"DATAPHONE®" SELECT-A-STATION SERVICE
DATA STATION SELECTOR J70180AA
DESCRIPTION

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1. GENERAL

1.01 This section describes the physical and functional features of the Data Station Selector (DSS). The DSS provides the end-to-end connection between the customer's master station and a remote station.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 Operation of the DSS may be automatic, semiautomatic, or completely controlled. The amount of control depends on the service offering option selected by the customer. The 833A data station is the telco equipment interface between the customer-provided equipment (CPE) and the DSS. The data station houses the selector control units (SCUs) which provide control signaling to the DSS. The master station contains the CPE and the data station on customer premises.

A. Service Description

1.04 The DATAPHONE® Select-A-Station service provides a private line, multistation data network over voice bandwidth channels. Alternate voice service or a dc continuity connection cannot be furnished between the master and remote stations. In addition, the master station cannot simultaneously transmit (broadcast) to all remote stations. A remote station cannot communicate with another remote station.

B. Service Offerings

1.05 Two service offerings and several options are available to accommodate customer operating procedures and system structure. The service offerings and options are as follows:

(a) Sequential

- Automatic step DSS option (auto step)
- Automatic step with reset DSS option
- Controlled step DSS option.

(b) Addressable

- Single address error control DSS option
- Double address error control DSS option.

Note: Both service offerings and all DSS options have the advantage that no remote station can control the operation of the DSSs. This provides maximum security of the system from outside interference.

Sequential Offering

1.06 In the sequential offering, the connection sequence to remote stations is determined by the customer. Initial assignment of remote stations is given on the service order. The auto step DSS option provides for automatic operation of the DSS on a continuous basis. The sequence of connections and the connection hold time are fixed, and the hold time is the same for each connection. The hold time can only be changed by changing the setting of a hold time option switch in the DSS.

1.07 The sequential offering, automatic step with reset option permits the CPE to reset the DSS to the beginning of the connection sequence.

1.08 The third type of sequential operation is the controlled step option. This option allows the customer to control the connection time between the master station and a remote station.

Addressable Offering

1.09 In the addressable service offering, the connection hold time and the order of connections is controlled by the customer. Each port (connection to a remote station) is assigned an address, and the DSS will connect to a specific port when it receives a specific port address. Three ports are reserved for special functions: ports 125, 126, and 127. Port 125 causes the DSS to operate in the sequential mode when addressed. (Operation in the sequential mode of the addressable offering is similar to that described in 1.06.) Ports 126 and 127 are reserved for test functions.

1.10 The single address error control option is described in detail in Section 314-410-550.

1.11 The double address error control option provides a comparison of two addresses sent in sequence. If the addresses are not identical, an error will be detected by the DSS. If more than one address is required, the first and second addresses must be sent twice.

1.12 To communicate with a remote station, customer signals may only have to pass through one DSS. In that case the DSS is designated a primary DSS. To more economically serve geographical groupings of remote stations, customer transmissions are sometimes routed through a secondary DSS. The primary DSS must remain connected to the secondary DSS long enough for the secondary DSS to make all of its port connections. This tandem DSS arrangement is allowed only in the controlled step option and the addressable offering which provide customer controlled connection of hold times. Operating design does not permit tandem arrangement of any third-level DSSs since total cycle time would become excessive. Fig. 1 is a block diagram of a typical DATAPHONE® Select-A-Station service.

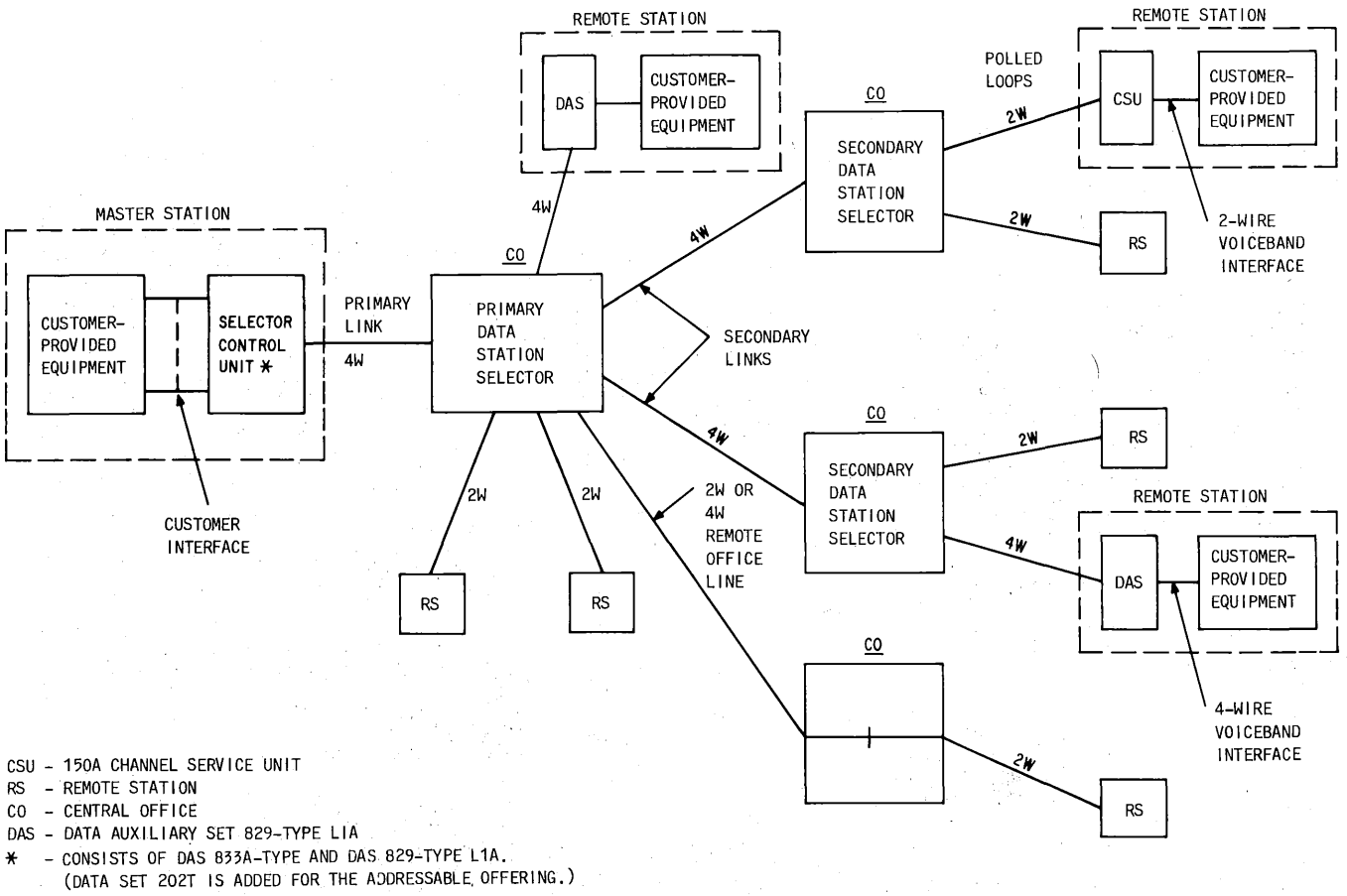
1.13 A glossary of the most commonly encountered terms and acronyms relating to DATAPHONE Select-A-Station service is given in Part 7 of this section.

2. PHYSICAL DESCRIPTION

2.01 The DSS consists of a 2-shelf mounting unit equipped with various circuit packs (CPs) to accommodate customer operating procedures and system structure.

A. J70180AA DSS 2-Shelf Unit

2.02 The J70180AA DSS 2-shelf unit (Fig. 2) is divided into two shelves by the power distribution panel. The bottom shelf is designated 'A' and the top shelf is designated 'B'. The power distribution panel provides alarm and fuse indicators and connections for two plug-in power supplies. The DSS mounting is 17 inches high, 12 inches deep, and mounts on the standard 23 inch central office frame. The DSS mounting weighs 24-1/2



CSU - 150A CHANNEL SERVICE UNIT
RS - REMOTE STATION
CO - CENTRAL OFFICE
DAS - DATA AUXILIARY SET 829-TYPE L1A
* - CONSISTS OF DAS 833A-TYPE AND DAS 829-TYPE L1A. (DATA SET 202T IS ADDED FOR THE ADDRESSABLE OFFERING.)

Fig. 1—DATAPHONE® Select-a-Station Service—Overall Block Diagram

pounds without circuit packs or plug-in power supplies. A printed wiring board type backplane is attached at the rear of the DSS mounting, and provides electrical connections between circuit packs and the line connectors.

B. Circuit Packs

2.03 Up to 13 different circuit packs may be required in a fully equipped DSS. These circuit packs are described as follows:

(a) Common equipment

- Data Auxiliary Set (DAS) 829-type L1A
- RL1 CP—Four 2-Wire Ports
- RL2 CP—One 4-Wire Port
- RL3 CP—One 4-Wire Port with Equalization
- RL5 CP—Analog Control Circuit
- RL6 CP—Expansion Control Circuit
- RL7 CP—Verify Circuit Pack
- RG3 CP—Power Supply

(b) Sequential Offering Equipment

- RL4 CP—Digital Control Circuit for Sequential Offering

(c) Addressable Offering Equipment

- Data Set 202T
- RL8 CP—Digital Control Circuit for Addressable Offering
- RL9 CP

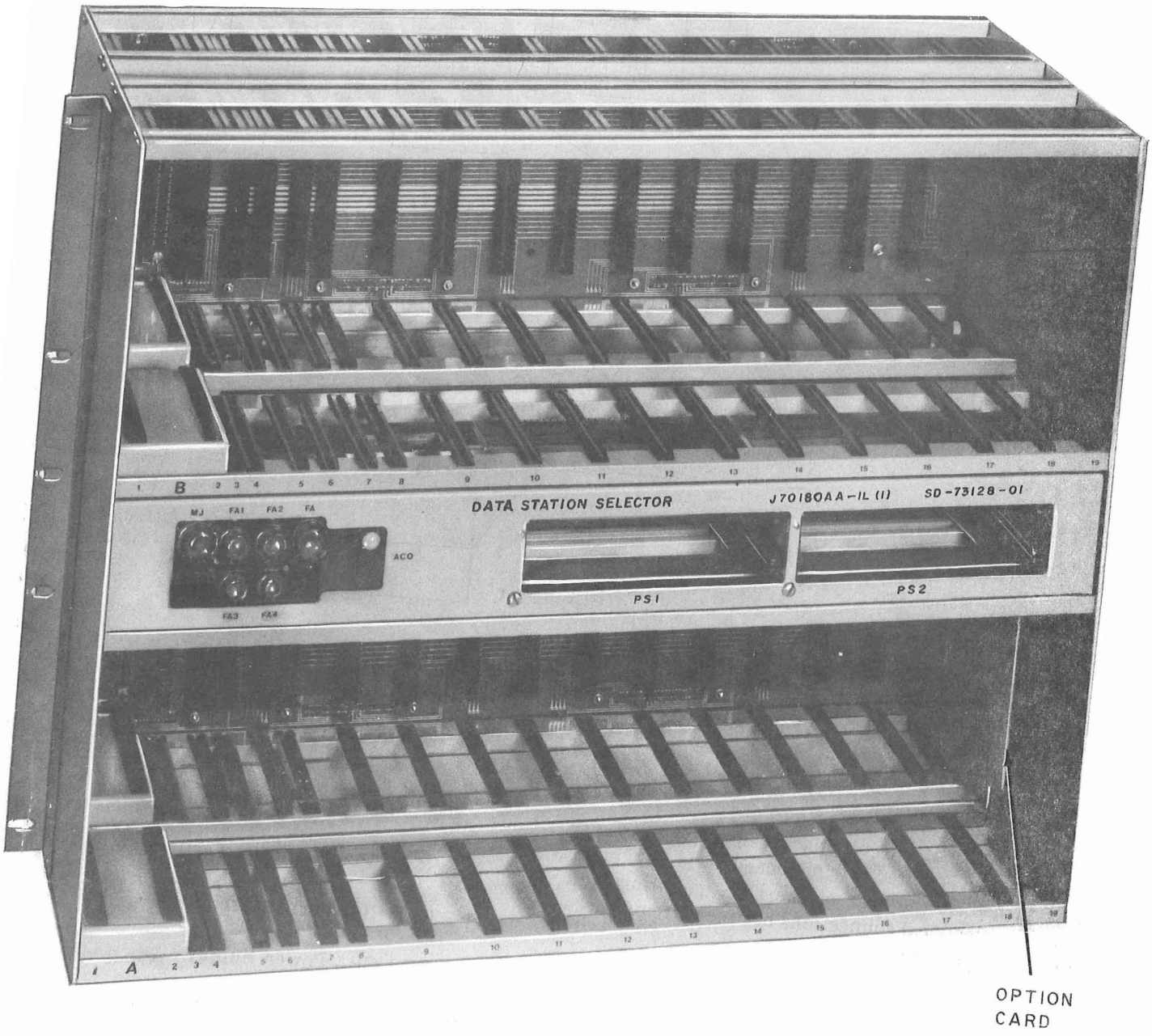


Fig. 2—Data Station Selector Mounting Unit J70180AA

- RL10 CP—Power Supply.

Each circuit pack plugs into a KS-21479-L5 or 908W connector provided on the DSS mounting. The jacks mounted on the faceplates of various circuit packs accept the standard 310 plug. Tip-sleeve plugs should not be used as they cause the jack to fail mechanically. The IN SERV/OUT SERV switches on RL_1, RL_2, and RL_3 CPS have a metal bracket guard to prevent accidental operation of the switch.

Common Equipment

2.04 ***DAS 829-type L1A (Fig. 3):*** The DAS 829-type L1A is available in three basic

codes; DAS 829A-L1A, DAS 829B-L1A, and DAS 829C-L1A depending on the type of loop it interfaces.

> ***Note:*** The DAS 829-type L1s are not to be used in this service.

