HARDWARE OVERVIEW

APPENDIX A

HARDWARE OVERVIEW

INTRODUCTION

This section is an overview of Burroughs large systems hardware. Because of hardware differences among large systems the hardware overview is divided into five sections as follows:

B7800 hardware

B7900 hardware

B5900 hardware

B6900 hardware

B5900/B6900 I/O Overview

B7800 HARDWARE OVERVIEW

GENERAL

The Burroughs B7800 information processing system is a large scale, multiprogramming and multiprocessing computing system. The hardware is controlled by the Burroughs Master Control Program (MCP) and can be tailored to the processing needs of a user by arranging Central Processor Modules (CPM), Input/Output Modules (IOM), and Memory Control Modules (MCM) on an electronic grid, or exchange (figure 1-1). The MCP can be changed dramatically by merely setting or resetting run time options with simple operator input commands. The system may be balanced by other operator instructions (and dynamically by the MCP) that control the interaction of the independently operating CPM's, IOM's, and MCM's. The throughput of the system as a whole is maximized, but the performance of no single element of the system is maximized to the neglect or detriment of others.

The key to the efficient balanced use of the system is the Burroughs Master Control Program, a unique executive software operating system that automatically makes optimum use of all system resources. It is this operating system that makes multiprogramming and multiprocessing both functional and practical by dynamically controlling system resources and scheduling jobs in the multiprogramming mix. The MCP allocates system resources to meet the needs of the programs introduced into the computer. It continually and automatically reassigns resources, starts jobs, and monitors their performance.

Further implications of the modularity and flexibility of the system are its expandability (a capacity to add hardware modules without reprogramming) and its increased reliability (and, thus, increased availability to the user). This reliability is achieved by the use of failsoft techniques that (error detection and correction, redundancy of power supplies) exclude faulty modules from the system and permit processing to continue (without reprogramming) with a temporarily reduced configuration.

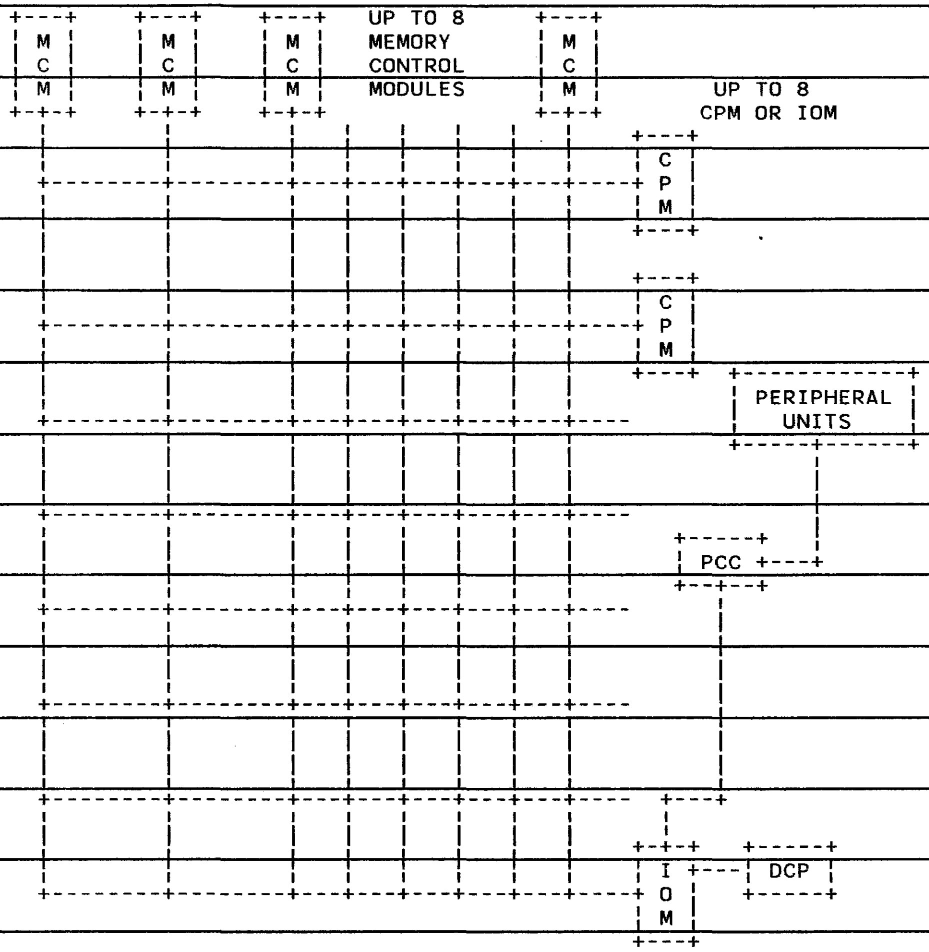


Figure 1-1. B7800 Exchange

SYSTEM CONFIGURATION

Physically, the components of the system fall into three categories, as follows:

1. Central components of the system: Central Processor Module (CPM), Input/Output Module (IOM), Memory Control Module (MCM), Maintenance Diagnostic Processor (MDP), and operator's console.

2. Standard Burroughs cabinets that contain peripheral controls and exchanges, Data Communications Processor (DCP), and AC power supplies.

3. Peripheral devices that are joined to the central system by means of peripheral controls and exchanges. Remote devices that are joined to the central system by means of line adapters and the data communications processor.

The arrangement of these components into a system and the size of the system depend on the application and workload of the user.

HARDWARE REVIEW

Before looking at the MCP it is important for the student to have a good understanding of the hardware. Each module on the system will be discussed. The discussion will start with a general overview of the system and follow with detailed information on each module.

Figure 1-2 is a diagram of a system which is composed of Central Processor Modules (CPM), Input/Output Modules (IOM), Memory Control Modules (MCM) and Data Communication Processors (DCP).

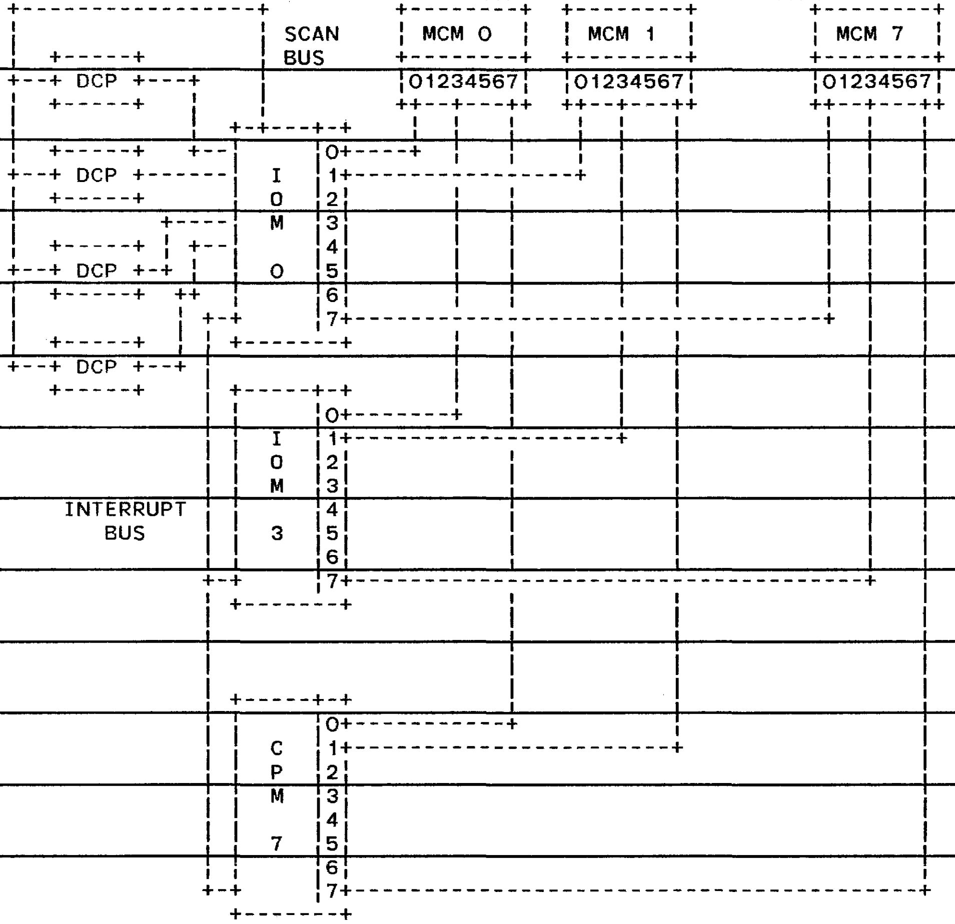


Figure 1-2. B7800 SYSTEM

The following general comments can be made about the system.

1. Each module on the system is independently powered.

2. All CPM's and IOM's are connected with an interrupt bus.

3. There is a scan bus that connects an IOM and the DCP's on that IOM.

4. The DCP's on an IOM will use the IOM's memory access logic.

5. Each CPM has a time of day clock.

6. There is one master clock for the system. It has it's own power supply.

A general discussion of each system component follows. This discussion is intended to give the student an overview of the system.

MEMORY

All memory will do single bit error correction and multi-bit error detection. Access to memory is phased (interleaved). All requestors will take advantage of memory phasing. The IOM will make four word requests to an MCM. CPM's will make four or eight word requests to an MCM. A planar memory MCM will return at most four words. An IC memory MCM will return at most eight words. Thus, the number of words returned for a given request is based on the type of memory.

CPM

The CPM has a 2K word data buffer and a 2K word code buffer. There is a 32 word store queue which will buffer data before it is sent to memory. Thus, memory accesses can be grouped into multi-word stores. Also repeated stores to an address can be eliminated, only the newest data will be written to memory. The local buffers in the CPM will attempt to keep memory requests to a minimum and will try to have code and data ready for the execution unit. Thus, the CPM can overlap fetching of data with execution of instructions.

IOM

An IOM has up to 28 fixed channels. Each channel has its own (2 four word) buffers. Data is transfered to and from the IOM in 4 word groups. The IOM does it's own path checking and can handle a queue of I/O's, not just one at a time. I/O results are reported in a queue. Thus, an IOM need not interrupt a CPM for an I/O finish. The IOM will handle conditional seek logic for disk packs. The IOM uses MCP generated I/O queues and an I/O map.

MDP

Maintenance Diagonistic Processing (MDP) is used for testing mainframe modules (CPM, IOM and MCM), testing logic cards and PROM programming. MDP can be run online with a CPM or with the Maintenance Processor (MP). The MP is a B800 system. Thus, maintenance operations can be run by a CPM or the B800. The MP can be connected to a datacomm line so remote diagnostics can be done.

MAXIMUM CONFIGURATION

8 Processors (IOM and CPM)
8 MCM's (2.5 million words usable)
255 Units
8 DCP's

The following part of this review will give a more detailed discussion of the MCM, CPM and IOM. In addition, the MCP interface with the IOM will be discussed.

MEMORY

Memory Control Modules (MCM's) form the interface between a requestor (IOM and CPM) and memory. Each requestor is connected to each MCM. A system can be configured with up to 8 MCM's. The MCM is connected to memory storage cabinets which contain actual memory storage (planar or IC memory).

Figure 1-3 shows two MCMs with planar memory. Each MCM can have up to 2 Memory Storage Cabinets (MSC). Each MSC has 2 Memory Storage Units (MSU). A MSU has 65K words. Planar memory will phase at most 4 words. Thus, the maximum number of words that can be transfered in one operation is 4 words. Following is the amount of time required to transfer 4 words using planar memory.

1 MSC/MCM 3.75 microseconds (2 word phased)
2 MSC/MCM 2.125 microseconds (4 word phased)

Figure 1-4 is a diagram of a MCM with IC memory. Each MCM can have up to 2 Memory Storage Cabinets (MSC). A MSC can have up to four Memory Storage Units (MSU). Each MSU has 131K words. Memory is phased at the MSU level and will phase at most 8 words. Thus, the maximum number of words that can be transfered in one operation is 8 words. Following is the amount of time required to transfer the number of words indicated using IC memory.

1.87 microseconds for 4 words
2.37 microseconds for 8 words

There are two models of MCM's (model II and model III). A model II MCM can control 256K words of memory. A model III MCM can control 1 million words of memory. This configuration (1 MCM with 1 million words) would provide only one path to memory and could cause performance problems. Better performance could be achieved by using two model III MCM's with each MCM controlling 500K words.

A requestor can address 1 million words. Therefore a monolithic system can use at most 1 million words. More memory can be configured but would not be usable. Any additional memory could be used if the system was split into two systems. A system running tightly coupled can use up to 2 million words (2.5 million words using model III MCM's). This tightly coupled configuration (2.5 million words) would require 5 model III MCM's, 4 CPM's and 4 IOM's.

Words stored in memory are 60 bits as follows:

- 8 bits for error correction and detection. This allows single bit error correction and multi-bit error detection.

- 52 data bits are transfered to and from requestor.
  - 48 data
  - 3 tag
  - 1 parity

The MCM is responsible for:

- Buffering multi word transfers to and from a requestor (memory phasing).

- Locking out MCM's to requestors. This is used when the system is split or running tightly coupled. Requestors are locked out by setting requestor inhibit switches on the MCM. These switches can be set by the operator or the MCP.

- Controlling requestor priority.

- Doing error correction and detection.

- Broadcasting which addresses the MCM controls. The address range switches (UPPER and LOWER) specify the memory addresses a MCM spans. These switches can be set by the operator or MCP. The register contains the six most significant bits of the address that is controlled by this MCM.

- Maintaining the MSU status register which specifies which MSU's are available. These switches can be set by the operator or MCP.

One should note a requestor (not the MCM) must keep track of how many words are received from a memory request. If all words that were requested were not received a request for the remaining words must be made. For example, if a request is made for 8 words from an MCM that is only 4 way phased, only 4 words are returned. The requestor must change the word count and memory address in the MCM control word and make the request to the MCM again.

As an example of how these switches are set, assume a system is configured as follows: (see figure 1-3)

2 MCM (MCM 1 and MCM 4)   4 MSU each (planar MSU)
1 IOM (IOM 1)
1 CPM (CPM 5)

The switches should be set as follows:

MCM	LOWER	UPPER	INHIBIT	MSU STATUS
1	000000	001111	11011101	1111
4	010000	011111	11011101	1111

```
         +--------+     +--------+
         |        |     |        |
         |  IOM   |     |  CPM   |
         |   1    |     |   5    |
         |        |     |        |               MODEL II MCMS
         +--------+     +--------+              (PLANAR MEMORY)
         |01234567|     |01234567|
         +-+--+---+     +-+--+---+
           |  |           |  |                      +----------------------+
           |  |           |  |                      | +-------+  +-------+ |
           |  |           |  |      +-----------+   | | MSU   |  | MSU   | |
           |  |           |  |      | 0 |       +---+ |65 KW  |  |65 KW  | |
           +-- ----------- -- ------+ 1 |       |   | +-------+  +-------+ |
              |           |  |      | 2 |       |   +----------------------+
              |           |  |      | 3 |  MCM  |             MSC
              |           |  |      | 4 |   1   |
              |           +-- ------+ 5 |       |   +----------------------+
              |              |      | 6 |       |   | +-------+  +-------+ |
              |              |      | 7 |       +---+ | MSU   |  | MSU   | |
              |              |      +-----------+   | |65 KW  |  |65 KW  | |
              |              |                      | +-------+  +-------+ |
              |              |                      +----------------------+
              |              |                                MSC
              |              |
              |              |
              |              |                      +----------------------+
              |              |                      | +-------+  +-------+ |
              |              |      +-----------+   | | MSU   |  | MSU   | |
              |              |      | 0 |       +---+ |65 KW  |  |65 KW  | |
              +-------------- ------+ 1 |       |   | +-------+  +-------+ |
                             |      | 2 |       |   +----------------------+
                             |      | 3 |  MCM  |             MSC
                             |      | 4 |   4   |
                             +------+ 5 |       |   +----------------------+
                                    | 6 |       |   | +-------+  +-------+ |
                                    | 7 |       +---+ | MSU   |  | MSU   | |
                                    +-----------+   | |65 KW  |  |65 KW  | |
                                                    | +-------+  +-------+ |
                                                    +----------------------+
                                                              MSC
```

Figure 1-3. MCM Configuration and Planar Memory

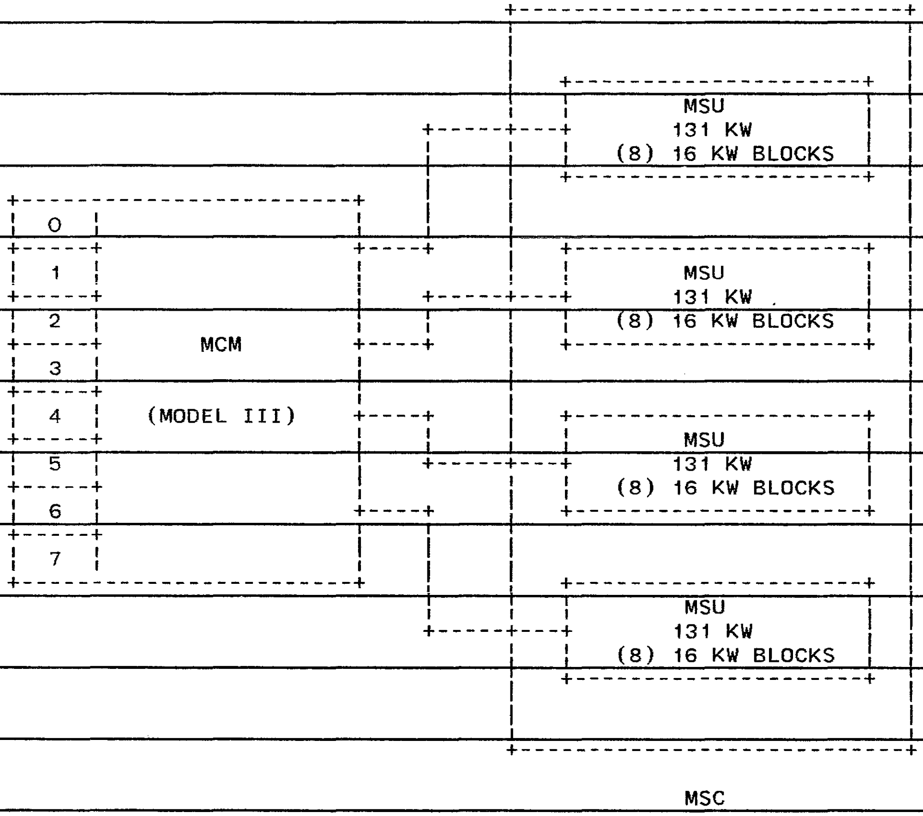


Figure 1-4. MODEL III MCM Block Diagram (IC Memory)

CPM

The CPM is composed of several independent asynchronous units. It is this independence that allows data fetches to be overlapped with instruction execution. The basic functions of these units in the CPM are described in the following paragraphs (see figure 1-5).

MEMORY ACCESS UNIT (MAU):

The memory access unit provides the memory interface for the CPM. The MAU is capable of doing simultaneous fetches and stores to memory as long as the addresses are not in the same MCM.

PROGRAM CONTROL UNIT (PCU):

The Program Control Unit (PCU) interprets object code and builds micro operators for the execution unit. These micro operators are placed in a queue for the execution unit. The PCU will pre process code doing operations such as taking unconditional branches, generating absolute addresses from relative addresses and operator concatenation. That is, join more than one instruction into a single micro op.

In addition, the PCU is responsible for allocation of registers in the Central Data Buffers (CDB).

EXECUTION UNIT (EU):

The Execution Unit (EU) performs the actual operations. These operators come from a queue built by the PCU.

The EU includes logic for short arithmetics, add operations less than 20 bits and multiply operations with results less than 16 bits.

DATA REFERENCE UNIT (DRU):

The Data Reference Unit (DRU) fetches data from associative memory or main memory so it can be used by the EU.

STORE QUEUE (SQ):

All stores to main memory go thru the store queue. The store queue will try to group adjacent words into a multi word write. In addition, it will test for repeated stores to the same address. This will help cut down on memory traffic.

LOCAL MEMORY (ASSOCIATIVE MEMORY):

The program buffer will hold up to 2K words of object code in the CPM. The data buffer will hold up to 2K words of data and control information.

CENTRAL DATA BUFFER (CDB):

The central data buffer (64 words) acts as storage and an exchange between CPM units.

INTERRUPT BUS:

Module to module interrupt line used to interrupt other CPM's and IOM's.

The CPM will do internal residue, parity and continuity checking. If errors are detected a CPM fail word is generated and an interrupt occurs. The CPM is also capable of instruction retry.

The CPM must read a register (62) every 8 to 16 seconds. If this is not done an EGG TIMER interrupt is generated. This will prevent the CPM from looping in control state.

```
+---+----------+-------------+----------------+-----------------+
| 0 |          |             |                |                 |
+---+          |   CENTRAL   |                |                 |
| 1 |          |    DATA     |                |                 |
+---+          |   BUFFER    |   EXECUTION    |     PROGRAM     |
| 2 |          |             |     UNIT       |     CONTROL     |
+---+  MEMORY  +-------------+                |      UNIT       |
| 3 |          |             |                |                 |
+---+  ACCESS  |    DATA     |                |                 |
| 4 |          |  REFERENCE  +----------------+-----------------+
+---+   UNIT   |    UNIT     |                *                 |
| 5 |          |             |        ASSOCIATIVE MEMORY        |
+---+          +-------------+                *                 |
| 6 |          |             |  DATA BUFFER   *   CODE BUFFER   |
+---+          | STORE QUEUE |   2K WORDS     *     2K WORDS    |
| 7 |          |             |                *                 |
+---+----------+-------------+----------------+-----------------+
```

Figure 1-5. CPM Block Diagram

The following discussion on associative memory is based on the B7800 CPM.

Figure 1-6 is a diagram of how the code buffer is set up. Three data structures are used. These structures are the address array, priority array and the actual code buffers.

To access a word in this part of associative memory bits [7:6] of the 20 bit address are used to get the block number. This block number is used to index the address array. By comparing bits [19:12] of the address with the eight groups in the block you can determine if the word you are looking for is present.

Assuming the address is present, bit [0:1] selects the EVEN or ODD buffers. The group number (determined in the address array) is used to choose a 128 word buffer. Bits [7:7] of the address are used to index into the 128 words.

The priority array has a three bit entry for each of the 64 blocks. It contains the next group number to be overlayed. When that group is overlayed the array value is incremented by one. When seven (111) is reached it will go back to zero (000).

```
          19                              +---+---+---+---+---+---+---+---+
         +---+---+---+---+---+         63 |   |   |   |   |   |   |   |   |
         |   |   |   |   |   |            +---+---+---+---+---+---+---+---+
         +---+---+---+---+---+            |   .   .   .   .   .   .   .   |
         |   |   |   |   |   |            |   .   .   .   .   .   .   .   |
         +---+---+---+---+---+     BLOCKS |   .   .   .   .   .   .   .   |
         |   |   |   |   |   |            |   .   .   .   .   .   .   .   |
         +---+---+---+---+---+            +---+---+---+---+---+---+---+---+
         |   |   |   |   |   |          1 |   |   |   |   |   |   |   |   |
         +---+---+---+---+---+            +---+---+---+---+---+---+---+---+
                            0           0 |   |   |   |   |   |   |   |   |
                                          +---+---+---+---+---+---+---+---+
          20 BIT ADDRESS                    7   6   5   4   3   2   1   0
                                                        GROUPS
          [19:12] ADDRESS ARRAY
          [07:06] BLOCK NUMBER                       ADDRESS ARRAY
          [00:01] SELECT BIT
                  (ODD OR EVEN)                      64 BLOCKS
          [07:07] USED TO INDEX INTO                    8 GROUPS
                  THE 128 WORD BUFFERS                     12 BIT ADDRESS
                                                            2 BIT RESIDUE


              +---------------+     +---------------+              +-----+
            7 |   128 WORDS   |   7 |   128 WORDS   |           63 |     |
              +---------------+     +---------------+              +-----+
              |       .       |     |       .       |              |  .  |
              |       .       |     |       .       |              |  .  |
        GROUP |       .       |     |       .       |              |  .  |
              +---------------+     +---------------+              |  .  |
            1 |   128 WORDS   |   1 |   128 WORDS   |        BLOCK |  .  |
              +---------------+     +---------------+              |  .  |
            0 |   128 WORDS   |   0 |   128 WORDS   |              +-----+
              +---------------+     +---------------+            1 |     |
                    EVEN                  ODD                      +-----+
                                                                 0 |     |
                          CODE BUFFERS                             +-----+

                    8 GROUPS                                      PRIORITY
                       128 WORDS                                   ARRAY
                          48 BITS CODE                            (3 BITS)
                           6 BITS PARITY (1 PER SYLLABLE)
                           1 BIT OVERALL PARITY
                           2 BITS ERROR
```

Figure 1-6. CODE BUFFER (Associative Memory)

Figure 1-7 is a diagram of how the data buffer is set up. Again three data structures are used. These include the address array, the priority array and the data array.

To access a word in this part of associative memory bits [8:6] of the 20 bit address are used to get the block number. As with the code buffer, this block is indexed in the address array. Bits [19:11] of the address are compared with the four groups to see if the address is present.

Assuming the address is present, the block number and the group number are used to locate the proper eight word group in the data array. Bits [2:3] of the address are used to get the proper word from the eight word group.

The priority array has 64 entries, 5 bits each. Two bits indicate the 'oldest' group in the block. Two bits indicate the 'second oldest' group in the block. The fifth bit determines the order of the other two groups. The fifth bit is set if the 'newest' group (number) has a greater value than the 'second newest' group (number).

The priority array is updated whenever new data is written to the data buffer and also whenever a word local to the buffer is accessed. If new data is to be loaded, the 'oldest' group entry is overlayed. If a word already local in the buffer is accessed it is moved to the 'newest' position in the priority array.

```
             19
            +---+---+---+---+---+    20 BIT MEMORY ADDRESS
            |   |   |   |   |   |
            +---+---+---+---+---+       [19:11] ADDRESS ARRAY
            |   |   |   |   |   |       [08:06] BLOCK NUMBER
            +---+---+---+---+---+
            |   |   |   |   |   |
            +---+---+---+---+---+
            |   |   |   |   |   |
            +---+---+---+---+---+
                               0




                +-----------------------------------------------+
               /                    GROUP 3                    /|
              +-----------------------------------------------+ |
             /                    GROUP 2                    /63+
            +-----------------------------------------------+  /|
           /                    GROUP 1                    / K/ |
          +-----------------------------------------------+ C/  |
         /                    GROUP 0                    / O/   |
        +-----+-----+-----+-----+-----+-----+-----+-----+ L/.   +
        | WRD | WRD | WRD | WRD | WRD | WRD | WRD | WRD |B/ .  /|
        |  7  |  6  |  5  |  4  |  3  |  2  |  1  |  0  |/  . / |
        +-----+-----+-----+-----+-----+-----+-----+-----+   ./ 1+
        |     .     .     .     .     .     .     .     |   /  /|
        |     .     .     .     .     .     .     .     |  / K/ +
        |     .     .     .     .     .     .     .     | / C/ O/
        |     .     .     .     .     .     .     .     |/ O/  /
        +-----+-----+-----+-----+-----+-----+-----+-----+ L/ K/
        | WRD | WRD | WRD | WRD | WRD | WRD | WRD | WRD |B/ C/
        |  7  |  6  |  5  |  4  |  3  |  2  |  1  |  0  |/ O/
        +-----+-----+-----+-----+-----+-----+-----+-----+ L/
        | WRD | WRD | WRD | WRD | WRD | WRD | WRD | WRD |B/
        |  7  |  6  |  5  |  4  |  3  |  2  |  1  |  0  |/
        +-----+-----+-----+-----+-----+-----+-----+-----+

                        DATA ARRAY WORDS

                           64 BLOCKS
                              4 GROUPS
                                 8 WORDS
```

Figure 1-7. DATA BUFFER (Associative Memory) (1 of 2)

```
+-------+-------+-------+             +---+---+---+---+
| 1 BIT | 2 BIT | 2 BIT | 63       63 |   |   |   |   |
+-------+-------+-------+             +---+---+---+---+
|       .       .       |             |   .   .   .   |
|       .       .       |   BLOCKS    |   .   .   .   |
|       .       .       |             |   .   .   .   |
+-------+-------+-------+             +---+---+---+---+
| 1 BIT | 2 BIT | 2 BIT | 1         1 |   |   |   |   |
+-------+-------+-------+             +---+---+---+---+
| 1 BIT | 2 BIT | 2 BIT | 0         0 |   |   |   |   |
+-------+-------+-------+             +---+---+---+---+
                                        3   2   1   0
     PRIORITY ARRAY                        GROUPS

64 ENTRIES                            ADDRESS ARRAY
   2 BITS = OLDEST ENTRY
   2 BITS = 2ND OLDEST                64 BLOCKS
   1 BIT  = SET IF                       4 GROUPS
            'NEWEST' ENTRY >                 11 BIT ADDRESS
            'SECOND NEWEST'                   2 BIT RESIDUE
            ENTRY
```

Figure 1-7. DATA BUFFER (Associative Memory) (2 of 2)

IOM

The IOM serves as a buffer and control unit for all I/O operations. The IOM is composed of several asynchronous units. These units can be seen in figure 1-8 and are described in the following paragraphs.

MEMORY INTERFACE UNIT

The memory interface unit provides memory interface for the IOM. It buffers and controls all IOM memory access. The memory interface unit controls access priority. The priority is:

- DSU - Data Service Unit
  - PCI
  - DFIA
  - DFIB

  Lowest number channel in each unit
  has highest priority
- Data comm interface unit
- Translator

TRANSLATOR UNIT

The translator is the control unit of the .IOM. It fetches commands from memory and starts I/O operations. The translator sends interrupts for I/O finish and ODT status change. It holds 20 bit addresses for Home Address (HA), Unit Table (UT), Queue Head (QH) and Status Queue (SQ). In addition, the translator contains channel status information, peripheral status and controls conditional I/O operations.

DATACOMM INTERFACE UNIT

The datacomm interface unit transfers information between the IOM and DCP. Thus, it provides the memory interface for the DCP.

SCAN INTERFACE UNIT

The scan interface is for scan type operations between the IOM and DCP's connected to the IOM.

DATA SERVICE UNIT

The data service unit is made up of peripheral interface unit, Disk File Interface "A" (DFIA), and Disk File Interface "B" (DFIB). It forms the buffer between memory and peripherals. There are two (2) four word buffers on each channel which allows the IOM to take advantage of 4 word phased access to memory.

CONNECTED TO DATA SERVICE UNIT

A Peripheral Control (PC) bus is used to connect the IOM to the Peripheral Control Cabinet (PCC). The PCC contains peripheral controls. Data is transferred to the IOM in one or two byte groups. The PCC is independently powered or powered by B6700 style AC mods.

```
                DCP DATA BUS    DCP’s
                   | | | |        |
                   | | | |        |       DATA SERVICE UNIT
+---+-----------+--+-+-+-+--+-----+-----+------------+------+
| 0 |           |           |           |            |      |  PC BUS
+---+           | DATA COMM |   SCAN    |            |  10  +--------
| 1 |           | INTERFACE | INTERFACE | PERIPHERAL | CHAN |
+---+           |           |           | INTERFACE  +------+
| 2 |           +-----------+-----------+    UNIT    |      |  PC BUS
+---+           |                       |            |  10  +--------
| 3 |  MEMORY   |                       |            | CHAN |
+---+ INTERFACE |                       +------------+------+
| 4 |   UNIT    |                       | DISK FILE  |      |  PC BUS
+---+           |      TRANSLATOR       | INTERFACE  |   4  +--------
| 5 |           |         UNIT          |     A      | CHAN |
+---+           |                       +------------+------+
| 6 |           |                       | DISK FILE  |      |  PC BUS
+---+           |                       | INTERFACE  |   4  +--------
| 7 |           |                       |     B      | CHAN |
+---+-----------+----------+------------+------------+------+
                           |
                           |   INTERRUPT BUS
                           +-------------------
```

Figure 1-8. IOM Block Diagram

The IOM and MCP share several data structures. These structures are located in main memory and are shown in figure 1-9. The following paragraphs describe these structures.

I/O QUEUE:

All I/O'S for a unit are linked to each other. The first I/O Control Block (IOCB) is pointed to by the I/O queue head word. The last IOCB is pointed to by the I/O queue tail word. The linkage from IOCB to IOCB is thru a link word in the IOCB. All IOM's will use the same I/O queue. A queue for a unit is started when the first IOCB is placed in the I/O queue. The IOM will process the next IOCB in the queue without MCP intervention. Thus, a queue is only started when a IOCB is placed in a empty queue.

RESULT QUEUE:

When an I/O has finished, the IOM will place the IOCB in the result queue. Each IOM has it's own result queue. All I/O operations done by an IOM are placed in the, same result queue.

The operator can decide when it wants the MCP to be interrupted by the IOM. This interrupt will cause the MCP to look at the result queue. The system can be set up (see SBP ODT command) so the IOM will interrupt the MCP when:

An I/O queue is empty or CPM is idle
Each I/O finishes
A task is waiting on an I/O or CPM is idle
The CPM is idle

UNIT TABLE:

The unit table contains unit information used by the IOM and MCP. This information includes ring walk information, number of channels on an exchange and a lock bit for the unit table and I/O queue.

HOME ADDRESS:

The home address words are used by the MCP to give the IOM commands. The types of commands to an IOM include load registers (HA, UT, QH, SQ), start I/O, interrogate peripheral status and scan out DCP (INITIALIZE, HALT and ATTENTION NEEDED). There are 6 home address words and are defined as follows:

HA[0]
Command to IOM.

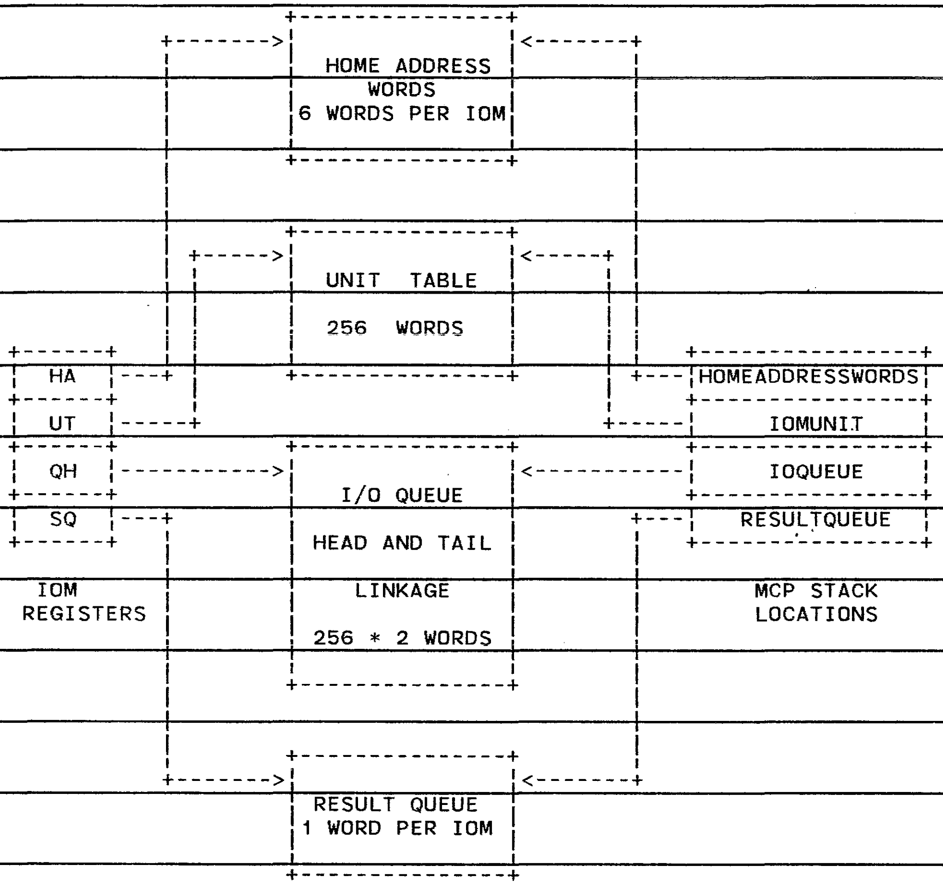
HA[1]
Special information (peripheral status).

HA[2]
HALOCKWORD. Buzzed by MCP to get control of Home Address words.

HA[3]
Not used.

HA[4]
IOM fail word, or hard H/L result descriptor.

HA[5]
Sync I/O result descriptor.



These structures are in memory and can be addressed by the IOM or MCP.

Figure 1-9. IOM Structures

IOCB's

An I/O operation is defined by an IOCB (18 words). The first 7 words are used by the IOM (hardware) and the MCP. The other words are used by the MCP only. The words in an IOCB used by hardware are:

0 IOMNEXTLINK.
Link to next IOCB.

1 IOMSIDELINK.
Not used by hardware.

2 IOMAREADESC.
Buffer descriptor, address and length.

3 IOMIOCW.
IOCW for I/O.

4 IOMCDL.
CDL built by software for IOM.

5 PHYSICALRD.
Hardware result descriptor.

6 IOMTIMECELL.
Channel busy time.

The other words of an IOCB can be found in the MCP. These words include I/O mask, reference to event, reference to FIB and other information.

I/O FLOW

The flow of an IOCB will be traced. This flow will start with the MCP building an IOCB. The required words are placed in the IOCB. The MCP will link the IOCB into the proper I/O queue. The following procedure is used:

```
BUZZ47(IOMUNIT[UNITNO]) % LOCK UNIT TABLE AND I/O QUEUE
GET TAIL WORD FOR UNIT
IF THE TAIL WORD IS 0 THEN
   PLACE ADDRESS OF THIS IOCB IN TAIL AND
    HEAD WORD FOR THE QUEUE
ELSE
   PLACE THE ADDRESS OF THIS IOCB IN THE IOMNEXTLINK
    WORD OF THE LAST IOCB IN THE QUEUE.
   PLACE THE ADDRESS OF THIS IOCB IN THE
    TAIL WORD FOR THE QUEUE.
UNLOCK AND STORE IOMUNIT[UNITNO]
IF THIS I/O IS THE FIRST IOCB IN THE QUEUE THEN
   BUZZ(HALOCKWORD)
   BE SURE LAST COMMAND IS CLEAR
   STORE A START I/O COMMAND IN HA[0]
   INTERRUPT THE IOM
   UNLOCK THE HALOCKWORD
```

Before we look at what the IOM does when it is interrupted a few comments need to be made about the start I/O process.

Bit 47 of a home address command is called the lock bit. This bit must be on for all IOM commands.

All IOM's that have a path to the unit will be interrupted. Only one IOM will do the I/O operation. The MCP maintains information of which IOM's to interrupt for a given unit.

The IOM will read HA[O] then zero it. Before a CPM places a new command in HA[O] it will make sure the IOM has cleared the last command. If the last command has not been cleared the CPM will wait .5 sec. If the command is still not clear the CPM will interrupt the IOM again. If the command is still not clear after .5 sec the IOM will be removed from the system.

Once ring walk is entered the IOM will follow the next unit field of the unit table word looking for a unit with the JB bit on. This bit indicates the I/O was not done because there was no channel available at the time. Ring walk will give all units on an exchange equal priority.

The IOM has a thruput scheduler for I/O's which are marked by the MCP (DISK, PACK and TAPE). A count of the I/O's in process will be kept and compared against a maximum value (set by F.E.). When the maximum value is reached the IOM will queue requests to start more I/O's. This will only be done for units in the PCI. The queue size for start I/O commands is 16. If the queue is exceeded, the IOM will not respond to a start I/O command.

Fail IOCB's will be generated by the IOM if an error is detected by the IOM which is not associated with a unit. The IOM will use IOCB's in unit 0. It will place a fail word in the PHYSICALRD word of the IOCB and place it in the result queue. The CPM will be interrupted.

An I/O error to a unit will stop processing on that unit.

Figure 1-10 thru 1-14 are flow charts of start I/O and finish I/O operations.

```
             +-------------------+
             |      BUZZ47       |
             | (IOMUNIT[UNITNO]) |
             +---------+---------+
+---+                  |
| 1 +----------------->|
+---+                  |
                       V
              +-----------------+
              |      FETCH      |
              | IOQUEUE[UNITNO] |
              +--------+--------+
                       |
                       |
                       |
                       V
                   +-------+
                   | NULL  | YES
                   | QUEUE +-----------------------------+
                   +---+---+                             |
                       | NO                              |
                       |                                 |
                       |                                 |
                       V                                 V
                   +------+      +----------+     +---------------+
                   | UNIT | YES  |   UNIT   | YES |  UNLOCK AND   |
                   | BUSY +----->|    ON    +---->|     STORE     |
                   +---+--+      | EXCHANGE |     |IOMUNIT[UNITNO]|
                       | NO      +----+-----+     +------+--------+
                       |              | NO               |
                       |              |                  |
                       V              V                  V
                     +---+      +-----------+        +------+
                     | 2 |      | FAIL MODE |        | IDLE |
                     +---+      +-----------+        +------+
```

Figure 1-10. START I/O (PAGE 1 OF 2)

```
                 +---+
                 | 2 |
                 +-+-+
                   |
                   |<-----------------+
                   |                  |
                   V                  | YES
              +---------+        +----+----+     +-----------------+
              | CHANNEL | YES    | ANOTHER | NO  |  SET JB BIT IN  |
              |  BUSY   +------->| CHANNEL +---->| IOMUNIT[UNITNO] |
              +----+----+        |AVAILABLE|     +--------+--------+
                   | NO          +---------+              |
                   |                                      |
                   V                                      V
         +-------------------+                   +-----------------+
         |   FETCH IOCB[2]   |                   |  SET RING WALK  |
         | BUFFER DESCRIPTOR |                   |  FLAG FOR THESE |
         |                   |                   |     CHANNELS    |
         |   FETCH IOCB[3]   |                   +--------+--------+
         |       IOCW        |                            |
         |                   |                            |
         |   FETCH IOCB[4]   |                            |
         |     CDL WORD      |                            |
         |                   |                            |
         | SEND INFORMATION  |                            |
         |  TO DATA SERVICE  |                            |
         +---------+---------+                            |
                   |                                      |
                   |                                      |
                   V                                      |
              +----------+       +----------------------+ |
              | UNIT ON  | YES   |CHANNEL NUMBER USED IN| |
              | EXCHANGE +------>|IOMUNIT[UNITNO].[7:5] | |
              +----+-----+       +-----------+----------+ |
                   | NO                      |            |
                   |<------------------------+            |
                   |                                      |
                   V                                      V
         +-------------------+                   +-----------------+
         |    SET BZ BIT     |                   | UNLOCK AND STORE|
         |    RESET JB BIT   +------------------>| IOMUNIT[UNITNO] |
         | IN IOMUNIT[UNITNO]|                   +--------+--------+
         +-------------------+                            |
                                                          |
                                                          V
                                                      +-------+
                                                      | IDLE  |
                                                      +-------+
```

Figure 1-11. START I/O (PAGE 2 OF 2)

```
  +-------------------+
  |       BUZZ47      |
  | (IOMUNIT[UNITNO]) |
  +---------+---------+
            |
            V
+-----------------------+
| FETCH IOQUEUE[UNITNO] |
+-----------+-----------+
            |
            V
+-----------------------+
| GET RESULT DESCRIPTOR |
| FROM DATA SERVICE AND |
|   STORE IN IOCB[5]    |
|                       |
|   STORE I/O TIME IN   |
|       IOCB[6]         |
+-----------+-----------+
            |
            V
+-----------------------+
| FETCH NEXT LINK FROM  |
|       IOCB[0]         |
|                       |
|   STORE NEXT LINK IN  |
|     IOQUEUE[UNITNO]   |
+----------+------------+
           |
           V
     +-----------+       +---------------------+
     | NEXT LINK | YES   |      STORE 0 IN     |
     |   EQL 0   +------>| IOQUEUE[UNITNO+256] |
     +-----+-----+       +----------+----------+
           | NO                     |
           |<-----------------------+
           V
     +-----------+
     |  BUZZ47   |
     | (STATUSQ) |
     +-----+-----+
           |
           V
         +---+
         | 3 |
         +---+
```

Figure 1-12. TERMINATE I/O (PAGE 1 OF 3)

```
       +---+
       | 3 |
       +-+-+
         |
         V
+-----------------+
| LINK IOCB INTO  |
| TAIL OF STATUSQ |
+--------+--------+
         |
         V
+-------------------+       +---------------------+
| DID I/O TERMINATE | YES   |   SET BIT 0 (ET)    |
|    WITH ERROR     +------->| IN IOMUNIT[UNITNO]  |
+--------+----------+       +----------+----------+
         | NO                          |
         |<----------------------------+
         V
+--------------------+      +--------------+
| IS BIT 40 (INT) OF | YES  | RESET BIT 40 |
|   STATUSQ SET      +----->|  IN STATUSQ  |
+--------+-----------+      +-------+------+
         | NO                       |
         V                          |
+-------------------+               |
| IS BIT 45 (C) OF  | YES           |
|    STATUSQ SET    +-------------->|
+--------+----------+               |
         | NO                       V
         V                   +---------------+
+--------------------+       | INTERRUPT CPM |
| IS BIT 40 (INT) OF | YES   | DESIGNATED BY |
| IOCB IOLINKAGE SET +------>|  BITS [44:3]  |
+--------+-----------+       |   STATUSQ     |
         | NO                +-------+-------+
         |                           |
         |<--------------------------+
       +---+
       | 4 |
       +---+
```

Figure 1-13. TERMINATE I/O (PAGE 2 OF 3)

```
                 +---+
                 | 4 |
                 +-+-+
                   |
                   V
          +------------------+
          | UNLOCK AND STORE |
          |     STATUSQ      |
          +--------+---------+
                   |
                   V
          +-------------------+        +------------------+
          | DID I/O TERMINATE | YES    | UNLOCK AND STORE |
          |     WITH ERROR    +------->| IOMUNIT[UNITNO]  |
          +--------+----------+   A    |  WITH JB AND BZ  |
                   | NO           |    |   BITS RESET     |
                   V              |    +---------+--------+
          +------------------+    |              |
          | IS THERE AN IOCB | NO |              V
          |   IN THIS QUEUE  +----+       +--------------+       +----+
          +--------+---------+            | IS RING WALK | YES   |RING|
                   | YES                  |   FLAG SET   +------>|WALK|
                   V                      +------+-------+       +----+
           +--------------+                      | NO               A
           | IS RING WALK | YES                  V                  |
           |   FLAG SET   +-------+           +------+              |
           +-------+------+       |           | IDLE |              |
                   | NO           |           +------+              |
                   V              |                                 |
                 +---+            |      +------------------+       |
                 | 1 | START I/O  |      | UNLOCK AND STORE |       |
                 +---+   PAGE 1   |      | IOMUNIT[UNITNO]  |       |
                                  +----->|  WITH BZ RESET   +-------+
                                         |    AND JB SET    |
                                         +------------------+
```

Figure 1-14. TERMINATE I/O (PAGE 3 OF 3)

B7800 TIGHTLY COUPLED SYSTEMS

----- ------- ------- -------

The primary goal of tightly coupling is to achieve a multiprocessor system with more addressable memory than could be configured for a monolithic multiprocessor system. The 20 bit address field limits a monolithic system to one million words (6 MB) of addressable memory. A Tightly Coupled (TC) system, by making certain address ranges visible only to certain requestors, allows those ranges to be duplicated, and expands the total amount of memory accessible to the TC system to more than one million words. The B7800 implementation of Tightly Coupled Systems was accomplished under the restriction that it require absolutely no special hardware changes.

ARCHITECTURE

B7800 architecture dictated that a TC system be initialized (and run), as would any other multiprocessor system, from a single Halt/Load unit. A B7800 Tightly Coupled system has its low address memory visible to all on-line requestors; the MCM(s) comprising this shared memory constitute the SHARED or GLOBAL BOX. Above the highest SHARED mod is local memory: those MCMs which are visible only to specific requestors. A local BOX on a B7800 TC system consists of one or more CPMs, one or more IOMs and the high address MCM(s).

An important configuration restriction imposed on B7800 TC systems is that no unit may have in-use paths to more than one local box. Units may be exchanged across IOMs as long as the IOMs are in the same local box.

CONFIGURATION FILES

The configuration file is used to hold GROUP descriptions which define how the system is to be configured. The RECONFIGURE ODT command causes the MCP to assume a specified GROUP configuration.

The utility program, SYSTEM/CONFIGURATOR, is used to construct object configuration files (which can be used by the MCP) from symbolic configuration files. The internal file names used by CONFIGURATOR are SOURCE for the input file and OBJECT for the output file (defaults: input TITLE SYMBOL/CONFIGURATION, output TITLE SYSTEM/CONFIGURATION).

Input to SYSTEM/CONFIGURATOR consists of one or more GROUP descriptions, each with a unique GROUP name and its associated mainframe and peripheral specifications. The output file from SYSTEM/CONFIGURATOR is designated as the configuration file with the CF ODT command. The RECONFIGURE GROUP AS <GROUP Name> ODT command causes the configuration found to be displayed; an operator OK causes the MCP tables on the H/L unit to be updated. The system will deadstop to allow the operator to make whatever changes are necessary to mainframe switch settings for the new configuration. When the system is loaded it will result in initialization based on the new configuration.

SUBSYSTEM DEFINITIONS

A TC system contains one GLOBAL memory subsystem and a local memory subsystem for each box. The local memory subsystems are identified by their BOX numbers and the GLOBAL memory is identified by the letter G or GLOBAL.

Subsystems may be given names in the form of alphanumeric identifiers. Subsystem identifiers are defined by the operator through the ODT command MS (Make Subsystem). Subsystems may be defined including any one or more memory subsystems in the system.

The user specifies a subsystem by using the task attribute SUBSYSTEM which may assigned a value only when the task is inactive. The SUBSYSTEM task attribute can be used in WFL, CANDE, programming languages and on Job Queues. The SUBSYSTEM attribute is treated as a request to guide placement of a task in memory.

B7900 HARDWARE OVERVIEW

This sub-section provides an overview of B7900 hardware and software. The information has been extracted from the 34 B7900 D-notes. In many cases the information has been copied from these D-notes. It is provided in this document for completeness.

INTRODUCTION

A B7900 system is comprised of several different modules. These include Central Processing Modules (CPM), Memory Subsystem Modules (MSM), I/O Subsystem Modules (IOSM), I/O Expansion Cabinets, a System Control Cabinet (SCC) and the System Console.

The MSM allows the B7900 to address more memory than any previous large system and allows simultaneous read/write operations.

The B7900 CPM is a pipelined processor with multiple (data and code) high speed cache (associative) memories.

The IOSM is comprised of two separate processing modules: the Auxiliary Processor (AP) and the Host Data Unit (HDU). The AP is a small, strictly serial processor which functions as a maintenance processor or in the B7900 system as an auxiliary processor.

The HDU manages all I/O operations on the system. The I/O subsystem it supports is the DLP-based Input/Output subsystem used by all of the 900 series systems. The IOSM also contains four base modules which contain the Data Link Processors which control the peripherals. The I/O Expansion Cabinet is used if additional base modules are required to configure the I/O subsystem. It contains up to six base modules.

The SCC houses three components: the master clock, the Maintenance Exchange (MEX), and the HDU/MSM profile card test station. The master clock provides clock signals to each of the boxes in the system. The MEX provides connection between the components which may act as "maintenance processors" and the maintenance interface in each box in the system.

The System Console provides table space for the system ODTs. For system initialization and maintenance, a modified MTS2 series terminal (MMTS2) is used. The MMTS2 acts as a maintenance processor, using two ICMD drives packaged in the leg of the maintenance console for program and file storage. The MMTS2 has access to the MEX for system initialization and maintenance, and to the I/O Testbus for off-line DLP testing.

In the text that follows, these new features are explained in terms of their impact on the hardware and software that comprise the B7900 system. This explanation is by no means comprehensive.

CENTRAL PROCESSING MODULE (CPM)

The B7900 CPM is a powerful pipelined processor with high speed code and data caches. It is object-code compatible with all previous B5000, B6000 and B7000 machines except in two respects: it does not support the six bit character data type (BCL) and, like the B7800, it does not support vector-mode.

In addition to these changes, the basic design of the B7900 includes many improvements over the B7800. The two most noticeable of these are the more accurate arithmetic operations and more efficient branch handling.

The B7900 CPM performs arithmetic operations more accurately than any previous machine (except the B5900). This increased accuracy should cause numerical algorithms to converge slightly faster and may cause minor differences in arithmetic results as compared to previous machines.

As the B7900 CPM is a pipelined processor, it has the traditional difficulty handling conditional branches within a program. It must always choose a particular direction for a branch and prepare to execute the proper code for that direction. For example, the B7800 always assumes that the condition of an IF statement in FORTRAN or ALGOL will be true and fills its pipeline with the code that would be executed based on this assumption. Performance of the pipeline is penalized when branches do not go according to their assumed direction. The B7900 mitigates this penalty by remembering the direction which the branch last took, and assuming the same branch will be taken the next time.

The B7900 CPM has an increased memory addressing capability over the B7800 CPM, which is accomplished by memory environment registers. Because of the 20-bit address field, the CPM still only addresses one million words at any one time, but it can address all of memory by changing its environment registers to access different million-word environments. Extended Memory is discussed in the Memory Management sub-section.

The CPM consists of the following hardware modules: Program Control Unit, Data Reference Unit, Execution Unit, Store Queue, Memory Access Unit, and Card Test Station.

```
                    +--------+---------+----------------------------------+
                    |        | CODE    |                                  |
                    |        | CACHE   |      PROGRAM CONTROL UNIT        |
                    |        |         |                                  |
                    |        | 2048    |              (PCU)               |
          +-----+   |        | WORDS   |                                  |
          | MSM |---+        +---------+-----+--------------+-------------+
          |  2  |   | MEMORY |     DATA      |   CENTRAL    |             |
          +-----+   | ACCESS |   REFERENCE   |    DATA      |  EXECUTION  |
                    |  UNIT  |     UNIT      |   BUFFERS    |    UNIT     |
                    | (MAU)  |     (DRU)     |    (CDB)     |    (EU)     |
          +-----+   |        +---------+-----+--------------+-------------+
          | MSM |---+        | DATA    |                                  |
          |  1  |   |        | CACHE   |           STORE QUEUE            |
          +-----+   |        |         |                                  |
                    |        | 2048    |              (SQ)                |
                    |        | WORDS   |                                  |
                    +--------+---------+----------------------------------+
```

Figure 1-15. B7900 Central Processor Module (CPM)

The Program Control Unit (PCU) extracts code from the code stream and generates instructions for the Execution Unit and Data Reference Unit. These instructions are placed in queues along with a job number and addresses in the Central Data Buffer where input data can be found and where the result is to be stored. The PCU is the key unit for the pipeline by causing data to be ready for the Execution Unit ahead of time. Operator concatenation is also performed by the PCU.

The Data Reference Unit (DRU), upon command from the PCU, fetches data either from associative memory or main memory. Extensive use of pipelining allows one-clock references to associative memory.

The Execution Unit (EU) performs all arithmetic and logical operations using data in the Central Data Buffer. The result is either placed in the Central Data Buffer or may be sent to associative memory and the store queue.

The Store Queue (SQ) is used to reduce traffic to main memory by buffering data. Repeated stores to the same address will be performed as one store to main memory. Also, adjacent stores will be grouped into one multi-word store by the store queue.

The Memory Access Unit (MAU) provides the interface to main memory. The MAU can interface to two MSMs. On memory references the CPM Environment Register along with the 20-bit address are sent to the MSM.

The Card Test Station is used to run maintenance tests on CPM-style cards.

MEMORY SUBSYSTEM MODULE (MSM)
------ --------- ------ -----

The B7900 includes one or two Memory Subsystem Modules (MSMs) totaling up to 96 megabytes. A MSM has a bandwidth of 72 MB/SEC. Each MSM contains from one to four Memory Storage Units (MSUs) and a Memory Control (MC).

The Memory Storage Unit (MSU) contains one or two sub-modules, each consisting of 6 megabytes. The memory is eight-word phased (transmission of words at clock rate) within each sub-module. This means the system can run with half an MSU or one sub-module without losing the speed of the eight-word phasing.

The Memory Control consists of the following major modules: Requestor Interface Adapter (RIA), Memory Interface Adapter (MIA), Priority Resolution Module, Error Module, Requestor Interrupt Module and Maintenance Module.

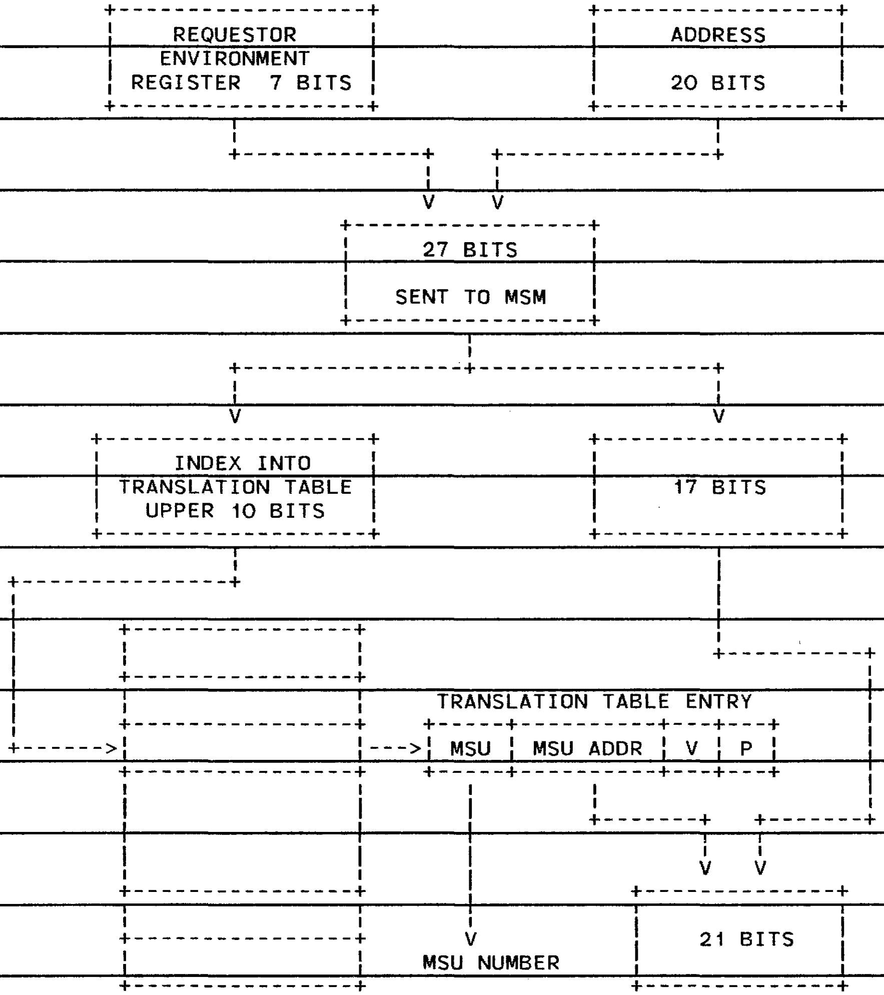
```
                       MEMORY    CONTROL              REQUESTORS

                +-----+------------------+-----+      +--------+
 +---------+    |     |                  | RIA |      |        |
 |   MSU   |    | MIA |     PRIORITY     |  7  |      |   CPM  |
 | 6 OR 12 +----+     |    RESOLUTION    +-----+      |        |
 |   MB    |    |  3  |     MODULE       | RIA +------+    6   |
 +---------+    |     |                  |  6  |      |        |
                +-----+  --------------  +-----+      +--------+
 +---------+    |     |                  | RIA |
 |   MSU   |    | MIA |     ERROR        |  5  |
 | 6 OR 12 +----+     |     MODULE       +-----+      +--------+
 |   MB    |    |  2  |                  | RIA |      |        |
 +---------+    |     |                  |  4  |      |   AP   |
                +-----+  --------------  +-----+      |        |
 +---------+    |     |                  | RIA +------+    3   |
 |   MSU   |    | MIA |    REQUESTOR     |  3  |      |        |
 | 6 OR 12 +----+     |    INTERRUPT     +-----+      +--------+
 |   MB    |    |  1  |     MODULE       | RIA |
 +---------+    |     |                  |  2  |
                +-----+  --------------  +-----+      +--------+
 +---------+    |     |                  | RIA |      |        |
 |   MSU   |    | MIA |   MAINTENANCE    |  1  |      |   HDU  |
 | 6 OR 12 +----+     |     MODULE       +-----+      |        |
 |   MB    |    |  0  |                  | RIA +------+    0   |
 +---------+    |     |                  |  0  |      |        |
                +-----+------------------+-----+      +--------+
```

Figure 1-16. B7900 Memory Subsystem Module (MSM)

Each requestor interfaces to memory through its own Requestor Interface Adapter (RIA). For any memory operation, a control word and up to eight data words are sent by the requestor to its RIA. The RIA checks these words for errors, reports any errors to the requestor, and stores them in a buffer memory until the priority resolver commands their transmission to the Memory Interface Adapter (MIA).

