UNISYS

DCP/30

Operations Reference Manual

October 1988

Printed in U S America
UP–14131

Priced Item

The names, places, and/or events used in this publication are not intended to correspond to any individual, group, or association existing, living, or otherwise. Any similarity or likeness of the names, places and/or events with the names of any individual living or otherwise, or that of any group or association is purely coincidental and unintentional.

NO WARRANTIES OF ANY NATURE ARE EXTENDED BY THE DOCUMENT. Any product and related material disclosed herein are only furnished pursuant and subject to the terms and conditions of a duly executed Program Product License or Agreement to purchase or lease equipment. The only warranties made by Unisys, if any, with respect to the products described in this document are set forth in such License or Agreement. Unisys cannot accept any financial or other responsibility that may be the result of your use of the information in this document or software material, including direct, indirect, special or consequential damages.

You should be very careful to ensure that the use of this information and/or software material 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 to advise of such changes and/or additions.

UNISYS

PUBLICATIONS RELEASE

DCP/30 System

UNISYS™
DCP/30
Operations
Reference Manual

UP–14131

This library memo announces the release and availability of "Unisys DCP/30 Operations Reference Manual", UP–14131. It is a Standard Library Item (SLI).

This manual contains DCP/30 hardware-related operating instructions, including controls and indicators, system load procedures and status reports, offline utilities (such as disk copying) and MCF console commands.

Additional copies of this manual may be ordered through your Unisys representative.

LIBRARY MEMO ONLY	LIBRARY MEMO AND ATTACHMENTS	THIS SHEET IS
Lists MUQ5, MUQ4, MUQ2, MV7W, MVE6, MAC	**Lists MUQ0, MDFW, MDFX, MDH7, MZZ**	**Library Memo for UP–14131**
		RELEASE DATE: **October 1988**

About This Document

Purpose

This reference is part of the DCP series books intended for use with DCP/30 equipment. This manual is primarily a hardware reference to the DCP/30 and its associated peripheral or auxiliary devices. These include the 8441 Mass Storage Subsystem, and the 2523 Line Switch Module.

NOTE: The description of DCP components contains the most current information available at time of printing.

Scope

This document details only the current DCP/30 system. It provides operator instructions about the location, function and use of the various controls and features of the DCP/30 system.

Audience

The intended audience for this document is the customers and operators of DCP/30 systems. Customers now using other DCP systems may find some commonality in the information provided here with the systems they are using. In using those systems, however, they should refer to the documentation provided with those systems. Differences in operation between the DCP/30 and those systems won't be covered in this document.

Prerequisites

You should be familiar with product information and bulletins for the appropriate equipment. Hardware system descriptions and capabilities overviews are also available. See Related Product Information.

Organization

Section 1 covers DCP/30 Controls and Indicators
Section 2 covers Maintenance Control Feature
Section 3 covers DCP/30 Operating Procedures
Section 4 covers System Utilities and Troubleshooting
Section 5 covers Peripheral Devices

Appendix A covers Line Module/Microcode Identifiers

Appendix B covers Hexidecimal/ASCII Conversion Chart

Appendix C covers Diagnostic Resident Utilities:
Memory Map and Configuration Table

Related Product Information

Following is a list of related publications that you may wish to include in your system library:

- UP-14130 DCP/30 Capabilities Planning Guide
- UP-12728 DCP Series Implementation Reference Manual, volumes 1, 2 and 3
- UP-9827 8441 Mass Storage Subsystem General Description
- UP-9829 8441 Mass Storage Subsystem Installation and Servicing Guide

Software-related system publications include:

- UP-11540 DCP Series, Distributed Communications Processor Operating System (DCP/OS) Operations Reference
- UP-11541 DCP Series, Distributed Communications Processor Operating System (DCP/OS) Programming Reference
- UP-9256 DCP Series Telcon Operations Reference (current release version)
- UP-9757 OS 1100/DCP Series Communications Delivery Software Configuration Guide
- UP-9956 OS 1100/DCP Series Communications Delivery Software Installation Guide

Contents

Figures

Tables

Section 1.
DCP/30 Controls and Indicators

Figure 1-1 shows the locations of the DCP/30 basic cabinet controls and indicators. The basic cabinet will contain all three panels shown. (The DCP/30 to DCP/50 conversion/ expansion cabinets will only include the active line indicators and power control panel.)

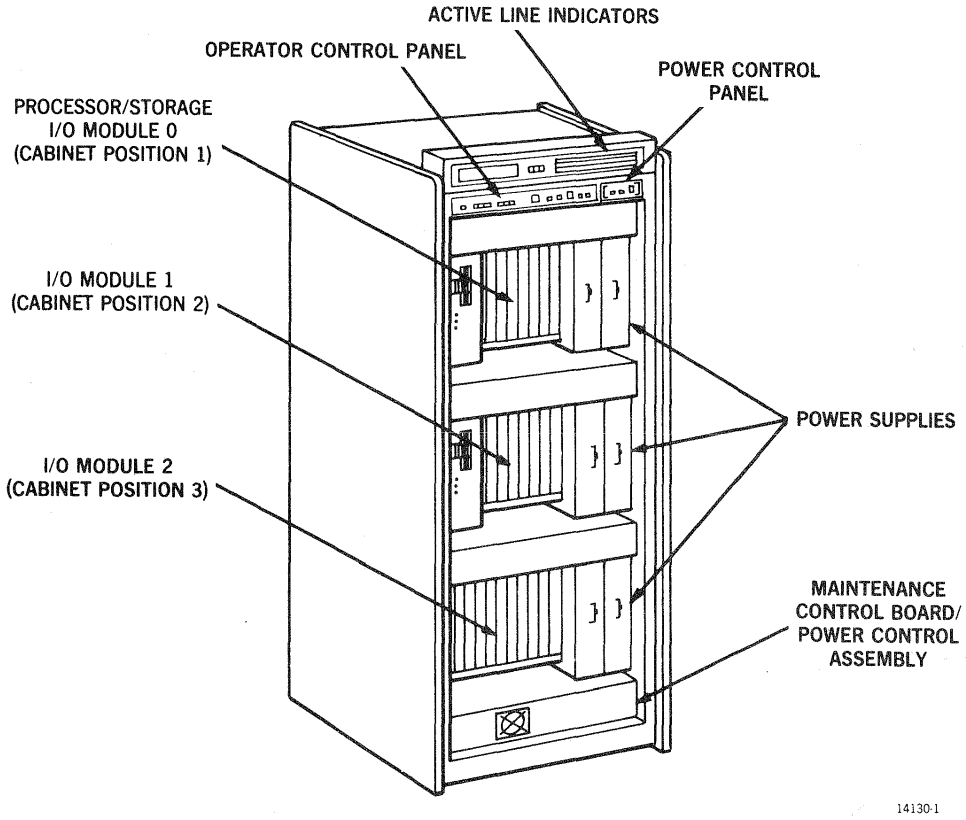
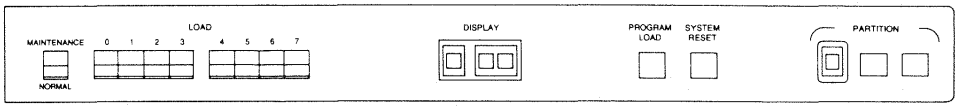


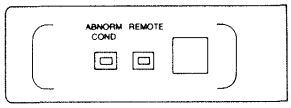
Figure 1-1. DCP/30 Controls and Indicators

Operator Control Panel



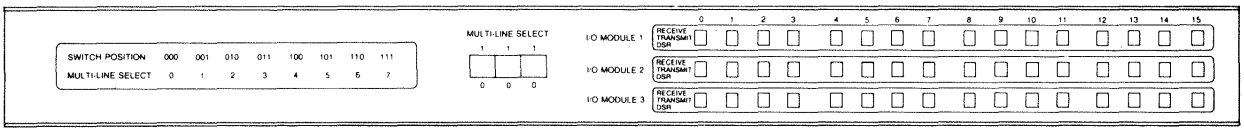
Control/Indicator	Function
MAINTENANCE/NORMAL switch	NORMAL: For the below functions. MAINTENANCE: Selects the Maintenance Control Feature only. The switch functions are redefined and used by MCF (refer to Section 2).
LOAD (0-7) switches	Selects DCP/30 port and type of load.
DISPLAY indicators	Displays a 1-character code (Operation Mode) representing the general state of the partition and a 2-character code (Program Status) representing the current program executing on the partition.
PROG LOAD switch	System reloads according to LOAD switches. A non-destructive POC is executed once the microcode load source has been established.
SYSTEM RESET switch	Reboots the system. The SYSTEM RESET (or Power on/off) clears the system, reruns POC, and reloads microcode. Loader path is determined by the setting of the LOAD switches.
PARTITION switches	Selects DCP/30 partition controlled and monitored by operator panel (For future use). Partition switches must be set to match the partition ID strapped on the System Control PCA. (Both switches set to zero (down), until multiple partitions are allowed on DCP/30).

Power Control Panel



Control/Indicator	Function
POWER switch	Turns power on and off to all components (except MCF) in DCP/30 cabinet, unless cabinet is set for remote power control (slave cabinet).
REMOTE indicator	Illuminates when cabinet is being controlled by a remote device, rather than through Power Control Panel.
ABNORM COND indicator	Illuminates to indicate an error condition or other hardware problem in this cabinet (i.e. power supply, cooling, etc.).

Active Line Indicator Panel



Control/Indicator	Function
MULTILINE SELECT switches	Selects lines on multiline interface for monitoring on the active line indicators.
Active Line indicators	Monitors line activity on 16 communication lines per module.

The active line indicators allow you to monitor line activity on up to 16 communications lines at a time. The meaning of the indicators differs depending on whether a communications line module or other types of interfaces are being monitored.

On communications lines, the RECEIVE indicator shows that data is being received, the TRANSMIT indicator shows that data is being transferred, and the DSR (data set ready) indicator shows that connection has been made with the appropriate data set and that line conditions are ready for data transmission.

On other interfaces types, the RECEIVE and DSR indicators have no meaning. The TRANSMIT indicator shows that a call signal is being transmitted.
The Active Line Indicators are labeled I/O Module 1, 2 and 3 for convenience, and correspond to I/O modules 0, 1, and 2 as addressed by the system.

The multiline select switches let you select which of the eight possible communication lines accessed by each port will be monitored on the active line indicators. The same interface of each port is displayed across the sixteen indicators on the panel. (If only one line resides on a port, it will always appear on the monitor, regardless of the multiline switch setting.)

Figure 1-2 summarizes the switch settings.

