OR'                   ' PIC X(33).
2008 GC1213    05 VALUE 'FORD'                  ' PIC X(33).
2009 GC1213    05 VALUE 'FORD-MAX'              ' PIC X(33).
2010 GC1213    05 VALUE 'FORD-MIN'              ' PIC X(33).
2011          05 VALUE ' ORDER'                 ' PIC X(33).
2012          05 VALUE ' ORGANISATION'          ' PIC X(33).
2013          05 VALUE ' ORGANIZATION'          ' PIC X(33).
2014          05 VALUE ' OTHER'                 ' PIC X(33).
2015          05 VALUE ' OUTPUT'                ' PIC X(33).
2016          05 VALUE ' OVERFLOW'              ' PIC X(33).
2017          05 VALUE ' OVERLINE'              ' PIC X(33).
2018          05 VALUE ' OVERRIDE'              ' PIC X(33).
2019          05 VALUE ' PACKED-DECIMAL'        ' PIC X(33).
2020          05 VALUE ' PADDING'               ' PIC X(33).
2021          05 VALUE ' PAGE'                  ' PIC X(33).
2022 GC1213    05 VALUE ' IPAGE-COUNTER'         ' PIC X(33).
2023          05 VALUE ' PARAGRAPH'              ' PIC X(33).
2024          05 VALUE ' VPERFORM'              ' PIC X(33).
2025          05 VALUE ' PF'                    ' PIC X(33).
2026          05 VALUE ' PH'                    ' PIC X(33).
2027 GC1213    05 VALUE ' FPI'                   ' PIC X(33).
2028          05 VALUE ' KPIC'                   ' PIC X(33).
2029          05 VALUE ' KPICTURE'               ' PIC X(33).
2030          05 VALUE ' PLUS'                   ' PIC X(33).
2031          05 VALUE ' KPOINTER'               ' PIC X(33).
2032          05 VALUE ' POSITION'                ' PIC X(33).
2033          05 VALUE ' POSITIVE'               ' PIC X(33).
2034          05 VALUE ' PREFIXED'               ' PIC X(33).      UNIMPLEMENTED
2035          05 VALUE ' PRESENT'                ' PIC X(33).
2036 GC1213    05 VALUE ' FPRESENT-VALUE'        ' PIC X(33).
2037          05 VALUE ' PREVIOUS'               ' PIC X(33).
2038          05 VALUE ' MPRINTER'               ' PIC X(33).
2039          05 VALUE ' PRINTING'               ' PIC X(33).
2040          05 VALUE ' KPROCEDURE'             ' PIC X(33).
2041          05 VALUE ' PROCEDURE-POINTER'       ' PIC X(33).
2042          05 VALUE ' PROCEDURES'             ' PIC X(33).
2043          05 VALUE ' PROCEED'                ' PIC X(33).
2044          05 VALUE ' PROGRAM'                ' PIC X(33).
2045          05 VALUE ' KPROGRAM-ID'            ' PIC X(33).
2046          05 VALUE ' PROGRAM-POINTER'        ' PIC X(33).
2047          05 VALUE ' PROHIBITED'             ' PIC X(33).
2048          05 VALUE ' PROMPT'                 ' PIC X(33).
2049          05 VALUE ' PROPERTY'               ' PIC X(33).      UNIMPLEMENTED
2050          05 VALUE ' PROTOTYPE'              ' PIC X(33).      UNIMPLEMENTED
2051          05 VALUE ' PURGE'                  ' PIC X(33).      OBSOLETE
2052          05 VALUE ' QUEUE'                  ' PIC X(33).      OBSOLETE
2053          05 VALUE ' QUOTE'                  ' PIC X(33).
2054          05 VALUE ' QUOTES'                 ' PIC X(33).
2055          05 VALUE ' RAISE'                   ' PIC X(33).      UNIMPLEMENTED
2056          05 VALUE ' RAISING'                ' PIC X(33).      UNIMPLEMENTED
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2057 GC1213      05 VALUE 'FRANDOM          ' PIC X(33).
2058 GC1213      05 VALUE 'FRANGE           ' PIC X(33).
2059 GC1213      05 VALUE 'KRD              ' PIC X(33).
2060              05 VALUE 'VREAD            ' PIC X(33).
2061              05 VALUE 'VREADY           ' PIC X(33).
2062              05 VALUE 'VRECEIVE          ' PIC X(33).      OBSOLETE
2063              05 VALUE ' RECORD           ' PIC X(33).
2064              05 VALUE ' RECORDING        ' PIC X(33).
2065              05 VALUE ' RECORDS          ' PIC X(33).
2066              05 VALUE ' RECURSIVE        ' PIC X(33).
2067              05 VALUE 'KREDEFINES        ' PIC X(33).
2068              05 VALUE ' REEL              ' PIC X(33).
2069 GC0712      05 VALUE 'AREREFERENCE       ' PIC X(33).
2070              05 VALUE ' REFERENCES        ' PIC X(33).
2071              05 VALUE ' RELATION          ' PIC X(33).      UNIMPLEMENTED
2072              05 VALUE ' RELATIVE          ' PIC X(33).
2073              05 VALUE 'VRELEASE          ' PIC X(33).
2074 GC1213      05 VALUE 'FREM              ' PIC X(33).
2075              05 VALUE ' REMAINDER         ' PIC X(33).
2076              05 VALUE ' REMARKS           ' PIC X(33).      OBSOLETE
2077              05 VALUE ' REMOVAL           ' PIC X(33).
2078              05 VALUE 'KRENAMES           ' PIC X(33).
2079              05 VALUE ' REPLACE           ' PIC X(33).
2080              05 VALUE 'KREPLACING         ' PIC X(33).
2081              05 VALUE 'KREPORT           ' PIC X(33).
2082              05 VALUE ' REPORTING         ' PIC X(33).
2083              05 VALUE ' REPORTS           ' PIC X(33).
2084              05 VALUE ' REPOSITORY         ' PIC X(33).
2085              05 VALUE ' REQUIRED           ' PIC X(33).
2086              05 VALUE ' RESERVE           ' PIC X(33).
2087              05 VALUE 'VRESET            ' PIC X(33).
2088              05 VALUE ' RESUME            ' PIC X(33).      UNIMPLEMENTED
2089              05 VALUE ' RETRY             ' PIC X(33).      UNIMPLEMENTED
2090              05 VALUE 'VRETURN            ' PIC X(33).
2091              05 VALUE ' IRETURN-CODE      ' PIC X(33).
2092              05 VALUE 'KRETURNING         ' PIC X(33).
2093 GC1213      05 VALUE 'FREVERSE           ' PIC X(33).
2094              05 VALUE ' REVERSE-VIDEO     ' PIC X(33).
2095              05 VALUE ' REVERSED          ' PIC X(33).
2096              05 VALUE ' REWIND           ' PIC X(33).
2097              05 VALUE 'VREWRITE           ' PIC X(33).
2098              05 VALUE ' RF                ' PIC X(33).
2099              05 VALUE ' RH                ' PIC X(33).
2100              05 VALUE ' RIGHT             ' PIC X(33).
2101              05 VALUE ' RIGHT-JUSTIFY     ' PIC X(33).      UNIMPLEMENTED
2102              05 VALUE 'VROLLBACK          ' PIC X(33).
2103              05 VALUE ' ROUNDED           ' PIC X(33).
2104              05 VALUE ' ROUNDING          ' PIC X(33).      UNIMPLEMENTED
2105              05 VALUE ' RUN               ' PIC X(33).
2106              05 VALUE ' SAME              ' PIC X(33).
2107              05 VALUE 'KSCREEN            ' PIC X(33).
2108              05 VALUE ' SCROLL            ' PIC X(33).
2109              05 VALUE 'KSD                ' PIC X(33).
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2110          05 VALUE 'VSEARCH'                ' PIC X(33).
2111          05 VALUE ' SECONDS'                ' PIC X(33).      UNIMPLEMENTED
2112 GC1213    05 VALUE 'FSECONDS-FROM-FORMATTED-TIME' ' PIC X(33).
2113 GC1213    05 VALUE 'FSECONDS-PAST-MIDNIGHT'    ' PIC X(33).
2114          05 VALUE 'KSECTION'                ' PIC X(33).
2115          05 VALUE ' SECURE'                  ' PIC X(33).
2116          05 VALUE ' SECURITY'                ' PIC X(33).      OBSOLETE
2117          05 VALUE ' SEGMENT'                 ' PIC X(33).      OBSOLETE
2118          05 VALUE ' SEGMENT-LIMIT'           ' PIC X(33).
2119          05 VALUE ' SELECT'                  ' PIC X(33).
2120          05 VALUE ' SELF'                    ' PIC X(33).      UNIMPLEMENTED
2121          05 VALUE 'VSEND'                    ' PIC X(33).      OBSOLETE
2122          05 VALUE ' SENTENCE'                ' PIC X(33).
2123          05 VALUE ' SEPARATE'                ' PIC X(33).
2124          05 VALUE ' SEQUENCE'                ' PIC X(33).
2125          05 VALUE ' SEQUENTIAL'              ' PIC X(33).
2126          05 VALUE 'VSET'                    ' PIC X(33).
2127          05 VALUE ' SHARING'                 ' PIC X(33).
2128 GC1213    05 VALUE 'FSIGN'                  ' PIC X(33).
2129          05 VALUE ' SIGNED'                   ' PIC X(33).
2130          05 VALUE ' SIGNED-INT'               ' PIC X(33).
2131          05 VALUE ' SIGNED-LONG'              ' PIC X(33).
2132          05 VALUE ' SIGNED-SHORT'             ' PIC X(33).
2133 GC1213    05 VALUE 'FSIN'                   ' PIC X(33).
2134          05 VALUE ' SIZE'                    ' PIC X(33).
2135          05 VALUE 'VSORT'                    ' PIC X(33).
2136          05 VALUE ' SORT-MERGE'               ' PIC X(33).
2137          05 VALUE ' ISORT-RETURN'             ' PIC X(33).
2138          05 VALUE ' SOURCE'                   ' PIC X(33).
2139          05 VALUE ' SOURCE-COMPUTER'           ' PIC X(33).
2140          05 VALUE ' SOURCES'                  ' PIC X(33).      UNIMPLEMENTED
2141          05 VALUE ' SPACE'                   ' PIC X(33).
2142          05 VALUE ' SPACE-FILL'               ' PIC X(33).      UNIMPLEMENTED
2143          05 VALUE ' SPACES'                   ' PIC X(33).
2144          05 VALUE ' SPECIAL-NAMES'            ' PIC X(33).
2145 GC1213    05 VALUE 'FSQRT'                   ' PIC X(33).
2146          05 VALUE ' STANDARD'                 ' PIC X(33).
2147          05 VALUE ' STANDARD-1'               ' PIC X(33).
2148          05 VALUE ' STANDARD-2'               ' PIC X(33).
2149          05 VALUE ' STANDARD-BINARY'           ' PIC X(33).      UNIMPLEMENTED
2150 GC1213    05 VALUE 'FSTANDARD-COMPARE'         ' PIC X(33).      UNIMPLEMENTED
2151          05 VALUE ' STANDARD-DECIMAL'          ' PIC X(33).      UNIMPLEMENTED
2152 GC1213    05 VALUE 'FSTANDARD-DEVIATION'       ' PIC X(33).
2153          05 VALUE 'VSTART'                    ' PIC X(33).
2154          05 VALUE ' STATEMENT'                 ' PIC X(33).      UNIMPLEMENTED
2155          05 VALUE ' STATIC'                   ' PIC X(33).
2156          05 VALUE ' STATUS'                   ' PIC X(33).
2157          05 VALUE ' STDCALL'                  ' PIC X(33).
2158          05 VALUE 'MSTDERR'                   ' PIC X(33).
2159          05 VALUE 'MSTDIN'                    ' PIC X(33).
2160          05 VALUE 'MSTDOUT'                   ' PIC X(33).
2161          05 VALUE ' STEP'                     ' PIC X(33).
2162          05 VALUE 'VSTOP'                     ' PIC X(33).
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2163 GC1213      05 VALUE 'FSTORED-CHAR-LENGTH      ' PIC X(33).
2164              05 VALUE 'VSTRING                  ' PIC X(33).
2165              05 VALUE ' STRONG                    ' PIC X(33).      UNIMPLEMENTED
2166              05 VALUE ' SUB-QUEUE-1              ' PIC X(33).      OBSOLETE
2167              05 VALUE ' SUB-QUEUE-2              ' PIC X(33).      OBSOLETE
2168              05 VALUE ' SUB-QUEUE-3              ' PIC X(33).      OBSOLETE
2169 GC1213      05 VALUE 'FSUBSTITUTE                ' PIC X(33).
2170 GC1213      05 VALUE 'FSUBSTITUTE-CASE            ' PIC X(33).
2171              05 VALUE 'VSUBTRACT                  ' PIC X(33).
2172 GC1213      05 VALUE 'FSUM                        ' PIC X(33).
2173              05 VALUE ' SUPER                      ' PIC X(33).      UNIMPLEMENTED
2174              05 VALUE 'VSUPPRESS                  ' PIC X(33).
2175              05 VALUE 'MSW0                        ' PIC X(33).
2176              05 VALUE 'MSW1                        ' PIC X(33).
2177              05 VALUE 'MSW10                       ' PIC X(33).
2178              05 VALUE 'MSW11                       ' PIC X(33).
2179              05 VALUE 'MSW12                       ' PIC X(33).
2180              05 VALUE 'MSW13                       ' PIC X(33).
2181              05 VALUE 'MSW14                       ' PIC X(33).
2182              05 VALUE 'MSW15                       ' PIC X(33).
2183              05 VALUE 'MSW2                        ' PIC X(33).
2184              05 VALUE 'MSW3                        ' PIC X(33).
2185              05 VALUE 'MSW4                        ' PIC X(33).
2186              05 VALUE 'MSW5                        ' PIC X(33).
2187              05 VALUE 'MSW6                        ' PIC X(33).
2188              05 VALUE 'MSW7                        ' PIC X(33).
2189              05 VALUE 'MSW8                        ' PIC X(33).
2190              05 VALUE 'MSW9                        ' PIC X(33).
2191              05 VALUE 'MSWITCH-0                   ' PIC X(33).
2192              05 VALUE 'MSWITCH-1                   ' PIC X(33).
2193              05 VALUE 'MSWITCH-10                  ' PIC X(33).
2194              05 VALUE 'MSWITCH-11                  ' PIC X(33).
2195              05 VALUE 'MSWITCH-12                  ' PIC X(33).
2196              05 VALUE 'MSWITCH-13                  ' PIC X(33).
2197              05 VALUE 'MSWITCH-14                  ' PIC X(33).
2198              05 VALUE 'MSWITCH-15                  ' PIC X(33).
2199              05 VALUE 'MSWITCH-2                   ' PIC X(33).
2200              05 VALUE 'MSWITCH-3                   ' PIC X(33).
2201              05 VALUE 'MSWITCH-4                   ' PIC X(33).
2202              05 VALUE 'MSWITCH-5                   ' PIC X(33).
2203              05 VALUE 'MSWITCH-6                   ' PIC X(33).
2204              05 VALUE 'MSWITCH-7                   ' PIC X(33).
2205              05 VALUE 'MSWITCH-8                   ' PIC X(33).
2206              05 VALUE 'MSWITCH-9                   ' PIC X(33).
2207              05 VALUE ' SYMBOL                      ' PIC X(33).      UNIMPLEMENTED
2208              05 VALUE ' SYMBOLIC                    ' PIC X(33).
2209              05 VALUE ' SYNC                        ' PIC X(33).
2210              05 VALUE ' SYNCHRONISED                ' PIC X(33).
2211              05 VALUE ' SYNCHRONIZED                ' PIC X(33).
2212              05 VALUE 'MSYSERR                      ' PIC X(33).
2213              05 VALUE 'MSYSIN                      ' PIC X(33).
2214              05 VALUE 'MSYSIPT                      ' PIC X(33).
2215              05 VALUE 'MSYSLIST                    ' PIC X(33).
=====

```

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```

=====
2216          05 VALUE 'MSYSLST          ' PIC X(33).
2217          05 VALUE 'MSYSOUT          ' PIC X(33).
2218          05 VALUE ' SYSTEM-DEFAULT  ' PIC X(33).
2219          05 VALUE ' TABLE          ' PIC X(33).      UNIMPLEMENTED
2220          05 VALUE 'KTALLYING         ' PIC X(33).
2221 GC1213     05 VALUE 'FTAN            ' PIC X(33).
2222          05 VALUE ' TAPE            ' PIC X(33).
2223          05 VALUE ' TERMINAL        ' PIC X(33).      OBSOLETE
2224          05 VALUE 'VTERMINATE       ' PIC X(33).
2225          05 VALUE ' TEST            ' PIC X(33).
2226 GC1213     05 VALUE 'FTEST-DATE-YYYYMMDD ' PIC X(33).
2227 GC1213     05 VALUE 'FTEST-DAY-YYYYDDD   ' PIC X(33).
2228 GC1213     05 VALUE 'FTEST-FORMATTED-DATETIME ' PIC X(33).      UNIMPLEMENTED
2229 GC1213     05 VALUE 'FTEST-NUMVAL       ' PIC X(33).
2230 GC1213     05 VALUE 'FTEST-NUMVAL-C     ' PIC X(33).
2231 GC1213     05 VALUE 'FTEST-NUMVAL-F     ' PIC X(33).
2232          05 VALUE ' TEXT            ' PIC X(33).      OBSOLETE
2233          05 VALUE ' THAN            ' PIC X(33).
2234          05 VALUE ' THEN            ' PIC X(33).
2235          05 VALUE ' THROUGH         ' PIC X(33).
2236          05 VALUE ' THRU            ' PIC X(33).
2237          05 VALUE ' TIME            ' PIC X(33).
2238 GC0711     05 VALUE ' TIME-OUT        ' PIC X(33).
2239 GC0711     05 VALUE ' TIMEOUT        ' PIC X(33).
2240          05 VALUE ' TIMES           ' PIC X(33).
2241          05 VALUE 'KTO              ' PIC X(33).
2242          05 VALUE ' TOP              ' PIC X(33).
2243          05 VALUE ' TOWARD-GREATER    ' PIC X(33).
2244          05 VALUE ' TOWARD-LESSER    ' PIC X(33).
2245          05 VALUE ' TRAILING         ' PIC X(33).
2246          05 VALUE ' TRAILING-SIGN    ' PIC X(33).      UNIMPLEMENTED
2247          05 VALUE 'VTRANSFORM        ' PIC X(33).
2248 GC1213     05 VALUE 'FTRIM           ' PIC X(33).
2249          05 VALUE ' TRUE             ' PIC X(33).
2250          05 VALUE ' TRUNCATION        ' PIC X(33).
2251          05 VALUE ' TYPE             ' PIC X(33).
2252          05 VALUE ' TYPEDEF          ' PIC X(33).      UNIMPLEMENTED
2253          05 VALUE ' UCS-4            ' PIC X(33).      UNIMPLEMENTED
2254          05 VALUE ' UNDERLINE        ' PIC X(33).
2255          05 VALUE ' UNIT             ' PIC X(33).
2256          05 VALUE ' UNIVERSAL        ' PIC X(33).      UNIMPLEMENTED
2257          05 VALUE 'VUNLOCK           ' PIC X(33).
2258          05 VALUE ' UNSIGNED         ' PIC X(33).
2259          05 VALUE ' UNSIGNED-INT     ' PIC X(33).
2260          05 VALUE ' UNSIGNED-LONG    ' PIC X(33).
2261          05 VALUE ' UNSIGNED-SHORT   ' PIC X(33).
2262          05 VALUE 'VUNSTRING         ' PIC X(33).
2263          05 VALUE ' UNTIL            ' PIC X(33).
2264          05 VALUE 'KUP               ' PIC X(33).
2265          05 VALUE ' UPDATE           ' PIC X(33).
2266          05 VALUE ' UPON            ' PIC X(33).
2267          05 VALUE ' UPPER           ' PIC X(33).
2268 GC1213     05 VALUE 'FUPPER-CASE     ' PIC X(33).
=====

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=====
2269          05 VALUE 'USAGE'                ' PIC X(33).
2270          05 VALUE 'VUSE'                  ' PIC X(33).
2271 GC0711    05 VALUE 'USER'                  ' PIC X(33).
2272          05 VALUE 'USER-DEFAULT'            ' PIC X(33).
2273          05 VALUE 'KUSING'                  ' PIC X(33).
2274          05 VALUE 'UTF-16'                  ' PIC X(33).      UNIMPLEMENTED
2275          05 VALUE 'UTF-8'                   ' PIC X(33).      UNIMPLEMENTED
2276          05 VALUE 'VAL-STATUS'              ' PIC X(33).      UNIMPLEMENTED
2277          05 VALUE 'VALID'                   ' PIC X(33).      UNIMPLEMENTED
2278          05 VALUE 'VALIDATE'                ' PIC X(33).      UNIMPLEMENTED
2279          05 VALUE 'VALIDATE-STATUS'          ' PIC X(33).      UNIMPLEMENTED
2280 GC0712    05 VALUE 'AVALUE'                 ' PIC X(33).
2281          05 VALUE 'VALUES'                  ' PIC X(33).
2282 GC1213    05 VALUE 'FVARIANCE'              ' PIC X(33).
2283          05 VALUE 'KVARYING'                ' PIC X(33).
2284          05 VALUE 'VDISABLE'                ' PIC X(33).      UNIMPLEMENTED
2285          05 VALUE 'WAIT'                    ' PIC X(33).
2286          05 VALUE 'VWHEN'                   ' PIC X(33).
2287 GC1213    05 VALUE 'FWHEN-COMPILED'          ' PIC X(33).
2288          05 VALUE 'WITH'                    ' PIC X(33).
2289          05 VALUE 'WORDS'                   ' PIC X(33).
2290          05 VALUE 'KWORKING-STORAGE'          ' PIC X(33).
2291          05 VALUE 'VWRITE'                   ' PIC X(33).
2292 GC1213    05 VALUE 'FYEAR-TO-YYYY'           ' PIC X(33).
2293          05 VALUE 'YYYYDDD'                 ' PIC X(33).
2294          05 VALUE 'YYYYMMDD'                ' PIC X(33).
2295          05 VALUE 'ZERO'                    ' PIC X(33).
2296          05 VALUE 'ZERO-FILL'               ' PIC X(33).      UNIMPLEMENTED
2297          05 VALUE 'ZEROES'                  ' PIC X(33).
2298          05 VALUE 'ZEROS'                   ' PIC X(33).
2299          01 WS-Reserved-Word-Table-TXT REDEFINES WS-Reserved-Words-TXT.
2300 GC1113    05 WS-Reserved-Word-TXT OCCURS 754 TIMES
2301                                     ASCENDING KEY
2302                                     WS-RW-Word-TXT
2303                                     INDEXED WS-RW-IDX.
2304          10 WS-RW-Type-CD                   PIC X(1).
2305          10 WS-RW-Word-TXT                   PIC X(32).
2306
2307          01 WS-Runtime-Switches.
2308 GC0710    05 WS-RS-Duplicate-CHR             PIC X(1).
2309          05 WS-RS-In-Which-Pgm-CHR           PIC X(1).
2310          88 WS-RS-In-Main-Module-BOOL        VALUE 'M'.
2311          88 WS-RS-In-Copybook-BOOL           VALUE 'C'.
2312          05 WS-RS-Last-Token-Ended-Sent-CHR  PIC X(1).
2313          05 WS-RS-Processing-PICTURE-CHR     PIC X(1).
2314          05 WS-RS-Token-Ended-Sentence-CHR   PIC X(1).
2315 GC0710    05 WS-RS-Verb-Has-Been-Found-CHR  PIC X(1).
2316
2317          01 WS-Saved-Section-TXT              PIC X(15).
2318
2319 GC1213 01 WS-Src-Dashes-TXT.
2320 GC0712    05 VALUE '====='                   PIC X(7).
2321 GC0712    05 VALUE ALL '='                   PIC X(128).
=====

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=====
2322
2323      01 WS-Src-Detail-Line-TXT.
2324      05 WS-SDL-Line-NUM          PIC ZZZZZ9.
2325      05 FILLER                  PIC X(1).
2326      05 WS-SDL-Statement-TXT    PIC X(256).
2327
2328 GC1213 01 WS-Src-Hold-TXT        PIC X(256).
2329
2330      01 WS-Src-Line-NUM          PIC 9(6).
2331
2332 GC1213 01 WS-Src-Lines-NUM       USAGE BINARY-LONG.
2333
2334      01 WS-Src-SUB              USAGE BINARY-LONG.
2335
2336      01 WS-Tally-QTY            USAGE BINARY-LONG.
2337
2338      01 WS-Temp-10-Chars-TXT     PIC X(10).
2339
2340      01 WS-Temp-32-Chars-1-TXT   PIC X(32).
2341
2342 GC0711 01 WS-Temp-32-Chars-2-TXT PIC X(32).
2343
2344 GC0711 01 WS-Temp-32-Chars-3-TXT PIC X(32).
2345
2346 GC0712 01 WS-Temp-65-Chars-TXT   PIC X(65).
2347
2348      01 WS-Temp-256-Chars-TXT    PIC X(256).
2349
2350      01 WS-Today-DT             PIC 9(8).
2351
2352      01 WS-Token-Curr-TXT        PIC X(32).
2353
2354      01 WS-Token-Curr-Uc-TXT     PIC X(32).
2355
2356      01 WS-Token-Prev-TXT        PIC X(32).
2357
2358      01 WS-Token-Search-TXT      PIC X(32).
2359
2360      01 WS-Token-Type-CD         PIC X(1).
2361 GC0712      88 WS-TT-Token-Is-Argtype-BOOL  VALUE 'A'.
2362      88 WS-TT-Token-Is-EOF-BOOL    VALUE HIGH-VALUES.
2363 GC1213      88 WS-TT-Token-Is-Function-BOOL  VALUE 'F'.
2364      88 WS-TT-Token-Is-Identifier-BOOL  VALUE 'I'.
2365 GC0712      88 WS-TT-Token-Is-Keyword-BOOL  VALUE 'K', 'V', 'A'.
2366      88 WS-TT-Token-Is-Lit-Alpha-BOOL  VALUE 'L'.
2367      88 WS-TT-Token-Is-Lit-Number-BOOL  VALUE 'N'.
2368      88 WS-TT-Token-Is-Verb-BOOL    VALUE 'V'.
2369 GC1213      88 WS-TT-Token-Is-Reserved-Wd-BOOL  VALUE ' ', 'F'.
2370
2371      01 WS-Usernames-QTY         USAGE BINARY-LONG.
2372
2373      01 WS-Version-TXT           PIC X(23).
2374
=====

