SPERRY

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MAPPER 10/System 11

Type 3065
Central Complex

Operator's Guide

UP-10061

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The Type 3065 central complex components described in this manual are required components in some smaller Series 1100 Systems (for example, the Distributed Data Processing System 11).

This manual contains information and procedures needed by operators of the Type 3065 central complex. It does not contain information on the peripherals used with the host system; these have their own operator reference manuals.

This manual consists of:

1. Introduction
2. Description
3. Controls and Indicators
4. Operating Procedures
5. Operator-Performed Maintenance
6. Glossary
7. Index

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Preface

The Type 3065 central complex components described in this manual are required components in some smaller Series 1100 Systems (for example, the Distributed Data Processing System 11).

This manual contains information and procedures needed by operators of the Type 3065 central complex. It does not contain information on the peripherals used with the host system; these have their own operator reference manuals.

In particular, this manual describes how to load system diskettes, apply and remove system power, initialize the system, perform a controlled system stop, perform auto recovery, and connect the system to a Sperry Support Center.

Other manuals tell how to install the system and how to interact with the System Support Processor and operating system software package.

The manual consists of:

1.	Introduction	Introduces the Type 3065 central complex and describes operator responsibilities.
2.	Description	Briefly discusses the function of each central complex unit.
3.	Controls and Indicators	Describes the power and control panels of the central complex.
4.	Operating Procedures	Describes the following procedures: power on, initialization, system stop, power off, partitioning, auto recovery, use of the Sperry Support Center.
5.	Operator-Performed Maintenance	Describes how to change the central complex air filters and other duties that may be assigned to the operator.

The information in this manual is concerned primarily with operation of the host system hardware. For information on individual peripherals, consult:

- *3782 Streaming Tape Operator Reference,* UP-9381.

  Describes the controls and indicators for the streaming tape.

- *8436 Disk Subsystem Operator Reference,* UP-10057.

  Describes the controls and indicators for the disk subsystem.

- *Model 25 Printer General Description,* UP-9581.

  Describes the controls and indicators for the printer.

Contents

Tables

1. Introduction

1.1. Features of the Type 3065 Central Complex

Basic features

The system comes with a cabinet that houses the basic central complex. This central complex consists of:

- an instruction processor
- channel input/output processors
- up to 2 million words of main storage
- system support processor
- system console
- system panel
- optional console printer
- optional battery powered clock/calendar
- integrated peripheral control units
- communication line modules

Figure 1-1 shows a typical central complex hardware setup.

Expansion

You can add an expansion cabinet, with its own instruction processor, channel input/output processor, and additional main storage.

Figure 1-2 shows the location of the operator panels in the central complex cabinets.

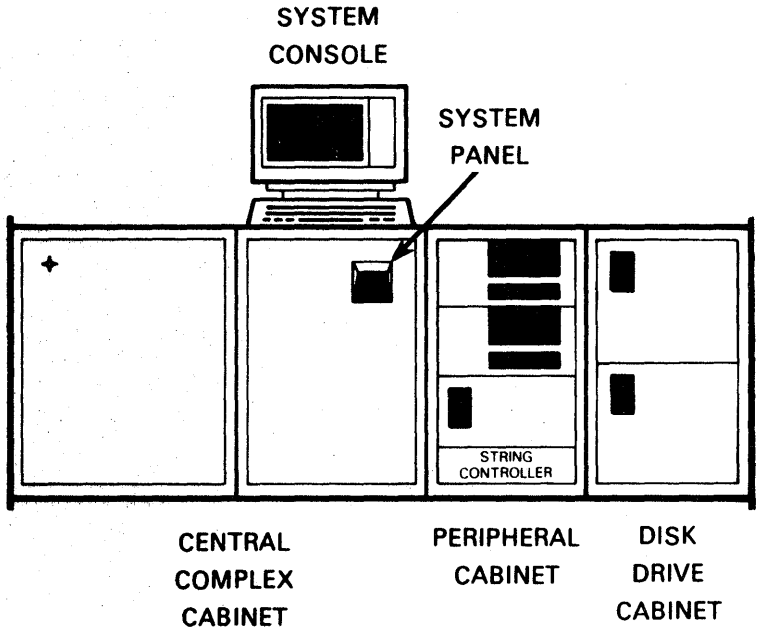


Figure 1-1. Typical Type 3065 Central Complex Hardware Setup

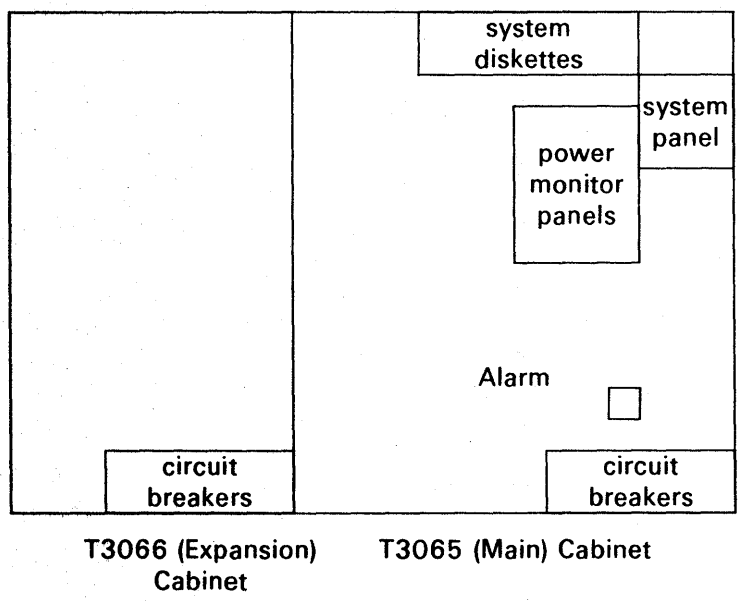


Figure 1-2. Type 3065 Central Complex Operator Panel Locations (Front View)

Peripheral cabinets

Since the T1974 cabinet also accommodates the optional Subsystem Power Controller (SPC), there might be more than one of these cabinets in the configuration. Also, with more than two K3886 Disk Drives in the system, the configuration will include additional T8436 cabinets.

System support processor

The integrated (built-in) System Support Processor (SSP) of the central complex uses the same console as the system. The SSP provides system control, system recovery, and maintenance functions.

Partitioning

The system can run only a single system application or maintenance application at a time. In other words, the entire system must be dedicated to one processing function. The operator, however, can partition the major components of the system into or out of the application. The system provides static and dynamic partitioning. Static partitioning is operator initiated and dynamic partitioning is system initiated (frequently called fail-soft operation).

1.2. Operator Responsibilities

The operator is responsible for preparing the central complex for operation and for performing the procedures required for efficient operation. These responsibilities consist of:

- operating the system panel and console;
- being familiar with the SSP and Operating System commands and directives;
- powering the system on and off;
- executing the initialization and IPL of the system in AUTO and STEP modes;
- statically and dynamically partitioning the major components and the SSP into and out of the application;
- executing maintenance and diagnostic operations;
- observing and responding to indications on the operator control panels;
- responding to system console outputs;
- establishing a connection to a Sperry Support Center; and
- performing maintenance procedures.

2. Description

2.1. Introduction

The central complex has a bus structure that connects instruction processors, channel input/output processors, a main storage unit, and a system support processor.

Instruction Processor (IP)

The instruction processor executes instructions, initiates I/O operations, reads from, and writes to main storage.

Channel Input/ Output Processors (IOPs)

The channel input/output processors execute input and output operations between the peripheral devices and the instruction processor and main storage units. These types of channel input/output processors are:

- Disk Controller/Channel (DCC)
- Byte Bus Channel (BCC)
- Block Multiplexer Channel (BMC)

Main Storage Unit (MSU)

The main storage unit provides dynamic Random Access Memory (RAM) main storage that can be accessed by the instruction processor and channel input/output processors.

System Support Processor (SSP)

The system support processor executes initialization, IPL, Automatic Recovery, and many other control and maintenance functions for the system.

Other central complex components are:

- System console
- System panel

- Subsystem power controller

System console

The system console provides the operator interface to both the system support processor software and the operating system.

System panel

The system panel provides system control and reporting functions.

Subsystem power controller

The subsystem power controller provides centralized, remote power control of peripheral subsystems.

The remainder of this section discusses the configuration of the Type 3065 System and, in turn, each component of the system.

2.2. Component Configuration

The system is oriented around a bus structure. That is, the components of the central complex share common electrical pathways or buses. The central complex has the following kinds of buses:

- Main storage bus (S-Bus)
- Line module bus (L-Bus)

S-Bus

The S-Bus is the primary data path between central complex units, providing the attached components access to main storage, as well as access to each other. The units attached to the S-Bus are the IP, SSP, MSU, and the three kinds of IOPs: the DCC, BBC, and BMC. Figure 2-1 shows this S-Bus configuration.

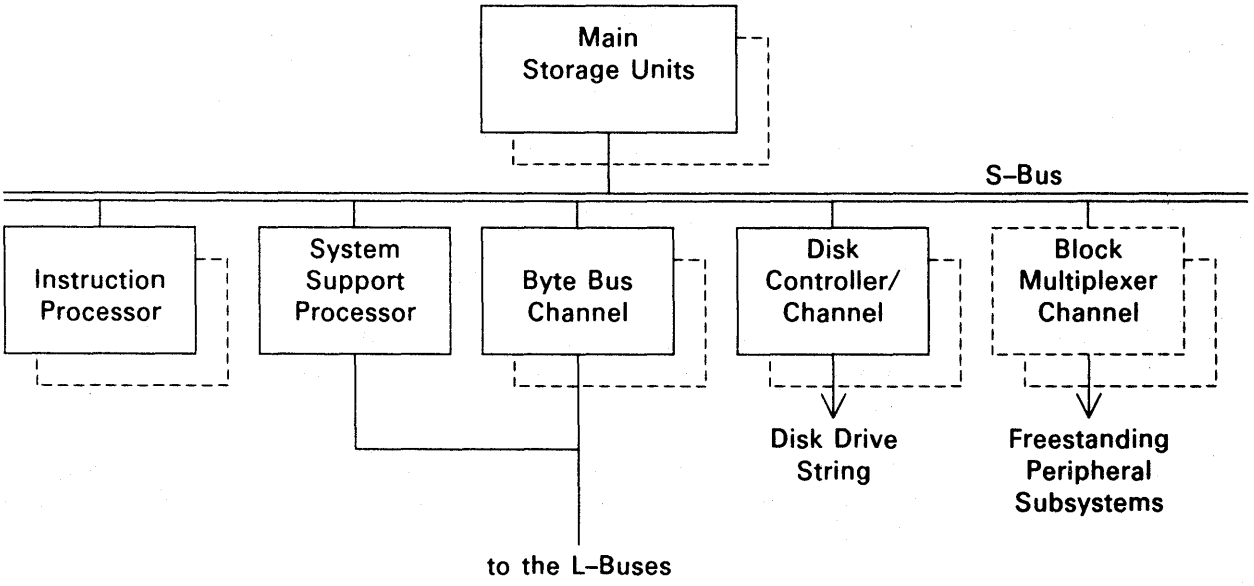


Figure 2-1. S-Bus Configuration

L-Bus

The L-Bus provides a pathway for a variety of integrated control units, line modules, and other components to access the SSP and/or the BBC. Through the BBC, components attached to the L-Bus can access the operating system. The following kinds of components can be attached to the L-Bus:

Components connected to the L-Bus

- communications line modules
- peripheral control units
- console control unit
- system diskette control unit
- front end processor interface
- communications line control unit for attachment to the Sperry Support Center

Sections of the L-Bus

The L-Bus consists of the following three sections:

- the BBC-dedicated section,
- the SSP-dedicated section, and
- the section that is switched between the BBC and the SSP.