The dimensions of each DAS 829-type L1A are 6-3/8 inches high, 1-3/8 inches wide, and 10 inches deep. The weight of each circuit pack varies from 15 ounces to 1-5/8 pounds depending on the code. Four jacks (TRANS TST, TRANS MON, REC TST, REC MON) and an LB (loopback) indicator are mounted on each faceplate. DAS 829B-L1A and DAS 829C-L1A also have a REC IN jack mounted on the faceplate with an accessible adjustment screw through the faceplate.

2.05 ***RL1 (Fig. 4), RL2 (Fig. 5), and RL3 (Fig. 6) CPs:*** Each circuit pack is 6-3/8 inches high, 7-3/8 inches wide, and 10 inches deep. A pushbutton switch (VER), a toggle switch (IN SRV/OUT SRV), and an indicator (OUT SRV) are mounted on the faceplate of each circuit pack. In addition, the RL2 CP and the RL3 CP have four jacks (TRANS TST, TRANS MON, REC TST, and REC MON) mounted on their faceplates. The RL3 CP also has a REC IN jack mounted on the faceplate with an accessible adjustment screw through the faceplate. The RL1 CP weighs 1-3/8 pounds; the RL2 CP weighs 1 pound, and the RL3 CP weighs 1-7/8 pounds.

2.06 ***RL5 CP (Fig. 7):*** This circuit pack has two jacks (DSS IN, DSS OUT) and a TONE

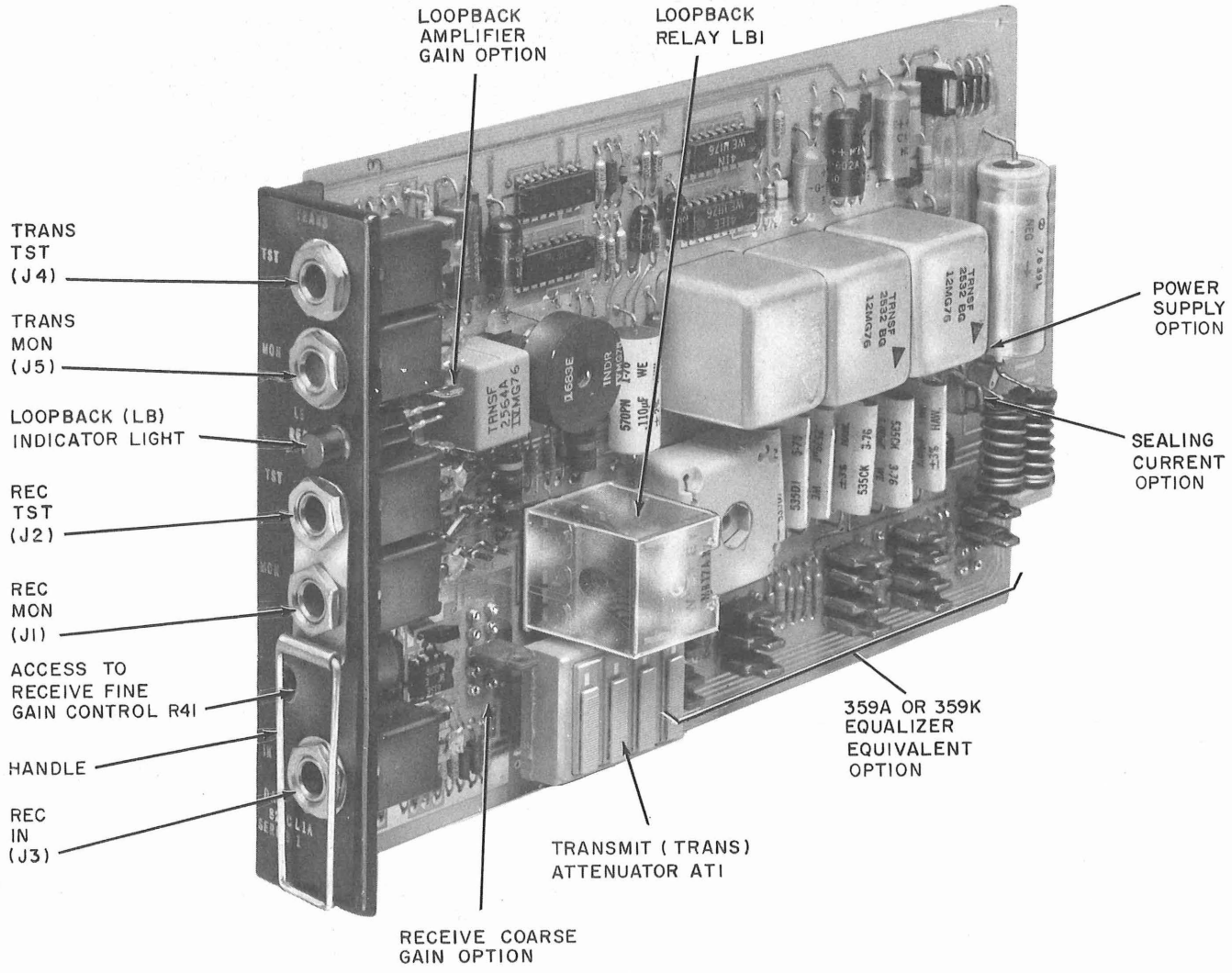


Fig. 3—DAS 829C-L1A

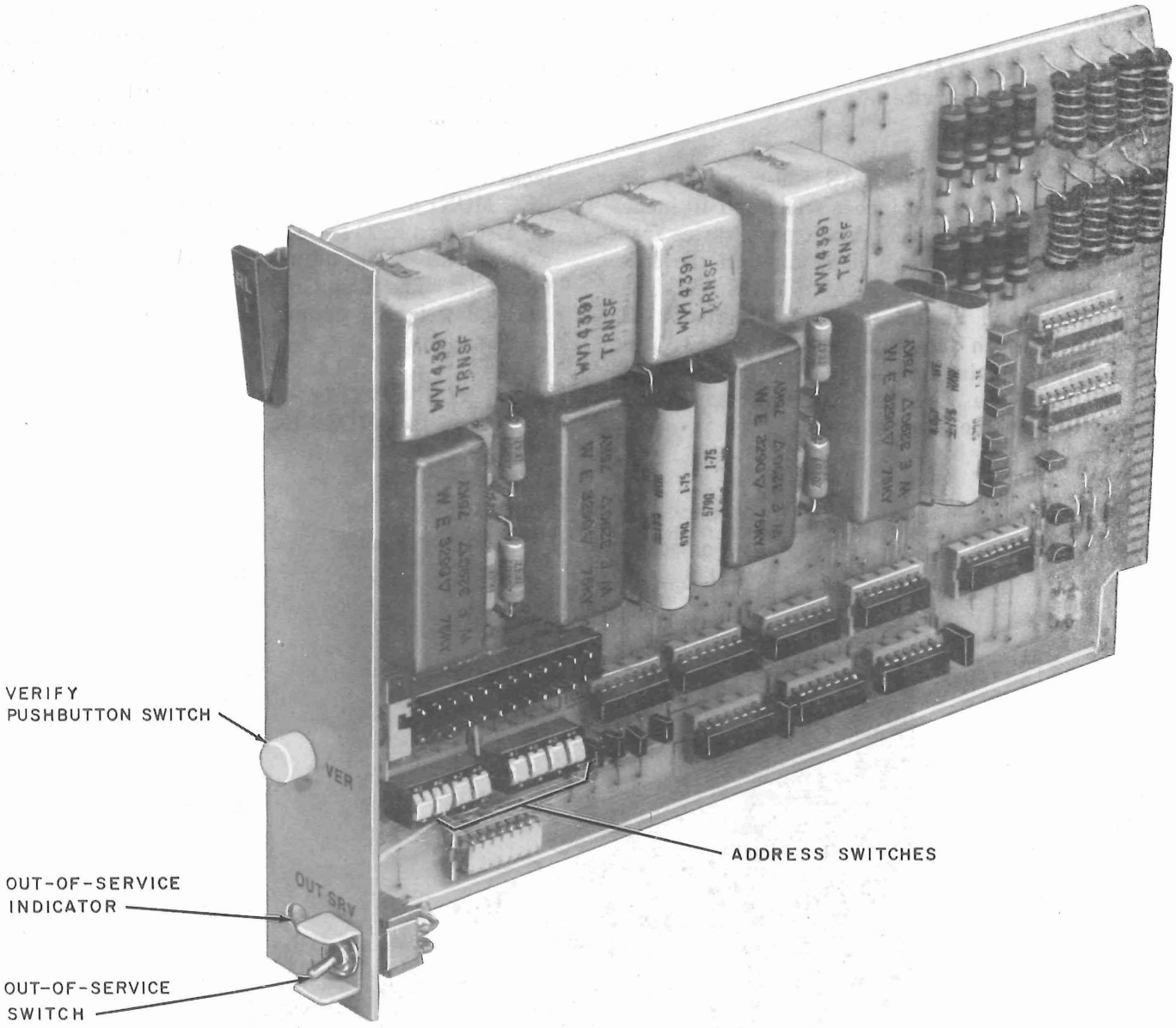


Fig. 4—RL1 CP—Four 2-Wire Ports

DETECT indicator mounted on the faceplate. The RL5 CP is 6-3/8 inches high, 1-3/8 inches wide, 10 inches deep, and weighs 1-1/8 pounds.

2.07 ***RL6 CP (Fig. 8):*** The RL6 CP faceplate is bare. The circuit pack is 6-3/8 inches high, 1-3/8 inches wide, 10 inches deep, and weighs 1 pound.

2.08 ***RL7 CP (Fig. 9):*** A three-digit display window (ADDRESS), three jacks (AMPL IN, AMPL OUT, and TONE OUT), and a three-position toggle switch (A/VER/B) are mounted on the faceplate. The RL7 CP is 6-3/8 inches high, 1-3/8 inches wide, 10 inches deep, and weighs 1 pound.

2.09 ***RG3 CP (Fig. 10):*** Two indicators (IN SERVICE, ALARM) and a pushbutton switch (RESET) are mounted on the faceplate. The RG3 CP weighs 1-1/8 pounds and measures 1-1/2 inches high, 5-1/2 inches wide, and 10 inches deep.

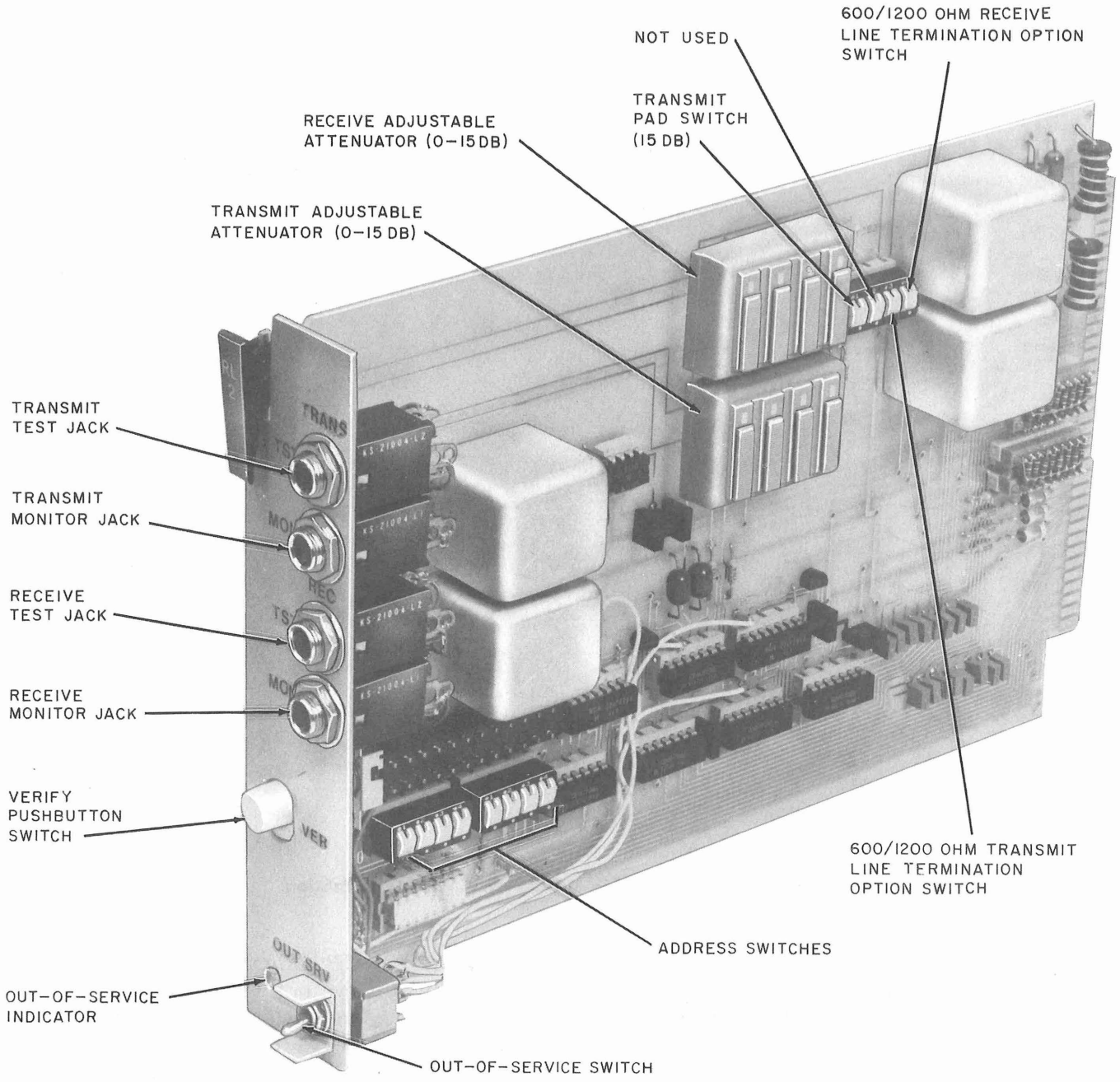


Fig. 5—RL2 CP—One 4-Wire Port

Sequential Offering Equipment

2.10 ***RL4 CP (Fig. 11):*** One indicator (FRAME TONE) is mounted on the faceplate of the circuit pack. The RL4 CP is 6-3/8 inches high, 5/8 inch wide, 10 inches deep, and weighs 1/2 pound.