```

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=====
2375      01  WS-Xref-Detail-Line-TXT.
2376          05  WS-XDL-Prog-ID-TXT          PIC X(15).
2377          05  FILLER                      PIC X(1).
2378          05  WS-XDL-Token-TXT             PIC X(32).
2379          05  FILLER                      PIC X(1).
2380          05  WS-XDL-Def-Line-NUM          PIC ZZZZZ9.
2381          05  FILLER                      PIC X(1).
2382          05  WS-XDL-Section-TXT           PIC X(15).
2383          05  FILLER                      PIC X(1).
2384          05  WS-XDL-Reference-TXT         OCCURS 8 TIMES.
2385              10  WS-XDL-Ref-Line-NUM     PIC ZZZZZ9.
2386              10  WS-XDL-Ref-Flag-CHR     PIC X(1).
2387              10  FILLER                  PIC X(1).
2388
2389 GC1213 01  WS-Xref-Lines-Per-Rec-NUM     PIC 9(1).
2390
2391          LINKAGE SECTION.
2392 GC0712 01  L-Listing-Fn-TXT              PIC X(256).
2393
2394          01  L-Src-Fn-TXT                 PIC X(256).
2395
2396 GC0712 01  L-OS-Type-CD                  PIC 9(1).
2397
2398 GC1213 01  L-LPP-NUM                     USAGE BINARY-LONG.
2399
2400 GC1213 01  L-LPP-Port-NUM                USAGE BINARY-LONG.
2401
2402 GC1213 01  L-Listing-CD                  PIC 9(1).
=====

```

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=====

```

2404 GC0712 PROCEDURE DIVISION USING L-Listing-Fn-TXT
2405 GC0712                      L-Src-Fn-TXT
2406 GC0712                      L-OS-Type-CD
2407 GC1213                      L-LPP-NUM
2408 GC1213                      L-LPP-Port-NUM
2409 GC1213                      L-Listing-CD.
2410      000-Main SECTION.
2411      PERFORM 100-Initialization
2412 GC0712      OPEN OUTPUT F-Listing-FILE
2413 GC0712      PERFORM 500-Produce-Source-Listing
2414 GC0712      SORT F-Sort-Work-FILE
2415 GC0712          ASCENDING KEY      F-SW-Prog-ID-TXT
2416 GC0712          F-SW-Token-Uc-TXT
2417 GC0712          F-SW-Ref-Line-NUM
2418 GC0712          INPUT PROCEDURE 300-Tokenize-Source
2419 GC0712          OUTPUT PROCEDURE 400-Produce-Xref-Listing
2420 GC0712      CLOSE F-Listing-FILE
2421      GOBACK
2422      .

```

=====
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```

=====
2424      *>*****
2425      *> Perform all program-wide initialization operations      **
2426      *>*****
2427      100-Initialization SECTION.
2428 GC1213      MOVE 0 TO WS-Page-NUM
2429 GC1213      MOVE 'N' TO WS-Suppress-FF-CHR
2430 GC1213      MOVE SPACES TO WS-Copyright-TXT
2431 GC1213      STRING 'GCic for '                DELIMITED SIZE
2432 GC1213              WS-OS-Type-TXT(L-OS-Type-CD) DELIMITED SPACE
2433 GC1213              ' Copyright (C) 2009-2018, Gary L. Cutler, GPL'
2434 GC1213              DELIMITED SIZE
2435 GC1213      INTO WS-Copyright-TXT
2436 GC1213      MOVE 'GNUCOBOL 3.0 24DEC2017' TO WS-Version-TXT
2437      MOVE TRIM(L-Src-Fn-TXT,Leading) TO L-Src-Fn-TXT
2438 GC1010      PERFORM VARYING WS-I-SUB FROM LENGTH(L-Src-Fn-TXT) BY -1 *> Locate last direct
      ory delimiter character so that the filename can be extracted
2439 GC1010              UNTIL L-Src-Fn-TXT(WS-I-SUB:1) = '/' OR '\'
2440 GC1010              OR WS-I-SUB = 0
2441 GC1010      END-PERFORM
2442 GC1010      IF WS-I-SUB = 0
2443 GC1010      MOVE UPPER-CASE(L-Src-Fn-TXT) TO WS-Main-Module-Name-TXT *> No directory d
      elimiter, whole thing is filename
2444 GC1010      ELSE
2445 GC1010      ADD 1 TO WS-I-SUB
2446 GC1010      MOVE UPPER-CASE(L-Src-Fn-TXT(WS-I-SUB:))
2447 GC1010      TO WS-Main-Module-Name-TXT *> Extract filename
2448 GC1010      END-IF
2449 GC1213      IF L-Listing-CD = 1 *> LANDSCAPE
2450 GC1213      MOVE 8 TO WS-Xref-Lines-Per-Rec-NUM
2451 GC1213      ACCEPT WS-Lines-Per-Page-Env-TXT
2452 GC1213      FROM ENVIRONMENT 'GCXREF_LINES'
2453 GC1213      ELSE *> PORTRAIT
2454 GC1213      MOVE 3 TO WS-Xref-Lines-Per-Rec-NUM
2455 GC1213      ACCEPT WS-Lines-Per-Page-Env-TXT
2456 GC1213      FROM ENVIRONMENT 'GCXREF_LINES_PORT'
2457 GC1213      END-IF
2458      INSPECT L-Src-Fn-TXT REPLACING ALL '\' BY '/'
2459      MOVE L-Src-Fn-TXT TO WS-Program-Path-TXT
2460      CALL 'C$JUSTIFY' USING WS-Program-Path-TXT, 'Right'
2461      MOVE LENGTH(TRIM(L-Src-Fn-TXT,Trailing)) TO WS-I-SUB
2462      MOVE 0 TO WS-J-SUB
2463      PERFORM UNTIL L-Src-Fn-TXT(WS-I-SUB:1) = '/'
2464      OR WS-I-SUB = 0
2465      SUBTRACT 1 FROM WS-I-SUB
2466      ADD 1 TO WS-J-SUB
2467      END-PERFORM
2468      UNSTRING L-Src-Fn-TXT((WS-I-SUB + 1):WS-J-SUB)
2469      DELIMITED BY '.'
2470      INTO WS-Filename-TXT
2471      WS-Dummy-TXT
2472 GC1010      STRING
2473 GC1010      TRIM(WS-Filename-TXT,Trailing)
=====

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```

=====
2474 GC1010          '.i'
2475 GC1010          DELIMITED SIZE
2476 GC1010          INTO WS-Expanded-Src-Fn-TXT
2477 GC1010          CALL 'CBL_CHECK_FILE_EXIST' USING WS-Expanded-Src-Fn-TXT
2478 GC1010                               WS-Temp-256-Chars-TXT
2479 GC1010          IF RETURN-CODE NOT = 0
2480 GC1010              GOBACK
2481 GC1010          END-IF
2482          IF WS-Lines-Per-Page-Env-TXT NOT = SPACES
2483              MOVE NUMVAL(WS-Lines-Per-Page-Env-TXT)
2484                  TO WS-Lines-Per-Page-NUM
2485          ELSE
2486 GC1213              IF L-LISTING-CD = 1 *> LANDSCAPE
2487 GC1213                  MOVE L-LPP-NUM TO WS-Lines-Per-Page-NUM
2488 GC1213              ELSE                  *> PORTRAIT
2489 GC1213                  MOVE L-LPP-Port-NUM TO WS-Lines-Per-Page-NUM
2490 GC1213              END-IF
2491          END-IF
2492 GC1213          SUBTRACT 3 FROM WS-Lines-Per-Page-NUM *> FOR PAGE FOOTER
2493          ACCEPT WS-Today-DT FROM DATE YYYYMMDD
2494 GC1213          MOVE WS-Today-DT TO WS-Formatted-DT
2495          MOVE '?????????????...' TO WS-Curr-Prog-ID-TXT
2496          MOVE SPACES              TO WS-Curr-Verb-TXT
2497                               WS-Held-Reference-TXT
2498          .
=====

```

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```

=====
2500      300-Tokenize-Source SECTION.
2501      OPEN INPUT F-Expanded-Src-FILE
2502      MOVE SPACES TO F-Expanded-Src-REC
2503      MOVE 256 TO WS-Src-SUB
2504      MOVE 0 TO WS-Usernames-QTY
2505      WS-Curr-Line-NUM
2506      MOVE '?' TO WS-Curr-Division-TXT
2507 GC0710 MOVE 'N' TO WS-RS-Verb-Has-Been-Found-CHR
2508      PERFORM FOREVER
2509          PERFORM 310-Get-Token
2510          IF WS-TT-Token-Is-EOF-BOOL
2511              EXIT PERFORM
2512          END-IF
2513          MOVE UPPER-CASE(WS-Token-Curr-TXT)
2514              TO WS-Token-Curr-Uc-TXT
2515 GC1010 IF WS-TT-Token-Is-Keyword-BOOL
2516 GC1010 OR WS-TT-Token-Is-Reserved-Wd-BOOL
2517 GC1010 MOVE WS-Token-Curr-Uc-TXT TO WS-Token-Curr-TXT
2518 GC1010 END-IF
2519 IF WS-TT-Token-Is-Verb-BOOL
2520     MOVE WS-Token-Curr-Uc-TXT TO WS-Curr-Verb-TXT
2521     WS-Token-Prev-TXT
2522     IF WS-Held-Reference-TXT NOT = SPACES
2523         MOVE WS-Held-Reference-TXT TO F-Sort-Work-REC
2524         MOVE SPACES TO WS-Held-Reference-TXT
2525         RELEASE F-Sort-Work-REC
2526     END-IF
2527 END-IF
2528 EVALUATE TRUE
2529 WHEN WS-CD-In-IDENT-DIV-BOOL
2530     PERFORM 320-IDENTIFICATION-DIVISION
2531 WHEN WS-CD-In-ENV-DIV-BOOL
2532     PERFORM 330-ENVIRONMENT-DIVISION
2533 WHEN WS-CD-In-DATA-DIV-BOOL
2534     PERFORM 340-DATA-DIVISION
2535 WHEN WS-CD-In-PROC-DIV-BOOL
2536     PERFORM 350-PROCEDURE-DIVISION
2537 END-EVALUATE
2538 IF WS-TT-Token-Is-Keyword-BOOL
2539     MOVE WS-Token-Curr-Uc-TXT TO WS-Token-Prev-TXT
2540 END-IF
2541 IF WS-RS-Token-Ended-Sentence-CHR = 'Y'
2542 AND WS-Curr-Division-TXT NOT = 'I'
2543     MOVE SPACES TO WS-Token-Prev-TXT
2544     WS-Curr-Verb-TXT
2545 END-IF
2546
2547 END-PERFORM
2548 CLOSE F-Expanded-Src-FILE
2549 .
=====

```

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```

=====
2551      310-Get-Token SECTION.
2552      *>-- Position to 1st non-blank character
2553          MOVE WS-RS-Token-Ended-Sentence-CHR
2554              TO WS-RS-Last-Token-Ended-Sent-CHR
2555          MOVE 'N' TO WS-RS-Token-Ended-Sentence-CHR
2556          PERFORM UNTIL F-Expanded-Src-REC(WS-Src-SUB : 1) NOT = SPACE
2557              IF WS-Src-SUB > 255
2558                  READ F-Expanded-Src-FILE AT END
2559                      IF WS-Held-Reference-TXT NOT = SPACES
2560                          MOVE WS-Held-Reference-TXT TO F-Sort-Work-REC
2561                          MOVE SPACES TO WS-Held-Reference-TXT
2562                          RELEASE F-Sort-Work-REC
2563                      END-IF
2564                      SET WS-TT-Token-Is-EOF-BOOL TO TRUE
2565                      MOVE 0 TO WS-Curr-Line-NUM
2566                      EXIT SECTION
2567              END-READ
2568 GC0712          IF F-ES-1-7-TXT NOT = '#DEFLIT'
2569 GC0712              IF F-ES-1-CHR = '#'
2570 GC0712                  PERFORM 311-Control-Record
2571 GC0712              ELSE
2572 GC0712                  PERFORM 312-Expanded-Src-Record
2573 GC0712              END-IF
2574 GC0712          END-IF
2575          ELSE
2576              ADD 1 TO WS-Src-SUB
2577          END-IF
2578      END-PERFORM
2579      *>-- Extract token string
2580          MOVE F-Expanded-Src-REC(WS-Src-SUB : 1)
2581              TO WS-Curr-CHR
2582          MOVE F-Expanded-Src-REC(WS-Src-SUB + 1: 1)
2583              TO WS-Next-CHR
2584          IF WS-Curr-CHR = '.'
2585              ADD 1 TO WS-Src-SUB
2586              MOVE WS-Curr-CHR TO WS-Token-Curr-TXT
2587              MOVE SPACE TO WS-Token-Type-CD
2588              MOVE 'Y' TO WS-RS-Token-Ended-Sentence-CHR
2589              EXIT SECTION
2590          END-IF
2591          IF WS-Curr-Char-Is-Punct-BOOL
2592              AND WS-Curr-CHR = '='
2593              AND WS-Curr-Division-TXT = 'P'
2594                  ADD 1 TO WS-Src-SUB
2595                  MOVE 'EQUALS' TO WS-Token-Curr-TXT
2596                  MOVE 'K' TO WS-Token-Type-CD
2597              EXIT SECTION
2598          END-IF
2599          IF WS-Curr-Char-Is-Punct-BOOL *> So subscripts don't get flagged w/ '*'
2600              AND WS-Curr-CHR = '('
2601              AND WS-Curr-Division-TXT = 'P'
2602              MOVE SPACES TO WS-Token-Prev-TXT

```

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```

=====
2603      END-IF
2604      IF WS-Curr-Char-Is-Punct-BOOL
2605          ADD 1 TO WS-Src-SUB
2606          MOVE WS-Curr-CHR TO WS-Token-Curr-TXT
2607          MOVE SPACE TO WS-Token-Type-CD
2608          EXIT SECTION
2609      END-IF
2610      IF WS-Curr-Char-Is-Quote-BOOL
2611          ADD 1 TO WS-Src-SUB
2612          UNSTRING F-Expanded-Src-REC
2613              DELIMITED BY WS-Curr-CHR
2614              INTO WS-Token-Curr-TXT
2615              WITH POINTER WS-Src-SUB
2616          IF F-Expanded-Src-REC(WS-Src-SUB : 1) = '.'
2617              MOVE 'Y' TO WS-RS-Token-Ended-Sentence-CHR
2618              ADD 1 TO WS-Src-SUB
2619          END-IF
2620          SET WS-TT-Token-Is-Lit-Alpha-BOOL TO TRUE
2621          EXIT SECTION
2622      END-IF
2623      IF WS-Curr-Char-Is-X-BOOL AND WS-Next-Char-Is-Quote-BOOL
2624          ADD 2 TO WS-Src-SUB
2625          UNSTRING F-Expanded-Src-REC
2626              DELIMITED BY WS-Next-CHR
2627              INTO WS-Token-Curr-TXT
2628              WITH POINTER WS-Src-SUB
2629          IF F-Expanded-Src-REC(WS-Src-SUB : 1) = '.'
2630              MOVE 'Y' TO WS-RS-Token-Ended-Sentence-CHR
2631              ADD 1 TO WS-Src-SUB
2632          END-IF
2633          SET WS-TT-Token-Is-Lit-Number-BOOL TO TRUE
2634          EXIT SECTION
2635      END-IF
2636      IF WS-Curr-Char-Is-Z-BOOL AND WS-Next-Char-Is-Quote-BOOL
2637          ADD 2 TO WS-Src-SUB
2638          UNSTRING F-Expanded-Src-REC
2639              DELIMITED BY WS-Next-CHR
2640              INTO WS-Token-Curr-TXT
2641              WITH POINTER WS-Src-SUB
2642          IF F-Expanded-Src-REC(WS-Src-SUB : 1) = '.'
2643              MOVE 'Y' TO WS-RS-Token-Ended-Sentence-CHR
2644              ADD 1 TO WS-Src-SUB
2645          END-IF
2646          SET WS-TT-Token-Is-Lit-Alpha-BOOL TO TRUE
2647          EXIT SECTION
2648      END-IF
2649      IF WS-RS-Processing-PICTURE-CHR = 'Y'
2650          UNSTRING F-Expanded-Src-REC
2651              DELIMITED BY ' ' OR ' '
2652              INTO WS-Token-Curr-TXT
2653              DELIMITER IN WS-Delim-TXT
2654              WITH POINTER WS-Src-SUB
2655          IF WS-Delim-TXT = ' '

```

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```

=====
2656             MOVE 'Y' TO WS-RS-Token-Ended-Sentence-CHR
2657             ADD 1 TO WS-Src-SUB
2658             END-IF
2659             IF UPPER-CASE(WS-Token-Curr-TXT) = 'IS'
2660                 MOVE SPACE TO WS-Token-Type-CD
2661                 EXIT SECTION
2662             ELSE
2663                 MOVE 'N' TO WS-RS-Processing-PICTURE-CHR
2664                 MOVE SPACE TO WS-Token-Type-CD
2665                 EXIT SECTION
2666             END-IF
2667         END-IF
2668         UNSTRING F-Expanded-Src-REC
2669             DELIMITED BY ' ' OR ' ' OR '=' OR '(' OR ')' OR '*'
2670                 OR '/' OR '&' OR ';' OR ',' OR '<'
2671                 OR '>' OR ':'
2672             INTO WS-Token-Curr-TXT
2673             DELIMITER IN WS-Delim-TXT
2674             WITH POINTER WS-Src-SUB
2675             IF WS-Delim-TXT = ' '
2676                 MOVE 'Y' TO WS-RS-Token-Ended-Sentence-CHR
2677             END-IF
2678             IF WS-Delim-TXT NOT = ' ' AND ' '
2679                 SUBTRACT 1 FROM WS-Src-SUB
2680             END-IF
2681         *>-- Classify Token
2682         MOVE UPPER-CASE(WS-Token-Curr-TXT) TO WS-Token-Search-TXT
2683         IF WS-Token-Search-TXT = 'EQUAL' OR 'EQUALS'
2684             MOVE 'EQUALS' TO WS-Token-Curr-TXT
2685             MOVE 'K' TO WS-Token-Type-CD
2686             EXIT SECTION
2687         END-IF
2688         SEARCH ALL WS-Reserved-Word-TXT
2689             WHEN WS-RW-Word-TXT (WS-RW-IDX) = WS-Token-Search-TXT
2690                 MOVE WS-RW-Type-CD (WS-RW-IDX) TO WS-Token-Type-CD
2691 GC0710             IF WS-TT-Token-Is-Verb-BOOL
2692 GC0710                 MOVE 'Y' TO WS-RS-Verb-Has-Been-Found-CHR
2693 GC0710             END-IF
2694             EXIT SECTION
2695         END-SEARCH
2696         *>-- Not a reserved word, must be a user name
2697         SET WS-TT-Token-Is-Identifier-BOOL TO TRUE
2698         PERFORM 313-Check-For-Numeric-Token
2699         IF WS-TT-Token-Is-Lit-Number-BOOL
2700             IF (WS-RS-Last-Token-Ended-Sent-CHR = 'Y')
2701                 AND (WS-Curr-Division-TXT = 'D')
2702                 MOVE 'LEVEL #' TO WS-Token-Curr-TXT
2703                 MOVE 'K' TO WS-Token-Type-CD
2704                 EXIT SECTION
2705             ELSE
2706                 EXIT SECTION
2707             END-IF
2708         END-IF
=====