Switchable L-Bus components

The console control unit and the communication line control unit to the Sperry Support Center are attached to the switchable portion of the L-Bus. Either the SSP or the operating system (through the BBC) can access a Sperry Support Center and the system console. In other words, both the SSP and the operating system can use the same console, and the Sperry Support Center can access either the SSP software or the operating system.

The system is connected to the Sperry Support Center for special operations (for example, remote maintenance and new software updates).

2.3. Auto Recovery

Auto Recovery

When enabled, this function causes the Series 1100 Operating System (1100 OS), executing in the IP, to exchange a software signal with the SSP software. If either the IP or the SSP ceases to pass the signal, the software of that component is automatically reloaded.

2.4. Transplant

Transplant

When there are two IPs in the system, this function enables the job from an IP to be moved to the other IP for execution. The system continues the function with one IP and the operator is notified on the system console of this action.

2.5. System Support Processor

The System Support Processor (SSP) is a separate processor, integrated into the central complex cabinet. It executes system control, system recovery, and maintenance functions. The SSP uses the same console as used by the operating system, depending on how the L-Bus is switched.

SSP connections

The SSP is attached to the S-Bus, giving it access to the other major components of the central complex, that is, the IP(s), MSU(s), and IOP channels.

The system diskette drives are always connected to the SSP. The console control unit and the Sperry Support Center can be switched between the SSP and the BBC.

SSP functions

The SSP controls system initialization and system IPL. Once IPL of the operating system is accomplished and the operating system is runni: g (in System mode), the SSP reverts to a support role. In this capacity, the operator cannot access the SSP software.

2.6. System Console

System console components consist of:

- display screen
- 96-character keyboard
- optional console printer
- optional battery-powered clock/calendar

Display screen and keyboard

The display screen and keyboard allow you to communicate directly with the system. The keyboard is a low-profile, expanded typewriter keyboard.

Console printer

The console printer provides you with a hard copy of various system messages.

Clock/calendar

The clock/calendar can be used for automatic updating of time and date. The time and date appear on the bottom line of the display screen.

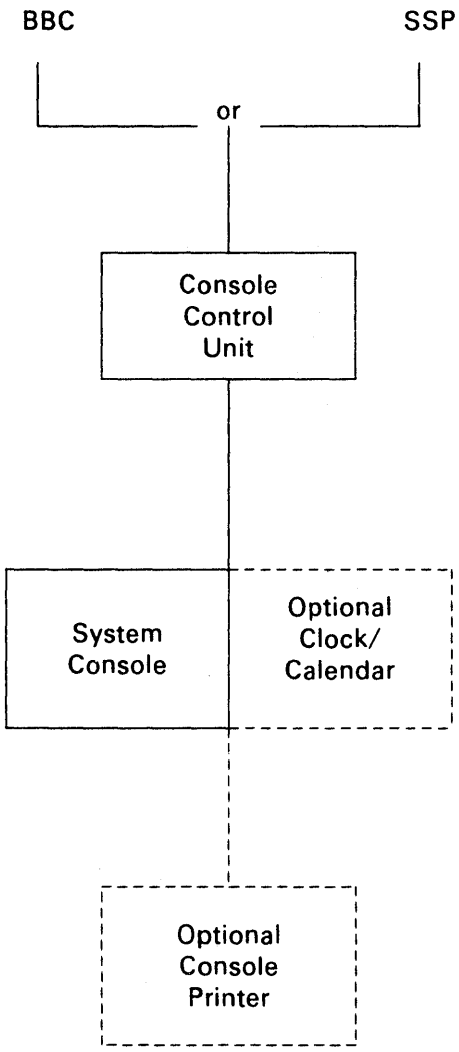


Figure 2-2. System Console Configuration

Switching of the operator–console

The system console can be switched between the SSP software and the operating system (through the byte bus channel). (See Figure 2-2.) In System mode (the normal operating mode of the system), the operating system has control of the console and the operator cannot communicate with the SSP. The SSP in this case is automatic and independent of operator involvement. However, the SSP gains control of the console under the following circumstances:

- when a system failure occurs that was not recoverable
- when there is a system panel activated system stop

- when the system is being initialized
- when the system is running in Maintenance mode

2.7. Subsystem Power Controller (SPC)

The SPC, an optional component of the system, provides remote power control of attached peripheral subsystems.

Two modes of operation are supported for the SPC: local and remote.

Local mode

Local operation requires the SPC's LOCAL/REMOTE power switch to be set to the LOCAL position. This switch setting allows initiation of the power-up sequencing when the SPC's ON/OFF switch is set to the ON position. Setting the ON/OFF switch to the OFF position sequences all attached subsystems down and then the SPC will power down. In this mode, there is no FIPS-61 connection between the central complex cabinet and the SPC.

Remote mode

Remote operation uses one of the FIPS-61 input interfaces allowing the SPC to be connected to the central complex cabinet. With the SPC's LOCAL/REMOTE switch set to REMOTE, the SPC provides the same sequential power control as in local operation, except the sequence is initiated when the central complex cabinet is powered up. If the LOCAL/REMOTE switch is set to LOCAL, the SPC will be in local operation regardless of the FIPS-61 input interface.

2.8. System Panel

The system panel provides the operator a number of system control and reporting functions. The activities initiated through the system panel are the following:

System panel functions

- Power control, serving the single-action turn-on concept
- Automatic or Step mode initialization
- System start and stop
- System status indicators
- System alarm reset
- Keylock access to the system

The controls and indicators of the system panel are discussed in detail in Section 3.

3. Controls and Indicators

3.1. Introduction

To carry out their duties, operators must be familiar with the central complex controls and indicators—not only where they are, but what each does. These components have controls and indicators:

Control and indicator panels

- Central complex cabinet

System panel, power control panel, circuit breaker panel

The central complex cabinet has a system panel, a power control panel, and a circuit breaker panel.

- Display screen

Display screen

Controls and indicators are located on the front panel below the screen.

- Keyboard

Keyboard

The console keyboard contains a 96-character typewriter keyboard.

Console printer

- Console printer

The console printer is an optional component. It is not described in this manual. For information on the console printer, see *Model 25 Printer General Description,* UP-9581.

This section describes the location and function of each control and indicator. Which ones are used by the operators is determined by the operator's assigned duties.

3.2. System Panel

The system panel is located on the central complex cabinet. The panel can be reached through a cutout on the front of the cabinet.

Figure 3-1 shows the system panel and Table 3-1 describes the controls and indicators used by the operator.

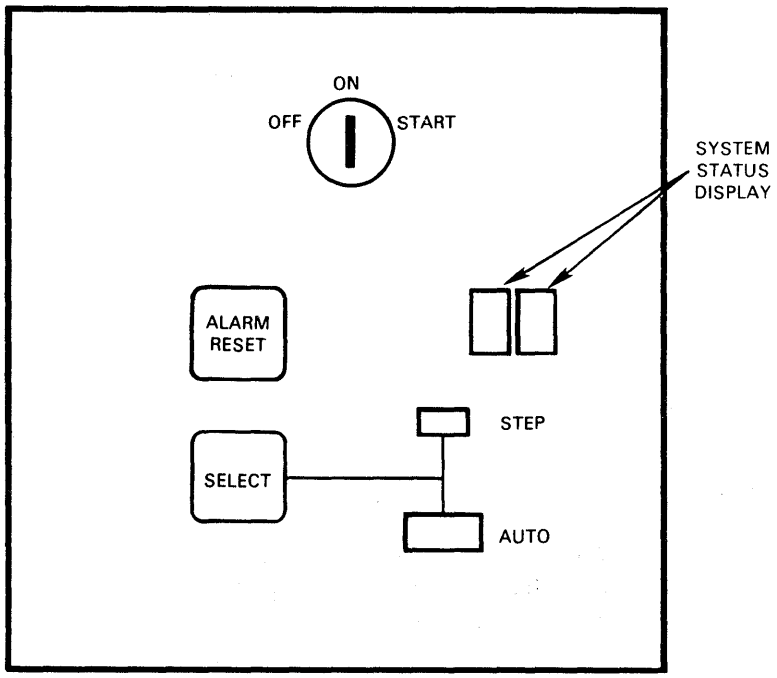


Figure 3-1. System Panel

Table 3-1. System Panel Controls and Indicators

CONTROL/INDICATOR	FUNCTION
OFF/ON/START key switch	In the ON position, applies DC power to the central complex. If held momentarily to the START position, system initialization starts. After initialization is complete, if the switch is turned to the START position once again, the system undergoes a stop (that is, the Operating System ceases to execute and the SSP takes control). In the OFF position, removes DC power from the central complex.
ALARM RESET switch	Silences the alarm.
SELECT switch	Selects STEP mode initialization.
STEP indicator	Lights when the system is being initialized in STEP mode.
AUTO indicator	Lights when the system is being initialized in AUTO mode.
System Status Display	The two digits in these indicators provide a code so the operator can identify a system fault.

3.3. Power Control Panel

The power control panel is located behind the right front door of the central complex cabinet, to the left of the system panel.

Figure 3-2 shows the power control panel. Table 3-2 describes the controls and indicators used by the operator.

