

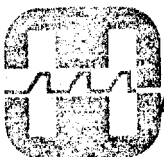
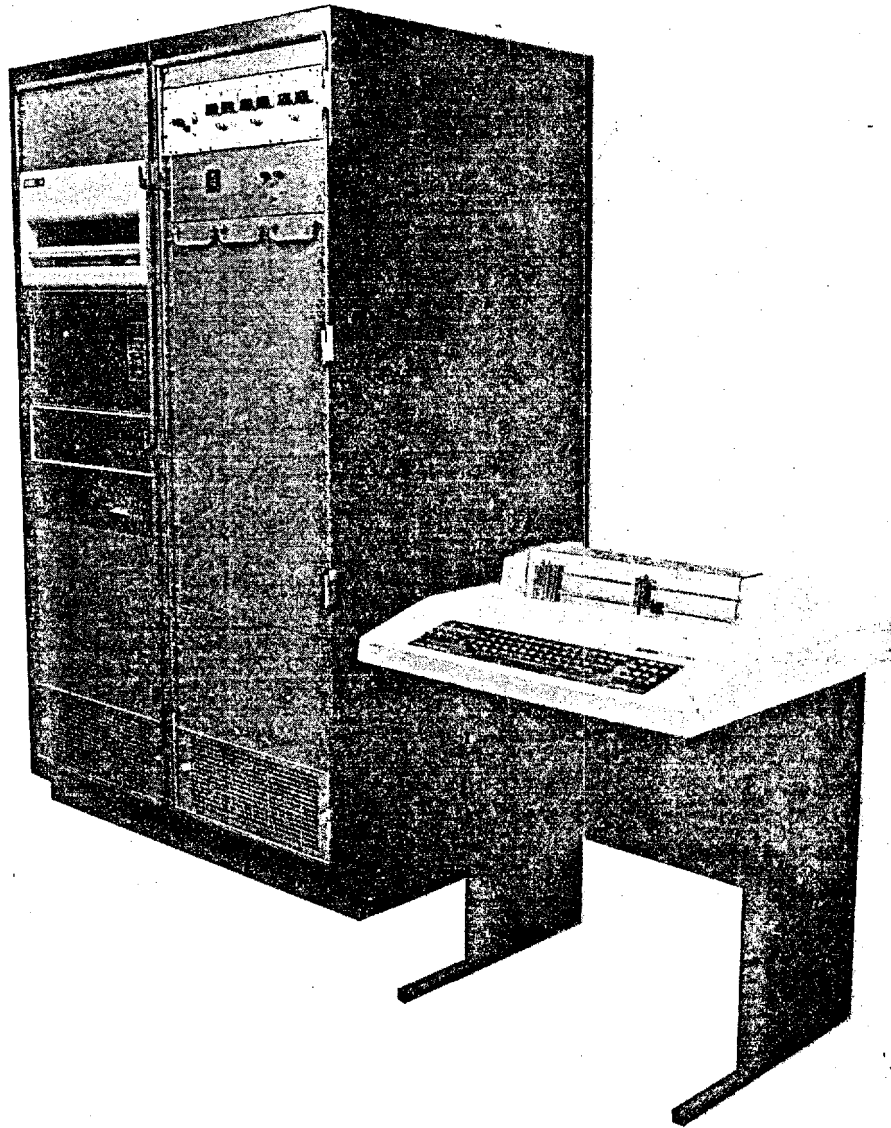
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ITS-W

WASHINGTON AREA IMAGE TRANSMISSION SYSTEM

CENTRAL SITE

OPERATORS MANUAL



HARRIS

HARRIS CORPORATION Electronic Systems Division

Approved For Release 2000/08/04 : CIA-RDP80B00829A000800020001-8

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ITS-W

WASHINGTON AREA IMAGE TRANSMISSION SYSTEM

CENTRAL SITE
OPERATOR'S MANUAL

JANUARY 1977/78

HARRIS ELECTRONIC SYSTEMS DIVISION
MELBOURNE, FLORIDA

CAUTIONARY NOTICE

While the Manufacturer has attempted to detail in this manual all areas of possible danger to personnel in connection with the use of this equipment, personnel should use caution when installing, checking out, operating and servicing this equipment, especially when power is on. Like all electronic equipment, care should be taken to avoid electrical shock in all circuits where substantial currents or voltages may be present, either through design or short circuit. Caution should be observed also in lifting and hoisting equipment especially regarding large structures during installation.

The Manufacturer is specifically not liable for any damage or injury arising out of a worker's failure to follow the instructions contained in this manual, or his failure to exercise due care and caution in the installation, operation, checkout and service of this equipment.

TABLE OF CONTENTS

<u>Paragraph</u>	<u>Title</u>	<u>Page</u>
Section I. GENERAL INFORMATION		
1-1	Scope.....	1-1
1-2	ITS-W Network.....	1-1
1-3	CSS Purpose and Use.....	1-1
1-4	Physical Description.....	1-5
1-5	Functional Operation.....	1-13
1-6	Capabilities and Limitations.....	1-16
Section II. THEORY OF OPERATION		
2-1	General.....	2-1
2-2	Remote Terminal Subsystem Functions.....	2-1
2-3	Central Site Subsystem Operational Configuration.....	2-3
2-4	RTS/CSS/RTS Information Exchange.....	2-6
2-5	CSS Switch Full Duplex Connection Service.....	2-11
2-6	CSS Switch Broadcast Connection Service.....	2-15
2-7	Programmable Functions.....	2-19
Section III. OPERATION		
3-1	General.....	3-1
3-2	Controls and Indicators.....	3-1
3-3	Operator Messages.....	3-3
3-4	Operator General Instructions for Normal System Operation.....	3-22
3-5	System Power Startup Procedure.....	3-23
3-6	System Initialization and Run Operation Procedure.....	3-25
3-7	Operator General Instructions for Modifying the System Static Data Base.....	3-26
3-8	Static Data Base Modification Procedures.....	3-29
3-9	Diskette Copying.....	3-46
Section IV. MAINTENANCE		
4-1	General.....	4-1
4-2	Checks and Services.....	4-1
4-3	Cleaning.....	4-1
4-4	Fault Isolation and Corrective Action.....	4-2

LIST OF ILLUSTRATIONS

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1-1	Image Transmission System Central Site Subsystem.....	1-2
1-2	Image Transmission System Block Diagram.....	1-3
1-3	Central Site Subsystem Configuration.....	1-4
1-4	Central Site Subsystem Equipment Designation and Cable Configuration.....	1-6
1-5	LA36 Data Terminal.....	1-8
1-6	Central Site Subsystem Switch (Unit 2).....	1-9
1-7	Timing Distribution Unit (4A2).....	1-12
1-8	COMSEC Interface Conditioning Unit.....	1-14
1-9	CSS Switch Modes of Operation.....	1-17
2-1	Remote Terminal Subsystem Block Diagram.....	2-2
2-2	Central Site Subsystem Functional Block Diagram.....	2-4
2-3	Data Exchange Format.....	2-7
2-4	Duplex Connection Service Flow Diagram (2 Sheets).....	2-12
2-5	Connection Service Check Flow Diagram.....	2-14
2-6	Broadcast Sequence Flow Diagram (3 Sheets).....	2-16
3-1	LA36 Keyboard Printer/Loader Controls and Indicators (Unit 1).....	3-2
3-2	Paper Tape Reader/Punch (PC-11) Controls and Indicators (A2).....	3-4
3-3	Computer (PDP 11/04) Front Panel Controls and Indicators (A3).....	3-7
3-4	Power Supply Controls and Indicators (A4).....	3-9
3-5	System Control Unit Controls and Indicators (A5).....	3-11
3-6	Timing Distribution Unit Controls and Indicators (4A2).....	3-13
3-7	COMSEC Interface Conditioning Unit Controls and Indicators.....	3-15
3-8	Flow Chart, Operator Sequence of Data Base Modification.....	3-32
4-1	Data Terminal Fuse Locations and Types.....	4-5

LIST OF TABLES

Figure	Title	Page
1-1	Central Site Subsystem Characteristics.....	1-18
3-1	Paper Tape Reader/Punch (PC-11) Controls and Indicators (A2).....	3-3
3-2	Computer (PDP 11/04) Front Panel Controls and Indicators.....	3-5
3-3	Power Supply Controls and Indicators (A4).....	3-8
3-4	System Control Unit Controls and Indicators (A5).....	3-10
3-5	Timing Distribution Unit Controls and Indicators (4A2).....	3-12
3-6	COMSEC Interface Conditioning Unit Controls and Indicators.....	3-14
3-7	CSS Operator Messages.....	3-16
4-1	Operator Checks and Services.....	4-2
4-2	Operator Fault Isolation.....	4-3

INTRODUCTION

This operator's manual contains a physical, functional and operational description of the Washington Area Image Transmission Central Site Subsystem. The subsystem hardware and software configuration described in this manual was designed and manufactured by Harris Electronic Systems Division, Melbourne, Florida.

- a. This operator's manual includes sections describing the purpose, use, function, operation and operator maintenance of the Central Site Subsystem.
- b. Section I describes the configuration, functional operation and characteristics of the equipment.
- c. Section II describes the system theory of operation.
- d. Section III describes each operator control and indicator and provides step by step procedures for equipment turn-on and normal operation.
- e. Section IV includes preventative maintenance and fault isolation procedures pertinent to operator maintenance.

Section I. GENERAL INFORMATION

1-1. Scope.

This manual describes the Central Site Subsystem (CSS) equipment which is part of the Washington Area Image Transmission System (ITS-W). The CSS (figure 1-1) is located at a central site that includes user furnished communication (COMSEC) security and link equipment. This manual is directed to personnel who will operate and monitor the CSS equipment. To familiarize the operator with the various modes of operation and operating procedures described in this manual, the overall ITS-W network is described briefly.

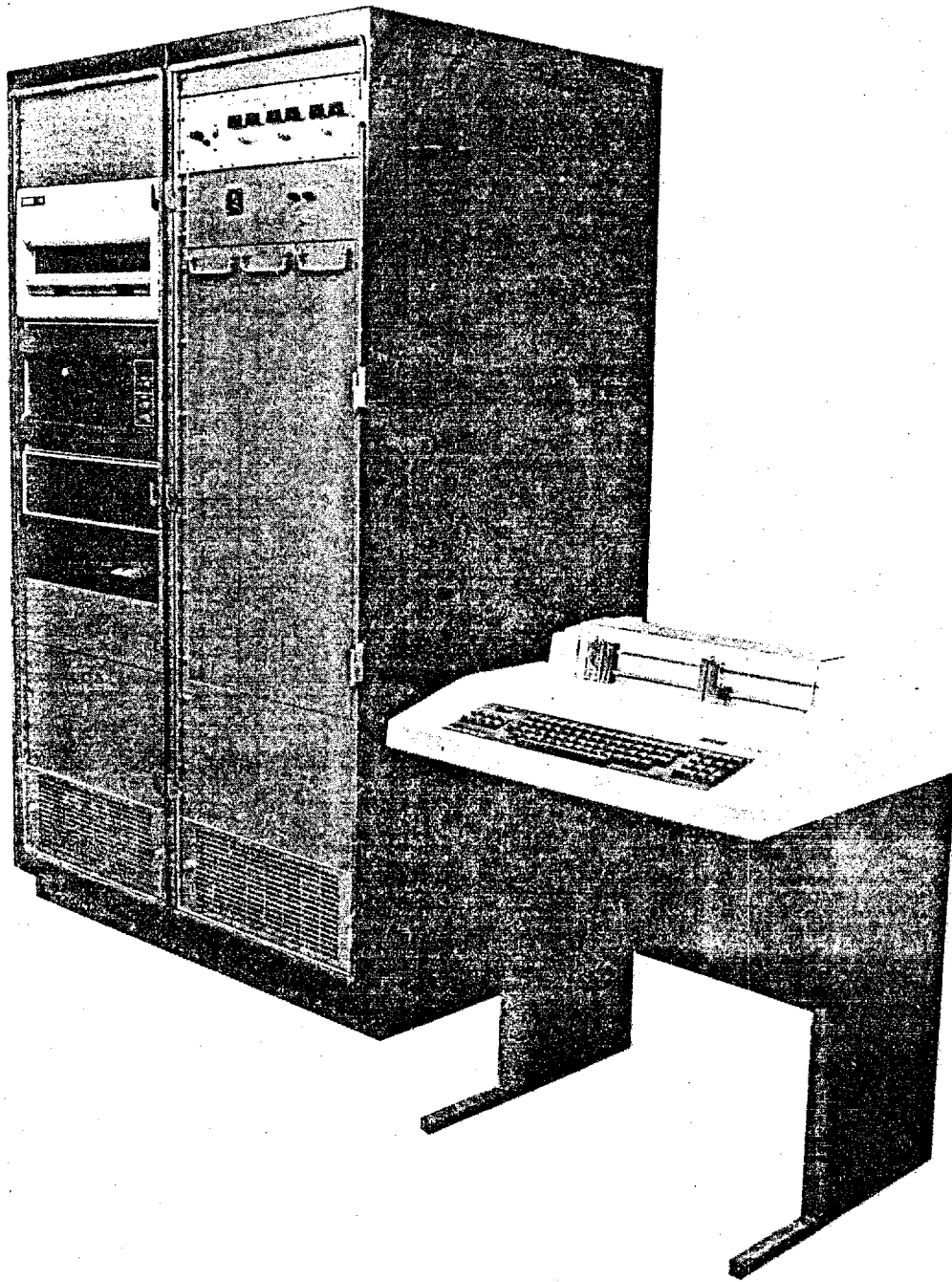
1-2. ITS-W Network.

a. ITS-W is a secure multisubscriber, high-resolution photo facsimile transmission network. The ITS-W (figure 1-2) is organized as a star network of up to 60 Remote Terminal Subsystems (RTS's) with the CSS as the hub. The CSS is a computer-controlled switch whose main function is to automatically interconnect communication lines between RTS's. The interconnects are made in response to call requests (telephone dialing) originating at each RTS. The CSS automatically disconnects communication lines between interconnected RTS's when they have completed transmissions.

b. The RTS may be colocated with the CSS or remotely located. Remote locations are interfaced to the CSS via customer furnished COMSEC and communication link equipment.

1-3. CSS Purpose and Use.

a. The CSS (figure 1-3) is a digital switch controlled by a PDP 11/04 computer and its peripherals. The CSS switch is designed to operate automatically and unattended from a system program on a floppy disc. When commanded by the program, the CSS switch will interconnect RTS communication lines for the purpose of voice and facsimile transmission between RTS's.



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Figure 1-1. Image Transmission System Central Site Subsystem

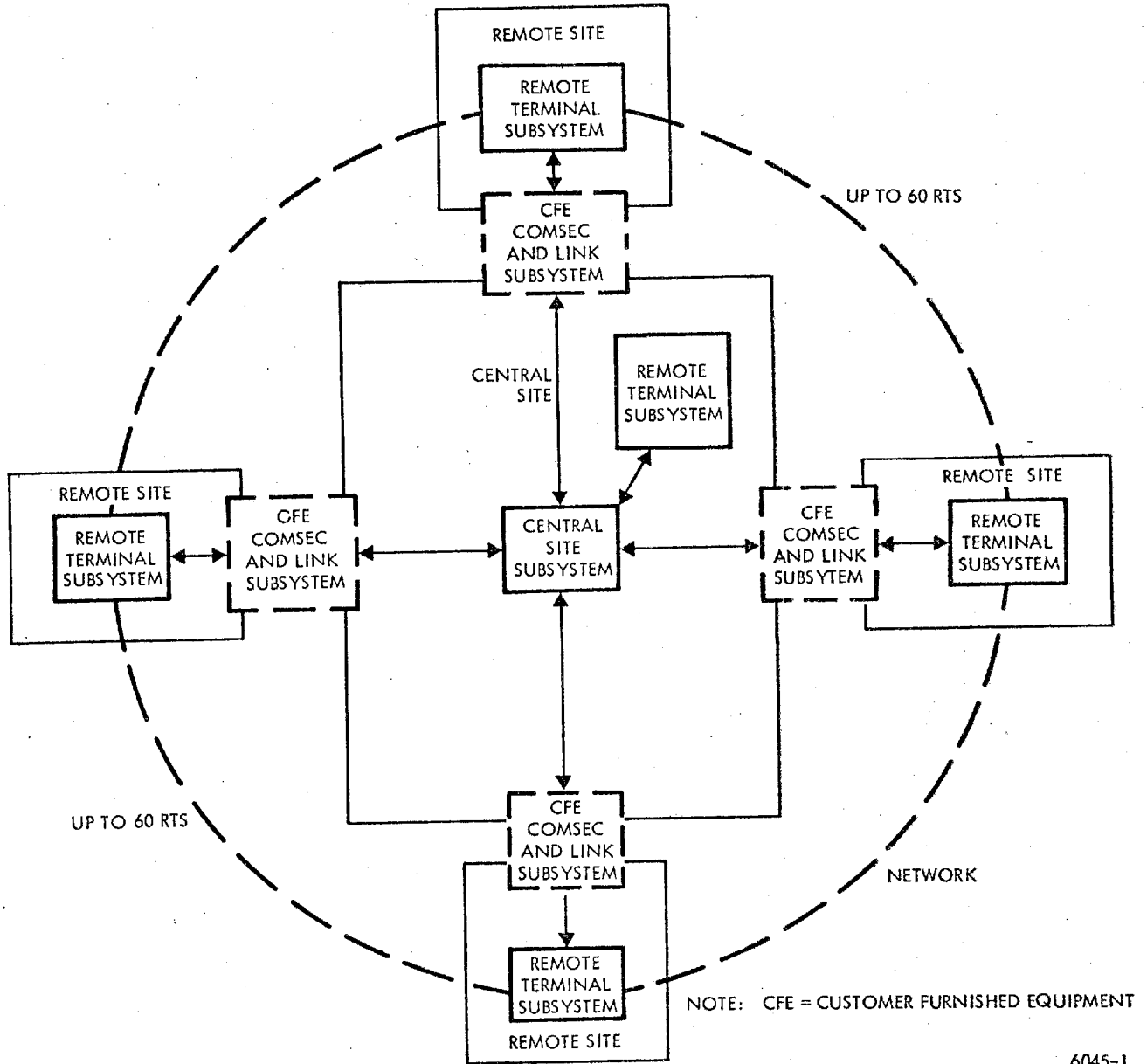


Figure 1-2. Image Transmission System Block Diagram

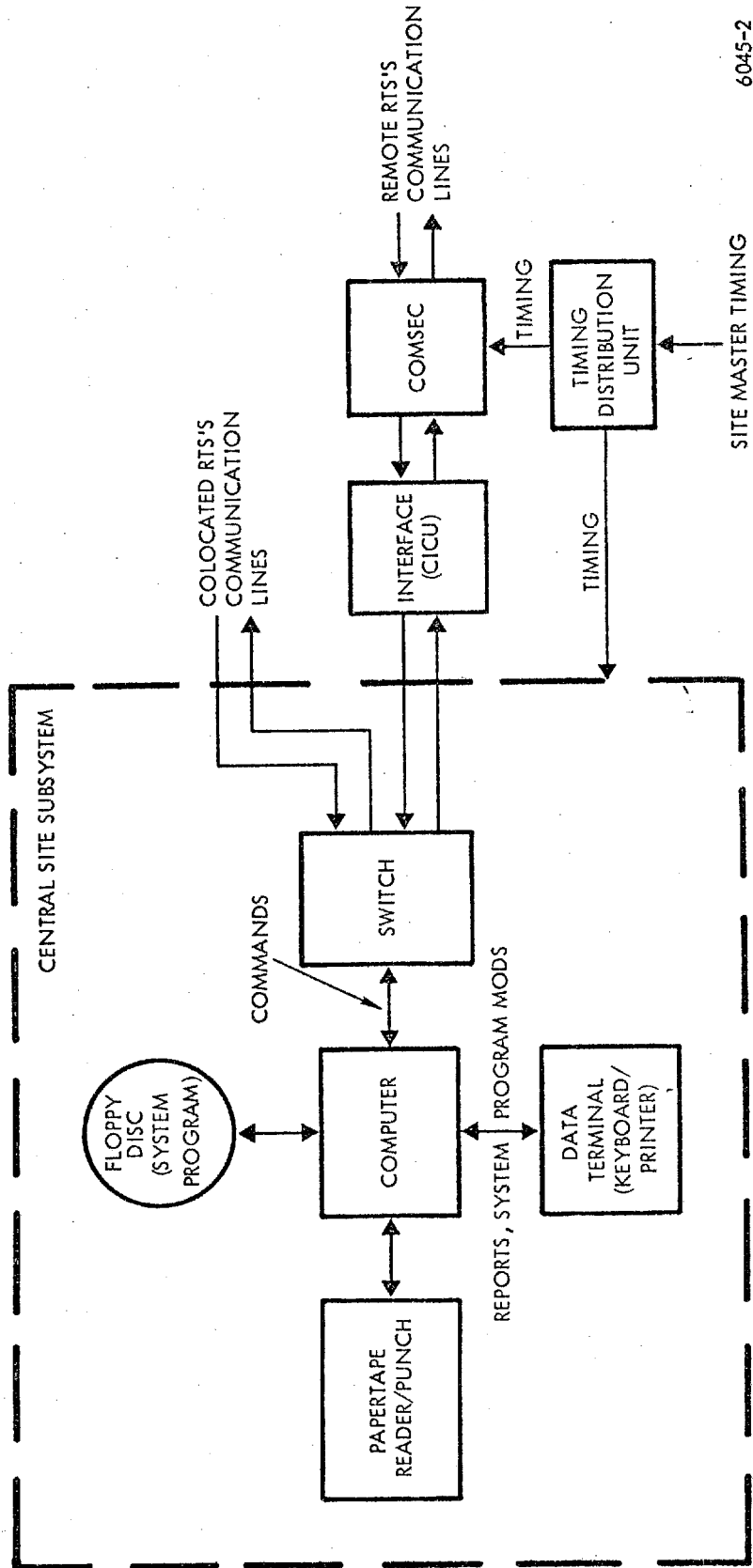


Figure 1-3. Central Site Subsystem Configuration

b. A data terminal keyboard/printer provides printouts of specific reports such as power interruptions. During normal system operation the keyboard portion is locked out by the program preventing unauthorized entries. The keyboard can be unlocked by entry of a system program password for the purpose of modifying specific items on the program.

