

TECHNICAL MANUAL

FIELD MAINTENANCE INSTRUCTIONS

**RADIO COMMUNICATIONS SET, AIRBORNE
AN/ARC-96**

(WESTINGHOUSE ELECTRIC CORPORATION)

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1-1. GENERAL

1-2. This publication contains field maintenance instructions for Airborne Radio Communications Set AN/ARC-96. The equipment is manufactured under Contract No. AF19(628)4843. The technical manual provides theory of operation, troubleshooting data and performance tests to aid the technician in maintaining the radio transmitting set. The material is arranged as described in the Introduction to simplify isolation of the defective circuit in a component. The maintenance instructions facilitate the complete repair and checkout of a component.

1-3. DESCRIPTION AND PURPOSE.

1-4. RECEIVER-TRANSMITTER GROUP
OA-7976/ARC-96.

1-5. Receiver-Transmitter Group
OA-7976/ARC-96 consists of one each Sequential Timer TD-818/ARC-96, four each Radio Receiver R-1408/ARC-96, and four each Demodulator Data Converter MD-690/ARC-96. The components are housed in Electrical Equipment Cabinet CY-6088/ARC-96. Refer to figure 1-1 to locate the receiver group components.

1-6. SEQUENTIAL TIMER TD-818/ARC-96.
The Sequential Timer TD-818/ARC-96 (clock assembly), figure 1-2, is a highly stable three-megahertz pulse generator. The clock assembly is a self-contained, completely enclosed, rack-mounted assembly. The purpose of the clock assembly is to provide nine synchronizing master clock pulses for use within the radio set.

1-7. The clock assembly contains five printed circuit card assemblies and two sealed oscillator assemblies. Each of the assemblies employ analog type electronic circuitry. Cooling is accomplished by blowers mounted in the cabinet. The oscillators are actively redundant, each producing 3-megahertz square-wave pulses. However, only one oscillator is used to produce the master clock pulse trains. If the oscillator output fails, the second oscillator is automatically switched in to produce the clock pulses without undue interruption to system operation. Monitoring of the clock outputs is accomplished through front panel test points which aid in locating trouble areas during operation. The clock unit also contains a regulated power supply which produces + 28 volts for both the clock and antenna coupler CU-1566/ARC-96.

1-8. DEMODULATOR DATA CONVERTER
MD-690/ARC-96. The Demodulator Data Convert-

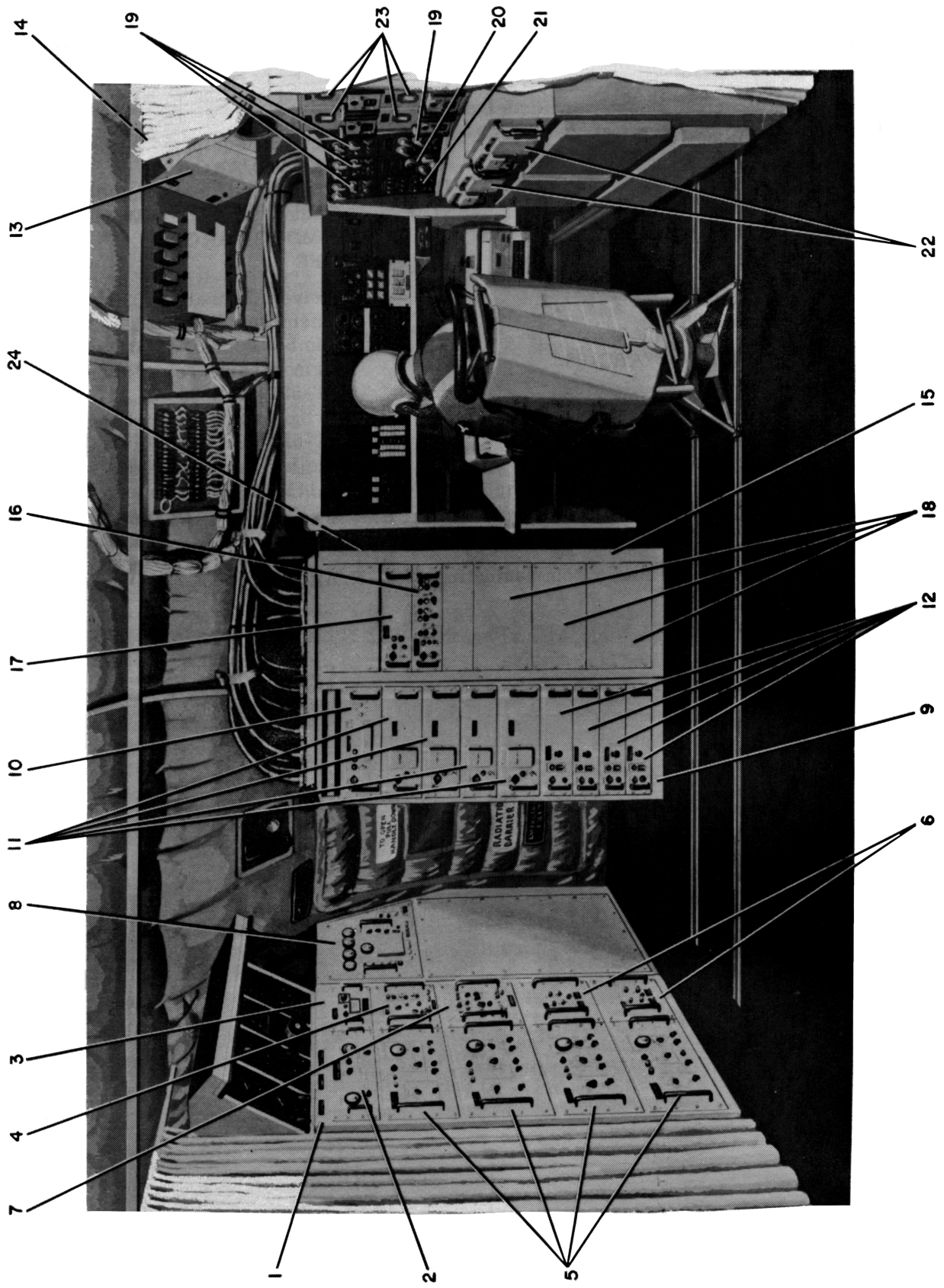
er MD-690/ARC-96 (demodulator data converter), figure 1-3, supplies decoded characters to a teleprinter. The demodulator data converter assembly is a self-contained, completely enclosed, rack-mounted assembly. The purpose of the demodulator data converter is to extract frequency shift keyed (fsk) data from a signal carrier and convert the fsk data into digital form for transmission to the teleprinter.

