Burroughs

Operator's Guide

B7900 System

(Relative to the Mark 3.4 Release)

Priced Item
Printed in U.S.A.
April 1984

1166162

Burroughs

Operator's Guide

B7900 System

(Relative to the Mark 3.4 Release)

Priced Item
Printed in U.S.A.
April 1984

1166162

Burroughs cannot accept any financial or other responsibilities that may be the result of your use of this information or software material, including direct, indirect, special or consequential damages. There are no warranties extended or granted by this document or software material.

You should be very careful to ensure that the use of this software material and/or information complies with the laws, rules, and regulations of the jurisdictions with respect to which it is used.

The information contained herein is subject to change without notice. Revisions may be issued from time to time to advise of such changes and/or additions.

Correspondence regarding this publication should be forwarded, using the Documentation Evaluation Form at the back of the manual, or remarks may be addressed directly to Burroughs Corporation, Corporate Documentation Planning, East, 209 W. Lancaster Ave., Paoli, PA 19301, U.S.A.

LIST OF EFFECTIVE PAGES

Page	Issue
iii	Original
iv	Blank
v thru ix	Original
x	Blank
xi	Original
xii	Blank
1-1 thru 1-2	Original
2-1 thru 2-4	Original
3-1 thru 3-5	Original
3-6	Blank
4-1 thru 4-2	Original
5-1 thru 5-18	Original
6-1 thru 6-8	Original
7-1 thru 7-35	Original
7-36	Blank
8-1 thru 8-6	Original
9-1 thru 9-28	Original
A-1 thru A-2	Original

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

LIST OF ILLUSTRATIONS

LIST OF TABLES

INTRODUCTION

This manual illustrates the system and its units with callouts of the operator-related areas.

SYCON (SYstem CONsole) is the software which is responsible for configuring and starting B 7900 partitions. It also provides panels for each of the B 7900 box types (e.g., CPM4, MSM1, HDU1, AP1). These panels are oriented towards operating the system, rather than towards detailed diagnostics of hardware failures.

SYCON executes on a modified MTS2 terminal. The software (and related files) are loaded from a set of ICMD drives packaged in the leg of the B 7900 console, so typically, the MTS2 is on the console with the system Operator Display Terminals (ODT). SYCON accesses the various states of the B 7900 boxes via the system console connection to the B 7900 MEX (Maintenance EXchange), packaged in the SCC (System Control Cabinet). Both the connection to the ICMDs (Industry Compatible Mini Disks) and the connection to the MEX are realized through the MIP (Maintenance Interface Processor), also packaged in the leg of the console. (For more information, see HARDWARE CONTEXT.)

A B 7900 system consists of some number of partitionable boxes. SYCON has access to all of the boxes in the system. SYCON is restrained by hardware and software conventions which limit access to fit boxes into an overall system mainframe partitioning scheme. (For more information, see PARTITIONING.)

Each box contains a PID (Partition Identification Register). PID is not used by the hardware, but it is used by the software to designate the way the box is being used (e.g., the state it is in vis-a-vis partitioning). INHIBIT and AVAILABLE are two such states. SYCON and the Master Control Program (MCP) are the primary software that manipulate the PIDs during any partition configuration changes. (For more information on states, see PARTITIONING.)

SECTION 1
HARDWARE CONTEXT

GENERAL DESCRIPTION

The mainframe partition components of a B 7900 are often called boxes. (See figure 1-1.) The box types are CPM (Central Processor Module), MSM (Memory Subsystem Module), HDU (Host Data Unit), or AP (Auxiliary Processor). This nomenclature does not necessarily match the physical cabinet and power distribution of a B 7900. In particular, APs and HDUs share the IOSM (Input/Output Subsystem Module) cabinet and may share the same power supply.

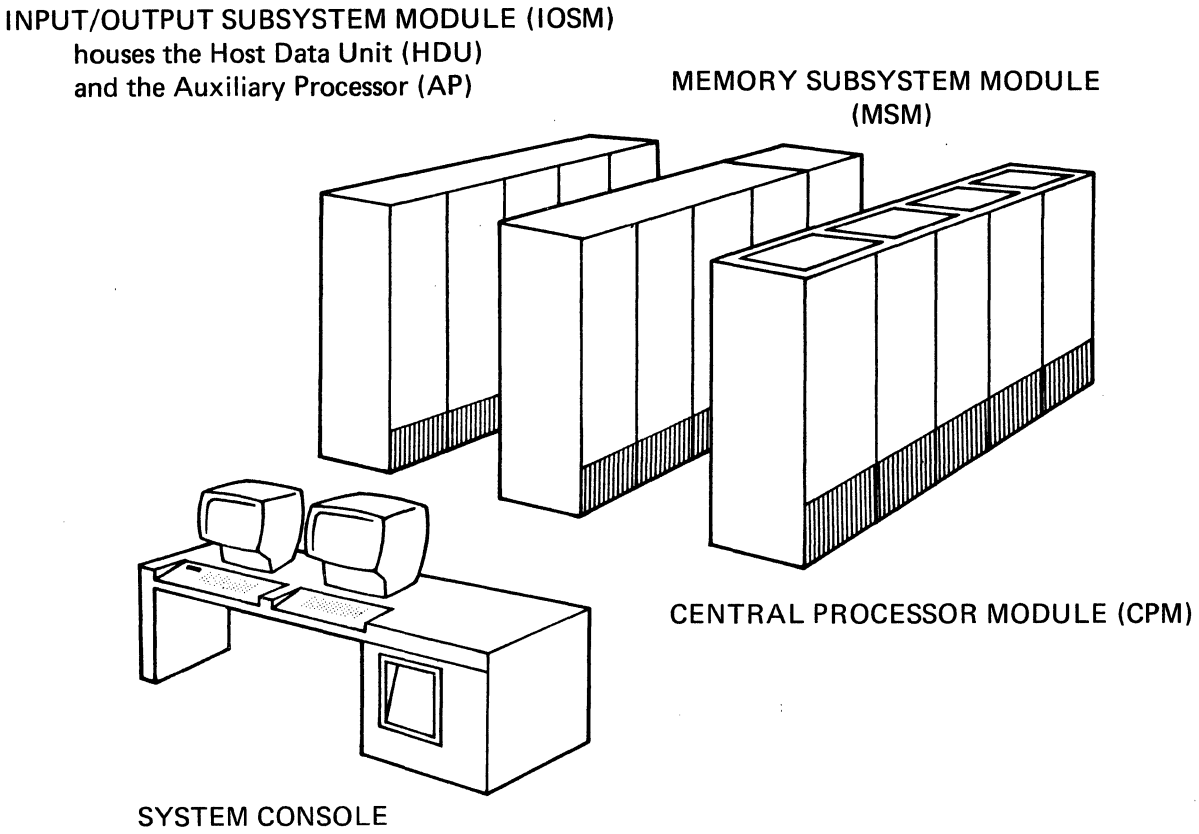


Figure 1-1. B 7900 System

Boxes are divided into two classes: MSMs and requestors (which includes CPMs, HDUs, and APs). Within any system, each requestor is cabled to each MSM. This is called "system interface."

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

A Maintenance Interface Processor (MIP) is a hardware component housed in the leg of a B 7900 Console. It is cabled to a pair of ICMD (floppy) drives, also housed in the console leg. The MIP may also be cabled to a UIO (Univeral Input/Output) Testbus. An MIP is driven by a system console. Only one system console may be cabled to any particular MIP so they are typically paired and thought of as one unit. They are cabled to the MEX and act as a maintenance processor for the system.

A B 7900 has every requestor and every MSM cabled as a slave to the MEX. Every processor is cabled as a master to the MEX. In addition, there is one or more system consoles/MIPs cabled as masters to the MEX.

SYCON software runs on a system console. It is loaded from the associated MIP and ICMD. It uses the MEX connection to obtain state access to the system components.

SECTION 2
PARTITIONING

GENERAL DESCRIPTION

In a B 7900 System, a partition is a subset of boxes that is managed by a single MCP. Partitioning prevents any box not in the subset from interfering with the successful execution of the subset. This capability can be used in two ways:

A broken box may be tested while the remainder of the boxes executes as a partition. The partition is protected against interference from the broken box.

A given system may be split into more than one partition, each partition run independently. Each partition is protected against interference from actions in the other partitions.

Partitioning is established by software, but enforced by hardware. It involves the control of two interfaces: the system interface and the maintenance interface. Partition membership is marked in the PID.

System Interface

Each requestor is cabled to each MSM. Each box has an SIE (System Interface Enable) register which enables or disables the use of the interface. Within each MSM, the SIE controls which MSMs are in the partition and which are to be ignored. By assigning values to the SIE registers, the software can instruct the hardware to completely ignore some boxes and pay attention to others. In effect, boxes being ignored are treated as though they are physically not present at all.

For example, to isolate CPM4, the software assigns values to each MSMs SIE register such that CPM4 is ignored by all MSMs in the partition. The MSMs continue to ignore the isolated CPM4 regardless of what value is assigned to the SIE register in the isolated CPM4, and regardless of what operations the isolated CPM4 attempts. Similarly, an MSM may be isolated by instructing all requestors in the partition to ignore it.

For example, in a system which has two MSMs, two CPMs, and two HDUs, the software may assign values such that two partitions are formed. In each partition, the boxes are instructed to pay attention to the boxes in that partition and to ignore all others. Each partition operates independently of the other and a halt/load (H/L) of one partition has no effect on the other partition.

Maintenance Interface

A running partition cannot be interfered with by a component that is not under the direct control of the MCP operating the partition. A maintenance processor operates independently of the partition, so once it has configured and started a partition, it must be excluded from further access. In the event that the partition crashes, it must be possible for a maintenance processor to gain access to the partition and restart it.

On the B 7900, each box has:

An Maintenance Bus Mode (MBM) switch. This physical switch is housed inside the skins of each box. It has three positions:

Unconditionally enabled; maintenance bus is unconditionally enabled regardless of the value of MBE (Maintenance Bus Enable). There is no partitioning protection on the interface. Any maintenance processor may, at any time, obtain state access to the box and so may interfere with the execution of the partition. This mode is useful in certain debugging situations.

Unconditionally disabled; maintenance bus is unconditionally disabled regardless of the value of MBE. No maintenance processor may, in any way, obtain state access to the box. This mode is useful in certain special circumstances.

Normal or System mode; mode in which the system is normally run. In this position, the maintenance bus is enabled or disabled by MBE under control of the running light.

MBE is set by expiration of the running light timer, and when the MBM switch is in the system position, controls access over the maintenance bus.

A running light is wired to a timer such that, if the timer ever counts down to zero, then the running light goes out and MBE is set. If MBM is in the system position, the maintenance bus is enabled. When the MCP is executing successfully, it periodically recharges the timers, thus preventing them from ever counting down to zero and so keeping the maintenance bus disabled. When the MCP is not executing successfully, it does not recharge the timers and they eventually count down, then enable the maintenance bus. (The maintenance bus is enabled to a particular box when MBM = system and MBE, or when MBM = enabled.)

The PID register is not used by hardware, but it used by software to mark the state (vis-a-vis partitioning) of the box. The values 1 through 4 are used to designate partitions (see PARTITIONING).

Software

The software involved in marking partitions is SYCON and the MCP. SYCON initially establishes a partition upon instructions from the user. This includes setting the SIE registers and the PIDs in all boxes in the partition. SYCON then starts the MCP running. The MCP, as part of its initialization, charges the timers, thus disabling the maintenance bus and excluding the maintenance processors.

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

Box States (BOXID)

Each box has a sub-field of the Box Identification Register (BOXID) implemented such that it may be accessed over the maintenance bus at any time, even when access to another state is prevented by the partitioning hardware. Values in this register describe the overall state of the box with respect to system mainframe partitioning. The various fields are:

PID	Set by software, this field contains the overall state designation.
HALT/SRV	For requestors, this field is set by hardware and indicates that the box is halted. For MSMs, it carries the Store Request Valid indicator, which is reset by the hardware when the box is initialized, and set by software when the translation tables are set by software.
Software Running	Previously discussed under Maintenance Interface.

MBE (Maintenance Bus Enabled)	Previously discussed under Maintenance Interface.
MBM (Maintenance Bus Mode)	Carries the value from the Mode switch (previously discussed under Maintenance Interface). The values are: 0 Not powered on. 1 Unconditionally enabled. 2 Unconditionally disabled. 3 System.

An indication of the box type (e.g., CPM4, MSM1, AP1, HDU1) is carried on DIP switches in the FOA for each maintenance bus address. This field is also available to the maintenance processor, even when the maintenance bus is disabled.

The above fields are used by SYCON in various ways. MBE and MBM are read to determine whether or not the bus is enabled to a particular box (SYCON does this to generate various displays. SYCON cannot in any way override the hardware and obtain state access when the bus is disabled). The box type is read for various displays and is used to classify a particular box as either MSM or REQuestor.

PID and the running light are used to determine the box state.

State (PID)	Comments
Power Down (0)	When PID is zero, an MBM value of zero indicates that there is no box at that address, or that the box is powered down. A non-zero MBM value indicates that the box is present, but has not been operated on by SYCON yet. Typically, this occurs when the box has just been physically powered up, but the SYCON logical power up has not been done.
Assigned (1-4)	When PID is 1, 2, 3 or 4, the box is assigned to the designated partition. For boxes assigned to a partition, the running light indicates whether or not the partition is actually running.
Maintenance (5)	The box is undergoing hardware maintenance in some way when PID is 5. SYCON never assigns this value; it must be done by the user, with IDA (Interactive Diagnostic Access).
Inhibit (6)	When PID is 6, the box is marked as being "not in any (6) of the other states." There are several ways a box can be put into Inhibit, so the person using the system needs to keep track of the actual state of the box (e.g., SYCON logical power up function leaves the box in Inhibit. A person may push the SYCON INHIBIT button for some box, which puts it in Inhibit. The MCP may, due to errors, force a box out of the partition by putting it in Inhibit.
Available (7)	When PID is 7, the box is ready for incorporation into some partition. Boxes are moved from the available to the assigned state by either SYCON as a partition is being configured, or by the MCP acting on an ACQUIRE command.
Running	When Assigned and the running light is on, the box is a member of a running partition.

State Transitions

When IDA is used during hardware maintenance on a particular box, unusual state transitions might be done. The following indicates the usual state transitions, which occur when using SYCON and the MCP. It lists all such transitions. Transitions not listed here cannot be made using SYCON and the MCP; (e.g., it is not possible to go directly from Power Down to In Partition).

States Initial	Subsequent	Comments
Power Down	Inhibit	Done by pushing SYCON POWER UP button for that box.
Inhibit	Available	SYCON AVAILABLE button.
Available	Inhibit	SYCON INHIBIT button.
	Assigned	SYCON ACQUIRE button.
	Running	MCP ACQUIRE command.
Assigned	Inhibit	SYCON INHIBIT button.
	Available	SYCON FREE button.
	Running	SYCON LOAD or BOOT LOAD buttons cause a configured partition to begin running. When the MCP starts, it arms the running light timers, which turn on the running lights.
Running	Inhibit	A box is forced out of partition and goes from running to assigned.
	Available	MCP FREE command.
	Assigned	When the partition halts, or is halted, the running lights in the partitions of the boxes goe out; the boxes remain assigned to the partition.

SECTION 3
MENUS

GENERAL DESCRIPTION

SYCON is menu-driven. A menu is one screen worth of information. A given menu may contain:

Displayed data: these fields are strictly output information about the system.
Buttons: consist of displayed text, giving the name of the button, followed by a special character which is the button itself. To push a button, the cursor is moved to the special character, then the system console SPCFY key is pushed.

Input fields: these consist of text, naming the field, followed broken brackets indicating the actual data field (e.g., AREG > < input fields both allow for specification of some input data and request SYCON to perform some function on that data). To enter data, the cursor is first moved to the input field, then the data is typed in, then the system console XMT key is pushed. Some input fields are broken into several parts, each of which is called a "partial field." These must all be filled in before SYCON actually performs the function. The cursor is positioned at each partial field in turn, and when all are filled in, the system console XMT key is pushed.

SYCON indicates the current cursor position by blinking the character at that position on the screen. The keyboard cursor control keys used in SYCON are the up, down, left and right arrow keys, the SKIP, TAB and RTAB keys, the RETURN key, and the HOME key. The menus are displayed in system console Forms mode, using protected fields. This means that the cursor is only positioned on items which are actually buttons or input fields (e.g., when the cursor is on some button, pushing TAB moves the cursor to the next button or input field on that line or, if there are no more on that line, to the first one on the next line). CHAR INS, CHAR DEL, EOP and EOL may be used for editing input fields.

SYCON does not perform any function until the keyboard SPCFY (for buttons) or XMT (for input fields) key is pushed for the function. During the time the function is being performed, the blinking cursor is not shown. When the function is complete, SYCON again shows the blinking cursor, indicating that it is ready for the next function. For some functions, actual interaction with the hardware is deferred until leaving the screen on which the requested function occurs (e.g., the H/L HDU RAM is not actually updated until the MASTER or CONFIGURE button on the H/L Info Menu is pushed).

The bottom left-hand corner of the screen (for every menu) is the screen status line. This line is used to display status messages, indicating the discrete step within some function which SYCON is currently performing, to display error messages, and in certain circumstances to prompt the user for additional information.

Most SYCON functions are invoked by buttons or input fields on the various menus. There are a few special purpose functions which are implemented using the keyboard CTRL key. (For more information, see CTRL COMMANDS.)

Menu Overview

SYCON has seven menus. Four of these are for hardware panel displays, with one menu per box type (CPM, HDU, MSM, AP). The other three menus are:

Master — This is the primary operational menu. It is the menu SYCON displays when first run. It is used to select status displays, to H/L partitions, and so on. It

	is also used to select the other menus. Throughout this manual it is referred to as the Initial Menu.
Configuration	This menu allows for constructing and reconfiguring partitions. It is also used to select the H/L Info Menu.
H/L Info	This menu is used to enter the H/L information including designation of the H/L processor, H/L HDU, H/L MSM and detailed specifications of the minimal peripheral configuration.

The usable boxes (e.g., usable by the MCP) are the AVAILABLE boxes and the ones currently assigned to a partition. In general, the Initial Menu is used to move boxes from unusable (e.g., Power Up, Inhibit) to Available. The Configuration Menu moves boxes between Available and Assigned.

The Initial Menu may be used anytime. In all cases, to switch from the Initial Menu to some other menu, the maintenance bus must be enabled to the boxes involved. For the CPM Panel only, the CPM may have its running light on (in this case, the CPM MBM switch must select unconditionally enabled). In all other cases, the boxes must not be running. The following outlines the only transitions from menu to menu that can be made.

From	To	Comments
Master	Configuration	Fill in a partition number, then push the CONFIGURE button. If any requestor in the specified partition has its running light on, or has the maintenance bus disabled, SYCON displays a message and remains on the Master Menu.
	CPM Panel	Fill in the CPM number in the REQuestor input field, then push the PANEL button. The maintenance bus must be enabled to the CPM in order to switch to its Panel Menu, but the CPM may or may not have its running light on.
	HDU or AP Panel	Fill in the AP or HDU number in the REQuestor input field, then push the PANEL button. The maintenance bus must be enabled to the AP or HDU, and the running light must be off.
	MSM Panel	Fill in the MSM number in the MSM input field, then push the PANEL button. The maintenance bus must be enabled to the MSM, and the running light must be off.
	Master H/L INFO	Push the MASTER button. Push the H/L INFO button. At this point, the H/L Info is read from the currently designated HDU and displayed on the screen.
H/L INFO	Master	Push the H/L INFO button. At this point, the H/L INFO is written to the H/L Info RAM in the H/L HDU and a valid environment zero/page zero is built in the H/L MSM.
	Configure	Push the CONFIGURE button. At this point, the H/L Info is written to the H/L Info RAM in the H/L HDU and a valid environment zero/page zero is built in the H/L MSM.
Any PANEL	Master	Push the MASTER button.

SYSTEM CONSOLE OPERATIONS

SHELL

Resident in PROM on the system console is a program called "SHELL." When the system console is powered on, a self-test is run and, if no fatal errors occur, SHELL is invoked. SHELL prompts the user to enter a SHELL command. The commands are entered by entering the appropriate text, then hitting the keyboard XMT key. The commands are:

FILES <drive number>; where drive number is either 0 or 1 and selects the drive to be searched. The names of the files on the ICMD mounted in the selected drive are listed on the screen. If no drive number is entered, drive 0 is selected.

SYCON is loaded into the system console, then executed. The ICMD containing SYCON may be in drive 0 or 1.

When SYCON is running, it may be terminated and control returned to SHELL by entering the CTRL Q CTRL command.

ICMD Diskettes

There are various diskettes needed during the course of using SYCON. A given diskette need only be in an ICMD drive when a function is executed which uses a file on that particular diskette. Any given diskette may be used from either of the ICMD drives. The diskettes are:

SYCON	Contains SYCON and UTILODER. It is needed for the initial SYCON load. It is also needed for the BOOT LOAD function (which includes loading UTILODER into an MSM). The ICMD also contains two SYCON utility files (SYCONFMS and SYCONSAD) which are used immediately following a load of SYCON.
APMC	Contains the microcode for the AP. It is needed when the Power Up function is invoked for an AP (Power Up includes loading microcode to that AP).
HDUMC	Contains the microcode for the HDU. It is needed when the Power Up function is invoked for an HDU (Power Up includes loading microcode to that HDU).

CTRL Commands

Certain SYCON commands are implemented as CTRL commands, rather than as buttons or fields on one of the menus. A CTRL command is entered by pressing the keyboard CTRL key, then pressing the letter(s) for the command, then again pressing the CTRL key. The commands are:

CTRL V CTRL	SYCON displays its version number on the screen status line.
CTRL Q CTRL	SYCON terminates, returning control to the SHELL program.
CTRL CE CTRL	For the LOAD and BOOT LOAD functions, the last step SYCON takes is to turn on the clock in each box in the partition (H/L MSM is last). CE is a software flag which, when set, causes SYCON to halt and wait for a user "OK" before turning on the clocks. The CTRL CE CTRL command inverts the value of the CE flag.

CTRL P CTRL

SYCON has the capability to produce hard copy of whatever is currently displayed on its screen. This requires that a TP313 printer be connected to the system console via the SIO connection. When the printer is connected, the CTRL P CTRL command causes the current screen contents to print.

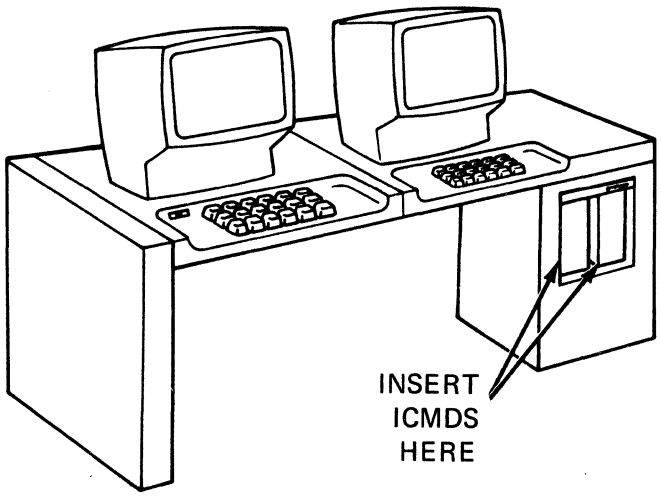


Figure 3-1. System Console

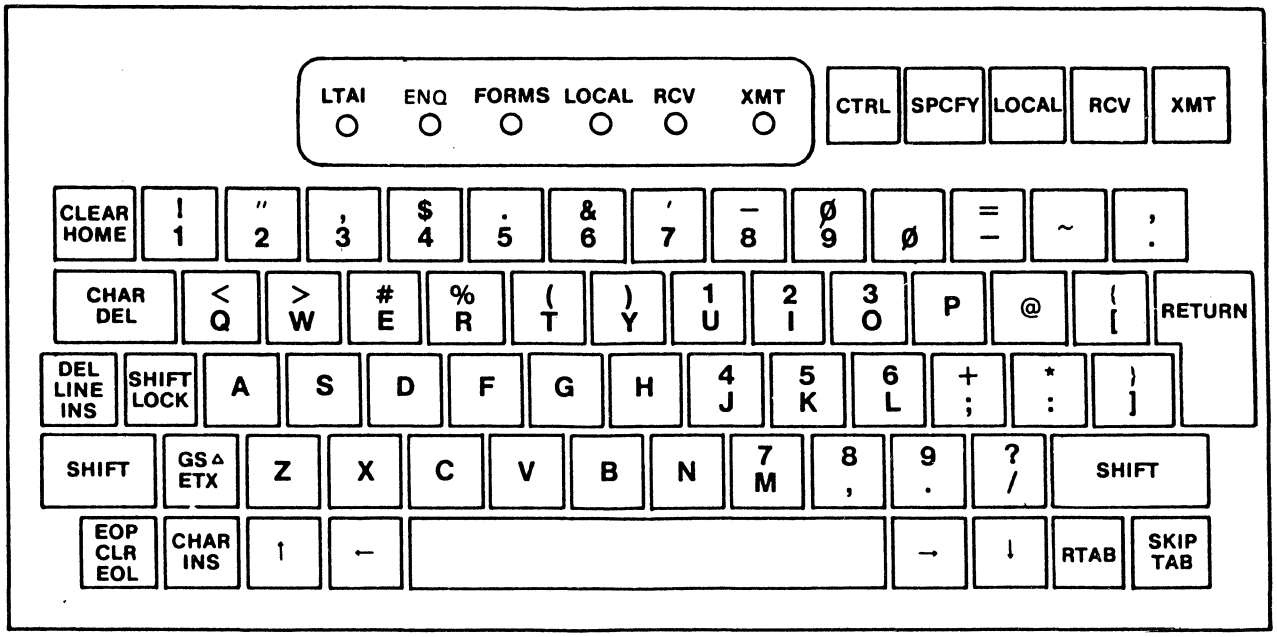


Figure 3-2. Modular Terminal Keyboard

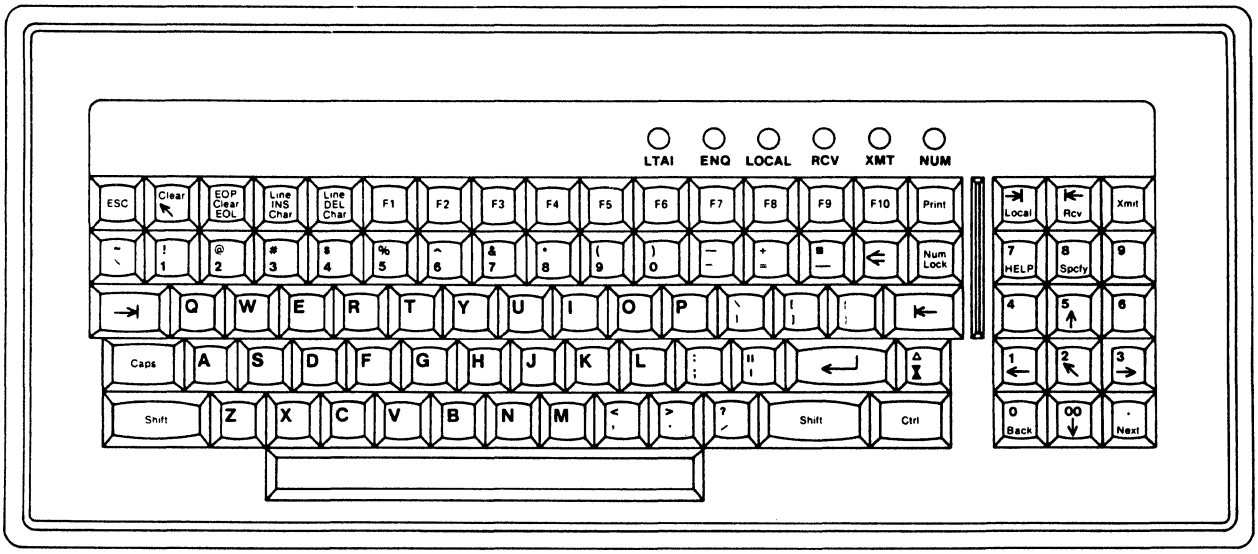


Figure 3-3. Ergonomic Terminal Keyboard

SECTION 4
OPERATION

GENERAL DESCRIPTION

This section provides step-by-step instructions for the power on cycle and the power off cycle of the system. It includes a description of the media needed.

