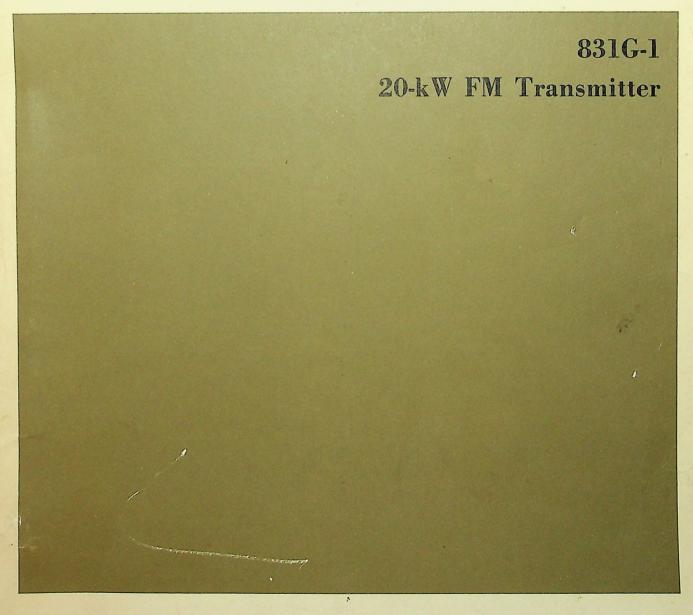


Collins Radio Company



BROADCAST EQUIPMENT GUARANTEE

The equipment described herein is sold under the following guarantee:

- a. Except as set forth in paragraph b. of this section, Collins agrees with Buyer to repair or replace, without charge, any properly maintained equipment, parts or accessories which are defective as to design, materials, or workmanship and which are returned in accordance with Collins instructions by Buyer to Collins factory, transportation prepaid, provided:
 - 1. Notice of a claimed defect in the design, materials or workmanship of the equipment manufactured by Collins is given by Buyer to Collins within five (5) years from date of delivery, with exception of rotating machinery such as blowers, motors, and fans whereby notice must be given by Buyer to Collins within two (2) years from date of delivery.
 - 2. Notice of a claimed defect in the design, materials or workmanship of the following described Collins manufactured equipment is given by Buyer to Collins within two (2) years from the date of delivery:

20 V -3	26U-2	81M	172G-2	216C-2	313T-4	642A-2	820F-1	830D-1	830F-2A
26J-1	42E-7	144A-1	212H-1	313T-1	356H-1	786M-1	A830-2	830E-1	830H-1A
26U-1	42E-8	172G-1	212Z-1	313T-3	564A-1	820E-1	830B-1	830F-1	830N - 1 A

- b. The above guarantee does not extend to other equipment, accessories, tubes, lamps, fuses, and tape heads manufactured by others which are subject to only adjustment as Collins may obtain from the supplier thereof.
- c. Collins further guarantees that any radio transmitter described herein will deliver full radio frequency power output at the antenna lead when connected to a suitable load, but such guarantee shall not be construed as a guarantee of any definite coverage or range of said apparatus.

d. The guarantee of this section is void if:

- 1. The equipment malfunctions or becomes defective as a result of alterations or repairs by others than Collins or its authorized service center, or
- 2. The equipment is exposed to environmental conditions more severe than specified by Collins in equipment manuals.
- e. NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR INTENDED PURPOSE, SHALL BE APPLICABLE TO ANY EQUIPMENT SOLD HEREUNDER.
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INFORMATION NEEDED:

- (A) Type number, name and serial number of equipment
- (B) Date of delivery of equipment
- (C) Date placed in service
- (D) Number of hours of service
- (E) Nature of trouble
- (F) Cause of trouble if known
- (G) Part number (9 or 10 digit number) and name of part thought to be causing trouble
- (H) Item or symbol number of same obtained from parts list or schematic
- (I) Collins number (and name) of unit subassemblies involved in trouble
- (J) Remarks

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INFORMATION NEEDED:

(A) Quantity required

- (B) Collins part number (9 or 10 digit number) and description
- (C) Item or symbol number obtained from parts list or schematic
- (D) Collins type number, name and serial number of principal equipment
- (E) Unit subassembly number (where applicable)

1 December 1967

Collins Radio Company

Service Parts, 412-024 1225 North Alma Road

Richardson, Texas 75080

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instruction book

831G-1 20-kW FM Transmitter

Printed in United States of America

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Figure 1-1. 831G-1 20-kW FM Transmitter.

section 1 general description

1.1 GENERAL DESCRIPTION

1.2 INTRODUCTION

When equipped with optional 786V-1 Stereo Generator and 786W-1 SCA Generator, the 831G-1 20-kw FM Transmitter provides continuous monophonic, stereophonic, and SCA (subsidiary communication authorization) frequency modulated service. The transmitter output frequency is determined by two crystals. The first is a 14-MHz crystal that is used in a reference oscillator to control the carrier frequency of the 14-MHz fm oscillator. The second crystal controls the oscillator that is used to heterodyne the 14-MHz fm signal to the customer-specified frequency. The transmitter operates in the fm broadcast range (88 to 108 MHz) at an output of 20,000 watts.

1.3 PHYSICAL DESCRIPTION

The transmitter is housed in a basic unistrut cabinet that contains all transmitter components. (Refer to figure 1-1.) The transmitter contains three sections. The section on the left in figure 1-1 contains the power amplifier and driver circuits. The center section houses the extended control panel, 310Z-1 Exciter, and control circuits. The section on the right in the figure contains the power supplies, the circuit breaker, and fuse panel.

Mechanical and electrical interlocks are provided on all access panels, the power amplifier plate cavity door, and grid tuning door.

1.4 FUNCTIONAL DESCRIPTION

The transmitter consists of an exciter, a driver, and power amplifier. The output of the exciter is applied to the driver. The driver stage consists of two 4CX250B tubes connected in parallel and operated class C. The input to the driver is amplified to approximately 400 watts and applied to the power amplifier that contains one 4CX15000A tube operated class C. The input to the power amplifier is amplified to 20,000 watts and applied to a 50-ohm unbalanced load. Power control circuits monitor the rf output power level. When a change in output power is detected, these circuits change the plate voltage to compensate. Other control circuits within the transmitter monitor reflected power, forward power, operating voltage, and air pressure within the driver and power amplifier section. They protect the transmitter by removing power when excessive currents or loss of air pressure occurs.

The extended control panel operation can be increased to a maximum of 250 feet with additional cabling.

1.5 TECHNICAL CHARACTERISTICS

1.5.1 Mechanical

Weight: 2000 pounds

Size: Height 69 inches

Width 71-1/2 inches

Depth 27-1/2 inches

Ventilation (2 sources): Squirrel-cage type blower mounted under the cavity Axial fan that positively charges the entire cabinet

Ambient Temperature Range: +15° to +45°C (59° to 113°F) operating

Relative Humidity Range: 0 to 95% relative humidity

Altitude: Up to 7500 feet at 40°C (104°F) Shock and Vibration: Normal handling and transportation

Finish: Cabinet Exterior Collins gray baked enamel

Control Panel White baked enamel

1.5.2 Electrical

Frequency Range: 88 to 108 MHz Specified customer frequency is determined by two crystals in the exciter

Power Output: 20,000 watts into a 50-ohm unbalanced line

Standing Wave Ratio: Not to exceed 2:1

Power Source: 208 to 240 volts, 60 Hz 3-phase Available voltage taps on transformer: 200, 210, 220, 230, 240, and 250. 50-Hz operation available on special order

Power Line Variations: $\pm 5\%$ overall power line variations; in addition, the phase angle and voltage unbalance shall be within 5% of the average of all three phases.

Harmonic and Spurious Radiation:

Any emission appearing on a frequency removed from the carrier by between 120 kHz and 240 kHz inclusive, is attenuated at least 25 dB below the level of the unmodulated carrier.

Any emission appearing on a frequency removed from the carrier by more than 240 kHz and up to and including 600 kHz is attenuated at least 35 dB below the level of the unmodulated carrier.

Any emission appearing on a frequency removed from the carrier by more than 600 kHz is attenuated at least 80 dB below the level of the unmodulated carrier. Modulation Characteristic: Wide-band direct fm: standard audio preemphasis is incorporated Input Power Requirements: 35,000 watts at 0.97 power factor Excitation Source: Collins 310Z-1 Exciter that is capable of accepting an input signal of from 30 Hz to 75 kHzOptional: Stereo Add Collins 786V-1 Stereo Generator to exciter Stereo and SCA Add Collins 786V-1 and 786W-1 SCA Generator to exciter Output Impedance: 50 ohms, unbalanced Carrier Frequency Stability: Frequency will not vary more than ±1000 Hz for an ambient temperature range of +15° to +45°C (59° to 113°F) and a line variation of $\pm 5\%$ Audio Input Impedance: 600 ohms, balanced Audio Input Level: $+10 \text{ dBm} \pm 2 \text{ dB}$ Audio Frequency Response: Complies with FCC standard 75microsecond preemphasis curve Audio Frequency Distortion:

Not more than 1% in the range from 50 Hz to 15 kHz

FM Noise Level: 65dB below 100% modulation (±75 kHz)

AM Noise Level: 55dB below equivalent 100% am modulation

$\frac{\text{section } 2}{\text{installation}}$

2.1 UNPACKING AND INSPECTING

- a. The transmitter is shipped in a skid-type crate with unpacking instructions stenciled on the side. Uncrate the transmitter carefully to avoid damage. Inspect for loose screws and fasteners. Ensure that all controls operate freely. Examine the cabinet for dents or scratches. Ensure that cable and wiring connections are tight and situated clear of each other and the chassis.
- b. Carefully unpack the transformers, filters, and power amplifier tube. Inspect each unit for damage.
- c. File any damage claims properly with the transportation company. Retain all packing material if a claim is filed.

2.2 ASSEMBLY

- a. Plan the placement of the transmitter and its external wiring carefully before beginning installation. (Refer to figure 2-1.) Four knockout holes are located on the top of the transmitter section that contains the fuse panel. The holes accommodate cabling for 3-phase input voltage, audio input signal, remote control unit, and the extended control panel.
- b. If optional modulation and frequency monitoring equipment is used, remove the center rear panel before positioning the transmitter. Determine the length of cable needed to connect the transmitter sample output of the monitoring equipment. Once the length is determined, connect the cable to the monitor jacks, and run the cable out of the transmitter through a previously unused knockout hole.
- c. Use the space provided in the transmitter center section to install the exciter. Connect an rf cable from the exciter output to the driver input. Attach the override voltage lead to TB1 pin 12. Connect the 117-volt ac power cable to the exciter. (See figure 2-1.) Refer to 310Z-1 Exciter Instruction Book,

part number 523-0560518-001438, for installation of audio input cables. Replace the rear cover and place the transmitter in its permanent location.

- d. If the extended control panel is mounted away from the transmitter, connect the extended cable from TB1 on the transmitter to TB1 and TB2 on the extended control panel.
- e. Install all customer-supplied wiring.
- f. Install plate power supply transformer T1, screen power supply transformer T2, plate power supply filter L1, screen power supply filter L2, and filter capacitor C3. Connect the transformers using table 2-1. Change taps if necessary to obtain correct operating parameters.
- g. Install the 4CX15000A tube using the procedure outlined in paragraph 5.7.1.
- h. If a remote control panel is used, run the external wiring from the remote unit into the transmitter and connect it to TB4.
- i. The pa grid sliders, driver plate slider, and the driver grid slider are in their approximate locations when shipped. The plate cavity slider is shipped separately and must be installed by the customer. Use the graphs in figures 5-1 and 5-2 of section 5 to determine the approximate settings of these adjustments. (Refer to the procedure in paragraph 5.6.2 if necessary.)
- j. Connect the customer-supplied 50-ohm transmission line to the rf output connector mounted on top of the transmitter cabinet.



Damage will result from an improper impedance match between the transmitter and the transmission line. Ensure that the transmission line and antenna present a 50-ohm impedance and a vswr not greater than 2:1 to the transmitter at the operating frequency.

installation

LINE VOLTAGE	CONNECTIONS FOR DELTA PRIMARY
T1 , 2	r2, and T3
200 volts, 3-phase	4 to 10, 13 to 19, 22 to 1
210 volts, 3-phase	5 to 10, 14 to 19, 23 to 1
220 volts, 3-phase	6 to 10, 15 to 19, 24 to 1
230 volts, 3-phase	7 to 10, 16 to 19, 25 to 1
240 volts, 3-phase	8 to 10, 17 to 19, 26 to 1
250 volts, 3-phase	9 to 10, 18 to 19, 27 to 1
	Τ4
200 volts, 3-phase	1 to 2
210 volts, 3-phase	1 to 3
220 volts, 3-phase	1 to 4
230 volts, 3-phase	1 to 5
240 volts, 3-phase	1 to 6
250 volts, 3-phase	1 to 7

Table 2-1. Transformer Connections.

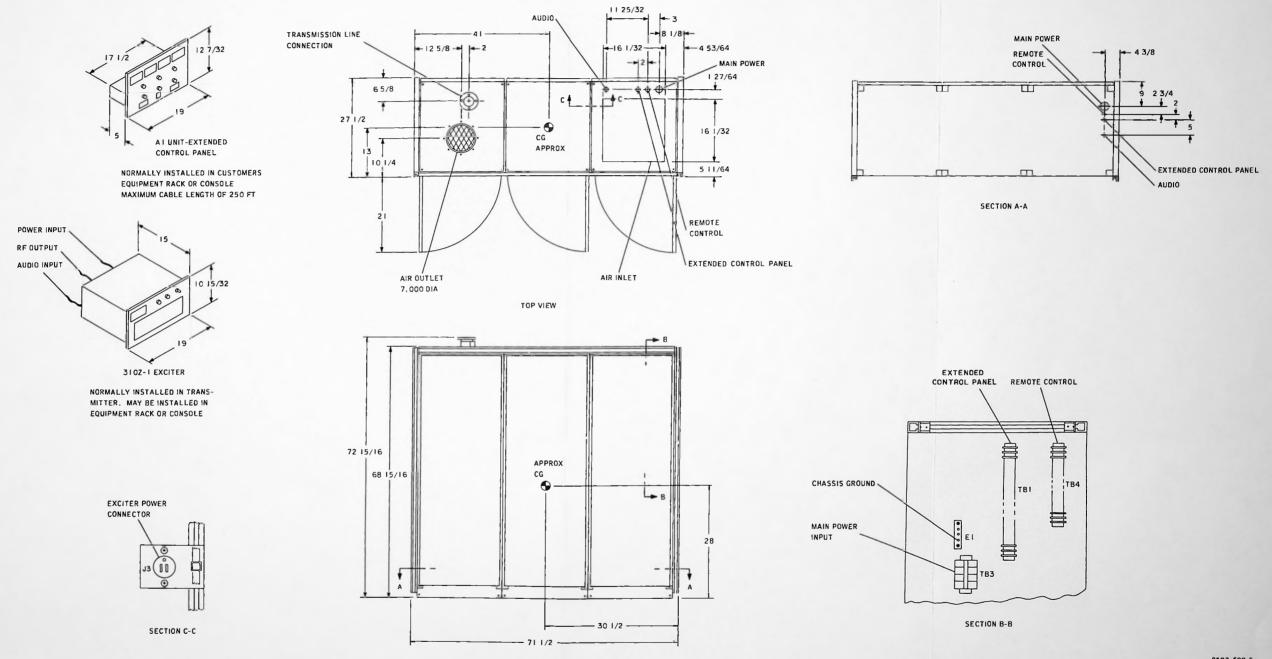
2.3 PRIMARY POWER

The transmitter requires a 208- to 240-volt $\pm 5\%$, 3-phase, 60-Hz ac power source that delivers 35 kilowatts at a 0.97 power factor. Make provisions for a fused main power disconnect switch or circuit breaker capable of handling 125 amperes. Run the main power cable from the main power disconnect switch or circuit breaker to TB3 in the transmitter.

2.4 INITIAL TURN-ON PROCEDURE

a. Ensure that the main power disconnect switch is off.

- b. Ensure that all circuit breakers are off.
- c. Ensure that the circuit breakers and fuses are the correct value.
- d. Set the 28 VDC POWER SUPPLY circuit breaker to ON.
- e. Set the test meter selector switch to the 28V SUPPLY 40V position.
- f. Set the POWER switch to the FORWARD position.
- g. Set the POWER CONTROL switch to the MANUAL position.



FRONT VIEW

1

8502 599 6

Figure 2-1. 831G-1 20-kW FM Transmitter, Outline and Installation Drawing.

- h. Set the exciter POWER switch to OFF.
- i. Set the primary disconnect switch to ON.
- j. Set the BLOWERS circuit breaker to ON and press the FILAMENT ON pushbutton. The test meter should indicate 28 volts.
- k. Set the test meter selector switch in the PA FIL 8V position, and observe that the test meter reads 5.8 volts.
- 1. Perform procedure in paragraph 5.6.3 and/or 5.6.4 if the meter fails to show 5.8 volts.

Caution

Do not perform the remainder of this procedure if the transmitter is not connected to an antenna with a 50-ohm impedance or a dummy load capable of dissipating 28 kilowatts.

- m. Set all circuit breakers to ON.
- n. Perform steps d. through w. of procedure in paragraph 5.6.9.1.
- o. Perform procedure 5.6.8 if less than 30 mA of pa grid current is indicated on the test meter and the power amplifier output is low.
- p. Perform procedure in paragraph 5.6.9.2.
- q. Perform procedure in paragraph 5.6.9.3 if necessary. Compare the transmitter readings with those listed in table 5-2.

- r. Run the manual POWER ADJUST switch between its two limits. If the control is too fast and cannot be adjusted to a discrete power setting, perform procedure in paragraph 5.6.11.
- s. Perform procedure in paragraph 5.6.10 to ensure the adjustment on board A3 is correct.
- t. Perform procedure in paragraph 5.6.11 to set the automatic power control level.
- u. Perform FCC proof-of-performance tests and record normal operating voltages, currents, and power levels in table 5-2 or 5-3.
- v. The transmitter is now ready for normal operation.

2.5 REMOTE OPERATION

To initiate remote operation, set the TRANS-MITTER CONTROL LOCAL/REMOTE switch in the REMOTE position. When operating with the extended control panel, this switch must be in the LOCAL position.

2.6 FREQUENCY CHANGE

The transmitter operating frequency can be changed by replacing the crystal in the exciter (see 310Z-1 Exciter Instruction Manual, part number 523-0560518-001438, for details) and performing procedure in paragraph 5.6.2.

3.1 GENERAL

The transmitter is operated from the extended control panel. Once the transmitter has been installed and properly tuned, it is only necessary to monitor meter indications and to make minor tuning and loading adjustment (figure 3-1).

3.2 CONTROLS AND INDICATORS

Refer to the following tables for a general description of the operational controls found on the three front panels of the transmitter: table 3-1, left; table 3-2, center; and table 3-3, right.

3.3 TURN-ON PROCEDURE

After the transmitter has been tuned, apply power as follows:

- a. Be sure that all interlocked doors and panels are secured.
- b. Inspect the fuse panel and ensure that all fuses are inserted.
- c. Close the primary disconnect switch.
- d. Set all circuit breakers on.
- e. Press the FILAMENT ON pushbutton.
- f. Set the test meter selector switch to both the 28V SUPPLY 40V and PA FIL 8V positions.
- g. Make certain that the test meter readings agree with those in table 5-2 in section 5.
- h. Press the PLATE ON pushbutton.



An automatic 120-second delay occurs after the PLATE ON pushbutton has been pressed. This delay only occurs when the transmitter is started with the PLATE ON pushbutton.

- i. Observe the extended control panel meters after plate voltage is applied and ensure that the transmitter readings agree with those recorded in table 5-2.
- j. Adjust the PA TUNING and PA LOADING if minor tuning is required.
- k. Remove all transmitter power, if major tuning is required, and perform steps c. to u. of paragraph 5.6.9.1.

3.4 SHUTDOWN PROCEDURES

3.4.1 Normal Turnoff

- a. Press the PLATE OFF pushbutton and allow a few seconds for the voltage to decrease.
- b. Press the FILAMENT OFF pushbutton.
- c. Set the PLATE POWER SUPPLY circuit breaker, CB5, OFF.
- d. Set the 28 VDC POWER SUPPLY circuit breaker, CB1, OFF.
- e. Open the primary disconnect switch.
- 3.4.2 Emergency Turnoff

In the event of an emergency, remove power in any of the following ways: press the FILAMENT OFF pushbutton, turn 28 VDC POWER SUPPLY circuit breaker CB1 off, or open the primary disconnect switch.

3.5 POWER READINGS

The transmitter extended control panel RF WATTMETER indicates forward and reverse power. It does not indicate true power. To obtain true power, using the wattmeter, subtract reverse power from forward power.

operation

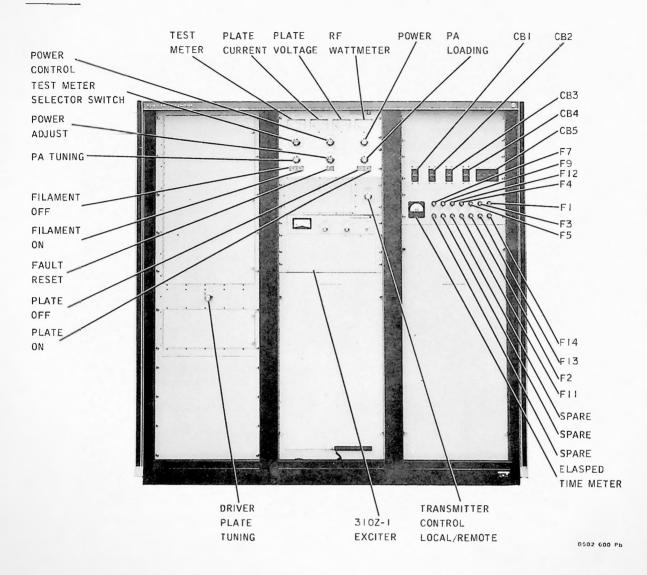


Figure 3-1. 831G-1 20-kW FM Transmitter, Controls and Indicators.

Table 3-1. Left Pan	Table	3-1.	Left	Panel.
---------------------	-------	------	------	--------

REF DESIG	LEFT PANEL CONTROLS	FUNCTION
C37	DRIVER PLATE TUNING	A variable capacitor that adjusts driver tuning



Table 3-2. Center Panel.

REF DESIG	EXTENDED CONTROL PANEL CONTROLS AND INDICATORS	FUNCTION
A1M1	TEST METER	Displays 12 internal operational voltage or current readings
A1S1	Test meter selector	Rotary switch that selects one of 12 readings to display on the test meter
A1M2	PLATE CURRENT	Displays power amplifier plate current
A1M3	PLATE VOLTAGE	Displays power amplifier plate voltage
A1M4	RF WATTMETER	Displays transmitter forward and re- flected power
A1S2	POWER FORWARD/REFLECTED	2-position switch that selects forward or reflected power for display on the RF WATTMETER
A1S5	POWER CONTROL	2-position switch that selects auto-
A1S6	AUTOMATIC/MANUAL	matic or manual power control
A156	POWER ADJUST LOWER/RAISE	Spring-loaded momentary switch that lowers or raises power when POWER CONTROL switch S5 is in the MANUAL position
A1S3	TUNING RAISE/LOWER	Spring-loaded momentary switch that positions tuning capacitor C50
A1S4	PA LOADING RAISE/LOWER	Spring-loaded momentary switch that positions loading capacitor C51
A1S7	PLATE OFF	Pushbutton momentary indicator switch that removes all operating voltage from the transmitter
A1S8	PLATE ON	Pushbutton momentary indicator switch that applies operating voltage to the transmitter
A1S9	FILAMENT OFF	Pushbutton momentary indicator switch that removes filament voltage from the transmitter
A1S10	FILAMENT ON	Pushbutton momentary indicator switch that applies filament voltage to the transmitter
A1S11	FAULT RESET	Pushbutton momentary indicator switch that resets the fault indicator
S10	TRANSMITTER CONTROL LOCAL/REMOTE	2-position switch that selects local or remote operation

Table 3-3. Right Panel.

REF DESIG	FUSE PANEL	FUNCTION
CB1	28 VDC POWER SUPPLY	1.0-ampere magnetic circuit breaker that protects the 28-vdc power supply
CB2	BLOWERS	10-ampere magnetic circuit breaker that protects both blowers

REF DESIG	FUSE PANEL	FUNCTION
CB3	DRIVER POWER SUPPLY	4.5-ampere magnetic circuit breaker that protects the driver power supply
CB4	PA SCREEN POWER SUPPLY	15-ampere magnetic circuit breaker that protects the pa screen power supply
CB5	PA PLATE POWER SUPPLY	100-ampere magnetic circuit breaker with a series trip feature that allows the circuit breaker to be tripped from a remote location
F7/F9/ F12	FAN	2-ampere fuse
F4/F5	PA BIAS POWER SUPPLY	1/2-ampere fuse
F1/F3	FILAMENTS	10-ampere fuse
F2/F11	EXCITER	3-ampere fuse
F13/F14	DRIVER FILAMENT	5-ampere fuse

Table 3-3. Right Panel (Cont).

section 4 principles of operation

4.1 GENERAL

The 831G-1 FM Transmitter operates in the 88to 108-MHz range at a maximum output of 20,000 watts. A Collins 310Z-1 solid-state fm wide-band exciter, with provision for optional stereo and/or SCA operation, provides excitation. The transmitter is equipped with monitoring circuits that check and correct changes in power output and overload conditions. A remote control panel, which may be mounted up to 250 feet from the transmitter cabinet, provides complete transmitter metering and tuning controls. Refer to the overall schematic diagram (figure 7-1) for detailed circuit information.

4.2 BLOCK DIAGRAM DISCUSSION

Refer to figure 4-1. A 10-dBm signal (monaural, stereo, or SCA) input modulates a 14-MHz signal that is heterodyned with a 74- to 94-MHz signal to produce the desired output frequency (88 to 108 MHz). The output of the exciter is 10 to 20 watts, which is applied to the driver stage. The output of the driver is applied to the power amplifier. Then the signal is transmitted via a low-pass filter and directional coupler.

A small portion of the forward power in the coupler is sent to the vswr calibrate and auto power control circuit for monitoring. If a change in output power is detected, a signal is sent to the power control unit that increases or decreases the plate and screen power supply input voltage to compensate. A sample of the reflected power is also sent to the power control circuits for monitoring. If an excessive amount of reflected power is detected, the control circuits remove plate voltage from the power amplifier. The 28-volt power supply provides power for the control circuits.

4.3 RF CIRCUITS

4.3.1 Exciter

Refer to the 310Z-1 Exciter instruction manual for principles of operation.

4.3.2 RF Driver

The exciter output is applied to the driver stage that consists of two 4CX250B triodes in parallel (A11V1 and A11V2). The stage operates class C2 with adjustable cathode bus provided by R40 and R44 and grid leak bias by R50. The driver grid swamping resistor, R57, provides wide bandwidth and minimized plate to grid feedback.

The input circuit is a tuned cavity with resistance loading. Capacitor $C_{_{\rm NI}}$ is a short piece of wire

with a paddle on the end physically placed in parallel with the anodes of V1 and V2. The location of the paddle provides sufficient capacitance to neutralize the stage. A sample of the screen current flows through a winding connected across pins 9 and 12 inside the Hall effect probe, A22, Z5, for screen current monitoring. Using the principle of the Hall effect, the stationary magnetic field around the transformer produces a current through the control panel meter connected across pins 3 and 4 of A22Z5. A control current that can be adjusted to calibrate the control panel meter flows through pins 1 and 2.

4.3.3 RF Power Amplifier

The driver output is capacitively coupled to the grid of the power amplifier tube A18V3. A high Q-tuned circuit composed of A21L7 and A11C37 provides impedance matching and reduces unwanted harmonics. Loading of the power amplifier is accomplished by adjusting A21L7 (tuning) and A21L8 (loading). Inductor A21L8 is used to cancel a portion of the input capacity. Capacitor A21C36, in series with inductor A21L8, is a blocking capacitor for the dc bias voltage. The cavity damping resistor A18R75 is connected behind the pa plate tuning capacitor A18C51. Strap inductance A18L14 and its distributed capacity, A18C89, to the cavity wall, form a suppressor that dampens the higher order cavity resonances that can occur near the 3rd harmonic of the output frequency. Cathode tuning (or peaking) capacitor A21C39 improves the bypass action at the operating frequency. Resistors

principles of operation

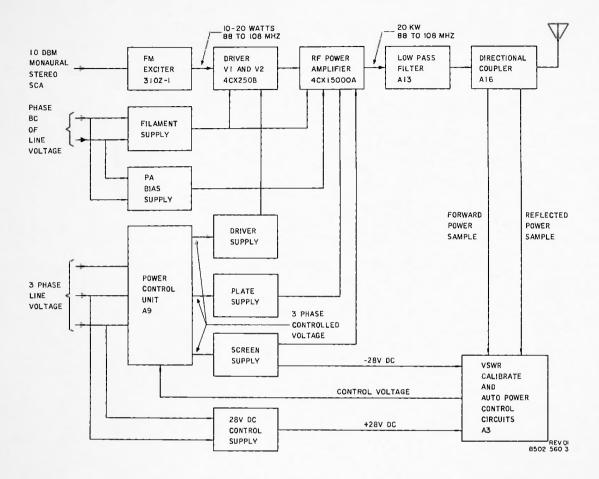


Figure 4-1. 831G-1 20-kW FM Transmitter, Block Diagram.

A21R76 and A21R77 broaden the frequency response and minimize synchronous amplitude modulation products. Inductors A11L4 and A21L5 keep rf out of the power supplies and A18LN1 and A18LN2 provide neutralization.

The power amplifier is a plate-tuned 4CX15000A that is operated class $C_{\bar{z}}$. The tube screen is grounded and the cathode is placed -750 volts below ground. A fixed bias from the pa bias power supply is applied to the control grid through A22TB8-19, A22R37, and A22TB8-20. When an input signal is present, grid current flows and develops grid leak bias across R35. The increased negative potential on the grid causes the diode in the pa bias supply to reverse bias, preventing grid current flow through the supply.