```

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```
=====
2709      .
```

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```

=====
2711      311-Control-Record SECTION.
2712      UNSTRING F-ES-2-256-TXT-256
2713          DELIMITED BY '''
2714      INTO WS-Temp-10-Chars-TXT
2715          WS-Temp-256-Chars-TXT
2716          WS-Dummy-TXT
2717      INSPECT WS-Temp-10-Chars-TXT REPLACING ALL ''' BY SPACE
2718 GC0712 IF WS-Temp-10-Chars-TXT(1:4) = 'line'
2719 GC0712     MOVE SPACES TO WS-Temp-10-Chars-TXT(1:4)
2720 GC0712 END-IF
2721      COMPUTE WS-I-SUB = NUMVAL(WS-Temp-10-Chars-TXT) - 1
2722 GC1010 IF UPPER-CASE(TRIM(WS-Temp-256-Chars-TXT,Trailing)) =
2723 GC1010     TRIM(WS-Main-Module-Name-TXT)
2724          MOVE WS-I-SUB TO WS-Curr-Line-NUM
2725          SET WS-RS-In-Main-Module-BOOL TO TRUE
2726          IF WS-Saved-Section-TXT NOT = SPACES
2727              MOVE WS-Saved-Section-TXT TO WS-Curr-Section-TXT
2728          END-IF
2729      ELSE
2730          SET WS-RS-In-Copybook-BOOL TO TRUE
2731          IF WS-Saved-Section-TXT = SPACES
2732              MOVE WS-Curr-Section-TXT TO WS-Saved-Section-TXT
2733          END-IF
2734          MOVE LENGTH(TRIM(WS-Temp-256-Chars-TXT,Trailing))
2735              TO WS-I-SUB
2736          MOVE 0 TO WS-J-SUB
2737          PERFORM UNTIL WS-Temp-256-Chars-TXT(WS-I-SUB:1) = '/'
2738              OR WS-I-SUB = 0
2739              SUBTRACT 1 FROM WS-I-SUB
2740              ADD 1 TO WS-J-SUB
2741          END-PERFORM
2742          UNSTRING WS-Temp-256-Chars-TXT((WS-I-SUB + 1):WS-J-SUB)
2743              DELIMITED BY ','
2744          INTO WS-Filename-TXT
2745              WS-Dummy-TXT
2746          MOVE '[' TO WS-CS-1-CHR
2747          MOVE WS-Filename-TXT TO WS-CS-2-14-TXT
2748          IF WS-CS-11-14-TXT NOT = SPACES
2749              MOVE '...' TO WS-CS-11-14-TXT
2750          END-IF
2751          MOVE ']' TO WS-CS-15-CHR
2752      END-IF
2753      MOVE SPACES TO F-Expanded-Src-REC *> Force another READ
2754      MOVE 256 TO WS-Src-SUB
2755      .
=====

```

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=====

```
2757      312-Expanded-Src-Record SECTION.  
2758 GC0314      IF F-Expanded-Src-REC(1:1) = SPACE  
2759 GC0314          MOVE 2 TO WS-Src-SUB  
2760 GC0314      ELSE  
2761 GC0314          MOVE 1 TO WS-Src-SUB  
2762 GC0314      END-IF  
2763      IF WS-RS-In-Main-Module-BOOL  
2764          ADD 1 To WS-Curr-Line-NUM  
2765      END-IF  
2766      .
```

=====

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```

=====
2768      313-Check-For-Numeric-Token SECTION.
2769      MOVE WS-Token-Curr-TXT TO WS-Temp-32-Chars-1-TXT
2770      INSPECT WS-Temp-32-Chars-1-TXT
2771 GC0711      CONVERTING '0123456789' TO SPACES
2772 GC0711      IF WS-Temp-32-Chars-1-TXT = SPACES          *> Simple Unsigned Integer
2773      SET WS-TT-Token-Is-Lit-Number-BOOL TO TRUE
2774      EXIT SECTION
2775      END-IF
2776 GC0711      MOVE SPACES TO WS-Temp-32-Chars-2-TXT
2777 GC0711      WS-Temp-32-Chars-3-TXT
2778 GC0711      WS-Dummy-TXT
2779 GC0711      UNSTRING WS-Temp-32-Chars-1-TXT
2780 GC0711      DELIMITED BY 'e' OR 'E'
2781 GC0711      INTO WS-Temp-32-Chars-2-TXT
2782 GC0711      WS-Temp-32-Chars-3-TXT
2783 GC0711      WS-Dummy-TXT
2784 GC0711      IF WS-Dummy-TXT NOT = SPACES          *> More than one 'E' - Not Numeric
2785 GC0711      EXIT SECTION
2786 GC0711      END-IF
2787 GC0711      IF WS-Temp-32-Chars-2-TXT(1:1) = '+' OR '-'
2788 GC0711      MOVE SPACE TO WS-Temp-32-Chars-2-TXT(1:1)
2789 GC0711      END-IF
2790 GC0711      IF WS-Temp-32-Chars-3-TXT(1:1) = '+' OR '-'
2791 GC0711      MOVE SPACE TO WS-Temp-32-Chars-3-TXT(1:1)
2792 GC0711      END-IF
2793      MOVE 0 TO WS-Tally-QTY
2794 GC0711      INSPECT WS-Temp-32-Chars-2-TXT
2795      TALLYING WS-Tally-QTY FOR ALL '.'
2796      IF WS-Tally-QTY = 1
2797 GC0711      INSPECT WS-Temp-32-Chars-2-TXT REPLACING ALL '.' BY SPACE
2798      END-IF
2799 GC0711      INSPECT WS-Temp-32-Chars-3-TXT
2800 GC0711      TALLYING WS-Tally-QTY FOR ALL '.'
2801 GC0711      IF WS-Tally-QTY = 1
2802 GC0711      INSPECT WS-Temp-32-Chars-3-TXT REPLACING ALL '.' BY SPACE
2803 GC0711      END-IF
2804 GC0711      IF WS-Temp-32-Chars-2-TXT = SPACES AND WS-Temp-32-Chars-3-TXT = SPACES
2805      SET WS-TT-Token-Is-Lit-Number-BOOL TO TRUE
2806      EXIT SECTION
2807      END-IF
2808      .
=====

```

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```

2810      320-IDENTIFICATION-DIVISION SECTION.
2811 GC0712      IF WS-TT-Token-Is-Argtype-BOOL
2812 GC0712          SET WS-TT-Token-Is-Reserved-Wd-BOOL TO TRUE
2813 GC0712      END-IF
2814 GC0710      MOVE 'N' TO WS-RS-Verb-Has-Been-Found-CHR
2815              IF WS-TT-Token-Is-Keyword-BOOL
2816                  AND WS-Token-Curr-TXT = 'DIVISION'
2817                      MOVE WS-Token-Prev-TXT TO WS-Curr-Division-TXT
2818                      EXIT SECTION
2819              END-IF
2820 GC0712      IF WS-Token-Prev-TXT = 'PROGRAM-ID' OR 'FUNCTION-ID'
2821                  MOVE SPACES TO WS-Token-Prev-TXT
2822                  MOVE WS-Token-Curr-TXT TO WS-Curr-Prog-ID-TXT
2823 GC0712      IF WS-CPI-16-CHR NOT = SPACES
2824                  MOVE '...' TO WS-CPI-13-15-TXT
2825              END-IF
2826              EXIT SECTION
2827      END-IF
2828      .

```

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```

2830      330-ENVIRONMENT-DIVISION SECTION.
2831 GC0712      IF WS-TT-Token-Is-Argtype-BOOL
2832 GC0712          SET WS-TT-Token-Is-Reserved-Wd-BOOL TO TRUE
2833 GC0712      END-IF
2834          IF WS-TT-Token-Is-Keyword-BOOL
2835      AND WS-Token-Curr-TXT = 'DIVISION'
2836          MOVE WS-Token-Prev-TXT TO WS-Curr-Division-TXT
2837      EXIT SECTION
2838      END-IF
2839      IF WS-TT-Token-Is-Keyword-BOOL
2840      AND WS-Token-Curr-TXT = 'SECTION'
2841          MOVE WS-Token-Prev-TXT TO WS-Curr-Section-TXT
2842      EXIT SECTION
2843      END-IF
2844      IF WS-TT-Token-Is-Identifier-BOOL
2845 GC0712          IF WS-Token-Prev-TXT = 'FUNCTION'
2846 GC0712              PERFORM 360-Release-Def
2847 GC0712          ELSE
2848 GC0712              PERFORM 361-Release-Ref
2849 GC0712          END-IF
2850      END-IF
2851 GC1213      IF WS-TT-Token-Is-Function-BOOL
2852 GC1213          PERFORM 361-Release-Ref
2853 GC1213      END-IF
2854      .

```

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```

=====
2856      340-DATA-DIVISION SECTION.
2857 GC0712      IF WS-TT-Token-Is-Argtype-BOOL
2858 GC0712          SET WS-TT-Token-Is-Reserved-Wd-BOOL TO TRUE
2859 GC0712      END-IF
2860          IF WS-TT-Token-Is-Keyword-BOOL
2861      AND WS-Token-Curr-TXT = 'DIVISION'
2862          MOVE WS-Token-Prev-TXT TO WS-Curr-Division-TXT
2863          EXIT SECTION
2864      END-IF
2865          IF WS-TT-Token-Is-Keyword-BOOL
2866      AND WS-Token-Curr-TXT = 'SECTION'
2867          MOVE WS-Token-Prev-TXT TO WS-Curr-Section-TXT
2868          EXIT SECTION
2869      END-IF
2870          IF (WS-Token-Curr-TXT = 'PIC' OR 'PICTURE')
2871      AND (WS-TT-Token-Is-Keyword-BOOL)
2872          MOVE 'Y' TO WS-RS-Processing-PICTURE-CHR
2873          EXIT SECTION
2874      END-IF
2875 GC0710      IF WS-TT-Token-Is-Reserved-Wd-BOOL
2876 GC0710      AND WS-Token-Prev-TXT = 'LEVEL #'
2877 GC0710          MOVE SPACES TO WS-Token-Prev-TXT
2878 GC0710          EXIT SECTION
2879 GC0710      END-IF
2880          IF WS-TT-Token-Is-Identifier-BOOL
2881      EVALUATE WS-Token-Prev-TXT
2882          WHEN 'FD'
2883              PERFORM 360-Release-Def
2884              MOVE SPACES TO WS-Token-Prev-TXT
2885 GC1213          WHEN 'RD'
2886 GC1213              PERFORM 360-Release-Def
2887 GC1213              MOVE SPACES TO WS-Token-Prev-TXT
2888          WHEN 'SD'
2889              PERFORM 360-Release-Def
2890              MOVE SPACES TO WS-Token-Prev-TXT
2891          WHEN 'LEVEL #'
2892              PERFORM 360-Release-Def
2893              MOVE SPACES TO WS-Token-Prev-TXT
2894          WHEN 'INDEXED'
2895              PERFORM 360-Release-Def
2896              MOVE SPACES TO WS-Token-Prev-TXT
2897          WHEN 'USING'
2898              PERFORM 362-Release-Upd
2899              MOVE SPACES TO WS-Token-Prev-TXT
2900          WHEN 'INTO'
2901              PERFORM 362-Release-Upd
2902              MOVE SPACES TO WS-Token-Prev-TXT
2903          WHEN OTHER
2904 GC1213              IF WS-Token-Curr-TXT NOT = 'SUM'
2905 GC1213                  PERFORM 361-Release-Ref
2906 GC1213              END-IF
2907          END-EVALUATE
=====

```

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```
=====
2908          EXIT SECTION
2909          END-IF
2910          .
```

```
=====
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```

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```

=====
2912      350-PROCEDURE-DIVISION SECTION.
2913      IF WS-Curr-Section-TXT NOT = 'PROCEDURE'
2914          MOVE 'PROCEDURE' TO WS-Curr-Section-TXT
2915      END-IF
2916 GC0710  IF WS-Token-Curr-Uc-TXT = 'PROGRAM'
2917 GC0710  AND WS-Token-Prev-TXT = 'END'
2918 GC0710      MOVE '?' TO WS-Curr-Division-TXT
2919 GC0710      EXIT SECTION
2920 GC0710  END-IF
2921      IF WS-TT-Token-Is-Keyword-BOOL
2922      AND WS-Token-Curr-TXT = 'DIVISION'
2923          MOVE WS-Token-Prev-TXT TO WS-Curr-Division-TXT
2924      EXIT SECTION
2925      END-IF
2926 GC0313  IF WS-TT-Token-Is-Identifier-BOOL
2927 GC0313  AND WS-Token-Prev-TXT = SPACES
2928 GC0313  AND WS-Curr-Verb-TXT = SPACES
2929 GC0313*> ----- Definition of a Paragraph or Section
2930 GC0313      PERFORM 360-Release-Def
2931 GC0313      MOVE SPACES TO WS-Token-Prev-TXT
2932 GC0313      EXIT SECTION
2933 GC0313  END-IF
2934      IF NOT WS-TT-Token-Is-Identifier-BOOL
2935          EXIT SECTION
2936      END-IF
2937      EVALUATE WS-Curr-Verb-TXT
2938      WHEN 'ACCEPT'
2939          PERFORM 351-ACCEPT
2940      WHEN 'ADD'
2941          PERFORM 351-ADD
2942      WHEN 'ALLOCATE'
2943          PERFORM 351-ALLOCATE
2944      WHEN 'CALL'
2945          PERFORM 351-CALL
2946      WHEN 'COMPUTE'
2947          PERFORM 351-COMPUTE
2948      WHEN 'DIVIDE'
2949          PERFORM 351-DIVIDE
2950      WHEN 'FREE'
2951          PERFORM 351-FREE
2952 GC1213  WHEN 'GENERATE'
2953 GC1213      PERFORM 351-GENERATE
2954      WHEN 'INITIALIZE'
2955          PERFORM 351-INITIALIZE
2956 GC1213  WHEN 'INITIATE'
2957 GC1213      PERFORM 351-GENERATE
2958      WHEN 'INSPECT'
2959          PERFORM 351-INSPECT
2960      WHEN 'MOVE'
2961          PERFORM 351-MOVE
2962      WHEN 'MULTIPLY'
2963          PERFORM 351-MULTIPLY
=====

```

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```

=====
2964      WHEN 'PERFORM'
2965          PERFORM 351-PERFORM
2966      WHEN 'SET'
2967          PERFORM 351-SET
2968      WHEN 'STRING'
2969          PERFORM 351-STRING
2970      WHEN 'SUBTRACT'
2971          PERFORM 351-SUBTRACT
2972 GC1213  WHEN 'TERMINATE'
2973 GC1213  PERFORM 351-GENERATE
2974      WHEN 'TRANSFORM'
2975          PERFORM 351-TRANSFORM
2976      WHEN 'UNSTRING'
2977          PERFORM 351-UNSTRING
2978      WHEN OTHER
2979          PERFORM 361-Release-Ref
2980      END-EVALUATE
2981      .
=====

```



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```

=====
2983      351-ACCEPT SECTION.
2984          EVALUATE WS-Token-Prev-TXT
2985          WHEN 'ACCEPT'
2986              PERFORM 362-Release-Upd
2987              MOVE SPACES TO WS-Token-Prev-TXT
2988          WHEN OTHER
2989              PERFORM 361-Release-Ref
2990          END-EVALUATE
2991      .
2992
2993      351-ADD SECTION.
2994          EVALUATE WS-Token-Prev-TXT
2995          WHEN 'GIVING'
2996              PERFORM 362-Release-Upd
2997          WHEN 'TO'
2998              PERFORM 362-Release-Upd
2999          WHEN OTHER
3000              PERFORM 361-Release-Ref
3001          END-EVALUATE
3002      .
3003
3004      351-ALLOCATE SECTION.
3005          EVALUATE WS-Token-Prev-TXT
3006          WHEN 'ALLOCATE'
3007              PERFORM 362-Release-Upd
3008              MOVE SPACES TO WS-Token-Prev-TXT
3009          WHEN 'RETURNING'
3010              PERFORM 362-Release-Upd
3011          WHEN OTHER
3012              PERFORM 361-Release-Ref
3013          END-EVALUATE
3014      .
3015
3016      351-CALL SECTION.
3017          EVALUATE WS-Token-Prev-TXT
3018          WHEN 'RETURNING'
3019              PERFORM 362-Release-Upd
3020          WHEN 'GIVING'
3021              PERFORM 362-Release-Upd
3022          WHEN OTHER
3023 GC1213      PERFORM 365-Release-Arg
3024          END-EVALUATE
3025      .
3026
3027      351-COMPUTE SECTION.
3028          EVALUATE WS-Token-Prev-TXT
3029          WHEN 'COMPUTE'
3030              PERFORM 362-Release-Upd
3031          WHEN OTHER
3032              PERFORM 361-Release-Ref
3033          END-EVALUATE
3034      .
=====

```

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```

=====
3035
3036      351-DIVIDE SECTION.
3037      EVALUATE WS-Token-Prev-TXT
3038      WHEN 'INTO'
3039          PERFORM 363-Set-Upd
3040      MOVE F-Sort-Work-REC TO WS-Held-Reference-TXT
3041      WHEN 'GIVING'
3042          IF WS-Held-Reference-TXT NOT = SPACES
3043              MOVE WS-Held-Reference-TXT To F-Sort-Work-REC
3044              MOVE SPACES          To WS-Held-Reference-TXT
3045                                  F-SW-Ref-Flag-CHR
3046          RELEASE F-Sort-Work-REC
3047      END-IF
3048      PERFORM 362-Release-Upd
3049      WHEN 'REMAINDER'
3050          PERFORM 362-Release-Upd
3051      WHEN OTHER
3052          PERFORM 361-Release-Ref
3053      END-EVALUATE
3054      .
3055
3056      351-FREE SECTION.
3057      PERFORM 362-Release-Upd
3058      .
3059
3060 GC1213 351-GENERATE SECTION.
3061 GC1213      PERFORM 362-Release-Upd
3062 GC1213      .
3063
3064      351-INITIALIZE SECTION.
3065      EVALUATE WS-Token-Prev-TXT
3066      WHEN 'INITIALIZE'
3067          PERFORM 362-Release-Upd
3068      WHEN 'REPLACING'
3069          PERFORM 361-Release-Ref
3070      END-EVALUATE
3071      .
3072
3073 GC1213 351-INITIATE SECTION.
3074 GC1213      PERFORM 362-Release-Upd
3075 GC1213      .
3076
3077      351-INSPECT SECTION.
3078      EVALUATE WS-Token-Prev-TXT
3079      WHEN 'INSPECT'
3080          PERFORM 364-Set-Ref
3081          MOVE SPACES TO WS-Held-Reference-TXT
3082          MOVE SPACES TO WS-Token-Prev-TXT
3083      WHEN 'TALLYING'
3084          PERFORM 362-Release-Upd
3085          MOVE SPACES TO WS-Token-Prev-TXT
3086      WHEN 'REPLACING'
3087          IF WS-Held-Reference-TXT NOT = SPACES
=====

```

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```

=====
3088             MOVE WS-Held-Reference-TXT TO F-Sort-Work-REC
3089             MOVE SPACES          TO WS-Held-Reference-TXT
3090             MOVE '*'              TO F-SW-Ref-Flag-CHR
3091             RELEASE F-Sort-Work-REC
3092             END-IF
3093             MOVE SPACES TO WS-Token-Prev-TXT
3094             WHEN 'CONVERTING'
3095                 IF WS-Held-Reference-TXT NOT = SPACES
3096                     MOVE WS-Held-Reference-TXT TO F-Sort-Work-REC
3097                     MOVE SPACES          TO WS-Held-Reference-TXT
3098                     MOVE '*'              TO F-SW-Ref-Flag-CHR
3099                     RELEASE F-Sort-Work-REC
3100                 END-IF
3101                 MOVE SPACES TO WS-Token-Prev-TXT
3102             WHEN OTHER
3103                 PERFORM 361-Release-Ref
3104             END-EVALUATE
3105             .
3106
3107             351-MOVE SECTION.
3108                 EVALUATE WS-Token-Prev-TXT
3109                 WHEN 'TO'
3110                     PERFORM 362-Release-Upd
3111                 WHEN OTHER
3112                     PERFORM 361-Release-Ref
3113                 END-EVALUATE
3114             .
3115
3116             351-MULTIPLY SECTION.
3117                 EVALUATE WS-Token-Prev-TXT
3118                 WHEN 'BY'
3119                     PERFORM 363-Set-Upd
3120                     MOVE F-Sort-Work-REC TO WS-Held-Reference-TXT
3121                 WHEN 'GIVING'
3122                     MOVE WS-Held-Reference-TXT TO F-Sort-Work-REC
3123                     MOVE SPACES          TO WS-Held-Reference-TXT
3124                                     F-SW-Ref-Flag-CHR
3125                     RELEASE F-Sort-Work-REC
3126                     PERFORM 362-Release-Upd
3127                 WHEN OTHER
3128                     PERFORM 361-Release-Ref
3129                 END-EVALUATE
3130             .
3131
3132             351-PERFORM SECTION.
3133                 EVALUATE WS-Token-Prev-TXT
3134                 WHEN 'VARYING'
3135                     PERFORM 362-Release-Upd
3136                     MOVE SPACES TO WS-Token-Prev-TXT
3137                 WHEN 'AFTER'
3138                     PERFORM 362-Release-Upd
3139                     MOVE SPACES TO WS-Token-Prev-TXT
3140                 WHEN OTHER

```

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=====
3141          PERFORM 361-Release-Ref
3142          END-EVALUATE
3143          .
3144
3145      351-SET SECTION.
3146          EVALUATE WS-Token-Prev-TXT
3147          WHEN 'SET'
3148              PERFORM 362-Release-Upd
3149          WHEN OTHER
3150              PERFORM 361-Release-Ref
3151          END-EVALUATE
3152          .
3153
3154      351-STRING SECTION.
3155          EVALUATE WS-Token-Prev-TXT
3156          WHEN 'INTO'
3157              PERFORM 362-Release-Upd
3158          WHEN 'POINTER'
3159              PERFORM 362-Release-Upd
3160          WHEN OTHER
3161              PERFORM 361-Release-Ref
3162          END-EVALUATE
3163          .
3164
3165      351-SUBTRACT SECTION.
3166          EVALUATE WS-Token-Prev-TXT
3167          WHEN 'GIVING'
3168              PERFORM 362-Release-Upd
3169          WHEN 'FROM'
3170              PERFORM 362-Release-Upd
3171          WHEN OTHER
3172              PERFORM 361-Release-Ref
3173          END-EVALUATE
3174          .
3175
3176 GC1213 351-TERMINATE SECTION.
3177 GC1213     PERFORM 362-Release-Upd
3178 GC1213     .
3179
3180      351-TRANSFORM SECTION.
3181          EVALUATE WS-Token-Prev-TXT
3182          WHEN 'TRANSFORM'
3183              PERFORM 362-Release-Upd
3184              MOVE SPACES TO WS-Token-Prev-TXT
3185          WHEN OTHER
3186              PERFORM 361-Release-Ref
3187          END-EVALUATE
3188          .
3189
3190      351-UNSTRING SECTION.
3191          EVALUATE WS-Token-Prev-TXT
3192          WHEN 'INTO'
3193              PERFORM 362-Release-Upd
=====