Addressable Offering Equipment

2.11 ***Data Set 202T (Fig. 12):*** The faceplate of the data set provides six indicators (ON, MR, RS, CS, CO, and TM) and three pushbutton test switches (AL, LT, and RT). The data set is 5-1/2 inches high, 1-1/2 inches wide, 10-3/8 inches deep, and weighs 1-1/2 pounds.

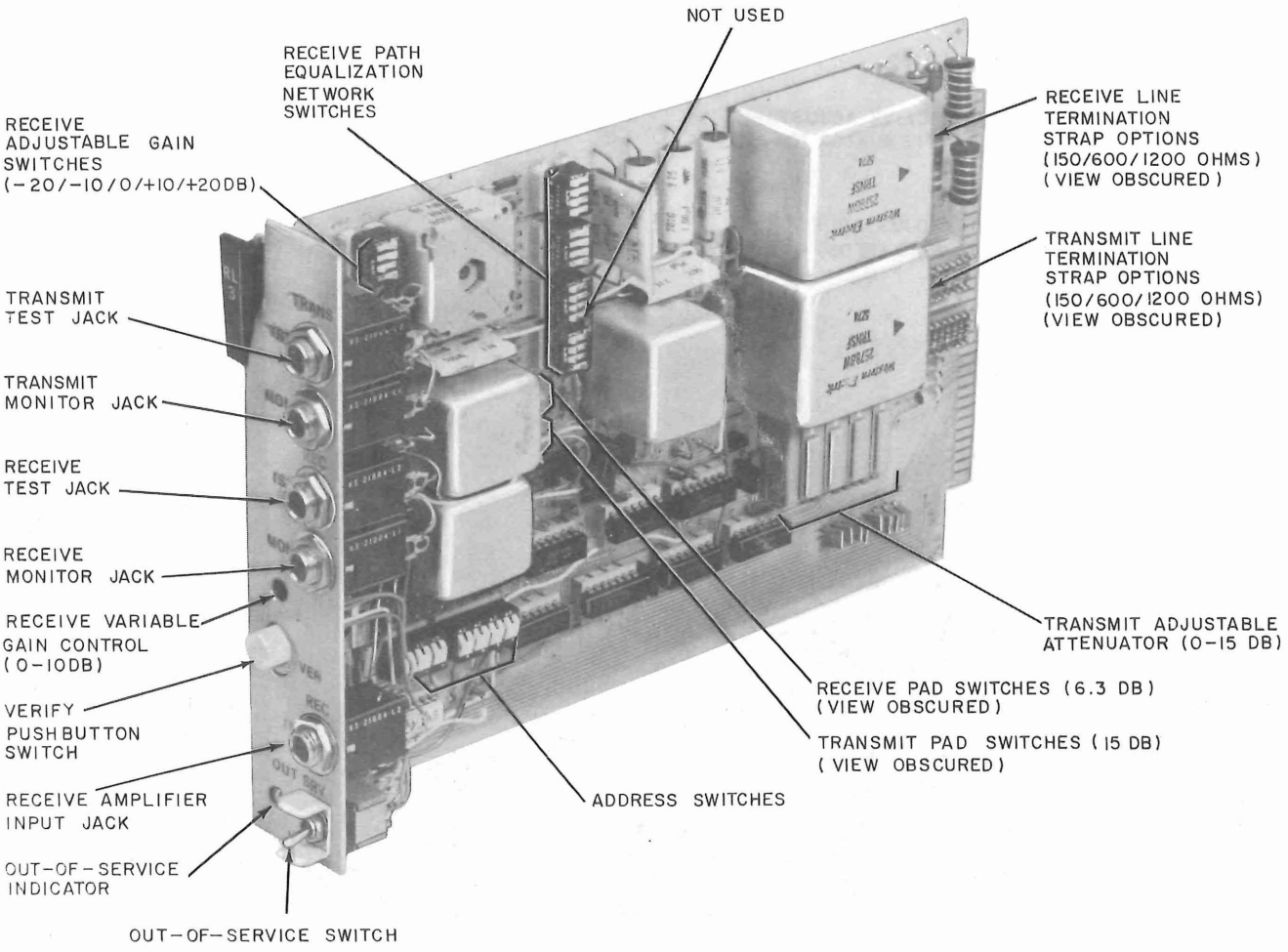


Fig. 6—RL3 CP—One 4-Wire Port With Equalization

2.12 ***RL8 CP (Fig. 13):*** One indicator (ACK TONE) is mounted on the faceplate of the circuit pack. The RL8 CP is 6-3/8 inches high, 5/8 inches wide, 10 inches deep, and weighs approximately 1/2 pound.

2.13 ***RL9 CP (Fig. 14):*** The RL9 CP has two printed wiring boards arranged in a mother-daughter type circuit pack. The PWBs are joined with four flat connector-ended cables which attach near the top of each board.

A 25-pin female connector and a two-position (NORMAL/202 TEST) toggle switch are mounted on the faceplate. The RL9 CP is 6-3/8 inches high, 1 inch wide, 10 inches deep, and weighs approximately 1-1/2 pounds.

2.14 ***RL10 CP (Fig. 15):*** The RL10 CP has two indicators (IN SERVICE, ALARM) mounted on the faceplate. This circuit pack is 6-3/8 inches high, 1-3/8 inches wide, 10 inches deep, and weighs approximately 1-1/4 pounds.

3. FUNCTIONAL DESCRIPTION

A. Common Equipment

3.01 The equipment that is common to the addressable and sequential offerings includes:

- J70180AA DSS 2-Shelf Unit (DSS Mounting), Equipped with Option Card
- DAS 829-Type L1A CP

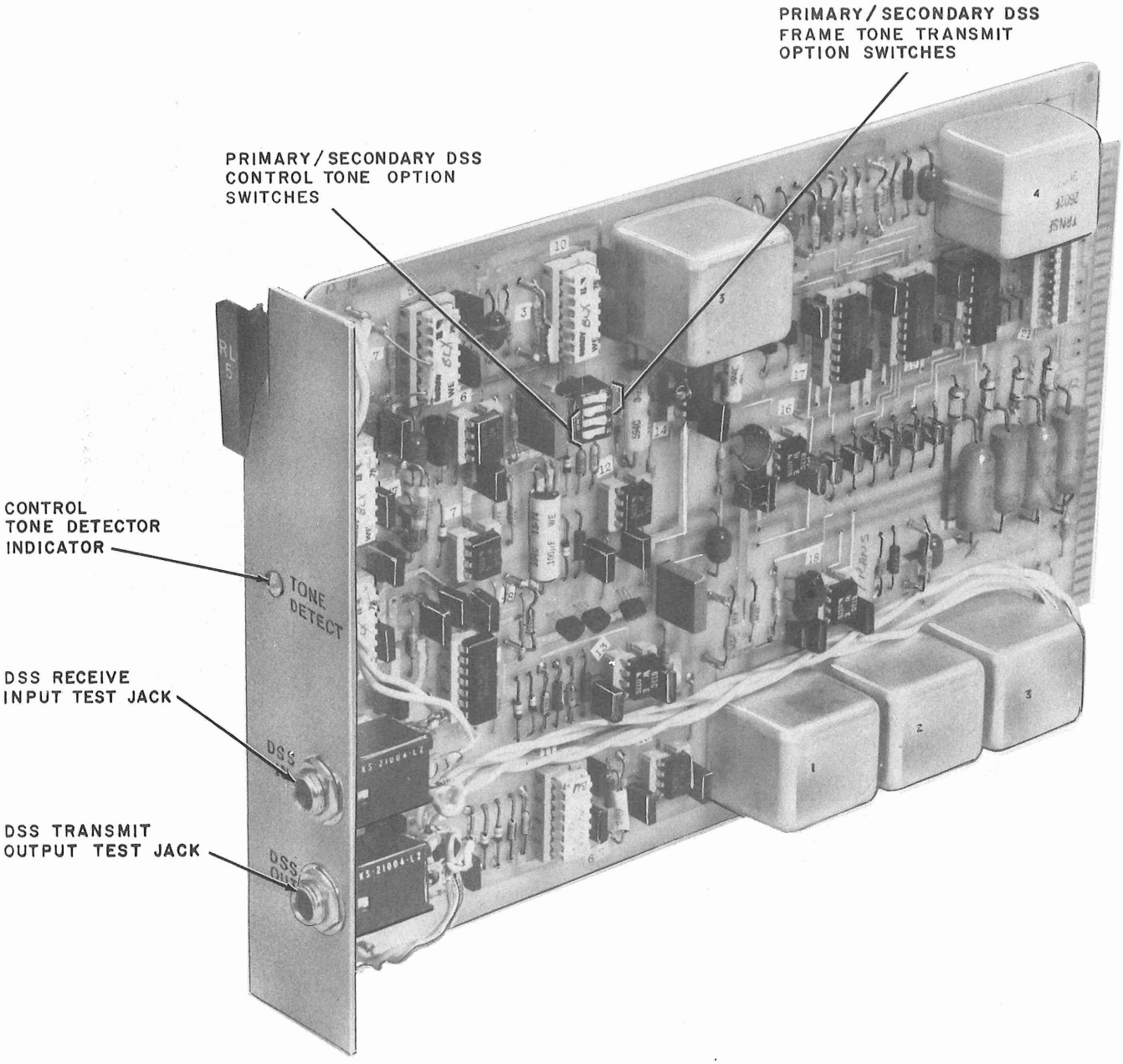


Fig. 7—RL5 CP—Analog Control Circuit

- RL1 CP—Four 2-Wire Ports
- RL2 CP—One 4-Wire Port
- RL3 CP—One 4-Wire Port with Equalization
- RL5 CP—Analog Control Circuit
- RL6 CP—Expansion Control Circuit
- RG3 CP—Power Supply.

The DSS mounting includes a power distribution panel which is discussed separately.

3.02 ***DSS Mounting:*** The DSS mounting provides connectors for the plug-in circuit packs. A terminal strip accessible from the rear of the DSS mounting provides connection for the

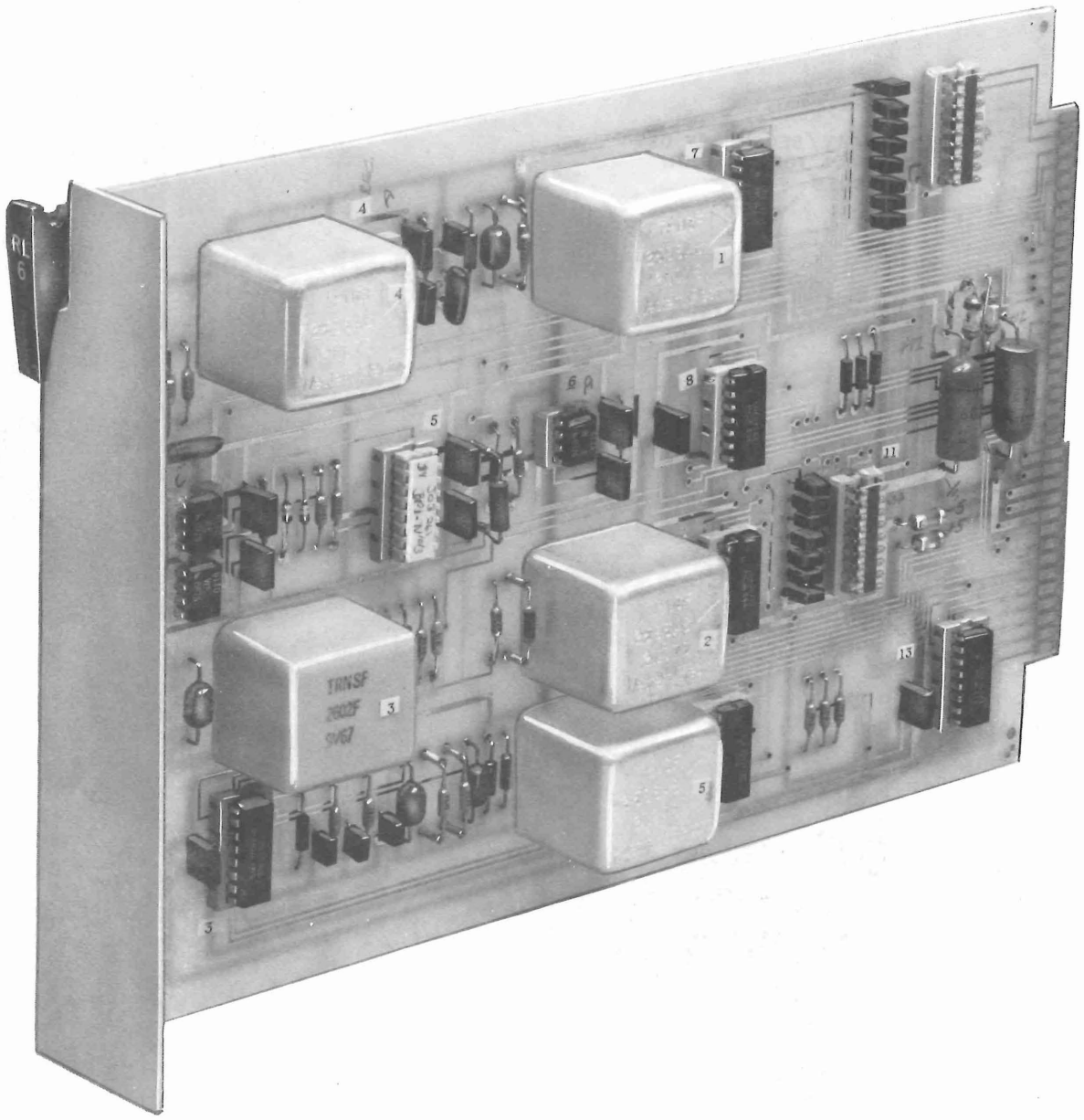


Fig. 8—RL6 CP—Expansion Control Circuit

power supplied from the central or local office battery. Up to six DSS mountings may be used to form a single DSS. This will accommodate various customer operating procedures and system requirements. Each DSS mounting is connected in sequence to the next DSS mounting by expansion cables to form a chain. The combined length of the cables must not exceed 50 feet. The first DSS mounting in the chain is called the start-up unit. The start-up unit is equipped with common control and port circuit packs for either the addressable or sequential offering. The units that follow the start-up unit are called expansion units. Expansion units are used to house additional port circuit packs. The DSS mounting may also be equipped for one customer (non-split) or two customers (split). In a two-customer arrangement, shelf A serves one customer and shelf B serves the other customer.