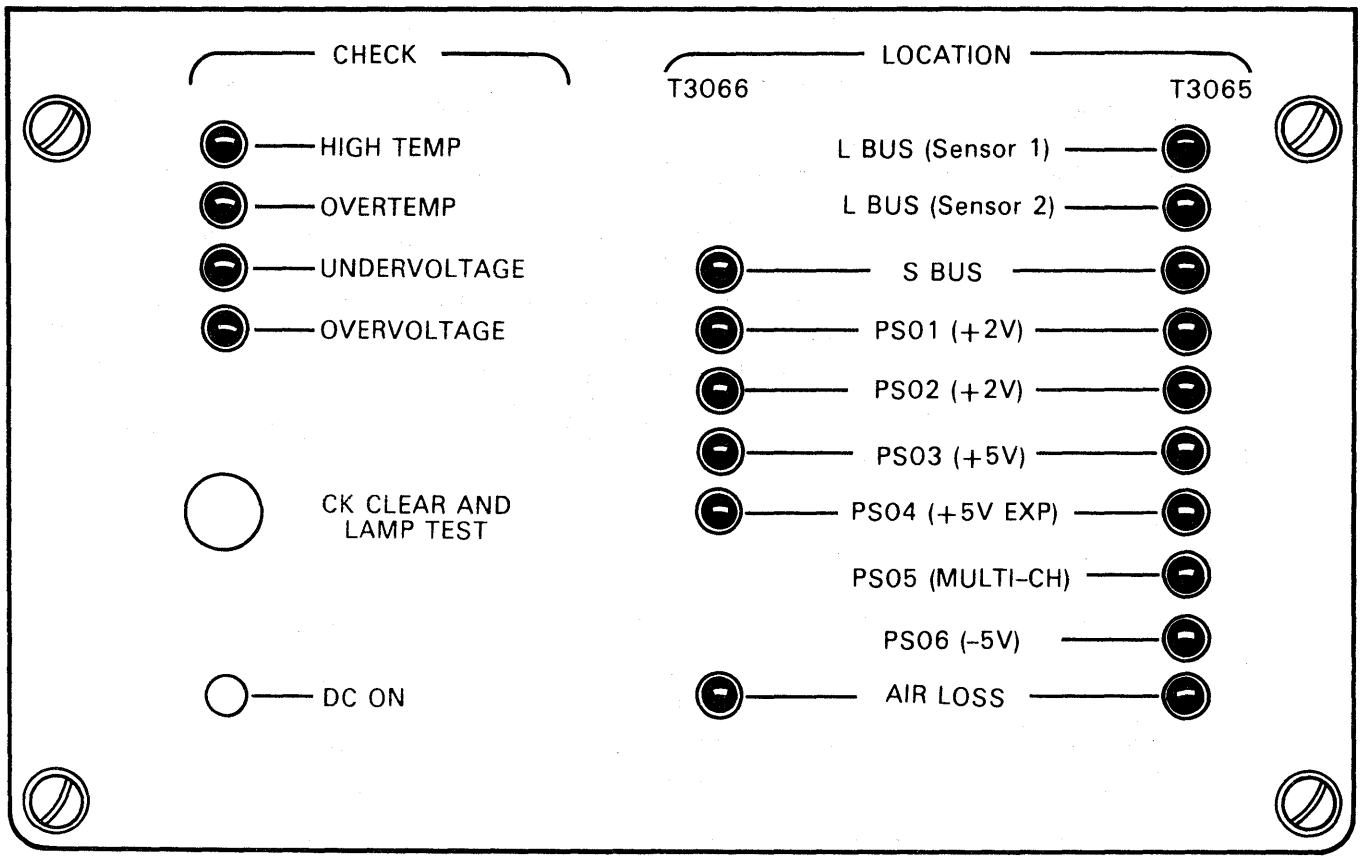


Figure 3-2. Power Control Panel

Table 3-2. Power Control Panel Controls and Indicators

CONTROL/INDICATOR	FUNCTION
HIGH TEMP indicator	Lights when a high temperature (noncritical) fault has occurred.
OVER TEMP indicator	Lights when an over temperature (critical) fault occurs.
UNDERVOLTAGE indicator	Lights when an undervoltage (critical) fault has occurred.
OVERVOLTAGE indicator	Lights when an overvoltage (critical) fault has occurred.
CK CLEAR AND LAMP TEST switch	Tests all the lamps on the power control panel.
DC ON indicator	Lights when DC power is applied to the central complex.

The remaining indicators apply to either the main central complex cabinet (T3065) or to the expansion central complex cabinet (T3066), or to both. These indicators light to notify the operator that attention should be paid to the labeled component (for example, Power Supply 0 L, S-Bus, and so forth).

3.4. Circuit Breaker Panel

The circuit breaker panel is located behind the right front door, at the bottom right of the central complex cabinet, and is beneath the system panel.

Figure 3-3 shows the circuit breaker panel. Table 3-3 describes the controls and indicators used by the operator.

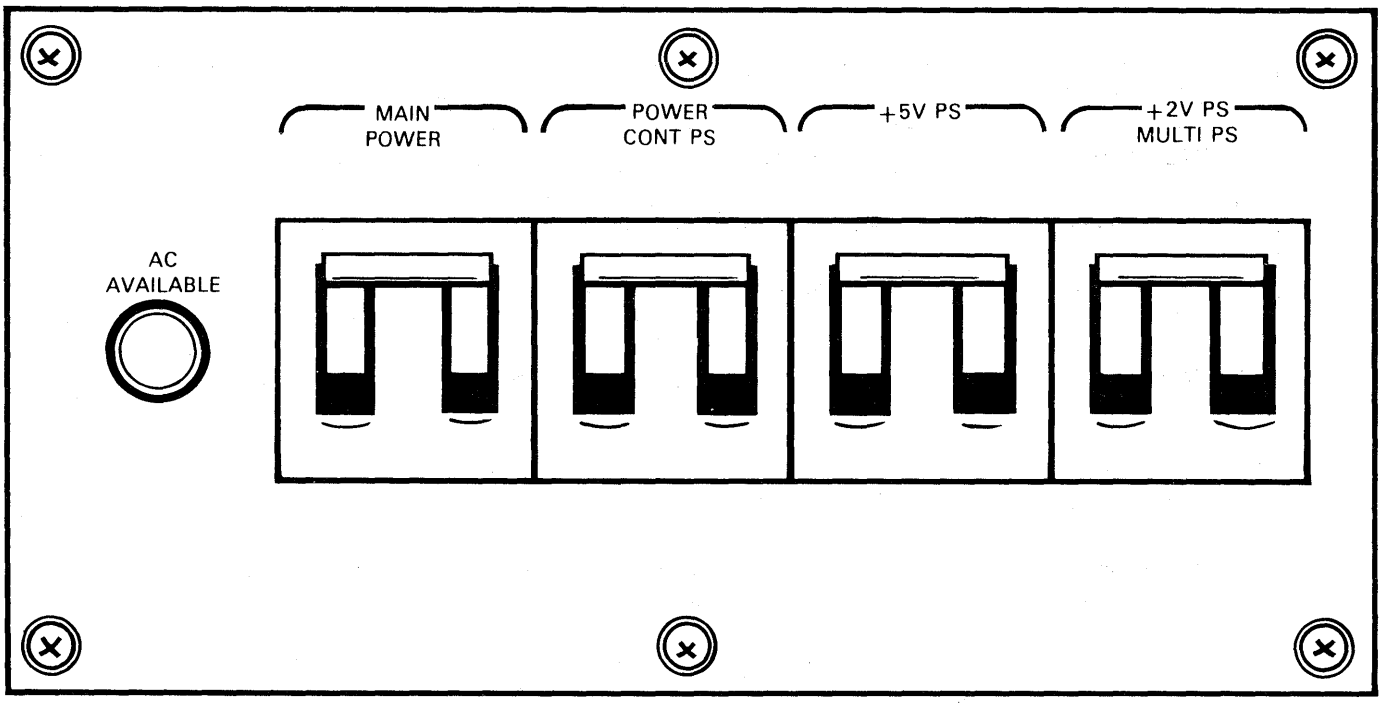


Figure 3-3. Circuit Breaker Panel

Table 3-3. Circuit Breaker Panel Controls and Indicators

CONTROL/INDICATOR	FUNCTION
AC AVAILABLE indicator	Lights when AC power is applied to the central complex cabinet.
MAIN POWER circuit breaker	Controls AC power to all the power supplies in the cabinet.
POWER CONT PS circuit breaker	Controls AC power to the power control power supply.
+5V PS circuit breaker	Controls AC power to the +5V power supply.
+2V PS MULTI PS circuit breaker	Controls AC power to the remaining power supplies.

3.5. Display Screen

The display screen has a set of controls and indicators located beneath the screen.

Figure 3-4 shows the display screen. Table 3-4 describes the controls and indicators used by the operator.

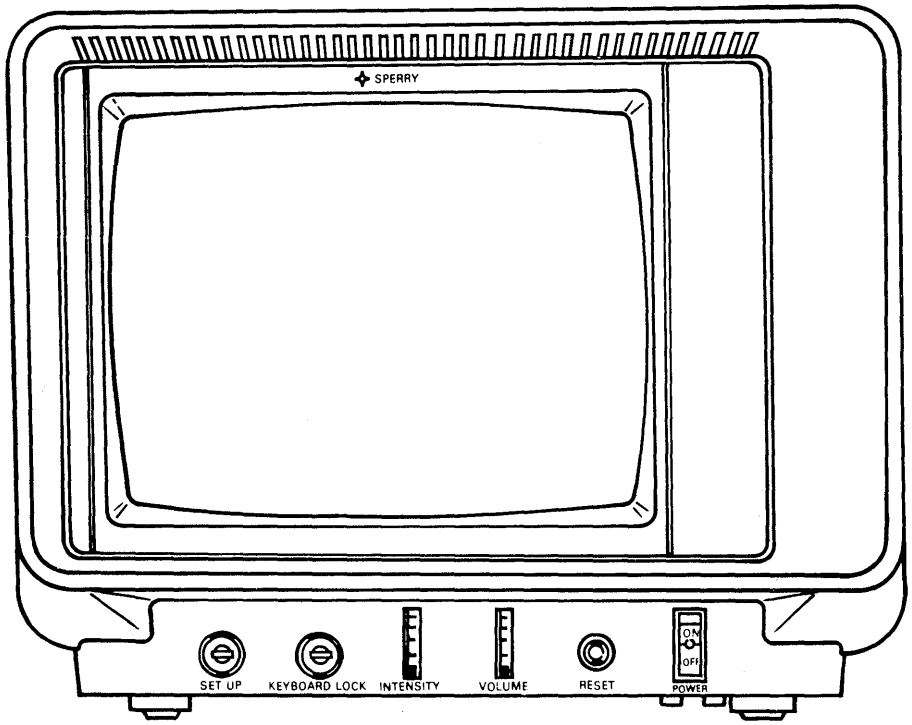


Figure 3-4. Display Screen

Table 3-4. Display Screen Controls and Indicators

CONTROL/INDICATOR	FUNCTION
SET UP key switch	Must be unlocked to enter or change parameter settings. The key may be withdrawn from the lock in either the locked or unlocked position. (The vertical position is unlocked.)
KEYBOARD LOCK key switch	Must be unlocked before keyboard entries are accepted. (The vertical position is unlocked.)
INTENSITY control	Rotating this wheel downward reduces the light intensity; rotating it upward increases the intensity.
VOLUME control	Rotating this control downward silences the keyboard click and the audible alarm.
RESET button	Pressing this button clears the console RAM (including the screen display) and reruns the internal power-on confidence test. The red light in the RESET button lights momentarily when the button is pushed. The light comes on and remains on when the display unit overheats.
POWER ON/OFF switch	This switch controls power to the console. The green indicator in the center of the switch lights when power is on.

3.6. Keyboard

Console keyboard

The system console uses a low-profile, expanded typewriter keyboard.

Keyboard functions

The keyboard is the operator interface with the display screen and the system. Using the keyboard, the operator can enter, edit, and manipulate data on the screen or type in specific operating instructions and commands. When the character keys are pressed, the data is stored in the display screen. At the same time, the data is displayed on the display screen, allowing the operator to edit and verify the data before transmitting it by pressing the XMIT key.

Key functions

The low-profile, expanded typewriter keyboard is an expanded version of the standard typewriter keyboard with additional editing and function control capabilities, plus a separate adding machine-style keypad. The keys of the expanded typewriter keyboard can be divided into the following categories according to function:

- Cursor control keys
- Editing keys
- Function control keys
- Peripheral device keys

- Character (alphanumeric/symbolic) keys

Figure 3-5 shows the expanded typewriter keyboard.

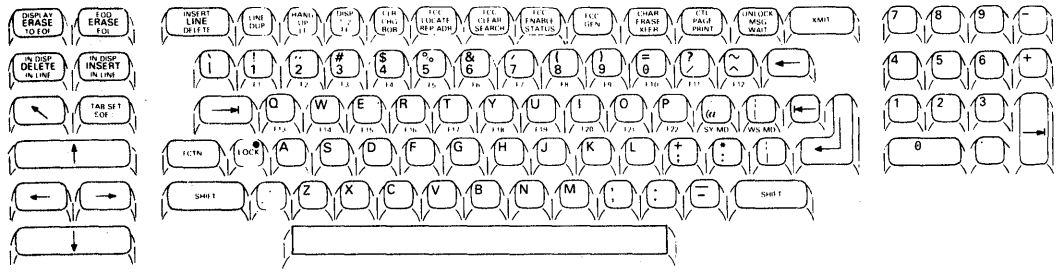


Figure 3-5. Expanded Typewriter Keyboard

Two uses of the keyboard deserve special attention:

- Automatic cycling
- Use of the function key

Automatic cycling

Automatic cycling, the rapid automatic repetition of a single keystroke, occurs when the operator presses a key down and holds it for 1/2 second or longer. It allows the operator to easily repeat a data key or perform a repetitious editing function. All the functional keys on the expanded typewriter keyboard cycle except:

XMIT	FCC GEN
XFER	FCC ENABLE

CTL	FCC CLEAR
PAGE	FCC LOCATE
PRINT	CLR CHG
UNLOCK	STATUS
MSG WAIT	

Though the other functional keys cycle, it is not always apparent. For example, the ERASE DISPLAY key cycles, but only the first erase action is visible.