BASIC REQUIREMENTS

In order to initialize the system, the following steps are required:

1. A H/L pack must be available. A H/L pack is on containing a basic directory structure, a CMed MCP of an appropriate version, (for B 7900 systems, Mark 3.4) a Peripheral-Configuration Diagram (PCD), and optionally, a GROUP from a configuration file.
2. The appropriate CONTROLWARE (firmware) must be loaded into the DPDC(s) (Disk Pack Drive Controller(s)) which controls the unit to be used to accommodate the H/L pack.

Halt/Load Pack

The H/L pack may be created in two ways - on another B 7900 system or by using the SYSTEM/LOADER program on the B 7900 itself. To create an H/L pack on another B 7900 system, it is necessary to do the following:

1. While the system is running, RC or LB the pack so that it is suitably labelled.
2. Copy the MCP from the SYSTEMB7900 tape to the pack.
3. Mark the copied MCP as the H/L MCP on that pack via the CM <MCP name> ON <familyname> ODT command. (This causes the current configuration information and PCD to be copied to the pack.)
4. Power off the pack and take it to the new B 7900 system.
5. Use SYCON to H/L the system and specify the new pack as the H/L pack.

CAUTION

This operation can be extremely dangerous if the B 7900 system, where the CM is being performed, has a configuration file which is incompatible with the configuration of the new system being brought up. The new system may not be able to H/L.

To create an H/L pack on the B 7900 itself, it is necessary to use the SYSTEM/LOADER program, as described in detail later. SYSTEM/LOADER is contained on the SYSTEMB7900 tape, and must be loaded into the system by using the TAPELOAD or PACKLOAD function of SYSTEM/UTILOADER.

COLD/COOL/WARM STARTS

The following paragraphs discuss the different kinds of starts.

Cold Start

By definition, an MCP must be loaded (via the LOAD command) during Cold Start. Optionally, a CATALOG and/or a CONFIGURATION file may also be loaded (via LOAD command) during Cold Start. No matter which files are loaded, the following rules must be followed:

1. If a CATALOG is to be loaded, it must be loaded first.
2. The MCP must be loaded after the CATALOG (if any) and before the CONFIGURATION file (if any).
3. If a CONFIGURATION file is to be loaded, it must be loaded last. These rules have been established to make disk space allocation for these files more orderly and thereby enable the LOADER to check for possible file overlap (where MCPADDRESS and/or CATALOG address commands are being used).

Cool Start

A Cool Start is a LOADER run which results in a new MCP being loaded to the H/L unit while preserving the current disk directory. This is done as long as none of the LOADER commands, which force a Cold Start, are executed. Upon executing the STOP statement, the LOADER halt/loads the system and brings it up on the newly loaded MCP.

Warm Start

A Warm Start is a LOADER run in which the H/L units directory is left intact and no new MCP is loaded. An example of a Warm Start is a LOADER run which loads disk pack controller firmware and halt/loads. Warm starts are now implemented for all machines. If the STOP command is entered and no MCP is loaded, the LOADER checks MCPINFO for the name of the MCP (if any). If an MCP is located, the LOADER halt/loads to this MCP. If no MCP is located, the LOADER prompts the user to enter a LOAD MCP command. The LOADER loads this MCP and halt/loads (Cool Start).

Cold Start Instructions

The following are step-by-step instructions for the initial start up of a B 7900 system.

Start up requires that a good, initialized (IVRed) pack be mounted on a suitable pack drive for use as the H/L unit. (If the pack is not IVRed properly, run PTD/CONF/IVR on line.) The pack must be powered up and the controller ready.

Start up requires the SYCON/UTILODER ICMD (Industry Compatible Mini Disk) which contains the SYCON and the UTILOADER programs.

NOTE

The functions work with the ICMD in either of the drives in the leg of the system console.

Start up also requires the SYSTEMB7900 tape. It contains the non-diagnostic version of the MCP. The necessary DPDC firmware files are also needed and may be found on the SYSTEMB7900 tape.

If there is no valid MCP on disk, a Cool Start or Cold Start of the disk must be performed. (Cold start is only necessary when the FLAT directory must be rewritten). UTILOADER must be loaded and its TAPELOAD or PACKLOAD function used to load SYSTEM/LOADER. Then SYSTEM/LOADER is run to establish a basic disk directory structure, to copy the MCP code file and CONFIGURATION file from tape to disk, to specify a GROUP or PCD, and to initiate a halt/load.

SECTION 5
SYCON

GENERAL DESCRIPTION

SYCON is used to initialize and start a B 7900. These are the steps to follow to run SYCON:

1. At the system console, power it off and on or press CNTRL Q CNTRL if something else is already running.
2. Load the SYCON ICMD (Industry Compatible Mini Disk) into either of the ICMD disk stations in the leg of the console.
3. Type in SYCON and press XMIT.

NOTE

<etx> is not needed at the end of lines to be transmitted.

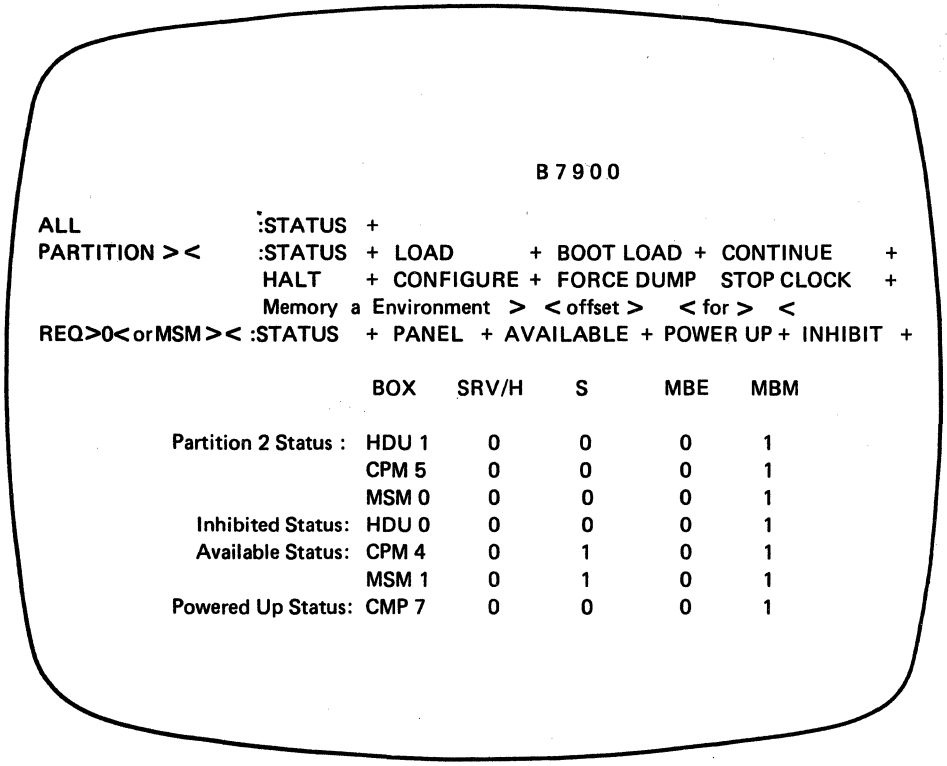
Messages indicating that SYCON is loading and is initializing are displayed. It takes about a minute to 75 seconds for SYCON to load. The Initial Menu is displayed when SYCON is finished initializing. This is the primary operational menu. Requests may be made on this menu at the system level, at the partition level, or at the individual box level.

Pressing SPCFY after the words ALL :STATUS displays the status of all the system mainframe components. This is the only system level button.

On the STATUS displays, a box is marked "Powered Down" if it is physically present, but powered down. It is marked "Powered Up" if it is physically present and physically powered up. Pushing the Powered Up button on a box in the Powered Up state initiates the power up sequence for the box, then puts the box in INHIBIT.

Other fields in the status display are:

Halt/SRV	For requestors, a halt indicator; for MSMs, the Storage Request Valid indicator.
Running	Running Light
MBE	Maintenance Bus Enabled
MBM	Maintenance Bus Mode switch



SYCON - ALL Status Display

Partition Level

NOTE

The following commands: STATUS, LOAD, BOOT LOAD, HALT, CONTINUE, CONFIGURE, FORCE DUMP, STOP CLOCK, and Memory Display can only be performed for a specific partition. The partition is indicated by filling in the field "PARTITION > <" with a number and transmitting. For every button except STATUS, the maintenance bus must be enabled to all boxes in the partition. Except for STATUS, HALT, FORCE DUMP, and STOP CLOCKS, the buttons are operative only when the partition is halted (e.g., the running lights are off in every box in the partition).

STATUS

Pressing SPCFY after the word "STATUS" on the second line shows the status of the boxes in the partition. The maintenance bus may or may not be enabled. The partition may or may not be running.

LOAD

This causes a H/L of the specified partition. To load the system, it must first be halted. (See HALT below.) Once the system is halted, position the cursor after the word "LOAD," and press SPCFY. The message:

Press SPCFY to LOAD

is displayed to make sure you really want to load the system. Press SPCFY.

The messages:

MSM 0 ETIS

HDU 0 ETIS

CPM 4 ETIS

etc.

are displayed alternately for each box in the partition. The system halt/loads and an Automatic Display Mode (ADM) screen appears on the ODT in about 2 minutes, depending on the amount of memory on the system. Internally, the BOXID registers are checked to locate the H/L Processor, HDU and MSM. The Execute To Initial State is done for each box in the partition. The H/L parameter is written to the H/L MSM. DUMP BOOT interrupt for the H/L HDU is placed in the H/L MSM. Finally, the clocks are turned on for all the boxes in the partition with the H/L MSM being the last one.

BOOT LOAD

See SYSTEM INITIALIZATION - UTILOADER.

CONTINUE

If the system is successfully halted with the HALT button, pressing SPCFY after the word "CONTINUE" gets it running again. Internally, a continue interrupt is placed in the H/L MSM for each requestor in the partition. The clocks are turned on with the H/L MSM being the last one.

HALT

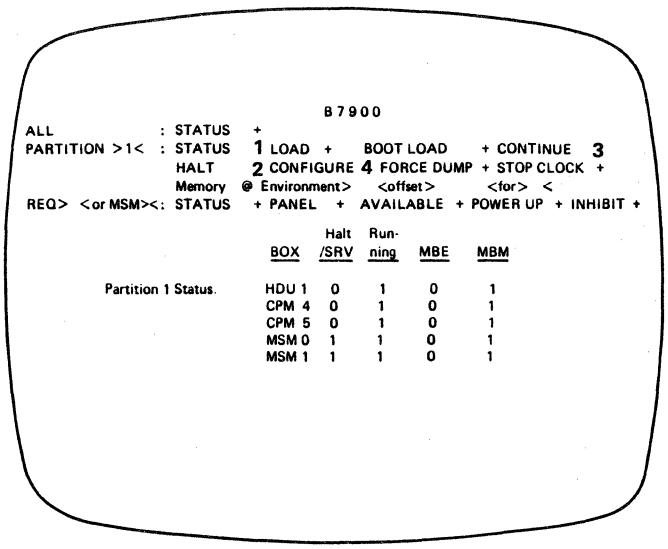
On the Initial Menu, position the cursor after the word "HALT," and press SPCFY. The message:

Press SPCFY to HALT

is displayed to make sure you really want to halt. Press SPCFY. The message:

Partition Halted

is displayed and the status of the mainframe modules within the halted partition is displayed. Wait 20 to 30 seconds for the Running column to have a 0 for each of the modules, with the exception of the maintenance modules. The system is now brought to a CONTINUEable halt. Internally, the CPM(s) are put in single instruct. A soft halt is sent to the AP(s). The halt bit in the HMC is set for the HDU(s). Finally, the clocks are stopped on the HDU(s), AP(s), and MSM(s). The CPM(s) clock is left running, but its MSM interface is disabled.



1 cursor position to see partition status
2 cursor position to halt the partition
3 cursor position to continue running
4 cursor position to get the Configuration Menu

SYCON - Partition Status Display

CONFIGURE

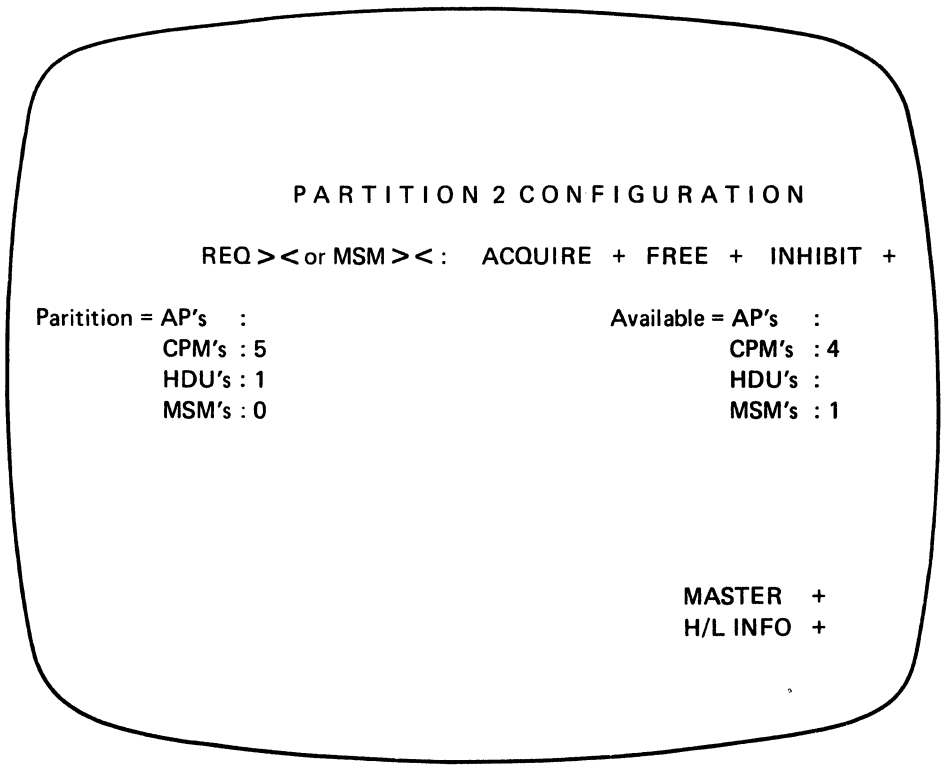
Before going to the Configuration Menu, you must first halt the partition as explained in the previous paragraph. Pressing SPCFY after the word "CONFIGURE" displays the Configuration Menu.

This menu is used to construct a partition. It shows what components are in the partition and what components are available to the partition.

NOTE

This menu lists only the usable boxes; it does not list boxes assigned to other partitions, Inhibited, just powered up, Maintenance.

Pressing SPCFY after the word "ACQUIRE" brings a component that is AVAILABLE into the partition. The SIE register is set to enable the boxes in the partition (for an MSM this means to enable all requestors in the partition; for a requestor, to enable all MSMs). The PID is set to the current partition number. Then the clocks are off. Pressing SPCFY after the word "FREE" takes a component out of the active partition and makes it Available to all partitions. The internal steps taken are the same as those described for the AVAILABLE button on the Initial Menu. Pressing SPCFY after the word "INHIBIT" takes a component out of the active partition. This is usually used for broken boxes. The internal steps taken are the same as those described for the INHIBIT button on the Initial Menu. At the bottom of this menu, you can SPCFY after MASTER to get back to the Initial Menu or after H/L INFO button to get the H/L Info Menu.



SYCON - Configuration Menu

H/L INFO Menu

This menu operates on behalf of a partition. It is invoked by pressing the H/L INFO button on the Configuration Menu. The menu is used to establish or display the H/L parameters for the partition. Upon switching to the menu, the initial state display is formed by extracting the information from the currently marked H/L HDU, if any. When a new H/L HDU is designated, the display is updated from that HDU RAM.

SYCON defers writing the information obtained from the input fields until a request is made to switch to another menu. At that time, SYCON:

Stores the information in the H/L RAM of the H/L HDU.
Updates the BOXID registers of the boxes in the partition to mark the H/L Processor, MSM and HDU.
In the H/L MSM, establish translation tables for each RIA marking a valid environment zero/page zero; other environments are indeterminate. The physical memory selected to contain the logical address zero is the lowest available physical memory.

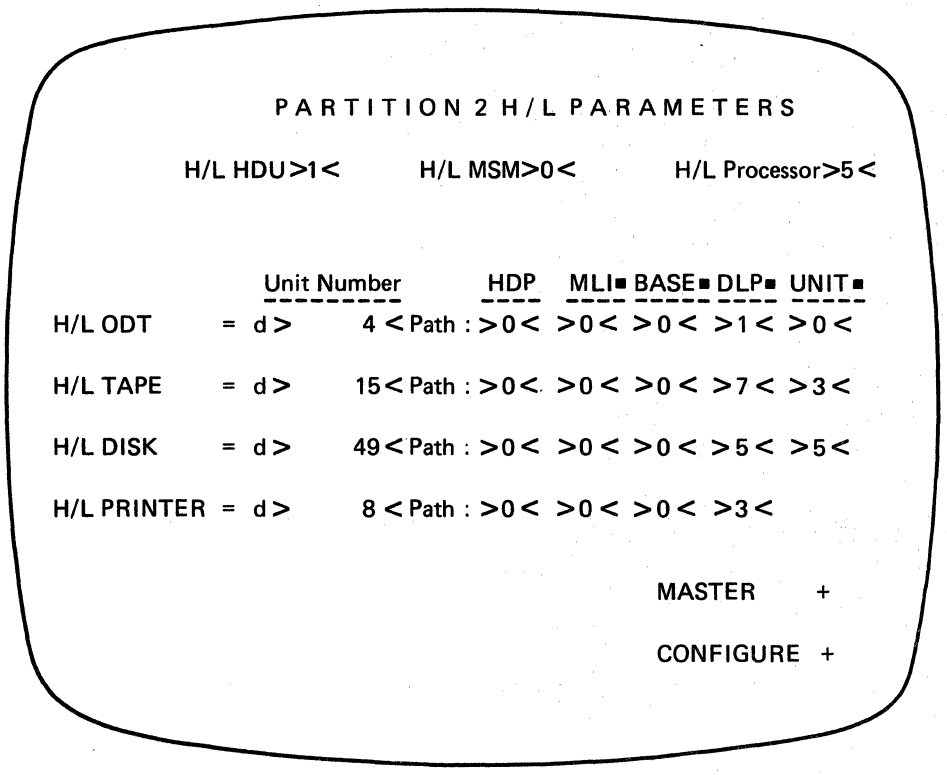
The H/L Info is specified in various input fields and includes:

H/L HDU; this is the HDU expected to do the I/O operations used during the system initialization procedure (LOAD or BOOT LOAD). Further, it is the HDU into which RAM SYCON writes the H/L Info, including the minimal peripheral configuration info.

H/L MSM; SYCON establishes an environment zero in this MSM. It is expected to be used by the H/L HDU and H/L processor.

H/L Processor; the processor to be used.

Minimal Peripheral Configuration: this designates units and paths within the H/L HDU to be used for system initialization activities. Peripheral information is entered in decimal. (See the Minimal Peripheral Configuration section for more information.)



SYCON - Halt/Load Info Menu

At the top of the H/L Info Menu, "H/L HDU > <", "H/L MSM > <", a "H/L Processor > <" are displayed. These can only be specified one at at time.

The rest of the screen contains the H/L peripheral information. The unit number and the path information is displayed for each peripheral. The path information includes HDP (the number of the HDP in the H/L HDU), MLI @ (the port number of the MLI relative to the HDP), BASE 0 (the address of the base relative to the LEM), DLP @ (the address of the DLP relative to the base), and UNIT @ (the address of the unit relative to the DLP).

This information is contained in partial fields which means the whole line must be filled in before transmitting. If you fail to do so, the message:

Cursor in partial fields

is displayed. At the bottom of this menu, you can SPCFY MASTER to get back to the Initial Menu or CONFIGURE to get back to the Configuration Menu.

FORCE DUMP

Pressing SPCFY after the words "FORCE DUMP" initializes the MCP dump procedure for a Standalone Tape Dump. This requires an "OK" response. Internally, various processor registers are saved. For CPM(s), the TOS registers are pushed and the Store Queue is purged. The H/L parameter in main memory is modified to specify a dump rather than a H/L. The saved registers are written to memory and finally, a load is done.

STOP CLOCK

Pressing SPCFY after the words "STOP CLOCK" stops the partition by stopping the clocks on the various boxes. You need to press the SPCFY button after LOAD or BOOT LOAD to get the partition running again. Also, a dump taken following a STOP CLOCK specification may show a variety of MCP failures brought on by this procedure.

Memory Display

Fill in the environment number after:

Memory @ Environment > <

Fill in the address after the word:

offset > <

Fill in the number of words you wish to look at after:

for> <

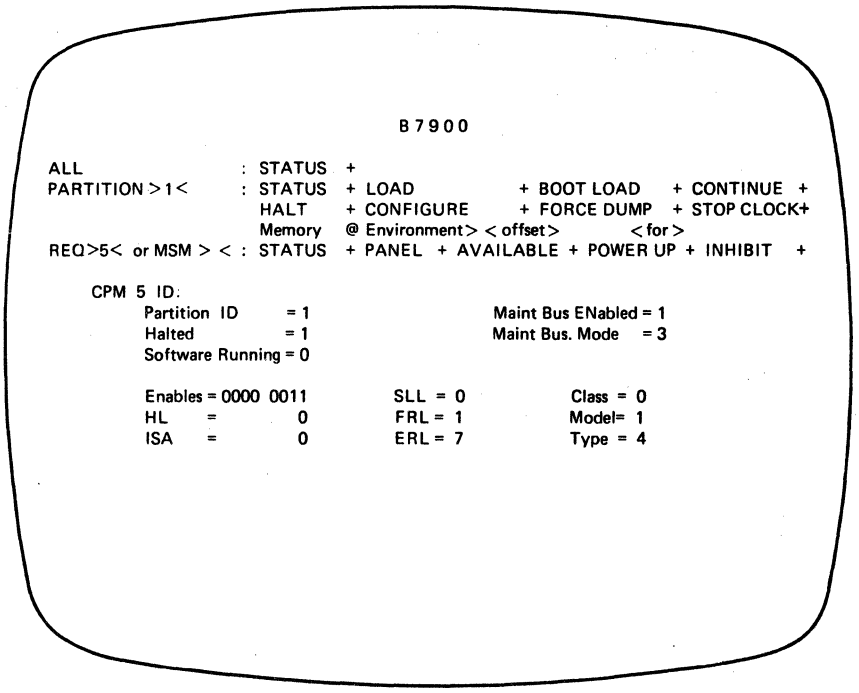
and then press XMT. All three of these items must be filled in before you press XMT because each one is a partial field. This display is by logical address. Internally, SYCON searches through all the MSMs in the partition to find and display the data from the specified environment.

BOX LEVEL

Place a CPM or HDU number in the field "REQ > <", or place an MSM number in the field "or MSM> <" and press XMT. Now the following can be done:

STATUS

Pressing SPCFY after the word "STATUS" displays the status of the box. If the maintenance bus is enabled, additional information is given.