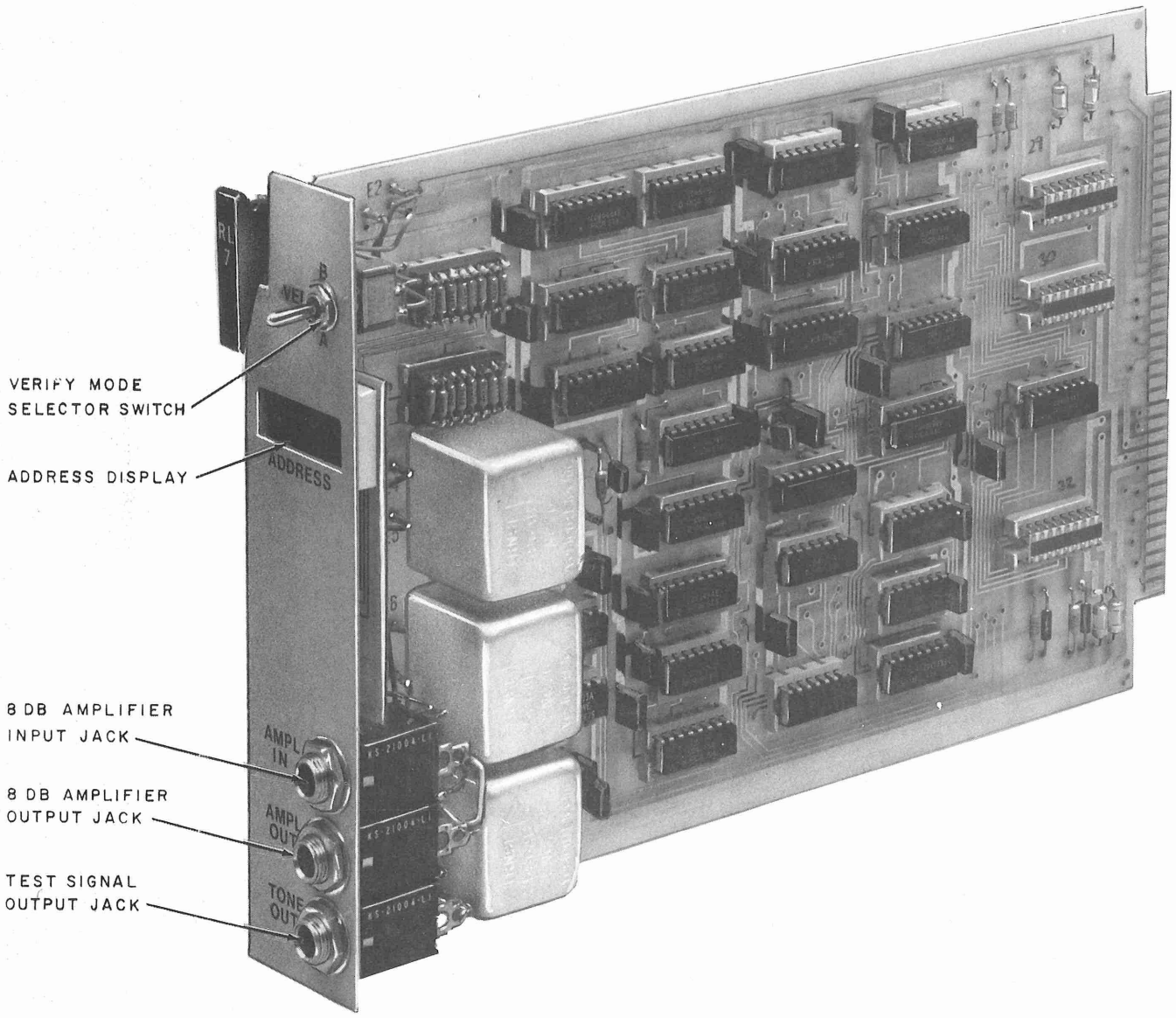


Fig. 9—RL7 CP—Verify Circuit Pack

Table A gives the circuit pack requirements for various arrangements illustrated in Fig. 16 through 20. The expansion units are supplied with power from the start-up unit via the expansion cables. The slot numbers given in Table A correspond to the numbers on the DSS mounting shown in Fig. 2. In addition, each DSS mounting is furnished with an option card which interconnects the backplane wiring for one of the following four arrangements:

- X - One-Customer Start-Up
- Y - Two-Customer Start-Up
- X - One-Customer Expansion
- Z - Two-Customer Expansion.

The backplane provides interconnections between shelves A and B and the circuit packs. Also contained on the backplane are the analog and digital buses, four test connectors, four expansion connectors, and four line connectors. The test

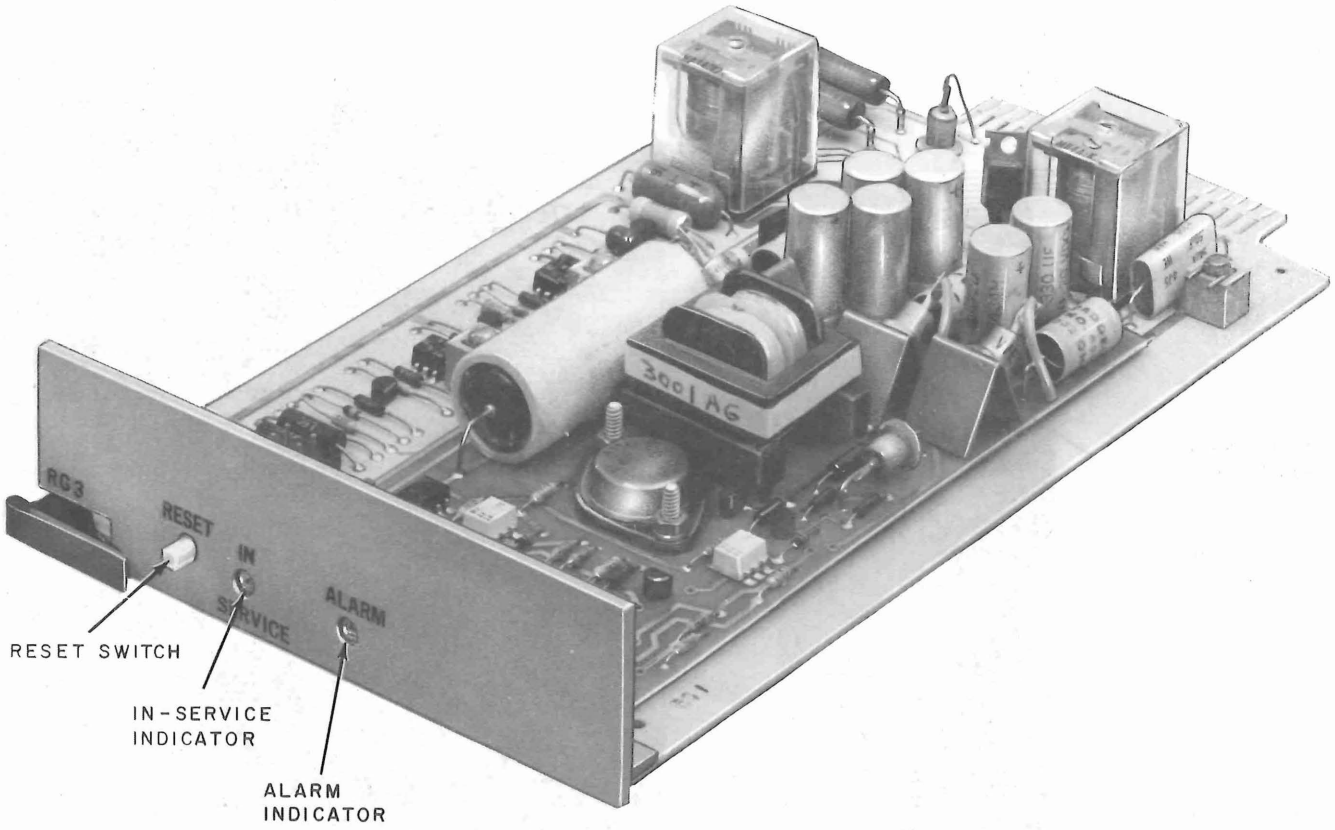


Fig. 10—RG3 CP—Power Supply

connectors are used with the Switched Maintenance Access System (SMAS). These connectors interrupt the analog path and shorting plugs must be provided when the SMAS connctors are not in use. The expansion connectors are used to interconnect the expansion with the startup or other expansion DSS mountings. The line connectors are used to interconnect the 4-wire backbone and port lines from the main distributing frame.

3.03 ***Power Distribution Panel:*** The power distribution panel provides fusing, visual local alarm indications, power bus, and dualized dc power for the DSS. Central office alarm connections to indicate local alarm conditions are also provided. The -48 volts from the central or local office battery is distributed to both shelves and each plug-in power supply (RG3 CP and RL10 CP). Power is also distributed from the start-up unit to the expansion units. The power distribution panel also contains four 1-1/3 ampere fuses. Two of these fuses protect shelves A and B, and two of the fuses protect the RG3 CPs. Only one RG3 CP is needed to power the DSS. Two RG3 CPs may be used to provide a dualized power supply for added reliability. The -48 volts provides power for the DAS 829-type L1A and sealing current to the 2-wire polled links.

3.04 ***DAS 829-type L1A:*** The DAS 829-type L1A provides the following features:

- 4-wire standard termination
- Hazardous voltage protection
- Longitudinal balance
- Equal level channel loopback
- Level adjustment in transmit and receive paths

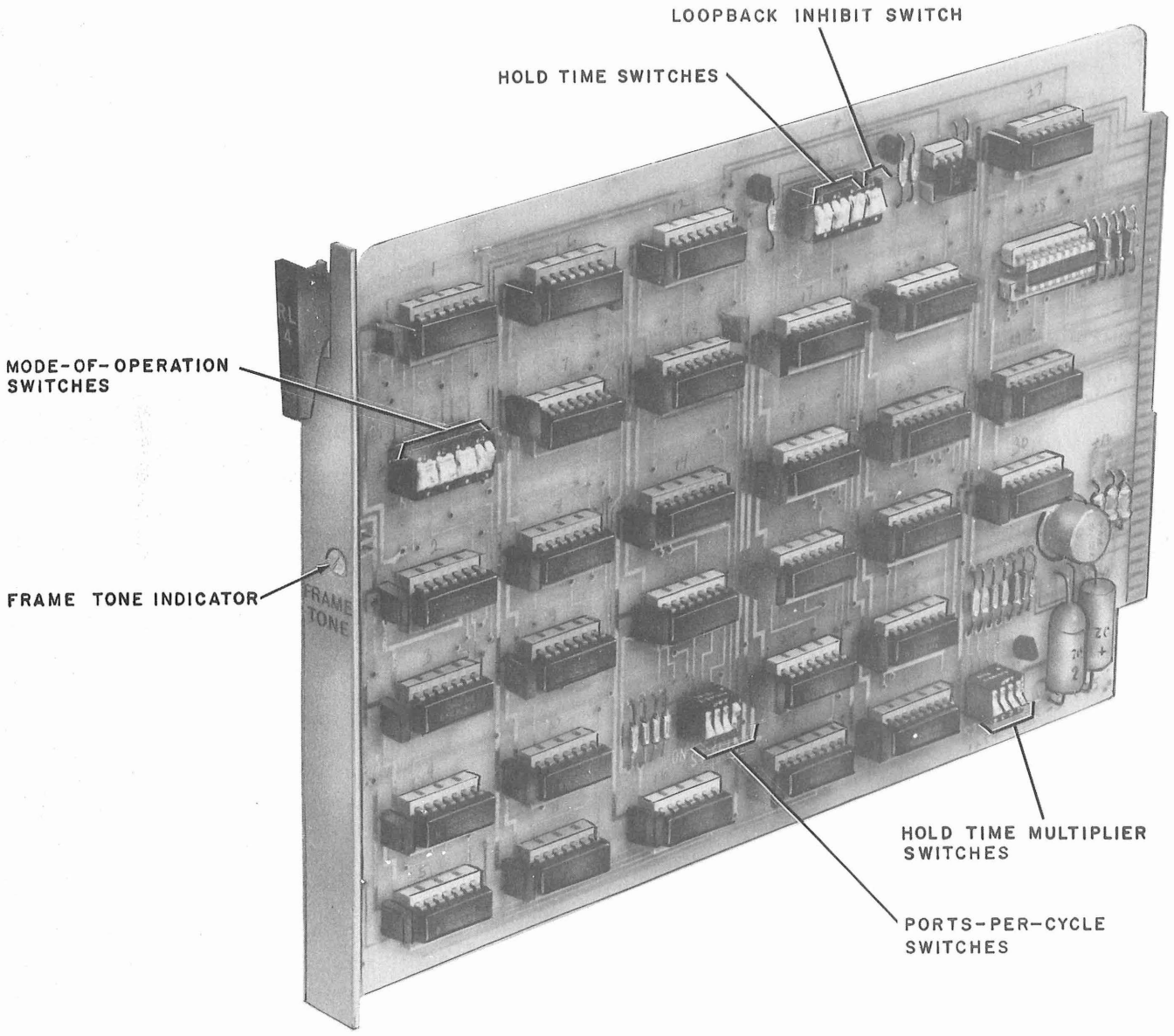


Fig. 11—RL4 CP—Digital Control Circuit for Sequential Offering

- Amplitude equalization
- Test and monitor access
- Sealing current option.

The major function of the DAS 829-type L1A is to interface with the 4-wire primary link. The DSS and the 833A data station use the DAS 829-type L1A for this purpose.