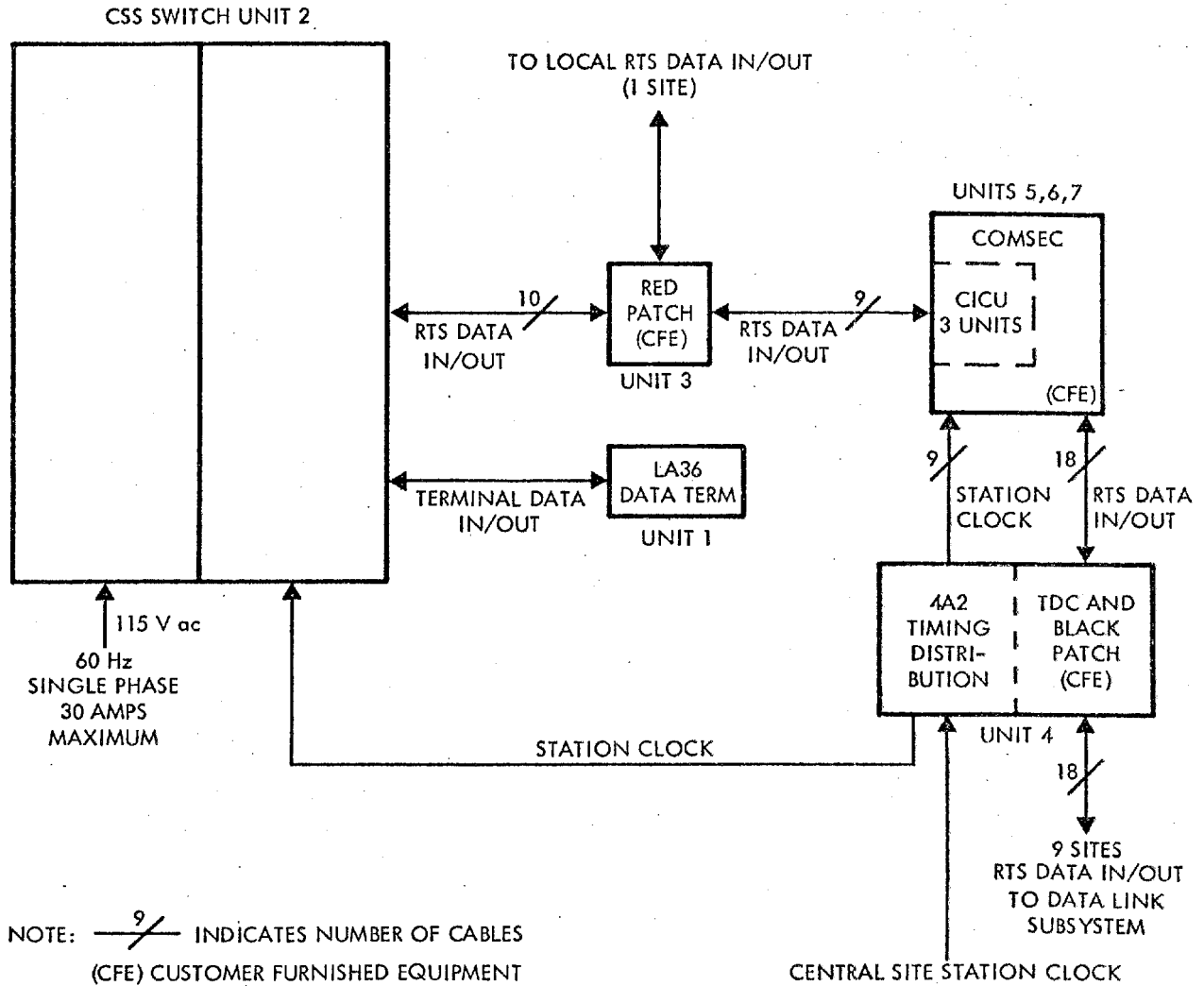
c. A paper tape reader/punch is provided for initial loading of the computer operating program and for diagnostic purposes.

d. For remote located RTS's, the CSS switch is interfaced to COMSEC communication equipment via a COMSEC interface conditioning unit (CICU) for the purpose of signal level compatibility between units.

e. Central site master timing is distributed to the CSS and COMSEC equipment by a timing distribution unit. The unit also provides automatic backup timing if the site master timing is lost.

1-4. Physical Description.

a. Major unit designators of the central site and cabling between units is shown in figure 1-4. Unit designators are used to define the unit as an end item; i.e., Unit 2 is the CSS switch cabinet. Designators are also used to define the location of assemblies within the unit; i.e., 2A1 indicates that the assembly is in Unit 2 and in equipment rack position A1 (in this case A1 is the floppy disc system). Rack positions A1, A2, A3, etc., are assigned by the manufacturer from top to bottom, left to right when viewed from the front of the equipment rack. The CSS consists of a Data Terminal - keyboard/printer (Unit 1), CSS switch (Unit 2), a Timing Distribution Unit 4A2 (located in Unit 4), and three COMSEC interface conditioning units (CICU) (located in Units 5, 6 and 7). The present CSS equipment configuration accommodates nine RTS's at remote sites and one RTS at the central site. The CSS may be expanded in the future to accommodate up to a total of 60 RTS's by the addition of plug-in units at the CSS switch, additional CICU's, and associated cabling between units.



6045-3

Figure 1-4. Central Site Subsystem Equipment Designation and Cable Configuration

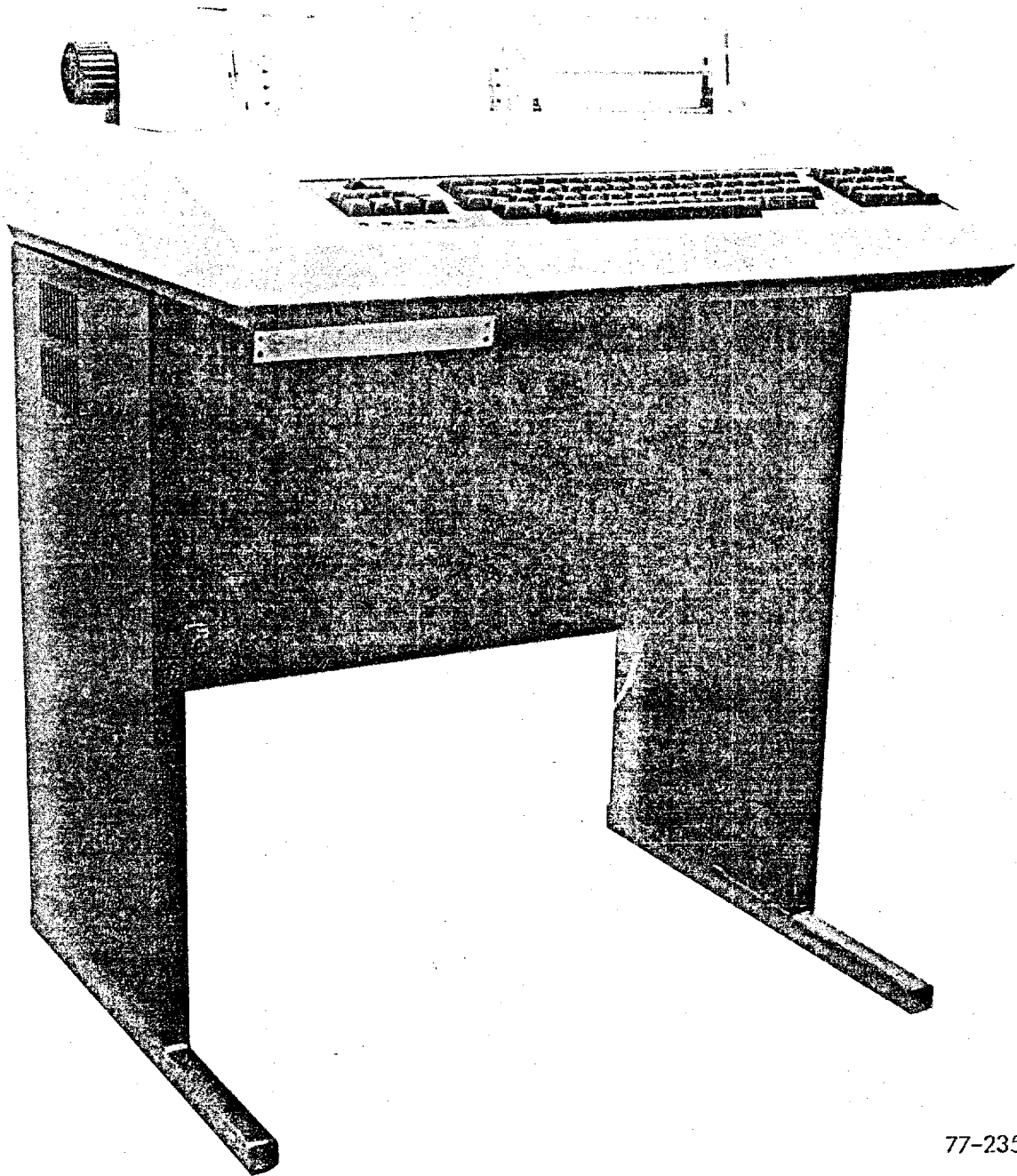
b. The data terminal (Unit 1) (figure 1-5) is a Digital Equipment Corporation DECwriter II, model LA36 CE ASR Data Terminal. It is the primary man-machine interface with the on-line computer in the CSS switch. The data terminal is a stand-alone device with a single interconnecting cable routed to the on-line computer interface. Detailed physical descriptions and operation and maintenance instructions for the data terminal are provided in the DEC LA36/LA35 DECwriter II Users Manual.

c. The CSS switch (Unit 2) (figure 1-6) is housed in a dual RFI tight equipment cabinet with front and rear access doors.



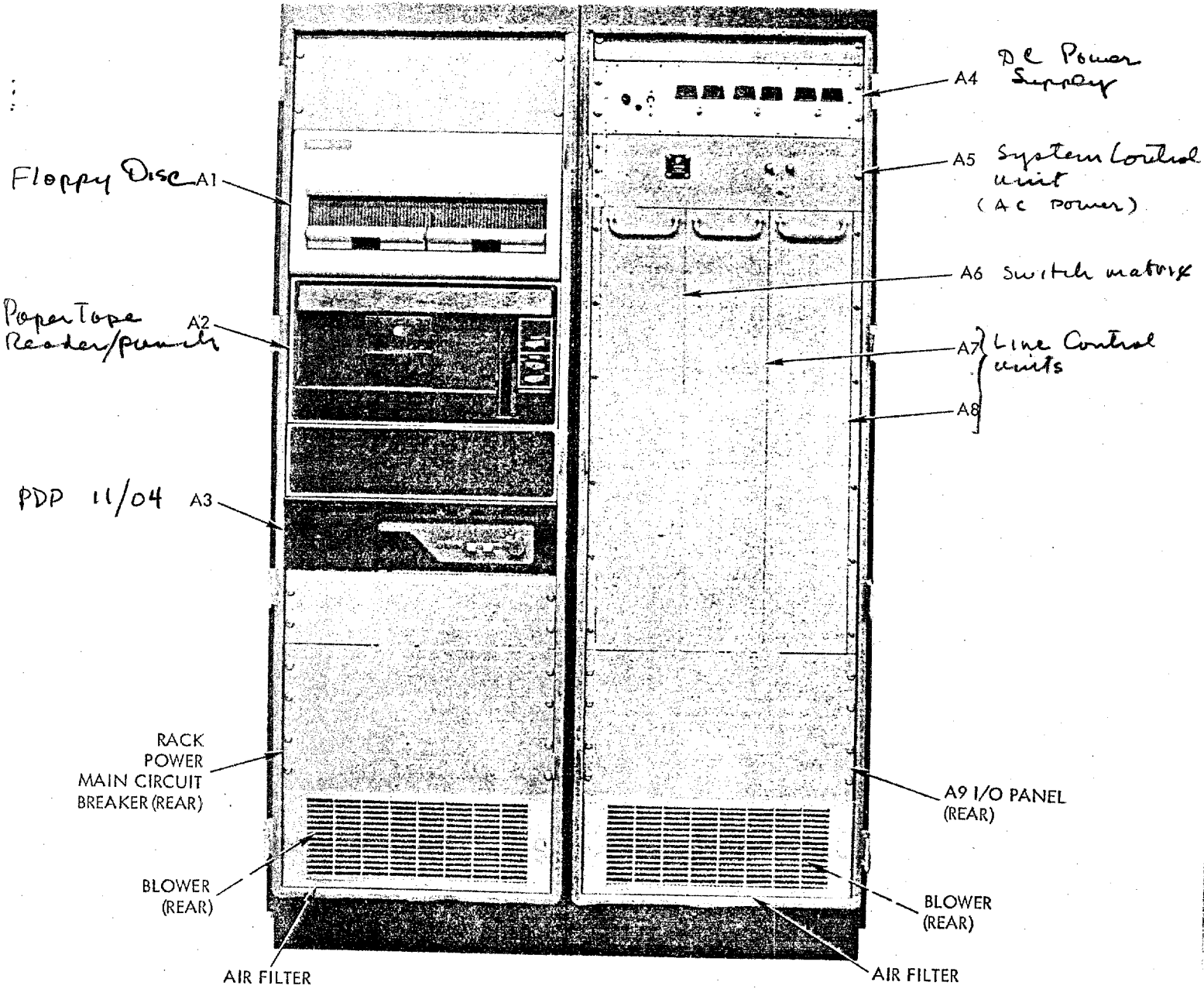
The RFI (TEMPEST) integrity of the CSS cabinet is lost when the doors are open.

The cabinet is 69-inches high, 25-inches deep and 42.125-inches wide and is configured for standard 19-inch width equipment. The cabinet contains two ventilation blowers in the bottom of each equipment rack with reusable air filters accessible at the front of the unit. Ac power is routed from the user's external source through conduit to a filter box in the bottom of the cabinet. From the box, RED ac power is routed to a contactor/circuit breaker assembly. The contactor is controlled from a system control panel (A5) on the front of the CSS switch. AC power is switched manually at the system control to provide power to two vertical power strips that are mounted adjacent to the equipment rack positions. The power source for all rack equipment is provided through the power strips. All signal data input and output cables and power cables are routed through the bottom of the cabinet.



77-2354

Figure 1-5. LA36 Data Terminal



77-2360

Figure 1-6. Central Site Subsystem Switch (Unit 2)

(1) A dual floppy disc assembly (2A1) is a Digital Equipment Corporation RX11-BA Floppy Disc System including an RX11 Interface Module for use with a PDP 11 computer. The disc assembly is a random access, mass memory device that stores data in fixed length blocks on a preformatted flexible diskette. The front of the unit has two disc drive openings with spring loaded covers. The rear of the unit contains a dc power supply and circuit breaker. Ac power to the disc assembly is provided by the cabinet ac power strip. Detailed physical descriptions and operation and maintenance instructions for the disc assembly are provided in DEC EK-RX01-MM-002 Users Manual.

(2) The paper tape reader/punch (2A2) is a Digital Equipment Corporation PC11, Reader/Punch and Control. It comprises a PC05 High-Speed Paper Tape Reader/Punch and a PC11 Control. The PC05 serves as an input device (for eight-channel perforated papertape) and as an output device (to the same medium) for the system. Front panel controls include an ON/OFF switch and tape FEED (advance) switches for both punch and reader. The PC05 reader unit accepts fan-folded paper tape as input from a bin. The output tape from the punch is collected in a second bin. Both bins are accessible from the front. The unit contains internal power supplies and is provided ac power from the cabinet ac power strip. Specific physical characteristics as well as operation and maintenance instructions for the paper tape reader/punch control is given in DEC EK-PC11-TM-003 (PC11) and EK-PC04/05-OP (PC05) manuals.

(3) The computer system (2A3) is a Digital Equipment Corporation PDP-11/04 computer. The front panel of the computer provides a power ON/OFF/STANDBY switch, HALT/CONTINUE program switch, and a BOOT sequence/processor INITIALIZATION switch. Front panel indicators include: condition of backup battery, dc power on, and an indication if the processor is running or halted. The computer has internal dc power supplies that are provided ac power from the cabinet ac power strip. Refer to Digital Equipment Corporation PDP-11/04 User Guide EK-11004-OP-PRE for specific configurations and basic information required to operate and maintain the PDP-11/04 computer system.

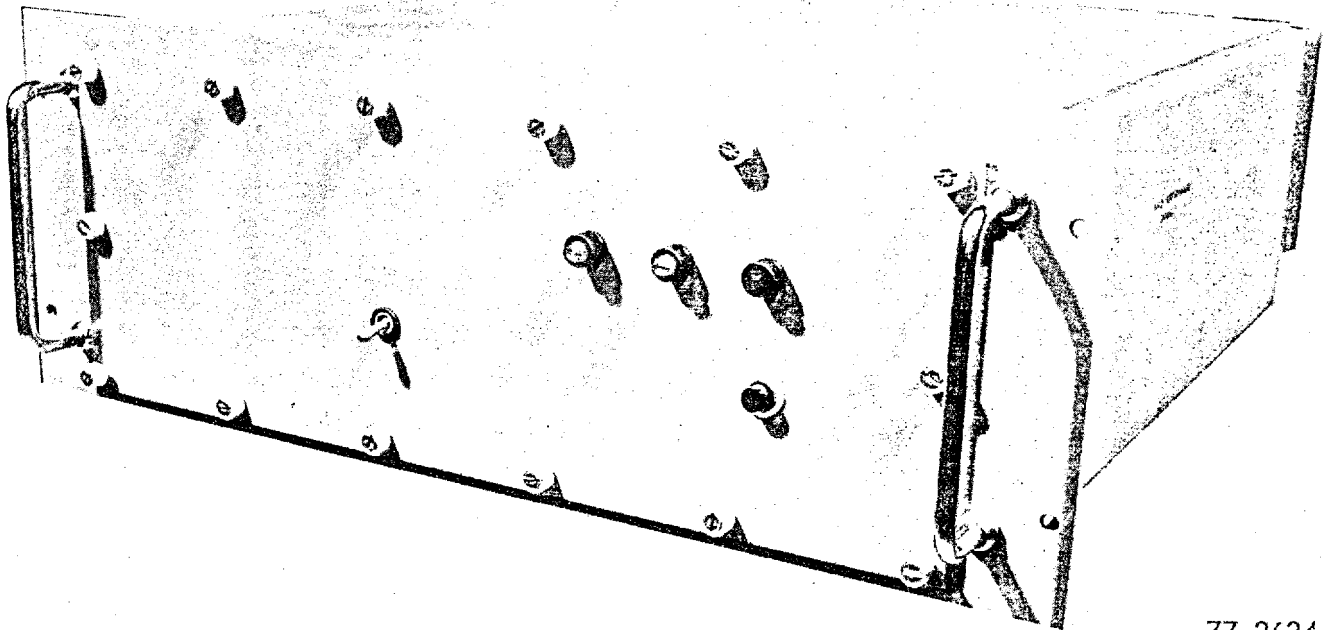
(4) A dc power supply (2A4) supplies +12 V dc, +5 V dc, and +15 V dc to the equipment cabinet dc bus for distribution to a switch matrix and control (A6) and line control units (A7 and A8). Input ac power is supplied by the cabinet ac power strip. The power supply front panel provides meter indications of all the dc voltages and currents on the bus, and individual adjustment potentiometers for each voltage. A power ON/OFF switch with power indicator and a main fuse are also provided.

(5) A system control unit (2A5) controls the ac power distribution. The front panel of the unit provides a power ON/OFF switch and indicator, an indication if main power is applied to the rack, and an elapsed time meter indicating the accumulative time system power has been on. Ac power is distributed via this assembly to the ac power strips in the cabinet. The unit's front panel is hinged on one end to provide access for maintenance.

(6) A switch matrix and control (2A6) and line control units (2A7, 2A8) are vertical logic drawers, each accommodating a rack space 6.4-inches wide by 34-inches high. Input dc power to the drawers is supplied by the dc power supply (A4). The units contain the network switch matrix. The units interface with the on-line computer for output control information to and input status information from each RTS and for control of the switch matrix. The control units also provide an END-AROUND PREP signal (EAP alarm) to COMSEC equipment for synchronization purposes.

d. The timing distribution unit (4A2) (figure 1-7) is configured for a standard 19-inch equipment rack. The unit provides master timing for the CSS switch and the COMSEC equipment, and is driven by the site master station clock. The unit contains a 1.544 MHz square wave oscillator that is automatically switched in to provide master timing to the CSS switch and COMSEC equipment when the station clock is not available. The front panel of the unit provides indications of station clock and internal clock status. A RESET button is used to switch from the internal clock back to the station clock when the station clock is restored. The unit is fused by a front panel mounted ON/OFF circuit breaker.