Each RIA contains an address translation table which determines the validity of the address for this MSM and where the address resides physically in storage. That is, the address translation table provides a mapping from environment number and address to physical location in memory. Each address translation table contains 1024 eight bit words. Each entry provides information for a page (128K words) of memory. The table entry contains a MSU number (2 bits), MSU relative address (4 bits), validity bit and parity bit.



MSU NUMBER AND 21 BIT ADDRESS ARE
USED TO ACCESS PHYSICAL MEMORY

Figure 1-17. MSM Translation Table

The Memory Interface Adapter (MIA) controls the flow of information between the memory control internal bus structure and the Memory Storage Unit (MSU). A memory control contains from one to four MIAs with the capability of all MIAs making simultaneous requests to the MSU to which they are connected.

The order in which system requests are handled by the MSM is determined by the Priority Resolver Module. Requests are processed by a modified First In First Out (FIFO) algorithm. Snapshots of memory requests are recorded on a basic time interval as they arrive. The snapshots of requests are processed in the order they are taken.

Within a snapshot, requests will be serviced in the following sequence: read operations, write operations, special operations (except for write translation table), write translation table. The higher number requestor will be given the higher priority, if there are duplicate requests for a particular type, although this should have no effect on system performance.

By means of a modified Hamming Code, the Error Module can detect and correct single bit errors and detect two-bit errors. Any errors detected during MSU operations or internal memory control operations are reported to the RIA. The Error Module will report the control word or the fail word or both if requested by the requestor.

The requestor interrupt module is responsible for the correct routing of interrupts and for interrupting the destination requestor via unique interrupt lines on receipt of an incoming interrupt. There are two types of interrupt buffers maintained by the MSM for each requestor: hardware and software. These buffers are used to accumulate interrupts and can be read by the requestor via a system operation. The software interrupt buffer contains a bit mask of requestors from which interrupts have been received. The hardware interrupt buffer is an eight-bit mask which designates the type of interrupt.

The maintenance module performs all maintenance type functions for the MSM. In system mode, the maintenance module handles reading and writing the fields in the MSM BOXID. All other maintenance operations are done through the maintenance interface.

AUXILIARY PROCESSOR (AP/AMP)

The Auxiliary Processor/Auxiliary Maintenance Processor (AP/AMP) is based on the B5900 Entry Level System and is compatible with the B7900 CPM. The AP/AMP has two distinct modes of operation: AP and AMP. To support these two different modes two unique versions of micro-code, which communicate with different sets of hardware, are required.

In Auxiliary Processor (AP) mode, the AP/AMP acts as a co-processor to the B7900 CPM with the purpose of handling I/O finishes when the CPM is busy. The system has the capability of running with no CPMs (AP only mode). The AP will perform all the functions a CPM would do in this case. When the last CPM is removed from the system, the MCP notifies the operator (with an RSVP) that no CPMs remain. The operator must OK this waiting entry in order to allow jobs to run on the AP.

In Auxiliary Maintenance Processor (AMP) mode, the AP/AMP utilizes its own local memory and HDP hardware section of the processor to exist as a standalone system. The primary function of the AMP is to perform maintenance on the B7900 system. The AMP operationally is the same as the B5900.

The AP/AMP can be divided into five major units: Processor, Local Memory (LM), Cache and System Memory Controller (APMC), Interrupt and Maintenance (APIM) and the Host Dependent Port (HDP).

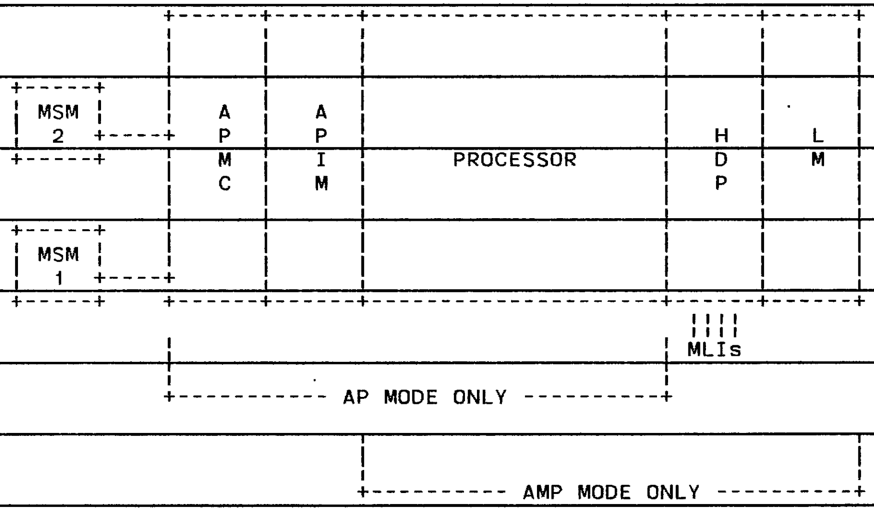


Figure 1-18. Auxiliary Processor (AP/AMP)

The processor module performes all arithmetic and logical operations for the AP/AMP.

When the AP/AMP is running in AMP mode, the HDP section becomes active. The HDP provides the I/O subsystem interface for the AMP.

When the AP/AMP is running in AMP mode, the local memory becomes active and the B7900 MSM memory is no longer used. The local memory has a capacity of 512K words. Error correction and logging are features provided by the LM.

When the AP/AMP is running in AP mode, the AP interfaces to the B7900 MSM memory by means of the APMC (Cache and System Memory Controller) module. The APMC can interface with two MSMs. The cache memory consists of 128 words of code and 128 words of data. The cache hardware performs automatic prefetching of code. Any word in the cache can be accessed in 1 clock and the cache can be purged in 2 clocks.

The AP/AMP Interrupt and Maintenance Module (APIM) interfaces to the MSM system interrupt bus and Maintenance Exchange (MEX), contains AP box identification information, and provides support for the AP Memory Control/Cache (APMC).

HOST DATA UNIT (HDU)

The HDU contains a Memory Bus Control (MBC) which handles the HDU's interface to the MSM, the Queue Manager (QM) which handles the I/O queue structures and flow control, and three Host Dependent Ports (HDPs) which connect to the I/O subsystem. Each HDP is capable of operating at a burst rate of 8 Megabytes/Second for a total of 24 Megabytes/Second per HDU.

```
+---------------------+-------------+          +------------+
|                     |             |          |            |
|                     |             +--MLI-----+    BASE    |
|                     |    HDP 0    |          |            |
|        QUEUE        |             +--MLI--   +------------+
|       MANAGER       |             |
|                     +-------------+          +------------+
|                     |             |          |            |
|                     |             +--MLI-----+    BASE    |
|                     |    HDP 1    |          |            |
+---------------------+             +--MLI--   +------------+
|                     |             |
|                     +-------------+
|       MEMORY        |             |
|         BUS         |             +--MLI--   +------------+
|       CONTROL       |    HDP 2    |          |            |
|                     |             +--MLI-----+    BASE    |
|                     |             |          |            |
+----+-------------+--+-------------+          +------------+
     |             |
     |             |
     |             |
     |             |
+----+----+   +----+----+
|         |   |         |
|   MSM   |   |   MSM   |
|         |   |         |
+---------+   +---------+
```

Figure 1-19. Host Data Unit (HDU)

The Queue Manager (QM) is responsible for managing the I/O queue structures and the scheduling of jobs for the HDPs. It has a 4K word local memory which is used to selectively store copies of the IOCBs that have been issued to the I/O subsystem. 256 words of this local memory are used to contain the code for the MCP Boot and the Minimal Configuration information needed to initialize the system. It is called the HDU's Halt Load RAM.

The Memory Bus Control (MBC) provides the HDU's interface to the memory subsystem. It can connect to up to two MSMs. The MBC handles up to eight-word memory transfers and uses the same memory addressing mechanism (Environment Register plus 20-bit address) as the CPM. It also handles the requestor to requestor interrupts which use the memory buses.

The Host Dependent Port (HDP) provides the HDU's interface to the I/O subsystem using the Message Level Interface (MLI). Each HDP controls two MLI ports, each of which connects to one

MLI cable. The HDPs control the MLI and are responsible for all data transfer for the system.

DLP-BASED I/O SUBSYSTEM COMPONENTS

Each HDP in the HDU contains two MLI ports which are connected to I/O bases via an MLI. An I/O Base is a rack which contains a Base Control Card (BCC), Distribution Cards (DCs), a Maintenance Card (MC), Data Link Processors (DLPs), and, optionally, a Path Selection Module (PSM), and/or Line Expansion Module (LEM).

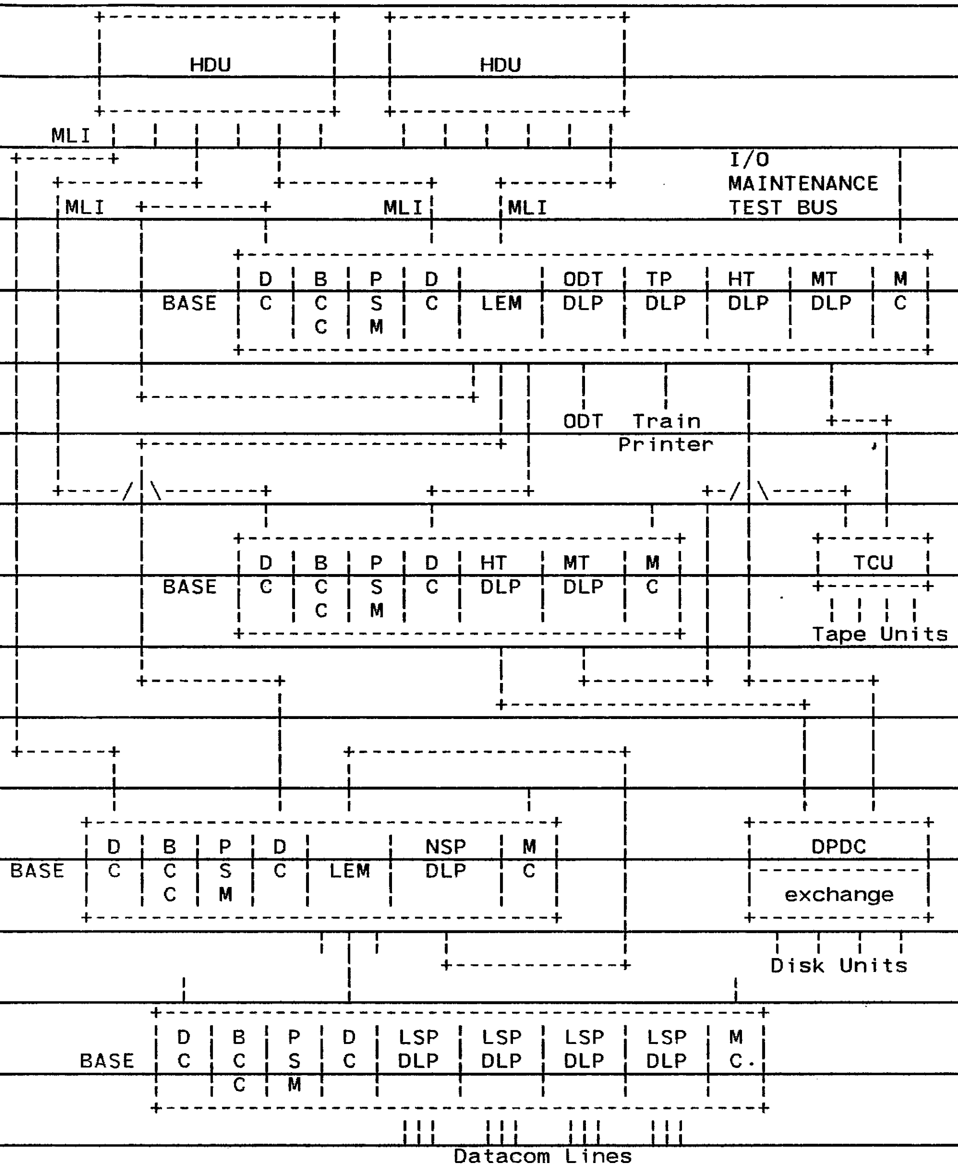


Figure 1-20. UIO Subsystem Components

The Maintenance Card (MC) provides maintenance functions for the base. It connects to the I/O Maintenance Test Bus which is used to perform off-line maintenance.

A Distribution Card (DC) provides the interface between the base module and the host. One MLI cable from a host's MLI Port connects to a DC in the Base Module. Through the DC, a host can communicate with the BCC and the DLPs in the base. There can be only six DCs in a base although the "addressing" allows for eight. DCs are "addressed" by jumpering an ID from O to 7.

A Path Selection Module (PSM) coordinates the activities of multiple DCs in a base, and is required in a base which has more than one DC. Several hosts can be actively communicating with DLPs in a base, but only one DC can access the BCC or have access to the base backplane at any time. The PSM resolves these conflicts.

The PSM also uses the masks in the BCC in order to clear only the DLPs assigned to the host issuing a Master Clear by issuing a Selective Clear or Selective Master Clear (see below) to each assigned DLP.

The PSM contains eight field-installed jumpers (one for each possible DLP in the Base) which, when set, will cause a Selective Master Clear (instead of a Selective Clear) to be issued to the corresponding DLP when the host system issues a Master Clear.

The Base Control Card (BCC) provides identification and access control for a Base Module. The BCC contains two types of masks which are used to control access into a base and its DLPs. These are the DC Enable Mask and the DLP Enable Masks.

The eight-bit DC Enable Mask indicates which DCs are allowed access to the base. A locked-out DC will not respond to the host or execute a host-generated Master Clear.

The BCC also has eight 16-bit DLP Enable Masks, one for each possible DC in the base. A DC's DLP Enable Mask indicates to the PSM which DLPs this DC is allowed to access. The PSM also uses these masks in order to determine which DLPs will be cleared when a MLI Master Clear is received via a DC. Only those DLPs enabled to that DC will be cleared.

Along with the eight DLP Enable Masks, the BCC contains an Acquire Enable Bit for each possible DC in the base. This bit indicates whether or not another DC may "steal" DLPs from this DC.

The BCC also has a 32-bit Maintenance Mask that indicates which devices in the base (DLPs, DCs, BCC, PSM, LEM) are enabled on the I/O Maintenance Test Bus. Devices are identified in the mask by their Maintenance Addresses (or Unit Numbers).

The DC Enable Mask and the DLP Enable Masks can be cleared only by one of the following manual operations:

1. Powering up the Base.

2. Pushing the BCC Clear Switch on the BCC.

3. Pushing the Base Clear Switch on the MC.

When the BCC is cleared, the DC Enable mask is set so all DCs are enabled in the Base, the DLP Enable masks are set so all DLPs are disabled from all DCs, all Acquire Enable bits are set to disable the "steal" function and Maintenance is enabled to all devices in the Base.

The DC Enable Mask can be set only via a DC (by software) if it is enabled in the DC Enable Mask. A DC can enable a DLP in its DLP Enable Mask only if the DLP is not already enabled in another DC's DLP Enable Mask. The exception to this rule is the ability to "steal" a DLP. In order for a DC (DC 1) to steal DLPs from another DC (DC 2), DC 2's host must have previously set DC 2's Acquire Enable bit. When DC 1's host issues a variant of the LOAD DLP MASK command, the specified DLPs will be disabled from DC 2's DLP Enable mask and enabled in DC 1's DLP Enable Mask. A DC may also share DLPs with other DCs and transfer DLPs to another DC.

A Line Expansion Module (LEM) enables a host to be connected to more bases by expanding one MLI to up to seven MLIs. It resides in a base.

A LEM consists of three types of cards. The type "A" card contains the basic LEM logic, two MLI ports (ports 6 and 7) and the Maintenance Address jumpers.

The 1x2 LEM ID, or type "C" card, provides two MLI ports (ports 1 and 2) and LEM identification. The 1x3 LEM Exchange, or type "B" card, provides three MLI Ports (ports 3, 4 and 5).

A Data Link Processor (DLP) provides the interface between hosts and peripheral devices. The operation of a DLP is device-dependent, and there are different types of DLPs to control different types of devices. All DLPs follow the MLI protocols to communicate with a host, perform a set of standard DLP operations, and return certain standard results. Included in these standard DLP operations is the TEST IDENTIFY operation which returns the DLP type and the DLP's strapped ID.

The DLPs that are currently supported on the B7900 are:

DLP	Peripheral
CR1	Card Reader
HC2	ISC Host Control
HT1	(Host Transfer) 206,207,659,677 Disk Pack
MT1	Mag Tape: PE
MT2	Mag Tape: PE/GCR
MT3	Mag Tape: NRZ
ODT1	Operator Display Terminal
LSP1	Datacom Line Support: Sub-broadband
TP2	Buffered Printer: 1200/2000 LPM
NSP3	Datacom NSP: Blocked

There can currently be up to eight DLPs in a base although there are 16 "addresses" reserved. A DLP's "address" is determined from jumpers on the DLP's logic cards and is also its Maintenance Address.

DLP address assignment affects hardware priority algorithms. For proper operation of the system, these algorithms must be understood and the DLP addresses assigned accordingly.

Within each Base, concurrent requests by multiple DLPs are arbitrated by the Base Control Card based on the Base Module Priority of the DLPs. The Base Module Priority of a DLP is determined directly by its address; the DLP with address 7 has a Base Module Priority of 7, which is the highest possible priority. When presented with multiple DLP requests, the Base Control Card selects the DLP with the highest Base Module Priority.

DEVICE NAMING

The B7900 will have its I/O configuration described in a Peripheral Configuration Diagram (PCD). The PCD is the B7900 equivalent of the B7700/B7800 Unitcards and contains descriptions of all devices and connections in the peripheral subsystem. In the PCD all devices (including units, DLPs, LEMs, Bases and MLI Ports) are assigned arbitrary numbers, called Device Numbers, which will be used when referring to a device. The PCD also contains the information necessary to determine the paths to the device to be used in performing I/O operations.

The B7900 supports larger device numbers than previous systems, which supported eight-bit device numbers. Device numbers for the B7900 are currently 15-bit numbers (or between 1 and 32767). Although devices may be numbered between 1 and 32767, only 255 peripherals, NSPs and LSPs may be in a B7900 partition at one time. The B6800, B5900/B6900 and B7700/B7800 systems are still restricted to eight-bit device numbers (between 1 and 255).

The device number for an NSP or LSP must be an integer from 1 to 255. This device number must match the NDLII program. An NSP can control up to 8 LSPs at any time.

The device number for an HC must be an integer from 1 to 255 if BNA is to be used.

The B7900 MCP will use the PCD to determine the paths to a device and will attempt to verify the information in the PCD before using a device.

AMP DEVICE NAMING

The B7900 AMP, which is a modified B5900, uses the B5900 device naming rules. B5900 systems use the strapped ids in the I/O subsystem components in order to identify or name the peripheral units controlled by them. Currently the MCP only allows for eight-bit device numbers for the B5900. If a DLP can have only one unit attached to it, the lower eight bits of that unit's number are the same as the DLP's strapped ID. If there can be more than one unit controlled by a DLP, the unit's number is the DLP's strapped ID plus the unit's address relative to the DLP.

Peripherals not qualified on the B5900 are not supported on the AMP.

I/O RECONFIGURATION

Online I/O reconfiguration on the B7900 has similar capabilities to the B7800. Many of the functions are identical, in syntax and semantics. Because of the difference in the hardware components, though, there are some differences in syntax and functionality, and there are several new and unique functions.

B7900 peripheral reconfiguration (FREE, ACQUIRE, RY, SV, UR, UR-, MOVE, REPLACE and CL) is identical to B7800 peripheral reconfiguration with two exceptions. The first is that the RY command with path selection to append devices and the SV (-) command to remove them are not supported. These functions can be accomplished by loading a new Peripheral Configuration Diagram (PCD). The second is that the syntax of the LH (Load Host) command (to load a controlware file to a disk pack drive controller) is slightly different. The DLP device number is used to specify the path instead of CH <#> IOM <#>.

There are two B7900 I/O reconfiguration capabilities which are functionally similar to B7800 capabilities. FREE/ACQUIRE IOP (IOP is used to refer to an HDU in the B7900 I/O ODT commands) corresponds to FREE/ACQUIRE IOM. UR DLP <dlp device number> is similar to UR CH <#> IOM <#>.

The unique B7900 I/O reconfiguration capabilities include FREE/ACQUIRE DLP, UR/UR- MLI, UR/UR- BASE, UR/UR- BASE MAINT and UR/UR- DLP MAINT.

DLPs are not shareable between partitions and, therefore, must only be ACQUIREd by one partition at any time (FREE/ACQUIRE DLP). DLPs may be reserved in order to perform on-line maintenance or to suspend operations to the DLP via UR/UR- DLP. Off-line maintenance via the I/O Maintenance Test ·Bus can be performed using UR/UR- DLP MAINT.

Bases are shared by all B7900 partitions to which they are connected. Bases may be reserved in order to suspend operations through the Base or reserved for off-line maintenance.

MLIs are implicitly ACQUIREd with the HDUs to which they are connected. They may be reserved in order to suspend operations through a particular MLI.

I/O UNIT/DLP/MLI LOAD BALANCING

Each Base typically has multiple Distribution Cards and, thus, there are typically multiple paths into each Base. Each of these paths is connected directly to an MLI or fans out from an MLI via a LEM. Between a running partition and a particular Base, there is at any given time a set of viable MLIs. This set of MLIs is relatively static; it can change only when HDUs are FREEd/ACQUIREd or MLIs are URed/UR-ed/BROKEN. The MCP automatically attempts to evenly distribute I/O traffic over all viable MLIs. The balancing algorithm is always active and does not require operator action.

Pack and tape units (which can be connected to an exchange) may be accessible by more than one DLP. (Note: each DLP or peripheral should be ACQUIREd in only one partition at a time.) Between a running partition and a particular string of exchanged units, there is at any given time a set of viable DLPs. This set of DLPs is relatively static; it can change only when HDUs, MLIs, Bases, or DLPs are reconfigured or marked BROKEN. The MCP automatically attempts to evenly distribute I/O traffic over all viable DLPs. The balancing algorithm is always active and does not require operator action.

System Option 39 (PATHBALANCING) has no effect on B7000

Systems, including B7900 Systems.

I/O TIME

Reported "I/O Time" for tasks using moving-head media (e.g., packs) will generally be greater on HDU Systems (e.g., B7900) than on IOM Systems. This discrepancy results from the different handling of seek operations by the two I/O subsystems and does not indicate that the actual I/O operations are slower on the B7900.

On IOM Systems, I/O Time on moving-head media is the sum of rotational latency and data transfer time. On HDU Systems, I/O Time on moving-head media is the sum of seek time, rotational latency, and data transfer time.

MAINTENANCE HARDWARE

The B7900 incorporates "soft" access to low-level machine state. Using this mechanism, initialization and maintenance software may interrogate and set flip-flops, registers and RAM storages in the various boxes in the system.

Within any system, every box is cabled to the System Control Cabinet (SCC) which houses the Maintenance Exchange (MEX). The MEX provides for connection from any of the "maintenance processors" in the system to each of the boxes in the system. The overall management of the maintenance bus is a "master-slave" relationship, where "maintenance processors" are masters and the various boxes they access are slaves. The MEX includes Fan In Adaptors (FIAs) and Fan Out Adaptors (FOAs). There is a FIA for each of the possible masters, and a FOA for each of the slaves in the system. Within each box (slave) there is "on-board" maintenance interface logic to allow for state access to that box. The overall arrangement of FIAs, MEX, FOAs and on-board maintenance logic is commonly called the "maintenance bus".

A MIP is a hardware component housed in the "leg" of a B7900 Console. It is cabled to a pair of ICMD (floppy) drives, also housed in the console leg. The MIP may also be cabled to the I/O Testbus. A MIP is driven by a Modified MTS2 terminal; only one MMTS2 may be cabled to any particular MIP, so the MMTS2/MIP will typically be paired and thought of as one unit. A MMTS2/MIP which is cabled to the MEX may act as a "maintenance processor" for the system.

In any system, every processor will be cabled as a master to the MEX. This allows any "running" B7900 partition to act as a "maintenance processor" for hardware maintenance of boxes not in the partition. The maintenance software used in this mode is IDA.

In any system, one or more APs will be configurable as AMPs. Using its connection to the MEX, an AMP may act as "maintenance processor"; this is done when it is not possible to configure a B7900 partition (for example, all MSMs down). The maintenance software used in this mode is IDA.

Built into the CPM cabinet, and appearing over the maintenance bus as another "slave" station, is the CPM profile card test station. The software used for CPM card testing is IDA.

MAINFRAME MAINTENANCE

Mainframe maintenance for the B7900 is divided into two groups: the AP/AMP and the other mainframe boxes (MSM, HDU, CPM).

Maintenance for the AP/AMP is done using the MMTS2/MIP on the System Console. Two software packages are used: BEAM and APCON. BEAM provides for "low-level" static testing of the AP/AMP. The test patterns for these static tests are packaged on a set of ICMD diskettes, and the BEAM program uses the MIP to run the patterns against the AP/AMP hardware. APCON provides for dynamic tests. The dynamic tests are written in AP/AMP microcode, and execute on the AP/AMP itself, with APCON serving to load the tests from their ICMD diskette and to monitor their execution.

The CPM, MSM and HDU are maintained from a "running system", using the IDA software. IDA is an ALGOL program, supported by a set of maintenance libraries. It runs under MCP control, using normal system resources (such as CANDE). When enough hardware remains operational to configure and run a B7900 partition, IDA is executed on that partition. When it is not possible to configure a B7900 partition (for example, in a model B7900F with the MSM down), the AP/AMP is configured and run as an AMP, and IDA executes there. In either case, IDA uses the system processor's connection to the MEX to gain maintenance bus access to the box under test. Both dynamic and static tests are provided for each of the box types. IDA is also used to drive the two card test stations: the CPM profile test station, packaged in the CPM itself, and the HDU/MSM profile test station, packaged in the SCC.

I/O SUBSYSTEM MAINTENANCE

The B7900 I/O subsystem will be maintained either in an off-line mode or an on-line mode. Off-line maintenance allows for the execution of diagnostic tests on the I/O components in a Base. These tests are run from the MMTS2/MIP on the

Maintenance Console, accessing state in the off-line device via the I/O Maintenance Test Bus. The test patterns are shipped on ICMD diskettes, along with the various I/O components.

On-line maintenance allows for confidence and maintenance testing of DLPs and the peripherals they control. These tests will be performed by running Peripheral Test Language (PTL) programs through Peripheral Test Driver (PTD) under MCP control.

PARTITIONING

In a B7900 system, "Partitioning" provides a means whereby a subset of the boxes in the system may be managed by a single MCP. Moreover, partitioning prevents any box not in the subset from in any way interfering with the successful execution of the subset. Such a subset is called a partition. This capability may be used in two ways:

> A broken box may be tested while the remainder of the boxes executes as a partition. In this scheme the partition is protected against interference from the broken box.
>
> A given system may be "split" into more than one partition, with each partition run independently. In this scheme each partition is protected against interference from actions in the other partitions.

Partitioning is established by software, but enforced by hardware. It involves the control of three interfaces: the system interface, the I/O subsystem interface, and the maintenance interface. Partition membership is marked in the Partition Identification Register (PID) in each box.

For example, in a Model H or K B7900 with the PAC kit, the system can be run as a single partition, including all boxes. A "broken" box may be removed from the partition, tested, and returned without jeopardizing the continued execution of the partition. Further, the system may be "split" into two partitions; each half would be run completely independently of the other.

The software involved in making partitions are SYCON and the MCP. SYCON will initially establish a partition upon instructions from the user. This includes setting the controls for the system and maintenance interface, and the PIDs in all boxes in the partition. SYCON will then start the MCP running. SYCON is further discussed in the section on System Initialization.

The MCP will, as part of its initialization, establish control over the maintenance interface, thus disabling the maintenance bus and excluding the "maintenance processors" from further access over the bus.

Boxes may be moved into a running partition only by the MCP executing in that partition, using the MCP's ACQUIRE command. During this acquisition, the system interface controls in the boxes currently in the partition will be updated to acknowledge the existence of the incoming box, and the system interface controls in the incoming box will be updated to reflect the partition's membership. The PID in the incoming box will be set to match the partition number. Similarly, a box may be removed from a running partition only by the MCP executing in that partition, using the MCP's FREE command. During that process all boxes remaining in the partition will have their system interface controls updated such that they ignore the outgoing box.

SOFT CONFIGURATION

Soft configuration is a software function that allows control over how the hardware resources are partitioned into systems and how each system's memory is partitioned into address spaces. Since the B7900 hardware has much greater architectural flexibility than any previous machine, extensive changes to the soft configuration mechanism were required.

The SYMBOL/CONFIGURATION file is the human interface to the soft configuration mechanism. This file is created or modified to define the possible configurations of the hardware resources. The SYMBOL/CONFIGURATION file is converted into a SYSTEM/CONFIGURATION file by the utility program SYSTEM/CONFIGURATOR.

SYSTEM/CONFIGURATION is the MCP's interface to the soft configuration mechanism. This interface is established through the ODT CF command. Once these files have been created, and the SYSTEM/CONFIGURATION file has been attached through the CF command, actual reconfiguration is done through the ODT RECONFIGURE command. Reconfiguration can also be performed from the Loader by using the LOAD CONFIGURATION and RECONFIGURE commands. The syntax and semantics of the CF and RECONFIGURE commands are specified in the Operator Display Terminal (ODT) Reference Manual (Form # 5011687).

DATA COMMUNICATIONS

The B7900 Data Communications Subsystem is substantially different at the hardware level from B7700 and B7800 (DCP) data communications. In place of the DCP and Adaptor Cluster modules, the B7900 uses the Network Support Processor (NSP) and Line Support Processor (LSP) modules.

The NSP and the LSP are Data Link Processors (DLPs) that communicate with the system through the HDU. An LSP can support up to 16 full or half-duplex data comm lines, and an NSP can control up to eight LSPs with a maximum of 96 lines.

A Network Definition Language, called NDLII, was developed for use with this new hardware. NDLII is described in the B5000/B6000 Series NDLII REFERENCE MANUAL (form no. 5011828). This document also describes the logical partitioning of data comm functions between the NSP and the LSP.

The SOURCENDLII symbolic provides an example of how NDLII programs are written. In order to provide a compatible interface to an MCS, certain NDLII programming conventions must be followed. The SOURCENDLII symbolic contains numerous comments explaining these conventions in detail.

In order to initialize an NSP, a NIF file and firmware file must be provided. A standard firmware file called FIRMWARE/NSP is provided. The NIF file is provided by the user by compiling a source NDLII program, such as the example SYMBOL/SOURCENDLII. The file name of the NIF must have "NIF" as the last node of its identifier. If <prefix>/NIF is the NIF file, the MCP creates an auxiliary file <prefix>/DCPCODE when the NSP is initialized with the NIF for the first time.

The ID (Initiate Datacom) ODT command is used to initialize an NSP, interrogate or alter the setting of various data comm options and direct commands to the DCCONTROL process.

One of the functions that can be initiated through the ID command is data comm auditing. A program, SYSTEM/DCAUDITOR, can be used to analyze the files produced during the auditing process.

A dump of the local memory of a specified NSP can be requested through the DUMP option of the ID command. The file produced can be analyzed with a program, SYSTEM/NSPDUMPANALYZER.

A report of the network configuration can be obtained through the DCSTATUS utility.

B5900 HARDWARE OVERVIEW

The B5900 central processing unit represents an architecture based on a series of fully microprogrammed function processors supported by a multi-bus structure. Despite the simplicity of its internal operation the B5900 is fully code compatible with all other large systems.

The processor is divided into five main areas that operate concurrently. These modules are serviced by two high-speed communication buses that are are capable of simultaneous data transfer (see figure 1-21).

```
+------------+
|            |
|            +----+
| MEMORY     |    |
| CONTROLLER |    |
|            +----------+
|            |    |     |    +---------------+
+------------+    |     |    |               |
                  +==========+   MICRO       |
+------------+    |     |    |   MASTER      |
|            |    |     |    |   CONTROL     |
|            +----+     +====+   PROCESSOR   |
| PROGRAM    |    |     |    |               |
| CONTROLLER |    |     |    +---------------+
|            +----------+
|            |    |     |    +---------------+
+------------+    |     |    |               |
                  +==========+   MESSAGE     |
+------------+    |     |    |   LEVEL       |
|            |    |     |    |   INTERFACE   |
|            +----+     +====+   PROCESSOR   |
| DATA       |          |    |               |
| PROCESSOR  |          |    +---+---+---+---+
|            +----------+    | 0 | 1 | 2 | 3 |
|            |               +---+---+---+---+
+------------+
```

Figure 1-21. B5900 System

BUS STRUCTURE

There are two major buses on the B5900, the Main Data Bus (M-Bus) and the Control Bus (C-Bus). The M-bus is 52-bits wide to allow the movement of one word (48 data-bits, 3 tag-bits and 1 parity-bit) through the system at high speed. The C-Bus is 30-bits wide and is used by the Micro Master Control processor to control the other modules in the CPU.

MICRO MASTER CONTROL PROCESSOR

This is the master processor designed to execute the large system instruction set. It is a micro-programmed processor that guides the other processors through the execution of an instruction. This is done by addressing commands to a specific CPU component via the C-Bus.

PROGRAM CONTROLLER

This processor is designed to independantly decode instructions for the Micro Master Control processor as well as work directly with the Memory Controller to fetch additional program words.

DATA PROCESSOR

This unit is responsible for the actual arithmetic and logical processing done on the B5900. It is fed a series of commands from the Micro Master Control processor via the C-Bus.

MESSAGE LEVEL INTERFACE PROCESSOR

This unit provides an interface between the CPU and the DLPs actually doing the I/O. It will manage up to four MLI ports and is responsible for providing the DLPs with a high speed path to and from memory.

MEMORY CONTROLLER

The Memory Controller is responsible for providing the system with access to up to 6.2 MB of memory. It also provides the pathway to GLOBAL(TM) Memory.

B6900 HARDWARE OVERVIEW

----- -------- --------

The Burroughs B6900 system is high speed computer system derived from the B6800 series architecture. It was the first large system to support Universal I/O (UIO) hardware. It provides reliable high speed processing with a relatively low environmental cost in either floorspace or power.

The system is divided into three major parts, each operating to provide independant services to maximize system throughput. A schematic of the B6900 is shown in figure 1-22.

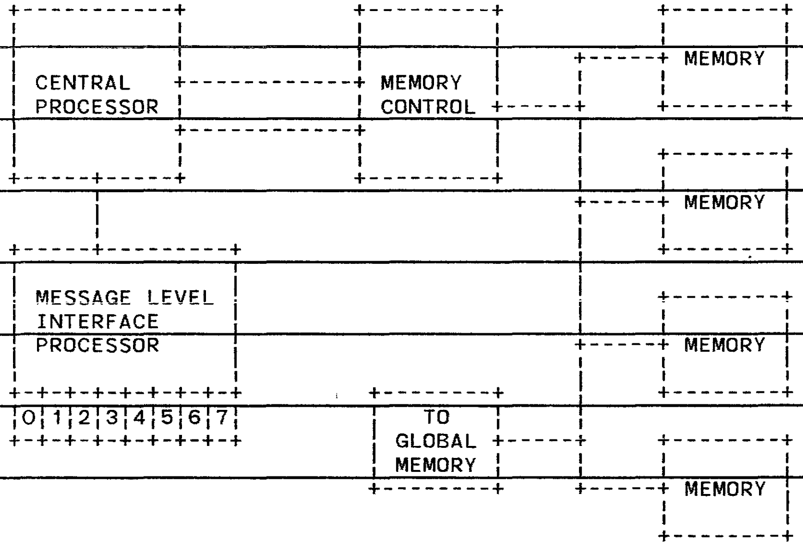


Figure 1-22. B6900 System

CENTRAL PROCESSOR

The Central Processor is the unit responsible for all program and MCP code execution. It does all arithmetic and logical operators based on the operator strings it is directed to execute. The CPU itself is almost identical with the B6800 CPU. A two words top-of-stack buffer is maintained in the CPU to speed operation. Also there is an automatic 1-word code look-ahead that is done via the CPU's second port to the Memory Control. This second path is dedicated to the look-ahead function.

MEMORY CONTROL

This unit provides the CPU with access to up to 6.2 MB of high speed memory. It acts as an exchange to allow either of the two CPU memory request ports with access to up to five memory modules. It is the fifth memory module that is the B6900's path to GLOBAL(TM) Memory.

MESSAGE LEVEL INTERFACE PROCESSOR

This processor is responsible for all the management of I/O done to and from the DLPs. It handles all main-memory queue manipulation as well as provides a path to memory for the DLP when data transfer is required. The MLIP must share the CPU's data path to memory, however, it is designed to work in a "burst" mode so as to make the memory accessing as efficient as possible. The MLIP is capable of handling up to 8 MLI ports. All input/output, both peripheral and datacom, is managed by the MLIP independantly of the CPU.

B5900/B6900 I/O OVERVIEW

This section deals with the technical aspects of the B5900/B6900 Universal Input Output (UIO) hardware operation. The details of both the hardware and software operation of UIO are extremely well covered in the manual "OVERVIEW OF PHYSICAL I/O ON B5900/B6900 SYSTEMS" (form #5013758). This section will simply review the main concepts behind UIO.

MAIN COMPONENTS

Below are listed the main components of the UIO system hardware:

1. Message Level Interface Processor - That part of a B5900/B6900 mainframe that is given the task of managing the I/O by the central processor. Its duties will include I/O queue handling, path queue handling, data transfer to and from memory, DLP initiation and generating an interrupt to flag the CPU to handle all queued results.

2. Message Level Interface - A standard hardware/software protocol to allow the development of an I/O subsystem that is independant of the characteristics of a given mainframe.

3. Line Expansion Module - A device to allow a Message Level Interface port to connect to up to 7 I/O Bases rather than just one.

4. I/O Base - A physical card cage to house up to 8 DLPs.

5. Data Link Processor - A specialized microprocessor with sufficient intelligence and storage to complete 1 entire I/O to a given peripheral. DLPs are designed to interface to specific peripheral devices and represent the connection port of the mainframe to the peripheral.

I/O INITIATION

The general flow for I/O on a UIO system is as follows:

1. The CPU formats an IOCB (I/O Control Block). This data structure totaly defines the nature of the I/O to be done including unit number and location, I/O control bits, buffer location, I/O queue locations and reserved space for I/O results and times.

2. The processor executes the CUIO operator passing it a descriptor to the IOCB.

3. The MLIP links the IOCB into the unit's command queue.

4. If this is the first I/O in the command queue then the unit's DLP is checked to see if the I/O can be initiated. If it can, the IOCB is delinked from the command queue and the DLP is passed the IO to initiate.

5. If the unit is sharing a path with other units and the DLP is busy then the MLIP will link the unit's entire command queue into the specified horizontal queue. The command queue will remain in this state until some'other unit on the same path completes its command queue, freeing the DLP.

6. When the MLIP senses that an I/O has completed, it links the IOCB into the designated result queue. If the interrupt bit is on in the IOCB's MLIP control word, or if an I/O exception occurred or if the command queue is empty then the CPU will be given an I/O finish interrupt. If the command queue is empty then the MLIP will also check the unit's horizontal queue to see if there is another command queue queued for activation.

7. Upon receipt of an I/O finish interrupt the CPU will process the entire result queue. For each IOCB the following will be done:

   - delink from result queue

   - perform exception handling if necessary

   - perform all statistical accounting

   - wake up any task waiting on the I/O's completion

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CODE FILE INFORMATION

APPENDIX B

```
                                                                      1

COMPILERS         Large Systems Code File Format 3.5.0 Release                                    00010200
BINDER                                                                                            00010205
MCP                                                        06-16-75                               00010400

                                                          10-13-77 Rev                            00010410
                    Nick Smilonich, Burroughs, CSG                                                00010500





                                                                                                  00010540
```

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             Feature - Large Systems Code File Format For 3.5.0 Release                             00010504



                                        INTRODUCTION                                                00010555
                                        ------------                                                --------

        This document describes the format  and  content  of  the  code  file                      00010800
        objects,  as emitted by the Large Systems compilers.  The information                      00010900
        was  derived  from  the  WRAPUP  procedures  in  the  compilers,                           00011000
        SYMBOL/BINDER  and  the  MCP  global  section.  Where  applicable,                         00011100
        references to pertinent sequence numbers and symbolics are noted.                          00011300

        The description is organized as follows:                                                  00011500

            OPERATING SYSTEM INTERFACE                                                             00011600
            CODE FILE DECLARATION                                                                  00011700
            GENERAL CODE FILE LAYOUT                                                               00011800
            SEGMENT ZERO LAYOUT WORD AND COMPILERINFO                                              00011900
            SEGMENT DICTIONARY                                                                     00012000
            FILE PARAMETER BLOCKS (FPBS)                                                           00012100
            COMPILER/INTRINSIC INTERFACE                                                           00012200
            CODE FILE BINDER INFORMATION                                                           00012300
               BINDER CONVENTIONS                                                                  00012500
               PROGRAM DESCRIPTION                                                                 00012600
               PROCEDURE DIRECTORY                                                                 00012700
               LOCAL DIRECTORY REFERENCES                                                          00012800
            FPB/PPB RUN-TIME INFORMATION                                                           00013000

            APPENDIX A - SUPPLEMENTARY BINDER INFORMATION                                          00013200


                              OPERATING SYSTEM INTERFACE                                            00013400
                              --------- ------ ---------                                            --------

        Large Systems compilers are declared  as  real  procedures  with  one                      00013700
        array parameter.                                                                           00013800

            REAL PROCEDURE ALGOLCOMPILER (SHEET); ARRAY SHEET [*];                                 00013900

        The SHEET array is passed in from the MCP, and  contains  a  skeleton                      00014200
        segment  zero.  This  skeleton  will  be  used  by  the  compiler  in                      00014300
        constructing the real segment zero for the compiled code  file.  The                       00014400
        SHEET   passed   contains   values  from  WFL  control  cards  (e.g.,                      00014500
        PRIORITY=75, SHEET  [9]=75)  and  file-equation  control  information                      00014600
        (e.g.,  ?FILE  LINE(KIND=REMOTE)).  SHEET [0] contains the offset in                       00014700
        the SHEET to  the  variable  (file-equation  and  program  parameter)                      00014800
        information.                                                                               00014900
```

CODE FILE DECLARATION

Code files are declared in the compilers as disk files with a MAXRECSIZE of 30 words (1 segment).

A typical declaration is:

```
   FILE CODE    (MAXRECSIZE=30,
                 BLOCKSIZE=270,
                 EXTMODE=SINGLE,
                 FLEXIBLE=TRUE,
                 KIND=PACK, PACKNAME="DISK.",
                 MYUSE=OUT,
                 AREAS=40,
                 AREASIZE=504,
                 BUFFERS=2,
                 SAVEFACTOR=999);
```

In addition, these attributes and certain others are checked at compiler initialization to prevent incorrect or mischievous file-equation.

The AREASIZE attribute is defined as CHUNK in some of the compilers and represents the disk rowsize. The compilers use this to ensure code segments are kept within a single disk row (to avoid problems with PRESENCEBIT).

GENERAL CODE FILE LAYOUT

The following chart illustrates the contents of the code

The order of the various parts of the code file is not fixed and varies between compilers. Only segment zero is fixed. file, which will be described herein.

```
     4                                                                                              .FLAG 52
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    GENERAL CODE FILE LAYOUT                                                             00019601
    ------------------                                                                   00019602
    |  SEGMENT ZERO  |        Directory of code file                                     00019603
    |                |        and accumulator of                                         00019604
    |                |        run-time information                                       00019605
    ------------------                                                                   00019606
    ------------------                                                                   00019607
    |      FPB       |        An attribute list                                          00019608
    |(file parameter |        describing files                                           00019609
    |     block)     |        declared in program                                        00019610
    ------------------                                                                   00019611
    ------------------                                                                   00019612
    |  OBJECT CODE   |        Actual object code to be executed                          00019613
    |                |                                                                   00019614
    ------------------                                                                   00019615
    ------------------                                                                   00019616
    |  OBJECT CODE   |        Object code.  The code segment                             00019617
    |   REFERENCES   |        may also contain references                                00019618
    |                |        (code markers for binding)                                 00019619
    ------------------                                                                   00019620
    ------------------                                                                   00019621
    |     LOCAL      |        Description of local variables                             00019622
    |   DIRECTORY    |        for binding                                                00019623
    |                |                                                                   00019624
    ------------------                                                                   00019625
    ------------------                                                                   00019626
    |   PROCEDURE    |        List of procedures                                         00019627
    |   DIRECTORY    |        (blocks in the program)                                    00019628
    |                |        used for binding                                           00019629
    ------------------                                                                   00019630
    ------------------                                                                   00019631
    |  VALUE ARRAY   |        Preset data arrays, pools                                  00019632
    |                |                                                                   00019633
    ------------------                                                                   00019634
    ------------------                                                                   00019635
    |    PROGRAM     |        Directory of binding information                           00019636
    |  DESCRIPTION   |        in code file                                               00019637
    |                |                                                                   00019638
    ------------------                                                                   00019639
    ------------------                                                                   00019640
    |    D1 STACK    |        Segment dictionary or D[1]                                 00019641
    |     IMAGE      |        stack image in 64-bit format                               00019642
    |                |                                                                   00019643
    ------------------                                                                   00019644
    ------------------                                                                   00019645
    |    FPB/PPB     |        Run-time file/program information                          00019646
    |                |        (indicated by SHEET [0])                                   00019647
    ------------------                                                                   00019648
                                                                                         00019649
                                                                                         00019650
                                                                                         00019651
                                                                                         00019652
```

```
                                SEGMENT ZERO LAYOUT                                       00021100
                                ------- ---- ------                                       --------

            This section outlines the content of each word in  segment  zero  and         00021400
            indicates  the  portion to be built by the compiler.  The MCP defines         00021500
            at 05043000 describe the segment words.                                       00022000


                                 COMPILER                                                 00022455
            WORD  DEFINITION     SUPPLIED   FORMAT           COMMENTS                     00022460
            ----  ----------     --------   ------           --------                     00022465
             0                                               Displacement in the          00022600
                                                             SHEET of PPB/FPB             00022620
                                                             run-time information,        00022640
                                                             to be written by             00022660
                                                             the compiler into            00022680
                                                             the code file.  This         00022700
                                                             location is zeroed           00022720
                                                             by the compiler.             00022740
                                                                                          00022900
            1     LIBWORD          YES                       Information concerning       00023000
                                                             the Library                  00023020
                                                             SHARINGCLASS of the          00023040
                                                             codefile.                    00023060
                                                                                          00023100
            2     ENTRYPOINT       YES       Integer         Stack address of the         00023200
                                                             outer block PCW     cobol flo 00023300
                                                             in the segment               00023400
                                                             dictionary.  Used            00023450
                                                             by the MCP to                00023500
                                                             construct a phony RCW        00023550
                                                             which allows NORMALBOJ       00023600
                                                             to exit into the JOB.        00023650
                                                                                          00023700
            3     ROLLOUT          YES       Integer         Last code file record        00023800
                                                             (segment) number;            00023850
                                                             i.e., size of code           00023900
                                                             file.  Used for              00023920
                                                             RESTART.  See DOCTOR         00023940
                                                             at 35197810.  VERSION        00024000
                                                             for MCP.                     00024003
                                                                                          00024100
            4     DATE             YES       Integer         Set to TIME(5) at            00024200
                                                             at compile wrapup.           00024300
                                                                                          00024400
            5     TIME             YES       Integer         Set to TIME(11)              00024500
                                                             at compile wrapup.           00024520
```

```
                          COMPILER                                                 00024580
WORD  DEFINITION          SUPPLIED    FORMAT        COMMENTS                       00024600
----  ----------          --------    ------        --------                       00024620
  6     SOEXECUTEINFO      YES        Word                                         00024800
        NONEXECUTABLEF                [47:1]        1 means this code file         00024804
                                                    is not excutable.              00024806
                                                                                   00024808
        NONEXECUNSAFEF     YES        [45:1]        If NONEXECUTABLEF is           00024810
                                                    1, then this field             00024812
                                                    indicates why the code         00024814
                                                    file is nonexecutable.         00024816
                                                    A 1 means the file is          00024818
                                                    not executable because         00024820
                                                    it contains unsafe             00024822
                                                    code.  A 0 is used in          00024824
                                                    all other cases.               00024826
                                                                                   00024828
      NONEXECMACHINEF      YES        [44:19]       Familes not supported          00024830
                                                    by this code file.             00024832
                                                    For each machine,              00024834
                                                    0 (false) means that           00024836
                                                    the code file will run         00024838
                                                    on the machine, and            00024840
                                                    1 (true) means it will         00024842
                                                    not. The bits in the           00024844
                                                    field are indexed              00024846
                                                    with the following,            00024848
                                                    where 0 implies                00024850
                                                    (bit 26).                      00024852

   B6800ID  =  2                                                                   00024856
   B6900ID  =  3                                                                   00024858
   B5900ID  =  4                                                                   00024860
   A3ID     =  5                                                                   00024862
   A9ID     =  6                                                                   00024864
   A13ID    =  7                                                                   00024866
   B7700ID  = 11                                                                   00024868
   B7800ID  = 12                                                                   00024870
   B7000ID  = 13                                                                   00024872
   B7900ID  = 14                                                                   00024874
```

Keeps [illegible] programs from running (

A15 →

WORD	DEFINITION	COMPILER SUPPLIED	FORMAT	COMMENTS
----	-----------	--------	------	--------
	PARAMCOUNTF	YES	[19:20]	Number of formal parameters.
			[46:1]	Unused.
~~6~~	PARAMCOUNT	YES	Pars	Number of parameters to the main program.
			Nonexec [47:1]	NONEXEC=1 means this code file is nonexecutable as a unit.
7	CORRESTIMATE 30% code 70% data	YES	Integer compiler's guess; used for scheduling	If SHEET [7] is not zero, use supplied core estimate (from ?CORE card); else insert compiler generated core estimate.
8	COMPILERINFO	YES		See section on COMPILERINFO
9	PRIORITY			MCP supplied from PRIORITY card
10	MAXPROCESSTIME			MCP supplied from PROCESSTIME card
11	MAXIOTIME			MCP supplied from IOTIME card
12	FPB	YES	Record number & length= [39:20]	If SHEET[0] NEQ 0, a file parameter or program parameter block is passed in the SHEET starting at [SHEET[0]] If it exists, the compiler writes it out to the code file. See DOCTOR at 35197600.

```
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                           COMPILER                                                            00027840
         WORD  DEFINITION  SUPPLIED  FORMAT          COMMENTS                                   00027860
         ----  ----------  --------  ------          --------                                   00027880
         13    OPTION                                Standard MCP option                        00027884
                                                     word.  See MCP at                          00027886
                                                     01305000 for format.                       00027888
                                                                                                00027900
         14   SODEIMPLEMENTINFO YES  Word            Miscellaneous                              00028000
                                                     deimplementation                           00028100
                                                     warnings will be                           00028102
                                                     assigned specific                          00028104
                                                     bits.  The appropriate                     00028106
                                                     bits will either                           00028108
                                                     be set by the MCP or                       00028110
                                                     by a compiler.                             00028112

            This word will be used only by 3.7 compilers, 3.5, 3.6 and 3.7 MCP,                 00028130
            and 3.5, 3.6 and 3.7 Binder.                                                        00028140
                                                                                                00028150
            This word will become available starting 4 releases after 3.7                       00028160
            (currently estimated to be 4.1).                                                    00028170

         15   STACKSIZE         YES  Integer         Stack estimate.                            00028300
                                                     If SHEET [15]                              00028320
                                                     EQL 0, use 512 else                        00028350
                                                     SHEET [15].                                00028360
                                                                                                00028400
         16   PROGRAM                                                                           00028450
              DESCRIPTION       YES  Record number   Used with paramcount                       00028454
                                     & length        for parameter checking                     00028510
                                     [39:20]         (see external                              00028555
                                                     reference of DOCTOR).                      00028600
                                                     Also used for binding                      00028650
                                                     (see section on binder                     00028660
                                                     information).                              00028680
                                                                                                00028690
```

addressed Seg/dict

variable names

```
         17  INTRINSICTABLE                          For intrinsics code                        00028700
                                                     files.  Points to                          00028702
                                                     "INTRINSICINFO" array.                     00028705
                                                                                                00028750
         18  D1DESC             YES  Record number                                              00028800
                                     & length                                                   00028860
                                     [39:20]         Address in code file                       00028900
                                                     of 64-bit D1 stack                         00028950
                                                     (segment dictionary)                       00028960
                                                     image.  Length is                          00028980
                                                     number of 64-bit                           00029000
                                                     tagged words (see                          00029002
                                                     section on segment                         00029004
                                                     dictionary).                               00029006
                                                                                                00029010
                                                                                                00029150
```

19:20 relative codefile address

```
           Feature - Large Systems Code File Format For 3.5.0 Release                  00010504

                           COMPILER                                                    00029180
     WORD  DEFINITION      SUPPLIED   FORMAT          COMMENTS                         00029200
     ----  ----------      --------   ------          --------                         00029220
     19    LOCALCOUNT        YES      Integer         Size of D2 stack                 00029240
                                                      allocated by                     00029250
                                                      compilers.  FORTRAN              00029260
                                                      and PL/I includes                00029270
                                                      the D3 size too.                 00029280
                                                                                       00029290
     20    WSLMIT                                     Working set core                 00029300
                                                      limit.                           00029350

     21    DIESTIMATE                                                                  00029500
           Working set code estimate                                                   00029600

     22    RESTARTCOUNT                                                                00029700
           Checkpoint/restart use (?RESTART card)                                      00029800

     23    EXECUTION COUNT                                                             00029900
                                                                                       00030000
     24    D1WSAVRG                                                                    00030100
                                                                                       00030200
     25    RUNWSAVRG                                                                   00030300
           Used for working set statistics, average amount of core and  data.          00030400
           See UPDATECOREEST in MCP at 35370000.                                       00030600

     26    LOGSTART                                                                    00030700
           For restart.  See DOCTOR at 35147910                                        00030800

     27    SKELSTACK                                                                   00030900
           For restart.  See DOCTOR at 35197825                                        00031000

     28    PROGRAMUNIT                                                                 00031100
           DESCRIPTOR      YES      Record number                                      00031104
                                    & length                                           00031110
                                    [39:20]           Points to a Program              00031114
                                                      Unit Directory if                00031120
                                                      the code file contains           00031122
                                                      one or more program              00031125
                                                      units compiled under             00031126
                                                      the LIBRARY compiler             00031128
                                                      control option.                  00031130
                                                                                       00031200
```

```
                   COMPILER                                                       00031220
WORD  DEFINITION   SUPPLIED   FORMAT          COMMENTS                            00031230
----  ----------   --------   ------          --------                            00031240
29    SYMBOLICDESC  YES       Record number                                       00031300
                              & length                                            00031310
                              [39:20]         Points to                           00031314
                                              SYMBOLICINFO.  Used                 00031315
                                              automatic separate                  00031316
                                              compilation and                     00031320
                                              binding (ALGOL                      00031340
                                              code files only).                   00031360


         SEGMENT ZERO EXAMPLE                                                     00032153
         ------- ---- -------                                                     --------

      SEGMENT NO. 000                                                             00032410
                                                                                  00032414
   0   000000000000   000000000000   000000000002*                                00032500
   3   00000000000C   0000050431C5   0004E38B7F8C                                 00032600
                                                                                  00032650
   6   000000000000   0000000005A7   000000020600                                 00032700
   9   000000000000   000000000000   000000000000                                 00032800
                                                                                  00032900
  12   00000060000B   000000000000   000000000000                                 00033000
  15   000000000200   000001200009** 000000000000                                 00033100
                                                                                  00033150
  18   00000060000A***000000000009   000000000000                                 00033200
  21   000000000000   000000000000   000000000000                                 00033300
                                                                                  00033350
  24   000000000000   000000000000   000000000000                                 00033400
  27   000000000000   000000000000   000000000000                                 00033500
                                                                                  00033600
       *         ENTRYPOINT AT D1[2]                                              00033700
       **        PROGRAM DESCRIPTION AT RECORD # 9,  18 WORDS LONG                00033800
       ***       SEGMENT DICTIONARY AT RECORD # A,    6 WORDS LONG                00033900
```

COMPILERINFO EXAMPLE

```
 -------------------------------------------------------------------------------
 |47  |46  |45  |44  |43  |42|41|40|31          |23         |15         |9         |
 |    |    |    |    |    |  |  |  |LANGUAGEF   |RELEASENUM |UNUSED     |CYCLENUM  |
 |    |    |    |    |    |  |  |  |            |           |           |          |
 -------------------------------------------------------------------------------
   |    |    |    |    |   |   |            |
   |    |    |    |    |   |   |            |-These fields contain the--------|
   |    |    |    |    |   |   |             version of the compiler that
   |    |    |    |    |   |   |             compiled the codefile.
   |    |    |    |    |   |   |
   |    |    |    |    |   |   |------Library capable
   |    |    |    |    |   |
   |    |    |    |    |   |--PP----Privileged program  ← avoid usercode security
   |    |    |    |    |
   |    |    |    |    |-------------Not used
   |    |    |    |
   |    |    |    |----------------DMS Capable
   |    |    |
   |    |    |--------CP---------Control Program  ← means program will always run
   |    |                                              won't wait in schedule
   |    |-------------------------Not used
   |
   |----------------------------IPC Capable
```

The version 31.234.567 would be store RELEASENUM = 31.
CYCLENUM = 234.

The unused fields contain zeros.

LANGUAGEF

ALGOL	=	0	JOVIAL	=	5
COBOL	=	1	BETA	=	6
FORTRAN	=	2	ESPOL	=	7
XALGOL	=	3	DCALGOL	=	8
PL/1	=	4	BASIC	=	9
			WFL	=	10

```
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        The defines for the COMPILERINFO word are at  05050500,  05034030  in               00038700
        the MCP.                                                                            00038750
```

SEGMENT DICTIONARY (D1 STACK)

The segment dictionary generated by the compilers is written to the code file in a special format. Each stack entry is written as a 64-bit word. The purpose of this technique is to allow the MCP to perform a "read with tags", when setting up the D1 stack. The hex format of each entry is:

```
        AT 00  DDDD DDDD DDDD
            T = TAG
            D = DESCRIPTOR BODY OR WORD
            A = BINDER INFORMATION FIELD
```

The first two 64-bit entries in the stack image are zero, reserving space for MSCW/RCW. Segment zero [18] identifies the starting record number [19:20] and the length in 64-bit words [39:20]. The PCW (TAG 7) for the outer block (i.e., the starting point of the program) is generally one of the latter entries in the segment dictionary. The D1 stack address of this PCW is stored in segment zero [2].

The high order bit of field A is used as an indication bit for the Binder. Normally, A = 4"0". However, the high order bit of field A is set to 1 in the following two situations.

First, in a program that allows or requires an external procedure to be bound in, the high order bit of field A is set to 1 in the entry for the data descriptor (tag 5) that points to the description of how the external procedure and its parameters, if any, were declared.

Second, in a separately-compiled procedure that requires access to global variables, the high order bit of field A is set to 1 in the entry for any segment descriptors (tag 3) for code segments that contain references (NAMCs and VALCs) to the global variables.

The Binder may also preserve the value of field A after binding the external procedures to the host so that replacement binding can be used.