Hall effect probe Z4 monitors the amount of grid current for control panel metering.

The power amplifier plate circuit is tuned by an adjustable, resonant cavity. (Refer to figure 4-2.) The cavity is the area between the tube shelf and the movable plate shorting plane. The shorting plane permits course adjustment while two motor-driven capacitors, A18C50 and A18C51, provide more precise loading and tuning. Capacitor A18C50 is loading and A18C51 is tuning. The tube anode cover is separated by a thin sheet of Teflon. This physical arrangement forms blocking capacity A18C45. The electrical equivalent of the plate tuning circuit is illustrated in figure 4-3.

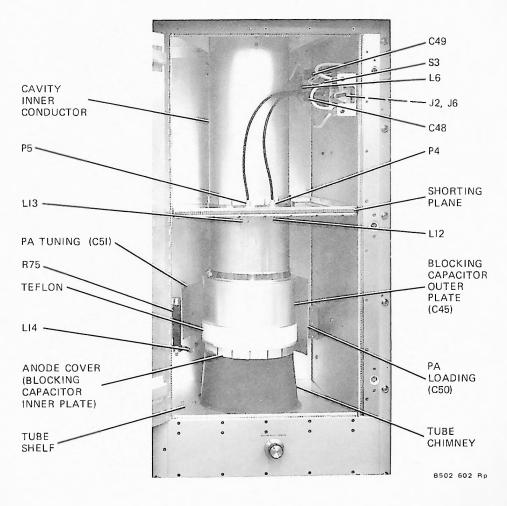


Figure 4-2. Plate Cavity.

4.3.4 Low-Pass Filter A13

Low-pass filter A13 consists of two 7-pole coaxial filters in tandem. The first filter has a cutoff of 130 megacycles, while the second has a cutoff of 300 megacycles.

4.3.5 Directional Coupler

The directional coupler A16 provides monitor samples for auto power control unit A3. Forward power from C3 is rectified by CR2, filtered, and applied to amplifier AR2 in auto power control unit A3. Reflected power is acquired in the same manner through C1 and applied to amplifier AR1.

4.3.6 Tuning Controls

The plate shorting plane in the resonant cavity of the power amplifier plate circuit provides tuning from 88 to 108 MHz. Once the slider is positioned, two motor-driven capacitors, A18C50 and A18C51, control the loading and tuning of the plate circuit. (Refer to figure 4-4.) Control panel A1 switches S3 and S4 control the raise and lower relays in tune and power control relay unit A7 to effect tuning and loading.

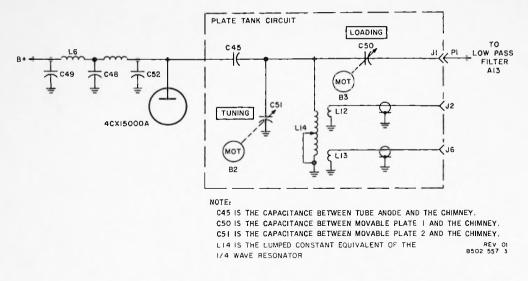


Figure 4-3. 831G-1 20-kW FM Transmitter, Schematic Diagram, Output Network.

4.4 POWER SUPPLIES

4.4.1 General

There are five separate power supplies in the transmitter. Three of the five, the plate, screen amd bias power supplies, provide voltage to the power amplifier. One of the remaining two, the driver power supply, furnishes voltage to the driver stage. The remaining one, the 28-volt dc power supply, provides power to the control circuits.

4.4.2 28-Volt DC Power Supply

The 28-volt dc supply receives its 3-phase 60-Hz input from the unregulated line voltage. The input is applied through stepdown transformer T1 to the 3-phase bridge rectifier assembly, CR1. The 28-volt dc output of the bridge is filtered by the RC circuits and applied to the control circuits through terminal connection 6 and 7 of TB1.

4.4.3 PA Bias Power Supply

The pa bias power supply provides the power amplifier with fixed grid bias that holds the tube cutoff when no signal is present on the grid. The supply receives primary power ac from phase B and C of the line voltage. The input voltage is applied through step-up transformer T1 to the bridge network. An L-section filter is formed by C1, R1, and L1. The output of the power supply is applied to the grid of the power amplifier through CR5 that also blocks grid current flow through the supply when the grid leak bias exceeds the fixed bias. A sample of the bias voltage is also applied through R3 to front panel meter M1 for monitoring.

4.4.4 PA Plate Power Supply, Power Control Regulator and Power Control

The plate power supply provides plate voltage to the power amplifier. The input voltage to the plate supply is regulated by power control A9. The power control has three pairs of silicon control rectifiers (scr's), one pair in series with each of the three primary windings.

Control amplifier AR1 is a magnetic power control unit that contains four input control windings. In this application, three windings are used. The 500-turn winding and A8R2 regulates the upper power limit and the 1000-turn winding and A8R4 regulates the lower power limit. Once these limits are set, POWER ADJUST switch on the A1 control panel can only select values of output power between these preset limits. The circuit reacts to any change in transmitter power. For this reason, the POWER CONTROL switch must be in MANUAL when tuning the transmitter. When automatic power control is used, the control regulator A8 increases or decreases the plate supply input voltage to compensate for increases or decreases in transmitter power.

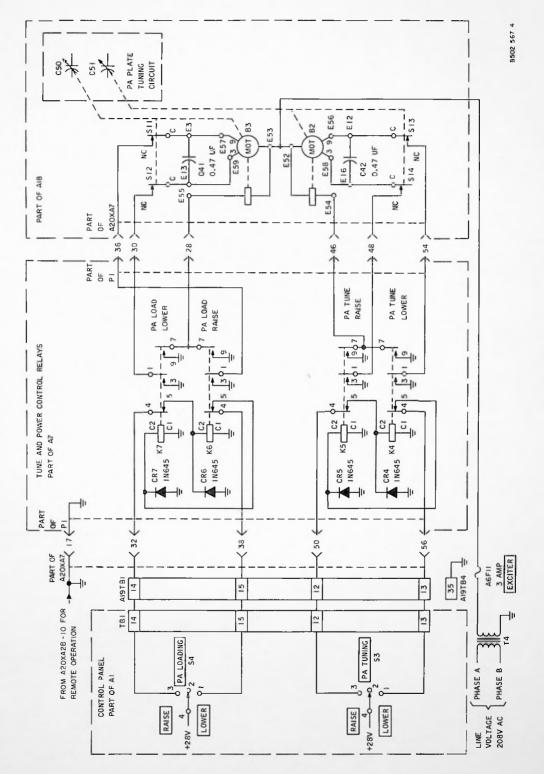


Figure 4-4. Tuning Control, Simplified Schematic.

principles of operation

principles of operation

A28-volt dc control voltage from the 28-volt dc power supply (figure 4-5) is applied to XA8-27 and K12 through the contacts of A19K3, phaseloss relays A19K10, A19K11, A19K5, and time delay relay A19K4. Power control regulator A8 provides anti-false fire and soft start features. Soft start is provided by the time constant (1.5 seconds) of R7 and C4. The RC combination controls the Q4, Q5 transistor gate that applies the slowly rising voltage to the RAISE limit resistor. The raise limit voltage (or "on" signal) is applied to the 500-turn control winding of A9AR1. With 3.8 mA into the control winding (0.25 volt at A8TP5), the control amplifier unit will be fully on.

The magnetic amplifier used in the firing circuit of A9 has a memory in that if the control signal at XA8-27 is removed and suddenly reapplied for any reason, the magnet amplifier will immediately revert to its original operating point. Transistor A8Q3 is normally biased off. When the 28-volt control voltage is removed, C1 leaks off rapidly and Q1, which is normally conducting, is shut off, turning on Q3. When Q3 conducts, a negative control signal is applied to the 200-turn winding of A9AR1 that resets the core to zero output (off). The firing circuit, therefore, must always start from a zero output operating point. The 100-turn winding of A9AR1 is short circuited to slow response time.

Open loop control (manual) of the system is provided by driving the 1000-turn winding with a negative signal. The resulting negative output moves the firing circuit operating point to correspond with the net output produced by all winding (figure 4-6). The absolute value of the negative signal is set by A8R4 LOWER limit and is adjustable to zero by the motor-driven potentiometer A20R43. The lower level is normally set to permit reduction of rf output power to some arbitrary level, usually minus 20 percent of assigned power.

Closed loop control (automatic) is provided by sampling the rf output, from directional coupler A16, which is amplified by A3AR2 and A3AR3. Loop gain is adjusted by A3R24. The automatic mode is selected by energizing A7K1. (The deenergized position is the manual mode.) Control panel A1 PA TUNING switch provides this function. The same 1000-turn winding is used for the automatic function. The 3-phase voltage from the scr control unit is applied through transformer T1, to a silicon 3-phase, full-wave bridge assembly, Z1, with RC compensation. The bridge output is filtered and applied to the plate of the power amplifier through choke coil A18L6. The plate voltage is supplied to high-voltage meter multiplier A15 pin 12. The voltage is dropped through a network of resistors to a level suitable for monitoring. A sample for local metering is taken at pin 38, while a sample for remote metering is taken across pins 37 and 43. Zener diodes VR1 through VR4 provide meter protection. A17E2A is one portion of a 3-part gaseous protector that shorts excessive voltage to ground.

A transient surge network is formed by A14C2 and A14R5 while an L-section filter is formed by L1 and C3. Resistor A17R6 limits the charge and discharge current of C3, and A17R7 and A17R8 are bleeder resistors connected across C3 for protection should R6 become open.

4.4.5 PA Screen Power Supply

The 3-phase regulated voltage from the power control unit is applied through transformer T2 to the silicon 3-phase, full-wave bridge assembly, Z2, in the pa screen power supply. The output of Z2 is filtered and applied to feedthrough capacitor A18C54 in the cathode of the power amplifier. The screen supply also provides -28 volts to the vswr and auto power control circuits A3 from A17R4 and A17R8.

Terminal board A14TB7 provides samples of pa plate current to both the local and remote control meters. It also supplies the local control panel with a sample of the pa screen current through A14R15 and a sample of the screen voltage from A14R23.

4.4.6 Driver Power Supply

The driver power supply provides plate voltage for the driver stage. The supply receives 208-volt, 3-phase regulated voltage from the scr control unit A9, to one end of three primary windings of transformer T3 and 208-volt, 3-phase line voltage to the other end of each of the three primary windings. The output of T3 is applied to silicon full-wave bridge assembly Z3 that contains resistive and capacitive compensation. The output of the bridge is filtered and applied to the driver plate from A17R34 through S9 and from E20 to the overload and metering panel A22 and to the

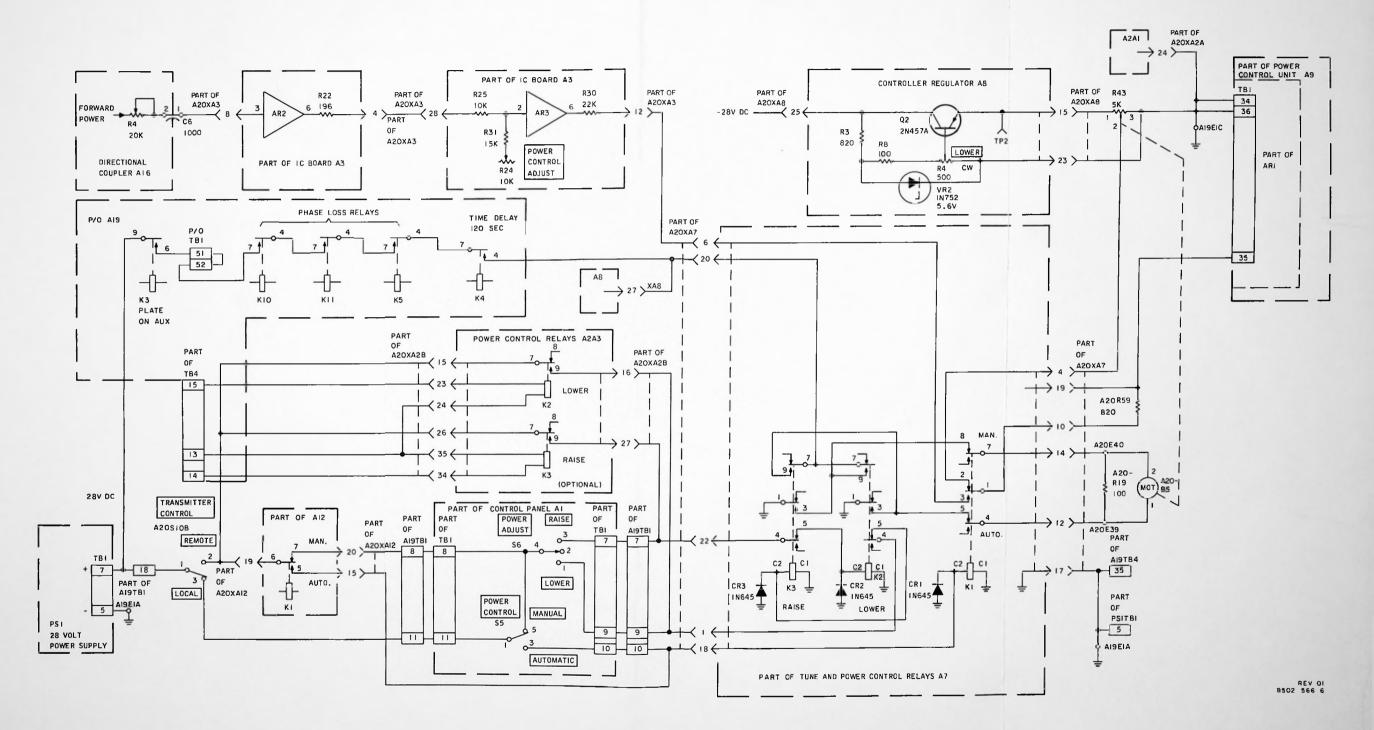


Figure 4-5. Power Control Circuits, Schematic Diagram.

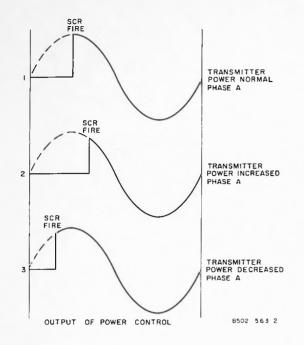


Figure 4-6. Power Control Output Waveshapes.

A114CX250B driver screen. A portion of the output is supplied to the control panel A1 for plate and screen voltage monitoring from E32 and E41. The negative terminal of Z3 is connected to CVR PLATE O/L ADJ A22R60 in the control circuits. An excessive voltage from the bridge circuit causes A22K8 to energize, thus removing power from the transmitter. The second portion of gaseous protector A17E2B (refer to paragraph 4.4.4) is also connected to the negative terminal of Z3 for protection.

4.4.7 Filament Voltage Regulator

The filament voltage regulator maintains a constant rms voltage on the filaments of the driver and power amplifier. One of the two scr's is triggered on each alternation of the input line voltage. (Refer to figure 4-7.) When the amplitude of the input voltage increases, the regulator prevents the scr's (A20Q1 and A20Q2) from firing until later in the cycle. The resultant rms voltage on the tube filaments remains constant. When the line voltage decreases, the scr's fire sooner and permit more of the input alternation to appear on the filaments. Again the rms voltage on the filaments is unchanged. When input

voltage is first applied, a soft start feature gradually applies the filament voltage through a period determined by the charge time of C3, CR5, and R7. When the potential at the top of C3 equals the potential on the collector of Q2, the path is opened and normal operation begins.

The bridge circuit rectifies the incoming ac and supplies the unfiltered voltage to R11 and R12. During normal operation, C2 charges through CR6, R9, and R7. When the top of C2 becomes sufficiently positive, unijunction transistor Q3 fires and triggers the scr. When C2 has discharged through Q3, the action begins again. The circuit is timed so that Q3 fires on each alternation of the incoming ac.

When an increase in line voltage occurs, the current through RV1 increases thus decreasing the resistance from the base of Q1 to ground. When this occurs, Q1 conducts less, causing Q2 to conduct more. The collector of Q2 becomes less positive, increasing the RC charge time of C2.

The delay prevents Q3 from firing until a larger portion of the input alternation has occurred. The resulting output voltage on T1 is thus maintained at its preset value. If a decrease in line

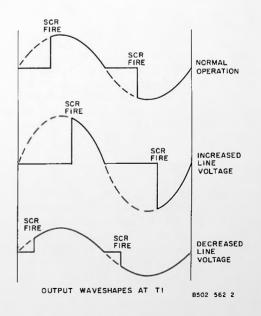


Figure 4-7. Filament Regulator Output Waveshapes. voltage occurs, C2 charges faster and fires Q3 when a smaller amount of the input alternation has occurred.

4.4.8 Filament Voltage Distribution

The filament voltage distribution is shown in figure 4-8. The input ac voltage to the filament voltage regulator maintains a constant rms voltage on the filaments as discussed in paragraph 4.4.7.

4.5 PRIMARY POWER DISTRIBUTION CONTROL AND OVERLOAD CIRCUITS

4.5.1 Primary Power Distribution

The 3-phase 60-Hz line voltage is applied to the power control, the 28-volt dc power supply, the cabinet blowers, the pa bias power supply and A19R5, A19R18, and A19K11. Line voltage is always present at the input of the 28-volt power supply and is applied to the blowers and bias supply through relay contacts that close during normal turn-on. Power control A9 is energized during the turn-on sequence by control regulator The positive dc voltage that operates the A8. central amplifier AR1 in the power control is applied to A8Q1 in the control regulator during the turn-on sequence through the following relays; plate on auxiliary relay A19R3, phase loss relays A19K5, A19K10, A19K11, and time delay relay A19R4. Relays A19K5, A19K10, and A19K11 are connected across the three ac input phases. Loss of a phase will drop out the relay across that phase and remove the 28-volt control signal to power control regulator A8. In addition, K12 will be deenergized and the ac power to A9AR1 will be disconnected. A blown current limiting fuse, F15, F16, or F17, will also result in phase failure action. F15, F16, and F17 limit the total energy applied to the scr's.

The transmitter is energized by pressing the FILAMENT-ON switch S10 in the A1 control panel. (Refer to figure 4-9.) Relay A19K2 is energized and power is applied to the blower meters. After sufficient air pressure is created in the power amplifier cabinet, air switch A18S1 is closed and relay A19K1 is energized. The closed contacts of A19K1 supply line voltage to the pa bias power supply and to the exciter. When the PLATE ON switch is pressed, a time delay of 120 seconds occurs before relay A19K4 is energized. This delay permits the tube filaments to warm before plate voltage is applied.

After the FILAMENT ON switch is pressed, PLATE ON switch is pressed and relay A19K3 is energized. After the 120-second delay, relay A19K4 is energized and a +28 volts is supplied to the base of transistor A8Q3. This turns on the control amplifier AR1 that applies input voltage to the plate, screen, and driver power supplies.

4.5.2 Exciter Power Control Override

An output override voltage is supplied to the 310Z-1 exciter when the plate voltage is turned off. This turns off the output of the exciter while the pa plates are off. (Refer to figure 4-9.) The voltage is applied from the 28-volt power supply through contacts 7 and 8 of relay A19K3 to the 310Z-1 exciter power supply regulator.

4.5.3 VSWR Calibrate and Auto Power Control Unit

The vswr calibrate and auto power control unit A3 monitors the forward and reflected power received from directional coupler A16. Forward power is applied to pin 3 of operational amplifier AR2 through R18. A portion of the forward power is also applied to the control panel RF WATTMETER through R7, that is used to calibrate the control panel meter. The forward power on pin 3 of AR2 is compared with a dc reference level on pin 2. This reference is the output of AR2 supplied as feedback through R15. The output on pin 6 of AR2 is supplied to A19TB4-34 for remote monitoring and to pin 2 of amplifier AR3.

Operational amplifier A3AR3 is connected as an integrator. Feedback is supplied by the parallel combination of capacitor C5 and resistor R8. During automatic power operation, the output of A3AR3 is connected to power control A9 through relay A7K1-3 in the tune and auto central relay unit A7. Resistor R24 in the input of AR3 increases or decreases the transmitter output power during automatic power operation by increasing or decreasing the output of AR3.

Reflected power is applied to pin 3 of AR1 through R3. A portion of the reflected power is also applied to the control panel RFWATTMETER through meter calibrate resistor R1. The output of AR1 is applied to the grid of A22Q6 through A22TB8-17. When excessive reflected power exists in the transmitter and trip disable switch A351 is closed, AR1 produces an output that

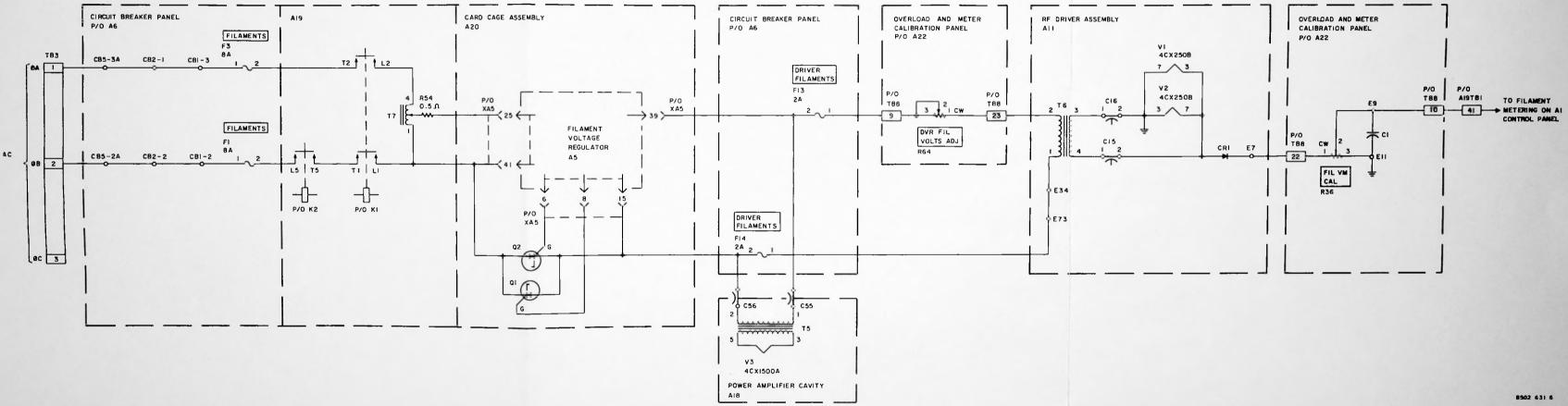


Figure 4-8. Filament Voltage Distribution.

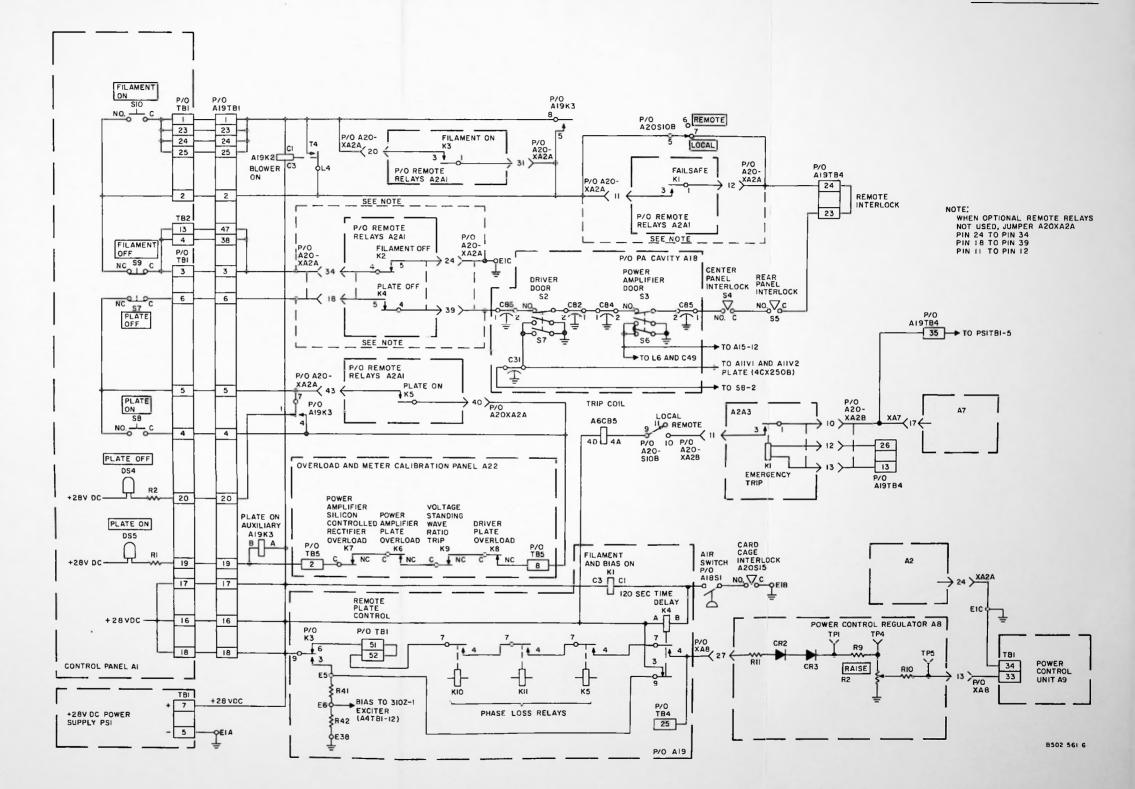
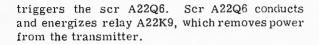


Figure 4-9. Power ON-OFF Control Circuits.



OFFSET ZERO controls A13R19 and A3R11 of AR1 and AR2 prevent an output on pin 6 of the amplifiers when no input exists on pin 3 of each amplifier.

4.5.4 Power Control Relays A7

The power control relays perform several functions. They select either automatic or manual power control, and in the manual mode, they control the raising and lowering of transmitter power. (Refer to figure 4-5.) When POWER CONTROL switch S5, on the control panel A1, is placed in the AUTOMATIC position, +28 volts is applied through the TRANSMITTER CONTROL switch A20S10B, LOCAL position, to relay A7K1. When A7K1 is energized, the output of A3AR3 is supplied through contacts 1 and 3 of relay A7K1 and resistor A20RJ9 to A9AR1TB1-35.

When POWER CONTROL switch A1S5 is in the MANUAL position, relay A7K1 is deenergized. Power is increased by placing switch A1S6 in the RAISE position. The +28 volts from A20S10B pin 3 is applied through A155 pin 5, A1S6 pin 3, and relay contacts 4 and 5 of A2K3 to energize relay A7K2. When A7K2 is energized, +28 volts is applied to motor A20B5 at point E40 through relays A19K3, A19K10, A19K11, A19K5, and A19K4. Ground is applied at point E39 through contacts 1 and 3 of A7K2. Motor A20B5 is turned on and adjusts the resistance of A20R43 to increase the transmitter power output.

When switch A156 is placed in the LOWER position, relay A7K3 is energized and +28 volts is applied to motor A20B5 at point E39 through contacts 7 and 9 of A7K3. Ground is applied at point E40 through contacts 1 and 3 of A7K3. The motor direction is reversed and the transmitter output is decreased.

4.5.5 Remote Control Relays

Latching relays A12, power control relays A2A3, and remote relays A2A1 are optional units that provide transmitter control from a remote location. The latching relays permit the transmitter to interface with remote control panels that operate on 28/48 volts dc, negative or positive common, or 117 volts ac. Unit A12 also provides remote selection of normal or automatic power control and remote selection of stereo and monaural excitation. Unit A2A3 controls the remote manual raising or lowering of power. It also provides an emergency trip feature that removes power from the transmitter in an emergency. Unit A2A1 provides the holding relays for filament and plate remote on/off controls. The unit also provides a fail-safe feature that removes power from the transmitter when the external control voltage is lost.

4.5.5.1 Latching Relay A12

Unit A12 is connected to the remote control panel through TB4. Refer to figure 4-10. When S10B on the transmitter is in the remote position, +28 volts is applied to contact 6, relay A12K1. If the remote control MANUAL-AUTOMATIC switch is in the AUTOMATIC position, +28 volts is applied to energize relay K1 in unit A7. When relay A7K1 is energized, the transmitter power is controlled automatically (paragraphs 4.5.3 and 4.5.4). When the remote control MANUAL-AUTOMATIC switch is in the MANUAL position, relay A7K1 is deenergized and the transmitter responds to manual power control.

Unit A12 also provides remote selection of monaural or stereo excitation to the exciter.

4.5.5.2 Power Control Relays A2A3

Unit A2A3 provides remote manual power lower and raise control. Refer to figure 4-11. When power is decreased at the remote control panel, relay A2A3K2 is energized and closed contacts 7 and 9 provide +28 volts to relay A7K2 contacts 4 and 5. When the power is increased at the remote control panel, relay A2A3K3 is energized and closed contacts 7 and 9 provide +28 volts to relay A7K3 contacts 4 and 5. (The operation of unit A7 is discussed in paragraph 4.5.4).

The emergency trip relay A2A3K1 provides the remote location with an alternate means of removing power in the event of an emergency. (Refer to figure 4-9.) During abnormal operation, A2A3K1 is energized from the remote control panel and trips circuit breaker CB5 that removes power from the transmitter.

4.5.5.3 Remote Relays A2A1

Remote relays unit A2A1 parallels the front panel control operations. All relays and switches are momentary in operation. The function of each

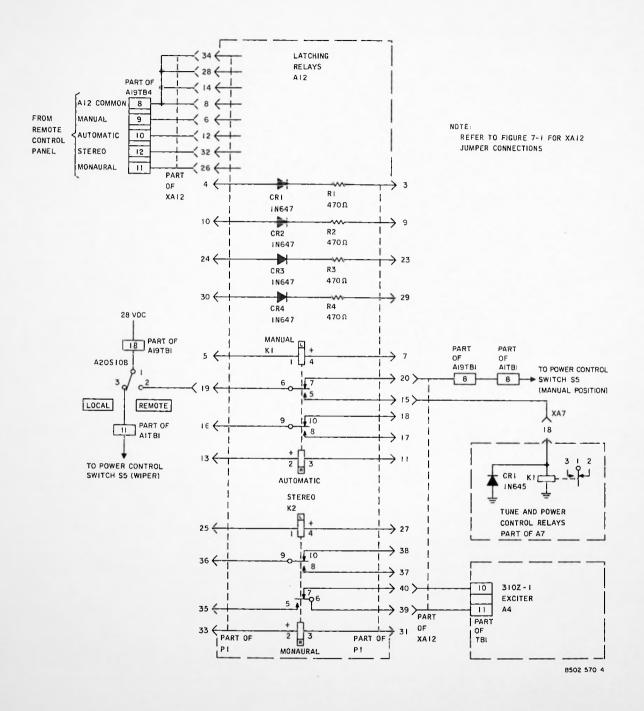


Figure 4-10. Latching Relays A12, Simplified Schematic.