Timing Redundancy



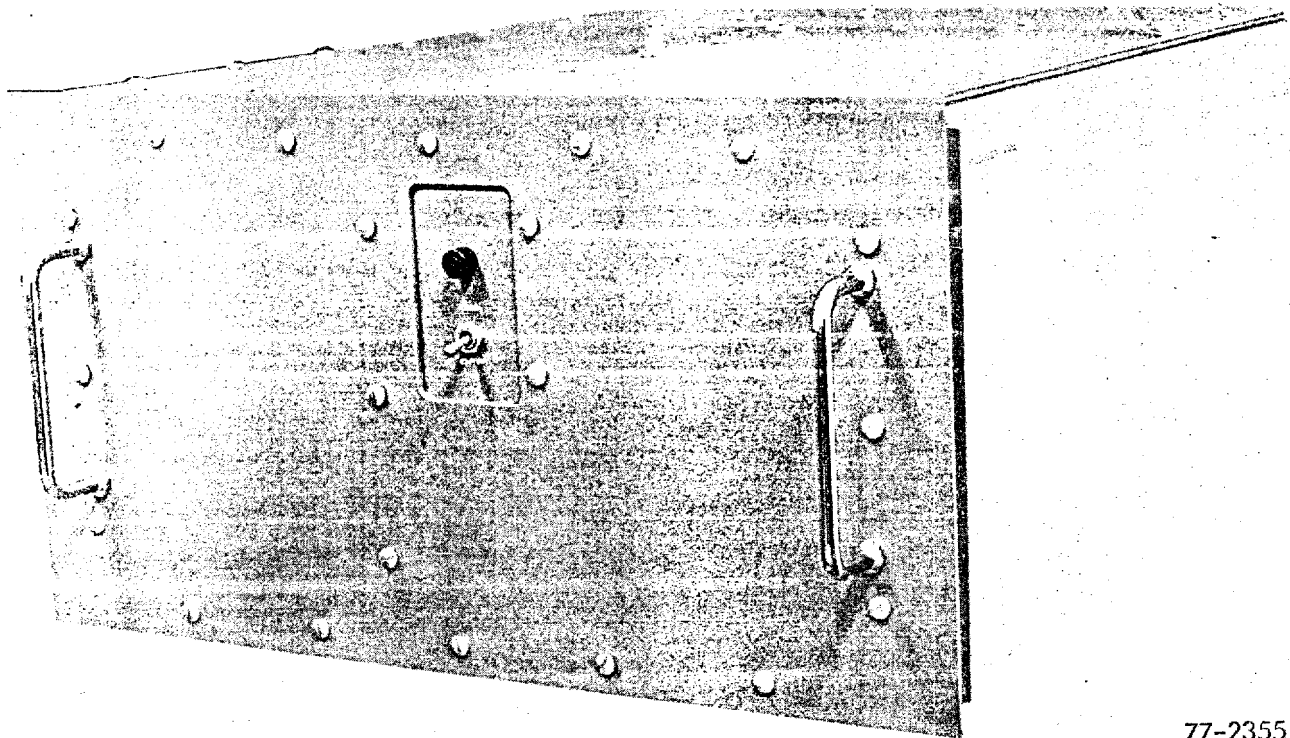
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Figure 1-7. Timing Distribution Unit (4A2)

e. The CICU (located in Units 5, 6, and 7) (figure 1-8) is configured for a standard 19-inch equipment rack. The unit front panel contains a manually operated circuit breaker and power on indicator. The unit is designed to interface the CSS switch with the COMSEC equipment and accommodates up to three full duplex data channels. The CICU converts CSS switch signal levels to levels that are compatible with the COMSEC equipment (HN74/KG34).

1-5. FUNCTIONAL OPERATION.

a. Call Setup. The CSS provides RTS-to-RTS connection service by use of a call setup originating at the RTS's. The call setup is similar to that provided by a standard telephone network. The CSS switch is continually monitoring each RTS communication line. A call is initiated using a telephone handset and keypad located on an RTS operator's console. The RTS operator desiring to initiate a data transmission removes the handset from the hook and receives a dialtone signal indicating that the CSS switch is ready to provide service. The calling RTS operator enters the connection request (two digit number of called party) by pushbutton on the telephone keypad. The CSS switch then determines if the requested party is a valid connection and is not busy. If the request is valid, the CSS switch rings the called party while providing ringback to the calling party. If an invalid connection is requested, the CSS switch signals the calling party so that he will cancel his call. If the called party answers his telephone, the CSS switch stops the ring and ringback signals at both ends and interconnects both parties. Both RTS parties may simultaneously transmit and receive facsimile and voice data through the switch connection. The CSS switch monitors the calling party line for a signal indicating that he has completed data transmission and/or reception and hung up the handset. When this signal is received, the CSS switch disconnects both parties.



77-2355

Figure 1-8. COMSEC Interface Conditioning Unit

b. Connection Service. The CSS switch provides three types of connection service between RTS's; full duplex, broadcast and self call. The full duplex service allows two RTS's to be interconnected for simultaneous transmission and reception of facsimile and voice data (as described in the previous paragraph). Broadcast connection service allows an authorized broadcast initiator RTS to dial a two-digit number and be interconnected to up to 59 RTS's on a broadcast list for simplex transmission of data. Broadcast facsimile and voice transmission is one way only, from the broadcast initiator RTS to the RTS's on the broadcast list. The CSS switch provides simultaneous duplex connection service to two through 30 party pairs and broadcast connection service to one broadcast initiator party at any one time in the network. Self call service allows an RTS to dial his own number and be simplex connected back to himself for facsimile transmission and reception. This service is used by the RTS's as a diagnostic. The CSS switch provides simultaneous self call service for each RTS in the network.

c. Program Modifications. The system program (disc) can be modified via use of the data terminal to configure each RTS for CSS switch connection services as follows: (See paragraph 2-7 for details on program modifications.)

(1) Individual RTS's are assigned a class mark in one of four levels (1-4). The class marking enables only the higher class marked RTS's to initiate connections with equivalent or lower class marked RTS's. The class mark applies to both full duplex and broadcast connection service.

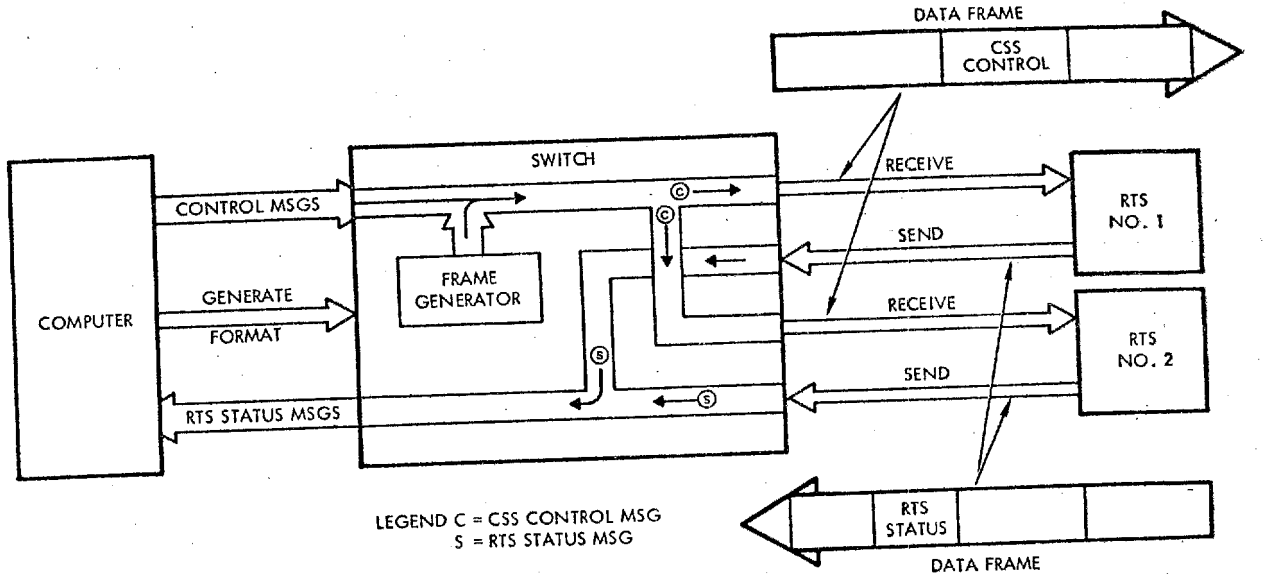
(2) Ten unique broadcast lists and ten associated broadcast initiator lists are available for program modification. Up to 60 RTS's can be assigned to each list. Lists are automatically classed marked by the class mark of the first RTS assigned to a list.

(3) Status of each RTS can be changed to reflect the RTS in or out-of-service; installed or not installed in the network.

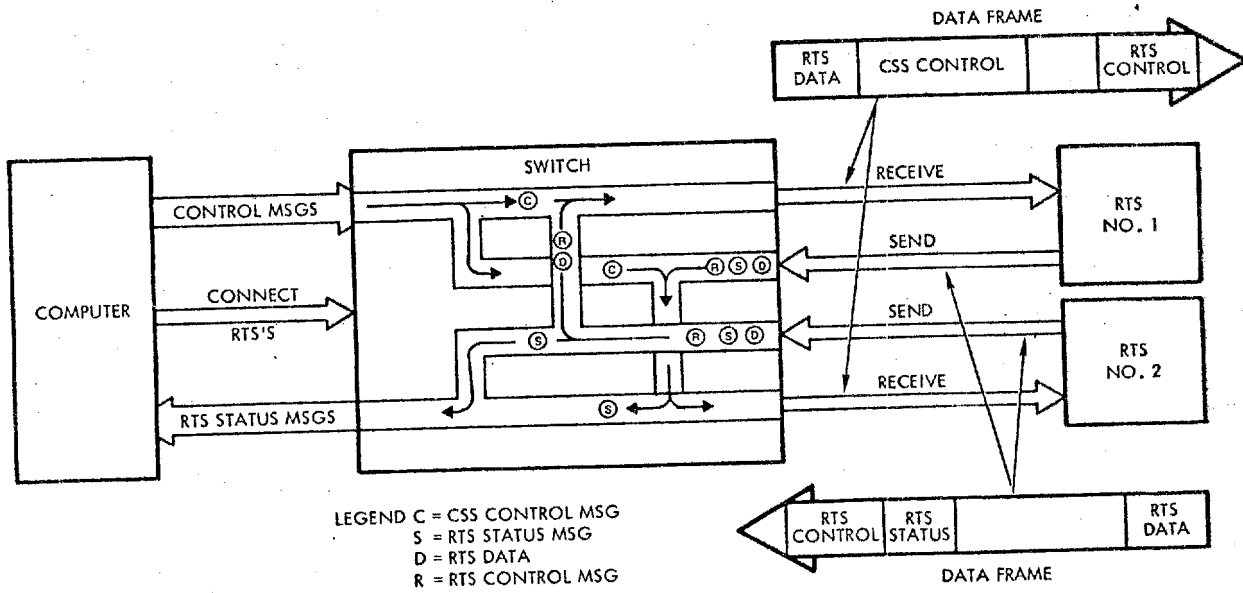
d. RTS/CSS/RTS Communication. Each RTS continually transmits serial word frames to the CSS switch (see figure 1-9). Each frame contains an RTS status word (i.e., RTS identity, call requests, hook status, etc.). The RTS status word is extracted from the frame by the CSS switch for processing. The CSS switch also continually transmits a control word (i.e., ring, ringback, busy, etc.) to each RTS in one of two modes. In a CSS idle format mode (figure 1-9A), an RTS is not interconnected to another RTS by the CSS switch, and the CSS switch generates its own word frames, identical to RTS word frames, but containing only the CSS control word. This format is sent to all RTS's not engaged in a call. In a CSS connected mode (figure 1-9B), an RTS is interconnected to another RTS by the CSS switch, and the CSS switch injects the CSS control word in the frames passing between RTS's. This format is sent to all RTS's who are duplex, broadcast, or self call connected. An RTS control word generated by the RTS's is used by interconnected RTS's for automatic control of their facsimile transmitter and receiver equipment. The RTS data is the voice and facsimile data transmitted by the RTS's.

1-6. Capabilities and Limitations.

The Central Site Subsystem characteristics and limitations are listed in table 1-1.



IDLE FORMAT MODE



CONNECTED FORMAT MODE

6045-4

Figure 1-9. CSS Switch Modes of Operation

Table 1-1. Central Site Subsystem Characteristics

Parameter	Characteristics
<p><u>CSS Switch (Unit 2)</u></p> <p>Power Requirements</p> <p>Connection Services (automatic)</p> <p>Maximum Service Capability</p> <p>Operator Interface</p> <p>System Program</p> <p> Program Modification Capability</p> <p>Transmission/Reception Format</p> <p>Interface</p>	<p>115 \pm10 V ac, single phase, 60 \pm0.5 Hz, 30 amperes maximum.</p> <p>Full duplex connection/disconnection service. Broadcast simplex connection/disconnection service. Self Call simplex connection/disconnection service.</p> <p>60 Remote Terminal Subsystems</p> <p>LA36 ASR Data Terminal</p> <p>Flexible Diskette</p> <p>Timer Durations:</p> <ul style="list-style-type: none"> \ Dialtone = Broadcast Alert <p>Remote Terminals Subsystems:</p> <ul style="list-style-type: none"> Install/Remove, In-Service/Out-of Service, Ten Broadcast Lists, Ten Broadcast Initiator Lists, Class Mark. <p>Password Change</p> <p>733/4 40-Bit Word Frame</p> <p>1.544 Mb/s data link</p>

Table 1-1. Central Site Subsystem Characteristics (Continued)

Parameter	Characteristics
Dimensions	
Width	42.125 inches
Height	69 inches
Depth	25 inches
Environment	
Operating Temperature Range	+50 ⁰ F (+10 ⁰ C) to +110 ⁰ F (+43.3 ⁰ C)
Storage Temperature Range	0 ⁰ F (-17.8 ⁰ C) to +140 ⁰ (+60 ⁰ C)
Relative Humidity	20% to 90%

Section II. THEORY OF OPERATION

2-1. General.

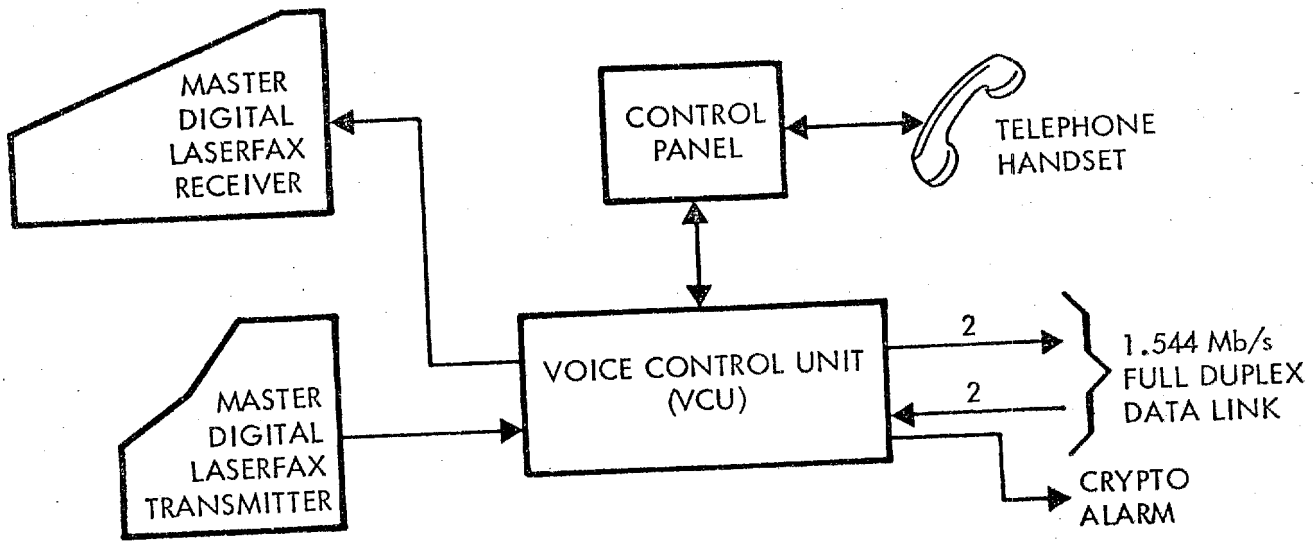
a. This section provides a detailed description of the CSS and RTS operation, the data information exchanged between the RTS/CSS/RTS, the sequence of CSS connection services, and an explanation of the operator programmable functions. This section will be referred to in Section III, Operation, so that the operator will have a complete understanding of procedures therein.

b. This section first describes the basic functions of the RTS to relate equipment and signals with the CSS descriptions.

2-2. Remote Terminal Subsystem Functions.

a. An RTS (figure 2-1) consists of a console containing a digital LASERFAX transmitter, digital LASERFAX receiver (recorder), and voice control unit (VCU) with control panel. The transmitter is the terminal device used to scan documents such as photographs or printed matter and the receiver is the terminal device used to convert facsimile data to hard copy. The VCU is the data processor and controller for the RTS and interfaces with the transmitter, receiver, control panel, and 1.544 Mb/s full duplex data link.

b. The RTS has a telephone handset and a keypad that is used to initially establish an RTS-to-RTS connection via the CSS. When a connection is established, facsimile data can be transmitted and received simultaneously with or without voice data. The VCU accepts digital facsimile data from the transmitter and analog voice information from the handset. It digitizes the voice signal and formats these data along with control and digital status information from the VCU control panel and adds frame synchronization words. The formatted digital data is transmitted over the data link to the CSS.



6045-13

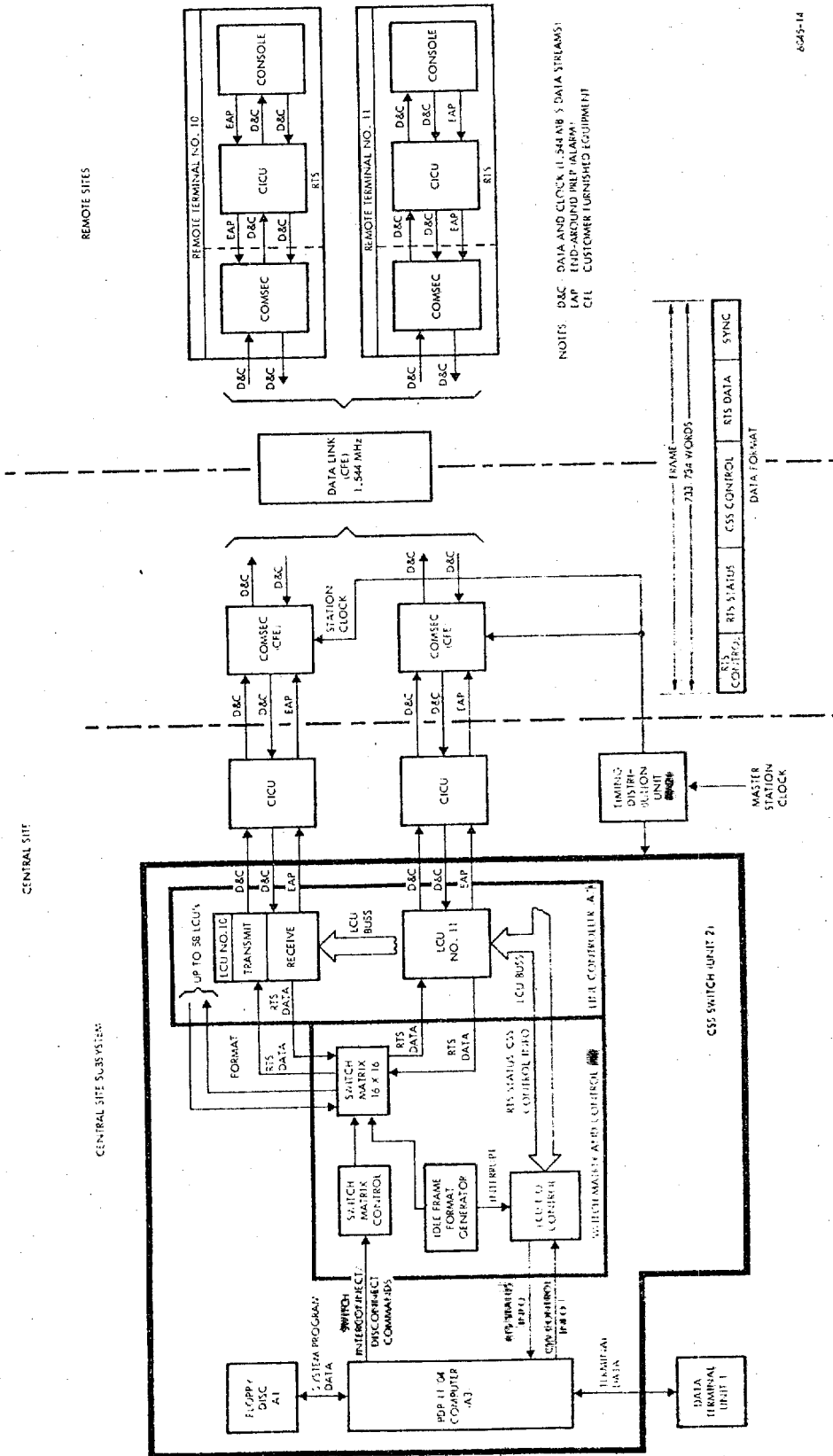
Figure 2-1. Remote Terminal Subsystem Block Diagram

c. In a like manner, the VCU receives formatted digital data from the transmitting RTS via the CSS. The VCU deformats the facsimile data, converts it to analog, and routes it to the receiver for use in modulating a laser beam which reproduces the transmitted image on photo-sensitive paper. The digital voice data is converted to analog by the VCU and routed to the telephone handset to reproduce the transmitted voice signal. The control signals are routed to control panel circuits controlling the transmitter and receiver. Additional information on the RTS is given in the ITS-W Remote Terminal Operators Manual.

2-3. Central Site Subsystem Operational Configuration.

a. Refer to figure 2-2. The configuration shown accommodates two Remote Terminal lines for explanation purposes. The data format shown at the bottom of the figure is the frame format used for all data between the RTS/CSS/RTS. Data is serially transmitted at 1.544 Mb/s in 733 or 734 40-bit word blocks that include frame synchronization words. The synchronization words are used to identify the start of a new frame and to maintain synchronization between RTS/CSS/RTS operations. A detailed description of the data format is given in paragraph 2-4.

b. The PDP 11/04 provides crosspoint closure control signals to the switch matrix which interconnect the RTS-to-RTS lines, processes received RTS status information, and provides control information to be sent to RTS's via the line control units. The system program is run from the floppy disc system assembly. Operator interface with the computer system is via the data terminal for system initialization and modification of variables in the program.