Function key

The Function (FCTN) key is used with many of the control keys. Many control key keycaps control two different control functions. To use the upper key function, hold down the FCTN key and press the control key. To use the lower key function, just press the control key.

For example in Figure 3-6, the key to the left controls the DELETE IN DISP (display) and DELETE IN LINE functions. If you press the control key alone, you select the lower function DELETE IN LINE. If you press that key and the FCTN key together, you select the upper function DELETE IN DISP.

NOTE: Don't confuse the FCTN key with the SHIFT key. The FCTN key selects the upper function of a control key. The SHIFT key activates the uppercase of a character (alphanumeric/symbolic) key.

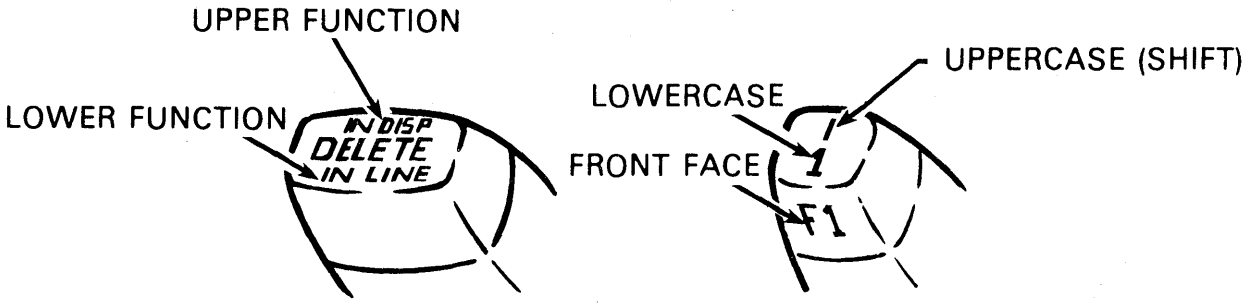


Figure 3-6. Use of the FCTN and SHIFT keys

Table 3-5 describes the function(s) of each key on the expanded typewriter keyboard.

Table 3-5. Expanded Typewriter Keyboard Key Functions

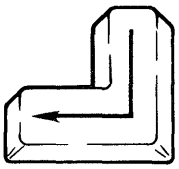
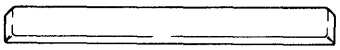
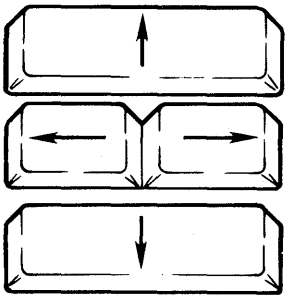
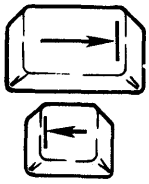
KEY	FUNCTION
Cursor Control Keys	
Cursor to Home 	When pressed, repositions the cursor to the first character position (home) on the screen. The home position is at the top line, left margin.
Return 	When pressed, the cursor moves down one line and to the left margin. Cursor return is automatic following the last character of each line; you do not need to press the return key.
Space Bar 	When pressed, moves the cursor one space to the right.
Scan Keys 	When pressed, moves the cursor in the direction of the arrow on the key, one character position at a time. It repeats as long as the key is pressed. When the cursor reaches the end of a line, it moves to the first character position of the next lower line (scan right) or the last character position of the next line up (scan left). When the cursor reaches the top (scan up) or bottom line (scan down), it moves to the bottom line (scan up) or the top line (scan down) of the same column position.
Tab Forward and Tab Back 	When pressed, these keys move the cursor forward and backward until a tab stop is detected. If a tab-stop character is detected, the cursor stops at the first character position beyond it. If no tab stop character is found, the cursor returns to the home position.
TAB SET 	When pressed, sets the tab stops. The cursor terminal storage to use with the tab keys. The cursor indicates the position for setting a tab stop.

Table 3-5. Expanded Typewriter Keyboard Key Functions (continued)

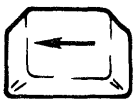
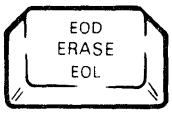
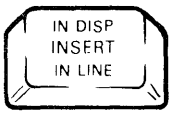
KEY	FUNCTION
Backspace 	When pressed, moves the cursor one position to the left each time it is pressed. When the cursor reaches the left end of the line, the cursor moves to the last character position of the previous line.
Editing Keys	
CHAR ERASE 	When pressed, erases the character under the cursor and enters a space in that position. The cursor moves to the first character position to the right.
DISPLAY ERASE TO EOF 	In upper function mode (FCTN key is pressed), the ERASE DISPLAY function is activated. This function causes all data from the cursor position through the end of the screen to be erased. In lower function mode, the ERASE TO END-OF-FIELD function is activated. All characters from the cursor to the end of the field are erased.
EOD ERASE EOL 	In upper function mode (FCTN key is pressed), the ERASE TO END OF DISPLAY function is activated. This function causes all characters from the cursor position to the end of the screen to be erased. In lower function mode, the ERASE TO END OF LINE function is activated. This function causes all characters from the cursor position to the end of the line to be erased.
IN DISP INSERT IN LINE 	In upper function mode (FCTN key is pressed), the INSERT IN DISPLAY function is activated. This function causes the data from the cursor to the end of the screen to be moved one space to the right, leaving a space under the cursor. Characters at the end of the lines in the data being moved are shifted to the beginning of the next line; the character in the last position on the screen is lost. In lower function mode, the INSERT IN LINE function is activated. This function causes the data from the cursor to the end of the line to be moved one space to the right each time the key is pressed, leaving a space under the cursor; the character in the last position of the line is lost.
IN DISP DELETE IN LINE 	This key deletes the character in the cursor position; all characters to the right of the cursor shift one position to the left (the cursor does not move). In upper function mode (FCTN key is pressed), all the characters from the cursor to the end of the screen shift to the left; a space is inserted in the last position on the screen. Characters in the first position of each line are moved to the last position of the previous line. In lower function mode, only the characters in the line containing the cursor move to the left, and a space is inserted at the end of the line.

Table 3-5. Expanded Typewriter Keyboard Key Functions (continued)

KEY	FUNCTION
INSERT LINE DELETE 	In upper function mode (FCTN key is pressed), the INSERT LINE function is activated. This function causes a blank line to be inserted in place of the line in which the cursor is located. This line and all lines below it are moved down one line position on the screen. In lower function mode, the DELETE LINE function is activated. This function removes the line in which the cursor is located. All lines that were below it are moved up to fill the void; a blank line is inserted at the bottom of the screen.
LINE DUP 	When pressed, duplicates the line in which the cursor is located on the line below it. The duplicated line overwrites the existing line.
LF (Line Feed) 	Used when entering data to be printed later on specially formatted paper or forms. When pressed, the display screen internally flags that location with an instruction to the printer to perform a carriage return when printing.
FF (Form Feed) 	Another printer format control key used when entering data to be printed in a special format or on preprinted forms. When pressed, generates an internal form feed indicator that instructs the printer to perform a carriage return at that location and advances the paper to the beginning of the next form.
Function Control Keys	
SHIFT 	When pressed, shifts the keyboard from lowercase to uppercase mode. In uppercase mode, the symbol characters (!, #, $, and so forth) are generated in place of the numerals, and uppercase alphabetics instead of lowercase. Hold the SHIFT key while the character key is pressed; when it is released, the mode shifts back to lowercase.
LOCK 	When pressed, locks the keyboard in uppercase mode; uppercase mode is released when the SHIFT key is pressed and released. When the keyboard is in uppercase mode, the indicator on the LOCK key lights.
SOE 	When pressed, positions the START OF ENTRY (SOE) symbol (▶) on the screen. The SOE character designates the character position where a message starts when the XMIT key is pressed.
FCTN (Function) 	When pressed, selects the upper function of a control key. To set the upper function, the function key must be held while the control key is pressed.

Table 3-5. Expanded Typewriter Keyboard Key Functions (continued)

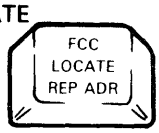
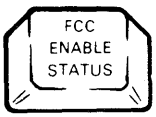
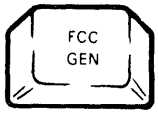
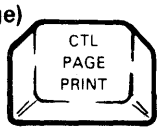
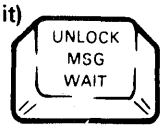
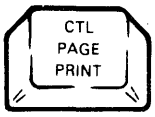
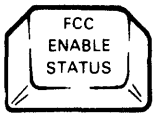
KEY	FUNCTION
UNLOCK 	When pressed, cancels the transmission of data, clears an error condition, silences the alarm, and opens the keyboard to additional keyboard entries.
XMIT (Transmit) 	When pressed, data displayed on the screen, between the SOE character closest to the left of the cursor and the cursor, is transmitted to the host. The keyboard locks until the system releases it.
CLR CHG (Clear Changed-Field Indicators) 	When pressed, allows the operator to clear the previous changed-field indicators before entering new data in a field defined by Field Control Characters (FCC). Changed-field indicators are codes set internally by the CRT each time data is entered or changed in a field defined by FCCs. To transmit only data that is new or has been changed since the last operation, the operator must clear the previous changed-field indicators before entering the new data.
FCC LOCATE 	When pressed, moves the cursor to the first position of the next FCC-defined field in the display. If no FCCs have been defined to the right of the cursor, the FCC LOCATE key moves the cursor to the home position.
FCC CLEAR 	When pressed, clears the Field Control Character (FCC) at the cursor position or, if the cursor is not on an FCC, the first FCC to the left of the cursor.
FCC ENABLE 	When pressed, puts the selected FCC characteristics into effect. Once the FCC ENABLE key has been pressed, all FCCs set up on that displayed page become enabled.
FCC GEN 	When pressed, initiates the beginning of the FCC code sequence, thereby establishing the start of a new field. Once the FCC GEN key is pressed, all data positions from that location to either the next field or the end of the screen become part of that field. Generating another FCC marks the beginning of the next field.
CTL PAGE (Control Page) 	When pressed once, displays the two-line control page on the screen; pressing it again removes the control page from the screen. Pressing the CTL PAGE key also enables FCCs.

Table 3-5. Expanded Typewriter Keyboard Key Functions (continued)

KEY	FUNCTION
MSG WAIT (Message Wait) 	When pressed, displays an incoming message sent to the terminal by the processor, as signaled by the MSGW indicator on the indicator line of the screen.
Peripheral Device Keys	
PRINT 	When pressed, transfers the data presented on the display between the SOE symbol (▶) and the cursor to the console printer.
XFER (Transfer) 	When pressed, sends up to one screen of data to the printer.
STATUS 	When pressed, displays a code in the six-character control page field describing the operational status of the printer.
Character Keys	
Alphanumeric Keys	Provide the English alphabet in uppercase and lowercase and the digits 0 – 9. The keys are arranged like those of a standard typewriter.
Punctuation and Special Characters	Provide the punctuation marks and some special characters found on a standard typewriter. Several extra characters not common to standard typewriters are also supplied.

Nonfunctional keys

The following keys will be physically retained, but will have no function. When these keys are pressed, the microcode sounds a "beep."