```

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```

=====
3194      WHEN 'DELIMITER'
3195          PERFORM 362-Release-Upd
3196      WHEN 'COUNT'
3197          PERFORM 362-Release-Upd
3198      WHEN 'POINTER'
3199          PERFORM 362-Release-Upd
3200      WHEN 'TALLYING'
3201          PERFORM 362-Release-Upd
3202      WHEN OTHER
3203          PERFORM 361-Release-Ref
3204      END-EVALUATE
3205      .
3206
3207      360-Release-Def SECTION.
3208          MOVE SPACES                TO F-Sort-Work-REC
3209          MOVE WS-Curr-Prog-ID-TXT    TO F-SW-Prog-ID-TXT
3210          MOVE WS-Token-Curr-Uc-TXT   TO F-SW-Token-Uc-TXT
3211          MOVE WS-Token-Curr-TXT      TO F-SW-Token-TXT
3212          MOVE WS-Curr-Section-TXT    TO F-SW-Section-TXT
3213          MOVE WS-Curr-Line-NUM       TO F-SW-Def-Line-NUM
3214          MOVE 0                     TO F-SW-Ref-Line-NUM
3215          RELEASE F-Sort-Work-REC
3216      .
3217
3218      361-Release-Ref SECTION.
3219          PERFORM 364-Set-Ref
3220          RELEASE F-Sort-Work-REC
3221      .
3222
3223      362-Release-Upd SECTION.
3224          PERFORM 363-Set-Upd
3225          RELEASE F-Sort-Work-REC
3226      .
3227
3228      363-Set-Upd SECTION.
3229          MOVE SPACES                TO F-Sort-Work-REC
3230          MOVE WS-Curr-Prog-ID-TXT    TO F-SW-Prog-ID-TXT
3231          MOVE WS-Token-Curr-Uc-TXT   TO F-SW-Token-Uc-TXT
3232          MOVE WS-Token-Curr-TXT      TO F-SW-Token-TXT
3233          MOVE WS-Curr-Section-TXT    TO F-SW-Section-TXT
3234          MOVE WS-Curr-Line-NUM       TO F-SW-Ref-Line-NUM
3235          MOVE '*'                   TO F-SW-Ref-Flag-CHR
3236      .
3237
3238      364-Set-Ref SECTION.
3239          MOVE SPACES                TO F-Sort-Work-REC
3240          MOVE WS-Curr-Prog-ID-TXT    TO F-SW-Prog-ID-TXT
3241          MOVE WS-Token-Curr-Uc-TXT   TO F-SW-Token-Uc-TXT
3242          MOVE WS-Token-Curr-TXT      TO F-SW-Token-TXT
3243          MOVE WS-Curr-Section-TXT    TO F-SW-Section-TXT
3244          MOVE WS-Curr-Line-NUM       TO F-SW-Ref-Line-NUM
3245      .
3246
=====

```

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```

=====
3247 GC1213 365-Release-Arg SECTION.
3248 GC1213      PERFORM 366-Set-Arg
3249 GC1213      RELEASE F-Sort-Work-REC
3250 GC1213      .
3251
3252 GC1213 366-Set-Arg SECTION.
3253 GC1213      MOVE SPACES              TO F-Sort-Work-REC
3254 GC1213      MOVE WS-Curr-Prog-ID-TXT  TO F-SW-Prog-ID-TXT
3255 GC1213      MOVE WS-Token-Curr-Uc-TXT TO F-SW-Token-Uc-TXT
3256 GC1213      MOVE WS-Token-Curr-TXT    TO F-SW-Token-TXT
3257 GC1213      MOVE WS-Curr-Section-TXT  TO F-SW-Section-TXT
3258 GC1213      MOVE WS-Curr-Line-NUM     TO F-SW-Ref-Line-NUM
3259 GC1213      MOVE 'C'                  TO F-SW-Ref-Flag-CHR
3260 GC1213      .
3261

```

```

=====
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```

=====
3263      400-Produce-Xref-Listing SECTION.
3264      MOVE SPACES          TO WS-Xref-Detail-Line-TXT
3265                               WS-Group-Indicators-TXT
3266      MOVE 0                TO WS-I-SUB
3267                               WS-Lines-Left-NUM
3268 GC0710  MOVE 'N'           TO WS-RS-Duplicate-CHR
3269      PERFORM FOREVER
3270          RETURN F-Sort-Work-FILE AT END
3271 GC1213      IF WS-Xref-Detail-Line-TXT NOT = SPACES
3272 GC1213          PERFORM 410-Generate-Report-Line
3273 GC1213      END-IF
3274 GC1213      MOVE SPACES TO WS-Xref-Detail-Line-TXT
3275 GC1213      PERFORM 410-Generate-Report-Line
3276 GC1213          UNTIL WS-Lines-Left-NUM = 0
3277 GC1213      MOVE 'Y' TO WS-Suppress-FF-CHR
3278 GC1213      PERFORM 420-Generate-Xref-Footer
3279      EXIT PERFORM
3280      END-RETURN
3281      IF F-SW-Prog-ID-TXT NOT = WS-GI-Prog-ID-TXT
3282      OR F-SW-Token-Uc-TXT NOT = WS-GI-Token-TXT
3283 GC0710      MOVE 'N' TO WS-RS-Duplicate-CHR
3284          IF WS-Xref-Detail-Line-TXT NOT = SPACES
3285              PERFORM 410-Generate-Report-Line
3286          END-IF
3287          IF F-SW-Prog-ID-TXT NOT = WS-GI-Prog-ID-TXT
3288 GC1213              MOVE SPACES TO WS-Xref-Detail-Line-TXT
3289 GC1213              PERFORM 410-Generate-Report-Line
3290 GC1213              UNTIL WS-Lines-Left-NUM = 0
3291          END-IF
3292          MOVE F-SW-Prog-ID-TXT TO WS-GI-Prog-ID-TXT
3293          MOVE F-SW-Token-Uc-TXT TO WS-GI-Token-TXT
3294      END-IF
3295 GC0710      IF F-SW-Token-Uc-TXT = WS-GI-Token-TXT
3296 GC0710      AND F-SW-Def-Line-NUM NOT = SPACES
3297 GC0710      AND WS-Xref-Detail-Line-TXT NOT = SPACES
3298 GC0710          MOVE 'Y' TO WS-RS-Duplicate-CHR
3299 GC0710          PERFORM 410-Generate-Report-Line
3300 GC0710          MOVE 0 TO WS-I-SUB
3301 GC0710          MOVE F-SW-Prog-ID-TXT TO WS-XDL-Prog-ID-TXT
3302 GC0710          MOVE ' (Duplicate Definition)' TO WS-XDL-Token-TXT
3303 GC0710          MOVE F-SW-Section-TXT TO WS-XDL-Section-TXT
3304 GC0710          MOVE F-SW-Def-Line-NUM TO WS-XDL-Def-Line-NUM
3305 GC0710          EXIT PERFORM CYCLE
3306 GC0710      END-IF
3307 GC0710      IF F-SW-Token-Uc-TXT = WS-GI-Token-TXT
3308 GC0710      AND F-SW-Def-Line-NUM = SPACES
3309 GC0710      AND WS-RS-Duplicate-CHR = 'Y'
3310 GC0710          MOVE 'N' TO WS-RS-Duplicate-CHR
3311 GC0710          PERFORM 410-Generate-Report-Line
3312 GC0710          MOVE 0 TO WS-I-SUB
3313 GC0710          MOVE F-SW-Prog-ID-TXT TO WS-XDL-Prog-ID-TXT
3314 GC0710          MOVE ' (Duplicate References)' TO WS-XDL-Token-TXT
=====

```

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=====
3315 GC0710      END-IF
3316             IF WS-Xref-Detail-Line-TXT = SPACES
3317                 MOVE F-SW-Prog-ID-TXT TO WS-XDL-Prog-ID-TXT
3318                 MOVE F-SW-Token-TXT TO WS-XDL-Token-TXT
3319                 MOVE F-SW-Section-TXT TO WS-XDL-Section-TXT
3320                 IF F-SW-Def-Line-NUM NOT = SPACES
3321                     MOVE F-SW-Def-Line-NUM TO WS-XDL-Def-Line-NUM
3322                 END-IF
3323             END-IF
3324             IF F-SW-Reference-TXT > '000000'
3325                 ADD 1 TO WS-I-SUB
3326                 IF WS-I-SUB > WS-Xref-Lines-Per-Rec-NUM
3327                     PERFORM 410-Generate-Report-Line
3328                     MOVE 1 TO WS-I-SUB
3329                 END-IF
3330                 MOVE F-SW-Ref-Line-NUM
3331                     TO WS-XDL-Ref-Line-NUM (WS-I-SUB)
3332                 MOVE F-SW-Ref-Flag-CHR
3333                     TO WS-XDL-Ref-Flag-CHR (WS-I-SUB)
3334             END-IF
3335         END-PERFORM
3336         IF WS-Xref-Detail-Line-TXT NOT = SPACES
3337             PERFORM 410-Generate-Report-Line
3338         END-IF
3339         .
=====

```



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```

=====
3341      410-Generate-Report-Line SECTION.
3342      IF WS-Lines-Left-NUM < 1
3343 GC1213      PERFORM 420-Generate-Xref-Footer
3344 GC1213      ADD 1 TO WS-Page-NUM
3345 GC1213      MOVE 'Page:' TO WS-PN-Literal-TXT
3346 GC1213      MOVE WS-Page-NUM TO WS-PN-Page-NUM
3347 GC1213      CALL 'C$JUSTIFY' USING WS-PN-Page-NUM, 'Left'
3348 GC1213      CALL 'C$JUSTIFY' USING WS-Page-No-TXT, 'Right'
3349 GC1213      IF L-Listing-CD = 1 *> LANDSCAPE
3350 GC1213          MOVE WS-Version-TXT
3351 GC1213              TO F-Listing-135-REC
3352 GC1213          MOVE 'Cross-Reference Listing'
3353 GC1213              TO F-Listing-135-REC(25:23)
3354 GC1213          MOVE WS-Formatted-DT
3355 GC1213              TO F-Listing-135-REC(126:10)
3356 GC1213          WRITE F-Listing-135-REC BEFORE 1 *> Page Header Line #1
3357 GC1213          MOVE WS-Program-Path-TXT
3358 GC1213              TO F-Listing-135-REC
3359 GC1213          WRITE F-Listing-135-REC BEFORE 1 *> Page Header Line #2
3360 GC1213          MOVE 'PROGRAM-ID Identifier/Register/Function' &
3361 GC1213              ' Defn Where Defined References'
3362 GC1213              TO F-Listing-135-REC
3363 GC1213          MOVE WS-Page-No-TXT
3364 GC1213              TO F-Listing-135-REC(126:10)
3365 GC1213          WRITE F-Listing-135-REC BEFORE 1 *> Page Header Line #3
3366 GC1213          MOVE ALL '=' TO F-Listing-135-REC
3367 GC1213          MOVE SPACE TO F-Listing-135-REC(16:1)
3368 GC1213              F-Listing-135-REC(49:1)
3369 GC1213              F-Listing-135-REC(56:1)
3370 GC1213              F-Listing-135-REC(72:1)
3371 GC1213          WRITE F-Listing-135-REC BEFORE 1 *> Page Header Line #4
3372 GC1213      ELSE *> PORTRAIT
3373 GC1213          MOVE WS-Version-TXT
3374 GC1213              TO F-Listing-96-REC
3375 GC1213          MOVE 'Cross-Reference Listing'
3376 GC1213              TO F-Listing-96-REC(25:23)
3377 GC1213          MOVE WS-Formatted-DT
3378 GC1213              TO F-Listing-96-REC(87:10)
3379 GC1213          WRITE F-Listing-96-REC BEFORE 1 *> Page Header Line #1
3380 GC1213          MOVE WS-Program-Path-TXT(40:96)
3381 GC1213              TO F-Listing-96-REC
3382 GC1213          WRITE F-Listing-96-REC BEFORE 1 *> Page Header Line #2
3383 GC1213          MOVE 'PROGRAM-ID Identifier/Register/Function' &
3384 GC1213              ' Defn Where Defined References'
3385 GC1213              TO F-Listing-96-REC
3386 GC1213          MOVE WS-Page-No-TXT
3387 GC1213              TO F-Listing-96-REC(87:10)
3388 GC1213          WRITE F-Listing-96-REC BEFORE 1 *> Page Header Line #3
3389 GC1213          MOVE ALL '=' TO F-Listing-96-REC
3390 GC1213          MOVE SPACE TO F-Listing-96-REC(16:1)
3391 GC1213              F-Listing-96-REC(49:1)
3392 GC1213              F-Listing-96-REC(56:1)
=====

```

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```

=====
3393 GC1213                      F-Listing-96-REC(72:1)
3394 GC1213          WRITE F-Listing-96-REC BEFORE 1 *> Page Header Line #4
3395 GC1213          END-IF
3396 GC1213          COMPUTE WS-Lines-Left-NUM = WS-Lines-Per-Page-NUM - 4
3397          END-IF
3398 GC1213          IF L-Listing-CD = 1 *> LANDSCAPE
3399 GC1213          WRITE F-Listing-135-REC FROM WS-Xref-Detail-Line-TXT
3400 GC1213          BEFORE 1
3401 GC1213          ELSE          *> PORTRAIT
3402 GC1213          WRITE F-Listing-96-REC FROM WS-Xref-Detail-Line-TXT
3403 GC1213          BEFORE 1
3404 GC1213          END-IF
3405          MOVE SPACES TO WS-Xref-Detail-Line-TXT
3406          MOVE 0 TO WS-I-SUB
3407          SUBTRACT 1 FROM WS-Lines-Left-NUM
3408          .
3409 GC1213 420-Generate-Xref-Footer SECTION.
3410 GC1213          IF L-Listing-CD = 1 *> LANDSCAPE
3411 GC1213          WRITE F-Listing-135-REC FROM SPACES BEFORE 1 *> Footer Line #1
3412 GC1213          MOVE ALL '='
3413 GC1213          TO F-Listing-135-REC
3414 GC1213          WRITE F-Listing-135-REC BEFORE 1 *> Footer Line #2
3415 GC1213          MOVE WS-Copyright-TXT
3416 GC1213          TO F-Listing-135-REC
3417 GC1213          MOVE WS-Page-No-TXT
3418 GC1213          TO F-Listing-135-REC(126:10)
3419 GC1213          IF WS-Suppress-FF-CHR = 'Y'
3420 GC1213          WRITE F-Listing-135-REC BEFORE 1 *> Footer Line #3
3421 GC1213          ELSE
3422 GC1213          WRITE F-Listing-135-REC BEFORE PAGE *> Footer Line #3
3423 GC1213          WRITE F-Listing-135-REC FROM SPACES BEFORE 1 *> Spaces After FF Charac
3424 GC1213          ter
3425 GC1213          END-IF
3426 GC1213          ELSE          *> PORTRAIT
3427 GC1213          WRITE F-Listing-96-REC FROM SPACES BEFORE 1 *> Footer Line #1
3428 GC1213          MOVE ALL '='
3429 GC1213          TO F-Listing-96-REC
3430 GC1213          WRITE F-Listing-96-REC BEFORE 1 *> Footer Line #2
3431 GC1213          MOVE WS-Copyright-TXT
3432 GC1213          TO F-Listing-96-REC
3433 GC1213          MOVE WS-Page-No-TXT
3434 GC1213          TO F-Listing-96-REC(87:10)
3435 GC1213          IF WS-Suppress-FF-CHR = 'Y'
3436 GC1213          WRITE F-Listing-96-REC BEFORE 1 *> Footer Line #3
3437 GC1213          ELSE
3438 GC1213          WRITE F-Listing-96-REC BEFORE PAGE *> Footer Line #3
3439 GC1213          WRITE F-Listing-96-REC FROM SPACES BEFORE 1 *> Spaces After FF Charact
3440 GC1213          er
3441 GC1213          END-IF
3442 GC1213          END-IF
3443 GC1213          .
=====

```

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=====

```

3443      500-Produce-Source-Listing SECTION.
3444      OPEN INPUT F-Original-Src-FILE
3445              F-Expanded-Src-FILE
3446      MOVE 0 TO WS-Src-Line-NUM
3447      PERFORM FOREVER
3448              READ F-Expanded-Src-FILE AT END
3449 GC1213      MOVE SPACES TO WS-Src-Detail-Line-TXT
3450 GC1213      PERFORM 530-Generate-Source-Line
3451 GC1213      UNTIL WS-Lines-Left-NUM = 0
3452      EXIT PERFORM
3453      END-READ
3454 GC0712      IF F-ES-1-7-TXT NOT = '#DEFLIT'
3455 GC0712      IF F-ES-1-CHR = '#'
3456 GC0712      PERFORM 510-Control-Record
3457 GC0712      ELSE
3458 GC0712      PERFORM 520-Expanded-Src-Record
3459 GC0712      END-IF
3460 GC0712      END-IF
3461      END-PERFORM
3462      CLOSE F-Original-Src-FILE
3463      F-Expanded-Src-FILE
3464      .

```

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=====

```

3466      510-Control-Record SECTION.
3467      UNSTRING F-ES-2-256-TXT-256
3468          DELIMITED BY ' '
3469      INTO WS-Temp-10-Chars-TXT
3470          WS-Temp-256-Chars-TXT
3471          WS-Dummy-TXT
3472 GC1010  IF UPPER-CASE(TRIM(WS-Temp-256-Chars-TXT,Trailing)) =
3473 GC1010  TRIM(WS-Main-Module-Name-TXT) *> Main Pgm
3474          SET WS-RS-In-Main-Module-BOOL TO TRUE
3475          IF WS-Src-Line-NUM > 0
3476              READ F-Expanded-Src-FILE END-READ
3477          END-IF
3478      ELSE *> COPY
3479          SET WS-RS-In-Copybook-BOOL TO TRUE
3480      END-IF
3481      .

```

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```

=====
3483      520-Expanded-Src-Record SECTION.
3484      IF WS-RS-In-Main-Module-BOOL
3485          ADD 1 To WS-Curr-Line-NUM
3486 GC0712      READ F-Original-Src-FILE AT END CONTINUE END-READ
3487          ADD 1 TO WS-Src-Line-NUM
3488          MOVE SPACES TO WS-Src-Detail-Line-TXT
3489          MOVE WS-Src-Line-NUM TO WS-SDL-Line-NUM
3490 GC1213      MOVE F-Original-Src-REC TO WS-SDL-Statement-TXT
3491 GC0712      MOVE LOWER-CASE(TRIM(F-OS-8-72-TXT,LEADING))
3492 GC0712          TO WS-Temp-65-Chars-TXT
3493 GC0712      INSPECT WS-Temp-65-Chars-TXT REPLACING ALL '.' BY SPACE
3494 GC0712      EVALUATE TRUE
3495 GC0712          WHEN F-OS-7-CHR = '/'
3496 GC1213              MOVE SPACES TO WS-Src-Detail-Line-TXT
3497 GC1213              PERFORM 530-Generate-Source-Line
3498 GC1213                  UNTIL WS-Lines-Left-NUM = 0
3499 GC0712          WHEN WS-Temp-65-Chars-TXT = "eject"
3500 GC1213              MOVE SPACES TO WS-Src-Detail-Line-TXT
3501 GC1213              PERFORM 530-Generate-Source-Line
3502 GC1213                  UNTIL WS-Lines-Left-NUM = 0
3503 GC0712          EXIT SECTION
3504 GC0712          WHEN WS-Temp-65-Chars-TXT = "skip1"
3505 GC0712              MOVE SPACES TO WS-Src-Detail-Line-TXT
3506 GC0712              PERFORM 530-Generate-Source-Line
3507 GC0712          EXIT SECTION
3508 GC0712          WHEN WS-Temp-65-Chars-TXT = "skip2"
3509 GC0712              MOVE SPACES TO WS-Src-Detail-Line-TXT
3510 GC0712              PERFORM 530-Generate-Source-Line 2 TIMES
3511 GC0712          EXIT SECTION
3512 GC0712          WHEN WS-Temp-65-Chars-TXT = "skip3"
3513 GC0712              MOVE SPACES TO WS-Src-Detail-Line-TXT
3514 GC0712              PERFORM 530-Generate-Source-Line 3 TIMES
3515 GC0712          EXIT SECTION
3516 GC0712      END-EVALUATE
3517      PERFORM 530-Generate-Source-Line
3518      ELSE
3519      IF F-Expanded-Src-REC NOT = SPACES
3520          MOVE SPACES TO WS-Src-Detail-Line-TXT
3521 GC1213      MOVE F-Expanded-Src-REC
3522          TO WS-SDL-Statement-TXT
3523 GC0712      MOVE LOWER-CASE(TRIM(F-OS-8-72-TXT,LEADING))
3524 GC0712          TO WS-Temp-65-Chars-TXT
3525 GC0712      INSPECT WS-Temp-65-Chars-TXT
3526 GC0712          REPLACING ALL '.' BY SPACE
3527 GC0712      EVALUATE TRUE
3528 GC0712          WHEN WS-Temp-65-Chars-TXT = "eject"
3529 GC0712              MOVE 0 TO WS-Lines-Left-NUM
3530 GC0712          EXIT SECTION
3531 GC0712          WHEN WS-Temp-65-Chars-TXT = "skip1"
3532 GC0712              MOVE SPACES TO WS-Src-Detail-Line-TXT
3533 GC0712              PERFORM 530-Generate-Source-Line
3534 GC0712          EXIT SECTION
=====