6045-14

Figure 2-2. Central Site Subsystem Functional Block Diagram

c. The line control units (LCU's) are unique for each RTS line and contain frame synchronizers and formatters/deformatters that synchronize with the data frames passing between interconnected RTS's and inject CSS switch control information (formatters) and extract RTS status information (deformatters) to and from the data frames. If synchronization is lost on the RTS receive line, the LCU synchronizer provides an EAP (alarm) to the local COMSEC equipment so that it can resynchronize with the remote COMSEC equipment.

d. The idle frame format generator creates a serial bit stream format identical to that of an RTS, except that it contains 733 words per frame. The idle frame format is routed by the switch matrix to all RTS's which are not engaged in a call. The idle frame format is designed to look like an inactive terminal.

e. Continuous 1.544 Mb/s (clock) data streams containing the word frames are transmitted by the RTS's to the receive side of their respective LCU's. The LCU synchronizes with the incoming data frames and deformats the word of the frame containing the RTS status information. This information is then routed to the processor. The original data stream is not altered in any way by the LCU, and is routed to the switch matrix for possible interconnection to other LCU lines for transmission/reception between RTS's. The data format is designed so that RTS's can communicate directly without CSS switch intervention (i.e., manually patched around the CSS switch). If no interconnection has been commanded by the processor, the data stream is appropriately terminated at the switch matrix. The transmit side of the LCU synchronizes to the data stream from the switch (either idle format or connected RTS format) and places control information from the processor in word two of the format.

f. The CICU units at both the CSS and RTS provide level conversion necessary for all data, clock and control signals to interface the COMSEC equipment to CSS switch or the RTS console equipment. The CICU also provides a reclock function to properly phase the serial data stream to the timing of the COMSEC equipment.

2-4. RTS/CSS/RTS Information Exchange.

The data format exchanged between RTS's is shown in figure 2-3.

a. Signal Data from Remotes.

(1) Address Request. The Address Request signal received into the CSS switch is two digits. The CSS switch recognizes and services the input addresses defined as follows:

<u>Address Numbers</u>	<u>Usage</u>
00 through 09	Invalid Addresses
10 through 69	Remote Terminal Addresses
70 through 79	Invalid Addresses
80 through 89	Network Broadcast List Addresses
90 through 99	Invalid Addresses

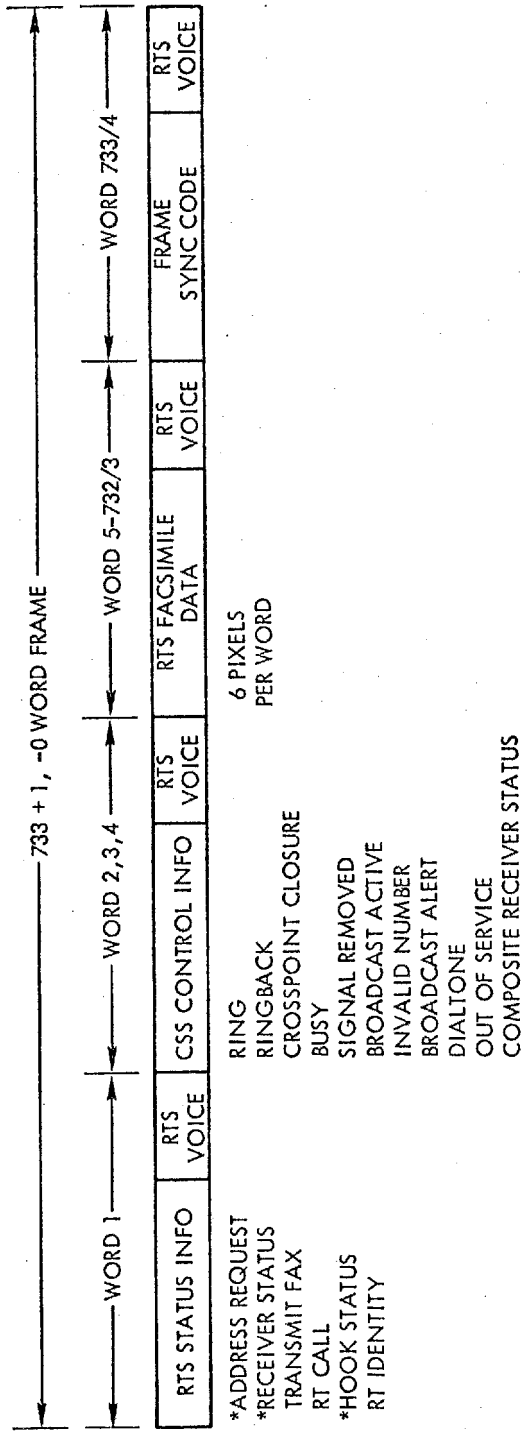
Any remote that requests an invalid address or an unimplemented address is sent an invalid number signal tone.

(2) Receiver Status. Receiver Status signal indicates to the CSS switch that the RTS receiver is either available, out-of-service or busy.

(3) Transmit Facsimile. The Transmit Facsimile signal indicates to the connected RTS that the RTS transmitter is presently busy (off-hook) or the transmitter has completed transmissions and shutdown (on-hook).

(4) RT Call. The RT (Remote Terminal) Call is a request signal to the connected RTS or RTS's to issue an audible ring. If parties are broadcast connected, only the broadcast initiator can ring the broadcast list parties.

(5) Hook Status. The Hook Status signal indicates to the CSS switch that the RTS is requesting service or termination of service.



6045-5

*DEFORMATTED BY THE LCU AND SENT TO THE COMPUTER FOR PROCESSING.

Figure 2-3. Data Exchange Format

(6) RT Identity. The RT Identity signal indicates to a connected RTS the address of the calling RTS (numbers 10 through 69). The CSS switch will put digit 77 in the format of the idle frame. However, during broadcast the 77 is displayed only for the broadcast initiator.

b. Signal Data from CSS Switch.

(1) Ring and Ringback. A Ring signal is sent to the called party and a Ringback signal is sent to the calling party after a valid address request is received at the CSS switch and the called party is on-hook (not busy or out-of-service).

(2) Crosspoint Closure. A Crosspoint Closure signal is sent to each called or calling party when the called and calling parties are correctly connected in either the duplex or broadcast service. The signal is used at the RTS to indicate that the connection is active.

(3) Busy. A Busy signal is sent to a calling party when a valid address request is received by the CSS switch and the called party is off-hook (handset off-hook, duplex or simplex self call connected). A Busy signal is sent to a broadcast initiator requesting a broadcast connection when a broadcast is presently active in the network.

(4) Signal Removed. A Signal Removed signal is sent to an RTS when the CSS switch has detected that the RTS is on-hook after either the Broadcast Active signal, Busy signal, and Invalid Number signal has been sent to the RTS by the CSS switch..

(5) Broadcast Active. A Broadcast Active signal is sent to all broadcast list parties who are properly simplex connected to the broadcast initiator. Broadcast Active is removed when the broadcast initiator goes on-hook.

(6) Invalid Number. An Invalid Number signal is sent to a calling party who requests an invalid address or unimplemented number (paragraph 2-4. a. (1)), or if the address request is prohibited by class marking (paragraph 2-7. b.).

(7) Broadcast Alert. A Broadcast Alert signal is sent to the broadcast initiator, the in-service broadcast list parties, and non-broadcast parties who are duplex connected to broadcast list parties, after the broadcast initiator has requested a valid broadcast list number (80-89). Broadcast Alert is removed after T2 seconds (programmable - see paragraph 2-7. a.(2)).

(8) Dialtone. A Dialtone signal is sent to in-service RTS's during the call setup and tear down process. Dialtone is sent when a unconnected RTS is off-hook prior to requesting an address and to a connected and called RTS that is off-hook after the calling RTS has gone on-hook. Dialtone is removed for a unconnected RTS off-hook when an address request is not received at the CSS switch within T1 seconds (programmable-see paragraph 2-7. a.). Dialtone is not sent to RTS's marked out-of-service by the CSS switch (programmable - see paragraph 2-7. e.).

(9) Out-of-Service. An Out-of-Service signal is sent to all parties that request a connection with an RTS marked out-of-service (paragraph 2-7. e.) or if the requested RTS is out-of-service due to hardware failures or maintenance actions (maintenance loopback modes) initiated at the RTS.

(10) Composite Receiver Status. A real-time Composite Receiver Status signal is sent to each RTS subscriber from the CSS switch. Receiver status from each implemented RTS subscriber is stored and routed to a composite multiplexer in the processor for transmission to the RTS's for display. Each RTS has a composite display (an indicator for each RTS address). During normal operation this signal is sent to each RTS to indicate the status of all other RTS receivers. During a Broadcast Alert period the composite status is used to inform the broadcast initiator as to the composition of the broadcast list and status of the individual members of the broadcast list. The CSS switch sends the following composite receiver status signals:

(a) The normal composite receiver status is sent to all remote terminals that are idle (not connected), duplex connected, or broadcast receive connected. The Composite Receiver Status signal informs each RTS operator whether all other RTS receivers are ready for reception, out-of-service, out-of-sync or busy as follows:

(1) A steady on-state signal indicates that the receiver is out-of-service or out-of-sync (status indicator illuminated steady).

(2) A steady off-state signal indicates that the receiver is in service and ready for reception (status indicator extinguished).

(3) An alternating state signal indicates that a receiver is presently in operation or busy (status indicator flashing).

(b) The composite receiver status sent to an authorized broadcast initiator RTS only is modified to provide the following display for the initiator:

(1) After the Broadcast Initiator has requested a valid broadcast list address, the CSS switch sends a Broadcast Alert signal and the composite broadcast list information. All non-broadcast party status indicators extinguish and all broadcast list party indicators illuminate steady.

(2) After interval T2 (programmable - see paragraph 2-7. a.), the CSS switch removes the Broadcast Alert signal and sends a Broadcast Active signal and the normal Composite Receiver Status described in (10) (a) above only of RTS's on the broadcast list. All non-broadcast parties indicators remain blanked.

2-5. CSS Switch Full Duplex Connection Service.

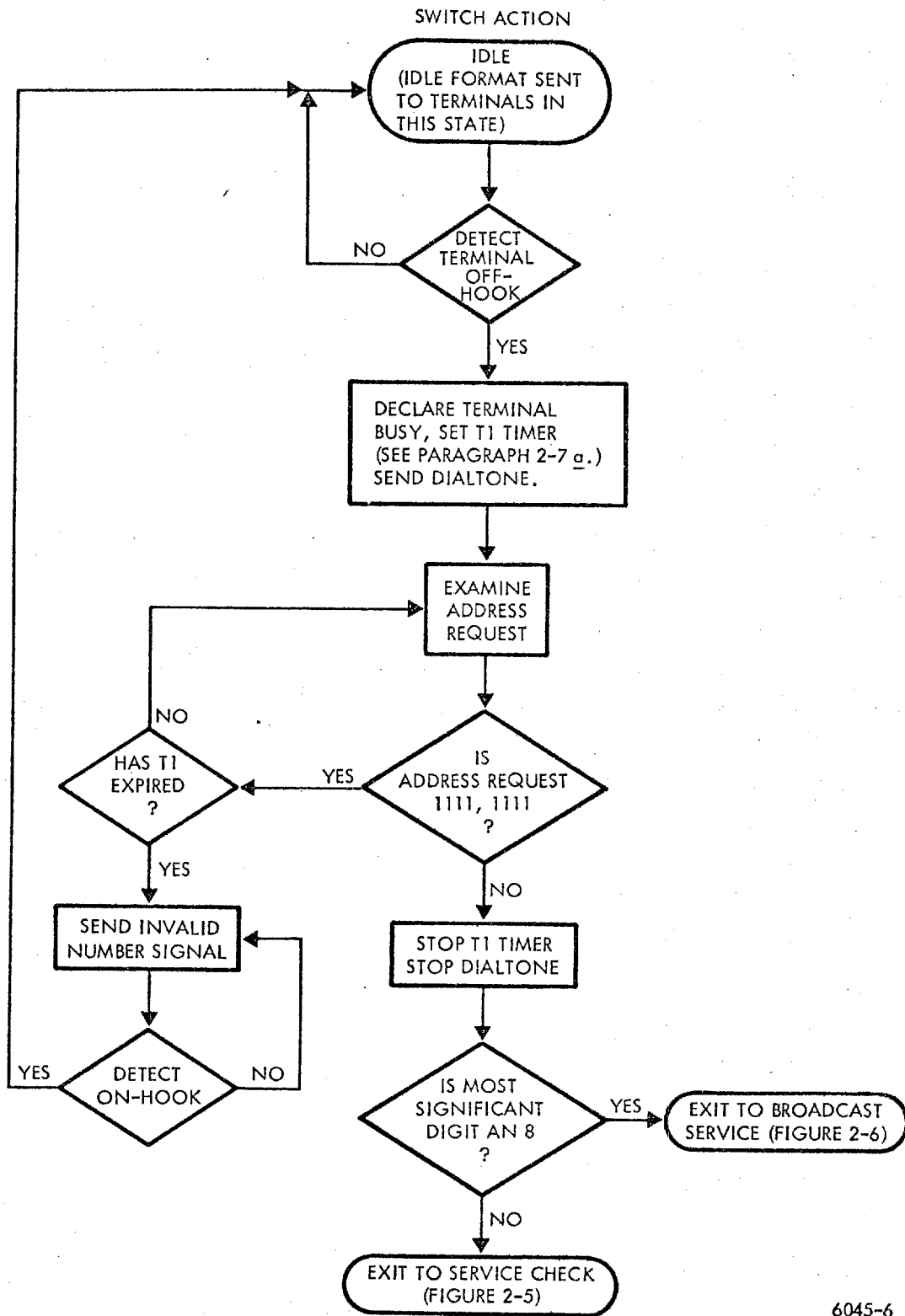
The CSS switch automatically carries out sequenced actions to connect any network pair for simultaneous full duplex voice and facsimile transmission and reception when the proper status signals are received from the pair (paragraph 2-4. a.) and they are not class marked (paragraph 2-7. b.) for no-connection. The CSS switch will automatically disconnect the pair when the calling party has completed transmission/reception and has hung up the handset (on-hook). The sequence of events that take place for full duplex connection service is shown in figure 2-4.

a. Service Check. The CSS switch performs a service check for each request for service as defined in figure 2-4. Requests will be rejected if the number is invalid or out-of-service. Figure 2-5 shows the sequence in which the request is considered and rejected, or processed.

b. Self Call. The CSS switch bypasses the busy mode constraints and simplex connects any calling party back to itself when the calling party is not receiving a transmission and the calling party's own address is received at the CSS switch.

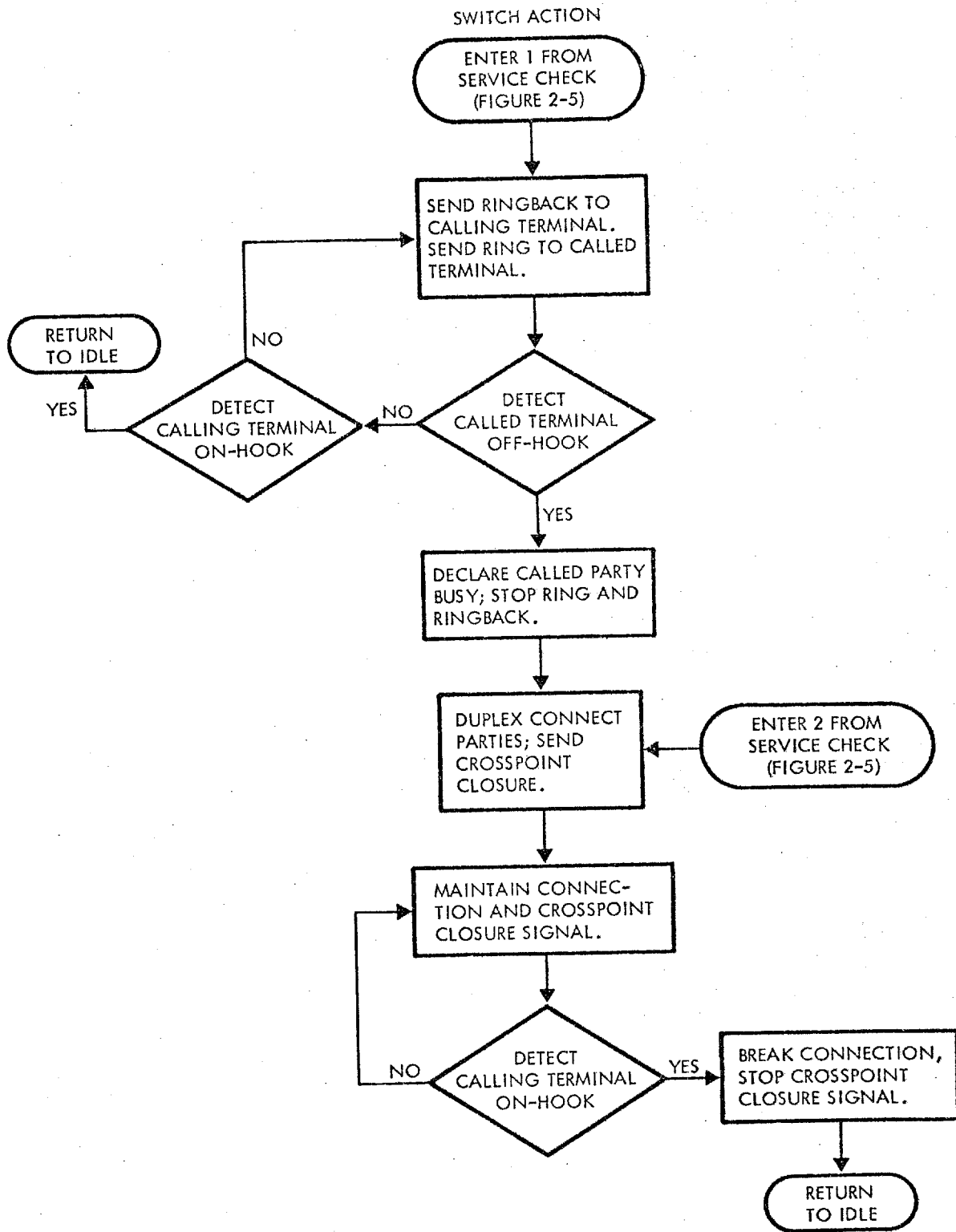
c. Service Limitations. The CSS switch cancels any requested service if the calling party goes on-hook at any point during the duplex connection or service check sequence (figure 2-4, 2-5).

d. Loss of Sync. If loss of sync is detected by the CSS switch during duplex service, the connection (or pending connection) is removed and both parties are connected to the CSS switch idle format. If the in-sync party remains off-hook, dialtone is sent to that party. If the out-of-sync party remains off-hook after restoration of sync, that party is sent dialtone.



6045-6

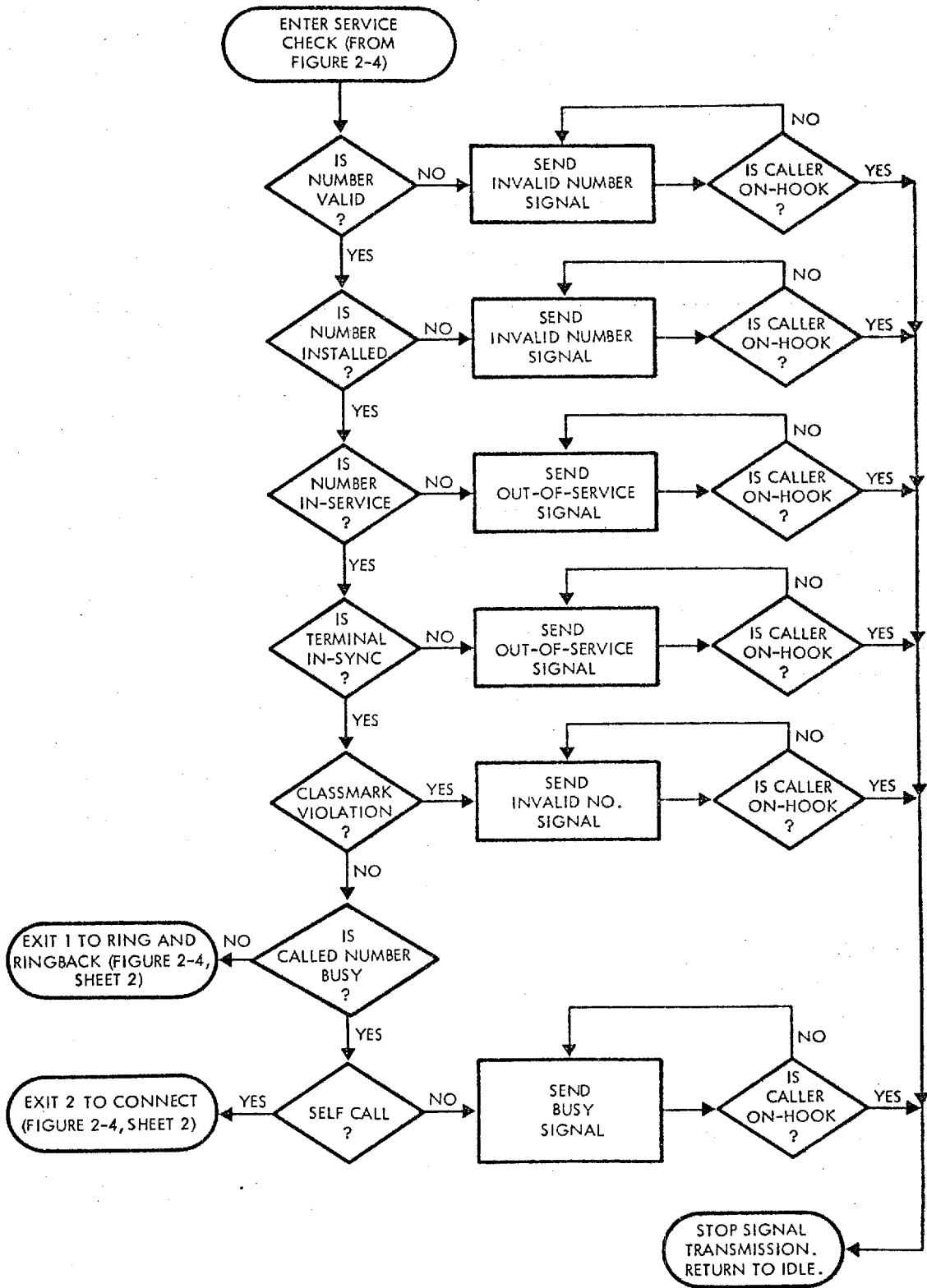
Figure 2-4. Duplex Connection Service Flow Diagram (Sheet 1 of 2)



6045-7

Figure 2-4. Duplex Connection Service Flow Diagram (Sheet 2 of 2)

SWITCH ACTION



6045-8

Figure 2-5. Connection Service Check Flow Diagram

2-6. CSS Switch Broadcast Connection Service.