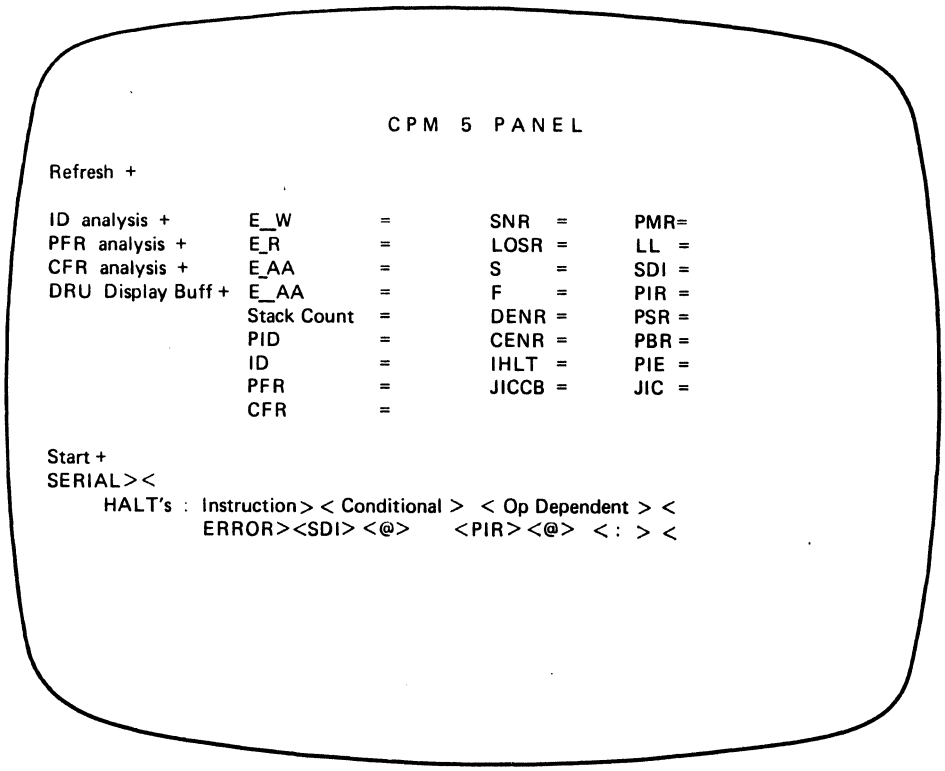


SYCON - Box Level Partition Status Display

PANEL

Pressing SPCFY after the word "PANEL" displays a menu which provides functions unique to the type of the box (e.g., CPM, MSM, HDU). In every case, the maintenance bus must be enabled or SYCON generates an error and remains on the Initial Menu. A PANEL display can be done on any box in which the running light is off. For the CPM, the PANEL may be used with the running light on (which implies that for the CPM, the MBM switch selects unconditionally enabled). In using the CPM Panel when the CPM is running, be sure to take note of the exceptions listed under the CPM Panel section.

Each box type has a primary menu, of which the state is obtained from the hardware and displayed. This primary menu has sub-panel buttons which may be used to obtain additional state displays.



SYCON - Processor Panel Display

CPM Panel

The CPM Panel may be used when the partition, and the CPM are not running. The maintenance bus must be enabled. This occurs when the CPM MBM switch selects "system" and the CPM running light is out (previously discussed under Maintenance Interface).

The CPM Panel is the only box panel which may also be used when the partition, including the CPM, is running. In order to enable the maintenance bus to the CPM while its running light is on, the CPM MBM switch must select unconditionally enabled. Special considerations for using this mode are:

A given updated panel may be utterly inconsistent, because the process which obtains the data from the hardware operates over many CPM clocks; the only time a display is a snapshot rather than a blur is when the CPM is halted.

Some state normally displayed on the CPM Panel from a halted CPM cannot be accessed while the CPM is running. SYCON substitutes blanks for these state values.

Pushing the REFRESH button on the CPM Panel causes SYCON to update the display from CPM state.

Of the writeable state on this panel, Conditional Halt, Instruction Halt, Operator Halt and Error Halt may be set anytime, even if the box is running. PIR Halt, SDI Halt and Serial Mode may be set only if the box is not running.

For the START button, its effect depends on the setting of the various halt switches; for example, if Instruction Halt is set, one instruction is executed, then the CPM again halts.

Hardware resets the PIR and SDI HALT switches after each push of the START (or LOAD) button.

Control from the CPM Panel is over that CPM only, and not over any other box in the partition.

Primary CPM Menu

REFRESH	Causes the display to be updated from machine state.
MASTER	Returns to the Initial Menu.

The contents of the various registers displayed on this menu depend on whether the CPM is running or halted, and if halted, whether it is at an orderly halt or in some crashed state. The following lists the contents seen at an orderly halt.

E__W	(See Stack Count) value from TOS (Top Of Stack)
E__R	(See Stack Count) value from TOS-1
E__AA	(See Stack Count) value from TOS-2
E__AS	(See Stack Count) value from TOS-3
Stack Count	Marks which of E__W, E__R, E__AA, E__AS are valid: 0 = E__W valid 1 = E__W, E__R valid 2 = E__W, E__R, E__AA valid 4 = E__W, E__R, E__AA, E__AS valid
PID	Program Instruction Decode
ID	BOXID
PFR	Processor Fault Register
CFR	Condition Fault
SNR	Stack Number
LOSR	Limit Of Stack
S	Top of Stack
F	Stack History Head
DENR	Data Environment Number
CENR	Code Environment Number
IHLT	I Section Halt Bit
JICCB	Job Interrupt Controller, Conditional Branch
PMR	Processor Control Mode
LL	Lexic Level
SDI	Segment Dictionary Index
PIR	Program Index Register (program word)
PSR	Program Syllable Register (index of byte within word)
PBR	Program Base Register
PIE	PCU Instruction Execute Register
JIC	Job Interrupt Controller

The following items are settable:

Instruction	Instruction halt (single instruct)
Conditional	Conditional Halt
Op Dependent	Op Dependent Halt
Error	Error Halt
SDI	This has two input fields, one for the SDI HALT switch and one for the SDI value.
PIR	This has three input fields: the PIR Halt switch, the program address word index value (PIR) and the syllable index value (PSR).
Start	The start button; the action for this depends on the setting of the various halt switches.
Serial	Serial Mode

Sub-panels are invoked by pushing the appropriate button on the primary menu.

ID analysis	Breakdown of BOXID register.
PFR analysis	Breakdown of the PFR register.
CFR analysis	Breakdown of CFR register.
DRU Display Buff	Shows DRU display buffer.

AP Panel

An AP panel may be selected only when the AP is not running.

Master	Returns to the Initial Menu
Arof	A Register Valid indicator
A	A register; when Arof = 1, is the value from TOS
X	Extension of A register
Brof	B Register Valid indicator
B	B register; when Arof = 0, Brof = 1, is the value from TOS; when Arof = 1, Brof = 1 is the value from TOS-1
Y	Extension of B register
PMR	Processor Mode Register
ID	BOXID Register
P	Instruction Decode Register
D0	Base of Segment Dictionary or Activation Record for LL 0.
D1	Base of Segment Dictionary or Activation Record for LL 1.
D2	Base of Activation Record for LL 2
DLL	Base of Activation Record for current LL
LOSR	Limit Of Stack
S	Top of Stack
F	Stack History Head
BOSR	Base Of Stack
LL	Lexic Level
SNR	Stack Number
SDI	Segment Dictionary Index
PIR	Program Index Register (program word)

PSR	Program Syllable Register (index of byte within word)
MERHLD	Holding due to Memory Error
PBR	Program Base Register
PLR	Program Limit Register
DENR	Data Environment Number
CENR	Code Environment Number
ERR	Error associated with MERHLD

The following items are settable:

Conditional	Conditional Halt
ODI Error	Halt on Operator Dependent Interrupt Error
Alarm	Halt on Alarm Interrupt
Instruction	Instruction halt (single instruct)
ODI Service	Halt on Operator Dependent Interrupt Service Error
Super Alarm	Halt on Super Alarm Interrupt
External	Halt on External Interrupt
SDLL, SDI	Three input fields: the first is the Halt switch, the second and third specify lexic level (0 or 1) and an SDI value.
PIR : PSR	This has three input fields: the PIR Halt switch, the program address word index value (PIR) and the syllable index value (PSR).

Sub-panels are invoked by pushing the appropriate button on the primary menu.

ID analysis	Breakdown of BOXID register.
STATE display	Subsurface state display, including Halt Reason.

HDU Panel

An HDU Panel may be selected only when the HDU is not running.

MASTER	Returns to the Initial Menu
ERSTOP	Halt on QM hardware error
PESTOP	Halt on QM bus parity error
PHSTOP	Halt on QM microcode address error
PHALT	Indicates halted due to PHSTOP
ID	BOXID register
DPE	Data Parity Error
QMF	QM Fail Register
RPA	QM Current Microcode Address
QCY0	Cycle flip-flop zero
QCY1	Cycle flip-flop one
HMK	HDP Mask register
FAULT CW	Fault Control Word
SAQF	Suspend All Queues Flag
HALT FLAG	Indicates HDU is halted
ENV REG	Memory Environment of HAQPTR and ECQPTR
HAQPTR	Home Address Queue Pointer
ECQPTR	Error Command Queue Pointer

Sub-panels invoked by pushing the appropriate button on the primary menu:

ID display	Breakdown of BOXID register.
MBC display	Selected hardware fields of the MBC are displayed.
FCW analysis	Analysis of FAULT CW is performed.

Sub-panels invoked by entering a value in the appropriate field on the primary menu:

HQ display	The specified HQ is displayed.
Fault Buffer	The specified Fault Buffer is displayed.

MSM Panel

An MSM Panel may be selected only when the MSM is not running.

MASTER	Returns to the Initial Menu
ID	BOXID register
FAIL	Fail register
SROW	Error stop parameters
ZERROR	ERSTOP occurs
ERSTOP	Error Stop switch
RQIN	Requestor Inhibit Mask
RN0F	Requestor associated with MIA0
RN1F	Requestor associated with MIA1
RN2F	Requestor associated with MIA2
RN3F	Requestor associated with MIA3
RNSF	Requestor associated with EREP

Sub-panels invoked by pushing the appropriate button on the primary menu:

ID display	Breakdown of BOXID register
FAIL display	Breakdown of Fail register
SROW display	Breakdown of SROW, Error stop parameters may be updated
Failed CW display	Displays the failed CW and its breakdown
RINT display	Requestor Interrupts
PRI display	Displays selected hardware fields from PRI1, PRI2, and PRI3

The RIA display is invoked by entering an RIA number.

The MSM translation tables may be displayed by entering the environment number in the translate tables for environment field. The contents of memory locations can be displayed by entering the physical address (MSM relative) of the first word to be displayed, and the number of word to be displayed in the read memory @ address fields. The contents of a single word may be read and then altered by entering its address in the write memory @ address field, and then altering the displayed data.

AVAILABLE

Pressing SPCFY after the word "AVAILABLE" causes the box, if it is INHIBITed, to be AVAILABLE for use in the partition. Internally, an Execute To Initial State is done to the box. The SIE register is set to all enabled. The PID is set to AVAILABLE. Finally, the box clock is turned on.

POWER UP

Pressing SPCFY after the words "POWER UP" causes the box to be powered up and put in the INHIBIT state. The box may initially have been in INHIBIT, POWERed UP, or MAINTENANCE. The logical POWER UP sequence is done, followed by the steps described for the INHIBIT button. The Power Up steps vary depending on the box type:

MSM	The configuration registers for each MSU are set. All available MSUs have their storage smeared with a data pattern of fives. This flushes any parity errors which may have resulted from a physical power up of the MSM. Finally, the steps described for the INHIBIT button are performed.
CPM	The steps described for the INHIBIT button are performed.
HDU	The QM microcode is loaded. (Note that the ICMD containing the microcode must be in an ICMD drive.) The steps described for the INHIBIT button are performed.
AP	The AP microcode is loaded. (Note that the ICMD containing the microcode must be in an ICMD drive.) The steps described for the INHIBIT button are performed.

INHIBIT

Pressing SPCFY after the word "INHIBIT" causes the box, if it is AVAILABLE, to be INHIBITed. Internally, the SIE register is set to all disabled. The PID is set to INHIBIT. Finally, the clock is left off.

POWER UP INSTRUCTIONS FOR B 7900 SYSTEMS

Power on the terminals and physically power up each box by pushing the power on button located at the base of each box. Then use SYCON to logically power up each box and make them available for partitioning by doing the following:

Use the Initial Menu to power up each box, then to make the box AVAILABLE; for each box:

Enter the box number in the REQ field (for HDUs, and APs) or the MSM field.

Push the POWER UP button; this puts the box in Inhibit.

Push the AVAILABLE button.

Enter the partition number on the Initial Menu, and then press the CONFIGURE button; this selects the Configuration Menu for that partition.

The Configuration Menu lists all AVAILABLE boxes. For each box to be used in the partition:

Enter the box number.

Push the ACQUIRE button.

On the Configuration Menu, push the H/L INFO button; this selects the H/L Info Menu; use this menu to specify the H/L parameters; (e.g., the H/L disk).

On the H/L Info Menu, push the MASTER button to return to the Initial Menu.

On the Initial Menu, press the BOOT LOAD button to initiate UTILOADER or, if the disk is already initialized, press the LOAD button for a halt/load.

To halt a running partition, the physical MBM switch must be in the unconditionally enabled position. On the Initial Menu, enter the number of the partition you wish to halt. Push the HALT button. Push the STATUS button to observe when all boxes in the partition have their running lights off. In certain hardware "runaway" situations, some boxes in the partition do not respond to the HALT request and their running lights remain on. In this case, you must push the STOP CLOCKs buttons; a partition halted by stopping the clocks cannot be CONTINUEd, and you have to LOAD or BOOT LOAD.

When it appears that a partition is not running (e.g., not responding to ODT commands, tapes or printers not moving), use the partition STATUS button to see if the partition has halted. If it has, then the various box panels may be used to determine the reason for the halt (e.g., the CPM Panel may be used to see if any processor has a Dead Stop).

To restart a previously constructed partition, use the Initial Menu to specify the partition number, then LOAD or BOOT LOAD.

Boxes can be added to or subtracted from a running partition only by entering ACQUIRE and FREE commands at a system ODT; they cannot be added or subtracted using SYCON. However, when a partition is halted, boxes can be added or subtracted. Enter the partition number on the Initial Menu, then push the CONFIGURE button; this switches to the Configuration Menu. Use it to add or delete boxes.

NOTE

If you delete the H/L Processor, MSM or HDU from a partition, you have to use the H/L INFO Menu to specify their replacement.

ERROR NUMBER INTERPRETATION

Some errors detected in SYCON are reported as two numbers, a CLASS value and a SUBCLASS value. CLASS locates where the error in the software is detected. SUBCLASS identifies a particular error. Not all values of SUBCLASS are valid for every CLASS.

The following lists the CLASS and SUBCLASS values that are helpful in locating a problem caused by a hardware failure or an operational error. Other values may be displayed; these must always be included on a QPN, ITR or FTR describing a problem. Except where noted in the CLASS list, SUBCLASS is interpreted:

SUBCLASS IS

- 03 COPY_NOT_SAME: In an attempt to fetch a duplicated item, one of the values of a copy does not match. Currently, this only occurs on an AP access and implies an AP error.
- 09 MSM_FAILURE: Error on memory access, see MSM FAIL register.
- 0A NO_FILE: Attempt to load, for example, stored logic, but correct file not available on currently active floppys.
- 0B EMPTY_FILE: Corrupted file.
- 0C BAD_FILE: Corrupted file.

CLASS IS

- C MAM_CLEAR: CLEAR issued over maintenance bus.
- 10 MAM_PULSE: Clocks being issued over maintenance bus.
- 20 MAM_GET_FIELD: Data is being read over the maintenance bus.
- 24 MAM_SET_FIELD: Data is being read or written over the bus.
- 30 LDR_HARD: Stored logic or UITLOADER is being loaded. In this CLASS, SUBCLASS contains a MIP D-status value.
- 34 LDR_SOFT: Stored logic or UTILOADER load.
  SUBCLASS IS:
  - 01 BCC_ERR: On SIO bus (between MMTS2 and MIP).
  - 02 PROTOCOL_ERR: On SIO bus (between MMTS2 and MIP).
- 38 LDR_LOAD: Stored logic or UTILOADER is being loaded.
- 40 MIM_HARD: hardware error during bus operation. SUBCLASS is MIP D-status value.
- 44 MIM_SOFT: SUBCLASS is as LDR_SOFT.
- 80 SAM_GET_MODULE: attempting to acquire a box.
- 84 GET_FIELD: (as class 20).
- 88 SAM_GET_FIELD: (as class 20).
- 8C SET_FIELD: (as class 24).
- 90 SAM_GET_FIELD: (as class 24).
- 94 SAM_GET_VECTOR: (as class 20,24).
- 98 SAM_SET_VECTOR: (as class 20,24).
- 9C SAM_SMEAR_VECTOR: (as class 20,24).

MIP D-Status

The D-status is an 8-bit field: the first three bits identify the device giving the error, and the last five bits are a device dependent error code. D-status values are generated by the hardware; SYCON just displays them. A partial list:

Device	D-status	Is
0		EXECUTE or self-test of the MIP.
	01	Memory Error.
	02	ALU error.
	03	FLAG error.
	04	HCP error (can also be caused by bad MEX).
	05	BDI (Testbus) error.
	06	Floppy error.
1		MIP.
	22	Out of memory.
	23	Invalid D command sent.
3		ICMD.
	61	The selected drive is NOT READY.
	62	Cylinder address error during write or read.
	63	Sector address not found during write or read.
	64	Address CRC error during write or read.
	65	Data CRC error during read.
	66	MMTS2 requested an invalid cylinder address.
	67	MMTS2 requested an invalid head address.
	68	MMTS2 requested an invalid sector address.
	69	Firmware not in sync with the formatter firmware.
	6A	Could not load head.
	6B	Could not unload head.
	6C	Could not find track 0.
	6D	Timeout while looking for data sync byte.
	6E	Timeout while looking for address mark.
	6F	Invalid bad track address received from MMTS2.
	70	MMTS2 requested read PHYSICALLY DELETED sector.
	71	MMTS2 requested read LOGICALLY DELETED sector.
	72	Could not define the current deleted sector as either physically or logically deleted.
	73	Timeout while waiting for a data mark.
	74	Over 75 disk rotating at wrong speed.
	76	Drive is made NOT READY then READY again.
4		Testbus.
	81	NAK received.
	82	Data exhausted.
	83	Timeout sending.
	84	Timeout receiving.
5		MEX/MIP/MP.
	A0	MEX not captured, after 10,000 retries.

1166162

(continued)

Device	D-status	Is
	A5	AMP system error.
	A8	AP-MP detected command parity error.
	A9	AP-MP detected data parity error.
	AA	AP-MP data compare error (typically during microcode load).
	AB	AP-MP failed self-test.
	AD	MEX detected parity error.
	AE	AP-MP comparitor test error.
	B1	Timeout: No ACK from MEX (detected by MIP).
	B2	Unexpected ACK (detected by MIP).
	B3	MP PROM parity: from AP only (AP failure).
	B4	Odd number bytes on transfer from MMTS2 to MIP.
	B5	Bad parity on xfer from MEX to MIP.

SECTION 6
UTILOADER

GENERAL DESCRIPTION

The B 7900 minimal configuration is a list of mainframes and peripheral devices which is provided to primitive system software which does not have access to or knowledge of the peripheral configuration diagram. This software includes the UTILOADER, the LOADER, the BOOT and certain primitive portions of the MCP (GETITGOING and Standalone Tape Dump). Included in the minimal configuration are the H/L HDU id, the H/L CPM id, the H/L MSM id and the device number and paths for the H/L ODT, H/L tape unit, H/L disk pack unit and H/L printer.

The minimal configuration is specified using the H/L Info Menu. SYCON stores this info in the H/L HDU RAM according to the following map:

Word	Contents
246	Device Number for the H/L disk.
247	Address word for the H/L disk.
248	Device Number for the H/L ODT.
249	Address word for the H/L ODT.
250	Device Number for the H/L tape.
251	Address word for the H/L tape.
252	Device Number for the H/L printer.
253	Address word for the H/L printer.
254	H/L MSM id (used by hardware).
255	H/L CPM id (used by hardware).

NOTE

The system software has no way of verifying the device numbers for the peripherals in the minimal configuration until MCP peripheral initialization is complete. The path information is used to perform the I/O operations and the device numbers are used for display purposes only.

It is strongly recommended that the minimal configuration be completely specified to SYCON, but the actual subset depends on the functions to be invoked. The H/L ODT must always be specified. The H/L mainframe ids must be specified when the partition is initially established. The H/L tape must be specified for a BOOT LOAD. The H/L disk pack must be specified in order to H/L.

Other than SYCON, there are several operator interfaces for displaying and modifying the minimal configuration. The UTILOADER has a CONFIGURATION command which displays the information. It also allows the tape unit and disk pack unit to be specified or changed. The LOADER displays the configuration and allows the disk unit and the printer to be specified or changed. In addition, the LOADER allows the paths to another tape or disk unit to be specified for use during a specific LOADER command. The MCP displays and modifies the configuration information via the BOOTUNIT command.

All software uses the same displays and terminology when referring to the units in the minimal configuration.

The unit number is the device number of the unit as specified in the peripheral configuration diagram

(PCD). The path info is defined as follows:

HDP - The number (address) of the HDP in the H/L HDU.

MLI - The address (port number) of the MLI relative to the HDP.

BASE - The address of the base relative to the LEM (0 if no LEM).

DLP - The address of the DLP relative to the base.

UNIT - The address of the unit relative to the DLP.

SYSTEM INITIALIZATION - UTILOADER

UTILOADER is a system software program which loads the LOADER from a tape or pack. Due to file naming conventions, the file name on the ICMD is UTILODER. The UTILOADER is loaded by the system console through the use of the SYCON/UTILODER ICMD.

To load UTILOADER, perform the operations described in the beginning of the SYCON section until the Initial Menu is displayed.

Insert the SYCON/UTILODER ICMD into either of the two ICDM drive stations in the leg of the system console.

Position the cursor after the words "BOOT LOAD" on the second line. Press SPCFY. The message:

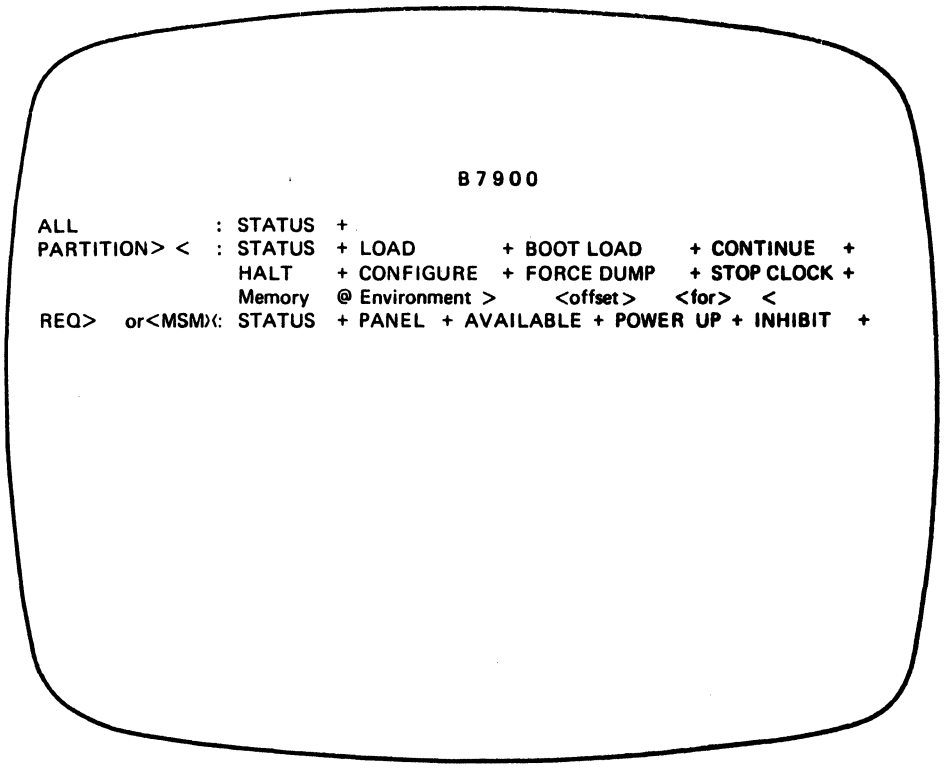
```
Press SPCFY to BOOT LOAD otherwise press XMT
```

is displayed at the bottom of the screen. This ensures that you really want to run UTILOADER. The cursor is still positioned after the words "BOOT LOAD," so press SPCFY again. At the bottom left-hand corner of the screen the messages:

```
MSM 0 ETIS
HDU 0 ETIS
CPM 4 ETIS
  etc.
```

are displayed for each box in the partition, followed by the message:

```
Loading UTILODER (<version>)
```



SYCON - Initial Menu

The message:

LOAD complete; clocks enabled

is displayed when the load is complete. At this point, SYCON has initiated the running of UTILOADER on the B 7900 partition. At the H/L ODT,

>>>UTILOADER <<<

VERSION nn.nnn.nn

is displayed in the center of the screen, and

TAPELOAD

CONFIGURATION

PACKLOAD

is displayed in the upper left-hand corner.

To see the minimal configuration, position the cursor on CONFIGURATION and press XMT. The configuration screen displays the H/L HDU, H/ MSM, and the H/L processor at the top, followed by the device numbers and the paths for the H/L ODT, H/L TAPE, H/L DISK and H/L PRINT. The configuration screen is only used for displaying the minimal configuration; it cannot be used to modify it.

To load from tape, position the cursor after TAPELOAD and press XMT. The ODT responds with the syntax for loading SYSTEM/LOADER. Type <filename> FROM <volumename> and press XMT. This loads the LOADER from the specified tape which is mounted on the H/L tape unit. The UTILOADER then tranfers control to the LOADER.

