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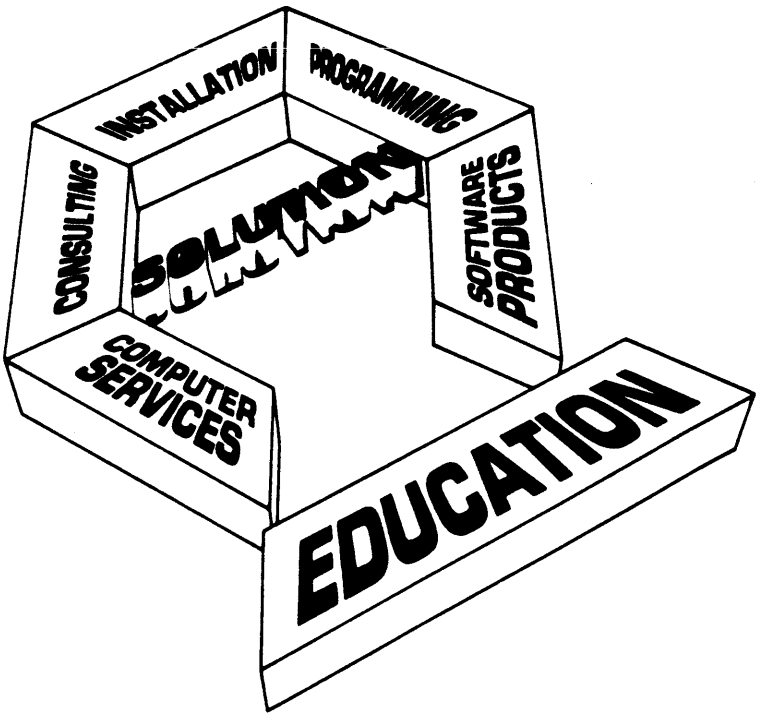

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Student Guide

A Series and B 5000/B 6000/B 7000 Operations Mark 3.6 EP 4045

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A SERIES AND B5000/6000/7000
OPERATIONS

INTRODUCTION

COURSE OBJECTIVE:

Follow established procedures to operate and maintain a computer system.

PURPOSE:

The operator will be able to perform the following duties at the conclusion of this course:

- HALT LOAD a computer system.
- Use the appropriate ODT and MARC commands to modify file attributes.
- Produce reports of disk and tape directory contents.
- Run Work Flow Jobs.
- Use the appropriate ODT and MARC commands to interrogate and manipulate program and peripheral status.
- Use the appropriate utility programs to copy files between media.
- Produce reports of log contents.
- Use the appropriate ODT and MARC commands to control the data communications operating environment.
- Modify the run-time environment of the Master Control Program (MCP).
- Use the appropriate ODT and MARC commands to manage allocation of memory.

AUDIENCE:

This course is designed for people who will be operators of Burroughs **A SERIES** systems. These people may or may not have previously operated Burroughs Systems. Other computer personnel may take this course for informational purposes.

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PREREQUISITES:

There are no prerequisites for this course, however, three months of Burroughs **A SERIES** systems experience is recommended.

COURSE LENGTH:

The course will take about 40 hours to complete.

COURSE MODE:

This course is designed to be instructor-led.

REFERENCES:

o A Series ODT Reference Manual	FORM 1169612
o A Series ODT Reference Card	FORM 5013907
o A Series System Software Utilities Reference Manual	FORM 1170024
o A Series Print System (PrintS/ReprintS) User's Guide	FORM 1169919
o A Series Menu-Assisted Resource Control (MARC) User's Guide	FORM 1169588
o A Series WFL Reference Manual	FORM 1169802
o A Series I/O Subsystem Reference Manual	FORM 1169984
o A Series Printing Utilities User's Guide	FORM 1169950
o A Series CANDE Operations Manual	FORM 1170065
o A Series CANDE Reference Manual	FORM 1169869
o A Series System Software Site Management Reference Manual	FORM 1170008

SECTION 1
SYSTEM CONCEPTS

A SERIES AND B5000/6000/7000 OPERATIONS

SYSTEM CONCEPTS

SECTION 1

INTRODUCTION

SECTION OBJECTIVE:

Define the hardware and software associated with the Burroughs **A SERIES** systems.

PURPOSE:

A familiarity with the hardware elements and software associated with the system is necessary to fully understand the operational environment of the Burroughs **A SERIES** systems. This section describes the hardware that comprises your system and the types of software that are used on the system. Later sections of this course will detail much of the software needed to operate your system.

UNIT OBJECTIVES:

Objective 1 Identify hardware and software elements of the Burroughs **A SERIES** systems and their functions as they relate to the operations of the system.

Objective 2 Manipulate files and their attributes on the Burroughs **A SERIES** systems.

Objective 3 Identify all key elements of system initialization for the Burroughs **A SERIES** systems.

A SERIES AND B5000/6000/7000 OPERATIONS

SYSTEM CONCEPTS

UNIT 1

HARDWARE AND SOFTWARE OVERVIEW

OBJECTIVE:

Identify hardware and software elements of the Burroughs **A SERIES** systems and their functions as they relate to the operations of the system.

RESOURCE:

None.

INTRODUCTION:

The computer is a tool for solving problems. In order for this problem solving to proceed the following two elements are required:

1. The hardware or the physical computer equipment;

2. The software or the instructions that direct the hardware's internal operations and guide the computer system through the completion of a job or the solution of a user's problem. This unit will identify the types of hardware and software used with the systems.

HARDWARE ELEMENTS

In order for computers to be used as tools in the problem solving process, both the hardware and the software must be present. The hardware is the physical equipment such as:

peripheral devices (for example, disk and tape drives, card devices, and printers);

micro-processors, or modules, that manipulate the information, such as data or instructions, provided to the computer.

To understand the functions of the various hardware elements on your system, you must understand the meanings of the following terms.

1. **Bit** - The smallest unit of data.
2. **Byte** - Eight-bit string operated upon as a unit.
3. **Word** - Six-byte string operated upon as a unit.
4. **Memory Module** - Approximately 16,000 words (logical memory module) or 65,000 words (physical memory module).

Burroughs **A SERIES** systems have several hardware features that logically perform very similar functions. These functions include the following: processing data, processing data communications, and controlling the data flow between input or output devices and the processor.

The hardware elements that provide these and other functions are described briefly in the following pages.

A 2

The A 2 is a the entry-level system of the A SERIES family. It consists of the following:

Central Processor Unit (**CPU**). The Processor of the machine.

Host Dependent Port (**HDP**). The interface between the Processor and associated I/O Peripheral Processors.

Memory Control Unit (**MCU**). The interface between the Processor and the Main Memory Subsystem.

User Interface Processor (**UIP**). The core of the Maintenance Subsystem.

The A 2 may have up to 9 million bytes of memory, and up to 16 data communication lines. It has an ET 1100 as its Operator Display Terminal (ODT). An A 2 can be upgraded later to an A 3.

A 3

The A 3 is a general-purpose data processing system. It consists of the Central Processor Unit, Host Dependent Port, Memory Control Unit, and User Interface Processor, as described above for the A 2.

An A 3 may have one or two processors. The maximum memory is 24 million bytes for a single processor system, and 48 million bytes for a dual processor system. It may have one or more spindles of Winchester disk built into the main cabinet, 4095 peripherals in use, and up to 120 data communication lines attached. The A 3 has an ET 1100 as an ODT.

A 9

The A 9 is another model of the Burroughs A SERIES computer systems. It depends upon two hard disk drives (Winchester drives) for system initialization and field engineering testing. It also has one 5 1/4" Mini Disk drive. The A 9 uses two ET 2000 terminals as its ODT and SCP (System Control Processor) since it must rely on this terminal's intelligence. The system consists of the following:

Processor Element (**PE**). The Processor of the machine.

Message Level Interface Port (**MLIP**). The interface between the Processor and associated I/O Peripheral Processors.

Memory Control (**MC**). Controls the interface between the Processor and the Memory Storage resources.

Maintenance Interface Processor (**MIP**). Provides the testing and control of all A 9 hardware resources.

This system has a maximum memory configuration of 24 million bytes. Additionally up to 512 data communication lines and 4095 peripherals may be attached.

A 10

The A 10 hardware is very similar to the A 9. The major difference is that the A 10 may have either one or two processors. The dual processor A 10 can be configured as a large multiprocessor system with all resources controlled by a single MCP, or partitioned into two single processor systems under two separate MCP's. A single processor A 10 has a maximum configuration of 48 million bytes; a dual processor A 10 may have 96 million bytes of memory.

A 12

The A 12 is a very large-scale computer system, which consists of the following:

Central Processing Module (**CPM**). The Processor of the machine.

Memory Subsystem Module (**MSM**). Provides the control of the Memory Storage Units.

Input/Output Subsystem Module (**IOSM**). Houses the Host Data Unit and the System Maintenance Processor.

Host Data Unit (**HDU**). Handles all I/O Data transfers between the Main Memory and the I/O Subsystem.

System Maintenance Processor (**SMP**). A free-standing processor that executes maintenance programs and diagnostic functions. Diagnostics can be performed on-site, or from a remote Burroughs facility.

The A 12 has a maximum memory configuration of 96 million bytes. An A 12 can be upgraded later to an A 15.

A 15

The A 15 is a very large-scale computer system, which contains Central Processing Modules, Memory Subsystem Modules, and Input/Output Subsystem Modules, as described above for the A 12. The major difference between the A 12 and the A 15 is that the A 15 may have a maximum of four processors, which may be configured as one large system under the control of a single MCP, or as two logical subsystems under the control of separate MCPs. The A 15 may also contain up to 192 million bytes of memory. The initialization procedures for the A 15 vary depending on the configuration of the processors.

A SERIES AND B5000/6000/7000 OPERATIONS

B 5900

The B 5900 consists of a series of functional processors. They logically operate on various phases of the workload. One example is the Message Level Interface Processor (**MLIP**) which controls input/output processing. Processor logic is micro-programmed (logically programmed with software) rather than hard-wired (physically programmed with wiring). The B 5900 has a maximum memory capacity of 6.29 million bytes (6MB). It may have a maximum of 4095 peripheral devices connected to it. The B 5900 may have one or two ODTs. It also has a Maintenance Interface Processor (**MIP**) and two Industry Compatible Minidisk drives (**ICMD**). The Minidisk drives are used for initializing the system.

B 6800

The B 6800 consists of the following four functional processors: the central processor which processes data; the input/output (I/O) processor which moves data between the various peripheral devices and the system; the data communications processor which maintains the data communications workload; and the maintenance processor which maintains information on the status of the various components of the system. Unlike the B 5900, the processor logic is hard-wired. Like the B 5900, the B 6800 has a maximum memory capacity of 6 million bytes. It has a maximum of 255 peripheral devices and there may be one or two ODTs.

Note: The data communications works differently on the B 6800 than on most other systems discussed in this document.

B 6900

Input/output processing is performed by the Message Level Interface Processor ,as in the B 5900. The B 6900 is physically smaller than the B 6800 but larger than the B 5900. Like the B 5900, it has many of the instructions included in the micro-code. It has an operator console which contains two ODTs, and the Maintenance Display Cabinet contains an Industry Compatible Minidisk drive.

B 7800

The B 7800 is a large-scale data processing system. It may consist of several Central Processor Modules (**CPM**), Input/Output Modules (**IOM**), Memory Control Modules (**MCM**), and a Maintenance Processor (**MP**).

Note: The data communications works differently on the B 7800 than on most other systems discussed in this document.

B 7900

The B 7900 is a very large-scale data processing system. It consists of the following:

Central Processing Module (**CPM**). The Processor of the machine.

Memory Subsystem Module (**MSM**). Provides the control of the Memory Storage Units.

Input/Output Subsystem Module (**IOSM**). Houses the **HDU** and the **AP**.

Host Data Unit (**HDU**). Handles all I/O Data transfers between the Main Memory and the I/O Subsystem.

Auxiliary Processor (**AP**). Offloads selected System Software functions from the **CPM** during normal execution. It also will act as a Maintenance Processor for the system.

The B 7900 has a maximum memory configuration of 96 million bytes, a maximum of three processors, and a maximum of 1920 data communication lines attached via three IOSMs.

CATEGORIES OF SOFTWARE

The software is any one or all of the step-by-step instructions, called programs, that guide the computer through the completion of a job or the solution of a problem. The software used on your system is divided into three categories: System, Application, and Environmental.

System software coordinates the operations of the computer system and manages the use of the system's resources so the system runs efficiently. One example is the Master Control Program, or **MCP**. System software can be further divided into three categories:

1. The **operating system**, or MCP, controls the overall operations and performs many of the functions involved in running your system.

2. **Compilers** generate machine-executable object code from the source code. The compilers available on your system include: ALGOL, COBOL, PASCAL, FORTRAN, WFL, NDLII or NDL, PL/I, and BASIC.

3. **Utility programs** perform frequently required tasks such as copying data between media. The use of utility programs can save the programmer from having to write the same group of instructions each time a program requires the performance of that operation. These include: SYSTEM/BACKUP, SYSTEM/DUMPALL, SYSTEM/FILECOPY, SYSTEM/FILEDATA, and SYSTEM/MAKEUSER.

Application software solves specific user problems, such as the processing of payroll. Other application programs used on your system might include: Text Management and Communication System (TMCS), Distribution Information System (DIS), Bank Information System (BIS), Burroughs Hospital Information System (BHIS), and Production Control System (PCS III).

Environmental software establishes the environment or conditions under which the application programs will be running. Included are:

Generalized Message Control System (GEMCOS), Command and Edit (CANDE) Language, Data Management System II (DMS II), Network Definition Language (NDLII), Burroughs Network Architecture (BNA), and InterPro Software(COMS, MARC, IDC, ADDS, and SDF).

Certain of these environmental software programs handle the message flow between the terminals and the computer system and the MCP. Others are used to maintain common data bases and libraries which can be accessed by one or more application programs.

Examples of software:

SYSTEM

- MCP
  - SYSTEM/MCP36141
- COMPILERS
  - SYSTEM/ALGOL
  - SYSTEM/COBOL
  - SYSTEM/COBOL74
- UTILITY PROGRAMS
  - SYSTEM/BACKUP
  - SYSTEM/DUMPALL
  - SYSTEM/FILEDATA
  - SYSTEM/FILECOPY

APPLICATION

- DIS
- BHIS
- PCS III
- BAMCS
- GFS

ENVIRONMENTAL

- SYSTEM/COMS
- SYSTEM/CANDE
- DMSII
- SYSTEM/NDLII

PRACTICE EXERCISE:

In the space provided beside the term, write the letter of the statement that best defines the term. Statements are used only once.

_____1. Peripheral Device

_____2. MCP

_____3. Utility Program

_____4. Hardware

_____5. Compiler

a. Is an example of application software that is known as the Production Control System.

b. Is an example of system software that translates a program into machine-understandable language.

c. Is an example of environmental software that handles the message flow between terminals and the system.

d. Is an example of system software that performs certain tasks that are frequently required such as sorting or copying data between media.

e. Is a piece of hardware, such as a tape or disk drive, used on the systems.

f. Is an example of application software that is known as the Bank Information System.

g. Is the physical equipment of the computer including the peripheral devices.

h. Is the system software that controls the overall operation of the system.

A SERIES AND B5000/6000/7000
OPERATIONS

SYSTEM CONCEPTS

UNIT 2

FILES AND JOBS

OBJECTIVE:

Manipulate files and their attributes on the Burroughs **A SERIES** systems. This includes:

File Overview: Define the concepts of file storage and access.

File Naming Conventions: Identify the purpose for and effects of file naming conventions.

Family Substitution: Identify the purpose and effects of family substitution.

File Equation: Identify the purpose and effects of file substitution.

Work Flow Overview: Identify and execute Work Flow jobs.

Library Maintenance: Determine the use of the library maintenance commands.

Security Overview: Identify aspects of file security and related system utilities.

RESOURCES:

- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series Work Flow Language Reference Manual.
- A Series System Software Site Management Reference Manual.

INTRODUCTION:

You will often have to perform operations that use files and jobs. Each file or job will have a specific name, be located on a specific medium, such as disk or magnetic tape, be accessed via a guide to the files, known as a disk or tape directory, and may be listed in a catalog of file and job names and their associated media. You will have to make the system copy files between media and start Work Flow jobs to handle a variety of operational duties. Your company may also use any of a number of file security methods to indicate who may access other user's files and jobs. The following discussions will cover a variety of important topics.

FILE OVERVIEW

A file is an organized collection of data and consists of related records. A program may work with none to many different data files during its run.

File Storage

Before proceeding with a description of disk file storage, we must first define some terms relating to these subsystems. The following terms are used in conjunction with disk subsystems on Burroughs **A SERIES** systems:

1. **Family name** - The family name is the label assigned by the operator to the base pack and any associated continuation packs.

2. **Base Pack** - When files cannot be contained on a single pack, one or more additional packs may be required. The first pack is then known as the base pack, and all subsequent packs related to that same pack are known as continuation packs. All of these packs would then have the same name but would be distinguished by their family index.

3. **Continuation Pack** - The second and subsequent packs within the same family are known as continuation packs. Continuation packs are declared using the ODT command RC (discussed in Section 3).

4. **Family Index** - The relative number of a pack within its family. The base pack is considered family index number 1. Continuation packs are assigned family indices beginning with the number 2.

A family of disk type devices may consist of one or more packs having a common name. Each family has a file called the flat directory which contains the file headers. The headers contain the names of the files residing on that pack, and information about the creation and accessing of the files. The flat directory is used to determine the location of files on a given pack. Additional copies of the flat directory may be included on the continuation packs for use in case one of the continuation packs has to substitute for an unusable base pack. A total of three copies of the flat directory may be included per disk family (the ODT command DD used to duplicate the flat directory is discussed later).

One of several system files, SYSTEM/ACCESS is used specifically to access the headers in the flat directories. This file resides on the Halt/Load disk and consists of the Pack Access Structure (PAST) and the File Access Structure (FAST). The flat directory is listed in the order in which the files were created and, therefore, would make file accessing very time consuming. By using the PAST and FAST, the system is able to determine rapidly and randomly which pack the file is on and the location of the file header in the flat directory on that pack. Then, the file header is used to locate the file on that pack.

The following ODT/MARC commands are used to deal with the PAST and FAST structures (the use of the ODT and MARC is covered in Section 2):

1. **AD** (Access Duplicate) - Duplicates the PAST and FAST found on the Halt/Load pack, which is usually labeled DISK and which has the MCP sections used to Halt/Load the system and the system's files including many of the often used utility programs. A second copy of the PAST and FAST may be kept for use if the first copy is accidentally destroyed. These are not large files.

   Example: AD (2)
   (Copies the PAST and FAST to the first continuation pack of the Halt/Load family.)

2. **DD** (Directory Duplicate) - Copies the flat directory to continuation packs. Only three copies of the flat directory including the original are permitted. Copies are useful if the original on the base pack is accidentally destroyed.

   Example: DD ON CUSTOMER (3)

3. **RB** (Rebuild Access) - Causes a new PAST and FAST to be built on the indicated pack, based on information that the system obtains from the flat directory.

   Example: RB ON PACK

File Attributes

File attributes are characteristics about the file such as how it is stored, the number of sectors and disk areas that the file is using, the maximum and minimum number of characters in the records, the title of the file, and whether the file is to be used for input, output, or both. These attributes give the system the information it needs to make the connection between the logical file which a program requests and the physical file that it will be able to access. The following are some file attributes:

1. **CREATIONDATE** - The date the file was created.

2. **LASTACCESSDATE** - The date the file was last accessed.

3. **SECURITY** - The class of the file, such as PRIVATE, PUBLIC, GUARDED, or CONTROLLED.

4. **AREAS** - The maximum number of areas or rows (groups of disk sectors), that can be allocated to the file.

5. **TITLE** - The name of the file.

6. **BLOCKSIZE** - The number of characters or words written together as a block. The file attribute UNITS (described below) indicates to the system whether the block size is in characters or words.

7. **AREASIZE** - The number of records to be stored in each area of the file.

8. **FILEKIND** - The type of data in the file, such as symbol or machine understandable object code (for example, ALGOLSYMBOL or ALGOLCODE).

9. **SERIALNO** - The serial number of the tape or disk. It can be used to indicate the destination when telling the system to copy files out to a specific purged tape.

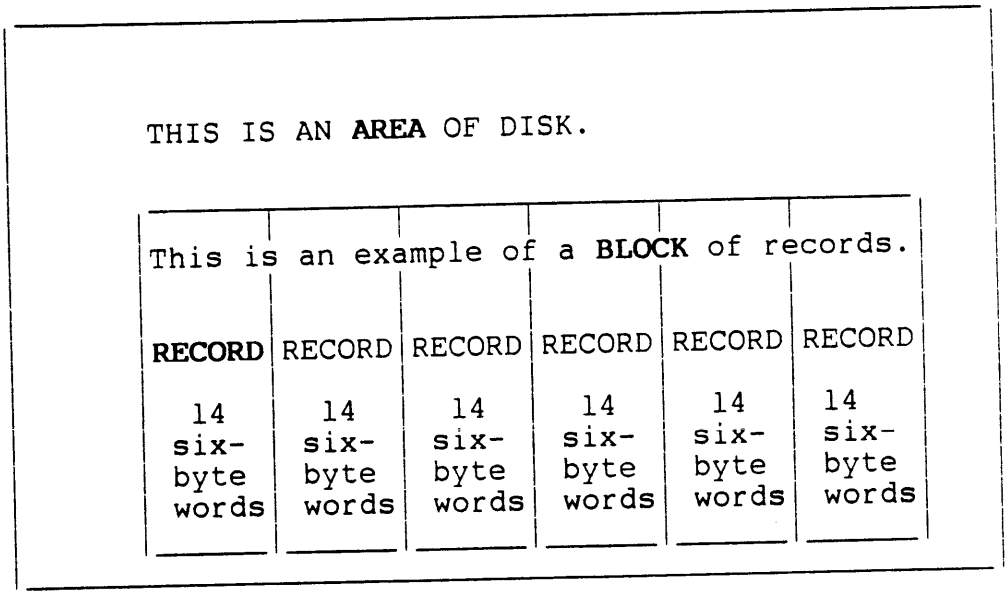
10. **UNITNO** - The number of the tape or disk drive.

11. **UNITS** - Indicates whether certain attributes are stated in terms of characters (UNITS=1) or words (UNITS=0).

12. **MAXRECSIZE** - Indicates the maximum size of the logical records in the file in units.

13. **MINRECSIZE** - Indicates the minimum size of the logical records in the file in units.

Some of these attributes are depicted in the following diagram.



FILE ATTRIBUTES

The following ODT/MARC command is used to list files in the flat directory and display their attributes (the use of the ODT and MARC is covered in Section 2):

PD (Print Directory) - Displays a list of the files in the flat directory. If PD= is used, only the leftmost identifier (described later) of the file names is listed. If PD ACCT=, ACCT-, ACCT/-, or ACCT/= is used, all files having ACCT as the first identifier will be listed. The ON <familyname> lists the files on the pack having that name.

If an exact file name is provided, the presence of that file is checked and the type of file (FILEKIND) is displayed. If a number is included, it represents the number of leftmost identifiers of the file name to be searched and displayed.

Example: PD ACCT/- 2 ON EDUCATION

Output:
```
ACCT (DIRECTORY)
. QUERY (ALGOLCODE) & (DIRECTORY)
. . HELPFILE (DATA)
. UPDATER (ALGOLCODE)
. DOC (DIRECTORY)
. . EXAMPLES (SEQDATA)
. . STARTUP (DIRECTORY)
```

PRACTICE EXERCISE:

A. In the space provided, write the letter of the description that best defines the function of the associated ODT command.

_____1. AD

_____2. PD

_____3. DD

a. Sets the ODT automatic display mode.

b. Deletes from the flat directory the old file having the same name as a new file.

c. Copies the flat directory to a continuation pack.

d. Duplicates the PAST and FAST.

e. Prints, punches, or displays the contents of a tape directory.

f. Displays the list of files in the flat directory.

B. In the space provided, write the number or word that best completes the statement.

1. Disk type devices having the same label and flat directory are organized into groups known as _____.

2. The attribute of a file which contains the date that it was created is known as _____.

3. The consecutive numbers used in certain ODT statements to indicate continuation packs are known as _____.

4. The attribute of a file which contains its name is known as _____.

FILE NAMING CONVENTIONS

The following principles of file naming should be considered when creating files:

1. A file may have up to **14** file identifiers, and each identifier may contain up to **17** alphanumeric characters. At least one of these characters must be alphabetic and it is recommended that no special characters be used. **Note:** Pack names are not used as part of the file identifiers.

   Examples: A/B/C/D/E/F/G

   A123/B453/D3456/PRODA

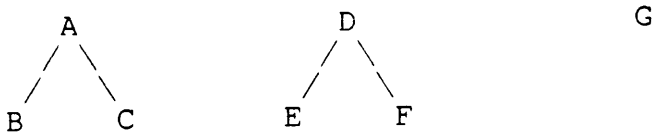
2. If a file is usercoded (discussed later) the first identifier is always the usercode (now only thirteen more identifiers are permitted) and, although a slash (/) is used to separate other file identifiers, it is not used to separate the usercode from the next identifier. Files which are not usercoded (usually system utility programs) are called star files because a star or asterisk (*) precedes the first identifier.

   Examples: (ABC)A/B/C/D/E/F/G

   *SYSTEM/MAKEUSER

If the file name has two or more identifiers, each of the identifiers except the rightmost one is considered a directory or guide to the file names contained under that directory. If a file consists of two or more identifiers, each identifier is separated from the one before and after it by a slash (/).

For example, if you had five files named A/B, A/C, D/E, D/F, and G, you would have the following directories: A, and D. Directory A would have two entries; one for file B and one for file C. Directory D would have two entries; one for file E and one for file F. File G would have only one entry at the same level as directories A and D. This relationship is depicted below:



PRACTICE EXERCISE:

In the space provided, write the number or word that best completes the statement.

1. File names can contain only up to _____ identifiers.
2. An * is used as the first character of a file name when the file is _____.
3. Identifiers can contain only up to _____ alphanumeric characters.
4. If the file name contains two or more identifiers each identifier is separated from the others by a _____.

FAMILY SUBSTITUTION

All disk type devices are organized into families. Certain system and environmental software programs expect to find a disk type device with a family name of DISK and certain other software may expect to find a disk type device with a family name PACK. The MCP, by default, always looks for files on the pack called DISK. If the file is not found there, the task or job calling for the file is put into the waiting entries with a "NO FILE" condition. Family substitution tells the MCP that instead of using the family named DISK, use the family name from the family substitution specification. Family substitution may be specified:

- When the usercode is created,
- In a job or task, using the Work Flow Language FAMILY statement, or
- In CANDE or MARC sessions, using the FAMILY command.

Examples of family substitution are as follows:

```
FAMILY DISK = PROD ONLY
(Reads and writes files only to the family named PROD)

FAMILY DISK = PROD OTHERWISE PACK
(Reads files from the families named PROD or PACK, and
writes to the family named PROD only. The system
always looks on PROD first.)
```

Family substitution is not limited to the family DISK, but only **one** family statement can be used at a time, and DISK is the most common family used for substitution. Rules for family substitution are:

1. The priority of family substitution is determined in the following order (low to high):
   A. The CANDE session's usercode default statement,
   B. May be overridden by the CANDE session's FAMILY command,
   C. May be overridden by the job's usercode's FAMILY statement, and
   D. May be overridden by the job's FAMILY statement,
2. The queue's FAMILY statement, if any, must agree with the result of rule 1, or else the job is Q-DS;
3. Finally, apply a task's FAMILY statement, if any.

PRACTICE EXERCISE:

Given the prior set of rules, complete the following FAMILY statement based upon family substitution. Place the correct family name or action in the numbered boxes provided in the table. See 1 and 2 as examples:

"FAMILY DISK = . . . ONLY" from the:						Resulting FAMILY statement or action
CANDE session's usercode statement	CANDE session statmnt	Job's user-code statmnt	Job statmnt	Queue test	Task statmnt	
PROD	-	-	-	-	-	1. PROD
TESTPK		-	-	PAYPK	-	2. Q-DS
PROD	TESTPK	-	-	-	-	3.
-	PROD	-	PAYPK	-	-	4.
-	-	DISK	PROD	-	5.	TESTPK
-	TESTPK	-	6.	-	-	PROD
PROD	PAYPK	DISK	PROD	PAYPK	-	7.
TESTPK	PROD	DISK	-	8.	-	DISK
PROD	9.	-	-	TESTPK	-	TESTPK
-	-	-	PAYPK	PAYPK	TESTPK	10.
-	-	-	-	-	-	11.

"-" means no FAMILY statement.

FILE EQUATION

Programs expect their data files' attributes to have certain values. Examples of attributes are title, record size, blocking factor, and location (pack name or hardware type). These expectations can be overridden at execution time by:

```
RUN MASTER/PROGRAM;
    FILE CARD (TITLE = (WFR)PAYDATA ON GENACCT);
```

When the program is running if the program is looking for a specific file and the MCP cannot locate it, the MCP will display: **<mix number> NO FILE <file name>.** The response might be:

```
<mix number> FA KIND=PACK,TITLE=(WFR)PAYDATA ON GENACCT
```

FA (File Attribute) - is most frequently used to change the file title, file kind or family statement attributes, but it may be used to change other attributes for the current run also. If the internal file name is CARD, it may be necessary to modify both the KIND and the TITLE attributes since the task is probably looking for a card reader for input. The FA command above would be applicable.

PRACTICE EXERCISE:

In the space provided, write the numbers and words that best complete the statement.

1. The _____ command is used to change attributes once the program is running.

2. The statement used to override the attributes of a file at task initiation time is a _____.

3. The most common usage for the FA command is to change the _____ attribute, _____ attribute, or the _____ attribute.

WORK FLOW OVERVIEW

The Work Flow Management (**WFM**) system is a set of computer programs and files which constitute an operating system used to process programs written in the Work Flow Language (**WFL**).

WFM System

The WFM system is is made up of four major components. They are as follows:

WFL compiler	SYSTEM/WFL
Controller	SYSTEM/CONTROLLER
MCP	SYSTEM/MCP
Jobformatter	SYSTEM/JOBFORMATTER

These components are described briefly below:

WFL Compiler

When a job is started from a terminal or the ODT, the MCP starts the WFL compiler. The WFL compiler checks for the correct language syntax of the job, translates the job source statements into object code, and creates a jobfile for each job it compiles.

When the job is ready for execution, the jobfile is passed to the **Controller**.

Controller

The Controller is the program that manages the overall workload of the jobs in the system. This program is fired up by the MCP at Halt/Load time and is in charge of the scheduling of the queues and operator communication.

Once a job is placed in a queue, Controller will select the jobs based upon job priorities and the overall mix limits of the MCP and the queue (priorities and limits are discussed later). Upon selection, any job attributes which were not explicitly set by the job are set, and Controller then passes a job entry to the **MCP** for processing of the job.

MCP

The MCP procedure Jobstarter receives the job from the controller, and transfers the job to the correct environment so it can be run. Upon normal completion of the job, the MCP passes an end-of-job (EOJ) notice to Controller. Controller then enqueues the jobfile for printing and initiates **Jobformatter.**

Jobformatter

Jobformatter formats the jobfile for printing. The printing subsystem then takes over and prints all the related printer backup files for the job. When the printing is completed, an end-of-printing notice is passed to Controller. Controller then deallocates the disk space assigned to the jobfile and the process is completed.

Work Flow Language (**WFL**)

Work Flow Language (WFL) is an English-like language used solely to create WFL jobs. It is designed to allow a user to control the flow of tasks performed. A task can be any program that is executed or any Library Maintenance statement used to manipulate a file on pack or tape.

WFL Job

The WFL job is a set of interrelated tasks to be performed. A task is a statement or group of statements that, when executed, are processed as one entity. For example, a compilation of a program, copying files between media, or the execution of a program are each considered tasks. Both serial and parallel execution of tasks are possible through WFL.

Every WFL job begins with a BEGIN JOB statement and ends with an END JOB statement. If a task is executed outside of a WFL job (for example, from the ODT), the MCP performs the task as a WFL job, appending BEGIN JOB and END JOB statements and sending it through the WFL compiler.

WFL jobs are automatically restarted by the system if they were in the process of running when the system had to be Halt/Loaded and the MCP option AUTORECOVERY was set. Jobs can contain restart logic to control the recovery process.

To initiate a WFL job at the ODT (the use of the ODT is covered in Section 2), the operator enters a START statement with a USER statement preceding (if the WFL job is located under a usercode). See the following example:

```
USER = XYZ/CORP; START PAYROLL/MASTER ON PROD
(the WFL compiler will look for a file of
type JOB named (XYZ)PAYROLL/MASTER on the
family named PROD)
```

Once the job is started, a job number is assigned to the object created by the WFL compiler. A task number is also assigned to each program executed. Thus for an ODT request to view active, waiting, or scheduled tasks, two numbers separated by a slash (/) appear beside each entry. The first number is the job number, and the second number is the task number. The task number is used to communicate with the program and may be thought of as the **mix number**.

Example: -----1 WAITING ENTRY -----

```
 9715/9716 50 *SYSTEM/DUMPALL
TDATA/0000 REQUIRES MT #1
(9716 is the mix number)
```

Each WFL task begins with a WFL verb. Tasks may be specified as those that are to be performed at the same time as other tasks in the job, those that have to wait for one or more specific conditions to be satisfied, those that have to wait for other tasks to finish, or those that have to wait a specified period of time. With few exceptions, the WFL statements within a WFL job may be written in any order. WFL is not a substitute for application programming languages, such as COBOL.

Examples of tasks include program compilation and program execution. Examples of jobs include execution of several utility programs to copy files between media, performing a series of tasks such as compiling, or executing a series of programs.

Each WFL job must be named and certain verbs must be used to indicate where the job begins and ends. An example is provided below.

Example:
```
BEGIN JOB PROGR1;
PRIORITY=60;
  PROCESS RUN ACCT/UPDATE1 ON PACK;
    FILE PROD1 (KIND=DISK,
      TITLE=ACCT/TEST/DATA1 ON TESTPK);
  RUN ACCT/UPDATE2 ON PACK;
    FILE PROD2 (KIND=DISK,
      TITLE=ACCT/TEST/DATA2 ON TESTPK);
END JOB;
```

Some Work Flow Language Constructs

1. **BEGIN JOB <job name>;** - Indicates the beginning point of a WFL job.

   Example: BEGIN JOB SAMPLE1;

2. **END JOB;** - Indicates the ending point of the WFL job.

   Example: END JOB;

3. **USERCODE = <usercode> / <password>;** - Indicates under which usercode the job is to be executed.

   Example: USERCODE = A/B;

4. **QUEUE** or **CLASS = <number>;** - Indicates in which queue the WFL job will be placed (discussed later).

   Example: QUEUE = 3;

5. **RUN <file name>;** - Indicates that the named program is to be executed. The WFL verb EXECUTE could be used in place of RUN. This is known as synchronous processing.

   Example: RUN SYSTEM/FILECOPY;

6. **PROCESS <WFL verb syntax>;** - Indicates that the named statement is to be performed at the same time as the next executable statement. This is known as asynchronous processing.

   Example:
   ```
   PROCESS RUN PROG2;
   RUN PROG3;
   ```

7. **START <WFL source file name>;** - Indicates that the specified WFL job is to be passed to the WFL compiler to have its syntax checked, and if it is syntactically correct, the job will be placed in a queue to wait for its turn to execute.

   Example: START DAYBACKUP;

8. **STARTTIME = <starttime specs>;** - Indicates when the job is to be executed. The time and date may both be specified.

   Examples:
   ```
   BEGIN JOB MYJOB;
     STARTTIME = 13:00 ON 10/03/99;
   ```
   (The job instructions will begin to be executed after 1:00 p.m. October 3, 1999.)

   ```
   BEGIN JOB MYJOB;
     STARTTIME = +1:15;
   ```
   (The job instructions will begin to be executed one-and-one-quarter hours from the time the job is started.)

   The STARTTIME statement may be included within a WFL job, as shown above, or may be included when the START statement is entered.

   ```
   START MYJOB/JOB2; STARTTIME = 13:00;
   ```

PRACTICE EXERCISE:

In the space provided, write the word or words that best complete the statement.

