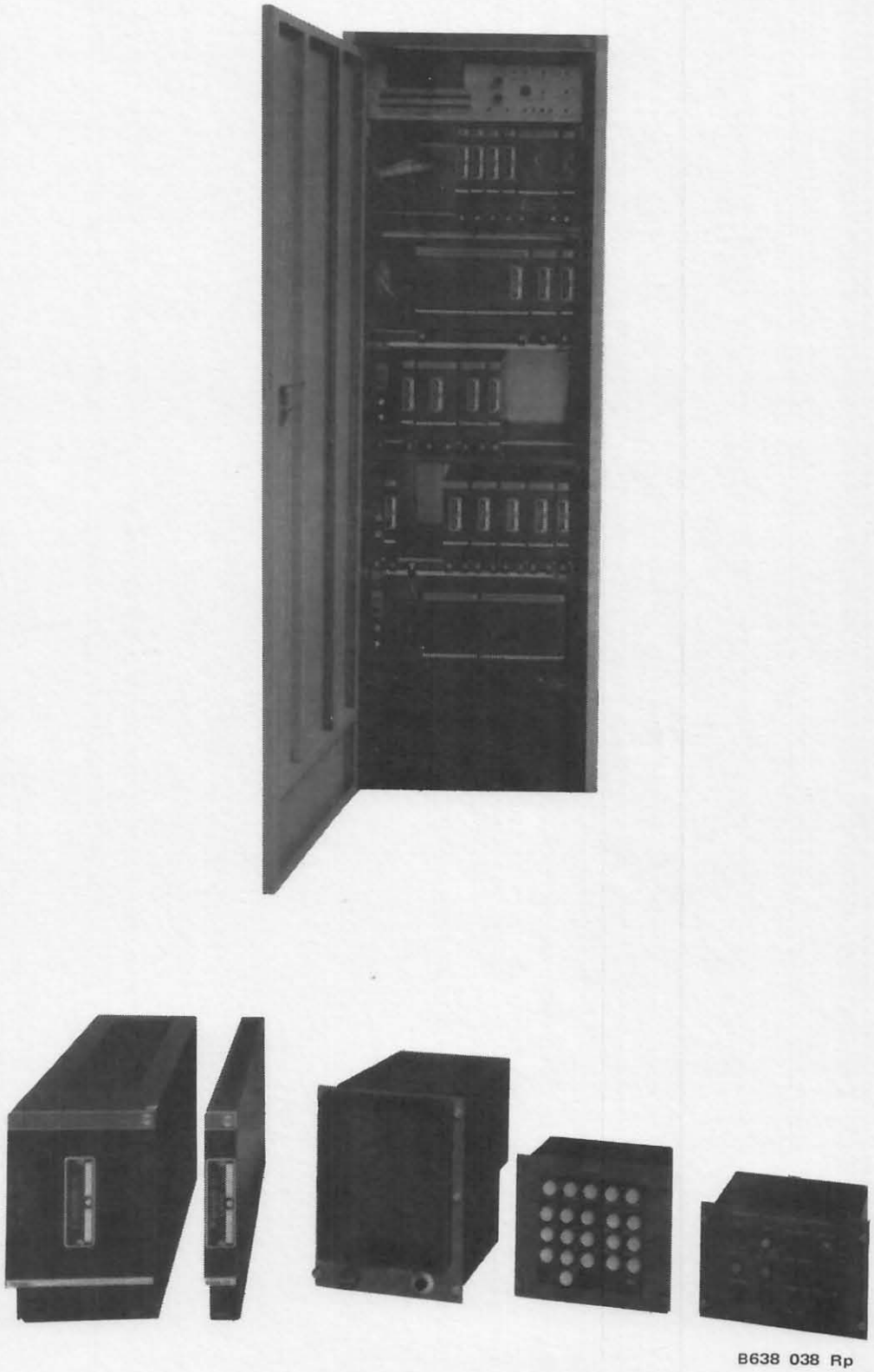


Figure 1-1. Digital Data Communication System AN/USC-27.

section 1
general description

1.1 PURPOSE OF HANDBOOK

This manual provides general description, installation instructions, and maintenance instructions for Digital Data Communication System AN/USC-27 (system). Information is written for operators experienced in the operation of digital and radio equipments. Descriptions of the various equipment comprising the system are contained in separate manuals. Refer to table 1-4 for a list of applicable manuals.

1.2 PURPOSE OF SYSTEM

The system (figure 1-1) can operate either as a net control station, a picket station, or a relay station, providing long-range (high frequency) and short-range (ultrahigh frequency) data communications. The system provides automatic operating mode and frequency selection, monitors system performance, and identifies and reports operational malfunctions. Communication modes other than data, include single-sideband clear voice, amplitude- and frequency-modulated voice, vocoder, break-in continuous wave, and frequency-shift keying.

1.3 EQUIPMENT SUPPLIED

Equipments supplied as part of the system are listed in table 1-1.

1.4 EQUIPMENT REQUIRED BUT NOT SUPPLIED

Table 1-2 lists equipments required for operation of the system that are not supplied as part of the system.

1.5 DESCRIPTION OF MAJOR EQUIPMENT

1.5.1 General

Digital Data Communication System AN/USC-27 is functionally divided into two parts; the main equipment cabinet and the remote control units. Electrical Equipment Cabinet CY-6983/USC-27 contains Radio Set AN/URC-75, Radio Set AN/ARC-138(V)1, Communications Control Group OK-163/USC-27, and Data Terminal Set AN/UYQ-7. The remote control units, Control-Indicator C-8674/USC-27, Alpha-Numeric Keyset KY-667/USC-14, Alpha-Numeric Indicator ID-955/USC-14, Power Supply PP-6654/USC-27, and Computer Control C-7933/USC-14 are used at a remote control station as the operator/system interface. Antenna Coupler CU-1849/U (with Coupler Mount MT-3910/ARC-132) is an ancillary device for matching Radio Set AN/URC-15 output impedance to the hf antenna characteristic impedance.

1.5.2 Radio Set AN/URC-75

Radio Set AN/URC-75 transmits and receives radio high-frequency signals on upper sideband and/or lower sideband, amplitude modulation, or continuous wave. Automatic tuning

Table 1-1. Equipment Supplied.

NOMENCLATURE NAME	MIL TYPE	COLLINS TYPE	REFERENCE DESIGNATION
Digital Data Communication System	AN/USC-27	None	None
Cabinet, Electrical Equipment	CY-6983/USC-27	None	None
Communications Control Group	OK-163/USC-27	None	1A2
Drawer, Electrical Equipment, Cabinet	CH-671/USC-27	None	1A2A1
Relay Assembly (2 supplied)	RE-1053/USC-27	7201F-1	1A2A2, 1A2A3
Control, Relay Assembly	C-8670/USC-27	8791B-1	1A2A4
Power Supply	PP-6623/USC-13	652A-27	1A2A5
Computer, Device Control	CP-1162/US	768Z-1	1A2A6
Adapter, Computer	MX-9511/US	8311C-1	1A2A7
Data Terminal Set	AN/UYQ-7	None	1A3
Drawer, Electrical Equipment, Cabinet	CH-672/UYQ-7	None	1A3A1
Converter, Digital to Analog	CV-2813/UYQ-7	None	1A3A2
Encoder-Decoder-Control	KY-698/UYQ-7	None	1A3A3
Converter, Signal Data	CV-2814/UYQ-7	None	1A3A4
Radio Set	AN/ARC-138(V)1	U-1402	1A4
Drawer, Electrical Equipment, Cabinet	CH-673/ARC-138(V)	499S-1A	1A4A1
Amplifier, Intermediate Frequency	AM-6149/ARC-138(V)	940A-1	1A4A2

Table 1-1. Equipment Supplied (Cont).

NOMENCLATURE NAME	MIL TYPE	COLLINS TYPE	REFERENCE DESIGNATION
Amplifier-Modulator	AM-6148/ARC-138(V)	943A-1	1A4A3
Translator, Receiver	CV-2577/ARC-138(V)	941A-1B	1A4A4
Control-Synthesizer	O-1526/ARC-138(V)	942A-1	1A4A5
Radio Set	AN/URC-75	URG-II	None
Receiver-Transmitter Radio	OR-81/URC-75	671T-3A	1A5
Drawer, Electrical Equipment, Cabinet	CH-674/U	499R-4	1A5A1
Control-Adapter, Radio Set	C-8673/URC-75	599H-4	1A5A2
Amplifier, Converter	CV-2649A/GRT-17(V)1	888B-1	1A5A4
Synthesizer, Electrical Frequency	O-1596/URC-75	887B-1	1A5A5
Detector, Audio Frequency	CV-2652A/GRR-18(V)1	889B-1	1A5A6
Translator, Signal Data	CV-2815/URC-75	899B-6	1A5A7
Power Supply	PP-4992A/ARC-132	652J-4	1A5A8
Amplifier-Power Supply Group	OG-98/URC-75	548U-1	1A6
Drawer, Electrical Equipment, Cabinet	CH-675/URC-75	499R-7	1A6A1
Power Supply	PP-7108/URC-75(V)	636Y-2	1A6A2
Amplifier, Radio Frequency	AM-6176/URC* or	648A-1	1A6A3
Control Group Control-Indicator	C-8674/USC-27	None	None

Table 1-1. Equipment Supplied (Cont).

NOMENCLATURE NAME	MIL TYPE	COLLINS TYPE	REFERENCE DESIGNATION
Keyset, Alpha-Numeric	KY-667/USC-14	7513B-1	None
Power Supply (CRT)	PP-6554/USC-27	652A-32	None
Indicator, Alpha-Numeric (CRT)	ID-955/USC-14	7514B-1	None
Control, Computer	C-7933/USC-14	7512B-1	None
Antenna Coupler	CU-1849/U	490T-3	None
Coupler Mount	MT-3910/ARC-132	890F-1	None

*The AM-6176/URC military nameplates are on the radio frequency amplifiers in systems serial-numbered DBS-1 and DBS-2, only. The AM-6176/URC units have been modified, and are interchangeable with the AM-6518/URC units in all other systems.

Table 1-2. Equipment Required But Not Supplied.