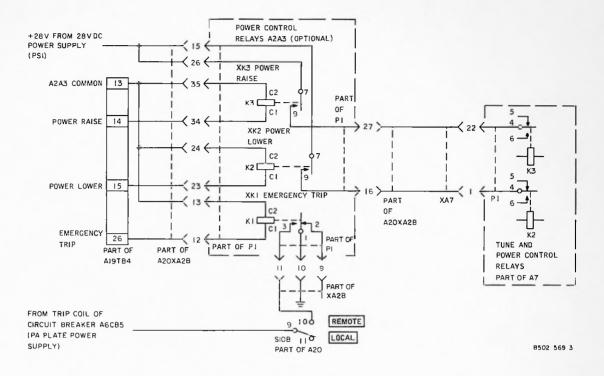
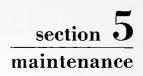


Figure 4-11. Power Control Relays A2A3, Simplified Schematic.

relay is illustrated in figure 4-9. Fail-safe relay A2K1 is energized only when +28 volts is present in the control circuit. If +28 volts is lost, the relay deenergizes and removes power from the transmitter.

4.5.5.4 Plate and Driver Overload Protection

Relays A22K6, A22K7, and A22K8 are adjusted to energize and remove power from the transmitter when an overload occurs in the plate, screen, or driver power supply. Screen current at the junction of A14R14 and A14R15 is applied to relay A22K7 through resistor A22R65. Plate current at the junctions of A14R13 and A14R16 is applied to relay A22K6. Driver current, from the negative terminal of A10Z3 in the driver power supply, is applied to relay A22K8 through resistor A22R60. Each relay is adjusted to trip after detecting a certain current level. (Refer to figure 4-9.) The relay contacts are in series with relay A19K3. If an overload occurs in the plate, screen, or driver supply, the corresponding relay trips and removes power from the transmitter.



5.1 GENERAL

The transmitter has been carefully inspected and adjusted at the factory to reduce maintenance to a minimum. To ensure peak performance, adhere to a regular schedule of periodic checks and maintenance procedures. Refer to the parts list, section 6, for component location in the transmitter.

Warning

Remove primary power before working inside the transmitter, unless otherwise instructed. Use the shorting stick to discharge all large capacitors.

5.2 CLEANING

Clean the transmitter when dust accumulation occurs anywhere inside the equipment. A solvent composed of 25% methylene chloride, 5% perchloroethylene, and 70% dry cleaning fluid may be used as a cleaning material.

5.2.1 General Cleaning Procedures

- a. Remove dust from chassis, panels, and components with a soft-bristled brush.
- b. Remove foreign matter from flat surfaces and accessible areas with a lintless cloth with solvent. Dry with a clean, dry, lintless cloth.
- c. Wash switch and relay contacts with relay contact cleaner and less accessible areas with solvent lightly applied with a small soft-bristled brush.

5.2.2 Air Filter

The air filter should be cleaned whenever a perceptible quantity of dust and dirt accumulates on the filter element. Remove and clean the filter as follows:

a. Remove the cross-wire brace that holds the filter in place.

- b. Remove the filter.
- c. Use a vacuum cleaner to remove heavy dust accumulation from the filter.
- d. Blow a stream of air through the filter in a direction opposite to normal airflow.
- e. Wash the filter in a solution of hot water and detergent.
- f. Replace the filter when dry.

5.2.3 Tube Cleaning

The power amplifier and driver tubes should be cleaned when a visible quantity of dust accumulates on the cooling fins of the tubes. Carefully remove the tubes from their sockets and clean each with a dry, oil-free jet of air.

5.3 INSPECTION

Inspect the transmitter at least once a week. Check all metal parts for corrosion and general deterioration. Examine wiring and components for signs of overheating. Ensure that all controls are operating smoothly. Inspect all connections and tighten any nuts, screws, or bolts found loose. Examine the blower and cabinet fans for normal operation.

5.4 LUBRICATION

The tuning and loading motor, the manual power increase/decrease motor, and pa cavity blower motor are all sealed and do not require lubrication. The cabinet inlet motor should be lubricated after 1 year of heavy use or 3 years of normal use. Use one teaspoon of SAE 10 oil. Lubrication should continue annually for normal use and semiannually for heavy use or as required.

5.5 TROUBLESHOOTING

If the transmitter fails to operate properly, check each circuit in the order that it is made operative. Use the simplified schematics in section 4 and the

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overall schematic in section 7 when needed. Tables of nominal meter readings for rated and reduced power operation and a graph illustrating plate efficiency are supplied in adjustment procedure 5.6.9.

5.5.1 Access Panel Interlock Switch

The access panel interlock switches must be blocked open to perform certain adjustment procedures. To block the panel switch open, push in on the plunger and insert two insulated blocks between the switch contactors. Remove the insulated blocks before replacing the panel.

Table 5-1 lists the test equipment necessary to maintain the transmitter.

5.6 ADJUSTMENTS

Caution

The 28-volt power supply is on when both the filament and plate voltage is removed.

5.6.1 Switch Adjustments

- 5.6.1.1 Air Interlock Switch S1
- a. Press the PLATE OFF and FILAMENT ON switches on control panel A1.
- b. Remove the side panel next to the plate cavity.

- c. Adjust the tension bolt on switch S1 so that the green filament light goes out when the pagrid compartment door is opened approximately 1 inch.
- 5.6.1.2 Tuning Motor Limit Switches S11, S12, S13, and S14
- a. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- b. Remove the rear panel behind the plate cavity; or, if the unit is against the wall, remove the side panel next to the cavity. If the transmitter is located in a corner, there is no access to the limit switch.
- c. Loosen the mounting screws on the limit switch.
- d. Position the limit switch so that the peg mounted to the rack gear causes the switch to trip before the peg runs into the stop. The loading paddle must be approximately fiveeighths inch from the blocking capacitor at this point.

5.6.2 Cavity, Shorting Bar, and PA Neutralization Adjustment

a. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.

NAME	DESCRIPTION	MANUFACTURER AND MODEL
Volt-ohm-milliammeter		Triplett 630-N
Ac voltmeter	0 to 10 volts, 1% tol	Weston 433
Power supply	0 to 28 volts dc, 5 amperes	
Rf wattmeter	2.5- and 25-kW elements, 50 to 125 MHz	Bird 460
Thruline wattmeter	25 watts	Bird 43
Dc voltmeter	0 to 10 k V	
Dc ammeter	0 to 5 amperes	

Table 5-1. Required Test Equipment.

- b. Open the plate cavity and grid compartment doors.
- c. Use the graph in figure 5-1 and adjust the plate cavity shorting plane to the desired frequency.



The pa plate shorting plane location may be different than the location used in the factory due to variations in the antenna characteristic impedance.

- d. Use the graph in figure 5-2 and adjust the pa grid slider A21L8 and the driver plate slider A21L7 to the desired frequency. Adjust the pa neutralization bar in accordance with the chart in figure 5-3.
- e. Remove the panel located beneath the exciter.



Voltages hazardous to life exist in this compartment.

f. Discharge all large capacitors.

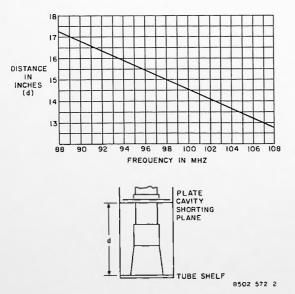
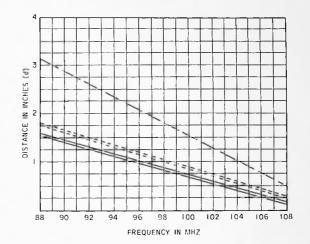
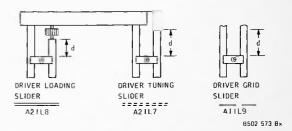


Figure 5-1. PA Plate Cavity Shorting Plane Approximate Adjustment.





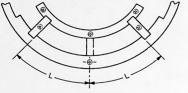
- Figure 5-2. Graph for Approximate Setting of Driver Loading, Driver Tuning, and Driver Grid Slider.
- g. Remove the driver box access panel.
- h. Use the graph in figure 5-2 and adjust the driver grid slider to the desired frequency.

5.6.3 Filament Voltage Adjustment

- a. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- b. Open the pa grid compartment and connect a 0- to 10-volt true rms ac 1% meter to the pa filament rings on the tube socket.



The filament voltage regulator is an scr phase-controlled circuit. The ac voltmeter used must be a true rms indicating device.



PA NEUTRALIZING ADJUSTMENT

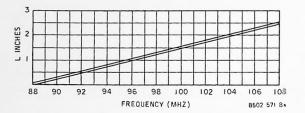


Figure 5-3. PA Neutralizing Adjustment.

- c. Run the meter leads out the corner of the compartment and close the pa compartment door.
- d. Remove the control circuits cover and pull the plunger on the card cage interlock all the way out.
- e. Short across A5C4 and A5R16.
- f. Press FILAMENT ON switch on control panel A1.
- g. Adjust variable transformer A19T7 of an indication of 6.6 volts ac.
- h. Press FILAMENT OFF switch on control panel A1.
- i. Remove the jumpers across A504 and A5R16.
- j. Press FILAMENT ON switch on control panel A1.
- k. Adjust A5R4 for an indication of 6.0 volts ac.

5.6.4 Filament Voltmeter Adjustment



This procedure should be performed only after procedure 5.6.3 has been completed.

- a. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- b. Remove the front panel beneath the grid compartment door on control panel A1.
- c. Set the TEST METER selector switch on control panel A1 to the PA FIL 8V position.
- d. Press the FILAMENT ON switch.
- e. Adjust FIL VM CAL control A22R36 to produce an indication of 5.8 volts on the TEST METER.



Because the TEST METER is a peak reading detector, its indication increases approximately 0.2 volt when the transmitter is at rated power.

f. Connect an ac voltmeter across terminals 3 and 4 of driver filament transformer A11T6 and adjust DVR FIL VOLTS ADJUST control A11R64 to produce an indication of 5.6 to 5.8 volts on the ac voltmeter.

5.6.5 DC Overload Adjustment

- a. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- b. Remove the front panel beneath the pa grid compartment door.
- c. Turn the pa PLATE OVLD ADJ A22R66, PA SCREEN OVLD ADJ A22R65, and DVR (driver) PLATE OVLD ADJ A22R60 to their full ccw position.
- d. Connect a milliammeter from the positive terminal of a 28-volt power supply to TB8-6 on the transmitter.
- e. Connect the negative terminal of the power supply to the transmitter chassis.

- f. Adjust the power supply current to 600 mA.
- g. Adjust DVR OVLD ADJ A22R60 to trip relay A22K8 at this current. (The FAULT RESET indicator on the extended control panel lights when the relay trips.)
- h. Remove the power supply and reset the FAULT RESET indicator.
- i. Connect an ammeter from the positive terminal of the 28-volt power supply to TB8-5.
- j. Connect the negative terminal of the power supply to TB8-7.
- k. Adjust the power supply current to 4.5 amperes.
- 1. Adjust PA PLATE OVLD ADJ A22R66 to trip relay A22K6 at this current.
- m. Remove the power supply and reset the FAULT RESET indicator.
- n. Connect the milliammeter from the positive terminal of the 28-volt power supply to TB8-5.
- o. Connect the negative terminal of the power supply to TB8-4.
- p. Adjust the power supply current to 900 mA.
- q. Adjust PA SCREEN OVLD ADJ A22R65 to trip relay A22K7 at this current.
- r. Remove the power supply and reset the FAULT RESET indicator (on control panel A1).
- 5.6.6 PA Grid Current and Driver Screen Current Meter Calibration
- a. Turn the -28-volt dc power supply on (28 V).
- b. Press PLATE OFF and FILAMENT OFF switches on control panel A1.
- c. Remove the front panel beneath the pa grid compartment door.
- d. Connect the negative terminal of a dc power supply to A22TB8-20 and the positive terminal to A22TB8-19.
- e. Adjust the power supply current to 80 mA.

- f. Set the TEST METER selector switch to the PA GRID 80 mA position.
- g. Adjust PA GRID MTRG CAL control A22R72 for an 80-mA reading on the test meter.
- h. Remove the power supply test leads.
- i. Attach the positive terminal of the dc power supply to A22TB8-11 and the negative terminal to A22TB8-21.
- j. Set the TEST METER selector switch to the DVR SCREEN 80 MA position.
- k. Adjust the DVR SCREEN MTRG CAL control A22R73 for an 80-mA driver screen current reading on the TEST METER.
- 1. Remove the power supply test leads.

Warning

The access panel for the driver box area must be removed and the panel interlock grounding switch must be blocked open. Voltage hazardous to life is present in the driver box area. Use extreme caution when performing the following procedure.

5.6.7 Power Control Regulator Adjustment

- a. Press the FILAMENT OFF and PLATE OFF switches on control panel A1. Set the TEST METER switch to PA SCREEN 800V.
- b. Remove the control circuits cover and pull the plunger on the card cage interlock all the way out.
- c. Remove the access panel below the exciter and block the interlock grounding switch open.
- d. Discharge all large capacitors.
- e. Ensure that all other panels and doors are closed.



The transmitter should not be operated with a static plate current of 1 ampere or more when the exciter is turned off. Monitor the plate current meter and remove transmitter power when excessive plate current occurs.

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- f. Adjust A8R2 fully ccw; adjust A8R4 fully cw.
- g. Set DRIVER power supply circuit breaker A6CB3 to OFF.
- h. Set POWER CONTROL switch to MANUAL position.
- i. Press the FILAMENT ON and PLATE ON switches on control panel A1 and wait for time delay of approximately 120±20 seconds.
- j. Slowly rotate RAISE control A8R2 fully cw. The plate voltage should increase to approximately 8000 volts and the screen voltage should be approximately 750 volts when the maximum cw position is obtained.
- k. Adjust the POWER ADJUST switch on the control panel to RAISE, and hold until the motor has run to the end of its travel. Rotate RAISE control A8R2 ccw until a slight decrease in plate voltage is observed. This indicates that the control range has been reached.
- 1. Rotate the POWER ADJUST switch on the control panel in the LOWER direction and hold until the motor has run to the end of its travel. Rotate LOWER control A8R4 in the ccw direction until a plate voltage of 7300 volts is indicated.

Note

A8R2 and A8R4 may require readjusting to set proper output power limits under normal operating conditions. The time required for limit-to-limit motor travel is approximately 30 seconds.

- m. Set DRIVER power supply circuit breaker A6CB3 to ON.
- n. Set the TEST METER selector switch to the DVR SCREEN 400V position. The TEST METER should indicate 280 ±10 volts.
- o. Set the TEST METER selector switch to the LEFT DVR K 400 MA position.
- p. Adjust the LEFT BIAS control on the driver box A11 until the TEST METER indicates 150 mA.

- q. Set the TEST METER selector switch to the RIGHT DVR K 400 MA position.
- r. Adjust the RIGHT BIAS control on the driver box A11 until the TEST METER indicates 150 mA.

The two bias controls interact and should be adjusted several times to acquire a constant 150 mA in both tubes.

- s. Set the TEST METER selector switch to the DVR PLATE 4000V position. The TEST METER should indicate between 1800 to 2000 volts.
- t. Refer to table 5-2 and ensure the transmitter readings are approximately the same.

5.6.8 Driver Grid Tuning

- a. Press the FILAMENT OFF and PLATE OFF switches on control panel A1.
- b. Perform steps e., f., g., and h. in paragraph 5.6.2, Cavity, Shorting Bar, and PA Neutralization Adjustment, before proceeding.
- c. Mount on top of the driver box a Bird wattmeter, model 43, that contains a 25-watt, 50- to 125-MHz element.
- d. Attach the shortest possible length of coaxial cable between the wattmeter output and driver rf input jack J1.



The access panel for the driver area (center bay) must be removed. Voltage hazardous to life is present in the driver box area. Use extreme caution when performing the following procedure.

- e. Block the interlock grounding switch open.
- f. Set PA SCREEN POWER SUPPLY circuit breaker A6 CB4 to OFF.
- g. Remove the exciter cover and set the exciter POWER switch to ON.

METERS	READINGS
Pa PLATE VOLTAGE	8100 volts
Pa PLATE CURRENT	100 to 300 mA
TEST METER positions	
PA SCREEN 800 MA	0 mA
PA SCREEN 800 V	800 volts
PA FIL 8 V	5.84 volts
LEFT DVR K 400 MA	150 mA
RIGHT DVR K 400 MA	150 mA
DVR SCREEN 400 V	310 volts
DVR GRID 80 MA	0
DVR PLATE 4000 V	2140 volts
28 V SUPPLY 40V	27 volts

Table 5-2. Typical Meter Readings With No Excitation and Manual Power Control at Maximum.

- h. Press the FILAMENT ON and PLATE ON switches.
- i. Adjust exciter POWER OUTPUT control A4R15 cw until 15-watt forward power is indicated on the Bird wattmeter.
- j. Turn the wattmeter element to indicate reflected power and adjust the TUNE and COUPLE controls, A11C33 and A11C34, on the driver box for minimum reflected power.
- k. Repeat the adjustment several times to reduce interaction between controls.

Note	
Note	

Reflected power should be less than 1/2 watt when the forward power is 15 watts.

1. Check that the TUNE and COUPLING controls are approximately one-half mesh when they are adjusted for minimum reflected power.

- m. Remove power from the transmitter, adjust grid inductor A11L9, and repeat steps j. and k. if either control is not approximately onehalf mesh.
- 5.6.9 PA Tuning Procedure

Warning

Voltage hazardous to life is present in the pa plate cavity and grid compartment. Use extreme caution when performing the following procedure.

- 5.6.9.1 PA Tuning
- a. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- b. Perform steps a. through h. in paragraph 5.6.2, Cavity, Shorting Bar, and PA Neutralization Adjustment, before proceeding.

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- c. Attach to the transmitter output terminals a Bird rf wattmeter, model 460, that contains a 25-kilowatt, 50- to 125-MHz element and an rf dummy load capable of dissipating 25 kilowatts.
- d. Adjust DRIVER PLATE TUNING control A11C37 to one-half mesh.
- e. Set the exciter POWER switch to ON; remove the exciter cover and adjust the POWER OUTPUT control (A4R15) until approximately 5 watts is indicated on the Bird in-line wattmeter.
- f. Press the FILAMENT ON switch.
- g. Set the POWER CONTROL to the MANUAL position.
- h. Adjust the PA TUNING and PA LOADING controls to position the tune and load capacitors, A18C50 and A18C51, approximately midrange.

Caution

Do not exceed the following maximum ratings:

Left driver cathode current	250 mA
Right driver cathode current	250 mA
Pa screen current	600 mA
Pa plate current	4.0 amperes

- i. Press the PLATE ON switch.
- j. Quickly adjust PA TUNING and PA LOADING controls for a maximum power output indication on the RF WATTMETER if an rf output from the transmitter is indicated when power is applied.



Prolonged operation with the plate poorly tuned may damage the power amplifier.

k. Adjust the DRIVER PLATE TUNING control until an rf output is indicated if one is not present when power is applied.

- 1. Repeat steps j. and k. until maximum output power is obtained.
- m. Increase the exciter output to produce 10 mA of grid current. Retune as necessary. The driver loading adjustment is correct when from 15 to 40 mA of positive driver screen current is obtained. Trim the driver tuning and loading inductors until the driver and pa screen current peaks coincide.
- n. Adjust driver neutralization capacitor C_N so that the driver screen current peaks at the point of minimum driver cathode current.
- o. If the screen peak does not occur at the same time maximum output is obtained, adjust the two screen sliders L7 and L8 in approximately one-sixteenth-inch increments until the screen current and rf output peak together. A minimum value of pa plate current will also be noted when neutralization is correct. Pa neutralization is not critical and the required adjustment should not deviate more than one-fourth inch from that given on figure 5-3.

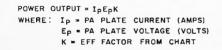
Note

Because of the relatively high output capacity of the 4CX15000A and the resulting low cavity inductance, NO plate current dip will be noted at higher power levels. Tuning and loading should be adjusted in steps for maximum output power. Adjust pa plate voltage for 7500 volts using manual control.

p. Tuning and neutralization checks are conventional. The driver loading is critical if minimum synchronous am is desired. Observe the driver screen current peak and adjust loading until it coincides with the pascreen peak. Driver screen current should be between 15 and 40 mA. During adjustment, and as final check, observe the heating effect on the filament bypass capacitors, particularly C36. If C36 heats noticeably, increase the inductance L8. Work the two inductors, L7 and L8, until the above condition is found.

If the driver tank circuit Q is too high (too much capacitance), excessive drift will be noted on starting up after the circuit has cooled. Full power should be noted in 15 to 30 seconds and the pa screen current should stabilize in from 30 to 60 seconds. To minimize this drift, increase inductance to decrease the circuit Q.

- q. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- r. Open the pa cavity door and ensure that the plate tuning capacitor A18C50 is approximately halfway between its limits.
- s. If the plate tuning capacitor A18C50 is not approximately halfway between its limits, adjust the pa plate cavity shorting plane (paragraph 5.6.2) and repeat steps 1. through r. of this paragraph.
- t. With the transmitter operating in the MANUAL mode, adjust the grid-leak bias resistor A18035 for proper output currents. The PA grid drive level determines the amount of bias required, and with higher drive levels an increase in bias results in greater amplifier efficiency.
- u. With the transmitter operating in the MANUAL mode, observe the plate current and output power meters and adjust A21C39 for maximum power output with minimum plate current.



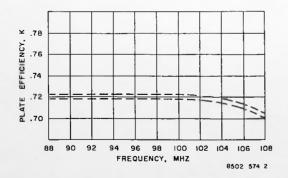


Figure 5-4. 831G-1 Amplifier Efficiency Vs Frequency Graph.

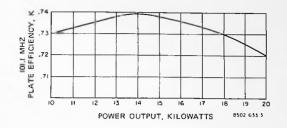


Figure 5-5. 831G-1 Amplifier Efficiency Vs Power Output Graph.

A significant loss of efficiency will result if this capacitor is adjusted to the point at which the power output and plate current start decreasing.



The pa plate efficiency with the above indications is 70 to 76 percent. Refer to figure 5-4 for the graph of plate efficiency versus frequency. Figure 5-5 is the graph of plate efficiency versus power output. Figure 5-6 is the power-to-vswr conversion graph.

v. Refer to tables 5-3 and 5-4 for a list of typical meter readings.

Note

The nominal voltages for the reduced power levels should be brought as close to the tabulated values as possible by adjusting the transformer primary taps. The secondaries may be reconnected in delta if necessary.

Note

The taps on the transformers should be selected in such a manner that the output power control circuit will not phase back the power too far (refer to figure 4-8). Best method is to allow +10% of licensed power for peak to allow for automatic power control. Failure to do this will cause fm noise with an excessive phase angle retardation.

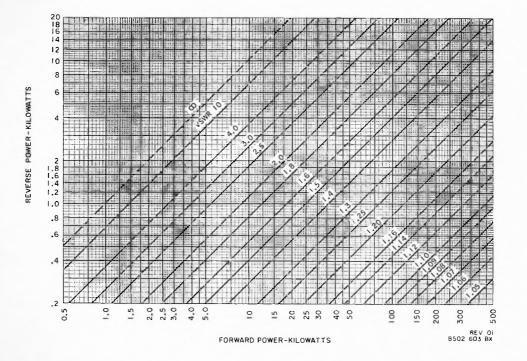


Figure 5-6. Power to VSWR Conversion Graph.

TYPICAL METER	R READINGS
Power output	20.0 kilowatts
Pa plate volts	7600 to 7900 volts
Pa plate current	3.40 to 3.65 amperes
Pa screen current	350 to 500 mA
Pa grid current	50 to 65 mA
Left dvr. cath. I	180 to 200 mA
Right dvr. cath. I	180 to 200 mA
Dvr. screen I	5 to 30 mA
Dvr. grid I	10 mA
Dvr. plate volts	1800 to 2000 volts
Dvr. screen volts	290 to 310 volts
310Z-1 Output Power	20 watts
Pa plate efficiency	70 to 76%
Control V	28 volts

Table 5-3. Nominal Indications, 20-Kilowatt Power Output.

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Table 5-4. Nominal Readings, Reduced Power Operation.

POWER OUTPUT	PLATE VOLTAGE	E AGE	PLATE CURRENT	ENT	SCREEN VOLTAGE	EN AGE	SCREEN CURRENT	EN ENT	CONTROL GRID CURRENT	L GRID T	EFFICIENCY (%)	ICY (%)
	Recorded Nominal	Nominal	Recorded	Nominal	Recorded	Nominal	Recorded Nominal Recorded Nominal Recorded Nominal Recorded Nominal Recorded Nominal	Nominal	Recorded	Nominal	Recorded	Nominal
18,000		7450		3.3		690		400		50		73.0
16,000		7200		3.0		670		380		50		73.5
14,000		6950		2.7		640		370		50		74.0
12,000		6750		2.4		610		350		50		73. 5
10,000		6500		2.1		580		330		50		73.0
Note:	The abov	e are app	The above are approximations. The individual transmitters will vary with source voltage and installation.	s. The ir	ndividual tı	ransmitter	rs will var	y with sou	Irce voltag	e and inst	allation.	

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5.6.9.2 Driver Bias Adjust

Warning

The access panel for the driver box area must be removed and the panel interlock grounding switch must be blocked open. Voltage hazardous to life is present in the driver box area. Use extreme caution when performing the following procedure.

- a. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- b. Remove the front panel below the exciter.
- c. Discharge all large capacitors.
- d. Block the interlock grounding switch open.
- e. Press FILAMENT ON and PLATE ON switches and observe the left and right driver plate current on the test meter.
- f. Adjust the driver bias controls R40 and R44 for equal left and right driver cathode currents (180 to 200 mA).



The controls may need to be adjusted several times before the current is the same in both tubes.

e. At this time, be certain that the PA bias supply, PS2 is gated off. Remove F5 to turn off the protective bias. Observe the reaction on the pa screen current. If it rises, more drive is needed to the pa. Recheck tuning and grid-leak setting.

5.6.9.3 PA Neutralization

a. Check the transmitter for proper neutralization by tuning the transmitter for a pascreen current power peak and observing that maximum output power occurs at the same time.

Note

A minimum value of paplate current also occurs when neutralization is correct.

Warning

The cavity door must be opened to perform this procedure. Remove all power from the transmitter before opening the cavity door.

- b. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- c. Open the pa cavity door.
- d. Slide the blocking capacitor and the tube anode cover up to expose screen sliders.
- e. Refer to figure 5-3. The sliders should not require an adjustment greater than $\pm 1/4$ inch from the initial setting.
- f. Slide the blocking capacitor and tube anode cover back into place.
- g. Close the cavity door and apply power to the transmitter.
- h. Check for proper neutralization again. If incorrect, repeat steps a. through g.

5.6.10 Control Regulator Final Adjustment

- a. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- b. Set the POWER CONTROL switch to the MANUAL position.
- c. Remove the control circuits cover and pull the plunger on the card cage interlock all the way out.
- d. Press the FILAMENT ON and PLATE ON switches.
- e. Adjust RAISE control A8R2 on control regulator board A8 until pa PLATE VOLTAGE meter indicates maximum.
- f. Adjust A8R2 until a small decrease in plate voltage is observed.
- g. Hold the POWER ADJUST switch on the extended control panel in the LOWER position until the minimum limit of the control is reached.

- h. Adjust LOWER control A8R4 on control regulator board A8 for an 18-kilowatt power output.
- i. Run the POWER ADJUST control between its maximum and minimum limits (18-21 kilo-watts) and note the rate of change in power output.
- j. Readjust A8R4 if the control is too fast and cannot be adjusted to a distinct power setting.

5.6.11 Board A3, Offset Zero Adjustment

- a. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- b. Remove the control circuits cover and pull the plunger on the card cage interlock all the way out.
- c. Set the exciter POWER switch to OFF.
- d. Place board A3 on a card extender.
- e. Press the FILAMENT ON and PLATE ON switches.
- f. Connect a high-impedance voltmeter from A3AR1 pin 6 and ground. Set TRIP DISABLE switch to OFF.
- g. Adjust OFFSET REFL control A3R11 until 0 volt is indicated on the vtvm.
- h. Remove the voltmeter from A3AR1 pin 6 and connect it to A3AR2 pin 6.
- i. Adjust FWD OFFSET control A3R19 until 0 volt is indicated on the vtvm.

5.6.12 Automatic Power Control

- a. Press the FILAMENT OFF and PLATE OFF switches on control panel A1.
- b. Remove the control circuits cover and pull the plunger on the card cage interlock all the way out.
- c. Set the POWER CONTROL switch to the MANUAL position.
- d. Depress the FILAMENT ON and PLATE ON switches.

- e. Adjust the POWER ADJUST switch for 20kilowatt output.
- f. Set the POWER CONTROL switch to the AUTOMATIC position.
- g. Adjust PWR CONT ADJ A3R24 until the transmitter output power is 20 kilowatts.
- h. Set the POWER CONTROL switch to the MANUAL position.



If the transmitter trips the dc plate overload relay A22K6 when switching from manual to automatic power control, adjust PA PLATE OVLD ADJ A22R66 for a slightly higher trip current.

- i. Hold the POWER ADJUST switch in the LOWER position until the minimum limit of the control is reached.
- j. Set the POWER CONTROL switch to the AUTOMATIC position.

Note

The automatic power control should return the transmitter output to 20 kilowatts.