1. To indicate the end of a WFL job named PROD/FIRST/ONE, you would use the WFL statement

   _____.

2. To indicate within a WFL job that the program MY/CHANGER is to be executed at the same time as MY/UPDATER, you would use what two WFL statements (in the correct order):

   _____

   _____

3. To have the system begin executing the WFL job named MY/UPDATER, which is contained in a file named START/UPDATER you would use the WFL statement

   _____.

4. To indicate within a WFL job that all programs are to be executed under the usercode ABC with the password DEF, the following statement would be used:

   _____

5. To indicate the beginning of a WFL job named PROD/FIRST/ONE, you would use the WFL statement

   _____.

LIBRARY MAINTENANCE

Library Maintenance is initiated by a WFL request to COPY, ADD, CHANGE, or REMOVE files. The following are some Library Maintenance constructs:

1. **COPY <file name list> FROM <device name> (<device kind>) TO <device name> (<device kind>)** - Copies the indicated files from and to the indicated devices. If a device name is given then the default device kind is tape. If no device name is given then the default device kind is a pack called DISK.

   Examples: COPY = FROM MYTAPE TO YOURTAPE;
   (Copies all files from tape to tape.)

   COPY A AS B FROM MYTAPE TO EDUCATION2(PACK);
   (Copies file A from tape to the indicated pack giving the copied file the new name B).

   COPY A/B/= TO YOURTAPE;
   (Copies all files from DISK having three or more identifiers of which A and B, in that order, are the first two identifiers. Any file having only one or two identifiers of which A and B, in that order, or only A or B alone, are the identifiers will not be copied.)

2. **ADD <file name list> FROM <device name> (<device kind>) TO <device name> (<disk device kind>)** - Copies the indicated files to and from the indicated devices just as the COPY statement does, but does not add to the disk or pack any files whose names already exist in the disk directory. As with the COPY statement if a device name is given then the default device kind is tape. If no device name is given then the default device kind is a pack called DISK.

   The ADD or the COPY statement may include the option "& COMPARE" to have the copied or added files compared with their original sources to determine if the files have been copied correctly. Two other options "& CATALOG" and "& BACKUP" are used only with cataloging systems (See Appendix H).

   Examples: ADD & COMPARE A/B/= FROM DISK TO PACK

3. **CHANGE <file name>** TO **<file name>** FROM **<pack name>** - Changes the title of the named file to the indicated new name.

   Example: CHANGE A1 TO B1 FROM EDUCATION2;

4. **REMOVE <file name list> FROM <pack name>** - Removes the indicated files from the specified pack. If the file is on the pack named DISK, the FROM option is not used.

   Example: REMOVE (AB)= FROM USER2; (Removes all files under the usercode AB on the pack named USER2.)

PRACTICE EXERCISE:

What series of statements in their correct sequence will have the system do the following:

A. Copy and compare all files under the usercode TUV in the directory PROD as usercode XYZ in the directory TEST from the tape named ABC to the family named TESTPK.

_____

_____

B. Change the name of the directory of the files, copied in part A. above, from TEST to TEST1 under the usercode XYZ. Leave the pack location the same.

_____

C. Remove the files in the directory named TEST1 for usercode XYZ. Again, leave the pack location the same.

_____

SECURITY OVERVIEW

Most systems run with usercodes assigned to each person using the system. A usercode is a unique identifier that establishes user identity and file access security limitations. It provides for the separation of files by user. As stated before, usercodes are attached by the system before the leftmost identifier of the file name. Additionally, Accesscodes are also provided as a means to further sub-divide Usercodes.

Through the use of various file attributes, two utility programs, SYSTEM/MAKEUSER and SYSTEM/GUARDFILE, and the SECURITY Work Flow Language statement, systems personnel can indicate which users will have access to specified files. The MCP has ultimate responsibility for maintaining file security according to the company's requirements.

File Attributes Used With File Security

Three file attributes are used to indicate how file security will be implemented. These file attributes are **SECURITYGUARD**, **SECURITYTYPE**, and **SECURITYUSE**. These and other file attributes are described in the I/O Subsystem Reference Manual.

SYSTEM/MAKEUSER

The **SYSTEM/MAKEUSER** utility program is used to establish controls over which local or remote users have access to the system. It creates or updates a file known as **SYSTEM/USERDATAFILE**, which is indexed by usercodes. This data base contains a list of valid usercodes and other kinds of data relative to the users of the system. All access to the SYSTEM/USERDATAFILE is performed by procedures of the MCP.

Additions and deletions to the SYSTEM/USERDATAFILE list are performed by using the ODT command MU (discussed later) or by running SYSTEM/MAKEUSER either interactively from a terminal or in batch mode via Work Flow. SYSTEM/MAKEUSER can only be run by someone having a privileged usercode.

SYSTEM/GUARDFILE

The **SYSTEM/GUARDFILE** utility program is a further extension of file security. It is used to create a file that describes the relationship between various files or programs and various users. This file is called a guardfile. It is created by you, by your operations manager, or by users within your company.

The guard file is examined by the MCP whenever a file or database secured by the guard file is opened. Thus only those usercodes that are included in the guard file will be granted a certain type of access; all others will be denied access to the guarded files or database. Access may be differentiated as to whether the file is to be considered as read-only (RO), no access (NO), execute-only (EO), read and write-ok (RW), or write-only (WO), to name a few. If an access right has not been specified but a file name has been specified, the default for a file is no access (NO). Guard files are not checked when owners of given files access their own files, since files are considered to be public to the owner.

ODT/MARC Commands

The following are used to build file security into the system (the use of the ODT and MARC is covered in Section 2).

1. **MU** (Make User) - Places a usercode and its associated password into the SYSTEM/USERDATAFILE. The MU command may be disabled through SYSTEM/MAKEUSER commands.

2. **SR** (Secure Reader) - Requires that any data input via a card reader be preceded by a card indicating the associated usercode.

Work Flow Language Statement

The **SECURITY** statement in the Work Flow Language is used to change the security-related file attributes of an existing disk file.

Example: SECURITY ABC/PROG1 PUBLIC IO (This changes the file ABC/PROG1 to public access with reading and writing allowed.)

PRACTICE EXERCISE:

A. Orally define the functions of the following:

1. SYSTEM/MAKEUSER
2. SYSTEM/GUARDFILE
3. SYSTEM/USERDATAFILE

B. In the space provided, write the word or words that best answers the statement.

1. The ODT command that is used to place a usercode and its associated password into the SYSTEM/USERDATAFILE is:

   _____

2. The Work Flow Language statement which would be used to change the file MANUFACTURING/QUALITYDATA/052184 from PUBLIC IO to PRIVATE IN is (show full syntax):

   _____

A SERIES AND B5000/6000/7000 OPERATIONS

SYSTEM CONCEPTS

UNIT 3

SYSTEM INITIALIZATION CONCEPTS

OBJECTIVE:

Identify all key elements of system initialization for the Burroughs **A SERIES** systems.

RESOURCE:

o A Series System Software Site Management Reference Manual.

INTRODUCTION:

As an operator you will be required to be able to initialize a halted or a powered down system. This unit describes the procedures for initializing your system, depending on the level of initialization required.

SYSTEM INITIALIZATION PROCEDURES

Your system must be initialized when the central processor, peripherals, and controllers have been powered down, when the system has developed a fatal error and has not reinitialized itself, or when the copy of the MCP in memory has become unusable. Initialization means that a new copy of the MCP will be loaded into memory. The four levels of initialization (Halt/Load, Warm Start, Cool Start, and Cold Start) are briefly described below (Appendices A-G cover the procedures in greater detail):

Halt/Load

The Halt/Load process halts the system and loads a fresh version of the MCP to main memory from the Halt/Load disk pack. The MCP tables are updated and the disk directory remains intact.

The following occurs during a Halt/Load:

All tasks are terminated.

All input/output operations cease.

A fresh version of the MCP is loaded to main memory.

All MCP tables are reinitialized.

On the B6800 and B7800 a tape drive is used; the B5900, B6900, and B7900 uses a floppy disk drive; and the A Series machine uses hard disk drives.

The Halt/Load unit (the pack on which the MCP resides) can be any disk pack on the system. It does not have to be a specific drive. The Halt/Load unit is connected to the system in the same manner as the other packs. The name of the Halt/Load unit on the system is usually DISK, but it is not restricted to this name.

A "long Halt/Load" reloads pack and processor firmware and is normally used for restarting after a power loss.

A Halt/Load may be performed at the ODT by entering the primitive:

??PHL <ETX> <XMIT> This will cause a programmatic Halt/Load on **all** Burroughs **A SERIES** systems.

Warm Start

The warm start method is used to update MCP tables or load pack controller firmware from the system tape.

A warm start has the following effects:

Requested files are loaded to the pack controller.

Entries in the existing MCP tables are updated.

The system does a Halt/Load to the new MCP.

Cool Start

A cool start is performed to load a copy of the MCP to a disk pack from the system tape. The directory of the disk pack does not change during the procedure (except for the new copy of the MCP). A cool start is generally performed only when the copy of the MCP on disk is unusable.

A cool start has the following effects:

A new MCP is loaded on the Halt/Load unit.

Entries in the existing MCP tables are updated.

The system does a Halt/Load to the new MCP.

Cold Start

During a cold start, a copy of the MCP is loaded to a disk pack from the system tape causing the loss of all existing files on the family where the MCP is copied to. A cold start is normally performed when the system is powered up for the first time. However, it may be performed whenever your installation requires.

The following occurs during a cold start:

A new MCP is copied to the disk pack designated as the Halt/Load unit.

MCP tables are created.

A new disk directory is created on the Halt/Load unit.

The system does a Halt/Load to the new MCP.

PRACTICE EXERCISE:

In the space provided, write the best answers to the following statements:

1. What four events occur during a Halt/Load?

   _____

   _____

   _____

   _____

2. The most drastic form of system initialization is a

   _____.

3. Under what condition would you use the programmatic Halt/Load?

   _____

   _____

SYSTEM CONCEPTS

SECTION 1

REVIEW

In this section you have been provided with an overview of the hardware and types of software used on Burroughs **A SERIES** systems. This information is important to know because subsequent discussions in this course assume that you know the names of the hardware elements and examples of the various types of software that comprise these Burroughs systems.

You were told about examples of the three different types of software used on your system: system software such as the MCP and utility programs, application software such as TMS, BIS, DIS, and PCS, and environmental software such as DMSII, NDLII, CANDE, and COMSs. Many hardware elements were described to you in this section. They include the Processors, Memory Subsystems, and I/O Subsystems.

PRACTICE EXERCISE:

1. Define hardware and give an example of hardware.

   _____

2. Define system, application, and environmental software.

   _____

3. Describe the use of the WFL language.

   _____

4. List at least three of the verbs used in Library Maintenance.

_____

5. Describe when a Cold Start and a Halt/Load would be needed.

_____

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SECTION 2

ODT AND MARC OPERATIONS

A SERIES AND B5000/6000/7000 OPERATIONS

ODT AND MARC OPERATIONS

SECTION 2

INTRODUCTION

SECTION OBJECTIVE:

Identify the use of the Operator Display Terminal (ODT) via its Automatic Display Mode (ADM) capability and the Menu-Assisted Resource Control (MARC) interface for use with the Burroughs **A SERIES** systems.

PURPOSE:

To perform most of your duties as a computer operator it is important to be familiar with how to communicate with the system from the Operator Display Terminal (ODT) or a standard data communications terminal (non-ODT device). This section describes the commands which you will use to work with the system.

UNIT OBJECTIVES:

Objective 1 Identify the ODT commands used to set the Automatic Display Mode (ADM) for the Operator Display Terminal.

Objective 2 Identify and use the basic functions of the Menu-Assisted Resource Control (MARC) software package.

A SERIES AND B5000/6000/7000 OPERATIONS

ODT AND MARC OPERATIONS

UNIT 1

AUTOMATIC DISPLAY MODE ODT COMMANDS

OBJECTIVE:

Identify the ODT commands used to set the Automatic Display Mode (ADM) for the Operator Display Terminal.

RESOURCE:

o A Series Operator Display Terminal (ODT) Reference Manual.

INTRODUCTION:

You will normally have to communicate with the system using the ODT. This unit explains the functions of the ODT's Automatic Display Mode (ADM). This capability provides the operator with the opportunity to start and stop the display of information regarding system status.

ODT COMMANDS USED WITH THE AUTOMATIC DISPLAY MODE (ADM)

The operator may indicate how much information is to be displayed on the ODTs and how often the screens of information are to be redisplayed, by setting the Automatic Display Mode (ADM). The commands are transmitted to the system via the ODT to request information regarding system status, including that of specific peripheral devices, tasks, and jobs.

ODT commands used with the ADM

1. **ADM** (Automatic Display Mode) - Sets up, cancels, or displays the automatic display mode. ADM- cancels the specified ADM variables. Many of the following commands are used together with the ADM command to limit the number of waiting, scheduled, active, and completed jobs, on-line peripheral devices, and data bases to be displayed.

   Example: ADM (S 3, A 9, W) DELAY 7
   (The "S 3" allows for 1 line of heading and 2 lines of scheduled entries . The "A 9" allows 1 line for the heading and 8 lines for active entries. The "W" allows the rest of the screen to be used for waiting entries. See example output on the following page.)

2. **EVENT** - Indicates that the system is to update the screen each time that an entry in the specified list of entries changes. Tape labels may be printed, if EVENT PRINTLABEL is specified. In that case, printing would be directed to a terminal printer.

   Example: ADM EVENT W

3. **DELAY** - Indicates the number of seconds between displays of the updated screen information. The word DELAY may be omitted in which case just an integer would be entered. You should not set the delay to an exceedingly low number.

   Example: ADM (A 5, C 5, MSG) 6 (W 5, S 5, MSG) 9

```
----- 2 SCHEDULED ENTRIES -----

 0500 JOB  55  JOB/ACCOUNTING
*.... 0501 50  O/FIXUP

----- 8 ACTIVE ENTRIES -----

 0254/0254 55 #SEPCOMP JHOST2/HOST
 0243       70  SWAPPER
*0399/0399 60  TAPEPRINT/LP021/#000123
 0398 JOB  45  JOBTWO
 0398/0399 60  ALGOLPROG/TWO
 0234       60 *SYSTEM/CANDE
 .... 1235 60 *CANDE/STACK01
*1084\0185 50  ALGOL KAP

----- 4 WAITING ENTRIES -----

 0403/0404 50  PROG/ONE
NOFILE "TEST/INPUT ON TESTPACK"
*0579      45  JOB/INVENTORY; IN QUEUE 50
REQUIRES FETCH
 0395/0405 50  PROG/SPEC
OPERATOR STOPPED
*0393/0394 50  PAYROLL
ACCEPT CLOSING DATE IN MMDDYY
```

EXAMPLE OF AN ADM SCREEN WHEN ADM (S 3, A 9, W) IS SET

On the prior ADM screen, the following symbols appeared:

1. Pound sign: indicates that the job's tasks are running in SWAPSPACE (discussed later).

2. Asterisk sign: indicates that the entry is being displayed under this category of entries for the first time.

3. Reverse slash sign: indicates that the job has been initiated under control of a message control system such as CANDE.

ODT commands which are useful when using the ADM

1. **NS** (Next Screen) - Displays the next screen of information either when the system has to use more than one screen to respond to your command, or when the screen has accidentally been cleared. This command is automatically entered by the system, after you have accidentally cleared the screen.

   Example: NS

2. **TERM** (Terminal) - Sets up the maximum number of lines, the maximum number of characters per line to be used for displays on the ODT screens or terminal displays, whether messages are to be cut off at the right of each line, and how many lines are to be used for operator input. The default number of lines used for operator input is two. The remaining lines are used to display a heading and up to the specified number of entries in each of the indicated categories, such as waiting entries. The default number of lines is 24 and number of characters per line is 80. This commands will also stop system messages which are normally displayed to the terminal.

   Examples: TERM TRUNCATE TRUE LINES 20
   (Only 20 lines per page will be used and displays of text will be truncated.)

   TERM USER STUDENT
   (All messages to MCP will be prefaced by usercode "STUDENT.")

   TERM MSG FALSE
   (This stops the display of messages to the screen.)

3. **CQ** (Clear Queue) - Clears the list, or queue, of messages just coming to the ODT. New messages will still come to the screen after that point.

   Example: CQ

4. **SUPPRESS** (Suppress Display) - Suppresses display of the indicated jobs by job number. It is overridden if it is followed by A ALL, C ALL, W ALL, S ALL, or J ALL. It can be used to suppress the display of jobs that are always in the list of active entries. <job number list> SUPPRESS - cancels the suppression of the specified jobs.

   Example: 123, 136 SUPPRESS

ODT command used to designate a terminal (non-ODT device) as a remote ODT

REMOTESPO - Designates a terminal (non-ODT device) as a remote ODT or removes such a designation. Only certain terminal types may have remote ODT status applied to them. A remote ODT can send and receive the same messages as the system ODT.

Examples: REMOTESPO MT102
(MT102 is the name of a station.)

REMOTESPO - TD623
(The "-" removes the designation from TD623. At this point a: **?END <XMT>** must be entered at the terminal to return it to its controlling MCS.)

Other ODT commands used to display the status of the system

1. **A** (Active Mix Entries) - Displays all or the specified number of jobs presently in the list of active entries.

2. **W** (Waiting Mix Entries) - Displays all or the specified number of jobs presently in the list of waiting entries awaiting operator response.

3. **S** (Scheduled Mix Entries) - Displays the list of all or a designated number of scheduled jobs which have not yet gone into the list of active or waiting entries.

4. **J** (Job and Task Structure Display) - Displays all jobs in the mix, including the lists of waiting, scheduled, and active entries, but omitting the display of any messages coming from the jobs or from the system regarding each of the jobs.

5. **MX** (Mix Display) - Displays the same item as the J command, except the messages coming from the job or from the system are also displayed.

6. **MSG** (Display Messages) - Displays all or a specified number of recent program messages including those from discontinued jobs and jobs requiring operator input, and those coming from on-line users.

7. **C** (Completed Mix Entries) - Displays the list of all or a designated number of recently completed jobs.

8. **PER** (Peripheral Status) - Displays the status of all peripherals or only a designated category or units of peripherals. If a magnetic tape has a write ring on it, the tape number will appear on the ODT screen followed by an asterisk (*).

   Example: PER MT

9. **CU** (Core Usage) - Displays available and in-use memory usage for either the entire system, one or more jobs, or a task.

10. **DBS** (Database Stack Entries) - Displays the list of the active data bases in the system. DBS ALL displays both active and suppressed data bases.

11. **ALL** - Displays all mix entries, even those that have been suppressed using the SUPPRESS command.

    Example: A ALL

PRACTICE EXERCISE:

Write the ODT commands required to show the following automatic display mode options. The numbers below include a heading line for each category.

1. Alternating displays on the left ODT:

   5 lines for magnetic tape unit status
   4 lines for waiting entries
   2 lines for data bases
   the rest of the screen for system messages
   delay of 6 seconds

   5 lines for magnetic tape unit status
   4 lines for line printer status
   2 lines for scheduled entries
   the rest of the screen for system messages
   delay of 6 seconds

   _____

   _____

2. Display on the right ODT:

   11 lines for active entries
   5 lines for core usage
   the rest of the page for completed entries
   delay of 6 seconds

   _____

   _____

A SERIES AND B5000/6000/7000 OPERATIONS

ODT AND MARC OPERATIONS

UNIT 2

MARC CONCEPTS AND USAGE

OBJECTIVE:

Identify and use the basic functions of the Menu-Assisted Resource Control (MARC) software package.

RESOURCES:

- A Series Menu-Assisted Resource Control (MARC) User's Guide.

INTRODUCTION:

You have been introduced to the use of the ODT for communication with the system. This section describes the MARC software and allows you to use basic MARC functions.

MARC SOFTWARE

The **Menu-Assisted Resource Control (MARC)** is a simple, consistent interface that has been developed for systems operations, programming, and end users. MARC is based on menus and forms; it also includes a command facility. MARC provides help text for on-line usage. This interface is available from terminals as well as from the ODT. The current ODT commands (subsequent to system initialization), all Work Flow Language (WFL) commands, and a number of system utilities are provided by MARC. Additionally, the commands for the Communications Management Systems (COMS) Message Control System (MCS) and tasking functions are also provided.

MARC runs as a transaction processor under the COMS environment. It gathers input from a number of users at a number of different stations, translates the input into specific commands, and passes these commands to the appropriate components of the system. MARC then gathers the command output and sends it to the appropriate stations. MARC is provided with all versions of the COMS MCS.

MARC operates from Burroughs TD830-like terminals, such as TD830, MT983, MT987, ET1100, SR100, and B20/MT983. The ODTs attached to many Burroughs **A SERIES** systems are capable of supporting both data communications and MARC.

General Concepts

If you are at a terminal which is connected to COMS and it is ready to be logged on, a LOGON screen will be displayed. To log onto MARC you must enter a valid usercode/password combination for the system.

If you are at an ODT and it is currently not in data communications mode, then the MARC LOGON screen can be displayed by use of a primitive ODT command (assuming COMS is available):

??MARC

If you are finished with MARC and want to return the ODT back to normal functions, enter a primitive ODT command:

??ODT

Once the MARC system is active at the ODT or a terminal, it builds up commands as they are entered and sends them off to be processed by the appropriate system software procedures.

The system is based upon screen usage, of which there are two main types, menus and forms. Menus are used to select a particular function to be performed, while forms are used to specify the information required to process the given function.

In addition to the screens, the command mode capability enables ODT commands to be entered and passed directly to the MCP, without MARC processing.

Menus

An example of a **home** menu is on the following page. The top line of the menu states the screen name (MARC), the screen title (MENU-ASSISTED RESOURCE CONTROL), the time of day, and the product name (MARC).

The **action line** is used for direct commands, and for action outside the menu, such as, skipping to a specified, a parent, or a home screen. The line just below the action line is the **hint line** which specifies what choices can be entered on the action line.

Menus may have one, two, or three columns; the example has three. The menu selections are usually functionally grouped. The required choice is entered on the **choice line**, which takes effect if the action line is blank. The choices may be abbreviated, with the minimum abbreviation being that which will make it unique from other selections. Some selections lead to forms, some to output displays, and some to still other menus. Under certain circumstances, the action line may be prefilled; however, if the prefilled text is replaced with a valid command, then the action can be changed.

```
------------------------------------------------------------------------
        MARC - MENU-ASSISTED RESOURCE CONTROL        11:49 PM        MARC
                                                                        ]
Action: [
        HOme PRev GO PArent COmnd                  (Press SPCFY for Help)
------------------------------------------------------------------------
INTRO   Intro to MARC       SYS     System Control   NEWS   System News
JD      Job Display         CONFIG  System Config    DATE   Date and Time
JC      Job Control                                  USER   Usercode/Password
JQ      Job Queues          PK      Disk Pack
PS      Printing System     MT      Magnetic Tape    FILE   File Management
                            LP      Line Printer     LIBS   System Libraries
RUN     Run a Task          IM      Image Printer
START   Start WFL Job       CR      Card Reader      DC     DataComm Control
UTIL    System Utilities    CP      Card Punch       BNA    BNA Control
                                                     COMS   COMS Displays
MEM     Memory Management   HC      Host Control     SEND   Send Messages
SP      Special Programs    PROC    Processors       SC     Session Control
DUMPS   Dumps               MM      Memory Modules   ON     Change Window
LOG     Logging             OTHER   Other Devices    CANDE  Cande Window
SWAP    Swapper
------------------------------------------------------------------------
                                                                        ]
Choice: [

------------------------------------------------------------------------
```

MENU EXAMPLE

The two lines under the choice line are used to display **error messages** and other **system messages.** This area is also used to display a one or two line **help text.**

To assist with menu usage, the last 15 menus used are stored internally and the data will be displayed for a re-used menu.

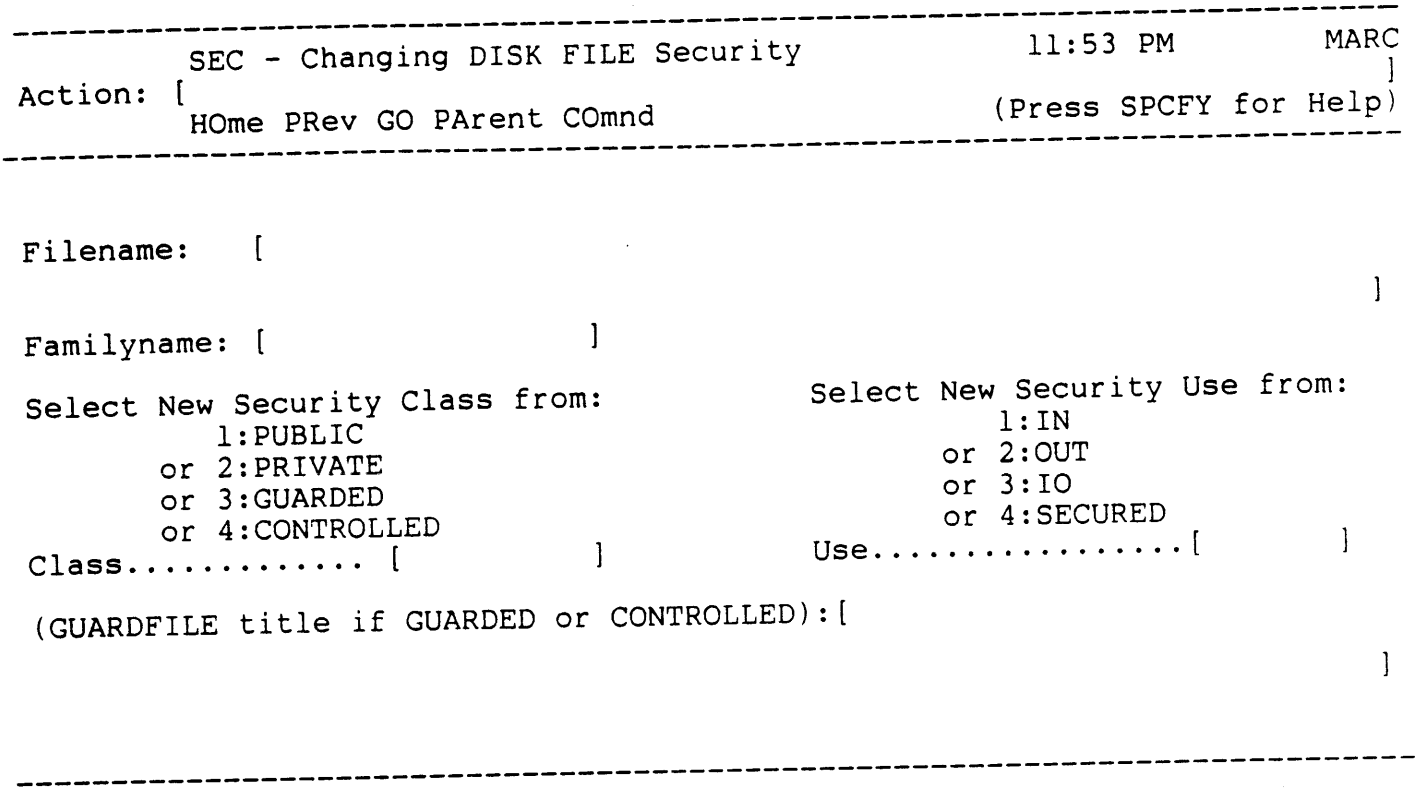
The cursor is normally positioned on the choice line when the menu is displayed.

Forms

The form is the other type of screen. As with the menus the last 15 forms are stored internally for display of a reselected form.

In the example on the next page, actions may be entered on the action line as previously described with menus. Unlike menus, however, there is no choice line. Entries on a form are made in the unprotected areas designated by the right and left square brackets following a description of those areas. On some forms, a choice of entries are included. In the case of the example, either the name or the number of the selection may be entered.

Blanks cause the system default to be used, where appropriate. Some fields may be prefilled. Where this occurs, you may leave the field as is or change the information you desire.



FORM EXAMPLE

Screen Actions

The following are screen "actions" which are used with the MARC package. The capitalized letters are the minimum required input:

1. **HOme** - This action returns you to the home menu, the menu that was presented after logging on.

2. **PArent** - This action displays the menu that is the parent of the current screen. The parent menu is the menu that contained the selection that lead to the current screen.

3. **PRev** - This action returns you to the screen that was last displayed.

4. **GO** - Typing GO followed by a screen name causes the requested screen to be displayed.

   Example: GO SEC

5. **REturn** - This action causes MARC to leave its present screen and return to the screen that you entered your last sequence from.

6. (+) - This action is used for scrolling forward through command output or help text.

7. (-) - This action has the same capabilities as the + action except that it scrolls the output backwards.

8. **KEys** - This action displays all the help keywords that are available through MARC.

9. **COmnd** - This action initiates command mode.

ODT commands in MARC

Most of the ODT commands are available through MARC. However, the following commands are not:

1. **ADM** - Automatic Display Mode
2. **CQ** - Clear Queue
3. **LABEL** - LABEL ODT
4. **TERM** - Terminal

The following ODT commands are not available in MARC because their functions are provided by the print subsystem commands (**PS**):

1. **AB** - Auto Backup
2. **EP** - Eliminate Print Queue
3. **FORM** - Assign FORM Identification
4. **PA** - Peripheral Association
5. **PB** - Print Backup
   (The **PB MT <unit number>** is an exception. This form of the PB command is available.)
6. **SP** - Show Print Queue

All of these ODT commands are described either in later sections of this course or in the Operator Display Terminal (ODT) Reference Manual.

The MARC **PS** command and other commands are further described in the Menu-Assisted Resource Control (MARC) User's Guide.

LAB EXERCISE:

Go to the lab and observe the instructor's brief demonstration of the MARC software. Then perform the steps listed below:

1. Enter your designated usercode and password on the log-on screen and press the **XMT** key. Observe the following:

   a. Screen name, title, time, and product name

   b. Action line

   c. Hint line

   d. Menu selections

   e. Choice field

   f. Cursor position

2. Do each of the following with the cursor positioning keys:

   a. Use the arrow key to position the cursor anywhere outside the protected areas.

   b. Try to use any of the letter keys.

   c. Now, press the **XMT** key and note the new cursor position.

   d. Press the **TAB** key, then press the **RTAB** key.

   e. Press the **HOME** key.

3. Now, do each of the following using the help/teach facility:

   a. Press the **SPCFY** key and note the highlighted area at the top of the screen.

   b. Read the help text at the bottom of the screen and press **SPCFY** again.

   c. After viewing this screen press **XMT**. Notice that because the action line was prefilled with a +, you have moved forward in the teach text by simply pressing **XMT**.

d. Enter: - on the action line and **XMT**. Notice that you have moved back one full page in the teach text.

e. Enter: **+8** on the action line and **XMT**. Now notice how the teach text has scrolled forward by just 8 lines.

f. Enter: **+2P** on the action line and **XMT**. This causes the teach text to move forward by two full pages.

g. Enter: **PRev** on the action line and **XMT**. The teach text that is now being displayed is the one displayed in step e.

h. Enter: **KEys** on the action line and **XMT**. This will display a list of key words and phrases associated with this menu.

i. Enter: **HELP *ACCESS CODE*** on the action line and XMT. This displays the help/teach text associated with this keyword phrase.

j. Enter: **REturn** on the action line and **XMT**. This takes you back to the home menu.

4. Now, do each of the following:

a. Enter: **INTRO** on the choice line and **XMT**. You have now moved to a new menu.

b. Select any choice available and enter it on the choice line and **XMT**. You are now on an output screen.

c. To return to the parent screen enter: **RE** on the action line and **XMT**. This particular menu contains selections which give a comprehensive overview concerning many of the MARC concepts. Select several other choices and read them.

d. Press **HOME** and then enter: **HO** on the action line and **XMT**. This returns you to the home menu.

e. Enter: **PR** on the action line and **XMT**. This takes you back to the previous screen.

f. Now enter: **PA** on the action line and **XMT**. This again returns you to the home menu because in this case your home screen is also your parent screen.

g. Enter: **JD** on the choice line and **XMT**.

h. Now enter: **A** on the choice line and **XMT**. A MARC command output screen is now displayed. Notice that the REturn is prefilled on the action line.

i. Notice the **A** at the bottom of the screen. This informs you that this was the menu selection which requested this output screen to be displayed. Now **XMT**.

j. Enter several of the other menu selections in order to view the other associated responses.

k. Now return to the MARC home menu. There were several ways you could have viewed the same output screens. Try all of the following from the home menu:

   1. Enter: **JD A** on the choice line and **XMT**.

   2. Enter: **GO JD** on the action line and **XMT**, then enter: **A** on the choice line of the JD menu and **XMT**.

   3. Enter: **GO JD A** on the action line and **XMT**.

   4. Enter: **A** on the action line and **XMT**.

   5. Enter: **COmnd A** on the action line.

   6. Enter: **COmnd** on the action line. The form COMND now appears. This screen is useful if the command you want to enter would take up more space than provided on the action line. Enter: **A** in the I/O field on the form and **XMT**.

l. Return to the home menu.

5. Now that you are finished enter: **BYE** on the action line and **XMT**. This logs you out of MARC.

ODT AND MARC OPERATIONS

SECTION 2

REVIEW

You may have to initialize a powered up or powered down system. Certainly, you will have to determine or modify the status of some peripherals, determine completed jobs, and determine waiting entries. In this section you have learned several procedures to communicate with your system to provide these and other functions.

LAB EXERCISE:

A. Make your terminal a REMOTESPO from the ODT (terminal names will be given by the instructor).

B. Put your REMOTESPO in ADM mode. Set it to the following and observe it for a minute or so:

First Screen

5 lines for database information.
5 lines for waiting entries
the rest of the screen for system messages
delay of 5 seconds

Second Screen

5 lines for active entries
5 lines for scheduled entries
the rest of the screen for completion messages
delay of 5 seconds

C. Now perform a DBS, W, MSG, A, S, and C as individual commands. Compare each response to what is shown on the ADM screens.

D. Remove the REMOTESPO status from the terminal. Remember to enter: **?END <XMT>** (This returns control back to your MCS.)

E. Now run the MARC software from your terminal to test yourself on the package and the ODT commands taught in this section. Perform the following steps listed below:

1. Log on to the system using your assigned usercode.
2. Request to see all active entries.
3. Determine the names of all pack drive (PK) families.
4. COPY & COMPARE a file from one pack to another (the file name and pack names will be given by the instructor).
5. Request to see all completed entries.
6. You have now been exposed to most aspects of MARC. Continue your familiarization for the rest of the Lab period. When you are finished, sign off by entering: **BYE** on the action line of the home menu and **XMT**.

SECTION 3

PERIPHERAL OPERATIONS

A SERIES AND B5000/6000/7000 OPERATIONS

PERIPHERAL OPERATIONS

SECTION 3

INTRODUCTION

SECTION OBJECTIVE:

Identify the ODT and MARC commands that deal with the operation of peripheral devices.

PURPOSE:

One of your main duties as a computer operator is to operate the peripheral devices used to input and output information from the system. This section describes the ODT and MARC commands that deal with these operational aspects.

UNIT OBJECTIVES:

Objective 1 Identify the peripheral unit mnemonics.

Objective 2 Identify the ODT and MARC commands associated with printer backup, the line printer and stacker, and the card reader and punch.

Objective 3 Identify the ODT and MARC commands associated with tape subsystems.

Objective 4 Identify the ODT and MARC commands associated with disk subsystems.

Objective 5 Identify the ODT and MARC commands used to determine and modify peripheral status.

PERIPHERAL OPERATIONS

UNIT 1

PERIPHERAL UNIT MNEMONICS

OBJECTIVE:

Identify the peripheral unit mnemonics.

RESOURCE:

o A Series Operator Display Terminal (ODT) Reference Manual.

INTRODUCTION:

A knowledge of the unit mnemonics will help you to communicate with your system from the ODT or through MARC.