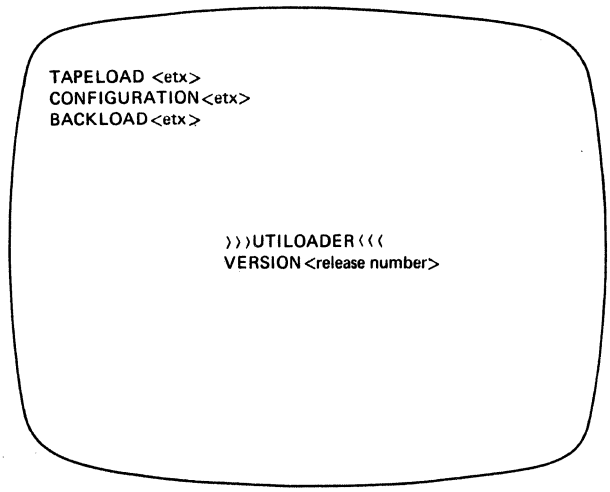
NOTE

There is additional syntax to the TAPELOAD command to specify the H/L tape unit and path if it has not already been specified in the H/L HDU RAM, or if you wish to change the path information at this point.

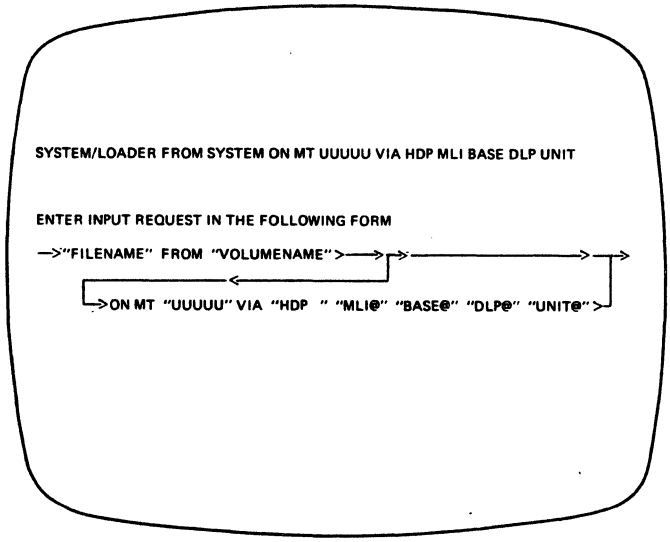
To load from pack, position the cursor on PACKLOAD and press XMT. The ODT responds with the syntax for loading SYSTEM/LOADER. Type <filename> FROM <volumename> and press XMT. This tranfers control to the LOADER.

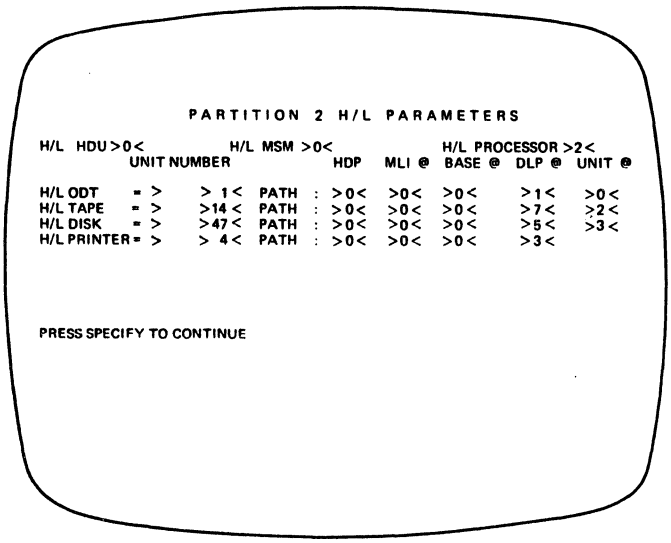
NOTE

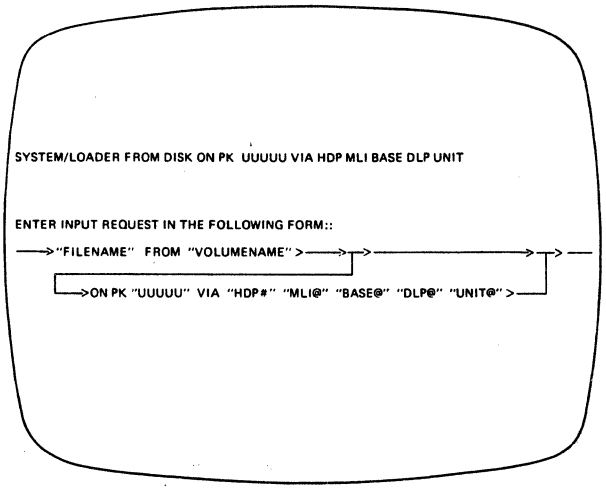
There is additional syntax to the PATHLOAD command to specify the H/L disk and path if it has not already been specified in the H/L HDU RAM, or if you wish to change the path information at this point.



UTILOADER MAIN (Initial Menu)


SYSTEM/LOADER FROM SYSTEM ON MT UUUUU VIA HDP MLI BASE DLP UNIT
ENTER INPUT REQUEST IN THE FOLLOWING FORM
—>"FILENAME" FROM "VOLUMENAME">
—>ON MT "UUUUU" VIA "HDP " "MLI@" "BASE@" "DLP@" "UNIT@">
UTILOADER (Tapeload Menu)


PARTITION 2 H/L PARAMETERS
H/L HDU >0< H/L MSM >0< H/L PROCESSOR >2<
UNIT NUMBER HDP MLI @ BASE @ DLP @ UNIT @
H/L ODT = > > 1< PATH : >0< >0< >0< >1< >0<
H/L TAPE = > >14< PATH : >0< >0< >0< >7< >2<
H/L DISK = > >47< PATH : >0< >0< >0< >5< >3<
H/L PRINTER = > > 4< PATH : >0< >0< >0< >3<
PRESS SPECIFY TO CONTINUE
UTILOADER (Configuration Menu)



UTILOADER (Packload Menu)

Internally, when UTILOADER is loaded, the BOXID registers are checked to locate the H/L Processor, HDU, and MSM. UTILODER is loaded from the ICMD to the H/L MSM. An Execute To Initial State is done on each box in the partition. The H/L Parameter and identification of the H/L MSM and HDU are written to the H/L MSM. Start interrupt for the H/L Processor is placed in the H/L MSM. Finally, the clocks are turned on for all the boxes in the partition with the H/L MSM being the last one.

UTILOADER Troubleshooting

Since UTILOADER is usually the first system program run after any major hardware change, it is the first place that many kinds of hardware failures show up. Furthermore, these failures tend to occur during program initialization, when error reporting capability is at its worst. A major design goal of the UTILOADER is to rely on as little hardware as possible to run, so it has the best chance to successfully transfer control to the programs which have more sophisticated error detection and recovery techniques.

It is extremely useful to have a compiled listing of UTILOADER available for troubleshooting.

The main tools for troubleshooting UTILOADER are the SYCON STATUS and PANEL screens. These can be invoked from the initial menu by inserting the halt/load processor ID into the "REQ > <" field, pressing XMT, positioning the cursor after the word "STATUS" or "PANEL" on the same line as the REQUESTOR field, and pressing SPCFY.

The most important information is:

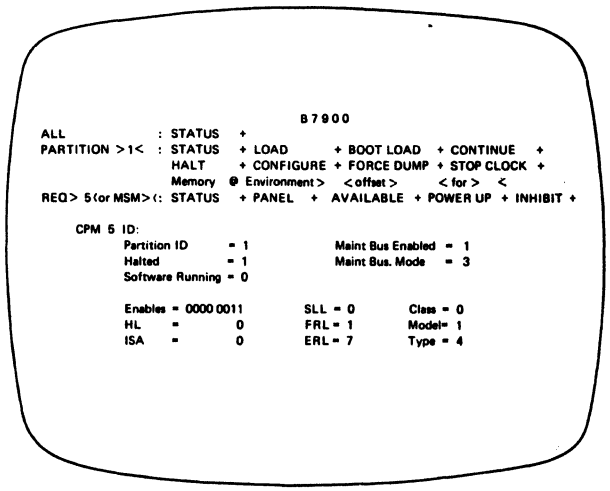
1. Software running (retrievable from SYCON).
2. The top of stack registers (A,B,X,Y,S,F).
3. The code address (SDI, PIR, PSR), the control mode register (PMR), and the recent stack history.

When the system appears to stop unexpectedly (e.g., the software running lights are off):

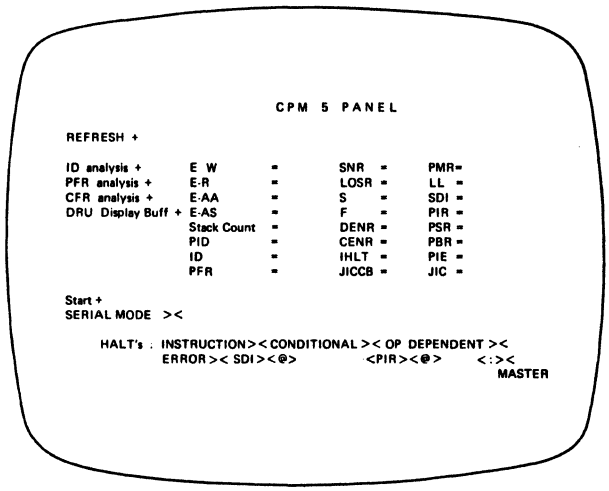
Invoke SYCON on the system console (see the beginning of the SYCON section).

Type the partition ID into the PARTITION field and XMT it. Type the H/L processor ID into the REQuestor field and XMT it. Position the cursor after the word "STATUS" and press SPCFY. Processor status is displayed on the bottom half of the screen.

Check the software running field. If it is 0, the processor has halted for some reason. If it is 1, the partition is running and you have to halt it. To halt the partition, position the cursor after the word "HALT" and press SPCFY.



SYCON - BOX LEVEL PARTITION STATUS Display



SYCON - PROCESSOR PANEL Display

If Software Running = 0 on the STATUS screen, and PMR = 4 on the PANEL screen, then the processor kept taking interrupts without being able to handle them, until it got to control mode 5.

This can mean one of the following:

A mainframe error occurred. The CPM could not access memory which could be a processor or memory problem, or the CPM got to memory but was not able to execute the interrupt handling code. This usually occurs when the PCW at D0+3 gets corrupted (usually by the HDU or by software). Suggested tests in order of use are:

1. Try using a different H/L processor (if available).
2. Clear and reinitialize memory.
3. Try a different MSM (if available).
4. If UTILOADER appeared to initialize correctly, get a listing and look for a software error.

If Software Running is 0 and Halted is 1 on the STATUS screen, then the program has Dead Stopped. If a listing of UTILOADER is available, use SDI:PIR:PSR to locate the stop in the program. The A register contains 4'E4E3C9D3C4D9' (8''UTILDR''). The B register contains the line number where the error occurred. The X register contains F[39:20] and S[19:20]. The Y register contains error dependent information.

NOTE

The most common Dead Stop is for unexpected interrupts. The P1 interrupt parameter is stored in the Y register. If more information is needed, then the interrupt stack frame can be displayed by displaying memory between F and S.

If the processor is still running when SYCON is invoked, three possibilities exist.

1. An I/O did not complete. This case can easily be identified because all four top of stack registers have the bit pattern 4'B7900FFB7900'. Some component of the I/O subsystem failed to respond when the I/O operation is initiated to it. If a UTILOADER listing is available, it can usually be determined from the stack, whether the I/O is initiated to the HDU, to a BCC, or to a DLP. If the BCC appears to be at fault, or if you just do not know, the steps to try are:

   1) Take the skins off the front of the base cabinet and push all the clear buttons you find (usually 3 per base). Try again.
   2) If that does not work, try configuring a partition with only the ODT path. If this does not work, try different paths. If it does work, try to pick disk and tape paths which use as much of the ODT path as possible (HDP, MLI, port, base).

2. You might have halted too quickly, (e.g., after the final UTILOADER message, LOAD COMPLETE, you did not wait at least 30 seconds for the UTILOADER screen to appear on the ODT). Run UTILOADER again and if it still fails, then...

3. There must be a loop in the software. Get a listing and stack dump and try to trace it down.

SECTION 7
SYSTEM/LOADER

GENERAL DESCRIPTION

SYSTEM LOADER is a utility word to perform Warm, Cold and Cool Starts.

MCP STRUCTURE TABLE

The LOADER now has the ability to construct and make use of MCP structure tables. During Cold Start, the LOADER constructs default MCP structure tables with entries pointing to the following MCP structures: MCPINFO, UNITADDL, and PERCONINFO (for B 7700/B 7800 only). Entries for other MCP structures are set to a pre-defined uninitialized state. A primary MCP structure table and a secondary MCP structure table are constructed and placed on the halt/load unit (once the halt/load unit is established).

During Cool Start/Warm Start, the LOADER examines the halt/load unit to determine whether valid MCP structure tables exist. If so, the existing structures are used. If they do not exist or are invalid, the LOADER constructs default MCP structure tables.

Currently, there are two LOADER commands which cause new entries to be placed into the MCP structure tables: RECONFIGURE and PCDIAGRAM.

SYSTEM LOADER Commands

The B 7900 System assumes a Minimal Peripheral Configuration (MPC) when control is transferred from the UTILOADER to the LOADER. The MPC includes and ODT (path information is specified through SYCON), a tape drive (path information is specified during the UTILOADER run), and optionally, a disk pack drive and line printer (paths of which may be described during the LOADER run).

Information describing the paths to the MPC peripherals is stored in the H/L Host Data Unit Random Access Memory (HDU RAM). The optional peripheral path information may be specified by the operator while running the LOADER. This information is stored in the HDU RAM. All MPC information is preserved in the HDU RAM across H/Ls. Therefore, MPC path information residing in the HDU RAM prior to the run of the LOADER is, by default, defining the MPC for that LOADER run. Of course, the user still has the ability to redefine the halt/load unit and printer if this is desired. The peripherals paths which are defined in the HDU RAM are the only four peripherals which are known to the LOADER throughout the run of the LOADER. Some LOADER commands, however, allow the user to temporarily define a path to a unit which is not in the MPC. This path is only valid during the execution of the command in which it is defined. Examples of LOADER commands which permit this temporary path definition are LOAD and LH. Typically, the peripherals for which temporary paths are defined are disk drives or tape drives.

Table 7-1. Commands Available on the B 7900

	CATALOGADRESS		OP
	DATE		PACKLABELS
	HALTLOADUNIT	*	PCDIAGRAM
*	HELP		READISC
	INTRINSIC	*	RECONFIGURE
	LH		REMOVE
*	LINEPRINTER		SET/RESET
	LISTDIRECTORY		SMEARDISC
*	LOAD (MCP, CONFIGURATION, CATALOG)		STOP
	LOADTRANSLATETABLE	*	SWITCHTOFILEINPUT
	MCPADDRESS		SYSTEMSERIAL
	OLAYROW		TAPELABELS
			XD

NOTE

* means that this command is new for Mark Level 3.4.

CATALOGADDRESS Statement

Syntax

—— CATALOGADDRESS <integer>————————————————————————————

Semantics

The CATALOGADDRESS statement specifies the starting (decimal) segment address at which the CATALOG is to be loaded. If present, this statement must precede the LOAD CATALOG statement. The CATALOG address may only be specified during a Cold Start; it may not be altered during Cool Start/Warm Start. If this statement is not used during Cold Start, the LOADER loads the CATALOG at the first available disk segment on the H/L unit.

This command is valid for all systems.

Example:

```
CATALOGADDRESS 75000

LOAD CATALOG SYSTEM/CATALOG/001 FROM TAPE CATALOGTAPE
```

DATE Statement

Syntax

```
—DATE—<mm> / <dd> / <yy> ————————————————————————————————
```

Semantics

The DATE statement establishes the current date used by the MCP. This statement is optional during Cool Start/Warm Start. If this statement is not present during Cold Start, the LOADER requests that the date be entered via the ODT.

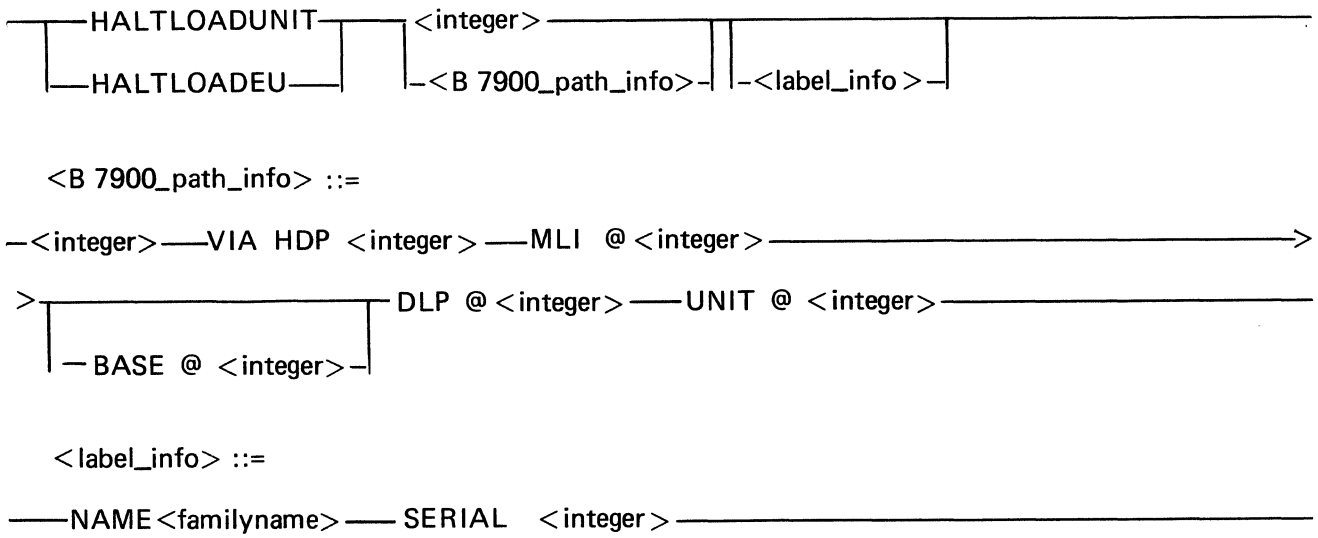
This command is valid for all systems.

Example:

```
DATE 09/22/76
```

HALTLOADUNIT or HALTLOADEU Command

Syntax



Semantics

The HALTLOADUNIT statement selects the disk or pack to be used as the H/L unit. The unit must be ready and must not be write lock-out or reserved. If specified, it must precede any LOADER command which requires the H/L unit (e.g., LOAD, RECONFIGURE). The HALTLOADUNIT command may only be used once. If a LOADER command requiring the H/L unit is executed and the HALTLOADUNIT command has not been specified, then the LOADER selects a default H/L unit according to the following algorithm:

1. For B 5900, B 6800, B 6900, B 7700, and B 7800 systems:

   1) Select lowest numbered viable disk unit, else
   2) Select lowest numbered viable pack unit, else
   3) Display message at ODT and terminate current command.

2. For the B 7900 system:

   1) Select H/L pack specified in contents of HDU RAM, else
   2) Display message at ODT and terminate current command.

NOTE

Selection of a default halt/load unit in this situation is accompanied by a message informing the user of what is happening.

The <B7900_path_info> specification applies only to B 7900 systems. The first <integer> is the unit number of the pack. Specifying BASE @ <integer> is optional.

The <label info> specification is optional for all machines and is intended to be an alternative place to specify label information for the H/L unit. This information can also be specified in the LOAD command, with the LOAD command specification taking precedence. This command is valid for all systems.

NOTE
The HALTLOADEU keyword is de-implemented in Mark Level 3.6.

Examples:

```
HALTLOADUNIT 32
HALTLOADUNIT 64 NAME HLDISK SERIAL 112233
HALTLOADUNIT 70 VIA HDP 0 MLI @ 1 DLP @ 2 UNIT @ 6
```

HELP Command

Syntax

—HELP—

Semantics

The HELP statement displays, at the ODT, syntax and semantics information for any LOADER command that the user selects. As a result of executing a HELP command, the LOADER exits LOADER command mode and enters HELP Menu mode (e.g., subsequent input by the user is interpreted as a HELP request until CONTINUE is entered, at which time the LOADER returns to LOADER command mode.

The HELP Menu mode causes a menu of LOADER commands to be displayed at the ODT. Only LOADER commands which are valid for the machine on which the LOADER is currently executing are displayed. The user transmits any LOADER command for which help is desired (even LOADER commands not valid on the current machine) and the LOADER displays HELP information for that command. Transmitting any input at the ODT at this point causes the LOADER to refresh the HELP Menu, returning to HELP Menu mode.

This command is valid for all systems.

Examples:

```
HELP

<HELP menu is displayed at ODT>

RECONFIGURE

<HELP information for RECONFIGURE command is displayed at ODT>

* user transmits anything *

<HELP menu is displayed at ODT>

LH

<HELP information for LH command is displayed at ODT>

* user transmits anything *

<HELP menu is displayed at ODT>

CONTINUE

* LOADER now resumes execution of LOADER commands *
```

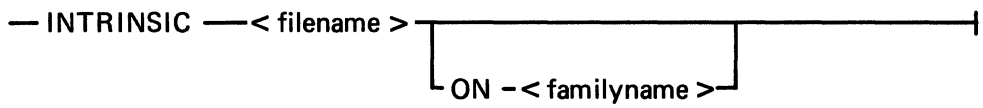
Menu of LOADER Commands

XMIT a command for command information, or XMIT CONTINUE to exit HELP.

CATALOGADDRESS	DATE	HALTLOADUNIT	HELP
INTRINSIC	LH	LINEPRINTER	LISTDIRECTORY
LOAD	LOADTRANSLATETABLE	MCPADDRESS	OLAYROW
OP	PACKLABELS	PCDIAGRAM	READISC
RECONFIGURE	REMOVE	SMEARDISC	STOP
SWITCHTOFILEINPUT	SYSTEMSERIAL	TAPELABELS	XD

INTRINSIC Statement

Syntax



Semantics

The INTRINSIC statement indicates the title of the intrinsics file used by the MCP. The statement may be used during Cold Start or Cool Start/Warm Start. When Cold Starting, the default value is SYSTEM/INTRINSICS. When Cool Starting or Warm Starting, the previous intrinsics are retained by default. This command is valid for all systems.

NOTE

This feaature is de-implemented on Mark Level 3.6.

Example:

```
INTRINSIC SYSTEM/TEST/INTRINSICS
```

LH Statement

Syntax

```
—LH——<target path>———<filename>———FROM———<source medium>————————————

   <target_path>
—┬—<B5900_B6900_path>—————————————————————————————————————————————————
 ├—<B6800_path>———┤
 ├—<B7700_B7800 path>—┤
 ├—<B7900_path>———┤

   <B5900_B6900_path>  ::=
—PK—<integer>—VIA—<port #>—<lem #>—<dip #>———————————————————————————

   <B6800_path>  ::=
—PK—<integer>—MPX—<integer>—PATH—<integer>———————————————————————————

   <B7700_B7800_path>  ::=
—IOM—<integer>—CH—<integer>—————————————————————————————————————————

   <B7900_path> ::=
———————————————————————————————————————————————————————————————————
 ├—<B7900_path_info>—┤

   <B7900_path_info>

  VIA HDP <integer>   MLI @<integer>   BASE @   <integer>

  DLP @ <integer>

   <source medium>
      TAPE <tape volume name>
      DISPACK <family name>
      DISK
         <integer>
    <B7900 source medium>

   <B7900 source medium>
     TAPE
     DISK
   <B7900 additional path>

   <B7900 additional path>
   <integer> VIA   HDP <integer>    MLI @ <integer>
                   DLP @ <integer>  UNIT @ <integer>
    BASE @ <integer>
```

Semantics

The LH (Load Host) statement is used to load controlware into a disk pack drive controller. The name of the controlware file is <filename> and it must be located on the <source_medium>.

Special semantics apply to the B 7900. The syntax for LH permits a null <target_path> for the B 7900. If this form is used, the disk pack drive controller on the H/L path is loaded. If TAPE is specified for the <B7900_source_medium>, the LOADER searches for <filename> on the H/L tape drive. If DISK is specified, the H/L pack is searched. If a <B7900_additional_path> is specified, the unit on this path is searched. Use of <B7900_additional_path> enables the user to load a controlware file from a unit other than the ones described in the HDU RAM.

NOTE

This additional path is only known to the LOADER during execution of the LH command in which it is described.

For all other systems, specifying DISK as the <source_medium> causes the LOADER to look for <filename> on the H/L unit if it is a HPT disk; if it is not, the LOADER searches the lowest numbered online HPT disk for <filename>. This method of specifying the <source_medium> becomes illegal on Mark Level 3.6. Instead, the HPT unit number is required after the keyword DISK.

If the LOADER encounters a problem while loading controlware, an error message is displayed at the ODT and the user is given the option to DS, OK or QT the LH. A DS causes the LOADER to abort the LH and leaves the controller in an undefined state. An "OK" causes the LOADER to bypass the diagnostics (B 9387 controller) and continue loading the controlware. Bypassing the diagnostic segments is not recommended and requires an additional operator "OK." After successfully loading the controlware, the LOADER displays the controlware ID and patch status for the loaded file.

This command is valid for all systems.

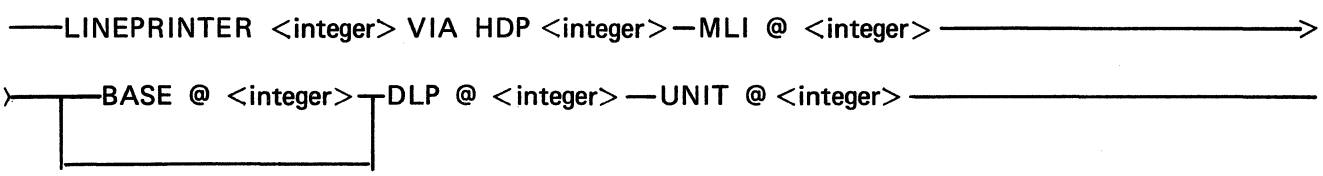
B 7900 Examples:

```
LH VIA HDP 0 MLI @ 1 DLP @ 0 SYSTEM/CONTROLWARE79 FROM TAPE

LH SYSTEM/CONTROLWARE79 FROM 220 VIA HDP 1 MLI @ 1 DLP @ 3 UNIT @ 10
```

LINEPRINTER Statement

Syntax



Semantics

The LINEPRINTER statement is used to specify the line printer which the B 7900 is to use. At the end of the LOADER run, this information is preserved in the HDU RAM. This statement is permitted during Cold Start and Cool Start/Warm Start. This command is only valid for B 7900 systems.