The switch automatically carries out sequenced actions, information signal detection and generation, and RTS interconnection/disconnection when a broadcast address (numbers 80 through 89) is received at the CSS switch from an authorized broadcast party (broadcast initiator). The CSS switch is configured to provide this service to only one broadcast initiator in the network at a time. The CSS switch is programmable to allow a specified interval of time (T2) for called broadcast parties who are already duplex or simplex (self call) connected, to complete their transmission/reception prior to receiving a broadcast (see paragraph 2-7. a. (2)). The CSS switch is also programmable to configure up to 10 broadcast lists authorizing broadcast reception and 10 broadcast initiator lists to authorize broadcast transmissions for the associated broadcast lists (see paragraph 2-7 c. and d.). The broadcast connection between broadcast parties is simplex, allowing only the broadcast initiator to transmit facsimile and voice data to RTS's on the broadcast list. The sequence of events that take place for broadcast connection service is shown in figure 2-6.

a. Service Limitations. The CSS switch cancels broadcast service if the broadcast initiator goes on-hook at any point during the broadcast sequence as defined in figure 2-6.

b. Loss of Sync. When loss of sync is detected on the broadcast initiator's line, the broadcast is canceled and all lines (terminals) released for resumption of normal service. If sync loss occurs on any broadcast list party line after crosspoint connection, the loss of sync causes no effect on the broadcast. Loss of sync prior to crosspoint closure is treated according to individual terminal status.

c. Resumption of Service. The CSS switch automatically provides normal full duplex service (and service checks) to all noninvolved parties during a broadcast. After exiting broadcast service, the CSS switch automatically resumes all connection services.

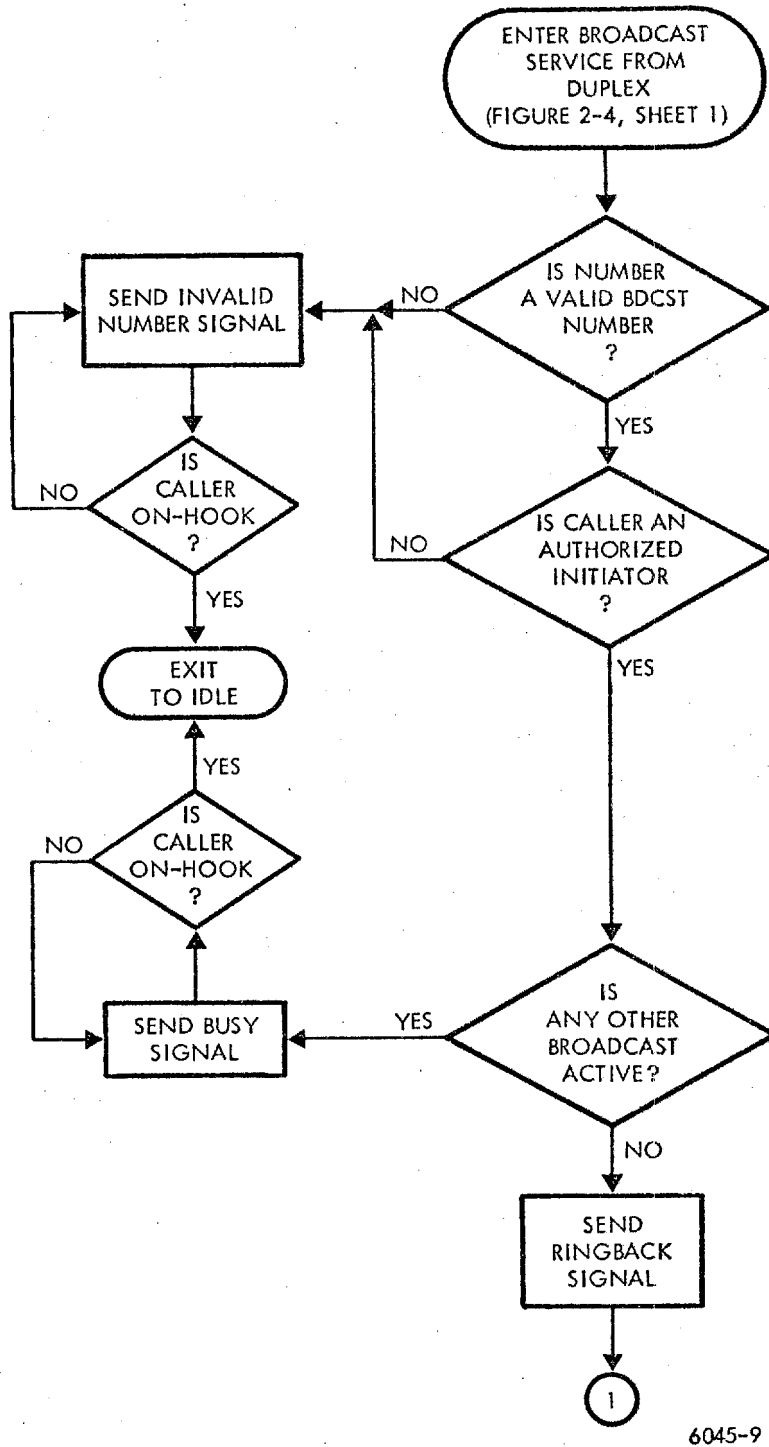
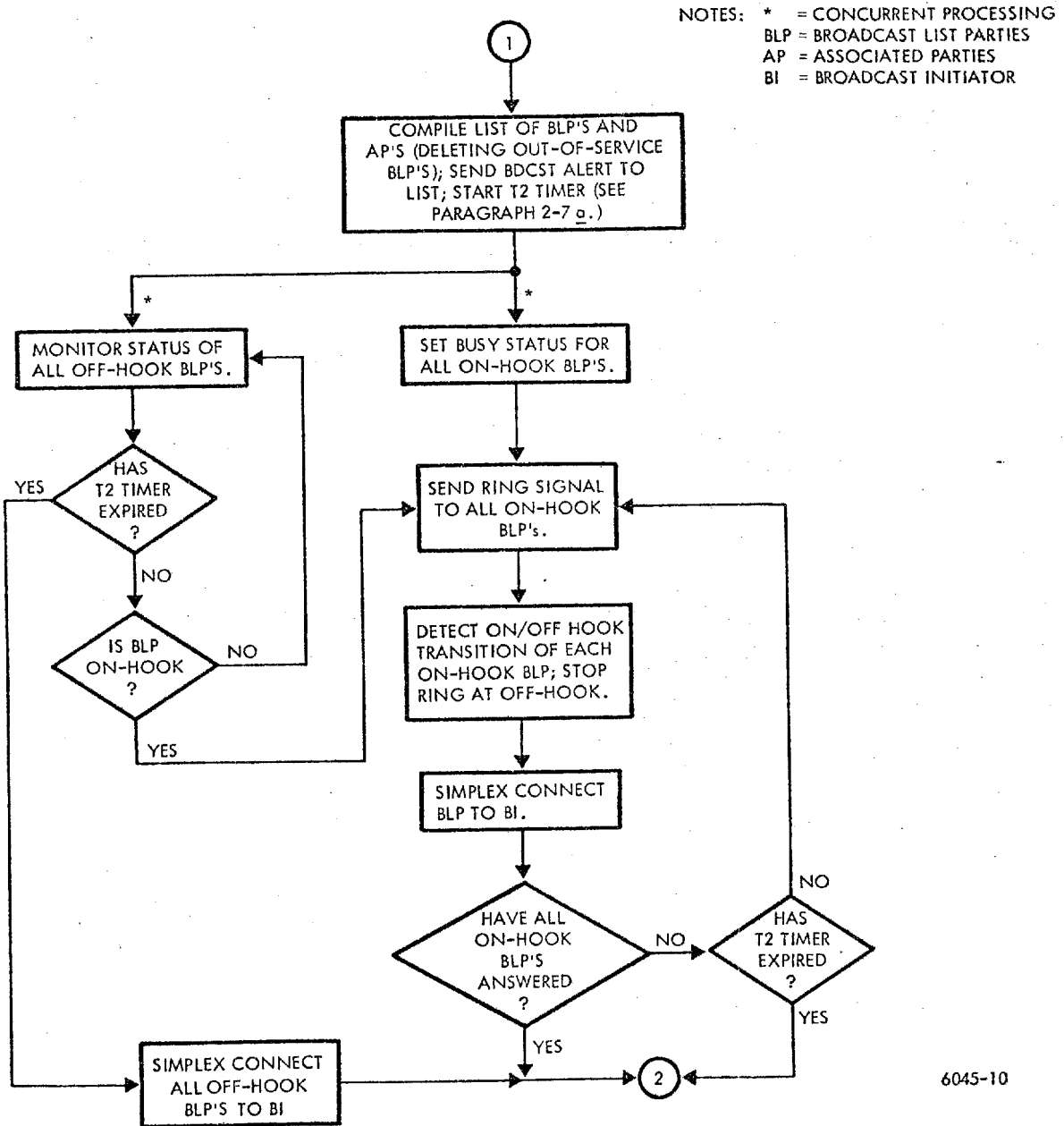
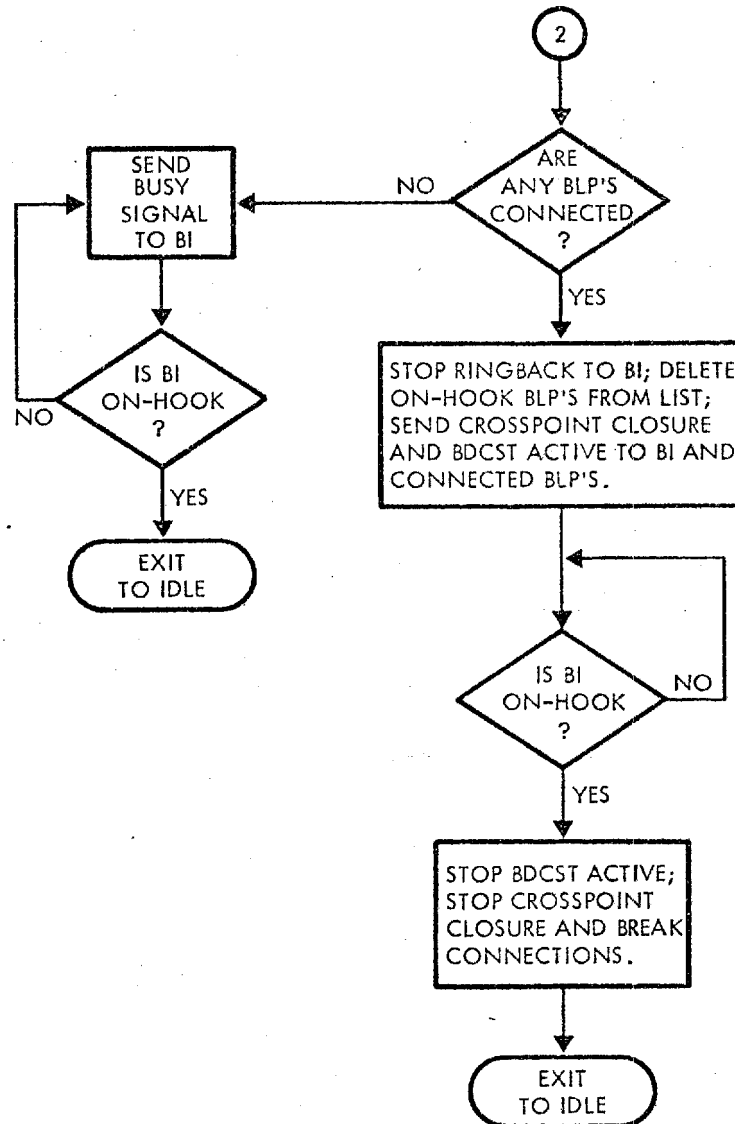


Figure 2-6. Broadcast Sequence Flow Diagram (Sheet 1 of 3)



6045-10

Figure 2-6. Broadcast Sequence Flow Diagram (Sheet 2 of 3)



6045-11

Figure 2-6. Broadcast Sequence Flow Diagram (Sheet 3 of 3)

2-7. Programmable Functions.

The following items in the system program can be modified by the operator. (See paragraph 3-7 and 3-8 for additional details.)

a. Switch Timers

(1) T1 is the CSS switch duration between send dialtone and send invalid number informaton signal. The RTS operator, after removing his handset from the hook and receiving dialtone, must request an address within T1 seconds or the dialtone is removed and the CSS switch sends the Invalid Number signal. The time is programmable from 1 to 35,000 seconds. Normal settings are generally 10 to 20 seconds. The higher settings can be used for maintenance purposes.

(2) T2 is the CSS switch duration between send and remove Broadcast Alert. This time is used to allow called broadcast list parties who are presently busy (connected in either duplex or simplex (self call) mode) to complete their transmission and reception prior to receiving Broadcast Active. Normal RTS transmission/reception of documents takes 60 seconds. T2 time is programmable from 1 to 35,000 seconds. Normal setting must be greater than 60 seconds dictated by RTS equipment constraints. Higher settings can be used for maintenance purposes.

b. RTS Class Marking. The CSS switch is programmable to class mark all RTS subscribers in one of four levels for the purpose of limiting access to other subscribers. These class marks limit access to duplex connections, and limit access to broadcast initiator lists and broadcast lists. The four levels of access and their corresponding class marks are:

Level 1 - has access to all RTS subscribers.

Level 2 - has access to all RTS subscribers except Level 1.

Level 3 - has access to Level 3 and Level 4 RTS subscribers only.

Level 4 - has access to Level 4 subscribers only.

All calls to numbers to which connections are prohibited by class marking are not connected and an Invalid Number signal is sent to the unauthorized caller.

c. Broadcast Initiators. The CSS switch is programmable to configure up to ten unique broadcast initiator lists for each of the ten broadcast lists. Up to a maximum of 60 RTS subscribers can be assigned to each broadcast initiator list. Each list is class marked by the class mark of the first RTS assigned to it, requiring additional RTS's to have an equivalent class mark. Therefore, all RTS's on a broadcast initiator list must have the same class mark.

d. Broadcast Lists. The CSS switch is programmable to configure up to ten unique broadcast lists. Up to a maximum of 60 RTS subscribers can be assigned to each list. Each list is class marked by the class mark of the first RTS assigned to it, requiring additional RTS's to have an equivalent class mark. Therefore, all RTS's on a broadcast list must have the same class mark.

e. RTS and CSS In or Out-of-Service. The CSS switch is programmable to mark an RTS in or out-of-service. All calls to an RTS marked out-of-service by the switch are not connected and an Out-of-Service signal is sent to the calling party. The out-of-service RTS line is not monitored by the CSS switch and no signals (including Dialtone) are sent by the switch to the out-of-service RTS. The CSS switch is also programmable to mark itself in or out-of-service. When the CSS switch is marked out-of-service, all RTS subscribers are declared out-of-service.

NOTE

RTS put in a maintenance loopback mode (initiated at the RTS) will appear to other RTS's as out-of-service.

f. RTS Installed or Removed. The CSS switch is programmable to mark an RTS installed or removed from the network. All calls to an RTS not marked as installed are disregarded and an Invalid Number signal is sent to the calling party.

2-8. Power Monitor.

a. AC Power Interruptions. Whenever ac power to the CSS switch violates the standard power failure detection thresholds of the computer system, the CSS switch stores the power failure status and shuts down. When ac power is restored to the CSS switch, the computer goes into an automatic power-up routine, disconnects all party interconnections, master clears all operating modes and diagnostics, and sends Dialtone to all off-hook parties. The CSS switch then starts all normal operating modes and diagnostics without regard to prefailure states and prints out the power failure as "PF" on the data terminal.

b. DC Power Interruptions. The CSS switch 5 volt and 12 volt dc power supplies (2A4) for the switch matrix and line control units are equipped with over/under voltage failure detectors which are used to generate dc power bus failures status. When a dc power failure occurs, the CSS switch prints out the power failure on the data terminal as "5 VOLT SUPPLY FAILURE" or "12 VOLT SUPPLY FAILURE" as appropriate.

Section III. OPERATION

3-1. General.

a. This section provides descriptions of all operator controls and indicators, system power start-up procedures, and system operating procedures. Prior to any operation of the Central Site Subsystem (CSS), it is recommended that the operator be completely familiar with the functions of the controls and indicators (paragraph 3-2), operator messages (paragraph 3-3), operator general instructions (paragraph 3-4), system operating sequences and programmable functions given in Section II of this manual, and the following Digital Equipment Corporation manuals for basic operating procedures:

PDP-11/04 Users Guide EK11004-OP-PRE

DEC LA36/LA35 DECwriter II Users Manual

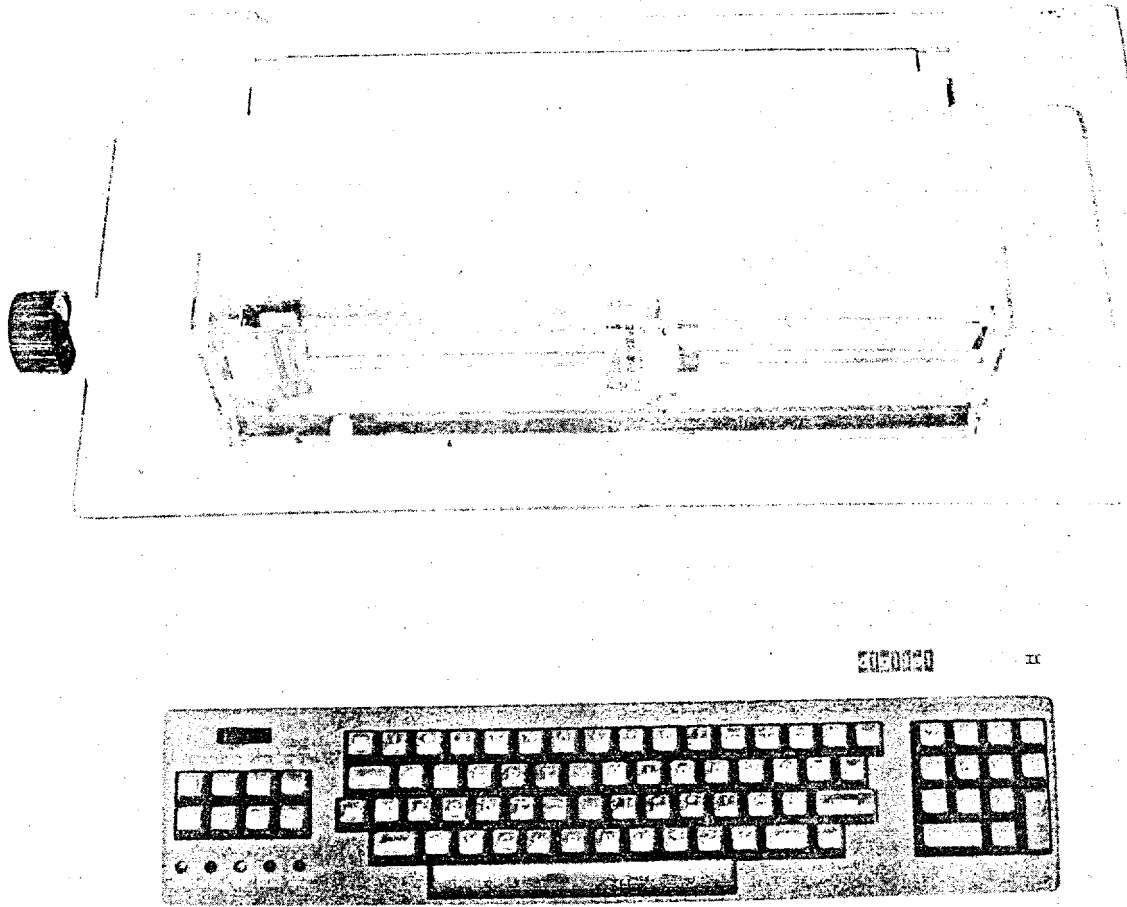
RX01-CA Floppy Disc System Users Manual DEC EK-RX01-MM-002.

b. The PC11 paper tape reader/punch described in the previous section of this manual is used for maintenance purposes and is not required for normal operation of the system. For reference purposes only, see Digital Equipment Corporation manuals EK-PC11-TM-003 and EK-PC04/05-OP.

c. This section also provides procedures for duplicating diskettes (paragraph 3-9).

3-2. Controls and Indicators.

Functions of the LA36 controls and indicators are given in DEC LA36/LA35 DECwriter II Users Manual and illustrated for reference purposes in figure 3-1. Functions of controls and indicators of all other equipment are given in tables 3-1 (PC-11 punch/reader), 3-2 (PDP 11/04 computer), 3-3 (power supply), 3-4 (system control), 3-5 (timing distribution) and 3-6 (CICU), and are illustrated in figures 3-2, 3-3, 3-4, 3-5, 3-6 and 3-7, respectively.



77-2363

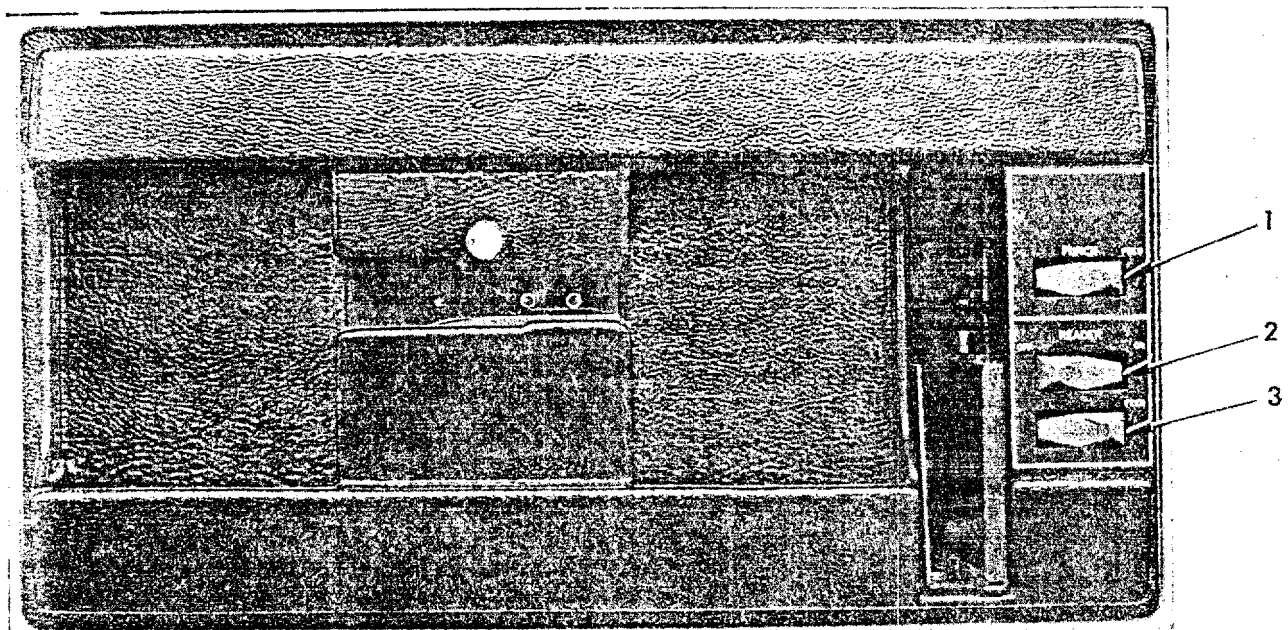
Figure 3-1. LA36 Keyboard Printer/Loader Controls and Indicators (Unit 1)

3-3. Operator Messages.