PERIPHERAL UNIT MNEMONICS

The Burroughs **A SERIES** systems can handle up to 4095 peripheral devices (depending upon system type). This includes the ODT(s), which are always used by the system. The peripheral devices are referenced by unit numbers. For example, MT 84 refers to magnetic tape drive number 84. You will generally refer to the peripheral devices by their unit mnemonic and their unit number. The valid unit mnemonics are the following:

1. **CP** - Card Punch
2. **CR** - Card Reader
3. **DC** - Datacomm (valid only for DLP-based systems)
4. **DK** - Disk
5. **DT** - Diskette
6. **HC** - Host Control
7. **IP** - Image Printer
8. **LP** - Line Printer
9. **MD** - Memory Disk
10. **MT** - Magnetic Tape Drive
11. **MTP** - Phase-encoded Tape
12. **PK** - Pack
13. **PP** - Paper Tape Punch
14. **PR** - Paper Tape Reader
15. **SC** - ODT

Many of these unit mnemonics will be used throughout this course and in your job as you communicate with the system.

PRACTICE EXERCISE:

Give the unit mnemonic associated with each peripheral device stated by your instructor.

A SERIES AND B5000/6000/7000 OPERATIONS

PERIPHERAL OPERATIONS

UNIT 2

ODT AND MARC COMMANDS FOR PRINTER BACKUP, LINE PRINTER, AND CARD READER AND PUNCH

OBJECTIVE:

Identify the ODT and MARC commands associated with printer backup, the line printer and stacker, and the card reader and punch.

RESOURCES:

- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series Menu-Assisted Resource Control (MARC) User's Guide.
- A Series Print System (PrintS/ReprintS) User's Guide.
- A Series Printing Utilities User's Guide.

INTRODUCTION:

Most companies require printed copies of reports and information from files. The line printer must be kept in adequate working order so printed reports or hard copies can be produced when needed. Some companies will also use table top card readers or punches to input or output data from the system. This unit will introduce to you the ODT and MARC commands and maintenance procedures for line printers, card readers, and card punches.

ODT/MARC COMMANDS USED TO CONTROL LINE PRINTERS, CARD READERS, AND CARD PUNCHES

Because printer and punch peripheral devices are very slow, it is necessary to be able to write printer files to a medium that is faster than printers or card punches such as disk. From disk, the file can be written out to the printer or card punch while other programs are being processed. This concept is known as backup.

The printing subsystem PrintS supports backup file creation, automatic printing, print routing, and printing control. Remote printing, ReprintS, has been integrated into the printing subsystem to make routing to remote printers as easy as routing to site printers and to allow remote printers to be controlled with the same operator commands that work for site printers. PrintS and ReprintS is available beginning with the Mark 3.6 release.

PrintS and ReprintS route output by creating and using print requests, which contain information on how, when and where a file is to be printed. Print requests can be created automatically by setting file attributes through a program or WFL job, or created manually through the PRINT statement.

The print subsystem will automatically generate print requests and print backup files having a BD directory name.

The Printing Subsystem offers the following commands for controlling the printing environment.

1. **PRINT** - This command may be used from the ODT, CANDE, MARC, or WFL to print printer backup files. The PRINT command creates a print request that is then processed by the printing subsystem. It may be used to print a single backup file or an entire directory of backup files. A user may specify file attributes and modifiers to be applied to the backup file when it is printed. These attributes and modifiers may also be changed any time before the print request is acted upon. This command is used to print backup files only! The following examples are written for execution from a WFL job. To make them work from MARC or CANDE insert the word WFL in front of the word print.

Examples:

To print 5 copies of the backup file MYPROG/PRINTOUTS

```
PRINT MYPROG/PRINTOUTS (PRINTCOPIES = 5);
```

To print the backup file BIG/REPORT after 8:00 p.m.

```
PRINT BIG/REPORT (AFTER = "2000");
```

To print the backup file MYSOURCE double spaced.

```
PRINT MYSOURCE; PRINTDEFAULTS = (DOUBLESPACE =
TRUE);
```

To print the backup file PAYROLL/CHECKS on a printer with checks loaded and print 2 copies of the backup file PAYROLL/REPORTS on LP4.

```
PRINT PAYROLL/CHECKS (FORMID= "CHECKS"),
PAYROLL/REPORTS(DESTINATION="LP4",PRINTCOPIES=2);
PRINTDEFAULTS = (HEADER = UNCONDITIONAL) ;
```

2. **PS** (Print System) - This command controls the use and the configuration of the printing subsystem. The PS command has 13 options, each of which governs a particular aspect of the printing subsystem.

   SERVERS - This command displays or assigns the maximum number of Print Servers, which are responsible for routing print requests.

   Example: PS SERVERS = 2

   DEVICES - This command adds or deletes the names of printers that can be used by the printing subsystem. The names of the available devices are located in a printer pool. In addition, this command can list the printing devices and their configurations.

   Example: PS DEVICES

   PS DEVICES + LP12

DEFAULT - This command specifies the kind of printer to be used for printing backup files, if the kind was not specified when the backup file was created. Jobsummaries can also be assigned to a specified kind of printer.

Example: PS DEFAULT JOBSUMMARY PRINTERKIND = LP

PS DEFAULT PRINTERKIND = DONTCARE

CONFIGURE - This command displays or assigns device characteristics such as volume limits, formid, and transform function.

Example: PS CONFIGURE LP4

PS CONFIGURE LP8 LIMIT MAX = 15000

SHOWREQUESTS - This command displays the print request list. It can optionally show only requests that are completed, waiting, printing, scheduled or exceptions. Showrequest can be limited to requests for a particular usercode.

Example: PS SHOWREQUESTS

PS SHOWREQUESTS PRINTING

MODIFY - This command changes attributes of a pending print request such as the destination for printing.

Example: PS MODIFY ALL

PS MODIFY 1125 DESTINATION = LP5

ADDFILES - This option creates print requests for existing backup files with the directory names of BD or BP that do not have print requests associated with them.

Example: PS ADDFILES ALL

DELETE - This command deletes print requests and removes the backup files that are associated with the deleted print request.

Example: PS DELETE 1415

PS DELETE ALL EXCEPTIONS

FORCE - This command forces a print request to print as soon as possible. The print request is assigned an arbitrarily high priority.

Example: PS FORCE REQUEST 2167

PS FORCE JOB 136

STOP - This command temporarily stops the printing on a device.

Example: PS STOP LP4

OK - This command restarts printing on the device where the printing was stopped.

Example: PS OK LP4

REQUEUE - This command stops the printing on a device and requeues the print request.

Example: PS REQUEUE LP5

SKIP - This command causes a skip forward or backward within a file to occur during printing. A file can be completely skipped during printing.

Example: PS SKIP LP2 + 15

PS SKIP LP4 TO EOF

3. **FM** (Form Message) - This command restarts a program that has been halted due to the FORMID attribute having been set. FM indicates which output device will be used for printing or punching. The job that is waiting for the FM command will appear in the list of waiting entries (W command).

   Example: 3311 FM LP27

4. **CL** (CLEAR) - This command will terminate the current task, remove the printer backup file, and reset the exception flags for that device.

   Example: CL LP 10

5. **SB** (Substitute Backup) - This command provides for substitution of one backup kind for another backup kind.

   Example: SB PACK = DISK

   SB TAPE = DLBACKUP

6. **DL** (Disk Location) - This command establishes the location of system files that are not located on the halt/load unit.

   Example: DL BACKUP ON SPAREPACK

Prior to the Mark 3.6 release, the following commands were used to control line printers, card readers and card punches.

1. **AB** (Auto Backup) - This command sets the maximum number of copies of AUTOPRINT or AUTOPUNCH that will be running in the target system and can designate which line printers and which card punches will be preferred for automatic printing of backup files.

   Examples: AB 2 CP
   (Allows two copies of AUTOPUNCH to be in the mix. This would be used only if you had at least two card punches.)

   AB LP 27
   (Sets up LP27 as the preferred printing device for AUTOBACKUP. It is a shared printer, available for other print jobs.)

2. **PB** (Print Backup) - This command sends AUTOPRINT or AUTOPUNCH into the mix. You can indicate whether only backup printer (LP) or only backup punch (CP) files are to be output. The default is LP (so if neither LP or CP is specified, only printer backup files will be output). If CP is indicated, only backup punch files will be output.

   Examples: PB 1123 LP
   Sends backup files produced by job number 1123 to the line printer.

   PB MT 13
   Sends all backup files on tape unit 13 to the line printer.

   Unlike the PB command which uses AUTOPRINT to print only files in the **BD directory**, the **?PB** command executes SYSTEM/BACKUP to print any specified directory of files (SYSTEM/BACKUP is covered in section 4).

   Example: ?PB "MYDIR" SAVE

3. **FORM** (Assign Form ID) - This command assigns a form ID to a printer in anticipation of or response to a program which requires special forms. The printer is said to be "FORMed."

   Examples: FORM LP 4 "PAYCHECKS"

   CL LP 4
   Printer 4 is changed back to standard form.

4. **SP** (Show Print Queue) - This command shows the contents of the print queue: job number, number of lines and job name.

   Example: SP

   Output: PRINT/PUNCH QUEUE
   LP 1127 :1024 LINES:
   LP 5679 :11347 LINES:IC/INVENTORY/LIST

5. **QT** (Quit) - This command terminates the printing or punching of a backup file on the system and saves the copy of the backup file for later printing or punching. It may be printed or punched later by entering the PB command. The complete QT statement includes the mix number(s) from task(s) that produced the backup files. The operator should write down the printer backup file number(s) for later use.

   For example, if the following appears in the mix:

   4022 JOB AUTOPRINT/LP004/#3519
   (**4022** is the job number used to QT the printout, and **3519** is the job number that is used with the PB command to restart the printing of the file after the QT.)

   eg. 4022 QT

   Note: The **DS** command could be used, however when used with AUTOPRINT or AUTOPUNCH, DS will **discontinue** the task and then **remove** the file that was printing.

6. **EP** (Eliminate Print Queue) - If AUTOPRINT is not active, because AB = 0, this command purges all jobs in the print queue. The list of backup files to be printed is purged, but the copies of the backup files in the disk directory are saved. If it is followed by entering the AB command, the print queue is reactivated with the list of backup files to be printed or punched.

   Example: EP

For more information on PrintS and Autoprint, see Appendix I.

PRACTICE EXERCISE:

In the space provided, write the letter that represents the description of the function for each of the 3.6 ODT commands listed .

_____1.	PS SERVERS	a. Deletes all print requests and backup files.
_____2.	PS STOP	b. Displays all or selected groupings of print requests.
_____3.	PS DEVICES <device name>	c. Displays the list of all jobs in the mix.
_____4.	PS SHOWREQUESTS	d. Establishes the maximum number of Print Servers for the system.
_____5.	FM	e. Temporarily suspends the printing of a backup file.
_____6.	PS FORCE	f. Displays the status and configuration of a printing device.
_____7.	PS DELETE ALL	g. Allows an operator to change the attributes of a printer backup file prior to printing.
_____8.	PS MODIFY	h. Enables the operator to assign certain characteristics to an printer.
_____9.	PS CONFIGURE	i. Causes an arbitrarily high priority to be assigned to a print request for immediate printing.
		j. Indicates the device that a waiting entry is to go to when the file attribute FORMID has been set but the printer has not been associated with a literal.

PRACTICE EXERCISE:

In the space provided, write the letter that represents the description of the function for each of the 3.5 ODT commands listed.

_____1. SP	a. Deletes all entries in the print queue.
_____2. AB	b. Displays the contents in the print queue.
_____3. QT	c. Displays waiting entry list.
_____4. EP	d. Marks a line printer as the preferred output device for AUTOBACKUP which controls the printing of printer backup files.
_____5. FM	e. Indicates the device that a waiting entry is to go to when the file attribute FORMID has been set but the printer has not been associated with a literal, that is, it has not been formed.
_____6. PB	f. Terminates printing of a backup file and saves the file on disk for later printing.
_____7. FORM	g. Prints or punches backup files in the BD directory.
_____8. ?PB	h. Associates a printer with an identifier so files indicating that identifier will go to that printer.
	i. Executes SYSTEM/BACKUP to print any specified directory of files.

A SERIES AND B5000/6000/7000 OPERATIONS

PERIPHERAL OPERATIONS

UNIT 3

TAPE SUBSYSTEMS ODT AND MARC COMMANDS

OBJECTIVE:

Identify the ODT and MARC commands associated with tape subsystems.

RESOURCES:

- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series Menu-Assisted Resource Control (MARC) User's Guide.

INTRODUCTION:

Most companies use tape devices to input and output information from the system. For example, tape is often used as a backup device for disk files. When starting up a newly installed system a particular tape might contain a copy of those files which must be copied to disk. It is essential for you to know how to communicate with the tape drives used on your system.

ODT/MARC COMMANDS USED WITH TAPE SUBSYSTEMS

The following ODT commands are used to control input or output from tape subsystems.

1. **SN** or **SNL** (Serial Number) - Writes a serial number on one or more magnetic tapes. It can optionally lock (SNL) or set the density of tapes. Serial numbering makes the tape a scratch tape, or one ready to be reused. Serial numbers are a distinct combination of up to six numbers and/or letters used to identify the tape. Lock (SNL) prohibits programs from accessing those tape devices. Density is the number of bits that can be recorded on one inch of magnetic tape, and can be 800, 1600, or 6250.

   Example: SN MT 114 OP567 (1600)

2. **PG** or **PGL** (Purge) - Purges disks or tapes and optionally sets the density of tapes and locks tape or disk drives. After the tape or disk is purged, it is considered a scratch disk or tape. However, the serial number is not changed.

   Example: PGL MT114-116 (6250)
   (Purges, locks, and sets the recording density to 6250 bits per inch for tape drives 114 through 116.)

3. **RW** (Rewind) - Rewinds, unloads, and locks one or more magnetic tape drives. Rewind will not be performed for tape drives presently in use.

   Example: RW MT 114-116

4. **FR** (Final Reel) - Indicates that the present input reel is the final reel. It is primarily used with SYSTEM/DUMPALL (discussed in section 4) job. FR is often used with unlabeled tape files, and can be used if an error is encountered while copying files to or from a given tape drive so the job will be discontinued.

   For example, it can be used when a message such as "<job number> RECOPY REQD" comes from the system and you want the job to be discontinued.

   Example: 1234 FR

5. **TDIR** (Tape Directory) - Invokes the utility program SYSTEM/FILEDATA (discussed in section 4) to produce a copy of the directory of files on one or more given tapes. Output by default is printed but may be punched on cards or displayed. The tape name, unit number, serial number, density, file names, and tape creation date are included in the report of the tape's contents. Only privileged or ODT users can use this option.

   Examples: TDIR MYTAPE

   TDIR 114

OPERATIONAL ISSUES

Cleaning the Tape Drive

Using a lint-free cloth, cotton swabs, tape path cleaner, and water, clean the following tape drive components:

a. capstan (use a cloth and **water**)

b. read/write head (use a cotton swab and tape path cleaner)

c. tape path, tape guide, and vacuum columns (use a lint-free cloth and tape path cleaner)

d. supply hub (use a lint-free cloth and tape path cleaner)

Installing Beginning-of-Tape (BOT) Marker

New tapes from Burroughs have a Beginning-of-Tape and an End-of-Tape marker already installed to indicate to the system the beginning of usable tape and end of usable tape. However, if the tape drive fails to find the beginning of the usable tape or the tape pulls off the bottom or take up reel early in the loading process, use a tape crimper and then install a new beginning-of-tape (BOT) marker, which consists of a silver reflecting strip. This strip is installed by performing the following steps.

1. Place the tape out in front of you.

2. Pull the tape toward you until you have pulled six feet of tape off the reel.

3. Place the silver reflecting strip by the tape's outside left edge.

Maintaining a Tape Library

There are many hazards that may affect the reliability of tapes. To maintain a tape library or a collection of tapes, the following rules should be kept in mind:

1. **Usage** - Magnets, liquids, food, moisture, dirt or dust, heat, skin oil, and improper handling may cause parity errors or unreliability of the data stored on tapes. **Parity** is the method of checking to see whether an accurate retrieval of the data has occurred. A parity error indicates that during the most recent transfer of data something caused the data to become unreliable. The system keeps attempting to transfer the original data until it is transferred correctly. After a certain number of unsuccessful attempts, the system will stop trying to read (input to the system) or write (output from the system) that data.

2. **Backup** - All critical data files should be copied to tape on a regular basis. In doing this you have provided a basis for recovering your work in case a disaster strikes. The method used for the backup of files will depend upon the file type and frequency of use of the files.

3. **Onsite Storage** - Store tapes vertically in approved containers away from tape drives, as the heat of the drives, vibration of the motors, and weight of other tapes can damage the tapes or cause parity errors.

4. **Offsite Storage** - Find a location away from the computer room where backup copies of tapes will be placed for use in case of a disaster in which the original data on the tapes has been destroyed. This backup should be performed on a regularly scheduled basis and backup tapes should be stored in another building, if possible.

5. **Programmatic Tracking** - If possible, use an on-line program that keeps track of the last certification date of the reliability of the tapes, the number of tapes available for use, any special uses for which certain tapes have been reserved, and last dates of cleaning. Make sure that the latest copy of this information is stored with the tapes at the Offsite Storage location.

PRACTICE EXERCISE:

In the space provided, write the ODT command associated with tape subsystems that best completes the statement.

1. To have the system rewind a magnetic tape via input from the ODT, you must input a statement that uses the _____ command.
2. To have the system purge and write a serial number on a tape, you must input a statement that uses the _____ command.
3. To indicate to the system that a specified unlabeled reel of tape is the last one, you must input a statement that uses the _____ command.
4. To get a copy of the directory of files on a given tape, you must input a statement that uses the _____ command.
5. To have the system purge a tape and lock it, you must input a statement that uses the _____ command.

A SERIES AND B5000/6000/7000 OPERATIONS

PERIPHERAL OPERATIONS

UNIT 4

DISK SUBSYSTEMS ODT AND MARC COMMANDS

OBJECTIVE:

Identify the ODT and MARC commands associated with disk subsystems.

RESOURCES:

- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series Menu-Assisted Resource Control (MARC) User's Guide.

INTRODUCTION:

All companies use disk as the primary medium for input and output of data from the system. It is essential to be able to operate the disk subsystems to initialize the system, change packs if necessary, and otherwise run the system.

ODT/MARC COMMANDS USED WITH DISK SUBSYSTEMS

The following ODT commands are used with disk subsystems.

1. **PD** (Print Directory) - Displays on the ODT certain information about a file specified such as SIZE IN SEGMENTS, DATE AND TIME OF CREATION, etc. If a file directory is specified (such as PD PAYROLL/MASTER/OCTOBER/=), all files under the directory will be displayed, but no information about these files will appear other than file type. If more than one screen is needed, the literal NS will appear in the bottom right-hand corner, and NS must be transmitted to get the next screen. To specify a family other than DISK, use the ON <family name> option. If the system is running using cataloging, you can also use the PD command (PD <file name> ON TAPE) to determine the latest file having that name on a magnetic tape device. (Cataloging is discussed in Appendix H.)

   Examples: PD -

   PD ACCNTNG/PAYROLL ON USER1

   PD EP4197/= ON ACCOUNTS

2. **DU** (Disk Utilization) - Displays the total number of available segments on the specified disk device and the size of the largest available area on that disk device. DU can be used with the base pack or with any of the continuation packs if you also indicate the family index.

   Example: DU ON TRAINING (2)
   (Displays the disk utilization on a continuation pack of the family called TRAINING.)

3. **RC** (Reconfigure Disk) - Purges and writes a serial number on a pack. It optionally can change the designated owner and internal label, or name, of the pack. If the pack is a continuation pack, you must include the base pack's serial number in the RC statement, using the BP=<integer> option. For continuation packs, the family index must be included to have one continuation pack replace another in the series. This can be useful when a continuation pack becomes unusable.

   Example: RC PK 37 OWNER = CEC OLDNAME = TESTPK
   NAME = LOGS BP = 12345 FAMILYINDEX = 3

4. **LB** (Relabel Pack) - Changes the family name of a pack without purging the contents of the pack, and optionally changes the serial number or declared owner of the pack.

   Example: LB PK 37 OWNER = CEC NAME = CUSTOMER
   OLDNAME = TESTPK SERIAL = 12345

5. **PO**(Power Off- **Being De-implemented**) - Powers off a pack when the pack is not presently being used. The PO command should be used to power the disk off logically. Pressing the Stop switch on the disk drive causes the drive to be powered off immediately. Most packs should not be powered off manually by pressing the Stop switch on the disk drive. The halt/load pack and any other packs presently in use can not be powered off by using the PO command; they must be powered off only by halting the system and then by pressing the switch on the disk drive. **Use the POWER command.**

   Example: PO PK 193

6. **CLOSE** (Close Pack) - Does not power off the pack but makes it unavailable to the system, or off-line. A CLOSE is actually performed when the pack is not presently being used. It can be used when the system is not able to read the internal label or family name. After using the CLOSE command, you must use the RY command (discussed later).

   Example: CLOSE PK 193

7. **MODE** (Input or Output Mode) - Changes the WRITE ENABLE status of tape or disk devices. The OUT or IO options revert the devices to normal operations. The IN option disallows creation of new files but allows the reading and writing of files currently on the device. MODE is used when you want to be able to write to the pack but have not pressed the WRITE ENABLE switch.

   Example: MODE PK 193 IO

8. **LH** (Load Host) - During system initialization or normal processing, this command tells the system to transmit to the disk pack controller the information it needs to be able to communicate between the disk drives and the system.

   Example: LH PK 96 PATHID 14

9. **MOVE** (Move Job/Pack) - Tells the system that you are moving a pack from one drive to another. The system stops jobs accessing that pack and lets you physically move the pack. Then, the system automatically restarts those jobs using that pack. When a drive begins experiencing reduced reliability, the system may halt. Advising the MCP that the pack is to be moved to another drive may prevent the halt; then, the MCP updates its tables of pack names and their locations and advises you when the pack can be physically moved.

   Example: MOVE PK 193 TO PK 194
   (Allows the pack on drive 193 to be physically moved to drive 194.)

10. **POWER** (Power Up/Down) - Powers up or powers down the indicated disk pack drives on MLIP systems. POWER OFF has the same effect as using the ODT command PO. Drives that have been powered down by pressing the drive's STOP switch can not be powered up by using the POWER UP (POWER ON) command.

    Note: Special controllers are needed for this function to work.

    Example: POWER ON PK 94-95

11. **SQUASH** - Moves in-use areas to existing available areas by executing "SQUASH <family name>". This is done to reduce the amount of fragmentation in disk allocation.

    Example: SQUASH LOGS

12. **XD** (Bad Disk) - Permanently makes one or more sectors of disk unusable by the system. This command is primarily used by field engineers. In the case of RES (see next page) and XD, the disk may be reinitialized to reclaim the sectors, but whatever problem caused you to XD those sectors may continue. The BADDISK files that are created, may be removed.

    Note: XD does not relocate files occupying the XD'd disk sectors.

    Example: XD PK 93 ADDRESS 122212 FOR 10

13. **RES** (Reserve) - Reserves for maintenance or returns to the system specified disk sector addresses. It is more often used by field engineers.

    Example: RES PK 93 SEGMENT 122212 FOR 10
    (The system will create a file on that pack known as **BADDISK/FMLYINX<integer>/UNIT<integer>/AD0<integer>H** and will relocate on the pack certain files presently occupying that space on the pack)

    To have the system rearrange files on disk and free areas not being used efficiently (a condition known as **checkerboarding**), copy all files from that disk to a tape and then copy the files from that tape back to the disk, or perform the following steps, which utilize the RES command.

    a. At the ODT, enter:

       RES PK <pack number> SEGMENT <6-digit number> FOR <5-digit number>

    b. To be able to reuse the space presently being occupied by the BADDISK file, perform the following two steps:

       1. At the ODT, enter:

          PD BADDISK= ON <packname>

       2. At the ODT, enter:

          REMOVE BADDISK/FMLYINX<integer>/UNIT <integer>/AD<integer>H ON <packname>(PACK)

14. **SCAN** - Reads a pack and analyzes and records any errors. If read errors are found, a damage analysis is performed and reports are produced. Before you use the SCAN command, you must first use the CLOSE and the UR (described later) commands for that pack.

    Example: SCAN PK 194

15. **REPLACE** - Copies bit by bit the contents of one pack to another pack. A damage analysis is performed and reports are produced to document the effects of any bad sectors found on the media (the reports are the same as for the SCAN command). The medium's directory is updated to indicate that bad areas exist on that disk or pack.

    Note: Affected rows on the media are marked to prevent them from being used.

    The reports generated and their contents are:

    SECTORSINERROR - List of areas that were not successfully copied.

    DAMAGEDFILES - List of files for which one or more rows were not successfully copied.

    DAMAGEREPORT - Detailed description of the damage to the files for which one or more rows were not successfully copied. This includes the file title and a list of affected rows.

    After completion of the copy, the system marks the source medium as unlabeled and writes the source medium's label information on the destination medium. To use this command you must first use the CLOSE and the UR (described later) commands for the pack.

    Example: REPLACE PK 194 ONTO PK 199

16. **MIRROR** (Control Disk Mirroring) - The MIRROR command (3.6 only) provides control over disk mirroring on the system. It provides the capability of having from 2 to 4 disks maintained as exact copies of each other. Disk mirroring is transparent to the user program and is handled entirely by the system software. Two tables are maintained by the MCP, OWL - outstanding write list and MIT - mirror information table. It is initiated after the option MIRRORING is set via the OP command. Mirrored sets are established by the MIRROR command. It also allows for the creation/deletion and maintenance of the mirrored sets.

    Example: MIRROR CREATE PK 46 FROM PK 48

PRACTICE EXERCISE:

In the space provided write the ODT command associated with disk subsystems that best completes the sentence.

1. To indicate to the system that a pack is to be purged and a serial number is to be written on it, you must input a statement containing the _____ command.
2. To determine the largest available and in use disk space on a specific pack, you must input a statement containing the _____ command.
3. To display on the ODT just the file names on a specific pack, you must input a statement containing the _____ command.
4. To change the internal name of a pack without having the pack initialized and purged, you must input a statement containing the _____ command.
5. To be able to use a pack for output after you have powered it up but have forgotten to press the WRITE ENABLE switch at that time, you must input a statement containing the _____ command.
6. To indicate to the system that a pack is to be powered off if all users have finished using the pack, you must input a statement containing the _____ command.

PERIPHERAL OPERATIONS

UNIT 5

ODT AND MARC COMMANDS USED TO DETERMINE AND MODIFY PERIPHERAL STATUS

OBJECTIVE:

Identify the ODT and MARC commands used to determine and modify peripheral status.

RESOURCES:

- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series Menu-Assisted Resource Control (MARC) User's Guide.

PURPOSE

You will very often have to determine or change the status of line printers, disk and tape drives, or card readers and punches. The ODT and MARC w l be your primary medium of communication with those devices. Specific commands will be used to perform the functions of changing or determining peripheral status.

ODT/MARC COMMANDS TO CHANGE OR DETERMINE PERIPHERAL STATUS

1. **CL** (Clear) - Stops the printing or punching of a file or the writing of a file to tape. The file being output is not saved. CL is valid for line printers, magnetic tape devices, and the ODT. If the CL command is preceded by the SV command, the printing or punching of the particular file is completed.

   Example: CL LP3

2. **OL** (Display Label and Paths) - Displays label information for one or more units of the indicated peripheral device that are on-line to the system. It is used with specific units of peripheral devices.

   Example: OL MT 84, PK96, CR3, LP20, CP3

3. **RY** (Ready) - Returns to the system the use of the designated tape or disk drive, line printer, or memory module. This command must be used if you have just previously used the save (SV), serial number and lock (SNL), purge and lock (PGL), or close (CLOSE) command.

   For B7800 and B7900 systems, you can also RY an Input/Output Module (DCP and MSM respectively).

   Example: RY MT114-116

4. **SV** (Save) - Makes memory modules or peripheral devices unavailable to the system. It must be followed by using the RY command to make the indicated devices available to the system. If a pack is in saved (SV) status, it can be relabeled (LB), if required.

   For B7800 and B7900 systems, you can also SV an Input/Output Module (DCP and MSM respectively).

   Example: SV LP 4

5. **FAS** (Failure Analysis Summary) - (B7800 and B7900 only) Displays, in matrix form, the current intermittent failure count for the memory subsystem.

6. **UR** (Unit Reserve) - Reserves for maintenance or returns to the system a specified peripheral device unit. Before reserving (UR) a pack, you must first have the system close (CLOSE) the pack.

   Example: UR MT 234

7. **RF** (Reliability Factor) - Displays messages from the system indicating the percent of reliability of the indicated peripheral device, when the device begins to experience degraded throughput or reduced performance and efficiency. The MCP has to have been compiled with the option MTBF, or Mean Time Between Failures, (not discussed in this course) set.

   For B7800 and B7900 systems, you can also RF an Input/Output Module (IOMs and DLPs/MLIs respectively).

   Example: RF MT 227

ODT COMMAND TO ASSOCIATE PERIPHERAL DEVICES

PA - Indicates that input from specified input devices is to be output to the output device associated with that input device, that is, specified input devices are paired to specified output devices. The abbreviations, or mnemonics, used in the PA statement are LP (Line Printer), SC (ODT), CR (Card Reader), and CP (Card Punch). In MARC the **PS** command provides this function.

Example: PA CR3 = LP31, CP13

PRACTICE EXERCISE:

In the space provided, write the ODT command that best completes the statement.

1. To return to the system a locked pack, for example, after transmitting a CLOSE command on the pack, you would input a statement containing the _____ command.
2. To display label information for specific on-line peripheral units, you would input a statement containing the _____ command.
3. To make any peripheral device temporarily unavailable to the system, you would input a statement containing the UR or _____ command.

PERIPHERAL OPERATIONS

SECTION 3

REVIEW

This section has described the ODT and MARC commands used to control the peripheral devices used on your system. Three of these devices - the line printer, tape drive, and disk drive and their associated controllers and exchanges - are used in your every day operations. Other ODT and MARC commands which are used to determine and modify the status of peripheral devices were also explained in this section.

LAB EXERCISE:

Do the following first using a REMOTESPO then repeat the exercise running the MARC software:

A. Use the **PER** command to determine the valid pack names.

B. Then use the **PD** or **FILES** (MARC specific) command to:

1. Obtain a display of the first three levels of directories.

2. Choose a displayed directory and obtain a display of all file names in that directory.

3. Choose a displayed file name and obtain a display of creation date and time, last access, size, etc. for that file.

C. Use the **MSG** or **SMSG** (MARC specific) command to view all recent system messages.

D. Upon completion remember to log off.

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SECTION 4

PROGRAMS AND UTILITIES

A SERIES AND B5000/6000/7000 OPERATIONS

PROGRAMS AND UTILITIES

SECTION 4

INTRODUCTION

SECTION OBJECTIVE:

Perform operation duties associated with program communication and the use of system utilities.

PURPOSE:

You will often have to communicate with programs regarding their status, control the flow of jobs through the system, copy files between media, and produce reports of system usage from logs the system maintains. This section will explain how to perform these operation duties and will provide you with an opportunity to practice them.

UNIT OBJECTIVES:

Objective 1 Identify ODT and MARC program communication messages.

Objective 2 Identify some system utilities which are used to print, copy, and identify files.

Objective 3 Identify ODT and MARC log commands used to produce reports of system usage.

A SERIES AND B5000/6000/7000
OPERATIONS

PROGRAMS AND UTILITIES

UNIT 1

PROGRAM COMMUNICATIONS AND RELATED ODT AND MARC COMMANDS

OBJECTIVE:

Identify ODT and MARC program communication messages.

RESOURCES:

- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series Menu-Assisted Resource Control (MARC) User's Guide.

INTRODUCTION:

Programs executing in the system will sometimes require planned or unplanned operator communication. This unit will introduce those ODT and MARC messages used to communicate with executing programs.

PROGRAM COMMUNICATIONS

When you want the system to perform the routines included in a program, you tell the system to execute that program. The program then becomes a task to be performed by the system. A job consists of one or more related tasks. The ODT messages used in communicating with the task or job are known as program communication messages.

The ODT commands associated with program communication can be classified into the following categories:

1. Those that change program status: PR and LP.
2. Those that provide a dump or "picture" of the contents of memory at the time the memory dump was taken and initiate a program that analyzes the contents of that dump: DUMP, DA, DN, and DF.
3. Those that suspend or continue running a suspended program: HI, ST, OK, UL, IL, OU, OF, RM, DS, and FM.
4. Those that inquire into the status of programs or information kept by programs: TI, WY or Y, IB, and PF.
5. Those that provide information to a running program: LABEL and AX.

Commands Used to Change Program Status

1. **PR** (Priority) - Changes the priority of a scheduled, active, or waiting job. The maximum priority for any job is 99.

   Example: 3271 PR 70

2. **LP** (Lock Program) - Locks the program and prohibits certain ODT commands from interfering with the indicated program's execution.

   Example: 3256 LP

Commands Used to Dump Memory

1. **DUMP** - Dumps the full contents of memory to a tape or makes a backup file for a program's dump. It optionally will write a user defined literal on the tape to indicate the reason for the dump. You have the option to specify what items of memory are to be dumped or when the dump is to be taken. **DUMP FAULT** or **DUMP DSED** gives you a dump only if the program is abnormally discontinued.

   Example: 3214 DUMP ARRAYS

2. **DN** (Dump Name) - Creates a disk file used to hold system memory dumps, which can be analyzed later using SYSTEM/DUMPANALYZER or can be copied to tape for later analysis. DN is also used to find out or negate the assignment of disk space for the system memory dumps. To have memory dumps go to the halt/load unit, you must use the ODT statement CM <MCP file name> + AUTOLOAD, HLDUMPDISK. Memory dumps that occur early in system initialization must go to the halt/load unit.

   Example: DN SYSDUMP ON PACK

3. **DA** (Dump Analyzer) - Indicates that the utility program SYSTEM/DUMPANALYZER is to be run. Memory dumpdisk files are copied to disk or to tape. **DA<number>** can be used to indicate the number of the drive on which the tape of the dump is loaded. **DA*** can be entered to interactively communicate with SYSTEM/DUMPANALYZER. The following statement: **RUN SYSTEM/DUMPANALYZER;FILE TAPEIN=DP/date/time/reason** can also be entered from the ODT.

4. **DF** (Empty Dumpdisk File) - Empties dumps from dumpdisk files. If a file name and family is not specified, the current dumpdisk file on the halt/load unit is assumed.

ODT Commands Used to Suspend or Continue Running Programs

1. **HI** (Cause Exceptionevent) - Temporarily interrupts a running program. The program must include a test for the interruption and a means for indicating that the program is to continue. If the program is to test for a specific value and proceed according to the directions indicated for that value, HI can pass a value to the program.

   Example: 4219 HI

2. **ST** (Stop) - Temporarily suspends the indicated task. It must be followed by an OK command to indicate that the job is to continue, or by a DS command to delete the task from the lists of waiting and active entries.

   Example: 3256 ST

3. **OK** (Reactivate) - Continues certain types of suspended jobs.

   Example: 3256 OK

4. **UL** (Unlabeled) - Indicates that the file required by a program is on an unlabeled medium on a specified device for that run only.

   Example: 1231 UL MT 91

5. **IL** (Ignore Label) - Indicates where the required file is actually located, if it is not on the assumed or default device. This command is often used in response to a DUP FILE or a NO FILE message.

   Example: 937 IL MT 81

6. **OU** (Output Unit) - Directs an output file to a designated output device. It is often used in response to system messages similar to the following: "<task number> REQUIRES MT". You may first need to RY the required unit.

   Example: 9057 OU MT 81

7. **OF** (Optional File) - Tells the system to retain the old file and remove the new file when it has encountered a duplicate file name condition. It can also be used if a waiting entry indicates that the required file is not presently available on an on-line peripheral device. The file attribute OPTIONAL must be set to TRUE within the individual programs so the operator can then respond using the ODT command OF.

   Example: 3716 OF

8. **RM** (Remove) - Removes the old file having the same name as the new file and retains the new file. This is used in response to the system's message DUP LIBRARY. The system waits for you to respond, or RSVP, to its message. After receiving the RM message, the system responds that it has removed the old file and has given the new file the same name as the removed file. When a duplicate file condition is encountered, the job is placed in the list of waiting entries until you respond and then the job is taken off the list of waiting entries. The directory is then updated.

   Example: 3214 RM

9. **DS** (Discontinue) - Discontinues the indicated job(s) in the active, scheduled, or waiting mix and also can get a program dump.