HANG UP
DISP 1-2
BOB
REP ADR
SEARCH
WS MODE
SYS MODE
F1-F22
FCTN D
FCTN H
FCTN M

4. Operating Procedures

4.1. Introduction

This section describes how to operate the Type 3065 central complex. The following operating procedures are described:

- loading the system diskettes
- power on
- initialization modes
  - STEP
  - AUTO
  - MANUAL
- system stop
- power off

4.2. System Diskettes

This section describes the system diskettes and the procedure by which the system diskettes are loaded.

General

System diskettes

There are two system diskettes, SYSVOL00 and SYSVOL01. These diskettes contain the SSP software and system microcode that establish system operation. Operator data cannot be stored on the system diskettes.

The system diskette drives are connected to the SSP dedicated portion of the L-Bus.

Loading the System Diskettes

This section describes how to load the system diskettes into the system diskette drives. A few precautions when handling diskette media should be noted first:

Precautions for using diskettes

- Avoid writing on the diskette envelope, as writing pressure may damage the diskette.
- Do not bend or attach paper clips to the diskette.
- Do not clean or touch the diskette surface.
- When not in use, replace the diskette into its protective envelope. Replace the envelope if worn or bent out of shape.
- Do not expose the diskette to direct sunlight or excessive heat.
- Keep the diskette away from magnetic fields or metal objects.

Figure 4-1 shows a system diskette.

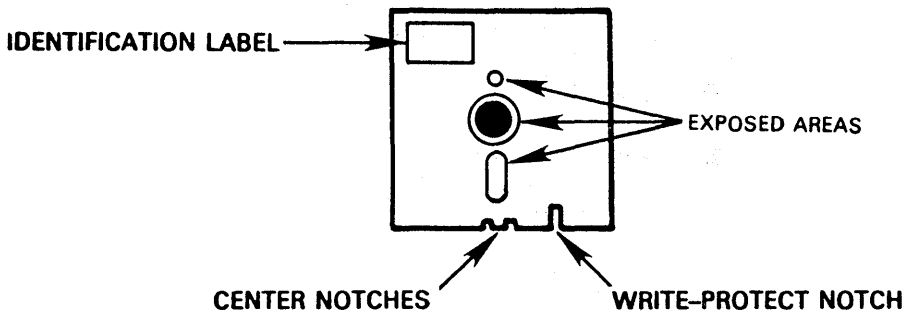


Figure 4-1. Diskette

The write-protect notch

Note that the diskette has a write-protect notch to the right of the center notches. When this notch is exposed, you can store, read, or erase data on the diskette. If it is covered with a special adhesive label, you can only read data from the diskette.

Loading the system diskette

Go through the following steps to load the diskettes on the drives:

1. Press the release latch on diskette drive 0 to open the drive door. There is a small indicator on the release latch that lights when the diskette is being read from or written to.

2. Take the diskette media supplied with the equipment and insert the diskette media designated SYSVOL01 into diskette drive 0. Make sure the edge with the notches goes in first, and the silver unite-enable tab is on the right.

3. Slide the diskette in gently, without bending it, until it is completely in the slot.

4. Close the drive door by pushing it up until it latches shut.

5. Insert the diskette media designated SYSVOL00 into diskette drive 1, in the same manner as described in Steps 3 and 4.

To unload a system diskette, press the release latch on the diskette drive. Once installed, however, the system diskettes should not be removed from their drives unless directed otherwise.

NOTE: Never unload a diskette from a drive when the indicator on the release latch is lit.

4.3. Power On

This section describes the procedures to power on the Type 3065 central complex from a completely shut-down condition. In most cases, when the operator powers on the system, AC power will already have been applied and the system diskettes mounted. Usually, therefore, the power-on procedure can be started at Step 6, in Table 4-1.

In Table 4-1, the OPERATOR column gives the actions and indications of concern to the operator. Related system events are discussed in the SYSTEM column.

Table 4-1. Power-On Procedure

OPERATOR	SYSTEM
CAUTION *Even if power has not yet been applied to the Instruction Processor (IP) do not touch any printed circuit wiring or connector pins on printed circuit boards in the central complex cabinet without first discharging yourself of static electricity on bare metal of the cabinet frame. Otherwise, damage may result to sensitive circuits in the IP.* 1. Open both doors of the central complex cabinet and set all circuit breakers on the processor circuit breaker panels to the OFF position. 2. Insert the processor key into the OFF/ON/START key switch on the system panel. Set the switch to the OFF position. 3. Plug the processor power plug into a utility power outlet provided for the processor. Note that this causes the AC AVAILABLE indicator on the processor circuit breaker panel to light. WARNING *After the processor power plug is connected to a power outlet, hazardous voltages are present at certain points in the central complex cabinet. Do not touch anything in the cabinet except specific items as directed in these instructions.* 4. Set all circuit breakers on the circuit breaker panels to the ON position. 5. Load the system diskettes. (See subsection 4.2 if this needs to be done.) 6. Turn the OFF/ON/START switch on the system panel to the ON position.	The hardware in the power control section powers up the central complex (including the console and diskette drives).

(continued)

Table 4-1. Power-On Procedure (continued)

OPERATOR	SYSTEM
7. The AUTO indicator lights to indicate that the central complex is powered up. This also indicates that the central complex is ready to be initialized in AUTO mode.	
8. If the power up of the central complex has been fault-free, the system status display on the system panel displays a D6. Wait (approximately 5–6 seconds) for the D6 display before going to the next step.	
9. Turn the OFF/ON/START key switch to the START position momentarily, then allow it to return to the ON position.	
NOTE: From this point on in AUTO mode, the initialization of the central complex and power up of the peripherals (with an SPC in the system) proceeds automatically.	
	The SSP PROM software loads the SSP boot block which, in turn, loads the SSP Supervisor.
10. A 00 value appears on the system status display when the SSP has been initialized without an error.	
	The SSP initializes and loads microcode to the system console.
NOTE: At this point (that is, once the SSP has established communication with the console) in STEP and MANUAL modes, operator entries are required to complete the initialization and power-up procedures. For the details of system initialization in STEP, AUTO, and MANUAL modes, see subsection 4.4.	
	The SSP does a configuration check of its L-Bus.
11. The date/time message is displayed.	

4.4. Initialization

This section discusses the system initialization process, starting with an overview of this process and then the STEP, AUTO, and MANUAL modes of initialization, respectively.

Overview

Initialization of the central complex covers the time from when the operator turns the key switch to START until the Initial Control and Load Program (ICLP) activity is completed. The ICLP initiates the loading of the operating system. During initialization, the SSP has control of the switchable portion of the L-Bus. Only SSP commands can be entered.

The steps in SSP initialization are summarized in Table 4–2. The initialization event is labeled in the left column; some of the specifics of that event are given in the right column. The left column also gives the operator involvement at each event.

Table 4-2. Initialization Overview

EVENT	DESCRIPTION
"Power Up Clear" A D0 is displayed on the system status display if there are no errors.	Following power on, this signal from power control causes the SSP to begin instruction execution. It also sets the switchable portion of the L-Bus to SSP control.
Initialization Setup Errors will be displayed by the system status display on the system panel. Status codes D2 through D6 are displayed if there are no errors in the PROM confidence test. Status codes D1, D7, and DB through DF are then displayed if control is passed to the SSP boot block to execute. The SSP boot block displays status codes C0 through C4 if it completes successfully. *NOTE: Some of these status codes may not be visible to the operator because they happen so quickly.* The SSP displays 00 value in the system panel to show that the SSP was loaded without error. Any nonrecoverable SSP hardware fault (system panel codes F0-FF) that occurs while the SSP software is operational results in the fault code being displayed in the System Status Display and SSP execution halting.	SSP PROM software starts execution. First, it executes the UPRDC confidence test, register, scan set, S-BUS test to SSP, L-Bus register, and RAM confidence tests. Then, it loads the SSP boot block from System Diskette Volume, SYSVOL01, and gives it control. The boot block loads the SSP software and relays control to the supervisor.
L-Bus ID Probe Errors during this process are reported on the System Status Display on the system panel.	The SSP checks the hardware identities of all units on the SSP accessible portion of the L-Bus and fills the configuration table with the addresses and IDs (Identification codes) of all correct L-Bus modules. The SSP thus determines if the console control unit is available.
L-Bus Microcode Load	The SSP loads microcode into each of the console line modules in the configuration table. If no console line module is found in the configuration table, an error condition results.
SSP initialization is aborted and an appropriate error code is displayed on the System Status Display. The SSP ceases operation awaiting an operator restart (OFF/ON/START switch to START).	
L-Bus Start-Up	The SSP sends a START command to the console line modules.

(continued)

Table 4-2. Initialization Overview (continued)

EVENT	DESCRIPTION
Device ID Probe If no device ID is found, the SSP ceases operation and the appropriate error code is displayed on the System Status Display. The operator can restart the system by turning the key switch to START.	The SSP probes for the IDs of devices attached to the console line modules.
Time and Date In STEP and MANUAL modes, the operator enters the date and time by way of an SSP solicit. In AUTO mode, the date and time entry is not necessary.	The SSP must obtain the date and time for the clock/calendar if it has not previously been set.
Configuration Table Build If the system is being initialized in MANUAL mode or if the system is running in Maintenance mode, this operation is the result of SSP commands keyed in by the operator at the SSP console. If the system is being initialized in STEP or AUTO mode, the operation is automatic. Messages are displayed to the SSP console if discrepancies are found between the SSP's configuration table and the CFIG table on disk.	The SSP builds the configuration table.
Partitioning Static partitioning (in which the operating system is not running) is done by operator entry of the SSP command /PART. When this command is executed, the major components that have not been initialized are initialized. In STEP and AUTO modes, the S-Bus units are automatically initialized.	The SSP loads microcode from the system diskette (SYSVOL00) into all S-Bus units that have been partitioned online. This is the process of bringing units into or out of the single application that is running on the system.
Operator Entries In STEP mode, the entries are made in response to system messages. In MANUAL mode, the entries are made by entry of the /OPER command.	These entries are made by the operator to set up the system for the IPL sequence. The information entered is stored on diskette for use during the IPL sequence.
System IPL In AUTO or STEP mode, the IPL sequence is automatic. In MANUAL mode, the IPL sequence is started by issuing the /IPL command.	The SSP software controls the start of the IPL operation. The SSP loads the ICLP program and writes the ICLP flags, load path information, and selected load path number into the ICLP. The SSP must enable the subchannel in the load path I/O unit (BBC, DCC, or BMC) to which the load path device is connected. Finally, the SSP signals

(continued)

Table 4-2. Initialization Overview (continued)

EVENT	DESCRIPTION
	the IP to begin execution of the ICLP in memory. Execution of the ICLP causes the Operating System to be loaded. After "IPL complete," the Operating System requests the SSP to set the L-Bus to BBC control of the switchable portion of the L-Bus.
This completes SSP initialization. The operator no longer has access to the SSP, unless a) the system is stopped, b) the system is put in Maintenance mode, c) a system fault that cannot be handled by the Operating System occurs, or d) the system is initialized with the console connected to the SSP.	

There are three modes of initialization: STEP, AUTO, and MANUAL.

STEP In STEP mode, the proceeding events are executed automatically except that the operator must issue entries to set up the system for the IPL sequence. These entries include the date and time, the ICLP flags, load path information, and auto recovery enable.

AUTO The AUTO mode of initialization will be used in most cases of system start-up. Using AUTO mode, the initialization process is executed automatically and the foregoing events (just listed) do not require operator involvement (other than turning the key switch to START). The operator, however, should be aware of the system status codes that can be issued by the SSP at various stages in the process.

MANUAL When initializing the system in MANUAL mode, the operator must execute the process by issuing a number of SSP commands (for example, /CFIG, /PART, /OPER, /IPL). This gives the operator much greater control of the initialization process. Generally, however, once the system has been installed, the AUTO and STEP modes of initialization will be used, with MANUAL mode reserved for maintenance applications executed in conjunction with an onsite customer engineer or after establishing the Sperry Support Center connection.