- k. Replace the control circuits cover and observe the RF WATTMETER for an indication of power change.
- 1. Readjust PWR CONT ADJ A3R24 if a power change should occur.

Note

The high velocity airflow through the card cage when the card cage cover is removed has a slight effect on the setting of A3R24.

Note

Any adjustment of A8R2 will change the automatic power control calibration.

5.6.13 VSWR Trip

a. Press the FILAMENT ON and PLATE ON switches on control panel A1.

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- b. Place the POWER CONTROL switch in the MANUAL position.
- c. Reduce the plate voltage with A8R2 until the output power is reduced to 2000 watts.
- d. Press the PLATE OFF and FILAMENT OFF switches on control panel A1.
- e. Carefully loosen the base clamps on the directional coupler A16 and reverse the assembly.
- f. Remove the control circuits cover and pull out the plunger on the card cage interlock.
- g. Set the DISABLE switch on A3 to ON.
- h. Press the FILAMENT ON and PLATE ON switches on control panel A3.
- i. Adjust TRIP LEV A3R23 until vswr trip relay A22K9 is energized and plate voltage is removed.
- j. Set the TRIP DISABLE switch to OFF and press the PLATE ON switch.
- k. Set the TRIP DISABLE switch to ON. If the transmitter fails to turn off, repeat steps a. through j.
- 1. Press the FILAMENT OFF switch, if plate power has been removed.
- m. Replace the directional coupler in its normal position.
- n. Adjust A8R2 for 20,000 watts output. Refer to paragraph 5.6.12.

5.7 PARTS REPLACEMENT

5.7.1 4CX15000A PA Tube

- a. Slide the blocking capacitor and the anode cover up (figure 4-2) (also the cavity slides if the operating frequency is at the lower end of the fm band) to expose the tube.
- b. Remove the anode lead.
- c. Carefully lift the tube out of its socket.
- d. Reverse the procedure to replace the tube, however, do not slide the blocking capacitor all the way down on the chimney. This allows some air to escape and positively charge the plate compartment. The air also cools the low-pass filter in the transmission line.

5.7.2 Extended Control Panel Indicator Lamps

- a. Pull the switch out and rotate it 90° ccw; the lamp assembly should pop out.
- b. Remove the defective lamp by pressing down on the bulb.
- c. Reinsert new bulb and replace the assembly.

5.7.3 Fuses

Fuses F15, F16, and F17 are current limiting type fuses that protect the scr's on power control unit A9. When one of these fuses blows, the links in the remaining two may have been weakened, and as a result, their ratings may have been changed to a lower value. For this reason, all three fuses should be replaced when one is blown.

5.7.4 Replacement Parts

Order replacement parts from the following address:

> Collins Radio Company Service Parts, 412-012 1200 N Alma Rd. Richardson, Texas 75080

6.1 GENERAL

This section contains a list of all repairable/ replaceable electrical, electronic, and critical mechanical parts for the 831G-1 20-kW FM Transmitter.

6.2 SYMBOL

This column contains the electrical symbols of all parts that have been assigned to schematics on wiring diagrams, and/or index numbers for all parts for which symbols have not been assigned. When a symbol, within a series of symbols, has not been assigned a part number, the unassigned symbol will be reflected as "NOT USED" in the DESCRIPTION column.

6.3 DESCRIPTION

This column contains the identifying noun or item name followed by a brief description. The description for electrical/electronic parts includes the applicable ratings and tolerances. For consecutively listed identical parts within. an assembly, "SAME AS - - -" is reflected in the description of subsequent listings, referencing to the first listing within the assembly.

6.4 MANUFACTURERS PART NUMBER

The part number for each item not manufactured by Collins Radio Company is reflected in the column.

6.5 MFR CODE

The manufacturers codes, in accordance with Federal Supply Codes for Manufacturers Handbook H4-1, are reflected in this column. Manufacturers not listed in Handbook H4-1 are assigned a 5-letter code. This column is left blank for items manufactured by Collins Radio Company. Refer to paragraph 6.9, Manufacturers Code and Name Index.

6.6 COLLINS PART NUMBER

The Collins Radio Company Specification or drawing number, for each item in the parts list, is reflected in this column.

6.7 ILLUSTRATIONS

All parts listed in the SYMBOL column are located on corresponding illustrations. The illustration always precedes the parts list. When a replaceable electrical item is hidden from view by structural parts or wiring, a dotted leader line is used to show the location of the item on the illustration.

6.8 LIST OF EQUIPMENT

Ρ	age	9

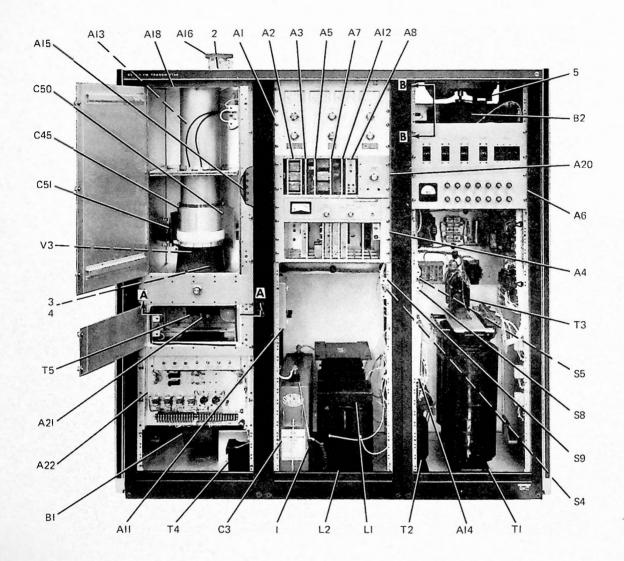
831G-1 20-kW FM Transmitter	6-6
Control Panel, A1	6-12
Remote Control Assembly, A2	6-16
IC Board, A3	6-18
Filament Regulator, A5	6-21
Circuit Breaker Panel, A6	6-23
Tuning/Power Control	
Relay Board, A7	6-25
Power Control Regulator, A8	6-27
Power Control Panel, A9	6-29
2-kV Power Supply, A10	6-31
RF Driver Assembly, A11	6-33
Remote Control Latching Relay	
Board, A12	6-37
RF Output Low-Pass Filter, A13	6-39
Power Supply Filter, A14	6-41
Metering Multiplier Board, A15	6-45
Directional Coupler, A16	6-47
Bleeder Resistor Panel, A17	6-49
Power Amplifier Cavity, A18	6 - 51
Input Terminal Panel, A19	6-56
Card Cage Assembly, A20	6-58
Power Amplifier Socket, A21	6-60
Overload and Meter Calibrate	
Panel, A22	6-62
28-Volt Power Supply, PS1	6-65
PA Bias Power Supply, PS2	6-67

6.9 MANUE NAME	FACTURERS CODE AND	CODE	NAME AND ADDRESS
CODE	NAME AND ADDRESS	06751	Components, Inc. Semcor Div. Phoenix, AZ
ASSOC	Associated Electrical Ind.		
	Eugene Munsell, Distributor Box 126 Ho Ho Kus, NJ 07423	06978	Aladdin Electronics Div. of Aladdin Industries, Inc. 705 Murfreesboro Rd. Nashville, TN 37210
FIRIN	Firing Circuits, Inc. Div. of Marathon Electric Muller Ave. Norwalk, CT	06980	Varian Eimac Div. 301 Industrial Way San Carlos, CA 94070
POWER	Power Semiconductors, Inc. Munson St. Devon, CT 06460	07263	Fairchild Camera and Instrument Corp. Semiconductor Div. 464 Ellis St.
00141	Pic Design Corp. 477 Atlantic Ave.		Mountain View, CA 94040
	East Rockaway, NY 11518	07716	IRC, Div. of TRW, Inc. Burlington Plant
01002	General Electric Co. Industrial and Power Capacitor Dept. John St.		2850 Mt. Pleasant Burlington, IA 52601
	Hudson Falls, NY 12839	08289	Blinn Delbert Co., Inc. 1678 E Fifth Ave.
01295	Texas Instruments, Inc. Semiconductor and Components Div. 13500 N Central Expwy.		PO Box 2007 Pomona, CA 91766
	Dallas, TX 75231	08466	General Instrument of Canada, Ltd. 151 Weber South
03508	General Electric Co. Semiconductor Products Dept.		Waterloo, Ontario, Canada
	Electronics Park Syracuse, NY 13201	08510	Magnetics, Inc. Kemco Div. Sandy Lake, PA 16145
03877	Transitron Electronic Corp.		
	168-186 Albion St. Wakefield, MA 01880	09023	Cornell-Dubilier Electronics Div. Federal Pacific Electric Co. 2562 Dalrymple
04009	Arrow-Hart and Hegeman Electric Co.		Sanford, NC 27330
	103 Hawthorne St. Hartford, CT 06106	09214	General Electric Co. Semiconductor Products Dept. West Genesee St.
04713	Motorola Semiconductor Products, Inc.	10100	Auburn, NY 31022
	5005 E McDowell Rd. Phoenix, AZ 85008	10108	Hurst Mfg. Corp. Road 64 East Princeton, IN 47570
05277	Westinghouse Electric Corp. Semiconductor Dept. Youngwood, PA 15697		

CODE	NAME AND ADDRESS	CODE	NAME AND ADDRESS
10646	Carborundum Co. PO Box 337 Niagara Falls, NY 14302	49671	RCA Corp. 30 Rockefeller Plaza New York, NY 10020
11502	IRC, Div. of TRW, Inc. Boone Plant Greenway Rd. Boone, NC 28607	52090	Rowan Controller Co. PO Box 306 Westminster, MD 21157
12066	Ohio Semitronics, Inc. 1205 Chesapeake Ave. Columbus, OH 43212	53021	Sangamo Electric Co. 1301 N 11th Springfield, IL 62705
13103	Thermalloy Co. 8717 Diplomacy Row	56289	Sprague Electric Co. North Adams, MA 01247
14433	Dallas, TX 75247 ITT Semiconductors	56365	Square D Co. Executive Plaza Park Ridge, IL 60068
	Div. of International Telephone and Telegraph Corp. 3301 Electronics Way West Palm Beach, FL 33401	58474	Superior Electric Co. 383 Middle St. Bristol, CT 06010
19070	Eastern Air Devices, Inc. 385 Central Ave. Dover, NH 38022	59730	Thomas and Betts Co. 36 Butler St. Elizabeth, NJ 07207
19701	Electra/Midland Corp. PO Box 760 Mineral Wells, TX 76067	60399	Torrington Mfg. Co. 100 Franklin Dr. Torrington, CT 06790
33173	General Electric Co. Tube Dept. 316 E Ninth St. Owensboro, KY 42301	65092	Weston Instruments, Inc. Weston Instruments Div. 614 Frelinghuysen Ave. Newark, NJ 07114
35844	Andrew Antenna Corp, Ltd. 606 Beech St. Whitby, Ontario, Canada	70309	Allied Control Co., Inc. 2 East End Ave. New York, NY 10021
37942	P.R. Mallory and Co., Inc. 3029 E Washington St. Indianapolis, IN 46206	70371	American Lava Corp. Cherokee Blvd. and Manufacturers Rd. Chattanooga, TN 37405
41197	Modine Mfg. Co. 1500 Dekoven Ave. Racine, WI 53401	70674	ADC Products Div. of Magnetic Controls Co. 6405 Cambridge St. Minneapolis, MN 55426
44655	Ohmite Mfg. Co. 3601 W Howard St. Skokie, IL 60076	71313	Cardwell Condenser Corp. 80 E Montauk Highway Lindenhurst, Long Island, NY 11757

CODE	NAME AND ADDRESS	CODE	NAME AND ADDRESS
71400	Bussman Mfg. Div. of McGraw & Edison Co. 2536 W University St.	74545	Hubbell Harvey, Inc. State St. and Bostwick Ave. Bridgeport, CT 06602
	St. Louis, MO 63017		Bridgeport, or occor
F1404		74970	E.F. Johnson Co.
71424	Chase Shawmut Co. 374 Merrimac St.		299 10th Ave. SW Waseca, MN 56093
	Newburyport, MA 01950		waseca, mit 50055
		75042	IRC, Div. of TRW, Inc.
71450	CTS Corp.		401 N Broad St.
	1142 W Beardsley Ave. Elkhart, IN 46514		Philadelphia, PA 19108
		75382	Kulka Electronic Corp.
71590	Globe-Union, Inc.		520 S Fulton Ave.
	Centralab Div. PO Box 591		Mt. Vernon, NY 10550
	Milwaukee, WI 53201	76487	James Millen Mfg. Co., Inc. 150 Exchange St.
71785	Cinch Mfg. Co.		Malden, MA 02148
	Howard B. Jones Div.		
	1026 S Homan Ave.	76854	Oak Mfg. Co.
	Chicago, IL 60624		Div. of Oak Electro/Netics Corp. S Main
72136	Electro Motive Mfg. Co., Inc.		Crystal Lake, IL 60014
	South Park and John St. Willimantic, CT 06226	77342	American Machine and Foundry Co Potter and Brumfield Div.
72699	General Instrument Corp.		1200 E Broadway
	Automatic Manufacturing Div.		PO Box 522
	65 Gouverneur St. Newark, NJ 07104		Princeton, IN 47570
	Newalk, NJ 07104	78277	Sigma Instruments, Inc.
72962	Elastic Stop Nut		170 Pearl St. South
	Div. of Amerace Esna Corp. 2330 Vauxhall Rd.		Braintree, MA 02185
	Union, NJ 07083	79136	Waldes Kohinoor, Inc.
72982	Erie Technological Products, Inc.		47-16 Austel Place Long Island City, NY 11101
12902	644 W 12th St.		Long Island City, N1 11101
	Erie, PA 16512	80008	Electro Engineering Works, Inc. 6555 Covey Rd.
73293	Hughes Aircraft Co.		PO Box 338
	Electron Dynamics Div. PO Box 2999		Forestville, CA 95436
	Torrance, CA 90509	80058	Military Standards
73445	Amperex Electronic Corp.	80089	Essex Wire Corp.
	230 Duffy Ave.		Controls Div.
	Hicksville, Long Island, NY 11801		131 Godfrey St. Logansport, IN 46947
74193	Heinemann Electric Co.		D
	2612 Brunswick Pike	80583	Hammarlund Mfg. Co.
	Trenton, NJ 08602		73-88 Hammarlund Dr. Mars Hill, NC 28754

CODE	NAME AND ADDRESS	CODE	NAME AND ADDRESS
81349	Military Standards	91662	Elco Corp. Maryland Rd, and Computer Ave.
81350	Military Standards		Willow Grove, PA 19090
81483	International Rectifier Corp. 233 Kansas St. El Segundo, CA 90245	91929	Honeywell, Inc. Micro Switch Div. Chicago and Spring St.
82227	A.W. Haydon 232 N Elm St. Waterbury, CT 06720	93790	Freeport, IL 61032 Cornell-Dubilier Electronics Div. Federal Pacific Electric Co. 1605 Rodney French Blyd.
82386	Sun Electric Corp. 6321 Avondale Ave. Chicago, IL 60631	94154	New Bedford, MA 02741 Wagner Electric Corp.
83330	Herman H. Smith, Inc. 812 Snediker Ave. Brooklyn, NY 11207		Tung Sol Div. 630 W Mount Pleasant Ave. Livingston, NJ 07039
83781	National Electronics, Inc. PO Box 269 Geneva, IL 60134	94375	Automatic Metal Products Corp. 315-323 Berry St. Brooklyn, NY 11211
84147	Andrew Corp. 10500 W 153rd. St. Oland Park, IL 60462	96095	Aerovox Corp. Seneca Ave. Olean, NY 14760
86151	Genisco Technology Corp. Illinois Div. 9367 William St. Rosemont, IL 60018	96182 96502	Master Specialties Co. 1640 Monrovia Costa Mesa, CA 92627 Henry G. Dietz Co., Inc.
87216	Philco-Ford Corp. Lansdale Div. Church Rd.		14-26 28th Ave. Long Island City, NY 11102
	Lansdale, PA 19446	96906	Military Standards
88422	General Electric Co. General Purpose Motor Dept. 2000 Taylor St. Fort Wayne, IN 46804	98978	International Electronic Research Corp. 135 W Magnolia Ave. Burbank, CA 91502
88797	Robintech, Inc. Electro Mechanical Div. PO Box 714	99934	Renbrandt, Inc. 6 Parmelee St. Boston, MA 02118
90634	Binghamton, NY 13902 Gulton Industries, Inc. Gulton St. Metuchen, NJ 08840	99942	Globe-Union, Inc. Centralab Semiconductor Div. 4501 N Arden Drive El Monte, CA 91734
91637	Dale Electronics, Inc. PO Box 609 Columbus, NB 68601	99971	General Electric Co. Aerospace Electronics Dept. French Rd. Utica, NY 13503



8700 426 Pb

Figure 6-1. 831G-1 20-kW FM Transmitter (Sheet 1 of 3).



8700 407 Pb

Figure 6-1. 831G-1 20-kW FM Transmitter (Sheet 2 of 3).

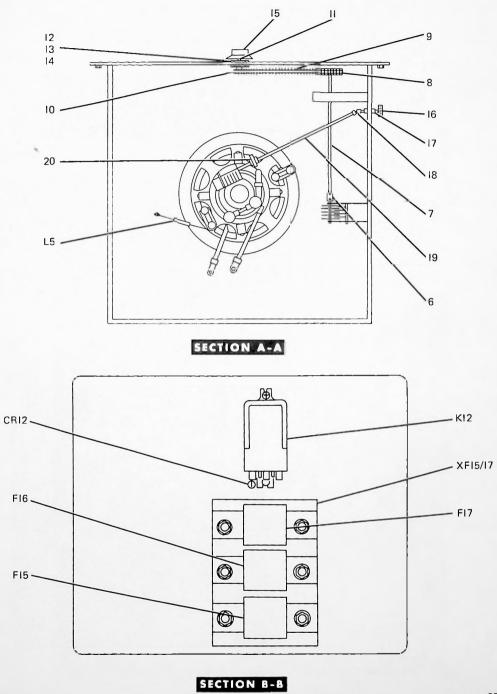


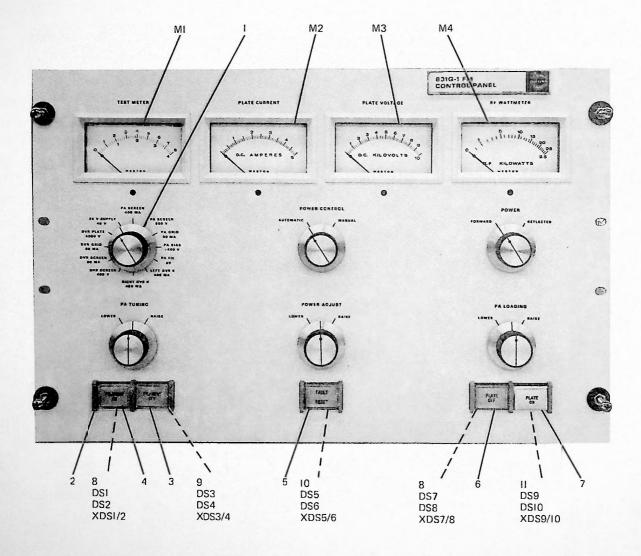
Figure 6-1. 831G-1 20-kW FM Transmitter (Sheet 3 of 3).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	831G-1 20-KW FM TRANSMITTER			522-4685-X
A1	CONTROL PANEL			786-3243-0
AZ	SEE BREAKDOWN ON PAGE 6-12 REMOTE CONTROL ASSEMBLY -OPTIONAL EQUIPMENT-			786-3327-0
A3	SEE BREAKDOWN ON PAGE 6-16 IC BOARD			786-3499-C
A4	SEE BREAKDOWN ON PAGE 6-18 310Z-1 FM EXCITER			522-4687-0
Δ5	SEE SEPARATE PUBLICATION FILAMENT REGULATOR			786-3085-C
A6	SEE BREAKDOWN ON PAGE 6-21 CIRCUIT BREAKER PANEL			786-3416-0
A7	SEE BREAKDOWN ON PAGE 6-23 TUNING/POWER CONTROL RELAY BOARD			786-3018-0
A 8	SEE BREAKDOWN ON PAGE 6-25 Power Control Regulator SEE BREAKDOWN ON PAGE 6-27			789-4327-0
A9	POWER CONTROL PANEL SEE BREAKDOWN DN PAGE 6-29			789-4342-0
A10	2 KV POWFR SUPPLY SEE BREAKDOWN ON PAGE 6-31			789-4358-0
A11	RF DRIVER ASSEMBLY SEE BREAKDOWN ON PAGE 6-33			786-3309-0
A12	REMOTE CONTROL LATCHING RELAY BOARD -OPTIONAL EQUIPMENT-			778-2538-C
A13	SEE BREAKDOWN ON PAGE 6-37 RF OUTPUT LOW-PASS FILTER SEE BREAKDOWN ON PAGE 6-39			786-3451-0
A14	POWER SUPPLY FILTER SEE BREAKDOWN ON PAGE 6-41			786-3583-0
A15	METERING MULTIPLIER BOARD SEE BREAKDOWN ON PAGE 6-45			786-3168-0
A16	DIRECTIONAL COUPLER SEE BREAKDOWN ON PAGE 6-47			786-3264-0
A17	BLEEDER RESISTOR PANEL SEE BREAKDOWN ON PAGE 6-49			786-3154-0
A18	POWER AMPLIFIER CAVITY SEE BREAKDOWN ON PAGE 6-51			786-3335-0
A19	INPUT TERMINAL PANEL			786-3333-C
A20	SEE BREAKDOWN ON PAGE 6-56 CARD CAGE ASSEMBLY			786-3301-00
A21	SEE BREAKDOWN ON PAGE 6-58 POWER AMPLIFIER SOCKET			786-3686-0
A22	SEE BREAKDOWN ON PAGE 6-60 OVERLOAD AND METER CALIBRATE PANEL			786-3666-0
A23	SEE BREAKDOWN ON PAGE 6-62 EXTENDER CARD NOTEACCESSORY ITEM NOT SHOWN			771-9168-0
	INCLUDES CONNECTOR, ELECTRICAL	375430904501	91662	372-2425-04
81 R2	4 CONTACTS FAN, CENTRIFUGAL MOTOR, ALTERNATING CURRENT	879A10R7 5K33GG102	19070 88422	009-0167-01 230-0593-0
C1	0.5A, 208/220 VAC NOT USED			
C2 C3	NOT USED Capacitor, FXD, Paper 30 UF, 10% TOL, 7.5 VDCW	702013-5703	53021	930-0781-0
C4 THROUGH	NOT USED			
C44 C45	BLOCKING CAPACITOR			786-3597-00

YMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEI
C46 Through	NOT USED			
C49 C50	PA LOADING CAPACITOR			786-3048-00
C51	PA TUNING CAPACITOR			786-3049-00
CR1 THROUGH	NOT USED			
CR11	NOT USED			
CR12 F1	DIODE	1 N64 5	14433	353-2607-00
THROUGH	NOT USED			
F14 . F15	FUSE, CARTRIDGE	A25X350	71424	264-0917-7
	350A CURRENT RATING			
F16 F17	SAME AS F15 SAME AS F15			
JI	NOT USED			
J2	NOT USED			
J3	CONNECTOR, ELECTRICAL 1 CONTACT	52588LK	74545	368-0136-0
K1 THROUGH	NOT USED			
K11	NUT USED			
K12	RELAY, ARMATURE 3 Form C Contact	KUP14D5124V	77342	970-0007-2
	ARRANGEMENT			
LI	REACTOR	E16437	80008	668-0199-0
L2	4H INDUCTANCE REACTOR	E16439	80008	668-0200-0
	1H INDUCTANCE			
L3 L4	NOT USED Not used			
L5	COIL, RF			240-0178-0
0.61	4.7 UH, 10% TOL,			
PS1	28 VOLT POWER SUPPLY SEE BREAKDOWN ON PAGE 6-65			786-3013-0
PS2	PA BIAS POWER SUPPLY			786-3081-0
S1	SEE BREAKDOWN ON PAGE 6-67 NOT USED			
S2	NOT USED			
\$3	NOT USED			
54	SWITCH, SENSITIVE SPDT CONTACT ARRANGEMENT	MS25253-4	96906	260-0025-0
	INCLUDES		_	
	ACTUATOR, SWITCH	JV9	91929	260-0026-0
S 5 S 6	SAME AS S4 NOT USED			
57	NOT USED			
S 8	SHORTING SWITCH			786-3156-0
	INCLUDES Spring, Shorting Switch			540-5342-0
	STRAP, GROUNDING			542-1768-0
	STRIP, SHORTING			542-1770-0
	CONTACT, SHORTING Shaft, Flat, Straight			542-1773-0
	INSULATOR, STANDOFF	3BX3841	71590	190-0026-0
S9	SAME AS S8			
T1 T2	TRANSFORMER, PWR, STEP-UP TRANSFORMER, PWR, STEP-UP	E16436 E16438	80008	664-0124-0
T3	TRANSFORMER, PWR, STEP-UP	E16445	80008	664-0125-0
T4	TRANSFORMER, PWR, STEP-DOWN	E12322	80008	662-0043-C
15 XF1	TRANSFORMER, PWR, STEP-DOWN	3-18174	70674	662-0410-0
THROUGH	NOT USED			
XF14			71.00	2/5 12/0
XF15/17	FUSEHOLDER 225 - 600A CURRENT RATING	3515	71400	265-1269-0
V1	NOT USED			
V2	NOT USED			



SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
٧3	ELECTRON TUBE	8281-4CX15000A	06980	256-0157-000
Z 1	COMPLETE RECTIFIER INCLUDES	67-7226	81483	353-6241-000
	RECTIFIER COLUMN	67-7329	81483	353-6242-000
	-QTY 3-			
	INCLUDES MODULE	67-7468	81483	353-6243-00
	-QTY 31-	0	or los	333 0213 00
	MODULE , AC CONNECT -QTY 3-	67-7469	81483	353-6244-00
1	SHORTING STICK INCLUDES			786-3553-00
	ROD, SHORTING			547-6574-00
	SPRING, COMPRESSION			547-6575-00
3	CORD, SHORTING STICK	24216-2	84147	786-3550-00
2	CONDUCTOR, CENTER CLAMP, NEUTRALIZING	24210-2	04147	786-3236-00
	-QTY 2-			
4	CLAMP, NEUTRALIZING			786-3237-00
5	-QTY 2- Impeller, Fan	009-3118-010	60399	009-3118-01
6	COUPLING, SHAFT	39003	76487	015-0257-00
7 8	SHAFT	FC6-88	00175	786-3688-00
8 9	SPROCKET, WHEEL BELT, POSITIVE DRIVE	FC5~88	00141 00141	233-0255-15
10	SPROCKET, WHEEL	FC6-24	00141	233-0255-04
11	SHAFT, KNOB	NS2E002010	0/00/	789-4375-00
12	NUT, PLAIN, HEX 5/8-18 THD	MS25082B10	96906	313-0479-00
13	RING, RETAINING	5100-25C	79136	340-0038-00
14 15	BUSHING KNDB			789-4374-00
16	KNOB			757-0228-00
17	BEARING ASSEMBLY, PANEL	148	83330	015-3437-01
18 19	JOINT, UNIVERSAL Shaft	M8360	88797	233-0132-00
20	COUPLING, INSULATOR	FC46-5	80583	015-3438-01
	NOTE THE FOLLOWING ITEMS			
	ARE NEITHER SHOWN NOR DESIGNATED IN THIS PARTS			
	LIST DUE TO THEIR OPTIONAL			
	CHARACTER			
	CABLE, CONTROL PANEL			786-3454-00
	-LENGTH OPTIONAL-			
	50 HZ CONVERSION KIT			786-3440-00
/ /	-OPTIONAL EQUIPMENT- INCLUDES			
/	AMPLIFIER, MAGNETIC	270-0102-020	08510	270-0102-02
1	AMPLIFIER, MAGNETIC METER, TIME-TOTALIZING	R633A374-208V 458-0190-010	FIRIN 82386	270-0122-02 458-0190-01
12	METER, TIME-TUTALIZING METER, TIME-TOTALIZING	K42203P10	82227	458-0190-01
		0.20		0.30
- course				NOT X



8700 405 Pb

Figure 6-2. Control Panel, A1 (Sheet 1 of 2).