   Programs can be DSed by a user or the operator, in which case the message displayed is O-DS; they can be DSed from a queue for any number of reasons, in which case the message displayed might be Q-DS; the program may be DSed because it exceeds its allocated resources, in which case the message displayed is R-DS; the program may encounter a problem itself, in which case the message displayed might be DSED MISSING CODE FILE, F-DS, I-DS, or P-DS.

   Examples: 3256 DS

   7385 DS CODE BASE ARRAYS FILES

10. **FM** (Form Message) - Continues a specified program that stopped itself to wait for certain forms to be loaded on the line printer.

    Example: 9999 FM LP27

ODT Commands Used to Inquire Into Program Status

1. **TI** (Times) - Provides information about elapsed time of the task or job in the mix, the job's processor and IO times, the amount of time the job has been in the READYQ waiting for processor time, and the number of times the task has been interrupted to bring into memory another segment of object code to continue processing.

   Example: 3271 TI

2. **WY** or **Y** (Status Interrogate)- Provides information regarding the reason a job or task is in the list of waiting entries, the accepted operator replies to the job (RSVPs), and the status of the job. If an executing job has been temporarily suspended and its memory space is being used by another program, a message to that effect will be displayed for the indicated job or task. Also, the usercode and accesscode associated with the job or task will be displayed.

   Example: 3271 WY

3. **IB** (Instruction Block) - Displays the requested instruction block for a job. A WFL statement INSTRUCTION can be placed in Work Flows to aid in documentation. You can specify which instruction block you want to see or you can have the most current instruction block displayed.

   Example: 3731 IB 3

4. **PF** (Print Fetch) - Displays the FETCH message of a WFL job while it is in a queue, if the MCP option NOFETCH is reset. The need for operator intervention is indicated by the job displaying the statement **<job number> REQUIRES FETCH** and the job appearing in the list of waiting entries. You can bypass examining the instructions by entering the command **<job number> OK.**

   Example: 3731 PF
   (This is followed by 3731 OK.)

ODT Commands Used To Enable the Sending or Receiving of Information From a Program

1. **LABEL** - Names the ODT as an output file or input file used for data entry, so a programmer can indicate that the output or input is to go to the program via the ODT. The automatic display mode (ADM) of that ODT will be disabled while that particular program is using the ODT. The program can receive input via the ODT only if that input is preceded by pressing the **<SHIFT>** and the **<GS /_\ ETX>** keys at the same time and entering the data. (This is an ODT only command.)

   Example: LABEL LEFT

2. **AX** (Accept) - Passes information to a specified program.

   Example: 3211 AX 23

```
----- 2 SCHEDULED ENTRIES -----

 0500 JOB  55  JOB/ACCOUNTING
*.... 0501 50  O/FIXUP

----- 8 ACTIVE ENTRIES -----

 0254/0254 55 #SEPCOMP JHOST2/HOST
 0243       70  SWAPPER
*0399/0399 60  TAPEPRINT/LP021/#000123
 0398 JOB  45  JOBTWO
 0398/0399 60  ALGOLPROG/TWO
 0234       60 *SYSTEM/CANDE
 .... 1235 60 *CANDE/STACK01
*1084\0185 50  ALGOL KAP

----- 4 WAITING ENTRIES -----

 0403/0404 50  PROG/ONE
NOFILE "TEST/INPUT ON TESTPACK"
*0579      45  JOB/INVENTORY; IN QUEUE 50
REQUIRES FETCH
 0395/0405 50  PROG/SPEC
OPERATOR STOPPED
*0393/0394 50  PAYROLL
ACCEPT CLOSING DATE IN MMDDYY
```

EXAMPLE OF ODT SCREEN DISPLAYING WAITING ENTRIES

PRACTICE EXERCISE:

A. Write statements which you could use to respond to the waiting entries listed on the ODT screen displayed on the previous page. Assume that missing files are on the family Education.

B. Write the letter of the description that best defines the associated ODT command.

_____1. WY	a. Discontinues a specified job and optionally produces a program dump.
_____2. AX	b. Allows you to examine the contents of the Work Flow Language FETCH statement.
_____3. PR	c. Continues certain types of suspended jobs.
_____4. DS	d. Allows you to examine the contents of the program's instruction block.
_____5. OK	e. Directs an output file to a designated output device.
_____6. TI	f. Provides information regarding the elapsed time of a job within the mix.
_____7. ST	g. Tells the status of a job including why it is in the waiting mix.
_____8. PF	h. Passes information to a specified program.
	i. Temporarily suspends the indicated job until the system is told to continue.
	j. Changes the priority of a specified job.

C. In the space provided, write the ODT command that best completes the statement.

1. To indicate to the system that a file required by a program is on an unlabeled tape, you would input a statement containing the _____ command.

2. To indicate to the system that a waiting entry is to be output to a tape on a specific drive, you would input a statement containing the _____ command.

3. To respond to a DUP FILE or NO FILE message by indicating to the system that the required file is on a tape other than the assumed one, you would input a statement containing the _____ command.

PROGRAMS AND UTILITIES

UNIT 2

SYSTEM UTILITY USAGE

OBJECTIVE:

Identify some system utilities which are used to print, copy, and identify files.

RESOURCES:

- A Series System Software Utilities Reference Manual.
- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series Menu-Assisted Resource Control (MARC) User's Guide.
- A Series Printing Utilities User's Guide.

INTRODUCTION:

You will often need to have the system print backup files, copy files between media, such as from tape to disk or vice versa, and interrogate the attributes of files. This unit will explain how to use four utility programs that perform these functions.

MARC AND SYSTEM UTILITIES

A number of the menu selections in MARC initiate system utilities. MARC will enter tasking mode to run the utilities. It does this because "RUN" is a WFL command, and all WFL commands entered in command mode cause tasking. All utilities which can be accessed through MARC, those on the menu screens and those not listed, are able to be initiated by using the following command mode statement:

RUN *SYSTEM/<utility name>

Refer to the Menu-Assisted Resource Control (MARC) User's Guide for further detail on the running of system utilities.

SYSTEM/BACKUP

One utility program that performs the backup function is known as SYSTEM/BACKUP. It can be used instead of the PRINT statement to initiate printing of backup files, although it is not as flexible as Print.

The SYSTEM/BACKUP utility program permits the user to control when and how the printing or punching will be done. It also can be used when a problem occurs while a file is being printed or punched. SYSTEM/BACKUP may be invoked in any one of the following ways:

1. At the ODT using a statement containing the ODT command:

   ?PB "<file or directory name>" <SYSTEM/BACKUP options>

2. At the ODT using the WFL statement:

   RUN SYSTEM/BACKUP (""<file or directory name>" "<SYSTEM/BACKUP options>")

3. Within a WFL job deck using the statement:

   RUN SYSTEM/BACKUP (""<file name or directory name" "<SYSTEM/BACKUP options>");

4. Within a WFL job deck using the statement:

   PB "<file name or directory name>" <SYSTEM/BACKUP options>;

If the MCP run-time option (discussed later) **LPBDONLY** is set (turned on), files are sent to disk and are labeled:

***BD / <job number> / <task number> / <file number> <file title>**

The file number is the sequential number of the backup file created by each task. For example, if one task within a series of tasks in a job created two backup files, the task's first backup file number would be 000 and its second backup file number would be 001. The file title is the designated output file name within the program that produced the backup file.

You can override the *BD (in the backup file name stated above) with another name, possibly to remind you of the file's contents, by using the following series of statements:

BDNAME = <new name>;

Example:
```
BEGIN JOB;
  RUN MYPROG;  BDNAME=MYFILE;
END JOB;
```
(If the job number is 1234, the task number is 1332, and the designated output file within the program MYPROG is OUT, then the backup file will be named MYFILE/0001234/0001332/000OUT.)

You can select certain SYSTEM/BACKUP options to be invoked when SYSTEM/BACKUP begins to print or punch the backup files. Some of these options are described below.

For disk or tape files:

1. **"<file or directory name> ON <family name>"** - Indicates that the specified files are on the indicated disk device.

   Example: ?PB "DAILYREPORT ON USER1"

2. **COPIES** - Indicates the number of copies to be printed or punched.

   Example: ?PB "DAILYREPORTS" COPIES 10

3. **DOUBLE** - Indicates that the printed output is to be double-spaced.

   Example: ?PB "DAILYREPORTS" DOUBLE COPIES 2

4. **ID** - Indicates the literal string that is to be printed as a heading. SYSTEM/BACKUP must have been compiled with the option $IDOPTION turned on. The ID and ND options can not be used within the same SYSTEM/BACKUP statement.

   Example: ?PB "DAILYREPORTS" ID "ACCOUNTING"

5. **SAVE** - Prevents the purging of that backup file after printing.

   Example: ?PB "FILE1" SAVE

6. **ND** (Non-Direct) - Indicates that the file will not be printed until the entire program or set of related tasks is completed. When ND is used, backup files having the name BD or the BDNAME designated by you are backed up a second time and given the internal file name of BDFILE and the external file name given by you via the BDNAME file attribute.

   Example: ?PB "REPORTS1" ND COPIES 2

   The backup file can be directed to a terminal by file equating, using a statement like the following:

   ```
   ?PB "REPORTS1" ND;
   FILE BFILE(KIND=REMOTE,TITLE=<station name>);
   ```

   or

   ```
   ?PB "REPORTS1" ND;
   FILE BFILE(KIND=PRINTER, BACKUPKIND=TAPE);
   ```

   The concept of station names is discussed later. The phrase that indicates file equating is to take place begins with the words FILE BFILE (the expected name of the backup file). The file attributes KIND and TITLE indicate that a station having the indicated name is to display the contents of the backup file.

7. **LP <unit number>** or **CP <unit number>** - Indicates that the output is to be printed or punched using the specified device.

   Example: ?PB "FILE1" LP 27

8. **KEY** - Indicates the record character positions to be checked for range limits prior to printing or punching. Used with RANGE below.

   Example: ?PB "DAILYREPORTS" KEY 5 4 RANGE "DAY1" "DAY2"

9. **RANGE** - Indicates the starting and stopping values of strings or numbers, that show the system what to look for in the character positions stated in the KEY statement described above. The word "END" can be used to indicate that the end of the file is to be the stopping point.

   Example: ?PB "DAILYREPORTS" KEY 5 4 RANGE "DAY1" "END"
   (The system searches for the first record it finds in which "DAY1" is found in character positions five through eight and prints all records to the end of the file.)

For tape files only:

1. **FILE <integer>** - Indicates the number of the backup file on tape that is to be printed or punched.

   Example: ?PB MT 243 FILE 3

2. **REEL** <integer> - Indicates the number of the reel that has the input backup files.

   Example: ?PB MT 243 REEL 2

3. **KIND = PRINTER** or **KIND = PUNCH** - Indicates whether the backup tape file is to be printed or punched.

   Example: ?PB MT 243 KIND = PUNCH

To interrupt SYSTEM/BACKUP's printing of backup files on tape and have it restart after repositioning the file, perform the following steps:

1. Enter: <mix number of SYSTEM/BACKUP> HI

2. Enter: <mix number of SYSTEM/BACKUP> AX <message>

   The <message> may include any one or more of the following options:

   a. LP or CP <unit number> - Indicates that printing or punching is to begin using the specified device rather than the current device.

   b. <plus sign or minus sign> <integer> - Indicates the number of lines the printer is to skip forward or backward.

   c. < option "b" above> <integer> - If the skip count (option "b" above) is followed by another integer, the second integer is interpreted as a channel number and the first number is interpreted as the number of times to skip to that channel.

   Example: <mix number of SYSTEM/BACKUP> AX LP 28 + 3 1
   (Tells SYSTEM/BACKUP to stop printing the current backup file on tape, use LP 28, and skip to channel one, or to the top of page, three pages ahead.)

ODT/MARC COMMANDS USED TO INDICATE THE LOCATION OF BACKUP FILES

1. **SB** (Substitute Backup) - Substitutes one or more backup media for others. See below for use.

2. **DL** (Disk Location) - Can be used to indicate that backup files, the usercode file, known as SYSTEM/USERDATAFILE, or the system's log file, known as SYSTEM/SUMLOG, and the dumpdisk files (DPFILES) of dumps taken are to be located on a disk device other than the halt/load unit. The correct location of these files is important to system performance.

   Example:
   ```
   SB TAPE=DLBACKUP
   DL BACKUP ON USER1
   DL LOG ON LOGS
   DL USERDATA ON PACK
   DL DPFILES ON USER2
   ```

SYSTEM/DUMPALL

SYSTEM/DUMPALL is a utility program which copies files between media. Instructions on using SYSTEM/DUMPALL can be obtained by entering the following syntax:

RUN SYSTEM/DUMPALL ON <pack name> ("TEACH ALL PRINT UPCASE")

Instructions to SYSTEM/DUMPALL are always provided within a set of parentheses () and quote marks (""). The information included between the quote marks is known as an instruction string. The instructions that may be used to indicate the source and destination media, the specific part of the file to be copied, and the output format are described below. The instructions between parentheses and quote marks are limited to a total of 256 characters.

SYSTEM/DUMPALL Routine Types

1. **LIST** - Prints the file in alphanumeric format.

2. **LISTAN** - Prints the file in alphanumeric format with the translation of each character to its hexadecimal equivalent or any other specified format.

3. **COPY** - Copies files between source and destination devices. Up to 100 input and output files can be specified in one COPY statement. You can also give your output files new names, and specify certain attributes different from those of the input files, such as maximum record size and the units used, and block size in records. The example displayed below shows how to indicate to SYSTEM/DUMPALL that the input files are named IN1 and IN2, the output files are named OUT1 and OUT2, SYSTEM/DUMPALL is on the pack named PACK, the first input file is on tape, only certain records are to be copied, and OUT1 can not be extended.

   Example: RUN SYSTEM/DUMPALL ON PACK ("COPY IN1 (TAPE) REC 10 THRU 95 TO OUT1 (DISK) CRUNCH THEN IN2 (DISK) SKIP 9 TO OUT2 (DISK)")

4. **FILE** - Prints the values of the file attributes associated with the indicated file.

5. **DMPMT** - Prints a tape file in whatever format is specified.

6. **HEXDSK** - Prints a disk file in hexadecimal and EBCDIC format.

7. **LIBMT** - Prints a library tape file in hexadecimal format. A library tape is one that was created by indicating a specific tape as the destination of a WFL COPY statement.

8. **TEACH** - HELP is accepted by the system as a synonym for TEACH. The instructions will be displayed at the device where the TEACH instruction was input.

   TEACH <chapter name> - Provides the syntax and function of the indicated chapter.

   TEACH CONTENTS - Provides a list of chapter names.

   TEACH ALL - Provides a list of all of instructions, syntax, and functions.

   TEACH <ALL, chapter name, or CONTENTS> PRINT - Provides a line printer listing for the specified option. The UPCASE option can be used to have the information printed in upper case only.

9. **INTER** - Indicates that parameters and instructions will be entered interactively via a terminal device. The system responds by displaying: PLEASE ENTER DUMPALL COMMAND. After SYSTEM/DUMPALL performs each task, it responds by displaying either NEXT, CONT, or PLEASE ENTER NEXT COMMAND. To stop communicating interactively with SYSTEM/DUMPALL, enter the following: QUIT

10. **CARD** - Indicates that certain parameters and instructions to be used by SYSTEM/DUMPALL are contained in a file on disk. When you use this instruction, you must also include the name and pack location of the file.

    Example: RUN SYSTEM/DUMPALL ("CARD"); FILE CARD(TITLE=DUMPALL/BATCH/INPUT ON PROD)

Selected Input and Output File Specifications

1. **MAXRECSIZE** and **BLOCKSIZE** - Are two examples of file attributes. They indicate the size of the largest record and the block size. To indicate that the measurements, or units, are in characters and not words, you must use the abbreviation CHAR after the maximum record size and block size.

   Example:
   ```
   RUN SYSTEM/DUMPALL ON PACK
   ("COPY IN1 (KIND=TAPE, MAXRECSIZE=80
   CHAR, BLOCKSIZE=80 UNITS=CHARACTERS) TO
   OUT1 (KIND=DISK, MAXRECSIZE=80 CHAR,
   BLOCKSIZE=2400 UNITS=CHARACTERS)")
   ```

2. **UL** - Indicates that the file is or will be unlabeled. If UL is used with the LIST or LISTAN routine type, the input file maximum record size, block size, and character type must be indicated in the instruction string. The job will then appear in the list of waiting entries. You must then respond with a statement containing either the UL or the IL command.

3. **SKIPTM <number>** - Indicates that one or more tape marks are to be bypassed. For unlabeled tapes, SKIPTM 1 indicates that the first file is to be bypassed. For labeled tapes, SKIPTM 1 indicates that the internal tape label is to be bypassed. To indicate that the first file of a labeled tape is to be bypassed, you would have to indicate SKIPTM 2 in your instruction string.

4. **ON <pack name>** - Indicates the location of the input file.

5. **SKIP <number>** - Indicates the number of records that should be bypassed before printing should begin. It is used with the LIST or LISTAN routine type. You can follow it with the word REC and another number or a sequence range to indicate which records are to be printed or you can just use SKIP <number> to have printing begin after that number of records has been skipped and print all succeeding records.

   Example:
   ```
   RUN SYSTEM/DUMPALL ON PACK
   ("LIST (PAY)ACCTNG/PYRLL ON USER1
   SKIP 10 REC 11 THRU 110")
   (Printing of 90 records from the named
   file starting at record 11.)
   ```

6. **DBL** - Indicates that printed output is to be double spaced.

   Example: RUN SYSTEM/DUMPALL ON PACK
   ("LIST (PAY)ACCTNG/PYRLL ON USER1 DBL")
   (Double spaces the entire file.)

7. **B, E, N,** or **S** - Indicates which character type is being used. B indicates Burroughs Common Language, a six-bit character. E indicates EBCDIC, an eight-bit character. N (Nonstandard) indicates seven-track magnetic tape even parity records. S (Standard) indicates variable length BCL records. The character types referenced by the B and the S options are not used on the B5900, B7900, or A Series.

SYSTEM/FILECOPY

SYSTEM/FILECOPY is a library maintenance utility program which performs operations on files. This utility program functions by:

1. Generating a WFL job containing the copy specifications.

2. The WFL job then copies one or more files between media.

You can specify the criteria for selecting certain files from within the library, for example, you may select files created after a certain date and time. If SYSTEM/FILECOPY is run from a WFL job, the WFL job can be saved on disk for future use or modification.

Certain key words particular to this program must be used to communicate with the SYSTEM/FILECOPY program. You can, for example, specify that only some files CREATED, ACCESSED, UPDATED, EXPIRED, or ADDED AFTER, BEFORE, or BETWEEN certain dates, all files, or just those CREATED, ACCESSED, UPDATED, EXPIRED, or ADDED today are to be copied from a specified source to a specified destination. You can also indicate that only certain files are to be included or that certain files are to be excluded. Up to five different tasks can be included within a run of SYSTEM/FILECOPY. If you want the file to be removed after all files have been copied, you can use the word REMOVE to indicate this instruction to SYSTEM/FILECOPY. In that case, after copying the specified files, the job will be placed in the list of waiting entries and will await an OK from you to continue executing the statements in your WFL job.

If you are running as a cataloging system (discussed in Appendix H) and your files have been successfully copied, you can use the word BACKUP to indicate that the file names, cycles, and versions are to be cataloged.

SYSTEM/FILEDATA

SYSTEM/FILEDATA is a utility program which produces a printed copy of the directory of files on a specified disk or tape. The ODT commands TDIR and DIR produce a variety of reports.

1. **TDIR** - The tape name, unit number, serial number, density, file names, and tape creation date are included in the report of the tape's contents. Output by default is printed but may be punched on cards or displayed. Only privileged or ODT users can use this option.

   Example: TDIR 92

2. **DIR** - Prints disk information. The default report formats are STRUCTUREMAP and FILENAMES.

   Some Options Used With the DIR Command

   STRUCTUREMAP - Indicates the in use disk space in file name order and gives the starting sector address and length in sectors in each area used by the file.

   FILENAMES - Lists the disk file names segregated by the length of the first identifier in characters and in alphabetical order. Indicates CLASSA (A) for public or CLASSB (P) for private files, file names, access and creation dates, kind of file, size in segments per file, and other information about each file.

   ATTRIBUTES - Reports the values associated with specific attributes describing a specific file.

CHECKERBOARD or **MAP** - Produces a map of files on disk, indicating the base and ending addresses of the files, and the unused disk space between files, and provides a graph. The information is useful in reporting the size of the largest available disk area, or contiguous group of disk sectors. A report of an entire pack or only part of a pack can be produced.

Examples:

```
DIR ATTRIBUTES: LASTACCESSDATE
FAMILYNAME=USER1

DIR CHECKERBOARD: FAMILYNAME=USER2

DIR FILENAMES: TAPE=ABC SORT
```

PRACTICE EXERCISE:

In the space provided, complete the statements in writing. For practice, complete them as asked for and also as it could be done using the new printing subsystem.

1. Write the ODT statement that will have three copies of the backup file named REPORTS printed on line printer LP13, saved on disk, double-spaced, and identified on the printer output as "OPERATIONS".

   _____

   _____

   _____

2. Assume the printer broke down while printing checks and you want to restart the printing of the checks. The records within the program, which reads a master file and produces a backup check writing file, have a sequence number which appears in the record in character positions 12 through 18. The last good check printed before the printer broke down is #0000123. In their correct sequence, write the following:

   A. The statement containing the ODT command which will have Autoprint, whose job number is 3678 (which was printing the checks), stopped and have the backup check writing file saved on disk.

      _____

      _____

      _____

B. The WFL statement containing the PB command, input via the ODT, which will have SYSTEM/BACKUP print the remaining checks (after #0000123) from the file named CHECKFILE on line printer 21.

3. The MARC statement to have the system use SYSTEM/DUMPALL to print the file named OPERCLASS/UTILITIES that is on a pack named EDUCATOR1 and is under the usercode of OPERATIONS. The first five records of the file are to be skipped and the next 300 records are to be printed. Double space the printed output. Tell the system that the SYSTEM/DUMPALL utility program is on the pack named PACK.

4. Write the ODT statement to have the system copy an unlabeled tape file as OPERCLASS/UTILITIES under the usercode of OPERATIONS on the pack named DISK. For the input file, the maximum record size is 90 characters and blocksize is 1800 characters. The record size for the output file is to be 14 words and the block size is to be 420 words. Tell the system that the SYSTEM/DUMPALL utility program is on the pack named PACK.

A SERIES AND B5000/6000/7000
OPERATIONS

PROGRAMS AND UTILITIES

UNIT 3

LOG OVERVIEW AND RELATED ODT AND MARC COMMANDS

OBJECTIVE:

Identify ODT and MARC log commands used to produce reports of system usage.

RESOURCES:

- A Series System Software Site Management Reference Manual.
- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series Menu-Assisted Resource Control (MARC) User's Guide.

INTRODUCTION:

You will sometimes have to produce printed reports on the system usage. This unit will introduce you to producing reports on system usage, which is contained in the system log. It will also describe the types of information that can be extracted. You will also be introduced to the particular ODT and MARC commands which enable you to insert information into the log.

LOG OVERVIEW

Much of the information regarding the past status of the machine environment, for example, MCP activities and jobs previously run is stored as records in a log known as the system summary log or **SYSTEM/SUMLOG**. When the ODT command **TL** (Transfer Log) is entered to the system, the current SYSTEM/SUMLOG is renamed and a new SYSTEM/SUMLOG is started. The renamed system log is referred to as:

SUMLOG/<system serial number>/<date>/<six-digit number>

The six-digit number is one greater than the last system log that was transferred. After a cold start, the six-digit number returns to "000001". The MCP will automatically transfer the current system log when the log is 95% full (at least 95,000 records).

Several utility programs are available on the **A SERIES** systems for use in analyzing the log files. Two of these, **SYSTEM/LOGGER** and **SYSTEM MANAGEMENT FACILITY II (SMFII)**, are briefly described.

SYSTEM/LOGGER

This utility allows a user to obtain reports from the system log which will aid in the analysis of system performance and utilization. LOGGER may also serve as a basis for an installation's billing system.

The original data for the utility is stored in either the current SYSTEM/SUMLOG or in one or more logs which were created with the ODT command TL. LOGGER can also generate reports from files that it saves each time that it is run. This avoids the need to load a large number of log files in order to generate weekly or monthly reports.

The utility accepts a set of report specification commands from the user. These commands may specify information such as which data from the log file or files is to be included in the report, the sorting by a particular data item, and data items to be used as control breaks. Usually, a set of specifications for a report consists of only six or seven commands. Thus, the setup time involved in running LOGGER is minimal.

SYSTEM MANAGEMENT FACILITY II (SMFII)

The System Management Facility II (SMFII) is designed to provide extensive capabilities in the areas of system performance review and control. Through several software modules, SMFII provides comprehensive information regarding system resource usage, hardware performance, and system availability.

All pertinent data is extracted from the system log and is combined with sampling data obtained from the MCP to measure the usage of system resources by the program mix. This performance data is stored in disk files which are subject to the control of the user. A facility is provided for the backup, removal, and other maintenance of this information.

Extensive management reporting is provided through an inquiry and reporting software module. This reporting capability has a provision for graphic and statistical performance analysis, as well as trend analysis through the collection and analysis of ongoing system information. Ad hoc or production reports can be based upon the default or user-written report specifications. The following lists some of the types of information that are available from SMFII:

Workload Characterization - Resource usage of programs and their access of disk files.

Utilization Measurement - Processor and I/O queuing and memory allocation over time.

Degradation of Performance below Standards.

Incidence of Intermittent Errors - Mainframe components and peripheral devices.

Occurrence of Media Maintenance Events - Tape cleaning and certification and disk pack certification and initialization.

Cause of Service Interruption - Hardware, Software, Operational, and Environmental.

ODT/MARC COMMANDS USED WITH THE SYSTEM SUMMARY LOG

1. **TL** (Transfer Log) - Creates a new log and stores the old log as a file named:

   SUMLOG/<system serial number>/date/<six-digit number>.

2. **LC** (Log Comment) - Inserts the indicated comment, or literal, in the current SYSTEM/SUMLOG.

   Example: LC NO PROBLEMS TODAY

3. **LJ** (Log Job) - Inserts the indicated comment, or literal, in the summary for the specified job and in the system summary log.

   Example: 2731 LJ THIS WAS A TEST RUN

4. **LOG** (Analyze Log) - Initiates the utility program SYSTEM/LOGANALYZER. Some of the information which is available includes: specific job, task, and mix information, comments which were entered via the LC or LJ commands, and maintenance information.

   Examples: LOG ALL
   (Causes the system to print all information contained in the system summary log.)

   LOG JOB 1234
   (Causes the system to print all information pertaining to job 1234 that has been accumulated in the system summary log.)

   LOG 1530 10/10/90 TO 1600 10/10/90 MIX 4321
   (Causes the system to print all information pertaining to mix number 4321 running between the specified times and dates.)

   LOG MAINT
   (Causes all memory and I/O access problems to be printed from the current system summary log.)

   LOG MSG
   (Causes all messages from the current system summary log to be printed.)

PRACTICE EXERCISE:

In the space provided, write the word or words that correctly complete the statement.

1. To have the current SYSTEM/SUMLOG transferred and a new system summary log started, you must use the _____ command.

2. To indicate that the comment TEST RUN is to be printed with the summary for job # 1234, you must enter the following statement:

   _____.

3. The ODT command that is used to have a comment placed in the system summary log but not associated with any particular job is

   _____.

4. The complete ODT statement that will have a report printed from the current SUMLOG, specifically for I/O and memory access problems, is

   _____.

5. The complete ODT statement that will have a report printed from the current SUMLOG, specifically for job "PAYROLLWE123190", is

   _____.

6. The complete ODT statement that will have a report printed from the current SUMLOG, specifically for mix number 9876, is

   _____.

PROGRAMS AND UTILITIES

SECTION 4

REVIEW

You will often have to communicate with programs regarding their status, indicate that you want the system to copy files between media, and have the system produce reports of certain aspects of system usage from the contents of the SYSTEM/SUMLOG. This section introduced to you how to perform these operation duties.

LAB EXERCISE:

Do the following first using a REMOTESPO then repeat the exercise running the MARC software:

A. Determine the valid pack names.

B. Use the **DIR** command to obtain a "checkerboard" report on any pack.

C. Look for your DIR reports in the print queue (Use one of the **PS** commands).

D. Use SYSTEM/DUMPALL to print the contents of a file (the instructor will give you a file name and pack location) in alphanumeric format, double-spaced. Optionally, you should run SYSTEM/DUMPALL interactively from a terminal device and have SYSTEM/DUMPALL print the entire contents of the SYSTEM/DUMPALL TEACH (or HELP) file.

E. Determine what jobs are in the mix and have the system print the contents of the summary log for any one job in the mix.

F. Log off and collect your printouts.

SECTION 5

MASTER CONTROL PROGRAM AND MEMORY MANAGEMENT

A SERIES AND B5000/6000/7000 OPERATIONS

MASTER CONTROL PROGRAM AND MEMORY MANAGEMENT

SECTION 5

INTRODUCTION

SECTION OBJECTIVE:

Identify Master Control Program (MCP) options and techniques used to control the the operating environment for Burroughs **A SERIES** systems.

PURPOSE:

To perform your duties as a computer operator it is important to be familiar with the functions of the Master Control Program (MCP). The MCP is responsible for performing many of the repetitive functions involved in efficiently operating your computer and controlling the overall operations of your computer. This section introduces you to queues and to tailoring the run-time environment of the MCP to have it automatically perform certain functions. Additionally, memory management techniques which can keep your system operating at a highly efficient level are discussed. These memory management functions can also be tailored to your company's specific needs.

UNIT OBJECTIVES:

Objective 1 Identify the MCP run-time options, the ODT and MARC command used to modify their status, and the ODT and MARC MCP-directive commands.

Objective 2 Describe the function of job queues and identify the ODT and MARC commands used to modify queue attribute values.

Objective 3 Identify memory management tools.

MASTER CONTROL PROGRAM AND MEMORY MANAGEMENT

UNIT 1

MCP RUN-TIME OPTIONS

OBJECTIVE:

Identify the MCP run-time options, the ODT and MARC command used to modify their status, and the ODT and MARC MCP-directive commands.

RESOURCES:

- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series System Software Support Reference Manual.

INTRODUCTION:

The Master Control Program (MCP) performs many of the repetitive functions involved in efficiently operating the computer system and controlling overall operations of the computer system. This unit introduces you to the tailoring of the run-time environment of the MCP.

ODT/MARC COMMAND USED TO MODIFY THE RUN-TIME OPTIONS OF THE MCP

MCP run-time options designate that certain actions are to be taken or certain types of messages are to be displayed by the Master Control Program as it performs tasks and jobs. Some of these run-time options are described on the following pages. To turn on, turn off, and display these run-time options, you must use the ODT command **OP** as described below.

1. **OP** or **OP <option list>** - Displays the status of one or more options.

   Examples: OP 1 2 3
   or
   OP OPEN TERMINATE NOCHECK

2. **OP+** or **OP-** - Displays only those options that are turned on (OP+) or turned off (OP-) respectively.

   Example: OP+

3. **OP+<option list>** or **OP-<option list>** - Sets or resets only the indicated options, respectively.

   Examples: OP+ 5 4
   or
   OP+ LPBDONLY AUTORM

Either the option number or its name may be used in the OP statement. If two or more options are to be included in one OP statement, the option numbers or their names need only be separated by one blank space. The following chart indicates what the MCP does if some of the options are set.

Selected MCP Options

Option Number	Option Name	Option Definition
1	**OPEN**	Displays a message each time a file is opened.
4	**LPBDONLY**	Printer backup files are assigned to disk.
5	**AUTORM**	Old files having the same names as new files are automatically removed.
7	**CDONLY**	Requires that data for a WFL job be part of a WFL deck and not be input separately via a card reader.

8	**AUTORECOVERY**	After a halt/load, jobs running at the time of the halt/load are automatically restarted.
12	**AUTODC**	Automatically starts up data communications when the first attempt is made to send or receive a message via a terminal.
16	**CRUNCH**	When code and backup disk files are allocated disk space by the MCP, unused disk space within the last area will be made available to the system.
17	**BACKUPBYJOBNR**	Backup printer or punch files are output to their respective devices in job number order. If reset, output is by quantity of lines to be printed or punched.
19	**NOFETCH**	Disables WFL FETCH statements. Jobs will not wait for the operator to look at any messages contained in the FETCH statement within a program.
20	**RESOURCECHECK**	Requires the enforcement of queue resource attribute limits.
21	**NOSUMMARY**	A job summary is produced only if a job terminates abnormally or if backup files are created under the BD directory.
23	**CATALOGING**	Allows the cataloging function to begin and must be followed by a halt/load for cataloging to take effect.
24	**OKTIMEANDDATE**	Requires you to verify the system's time and date after every halt/load. You would then have to use the response TIMEOK after every halt/load.
27	**SERIALNUMBER**	Requires you to use the ODT command OU to indicate an output tape unit. The job requiring a tape unit will not go automatically to the first available scratch tape or the highest numbered tape drive.

28	**ARCHIVING**	Creates an archive log and enables the archiving function.
32	**SWAPALLJOBS**	Memory locations containing certain information relative to jobs will be allocated in an area known as swapspace (discussed later). Jobs use more memory space than they do processor time. Tasks use more processor time than do jobs. You may want to have your jobs "swapped" out to disk while their associated tasks are running. Therefore, this option could be used if you often find you have less available memory than you may need.
34	**MIRRORING**	This option allows disk mirroring to occur after the next Halt/Load. At that time, a Mirror Information Table (MIT) and other structures required are created.
37	**FILESATURATION**	Disk space is allocated in rows of user specified number of segments. When the disk space allocated for a given user file approaches its saturation level, a warning message will be displayed.
38	**EOTSTATISTICS**	Displays time statistics for tasks that have gone to end of task. These times include the total amounts of elapsed time, processor time, and Input/Output (IO) time used by the task.
39	**PATHBALANCING**	Allows dynamic path balancing to be used for reads and writes to multiple-path disk pack subsystems attached to systems using MLIPs.
45	**USECATDEFAULT**	If cataloging is being used, the USECATALOG file attribute is automatically set for all files, so all new file names are listed in the system catalog.

ODT/MARC MCP-DIRECTIVE COMMANDS

Another way to control the run-time environment of the MCP is to use certain ODT commands to identify to the MCP the names of predeveloped support libraries you want to have linked to the MCP, including any libraries which programmers have developed. A support library can be created by non-privileged users as well as by privileged users, can be written in various languages, can communicate with other libraries, and can have various files it needs to use associated with it. The loaded support libraries are retained in memory and do not have to be reloaded after a halt/load.

ODT/MARC Commands Used to Identify to the System or Display Libraries or Intrinsics

1. **SL** (Support Library) - Specifies or displays the names of certain support libraries, which may be used at some time by one or more programs. SL- performs a gradual DS of the program. The library stays in the mix until you use the ODT command SL-. Then, to use the library again, after using the ODT command SL-, the SL command would have to be input at the ODT. The command can also be used to change the function name associated with a system file or can be used to create support libraries. In the example below, GENERALSUPPORT is the function name and SYSTEM/GENERALSUPPORT is the system file.

   Examples: SL GENERALSUPPORT=SYSTEM/GENERALSUPPORT
   (GENERALSUPPORT is a replacement for the intrinsics.)

   SL MYLIBRARYSUPPORT = SYSTEM/MYLIBRARYSUPPORT

2. **LIBRARIES** or **LIBS** - Displays on the ODT a list of all libraries.

   Example: LIBRARIES ALL

3. **THAW** - Makes a library a temporary job in the mix. It is terminated once all present users have finished with it, but comes back into the mix once a user invokes it.

   Example: 3256 THAW

4. **SI** (System Intrinsics) - Specifies or displays the name of the intrinsics file. Intrinsics are predeveloped routines that perform certain functions, such as mathematical routines.

   Example: SI SYSTEM/INTRINSICS

ODT/MARC Commands Used to Change or Display the System's Time and Date

1. **TD** (Time Date) - Displays the system's present time and date.

   Example: TD

2. **TR** (Time Reset) - Changes the system's time. A four-digit number based on the 24-hour clock is used to indicate to the system the new time.