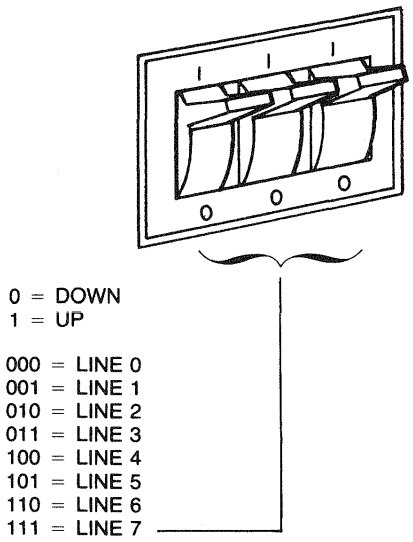
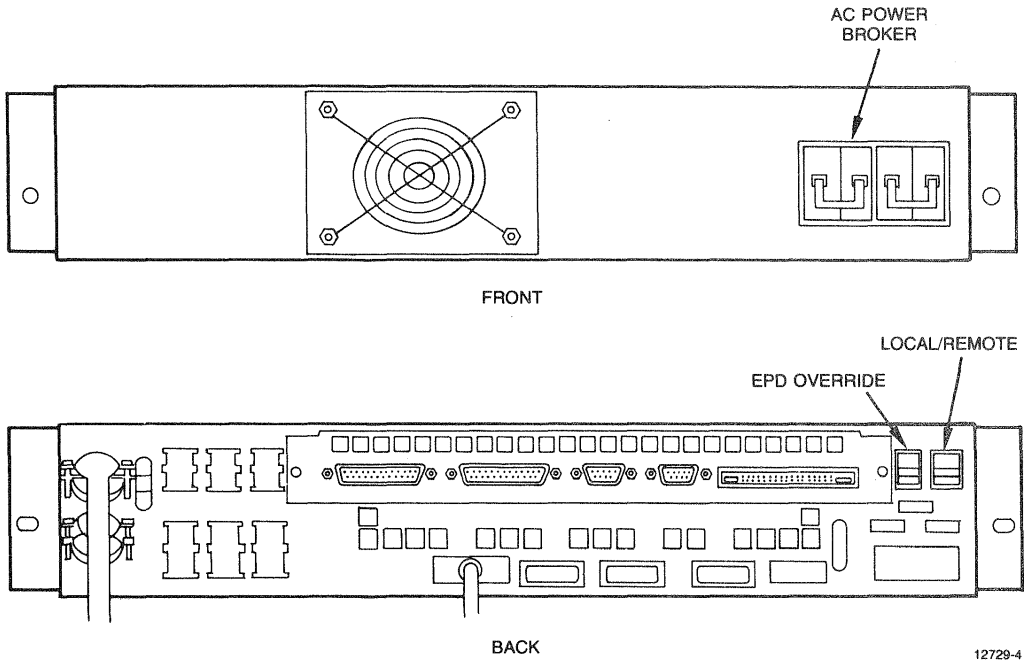


Figure 1-2. Multiline Select Switch Settings

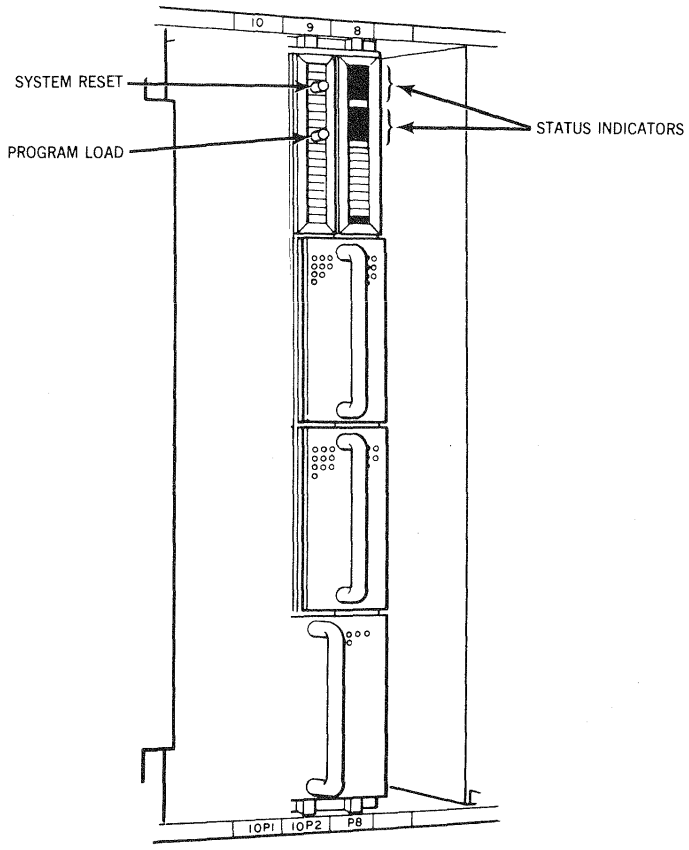
Power Controller Control Panel



Control/Indicator	Function
LOCAL/REMOTE Switch	Determines whether power on/off is controlled by the DCP (LOCAL) or by a remote device (REMOTE).
MAIN AC POWER Switch	Applies AC power to Power Control Module. Used to completely disconnect the system power, including MCF.
EPO OVERRIDE Switch	Overrides the Emergency Power Off signal of the SU00209 interface. Always on unless connected to host through a FIPS-61 interface.

NOTE: Peripheral devices connected to the DCP and equipped with remote power control features, will be turned off when DCP power is turned off. Devices not set for remote power control must be turned off and on individually.

CP/Storage PCA Control Panel



Control/Indicator	Function
PROG LOAD switch	Dumps system to load source, then initiates program load. (See section 2.)
SYSTEM RESET switch	Reboots the system. Loader path is determined by the setting of the LOAD switches. (See section 2.)
Hrdwr Error indicators	Illuminate to indicate an error condition or other hardware problem.
Status indicators	Illuminate to indicate the current status of the processor.

CP/Storage Load Status Codes

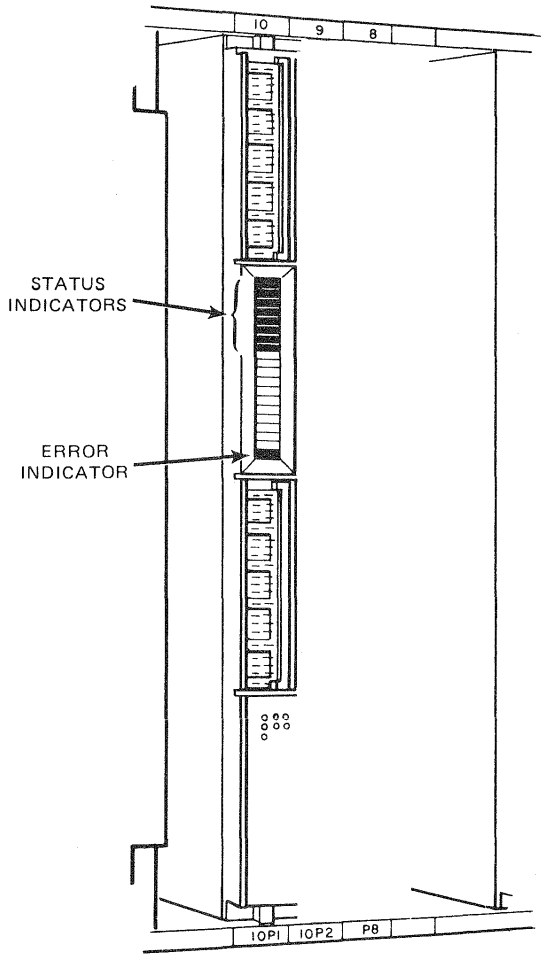
The 2-character hexidecimal codes identified by the 8 status indicator LEDs on the CP/Storage CPA card, indicate the load sequence and status of the system control PCA. Note that some codes appear too quickly to be readily observed.

The codes are read top to bottom, MSB to LSB. The first four LEDs represent the first hexidecimal character, the second four represent the second. All status LEDs illuminated would represent the hexidecimal code 'FF'.

CODE	INTERPRETATION
00	Executing POC test
01	Delay for load device
03	Loadee Mode - Search for ICB (error indicator illuminated while searching)
07	Completed extended POC successfully -- executing initialization microcode
03*	Initialization microcode execution finished -- PROM now loading operational microcode
1F*	Finished operational microcode load -- wait for macro start address

* Code may occur too quickly to be visible to system operator

I/O Module Control Panel



Control/Indicator	Function
Hrdwr Error indicators	Illuminate to indicate an error condition or other hardware problem.
Status indicators	Illuminate to indicate the current status of the processor.

IOP Load Status Codes

The 2-character hexidecimal codes identified by the 8 status indicator LEDs on the I/O Module card, indicate the IOP load process currently executing.

The codes are read top to bottom, MSB to LSB. The first four LEDs represent the first hexidecimal character, the second four represent the second. All status LEDs illuminated would represent the hexidecimal code 'FF'.

CODE	INTERPRETATION
00	Executing Power-On Confidence (POC) test
01	Delay for load device
02	IOP look for alternate load device
03	IOP loadee mode - Search for ICB (error indicator illuminated while searching)
04	IOP loader honor load request
05	Program load
06	Executing extended POC (destructive tests) Test DCP/30 microinstructions Test flag RAM Initialize flag RAM Test GS RAM Initialize GS RAM Test register stack Initialize register stack Initialize link RAM
07	Build architectural interface Build initialization control block Initialize local storage map
08	Local storage POC Test local storage for stuck bits Test local storage address generate logic Initialize local storage
09	Build Load directory
0A	Load MCF
0B	Macro storage load (boot loader)
0C	Microstorage register load
0D	System reset
0E	Executing MCF routines
1F	UIPL load complete - no errors
10	Universal IPL load device - MDLM
20-0ff	Reserved for software

IOP Load Sequence

The DCP/30 basic cabinet may contain up to 3 Input/Output processors (IOPs). Each could have an associated Integrated Mass Storage, however the processor in I/O Module 0 (top) is designated by default as the "Loader" which loads the microprograms and OS. Each other IOP is designated as a "Loadee" and will follow a different sequence during load. In the event that IOP 0 cannot perform the loader function, then IOP 1 or 2 may serve as loader, depending on which responds first to the load command.

IOP Loading Sequence

Loadee WITH Mass Storage	Loadee WITHOUT Mass Storage
00	00
01	01
88 No Load (Error indicator on)	10
03	06*
06	03
0C*	06*
03*	0C*
1F	03*
	1F

* Code may not be visible to system operator

The following status codes will appear in the DISPLAY window during a normal power on/system reset load sequence:

MODE	CODE	INTERPRETATION
2	00	Executing POC test
2	10	Load from load device (microloader/extended POC)
2	06	Executing extended POC (destructive tests) Test DCP/30 microinstructions Test flag RAM Initialize flag RAM Test GS RAM Initialize GS RAM Test register stack Initialize register stack Initialize link RAM
2	07	Build architectural interface Build initialization control block Initialize local storage map
2	08	Test local storage Test local storage for stuck bits Test local storage address generate logic Initialize local storage
2	09	Build Load directory
2	04	IOP loader honor load request
2	0B	Macro storage load (macroboot loader)
2	0C	Register load
2	10	Load from UIPL (operational microcode)
2	1F	UIPL load complete - no errors. This display will be visible only as long as macrocode does not execute display instruction.

The following status codes will appear in the DISPLAY window during a normal program load:

MODE	CODE	INTERPRETATION
2	05	Initiate program load
2	0B	Macro storage load (macroboot loader)
2	1F	UIPL load complete - no errors. This display will be visible only as long as macrocode does not execute display instruction.

If any other status code not listed above appears in the DISPLAY, the DCP/30 is recovering from an error detected by the microcode. If the error recovery attempt is unsuccessful the appropriate error message will be displayed (see DCP/OS Operations Reference Manual, UP-11541 for error codes).

Other DCP/30 Indicators

You should be aware of the location and significance of indicator LEDs associated with the integrated drives, power supply, and line modules inside the DCP/30 module (Figure 1-3).