QTY PER SYSTEM	NOMENCLATURE NAME	TYPE	REQUIRED CHARACTERISTICS
1	Power supply		3-phase, wye-connected, 4-wire, 400 Hz, 208 volts phase-to-phase, 120 volts phase-to-neutral, 5400 VA
1	Tactical Computer	Univac 1830B	
1	Vocoder		Optional for digital voice
1	Fsk modem		Optional for uhf operation
1	Multiplexer/tone fsk		Optional for fsk operation
1	Frequency standard		Optional, 100 kHz ±1 part in 10^9, 3.0 ±0.5 volts rms

Table 1-2. Equipment Required But Not Supplied (Cont).

QTY PER SYSTEM	NOMENCLATURE NAME	TYPE	REQUIRED CHARACTERISTICS
As required	Electrical installation cables		See tables 2-2 thru 2-15
*2	Microphone		Dynamic or carbon
*2	Headphone		Standard, high impedance, 250-mW input
*2	Speaker		8 ohms, high efficiency, approximately 3 to 6 inches (7.62 to 15.24 cm) in diameter, 2-watt input

*Quantity depends upon configuration of customer-fabricated audio panel. At the cabinet, a carbon microphone and headphones must be used. At the remote control station, either dynamic or carbon microphones can be used; reception can be through headphones or speakers to monitor the hf, uhf, and guard receivers. Table 2-10 lists the audio inputs and outputs from the cabinet. The customer may select the options that best meet his requirements.

and operating mode selection is remotely controlled by serial digital words from Communications Control Group OK-163/USC-27. The AN/URC-75 sends serial digital words to OK-163/USC-27 to report operating status of the radio. Operating parameters of the AN/URC-75 are listed in table 1-3.

The AN/URC-75 consists of eight modules mounted on cabinet electrical equipment drawers. Six modules mounted on Cabinet Electrical Equipment Drawer CH-674/U form Radio Receiver-Transmitter OR-81/URC-75 (shelf number five). Amplifier-Power Supply Group OG-98/URC-75 (shelf number six) consists of two modules mounted on Cabinet Electrical Equipment Drawer CH-675/URC-75.

Antenna Coupler CU-1849/U is used to match the antenna characteristic impedance to the output impedance of Amplifier-Power Supply Group OG-98/URC-75 over the 2- to 30-MHz range.

1.5.3 Radio Set AN/ARC-138(V)1

Radio Set AN/ARC-138(V)1 transmits and receives ultrahigh frequency radio signals with amplitude modulation, frequency modulation, or frequency-shift keying modes. Automatic tuning, operating mode selection, and radio status reporting are performed through Communications Control Group OK-163/USC-27. The AN/ARC-138(V)1 operating parameters are listed in table 1-3.

The AN/ARC-138(V)1 consists of four modules mounted on Cabinet Electrical Equipment Drawer CH-673/ARC-138(V) (shelf number four).

1.5.4 Communications Control Group OK-163/USC-27

All control and performance monitoring functions for the system are processed by Communications Control Group OK-163/USC-27. The remote operator enters commands on Alpha-Numeric Keyset KY-667/USC-14 and monitors the commands on Alpha-Numeric Indicator ID-955/USC-14. Device Control Computer CP-1162/US interprets the operator commands, generates the signals necessary to instruct AN/USC-27 subsystem equipments to execute the commands, and reports system status to the operator.

An audio-switching matrix formed by two Relay Assemblies RE-1053/USC-27 and Relay Assembly Control C-8670/USC-27 is part of the OK-163/USC-27. The audio-switching matrix provides switching of audio and keyline functions among subscribers and radios. Communications Control Group OK-163/USC-27 automatically selects the matrix switch configuration required for the selected system operating mode.

The six modules that form the OK-163/USC-27 are mounted on Cabinet Electrical Equipment Drawer CH-671/USC-27 (shelf number two).

1.5.5 Data Terminal Set AN/UYQ-7

Cabinet Electrical Equipment Drawer (cabinet shelf three) contains the three modules of Data Terminal Set AN/UYQ-7.

The AN/UYQ-7 provides the interface between the AN/URC-75 and/or AN/ARC-138(V)1 and the tactical computer or vocoder equipment. In the transmit mode, input digital data is converted to differentially coherent, phase-shift-keyed audio tones for transmission by radio. In the receive mode, the received audio tones are converted to digital data as outputs to external devices.

1.5.6 Remote Control Units

Operator commands for control of a tactical data link are entered through Control-Indicator C-8674/USC-27. Commands include power-on/off, receive reset, transmit initiate, and program load initiate. Indicator lamps report system status.

Alpha-Numeric Keyset KY-667/USC-14 is used to enter operator commands for control of system operating modes. Alpha-numeric characters, editing functions, and send commands are transmitted by using the keyset keyboard. These operator commands are processed by Computer Control C-7933/USC-14 and sent to Device Control Computer CP-1162/US in the main cabinet for interpretation and generation of instructions and addresses.

Alpha-Numeric Indicator ID-955/USC-14 displays system status and commands upon a cathode ray tube. The cathode ray tube display contains a maximum of 15 lines with up to 16 characters in a line. Communications Control Group OK-163/USC-27 generates the display data in response to monitor words and to commands from Alpha-Numeric Keyset KY-667/USC-14.

1.6 ELECTRICAL CHARACTERISTICS

The system electrical characteristics are listed in table 1-3. Weight and size of the various units are included in the table.

Table 1-3. Electrical Characteristics.

EQUIPMENT/ITEM	CHARACTERISTICS
Digital Data Communication System AN/USC-27	
Primary power requirements	120/208 volts, 3-phase, wye-connected, 400 Hz, 5400 VA
Cabinet size	70 H x 23-5/8 W x 30 D inches (177.80 x 60.0 x 76.20 cm)
Total weight	648 pounds (291.60 kg)
Audio outputs	
Hf receiver	2 watts, 8 ohms 250 mW, 600 ohms
Uhf receiver	2 watts, 8 ohms 250 mW, 600 ohms
Guard receiver	2 watts, 8 ohms 250 mW, 600 ohms
Audio inputs	
Hf transmitter	600 ohms for dynamic microphone 100 ohms for carbon microphone
Uhf transmitter	600 ohms for dynamic microphone 100 ohms for carbon microphone
Radio Set AN/URC-75 and Radio Receiver-Transmitter OR-81/URC-75	
General:	
Frequency range	2.0 to 29.9999 MHz in 0.1-kHz increments
Number of channels	280,000
Modes	Upper sideband (usb), lower sideband (lsb), amplitude modulation (am), continuous wave (cw), frequency-shift keying (fsk) with external modem
Frequency stability	Within ±1 part in 10^6 after 10 minutes operation and within ±1 part in 10^8 after

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
Frequency stability (Cont)	30 minutes operation, as referenced to the frequency at the end of 2 hours
Phase jitter	Not more than 5° average phase deviation between adjacent 13.33- or 22-millisecond periods
Duty cycle	Continuous
Tuning time	Less than 2 seconds
Transfer time	Receive-to-transmit, 10 milliseconds
Power input	115 volts ±10%, 47 to 450 Hz, single-phase, 420 watts maximum
Size	9.8 H x 18.8 W x 22.6 D inches (24.89 x 47.75 x 57.40 cm) (on shelf)
Weight	60 pounds (27.0 kg) (including shelf)
HF Receiver:	
	Note All input signal levels are expressed in open circuit, peak envelope voltage from a 50-ohm source.
Input impedance	50 ohms unbalanced
Sensitivity	
Usb	1.0 microvolt for 10-dB signal plus noise-to-noise ratio; equivalent to 13.5-dB noise figure
Am	5.0 microvolts modulated 30% at 1000 Hz for a 10-dB signal-plus-noise to noise ratio
Selectivity	
Usb	2.0-dB bandpass response, 255 to 3050 Hz; 60-dB attenuation points, 0 and 3260 Hz

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
Lsb	2.0-dB bandpass response, -255 to -3050 Hz; 60-dB attenuation points, 0 and -3260 Hz
Am	3-dB attenuation points, -3000 to +3000 Hz; 60-dB attenuation points, -6000 to +6000 Hz
Unwanted signal rejection	70-dB attenuation of signals ±6400 Hz from carrier
Output noise quieting	60-dB linear attenuation with linear increase in input signal
Automatic gain control characteristics	Maximum variation of audio output is 3.0 dB for input signals from 4 to 800,000 microvolts
Audio muting	The audio output is muted during tuning
Squelch	An internal squelch is provided. Squelch threshold controlled for squelch operation on input levels from receiver thermal noise to 200,000 microvolts
Audio output data	-30 to +10 dBm adjustable balanced, floating center-tapped source
Audio frequency response	
Data, usb, and lsb	255 to 3050 Hz with 3-dB maximum variation
Am	300 to 3000 Hz with a 3-dB maximum variation relative to peak response
Harmonic Distortion	
Ssb	Not more than 0.3% at +10 dBm out
Am	Not more than 2.0% at +10 dBm out
Oscillator leakage	Less than 5 microvolts into a 50-ohm antenna
Input signal protection	Internally protected from destructive input signal levels; 4-volt inband signal

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
Input signal protection (Cont)	will disable the receiver; 200 volts ±10% away in frequency from the desired signal will disable the receiver
Exciter:	
Rf power output	0.4 watt peak envelope power or average
Rf output load impedance	50 ohms, 1.3:1 vswr maximum
Cross channel interference	60 dB down in any enabled channel with another channel at rated power out with a single tone
Spurious radiation	80 dB below rated peak envelope power
Intermodulation distortion	Third order products at least 50 dB below 0.1 watt, 46 dB below 0.4 watt
Hum	60 dB down from rated peak envelope power
Carrier suppression	60 dB below rated peak envelope power
Sidetone output	Intermediate frequency sidetone is provided at nominal audio output
Transmit gain control	Infinite memory automatic gain control and peak power control circuitry maintain power amplifier power out to ±1 dB of rated power
Radio Set AN/URC-75 and Amplifier-Power Supply Group OG-98/URC-75	
Frequency range	2 to 30 MHz
Power output	1000 watts at ±1 dB peak envelope power
Load impedance	50 ohms, 1.3:1 vswr maximum
Rf input power	Not more than 100 milliwatts peak envelope power required for rated output
	No performance degradation for inputs up to 800 milliwatts peak envelope power