The STEP mode of initialization (or MANUAL mode) must be used for the installation boot of the system or when a new EXEC (Operating System) tape is being loaded. Thereafter, the AUTO mode of initialization can be used.

In all three modes of initialization, the events described in the overview of initialization take place. The difference is the amount of operator intervention.

STEP Mode

Definition STEP mode initialization requires operator intervention during the initialization process. Though, in this mode, most of the events of the

central complex initialization are done automatically by the SSP software, the operator must enter a few selected parameters. The entries that must be supplied by the operator in STEP mode — in response to system messages — are required to set up the system for the IPL sequence. These entries include the following information:

STEP mode operator entries

- time and date
- Initial Control and Load Program (ICLP) flags
- Auto Recovery enable/disable
- load path information

Once entered, this information is stored on the system diskette SYSVOL01 and is available to be used during the IPL sequence for all three modes of initialization.

In Table 4–3, the procedures and indicators the operator should be aware of to initialize the system in STEP mode are given in the left column. The right column discusses the corresponding system events.

Table 4-3. STEP Mode Procedures

OPERATOR	SYSTEM
1. Load the system diskettes as described in 4.2.	
2. Apply DC power to the system by turning the OFF/ON/START switch to ON. This switch is located on the system panel.	
	The hardware in the power control section sequentially supplies power to the power supplies of the central complex (including the console and system diskette drives).
3. The AUTO indicator on the system panel lights to indicate that the central complex is powered up.	
4. When the central complex power supplies are on (and no errors have occurred in the power-up sequence), a D6 is displayed in the system panel System Status Display. The D6 code indicates the system is ready to be initialized.	
5. Press the SELECT switch on the system panel and note that the STEP indicator lights. This indicator means that the system is ready to be initialized in STEP mode.	
6. Start the initialization process by turning the OFF/ON/START key switch to START. Release the key to allow it to return to the ON position.	
7. Errors in the power-on confidence tests are displayed in the System Status Display.	
	SSP PROM software loads the SSP boot block from the system diskette SYSVOL01 and this block loads the SSP software.
8. If SSP initialization has occurred without error, 00 on the System Status Display is cleared.	
	The SSP establishes communication with the system console (during initialization the L-Bus is switched to the SSP and the system console is an SSP console). A message at the console asks the operator to enter the date and time.
9. If the system has a clock/calendar attached to the console line module and it has not previously been set, enter the date and time. Use the following format:	

(continued)

Table 4-3. STEP Mode Procedures (continued)

OPERATOR	SYSTEM
yymmdd/hhmmss where: yy – year mm – month in two numeric digits dd – day hh – hour mm – minute ss – second	
	A message at the console asks the operator to enter whether or not initialization is to be done in STEP or MANUAL mode.
10. Enter the STEP mode.	
	The system automatically probes for the units and compares against the configuration table and initializes the S-Bus units. A rebuild of the configuration table is only done if specified by a command in the manual mode.
11. The operator is informed of any errors that occur during the initialization process by messages at the system console.	
	A solicit at the system console permits the operator to enter the load path information.
12. Define the load path. Enter the following: Load path number Channel type Channel number Subchannel number Device For example: LP0/BBC/0/11/T	

(continued)

Table 4-3. STEP Mode Procedures (continued)

OPERATOR	SYSTEM
	A solicit at the system console permits the operator to enter the ICLP flags.
13. Enter the ICLP flags.	
	A solicit at the system console permits the operator to enable or disable Auto Recovery.
14. Key in the entry required to enable or disable Auto Recovery.	
15. Terminate the operator entries by entering a T.	
	The information that has been entered is stored on the system diskette SYSVOL01 and will be retrieved later for use during the IPL sequence.
	The system automatically executes the IPL sequence, using the information just stored on diskette. Load path 0 is automatically selected in STEP mode.
16. If an error occurs during IPL, the System Status Display gives the applicable error code.	

NOTE: If an error occurs that is fatal to the initialization sequence, the following general recovery occurs for STEP mode initialization: the operator is informed of the error, the initialization sequence halts, and initialization reverts to MANUAL mode at the point of console communications being established.

AUTO Mode

Definition

AUTO mode initialization provides an automatic initialization procedure that can be used in most cases to initialize the system. This mode enables the operator to initialize and load the system with a single step; the SSP accomplishes the initialization functions automatically. AUTO mode initialization can be used at any time, except when an installation boot is being done or when a new EXEC tape is being loaded.

In Table 4-4, the procedures and indications the operator should be aware of to initialize the system in AUTO mode are given in the left column. The right column discusses the corresponding system events.

Table 4-4. AUTO Mode Procedures

OPERATOR	SYSTEM
1. Load the system diskettes as described earlier in this section.	
2. Apply DC power to the system by turning the OFF/ON/START switch to ON.	
	The hardware in the power control section sequentially applies power to the power supplies of the central complex (including the console and system diskette drives).
3. The AUTO indicator on the system panel lights to indicate that the central complex is powered up. This indicator also means that the system is ready to be initialized in AUTO mode.	
4. When the central complex power supplies are on (and no errors have occurred in the power on sequence) a D6 is displayed in the System Status Display. The D6 indicates the system is ready to be initialized.	
5. Start the initialization process by turning the OFF/ON/START key switch to START. Release the key to allow it to return to the ON position.	
	From here on, the SSP software executes the initialization procedure automatically.
	The SSP PROM executes power-on confidence tests on the S-Bus interface.
6. Errors in the power-on confidence tests are displayed in the System Status Display.	
	SSP PROM software loads the SSP boot block from the system diskette SYSVOL01 and this block loads the SSP software.
7. If the SSP initialization has occurred without error, the 00 on the System Status Display is cleared.	
	The SSP establishes communication with the system console (during initialization the L-Bus is switched to the SSP and the system console is an SSP console).
	The system automatically probes against the configuration table and initializes the S-Bus units.

(continued)

Table 4-4. AUTO Mode Procedures (continued)

OPERATOR	SYSTEM
8. The operator is informed of any errors that occur during the initialization process by messages at the system console.	
	The system automatically executes the IPL sequence using the IPL information (that is, load path, ICLP flags, and so forth) stored on the system diskette SYSVOL01. The load path selected on the previous initialization is used.
9. If an error occurs during IPL, the System Status Display gives the applicable error code.	

NOTE: If an error occurs that is fatal to the initialization sequence, the following general recovery occurs for AUTO mode initialization: the error is displayed on the system console, and initialization reverts to MANUAL mode at the point of console communications being established.

MANUAL Mode

Definition

MANUAL mode initialization requires operator intervention throughout the initialization process. This mode is used when the system is being initialized for maintenance operations or when the operator wants total control of the initialization process. The operator, for example, might want to control the initialization of the system for the following reasons:

Reasons for using MANUAL mode initialization

- to update or display the configuration table;
- to partition major components or SSP CRTs into or out of the application;
- to select a load path other than the one automatically used in AUTO or STEP mode;
- to initialize major components manually;
- to define the load paths and other IPL information during an installation boot;
- to select Maintenance mode;
- to manually perform an IPL when Auto Recovery fails.

All SSP console keyins are allowed during MANUAL mode initialization.

In Table 4-5, the procedures and indicators the operator should be aware of to initialize the system manually are given in the left column. The right column discusses the corresponding system events.

Table 4-5. MANUAL Mode Procedures

OPERATOR	SYSTEM
1. Load the system diskette as described earlier in this section.	
2. Apply DC power to the system by turning the OFF/ON/START key switch to ON.	
	The hardware in the power control section sequentially applies power to the power supplies of the central complex (including the console and system diskette drives).
3. The AUTO indicator on the system panel lights to indicate that the central complex is powered up.	
4. When the central complex power supplies are on (and no errors have occurred in the power–on sequence), a D6 is displayed in the System Status Display. The D6 indicates that the system is ready to be initialized.	
5. Press the SELECT switch on the system panel and note that the STEP indicator lights. This indicator means that the system is ready to be initialized in STEP (or MANUAL) mode.	
6. Start the initialization process by turning the OFF/ON/START key switch to START. Release the key to allow it to return to the ON position.	
	The SSP PROM executes power–on confidence tests on the units of the S–Bus interface.
7. Errors in the power–on confidence tests are displayed in the System Status Display.	
	SSP PROM software loads the SSP boot block from the system diskette SYSVOL01 and this block loads the SSP software.
8. If the SSP initialization has occurred without error, the 00 on the System Status Display is cleared.	
	The SSP establishes communication with the operator console.
	A message at the console asks the operator to enter the date and time.

(continued)

Table 4-5. MANUAL Mode Procedures (continued)

OPERATOR	SYSTEM
9. If the system has a clock calendar attached to the console line module and it has not previously been set, enter the date and time. Use the following format: yymmdd/hhmmss where: yy – year mm – month in two numeric digits dd – day hh – hour mm – minute ss – second	
	A message at the console asks the operator to enter whether initialization is to be done in STEP or MANUAL mode.
10. Enter MANUAL mode.	
11. From this point on, the operator is in control of the initialization process and initializes the system by entering the appropriate SSP commands.	

Table 4-6 lists the SSP commands used to initialize the system.

Table 4-6. SSP Commands to Initialize the System

COMMAND	FUNCTION
/CFIG	Updates or displays the configuration information in the CFIG table on the system diskette SYSVOL01. This information includes, for each major component: name, revision level, type, and location on the S-Bus.
/PART	Partitions major components and SSP CRTs into or out of the application (static partitioning). Also puts the system in Maintenance or System mode. The major components partitioned into the application are automatically (only in System mode) initialized when this command terminates. It must be specifically indicated if these units are to be initialized in Maintenance mode.
/INIT	Initializes major components.
/OPER	Defines the load paths by which the IPL of the operating system is to be done. Sets the IPL ICLP flags. Enables or disables Auto Recovery. This information is stored on the system diskette SYSVOL01 for use during the IPL sequence.
/IPL	Performs an IPL of the operating system by the load path specified in the command.
/DOWN	Brings down a system console and stops the polling of that console.
/UP	Initializes a system console.

These SSP keyins are only allowed if the system is either being initialized in MANUAL mode or running in Maintenance mode. If the system is running in System mode, the SSP keyins are not allowed.

NOTE: If an error occurs that is fatal to the initialization sequence, the following general recovery occurs for MANUAL mode initialization: the operator is informed of the error, and using manual SSP commands, the operator must input the information necessary to fix the error or try some sort of maintenance.

4.5. System Stop

This section describes the procedures used by the operator to stop the system, that is, cause instruction execution to halt without powering the system down. Following a system stop, the operator must reboot the operating system.

NOTE: A system stop causes corruption of the data currently being generated by the system.

System stop

The events in bringing the system to a stop are as follows:

OPERATOR	SYSTEM
1. Turn the OFF/ON/START key switch to the START position.	The SSP software issues an orderly halt to the IPs. The SSP software takes control of the switchable portion of the L-Bus. The SSP software puts the system in maintenance mode.

NOTES: 1. A system stop automatically takes place when a critical fault occurs.

2. A system stop also occurs when the SSP software detects an S-Bus message generated by a Halt Jump instruction being executed in a specific IP.

4.6. Power Off

This section describes the system power-off procedures. Power off of the central complex can be initiated in the following ways:

Methods to power off

- by turning the system panel key to OFF
- as a result of a critical environmental voltage or temperature fault

Key switch power off

When the operator turns the key switch to OFF, the central complex is powered down as follows:

OPERATOR	SYSTEM
1. Turn the OFF/ON/START switch to the OFF position.	Power is removed in a noncontrolled fashion from the central complex. When the central complex powers down, the SPC also drops power, causing all devices connected to the SPC that have the LOCAL/REMOTE switch set to REMOTE to drop power.