1-9. The demodulator data converter contains 24 printed circuit card assemblies. These printed cards are grouped into three sections, each pertaining to a mode of operation. The printed cards are sectionalized as follows: coherent, non-coherent, and data converter assemblies. Capacitors and filters are located on the bottom of the unit. To facilitate removal and replacement of a printed card, the code number of each card is silkscreened on the partition. The cards in the data converter section are individually enclosed in a metal shield; the other two sections are unshielded. Cooling is accomplished by blowers mounted in the cabinet. The cooling air is forced through perforated plates on the left side, through the power supply at the back of the chassis and out a similar perforated section on the right side. For test purposes, a test jack is mounted on the front panel. The demodulator data converter produces +25 volts unregulated and two separate regulated outputs of +6 volts.

1-10. RADIO RECEIVER R-1408/ARC-96. The Radio Receiver R-1408/ARC-96 (receiver), figure 1-4, is a self-contained, completely enclosed, rack-mounted assembly. When the receiver is placed within the cabinet, power and signal connections are made through a plug and jack assembly at the rear. The receiver contains 12 assemblies, three of which consist of several subassemblies. All assemblies are analog-type electronic circuits. Cooling is accomplished by blowers mounted in the cabinet. The cooling air is forced through perforated plates on the left side of the receiver chassis and is expelled through a similar perforated section on the right side. The receiver is operated by means of front panel controls and by the receiver remote control assembly. The receiver contains a regulated power supply that produces the dc power necessary for operation.

1-11. ELECTRICAL EQUIPMENT CABINET
CY-6070/ARC-96.

1-12. The cabinet assembly consists of one Radio Transmitter Modulator MD-684/ARC-96, one Unit Code Selector C-7043/ARC-96, and six government furnished equipment assemblies. The components are housed in Electrical Equipment Cabinet CY-6070/ARC-96. Refer to figure 1-1 to locate the components of the assembly.



RADIO COMMUNICATIONS SET, AIRBORNE AN/ARC-96

	Amplifier-Power Supply Group OA-7977/ARC-96	12	Demodulator Data Converter MD-690/ARC-96
1	Electrical Equipment Cabinet CY-6024/ARC-96	13	Antenna Coupler CU-1566/ARC-96
2	Radio Interference Filter F-1091/ARC-96	14	Antenna AS-1909/ARC-96
3	Power Control Subassembly SB-2812/ARC-96	15	Electrical Equipment Cabinet CY-6070/ARC-96
4	Amplifier Control C-7029/ARC-96	16	Unit Code Selector C-7043/ARC-96
5	Radio Frequency Amplifier AM-4555/ARC-96	17	Radio Transmitter Modulator MD-684/ARC-96
6	Power Supply PP-4553/ARC-96	18	GFE
7	Power Supply Subassembly MX-7282/ARC-96	19	Receiver Control C-7030/ARC-96
8	Antenna Coupler CU-1643/ARC-96	20	Transmitter Control C-7028/ARC-96
	Receiver-Transmitter Group OA-7976/ARC-96	21	Radio Set Control C-7027/ARC-96
9	Electrical Equipment Cabinet CY-6088/ARC-96	22	Thermochrome Teleprinter TT-522/ARC-96
10	Sequential Timer TD-818/ARC-96	23	Thermochrome Teleprinter TT-521/ARC-96
11	Radio Receiver R-1408/ARC-96	24	Radio Interference Filter F-1111/ARC-96
		-	Hand Key (Part No. 128C375H01)

Figure 1-1. Airborne Radio Communications Set AN/ARC-96 (Sheet 2 of 2)



Figure 1-2. Sequential Timer
TD-818/ARC-96

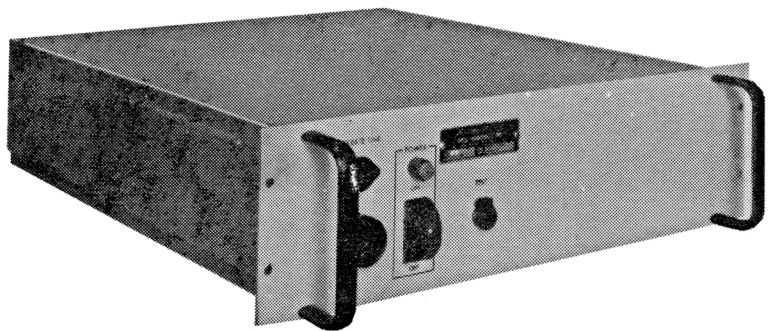


Figure 1-3. Demodulator Data Converter
MD-690/ARC-96

1-13. UNIT CODE SELECTOR C-7043/ARC-96. The Unit Code Selector C-7043/ARC-96 (code selector), figure 1-5, functions as an interface between the four demodulator data converters and a GFE assembly or between the modulator data converter and a GFE assembly. The code selector is enabled by the receipt of encoded data. Clear data is coupled through the code selector. The code selector also provides the correct frequency to the GFE as determined by the baud rate of the selected modulator data converter or demodulator data converter.

1-14. The code selector is a completely enclosed, rack-mounted assembly containing 20 printed circuit card assemblies including a number of redundant assemblies. Each of the assemblies employs digital circuitry. There are 14 assemblies located in a non-shielded area and six assemblies in a shielded area of the code selector. The six shielded assemblies are protected from atmospheric disturbances and radiation. In addition, further isolation between the non-shielded and shielded sections is provided by

feedthrough filters and feedthrough capacitors. Two power supplies are located in the drawer. Power supply no. 1 is identical to power supply no. 2 except that in addition to outputs of +6 volts and -6 volts, a +25 volt output is obtained from power supply no. 1. Power supply no. 1 provides the operating power for the non-shielded printed cards, and power supply no. 2 is connected to the shielded cards. Cooling is accomplished by a blower mounted in the cabinet. The cooling air is forced into the left side of the chassis through perforations and exhausted through perforations on the opposite side.

1-15. RADIO TRANSMITTER MODULATOR MD-684/ARC-96. The Radio Transmitter Modulator MD-684/ARC-96 (modulator data converter), figure 1-6, receives digital data from a tape printer reader and references the data to a selected baud rate. The data is then used to modulate an internally generated carrier to produce a desired frequency shift keyed (fsk) signal between 17 and 60 kilohertz.

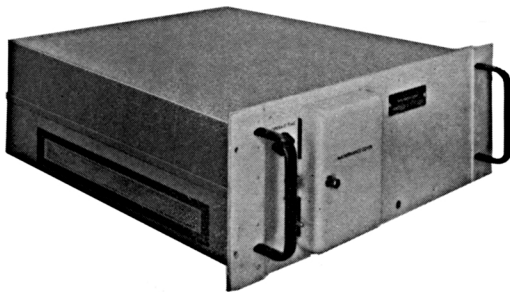


Figure 1-4. Radio Receiver
R-1408/ARC-96



Figure 1-5. Unit Code Selector
C-7043/ARC-96

1-16. The modulator data converter is a completely enclosed, rack-mounted assembly. The assembly contains 21 replaceable assemblies, which employ both digital and analog circuitry. Ten of the assemblies are printed cards, three assemblies are wired to the chassis, and one assembly is a plug-in device having eight sub-assemblies. Cooling is accomplished by a blower mounted in the cabinet. The modulator data converter receives data from a tape printer reader and timing pulses from the clock assembly. Internal power supplies generate regulated dc power. The code selector is connected in series with the internal signal flow and enables a message to be transmitted in code should the preamble of the message indicate such transmission. Remote panel switches enable the selection of three modes of operation: coherent, non-coherent, or emergency, as well as the frequency shift keying baud rate in each mode.