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
Input impedance	50 ohms, 1.3:1 vswr maximum
Harmonic attenuation	All harmonics 80 dB below fundamental frequency output
Intermodulation distortion	
Two-tone test	All products at least 40 dB below either of two tones at a 1000-watt peak envelope power output
Noise loading test	-40 dB at 200-watt average power output
Signal bandwidth	12 kHz, 0.1-dB variation
Internal automatic gain control	Sufficient peak power control circuitry and infinite memory automatic gain control voltage output to allow 1000 watts ±1 dB for allowable rf input and vswr conditions
Primary power	120/208 volts, 3-phase, wye-connected, 380 to 420 Hz, 3200 VA maximum
Size	The amplifier with its power supply shall be capable of being housed on a single cabinet shelf 9.8 H x 18.8 W x 22.6 D inches (24.89 x 47.75 x 57.40 cm)
Weight	64 pounds (28.8 kg)
Radio Set AN/ARC-138(V)1	
Transceiver:	
Frequency range	225.00 to 399.95 MHz
Channels	3,500
Frequency stability	
Am	±1 part per million
Fm	±2500 Hz
Duty cycle	Continuous

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
Size	7.6 H x 8.6 W x 19.5 D inches (19.30 x 21.84 x 49.53 cm) (exclusive of shelf)
Weight	35 pounds (15.75 kg)
Power	120/208 volts, 400 Hz, 3-phase, wye-connected, 600 watts
Cooling	Forced air, 52.5 pounds (23.62 kg) per hour at +55° C (+131° F), or 42.0 pounds (18.90 kg) per hour at +25° C (+77° F)
Transmit:	
Power output	30 watts, amplitude modulation 100 watts, frequency modulation
Harmonics	Second harmonic down 60 dB or more
Spurious and other harmonics	Down 80 dB or more
Keying time	
Carrier-on	160 microseconds or less
Carrier-off	80 microseconds or less
Distortion	
Am mode	10% maximum at 90% modulation
Fm multiplex	35 dB or more signal-to-noise power ratio for normal loading at 12 to 60 kHz
Receive:	
Input impedance	50 ohms
Noise figure	9.0 dB maximum except 15 dB within 10 MHz of guard receiver
If. rejection	100 dB
Dynamic range	Up to 3.0 volts input (open circuit) without blocking, 10 volts (open circuit) without damage

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
Image rejection	100 dB
Spurious response	70 dB to ±10 MHz; 80 dB beyond ±10 MHz
Cross modulation (input for -10-dB cross modulation)	10 volts (open circuit), 10 MHz apart
AM Receive:	
Rf bandwidth	
Normal	Not less than ±22.5 kHz at 6 dB down; not more than ±45 kHz at 60 dB down
Wideband	Not less than ±45 kHz at 6 dB down; not more than ±90 kHz at 60 dB down
Carrier-to-noise squelch	Adjustable from 4 to 15 dB signal-plus-noise to noise ratio at audio output with 30% modulated, 1000-Hz input
Agc characteristics	±2-dB output variation for 30% modulated 1000-Hz inputs from 30 microvolts to 200 millivolts (hard)
Audio output bandwidth	
Normal	300 to 6000 Hz; +1, -3 dB
Wideband	70 to 20,000 Hz; +1, -3 dB
Audio distortion	10% maximum at 30% modulation
FM Receive:	
Rf bandwidth	
Multiplex	Not less than ±180 kHz at 3 dB down; not more than ±500 kHz at 60 dB down
Tactical data of fsk	Not less than ±45 kHz at 6 dB down; not more than ±90 kHz at 60 dB down

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
Communications Control Group OK-163/USC-27 and Device Control Computer CP-1162/US	
Control Bus:	
Conductor	90-ohm twisted pair
Waveform	Phase-shifted sine wave with 1 bit of data per cycle; words consist of four cycles of carrier-off followed by 32 data bits
Signaling	Logic 1 = 0° phase shift Logic 0 = 180° phase shift
Voltage	1.0 volt peak-to-peak nominal, 1.25 volts peak-to-peak maximum, 0.25 volt peak-to-peak minimum
Data rate	4.8 kHz
Carrier Bus:	
Conductor	90-ohm twisted pair
Waveform	Sine wave
Voltage	Same as control bus
Data rate	4.8 kHz
Monitor bus:	
Conductor	90-ohm twisted pair
Waveform	Phase-shifted sine wave with 1 bit of data per cycle; words consist of four cycles of carrier-on followed by 32 data bits
Signaling	Logic 1 = 0° phase shift Logic 0 = 180° phase shift

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
Voltage	Same as control bus
Data rate	4.8 kHz
Machine language instructions	LOAD, STORE, ADD, AND, EXCLUSIVE OR, BRANCH NON-ZERO, BRANCH NEGATIVE, INCREMENT AND BRANCH NON-ZERO, ROTATE, RESET CONTROL, INPUT FROM I/O, OUTPUT TO I/O
Instruction execution time	6.5 to 16.3 microseconds
Serial bit transfer rate	3.7 megabits per second
Memory storage capacity	49,152 bits
Bits per access	12
Cycle time	3 microseconds
Size	7.6 H x 3.55 W x 19.5 D inches (19.30 x 9.0 x 49.53 cm) (excluding shelf)
Weight	15 pounds (6.75 kg)
Communications Control Group OK-163/USC-27 and Computer Control C-7933/USC-27	
Inputs	Serial digital words on control bus from Device Control Computer CP-1162/US Parallel digital words from Alpha-Numeric Keyset KY-667/USC-14
Outputs	Serial digital words on monitor bus to Device Control Computer CP-1162/US Parallel digital words to Alpha-Numeric Indicator ID-995/USC-14
Size	7.6 H x 4.8 W x 19.5 D inches (19.30 x 12.19 x 49.53 cm)
Weight	15 pounds (6.75 kg)

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
Communications Control Group OK-163/USC-27, Relay Assembly RE-1053/USC-27, and Relay Assembly Control C-8670/USC-27 (audio switching matrix)	
Control	Serial digital data words on control bus from Device Control Computer CP-1162/US
Capability	64 crosspoints; each crosspoint consists of three normally open contacts
Relay Assembly RE-1053/USC-27	
Size	7.6 H x 1.1 W x 19.5 D inches (19.30 x 2.79 x 49.53 cm) (each - 2 required per system)
Weight	5 pounds each (2.25 kg)
Relay Assembly Control C-8670/USC-27	
Size	7.6 H x 1.1 W x 19.5 D inches (19.30 x 2.79 x 49.53 cm)
Weight	3 pounds (1.35 kg)
Data Terminal Set AN/UYQ-7	
Data rates	2400 bits per second data, 1200 bits per second data
Audio output	Two separate but identical 600-ohm transformer-coupled outputs, center-tap grounded, 0-dBm nominal level, adjustable
Audio input	Two separate audio inputs (usb and lsb), each 600-ohm transformer-coupled with center-tap grounded, 0-dBm nominal level, adjustable
Digital data input tactical data	Parallel input-output interface, 0- and +3-volt logic levels

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
2400-bits-per-second data	Serial input-output interface, per MIL-STD-188B
Digital data output	Same as input
Control and monitor data	Serial digital data compatible with device control computer
Doppler correction	±30-Hz correction
Power	115/208 volts ac, 3-phase, wye-connected, 240 watts
Weight	60 pounds total (27.0 kg)
Size	Set contains three modules as follows:
Height	7.6 inches (19.30 cm)
Width	10.1 inches (25.65 cm), 2.25 inches (5.71 cm), 1.1 inches (2.79 cm), (13.45 inches (34.16 cm) total),
Depth	19.5 inches (49.53 cm)
Volume	1530, 341, 167 in^3 (2038 in^3 total) (3886.20, 866.14, 424.18 cm^3) (5176.52 cm^3 total)
Alpha-Numeric Keyset KY-667/USC-14	
Data Logic	Parallel digital data; short circuit is logic 1; open circuit is logic 0
Data repertoire	10 numeric
	14 functions (four functions not used by system). Following functions are used.
	Enter symbol
	Single space cursor
	Slew cursor spacing
	Return cursor to left margin at next line

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
	Slew cursor return
	Erase character at cursor position
	Slew erase
	Return cursor to home
	Clear screen and return cursor to home
	Send message
Size	5.25 H x 5.75 W x 4.44 D inches (13.34 x 14.60 x 11.28 cm)
Weight	4.5 pounds (2.02 kg)
Alpha-Numeric Indicator ID-955/ USC-14	
Maximum characters per display	240
Maximum characters per line	16
Maximum lines per frame	15
Character repertoire	26 alphabetic
	10 numeric
	6 punctuation marks
Character function code	ASCII
Character height	0.19 inch (0.48 cm)
Character width	0.15 inch (0.38 cm)
Refresh rate	166 frames per second
Size	7.50 H x 5.75 W x 8.50 D inches (19.05 x 14.60 x 21.59 cm)
Weight	8.50 pounds (3.82 kg)

Table 1-3. Electrical Characteristics (Cont).

EQUIPMENT/ITEM	CHARACTERISTICS
Antenna Coupler CU-1849/U	
Frequency range	2 to 30 MHz with continuous tuning
Vswr	1.3:1 or better
Rated rf input power	1600 watts peak envelope power, 1250 watts average
Rf duty cycle	Continuous
Modulation	All types
Tuning time	4 seconds maximum 2 seconds average
Size	11.06 H x 9.50 W x 25.87 D inches (28.09 x 21.59 x 65.70 cm) when mounted in Coupler Mount MT-3910/ARC-132
Weight	37 pounds (16.65 kg) when mounted in Coupler Mount MT-3910/ARC-132

1.7 APPLICABLE EQUIPMENT TECHNICAL MANUALS

Details on the individual units that comprise the system can be found in the manuals listed in table 1-4.

Table 1-4. Equipment Manuals.