System-critical fault power off

When a system-critical fault occurs (see subsection 4.8), the central complex is powered down as follows:

OPERATOR	SYSTEM
	One of the central complex sensors detects a system-critical fault (a critical voltage or temperature condition). The power control hardware powers down the central complex.
1. The power control alarm sounds.	
	When the central complex powers down, the SPC also drops power, causing all devices connected to the SPC that have the LOCAL/REMOTE switch set to REMOTE to drop power.
2. Look on the power control and indicator panel behind the front door of the central complex cabinet (to the left of the system panel) to see the kind of fault that occurred and its location.	

4.7. Auto Recovery

Auto Recovery (AR) refers to the ability of the system to automatically execute a re-IPL. Re-IPL of both the Operating System and the SSP software is provided. There are two ways in which an Auto Recovery can be initiated:

Initiation of Auto Recovery

- Loss of a software signal between the Operating System and the SSP software.
- Execution of an Initiate Auto Recovery (IAR) instruction.

Auto Recovery, as a result of the execution of a software signal between the SSP software and the Operating System, occurs when either entity detects the loss of the software signal. This triggers the SSP software or the Operating System to re-IPL its counterpart.

The software signal is enabled during initialization in the following ways:

Enabling the Auto Recovery software signal

- STEP mode - by selecting Auto Recovery
- MANUAL mode - by selecting Auto Recovery during parameterization of the /OPER command.
- AUTO mode - Auto Recovery is automatically enabled if previously enabled on the step or manual boot.

Auto Recovery by execution of an IAR instruction

Auto Recovery of the Operating System occurs when an Initiate Auto Recovery (IAR) instruction is executed by the Operating System. Execution of this instruction causes the SSP to initiate a load of the Initial Control and Load Program to the load path defined MSU. Thereafter, the re-IPL sequence is the same as the initial IPL of the Operating System.

If four attempts at Auto Recovery by way of the IAR instruction fail, the SSP puts a message on the console.

4.8. Critical and Noncritical Faults

The central complex monitors and responds to two categories of system faults: critical faults and noncritical faults. Critical faults include the following:

Critical system faults

- over temperature
- over voltage
- under voltage
- DC faults
- air flow
- special interface

When a critical fault occurs, the system powers down automatically and the power control alarm sounds. The operator should open the panel doors at the front of the central complex cabinet and look at the power control and indicator panel (to the left of the system panel) to determine the cause of the fault.

Noncritical faults include the following:

Noncritical system faults

- high temperture
- air flow
- special interface

When a noncritical fault occurs, the power control alarm sounds and a message displays on the system console.

Special interfaces

Two external interfaces are provided on the power control section of the central complex cabinet. The user may connect a contact closure and sensors to these interfaces to detect external conditions, for example, smoke or earthquakes. These special interface faults may be defined by the user to be critical or noncritical faults.

NOTE: To turn off the alarm, press the ALARM RESET button on the system panel.

4.9. System and Maintenance Modes

The system has two modes of operation, System mode and Maintenance mode. The entire system must be running in one mode or the other. System mode is characterized by the following points:

Characteristics of System mode

- It is the normal operating mode of the system
- The Operating System is running
- Most SSP commands and all maintenance programs are not allowed
- The BBC has control of the switchable portion of the L–Bus
- When the application is initialized in AUTO or STEP mode, the application defaults to System mode.

Maintenance mode is characterized by the following points:

Characteristics of Maintenance mode

- It is used to perform maintenance procedures, diagnostic tests, and software debugging techniques
- Access to all units in the application is fully open to external operations. All SSP "/" commands are allowed
- The SSP has control of the switchable portion of the L–Bus (and thus of the system console)
- To select Maintenance mode, initialize the system in MANUAL mode, and enter the /PART command and the M option
- To do maintenance on a unit, if the Operating System is running, the system must be stopped and restarted in Maintenance mode.

4.10. Partitioning

Definition

Partitioning is the process of bringing components into or taking them out of an application. An application consists of one or more major components that have been assigned a specific function. The system supports only one application at a time.

Partitioning of the system can be done in two ways: statically and dynamically.

Static partitioning

Static partitioning is the process of assigning major components to an application before the application is running (that is, before the operating system has been loaded). It is initiated by entry of the SSP /PART command, and it can only be executed during the initialization sequence (in MANUAL mode).

Dynamic partitioning

Dynamic partitioning is the process of assigning major components to an application while the application is running. It is initiated by commands to the Operating System. The system also has the capability to automatically partition components dynamically out of an application when system faults occur. This capability enables the application to continue to run when one of the components of the application fails.

Two types of partitioning can be done on the system:

- SSP CRT partitioning (static partitioning only)

- Major component partitioning

SSP CRT Partitioning

Definition

SSP CRT partitioning enables the operator to select a CRT to be assigned to an application. On the system, an application can have only one CRT assigned to it.

NOTE: CRT 3 is for the modem connections to the Sperry Support Center.

When running in Maintenance mode or initializing the system (in MANUAL mode), the operator can display the SSP CRT partitioning information by entering the /PART command, as follows:

```
/PART, C 0,S
```

/PART command for SSP CRT partitioning

where:

C - indicates display the SSP CRT partitioning information

0 - number of the application

S - System mode (or M for Maintenance mode)

The SSP CRT display is shown in Figure 4-2.

```
          SSP CRT          CRT      SSP CRT ASSIGNED TO
            IDS          STATUS       APPLICATION 0

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

          SSP*CRT0          UP              -
         →SSP*CRT1          UP              *
          SSP*CRT2         DOWN             -
          SSP*CRT3         DOWN             -
▶/PART ,CMO 0,S
▶ENTER DIRECTIVE▶TER■
```

Figure 4-2. SSP CRT Display

CRT statuses as indicated in the display can be as follows:

UP - Powered up and available for use

DOWN - Not powered up or not configured

CON - In use as a console. You cannot take this CRT offline until it is no longer a console.

DM – Dual Master. This CRT is the source of SSP CRT control.

DS – Dual Slave. This CRT is the display console for the input and output of a Dual Master.

To statically partition the SSP CRTs, the operator uses the /PART command, as follows:

```
/PART C 0,S
```

Following display of the SSP CRT information, the system prompts the operator with:

```
▶ENTER DIRECTIVE ▶
```

The operator partitions the SSP CRT by selecting directives from the following list:

SSP CRT partitioning directives

ON (CRT)

places the SSP CRT online.

OFF (CRT)

places the SSP CRT offline.

CANCEL

ignores the directives entered so far and terminates the partitioning session.

REVERT

cancels the directives entered so far.

TER

terminates directives for SSP CRTs.

where CRT is the mnemonic of an SSP CRT.

Major Component Partitioning

Definition

Major component partitioning enables the operator to select which major components are to be assigned to an application. The major components that can be partitioned are:

Major components

- Instruction Processors (IP)
- Byte Multiplexer Channels (BMC)
- Disk Controller/Channels (DCC)
- Byte Bus Channels (BBC)

- Main Storage Units (MSU)

When running in Maintenance mode or initializing the system (in MANUAL mode), the operator can display the major component partitioning information by entering the /PART command, as follows:

/PART command for major components partitioning

```
/PART M 0,S
```

where:

M – indicates display major component partitioning information

0 – number of the application

S – System mode (or M for Maintenance mode)

The major component display is shown in Figure 4-3.

```
MAJOR COMPONENT PARTITIONING FOR SSP 0 / APPLICATION 0 SYSTEM MODE

        IP          DCC          BBC        BMC          MSU
        0           0 1 2 3      0  1       0          0 1 2

OFFLINE -           - - R N      -  R       -          - - R
APP  0  A           A I - -      A  -       I          A A -

▶ /PART ,CMO 0,S
▶ENTER DIRECTIVE▶TER
■
```

Figure 4-3. Major Component Display

Major component statuses as indicated in the display can be as follows:

N – offline–not–ready (not initialized)

R – offline–ready (initialized)

A – online–active (started up)

I – online–inactive (halted due to error)

To statically partition the major components, the operator uses the /PART command, as follows:

```
/PART M 0,S
```

Following display of the major component information, the system prompts the operator with:

▶ENTER DIRECTIVE▶

The operator partitions the major components by entering the following directives:

Major component partitioning directives

ON (component)

changes the component from OFFLINE to ONLINE-ACTIVE. Also, in System mode, initializes the component.

OFF (component)

changes the component from ONLINE to OFFLINE-READY in System mode or to OFFLINE-NOT-READY in Maintenance mode.

CANCEL

ignores the directives entered so far and terminates the partitioning session.

REVERT

cancels the directives entered so far.

TER

terminates directives for the major components and proceeds with the required unit initialization.

Major component partitioning in dynamic mode is done through the Operating System by way of operator entry of partitioning commands. In addition, major components are automatically partitioned dynamically when a fault occurs in one of the S-Bus units.

4.11. SSP Console Mode

Definition

When functioning as an SSP console, the switchable portion of the L-Bus — to which the console line module is connected — is switched to the SSP. When functioning as a system console, the switchable portion of the L-Bus is switched to the BBC (which is attached to the S-Bus and thus is accessible by the Operating System). Normally, in System mode, to allow operator interaction with the Operating System, the switchable portion of the L-Bus is switchable to the BBC. However, in the event of the inability of the operator to interact with the Operating System normally, the system provides the capability of the system console, functioning as an SSP console, to relay messages between the operator and the Operating System. In other words, all data passed between the operator and the Operating System is passed by way of the SSP software.

SSP console mode can be entered in two ways:

Ways of entering SSP console mode

- by an operator keyin to the Operating System

- automatically when a fault occurs causing the Operating System to lose access to the console line module

Messages and commands are passed between the Operating System and the SSP by the Executive Link.

4.12. Sperry Support Center Connection

System sites equipped with a modem/telephone allow you to interface to the Sperry Support Center for hardware or software problem assistance. The modem/telephone interface enables verbal assistance to be provided and a data connection to be established with the system. This way the Sperry Support Center serves as an information, problem analysis, and problem logging facility. Figure 4–3 shows this Sperry Support Center voice/data hookup.

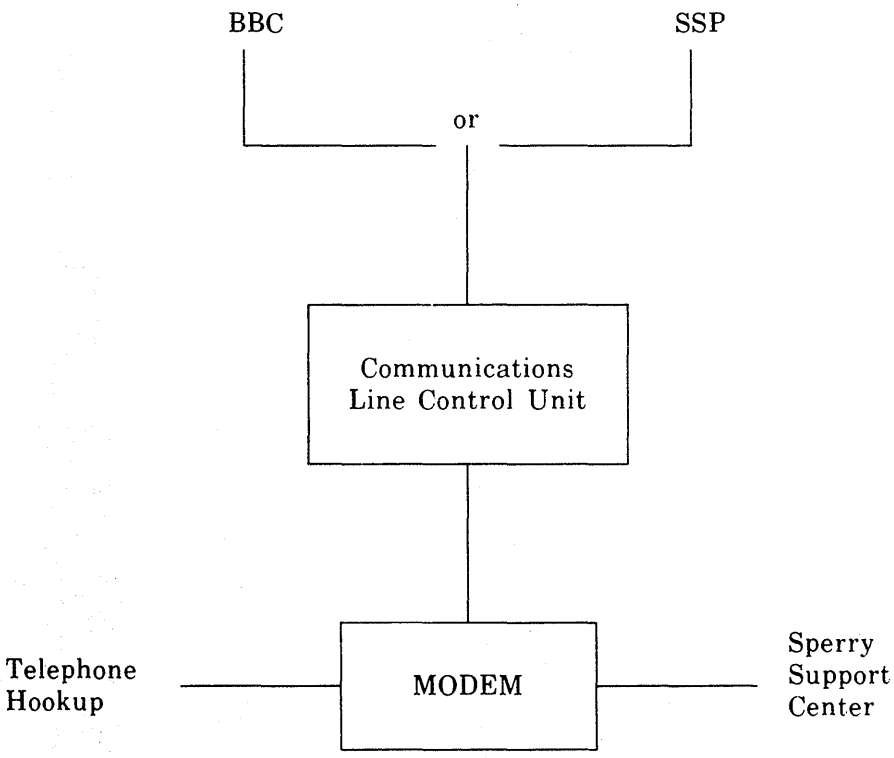


Figure 4–4. Sperry Support Center Voice/Data Hookup

The steps in contacting and establishing a data connection with the Sperry Support Center are as follows:

1. Switch the VOICE/DATA modem switch to VOICE, and use the modem/telephone interface to call the Sperry Support Center.

2. Provide the technical receptionist with the customer site number. This number will be verified and the call passed to a technical analyst. If a technical analyst is not available, the caller should supply the following information for a return call:

   - caller's name and telephone number
   - type of problem: hardware, 1100 software, user software

3. The technical analyst will discuss the problem with the caller. If a data connection is required, the analyst will request the caller to manually switch the modem/telephone from voice to data mode.