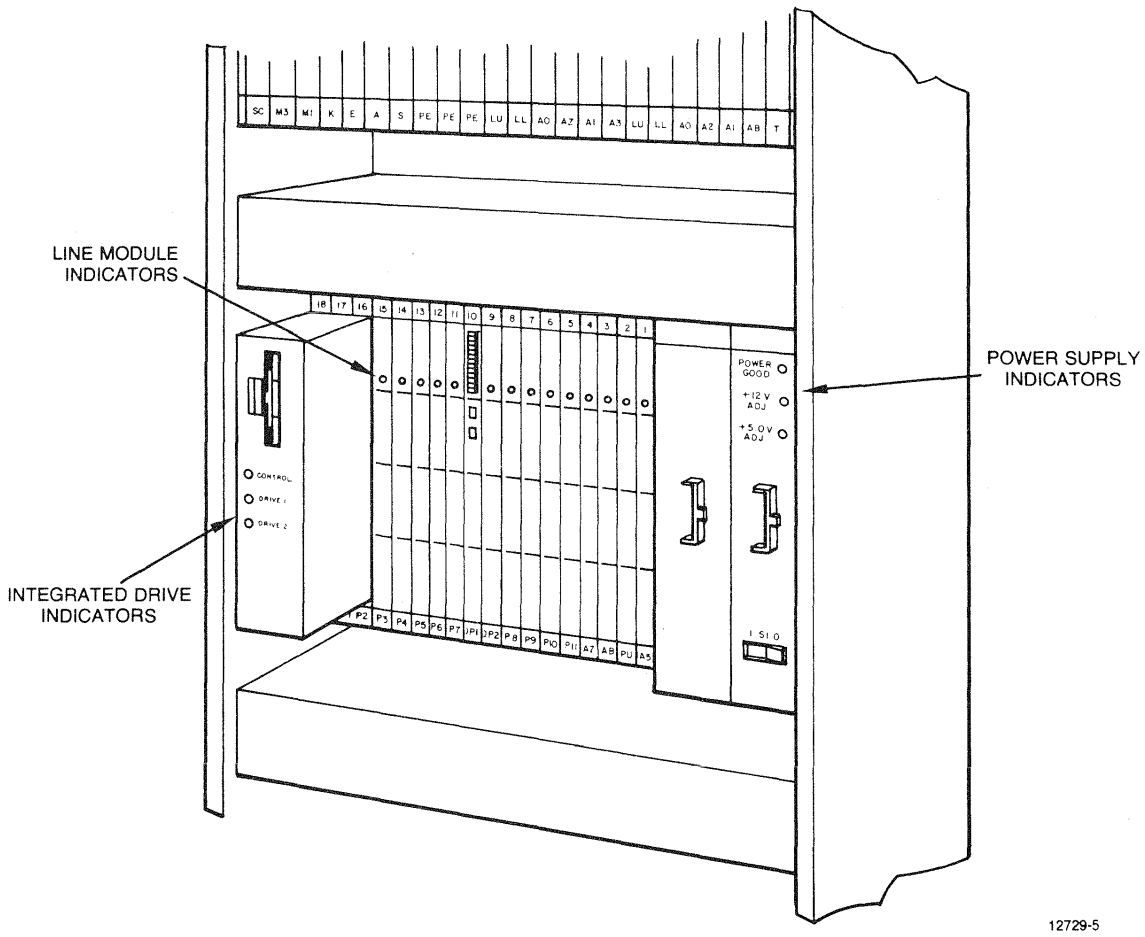


Figure 1-3. Indicators Inside the DCP/30 Module

Integrated Drive Indicators

All three integrated drive indicators light after successful completion of POC. If one of the three components is defective one or more indicators will go off indicating hardware failure.

Power Supply Indicator

You have to look directly into the hole in the power supply to see the two green LEDs inside. These should always be ON whenever the machine is turned on. If the DCP/30 is turned on, but you can't see these indicators, turn power off and call a Unisys service representative.

Line Module Indicators

Most of the line modules use one or more LEDs to indicate that they have successfully passed POC tests or have been loaded with microcode, and are operating normally. If an LED flashes repeatedly, line module has passed POC but microcode has not been loaded. If an indicator fails to light when the DCP/30 is turned on, you may need to run the appropriate offline diagnostics test to identify the failure. Section 4 describes how to load the diagnostic tests.

Section 2.
Maintenance Control Feature

The MAINTENANCE CONTROL Feature F4994-00 (MCF) is comprised of the PCA (mounted inside the power control module at the bottom of the basic processor cabinet), internal cables, and the operator control panel on the top of the processor cabinet. The MCF provides an interface to the communications processor and the IOPs, and a connection to the operator control panel and the power control board. This allows local and remote modes of DCP system reset and program load, and remote control of DCP power on/off. The feature controls system status display and provides a date and time calendar with battery back-up power. The MCF also provides maintenance and diagnostic access to DCP CP and IOP processors via microprogrammed processor routines. In addition, two RS-232 connectors are available: The default usage is one for attaching an asynchronous maintenance terminal and the other providing a synchronous UDLC link to a remote DCP for remote system control.

Controls and Indicators

The controls and indicators on the Operator Control Panel described in chapter 1 are also used by the MCF during a maintenance session. When the MAINTENANCE/NORMAL switch is set to MAINTENANCE position, the functions of the switches and indicators are redefined as described below.

Control/Indicator	Function
MAINTENANCE/NORMAL switch	Allows the operator to establish a maintenance session wherein the switches and indicators function as described below.
LOAD (0-7) switches	Used to initiate an MCF command as described in Table 2-1.
DISPLAY indicators	A three window display, one of which displays a 1-character code (Operation Mode) representing the general state of the MCF during the maintenance session. The other two windows display a 2-character code (Program Status) that duplicates the Load switch values for the current entered function. See Table 2-1 for details.
PROGRAM LOAD switch	Causes the MCF to read the Load switches to determine which function to perform.

SYSTEM RESET switch	Resets the maintenance controller. MCF RAM contents are not destroyed.
PARTITION switches	These switches are ignored during a maintenance session.
PARTITION indicator	Indicates the partition ID of the physical partition to which the Operator Control Panel is attached.

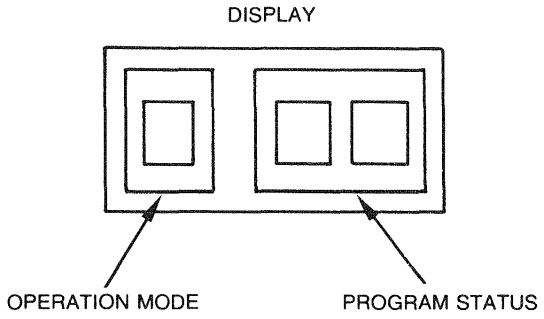
The controls and indicators of the Power Control Panel described in section 1 serve the same function in the maintenance session. The correct sequence for power on is 1) select partition, 2) set load path, and 3) power on.

Operator Control Panel Commands

All Operator Control Panel commands and data are entered by following these procedures:

1. Set MAINTENANCE/NORMAL switch to MAINTENANCE.
2. Set LOAD switches to the desired value (Table 2-1).
3. Press PROGRAM LOAD switch.
4. Repeat steps 2 and 3 as necessary to complete entry of commands and data.
5. Terminate maintenance mode session by pressing SYSTEM RESET when commands (marked by '*' in table 2-1) are entered.
6. Return MAINTENANCE/NORMAL switch to NORMAL position.

Once in Maintenance Mode you can enter as many commands as needed by changing the LOAD switches values and pressing the PROGRAM LOAD switch after each command. The Operation Mode window (Figure 2-1) indicates the current status of the MCF. The Program Status display windows will indicate the value of the LOAD PATH switches after pressing PROGRAM LOAD.



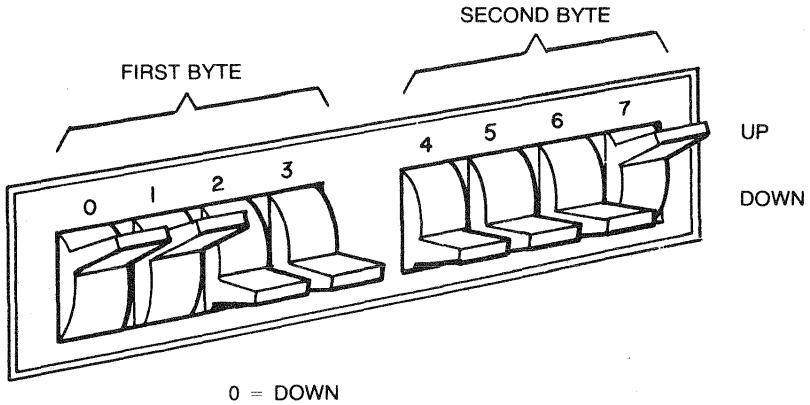
3 = Command is entered correctly; new command can be entered.

2 = Additional command parameters are required for the correctly-entered command.

1 = First byte of data following a command is to be entered.

F = Operator error; enter new command.

Figure 2-1. Display Windows



0 = DOWN
1 = UP

LOAD SWITCHES

COMMAND	0	1	2	3	1 BYTE
	4	5	6	7	2 BYTE
0	0	0	0	0	
1	0	0	0	1	
2	0	0	1	0	
3	0	0	1	1	
4	0	1	0	0	
5	0	1	0	1	
6	0	1	1	0	
7	0	1	1	1	
8	1	0	0	0	
9	1	0	0	1	
A	1	0	1	0	
B	1	0	1	1	
C	1	1	0	0	
D	1	1	0	1	
E	1	1	1	0	
F	1	1	1	1	

Figure 2-2. LOAD PATH Switch settings for command 'C1'

Table 2-1. Operator Control Panel Maintenance Commands (Part 1 of 4)

	Command	Description
	F0	Load working address pointer. This function requires four more bytes to be entered. The four bytes make up the address to be used by the read and write MCF memory commands. Load MS(Byte), followed by LS(Byte).
	F1	Increment the working address pointer No more input is required.
	F2	Decrement the working address pointer No more input is required.
	E0	Read from MCF memory No more input is required. This command will read the MCF memory location specified by the working address pointer.
	D0	Write to MCF memory One more byte of input specifying the data to write is required. Once the second byte is entered, the MCF memory location specified by the working address pointer will be changed to the value of the second byte.
*	C0	Change the J1 RS232 connection designation One more byte of input specifying the protocol is required and must be one of the following: 01 = Async Maintenance Terminal connection (default) 02 = UDLC RCI connection
*	C1	Change the J2 RS232 connection designation One more byte of input specifying the protocol required and must be one of the following: 01 = Async Maintenance Terminal connection 02 = UDLC RCI connection (default)
*	C2	Enable/Disable echo on the J1 RS232 connection One more byte of input is required and must be one of the following: 01 = Echo (default) 02 = No Echo

Table 2-1. Operator Control Panel Maintenance Commands (Part 2 of 4)