EQUIPMENT NOMENCLATURE AND DESCRIPTION	HANDBOOK PART NUMBER
Communications Control Group OK-163/USC-27	
CP-1162/US, Device Control Computer (8311C-1)	523-0759724-01273A
PP-6223/USC-13, Power Supply (652A-27)	523-0760741-001H1A

Table 1-4. Equipment Manuals (Cont).

EQUIPMENT NOMENCLATURE AND DESCRIPTION	HANDBOOK PART NUMBER
C-7933/USC-14, Computer Control (7512B-1) KY-667/USC-14, Alpha-Numeric Keyset (7513B-1) ID-955/USC-14, Alpha-Numeric Indicator (7514B-1)	523-0560870-00173A
PP-6554/USC-27, Power Supply (652A-32)	523-0762133-001H1A
RE-1053/USC-27, Relay Assembly (7201F-1)	523-0561351-00173A
C-8670/USC-27, Relay Assembly Control (8791B-1)	523-0561326-00173A
Data Terminal Set AN/UYQ-7	
AN/UYQ-7, Data Terminal Set and CH-672/UYQ-7, Electrical Equipment Drawer	NPN
KY-698/UYQ-7, Signal Data Converter	NPN
CV-2814/UYQ-7, Signal Data Converter	NPN
CV-2813/UYQ-7, Digital-to-Analog Converter	523-1001123-101721 523-1001124-101721
AN/ARC-138(V)1, Radio Set (U-1402) and CH-673/ARC-138(V), Electrical Equipment Cabinet Drawer (499S-1A), with the following subitems —	523-0760381-00211A
AM-6149/ARC-138(V), Intermediate Frequency Amplifier (940A-1)	523-0760389-00111A
CV-2577/ARC-138(V), Receiver Translator (941A-1B)	523-0760390-00111A
O-1526/ARC-138(V) Control Synthesizer (942A-1)	523-0760392-00111A
AM-6148/ARC-138(V) Amplifier-Modulator (943A-1)	523-0760391-00111A
AN/URC-75, Radio Set (URG-II)	
OR-81/URC-75, Radio Receiver-Transmitter	523-0762346-00121A
CH-674/U, Electrical Equipment Cabinet Drawer (499R-4)	NPN

Table 1-4. Equipment Manuals (Cont).

EQUIPMENT NOMENCLATURE AND DESCRIPTION	HANDBOOK PART NUMBER
CV-2649A/GRT-17(V)1, Amplifier, Converter (888B-1)	523-0763045-00111A
CV-2815/URC-75, Signal Data Translator (889B-6)	523-0762920-00111A
CV-2652A/GRR-18(V)1, Audio Frequency Detector (889B-1)	523-0763058-00121A
O-1596/URC-75, Electrical Frequency Synthesizer (887B-1)	523-0763042-00111A
PP-4992A/ARC-132, Power Supply (652J-4)	523-0763057-00121A
C-8673/URC-75, Radio Set Control-Adapter (599H-4)	523-0762347-00111A
OG-98/URC-75, Amplifier-Power Supply Group (548U-1)	523-0760258-00111A
CH-675/URC-75, Electrical Equipment Cabinet Drawer (499R-7)	
AM-6176/URC, Radio Frequency Amplifier (648A-1)	
PP-7108/URC-75(V), Power Supply (636Y-2)	
CU-1849/U, Antenna Coupler (490T-3), including MT-3190/ARC-132, Coupler Mount (890F-1) and Bus Filter Box Assembly	523-0760349-00111A

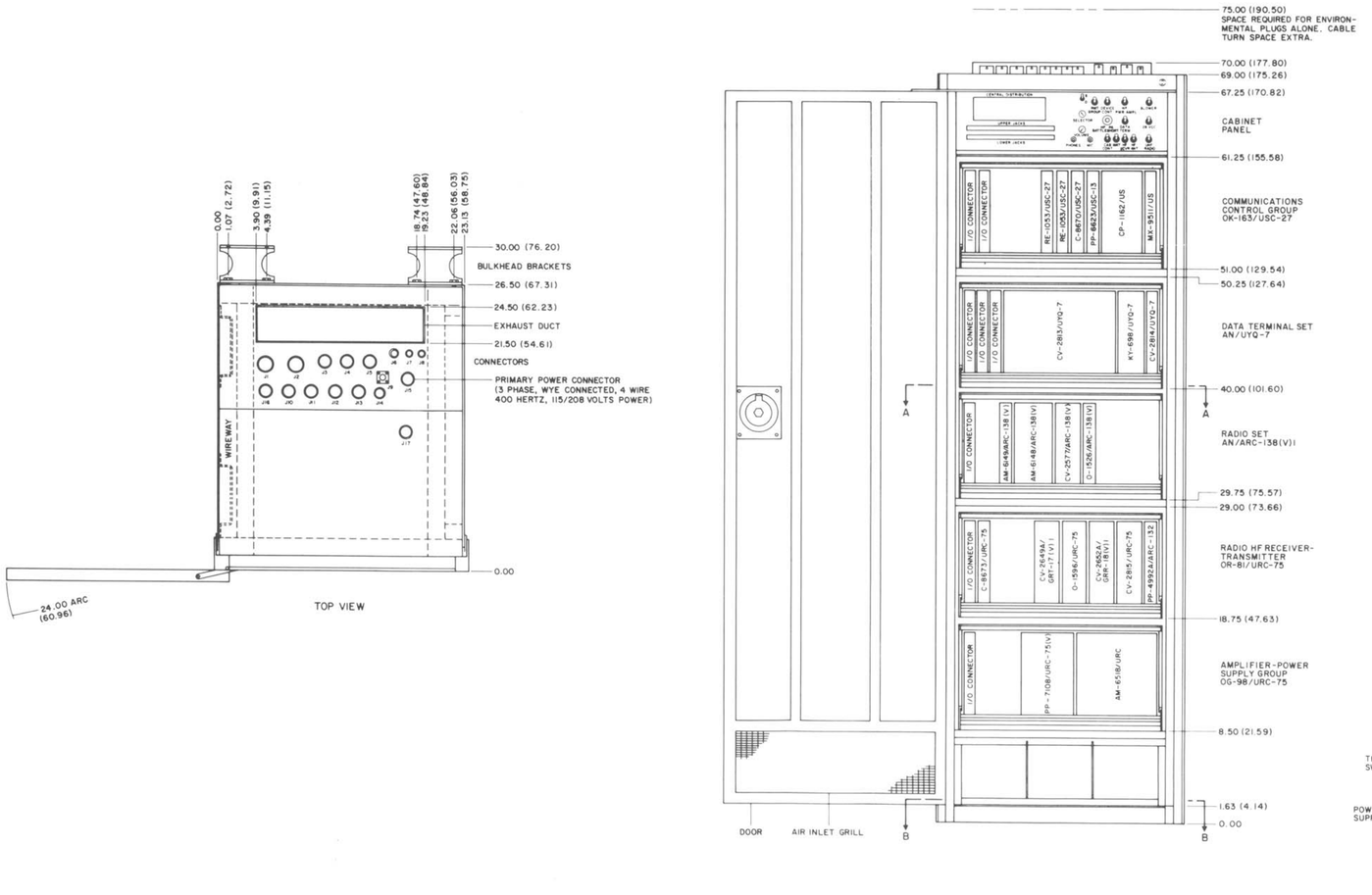
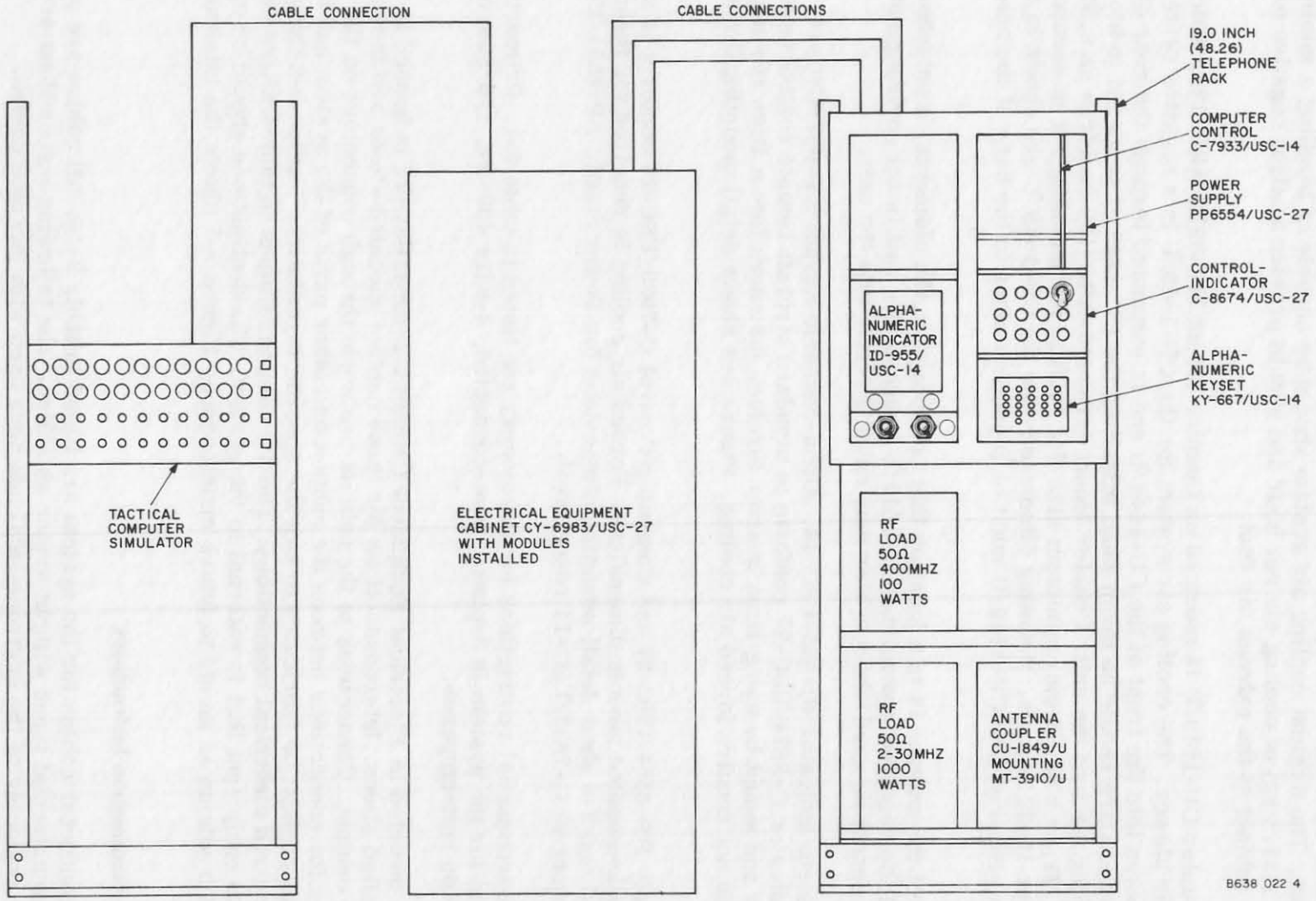


Figure 2-1. Equipment and Cabinet CY-6983/USC-27, Outline and Dimensions.