```
                  SEGMENT DICTIONARY EXAMPLE                                                                00040900
                  ------- ---------- -------                                                                --------

             SEGMENT NO. 00A                                                                                00040993
                                                                                                            00040998
                                                     ENTRYPOINT                                             00041001
                                                       PCW                                                  00041003
                 ZERO                  ZERO            TAG 7                                                00041005
                                                                                                            00041010
            |                   |                  |                                                        00041020
            000000000000   000000000000   000000000700   00000360A003                                       00041100
                SEGMENT                                                                                     00041183
               DESCRIPTOR                                                                                   00041184
                 TAG 3                                                                                      00041185
                                                                                                            00041188
            |                   |                                                                           00041190
            030000000430   000405000700                                                                     00041200
                                                                                                            00041300
                       READ ONLY                                                                            00041381
                      VALUE ARRAY                                                                           00041383
                          TAG 5                                                                             00041385
                    -------------------                                                                     00041388
                    |                 |                                                                     00041390
            000000300500   080000840007   000000100004   000000E00002                                       00041400
            000A03600003   000803800003                                                                     00041500
                                                                                                            00041600
            000001900001   000203508003   000001200001   000004000003                                       00041700
            000001500001   000000000009                                                                     00041800
                                                                                                            00041900
            B280ABB7A080   32402EB00F50   03AFABB51005   B180875005B9                                       00042000
            B327108BA180   00AE400AABA3                                                                     00042100
                                                                                                            00042200
            6000AF960DBE   270000840001   B20595B4BEFF   270000740002                                       00042300
            B20595B4B0BE   000001E00000                                                                     00042400
```

stack = 0
PSI = 0
PWI = 36
L = 2
SDLL = 1
SDI = 3

leftovers trash

```
                   FILE PARAMETER BLOCKS (FPBS)                                    00043100
                   ---- --------- ------ ------                                    --------

       FPBS are collections of attributes describing files declared  in  the       00043400
       user  program.  The FPB will eventually be converted to a FIB when a        00043500
       file is opened.                                                             00043600

       FPBS are generated and written to the  code  file  in  the  following       00043800
       manner:                                                                     00043900

          WORD 0         LANGUAGENUMBER (see COMPILERINFO)                         00044000
                         & FILELEVEL [47:8] (software)                             00044100
                                                                                   00044200
          WORD 1-N       INTNAME of the file in the form (HEX):                    00044300
                              TT 01 01 LL NN ... NN 00 ... 00                      00044400
                                                                                   00044500
                                                                                   00044600
                              TT = Total length (bytes)                            00044700
                              LL = Length of name                                  00044800
                              NN = Name                                            00044900
                              00 = Padded to word boundary                         00045000
                                                                                   00045100
          WORD N+1       List of attributes in hex form:                           00045200
                              Numeric/Boolean attributes                           00045300
                                   LL AA VV .. VV                                  00045400
                                                                                   00045500
                                        LL = Length in bytes                       00045600
                                        AA = Attribute number                      00045700
                                        VV = Attribute value                       00045800
                                                                                   00045900
                              String attributes                                    00046000
                                   02 AA LL VV .. VV                               00046100
                                                                                   00046200
                                        AA = ATTRIBUTE NUMBER                      00046300
                                        LL = Length                                00046400
                                        VV = Attribute value                       00046500
                                                                                   00046515
                              Padding, used to adjust to word boundary             00046525
                              for FPB's with variable entries filled               00046530
                              in at run time.                                      00046535
                                   01                                              00046540
                                                                                   00046545
                              Stopper, the last valid byte in the FPB.             00046550
                                   00                                              00046555
```

Reference to the FPB in the code file is via a special descriptor allocated for the file in the user stack (e.g., at D2 or higher). This stack descriptor is allocated at the level of the file declaration, and is constructed within the stack building code. The stack location will eventually be changed to a descriptor pointing to the FIB in memory. The format of the FPB descriptor is:

[45:1]	= 1	Indexed bit
[42:3]	= 7	Invalid SZF field
[35:16]		Length of FPB (words)
[18:1]	= 1	MCP value array bit
[17:18]		Record number of FPB
[TAG]	= 5	

A typical descriptor in HEX would look like the following:

```
5 270000440001
```

The indexed/byte (SZF) fields are invalid and will cause a hardware interrupt when the descriptor is accessed. The interrupt will force a FIB to be constructed (GETFPB, ATTRIBUTEHANDLER in the MCP), and the descriptor will be overwritten by a legitimate one pointing to the FIB memory space.

```
          FPB EXAMPLE
          --- -------

       SEGMENT NO. 002


      LANGUAGE
        (0=ALGOL)
      FILELEVEL=1              INTNAME="CODE"         INTMODE=EBCDIC
      ┬────────────┬  ┬──────────────────────────┬  ┬─────┬
      |            |  |                          |  |     |
      010000000000    08010104C3D6  C4C500000000    031D04030801

                  TITLE="HEXER."

      ┬────────────────────┬
      |                    |
      030F1E020006    C8C5E7C5D94B

      000000000000    000000000000  000000000000    000000000000
      000000000000    000000000000
```

COMPILER/INTRINSIC INTERFACE

The compilers interface code files with system intrinsics by generating special descriptors (TAG 5) in the segment dictionary for each intrinsic referenced. The descriptor format is:

```
        TAG 5
          [42:3]        Invalid SZF=7
          [23:11]       Installation number
          [12:13]       Intrinsic number
```

The INTRINSICINFO table (0,17) contains all intrinsic/installation numbers for the current intrinsic file. The compilers use this table for intrinsic calls. For standard intrinsics (e.g., SIN), the intrinsic numbers are predefined (see SYMBOL/BINDER at 10670000) and the installation number is ZERO. For installation intrinsics, these numbers originate from the BIND cards used to create the intrinsic file.

Any call on an intrinsic is generated as a normal MKST, NAMC, ENTR sequence, where the NAMC address couple is the D1 location of the special TAG 5 descriptor. A special hardware interrupt will occur on the first call on the intrinsic, due to the invalid SZF field. The descriptor will be overwritten with an SIRW to the intrinsic's PCW in the running intrinsic stack and subsequent calls will function as procedure calls.

```
    18
           Feature - Large Systems Code File Format For 3.5.0 Release                    00010504

    The procedure FETCHINTRINSIC at  MCP  31500000  handles  the  special               00055100
    intrinsic interrupt processing.                                                      00055200

       BEFORE FIRST CALL ON INTRINSIC                                                    00057101
                                                                                         00057102
                                                                                         00057103
    ----------                                                                           00057104
    |        |                                                                           00057105
    ----------                                                                           00057106
    |  IRW   |---->|                                                                     00057107
    |        |     |                                                                     00057108
    ----------     |                                                                     00057120
    |  RCW   |     |                                                                     00057140
    |        |     |                                                                     00057160
    ----------     |                                                                     00057180
    |  MSCW  |     |                                                                     00057200
    |        |     |                                                                     00057220
    ----------     |      --------------                                                 00057240
    |        |     |      |            |                                                 00057260
    |        |     V   -----------------                                                 00057280
    |        |     |-->|5 |070000000003D|                                                00057300
    ----------         |  |            |                                                 00057320
                       -----------------                                                 00057340
    USER STACK            |            |                                                 00057360
                          |            |                                                 00057380
                          |            |                                                 00057400
                          --------------                                                 00057420
                                                                                         00057440
                          SEGMENT DICT                                                   00057460
                            (USER)                                                       00057480
                                                                                         00057500
                                                                                         00057520
                                                                                         00057540
                                                                                         00057560
```

```
                                                                              19
               Feature - Large Systems Code File Format For 3.5.0 Release       00010504

            SUBSEQUENT CALLS ON INTRINSIC                ----------------       00060401
                                                         |              |       00060402
                                                      -------------------       00060403
         ----------                               |-->|7 |     PCW      |       00060404
         |        |                               A   |  |              |       00060405
         ----------                               |   -------------------       00060406
         |  IRW   |---->|                         |      |              |       00060407
         |        |     |                         |      |              |       00060408
         ----------     |                         |      |              |       00060410
         |  RCW   |     |                         |      |              |       00060420
         |        |     |                         |   -------------------       00060430
         ----------     |                         |   |3 |SEG DESCRIPTOR|       00060440
         |  MSCW  |     |                         |   |  |              |       00060450
         |        |     |                         |   -------------------       00060460
         ----------     |      ---------------    |      |              |       00060470
         |        |     |      |             |    |      ----------------       00060480
         |        |     V   ------------------    |           INTRINSIC         00060490
         |        |     |-->|1 |    SIRW     |--->|           STACK             00060500
         ----------         |  |             |                                  00060510
                            ------------------                                  00060520
         USER STACK            |             |                                  00060530
                               ---------------                                  00060540
                             SEGMENT DICTIONARY                                 00060550
                                    (USER)                                      00060560
                                                                                00060570
                                                                                00060580
                                                                                00060590
                                                                                00060600
                                                                                00060610
                                                                                00060620
                                                                                00060630
                                                                                00060700
```

```
                  CODE FILE BINDER INFORMATION                      00060900
                  ---- ---- ------ -----------                      --------

Extensive information is maintained in the  code  file  which  allows    00061200
binding of program objects.                                         00061300

This information is comprised of:                                   00061500

    PROGRAM DIRECTORY                                               00061600
    PROCEDURE DIRECTORY                                             00061700
    LOCAL DIRECTORIES                                               00061800
    REFERENCES                                                      00061900
    SEGMENT DICTIONARY                                              00061940

Although  a  thorough  understanding  of  these  structures  is   not    00062200
essential  for  analyzing  a  Large Systems Code file, the ability to    00062300
identify the above components in the code file necessary.           00062320

For a description of the information  kept  for  the  Binder  in  the   00062380
segment dictionary, see the section SEGMENT DICTIONARY (D1 STACK).  00062420


                       BINDER CONVENTIONS                           00062500
                       ------ -----------                           --------

To describe the content of  the  binder  information,  the  following   00062800
conventions  will  be  used.  The binder directories/descriptions are   00062900
keyed by special words in the code file in the following form:      00063100

    UC = [47:8]  = Universal class                                  00063200
    SC = [39:20] = Subclass                                         00063300
    N  = [19:20] = Length                                           00063400

Example:                                                            00063700


   02 0000 0004                                                     00063900
        Universal class = 2 = Single precision operand              00064000
        Sub class       = 0 = Integer type                          00064100
        Length          = 4 Words                                   00064200

Keywords may be denoted as (UC, SC, N, ENTRY).  Appendix A contains a    00064500
complete list of universal/sub classes.                             00064600

Identifiers are constructed as:                                     00064800


        4" TT 01 01 CC "8" NN . . . N"                              00064900
                                                                    00065000
             TT = Total length in bytes of this construct           00065100
             CC = Number of characters in idetifier                 00065200
```

NN = The identifier

Individual stack items are described by ITEM DESCRIPTIONS. These descriptions usually include an identifier entry (0,1,N) (IDENTIFIER) and an address couple entry (0,2,N) (ADDRESS COUPLE).

PROGRAM DESCRIPTION

The program description (PD) is located by the code file segment number at segment ZERO [16].[19:20]. It describes the outer procedure (if this is a procedure program), global items (GLOBALS), points at the procedure/block directory (called the PROCEDURE DIRECTORY) and supplies miscellaneous code information (code address of stack building code, etc.). The PD is also used for run-time parameter checking of procedure programs (e.g., SYSTEM/DUMPALL). See EXTERNALREFERENCE of DOCTOR for this usage.

Program descriptions are structured differently depending on whether the program is a HOST/BLOCK program or a separate procedure program.

```
   PROCEDURE PROGRAM            BLOCK PROGRAM
   --------- -------            ----- -------

      SEGO[16]---------------      SEGO[16]--------------
                            |                           |
                            |                           |
      Item description of<- |                           |
      outer procedure                                   |
      including parameters                              |
                                                        |
      Procedure directory          Procedure directory<-|
      pointer                      pointer

      External directory           External directory

      MISCELLANEOUS                MISCELLANEOUS
```

The procedure directory is a list of blocks/procedures in the program and resides apart from the PD. The procedure directory pointer in the PD is HEX encoded (0,22,L). The next word contains the disk segment number of the procedure directory [19:20] and length [39:20].

Note: In the following discussion and examples, all program description subclasses are in base 16.

After finding the PD from SEGO[16], a quick scan through the PD for an entry like the following example will lead to the procedure directory.

```
        000002200005        000000500009
```

```
           UC=00, SC=22         PROCEDURE DIRECTORY AT                                      00070700
                                SEGMENT 9, LENGTH=5                                         00070800

     Other elements of the program description are:                                         00071200

           GLOBAL DIRECTORY (0,4,L)                                                         00071300
                                                                                            00071400
                Contains descriptions of all GLOBALS/EXTERNALS                              00071500
                for this program.  Separate intrinsics are                                  00071600
                entered here; e.g., (24,0,L).                                               00071700
                                                                                            00071800
           MISCELLANEOUS INFORMATION                                                        00071900
                                                                                            00072000
                BLOCKEXIT POINTERS          (0,19,1) (PCW)                                  00072100
                END D2 STACK BUILDING CODE  (0,12,1) (PCW)                                  00072200
                D2 STACK SIZE               (0,15,1) (SIZE)                                 00072300
                                                                                            00072400
                LT48 POINTERS FOR VALUE                                                     00072500
                ARRAYS (SUCH AS FPBS)       (0,E,1)  (PCW)                                  00072600
                                                                                            00072603
                LEVEL 2 SOFTWARE CONTROL                                                    00072605
                WORD IMAGE                  (0,2A,1)                                        00072608
                                                                                            00072700
                where PCW is a skeleton PCW (no tag) pointing                               00072800
                to the appropriate syllable of code.                                        00072900
```

```
         PROGRAM DESCRIPTION EXAMPLE                                            00073100
         ------- ----------- -------                                            --------

   SEGMENT NO. 009                                                              00073300
                                                                                00073400
                                   EXTERNAL                                     00073475
     PROCEDURE DIRECTORY           DIRECTORY                                    00073477
     POINTER (0,22,L)              (0,4,L)       INTRINSIC                      00073479
     DIRECTORY AT RECORD #8        6 WORDS       (24,2,L)                       00073481
                                                 5 WORDS                        00073482
   ┬─────────────────────────┬   ┬──────────┬   ┬──────────┬                    00073483
   |                         |   |          |   |          |                    00073485
   000002200003   000000300008   000000400006   240000200005                    00073500
   000000100002   07010103F0F6                                                  00073600
                                                                                00073700
                                                LT48 POINTERS                   00073780
                                                (0,E,L)                         00073782
                                                2 WORDS                         00073784
                                                ┬───────────                    00073785
                                                |                               00073790
   F135402EB60F   000000200001   000000100004   000000E00002                    00073800
   ──────────────────────────┬                                                  00073885
                             |                                                  00073890
   000A03600003   000803800008                                                  00073900
                                                                                00073920
   BLOCKEXIT POINTER             END OF D2 STACK                                00073940
   (0,19,L)                      (0,12,L)                                       00073960
   ┬─────────────────────────┬   ┬──────────────────────────┬                   00074000
   |                         |   |                          |                   00074050
   000001900001   000203508003   000001200001   000004000003                    00074100
                                                                                00074110
   D2 STACK SIZE                                                                00074120
   (0,15,L)                                                                     00074130
   ┬─────────────────────────┬                                                  00074140
   |                         |                                                  00074150
   000001500001   000000000009                                                  00074200
                                                                                00074300
   B280ABB7A060   32402EB6CF50   03AFABB51005   B180875005B9                    00074400
   B327108BA180   00AE400AABA3                                                  00074500
                                                                                00074600
   6000AF960DBE   270000840001   B20595B4BEEF   270000740002                    00074700
   B20595B4B0BE   000001E00000                                                  00074800


                         PROCEDURE DIRECTORY                                    00075000
                         --------- ---------                                    --------

The procedure directory contains information about all of the  blocks          00075200
and procedures in the program.                                                  00075400
```

```
        24
             Feature - Large Systems Code File Format For 3.5.0 Release                        00010504

       The procedure directory is located from  the  entry  in  the  program                   00075600
       description  of the form (0,22,L1) (L2,ADDRESS).  L1 is the length of                   00075600
       the entire procedure directory.                                                         00075705

       If L1 = L2, then the entire procedure directory is  in  disk  segment                   00075715
       ADDRESS, beginning in word 1.  Word 0 of that segment is zero.                          00075720

       If L1 > L2, then the procedure directory is in several  pieces.   The                   00075730
       first  piece is of length L2 and begins in word 1 of the disk segment                   00075735
       specified by ADDRESS.   Word  0  of  that  segment  is  of  the  form                   00075740
       (L3,ADDRESS)  and  gives  the  length and disk segments number of the                   00075740
       next piece of procedure  directory.  This  chain  of  disk  segments                    00075745
       continue until a disk segment is reached that contains a zero in word                   00075750
       0; this disk  segment  contains  the  last  piece  of  the  procedure                   00075755
       directory.   In  each  disk  segment  in  the  chain,  the  procedure                   00075760
       directory information begins in word 1.                                                 00075800

       The format of the procedure directory is as follows:                                    00076000

       WORD 1                                                                                  00076300

          47:1      BIT47          1 if procedure is external.                                 00076600

          46:1      BIT46          1  if  local  directory  of  procedure                      00076700
                                   contains  owns  or  segment  dictionary                     00076800
                                   items.                                                      00076900

          45:18     DISKSEGF       disk segment number  of  local  directory                   00077050
                                   for this procedure or block.                                00077100

          27:1      NEWPROCF       1 if this is a new procedure added to the                   00077200
                                   host  because of an unresolved call on it                   00077300
                                   by a procedure bound in.                                    00077400

          26:1      VALARYBIT      1 if this is not a  procedure  but  a  D1                   00077500
                                   value array.                                                00077700

          25:5      LDWORDF        Local directory of this procedure may not                   00077850
                                   start  on segment boundary, but may start                   00077900
                                   at this word (0-29) of segment  indicated                   00078000
                                   by DISKSEGF.                                                00078100

          20:5      NESTLVLF       Lexical level of this procedure.                            00078400

          15:3                                                                                 00078600
          12:13 SEGDIF             Code 0 segment (see SEGSBIT) number which                   00078750
                                   is  stack  building  code  for  this                        00078800
                                   procedure.  All non-own  and  non-segment                   00078850
                                   directory  items  in  the local directory                   00078900
                                   are built  in  this  segment  (code  also                   00078900
                                   exists there).                                              00079050
       WORD 2                                                                      00079200

          47:8                      Number  of  characters   in   identifier.     00079450
                                    blocks; e.g. BLOCK#6.                          00079500
          XXXXXXX                   identifier (in EBCDIC).  Compilers assign      00079600
                                    names  to  blocks;  e.g. BLOCK#6. As many      00079700
                                    words as necessary.                            00079800

       WORDS N-M                                                                   00079900

          15:1       SEGSBIT        Implies  that  this  word  contains   the      00080100
                                    number  of all the code segments that are      00080200
                                    unique to this procedure.                      00080300

          12:13, 28:13, 44:13       Up to 3 code segment numbers per word are      00080450
                                    placed  in these fields in the order list      00080500
                                    at only if SEGSBIT is on.                      00080600


                TYPICAL ENTRY                                                      00080700
                ------- -----                                                      --------


                          SEGSBIT                                                  00080900
                            ON                                                     00081000
                                                                                   00081100
                   ID,                                                             00081190
                  LENGTH                                                           00081193
       ------     ------     ------     ------     ------                          00081200
       WORD 1     4 PROC        1           1      WORD 1  of next entry           00081300
       ------     ------     ------     ------     ------                          00081400
                             EXTRA SEGMENTS                                        00081500
                             other than stack building segment                     00081600
                             indicated in WORD 1                                   00081650

       Note:  If no extra segments are contained in a  procedure,  the  word       00081900
              following  the  IDENTIFIER will have 15:1 = 0 since it will be       00081900
              WORD 1 of the next entry.                                            00082100
```

```
        PROCEDURE DIRECTORY EXAMPLE                                          00082110
        --------- --------- -------                                          --------

  LENGTH OF DIRECTORY = 3                                                    00082300
                                                                             00082400
           LOCAL DIRECTORY                                                   00082475
             AT SEGMENT #3          ID "BLOCK#6"                             00082480
                                                                             00082485
                    | |            |              |                          00082490
  000000000000  400030020003  07C2D3D6C3D2  7BF600000000                     00082500
                                                                             00082700
  000000000000  000000000000  000000000000  000000000000                     00082800
  000000000000  000000000000  000000000000  000000000000                     00082900
  000000000000  000000000000  000000000000  000000000000                     00083000
  000000000000  000000000000  000000000000  000000000000                     00083100
  000000000000  000000000000  000000000000  000000000000                     00083120
  000000000000  000000000000  000000000000  000000000000                     00083140
  000000000000  000000000000                                                 00083200
                                                                             00083300


                          LOCAL DIRECTORY                                    00084000
                          ----- ---------                                    --------

The local directory  of  procedure  or  block  describes  all  locals        00084250
declaredin   the   procedure   or  block.   This  includes  procedure        00084300
parameters, procedures  declared  internally,  procedure  values  for        00084400
typed  procedures,  and local variables.  Local directories generally        00084700
start on a segment boundary and can be identified by (0,21,L) in word        00084800
0.  This word is followed by items descriptions for the locals.              00085100

The local directory of a procedure of block  is  pointed  to  by  the        00085250
DISKSEGF field of the procedure directory entry for that procedure or        00085300
block.                                                                       00085400
```

LOCAL DIRECTORY EXAMPLE

```
  LOCAL DIRECTORY       FILE          IDENTIFIER
     (0,21,18)        (16,1,5)          (0,1,L)

   +-----------+   +-----------+   +-----------+
   |           |   |           |   |           |
   000002100018    160000100005    000000100002
                                   ADDRESS COUPLE
             "LINE"                   (0,2,L)
   +---------------------------+   +-----------+
   |                           |   |           |
   08010104D3C9    D5C500000000    000000200001

      (2,3)

   +-----------+
   |           |
   000000200003    160000100005    000000100002
   08010104C3D6    C4C500000000    000000200001

   000000200004    020000000004    000000100001
   05010101C900    000000200001    000000200005

   060000100006    000000100001    05010101C100
   000000200001    000000200006    000000F00001

   000000000001    000000000000    000000000000
   000000000000    000000000000    000000000000
```

REFERENCES

References are pointers into the code file that mark code to be fixed up should binding occur.

In the segment dictionary, if the TAG field of a segment descriptor is 4"8300", there are references to code in that segment. The word immediately following the object code in the disk segment (the length of the code is given in the segment discriptor) has the following format:

[47:12] REFNUMF Number of references following this word (the references may cross the segment boundary into the following disk segment).

[35:20] REFDISKADF If zero, all of the references follow this word.If nonzero, it is the disk segment number of the next groyp of references.

If REFDISKADF is nonzero, then the references appear in more than group, and the next group is in the disk segment addressed by REFDISKADF. In that segment, word 0 has the following format:

```
     [47:12] REFNUMF     The number of references following this word.

     [35:20] REFDISKADF  If zero, this is the last group of
     references.  If nonzero, it is the disk
     segment number of the next group of
     references.
```

The references following this word are in the form of a PCW with SDI, word index, and syllable index fields.

References refer to operators that contain address couples, such as NAMC and VALC, where the address couple addresses D1 or D2 stack locations (since these addresses may change upon binding), or to LT48/MPCW operators in D2 stack building code (the literal or the PCW may require modification upon binding).

FPB/PPB RUN-TIME INFORMATION

SHEET[0] indicates to the compiler whether run-time file-equation information (FPB) or program parameter information (PPB) is to be written to the code file.

This information is usually the last segment of the code file. The format of the FPB was discussed in thw FPB section. The PPB is a list of task attributes to be applied at task initiation.

The PPB (program parameter block) is formatted as follows:

```
   each task
        PTASKLINKF = [47:28]
        PATLINKF   = [19:20]

   for each attribute
        PATNOF     = [47:08]      attribute number
        PATTYPEF   = [39:08]      attribute type (i.e., STRING ...)
        PATMISCF   = [31:08]
        PATLENF    = [23:24]      length of entry
        Word 0 of the segment for an FPB or PPB contains the following:                   00092400

            [47:1]  = 1 for a PPB, 0 for an FPB                                           00092500
            [19:20] = length of PPB/FPB                                                   00092600


                PPB EXAMPLE                                                               00092800
                --- -------                                                               --------


                                                                                          00093100
                                             ATTRIBUTE NUMBER=0                           00093175
           [47:1]=1                          =NYNAME                                      00093180
                                                                                          00093184
          ┌──────────┐                       ┌──────────┐                                 00093190
          800000000006  000000400000         000200000003                                 00093200
             COMPILED PROGRAM NAME                                                        00093280
                                                                                          00093285
          ┌─────────────────────────┐                                                     00093290
          09010105C8C5  E7C5D9000000         000000000000                                 00093300
                                                                                          00093400
          0000003D0500  080000840007         000000100004                                 00093500
          000000E00002  000A03600003         000803800003                                 00093600
                                                                                          00093700
          000001900001  000203508003         000001200001                                 00093800
          000004000003  000001500001         000000000009                                 00093900
                                                                                          00094000
          B280ABB7A060  32402EB60F50         03AFABB51005                                 00094100
          B18087500589  B327108BA180         00AE400AABA3                                 00094200
                                                                                          00094300
          6000AF960DBE  270000840001         B20595B4BEFF                                 00094400
          270000740002  B20595B4B0BE         000001E00000                                 00094500
```

```
                            APPENDIX A                                        00094900
                            -------- -                                        --------


                 Supplementary Binder Information                             00095100
                 ------------- ------ -----------                             --------

    This appendix  outlines  supplementary  information  needed  for  the     00095400
    section on code file binder data.                                         00095500



                      UNIVERSAL INFORMATION                                   00095600
                      --------- -----------                                   --------

    A typical entry h as the following form:                                  00096696

                                                                              00096701
            ----------------                                                  00096702
            : UC : SC : N  :                                                  00096703
            :    :    :    :                                                  00096704
            ----------------                                                  00096705
            :              : :                                                00096706
            :    STUFF     : :                                                00096707
            :              : > N WORDS                                        00096708
            ----------------                                                  00096709
                                                                              00096710
                                                                              00096711
                                                                              00097000

        where UC FIELD = [47:8]                                               00097200
              SC FIELD = [39:20]                                              00097400
              N  FIELD = [19:20]                                              00097500

    Such an entry may be denoted by (UC,SC,N,STUFF).                          00097800
```

```
                                  UNIVERSAL CLASSES                                   00097900
                                  --------- -------                                   --------

              UC   DESCRIPTION                                                        00098100
              --   -----------                                                        00098200

               0   INFORMATION KEYWORD                                                00098400
               2   48-BIT OPERAND (ANY TAG 0)                                         00098500
               4   96-BIT OPERAND (ANY TAG 2)                                         00098600
               6   DATA DESCRIPTOR (D=0,I=0)                                          00098700
               8   DATA DESCRIPTOR (D=0,I=1)                                          00098800
              10   DATA DESCRIPTOR (D=1,I=0)                                          00099000
              12   DATA DESCRIPTOR (D=1,I=1)                                          00099100
              14   STRING DESCRIPTOR (I=0)                                            00099200
              16   STRING DESCRIPTOR (I=1)                                            00099300
              18   PCW (UNTYPED PROCEDURE OR SUBROUTINE)                              00099400
              20   PCW (TYPED PROCEDURE OR FUNCTION)                                  00099500
              22   FILE                                                               00099600
              24   TASK                                                               00099700
              26   PAIR OF DATA DESCRIPTORS TO ONE ARRAY                              00099800
                   FIRST IS SP, SECOND IS DP                                          00099900
                                                                                      00100000
                   (This is primarily for FORTRAN common blocks                       00100100
                   and equivalence groups)                                            00100200
                                                                                      00100300
              28   INTERRUPT                                                          00100400
              30   MESSAGE OR MESSAGE ARRAY                                           00100500
              32   QUEUE OR QUEUE ARRAY                                               00100600
              34   INTRINSIC (SUBROUTINE)                                             00100700
              36   INTRINSIC (FUNCTION)                                               00100800
              38   PL/I VARIABLES                                                     00100805
              40   DATA BASE                                                          00100815
              42   STRING VARIABLE                                                    00100820
              44   STRING ARRAY                                                       00100825
              46   STRING PROCEDURE                                                   00100830
              48   ALTERNATIVE ITEM GROUP                                             00100835
              50   DATA DICTIONARY DESCRIPTIONS                                       00100840
              52   TRANSACTION BASE                                                   00100845
              54   LIBRARY                                                            00100850
              56   LIBBRARY ENTRY POINT                                               00100855
              58   EXPORTED SUBROUTINE OR FUNCTION                                    00100860
              60   BY-CALLING SUBROUTINE OR FUNCTION                                  00100865
                                                                                      00100900
                   NOTES:                                                             00101000

                       (1) AN ODD  UC  MEANS  THE  ITEM  IS  A  CALL-BY-NAME  OR      00101200
                           CALL-BY-REFERENCE PARAMETER.                               00101240

                       (2) SUBROUTINE = UNTYPED PROCEDURE, FUNCTION = TYPED           00101260
                           PROCEDURE                                                  00101280
```

Feature - Large Systems Code File Format For 3.5.0 Release 00010504

SUBCLASSES 00101400

UC	SC	DESCRIPTION	00101900
			00102000
0	1	IDENTIFIER	00102200
	2	ADDRESS COUPLE	00102300
	3	PARAMETERS	00102400
	4	GLOBAL DIRECTORY	00102500
	5	D1 REFERENCES	00102600
	6	GLOBAL REFERENCES	00102700
	7	LT48 POINTER FOR MAKING PCW	00102800
	8	SEGMENTS	00102900
	9	NUMBER OF PARAMETERS	00103000
	10	EXTERNAL IDENTIFIER	00103200
	11	OWN DIRECTORY	00103300
	12	OWN REFERENCES	00103400
	13	D2 STACK BUILING CODE ARRAY	00103500
	14	LT48 POINTERS FOR MAKING VALUE ARRAY DESCRIPTORS	00103600
	15	NUMUMBER OF DIMENSIONS (PARAM. ARRAY WITH LOWER BOUNDS	00103700
		OR GLOBAL ARRAY)	00103750
	16	ARRAY LENGTH (SEGMENTATION ALLOWED)	00103800
	17	SEGMENT DICTIONARY INDEX	00103900
	18	END OF D2 STACK POINTER	00104000
	19	FIRST EXECUTABLE CODE SYLLABLE	00104100
	20	SUBSCRIPTED VARIABLE POINTER (FORTRAN)	00104200
	21	GLOBAL STACK SIZE	00104300
	22	ARRAY LENGTH (SEGMENTATION NOT ALLOWED)	00104400
	23	LT16 POINTER FOR COMMON BLOCK LENGTH	00104500
	24	REFERENCES TO DOUBLE AND COMPLEX ITEMS IN COMMON	00104600
	25	BLOCK EXIT POINTER FOR FORTRAN STOP IN SUBPROGRAM	00104700
	26	INTRINSIC SPECIAL INFORMATION	00104800
	27	NUMBER OF DIMENSIONS (PARAMETER ARRAY WITHOUT LOWER BOUNDS	00104900
	28	INITIAL VALUE OF A VARIABLE OR ARRAY	00105000
	29	CODE COPYING STARTING AND ENDING LOCATIONS	00105100
	30	HEX REFERENCES TO OWNS	00105200
	31	BCL REFERENCES TO OWNS	00105300
	32	EBCDIC REFERENCES TO OWNS	00105400
	33	LOCAL DIRECTORY	00105500
	34	PROCEDURE DIRECTORY	00105600
	35	NUMBER OF ADDRESS COUPLES (PARAMETERS)	00105700
	36	CHECKING CODE FOR FORMAL PROCEDURE	00105800
	37	EXTRA SEGS FOR PL/I CONTROLLED VARIABLES	00106000
	38	INITIAL CODE SCW AND # OF STACK CELLS (PL/I)	00106100
	39	TIMESTAMP FOR DATA BASE	00106115
	40	FIRST ADDRESS/COUPLE OF SIB FOR DATA BASE	00106120
	41	LIST OF (STRNAME,STR#,ADRCPL) GROUPS FOR DATA BASE	00106125
	42	LEVEL 2 SOFTWARE CONTROL WORD IMAGE	00106130
	43	LEVEL 2 EPILOG OR STATISTICS PCW IMAGE (DCALGOL)	00106135
	44	LT48 POINTER FOR MAKING EPILOG PCW BELOW SCW	00106140
	45	TRANSACTION BASE CREATION TIMESTAMP AND UPDATE TIMESTAMP	00106150

```
            Feature - Large Systems Code File Format For 3.5.0 Release              00010504

      UC    SC  DESCRIPTION                                                         00101600
      --    --  -----------                                                         00101700

            46  LIST OF FORMATS AND SUBFORMATS INVOKED FOR TRANSACTION              00106160
                BASE                                                                00106165
            47  TRANSACTION BASE FORMAT                                             00106170
            48  TRANSACTION BASE SUBFORMATILOG PCW BELOW SCW                        00106180
            49  TRANSACTION BASE ASSOCIATED WITH TR RECORD OR RECORD ARRAY          00106190
            50  PROCEDURE/SUBROUTINE COMPILERINFO WORD                              00106200
            51  LIBRARY TEMPLATE ATTRIBUTES                                         00106210
            52  DATA DICTIONARY INVOCATION DIRECTORY                                00106220
            53  DATA DICTIONARY USAGE DIRECTORY                                     00106230
            54  ENTRY POINT DESCRIPTION OF A LIBRARY ENTRY POINT                    00106240
            52  LIBRARY TO WHICH AN ENTRY POINT BELONGS                             00106250
       2     0  SP OPERAND (INTEGER)                                                00106400
             1  SP OPERAND (REAL)                                                   00106500
             2  SP OPERAND (BOOLEAN)                                                00106600
             3  WORD VARIABLE                                                       00106700
             4  REFERENCE VARIABLE                                                  00106800
       4     1  EVENT                                                               00106900
             3  DOUBLE PRECISION OPERAND                                            00107000
             4  COMPLEX OPERAND                                                     00107100
       6     0  SP ARRAY (INTEGER)                                                  00107200
             1  SP ARRAY (REAL)                                                     00107300
             2  SP ARRAY (BOOLEAN)                                                  00107400
             3  WORD ARRAY                                                          00107500
             4  REFERENCE ARRAY                                                     00107600
             5  DIRECT INTEGER ARRAY                                                00107700
             6  DIRECT REAL ARRAY                                                   00107800
             7  DIRECT BOOLEAN ARRAY                                                00107900
             8  COBOL SEGMENTED ARRAY                                               00108000
             9  FORTRAN VARFILE ARRAY                                               00108100
            10  NEW FORMAT ARRAY                                                    00108300
            11  TRANSACTION RECORD OR RECORD ARRAY                                  00108350
       8     0  SP SUBSCRIPTED VARIABLE (INTEGER)                                   00108500
             1  SP SUBSCRIPTED VARIABLE (REAL)                                      00108600
             2  SP SUBSCRIPTED VARIABLE (BOOLEAN)                                   00108700
             3  FORMAT (ALGOL)                                                      00108800
             4  PICTURE (ALGOL)                                                     00108900
      10     2  EVENT ARRAY                                                         00109100
             3  DOUBLE PRECISION ARRAY                                              00109200
             4  COMPLEX ARRAY                                                       00109300
             5  DIRECT DOUBLE ARRAY                                                 00109400
      12     3  DOUBLE PRECISION SUBSCRIPTED VARIABLE                               00109500
             4  COMPLEX SUBSCRIPTED VARIABLE                                        00109600
      14     1  CHARACTER ARRAY:CHARACTER SIZE=4                                    00109700
             2  CHARACTER ARRAY:CHARACTER SIZE=6                                    00109800
             3  CHARACTER ARRAY:CHARACTER SIZE=8                                    00109900
             4  NON REENTRANT FORMAT ARRAY (FORTRAN)                                00110000
             5  DIRECT CHARACTER ARRAY:CHARACTER SIZE=4                             00110100
             6  DIRECT CHARACTER ARRAY:CHARACTER SIZE=6                             00110200
             7  DIRECT CHARACTER ARRAY:CHARACTER SIZE=8                             00110300
```

```
     34
            Feature - Large Systems Code File Format For 3.5.0 Release                 00010504

        UC   SC   DESCRIPTION                                                          00101600
        --   --   -----------                                                          00101700

        16    1   POINTER                                                              00110400
        18    0   SUBROUTINE                                                           00110500
              1   INITIALIZATION SUBROUTINE (FORTRAN)                                  00110600
              2   LABEL                                                                00110700
              3   SWITCH (LABEL)                                                       00110800
              4   LABEL FOR STOP IN SUBROUTINE (FORTRAN)                               00110900
              5   SWITCH FORMAT                                                        00111000
              6   SWITCH LIST                                                          00111100
              7   SWITCH FILE                                                          00111200
              8   DIRECT SWITCH FILE                                                   00111300
              9   MCP SAVE CODE (SEGMENT 1 AND/OR 5)                                   00111400
             10   FORMAL LABEL                                                         00111600
             11   EPILOG PROCEDURE (DCALGOL,ESPOL)                                     00111615
        20    0   FUNCTION (INTEGER)                                                   00111800
              1   FUNCTION (REAL)                                                      00111900
              2   FUNCTION (BOOLEAN)                                                   00112000
              3   FUNCTION (DOUBLE PRECISION)                                          00112100
              4   FUNCTION (COMPLEX)                                                   00112200
              5   FORTRAN EXTERNAL SUBPROGRAM EXTERNAL INTRINSIC                       00112300
                  OR (NOTHING UNKNOWN)                                                 00112400
              6   I/O LIST (ALGOL)                                                     00112500
              7   POINTER PROCEDURE                                                    00112600
              8   WORD PROCEDURE                                                       00112700
              9   REFERENCE PROCEDURE                                                  00112800
             10   & UP - PL/I FUNCTIONS                                                00113000
        22    1   FILE                                                                 00113200
              2   DIRECT FILE                                                          00113300
              3   COBOL FILE                                                           00113400
              4   DM RESTART FILE (COBOL)                                              00113500
        24    1   TASK                                                                 00113600
              2   TASK ARRAY                                                           00113700
        26    1   FORTRAN COMMON BLOCK                                                 00113800
              2   FORTRAN EQUIVALENCE ARRAY                                            00113900
        28    1   INTERRUPT                                                            00114000
        30    1   MESSAGE                                                              00114100
              2   MESSAGE ARRAY                                                        00114200
        32    1   QUEUE                                                                00114300
              2   QUEUE ARRAY                                                          00114400
        34    0   INTRINSIC (SUBROUTINE)                                               00114500
        36    0   INTRINSIC (INTEGER)                                                  00114600
              1   INTRINSIC (REAL)                                                     00114700
              2   INTRINSIC (BOOLEAN)                                                  00114800
              3   INTRINSIC (DOUBLE PRECISION)                                         00114900
              4   INTRINSIC (COMPLEX)                                                  00115000
        38        PL/I VARIABLES                                                       00115100
        40    0   DATA BASE                                                            00115115
        42    0   EBCDIC STRING VARIABLE (ALGOL)                                       00115120
              1   ASCII  STRING VARIABLE (ALGOL)                                       00115125
              2   HEX    STRING VARIABLE (ALGOL)                                       00115130
        44    0   EBCDIC STRING ARRAY (ALGOL)                                          00115135
```

```
      Feature - Large Systems Code File Format For 3.5.0 Release                          00010504

           UC    SC   DESCRIPTION                                                          00101600
           --    --   -----------                                                          00101700

                  1   ASCII  STRING ARRAY (ALGOL)                                          00115140
                  2   HEX    STRING ARRAY (ALGOL)                                          00115145
           46     0   EBCDIC STRING PROCEDURE (ALGOL)                                      00115150
                  1   ASCII  STRING PROCEDURE (ALGOL)                                      00115155
                  2   HEX    STRING PROCEDURE (ALGOL)                                      00115160
           48     0   ALTERNATIVE ITEM GROUP (NEWP)                                        00115165
           50     1   DATA DICTIONARY DESCRIPTION OF DATABASE                              00115170
                  2   DATA DICTIONARY DESCRIPTION OF TRANSACTION BASE                      00115175
                  3   DATA DICTIONARY DESCRIPTION OF DATA SET                              00115180
                  4   DATA DICTIONARY DESCRIPTION OF TRANSACTION FORMAT                    00115185
                  5   DATA DICTIONARY DESCRIPTION OF EXPLICITLY-INVOKED DISJOINT           00115190
                      SET                                                                  00115192
                  6   DATA DICTIONARY DESCRIPTION OF GLOBAL DATA SET                       00115195
           52     0   TRANSACTION BASE                                                     00115200
           54     0   LIBRARY                                                              00115205
           56     0   LIBRARY ENTRY POINT                                                  00115210
           58     0   EXPORTED SUBROUTINE                                                  00115215
                  1   EXPORTED INTEGER FUNCTION                                            00115220
                  2   EXPORTED REAL FUNCTION                                               00115225
                  3   EXPORTED BOOLEAN FUNCTION                                            00115230
                  4   EXPORTED DOUBLE FUNCTION                                             00115235
                  5   EXPORTED COMPLEX FUNCTION                                            00115240
                  6   EXPORTED EBCDIC STRING PROCEDURE                                     00115245
                  7   EXPORTED ASCII STRING PROCEDURE                                      00115250
                  8   EXPORTED HEX STRING PROCEDURE                                        00115255
           60     0   BY-CALLING SUBROUTINE OF FUNCTION                                    00115260
                                                                                           00115270
                      NOTES:                                                               00115300

                     (1) AN ODD  UC  MEANS  THE  ITEM  IS  A  CALL-BY-NAME  OR             00115340
                         CALL-BY-REFERENCE                                                 00115360
                         PARAMETER.                                                        00115400

                      (2) SUBROUTINE=UNTYPED PROCEDURE,                                    00115600
                          FUNCTION=TYPED PROCEDURE                                         00115990
                         KEYWORD DESCRIPTIONS                                   00116100
                         ------- ------------                                   --------

(0,1,N,IDENTIFIER)                                                              00116300

    IDENTIFIER has the form:                                                    00116500

       4"TT0101CC"8"XX...X"                                                     00116700

    where:                                                                      00116900

       CC is the number of characters in the IDENTIFIER string                  00117100
       TT=CC+4 (total number of bytes in string)                                00117200
       N=(TT+5) DIV 6                                                           00117300

   The string is left justified and the last word contains  undefined           00117600
   filler.                                                                      00117700

(0,2,1,ADDRESSCOUPLE)                                                           00117800

    ADDRESSCOUPLE has the form:                                                 00118000

       :////:  LEVEL  :  DISP  :                                                00118200

    where:                                                                      00118400

       LEVEL=[39:20]                                                            00118600
       DISP =[19:20]                                                            00118700

(0,3,N,PARAMETERS)                                                              00118900

    PARAMETERS has the form:                                                    00119100

        (0,9,1,P)           :                                                   00119300
                            :                                                   00119400
        (UC1,SC1,M1,ITEM1)  :                                                   00119500
                            :                                                   00119600
        (UC2,SC2,M2,ITEM2)   > N WORDS                                          00119700
                  :         :                                                   00119800
                  :         :                                                   00119900
        (UCP,SCP,MP,ITEMP)  :                                                   00120000

    where:                                                                      00120200

       P is the number of parameters (P GEQ 0)                                  00120400
       N is the total number of words describing parameters (N GEQ 0)           00120500
    Each item is a description of a parameter.  The items must  appear       00120800
    in the order of the required parameters.                                 00120900

(0,4,N,GLOBALDIRECTORY)                                                      00121000

     GLOBALDIRECTORY has the form:                                           00121200

         (UC1,SC1,M1,ITEM1)  :                                               00121400
                   :         :                                               00121500
                   :          > N WORDS                                      00121600
                   :         :                                               00121700
         (UCP,SCP,MP,ITEMP)  :                                               00121800

     where:                                                                  00122000

        N is the total number of words in the global directory               00122200

    Each item is a description of  something  global  to  an  external       00122400
    procedure.                                                               00122500

    For a block program, each item must contain:                             00122700

        (0,1,N1,IDENTIFIER)                                                  00122800
        (0,2,N2,ADDRESSCOUPLE)                                               00122900
        (0,15,1,NUMBERDIMENSIONS) IF ARRAY                                   00123000
        (0,7,N7,MPCWPOINTER)      IF EXTERNAL PROCEDURE                      00123100
        (0,14,1,LENGTH)           IF FORTRAN COMMON BLOCK                    00123200
        (0,3,N3,PARAMETERS)       IF PROCEDURE WITH PARAMETERS.              00123300

    For a procedure program, each item description  must  contain  the       00123600
    above plus:                                                              00123700

        (0,6,N6,GLOBALREFERENCES)                                            00123800

    The description for an external procedure is contained in a  value      00124100
    array  whose  descriptor  is  in  the segment dictionary.  In this       00124100
    case, the global directory entry may contain:                            00124300

        (UC,SC,2)                                                            00124400
        (0,17,1,SDI)                                                         00124500

    where SDI is the segment dictionary index for the  descriptor,  or       00124800
    it may be a normal entry.                                                00124900

(0,5,N,D1REFERENCES)                                                         00125000

     D1REFERENCES has the form:                                              00125200
```

```
          SP1       :                                                  00125400
                    :                                                  00125500
          SP2        > N WORDS                                         00125600
           :        :                                                  00125700
          SPN       :                                                  00125800

      where each SP is a "SYLLABLE POINTER" to an operator referring  to 00126100
      a level 1 item.  The syllable pointer has the form of a PCW with a 00126200
      TAG of 0 as follows:                                               00126300

         ://////:PSR:  PIR  :  :LL:  SDI  :                              00126400

       where:                                                            00126600

         PSR=[35:3]  = syllable index for start of the operator          00126800
         PIR=[32:13] = word index for start of the operator              00126900
         LL =[18:5]  = lex level at which the operator is executed       00127000
         SDI=[13:14] = segment dictionary index for code segment         00127100
                       containing the operator                           00127200

   (0,6,N,GLOBALREFERENCES)                                              00127400

      GLOBALREFERENCES has the same form as D1REFERENCES.  The  operator 00127700
      VALC  may  reference any level global to the procedure in which it 00127800
      occurs.                                                            00127900

   (0,7,N,MPCWPOINTERS)                                                  00128000

      MPCWPOINTER is a syllable pointer to a LT48 operator which is used 00128300
      to make a literal containing the SDI of the value array descriptor 00128400
      for the external procedure.                                        00128500

   (0,9,1,NUMBERPARAMETERS)                                              00128600

      NUMBERPARAMETERS is the number  of  parameters  required  by  this 00128800
      program, procedure or entry.                                       00129000

   (0,10,N,EXTERNALID)                                                   00129100

      EXTERNALID is a explicit file identifier in KUNKERFORM.            00129400

   (0,11,N,OWNDIRECTORY)                                                 00129500

      OWNDIRECTORY is a list of own variables which were declared  in  a 00129800
      procedure  program.   These  are  items which must be added to the 00129900
      host D2 stack.  The format is the  same  as  that  in  the  global 00130000
      directory.                                                         00130100

   (0,12,N,OWNREFERENCES)                                                00130200
   OWNREFERENCES  is  a  list  of  syllable  pointers  to  all   code     00130450
   references to an own variable.                                        00130600

(0,13,N,MAKEFIBPOINTERS)                                                 00130700

   MAKEFIBPOINTERS is a list of syllable pointers to  LT48  operators    00131000
   for  making  FIB descriptors.  There must be one of these for each    00131100
   file.  It may be in  the  global  directory  or  directly  in  the    00131200
   program description.                                                  00131300

(0,14,N,MAKEARRAYDESCPNTRS)                                              00131400

   MAKEARRAYDESCPNTRS  is  a  list  of  syllable  pointers  to   LT48    00131700
   operators  for  making  value  array descriptors.  One of these is    00131800
   required for each value array (such as format strings) that is not    00131900
   a file and does not have a D1 descriptor.                             00132000

(0,15,1,NUMBERDIMENSIONS)                                                00132100

   NUMBERDIMENSIONS is the number of  dimensions  (in the  ALGOL  or     00132400
   hardware sense) required by an array.                                 00132500

(0,16,1,LENGTH)                                                          00132600

   LENGTH is the number length in elements of an array.                  00132900

(0,17,1,SDI)                                                             00133000

   SDI  is the segment dictionary index of the value array  descriptor   00133300
   for an external procedure.                                            00133400

(0,18,1,ENDOFD2CODE)                                                     00133500

   ENDOFD2CODE is a syllable  pointer  to  the  syllable  immediately    00133800
   after the D2 stack building code.                                     00133900

(0,19,1,FIRSTEX)                                                         00134000

   FIRSTEX is  a  syllable  pointer  to  the  first  executable  code    00134300
   syllable  of a separately-compiled procedure.  (This refers to the    00134400
   procedure itself, not the pseudo outer block.)                        00134500

(18,SC,N,PROCEDUREITEM)                                                  00134600
   or                                                                    00134700
(20,SC,N,PROCEDUREITEM)                                                  00134800

   PROCEDUREITEM is a description of a procedure.  This may be found:    00135100

   (1) As the first entry in the program description for a  procedure    00135300
       program.                                                          00135400
   (2) As an external procedure description.                             00135600
   (3) As an entry in the global  directory  in  either  the  program    00135800
       description or an external procedure description.                 00135900
```

```
     A PROCEDUREITEM must include:                                                    00136100

         (0,1,N,IDENTIFIER)                                                           00136200
         (0,2,1,ADDRESSCOUPLE)                                                        00136300
         (0,3,N,PARAMETERS)       IF IT HAS PARAMETERS                                00136400
         (0,7,1,MPCWPOINTER)      IF EXTERNAL PROCEDURE DESCRIPTION                   00136500
                                                                                      .FINISH
```

EVENTS

APPENDIX C