	Command	Description
*	C3	Enable/Disable echo on the J2 RS232 connection One more byte of input is required and must be one of the following: 01 = Echo (default) 02 = No Echo
*	A0	Specify J1 RS232 async baud rate One more byte of input is required and must be one of the following: 01 = Async baud rate = 110 02 = Async baud rate = 300 03 = Async baud rate = 600 04 = Async baud rate = 1200 05 = Async baud rate = 2400 06 = Async baud rate = 4800 07 = Async baud rate = 9600 08 = Automatic Data Rate Detection (ADRD) (default)
*	A1	Specify J1 RS232 async bits/character One more byte of input is required and must be one of the following: 07 = 7 bit s/character (default) 08 = 8 bits/character
*	A2	Specify J1 RS232 async parity One more byte of input is required and must be one of the following: 01 = Even parity (default) 02 = Odd parity 03 = No parity
*	A3	Specify J1 RS232 async new line echo character(s) One more byte of input is required and must be one of the following: 01 = Echo CR only 02 = Echo LF only 03 = Echo both CR and LF (default)

Table 2-1. Operator Control Panel Maintenance Commands (Part 3 of 4)

	Command	Description
*	A4	Specify J2 RS232 async baud rate One more byte of input is required and must be one of the following: 01 = Async baud rate = 110 02 = Async baud rate = 300 03 = Async baud rate = 600 04 = Async baud rate = 1200 05 = Async baud rate = 2400 06 = Async baud rate = 4800 07 = Async baud rate = 9600 08 = Automatic Data Rate Detection (ADRD) (default)
*	A5	Specify J2 RS232 async bits/character One more byte of input is required and must be one of the following: 07 = 7 bits/character (default) 08 = 8 bits/character
*	A6	Specify J2 RS232 async parity One more byte of input is required and must be one of the following: 01 = Even parity (default) 02 = Odd parity 03 = No parity
*	A7	Specify J2 RS232 async new line echo character(s) One more byte of input is required and must be one of the following: 01 = Echo CR only 02 = Echo LF only 03 = Echo both CR and LF (default)
*	90	Specify MCF password Eight more bytes of input are required specifying ASCII characters in hexidecimal. A password consists of 0 to 8 characters in the range 0-9 (<30>-<39>) and A-Z (<41>-<5A>). When there are less than eight characters in a password, the remaining bytes must be SP <20> characters. A SP character followed by a character other than a SP results in an error with no password change. An invalid character results in an error with no password change. The default password is eight SP characters.

Table 2-1. Operator Control Panel Maintenance Commands (Part 4 of 4)

	Command	Description
*	80	Specify J1 RS232 RCI communication mode One more byte of input is required and must be one of the following: 00 = Modem Communications (default) 01 = Direct Connect Module (DCM) Communications 02 = Direct Connect Communications
*	81	Specify J1 RS232 UDLC address One more byte of input is required specifying the UDLC address for the RCI on the J1 RS232 interface. (default=66)
*	82	Specify J1 RS232 RCI address Two more bytes of input are required specifying the RCI address for the RCI on the J1 RS232 interface. (default=66,96)
*	83	Specify J2 RS232 UDLC address One more byte of input is required specifying the UDLC address for the RCI on the J2 RS232 interface. (default=66)
*	84	Specify J2 RS232 RCI address Two more bytes of input are required specifying the RCI address for the RCI on the J2 RS232 interface. (default=66,96)
*	85	Specify J2 RS232 RCI communication mode One more byte of input is required and must be one of the following: 00 = Modem Communications (default) 01 = Direct Connect Module (DCM) Communications 02 = Direct Connect Communications
	70	Reinitialize Non Volatile RAM (NVR) to Default Values No more input is required. (Default values are set in NVR)
	71	Boot MCF No more input is required. POC is performed and MCF RAM contents are destroyed.
	72	Read MCF Non Volatile RAM (NVR) One more byte of input is required specifying the NVR address. NVR address range is 00-31h

RS-232 Interfaces

Two RS-232 interfaces can be used to communicate with the MCF using either an asynchronous protocol or a synchronous UDLC protocol. System diagnostics programs can be initiated using maintenance terminals connected to the interfaces (refer to Section 4 for diagnostic procedures). Typically, one connection, the asynchronous port, would be to a local or remote terminal dedicated to maintenance or diagnostic functions; the other, a remote control interface, could connect through a trunk line to a local or remote DCP with a UDLC line module for remote control of the system.

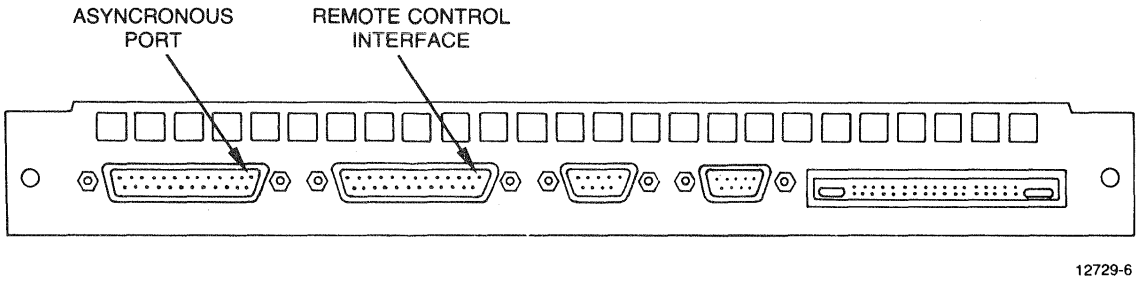


Figure 2-3. MCF RS-232 Interfaces

Both RS-232 interfaces (J1 and J2) can be used either as asynchronous port or remote control interface. However, the default connector for the asynchronous port is J1; J2 is the default connector for the remote control interface. Connector J1 can be used as remote control interface by entering commands and data listed in Table 2-1.

Maintenance Session

The MCF performs maintenance functions as a result of action initiated by the asynchronous port, the remote control interface, or the CP macrocode software. Whenever one of these initiates activity, a 'maintenance session' is established. Only one maintenance session is active on a DCP system. For example, if a CP software application tries to establish a maintenance session while another maintenance session is active, the MCF will deny the CP software application session establishment.

Section 3.
DCP/30 Operating Procedures

DCP/Operating System

The DCP/30 is controlled by the DCP Operating System (DCP/OS). The DCP/OS can be booted from the system diskette, hard disk, or it can be downloaded to the DCP from the host or from another DCP. Once the DCP/OS is operational, other application programs, such as Telcon, can be loaded. Telcon opens the door to total network communications. Figure 3-1 shows one example of a network of three DCPs and a Series 1100 host.

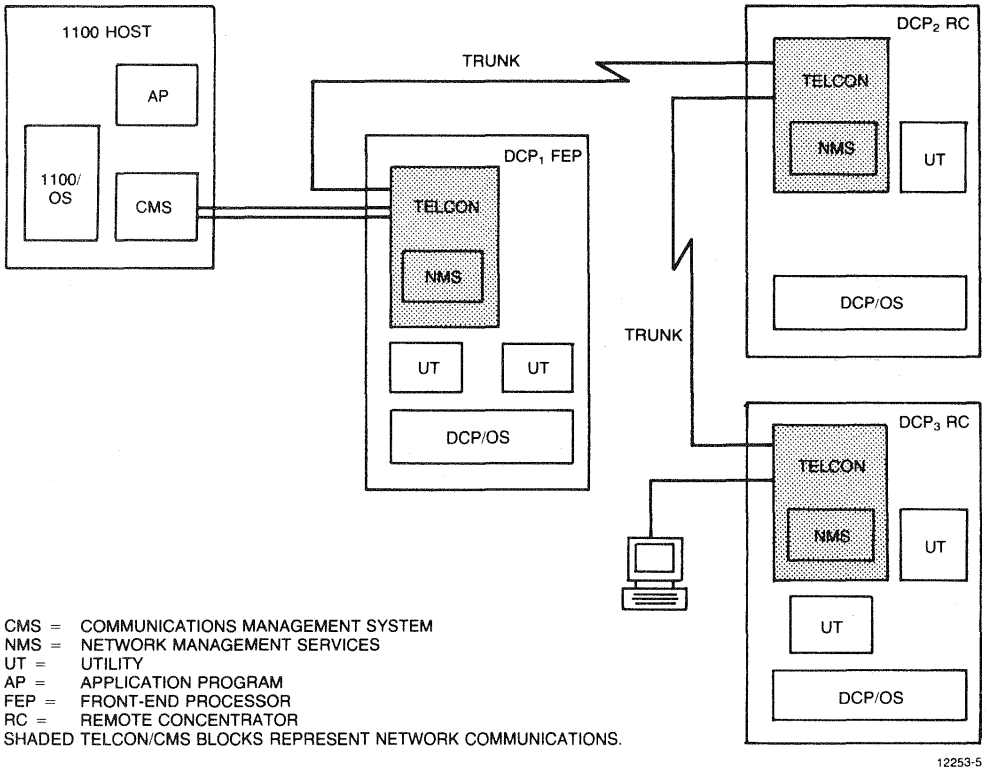


Figure 3-1. Sample Network System

In Figure 3-1, DCP_1 is the front-end processor to the host; DCP_2 is a remote concentrator, connected to DCP_1 through a trunk line. The third DCP is also a remote concentrator connected to DCP_2 through another trunk.

A terminal operator connected to DCP3 can communicate with any other network user through Telcon. Regardless of what the network is doing, each of the three DCP/OSs' are operating independently. If Telcon fails, it does not affect the DCP/OS or other utilities running under DCP/OS control.

Figure 3-2 focuses on DCP3, and adds a dedicated DCP/OS workstation.

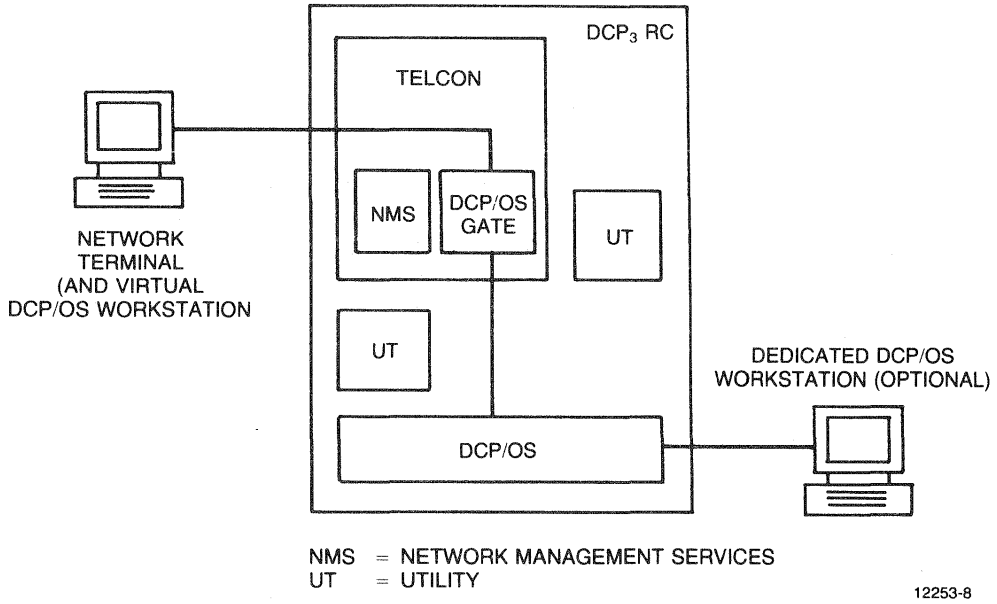


Figure 3-2. Communicating with the DCP/OS

Both terminal operators in Figure 3-2 can communicate with the DCP/OS. The dedicated workstation is connected directly to the DCP and directly accesses the OS. It is not part of the network and cannot access Telcon applications. The workstation is optional, but it does enable control of the DCP/OS system in case the network fails. The network terminal can communicate with the DCP/OS via the Telcon DCP/OS Gateway. In this manner, the terminal functions as a virtual DCP/OS workstation. However, if Telcon fails, communication with the DCP/OS is lost.