```

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```

=====
3535 GC0712          WHEN WS-Temp-65-Chars-TXT = "skip2"
3536 GC0712          MOVE SPACES TO WS-Src-Detail-Line-TXT
3537 GC0712          PERFORM 530-Generate-Source-Line 2 TIMES
3538 GC0712          EXIT SECTION
3539 GC0712          WHEN WS-Temp-65-Chars-TXT = "skip3"
3540 GC0712          MOVE SPACES TO WS-Src-Detail-Line-TXT
3541 GC0712          PERFORM 530-Generate-Source-Line 3 TIMES
3542 GC0712          EXIT SECTION
3543 GC0712          END-EVALUATE
3544                PERFORM 530-Generate-Source-Line
3545                END-IF
3546          END-IF
3547          .
=====

```

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```

=====
3549      530-Generate-Source-Line SECTION.
3550 GC1213      MOVE 1 TO WS-Src-Lines-NUM
3551 GC1213      IF L-Listing-CD = 1 *> LANDSCAPE
3552 GC1213          IF WS-SDL-Statement-TXT(129:128) > SPACES
3553 GC1213              ADD 1 TO WS-Src-Lines-NUM
3554 GC1213          END-IF
3555 GC1213      ELSE
3556 GC1213          IF WS-SDL-Statement-TXT(90:167) > SPACES
3557 GC1213              ADD 1 TO WS-Src-Lines-NUM
3558 GC1213              IF WS-SDL-Statement-TXT(179:78) > SPACES
3559 GC1213                  ADD 1 TO WS-Src-Lines-NUM
3560 GC1213              END-IF
3561 GC1213          END-IF
3562 GC1213      END-IF
3563 GC1213      IF WS-Lines-Left-NUM < WS-Src-Lines-NUM
3564 GC1213          IF WS-Page-Num > 0 *> Don't print footer before page 1
3565 GC1213              IF L-Listing-CD = 1 *> LANDSCAPE
3566 GC1213                  IF WS-Src-Lines-NUM = 2
3567 GC1213                      WRITE F-Listing-135-REC FROM SPACES BEFORE 1 *> Blank Line
3568 GC1213                  END-IF
3569 GC1213                  WRITE F-Listing-135-REC FROM SPACES BEFORE 1 *> Footer Line #1
3570 GC1213                  MOVE ALL '='
3571 GC1213                      TO F-Listing-135-REC
3572 GC1213                  WRITE F-Listing-135-REC BEFORE 1 *> Footer Line #2
3573 GC1213                  MOVE WS-Copyright-TXT
3574 GC1213                      TO F-Listing-135-REC
3575 GC1213                  MOVE WS-Page-No-TXT
3576 GC1213                      TO F-Listing-135-REC(126:10)
3577 GC1213                  WRITE F-Listing-135-REC BEFORE PAGE *> Footer Line #3
3578 GC1213                  WRITE F-Listing-135-REC FROM SPACES BEFORE 1 *> Spaces After FF Ch
aracter
3579 GC1213              ELSE
3580 GC1213                  EVALUATE WS-Src-Lines-NUM
3581 GC1213                      WHEN 1 *> Need no extra blank lines
3582 GC1213                          CONTINUE
3583 GC1213                      WHEN 2 *> Need 1 extra blank line
3584 GC1213                          WRITE F-Listing-96-REC FROM SPACES BEFORE 1
3585 GC1213                      WHEN 3 *> Need 2 extra blank lines
3586 GC1213                          WRITE F-Listing-96-REC FROM SPACES BEFORE 1
3587 GC1213                          WRITE F-Listing-96-REC FROM SPACES BEFORE 1
3588 GC1213                      END-EVALUATE
3589 GC1213                  WRITE F-Listing-96-REC FROM SPACES BEFORE 1 *> Footer Line #1
3590 GC1213                  MOVE ALL '='
3591 GC1213                      TO F-Listing-96-REC
3592 GC1213                  WRITE F-Listing-96-REC BEFORE 1 *> Footer Line #2
3593 GC1213                  MOVE WS-Copyright-TXT
3594 GC1213                      TO F-Listing-96-REC
3595 GC1213                  MOVE WS-Page-No-TXT
3596 GC1213                      TO F-Listing-96-REC(87:10)
3597 GC1213                  WRITE F-Listing-96-REC BEFORE PAGE *> Footer Line #3
3598 GC1213                  WRITE F-Listing-96-REC FROM SPACES BEFORE 1 *> Spaces After FF Cha
racter
=====

```

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```

=====
3599 GC1213          END-IF
3600 GC1213          END-IF
3601 GC1213          ADD 1          TO WS-Page-NUM
3602 GC1213          MOVE 'Page:'    TO WS-PN-Literal-TXT
3603 GC1213          MOVE WS-Page-NUM TO WS-PN-Page-NUM
3604 GC1213          CALL 'C$JUSTIFY' USING WS-PN-Page-NUM, 'Left'
3605 GC1213          CALL 'C$JUSTIFY' USING WS-Page-No-TXT, 'Right'
3606 GC1213          IF L-Listing-CD = 1 *> LANDSCAPE
3607 GC1213              MOVE WS-Version-TXT
3608 GC1213                  TO F-Listing-135-REC
3609 GC1213              MOVE 'Source Listing'
3610 GC1213                  TO F-Listing-135-REC(25:14)
3611 GC1213              MOVE WS-Formatted-DT
3612 GC1213                  TO F-Listing-135-REC(126:10)
3613 GC1213              WRITE F-Listing-135-REC BEFORE 1 *> Page Header Line #1
3614 GC1213              MOVE WS-Program-Path-TXT
3615 GC1213                  TO F-Listing-135-REC
3616 GC1213              WRITE F-Listing-135-REC BEFORE 1 *> Page Header Line #2
3617 GC1213              MOVE 'Line Statement'
3618 GC1213                  TO F-Listing-135-REC
3619 GC1213              MOVE WS-Page-No-TXT
3620 GC1213                  TO F-Listing-135-REC(126:10)
3621 GC1213              WRITE F-Listing-135-REC BEFORE 1 *> Page Header Line #3
3622 GC1213              MOVE WS-Src-Dashes-TXT
3623 GC1213                  TO F-Listing-135-REC
3624 GC1213              WRITE F-Listing-135-REC BEFORE 1 *> Page Header Line #4
3625 GC1213          ELSE          *> PORTRAIT
3626 GC1213              MOVE WS-Version-TXT
3627 GC1213                  TO F-Listing-96-REC
3628 GC1213              MOVE 'Source Listing'
3629 GC1213                  TO F-Listing-96-REC(25:14)
3630 GC1213              MOVE WS-Formatted-DT
3631 GC1213                  TO F-Listing-96-REC(87:10)
3632 GC1213              WRITE F-Listing-96-REC BEFORE 1 *> Page Header Line #1
3633 GC1213              MOVE WS-Program-Path-TXT(40:96)
3634 GC1213                  TO F-Listing-96-REC
3635 GC1213              WRITE F-Listing-96-REC BEFORE 1 *> Page Header Line #2
3636 GC1213              MOVE 'Line Statement'
3637 GC1213                  TO F-Listing-96-REC
3638 GC1213              MOVE WS-Page-No-TXT
3639 GC1213                  TO F-Listing-96-REC(87:10)
3640 GC1213              WRITE F-Listing-96-REC BEFORE 1 *> Page Header Line #3
3641 GC1213              MOVE WS-Src-Dashes-TXT
3642 GC1213                  TO F-Listing-96-REC
3643 GC1213              WRITE F-Listing-96-REC BEFORE 1 *> Page Header Line #4
3644 GC1213          END-IF
3645 GC1213          COMPUTE WS-Lines-Left-NUM = WS-Lines-Per-Page-NUM - 4
3646 GC1213          END-IF
3647 GC1213          IF L-Listing-CD = 1 *> LANDSCAPE
3648 GC1213              EVALUATE WS-Src-Lines-NUM
3649 GC1213                  WHEN 1
3650 GC1213                      MOVE WS-Src-Detail-Line-TXT TO F-Listing-135-REC
3651 GC1213                      WRITE F-Listing-96-REC BEFORE 1
=====

```

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```

=====
3652 GC1213          SUBTRACT 1 FROM WS-Lines-Left-NUM
3653 GC1213          WHEN 2
3654 GC1213              MOVE WS-SDL-Statement-TXT TO WS-Src-Hold-TXT
3655 GC1213              MOVE WS-Src-Detail-Line-TXT TO F-Listing-135-REC
3656 GC1213              WRITE F-Listing-135-REC BEFORE 1 *> Prints chars 1-128 of stmtnt
3657 GC1213              MOVE SPACES TO WS-Src-Detail-Line-TXT
3658 GC1213              MOVE WS-Src-Hold-TXT(129:128) TO WS-SDL-Statement-TXT
3659 GC1213              MOVE WS-Src-Detail-Line-TXT TO F-Listing-135-REC
3660 GC1213              WRITE F-Listing-135-REC BEFORE 1 *> Prints chars 129-256 of stmtnt
3661 GC1213              SUBTRACT 2 FROM WS-Lines-Left-NUM
3662 GC1213          END-EVALUATE
3663 GC1213          ELSE          *> PORTRAIT
3664 GC1213              EVALUATE WS-Src-Lines-NUM
3665 GC1213              WHEN 1 *> Print only chars 1-89 of stmtnt
3666 GC1213                  WRITE F-Listing-96-REC FROM WS-Src-Detail-Line-TXT
3667 GC1213                      BEFORE 1
3668 GC1213                  SUBTRACT 1 FROM WS-Lines-Left-NUM
3669 GC1213              WHEN 2 *> Print only chars 1-89 and 90-178 of text
3670 GC1213                  MOVE WS-SDL-Statement-TXT TO WS-Src-Hold-TXT
3671 GC1213                  WRITE F-Listing-96-REC FROM WS-Src-Detail-Line-TXT
3672 GC1213                      BEFORE 1
3673 GC1213                  MOVE SPACES TO WS-Src-Detail-Line-TXT
3674 GC1213                  MOVE WS-Src-Hold-TXT(90:89) TO WS-SDL-Statement-TXT
3675 GC1213                  WRITE F-Listing-96-REC FROM WS-Src-Detail-Line-TXT
3676 GC1213                      BEFORE 1
3677 GC1213                  SUBTRACT 2 FROM WS-Lines-Left-NUM
3678 GC1213              WHEN 3 *> Print chars 1-89, 90-178 and 179-256 of stmtnt
3679 GC1213                  MOVE WS-SDL-Statement-TXT TO WS-Src-Hold-TXT
3680 GC1213                  WRITE F-Listing-96-REC FROM WS-Src-Detail-Line-TXT
3681 GC1213                      BEFORE 1
3682 GC1213                  MOVE SPACES TO WS-Src-Detail-Line-TXT
3683 GC1213                  MOVE WS-Src-Hold-TXT(90:89) TO WS-SDL-Statement-TXT
3684 GC1213                  WRITE F-Listing-96-REC FROM WS-Src-Detail-Line-TXT
3685 GC1213                      BEFORE 1
3686 GC1213                  MOVE SPACES TO WS-Src-Detail-Line-TXT
3687 GC1213                  MOVE WS-Src-Hold-TXT(179:78) TO WS-SDL-Statement-TXT
3688 GC1213                  WRITE F-Listing-96-REC FROM WS-Src-Detail-Line-TXT
3689 GC1213                      BEFORE 1
3690 GC1213                  SUBTRACT 3 FROM WS-Lines-Left-NUM
3691 GC1213              END-EVALUATE
3692 GC1213          END-IF
3693              MOVE SPACES TO WS-Src-Detail-Line-TXT
3694              .
3695
3696          END PROGRAM LISTING.
=====

```

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PROGRAM-ID	Identifier/Register/Function	Defn	Where Defined	References	Page: 89	
=====	=====	=====	=====	=====	=====	
CHECKSRC	000-Main	1318	PROCEDURE			
CHECKSRC	L-A1-CHR	1308	LINKAGE	1320	1332	1335
				1342		
CHECKSRC	L-A2-IDENT-DIVISION-BOOL	1313	LINKAGE	1364*		
CHECKSRC	L-A2-LINKAGE-SECTION-BOOL	1312	LINKAGE	1358*		
CHECKSRC	L-A2-Nothing-Special-BOOL	1314	LINKAGE	1319*		
CHECKSRC	L-Argument-1-TXT	1307	LINKAGE	1316		
CHECKSRC	L-Argument-2-CHR	1311	LINKAGE	1317		
CHECKSRC	WS-Compressed-Src-TXT	1294	WORKING-STORAGE	1329*	1352	1356
				1362		
CHECKSRC	WS-CS-CHR	1295	WORKING-STORAGE	1336*	1342*	1351
				1355	1361	
CHECKSRC	WS-I-SUB	1303	WORKING-STORAGE	1330*	1331	1332
				1335	1342	1348*
				1349	1351	1352
				1355	1355	1356
				1361	1361	1362
CHECKSRC	WS-J-SUB	1305	WORKING-STORAGE	1328*	1334*	1336
				1341*	1342	
CHECKSRC	WS-RS-Found-SPACE-CHR	1299	WORKING-STORAGE			
CHECKSRC	WS-RS-Not-Skipping-SPACE-BOOL	1301	WORKING-STORAGE	1327*	1333	1340*
CHECKSRC	WS-RS-Skipping-SPACE-BOOL	1300	WORKING-STORAGE	1337*		
CHECKSRC	WS-Runtime-Switches-TXT	1298	WORKING-STORAGE			

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PROGRAM-ID	Identifier/Register/Function	Defn	Where Defined	References	Page: 90
=====					
GCic	000-File-Error	657	PROCEDURE		
GCic	000-Main	678	PROCEDURE		
GCic	100-Initialization	702	PROCEDURE	679	
GCic	200-Let-User-Set-Switches	816	PROCEDURE	682	
GCic	210-Run-Compiler	907	PROCEDURE	683	
GCic	220-Make-Listing	1043	PROCEDURE	687	
GCic	230-Run-Program	1074	PROCEDURE	691	
GCic	240-Find-LINKAGE-SECTION	1176	PROCEDURE	750	
GCic	250-Autoload-Listing	1215	PROCEDURE	693	1034 1068
GCic	900-Terminate	1261	PROCEDURE	695 744 887	
				1035 1169	
GCic	COB-COLOR-BLACK	181	[screenio ]	442 447 537	
				547 557 562	
				572 579 594	
				609 625 632	
				639	
GCic	COB-COLOR-BLUE	181	[screenio ]	525	
GCic	COB-COLOR-CYAN	181	[screenio ]	538	
GCic	COB-COLOR-GREEN	181	[screenio ]	448 563 610	
				626	
GCic	COB-COLOR-MAGENTA	181	[screenio ]		
GCic	COB-COLOR-RED	181	[screenio ]	531 595	
GCic	COB-COLOR-WHITE	181	[screenio ]	443 526 532	
				548 558 573	
				580 633 640	
GCic	COB-COLOR-YELLOW	181	[screenio ]		
GCic	COB-SCR-BACK-TAB	181	[screenio ]		
GCic	COB-SCR-BACKSPACE	181	[screenio ]		
GCic	COB-SCR-DELETE	181	[screenio ]		
GCic	COB-SCR-ESC	181	[screenio ]	886	
GCic	COB-SCR-F1	181	[screenio ]	833	
GCic	COB-SCR-F10	181	[screenio ]		
GCic	COB-SCR-F11	181	[screenio ]		
GCic	COB-SCR-F12	181	[screenio ]	889	
GCic	COB-SCR-F13	181	[screenio ]		
GCic	COB-SCR-F14	181	[screenio ]		
GCic	COB-SCR-F15	181	[screenio ]		
GCic	COB-SCR-F16	181	[screenio ]		
GCic	COB-SCR-F17	181	[screenio ]		
GCic	COB-SCR-F18	181	[screenio ]		
GCic	COB-SCR-F19	181	[screenio ]		
GCic	COB-SCR-F2	181	[screenio ]	839	
GCic	COB-SCR-F20	181	[screenio ]		
GCic	COB-SCR-F21	181	[screenio ]		
GCic	COB-SCR-F22	181	[screenio ]		
GCic	COB-SCR-F23	181	[screenio ]		
GCic	COB-SCR-F24	181	[screenio ]		
GCic	COB-SCR-F25	181	[screenio ]		
GCic	COB-SCR-F26	181	[screenio ]		
GCic	COB-SCR-F27	181	[screenio ]		
GCic	COB-SCR-F28	181	[screenio ]		
GCic	COB-SCR-F29	181	[screenio ]		
GCic	COB-SCR-F3	181	[screenio ]	845	

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PROGRAM-ID	Identifier/Register/Function	Defn	Where Defined	References	Page: 91
=====					
GCic	COB-SCR-F30	181	[screenio	]	
GCic	COB-SCR-F31	181	[screenio	]	
GCic	COB-SCR-F32	181	[screenio	]	
GCic	COB-SCR-F33	181	[screenio	]	
GCic	COB-SCR-F34	181	[screenio	]	
GCic	COB-SCR-F35	181	[screenio	]	
GCic	COB-SCR-F36	181	[screenio	]	
GCic	COB-SCR-F37	181	[screenio	]	
GCic	COB-SCR-F38	181	[screenio	]	
GCic	COB-SCR-F39	181	[screenio	]	
GCic	COB-SCR-F4	181	[screenio	]	851
GCic	COB-SCR-F40	181	[screenio	]	
GCic	COB-SCR-F41	181	[screenio	]	
GCic	COB-SCR-F42	181	[screenio	]	
GCic	COB-SCR-F43	181	[screenio	]	
GCic	COB-SCR-F44	181	[screenio	]	
GCic	COB-SCR-F45	181	[screenio	]	
GCic	COB-SCR-F46	181	[screenio	]	
GCic	COB-SCR-F47	181	[screenio	]	
GCic	COB-SCR-F48	181	[screenio	]	
GCic	COB-SCR-F49	181	[screenio	]	
GCic	COB-SCR-F5	181	[screenio	]	857
GCic	COB-SCR-F50	181	[screenio	]	
GCic	COB-SCR-F51	181	[screenio	]	
GCic	COB-SCR-F52	181	[screenio	]	
GCic	COB-SCR-F53	181	[screenio	]	
GCic	COB-SCR-F54	181	[screenio	]	
GCic	COB-SCR-F55	181	[screenio	]	
GCic	COB-SCR-F56	181	[screenio	]	
GCic	COB-SCR-F57	181	[screenio	]	
GCic	COB-SCR-F58	181	[screenio	]	
GCic	COB-SCR-F59	181	[screenio	]	
GCic	COB-SCR-F6	181	[screenio	]	862
GCic	COB-SCR-F60	181	[screenio	]	
GCic	COB-SCR-F61	181	[screenio	]	
GCic	COB-SCR-F62	181	[screenio	]	
GCic	COB-SCR-F63	181	[screenio	]	
GCic	COB-SCR-F64	181	[screenio	]	
GCic	COB-SCR-F7	181	[screenio	]	868
GCic	COB-SCR-F8	181	[screenio	]	874
GCic	COB-SCR-F9	181	[screenio	]	880
GCic	COB-SCR-FATAL	181	[screenio	]	
GCic	COB-SCR-INSERT	181	[screenio	]	
GCic	COB-SCR-KEY-DOWN	181	[screenio	]	
GCic	COB-SCR-KEY-END	181	[screenio	]	
GCic	COB-SCR-KEY-HOME	181	[screenio	]	
GCic	COB-SCR-KEY-LEFT	181	[screenio	]	
GCic	COB-SCR-KEY-RIGHT	181	[screenio	]	
GCic	COB-SCR-KEY-UP	181	[screenio	]	
GCic	COB-SCR-KEY_DOWN	181	[screenio	]	
GCic	COB-SCR-KEY_UP	181	[screenio	]	
GCic	COB-SCR-MAX-FIELD	181	[screenio	]	
GCic	COB-SCR-NO-FIELD	181	[screenio	]	

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=====						
GCic	COB-SCR-OK	181	[screenio ]			
GCic	COB-SCR-PAGE-DOWN	181	[screenio ]			
GCic	COB-SCR-PAGE-UP	181	[screenio ]			
GCic	Cob-Scr-Page_Down	181	[screenio ]			
GCic	Cob-Scr-Page_Up	181	[screenio ]			
GCic	COB-SCR-PRINT	181	[screenio ]			
GCic	COB-SCR-TAB	181	[screenio ]			
GCic	COB-SCR-TIME-OUT	181	[screenio ]			
GCic	F-Cobc-Output-FILE	173	FILE	164	1011	1029
GCic	F-Cobc-Output-REC	174	FILE	1012	1017*	1018
				1026*	1027	
GCic	F-Source-Code-FILE	176	FILE	167	658	1177
				1181	1182	1195
				1196	1203	
GCic	F-Source-Code-REC	177	FILE	1186C	1200C	
GCic	F1		WORKING-STORAGE	209		
GCic	F12		WORKING-STORAGE	203		
GCic	F2		WORKING-STORAGE	216		
GCic	F3		WORKING-STORAGE	212		
GCic	F4		WORKING-STORAGE	210		
GCic	F5		WORKING-STORAGE	213	260	
GCic	F6		WORKING-STORAGE	214		
GCic	F7		WORKING-STORAGE	217		
GCic	F8		WORKING-STORAGE	211		
GCic	F9		WORKING-STORAGE	215		
GCic	LD-Horiz-Line	436	SCREEN	804		
GCic	LD-LL-Corner	431	SCREEN	459	489	505
				519		
GCic	LD-Lower-T	435	SCREEN	491		
GCic	LD-LR-Corner	433	SCREEN	461	493	507
				521		
GCic	LD-UL-Corner	430	SCREEN	449	463	495
				509		
GCic	LD-Upper-T	434	SCREEN	465		
GCic	LD-UR-Corner	432	SCREEN	451	467	497
				511		
GCic	LD-Vert-Line	437	SCREEN	453	454	456
				457	469	470
				471	473	474
				475	477	478
				479	481	482
				483	485	486
				487	499	500
				502	503	513
				514	516	517
GCic	LPP		PROCEDURE	1054C		
GCic	LPPP		PROCEDURE	1055C		
GCic	RETURN-CODE		PROCEDURE	1013	1046*	1060*
				1062		
GCic	S-Blank-SCR	440	SCREEN	686	1237	1266
GCic	S-Switches-SCR	442	SCREEN	830*	911	1001
				1030	1045	1066
				1077	1263	

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GCic	SELCHAR		PROCEDURE	722 825 828 835 841 847 853 864 870 876 882 1205	
GCic	WS-Cmd-Args-TXT	232	WORKING-STORAGE	726* 728 729 732 737	
GCic	WS-Cmd-End-Quote-CHR	234	WORKING-STORAGE	730* 733	
GCic	WS-Cmd-SUB	236	WORKING-STORAGE	727* 728 729 731* 735* 740*	
GCic	WS-Cmd-TXT	230	WORKING-STORAGE	908* 1003* 1008* 1010C 1079* 1086* 1096* 1099* 1106* 1110* 1116* 1121* 1126* 1134* 1142* 1148* 1154* 1159* 1166C 1218* 1222* 1223C 1225* 1229* 1230C 1240* 1243* 1246C 1248C 1250C 1252C 1254C	
GCic	WS-Cobc-Cmd-TXT	238	WORKING-STORAGE	909* 918* 922* 926* 930* 935* 940* 945* 950* 955* 960* 964* 977* 985* 989* 1004	
GCic	WS-Compilation-Switches-TXT	183	WORKING-STORAGE		
GCic	WS-Config-Fn-TXT	240	WORKING-STORAGE	914* 920	
GCic	WS-CS-All-Switches-TXT	218	WORKING-STORAGE		
GCic	WS-CS-Arg-H1-TXT	185	WORKING-STORAGE	643*	
GCic	WS-CS-Arg-H2-TXT	186	WORKING-STORAGE	644*	
GCic	WS-CS-Args-TXT	184	WORKING-STORAGE	1157 1158	
GCic	WS-CS-Config-NUM	203	WORKING-STORAGE	635 890* 891 892* 913	
GCic	WS-CS-DEBUG-CHR	220	WORKING-STORAGE	596 834 835* 837* 933	
GCic	WS-CS-EXECUTE-CHR	221	WORKING-STORAGE	599 689 852 853* 855*	
GCic	WS-CS-Extra-H1-TXT	206	WORKING-STORAGE	641*	
GCic	WS-CS-Extra-H2-TXT	207	WORKING-STORAGE	642*	
GCic	WS-CS-Extra-TXT	205	WORKING-STORAGE	981 983	
GCic	WS-CS-Filename-TXT	196	WORKING-STORAGE	635 913	
GCic	WS-CS-Filenames-Table-TXT	195	WORKING-STORAGE		
GCic	WS-CS-Filenames-TXT	187	WORKING-STORAGE	195	
GCic	WS-CS-FREE-CHR	222	WORKING-STORAGE	604 875 876* 878* 958	
GCic	WS-CS-LIBRARY-CHR	223	WORKING-STORAGE	598 846 847* 849* 924 1084 1139 1178* 1205*	
GCic	WS-CS-LISTING-CHR	224	WORKING-STORAGE	600 685 822* 825* 828* 971 973* 975	
GCic	WS-CS-NOFUNC-CHR	225	WORKING-STORAGE	602 863 864*	