8700 406 Pb

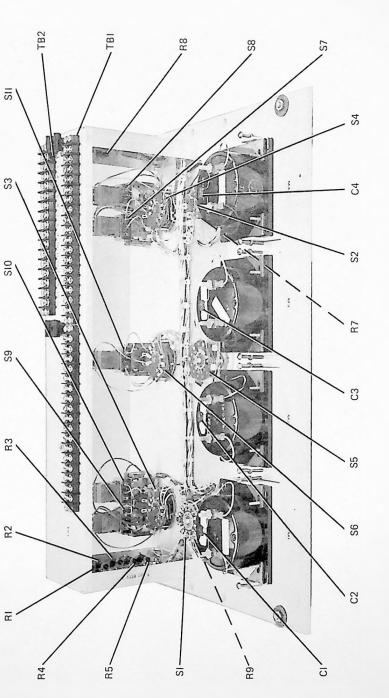
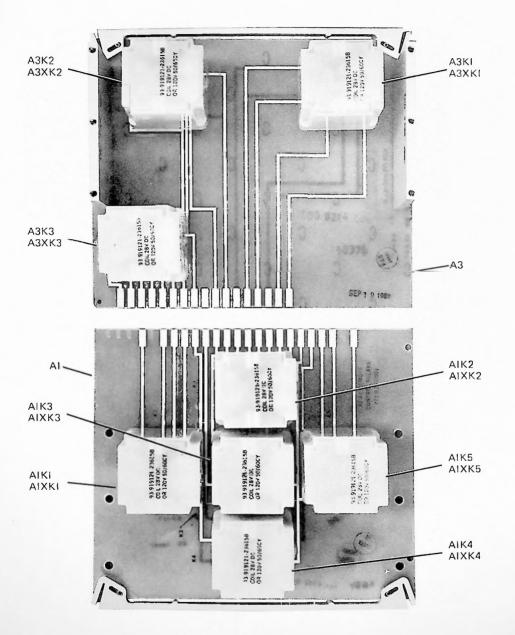


Figure 6-2. Control Panel, A1 (Sheet 2 of 2).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	CONTROL PANEL, A1			786-3243-0
Cl	CAPACITOR, FXD, MICA 100 PF, 5% TOL, 500 VDCW	CM05FD101J03	81349	912-2816-0
CZ	SAME AS CI			
C3	SAME AS CL			
C4 DS1	SAME AS C1 LAMP, INCANDESCENT 0.04A, 28 VOLTS	MS25237-327	96906	262-0179-0
DS2 THROUGH	SAME AS DS1			
DS10 M1	AMMETER, DC TEST O TO 1 MA	260842	65092	458-0783-1
M 2	AMMETER, DC PLATE CURRENT	260840	65092	458-0783-1
MB	O TO 1 MA AMMETER, DC PLATE VOLTAGE O TO 2 MA	260841	65092	458-0783-1
M4	AMMETER, DC WATTMETER	265202	65092	458-0821-0
R1	O TO 100 MA RESISTOR, FXD, COMPOSITION 39 DHMS, 10% TOL, 1 WATT	RCR32G390KS	81349	745-3293-0
R2				
THROUGH R5	SAME AS R1			
R6	NOT USED			
R 7	RESISTOR, FXD, FILM 1740 OHMS, 1% TOL, 1/4 WATT	RN6001741F	81349	705-6758-0
R 8	RESISTOR, FXD, COMPOSITION 39 KILOHMS, 10% TOL,	RCR32G393KS	81349	745-3419-0
R9	1 WATT RESISTOR, FXD, FILM	RN65D3010F	81349	705-7071-0
S 1	301 OHMS, 1% TOL, 1/2 WATT SWITCH, ROTARY DP12T CONTACT ARRANGEMENT	271711K2	76854	259-2219-0
S 2	SWITCH, ROTARY DPDT CONTACT ARRANGEMENT	271016K1	76854	259-2759-(
\$3	SWITCH, ROTARY DP3T CONTACT ARRANGEMENT	242752H1	76854	259-1980-0
54 55	SAME AS S3 SWITCH, ROTARY SPDT CONTACT ARRANGEMENT	210786H1	76854	259-1321-0
S6 S7	SAME AS S3 SWITCH, PUSH, ILLUMINATED	12-327	96182	266-6806-1
58	SPDT CONTACT ARRANGEMENT		10102	200 0000 1
THROUGH	SAME AS S7			
511 TB1	STRIP, TERMINAL 17 TERMINALS	353-18-17-001	71785	367-0025-0
TB2	-QTY 2- STRIP, TERMINAL	353-18-16-001	71785	367-0024-0
XDS1/2	16 TERMINALS SWITCH, PUSH, ILLUMINATED	12-1	96182	266-6806-0
XDS3/4 THROUGH	SAME AS XDS1/2			
XDS9/10 1	KNOB, RDUND, SKIRTED			757-0233-0
2	-OTY 6- BARRIER, VERTICAL MOUNTING	12\$2	96182	266-6806-0
3	-QTY 8- LENS, ENGRAVED	12-240-13FILA MENTOFF	96182	266-6806-2
4	FILAMENT OFF LENS, ENGRAVED	12-240-13FILA	96182	266-6806-2
5	FILAMENT ON LENS, ENGRAVED FAULT/RESET	MENTON 12-240-16	96182	266-6806-8



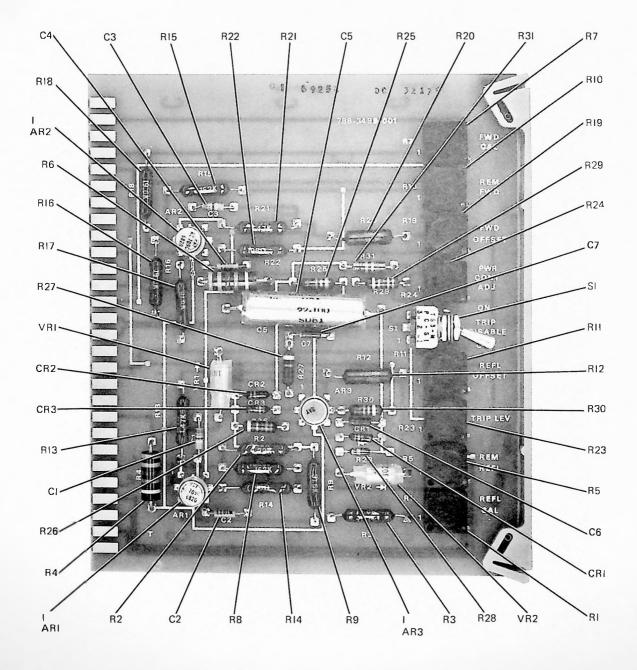
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
6	LENS, ENGRAVED PLATE OFF	12-240-13PLAT EOFF	96182	266-6806-746
7	LENS, ENGRAVED	12-240-13PLAT	96182	266-6806-79
8	PLATE ON BOOT, BULB WHITE	E ON 1 O W	96182	266-6268-00
,	-QTY 4- BOOT, BULB Green	12G	96182	266-6806-04
10	-QTY 2- BOOT, BULB YELLOW	12Y	96182	266-6806-05
11	-QTY 2- BODT, BULB RED -QTY 2-	12R	96182	266-6806-061



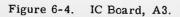
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Figure 6-3. Remote Control Assembly, A2.

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	REMOTE CONTROL ASSEMBLY, A2			786-3327-00
Al	REMOTE CONTROL RELAY BOARD INCLUDES RELAY, ARMATURE 2A, IB CONTACT ARRANGEMENT	93-919454-23615A	80089	771-9256-00 970-2454-44
	-AIKI THRU AIK5- Socket, relay Includes	93-153-31	80089	220-1399-02
	PIN, SOCKET -QTY 8- -A1XK1 THRU A1XK5-	93-46-101	80089	220-1399-03
A2 A3	NOT USED POWER CONTROL RELAY ASSEMBLY INCLUDES			778-2539-00
	RELAY, ARMATURE 2A, 1B CONTACT ARRANGEMENT -A3K1, A3K2, A3K3- SOCKET, RELAY INCLUDES	93-919454-23615A	80089	970-2454-44
		93-153-31	80089	220-1399-0
	PIN, SOCKET -QTY 11-	93-46-101	80089	220-1399-0
	-A3XK1, A3XK2, A3XK3-			
				-



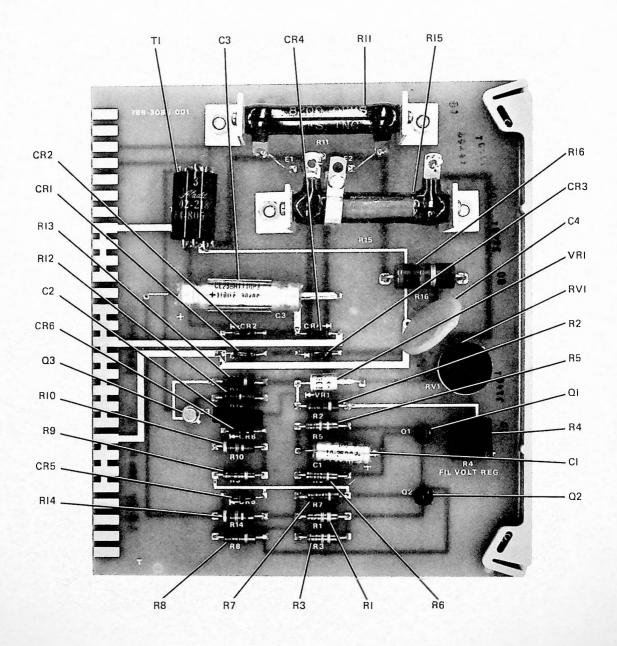
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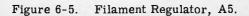
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	IC BOARD, A3			786-3499-00
AR1	AMPLIFIER, OPERATIONAL	U58770939	07263	351-7140-01
AR2	SAME AS AR1			
AR3	SAME AS AR1			
C 1	CAPACITOR, FXD, CERAMIC	CT10-562K	90634	913-5661-09
C 2	5600 PF, 10% TOL, 100 VDCW Capacitor, FXD, Ceramic 200 PF, 20% TOL, 100 VDCW	CT10-201M	90634	913-5661-54
C3	SAME AS C1			
C 4	SAME AS C2			
C 5	CAPACITOR, FXD, PAPER	SDB1KD1224M	53021	931-4492-00
C 6	0.22 PF, 20% TOL, 100 VDCW CAPACITOR, FXD, CERAMIC	CT10-220M	90634	913-5661-3
C 7	22 PF, 20% TOL, 100 VDCW CAPACITOR, FXD, CERAMIC 4700 PF, 20% TOL, 100 VDCW	CT10-472M	90634	913-5661-08
CR1	DIODE	1N645	14433	353-2607-00
CR2	SAME AS CR1		11755	555 2001-00
CR3	SAME AS CR1			
R 1	RESISTOR, VAR, WIRE-WOUND 10 KILDHMS, 5% TOL,	RT22C2P103	81349	381-1721-13
R 2	3/4 WATT RESISTOR, FXD, FILM 4220 OHMS, 1% TOL,	RN65D4221F	81349	705-7126-00
R3	1/2 WATT RESISTOR, FXD, FILM 19.6 KILOHMS, 1% TOL,	RN65D1962F	81349	705-7158-00
R4	1/2 WATT RESISTOR, FXD, COMPOSITION	RCR32G331JS	81349	745-3330-00
R5	330 OHMS, 5% TOL, 1 WATT SAME AS RI			
R6	SAME AS R4			
R7	SAME AS R1			
RB	RESISTOR, FXD, FILM 162 KILOHMS, 1% TOL,	RN65D1623F	81349	705-7202-00
R 9	L/2 WATT RESISTOR, FXD, FILM 31.6 KILOHMS, 1% TOL, 1/2 WATT	RN65D3162F	81349	705-7168-00
R10 R11	SAME AS R1 RESISTOR, VAR, WIRE-WOUND 20 KILOHMS, 5% TOL,	RT22C2P203	81349	381-1721-15
	3/4 WATT			
R12	RESISTOR, FXD, FILM 287 KILOHMS, 1% TOL,	RN65D2873F	81349	705-7214-00
R13	1/2 WATT RESISTOR, FXD, FILM 1470 OHMS, 1% TOL, 1/2 WATT	RN65D1471F	81349	705-7104-00
R14	RESISTOR, FXD, FILM 196 OHMS, 1% TOL, 1/2 WATT	RN65D1960F	81349	705-7062-00
R15	SAME AS R8			
R16	SAME AS R3			
R17	SAME AS R9			
R18	SAME AS R3			
R19	SAME AS R11			
R20	SAME AS R12			
R21 R22	SAME AS R13 SAME AS R14			
R23	SAME AS R14 SAME AS R1			
R24	SAME AS RI			
R25	RESISTOR, FXD, FILM 10 KILOHMS, 5% TOL,	RL205103J	81349	745-2661-00
2.24	1/2 WATT	01.0001.001		7/
R26	RESISTOR, FXD, FILM 6800 OHMS, 5% TOL, 1/2 WATT	RL20S6B2J	81349	745-2651-00

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
R27	RESISTOR, FXD, FILM 1500 DHMS, 5% TOL,	RL205152J	81349	745-2610-00
R28	1/2 WATT RESISTOR, FXD, COMPOSITION 470 KILOHMS, 10% TOL,	RCR20G474KS	81349	745-1464-00
R29	1/2 WATT RESISTOR, FXD, FILM 3900 OHMS, 5% TOL,	RL 20 \$ 392 J	81349	745-2636-00
R 30	1/2 WATT RESISTOR, FXD, FILM 22 KILOHMS, 5% TOL,	RL20S223J	81349	745-2681-00
R31	1/2 WATT RESISTOR, FXD, COMPOSITION 15 KILOHMS, 10% TOL,	RCR20G153KS	81349	745-1401-00
S 1	1/2 WATT Switch, Toggle	TS3PCMS I	04009	266-5032-0
VR1	SPDT CONTACT ARRANGEMENT DIODE	1 N30 22 A	03877	353-1317-0
VR2 1	SAME AS VR1 INSULATOR, DISC -QTY 3-	7717-19N	13103	352-9552-0



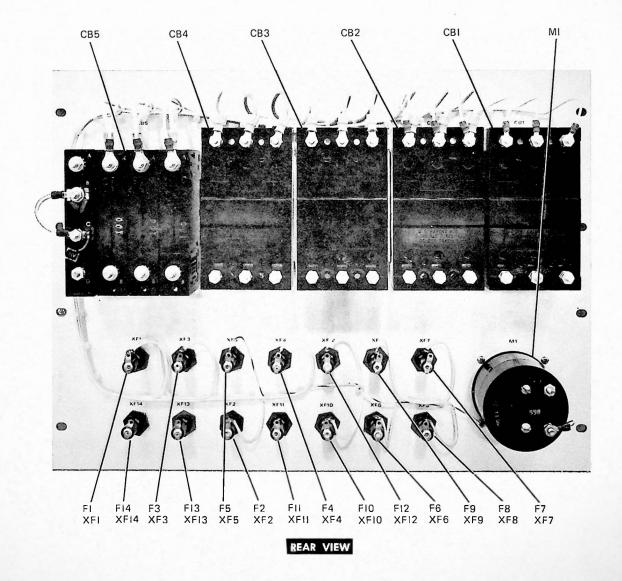


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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	FILAMENT REGULATOR, A5			786-3085-0
C1	CAPACITOR, FXD, ELECTROLYTIC 10 UF, 20% TDL, 35 VDCW	CS138F106M	81349	184-6219-0
C 2	CAPACITOR, FXD, FILM 0.22 UF, 10% TOL, 50 VDCW	65F15AA224	99971	933-0870-0
C 3	CAPACITOR, FXD, ELECTROLYTIC 110 UF, PLUS 75% MINUS 15%, 30 VDCW	CL258H111UP3	81349	184-8012-0
C4	CAPACITOR, FXD, CERAMIC 0.1 UF, PLUS 80% MINUS 20%, 50 VDCW	3857X5V0-104Z	72982	913-3234-0
CR1	DIODE	1N647	08466	353-2596-0
CR2	SAME AS CR1			
CR3	SAME AS CR1			
CR4	SAME AS CR1		1000	
CR5	DIODE	1N645	14433	353-2607-0
CR6	SAME AS CR5			
Q1	TRANSISTOR	2N3390	03508	352-0731-0
02	SAME AS Q1	2112444		252 0712
Q3 R1	TRANSISTOR	2N2646	04713	352-0712-0
	RESISTOR, FXD, COMPOSITION 22 KILOHMS, 10% TOL, 1/2 WATT	RCR20G223KS	81349	745-1408-0
R2	RESISTOR, FXD, COMPOSITION 1000 OHMS, 10% TOL, 1/2 WATT	RCR20G102KS	81349	745-1352-(
R3	RESISTOR, FXD, COMPOSITION 18 KILOHMS, 10% TOL, 1/2 WATT	RCR20G183KS	81349	745-1405-0
R4	RESISTOR, VAR, WIRE-WOUND 10 KILOHMS, 5% TOL, 3/4 WATT	RT22C2P103	81349	381-1721-1
R5	RESISTOR, FXD, COMPOSITION 10 KILOHMS, 10% TOL, 1/2 WATT	RCR20G103KS	81349	745-1394-0
R 6	RESISTOR, FXD, COMPOSITION 2200 OHMS, 10% TOL, 1/2 WATT	RCR20G222KS	81349	745-1366-0
87	SAME AS R6			
R8	SAME AS R6			
R9	SAME AS R2		0.11	
R10	RESISTOR, FXD, COMPOSITION 27 KILOHMS, 10% TOL, 1/2 WATT	RCR20G273KS	81349	745-1412-0
R11	RESISTOR, FXD, WIRE-WOUND 8200 DHMS, 5% TOL, 10 WATTS	0324	44655	710-0246-0
R12	RESISTOR, FXD, COMPOSITION 1500 KILOHMS, 10% TOL, 1/2 WATT	RCR20G155KS	81349	745-1485-0
R13	SAME AS R2			
R14	SAME AS R10			
R15	RESISTOR, ADJ, WIRE-WOUND 7500 DHMS, 10% TOL, 25 WATTS	0384	44655	716-0055-1
R16	RESISTOR, FXD, COMPOSITION 100 OHMS, 10% TOL,	RC42GF101K	81349	745-5610-0
RVI	2 WATTS CELL, PHOTOELECTRIC	PL581	33173	714-3219-0
T1	TRANSFORMER, PULSE ENCAPSULATED, LEAD 1 TO 2 5.5 OHMS RESISTANCE, LEAD 3 TO 4 5.5 OHMS RESISTANCE LEAD 5 TO 6 5.5 OHMS	02-2185	06978	664-8050-0
VR1	RESISTANCE DIODE	1N3028A	06751	353-1323-0



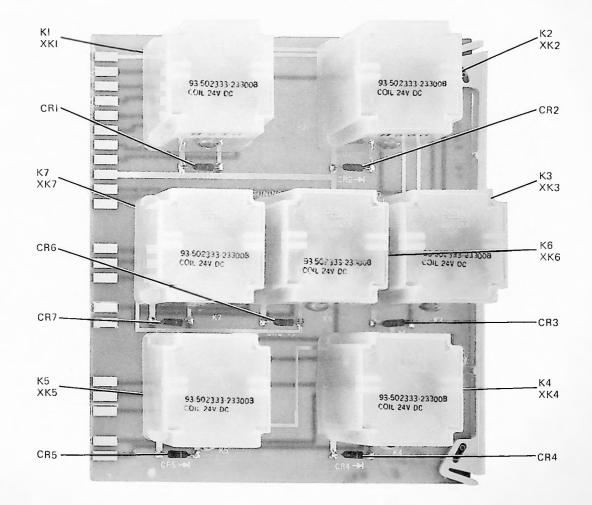


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Figure 6-6. Circuit Breaker Panel, A6.

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	CIRCUIT BREAKER PANEL, A6	l.		786-3416-00
CB1	CIRCUIT BREAKER 0.55A CURRENT RATING	3363SHK-55-250-6 0-3	74193	260-4038-03
CB2	CIRCUIT BREAKER 10A CURRENT RATING	3363SMG410-230-6 0-3	74193	260-0407-00
C 83	CIRCUIT BREAKER 4.5A CURRENT RATING	3363SMG4-0-4-5-2 50-60-3	74193	260-4038-0
CB4	CIRCUIT BREAKER 15A CURRENT RATING	33635MG415-230-6 0-3	74193	260-0409-0
C 85	CIRCUIT BREAKER 100A CURRENT RATING	CD4A3A3B6	74193	264-0972-0
Fl	FUSE, CARTRIDGE 8A CURRENT RATING	MDA8	71400	264-0912-3
F2	FUSE, CARTRIDGE 3A CURRENT RATING	F02B125V3AS	81349	264-0009-0
F3 F4	SAME AS F1 FUSE, CARTRIDGE 1/8A CURRENT RATING	FO2B250V8AS	81349	264-4230-0
F5 F6 F7	SAME AS F4 SAME AS F1 FUSE, CARTRIDGE 2A CURRENT RATING	F02B125V2AS	81349	264-C008-C
F8 F9 F10 F11 F12 F13	SAME AS F2 SAME AS F7 SAME AS F7 SAME AS F2 SAME AS F7 SAME AS F7			
F14 M1 XF1 XF2	SAME AS F7 METER, TIME TOTALIZING FUSEHOLDER 20A CURRENT RATING	458-0190-000 нкlex	82386 71400	458-0190-C 265-1241-0
THRDUGH XF14	SAME AS XF1			

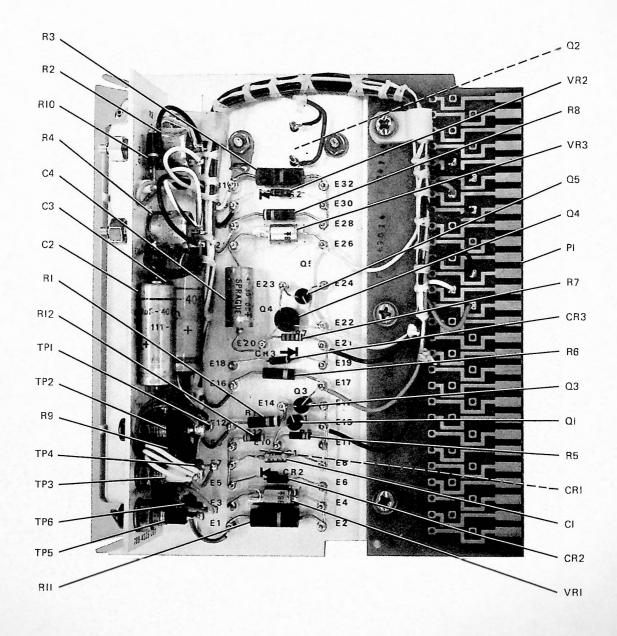




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Figure 6-7. Tuning/Power Control Relay Board, A7.

	PART NUMBER	CODE	PART NUMBE
TUNING/POWER CONTROL RELAY BOARD, A7			786-3018-00
DIODE	1 N645	14433	353-2607-00
SAME AS CR1 Relay, Armature	93-502333-23300B	80089	970-2454-27
3C CONTACT ARRANGEMENT			
SOCKET, RELAY	93-153-1	80089	220-1399-0
PIN	93-46-101	80089	220-1399-0
SOCKET, RELAY INCLUDES	93-153-1	80089	220-1399-02
PIN -QTY 8-	93-46-101	80089	220-1399-0
SAME AS XK2			
	SAME AS CR1 RELAY, ARMATURE 3C CONTACT ARRANGEMENT SAME AS K1 SOCKET, RELAY INCLUDES PIN -QTY 11- SOCKET, RELAY INCLUDES PIN -QTY 8-	SAME AS CR1 93-502333-23300E RELAY, ARMATURE 93-502333-23300E 3C CONTACT ARRANGEMENT 93-153-1 SAME AS K1 93-153-1 SOCKET, RELAY 93-46-101 -QTY 11- 93-153-1 SOCKET, RELAY 93-153-1 INCLUDES 93-153-1 INCLUDES 93-46-101 -QTY 8- 93-46-101	SAME AS CR1 93-502333-23300E 80089 RELAY, ARMATURE 93-502333-23300E 80089 3C CONTACT ARRANGEMENT 93-153-1 80089 SAME AS K1 93-153-1 80089 INCLUDES 93-46-101 80089 -QTY 11- 93-153-1 80089 SOCKET, RELAY 93-153-1 80089 INCLUDES 93-153-1 80089 PIN 93-153-1 80089 INCLUDES 93-46-101 80089 PIN 93-46-101 80089

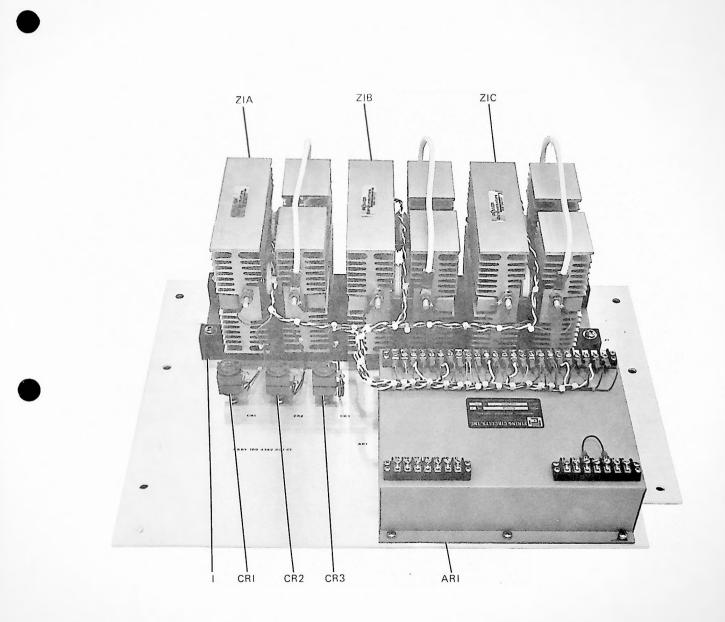


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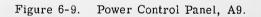
Figure 6-8. Power Control Regulator, A8.

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBI
	POWER CONTROL REGULATOR, A8			789-4327-0
C 1	CAPACITOR, FXD, ELECTROLYTIC 1 UF, 10% TOL, 50 VDCW	M39003-01-2116	81349	184-9084-4
C2	CAPACITOR, FXD, ELECTROLYTIC 100 UF, PLUS 50% MINUS	C437ARG100	73445	183-2355-1
C3	10%, 40 VDCW CAPACITOR, FXD, ELECTROLYTIC 250 UF, PLUS 50% MINUS	C437ARG250	73445	183-2355-1
C4	10%, 40 VDCW Capacitor, FXD, Electrolytic 47 UF, 20% TOL, 35 VDCW	150D476X0035S2	56289	184-7411-0
CR1	DIODE	1N4586	01295	353-6467-0
CR2	DIODE	1N645	14433	353-2607-0
CR3	SAME AS CR2			555 2001
P1	BOARD, PRINTED CIRCUIT			770-7482-1
01	TRANSISTOR	2N3390	03508	352-0731-0
Q2	TRANSISTOR		01295	352-0134-0
		2N457A	01293	572-0134-0
Q3	SAME AS 01	21/27/20	07014	262 0/2/
Q4	TRANSISTOR	2N3638	87216	352-0636-
Q5 R1	SAME AS Q1 RESISTOR, FXD, COMPOSITION 2200 DHMS, 10% TDL, 1/2	RCR206222KS	81349	745-1366-1
R 2	WATT RESISTOR, VAR, COMPOSITION 1000 OHMS, 20% TOL, 1/2 WATT	RV61AYSA102B	81349	380-2261-
R 3	RESISTOR, FXD, COMPOSITION 820 DHMS, 10% TOL, 1 WATT	RCR32G821KS	81349	745-3349-
R4	RESISTOR, VAR, COMPOSITION 500 OHMS, 10% TOL, 1/2 WATT	RVLAYSA501A	81349	380-2287-0
R 5	RESISTOR, FXD, COMPOSITION 1000 OHMS, 10% TOL, 1/4 WATT	RCR07G102KS	81349	745-0749-0
R6	RESISTOR, FXD, COMPOSITION 150 OHMS, 10% TOL, 1/2 WATT	RCR20G151KS	81349	745-1317-1
R7	RESISTOR, FXD, COMPOSITION 33 KILOHMS, 10% TOL, 1/4 WATT	RCR07G333KS	81349	745-0803-
R 8	RESISTOR, FXD, COMPOSITION 100 OHMS, 10% TOL, 1/2 WATT	RCR20G101KS	81349	745-1310-
R9	RESISTOR, FXD, COMPOSITION 470 OHMS, 10% TOL, 1 WATT	RCR32G471KS	81349	745-3338-1
R10	RESISTOR, FXD, COMPOSITION 1000 OHMS, 10% TOL, 1/2 WATT	RCR20G102KS	81349	745-1352-1
R 11	RESISTOR, FXD, COMPOSITION 22 OHMS, 10% TOL, 1 WATT	RCR32G220KS	81349	745-3282-0
R12	RESISTOR, FXD, COMPOSITION 4700 OHMS, 10% TOL, 1/4 WATT	RCR07G472KS	81349	745-0773-0
TP1	JACK, TIP BROWN	MS16108-4A	96906	360-0152-0
TP2	JACK, TIP RED	MS16108-2A	96906	360-0150-0
TP3	JACK, TIP DRANGE	MS16108-6A	96906	360-0154-0
TP4 TP5	JACK, TIP Yellow JACK, TIP	MS16108-8A	96906	360-0156-0
TP6	GREEN JACK, TIP	MS16108-5A MS16108-3A	96906 96906	360-0153-0
	BLACK	HOLOTOO SA	,5,00	200 0121 0
VR1	DIODE	1N3029B	99942	353-3134-0
VR2	DIODE	1N752A	81350	353-2979-0
	DIODE		01000	222 2713 (

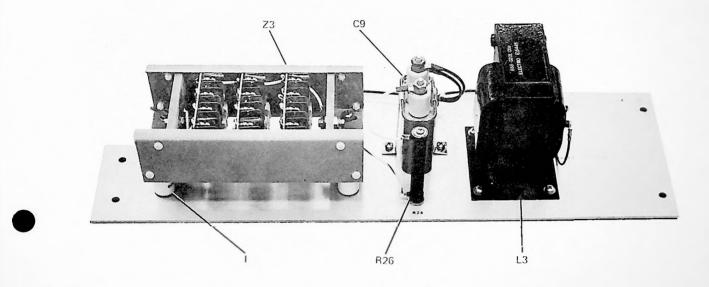




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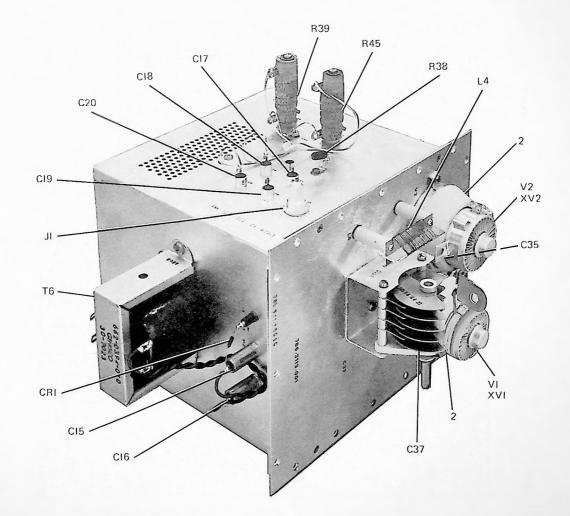


SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	POWER CONTROL PANEL, A9			789-4342-00
AR1 CR1 CR2 CR3 Z1A Z1B Z1C 1	AMPLIFIER, MAGNETIC ABSORBER, OVERVOLTAGE SAME AS CR1 SAME AS CR1 SCR ASSEMBLY SAME AS Z1A SAME AS Z1A STRIP, INSULATOR	R633A372-208V 6RS2LSA11H11 PS160066	POWER 09214 Power	270-0122-01 353-0283-10 353-6551-01 789-4349-00



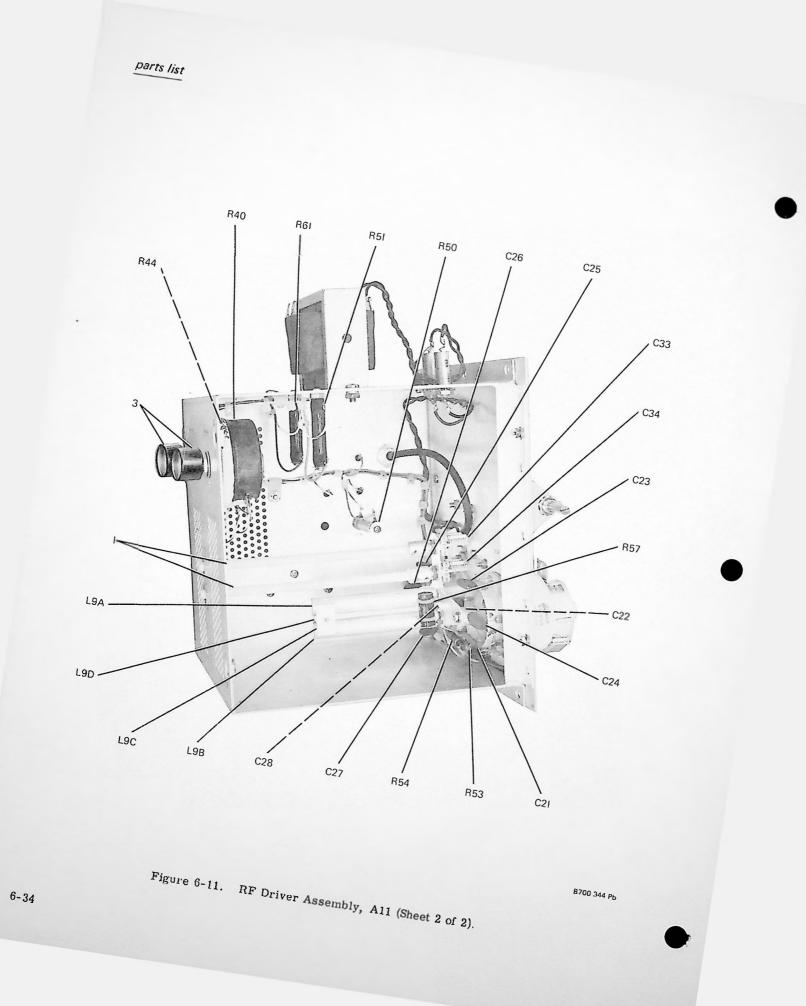
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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEF
	2 KV POWER SUPPLY, A10			789-4358-00
C 1 THROUGH	NOT USED			
C 8				
C9	CAPACITOR, FXD, PAPER 0.05 UF, 10 % TOL, 5000 VDCW	23F1129G2	01002	930-0728-00
L1 L2	NOT USED Not used			
L3 R1	CHOKE, RF 1.5H INDUCTANCE	E16446	80008	668-0201-01
THROUGH	NOT USED			
R25 R26	RESISTOR, FXD, WIRE-WOUND 3900 OHMS, 5% TOL, 26 WATTS	RW33V392	81349	747-1808-00
Z 1	NDT USED			- S. S. L.
22 23 1	NOT USED Rectifier Insulator, standoff - Oty 4-	6-1-2M1B398BS E1010	05277 70371	353-0435-01 190-1156-00



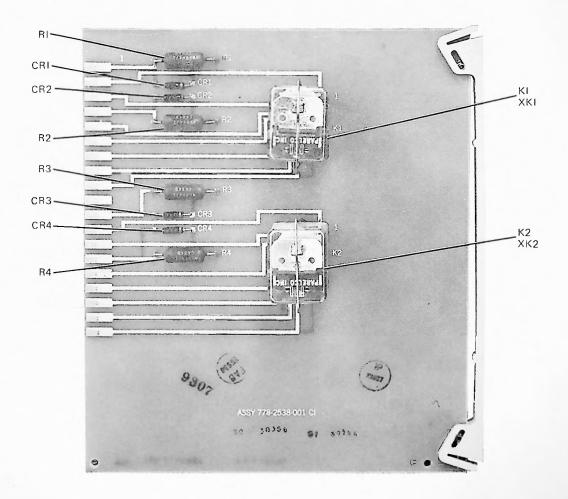
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Figure 6-11. RF Driver Assembly, A11 (Sheet 1 of 2).



SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	RF DRIVER ASSEMBLY, All			786-3309-001
C 1 THROUGH	NOT USED			
C14 C15	CAPACITOR, FXD, PAPER 0.1 UF, 10% TOL, 100 VDCW	CZ248KP104	81349	241-0088-CCO
C16 C17	SAME AS C15 CAPACITOR, FXD, CERAMIC 1000 PF, 20% TDL, 500 VDCH	CK70AW102M	81349	913-4064-000
C18 C19 C20	SAME AS C17 SAME AS C17 SAME AS C17			
C21	CAPACITOR, FXD, CERAMIC 0.02 UF, 20% TOL, 500 VDCW	58C40	56289	913-2142-000
THROUGH C28 C29	SAME AS C21			
THROUGH C32	NOT USED		24020	
C33 C34 C35	CAPACITOR, VAR, AIR 2.2 PF TO 34 PF, 650 VDCW SAME AS C33 SAME AS C17	193-10-1	74970	922-1020-070
C36 C37	NOT USED CAPACITOR, VAR, AIR	PL1752	71313	922-0571-000
CR 1 J 1	6 PF TO 20.7 PF, 4500 VDCW DIODE CONNECTUR, ELECTRICAL 1 CONTACT	LN645 UG909BU	14433 80058	353-2607-CC0 357-9248-C10
L 1 L 2 L 3 L 4	NOT USED NOT USED NOT USED COIL			786-3527-001
L5 Through L8	NOT USED			
L9	COIL INCLUDES ROD			786-3110-001
	-A, B- BAR -C-			786-3283-003
	BAR -D-			786-3283-004
R1 THROUGH R37	NOT USED			
R 38	RESISTOR, FXD, WIRE-WOUND 5 OHMS, 1% TOL, 2.5 WATTS	RS2C62-5R000F	91637	
R 3 9 R 40	RESISTOR, FXD, WIRE-WOUND 1 OHM, 1% TOL, 36 WATTS RESISTOR, VAR, WIRE-WOUND	2K46C1-1PCT J500S553E	44655 44655	
	500 DHMS, 10% TOL, 50 WATTS	120022225	44000	755-1015-410
R41 R42	NOT USED NOT USED			
R43 R44 R45	NOT USED Same as R40 Same as R39			
R46 Through R49	NOT USED			
R50	RESISTOR, FXD, WIRE-WOUND 820 DHMS, 5% TOL, 11 WATTS	RW29V821	81349	746-6158-000
R 51	RESISTOR, FXD, WIRE-WOUND 160 OHMS, 5% TOL, 10 WATTS	1-3-4057F160POR	44655	710-2921-000

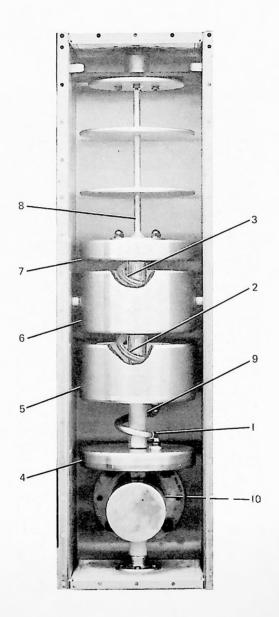
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEI
R52 R53	NOT USED RESISTOR, FXD, COMPOSITION 47 OHMS, 10% TOL, 1 WATT	RCR32G470KS	81349	745-3296-C0
R54 R55	SAME AS R53 NOT USED			
R56	NOT USED			
R57	RESISTOR, FXD, COMPOSITION 50 OHMS, 10% TOL, 16.5 WATTS	780SP2	10646	712-0129-00
R58				
THROUGH R60	NOT USED			
R61 T1	SAME AS R51			
THROUGH	NOT USED			
T6 V1	TRANSFORMER, PWR, STEP-DOWN ELECTRON TUBE	40-9023 7203-4CX250B	86151 49671	662-0394-01 256-0138-00
V2 XV1	SAME AS V1 Socket, Electron Tube	SK620A	06980	220-1294-00
XV2	8 PINS SAME AS XV1 POD EXTENSION			786-3312-00
2	ROD, EXTENSION -QTY 2- CHIMNEY, AIR SOCKET	SK626	06980	220-1466-00
3	-QTY 2- KNOB, PLASTIC	MS91528-1D2B	96906	281~0122-00
				12402



8700 1084 Pb

Figure 6-12. Remote Control Latching Relay Board, A12.

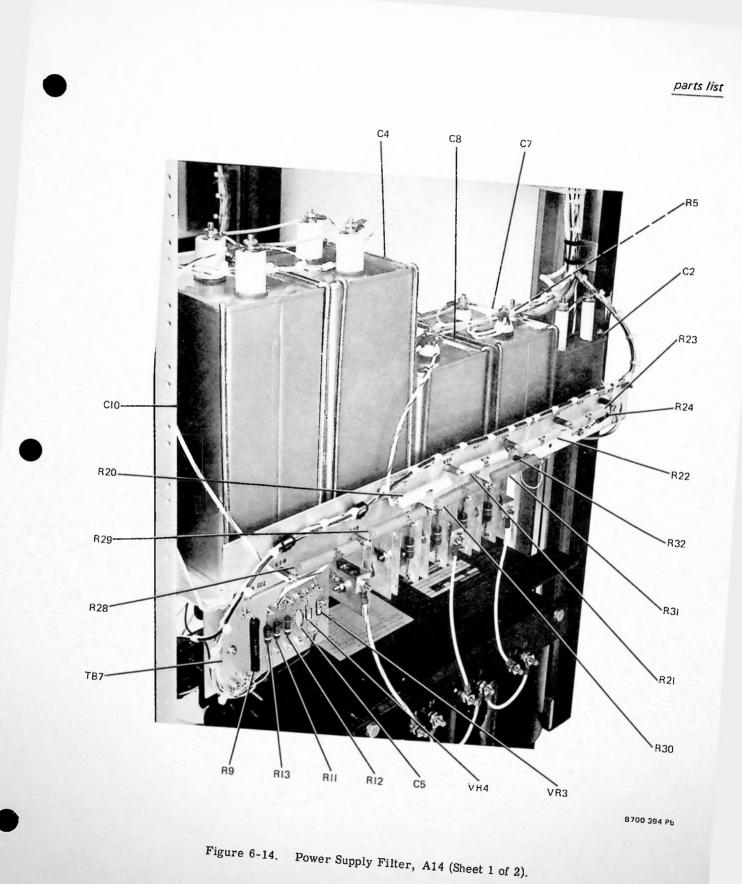
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEI
	REMOTE CONTROL LATCHING RELAY BOARD, A12			778-2538-00
CR1 CR2 CR3	DIODE SAME AS CR1 SAME AS CR1	1N647	01295	353-2596-00
CR4 K1	SAME AS CR1 Relay, Armature 2C contact arrangement	TF351CC2-24	70309	970-0004-03
K2 R1 R2	SAME AS K1 RESISTOR, FXD, WIRE-WOUND 470 OHMS, 5% TOL, 3 WATTS SAME AS R1	RW69V471	81349	747-5391-00
R3 R4 XK1	SAME AS RI SAME AS RI SOCKET, RELAY 10 PINS	30054-3	70309	220-1520-00
ХК2	INCLUDES PIN, GROUNDING SAME AS XK1	99-018-078-0250	72962	311-0605 - CC
			561	

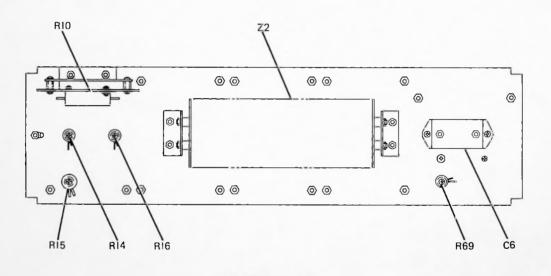


8700 387 Pb

Figure 6-13. RF Output Low-Pass Filter, A13.

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	RF DUTPUT LOW-PASS FILTER, A13			786-3451-001
1 2 3 4 5 6 7 8 9 10				786-3367-001 786-3369-001 786-3371-001 786-3372-001 786-3374-001 786-3375-001 786-3448-001 786-3448-001 786-3469-001





BOTTOM VIEW

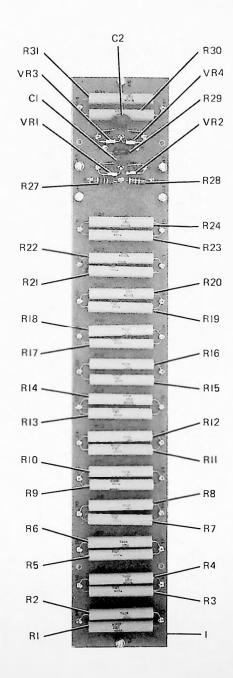
8700 462 Bx

Figure 6-14. Power Supply Filter, A14 (Sheet 2 of 2).

6-42

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
I	POWER SUPPLY FILTER, A14			786-3583-00
C1	NOT USED			
C2	CAPACITOR, FXD, PAPER 0.05 UF, 10% TOL, 10,000 VDCW	Y48960	56289	930-0610-00
C3 C4	NOT USED CAPACITOR, FXD, PAPER	CP70E1EK106K1	81349	962-4204-CC
C 5	10 UF, 10% TOL, 2500 VDCW Capacitor, FXD, geramic	CK6AWI03M	81349	913-1188-000
C 6	0.01 UF, 20% TOL, 500 VDCW CAPACITOR, FXD, MICA 0.022 UF, 2% TOL,	CM708223GM1	81349	938-2129-000
C 7	2000 VDCW Capacitor, FXD, Paper 12 UF, 10% Tol, 1500 VDCW	CP70E1EH126K1	81349	962-4246-000
C8 C9 C10	SAME AS C7 NOT USED SAME AS C4			
R1 Through R4	NOT USED			
R5 R6	RESISTOR, FXD, WIRE-WOUND 330 OHMS, 5% TOL, 26 WATTS NOT USED	RW33V331	81349	747-1790-CC(
R7 R8	NOT USED NOT USED			
R9	RESISTOR, FXD, WIRE-WOUND 0.25 OHMS, 1% TOL, 10 WATTS	RS1DX41DER2500F	91637	747 -9451-000
R10	RESISTOR, FXD, WIRE-WOUND 2.5 OHMS, 3% TUL, 50 WATTS	RH50-2R500G	91637	747-8697-CC
R11	RESISTOR, FXD, FILM 1200 OHMS, 5% TOL, 1 WATT	RL325122J	81349	745-3946-000
R12 R13	RESISTOR, FXD, FILM 3600 OHMS, 5% TOL, 1 WATT SAME AS RI1	RL32S362J	81349	745-3974-COC
RIA RI4	RESISTOR, FXD, WIRE-WOUND	2K46C5-1PCT	44655	710-5076-030
R15	5 OHMS, 1% TOL, 36 WATTS RESISTOR, FXD, WIRE-WOUND 4 OHMS, 10% TOL, 100 WATTS	3-1-2M45CE4	44655	710-5076-060
R16	RESISTOR, FXD, WIRE-WOUND 1 DHM, 1% TOL, 36 WATTS	2K46C1-1PCT	44655	710-5076-010
R17	NOT USED			
R18 R19	NOT USED NOT USED			
R20	RESISTOR, FXD, FILM 200 DHMS, 1% TOL, 2 WATTS	MEH200K1PCTT1	07716	705-1493-050
R22	SAME AS R20 SAME AS R20			
R23	SAME AS R20			
R24	RESISTOR, FXD, COMPOSITION 47 KILOHMS, 10% TOL, 1 WATT	RCR32G473KS	81349	745-3422-000
R25	NOT USED			
R26				
R27 R28	NOT USED RESISTOR, FXD, FILM 1000 KILOHMS, 1% TOL, 2 WATTS	RN8081004F	81349	705-4254-000
R29	SAME AS R28			
R30 R31 R32	SAME AS R28 SAME AS R28 SAME AS R24			
R33 THROUGH R68	NOT USED			

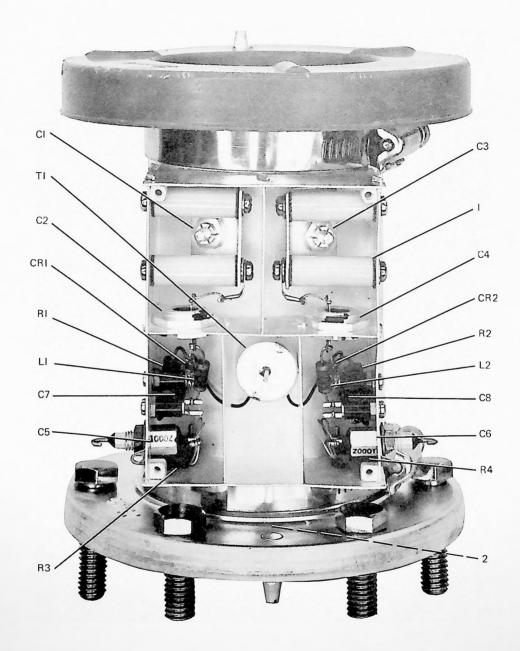
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEI
R69 T81	RESISTOR, FXD, WIRE-WOUND 310 OHMS, 5% TOL, 14 WATTS	HL15-3100HMS5PCT	91637	747-0754-00
THROUGH TB6 TB7 VR1	NOT USED BOARD, TERMINAL NOT USED			786-3126-00
VR2 VR3 VR4	NDT USED DIDDE SAME AS VR1	1N30168	99942	353-3121-00
Z 1 Z 2	NOT USED Rectifier	6-2-18404\$3 X 3	05277	353-0434-01
			;	



8700 392 Pb

Figure 6-15. Metering Multiplier Board, A15.

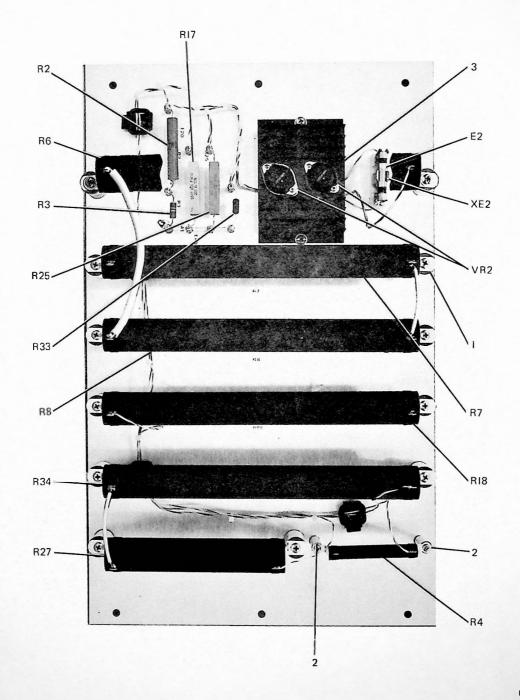
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	METERING MULTIPLIER BOARD, A15			786-3168-0
C 1	CAPACITOR, FXD, CERAMIC 0.01 UF, 20% TOL, 500 VDCW	CK63AW103M	81349	913-1188-00
C2 R1	SAME AS C1 RESISTOR, FXD, FILM 750 KILOHMS, 1% TOL, 2 WATTS	MEH750K1PCTT2	07716	705-1493-0
R2 THROUGH	SAME AS RI			
R24				
R25 R26	NOT USED NOT USED			
R27	RESISTOR, FXD, COMPOSITION 47 KILOHMS, 10% TOL, 1 WATT	RCR32G473KS	81349	745-3422-0
R28 R29	SAME AS R27 RESISTOR, FXD, FILM 5110 OHMS, 1% TOL,	RN65D5111F	81349	705-7130-0
R 30	1/2 HATT RESISTOR, FXD, FILM 1000 KILOHMS, 1% TOL, 2 WATTS	RN8001004F	81349	705-4254-0
R 31 VR 1	SAME AS R30 DIODE	1N3044A	06751	353-1339-C
VR2	SAME AS VR1	APPUCNI	00751	
VR3 VR4	SAME AS VR1 SAME AS VR1			
1	BOARD, TERMINAL			786-3015-0



8700 391 Pb

Figure 6-16. Directional Coupler, A16.

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	DIRECTIONAL COUPLER: A16			786-3264-001
Cl	CAPACITOR			786-3059-001
C 2 C 3	CAPACITOR, FXD, MICA 250 PF, 2% TOL, 1000 VDCW SAME AS C1	66901314A0-251G	72982	912-4133-030
C4 C5	SAME AS C2 CAPACITOR, FXD, CERAMIC 1000 PF, PLUS 80% MINUS 20%, 500 VDCW	327-029X5T01027	72982	913 - 1292-CCC
C6 C7	SAME AS C5 CAPACITOR, FXD, MICA 10 PF, 10% TOL, 500 VDCH	0M15C100K500WV4C R	72136	912-2754-000
C8 CR1	SAME AS C7 DIODE	HD1811	73293	353-2057-000
CR2 L1	SAME AS CR1 COIL, RF 3.3 MH, 10% TOL	M S1 8 130-14	81349	240-0791-000
L 2 R 1	SAME AS L1 RESISTOR, FXD, COMPOSITION 22 OHMS, 10% TOL, 1 WATT	RCR32G220KS	81349	745-3282-000
R2 R3	SAME AS R1 RESISTOR, VAR, WIRE-WOUND 20 KILOHMS, 5% TOL,	RT22C2L203	81349	381-1721-160
R4 T1	3/4 WATT Same as R3 Toroid			786-3075-001
1	STANDOFF, INSULATOR -QTY 4-	E1706	70371	190-1144-000

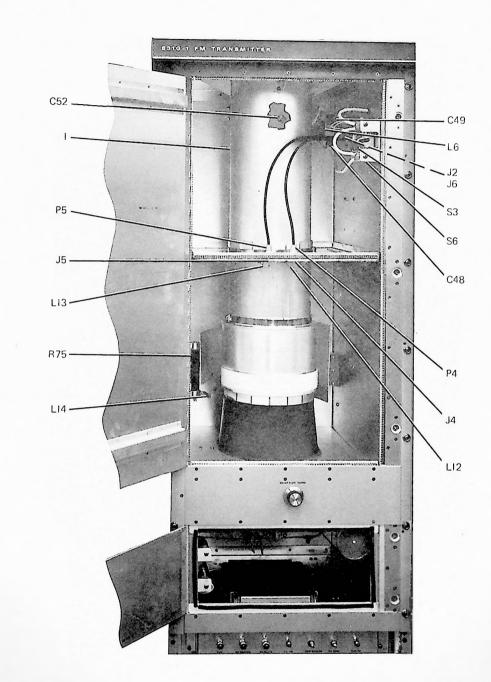


8700 390 Pb

Figure 6-17. Bleeder Resistor Panel, A17.

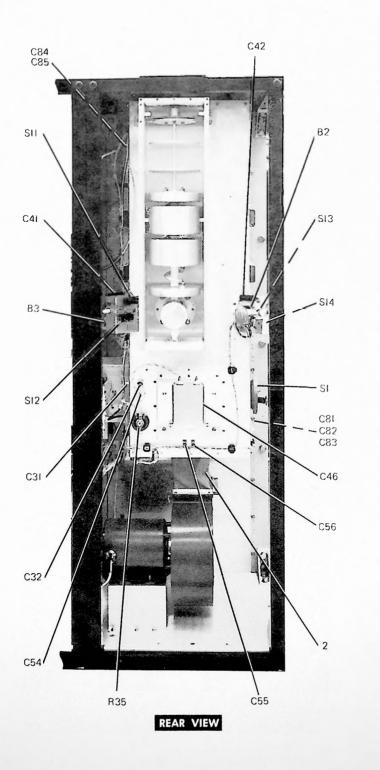
16 A MF9 AD4003 F RCR32G473KS RW33V331 RW47V180 RW47V104 PW1020010PCT GBT1-39K5 PW1020K10PCT RW37V823	ASSOC 19701 81349 81349 81349 81349 81349 11502 75042 11502 81349	786-3154-00 013-1332-02 705-1457-21 745-3422-00 747-1790-00 746-6662-00 746-6737-00 710-9054-00 745-6817-00
MF9 AD4003F RCR32G473KS RW33V331 RW47V180 RW47V104 PW1020010PCT GBT1-39K5 PW1020K10PCT	19701 81349 81349 81349 81349 81349 11502 75042 11502	70 5- 1 45 7- 2 74 5- 3422- 0 74 7- 1 790- 0 74 6- 666 2- 0 74 6- 673 7- 0 71 0- 905 4- 0 74 5- 681 7- 0 71 0- 906 7- 0
MF9 AD4003F RCR32G473KS RW33V331 RW47V180 RW47V104 PW1020010PCT GBT1-39K5 PW1020K10PCT	19701 81349 81349 81349 81349 81349 11502 75042 11502	705-1457-2 745-3422-0 747-1790-0 746-6662-0 746-6737-C 710-9054-0 745-6817-0 710-9067-0
RCR32G473KS RW33V331 RW47V180 RW47V104 PW1020010PCT GBT1-39K5 PW1020K10PCT	81349 81349 81349 81349 11502 75042 11502	745-3422-0 747-1790-0 746-6662-0 746-6737-C 710-9054-0 745-6817-0 710-9067-0
RW33V331 RW47V180 RW47V104 PW1020010PCT GBT1-39K5 PW1020K10PCT	81349 81349 81349 11502 75042 11502	747-1790-0 746-6662-0 746-6737-C 710-9054-0 745-6817-0 710-9067-0
RW47V180 RW47V104 PW1020010PCT GBT1-39K5 PW1020K10PCT	81349 81349 11502 75042 11502	746-6662-0 746-6737-C 710-9054-0 745-6817-0 710-9067-0
RW47V104 PW1020010PCT GBT1-39K5 PW1020K10PCT	81349 11502 75042 11502	746-6737-0 710-9054-0 745-6817-0 710-9067-0
PW1020010PCT GBT1-39K5 PW1020K10PCT	11502 75042 11502	710-9054-0 745-6817-0 710-9067-0
PW1020010PCT GBT1-39K5 PW1020K10PCT	11502 75042 11502	710-9054-0 745-6817-0 710-9067-0
GBT1-39K5 Pw1020K10PCT	75042	745-6817-0 710-9067-0
GBT1-39K5 Pw1020K10PCT	75042	745-6817-0 710-9067-0
GBT1-39K5 Pw1020K10PCT	75042	745-6817-0 710-9067-0
PW1020K10PCT	11502	710-9067-0
RW37V823	81349	
		747-3834-0
RS2C62-5R000F	91637	746-9441-0
RW47V203	81349	746-6723-0
50M140ZB5	04713	353-6015-0
53	45500	013-1332-0
3BX3822	71590	190-0025-0
E1708	70371	190-1145-0
1E1155B3033	41197	352-9866-0
	53 3BX3822 E1708	53 ASSOC 38X3822 71590 E1708 70371





8700 454 Pb

Figure 6-18. Power Amplifier Cavity, A18 (Sheet 1 of 3).



8700 395 Pb

Figure 6-18. Power Amplifier Cavity, A18 (Sheet 2 of 3).

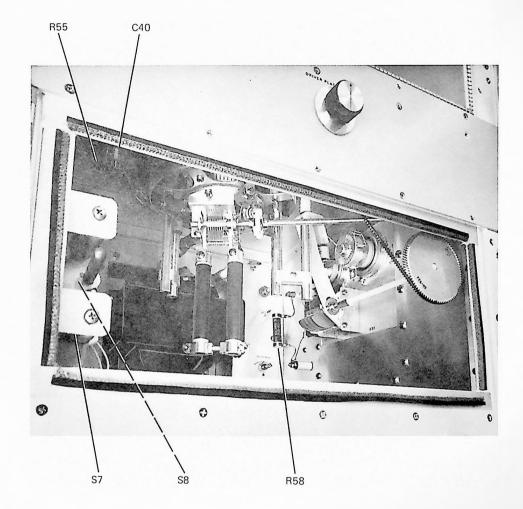
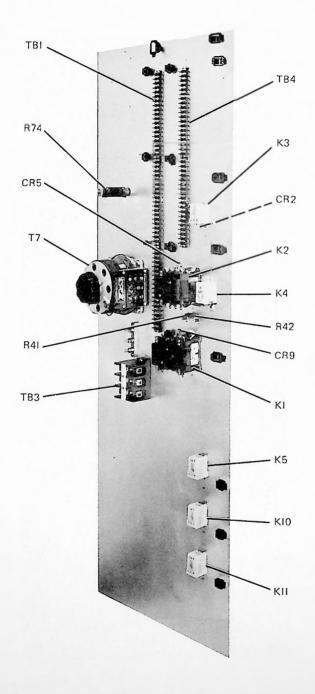


Figure 6-18. Power Amplifier Cavity, A18 (Sheet 3 of 3).