```
12260000           DEFINE          % ESPOL FIELDS                                          12260000  31.061.240
12260200    % FIELDS IN FIRST WORD OF EVENT                                                12260200  31.055.217
12260400            EVENTUSAGEF =[47:2]#      % USAGE OF SECOND WORD OF EVENT              12260400  32.044.309
12260800          , PROCUREDATAF=[36:35]#     % TRANSFERRED FROM PROCURER LINKWORD         12260800  351022452
12261000          ,   PROCURERF   =[36:SNSIZE]# %   STACK WHICH FIXED OR PROCURED          12261000  351022452
12261400          ,   EVENTQHEADF =[24:21]#   %   LINKAGE TO WAITING STACK:                12261400  351022452
12261600          ,     EVENTNUMF   =[24:9]#  %       RELATIVE INDEX (0,2,4...)            12261600  351022452
12261800          ,     EVENTSNRF   =[15:SNSIZE]# %     STACK NUMBER                       12261800  35.026.736
12262000          ,   UNAVAILABLEF=[2:1]#     %   NOT AVAILABLE(EVENT)                     12262000  31.061.240
12262200          , HAPPENEDBITF=[0:1]#       % HAPPENED(EVENT)                            12262200  31.061.240
12262240    % VALUES OF THE EVENTUSAGE FIELD                                               12262240  32.044.309
12262260          , EVUNUSED          = 0 #   % SECOND WORD NOT IN USE                     12262260  32.044.309
12262280          , EVRWTLOCK         = 1 #   % EVENT USED AS READ/WRITER/THINKER          12262280  32.044.309
12262300          , EVINTATTACHED     = 2 #   % SOFTWAREINTERRUPT ATTACHED                 12262300  32.044.309
12262320          , EVINSCRIBED       = 3 #   % EVENT INSCRIBED WITH SIGNATURE             12262320  32.044.309
12262340    % FIELDS IN 2ND WORD OF EVENT WHEN INSCRIBED WITH A SIGNATURE                  12262340  32.044.309
12262360          % THE WHOLE WORD IS THE INDEX INTO THE GETAREA POOL OF THE MEMO          12262360  32.044.309
12262400    % FIELDS IN 2ND WORD OF EVENT WHEN ATTACHED TO SOFTWARE INTERRUPT              12262400  31.055.217
12262600          % THE WHOLE WORD IS AN ABSOLUTE ADDRESS TO A LINKAGE AREA.               12262600  31.082.217
12262800    % FIELDS IN 2ND WORD OF EVENT WHEN USED AS READER/WRITER/THINKER LOCK          12262800  31.055.217
12263000          , READERCOUNTF=[23:12]#     % NUMBER OF READERS                          12263000  31.061.240
12263200          , THINKERSNRF =[35:SNSIZE]# % STACK NUMBER OF THE THINKER, OR 0          12263200  35.026.736
12263400          , WRITINGF    =[0:1]#       % THE THINKER STACK IS WRITER                12263400  31.061.240
12263410    % FIELDS IN A LINKWORD (FOR AN EVENT) IN THE SIDECAR                           12263410  351022452
12263420          , EVLINK_STATEF    =[45:02]# % STATE OF THE LINKWORD                     12263420  351022452
12263430          ,   EVLINK_NORMALV   =1’00’# %   LINKED TO AN EVENT                      12263430  351022452
12263440          ,   EVLINK_CAUSEDV   =1’01’# %   MARKS EVENT THAT WOKE UP STACK          12263440  351022452
12263450          ,   EVLINK_DISCARDV  =1’11’# %   NOT LINKED TO AN EVENT                  12263450  351022452
12263460          ,   EVLINK_TIMEV     =1’10’# %   LINKWORD IS LINKED IN CALENDAR          12263460  351022452
12263470          % PROCUREDATAF     =[36:35]# % USED FOR PROCURING EVENT                  12263470  351022452
12263480          %   PROCURERF      =         %   USED FOR PROCURING EVENTS               12263480  351022452
12263490          %   EVENTQHEADF    =         %   USED FOR PROCURING AND WAITING          12263490  351022452
12263500          %   UNAVAILABLEF   =[ 2: 1]# %   USED FOR PROCURING EVENTS               12263500  351022452
12263600    % FIELDS IN CALENDAR LINKWORD (1ST OF PAIR)                                    12263600  31.055.217
12263800          , CALTYPEF    =[47:2]#      % WHAT TO DO AT THE SPECIFIED TIME           12263800  35.008.265
12263850          % EVLINK_STATEF=[45:02]#    % SET TO EVLINK_TIMEV WHEN LINKED IN         12263850  351022452
12263900                                      %   CALENDAR, SET TO EVLINK_CAUSEDV          12263900  351022452
12263950                                      %   ONCE ITS DELINKED.                       12263950  351022452
12264000          , QBACKF      =[39:20]#     % BACKWARD LINK (SEGMENT NUMBER)             12264000  351022452
12264200          % QNEXTF      =[19:20]      % FORWARD LINK      "        "               12264200  31.061.240
12264400    % FIELDS IN CALENDAR INFO WORD (2ND OF PAIR; SEE ALSO WAIT LINK WORD)          12264400  31.055.217
12264600          , CALSNRF     =[47:SNSIZE]# % STACK NUMBER TO BE AWAKENED                12264600  35.026.736
12264800          , CALTIMEF    =[35:32]#     % WAKE-UP VALUE FOR CLOCK/255                12264800  31.061.240
12265000    % FIELDS IN 2ND PARAMETER TO WAITP,TIMETUNNEL (THIS INFORMATION IS             12265000  351022452
12265100    %                                           COPIED TO THE BEDWORD)             12265100  351022452
12265200          , NOTDSABLEF  =[47:1]#      % DSABLE OPTION         (FROM COMPILER)      12265200  31.153.521
12265400          , DSABLEF     =[46:1]#      % NOTDSABLE OPTION      (FROM COMPILER)      12265400  31.153.521
12266200          , SWAPF       =[3:2]    #   % SWAP OPTIONS (TEMP)   (FROM COMPILER)      12266200  31.153.521
12266400          ,   SWAPNOWV      =1’11’#   %   SWAP IMMEDIATELY                         12266400  32.048.390
12266600          ,   DELAYSWAPV    =1’01’#   %   SWAP IF STILL ASLEEP AFTER WHILE         12266600  32.048.390
12266800          ,   NOSWAPV       =1’10’#   %   DO NOT SWAP                              12266800  32.048.390
12267000          %                 1’00’     %   NO RECOMMENDATION                        12267000  32.048.390
12267200          , RESETF      =[0:1]#       % RESET EVENT           (FROM COMPILER)      12267200  31.153.521
12267400    % FIELDS IN BEDWORD OF PIB                                                     12267400  31.170.674
12267500          % NOTDSABLEF       =[47:01]#                                             12267500  351022452
12267600          % DSABLEF          =[46:01]#                                             12267600  351022452
12267800           , EVENTCOUNTF     =[44:09]# %   NUMBER OF EVENTS AWAITED                12267800  351022452
```

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12268000          , EVENTOFFSETF     =[35:16]# %   OFFSET TO EVENTS IN STACK                 12268000  351022452
12268005          % SWAPF            =[ 3: 2]#                                               12268005  351022452
12268010          % RESETF           =[ 0: 1]#                                               12268010  351022452
12268012     %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%       12268012  351022452
12268014                                                                                     12268014  351022452
12268016     %    <<< ON THE INTERPRETATION OF THE FIELDS OF THE BEDWORD .... >>>            12268016  351022452
12268018                                                                                     12268018  351022452
12268020     %         THE BEDWORD OF THE PIB IS SET UP EITHER WHEN A STACK IS WAITING       12268020  351022452
12268024     %    FOR AN EVENT OR IT IS LINKED IN THE CALENDAR QUEUE.  THE CALENDAR          12268024  350711819
12268026     %    QUEUE CONSISTS OF STACKS THAT NEED TO BE AWAKENED AFTER A SPECIFIED        12268026  350711819
12268028     %    AMOUNT OF TIME HAS ELAPSED.                                                12268028  350711819
12268030     %                                                                               12268030  350711819
12268032     %         WAITING FOR A SINGLE EVENT CAN OCCUR EITHER FROM MULTIPLEWAIT         12268032  350711819
12268034     %    OR FROM ANY ONE OF OTHER PROCEDURES LIKE WAITP, PROCUREP ETC.              12268034  350711819
12268036     %    A DISTINCTION NEEDS TO BE MADE BETWEEN THE TWO CASES. IN THE               12268036  350711819
12268038     %    MULTIPLEWAIT CASE, WHEN THE EVENT IS CAUSED, MULTIPLDELINK NEEDS TO        12268038  350711819
12268040     %    BE CALLED TO RETURN THE RESULT OF THE WAIT FUNCTION. NO SUCH CALL          12268040  350711819
12268042     %    NEEDS TO BE MADE IN THE OTHER INSTANCES OF WAITING FOR A SINGLE            12268042  350711819
12268044     %    EVENT. ON THE OTHER HAND, IF SUCH A WAITING STACK HAS TO BE DS-ED,         12268044  350711819
12268046     %    MULTIPLEDELINK HAS TO BE CALLED IN ALL THE ABOVE INSTANCES, TO             12268046  350711819
12268048     %    DELINK THE SINGLE EVENT. MULTIPLEDELINK KNOWS THAT AN EVENT NEEDS TO       12268048  350711819
12268050     %    BE DELINKED EITHER IF THE EVENTCOUNTF FIELD IS NON-ZERO OR IF IT           12268050  350711819
12268052     %    DETERMINES THAT TIME DID NOT HAVE TO BE DELINKED ( THE ASSUMPTION          12268052  350711819
12268054     %    BEING THAT MULTIPLEDELINK IS CALLED TO DELINK AT LEAST ONE OF EITHER       12268054  350711819
12268056     %    TIME OR EVENTS).                                                           12268056  350711819
12268058     %                                                                               12268058  350711819
12268060     %         WAITING FOR ONLY TIME (NO EVENTS) CAN OCCUR EITHER FROM               12268060  350711819
12268062     %    MULTIPLEWAIT, OR FROM DMSWAIT. EVEN HERE, A DISTINCTION NEEDS TO BE        12268062  350711819
12268064     %    MADE. IN THE MULTIPLEWAIT CASE WHEN THE SPECIFIED TIME HAS ELAPSED         12268064  350711819
12268066     %    MULTIPLEDELINK MUST BE CALLED. IN THE OTHER CASE NO SUCH CALL NEEDS        12268066  350711819
12268068     %    TO BE MADE. ON THE OTHER HAND WE NEED TO MAINTAIN INFORMATION IN           12268068  350711819
12268070     %    BOTH THE ABOVE CASES THAT THE STACKS HAVE BEEN LINKED IN THE               12268070  350711819
12268072     %    CALENDAR. THIS IS NECCESSARY BECAUSE, DELINKING NEEDS TO BE DONE IN        12268072  350711819
12268074     %    BOTH CASES IF THE STACKS ARE BEING DS-ED. THE ABOVE CONSTRAINTS            12268074  350711819
12268076     %    ARE SATISFIED BY SETTING THE EVENTCOUNTF TO ZERO FOR THE DMSWAIT           12268076  351022452
12268078     %    CASE, SINCE THE EVENTCOUNTF IS ALWAYS GREATER THAN ZERO FOR THE            12268078  351022452
12268080     %    MULTIPLEWAIT CASE.                                                         12268080  351022452
12268090     %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%       12268090  350711819
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ATTRIBUTES

APPENDIX D

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SYMBOL/ATTABLEGEN (03/20/85)                                                     11:59 AM TUESDAY, APRIL 9, 1985


  177000    FILE ATTRIBUTE SECTION.                                                       00177000
  177500                                                                                  00177500  32.123.013
  178000    TITLE  0  <NAME> PRIORITY HIGH  WFL COMPILERS                                 00178000  29.012.008
  179000        PARAMETERS 1OPT,                                                          00179000
  180000    FILESECTION  1  <INTEGER>   WFL                                               00180000  29.012.008
  181000        COMPILERS ,                                                               00181000  29.012.008
  182000    REEL = FILESECTION,                                                           00182000
  183000    CREATIONDATE  2  <INTEGER>   WFL                                              00183000  29.012.008
  184000        COMPILERS READONLY ,                                                      00184000  29.012.008
  185000    DATE = CREATIONDATE,                                                          00185000
  186000    CYCLE  3  <INTEGER>   WFL COMPILERS                                           00186000  29.012.008
  187000        CATALOG LIBMAINT ,                                                        00187000  29.012.008
  188000    VERSION  4 <INTEGER>   WFL COMPILERS                                          00188000  29.012.008
  189000        CATALOG LIBMAINT ,                                                        00189000  29.012.008
  190000    SAVEFACTOR  5  <INTEGER>   WFL                                                00190000  29.012.008
  191000        COMPILERS ,                                                               00191000  29.012.008
  192000    DENSITY  6  <INTEGER>  MNEMONIC BPI200/BPI556/BPI800/BPI1600/BPI6250/         00192000  31.157.015
  193000        LOW/MEDIUM/HIGH/SUPER  WFL COMPILERS ,                                    00193000  31.157.015
  194000    PARITY  7  <INTEGER>  MNEMONIC STANDARD/NONSTANDARD/ODD/EVEN                  00194000  35.028.008
  195000         WFL COMPILERS ,                                                          00195000  29.012.008
  196000    KIND CASE 8   <KIND> PRIORITY HIGH MNEMONIC                                   00196000  29.012.008
  196100        DONTCARE SA/NOUNIT SA/DISK SA/ODT SA/                                     00196100  35.039.013
  197000        REMOTE SA/PAPERREADER SA/PAPERPUNCH SA/PRINTER SA/                        00197000  35.151.028
  197050        HY SA/READER SA/                                                          00197050  35.151.028
  197100        PUNCH SA/DISKETTE SA/                                                     00197100  30.031.008
  197200        PORT SA/HC SA/                                                            00197200  34.058.012
  197500        ASID SA/FPSAP SA/                                                         00197500  35.079.023
  197550        CSMA SA/                                                                  00197550  35.074.020
  197600        SPC SA/                                                                   00197600  35.038.011
  198000        TAPE7 SA/TAPE9 SA/TAPEPE SA/TAPE SA/PACK SA                               00198000  34.043.010
  198010         WFL                                                                      00198010  29.012.008
  199000        COMPILERS CATALOG VOLUME LIBMAINT ,                                       00199000  29.012.008
  200000    LABEL  9  <INTEGER>  MNEMONIC OMITTED/STANDARD/                               00200000  29.012.008
  201000        OMITTEDEOF  WFL COMPILERS ,                                               00201000  29.012.008
  202000    LABELTYPE = LABEL,                                                            00202000
  203000    EXTMODE  10  <INTEGER> PRIORITY HIGH MNEMONIC SINGLE/HEX/                     00203000  29.012.008
  204000        BCL/EBCDIC/ASCII/BINARY  WFL COMPILERS ,                                  00204000  29.012.008
  205000    OPTIONAL  11  <BOOLEAN>  MNEMONIC TRUE/FALSE/                                 00205000  29.012.008
  206000        <NUL TRUE>  WFL COMPILERS ,                                               00206000  29.012.008
  207000    PROTECTION  12  <INTEGER>  MNEMONIC TEMPORARY/                                00207000  29.012.008
  208000        SAVE/PROTECTED  WFL COMPILERS ,                                           00208000  29.012.008
  209000    FILETYPE  13  <INTEGER> PRIORITY HIGH  WFL                                    00209000  29.012.008
  210000        COMPILERS ,                                                               00210000  29.012.008
  211000    BLOCKSIZE  14  <INTEGER> PRIORITY HIGH  WFL                                   00211000  29.012.008
  212000        COMPILERS,                                                                00212000  35.001.001
  213000    MAXRECSIZE  15  <INTEGER> PRIORITY HIGH  WFL                                  00213000  29.012.008
  214000        COMPILERS  PARAMETERS 1OPT ,                                              00214000  32.052.007
  215000    MINRECSIZE  16  <INTEGER>   WFL                                               00215000  29.012.008
  216000        COMPILERS ,                                                               00216000  29.012.008
  217000    AREASIZE  17  <INTEGER> PRIORITY HIGH  WFL                                    00217000  29.012.008
  218000        COMPILERS ,                                                               00218000  29.012.008
  219000    AREAS  18  <INTEGER> PRIORITY HIGH  WFL COMPILERS,                            00219000  29.012.008
  220000    APL   19  <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> COMPILERS,                 00220000  33.046.012
  221000    MYUSE  20  <INTEGER> PRIORITY HIGH MNEMONIC CLOSED/IN/OUT/IO                  00221000  29.012.008
  222000         WFL COMPILERS ,                                                          00222000  29.012.008
  223000    OTHERUSE  21  <INTEGER>  MNEMONIC SECURED/IN/                                 00223000  29.012.008
  224000        OUT/IO  WFL COMPILERS ,                                                   00224000  29.012.008
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225000   FLEXIBLE  22  <BOOLEAN> PRIORITY HIGH MNEMONIC TRUE/FALSE/                     00225000  29.012.008
226000       <NUL TRUE>  WFL COMPILERS ,                                                00226000  29.012.008
227000   IAD 23 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> COMPILERS READONLY,            00227000  29.012.008
230000   BUFFERS 26 <INTEGER> WFL COMPILERS,                                            00230000
231000   DIRECTION 27 <INTEGER> MNEMONIC REVERSE/FORWARD WFL COMPILERS,                 00231000
232000   CURRENTBLOCK 28 <INTEGER> COMPILERS READONLY,                                  00232000
233000   INTMODE 29 <INTEGER> MNEMONIC SINGLE/HEX/BCL/EBCDIC/ASCII WFL                  00233000
234000       COMPILERS,                                                                 00234000
235000   OPEN 30 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> COMPILERS,                    00235000  33.046.012
236000   PRESENT 31 <BOOLEAN> MNEMONIC TRUE/FALSE COMPILERS READONLY,                   00236000
237000   SIZEMODE 32 <INTEGER> MNEMONIC SINGLE/HEX/BCL/EBCDIC/ASCII WFL                 00237000
238000       COMPILERS,                                                                 00238000
239000   SIZEOFFSET 33 <INTEGER> WFL COMPILERS,                                         00239000
240000   SIZE2 34 <INTEGER> WFL COMPILERS,                                              00240000
241000   STATE 35 <REAL> COMPILERS READONLY PARAMETERS 1OPT,                            00241000  32.052.007
242000   EOF 36 <BOOLEAN> MNEMONIC TRUE/FALSE COMPILERS READONLY,                       00242000
242700   DMAREALOCK 38 <INTEGER> COMPILERS PARAMETERS 1REQ1OPT,                         00242700  32.141.014
242800   DMROWLOCK = DMAREALOCK,                                                        00242800  32.141.014
243000   FAMILYNAME 39 <IDENTIFIER> PRIORITY HIGH WFL COMPILERS CATALOG,                00243000  003
244000   PACKNAME = FAMILYNAME,                                                         00244000
245000   SINGLEUNIT 40 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS           00245000
246000       LIBMAINT,                                                                  00246000  29.012.008
247000   SINGLEPACK = SINGLEUNIT,                                                       00247000
248000   CYLINDERMODE 41 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS,        00248000
249000   RESIDENT 42 <BOOLEAN> MNEMONIC TRUE/FALSE COMPILERS READONLY,                  00249000
250000   BLOCK 44 <INTEGER> COMPILERS READONLY,                                         00250000
251000   CARRIAGECONTROL 45 <INTEGER> MNEMONIC STANDARD/CTLASA/CTL360 WFL               00251000
252000     COMPILERS,                                                                   00252000
253000   RECORD 46 <INTEGER> COMPILERS READONLY,                                        00253000
254000   UPDATEFILE 47 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS,          00254000
255000   AVAILABLE 48 <INTEGER> COMPILERS READONLY,                                     00255000
256000   LASTRECORD 49 <INTEGER> COMPILERS,                                             00256000
257000   PAGESIZE 50 <INTEGER> WFL COMPILERS PARAMETERS 1OPT,                           00257000
258000   PAGE 51 <INTEGER> COMPILERS,                                                   00258000
259000   LINENUM 52 <INTEGER> COMPILERS,                                                00259000
260000   FORMID 54 <STRING> WFL COMPILERS,                                              00260000  29.053.020
261000   FORMMESSAGE = FORMID,                                                          00261000
262000   FORMESSAGE =FORMMESSAGE,                                                       00262000
263000   UPDATED 57 <BOOLEAN> MNEMONIC TRUE/FALSE COMPILERS READONLY,                   00263000
264000   FILEKIND 58 <INTEGER> MNEMONIC NULLFILE/DIRECTORY/SYSTEMDIRECTORY/             00264000  29.023.006
264100       VERSIONDIRECTORY/                                                          00264100  29.023.006
265000       CATALOG/BACKUPDISK/RECONSTRUCTIONFILE/SYSTEMDIRFILE/                       00265000  29.023.006
265500       ARCHIVELOG/BOOTCODE/MDLCODE/MDLSYMBOL/                                     00265500  35.073.019
265600       REMOTEAUDIT/REMOTEBACKUP/                                                  00265600  31.143.013
266000       JOBDESCFILE/XDISKFILE/COMPILERCODEFILE/CHECKPOINTFILE/CPJOBFILE/           00266000
267000       DCPCODE/NDLCODE/LIBRARYCODE/INTRINSICFILE/MCPCODEFILE/ALGOLCODE/           00267000
268000       COBOLCODE/FORTRANCODE/XALGOLCODE/PLICODE/JOVIALCODE/ESPOLCODE/             00268000
269000       DCALGOLCODE/BASICCODE/XFORTRANCODE/JOBCODE/BOUNDCODE/CODEFILE/             00269000
270000       ALGOLSYMBOL/COBOLSYMBOL/FORTRANSYMBOL/XALGOLSYMBOL/PLISYMBOL/              00270000
271000       JOVIALSYMBOL/ESPOLSYMBOL/DCALGOLSYMBOL/BASICSYMBOL/XFORTRANSYMBOL/         00271000
272000       BINDERSYMBOL/DASDLSYMBOL/DMALGOLSYMBOL/DCPSYMBOL/NDLSYMBOL/DATA/           00272000
273000       SEQDATA/GUARDFILE/APLDATA/APLWORKSOURCE/CDATA/CSEQDATA/                    00273000
273500       RECOVERYFILE/DMALGOLCODE/JOBSYMBOL/                                        00273500  29.004.001
273600       BACKUPPRINTER/INFOFILE/                                                    00273600  34.043.010
273700       VFORTRANSYMBOL/VFORTRANCODE/VLINKEDCODE/VMCPCODE/                          00273700  29.051.016
273710       LCOBOLSYMBOL/LCOBOLSL3CODE/LCOBOLSL5CODE/                                  00273710  33.003.002
273720       SFORTRANSYMBOL/ SFORTRANCODE/ SLINKEDCODE/ SMCPCODE/                       00273720  33.003.002
273730       FIRMWARE/                                                                  00273730  35.073.019
273740       NEWPSYMBOL/NEWPCODE/                                                       00273740  33.003.002
273745       PAGEBACKUP/FONT/FORM/GRAPHICS/                                             00273745  34.042.008
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273750          SANSSYMBOL/SANSCODE/                                                  00273750  33.003.002
273760          PASCALSYMBOL/PASCALCODE/                                              00273760  33.003.002
273770          RPGSYMBOL/RPGCODE/                                                    00273770  33.003.002
273780          NDLIISYMBOL/NDLIICODE/                                                00273780  33.003.002
273790          FORTRAN77SYMBOL/FORTRAN77CODE/                                        00273790  33.003.002
273800          SORTSYMBOL/SORTCODE/                                                  00273800  34.005.001
273847          MDTTEST/MDTDUMP/PROMBURNERDATA/CONFIGURATIONDATA/CONFIDENCECODE/      00273847  32.7X.001
273850          BDDATA/MP1FIRMWARE/MP1ALGOLCODE/                                      00273850  33.101.013
273900          COBOL74SYMBOL/COBOL74CODE/                                            00273900  34.017.003
273950          OHNESYMBOL/TEXTDATA/PRINTERCONTROLFILE/                               00273950  35.015.006
274000          DBRESTARTSET/DBDATA/BACKUPPUNCH/SCHEDULEFILE COMPILERS WFL,           00274000  29.017.004
275000      CRUNCHED 59 <BOOLEAN> MNEMONIC TRUE/FALSE COMPILERS                       00275000
276000          READONLY,                                                             00276000
277000      ROWSINUSE 60 <INTEGER> COMPILERS READONLY,                                00277000
278000      USEDATE 61 <INTEGER> COMPILERS READONLY,                                  00278000
279000      ROWADDRESS 64 <INTEGER> COMPILERS READONLY PARAMETERS 1REQ1OPT,           00279000  29.012.008
280000      INTERCHANGE 66 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS     00280000
281000          LIBMAINT,                                                             00281000  29.012.008
282000      IC = INTERCHANGE,                                                         00282000
283000      DUPLICATED 67 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS,     00283000
284000      COPIES 69 <INTEGER> WFL COMPILERS,                                        00284000
285000      INTNAME 72 <IDENTIFIER> COMPILERS,                                        00285000  003
286000      UNITS 73 <INTEGER> MNEMONIC CHARACTERS/WORDS/TRUE/FALSE/<NUL CHARACTERS>  00286000
287000           WFL COMPILERS,                                                       00287000
288000      ATTERR 74 <BOOLEAN> MNEMONIC TRUE/FALSE COMPILERS READONLY,               00288000
289000      ATTYPE 75 <INTEGER> MNEMONIC * COMPILERS READONLY,                        00289000  29.023.007
290000      ATTVALUE 76 <REAL> COMPILERS READONLY,                                    00290000
291000      IOCLOCKS 77 <REAL> COMPILERS READONLY,                                    00291000
292000      UNITNO 78 <INTEGER> WFL COMPILERS CATALOG LIBMAINT,                       00292000  29.012.008
293000      SECURITYGUARD 79 <NAME> WFL COMPILERS,                                    00293000
294000      SECURITYTYPE 80 <INTEGER> MNEMONIC PRIVATE/PUBLIC/GUARDED/CONTROLLED      00294000  31.041.003
295000          WFL COMPILERS,                                                        00295000  31.041.003
296000      SECURITYUSE 81 <INTEGER> MNEMONIC SECURED/IN/OUT/IO WFL COMPILERS,        00296000
299000      READCHECK 83 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS,      00299000
300000      RECORDINERROR 84 <INTEGER> COMPILERS READONLY,                            00300000
301000      ERRORTYPE 85 <INTEGER> MNEMONIC NOERROR/SUNOTREADY/READPARITYERROR/       00301000
302000          READCHECKFAILURE COMPILERS READONLY PARAMETERS 1OPT,                  00302000
303000      IOINERROR 87 <BOOLEAN> MNEMONIC TRUE/FALSE COMPILERS READONLY,            00303000
304000      TAPEREELRECORD 88 <INTEGER> COMPILERS READONLY,                           00304000
304500      DMTIMESTAMP 89 <REAL> COMPILERS,                                          00304500  29.041.015
305000      EXCLUSIVE 90 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS,      00305000
306000      TRANSLATE 91 <INTEGER> MNEMONIC DEFAULTTRANS/FULLTRANS/SOFTONLY/          00306000
307000          FORCESOFT/NOSOFT/NOTRANS WFL COMPILERS,                               00307000
308000      TRANSLATING 92 <BOOLEAN> MNEMONIC TRUE/FALSE COMPILERS  READONLY,         00308000
309000      INPUTTABLE 93 <TRANSLATIONTABLE> COMPILERS WRITEONLY,                     00309000  29.012.008
310000      OUTPUTTABLE 94 <TRANSLATIONTABLE> COMPILERS WRITEONLY,                    00310000  29.012.008
311000      USECATALOG 95 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS,     00311000
312000      GENERATION 96 <INTEGER> WFL CATALOG LIBMAINT COMPILERS,                   00312000  29.012.008
313000      SENSITIVEDATA 97 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL             00313000
314000          LIBMAINT COMPILERS,                                                   00314000  29.012.008
315000      FAMILYINDEX 98 <INTEGER> WFL LIBMAINT COMPILERS PARAMETERS 2OPT,          00315000  29.053.020
317000      STATIONCOUNT 99 <INTEGER> COMPILERS READONLY,                             00317000
318000      FAMILYSIZE = STATIONCOUNT,                                                00318000
319000      POPULATION 100 <INTEGER> COMPILERS READONLY,                              00319000
320000      STATIONLIST 101 <SIMPLENAME> COMPILERS WRITEONLY,                         00320000  31.215.029
321000      FAMILY = STATIONLIST,                                                     00321000
322000      ENABLEINPUT 102 <BOOLEAN> MNEMONIC TRUE/FALSE COMPILERS                   00322000
323000          READONLY PARAMETERS 1OPT,                                             00323000
324000      STATIONSDENIED 103 <INTEGER> COMPILERS READONLY,                          00324000
325000      TRAINID 104 <INTEGER> MNEMONIC ASCII72/BCL64/EBCDIC18/EBCDIC48/           00325000
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326000        EBCDIC72/EBCDIC96/NOID WFL COMPILERS,                                     00326000
327000    TIMELIMIT 105 <REAL> WFL COMPILERS,                                           00327000
328000    LASTSUBFILE 106 <INTEGER> COMPILERS,                                          00328000  32.052.007
328500    LASTSTATION = LASTSUBFILE,                                                    00328500  32.052.007
329000    RECEPTIONS 107 <INTEGER> COMPILERS READONLY PARAMETERS 1OPT,                  00329000
330000    CENSUS 108 <INTEGER> COMPILERS READONLY PARAMETERS 1OPT,                      00330000  29.051.019
330100    NORESOURCEWAIT 109 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL.TRUE>                   00330100  004
330200        WFL COMPILERS,                                                            00330200  004
331000    DISPOSITION 111 <INTEGER> COMPILERS READONLY PARAMETERS 1OPT,                 00331000  32.052.007
332000    TRANSMISSIONS 112 <INTEGER> COMPILERS READONLY PARAMETERS 1OPT,               00332000
333000    ASSIGNTIME 113 <INTEGER> COMPILERS READONLY PARAMETERS 1REQ,                  00333000
333100    TANKING 114 <INTEGER> MNEMONIC UNSPECIFIED/NONE/SYNC/ASYNC                    00333100  29.038.014
333120                          COMPILERS WFL,                                          00333120  29.035.014
334000    SCREEN 116 <BOOLEAN> MNEMONIC TRUE/FALSE COMPILERS READONLY                   00334000
335000        PARAMETERS 1REQ,                                                          00335000
336000    TRANSMISSIONNO 117 <INTEGER> COMPILERS READONLY PARAMETERS 1REQ,              00336000  31.215.029
337000    TRANSMISSIONO = TRANSMISSIONNO,                                               00337000  31.215.029
338000    WIDTH 118 <INTEGER> COMPILERS READONLY PARAMETERS 1REQ,                       00338000
339000    SERIALNO 119 <SERIALNO> COMPILERS WFL LIBMAINT CATALOG VOLUME                 00339000  29.053.020
339010        PARAMETERS 1OPT,                                                          00339010  29.053.020
357020    BACKUPKIND  135  <INTEGER>  MNEMONIC                                          00357020  29.051.017
357040        DONTCARE/ DISK/ PACK/ TAPE/ TAPE7/ TAPE9/ TAPEPE                          00357040  31.215.029
357060        WFL COMPILERS,                                                            00357060  30.021.006
357100    NEWFILE 136 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS,           00357100  31.057.007
357110    EXTENT 137 <INTEGER> WFL COMPILERS,                                           00357110  30.031.008
357120    WRITECHECK 138 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS,        00357120  30.031.008
357130    CURRENTEXTENT 139 <INTEGER> WFL COMPILERS READONLY,                           00357130  30.031.008
357140    MYNAME  140  <NAME>  WFL COMPILERS,                                           00357140  30.031.007
357150    YOURNAME  141  <NAME>  WFL COMPILERS PARAMETERS 1OPT,                         00357150  32.052.007
357160    FILEUSE  142  <INTEGER> PRIORITY HIGH MNEMONIC IN/OUT/IO                      00357160  31.092.008
357170         WFL COMPILERS,                                                           00357170
357180    HOSTNAME 143 <IDENTIFIER> WFL COMPILERS LIBMAINT PARAMETERS 1OPT,             00357180  32.052.007
357190    FILEORGANIZATION 144 <INTEGER> MNEMONIC NOTRESTRICTED/RELATIVE/INDEXED/       00357190  33.121.017
357195                                            INDEXEDNOTRESTRICTED/PLIISAM          00357195  35.039.012
357200        WFL COMPILERS,                                                            00357200  31.167.017
357210    HSDIALOGNO 145 <INTEGER> COMPILERS,                                           00357210  31.186.025
357220    TIMESTAMP 146 <REAL> COMPILERS READONLY,                                      00357220  32.141.014
357230    HSFILECOPY 147 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> COMPILERS             00357230  32.141.014
357240         READONLY,                                                                00357240  32.141.014
357250     KEYEDIOKEYS 148 <REAL> COMPILERS WRITEONLY                                   00357250  35.047.014
357260    ,ACCESSMODE  149 <INTEGER> MNEMONIC SEQUENTIALACCESS/                         00357260  32.141.014
357270                                        RANDOMACCESS/DYNAMICACCESS COMPILERS      00357270  32.141.014
357280                               WRITEONLY                                          00357280  32.141.014
357290    ,MAXSUBFILES 150 <INTEGER> WFL COMPILERS                                      00357290  32.141.014
357300    ,MYHOSTNAME 151 <IDENTIFIER> WFL COMPILERS READONLY                           00357300  32.141.014
357310    ,INPUTEVENT 152 <EVENT> COMPILERS READONLY PARAMETERS 1OPT                    00357310  32.141.014
357320    ,OUTPUTEVENT 153 <EVENT> COMPILERS READONLY PARAMETERS 1OPT                   00357320  32.141.014
357330    ,CHANGEEVENT 154 <EVENT> COMPILERS READONLY PARAMETERS 1OPT                   00357330  32.143.015
357340    ,YOURUSERCODE 155 <IDENTIFIER> WFL COMPILERS PARAMETERS 1OPT                  00357340  32.141.014
357350    ,COMPRESSION 156 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS       00357350  32.141.014
357360         PARAMETERS 1OPT                                                          00357360  32.141.014
357370    ,MAXCENSUS 157 <INTEGER> WFL COMPILERS PARAMETERS 1OPT                         00357370  32.141.014
357380    ,CHANGEDSUBFILE 158 <INTEGER> COMPILERS READONLY                              00357380  32.141.014
357390    ,AREALENGTH 159 <INTEGER> PRIORITY HIGH WFL COMPILERS                         00357390  32.141.014
357400    ,AREAALLOCATED 160 <BOOLEAN> MNEMONIC TRUE/FALSE WFL COMPILERS READONLY       00357400  32.141.014
357410         PARAMETERS 1REQ1OPT                                                      00357410  32.141.014
357420    ,FRAMESIZE 161 <INTEGER> PRIORITY HIGH WFL COMPILERS                          00357420  32.141.014
357430    ,FILENAME 162 <NAME> PRIORITY HIGH WFL COMPILERS                              00357430  32.141.014
357440    ,COPYNAME 163 <NAME> COMPILERS READONLY PARAMETERS 1REQ                       00357440  32.141.014
357450    ,STATIONNAME 164 <NAME> COMPILERS READONLY PARAMETERS 1REQ                    00357450  32.141.014
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357460    ,BLOCKSTRUCTURE 165 <INTEGER> PRIORITY HIGH                                      00357460  32.141.014
357470         MNEMONIC FIXED/EXTERNAL/VARIABLE/LINKED WFL COMPILERS                       00357470  32.141.014
357480    ,DEPENDENTSPECS 166 <BOOLEAN> PRIORITY HIGH                                      00357480  32.141.014
357490         MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS                                00357490  32.141.014
357500    ,SCREENSIZE 167 <INTEGER> COMPILERS READONLY PARAMETERS 1REQ                     00357500  32.141.014
357510    ,CURRENTRECORD 168 <INTEGER> COMPILERS READONLY                                  00357510  32.143.015
357520    ,SUBFILEERROR 169 <INTEGER> MNEMONIC NOERROR/DISCONNECTED/DATALOST/              00357520  32.143.015
357530         NOBUFFER/NOFILEFOUND/UNREACHABLEHOST/UNSUPPORTEDFUNCTION                    00357530  33.111.016
357535         COMPILERS READONLY PARAMETERS 1OPT                                          00357535  33.111.016
357540    ,FILESTATE 170 <INTEGER> MNEMONIC CLOSED/AWAITINGHOST/OFFERED/OPENED/            00357540  32.143.015
357550         SHUTTINGDOWN/BLOCKED/CLOSEPENDING/DEACTIVATIONPENDING/DEACTIVATED/          00357550  32.143.015
357560         DENIED/POSTPONED/DENIEDILLEGALUSE                                           00357560  32.143.015
357570         COMPILERS READONLY PARAMETERS 1OPT                                          00357570  32.143.015
357580    ,NEXTRECORD 171 <INTEGER> COMPILERS READONLY                                     00357580  33.027.005
357590    ,LABELKIND 172 <INTEGER> COMPILERS READONLY                                      00357590  33.027.005
357600    ,STATIONSALLOWED 173 <INTEGER> COMPILERS READONLY                                00357600  33.027.005
357610    ,COPYINERROR 174 <INTEGER> COMPILERS READONLY                                    00357610  33.027.005
357615    ,USETIME 175 <INTEGER> COMPILERS READONLY                                        00357615  33.030.007
357620    ,USERINFO 176 <REAL> COMPILERS                                                   00357620  33.030.007
357625    ,ALTERDATE 177 <INTEGER> COMPILERS READONLY                                      00357625  33.030.007
357630    ,ALTERTIME 178 <INTEGER> COMPILERS READONLY                                      00357630  33.030.007
357635    ,CREATIONTIME 179 <INTEGER> COMPILERS READONLY                                   00357635  33.030.007
357640    ,BLANK 180 <INTEGER> MNEMONIC NULL/ZERO COMPILERS                                00357640  34.005.002
357645    ,PRINTERKIND 181 <INTEGER> MNEMONIC DONTCARE/IMAGEPRINTER/LINEPRINTER            00357645  35.015.006
357650                     WFL COMPILERS                                                   00357650  35.015.006
357655    ,PRINTERCONTROL 182 <NAME> WFL COMPILERS                                         00357655  35.015.006
357660    ,SIZEVISIBLE 183 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE>                        00357660  35.035.009
357665                     WFL COMPILERS                                                   00357665  35.035.009
357670    ,AFTER 184 <STRING> WFL COMPILERS                                                00357670  35.076.021
357675    ,ALIGNFILE 185 <NAME> WFL COMPILERS                                              00357675  35.076.021
357680    ,ALIGNMENT 186 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS            00357680  35.076.021
357685    ,BANNER 187 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS               00357685  35.076.021
357690    ,PRINTCHARGE 188 <SIMPLENAME> WFL COMPILERS                                      00357690  35.151.026
357695    ,CHARSET 189 <SIMPLENAME> WFL COMPILERS                                          00357695  35.076.021
357700    ,CHECKPOINT 190 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS           00357700  35.076.021
357705    ,DESTINATION 191 <STRING> WFL COMPILERS                                          00357705  35.076.021
357710    ,NOTE 192 <STRING> WFL COMPILERS                                                 00357710  35.076.021
357715    ,PRINTCOPIES 193 <INTEGER> WFL COMPILERS                                         00357715  35.076.021
357720    ,PRINTDISPOSITION 194 <INTEGER>                                                  00357720  35.076.021
357725                     MNEMONIC DONTPRINT/DIRECT/CLOSE/EOT/EOJ                         00357725  35.076.021
357730                     WFL COMPILERS                                                   00357730  35.076.021
357735    ,SAVEBACKUPFILE 195 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE>                     00357735  35.113.025
357736                     WFL COMPILERS                                                   00357736  35.113.025
357740    ,TRANSFORM 196 <STRING> WFL COMPILERS                                            00357740  35.076.021
357745    ,USERBACKUPNAME 197 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE>                     00357745  35.076.021
357750                     WFL COMPILERS                                                   00357750  35.076.021
357755    ,DUMMYFILE 198 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS            00357755  35.076.021
357760    ,TRIMBLANKS 199 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS           00357760  35.077.022
357765    ,OLDYOURUSERCODE 200 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE>                    00357765  35.093.024
357770                     WFL COMPILERS                                                   00357770  35.093.024
```

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SYMBOL/ATTABLEGEN (03/20/85)                                                            11:59 AM TUESDAY, APRIL 9, 1985