NOTE:
UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN INCHES
WITH CM EQUIVALENT IN ( )

Figure 2-2. Preinstallation Test Configuration.

d. Check that all equipment is clean and that metal parts are free of corrosion. If needed, clean face of Alpha-Numeric Indicator ID-955/USC-14 as instructed in applicable manual. Refer to table 1-4.

5.2.2 Testing

During system operation, Communications Control Group OK-163/USC-27 is continuously checking the system for proper operation. Malfunctions are displayed on lines 14 and 15 of Alpha-Numeric Indicator ID-955/USC-14 display pages except the status display page. However, it is recommended that the fault isolation program be performed each month. The fault isolation program should also be used to determine system operational status when the system is initially installed.

To perform the fault isolation procedure, it is necessary to understand the fault isolation display page. The page is shown in figure 5-1. The following paragraphs provide a detailed description of the fault isolation display page.

Line 1, columns 1 and 2 contain the letters HF (high frequency). Columns 3 through 8 indicate the operating frequency of Radio Set AN/URC-75. (Multiply indication by 100 to obtain frequency in hertz.) Columns 9 through 12 contain the word TUNE. Column 13 indicates the current step of the tune cycle (digits 0 through 7). When the high-frequency tune cycle has been completed, column 13 contains a 7 and columns 14 through 16 contain the letters OPR (operate) to indicate that Radio Set AN/URC-75 is operational. In radio silence, OPR appears when 3 appears in column 13 showing that the receiver only has completed the tune cycle.

Line 2, columns 1 and 2 contain the letters UF (ultrahigh frequency). Columns 3 through 7 indicate the frequency to which Radio Set AN/ARC-138(V)1 is tuned. (Multiply indication by 10,000 to obtain frequency in hertz.)

Mode commands and status are entered and displayed in lines 3 through 6. Table 5-1 shows the command coding.

Line 7 contains the frequency entry positions. Frequencies are entered in columns 3 through 8 and 12 through 16 for Radio Set AN/URC-75 and Radio Set AN/ARC-138(V)1, respectively. Columns 1 and 10 always contain the letters H and U, respectively, to identify the radio set. Columns 2 and 11 are used to initiate the frequency tune cycles. To initiate a complete hf tune cycle (tune all receiver-exciter units, power amplifier, and antenna coupler), the operator enters the letter F in column 2. The desired operating frequency is entered in columns 3 through 8. If the letter F is not entered in column 2 and frequency has changed less than 0.1 MHz, a simple tune cycle is initiated (tune only the receiver-exciter units). To initiate a uhf tune cycle, the letter F is entered in column 11. The desired operating frequency is entered in columns 12 through 16.

Figure 5-1. Typical Fault Isolation Display Page.

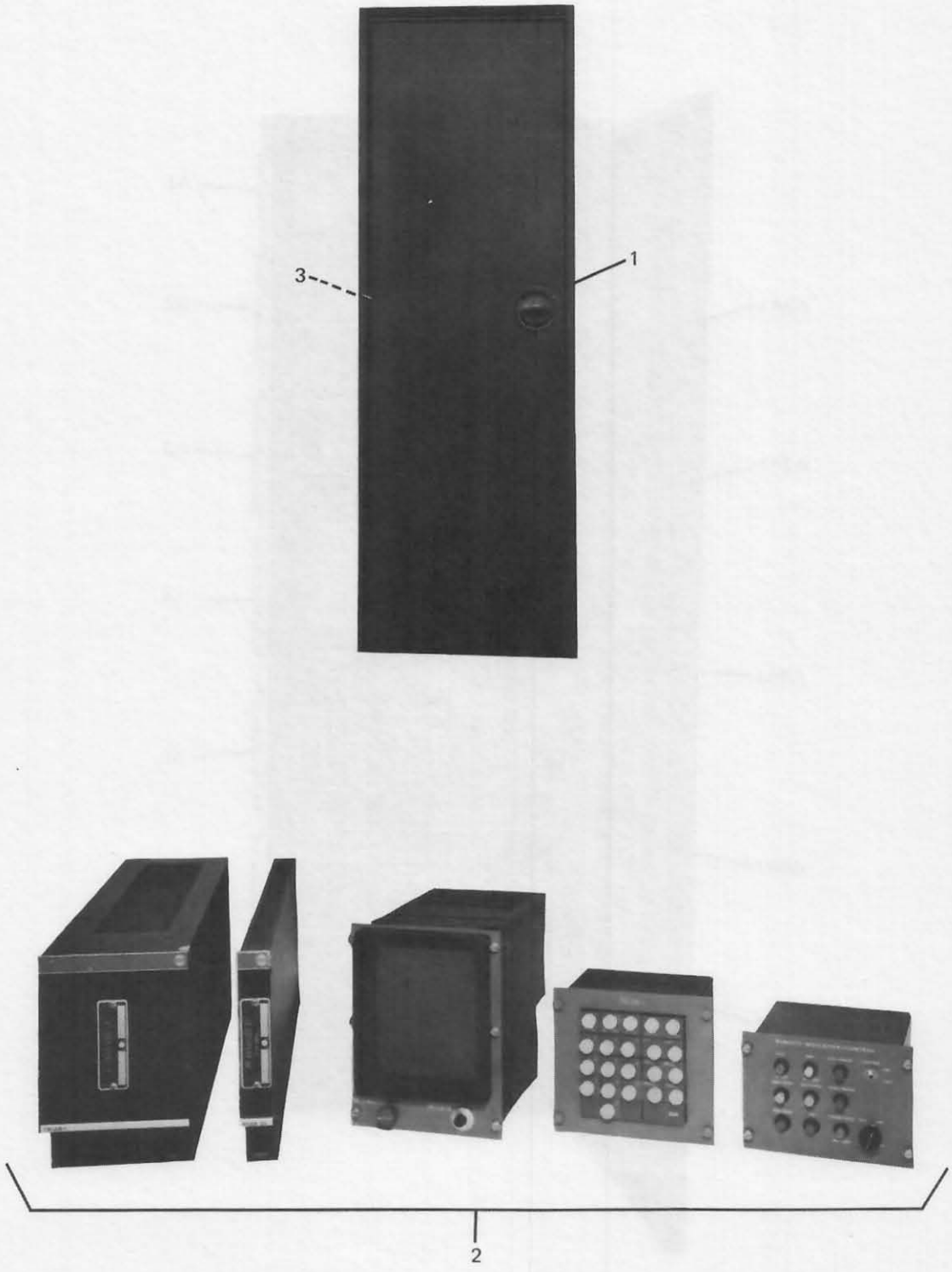
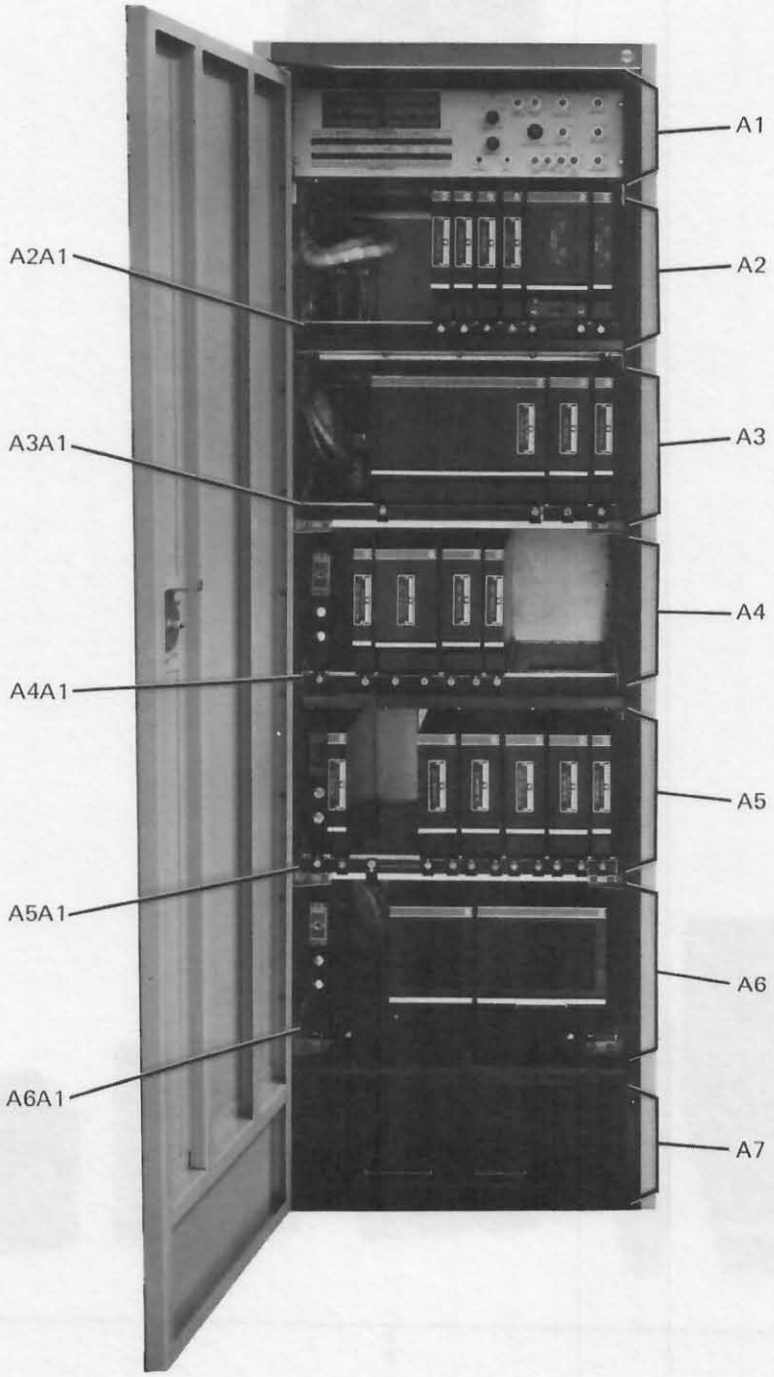


Figure 6-1. Digital Data Communication System AN/USC-27.