Boot Options

The system diskette contains the microcode loader, DCP/OS, and other system library files. Initially, you boot the DCP/30 from the diskette, and downline load the rest of the DCP system, including Telcon, from the host. Subsequent loads can originate from either the host or local mass storage.

The setting of the eight LOAD switches (0-7) on the operator panel determines the source of the load. The load can originate either from a particular device indexed in the DCP/OS configuration (LOADPATH), or through a specific DCP/30 port (PORTPATH). Switch 0 selects LOADPATH or PORTPATH. Switches 1 through 7 specify the index or port number.

Once the load switches have been set for the desired path and type, and the boot diskette has been inserted into the integrated diskette drive, system loading is initiated when power is turned on, or when either the SYSTEM RESET or the PROGRAM LOAD switch is pressed.

NOTE: The OS/1100/DCP Series Communication Delivery Software Guide (UP 9956, latest revision) gives instruction on how to prepare the host for DCP/OS and Telcon downloading. If these preparations are not complete, the download operation cannot be performed but DCP/OS can be loaded from the boot diskette.

If a system failure occurs during loading or operation, press the SYSTEM RESET switch to reinitialize the DCP system. If you first want to dump the system for problem analysis and then reinitialize it, press the PROG LOAD switch. The system will be dumped to the source of the load; to the host, if an initial program load was being performed, or to the local mass storage device, if a local load was being performed. The dump can be analyzed with a program residing in the host, or it can be analyzed with online utilities on the DCP.

Initial Boot

1. Verify that each peripheral device to be used with the system is turned on and is ready to operate.
2. Insert the microcode load diskette into the integrated diskette drive.
3. Set all LOAD switches to zero.
4. Press the POWER switch and observe that the power indicator lights. (Pressing the SYSTEM RESET switch will also initiate the load if the DCP/30 is already on.)
5. Check that the ABNORM COND indicator does not light.

The bootstrap program automatically determines the port number for the integrated diskette drive, and loads from the system diskette.

Download Boot

You can set the switches for either the port number of the host channel interface or UDLC line, or to the path number specifying a download. (Path numbers can be added or modified later. Refer to DCP/OS Operations Reference Manual, UP-11541 for more information.)

The leftmost load switch determines the Load Path or Port Path for the boot.

Figure 3-3 gives the switch settings using a Portpath or a Loadpath.

1. Set the LOAD switches according to the desired path.
2. Press the SYSTEM RESET or PROG LOAD pushbutton. (Turning power on will also initiate the load.)

Boot from Mass Storage

When loading from local mass storage, you would typically set the switches to perform a load path boot, to specify the disk containing the system software.

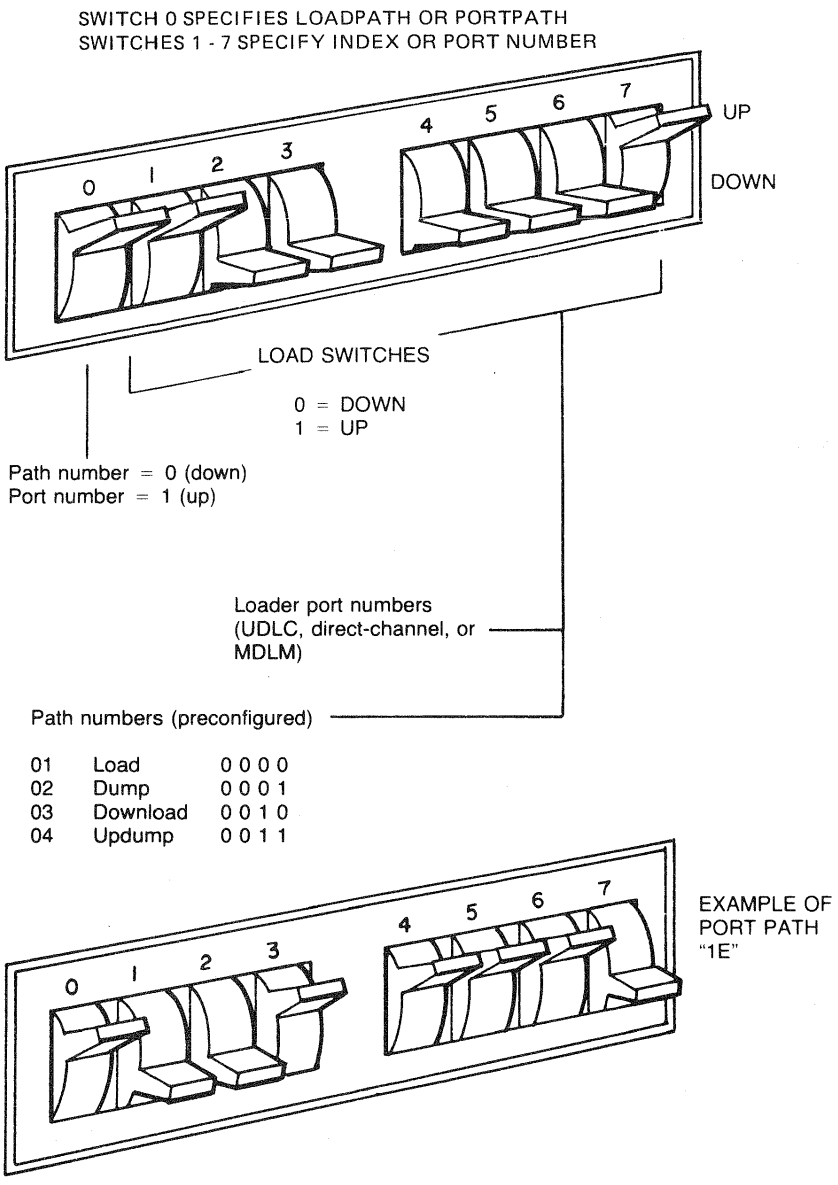


Figure 3-3. Example Load Switch Settings

System Load Status Codes

The 2-character codes appearing in the DISPLAY window identify the status of the load. Note that some codes appear too quickly to be readily observed. Following is a list of the microcode and boot status codes.

MODE	CODE	INTERPRETATION
2	00	Executing POC test
2	10	Load from load device (microloader/extended POC)
2	06	Executing extended POC (destructive tests)
2	07*	Build architectural interface
2	08*	Test local storage
2	09	Build Load directory
2	04	IOP loader honor load request
2	0B	Macro storage load (macroboot loader)
2	0C*	Register load
2	10	Load from UIPL (operational microcode)
2	1F*	IFDC load complete - no errors. This display will be visible only as long as macrocode does not execute display instruction.
B	BO	Booting started
B	B5	Booting DCP/OS
B	BC	Booting complete

Depending on the type of load you are doing, other boot status codes may appear in the above sequence. These include:

B	B1	Alternate load path taken
B	B2	Successor path taken
B	B3	Waiting for host
B	B4	DOWNLOAD active
B	BD	Dump started
B	BE	Dump ended

If an error occurs during the load, the DCP/30 will automatically attempt to reboot. If rebooting continues to fail, remove the system diskette, and try the diagnostics diskette. Refer to section 4 for diagnostic procedures.

DCP/OS Boot Error Codes

DCP/OS boot errors are reported through the DISPLAY indicator. Assuming the system microcode was loaded successfully, A "BO" indicates that DCP/OS boot has started. Boot errors are four-digit codes, repeated three times. (The first two digits alternate with the second two digits.) After the three repetitions of the error code, the system will attempt to reboot, as identified by another "BO". This cycle will continue until you press SYSTEM RESET or PROG LOAD.

To interpret the meaning of any DCP/OS error code, enter "@FAC **errorcode**" at an operational DCP/OS console, or consult a list of DCP/OS error codes appearing in the DCP/OS Operations Reference Manual, UP-11541.

The code and probable cause of the error is listed on the DCP/OS console. Most codes will need to be reported to a service representative or system programmer. However, some errors, such as "Bad Load Path" would indicate a condition that you may correct by resetting the load switches or checking a drive.

Section 4.
System Utilities and Troubleshooting

Some useful operator utilities are accessed from the DCP series diagnostics programs. The diagnostics software includes both microdiagnostics and macrodiagnostics which aid in tracking problems that occur during normal system operation. These utilities, a subset of functions of the DCP macrodiagnostics, include: disk formatting, parking disk heads for shipping, disk copying and language translate utilities. The full function of these diagnostic programs is described in the DCP Series Implementation Reference, volume 3.

The diagnostics program for the DCP/30 is on a 3.5-inch diskette. This diskette contains the DCP/30 operating microcode, the diagnostic macro bootloader, the diagnostic executive, the loadable line module operating microcodes and all the diagnostic tests available with release 6.1.

These utilities, by means of the DCP macrodiagnostics programs, are run and monitored through a synchronous (UTS) terminal connected to the DCP. If a failure occurs during the load of macrodiagnostics, refer to the instructions regarding operation of the diagnostic software in the DCP Series Implementation Reference.

The following line modules can accommodate a synchronous terminal that can be connected and used as a diagnostic console.

F1942	Synchronous
F3163-04	Medium-speed loadable (RS-449)
F3163-00	Medium-speed loadable (RS-232-C)
F3837-04	Synchronous-Asynchronous

A diagnostics console terminal can be directly-connected, or connected by a multiplexed or multidropped line to the DCP. Diagnostics cannot be run from a remote console. The initial keyboard entry you make will identify that terminal as the diagnostics console.

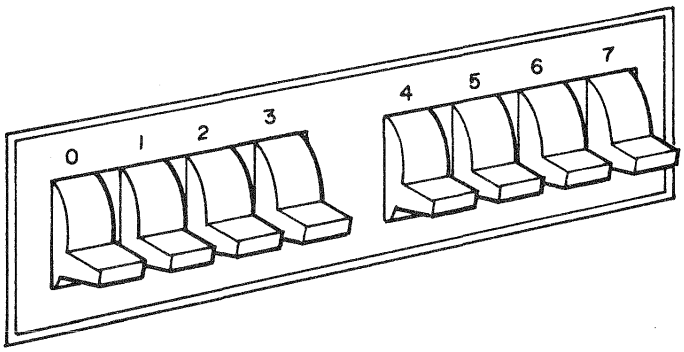
If neither a terminal nor one of the above line modules is available in your DCP, you can still perform the load process and verify basic functions while observing the indicators.

Loading the Diagnostics

1. With the processor on, remove, if present, the microcode diskette from the integrated diskette drive and insert the diagnostic diskette, label side facing right.

2. Set switches 0 through 7 as defined in Figure 4-1, to identify the port to which the console terminal is attached. (If you do not have one of the listed line modules or a console, set the switches to a port containing any other communications line module.)

