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TECHNICAL MEMORANDUM

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Utility System Programming Proposals

Proposal for a BLOCK Pseudo Operation in LARII

By

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Approved

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Proposal for a BLOCK Pseudo Operation in LARII

Sometimes it is desirable to combine several sub-programs, written by several different programmers, into a single program. At other times it is necessary to incorporate a general purpose subroutine into an operational program. In both of these instances there is the possibility that one or more sets of duplicate symbols may occur between the programs being combined. It is because of this problem that we are proposing a new pseudo operation called BLOCK. BLOCK would be used to segregate a program into logically separate regions for assembly.

Each logical section of the program would be preceded by a BLOCK pseudo op containing the block name to be associated with all the location symbols in this section. Certain program areas need to be shared by two or more unique program blocks. These common areas would be preceded by a BLOCK pseudo containing a block name of all blanks. The common program areas would be referred to as SHARE areas.

General Usage

Each block would have a distinct name (BLOCK names have no relation to program tags). Ordinary references to symbols would be treated in the following manner: If the reference is within a block, the symbols in that block are searched first. If the symbol is not found, the share area is searched. If it is not found there, the symbol is treated as an undefined. If the reference is within the share area, the share area only is searched for the symbol with a resulting undefined if it is not found.

Communication between blocks would be accomplished by the following notation: A(B), where A is the symbol to be found, and B is the block which contains the correct A. If A is not found in the B block, the share area is searched automatically with a resulting undefined if it is not found there.

Pseudo Instructions

The constituents of the BLOCK pseudo are:

1. Blanks in the location field.
2. The word BLOCK in the operation field.
3. The name of this block in the M-term. This name must be seven characters or less (each character must be a letter or digit) and must contain at least one letter. A string of digits followed by the letter "B" is not allowed.
4. If the M-term is blank, a share area will be formed. This area is treated differently from a regular block in that it is searched automatically if any reference cannot be found elsewhere.

This instruction directs the assembler to consider all the symbols which are defined by the following cards to be classified as a part of the block name specified. This grouping is terminated with another BLOCK pseudo. Upon termination, the following symbols go under the new block name or into a share area in the case when no name is given with the BLOCK pseudo.

When a reference to a symbol is given from within the share area, the share block only is searched. If a reference is not found within a block, the share block is searched as described above. If the share area is referenced from within some block the notation is: A ( ). The symbol A is searched for in the share block only when the block name is blank.

Programs which use the BLOCK pseudo may or may not have share areas.

Blocking a Program

One block can consist of more than one part. The first time a BLOCK pseudo with a distinct name is encountered, a block with that name is set up. If

another BLOCK pseudo with the same name is found, the previous block will be added to accordingly. Similarly, more than one share definition may exist in a program.

If the first portion of the program is not blocked, it will automatically be a share portion. Similarly, a program which contains no BLOCK pseudo is just one share block. If a blocked program contains no share block, then a reference within a block is searched for in that block only. Also, any reference to the share block will be undefined.

The processing of EQU cards would be the same as described in TM-890/009/00 with the following provision: When defining equates, the processing of the M-term would follow the rules given above according to blocks and the process outlined in TM-890/009/00 would be carried to completion for each block (and the share block) of the program.

Example

Suppose a programmer wished to merge the following programs:

				STA		X			
	LDA	A		LDQ		A	A	EQU	B
	ADD	B		STQ		B	B	EQU	C
	STA	C		ENQ	7	C	C	EQU	10B
	STA	X	A	OCT		77			
			B	OCT		0		ENA	C
A	DEC	100	C	OCT		60		STA	A (of the first block)
B	DEC	50							
C	BSS	1	X	BSS		1			

If these three decks were merged in the following manner the A, B and C of each program would remain separate; the reference to A in the third program would refer to the A of the first program; any reference to X in any of the

programs would be to the X in the share block; the equates in the third program would be defined correctly regardless of any other equates in the first or second program.

```
      IDENT
      BLOCK    A1
      LDA      A
      ADD      B
      STA      C
      STA      X
      BLOCK    A2
      STA      X
      LDQ      A
      STQ      B
      ENQ  7   C
      BLOCK    A3
A     EQU      B
B     EQU      C
C     EQU      10B
      ENA      C
      STA      A(A1)
      BLOCK    A1
A     DEC      100
B     DEC      50
C     BSS      1
      BLOCK    A2
A     OCT      77
B     OCT      0
C     OCT      60
      BLOCK
X     BSS      1
      END
```

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Proposes a pseudo operation called BLOCK
in LARII (Lockheed Assembly Routine). States
that BLOCK would segregate a program into UNCLASSIFIED

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logically separate regions for assembly UNCLASSIFIED
and that each section would be
preceded by a BLOCK pseudo operation
containing the block name associated
with all the location symbols in this
section. Reports that certain program
areas need to be shared by two or more
unique program blocks, that these areas
could be preceded by a BLOCK pseudo
containing a block name of all blanks
and referred to as SHARE areas. UNCLASSIFIED