B700 913 Pb

Figure 6-2. Equipment Cabinet.

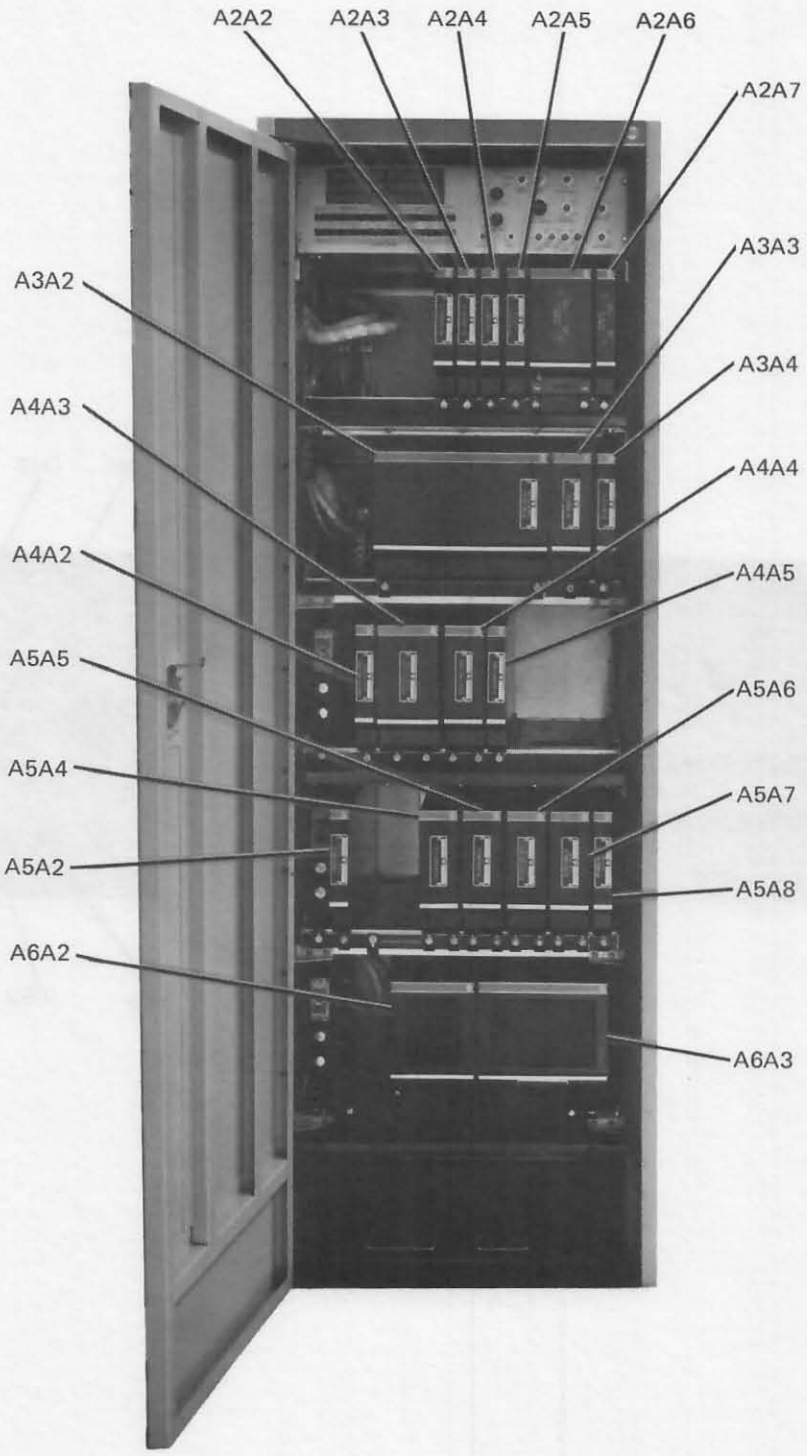


Figure 6-3. Equipment Cabinet.

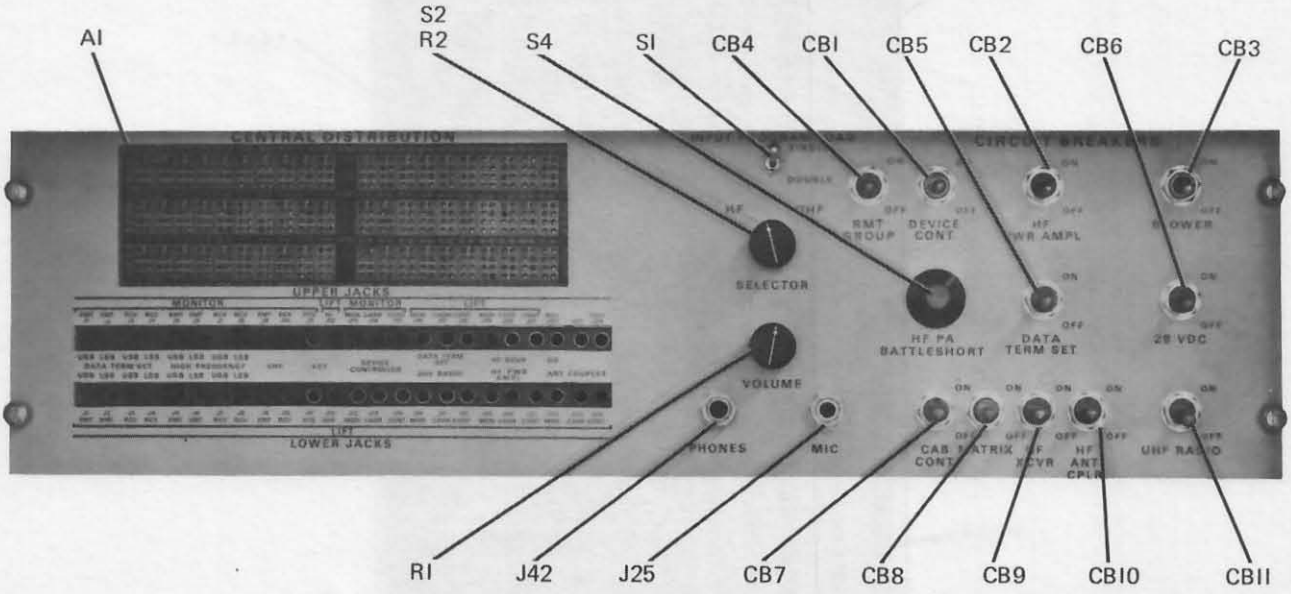
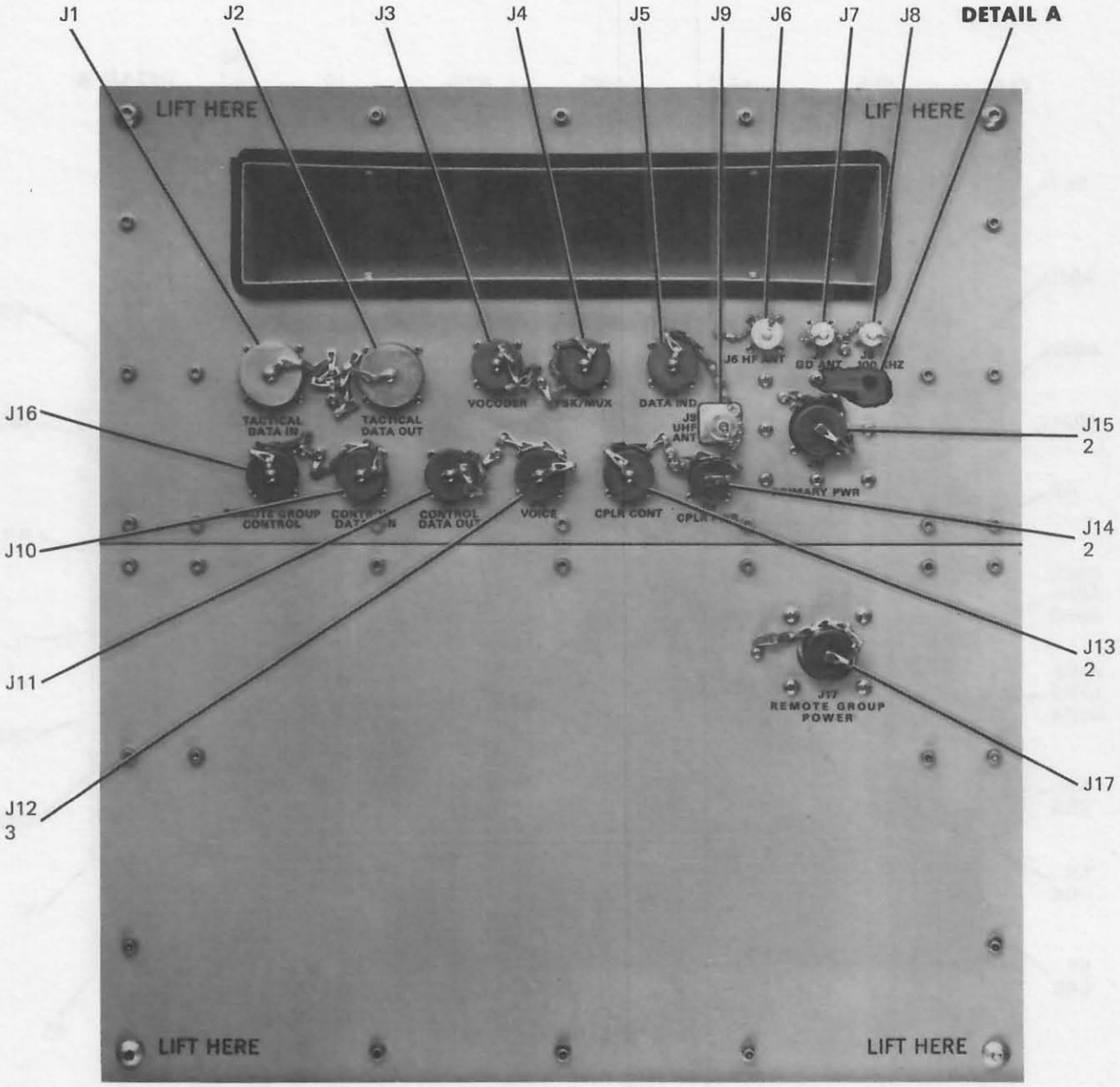


Figure 6-4. Central Distribution Shelf, Front View.



