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19A.

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FORTRAN NOTE 16
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Consolidated Leader Listing and Private Error Codes

This Fortran Note describes in detail the format of the listing of the consolidated leader. The interpretation of the private error code number printed out when an error occurs is also explained.

Note: This facility has been implemented for internal use only at present, since the consolidated leader is printed without any frills and without any explanation. Listing facilities in issued compilers may differ radically.

Consolidated Leader

A listing of the consolidated leader will only occur if the statement "LEADER" is present within the program description.

The appendix shows a typical example of such a listing which is explained in the following notes.

a) The relativisor block, (=)

This block contains ten octal fields, followed by the terminator '4', with the significance:

Octal field	Starting address of	Mnemonic
43	Lower workspace	W
45	Lower variables	V
61	Lower common variables	
100	Lower present	C
310	Literals	LT
311	Lower common preset	
2421	Upper preset	UC
2515	Upper common preset	
2515	Upper variables	UV
2651	Upper common variables	

b) The parameter block, (>)

The Fortran compiler puts out five octal fields; a typical example is :

633	Offset (used by GPL)
0	Release instruction (null in this case)
51576445	Program name in character form (I6TE)
3350	Total core store used
201	Listspace used during compilation

c) The cue blocks, (?)

These contain two fields : an octal field and a character field. In the octal field, the top two digits give the type of field and the bottom five digits give the starting address within core store. The character field contains the name associated with the cue (% indicates that it is a private routine).

Cue value	Type	Rest of word
41	Program	Starting address
33	Lower common preset	" "
23	Lower common variable	" "
04	Peripheral	## xy(x = type, y = unit)
02	Entry	Entry address
00	Blank	#70077
03	Upper common variable	Starting address
13	Upper common preset	" "

Thus using the information contained in the consolidated leader it is possible to build up a complete picture of the core store giving both starting address of area and size of area.

Private Error Code

The compiler has recently been modified so that every time an error occurs, and provided full listing mode has been specified, the contents of accumulator X0 are printed out in octal . Since the vast majority of subroutines in the compiler use X0 to store the link, this provides a method, in conjunction with a printout of the consolidated leader of the relevant version of the compiler, of locating where the error occured.

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12.10.65.

Appendix - Example of Listing

```
FORTRAN COMPILATION BY #FORT MK 1A   DATE 14/09/65

    NAME(IOTEST)                                    )
    LIST                                            )
    LEADER                                          ) Program Description
    INPUT 4, 7=TRO                                  )
    OUTPUT 3, (MONITOR)=TPO                         )
    OUTPUT 1=LPO                                    )
    MASTER PL04
    DIMENSION A(13)
    F = 3, 1415926536/180
    DO 1 I = 0, 360, 3
    X = I * F
    KS = 50 + NINT (SIN(X) * 50  )
    KC = 50 + NINT (COS(X) * 50  )
    CALL PLOT (64, 10, 101, A(1) )
    CALL PLOT (51, KS, 101, A(1) )
    CALL PLOT (35, KC, 101, A(1) )
1   WRITE (1, 2)  I, A(1)
2   FORMAT (I4, 3XA101)
    PAUSE JJ
    END

END OF SEGMENT PL04, LENGTH   72


    FINISH

=  43 45 61 100 310 311 2421 2515 2515 2651 4
>  633 0 51576445 3350 201 4
?  41000324  %%%F 4
?  33000311  %FIOLIST 4
?  23000061  %FIOPT   4
?  40000000  %TPO 4
?  40000010  %TPC 4
?  23000062  %FIOLP   4
?  40000200  %LPO 4
?  41000324  PL04 4
?  41000434  %FAP4    4
?  41002343  NINT 4
?  41002227  SIN  4
?  41002224  COS  4
?  41002361  PLOT 4
?  41000702  %FINOUT  4
?  23000063  %LIB 4
?  23000073  %FMC 4
?  23000076  AAAA 4
?  23000077  %FIOCARD 4
PROGRAM NAME ## IOTE, CORE  1768
END OF COMPILATION - NO ERRORS
```