  358000    TASK ATTRIBUTE SECTION.                                                  00358000
  358500                                                                             00358500  32.123.013
  359000    NAME  0  <NAME>   WFL COMPILERS,                                         00359000  29.012.008
  361000    MIXNUMBER 1  <INTEGER>   WFL COMPILERS READONLY ,                        00361000  33.002.001
  362000    STACKNO = MIXNUMBER,                                                     00362000  33.002.001
  363000    CORE  2  <CORE> PRIORITY HIGH  WFL COMPILERS,                            00363000  29.012.008
  365000    COREESTIMATE = CORE,                                                     00365000
  366000    PRIORITY  3  <INTEGER> PRIORITY HIGH  WFL COMPILERS,                     00366000  29.012.008
  368000    DECLAREDPRIORITY = PRIORITY,                                             00368000
  369000    MAXPROCTIME  4  <INTEGER> PRIORITY HIGH  WFL                             00369000  29.012.008
  370000        COMPILERS ,                                                          00370000  29.012.008
  371000    MAXIOTIME  5  <INTEGER>   WFL COMPILERS,                                 00371000  29.012.010
  374000    IOTIME = MAXIOTIME,                                                      00374000  29.012.010
  375000    TARGET  6  <INTEGER>   WFL COMPILERS,                                    00375000  29.012.008
  377000    TARGETTIME = TARGET,                                                     00377000
  378000    STACK  7  <INTEGER>   WFL COMPILERS,                                     00378000  29.012.008
  380000    STACKSIZE = STACK,                                                       00380000
  381000    USERCODE  8  <SIMPLENAME>   COMPILERS ,                                  00381000  29.012.008
  383000    TASKVALUE  9  <REAL> PRIORITY HIGH  WFL COMPILERS,                       00383000  29.012.008
  385000    VALUE = TASKVALUE,                                                       00385000  29.012.008
  386000    HISTORY  10  <REAL>  WFL COMPILERS READONLY,                             00386000  29.012.008
  391000    TYPE 11 <REAL> MNEMONIC PROCESS/CALL/RUN/JOBSTACK WFL COMPILERS          00391000
  392000        READONLY,                                                            00392000
  393000    STATUS 12 <INTEGER> MNEMONIC                                             00393000  31.218.031
  393500        NEVERUSED                                                            00393500  31.218.031
  393600       /SCHEDULED                                                            00393600  31.218.031
  393700       /ACTIVE                                                               00393700  31.218.031
  393800       /SUSPENDED                                                            00393800  31.218.031
  393900       /FROZEN                                                               00393900  31.218.031
  394000       /GOINGAWAY                                                            00394000  31.218.031
  394100       /UNINITIATED                                                          00394100  31.218.031
  394200       /TERMINATED                                                           00394200  31.218.031
  394300       /BADINITIATE                                                          00394300  31.218.031
  394400      WFL COMPILERS,                                                         00394400  31.218.031
  395000    ACCUMPROCTIME 13 <INTEGER>  WFL COMPILERS READONLY,                      00395000  29.012.010
  395100    PROCESSTIME = ACCUMPROCTIME,                                             00395100  29.012.010
  396000    ACCUMIOTIME 14 <INTEGER> WFL COMPILERS READONLY,                         00396000  30.036.010
  396100    PROCESSIOTIME = ACCUMIOTIME,                                             00396100  29.012.010
  397000    ELAPSEDTIME 15 <INTEGER> WFL COMPILERS READONLY,                         00397000  30.036.010
  398000    EXCEPTIONTASK 16 <TASK> COMPILERS,                                       00398000
  399000    LOCKED 17 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> COMPILERS,            00399000
  400000    STOPPOINT 18 <REAL> WFL COMPILERS READONLY,                              00400000
  401000    PARTNER 19 <TASK> COMPILERS,                                             00401000
  402000    STATION 20 <REAL> WFL COMPILERS,                                         00402000
  403000    INITIATOR = STATION,                                                     00403000
  404000    EXCEPTIONEVENT 21 <EVENT> COMPILERS,                                     00404000
  405000    OPTION 22 <OPTION> MNEMONIC */LONG/FAULT DP/DSED DP/CCLIST/BACKUP/       00405000  29.023.007
  405100         BDBASE/SIBS DP/LIBRARIES DP/PRIVATELIBRARIES DP/                    00405100  32.123.012
  405200         DEBUG/                                                              00405200  31.192.026
  406000         BASE DP/ARRAYS DP/CODE DP/FILES DP/NOSUMMARY/HARDDUMP/DBS DP/       00406000  31.191.022
  406500         AUTORM/IPCOVERRIDE                                                  00406500  31.191.022
  407000        WFL COMPILERS,                                                       00407000
  408000    OPTIONS = OPTION,                                                        00408000
  409000    VALIDITYBITS 23 <BOOLEAN> MNEMONIC * COMPILERS                           00409000  29.023.007
  410000        READONLY,                                                            00410000
  411000    FILECARDS 24 <ATTRIBUTELIST> WFL COMPILERS ,                             00411000  32.046.005
  412000    FILE = FILECARDS,                                                        00412000  29.012.008
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413000    ERROR 25 <REAL> MNEMONIC * WFL COMPILERS,                                    00413000  29.023.007
414000    TASKATTERR = ERROR,                                                          00414000
414500    PARTNEREXISTS 27 <BOOLEAN>  COMPILERS READONLY,                              00414500  34.062.015
415000    RESTART 28 <INTEGER> WFL COMPILERS,                                          00415000
416000    BDNAME 29 <SIMPLENAME> WFL COMPILERS,                                        00416000  003
417000    BACKUPPREFIX = BDNAME,                                                       00417000
418000    STACKHISTORY 30 <STRING> COMPILERS READONLY,                                 00418000
419000    SUBSPACES 31 <INTEGER> WFL COMPILERS,                                        00419000
420000    TASKFILE 32 <TASKFILE> COMPILERS,                                            00420000
421000    DECKGROUPNO 33 <INTEGER> COMPILERS READONLY,                                 00421000
422000    CLASS 34 <INTEGER> WFL COMPILERS READONLY,                                   00422000
423000    QUEUE = CLASS,                                                               00423000
424000    COMPILETYPE 35 <INTEGER> MNEMONIC COMPILEANDGO/SYNTAX/LIBRARYANDGO/          00424000  29.017.003
425000        LIBRARY COMPILERS,                                                       00425000  29.035.013
426000    TASK 37 <TASK> WFL,                                                          00426000
427000    ORGUNIT 38 <INTEGER> COMPILERS READONLY,                                     00427000
428000    MAXCARDS 39 <INTEGER> WFL COMPILERS,                                         00428000  29.012.008
429000    PUNCHLIMIT = MAXCARDS,                                                       00429000  29.012.008
430000    MAXLINES 40 <INTEGER> WFL COMPILERS,                                         00430000  29.012.008
431000    PRINTLIMIT = MAXLINES,                                                       00431000  29.012.008
432000    JOBNUMBER 41 <INTEGER> COMPILERS,                                            00432000
433000    CHARGE 42 <SIMPLENAME> WFL COMPILERS,                                        00433000  29.035.013
434000    CHARGECODE = CHARGE,                                                         00434000
435000    DESTNAME 44 <DESTINATION> WFL COMPILERS,                                     00435000
436000    BACKUPDESTINATION = DESTNAME,                                                00436000
437000    SOURCESTATION 45 <REAL> COMPILERS,                                           00437000
438000    DESTSTATION 46 <REAL> COMPILERS,                                             00438000
439000    SOURCEKIND 47 <REAL> COMPILERS READONLY,                                     00439000
440000    RESTARTED 48 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> COMPILERS,             00440000  31.056.007
441000    MAXWAIT 49 <REAL> WFL COMPILERS,                                             00441000  29.017.004
442000    STACKLIMIT 50 <INTEGER> WFL COMPILERS,                                       00442000  29.035.013
443000    FETCH 52 <FETCH> WFL,                                                        00443000
444000    RESOURCE 53 <RESOURCE> WFL,                                                  00444000
445000    FAMILY 55 <FAMILY> WFL COMPILERS,                                            00445000  29.017.004
446000    WAITLIMIT 56 <REAL> WFL COMPILERS,                                           00446000
447000    ELAPSEDLIMIT 57 <REAL> WFL COMPILERS,                                        00447000
448000    TASKLIMIT 58 <REAL> WFL COMPILERS,     %QUEUE ATTRIBUTE ONLY                 00448000  29.059.020
449000    DISKLIMIT 59 <INTEGER> WFL COMPILERS,                                        00449000  29.059.020
449100    TANKING 60 <INTEGER> MNEMONIC UNSPECIFIED/NONE/SYNC/ASYNC                    00449100  29.038.014
449120                             COMPILERS WFL,                                      00449120  31.041.003
449130    ACCESSCODE 61 <SIMPLENAME> WFL COMPILERS,                                    00449130  31.215.029
449140    SUBSYSTEM 62 <IDENTIFIER> WFL COMPILERS,                                     00449140  31.215.029
449150    BACKUPFAMILY 63 <IDENTIFIER> WFL COMPILERS,                                  00449150  31.158.016
449525    HOSTNAME 64 <IDENTIFIER> WFL COMPILERS,                                      00449525  31.215.029
449600    HISTORYTYPE 66 <INTEGER> MNEMONIC                                            00449600
449650        NORMALV/                                                                 00449650  31.218.031
449655        DUMPINGV/                                                                00449655  31.218.031
449660        QTEDV/                                                                   00449660  31.218.031
449665        STEDV/                                                                   00449665  31.218.031
449670        DSEDV/                                                                   00449670  31.218.031
449680        NORMALEOTV/                                                              00449680  31.218.031
449685        SYNTAXERRORV/                                                            00449685  31.218.031
449690        UNKNOWNEOTV/                                                             00449690  31.218.031
449695        UNINITIATEDV                                                             00449695  31.218.031
449700      WFL COMPILERS READONLY,                                                    00449700  31.218.031
449750    HISTORYCAUSE 67 <INTEGER> MNEMONIC                                           00449750
449800        OPERATORCAUSEV/PROGRAMCAUSEV/RESOURCECAUSEV/                             00449800
449820        FAULTCAUSEV/SYSTEMCAUSEV/                                                00449820
449850        DCERRCAUSEV/IOERRCAUSEV/                                                 00449850
449880        SOFTIOERRCAUSEV/NEWIOERRCAUSEV/                                          00449880
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449900       UNIMPLEMENTEDCAUSEV/UNSPECIFIEDCAUSEV/                   00449900
449920       EBDMSERRCAUSEV/NETWORKCAUSEV                             00449920
449950       WFL COMPILERS READONLY,                                  00449950
450010    HISTORYREASON 68 <INTEGER> MNEMONIC                         00450010
450020       RSVPV/                                                   00450020
450030       CLEARUNITV/                                              00450030
450040       JUSTDSEDV/                                               00450040
450050                                                                00450050
450060       MISSINGCODEFILENAMEV/                                    00450060
450070       MISSINGCODEFILEV/                                        00450070
450080       INITACTIVETASKV/                                         00450080
450090       NOEXTERNALRUNV/                                          00450090
450100       INVALIDACCESSCODEV/                                      00450100
450110       DEATHINFAMILYV/                                          00450110
450120       CRITICALBLOCKV/                                          00450120
450130       BADGOTOV/                                                00450130
450140       NOTEXECUTABLEV/                                          00450140
450150       UNMATCHEDPARAMSV/                                        00450150
450160       INVCOMPILERVV/                                           00450160
450170       SECURITYERRORV/                                          00450170
450180       LIBMAINTV/                                               00450180
450190       BADRESIZEDEALLOCV/                                       00450190
450200       MISSINGINTRINSICV/                                       00450200
450210       INCOMPATIBLELEVELV/                                      00450210
450220       INFANTICIDEV/                                            00450220
450230       NOTBOUNDV/                                               00450230
450240       ILLEGALOWNARRAYV/                                        00450240
450250       DIMSIZERRORV/                                            00450250
450260       UPLEVELATTACHV/                                          00450260
450270       ILLEGALSWAPV/                                            00450270
450280       SWAPDOESNTALLOWV/                                        00450280
450290       BADTASKATTRIBUTEV/                                       00450290
450300       MISSINGCARDDECKV/                                        00450300
450310       BADRESTARTV/                                             00450310
450320       BADEVENTUSAGEV/                                          00450320
450330       BADGIVELOCKV/                                            00450330
450340       BADGETLOCKV/                                             00450340
450350       COMPILERSONLYV/                                          00450350
450360       TASKLIMITEXCEEDEDV/                                      00450360
450370       AXBADARRAYV/                                             00450370
450380       RUNTIMEWFLV/                                             00450380
450390       COMPILERERRORV/                                          00450390
450400       LIBMISSINGNAMEV/                                         00450400
450410       LIBTYPEMISMATCHV/                                        00450410
450420       LIBDIRECTORYNOTFOUNDV/                                   00450420
450430       CYCLICPROVISIONV/                                        00450430
450440       PREVIOUSLYFROZENLIBV/                                    00450440
450450       LIBIMPLEMENTATIONERRORV/                                 00450450
450460       BADPTRLIBV/                                              00450460
450470       NONUNIQLIBV/                                             00450470
450480       NOINITPARAMV/                                            00450480
450490       SWAPJOBCANTBELIBV/                                       00450490
450500       GLOBALLIBSONLYV/                                         00450500
450510       INVALIDLIBREFV/                                          00450510
450520       LIBFEATURENOTIMPLEMENTEDV/                               00450520
450530       BADCOMPILERINDEXV/                                       00450530
450540       LIBNOTPROCESSEDORRUNV/                                   00450540
450550       LIBMUSTBESEPARATESTACKV/                                 00450550
450560                                                                00450560
450570       PROCESSEXCEEDEDV/                                        00450570
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450580        IOEXCEEDEDV/                                           00450580
450590        STACKEXCEEDEDV/                                        00450590
450600        PRINTEXCEEDEDV/                                        00450600
450610        PUNCHEXCEEDEDV/                                        00450610
450620        CARDREADEXCEEDEDV/                                     00450620  33.008.003
450630        MEMORYEXCEEDEDV/                                       00450630
450640        DIRECTORYEXCEEDEDV/                                    00450640
450650        TAPEEXCEEDEDV/                                         00450650
450660        WAITEXCEEDEDV/                                         00450660
450670        ELAPSEDEXCEEDEDV/                                      00450670
450680        DISKLIMITEXCEEDEDV/                                    00450680
450690        STRINGPOOLEXCEEDEDV/                                   00450690
450700                                                               00450700
450710        DIVIDEBYZEROV/                                         00450710
450720        EXPOVERFLOWV/                                          00450720
450730        EXPUNDERFLOWV/                                         00450730
450740        INVALIDINDEXV/                                         00450740
450750        INTEGEROVERFLOWV/                                      00450750
450760        INACTIVEQV/                                            00450760
450770        MEMORYPROTECTV/                                        00450770
450780        INVALIDOPV/                                            00450780
450790        LOOPV/                                                 00450790
450800        MEMORYPARITYV/                                         00450800
450810        SCANPARITYV/                                           00450810
450820        INVALIDADDRESSV/                                       00450820
450830        STACKOVERFLOWV/                                        00450830
450840        STRINGPROTECTV/                                        00450840
450850        PROGRAMMEDOPV/                                         00450850
450860        BOTTOMOFSTACKV/                                        00450860
450870        SEQUENCEERRORV/                                        00450870
450880        INVALIDPCWV/                                           00450880
450890        STACKUNDERFLOWV/                                       00450890
450900        ZAPPEDV/                                               00450900
450910        DISKPARITYV/                                           00450910
450936                                                               00450936
450938        NOMEMV/                                                00450938
450940        PARITYONPBITV/                                         00450940
450942        ARRAYTOOLARGEV/                                        00450942
450944                                                               00450944
450946        WSSIZEEXCEEDEDV/                                       00450946
450948                                                               00450948
450950        RESPONSEREQUIREDV/                                     00450950
450952                                                               00450952
450954        DYNAMICOWNARRAYV/                                      00450954
450956                                                               00450956
450958        NOHOSTV/                                               00450958
450960        HOSTNOTREACHABLEV/                                     00450960
450962        HOSTHALTLOADEDV/                                       00450962  35.181.029
450964        TASKPROTOCOLERRORV/                                    00450964  35.181.029
450966                                                               00450966  35.181.029
450968        DISCONNECTEDV/                                         00450968  35.181.029
450970        SUSPENDEDV                                             00450970  35.181.029
450972        WFL COMPILERS READONLY,                                00450972  35.181.029
450980    HSINFO 69 <STRING> WFL COMPILERS READONLY,                 00450980  31.186.025
450982    HSPARAMSIZE 70 <INTEGER> WFL COMPILERS READONLY, % TEMP FOR 31&32&33   00450982  33.105.015
450984    HSPARAMARRAY 71 <STRING> WFL COMPILERS READONLY, % TEMP FOR 31&32&33   00450984  33.105.015
450985    ITINERARY 72 <STRING> COMPILERS READONLY,                  00450985  32.048.003
450986    DATABASE 73 <ATTRIBUTELIST> WFL,                           00450986  32.046.005
450987    LIBRARY 74 <ATTRIBUTELIST> WFL,                            00450987  32.049.006
450988    VISIBILITY 75 <INTEGER> MNEMONIC UNSPECIFIED/              00450988  32.049.006
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450989                                     MINIMAL/                                                 00450989  32.049.006
450990                                     SUBSYSTEM/                                               00450990  32.049.006
450991                                     GLOBAL        WFL COMPILERS                              00450991  32.123.013
450995    ,TASKPARAMETERS 76 <STRING> COMPILERS READONLY  %PRELIMINARY FOR 32 IMP                   00450995  32.123.013
451050    ,STACKNUMBER 77 <INTEGER>   COMPILERS READONLY                                            00451050  33.002.001
451100    ,TIMESTARTED 78 <REAL>      COMPILERS READONLY                                            00451100  33.002.001
451102    ,STARTTIME 79 <STRING> WFL            READONLY                                            00451102  33.043.008
451104    ,STARTTIMETIMESTAMP 80 <REAL> WFL     READONLY                                            00451104  33.043.008
451106    ,JOBSUMMARY 81 <INTEGER> MNEMONIC DEFAULT/                                                00451106  33.043.009
451108                                      CONDITIONAL/                                            00451108  33.043.009
451110                                      SUPPRESSED/                                             00451110  33.043.009
451112                                      UNCONDITIONAL WFL COMPILERS                             00451112  33.043.009
451115    ,CHECKPOINTABLE 82 <BOOLEAN> MNEMONIC TRUE/FALSE WFL COMPILERS READONLY                   00451115  33.045.011
451120    ,BRCLASS 83 <INTEGER> MNEMONIC NOBR/ONCEONLY/MULTIPLE WFL COMPILERS                       00451120  33.045.011
451122    ,SW1 84 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS                            00451122  33.104.014
451124    ,SW2 85 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS                            00451124  33.104.014
451126    ,SW3 86 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS                            00451126  33.104.014
451128    ,SW4 87 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS                            00451128  33.104.014
451130    ,SW5 88 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS                            00451130  33.104.014
451132    ,SW6 89 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS                            00451132  33.104.014
451134    ,SW7 90 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS                            00451134  33.104.014
451136    ,SW8 91 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS                            00451136  33.104.014
451140    ,INHERITMCSSTATUS 92 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL                         00451140  33.105.015
451145                                                                   COMPILERS                  00451145  33.105.015
451148    ,ACTUALDESTNAME 93 <STRING> WFL COMPILERS                                                 00451148  35.190.031
451150    ,TADS 94 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE> WFL COMPILERS                           00451150  35.190.031
451152    ,LANGUAGE 95 <SIMPLENAME> WFL COMPILERS                                                   00451152  35.190.031
451154    ,CODEVISIBILITY 96 <INTEGER> MNEMONIC UNSPECIFIED/                                        00451154  35.190.031
451156                                          MINIMAL/                                            00451156  35.190.031
451158                                          SUBSYSTEM/                                          00451158  35.190.031
451160                                          GLOBAL        WFL COMPILERS                         00451160  35.190.031
451162    ,JOBSUMMARYTITLE 97 <NAME> WFL COMPILERS                                                  00451162  35.190.031
451164    ,NOJOBSUMMARYIO 98 <BOOLEAN> MNEMONIC TRUE/FALSE/<NUL TRUE>                               00451164  35.190.031
451166                        WFL COMPILERS                                                         00451166  35.190.031
451168    ,PRINTDEFAULTS 99 <STRING> WFL COMPILERS                                                  00451168  35.190.031
451170    ,ACCEPTEVENT 100 <EVENT> COMPILERS                                                        00451170  35.190.031
```

PROGRAM INFORMATION BLOCK

APPENDIX E

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15371200  %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%         15371200  31.062.240
15371220  % BOTH PROCESS TASKS AND PROGRAM SEGMENT DICTIONARIES ARE IMPLEMENTED          15371220  31.170.674
15371240  % AS STACKS - ARRAYS IN THE STACKVECTOR.  THE FIXED BASE OF THE STACK          15371240  31.170.674
15371260  % CONTAINS SOME CONTROL INFORMATION REQUIRED BY HARDWARE OR SOFTWARE           15371260  31.170.674
15371280  % CONVENTION, AND SOME DATA THAT ARE NEEDED ONLY WHEN THE STACK IS             15371280  31.170.674
15371300  % PRESENT AND AVAILABLE.  THE REST OF THE CONTROL INFORMATION IS               15371300  31.170.674
15371320  % KEPT IN SOME ARRAYS INDEXED IN PARALLEL WITH THE STACKVECTOR:                15371320  34.005.122
15371340  %   STACKINFO IS A SCALAR ARRAY CONTAINING DATA THAT                           15371340  34.009.256
15371360  % CHARACTERIZE EACH STACK NUMBER AS TASK, SEGDICT, ETC.                        15371360  34.005.122
15371370  % STACKINFO FIELDS ARE ACCESSIBLE AT ALL TIMES FOR EVERY                       15371370  34.009.256
15371380  % STACK INDEX IN THE ALLOWABLE RANGE, AND IS ARRANGED FOR                      15371380  34.009.256
15371390  % MASKSEARCHING.                                                               15371390  34.005.122
15371420  %   STACKSTATUS IS A SCALAR ARRAY CONTAINING PRIORITY AND PROCESSING           15371420  31.170.674
15371440  % STATE.                                                                       15371440  34.005.142
15371480  %   SPIBVECTOR IS A DOPE VECTOR TO STRUCTURES CONTAINING ALL THE REST          15371480  31.170.674
15371500  % OF THE CONTROL INFORMATION FOR A TASK OR SEGDICT.  EACH SUCH STRUCTURE       15371500  31.170.674
15371520  % IS CALLED A "PROGRAM INFORMATION BLOCK" (PIB) AND IS BASICALLY A             15371520  31.170.674
15371540  % CONTAINER FOR ALL SORTS OF DATA REQUIRED BY MANY DIFFERENT MODULES.          15371540  31.170.674
15371560  %                                                                              15371560  31.170.674
15371580  % THE "TASK" VARIABLE DECLARED IN USER LANGUAGES IS IMPLEMENTED AS A           15371580  31.170.674
15371600  % PIB.  ALL PIBS BELONG (IN THE MEMORY-MANAGEMENT SENSE) TO THE MCP            15371600  31.170.674
15371620  % AND RESIDE IN GLOBAL MEMORY, NO MATTER WHERE DECLARED.  THOSE PIBS           15371620  31.170.674
15371640  % WHICH ARE ACTIVE HAVE DESCRIPTORS IN THE SYSTEM PIB VECTOR AND ARE           15371640  31.170.674
15371660  % ADDRESSABLE AS SPIB[<STACK NUMBER>,*].  (TASKS BEING RUN VIA HOST            15371660  31.170.674
15371680  % SERVICES AT AN EXTERNAL HOST HAVE PIBS WITH DESCRIPTORS IN THE               15371680  31.170.674
15371700  % EXTSPIBVECTOR.)                                                              15371700  31.170.674
15371720  %                                                                              15371720  31.170.674
15371740  CONSTANT % PIB STRUCTURE: COMPLETE PIBS ARE USED FOR PROCESS STACKS            15371740  31.170.674
15371760           %   AND FOR DBS AND THE MCP STACK.  SHORT PIBS ARE USED               15371760  31.170.674
15371800           %   FOR ORDINARY SEGDICTS AND INTRINSICS.                             15371800  31.062.240
15372000           % ORDERED ALPHABETICALLY EXCEPT WHEN OTHERWISE CONSTRAINED.           15372000  31.062.240
15372200                     %%%%%%%%% ONLY IN PROCESS PIBS:                             15372200  31.170.674
15372400   PIBMSCW           =0,       % D1 MSCW FOR SOPHIA ROUTINES                     15372400  31.170.674
15373200                    %%%%%%%%% ONLY IN SEGDICT PIBS:                              15373200  31.170.674
15373400   CODEHEADERINDEX   =0,       % INDEX OF CODE-FILE HEADER                       15373400  31.166.240
15373800                    %%%%%%%%% IN ALL PIBS:                                       15373800  31.170.674
15374000                    ZOTBOT1,               % CLEARED BY DOCTOR BEFORE BOT        15374000  31.162.599
15374100   ACTUALBOXES       =ZOTBOT1, % BOXMASK FOR LOGGING - ACTUALLY USED BOXES       15374100  34.004.078
15374200   CODELINKS,                  % SEGDICT LINKAGES: CF SEGDICTF, ETC              15374200  312261018
15374400   COMPILERINFO,               % FROM SEGO: CF LANGUAGETYPEF, ETC                15374400  31.162.599
15374600   COREINTEGRAL,               % WORKING-SET ACCOUNTING                          15374600  31.162.599
15374800   COREINUSE,                  % TOTAL WORDS OF CORE IN USE                      15374800  31.162.599
15375000   COREINUSESAVED,             % WORDS OF CORE IN USE THAT ARE MARKED SAVE       15375000  31.162.599
15375200   FORCEDOLAYTIME,             % OVERLAY ACCOUNTING                              15375200  31.162.599
15375300   GRAPHHEADWORD,              % HEADWORD FOR GRAPH ROUTINES                     15375300  32.034.203
15375400   OLAYCNTL,                   % OLAYFREQ=47:24 OLAYAMT=23:24                    15375400  31.162.599
15375450   ORIGBOXES,                  % BOXMASK FOR LOGGING - ORIGINAL BOXES            15375450  34.004.078
15375500   SEARCHINFO,                 % INFO NEEDED TO SEARCH A STACK                   15375500  32.056.510
15375600   SUBSPACEID,                 % NAME OF OWNER OF SUBSPACE                       15375600  31.162.599
15375800   SWAPHOLD,                   % SWAPJOB COUNT OF I/O OR SONS ACTIVE             15375800  31.162.599
15376000   TIMESTARTED,                % -CLOCK AT INITIATION; ELAPSED TIME AT EOT       15376000  31.162.599
15376200                    ZOTBOT1L =TIMESTARTED,                                       15376200  31.166.240
15376500   RUNNINGCOUNT,               % USERS OF SEGDICT/DBS (& SIBS FOR DM)            15376500  32.033.179
15376600  D1PIBLENGTH,                 %========= END OF SEGDICT PIB ============         15376600  31.170.674
15376800                    %%%%%%%%% REST OF PROCESS (& DBS & MCP) PIBS:                15376800  31.170.674
15377000                    %%%%%%%%% SELF-VALIDATING ARRAY ITEMS:                       15377000  31.062.240
15377200                    FIRSTINITARRAY =D1PIBLENGTH,     % TRANSCRIBED FOR RUN       15377200  31.170.674
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15377400     ACCESSCODE =FIRSTINITARRAY, % ARRAY: STANDARDFORM NAME                          15377400  31.166.240
15377600     CHARGECODE,                 % ARRAY: STANDARDFORM NAME                          15377600  31.162.599
15377650     DBEQTNBLK,                  % DATABASE LABEL EQUATION BLOCK                     15377650  32.052.429
15377700     DBSINFO,                    % TOP OF FROZEN DBS, ETC. (SEE LAYOUT)              15377700  32.033.179
15377750     DESTNAME,                   % STD. FORM STATION NAME OF DESTINATION             15377750  35.027.777
15377800     HOSTNAME,                   % STD. FORM HOST NAME                               15377800  31.162.599
15378200     FAMILYSUB,                  % INTERNALFORM FAMILY SPECIFICATIONS                15378200  31.162.599
15378500     JSTITLE,                    % DISPLAYFORM JOBSUMMARYTITLE                       15378500  351122543
15378600     MYBDNAME,                   % STANDARDFORM PREFIX FOR BD FILES                  15378600  31.162.599
15378800     MYFPB,                      % FILE PARAMETER BLOCK                              15378800  31.162.599
15379000     MYNAME,                     % STANDARDFORM TASK NAME                            15379000  35.011.319
15379400     MYPPB,                      % PROGRAM PARAMETER BLOCK                           15379400  31.162.599
15379600     SUBSYSTEMID,                % SUBSYSTEM NAME (SUBSTANDARDFORM NAME)             15379600  31.162.599
15379800     YOURNAME,                   % STANDARDFORM COMPILEE NAME                        15379800  31.162.599
15380000     BACKUPFAMILY,               % PACKNAME IN SUBSTANDARDFORM                       15380000  31.162.599
15380200                       LASTINITARRAY =BACKUPFAMILY,                                  15380200  31.166.240
15380400                       %%%%%%%%% ITEMS NOT REPORTABLE AFTER EOT:                     15380400  31.062.240
15380600                       ZOTEOT,                % CLEARED BY TERMINATE AFTER EOT       15380600  31.162.599
15381000     BDINFO             =ZOTEOT, % BACKUP OUTPUT CONTROL: CF BDNUMF, ETC             15381000  35.023.641
15381200     EVENTCAR,                   % DESCRIPTOR TO SIDECAR ARRAY FOR EVENTS            15381200  35.008.265
15381300     BEDWORD,                    %   INFO FOR EVENT LINKAGE (CF MULTI-WAIT)          15381300  35.008.265
15381400     BLOCK,                      % SIRW TO (SCW OF) CRITICAL BLOCK                   15381400  31.162.599
15381600     CARDSPUNCHED,               % DECREMENTED PUNCH-CARD OUTPUT LIMIT               15381600  31.162.599
15381640     ALARMTIMES,                 % MEASURES FREQUENCY OF ALARM INTERRUPTS            15381640  35.032.873
15381660                                 % (TWO 24 BIT FIELDS, TIMES IN SECONDS)             15381660  35.032.873
15381700     BOTTIMESTAMP,               % TIMESTAMP AT BOT                                  15381700  34.018.467
15382000     CPINFO,                     % CHECKPOINT DATA: CF CPCOUNTF, ETC                 15382000  31.162.599
15382200     DISKUSED,                   % DECREMENTED USER-DISK LIMIT                       15382200  31.162.599
15382600     ENTRYPOINT,                 % PCW OR SIRW FOR TASK ENTRY POINT                  15382600  31.162.599
15382800     EXCEPTIONEVENT,             % EVENT CAUSED BY IPC STATUS CHANGE                 15382800  31.162.599
15383000       EXCEPTIONEVENT2,          %   (SECOND WORD)                                   15383000  31.162.599
15383200     EXTERNALFAMILYLINK,         % EXTERNAL FAMILY LINKAGE VIA TAGS                  15383200  31.163.603
15383400     FREEPBITS,                  % WORDS OVERLAYED WHILE BATCH JOB SUSPENDED         15383400  31.162.599
15383450     HEADERACCESS,               % JOB AND CODE FILE HEADER INDICIES                 15383450  35.013.388
15383500     INSTRETRYINFO,              % B7700 INSTRUCTION RETRY INFORMATION               15383500  31.7X.026
15383600     INTERCEPTEDRCW,             % RCW DISPLACED BY INTERLOOPER'S                    15383600  31.162.599
15383800     INTERCESSION,               % INTERCEDE DRIVER                                  15383800  31.162.599
15383900     ITINERARY,                  % HOSTSERVICES ITINERARY INFORMATION                15383900  32.044.304
15383920     JOBDECKINFO,                % JOB DECK CONTROL ARRAY                            15383920  32.054.458
15383940     JOBINFO,                    % ABOUT THE JOB OF THIS TASK: CF JOBCLASSF          15383940  32.054.458
15384000     JOBMSGS,                    % 2-D ARRAY: DISPLAY RSVP ACCEPT ETC.               15384000  31.162.599
15384200       PIBMEMLOC =JOBMSGS,       % TEMP MEMLOC WORD (SWAPPER TO INITIATE)            15384200  31.170.674
15384600     LIBRARYDIR,                 % LIBRARY  DIRECTORY DESCRIPTOR                     15384600  31.163.577
15384700     LIBINITIATOR = LIBRARYDIR,  % LIB INITIATION INFO (LIBACCESS, ETC.)             15384700  32.147.947
15384800     LINESPRINTED,               % DECREMENTED PRINTER OUTPUT LIMIT                  15384800  31.162.599
15385000     OLAYFILEDESC,               % HEADER FOR OVERLAY FILE.  SHARED WITH:            15385000  31.162.599
15385200       D1STACKINFO =OLAYFILEDESC,% CODE-FILE DESC FOR D1STACK (BEFORE BOJ)           15385200  31.166.240
15385550     PORTLIB_PIB,                % NO OF PORTS DECLARED AND TOUCHED, ETC.            15385550  35.005.118
15385600     PROCESSFAMILYLINK,          % CF PARENTF, ETC                                   15385600  31.162.599
15386400     REMPRINTMASK,               % WHICH MCS'S TO NOTIFY OF PRINTING AT EOJ          15386400  31.162.599
15386600     REMPUNCHMASK,               % WHICH MCS'S TO NOTIFY OF PUNCHING AT EOJ          15386600  31.162.599
15386800     REPLY,                      % RSVP COMMUNICATION: CF REPVALF, ETC               15386800  31.162.599
15387000     REPLYEVENTX,                % RSVP EVENT                                        15387000  31.222.003
15387200       REPLYEVENT2,              %   (SECOND WORD)                                   15387200  31.222.003
15387600     ROLLOUTINFO,                % WFL-SUPPLIED JOBSTACK ROLLOUT DATA                15387600  31.162.599
15388000     SOFTINTQ,                   % SOFTWARE INTERRUPT QUEUE HEADWORD                 15388000  31.162.599
15388400     SWAPDATA,                   % SIDE CAR FOR SWAPPER STUFF                        15388400  31.162.599
15388500     TASKBOXES,                  % BOXES TASK IS ALLOWED IN                          15388500  34.004.078
15388600     TASKINFO,                   % MISCELLANEOUS: CF INUSEBYSYSTEMF, ETC             15388600  31.162.599
15388650     TASKPARAMS,                 % BEFORE INITIATE: ARRAY OF PARAMETERS              15388650  32.033.179
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15388700                                  %  AFTER INITIATE: NUMBER OF PARAMETERS              15388700  32.033.179
15388800     PIBIOCB,                     % ARRAY: IOCB FOR DISKWAIT, SWAPPER ETC.             15388800  31.170.674
15389000     TASKTYPE,                    % SEE PROCESSTYPE DEFINE ET SEQ.                     15389000  31.162.599
15389700     HSINFO,                      % HOSTSERVICES TAG INFORMATION                       15389700  31.185.744
15389800     SURROGATEINFO,               % FOR CONTROLLING INTER-HOST TASKING                 15389800  31.162.599
15389830     WAITSTART,                   % CLOCK WHEN AN EVENT-WAIT STARTED, IF > 0.          15389830  35.023.641
15389840                                  % ALSO USED (<0) TO LINK STACKS TO SWAP IN           15389840  35.023.641
15389842     DEIMPRUNTIMESET,             % THE BITS CORRESPONDING TO DEIMPLEMATION            15389842  350772055
15389844                                  % WARNIG'S BITS ARE SET HERE TO REPORT THE           15389844  350772055
15389846                                  % DISPLAYED WARNINGS FOR A SOFTWARE.                 15389846  350772055
15389850                              %%%%% BELOW ARE ITEMS USED BY GEORGE, ORDERED &          15389850  35.023.641
15389860                              %%%%% GROUPED TOGETHER FOR B7000 PERFORMANCE BOOST       15389860  35.023.641
15389870     ACTIONQ,                     % THINGS THIS STACK MUST DO: CF ACTIONCASEF          15389870  35.023.641
15389880     RECENTPROC,                  % PROC TIME AT LAST RESURRECT                        15389880  35.023.641
15389890     PALACE,                      % PCW TO GEORGE OF SOPHIA                            15389890  35.023.641
15389900     PALACEREF,                   % PSEUDOSTACK SIRW TO PALACE IN THIS PIB             15389900  35.023.641
15389910     USAGE,                       % MISCELLANEOUS: SEE ARP, ETC                        15389910  35.023.641
15389920     DMSBED,                      % DM EVENT LINKAGE                                   15389920  35.023.641
15389930     READYON,                     % CLOCK WHEN ENTERED INTO READYQ OR GEORGED          15389930  35.023.641
15389940       SCHEDDATA =READYON,        % SCHEDULING INFORMATION                             15389940  35.023.641
15389950     PROCESSOR,                   % PROCESSOR CURRENTLY EXECUTING THIS STACK           15389950  35.023.641
15389960     CLOCKONTIME,                 % CLOCK WHEN STACK GOT PROCESSOR                     15389960  35.023.641
15389970     LETGEORGEDOIT,               % SIGNAL FOR GEORGE (FULL WORD, NOT LOCKED)          15389970  35.023.641
15390000                          ZOTEOTL =LETGEORGEDOIT,                                      15390000  35.023.641
15390200                          %%%%%%%%% ITEMS REPORTABLE AFTER EOT:                        15390200  31.062.240
15390400                          ZOTBOT2,             % CLEARED BY DOCTOR BEFORE BOT          15390400  31.162.599
15390450     READYTIME = ZOTBOT2,         % TIME-I-WANTED-PROCESSOR ACCUMULATOR                15390450  35.023.641
15390500     PROCESSTIME,                 % PROCESS TIME ACCUMULATOR (CLOCK UNITS)             15390500  35.023.641
15390540     $ SET OMIT = NOT ACTIVETIME                                                       15390540  340431074
15390560     % ACTCOUNT & ACTTIME ONLY TAKE UP PIB SPACE IF ACTIVETIME OPTION IS SET           15390560  340431074
15390580     ACTCOUNT,                    % COUNTER TO CONTROL ACTTIME                         15390580  35.023.641
15390600     ACTTIME,                     % ACCUMULATES TIME DURING PROCESS OR I/O             15390600  340431074
15390620     $ POP OMIT SET OMIT = ACTIVETIME                                                  15390620  340431074
15390640     ACTCOUNT = 4'FFF',           % INVALID WITHOUT THE ACTIVETIME OPTION              15390640  340431074
15390660     ACTTIME =  4'FFF',           % INVALID WITHOUT THE ACTIVETIME OPTION              15390660  340431074
15390680     ACTTIMEFUDGE = PROCESSTIME,  % RESTORE CORRECT COUNT                              15390680  35.023.641
15390700     $ POP OMIT                                                                        15390700  340431074
15390800                              %%%%% ABOVE ARE ITEMS USED BY GEORGE                     15390800  35.023.641
15390850     IOTIME,                      % I/O TIME ACCUMULATOR (CLOCK UNITS)                 15390850  34.018.467
15390960     INITPBITKOUNT,               % COUNT OF INIT PBITS                                15390960  34.018.467
15390970     INITPBITTYME,                % PROC TIME DOING INIT PBITS                         15390970  34.018.467
15390980     OTHERPBITCOUNT,              % COUNT OF OTHER PBITS                               15390980  34.018.467
15390990     OTHERPBITTIME,               % PROC TIME DOING PBITS EXCEPT INIT PBITS            15390990  34.018.467
15391000     HISTORY,                     % CF HISTYPEF, ETC, & HISTORYTYPE ET SEQ.            15391000  31.162.599
15391200     IOCOUNT1,                    % CARDS READ=47:24 CARDS PUNCHED=23:24               15391200  31.162.599
15391300       COMPTIME = IOCOUNT1,       % TEMP - TIME CODE COMPILED (DOCTOR TO BOJ)          15391300  33.001.013
15391400     IOCOUNT2,                    % LINES PRINTED                                      15391400  31.162.599
15391500     SCHEDTIME =IOCOUNT2,         % HOLD SCHEDULE TIME BEFORE BOT                      15391500  31.201.856
15391800     MYSTACKHISTORY,              % ARRAY: TEXT DISPLAY OF PROCEDURE HISTORY           15391800  31.162.599
15392400     STOPPOINT,                   % RCW AND FAULT NUMBER OF LAST FAULT                 15392400  31.162.599
15392600                          ZOTBOT2L =STOPPOINT,                                         15392600  31.166.240
15392800                          %%%%%%%%% ITEMS NEVER CLEARED:                               15392800  31.062.240
15393000     LOCKEDEVENT,                 % EVENT FOR "LOCKED" ATTRIBUTE                       15393000  31.162.599
15393200       LOCKEDEVENT2,              %   (SECOND WORD)                                    15393200  31.162.599
15393400                          USERSTUFF,          % REST OF PIB TRANSCRIBED FOR RUN        15393400  31.170.674
15393600     VALIDITYBITS        =USERSTUFF, % VALIDITYBITS.VALBIT(X) MARKS PIB ITEM X         15393600  31.170.674
15393800                          %%%%%%%%% ITEMS WITH VALIDITY BITS (LIMIT 48):               15393800  31.062.240
15394000                          VALBIAS,                        % SEE VALBIT DEFINE          15394000  31.162.599
15394200     AVALUE                =VALBIAS, % "TASKVALUE" ATTRIBUTE                           15394200  31.166.240
15394300     MAXPROCESSTIME,              % LIMIT ON PROCESSOR TIME                            15394300  35.023.641
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15394350     SWAPSPEX,                   % SWAPPER SPEX & CONTROLS: CF LOCATIONF ETC        15394350  35.023.641
15394400     CODECORE,                   % D1 MEMORY SPEX: LIMITF & ESTIMATEF               15394400  31.162.599
15394600     DATACORE,                   % D2 MEMORY SPEX: LIMITF & ESTIMATEF               15394600  31.162.599
15394800     DISKLIMIT,                  % LIMIT ON USER DISK                               15394800  31.162.599
15395000     ELAPSEDLIMIT,               % LIMIT ON ELAPSED TIME                            15395000  34.018.467
15395020     MAXIOTIME,                  % LIMIT ON I/O TIME                                15395020  34.018.467
15395060     MAXWAIT,                    % LIMIT ON DM LOCK WAIT                            15395060  34.018.467
15395080     WAITLIMIT,                  % LIMIT ON EACH EVENT WAIT                         15395080  34.018.467
15395200     ERROR,                      % -HOW IF ERROR ON TASK ATTRIBUTE # HOW            15395200  31.162.599
15395400     EXCEPTIONTASK,              % REF TO PIB TO KICK AT OUR STATUS CHANGE          15395400  31.170.674
15396200     OPTION,                     % THE "OPTION" ATTRIBUTE: CF FAULTCLSF, ETC        15396200  31.162.599
15396400     PARTNER,                    % REF TO PIB TO WAKE IF I CONTINUE OR DIE          15396400  31.170.674
15396600     PATHCONTROL,                % SOURCE ID OUTPUT ROUTE: CF DESTCONTROLF          15396600  31.162.599
15396800     PRINTLIMIT,                 % LIMIT ON PRINTED LINES                           15396800  31.162.599
15397000     PRIORITY,                   % "DECLAREDPRIORITY" ATTRIBUTE                     15397000  31.162.599
15397200     PUNCHLIMIT,                 % LIMIT ON PUNCH-CARD OUTPUT                       15397200  31.162.599
15397400     RESTARTCOUNT,               % NUMBER OF TIMES RESTARTED                        15397400  31.162.599
15397600     SERIAL,                     % STK/JOB/PIB ID:SERIALSTKNRF,JOBNRF,TSKNRF        15397600  350741952
15397800     STACKLIMIT,                 % LIMIT ON STACK SIZE                              15397800  31.162.599
15398000     STACKSIZE,                  % INITIAL STACK SIZE                               15398000  31.162.599
15398200     STATIONINFO,                % "STATION"&"TANKING": STATIONF & TASKTANKF        15398200  31.162.599
15398600     TARGETTIME,                 % "TARGETTIME" ATTRIBUTE (NOT YET IMPL.)           15398600  31.162.599
15398800     TAPECOUNT,                  % RESOURCE ACCTG: CF PETAPEF, ETC                  15398800  31.162.599
15399000     TAPEPOOL,                   % DITTO                                            15399000  31.162.599
15399200     TASKLIMIT,                  % DECREMENTED LIMIT ON TASK INITIATIONS            15399200  31.162.599
15399400     USERCODE,                   % STANDARDFORM USERCODE (4 WORDS IN PIB)           15399400  31.170.674
15399600     USERCODEPRIV  = USERCODE+3, % 4TH WORD OF USERCODE PLUS:                       15399600  31.166.240
15400000                                 %   SEE USERCODEPRIVF DEFINE ETC.                  15400000  32.055.474
15400400    PIBLENGTH,                   %========= END FIXED PROCESS PIB ==========        15400400  31.170.674
15400600     TASKNAME1  = PIBLENGTH,     % FIRST WORD OF MYNAME IF APPENDED TO PIB          15400600  31.170.674
15400800       PIBNAMESPACE    =      8; %   DEFAULT LENGTH FOR MYNAME APPENDIX             15400800  31.170.674
```

```
15506400   % FIELDS IN STACKINFO                                                          15506400  31.053.002
15506600          , BOXTHRUVISF      =[47:10]# % PUN FOR GEORGE: BOX & 3 BITS & VIS       15506600  34.005.132
15506800          , BOXNOF           =[47:6]#  % BOX NUMBER IN WHICH STACK RESIDES        15506800  34.005.132
15507000          , URSVPWAITINGF    =[41:1]#  % WAITING ON A UNIT RSVP                   15507000  34.005.132
15507200          , TIMELIMITSF      =[40:1]#  % ETERNALIR MUST MONITOR TIME LIMITS       15507200  34.005.132
15507400          , NEEDAROWF        =[39:1]#  % OLAYSCOUT SERVICES ARE NEEDED            15507400  34.005.132
15507600          , VISIBLEF         =[38:1]#  % DISPLAY AND LOG THIS TASK (NOTE PUN)     15507600  34.005.132
15507800          , CANTSUSPENDF     =[37:1]#  % MAY NOT BE SUSPENDED                     15507800  34.005.132
15508000          , SUSPF            =[36:1]#  % SUSPENDED BY SYSTEM                      15508000  34.005.132
15508600          , PRIVILEGEDUSERF  =[35:1]#  % THIS PROCESS IS PRIVILEGED               15508600  31.138.003
15508800          , COMPILERF        =[34:1]#  % THIS IS A COMPILER                       15508800  31.138.003
15509000          , ACTIVEDBSF       =[33:1]#  % DBS IS (STILL) ACTIVE                    15509000  31.138.003
15509100          , SUSPREQUESTF     =[32:1]#  % ST BY SYS REQUESTED                      15509100  33.011.314
15509200          , STACKKINDF       =[31:8]#  % NATURE OF STACK:                         15509200  31.138.003
15509400          ,    MCPSTACKF     =[31:1]#  %   THE MCP (D[0]) STACK       10010000    15509400  31.138.003
15509500                                       %   FROZEN  (D[0]) MCP STACK   10011000    15509500  32.048.380
15509600          ,    DBSF          =[30:1]#  %   OLD STYLE DATABASE STACK   01010000    15509600  32.033.179
15509700                                       %   NEW STYLE DATABASE STACK   01000001    15509700  32.033.179
15509800          ,    INTRINSICSF   =[29:1]#  %   AN INTRINSICS STACK        00110000    15509800  31.138.003
15510000          ,    SEGDICTSTACKF=[28:1]#   %   A SEGMENT DICTIONARY       XXX1X000    15510000  31.138.003
15510200          ,    LIBRARYSTACKF=[27:1]#   %   A USABLE (FROZEN) LIBRARY  000X100X    15510200  31.183.733
15510400          ,    JOBSTACKF     =[26:1]#  %   A JOB STACK                00000101    15510400  31.138.003
15510600          ,    IRINDICATORF  =[25:1]#  %   AN INDEPENDENT RUNNER      0000X011    15510600  321741152
15510800          ,    TASKSTACKF    =[24:1]#  %   A TASK (PROCESSING) STACK  0000XXX1    15510800  31.138.003
15510900          , INTERCEPTABLEF   =[23:1]#  % IR STACK CAN BE INTERCEPTED              15510900  340621601
15511000          , VIEWABLEF        =[22:1]#  % OK TO LOOK AT THE ASSOCIATED PIB         15511000  31.170.674
15511200          , LOGGABLEF        =[21:1]#  % OK TO WRITE TO JOBLOG                    15511200  31.062.240
15511400          , STACKPRESENTF    =[20:1]#  % STACK HAS BEEN BUILT AND IS IN CORE      15511400  31.144.496
15511600          , SEARCHABLEF      =[19:1]#  % STACK (OR PARAMS) SUBJECT TO SEARCH      15511600  31.144.496
15511800          , SEARCHVIAQF      =[18:1]#  % SEARCH MUST BE DONE VIA SEARCHQ          15511800  31.144.496
15512000          , BLOCKEDF         =[17:1]#  % STACK IS BLOCKED - NO PROCS ALLOWED      15512000  32.056.510
15512200          , STATSTACKF       =[16:1]#  % STAT STACK NEEDED IF STATISTICS          15512200  31.201.870
15512300          , STRETCHINGF      =[15:1]#  % STACK IS BEING STRETCHED                 15512300  321781141
15512350          , SIWSGOINGF       =[14:1]#  % WSSHERIFF IS INVOLVED WITH THIS          15512350  34.012.256
15512400                                       %   STACK'S MEMORY: EOJ MUST WAIT.         15512400  34.012.256
15512450          , SIEOJF           =[13:1]#  % EOJ IS DESTROYING THIS STACK, SO         15512450  34.012.256
15512500                                       %   WSSHERIFF MUST LAY OFF.                15512500  34.012.256
15512520          , DONTUPDATEF      =[12:1]#  % DONT UPDATE SEGO STACKSIZE               15512520  340581495
15512540          , NOTRESUMEABLEF   =[11:1]#  % THIS LIBRARY MUST NOT BE RESUMED AT      15512540  350571529
15512560                                       %   THIS STAGE                             15512560  350571529
15512570          , DONTKANGAROOF    =[10:1]#  % DO NOT KANGAROO ANY CODE THAT HAS        15512570  350761985
15512580                                       % THIS STACK AS A SEG DICT (DMS,HS)        15512580  350761985
15512590          , EOJINUSEONESF    =[ 9:1]#  % IF GOTOSOLVER FINDS THAT THE WORD        15512590  350762001
15512592                                       %           VIA SIRW ISNT EOJRCW THEN      15512592  350762001
15512594                                       %   IF THERE ISNT A GO-PAST SCW            15512594  350762001
15512596                                       %             OR THIS BIT IS OFF THEN      15512596  350762001
15512598                                       %     ITS TIME GET A MEMDUMP               15512598  350762001
15512600                                       %   OTHERWISE                              15512600  350762001
15512602                                       %     TURN OFF THIS BIT AND USE THE        15512602  350762001
15512604                                       %     GO-PAST                              15512604  350762001
15512650          , LIBRESUMINGF     =[ 8:1]#  % LIB BEING RESUMED BUT NOT STRETCHED      15512650  351122539
15512700                                       % YET                                      15512700  351122539
15512780          , SWAPJOBF         =[ 0:1]#  % THIS IS A SWAPPED TASK                   15512780  350762001
15512800          , SWAPANDBOXF      =[ 0:7]#  % COMBINATION: = BOXNO IF NOT SWAPPED      15512800  34.005.132
15512960   % FIELDS IN PIB[SEARCHINFO]                                                    15512960  32.056.510
15512980     , BLOCKINGNUMBERF        =[ 7: 8]# % NUMBER OF OUTSTANDING BLOCKS            15512980  32.056.510
15512982     , NSTACKSEARCHEDGESF     =[23:16]#                                           15512982  350711823
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15512990        , WAITINGFORUNBLOCKF  =[47: 1]#                                                         15512990  34.035.855
15513000     % FIELDS IN PIB[CODELINKS]         % CHANGED UNDER PROCESSCHANGELOCK                       15513000  350531393
15513200        , TADSBPF             =[47:1]#  % A BP IS PENDING FOR THIS SESSION                      15513200  350531393
15513250        , TADSPRIVATEF        =[46:1]#  % NON SHARABLE SEGDICT BECAUSE OF TADS                  15513250  350531393
15513300        , BOJINTRINSICSF      =[45:1]#  % ORIGINAL BOJ MUST LINK INTRINSICS                     15513300  32.060.553
15513400        , SEGDICTLINKF        =[35:SNSIZE]# % LINK TO NEXT SEGDICT                              15513400  35.026.736
15513500                                          % FOR SAME HEADER                                     15513500  35.026.736
15513600        % AVAILABLE           =[21:10]# % FORMERLY - INTRINSICS STACK NUMBER                    15513600  32.174.947
15513800        , SEGDICTF            =[11:SNSIZE]# % SEGMENT-DICTIONARY (D1) STACK                     15513800  35.026.736
15513900                                          % NUMBER                                              15513900  35.026.736
15514000     % FIELDS IN PIB[COMPILERINFO] AND CODEFILE SEGO[SOCOMPILERINFO]                            15514000  312241005
15515000        , IPCCAPABLEF         =[47:1]#                                                          15515000  31.062.240
15515200        , SORTCAPABLEF        =[46:1]#                                                          15515200  31.062.240
15515400        , CONTROLPROGRAMF     =[45:1]#   % SET BY CP COMMAND IN SETSTATUS                       15515400  31.157.559
15515600        , DMSCAPABLEF         =[44:1]#                                                          15515600  31.062.240
15515800        % NOBADPTRF           =[43:1]#   % NO "UPLEVEL" POINTER ASSIGNMENT                      15515800  31.140.002
15516000        , PRIVILEGEDPROGRAMF  =[42:1]#   % SET BY PP COMMAND IN SETSTATUS                       15516000  31.157.559
15516200        , LIBRARYCAPABLEF     =[41:1]#   % COULD "FREEZE" AS A LIBRARY                          15516200  31.092.375
15516210        , NOGLOBALEQUATEF     =[40:1]#   % WFL: NO GLOBAL FILE EQUATION                         15516210  32.054.458
15516215        , TRANSPARENTPRIVF    =[39:1]#   % TRANSPARENT PRIVILEGE                                15516215  321741148
15516218        , AUTOSUPPRESSF       =[38:1]#   % SET BY SUPPRESS COMAND IN SETSTATUS                  15516218  35.023.638
15516219        , RESIDENTPROGRAMF    =[37:1]#   % SET BY RP COMMAND IN SETSTATUS                       15516219  350711854
15516220        , LANGUAGETYPEF       =[31:8]#                                                          15516220  312241005
15516240        % IN COMPILERINFO AND IN SOCOMPILERINFO OF NEW CODE FILES:                              15516240  312241005
15516260        , MARKLEVELF          =[23:8]#   % MARK*10+LEVEL    LEQ 99; GEQ 10 (31)                 15516260  312241005
15516270        % U N U S E D          [15:6]                                                           15516270  312241005
15516280        , CYCLENUMBERF        =[9:10]#   % CYCLE            LEQ 999                             15516280  312241005
15516300        % IN SOCOMPILERINFO OF OLD CODE FILES:                                                  15516300  312241005
15516320        , OLDMARKF            =[23:8]#   % MARK             LEQ 9  (3)                          15516320  312241005
15516340        , OLDLEVELF           =[15:8]#   % LEVEL            LEQ 9                               15516340  312241005
15516360        % OLDCYCLEF           =[ 7:8]#   % CYCLE            LEQ 255                             15516360  312241005
15516400     % FIELDS IN PIB[CODECORE] AND PIB[DATACORE]                                                15516400  31.170.674
15516600        , LIMITF              =[39:20]#                                                         15516600  31.062.240
15516800        , ESTIMATEF           =[19:20]#                                                         15516800  31.062.240
15517000     % FIELDS IN PIB[CPINFO]                                                                    15517000  31.170.674
15517200        , CPCOUNTF            =[ 9:10]#                                                         15517200  31.062.240
15517320        % BR ATTRIBUTES FIELDS:                                                                 15517320  35.027.799
15517340        , CPDISABLEF          =[10:1]#  % SET => NOT CHECKPOINTABLE                             15517340  33.045.739
15517360        , CPDSEDF             =[11:1]#  % SET = DO NOT RUN EPILOG PROCEDURES                    15517360  33.045.739
15517380        , BRCLASSF            =[14:3]#  % BRCLASS ATTRIBUTE + 1                                 15517380  35.027.799
15517400        , CPSTATUSF           =[17:3]#  % SEE CHECKPOINTNULLV,ETC                               15517400  35.027.799
15517405                                                                                                15517405  340531285
15517600        , TEMPCNTF            =[27:10]#                                                         15517600  35.027.799
15517800        , CPIXF               =[43:HEADERBITS]#                                                 15517800  35.027.799
15517900        , RBCOUNTF            =[45:2]#  % COUNT OF ERRORHANDLER REBUILDS                        15517900  35.027.799
15518000        , CPDKF               =[46:1]#                                                          15518000  31.062.240
15518200        , CPPKF               =[47:1]#                                                          15518200  31.062.240
15518210     % FIELDS IN PIB[PRINTLIMIT]                                                                15518210  350792173
15518220        , BDNUMF              =[47:10]#                                                         15518220  350792173
15518230        , PIBPRINTLIMF        =[37:38]#                                                         15518230  350792173
15518250     % FIELDS IN PIB[PUNCHLIMIT]                                                                15518250  350711762
15518300        , PIBTONGUEF          =[47: 8]#                                                         15518300  350711762
15518350        , PIBPUNCHLIMF        =[39:40]#                                                         15518350  350711762
15518400     % FIELDS IN PIB[RESTARTCOUNT]                                                              15518400  33.045.739
15518600        , STACKSZF            =[47:16]# %CLEARED BY INITIATE,SET BY RESTART                     15518600  33.045.739
15518620        , TADSD1F             =[31:SNSIZE]#  % SEGDICT OF PROGRAM THAT INVOKE                   15518620  350762003
15518640                                         % TADS                                                 15518640  350531393
15518650        , TADSWANTEDF         =[19:1]#   % TADS TASK ATTRIBUTE SET                              15518650  350531393
15518700        , TADSUSERF           =[18:1]#   % TADS ATTRIBUTE SET AND PROGRAM                       15518700  350531393
15518750                                         % WAS COMPILED FOR TADS                                15518750  350531393
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15518760      , TADSVALIDF        =[17:1]#   % TADS ATTRIBUTE HAS BEEN SET              15518760  350611718
15518770                                     % (PREVENTS DOCTOR FROM OVERRIDING         15518770  350611718
15518780                                     % PPB WITH COMPILE TIME PPB).              15518780  350611718
15518800      , RESTARTCOUNTF     =[16:17]# % 2**17-1 RETRIES SHOULD BE ENOUGH          15518800  350611718
15518860    % FIELDS IN PIB [DBSINFO]                                                   15518860  32.033.179
15518862      , DBSDYINGF         =[45: 1]# % SET TO 1 WHEN DBS IS PROCESSKILLED        15518862  33.041.627
15518864      , DBSSHUTDOWNF      =[44: 1]# % SET TO 1 TO TELL DBS TO GO AWAY           15518864  33.041.627
15518866      , STACKSINDMSOPENF  =[43:SNSIZE]# % # OF STACKS WAITING IN DMSOPEN        15518866  35.026.736
15518868                                    % FOR DATABASE TO BECOME ACTIVE             15518868  33.041.627
15518870      , TOPOFDBSSCWF      =[31:16]# % OFFSET OF SCW IN TOPMOST ENVIRONMENT      15518870  32.033.179
15518880      , TOPOFDBSF         =[15:16]# % OFFSET FROM BOSR OF TOP OF FROZEN         15518880  32.033.179
15518900                                    % PORTION OF DBS (NEW DBS ONLY AFTER        15518900  32.033.179
15518920                                    % DMSFREEZE)                                15518920  32.033.179
15518940    % FIELDS IN PIB[PORTLIB_PIB]                                                15518940  35.005.118
15518950      , MPS_COUNTF     =[39:20]# % NO OF REMOTE FILES CONNECTED TO MPS          15518950  350772066
15518960      , PORT_COUNTF    =[19:20]# % NO OF PORTS DECLARED AND TOUCHED             15518960  35.005.118
15519000    % FIELDS IN PIB[PROCESSFAMILYLINK]                                          15519000  31.170.674
15519200      , CAUSEREPLYEVENTF =[47:1]#  % FOR DEATHINFAMILY COORDINATION             15519200  31.062.240
15519400      , EXTERNALPROCESSF =[46:1]#  % THIS TASK HAS ITS OWN CODE FILE            15519400  31.062.240
15519600      , COPYPARAMF     =[45:1]#  % THERE IS A COPYDESC PARAMETER                15519600  31.071.002
15519800      % SEARCH CONTROL FIELD     % THIS STACK MAY:                              15519800  31.062.240
15520000      , CANSEEF        =[44:1]#  %   REFERENCE DATA IN PARENT STACK             15520000  31.062.240
15520200      , RUNCODEF       =[43:1]#  %   COPY DESCRIPTORS FORM PARENT SEGDICT       15520200  31.062.240
15520400      , COPYDESCF      =[42:1]#  %   COPY DESCRIPTORS FROM PARENT STACK         15520400  31.062.240
15520600      , BADPTRF        =[41:1]#  %   ASSIGN "UPLEVEL" POINTER IN PARENT         15520600  31.062.240
15520800      , DRELBADPTRF    =[40:1]#  %   ASSIGN UPLEVEL POINTER WITHIN OWN          15520800  31.062.240
15521000                                 %      SCOPE (ACCORDING TO COMPILER)           15521000  31.062.240
15521200                                 % RUNCODE OR BADPTR IMPLIES COPYDESC;          15521200  31.062.240
15521400                                 % COPYDESC IMPLIES CANSEE                      15521400  31.062.240
15521500      , GLOBALFILEEDGE =[36:1]#  % GOT EDGE FROM JOB FOR GLOBAL FILE            15521500  32.123.458
15521600      , PARENTF        =[35:12]#                                                15521600  31.062.240
15521800      , SIBLINGF       =[23:12]#                                                15521800  31.062.240
15522000      , OFFSPRINGF     =[11:12]#                                                15522000  31.062.240
15522200    % FIELDS IN PIB[EXTERNALFAMILYLINK]                                         15522200  31.170.674
15522300      , EXTLINKAGELOCKEDF=[47:1]#  % LINKAGE MAY NOT BE ALTERED                 15522300  31.181.700
15522400      % PARENTF        =[35:12]# % PARENTS STACK NUMBER                         15522400  31.163.603
15522600      % SIBLINGF       =[35:12]# % BROTHERS TAG                                 15522600  31.163.603
15522800      % OFFSPRINGF     =[11:12]# % SONS TAG                                     15522800  31.163.603
15523200    % FIELDS IN PIB[HEADERACCESS]                                               15523200  35.013.388
15523400      , JOBFILEINDEXF  =[31:16]# % DISKFILEHEADERS INDEX OF JOBFILE             15523400  35.013.388
15523600      , CODEFILEHEADERINDEXF                                                    15523600  35.013.388
15523800                       =[15:16]# % DISKFILEHEADERS INDEX OF CODEFILE            15523800  35.013.388
15524400    % FIELDS IN PIB[JOBINFO]                                                    15524400  31.170.674
15524600      , JOBSTKNRF      =[47:SNSIZE]#                                            15524600  350591706
15524660      , IBSF           =[35:6]#                                                 15524660  350591706
15524680      , MYJOBFILEF     =[29:1]#                                                 15524680  350591706
15524700      , CLASSBIT       =[28:1]#                                                 15524700  350591706
15524720      , NOJOBSUMMARYIOBIT=[27:1]#                                               15524720  351152609
15524740     %, AVAILABLE      =[26:7]#    % SAVE 2 BITS FOR STKNRF ADJUSTMENT          15524740  351112511
15524800      , JOBCLASSF      =[19:10]#                                                15524800  31.062.240
15525200      , DECKGROUPNOF   =[ 9:10]#                                                15525200  31.062.240
15526000    % FIELDS IN PIB[OPTION]                                                     15526000  31.170.674
15526200      , LONGCLSF       =[0:1]#                                                  15526200  31.141.003
15526400      , FAULTCLSF      =[1:1]#                                                  15526400  31.062.240
15526600      , DSEDCLSF       =[2:1]#                                                  15526600  31.062.240
15526800      % CCLISTCLSF     =[3:1]#                                                  15526800  31.138.003
15527000      , BACKUPPRINTCLSF  =[4:1]#                                                15527000  31.062.240
15527200      , AUTORMCLSF     =[5:1]#                                                  15527200  31.062.240
15527400      , BDBASECLSF     =[6:1]#                                                  15527400  31.062.240
15527600      , BASECLSF       =[7:1]#       % NOTE:                                    15527600  31.062.240
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15527800      , ARRAYSCLSF        =[8:1]#       %   IF ADDING DUMP-CONTROL OPTIONS,          15527800  31.062.240
15528000      , CODECLSF          =[9:1]#       %   EMBELLISH THE DEFINE "DSOPTIONS"         15528000  31.062.240
15528200      , FILESCLSF         =[10:1]#      %   IN MIXREQUEST OF SETSTATUS.              15528200  31.062.240
15528400      , BACKUPPUNCHCLSF   =[11:1]#                                                   15528400  31.062.240
15528600      , NOSUMMARYF        =[12:1]#                                                   15528600  31.062.240
15528800      % HARDDUMPF         =[13:1]#                                                   15528800  31.138.003
15529000      , PRIVATETASKF      =[14:1]#                                                   15529000  31.062.240
15529200      , DBSDUMPF          =[15:1]#                                                   15529200  31.062.240
15529400      % PDSDUMPF          =[16:1]#    ******* AVAILABLE *********                    15529400  32.092.773
15529420      , IPCOVERRIDEF      =[17:1]#                                                   15529420  31.191.727
15529450      , SIBDUMPF          =[18:1]#                                                   15529450  31.185.740
15529500      , LIBRARYDUMPF      =[19:1]#                                                   15529500  31.185.740
15529550      , PRIVLIBDUMPF      =[20:1]#                                                   15529550  31.185.740
15529600    % FIELDS IN PIB[PATHCONTROL]                                                     15529600  31.170.674
15529800      , DESTCONTROLF         =[47:24]#  % VALIDITYBIT IS FOR THIS FIELD              15529800  31.062.240
15530000      ,   DESTMCSF           =[45:6]#                                                15530000  31.062.240
15530200      ,   DESTINATIONUNITF   =[39:16]#                                               15530200  31.062.240
15530400      ,     DESTISREMOTEF    =[39:1]#                                                15530400  31.062.240
15530600      ,     DESTUNITF        =[38:15]#                                               15530600  31.062.240
15530800      , ORGCONTROLF          =[23:24]#                                               15530800  31.062.240
15531000      ,   ORGWANTSF          =[23:2]#                                                15531000  31.062.240
15531200      ,     ORGWANTSSUMMARYF=[23:1]#                                                 15531200  31.062.240
15531400      ,     ORGWANTSMESSAGEF=[22:1]#                                                 15531400  31.062.240
15531600      ,   ORGMCSF            =[21:6]#                                                15531600  31.062.240
15531800      ,   ORIGINALUNITF      =[15:16]#                                               15531800  31.062.240
15532000      ,     ORGISREMOTEF     =[15:1]#                                                15532000  31.062.240
15532200      ,     ORGUNITF         =[14:15]#                                               15532200  31.062.240
15532400    % FIELDS IN PIB[REPLY]                                                           15532400  31.170.674
15532600      , REPATTNF             =[47:1]#   % TRUE IF 46:47 IS A MASK                    15532600  31.062.240
15532800      , REPINFOF             =[45:40]#  % INFO DEPENDING ON TYPE OF REPLY            15532800  31.062.240
15533000      ,    REPINFO1F         =[45:20]#  %    SUBFIELD 1                              15533000  31.062.240
15533200      ,    REPINFO2F         =[25:20]#  %    SUBFIELD 2                              15533200  31.062.240
15533400      , REPVALF              =[ 5:6]#   % REPLY NUMBER (0 - 46)                      15533400  31.062.240
15533600    % FIELDS IN PIB[SERIAL]                                                          15533600  31.170.674
15533800      , SERIALSTKNRF         =[47:SNSIZE]#                                           15533800  350591706
15534000      , JOBNRF               =[31:16]#                                               15534000  31.062.240
15534200      , TSKNRF               =[15:16]#                                               15534200  31.062.240
15534400    % FIELDS IN PIB[USAGE] % SET BEFORE INIT. OR FROM OWN STACK ONLY                 15534400  321781213
15534600      , STKMCSSTATUSF       =[47:8]#                                                 15534600  31.062.240
15534800      ,    STKISMCSF         =[47:1]#                                                15534800  31.062.240
15535000      ,    STKMCSNRF         =[46:7]#                                                15535000  31.062.240
15535200      , LIBPERMANENTF        =[39:1]#                                                15535200  34.017.440
15535300      , BNACOUNTF            =[38:6]#   % # BEGINHSUSE CALLS - ENDHSUSE CALLS        15535300  33.008.209
15535400      , SHARINGSPEC          =[32:4]#   % LIBRARIES:  SHARING SPECIFICATION          15535400  351022457
15535600      , WARNDIDDLEF          =[28:1]#   % REMOVE ON 3.6                              15535600  350762002
15535800      , INHIBSOFTINTSF       =[27:2]#   % NEXT TWO BITS:                             15535800  31.062.240
15536000      ,    GENDISABLEF       =[27:1]#   %   INTERRUPTS ARE DISABLED GENERALLY        15536000  31.062.240
15536200      ,    DOINGSOFTINTF     =[26:1]#   %   WE ARE PROCESSING SOFT INTERRUPT         15536200  31.062.240
15536400      , PBITSTATEF           =[25:2]#                                                15536400  31.062.240
15536500      , UNITSWARNEDF         =[23:1]#   % MCP STATUS WARNING (REMOVE ON 37)          15536500  350451294
15536520      , GETSTATUSWARNEDF     =[22:1]#   % GETSTATUS WARNING GIVEN (REMOVE 36)        15536520  350471330
15536600      , IORESULTWARNEDF      =[21:1]#   % DIRECTBUF.IORESULT FOR MLI SYSTEMS         15536600  350431234
15536800                                        % CHANGED WARNING GIVEN (REMOVE @ 36)        15536800  350431234
15537200      , NOMEMF               =[20:1]#                                                15537200  31.062.240
15537400      , DUMPINGF             =[19:1]#                                                15537400  31.062.240
15537600      , SORTTINGF            =[18:1]#                                                15537600  31.062.240
15537800      , UNITATTACHEDF        =[17:1]#                                                15537800  31.062.240
15538000      , LIBSTATEF            =[16:3]#   % LIBRARY STATE                              15538000  31.183.733
15538150      ,    LIBINITBYLINKER   = 1 #      %   INITIATED BY LIBRARY LINKER              15538150  31.183.733
15538200      ,    LIBINITBYUSER     = 2 #      %   NORMAL TASK STARTING TO FREEZE           15538200  31.183.733
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15538250        ,    LIBFROZEN       = 3 #       %   USABLE STATIC LIBRARY                   15538250  31.183.733
15538300        %    LIBTHAWING      = 4 #       %   UNLINKABLE BUT STILL IN USE             15538300  31.183.733
15538350        ,    LIBRESUMED      = 5 #       %   NO LONGER LINKED NOR LINKABLE           15538350  31.183.733
15538400        ,    LIBNEVERFROZE   = 6 #       %   INIT BY LINKER BUT NEVER FROZE          15538400  31.183.733
15538600        , NOHISTORYF         =[13:1]#                                                15538600  31.062.240
15538700        , SYSTEMLIBRARYF     =[12:1]#    % ALLOWED SYSTEM LIBRARY PRIVILEGES         15538700  321741167
15538800        , FREEZEOVERRIDEF    =[11:1]#    % OVERRIDE THE USERS FREEZE.                15538800  33.030.547
15539000        , DONTSTRETCHF       =[10:1]#    % DO NOT STRETCH THIS STACK                 15539000  32.148.991
15539100        , BLOCKSEARCHLOOPF   =[ 9:1]#    % GOTOSOLVER LOOPING ON BLOCKSEARCH         15539100  31.212.346
15539120        , SEGPTRWARNEDF      =[ 8:1]#    % FAULT(S) DUE TO UNINDEXED SEGMENTED       15539120  35.015.521
15539140                                         % POINTER ARGS TO STRING OPS; HAPPENS       15539140  35.015.521
15539160                                         % ON B7XXX WITH PRE 3.4 STRING CODE.        15539160  35.015.521
15539200        , WARNSECURITYF      =[ 7:1]#    % REMOVE ON 3.6                             15539200  350762002
15539250        , CURRENTASNF        =[ 6:6]#    % FOR MOVESTACK, CHANGED BY SELECTBOX       15539250  34.004.078
15539300        , ARP                =[ 0:1]#    % ASSOCIATION OF RETIRED PROCESSORS         15539300  32.072.627
15539400      % FIELDS IN PIB[SCHEDDATA] WHILE STATUS LEQ SELECTED                           15539400  31.170.674
15539500        , SCHEDULEQLINKF     =[47:SNSIZE]# % NEXT STACK IN SCHEDULE QUEUE            15539500  350591706
15539800        , SCHEDD2SIZEF       =[35:16]#    % LENGTH OF TASK STACK                     15539800  31.140.002
15540000        , SCHEDCOREF         =[19:20]#    % CORE ESTIMATE                            15540000  31.140.002
15540200      % FIELDS IN PIB[STATION]                                                       15540200  31.170.674
15540400        , TASKTANKF          =[33:2]#                                                15540400  31.062.240
15540600        , STATIONF           =[15:16]#                                               15540600  31.138.003
15540800      % FIELDS IN PIB[STOPPOINT]                                                     15540800  31.170.674
15541000        , FAULTNUMF          =[47:8]#    % FAULT REASON                              15541000  31.062.240
15541100        , FAULTHANDLEDF      =[39:1]#    % ON IF FAULT PROCEDURE HANDLED IT          15541100  33.042.678
15541200        % RCWGUTSF           =[35:36]                                                15541200  31.062.240
15541400      % FIELDS IN PIB[HISTORY]                                                       15541400  31.170.674
15541440        , NOFAULTOFHISF      =[47:1]#                                                15541440  321731114
15541460        , BITOFHISTORYF      =[46:1]#                                                15541460  321731114
15541480        , IGNOREDSEDF        =[45:1]#                                                15541480  321731114
15541500        , HISTINFOF          =[43:20]#                                               15541500  321731114
15541520        , HISTRCTF           =[23:24]#   % COMBINED REASON,CAUSE,TYPE FIELDS         15541520  321731114
15541540        , HISREASONF         =[23:8]#                                                15541540  321731114
15541560        , HISCAUSEF          =[15:8]#                                                15541560  321731114
15541600        , HISTYPEF           =[7:8]#                                                 15541600  31.062.240
15543000      % FIELDS IN PIB[TASKLIMIT]                                                     15543000  31.170.674
15543100        , TASKDECLARERF      =[47:SNSIZE]# % STACK DECLARING PIB                     15543100  35.026.736
15543110      % , UNUSED             =[35:8]#                                                15543110  34.035.841
15543120        , SWVALIDF           =[27:8]#    % VALIDITY BITS FOR SWITCHES                15543120  33.104.993
15543140        , SWITCHESF          =[19:8]#    % COBOL SWITCHES 1 TO 8                     15543140  33.104.993
15543145        % UNUSED             =[11:2]#                                                15543145  33.104.993
15543150        , JOBSUMMARYF        =[ 9:4]#    % CONTAINS JOBSUMMARY VALUE                 15543150  33.044.732
15543200        , TASKLIMVALIDF      =[ 5:1]#                                                15543200  31.062.240
15543400        , TASKLIMF           =[ 4:5]#                                                15543400  31.062.240
15543450      % FIELDS IN PIB[LIBINITIATOR], ONLY VALID BEFORE LIBRARY FREEZES               15543450  32.147.947
15543500        , LIBINITSTKNRF      =[47:SNSIZE]# % SN OF INITIATOR OF THIS LIBRARY         15543500  350591706
15543520        , LIBRARYUSERF       =[35:SNSIZE]# % SN OF USER OF THE LIBRARY.              15543520  35.026.736
15543540        , INBYCALLINGPROCF   =[4:1]#     % STACK IS IN A LIB BYCALLING PROC          15543540  351022457
15543550        , LIBACCESSTYPEF     =[3:4]#     % VALUE OF LIBACCESS PARAM IN TEMPLTE       15543550  32.147.947
15543600      % FIELDS IN PIB[TASKINFO] % SET BEFORE INIT. OR WITH PROCESSCHANGELOCK         15543600  321781213
15543800        , INUSEBYSYSTEMF     =[47:1]#    % TASK IS BEING STARTED OR RUNNING          15543800  321781213
15544000        , COMPILETYPEF       =[46:3]#    % SEE COMPILETYPE                           15544000  321781213
15544100        , PROGRAMLOCKEDF     =[43:1]#    % ODT <MIXNO> LP                            15544100  321781213
15544200        , QPRIORLIMTF        =[42:7]#    % PRIORITY LIMIT FROM QUEUE                 15544200  321781213
15544250        , ASN_WARNING_GIVEN  =[35:1]#    % 1 IF THE WARNING WAS GIVEN ALREADY        15544250  351612827
15544300        % AVAILABLE          =[34:1]#                                                15544300  351612827
15544400        , TASKVISIBLEF       =[33:1]#    % TO BE INITIATED AS VISIBLE TASK           15544400  321781213
15544500        , RUNDBSF            =[32:1]#    % DBS INITIATED BY DMSOPEN                  15544500  321781213
15544550        , CRITICALSTACKF     =[31:1]#    % B79 APS ALLOWED IF LAST CPM DIES          15544550  35.026.762
15544700        , OLAYFILELINKF      =[19:SNSIZE]#% STKNR OF SHARER OF OLAYFILE, OR 0        15544700  35.026.736
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15544720                                  % THE FIELD OLAYFILELINKF IS SEARCHED     15544720  34.016.398
15544730                                  % BY OLAYSCOUT UNDER OLAYINFOLOCK         15544730  34.016.398
15544740                                  % ( A BUZZ LOCK).  THEREFORE              15544740  34.016.398
15544750                                  % BOJ & EOJ MUST OWN OLAYINFOLOCK         15544750  34.016.398
15544760                                  % AND PROCESSCHANGELOCK WHEN THEY         15544760  34.016.398
15544770                                  % CHANGE THIS FIELD.                      15544770  34.016.398
15544800     %, AVAILABLE          =[7:8]#                                          15544800  35.013.388
15545000    % PIB[TASKPARAMS] IS USED VARIOUSLY ACCORDING TO THE PARAMETERS BEING  15545000  31.170.674
15545200    %   SPECIFIED FOR THE TASK, THE MEANS OF THEIR SPECIFICATION, AND THE  15545200  31.071.002
15545400    %   STAGES OF INITIALIZATION OF THE TASK:                              15545400  31.071.002
15545600    %     1: A ZERO OPERAND MEANS THERE ARE NO PARAMETERS.                 15545600  31.071.002
15545800    %     2: AN ORDINARY TASK INITIATION VIA DELIVERY/INITIATEUSERTASK     15545800  31.071.002
15546000    %        NOTES THE DISPLACEMENT INTO THE PARENT STACK AND THE NUMBER OF 15546000 31.071.002
15546200    %        WORDS OF PARAMETERS IN PARAMDISP AND PARAMWORDS OF AN OPERAND. 15546200 31.071.002
15546400    %        SIMILAR ACTION IS TAKEN BY FORKCONTROLCARD FOR A ZIP.         15546400  31.071.002
15546460    %     3: WITH A KLUDGE INSTALLED IN MARK 31.1, INITIATEUSERTASK NOTICES 15546460 35.003.072
15546500    %        ARRAY PARAMETERS FROM WFL OR FROM MCS TO SESSION OR TO FOREIGN 15546500 35.003.072
15546520    %        TASK AND BUILDS AN (MCP) OVERLAYABLE ARRAY IN TASKPARAMS TO   15546520  35.003.072
15546530    %        PASS THE ARRAY BY VALUE.  UNRAVEL RETURNS LENGTH AND TEXT     15546530  35.003.072
15546540    %        OF THE ARRAY PARAMETER TO HOST SERVICES VIA AD-HOC ATTRIBUTES. 15546540 31.191.776
15546560    %     4: SINCE MARK 31.1, THERE HAS BEEN A FIELD DEFINE (PARAMDESCLINK) 15546560 35.003.072
15546570    %        AND SOME SKELETAL CODE IN INITIATEUSERTASK FOR AN UNIMPLEMENTED 15546570 35.003.072
15546580    %        FEATURE:                                                      15546580  35.003.072
15546600    %        IF THE USER SPECIFIES PARAMETERS VIA MUTATE, TASKPARAMS BECOMES 15546600 35.003.072
15546800    %        A MOM FOR AN (MCP) OVERLAYABLE ARRAY HOLDING HIS PARAMETER    15546800  31.071.002
15547000    %        VALUES AND A BINDINFO-FORMAT DESCRIPTION OF HIS PARAMETERS.   15547000  31.071.002
15547200    %        INITIATEUSERTASK AND/OR EXTERNALREFERENCE OF DOCTOR WILL CHECK 15547200 31.071.002
15547400    %        THAT THE SUPPLIED PARAMETERS FIT THE CALLED PROCEDURE.        15547400  31.071.002
15547600    %     5: IF A FORK INVOLVES PARAMETERS, THEY ARE COPIED INTO THE GETAREA 15547600 35.003.072
15547800    %        MESSAGE ENQUEUED FOR ANABOLISM, WHO THEN USES THE SAME MEMORY 15547800  31.071.002
15548000    %        TO BUILD A PARAMETER ARRAY WITH MOM AT TASKPARAMS.            15548000  31.071.002
15548200    %     6: IF EXTERNALREFERENCE FINDS PARAMETERS ON THE STACK (STATE 2)  15548200  35.003.072
15548250    %        AND THE PARAMETERS MISMATCH THE EXTERNAL PROCEDURE BUT CAN BE 15548250  35.003.072
15548300    %        COERCED, A PARAMETER ARRAY (GETAREA) IS BUILT WITH COERCION   15548300  35.003.072
15548350    %        INSTRUCTIONS IN THE PARAMETER SLOTS.  THIS CASE IS DISTINGISHED 15548350 35.003.072
15548400    %        FROM CASES 3-5 BY RETAINING NON-ZERO PARAMDISP IN PARAMINFO.  15548400  35.003.072
15548450    %        (IF COERCEABLE MISMATCH IS FOUND FROM STATE 3 OR 4, THE       15548450  35.003.072
15548500    %        EXISTING TASKPARAMS ARRAY IS ADJUSTED; NO NEW STATE ARISES.)  15548500  35.003.072
15548550    %     7: THE FOLLOWING ACTIONS ARE TAKEN BY THE FIRST PART OF INITIATE 15548550  35.003.072
15548600    %        (WHEN A STACK NUMBER HAS BEEN OBTAINED):  IF TASKPARAMS       15548600  35.003.072
15548650    %        CONTAINS A NON-ZERO PARAMDISP (STATE 2), TASKPARAMS IS CHANGED 15548650 35.003.072
15548700    %        TO AN ARRAY (GETAREA) AND THE PARAMETERS ARE COPIED INTO IT   15548700  35.003.072
15548750    %        FROM THE PARENT STACK.  IF TASKPARAMS IS AN ARRAY AND THE     15548750  35.003.072
15548800    %        PARAMINFO WORD HAS NON-ZERO PARAMDISP (STATE 6), THE PARAMETERS 15548800 35.003.072
15548850    %        ARE COPIED FROM THE STACK INTO THE ARRAY, WITH ANY REQUIRED   15548850  35.003.072
15548900    %        ADJUSTMENTS.                                                  15548900  35.003.072
15548950    %        IF THERE ARE COPY-DESCRIPTOR PARAMETERS IN THE PARAMETER ARRAY, 15548950 35.003.072
15549000    %        A COPY OF THE TASKPARAMS DESCRIPTOR IS PUT IN THE NEW         15549000  35.003.072
15549050    %        STACKVECTOR SLOT FOR SEARCHING.                               15549050  35.003.072
15549100    %        FOR A SWAPJOB, AN APPENDIX TO THE ARRAY RETAINS THE OWNER STACK 15549100 35.003.072
15549150    %        FOR EACH COPY DESCRIPTOR OR PSEUDOSTACK SIRW.                 15549150  35.003.072
15549400    %     8: AFTER THE SECOND PART OF INITIATE HAS ACQUIRED STACK SPACE, THE 15549400 35.003.072
15549600    %        APPROPRIATE WORDS ARE COPIED INTO THE NEW STACK BEING BUILT.  15549600  31.071.002
15549800    %        UNLESS THERE ARE ARRAYS BY VALUE, THE PARAMETER ARRAY IS      15549800  31.071.002
15550000    %        DISCARDED AND PARAMINFO SAVED IN TASKPARAMS (FOR STATE 10).   15550000  35.003.072
15550200    %        IF ANY ARRAY IS BEING PASSED BY VALUE, AN EXTRA BLOCK IS PUT  15550200  31.071.002
15550400    %        INTO THE NEW STACK BETWEEN THE USER OUTER BLOCK AND THAT OF   15550400  31.071.002
15550600    %        EOJ, TO HOLD THE MOM(S).                                      15550600  31.071.002
15550800    %     9: IF THERE IS STILL AN ARRAY AT BOJ TIME, NORMALBOJ SETS UP MOM 15550800  35.003.072
15551000    %        DESCRIPTORS FOR ANY ARRAYS BEING PASSED BY VALUE AND COPIES   15551000  31.071.002
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15551200    %        THEIR CONTENTS FROM THE TASKPARAMS ARRAY.  THE PARAMETER ARRAY        15551200  31.071.002
15551400    %        IS THEN DISCARDED AND PARAMINFO SAVED IN TASKPARAMS.                  15551400  35.003.072
15551600    %    10: BY THE TIME THE USER PROGRAM IS ENTERED, TASKPARAMS IS AN             15551600  35.003.072
15551800    %        OPERAND CONTAINING PARAMWORDS AND PARAMBLOCK.                         15551800  31.071.002
15552000    % INDICES INTO ARRAYSPIB[SN,TASKPARAMS,*]                                      15552000  35.003.072
15552200      % TOSCW             = 0#       % DUMMY TOSCWD FOR SEARCHING AS STACK         15552200  31.071.002
15552400      , PARAMINFOX        = 1#       % PARAMBLOCK/PARAMWORDS                       15552400  31.071.002
15552600      , PARAMLINKX        = 2#       % PARAMDESCLINK/PARAMLINK                     15552600  31.071.002
15552800      , PARAMFIXEDL       = 3#       % LINKS POINT HERE OR LATER                   15552800  31.071.002
15553000    % FIELDS IN SPIB[SN,TASKPARAMS] OR ARRAYSPIB[SN,TASKPARAMS,PARAMINFOX]         15553000  35.003.072
15553200      , PARAMDISP         =[47:16]# % DISPLACEMENT IN PARENT STK OF 1ST PARAM      15553200  31.071.002
15553400      , PARAMBLOCK        =[31:16]# % WIDTH OF EXTRA MOM-PARAMETER BLOCK           15553400  31.071.002
15553600      , PARAMWORDS        =[15:16]# % NUMBER OF WORDS OF PARAMETERS                15553600  31.071.002
15553800    % FIELDS IN ARRAYSPIB[SN,TASKPARAMS,PARAMLINKX]                                15553800  35.003.072
15554000      , PARAMDESCLINK     =[31:16]# % INDEX OF PARAMETER "BINDINFO"                15554000  31.071.002
15554200      , PARAMLINK         =[15:16]# % INDEX OF 1ST PARAMETER IMAGE                 15554200  31.071.002
15554400      % PARAMLINK POINTS TO A STACK IMAGE OF PARAMBLOCK+PARAMWORDS WORDS.          15554400  31.071.002
15554600      % IF PARAMBLOCK IS NON-0, THE FIRST PARAMBLOCK-3 WORDS OF THE IMAGE          15554600  31.071.002
15554800      % ARE MOM SPECIFIERS, FOLLOWED BY PLACEHOLDERS FOR AN SCW, MSCW AND          15554800  31.071.002
15555000      % RCW FOR THE MOM BLOCK.  THE PARAMETER IMAGE FOLLOWS THE BLOCK IMAGE.       15555000  31.071.002
15555200      % THE PARAMETER SLOT FOR ANY ARRAY-BY-VALUE IS A TAGBLASTED COPY             15555200  32.054.458
15555400      % DESCRIPTOR, WHICH EVENTUALLY BECOMES A COPY OF THE LOCAL MOM.              15555400  32.054.458
15555600      % WHEN PARAMETERS ARE ORIGINATED BY MUTATE, PARAMDESCLINK POINTS TO          15555600  31.071.002
15555800      % A BINDINFO-FORMAT PARAMETER DESCRIPTION FOR THE PARAMETERS PRESENT.        15555800  31.071.002
15556000    % FIELDS IN A MOM SPECIFIER IN ARRAYSPIB[SN,TASKPARAMS,*]                      15556000  35.003.072
15556200      , PCONLINK          =[47:16]# % INDEX OF 1ST WORD OF ARRAY VALUE             15556200  31.071.002
15556400      , PCONLEN           =[31:16]# % LENGTH OF ARRAY VALUE (WORDS)                15556400  31.071.002
15556600      , PCOPYLINK         =[15:16]# % RELATIVE DISPLACEMENT TO COPY PARAMETER      15556600  35.003.072
15556620      % COPY SLOT HAS A TAG-BLASTED COPY DESCRIPTOR WHOSE ADDRESSF IS THE          15556620  35.003.072
15556640      % INDEX INTO TASKPARAMS OF THE CORRESPONDING MOM SPECIFIER.                  15556640  35.003.072
15556660    % FIELDS IN A COERCION SPECIFIER IN ARRAYSPIB[SN,TASKPARAMS,*]                 15556660  35.003.072
15556680      , PCOERCIONTYPE     =[45: 2]# % COERCION ACTION REQUIRED:                    15556680  35.003.072
15556700      ,   PCOERCECONST    =       0# %   COPY THE COERCION SPECIFIER               15556700  35.003.072
15556720      ,   PCOERCECOPY     =       1# %   COPY THE WORD AT PCOERCIONDISP            15556720  35.003.072
15556740      , PCOERCIONSZ       =[42: 3]# % SZF VALUE FOR COERCED DESCRIPTOR             15556740  35.003.072
15556760      , PCOERCIONBITS     =[39: 8]# % BITSPERSZ FOR COERCED DESCRIPTOR, OR 0       15556760  35.003.072
15556780      , PCOERCIONDISP     =[15:16]# % PARENT-STACK DISPLACEMENT OF PARAMETER       15556780  35.003.072
15556800    % FIELDS IN PIB[SURROGATEINFO]                                                 15556800  31.170.674
15556900      , SURROGATESTKNRF   =[47:SNSIZE]# % STACK LOCKING THE TASK                   15556900  350591706
15557000      , SURROGATEF        =[35:1]#  % TASK ORIGINATED AT ANOTHER HOST              15557000  31.181.700
15557200      , RUNNINGEXTERNALF  =[34:1]#  % TASK RUNNING AT ANOTHER HOST                 15557200  31.181.700
15557300      , TASKLOCKEDF       =[33:1]#  % HOSTSERVICES VS MCP LOCKOUT SWITCH           15557300  32.055.474
15557350      , EXTERNALSTATUSF   =[32:8]#  % STATUS OF AN EXTERNAL TASK                   15557350  32.077.694
15557600      , SURROGATEINDEXF   =[11:SNSIZE]# % IF RUNNINGEXTERNALF, THIS IS THE         15557600  350591706
15558000                                    % INDEX INTO THE EXTERNAL PIB VECTOR.          15558000  32.046.351
15558400    % FIELDS IN WORD 0 OF ITINERARY                                                15558400  32.044.304
15558450      , ITINERARYINHERITEDF    =[47:01]# % TRUE IF ITINERARY WAS INHERITED         15558450  321741144
15558500      , ITINERARYLENGTHF       =[15:16]# % LENGTH (IN BYTES) OF ITINERARY          15558500  321741144
15558506    % FIELDS IN PIB[USERCODEPRIV]                                                  15558506  32.055.474
15558508      , UCODEANDMCSF         =[1:2]#                                               15558508  32.055.474
15558510      ,    USERCODEPRIVF     =[0:1]# % THIS USERCODE IS PRIVILEGED                 15558510  32.077.694
15558512      ,    MCSABSTAININGF    =[1:1]# % MCS ABSTAINS FROM MCS PRIVILEGE             15558512  32.077.694
15558514      , HOSTSERVICESRINGBIT =[2:1]# % THIS BIT PROVIDES THE EQUIVALENT OF          15558514  340631689
15558516                                     % MCSABSTAININGF FOR HOST SERVICES. THE       15558516  32.055.474
15558518                                     % BIT IS DEFINED AS FOLLOWS:                  15558518  32.055.474
15558520                                     %   0 = THIS STACK MAY GET SPECIAL            15558520  32.055.474
15558522                                     %       PRIVILEGES WHILE IT IS                15558522  340631689
15558524                                     %       RUNNING CODE FROM THE HOST            15558524  32.055.474
15558526                                     %       SERVICES LIBRARY.                     15558526  32.055.474
15558528                                     %   1 = THIS STACK CAN NOT GET THE            15558528  32.055.474
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15558530                              %       SPECIAL PRIVILEGES ASSOCIATED      15558530  340631689
15558532                              %       WITH RUNNING HOSTSERVICES CODE.    15558532  32.055.474
15558534                              % THIS BIT'S DEFAULT IS 0.  IT IS NOT      15558534  340631689
15558536                              % EXPLICITLY SET UP ANYWHERE; WE ASSUME    15558536  340631689
15558538                              % THAT UNLESS STATED OTHERWISE, ANYONE     15558538  340631689
15558540                              % IS ALLOWED TO PASS "IF                   15558540  32.055.474
15558542                              % HOSTSERVICESCALLING" TESTS IN THE MCP.   15558542  32.055.474
15558544      , HSSTATUSTURNEDOFF  =[3:1]# % FLAG TO AVOID SENDING STATUS MESSAGES 15558544  32.077.694
15558546                              % WHILE RUNNING HOSTSERVICES CODE,         15558546  32.077.694
15558548                              % SET WHILE ON TOP ON USERS STACK          15558548  32.077.694
15558549      , CHARGEREQF         =[4:1]#                                       15558549  30.7X.330
15558552      , KEYEDIOCALLINGF    =[5:1]# % WE ARE RUNNING ON TOP OF KEYEDIO.   15558552  33.101.858
15558554      , INHERITMCSSTATUSF  =[6:1]# % TRUE STOPS THIS TASK FROM INHERITING 15558554  331051031
15558556                              % "MCSNESS" FROM IT'S PARENT WHEN          15558556  331051031
15558558                              % INITIATED.                               15558558  331051031
15558560      , USEDEFLTF          =[7:1]# % USEDEFAULTCHARGE BIT SET FOR USER.  15558560  340621631
```