Example:

```
LINEPRINTER 7 VIA HDP 1 MLI @ 1 BASE @ 2 DLP @ 5 UNIT @ 11
```

LISTDIRECTORY Statement

Syntax

—LISTDIRECTORY—

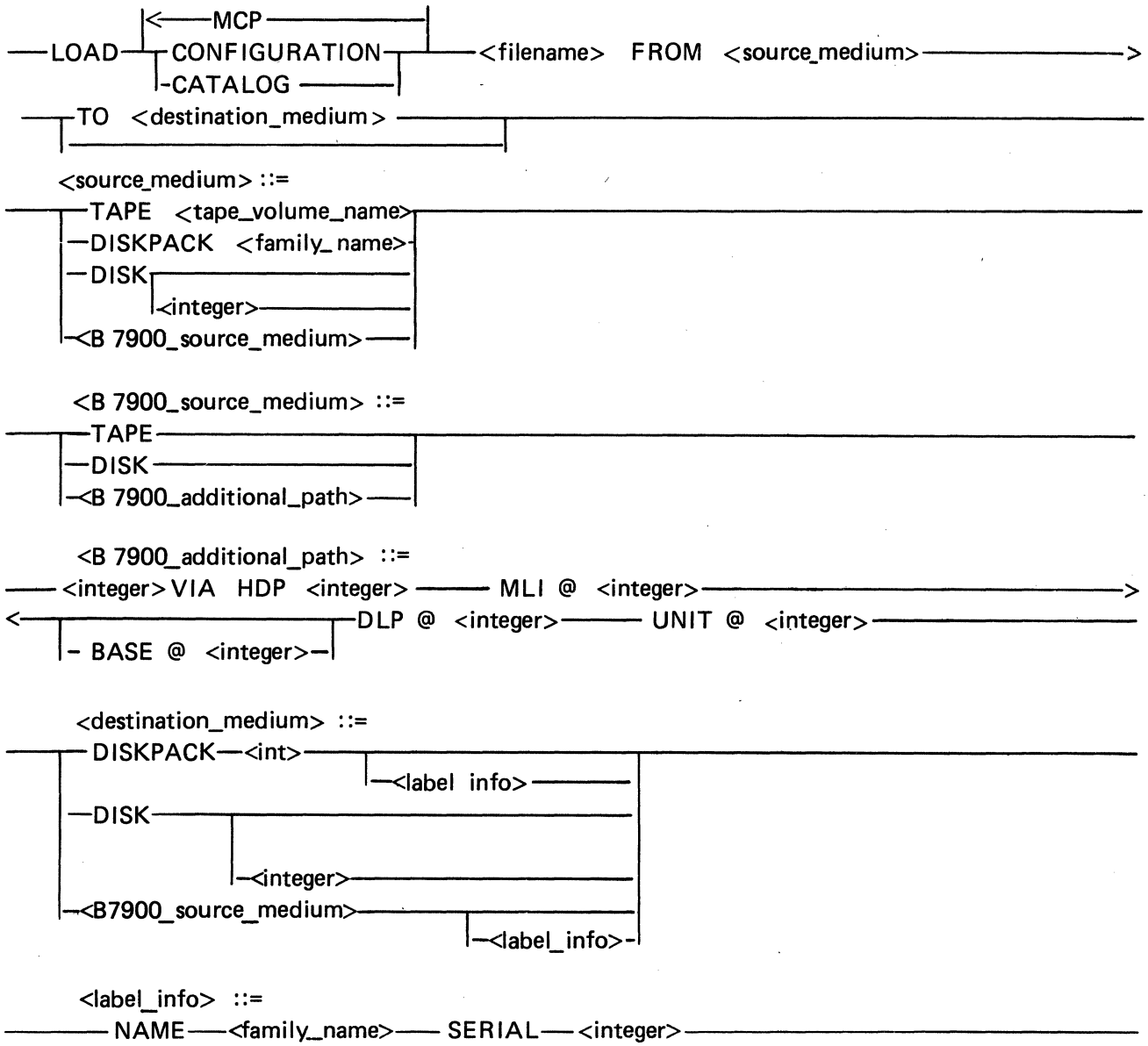
Semantics

The LISTDIRECTORY statement causes a complete directory listing of the halt/load family to be printed. The directory listing includes the file name, file kind, and total number of segments that the file occupies on disk. This statement is used only during Cool Start/Warm Start. This command is valid for all systems.

Example:

```
LISTDIRECTORY
```

LOAD Statement



Semantics

The LOAD statement is used to load MCP, CATALOG or CONFIGURATION files to the H/L unit. The syntax described is a modification of the LOAD statement syntax accepted on previous releases of LOADER software. The previous syntax continues to be accepted until Mark Level 3.6. Beginning with Mark Level 3.6, the above syntax is the only legal syntax.

For systems other than the B 7900, the keyword DISK in the <source_medium> specification indicates head-per-track (HPT) disk and when used without specifying a unit number, causes the LOADER to load from the H/L disk if it is HPT disk. Beginning with Mark Level 3.6, the DISK keyword must be followed by a unit number.

The LOAD statement only loads files to the H/L unit. The <destination_medium> must match the H/L unit or else the LOADER terminates the LOAD statement. The medium> clause is optional and ensures that the correct unit is selected.

During Cold Start, the <label_info> clause defines the family name and serial number of the H/L unit. The defaults are DISK and the H/L unit number, respectively. For HPT disk, the HLFAMILY statement can be used to change the familyname. During Cool Start, the only reason for including the <label_info> clause is to cause the LOADER to check that the correct pack is being loaded with the file.

If the MCPADDRESS statement is present, it must be placed before the LOAD MCP statement. Similarly, if the CATALOGADDRESS statement is used, it must precede the LOAD CATALOG statement. If either of these address statements is used, the LOADER checks that file overlap does not occur during the LOAD statement. If such a condition is detected, a message is issued at the ODT, and the LOAD statement is aborted.

If a CATALOG is to be loaded during Cold Start, it must be loaded before any other files are loaded.

During Cold Start, an MCP must be loaded before a CONFIGURATION file is loaded (if any). No duplication of MCPs is permitted by the LOADER; this must be done using the CM and DD statements after the system is operational.

During Cold Start, loading a CONFIGURATION file is necessary before a RECONFIGURE or PCDIAGRAM statement may be executed. During Cool Start/warm start, the LOADER can access a previously CF-ed CONFIGURATION file or a new CONFIGURATION file may be loaded. The LOAD CONFIGURATION statement copies the file to the H/L unit and CFs the file (e.g., designates that file as the Configuration file).

For the B 7900, the use of the keywords DISK or TAPE in the medium clauses indicates use of the minimal peripheral configuration units: H/L pack and tape drive, respectively. The <B7900_additional_path> may be used to specify a path to a unit not in the minimal peripheral configuration. This path is only valid for the duration of the LOAD statement in which it appears.

All three forms of the LOAD command (LOAD MCP, LOAD CATALOG, and LOAD CONFIGURATION) are valid for all systems.

Examples:

LOADing a CATALOG from tape labelled SYSTEM to H/L unit

```
LOAD CATALOG SYSTEM/CATALOG FROM TAPE SYSTEM
```

LOADing an MCP from disk pack labelled MCPPACK to H/L unit number 32 labelled HLPACK with serial number 123456

```
LOAD MCP SYSTEM/MCP FROM DISKPACK MCPPACK TO DISKPACK 32 NAME HLPACK
                                  SERIAL 123456
```

LOADing a Configuration file from HPT disk 46 to H/L HPT disk number 50

```
LOAD CONFIGURATION FROM DISK 46 TO DISK 50
```

B 7900 MCP LOAD from minimal peripheral configuration tape drive to the H/L disk pack

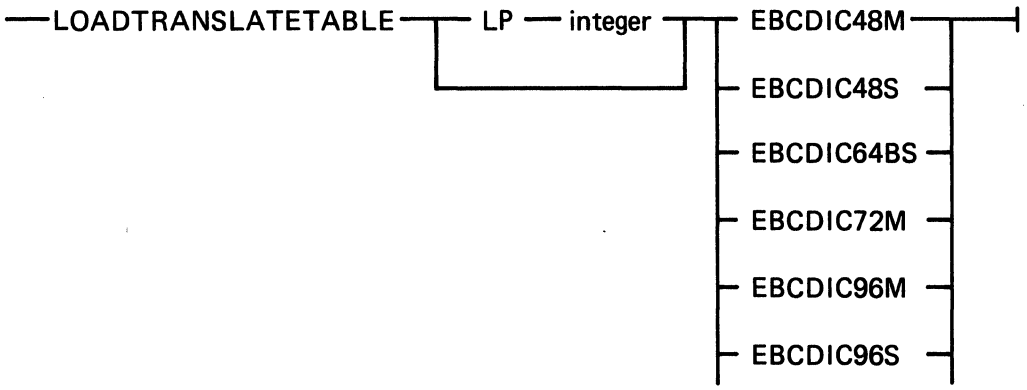
```
LOAD MCP SYSTEM/MCP FROM TAPE TO DISK
```

B 7900 MCP LOAD from <B7900_additional_unit> to H/L unit

```
LOAD MCP SYSTEM/MCP FROM 224 VIA HDP 0 MLI @ 1 DLP @ 0 UNIT @ 10
```

LOADTRANSLATETABLE Statement

Syntax



Semantics

The LOADTRANSLATETABLE statement loads a train printer with a particular translate table.

The <integer> must specify the unit number of a ready train printer. The LP <integer> specification must be specified for all systems except the B 7900; it must not appear on B 7900 systems. An "M" following the trainid signifies a medium speed printer (1100 LPM); an "S" signifies a slow speed printer (750/450 LPM). This command is valid for all systems.

Example:

```
LOADTRANSLATETABLE LP 12 EBCDIC72M
```

MCPADDRESS Statement

Syntax

```
———MCPADDRESS <integer> ————————————————————————————————
```

Semantics

The MCPADDRESS statement specifies the starting (decimal) segment address on the H/L unit at which the MCP is loaded. If present, this statement must precede the LOAD MCP statement. The MCP address may only be specified during Cold Start.

The LOADER checks to ensure that file overlap does not occur with the CATALOG (if loaded) during the LOAD MCP statement. If the LOADER detects that file overlap occurs, the LOAD MCP statement is aborted, the user may specify a valid MCP address, and the LOAD MCP statement may be resubmitted.

If this statement is not used during Cold Start, the LOADER places the MCP at the first available area on the H/L unit by default. This command is valid for all systems.

Example:

```
MCPADDRESS 60000

LOAD MCP SYSTEM/MCP FROM TAPE SYSTEM
```

OLAYROW Statement

Syntax

```
——OLAYROW  <integer>——————————————————————————————————————
```

Semantics

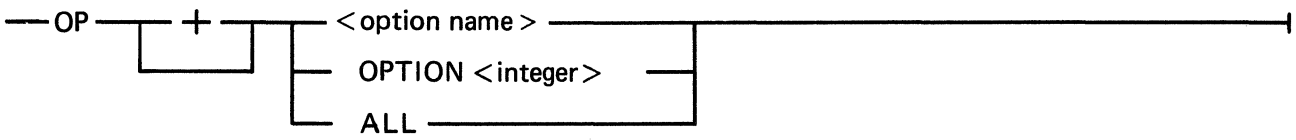
The OLAYROW statement specifies the overlay row size in segments. This row size applies to the MCP and to all user tasks. This statement causes a Cold Start. If OLAYROW is not set, the row size already in effect for that disk (by the previous Cold Start) is used. If no row size is in effect, a default value of 400 is used. If more than one OLAYROW statement appears, the value in the last OLAYROW statement is used. This command is valid for all systems.

Example:

```
OLAYROW 1000
```

OP Statement

Syntax



Semantics

The OP+ and OP- statements are used to set and reset MCP run-time system options. The options may be identified by name or by number; thus, OP+ AUTORM and OP+ OPTION 5 have the same effect. Refer to the B 5000/B 6000/B 7000 Series Operator Display Terminal Reference Manual (form number 5001704).

The following options are set by default during Cold Start:

Option #	Option
2	TERMINATE
4	LPBDONLY
5	AUTORM
8	AUTORECOVERY
14	CPBDONLY

All other options are reset. This command is valid for all systems.

Examples:

```
OP+ AUTORM
OP+ OPTION 5
OP- NOSUMMARY
```

PACKLABELS Statement

Syntax

PACKLABELS

Semantics

The PACKLABELS statement causes the LOADER to display the labels of all ready pack units on the ODT. This command is valid for all systems.

Example:

```
PACKLABELS
```

PCDIAGRAM Statement

Syntax

```
———PCDIAGRAM <PCD_name> ————————————————————————————————

        <PCD_name> ::= <identifier with up to 17 characters>
```

Semantics

The PCDIAGRAM statement enables the user to load a peripheral configuration diagram from a configuration file. A valid configuration file must have been previously specified (either previously CF-ed by the MCP or by a LOAD CONFIGURATION statement).

The LOADER stores the PCD on the H/L unit and establishes it as the peripheral configuration diagram. If a group is entered into the MCP structure table (either by the MCP or LOADER RECONFIGURE), then this group entry is invalidated as a result of a PCDIAGRAM statement since the group may not be compatible with the new PCD. This command is valid for B 7900 systems.

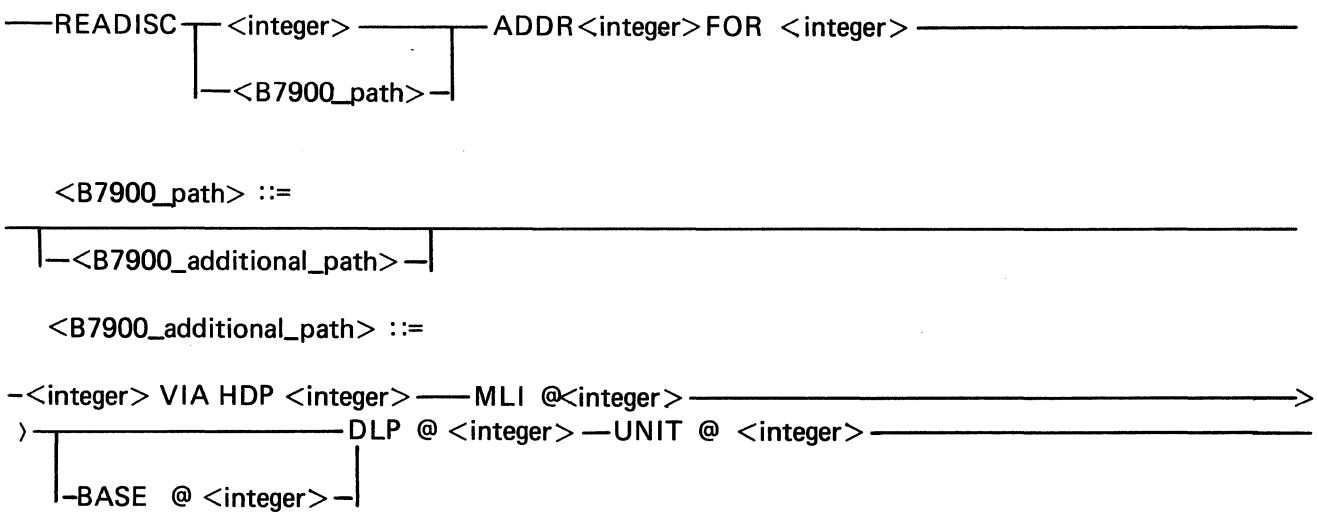
Examples:

```
PCDIAGRAM B7900PCD

LOAD CONFIGURATION SYSTEM/CONFIGURATION FROM TAPE SYSTEM
PCDIAGRAM BATCHPCD
```

READISC Statement

Syntax



Semantics

The READISC statement reads information from disk or pack and lists it on a line printer.

For systems other than the B 7900, the first <integer> identifies the input device and must specify a ready disk or pack. For the B 7900, a null <B7900_path> defaults to the H/L unit. The <B7900_additional_path> may be used to specify a path to a unit not in the minimal peripheral configuration. This path is only valid for the duration of the READISC statement in which it appears. The <integer> following "ADDR" indicates the starting segment number in decimal. The <integer> following "FOR" controls the number of segments listed. This command is valid for all machines.

Examples:

```
READISC 32 ADDR 10000 FOR 100

READISC 32 VIA HDP 0 MLI @ 1 DLP @ 4 UNIT @ 0 ADDR 50000 FOR 50
```

RECONFIGURE Statement

Syntax

```
——RECONFIGURE GROUP AS <group_name>————————————————————————
```

Semantics

The RECONFIGURE statement is used to specify a group which is used by MCP initialization to form the running partition. The information specified by the group has no bearing on the current LOADER run.

The <group_name> must be a valid group in the current Configuration file. A Configuration file may be loaded via the LOAD CONFIGURATION statement. The LOADER only RECONFIGUREs a group of level 5 or greater, and the group must be valid for the machine on which the LOADER is currently running.

If the <group_name> is not a group in the configuration file, then the LOADER displays a list of valid groups in the configuration file and the RECONFIGURE statement is aborted.

For B 7900 systems, the peripheral configuration diagram associated with the target group is loaded. This command is valid for all systems.

Examples:

```
LOAD CONFIGURATION SYSTEM/CONFIGURATION FROM DISKPACK SYSPACK
RECONFIGURE GROUP AS TIGHTLYCOUPLED

RECONFIGURE GROUP AS MONOLITHIC
```

REMOVE Statement

Syntax

```
——REMOVE  <filename>——————————————————————————————————————
```

Semantics

The REMOVE statement removes a file or directory from the H/L family and may be used during Cool Start to make room for a new MCP, CATALOG or CONFIGURATION file. If the file specified in the REMOVE statement cannot be found, an error message is displayed on the ODT. This command is valid for all systems.

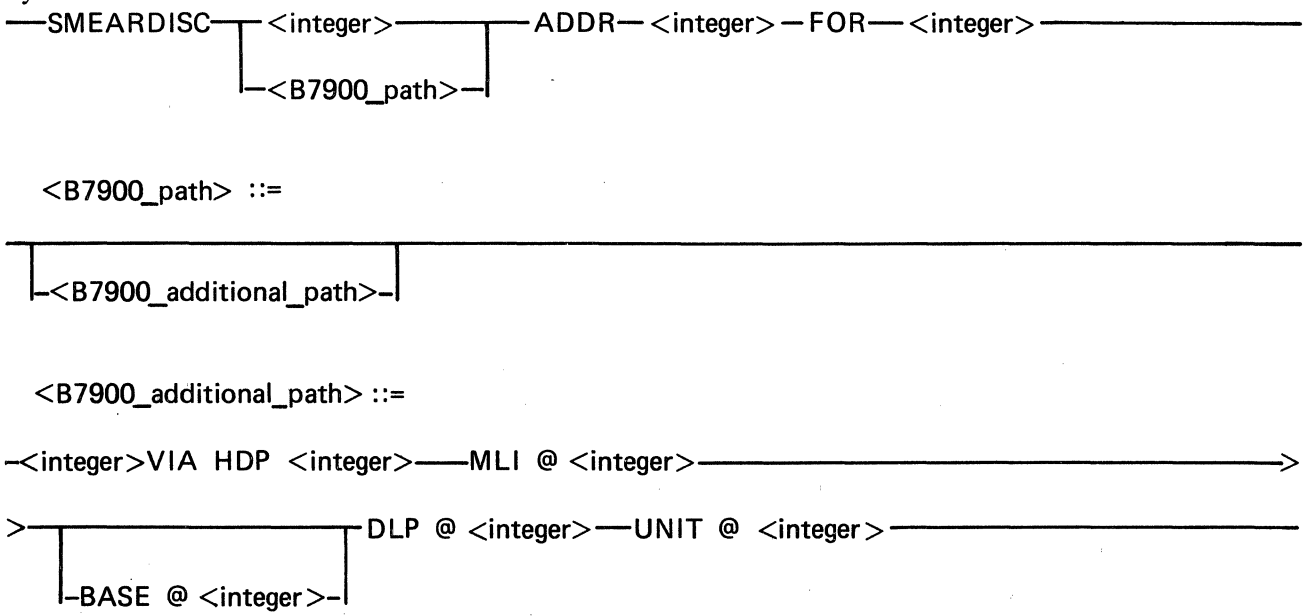
Examples:

```
REMOVE SYSTEM/USERDATAFILE

REMOVE SYSTEM
```

SMEARDISC Statement

Syntax



Semantics

The SMEARDISC statement writes all zeroes to disk or pack. For systems other than the B 7900, the first <integer> identifies the output device and must specify a ready disk or pack.

For the B 7900, a null <B7900_path> defaults to the H/L unit. The <B 7900_ additional_path> may be used to specify a path to a unit not in the minimal peripheral configuration. This path is only valid for the duration of the SMEARDISC statement in which it appears.

The <integer> following "ADDR" indicates the starting segment number in decimal. The <integer> following "FOR" controls the number of segments written. The LOADER requests permission to perform the SMEARDISC operation via the ODT. The operation is only performed after OK is entered.

The SMEARDISC statement is permitted during Cold Start or Cool Start/Warm Start. This command is valid for all systems.

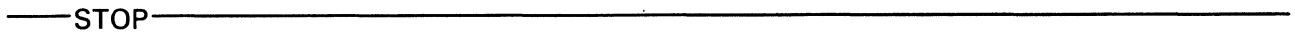
Examples:

```
SMEARDISC 32 ADDR 10000 FOR 100

SMEARDISC 46 VIA HDP 1 MLI @ 1 DLP @ 5 UNIT @ 2 ADDR 3000
         FOR 50
```

STOP Statement

Syntax



Semantics

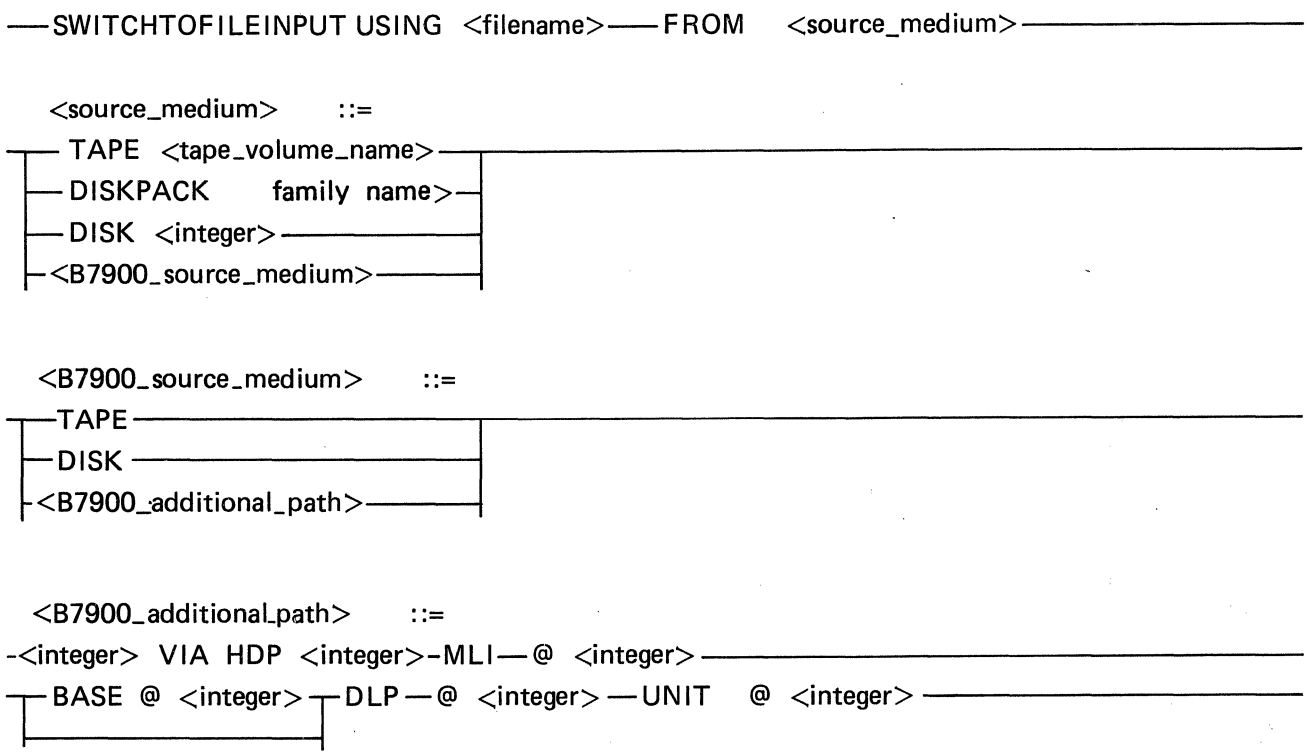
The STOP statement causes processing of LOADER input statements to cease. At this point, the LOADER updates the system tables (MCPINFO and UNITADDL). B 5900 and B 6900 systems halt at this time and prompt the user to run UTILOADER to halt/load. B 6800, B 7700, B 7800, and B 7900 systems automatically halt/load to the MCP. This command is valid for all systems.

Example:

```
STOP
```

SWITCHTOFILEINPUT Statement

Syntax



Semantics

The SWITCHTOFILEINPUT statement enables the LOADER to begin accepting input from a designated file. The file may contain any LOADER command except for B 7700/B 7800 configuration statements or another SWITCHTOFILEINPUT statement.