1-17. AMPLIFIER-POWER SUPPLY GROUP
OA-7977/ARC-96.

1-18. The Amplifier Power Supply Group OA-7977/ARC-96 (power amplifier) is made up of Radio Interference Filter F-1091/ARC-96, Power Control Subassembly SB-2812/ARC-96, four each Radio Frequency Amplifier AM-4555/ARC-96, Amplifier Control C-7029/ARC-96,

Power Supply Subassembly MX-7282/ARC-96, and two each Power Supply PP-4553/ARC-96. The components of the power amplifier group are housed in Electrical Equipment Cabinet CY-6024/ARC-96. Refer to figure 1-1 to locate the power amplifier group components.

1-19. RADIO INTERFERENCE FILTER
F-1091/ARC-96. The Radio Interference Filter F-1091/ARC-96 (rfi filter), figure 1-7, provides the tunable impedance to control the phase angle of the four rf amplifiers.

1-20. POWER CONTROL SUBASSEMBLY
SB-2812/ARC-96. The Power Control Subassembly SB-2812/ARC-96 (power control assembly), figure 1-8, controls the primary input to the rf amplifier power supplies, the driver amplifier, and the transmit antenna coupler. Primary power is also supplied to the amplifier control through the power control assembly.

1-21. RADIO FREQUENCY AMPLIFIER
AM-4555/ARC-96. The Radio Frequency Amplifier AM-4555/ARC-96 (rf amplifier), figure 1-9, amplifies the rf signal during the full, medium and low power modes of transmitter operation. The 17- to 60-kilohertz signal is amplified from 25 watts to 5250 watts in the rf amplifier. Sixty-four transistors, operating in a switching mode,

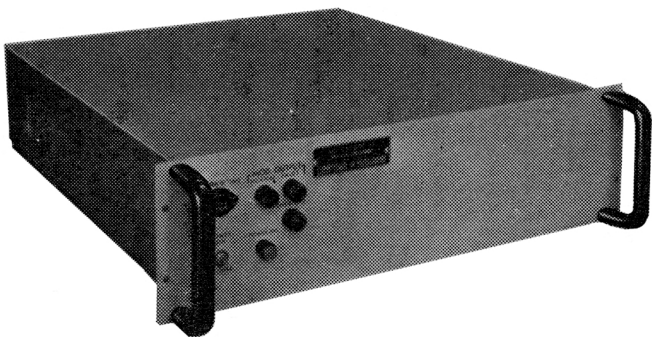


Figure 1-6. Radio Transmitter Modulator
MD-684/ARC-96

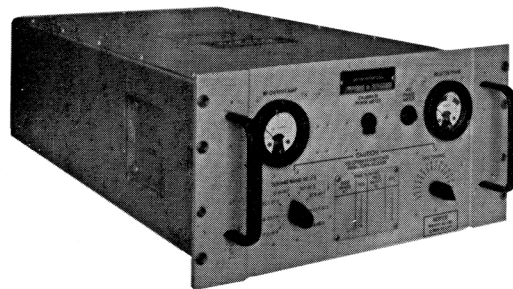


Figure 1-7. Radio Interference Filter
F-1091/ARC-96

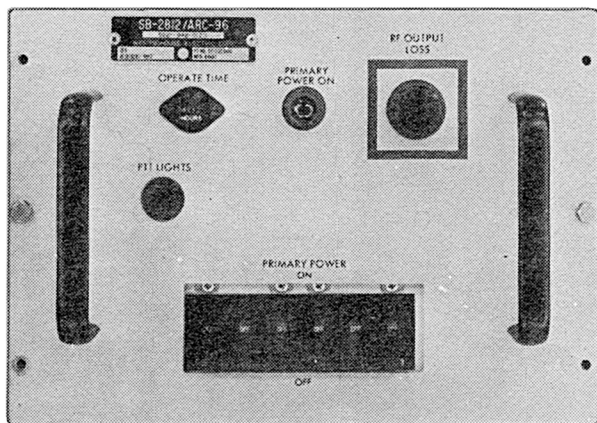


Figure 1-8. Power Control Subassembly SB-2812/ARC-96

provide the required power amplification. The 16 rf module assemblies of the rf amplifier are connected in parallel. The combined output of the modules is a 240-volt peak-to-peak square wave having an rf frequency equal to that of the input. Included in the rf amplifier are circuits which sense transistor rf current overloads, and a crowbar circuit shuts off the rf amplifier power supply when an overload is present.

1-22. The rf amplifier is a rack-mounted assembly. All power and signal connections to the rf amplifier are made when the assembly is in the cabinet through a plug and jack located at the rear. Cooling is furnished from the aircraft blower system.

1-23. **AMPLIFIER CONTROL C-7029/ARC-96.** The Amplifier Control C-7029/ARC-96 (amplifier control), figure 1-10, contains the control circuits that are integral with the control circuits throughout the power amplifier. The control circuits are made up of four functional groups: rf amplifier dropout, driver amplifier transfer, phase angle monitor, and power selection. The low voltage power supplies for the control circuits are contained in the amplifier

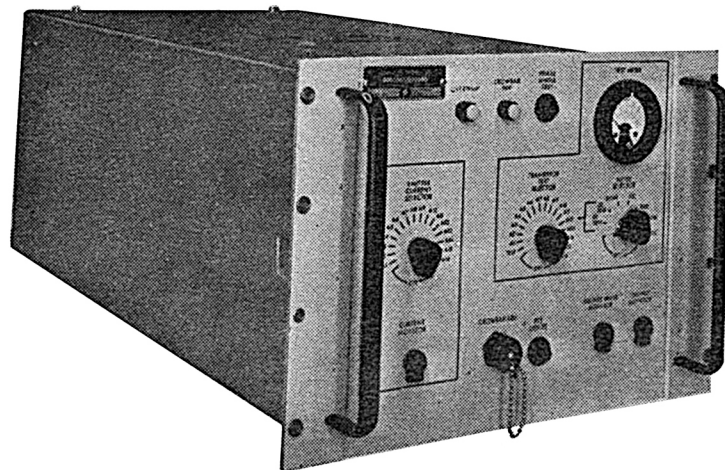


Figure 1-9. Radio Frequency Amplifier AM-4555/ARC-96

control. The amplifier control is a rack-mounted assembly.