   Example: TR 1354
   (Changes the system time to 1:54 which the system would display as 13:54:00.)

3. **DR** (Date Reset) - Changes the system's date.

   Example: DR 12/12/90

ODT/MARC Commands Used to Change the MCP's Handling of Certain Programs

1. **MC** (Make Compiler) - Makes a program into a compiler that can be used to check the syntax of certain other programs and produce their associated object code. The code file must be on disk as SYSTEM/<file name> and must not be under a usercode.

   Example: MC SYSTEM/COBOL74

2. **CP** (Control Program) - Assigns or cancels control program status for an indicated program.

   A control program is never scheduled. It immediately goes into the mix and stays there, even if the system becomes overloaded with jobs and tasks. CP- cancels the control program status of a given program. A supervisor program can be assigned control program status.

   Example: CP- SYSTEM/CANDE

3. **CS** (Change Supervisor) - Assigns or cancels supervisor program status for an indicated program, or displays the name of the current supervisor program.

   A supervisor program can perform many of the operations that you might normally need to perform often, such as dynamically changing memory management factors (discussed later), stopping certain jobs from running, scheduling certain jobs, changing the priority of certain jobs or tasks, or changing queue attribute values. It is restarted immediately after a halt/load occurs.

   Example: CS SYSTEM/SUSPENDER

4. **PP** (Privileged Program) - Makes a program a privileged program.

   Privileged programs are programs that allow a user to gain access to certain MCP-maintained information. If the privileged program is run by someone not having a privileged usercode, the usercode running the privileged program temporarily will acquire privileged status.

   To keep a non-privileged usercode from obtaining privileged status while the non-privileged usercode is running a privileged program, you can use the ODT command **PP <program name>: TRANSPARENT** option.

   A supervisor program can also be assigned privileged program status, and then can extract certain MCP-maintained information and perform certain actions depending on the obtained information.

   Example: PP SYSTEM/CANDE:TRANSPARENT

ODT/MARC Commands Used to Identify or Change MCPs

Certain ODT commands identify which MCP release and patch level your system is using; other commands change MCPs. We identify the MCP by its release and patch levels. For example, 3.5.220 represents release level 3.5 and patch level 220. Releases are major changes; patches are minor changes.

1. **WM** (What MCP) - Displays the MCP's name, release, patch level, and options set at compile time. (These options are not discussed in this course.)

   Example: WM

2. **CM** (Change MCP) - Advises the system of a pending MCP change. If the old and new MCPs are on the same family, the system automatically changes MCPs when the mix is empty. A manual Halt/Load can be done also.

   This command has many options including **HLDUMPDISK** and **AUTOLOAD.** HLDUMPDISK creates a disk file to hold memory dumps.

   AUTOLOAD (B5900 systems only) makes a 206 or a 207 pack into a candidate for the alternative halt/load unit list. The candidate must contain a copy of the pack controller controlware file, named CONTROLWARE/B9387/<family index> and a copy of the MCP.

   Examples: CM SYSTEM/NEWMCP ON PACK

   CM SYSTEM/MCP33320 ON USER3 +
   AUTOLOAD, HLDUMPDISK

3. **AL** (Alternative Load) - (B5900 systems only) Adds or deletes candidates from the alternative halt/load unit list or displays the list. To use AL, you must first use the CM command with the AUTOLOAD option set.

   Example: AL + PK 193

4. **MB** (Make Boot) - (A3 systems only) Controls the selection of the bootcode file used during system initialization.

5. **HLUNIT** - (B5900, B6900, B7900, A Series) Allows a new halt/load unit to be specified.

ODT/MARC Commands Used to Determine or Change the System Configuration

1. **CF** (Configuration File) - Displays, designates, or removes the present configuration file. The default name is SYSTEM/CONFIGURATION.

   Example: CF SYSCONFIGURATIQN

2. **SC** (System Configuration) - Displays the present system configuration, including memory modules and the number of processors in use.

   Example: SC

3. **MS** (Make Subsystem) - Displays, designates, or removes a subsystem within a system.

   Example: MS SUB1=(1,2,GLOBAL)
   (This logically clusters locals 1 and 2 with GLOBAL to create a subsystem SUB1.)

4. **EC** (Environment Change) - (A Series and B7900 only) Displays or sets the size of the global memory component on A Series systems with more than 1024K words of memory. On the B7900 it allows the setting of memory for all address spaces (ASNs).

5. **MM** (Memory Module) - Identifies ready and to-be-saved memory module areas and those whose status has not been verified.

   Example: MM

6. **SWAP** - (B7700 and B7800 systems only) Allows a Memory Control Module (MCM) to be physically removed from a running system by having the contents of the MCM transferred to another MCM. The destination MCM must have sufficient memory available to store the contents of the source MCM. This command can also be used to add memory to the system.

   Example: SWAP MCM 2 INTO 3

7. GC (Group Configuration) - Displays the current group configuration, for example, memory modules in use or available.

   Example: GC

8. **RECONFIGURE** - This command is used when deleting or adding a processor or GLOBAL* memory to a system. RECONFIGURE causes a halt/load of the processor being added to the existing system. To have the system reconfigured, you must perform the following steps:

   a. Revise the configuration file.

   b. Compile the file using SYSTEM/CONFIGURATOR.

   c. Enter the CF command (described above) to indicate the name of the new configuration file.

   The NOW option causes the system to be reconfigured immediately, without waiting for a null mix. If you omit the NOW option, the system waits for a null mix before beginning the reconfiguration.

   Example: RECONFIGURE GROUP AS BLUE NOW

*GLOBAL is a trademark of Burroughs Corporation.

PRACTICE EXERCISE:

A. In the space provided write the word or words that best complete the statement.

1. To display the status of all of the MCP options, you must use the ODT statement _____.
2. To reset the MCP option NOSUMMARY, you must use the ODT statement _____.
3. To set the MCP option AUTORM, you must use the ODT statement _____.
4. The MCP option that requires you to use the ODT command OU to indicate which tape unit is to be used for output is called _____.
5. The MCP option that assigns print backup files to disk is known as _____.
6. Which MCP option indicates that unused disk space within the last area used by a code or a backup file is to be made available to the system?

   _____
7. To have the system require a verification of its time and date after every halt/load, you must set the MCP option number _____.

B. In the space provided write the letter that represents the best answer to the question.

_____1. Which of the following commands is used to display the name of the system intrinsics file?

a) SL b) MC c) SI d) TR

_____2. Which of the following commands is used to make a library a temporary job in the mix?

a) SL b) SI c) TR d) THAW

_____3. Which of the following commands is used to change the system's internal date?

a) TD b) DR c) TR d) SI

_____4. Which of the following commands is used to indicate to the system the name of a support library?

a) $. FILE b) SI c) SL d) THAW

_____5. Which of the following commands is used to indicate that the system is to change to another MCP?

a) CM b) WM c) MC d) CP

_____6. Which of the following commands makes a program into a privileged program?

a) WM b) CS c) CP d) PP

_____7. Which of the following commands identifies to the system the name of a supervisor program?

a) SI b) CS c) CP d) SL

C. In the space indicated write the letter of the statement which best defines the word or phrase.

_____1.	CF	a. Defines a logical subsystem within a system.
_____2.	GC	b. Designates the configuration file to be used.
_____3.	MC	c. Displays the system configuration.
_____4.	MS	d. Displays the current group configuration.
		e. Makes a program a compiler.

MASTER CONTROL PROGRAM AND MEMORY MANAGEMENT

UNIT 2

JOB QUEUES

OBJECTIVE:

Describe the function of job queues and identify the ODT and MARC commands used to modify queue attribute values.

RESOURCE:

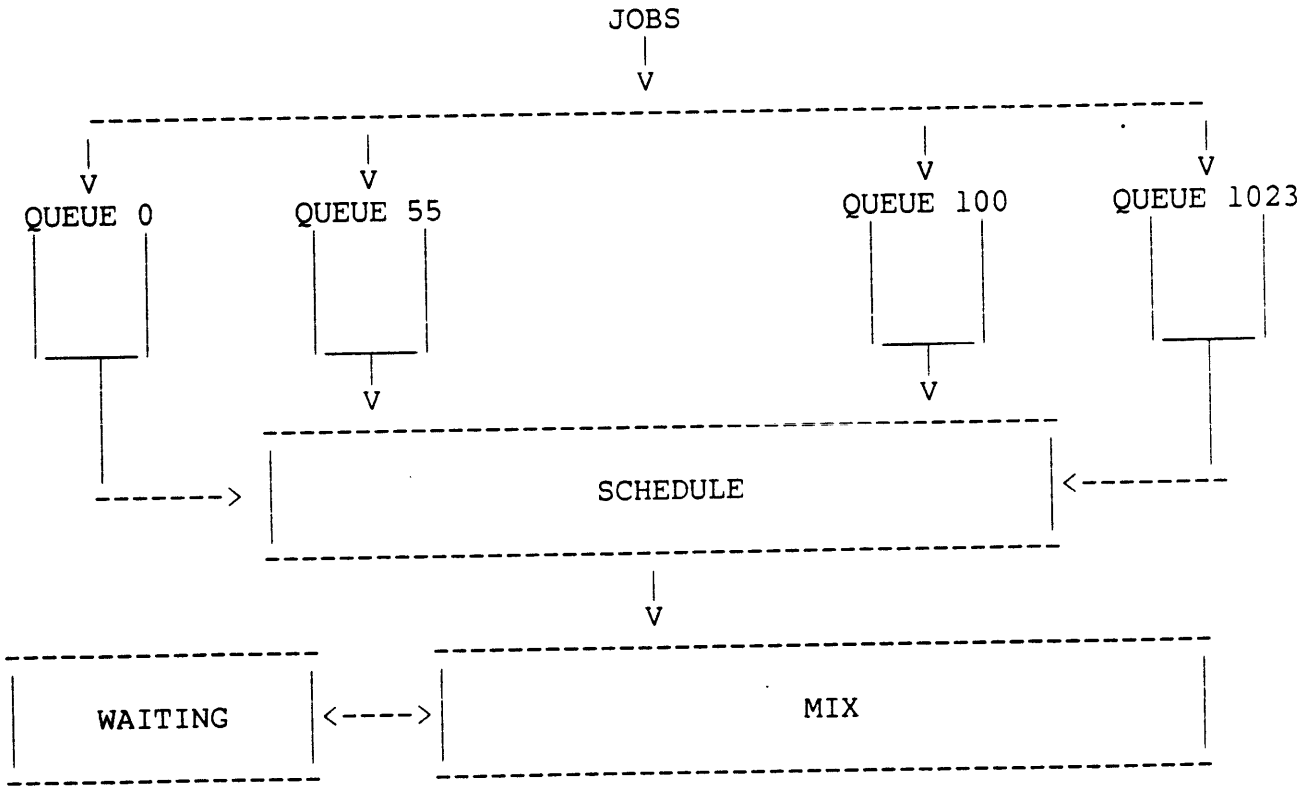
- A Series Operator Display Terminal (ODT) Reference Manual.

INTRODUCTION:

You will often have to control the flow of jobs through the system. The primary method used is to set up queues. Queues are waiting lists where jobs wait their turn to be executed. Queues provide both you and the system with more control over which jobs are placed in the mix and the amount of each resource a given job will use. This unit introduces how to create or delete queues, inquire into the contents of queues, move jobs within queues, purge queues, and change the variables associated with specific queues.

QUEUE OVERVIEW

Queues are waiting lines where jobs wait to be placed in the mix (list of active entries). The queue number implies a certain priority from the lowest (0) to the highest (1023). You can set up queues and place limits on the queues so the system will have to compare the queues' limits with the specifications of the incoming jobs before deciding in which queue the job will be placed. If the queue specifications are exceeded, jobs may be Q-DSed out of their queues. Any jobs that do not have an absolute limit value corresponding to a queue specification limit will inherit the default limits of the queue.



QUEUES

Queues are searched in reverse queue number order in order to select jobs to begin running. All jobs go from queues to the schedule, and if enough system resources are available, the system will try to run each job. The system also checks the number of jobs in the active list and the mix limit, and will determine the turnaround time for each job, before selecting jobs to be run.

Once the conditions for execution have been met, the job will leave the queue and enter the mix. The mix is the collection of all jobs that have left the schedule and have gone to the list of active entries. When a job is completed, it goes to the list of completed entries. When a job or task is waiting for an event to occur before it can continue, it goes to the list of waiting entries and often requires operator intervention in the form of certain ODT commands, or loading media on certain peripherals.

ODT/MARC Command Used to Create Queues

MQ (Make Queue) - Creates or deletes a queue or changes the values of the designated queue specifications such as the maximum number of tasks that a job in a specified queue can have, and the maximum number of jobs and tasks that can be running from the given queue at any given time. These values for the queue specifications are retained when the system has to be halt/loaded. To delete any job queue, use the MQ- <queue number> command. When a queue is deleted, the jobs from that queue will be moved to another queue, if possible.

Example: MQ 3 TURNAROUND=3, MIXLIMIT=5,
TASKLIMIT=4

Queue Specifications Used With the **MQ** (Make Queue) Command

Queue specifications allow you to indicate limitations for those jobs that are to be included within a specific queue. An alternative is not to set certain queue specifications. You can designate which queue is to be considered the default queue.

1. **DEFAULTS** - Indicate **default** system resources assigned to jobs in the specified queue. These can be overridden by assigning values to the specific job.

   A. **PRIORITY** - Can be from 0 to 99. It is the priority to be assigned to jobs in the specific queue.

B. **IOTIME** - Is the maximum amount of I/O time allowed for any job in that queue, stated in seconds.

C. **PROCESSTIME** - Is the maximum amount of processor time allowed for any job in that queue, stated in seconds.

D. **LINES** or **CARDS** - Is the maximum number of lines that may be printed or cards that may be punched by any job in that queue.

E. **WAITLIMIT** - Is the maximum amount of time in seconds that a job may wait for an event, such as with interactive programs.

F. **DISKLIMIT** - Is the maximum amount of disk sectors that a job may request from the MCP for writing purposes.

G. **ELAPSEDTIME** - Is the maximum amount of time that a job may be active in the system.

H. **TAPE7**, **TAPE9**, or **PETAPE** - Indicates the maximum number of that tape device type that may be assigned to the job. More than one tape device type may be specified.

```
Example:  MQ 5 DEFAULTS(PRIORITY=70,
          IOTIME=30, PROCESSTIME=4,
          LINES=70, CARDS=30)
```

2. **LIMITS** - Indicate **maximum** system resources for jobs in the specific queue. The same attributes are available as for DEFAULTS.

```
Example:  MQ 5 LIMITS(PRIORITY=80, CARDS=70,
          LINES=230, PETAPE=3, TAPE9=3)
```

3. **TASKLIMIT** - Limits the number of tasks that a job may initiate. The maximum number of tasks that can be specified is 30. If no limit is specified, a job may initiate an unlimited number of tasks.

```
Example:  MQ 5 TASKLIMIT=4
```

4. **MIXLIMIT** - Indicates how many jobs and tasks can be in the scheduled and active mix from that queue at any particular time. MIXLIMIT=0 indicates that no jobs from that queue are to be selected for execution until the MIXLIMIT is changed to a non-zero number. This can be useful when you want to have certain jobs executed in the evening. You simply have those jobs directed to the queue having a mixlimit of zero, and then change the mixlimit when you want to have those jobs begin execution.

   Example: MQ 3 MIXLIMIT=4

5. **FAMILY** - Causes all jobs in the designated queue to use the indicated disk pack as the default family or pack. The default pack must be the same as the pack assigned to the usercodes using that queue.

   Example: MQ 3 FAMILY DISK=EDUCATION
   OTHERWISE DISK
   (All jobs in queue 3 would use EDUCATION pack as the default pack for disk files.)

   The family name can also be specified in WFL statements for a specific job or task, or can be associated with a specific usercode when that usercode is created.

6. **TURNAROUND** - Is the desired maximum time in minutes between selection of jobs from the indicated queue.

   Example: MQ 3 TURNAROUND=3

7. **SUBSYSTEM** - Indicates the subsystem (discussed later) in which the job queue is to be located.

8. **SUBSPACES** - Is used with memory management, specifically the SYSTEM/SWAPPER utility program (discussed later).

ODT/MARC Commands Used to Display or Change the Contents of Queues

1. **SQ** (Show Queue) - Displays the job number, priority, and job name for all jobs in a specified queue, or for only the job having the highest priority in one or more queues. Optionally can limit the listing to those jobs having a specified priority.

   Example: SQ 3 60

2. **QF** (Queue Factors) - Displays the values associated with the queue attributes for one or more queues.

   Example: QF 7

3. **DQ** (Default Queue) - Assigns, deallocates, or displays a default queue from among the already existing queues.

   Example: MQ 7
   DQ 7
   (First make the queue, then the DQ makes queue 7 the default queue.)

4. **PQ** (Purge Queue) - Retains the queue but deletes all jobs presently in that queue. The MQ - <number> command also deletes all jobs presently in the indicated queue, in addition to deleting the queue. Before entering the PQ command, you should input the SQ <queue number> statement to determine what jobs are in that queue.

   Example: PQ 7

5. **MOVE** - Moves jobs around within a queue, if the jobs have the same priority.

   Example: MOVE 1234 1346
   (Moves job 1234 after 1346.)

6. **UQ** (Unit Queue) - Associates a queue with any jobs coming into the system from the designated input medium.

   Example: UQ CR27 5
   (Assuming queue 5 exists, queue 5 is now associated with any jobs coming into the system from card reader number 27).

7. **ML** (Mix Limit) - Displays, sets, or changes the maximum of the number of jobs and tasks that can be in the mix at any one time. The Mixlimit queue specification, which was discussed earlier, sets the maximum number of jobs that can be in the mix or scheduled from that queue at any one time, and should not be confused with ML, which pertains to the entire mix. ML optionally displays the queue number, mixlimit, number of jobs queued, and active count for all queues. The use of the **FS** command (see below) overrides the ML command.

   Example: ML 30

8. **FS** (Force Schedule) - Moves a job from the list of scheduled entries or from a queue into the mix. This command can be used when you know that a job is short and will not take much memory but has been scheduled by the system or is in a queue. In that case, you can use the **CU** command to determine how much available memory the system has at that time and then use the FS command.

   Example: 3221 FS

9. **HS** - Stops the system from selecting scheduled jobs to place in the mix.

   Example: HS

The ODT/MARC command **STARTTIME** can be used to indicate that the system is to begin executing a job at a specified time on a specified date. A job's starttime is displayed when the **SQ** command is used.

Example: 1234 STARTTIME = 1300 ON 10/03/90

PRACTICE EXERCISE:

In the spaces provided, using references, write the statements that would have the system perform the indicated functions.

1. Create queue 11. Use appropriate attributes to associate the following attribute values with queue 11.
   a. Limit to 6 the number of jobs and tasks that can be running from that queue.
   b. Limit to 3 the number of tasks that each job in that queue may initiate.
   c. Indicate that TRAINING2 is to be the only family associated with that queue.
   d. Assign the queue a turnaround time of 2.5 minutes.
   e. Set the default priority to 60, the default processor time 3.5 seconds, and the default I/O time to 35 seconds.
   f. Limit the priority to 80 and the number of lines to be printed to 400.

_____

_____

_____

_____

_____

2. Display the contents of queue 11.

_____

3. Delete the contents of queue 11.

_____

4. Set the limit of active entries to 30.

_____

MASTER CONTROL PROGRAM AND MEMORY MANAGEMENT

UNIT 3

MEMORY MANAGEMENT

OBJECTIVE:

Identify memory management tools.

RESOURCE:

- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series System Software Support Reference Manual.

INTRODUCTION:

Careful use of specific memory management techniques can keep your computer system running at a highly efficient level. There are a number of ways you can tailor the MCP's memory management routines to your company's specific needs. For example, you can have the system use certain MCP procedures, certain utility programs, and specific values to determine how much memory a specific program can use and for how long. This unit introduces the memory management tools available, how to invoke them, and how to use these tools to manage your system's memory usage more efficiently. With the addition MCP/AS on level 3.6, all the memory of the A Series machines becomes immediately available to the MCP. On the A3 and A15 special hardware is required to implement this capability.

MEMORY MANAGEMENT OVERVIEW

The **A SERIES** system uses a virtual memory technique for memory management, which is based on the concept of loading into memory only those parts of a program required for a given task to be executed. Therefore, at any time the system has to locate only enough memory space to load in the presently required parts. Program segments not presently needed by the running task reside on disk and can vary in length. Those that are very large in size are automatically segmented by the system.

At any time, local memory areas are either in-use or available. In-use memory areas are considered as either save or non-save. In-use save memory contains information that must be kept in memory until the task is completed. In-use non-save memory contains information that could be overlaid and thus does not have to be kept in memory the entire time a task is executing.

A number of factors may cause the system to manage memory inefficiently. These factors include the following:

1. **Checkerboarding**, where areas of in-use memory are located next to very small areas of available memory.

2. **Thrashing**, when the system is (1) spending less time completing the processing of data and more time trying to find enough available memory space needed to run a program and (2) trying to move information around within memory or between memory and disk. Thrashing may occur because you have set your mix limit too high.

To correct these situations you could respectively:

a. Perform a **Halt Load (with Option 8 Reset)** to clear memory and to allow you to manually restart the processing of jobs.

b. Perform the **HS** ODT command to hold all scheduled tasks for manual selection.

Some of the things you can do to help the system manage memory more efficiently , prior to encountering the above problems, include the following:

1. Include in your **MQ** statement the **TASKLIMIT** queue attribute to limit the number of tasks that jobs entering the associated queue can initiate.

2. Avoid using the **FS** command to force jobs into the mix.

3. Limit the number of user data communications tasks that can be processed at one time.

4. Reorganize the workload to balance the system's load.

5. Set or change, as needed, the memory management factors (described later) which invoke the MCP procedure **WSSHERIFF**, or invoke the MCP procedure **SWAPPER** (discussed later).

6. Use one or more of the means described below to manage memory efficiently.

MEMORY MANAGEMENT TOOLS

WSSHERIFF

This MCP routine provides constant memory management for all tasks.

The ODT command **SF** (Set Factors) is used to interrogate and change the status of the following memory management factors.

a. **1** - (**OLAYGOAL**) - The specified percentage of local memory for each task that will be overlaid per minute. To initiate WSSHERIFF, you must set this factor to a percentage greater than zero.

b. **2** -(**AVAILMIN**) - The percentage of local memory to be kept as available for on-demand usage. Factor 1 must be set to a percentage greater than zero for this factor to be effective.

c. **3** - (**FACTOR**) - Tells the system how much memory, by percent of total memory, it has for scheduling purposes. You can indicate that the system has more or less than 100 percent of total memory. If it is greater than 100 percent more jobs will be selected for execution, while if it is less than 100 percent fewer jobs will be selected.

d. **4** -(**MEMORY PRIORITY FACTOR**) - The percentage of one second that a program having a higher priority will be able to remain in memory before possibly being overlaid by a program having a lower priority. It is possible that a task will have its newly acquired memory space overlaid by WSSHERIFF when it looks for memory space to be given to another task. To protect tasks from being overlaid when they have just acquired the memory space, you can set this factor to a number greater than zero. Tasks with a priority greater than 50 will tend to stay in memory longer, while tasks with a priority less than 50 will tend to stay in memory for less time. The greater the difference from 50, the greater the time difference will be.

An example of the use of the SF command follows:

Example: **SF 1 2 2 1 3 100 4 2** **% 1 COMMAND**

or

SF 1 = 2 **% 4 COMMANDS**
SF 2 = 1
SF 3 = 100
SF 4 = 2

Sets factor 1 to 2%, factor 2 to 1%, factor 3 to 100%, and factor 4 to 2%; the outcome of setting these factors to the indicated percentages is the following:

(1) 2% of each task's in-use local memory will be overlaid per minute, and the MCP's WSSHERIFF routine will be invoked.

(2) 1% of all local memory will be kept available for on demand usage.

(3) Tells the system that it has use of all of its memory.

(4) 2% of one second that a task having a higher priority will be able to remain in memory before possibly being overlaid by a task having a lower priority.

The default memory management factor settings are:

SF 1 0 2 0 3 100 4 0

The ODT command **OG** (Overlay Goal) permits alteration of memory management factor 1 for one or more jobs rather than for all jobs. All other jobs would use the setting indicated for factor 1 in the SF statement or its default value.

Example: 3250, 3252 OG
(Sets factor 1 to % for the two indicated jobs.)

SWAPPER

This function provides constant memory management for tasks which are heavily data communications oriented.

This allows the user to set aside a certain amount of their actual local memory for the purposes of time-slicing. This space in memory is known as **SWAPSPACE**. The corresponding space on disk, known as **SWAPDISK**, is used when part or an entire program presently not being used is a likely candidate to be swapped out to disk. A program would be swapped out to disk in the following situations:

1. A data communications task running under SWAPPER is waiting for input.

2. A data communications task running under SWAPPER is waiting to output all of the data held in its output buffers.

3. The program running under SWAPPER has been in memory longer than its allotted amount of time.

4. The job running under SWAPPER has been suspended by the system for another reason.

The size of SWAPDISK and SWAPSPACE are user defined via the ODT command **SW** (Swap). This command also interrogates, initiates, and terminates SWAPPER. The size is in 990-word slots. Via the **SUBSPACES** queue attribute or the WFL task attribute, you can indicate what is to run in SWAPSPACE. The meanings of the values for programs run with the SUBSPACES attribute set are listed below. For further detail refer to the A Series System Software Support Reference Manual.

SUBSPACES=0 - Do not run in SWAPSPACE.

SUBSPACES=1 - Place only the task data in SWAPSPACE.

SUBSPACES=2 - Data is in SWAPSPACE; code also if this is a user program.

SUBSPACES=3 - Data and code are placed in SWAPSPACE.

To indicate that all specified tasks are to run in SWAPSPACE you would enter the ODT statement **OP+ 32** or **OP+ SWAPALLJOBS.** To run SWAPPER, you must have a SWAPDISK file created on a selected disk pack. The SWAPDISK file should exist on a disk pack having minimal I/O activity.

Default Memory Management

If neither of the MCP procedures SWAPPER or WSSHERIFF are used, the system will appropriate memory space **ON DEMAND** from programs competing for memory space. When memory space is needed for a given program, the system will proceed to move code and other information around within memory to make enough space available. If enough space is still not available within memory, the system will try to reuse memory areas presently containing program segments. If still more memory is needed, the system will try to write out to disk some data contained in memory.

MCP/AS

With the addition of the A Series machines, additional memory capabilities are present. To make use of these resources the Master Control Program / Advanced Systems was designed to compliment the new architecture. The standard MCP is available for the A Series, but for those users wishing to make use of more than 1 million words of memory without the use of subsystems.

MCP/AS looks at all memory as one contiguous area, all of which can be directly addressed. This provides a number of important benefits:

Memory addressing to 96MB.

MCP/AS supports programs of any size, limited on by available hardware resources.

MCP/AS is totally transparent to the operator/programmer.

Special configuring of the system is not required.

Existing application programs can be use without changes or recompilation.

All programs are visible to each other.

Improved system performance by faster memory access.

SWAPPER is not needed in this improved memory environment. The normal ON DEMAND memory management techniques are usually enough control. If not, the SF command should be more than sufficient to take care memory management.

MEMORY DISK

With the development of MCP/AS and the increased memory capacities on the A Series, some of the expanded memory area may now be set aside for use as a simulated disk unit.

Memory Disk is a mechanism which improves system performance by designating some of the additional memory as a disk unit.

- Memory Disk can increase throughput, because the speed of memory access over disk access is significant.

- Each unit of Memory Disk is identified by the unit mnemonic MD, a unit number, and a family name.

- Memory Disk does not require any changes to application programs or WFL jobs. It is accessed by its family name.

- The contents of a Memory Disk unit are vulnerable to power failure and off-line memory reconfiguration, so files stored here must not require recovery.

- Overlay files and sort work files are examples of files that could safely be directed to Memory Disk and may have a significant impact on system performance.

Memory Disk is created through the configuration file, memory section on the A Series. Therefore, the ODT commands MM (Memory Module) and U (Utilization).

PRACTICE EXERCISE:

In the space provided write the word or words that best complete the statement.

1. The two MCP procedures that perform memory management functions are known as _____ and _____.
2. The ODT command that can be used to display and set the four memory management factors is _____.
3. To set the overlay goal for one or more jobs at a percentage different from the majority of jobs, you would use the ODT command _____.
4. The memory management factor that tells the system how much memory it has for scheduling purposes is factor number _____.
5. The memory management factor that, if set to a nonzero percentage, initiates one of the MCP's memory management routines is factor number _____.
6. The ODT command used to define the size of SWAPDISK and SWAPSPACE is _____.

MASTER CONTROL PROGRAM AND MEMORY MANAGEMENT

SECTION 5

REVIEW

In this section you have been introduced to the following:

A. Modifying the run-time options of the MCP

B. Intrinsics, support libraries, supervisor programs, and privileged programs, and how to identify their names to the MCP

C. MCP-directive ODT commands used to modify the run-time environment in which the MCP operates

D. Creating, determining, and modifying the settings of queues

E. Two MCP procedures and a utility program that can be used to allow your system to manage its memory allocation and reallocation more efficiently.

PRACTICE EXERCISE:

1. State the function of the run-time options of the MCP.
2. State the use of privileged programs.
3. State the purpose of the MCP-directive ODT commands.
4. State the use of queues.
5. State the differences between the use of the following memory management tools:
   A. Memory Management Factors and WSSHERIFF
   B. SWAPPER

LAB EXERCISE:

Do the following first using a REMOTESPO then repeat the exercise running the MARC software:

A. Determine the current settings of the four memory management factors.

B. Your instructor will assign you a task number. Set the priority for it to 65. Observe its processor and IO usage vs. time (Check using the TI command every 30 seconds for 2 minutes).

C. Now set the overlay goal for it to 40. Observe its processor and IO usage vs. time (Check using the TI command every 30 seconds for 2 minutes).

D. Now set the priority for it to 35. Observe its processor and IO usage vs. time (Check using the TI command every 30 seconds for 2 minutes).

E. Return the task to its original settings for both priority and overlay goal.

F. Log off.

SECTION 6

DATA COMMUNICATIONS OPERATIONS

DATA COMMUNICATIONS OPERATIONS

SECTION 6

INTRODUCTION

SECTION OBJECTIVE:

Identify the operation duties associated with the controlling of the Data Communications operating environment.

PURPOSE:

To be able to communicate with message control systems (MCSs), it is important to know the following:

1. The functions of the various types of environmental software used on your system.
2. The logical and physical relationships among the following:
   a. The main components of the Data Communications Subsystem.
   b. The various types of environmental software.
   c. The other parts of your computer's central system.
3. Some of the network control commands used to communicate with CANDE.

This section will introduce to you the topics and concepts that you will need to know to perform the operational duties associated with the control of the Data Communications operating environment.

UNIT OBJECTIVES:

Objective 1 Identify the Data Communications Subsystem and types of environmental software used to control the Data Communications operating environment.

Objective 2 Identify some ODT and MARC commands associated with controlling the Data Communications operating environment.

Objective 3 Identify some CANDE commands associated with controlling the Data Communications operating environment.

A SERIES AND B5000/6000/7000 OPERATIONS

DATA COMMUNICATIONS OPERATIONS

UNIT 1

TYPES OF DATA COMMUNICATIONS SOFTWARE

OBJECTIVE:

Identify the Data Communications Subsystem and types of environmental software used to control the Data Communications operating environment.

RESOURCE:

None.

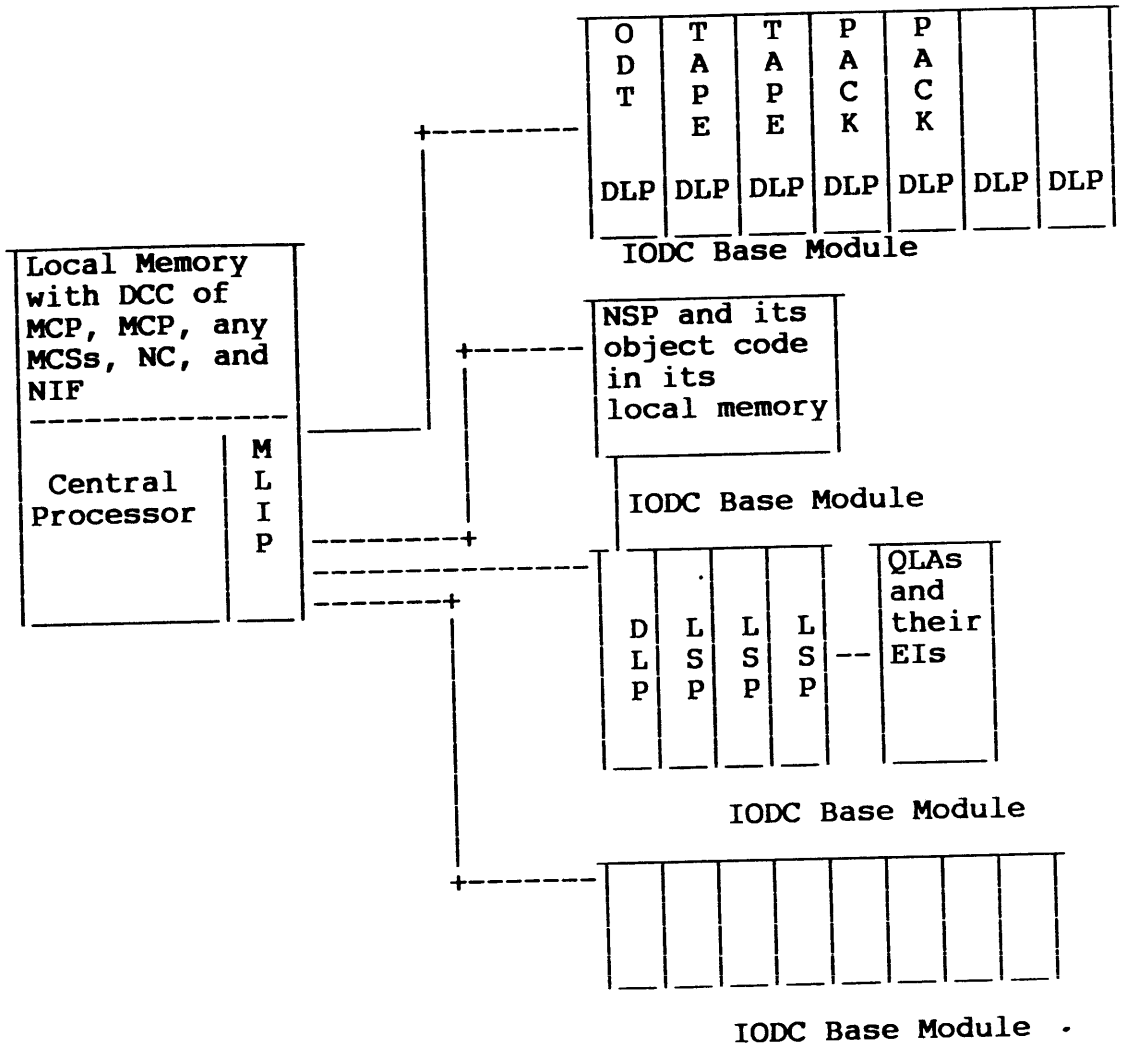
INTRODUCTION:

It is important to become familiar with both the Data Communications Subsystem and some of the types of environmental software that may be running on your system. Various types of environmental software can be used to tailor your system to the requirements of your company.

The Data Communications Subsystem, Network Controllers, and Message Control Systems (MCSs)

The Data Communications Subsystem is a microprocessor-based system. It is composed of a series of processors which perform many of the tasks associated with the central processor's data communications responsibilities. The design allows these responsibilities to be distributed among the data communications processors, known as the Network Support Processors (NSPs) and the Line Support Processors (LSPs).

The Data Communications Subsystem for B5900, B6900, B7900, and A Series systems is logically depicted on the next page.



Key:
- DLP - Data Link Processor
- MCSs - Message Control Systems
- IODC - Input/Output Data Communications
- NSP - Network Support Processor
- DCC of MCP - Data Communications Controller Routines of the MCP
- MLIP - Message Level Interface Port
- NC and NIF - Network Controller and Network Information File
- EI - Electrical Interface
- QLA - Quad Line Adapter
- LSP - Line Support Processor

Note: On large systems other than the B5900, B6900, B7900, and A Series the NSP and MLIP have different names (DCP and PC on B6800s; DCP and IOM or IOP on B7800s).