The file may be any word-oriented CANDE file type. This file may contain up to 100 records.

NOTE

Only columns 1-72 are recognized by the LOADER. If a statement cannot fit on one line, then the percent (%) character is recognized as a continuation signal so that a LOADER command may be split across two records.

For each statement processed from the file, the LOADER displays a message at the ODT indicating which statement is being executed. If, after the LOADER begins processing input from this file, it reaches end-of-file, the LOADER automatically switches back to the original means by which the LOADER received input, displaying a message at the ODT to that effect.

If <B7900_source_medium> is specified, then TAPE causes the file to be read from the minimal peripheral configuration tape drive. Specifying DISK causes the file to be read from the H/L unit. <B7900_additional_path> may be used to specify a path to a unit not in the minimal peripheral configuration. This path is only valid for the duration of the SWITCHTOFILEINPUT statement in which it appears. This command is valid for all systems.

Examples:

```
SWITCHTOFILEINPUT USING COOLSTART/DECK FROM DISKPACK HLPACK

SWITCHTOFILEINPUT USING COLDSTART/DECK FROM TAPE

SWITCHTOFILEINPUT USING FILEINPUT/COOLSTART FROM 46 VIA HDP 0 MLI @ 0 DLP
@ 5 UNIT @ 2
```

SYSTEMSERIAL Statement

Syntax

```
——SYSTEMSERIAL–<integer>————————————————————————————
```

Semantics

The SYSTEMSERIAL statement is used to enter the system serial number. The system serial number must be entered when Cold Starting; it is requested via the ODT if this statement is not present. This statement is optional during Cool Start/Warm Start. This command is valid for all systems.

Example:

```
SYSTEMSERIAL 277
```

TAPELABELS Statement

Syntax

—— TAPELABELS ——————————————————————————————

Semantics

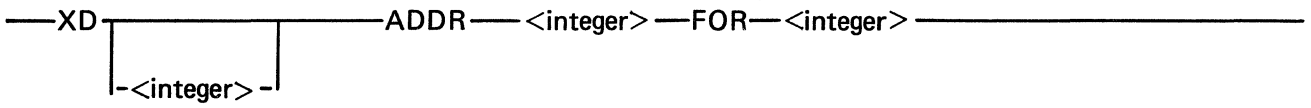
The TAPELABELS statement causes the LOADER to display the labels of all tapes on ready (and unPROTECTED) tape drives on the ODT. This statement is allowed during Cold Start and Cool Start/Warm Start. This command is valid for all systems.

Example:

```
TAPELABELS
```

XD Statement

Syntax



Semantics

The XD (Bad Disk) statement is used to eliminate defective segments on the H/L unit from the available disk table. The first <integer> must be the H/L unit number for systems other than the B 7900 (for the B 7900, this <integer> must not appear). The second <integer> specifies the starting segment address in decimal; the last <integer> indicates the total number of segments to be set aside. The eliminated area is entered in the disk directory with the following name:

BADDISK/FMLYINX<integer>/UNIT<integer>/AD<integer>

If the area to be XDed contains a file, an error message is displayed on the ODT, and the XD is not performed. This command is valid for all systems.

Examples:

```
XD 32 ADDR 10000 FOR 100
```

This statement causes creation of a file titled:

BADDISK/FMLYINX1/UNIT32/AD10000

SYSTEM/LOADER Instructions

The final steps to Cold Start the system are done through the LOADER utility invoked by UTILOADER as described in the previous section.

NOTE

The LOADER has a HELP command that displays the syntax and the semantics of the commands.

The LOADER is run to initialize the H/L disk by establishing a basic disk directory, loading an MCP and configuration file, and to specify a GROUP and PCD. The H/L disk is the one described in the H/L HDU RAM which is specified via the SYCON CONFIGURE command.

The volume name and serial number of the H/L disk may be specified by the LOAD command. The default volume name is DISK and the default serial number is the H/L disk device number.

NOTE

It is possible to change the H/L disk and path by using the HALTLOADUNIT command.

The controlware may be loaded, if necessary, by the LOADER. This is done by entering:

```
LH <controlware file> FROM TAPE
```

This loads the controlware file from the H/L tape unit to the H/L disk path.

NOTE

There is additional syntax for the LH command to load the controlware file from a tape unit other than the H/L tape unit, from packs, or to paths other than the H/L disk path.)

Once the controlware is loaded, LOADER can be interrogated to display the labels of the H/L pack unit and tape unit, as follows:

```
Enter PACKLABELS to have the H/L pack unit label displayed.

Enter TAPELABELS to have the H/L tape unit label displayed.
```

If a Cold Start is desired, the overlay row size must be specified as follows:

```
Enter OLAYROW <integer>
```

This specifies the overlay row size in segments and causes a Cold Start.

The recommended value is 900 segments. The default value is 400 segments.

The MCP can be loaded next, as follows:

```
Enter LOAD MCP <filename> FROM TAPE TO DISK
```

It is necessary to OK this command. If the system serial number is specified via the SYSTEMSERIAL command, the following message is displayed:

```
PLEASE ENTER THE NEW SYSTEM SERIAL NUMBER
```

Enter <integer>, where <integer> can be a maximum of four digits and is the system number specified in the peripheral configuration diagram (PCD) for this system.

If the date is not specified via the DATE command, the following message is displayed:

PLEASE ENTER THE DATE: MM/DD/YY

Enter the date in the form: MM/DD/YY and press XMT. SYSTEM/LOAD loads the MCP named in the LOAD command from the tape on the H/L tape unit to the H/L disk.

If the load does not complete because of defective segments on the pack unit, the XD command can be used during a Cold Start to eliminate defective segments on disk from the available disk table. Only the H/L unit can be XDed.

Enter XD ADDR <starting address> FOR <length>

<starting address> specifies the absolute decimal address of the first segment to be eliminated. <length> specifies the total number of segments to be set aside.

Example:

XD ADDR 100000 FOR 100

The eliminated area is entered in the disk directory with the following name:

BADDISK/FMLYINX1<integer>/UNIT<integer>/AD<hex number>.

The MCPADDRESS command may also be used to specify a different location on disk where the MCP is to be loaded.

After the MCP load completes, the configuration file should be loaded. Enter LOAD CONFIGURATION <configuration file name> FROM TAPE TO DISK.

After the configuration file is loaded, the GROUP and/or PCD must be specified.

Enter RECONFIGURE GROUP AS <group name from Configuration file>. The LOADER outputs the message:

RECONFIGURE IS NOW IN PROGRESS

When the group is loaded (e.g., group XYZ) the message:

SYSTEM WILL BE RECONFIGURED AS GROUP XYZ

is displayed.

To complete the Cold Start, and to signal the end of the LOADER functions, enter STOP. The SYSTEM/LOADER goes to end-of-job, and the system should halt/load. During halt/load initialization, if the STARTSYSTEM task becomes a Waiting Entry, it is because the SYSTEM/USERDATAFILE is not there. Enter <mix #>OK and then <mix #> DS. CONTROLLER/FIND/USERDATAFILE becomes a Waiting Entry because the SYSTEM/USERDATAFILE is not present. This task should also be DSed.

Cold Start Example

The following is an example of the LOADER commands for a Cold Start:

```
LH CONTROLWARE/B9387 FROM TAPE

OLAYROW 900

SYSTEMSERIAL 1

LOAD MCP SYSTEM/MCP FROM TAPE TO DISK NAME HLDISK SERIAL 206079

LOAD CONFIGURATION SYSTEM/CONFIGURATION FROM TAPE TO DISK

RECONFIGURE GROUP AS B7900GROUP

STOP
```

These commands may also be put in a CANDE file and executed using the SWITCHTOFILEINPUT command. If the file is called (UTILITY) FILEINPUT/COLDSTART and put on a tape, the command:

```
SWITCHTOFILEINPUT USING (UTILITY)FILEINPUT/COLDSTART FROM TAPE
```

causes the LOADER to read the file from the tape on the H/L tape unit and execute the commands.

SECTION 8
APCON

GENERAL DESCRIPTION

APCON is used to H/L and maintain the AMP/AP. APCON shows its mode in the upper left-hand corner of the screen. The mode is either AP or AMP. When APCON begins, the mode is taken from the state in the AP/AMP. Certain failures during state access operations between the system console and the AP/AMP cause the mode to be set to AMP. Pressing SPCFY after the words "Power Up AP" sets the AP mode; pressing SPCFY after the words "Power Up AMP" sets the AMP mode. The mode governs the validity of various operations (e.g., you should not press SPCFY after the words "BOOT AMP" in the AP mode).

When running via the MEX, certain conditions prevent APCON from accessing the box. These conditions are:

1. Software running on PID is 1, 2, 3, or 4.
2. Maintenance bus is disabled.

If either of these are true, APCON issues an error report, then loops until both are false.

If the PID of the AP/AMP is 5 (e.g., Maintenance), APCON assumes the AP/AMP is running as an AMP, and enters the ODT mode. For other PID values, APCON enters the Power Up Menu. During initial set up, APCON sets the PID to 5. This value is recognized by SYCON to mean that the box is not available for inclusion in a B 7900 partition. APCON sets the system interface partition register to disallow all MSMs; this protects the AMP from interference over the system interface.

The AP/AMP MP data buffer is used for all state access. APCON attempts to write and then reads this buffer. If this test fails, APCON issues an error report, then loops until the test succeeds. Here are the steps to follow to run APCON:

1. At the system console, if APCON is already running, press CNTRL H CNTRL to halt it and return to SHELL.
2. If SYCON is running on the system console, press CNTRL Q CNTRL to transfer system console control from SYCON to SHELL.
3. Finally, to get to SHELL, power off the system console and then power it back on.
4. Load the APCON ICMD into either of the ICMD drive stations in the leg of the system console.

Type in APCON <number>, where <number> is a digit from 1 to 7 and is the maintenance port address; or type in APCON DIRECT. DIRECT is used when the system console is cabled directly to the AP/AMP, bypassing the MEX. Normally, the system console is cabled to the MEX. The <number> then, is the system address of the AP desired. Messages are displayed to show that APCON is loading and accessing the boxes unless the AP/AMP is not direct, or the <number> is not the valid address of an AP/AMP type port. In these cases, APCON issues an error message and then returns control to the SHELL program.

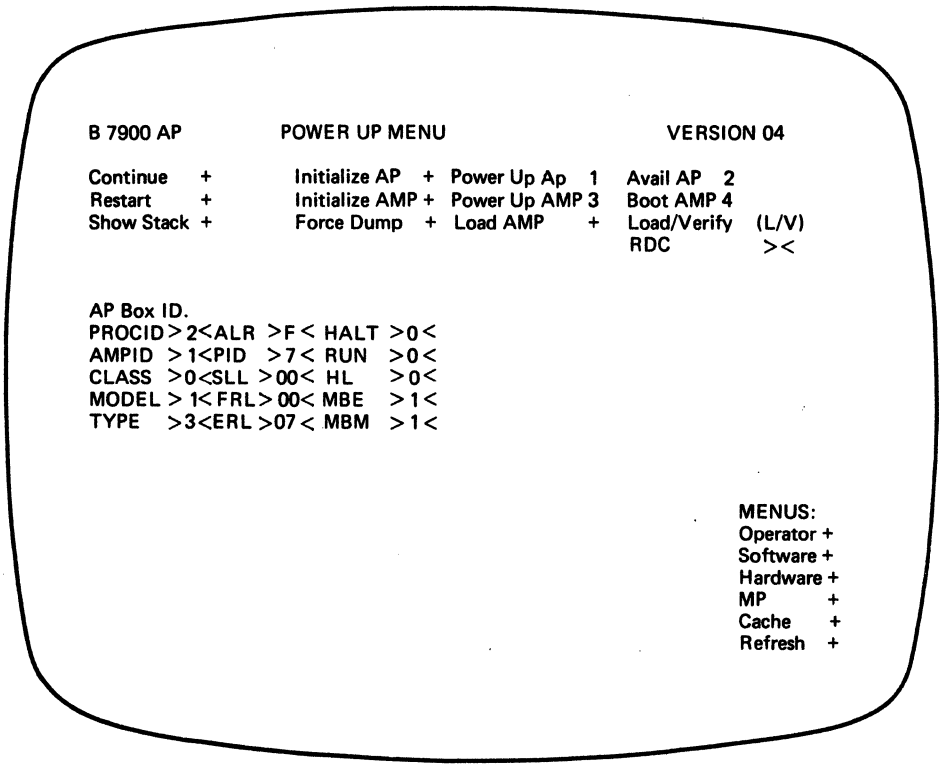
Once APCON has loaded, the Power Up Menu is displayed. Wait until the AP Box ID numbers are filled in and the cursor flashes on and off after the words "Power Up AP."

Insert the APMC (AP Microcode) ICMD into the other ICMD slot and press SPCFY. If you get some type of not ready message, remove the APCON ICMD and insert the APMC ICMD in the left-hand slot. Press SPCFY.

Type the available partition number, in this example, "7", in the line "AMPID > < PID <7> RUN > <", and press XMT. The messages:

Accessing AP Box ID
Writing AP Box ID
Accessing AP Box ID

are displayed alternately at the bottom of the screen.



1 and 2 are to power up the AP
3 and 4 are to power up the AMP

APCON Menu

Position the cursor after the words "AVAIL AP" and press SPCFY.

This is only possible when APCON is in AP mode. It sets the PID to AVAILABLE which sets the system interface partition register to ALLOW all MSMs. This, in turn, causes the AP to run. Messages indicating that APCON is initializing are displayed alternately at the bottom of the screen. Finally, control is transferred back to the SHELL program.

At the ODT, type ACQUIRE CPM <number> and the message:

CPM <number> WILL BE ACQUIRED

is displayed.

At the system console, after you have loaded the APCON ICMD and the Power Up Menu is displayed, bring up the AMP instead of the AP. To do this, position the cursor after the words "Power Up AMP" and press SPCFY. Messages are displayed to indicate that AMP is initializing.

The cursor flashes on and off after the words "CONTINUE." Move the cursor after the words "BOOT AMP" and press SPCFY. Messages indicating the opening and loading of boot are displayed. Finally, control passes to ODT emulation and the message:

```
Transfer Control Remove Floppy Disk
```

is displayed before *** ODT *** comes up at the top of the screen.

```
B7900 AP                    OPERATOR MENU                          VERSION 04

Continue      +      Initialize AP   +      Power Up AP      +     Avail AP  +
Restart       +      Initialize AMP  +      Power Up AMP     +     Boot AMP  +
Show Stack    +      Force Dump      +      Load AMP         +     Load/Verify    (L/V)
                                                                   RDC            ) (
Arof )F( A )0( )000000002001(    X  )0( )000000000000(    LOSR )04000(
Brof )F( B )0( )000011000012(    Y  )0( )000000000000(    S    )02008(
                                                          F    )02005(
                                                          BOSR )00000(

HALT ENABLES:          HALT REASON:          AP Box ID:
Conditional )F(        CONTROL MODE          PROCID )2( ALR )F( HALT )0(
External    )F(                              AMPID  )1( PID )5( RUN  )0(
Alarm       )F(                              CLASS  )0( SLL )00( HL  )0(
ODI_errors  )F(                              MODEL  )1( FRL )00( MBE  )1(
ODI_service )F(                              TYPE   )3( ERL )07( MBM  )1(
Alarm_stop  )F(        Control_mode    )3(
SDI_stop    )F( )0000( ERR          )T( )05002(

                                                          MENUS;
                                                          Software  +
                                                          Hardware  +
                                                          MP        +
                                                          Cache     +
                                                          Refresh   +
```

```
B7900 AP                    SOFTWARE MENU                          VERSION 04
Continue      +                                        Initialize AP  +  Avail AP  +
Restart       +                                        Initialize AMP +  Boot AMP  +
Goto Run )          ( Go PWI:PSI)          () (       Stop MA  )008E(  Load AMP  +
Issue Clocks )       (at MA)       (                   Stop EOP  )   (  Load File)        (
Show Stack    +      Access Loc Mem )                  (for)     (

Arof>F< A  >0<>000000002001<    X  >0<>000000000000<  Temp1 >0<>FFFFF0000000  <
Brof>F< B  >0<>000011000012<    Y  >0<>000000000000<  Temp2 >0<>000005800000  <
                                                      Temp3 >0<>000000002001  <
SDI  >0005<      D[0]>00000<     SNR >000<            Temp4 >7<>000000000800  <
PWI  >008F<      D[1]>00000<     LOSR>04000<          Latch  >7 >FFFFFFFFFFFF<
PSI     >0 <     D[2]>00000<     S    >02008<         DP-Q      >FFFFFFFFFFFF<
Next PSI >0 <    D[LL>00000<     F    >02005<         P      3  >000000000000  <
PBR>00000 <      LL  >0 <        BOSR>00000<
PLR>FFFFF<       SDLL>0<                              ERR   >T<>05002<
HALT ENABLES:                    MLIP Flags:
Conditonal >F< EXTF  F <        EIOCB_Valid  >F <          MENUS:
External   >F< OFFF  F <        Suspend_Queues)F <         Operator  +
Alarm      >F< TFFF  F <        OK_To_Initiate >F <        Hardware  +
ODI_errors>F< FLTF   F <        Complete_EIOCB)F <         MP        +
ODI_service>F< MCFF  F <        EIOCB_Addr  >00000<        Cache     +
Alarm_stop>F< Restart F<                                   Refresh   +
SDI_stop >F<>0000<
```

```
B7900 AP              HARDWARE MENU                                          VERSION 04
Continue    +          Restart   +                Initialize  AP    +   Avail  AP    +
Issue Clocks>         <at MA>     <               Initialize  AMP +   Load AMP +   Boot AMP   +
Single Clock Mode  +   Fatal Clear        +   Access  CM>       <for>  <
System Clock Mode +   Flush Subr Stk    +   Access  SM        <for    <
Minor Clock Mode   +   Show Subr Stk    +   Access Loc Mem>    .   <for>  <
TEST CONTROL:        TESTS:  Load/Verify (L/V)          SNAKES:
Goto Run >     <      DP     >  <  LM        >  <MCLK>00<      SLC4> F10<
Test Execute    +     HDP    >  <  LM Conf >  <DP1   >AFB80C<  DP2>FF8 < DP4>ED23<
Test Loop       +      APIM >  <  AP Conf  >  <ITM1>A963<     ITM2>E9EF0000000003FFF000<
MP   MA   >     <      APMC>  <  MSM        >  <PC1 >50000000000007C80F8F8FFF67DE7<
TEST  MA>       <                                   PC2 >C0E0700000000008E01208E<
MP  Selftest    +      AP   Operator Set      >  <HDP1>FE80000< HDP2>0040011C70080<
SLC RAM Test +       AMP Operator Set       >  <APIM>000000F0000800500<
MIP Selftest    +      RDC                        >  <
                     REGISTERS                                   Latch>7<>FFFFFFFFFFFF>
DP-0 >0<>FFFFF0000000<  DP-8  >0<>000000002001  <      DP-Q  >FFFFFFFFFFFF>
DP-1 >1<>FFFFF5800000<  DP-9  >0<>000011000012  <      HOLD>0<>800080008000>
DP-2 >2<>FFFFF0000000<  DP-10>0<>000000000000  <      PWAR>FFFFF<     MENUS:
DP-3 >0<>020080000000  <  DP-11>0<>000000000000  <                        Cache      +
DP-4 >0<>000000002005  <  DP-12>0<>FFFFF0000000<      Stop  MA>008E  <  Operator  +
DP-5 >0<>000400000000  <  DP-13>0<>000005800000  <      ERR>T<>05002<   Software  +
DP-6 >0<>FFFFF6000000<  DP-14>0<>000000002001  <      CTR0>14<          MP          +
DP-7 >0<>000000000005  <  DP-15>7<>000000000800  <      CTR1 >27<          Refresh    +
```

```
                                MP MENU

1.  Ram Select          ><   2.  Read Data Buf      +    3.  Write Data Buf  ><
4.  Read Snake          +    5.  Write Snake        ><   6.  Set/Reset Clock ><
7.  Enter Dis Mode      +    8.  Read MP Byte       +    9.  Write MP Byte   ><
A.  Read Byte           +    B.  Read SLC Byte      +    C.  Snake Select    ><
D.  System Halt         +    E.  Load Branch        ><   F.  Load Byte Index ><

Spcfy MP Loop           +    Execute MP Loop        ><

Mp Selftest             +    MIP Selftest           +    Read Memory Log     +
Display MA              +    Set MA>       <             Clear Memory Log    +

Issue Clocks>   <at  MA>    <
System Clock Mode +
Single Clock Mode   +
                                                            MENUS:
Load/Verify         (L/V)  Access CM        >  <for>  <     Cache        +
AP Operator Set    >  <    Access SM        >  <for>  <     Operator     +
AMP Operator Set>  <       Access Loc Mem >   <for>   <     Software     +
RDC                >  <                                     Hardware     +
MP Read Data                                                Refresh      +
```

```
B7900 AP                        CACHE MENU                          VERSION 04
Continue +          Restart +              Initialize AP +   Avail  AP   +
Issue Clocks >      <at MA>   <            Issue Strobe +
Access DA  >        <for >    <            Access TT><for>   <
                                           Access Subsurface +
APIM:   CR>0<    ALR>F<    HIR>0<  SIR>0<  CER>00<   DER>00<
CACHE:  ASRR>7<             ARG>0000000<              DR   >8000000002001<
        ASWR>8<             DAOR>FFFFFFFFFFFFF<       TTOR>2000<
        ERR  >T<>05002<     CBR >8000000002001<       MIR  >FFFFFFFFFFFFF<



ADT__E >F<  ADRERR>T<  CSR  >00 <  CCR >3< CHKMOD >F<  AERR>T<   CLKMAJ >F<
MCA_E  >F<  MCA_DL>F<  MSR  >00 <  MCR >0< MHCM_E >F<  LBSL>0<   MHOC_E>F<
DA_WE  >F<  DAPC__E>F<  CWPE >  0 <  DAPE>0< MASK__E>F<  DVDL>T<   MBCM_E>F<
MBSU_E >F<  MCDV__E>F<  MBOC>  T <  MBSL>0< MBSS    >F<  MABR>1<   MHSR   >F<
MERR   >0<  MACK   >0<  MFAL>  0 <  MFLD>0< MIIR    >00<  MISL >F<   MISS   >T<
MMHU_E >F<  MRDV   >T<  MROC>  T <  PCRQ>T< PCFBSR  >F<  PCF  >F<   OPAB__E>F<
PHCH_E >F<  RXREQ  >F<  RMDV>  F <  PLSR>F< PHDV__E >F<  COPR>000<  RQCM_E>F<
PLMHDV >F<  PREF__E>F<  VBRR>  1F <         TT___WE >F<
XMT__E >F<  WCDA  E>F<  VBWR>  0403<        PUWR    >00<                MENUS:
                                                                       Operator  +
SNAKE:459   >10020FFFFF0 <415   >0000FFFFFFFF8 <363    >00FFFFFF0CF00 <  Software  +
      311 >0000000001000 <259   >00FFFFFFFFFFF< 207    >FF80003E00000 <  Hardware  +
      156 >100C0CE60408D <103   >D002180000000  <  51    >020001F314002 <  MP        +
                                                                       Refresh   +
```

```
B7900 AP                      CACHE SUBSURFACE                      VERSION 04
Return +
VALID BIT DATA    >0000<
VALID BIT CODE    >0000<
PAGE USED ARRAY   >0000<
AR                >002006<
NPR               >100010<
PCAC              >100009<
```

SECTION 9
DEAD STOPS

NOTE
These are subject to change.

GENERAL DESCRIPTION

There is pertinent information in the A and B registers for diagnosing Dead Stops. This information must be recorded. The A register always indicates which Dead Stop occurred. The B register has additional information which varies from Dead Stop to Dead Stop.

Some Dead Stops are listed as non-fatal in this document. This means that a B 7000 system can continue running after the stop without halt/loading.

Utiloader Dead Stops

SYSTEM/UTILOADER is the BOOT LOADER for B 7900 systems. Utiloader Dead Stops are identified by line number only. When a Dead Stop occurs, the line number of the Dead Stop invocation is displayed in the A register. On B 7900 Systems, bits 47:16 of the A register contain 4'DEAD'. The error dependent information (parameter) is displayed in the B register. All Utiloader Dead Stops are fatal.

10036500	Parameter:	BOOTRESULTQ[0].ZOTTAG
	Procedure:	BOOTHARDWAREINTERRUPT
	Comment:	The Error IOCB completed during an attempted H/L.
10061000	Parameter:	P1
	Procedure:	BOOTHARDWAREINTERRUPT
	Comment:	Unexpected interrupt during attempted H/L.
20082000	Parameter:	MACHINEID
	Procedure:	ESPERA
	Comment:	Machine type unknown to Utiloader.
20481000	Parameter:	ADDR
	Procedure:	TRYANDSETTHEMASKS
	Comment:	Found a bad BCC.
26434000	Parameter:	ADDR
	Procedure:	SAVECURRENTDLPMASK
	Comment:	Found a bad BCC.
27632000	Parameter:	8'IOCBER'
	Procedure:	B7900FIRETHEERRORIOCB
	Comment:	IO exception occurred while trying to write ECQ pointer.
40048000	Parameter:	RESULT
	Procedure:	TAPEIO
	Comment:	Irrecoverable tape parity errors.
40161520	Parameter:	8'HLLOAD'
	Procedure:	B7900TEARDOWNUNITINPUT
	Comment:	IO exception while writing the H/L RAM.