FILE INFORMATION BLOCK

APPENDIX F

```
53621900         %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%         53621900  .
53622000         %    FIXED PART OF FILE INFORMATION BLOCK                          %         53622000  .
53622100         %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%         53622100  .
53622200          SELECTOR        = FIBW[0]#                                                  53622200  31.161.570
53622300         ,FIBMSCW         = FIBW[1]#          % (1,0)                                 53622300  .
53622400         ,FIBLOCK         = FIB[2]#           % (1,1)                                 53622400  .
53622500         ,RECORDSTATUS    = FIB[3]#           % (1,2)                                 53622500  .
53622600         ,FILESTATUS      = FIB[4]#           % (1,3)                                 53622600  .
53622650         ,FILE_STATUS(F)  = F[4]#             % (1,3)                                 53622650  350411171
53622700         ,FILESTATUSW     = FIBW[4]#          % (1,3)    (FOR NOTOPEN DEF)            53622700  21.000.049
53622800         ,TANKDATA1       = FIB[5]#           % (1,4)                                 53622800  .
53622900         ,TANKDATA2       = FIB[6]#           % (1,5)                                 53622900  .
53623000         ,DISKBLOCK       = FIB[7]#           % (1,6)                                 53623000  26.010.131
53623100         ,PAGESPEC        = FIB[8]#           % (1,7)                                 53623100  26.010.131
53623200         ,IOINFO          = FIB[9]#           % (1,8)                                 53623200  .
53623300         ,LBLEQTN         = FIBW[10]#         % (1,9)                                 53623300  .
53623400         ,IOADESC         = FIBW[11]#         % (1,A)                                 53623400  .
53623500         ,BUFDESC         = FIBW[12]#         % (1,B)                                 53623500  .
53623600         ,SBUFDESC        = FIBW[13]#         % (1,C)                                 53623600  24.000.232
53623700         ,FMTBUFFDESC     = FIBW[14]#         % (1,D)                                 53623700  23.001.076
53623800         ,FMTLOCK         = FIB[15]#          % (1,E)                                 53623800  26.010.131
53623900         ,FILIOTIME       = FIB[16]#          % (1,F)                                 53623900  .
53624000         ,PWRITES         = FIBW[17]#         % (1,10)                                53624000  .
53624100         ,PREADS          = FIBW[18]#         % (1,11)                                53624100  .
53624200         ,PWRITEN         = FIBW[19]#         % (1,12)                                53624200  .
53624300         ,PREADN          = FIBW[20]#         % (1,13)                                53624300  .
53624400         ,PSEEK           = FIBW[21]#         % (1,14)                                53624400  .
53624500         ,PINITIATE       = FIBW[22]#         % (1,15)                                53624500  35.015.440
53624600         ,PSEARCH         = FIBW[23]#         % (1,16)                                53624600  .
53624700         ,PLOCKER         = FIBW[24]#         % (1,17)                                53624700  .
53624800         ,PRELEASE        = FIBW[25]#         % (1,18)                                53624800  .
53624900         ,PMOVEOUT        = FIBW[26]#         % (1,19)                                53624900  26.010.131
53625000         ,PMOVEIN         = FIBW[27]#         % (1,1A)                                53625000  26.010.131
53625100         ,PWAIT           = FIBW[28]#         % (1,1B)                                53625100  26.010.131
53625200         ,PFLOAT          = FIBW[29]#         % (1,1C)                                53625200  26.010.131
53625300         ,PCWCONTROL      = FIB[30]#          % (1,1D)                                53625300  .
53625400         ,RECOFF          = FIB[31]#          % (1,1E)                                53625400  321771198
53625500         ,RECORDCOUNT     = FIB[32]#          % (1,1F)                                53625500  .
53625600         ,BLOCKCOUNT      = FIB[33]#          % (1,20)                                53625600  .
53625700         ,LOWER           = FIB[34]#          % (1,21)                                53625700  .
53625800         ,UPPER           = FIB[35]#          % (1,22)                                53625800  .
53625900         ,LOCALMINREC     = FIB[36]#          % (1,23)                                53625900  26.010.131
53626000         ,LOCALMAXREC     = FIB[37]#          % (1,24)                                53626000  22.000.020
53626100         ,FIBLOCAL1       = FIB[38]#          % (1,25)                                53626100  22.000.020
53626200         ,FIBLOCAL2       = FIB[39]#          % (1,26)                                53626200  22.000.020
53626300         ,FIBLOCAL3       = FIBW[40]#         % (1,27)                                53626300  22.000.020
53626400         ,DISKHEADER      = FIBW[41]#         % (1,28)                                53626400  .
53626500         ,FIBEOF          = FIB[42]#          % (1,29)                                53626500  .
53626550         ,FIB_EOF(FIB)    = FIB[42]#          % (1,29)                                53626550  350411171
53626600         ,ACTNUM          = FIB[43]#          % (1,2A)                                53626600  26.010.131
53626700         ,SBLOCKING       = FIB[44]#          % (1,2B)                                53626700  .
53626800         ,SIOINFO         = FIB[45]#          % (1,2C)                                53626800  .
53626900         ,SOFFSET         = FIB[46]#          % (1,2D)                                53626900  26.010.131
53627000         ,CURRENTBLOCK    = FIB[47]#          % (1,2E)                                53627000  26.010.131
53627100         ,FILEEVENT1      = FIBW[48]#         % (1,2F)                                53627100  26.010.131
53627200         ,FILEEVENT2      = FIBW[49]#         % (1,30)                                53627200  26.010.131
53627300         ,OUTPUTTRANS     = FIBW[50]#         % (1,31)                                53627300  26.010.131
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```
53627400        ,INPUTTRANS     = FIBW[51]#              % (1,32)                             53627400  26.010.131
53627500        ,USEROUTINES    = FIBW[52]#              % (1,33)                             53627500  26.010.131
53627600        ,FLOPPYMISC     = FIB[53]#               % (1,34)                             53627600  31.018.136
53627700        ,FIBLOCKSNR     = FIB[54]#               % (1,35)  FIBLOCK OWNERS SNR         53627700  31.018.136
53627800        ,IOCB           = FIBW[55]#              % (1,36)  IOCB DESCRIPTOR            53627800  31.036.239
53627850        ,LOGICALCOUNT   = FIB[56]#               % (1,37)  ACTUAL I/O COUNT           53627850  31.192.787
53627880        ,LIBRARYINFO    = FIB[57]#               % (1,38)  INDXIO & PORTS             53627880  32.073.641
53627885        ,PHYSICALIOCOUNT= FIB[58]#               % (1,39)  PHYSICAL I/O COUNT         53627885  33.003.091
53627888        ,LOGINTERVALSTARTTIME=FIB[59]#           % (1,3A)  COUNTER FOR LOGINT         53627888  33.026.464
53627890        ,SELFDESC       = FIBW[60]#              % (1,3B)  SELF POINTER               53627890  33.026.464
53627892        ,BUFLINKS       = FIB[61]#               % (1,3C)  BUF LINKAGE INFO           53627892  35.009.306
53627894        ,IOMOM          = FIBW[62]#              % (1,3D)  MOM FOR IOAREA             53627894  35.009.306
53627896        ,SIOMOM         = FIBW[63]#              % (1,3E)  MOM FOR SIOAREA            53627896  35.009.306
53627898        ,UNITNUMBERS    = FIB[64]#               % (1,3F)  SIO/IO UNITNUMBERS         53627898  35.028.840
53627900        ,INQ_LIST_DESC  = FIBW[65]#              % (1,40)  OLD INQ LIST               53627900  350721873
53627920        ,INQ_LIST_ARRAY = FIB2W[65,*]#           % (1,40)                             53627920  350721873
53627930        ,FABPLACE       = 66 #                                                        53627930  351012405
53627940        ,FAB_DESC       = FIBW[66] #             % (1,41)  FILE ATTRIBUTES            53627940  351012405
53627950         %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%         53627950  .
53628000         %    LABEL-EQUATION BLOCK (LEB)                                     %         53628000  .
53628100         %         SAME FORMAT ALSO USED IN LABEL TABLE AND FPB              %         53628100  .
53628200         %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%         53628200  .
53628300              % FIXED PART LEB                                                        53628300  .
53628400        ,LEBC          = LEB[0]#              % BASIC DATA: SIZE,KIND ...             53628400  35.006.200
53628500        ,LEBO(LEB)     = LEB[0]#                                                      53628500  35.006.200
53628600        ,GEN1          = GEN_1(LEB)#          % REEL, CYCLE, VERSION                  53628600  35.023.628
53628650        ,GEN_1(LEB)    = LEB[1]#                                                      53628650  35.023.628
53628700        ,GEN2          = GEN_2(LEB)#          % DATE, SAVE FACTOR                     53628700  350411173
53628750        ,GEN_2(LEB)    = LEB[2]#                                                      53628750  350411173
53628800        ,DSKS          = LEB[3]#              % DISK INFO AND MYUSE,OTHERUSES         53628800  35.006.200
53628900        ,OPENTIME      = LEB[4]#              % TIME FILE OPEN                        53628900  35.006.200
53629000        ,LEBDATA2      = LEB[5]#              % ORIGINAL TANKDATA2.                   53629000  35.006.200
53629100        ,ATTVALUE      = LEB[6]#                                                      53629100  35.006.200
53629150        ,DISKMISCINX   = 7#                                                           53629150  321761190
53629200        ,DISKMISC      = LEB[DISKMISCINX]#                                            53629200  35.006.200
53629400        ,TANKDATA3     = LEB[8]#                                                      53629400  35.006.200
53629500        ,LABELATT      = LEB[9]#                                                      53629500  35.006.200
53629550        ,LABATT(LEB)   = LEB[9]#                                                      53629550  35.006.200
53629600        ,FILEACCESS    = LEB[10]#                                                     53629600  35.006.200
53629650        ,FILEACC(LEB)  = LEB[10]#                                                     53629650  35.006.200
53629700        ,FIRSTSN       = LEB[11]#                                                     53629700  35.006.200
53629750        ,FOREIGNINFO   = LEB[12]#                                                     53629750  35.006.200
53629780        ,FAILUREREASON = LEB[13]#                                                     53629780  32.122.892
53629790        ,LEBMISC    = LEB[14]#                                                        53629790  32.142.970
53629818        ,LEBVALINX = 15#,            % WORD OFFSET FROM THE BASE OF A LEB             53629818  340511164
53629820                                     % WHERE THE ATTRIBUTE VALIDITY BITS              53629820  340511164
53629822                                     % ARE LOCATED.  THE ATTRIBUTE VALIDITY           53629822  340511164
53629824                                     % BITS OCCUPY WORDS 15 - 20 OF A LEB.            53629824  340511164
53629826                                                                                      53629826  340511164
53629828         LEBVALIDITY(A) =                                                             53629828  340511164
53629830             BOOLEAN(LEB[LEBVALINX + (A) DIV BITS_PER_WORD].                          53629830  340511164
53629832                     [((BITS_PER_WORD - 1) - ((A) MOD BITS_PER_WORD)):1])#,           53629832  340511164
53629834                                     % SELECTS THE ATTRIBUTE VALIDITY BIT             53629834  340511164
53629836                                     % FROM THE LEB_VALIDITY_MASK ARRAY               53629836  340511164
53629838                                     % WHICH CORRESPONDS TO THE ATTRIBUTE             53629838  340511164
53629840                                     % IDENTIFIED BY THE ATTRIBUTE NUMBER             53629840  340511164
53629842                                     % A.  BIT 47 OF WORD ZERO IS THE                 53629842  340511164
53629844                                     % VALIDITY BIT FOR FILE ATTRIBUTE 0,             53629844  340511164
53629846                                     % BIT 0 OF WORD ZERO IS THE VALIDITY             53629846  340511164
53629848                                     % BIT FOR FILE ATTRIBUTE 47.                     53629848  340511164
```

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53629850                                                                                    53629850  340511164
53629852       LEBVALIDITYLENGTH = BITSTOWORDS(256)#                                        53629852  340511164
53629854                                    % SIZE IN WORDS OF THE SECTION OF A LEB         53629854  340511164
53629856                                    % USED TO HOLD THE FILE ATTRIBUTE               53629856  340511164
53629858                                    % VALIDITY BITS.  AT LEAST 256 BITS             53629858  340511164
53629860                                    % ARE NEEDED TO HAVE A VALIDITY BIT             53629860  340511164
53629862                                    % FOR EVERY POSSIBLE FILE ATTRIBUTE             53629862  340511164
53629864                                    % NUMBER.                                       53629864  340511164
53629866       ,LEBVAL    = LEB[LEBVALINX]#        % FOR ATTRIBUTE VALIDITY BITS            53629866  321761190
53629867       ,TIMELIMIT = LEB[21]#        % TIMELIMIT ATTRIBUTE FOR REMOTE FILES.         53629867  351042479
53629868       %    NEXT AVAILABLE INDEX = 22                                               53629868  351042479
53629870       ,FIXEDLEBSZ= 22 #                   % CAN'T BE > 31 (SEE FXD)                53629870  351042479
53629874       ,VARIABLELEBSZ(TITLESZ) =           % ESTIMATE FOR LEB ALLOCATION            53629874  35.028.845
53629876                        % IF TITLE SIZE IS UNKNOWN, PASS 0 TO GET DEFAULT           53629876  35.028.845
53629878                        (                                                           53629878  35.028.845
53629880                          5             % FOR FAMILY NAME (20 CHAR)                 53629880  350341009
53629882                        + 2             % FOR KINDLIST    ( 1 WORD)                 53629882  35.028.845
53629884                        + 5             % FOR INTNAME     (20 CHAR)                 53629884  350341009
53629886                        + MAX(TITLESZ,8)% FOR TITLE       (44 CHAR MIN)             53629886  35.028.845
53629890                        ) #                                                         53629890  35.027.792
53629900             % LABEL TABLE                                                          53629900  .
53630600       ,PBRECORDCOUNT  = 298 #             % NUMBER OF RECORDS IN THIS BLOCK        53630600  31.040.271
53630700       ,PBNEXTRECORD   = 299 #             % RECORD NUMBER OF THE NEXT              53630700  31.040.271
53630800                                           %   RECORD IN THIS BLOCK                 53630800  31.040.271
53630900             %    DO NOT USE BIT 42 (LEBSB) BECAUSE OF 0-LENGTH FIELD               53630900  321761190
53630950       ,NULL_TYPE   =  0#                                                           53630950  35.028.834
53631000       ,FRSTPNTR    =  1#                  % FIRST POINTER TYPE.                    53631000  35.015.442
53631100       ,INTNAME     =  1#                                                           53631100  35.015.442
53631200       ,KINDLIST    =  2#                                                           53631200  35.015.442
53631300       ,FRMS        =  3#                                                           53631300  35.015.442
53631400       ,SECGUARD    =  4#                                                           53631400  35.015.442
53631500       ,NAMEDPF     =  5#                  % NAMED PACK FILE.                       53631500  35.015.442
53631600       ,SERIALNO    =  6#                                                           53631600  35.015.442
53632000       ,PRINTERCTL  =  7#                  % FILENAME OF NIP CONTROL FILE           53632000  35.015.442
53632020       ,PRINTERCTL2 =  8#                  % ACTUAL NAME OF OPENED CONTROL          53632020  35.015.442
53632040                                           %   FILE (USED BY BACKUPLABELS)          53632040  35.015.442
53632060       ,EIOLONGSTAT =  9#                  % EIO LONG STATUS (UINFO ENTRIES)        53632060  35.015.442
53632080       % AVAILABLE  = 10                                                            53632080  35.015.442
53632100       ,PSEUDONAME  = 11#                  % NAME CHECKPOINT CALLED IT.             53632100  35.015.442
53632200       ,PSEUDOFAM   = 12#                  % FAMILYNAME AT CHECKPOINT TIME          53632200  35.015.442
53632300       % AVAILABLE  = 13                                                            53632300  35.015.442
53632400       % AVAILABLE  = 14                                                            53632400  35.015.442
53632500       ,HOSTNAEM    = 15#                  % HOSTNAME (FILE ON ANOTHER HOST)        53632500  35.015.442
53632600       ,ISAMKEYS    = 16#                  % INDEXED IO KEYS                        53632600  35.015.442
53632800       ,TITEL       = 17#                  % SPECIAL.  ALSO MAKE SURE               53632800  35.015.442
53632820                                           % OPTMASK CAN FIT IN THE WORD            53632820  321761190
53632840                                           % OPTMASK IS IN IF THIS NUMBER IS        53632840  321761190
53632860                                           % CHANGED.                               53632860  321761190
53632900       ,LEBSB      = 42#                   % STARTING BIT OF OPTMASK                53632900  321761190
53633000       ,LEEB(FLD) = LEB[LEBC.FXD+ONES(LEBC.[LEBSB:FLD])]#                           53633000  .
53633050       ,LEEB1(LEB,FLD) = LEB[LEBO(LEB).FXD + ONES(LEBO(LEB).[LEBSB:FLD])] #         53633050  35.015.442
53633100       ,LEBB(FLD) = BOOLEAN(LEBC.[LEBSB-FLD:1])#                                    53633100  .
53633150       ,LEBB1(LEB,FLD) = BOOLEAN(LEBO(LEB).[LEBSB-FLD:1])#                          53633150  35.028.834
53633200       ,LEBPTR8(FLD) = POINTER(LEB[LEEB(FLD)],8)#                                   53633200  31.092.398
53633250       ,LEBPTR(LEB, FLD) = POINTER(LEB[LEEB1(LEB, FLD)], 8) #                       53633250  350411173
53633300       ,FIDPTR(A)    = POINTER(A[A[0].FXD+ONES(A[0].OPTMASK)],8)#                   53633300  31.092.398
53633400       ,FORMSPTR(A)  = POINTER(A[A[A[0].FXD+ONES(A[0].[LEBSB:FRMS])]],8)  #         53633400  31.092.398
53633500       ,FORMS      = LEBB(FRMS)#                                                    53633500  .
53633600       ,FORMSINDEX= LEEB(FRMS)#                                                     53633600  .
53633700       ,GUARDINFO = LEBB(SECGUARD)#                                                 53633700  20.000.105
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53633800         ,GUARDINDEX= LEEB(SECGUARD)#                                                    53633800  20.000.105
53633900         ,NAMEINDEX  = LEEB(NAMEDPF)#                                                    53633900  22.000.083
53633905         ,NAMEDB     = LEBB(NAMEDPF)#                                                    53633905  22.000.083
53633910         ,KLUDGED1   = 0#                                                                53633910  .
```

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53686800    DEFINE                                                                         53686800  340521258
53687000                                                                                   53687000  340521258
53687100        % IN RECORDSTATUS (RSLT)                                                   53687100  340521258
53687200            RECSIZEF    = LRDUNITSTRANSFERREDF#                                    53687200  340521258
53687300          , LRDUNITNBRF =  [24:8]#               % UNIT # RETURNED BY DIO          53687300  340521258
53687400          , QUALIFICATIONF=[24:8]#               % FOR DATACOM FILES               53687400  340521258
53687500          % IN LRDERRORF                                                           53687500  340521258
53688250          ,    DELDUPRECF  = LRDUNDEFINEDERRORF#  % REDEFINITIONS FOR RESULT       53688250  340521258
53688300          ,    DATAERRORF  = LRDDESCRIPTORERRORF# %   DESCR. GIVEN TO USERS        53688300  340521258
53688350        % IN RECORDSTATUS (RSLT)                                                   53688350  351512740
53688400          % SPECIAL FLAGS USED BY SEEKDISK WHEN BAD WRITE IS DETECTED              53688400  351512740
53688450          % RECSIZEF          =LRDUNITSTRANSFERREDF                                53688450  351512740
53688500          % DUPLCOPYERRORF    =[27:16]#  % WHICH COPIES HAD WRITE ERRORS           53688500  351512740
53688550          % DUPLREADRSLTF     =[11:5]#   % READ RSLT AFTR BAD WRITE                53688550  351512740
53688600          % DUPLBADWRITEFLAGF =[6:7]#    % FLAG BAD WRITE                          53688600  351512740
53688700             % FILESTATUS                                                          53688700  26.010.131
53688800          , LEVELF      =[47:8]#      % FILE DESCRIPTION LEVEL.                    53688800  31.061.240
53688900          , LANGUAGEF   =[39:8]#      % LANGUAGE WHERE FILE DECLARED.              53688900  31.061.240
53690000                                      % SEE ENUMERATION UNDER LANGUAGETYPE         53690000  32.054.458
53690300          , UPDATEREADFORBOTTOMBUFFERF=[31:1]# % 1 IF UPDATE READ TO DO            53690300  31.137.464
53690400                                                  % FOR BOTTOM BUFFER.             53690400  31.137.464
53690500          , REELSWITCHINGF=[30:1]#    % 1 IF OUTPUT REELSWITCH                     53690500  31.061.240
53690600          , DMSIOBIT    =[29:1]#      % 1 IF DMS, DIRECT I/O.                      53690600  31.061.240
53690700          , DIRECTBIT   =[28:1]#      % 1 IF DIRECT FILE.                          53690700  31.061.240
53690800          , WRITELABELSF=[27:1]#      % TRUE IFF NEED TO WRITE EOF LABELS.         53690800  331121095
53690900          , FILEINCLOSEF=[26:1]#      % 1 IF FILE IN CLOSE PROCEDURE.              53690900  31.061.240
53691000          , B5500LINK   =[25:1]#      % OLD FORTRAN LINKED (FILETYPE=6)            53691000  31.061.240
53691100          , EOFB        =[24:1]#      % 1 IF END OF FILE, NO MORE REELS            53691100  31.061.240
53691200          , SWAPFIBF    =[23:1]#      % 1 IF FILE IN SWAP SPACE.                   53691200  31.061.240
53691300          , INTSIZEF    =[22:3]#      % STRING DD SIZE IN INTMODES.                53691300  31.061.240
53691400          , INTSPERWRDF =[19:4]#      % INTMODES PER WORD.                         53691400  31.061.240
53691500          , EXTSPERWRDF =[15:4]#      % EXTMODES PER WORD.                         53691500  31.061.240
53691600          , BUFFASSGND  =[11:8]#      % BUFFERS ASSIGNED.                          53691600  31.061.240
53691700          , FILESTATEF  =[3:3]#       % LAST I/O ACTION.                           53691700  31.061.240
53691800          , NEWBUFFERF  =[0:1]#       % 1 IF MUST WAIT ON BUFFER.                  53691800  31.061.240
53691900             % TANKDATA1                                                           53691900  26.010.131
53692000          , BLKD        =[47:1]#      % 1 IF BLOCKED FILE.                         53692000  31.061.240
53692100          , EXTMODEF    =[46:3]#      % PHYSICAL RECORD MODE.                      53692100  31.061.240
53692200          , INTMODEF    =[43:3]#      % INTMODE ATTRIBUTE.                         53692200  31.061.240
53692300                            %  0 = SINGLE  (48-BIT).                               53692300  26.010.131
53692400                            %  2 = HEX     (4-BIT).                                53692400  26.010.131
53692500                            %  3 = BCL     (6-BIT).                                53692500  26.010.131
53692600                            %  4 = EBCDIC  (8-BIT).                                53692600  26.010.131
53692700                            %  5 = ASCII   (8-BIT).                                53692700  26.010.131
53692800                            %  6 = BINARY  (48-BIT).                               53692800  26.010.131
53692900          , CHAREC      =[40:1]#      % 1 IF CHAR-ORIENTED DATA MOVES.             53692900  31.061.240
53693000          % FILEORGF    =[39:40]      % DISKHEADER[2]-S FIELD.                     53693000  31.061.240
53693100          ,   RCDUNTS     =[39:1]#    %   UNITS ATTRIBUTE.                         53693100  31.061.240
53693200                            %  0 = WORDS.                                          53693200  26.010.131
53693300                            %  1 = CHARACTERS.                                     53693300  26.010.131
53693400          ,   RCRDTYPE    =[38:4]#    %   RECORD FORMAT (FILETYPE ATT):            53693400  31.061.240
53693500                            %  0 = "F" - FIXED LENGTH.                             53693500  26.010.131
53693600                            %  1 = "D" - VARIABLE LENGTH.  SIZE IN DECIMAL         53693600  26.010.131
53693700                                      % IN FIRST FOUR CHARACTERS.                  53693700  26.010.131
53693800                            %  2 = "V" - VARIABLE LENGTH.  SIZE IN BINARY          53693800  26.010.131
53693900                                      % IN FIRST TWO CHARACTERS.                   53693900  26.010.131
53694000                            %  3 = "U" - VARIABLE LENGTH.  SIZE PROVIDED           53694000  26.010.131
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53694100                            % EXPLICITELY IN I/O STATEMENT.          53694100  26.010.131
53694200                      %  4 = "I" - VARIABLE LENGTH.  SIZE IN RECORD  53694200  26.010.131
53694300                            % AT FIXED LOCATION (SIZE ATTRIBUTES).   53694300  26.010.131
53694400                      %  5 = "L" - VARIABLE LENGTH.  XALGOL LINKED.  53694400  26.010.131
53694500                      %  6 = "Z" - VARIABLE LENGTH.  FORTRAN LINKED. 53694500  26.010.131
53694600                      %  7 = DEPENDANT SPECIFICATION.  FIXED UP      53694600  26.010.131
53694700                            % AT OPEN.                               53694700  26.010.131
53694800                      %  8 = DEPENDANT SPECIFICATION.  DONT CHANGE   53694800  26.010.131
53694900                            % INTMODE.                               53694900  26.010.131
53695000          ,  SIZEMODE    =[34:3]#  %   SIZEMODE ATTRIBUTE.           53695000  31.061.240
53695100          ,  SIZEOFF     =[31:16]# %   SIZEOFFSET ATTRIBUTE.         53695100  31.061.240
53695200          ,  SIZESZ      =[15:16]# %   SIZE2 ATTRIBUTE.              53695200  31.061.240
53695300            % TANKDATA2                                              53695300  26.010.131
53695400          , BLOCKSIZEF   =[47:16]#  % PHYSICAL BLOCKSIZE             53695400  340521258
53695500          , MINRECSIZEF  =[31:16]#  % PHYSICAL MINRECSIZE            53695500  350441252
53695600          , MAXRECSIZEF  =[15:16]#  % PHYSICAL MAXRECSIZE            53695600  340521258
53695700            % DISKBLOCK                                              53695700  26.010.131
53695800          , SEGPERBLKF  =[47:12]#     % SEGMENTS PER BLOCK.          53695800  31.061.240
53695900          , RECPERBLKF  =[35:16]#     % RECORDS PER BLOCK.           53695900  34.009.255
53695915          , BINARYIPCF  =[19:3]#      % CONTAINS SELECTOR.[2:3], BINARY IPC  53695915  34.009.255
53695925          , RANDOMIOF   =[16:1]#      % IF ONLY RANDOM I/O IS TO BE DONE     53695925  34.009.255
53695935          , STACKSEARCHF=[15:1]#      % FOR PORTS                    53695935  35.005.118
53695950          , PORTLINKEDF =[14:1]#      % LINKED TO PORT LIBRARY       53695950  32.081.715
53696000          , DONTUNLOCKF =[13:1]#      % FOR MULTI-ENTRY FIBSTACK CALLS  53696000  31.141.240
53696100          , TANKINGF    =[12:2]#      % TANKING VALUE                53696100  31.061.240
53696200          , NORESWAITF  =[10:1]#      % DON-T WAIT FOR RESOURCES     53696200  31.061.240
53696300          , INPUTEVENTUSEDF=[9:1]#    % 1 IF INPUTEVENT HAS BEEN USED  53696300  350721873
53696400          , MPS_USERF   =[8:1]#       % FIB USED MPS OUTPUT ROUTER   53696400  350772066
53696500          , DUPLCOPIES  =[7:4]#       % NUMBER OF COPIES MINUS ONE.  53696500  31.061.240
53696550          , ISAMLINKEDF =[3:1]#       % LINKED TO KEYEDIO LIBRARY.   53696550  32.035.228
53696600          , UPDATEIOF   =[2:1]#       % 1 IF DOING UPDATE I/O.       53696600  31.061.240
53696700          , UPDATEFILEF =[1:1]#       % 1 IF UPDATE I/O DISK FILE.   53696700  31.061.240
53696800          , DUPLFILEF   =[0:1]#       % 1 IF DUPLICATED DISK FILE.   53696800  31.061.240
53696900            % PAGESPEC      (PRINTER FILES LOGICAL PAGE SPECIFICATIONS)  53696900  26.010.131
53697000          , FIBCHOOZEF  =[47:12]#                                    53697000  31.061.240
53697100          ,   PGSPFCTNCODEF=[47:4]#   %   CHOOZE.FUNCTIONCODEF.      53697100  31.061.240
53697200          ,   PGSPAFTERF  =[43:1]#    %   CHOOZE.AFTERF.             53697200  31.061.240
53697300          ,   PGSPACTIONF =[42:6]#    %   CHOOZE.ACTIONF.            53697300  31.061.240
53697400          ,   PGSKEYEDF   =[36:1]#    %   CHOOZE.KEYEDF.             53697400  31.061.240
53697500          , BUFFERD     =[35:1]#      % 1 IF MORE THAN ONE BUFFER.   53697500  31.061.240
53697600          , LTDLINEF    =[34:1]#      % 1 IF MAXLINES COUNTING.      53697600  31.061.240
53697700          , LTDPUNCHF   =[33:1]#      % 1 IF MAXCARDS COUNTING.      53697700  31.061.240
53697800          , PAGESPECF   =[32:1]#      % 1 IF LOGICAL PAGE COUNTING.  53697800  31.061.240
53697900          , PAGECOUNTF  =[31:16]#     % PAGE ATTRIBUTE.              53697900  31.061.240
53698000          , PAGESIZEF   =[15:8]#      % PAGESIZE ATTRIBUTE.          53698000  31.061.240
53698100          , LINECOUNTF  =[7:8]#       % LINENUM ATTRIBUTE.           53698100  31.061.240
53698200            % IOINFO                                                 53698200  26.010.131
53698300          , SKLTNIOCW   =[47:28]#     % SKELETON IOCW (EXCEPT FOR DATACOM),  53698300  340521258
53698350                                      %   SEE IOSTANDARDFIELD ETC.   53698350  340521258
53698400          , LASTSTATIONF=[47:24]#     % DATACOM LASTSTATION ATTRIBUTE.  53698400  31.061.240
53698850          %             =[23:4]#      % AVAILABLE FOR DATACOM        53698850  340521258
53698900          , RDCHECKF    =[19:1]#      % READCHECK ATTRIBUTE.         53698900  31.061.240
53699000          , BACKUPSWITCHF=[18:1]#     % 1 IF SIOINFO IN IOINFO SLOT. 53699000  31.061.240
53699100          , OVERROWF    =[17:1]#      % 1 IF BADLY BLOCKED DISK I/O. 53699100  31.061.240
53699200          , BACKUPF     =[16:1]#      % 1 IF CREATING BACKUP FILE.   53699200  31.061.240
53699300   %      , AVAILABLE   =[15:10]#     % FORMERLY UNITNUM LOCATION    53699300  35.027.799
53699400          , UNITYPP     =[5:6]#       % ASSIGNED UNIT TYPE.          53699400  340521258
53699500            % FIBEOF        (DISK EOF CALCUALTIONS).                 53699500  26.010.131
53699600          % EOFU        =[47:20]      % # OF VALID UNITS IN LAST BLOCK.  53699600  31.061.240
53699700          % EOFV        =[27:28]      % SEGMENT WHERE LAST BLOCK BEGINS  53699700  31.061.240
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53699800          % ACTNUM        (MAINTAINED BY IODISKADDRESS).             53699800  26.010.131
53699850         , ROWINVALIDF      =[47:1]#       % (IN)VALIDITY BIT.       53699850  350541499
53699900         , ROWUNITNUMF      =[46:LUB(14)]# % LOGICAL UNIT NUMBER.    53699900  350541499
53700100         , ROWBASEADDRESSF  =[32:33]#      % DISK ADDRESS IN BINARY. 53700100  350541499
53700200          % FLOPPYMISC                                                53700200  31.031.208
53700300         , NORMALIOLENGTHF=[47:20]#  % NORMAL IO AREADESC LENGTH     53700300  331121095
53700400         , CUREXTENTF  =[27:20]#     % TOTAL EXTENT USED             53700400  31.061.240
53700500         , CHARSPERSECTORF=[7:8]#    % FOR FLOPPY TEST OP            53700500  331121095
53700510          % HCPARTNERMISC            % = FLOPPYMISC                  53700510  340581503
53700520         % WRITEPARTNER        =[11:04]  % SAME HCFILES IOPARTNER FIELDS AS    53700520  340581503
53700530         % READPARTNER         =[07:04]  % THOSE IN IOCD[DIRECTIOCW], BUT      53700530  340581503
53700540         % READPARTNERVALID    =[02:01]  % HOLDS HUBMAP-LEVEL RESTRICTIONS;    53700540  340581503
53700550         % WRITEPARTNERVALID   =[01:01]  % PARTNERMISC IS SET-UP IN FIBOPEN.   53700550  340581503
53700556         , % BUFLINKS  - THIS FIELD CONTAINS THE NUMBER OF BUFFERS AND         53700556  35.009.306
53700558          %              CURRENT "TOP" BUFFER FOR THE IOMOM & SIOMOM           53700558  35.009.306
53700560          %              BUFFER POOLS. THE BOTTOM 24 BITS ARE USED BY          53700560  35.009.306
53700562          %              IOMOM, TOP 24 BY SIOMOM. IT IS VERY IMPORTANT TO      53700562  35.009.306
53700564          %              NOTE THAT THE FIELDS FOR IOMOM AND SIOMOM ARE         53700564  35.009.306
53700566          %              IDENTICAL IN FORMAT. THIS IS NECESSARY BECAUSE        53700566  35.009.306
53700568          %              THE TWO HALVES OF THE WORD ARE SWAPPED WHENEVER       53700568  35.009.306
53700570          %              IOMOM AND SIOMOM ARE SWAPPED (DONE FOR BACKUP         53700570  35.009.306
53700572          %              FILES)                                                53700572  35.009.306
53700576         , BACKUP_FLAG_FIELD      = [47:01]#    % USED TO MARK THE SIO AREA    53700576  35.028.847
53700578                                                % OF THE BUFFER - THIS HELPS   53700578  35.028.847
53700580                                                % WHEN ANALYZING DUMPS         53700580  35.028.847
53700582         , BUFFER_CONTROL_FIELD   = [23:48]#    % FIELD USED WHEN SWAPPING     53700582  35.009.306
53700584                                                % IOMOM AND SIOMOM             53700584  35.009.306
53700586         , CURRENT_BUFFER_FIELD   = [07:08]#    % # OF TOP BUFFER              53700586  35.009.306
53700588         , POPULATION_FIELD       = [15:08]#    % # OF BUFFS IN POOL           53700588  35.009.306
53700590         , SIOMOM_POPULATION_FIELD                                             53700590  35.009.306
53700592                                  = [39:08]#    % # OF BUFFS IN SIOMOM POOL    53700592  35.009.306
53700594    % ------------- E N D   F I B   F I E L D S --------------------------     53700594  340521258
53700595                                                                               53700595  35.028.847
53700596         % UNITNUMBERS - CONTAINS THE LOGICAL UNIT NUMBER FOR THIS FILE        53700596  350431237
53700598         %              (EXCEPT FOR DISK FILES WHERE IT CONTAINS THE           53700598  35.027.799
53700600         %              DISKFILEHEADER INDEX). "LUORHDRBITS" OF THE BOTTOM     53700600  350431237
53700602         %              24 BITS OF THE WORD CONTAIN THE FIELD WHICH IS         53700602  35.027.799
53700604         %              IS REFERENCED TO OBTAIN THE UNIT NUMBER.               53700604  35.027.799
53700606         %              WHEN IOINFO AND SIOINFO ARE SWAPPED, THIS WORD IS      53700606  35.027.799
53700608         %              ROTATED (SIMILARLY TO BUFLINKS) AND THE SIO            53700608  35.027.799
53700610         %              UNIT NUMBER IS RETURNED WHEN UNITORHEADERINDEXF        53700610  35.027.799
53700612         %              IS ACCESSED.  RE-ROTATION WOULD RETURN THE UNIT        53700612  35.027.799
53700614         %              NUMBER SAVED IN THE TOP HALF OF THE WORD TO ITS        53700614  35.027.799
53700616         %              ORIGINAL POSITION IN THE BOTTOM HALF OF THE WORD.      53700616  35.027.799
53700617         , LUORHDRBITS           = MAX(HEADERBITS,LUBMIN)#                     53700617  350431237
53700618         % AVAILABLE             = [47:(24-LUORHDRBITS)]                       53700618  350431237
53700619         , SIO_UNITORHEADERINDEXF= [39:LUORHDRBITS]#                           53700619  350431237
53700620         % AVAILABLE             = [23:(24-LUORHDRBITS)]                       53700620  350431237
53700621         , UNITORHEADERINDEXF    = [15:LUORHDRBITS]#                           53700621  350431237
53700623    % ------------- E N D   F I B   F I E L D S --------------------------     53700623  35.027.799
53700624                                                                               53700624  35.027.799
53700626                                                                               53700626  35.027.799
53700628                                                                               53700628  35.027.799
53700640    % ------------- L E B   F I E L D S ----------------------------------     53700640  340521258
53700660                                                                               53700660  340521258
53700700         ,   FXD        =[47:5]#       %   FIXED LENGTH OF LEB.                53700700  340521258
53700800         ,   OPTMASK    =[LEBSB:TITEL]#%  VARIABLE LENGTH PARTS, ALSO USES     53700800  340521258
53700850                                       %   NEXT BIT, SO USED BITS ARE [42:18]  53700850  321761190
53700900                   % (CANNOT USE) = 42:1,                                      53700900  321761190
53701000                   % (INTNAME)    = 41:1,                                      53701000  321761190
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53701100                  % (KINDLIST)    = 40:1,                                                   53701100  321761190
53701200                  % (FORMMESSAGE)= 39:1,                                                    53701200  321761190
53701300                  % (GUARDFILE)  = 38:1,                                                    53701300  321761190
53701400                  % (PACKNAME)    = 37:1,                                                   53701400  321761190
53701500                  % (SERIALNO)    = 36:1,                                                   53701500  321761190
53701600                  % (PRINTERCTL)  = 35:1,                                                   53701600  35.015.442
53701700                  % (PRINTERCTL2) = 34:1,                                                   53701700  35.015.442
53701800                  % (EIOLONGSTAT)= 33:1,                                                    53701800  35.015.442
53701900                  % AVAILABLE     = 32:1,                                                   53701900  35.015.442
53702000                  % (PSEUDONAME) = 31:1,                                                    53702000  321761190
53702100                  % (PSEUDOFAM)  = 30:1,                                                    53702100  321761190
53702200                  % AVAILABLE     = 29:1,                                                   53702200  35.015.442
53702300                  % AVAILABLE     = 28:1,                                                   53702300  35.015.442
53702400                  % (HOSTNAEM)    = 27:1,                                                   53702400  321761190
53702500                  % (ISAMKEYS)    = 26:1,                                                   53702500  321761190
53702700                  % (TITEL)       = 25:1,     % NOT IN OPTMASK, BUT USED                    53702700  321761190
53702800          , OPTIONALF    =[24:1]#      % OPTIONAL ATTRIBUTE                                 53702800  31.078.398
53702900          , BYPASSF      =[23:1]#      % FILE BYPASS INDICATOR                              53702900  31.078.398
53703000          , LEBOFFIBF    =[22:1]#      % TRUE IF THERE IS A FIB                             53703000  31.078.398
53703100          , FPRTCTD      =[21:1]#                                                           53703100  31.078.398
53703200          , LPARITY      =[20:1]#      % PARITY (1 IS NON-STANDARD).                        53703200  340521258
53703300             , DENSITYQ       = [19:3]#    % VALID IF GTR 0                                 53703300  31.155.541
53703400                                            % VALUE OF ATTRIBUTE (GIVEN                     53703400  31.155.541
53703500                                            % BELOW) IS LEBC.DENSITYQ-1.                    53703500  31.155.541
53703600                            %  0 = HIGH    (800).                                           53703600  26.010.131
53703700                            %  1 = MEDIUM  (556).                                           53703700  26.010.131
53703800                            %  2 = LOW     (200).                                           53703800  26.010.131
53703900                            %  3 = SUPER    (1600).                                         53703900  26.010.131
53704000                            %  4 =         (6250)                                           53704000  31.155.541
53704100          , LABELTYPES  =[16:1]#      % 1 IF LABELTYPE IS VALID.                            53704100  340521258
53704200          , LABELTYPEL  =[15:4]#      % LABELTYPE ATTRIBUTE.                                53704200  340521258
53704300                       %    LEBC                 LCNTRL                                     53704300  26.010.131
53704400                       %    0 = STANDARD.          0 = B6500 USASI.                         53704400  26.010.131
53704500                       %    1 = OMITTED.           1 = UNLABELED.                           53704500  26.010.131
53704600                       %                           2 = B5500 STANDARD.                      53704600  26.010.131
53704700                       %    3 = OMITTEDEOF.        3 = SYSTEM STANDARD.                     53704700  26.010.131
53704800                                            %      4 = B3500 USASI.                         53704800  26.010.131
53704900                                            %      5 = B3500 STANDARD.                      53704900  26.010.131
53705000                                            %      6 = BACKUP.                              53705000  26.010.131
53705100                                            %      7 = LIBRARY MAINTENANCE.                 53705100  26.010.131
53705200                                            %      8 = LOAD CONTROL.                        53705200  26.010.131
53705300                                            %     10 = B5500 BACKUP.                        53705300  26.010.131
53705400                                            %     11 = B5500 LIBRARY.                       53705400  26.010.131
53705500                                            %     12 = NON-STANDARD USASI.                  53705500  26.010.131
53705600                                            %     13 = USERDEFINED.                         53705600  26.010.131
53705700          , EXTVALID    =[11:1]#      % 1 IF EXTMODE IS SPECIFIED.                          53705700  31.061.240
53705800          , EXTFORML    =[10:3]#      % EXTMODE ATTRIBUTE.                                  53705800  31.061.240
53705900          , PTYPEL      =[7:8]#                                                             53705900  31.061.240
53706000          ,   PTYPECODEF=[7:3]#                                                             53706000  31.061.240
53706100          ,   PTYPEF    =[4:5]#                                                             53706100  31.061.240
53706200             % GEN1          (LEB WORD)                                                     53706200  26.010.131
53706300          , LABLEV      =[47:9]#      % LABEL LEVEL.                                        53706300  31.061.240
53706400          , CYCLES      =[38:1]#      % 1 IF GENEALOGY IS SPECIFIED.                        53706400  31.061.240
53706500          , GENEALOGYF  =[37:22]#     % (CYCLE + VERSION).                                  53706500  31.061.240
53706600          ,   CYCLE     =[37:14]#     %   CYCLE ATTRIBUTE.                                  53706600  31.061.240
53706700          ,   GENVERSN  =[23:8]#      %   VERSION ATTRIBUTE.                                53706700  31.061.240
53706800          , REELS       =[15:1]#      % 1 IF REEL NUMBER IS SPECIFIED.                      53706800  31.061.240
53706900          , REEL        =[14:15]#     % REEL ATTRIBUTE.                                     53706900  31.061.240
53707000             % GEN2          (LEB WORD)                                                     53707000  26.010.131
53707050          %             =[47:2]#      % AVAILABLE                                           53707050  35.011.316
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53707100          , CRTNSITEIDF =[45:14]#     % SYSTEM SERIAL NUMBER.                      53707100  35.011.316
53707200          , GENERATIONF =[31:4]#      % GENERATION ATTRIBUTE.                      53707200  31.061.240
53707300          , SAVFACTOR   =[27:11]#     % SAVEFACTOR ATTRIBUTE.                      53707300  31.061.240
53707400          , CRTNDATE    =[16:17]#     % CREATION DATE.                             53707400  31.061.240
53707500             % DSKS          (LEB WORD)                                            53707500  26.010.131
53707600          , DIRECTIONF  =[47:1]#      % DIRECTION ATTRIBUTE.                       53707600  31.061.240
53707700          , SINGLEPACKF =[46:1]#      % SINGLEPACK ATTRIBUTE.                      53707700  31.078.398
53707800          , USECATALOGF =[45:1]#      % USECATALOG ATTRIBUTE.                      53707800  31.061.240
53707900          , SENSITIVEF  =[44:1]#      % SENSITIVEDATA ATTRIBUTE.                   53707900  31.061.240
53708000          , DRCTRYF     =[43:1]#      % 1 IF GOES INTO DIRECTORY.                  53708000  31.061.240
53708100          , CYLMODEF    =[42:1]#      % CYLINDERMODE ATTRIBUTE.                    53708100  31.078.398
53708200          , FLEXIBLEF   =[41:1]#      % FLEXIBLE ATTRIBUTE.                        53708200  31.061.240
53708300          , SIZEVISBIASF=[40:3]#      % SIZEVISIBLE SIZE BIAS                      53708300  350942344
53708400          , OTHERUSEF   =[37:2]#                                                   53708400  31.061.240
53708500          , MYUSEF      =[35:2]#      % MYUSE ATTRIBUTE.                           53708500  31.061.240
53708600          , EXCLUSIVEF  =[33:1]#      % EXCLUSIVE ATTRIBUTE.                       53708600  31.078.398
53708700          , INTERCHGEF  =[32:1]#      % INTERCHANGE ATTRIBUTE.                     53708700  31.078.398
53708800          , FILEUSEF    =[31:2]#      % FILEUSE ATTRIBUTE.                         53708800  31.092.424
53708900          , NUMAREAS    =[29:10]#     % AREAS ATTRIBUTE.                           53708900  31.061.240
53709000          , AREASIZE    =[19:20]#     % AREASIZE ATTRIBUTE.                        53709000  31.061.240
53709100             % DISKMISC      (LEB WORD)                                            53709100  26.010.131
53709200          , LFILEORGANIZF=[47:3]#     % FILEORGANIZATION ATTRIBUTE                 53709200  350391118
53709400          , LEXTENTF    =[44:17]#     % EXTENT OF DISKETTE FILE                    53709400  32.141.948
53709500          , LEXCLUSIVECANF=[27:1]#    % FOR RESERVE                                53709500  31.061.240
53709600          , LUPDATEIOVF =[26:1]#      % 1 IF UPDATEFILE IS VALID.                  53709600  31.061.240
53709700          , LUPDATEIOF  =[25:1]#      % UPDATEFILE ATTRIBUTE.                      53709700  31.061.240
53709800          , LDUPLFILEF  =[24:1]#      % DUPLICATED ATTRIBUTE.                      53709800  31.061.240
53709900          , LFAMILYINDEX=[23:8]#      % FAMILYINDEX ATTRIBUTE.                     53709900  31.061.240
53709950          , LWRITECHECKF=[15:1]#      % WRITECHECK ATTRIBUTE                       53709950  350391118
53710000          %             =[14:7]#      % AVAILABLE                                  53710000  350391118
53710100          , LFILEKIND   =[7:8]#       % FILEKIND ATTRIBUTE.                        53710100  31.061.240
53710200             % TANKDATA3     (LEB WORD)                                            53710200  26.010.131
53710300          , BUFFREQSTD  =[47:8]#      % BUFFERS ATTRIBUTE.                         53710300  31.061.240
53710350          , BKUPKINDF   =[39:6]#      % ACTUAL KIND FOR PRINTER/PUNCH              53710350  31.061.240
53710400          % **NOT USED**=[33:1]#      % ***** AVAILABLE *****.                     53710400  350571579
53710450          , NEWFILEF    =[32:1]#      % NEWFILE ATTRIBUTE.                         53710450  350571579
53710500          , BLANKF      =[31:1]#      % BLANK ATTRIBUTE.                           53710500  34.006.198
53710550          % **NOT USED**=[30:1]#      % ***** AVAILABLE *****.                     53710550  350571579
53710600          , COBOL74LOCKF=[29:1]#      % CLOSED WITH COBOL74 LOCK                   53710600  32.048.381
53710650          , OPT         =[28:1]#      % 1 IF NON-PRESENT OPTIONAL FILE.            53710650  31.061.240
53710700          , ATTERRF     =[27:1]#      % ATTERR ATTRIBUTE.                          53710700  31.061.240
53710750          , ATTYPEF     =[26:8]#      % ATTYPE ATTRIBUTE.                          53710750  32.141.948
53710800          , SIZE_INVISF =[18:1]#      % SIZE FIELD IS CURRENTLY INVISIBLE          53710800  350571579
53710850                                      %   ~(VALID ONLY AFTER SETUPFIB)             53710850  350571579
53710900          , SIZEVISIBLEF=[17:1]#      % SIZEVISIBLE ATTRIBUTE.                     53710900  350571579
53710950          % **NOT USED**=[16:1]#      % **** AVAILABLE *****                       53710950  351122546
53710960           % INDICATES USER EXPLICITLY DECLARES TRANSLATE MODE                     53710960  350762030
53711000          , SOFTTRANSF  =[15:1]#      % TRANSLATING ATTRIBUTE.                     53711000  31.061.240
53711050          , TRANSLATEF  =[14:3]#      % TRANSLATE ATTRIBUTE.                       53711050  31.061.240
53711100          , CRIGECNTRLF =[11:2]#      % CARRIAGECONTROL ATTRIBUTE.                 53711100  31.061.240
53711150          ,   CONTROL360F =[11:1]#    %   IBM 1403 PRINTER CODE.                   53711150  32.142.970
53711200          ,   CONTROLASAF =[10:1]#    %   FORTRAN PRINTER CODE.                    53711200  32.142.970
53711250          , CHECKPOINTF =[8:1]#       % 1 IF ENTERED UNDER CP DIRECTORY            53711250  31.061.240
53711300          , DEFKINDF    =[7:1]#       % 1 IF KIND WAS ZERO.                        53711300  31.061.240
53711350          , EOFEDF      =[6:1]#       % 1 IF GIVEN ONE EOF ERROR MSG.              53711350  31.061.240
53711400          %*AVAILABLE** =[5:2]#       %                                            53711400  33.101.837
53711450          , BLOCKSTRUCTV=[3:1]#       % BLOCKSTRUCURE VALIDITY BIT                 53711450  32.142.970
53711500          , BLOCKSTRUCTF=[2:3]#       % BLOCKSTRUCTURE ATTRIBUTE                   53711500  32.142.970
53712000             % LABELATT      (LEB WORD)                                            53712000  26.010.131
53712050          , USERSETFAMILYNAMEF=[47:1]#% TRUE IFF THE USER SET THE FAMILYNAME       53712050  331521321
```

```
53712100           , LABELTYP     =[46:3]#       % ASSIGNED LABEL TYPE.                   53712100  31.061.240
53712200                               %  0 = USASI LABEL.                                53712200  26.010.131
53712300                               %  1 = COBOL UNLABELED (REELSWITCH).               53712300  26.010.131
53712400                               %  2 = NO TAPEMARK BETWEEN LABELS.                 53712400  26.010.131
53712500                               %  3 = UNLABELED MULTI/FILE REELS (EOF).           53712500  26.010.131
53712550           , ACTUAL PRINTERKINDF =[43:4]# % ACTUAL PRINTERKIND SET BY NIP         53712550  35.006.200
53712600           , SECTYPEBITF =[37:1]#        % 1 IF SECTYPE EXPLICITELY SET.          53712600  31.061.240
53712700           , SECUSEBITF  =[36:1]#        % 1 IF SECUSE EXPLICITELY SET.           53712700  31.061.240
53712800           , SECTYPEF     =[35:2]#       % SECURITYTYPE ATTRIBUTE.                53712800  31.061.240
53712900           , SECUSEF      =[33:2]#       % SECURITYUSE ATTRIBUTE.                 53712900  31.061.240
53712950           %              =[31:3]#       % AVAILABLE                              53712950  331121095
53713000           , USEINDEXF    =[28:8]#       % USEROUTINES INDEX.                     53713000  31.061.240
53713100           , LABELUSEF    =[20:1]#       % 1 IF LABEL USEROUTINES PRESENT.        53713100  31.061.240
53713200           , ERRUSEF      =[19:1]#       % 1 IF ERROR USEROUTINES PRESENT.        53713200  31.061.240
53713250           %              =[18:2]#       % AVAILABLE                              53713250  331121095
53713300           , USERSIZE     =[16:4]#       % NUMBER OF USER LABELS.                 53713300  31.061.240
53713400           , LBLEQTD      =[12:1]#       % 1 WHEN FINISHED LABEL EQUATION.        53713400  31.061.240
53713410           %              =[11:4]#       % AVAILABLE                              53713410  331121095
53713420           , FRF          =[7:8] #       % FILE REGULATION FIELD =SECURITY INFO   53713420  33.101.837
53713440                                         % MAINLY USED FOR TEMPORARY FILES        53713440  33.101.837
53713460                                         % SAVED BY CHECKPOINT                    53713460  33.101.837
53713500              % FILEACCESS    (LEB WORD)                                          53713500  26.010.131
53713550           , VOLUMEDMTBITF=[47:1]#       % CONSISTANT VOLUMED/UNVOLUMED           53713550  30.7X.685
53713600           , CREATEFILEF =[46:1]#        % FILE WAS CREATED IN OPEN               53713600  331121095
53713700           , PRINTERCTL_OKF=[45:1]#      % CONTROL FILE IS OK TO USE              53713700  35.015.442
53713800           , IMPLICIT_OPENF = [44:1]#    % FILE WAS IMPLICITLY  OPENED ON WRITE   53713800  35.032.944
53713910           , INUSEROUTINEF=[43:1]#       % IN COBOL USE ROUTINE                   53713910  29.7X.454
53713920           , APPLICATIONF=[42:1]#        % FILE PROPAGATES MA                     53713920  32.035.221
53713950           , INDEXEDMODEF=[41:2]#                                                 53713950  32.025.140
53713980           , UNVOLUMEDMTBITF=[39:1]#     % INDICATES IF 1ST REEL IS UNVOLUMED     53713980  331051020
53713990           , POSITIONATENDF=[38:1]#      % POSITION FILE AT END AT END OF OPEN    53713990  331061044
53713995           , USER_PRINTERKINDF=[37:4]#   % INDICATES THE TYPE OF PRINTER          53713995  35.006.200
53714020                                         %   0  DONT CARE                         53714020  35.006.200
53714040                                         %   1  IPONLY   NIP PRINTER ONLY         53714040  35.006.200
53714060                                         %   2  LPONLY   LINEPRINTER ONLY         53714060  35.006.200
53714080           , AUDITF       =[33:2]#       % RESERVE FOR B7700                      53714080  31.061.240
53714100           , TRAINIDF     =[31:8]#       % TRAINID ATTRIBUTE.                     53714100  31.061.240
53714200           , PCWERRF      =[23:8]#       % IF THE CORRESPONDING PCW               53714200  35.015.440
53714300           ,   PWRITESERRF =[23:1]#      %   HAS "BAD" IN IT, THESE FIELDS        53714300  35.015.440
53714400           ,   PREADSERRF  =[22:1]#      %   INDICATE THE REASON.                 53714400  35.015.440
53714500           ,   PWRITENERRF =[21:1]#      %                                        53714500  35.015.440
53714600           ,   PREADNERRF  =[20:1]#      %                                        53714600  35.015.440
53714700           ,   PSEEKERRF   =[19:1]#      %                                        53714700  35.015.440
53714800           %               =[18:3]#      % AVAILABLE PCW ERROR FIELDS             53714800  35.015.440
53714810           %              =[15:16]#      % AVAILABLE                              53714810  35.015.440
53714820              % FOREIGNINFO      (LEB WORD)      (HOST SERVICES INFO)             53714820  31.170.670
53714830           %                  [47:16]    % AVAILABLE                              53714830  32.081.715
53714835           , MAXSUBFILESF  = [31:16]#    % MAX SUB PORT FILES ALLOWED             53714835  32.081.715
53714840           , DIALOGNUMBERF = [15:08]#    % DIALOG NUMBER FROM HOST SERVICES       53714840  31.170.670
53714850           %               = [07:05]     % AVAILABLE                              53714850  331121095
53714855           , FILEXFERFILEF = [02:01]#    % THIS FILE IN USE BY HS FILE XFER       53714855  31.187.766
53714860           , FCFILEF       = [01:01]#    % FILECOOP'S FILE FOR ANOTHER HOST       53714860  31.170.670
53714870           , FOREIGNFILEF  = [00:01]#    % THIS FILE IS ON A FOREIGN HOST         53714870  31.170.670
53714875              % FAILUREREASON    (LEB WORD)      (OPEN/CLOSE FAILURE REASON)      53714875  32.122.892
53714880           ,FAILFATALF     = [47:01]#    % CALL MCPHANDLEERROR                    53714880  340441097
53714882           ,FAILWHICHSIGNF = [46:01]#    % SIGN OF FAILWHICHF                     53714882  340441097
53714884           ,FAILPRINTEDF   = [45:01]#    % 1 => MESSER CALLED FOR THIS MESSAGE    53714884  340441097
53714885           ,MYOFFSETF      = [44:16]#    % STACK RELATIVE OFFSET OF FILE          53714885  35.015.449
53714890                                         % (FOR USER LABELS)                      53714890  35.015.449
53714894           %               = [28: 5]#    % AVAILABLE                              53714894  35.015.449
```

```
53714896         ,FAILWHATF       = [23:12]#  % CLOSEERRORVV OR OPENERRORVV               53714896  340441097
53714898         ,FAILWHICHF      = [11:12]#  % MESSER ALREADY CALLED FOR THIS WHICH      53714898  340441097
53714900            % LEBMISC          (LEB WORD)      (MISCELLANEOUS INFORMATION)        53714900  32.142.970
53714905         %  UNUSED BIT      [47:01]                                               53714905  32.142.970
53714910         , FRAMESIZEV     = [46:01]#  % FRAMESIZE VALIDITY BIT                    53714910  32.142.970
53714915         , FRAMESIZEF     = [45:06]#  % FRAMESIZE VALUE                           53714915  32.142.970
53714920         , DEPENDENTSPECSD=[39:01]#  % DEPENDENTSPECS HAVE BEEN APPLIED           53714920  350571579
53714925         , DEPENDENTSPECSF=[38:01]#  % DEPENDENTSPECS VALUE                       53714925  32.142.970
53714930         %  UNUSED BITS     [37:05]                                               53714930  32.177.970
53714935         , AREALENGTHV    = [32:01]#  % AREALENGTH VALIDITY BIT                   53714935  32.177.970
53714940         , AREALENGTHF    = [31:32]#  % AREALENGTH VALUE                          53714940  32.177.970
53714960                                                                                  53714960  340521258
53714970    % ------------- E N D   L E B   F I E L D S -------------------------         53714970  340521258
```