SYSTEM/DCSTATUS, a utility program, can be used to have the system analyze the present status of the Data Communications Subsystem. The analysis can be performed for one or more stations, lines, or other parts of the Data Communications Subsystem. EIs, QLAs, and lines are used to physically connect one or more stations to the system.

The **Network Definition Language II (NDLII)** creates a **Network Controller** and a **Network Information File (NIF)**. Its contents includes: the hardware and the attributes of the various elements which comprise the system, relationships among some of the various components of the Data Communications Subsystem, control characters, **Message Control Systems (MCSs)**, and station names used with specific stations in the Data Communications network.

The Message Control Systems (MCSs) control the flow of data communications through your computer system. They are limited to the following: user-developed MCSs or Burroughs-supplied MCSs such as the Communications Management System (COMS), Generalized Message Control System (GEMCOS), Command and Edit Language (CANDE), DIAGNOSTICMCS, Remote Job Entry (RJE or SYCOM), and Burroughs Network Architecture (BNA). These Burroughs-supplied MCSs are briefly described on the next pages.

COMS - Controls on-line Data Communications environments. It supports the processing of multiprogram transactions as well as single-station and multi-station remote files. COMS provides the ability for a continuous operations environment without service interruptions for the additions or modifications of Application Programs, changes to User and Station Security, and modifications to the Station Device Lists to name a few. The following features are offered:

1. Access control for entrance to the system and for use of programs by specified users at specified stations.

2. Message transfers between the different terminals supported by the MCS.

3. Control of the Data Communication Network and the initiation/termination of application programs.

4. Data Communications error handling.

5. Extensive synchronized recovery facilities are available in COMS to address any form of critical system failure.

GEMCOS - Performs the processing of multiprogram transactions using the Transaction Control Language. It provides the following:

a. message routes

b. station and program security requirements

c. message formatting criteria

d. type of recovery selected for user programs

CANDE - Performs file preparation and updating, and program compilation and execution functions (described later).

DIAGNOSTICMCS - Performs many of the functions associated with other Burroughs-supplied MCSs, but does not perform security-checking functions. Its main use is the verification, monitoring, and error diagnosis of all data communications activity between this MCS and your system.

RJE - The functions of RJE are the following:

1. To introduce data or jobs from a remote system for processing at a central, or server, system;

2. To receive as output on a remote peripheral device the data processed by the server system; and

3. To control and monitor on the ODT those programs being processed on the server system.

RJE permits you to have computer systems from the same or different Burroughs product families form a single network. Systems are designated as either a server or a user system. User systems perform data input functions and receive data output. Server systems perform functions such as compiling or otherwise processing data in jobs. RJE also permits a user system to send and receive ODT messages from a server system and to transfer files between systems. Many of the duties associated with transferring file information and ODT messages between systems are performed by the Network Controller, created from the NDLII or NDL source program.

BNA - Provides the means to create a single network, in which any member system can access the resources associated with another member system on a peer basis. The computers in this network can be from the same or different Burroughs product families. BNA performs functions such as the following:

1. provides access to resources, such as databases
2. manages the following:
    a. transfer of files
    b. remote initiation and control of jobs
    c. communication between programs

A network consisting of two or more Burroughs computer systems may be connected by using any one of the following mediums:

1. switched, or dial-up lines
2. dedicated, or leased lines
3. the transfer of packets of data between stations and systems

Specific components of BNA perform designated functions. These components and the functions they perform are listed below:

1. Host Services perform functions such as responding to operator inquiry, transferring WFL job decks, initiating and controlling tasks, and performing inter-program communication. Each system in the BNA network is considered a host and is identified by a host name. The system that is to perform a particular task is indicated in a task statement. This information is passed through the network to the indicated system. Security checks determine whether access to the systems, files, records, and data items will be allowed. System resource level checks determine whether required peripheral units are present and whether sufficient file storage space and processor time are available. Host Services also checks whether certain ODT-initiated functions are allowed to be processed.

2. Network Services provide the communication rules required to handle the BNA network, including message routing within the BNA network, message segmentation and reassembly, and network configuration.

PRACTICE EXERCISE:

In the space provided write the letter of the statement that best defines the example of environmental software or Data Communications Subsystem hardware.

_____1. NDLII

_____2. COMS

_____3. NSP, LSP, or DCP

_____4. BNA

_____5. MCS

a. Is a database management system.

b. Is a language used to generate a Network Controller and a Network Information File.

c. Sets up the maximum number of lines and characters that can be displayed on a terminal or ODT screen.

d. Controls the flow of information from stations to application programs and is exemplified by COMS, GEMCOS, and CANDE.

e. Is hardware that performs many of the tasks associated with the central processor's data communications responsibilities.

f. Permits a network of Burroughs computer systems to communicate with each other and share peripheral resources.

g. Is an MCS that supports the processing of multiprogram transactions as well as single-station and multi-station remote files.

DATA COMMUNICATIONS OPERATIONS

UNIT 2

ODT AND MARC COMMANDS

OBJECTIVE:

Identify some ODT and MARC commands associated with controlling the Data Communications operating environment.

RESOURCE:

- A Series Operator Display Terminal (ODT) Reference Manual.
- A Series Menu-Assisted Resource Control (MARC) User's Guide.

INTRODUCTION:

An overview of the data communications environment and different types of environmental software has been presented. It is also important to become familiar with some of the ODT and MARC commands which are used to determine the status of that software or communicate with it.

SOME ODT/MARC COMMANDS ASSOCIATED WITH CONTROLLING THE DATA COMMUNICATIONS ENVIRONMENT

1. **ID** (Initialize Data Comm) - Initializes data communications within the system. It may provide more rapid initialization of a data communications processor or NSP even if the MCP run-time options AUTODC and AUTORECOVERY are set. An NSP's or DCP's local memory can be dumped by entering the DUMP option within the ID statement, and an NSP or a DCP can be directed to stop operating by entering the QUIT option within the ID statement. For B5900 and B6900 systems, the ID statement loads the Network Controller (object code) and the Network Information File (NIF) into the NSPs and the LSPs, and must be used each time the NSP must be initialized. The :CLEAR option causes the system to clear the NSP's local memory and reinitialize the NSP.

   For B6800 and B7800 systems, the ID statement initializes data communications within the system by loading the NIF and the Network Controller into the DCP's local memory or into the system's local memory.

   Example: ID 108 : CLEAR
   (In this case, 108 is the number of the DCP or hardware NSP.)

2. **SM** (Send to MCS) - Sends a message to the MCS associated with the mix number, and can be used to communicate with certain stations via an MCS. You can send various control commands to the indicated MCS. The allowable control commands are indicated in the appropriate reference manuals for each MCS.

   Example: 3731 SM SS ALL SYSTEM WILL BE HALTED
   AT 5:15 p.m.

3. **SS** (Send to Station) - Sends messages to various stations, but can be used only when RJE or CANDE are running on the system.

   Example: SS 31,35 SYSTEM WILL BE HALTED AT 5:15 p.m.

PRACTICE EXERCISE:

In the space provided write the letter of the statement that best defines the function of the ODT command.

_____1. SM

_____2. ID

a. Designates a terminal as a remote ODT.

b. Sets up the maximum number of lines and characters that can be displayed on a terminal or ODT screen.

c. Sends a control command to the designated MCS.

d. Initializes a data communications processor or NSP.

DATA COMMUNICATIONS OPERATIONS

UNIT 3

CANDE OPERATIONAL COMMANDS

OBJECTIVE:

Identify some CANDE commands associated with controlling the Data Communications operating environment.

RESOURCE:

- A Series CANDE Operations Manual.

INTRODUCTION:

One of the MCSs most often used on the system is CANDE. You will sometimes have to modify the Data Communications operating environment in which CANDE functions. For example, you may have to have CANDE update its table of stations and their associated lines in your Data Communications logical subsystem or to tailor CANDE to your company's requirements, using CANDE network control commands.

This unit defines some of the network control commands, concepts, and terms you will need to know in order to use the commands correctly.

CANDE MCS OVERVIEW

CANDE is one of the more commonly used MCSs on your system. The actual name of CANDE is SYSTEM/CANDE. Certain network control commands can be used to tailor CANDE's operation to your company's needs and modify the Data Communications logical subsystem of your computer system.

To be able to use the correct syntax for any of the CANDE network control commands, you will need to be familiar with the following terms.

1. **Control Station** - Stations with SPO=TRUE in their NDLII description are control stations. These may designate other control stations via the ??CONTROL network control command. These stations are authorized for entry of the CANDE network control commands to the system just as an ODT can be used for that purpose using the ODT command SM.

2. **LSN (Logical Station Number)** - The unique number assigned by the NDLII to each station defined for a network. Any time a new station is inserted in the NDLII station list, the LSN of all stations following the added station is changed.

3. **Station Name** - The unique identifier assigned to each station in the NDLII .

4. **Log Station** - Any station designated to receive CANDE log messages from activities such as user messages sent to the ODT, station log on and log off, station logical attachment to a data communications line, and certain data communications security violations and data communications errors. A log station must be a control station.

CANDE NETWORK CONTROL COMMANDS

The following control commands are used to determine or change the status of the CANDE network. They can be input only from the ODT or MARC, using the SM command, or from a control station. Some commands can be input only from a control station. If input from a control station, they must be preceded by the valid control character for that station. The default control character is the question mark. This control character can be changed at the control station by entering the statement:

?CHAR CONTROL=<character>

One of the procedures within the CANDE MCS is GRIND. It is responsible for performing most of the routines associated with the CANDE language verbs. The working areas of memory that contain the lists of steps within a specified CANDE task and their associated object code locations are known as GRIND stacks. Some CANDE tasks include terminal log on, in which users identify themselves to CANDE using a usercode, CANDE language verbs used to have the system perform text editing/file updating tasks, and task initiation.

If only one GRIND stack is permitted to exist in memory, all log-on, task initiation, and text editing/updating tasks will run from that one working area of memory. If more than one GRIND stack is designated the various tasks are divided up to run from the various GRIND stacks.

The number of editing and updating tasks that will be simultaneously performed out of the same GRIND stack is limited by the maximum number of workers. To change the maximum number of workers, you must change part of the SYSTEM/CANDE source program and recompile it. The maximum number of GRIND stacks to be kept in memory is limited by using the CANDE Network Control Command MAXGRINDS. More GRIND stacks allow more CANDE tasks to be running in the mix. However, this number is also affected by the number of other active tasks vying for processor and I/O time. CANDE text editing/updating and log-on tasks do not have their own task number, but rather run as part of a specific GRIND stack. Generally, if many people are using CANDE simultaneously, you will want to increase the number of GRIND stacks from which the user tasks will execute, up to a limit of 13.

Each GRIND stack appears in the mix as CANDE/STACK<number>. The CANDE MCS appears in the mix as SYSTEM/CANDE. CANDE/STACK and SYSTEM/CANDE have their own task numbers in the mix. A CANDE/STACK will appear in the mix, however, only when it is being used.

Network Control Commands Used to Change the Numbers of GRIND Stacks and User Tasks Processed at One Time

1. **?MAXGRINDS** - Displays or limits the maximum number of GRIND stacks to be used the next time CANDE starts running. The default and minimum is one, and the maximum is 13.

2. **?GRINDLIMIT** - Displays or limits the number of GRIND stacks presently being used. Changes take effect immediately, and do not require re-initialization of CANDE. The default is one, and the maximum must be less than or equal to the current MAXGRINDS value.

3. **?MAXTASKS** - Displays or limits the maximum number of CANDE user tasks that can be processed at one time. The default is 25.

Network Control Command Used to Display Command Values

?INFO - Displays the status or values associated with the other Network Control Commands, the NEWS file (discussed later), and CANDE control options (not discussed).

Network Control Command Used to Set the NEWS Option

?NEWS - Used to enable, disable, or interrogate the NEWS facility. A NEWS file provides information on the status of the system or of some software. Setting this option permits you to change the contents of your NEWS file periodically. Otherwise, you would have to broadcast the same information periodically throughout each day using the ODT command SS to ensure that the information is sent to all users communicating with CANDE at any time each day.

Some Network Control Commands Used to Terminate CANDE or Change the Logical Network

1. **?ABORT** or **?QUIT** - Causes termination of CANDE, DSing of all tasks, and performance of certain other routines. It is used to activate the new values set in the MAXGRINDS or MAXSTATIONS commands (discussed later). If ABORT is input, the contents of CANDE's stacks are also dumped.

2. **?RELEASE** - Passes logical control of a station to an MCS other than CANDE.

3. **?CLEAR** - Causes CANDE to logically clear one or more stations on a given line. It is used when you have a problem with a terminal. It will DS any task executing through CANDE from that station and create recovery files if applicable. To make the station available again, you must use the READY command (discussed later).

4. **?SAVE** - Makes the indicated stations unavailable for use. Unlike the CLEAR command, this command is not performed if the station is presently in use. To make the station available, you must use the READY command.

5. **?READY** - Restores the logical use of one or more stations that have been made unavailable by using the CLEAR or SAVE commands.

6. **?DISABLE** - Causes the appropriate data communications processor to ignore input from the indicated stations, even if they are ready and attached to a line. It can be used to prevent a specific station from communicating with the system.

7. **?ENABLE** - Causes the appropriate data communications processor to accept input from the indicated stations, if they are also ready and attached to a line. The appropriate data communications processor will begin polling the station.

8. **?STATUS** - Displays information on whether the indicated stations are READY, ENABLEd, and ATTACHed.

9. **?WHO** - Displays the usercode, station name, and LSN, if users are logged on to the indicated stations. This command can be entered only from a control station.

10. **?WHERE** - Displays information on all stations presently logged on or in the process of logging on. The usercode, station name, LSN, and other information is provided. If this command is entered from the ODT, the syntax is:

    <CANDE mix number> SM WH

11. **?MAXSTATIONS** - Displays or changes the number of stations that CANDE can support simultaneously. The default is 25 stations. Changes made using this command do not take effect until CANDE is re-initialized, or restarted.

12. **?COUNTS** - Displays the current count of CANDE running tasks, active stations, attached stations, and workers which can be executed by one GRIND stack simultaneously. The maximum number of workers can be changed only by modifying and recompiling the SYSTEM/CANDE program. It is not advisable to change the maximum number of workers.

Network Control Commands Used to Create or Revoke Log Station Status

1. **?LGSTA** - Gives the indicated station log station status. A maximum of 30 log stations are permitted. Any control station can be given log station status. This command can be input only from a control station.

2. **?DSLGSTA** - Revokes log station status from the indicated stations.

PRACTICE EXERCISE:

Using references, in the space provided write the CANDE network control command that best completes the sentence.

1. To immediately change the number of GRIND stacks that CANDE can support simultaneously, you would use the _____ command.
2. To display the values associated with Network Control Commands and options, you would use the _____ command.
3. To change (only after the next re-initialization of CANDE) the maximum number of stations that CANDE can support simultaneously, you would use the _____ command.
4. To change (only after the next re-initialization of CANDE) the maximum number of GRIND stacks that will be used, you would use the _____ command.
5. To cause the appropriate data communications processor to begin accepting input from a disabled station, you would use the _____ command.
6. To give a station log station status, you would enter the _____ command.

DATA COMMUNICATIONS OPERATIONS

SECTION 6

REVIEW

This section has introduced you to the various types of environmental software used on your system, such as COMS, GEMCOS, CANDE, and DIAGNOSTICMCS, RJE, BNA. The logical and physical relationships between the main components of the Data Communications Subsystem, the environmental software, and the rest of the system have been explained. The functions of the most often used ODT and MARC commands and CANDE Network Control Commands have been described in this section.

PRACTICE EXERCISE:

A. Using references, in the space provided write the letter of the statement that best defines the examples.

_____1. SS

_____2. COMS

_____3. CANDE

a. Is a language used to generate a Network Controller and a Network Information File.

b. Is an MCS that performs file preparation functions.

c. Identifies the MCS with which you are communicating.

d. Is an MCS that supports the processing of multiprogram transactions as well as single-station and multi-station remote files.

e. Can only be used to send a message to the appropriate CANDE or RJE station.

PRACTICE EXERCISE:

B. Using references, in the space provided write the CANDE network control command that best completes the sentence.

1. To interrogate the NEWS option, you would use the _____ command.
2. To make a saved or cleared station ready, you would use the _____ command.
3. To initialize and clear data communications for NSP 108, you would enter the _____ statement.

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APPENDIX A

B5900 INITIALIZATION INSTRUCTIONS

APPENDIX A:

B5900 INITIALIZATION INSTRUCTIONS

For a cold start or a cool start to be performed, the following items must be on hand:

1. Powered on console and ODTs, including the MTS2, and peripheral controllers and drives, including an ICMD drive for the system floppy disk.

2. The system release tape, which contains a copy of the MCP and various system software files. Examples of the system files include certain utility programs and the firmware, a series of micro-instructions that the controller requires to communicate with the drives. For the coldstart procedure steps which are described on the following pages, the appropriate name of the system release tape should be used wherever the word SYSTEMMV is used.

3. The system floppy disk that is labeled SYSTEM. The system floppy disk contains the UTILOADER program and the bootstrap loader, which is a small program that is used to give the operator access to the UTILOADER program.

4. An initialized pack mounted on a disk pack drive. This pack will be considered as the halt/load unit or pack. During the cold start procedure, the MCP will be copied from the SYSTEMMV tape to this pack. The halt/load pack must have been initialized on Burroughs 5000, 6000, or 7000 series systems. You must also use the "CM <MCP name> ON <pack name>" command to designate the copied MCP as the halt/load MCP on that pack, that is, the one to be used when the system has to be initialized. The "ON <family name>" part of the statement indicates that, although you may have two different versions of the MCP on that pack or on two different packs, the one that you want to use each time that you initialize the system is the one you have indicated in the CM statement.

APPENDIX A:

B5900 INITIALIZATION INSTRUCTIONS

COLD/COOL START

When a system is to be cold started, perform all of the steps listed below. When a system is to be cool started, perform steps 1 through 16 and 22 through 28, below, as needed, that is, step 16 may not be needed, and steps 27 through 28 could be performed at any later time.

1. Mount on a disk drive an initialized disk pack.

2. Press the POWER ON and ON LINE buttons on the disk pack drive controller (for 206 and 207 packs) and exchange.

3. Press the RUN and WRITE ENABLE buttons on the disk drive (for 206 and 207 packs).

4. Press the POWER ON switch on the tape drive controller (for PE NRZ drives).

5. Mount the SYSTEMMV system tape on a tape drive. Make sure that there is no write ring on the tape. Press the ON/RESET, LOAD, and ON LINE buttons on the tape drive. Be sure to press those buttons in the indicated sequence.

6. On the operator's console, press the ENABLE and the POWER ON buttons at the same time. The RUNNING indicator should lit.

7. Move the ON-OFF switch for the ODT(s) to the ON position. At this time make sure that the line printer is powered on and ready. Open the ICMD drive by pressing the button to the left of the drive.

8. Insert the ICMD labeled SYSTEM in one of the ICMD drives. The arrow on the ICMD should be on the upper half of the ICMD and should be pointing toward the back of the drive. When "ENTER Y TO CONTINUE" appears on the screen, press the letter "Y".

   If the message LOADING SOFTCON fails to appear, move the MTS2 ON-OFF switch to the OFF position. Make sure the ICMD is in its drive correctly, and then move the MTS2 ON-OFF switch to the ON position. You may also have to follow steps A through D below.

   A. Press the CLEAR HOME key to home the cursor.
   B. Type in, or enter, the word SOFTCON.
   C. Press the ETX key.
   D. Press the XMT key.

9. When the Power Up Menu appears on the MTS2 screen, the cursor, which shows the position where the next character will appear on the screen, should be at the "Power Up" position. Whenever the Power Up Menu is on the screen, you can move the cursor to the needed position by pressing the SKIP TAB key.

   Press the SPCFY key. It may take a minute or so for the power up sequence to complete.

   Your system may automatically perform steps eight and nine, so you may be able to avoid performing those steps.

10. When "POWER UP COMPLETE" appears at the lower left corner of the screen, the cursor should be positioned after the words "Boot Load".

    Press the SPCFY key.

    Remove the floppy disk (ICMD) or open the door to the ICMD drive.

11. Move the cursor to the beginning of the word "CONFIGURATION".

    Press the XMT key.

12. Write down the MLIP PORT number, LEM PORT number and the number next to the word "ADDRESS" for the disk pack (PACK), when the configuration appears on the screen. Write down the tape drive address for the device on which you mounted the SYSTEMMV tape. This number may be on the front of the tape drive.

13. Press the SPCFY key.

14. Move the cursor to the beginning of the word "TAPELOAD". Press the XMT key.

15. Home the cursor and then key in:

    SYSTEM/LOADER FROM SYSTEMMV ON MT <tape drive number> VIA <port number> <lemport number> <dlp number>;

    Press the ETX key. Then press the XMT key. (To home the cursor, press the CLEAR HOME key on the ODT keyboard.)

16. Home the cursor and then enter:

    LH PK <pack number> VIA <port number> <lem port number> <dlp id number> CONTROLWARE/B9387 FROM SYSTEMMV;

    Press the ETX key. Then press the XMT key.

    To specify which pack is to be used as the halt/load unit, enter the following:

    HALTLOADEU <pack number>;

    To specify where the SYSTEM/ACCESS file is to be located, enter the following:

    CATALOGFAMILY <packname> SERIAL <integer>;

17. If you do NOT want to cold start the system, continue at step 22. If you do want to cold start the system, home the cursor and then enter:

    OLAYROW <integer>;

    Press the ETX key. Then press the XMT key.

18. If cold starting, home the cursor and then enter:

    LOAD SYSTEM/MCPnnnnn FROM SYSTEMMV;

    Press the ETX key. Then press the XMT key. The following message will be displayed on the screen:

    COLD START IS REQUESTED TO PACK <pack number> DISK ENTER OK TO CONTINUE

19. If cold starting, home the cursor and then enter:

    OK

    Press the ETX key. Then press the XMT key.

20. If cold starting, home the cursor and then enter:

    <4-digit system serial number>

    Press the ETX key. Then press the XMT key.

21. If cold starting, home the cursor and then enter:

    <2-digit month>/<2-digit day>/<2-digit year>

    Press the ETX key. Then press the XMT key. This process may take about five minutes.

    If a message appears stating that the halt/load pack has defective segments during cold start, use the following command to eliminate the defective segments:

    XD <pack number> ADDR <starting segment number> FOR <length in segments>

    All numbers in this statement are in decimal notation. The starting segment number is provided by the system on the ODT, but the length must be an arbitrarily selected number and should be small.

22. Home the cursor and then enter:

    STOP;

    Press the ETX key. Then press the XMT key. At this point you may want to set (turn on) certain MCP options. To do this, use the ODT command OP.

23. Press the CTRL key. Then press the letter "H".

24. Wait for the cursor to return to the end end of the word "Continue". Then, press the SKIP TAB key three times so the cursor moves to the end of the phrase "Boot Load".

    Press the SPCFY key.

25. The cursor should be at the beginning of the word "HALTLOAD".

    Press the XMT key. The following message will be displayed:

    ENTER INPUT REQUEST IN THE FOLLOWING FORM: PK UUUU OR PK UUUU VIA PORT # LEM PORT # DLP #

26. Home the cursor and then enter:

    PK <pack number> VIA <port number> <lemport number> <dlp number>

    Press the ETX Then press the XMT key. If the system asks you to verify the time and date (by displaying the message PLEASE VERIFY TIME AND DATE), perform the following four steps, if the time and date are correct:

    1. Home the cursor.
    2. Enter: TIMEOK
    3. Press the ETX key.
    4. Press the XMT key.

    If the time and date are not correct, use the TR and DR commands to correct the time (TR) and the date (DR).

27. If the system responds with "<integer> FAMILY CATALOG NOT PRESENT" or with "<integer> FAMILY CATALOG MISSING", home the cursor and enter:

    <same integer> IL PK <pack #>

    Press the ETX key. Then press the XMT key.

    If the system also responds during the halt/load with the message similar to <integer or job #>REQUIRES SYSTEM/USERDATAFILE", enter:

    <same job #>DS

28. To copy other files that may be required by your company from the SYSTEMMV tape to one of your system packs, at the home position of the screen, enter (this is an example only):

    ADD & COMPARE SYSTEM/WFL, SYSTEM/ALGOL, SYSTEM/MAKEUSER, SYSTEM/DUMPALL FROM SYSTEMMV TO [<pack name>(PACK)];

    You may also want to copy all files from the SYSTEMMV tape. In that case you would enter:

    ADD & COMPARE = FROM SYSTEMMV [TO <pack name>(PACK)];

APPENDIX A:

B5900 INITIALIZATION INSTRUCTIONS

HALT/LOADING A RUNNING SYSTEM

When a system is already powered up but must be halt/loaded in order to change to another MCP that is already on the system disk or to get the system out of a looping situation in which no tasks are being processed, perform the following steps:

1. Press the CTRL key.
2. Press the letter "H".
3. When the Power Up Menu appears, use the SKIP TAB key to move the cursor to the end of the word "Load".
4. Press the SPCFY key, and wait until the screen display appears (approximately a minute or two).
5. If this halt/load procedure fails to function properly, begin with step 23 of the cold start procedure outlined above and complete all steps through step 26.

APPENDIX A:

B5900 INITIALIZATION INSTRUCTIONS

CHANGING TO A DIFFERENT MCP ON ANOTHER HALT/LOAD PACK

To have the system use a different MCP on another halt/load pack, you can use the ODT command HLUNIT. This command replaces a boot load (steps 24 through 26 above). Perform the following steps to have the system use a different MCP.

1. Power up the second halt/load pack, that is, the one containing the different MCP.

2. Enter the command:

   CM SYSTEM/MCPnnnnn ON PK <pack number> (nnnnn represents the release level, or number, of the different MCP, and the pack number is the unit number of the pack containing the different MCP).

3. Enter the command: HLUNIT PK <pack number> (The pack number is the unit number of the pack containing the different MCP.)

4. Press the CTRL key and the letter "H" on the MTS2 keyboard.

5. When the Operator Menu has completed displaying all entries and the cursor is flashing after the word "Continue," press the SKIP TAB key three times to reposition the cursor after the word "Load" on the Operator Menu. Then press the SPCFY key on the MTS2 keyboard. To verify that the new MCP has control of the system, you can enter the command WM.

APPENDIX A:

B5900 INITIALIZATION INSTRUCTIONS

MEANINGS OF UTILOADER SELECTION DISPLAY ITEMS

HALTLOAD - The system copies the MCP from disk to memory.

TAPELOAD - The system copies the MCP from tape to disk.

CONFIGURATION - The system displays the configuration table.

LAYDOWNBOOT - (Used only with tightly-coupled systems) The system writes the bootstrap to local memory. After the bootstrap is written to local memory, the processor is not halt/loaded.

PACKLOAD - The system loads programs such as SYSTEM/LOADER from pack to memory and transfers control to the program.

LOADHOST - The system loads a copy of the appropriate controlware to the disk pack drive controller from pack.

POWERON - The system powers on the indicated disk pack drive.

AUTOLOAD - (B 5900 systems only) The system builds the candidate list for automatic halt/loads performed when the MCP is no longer functioning normally. If necessary, the POWERON and LOADHOST functions are automatically performed.

APPENDIX A:

B5900 INITIALIZATION INSTRUCTIONS

MEANINGS OF POWER UP MENU ITEMS

Continue (ODT) - Returns display to the current ODT screen.

Initialize - Clears out memory addresses and resets register values. It must be followed by selecting the Load option.

Power Up - Loads code required to execute program instructions and some test routines.

HL Unit Load - Loads into memory the code, known as the boot, which is used to load part of the MCP from disk to memory.

Show Stack - Displays the contents of the area of memory that the processor was working in when the system halted.

Force Dump - Forces a memory dump to tape. The dump may then be analyzed after first halt/loading the system and then entering the ODT command DA to request that the program SYSTEM/DUMPANALYZER be executed. When using the Force Dump option, the operator must mount a scratch tape. This is a tape that has been purged and has had a serial number assigned to it. The Load option should be selected after the dump completes.

Load - Indicates the system is to perform a halt/load. Much of memory's contents are erased, and the MCP and certain uncompleted jobs will be brought into memory.

Load/Verify - Is used by Field Engineers to load certain (L/V) RDC software required in order to run specific test routines. The L/V indicates that an L should be used to indicate Load and a V should be used to indicate Verify.

Software, Hardware, and MP -

Are used to request that one of the three indicated menus be displayed. If you are asked to determine the contents of the A, B, S, F, LOSR, BOSR, X, and Y registers, perform the following steps:

1. Use the SKIP TAB key to reposition the cursor after the word Software.

2. Press the SPCFY key, and then wait a few moments. The contents of these registers will appear. There is other information that will be displayed at this time. You do not need to note this other information.

Refresh -

Updates the same power up menu screen.

B5900 POWER UP MENU VERSION 33.260.000

Continue (ODT)	X	Initialize	X	Power Up	X	Boot Load	X
Show Stack	X	Force Dump	X	Load	X	Load/Verify	(L/V)
						RDC	> <

MENUS
Operator X
Software X
Hardware X
MP X

POWER UP MENU

```
HALTLOAD X
TAPELOAD X
CONFIGURATION X
LAYDOWNBOOT X
PACKLOAD X
LOADHOST X
POWERON X
AUTOLOAD X
```

```
>>>   UTILOADER   <<<

VERSION 33.360.00
```

DISPLAY OF UTILOADER SELECTIONS

```
      CONFIGURATION TABLE

BASE 3/1/0        PATH: MLIP  PORT 0,  LEMPORT 0

     ADDRESS 0 DLPID 001  ODT
     ADDRESS 3 DLPID 004  TRAIN PRINTER
     ADDRESS 4 DLPID 060  STANDARD HT (PACK)
     ADDRESS 7 DLPID 012  PE MAG TAPE

BASE 4/1/0        PATH: MLIP  PORT 1,  LEMPORT 0

     ADDRESS 1 DLPID 108  NETWORK SUPPORT PR.


PUSH SPCFY TO CONTINUE                                          X
```

CONFIGURATION REQUEST DISPLAY

```
        3.3 SYSTEM/LOADER - BOJ
        ******************************
        PROCS: 1
13:19:01 MEMORY STATUS: 0-62 (63 MODS)
13:19:19 DISKPACKS: 63
13:19:25 076610 PK063 [076610] PACK, 076610 0, OLAYROW 0400
13:19:42 076610 PK063 [076610] PACK, 076610 0, OLAYROW 0800
13:19:42 COLD START IS REQUESTED TO PK 063 DISK
          ENTER  OK  TO CONTINUE
13:21:12 PLEASE ENTER THE NEW SYSTEM SERIAL NUMBER
13:22:28 PLEASE ENTER THE DATE: MM/DD/YY
13:22:46 077601 PK063 [077601] DISK, 077601 3005, OLAYROW 0800
13:22:49 SPACING UP THE FILE ...
13:23:47 LOADING SYSTEM/MCP33260 (33.040)
          FROM MT014 SYSTEMMV TO PK063 DISK (COLDSTART)  ***
13:23:52 MCPCODEFILE          DISK ROW: 0 LOADED
13:25:27 MCPCODEFILE          DISK ROW: 21 LOADED
13:27:00 MCPCODEFILE          DISK ROW: 42 LOADED
13:28:33 MCPCODEFILE          DISK ROW: 63 LOADED
13:28:37 077610 PK063 [077610] DISK, 077610 3005, OLAYROW 0800
```

DISPLAY OF SYSTEM COLD START MESSAGES

APPENDIX B

B6800 INITIALIZATION INSTRUCTIONS

APPENDIX B:

B6800 INITIALIZATION INSTRUCTIONS

The B6800 central system components consist of a Central Processing Unit (CPU), which contains three main elements: the Data Processor, the Memory Control, and the Multiplexor; Local Memory Units; an IO Subsystem, which is made up of the Peripheral Device Subsystem and the Data Communications Subsystem; and a Maintenance Display Processor (MDP).

The process which allows all of the parts of the B6800 to be brought together into an operating condition is the system initialization routine. This process includes powering on the computer, peripheral devices, and loading and executing the operating system software. When this is completed, the computer is under the control of the operating system software (MCP and associated files and programs) and is capable of reading, manipulating, and writing data from input to output peripheral devices.

APPENDIX B:

B6800 INITIALIZATION INSTRUCTIONS

COLD/COOL START

The sequence of steps to cold start or cool start a powered down B6800 system is the following:

1. After powering up the card reader, magnetic tape drive, magnetic disk drive, and, possibly, the line printer, press the POWER ON pushbutton, or switch, on the top of the MDP.

2. Move the OFF ON switches, which turn the two video displays on or off, to the ON position.

3. Press the CARD LOAD SELECT pushbutton/indicator, so it is illuminated.

4. Load the system tape on the tape drive.

   Be sure the tape does not have a write ring on it, and be sure that the drive is on line to the system (the ON LINE indicator on the drive is illuminated).

5. If your system has a halt/load block, set the switches in the up position so they add up to the number of the drive on which the pack containing the MCP is located. The halt/load block is a column of numbers 1, 2, 4, 8, 16, 32, 64, 128. For example, if the drive you will be using to halt/load the system is number 192, you would set in the up position those switches beside the following numbers: 128 and 64. The rest of the switches should be in the down position.

6. Load the cold start deck of cards in their appropriate order (described below) in the card reader.

   Cards 1 through 68 - UTILOADER object code deck (supplied with the system).

   Card 69 UTILOADER parameter card - This card tells UTILOADER where to find the LOADER object code. MVSYSTEM SYSTEM/LOADER, for example indicates that LOADER is on a tape named MVSYSTEM. This tape name will vary for each release. You must keypunch your own parameter card that includes both the name of the magnetic tape containing a copy of SYSTEM/LOADER, and the words SYSTEM/LOADER. SYSTEM/UTILOADER and SYSTEM/LOADER are two programs used together to load the MCP from the system tape to memory.

Card 70 - HALTLOADEU <disk drive number>. This card also must be keypunched by you. It indicates to the system the location of the disk pack to which the MCP will be loaded from tape. If this card is not included, the system will default to the disk pack on the lowest numbered disk drive.

Card 71 - SYSTEMSERIAL <system serial number>. This step is not required for a cool start. This card also must be keypunched by you. This card identifies to the system its serial number. One reason for making sure you have indicated the correct system serial number during a cold start is that when you have to send a memory dump to be analyzed at a Burroughs location, the correct system serial number must be on the dump.

Card 72 - OLAYROW <integer>. This card is required for a cold start, and is omitted for a cool start. This step causes a cold start to be performed. The default integer value is 400 sectors. The recommended integer value is 800 sectors. Rows are the certain number of disk sectors that will be used to copy the MCP and data from user programs when insufficient space is available in memory to hold that data at a given moment. The total row size in sectors is known as an area.

Card 73 - LOAD <name of MCP> FROM <tape name> TO DISKPACK <disk pack drive number> <disk pack name> SER <disk pack serial number>

This card indicates that the MCP is to be loaded from the indicated tape to the indicated disk.

Cards 74 through next to last - Cards used to set MCP options and provide other instructions to the system.

Last Card - STOP

7. Press the START pushbutton/indicator on the card reader.

8. Press the LOAD pushbutton, or switch, at the top of the MDP system control panel. When you are cool starting the system, you may want to immediately precede this step by pressing the GEN CLEAR pushbutton, or switch, two times to clear out the contents of memory.

   At this point, you may want to set certain MCP run-time options. To do this, use the ODT command OP.

9. Then, to halt/load the system, make sure the CARD LOAD SELECT pushbutton/indicator is extinguished. Then, simultaneously press the ENABLE and the HALT pushbuttons and then the ENABLE and the LOAD pushbuttons on the MDP System Control Panel.

   At this time, you may want to enter certain ODT and Work Flow commands, such as ADD&COMPARE, SI, SL, and MQ, to tailor your system to your company's needs. These commands may also be entered at any time while the system is running.