3.05 ***RL1 CP:*** This 2-wire port circuit pack provides switched ac continuity between one 2-wire analog input and four 2-wire port outputs. Each 2-wire port serves one 2-wire polled link. The RL1 CP consists of address decoder and comparator circuits, solid-state analog switches, and line-up tone distribution circuits. Seven address selection switches are mounted on each circuit pack. Only five of these switches are actually used to set the address of each RL1 CP. Each 2-wire circuit pack address corresponds to four port

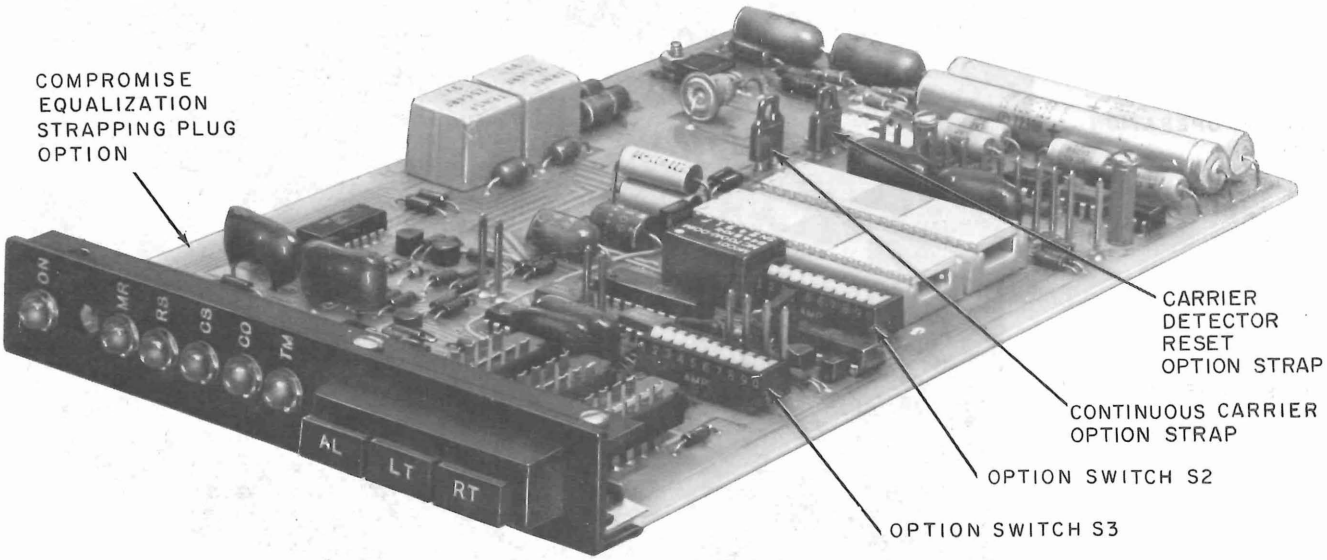


Fig. 12—Data Set 202T

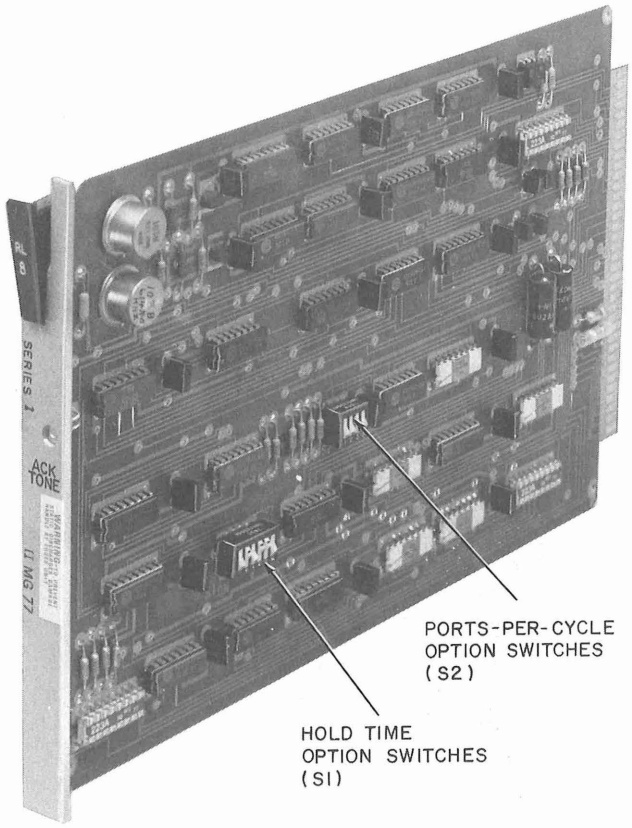


Fig. 13—RL8 CP—Digital Control Circuit for Addressable Offering

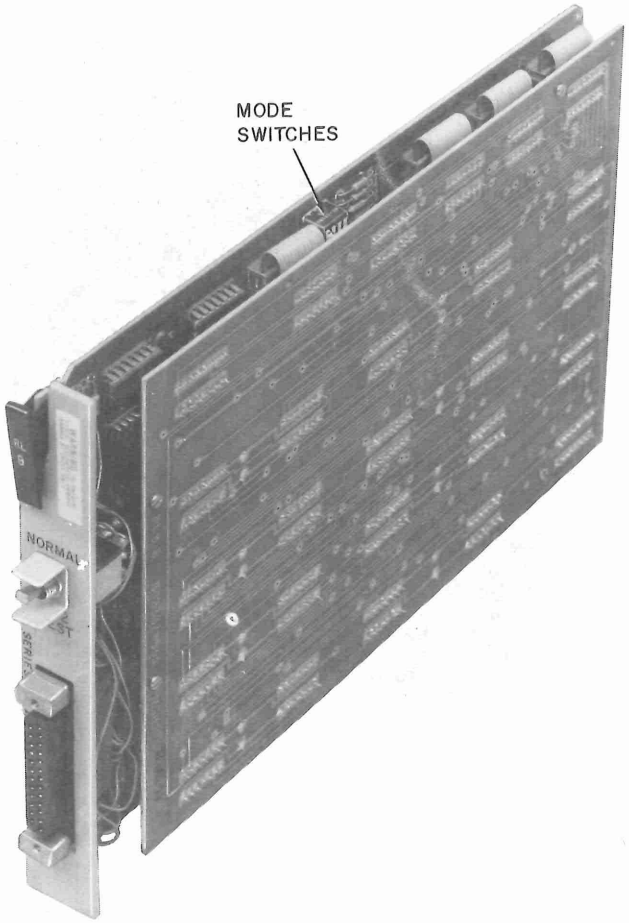


Fig. 14—RL9 CP

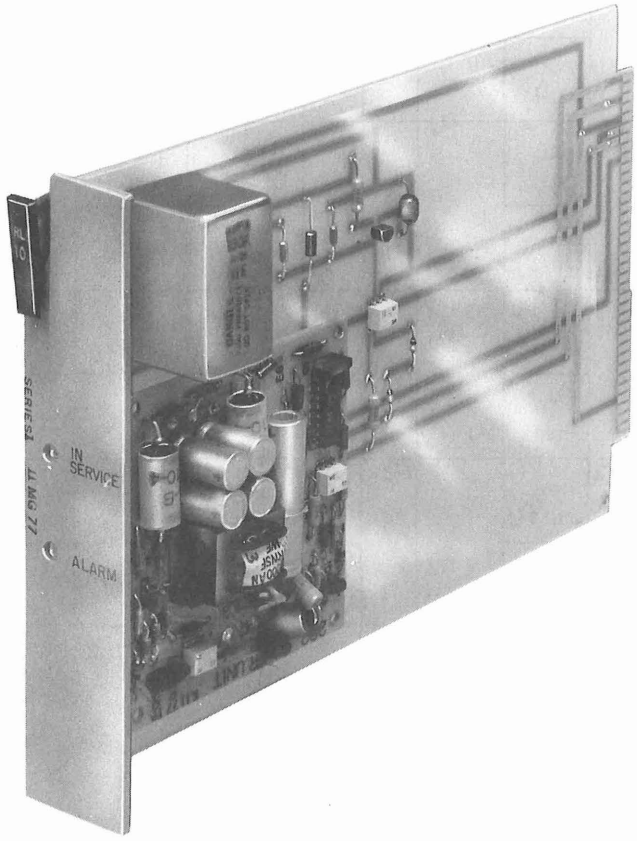


Fig. 15—RL10 CP—Power Supply

TABLE A

PLUG-IN CIRCUIT PACKS REQUIRED FOR DSS UNITS

SERVICE	UNIT ARRANGEMENT		RL 1	RL 2	RL 3	RL 4	RL 5	RL 6	RL 7	RL 8	RL 9	RL 10	RG 3	DAS 829	DATA SET 202T
Sequential Service	Start-up Unit	one cust	*	*	*	1	1	-	√	-	-	-	√√	1	-
		two cust				2	2	-	√	-	-	-	2	2	-
	Expansion Unit	one cust	*	*	*	-	-	1	√	-	-	-	-	-	-
		two cust				-	-	2	√	-	-	-	-	-	-
Addressable Service	Start-up Unit	one cust	*	*	*	-	1	-	√	1	1	1	√√	1	1
		two cust				-	2	-	√	2	2	2	2	2	2
	Expansion Unit	one cust	*	*	*	-	-	1	√	-	-	-	-	-	-
		two cust				-	-	2	√	-	-	-	-	-	-

* Port CPs - ordered as required.

√ Verify CPs - ordered as required.

√√ Power CPs - ordered as required.

addresses which are preset on each circuit pack. The preset addresses eliminate the need for two of the switches, which are not electrically connected. Port addresses occur in groups of four from 0 through 127. The address decoder and comparator circuit receives the address from the RL4 CP or the RL8 CP. If the address matches one of the four preset addresses, the solid-state analog switch is activated. The analog switch selects the proper channel and connects it to the analog circuit path. If a 2-wire port and a 4-wire port are assigned the same address, the 2-wire port is inhibited and only the 4-wire port will respond. A 1013 Hz lineup tone at -18 dB is connected by the RL1 CP to the 2-wire polled links when the DC sealing current at those links is interrupted. No provision is made to control the lineup tone at the central or local office. Lineup tone is not affected by operating the OUT SERV switch.

3.06 ***RL2 CP:*** This port circuit pack provides one 4-wire port which will serve one 4-wire polled link. The following features are set at installation:

- 600- or 1200-ohm terminal impedance for the polled link
- 0-30 dB attenuation in the transmit path
- 0-15 dB attenuation in the receive path.

Four slide switches on the attenuators control 1-, 2-, 4-, and 8-dB pads. The sum of the exposed numbers at each slide switch equals the total attenuation (15-dB maximum) in each path. An additional 15-dB pad is provided in the transmit path. The address (0-127) of the 4-wire port (RL2 CP) is set with seven address selection switches mounted on the circuit pack. The address comparator circuit receives the address from the RL4 CP or RL8 CP. When the address matches the preset address, the solid-state analog switch is activated. The solid-state analog switch connects the 4-wire

Fig. 16—DSS Mounting Arranged for One Customer Start-Up—Sequential Offering

port to the analog circuit path. If a 2-wire and a 4-wire port are assigned the same address, only the 4-wire port responds.

3.07 ***RL3 CP:*** This port circuit pack provides one 4-wire port with equalization to serve one 4-wire polled link. The following features are set at installation:

- 4-wire termination with 359-type equalizer
- 0-30 dB transmit attenuation
- -20 to +30 dB adjustable receive gain
- 150-, 600-, or 1200-ohm terminal impedance for the polled link 6.3 dB pad reduces interaction between the high and low frequency sections of the 359-type equalizer. The terminal impedance is a shorting plug option. The REC IN jack provides access for adjusting the receive gain, and a 10 dB receive gain fine control is accessible through the faceplate. Address assignment and circuit

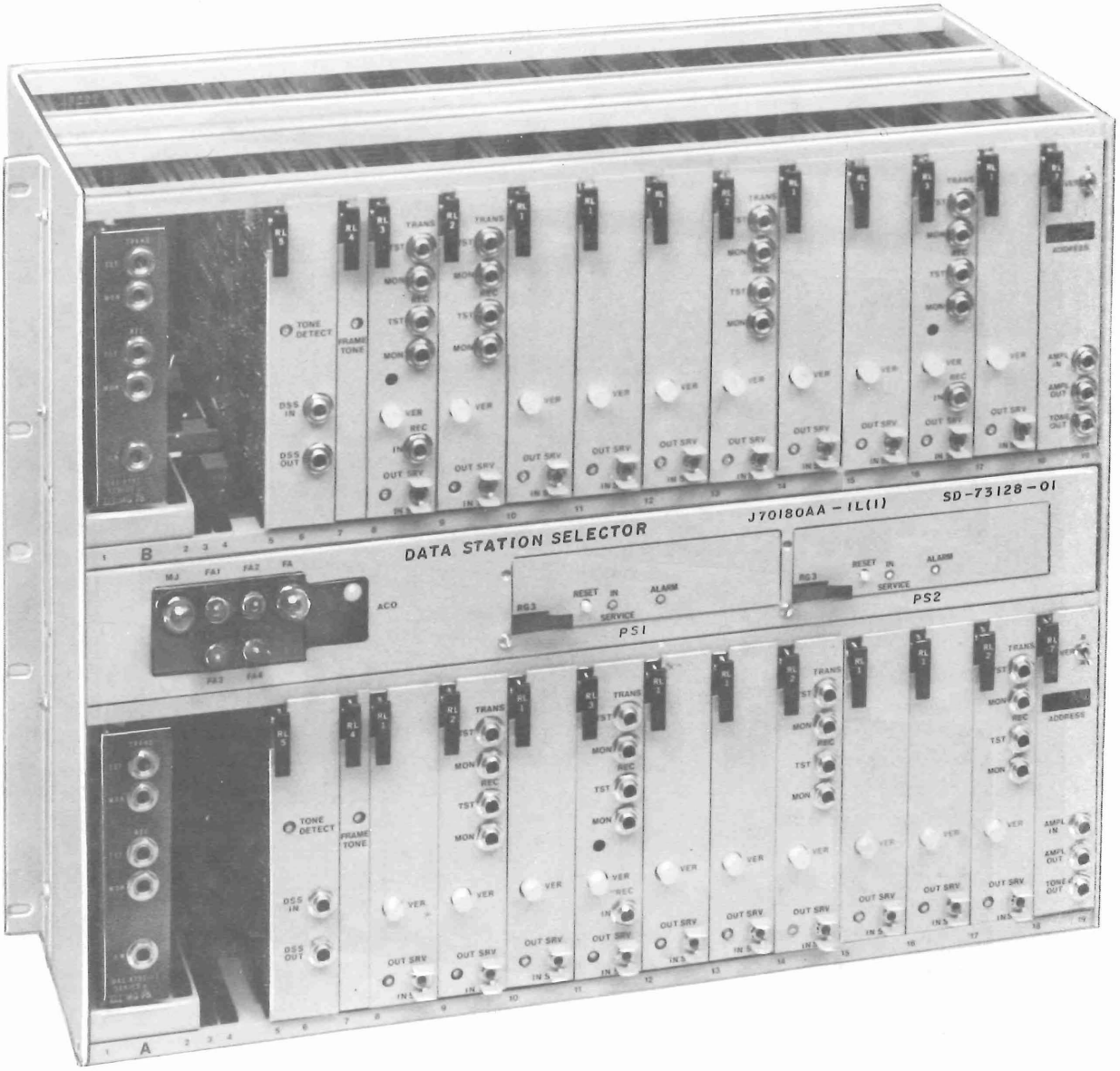


Fig. 17—DSS Mounting Arranged for Two Customer Start-Up—Sequential Offering

pack operation are the same as described for the RL2 CP.