DISK FILE HEADER

APPENDIX G

```
37660626    DEFINE                                                                          37660626  350922267
37660628                        % WORD ZERO OF HEADER                                       37660628  350922267
37660630        MARKERF            = [47:16]#                                               37660630  321721099
37660635       ,INUSEMARK               = 4'3F3F'#                                          37660635  321721099
37660640       ,AVAILMARK               = 4'3C3C'#                                          37660640  321721099
37660645       ,BADAREAMARK             = 4'3A3A'#                                          37660645  321721099
37660650       ,MCPUSEMARK              = 4'3939'#                                          37660650  321721099
37660655       ,PRESUSEMARK             = 4'3838'# % PRESERVER USED AREA                    37660655  321721099
37660656       ,HDROBUF            = [47:LUB(16)]#  % SAME AS MARKERF, BUT HDRO USES        37660656  350711836
37660658                                            % FIELD TO HOLD FILE'S BASEUNIT.        37660658  350711836
37660660       ,HDRBLOCKLENGTHF    = [31:11]#       % TOTAL HEADER SIZE IN WORDS            37660660  350922267
37660662           ,MAXHEADERSIZEV = (2 ** 11)#     % SIZE OF LARGEST POSSIBLE HDR          37660662  350922267
37660665       ,HDRLOCATIONF       = [20:21]#                                               37660665  321721099
37660670       ,AVAILFLAG(REC) = ((O & AVAILMARK MARKERF                                    37660670  321721099
37660675                  & 1 HDRBLOCKLENGTHF) & (REC) HDRLOCATIONF)#                       37660675  321721099
37660680       ,INUSEFLAG(L,R) = (O & INUSEMARK MARKERF & (L) HDRBLOCKLENGTHF               37660680  321721099
37660685                                  & (R) HDRLOCATIONF)#                              37660685  321721099
37660700            % HEADERINFOONE                                                         37660700  31.061.240
37660800                        % WORD 1                                                    37660800  31.061.240
37660900      , UPDATEBITF =[47:1]#            %TRUE IF FILE UPDATED                        37660900  321721099
37661000      , OPENCOUNTF =[46:11]#           % NUMBER OF PROCESSES  %LOOKING AT TH        37661000  31.061.240
37661050      , AVAILOF    =[35:04]#           % AVAILABLE, ZEROED BY HEADERKEEPER          37661050  34.028.677
37661100      , FILEKINDF  =[31:8]#            % DATA, CODE, ETC                            37661100  31.061.240
37661200      , HEADERSIZEF=[23:16]#           % SIZE IN WORDS                              37661200  31.061.240
37661300      , SECINFOSIZEF=[07:08]#          % SIZE IN WORDS OF THE % SECURITY INF        37661300  31.061.240
37661500            % HEADERTWO                                                             37661500  31.061.240
37661600                        %FILE ORGANIZATION                                          37661600  31.061.240
37661700      , IADBIT     =[47:1]#            % 1 IF IAD                                   37661700  31.061.240
37661800      , PROTECTIONF=[46:1]#            %  1 IF FILE PROTECTED                       37661800  33.012.356
37661900      , PERMANENCYF=[45:1]#            %  O IF TEMPORARY FILE.                      37661900  33.012.356
37661920                                       %  1 IF FILE HEADER IS IN FLAT               37661920  33.012.356
37661940                                       %    DIRECTORY OF JOBDESC FILE.              37661940  33.012.356
37661950      , SYSTEMFYLEF=[44:1]#            % NON REMOVABLE FILE.                        37661950  321721099
37661980      , APLMAF  =[43:1]#               % NEW APLMA BIT. SEE HEADERKEEPER            37661980  33.030.546
37662000      , PHYSICALMODEF=[42:3]#          % EXTMODE AT CREATION                        37662000  31.061.240
37662100      , FILEORGF   =[39:40]#           % SEE FIB[3]=TANKDATA1                       37662100  31.061.240
37662220            % FIB TANKDATA2                                                         37662220  32.7X.205
37662240                        %WORD 3                                                     37662240  32.7X.205
37662250            % TIMESTAMP                                                             37662250  32.7X.205
37662260                        %WORD 4                                                     37662260  32.7X.205
37662300            % ROWINFO                                                               37662300  31.061.240
37662400                        %WORD 5                                                     37662400  31.061.240
37662500      , VERSIONF   =[47:4]# % :=MCPHDRLEVEL  % IDENTIFIES FORMAT                    37662500  321721099
37662700      , PRIVUSERF  =[43:01]#           % 1=PRIV USER HDR                            37662700  31.061.240
37662750      , SENSITIVEDATAF=[42:1]#         % SCRUB WHEN RELEASED.                       37662750  321721099
37662800      , SECURITYCODEF=[41:02]#         % CLASS OF SECURITY.                         37662800  31.061.240
37662900      , READWRITEF =[39:02]#           % READ/WRITE SECURITY                        37662900  31.061.240
37663000      , NUMROWSF   =[37:14]#           % ROWS AVAIL FOR USE.                        37663000  321721099
37663100      , ROWSIZEF   =[23:24]#           % SEGMENTS IN EACH ROW.                      37663100  321721099
37663200            % NAMEQUALIFICATIONINFO                                                 37663200  31.061.240
37663300                        %WORD 6                                                     37663300  31.061.240
37663320      , JOBORDERF=[47:43]#             % USED BY CONTROLLER FOR JOB FILES           37663320  31.193.794
37663400      , SAVEFACTORF=[47:10]#           %SAVE TIME                                   37663400  31.061.240
37663500      , CREATEDDATEF=[37:18]#          %WHEN THE FILE WAS MADE                      37663500  31.061.240
37663600      , OPENERF    =[19:SNSIZE]#       % STK # OF OPENER                            37663600  35.026.736
37663700      , FILEORGANIZATIONF =[7:3]#      % FILEORGANIZATION ATTRIBUTE                 37663700  31.163.604
37663800      , COPYINFOF  =[4:5]#             % VERSION DRCTRY STUFF                       37663800  31.061.240
```

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37663900     ,    DUPLICATEDBIT=[4:1]#         %    FILE IS DUPLICATED                        37663900  31.061.240
37664000     ,    COPYNUMBERF=[3:4]#           %    NUMBER OF THIS COPY                       37664000  31.061.240
37664100            % ACCESSINFO                                                              37664100  31.061.240
37664200                        %WORD 7                                                       37664200  31.061.240
37664300       , DISKPACKF  =[47:1]#           %DISKPACK(HDR)                                 37664300  31.061.240
37664350       , WILLCRUNCHF=[45:1]#           % WILL BE CRUNCHED WHEN OPEN COUNT=0           37664350  321721099
37664400       , CRUNCHEDF  =[44:1]#           % 1 IF FILE IS CRUNCHED                        37664400  321721099
37664500       , CONTENDORSF=[42:11]#                                                         37664500  31.061.240
37664600       , IADVALIDITYF=[43:1]#          %FOR EXTERNAL IAD                              37664600  31.061.240
37664700       , REBUILDF   =[42:1]#           %REPRESENTATION                                37664700  31.061.240
37664800       , IADINFOF   =[41:10]#          % ONLY.....                                    37664800  31.061.240
37664900       , MODEF      =[31:3]#                                                          37664900  31.061.240
37665300       , WRITTENONF =[28:1]#           % 1 IF FILE WRITTEN ON.                        37665300  31.061.240
37665400       , WROTELASTROWF=[27:1]#         % 1 IF EOF ROW WRITTEN.                        37665400  31.061.240
37665500       , CHECKEOFF  =[26:1]#           % 1 IF MUST FIND EOF.                          37665500  31.061.240
37665510       , ORIGHEADERVERSIONF=[25:4]#    % ORIG. HDR VERSION IF THIS HEADER             37665510  350922267
37665520                                       % IS A HDR WHICH WAS CONVERTED WHEN            37665520  350922267
37665530                                       % IT WAS READ FROM DISK; 0 IF NOT              37665530  350922267
37665540                                       % CONVERTED (MEMORY VERSION ONLY)              37665540  350922267
37665542       , ROWADVERSIONF=[21:4]#         % VERSION OF ROWAD WORDS IN HEADER ON          37665542  350922267
37665544                                       % DISK (VERSION 5 AND LATER HEADERS)           37665544  350922267
37665550       , LASTACCESSDATEF=[17:18]#      %DATE LAST USED                                37665550  321721099
37665600            % D1LINKL                                                                 37665600  31.061.240
37665700                        % D1LINKWORD (CORE ONLY)  % WORD 8 OF CODEFILE                37665700  34.004.088
37665750      %% WORD 8 IS ALSO USED AS THE DMTIMESTAMPWORD (DATA FILES ONLY)                 37665750  34.004.088
37665800       , D1STACKLINKF=[35:SNSIZE]#                                                    37665800  35.026.736
37666000            % BDINFOWORDL                                                             37666000  31.061.240
37666100                        % WORD 9                                                      37666100  31.061.240
37666150      %% WORD 9 IS ALSO USED AS AN ERRORWORD IN ACTIVE MCP CODE FILE HEADERS          37666150  33.030.546
37666200      %% DESTCONTROLF = 47:24,                                                        37666200  321721099
37666400       , BDSTKNUMF  =[11:SNSIZE]#                                                     37666400  35.026.736
37666410            % CREATIONORAPLORJOBIX WORD           % WORD 11                           37666410  33.030.546
37666412       ,  CREATIONDATEF    = [47:16]#                                                 37666412  33.030.546
37666415       ,  CREATIONTIMEF    = [31:31]#  % 3.3 FILE ATTRIBUTE CREATIONTIME              37666415  33.030.546
37666420       ,  APLAPPLICATIONF  = [0:1]#    % APL IS BIT 0                                 37666420  32.035.221
37666500            % JOBNUMBERL                                                              37666500  31.061.240
37666600                        % WORD 11 OF A JOB FILE HEADER                                37666600  31.061.240
37666700       , JOBVALIDIF =[47:1]#                                                          37666700  31.061.240
37666800       , PBBITS     =[45:6]#           %% 45->LPDK,44->LPSRPK,43->LPNAMEDPK           37666800  31.061.240
37666900                                        % 42->CPDK,41->CPSRPK,40->CPNAMEDPK           37666900  31.061.240
37667000       ,    LPWHEREF   =[45:3]#                                                       37667000  31.061.240
37667100       ,    CPWHEREF   =[42:3]#                                                       37667100  31.061.240
37667150       , JOBSUMF    =[39:4]#           % CONTAINS VALUE OF JOBSUMMARY                 37667150  33.044.732
37667180       , NOJOBSUMMARYIOF =[35:1]#      % CONTAINS VALUE OF NOJOBSUMMARYIO             37667180  351112511
37667190       , JSTITLESETF=[34:1]#           % IS SET IF JOBSUMMARYTITLE IS SET             37667190  351122543
37667195       % %%%%%%%% UNUSED [33:2] %%%%%%%%%%                                            37667195  351122543
37667200       , JOBORGUNITF=[31:16]#                                                         37667200  31.061.240
37667300       , MIXNOF     =[15:16]#                                                         37667300  31.061.240
37667400            % COREINDEXL                                                              37667400  31.061.240
37667500       , TIMESTAMPSYNCF=[47:1]#        % 0 IMPLIES UPDATE CATALALOG                   37667500  31.061.240
37667600       , COREINDEXF =[46:47]#                                                         37667600  31.061.240
37667700            % DISKPACKINFO                                                            37667700  31.061.240
37667800                        % WORD 13                                                     37667800  31.061.240
37667900       , INTERCHANGEF=[47:1]#                                                         37667900  31.061.240
37667940       , SINGLEF    =[46:1]#                                                          37667940  321721099
37667960       , CYLMODEHDRF=[44:1]#           % CYLIN BOUNDARY ALLOC                         37667960  321721099
37668000       , SERNUMF    =[43:20]#                                                         37668000  31.061.240
37668050       , BASEUNITF  =[23:LUB(12)]#                                                    37668050  350421199
37668100       , LASTF      =[11:LUB(12)]#                                                    37668100  350421199
37668500            % HDREOFL                                                                 37668500  31.061.240
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37668600      , EOFU        =[47:20]#          % WORD 14.   CF: DSKEOFU AND FIBEOFU        37668600  340621611
37668700      , EOFV        =[27:28]#          % WORD 14.   CF: DSKEOFV AND FIBEOFV        37668700  340621611
37668740                       % WORD 15                                                  37668740  33.030.546
37668760      %%% USED FOR 3.3 FILE ATTRIBUTE USERINFO                                    37668760  33.030.546
37668800            % BACKUPCONTROLL                                                      37668800  31.061.240
37668820    %%%%%%%%%%%%%%%%%%%%%% WORD 16   (NEXTROWWRD)                                 37668820  31.218.969
37668830      , ALLOCATINGF=[47:1]#  % = 1 ALLOCATE RUNNING FOR THIS DIRECTORY HDR        37668830  31.218.969
37668840      , HDRCATF    =[46:1]#  % = 1 IF FILE IS CATALOGED                           37668840  31.218.969
37668850      %             [39:10]  % NEXT FASTIOV ROW                                   37668850  31.218.969
37668860      %             [29:10]  % NEXT VASTIOV ROW                                   37668860  31.218.969
37668870      %             [19:10]  % NEXT CATIOV ROW                                    37668870  31.218.969
37668880      %             [9:10]   % NEXT FLATIOV OR VOLIOV ROW                         37668880  31.218.969
37668900    %%%%%%%%%%%%%%%%%%%%%% WORD 17 OF A JOB FILE HEADER.                          37668900  31.218.969
37669000      , PHASEF     =[1:2]#                                                        37669000  31.061.240
37669020       % VALUES FOR JOBPHASE(HDR)                                                 37669020  33.012.356
37669040          ,RESTARTPHASE = 1 #                                                     37669040  33.012.356
37669060          ,RUNPHASE     = 2 #                                                     37669060  33.012.356
37669080          ,PRINTPHASE   = 3 #                                                     37669080  33.012.356
37669100      , NOSUMMARYOVRDF=[4:1]#                                                     37669100  31.061.240
37669200      , INFSF      =[5:1]#                                                        37669200  31.061.240
37669300      , FSFF       =[6:1]#                                                        37669300  31.061.240
37669400      , RESFF      =[7:1]#                                                        37669400  31.061.240
37669500      , BDPRIORF   =[29:22]#                                                      37669500  31.061.240
37669600      , CHECKPTF   =[39:10]#                                                      37669600  31.061.240
37669700      , JFCOPIEDF  =[40:1]#                                                       37669700  31.061.240
37669800      , CPRESTARTF =[41:1]#                                                       37669800  31.061.240
37669900      , CCRESTARTF =[42:1]#                                                       37669900  31.061.240
37670000      , CPPACKF    =[43:1]#                                                       37670000  31.061.240
37670100      , FSF        =[44:1]#                                                       37670100  31.061.240
37670200      , IBF        =[45:1]#                                                       37670200  31.061.240
37670300      , RESF       =[46:1]#                                                       37670300  31.061.240
37670400      , ROWF       =[47:1]#                                                       37670400  31.061.240
37670450      %%% WORD 17 ALSO USED FOR 3.3 FILE ATTRIBUTES ALTERDATE AND ALTERTIME       37670450  33.030.546
37670460      , ALTERDATEF =[47:16]#                                                      37670460  33.030.546
37670480      , ALTERTIMEF =[31:32]#                                                      37670480  33.030.546
37670500            % PBITIOCONTROLL                                                      37670500  31.061.240
37670600                       % WORD 18                                                  37670600  31.061.240
37670650      %%% HDRCM = [47:01]  = 1 ---> FOR POST 33 CM.  = 0 ---> PRE 33              37670650  33.030.546
37670700      , PBITIOHIATUSF=[1:1]#                                                      37670700  31.061.240
37670800      , CODEIOCOUNTF=[15:14]#                                                     37670800  31.061.240
37670840                       % WORD 19                                                  37670840  33.030.546
37670860      %%% WORD 19 IS USED FOR 3.3 FILE ATTRIBUTE USETIME ALIAS ACCESSTIME.        37670860  33.030.546
37670870      , ACCESSDATEF =[47:16]#                                                     37670870  33.030.546
37670880      , ACCESSTIMEF =[31:32]#                                                     37670880  33.030.546
37670882                                                                                  37670882  350922267
37670884    %        ROW ADDRESSES BEGIN AT FIRSTROWINDEX AND CONTINUE FOR AS MANY        37670884  350922267
37670886    %        WORDS AS THERE ARE ROWS (MAXIMUM=1023).  ROW ADDRESSES ARE IN        37670886  350922267
37670888    %        STANDARD MASS-ADDRESS FORM.                                          37670888  350922267
37670890    %        THE SECURITY INFORMATION FOLLOWS THE ROW ADDRESSES;                  37670890  350922267
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37623600    DEFINE                                                              37623600  34.034.823
37623700                                                                        37623700  31.036.234
37623800        %                                                               37623800  22.000.145
37623900        %                                                               37623900  31.041.240
37624000        %    THE FOLLOWING IS A DESCRIPTION OF A FILE HEADER            37624000  31.041.240
37624100        %                                                               37624100  31.041.240
37625500             %    THOSE NAMES  FOR ACCESSING THINGS FROM THE HEADER.    37625500  26.030.523
37625600        ACCESSDATE(HDR) = ACCESSDATEWORD(HDR).LASTACCESSDATEF #         37625600  321721099
37625700       ,ACCESSDATEWORD(HDR) = HDR[7] #                                  37625700  21.000.119
37625720       ,ACCESSTIMESTAMP(HDR) = HDR[19]#     % 3.3 FILE ATTRIBUTE USETIME 37625720  33.030.546
37625740       ,ACCESSTSTIME(HDR) = ACCESSTIMESTAMP(HDR).ACCESSTIMEF#           37625740  33.030.546
37625745       ,ACCESSTSDATE(HDR) = ACCESSTIMESTAMP(HDR).ACCESSDATEF#           37625745  33.030.546
37625800       ,ALLOCATEDROW(HDR,ROW) = BOOLEAN(HDR[FIRSTROWINDEX + ROW])       37625800  26.025.307
37625900                                             .ALLOCATEDROWF #           37625900  26.025.307
37626000       ,ALLOCATING(HDR)= NEXTROWWRD(HDR).ALLOCATINGF #                  37626000  31.218.969
37626020       ,ALTERTIMESTAMP(HDR) = HDR[17] #     % 3.3 FILE ATTRIBUTES       37626020  33.030.546
37626030       ,ALTERTIME(HDR) = ALTERTIMESTAMP(HDR).ALTERTIMEF #               37626030  33.030.546
37626040       ,ALTERDATE(HDR) = ALTERTIMESTAMP(HDR).ALTERDATEF #               37626040  33.030.546
37626060       ,APLMA(HDR) = HDR[2].APLMAF# % THIS IS A DUPLICATED APLMA BIT.  THE 37626060  33.030.546
37626080          % OLD APLMA BIT (OLDAPLMA) IS IN WORD 11 BIT 0. SEE HEADERKEEPER. 37626080  33.030.546
37626090       ,AVAILO(HDR) = HDR[1].AVAILOF# % FORMERLY SPEED ATTRIBUTE, AVAILABLE 37626090  34.028.677
37626100       ,BASEUNIT(HDR) = HDR[13].BASEUNITF #                             37626100  22.000.371
37626200       ,BACKUPFILE(HDR) = FILEKIND(HDR) IS BACKUPPRINTER                37626200  26.025.252
37626300                           OR FILEKIND(HDR) IS BACKUPPUNCH #            37626300  26.025.252
37626400       ,BDINFOWORD(HDR) = HDR[9] #                                      37626400  26.030.483
37626500       ,BACKUPCONTROLIX = 17 #                                          37626500  26.030.523
37626600       ,BACKUPCONTROL(HDR) = HDR[BACKUPCONTROLIX] #                     37626600  24.000.238
37626800       ,BDSTACKNUM(HDR) = BDINFOWORD(HDR).BDSTKNUMF#                    37626800  24.000.183
37626900       ,BDSERIALNUM(HDR) = BDINFOWORD(HDR).BDSERIALF #                  37626900  24.000.183
37627000       ,BUMPCODEIOCOUNT(HDR,TEMP)=                                      37627000  31.016.124
37627100                 BEGIN [ CONTROLSTATE ]                                 37627100  32.032.159
37627200                   TEMP:=BUZZ(HDR[18]);                                 37627200  31.016.124
37627300                   TEMP.CODEIOCOUNTF:=TEMP.CODEIOCOUNTF+1;              37627300  31.016.124
37627400                   HDR[18]:=TEMP;          % UNLOCK                     37627400  31.016.124
37627500                 END#                                                   37627500  31.016.124
37627600       ,CATALOGED(HDR) = NEXTROWWRD(HDR).HDRCATF#                       37627600  31.218.969
37627900       ,CHECKEOF(HDR)  = HDR[7].CHECKEOFF #                             37627900  26.025.196
37628000       ,CONTENDORS(HDR) = HDR[7].CONTENDORSF #                          37628000  22.000.265
37628300       ,COPYNUMBER(HDR)= FILEQUALITY(HDR).COPYNUMBERF #                 37628300  26.090.564
37628400       ,COREINDEX(HDR) = HDR[12].COREINDEXF #                          .37628400  29..0362
37628500       ,CREATIONDATE(HDR) = HDR[6].CREATEDDATEF#                        37628500  21.000.003
37628550       ,CREATIONORAPLORJOBIX = 11#                                      37628550  33.030.546
37628560       ,CREATIONTIMESTAMP(HDR) = HDR[CREATIONORAPLORJOBIX].[47:47]#     37628560  33.030.546
37628580       ,CREATIONTSDATE(HDR) = HDR[CREATIONORAPLORJOBIX].CREATIONDATEF # 37628580  33.030.546
37628590       ,CREATIONTSTIME(HDR) = HDR[CREATIONORAPLORJOBIX].CREATIONTIMEF#  37628590  33.030.546
37628600       ,CRUNCHED(HDR) = HDR[7].CRUNCHEDF #                              37628600  24.000.268
37628700       ,CYLMODE(HDR) = HDR[13].CYLMODEHDRF #         %CYLINDER ALLOC    37628700  26.000.086
37628800       ,D1LINKWORD(HDR) = HDR[8] #                                      37628800  34.004.088
37628850       ,D1LINK(HDR) = D1LINKWORD(HDR).D1STACKLINKF #                    37628850  34.004.088
37628900       ,DECREMENTCODEIOCOUNT(HDR,TEMP)=                                 37628900  DATEANDT
37629000                 BEGIN [ CONTROLSTATE ]                                 37629000  32.032.159
37629100                   TEMP:=BUZZ(HDR[18]);                                 37629100  31.016.124
37629200                   TEMP.CODEIOCOUNTF:=TEMP.CODEIOCOUNTF-1;              37629200  31.016.124
37629300                   IF TEMP.CODEIOCOUNTF = 0 THEN                        37629300  31.016.124
37629400                     TEMP.PBITIOHIATUSF:=0;                             37629400  31.016.124
37629500                   HDR[18]:=TEMP;          % UNLOCK                     37629500  31.016.124
37629600                 END#                                                   37629600  31.016.124
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37629700        ,DELAYEDCRUNCH(HDR) = BOOLEAN(HDR[7].WILLCRUNCHF) #                 37629700  24.000.268
37629800        ,DELAYCRUNCH(HDR) = HDR[7].WILLCRUNCHF #                            37629800  24.000.268
37629900        ,DISKADR(HDR,REC,RWSZ) = % RETURNS A SEGMENT ADDRESS                37629900  350541499
37630000            (ROWADDRESSWORD(HDR,(REC) DIV RWSZ).SEGADDRESSF+(REC) MOD RWSZ) #  37630000  350541499
37630025        ,DISKADRINFO(HDR,SEG) = % RETURNS A SEGMENT ADDRESS AND LU #        37630025  350611756
37630035                (O & ROWUNIT(HDR,(SEG DIV ROWSIZE(HDR)))  ROWUNITNUMF       37630035  350611756
37630055                   & (ROWADDRESSWORD(HDR,(SEG DIV ROWSIZE(HDR))).SEGADDRESSF+  37630055  350611756
37630060                                       (SEG MOD ROWSIZE(HDR)))              37630060  350611756
37630065                                                   ROWBASEADDRESSF) #       37630065  350541499
37630100        ,DISKBLOCKING(HDR) = HDR[3]#                                        37630100  21.000.003
37630200        ,DISKBLOCKSIZE(HDR) = DISKBLOCKING(HDR).BLOCKSIZEF#                 37630200  31.163.604
37630300        ,DISKCYCLE(HDR) = DISKGENEALOGYWORD(HDR).CYCLE #                    37630300  26.030.523
37630400        ,DISKFILEMODE(HDR) = HDR[7].MODEF #                                 37630400  22.000.265
37630500        ,DISKGENEALOGY(HDR) = DISKGENEALOGYWORD(HDR).GENEALOGYF #           37630500  26.030.523
37630600        ,DISKGENEALOGYWORD(HDR) = HDR[10] #                                 37630600  26.030.523
37630700        ,DISKMAXRECSIZE(HDR) = DISKBLOCKING(HDR).MAXRECSIZEF#               37630700  31.163.604
37630800        ,DISKPACK(HDR)=BOOLEAN(HDR[7].DISKPACKF)#                           37630800  21.000.187
37630900        ,DISKPACKHDR(HDR)=HDR[7].DISKPACKF#                                 37630900  21.000.187
37631000        ,DISKPACKSERNUM(HDR,ROW)=HDR[ROW].DPSERIALOREUF#                    37631000  21.000.199
37631100        ,DISKPACKWORD(HDR) = HDR[13]#                                       37631100  22.000.152
37631200        ,DISKSAVEFCTR(HDR) = HDR[6].SAVEFACTORF #                           37631200  21.000.003
37631400        ,DISKVERSION(HDR) = DISKGENEALOGYWORD(HDR).GENVERSN #               37631400  26.030.523
37631500        ,DMSROWLOCK(HDR,ROW)=HDR[ROW+FIRSTROWINDEX].DMLOCKBITSF#            37631500  25.020.200
37631600        ,DMTIMESTAMP(HDR) = D1LINKWORD(HDR) #                               37631600  34.004.088
37631700        ,DSKEOF(HDR)=HDR[14]#                                               37631700  21.000.119
37631800        ,DSKEOFU(HDR)=DSKEOF(HDR).EOFU#                                     37631800  21.000.119
37631900        ,DSKEOFV(HDR)=DSKEOF(HDR).EOFV#                                     37631900  21.000.119
37631920         % THE CONVENTION FOR DSKEOF IS SUPPOSED TO BE:                     37631920  331241208
37631940         %   DSKEOFV = NUMBER OF WHOLE SEGMENTS IN THE FILE;                37631940  331241208
37631960         %   DSKEOFU = NUMBER OF BITS IN ANY PARTIAL LAST SEGMENT (MAY BE 0).  37631960  331241208
37632000        ,DUPLICATED(HDR)=BOOLEAN(HDR[6].DUPLICATEDBIT)#                     37632000  21.000.232
37632100        ,ERRORWORD(HDR) = HDR[9] # % NOTE WORD 9 IS ALSO USED FOR BDINFO    37632100  33.030.546
37632200        ,FILEORGANIZATION(HDR)=HDR[6].FILEORGANIZATIONF #                   37632200  31.163.604
37632300        ,FILEQUALITY(HDR)=HDR[6]#                                           37632300  21.000.119
37632400        ,FILESTRUCTURE(HDR)=HDR[5]#                                         37632400  21.000.119
37632500        ,FILEKIND(HDR) = HDR[1].FILEKINDF #                                 37632500  26.025.252
37632600        ,FIBINFO(HDR) = HDR[2]#                                             37632600  21.000.003
37632700        ,FIRSTROWINDEX  = 20 #                                              37632700  26.030.480
37632900        ,HDRBLOCKLENGTH(HDR) = HDR[0].HDRBLOCKLENGTHF#                      37632900  26.025.406
37632950        ,HDRCM = [47:01] # % MAY BE TEMPORARY. SEE HEADERKEEPER NOTES.      37632950  33.030.546
37633000        ,HDRLOCATION(HDR) = HDR[0].HDRLOCATIONF#                            37633000  26.025.406
37633100        ,HDRMAKER(HDR) = HDR[6].OPENERF#                                    37633100  31.016.124
37633200        ,HDRMARKER(HDR) = HDR[0].MARKERF#                                   37633200  26.025.406
37633300        ,HEADERGUARDP(HDR) = POINTER(HDR[FIRSTROWINDEX                      37633300  26.090.564
37633400                                      + NUMBEROFROWS(HDR)],8) #             37633400  26.090.564
37633500        ,HEADERINFO(HDR) = HDR[1] #                                         37633500  21.000.119
37633550        ,HEADERROWADVERSION(HDR) = HDR[7].ROWADVERSIONF #                   37633550  350922267
37633600        ,HEADERSERNUM(HDR) = DISKPACKWORD(HDR).SERNUMF #                    37633600  26.090.564
37633700        ,HEADERSIZE(HDR) = HDR[1].HEADERSIZEF #                             37633700  21.000.003
37633800        ,HEADERTITLE(HDR) = POINTER(HDR[HEADERSIZE(HDR)],8)#                37633800  26.030.483
37633900        ,HEADERTITLEHEAD(HDR) = HDR[HEADERSIZE(HDR)]#                       37633900  31.143.489
37634000        ,HEADERVERSION(HDR)        = HDR[5] .VERSIONF#                      37634000  21.000.199
37634100        ,IADFILE(HDR)=BOOLEAN(HDR[2].IADBIT)#                               37634100  21.000.232
37634200        ,IADFILER(HDR)=HDR[2].IADBIT#                                       37634200  23.001.257
37634300        ,IADINFO(HDR)=HDR[7].IADINFOF#                                      37634300  23.001.257
37634400        ,INTERCHANGE(HDR)=BOOLEAN(HDR[13].INTERCHANGEF)#                    37634400  21.000.087
37634500        ,INTERCHG(HDR)=HDR[13].INTERCHANGEF#                                37634500  22.000.098
37634600        ,JOBNUMBERIX = CREATIONORAPLORJOBIX #                               37634600  33.030.546
37634700        ,JOBNUMBER(HDR) = HDR[JOBNUMBERIX] #                                37634700  24.000.238
37634800        ,JOBPHASE(HDR) = BACKUPCONTROL(HDR).PHASEF #                        37634800  24.000.238
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37634900    ,JOBMIXNO(HDR) = JOBNUMBER(HDR).MIXNOF #                                     37634900   24.000.238
37635000    ,LASTCP(HDR) = BACKUPCONTROL(HDR).CHECKPTF #                                 37635000   DISKFILE
37635100    ,LASTU(HDR)=HDR[13].LASTF#                                                   37635100   21.000.157
37635200    ,LINKVALIDITY(HDR)=HDR[7].IADVALIDITYF#                                      37635200   23.001.257
37635300    ,NEXTROW(HDR,T) = NEXTROWWRD(HDR)                                            37635300   26.030.480
37635400                              .[(CASE T OF (39,29,9,19,9)):10] #                 37635400   26.030.480
37635500    ,NEXTROWWRD(HDR)= HDR[16] #                                                  37635500   26.030.480
37635600    ,NOROWV         = 1023 #                                                     37635600   26.030.480
37635700    ,NUMBEROFROWS(HDR) = HDR[5].NUMROWSF #                                       37635700   21.000.003
37635720    ,NUMBEROFSEGMENTS(HDR) = (DSKEOFV(HDR) +                                     37635720   32.033.180
37635740                            (DSKEOFU(HDR)+(30*48)-1) DIV (30*48)) #              37635740   32.033.180
37635800    ,OLDAPLMA(HDR)=HDR[CREATIONORAPLORJOBIX].APLAPPLICATIONF#                    37635800   33.030.546
37635900    ,OPENCOUNT(HDR) = HDR[1].OPENCOUNTF #                                        37635900   21.000.003
37635950    ,ORIGHEADERVERSION(HDR) = HDR[7].ORIGHEADERVERSIONF #                        37635950   350922267
37636000    ,OUTSTANDINGIOCOUNT(HDR) = HDR[18]#      % FROM PBIT,EOJ,PROGRAMDUMP         37636000   31.016.124
37636100    ,PERMANENT(HDR) = BOOLEAN(HDR[2].PERMANENCYF) #                              37636100   22.000.457
37636200    ,PERMANENTDISKFILE(HDR) = HDR[2].PERMANENCYF #                               37636200   21.000.052
37636300    ,PMODE(HDR)     = FIBINFO(HDR).PHYSICALMODEF#                                37636300   33.003.076
37636400    ,PRIVILEDGEDBIT(HDR) = HDR[5].PRIVUSERF #                                    37636400   21.000.199
37636500    ,PROTECTEDBIT(HDR)=HDR[2].PROTECTIONF #                                      37636500   21.000.003
37636600    ,READWRITEUSE(HDR)=HDR[5].READWRITEF #                                       37636600   21.000.199
37636700    ,REBUILDLINKS(HDR)= HDR[7].REBUILDF#                                         37636700   23.001.257
37636900    ,ROWADDRESSWORD(HDR,ROWNBR) = HDR[FIRSTROWINDEX + ROWNBR] #                  37636900   26.025.307
37637000    ,ROWUNIT(HDR,ROW)=FAMINDEXUNIT(BASEUNIT(HDR),                                37637000   350541499
37637050                               HDR[FIRSTROWINDEX+ROW].FAMILYINDEXF) #            37637050   350541499
37637100    % ROWINDEX(FIB,SEGADDRESS,LU) IS A PROCEDURE THAT RETURNS THE ROW #          37637100   351802860
37637150    % OF THE FIB HEADER ROW THAT RESIDES ON LU AND CONTAINS SEGADDRESS.          37637150   351802860
37637200    ,ROWSIZE(HDR) = HDR[5].ROWSIZEF #                                            37637200   21.000.003
37637300    ,SAVETIME(HDR)  = HDR[6].SAVEFACTORF #                                       37637300   21.000.003
37637400    ,SECURITYAREA = 0#                                                           37637400   31.016.124
37637500    ,SECURITYCLASS(HDR)=HDR[5].SECURITYCODEF #                                   37637500   21.000.199
37637600    ,SECURITYINFO(HDR) = HDR[HDR[5].NUMROWSF+FIRSTROWINDEX] #                    37637600   21.000.003
37637700    ,SECURITYSIZE(HDR) = HDR[1].SECINFOSIZEF #                                   37637700   21.000.199
37637800    ,SENSITIVEDATA(HDR) = BOOLEAN(SENSITIVEDATAFILE(HDR)) #                      37637800   26.090.555
37637900    ,SENSITIVEDATAFILE(HDR) = FILESTRUCTURE(HDR).SENSITIVEDATAF #                37637900   26.090.555
37637940    ,SETCREATIONTIMESTAMP(HDR,VALU)=                                             37637940   33.030.546
37637960          CREATIONTIMESTAMP(HDR):=(VALU).[47:47] #                               37637960   33.030.546
37638000    ,SINGLEPACK(HDR)=BOOLEAN(HDR[13].SINGLEF)#                                   37638000   21.000.157
37638200    ,SYSTEMFILE(HDR)= FIBINFO(HDR).SYSTEMFYLEF #                                 37638200   26.030.480
37638300    ,TANKD1(HDR)=HDR[2].[43:44]#                                                 37638300   21.000.257
37638400    ,TANKD2(HDR)=HDR[3]#                                                         37638400   21.000.257
37638500    ,TEMPORARY(HDR) = NOT PERMANENT(HDR) #                                       37638500   26.030.480
37638600    ,TIMESTAMP(HDR) = HDR[4] #                                                   37638600   26.030.480
37638700    ,TIMESTAMPHEADER(HDR)= TIMESTAMP(HDR) := DATEANDTIME #                       37638700   26.030.480
37638800    ,TIMESTAMPSYNC(HDR) = HDR[12].TIMESTAMPSYNCF #                               37638800   29..0362
37638900    ,TIMESTAMPSYNCED(HDR) = BOOLEAN(HDR[12].TIMESTAMPSYNCF) #                    37638900   29..0362
37638920    ,TSTOMICRO = 38.4 # % THE TIMESTAMP (TS) TIME IS STORED IN 2.4 MICRO         37638920   33.030.546
37638940       % SECOND UNITS RIGHT TRUNCATED BY 4 BITS.  TO GET THE TS TIME TO          37638940   33.030.546
37638960       % MICROSECONDS, MUST MULTIPLY BY 2.4 AND ADJUST BY 16, THUS 38.4;         37638960   33.030.546
37638980       % CONVERSELY, TO OBTAIN TS TIME FROM MICROSECONDS, DIV BY THIS #.         37638980   33.030.546
37639000    ,UPDATED(HDR) = HDR[1].UPDATEBITF#                                           37639000   21.000.003
37639050    ,USERINFO(HDR) = HDR[15]#    % 3.3 FILE ATTRIBUTE.                          37639050   33.030.546
37639100    ,WAITFORIOHIATUS(HDR,TEMP)=           % RETURNS 0 IN TEMP IF OK              37639100   31.016.124
37639200              BEGIN [ CONTROLSTATE ]                                             37639200   32.032.159
37639300                TEMP:=BUZZ(HDR[18]);                                             37639300   31.016.124
37639400                IF TEMP.CODEIOCOUNTF = 0 THEN                                    37639400   31.016.124
37639500                BEGIN                                                            37639500   31.016.124
37639600                  HDR[18]:=TEMP;      % UNLOCK                                   37639600   31.016.124
37639700                  TEMP:=0;            % RETURN OK RESULT                         37639700   31.016.124
37639800                END ELSE                                                         37639800   31.016.124
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37639900                   BEGIN                                                            37639900  31.016.124
37640000                     HDR[18]:=TEMP:=*&1 PBITIOHIATUSF;   % UNLOCK                   37640000  31.016.124
37640100                     THRU 10 DO                                                     37640100  31.016.124
37640200                       BEGIN                                                        37640200  31.016.124
37640300                         IF TEMP.PBITIOHIATUSF = 1 THEN                             37640300  31.016.124
37640400                         BEGIN                                                      37640400  31.016.124
37640500                           TIMETUNNEL(1);                                           37640500  31.016.124
37640600                           TEMP:=BUZZ(HDR[18]);                                     37640600  31.016.124
37640700                           HDR[18]:=TEMP;             % UNLOCK                      37640700  31.016.124
37640800                         END;                                                       37640800  31.016.124
37640900                       END;                                                         37640900  31.016.124
37641000                     TEMP:=*.PBITIOHIATUSF;           % SET RESULT                  37641000  31.016.124
37641100                   END;                                                             37641100  31.016.124
37641200                 END#                                                               37641200  31.016.124
37641300       ,WRITTENON(HDR) = HDR[7].WRITTENONF #                                        37641300  26.025.196
37641400       ,WROTELASTROW(HDR) = HDR[7].WROTELASTROWF #                                  37641400  26.025.196
37641500      %THESE DEFINITIONS ARE TO BE USED FOR "FILEKIND" IN                           37641500  31.050.290
37641600      %FILE HEADERS AND DIRECTORY NAME ENTRIES:                                     37641600  31.050.290
37641800       ,VERSIONDIRECTORY = (VERSIONDIRECTORYAV).MVALUE #                            37641800  34.022.438
37642000       ,CATALOGFILE      = (CATALOGAV).MVALUE #                                     37642000  34.022.438
37642100       ,BACKUPPRINTER = (BACKUPPRINTERAV).MVALUE #                                  37642100  34.022.438
37642200       ,RECONSTRUCTIONFILE = (RECONSTRUCTIONFILEAV).MVALUE #                        37642200  34.022.438
37642300       ,SYSTEMDIRFILE = (SYSTEMDIRFILEAV).MVALUE #                                  37642300  34.022.438
37642400       ,JOBDESCFILE = (JOBDESCFILEAV).MVALUE #                                      37642400  34.022.438
37642500       ,ARCHIVELOG = (ARCHIVELOGAV).MVALUE #                                        37642500  34.022.438
37642550       ,BOOTCODE = (BOOTCODEAV).MVALUE #    % INITIALIZATION CODEFILE               37642550  350731899
37642600       ,XDISKFILE = (XDISKFILEAV).MVALUE #                                          37642600  34.022.438
37642700    % FILEKIND 16 IS RESERVED FOR FUTURE IMPLEMENTATION              %              37642700  31.156.552
37642800    %         ,   BACKUPPRINTER = 16 # % FOR FUTURE IMPLEMENTATION.  %              37642800  22.000.071
37642900       ,BACKUPPUNCH = (BACKUPPUNCHAV).MVALUE  #                       %             37642900  34.022.438
37643000       ,REMOTEBACKUP = (REMOTEBACKUPAV).MVALUE #                       %            37643000  34.022.438
37643100       ,REMOTEAUDIT = (REMOTEAUDITAV).MVALUE #                        %             37643100  34.022.438
37643200       ,COMPILERCODEFILE = (COMPILERCODEFILEAV).MVALUE #                            37643200  34.022.438
37643300       ,CHECKPOINTFILE = (CHECKPOINTFILEAV).MVALUE #                                37643300  34.022.438
37643400       ,CPJOBFILE = (CPJOBFILEAV).MVALUE #                                          37643400  34.022.438
37643500       ,DCPCODE = (DCPCODEAV).MVALUE #                                              37643500  34.022.438
37643700       ,RECOVERYFILE   = (RECOVERYFILEAV).MVALUE #                                  37643700  34.022.438
37643800       ,SCHEDULEFILE   = (SCHEDULEFILEAV).MVALUE #                                  37643800  34.022.438
37643900       ,INFOFILE       = (INFOFILEAV).MVALUE #                                      37643900  34.022.438
37644000       ,LIBRARYCODE = (LIBRARYCODEAV).MVALUE #                                      37644000  34.022.438
37644100       ,INTRINSICFILE = (INTRINSICFILEAV).MVALUE #                                  37644100  34.022.438
37644200       ,MCPCODEFILE = (MCPCODEFILEAV).MVALUE #                                      37644200  34.022.438
37644300       ,ALGOLCODE = (ALGOLCODEAV).MVALUE #                                          37644300  34.022.438
37645000       ,DCALGOLCODE = (DCALGOLCODEAV).MVALUE #                                      37645000  34.022.438
37645300       ,JOBCODE = (JOBCODEAV).MVALUE #                                              37645300  34.022.438
37645400       ,DMALGOLCODE    = (DMALGOLCODEAV).MVALUE #                                   37645400  34.022.438
37645600       ,CODEFILE = (CODEFILEAV).MVALUE #                                            37645600  34.022.438
37646000       ,BOUNDCODE = (BOUNDCODEAV).MVALUE #                                          37646000  350812184
37647900       ,FIRMWARE = (FIRMWAREAV).MVALUE #    % DISK PACK FIRMWARE FILE               37647900  34.022.438
37648000       ,DATA = (DATAAV).MVALUE #                                                    37648000  34.022.438
37648100       ,SEQDATA = (SEQDATAAV).MVALUE #                                              37648100  34.022.438
37648500       ,CDATA = (CDATAAV).MVALUE #                                                  37648500  34.022.438
37648700       ,DBRESTARTSET = (DBRESTARTSETAV).MVALUE #                                    37648700  34.022.438
37648800       ,DBDATA = (DBDATAAV).MVALUE #                                                37648800  34.022.438
37648900       ,DATAKIND(T) = (T GEQ DATA) #                                                37648900  29..0379
37649000       ,NONEXEC(T)=(T GEQ LIBRARYCODE AND T LEQ MCPCODEFILE) #                      37649000  DISKFILE
37649100       ,SYMBOLFILE(T)=(T GEQ ALGOLSYMBOL AND T LSS RSNETFILE) #                     37649100  27..0515
37649200       ,DANGEROUS(T)= (T EQL BOOTCODE OR                                            37649200  350731899
37649250                      (T GEQ COMPILERCODEFILE AND                                   37649250  350731899
37649300                       T LEQ CODEFILE AND T NEQ INFOFILE)) #                        37649300  350731899
```

```
37649400                  % DANGEROUS FILES ARE THOSE WHICH CAN BE SYSTEM FATAL            37649400  27..0147
37649500                  % IF THEY BECOME CORRUPTED                                       37649500  27..0147
37649600                                     %DISK FILE ACESS MODES                        37649600  22.000.265
37649700       ,SHARED    = 0  #                                                           37649700  22.000.265
37649800       ,EXCLUSIVE = 1  #                                                           37649800  22.000.265
37649900       ,INPUTONLY = 2  #                                                           37649900  22.000.265
37650000       ,OUTPUTONLY= 3  #                                                           37650000  22.000.265
37650100                  % MNEMONICS FOR FILEORGANIZATION ATTRIBUTE                       37650100  31.163.604
37650200       ,NOTRESTRFO = 0 #                                                           37650200  31.163.604
37650300       ,RELATIVEFO = 1 #                                                           37650300  31.163.604
37650350       ,INDEXEDFO  = 2 #                                                           37650350  331221137
37650500       ,INDEXEDNOTRESTRFO = 3 #  % ISAM FILE WITH RELATIVE KEYS.                   37650500  331221137
37650600             % INFORMER CODE FOR CALLS ON JEDGARHOOVER                             37650600  21.000.003
37650700       ,OPENSECURITY       =    0 #                                                37650700  21.000.003
37650800       ,DIDDLERSECURITY    =    1 #                                                37650800  21.000.003
37650900       ,ENTERFILESECURITY  =    2 #                                                37650900  21.000.003
37651000       ,DOCTORSECURITY     =    3 #                                                37651000  21.000.003
37651100       ,USERDATASECURITY   =    4 #                                                37651100  23.001.507
37651200       ,ATTRIBUTESECURITY  =    5 #                                                37651200  21.000.003
37651300       ,LRSECURITY         =    6 #                                                37651300  21.000.003
37651400       ,LIBRARY1           =    7 #                                                37651400  21.000.003
37651500       ,LIBRARY2           =    8 #                                                37651500  21.000.003
37651600       ,NEWFIBBER          =    9 #                                                37651600  21.000.003
37651700       ,ILLEGALCOL         =   10 #                                                37651700  21.000.003
37651800       ,BDFILESECURITY     =   11 #                                                37651800  29..0055
37651900             % FILE SECURITY CLASSES                                               37651900  21.000.003
37652000       ,CLASSA   =    0 #                                                          37652000  21.000.003
37652100       ,CLASSB   =    1 #                                                          37652100  21.000.003
37652200       ,CLASSC   =    2 #                                                          37652200  21.000.003
37652300       ,PRIVATE  =    3 #                                                          37652300  21.000.003
```

MISC

APPENDIX H

```
JSD/MEMDUMP/EXAMPLE (11/08/84)                                                    3:00 PM TUESDAY, APRIL 9, 1985


BEGIN
        REAL
                 R1
                ,R2
                ,R3
                ,R4
                ;

        EBCDIC ARRAY EB [0:179];
        ARRAY A[0] = EB;

        PROCEDURE CAUSEFINALFAULT;
          BEGIN

            REPLACE POINTER(A) BY "THIS SHOULD CAUSE AN ERROR"
                FOR 32 WORDS;         % SEG ARRAY

          END;

        PROCEDURE CAUSEFIRSTFAULT;
          BEGIN

                R1:=R2/R3;  % DIV ZERO

          END;

        INTERRUPT INT;
          BEGIN

                CAUSEFINALFAULT;

          END;

        EPILOG PROCEDURE EP;
          BEGIN

                ENABLE INT;
                ON ANYFAULT,
                    WAIT(MYSELF.EXCEPTIONEVENT);
                CAUSEFIRSTFAULT;

          END;

        RESET(MYSELF.EXCEPTIONEVENT);
        ATTACH INT TO MYSELF.EXCEPTIONEVENT;
        DISABLE INT;

        END.
```

```
INPUT: STACK 88
```

```
############################################ PROCESSOR 4 TOOK DUMP FROM THIS STACK ############################################

                                           STACKDUMP FOR STACK 088         MIX NUMBER 2575/2701

          NAME: (LFPROG)OBJECT/JSD/MEMDUMP/EXAMPLE.