The cause and effect of all operator messages printed out on the data terminal are given in table 3-7.

Table 3-1. Paper Tape Reader/Punch (PC-11) Controls and Indicators (2A2)

Item Fig. 3-2	Nomenclature	Description	Function
1.	PUNCH FEED	Spring loaded switch, normally off.	When pressed and held in FEED position, advances paper tape through punch.
2.	READER ON/OFF	Two position rocker switch	When set to ON applies power to enable reader.
3.	READER FEED	Spring loaded switch, normally off.	When pressed and held in FEED position, advances the paper tape through reader.



77-2364

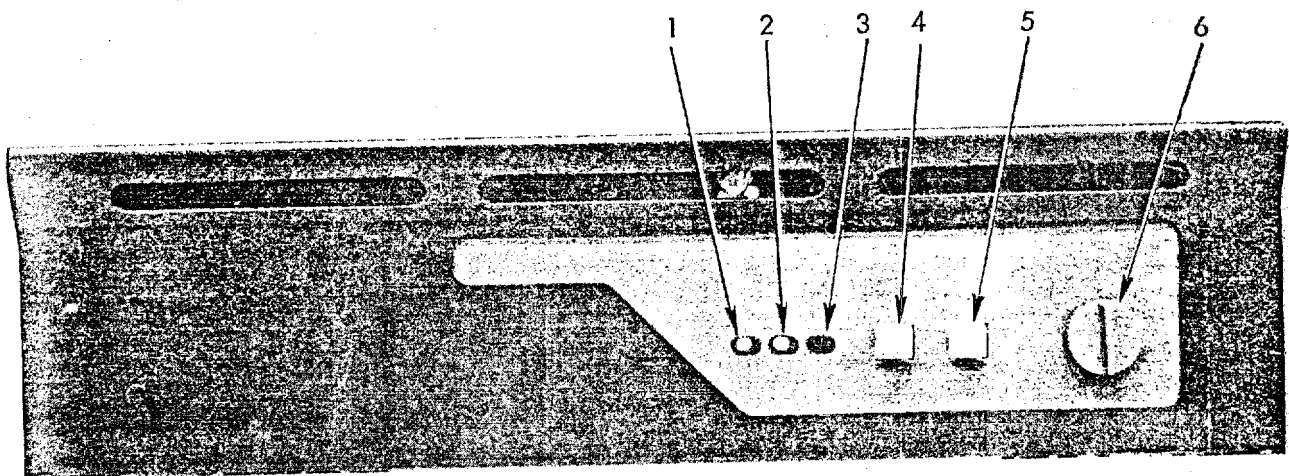
Figure 3-2. Paper Tape Reader/Punch (PC-11) Controls and Indicators (2A2)

Table 3-2. Computer (PDP 11/04) Front Panel Controls and Indicators (2A3)

Item Fig. 3-3	Nomenclature	Description	Function
1.	RUN	Indicator	<p>When lit, indicates machine is in one of following states:</p> <ol style="list-style-type: none"> 1. Running the user's programs. 2. Failed internal GO/NO-GO diagnostic and is executing a programmed loop. 3. Performing an unanticipated loop as a result of a program error. 4. Attempting to run but disabled due to a system hardware failure.
2.	DC ON	Indicator	<p>Whenever power switch (see item 6) is ON, DC ON indicator should be lit, indicating the presence of dc power to the machine logic.</p>
3.	<p>BATT (Battery)</p> <p>-NOTE- The Battery option is not included in the ITS-W equipment</p>	Indicator	<p>Indicates condition of backup battery (option) by its flash rate as follows:</p> <ol style="list-style-type: none"> 1. Slow flash (1 flash/2 sec), battery charging. 2. Fast flash (10 flashes/sec), battery discharging. 3. On (continuous), battery is present and fully charged.

Table 3-2. Computer (PDP 11/04) Front Panel Controls and Indicators
(Continued)

Item Fig. 3-3	Nomenclature	Description	Function
4.	BOOT/INIT (Boot/ Initialize)	Spring action momentary switch normally in the BOOT position.	Initiates action only when moved to or from INIT position. When When held in INIT position causes a con- tinuous initialization of processor. When switch is released to BOOT position, system will BOOT.
5.	CONT/HALT (Continue/ Halt)	Two position rocker switch	Used to manually halt processor or resume operation from halt state without reiniti- alizing processor. When switch is in HALT position causes processor to halt. The system (including keyboard function) cannot run in this position. Switch is always placed in CONT position during normal operation.
6.	DC OFF/DC ON/ STNDBY	Three position rotary selector switch	Allows the following modes of operation: 1. DC OFF - power is removed from system. (The con- tents of MOS memory are lost, fans are off). 2. DC ON - system is fully powered. 3. STNDBY - dc power is only applied to MOS memory to avoid loss of information, fans remain on.

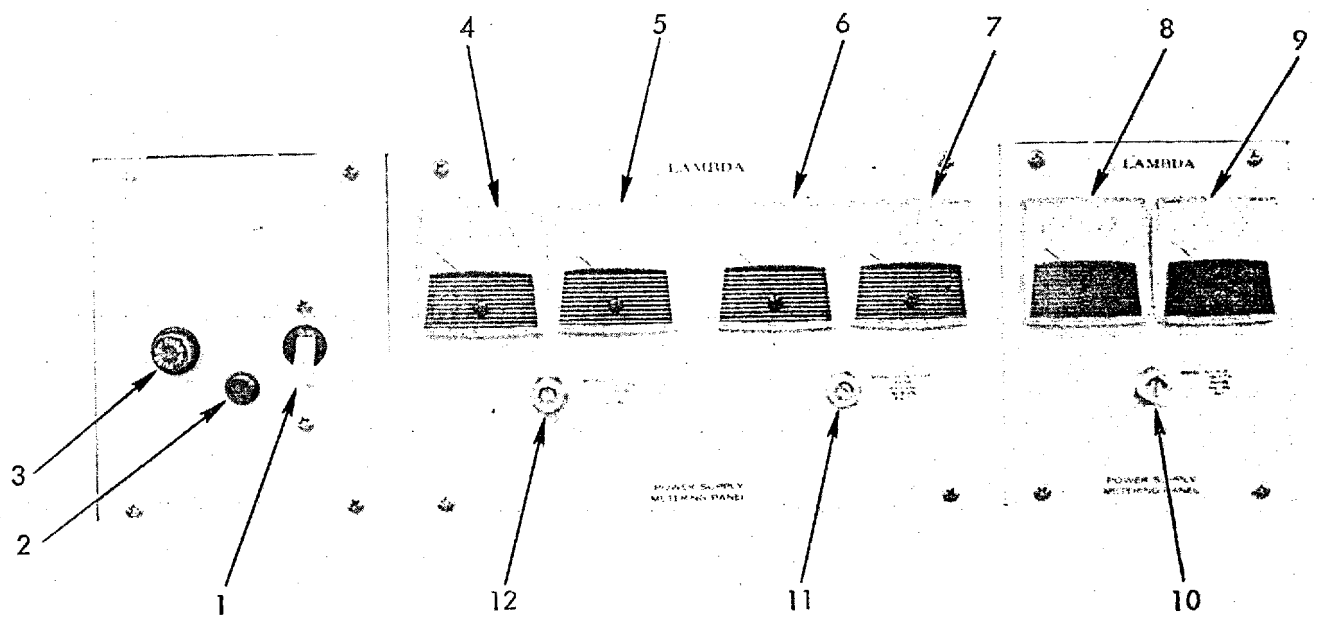


77-2368

Figure 3-3. Computer (PDP 11/04) Front Panel Controls and Indicators (2A3)

Table 3-3. Power Supply Controls and Indicators (2A4)

Item Fig. 3-4	Nomenclature	Description	Function
1.	Power on/off switch	Two position toggle switch	When set to on position (up) applies ac power to all dc power supplies.
2.	Power on indicator	Indicator (red)	When lit, indicates power to unit is on.
3.	Fuse	3AG, 30 amps, 250 volts	Fuses input ac power to unit.
4.	Voltmeter (12 V dc)	V-DC Meter Range - B Scale (0-20 V) x 1	Indicates voltage output of 12 V dc power supply.
5.	Ampmeter (12 V dc)	MA-DC Meter Range - F Scale (0-500 mA) x 100	Indicates current load of 12 V dc power supply.
6.	Voltmeter (5 V dc)	V-DC Meter Range - A Scale (0-10 V) x 1	Indicates voltage output of 5 V dc power supply.
7.	Ampmeter (5 V dc)	MA-DC Meter Range - E Scale (0-20 mA) x 10,000	Indicates current load of 5 V dc power supply.
8.	Voltmeter (15 V dc)	V-DC Meter Range - B Scale (0-20 V) x 1	Indicates voltage output of 15 V dc power supply.
9.	Ampmeter (15 V dc)	MA-DC Meter Range - D Scale (0-10 mA) x 1000	Indicates current load of 15 V dc power supply.
10.	15 Volt Adjustment	Common screwdriver adjustment potentiometer	Adjusts the 15 V dc power supply output voltage.
11.	5 Volt Adjustment	Common screwdriver adjustment potentiometer	Adjusts the 5 V dc power supply output voltage.
12.	12 Volt Adjustment	Common screwdriver adjustment potentiometer	Adjusts the 12 V dc power supply output voltage.

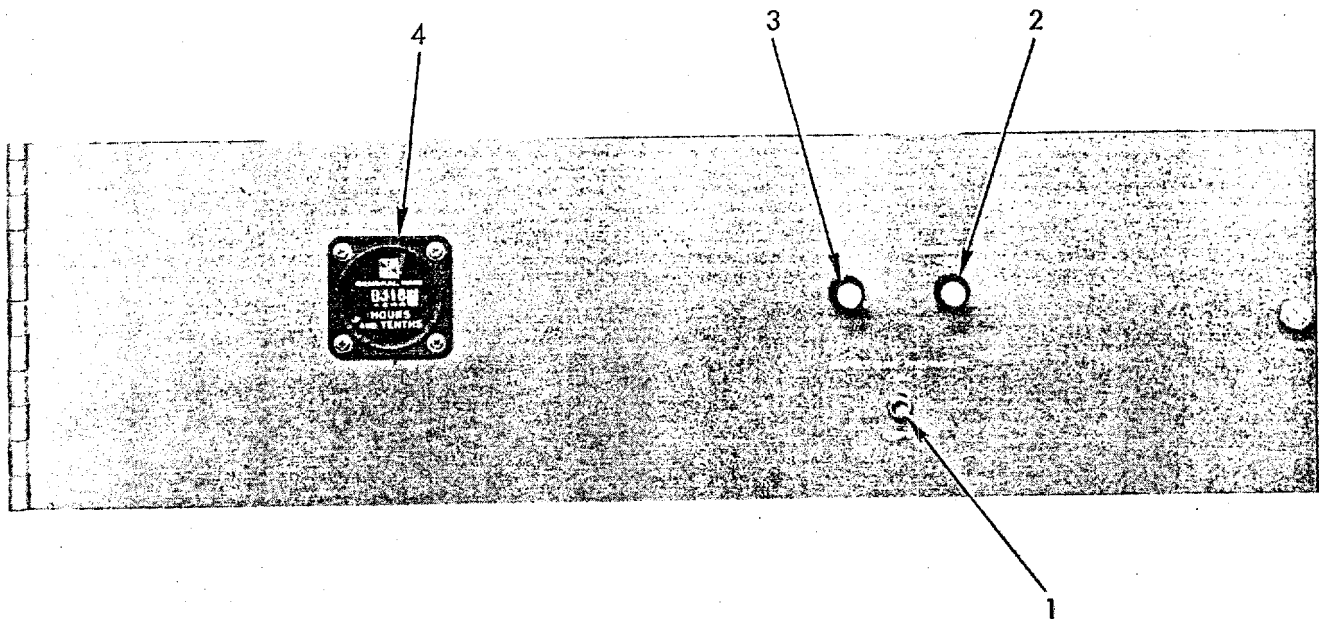


77-2366-1

Figure 3-4. Power Supply Controls and Indicators (2A4)

Table 3-4. System Control Unit Controls and Indicators (2A5)

Item Fig. 3-5	Nomenclature	Description	Function
1.	System Power ON/OFF	Two operating position toggle switch. Spring loaded to center position.	When toggled to ON position applies ac power to all system CSS switch equipment.
2.	POWER ON	Indicator (green)	Lights when ac power is applied to system CSS switch equipment (when power switch is ON).
3.	AC INPUT	Indicator (green)	When lit, indicates ac power is available from user's source and the CSS switch rack main power circuit breaker is ON.
4.	ELAPSED TIME	Hours and tenths elapsed time meter	Indicates accumulated time System Power has been ON.



77-2366-2

Figure 3-5. System Control Unit Controls and Indicators (2A5)

Table 3-5. Timing Distribution Unit Controls and Indicators (4A2)

Item Fig. 3-6	Nomenclature	Description	Function
1.	Power ON/OFF	Circuit breaker switch	When set to the ON position, fuses ac input to unit and applies ac power to internal dc power supplies.
2.	STATION CLOCK	LED indicator	When lit, indicates system timing is operating from Station Clock or is available. Remains lit during normal system operation. When extinguished, indicates Station Clock is not available.
3.	INTERNAL CLOCK	LED indicator	When lit, indicates internal clock is running. Remains lit during normal system operation.
4.	INTERNAL CLOCK SELECTED	LED indicator	When lit, indicates unit has detected a loss of Station Clock and has switched to Internal Clock for COMSEC and CSS switch timing. Remains lit until RESET button is depressed.
5.	RESET	Momentary pushbutton switch	When depressed and released, resets system timing from Internal Clock to Station Clock.

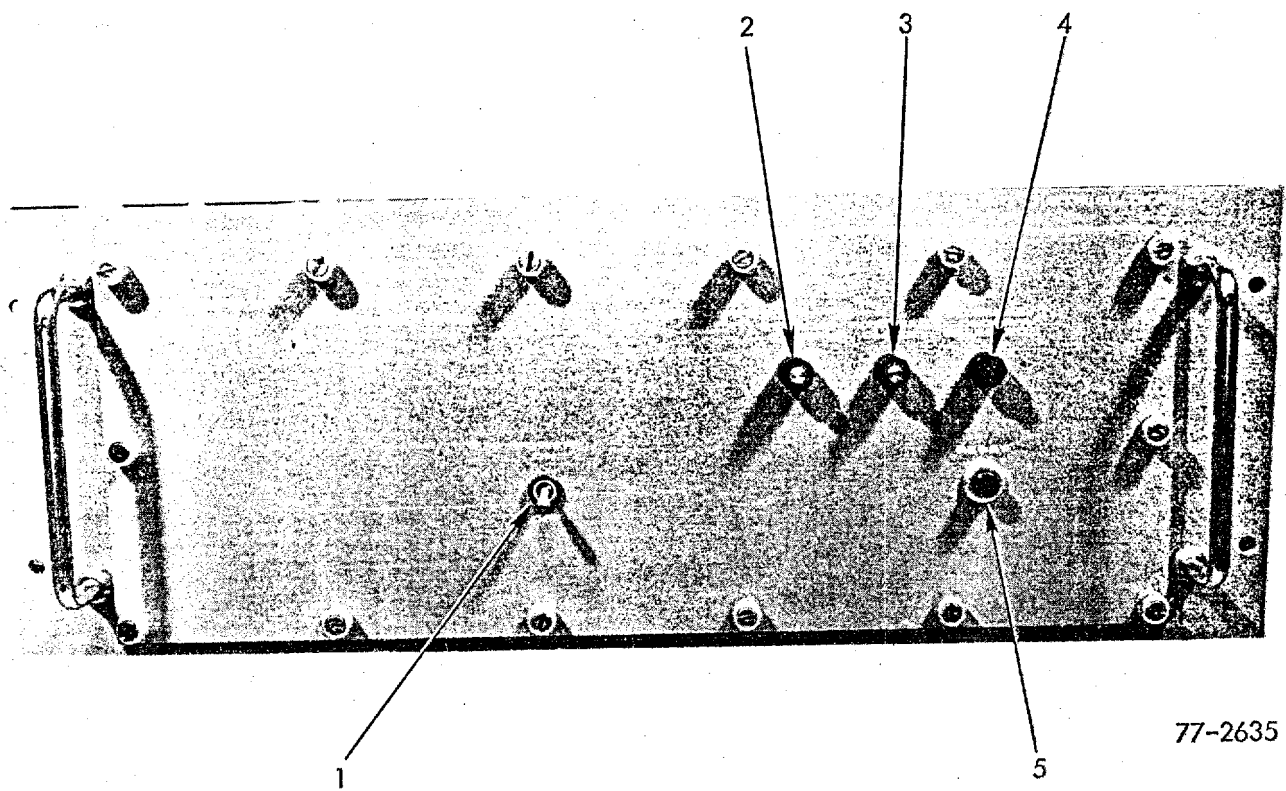
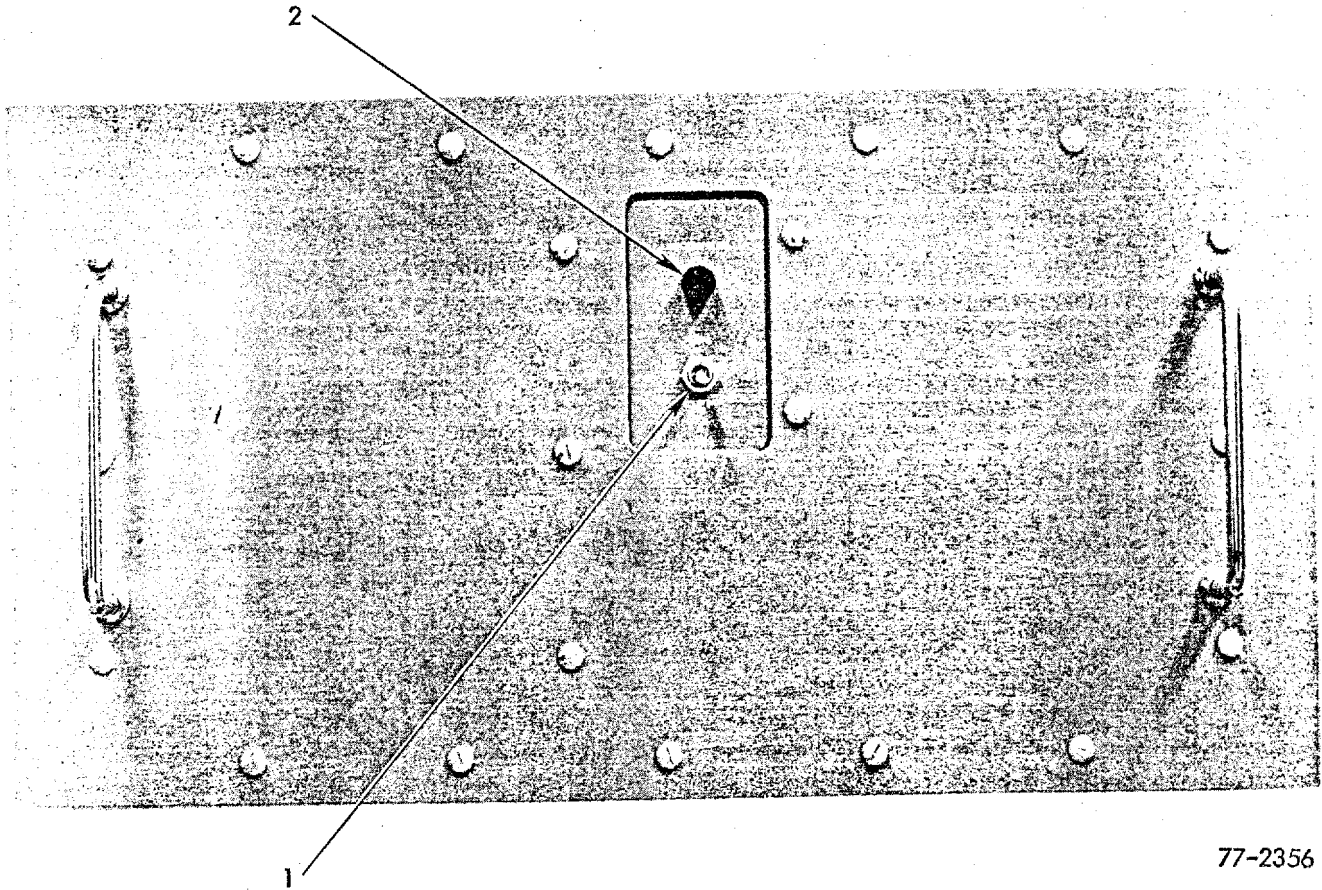


Figure 3-6. Timing Distribution Unit Controls and Indicators (4A2)

Table 3-6. COMSEC Interface Conditioning Unit Controls and Indicators

Item Fig. 3-7	Nomenclature	Description	Function
1.	Power Switch ON/OFF	Circuit Breaker Switch	When set to ON position, fuses ac input to unit and applies ac power to internal dc power supplies.
2.	Power (indicator)	Indicator (white)	When lit indicates power is applied to unit.