APPENDIX B:

B6800 INITIALIZATION INSTRUCTIONS

HALT LOAD

To perform a simple halt/load on the B6800 perform steps 5 and 9 on the previous pages. If this action does not clear the system a cool start might be needed.

APPENDIX C
B6900 INITIALIZATION INSTRUCTIONS

APPENDIX C:

B6900 INITIALIZATION INSTRUCTIONS

A B6900 system consists of the following modules: the Central Processing Unit (CPU), Local Memory modules, Message Level Interface Processor (MLIP), and the Memory Control, the IO Subsystem, and the Maintenance Processor (MP).

The process which allows all of the parts of the B6900 to be brought together into an operating condition is the system initialization routine. This process includes powering on the computer, peripheral devices, and loading and executing the operating system software. When this is completed, the computer is under the control of the operating system software (MCP and associated files and programs) and is capable of reading, manipulating, and writing data from input to output peripheral devices.

APPENDIX C:

B6900 INITIALIZATION INSTRUCTIONS

COLD/COOL START

For a cold start or a cool start to be performed, the following must be done:

1. Power up the peripherals, and load on a tape drive the tape containing the system files.

2. Load the Industry Compatible Mini Disk in its disk drive on the Maintenance Processor.

3. Place the PROC ENABLE switch in the up position, press the GCLR switch once, and place the SENSE switches in the straight ahead position. These switches are on the Maintenance Processor.

4. Press the INITIALIZE pushbutton on the Maintenance Processor. The system will respond at the ODT screen with "AWAITING A/T", or with a similar message.

5. At the ODT, enter:

   T <name of UTILOADER file on the system tape>

   Press the ETX and then the XMT pushbuttons, or switches, on the ODT.

   Then, at the ODT home the cursor and enter the following:

   N <number of tape drive containing system tape>

   Press the ETX and the XMT pushbuttons on the ODT.

   The SYSTEM/UTILOADER and SYSTEM/LOADER programs are used together to load the MCP from tape to disk.

6. When the UTILOADER menu appears, position the cursor at the word CONFIGURATION. Then, press the XMT pushbutton. When the system responds with a display of the system configuration, write down all of the numbers. You will especially need to note the PORT numbers, LEMPORT numbers, and DLP numbers for tape, disk, and head-per-track disk (HT).

   Then, press the SPCFY pushbutton as many times as you are asked by the system to press SPCFY. A message to this effect will keep appearing at the bottom of the screen.

7. When the UTILOADER menu reappears, position the cursor at the beginning of the word TAPELOAD.

   Then, press the XMT pushbutton.

8. At the ODT, enter:

   SYSTEM/LOADER FROM <system tape name> ON MT 0 <number of the drive on which the tape is loaded>

   Press the ETX pushbutton and then press the XMT pushbutton.

9. If the disk pack controllers are not powered up, power them up and at the ODT, enter:

   LH PK <pack number> VIA <port number> <lemport number> <dlp number> <firmware file name> FROM <system tape name>

   Then, press the ETX and the XMT pushbuttons. This will load the disk pack controller firmware, or information that the disk pack controller needs to be able to transfer information to and from the disk packs.

10. At the ODT, enter:

    HALTLOADEU <number of the pack which will be used to halt/load the system>

    Then, press the ETX and the XMT pushbuttons.

    This identifies to the system the number of the disk drive that has the pack to which the MCP will be loaded. If this statement is excluded, the system will default to the disk pack on the lowest numbered drive.

11. At the ODT, enter:

    OLAYROW 800

    This step distinguishes a cold start from a cool start. For a cool start, this step would not be included. The default for the integer value is 400. The advisable integer value in this statement is 800, and indicates the size in sectors that will be used to hold data from programs and the parts of the MCP that are not presently being used.

12. At the ODT, enter:

    LOAD SYSTEM/MCPnnnnn TAPE <system tape name> TO DISKPACK <pack number> <pack name> SER <pack serial number>

    The "nnnnn" indicates the release and patch levels of the MCP, for example, 33260 (release level 3.3 and patch level 260).

13. The system then will ask you whether a cold start is requested. At the ODT, enter:

    OK

    Then, press the ETX and the XMT pushbuttons. This step loads the MCP from tape to disk.

14. The system then will ask you for the system serial number. At the ODT, enter:

    <four-digit system serial number>

    Then, press the ETX and the XMT pushbuttons.

    It is important that the correct system serial number be entered for use in identifying memory dumps and other information from the system.

15. The system then will ask you for the correct date. At the ODT, enter:

    <two-digit month/two-digit day/two-digit year>

    Then, press the ETX and the XMT pushbuttons.

16. At the ODT, enter:

    STOP

    Then, press the ETX and the XMT pushbuttons.

17. Press and hold down the ENABLE pushbutton, while you press the HALT pushbutton.

18. At the ODT, enter:

    T <name of file containing the UTILOADER program>

    Then, press the ETX and the XMT pushbuttons.

    Then, enter:

    N <number of the drive containing the system tape>

    Then, press the ETX and the XMT pushbuttons.

19. At the ODT, position the cursor at the beginning of the word HALTLOAD.

    Then, press the XMT pushbutton.

20. At the ODT, enter:

    PK <number of pack containing the MCP>

    Then, press the ETX and the XMT pushbuttons.

21. If the system then asks you to verify the time and date, use the TR or DR command, if necessary, or enter:

    TIMEOK

    Then, press the ETX and the XMT pushbuttons.

APPENDIX C:

B6900 INITIALIZATION INSTRUCTIONS

SUMMARY OF INITIALIZATION STEPS

The four ways your system may be initialized are summarized below with their associated steps to be performed.

1.	Memory Load or Least Serious Halt/Load	a. Press the ENABLE and HALT switches simultaneously. b. Press the LOAD MODE switch so it is illuminated. c. Press the ENABLE and LOAD switches simultaneously.
2.	More Serious Halt/Load (used when a Memory Load fails)	Perform steps 17 through 21 listed above.
3.	Cool Start	Perform steps 1 through 10 and 12 through 21 listed above.
4.	Cold Start	Perform steps 1 through 21 listed above.

APPENDIX C:

B6900 INITIALIZATION INSTRUCTIONS

CHANGING TO A DIFFERENT MCP ON ANOTHER HALT/LOAD PACK

To change to a different MCP on another halt/load pack, you can use the ODT command HLUNIT. This command replaces a boot load (steps 17 through 21 above). Perform the following steps to change to a different MCP on another halt/load pack.

1. Power up the second halt/load pack, that is, the one containing the different MCP.

2. Enter the command:

   CM SYSTEM/MCPnnnnn ON PK <pack number> (where nnnnn represents the release level, or number, of the different MCP, and pack number is the unit number of the pack containing the different MCP).

3. Enter the command:

   HLUNIT PK <pack number> (where pack number is the unit number of the pack containing the different MCP).

4. Press the ENABLE and the HALT pushbuttons and then press the ENABLE and the LOAD switches, or pushbuttons, simultaneously.

   To verify that the new MCP has control of the system, you can enter the command WM.

APPENDIX D

B7800 INITIALIZATION INSTRUCTIONS

APPENDIX D:

B7800 INITIALIZATION INSTRUCTIONS

The B7800 system may include one B7800 Central Processor Module (CPM), the Input/Output Processor or Module (IOM), the Memory Subsystem which contains the Memory Control Modules (MCMs), and the Maintenance Diagnostic Processor (MDP). All of these parts interact to function as a computer when the system is operating correctly.

The initialization of the system is the process used to bring up the B7800 system to an operating condition. The process includes powering on the computer, peripheral devices, and loading and executing the operating system software. When this is completed, the computer is under the control of the operating system software (MCP and associated files and programs) and is capable of reading, manipulating, and writing data from input to output peripheral devices. There are three methods used to initiate the system: Cold Start, Cool Start, and Halt Load.

APPENDIX D:

B7800 INITIALIZATION INSTRUCTIONS

COLD/COOL START

For a cold start or a cool start to be performed, the following items must be done:

1. Turn on the ODTs.

2. Load the system tape and mount an initialized disk pack.

3. Ensure the various switches are set correctly, if you want to run with partitioned systems, and have at least two or more of each of the following system components: CPMs, MCMs, and IOMs and their associated card readers, tape drives, disk drives, and ODTs. Partitioning provides the opportunity to subdivide a physical system into two or more logical systems. To indicate that the physical system will be partitioned as two or more logical systems, you must:

   a. Set to either SYSTEM A or SYSTEM B the pushbutton/indicator on the system's console control, and move to either the A or the B position the A B toggle switch on each CPM, MCM, and IOM.

   b. Keypunch the peripheral configuration cards and partition cards to indicate the peripherals associated with the system and the partitions into which the physical system is divided. Other cards to be keypunched, if needed, are the cards used to set certain MCP options (described later) and provide other special instructions to the MCP. A card containing the word ENDUNITS must be keypunched and must immediately follow the PERIPHERAL CONFIGURATION cards (if you are not partitioning your system). If you are partitioning your system, you must have these cards in the following order:

      PERIPHERAL CONFIGURATION cards
      PARTITION cards
      ENDUNITS card

4. Load the MINILOADER object code deck (supplied with the system) in the card reader.

5. Load the MINILOADER parameter card in the card reader. This card indicates to the system where it can find the SYSTEM/LOADER file. Then, place in the card reader the following cards in the order listed: PERIPHERAL CONFIGURATION cards, PARTITION cards (optional), ENDUNITS card, other optional cards, and the STOP card.

6. Press the DISK LOAD CARD LOAD pushbutton/indicator so CARD LOAD illuminates (or press the COLD START HALT LOAD pushbutton/indicator so COLD START illuminates). For subsequent halt/loads of the system, ensure that DISK LOAD (or HALT LOAD) is illuminated instead of CARD LOAD or COLD START. The SEL switch on the back of the CPM and IOM to be cold started should be set in the up position. The A B switch on the back of each CPM and IOM should be set in the appropriate position, if you are partitioning your system, or it should be in the A position if you are not partitioning your system.

7. Press the START pushbutton on the card reader. Depending on the model of card reader you are using, you may have to press certain other pushbuttons, or switches.

8. Simultaneously press the ENABLE and HALT pushbuttons and then simultaneously press the ENABLE and LOAD pushbuttons. When the system (A or B) is running, its corresponding RUNNING indicator will be illuminated.

APPENDIX D:

B7800 INITIALIZATION INSTRUCTIONS

STEPS TO HALT/LOAD THE SYSTEM

The following sequence of steps will result in the system being halted and the operating system being reloaded from disk to memory.

1. Press and hold down the ENABLE pushbutton.
2. Press the HALT pushbutton.
3. Press the LOAD pushbutton.
4. Release the ENABLE pushbutton.

NOTES

APPENDIX E

B7900 INITIALIZATION INSTRUCTIONS

APPENDIX E:

B7900 INITIALIZATION INSTRUCTIONS

The B7900 is a system that may include one B7900 Processor, one Auxiliary Processor (B5900), and one UNIVERSAL IO (UIO) logical box. It may have three B7900 processors, one auxiliary processor (B5900) and four UIO processors within the processing environment. It is not necessary for all of the boxes to report to one MCP. The system may be broken into individual processing systems that report to their own MCPs. The individual systems are called PARTITIONS. Each Partition is an individual processing unit. Therefore, the minimum system is one partition. To know how to Cold Start and Halt/Load a partition is to know how to Cold Start and Halt/Load a system. It is also possible to Cold Start and Halt/Load a partition while other partitions are running. The system is designed to permit a partition to be completely independent of each other or the partition can be coupled through common memory to another partition. All operator interface to any partition is handled through a common control which is a terminal located on the main console.

System Initialization is the process used to bring up the B7900 system to a single partition operating condition. The process includes powering on the computers, peripheral devices, and loading and executing the operating system software. When this is completed, the computer is under the control of the operating system software (MCP and associated files and programs) and is capable of reading, manipulating, and writing data from input to output peripheral devices. There are three methods used to initiate the system: Cold Start, Warm Start, and Halt/Load.

APPENDIX E:

B7900 INITIALIZATION INSTRUCTIONS

COLD/WARM START

The B7900 system is composed of many individual processors. Each of these processors require a unit of hardware and some associated software. The process of initializing a system is to take each of these processors in a given sequence, initialize it with the proper software, allow it to test itself for confidence, and in turn initialize the next processor.

Power on the system and peripheral devices - On Cold Starting you assume that System Disk to have invalid data. The first step is to remove the skins and locate the Power On button and power on all of the required boxes. This will include the Master Power Supply, the B7900 Processor or Processors, Memory and the I/O cabinet which includes the Auxiliary Processor. The designated Disk Pack and Tape drive need to be powered on and the assigned Disk Pack and System Tape mounted.

Clear base registers in IO processor - When you remove the skins from the IODC cabinet, you will see a few circuit cards that have push buttons on them. These cards are BASE CONTROL CARDS and the push button resets the registers.in the base. If these are not cleared, the base may hang preventing the system from accessing the base. Each of these push buttons are clearly marked with "BASE". Depressing this button will clear the base.

It should be noted that if at any time during Cold Start or Halt/Load a problem is encountered, clearing the Bases associated with your partition should be tried first.

Initiate the Maintenance Terminal and SHELL program - When all of the above items are completed, the task of starting the Cold Start of the system begins. First to be initiated is the Maintenance Terminal which may be either a modified MT900 (Operator Display Terminal (ODT)) or an ET2100 (Ergonomic Work Station (EWS)) located on the console. To initialize the terminal, you power it on. It will automatically cycle itself through a confidence routine and, upon successful completion, will introduce a micro program called "SHELL". The EWS will require that SHELL be loaded from floppy.

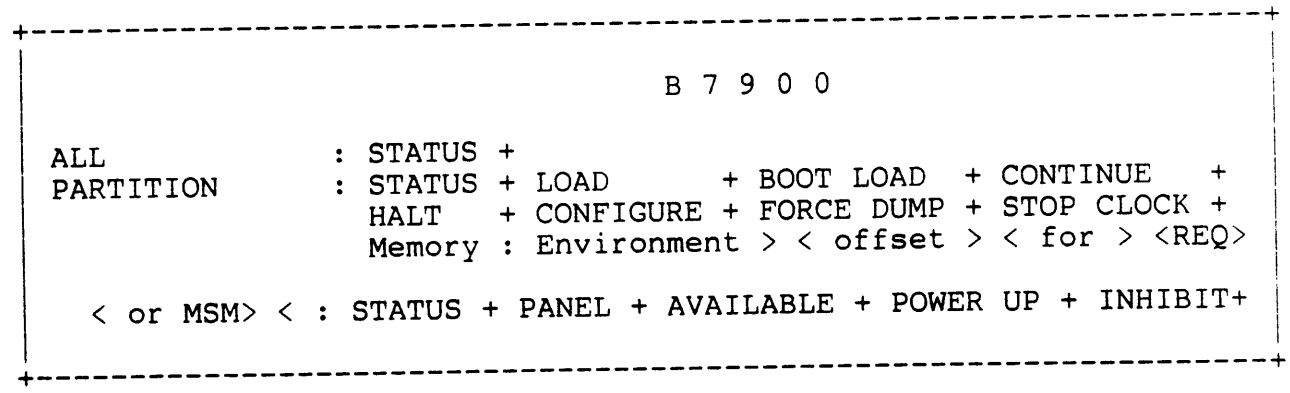
Insert the Disk - Select the proper diskette for Cold Starting the system. This diskette will have "SYCON" and "UTILOADER" programs on it. Place the diskette in one of the two drives. If you are sitting at the knee hole, then the drive nearest you is drive 0 and the outer one drive 1. Place the diskette into the drive with the label away from you. Place it all the way in until you feel it lock in place, now close the drive door. SHELL will prompt you to enter a command.

```
*** SHELL ***

COMMAND ?
```

The normal command to SHELL is "SYCON". Press <xmt> and you will hear a clicking sound from the diskette drive as the SYCON program is loading from disk. For further instructions in this operation refer to the B7900 Operations manual.

Specify the Required Operation - When SYCON is completely loaded it will display a menu on the maintenance terminal. The figure below illustrates the master menu. This menu can be brought up at any time on the maintenance terminal by typing in CTR S.



SYCON, INITIAL MENU

Load Firmware into the Box - When cold starting after power off, the HDU and AP are without microcode in their local memory. To load the local memory with the proper microcode, SYCON is used by selecting the POWER UP button (+) and pressing SPCFY. Before POWERING UP any box, the SYCON diskette must be removed and the correct diskette for the box being powered on must be inserted. Use the B7900 Operation manual as the guide and POWER ON each of the boxes. The CPM IV does not need to be POWERED ON as it does not use microcode.

Selecting Auxiliary or B7900 Processor - The selection of the Auxiliary Processor, CPM IV, and I/O processor is dependent on selecting the correct number of Requestor port. This port is determined at the time of the initial cabling of the cabinet. A port is a cable connector between the box and the memory control cabinet. The I/O cabinets will have a low value (0-6) and the processors a high value (1-7). The Auxiliary processor is selected as one of these ports. If possible it is advised against using the Auxiliary Processor as a working processor, as some programs may not run on it. However there may be times that this processor is the only working processor or it is needed for low volume production. If needed you will have to assign it to a partition.

INITIALIZING A PARTITION

Building the Partition - When the boxes are physically powered on and the microcode is loaded with a SYCON POWER ON the units are now ready to be assigned to a PARTITION. Before partitioning can occur the boxes must be made available to the system. This is done through the SYCON menu by placing the cursor over the AVAILABLE button(+) and pressing SPCFY. Each box must be selected by the correct Requestor number and made available. In order to select a PARTITION the cursor must be set to ALL STATUS +. Press SPCFY and a status of all of the partitions will be shown. PARTITIONS are numbered from 1 to 4. Determine the partition number that you wish to use, place this number in the window after PARTITION and press SPCFY.

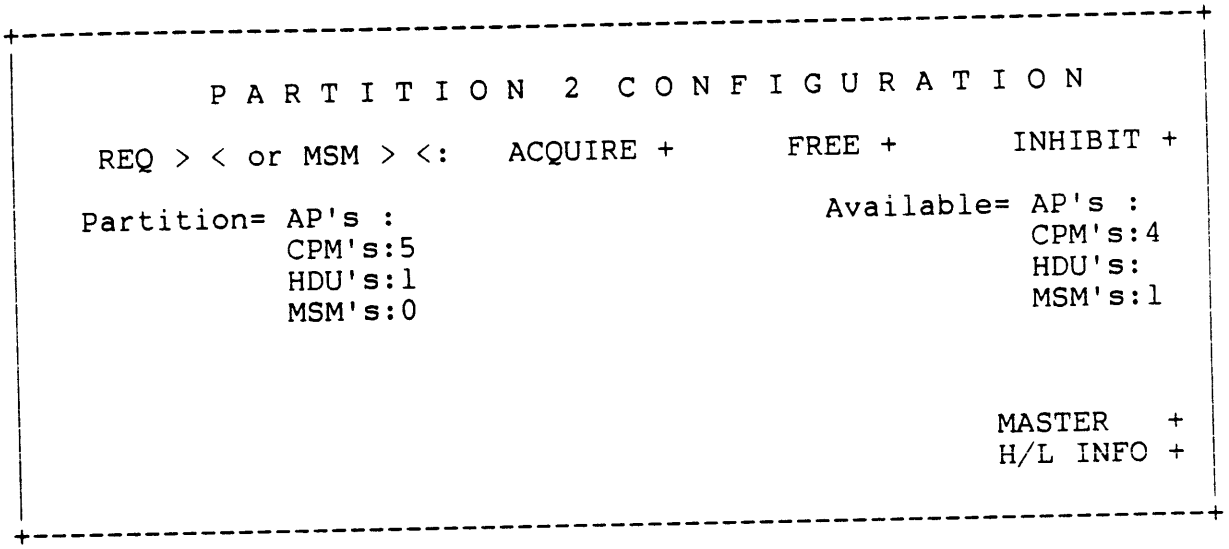
```
+-------------------------------------------------------------------+
|                                                                   |
|                            B 7 9 0 0                              |
|                                                                   |
|  ALL                 : STATUS +                                   |
|  PARTITION > <       : STATUS + LOAD      + BOOT LOAD  + CONTINUE   +
|                        HALT   + CONFIGURE + FORCE DUMP + STOP CLOCK +
|                        Memory : Environment > < offset > < for > <
|                                                                   |
| REQ> < or MSM> < : STATUS + PANEL + AVAILABLE + POWER UP + INHIBIT +
|                                                                   |
|                                BOX    SRV/H   S   MBE   MBM       |
|                                ---    -----   -   ---   ---       |
|            Partition 2 Status: HDU 1    0     1    0     1       |
|                                CPM 5    0     1    0     1       |
|                                MSM 0    0     1    0     1       |
|               Inhibited status: HDU 0    0     0    1     1       |
|               Available status: CPM 4    0     0    0     1       |
|                                MSM 1    0     0    0     1       |
|                Power Up Status: CPM 7    0     0    0     1       |
|                                                                   |
+-------------------------------------------------------------------+
```

SYCON, MASTER MENU

Definition of Status Fields

BOX - Mnemonic name and box number.
SRV/H - for requestors - a Halt indicator
for MSM - Storage Request Valid indicator
S - Running lite is on.
MBE - Maintenance Buss Enabled.
MBM - Maintenance Buss Mode Switch

This is your selected partition. To designate the boxes to be included within the partition, locate the word CONFIGURE on the SYCON Master menu. Set the marker on the CONFIGURE button(+) and press SPCFY. This will bring up the PARTITION CONFIGURATION MENU.



PARTITION MENU

This menu will show you the status of the boxes within the partition and the available boxes that were made available previously on the master menu. Using the requestor number (REQ) and the memory number (MSM), boxes can be transferred from the available list to the partitioned list by using the ACQUIRE button. At least one HDU, MSM and AP or CPM must be present to have a working partition.

It should be noted that this process is of value not only during the Halt/Load process, but also can be used to reconfigure the partition if one of the boxes fails. This is accomplished by using the FREE and INHIBIT buttons. SYCON is always available to the maintenance terminal. However, the boxes are not available to SYCON as long as they are running. The box or system must be halted to access it with SYCON. Use the HALT button on the master SYCON menu for this.

APPENDIX E:

B7900 INITIALIZATION INSTRUCTIONS

WARM START AND HALT/LOAD

When the selection of boxes is completed, place the cursor on the H/L INFO button and press SPCFY. This will take you to the Halt/Load parameter menu of SYCON for selection of Halt/Load peripheral units. When the system is cabled up, the location of the units will be designated by a number from one to 255.

This designation is used to assign these units to the partition. There are four units required to Halt/Load a partition and each of these must be identified at this time and will act as the default units during the Halt/Load. However, they may be over written during the Halt/Load. From the PCD diagram a path will be found to a peripheral unit which defines the Host Dependent Unit (HDU), Message Level Interface, Base Card, Data Link Processor, and Unit assignment.

All of this information must be given to SYCON for the loading of local registers in the HDU before continuing.

P A R T I T I O N 2 H / L P A R A M E T E R S

H/L HDU >1< H/L MSM >0< H/L Processor >5<

	Unit Number		HDP	MLI *	BASE *	DLP *	UNIT *
H/L ODT = d>	4<	Path :	>0<	>0<	>0<	>1<	>0<
H/L TAPE = d>	15<	Path :	>0<	>0<	>0<	>7<	>3<
H/L DISK = d>	49<	Path :	>0<	>0<	>0<	>5<	>5<
H/L PRINTER = d>	8<	Path :	>0<	>0<	>0<	>3<	

MASTER +

CONFIGURE +

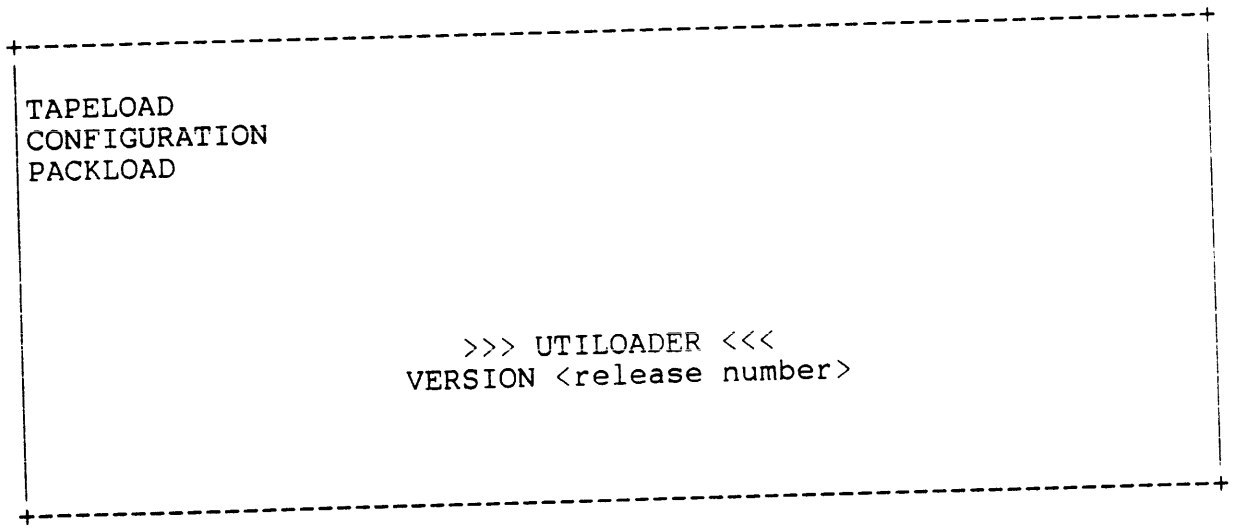
PARTITION PARAMETERS

Execute Utiloader - When the configuration is completed, the partition is ready to HALT/LOAD. Return to the master menu and you will find several options: HALT, LOAD, BOOT LOAD, and CONTINUE. These options are used to halt the system, start a halted system, Halt/Load and boot load.

To perform a BOOT LOAD, the disk drive must be loaded with the SYCON/UTILOADER diskette. Set the cursor to the BOOT LOAD button and press SPCFY. The loader will print:

Press SPCFY to BOOT LOAD otherwise press XMT

This gives you a chance to reverse your thinking. If you press SPCFY, then the loading of UTILOADER will continue. Once UTILOADER has loaded, SYCON will initiate it. At this point UTILOADER will display:



UTILOADER MAIN MENU

If you wish to see the minimal configuration, position the curser on CONFIGURATION and depress <etx> and <xmt>. This will show you the units that were assigned previously during the configuration process.

```
+-------------------------------------------------------------------+
|                                                                   |
|            P A R T I T I O N  2  H / L  P A R A M E T E R S        |
|                                                                   |
|       H/L HDU >1<          H/L MSM >0<          H/L Processor >5<|
|                                                                   |
|             Unit Number        HDP   MLI *   BASE *   DLP *  UNIT *|
|             -----------       ---    ----    ------   -----  ------|
| H/L ODT     = d>      4< Path : >0<   >0<     >0<      >1<     >0< |
| H/L TAPE    = d>     15< Path : >0<   >0<     >0<      >7<     >3< |
| H/L DISK    = d>     49< Path : >0<   >0<     >0<      >5<     >5< |
| H/L PRINTER = d>      8< Path : >0<   >0<     >0<      >3<     >0< |
|                                                                   |
|                                                                   |
|                                                                   |
| PRESS SPECIFY TO CONTINUE                                         |
+-------------------------------------------------------------------+
```

UTILOADER CONFIGURATION MENU

If you wish to continue the Halt/Load from the Magnetic tape unit then place the cursor on TAPELOAD. This will now ask you for the path to the magnetic tape by the following display:

LOAD SYSTEM/LOADER FROM SYSTEM ON MTUUUUU VIA HDP MLI BASE DLP UNIT

A typical response to this is:

SYSTEM/LOADER FROM SYSTEM <etx> <xmt>

Since no path information is included in this response, the path defined during CONFIGURATION will be used by default.

Refer to the Operations Manual for the exact syntax.

This response requests SYSTEM/LOADER to be copied from magnetic tape to memory. Loading SYSTEM/LOADER is the first magnetic tape activity of the cold start. In many cases the SYSTEM/LOADER is almost to the end of the System Tape and several minutes may pass before reaching it on the tape. For this reason many operators rewrite the system tape placing SYSTEM/LOADER and the MCP at the front of the tape.

After the SYSTEM/LOADER has completed the loading operation it will display:

>>>>>>>>>>>>>> SPO INPUT REQUIRED <<<<<<<<<<<<<<

More than one input is valid at this point. Refer to the Operators Guide for a complete list of possible inputs that can be entered.

If the disk pack controller does not have the firmware loaded then enter:

LOAD <controlware name> FROM TAPE <etx> <xmt>

Note: If the controlware is on a tape other than System, then the word TAPE must be replaced with the actual name of the tape.

Following is a list of required input messages entered next:

Enter:

SYSTEMSERIAL <#> <etx> <xmt>

Enter:

OLAYROW 900 <etx> <xmt>

Note: OLAYROW is the key for the system to either Cold Start or Warm Start. If this statement is present then a Cold Start is requested.

After all of the control cards are entered then enter:

LOAD MCP < mcp release number > FROM TAPE TO DISK
NAME = <pack name > SERIAL = <serial number> <etx> <xmt>

LOADER will locate the designated pack and change the name and serial number. Then it will ask if you wish to continue the cold start. If you do enter:

OK <etx> <xmt>

A prompt will now be received to enter the date in MM/DD/YY.

After this it will display: SPACING UP TO FILE

SYSTEM/LOADER will now search up to the MCP and transfer the file to disk. There are currently 84 rows of data.

After the MCP is loaded, Utiloader will request the PERIPHERAL CONFIGURATION DIAGRAM (PCD) file name.

Enter:

LOAD CONFIGURATION <file name> FROM TAPE TO <H/L pack name> <etx> <xmt>

After the PCD has been loaded, then enter:

RECONFIGURE GROUP AS <name of file> <etx> <xmt>

At this point the Cold Start has completed. To terminate the UTILOADER enter:

STOP <etx> <xmt>

The system will now Halt/Load the Partition and in a few minutes the system will display the familiar ADM pattern on the ODT.

APPENDIX E:

B7900 INITIALIZATION INSTRUCTIONS

FREE/ACQUIRE GROUP RESOURCES

A CONFIGURATION listing (or PCD) is required in order to establish a B7900 system. The original for this file may be from the plant at the time of shipment or it could be generated by the AMP prior to the Cold Start of the B7900 system. Once the system is established, the CONFIGURATION file can be regenerated by running SYSTEM/CONFIGURATOR, which is located on the SYSTEM tape. The execution of SYSTEM/CONFIGURATOR is explained in another class. The only use an operator has is to read the source file (or a PCD) and determine the allocation of boxes and peripheral units.

Read the Configurator source listing using Cande - To read the contents of the CONFIGURATION file, bring up CANDE in the normal way and do a "LIST" on the source file. The default name for the Configuration file is SYMBOL/CONFIGURATION, located on the System SYMBOL tape.

The contents of the Configuration file is an English listing of the information shown in the Peripheral Control Diagram (PCD).

Transfer a peripheral unit from one partition to another - The original assignment of a peripheral unit such as Pack, Tape and printer is done through the CONFIGURATION of the system.

Once they are assigned, then action from the ODT is needed to move the unit from one partition to another.

Control of boxes, such as the CPM, Memory and IODC can also be moved from one partition to another. Partitions may be altered by running the Configurator program on the system. This configures a system into what is referred to as "GROUP". ODT commands refer to these groups when they are used.

The System Configuration (SC) command will give you the status of all of the groups on the system. If you enter SC- then it will give you detail status of each box and memory assignment.

Refer to the SC command in the ODT Operators manual for detail syntax.

The PER command on the ODT will display the current assignment of peripheral equipment.

When you have determined what box or peripheral equipment is to be moved, then the box must be freed from the group. This is done through the FREE command. In the case of Disk Packs, another command must be used prior to the FREE. This command is the Power Off (PO) command. This is required because there are directories on these units which are updated periodically. If the FREE command came before the directory update then the directory could be in error. The PO command allows the MCP to keep the unit attached while any active program is using the pack and allows the final update of the directory before powering it off. This process could take minutes to hours. The MCP will not assign any new activity to the pack after the PO command. When the pack has completed operation by a message on the console and the Pack Lights going to POWER OFF status, then the FREE command may be executed.

Once the unit or box is FREE from one group then the unit or box may be ACQUIRED by another group.

Invoke the configuration file with the ODT - An ODT command is used to invoke the CONFIGURATION file on the system. This command is RECONFIGURE.

Syntax:

< RECONFIGURE--- GROUP --- AS ---< group name >--- >

The original CONFIGURATION file was initiated during the Cold Start or Halt/Load of the system. The <group name> refers to the name given in the configuration file. The word GROUP refers to the number of partitions being specified for the working system.

Examples: LOAD CONFIGURATION FROM DISK TO SYSPACK
RECONFIGURE GROUP AS THREEBY

or

RECONFIGURE GROUP AS ONEBY

APPENDIX E:

B7900 INITIALIZATION INSTRUCTIONS

COLD START AN AUXILIARY MAINTENANCE PROCESSOR (AMP)

There are times when the B7900 processor is down and the **AMP** must be used to run maintenance routines on the other boxes. In this mode the AMP is basically a B5900 running its own MCP, using its own memory and HDP. The B7900 memory and HDP are not used. The AMP is brought up under the control of APCON instead of SYCON.

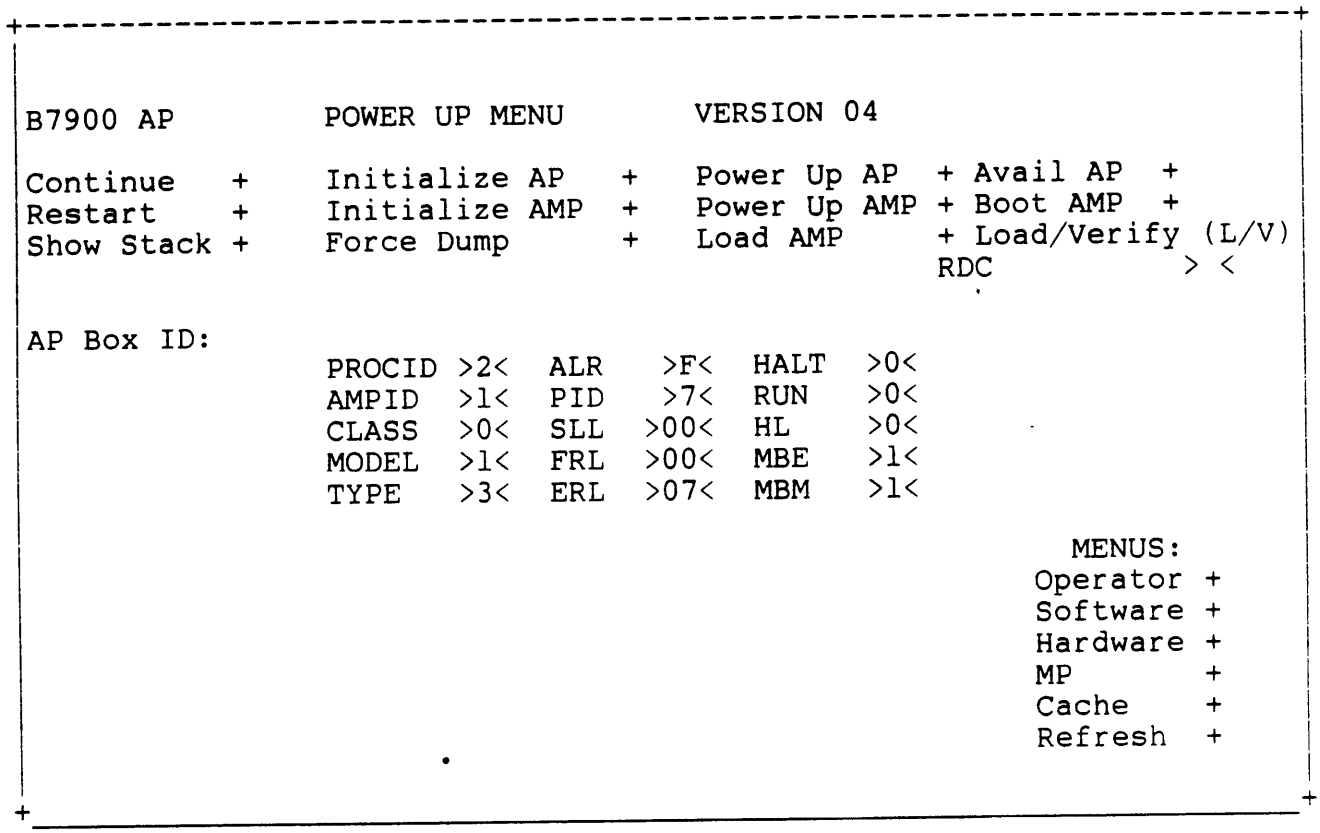
As an **AP**, cache memory, B7900 memory and HDP are used. Microcode is loaded to make it compatible for use with the regular B7900 system. When it is initialized, the AP is compatible with SYCON and can be acquired into a partition.