B700 922 Pb

Figure 6-5. Central Distribution Shelf, Top View.

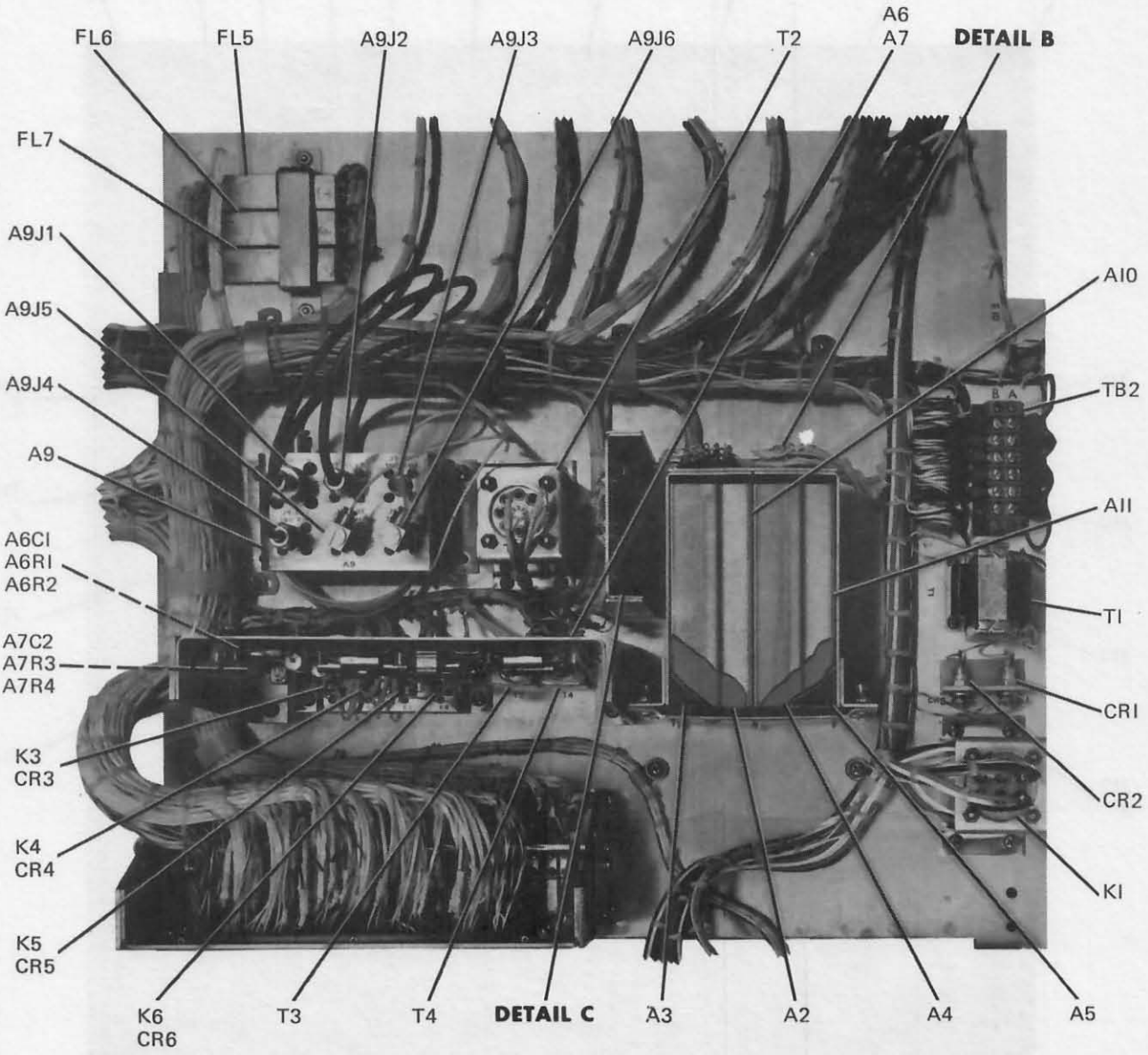
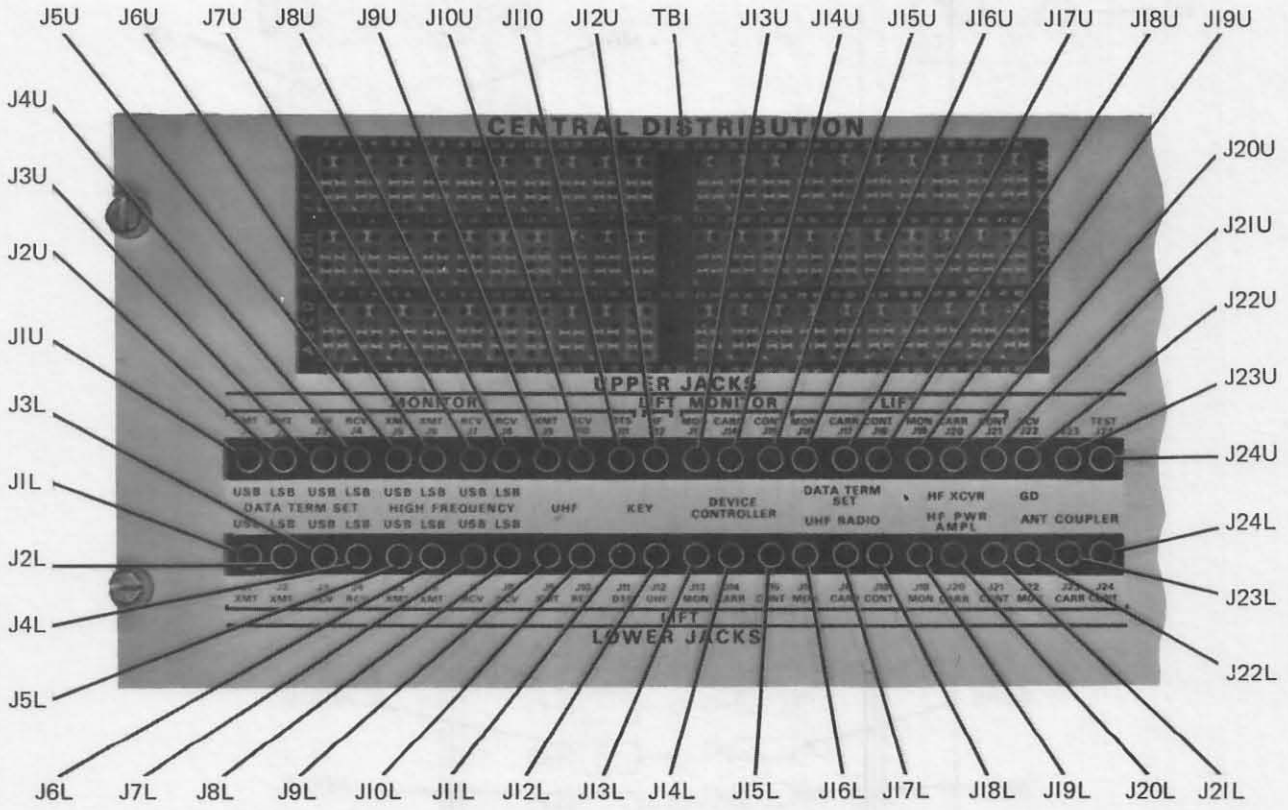


Figure 6-6. Central Distribution Shelf, Top View Cover Removed.



B700 1104 Pb

Figure 6-8 Jackstrip-Matrix Assembly.