77-2356

Figure 3-7. COMSEC Interface Conditioning Unit Controls and Indicators

Table 3-7. CSS Operator Messages

Message	Cause	Effect
<p>SWITCH ON LINE, NO. RT'S IN SERVICE = XX</p> <p>PF</p> <p>5 VOLT SUPPLY FAILURE</p>	<p>Software has just been initialized for one of three reasons:</p> <ol style="list-style-type: none"> 1 - Start Up 2 - CSS being marked on-line after an off-line operation (Menu No. 3) 3 - Power application after failure. <p>Whenever ac power drops below 95 volts or outside a limit of 47 to 63 Hz as measured by dc power, the hardware power failure sequence is initiated.</p> <p>CSS switch 12 volt supply has dropped below allowed lower limit voltage.</p>	<p>All RTS's have been connected to idle and static data base (SDB) on disc has been transferred into core. No of RTS's found with in-service bit set, has been indicated in message.</p> <p>When power is re-applied, software outputs this message and initializes system. Thus, all switch connections are broken and all RTS's are connected to idle. Any SDB changes that had not been saved on disc, have been lost.</p> <p>Software will output this message once per failure. Software will continue attempting output to interface so that when power is restored, normal</p>

Table 3-7. CSS Operator Messages (Continued)

Message	Cause	Effect
<p>12 VOLT SUPPLY FAILURE</p>	<p>CSS switch 12 volt supply has dropped below allowed lower limit voltage.</p>	<p>operations automatically continue with no operator intervention. No commands are lost.</p> <p>Software will output this message once per failure. Software will continue attempting output to interface so that when power is restored, normal operations automatically continue with no operator intervention. No commands are lost.</p>
<p>STBD NOT FOUND - ABORT</p>	<p>During initialization process software did not find static data base file (named STBD Bin) on the floppy disc, unit 0.</p>	<p>Program ITS has aborted back to RT-11 operating system. STBD must be recreated by executing program file. New STBD will have a new password for SDB modification.</p>

Table 3-7. CSS Operator Messages (Continued)

Message	Cause	Effect
STDB READ ERROR - ABORT	During initialization, a disc read error occurred while reading in file STDB Bin.	Program ITS has aborted back to RT-11. Suggest reentry of executing ITS prior to executing program file.
DDS INTERFACE FAILING	Three consecutive parity errors occurred on the digital data switch (DDS) output interface.	Software does not reset interface. Commanding will continue with these time error counters set to zero.
NO PROTECT ALLOWED OF PFAIL	During initialization the ITS program requested utilization of the power failure interrupt trap vectors. RT-11 has determined that it will not allow user utilization of these vectors.	Unlikely to occur since RT-11 is not presently using these vectors. Restart program if this does occur.
SWITCH OFFLINE	The operator has placed the entire CSS off-line to RTS's switching requests via the SDB modification of in or out-of service mods 0,0 (Menu No. 3).	CSS will not respond to any LCU input changes until on-line command is given through the SDB mod in or out-of-service of 0, 1. Com-posite receiver status output continues through off-line state.

Table 3-7. CSS Operator Messages (Continued)

Message	Cause	Effect
<p>ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE (menu prompt)</p> <p>MENU SELECTIONS ARE:</p> <ul style="list-style-type: none"> 1-TIMER MODS 2-CLASS MARKING MODS 3-IN OR OUT OF SERVICE MODS 4-INSTALLATION OR REMOVAL MODS 5-BROADCAST LIST MODS 6-BROADCAST INITIATOR LIST MODS 7-PASSWORD CHANGE 8-SAVE DATA BASE ON DISC - RELOCK TERMINAL <p>ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE</p> <p>ENTER TIMER NO., NEW VALUE IN SECONDS</p>	<p>Operator has:</p> <ol style="list-style-type: none"> 1. Entered proper password. 2. Satisfied last prompt. <p>Operator has entered a carriage return in response to the menu prompt.</p> <p>Operator has selected menu No. 1 in response to the menu prompt.</p> <p>Operator has selected menu No. 2 in response to the menu prompt.</p>	<p>SDB is now available for mods based on next expected operator response. No response to this prompt will cause no harm. A carriage return will cause software to print out menu selections.</p> <p>List of legal menu inputs will be output to data terminal and menu prompt message repeated.</p> <p>Software is awaiting a timer number entry and value in seconds (i.e., 1,20,2,85) and carriage return.</p> <p>Software is awaiting N entries of the type RT No, (1-4) (i.e., 15, 1, 16, 2, 10, 4) and carriage return.</p>
<p>ENTER RT NO., CLASS MARKING (1-4)</p>		

Table 3-7. CSS Operator Messages (Continued)

Message	Cause	Effect
ENTER RT NO., 0 = OUT OR 1 = IN	Operator has selected menu No. 3 or no. 4 in response to the menu prompt.	Software is awaiting N entries of the type RT No., 0 (i.e., 15, 0, 17, 1, 40, 1) and carriage return.
ENTER BROADCAST LIST NO.	Operator has selected menu No. 5 or No. 6 in response to the menu prompt.	Software is awaiting a single entry 80 through 89 and carriage return.
PRESENT LIST = XX, YY,	Operator has requested a print-out of either a broadcast list or a broadcast initiator list (menu No. 5 or No. 6).	Software will follow this message with a list mod request.
ENTER RT NO., 1 = ADD OR 0 = DELETE	Operator has responded with a legal broadcast list No.	Software is awaiting N entries of the type RT No., 0 (i.e., 40, 0, 12, 1, 15, 1) and carriage return.
ENTER NEW PASSWORD:	Operator has selected menu No. 7 in response to the menu prompt.	Software is awaiting entry of new password and carriage return.
VERIFY NEW PASSWORD:	Operator has entered a password in response to menu no. 7 prompt.	Software will alter core version of password only if operator responds with "y" and carriage return.

Table 3-7. CSS Operator Messages (Continued)

Message	Cause	Effect
ILLEGAL ENTRY	Operator has responded with: 1-A non-numeric character. 2-Improper No. of fields (entries) 3-Out of range response	Software has made no changes to the SDB. Entire line must be retyped based on prompt which follows this message.

3-4. Operator General Instructions for Normal System Operation.

a. Operator Interface. The operator interfaces with the system computer via the LA36 data terminal keyboard/printer. Through use of the keyboard, the operator loads and initializes the system program. The operator also has the capability to modify specific items in the system program. The program automatically prints out failure reports and other statements as described in following paragraphs.

b. Startup Sequence. The operator startup sequence is to first power up the system, then load and initialize the program. Separate procedures are given for each. Once the system is initialized and the program is running, no operator action is required for normal system operation other than a monitor function.

c. AC Power Failure Reports. Should an ac power failure occur at the CSS switch, the CSS switch automatically sequences to print out the ac power failure as "PF" after power is restored. This report is described in paragraph 2-8, and cause and effect is described in table 3-7 (CSS Operator Messages).

d. DC Power Failure Reports. Should either a 5 volt or 12 volt power failure occur at the CSS switch, the CSS switch prints out the power failure as "5 VOLT SUPPLY FAILURE" or "12 VOLT SUPPLY FAILURE", as appropriate. This report is described in paragraph 2-8, and cause and effect is described in table 3-7.

e. Program Failure Reports. Should a program failure occur during the system initialization process, the CSS switch will print out the appropriate failure as follows:

STDB NOT FOUND - ABORT
STDB READ ERROR - ABORT
DDS INTERFACE FAILING
NO PROTECT ALLOWED ON PFAIL

The cause and effect of these reports are given in table 3-7.

f. Program HALT.



To prevent interruption of the network, DO NOT move the computer CONT/HALT switch to the HALT position during normal system operation.

Should the system program automatically HALT during normal system operation (computer RUN indicator extinguishes), consult site maintenance personnel, or if authorized, move the computer CONT/HALT switch to HALT and back to CONT. The computer will automatically sequence to continue the program.

g. Other Monitor Functions. The operator may be required to monitor the timing distribution unit (4A2). If normal system timing (station clock) is lost and not automatically restored (within a certain period of time), an audible alarm will be heard at the site. The timing distribution unit will automatically switch to the internal clock (INTERNAL CLOCK SELECTED indicator lights). When the station clock is restored (STATION CLOCK indicator lights), press the RESET button to reset the internal clock.

3-5. System Power Startup Procedure.

The following procedure assumes that all COMSEC and link subsystem equipment is turned on and operating, and source power is available to the CSS.

a. Set all three CICU power switches to ON position. Verify that POWER indicators light.

b. Set timing distribution unit (4A2) POWER switch to ON position. Verify that STATION CLOCK and INTERNAL CLOCK indicators light. If INTERNAL CLOCK SELECTED INDICATOR is lit, press RESET button to extinguish.

c. Set CSS switch main power 30 AMP circuit breaker (rear of unit 2, figure 1-6) to ON position. Verify that cabinet blowers are operating.

d. On the system control unit (2A5), verify that AC INPUT indicator is lit. Set power switch to ON position. Verify that POWER ON indicator lights.

e. Set dc power supply (2A4) power switch to on (up) position. Verify that power indicator lights. Verify that voltage indicators read (left-to-right) 11.5 to 12.5 V, 4.75 to 5.25 V, 14.25 to 15.75 V.

f. Set computer (2A3) power switch to DC ON position. Verify DC ON indicator lights and cooling fan is operating.

g. To place LA36 Data Terminal (unit 1) on-line:

(1) Load paper (LA36 Users Manual).

(2) Set LINE/LOC switch to LOC.

(3) Set POWER ON/OFF switch to ON.

(4) Select HDX (half-duplex) on FDX/HDX switch.

(5) Select BAUD RATE 300 switch.

(6) Set LINE/LOC switch to LINE.

(7) The STD CHARACTER SET indicator should be lit.

h. Ensure that the paper tape reader (2A2) ON/OFF switch is in OFF position.

3-6. System Initialization and Run Operation Procedure.

The following procedures load and initialize the system program.

a. Booting the System Operating Program Using the RX01 Disc.

(1) Load diskette marked ITS-W SYSTEM SOFTWARE into RX01 disc drive number 0 (zero).

(2) Place computer HALT/CONT switch in the CONT position.

(3) Depress computer BOOT/INIT switch to INIT position and release.

b. Initialization and Run Operation.

(1) Perform the following keyboard entries and verify printout results on data terminal. Operator keyboard entries are underlined; symbols are (CR) = carriage RETURN key, (SB) = space bar. To delete a character, press the DELETE key; to delete a line, press the CTRL and U keys.

<u>Keyboard Displays and Entries</u>	<u>Remarks</u>
XXXXXX XXXXXX XXXXXX XXXXXX	Register contents at boot (where X = octal number)
<u>\$DXO</u> (CR)	Boot disc in drive No. 0 (zero)
RT-11SJ V02C-02D	Operating program and disc version
• <u>INIT</u> (CR)	Initialize
• <u>R(SB)ITS</u> (CR)	Run ITS program
SWITCH ON LINE, NO. RT'S IN SERVICE = XX	Where X = digit 1-9

(2) The system program is initialized and running. The computer RUN indicator is illuminated and the terminal keyboard is locked. No further entries are required to operate the system. For any modification to the static data base refer to paragraph 3-7.

(3) Close the CSS switch cabinet doors.

3-7. Operator General Instructions for Modifying the System Static Data Base.

a. Access. The operator can access the data base to perform modifications after the system is initialized and running and the proper password for the ITS-W SYSTEM SOFTWARE disc is entered on the keyboard.

b. Data Base Items. Seven data base items (called menu selections) can be modified and include:

<u>Menu Selection No.</u>	<u>Program Function</u>
(1)	Changing elapsed time of timers T1 and T2.
(2)	Assigning or changing remote terminal class marks.
(3)	Placing individual remote terminals or the CSS switch in or out-of-service.
(4)	Installing or removing remote terminals from the network.
(5)	Building or modifying broadcast lists.
(6)	Building or modifying broadcast initiator's lists.
(7)	Changing the system program password for access to the static data base.

These programmable data base items are described in detail in paragraph 2-7 and also summarized in the data base modification procedures in paragraph 3-8.

c. Writing Modifications on Disc. When the data base has been accessed, the system program on disc is transferring into core memory. The operator modifies items as required, then writes the modifications on the disc by typing in a single character, 8 (this is a menu selection). This also locks the keyboard, and the data base cannot be accessed without reentering the proper password. Modifications written into the disc in use will make it different from duplicate discs in storage. For duplication of discs, see paragraph 3-9.

d. Prompt Statements. Prompt statements are printed out by the program for each menu selection during the modification process of the selection. The prompt statements require that the operator perform an action. The statement related to menu selections is given below. Cause and effect of each statement is given in table 3-7.

<u>Menu Selection No.</u>	<u>Statement</u>
(1)	ENTER TIMER NO., NEW VALUE IN SECONDS
(2)	ENTER RT NO., CLASS MARKING (1-4)
(3),(4)	ENTER RT NO., 0 = OUT OR 1 = IN
(5),(6)	ENTER BROADCAST LIST NO. PRESENT LIST = XX, YY, ENTER RT NO., 1 = ADD OR 0 = DELETE
(7)	ENTER NEW PASSWORD: VERIFY NEW PASSWORD: XXXXX

e. Operator General Sequence.

(1) The operator first enters (by keyboard) the proper password related to the disc. The keyboard is unlocked, and a prompt statement ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE is printed out (see table 3-7).

(2) The operator enters the menu selection number (entries 1 through 8) by keyboard after the prompt statement ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE. If the RETURN key (null) is pressed immediately following this prompt statement, a numbered menu selection list will be printed out (Directory Assistance) followed again by the menu select prompt statement.

(3) After the menu selection number has been entered, the program responds with other prompt statements (paragraph d. above) requiring that the operator enter the modifications.

(4) After the modifications are entered, followed by a carriage return (RETURN key), the prompt statement ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE will be printed out if the modifications are accepted by the program. If the prompt statement does not immediately follow operator modifications, no modifications are entered by the program. (If one modification is illegal, all modification entries are illegal and no modifications are accepted by the program.)

(5) In all cases, except a PASSWORD CHANGE, an illegal entry will cause the program to respond with the statement ILLEGAL ENTRY followed by a prompt statement requiring the operator to reenter the modifications. The operator must reenter valid modifications or the program will loop back to ILLEGAL ENTRY followed again by the prompt statement requiring the operator to reenter the modifications. If, after the ILLEGAL ENTRY statement the operator desires not to enter a modification, the loop can be exited by duplicating an item that is already written on the data base; i.e., RT 12 is presently class marked 2. After the ILLEGAL ENTRY statement, class mark RT12 as a 2. This method can also be used if the operator decides not to make any modifications after entering a menu selection number (step (3) above).

(6) Generally, operator entries are declared illegal if the entry is not a numerical character, not within the range of 1 to 8 for the menu selection, or not within the range specified for the modification. Specific ranges for each modification and other illegal entries are given in the procedures for each menu selection (paragraph 3-8).

After legal modifications have been entered, the character "8" is entered to save the data base on the disc and relock the terminal keyboard.

f. Deletion of Entries. Operator entries can be deleted anytime prior to pressing the RETURN key. To delete a single character press the DELETE key; to delete an entire line press the CTRL and U keys.

g. Data Base Log. The system data base provides printouts of broadcast initiator RTS's for each of the ten available broadcast lists, and for RTS's assigned to each of the ten broadcast lists. For each menu selection on the data base it is recommended that a list of each item be composed and permanently logged (per site procedures) for each available disc. The log lists should be updated after the modifications are entered in the program to maintain an up-to-date running log.

3-8. Static Data Base Modification Procedures.

a. Access Procedure. The data base cannot be accessed to perform modifications without entry of a password related to the disc in use. The password is entered after the statement: SWITCH ON LINE, NO. RT's IN SERVICE = XX (where X is a digit 0-9). This statement will appear only after system initialization. The password may be entered anytime the keyboard is locked. When the password is entered, it is not typed out. The following is a valid password entry, where entries underlined are operator entry by keyboard; (CR) is the carriage RETURN key. All other line items are terminal printouts controlled by the computer program.

NOTE

Various diskettes are available for diagnostics that contain the ITS system program. Each diskette is assigned a unique password to access the ITS data base only.

SWITCH ON LINE, NO. RT'S IN SERVICE = XX (where X is digit 0-9)

Password(CR) (Note - Password will not be typed out by the terminal)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE (Note - keyboard is unlocked)

(CR)

MENU SELECTIONS ARE:

- 1 - TIMER MODS
 - 2 - CLASS MARKING MODS
 - 3 - IN OR OUT OF SERVICE MODS
 - 4 - INSTALLATION OR REMOVAL MODS
 - 5 - BROADCAST LIST MODS
 - 6 - BROADCAST INITIATOR LIST MODS
 - 7 - PASSWORD CHANGE
 - 8 - SAVE DATA BASE ON DISC - RELOCK TERMINAL
- ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

The static data base has now been accessed, the menu selections are printed out, and the keyboard is enabled to perform modifications.



Prior to any modifications to the data base, the operator must be completely familiar with the sequence of modification entries and modification procedures in following paragraphs to prevent unauthorized operations of the terminal.

b. Modification Procedures.

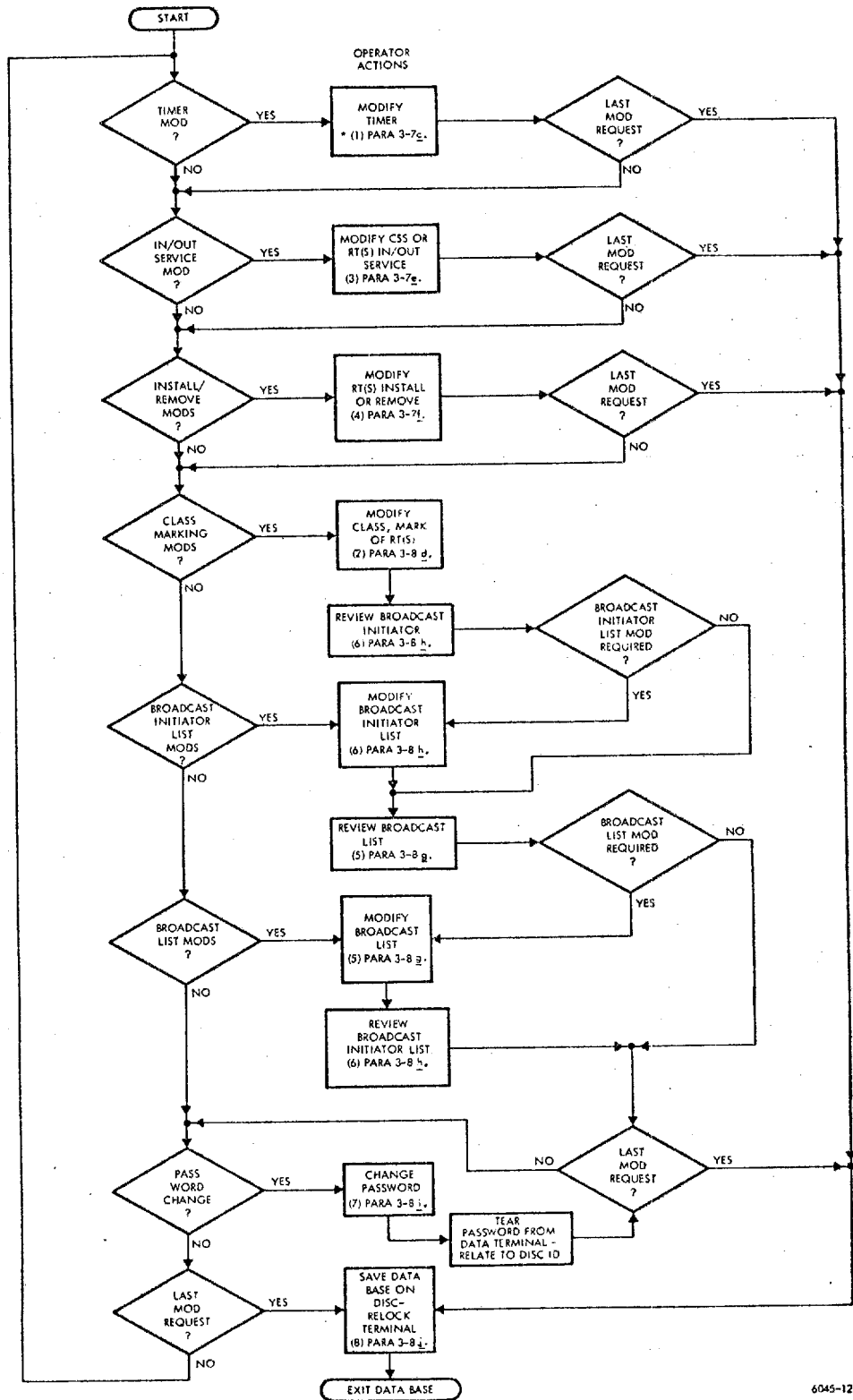


An RT Class Mark Modification does not affect the present broadcast initiator lists or broadcast lists. It is therefore possible that unauthorized broadcasts could take place if these lists are not reviewed for modification and modified as required after the RT Class Mark Modification is entered.

(1) Modifications to the data base must follow a specific sequence to prevent unauthorized broadcasts due to class mark modifications. The operator sequence of modification entries is given in flow chart form in figure 3-8. Follow the flow chart from top to bottom selecting the modifications desired on the left hand side. When operator action is directed (rectangular blocks), proceed to the referenced paragraph for the modification procedures. The sequence directs that after the last modification request, the operator enter menu 8 (SAVE DATA BASE ON DISC - RELOCK TERMINAL). This entry writes all modifications on the diskette, exits the data base, and locks the terminal keyboard.

NOTE

Modifications written into the disc in use will make it different from duplicate discs in storage (see paragraph 3-9 for duplication of discs).



6045-12

* NUMBER IN PARENTHESIS INDICATES MENU SELECTION NUMBER.

Figure 3-8. Flow Chart, Operator Sequence of Data Base Modification

NOTE

Modifications to the data base can be saved on the disc on an individual basis if desired. However, since entry 8 exits the data base, the password must be reentered for each subsequent modification entry.