1-24. **POWER SUPPLY SUBASSEMBLY MX-7282/ARC-96.** The Power Supply Subassembly MX-7282/ARC-96 (driver amplifier), figure 1-11, amplifies the rf signal from the modulator data converter and couples the amplified signal to the rf amplifier. The driver amplifier contains identical primary and standby circuits so that the power amplifier capability is not interrupted by a fault. If a fault occurs, the gate-off signal from the amplifier control will inhibit the rf signal. During normal operation, the level of the rf signal applied to the rf amplifier is controlled by the driver amplifier. The driver amplifier contains printed card assemblies in addition to the control circuitry, and is a rack-mounted assembly, cooled by the aircraft cooling system.

1-25. **POWER SUPPLY PP-4553/ARC-96.** The Power Supply PP-4553/ARC-96 (rf amplifier power supply), figure 1-12, is an unregulated power supply that delivers necessary operating voltages to a pair of rf amplifiers. A transient detector circuit protects the rf amplifier transistors against surges in the primary power



Figure 1-10. Amplifier Control
C-7029/ARC-96

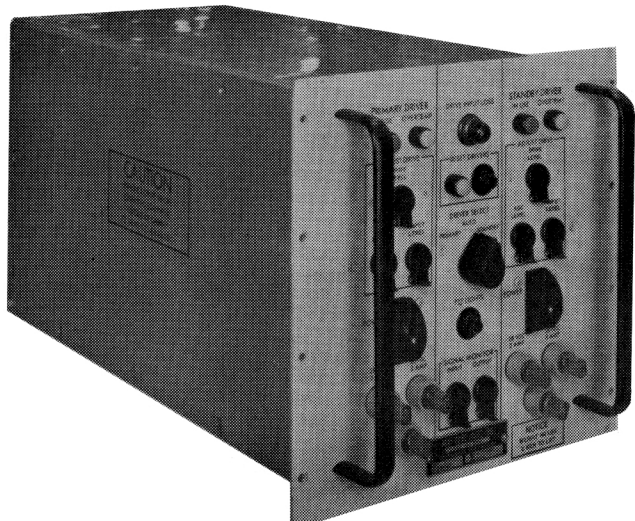


Figure 1-11. Power Supply Subassembly
MX-7282/ARC-96

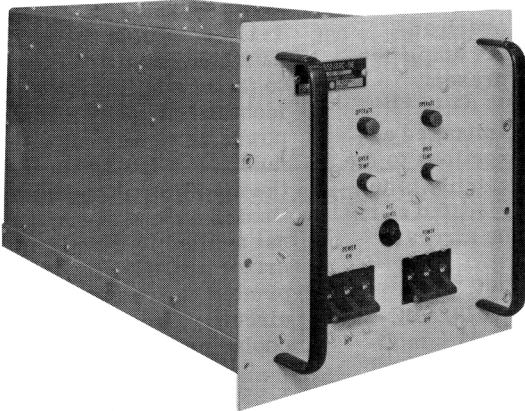


Figure 1-12. Power Supply
PP-4553/ARC-96

voltage. The rf amplifier power supply is a rack-mounted assembly.

1-26. ANTENNA COUPLER CU-1643/ARC-96.

1-27. The Antenna Coupler CU-1643/ARC-96 (transmit antenna coupler) consists of three components: the coil tank (antenna tuning inductance), the transformer tank (antenna matching transformer), and the control assembly. The two tanks are pressurized with sulfur hexafluoride (SF_6) gas to increase the electrical voltage rating of the components. Relief valves are provided to prevent overpressurization of the tanks.

1-28. The transmit antenna coupler is composed of an input filter and autotransformer to match the transmit antenna resistive component to a 100-ohm input. A variable inductor tunes out the antenna reactive component. The assemblies are completely shielded to prevent rf interference. See figure 1-1.

1-29. THERMOCHROME TELEPRINTER
TT-521/ARC-96.

1-30. The ThermoChrome Teleprinter TT-521/ARC-96 (page printer), figure 1-13, provides a permanent record alpha-numeric decoded print-out. The printed record appears in sequenced

line format on three-inch-wide thermochrome paper. The maximum line length is 26 characters. The page printers are used to record the output of each receiver.

1-31. The page printer dimensions are such that two units are mounted side-by-side in a 19-inch panel. All necessary wiring for primary power and signal inputs is completed through a connector at the rear. A window in the front panel permits the reading of printed copy one line after printing takes place. As a message is completed, it can be removed from the unit for immediate delivery. To prevent the printing of many split words, an automatic line feed is provided to advance the paper if a space character is received in any of the last six characters of a line. In addition, if no input characters are received within a period of five seconds, the paper advances four lines to prevent the accidental leaving of characters under the print head.

1-32. THERMOCHROME TELEPRINTER
TT-522/ARC-96.

1-33. The ThermoChrome Teleprinter TT-522/ARC-96 (tape printer reader), figure 1-14, provides a teletype tape printer and reader in a single unit. The reader section of the unit accepts either chadless or perforated tape. The printer