3. Enter " ▶ //diag" on the console terminal and press XMIT.



0 = DOWN
1 = UP

IOP	SWITCHES 0, 1, 2, 3 SELECT IOP 0	1	2	3
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

PORT	SWITCHES 4, 5, 6, 7 SELECT PORT NUMBER 4	5	6	7
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
IOP	–	–	–	–
RESERVED	–	–	–	–
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

Figure 4-1. Diagnostic Switch Settings

4. Press SYSTEM RESET. The integrated drive indicator lights while loading, and the following display appears (in about two minutes) on the console screen:

DCP FAMILY DIAGNOSTICS SYSTEM RELEASE R6.1

Now building the Configuration Table

▶ **Enter the Number of IOP to be checked (1-16)**
▶ **(Default is 4 Ports). 0 : Abort Build Routine**
▶ [ ]

5. Press XMIT or enter a number up to 3 (the screen says 1-16 because the diagnostic software is capable of operating on a large DCP/50 with 16 IOPs) and press XMIT. Unless you are running the system test or serial line Module test, you can enter 0--Abort Build Routine-to save time.

DCP FAMILY DIAGNOSTICS SYSTEM RELEASE R6.1

Processing IOP #: xxxxxx

To inspect the Configuration Table, use the
Display Routine which is in the Resident Utilities
Press TRANSMIT to continue.
[ ]

NOTE: XXXXX is the number of the current IOP being configured.

If you wish to see the configuration table, press the FUNCTION and F1 keys and enter a 3 if you now wish to see the configuration table. Refer to Appendix C for a description of the table.

The first screen of the main diagnostics menu will appear:

DCP FAMILY DIAGNOSTICS SYSTEM RELEASE R6.1
MENU OF DIAGNOSTIC TESTS

1. System Test
2. Local Lan*guage Translate
3. Serial Line Module Test
4. Local Storage (Memory) Test
5. SCSI (MDLM) Line Module Test
6. Host Channel Interface (SU00057) Test
Press TRANSMIT key to display other selections or
Select a Test Number from the Menu
[ ]

Press XMIT to display the second screen:

7. Host Channel Interface (SU00208) Test
8. Copy Utility
9. Twisted Pair Terminal Test
Press TRANSMIT key to display other selections or
Select Test Number from the Menu
[ ]

When you enter a test number, the screen will inform you that the selected message file is being loaded. Refer to the appropriate section for a description of the individual test.

Load Failures

If the menu shown above does not appear, press SYSTEM RESET again to reinitiate the process. Monitor the DISPLAY indicator while the system is rebooting, and if the load fails again, try to note the final sequence of DISPLAY codes to report to your Unisys representative.

Interrupting a Test

If you wish to interrupt a test for any reason, press the FUNCTION and F1 keys. This displays the following options:

1 = Continue the test
2 = Abort current activity and reinitialize the EXEC
3 = Hold current activity and use the RESIDENT UTILITIES

Enter 1 to resume the test where it had been interrupted. Enter a 2 to abort the test and redisplay the main diagnostics menu, or enter 3 to access the resident utilities. (See Appendix C.)

SCSI (MDLM) Line Module Mass Storage Test

The multiple device line module (MDLM) mass storage test checks the major functions of the line module, which includes the controller, integrated drives, and additional storage devices (8441 mass storage subsystems) attached to the DCP/30. The MDLM tests outlined here cover only the format test (4) and the park heads function (7). Other tests are detailed in the DCP Systems Implementation Reference, Volume 3.

CAUTION:

All data on the rigid disk or the load diskette will be destroyed during the format and read/write tests. During the rigid disk diagnostic, a warning message is displayed before tests will execute. No warning message is displayed during the diskette tests unless a diagnostic or Telcon diskette is loaded.

Test prompts will request the MDLM port number and target/L.U.N. Enter the target and L.U.N. as a two-digit sequence. Current values are:

	X (target)	Y (logical unit num., L.U.N.)
Integrated disk	7	0
Integrated diskette	7	2
8441 Subsystem		
1st disk	X*	0
2nd disk	X*	1
1st diskette	X*	2
2nd diskette	X*	3

* X is defined by the controller strapping in the 8441 subsystem.

4. FORMAT TEST

Performs controller-format-track (prep) function with two available options: type 0 and type 1.

Type 0 should be used when prepping the flexible diskette. Diskettes are formatted for 512 bytes per sector, 9 sectors per track, DSDD, and 96 tracks per inch.

Type 0 or 1 can be used for prepping the rigid disk drive. Approximate disk formatting times are:

10M bytes	20M bytes	30M bytes	72M bytes
15 min	30 min	40 min	90 min

The following message appears:

▶ **IS THIS A 3.5 INCH 20MB DRIVE?(1=Y,0=NO)XMIT=NO**

NOTE: When formatting a 10M byte drive, type 0 format does not return an error message if you erroneously entered a higher disk capacity. Be sure you know the capacity of the drive you are formatting before using the type 0 option.

Sense bytes are displayed at the completion of the format test. A successful result is:

sense bytes	**vld**	**ky/**	**blocks**	**ecc/rtry**
	F000	**0900**	**0000 0000**	**0000 000*0**

7. PARK HEADS FOR SHIPPING

The system will prompt for target and l.u.n., then execute the park heads command. When completed the system will report to the terminal that the fixed disk is parked and that the flexible disk did not successfully park (which is expected). The DCP system may then be powered down and transported.

As each test runs, the screen displays test status and parameters. For example:

DCP FAMILY DIAGNOSTICS SYSTEM. RELEASE R6.1
SCSI/MDLM MASS STORAGE TEST
PORT IS 0005 LM I.D. = 0009 TARGET/LUN = 7070
WRITE/READ TEST ***TEST IN PROGRESS* (or TEST COMPLETE)**
PATTERN = AAAA

- **(test information---up to 10 lines)**
- **response from target/LUN 0070**
- **response from target/LUN 0072**
- **response sub-test complete**
- **format complete**

The upper two digits of the target/LUN display in line 3 identify the selected device. The lower digits identify the target/LUN that answered the last good command. Both sets of numbers should be the same. The PATTERN display applies to the read/write and loopback tests.

NOTE: You can terminate a test in progress by pressing the FUNCTION and F2 keys. However, this is not recommended during the format sequence or the prep will have to be restarted.

Copy Utility

Test eight (8) from the main menu selection is described in this section. This procedure is not actually a test; rather it enables you to make copies of diskettes using the integrated diskette drive.

Before using this utility, you must first prep the receiving diskette for double-sided, double-density operation, using the "Format" selection from the SCSI/MDLM test.

To enter the utility, select option 8 from the main diagnostics menu.

DCP FAMILY DIAGNOSTIC SYSTEM. RELEASE R6.1
COPY UTILITY

****** NOTE ******

THIS UTILITY REQUIRES A DISKETTE FOR OUTPUT WHICH HAS
BEEN PREPARED FOR DOUBLE-SIDED, DOUBLE-DENSITY
OPERATION. DISKETTES MAY BE PREPPED USING THE MDLM
MASS STORAGE TEST. WHEN READY TO PROCEED, PRESS XMIT
KEY.
[ ]

1. When you press XMIT, this prompt appears:

   ENTER NUMBER OF OUTPUT COPIES (1-9) DEFAULT = 1

2. Press XMIT for a single copy, or enter a number and press XMIT. The screen will display:

   INSERT INPUT DISKETTE
   WHEN READY TO PROCEED, PRESS TRANSMIT KEY

   Insert the diskette you want to copy in the integrated drive and press the XMIT key. The screen will display:

   DCP FAMILY DIAGNOSTICS SYSTEM. R6.1
   COPY UTILITY
   Copy x of x Track No. xxxxx

   *********READING THE DISKETTE********

The contents of the diskette are being read into processor storage. You can monitor the progress of the read operation by watching the track number display on the third line of the screen. (The read operation will take approximately 5 minutes.)

3. When the read is complete, the screen displays:

   ▶ REMOVE INPUT DISKETTE, INSERT OUTPUT DISKETTE
   ▶ PRESS XMIT KEY WHEN READY

4. After you have inserted the blank diskette in the drive and pressed XMIT, the screen will display:

   ********WRITING TO THE DISKETTE********

   (This requires about the same length of time as the read operation.)

5. When the first copy is completed, the prompt will tell you to insert a new diskette in the drive (if you selected more than one copy). If the process complete, the screen will display:

   TOTAL NUMBER OF COPIES ARE COMPLETED

   Press XMIT to return to the main diagnostics menu.

ERROR MESSAGES

Errors reported through the copy utility are limited to those occurring in the integrated diskette drive and to media errors indicated by bad status following an I/O operation. Port processor hardware and program errors are reported from the executive program, not from the utility.

If the utility finds deleted data when reading the input diskette, it writes the data to the output diskette as valid data. The copy is not treated as an error and can affect later use of the output diskette, depending on the application. The utility reports only the first instance for each copy routine:

*** WARNING *** DELETED SECTOR FOUND ON INPUT DISKETTE

Local Language Translate Utility

This utility allows you to translate all diagnostic prompts and messages into languages other than English. (Translation of other files is not within this function.)

Once you translate a diagnostic routine, it exists on the diskette only in its translated form. The original is overwritten. Make a copy of the original diagnostics diskette and a translated version.

1. Make a backup copy of the diskette that will be translated.

2. Place the diskette to be translated in the integrated drive.

3. Display the main diagnostics menu and select option 2, LOCAL LANGUAGE TRANSLATE UTILITY

TRANSLATE DISPLAY

The display lists each diagnostic test and the executive message element. Select the test you wish translated by entering the corresponding number and pressing XMIT.

The message file is displayed one phrase at a time. Press XMIT until you reach the message you want to change. The message is displayed in the first line and cursor positioned in the second line. If you wish to change the message, type in the entire phrase the way you want it to appear. Press XMIT. The change is echoed back in the third line. You may enter a maximum of 72 characters per phrase.

NOTE: Don't be confused by the error messages that are included in the Executive Message Element. (If an actual error occurred, the message would be accompanied by additional lines of information.)

While in TRANSLATE DISPLAY option, use:

- MSG WAIT key to reverse the scrolling direction actuated by the XMIT key. (SCROLL SWITCH FORWARD is in effect from the time the message file is loaded until you XMIT to the last message in the file. If you press MSG WAIT before the last message or press XMIT after the last message, SCROLL SWITCH BACKWARD is in effect.)
- FUNCTION and F2 keys to redisplay the current message.
- FUNCTION and F3 keys to exit the utility and update the media.
- FUNCTION and F4 keys to return to the utility menu.

Using the FUNCTION and F3 keys is useful if you are interrupted before finishing the message file. This store what you have already completed and returns you to the main diagnostics menu. However, it flags the message you had just completed, so that when you reenter the utility and the same message file, this is displayed:

▶ THE MESSAGE FILE LOADED HAS A CONTINUATION INDEX OF : XXXX
▶ SHALL I CONTINUE WITH THIS INDEX Y/N?

If you enter n, the top of the message file is displayed (complete with any changes you had previously made to the file). If you enter y, the utility returns you to your previous position in the file, the next message that would have been displayed before you exited the utility.

When you are at the end of the message file, use the FUNCTION and F3 keys to store your changes and to return to the main diagnostics menu.

UPDATE MEDIA AND EXIT

Use this option to store on diskette the changes you have made to a message file and to return to the main diagnostics menu. (Each message file must be updated individually.)

EXIT UTILITY

This removes you from the utility and redisplays the main diagnostics menu.