(2) Modification procedures are given for each menu selection. Each procedure has a brief explanation of the function. A complete description of programmable functions is given in paragraph 2-7. Each procedure provides a valid and illegal operator entry sample. Underlined characters in the samples are operator entries by keyboard. The carriage return (RETURN key) is indicated by (CR). All other characters are response printouts controlled by the computer program.

c. Timer Modifications (Menu Select No. 1).

(1) Two timers are available for value modification and are defined as follows:

Timer No. 1 (T1) = Elapsed time between send and remove dialtone and send invalid number signal. Programmable from 1 to 35,000 seconds in 1 second increments.

Timer No. 2 (T2) = Elapsed time between send and remove broadcast alert. Programmable from 1 to 35,000 seconds in 1 second increments.

(2) A valid timer modification is shown in sample 1. Timer identities must be either number 1 or 2 and the time must be within the specified range of 1 to 35,000 seconds or declared an ILLEGAL ENTRY as shown in sample 2.

Sample 1 (Valid Entry)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

1(CR)

ENTER TIMER NO., NEW VALUE IN SECONDS

1,30,2,60(CR)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

Sample 2 (Illegal Entry - circled character)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

1(CR)

ENTER TIMER NO., NEW VALUE IN SECONDS

1,30,(3),60(CR)

ILLEGAL ENTRY

ENTER TIMER NO., NEW VALUE IN SECONDS

d. RTS Class Marking Modifications (Menu Select No. 2).



To prevent possible unauthorized broadcasts, examine broadcast initiator lists (Menu Select 6) and broadcast lists (Menu Select 5) for modification when class marks of RTS's are modified.

(1) All RTS subscribers are class marked for the purpose of limiting access to selected RTS subscribers. The class mark assigned to each RTS limits access in both duplex connections and broadcast connections. Four levels of class marking are available for assignment to RTS's:

Level 1 - has access to all RTS subscribers.

Level 2 - has access to all RTS subscribers except Level 1.

Level 3 - has access to Level 3 and Level 4 RTS subscribers.

Level 4 - has access to other Level 4 subscribers.

(2) A valid modification is given in sample 1. Class mark modifications must be within the range of 1 to 4 and the RTS identities must be within the range of 10 to 69 or else they will be declared an ILLEGAL ENTRY as given in sample 2.

Sample 1 (Valid Entries)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

2(CR)

ENTER RT NO., CLASS MARKING (1-4)

10,1,11,1,12,2,13,2,14,2,15,3,16,3(CR)

ENTER MENU SELECTION NO., NULL = DIRECTOR ASSISTANCE

Sample 2 (Illegal Entries - circled characters)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

2(CR)

ENTER RT NO., CLASS MARKING (1-4)

10,1,11,1,⑧,2,13,3,14,⑤,15,3,16,3(CR)

ILLEGAL ENTRY

ENTER RT NO., CLASS MARKING (1-4)

e. RTS or CSS In or Out-of-Service Modifications (Menu Select 3).

CAUTION

All RTS's should never be marked out-of-service.
At least one RTS at any one time must be marked
in-service or the system program will not run.

(1) When an RTS is marked out-of-service, the CSS switch will not examine its line and dialtone will not be sent to the out-of-service RTS. Callers to an out-of-service RTS will be sent an out-of-service tone signal.

(2) A valid RTS modification is given in sample 1. RTS identities must be between 10 and 69, a 0 (zero) is used to place an RTS out-of-service and a 1 for in-service. Any other entry will be declared an ILLEGAL ENTRY as shown in sample 2.

(3) For maintenance purposes, the entire CSS switch may be placed out-of-service. The CSS terminal identity is a 0 (zero). A 0 (zero) is used to place the CSS out-of-service and a 1 for in-service. A valid CSS modification is given in sample 3.

Sample 1 (Valid Modification)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

3(CR)

ENTER RT NO., 0 = OUT OR 1 = IN

10,1,11,1,12,1,13,1,14,1,15,1,16,0(CR)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

Sample 2 (Illegal Entry - circled characters)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

3(CR)

ENTER RT NO., 0 = OUT OR 1 = IN

10,1,11,2,12,1,13,14,1,15,1,16,0(CR)

ILLEGAL ENTRY

ENTER RT NO., 0 = OUT OR 1 = IN

Sample 3 (CSS Out-of-Service)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

3(CR)

ENTER RT NO., 0 = OUT OR 1 = IN

0,0(CR)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

SWITCH OFFLINE

(CSS In-Service)

3(CR)

ENTER RT NO., 0 = OUT OR 1 = IN

0,1(CR)

SWITCH ON LINE, NO. RT'S IN SERVICE = XX

NOTE

The CSS switch is now on-line and the password must be reentered to perform modifications to the data base.

f. RTS Installation or Removal Modifications (Menu Select No. 4).

(1) Any RTS that is not marked as installed will not receive dialtone. Callers to an RTS not marked as installed will be sent the invalid number signal.

(2) A valid modification is given in sample 1. RTS identities must be between numbers 10 and 69, a 0 (zero) is used for removing an RTS and a 1 for installing an RTS, or else entries will be declared an ILLEGAL ENTRY as shown in sample 2.

Sample 1 (Valid Modification)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

4(CR)

ENTER RT NO., 0 = OUT OR 1 = IN

10,1,11,1,12,1,13,1,14,1,15,1,16,0(CR)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

Sample 2 (Illegal Entry - circled characters)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

4(CR)

ENTER RT NO., 0 = OUT OR 1 = IN

10,1,11,②,12,1,⑬,14,1,15,1,16,0(CR)

ILLEGAL ENTRY

ENTER RT NO., 0 = OUT OR 1 = IN

g. RTS Broadcast List Modification (Menu Select No. 5).

(1) Ten broadcast lists are available for modification (numbers 80 through 89). This menu selection allows the operator to list the present RTS(s) on the broadcast lists and add or delete RTS's from each list. The maximum number of RTS's that can be assigned to a list is 60. The first RTS entry on the list establishes the list class marking and all RTS additions to the list must have the same class mark. Example: (where number in parentheses is the RT class mark assigned in Menu Select 2) Present broadcast list is RTS's 12 (2), 13 (2), 14 (2). The addition of 15 (3) or 16(1) to the list is an illegal entry. RT 15 (3) can be added to the list by one of two methods: 1) modify RT 15 class mark from 3 to 2, or 2) delete the entire present list and build a new list with the first entry being 15 (3). The new list from this point on will accept only the addition of class mark 3 RTS's. The same methods apply to RT 16 (1).



To prevent unauthorized broadcast operations when broadcast lists are modified, review the associated broadcast initiators list (Menu Select No. 6) to ensure that it has a higher or equivalent class marking than the broadcast list.

(2) The following are illegal operator entries and the ILLEGAL ENTRY statement is printed out by the program.

1. Requesting a broadcast list other than numbers 80 through 89.
2. Entering an RTS identity other than numbers 10 through 69.
3. Entering a character other than 1 or 0 (zero) to add or delete an RTS from the list.
4. Adding an RTS to an established list whose class mark is not the same as other RTS(s) on the list.

(3) The following samples show a valid modification, a review of the modification, and illegal entries.

Sample 1 (Valid modification and review - RTS 12, 13 and 14 are class marked 2)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

5(CR)

ENTER BROADCAST LIST NO.

80(CR)

PRESENT LIST = 12,13,

ENTER RT. NO., 1 = ADD OR 0 = DELETE

14,1(CR)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

5(CR)

ENTER BROADCAST LIST NO.

Review List

80(CR)

PRESENT LIST = 12,13,14,

ENTER RT NO., 1 = ADD OR 0 = DELETE

(CR)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

Sample 2 (Illegal Entry where RT 11 is class marked 1.
Circled characters indicate errors.)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE
5(CR)
ENTER BROADCAST LIST NO.
80(CR)
PRESENT LIST = 12,13,14,
ENTER RT NO., 1 = ADD OR 0 = DELETE
14,0,(11),(1)(CR)
ILLEGAL ENTRY
ENTER RT NO., 1 = ADD OR 0 = DELETE

h. Broadcast Initiator List Modification (Menu Select No. 6)

(1) Ten broadcast initiator lists for each of the ten broadcast lists (numbers 80 through 89) are available for modification. This modification allows the operator to list the present RTS(s) on the broadcast initiator lists and add or delete RTS(s) from each list. The maximum number of RTS's that can be assigned to a list is 60. The first RTS entry on the list establishes the list class marking and all RTS additions to the list must have that same class mark. Example: (where number in parentheses is RTS class mark assigned in Menu Select 2) Present broadcast initiator list is RTS's 12 (2), 13 (2), 14 (2). The addition of 11 (1) or 15 (3) to the list is an illegal entry. RTS 11 (1) can be added to the list by one of two methods: 1) modify RTS 11 class mark from 1 to 2 or, 2) delete the entire present list and build a new list with the first entry being RTS 11 (1). The new list from this point on will accept only the addition of class mark 1 RTS's. The same methods apply to RT 15 (3).

CAUTION

To prevent unauthorized broadcast operations when broadcast initiator lists are modified, review the associated broadcast list (Menu Select No. 5) to ensure that the broadcast list has a lower or equivalent class marking.

(2) The following are illegal operator entries and the ILLEGAL ENTRY statement is printed out by the program.

1. Requesting a broadcast initiator list other than numbers 80 through 89.
2. Entering an RTS identity other than numbers 10 through 69.
3. Entering a character other than 1 or 0 (zero) to add or delete an RTS from the list.
4. Adding an RTS to an established list whose class mark is not the same as other RTS(s) on the list.

(3) The following samples show a valid modification, a review of the modification, and illegal entries.

Sample 1 (Valid modification and review - RT 12, 13 and 14
are class marked 2)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

6(CR)

ENTER BROADCAST LIST NO.

80(CR)

PRESENT LIST = 12,13,

ENTER RT NO., 1 = ADD OR 0 = DELETE

14,1(CR)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

6(CR)

ENTER BROADCAST LIST NO.

80(CR)

Review List

PRESENT LIST = 12,13,14,

ENTER RT NO., 1 = ADD OR 0 = DELETE

(CR)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

Sample 2 (Illegal Entry: where RT 11 is class marked 1.
Circled characters indicate errors.)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

6(CR)

ENTER BROADCAST LIST NO.

80(CR)

PRESENT LIST = 12,13,14,

ENTER RT NO., 1 = ADD OR 0 = DELETE

14,0,(11),(1)(CR)

ILLEGAL ENTRY

ENTER RT NO., 1 = ADD OR 0 = DELETE

i. Password Change (Menu Select No. 7).

(1) The password change allows the operator to enter a new password for the diskette in use and verify the password entry prior to software entry of that password. The password is changed if Y is entered after the prompt statement VERIFY NEW PASSWORD. Any character entered other than Y after the prompt statement will not change the password.

CAUTION

The password is diskette associated. Therefore, when a password is changed for a diskette, all duplicate diskettes for the ITS program will contain the old password.

CAUTION

The New Password is printed out only during the password change. Tear the printout from the data terminal and store per site procedures. The new password must be related to the disc identity.

CAUTION

There is no ILLEGAL ENTRY statement for the Password Change entries. The operator must have prior knowledge of what constitutes illegal entries.

(2) Sample 1 shows a password that has been changed and verified. Sample 2 shows a password that is not changed due to verification entry other than Y.

Sample 1 (Valid Change)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE
7(CR)
ENTER NEW PASSWORD: LABOR(CR)
VERIFY NEW PASSWORD: LABOR
Y(CR)
ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

Sample 2 (No Change on Verification)

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE
7(CR)
ENTER NEW PASSWORD: LABOR(CR)
VERIFY NEW PASSWORD: LABOR
N(CR) (N or any other character)
ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

j. Save Data Base on Disc-Relock Terminal (Menu Select No. 8).

(1) This entry (8) allows the modified data base to be saved on the diskette. If a system ac power failure occurs prior to this entry, all modifications entered by the operator are void and the data base item values are the same as previous to modification entries. In this case, the modifications must be reentered after the system powers up. Normally, the data base is saved after all modifications have been entered. During periods when system power failures are frequent, it is recommended that the data base be saved after each modification. The save data base on disc-relock terminal (entry number 8) is entered after the prompt statement ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE. An ILLEGAL ENTRY statement will be printed out only if the character entered is not within the range of 1 to 8.

(2) The sample shows a valid entry where the modifications to the data base are saved on the disc and the terminal keyboard is relocked.

Sample

ENTER MENU SELECTION NO., NULL = DIRECTORY ASSISTANCE

8(CR)

3-9. Diskette Copying.

a. General. A program on one diskette can be written on another diskette using the RT-11 Peripheral Interchange Program (PIP) provided with the PDP 11 computer.

CAUTION

The ITS-W System Program cannot run during PIP operation, therefore user network communication is interrupted.

b. Procedure. To duplicate one of the diskettes, the following steps apply:

(1) Place diskette to be duplicated into DX0 (disc drive zero).

(2) Place blank diskette into DX1 (disc drive one).

(3) Press computer BOOT/INIT switch to INIT and release to BOOT.

(4) Perform the following keyboard entries and verify printout results on data terminal. Operator keyboard entries are underlined; symbols are (CR) = carriage RETURN key, (SP) = space bar.

<u>Data Terminal Entries and Printouts</u>	<u>Remarks</u>
XXXXXX XXXXXX XXXXXX XXXXXX	Register contents at boot (where X = octal number)
<u>\$DX0(CR)</u>	Boot diskette in drive No. 0 (zero)
RT-11SJ V02C-02D	Operating Program and Disc version
• <u>INIT(CR)</u>	Initialize
• <u>R(SB)PIP(CR)</u>	Run PIP
ARE YOU SURE? <u>YES(CR)</u>	Answer "yes" to question for con- tinuation.
<u>*DX1:/Z (CR)</u>	Prep diskette in disc drive 1.
<u>*DX1:*.*=DX0:*.*/X/Y(CR)</u>	New file name is old file name.
<u>*DX1:A=DX1:MONITR.SYS/U(CR)</u>	Bootstrap Program
The two diskettes should now be identical.	

Section IV. MAINTENANCE

4-1. General.

This section contains information on operator maintenance of the CSS. Operator maintenance is limited to checks and services, and replacement of fuses. For additional operator maintenance, consult the Digital Equipment Corporation manuals listed in Operator section, paragraph 3-1, of this manual.

4-2. Checks and Services.

To ensure that the CSS is always ready for operation, a systematic inspection will ensure that defects may be discovered and corrected before serious damage or failure occurs. The operator checks and services on the equipment is listed in table 4-1. Defects discovered when the system is running should be noted and correction made as soon as operation of the system is shut down. Immediately notify proper authorities if a deficiency is noted during operation which would damage the equipment. Record all deficiencies together with corrective action taken.

4-3. Cleaning.

a. Remove dust, dirt and other foreign matter with a soft bristle brush and a clean lint-free cloth.

b. Remove grease fungus and ground-in dirt with a lint-free cloth dampened with a detergent and water solution.

c. Clean cabinet air filters by washing thoroughly with detergent and water solution. Rinse with clear water and allow to dry.

Table 4-1. Operator Checks and Services

Sequence Number	Items to be Inspected	Procedures	Corrective Action
1.	CSS equipment (all)	Check for cleanliness and general condition.	See paragraph 4-3 for cleaning instructions.
2.	Indicator/Meters	Check for damaged indicators and meters and clean windows.	Clean indicators and meter window per paragraph 4-3.
3.	Air Filters (figure 1-6)	Remove air filters from the front of the cabinet.	See paragraph 4-3 for cleaning instructions.

4-4. Fault Isolation and Corrective Action.

Fault isolation is performed by observing abnormal indications during system power-up, while the system is in the normal run mode, or during operator entries at the data terminal. Normal indications are given for these items in the Operation section of this manual. Should an ac power failure occur, first check all CSS equipment circuit breakers to ensure that they are in the "on" position. Operator corrective action is limited to replacement of fuses located on the dc power supply (2A4) and the data terminal (Unit 1), and other operator actions not requiring parts replacement. Table 4-2 lists trouble symptoms and most probable cause and corrective action.

CAUTION

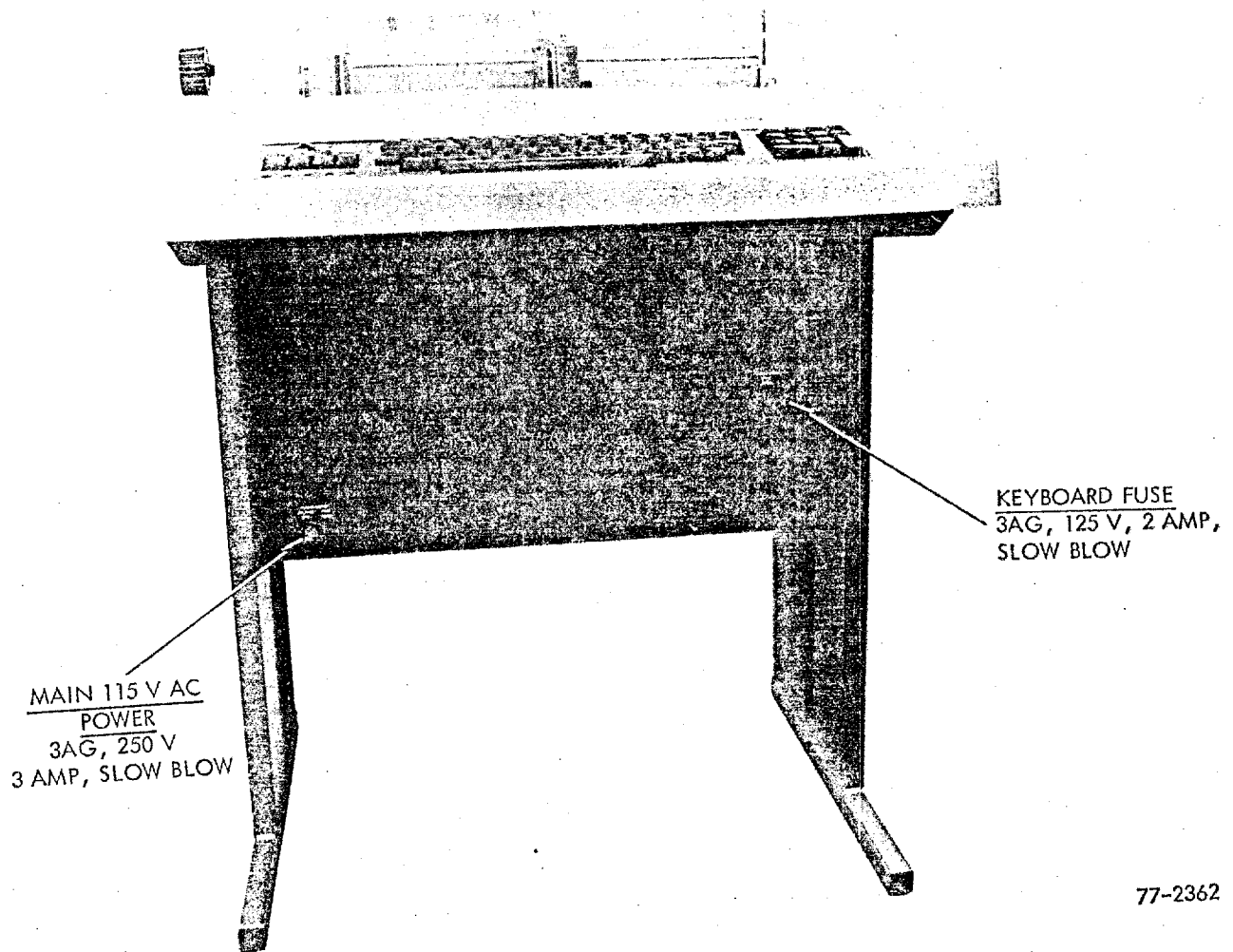
To prevent possible damage to equipment, ensure that power is removed from equipment before replacing fuses.

Table 4-2. Operator Fault Isolation

Symptom	Probable Cause/Corrective Action
<p><u>Terminal Report (individual)</u></p> <p>5 VOLT SUPPLY FAILURE</p>	<p>If power supply (2A4) voltage does not read within 4.75 to 5.25 volts, consult site maintenance. If voltage indication is normal, a temporary power interruption occurred and was restored to normal. No maintenance action is required.</p>
<p><u>Terminal Report (individual)</u></p> <p>12 VOLT SUPPLY FAILURE</p>	<p>If power supply (2A4) voltage does not read within 11.5 to 12.5 volts, consult site maintenance. If voltage indication is normal, a temporary power interruption occurred and was restored to normal. No operator action is required.</p>
<p><u>Terminal Report (simultaneous)</u></p> <p>5 VOLT SUPPLY FAILURE 12 VOLT SUPPLY FAILURE</p> <p>CSS switch stops running. All equipment indicators extinguished, cabinet blowers not operating.</p> <p>Data terminal will not unlock when password is entered.</p>	<p>Loss of all dc power. If power supply (2A4) voltage for both 5 volt and 12 volt read zero, replace power supply fuse (3AG, 30A, 250V).</p> <p>Loss of ac power source to CSS switch cabinet. Check ac power source switch box (site).</p> <p>Wrong password entered. check for correct password related to disc.</p>

Table 4-2. Operator Fault Isolation (Continued)

Symptom	Probable Cause/Corrective Action
<p>Data terminal completely inoperative or erratic.</p> <p>Computer RUN indicator extinguished. DC ON indicator illuminated.</p> <p>System control (2A5) POWER ON indicator extinguished. AC INPUT indicator illuminated.</p>	<ul style="list-style-type: none"> • Data terminal power on/off switch accidentally tripped to off position. • Check normal switch positions per paragraph 3-5 <u>g</u>. • No ac source power to terminal. Check line cord. • Fuse blown (see figure 4-1). <p>Computer program has halted. If authorized: move CONT/HALT switch to HALT and back to CONT. If program does not continue (RUN indicator still extinguished), initialize system program per paragraph 3-6 <u>b</u>.</p> <p>Power switch accidentally tripped to OFF. Toggle power switch to ON position. If system does not auto initialize, initialize system per paragraph 3-6 <u>b</u>.</p>



77-2362

Figure 4-1. Data Terminal Fuse Locations and Types