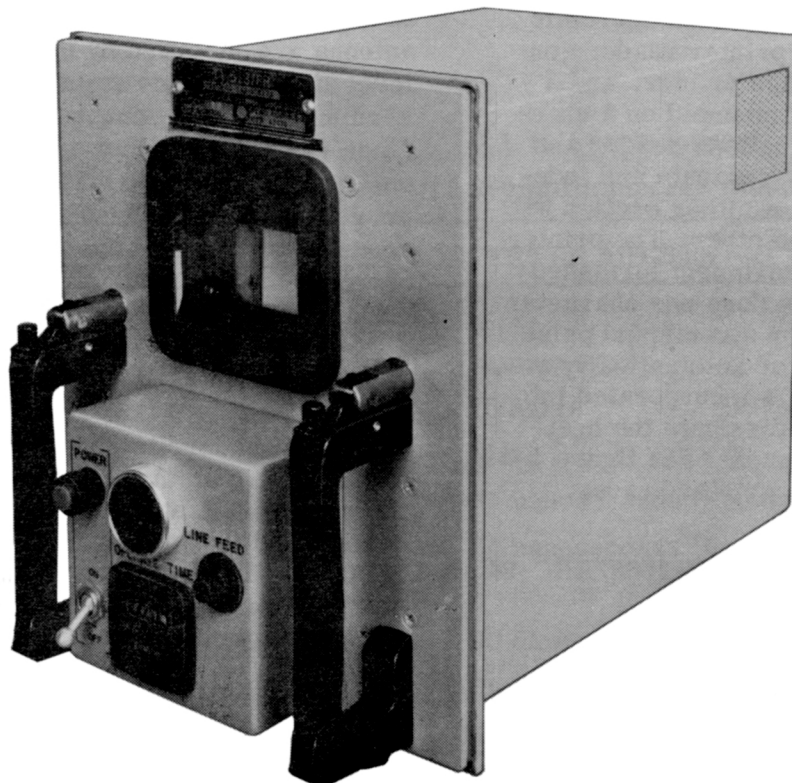


Figure 1-13. ThermoChrome Teleprinter
TT-521/ARC-96

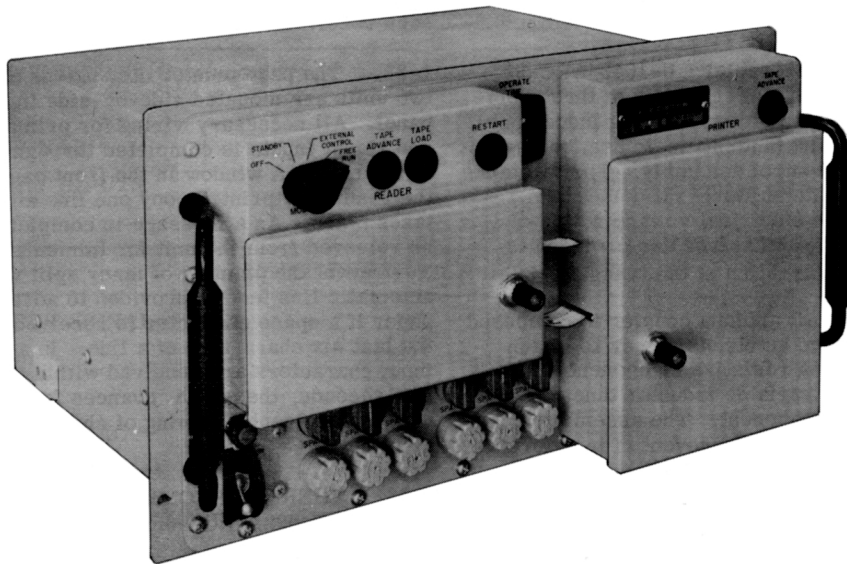


Figure 1-14. Thermochrome Teleprinter
TT-522/ARC-96

section of the unit produces a thermochromic (chadless) tape. The tape printer reader consists of a tape reader, a tape printer, and a common power supply, all mounted on a chassis for table operation. The tape reader and tape printer are capable of separate and independent operation; failure of either section will not prevent operation of the other. The printer receives an input from government furnished teletypewriter. Reading is done one character at a time, as determined by a command pulse from the transmit system or automatically at a 75 baud rate. A blower is incorporated into the tape printer reader to dissipate the heat generated by the reader lamps. See figure 1-1 for the location of the tape printer reader.

1-34. ANTENNA COUPLER CU-1566/ARC-96.

1-35. The Antenna Coupler CU-1566/ARC-96 (receive antenna coupler), figure 1-15, consists of seven modular assemblies mounted in a single enclosure. The receive antenna coupler is designed to function within an airborne multichannel receive system. The receive antenna coupler synthesizes an omnidirectional receive pattern mode from a four-dipole antenna and couples the rf energy to four receivers. The north-

south and east-west signals from the receive antenna are modified by the input amplifiers to a level and impedance suitable for the omni pattern combiner. The output from the omni pattern combiner is coupled to four identical output amplifiers, one for each receiver. The output amplifiers provide interchannel isolation and suitable impedance matching of the signal to the associated receiver.

1-36. ANTENNA AS-1909/ARC-96.

1-37. The Antenna AS-1909/ARC-96 (receive antenna), figure 1-16, consists of two pairs of bidirectional ferrite cone loop elements designed to function in an airborne installation. A part of the receive antenna, and mounted directly beneath it, is the junction box assembly (part no. 11D0299). This assembly is potted and requires no maintenance. The antenna assembly is potted and housed in a radome.

1-38. RECEIVER CONTROL C-7030/ARC-96.

1-39. The Receiver Control C-7030/ARC-96 (receiver remote control), figure 1-17, is located in the overhead console at the operator's station. The receiver remote control is provided to permit remote operation of the receiver. There is

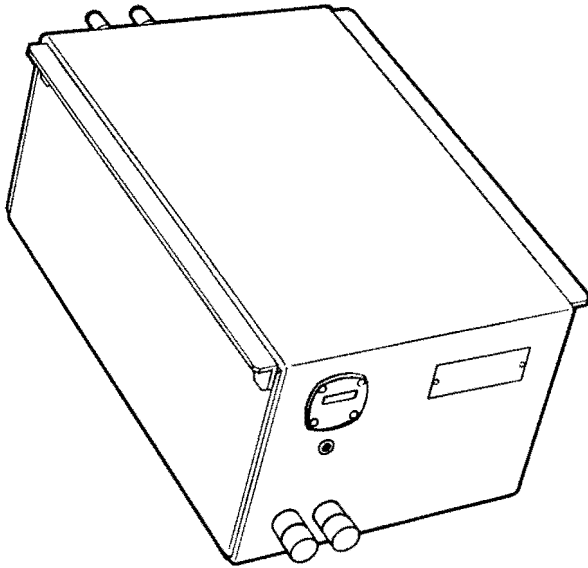


Figure 1-15. Antenna Coupler
CU-1566/ARC-96

a receiver control unit for each of the four receiver assemblies. The remote unit includes controls for baud rate selection, i-f bandwidth selection, demodulator mode selection, and printout mode selection. In addition, indicators are included to advise the condition of receiver operation.

1-40. TRANSMITTER CONTROL
C-7028/ARC-96.

1-41. The Transmitter Control C-7028/ARC-96 (transmitter control), figure 1-18, is located in the overhead console at the operator's station. The transmitter control is provided to permit remote operation of the modulator. The remote unit includes controls for the selection of modulation mode and baud rate as well as the selection of the tape printer reader input to the transmitter. The transmitter frequency and deviation are indicated.

1-42. RADIO SET CONTROL C-7027/ARC-96.

1-43. The Radio Set Control C-7027/ARC-96 (radio set control), figure 1-19, is located in the overhead console at the operator's station. The radio set control is provided to remotely monitor the status of the transmitter. Indicators

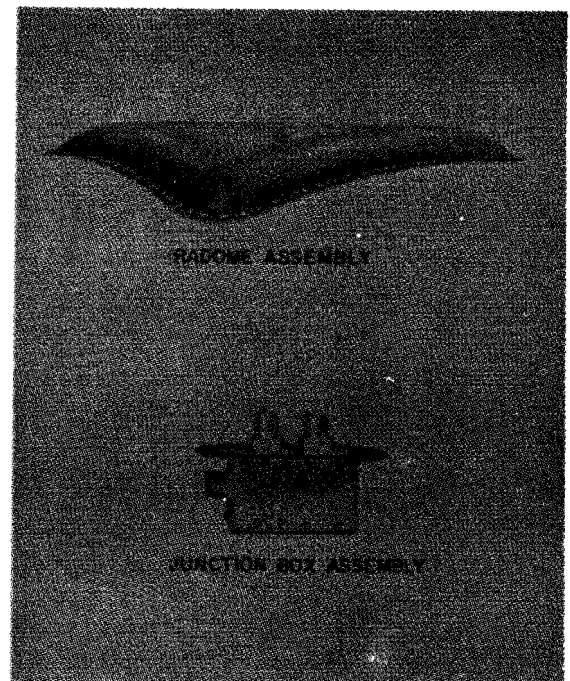


Figure 1-16. Antenna AS-1909/ARC-96

are included to advise the normal operation of the rf amplifier assemblies, the operating status of the driver amplifier, and the normal output of the modulator data converter.