40209000	Parameter:	CODELENGTH
	Procedure:	READINTHECODE
	Comment:	Requested codefile is larger than the available memory.
41054000	Parameter:	ADDR
	Procedure:	PACKMESSER
	Comment:	IO exception on a disk operation.
44029000	Parameter:	8'NOPACK'
	Procedure:	ALFATALMSG
	Comment:	No usable packs available for autoloading Utiloader.
44031000	Parameter:	8'NODPDC'
	Procedure:	ALFATALMSG
	Comment:	No usable disk pack controllers on autoloading system.
50300000	Parameter:	DESCRIPTOR(RESULTQ).ADDR
	Procedure:	IOFINISHHDP
	Comment:	IOfinish called but no IOs in queues.
50311000	Parameter:	ADDR
	Procedure:	IOFINISHHDP
	Comment:	MLIP completed the error IOCB.
50318000	Parameter:	ADDR
	Procedure:	IOFINISHHDP
	Comment:	Cancel error IOCB operation failed.
50332000	Parameter:	ADDR
	Procedure:	IOFINISHHDP
	Comment:	Irrecoverable DLP exception occurs.
50369000	Parameter:	RSLT
	Procedure:	IOFINISHHDP
	Comment:	Irrecoverable ODT exception occurs.
50375000	Parameter:	RSLT
	Procedure:	IOFINISHHDP
	Comment:	Irrecoverable DLP exception occurs.
50382000	Parameter:	RSLT
	Procedure:	IOFINISHHDP
	Comment:	Irrecoverable ODT exception occurs.
50401200	Parameter:	RSLT
	Procedure:	IOFINISHHDP
	Comment:	Discontinue op found nothing to cancel.
50425208	Parameter:	ADDR
	Procedure:	IOFINISHHDU
	Comment:	HDU compeleted the error IOCB.
50425236	Parameter:	ADDR
	Procedure:	IOFINISHHDU
	Comment:	Cancel error IOCB failed.
50425312	Parameter:	ADDR
	Procedure:	IOFINISHHDU
	Comment:	Irrecoverable DLP exception occurs.

50425624	Parameter:	RSLT
	Procedure:	IOFINISHHDU
	Comment:	Irrecoverable ODT exception occurs.
50425638	Parameter:	RSLT
	Procedure:	IOFINISHHDU
	Comment:	Irrecoverable DLP exception occurs.
50425652	Parameter:	RSLT
	Procedure:	IOFINISHHDU
	Comment:	Irrecoverable ODT exception occurs.
50439600	Parameter:	CONTROLMODE
	Procedure:	EMODEINT
	Comment:	Processor in control mode 2 in Utiloader.
50453000	Parameter:	P1
	Procedure:	EMODEINT
		Comment: Unexpected interrupt.
50455000	Parameter:	P1
	Procedure:	EMODEINT
	Comment:	Unexpected interrupt.
50491000	Parameter:	P1
	Procedure:	B6900INT
	Comment:	Unexpected interrupt.
50539000	Parameter:	P1
	Procedure:	B6800INT
	Comment:	Unexpected interrupt.
50541000	Parameter:	P1
	Procedure:	B6800INT
	Comment:	Unexpected interrupt.
50579000	Parameter:	P1
	Procedure:	B6700INT
	Comment:	Unexpected interrupt.
50581000	Parameter:	P1
	Procedure:	B6700INT
	Comment:	Unexpected interrupt.
50635000	Parameter:	P1
	Procedure:	WHATMACHINEINTERRUPT
	Comment:	Unexpected interrupt.
60002212	Parameter:	MEMADDR
	Procedure:	<outer block>
	Comment:	Not enough memory for stack.
60002480	Parameter:	MEMALLOCATIONADDR
	Procedure:	<outer block>
	Comment:	Not enough memory for D0 arrays.
60047220	Parameter:	8'NODLPS'
	Procedure:	<outer block>
	Comment:	No DLPs found on system (most likely a problem with the MLIP hardware).

60070700	Parameter:	ADDR
	Procedure:	<outer block>
	Comment:	IO exception on H/L unit.
60087845	Parameter:	TEMP
	Procedure:	<outer block>
	Comment:	Not enough memory left to move Utiloader stack.
60098765	Parameter:	TEMP
	Procedure:	<outer block>
		Comment: Not enough memory left to move the xfer control code.
70059000	Parameter:	8'NOFILE'
	Procedure:	<outer block>
	Comment:	Requested file not on tape.
80056000	Parameter:	8'HLREAD'
	Procedure	<outer block>
	Comment:	Cannot read the H/L RAM.
80067000	Parameter:	8'NOODT'
	Procedure:	<outer block>
	Comment:	The ODT slot in the minimal configuration is not valid.
80069200	Parameter:	8'BADODT'
	Procedure:	<outer block>
Comment:		The path to the ODT in the minimal configuration is either invalid or broken.
80089000	Parameter:	8'HLWRTE'
	Procedure:	<outer block>
	Comment:	Cannot write the H/L RAM.
80155000	Parameter:	EMP
	Procedure:	<outer block>
	Comment:	Not enough memory left to move Utiloader stack.
80176110	Parameter:	TEMP
	Procedure:	<outer block>
	Comment:	Not enough memory left to move the xfer control code.

Loader Dead Stops

On mark 3.4, the same SYSTEM/LOADER code file is used on all Burroughs large systems. When a fatal error occurs while SYSTEM/LOADER is running, the result varies with the type of machine that is running. B 7000 systems attempt to display a message on the ODT, then halt. The pattern 4'DEAD00000nnn', where nnn is the Dead Stop number, is displayed in the A register. The parameter is displayed in the B register. All LOADER Dead Stops are fatal.

101	Parameter:	0
	Procedure:	MEMDUMP
	Sequence #:	10367500
	Comment:	A B 7000 machine has tried to call procedure MEMDUMP. This indicates a coding problem. The Dead Stop is for debug purposes only.

102	Parameter:	HDU result
	Procedure:	IOINITIALIZE of PIO79
	Sequence #:	10509450
	Comment:	An IO exception occurs while trying to initialize the HDU error command queue pointer.
103	Parameter:	HDU result
	Procedure:	PIOINITIALIZE of PIO79
	Sequence #:	10511700
	Comment:	An IO exception occurs while trying to read the HDU H/L RAM.
104	Parameter:	DESCRIPTOR(PIOAREA)
	Procedure:	various
	Sequence #:	various
	Comment:	The PIOAREA array is too small. This indicates a coding problem and is for debug purposes only.
105	Parameter:	PIOFUNCTION
	Procedure:	various
	Sequence #:	various
	Comment:	The PIOAREA array is improperly set up. This indicates a coding problem.
106	Parameter:	HDU result
	Procedure:	PIOEND of PIO79
	Sequence #:	10520950
	Comment:	IO exception occurs while trying to write the HDU H/L RAM.
108	Parameter:	Physical unit type
	Procedure:	various
	Sequence #:	various
	Comment:	I/O attempts to unknown unit (DLP) type.
109	Parameter:	Head of result queue
	Procedure:	PIOFINISH of PIO79
	Sequence #:	10545500
	Comment:	HDU completes an error IOCB.
10C	Parameter:	Size of array required (in words)
	Procedure:	various
	Sequence #:	various
	Comment:	The IO buffer used by the LOAD command is too small. This indicates a coding problem.
10F	Parameter:	P1
	Procedure:	PIOFINISH of PIO78
	Sequence #:	10612856
	Comment:	An IOFINISH interrupt is detected from an IOM other than the H/L IOM.
110	Parameter:	P1
	Procedure:	PIOFINISH of PIO78
	Sequence #:	10612864
	Comment:	An indecipherable IO interrupt occurs. This could be a coding or a hardware problem.

111	Parameter:	Machine ID
	Procedure:	various
	Sequence #:	various
	Comment:	An IO procedure is called for a machine type for which it is not intended. This is a coding problem. This check is for debug purposes only.
112	Parameter:	Unitinfo
	Procedure:	MYIO of PIO79
	Sequence #:	10504520
	Comment:	A fatal IO exception occurs. Ten retries fail.
114	Parameter:	CQ head
	Procedure:	CIOIT
	Sequence #:	10710000
	Comment:	LOADER tries to use an already active unit.
115	Parameter:	Logical command
	Procedure:	CIOREQUEST
	Sequence #:	10836500
	Comment:	LOADER tries to issue an undefined logical IO command. This is a coding problem. This check is for debug purposes only.
116	Parameter:	Result Queue Head
	Procedure:	CIOFINISH
	Sequence #:	10933050
	Comment:	The MLIP completed an error IOCB.
117	Parameter:	DESCRIPTOR(IOCB)
	Procedure:	CIOFINISH
	Sequence #:	10933070
	Comment:	An IOCB with inconsistent information is found in the result queue.
118	Parameter:	0
	Procedure:	INTPROC_B5900_B6700_B6800_B6900
	Sequence #:	11068000
	Comment:	A presencebit is detected on returning from a value call. This probably means that the LOADER code is corrupted in memory.
119	Parameter:	0
	Procedure:	INTPROC_B5900_B6700_B6800_B6900
	Sequence #:	11090500
	Comment:	An unmasked IO error occurs.
11A	Parameter:	P1
	Procedure:	INTPROC_B5900_B6700_B6800_B6900
	Sequence #:	11099000
	Comment:	An unexpected interrupt occurs.
11B	Parameter:	P1
	Procedure:	INTPROC_B5900_B6700_B6800_B6900
	Sequence #:	various
	Comment:	An interrupt occurs while handling another.

11C	Parameter:	0
	Procedure:	SPOUT
	Sequence #:	12314000
	Comment:	A fatal condition occurs which is described by a message on the ODT.
11D	Parameter:	Number of retries
	Procedure:	DISKIO
	Sequence #:	13023000
	Comment:	A disk IO is retried the maximum allowable number of times without success.
11E	Parameter:	Logical unit type
	Procedure:	TAPEIO
	Sequence #:	14021250
	Comment:	An IO to a type of tape drive not supported by LOADER is attempted.
11F	Parameter:	Mask of available mods.
	Procedure:	WHATSOUTTHERE
	Sequence #:	23009070,23009116
	Comment:	There is insufficient contiguous memory to run the LOADER.
120	Parameter:	0 Procedure: WHATSOUTTHERE
	Sequence #:	23009680
	Comment:	The DLP specified for the ODT path in the B 7900 H/L RAM is not of type ODT1.
121	Parameter:	IO table index for HL ODT.
	Procedure:	PERIPHERALINIT
	Sequence #:	23054250
	Comment:	H/L ODT not ready.
122	Parameter:	WJ of FORGETSPACE
	Procedure:	FORGETSPACE
	Sequence #:	26040600
	Comment:	Bad FORGETSPACE in-use chain (bad memory links).
123	Parameter:	J of FORGETSPACE
	Procedure:	FORGETSPACE
	Sequence #:	26040950
	Comment:	Bad available memory chain (bad memory links).
124	Parameter:	P2
	Procedure:	PRESENCEBIT
	Sequence #:	26060700
	Comment:	A presencebit interrupt occurs on a word which is neither a code nor data descriptor.
125	Parameter:	P2
	Procedure:	PRESENCEBIT
	Sequence #:	26061000
	Comment:	PRESENCEBIT is invoked for a segment descriptor. This indicates a coding problem. The check is for debug purposes only.

126	Parameter:	0
	Procedure:	PRESENCEBIT
	Sequence #:	26061900
	Comment:	Out of memory for array allocation.
127	Parameter:	0
	Procedure:	FORGETDOPEVECTORS
	Sequence #:	26071450
	Comment:	Non-tag 5-word in dope vector.
128	Parameter:	Dimension.
	Procedure:	ARRAYDEC
	Sequence #:	26087500
	Comment:	LOADER detects an illegal dimension while allocating memory for a dope vector.
129	Parameter:	0
	Procedure:	ARRAYDEC
	Sequence #:	26083000
	Comment:	A dope vector is declared with too many dimensions.
12A	Parameter:	0
	Procedure:	ARRAYDEC
	Sequence #:	26083950
	Comment:	Out of memory for dope vector allocation.
12C	Parameter:	0
	Procedure:	SCANOUTDCP
	Sequence #:	45001600
	Comment:	An IO error occurs while initializing a DCP using the LOADER SCANOUT command. The state of the DCP is undefined.
12D	Parameter:	0
	Procedure:	GETUSERDISK
	Sequence #:	50149600
	Comment:	A logic error occurs while allocating space on the H/L disk.
12E	Parameter:	0
	Procedure:	DISKMAPPER
	Sequence #	50182610
	Comment:	LOADER detects an inconsistency in the information stored on the H/L disk.
12F	Parameter:	Size required.
	Procedure:	CHECKMSTSIZE
	Sequence #:	61068340
	Comment:	The LOADER array for the MCP structure table is too small. This check is for debug purposes only.
130	Parameter:	0
	Procedure:	JOBDESCCOMPLEMENT
	Sequence #:	70096680
	Comment:	Overlap of files is encountered while complimenting the Job Description file.

133	Parameter:	Machine ID.
	Procedure:	FINDWHATMACHINE
	Sequence #:	80095672
	Comment:	An invalid machine id is detected by the LOADER.
134	Parameter:	0
	Procedure:	various
	Sequence #:	various
	Comment:	The loader overflows its INPUTMODE stack. This is a coding error. The check is for debug purposes only.
135	Parameter:	0
	Procedure:	various
	Sequence #:	various
	Comment:	Out of room in FLAT directory.
150	Parameter:	0
	Procedure:	STOPRUN
	Sequence #:	53010030
	Comment:	This occurs normally after a LOADER STOP command when a DCP SCANOUT is initiated during the LOADER session.
151	Parameter:	0
	Procedure:	PROCESSINPUTCARDS
	Sequence #:	70374000
	Comment:	No unit card is found for an ODT.
152	Parameter:	0
	Procedure:	GETSPACE
	Sequence #:	26050700
	Comment:	No memory condition is detected during GETSPACE execution.
153	Parameter:	0
	Procedure:	GETSPACE
	Sequence #:	26051400
	Comment:	Bad GETSPACE available chain (bad memory links).

B 7900 MCP BOOT Dead Stops

The B 7900 MCP BOOT is stored in the HDU H/L Ram. When the HDU receives a Load interrupt, it loads the BOOT code into memory and interrupts the processor to execute it. A number of conditions can cause the boot to fail, all of which should end up as Dead Stops. BOOT Dead Stops halt the H/L CPM. The A register displays the hex pattern 4'DEAD00000nnn', where nnn is the Dead Stop number in the format 'B0n'. The B register displays the parameter. All BOOT Dead Stops are fatal.

B01	Parameter:	P1
	Comment:	Processor in control mode 2 in the BOOT after an interrupt occurs.
B02	Parameter:	P1
	Comment:	An unexpected interrupt occurs.

The following three Dead Stops occur if the CPM running light out interrupt occurs. This usually happens because an I/O never completed. The HDU fault buffer should be checked for an error IOCB.

B03	Parameter:	DESCRIPTOR(IOCB)
	Comment:	The running light went out, and the last command is an HDU command.
B04	Parameter:	DESCRIPTOR(IOCB)
	Comment:	The running light went out, and the last command is a BCC command. The base may have to be cleared manually.
B05	Parameter:	DESCRIPTOR(IOCB)
	Comment:	The running light went out, and the last command is a pack command. The disk pack controller may have to be cleared or have controlware loaded.

The following Dead Stops occur if an I/O operation fails all 10 retries.

B06	Parameter:	DESCRIPTOR(IOCB)
	Comment:	An HDU command failed all 10 retries.
B07	Parameter:	DESCRIPTOR(IOCB)
	Comment:	The disk DLP could not be enabled in the DLP enable mask. The H/L disk pack path specification may be incorrect or the DLP may be in use by another partition.
B08	Parameter:	DESCRIPTOR(IOCB)
	Comment:	A BCC operation failed all 10 retries.
B09	Parameter:	DESCRIPTOR(IOCB)
	Comment:	A pack operation failed all 10 retries. (The pack might be NOT READY.)

MCP Dead Stops

When an MCP Dead Stop occurs, the processor(s) which Dead Stops halts with the hex pattern 4'DEAD0000nnnn' in the A register, where nnnn is the Dead Stop number. The word described by "parameter" is displayed in the B register.

201	Parameter:	DUMMPBOOTSTRAPPER RCW & SNR [47:12]
	Procedure:	DUMPBOOTSTRAPPER
	Sequence #	91990320
	Status:	Non-fatal
	Comment: #:	Dead stop if diagnostic option ADS set.
202	Parameter:	Address of PERCONINFO
	Procedure:	GETITGOING
	Sequence #:	82043550/82043580 (HDU/IOM)
	Status:	Fatal
	Comment:	Invalid peripheral configuration on disk.

203	Parameter:	0
	Procedure:	GETITGOING
	Sequence #:	82045960
	Status:	Fatal
	Comment:	None of the hardware in the PCD is available to the partition.
205	Parameter:	GIGSYNCIORD
	Procedure:	GIGPIOIOM of GETITGOING
	Sequence #:	81776500
	Status:	Non-fatal
	Comment:	I/O Exception after 10 retries.
207	Parameter:	HANGUP
	Procedure:	SPOUT of TAPEDUMP
	Sequence #:	92479750
	Status:	Fatal
	Comment:	TAPEDUMP bombed (unexpected interrupt).
208	Parameter:	Location of the H/L page in the following format: [7:2] = H/L MSM number [5:2] = MSU number [3:4] = page number
	Procedure:	CONFIGESTABLISHER79
	Sequence #:	83499208
	Status:	Fatal
	Comment:	No available memory on the system; tries to use the half MSU containing the H/L page, but these pages fail memory testing.
209	Parameter:	DENR in [43:20] and CENR in [19:20]
	Procedure:	HARDWAREINTERRUPT79
	Sequence #:	11547720
	Status:	Fatal
	Comment:	All other processors are halted. This processor received a no access to memory while running in an ASN where memory reconfiguration is done. The MSM translation tables for this requestor are corrupted. Using SYCON (MSM Panel display), for each MSM on the system, dump the translation tables for the environments in the parameter. The translation table entries for each requestor in the system should be identical. If a discrepancy is found, the whole translation table display for that environment should be recorded. A Standalone Tape Dump should be taken (this may not always be possible if the H/L CPM is the requestor with the corrupted translation table; the H/L CPM may need to be changed). This processor RIA in the MSM with the corrupted translation tables should be checked out.
211	Parameter:	IOTYPE
	Procedure:	GIGPIOIOM of GETITGOING
	Sequence #:	81773800
	Status:	Non-fatal
	Comment:	Invalid IOTYPE case.

212	Parameter:	Q
	Procedure:	DOIOP of MEMDUMP (Printer dump)
	Sequence #:	92196684
	Status:	Non-fatal
	Comment:	Invalid IOTYPE case.
213	Parameter:	MCMMASK
	Procedure:	LOCKOUTSUBSYSTEM of SECONDARYINITIALIZE
	Sequence #:	83432920
	Status:	Fatal for slave.
	Comment:	No local memory for slave TCBOX.
214	Parameter:	MCMMASK
	Procedure:	MERGER
	Sequence #:	82144960
	Status:	Fatal for master.
	Comment:	No local memory for master TCBOX.
215	Parameter:	HANGUP
	Procedure:	TAPEDUMP
	Sequence #:	92479775
	Status:	Fatal
	Comment:	A processor did not respond.
216	Parameter:	HANGUP
	Procedure:	TAPEDUMP
	Sequence #:	92479785
	Status:	Fatal
	Comment:	Tape dump completed successfully and AUTORECOVERY is not set. A manual H/L is required.
218	Parameter:	None
	Procedure:	DUMPBOOTSTRAPPERIOM
	Sequence #:	91994500
	Status:	Non-fatal
	Comment:	No memory dump disk.
219	Parameter:	UNITTYPE
	Procedure:	DOSYNCHIO of PIO
	Sequence #:	30905700
	Status:	Non-fatal
	Comment:	Invalid unit type case.
221	Parameter:	0
	Procedure:	PRINTERDUMP
	Sequence #	92247160
	Status:	Fatal Comment: PRINTERDUMP is not implemented for the B 7900. Use Standalone Tape Dump instead.
222	Parameter:	P1
	Procedure:	PRINTERDUMPHI70P of MEMDUMP
	Sequence #:	92163000
	Status:	Eventually fatal
	Comment:	IOM error.

223	Parameter:	TPIOCB[PDIOMPHYSICALRD]
	Procedure:	PRINTERDUMPHI70P
	Sequence #:	92163050
	Status:	Eventually fatal
	Comment:	Result descriptor for Dead Stop 222.
224	Parameter:	P1
	Procedure:	PRINTERDUMPHI70P
	Sequence #:	92161150
	Status:	Fatal
	Comment:	60p/stack underflow/invalid PCW interrupt; also, where all Dead Stops in PRINTERDUMPHI70P go to.
225	Parameter:	RCW
	Procedure:	PRINTERDUMPHI70P
	Sequence #:	92161200
	Status:	Fatal
	Comment:	RCW for Dead Stop 224.
226	Parameter:	P1
	Procedure:	PRINTERDUMPHI70P
	Sequence #:	92161400
	Status:	Eventually fatal
	Comment:	Memory Fail 1/Processor Internal/Memory Parity
227	Parameter:	P2
	Procedure:	PRINTERDUMPHI70P
	Sequence #:	92161450
	Status:	Eventually fatal
	Comment:	P2 for Dead Stop 226.
228	Parameter:	RCW
	Procedure:	PRINTERDUMPHI70P
	Sequence #:	92161500
	Status:	Eventually fatal
	Comment:	RCW for Dead Stop 226.
229	Parameter:	PFR
	Procedure:	PRINTERDUMPHI70P
	Sequence #:	92161650
	Status:	Eventually fatal
	Comment:	Processor fail register for Proc Internal.
230	Parameter:	MCMFAILINFO (PFR.[3:4])
	Procedure:	PRINTERDUMPHI70P
	Sequence #:	92161700
	Status:	Eventually fatal
	Comment:	MCM fail register for Dead Stop 229.
232	Parameter:	GIGHLIOMMASK
	Procedure:	GIGPIOIOM of GETITGOING
	Sequence #:	81776800
	Status:	Fatal
	Comment:	I/O to interrupt IOM does not finish.

233	Parameter:	LENGTH
	Procedure:	PIOINITIALIZE of PIO
	Sequence #:	30938000
	Status:	Fatal
	Comment:	Attempt to access memory outside of PIOAREA.
234	Parameter:	None
	Procedure:	DUMPBOOTSTRAPPERIOM
	Sequence #:	91996320
	Status:	Non-fatal
	Comment:	Attempt to resume system I/O fails and halt/loads.
235	Parameter:	P1
	Procedure:	GIGB7000HI of GETITGOING
	Sequence #:	81553720
	Status:	Non-fatal
	Comment:	Unexpected external interrupt.
236		Parameter: P1
	Procedure:	GIGB7000HI,GIGB7900HI
	Sequence #:	81553800,81553810,81556970
	Status:	Fatal
	Comment:	Unexpected operator dependent or stack overflow interrupt.
237	Parameter:	P1
	Procedure:	GIGB7000HI,GIGB7900HI
	Sequence #:	81553920,81556940
	Status:	Fatal
	Comment:	Unexpected alarm interrupt.
238	Parameter:	P1
	Procedure:	GIGB7900HI
	Sequence #:	81555500
	Status:	Fatal
	Comment:	Processor in control mode 2 in GIGB7900HI.
239	Parameter:	P1
	Procedure:	GIGB7000HI,GIGB7900HI
	Sequence #:	81553960,81557100
	Status:	Fatal
	Comment:	All other interrupts.
242	Parameter:	P2
	Procedure:	MTBHARDWAREINTERRUPT
	Sequence #:	85762500
	Status:	Non-fatal
	Comment:	IOM error.
243	Parameter:	P2
	Procedure:	MTBHARDWAREINTERRUPT
	Sequence #:	85762900
	Status:	Non-fatal
	Comment:	Unexpected external interrupt.

244	Parameter:	P1
	Procedure:	MTBHARDWAREINTERRUPT
	Sequence #:	85763800
	Status:	Fatal
	Comment:	Any other interrupt.
245	Parameter:	LRD
	Procedure:	MASHTHEBUTTONS
	Sequence #:	85767900
	Status:1	Fatal
	Comment:	Cannot load boot.
249	Parameter:	All ones
	Procedure:	HARDWAREINTERRUPT77
	Sequence #:	11452300
	Status:	Fatal for CPM
	Comment:	CPM entered CM2.
250	Parameter:	PROCID
	Procedure:	ZOT
	Sequence #:	85876680
	Status:	Fatal for CPM
	Comment:	CPM removed by Failure Analysis.
251	Parameter:	The first six characters of the dump reason (in EBCDIC).
	Procedure:	PRINTERDUMP
	Sequence #:	92259042
	Status:	Fatal or non-fatal
	Comment:	PRINTERDUMP is called. Push through to Dead Stops 252 and 253 to see the complete dump reason and to see if the dump is fatal. If the dump is non-fatal, it is possible to push through the last Dead Stop (253) and to continue running the system; otherwise, if a dump is desired, use Standalone Tape Dump. (See Dead Stops 252 and 253.)
252	Parameter:	The next six characters of the dump reason.
	Procedure:	PRINTERDUMP
	Sequence #:	92259044
	Status:	Fatal or non-fatal
	Comment:	This Dead Stop follows Dead Stop 251. Push through to Dead Stop 253. (See Dead Stops 251 and 253.)
253	Parameter:	The last four characters of the dump reason. If [7:8] is equal to 4'FD', the dump is a fatal dump. If [7:8] is equal to 0, the dump is non-fatal.
	Procedure:	PRINTERDUMP
	Sequence #:	92259046
	Status:	Fatal or non-fatal
	Comment:	This Dead Stop follows Dead Stop 252. If the dump is non-fatal, it is possible to push through the Dead Stop to continue running the system; otherwise, the three Dead Stops are repeated. If a dump is desired, use Standalone Tape Dump. (See Dead Stops 251 and 252.)