3.08 ***RL5 CP:*** The RL5 CP functions as the analog control circuit (ACC) for the addressable and sequential offerings. The ACC is part of the analog circuit path. The ACC consists of a hybrid circuit, primary and secondary tone oscillators, a lineup tone oscillator, control signal detection circuits, and a solid-state analog switch. The hybrid circuit separates 2-wire transmit and receive signals from the 2-wire port circuit packs. The lineup tone oscillator produces the lineup tone for the 2-wire polled links. The control signal detector may be optioned to detect primary or secondary control signals. The option is set with a switch located on the RL5 CP. The solid-state analog switch provides switched ac continuity between the analog circuit path and one of seven signals. The switch is activated by directions from the RL4 CP or the RL8 CP.

3.09 ***RL6 CP:*** The RL6 CP functions as the expansion control circuit (ECC). The ECC

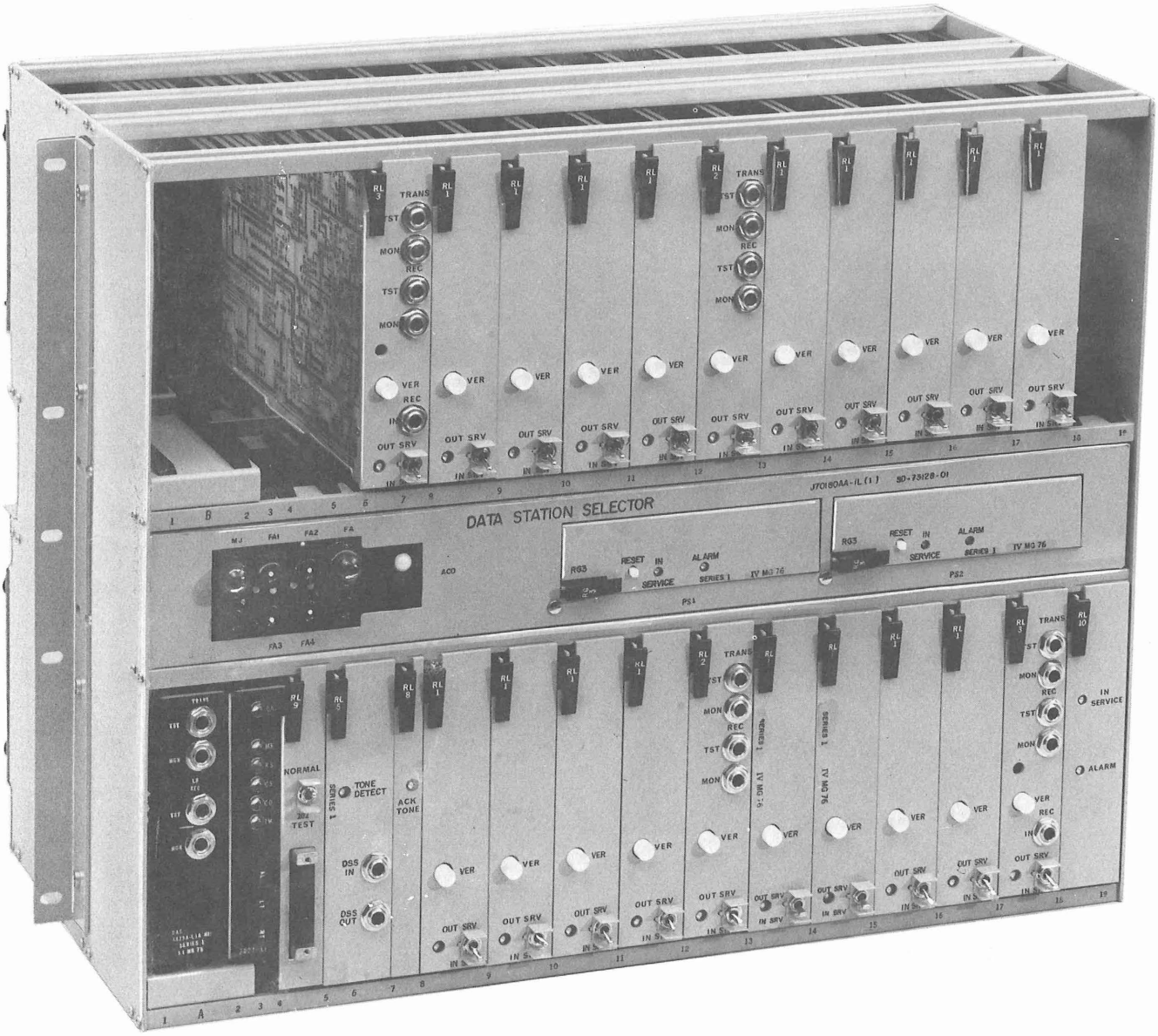


Fig. 18—DSS Mounting Arranged for One Customer Start-Up—Addressable Offering

provides an interface for expansion in and expansion out cables and control for port circuit packs. The RL6 CP is used only in expansion units. The following circuits of the ACC are also part of the ECC:

- Hybrid circuit
- Lineup tone oscillator
- Solid-state analog switch.

The ECC also contains port circuit pack control logic for the addressable offering. Signals from the master station are passed on to 2-wire and 4-wire ports and other expansion units via the analog switch.

3.10 ***RG3 CP:*** This circuit pack supplies power to the DSS and expansion units. A -48 volts is obtained from the central or local office battery. The RG3 CP provides ±5 volts and ±12 volts to each shelf of the mounting unit and to expansion units via expansion cables. The power

Fig. 19—DSS Mounting Arranged For One Customer Expansion

supply may be dualized if two RG3 CPs are provided. In this arrangement, one RG3 CP functions as the primary supply and the other RG3 CP is reserved for backup. When one power supply fails or is removed, the other power supply takes over. This power supply then continues to function until it fails or is replaced. The RG3 CP contains a voltage monitoring and switching circuit for under voltage and over voltage protection. If either of these conditions occurs, the power supply disconnects from the -48 volt source.

B. Sequential Offering Circuit Packs

3.11 ***RL4 CP:*** The RL4 CP provides digital control in the sequential offering and is referred to as the digital control circuit (DCC). The DCC contains control logic for the ACC, DAS 829-type L1A, ports, and expansion units. In addition, the DCC contains a hold-time clock, sequential address generator, and mode switches. The hold-time clock times each connection. The connection time is set with switches to provide a range of 20

Fig. 20—DSS Mounting Arranged For Two Customer Expansion

milliseconds (ms) to 10.24 seconds. The sequential address generator produces addresses sequentially to the maximum allowed ports-per-cycle. The number of ports-per-cycle is set with switches located on the RL4 CP. The mode switches set the DCC for operation in the auto-step, auto-step with reset, or controlled step options. In the auto-step with reset and controlled step options, the master station provides control signaling to the DCC.

C. Addressable Offering Circuit Packs

3.12 ***Data Set 202T:*** The data set 202T is a transmitter-receiver of nonsynchronous (intermittent) medium-speed binary serial data. Frequency-shift-key modulation is used for transmitting and receiving data at 1200 bits per second. Data set 202T is used only in the addressable offering to modulate and demodulate the signals containing addresses. Addresses from the master

station are received by the ACC and passed on to the data set for translation. Also, status report words which are sent to the master station are modulated through the data set.

3.13 ***RL8 CP:*** The RL8 CP replaces the RL4 CP as the DCC in the addressable offering. The RL8 CP actually shares the DCC function with the RL9 CP. For convenience, the RL8 CP is referred to as the DCC and the RL9 CP is called the addressable DCC. In addition to controlling the ACC, DAS 829-type L1A, ports, and expansion units, the DCC also interfaces with the RL9 CP. The RL8 CP contains a hold time clock and ports-per-cycle switches for the sequential mode of the addressable offering. Also contained on the RL8 CP are an address generator, a DAS 829-type L1A loopback inhibit, and a circuit to implement the status report DSS function. The address generator provides addresses according to instructions from the master station. The loopback inhibit prevents the DAS 829-type L1A from entering the tone-activated loopback test while the DSS is in service. In the addressable offering, the frame tone is designated acknowledgement tone. The acknowledgement tone, unlike the frame tone, is transmitted in response to a control signal. The frame tone oscillators of the ACC are used, but are not activated at the "end of cycle" as the frame tone is.

3.14 ***RL9 CP:*** This is the address DCC of the addressable offering. The major function of the address DCC is to interface between the data set 202T and the RL8 CP. In addition, mode switches set the RL9 CP and the RL8 CP for single address or double address error control DSS options. The address DCC also contains control logic for the ACC.

3.15 ***RL10 CP:*** The RL10 CP provides ±15 volts for data set 202T. This power supply has a voltage monitoring and switching circuit that causes an alarm condition when the output voltages are out of limits. When RL10 CP fails, it must be replaced and the ACO button must be depressed to clear the alarm condition.

4. OPERATION AND MAINTENANCE FEATURES

A. Installation of J70180AA DSS 2-Shelf Unit

4.01 This installation may be performed by telco crafts person or Western Electric installation force. The following instructions should be followed by telco crafts person to install this equipment.

4.02 No special tools are required to install the DSS mounting, which is mounted as follows:

(1) Install DSS mounting in 23-inch bay with ten screws.

(2) Make all connections to the DSS mounting as shown in Fig. 21.

(3) Make power connections from central office battery to terminals 51 and 53 of terminal strip TS-A (Fig. 22). Fig. 23 shows the J70180AA DSS 2-shelf unit backplane.

B. Features and Options

4.03 ***Power distribution Panel:*** The functions of the pushbuttons and indicators on the power distribution panel are given in Table B. Power supply (RG3 CP and RL10 CP) functions are included in the table. The pushbuttons and indicators operate as follows. The major alarm (MJ) indicator indicates a local alarm condition and will remain on until the alarm condition is cleared. The FA indicator goes on to indicate a fuse failure. If a power supply fails the red ALARM indicator on the power supply goes on. The green IN SERVICE indicator goes off. Depressing the alarm cutoff (ACO) pushbutton silences the central office audible alarm. This pushbutton locks under control of the local alarm condition. The ACO indicator goes on when the ACO pushbutton is depressed. When the alarm condition is cleared, all indicators that are on go off and the ACO pushbutton releases. The alarm condition may be cleared by replacing a fuse or power supply, or by depressing the reset pushbutton on the RG3 CP. When a power unit failure is cleared by depressing the RESET pushbutton, the power supply in service continues to be in service. The green IN SERVICE indicator goes on to indicate a power supply is in service. An over voltage or under voltage condition causes the power supply IN SERVICE indicator to go off and the ALARM indicator to go on. This condition also signals trouble to the central office alarm circuit and the MJ indicator goes on. The voltage monitoring and switching circuit of the RG3 or RL10 CP disconnects the power supply from the -48-volt source. If dualized power (RG3 CP only) is provided, the backup power supply will automatically take over operation. Failure of an RG3 CP may