1-44. RADIO INTERFERENCE FILTER
F-1111/ARC-96.

1-45. The Radio Interference Filter F-1111/ARC-96 (rf line filter), figure 1-20, is provided to filter the primary input to the two tape printer readers, the CY-6070 Electrical Equipment Cabinet, the receiver system, and the page printer.

1-46. REFERENCE DATA.

1-47. Tables 1-1 and 1-2, respectively, list the leading particulars and the capabilities and limitations of the radio set. The data given in the tables are useful as a familiarization aid for the maintenance technician.

1-48. LEADING PARTICULARS.

1-49. Table 1-1 lists the leading particulars of the radio set. The components are arranged in functional system signal flow order.



Figure 1-17. Receiver Control C-7030/ARC-96



Figure 1-18. Transmitter Control C-7028/ARC-96

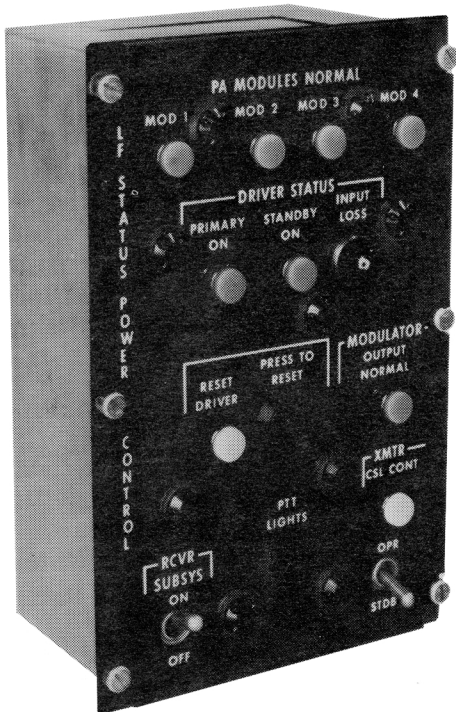


Figure 1-19. Radio Set Control C-7027/ARC-96

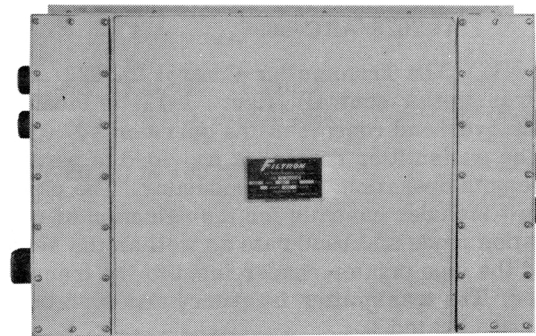


Figure 1-20. Radio Interference Filter F-1111/ARC-96

Table 1-1. Leading Particulars

 AIRBORNE RADIO COMMUNICATIONS SET AN/ARC-96

PRIMARY POWER:

Voltage	115/200 volts, 400 hertz, three phase, four wire
Power Input	28 kilowatts (maximum)
WEIGHT:	2600 pounds (estimated)

 SEQUENTIAL TIMER TD-818/ARC-96

PRIMARY POWER:

Voltage	115 volts, 400 hertz, single phase
Power Input	85 watts

DIMENSIONS:

Width	19.00 inches
Height	7.00 inches
Depth	12.00 inches
WEIGHT:	30 pounds (approximate)

 DEMODULATOR DATA CONVERTER MD-690/ARC-96

PRIMARY POWER:

Voltage	115 volts, 400 hertz, single phase
Power Input	120 watts

DIMENSIONS:

Width	19.00 inches
Height	5.00 inches
Depth	19.00 inches
WEIGHT:	50 pounds (approximate)

Table 1-1. Leading Particulars (Continued)

 RADIO RECEIVER R-1408/ARC-96

PRIMARY POWER:

Voltage	115 volts, 400 hertz, single phase
Power Input	110 watts

DIMENSIONS:

Width	19.00 inches
Height	7.00 inches
Depth	19.00 inches

WEIGHT: 60 pounds (approximate)

 UNIT CODE SELECTOR C-7043/ARC-96

PRIMARY POWER:

Voltage	115 volts, 400 hertz, single phase
Power Input	88 watts

DIMENSIONS:

Width	17.38 inches
Height	4.92 inches
Depth	19.62 inches

WEIGHT: 45 pounds (approximate)

 RADIO TRANSMITTER MODULATOR MD-684/ARC-96

PRIMARY POWER:

Voltage	115 volts, 400 hertz, single phase
Power Input	130 watts

DIMENSIONS:

Width	19.00 inches
Height	5.25 inches
Depth	19.00 inches

WEIGHT: 50 pounds (approximate)

 RADIO INTERFERENCE FILTER F-1091/ARC-96

DIMENSIONS:

Width	15.50 inches
Height	10.50 inches
Depth	35.00 inches

WEIGHT: 75 pounds (approximate)

Table 1-1. Leading Particulars (Continued)

POWER CONTROL SUBASSEMBLY SB-2812/ARC-96	
PRIMARY POWER:	
Voltage	115/200 volts, 400 hertz, three phase, four wire
Power Input	28 kilowatts (maximum)
DIMENSIONS:	
Width	10.00 inches
Height	10.50 inches
Depth	12.50 inches
WEIGHT:	25 pounds (approximate)
RADIO FREQUENCY AMPLIFIER AM-4555/ARC-96	
PRIMARY POWER:	
Voltage	+240 volts for full power +170 volts for one-half power +120 volts for one-quarter power
Current	26 amperes for full power 18 amperes for one-half power 13 amperes for one-quarter power
DIMENSIONS:	
Width	15.50 inches
Height	10.50 inches
Depth	35.00 inches
WEIGHT:	82 pounds (approximate)
AMPLIFIER CONTROL C-7029/ARC-96	
PRIMARY POWER:	
Voltage	200 volts, 400 hertz, three phase, four wire
DIMENSIONS:	
Width	10.00 inches
Height	10.50 inches
Depth	12.50 inches
WEIGHT:	25 pounds (approximate)
POWER SUPPLY SUBASSEMBLY MX-7282/ARC-96	
PRIMARY POWER:	
Voltage	200 volts, 400 hertz, three phase
Power Input	400 watts
DIMENSIONS:	
Width	10.00 inches

Table 1-1. Leading Particulars (Continued)

POWER SUPPLY SUBASSEMBLY MX-7282/ARC-96 (Continued)

DIMENSIONS (Continued)

Height	10.50 inches
Depth	25.00 inches
WEIGHT	40 pounds (approximate)