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GCic	WS-CS-NOTRUNC-CHR	226	WORKING-STORAGE	866* 948 605 881 882* 884* 938	
GCic	WS-CS-Switch-Defaults-TXT	208	WORKING-STORAGE	219	
GCic	WS-CS-TRACEALL-CHR	227	WORKING-STORAGE	597 840 841* 843* 943	
GCic	WS-CS-WARNALL-CHR	228	WORKING-STORAGE	603 869 870* 872* 953	
GCic	WS-Delete-Fn-TXT	242	WORKING-STORAGE		
GCic	WS-File-Name-TXT	244	WORKING-STORAGE	167 666 671 734* 739* 742 755 758 765 768 779 1052C	
GCic	WS-File-Status-Message-TXT	248	WORKING-STORAGE		
GCic	WS-FN-CHR	245	WORKING-STORAGE	760 767* 771*	
GCic	WS-FSM-Msg-TXT	252	WORKING-STORAGE	661* 661*	
GCic	WS-FSM-Status-CD	250	WORKING-STORAGE	169 661 663	
GCic	WS-Horizontal-Line-TXT	254	WORKING-STORAGE	450 460 464 466 490 492 496 506 510 520 804*	
GCic	WS-I-SUB	256	WORKING-STORAGE	758* 759 760 761 763 767 771 786* 787 788 789 791 795 799 912* 923* 927* 931* 936* 941* 946* 951* 956* 961* 965* 978* 986* 990* 1080* 1087* 1097* 1100* 1107* 1111* 1117* 1122* 1127* 1135* 1143* 1149* 1155* 1160*	
GCic	WS-J-SUB	258	WORKING-STORAGE	1102* 1103 1104 1109	
GCic	WS-Listing-CD	260	WORKING-STORAGE	819 858* 859 860* 1056C	
GCic	WS-Listing-Filename-TXT	262	WORKING-STORAGE	164 995* 996C 1005 1023 1051C 1221 1228	
GCic	WS-Listing-TXT	264	WORKING-STORAGE	616 821* 824* 827*	

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GCic	WS-OC-Compile-DT	266	WORKING-STORAGE	528	712*		
GCic	WS-OS-Cygwin-BOOL	300	WORKING-STORAGE	755	779	1094	
				1124	1217		
GCic	WS-OS-Dir-CHR	287	WORKING-STORAGE	756*	760	771	
				780*	1120		
GCic	WS-OS-Exe-Ext-CONST	288	WORKING-STORAGE	1140	1141		
GCic	WS-OS-Lib-Ext-CONST	289	WORKING-STORAGE	1146	1147		
GCic	WS-OS-Lib-Type-CONST	290	WORKING-STORAGE	614			
GCic	WS-OS-OSX-BOOL	302	WORKING-STORAGE	1224			
GCic	WS-OS-Type-CD	291	WORKING-STORAGE	806	1053C		
GCic	WS-OS-Type-FILLER-TXT	304	WORKING-STORAGE	310			
GCic	WS-OS-Type-TXT	311	WORKING-STORAGE	806			
GCic	WS-OS-Types-TXT	310	WORKING-STORAGE				
GCic	WS-OS-UNIX-BOOL	301	WORKING-STORAGE	1124			
GCic	WS-OS-Windows-BOOL	299	WORKING-STORAGE	1217	1238		
GCic	WS-Output-Msg-TXT	314	WORKING-STORAGE	533	662*	809*	
				896*	910*	1000*	
				1015*	1016	1024*	
				1032*	1044*	1050*	
				1059*	1064*	1076*	
				1167*	1168*	1262	
GCic	WS-Path-Delimiter-CHR	316	WORKING-STORAGE				
GCic	WS-PFN-CHR	323	WORKING-STORAGE	788	795*	799*	
GCic	WS-Pgm-Nm-TXT	326	WORKING-STORAGE	792*	797*	994	
				1133	1239	1242	
GCic	WS-Prog-Extension-TXT	318	WORKING-STORAGE	793*	798*		
GCic	WS-Prog-File-Name-TXT	322	WORKING-STORAGE	574	765*	770*	
				786	792	796	
				988			
GCic	WS-Prog-Folder-TXT	320	WORKING-STORAGE	575	764*	769*	
				773	774*	777C	
				1093	1094	1098	
				1103	1104	1109	
				1115			
GCic	WS-RS-1st-Prog-Complete-BOOL	339	WORKING-STORAGE	1180	1189*		
GCic	WS-RS-Compile-Failed-BOOL	332	WORKING-STORAGE	1021*	1033		
GCic	WS-RS-Compile-OK-BOOL	330	WORKING-STORAGE	684	1014*		
GCic	WS-RS-Compile-OK-CHR	329	WORKING-STORAGE				
GCic	WS-RS-Compile-OK-Warn-BOOL	331	WORKING-STORAGE	684			
GCic	WS-RS-Complete-BOOL	334	WORKING-STORAGE	681	1019*		
GCic	WS-RS-Complete-CHR	333	WORKING-STORAGE				
GCic	WS-RS-Double-Quote-Used-BOOL	337	WORKING-STORAGE	1092*	1118*	1152	
GCic	WS-RS-IDENT-DIV-CHR	338	WORKING-STORAGE				
GCic	WS-RS-More-To-1st-Prog-BOOL	340	WORKING-STORAGE	1179*			
GCic	WS-RS-No-Switch-Changes-BOOL	342	WORKING-STORAGE	818	899*		
GCic	WS-RS-No-Switch-Chgs-CHR	341	WORKING-STORAGE				
GCic	WS-RS-Not-Complete-BOOL	335	WORKING-STORAGE	680*			
GCic	WS-RS-Output-File-Avail-BOOL	346	WORKING-STORAGE	690	1002*		
GCic	WS-RS-Output-File-Busy-BOOL	345	WORKING-STORAGE				
GCic	WS-RS-Output-File-Busy-CHR	344	WORKING-STORAGE				
GCic	WS-RS-Quote-CHR	336	WORKING-STORAGE				
GCic	WS-RS-Source-Rec-Ident-BOOL	349	WORKING-STORAGE	1188	1194		
GCic	WS-RS-Source-Rec-Ignored-BOOL	350	WORKING-STORAGE	1192*			

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GCic	WS-RS-Source-Record-Type-CHR	347	WORKING-STORAGE	1187C	1201C	
GCic	WS-RS-Switch-Changes-BOOL	343	WORKING-STORAGE	817*		
GCic	WS-RS-Switch-Error-CHR	351	WORKING-STORAGE			
GCic	WS-RS-Switch-Is-Bad-BOOL	352	WORKING-STORAGE			
GCic	WS-RS-Switch-Is-Good-BOOL	353	WORKING-STORAGE			
GCic	WS-Runtime-Switches-TXT	328	WORKING-STORAGE			
GCic	WS-Tally-QTY	355	WORKING-STORAGE	968*	970*	972

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LISTING	100-Initialization	2427	PROCEDURE	2411	
LISTING	300-Tokenize-Source	2500	PROCEDURE	2418	
LISTING	310-Get-Token	2551	PROCEDURE	2509	
LISTING	311-Control-Record	2711	PROCEDURE	2570	
LISTING	312-Expanded-Src-Record	2757	PROCEDURE	2572	
LISTING	313-Check-For-Numeric-Token	2768	PROCEDURE	2698	
LISTING	320-IDENTIFICATION-DIVISION	2810	PROCEDURE	2530	
LISTING	330-ENVIRONMENT-DIVISION	2830	PROCEDURE	2532	
LISTING	340-DATA-DIVISION	2856	PROCEDURE	2534	
LISTING	350-PROCEDURE-DIVISION	2912	PROCEDURE	2536	
LISTING	351-ACCEPT	2983	PROCEDURE	2939	
LISTING	351-ADD	2993	PROCEDURE	2941	
LISTING	351-ALLOCATE	3004	PROCEDURE	2943	
LISTING	351-CALL	3016	PROCEDURE	2945	
LISTING	351-COMPUTE	3027	PROCEDURE	2947	
LISTING	351-DIVIDE	3036	PROCEDURE	2949	
LISTING	351-FREE	3056	PROCEDURE	2951	
LISTING	351-GENERATE	3060	PROCEDURE	2953	2957 2973
LISTING	351-INITIALIZE	3064	PROCEDURE	2955	
LISTING	351-INITIATE	3073	PROCEDURE		
LISTING	351-INSPECT	3077	PROCEDURE	2959	
LISTING	351-MOVE	3107	PROCEDURE	2961	
LISTING	351-MULTIPLY	3116	PROCEDURE	2963	
LISTING	351-PERFORM	3132	PROCEDURE	2965	
LISTING	351-SET	3145	PROCEDURE	2967	
LISTING	351-STRING	3154	PROCEDURE	2969	
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LISTING	351-TERMINATE	3176	PROCEDURE		
LISTING	351-TRANSFORM	3180	PROCEDURE	2975	
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LISTING	360-Release-Def	3207	PROCEDURE	2846 2883 2886 2889 2892 2895 2930	
LISTING	361-Release-Ref	3218	PROCEDURE	2848 2852 2905 2979 2989 3000 3012 3032 3052 3069 3103 3112 3128 3141 3150 3161 3172 3186 3203	
LISTING	362-Release-Upd	3223	PROCEDURE	2898 2901 2986 2996 2998 3007 3010 3019 3021 3030 3048 3050 3057 3061 3067 3074 3084 3110 3126 3135 3138 3148 3157 3159 3168 3170 3177 3183 3193 3195 3197 3199 3201	
LISTING	363-Set-Upd	3228	PROCEDURE	3039 3119 3224	

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LISTING	365-Release-Arg	3247	PROCEDURE	3023	
LISTING	366-Set-Arg	3252	PROCEDURE	3248	
LISTING	400-Produce-Xref-Listing	3263	PROCEDURE	2419	
LISTING	410-Generate-Report-Line	3341	PROCEDURE	3272 3275 3285 3289 3299 3311 3327 3337	
LISTING	420-Generate-Xref-Footer	3409	PROCEDURE	3278 3343	
LISTING	500-Produce-Source-Listing	3443	PROCEDURE	2413	
LISTING	510-Control-Record	3466	PROCEDURE	3456	
LISTING	520-Expanded-Src-Record	3483	PROCEDURE	3458	
LISTING	530-Generate-Source-Line	3549	PROCEDURE	3450 3497 3501 3506 3510 3514 3517 3533 3537 3541 3544	
LISTING	F-ES-1-7-TXT	1430	FILE	2568 3454	
LISTING	F-ES-1-CHR	1427	FILE	2569 3455	
LISTING	F-ES-2-256-TXT-256	1428	FILE	2712 3467	
LISTING	F-ES-8-256-TXT	1431	FILE		
LISTING	F-Expanded-Src-FILE	1425	FILE	1416 2501 2548 2558 3445 3448 3463 3476	
LISTING	F-Expanded-Src-REC	1426	FILE	2502* 2556 2580 2582 2612 2616 2625 2629 2638 2642 2650 2668 2753* 2758 3519 3521	
LISTING	F-Expanded-Src2-REC	1429	FILE		
LISTING	F-Listing-135-REC	1435	FILE	3351* 3353* 3355* 3356 3358* 3359 3362* 3364* 3365 3366* 3367* 3368 3369 3370 3371 3399 3411 3413* 3414 3416* 3418* 3420 3422 3423 3567 3569 3571* 3572 3574* 3576* 3577 3578 3608* 3610* 3612* 3613 3615* 3616 3618* 3620* 3621 3623* 3624 3650* 3655* 3656 3659* 3660	
LISTING	F-Listing-96-REC	1434	FILE	3374* 3376* 3378* 3379 3381* 3382 3385* 3387* 3388 3389* 3390* 3391 3392 3393 3394 3402 3426 3428* 3429 3431* 3433* 3435 3437 3438	

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				3584	3586	3587
				3589	3591*	3592
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				3598	3627*	3629*
				3631*	3632	3634*
				3635	3637*	3639*
				3640	3642*	3643
				3651	3666	3671
				3675	3680	3684
				3688		
LISTING	F-Listing-FILE	1433	FILE	1418	2412	2420
LISTING	F-Listing-REC	1436	FILE			
LISTING	F-Original-Src-FILE	1438	FILE	1420	3444	3462
				3486		
				3490		
LISTING	F-Original-Src-REC	1439	FILE			
LISTING	F-OS-1-128-TXT	1440	FILE			
LISTING	F-OS-129-256-TXT	1445	FILE			
LISTING	F-OS-7-CHR	1442	FILE	3495		
LISTING	F-OS-8-72-TXT	1443	FILE	3491	3523	
LISTING	F-Sort-Work-FILE	1447	FILE	1422	2414	3270
LISTING	F-Sort-Work-REC	1448	FILE	2523*	2525	2560*
				2562	3040	3043*
				3046	3088*	3091
				3096*	3099	3120
				3122*	3125	3208*
				3215	3220	3225
				3229*	3239*	3249
				3253*		
LISTING	F-SW-Def-Line-NUM	1453	FILE	3213*	3296	3304
				3308	3320	3321
LISTING	F-SW-Prog-ID-TXT	1449	FILE	2415	3209*	3230*
				3240*	3254*	3281
				3287	3292	3301
				3313	3317	
LISTING	F-SW-Ref-Flag-CHR	1456	FILE	3045*	3090*	3098*
				3124*	3235*	3259*
				3332		
LISTING	F-SW-Ref-Line-NUM	1455	FILE	2417	3214*	3234*
				3244*	3258*	3330
LISTING	F-SW-Reference-TXT	1454	FILE	3324		
LISTING	F-SW-Section-TXT	1452	FILE	3212*	3233*	3243*
				3257*	3303	3319
LISTING	F-SW-Token-TXT	1451	FILE	3211*	3232*	3242*
				3256*	3318	
LISTING	F-SW-Token-Uc-TXT	1450	FILE	2416	3210*	3231*
				3241*	3255*	3282
				3293	3295	3307
LISTING	L-Listing-CD	2402	LINKAGE	2409	2449	2486
				3349	3398	3410
				3551	3565	3606
				3647		
LISTING	L-Listing-Fn-TXT	2392	LINKAGE	1418	2404	
LISTING	L-LPP-NUM	2398	LINKAGE	2407	2487	

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LISTING	L-OS-Type-CD	2396	LINKAGE	2406	2432	
LISTING	L-Src-Fn-TXT	2394	LINKAGE	1420	2405	2437
				2437*	2438	2439
				2443	2446	2459
				2461	2463	2468
LISTING	RETURN-CODE		PROCEDURE	2479		
LISTING	WS-CD-In-DATA-DIV-BOOL	1473	WORKING-STORAGE	2533		
LISTING	WS-CD-In-ENV-DIV-BOOL	1472	WORKING-STORAGE	2531		
LISTING	WS-CD-In-IDENT-DIV-BOOL	1471	WORKING-STORAGE	2529		
LISTING	WS-CD-In-PROC-DIV-BOOL	1474	WORKING-STORAGE	2535		
LISTING	WS-Copyright-TXT	1459	WORKING-STORAGE	2430*	2435*	3415
				3430	3573	3593
LISTING	WS-CPI-13-15-TXT	1480	WORKING-STORAGE	2824*		
LISTING	WS-CPI-16-CHR	1481	WORKING-STORAGE	2823		
LISTING	WS-CS-1-CHR	1484	WORKING-STORAGE	2746*		
LISTING	WS-CS-11-14-TXT	1487	WORKING-STORAGE	2748	2749*	
LISTING	WS-CS-15-CHR	1488	WORKING-STORAGE	2751*		
LISTING	WS-CS-2-14-TXT	1485	WORKING-STORAGE	2747*		
LISTING	WS-Curr-Char-Is-Punct-BOOL	1462	WORKING-STORAGE	2591	2599	2604
LISTING	WS-Curr-Char-Is-Quote-BOOL	1466	WORKING-STORAGE	2610		
LISTING	WS-Curr-Char-Is-X-BOOL	1467	WORKING-STORAGE	2623		
LISTING	WS-Curr-Char-Is-Z-BOOL	1468	WORKING-STORAGE	2636		
LISTING	WS-Curr-CHR	1461	WORKING-STORAGE	2581*	2584	2586
				2592	2600	2606
				2613		
LISTING	WS-Curr-Division-TXT	1470	WORKING-STORAGE	2506*	2542	2593
				2601	2701	2817*
				2836*	2862*	2918*
				2923*		
LISTING	WS-Curr-Line-NUM	1476	WORKING-STORAGE	2505*	2565*	2724*
				2764*	3213	3234
				3244	3258	3485*
LISTING	WS-Curr-Prog-ID-TXT	1478	WORKING-STORAGE	2495*	2822*	3209
				3230	3240	3254
LISTING	WS-Curr-Section-TXT	1483	WORKING-STORAGE	2727*	2732	2841*
				2867*	2913	2914*
				3212	3233	3243
				3257		
LISTING	WS-Curr-Verb-TXT	1490	WORKING-STORAGE	2496*	2520*	2544*
				2928	2937	
LISTING	WS-Delim-TXT	1492	WORKING-STORAGE	2653*	2655	2673*
				2675	2678	
LISTING	WS-Dummy-TXT	1494	WORKING-STORAGE	2471*	2716*	2745*
				2778*	2783*	2784
				3471*		
LISTING	WS-Expanded-Src-Fn-TXT	1496	WORKING-STORAGE	1416	2476*	2477C
LISTING	WS-Filename-TXT	1498	WORKING-STORAGE	2470*	2473	2744*
				2747		
LISTING	WS-Flags-TXT	1500	WORKING-STORAGE			
LISTING	WS-Formatted-DT	1503	WORKING-STORAGE	2494*	3354	3377
				3611	3630	
LISTING	WS-GI-Prog-ID-TXT	1506	WORKING-STORAGE	3281	3287	3292*

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LISTING	WS-Group-Indicators-TXT	1505	WORKING-STORAGE	3265*		
LISTING	WS-Held-Reference-TXT	1509	WORKING-STORAGE	2497*	2522	2523
				2524*	2559	2560
				2561*	3040*	3042
				3043	3044*	3081*
				3087	3088	3089*
				3095	3096	3097*
				3120*	3122	3123*
LISTING	WS-I-SUB	1511	WORKING-STORAGE	2438*	2439	2440
				2442	2445*	2446
				2461*	2463	2464
				2465	2468	2721*
				2724	2735*	2737
				2738	2739	2742
				3266*	3300*	3312*
				3325*	3326	3328*
				3331	3333	3406*
LISTING	WS-J-SUB	1513	WORKING-STORAGE	2462*	2466*	2468
				2736*	2740*	2742
LISTING	WS-Lines-Left-NUM	1515	WORKING-STORAGE	3267*	3276	3290
				3342	3396*	3407
				3451	3498	3502
				3529*	3563	3645*
				3652	3661	3668
				3677	3690	
LISTING	WS-Lines-Per-Page-Env-TXT	1519	WORKING-STORAGE	2451*	2455*	2482
				2483		
LISTING	WS-Lines-Per-Page-NUM	1517	WORKING-STORAGE	2484*	2487*	2489*
				2492	3396	3645
LISTING	WS-Main-Module-Name-TXT	1521	WORKING-STORAGE	2443*	2447*	2723
				3473		
LISTING	WS-Next-Char-Is-Quote-BOOL	1524	WORKING-STORAGE	2623	2636	
LISTING	WS-Next-CHR	1523	WORKING-STORAGE	2583*	2626	2639
LISTING	WS-OS-Type-FILLER-TXT	1526	WORKING-STORAGE	1532		
LISTING	WS-OS-Type-TXT	1533	WORKING-STORAGE	2432		
LISTING	WS-OS-Types-TXT	1532	WORKING-STORAGE			
LISTING	WS-Page-No-TXT	1538	WORKING-STORAGE	3348C	3363	3386
				3417	3432	3575
				3595	3605C	3619
				3638		
LISTING	WS-Page-NUM	1536	WORKING-STORAGE	2428*	3344*	3346
				3564	3601*	3603
LISTING	WS-PN-Literal-TXT	1539	WORKING-STORAGE	3345*	3602*	
LISTING	WS-PN-Page-NUM	1540	WORKING-STORAGE	3346*	3347C	3603*
				3604C		
LISTING	WS-Program-Path-TXT	1542	WORKING-STORAGE	2459*	2460C	3357
				3380	3614	3633
LISTING	WS-Reserved-Word-Table-TXT	2299	WORKING-STORAGE			
LISTING	WS-Reserved-Word-TXT	2300	WORKING-STORAGE	2688		
LISTING	WS-Reserved-Words-TXT	1544	WORKING-STORAGE	2299		
LISTING	WS-RS-Duplicate-CHR	2308	WORKING-STORAGE	3268*	3283*	3298*