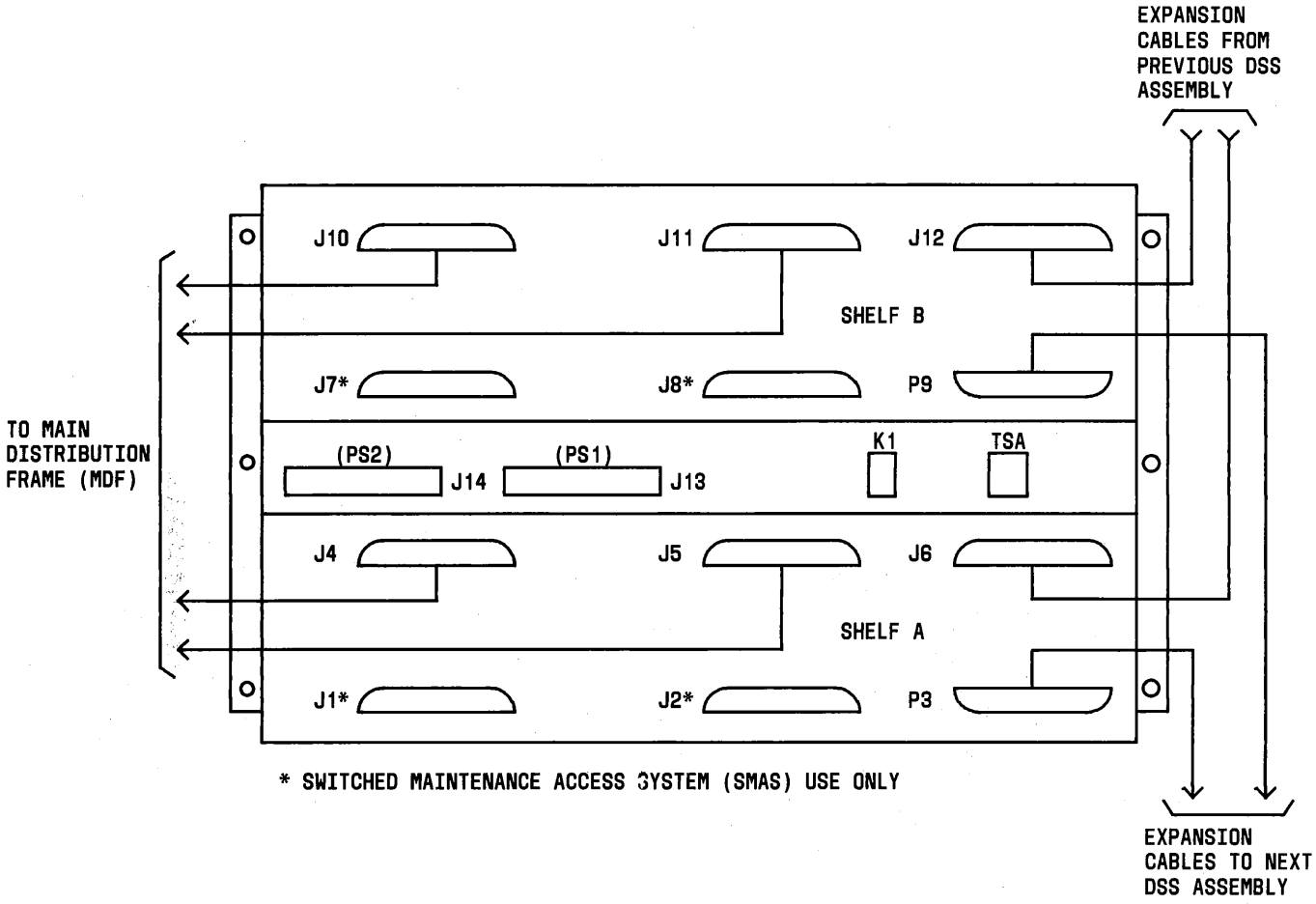


Fig. 21—Cable Connections on DSS Mounting Backplane

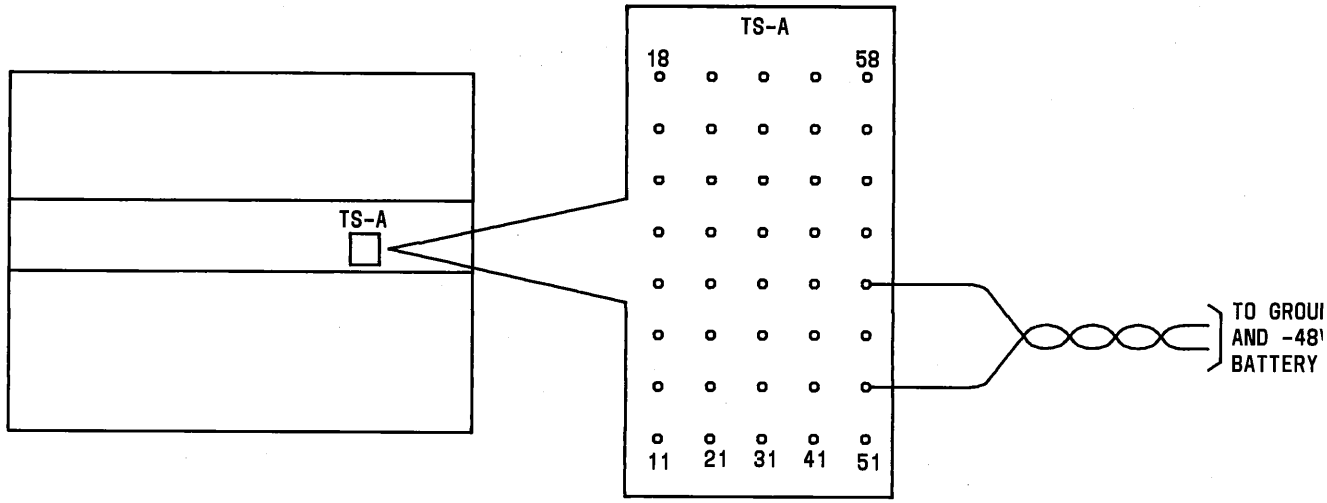


Fig. 22—Power Connections at TS-A Connector

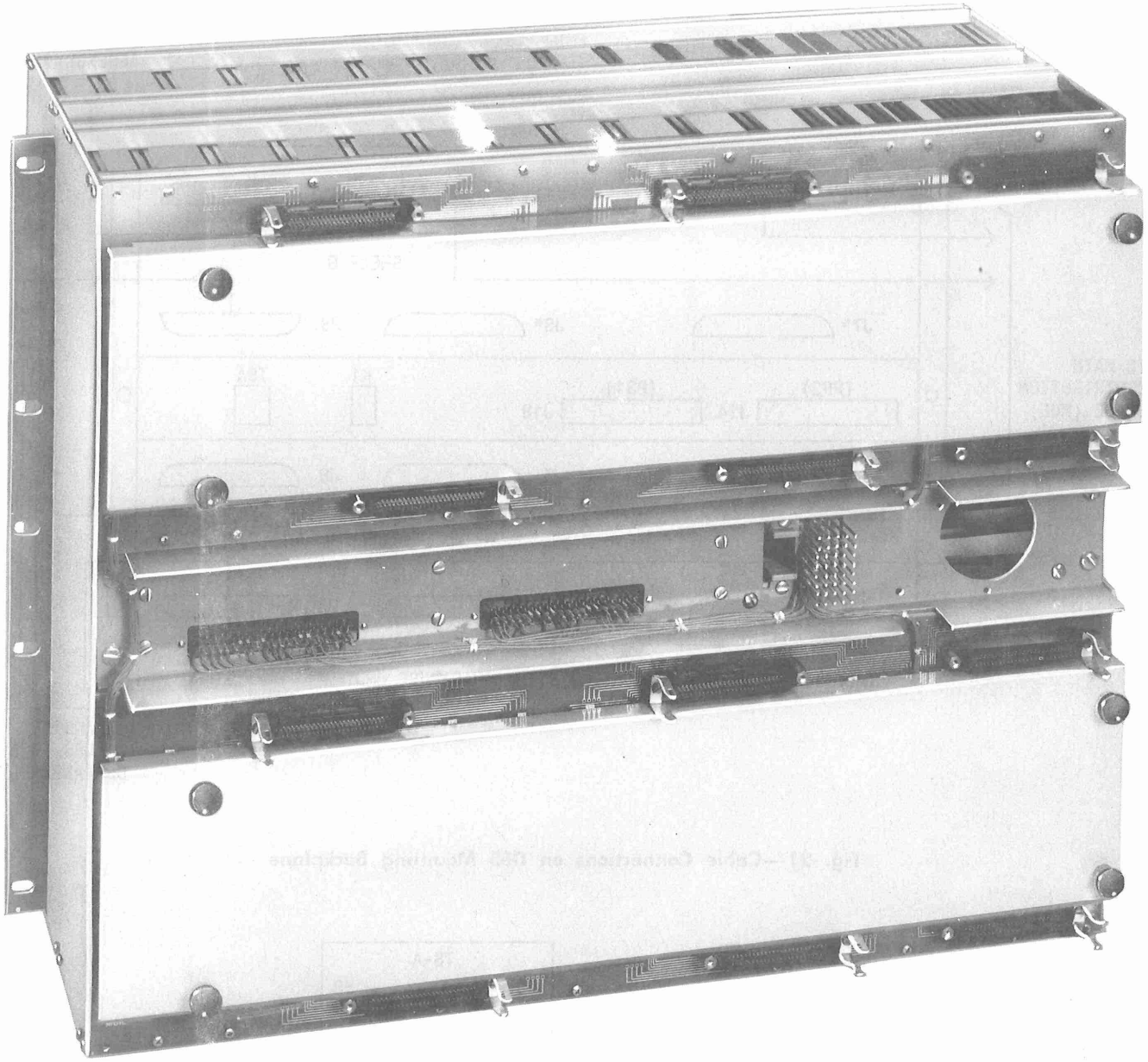


Fig. 23—DSS Mounting Backplane

be cleared by depressing the RESET pushbutton. Neither of the above two features is available on the RL10 CP.

Note: All testing referred to in this part is done under instructions from the test center.

4.04 ***DAS 829-type L1A:*** The TRANS TST, TRANS MON, REC TST, and REC MON jacks provide access for testing and monitoring the receive and transmit circuit paths. These jacks are used with the 178A test set and the test center to perform transmission level tests. The following features and options are set at installation:

- Loopback amplifier gain strapping option (all codes)
- Power supply strapping option (all codes)
- Sealing current strapping option (all codes)

TABLE B

POWER DISTRIBUTION PANEL FUNCTIONS

FUNCTION	LOCATION	COLOR	INDICATION
MJ	Power Distribution Panel	Red	Major Alarm
FA		Red	Fuse Failure
ACO		White	Central Office Audible Alarms Have Been Cut-Off
IN SERVICE	Power Supply	Green	Power Supply In Service
ALARM		Red	Power Supply Failure
ACO (pushbutton)	Power Distribution Panel		Audible Alarm Cut-Off
RESET (pushbutton)	Power Supply		Power Supply Reset

- Transmit attenuator (all codes)
- Receive attenuator (A code)
- Line impedance option (A and B codes)
- 359A or 359K equalizer (C code)
- Receive gain option (B and C codes).

The receive gain option includes a coarse gain strapping option and an adjustable fine gain control. The fine gain control is accessible through the faceplate of the B and C codes. A REC IN jack provides access for adjusting the receive levels on the B and C codes. The loopback (LB) indicator goes on when the DAS 829-type L1A is in the LB test mode.

4.05 ***RL1 CP:*** Depressing the VER pushbutton causes the four port addresses to be displayed sequentially in the ADDRESS window of the RL7 CP. Operating the OUT SRV switch inhibits the address decoder which disables the analog switches of that circuit pack. The OUT SRV indicator also goes on. Placing the circuit pack out of service does not disable the lineup tone or the verify function.

4.06 ***RL2 CP:*** Depressing the VER pushbutton causes the address of the 4-wire port to be displayed on the RL7 CP. Operating the OUT SRV switch places the circuit pack out of service but does not affect the verify function. The OUT SRV indicator also goes on. No lineup tone is provided. Four jacks (TRANS TST, TRANS MON, REC TST, and REC MON) provide access for testing and monitoring the transmit and receive path. The following features and options are set at installation.

- Adjustable transmit and receive attenuators (0-15 dB)
- Transmit pad (15 dB)
- 600- or 1200-ohm line termination option.

4.07 ***RL3 CP:*** The features of this circuit pack are similar to the RL2 CP with two additions. A REC IN jack provides access for adjusting the receive level. Accessible through the faceplate is a 0 through 10 dB receive fine gain control. The following features are set at installation:

- 150-, 600-, or 1200-ohm line termination option
- 359A or 359K equalization

- Transmit attenuator (0-30 dB)
- Adjustable receive gain (-20 dB to +30 dB).

4.08 ***RL5 CP (ACC):*** Two jacks (DSS IN and DSS OUT) provide access to the DSS primary link. The 178A test set uses this access to perform transmission tests. The TONE DETECT indicator goes on when the DSS receives a control signal from the master station.

4.09 ***RL7 CP:*** This is the verify circuit pack which functions as a maintenance tool. Operations connected with the RL7 CP do not affect DSS operation. The RL7 CP is designed to be transferred from shelf A to shelf B as it is needed. Only one shelf at a time can be monitored with one RL7 CP. The A/VER/B switch must be placed in the proper position. To monitor both shelves at once, two RL7 CPs must be used. The RL7 CP will then display the number of the port being addressed on the indicated shelf. If no port is being addressed on that shelf, the display will be blank. The RL7 CP is usually equipped in slot 18 of the DSS mounting. However, it may be used in any vacant port circuit pack slot. The RL7 CP will monitor the address(es) assigned to any 2-wire or 4-wire port of that same shelf when the A/VER/B switch is placed in the verify (VER) position and the VER pushbutton on a port circuit pack is depressed. For a 2-wire port circuit pack, the display will sequence through four numbers. For a 4-wire port circuit pack, the display will show only one number. For addresses of less than 100, the leading zero is blanked. Two jacks (AMPL IN and AMPL OUT) provide access to the 8-dB amplification used in loop-around testing of a 4-wire port. A -8 dBm tone is available at the TONE OUT jack for use as a lineup tone for 4-wire polled links.

4.10 ***RL4 CP (DCC of Sequential Offering):*** The FRAME TONE indicator of this circuit pack goes on at the beginning of a polling cycle. This includes the reset cycle in the auto-step with reset option and the new cycle in the controlled step option.

4.11 ***Data Set 202T:*** The data set 202T has six status LEDs on the faceplate. The functions of these LEDs are listed in Table C. The LEDs operate as follows. The ON LED will be on as long as power is supplied to data set 202T. The RS and CS LEDs go on to indicate the status of the CA and CB leads from and to the RL9 CP. When addresses are received from the master station, the CO LED goes on. The TM LED goes on when the data set is in local self-test (LT) or remote test (RT). The TM LED will go off when the test buttons are released except in the LT mode. If an error is made, the TM LED will go off before the LT is ended. All LEDs go on in the LT irrespective of actual conditions. The digital loopback DSS special function is used in place of the analog loopback (AL) test. The AL is inhibited by the RL9 CP. The local self-test (LT) pushbutton switch is nonlocking and must be kept manually depressed during the test. All LEDs on the data set are on during the test to check for LED failures. The output of the data set transmitter is connected to the input of the receiver. During the test, the data set generates a random address. This address is processed by the transmit and receive circuitry of the data set. If an error occurs during the test, the TM LED goes off and remains off. The LT pushbutton must be released and again depressed for the TM LED to go on again. If an error occurs in a 15-second test, the test should be repeated. The SCU should pass (TM LED stays on) four out of five 15-second tests. Releasing the LT pushbutton restores normal operation. The remote test (RT) is made in conjunction with a test center. As in the LT test mode, when the RT pushbutton is depressed, it causes a digital loopback within the data set. The TM LED goes on, and the RL9 CP interface leads are disabled. The random address is processed by the transmit and receive circuits as described for the LT. In addition, the random address is transmitted to the test center. The test center can then check for errors and perform a digital loopback test.