4. The caller must key in an SSP console directive to enable the remote data connection. This is done as follows:

   a. Enter the /PART command and partition CRT 3 to the maintenance application to be run (CRT 3 is the modem interface):

      /PART, C appl #, M

      The system returns:

      ▶ENTER DIRECTIVE ▶

   b. To which the operator responds:

      ON appl # CRT 3

   Which assigns control to the SSP modem interface.

5. Data messages can now be sent between the site and the Sperry Support Center.

6. Onsite personnel can activate dual-mode (Master/Slave) console operation. In dual mode, either the site or the Sperry Support Center can be the Master console (the console that interacts with the system) and the opposite end will be the Slave console (the console that merely monitors operator/system interaction). The onsite personnel, by console keyin, can stop dual-mode operation and assume console operation control at any time.

7. If a return to voice mode is requested, the telephone data set exclusion must be returned to normal (voice) mode.

8. Replacing the telephone hand set in its cradle terminates the Sperry Support Center connection.

Sperry Support Center connection to the Operating System and the SSP

The system allows a Sperry Support Center hookup either when the Operating System is up (executing) or down. Any Sperry Support Center hookup, while the Operating System is executing, is related to host system software control. In this case, the Sperry Support Center, by way of

switchable portion of the L-Bus, has been switched to the system interface (the BBC).

Any Sperry Support Center hookup, while the Operating System is down, is related to SSP software execution. In this case, the Sperry Support Center, by way of the switchable portion of the L-Bus, has been switched to the SSP interface. In both cases, switching to data mode on the modem and keying in the console directive, as described in Steps 3 and 4, must be done by the onsite operator.

5. Operator-Performed Maintenance

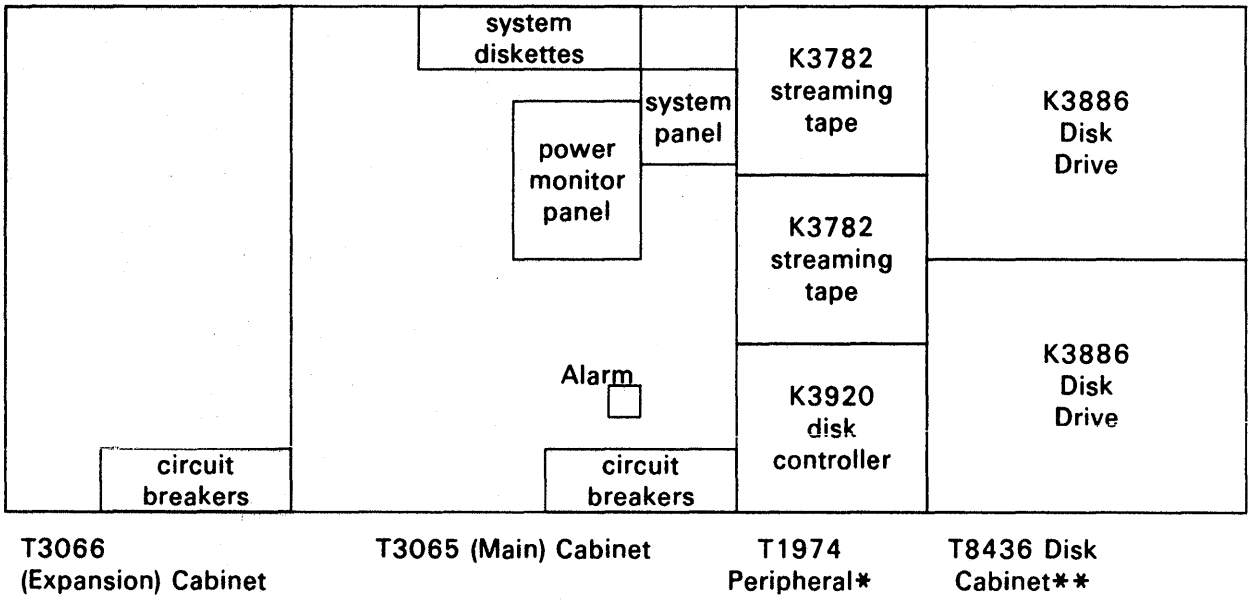
5.1. Air Filter Replacement

Replacement frequency

All units of the Type 3065 central complex are air cooled. The cooling air passes over filters that prevent dust from reaching the system circuitry. These air filters must be replaced or cleaned to prevent overheating and premature component failure from lack of air flow. The air filters should be replaced or cleaned once each month if the unit is in continuous operation, or proportionally less often if operation is not continuous.

To clean the filters, wash them in warm water and dry completely. Replacement air filters must be obtained from the local Sperry customer engineer.

Figure 5-1 identifies the cabinets and components of the Type 3065 central complex.



* *In the standard configuration, the T1974 cabinet contains two cipher tape drives and the K3920 Disk Controller. If the system has a Subsystem Power Controller (SPC), the system will have a second T1974 cabinet for that component.*

** *The system could have more than one T8436 cabinet to accommodate more than two disk drives.*

Figure 5-1. T3065 Central Complex

The following gives the location of the air filters and tells how to remove them.

CAUTION

Before removing any of the filters, be sure to turn off AC power to the central complex.

- T3065 Cabinet

  The air filter is located behind the front door and at the bottom of the cabinet. Remove the filter by pulling it toward you, using the plastic tab on the front edge of the filter.

- T3066 Cabinet

  The air filter is located behind the front door and at the bottom of the cabinet. Remove the filter by pulling it toward you, using the plastic tab on the front edge of the filter.

- K3920 Disk Controller

  The air filter is located behind the front panel of the disk controller. First remove the front panel by pulling it toward you. Next, lift the filter out at the bottom and slide it down.

- K3886 Disk Drives

  An air filter is located behind the front panel of each disk drive. First, remove the front panel by pulling it toward you. Next, remove the filter by pushing it up, compressing the foam rubber at the top, and pulling it out at the bottom.

- Subsystem Power Controller (SPC)

  The air filter is located behind the front panel of the SPC. First remove the front panel by pulling it toward you. Next, remove the filter by pulling it up.

5.2. Diskette Drive and Tape Drive Cleaning

The read/write heads of the system diskette drives and streaming tape drives should be cleaned once every two months or as needed (that is, when data errors occur). To clean the system diskette read/write heads, go through the following steps:

Steps for cleaning

1. Obtain a cleaning diskette and apply alcohol to the cleaning surface.
2. Insert the cleaning diskette into the drive.
3. Allow the drive to run a few minutes, then remove the cleaning diskette.
4 Repeat this procedure two to three times for each diskette drive.

To clean the streaming tape drive read/write heads, see the *3782 Streaming Tape Drive Operator Reference*, UP-9381.

Cleaning kits may be obtained from the local Sperry customer engineer.

5.3. Console Printer Paper Loading and Ribbon Changing

For information on printer paper loading and ribbon changing, see the *Model 25 Printer Installation Guide and Operation Guide,* UP-9584.

Glossary

A

application
: A group of major components which have been assigned a specific processing function.

auto initialization
: A mode of initialization that allows the system to be initialized and loaded without operator intervention. This is the normal means of system initialization and gives the system a one-button start.

auto recovery
: Re-IPL of the operating system or SSP software, activated by loss of the software signal or, in the case of the operating system, by a software command.

C

configuration table
: A table stored on system diskette SYSVOL01 that contains the SSP accessible L-Bus line module information and the mainframe S-Bus unit information.

D

dynamic partitioning
: The process of bringing major components into or out of an application while the application is running.

I

Initial Control and Load Program (ICLP)
: This is a 2,048-word 1100 macrocode program that controls the IPL sequence. The program resides on system diskette SYSVOL00 and is loaded into storage as part of the initialization sequence.

initialization
The setting of various values in local stores, registers and flip-flops, or the loading of control stores for all S-Bus units and some L-Bus modules. Initialization covers the time span from operator start up (key switch to START) until the ICLP program activity is completed.

initialized unit
A unit whose local stores, control stores, and so forth are initialized and whose S-Bus interface is enabled.

Initial Program Load (IPL)
Loading of the operating system or SSP software.

M

Maintenance mode
The operating mode of the system in which access to all units in the application is fully open to external operations. All SSP "/" commands can be entered.

manual initialization
A mode of initialization that enables the operator to manually execute the initialization sequence by entering SSP commands.

O

offline (IP, MSU, IOP channel)
The state of a unit that may or may not be initialized, but is disabled from all other units in the application.

offline-not-ready
The state of a unit that is not initialized and is disabled from the S-Bus.

offline-ready
The state of a unit that is initialized, but is disabled from the S-Bus.

online (IP, MSU, IOP channel)
The state of a unit that is assigned to an application and enabled to all other units in the application.

online-active
The state of a unit that is assigned to an application and is enabled to the other online-active units.

online-inactive
The state of a unit that is initialized and enabled on the S-Bus, but that has been halted due to the occurrence of an SSP-reportable error. The unit can either be activated by restarting the unit and placing it back into online-active, or dropped to offline-not-ready, disabling it from the S-Bus.

orderly halt
An SSP-controlled clear issued to a selected S-Bus unit using normal S-Bus protocol. Its usage allows an orderly halt of activity in the selected unit.

P

partitioning

The process by which major components or SSP CRTs are brought into or taken out of an application.

power on clear
This signal is issued when the power control unit senses DC power up. It clears all internal SSP entities, stops the system clock, and causes initialization of the PROM-controlled SSP self-confidence test.

R

remote console
The console station connected to the communications line module by way of a communications line.

S

static partitioning
The process of bringing components into or out of an application before the application is running.

step initialization
A mode of initialization that enables the operator to initialize the system without intervention, except for entering information necessary for IPL and the time and date.

system mode
The normal operating mode of the system.

T

transplantation
On multiprocessor systems, the ability to capture the operating environment from a failing IP and re-execute it on a good IP.

Index

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This User Comment Sheet will not normally lead to a reply to the originator. Requests for copies of manuals, lists of manuals, pricing information, etc. must be made through your Series 1100 site manager, to your Sperry Univac representative, or to the Sperry Univac office serving your locality. Software problems should be submitted on a Software User Report (SUR) form UD1–745. Questions of a technical nature regarding either the manual or the software should be submitted on a Technical Question (question/answer) form UD1–1195. These forms are available through your Sperry Univac representative.

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