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PROGRAM-ID	Identifier/Register/Function	Defn	Where Defined	References	Page: 102
LISTING	WS-RS-In-Copybook-BOOL	2311	WORKING-STORAGE	3309 3310*	
LISTING	WS-RS-In-Main-Module-BOOL	2310	WORKING-STORAGE	2730* 3479*	
				2725* 2763 3474*	
				3484	
LISTING	WS-RS-In-Which-Pgm-CHR	2309	WORKING-STORAGE		
LISTING	WS-RS-Last-Token-Ended-Sent-CHR	2312	WORKING-STORAGE	2554* 2700	
LISTING	WS-RS-Processing-PICTURE-CHR	2313	WORKING-STORAGE	2649 2663* 2872*	
LISTING	WS-RS-Token-Ended-Sentence-CHR	2314	WORKING-STORAGE	2541 2553 2555*	
				2588* 2617* 2630*	
				2643* 2656* 2676*	
LISTING	WS-RS-Verb-Has-Been-Found-CHR	2315	WORKING-STORAGE	2507* 2692* 2814*	
LISTING	WS-Runtime-Switches	2307	WORKING-STORAGE		
LISTING	WS-RW-IDX	2303	WORKING-STORAGE	2689 2690	
LISTING	WS-RW-Type-CD	2304	WORKING-STORAGE	2690	
LISTING	WS-RW-Word-TXT	2305	WORKING-STORAGE	2302 2689	
LISTING	WS-Saved-Section-TXT	2317	WORKING-STORAGE	2726 2727 2731	
				2732*	
LISTING	WS-SDL-Line-NUM	2324	WORKING-STORAGE	3489*	
LISTING	WS-SDL-Statement-TXT	2326	WORKING-STORAGE	3490* 3522* 3552	
				3556 3558 3654	
				3658* 3670 3674*	
				3679 3683* 3687*	
LISTING	WS-Src-Dashes-TXT	2319	WORKING-STORAGE	3622 3641	
LISTING	WS-Src-Detail-Line-TXT	2323	WORKING-STORAGE	3449* 3488* 3496*	
				3500* 3505* 3509*	
				3513* 3520* 3532*	
				3536* 3540* 3650	
				3655 3657* 3659	
				3666 3671 3673*	
				3675 3680 3682*	
				3684 3686* 3688	
				3693*	
LISTING	WS-Src-Hold-TXT	2328	WORKING-STORAGE	3654* 3658 3670*	
				3674 3679* 3683	
				3687	
LISTING	WS-Src-Line-NUM	2330	WORKING-STORAGE	3446* 3475 3487*	
				3489	
LISTING	WS-Src-Lines-NUM	2332	WORKING-STORAGE	3550* 3553* 3557*	
				3559* 3563 3566	
				3580 3648 3664	
LISTING	WS-Src-SUB	2334	WORKING-STORAGE	2503* 2556 2557	
				2576* 2580 2582	
				2585* 2594* 2605*	
				2611* 2615* 2616	
				2618* 2624* 2628*	
				2629 2631* 2637*	
				2641* 2642 2644*	
				2654* 2657* 2674*	
				2679 2754* 2759*	
				2761*	
LISTING	WS-Suppress-FF-CHR	1501	WORKING-STORAGE	2429* 3277* 3419	
				3434	
LISTING	WS-Tally-QTY	2336	WORKING-STORAGE	2793* 2795* 2796	

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		/home/vince/cobolsrc/Cobol-Tools/ocic/GCic.cbl				
PROGRAM-ID	Identifier/Register/Function	Defn	Where Defined	References	Page: 103	
=====	=====	=====	=====	=====	=====	
LISTING	WS-Temp-10-Chars-TXT	2338	WORKING-STORAGE	2800* 2714* 2721	2801 2718 3469*	2719*
LISTING	WS-Temp-256-Chars-TXT	2348	WORKING-STORAGE	2478C 2734 3470*	2715* 2737 3472	2722 2742
LISTING	WS-Temp-32-Chars-1-TXT	2340	WORKING-STORAGE	2769*	2772	2779
LISTING	WS-Temp-32-Chars-2-TXT	2342	WORKING-STORAGE	2776* 2788*	2781* 2804	2787
LISTING	WS-Temp-32-Chars-3-TXT	2344	WORKING-STORAGE	2777* 2791*	2782* 2804	2790
LISTING	WS-Temp-65-Chars-TXT	2346	WORKING-STORAGE	3492* 3508 3528 3539	3499 3512 3531	3504 3524* 3535
LISTING	WS-Today-DT	2350	WORKING-STORAGE	2493*	2494	
LISTING	WS-Token-Curr-TXT	2352	WORKING-STORAGE	2513 2595* 2627* 2659 2684* 2816 2840 2870 3211 3256	2517* 2606* 2640* 2672* 2702* 2822 2861 2904 3232	2586* 2614* 2652* 2682 2769 2835 2866 2922 3242
LISTING	WS-Token-Curr-Uc-TXT	2354	WORKING-STORAGE	2514* 2539 3231	2517 2916 3241	2520 3210 3255
LISTING	WS-Token-Prev-TXT	2356	WORKING-STORAGE	2521* 2602* 2821* 2845 2876 2884* 2893* 2902* 2927 2987* 3008* 3037 3082* 3101* 3133 3146 3181	2539* 2817 2836 2862 2877* 2887* 2896* 2917 2931* 2994 3017 3065 3085* 3108 3136* 3155 3184*	2543* 2820 2841 2867 2881 2890* 2899* 2923 2984 3005 3028 3078 3093* 3117 3139* 3166 3191
LISTING	WS-Token-Search-TXT	2358	WORKING-STORAGE	2682*	2683	2689
LISTING	WS-Token-Type-CD	2360	WORKING-STORAGE	2587* 2660* 2690*	2596* 2664* 2703*	2607* 2685*
LISTING	WS-TT-Token-Is-Argtype-BOOL	2361	WORKING-STORAGE	2811	2831	2857
LISTING	WS-TT-Token-Is-EOF-BOOL	2362	WORKING-STORAGE	2510	2564*	
LISTING	WS-TT-Token-Is-Function-BOOL	2363	WORKING-STORAGE	2851		

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				/home/vince/cobolsrc/Cobol-Tools/ocic/GCic.cbl		
PROGRAM-ID	Identifier/Register/Function	Defn	Where Defined	References	Page: 104	
=====						
LISTING	WS-TT-Token-Is-Identifier-BOOL	2364	WORKING-STORAGE	2697* 2926	2844 2934	2880
LISTING	WS-TT-Token-Is-Keyword-BOOL	2365	WORKING-STORAGE	2515 2834 2865	2538 2839 2871	2815 2860 2921
LISTING	WS-TT-Token-Is-Lit-Alpha-BOOL	2366	WORKING-STORAGE	2620*	2646*	
LISTING	WS-TT-Token-Is-Lit-Number-BOOL	2367	WORKING-STORAGE	2633* 2805*	2699	2773*
LISTING	WS-TT-Token-Is-Reserved-Wd-BOOL	2369	WORKING-STORAGE	2516 2858*	2812* 2875	2832*
LISTING	WS-TT-Token-Is-Verb-BOOL	2368	WORKING-STORAGE	2519	2691	
LISTING	WS-Usernames-QTY	2371	WORKING-STORAGE	2504*		
LISTING	WS-Version-TXT	2373	WORKING-STORAGE	2436* 3607	3350 3626	3373
LISTING	WS-XDL-Def-Line-NUM	2380	WORKING-STORAGE	3304*	3321*	
LISTING	WS-XDL-Prog-ID-TXT	2376	WORKING-STORAGE	3301*	3313*	3317*
LISTING	WS-XDL-Ref-Flag-CHR	2386	WORKING-STORAGE	3333*		
LISTING	WS-XDL-Ref-Line-NUM	2385	WORKING-STORAGE	3331*		
LISTING	WS-XDL-Reference-TXT	2384	WORKING-STORAGE			
LISTING	WS-XDL-Section-TXT	2382	WORKING-STORAGE	3303*	3319*	
LISTING	WS-XDL-Token-TXT	2378	WORKING-STORAGE	3302*	3314*	3318*
LISTING	WS-Xref-Detail-Line-TXT	2375	WORKING-STORAGE	3264* 3284 3316 3402	3271 3288* 3336 3405*	3274* 3297 3399
LISTING	WS-Xref-Lines-Per-Rec-NUM	2389	WORKING-STORAGE	2450*	2454*	3326



## 6. STREAMIO

STREAMIO is a utility I created to assist with handling stream I/O functions. I've used it to construct a number of useful little command-line utilities.

Usage of this subroutine is completely documented in the program comments. The program COPY's a copybook named STREAMIOcb, the format of which is described in the program comments.

Both STREAMIO.cbl and STREAMIOcb.cpy are included in the "samples" directory of any pre-built distributions of GnuCOBOL that I have created.

In addition to general GnuCOBOL concepts, this program provides a useful demonstration of the following:

- Coding a GnuCOBOL subroutine
- Using the "REPLACING" clause on a CDF "COPY" statement
- Using hexadecimal alphanumeric literals
- Using the following statements:
  - "ACCEPT FROM ENVIRONMENT" statement
  - "INSPECT" statement
  - "STRING" statement
- Using the following built-in subroutines:
  - "C\$PARAMSIZE" built-in system subroutine
  - "CBL\_CLOSE\_FILE" built-in system subroutine
  - "CBL\_DELETE\_FILE" built-in system subroutine
  - "CBL\_EXIT\_PROC" built-in system subroutine
  - "CBL\_OPEN\_FILE" built-in system subroutine
  - "CBL\_READ\_FILE" built-in system subroutine
  - "CBL\_WRITE\_FILE" built-in system subroutine
- Using the following intrinsic functions:
  - "RANDOM" intrinsic function
  - "TRIM" intrinsic function

First, here is the STREAMIOcb.cpy copybook:

```

05 SCB-Handle-NUM                PIC X(4) COMP-X.
05 SCB-Mode-CD                   PIC X(1).
    88 SCB-MODE-Input-BOOL       VALUE 'I', 'i'.
    88 SCB-MODE-Output-BOOL      VALUE 'O', 'o'.
    88 SCB-MODE-Both-BOOL        VALUE 'B', 'b'.
05 SCB-Function-CD               PIC X(2).
    88 SCB-Func-CLOSE-BOOL       VALUE 'C ', 'c '.
    88 SCB-Func-DELETE-BOOL      VALUE 'D ', 'd '.
    88 SCB-Func-OPEN-BOOL        VALUE 'O ', 'o '.
    88 SCB-Func-READ-BOOL        VALUE 'R ', 'r '.
    88 SCB-Func-READ-Delim-BOOL  VALUE 'RD', 'rd',
                                'rD', 'Rd'.
    88 SCB-Func-WRITE-BOOL       VALUE 'W ', 'w '.
    88 SCB-Func-WRITE-Delim-BOOL VALUE 'WD', 'wd',
                                'wD', 'Wd'.

05 SCB-Delimiter-Mode-CD         PIC X(1).
    88 SCB-DELIM-Unix-BOOL       VALUE 'U', 'u'.
    88 SCB-DELIM-Windows-BOOL    VALUE 'W', 'w'.
05 SCB-Offset-NUM                PIC X(8) COMP-X.
05 SCB-Error-Routine-PTR         USAGE PROGRAM-POINTER.
05 SCB-Error-Routine-NUM REDEFINES SCB-Error-Routine-PTR
                                USAGE BINARY-LONG.
05 SCB-Return-CD                 USAGE BINARY-LONG.
05 SCB-Filename-TXT              PIC X(256).

```

The program source and cross-reference listing, produced using the GnuCOBOL Interactive Compiler front-end (GCic.cbl, one of the sample programs included here), begins on the next page.

GNU COBOL 2.1 23NOV2013 Source Listing

2014/03/27

C:/Users/tda010/Documents/Programs/Samples/STREAMIO.cbl

Line Statement Page: 1

```

=====
1      >>SOURCE FORMAT IS FIXED
2      IDENTIFICATION DIVISION.
3      PROGRAM-ID. STREAMIO.
4      *>*****
5      *> Author: Gary L. Cutler **
6      *> **
7      *> This routine centralizes all bytestream file I/O functions **
8      *> into one routine. The manner in which this routine is **
9      *> CALLED is as follows: **
10     *> **
11     *> CALL "STREAMIO" USING control-block [ , arg2 ] **
12     *> **
13     *> where 'control-block' is defined by the "STREAMIOcb.cpy" **
14     *> copybook and 'arg2' will vary, depending upon the function **
15     *> specified in the control block. **
16     *> **
17     *> The STREAMIO routine has an advantage over the various **
18     *> "CBL_XXXXXX_FILE" routines in that: **
19     *> **
20     *> 1. It automates the establishment and on-going adjustment of **
21     *> the file-offset value in such a way as to simplify the **
22     *> sequential processing of a bytestream file (you may still **
23     *> specify a file-offset manually on each read or write, if **
24     *> you wish) **
25     *> **
26     *> 2. It auto-detects the size of the I/O buffer you supply to **
27     *> STREAMIO, using that as the byte-count of all read and **
28     *> write operations. **
29     *> **
30     *> 3. Not only does it support the raw input and output of data **
31     *> that the CBL_READ_FILE and CBL_WRITE_FILE routines do, **
32     *> but on input it is also capable of delivering just a **
33     *> single newline-delimited or carriage-return/newline de- **
34     *> limited record to the caller. **
35     *> **
36     *> 4. On output, STREAMIO can optionally append either a new- **
37     *> line or carriage-return/newline sequence (your choice) to **
38     *> the end of every record it writes. **
39     *> **
40     *> 5. STREAMIO can automatically generate filenames for output **
41     *> files if you wish, simplifying the process of creating **
42     *> scratch or work files. **
43     *> **
44     *> 6. The STREAMIO routine also allows you to (optionally) re- **
45     *> gister a general error-handling routine to be given con- **
46     *> trol should a fatal error be detected with STREAMIO. **
47     *> **
48     *> This routine can be "turned on" and "turned off" at will. **
49     *> **
=====

```

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GNU COBOL 2.1 23NOV2013 Source Listing

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Line Statement Page: 2

```

=====
50      *> The control block format is as follows. This structure must **
51      *> be defined under an 01-level data item of your creation and **
52      *> should be INITIALIZED before any items within it are used. **
53      *> **
54      *> 05 SCB-Handle-NUM PIC X(4) COMP-X. **
55      *> 05 SCB-Mode-CD PIC X(1). **
56      *> 88 SCB-Mode-Input-BOOL VALUE 'I', 'i'. **
57      *> 88 SCB-Mode-Output-BOOL VALUE 'O', 'o'. **
58      *> 88 SCB-Mode-Both-BOOL VALUE 'B', 'b'. **
59      *> 05 SCB-Function-CD PIC X(2). **
60      *> 88 SCB-Func-CLOSE-BOOL VALUE 'C ', 'c '. **
61      *> 88 SCB-Func-DELETE-BOOL VALUE 'D ', 'd '. **
62      *> 88 SCB-Func-OPEN-BOOL VALUE 'O ', 'o '. **
63      *> 88 SCB-Func-READ-BOOL VALUE 'R ', 'r '. **
64      *> 88 SCB-Func-READ-Delim-BOOL VALUE 'RD', 'rd', **
65      *> 'rD', 'Rd'. **
66      *> 88 SCB-Func-WRITE-BOOL VALUE 'W ', 'w '. **
67      *> 88 SCB-Func-WRITE-Delim-BOOL VALUE 'WD', 'wd', **
68      *> 'wD', 'Wd'. **
69      *> 05 SCB-Delimiter-Mode-CD PIC X(1). **
70      *> 88 SCB-Delim-Unix-BOOL VALUE 'U', 'u'. **
71      *> 88 SCB-Delim-Windows-BOOL VALUE 'W', 'w'. **
72      *> 05 SCB-Offset-NUM PIC X(8) COMP-X. **
73      *> 05 SCB-Error-Routine-PTR USAGE PROGRAM-POINTER. **
74      *> 05 SCB-Error-Routine-NUM REDEFINES SCB-Error-Routine-PTR **
75      *> USAGE BINARY-LONG. **
76      *> 05 SCB-Return-CD USAGE BINARY-LONG. **
77      *> 05 SCB-Filename-TXT PIC X(256). **
78      *> **
79      *> Such a structure is defined for your use using the copybook **
80      *> "STREAMIOcb.cpy" (you may also define your own, provided it **
81      *> conforms to the above layout). **
82      *>-----**
83      *> SCB-Handle-NUM **
84      *>-----**
85      *> **
86      *> Serves as a file handle to the file once it has been opened **
87      *> (via the "SCB-Func-OPEN-BOOL" function). **
88      *> **
89      *>-----**
90      *> SCB-Mode-CD **
91      *>-----**
92      *> **
93      *> Prior to calling "STREAMIO" for the first time for a file, **
94      *> the appropriate subordinate level-88 must be set to TRUE to **
95      *> select an I/O mode. You may also simply move one of the **
96      *> string values listed on the level-88 items to "SCB-Mode-CD". **
97      *> **
98      *>-----**
=====

```

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Line Statement

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```

=====
 99      *> SCB-Function-CD                                **
100      *>-----**
101      *>                                                **
102      *> The appropriate subordinate level-88 must be set to TRUE to **
103      *> select a function you'd like to execute against a file. You **
104      *> may also simply move one of the string values listed on the **
105      *> level-88 items to "SCB-Function-CD".                **
106      *>                                                **
107      *> Available functions are as follows:                **
108      *>                                                **
109      *> SCB-Func-OPEN-BOOL                                **
110      *>                                                **
111      *>      This must be the function specified the first time you **
112      *>      call STREAMIO for any given file. It opens the file & **
113      *>      makes it available for use according to the **
114      *>      "SCB-Mode-CD" specification.                    **
115      *>                                                **
116      *>      The filename being opened must be specified in the **
117      *>      "SCB-Filename-TXT" field.                        **
118      *>                                                **
119      *>      The SCB-Offset-NUM field will be initialized to ZERO. **
120      *>                                                **
121      *>      If "arg2" is specified in conjunction with this funct- **
122      *>      ion, it will be ignored.                          **
123      *>                                                **
124      *> SCB-Func-CLOSE-BOOL                                **
125      *>                                                **
126      *>      This function should be the one specified the LAST time **
127      *>      you call STREAMIO against a specific file. After this **
128      *>      function has been executed, you'll have to re-open the **
129      *>      file if you wish to use it with STREAMIO again.    **
130      *>                                                **
131      *>      The SCB-Handle-NUM item will be reset to ZERO.    **
132      *>                                                **
133      *>      If "arg2" is specified in conjunction with this funct- **
134      *>      ion, it will be ignored.                          **
135      *>                                                **
136      *> SCB-Func-DELETE-BOOL                                **
137      *>                                                **
138      *>      This function will delete the file specified in the **
139      *>      control block (see SCB-Filename-TXT).              **
140      *>                                                **
141      *>      This function should not be performed against a file **
142      *>      that is open.                                       **
143      *>                                                **
144      *>      If "arg2" is specified in conjunction with this funct- **
145      *>      ion, it will be ignored.                          **
146      *>                                                **
147      *> SCB-Func-READ-BOOL                                **
=====

```

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Line Statement

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```

=====
148      *>                                     **
149      *>   This function invokes a standard CBL_READ_FILE against **
150      *>   the file specified in the control block (see **
151      *>   SCB-Filename-TXT). **
152      *>                                     **
153      *>   The buffer into which you wish to read data must be **
154      *>   supplied as "arg2". The size of that buffer, in bytes, **
155      *>   will define the "byte-count" value supplied to the **
156      *>   CBL_READ_FILE subroutine. The buffer data item will be **
157      *>   set to SPACES before the read takes place. **
158      *>                                     **
159      *>   If the file-offset value (SCB-Offset-NUM) is greater **
160      *>   than the size of the file, a "no more data" return code **
161      *>   (01) will be passed back in SCB-Return-CD and the **
162      *>   buffer will have been set to SPACES. **
163      *>                                     **
164      *>   At the conclusion of a successful SCB-Func-READ-BOOL, **
165      *>   the value of SCB-Offset-NUM will have been automati- **
166      *>   cally incremented by the byte-count size of "arg2". **
167      *>                                     **
168      *> SCB-Func-WRITE-BOOL **
169      *>                                     **
170      *>   This function invokes a standard CBL_WRITE_FILE against **
171      *>   the file specified in the control block (see **
172      *>   SCB-Filename-TXT). **
173      *>                                     **
174      *>   The buffer from which data will be written to the file **
175      *>   must be supplied as "arg2". The size of that buffer, **
176      *>   in bytes, will define the "byte-count" value supplied **
177      *>   CBL_WRITE_FILE subroutine. The buffer data will be **
178      *>   written to the file-offset position defined by the **
179      *>   SCB-Offset-NUM value. You may specify "arg2" either **
180      *>   as an actual alphanumeric data item or as an alpha- **
181      *>   numeric literal. **
182      *>                                     **
183      *>   If the file-offset value (SCB-Offset-NUM) is greater **
184      *>   than the size of the file, a "no more data" return code **
185      *>   will be passed back in SCB-Return-CD and the buffer **
186      *>   will have been set to SPACES. **
187      *>                                     **
188      *>   At the conclusion of a successful SCB-Func-WRITE-BOOL **
189      *>   operation, the value of SCB-Offset-NUM will have been **
190      *>   automatically incremented by the byte-count size of **
191      *>   "arg2". **
192      *>                                     **
193      *> SCB-Func-READ-Delim-BOOL **
194      *>                                     **
195      *>   SCB-Func-READ-Delim-BOOL bahaves like the SCB-FUNC- **
196      *>   READ function, with the following behavioral dif- **
=====