4.12 ***RL8 CP (DCC for Addressable Offering):*** The ACK TONE indicator goes on to indicate that the DSS is transmitting the acknowledgement tone.

4.13 ***RL9 CP (Address DCC):*** The digital loopback mode and test tone mode are special functions of the DSS. The RL9 CP implements these two test functions according to instructions from the master station. The digital loopback mode allows the output of the data set 202T transmitter to be connected to the data set receiver input. The test center can then make a long term performance test of the data set and the primary

TABLE C

DATA SET 202T INDICATOR FUNCTIONS

LED	INDICATION
ON	Power is applied to data set.
MR - Modem Ready	Data set is not in a test condition. Data set is ready to transmit or receive.
RS - Request to Send	Signal from RL9 CP indicating it has data to transmit.
CS - Clear to Send	Data set is ready to transmit.
CO - Carrier On	A line signal is being received (carrier detected - not necessarily valid data).
TM - Test Mode	Data set is in AL, LT, or RT test mode. Also indicates an error in the local self-test.

or secondary link. The test tone mode causes the RL9 CP to activate the RL5 CP lineup tone. The lineup tone is then transmitted to the master station via the primary link. The 25-pin test connector and test switch (NORMAL/202 TEST) are used with a standard test set. The test switch should be in the NORMAL position for proper operation of the DSS.

5. DSS OPERATION

5.01 This part describes the operation of a primary DSS. Operation of a secondary DSS will be similar to the operation of a primary DSS. The only difference is the secondary DSS receives all control signals and addresses via the primary DSS and the secondary link (Fig. 1). The rules for tandem arrangement described in 1.12 also apply.

5.02 Fig. 24 shows a primary DSS equipped for the sequential offering. In the auto-step DSS option, the master station only monitors DSS operation. The RL4 CP (DCC) generates the control logic automatically to set up a polling link. The DCC automatically generates the port addresses in sequence and transmits these addresses in digital form to the digital data bus. This address on the digital data bus causes the port card RL1, RL2, or RL3, that is set for this address to operate its analog switch and complete the circuit to the remote station. In the auto-step with reset DSS option, the master station can send a reset control signal to the DSS. This reset signal instructs the DSS to restart the polling cycle and poll the first port. In the controlled step DSS option, the master station sends control signals to the DSS to step it one port at a time. Thus the stepping of the DSS is under complete control of the master station. When a port circuit pack is located in an expansion unit, the ACC completes the analog circuit path through the expansion out connector. The analog, control and address bus allows the DCC to control and monitor port circuit pack operation

5.03 Fig. 25 shows a primary DSS equipped for the addressable offering. Control signals received via the DAS 829-type L1A and ACC are passed on to the RL8 CP and RL9 CP. The RL9 CP then activates the data set 202T to receive

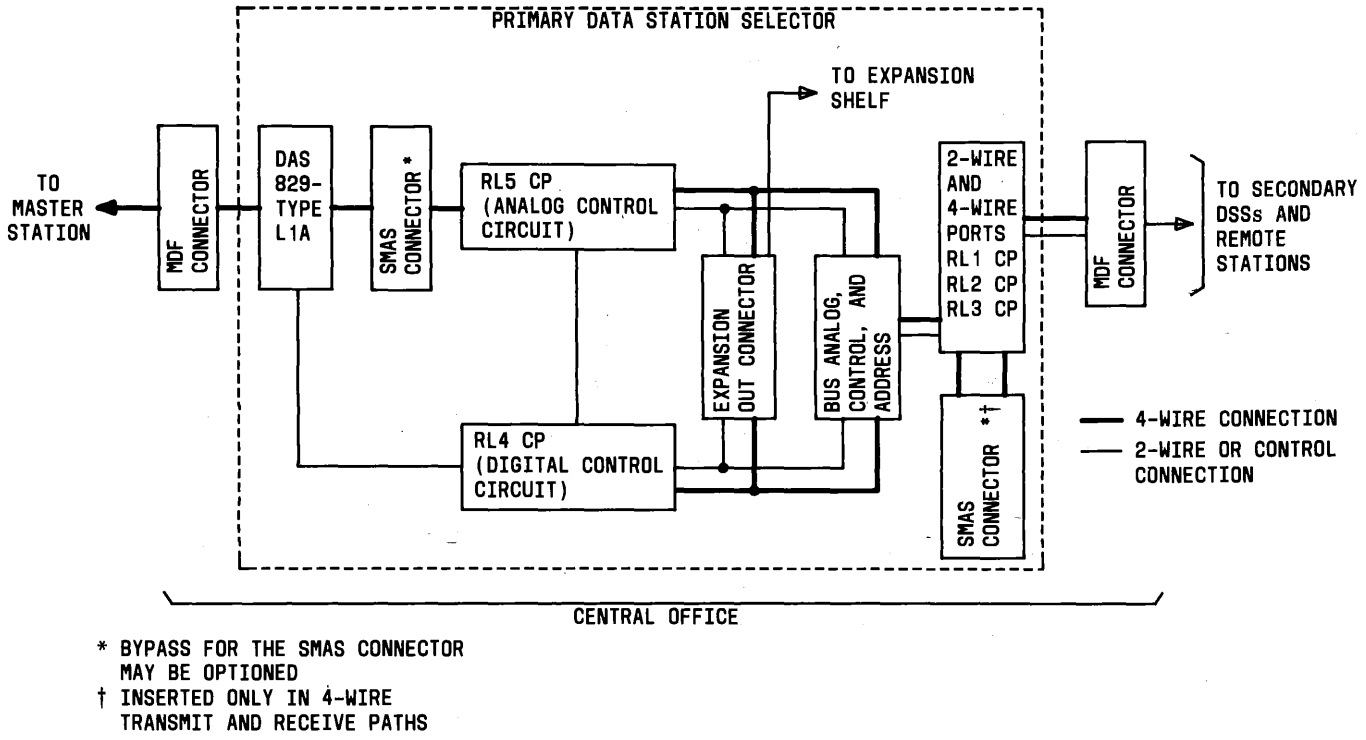


Fig. 24—Functional Block Diagram of DSS Equipped For Sequential Offering

addresses. If the address received matches a port address, the port circuit pack and the ACC are activated and the analog circuit path is completed to the remote station. If the address is an instruction, the RL8 CP or RL9 CP will implement the function using the ACC and/or the data set. The expansion out connector and analog, control, and address bus function similarly in the addressable and sequential offering.

6. REFERENCES

6.01 The following documents provide additional information on facilities and equipment that are associated with the J70180AA Data Station Selector and DATAPHONE® Select-A-Station Service.

NUMBER	TITLE
CD & SD-73128-01	Data Systems—DATAPHONE® Select-A-Sation System—Central Office-Data Station Selector
SECTION	TITLE
107-104-010	178A Test Set—Description and Operation
107-402-100	921 Data Test Set—Description and Operation
314-410-550	DATAPHONE® Select-A-Station Service— Overall System Description
590-101-000	150A Channel Service Units—Description Installation, Maintenance, and Tests
590-105-101	Data Station Selector J70180AA—TOP
592-031-100	Data Set 202T Transmitter-Receiver—Description
598-082-100	Data Auxiliary Set 829-Type, Channel Interface Units, Voiceband Private Line Channels—Description

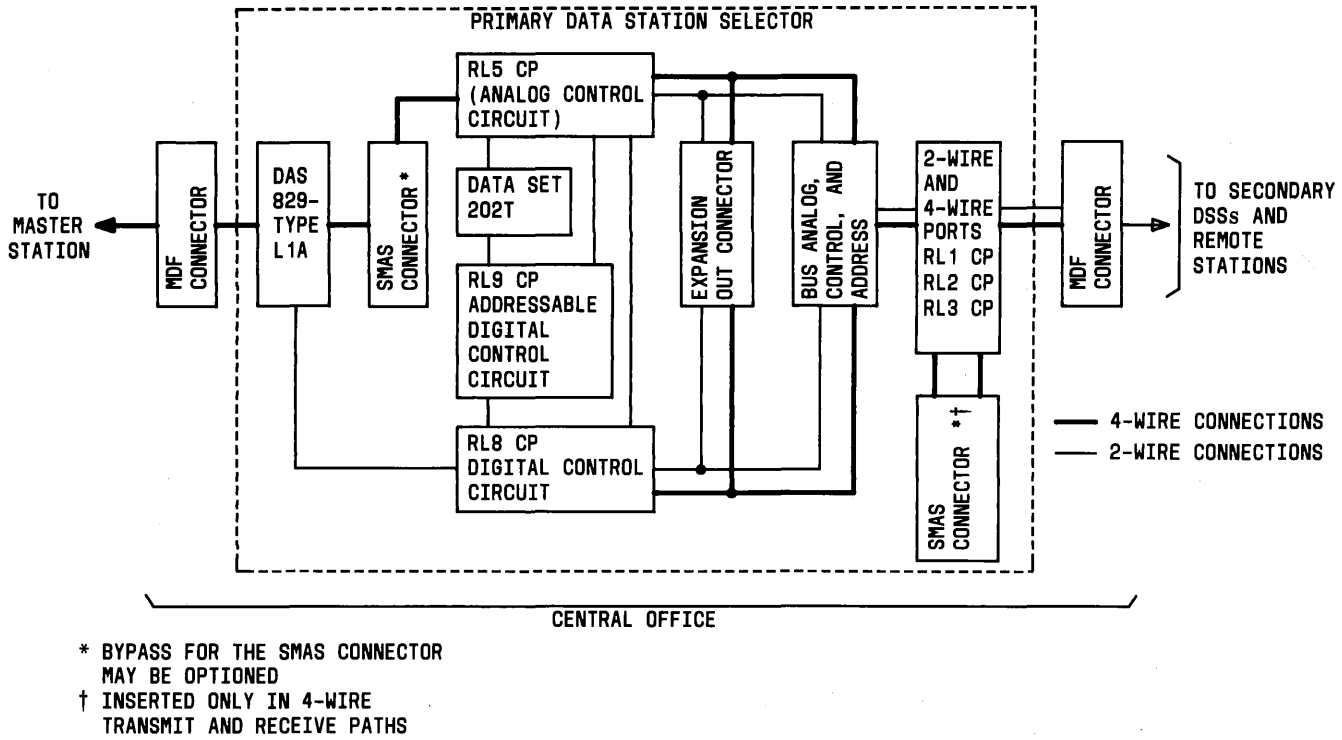


Fig. 25—Functional Block Diagram of DSS Equipped for Addressable Offering

598-082-200 Data Auxiliary Set 829-Type, Channel Interface Units, Voiceband Private Line Channels—Installation and Connections

598-082-500 Data Auxiliary Set 829-Type, Channel Interface Units, Voiceband Private Line Channels—Test Procedures

598-083-105 DATAPHONE® Select-A-Station Service—838A Data Station—Description

598-083-106 833A Data Station—TOP

598-083-180 833A Data Station—Summarizing Specification—Data System

666-617-100 Dataphone® Select-A-Station Service—Test Centers—Administration Procedures

666-617-101 Dataphone® Select-A-Station Service—Test Center Procedures—TOP Data Station Selector—Equipment Design Requirements—J70180AA

880-480-010 DATAPHONE® Select-A-Station Service— Description and Engineering Considerations

999-100-147 833A Data Station—How to Operate Manual

7. GLOSSARY

7.01 A list of unique terms and their definitions used in this section are as follows:

Address—Bit sequence that activates digital control circuitry. Used generally, address refers to port addresses, instructions, and control words.

Addressable—A service offering in which the customer has in-service control of both the function

and order of connections to a number of remote stations.

Automatic Step—A DSS option of the sequential offering in which the duration and order of connections are fixed.

Automatic Step with Reset—A DSS option of the sequential offering in which the duration and order of connections are fixed, but the DSS will reset to the beginning of the connection cycle upon command from the master station.

Channel Service Unit (CSU)—A standard termination device located at the remote station.

Control Signal—A signal transmitted from the master station (SCU) to reset the DSS, step the DSS to the next port, or implement a DSS control function.

Controlled Step—A DSS option of the sequential offering which allows the customer to have in-service control over the duration of the connection. However, the connection sequence is fixed.

Customer-Provided Equipment (CPE)—Customer equipment located on the customer side of the telephone company interface and provided by the customer. Examples are digital computers, communication controllers, and magnetic tape readers and recorders.

Data Auxiliary Set 829-Type—Circuit packs used to provide 4-wire terminations for 4-wire facilities.

Data Auxiliary Set 833A—Type-Circuit packs that provide control signaling functions in the SCU at the master station.

Data Station Selector (DSS)—A switching device located in central offices and having the capability of making connections between a 4-wire input and up to 128 outputs (sequential service) or 125 outputs (addressable service) which may be 2-wire or 4-wire.

Duplex Operation—The transmission of signals in both directions simultaneously.

Equal-Level Loopback—A circuit arrangement interconnecting the receive and transmit paths and correcting for any difference in the transmission level at the point of connection. This ensures that signals on the line are maintained at standard data level during loopback tests when a test signal at data level is applied toward a DSS or a 4-wire customer station.

Frame Tone—A tone from the DSS in the central office to the SCU at the master station to indicate the beginning of a connection cycle.

Half-Duplex Operation—The transmission of signals alternately in either direction, or for communication in one direction only, including bidirectional simultaneous transmission of tones required solely for control purposes or quick turnaround or synchronization.

Master Station—The station (containing CPE and SCUs) which controls the DSS operation and communicates with remote stations.

Polled Link—The transmission channel between the DSS and a remote station.

Remote Station—One of many remotely located stations on amultistation circuit that is connected to the master station by DSSs.

Selector Control Unit (SCU)—The equipment associated with one circuit located at the master station and used by the customer to transmit control signals to DSSs and receive supervisory signals from DSSs.

Sequential—A service offering to a customer in which the order of connections from the master station to the remote stations is fixed by that initial assignment to the DSS output ports.