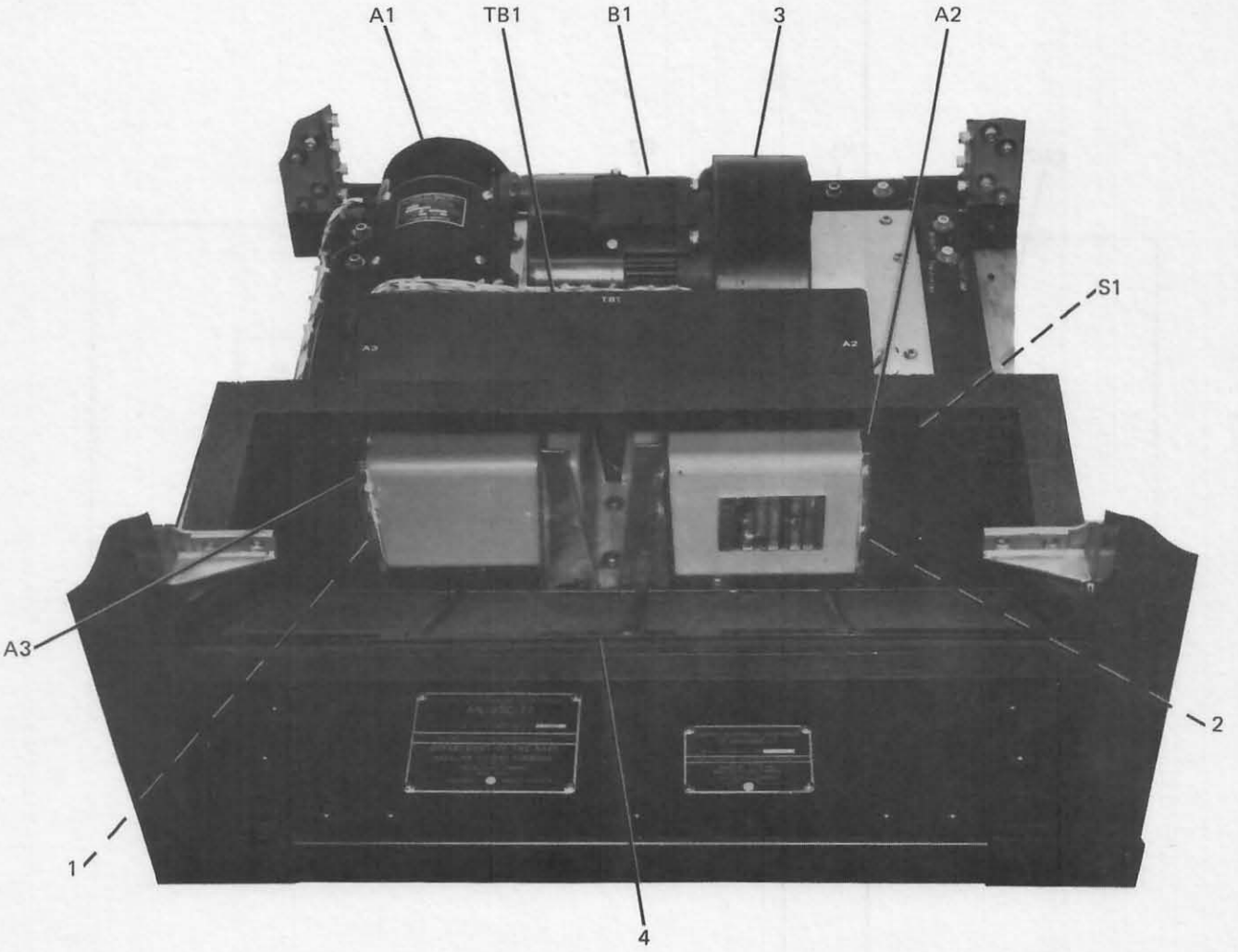


Figure 6-16. Power Supply Group.

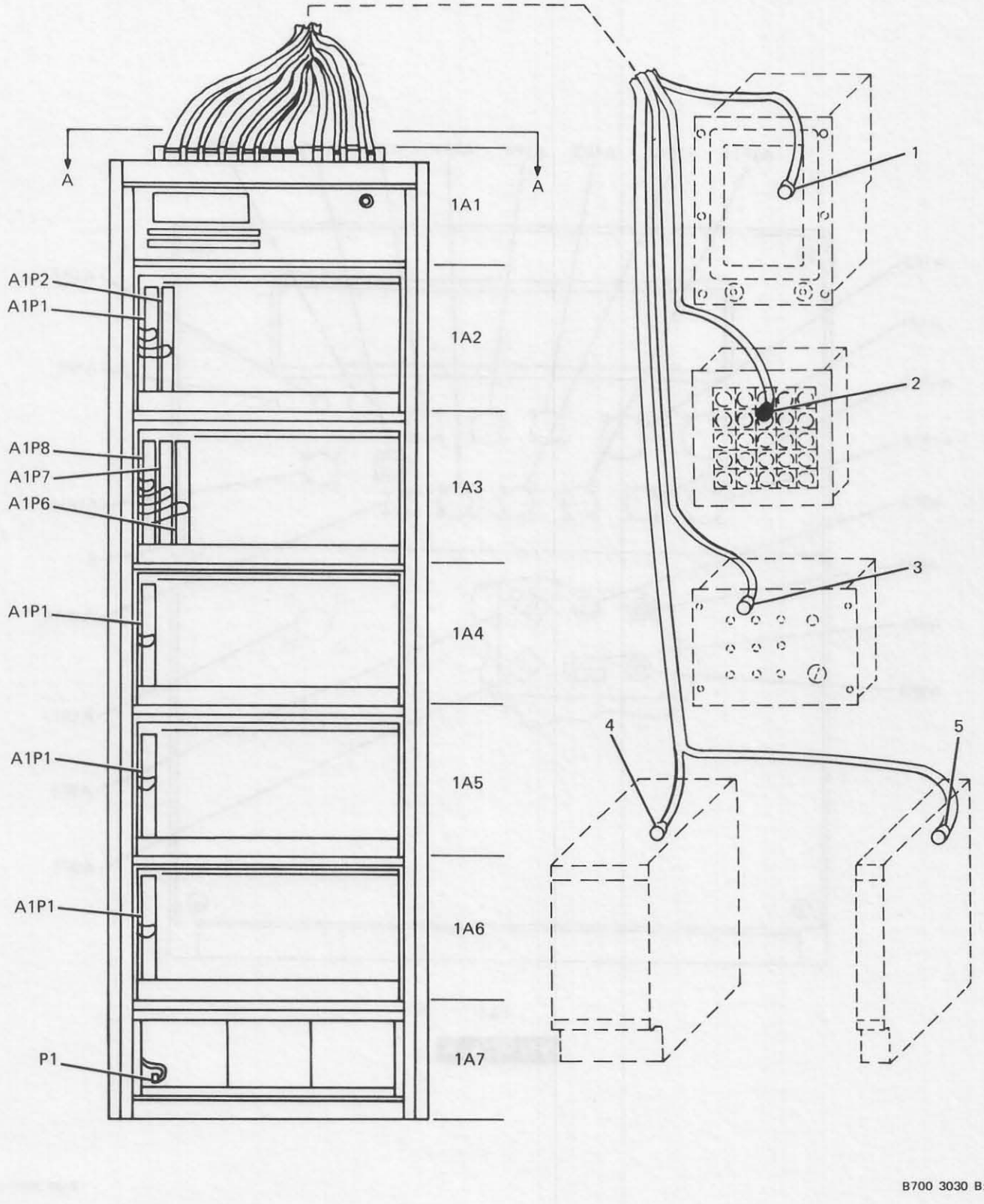
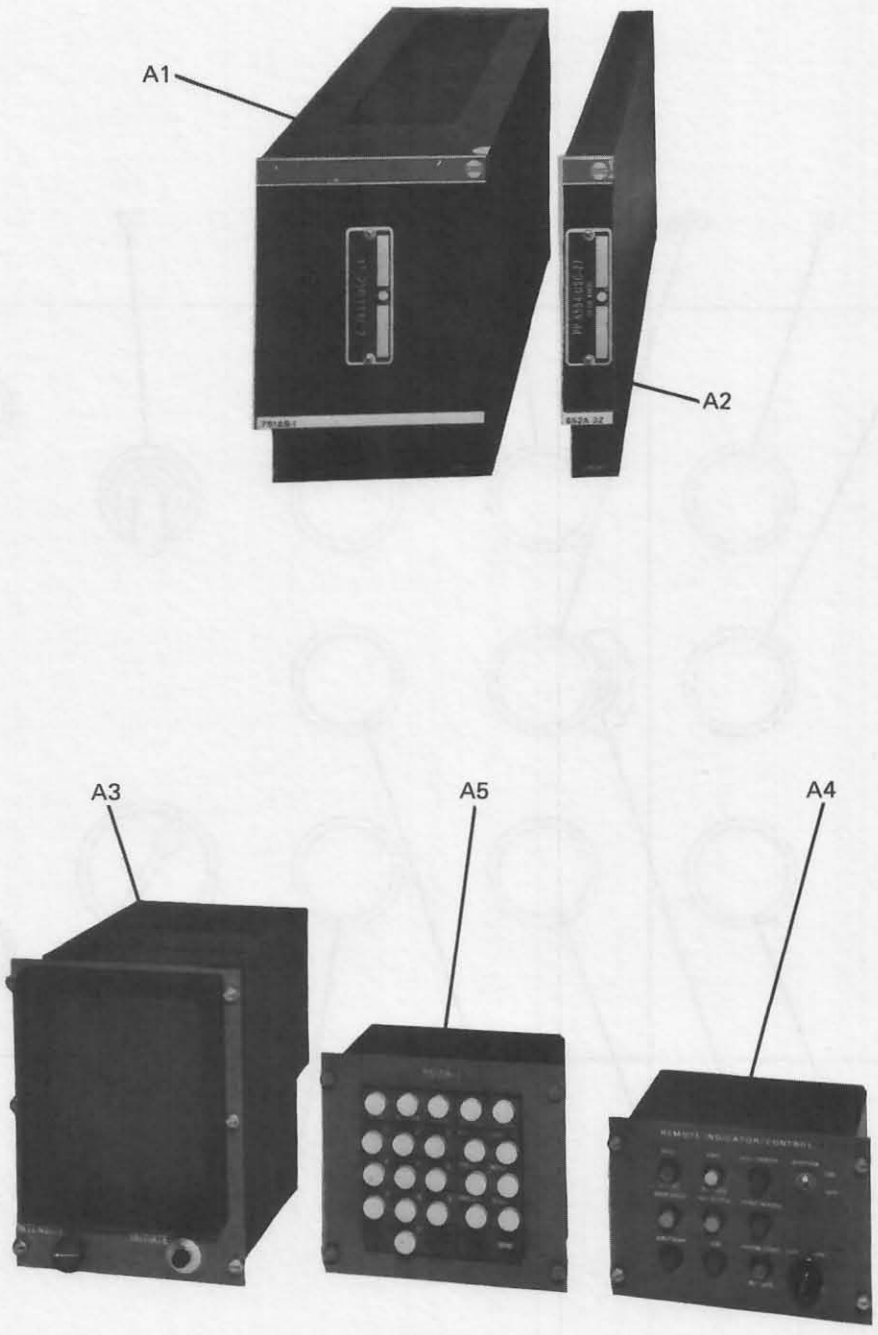


Figure 6-17. Rack Cabling.



B700 3029 Pb

Figure 6-19. Remote Control Group.