POWER SUPPLY PP-4553/ARC-96

PRIMARY POWER:

Voltage	200 volts, 400 hertz, three phase, four wire
Power Input	7 kilowatts (maximum)

DIMENSIONS:

Width	10.00 inches
Height	10.50 inches
Depth	25.00 inches
WEIGHT:	50 pounds (approximate)

ANTENNA COUPLER CU-1643/ARC-96

PRIMARY POWER:

Voltage	200 volts, 400 hertz, three phase, four wire
Power Input	600 volt amperes

DIMENSIONS:

Width	23.00 inches
Height	60.00 inches
Depth	48.00 inches
WEIGHT:	650 pounds (estimated)

THERMOCHROME TELEPRINTER TT-521/ARC-96

PRIMARY POWER:

Voltage	115 volts, 400 hertz, single phase
Power Input	
Standby	6 watts
Operate	12 to 30 watts

DIMENSIONS:

Width	8.62 inches
Height	10.25 inches
Depth	11.00 inches
WEIGHT:	25 pounds (approximate)

Table 1-1. Leading Particulars (Continued)

THERMOCHROME TELEPRINTER TT-522/ARC-96	
PRIMARY POWER:	
Voltage	115 volts, 400 hertz, single phase
Power Input	260 watts
DIMENSIONS:	
Width	18.00 inches
Height	10.00 inches
Depth	12.00 inches
WEIGHT:	75 pounds (approximate)
ANTENNA COUPLER CU-1566/ARC-96	
OPERATING POWER:	
Voltage	+28 volts
Current	360 milliamperes (maximum)
DIMENSIONS:	
Width	17.00 inches
Height	7.00 inches
Depth	10.00 inches
WEIGHT:	35 pounds (approximate)
ANTENNA AS-1909/ARC-96	
DIMENSIONS:	
Height	10.00 inches
Width	80.50 inches
WEIGHT:	200 pounds (approximate)
RECEIVER CONTROL C-7030/ARC-96	
DIMENSIONS:	
Width	5.75 inches
Height	9.00 inches
Depth	6.50 inches
WEIGHT:	10 pounds (approximate)
TRANSMITTER CONTROL C-7028/ARC-96	
DIMENSIONS:	
Width	5.75 inches
Height	9.00 inches
Depth	6.50 inches
WEIGHT:	10 pounds (approximate)

Table 1-1. Leading Particulars (Continued)

RADIO SET CONTROL C-7027/ARC-96	
DIMENSIONS:	
Width	5.75 inches
Height	9.00 inches
Depth	6.50 inches
WEIGHT:	10 pounds (approximate)
RADIO INTERFERENCE FILTER F-1111/ARC-96	
PRIMARY POWER:	
Voltage	200 volts, 400 hertz, three phase, four wire
Current	8 amperes per phase
DIMENSIONS:	
Width	20.00 inches
Height	3.00 inches
Depth	10.00 inches
WEIGHT:	50 pounds (approximate)

1-50. CAPABILITIES AND LIMITATIONS.

1-51. Table 1-2 lists the capabilities and limitations of the radio set. The components are arranged in functional system signal flow order.

Table 1-2. Capabilities and Limitations

AIRBORNE RADIO COMMUNICATIONS SET AN/ARC-96

CLIMATIC CHARACTERISTICS

Ambient Temperature -

Operating

Continuous duty -54°C (-65°F) to +55°C (130°F)

Intermittent duty -54°C (-65°F) to +71°C (158°F)

Non-operating -62°C (-80°F) to +85°C (185°F)

Altitude -

Full power

Transmit 0 to 12,500 feet

Receive 0 to 50,000 feet

Half power 12,500 to 50,000 feet

Non-operating 0 to 50,000 feet

OUTPUTS:

RF output power -

17 to 27 kilohertz 1.25 to 18 kilowatts in four steps (limited by trailing wire antenna)

Table 1-2. Capabilities and Limitations (Continued)

AIRBORNE RADIO COMMUNICATIONS SET AN/ARC-96 (Continued)	
RF output power (Continued)	
27 to 60 kilohertz	1.25 to 20 kilowatts in four steps
Bandwidth	800 hertz (minimum) flat within 0.5 db over 3-kilohertz bandwidth
Operational modes	Coherent mode Non-coherent mode Emergency mode
Baud rates	5, 50 and 75 baud
Type of Operation	Simplex
SEQUENTIAL TIMER TD-818/ARC-96	
OUTPUT SIGNAL:	
Waveform	Square wave
Frequency	3 megahertz
Amplitude	2.5 volts peak-to-peak
Rise time	35 nanoseconds (maximum)
Fall time	35 nanoseconds (maximum)
OUTPUT IMPEDANCE:	75 ohms balanced
NUMBER OF OUTPUTS:	9
OUTPUT VOLTAGE:	
Amplitude	+28 volts
Ripple	0.1 volt peak-to-peak
Current	360 milliamperes (maximum)
DEMODULATOR DATA CONVERTER MD-690/ARC-96	
OUTPUT SIGNAL:	
Waveform	Square wave
Frequency	75 hertz
Amplitude	Mark 6 (± 1) volts dc - Space 0 (± 0.5) volt dc
Rise time	35 nanoseconds (maximum)
Fall time	35 nanoseconds (maximum)
IMPEDANCE:	
Input	90 ohms
Output	200 ohms
NUMBER OF OUTPUTS:	2
OUTPUT VOLTAGE:	
Amplitude	120 volts
Frequency	400 hertz

Table 1-2. Capabilities and Limitations (Continued)

 DEMODULATOR DATA CONVERTER MD-690/ARC-96 (Continued)

OUTPUT VOLTAGE (Continued)

Power	30 watts
INPUT SIGNAL:	10-kilohertz i-f
AUXILIARY INPUTS:	5-, 50-, and 75-pps square wave
	3-megahertz clock

RADIO RECEIVER R-1408/ARC-96

I-F OUTPUT SIGNAL:

Waveform	Square wave
Frequency	10 kilohertz
TUNING ACCURACY:	± 0.01 hertz
DISCERNIBLE SIGNAL:	-170 dbw (minimum)
THERMAL NOISE FIGURE:	3 db
BANDWIDTH:	
Normal mode	500 hertz (nominal)
Emergency mode	30 (± 5) hertz, centered at 1000 (± 5) hertz
SYNTHESIZER INPUT:	1 megahertz, 1 volt rms at 75 ohms impedance
DYNAMIC RANGE:	120 db
IMAGE REJECTION:	80 db below response at the frequency receiver is tuned

UNIT CODE SELECTOR C-7043/ARC-96

INPUT SIGNALS:

Data -

Waveform	Square wave
Frequency	5, 50, or 75 baud
Amplitude	+4.5 (± 1.5) volts
Impedance	Less than 250 ohms

Clock data -

Waveform	Square wave
Frequency	5, 50, or 75 hertz
Amplitude	+4.5 (± 1.5) volts
Impedance	Less than 250 ohms