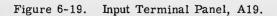
B1 NO B2 MO B3 SA C1 THROUGH C30 C31 C32 CA C33 THROUGH C32 CA C33 THROUGH C32 CA C33 THROUGH C34 NO C40 CA C41 CA C42 SA C43 NO C44 NO C45 NO C46 CA C47 NO C48 CA C49 NO C50 NO C51 NO C52 CA C53 NO C54 CA C55 CA C56 SA C57 THROUGH C80 CA	WER AMPLIFIER CAVITY, A18 T USED TOR, AC 115 VAC ME AS B2 T USED PACITOR, FXD, CERAMIC 1000 PF, 20% TOL, 4000 VDCW PACITOR, FXD, PAPER 0.1 UF, PLUS 30% MINUS 20%, 1250 VDCW T USED PACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, PAPER 0.47 UF, 20% TOL, 400 VDCW ME AS C41 T USED F USED T USED T USED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED F USED F USED F USED F USED T USED T USED F USED T USED F USED	PCDA1 2498-002X50-102M JN17-304A 850S310N 160P47404 T10100 HV50020KV 857-100N	10108 72982 56289 71590 56289 93790 96095	786-3335-0 230-0581-0 913-3120-C 241-0334-C 913-0845-C 913-6849-0 930-0038-C 913-1101-C
B2 MO B3 SA C1 THROUGH NO C30 C31 CA C32 CA C33 THROUGH NO C32 CA C33 THROUGH NO C34 CA CA C40 CA CA C41 CA CA2 C42 SA CA3 C44 NO CA4 C45 NO CA4 C46 CA4 NO C46 CA4 NO C50 NO C51 C51 NO C52 C53 CA4 CA4 C55 CA4 C55 CA4 C55 CA4 C55 CA4 C56 SA4 C57 THROUGH C80 CA1	TOR, AC 115 VAC ME AS B2 T USED PACITOR, FXD, CERAMIC 1000 PF, 20% TOL, 4000 VDCW PACITOR, FXD, PAPER 0.1 UF, PLUS 30% MINUS 20%, 1250 VDCW T USED PACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, CERAMIC 347 UF, 20% TOL, 400 VDCW ME AS C41 T USED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, 10% TOL,	2498-002X50-102M JN17-304A 850S310N 160P47404 T10100 HV50020KV	72982 56289 71590 56289 93790 96095	913-3120-0 241-0334-C 913-0845-C 913-6849-0 930-0038-C
B3 SA C1 THROUGH NO C30 C31 CA C32 CA C33 THROUGH NO C32 CA C33 THROUGH NO C39 CAO CA C40 CA CA C41 CA CA C42 SA NO C44 NO CA C45 NO CA C46 CA CA C47 NO CA C48 CA CA C49 NO C50 C51 NO C52 C53 NO C52 C55 CA CA C55 CA CA C55 CA CA C55 CA CA C56 SA C57 THROUGH CA CA C80 CA CA <	115 VAC ME AS B2 T USED PACITOR, FXD, CERAMIC 1000 PF, 20% TOL, 4000 VDCW PACITOR, FXD, PAPER 0.1 UF, PLUS 30% MINUS 20%, 1250 VDCW T USED PACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, PAPER 0.47 UF, 20% TOL, 400 VDCW ME AS C41 T USED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T USED T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T	2498-002X50-102M JN17-304A 850S310N 160P47404 T10100 HV50020KV	72982 56289 71590 56289 93790 96095	913-3120-0 241-0334-C 913-0845-C 913-6849-0 930-0038-C
B3 SA C1 THROUGH NO C30 C31 CA C32 CA C32 C33 THROUGH NO C32 CA C33 THROUGH NO C39 CAO CA C40 CA CA C41 CA CA2 C43 NO CA4 C44 NO C45 C45 NO CA6 C46 CA1 CA C47 NO C46 C47 NO C50 C51 NO C52 C53 NO C52 C54 CA1 CA1 C55 CA2 CA1 C53 NO C55 C56 SA1 C56 C81 CA1 CA1	ME AS B2 T USED PACITOR, FXD, CERAMIC 1000 PF, 20% TOL, 4000 VDCW PACITOR, FXD, PAPER 0.1 UF, PLUS 30% MINUS 20%, 1250 VDCW T USED PACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, PAPER 0.47 UF, 20% TOL, 400 VDCW ME AS C41 T USED F USED F USED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED F U	JN17-304A 8505310N 160P47404 T10100 HV50020KV	56289 71590 56289 93790 96095	241-0334-0 913-0845-0 913-6849-0 930-0038-0
C1 THROUGH NO C30 C31 CA C32 CA C32 CA C33 THROUGH NO C39 CAO CA C40 CA C41 CA C42 SA C43 NO C44 NO C45 NO C45 NO C46 CA C46 CA NO C50 NO C50 NO C51 NO C52 CA C53 NO C55 CA CA C55 CA CA CA CA C46 CA NO CA CA C50 NO C51 NO CA C53 CA CA CA CA C55 CA CA CA CA C56 SA C57 THROUGH CA C80 CA CA	T USED PACITOR, FXD, CERAMIC 1000 PF, 20% TOL, 4000 VDCW PACITOR, FXD, PAPER 0.1 UF, PLUS 30% MINUS 20%, 1250 VDCW T USED PACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, PAPER 0.47 UF, 20% TOL, 400 VDCW ME AS C41 T USED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED PACITOR, FXD, CERAMIC 100 PF, 10% TOL,	JN17-304A 8505310N 160P47404 T10100 HV50020KV	56289 71590 56289 93790 96095	241-0334-0 913-0845-0 913-6849-0 930-0038-0
THROUGH NO C30 C31 CA C32 CA C33 CA C32 CA C33 THROUGH C39 CA C33 NO C39 CA C40 CA C40 CA C41 CA C42 SA C44 NO C45 NO C46 CA C47 NO C48 CA C49 NO C50 NO C51 NO C52 CA C53 NO C54 CA C55 CA C55 CA C56 SA C57 THROUGH C80 CA	PACITOR, FXD, CERAMIC 1000 PF, 20% TOL, 4000 VDCW PACITOR, FXD, PAPER 0.1 UF, PLUS 30% MINUS 20%, 1250 VDCW T USED PACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, PAPER 0.47 UF, 20% TOL, 400 VDCW ME AS C41 T USED F USED F USED F USED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED F USED T USE	JN17-304A 8505310N 160P47404 T10100 HV50020KV	56289 71590 56289 93790 96095	241-0334-0 913-0845-0 913-6849-0 930-0038-0
C31 CA C32 CA C33 THROUGH ND C39 CAO CA C39 CAO CA C40 CA CA C41 CA CA C42 SA CA C43 NO CA C43 NO CA C44 ND CA C45 NO CA C46 CA CA C47 ND CA C48 CA CA C50 NO C51 C51 NO CA C55 CA CA C56 SA CA C80 CA CA	1000 PF, 20% TOL, 4000 VDCW PACITOR, FXD, PAPER 0.1 UF, PLUS 30% MINUS 20%, 1250 VDCW T USED PACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, PAPER 0.47 UF, 20% TOL, 400 VDCW ME AS C41 T USED T USED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T USED T USED T USED T USED T USED T USED PACITOR, FXD, CERAMIC 100 PF, 10% TOL,	JN17-304A 8505310N 160P47404 T10100 HV50020KV	56289 71590 56289 93790 96095	241-0334-0 913-0845-0 913-6849-0 930-0038-0
C32 CA C33 THRDUGH NO C39 CA CA C40 CA CA C41 CA CA C42 SA NO C43 NO CA C44 NO C45 C45 NO CA C46 CA CA C47 NO CA C48 CA CA C49 NO C50 C51 NO C51 C53 CA CA C55 CA CA C56 SA CA C80 CA CA	PACITOR, FXD, PAPER 0.1 UF, PLUS 30% MINUS 20%, 1250 VDCW T USED PACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, PAPER 0.47 UF, 20% TOL, 400 VDCW ME AS C41 T USED T USED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T	8505310N 160P47404 T10100 Hv50020KV	71590 56289 93790 96095	913-0845-0 913-6849-0 930-0038-0
THRDUGH NO C39 CA C40 CA C41 CA C42 SA C43 NO C44 NO C45 NO C46 CA C47 NO C48 CA C49 NO C50 NO C51 NO C52 CA C53 NO C54 CA C55 CA C56 SA C57 THROUGH C80 C81	PACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, PAPER 0.47 UF, 20% TOL, 400 VDCW ME AS C41 T USED T USED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 20%, 20,000 VDCW T USED T USED T USED PACITOR, FXD, CERAMIC 100 PF, 10% TOL,	160P47404 T10100 HV500ZOKV	56289 93790 96095	913-6849-0 930-0038-0
C39 CA C40 CA C41 CA C42 SA C43 NO C44 NO C45 NO C46 CA C47 NO C48 CA C49 NO C50 NO C51 NO C52 CA C53 CA C55 CA C55 CA C56 SA C57 THROUGH C80 CA	PACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, PAPER 0.47 UF, 20% TOL, 400 VDCW ME AS C41 T USED T USED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 20%, 20,000 VDCW T USED T USED T USED PACITOR, FXD, CERAMIC 100 PF, 10% TOL,	160P47404 T10100 HV500ZOKV	56289 93790 96095	913-6849-0 930-0038-0
C40 CA C41 CA C42 SA C43 NO C44 NO C45 NO C46 CA C47 NO C48 CA C49 NO C50 NO C51 NO C52 CA C53 CA C55 CA C56 SA C57 THROUGH C80 CA C81 CA	310 PF, 5% TOL, 2500 VDCW PACITOR, FXD, PAPER 0.47 UF, 20% TOL, 400 VDCW 4E AS C41 T USED 5 VSED PACITOR, FXD, PAPER 10 UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T USED	160P47404 T10100 HV500ZOKV	56289 93790 96095	913-6849-(930-0038-0
C41 CA C42 SA C43 NO C44 NO C45 NO C46 CA C47 NO C48 CA C49 NO C50 NO C51 NO C52 CA C53 NO C55 CA C55 CA C55 CA C56 SA C57 THROUGH C80 C81	PACITOR, FXD, PAPER D.47 UF, 20% TOL, 400 VDCW ME AS C41 T USED PACITOR, FXD, PAPER IO UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T USED T USED T USED F USED F ACITOR, FXD, CERAMIC 100 PF, 10% TOL,	160P47404 T10100 HV500ZOKV	93790 96095	913-6849-(930-0038-0
C42 SA. C43 NO C44 NO C45 NO C46 CA C47 NO C48 CA C49 NO C50 NO C51 NO C52 CA C53 NO C55 CA C55 CA C55 CA C56 SA C57 THROUGH C80 C81	0.47 UF, 20% TDL, 400 VDCW ME AS C41 F USED F USED PACITOR, FXD, PAPER LO UF, 10% TOL, 1000 VDCW F USED PACITOR, FXD, CERAMIC 20%, 20,000 VDCW F USED F USED F USED F USED PACITOR, FXD, CERAMIC LOO PF, 10% TDL,	T10100 HV50020KV	93790 96095	930-0038-0
C42 SA C43 NO C44 NO C45 NO C46 CA C47 NO C48 CA C49 NO C50 NO C51 NO C52 CA C53 NO C55 CA C56 SA C57 THROUGH C80 C81	AE AS C41 T USED T USED PACITOR, FXD, PAPER LO UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T USED PACITOR, FXD, CERAMIC LOO PF, 10% TOL,	HV50020KV	96095	
C43 NO C44 NO C45 NO C46 CA C47 NO C48 CA C49 NO C50 NO C51 NO C52 CA C53 NO C55 CA C55 CA C55 CA C56 SA C57 THROUGH C80 C81	T USED T USED T USED PACITOR, FXD, PAPER LO UF, 10% TOL, 1000 VDCW T USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T USED T USED T USED T USED PACITOR, FXD, CERAMIC LOO PF, 10% TOL,	HV50020KV	96095	
C45 NO C46 CA1 C47 NO C48 CA1 C49 NO C50 NO C51 NO C52 CA1 C53 NO C55 CA1 C55 CA2 C56 SA1 C57 THROUGH C80 CA1	T USED ACITOR, FXD, PAPER LO UF, 10% TOL, 1000 VDCW T USED ACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T USED F USED PACITOR, FXD, CERAMIC LOO PF, 10% TOL,	HV50020KV	96095	
C46 CA C47 NO C48 CA C49 NO C50 NO C51 NO C52 CA C53 NO C54 CA C55 CA C55 CA C56 SA C57 THROUGH C80 CA	PACITOR, FXD, PAPER LO UF, 10% TOL, 1000 VDCW F USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW F USED F USED F USED PACITOR, FXD, CERAMIC LOO PF, 10% TOL,	HV50020KV	96095	
C47 ND C48 CA C49 ND C50 ND C51 ND C52 CA C53 ND C54 CA C55 CA C55 CA C55 CA C56 SA C57 THROUGH C80 C81	LO UF, 10% TOL, 1000 VDCW F USED PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW F USED F USED F USED F USED F USED F ACITOR, FXD, CERAMIC LOO PF, 10% TOL,	HV50020KV	96095	
C48 CA C49 NO C50 NO C51 NO C52 CA C53 NO C54 CA C55 CA C55 CA C55 CA C55 CA C56 SA C57 THROUGH C80 C81	PACITOR, FXD, CERAMIC 500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T USED F USED PACITOR, FXD, CERAMIC 100 PF, 10% TDL,			913-1101-0
C49 NO C50 NO C51 NO C52 CA1 C53 NO C54 CA1 C55 CA1 C55 CA1 C55 CA1 C56 SA1 C57 THROUGH C80 C81	500 PF, PLUS 50% MINUS 20%, 20,000 VDCW T USED T USED PACITOR, FXD, CERAMIC LOO PF, 10% TDL,			913-1101-0
C50 NO C51 NO C52 CA C53 NO C54 CA C55 CA C56 SA C57 THROUGH C80 C81	T USED T USED Pacitor, FXD, Ceramic Loo PF, 10% Tol,	857-100N		
C51 NO C52 CA1 C53 NO C54 CA1 C55 CA1 C56 SA1 C57 THROUGH C80 C81	f USED PACITOR, FXD, CERAMIC LOO PF, 10% TOL,	857-100N		
C53 NO C54 CAI C55 CAI C56 SAI C57 THROUGH NO C80 C81 CAI	100 PF, 10% TOL,	857-100N		
C54 CA C55 CA C56 SA C57 THROUGH NO C80 C81 CA			71590	913-5113-0
C55 CA C56 SA C57 Through ND C80 C81 CA	USED	2/2222222222222		
C56 SA C57 Through No C80 C81 CA	PACITOR, FXD, CERAMIC LOOO PF, 20% TOL, LOOO VDCW	2432002X5S0102M	72982	913-4843-0
C56 SA C57 Through No C80 C81 CA	PACITOR, FXD, PAPER D.1 UF, 10% TOL, 600 VDCW	CZ24BKF104	81349	241-0090-0
C57 THROUGH NO C80 C81 CA	1E AS C55			
C80 C81 CA				
C81 CA	r USED			
	PACITOR, FXD, CERAMIC LOOO PF, 20% TOL,	DA858-003	71590	913-0101-0
C82 CA	5000 VDCW Pacitor, FXD, Ceramic	CK70AW102M	81349	913-4064-0
	1000 PF, 20% TOL, 500 VDCW			
	1E AS C82 1e As c82			
	IE AS C82			
JI NO	USED			
	NNECTOR, ELECTRICAL L CONTACT	100B3000C75	94375	357-9248-0
	I USED INECTOR, ELECTRICAL	UG625BU	80058	357-9670-0
	CONTACT			
	1E AS J4			
J6 SAI	IE AS J2			
THROUGH NO	USED			
L5 L6 CH				786-3548-0



SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
L 7 THROUGH				
L11	NOT USED			
L12	FERRULE, RF, GROUNDING	GSB165	59730	304-0160-000
L13	SAME AS L12			704 2472 001
L14 P1	STRAP NOT USED			786-3673-001
P2	NOT USED			
P3	NOT USED			
P4	CONNECTOR, ELECTRICAL	UG88EU	80058	357-9292-000
P5	1 CONTACT SAME AS P4			
RI	SAME AS F4			
THROUGH	NOT USED			
R34				
R35	RESISTOR, FXD, WIRE-WOUND 10 KILOHMS, 10% TOL, 50 WATTS	RP151SD103KK	81349	749-1032-CC0
R36 Through	NOT USED			
R 54 R 55	RESISTOR, FXD, COMPOSITION	RC42GF220K	81349	745-5582-000
	22 OHMS, 10% TOL, 2 WATTS	NC420F22UK	01549	145-5582-000
R56	NOT USED			
R57	NOT USED	770057		
R58	RESISTOR, FXD, COMPOSITION 22 DHMS, 20% TOL, 15 WATTS	772SP2	10646	712-0002-000
R59 THROUGH	NOT USED			
R74	101 0320			
R 75	RESISTOR, FXD, COMPOSITION 50 OHMS, 20% TOL, 60 WATTS	2185P9	10646	712-0070-000
S1	SWITCH, PRESSURE	146B	96502	266-8384-090
	SPDT CONTACT ARRANGEMENT			
S 2	SENSITIVE SWITCH SPOT CONTACT ARRANGEMENT INCLUDES	MS25253-4	96906	260-0025-000
	ACTUATOR	9VL	91929	260-0026-000
S 3	SAME AS S2			
S4 S5	NDT USED NDT USED			
S6	SHORTING SWITCH			786-3156-001
	INCLUDES			
	SPRING, SHORTING SWITCH			540-5342-002
	STRAP, GROUNDING			542-1768-002
	STRIP, SHORTING Contact, shorting			542-1770-002
	SHAFT, FLAT, STRAIGHT			542-2242-003
	INSULATOR, STANDOFF	38X3841	71590	190-0026-000
S7 S8	SAME AS S6			
58	NOT USED NOT USED			
\$10	NOT USED			
\$11	SWITCH, SENSITIVE	\$\$05A20	81350	266-3081-000
612	SPDT CONTACT ARRANGEMENT			
S12 S13	SAME AS SII SAME AS SII			
S14	SAME AS S11			
1	CONDUCTOR, CENTER, CAVITY			786-3124-001
2 3	DUCT, BLOWER Shield, RF			786-3026-001

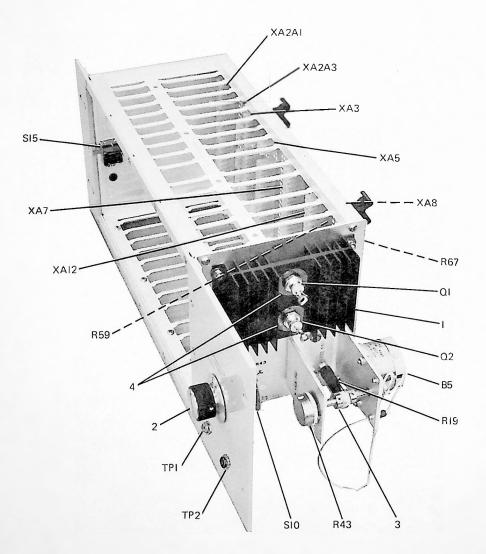


8700 396 Pb



6-56

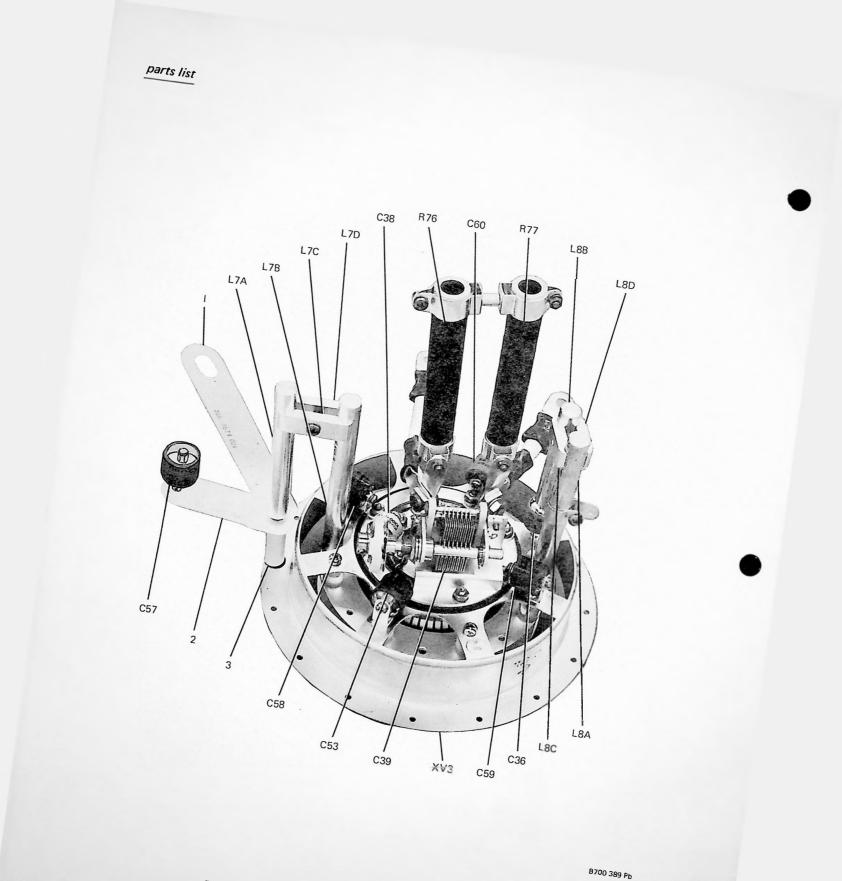
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	INPUT TERMINAL PANEL, A19			786-3333-001
CR1 CR2 CR3 CR4 CR5 CR6	NOT USED DIODE NOT USED NOT USED SAME AS CR2	1N645	14433	353-2607-000
THROUGH CR8 CR9 K1	NOT USED SAME AS CR2 RELAY, CONTACTOR	21608430QA3-4-22	52090	401-1607-000
К2	3A CONTACT ARRANGEMENT Relay, magnetic 1C contact arrangement	-41X81860 2195R50QAXR1920	52090	401-1614-000
КЗ	RELAY, ARMATURE 3C CONTACT ARRANGEMENT	KUP14D5124V	77342	970-0007-250
к4 к5	RELAY, TIME DELAY 2C CONTACT ARRANGEMENT DELAY ADMATURE	CUC43-30120	77342	402-0489-49
K5 K6 THROUGH K9 K10	RELAY, ARMATURE 3C CONTACT ARRANGEMENT NOT USED SAME AS K5	KUP14A51240V	11342	970-0007-270
K11 R1	SAME AS K5			
THROUGH R40 R41	NOT USED RESISTOR, FXD, COMPOSITION 820 DHMS, 10% TOL, 2 WATTS	RC42GF821K	81349	745-5649-00
R42 R43 Through R73 R74	SAME AS R41 Not used Resistor, fxd, wire-wound	3-1-2M45C5	44655	710-5076-05
T 1 Through T6	0.5 OHMS, 10% TOL, 100 WATTS NOT USED			
T7 TB1	TRANSFORMER, PWR, VARIABLE BOARD, TERMINAL 18 TERMINALS -QTY 3- NOT USED	226U 18-141	58474 71785	664-4020-02 367-4180-00
T B 2 T B 3	80ARD, TERMINAL 6 TERMINALS	908003	56365	36 7- 1188-00
T 84	BOARD, TERMINAL 18 TERMINALS -OTY 2-	18-141	71785	367-4180-00



8700 457 Pb

Figure 6-20. Card Cage Assembly, A20.

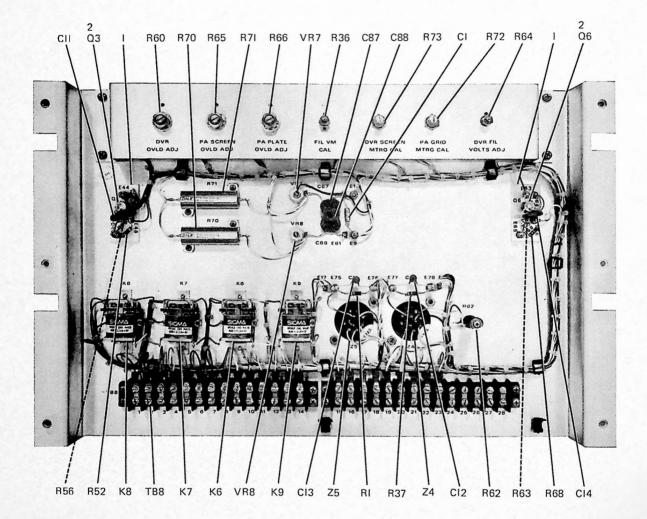
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	CARD CAGE ASSEMBLY, A20	1		786-3301-00
81				
THROUGH B4	NOT USED			
85	MOTOR	J6322	82227	230-0515-00
Ql	DIODE	NL461E	83781	353-3490-04
Q2	SAME AS Q1			
R1				
THROUGH R18	NOT USED			
R19	RESISTOR, FXD, WIRE-WOUND 100 DHMS, 5% TOL, 11 WATTS	RW29V101	81349	746-6060-00
R20				
THROUGH	NOT USED			
R42 R43	RESISTOR, VAR, COMPOSITION	RV4NAYSD254A	81349	380-2678-00
	250 DHMS, 10% TOL, 2 WATTS			
R44				
THROUGH	NOT USED			
R58 R59	RESISTOR, FXD, COMPOSITION	RCR20G821KS	81349	745-1349-00
	820 DHMS, 10% TOL,	NULLU UNL	01517	113 1343 0
	1/2 WATT			
S1				
THROUGH S9	NOT USED			
S10	SWITCH, ROTARY	262344K1	76854	259-2694-0
	DPDT CONTACT ARRANGEMENT			
S11				
THROUGH S14	NOT USED			
\$15	SWITCH, INTERLOCK	MS16106-4	96906	266-8000-00
	SPDT CONTACT ARRANGEMENT		,,,,,,	
TP1	JACK, TIP	M39024~1-22	81349	360-0439-12
TP2	RED	W20004 1 20		
172	JACK, TIP Black	M39024-1-23	81349	360-0439-13
XA1	NOT USED			
XA2	NOT USED			
XA2A1	CONNECTOR, ELECTRICAL	375430904501	91662	372-2425-04
	4 CONTACTS -QTY 10-			
XA2A2				
XA2A3	CONNECTOR, ELECTRICAL	375430904501	91662	372-2425-04
	4 CONTACTS			
XA3		275420004501	01442	372 2/25 24
ANJ	CONNECTOR, ELECTRICAL 4 CONTACTS	375430904501	91662	372-2425-04
	-QTY 11-			
X A 4	NOT USED			
XA5				
XA6 XA7	NOT USED Connector, electrical	375430904501	91662	372-2425-04
	4 CONTACTS	515150701501	1001	512 2425 0
	-QTY 13-			
XAB	SAME AS XA2A3 NOT USED			
XA9 XA10	NOT USED			
XA11	NOT USED			
XA12	SAME AS XA2A1			
1	HEAT SINK	64037B	13103	352-9597-03
2	KNOB, ALUMINUM Coupling, Shaft, Flexible	A201-5N	99934	757-0233-00
4	KIT, MOUNTING	PK22-31M	08289	352-9573-02
	-QTY 2-			



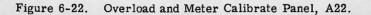


6-60

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	POWER AMPLIFIER SOCKET, A21			786-3686-01
C1				
THROUGH C35	NOT USED			
C36	CAPACITOR, FXD, CERAMIC 310 PF, 5% TOL, 2500 VDCW	850S310N	71590	913-0845-0
C37 C38	NOT USED CAPACITOR, FXD, CERAMIC 1000 PF, PLUS 40% MINUS	HPB20-8C1000PF	96095	913-2831-0
C39	20%, 2500 VDCW Capacitor, var, Air 7 pf to 100 pf	9404-18-00036	80583	922-0025-0
C40 THROUGH C52	NOT USED			
C53	CAPACITOR, FXD, CERAMIC 100 PF, 10% TOL, 5000 VDCW	850S100N	71590	913-0821-0
C54 C55	NOT USED NOT USED			
C56	NOT USED			
C57	CAPACITOR, FXD, CERAMIC 1000 pf, 20% TOL, 5000 VDCW	DA858-003	71590	913-0101-0
C58 C59	SAME AS C53 CAPACITOR, FXD, CERAMIC	850\$752	71950	913-0830-0
,	75 PF, 5% TOL, 3500 VDCW	0303732	11950	915-0850-0
C60 R1	CAPACITOR, FXD, CERAMIC 500 PF, 20% TOL, 5000 VDCW	858-500	71590	913-5113-2
THROUGH R75	NOT USED			
R76 R77	RESISTOR, FXD, COMPOSITION 22 OHMS, 10% TOL, 15 WATTS SAME AS R76	2165P3	10646	712-0007-0
LI				
THROUGH	NOT USED			
L6 L7	DRIVER PLATE INDUCTOR INCLUDES			
	ROD -A-			786-3110-0
	ROD			786-3110-0
	-8- BAR			794 2292 0
	-C-			786-3283-C
	BAR			786-3283-0
L8	-D- DRIVER LOADING INDUCTOR INCLUDES			
	ROD -A-			786-3110-0
	ROD -B-			786-3110-0
	BAR -C-			786-3283-0
	BAR -D-			786-3283-C
XV1 XV2	NOT USED NOT USED			
XV3 1	SOCKET, ELECTRON TUBE STRAP	¥291	06980	220-1491-0 786-3679-0
2 3	STRAP Standoff, insulator	E1002	70371	786-3685-0 190-1152-0



