COMPUTATION CENTER
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SUBJECT: Symbol Table Files

The following scheme is being proposed for criticism.

MAD and FAP will generate symbol table files in addition to BSS files and optional listing files. These translators will translate only the first subprogram in file α,β, and will generate the symbol table file α,SYMTAB (note change from SYMTB). This symbol table file will consist of a number of subtables constructed in a modular fashion. No program should assume a particular ordering of these subtables. Thus, programs which expect certain subtables will not be confused when finding other subtables.

The symbol table file will have the following format where all BCD information is left justified and is indicated below by capital letters:

1st word - TABLE which indicates that this is the beginning of a new symbol table. This identifier is necessary in order to allow a user to combine symbol table files together.

2nd word - Primary name of source program file.

3rd word - MAD or FAP.

4th through last word - As many non-empty subtables as are required. These subtables will have the following form:

1st word - One of the following BCD identifiers to indicate the type of subtable.

ENTRY (MAD and FAP) - entry points and values

SYMBØL (MAD and FAP) - symbols and values

SEQNØS (MAD and FAP) - sequence numbers and values

TV (MAD and FAP) - transfer vector and function dictionary

DIM (MAD) - dimension variables and lengths

MAP (MAD and FAP) - map of program areas

2nd word - The number of words W in the subtable not counting the first two. Empty subtables will be omitted entirely, thus W will never be zero.

3rd through (W+2)nd words - The pertinent information as described below.

DESCRIPTION OF SUBTABLES

ENTRY (MAD and FAP) - This subtable contains a list of the BCD symbols designated as entry points in the j th locations and their relative values in the address part of the (j + 1) st locations. A main subprogram will have the single entry point (MAIN).

Examples:

```
BCI 1,ENTRY          BCI 1,ENTRY
PZE 4                PZE 2
BCI 1,SUB            BCI 1,(MAIN)
PZE 7                PZE 5
BCI 1,SUB1
PZE 200
```

SYMBOL (MAD and FAP) - This subtable contains the BCD symbols in the i th locations and their values in the (i + 1) st locations as follows:

FAP: right half - value of symbol

bit 12	Boolean symbol
13	symbol value set by SET pseudo-op
14	multiply defined symbol
15	transfer vector symbol
16	common variable
17	relocatable symbol

MAD: address - value of symbol

tag 0	floating point
1	integer
2	Boolean
3	function name
4	statement label

decrement - address of dimension vector or 0

bit 2 - format variable

bit 0 - an array of one or more dimensions

SEQN$S (MAD and FAP) - This subtable contains the sequence number and the value of the next location to be assigned by the translator when it read the card but before it processed the card.

1. right half - binary value of the number in the sequence field (maximum of 5 decimal digits) of the card.

2. decrement - value of next location to be assigned by the translator.

3. prefix - 0.

Since this subtable will contain one entry for every symbolic card, the following compression scheme will be important. This compression will be used where two or more cards generate the same number of instructions and have the same increment in sequence numbers. For every sequence of C cards which each generate M locations (M = 0,1,...,6) and for which the difference between its sequence number and the one following it is N, only one word will appear in the subtable as follows:

1. right half - N

2. decrement - C

3. prefix - M + 1 (1,2,...,7)

TV (MAD and FAP) - This subtable contains a list of the BCD symbols appearing in the transfer vector in order of increasing relative address. In MAD this will be extended to include the internal function transfer vector.

DIM (MAD) - This subtable contains a list of all dimensioned variables and their lengths. Each dimensioned variable will use two words; the first is its BCD name and the second contains the first location (the location corresponding to the linear subscript zero) in the address and the true length (one more than the number in the dimension statement) in the decrement.

loc of dim vector?

MAP (MAD and FAP) - This subtable contains a map of the program areas within the subprogram. The form of this table is pairs of words, the pairs appearing in any order. The first word in the pair will contain a BCD word to identify the type of area. The second word has the following form:

1. address - the relative address of the first word in the program area

2. decrement - the length of this program area

The program areas along with their BCD names are:

LENGTH (MAD and FAP) total length of subprogram
TV (MAD and FAP) transfer vector
VAR (MAD) variables
LIT (MAD and FAP) literals
RMT (FAP) expansion of remote sequences at end
PRØG (MAD and FAP) programmed instructions
TEMP (MAD) temporary storage
CØMMØN (MAD and FAP) common storage

OUTLINE OF A SYMBOL TABLE FILE