Baud control -

75 baud	+4.5 (± 1.5) volts
50 baud	0 (± 0.5) volt
High control for 50 and 75 baud	+4.5 (± 1.5) volts
Low control for 5 baud	0 (± 0.5) volt

Table 1-2. Capabilities and Limitations (Continued)

UNIT CODE SELECTOR C-7043/ARC-96 (Continued)	
INPUT SIGNALS (Continued)	
Clock pulses -	
Waveform	Square wave
Frequency	3 megahertz
Amplitude	2.5 volts peak-to-peak (minimum)
Data from each encoder -	
Waveform	Square wave
Frequency	75, 50, or 5 baud
End of message signal -	
Waveform	Square wave
Amplitude	+4.5 (± 1.5) volts during message 0 (± 0.5) volt at end of message
Text fault lamp -	
Amplitude	25 (± 3) volts dc
Ripple	0.1 volt peak-to-peak
OUTPUT SIGNALS:	
Data -	
Waveform	Square wave
Frequency	5, 50, 75 baud
Amplitude	+4.5 (± 1.5) volts
Clock data -	
Waveform	Square wave
Frequency	5, 50, or 75 hertz
Amplitude	+4.5 (± 1.5) volts
Data to each encoder -	
Waveform	Square wave
Frequency	5, 50, and 75 baud
OUTPUT IMPEDANCE:	250 ohms or less
RADIO TRANSMITTER MODULATOR MD-684/ARC-96	
INPUT DATA:	Teleprinter digital signal 75 baud rate
OUTPUT SIGNAL FREQUENCIES:	Frequency-shift keyed signal - center frequency variable between 17 kilohertz and 60 kilohertz
OPERATIONAL MODES:	Coherent mode Non-coherent mode Emergency mode (hand-keyed input signal)

Table 1-2. Capabilities and Limitations (Continued)

RADIO TRANSMITTER MODULATOR MD-684/ARC-96 (Continued)

BAUD RATES:	5, 50, and 75 baud, selective in either coherent or non-coherent modes
CHARACTER REQUEST:	
Readout voltage	+6 (± 1) volts
Signal duration	30 (± 10) milliseconds
Rise time	2.4 (± 0.3) milliseconds
Fall time	2.4 (± 0.3) milliseconds

RADIO INTERFERENCE FILTER F-1091/ARC-96

RF INPUT:	
Power	20.5 kilowatts
RF OUTPUT:	
Power	20 kilowatts
HARMONIC ATTENUATION:	60 db down for harmonics of fundamental frequencies from 17 to 27 kilohertz, 70 db down for 27 to 60 kilohertz

RADIO FREQUENCY AMPLIFIER AM-4555/ARC-96

RF INPUT:	
Power	25 watts (nominal), 50 watts (maximum)
RF OUTPUT:	
Power	5250 watts (minimum) at 10 ohms

AMPLIFIER CONTROL C-7029/ARC-96

OUTPUTS:	115 volts, 400 hertz to main circuit breaker
	200 volts, 400 hertz, three phase to driver amplifier
	+25 volts to rf amplifier
	+28 volts to rf amplifier

POWER SUPPLY SUBASSEMBLY MX-7282/ARC-96

RF INPUT:	
Voltage	1.0 volt at 75 ohms
RF OUTPUT:	
Power	200 watts (maximum)
LOAD IMPEDANCE:	40 ohms

POWER SUPPLY PP-4553/ARC-96

OUTPUT:	
Voltage	+240, +170, +120 volts

Table 1-2. Capabilities and Limitations (Continued)

POWER SUPPLY PP-4553/ARC-96 (Continued)	
OUTPUT (Continued)	
Power	6 kilowatts (maximum)
EFFICIENCY:	90% at full power
ANTENNA COUPLER CU-1643/ARC-96	
INPUT IMPEDANCE:	100 ohms at vswr of 1.1:1 or less
AMPLITUDE RESPONSE:	
17 to 27 kilohertz	Flat within 0.5 db over a 1750-hertz bandwidth
27 to 60 kilohertz	Flat within 0.5 db over a 3-kilohertz bandwidth
PHASE RESPONSE:	Linear within 1 degree per 100 hertz
EFFICIENCY:	
17 to 27 kilohertz	80%
27 to 60 kilohertz	93%
AUTO-TRIM:	
Range	Maintain required input impedances for 10% change at 60 kilohertz
Rate	Full range (10% variation) within 1 minute
OUTPUT VOLTAGE:	32 (± 3) kilovolts limited by spark gap
INPUT VOLTAGE:	3 kilovolts limited by spark gap
THERMOCHROME TELEPRINTER TT-521/ARC-96	
DATA SOURCE SIGNAL REQUIREMENTS:	
Line	2-wire, ungrounded
Input impedance	5000 ohms (minimum)
Bipolar signal	Mark - +6 (<u>+</u> 1) volts, space - -6 (<u>+</u> 1) volts
Unipolar signal	Mark - +2.0 to +7.0 volts, space - less than +0.5 volt
READER SIGNAL OUTPUT:	
Visual print out	51 printable characters
	Page format
	10 characters per inch
	5-1/2 lines per inch
	26 characters per line (maximum)
Bell	2.5 kilohertz, 75 to 80 db on command signal (80 milliseconds)

READER OUTPUT:	7.0 serial Baudot code at 75 to 76.5 baud rate
PRINT FONT:	5 by 5 dot matrix

ANTENNA COUPLER CU-1566/ARC-96

FREQUENCY RANGE:	14 kilohertz to 60 kilohertz
RF INPUT:	Sensitive to input signal power 20 db above thermal noise
RF OUTPUT:	-166 dbw (-0, +1 db) signal power at each of four outputs in 100 ohms at minimum input 12 db signal-to-noise ratio (minimum) 12 db isolation between any output pair
SURGE AND TRANSIENT VOLTAGE:	Withstands transients to 500 volts from lightning strikes or EMP and overshoots of 3000 volts for 50 nanoseconds
DYNAMIC RANGE:	-166 dbw (minimum rf signal power) to -46 dbw

ANTENNA AS-1909/ARC-96

DYNAMIC RANGE:	120 db, linear to within 2 db
PATTERN:	
Omnidirectional	In a horizontal plane to within ± 1.5 db of circularity (in free space)
SENSITIVITY:	Constant within 1 db in any vertical plane for elevations up to $\pm 45^\circ$
EMP OVERVOLTAGE:	300 volts peak

RADIO INTERFERENCE FILTER F-1111/ARC-96

INSERTION LOSS:	2 volts (maximum) per phase at full load
RF ATTENUATION:	100 db, 14 kilohertz to 1 gigahertz

1-52. OPERATING CONTROLS AND INDICATORS.

1-53. Table 1-3 provides a tabular listing of the front panel operating controls and indicators for the components of the radio set. The controls and indicators are illustrated in figures 1-21 through 1-38.