254	Parameter:	The P1 interrupt parameter.
	Procedure:	PRINTERDUMP
	Sequence #:	92244245
	Status:	Fatal
	Comment:	An unexpected interrupt occurs, or another processor got an unexpected interrupt or calls PRINTERDUMP.
255	Parameter:	2BAD2BAD2BAD
	Procedure:	DUMPITP of MEMDUMP
	Sequence #:	92079296
	Status:	Non-fatal
	Comment:	No ready printer - push START.
256	Parameter:	REGISTER[58]
	Procedure:	SECONDARYINITIALIZE
	Sequence #:	83444040
	Status:	Non-fatal
	Comment:	Not a B 7000 class machine (CPM broke).
257	Parameter:	Unit number
	Procedure:	PIOFINDCHANNEL of PIO
	Sequence #:	30918600
	Status:	Fatal
	Comment:	Unable to find valid path to unit.
258	Parameter:	All ones
	Procedure:	ANSWER
	Sequence #:	11768200
	Status:	Fatal
	Comment:	Stop slaves on RECONFIGURE.
259	Parameter:	All ones
	Procedure:	FAKEAMOVE of CPUMORTICIAN
	Sequence #:	11925000
	Status:	Non-fatal
	Comment:	Processor saved off.
260	Parameter:	GROUPBOXMASKS (PROCID & BOXFROMPROC) Procedure: MCMMAPPER2
	Sequence #:	83497980
	Status:	Fatal
	Comment:	Slave TCBOX removed - no local memory.
262	Parameter:	None
	Procedure:	MCMMAPPER2
	Sequence #:	83497760
	Status:	Fatal
	Comment:	H/L box found no IOM.
264	Parameter:	PMAGLOBAL
	Procedure:	MEMESTABLISHER
	Sequence #:	83490820
	Status:	Fatal
	Comment:	Mod 0/1 no good.

265	Parameter:	CFCFCFCFCFCF
	Procedure:	CONFIGURATOR
	Sequence #:	02340200
	Status:	Non-fatal
	Comment:	System is reconfigured. Operator must set up new configuration and H/L.
267	Parameter:	Address of SATDPERCONINFO
	Procedure:	READINSATD of GETITGOING
	Sequence #:	81861220
	Status:	Non-fatal
	Comment:	Invalid peripheral configuration on disk.
271	Parameter:	None
	Procedure:	MCMMAPPER2
	Sequence #:	83497900
	Status:	Non-fatal
	Comment:	Slave box removed - lost IOM.
272	Parameter:	None
	Procedure:	PRIMARYINITIALIZE70
	Sequence #:	83471535
	Status:	Fatal
	Comment:	H/L IOM failed.
273		IOM Systems
	Parameter:	FLOW
	Procedure:	IOFAUCET
	Sequence #:	30875900
	Status:	Non-fatal
	Comment:	Invalid FLOW case.
		HDU Systems
	Parameter:	HDU, HDU, or FLOW (depending on invocation)
	Procedure:	IOFAUCET
	Sequence #:	32098350,32098365,32098690
	Status:	Non-fatal
	Comment:	The first two invocations mean that an HDU command failed; the third indicates an invalid FLOW case.
274	Parameter:	DECIMAL(LINENUMBER)
	Procedure:	Various, usually GETITGOING or PIO
	Comment:	Always followed by dead 275. This Dead Stop is invoked using the MCP defines DEAD and GIGDEAD. This stop should be pushed through to get at the additional information reported in Dead Stop 275.

The define GIGDEAD is always used in system initialization (GETITGOING). This define is invoked for a wide variety of reasons. The line number should be used to determine what the Dead Stop reason is.

Dead 274 B Reg	Dead 275 B Reg	Reason
81542326	RD	MLIP completed error IOCB.
81542334	RD	<same as above>.
81542400	RD	MLIP reported error on disk IO.
81544245	IOCB	HDU completed error IOCB.
81544310	RD	HDU error on IO.
81547800	P1	Unexpected interrupt (B5900).
81549330	P1	Unexpected interrupt (B6700).
81552800		Unexpected interrupt (B6800).
81553420	P1	Unexpected interrupt (B6900).
81595550	DESC	Unexpected P-Bit (B7000).
81596600	PLACE	Invalid stack structure (B7000).
81765400	RESULT	IO failed 10 times (MPX).
81850700	IOCB	IO failed 10 times (MLIP).
81851455	HAQHEAD	Non-empty HDU home address queue
81851475	HAQTAIL	Non-empty HDU home address queue
81851538	IOCB	IO failed 10 times (HDU).
81852810	99	Invalid MCP info table on H/L pk.
81860740	99	Invalid MCP info table on H/L pk.
81861040	J	Cannot find MCP code file header.
81893500	GIGMA	Not enough contiguous memory.
81894500	GIGMA	<same as above>.
81896820	GIGMA	<same as above>.
81975000	99	Invalid MCP info table on H/L pk.
82000000	J	Did not find H/L disk file hardware.

The define DEAD is used throughout the MCP, particularly when the same fatal condition is checked in a number of places (e.g., the define CHECKPIOAREA). The parameter to Dead 275 is usually an EBCDIC mneumonic which tries to describe the problem.

Dead 274 B Reg	Dead 275 B Reg	Reason
29575950	8'PUTYPE'	MPX unit type unknown to PIO.
29577750	8'UNKINT'	Unexpected interrupt (PIO MPX).
29587600	8'NOROOM'	PIOAREA is too small.
32119160		
36238000		
92299600		
92660600		
29592300	8'MOVED'	PIO valid mark is gone.
29602900		
29611900		
30940900		
30951948		
30961400		
30963656		
32110160		
32112100		

32120220		
32123120		
32131980		
32134434		
32134500		
36224550		
36222600		
36242650		
36251950		
36261950		
29592350	8'UA ERR'	Requested unit is not initialized.
29602950		
29611950		
30941000		
30951950		
30961500		
32120240		
32123140		
32127960		
32132000		
32134340		
32134436		
32134502		
36242680		
36257980		
36261980		
36263050		
29603050	8'BUFIND'	Invalid buffer index.
29605150	8'NO SPO'	No SPO found in configuration.
32104285	8'QLOCK'	HDU died with a queue locked.
32112220	8'ERHCB'	HDU completed an error IOCB.
32115306	8'PTYPE'	H/L unit has wrong DLP type.
36223200	8'ERIOCB'	MLIP completed the error IOCB.
80418000	8'NO HDR'	Cannot find disk file header.
80392500	RESULT	I/O exception.
82365800	4'222B67002222'	Invalid machine type.
82366600	4'222B79002222'	Invalid machine type.
84721420	98	Fault in MCP structure table.
85503050	8'NOMORE'	Autoloading system cannot find a usable H/L disk.
92654500	8'NODISK'	No disk path in HL RAM.
92654560	P2	Unexpected interrupt.
92659600		

275

Parameter:	Depends on invocation
Procedure:	Varies, usually GETITGOING or PIO
Status:	Fatal
Comment:	Always follows Dead Stop 274. For each invocation, the parameter contains the additional data described above.

280	Parameter:	0
	Procedure:	INITIALIZEPIO
	Sequence #:	32024630
	Status:	Fatal
	Comment:	Partition contains more than 255 peripherals.
281	Parameter:	Unitnumber of critical unit
	Procedure:	SETIOMSSERVVICING,SETCURRENTHDU
	Sequence #:	30111280,31696480
	Status:	Fatal
	Comment:	The last IOM servicing a critical unit has failed.
282	Parameter:	0
	Procedure:	INITIALIZECPIO
	Sequence #:	30742900
	Status:	Fatal
	Comment:	Reserved channel information is not found in PERCONINFO.
283	Parameter:	The H/L DISK path in internal format: [31:04] HDU [17:02] HDP [19:02] MLI [07:04] BASE [03:04] DLP [35:04] UNIT
	Procedure:	INITIALIZECPIO
	Sequence #:	30749400,32033080
	Status:	Fatal
	Comment:	The H/L unit cannot be found in UNITCARDS (IOM systems) or PCD (B 7900).
284	Parameter:	The DEVICE NUMBER of the unit in question, in packed decimal.
	Procedure:	INITIALIZECPIO
	Sequence #:	30749540,32033140
	Status:	Fatal
	Comment:	The H/L unit is not in the partition.
285	Parameter:	Contains the DEVICE NUMBER of the node in the H/L DISK path which is not viable, and a number to indicate the nature of the problem. The DEVICE NUMBER is in [47:24]; the error number in [23:24]. Both are in packed decimal. Refer to the following table to interpret the error number.

ERR Num	Node Type	Meaning
1	DLP	Read firmware ID operation failed.
4	DLP	Selective clear operation failed.
8	DLP	Test identify operation failed.
18	BASE	Base ID operation failed.
19	BASE	Base ID operation reports wrong strapped ID. (Strapped ID does not match PCDIAGRAM specification.)
20	BASE	Read DC mask operation failed.
21	BASE	Load DC mask operation failed.
22	BASE	Load DLP mask operation failed.
23	BASE	Share DLPs operation failed.
24	BASE	Read maintenance mask operation failed.
25	BASE	Load maintenance mask operation failed.
26	DLP	Load DLP mask operation on containing base failed to enable this DLP. The DLP is enabled to some other distribution card in the base.
27	MLI	LEM test ID operation failed.
28	MLI	LEM test ID operation reported wrong strapped ID. (Strapped ID does not match PCDIAGRAM specification).
29	MLI	LEM test operation failed.
30	MLI	LEM load port mask operation failed.
31	MLI	LEM read unit status operation failed.
32	BASE	LEM test operation indicates no connection between MLI and BASE.
33	DLP	Test identify operation reports wrong strapped ID. (DLP type does not match PCDIAGRAM specification.)
34	DLP	Test identify operation reported wrong strapped ID. (Strapped ID does not match PCDIAGRAM specification).
35	HDU	Write QM memory environment ID failed.
36	HDU	Write home address queue pointer failed.
37	HDU	Write error command queue pointer failed.
39	HDU	Write HDP mask failed.
40	HDU	Write HDP port mask failed.
48	BASE	Acquire DLPs operation failed.
60	HDU	Write box ID failed.
67	any	Node reserved.
68	DLP	Node FREEd.
71	HDU	Master clear ports operation failed.
73	BASE	Read DC mask operation reports wrong host return field.
	Procedure:	INITIALIZECPIO
	Sequence #:	30749700,32033200
	Status:	Fatal
	Comment:	No viable path to H/L unit.
286	Parameter	Specifies the nature of the inconsistency in the PCD.

Value	Sequence #	Meaning
1	31991980	There is no entry in the PCD for a particular device.
2	31992553	The physical unit number for a device is already assigned.
3	31993912	A unit in the PCD is connected to a DLP with an invalid DLP type.
4	31994105	An HC, LSP or NSP has an invalid DLP type.
5	31994400	A device exists in the PCD with an invalid type (it is not a unit, DLP, Base, LEM or Port).
6	32022820	A unit in the PCD is connected to a DLP with an invalid DLP type.
	Procedure:	INITIALIZECPIO of PHYSICALIOHDU
	Sequence #:	31991980, 31992553, 31993912, 31994105, 31994400, 32022820, 32024630
	Status:	Fatal
	Comment:	An internal inconsistency exists within the PCD.
287	Parameter:	The H/L DISK path in internal format (see Dead Stop 283).
	Procedure:	VERIFYHALTLOADPATHS
	Sequence #:	31985240
	Status:	Fatal
	Comment:	H/L DISK path in H/L RAM addresses unit which is neither DISK nor PACK.
289	Parameter:	HDU number
	Procedure:	BURYDEADHDU
	Sequence #:	31874788
	Status:	Non-fatal
	Comment:	The indicated HDU failed and did not recover an ETIS hardware interrupt. If the failure resulted from an error in Queue Manager microcode, the HDU might be recovered by the following sequence via SYCON: INHIBIT the failed HDU. POWERED UP the failed HDU. AVAILABLE the failed HDU. START the processor stopped on Dead 289. (At this point, the system is running normally if this sequence is successful.)
290	Parameter:	READ_BOX_ID_79
	Procedure:	STARTER CODE, CONFIGESTABLISHER79, SLAVECPMHOLDER
	Sequence #:	11933582,83499872,83500488
	Status:	Fatal to CPM
	Comment:	CPM has invalid BOXID during CPM initialization.
291	Parameter:	READ_MSM_BOX_ID_79
	Procedure:	CONFIGESTABLISHER79
	Sequence #:	83499794
	Status:	Fatal
	Comment:	MSM has invalid BOXID.

292	Parameter:	0
	Procedure:	MASHTHEBUTTONS79
	Sequence #:	85781950
	Status:	Fatal
	Comment:	This is the state in which the leading processor is left just before a programmatic H/L (??PHL or CM). If it remains in this state, then some problem occurred during the H/L.
293	Parameter:	P1
	Procedure:	DEFUNCTHWI79
	Sequence #:	91916820
	Status:	Fatal
	Comment:	Processor in control mode 2 in DEFUNCTHWI79.
294	Parameter:	P1
	Procedure:	TDHARDWAREINTERRUPT79
	Sequence #:	92703940
	Status:	Fatal
	Comment:	Processor in control mode 2 in TDHARDWAREINTERRUPT79
295	Parameter:	0
	Procedure:	ANSWER
	Sequence #:	11772650
	Status:	Non-fatal
	Comment:	A temporary state a processor can be put into during synchronization of TIMEOFDAY clocks. If it persists, then another processor probably has an error.
296	Parameter:	0
	Procedure:	ANSWER
	Sequence #:	11773600
	Status:	Non-fatal or fatal
	Comment:	Processor is told to HALT by some other processor. Can be non-fatal, as when memory reconfiguration is underway, or fatal, as when some other processor is halting the system. Check the other processors.
297	Parameter:	0
	Procedure:	READINSATD
	Sequence #:	81858660
	Status:	Fatal
	Comment:	Standalone Tape Dump cannot be taken because the MSM translation tables are corrupted. This can happen if the system is not executing the MCP just prior to the SYCON FORCE DUMP command.
301	Parameter:	P1
	Procedure:	CM3HI,EM_CM_HI
	Sequence #:	85860160,85869000
	Status:	Non-fatal
	Comment:	Unexpected interrupt.

302	Parameter:	CHECKIN
	Procedure:	CM3HI,EM__CM__HI
	Sequence #:	85861520,85869260
	Status:	Non-fatal
	Comment:	CPM in CM3 and others are not.
303	Parameter:	CHECKIN
	Procedure:	CM3HI
	Sequence #:	85864920
	Status:	Non-fatal
	Comment:	Dead stopping request in CM3.
304	Parameter:	CHECKIN
	Procedure:	CM3HI
	Sequence #:	85865420,85869570
	Status:	Non-fatal
	Comment:	CPM is bad - there is no legitimate way to reach this Dead Stop.
305	Parameter:	M[F-2] (old SNR) or 0
	Procedure:	CM3HI,EM__CM__HI
	Sequence #:	85860212,85868210,85868825
	Status:	Non-fatal
	Comment:	CPM in CM3 - start to push through.

Conditional Dump Stop List

When the MCP is running, a CD halt request may be issued at the ODT using the ??CD primitive. When a processor executes through the specified CD stop, it Dead Stops displaying 4'CD00CD000000'. The CD information is also stored in the trace table for diagnostic MCPs.

02	Parameter:	AAD
	Procedure:	AREALEFTTOBESAVED of SAVEMEMORY of MCMHANDLER
	Sequence #:	86196200
	Comment:	Area left to be saved.
07	Parameter:	M[STACKIRW]
	Procedure:	FORKHANDLER
	Sequence #:	15942500
	Comment:	IRW to forked procedure.
08	Parameter:	SNR & MANDATE [47:16]
	Procedure:	GEORGE of SOPHIA
	Sequence #:	12781700
	Comment:	Beginning of GEORGE B 7900 Systems
	Parameter:	P1 & P2.ADDRESSF [47:20] & P2.TAG TAG
	Procedure:	HARDWAREINTERRUPT79
	Sequence #:	11505340
	Comment:	Beginning of HARDWAREINTERRUPT79.
1C	Parameter:	READYQ
	Procedure:	PROCESSKILL
	Sequence #:	21035800
	Comment:	If stack dies on buried CPM.

20	Parameter:	IOCB [47:20] & U[7:8] & IOCW[27:47:20]
	Procedure:	INITIATEIOOPERATION
	Sequence #:	(30155920/31750780) (IOM/HDU)
	Comment:	The entry point for I/O operations.
21	Parameter:	IOCB[47:20] & U[7:8] & IOCW[27:47:20]
	Procedure:	FORCETOHEADOFIOQUE
	Sequence #:	(30189220/31756540) (IOM/HDU)
	Comment:	The entry point for retry operations, test-ops, load train tables, etc.
22	Parameter:	IOCB[47:20] & U[7:8] & LRD[24:16:17]
	Procedure:	REPORTIOOPERATIONCOMPLETE
	Sequence #:	(30118380/31717440) (IOM/HDU)
	Comment:	The exit point for I/O operations.
23	Parameter:	IOCB[47:20] & U[7:8] & LRD[24:16:17]
	Procedure:	REPORTIOOPERATIONCOMPLETE
	Sequence #:	(30115520/31710680) (IOM/HDU)
	Comment:	The exit point for retry operations.
24	Parameter:	IOCB[47:20] & U[7:8]
	Procedure:	RECALLIOCB
	Sequence #:	(30206520/31771540) (IOM/HDU)
	Comment:	The exit point for IOCBs recalled by UPPERPHYSICALIO.
25	Parameter:	IOCB[47:20] & U[7:8]
	Procedure:	RELINKATHEADOFIOQUEUE
	Sequence #:	(30193870/31758920) (IOM/HDU)
	Comment:	The entry point for in-process IOCBs recalled by UPPERPHYSICALIO.
26	Parameter:	HCB[47:20] & Tag Control TAG
	Procedure:	ENQUEUEHCB
	Sequence #:	31748502 (HDU only)
	Comment:	The entry point for HCBs from CPIO to the IO subsystem hardware.
27	Parameter:	DLP or HDU command descriptor
	Procedure:	ENQUEUEHCB
	Sequence #:	31748522 (HDU only)
	Comment:	The entry point for HCBs from CPIO to the IO subsystem hardware. Follows CD 26.
28	Parameter:	HDU buffer pointer
	Procedure:	ENQUEUEHCB
	Sequence #:	31748540 (HDU only)
	Comment:	The entry point for HCBs from CPIO to the subsystem hardware. Follows CD 27.
29	Parameter:	HCB & HCBEPILOG [47:4]
	Procedure:	HANDLERESULTQUEUES
	Sequence #:	31862032 (HDU only)
	Comment:	The exit point for HCBs the IO subsystem hardware to CPIO.

2A

IOM Systems

Parameter: IOCB[47:20] & U[7:8] & IOCBBEFORE[27:20]
Procedure: LINKAFTER, INITIATEIOOPERATION, INITIATEIOOPERATION
Sequence #: 30124120,30165310,30167110
Comment: The mechanism for linking an IOCB to the hardware request queues for a unit.

HDU Systems

Parameter: HCBHDURESULT
Procedure: HANDLERESULTQUEUES
Sequence #: 31862036
Comment: The exit point for HCBs from the IO subsystem hardware to CPIO. Follows CD 29.

2B

IOM Systems

Parameter: IOCB[47:20] & U[7:8]
Procedure: LINKATHEAD
Sequence #: 30129520
Comment: The mechanism for linking an IOCB at the head of a hardware request queue.

HDU Systems

Parameter: Result of HDU operation or, if as DLP exception occurs - DLP result or, if an HDU exception occurred - HDU result.
Procedure: HANDLERESULTQUEUES
Sequence #: 31862038,31862044,31862054 respectively
Comment: The exit point for HCBs from the IO subsystem hardware to CPIO. Follows CD 2A.

2C

Parameter: IOCB[47:20] & U[7:8]
Procedure: DELINKIOCB
Sequence #: 30132025 (IOM only)
Comment: The mechanism for delinking an IOCB from a hardware request queue.

2D

Parameter: IOCB[47:20] & U[7:8] & IOM[27:20]
Procedure: IOFINISH67
Sequence #: 30353610 (IOM only)
Comment: IOCB just delinked from IOM result queue.

2E

Parameter: Physical RD
Procedure: TERMINATEIOOPERATION
Sequence #: (30309120/31826480)
Comment: Occurs prior to CDSTOP 2F, after IOFINISH67 (CDSTOP 2D) or DELINKIOCB (CDSTOP 2C).

2F	Parameter:	Extended logical RD
	Procedure:	TERMINATEIOOPERATION
	Sequence #:	(30309140/31826500)
	Comment:	Occurs after CDSTOP 2E, after IOFINISH67 (CDSTOP 2D) or DELINKIOCB (CDSTOP 2C).
30		IOM Systems
	Parameter:	IOM[46:47] & FROMFAILQUEUE[47:1]
	Procedure:	HANDLEIOMFAILRD
	Sequence #:	30346080
	Comment:	IOM fail RD reported. Occurs prior to CDSTOP 31.
	HDU Systems	
	Parameter:	HDU
	Procedure:	HANDLEIOMFAILRD
	Sequence #:	31854100
	Comment:	HDU error HCB completed. Occurs prior to CDSTOP 31.
31		IOM Systems
	Parameter:	Fail RD
	Procedure:	HANDLEIOMFAILRD
	Sequence #:	30346090
	Comment:	IOM fail RD reported. Occurs after CDSTOP 30.
		HDU Systems
	Parameter:	HCBERTYP
	Procedure:	HANDLEIOMFAILRD
	Sequence #:	31854120
	Comment:	HDU error HCB compeleted. Occurs after CDSTOP 30.
32	Parameter:	SN & BOXNUM[47:8]
	Procedure:	INITIATE
	Sequence #:	18618500
	Comment:	After STACKINFO for SN is set up.
45	Parameter:	N & K [47:4]
	Procedure:	DIAL
	Sequence #:	11735900
	Comment:	Beginning of DIAL.
46	Parameter:	N
	Procedure:	HANGUP
	Sequence #:	11793520
	Comment:	First statement.
48	Parameter:	REAL(HELPING) & SEQRCHTRACEHEAD[47:24]
	Procedure:	SEARCHANSWER
	Sequence #:	10763980
	Comment:	After SEARCHTRACE call.

49	Parameter:	REAL(HELPING) & SEARCHTRACEHEAD[47:24]
	Procedure:	SEARCHBYEBYE
	Sequence #:	10765000
	Comment:	After SEARCHTRACE call.
4A	Parameter:	PACKETARRAY[PACKET, 5]
	Procedure:	REMOVEPROCSFROMPACKET
	Sequence #:	10780410
	Comment:	Before removing dead processor from all in-use packets.
4B	Parameter:	0 & REAL(HELPING)[47:8] & PROCMASK[31:8] & REAL(TEMPMASK)[7:8]
	Procedure:	REMOVEPROCSFROMPACKET
	Sequence #:	10780580
	Comment:	Before FORK of BURYTHEDEAD.
53	Parameter:	4'DDDDDDDDDDDD'
	Procedure:	ATTEMPTAUTORECOVERY in DCPSERVICES
	Sequence #:	43433740
	Comment:	If AUTORECOVERY, then before firing up DCPs.
57	Parameter:	4'EEEEEEEEEEEE'
	Procedure:	STARTSYSTEM
	Sequence #:	83834340
	Comment:	Last statement.
5E	Parameter:	0
	Procedure:	CHANGEMCP
	Sequence #:	85711700
	Comment:	Before seizing system.
78	Parameter:	SNR
	Procedure:	PROCESSKILL
	Sequence #:	21051500
	Comment:	Stack killed with PROCESSSCHANGELOCK.

APPENDIX A
ACRONYMS

AMP	Auxiliary Maintenance Processor
AP	Auxiliary Processor
APCON	Auxiliary Processor Configurator
BOJ	Beginning Of Job
BOXID	BOX IDentification register
CENR	Code ENvironment Register
CFR	CPM Fail Register
CPM	Central Processor Module
DENR	Data ENvironment Register
DLP	Data Link Processor
DP	Data Processor
DRU	Data Reference Unit
E	Enable bit
ERL	Engineering Release Level
ETIS	Execute To Initial State
F	most recent MSCW address
FIA	Fan In Adaptor
FOA	Fan Out Adaptor
FRL	Functional Release Level
HDP	Host Dependent Port
HDU	Host Data Unit
H/L	Halt/Load
ICMD	Industry Compatible Mini Disk
IDA	Interactive Diagnostic Access
IHLT	I section Halt bit
IOSM	Input/Output Subsystem Module
ISA	Initial State Acheived
JIC	Job Interrupt Controller
JICCB	Job Interrupt Controller, Conditional Branch
LL	Lex Level
LOSR	Limit of Stack Register
MBE	Maintenance Bus Enable
MBM	Maintenance Bus Mode
MCP	Master Control Program
MEX	Maintenance EXchange
MIP	Maintenance Interface Processor
MLI	Message Level Interface
MSCW	Mark Stack Control Word
MSM	Memory Subsystem Module
MTS2	Modular Terminal System Two
ODT	Operator Display Terminal
PA&S	Product Assurance and Support
PBR	Program Base Register
PCU	Peripheral Control Unit
PFR	Processor Fail Register
PID	Partition Identification
PIE	PCU Instruction Execute Register

PIR	Program Index Register
PMR	Processor Mode Register
PSR	Program Syllable Register
RAM	Random Access Memory
REQ	REQuestor
S	top of Stack address
SCC	System Control Cabinet
SDI	Segment Dictionary Index
SIE	System Interface Enable
SLL	Stored Logic Level
SNR	Stack Number
SRV/H	Software Requests Valid/Halted
SYCON	SYstem CONsole

Documentation Evaluation Form

Title: B 7900 System Operator's Guide Form No: 1166162

Date: April, 1984

Burroughs Corporation is interested in receiving your comments and suggestions regarding this manual. Comments will be utilized in ensuing revisions to improve this manual.

Please check type of Comment/Suggestion:

☐ Addition ☐ Deletion ☐ Revision ☐ Error ☐ Other

Comments:

From:

Name _____

Title _____

Company _____

Address _____

_____

Phone Number _____ Date _____

Remove form and mail to:

Burroughs Corporation
Corporate Documentation
Planning, East
209 W. Lancaster Ave.
Paoli, PA 19301, U.S.A.