INITIALIZING APCON

APCON initialization requires that the MTS2/EWS be reinitialized to the SHELL. This can be done by CNTR Q on the maintenance terminal or powering the maintenance terminal off, then on.

The APCON diskette must be inserted in the ICMD drive. When SHELL comes up on the screen, type in APCON <n>, where n = number of the AP maintenance port, and depress <xmt>.

After APCON completes reading the diskette, the POWER UP menu will be displayed, the boxes will be filled in by APCON, and the cursor will be flashing after the words "POWER UP AMP".

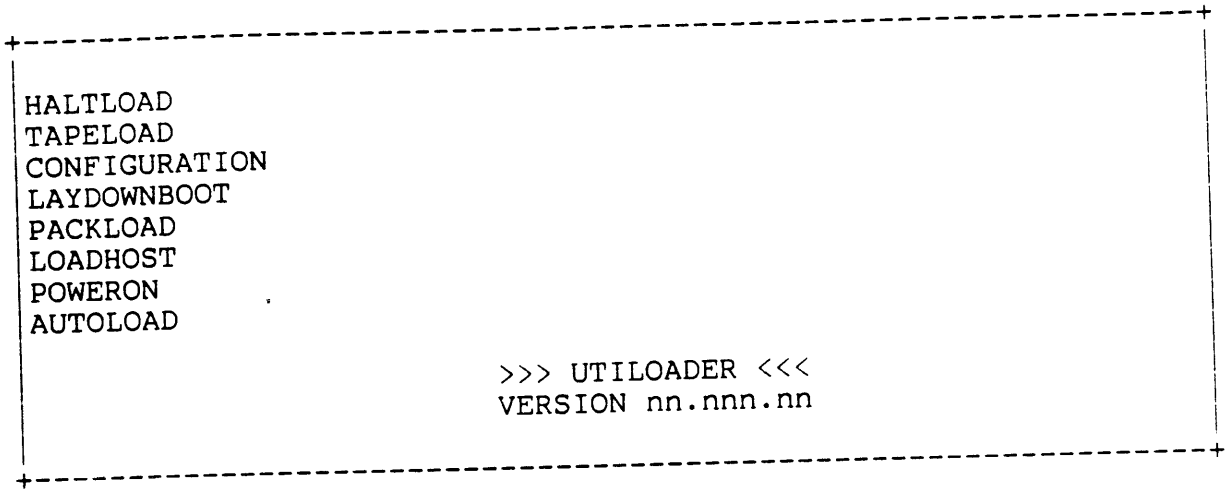


AP/AMP POWER UP MENU

If power has been off, then the AMP microcode will have to be loaded. Load AMPMC diskette into ICMD drive 1, place the cursor over the POWER UP button and press SPCFY. This will load the microcode into the box.

Load the AMPMC diskette that has the Boot Load files into the ICMD. Place the curser over the BOOT LOAD button and press SPCFY. This will load the UTILOADER.

After the UTILOADER has completed, a screen of UTILOADER menu will appear.



UTILOADER MENU

COLD START OR HALT LOAD THE PROCESSOR

At this point the choice of whether to Cold Start or Halt/Load must be made. Also a status of the DLP's and NSP/LSP can be determined by transmitting CONFIGURATION. If the HALTLOAD line is selected, then the processor will Halt/Load as previously described for SYCON. If TAPELOAD is transmitted, then a Cold Start using the SYSTEM tape is processed. Selecting PACKLOAD will force a Cold Start from PACK.

For complete information on the steps to follow refer to the B7900 Operations manual.

NOTES

APPENDIX F

A 2/A 3 INITIALIZATION INSTRUCTIONS

APPENDIX F:

A2/A3 INITIALIZATION INSTRUCTIONS

Note: Throughout this appendix, the notation **A3** applies to both **A2 and A3** systems.

The A3 Initialization Procedures are as follows:

A. Power Up Start

B. Running Start

C. Hot Start

D. Warm/Cool Start

E. Cold Start

They will be described on the following pages.

APPENDIX F:

A2/A3 INITIALIZATION INSTRUCTIONS

POWER UP START

- This is the simplest form of initialization.
- It is invoked by pushing the power button on the A3 or using the soft power up function when the system is halted.
- There must be a CM'ed MCP on the default HALT/LOAD unit.
- The System Control Processor (SCP) performs the following:
    - Initialize the system.
    - Load Microcode.
    - Load and start of SYSTEM/UTILOADER to load and start the MCP on the default HALT/LOAD unit.

Performing a Power Up Start:

1. If the system is off:

   Press the power button on the A3 cabinet

2. If the system is not powered off:

   A. Invoke the "operator menu" by pressing the **<F2>** key

   B. Halt the system by entering: **1 <XMT>**

   C. Select the "soft power up" function by entering: **6 <XMT>**

APPENDIX F:

A2/A3 INITIALIZATION INSTRUCTIONS

RUNNING START

- Certain ODT commands cause this to happen.

  Simple HALT/LOAD **??PHL**

  Indirect HALT/LOAD **CM** or **RECONFIGURE**

- The MCP restarts itself or another MCP

Example of a Running Start:

1. Enter: **CM <MCPCODEFILENAME> <ETX> <XMT>**
2. Enter: **??CM <MCPCODEFILENAME> <ETX> <XMT>**
3. Enter: **??PHL <ETX> <XMT>**

APPENDIX F:

A2/A3 INITIALIZATION INSTRUCTIONS

HOT START

- Performed when it is necessary to change the HALT/LOAD unit and run a different copy of the MCP.
- There must be a CM'ed MCP on a disk pack.

Steps required to Hot Start the system:

1. Invoke the "operator menu" by pressing the **<F2>** key
2. Halt the system by entering: **1 <XMT>**
3. Select the "go manual menu" function by entering: **5 <XMT>**
4. Move the cursor to the "clear cpu" function, enter: **X <XMT>**
5. Move the cursor to the "load utiloader" function, enter: **X <XMT>**
6. Move the cursor to the "start cpu" function, enter: **X <XMT>**
7. Wait for the SYSTEM/UTILOADER command list:

HALTLOAD	**<ETX>**
TAPELOAD	**<ETX>**
CONFIGURATION	**<ETX>**
PACKLOAD	**<ETX>**
LOADHOST	**<ETX>**
POWERON	**<ETX>**

8. Move the cursor to the first character of HALTLOAD and press **<XMT>**
9. Wait for SYSTEM/UTILOADER to display - **<HL UNIT>** or **<HL UNIT> VIA <HL PATH>** -

   Enter the new HALT/LOAD unit number (e.g.: **PK48 <XMT>**)

APPENDIX F:

A2/A3 INITIALIZATION INSTRUCTIONS

WARM/COOL START

- A **Warm** Start is used when it is necessary to modify the MCP tables on the HALT/LOAD pack.
- There must be a CM'ed MCP on a disk pack.
- A **Cool** Start is used when it is necessary to reload the MCP from tape.
- There must be a System Release Tape mounted on a tape drive.

Steps to perform a Warm/Cool Start:

1. Invoke the "operator menu" by pressing the **<F2>** key
2. Halt the system by entering: **1 <XMT>**
3. Select the go "manual menu" function by entering: **5 <XMT>**
4. Move the cursor to the "clear cpu" function, enter: **X <XMT>**
5. Move the cursor to the "load utiloader" function, enter: **X <XMT>**
6. Move the cursor to the "start cpu" function, enter: **X <XMT>**
7. Wait for the SYSTEM/UTILOADER command list to appear. Move the cursor to the first character of TAPELOAD and press **<XMT>**
8. Enter: **SYSTEM/LOADER FROM SYSTEMA3 ON MT <UNIT#> <XMT>**
9. Wait for the display **- SPO INPUT REQUIRED -**
10. Enter: **HALTLOAD UNIT PK <UNIT#> <ETX> <XMT>**
11. If you are Warm Starting enter run time attributes (e.g. **OP+NOSUMMARY <ETX> <XMT>**)
12. If you are Cool Starting, load the MCP to the HALT/LOAD unit (e.g.: **LOAD MCP SYSTEM/MCP34930 FROM SYSTEMA3 <ETX> <XMT>**)

    Note - The MCP name (SYSTEM/MCP34930 in this case) will vary depending upon release level.
13. To terminate SYSTEM/LOADER enter: **STOP <ETX> <XMT>**

APPENDIX F:

A2/A3 INITIALIZATION INSTRUCTIONS

COLD START

- A **Cold** Start is performed when the system is powered up for the first time, or after all other system initializations have failed.

Steps to perform a Cold Start:

1. Invoke the "operator menu" by pressing the **<F2>** key
2. Halt the system by entering: **1 <XMT>**
3. Select the go "manual menu" function by entering: **5 <XMT>**
4. Move the cursor to the "clear cpu" function, enter: **X <XMT>**
5. Move the cursor to the "load utiloader" function, enter: **X <XMT>**
6. Move the cursor to the "start cpu" function, enter: **X <XMT>**
7. Wait for the SYSTEM/UTILOADER command list to appear. Move the cursor to the first character of "configuration" command and press **<XMT>**

   Record the paths to the HALT/LOAD unit and the tape being used

   Press **<SPCFY>** to return to the utiloader command menu
8. Move the cursor to the first character of TAPELOAD and press **<XMT>**
9. Enter: **SYSTEM/LOADER FROM SYSTEMA3 ON MT <UNIT#> <XMT>**
10. Wait for the display **- SPO INPUT REQUIRED -**
11. Enter: **HALTLOAD UNIT PK <UNIT#> <ETX> <XMT>**
12. Enter: **OLAYROW 1200 <ETX> <XMT>**
13. Load the MCP to the HALT/LOAD unit (e.g.: **LOAD MCP SYSTEM/MCP34930 FROM SYSTEMA3 <ETX> <XMT>**)

    Note - The MCP name (SYSTEM/MCP34930 in this case) will vary depending upon release level.

14. Enter: **OK <ETX> <XMT>**

    When the message - **COLD START IS REQUIRED TO PK <UNIT#> DISK ENTER OK TO CONTINUE** - is displayed

15. To terminate SYSTEM/LOADER enter: **STOP <ETX> <XMT>**

APPENDIX G

A 9/A 10 INITIALIZATION INSTRUCTIONS

APPENDIX G:

A9/A10 INITIALIZATION INSTRUCTIONS

COLD/COOL START

Note: Throughout this appendix, the notation **A9** applies to both **A9** and **A10** systems.

When a system is to be cold started, perform all of the steps listed below. To cool start a system, perform all of the steps below except those that state "For a cold start, ...". To halt/load the system, perform the steps 18 through 22 below.

1. Power up the peripherals, load the system tape on a tape drive and load an initialized disk pack on a disk drive.

2. Power up the processor components except for the two ET2000s. Then, proceed to step three only if the required files are already loaded on the first Winchester drive, known as drive zero. The required files are called: SCREEN/=, MCODE/=, SOFTCON, SYSTEM/UTILOADER, and A9/INFO/FILE.

   If copies of each of the required files are not loaded on the first Winchester drive, perform steps "a." through "h." below; then proceed to step three.

   Notes: <ETX> means press the "X" key.

   If the message you key in at any point in the procedures described below exceeds one line on the screen, be sure to home the cursor before you transmit the message.

   a. Insert the SYSTEM floppy disk in the floppy disk drive and close the drive's door.

   b. Power on the ET2000s.

   c. Key in: 2, Press the ETX and then the XMIT keys.

   d. When the system displays SOFTWARE POWER UP SEQUENCE, key in: S, Press the ETX and then the XMIT keys.

   e. To format and label the Winchesters (drives zero and one), key in:

      FORMAT DT 0 A9MAINT

      The system expects the Winchester on drive zero to be labeled A9MAINT. You can use any name when you label drive one.

f. The system requires the files SCREEN/= (the screens used by SOFTCON, the SOFT CONSOLE executive), MCODE/= (the microcode set), SOFTCON, A9/INFO/FILE, and SYSTEM/UTILOADER. To copy the first four files (all but SYSTEM/UTILOADER) to the Winchester labeled A9MAINT, key in each of the following statements:

COPY SOFTCON FROM SYSTEM

COPY A9/INFO/FILE FROM SYSTEM

COPY MCODE/= FROM SYSTEM

COPY SCREEN/= FROM SYSTEM

g. To copy SYSTEM/UTILOADER, remove the SYSTEM diskette and then insert the MCODE diskette.

h. To copy SYSTEM/UTILOADER, key in:

COPY SYSTEM/UTILOADER FROM MCODE

For all of these COPY statements, the destination is assumed to be the drive labeled A9MAINT.

3. If the ET2000's are not already powered on, power them on, and set up the default parameters, by keying in the following:

DEFAULT CONFIDENCE FALSE

4. Optionally, to have SYSTEM/UTILOADER begin running in the system but to have the system not perform the confidence tests, key in:

POWERUP NC

5. You need to see the configuration of the system. So when the SYSTEM/UTILOADER menu is displayed, move the cursor to the beginning of the word CONFIGURATION.

Press the XMIT key.

Write down the MLIP PORT number, LEM PORT number and the number next to the word "ADDRESS" for the BASE (PACK), the tape drive address for the device on which you mounted the system tape (the unit number may be on the front of the tape drive), the NSP DLPID number, and the DLPID number of the pack. You may be told which halt/load unit.

6. Press the SPCFY key.

7. Move the cursor to the beginning of the word TAPELOAD.

   Press the XMIT key.

8. Key in:

   SYSTEM/LOADER FROM <system tape name> ON MT <tape drive number> VIA <port number> <lem port number> <dlp id number>

   Press the ETX key.

   Press the XMIT key.

   The screen displays:

   UTILOADER NOW TRANSFERRING CONTROL and SPO INPUT REQUIRED

9. Home the cursor and then key in:

   LH PK <pack number> VIA <port number> <lem port number> <dlp id number> <controlware file title> FROM <system tape name>

   Press the ETX key.

   The system responds at the bottom of the screen:

   SPACING UP TO THE FIRMWARE FILE...CONTROLWARE LOADED

10. To specify which pack is to be used as the halt/load unit, or system pack, key in the following:

    HALTLOADUNIT PK <pack number>;

    Press the ETX key. Then press the XMIT key.

    The following message will appear:

    HALTLOADUNIT PK <number> [serial number] DISK,
    SYSTEMSERIAL <number>, OLAYROW <number>

11. For a cold start, but not a cool start the system, perform this step. Home the cursor and then key in:

    OLAYROW <integer>

    Press the ETX key. Then press the XMIT key.

12. For a cold start or a cool start, home the cursor and then key in:

    LOAD MCP SYSTEM/MCPnnnnn FROM TAPE <system tape name> TO DISKPACK <disk pack unit number> NAME = <family name> SERIAL = <disk pack serial number>

    Press the ETX key. Then press the XMIT key.

    You can get the system serial number from the display for the HALTLOADUNIT command. You can get the MCP number from the release tape's directory, or possibly, the label.

    The following message is displayed:

    COLD START IS REQUESTED TO <halt/load unit> <family name> ENTER OK TO CONTINUE

13. For a cold start, but not a cool start, home the cursor and then key in:

    OK

    Press the ETX key. Then press the XMIT key.

    The screen displays the message:

    PLEASE ENTER THE NEW SYSTEM SERIAL NUMBER

14. For a cold start, but not a cool start, home the cursor and then key in:

    <4-digit system serial number>

    Press the ETX key. Then press the XMIT key.

    The screen displays the message:

    PLEASE ENTER THE DATE: MM/DD/YY

15. For a cold start, but not a cool start, home the cursor and then key in:

    <2-digit month>/<2-digit day>/<2-digit year>

    Press the ETX key. The press the XMIT key.

    At completion of the loading process, the system will display the following message:

    <MCP file name> LOADED SPO INPUT REQUIRED

16. For a cold start or a cool start, home the cursor and then key in:

    STOP

    Press the ETX key. Then press the XMIT key.

    Complete the following steps after you have cold started or cool started the system.

17. Home the cursor and then key in:

    SOFTCON

    Press the ETX key. Then press the XMIT key.

18. Home the cursor and then key in

    HALT

    Press the ETX key. Then press the XMIT key.

    The system will first display *HALTING* and then display *HALTED* at the bottom left.

19. Home the cursor and then key in:

    LOAD SYSTEM/UTILOADER

    Press the ETX key. Then press the XMIT key.

    The following message is displayed:

    LOAD COMPLETE

20. Home the cursor and then key in:

    START

    Press the ETX key. Then press the XMIT key.

    Many messages will be displayed. The last message will be:

    FINDING ODT

21. Move the cursor to the beginning of the word HALTLOAD.

    Press the XMIT key.

22. Key in:

    PK <pack number> VIA <port number> <lem port number> <dlp number>

    Press the ETX key. Then press the XMIT key.

    After a short while, the screen displays the following message:

    UTILOADER NOW TRANSFERRING CONTROL

    The default Automatic Display Mode will now appear and the system will display status messages.

23. To copy other files that may be required from the system tape to one of your packs, home the cursor and key in:

    ADD & COMPARE <file name list> FROM <system tape name> [TO <pack name>(PACK)]

    Note: In the event waiting entries appear showing that the MCP routine STARTSYSTEM is involved, be sure to discontinue (DS) the entries so the system can continue adding files.

APPENDIX G:

A9/A10 INITIALIZATION INSTRUCTIONS

HALT/LOADING A RUNNING SYSTEM

If you want to halt the system and reload the MCP, power off the non-maintenance ODT, and then at the maintenance ODT perform the following steps:

1. Enter: SOFTCON
2. Enter: HALT
3. Enter: LOAD SYSTEM/UTILOADER
4. Enter: START
5. When the SYSTEM/UTILOADER menu is displayed, move the cursor to the beginning of the word HALTLOAD and press the <XMIT>, or transmit key.
6. Enter: PK <halt/load unit number>

APPENDIX G:

A9/A10 INITIALIZATION INSTRUCTIONS

MEANINGS OF UTILOADER SELECTION DISPLAY ITEMS

HALTLOAD -	The MCP is started, and SYSTEM/UTILOADER writes the resident bootstrap into memory and transfers control to it.
TAPELOAD -	The system copies SYSTEM/LOADER from tape and transfers control to it.
CONFIGURATION -	The system displays the configuration table.
PACKLOAD -	The system loads a program, such as SYSTEM/LOADER, to memory and transfers control to the program.
LOADHOST -	The system loads a copy of the appropriate controlware to the disk pack drive controller.
POWERON -	The system powers on the indicated disk pack drive.

HALTLOAD X
TAPELOAD X
CONFIGURATION X
PACKLOAD X
LOADHOST X
POWERON X

>>> UTILOADER <<<

VERSION 34.750.00

DISPLAY OF UTILOADER SELECTIONS

CONFIGURATION TABLE

BASE 1/1/0 PATH: MLIP PORT 0, LEMPORT 0

ADDRESS 0 DLPID 001 ODT
ADDRESS 3 DLPID 004 TRAIN PRINTER
ADDRESS 4 DLPID 060 STANDARD HT (PACK)
ADDRESS 7 DLPID 012 PE MAG TAPE

BASE 2/1/0 PATH: MLIP PORT 2, LEMPORT 0

ADDRESS 5 DLPID 044 STANDARD HT (PACK)

BASE 3/1/0 PATH: MLIP PORT 3, LEMPORT 0

ADDRESS 6 DLPID 108 NSP3

PUSH SPCFY TO CONTINUE

CONFIGURATION REQUEST DISPLAY

```
          3.4 SYSTEM/LOADER - BOJ
          ******************************
          PROCS: 1
13:19:01  MEMORY STATUS: 0-62 (63 MODS)
13:19:19  DISKPACKS: 44
13:19:42  COLD START IS REQUESTED TO PK 044 DISK
          ENTER  OK  TO CONTINUE
13:21:12  PLEASE ENTER THE NEW SYSTEM SERIAL NUMBER
13:22:28  PLEASE ENTER THE DATE: MM/DD/YY
13:22:46  HALTLOADUNIT PK044 [123456] DISK, SYSTEMSERIAL 3005,
          OLAYROW 0800
13:22:49  SPACING UP THE FILE ...
13:23:47  LOADING SYSTEM/MCP34750 (34.040)
           FROM MT014 SYSTEMA9 TO PK044 DISK (COLDSTART)  ***
13:23:52  MCPCODEFILE          DISK ROW: 0 LOADED
13:25:27  MCPCODEFILE          DISK ROW: 21 LOADED
13:27:00  MCPCODEFILE          DISK ROW: 42 LOADED
13:28:34  MCPCODEFILE          DISK ROW: 63 LOADED
13:28:37  HALTLOADUNIT PK044 [123456] DISK, SYSTEMSERIAL 3005,
          OLAYROW 0800
```

DISPLAY OF SOME SYSTEM COLD START MESSAGES

APPENDIX H
FILE CATALOGING AND ARCHIVING OVERVIEW

APPENDIX H:

FILE CATALOGING AND

ARCHIVING OVERVIEW

FILE CATALOGING

Cataloging systems are systems that maintain a data base of information on files presently on the system and on backed up files that are not presently on the system. The type of information maintained for the cataloged file includes:

Creation Date
Last Access Date
Cycle and Version or Generation
Backup Device Type or Kind
Serial Number of the device on which the file can be found

Two MCP options (discussed in section 6) ARCHIVING and CATALOGING must be set, and the Data Management System II (DMS II) software must be running on the system for cataloging and archiving to be used. To have all files cataloged, you can either separately indicate that each file is to be cataloged, in which case you would specify that the file attribute USECATALOG=TRUE, or you can set the MCP option USECATDEFAULT. If you set the MCP option USECATDEFAULT, all files will be cataloged by the system. After you have set the MCP options ARCHIVING, CATALOGING, or USECATDEFAULT, you have to halt/load the system to have these options take effect.

Through the use of the VERSION,CYCLE, and GENERATION attributes, you can then specify to the system exactly which file you require. The system keeps track of those files having the same title, family, version, and cycle by including a timestamp for every file. The timestamp includes the date and the time of creation of the file, assuming no two files have the same date and time of creation.

The directory search routines of DMS II determine whether the specified generation, cycle, and version of that file exists and whether it is presently resident on the system. If the file exists but is not found to be presently on the system, you will receive the following message:

**NO FILE <file name> <genealogy or cycle and version>
FOUND ON <kind or device type> <serial number>**

If the file does not exist, you will receive a message that includes the statement UNMATCHED GENEALOGY. For either of these messages, you can respond with either of the following ODT commands: **IL** or **DS**.

Work Flow Statements Used With Cataloging

To indicate that the file information regarding the title, cycle, version, generation and location on a specific tape or disk is to be cataloged, you must use certain Work Flow Language statements. To have file location information cataloged, you must use the specific Work Flow Language statement CATALOG ADD or set the USECATALOG attribute when the file is created. The information is then added to the file's catalog block, which is maintained for files within a cataloging system.

```
Example:  CATALOG ADD ACCTNG/PYRLL12982
          (KIND=TAPE, SERIALNO=12345)
```

Two more statements can be used with cataloging. The COPY & BACKUP statement copies files between media and enters the serial number of the output medium in the catalog block for later retrieval if needed. The file must have already been marked as cataloged via the CATALOG ADD statement.

```
Example:  COPY & BACKUP <file name> TO
          <output medium>
```

The COPY & CATALOG statement combines the CATALOG ADD and the COPY & BACKUP statements.

```
Example:  COPY & CATALOG <file name> FROM
          <input medium> TO <output medium>
```

To delete entries in the catalog, use the CATALOG DELETE statement and indicate, if necessary, which cycle, version, device type, generation, pack name, and any other information needed to exactly specify the file to be deleted.

```
Example:  CATALOG DELETE A/B
          (KIND=PACK,PACKNAME=EDUC,CYCLE=2,
          VERSION=0)
```

To remove all references to backup files in the catalog, use the CATALOG PURGE statement. The file itself is not removed.

In addition to cataloging the files, you must create a volume library and include in it certain information pertaining to each medium on which cataloged files reside. This is performed by using the VOLUME ADD statement.

```
Example:  VOLUME ADD EDUCATION (KIND=PACK,
                                SERIALNO=135790)
```

To delete a medium from the volume library, use the VOLUME DELETE statement, which is identical to the VOLUME ADD statement. To have the system write a serial number, purge, reconfigure, or relabel a tape or disk that has become part of a volume library, you must first delete that medium from the volume library (use the VOLUME DELETE statement). Multi-file tapes can neither be cataloged nor included in a volume library.

FILE ARCHIVING

Archiving is an extension to cataloging. It permits more than two backup copies of a file. SYSTEM/ARCHIVEUPDATER maintains a data base which it updates according to information that it receives from the archive log file. Information can be retrieved from the data base via the SYSTEM/ARCHIVEINQUIRY program.

Input for the archive comes from the archive log. All VOLUME DELETE requests are stored in the archive log. The MCP option ARCHIVING must be set for archiving to take place. You can not add your own comments to this log file. Only a privileged user can run the SYSTEM/ARCHIVEUPDATER program or the SYSTEM/ARCHIVEINQUIRY program. The ODT command AR (described later) must be used to transfer the log data which can then be added to the data base by entering at the ODT the following statement:

```
RUN SYSTEM/ARCHIVEUPDATER
```

The first time you run this program, however, you must enter at the ODT the following statement:

```
RUN SYSTEM/ARCHIVEUPDATER; VALUE=99
```

The program SYSTEM/ARCHIVEINQUIRY retrieves information about the status of files from the catalog file, the archive log file, and the archive data base. Output will be directed to a terminal or the printer, depending on whether the program is run interactively via a terminal or in batch mode. The program requests input regarding what you want it to do, for example, you can have it LIST the attributes and the location of a specified file or you can have it LOCATE a specified file and provide to you the serial number, type of backup medium, and name of the backup medium containing that specific file. The listing or locating of files may be limited to a series of dates and times, cycles, and versions of the specified files, or the ALL option may be specified to indicate that all files are to be listed or located.

ODT/MARC COMMANDS USED WITH CATALOGING AND ARCHIVING

1. **PV** - Displays all the information from the volume library for a specified tape or disk volume or volume family.

   Example: PV MT 123456

2. **AR** - Releases the old archive log and creates a new one. When archive logs reach capacity (60,000 records) they are automatically released, so the AR command would not have to be used in that case. Once released the log data may be examined by using SYSTEM/ARCHIVEINQUIRY or updated by using SYSTEM/ARCHIVEUPDATER.

   Example: AR

NOTES

APPENDIX I

PRINTING SUBSYSTEM

APPENDIX I:

PRINTING SUBSYSTEM

Print Routing Implementation

A new Printing Subsystem, PrintS/ReprintS, available on the Mark 3.6 release, replaces the Autobackup facility. The new subsystem supports the backup file creation and automatic printing features that were previously provided by Autobackup, as well as providing capabilities for backup file creation, routing, and printing control. Remote printing has been integrated into the new subsystem to make routing to remote printers as easy as routing to site printers and to allow remote printers to be controlled with the same operator commands that work for site printers.

A brief summary of the new Printing Subsystem appears below. Following this summary is a comparison of the new Printing Subsystem to the old Autobackup facility. For more information, see the "Printing Subsystem Overview," Form 1169919.

The Printing Subsystem offers the following capabilities:

1. A programmatic interface through file attributes that gives the user control over backup file creation, routing, and printing.

2. The ability to set defaults for printing-related file attributes for a job, task, or MARC session through the task attribute PRINTDEFAULTS.

3. Extended operator control over printing devices and print jobs through a set of ODT commands that begin with the prefix PS.

4. The ability to manually create print requests with the PRINT statement in WFL.

5. Enhanced capabilities for viewing, copying, removing, and printing backup files via the Backup Processor utility that is available through MARC or CANDE.

6. The ability to optionally print job summary information, store it in a backup file for later analysis, or prevent job summary information from being written to the job code file through the task attributes JOBSUMMARY, JOBSUMMARYTITLE, and NOJOBSUMMARYIO, respectively.

7. Remote printing that is integrated with site printing and controlled by the same file attributes and operator commands.

Attributes Related to Printing

The Printing Subsystem offers new or enhanced file attributes discussed below.

1. For routing and scheduling of print requests:

AFTER	- Defers printing to later time.
DESTINATION	- Specifies destinations with optional copy count per destination. [Default value is set from DESTNAME, which CANDE extracts from CANDEDESTNAME in the USERDATAFILE.]
PRINTDISPOSITION	- Specifies when to logically queue the file for printing.
PRINTERKIND	- Indicates printer type or kind (Image Printer, Line Printer, or DONTCARE).

2. For backup file control:

PRINTCOPIES	- Indicates number of copies to print at DESTINATION.
SAVEBACKUPFILE	- Specifies whether a backup file should be removed or not after printing.
SECURITYTYPE	- Set to PRIVATE if backup file title includes a usercode.
TITLE	- Returns actual backup file name.
USERBACKUPNAME	- Allows user-specified backup file name.

3. For printing control:

BANNER	- Precedes file printing by banner page.
NOTE	- Allows user to supply text for banner page.
FORMID	- Indicates type of paper or kind of form required. [A string value up to 100 characters long.]
PRINTERCONTROL	- Indicates the printer control file.
TRANSFORM	- Specifies library entrypoint for transforming data on its way from backup file to printer, such as lower to upper case translation.

The Printing Subsystem offers the following new task attributes:

JOBSUMMARYTITLE	- Designates title of backup file to receive job summary.
NOJOBSUMMARYIO	- Inhibits writing of job summary information to the job code file.
PRINTDEFAULTS	- Specifies default values for printing-related file attributes.

Old Autobackup Commands versus New PS Commands

All the old operator commands that were supported by Autobackup are still accepted and cause equivalent actions in the new Printing Subsystem. The only old command without a direct equivalent is EP. The EP command did not remove backup files; it only eliminated the CONTROLLER's information about print jobs. The new PS DELETE ALL command is roughly equivalent to EP except that it also removes any files queued for printing.

The equivalent new syntax for the old Autobackup commands is shown below. Acceptable abbreviations are shown in upper case characters. The system automatically translates the old commands to the new commands for you, except for the EP command, which results in an informative error message.

Autobackup	PrintS/ReprintS
AB	PS SERVers
AB <number>	PS SERVers = <number>
AB <device>	PS DEVices + <device>
AB - <device>	PS DEVices - <device>
EP	PS DELete ALL
FORM <device>	PS DEVices <device>
FORM <device> <text>	PS CONFIGure <device> FORMid <text>
SP	PS SHowrequests

The CL, DS, and QT commands can still be used to affect printing on site printers, but it is recommended that you use the new PS commands, REQUEUE, SKIP, and STOP, because they provide new capabilities in addition to equivalent functions.

The AX commands that were applied to Autobackup tasks for printing control are no longer supported. Use the new command equivalents shown below:

Autobackup	PrintS/ReprintS
<mix> AX BS <blocks>	PS SKIP <device> - <number lines>
<mix> AX FS <blocks>	PS SKIP <device> + <number lines>
<mix> AX RS	PS SKIP <device> - <number lines>
<mix> AX SK	still accepted for tape printing
<mix> AX SU	PRINT <file>; PRINTDEFAULTS=(SUPPRESS=TRUE)
<mix> AX US	PRINT <file>; PRINTDEFAULTS=(SUPPRESS=FALSE)

Differences between Autobackup and Print Routing

Although the functionality of the old Autobackup facility is supported by the new Printing Subsystem, the mechanisms for providing these features are much different. Autobackup maintained very little information regarding print jobs and relied in large part upon searching disk directories for backup files under the known prefixes of BD and BP. The new Printing Subsystem maintains a great deal of information about backup files, print requests, and printers, thus facilitating better control and more flexibility.

The user/operator should be aware of differences in the following areas:

1. New Programs/Libraries

   a. The PRINTSUPPORT function must be SLed to SYSTEM/PRINT/SUPPORT, a system library that maintains most of the state for the Printing Subsystem.

   b. SYSTEM/PRINT/ROUTER is a process that will stay in the mix to handle asynchronous communications with the Printing Subsystem. It is responsible for creating printing requests, responding to ODT commands, and monitoring changes in printer status.

   c. A new Backup Processor Utility that is called for CANDE or MARC users is provided by the codefile SYSTEM/PRINT/BACKUP/PROCESSOR. This replaces the internal BACKUPPROCESSOR that CANDE previously used.

   d. Remote printing requires creation of a PRINTING window via the COMS UTILITY window and installation of the program titled SYSTEM/PRINT/REMOTE/SERVER. This program handles multiple remote printers and uses the library SYSTEM/PRINT/REMOTE/LIB to maintain state.

   e. Site printing is done by a stack per printer that is labeled SERVER/<unit name>/R#<request number>/J#<job number> rather than the old naming convention AUTOPRINT/<unit name>/<job number>.

   f. The stack that does tape printing follows the old naming convention with one exception: AUTOPRINT is replaced by TAPEPRINT.

2. New System Files

   a. Information regarding backup files and print requests is maintained in the system file SYSTEM/BACKUPFILELIST on the DL BACKUP family. If this file is not present at Halt/Load, the Printing Subsystem waits on a "NO FILE" condition. This wait allows the operator to copy the file from another pack or from tape, or to enter "<mix number> OF" and have the system create the file by searching the directory of all disk packs for files that begin with the prefix "*BD" or "*BP". If this system file is present, the disk pack directory will NOT be searched for backup files.

      Note that Autobackup searched the disk pack directory after Halt/Load or when the AB count went from zero to nonzero. Due to the existence of SYSTEM/BACKUPFILELIST, the disk pack directory is no longer searched automatically.

   b. Information regarding printer characteristics is maintained in the system file SYSTEM/PRINTERINFO on the DL BACKUP family. If this file is not present at Halt/Load, the Printing Subsystem waits on a "NO FILE" condition, allowing the operator to copy the file from another pack or from tape, or to enter "<mix number> OF" and have the system create the file.

3. Unit selection

   a. Rather than considering ABed devices as "preferred" in the sense that Autobackup used, the PrintS/ReprintS uses the concept that printers can be added to or deleted from the "default printer pool". This pool of printers is used for servicing requests that do not specify a destination. A printer that does not belong to the default pool is used only when a request specifically names that printer as its destination.

   b. Print requests are examined by the Printing Subsystem and split into separate requests if the files have different resource requirements. A request is not assigned to a Print Server stack unless the required resource is provided by that Server. If a request needs a resource that is unavailable or in use, the request is marked as waiting in the Print Request List, but it does not cause any task to wait. If special forms are required for printing a file, the print request is not assigned to a Print Server stack until the system is informed that the required form has been assigned to a device.

c. When a Print Server stack is initiated, it only handles requests for a specific printer and never tries to re-assign itself to a different printer. The fact that requests are split according to resource requirements makes it possible for Servers to be dedicated to one device and prevents a Server from having to wait for "REQUIRES LP", for example. If a Server finishes printing a request and no more requests are compatible with that printer, the Server stack terminates.

4. User-Named Backup Files

a. The BDNAME task attribute takes effect regardless of whether the BDBASE value of the OPTION task attribute is set. BDNAME still has the effect of preventing automatic printing for the backup files associated with that task.

b. The new file attribute USERBACKUPNAME can be used to override BDNAME for a particular backup file.

5. Job Summary

a. After EOJ, if conditions are such that job summary information is eligible for printing, that information is formatted into a printer backup file, then the disk header for the job file is released. Under Autobackup, the job header was kept until an Autobackup stack actually printed the job summary.

b. After Halt/Load, the NOSUMMARY system option is enforced when aborted jobs and sessions are being considered for printing.

Previously, Halt/Load was an exception to the NOSUMMARY rule.

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