                (DS-ED @ 0003:0005:2)
  JOB MESSAGES:    RSVP: (NULL)
                DISPLAY: SEG ARRAY ERROR @ (00001300)*
                 ACCEPT: (NULL)
   LOCK STATUS: (NONE FOUND)
    STACK KIND: TASK                                         STACKINFO = 0 004801 780000
                                                           STACKSTATUS = 0 FFF342 F13910
        STATUS: ALIVE                   DSED
  PROCESS TYPE: PROCESS           LANGUAGE: DCALGOL 35.220

BOSR=338D6  LOSR=33AFE  LENGTH=00228 (552)                    last valid thing

0083 (01,0003)  1 570A55 C95CFO  OP: BCL:E RESET
0082 (01,0002)  0 CD5A64 665473
0081            3 000807 184CB9  RCW:  LL=1, CNTRL STATE                  [MCP SEGMENT        @ 0CB9:0071:4 (21075040)]
                                 SEG DESC:  3 880017 77BD65  ------ PROCESSKILL
                                 CODE:  3 CD5A64 665473   3 BEFFFF FFFFFF   3 570A55 C95CFO  >3 B195B4 ABB235<  3 95B840 CBA5B2
0080 ----D[01]=>3 C08000 804009 *MSCW: PREVIOUS MSCW @ 0077; D[0]=0008 IN STACK 008

007F (01,0008)  5 C00034 7338D6  DESC [PRESENT-COPY]: DATA, LENGTH=839  (POINTS @ OFFSET=0000 IN THIS STACK)
007E (01,0007)  0 000000 000000
007D (01,0006)  0 000000 00007F
007C (01,0005)  0 000000 00033A
007B (01,0004)  0 000000 000000
007A (01,0003)  0 FFFFFF FFFFFF
0079 (01,0002)  0 000000 000014
0078            3 000A25 B84C72  RCW:  LL=1, CNTRL STATE                  [MCP SEGMENT        @ 0C72:025B:5 (11385000)]
                                 SEG DESC:  3 A00025 D014EC  ------ HARDWAREINTERRUPT68
                                 CODE:  3 60ADAB B23595   3 B840CB A5B260   3 A6B7BD 9E27B6  >3 B8AE40 3AABB5<  3 A3A3FF FFFFFF
0077 ----D[01]=>3 C08000 804008 *MSCW: PREVIOUS MSCW @ 006F; D[0]=0008 IN STACK 008

0076 (01,0007)  7 088224 308C72  PCW
0075 (01,0006)  0 000000 000004
0074 (01,0005)  0 000000 00000E
0073 (01,0004)  0 000000 000003
0072 (01,0003)  0 AB23E0 0D3038
0071 (01,0002)  0 000009 000400  ******** SEGMENTED ARRAY     ***********************************************************************
0070            3 000400 50E003  RCW:  LL=3, NORML STATE                  [USER SEGMENT       @ 0003:0005:2]
  CODE FILE NOT AVAILABLE: (LFPROG)OBJECT/JSD/MEMDUMP/EXAMPLE ON DISK.
                                 SEG DESC:  3 800002 B9F403
                                 CODE:  3 A2A012 B05007   3 A6B204 9C2A03   3 B06004 A6962A  >3 B220D3 A31003<  3 100483 5002B8
     0000:0  NVLD                FF
     0000:1  NAMC 02,0006        5006
     0000:3  LOAD                BD
     0000:4  LT8  1E(30)         B21E
     0001:0  INSR 42:23          9C2A17
     0001:3  NAMC 02,0007        5007
     0001:5  OVRD                BA
     0002:0  BRUN 0012:5         A2A012
     0002:3  ZERO                B0
     0002:4  NAMC 02,0007        5007
     0003:0  INDX                A6
     0003:1  LT8  04(4)          B204
```

```
       0003:3  INSR 42:3             9C2A03
       0004:0  ZERO                  B0
       0004:1  NAMC 01,0004          6004
       0004:3  INDX                  A6
       0004:4  BSET 42               962A
       0005:0  LT8  20(32)           B220
 >>>>>0005:2  TWSD                  D3
       0005:3  EXIT                  A3
       0005:4  VALC 02,0003          1003
       0006:0  VALC 02,0004          1004
       0006:2  DIVD                  83
       0006:3  NAMC 02,0002          5002
       0006:5  STOD                  B8
       0007:0  EXIT                  A3
       0007:1  BRUN 0008:3           A26008
       0007:4  MKST                  AE
       0007:5  NAMC 02,0008          5008

 006F ----D[01]=>3 C08000 804005 *MSCW: PREVIOUS MSCW @ 006A; D[0]=0008 IN STACK 008

 006E (03,0004)  0 000000 00001B
 006D (03,0003)  5 EC0000 5AB239  DESC [PRESENT-COPY]: STRING (8-BIT), INDEX=5+0, READONLY  (MOM @ OFFSET=0008 IN SEGDICT)
 006C (03,0002)  5 E40000 5C267B  DESC [PRESENT-COPY]: STRING (8-BIT), INDEX=5+0  (MOM @ OFFSET=001A IN THIS STACK)
 006B            3 000400 80E003  RCW:  LL=3, NORML STATE                  [USER SEGMENT      @ 0003:0008:2]
                                  SEG DESC:  3 800002 B9F403
                                  CODE:  3 B220D3 A31003   3 100483 5002B8   3 A3A260 08AE50  >3 08ABA3 AE6005<  3 500CAF ABBEFF
 006A ----D[03]=>3 488001 40C002 *MSCW: PREVIOUS MSCW @ 0068; D[2]=0014 IN THIS STACK

 0069            3 00020C E84C88  RCW:  LL=1, CNTRL STATE                  [MCP SEGMENT       @ 0C88:00CE:1 (12908400)]
                                  SEG DESC:  3 88000D BAF570  ------ PROCESSOFTWAREINTERRUPTS
                                  CODE:  3 9613B3 0A009C   3 2F0CB2 0695B4   3 6008BA AE6007  >3 ABB060 08BAA2<  3 A003B2 4F6005
 0068 ----D[03]=>3 488001 40C009 *MSCW: PREVIOUS MSCW @ 005F; D[2]=0014 IN THIS STACK

 0067 (01,0008)  6 A0040C F84C88  SCW: (BLOCK BELOW DECLARED INTERRUPTS, SNGL-DIM ARRAYS, LIBRARY TEMPLATE)
 0066 (01,0007)  1 488001 40000C  SIRW: OFFSET=0020 (0014+000C) IN THIS STACK
 0065 (01,0006)  0 000000 000000
 0064 (01,0005)  5 C00008 34917A  DESC [PRESENT-COPY]: DATA, LENGTH=131  (MOM NOT OF THIS STACK OR SEGDICT)
 0063 (01,0004)  6 000000 000000  (UNINITIALIZED VARIABLE)
 0062 (01,0003)  6 000000 000000  (UNINITIALIZED VARIABLE)
 0061 (01,0002)  6 000000 000000  (UNINITIALIZED VARIABLE)
 0060            3 000213 C88CCE  RCW:  LL=2, CNTRL STATE                  [MCP SEGMENT       @ 0CCE:013C:1 (23992040)]
                                  SEG DESC:  3 880017 B7BEE0  ------ INNERCEDE OF INTERCEDE
                                  CODE:  3 1AB6B8 B040A1   3 B80019 A0613B   3 B0958F AE426B  >3 ABA280 05B235<  3 95B840 CBA5B2
 005F ----D[01]=>3 C08000 804004 *MSCW: PREVIOUS MSCW @ 005B; D[0]=0008 IN STACK 008

 005E (02,0003)  0 000000 000000
 005D (02,0002)  0 000000 000002
 005C            3 000828 984BCE  RCW:  LL=1, CNTRL STATE                  [MCP SEGMENT       @ 0BCE:0289:4 (24001200)]
                                  SEG DESC:  3 A00036 C076FB  ------ INTERCEDE
                                  CODE:  3 95BCB6 BAB230   3 6003A6 B795BC   3 B09C2F 23B6BA  >3 AE6006 ABA3A3<  3 B0B0B0 B0B0B0
 005B ----D[02]=>3 488005 408007 *MSCW: PREVIOUS MSCW @ 0054; D[1]=0054 IN THIS STACK

 005A (01,0006)  7 088000 088CCE  PCW
 0059 (01,0005)  0 005500 000004
 0058 (01,0004)  6 000000 000000  (UNINITIALIZED VARIABLE)
 0057 (01,0003)  5 C00008 34917A  DESC [PRESENT-COPY]: DATA, LENGTH=131  (MOM NOT OF THIS STACK OR SEGDICT)
 0056 (01,0002)  0 000000 000003
 0055            3 020200 F12003  RCW:  LL=4, NORML STATE                  [USER SEGMENT      @ 0003:000F:1]
                                  SEG DESC:  3 800002 B9F403
                                  CODE:  3 BAA240 0FAE60   3 06AE60 07AE60   3 08ABB2 15ABB0  >3 ABA3AE 5009AB<  3 A3A240 0FB0BF
```

```
0054 ----D[01]=>3 C08000 804004 *MSCW: PREVIOUS MSCW @ 0050; D[0]=0008,IN STACK 008

0053 (04,0003)  0 000000 000001
0052 (04,0002)  0 000000 00003D
0051                3 020803 784CDD  RCW:  LL=1, CNTRL STATE                 [MCP SEGMENT       @ 0CDD:0037:4 (24643400)]
                                     SEG DESC:  3 A00004 807EC9  ------ FAULTHANDLER
                                     CODE:  3 089A0C 01A040   3 36AE60 05ABA2   3 8037AE 600520  >3 032002 ABB060<  3 06BA60 04B235
0050 ----D[04]=>3 488003 61000B *MSCW: PREVIOUS MSCW @ 0045; D[3]=0036 IN THIS STACK

004F (01,000A)  0 000000 000036
004E (01,0009)  0 000000 000038
004D (01,0008)  0 024FFF E20000
004C (01,0007)  7 088803 784CDD  PCW
004B (01,0006)  4 000000 320000  "ON <FAULT>" MARKER
004A (01,0005)  1 488003 600003  SIRW: OFFSET=0039 (0036+0003) IN THIS STACK
0049 (01,0004)  0 000000 000000
0048 (01,0003)  0 000000 00003D
0047 (01,0002)  0 000000 000001
0046                3 000624 784C72  RCW:  LL=1, CNTRL STATE                 [MCP SEGMENT       @ 0C72:0247:3 (11382600)]
                                     SEG DESC:  3 A00025 D014EC  ------ HARDWAREINTERRUPT68
                                     CODE:  3 000224 308C72   3 B4AE40 392005   3 B195B8 B22595  >3 B881AB 2005B2<  3 038CA0 A24D20
0045 ----D[01]=>3 C08000 804008 *MSCW: PREVIOUS MSCW @ 003D; D[0]=0008 IN STACK 008

0044 (01,0007)  7 088224 308C72  PCW
0043 (01,0006)  0 000000 000004
0042 (01,0005)  0 000000 000001
0041 (01,0004)  0 000000 000000
0040 (01,0003)  0 9F40A0 083020
003F (01,0002)  0 000009 000004  ********  DIVIDE BY ZERO    **********************************************************************
003E                3 000400 60E003  RCW:  LL=3, NORML STATE                 [USER SEGMENT      @ 0003:0006:2]
                                     SEG DESC:  3 800002 B9F403
                                     CODE:  3 A6B204 9C2A03   3 B06004 A6962A   3 B220D3 A31003  >3 100483 5002B8<  3 A3A260 08AE50
     0001:0  INSR 42:23         9C2A17
     0001:3  NAMC 02,0007       5007
     0001:5  OVRD               BA
     0002:0  BRUN 0012:5        A2A012
     0002:3  ZERO               B0
     0002:4  NAMC 02,0007       5007
     0003:0  INDX               A6
     0003:1  LT8  04(4)         B204
     0003:3  INSR 42:3          9C2A03
     0004:0  ZERO               B0
     0004:1  NAMC 01,0004       6004
     0004:3  INDX               A6
     0004:4  BSET 42            962A
     0005:0  LT8  20(32)        B220
     0005:2  TWSD               D3
     0005:3  EXIT               A3
     0005:4  VALC 02,0003       1003
     0006:0  VALC 02,0004       1004
>>>>>0006:2  DIVD               83
     0006:3  NAMC 02,0002       5002
     0006:5  STOD               B8
     0007:0  EXIT               A3
     0007:1  BRUN 0008:3        A26008
     0007:4  MKST               AE
     0007:5  NAMC 02,0008       5008
     0008:1  ENTR               AB
     0008:2  EXIT               A3
     0008:3  MKST               AE
```

```
      0008:4  NAMC 01,0005       6005

003D ----D[01]=>3 C08000 804003 *MSCW: PREVIOUS MSCW @ 003A; D[0]=0008 IN STACK 008

003C (03,0002)  0 000000 000000
003B            3 000001 00E003  RCW:  LL=3, NORML STATE                     [USER SEGMENT      @ 0003:0010:0]
                                 SEG DESC:  3 800002 B9F403
                                 CODE:  3 06AE60 07AE60   3 08ABB2 15ABB0   3 ABA3AE 5009AB  >3 A3A240 0FB0BF<  3 000800 C12003
003A ----D[03]=>3 488001 40C004 *MSCW: PREVIOUS MSCW @ 0036; D[2]=0014 IN THIS STACK

0039 (03,0003)  7 088800 C12003  PCW
0038 (03,0002)  4 024FFF E20000  "ON <FAULT>" MARKER
0037            3 000806 684CD8  RCW:  LL=1, CNTRL STATE                     [MCP SEGMENT       @ 0CD8:0066:4 (24531400)]
                                 SEG DESC:  3 880016 1FD41E  ------ BLOCKEXIT
                                 CODE:  3 6A2009 9A1401   3 A00066 AE6004   3 B0ABB5 A28066  >3 AE6004 ABB234<  3 B22695 B8B225
0036 ----D[03]=>3 488001 40C012 *MSCW: PREVIOUS MSCW @ 0024; D[2]=0014 IN THIS STACK

0035 (01,0011)  6 A00A06 A84CD8  SCW: (BLOCK BELOW DECLARED INTERRUPTS, SNGL-DIM ARRAYS, LIBRARY TEMPLATE)
0034 (01,0010)  7 088000 000000  PCW
0033 (01,000F)  0 000000 000000
0032 (01,000E)  0 000000 000000
0031 (01,000D)  0 000000 000000
0030 (01,000C)  0 000000 000000
002F (01,000B)  0 000000 000000
002E (01,000A)  0 000000 000014
002D (01,0009)  0 800000 204800
002C (01,0008)  0 000000 000000
002B (01,0007)  5 C0FFFF F338EA  DESC [PRESENT-COPY]: DATA, LENGTH=1048575  (POINTS @ OFFSET=0014 IN THIS STACK)
002A (01,0006)  0 000000 000000
0029 (01,0005)  0 000000 000000
0028 (01,0004)  1 488001 40000E  SIRW: OFFSET=0022 (0014+000E) IN THIS STACK
0027 (01,0003)  5 C00022 8338D6  DESC [PRESENT-COPY]: DATA, LENGTH=552  (POINTS @ OFFSET=0000 IN THIS STACK)
0026 (01,0002)  0 000000 00000F
0025            3 000201 A0A003  RCW:  LL=2, NORML STATE                     [USER SEGMENT      @ 0003:001A:1]
                                 SEG DESC:  3 800002 B9F403
                                 CODE:  3 B215AB 500CAF   3 B0ABAE 600B50   3 0CAFAB AE600C  >3 ABA3B0 B0B0B0<  3 BEFFFF FFFFFF
0024 ----D[01]=>3 C08000 804010 *MSCW: PREVIOUS MSCW @ 0014; D[0]=0008 IN STACK 008

0023 (02,000F)  6 800000 004800  SCW: (BLOCK BELOW DECLARED INTERRUPTS, SNGL-DIM ARRAYS)
0022 (02,000E)  7 088801 00E003  PCW
0021 (02,000D)  7 088801 00E003  PCW
0020 (02,000C)  7 888800 70E003  PCW
001F (02,000B)  5 E10002 94917A  DESC [PRESENT-COPY]: DATA, INDEX=41, DOUBLE  (MOM NOT OF THIS STACK OR SEGDICT)
001E (02,000A)  0 000000 000000
001D (02,0009)  7 088800 50E003  PCW
001C (02,0008)  7 088600 20E003  PCW
001B (02,0007)  5 C00001 EC267B  DESC [PRESENT-COPY]: DATA, LENGTH=30  (MOM @ OFFSET=001A IN THIS STACK)
001A (02,0006)  5 84000B 4C267B  DESC [PRESENT-MOM]: STRING (8-BIT), LENGTH=180
0019 (02,0005)  0 000000 000000
0018 (02,0004)  0 000000 000000
0017 (02,0003)  0 000000 000000
0016 (02,0002)  0 000000 000000
0015            3 000249 D88C9A  RCW:  LL=2, CNTRL STATE                     [MCP SEGMENT       @ 0C9A:049D:1 (16562000)]
                                 SEG DESC:  3 8800B0 BD8A1E  ------ BOJEOJ
                                 CODE:  3 BEFFFF FFFFFF   3 4A6870 C30C30   3 ABA3AE 400AAB  >3 A3B234 B22695<  3 B8B180 95B9A2
0014 ----D[02]=>3 C8A000 408002 *MSCW: PREVIOUS MSCW @ 0012; D[1]=0004 IN STACK 08A

0013            3 000000 002000  RCW:  DUMMY (RUN)
0012 ----D[02]=>3 F84917 A08011 *MSCW: PREVIOUS MSCW @ 0001; D[1]=917A IN STACK 384
```

```
0011            5 270000 841742  THEFILE
0010            0 000000 000000  STRINGPOOLMOM
000F            0 000000 000000  STRINGPOOLMARK
000E            0 000000 000000  LOCKCOUNT
000D            0 000300 052000  JUNK
000C            0 000000 0011F0  BLOWBY
000B            0 000000 000000  WARNINGLIST
000A            5 000000 400000  SEGMNTARRAY
0009            0 000000 000000  CONDLISTDESC
0008            0 000000 000000  OATDESC
0007            0 000000 000000  AITDESC
0006            7 088000 000000  STACKINFOTOP
0005            5 800000 635884  OLAYINFODESC
0004            6 800000 000000  OLAYCW
0003            0 000000 000000  INTMAPLINKS
0002            0 00FFFF F020D2  MEMLOC
0001            3 488000 000000  STUFFITMSCW
0000            0 000000 000004  TOSCWD

SPIBVECTOR[088] = 5 C00008 34917A    MOM @ 21631

00     3 C08000 804000     PIBMSCW
01     0 000000 000001     ACTUALBOXES
02     0 000000 00008A     CODELINKS         SEG DICT = 08A
03     0 000008 2300DC     COMPILERINFO
04     0 000001 11DCDE     COREINTEGRAL      = 17947870
05     0 000000 00038C     COREINUSE         = 908
06     0 000000 00036A     COREINUSESAVED    = 874
07     0 000000 000000     FORCEDOLAYTIME
08     0 000000 000107     GRAPHHEADWORD
- - - GRAPHS FOR STACK 088 - - -
PROGRAMDUMPGRAPH:
     08A ((LFPROG)OBJECT/JSD/MEMDUMP/EXAMPLE ON DISK.)

09     0 000000 000000     OLAYCNTL
0A     0 000000 000001     ORIGBOXES
0B     0 000000 000000     SEARCHINFO
0C     0 000000 000008     SUBSPACEID        = 8
0D     0 000000 000000     SWAPHOLD
0E     0 400C18 CDED05     TIMESTARTED       @ 34:38:13= 15.9476904 SECONDS PRIOR TO DUMP
0F-10  0 000000 000000     RUNNINGCOUNT      ACCESSCODE
11     5 800000 2B5990     CHARGECODE        = 6701
12-16  0 000000 000000     DBEQTNBLK         DBSINFO           DESTNAME          HOSTNAME          FAMILYSUB
17-19  0 000000 000000     JSTITLE           MYBDNAME          MYFPB
1A     5 800000 80E9F3     MYNAME            = (LFPROG)OBJECT/JSD/MEMDUMP/EXAMPLE
1B-1D  0 000000 000000     MYPPB             SUBSYSTEMID       YOURNAME
1E     5 800000 1C57AF     BACKUPFAMILY
                           0(0000) 0 04C4C9 E2D200
1F     0 000880 000000     BDINFO
20     5 800000 6100ED     EVENTCAR
                           0(0000) 0 000000 000000  THRU 5(0005)
21     0 000000 000000     BEDWORD
22     0 05B000 000000     BLOCK
23-24  0 000000 000000     CARDSPUNCHED      ALARMTIMES
25     0 3AFB63 EFCFD8     TIMESTAMP @ BOT   = 04/09/85 17:53:04
26     0 000000 000400     CPINFO
27     0 000000 000000     DISKUSED
28     1 48A000 400002     ENTRYPOINT        SIRW: OFFSET=0006 (0004+0002) STACK = 08A
29     2 800000 000001     EXCEPTIONEVENT    (HAPPENED, INT ATTACHED)
2A     2 000000 031907     (EXCEPTIONEVENT2)
```

```
2B-2C 0 000000 000000    EXTERNALFAMILYLINKFREEPBITS
2D    0 000000 AD00B2    HEADERACCESS
2E    0 000000 000000    INSTRYINFO
2F    3 020200 F12003    INTERCEPTEDRCW    LL=4, NORML [USER @ 0003:000F:1]
30-32 0 000000 000000    INTERCESSION      ITINERARY         JOBDECKINFO
33    0 088020 000000    JOBINFO
34    5 800000 436E0D    JOBMSGS
                         0(0000) 0 000000 000000  5 800000 63C2F8
                              0(0000) 0 002401 002100  0 00E2C5 C740C1  0 D9D9C1 E840C5  0 D9D9D6 D9407C  0 404DF0 F0F0F0
                              5(0005) 0 F1F3F0 F05D5C
                         2(0002) 0 000000 000000  THRU 3(0003)
35-36 0 000000 000000    LIBRARYDIR        LINESPRINTED
37    5 800001 9100B6    OLAYFILEDESC
                         0(0000) 0 000000 000000  THRU 4(0004)
                         5(0005) 0 000005 000320  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
                        10(000A) 0 000000 000000  THRU 12(000C)
                        13(000D) 0 000000 001000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
                        18(0012) 0 000000 000000  THRU 19(0013)
                        20(0014) 0 010040 435F79  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
38    0 000000 000000    PORTLIB_PIB
39    0 40005B 117000    PROCESSFAMILYLINK PARENT=05B SIBLING=117
3A-3E 0 000000 000000    REMPRINTMASK      REMPUNCHMASK      REPLY             REPLYEVENTX       (REPLYEVENT2)
3F-41 0 000000 000000    ROLLOUTINFO       SOFTINTQ          SWAPDATA
42    0 000000 000001    TASKBOXES
43    0 800200 000000    TASKINFO
44    0 000000 000000    TASKPARAMS
45    5 800001 E4EA87    PIBIOCB
                MLIP CNTRL: 0 10CB00 000C48 WRITE, WORD, FORWARD, PROTECT, CAUSE IO FINISH
               DLP ADDRESS: 0 000000 400002 MLIPNO = 4, MLIP PORT = 0, LEM PORT = 0, REL DLP = 2
                CMND QUEUE: 5 C00000 81D5B9
                  SELF PTR: 5 C00001 E4EA87
               COMMAND PTR: 5 E00001 94EA87
                RESULT PTR: 5 E00001 B4EA87
               C/R LENGTHS: 0 000000 0A000C
               RESULT MASK: 0 000000 000000
                RSLT QUEUE: 5 E00000 10BFDA
                 NEXT LINK: 0 000000 000000
                  DATA PTR: 5 E00001 F0E6CE
               CURR LENGTH: 0 000000 000000
                 MLIP RSLT: 0 000000 000000
                START TIME: 0 00063F 621FC3 17:53:19 (00:00:00.04071 PRIOR TO DUMP)
               FINISH TIME: 0 000000 003AC8 17:53:19 (00:00:00.00460 PRIOR TO DUMP)
                INFO1 WORD: 0 008088 140001 UNITNUMBER = 220, OWNER STKNO = 008, INITIATING STKNO = 088, REQUESTOR = 10 (MCPIO)
                INFO2 WORD: 0 0000F0 044100 STATE = 1 (INACTIVE), PATHNAME = 0F, PROC NO = 4, MLIP NO = 4
                  LOG DESC: 0 000000 000000
                      IOCW: 0 030000 0FFAF9 IOSTANDARDFIELD: WRITE, 8-BIT, MEMORY PROTECT
               BUFFER DESC: 5 C00005 B0E6CE
                 EVENT REF: 1 48800C 80000B
                  FIB DESC: 0 000000 000000
                   IO MASK: 0 000000 000000
                LOGICAL RD: 0 0001F0 000000 UNITS XFERRED = 0001F (31)
                   IO INFO: 0 800001 F00000 WORD, BUFFERINDEX = 00000 (0), IOLENGTH = 0001F (31)
                  COMMAND1: 0 400000 0FFAF9
                  COMMAND2: 0 000000 000000
                   RESULT1: 0 000000 000000
                   RESULT2: 0 000000 000000
                SAVED INFO: 0 030000 0000DC

46-4A 0 000000 000000    TASKTYPE          HSINFO            SURROGATEINFO     WAITSTART         DEIMPRUNTIMESET
4B    0 000000 000000    ACTIONQ
```

```
4C     0 000000 006DF4    RECENTPROC          =  0.0675552 SECONDS
4D     7 384050 788BCA    PALACE              PCW:  LL=2, D[0] SEGMENT @ OBCA:0507:0, CNTRL STATE, STACK=384 (12780000)
4E     1 784917 A0004D    PALACEREF           SIRW: OFFSET=91C7 (917A+004D) STACK = 384
4F     0 000044 000000    USAGE
50     0 000000 000000    DMSBED
51     0 000C19 334B9A    READYON             @ 34:38:29=  0.0036528 SECONDS PRIOR TO DUMP
52     0 000000 000004    PROCESSOR
53     0 000C19 334C95    CLOCKONTIME         @ 34:38:29=  0.0030504 SECONDS PRIOR TO DUMP
54     0 000000 000000    LETGEORGEDOIT
55     0 000000 00FF8E    READYTIME           =  0.1570128 SECONDS
56     0 000000 006DF4    PROCESSTIME         =  0.0675552 SECONDS
57     0 000000 017FFE    IOTIME              =  0.2359248 SECONDS
58     0 000000 000014    INITPBITKOUNT       = 20
59     0 000000 004469    INITPBITTYME        =  0.0420312 SECONDS
5A-5B  0 000000 000000    OTHERPBITCOUNT      OTHERPBITTIME
5C     0 000000 0E0404    HISTORY             REASON=14, CAUSE=4, TYPE=4
5D-5F  0 000000 000000    IOCOUNT1            IOCOUNT2            MYSTACKHISTORY
60     0 0E0400 50E003    STOPPOINT           LL=3, NORML [USER @ 0003:0005:2]
61-62  0 000000 000000    LOCKEDEVENT         (LOCKEDEVENT2)
63     0 000008 681004    VALIDITYBITS
64     0 000000 000000    AVALUE
65     0 007FFF FFFFFF    MAXPROCESSTIME      = 549755813887
66     0 000008 000300  =>SWAPSPEX            ACTMTYPE=0, ORIGMTYPE=3
67     0 000000 00001D    CODECORE
68     0 000000 000043    DATACORE
69-6A  0 000000 000000    DISKLIMIT           ELAPSEDLIMIT
6B     0 007FFF FFFFFF    MAXIOTIME           = 549755813887
6C-6D  0 000000 000000    MAXWAIT             WAITLIMIT
6E     0 000000 00001F    ERROR               = 31
6F     5 E00005 B093F0    EXCEPTIONTASK
70     0 000000 000070  =>OPTION
71     0 000000 000000    PARTNER
72     0 000000 4180BC    PATHCONTROL         (ORG MCS=1 LSN=188)
73     0 000000 000000    PRINTLIMIT
74     0 000000 000032    PRIORITY            = 50
75     0 010000 000000    PUNCHLIMIT          = 0
76     0 000000 000000    RESTARTCOUNT
77     0 08800A 0F0A8D  =>SERIAL
78     0 000000 001194    STACKLIMIT          = 4500
79     0 800001 200200  =>STACKSIZE           =18+512=530
7A     0 000000 0000BC  =>STATIONINFO
7B-7D  0 000000 000000    TARGETTIME          TAPECOUNT           TAPEPOOL
7E     0 05B000 000000    TASKLIMIT           = 1.77088743108E+21
7F     0 0A0101 06D3C6  =>USERCODE            = LFPROG
80     0 D7D9D6 C70000    (USERCODE2)
81     0 000000 000000    (USERCODE3)
82     0 000000 000093    USERCODEPRIV        PRIVLEDGED USER, MCS ABSTAINING, HS SPECIAL PRIVS ALLOWED FOR THIS STACK, THIS STACK DID
```

INPUT: RELEASE

MEMORY DUMP REVIEW

APPENDIX I

dumpanalyzer INPUT

D(9,2) stackvector

```
INPUT: MD 2100 FOR CD
02100(00000)  3 408000 000007  5 880144 8B2226  5 800039 009875  1 408000 800763  5 80FFFF F00000  6 000000 000000  0 000000 000000
02107(00007)  7 008000 084C36  7 008000 005204  5 080144 84FA40  7 008000 084CD8  7 008602 484CD2  0 000000 000000  7 008020 984BCA
0210E(0000E)  7 008000 084C8A  7 008000 004C33  7 008000 084CD0  6 000000 000000  7 008000 384BCD  7 008000 084C89  7 008000 085288
02115(00015)  7 008001 5051A8  7 008007 804CF6  7 0086A7 9050D3  7 008000 084D02  0 000000 000000  7 008000 004E68  7 008000 005045
0211C(0001C)  7 408024 484BD6  0 000000 000060  7 00800A 404EC8  7 008000 005043  7 008000 004CDC  5 080001 040002  5 080004 040003
02123(00023)  5 890004 5D8567  5 090004 04006E  5 090000 840073  5 880004 0B570D  5 880000 CC0869  7 00841C 60513B  7 0086B4 305050
0212A(0002A)  7 0082AE 90504A  7 008A07 7050F7  7 008ACF 1050E0  7 00824D 085118  7 008000 0050D9  7 008000 004C3E  7 008000 084E25
02131(00031)  7 008000 005200  7 008009 205209  7 00803F A84BBC  7 008000 005202  7 008000 084BE3  7 008A0A A04CF0  0 000000 000000
02138(00038)  7 00800B 484BC2  7 008000 084CDD  7 008000 084CB9  7 008000 004E26  7 008000 004E27  7 008000 084BC0  7 008076 E84BBF
0213F(0003F)  7 008066 884BBF  7 008000 004E51  7 408A00 184C15  7 008A0D 484BBC  7 008003 E84BE3  7 008004 684BC2  7 008000 0051AA
02146(00046)  7 008000 004C31  7 008000 084CD1  0 0005D9 D0EF86  7 00800B B84BBD  7 008000 00512A  7 008000 084C3D  7 008816 104CF9
0214D(0004D)  7 008000 0051A7  7 008000 005042  0 000000 014000  7 008027 684BCE  7 008005 684BBD  7 008009 C84BCE  7 008801 B84C90
02154(00054)  7 008000 004C91  7 008000 005088  7 008404 E051FA  7 008000 C85092  7 008000 C8508F  7 008000 0051F0  7 008000 084C3B
0215B(0005B)  7 008000 004E81  5 80000C 841510  7 008000 004C97  7 008000 084C3C  7 008800 B04E63  7 008000 004E65  7 008000 005058
02162(00062)  7 008000 005059  7 008000 004CF3  5 080001 040007  5 880004 0FB90C  7 008A02 604CB1  7 008005 904CB3  7 008000 084BCD
02169(00069)  7 008000 084C8E  7 008000 004CC4  7 008000 004EE3  7 008000 004EE2  7 008000 004EE5  7 008801 204EE8  7 008000 004C8F
02170(00070)  7 008200 105044  7 408000 004F0A  7 008000 084C8B  7 008000 004EE6  7 408002 B04F04  7 008804 004EE0  7 008403 505209
02177(00077)  7 008000 004EE7  7 00860B F04EE1  7 008000 004E39  7 008A07 1051F3  7 008004 F84BCE  3 000003 580BCE  7 008000 084C39
0217E(0007E)  7 008000 004C3F  7 008418 F04EC6  7 008000 0050DC  0 000000 00037D  7 008803 E04E74  7 008000 004CD5  7 008000 004E60
02185(00085)  7 008000 005054  7 008000 004F8E  7 008000 004F88  7 008000 004F84  7 008009 C84C39  7 008000 004F55  7 008600 D04CD3
0218C(0008C)  7 008060 F84BBF  7 008055 284BBF  7 00801E F84BCB  6 800000 000000  6 800000 000000  5 C00000 000000  5 000000 000000
02193(00093)  7 008000 004E38  7 008000 004E2B  7 00841F 985053  7 008033 A84BCA  0 000000 000000  7 00801C 984BCA  7 008045 484BCA
0219A(0009A)  7 008046 284BCA  7 008000 005127  7 00804A 984BCA  7 008021 784BCB  7 008025 884BCB  7 008020 584BCA  0 000000 000000
021A1(000A1)  0 000000 000000  0 000000 000000  7 00801D 304C1D  7 008000 004CC5  7 008000 004CAF  2 000000 000000  2 000000 000000
021A8(000A8)  7 008A11 0050D1  0 000000 000003  7 40860E 884C1B  7 008000 0051F7  7 008061 00512D  7 00880E 10512D  7 008001 805135
021AF(000AF)  7 008000 A84BCD  5 080001 04000B  5 080004 04000C  5 080004 04000F  5 080004 040012  5 080004 040015  7 008000 005174
021B6(000B6)  7 408000 00523F  0 000000 000000  7 008000 004E5F  7 008000 084C9C  7 008000 0051E4  7 008655 D05214  7 008802 F0521A
021BD(000BD)  5 880000 4A7430  5 080000 440019  7 008000 005235  0 000000 000000  0 000000 000000  7 008000 584BFA  0 000000 000000
021C4(000C4)  0 000000 000000  0 000000 000000  0 000000 000000  6 000000 000000  0 000000 000000  7 008000 004C66  7 008000 00508D
021CB(000CB)  5 800037 D093F0  7 008000 004C67
```

stack vector PIB vector 093F0

```
INPUT: MD 9875 FOR A0
09875(00000)  3 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
0987C(00007)  0 000000 000000  5 800145 0020F8  5 80001C 41CF3E  5 800014 20BFFF  5 80004B 20C164  0 000000 000000  0 000000 000000
09883(0000E)  0 000000 000000 THRU 09894(0001F)
09895(00020)  5 800016 00A704  0 000000 000000  0 000000 000000  5 800016 00CC1C  0 000000 000000  5 80001C 40D188  0 000000 000000
0989C(00027)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 800006 30C639  0 000000 000000
098A3(0002E)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 80001C 90C972
098AA(00035)  0 000000 000000  0 000000 000000  5 80000D 010715  0 000000 000000  5 800005 10EB31  0 000000 000000  0 000000 000000
098B1(0003C)  0 000000 000000 THRU 098BE(00049)
098BF(0004A)  5 800022 510A4E  5 80003C C10C77  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
098C6(00051)  5 800075 91AFF7  0 000000 000000  0 000000 000000  5 80001B B129D8  0 000000 000000  5 80004B 2134C4  5 80004B 213999
098CD(00058)  0 000000 000000  0 000000 000000  0 000000 000000  5 80004F 111CC6  5 80001F 018AA5  0 000000 000000  5 800086 31A202
098D4(0005F)  0 000000 000000  0 000000 000000  0 000000 000000  5 80004B 21F2F5  5 80004B 21F8CA  0 000000 000000  0 000000 000000
098DB(00066)  0 000000 000000  0 000000 000000  5 800058 821D39  5 80003C C22578  0 000000 000000  0 000000 000000  0 000000 000000
098E2(0006D)  0 000000 000000  5 800058 811066  5 80001C 923D00  5 80003D 619CBB  0 000000 000000  5 800021 61E735  5 800006 B26351
098E9(00074)  5 800032 A44F95  0 000000 000000  5 800003 0266F9  5 800046 2281A9  5 800016 A26ADC  5 800020 D26E15  5 800004 D27026
098F0(0007B)  5 80000F A26447  0 000000 000000  5 800009 E27281  5 800004 B26633  0 000000 000000  5 800058 82C905  0 000000 000000
098F7(00082)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 800022 8338D6
098FE(00089)  5 80004B 23E396  5 800001 35DAB3  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
09905(00090)  5 800005 9300DF  5 800006 230745  5 800003 E30AF9  0 000000 000000  0 000000 000000  0 000000 000000  5 80001C 42E554
0990C(00097)  0 000000 000000 THRU 09914(0009F)
```

in process stack

Not tag 3

MSCW

```
INPUT: MD 338D6 FOR 100
338D6(00000)  0 000000 000004  3 488000 000000  0 00FFFF F020D2  0 000000 000000  6 800000 000000  5 800000 635884  7 088000 000000
338DD(00007)  0 000000 000000  0 000000 000000  0 000000 000000  5 000000 400000  0 000000 000000  0 000000 0011F0  0 000300 052000
```

D(2) normal [illegible] error

```
338E4(0000E)  0 000000 000000  0 000000 000000  0 000000 000000  5 270000 841742  3 F84917 A08011  3 000000 002000  3 C8A000 408002
338EB(00015)  3 000249 D88C9A  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 84000B 4C267B  5 C00001 EC267B
338F2(0001C)  7 088600 20E003  7 088800 50E003  0 000000 000000  5 E10002 94917A  7 888800 70E003  7 088801 00E003  7 088801 00E003
338F9(00023)  6 800000 004800  3 C08000 804010  3 000201 A0A003  0 000000 00000F  5 C00022 8338D6  1 488001 40000E  0 000000 000000
33900(0002A)  0 000000 000000  5 C0FFFF F338EA  0 000000 000000  0 800000 204800  0 000000 000014  0 000000 000000  0 000000 000000
33907(00031)  0 000000 000000  0 000000 000000  0 000000 000000  7 088000 000000  6 A00A06 A84CD8  3 488001 40C012  3 000806 684CD8
3390E(00038)  4 024FFF E20000  7 088800 C12003  3 488001 40C004  3 000001 00E003  0 000000 000000  3 C08000 804003  3 000400 60E003
33915(0003F)  0 000009 000004  0 9F40A0 083020  0 000000 000000  0 000000 000001  0 000000 000004  7 088224 308C72  3 C08000 804008
3391C(00046)  3 000624 784C72  0 000000 000001  0 000000 00003D  0 000000 000000  1 488003 600003  4 000000 320000  7 088803 784CDD
33923(0004D)  0 024FFF E20000  0 000000 000038  0 000000 000036  3 488003 61000B  3 020803 784CDD  0 000000 00003D  0 000000 000001
3392A(00054)  3 C08000 804004  3 020200 F12003  0 000000 000003  5 C00008 34917A  6 000000 000000  0 005500 000004  7 088000 088CCE
33931(0005B)  3 488005 408007  3 000828 984BCE  0 000000 000002  0 000000 000000  3 C08000 804004  3 000213 C88CCE  6 000000 000000
33938(00062)  6 000000 000000  6 000000 000000  5 C00008 34917A  0 000000 000000  1 488001 40000C  6 A0040C F84C88  3 488001 40C009
3393F(00069)  3 00020C E84C88  3 488001 40C002  3 000400 80E003  5 E40000 5C267B  5 EC0000 5AB239  0 000000 00001B  3 C08000 804005
33946(00070)  3 000400 50E003  0 000009 000400 F3 0 AB23E0 0D3038  0 000000 000003  0 000000 00000E  0 000000 000004  7 088224 308C72
3394D(00077)  3 C08000 804008  3 000A25 B84C72  0 000000 000014  0 FFFFFF FFFFFF  0 000000 000000  0 000000 00033A  0 000000 00007F
33954(0007E)  0 000000 000000  5 C00034 7338D6  3 C08000 804009  3 000807 184CB9  0 CD5A64 665473  1 570A55 C95CF0  0 000000 014C6B
3395B(00085)  0 00063F 626206  0 0800DC 000002  0 000000 000000  0 000000 000260  0 000000 00027E  0 000000 001FCA  0 000000 00095D
33962(0008C)  0 000000 000004  0 000000 000000  0 400000 4E90AD  0 000000 00DF53  0 000000 000000  0 000000 000000  0 000000 000000
33969(00093)  0 000000 000000  5 C0000A 41D6E1 F 7 088400 289288  7 088400 C89288  7 088A04 789288  7 088205 989288  3 000102 80E070  1st bad
33970(0009A)  3 000006 40DF53  5 C0005D E0095D  3 C888FB F0401C  3 020A34 885288  5 C0001D 20A917  5 C00000 833956  5 C0005D E0095D
33977(000A1)  0 000000 00027E  0 000000 0007CD  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 00000A
3397E(000A8)  0 000000 000000  3 000807 184CB9  0 000000 000088  0 000000 002100  0 000000 000088  0 000000 0338D6  0 000000 033972
33985(000AF)  3 C08000 80401C  0 000000 033AFE  0 000000 000034  5 E03397 300000  0 000000 00002D  0 000000 000004  0 000000 000000
3398C(000B6)  0 000000 000010  0 000000 000004  0 000000 000000  0 000000 000000  3 C08000 80400B  3 000001 C85287  5 C00015 30A996
33993(000BD)  0 000000 000000  0 000000 000000  5 C00000 80A9A5  6 000000 000000  0 000000 000000  0 000000 000000  0 000000 000003
3399A(000C4)  0 000000 000008  6 000000 000000  0 000000 000000  1 000000 002004  0 000000 000003  0 FE0000 000000  0 000000 00002D
339A1(000CB)  0 000000 00000A  0 000000 000000  0 030000 0FFAF9  5 C00005 B0E6CE  0 000000 000000  0 000000 00001F  0 000000 000001
339A8(000D2)  0 000000 000000  2 000000 000001  2 000000 000000  3 C08000 80400D  3 200238 D04BD1  1 48800C 80000B  0 000000 000000
339AF(000D9)  0 000000 000000  0 000000 000000  3 F84917 A08006  3 200820 484BCA  0 000000 000000  0 000C19 334C03  0 000000 000000
339B6(000E0)  0 000000 0000FB  0 000000 000000  5 E00000 30A64A  0 000000 0000FB  0 000000 000004  0 00063F 643E18  0 000000 000057
339BD(000E7)  0 000000 000001  5 C00008 30FA93  0 000000 000000  5 E00000 408C1D  0 000000 000057  0 000000 000057  0 000000 000008
339C4(000EE)  0 000000 000020  5 E00000 808CDB  0 000000 000000  0 000000 000000  0 400000 000000  5 E00001 D4EA87  0 000000 000000
339CB(000F5)  0 000000 000000  0 400000 000000  0 000000 000006  0 000000 000000  0 000000 000000  0 000000 0020D2  0 000000 0AE2D9
339D2(000FC)  0 000000 0A6FDF  0 000000 0C0454  5 E0AE2D 400000  5 C0FFFF F00000

                                                D(Ø)
INPUT: MD 20F8 FOR A6
020F8(00000)  3 000145 001448  3 408000 000000  0 00FFFF F020D2  0 000000 000000  6 800000 000000  5 800001 A4353D  0 000000 000000
020FF(00007)  0 000000 000000  3 408000 000007  5 880144 8B2226. 5 800039 009875  1 408000 800763  5 80FFFF F00000  6 000000 000000
02106(0000E)  0 000000 000000  7 008000 084C36  7 008000 005204  5 080144 84FA40  7 008000 084CD8  7 008602 484CD2  0 000000 000000
0210D(00015)  7 008020 984BCA  7 008000 084C8A  7 008000 004C33  7 008000 084CD0  6 000000 000000  7 008000 384BCD  7 008000 084C89
02114(0001C)  7 008000 085288  7 008001 5051A8  7 008007 804CF6  7 0086A7 9050D3  7 008000 084D02  0 000000 000000  7 008000 004E68
0211B(00023)  7 008000 005045  7 408024 484BD6  0 000000 000060  7 00800A 404EC8  7 008000 005043  7 008000 004CDC  5 080001 040002
02122(0002A)  5 080004 040003  5 890004 5D8567  5 090004 04006E  5 090000 840073  5 880004 0B570D  5 880000 CC0869  7 00841C 60513B
02129(00031)  7 0086B4 305050  7 0082AE 90504A  7 008A07 7050F7  7 008ACF 1050E0  7 00824D 085118  7 008000 0050D9  7 008000 004C3E
02130(00038)  7 008000 084E25  7 008000 005200  7 008009 205209  7 00803F A84BBC  7 008000 005202  7 008000 084BE3  7 008A0A A04CF0
02137(0003F)  0 000000 000000  7 00800B 484BC2  7 008000 084CDD  7 008000 084CB9  7 008000 004E26  7 008000 004E27  7 008000 084BC0
0213E(00046)  7 008076 E84BBF  7 008066 884BBF  7 008000 004E51  7 408A00 184C15  7 008A0D 484BBC  7 008003 E84BE3  7 008004 684BC2
02145(0004D)  7 008000 0051AA  7 008000 004C31  7 008000 084CD1  0 0005D9 D0EF86  7 00800B B84BBD  7 008000 00512A  7 008000 084C3D
0214C(00054)  7 008816 104CF9  7 008000 0051A7  7 008000 005042  0 000000 014000  7 008027 684BCE  7 008005 684BBD  7 008009 C84BCE
02153(0005B)  7 008801 B84C90  7 008000 004C91  7 008000 005088  7 008404 E051FA  7 008000 C85092  7 008000 C8508F  7 008000 0051F0
0215A(00062)  7 008000 084C3B  7 008000 004E81  5 80000C 841510  7 008000 004C97  7 008000 084C3C  7 008800 B04E63  7 008000 004E65
02161(00069)  7 008000 005058  7 008000 005059  7 008000 004CF3  5 080001 040007  5 880004 0FB90C  7 008A02 604CB1  7 008005 904CB3
02168(00070)  7 008000 084BCD  7 008000 084C8E  7 008000 004CC4  7 008000 004EE3  7 008000 004EE2  7 008000 004EE5  7 008801 204EE8
0216F(00077)  7 008000 004C8F  7 008200 105044  7 408000 004F0A  7 008000 084C8B  7 008000 004EE6  7 408002 B04F04  7 008804 004EE0
02176(0007E)  7 008403 505209  7 008000 004EE7  7 00860B F04EE1  7 008000 004E39  7 008A07 1051F3  7 008004 F84BCE  3 000003 580BCE
0217D(00085)  7 008000 084C39  7 008000 004C3F  7 008418 F04EC6  7 008000 0050DC  0 000000 00037D  7 008803 E04E74  7 008000 004CD5
02184(0008C)  7 008000 004E60  7 008000 005054  7 008000 004F8E  7 008000 004F88  7 008000 004F84  7 008009 C84C39  7 008000 004F55
0218B(00093)  7 008600 D04CD3  7 008060 F84BBF  7 008055 284BBF  7 00801E F84BCB  6 800000 000000  6 800000 000000  5 C00000 000000
```

```
02192(0009A)  5 000000 000000  7 008000 004E38  7 008000 004E2B  7 00841F 985053  7 008033 A84BCA  0 000000 000000  7 00801C 984BCA
02199(000A1)  7 008045 484BCA  7 008046 284BCA  7 008000 005127  7 00804A 984BCA  7 008021 784BCB

                                                                              D(1) seg 0        seg 1            seg 2
INPUT: MD 5DAB3 FOR 13   stack 8A - on segdictionary
5DAB3(00000)  3 000001 28400E  3 48A000 000000  0 00FFFF F020D2  0 000000 000000  3 C08000 804003  5 880000 DA3335  7 08A401 A0A003
5DABA(00007)  3 800002 B9F403  5 880000 5AB239  1 408000 80009D  1 408000 800098  1 408000 800066  1 408000 800068  1 408000 800099
5DAC1(0000E)  1 408000 80000E  1 408000 80009E  1 408000 80000A  5 070000 00008C  5 070000 000093
                       seg 3
                                  goto DEF1  goto name 217  index lit 4  INSR  goto name 4  index BSET  lit 20  TWSD
INPUT: MD 9F403 FOR 2B
9F403(00000)  3 FF5006 BDB21E  3 9C2A17 5007BA  3 A2A012 B05007  3 A6B204 9C2A03  3 B06004 A6962A  3 B220D3 A31003  3 100483 5002B8
9F40A(00007)  3 A3A260 08AE50  3 08ABA3 AE6005  3 500CAF ABBEFF  3 024FFF E20000  3 B20495 B47002  3 BAA240 0FAE60  3 06AE60 07AE60
9F411(0000E)  3 08ABB2 15ABB0  3 ABA3AE 5009AB  3 A3A240 0FB0BF  3 000800 C12003  3 B4A260 08FFAE  3 6009AE 6007AE  3 6008AB B215AB
9F418(00015)  3 B0ABAE 600AAE  3 6007AE 6008AB  3 B215AB 500CAF  3 B0ABAE 600B50  3 0CAFAB AE600C  3 ABA3B0 B0B0B0  3 BEFFFF FFFFFF
9F41F(0001C)  3 04000B 400000  3 B20595 B4B0BF  3 000600 20E003  3 BFFFFF FFFFFF  3 000800 50E003  3 B0B0BF FFFFFF  3 000800 70E003
9F426(00023)  3 BFFFFF FFFFFF  3 000801 00E003  3 BFFFFF FFFFFF  3 000801 00E003  3 B4BEFF FFFFFF  3 800000 204800  3 B20695 B4A220
9F42D(0002A)  3 00FFFF FFFFFF


INPUT: MD 93F0 FOR 37D   PIB vector Cdex CB
093F0(00000)  3 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
093F7(00007)  0 000000 000000  5 800008 309C09  5 800008 30BA72  5 800008 31D32F  5 800008 31D3B6  0 000000 000000  0 000000 000000
093FE(0000E)  0 000000 000000 THRU 0940F(0001F)
09410(00020)  5 800008 30A675  0 000000 000000  0 000000 000000  5 800008 30CB95  0 000000 000000  5 800008 30CEEC  0 000000 000000
09417(00027)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 800008 30E851  0 000000 000000
0941E(0002E)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 800001 00D161
09425(00035)  0 000000 000000  0 000000 000000  5 800008 3102C2  0 000000 000000  5 800001 00D92B  0 000000 000000  0 000000 000000
0942C(0003C)  0 000000 000000 THRU 09439(00049)
0943A(0004A)  5 800001 00E3AC  5 800008 30F4E7  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
09441(00051)  5 800008 30F073  0 000000 000000  0 000000 000000  5 C00008 3101A1  0 000000 000000  5 800008 30FA0C  5 800008 30FA93
09448(00058)  0 000000 000000  0 000000 000000  0 000000 000000  5 800008 319A31  5 800001 00FDFF  0 000000 000000  5 800001 01C851
0944F(0005F)  0 000000 000000  0 000000 000000  0 000000 000000  5 C00008 31B788  5 C00008 31B831  0 000000 000000  0 000000 000000
09456(00066)  0 000000 000000  0 000000 000000  5 C00008 32164C  5 800008 3224F1  0 000000 000000  0 000000 000000  0 000000 000000
0945D(0006D)  0 000000 000000  5 C00008 3107E9  5 800008 30F3D4  5 800001 01C7D3  0 000000 000000  5 C00008 310349  5 C00008 3244BA
09464(00074)  5 C00008 3147CF  0 000000 000000  5 C00008 3242D3  5 C00008 31EC3F  5 C00008 324427  5 800001 0243E8  5 800008 3263C0
0946B(0007B)  5 800001 026D8F  0 000000 000000  5 800008 3271FA  5 800001 02661F  0 000000 000000  5 C00008 327C7F  0 000000 000000   PIB
09472(00082)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 C00008 34917A   for
09479(00089)  5 C00008 3417DD  5 800001 0183D7  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000   88
09480(00090)  5 800001 0300CB  5 800008 3306BE  5 800001 030AE5  0 000000 000000  0 000000 000000  0 000000 000000  5 800008 33FEB4
09487(00097)  0 000000 000000 THRU 09498(000A8)
09499(000A9)  5 800008 32B636  5 800001 02DFF6  5 800008 310414  5 800001 030AB7  0 000000 000000  0 000000 000000  0 000000 000000
094A0(000B0)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 800008 32AF97  5 800001 0368E9  5 C00008 335486
094A7(000B7)  0 000000 000000  0 000000 000000  5 800001 03691F  5 C00008 32B552  5 C00008 3291D3  5 800008 3383C2  5 800001 036DC0
094AE(000BE)  0 000000 000000 THRU 09506(00116)
09507(00117)  5 C00008 34D34D  5 C00008 33560D  5 800008 341CE5  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
0950E(0011E)  0 000000 000000 THRU 09526(00136)
09527(00137)  5 800008 33E275  5 800001 02C3F1  5 C00008 30FF57  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
0952E(0013E)  0 000000 000000 THRU 0953C(0014C)
0953D(0014D)  5 800008 31264C  5 800001 0529D5  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
09544(00154)  0 000000 000000 THRU 09553(00163)
09554(00164)  5 800008 341B6A  5 800001 02D5E0  5 C00008 356A05  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
0955B(0016B)  5 C00008 340448  5 800001 05CC4E  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
09562(00172)  0 000000 000000 THRU 095D1(001E1)
095D2(001E2)  5 800008 317543  5 800001 046E26  5 800008 34F5E5  5 800008 340FE6  5 800001 02D6B3  0 000000 000000  0 000000 000000
095D9(001E9)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 800008 3346A9  5 800001 0510F5
095E0(001F0)  5 C00008 33300B  0 000000 000000  0 000000 000000  5 C00008 340AE1  5 800008 3334DE  0 000000 000000  0 000000 000000
095E7(001F7)  0 000000 000000 THRU 096D3(002E3)
096D4(002E4)  5 C00008 3492CF  5 C00008 35A2EC  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
096DB(002EB)  0 000000 000000 THRU 0971E(0032E)
```

```
0971F(0032F)  5 C00008 35CA22  5 C00008 34EAB5  5 800008 342555  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
09726(00336)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 800008 30E647  5 800001 02FE18
0972D(0033D)  0 000000 000000 THRU 0976C(0037C)
```

My P/B task attributes

Backup pack

MSG

My NAME

```
INPUT: MD 4917A FOR 83
4917A(00000)  3 C08000 804000  0 000000 000001  0 000000 00008A  0 000008 2300DC  0 000001 11DCDE  0 000000 00038C  0 000000 00036A
49181(00007)  0 000000 000000  0 000000 000107  0 000000 000000  0 000000 000001  0 000000 000000  0 000000 000008  0 000000 000000
49188(0000E)  0 400C18 CDED05  0 000000 000000  0 000000 000000  5 800000 2B5990  0 000000 000000  0 000000 000000  0 000000 000000
4918F(00015)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  5 800000 80E9F3  0 000000 000000
49196(0001C)  0 000000 000000  0 000000 000000  5 800000 1C57AF  0 000880 000000  5 800000 6100ED  0 000000 000000  0 05B000 000000
4919D(00023)  0 000000 000000  0 000000 000000  0 3AFB63 EFCFD8  0 000000 000400  0 000000 000000  1 48A000 400002  2 800000 000001
491A4(0002A)  2 000000 031907  0 000000 000000  0 000000 000000  0 000000 AD00B2  0 000000 000000  3 020200 F12003  0 000000 000000
491AB(00031)  0 000000 000000  0 000000 000000  0 088020 000000  5 800000 436E0D  0 000000 000000  0 000000 000000  5 800001 9100B6
491B2(00038)  0 000000 000000  0 40005B 117000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000
491B9(0003F)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000001  0 800200 000000  0 000000 000000  5 800001 E4EA87
491C0(00046)  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 000000  0 000000 006DF4
491C7(0004D)  7 384050 788BCA  1 784917 A0004D  0 000044 000000  0 000000 000000  0 000C19 334B9A  0 000000 000004  0 000C19 334C95
491CE(00054)  0 000000 000000  0 000000 00FF8E  0 000000 006DF4  0 000000 017FFE  0 000000 000014  0 000000 004469  0 000000 000000
491D5(0005B)  0 000000 000000  0 000000 0E0404  0 000000 000000  0 000000 000000  0 000000 000000  0 0E0400 50E003  0 000000 000000
491DC(00062)  0 000000 000000  0 000008 681004  0 000000 000000  0 007FFF FFFFFF  0 000008 000300  0 000000 00001D  0 000000 000043
491E3(00069)  0 000000 000000  0 000000 000000  0 007FFF FFFFFF  0 000000 000000  0 000000 000000  0 000000 00001F  5 E00005 B093F0
491EA(00070)  0 000000 000070  0 000000 000000  0 000000 4180BC  0 000000 000000  0 000000 000032  0 010000 000000  0 000000 000000
491F1(00077)  0 08800A 0F0A8D  0 000000 001194  0 800001 200200  0 000000 0000BC  0 000000 000000  0 000000 000000  0 000000 000000
491F8(0007E)  0 05B000 000000  0 0A0101 06D3C6  0 D7D9D6 C70000  0 000000 000000  0 000000 000093


INPUT: MD 36E0D FOR 4
36E0D(00000)  0 000000 000000  5 800000 63C2F8  0 000000 000000  0 000000 000000
```

message pool

```
INPUT: MD C57AF FOR 1
C57AF(00000)  0 04C4C9 E2D200


INPUT: MD E9F3 FOR 8
0E9F3(00000)  0 250305 06D3C6  0 D7D9D6 C706D6  0 C2D1C5 C3E303  0 D1E2C4 07D4C5  0 D4C4E4 D4D707  0 C5E7C1 D4D7D3  0 C50000 000000
0E9FA(00007)  0 FEDFED FEDFED


INPUT: MD 3C2F8 FOR 6
3C2F8(00000)  0 002401 002100  0 00E2C5 C740C1  0 D9D9C1 E840C5  0 D9D9D6 D9407C  0 404DF0 F0F0F0  0 F1F3F0 F05D5C


INPUT: RELEASE
```

See P214 for dump analysis