Section 5.
Peripheral Devices

8441 Mass Storage Subsystem

A Unisys 8441 Mass Storage Subsystem (Figure 6-1) can be connected to the DCP/30 through the DCP Multiple Device Line Module, for use as auxiliary mass storage. A maximum of two 30M byte or 70M byte drives can be configured in one subsystem, and up to seven more subsystems can be daisy-chained from the DCP.

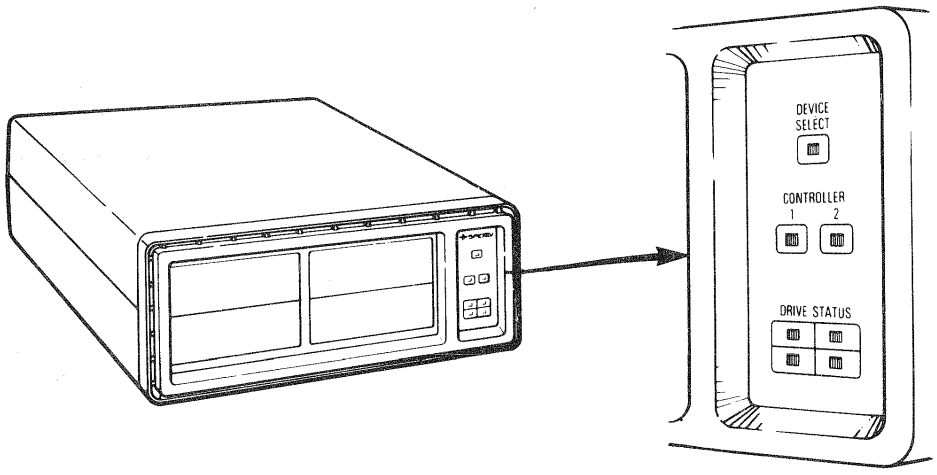


Figure 5-1. 8441 Subsystem Control Panel

Table 5-1. 8441 Subsystem Indicators

DEVICE SELECT	Flashes once when power is turned on. Remains lighted green when a drive is selected for operation.
CONTROLLER 1 and 2	Flashes red once when power is turned on; remains green if controller is configured. Lights red if failure occurs.
DRIVE STATUS	Flashes orange once, then stays green for appropriate drive, if connected and strapped properly. Lights red if failure occurs.

2523 Line Switch Module

The Unisys 2523 Line Switch Module (Figure 5-2) automatically switches failed lines, and enables selected switching of communication lines or peripheral devices from one destination to another. The automatic control is allowed by means of a local DCP interface, or through switched or dedicated communications lines or a network trunk. Up to four LSMs can be connected by means of RS-232 modem expanders, or an LSM can be connected to an 8590 remote control module.

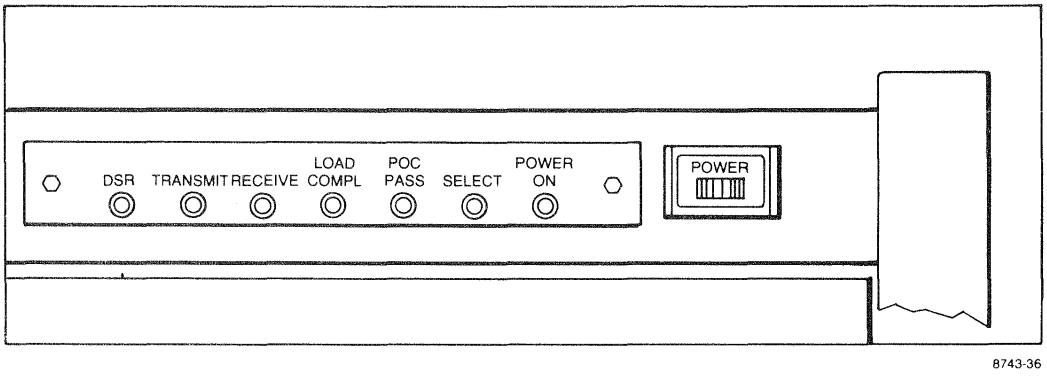


Figure 5-2. 2523 LSM Control Panel

Table 5-2. 2523 LSM Controls and Indicators

Power ON/OFF switch	Turns power on or off; also functions as a circuit breaker.
POWER indicator	Lights when power is on.
SELECT indicator	Lights when LSM has been selected for operation by receiving a valid communications message.
POC PASS indicator	Lights when LSM passes POC test.
LOAD COMPL indicator	Flashes each time a loadable line module is loaded; remains lit when all line modules are loaded successfully.
RECEIVE indicator	Lights when receive-data lead of a modem or local port is active.
TRANSMIT indicator	Lights when transmit-data lead of a modem or local port is active.
DSR indicator	Lights when data-set-ready lead from modem connected to line module is in "on" state. (When X.21 interface is used, indicator displays state of indication circuit.)

> **WARNING:**
>
> The front panel should be opened only by a trained customer engineer.

Modems

Check the DSR status on the active line indicator panel to ensure that dedicated line modems are ready for operation. (The DSR indicator remains lit when the modem is connected and ready for use.)

Switched line modems can function in three modes: manual, autoanswer, or automatic call. To use manual mode, lift the receiver, press the TALK button, and dial the connection number. When the connection has been established, press the DATA button and replace the receiver in its cradle. To disconnect manual mode, pick up the receiver, press the TALK button again, and replace the receiver. To operate in automatic mode, just be sure the AUTO button on the handset is pressed.

NOTE: The system console terminal must be located on a dedicated line.

Modems Connected Through the MCF

The following information relates to the parameters that are required to be set up at the near Modem in order to function properly when connected to the Maintenance Control Feature (F4994). It is recommended that the user refer to the MODEM User's Guide for more detailed information.

HAYES MODEM 1200

The HAYES MODEM 1200 switch settings described here are necessary for an asynchronous connection to the MCF. An asynchronous device is located at the far end as the DTE device from which the dialed-up connection is established between modems. The modem configuration switch settings are as follows:

Switch	Setting	Description/Meaning
1	UP (off)	Modem monitors DTR from MCF. If DTR goes inactive, modem drops phone line.
2	DOWN (on)	Not used (see switch 3).
3	UP	Result codes are not sent to MCF.
4	DOWN	No echo of output characters back to MCF.
5	UP	Modem auto-answers incoming calls.

6	UP	Carrier Detect signal goes active when receiving a carrier from a distant modem. Switch DOWN - constant Carrier Detect.
7	OPTIONAL	Switch UP - connecting modem to an RJ-11 modular phone jack for single-line. Switch DOWN - connecting modem to RJ-12 or RJ-13 phone jack for multi-line.
8	UP	Modem ignores output data for commands.
9	OPTIONAL	Switch UP - modem supports Bell 103 or 212A. Switch DOWN - CCITT V.22 mode supported.
10	UP	When DTR goes inactive, modem hangs up.

HAYES MODEM 2400

HAYES 2400 commands listed here are necessary for an asynchronous connection. These commands have to be issued to the modem using an asynchronous device such as a terminal. Once the proper commands have been issued, the HAYES 2400 MODEM can then be strapped to the "dumb mode", then connected to the MCF for asynchronous operation.

Command	Description/Meaning
AT&D2	Modem monitors DTR from MCF. If DTR goes inactive, modem drops phone line.
AT&S1	DSR operates according to RS232 (DSR drops if DTR drops).
AT&C1	Carrier Detect signal goes active when receiving a carrier from a distant modem.
ATS0=1	Auto Answer after one ring.
AT&W	Store new parameters (commands) in active configuration Non Volatile RAM of modem. Note: Issue this command at the BAUD rate you want the modem working at with the MCF.

Appendix A.
Line Module/Microcode Identifiers

The following table lists line module identifiers (LMIDs) and their associated microcode identifiers (MCIDs). FXXXX denotes a feature number.

LMID	Line Module	MCID
02	BIOC	02
04	SU00039 Host Interface (primary port) F1947	58
05	SU00039 Host Interface (secondary port) F1947	--
07	Byte Interface F3878	07
09	Multidevice (MDLM) F3893	09
10	16-Bit Peripheral Channel (PU100)	10
11	SU00057 Host Channel (32 bit) F1946	11
12	Intercomputer Channel (16 bit)	12
14	SU00208 Block Multiplexer (primary port)	48
15	SU00208 Block Multiplexer (secondary port)	48
38	Automatic Dialer F1945	38
40	Asynchronous F1941 (TTY low cost)	40*
44	Multiline (4X1) Async F3165	59
50	Synchronous F1942 (Uniscope)	50*

Line Module/Microcode Identifiers - continued

LMID	Line Module	MCID
54	Multiline Sync/Async F3837:	
	--Asynchronous	4D
	--UNISCOPE	4E
	--UDLC	4F
56	Multiline F3837-04 (bulkhead)	--
60	Medium Speed Loadable (MSLLM) F3163 (RS-449)	
	--Basic Asynchronous	20
	--Basic Synchronous	24
	--UDLC	28
	--1100 FDX	30
	--REM1	38
	--EBCDIC BSC	40
	--ASCII BSC	42
61	MSLLM (X.21)	
	--Basic Synchronous	25
	--UDLC	29
	--1100 FDX	31
	--EBCDIC BSC	41
	--ASCII BSC	43
62	MSLLM (X.20)	
	--Basic Asynchronous	21
63	MSLLM (RS-232/TREND)	
	--Basic Asynchronous	20
64	Direct Connect Single Station (DCSS) F3847	70
65	Twisted Pair (F4230-00)	27
67	MSLLM (RS-232-C)	
	--Basic Asynchronous	20
	--Basic Synchronous	24
	--UDLC	28
	--1100 FDX	30
	--REM1	38
	--EBCDIC BSC	40
	--ASCII BSC	42
6B	MSLLM (TWX)	
	--Basic Asynchronous	22

Line Module/Microcode Identifiers - continued

LMID	Line Module	MCID
6F	MSLLM (no cable)	--
70	High Speed Loadable (HSLLM) F3164 (RS-449)	
	--Basic Synchronous	26
	--UDLC	2A
	--1100 FDX	32
	--REM1	39
	--EBCDIC BSC	44
	--ASCII BSC	45
71	HSLLM (X.21)	
	--UDLC	2B
	--1100 FDX	33
7D	High Speed Loadable (HSLLM, BELL 303)	
	--Basic Synchronous	26
	--UDLC	2A
	--1100 FDX	32
	--REM1	39
	--EBCDIC BSC	44
	--ASCII BSC	45
7E	High Speed Loadable (HSLLM, V.35)	
	--Basic Synchronous	26
	--UDLC	2A
	--1100 FDX	32
	--REM1	39
	--EBCDIC BSC	44
	--ASCII BSC	42
A0	DCP 802.3 LAN	80

Microcode ID 00 = Line module microcode not loaded

Microcode ID EF = Microprogram was loaded but requires an end-of-function (EOF -- 4 bytes of 00 and 1 byte of FF) to operate. The ROM microcode still has control.

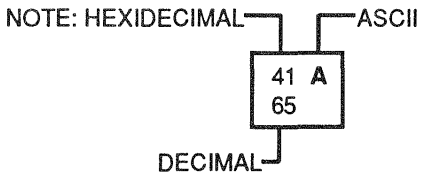
Microcode IDs
F0 through FF = An error was detected during the microprogram load and the line module is not operational.