```

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Line Statement

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```

=====
197      *>      ferences:                                **
198      *>                                             **
199      *>      1. When data is read from the file, only that data read **
200      *>      up to BUT NOT INCLUDING an end-of-line delimiter **
201      *>      sequence (either a LF or CRLF) will be retained in **
202      *>      the buffer - the remainder of the buffer from the **
203      *>      end-of-line sequence onward will be reset to SPACES. **
204      *>      The file-offset value (SCB-Offset-NUM) will be in- **
205      *>      cremented ONLY by the amount of data transferred up **
206      *>      to AND INCLUDING the end-of-line sequence. **
207      *>                                             **
208      *>      2. When data is read from the file and an end-of-line **
209      *>      delimiter sequence (either a LF or a CRLF) cannot be **
210      *>      found within the buffer, the assumption is made that **
211      *>      the record is too long to fit within the buffer. In **
212      *>      these instances, an SCB-Return-CD value of 02 will **
213      *>      be returned and the SCB-Offset-NUM value will be **
214      *>      incremented past the next end-of-line sequence in **
215      *>      the file (this will involve at least one additional **
216      *>      call to CBL_READ_FILE to locate that eol sequence, **
217      *>      but any additional such reads will be done internal- **
218      *>      ly to STREAMIO and will be entirely transparent to **
219      *>      the caller of STREAMIO. **
220      *>                                             **
221      *>      DO NOT USE the Streamio-READ-Delim function if the **
222      *>      possibility exists that linefeed (X"0A") or carriage- **
223      *>      return (X"0D") characters could exist as actual data **
224      *>      characters in the file. **
225      *>                                             **
226      *>      SCB-Func-WRITE-Delim-BOOL **
227      *>                                             **
228      *>      SCB-Func-WRITE-Delim-BOOL acts like the Streamio- **
229      *>      FUNC-WRITE function, with the following difference: **
230      *>                                             **
231      *>      After the specified data is written to the file, an **
232      *>      end-of-line sequence will also be written to the file. **
233      *>      The file-offset value (SCB-Value) will be incremented **
234      *>      by the byte-count size of the data PLUS the size of the **
235      *>      end-of-line sequence. One of two possible end-of-line **
236      *>      sequences must be specified using the value of SCB- **
237      *>      Delimter-Mode. **
238      *>                                             **
239      *>-----**
240      *>      SCB-Delimiter-Mode-CD **
241      *>-----**
242      *>                                             **
243      *>      This data item is needed only when issuing the Streamio- **
244      *>      FUNC-WRITE-Delim function. In those circumstances, this **
245      *>      item defines what end-of-line delimiter sequence is to be **
=====

```

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```

=====
246      *> written:                                     **
247      *>                                             **
248      *> If SCB-Delim-Unix-BOOL is true, a linefeed character will **
249      *> be written.                                   **
250      *>                                             **
251      *> If SCB-Delim-Windows-BOOL is true, a carriage-return and **
252      *> linefeed sequence will be written.           **
253      *>                                             **
254      *>-----**
255      *> SCB-Offset-NUM                                **
256      *>-----**
257      *>                                             **
258      *> This data item specifies the next relative byte number with- **
259      *> in the file where the next read or write will start.       **
260      *>                                             **
261      *> SCB-Offset-NUM is automatically set to 0 (the first byte)   **
262      *> when the file is opened, and is automatically incremented as **
263      *> the file is read or written via STREAMIO.             **
264      *>                                             **
265      *> You may also manually set this value as desired before any **
266      *> call to STREAMIO.                                       **
267      *>                                             **
268      *>-----**
269      *> SCB-Error-Routine-PTR                             **
270      *>-----**
271      *>                                             **
272      *> To specify a general error-handling routine for handling   **
273      *> STREAMIO failures, Create the routine and define an entry- **
274      *> name for it via the ENTRY statement. Then use the following **
275      *> to set that routine up as the error handler:             **
276      *>                                             **
277      *>     SET SCB-Error-Routine-PTR TO ENTRY "entry-name"      **
278      *>                                             **
279      *> To "turn off" the error-routine:                       **
280      *>                                             **
281      *>     SET SCB-Error-Routine-PTR TO NULL                  **
282      *>                                             **
283      *> If a fatal error occurs (any error not marked with a ">" in **
284      *> the SCB-Return-CD discussion), the error routine you spe- **
285      *> cified (if any) will be set up as an exit routine via the **
286      *> CBL_EXIT_PROC subroutine; the STREAMIO routine will then is- **
287      *> sue a STOP RUN to intentionally trigger your error routine. **
288      *> You will not be able to recover your program once your error **
289      *> routine triggers. If you wish to be able to recover from **
290      *> fatal STREAMIO errors, you should NOT use the SCB-Error- **
291      *> Routine feature but instead you should explicitly test the **
292      *> SCB-Return-CD value after every call to STREAMIO.         **
293      *>                                             **
294      *> A default error routine is defined by the "STREAMIOError.cpy" **
=====

```

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```

=====
295     *> copybook.                                **
296     *>                                           **
297     *>-----**
298     *> SCB-Return-CD                             **
299     *>-----**
300     *>                                           **
301     *> The following are the possible SCB-Return-CD values. The **
302     *> ones marked with a ">" will NOT trigger an error-routine, if **
303     *> one is currently registered via SCB-Error-Routine-PTR.    **
304     *>                                           **
305     *> 12 I/O error writing to file                 **
306     *> 11 File does not exist                     **
307     *> 10 File already OPEN or already CLOSEd      **
308     *> > 02 READ-Delim was truncated               **
309     *> > 01 No more data is available from the current **
310     *>      SCB-Offset-NUM                         **
311     *> > 00 OK - the operation was successful       **
312     *> -1 Invalid SCB-Function-CD                 **
313     *> -2 Invalid SCB-Mode-CD                     **
314     *> -3 CBL_XXXXX_FILE routine rejected operation **
315     *> -4 Invalid delimiter mode specified (Not U/W) **
316     *>                                           **
317     *>-----**
318     *> SCB-Filename-TXT                           **
319     *>-----**
320     *>                                           **
321     *> This is the name of the file you wish to access.      **
322     *>                                           **
323     *> If you are planning on reading the file, the file MUST exist **
324     *> at the time the SCB-Func-OPEN-BOOL is executed.      **
325     *>                                           **
326     *> If you are planning on writing to the file, the file need **
327     *> exist when the SCB-Func-OPEN-BOOL is issued.         **
328     *>                                           **
329     *> In general, the contents of SCB-Filename-TXT should re- **
330     *> flect the complete path to the file as well as the name of **
331     *> the file itself, unless the file is contained in whatever **
332     *> directory is current at the time the SCB-Func-OPEN-BOOL is **
333     *> executed.                                           **
334     *>                                           **
335     *> The following special values may be used for         **
336     *> SCB-Filename-TXT:                                **
337     *>                                           **
338     *> SPACES If the filename is SPACES, a filename will be created **
339     *>      automatically for you in whatever directory is de- **
340     *>      fined by the TEMP environment variable. If there IS **
341     *>      no TEMP variable defined, the "/tmp" folder will be **
342     *>      assumed. The filename will be STREAMIO-nnnnnnnn.dat **
343     *>      where "nnnnnnnn" is a random number.           **
=====

```

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```

=====
344      *>
345      *> .      If you specify only a dot (period) as the filename, **
346      *>      the behavior will be the same as with a value of **
347      *>      SPACES except there will be no ".dat" at the end of **
348      *>      the generated filename. **
349      *> **
350      *> .ext  If you specify a filename extension prefixed with a **
351      *>      dot (period), the behavior will be the same as if a **
352      *>      value of SPACES were specified, except that the given **
353      *>      extension will be used instead of ".dat". Note that **
354      *>      if you are using a Unix/Cygwin implementation of **
355      *>      OpenCOBOL and you'd like to specify a hidden file in **
356      *>      the current directory as the SCB-Filename-TXT, you **
357      *>      MUST code the filename as "./.xxxxx" to avoid having **
358      *>      it treated as this special name. **
359      *> **
360      *>*****
361      ENVIRONMENT DIVISION.
362      CONFIGURATION SECTION.
363      REPOSITORY.
364          FUNCTION ALL INTRINSIC.
365      DATA DIVISION.
366      WORKING-STORAGE SECTION.
367          01 WS-Access-Mode-CD                PIC X(1) COMP-X.
368          01 WS-Arg-Length-NUM                PIC X(4) COMP-X.
369          01 WS-Buffer-TXT                    PIC X(256).
370          01 WS-Delim-Buffer-TXT              PIC X(2).
371          01 WS-Env-Temp-TXT                  PIC X(256).
372          01 WS-Slash-CHR                     PIC X(1).
373          01 WS-Tally-NUM                     USAGE BINARY-LONG.
374          01 WS-8-Digit-NUM                   PIC 9(8).
375          01 WS-256-Byte-TXT                  PIC X(256).
376      LINKAGE SECTION.
377          01 L-StreamIO-Control-Block-TXT.
378          COPY STREAMIOcb
379              REPLACING LEADING ==SCB== BY ==L-SCB==.
05 L-SCB-Handle-NUM PIC X(4) COMP-X.
05 L-SCB-Mode-CD PIC X(1).
88 L-SCB-MODE-Input-BOOL VALUE 'I' 'i'.
88 L-SCB-MODE-Output-BOOL VALUE 'O' 'o'.
88 L-SCB-MODE-Both-BOOL VALUE 'B' 'b'.
05 L-SCB-Function-CD PIC X(2).
88 L-SCB-Func-CLOSE-BOOL VALUE 'C' 'c'.
88 L-SCB-Func-DELETE-BOOL VALUE 'D' 'd'.
88 L-SCB-Func-OPEN-BOOL VALUE 'O' 'o'.
88 L-SCB-Func-READ-BOOL VALUE 'R' 'r'.
88 L-SCB-Func-READ-Delim-BOOL VALUE 'RD' 'rd'
'rD' 'Rd'.
88 L-SCB-Func-WRITE-BOOL VALUE 'W' 'w'.
=====

```

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```

=====
      88 L-SCB-Func-WRITE-Delim-BOOL VALUE 'WD' 'wd'
      'WD' 'Wd'.
      05 L-SCB-Delimiter-Mode-CD PIC X(1).
      88 L-SCB-DELIM-Unix-BOOL VALUE 'U' 'u'.
      88 L-SCB-DELIM-Windows-BOOL VALUE 'W' 'w'.
      05 L-SCB-Offset-NUM PIC X(8) COMP-X.
      05 L-SCB-Error-Routine-PTR USAGE PROGRAM-POINTER.
      05 L-SCB-Error-Routine-NUM REDEFINES L-SCB-Error-Routine-PTR
      USAGE BINARY-LONG.
      05 L-SCB-Return-CD USAGE BINARY-LONG.
      05 L-SCB-Filename-TXT PIC X(256).
380      01 L-Arg2-TXT PIC X ANY LENGTH.
381      PROCEDURE DIVISION USING L-StreamIO-Control-Block-TXT,
382      L-Arg2-TXT.
383      000-Main SECTION.
384      MOVE 00 TO L-SCB-Return-CD
385      EVALUATE TRUE
386      WHEN L-SCB-Func-CLOSE-BOOL
387      PERFORM 030-Validate-Handle-NonZero
388      PERFORM 200-CLOSE
389      WHEN L-SCB-Func-DELETE-BOOL
390      CALL "CBL_DELETE_FILE" USING L-SCB-Filename-TXT
391      WHEN L-SCB-Func-OPEN-BOOL
392      PERFORM 020-Validate-Handle-Zero
393      PERFORM 100-OPEN
394      WHEN L-SCB-Func-READ-BOOL
395      PERFORM 030-Validate-Handle-NonZero
396      PERFORM 400-READ
397      WHEN L-SCB-Func-READ-Delim-BOOL
398      PERFORM 030-Validate-Handle-NonZero
399      PERFORM 500-READ-Delim
400      WHEN L-SCB-Func-WRITE-BOOL
401      PERFORM 030-Validate-Handle-NonZero
402      PERFORM 300-WRITE
403      WHEN L-SCB-Func-WRITE-Delim-BOOL
404      EVALUATE TRUE
405      WHEN L-SCB-Delim-Unix-BOOL
406      PERFORM 030-Validate-Handle-NonZero
407      PERFORM 300-WRITE
408      MOVE 1 TO WS-Arg-Length-NUM
409      MOVE X"0A" TO WS-Delim-Buffer-TXT
410      WHEN L-SCB-Delim-Windows-BOOL
411      PERFORM 030-Validate-Handle-NonZero
412      PERFORM 300-WRITE
413      MOVE 2 TO WS-Arg-Length-NUM
414      MOVE X"0D0A" TO WS-Delim-Buffer-TXT
415      WHEN OTHER
416      MOVE -4 TO L-SCB-Return-CD
417      PERFORM 099-ERROR-Return
=====

```

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```

=====
418             END-EVALUATE
419             CALL "CBL_WRITE_FILE" USING L-SCB-Handle-NUM
420                                     L-SCB-Offset-NUM
421                                     WS-Arg-Length-NUM
422                                     0
423                                     WS-Delim-Buffer-TXT
424             PERFORM 040-Check-WRITE-SCB-Return-CD
425             ADD WS-Arg-Length-NUM TO L-SCB-Offset-NUM
426             WHEN OTHER
427                 MOVE -1 TO L-SCB-Return-CD
428             PERFORM 099-ERROR-Return
429             END-EVALUATE
430             GOBACK
431             .
432             020-Validate-Handle-Zero SECTION.
433                 IF L-SCB-Handle-NUM NOT = ZERO
434                     MOVE 10 TO L-SCB-Return-CD
435                     PERFORM 099-ERROR-Return
436             END-IF
437             .
438             030-Validate-Handle-NonZero SECTION.
439                 IF L-SCB-Handle-NUM = ZERO
440                     MOVE 10 TO L-SCB-Return-CD
441                     PERFORM 099-ERROR-Return
442             END-IF
443             .
444             040-Check-WRITE-SCB-Return-CD SECTION.
445                 IF RETURN-CODE < 0
446                     MOVE -3 TO L-SCB-Return-CD
447                     PERFORM 099-ERROR-Return
448             END-IF
449                 IF RETURN-CODE = 30
450                     MOVE 12 TO L-SCB-Return-CD
451                     PERFORM 099-ERROR-Return
452             END-IF
453                 MOVE 00 TO L-SCB-Return-CD
454             .
455             050-Check-READ-SCB-Return-CD SECTION.
456                 IF RETURN-CODE < 0
457                     MOVE -3 TO L-SCB-Return-CD
458                     PERFORM 099-ERROR-Return
459             END-IF
460                 IF RETURN-CODE = 10
461                     MOVE 01 TO L-SCB-Return-CD
462                     GOBACK
463             END-IF
464                 MOVE 00 TO L-SCB-Return-CD
465             .
466             060-Identify-TEMP SECTION.
=====

```

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```

=====
467      ACCEPT WS-Env-Temp-TXT FROM ENVIRONMENT "TEMP"
468      EVALUATE TRUE
469          WHEN WS-Env-Temp-TXT (1:1) = "/"
470              MOVE "/" TO WS-Slash-CHR
471          WHEN WS-Env-Temp-TXT (2:1) = ":"
472              MOVE "\" TO WS-Slash-CHR
473          WHEN OTHER
474              MOVE "/tmp" TO WS-Env-Temp-TXT
475              MOVE "/" TO WS-Slash-CHR
476      END-EVALUATE
477      .
478      099-ERROR-Return SECTION.
479          IF L-SCB-Error-Routine-NUM NOT = 0
480              CALL "CBL_EXIT_PROC" USING 0, L-SCB-Error-Routine-PTR
481              STOP RUN
482          END-IF
483          GOBACK
484      .
485      100-OPEN SECTION.
486          IF (L-SCB-Mode-Input-BOOL OR L-SCB-Mode-Both-BOOL)
487          AND (L-SCB-Filename-TXT = SPACES OR LOW-VALUES)
488              MOVE 11 TO L-SCB-Return-CD
489              PERFORM 099-ERROR-Return
490          END-IF
491          EVALUATE TRUE
492              WHEN L-SCB-Filename-TXT = SPACES OR LOW-VALUES
493                  PERFORM 060-Identify-TEMP
494                  MOVE SPACES TO L-SCB-Filename-TXT
495                  COMPUTE
496                      WS-8-Digit-NUM =
497                      RANDOM(SECONDS-PAST-MIDNIGHT) * 100000000
498                  END-COMPUTE
499                  STRING
500                      TRIM(WS-Env-Temp-TXT,TRAILING)
501                      WS-Slash-CHR
502                      "STREAMIO-"
503                      WS-8-Digit-NUM
504                      ".dat"
505                      DELIMITED BY SIZE
506                      INTO L-SCB-Filename-TXT
507              WHEN L-SCB-Filename-TXT(1:1) = "."
508                  PERFORM 060-Identify-TEMP
509                  IF L-SCB-Filename-TXT(2:1) = SPACE
510                      MOVE SPACES TO WS-256-Byte-TXT
511                  ELSE
512                      MOVE L-SCB-Filename-TXT TO WS-256-Byte-TXT
513                  END-IF
514              MOVE SPACES TO L-SCB-Filename-TXT
515              COMPUTE WS-8-Digit-NUM =
=====

```

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```

=====
516          RANDOM(SECONDS-PAST-MIDNIGHT) * 100000000
517          STRING
518          TRIM(WS-Env-Temp-TXT,TRAILING)
519          WS-Slash-CHR
520          "STREAMIO-"
521          WS-8-Digit-NUM
522          TRIM(WS-256-Byte-TXT,TRAILING)
523          DELIMITED BY SIZE
524          INTO L-SCB-Filename-TXT
525      END-EVALUATE
526      EVALUATE TRUE
527          WHEN L-SCB-Mode-Input-BOOL
528              MOVE 1 TO WS-Access-Mode-CD
529          WHEN L-SCB-Mode-Output-BOOL
530              MOVE 2 TO WS-Access-Mode-CD
531          WHEN L-SCB-Mode-Both-BOOL
532              MOVE 3 TO WS-Access-Mode-CD
533          WHEN OTHER
534              MOVE -2 TO L-SCB-Return-CD
535              PERFORM 099-ERROR-Return
536      END-EVALUATE
537      CALL "CBL_OPEN_FILE" USING TRIM(L-SCB-Filename-TXT,TRAILING)
538                               WS-Access-Mode-CD
539                               0
540                               0
541                               L-SCB-Handle-NUM
542      IF RETURN-CODE = 35
543          MOVE 11 TO L-SCB-Return-CD
544          PERFORM 099-ERROR-Return
545      END-IF
546      IF RETURN-CODE < 0
547          MOVE -2 TO L-SCB-Return-CD
548          PERFORM 099-ERROR-Return
549      END-IF
550      MOVE 00 TO L-SCB-Return-CD
551      MOVE 0 TO L-SCB-Offset-NUM
552      .
553      200-CLOSE SECTION.
554      CALL "CBL_CLOSE_FILE" USING L-SCB-Handle-NUM
555      IF RETURN-CODE < 0
556          MOVE -2 TO L-SCB-Return-CD
557          PERFORM 099-ERROR-Return
558      END-IF
559      MOVE 00 TO L-SCB-Return-CD
560      MOVE 0 TO L-SCB-Handle-NUM
561      .
562      300-WRITE SECTION.
563      CALL "C$PARAMSIZE" USING 2
564      MOVE RETURN-CODE TO WS-Arg-Length-NUM
=====

```

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```

=====
565          CALL "CBL_WRITE_FILE" USING L-SCB-Handle-NUM
566                                     L-SCB-Offset-NUM
567                                     WS-Arg-Length-NUM
568                                     0
569                                     L-Arg2-TXT
570      PERFORM 040-Check-WRITE-SCB-Return-CD
571      ADD WS-Arg-Length-NUM TO L-SCB-Offset-NUM
572      .
573  400-READ SECTION.
574      CALL "C$PARAMSIZE" USING 2
575      MOVE RETURN-CODE TO WS-Arg-Length-NUM
576      MOVE SPACES TO L-Arg2-TXT(1:WS-Arg-Length-NUM)
577      CALL "CBL_READ_FILE" USING L-SCB-Handle-NUM
578                                     L-SCB-Offset-NUM
579                                     WS-Arg-Length-NUM
580                                     0
581                                     L-Arg2-TXT
582      PERFORM 050-Check-READ-SCB-Return-CD
583      ADD WS-Arg-Length-NUM TO L-SCB-Offset-NUM
584      .
585  500-READ-Delim SECTION.
586      CALL "C$PARAMSIZE" USING 2
587      MOVE RETURN-CODE TO WS-Arg-Length-NUM
588      MOVE SPACES TO L-Arg2-TXT(1:WS-Arg-Length-NUM)
589      CALL "CBL_READ_FILE" USING L-SCB-Handle-NUM
590                                     L-SCB-Offset-NUM
591                                     WS-Arg-Length-NUM
592                                     0
593                                     L-Arg2-TXT
594      PERFORM 050-Check-READ-SCB-Return-CD
595      MOVE 0 TO WS-Tally-NUM
596      INSPECT L-Arg2-TXT(1:WS-Arg-Length-NUM)
597          TALLYING WS-Tally-NUM FOR ALL X"OA"
598      IF WS-Tally-NUM = 0 *> No LF found - return truncated data and position past n
ext LF (if any)
599          IF L-Arg2-TXT(WS-Arg-Length-NUM:1) = X"OD"
600              MOVE SPACE TO L-Arg2-TXT(WS-Arg-Length-NUM:1)
601          END-IF
602      ADD WS-Arg-Length-NUM TO L-SCB-Offset-NUM
603      MOVE 02 TO L-SCB-Return-CD
604      MOVE 256 TO WS-Arg-Length-NUM
605      PERFORM UNTIL 0 = 1
606          MOVE SPACES TO WS-Buffer-TXT
607          CALL "CBL_READ_FILE" USING L-SCB-Handle-NUM
608                                     L-SCB-Offset-NUM
609                                     WS-Arg-Length-NUM
610                                     0
611                                     WS-Buffer-TXT
612      IF RETURN-CODE < 0
=====

```

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```

=====
613             MOVE -3 TO L-SCB-Return-CD
614             PERFORM 099-ERROR-Return
615             END-IF
616             IF RETURN-CODE = 10
617                 GOBACK
618             END-IF
619             MOVE 0 TO WS-Tally-NUM
620             INSPECT WS-Buffer-TXT
621                 TALLYING WS-Tally-NUM FOR ALL X"OA"
622             IF WS-Tally-NUM = 0
623                 ADD 256 TO L-SCB-Offset-NUM
624             ELSE
625                 MOVE 0 TO WS-Tally-NUM
626                 INSPECT WS-Buffer-TXT
627                     TALLYING WS-Tally-NUM
628                     FOR CHARACTERS BEFORE INITIAL X"OA"
629                 ADD WS-Tally-NUM, 1 TO L-SCB-Offset-NUM
630                 GOBACK
631             END-IF
632             END-PERFORM
633             ELSE             *> There is (at least) one LF in the buffer
634             MOVE 0 TO WS-Tally-NUM
635             INSPECT L-Arg2-TXT(1:WS-Arg-Length-NUM)
636                 TALLYING WS-Tally-NUM
637                 FOR CHARACTERS BEFORE INITIAL X"OA"
638             ADD WS-Tally-NUM, 1 TO L-SCB-Offset-NUM
639             IF WS-Tally-NUM > 1
640                 IF L-Arg2-TXT(WS-Tally-NUM:1) = X"OD"
641                     COMPUTE WS-Arg-Length-NUM =
642                         WS-Arg-Length-NUM
643                         - WS-Tally-NUM
644                         + 1
645                 ELSE
646                     COMPUTE WS-Arg-Length-NUM =
647                         WS-Arg-Length-NUM
648                         - WS-Tally-NUM
649                     ADD 1 TO WS-Tally-NUM
650                 END-IF
651             MOVE SPACES
652                 TO L-Arg2-TXT(WS-Tally-NUM:WS-Arg-Length-NUM)
653             ELSE
654             MOVE SPACES
655                 TO L-Arg2-TXT(1:WS-Arg-Length-NUM)
656             END-IF
657             END-IF
658             .
=====

```

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PROGRAM-ID	Identifier/Register/Function	Defn	Where Defined	References	Page: 15	
=====	=====	=====	=====	=====	=====	
STREAMIO	000-Main	383	PROCEDURE			
STREAMIO	020-Validate-Handle-Zero	432	PROCEDURE	392		
STREAMIO	030-Validate-Handle-NonZero	438	PROCEDURE	387	395	398
				401	406	411
STREAMIO	040-Check-WRITE-SCB-Return-CD	444	PROCEDURE	424	570	
STREAMIO	050-Check-READ-SCB-Return-CD	455	PROCEDURE	582	594	
STREAMIO	060-Identify-TEMP	466	PROCEDURE	493	508	
STREAMIO	099-ERROR-Return	478	PROCEDURE	417	428	435
				441	447	451
				458	489	535
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