---

* Both of these line modules return a hardware ID of 50 following either power-on or master-clear. After they are loaded with operating parameters, they return an ID of 50 if the parameters are synchronous and an ID of 40 if the parameters are asynchronous.

Appendix B.
Hexadecimal/ASCII Conversion Chart

CONTROL		DATA CHARACTERS						7 Bit			
0	0	0	0	1	1	1	1	6 Num.			
0	0	1	1	0	0	1	1				
0	1	0	1	0	1	0	1	5			
								4	3	2	1
00 **NUL** 00	10 **DLE** 16	20 **SP** 32	30 **0** 48	40 **@** 64	50 **P** 80	60 **'** 96	70 **p** 112	0	0	0	0
01 **SOH** 01	11 **DC1** 17	21 **!** 33	31 **1** 49	41 **A** 65	51 **Q** 81	61 **a** 97	71 **q** 113	0	0	0	1
02 **STX** 02	12 **DC2** 18	22 **"** 34	32 **2** 50	42 **B** 66	52 **R** 82	62 **b** 98	72 **r** 114	0	0	1	0
03 **ETX** 03	13 **DC3** 19	23 **#** 35	33 **3** 51	43 **C** 67	53 **S** 83	13 **c** 99	73 **s** 115	0	0	1	1
04 **EOT** 04	14 **DC4** 20	24 **$** 36	34 **4** 52	44 **D** 68	54 **T** 84	64 **d** 100	74 **t** 116	0	1	0	0
05 **ENQ** 05	15 **NAK** 21	25 **%** 37	35 **5** 53	45 **E** 69	55 **U** 85	65 **e** 101	75 **u** 117	0	1	0	1
06 **ACK** 06	16 **SYN** 22	26 **&** 38	36 **6** 54	46 **F** 70	56 **V** 86	66 **f** 102	76 **v** 118	0	1	1	0
07 **BEL** 07	17 **ETB** 23	27 **'** 39	37 **7** 55	47 **G** 71	57 **W** 87	67 **g** 103	77 **w** 119	0	1	1	1
08 **BS** 08	18 **CAN** 24	28 **(** 40	38 **8** 56	48 **H** 72	58 **X** 88	68 **h** 104	78 **x** 120	1	0	0	0
09 **HT** 09	19 **EM** 25	29 **)** 41	39 **9** 57	49 **I** 73	59 **Y** 89	69 **i** 105	79 **y** 121	1	0	0	1
0A **LF** 10	1A **SUB** 26	2A ***** 42	3A **:** 58	4A **J** 74	5A **Z** 90	6A **j** 106	7A **z** 122	1	0	1	0
0B **VT** 11	1B **ESC** 27	2B **+** 43	3B **;** 59	4B **K** 75	5B **[** 91	6B **k** 107	7B **{** 123	1	0	1	1
0C **FF** 12	1C **FS** 28	2C **,** 44	3C **<** 60	4C **L** 76	5C **** 92	6C **l** 108	7C **|** 124	1	1	0	0
0D **CR** 13	1D **GS** 29	2D **-** 45	3D **=** 61	4D **M** 77	5D **]** 93	6D **m** 109	7D **}** 125	1	1	0	1
0E **SO** 14	1E **RS** 30	2E **.** 46	3E **>** 62	4E **N** 78	5E **^** 94	6E **n** 110	7E **~** 126	1	1	1	0
0F **SI** 15	1F **US** 31	2F **/** 47	3F **?** 63	4F **O** 79	5F **_** 95	6F **o** 111	7F **DEL** 127	1	1	1	1



Appendix C.
Diagnostic Resident Utilities: Memory Map and Configuration Table

The resident utilities contain several types of system functions, most of which are useful only to a Unisys representative. This appendix is included primarily for your use in displaying the memory map and line module configuration table, a utilities command.

Accessing the Utilities

1. To access the utilities, press the FUNCTION and F1 keys. (This may be done from the main menu or during the execution of any diagnostic test.) The following appears:

   1 = Continue the test
   2 = Abort current activity and reinitialize the EXEC
   3 = Hold current activity and use the RESIDENT UTILITIES

2. Enter 3 and press XMIT. The screen will display:

   RESIDENT UTILITIES - ENTER COMMAND

3. Enter DC and press XMIT. This display appears:

   DCP FAMILY DIAGNOSTIC SYSTEM. RELEASE R6.1

   DISPLAY: CONFIGURATION TABLE

   DISPLAY OPTIONS
   1 - EXIT DISPLAY ROUTINE
   2 - DISPLAY THE MEMORY MAP
   3 - DISPLAY THE LINE MODULE COMPLEMENT

   Enter option (1-3) Default is 2:
   Press TRANSMIT to continue

If you enter 1, you return to the first utilities display and may exit the utility by entering EX.

If you enter 2, the screen displays the memory map.

If you enter 3, the screen displays the line module ID code under each port number. Appendix A lists each of these codes and the corresponding microcode ID.

Memory Map

The memory map display appears like this:

The Memory Map reads from the left (Lowest Address) with each character representing 64K Bytes of storage. A "1" indicates Error-free storage, while a "0" indicates storage errors, or non-existent storage.

RANGE	STORAGE	RANGE	STORAGE
000000 to 0FFFFF	1111111100000000	100000 to 1FFFFF	0000000000000000
200000 to 2FFFFF	0000000000000000	300000 to 3FFFFF	0000000000000000
400000 to 4FFFFF	0000000000000000	500000 to 5FFFFF	0000000000000000
600000 to 6FFFFF	0000000000000000	700000 to 7FFFFF	0000000000000000

Press TRANSMIT to continue

Each time you press XMIT, two more lines are displayed. The message End of memory map entries appears when the entire storage range has been displayed.

Run Configuration

You must run this utility if you had initially aborted the build routine after loading diagnostics (chapter 4) and now want to display the configuration table or run either the system test or serial line module test.

1. Enter RC in the resident utilities.

   A message will inform you that the build is complete. You may now display the table using the "Display Configuration" utility.

Configuration Table

The line module configuration table appears like this:

Each number displayed in a port number column is a Line Module I.D. code which identifies the L.M. type. Refer to the table of I.D. codes located in the manual to find a specific Line Module Type.

PORT: 00 01 02 03 04 05 06 07

LMID: xx xx xx xx xx xx xx xx
Last port found with line modules

NOTE: If 00 is displayed beneath any port number in which a line module resides, the module is defective and must be replaced by a Unisys representative.

FF indicates the port through which the system console is attached.

Refer to Appendix A for a list of the line module identifiers.

Glossary

The UNISYS DCP Series Systems System Reference, Volume I, UP.8720, provides complete information on DCP terms and procedures used in this book.

Address	Information for the system to locate something in memory. Several types of addressing are used in a system, with one type often translated to another as part of the storage or retrieval process. Byte addresses are grid coordinates that label each location on a given memory board. The processor uses one system of real addresses to label locations on all boards in local storage. When the processor requests a piece of data from a real address, logic on the appropriate memory board converts the real address to the correlating byte address and retrieves the data there. Virtual addresses are locations in virtual storage where a system user can send or find data. Virtual storage is limited by the system's addressing scheme and the amount of storage not needed for system operations.
Arithmetic logic unit (ALU)	A part of a computer that performs both arithmetic (adding, subtracting, etc.) and logic (comparing, selecting, etc.) functions.
Byte interface	The line module that serves communication between the processor and any 8-bit peripheral.
Check bits	A series of bits attached to a piece of stored data indicating its pattern of 0's and 1's. Comparison of this stored pattern with a pattern calculated upon retrieval can tell if the data has had one or more bits flipped. See syndrome.
CLC	Communications line controller. More commonly referred to input/output processor (IOP).
Configuration	A specific connecting order in which components of a system can find and gain access to each other.
Directory	Information arranged in a specified order, as in disk directory.
EI	External interrupt.
EOF	End of function. A code (four bytes of FF and one byte of 0) that tells the receiving processor unit that the preceding action is complete.

ESI	Externally specified index.
Executive	The part of the diagnostics program that controls loading and service requests for the diagnostics tests and utilities.
Exigent event	Exigent events are serious hardware or software failures, or other important events. They require the immediate services of the communications processor to maintain system processing or to enforce architectural security. When an exigent event occurs, the normal program sequence is suspended, processing states are saved, and a forced call is made to a programmed procedure. Status is also stored to permit the called procedure to analyze the event and take an appropriate course of action. When servicing an exigent event is not possible, processing reverts to an error-recovery routine that reinitializes the system and accomplishes a new program load. See queued events.
ID	Identifier.
IFDC (integrated flexible diskette controller)	The diagnostic test used to copy a 3/5 inch diskette.
Instrumentation call	The processor gathers information for performance analysis and software debugging. Instrumentation functions selectively record software execution and other internal events, format the information into instrumentation words, store them in buffers, and uses them to trace messages or to process steps throughout all elements of the system. An instrumentation call is a command to gather some of this information.
IOP	Input/output processor. Preferred term for communications line controller.
Line module	One, or more printed circuit assemblies (PCAs) combined in a unit and used for either serial or parallel communications to peripheral devices or terminals. The PCAs are housed in the I/O Module.
Loadee	An IOP within the system which does not control the load of microcode during load; rather it receives its code under control of a Loader IOP.
Loader	An IOP (default IOP 0) within the system that controls the loading of microcode and OS during system load. It may accomplish this through control of Mass Storage via a MDLM.
Menu	A list of choices, displayed on the screen.

Microcode	Machine-level programs embedded or loaded into the components of the system, that supply the instructions on how a higher level program is to be implemented. For instance, macrocode may require a copy function to be performed; microcode sends the appropriate messages to the appropriate locations on how to implement the command.
MDLM	See Multiple Device Line Module.
Multiple device line module	The line modules that control the integrated drives and the 8441 mass storage subsystem.
POC test	Power-on confidence test.
Port	The logical channel through which data input and output occurs. The port in a DCP is a physical location where a line module resides, that is linked to a logical position on the backpanel.
Port processor (PP)	Architecturally-defined processing element, using an instruction repertoire tailored for input/output operations.
Process control	A condition that is not an error event but must be resolved by the program executive before normal processing can continue.
PTS	Peripheral testing sequencer (Series 1100 diagnostics package).
Queued events	One of two kinds of special events (the other being an exigent event) requiring system attention. A queued event is one that has been delayed until it can be processed and has been put in a system queue list (SQL). Queued events do not require immediate communications processor attention or cause suspension of current program execution.
RAM	Random access memory -- stored information that can be entered and read at any point.
RCA	Remote control adapter line module. Connects DCP to a remote control module.
RID	Remote identifier.
ROM	Read-only memory. Non-accessible coded instructions, generally for machine-level functions.
RTC	Real time clock.
SCR	System control register.
SCT	System control table.

SD	Segment descriptor.
SDT	The start-data-transfer instruction.
SID	Site identifier.
SQL	System queue list.
SST	System segment table.
Specification error	A condition that does not comply with the architectural requirements of the processor.
Syndrome	A generated code, including check bits, used to invert a faulty bit, or to detect and report a double-bit error.
Time-out	Suspension of a process because an expected activity has not occurred.
UDLC	Universal data link control. A communications protocol.

Index

A

B

C

D

D (cont.)

F

H

I

L

M

M (Cont.)

P

R

S

T

T (cont.)

U

W