8700 388 Pb

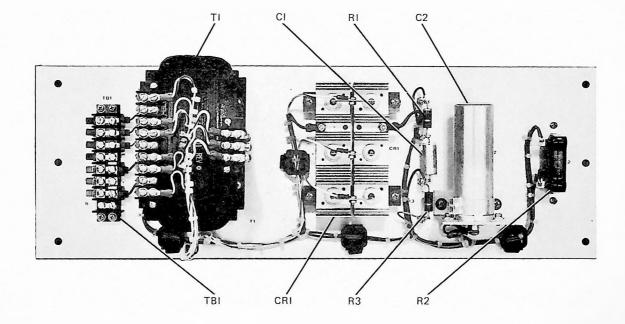


6-62

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	OVERLOAD AND METER CALIBRATE PANEL, A22			786-3666-00
C 1	CAPACITOR, FXD, ELECTROLYTIC	150D336X001082	56289	184-7382-00
C2 THROUGH	33 UF, 20% TOL, 10 VDCW NOT USED			
C10 C11	CAPACITOR, FXD, CERAMIC 0.1 UF, PLUS 80% MINUS 20%, 200 VDCW	825-213X5V0104Z	72982	913-3681-00
C12	200 VDCW Capacitor, FXD, Ceramic 1000 PF, 20% TDL, 1000 VDCW	CK60AW102M	81349	913-1186-00
C13 C14 C15	SAME AS C12 Same as C11			
THROUGH C86	NOT USED			
C87 C88 K1	SAME AS C11 SAME AS C11			
THROUGH K5 K6	NOT USED Relay, armature	95062	78277	408-1114-00
К7 К8 К9	1C CONTACT ARRANGEMENT SAME AS K6 SAME AS K6 SAME AS K6			
Q1 Q2 Q3 Q4	NOT USED NOT USED RECTIFIER NOT USED	C6F	03508	353-6468-01
Q5 Q6	NOT USED Same as q3	00000010045	01340	745 1353 00
R 1	RESISTOR, FXD, COMPOSITION 1000 OHMS, 10% TOL, 1/2 WATT	RCR20G102KS	81349	745-1352-00
R2 THROUGH R35	NOT USED			
R36 R37 R38	RESISTOR, FXD, COMPOSITION 25 KILOHMS, 10% TOL, 1/2 WATT SAME AS R1	RV6LAYSA253A	81349	380-2292-00
R58 THROUGH R51	NOT USED			
R 52	RESISTOR, FXD, COMPOSITION 4700 OHMS, 10% TOL, 1/2 WATT	RCR20G472KS	81349	745-1380-00
R53 R54 R55	NOT USED NOT USED NOT USED		1336	
R56	RESISTOR, FXD, COMPOSITION 220 OHMS, 20% TOL, 1/2 WATT	RCR20G221KS	81349	745-1324-00
R57 R58 R59	NOT USED NOT USED NOT USED			
R60	RESISTOR, VAR, WIRE-WOUND 50 OHMS, 10% TOL, 2 WATTS			377-0619-00
R61 R62	NOT USED RESISTOR, FXD, WIRE-WOUND 150 DHMS, 5% TOL, 1 WATT	RW29V151	81349	746-6145-00
R 63	RESISTOR, FXD, COMPOSITION 10 KILOHMS, 10% TOL,	RCR20G103KS	81349	745-1394-00

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R 64	1/2 WATT RESISTOR, VAR, WIRE-WOUND 100 DHMS, 10% TOL, 12.5 WATTS	44968-100	44655	749- 4512-CO
R65	SAME AS R60			
R66	SAME AS R60			
R67	NOT USED			
R68 R69	SAME AS R63 NOT USED			
R70	RESISTOR, FXD, WIRE-WOUND 4 OHMS, 1% TOL, 30 WATTS	RE75G60R4	81349	747-0990-73
R71 R72	SAME AS R70 Resistor, var, wire-wound 30 ohms, 10% tol, 4 watts	мзорх	37942	377-0032-00
R73 T81 THROUGH	SAME AS R72 Not used			
T87 T88	BOARD, TERMINAL	14-141	71785	367-4140-00
VR1 Through	14 TERMINALS NOT USED			
VR6 VR7 VR8	DIODE SAME AS VR7	324-7710	81483	353-1849-00
Z1 Z2	NOT USED Not used			
Z 3 Z 4 Z 5	NOT USED Magnetic circuit, halltron Same as Z4	MC103	12066	270-0080-02
1	HEAT SINK -QTY 2-	TX0506-18	98978	352-9555-01
2	INSULATOR -QTY 2-			796-9889-00
		1 Constant		



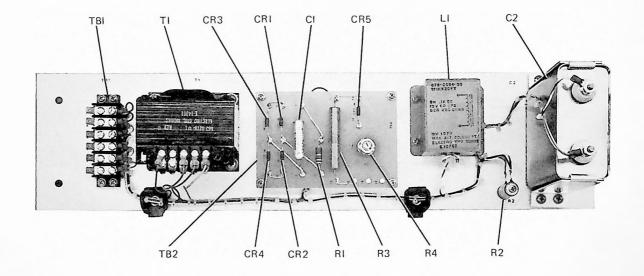


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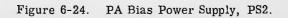


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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLIN S PART NUMBER
	28 VOLT POWER SUPPLY, PS1			786-3013-001
C1 C2 CR1 R1 R2 R3 T1 TB1	28 VOLT POWER SUPPLY, PS1 CAPACITOR, FXD, PAPER 0.68 UF, 203 TOL, 200 VOCW CAPACITOR, FXD, ELECTROLYTIC 1400 UF, PLUS 1003 MINUS 105, 50 VOCW RECTIFIER RESISTOR, FXD, COMPOSITION 150 DHMS, 52 TOL, 2 WATTS RESISTOR, FXD, COMPOSITION 10 OHMS, 103 TOL, 2 WATTS TRANSFORMER, PWR, SIEP-DOWN BOARD, TERMINAL 8 TERMINAL 8 TERMINALS	118P68402\$1 CE71C142G 27A611810H2 RC42GF470K 0200G RC42GF100K E14331 601-8	56289 81349 94154 81349 44655 81349 80008 75382	786-3013-001 951-0087-000 184-2516-000 745-5596-000 745-5568-000 664-0096-010 367-4080-000





8700 453 Pb



SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
I	PA BIAS POWER SUPPLY, PS2	J		786-3081-00
C1	CAPACITOR, FXD, PAPER 0.047 UF, 20% TOL,	186P4730651	56289	931-8592-00
C2	600 VDCW CAPACITOR, FXD, PAPER	T10100	09023	930-0038-0
CR1 CR2	10 UF, 10% TOL, 1000 VDCW DIODE	1N4586	72699	353-6467-0
THROUGH CR5	SAME AS CR1			
L1	REACTOR 5H INDUCTANCE	18892	80089	678-0584-0
R1 R2	RESISTOR, FXD, COMPOSITION 330 DHMS, 10% TOL, 1 WATT RESISTOR, FXD, WIRE-WOUND	RCR32G331KS	81349	745-3331-0
RZ	10 KILOHMS, 5% TOL, 14 WATTS	RW31V103	81349	746-9131-0
R3	RESISTOR, FXD, FILM 1000 OHMS, 1% TOL, 2 WATTS	RN8081004F	81349	705-4254-0
R4	RESISTOR, VAR, COMPOSITION 25 KILOHMS, 10% TOL,	RVLAYSA252A	81349	380-2768-0
T1 T81	2 WATTS TRANSFORMER, PWR, STEP-UP BOARD, TERMINAL	F14301 6-141	80008 71785	662-0218-0 367-4060-0
TB2	6 TERMINALS TERMINAL BOARD			786-3139-0



Refer to overall schematic diagram supplied in the back of manual.

		MANUA		
		MANUA	L PART NO	MANUAL DATE
		YOUR	NAME AND/OR	COMPANY
	CUSTOMERS' COMMENTS	ADDRE	ss	DATE
	ON MANUAL	PAGE	PARAGRAPHS	DISCREPANCIES, ERRORS, COMMENTS
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	COLLINS RADIO COMPANY PUBLICATIONS ENGINEERING DEPARTMENT			
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		MANUAL	PART NO	MANUAL DATE
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		PAGE	PARAGRAPHS	DISCREPANCIES, ERRORS, COMMENTS
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Printed in United States of America

523-0560518-011438 20 March 1971

310Z-1 FM EXCITER

CHANGE NOTICE NO. 1 to Instruction Book 523-0560518-001438

1. REASON FOR CHANGE

This addendum provides the following:

- a. New parts list for section 6.
- b. New schematic diagrams for section 7.
- 2. EFFECTIVITY

The new pages are effective upon receipt and should be used in place of the material contained in the instruction book.

section 6 parts list

6.1 GENERAL

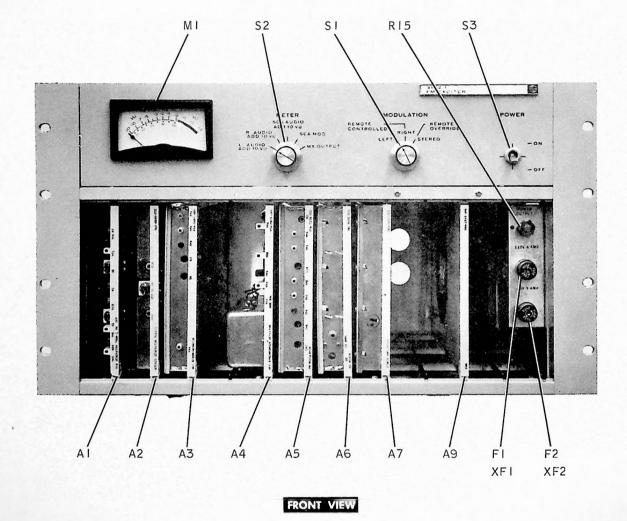
This section contains a list of all replaceable electrical, electronic, and critical mechanical parts for the 310Z-1 FM EXCITER.

The manufacturers' codes appearing in the MFR CODE column of the parts list are listed in numerical order at the end of the parts list. The code list provides the manufacturer's name and address as shown in the Federal Supply Code for Manufacturers' Handbook H4-1. Manufacturers not listed in Handbook H4-1 are assigned a 5-letter code and appear first in the code list.

6.2 LIST OF EQUIPMENT

Page

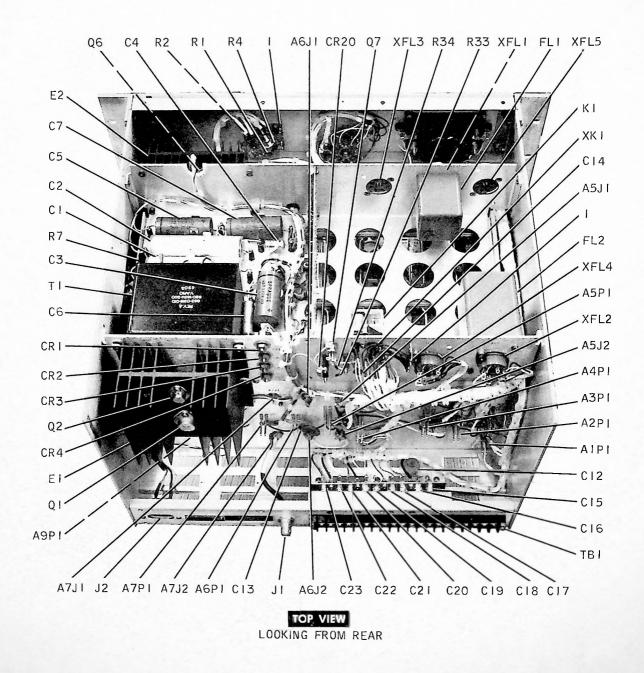
310Z-1 FM Exciter	6-2
SCA Generator 786W-1	6-7
Stereo Generator 786V-1	6-13
AFC Discriminator	6-18
AFC Synchronous Detector	6-23
FM Modulator	6-28
RF Mixer	6-36
Power Amplifier	6-40
Power Supply Regulator	6-43
Fan	6-46
Extender Board	6-48



8502 498 Pb

Figure 6-1. 310Z-1 FM Exciter (Sheet 1 of 3).

6-2



B502 508 Pb

Figure 6-1. 310Z-1 FM Exciter (Sheet 2 of 3).

6-3

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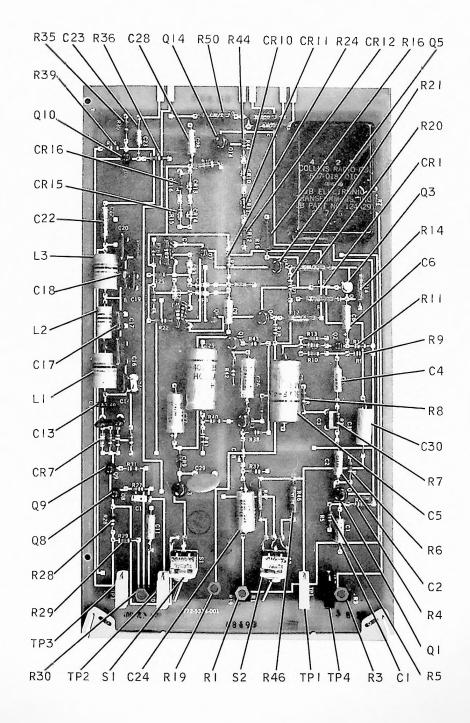
Figure 6-1. 310Z-1 FM Exciter (Sheet 3 of 3).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	3102-1 FM EXCITER			522-4687-001
A 1	SCA GENERATOR 786W-1 SEE BREAKDOWN ON PAGE 6-7			772-5338-001
A1P1	CONNECTOR, ELECTRICAL - OTY 3-	375430-9010	91662	372-2425-010
42	4 CONTACTS STERED GENERATOR 786V-1 SEE BREAKDOWN ON PAGE 6-13			772-5336-001
A2P1 A3	SAME AS AIPI AFC DISCRIMINATUR			774-7097-001
1LEA	SEE BREAKDOWN ON PAGE 6-18 CONNECTOR, ELECTRICAL L CONTACT	UG1050AU	80058	357-9211-000
A 3 P 1	CONNECTOR, ELECTRICAL -QTY 4-	375430-9010	91662	372-2425-010
A4	4 CONTACTS AFC SYNCHRONOUS DETECTOR 6-23 SEE BREAKDOWN ON PAGE			774-7075-00
A4P1	CONNECTOR, ELECTRICAL -CTY 5-	375430-9010	91662	372-2425-010
A 5	4 CONTACTS FM MODULATOR SEE BREAKDOWN ON PAGE 6-28			774-7160-001
A5J1	SAME AS A3J1			
45J2	SAME AS A3J1			
A5P1 A6	SAME AS A1P1 RF MIXER SEE BREAKDUWN ON PAGE 6-36			781-5380-001
A6J1	SAME AS A3J1			
A6J2 A6P1	SAME AS A3JI CONNECTOR, ELECTRICAL	375430-9010	91662	372-2425-010
A7	4 CONTACTS POWER AMPLIFIER SEE BREAKDOWN ON PAGE 6-40			769-0830-00
A7J1	SAME AS A3J1			+
A7J2	SAME AS A3J1			
A7P1	SAME AS AGP1			
A8 A9	POWER SUPPLY REGULATOR SEE BREAKDOWN ON PAGE 6-43 FAN			774-7216-00
A9 A9P1	SEE BREAKDOWN ON PAGE 6-46			783-7049-00
A10	SAME AS A6P1 EXTENDER BOARD SEE BREAKDOWN UN PAGE 6-48			781-5365-00
C1	CAPACITOR, FXD, ELECTROLYTIC 2300 UF, PLUS 75% MINUS 10%, 40 VDCW	601D238G040JT4	56289	183-1282-050
C 2 C 3	SAME AS C1 CAPACITOR, FXD, ELECTROLYTIC 500 UF, PLUS 100% MINUS 10%, 50 VDCW	D50447	56289	183-1309-000
C 4	CAPACITOR, FXD, ELECTROLYTIC 500 UF, PLUS 100% MINUS 10%, 25 VDCW	D25447	56289	183~1306-000
C 5	SAME AS C4			
C 6	CAPACITOR, FXD, ELECTROLYTIC 50 UUF, PLUS 75% MINUS 10%, 50 VDCW	D29238	56289	183-1170-000
C7	CAPACITOR, FXD, MICA 4700 UUF, 5%,TOL, 500 VDCW	CM06F472J03	81349	912-3052-000
C8 THROUGH C1.1	NOT USED			
C12	CAPACITOR, FXD, CERAMIC 10,000 UUF, 20% TOL, 500 VDCW	36C175A	01939	913-3013-000
C13	CAPACITOR, FXD, CERAMIC 0.1 UF, PLUS 80% MINUS 20%, 500 VDCW	41092	01939	913-3152-000
C14	CAPACITOR, FXD, CERAMIC 1 UF, 10% TOL, 50 VDCW	СКО6ВХ105К	81349	913-5019-560

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
C15	CAPACITOR, FXD, CERAMIC 1000 PF, 20% TOL, 500 VDCW	CK70AW102M	81349	913-4064-000
C16 THROUGH C23	SAME AS C15			
CR1 CR2 CR3	SEMICONDUCTOR DEVICE, DIODE SAME AS CR1 SAME AS CR1	1N1200	07688	353-1721-000
CR4 CR5	SAME AS CR1			
THROUGH CR19	NOT USED			
CR20 E1	DIODE HEATSINK	1N3030B	81349	353-3135-000 776-1855-001
E2 Fl	HEATSINK, TRANSISTOR FUSE, CARTRIDGE, (SLOW BLOW) 4 AMP, 250 VAC MAXIMUM	640382 F02A250V4AS	13103 81349	352-9597-010 264-0449-000
F2	FUSE CARTRIDGE, (NORMAL BLOW) 3 AMP, 250 VAC MAXIMUM	F02A250V3AS	81349	264-4080-000
FL1 FL2	NETWORK, PRE-EMPHASIS FILTER, HIGH PASS NOT USED	526-0016-010 D11193	95105 706 7 4	673-1158-010 673-1159-010
J1 J2	CONNECTOR, ELECTRICAL 1 CONTACT	UG1050AU	80058	357-9211-000
J3	CONNECTOR, ELECTRICAL 1 CONTACT	100B3000C75	94375	357-9248-000
Kl	RELAY, ARMATURE 4C CONTACT ARRANGEMENT	T154CCCC24VDC	70309	970-2106-000
M1. Q1	METER, AUDIO LEVEL	36-0 27 6-0000 2N3055	80105 07688	456-0056-000 352-0583-010
Q2 Q3 Q4 Q5 Q6	TRANSISTOR NOT USED NOT USED SAME AS 01	2N3740	07688	352-0695-010
Q7 R1	DIODE RESISTOR, FXD, FILM 261 OHMS 1% TOL, 1/4 WATT	2N4168 RN60D2610F	04713 81349	353-6485-020 705-6568-000
R2 R3	SAME AS R1 RESISTOR, FXD, FILM 562 OHMS, 1% TOL, 1/4 WATT	RN60D5620F	81349	705-6584-000
R4 R5	SAME AS R1 RESISTOR, FXD, COMPOSITION	RC07GF104K	81349	745-0821-000
R6	100K OHMS, 10% TOL, 1/4 WATT RESISTOR, FXD, FILM	RN60D2152F	81349	705-6660-000
R7	21.5K DHMS 1% TOL, 1/4 WATT RESISTOR, FXD, WIRE-WOUND 0.2 DHM, 3% TOL, 3 WATTS	RSM2-0.2 DHM	91637	747-9651-000
R8 THROUGH R15	NOT USED			
R16	RESISTOR, FXD, FILM 5620 OHMS, 1% TOL, 1/2 WATT	RN65D5621F	81349	705-7132-000
R17	RESISTOR, VAR, COMPOSITION 5K OHMS, 20% TOL, 1/4 WATT	LL6059	71450	376-4729-000
R18 THROUGH R32	NOT USED			
R33	RESISTOR, FXD, COMPOSITION 100 OHMS, 10% TOL, 1.4 WATT	RCR07G101KS	81349	745-0713-000
R34	RESISTOR, FXD, COMPOSITION 1K OHMS, 10% TOL, 1/4 WATT	RCR07G102KS	81349	745-0749-000
Sl	SWITCH, ROTARY, WAFER 3 POLE, 3 POSITION,	233065A1	76854	259-1866-010
52	1 SECTION SWITCH, ROTARY, WAFER 2 POLE, 5 POSITION	264752N1	76854	259-2328-030
\$3	2 SECTIONS SWITCH, TOGGLE DPST CONTACT ARRANGEMENT	81024SP	04009	266-5376-010

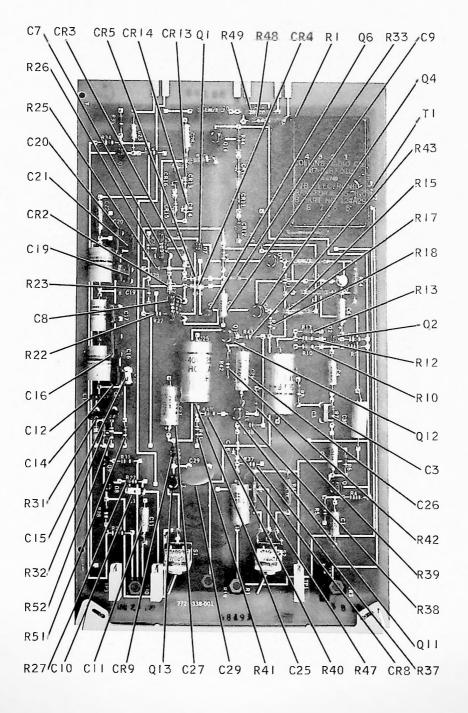
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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
T1	TRANSFORMER, AF, STEP-DOWN 115/230 VOLTS TO 28 VOLTS	950-1669-200	83003	662-0318-010
TB1	BOARD, TERMINAL 20 TERMINALS	670A3000-20	75382	367-1852-200
XF1	FUSEHOLDER 30-AMP CURRENT RATING	нкрн	71400	265-1171-000
XFL1 XFL2	SOCKET, ELECTRON TUBE 8 CONTACTS	88-8TM	02660	220-1005-000
	SAME AS XFL1			
XK1	SDCKET, RELAY 16 CONTACTS	30055-2	02288	220-1471-000
	BOARD, TERMINAL -QTY 2-	1532	71785	306-2230-000



B502 515 Pb

Figure 6-2. SCA Generator 786W-1 (Sheet 1 of 2).



B502 515 Pb

Figure 6-2. SCA Generator 786W-1 (Sheet 2 of 2).

COLLINS

PART NUMBER 772-5338-001

184-6216-000

933-0854-000

183-2355-150

912-3046-000

916-0076-000

912-2977-000

912-2816-000

912-2792-000

916-0118-000

1	-	

	SYMBOL	DESCRIPTION	PART NUMBER
		CAPACITOR, FXD, ELECTROLYTIC CSI3BF685M 6.8 UF, 20X TOL, 35 VDCW SAME AS CI CAPACITOR, FXD, FILM 65F10AA103 0.01 UF, 10X TOL, 50 VDCW SAME AS CI CAPACITOR, FXD, FILM 65F10AA103 0.01 UF, 10X TOL, 50 VDCW SAME AS CI CAPACITOR, FXD, ELECTROLYTIC C437ARG250 250 UF, PLUS 50X, MINUS 10%, 40 VDCW SAME AS CI CAPACITOR, FXD, MICA CAPACITOR, FXD, MICA CM06FD392J03 3900 UUF, 5% TOL, 500 VDCW SAME AS CI CAPACITOR, FXD, MICA CC20CK020D 2 UUF, 1/2 UUF TOL, 500 DM19E501J03 500 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA CAPACITOR, FXD, MICA CM05F101J03 100 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA CAPACITOR, FXD, MICA CM05F820J03 20 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA CAPACITOR, FXD, MICA CM06F821J03 20 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA CAPACITOR, FXD, MICA CM05F12J03 20 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA CAPACITOR, FXD, MICA	
	C 1	6-8 UF, 20% TOL, 35 VDCW	C\$138F685M
	C2 C3	CAPACITOR, FXD, FILM 0.01 UF, 10% TOL, 50 VDCW	65F10AA103
	C4 C5	CAPACITOR, FXO, ELECTROLYTIC 250 UF, PLUS 50%, MINUS 10%, 40 VDCW	C437ARG250
	C6 C7 C8	CAPACITOR, FXD, MICA 3900 UUF, 5% TOL, 500 VDCW	C M06FD392J03
	C10	SAME AS CI CAPACITOR, FXD, CERAMIC 2 UUF, 1/2 UUF TOL, 500	CC20CK020D
	C11 C12	CAPACITOR, FXD, MICA	DM19E501J03
	C13	CAPACITOR, EXD, MICA	CM05F101J03
	C14	CAPACITUR, FXD, MICA	CM05F470J03
	C15	CAPACITOR, FXD, CERAMIC 5 UUF, 1/2 UUF TOL, 500	CC20CH050D
	C16	CAPACITOR, FXD, MICA	CM06F821J03
	C17		CM05E220J03
	C18	CAPACITOR, FXD, MICA	CM05F121J03
-	C19	CAPACITOR, FXD, MICA	CM05C180K03
	C20	CAPACITOR, FXD, MICA	CM06F471J03
	C21 C22	CAPACITUR, FXD, ELECTROLYTIC 0-0075 UF, 20% TOL,	151D752X00 75 W2
	C23	CAPACITOR, FXD, ELECTROLYTIC	CS138J333M
	C24	CAPACITOR, FXD, ELECTROLYTIC 22 UF, 20% TOL, 50 VDCW	CS13BG226M
	C25 C26	SAME AS C5 CAPACITOR, FXD, ELECTROLYTIC 47 UF, 20% TDL, 35 VDCW	CS138F476M
	C27	CAPACITOR, FXD, ELECTROLYTIC 68 UF, 20% TOL, 30 VDCW	109D686X0030F2
	C 28 C 29	SAME AS C1 CAPACITOR, FXD, CERAMIC	36C175A
	C30	0.01 UF, 20% TOL, 500 VDCW CAPACITOR, FXD, ELECTROLYTIC 15 UF, 20% TOL, 35 VDCW	CS138F156M

VDCW			
CAPACITOR, FXO, MICA 820 UUF, 5% TOL, 500 VDCW	CM06F821J03	81349	912-2995-000
CAPACITOR, FXD, MICA	CM05E220J03	81349	912-2768-000
CAPACITOR, FXD, MICA 120 UUF, 5% TOL, 500 VDCW	CM05F121J03	81349	912-2822-000
CAPACITOR, FXD, MICA 18 UUF, 10% TOL, 500 VDCW	CM05C180K03	81349	912-2763-000
CAPACITOR, FXD, MICA 470 UUF, 5% TOL, 500 VDCW SAME AS C14	CM06F471J03	81349	912-2974-000
CAPACITUR, FXD, ELECTROLYTIC 0.0075 UF, 20% TOL, 75 VDCW	151D752X00 75 H2	56289	184-9062-040
CAPACITOR, FXD, ELECTROLYTIC 0.033 UF, 20% TOL, 100 VDCW	CS13BJ333M	81349	184-6326-580
CAPACITOR, FXD, ELECTROLYTIC 22 UF, 20% TOL, 50 VDCW SAME AS C5	CS13BG226M	81349	184-6257-000
CAPACITOR, FXD, ELECTROLYTIC 47 UF, 20% TOL, 35 VDCW	CS138F476M	81349	184-6231-000
CAPACITOR, FXD, ELECTROLYTIC 68 UF, 20% TOL, 30 VDCW	109D686X0030F2	56289	184-7782-000
SAME AS C1 CAPACITOR, FXD, CERAMIC 0.01 UF, 20% TOL, 500 VDCW	36C175A	01939	913-3013-000
CAPACITOR, FXD, ELECTROLYTIC 15 UF, 20% TOL, 35 VDCW	CS138F156M	81349	184-6222-000
SEMICONDUCTOR DEVICE, DIODE SEMICONDUCTOR DEVICE, DIODE	1N914 1N995	07688	353-2906-000 353-2042-000
SAME AS CR2 SAME AS CR2 SAME AS CR2 NOT USED			
SAME AS CR2 SAME AS CR1			
SEMICONDUCTOR DEVICE, DIODE	1N758	07688	353-2723-000

1N756

MANUFACTURER'S

MFR

CODE

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81349

72136

81349

81349

81349



CRI

CR2

CR3 CR4

CR5 CR6

CR7 CR8

CR9

CR10

CR11

SAME AS CR1

SEMICONDUCTOR DEVICE, DIODE

6-9

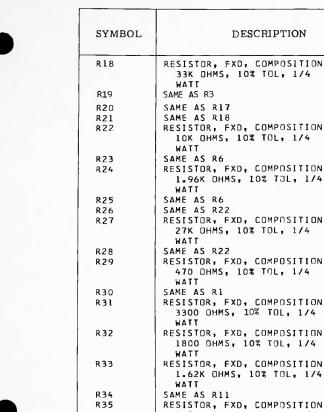
353-2719-000

07688

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
CR12	SAME AS CR11			
CR13	SAME AS CR1			
CR14	SAME AS CR1			
CR15	SAME AS CR1			
CR16	SEMICONDUCTOR DEVICE, DIODE	1N754A	07688	353-2981-000
	CHOKE, RF	3500-40	99800	240-0843-000
		5500-40	33000	240-0049-000
	5000 UH, 10% TOL	3500 33	00000	2/0 0020 000
L2	COIL, RF	3500-32	99800	240-0839-000
	1000 UH, 10% TOL			
L3	SAME AS L1			
QI	TRANSISTOR	2N3569	07688	352-0629-030
Q2	TRANSISTOR	2N3565	07688	352-0638-010
03	TRANSISTOR	2N718A	07688	352-0318-000
04	TRANSISTOR	2N3638A	07688	352-0636-020
Q5	SAME AS Q4			
Q6	TRANSISTOR	2N3563	07688	352-0630-010
Q7	SAME AS Q6			
08	SAME AS Q6			
Q9	TRANSISTOR	2N3646	07688	352-0680-010
Q10	SAME AS Q2	2113010	0.000	572 0000 010
011	TRANSISTOR	2N3643	07688	352-0712-020
		2113043	01008	352-0713-030
Q12	SAME AS Q11			
013	SAME AS Q11			N 10 2 4.12
014	SAME AS Q11			
R1	RESISTOR, VAR, CERAMIC	3069P-1-503	73138	382-0012-13
	50K DHMS, 10% TOL,			
	3/4 WATT			
R 2	RESISTOR, FXD, COMPOSITION	RC07GF472K	81349	745-0773-00
	4700 DHMS, 10% TDL, 1/4			
	WATT			
R3	RESISTOR, VAR, CERAMIC	30692-1-502	73138	382-0012-09
	5K OHMS, 10% TOL, 3/4 WATT	50051 1 502	19190	502-0012-05
R4		0007052028	012/0	7/5 000/ 00
K4	RESISTOR, FXD, COMPOSITION	RC07GF393K	81349	745-0806-00
	39K OHMS, 10% TOL, 1/4			
	WATT			
R5	RESISTOR, FXD, COMPOSITION	RC07GF563K	81349	745-0812-00
	56K DHMS, 10% TOL, 1/4			
	WATT			
R6	RESISTOR, FXD, COMPOSITION	RC07GF102K	81349	745-0749-00
	1K OHMS, 10% TOL, 1/4 WATT			
R7	RESISTOR, FXD, COMPOSITION	RC07GF682K	81349	745-0779-00
	6800 OHMS, 10% TOL, 1/4			
	WATT			
R8	RESISTOR, FXD, COMPOSITION	RC07GF821K	81349	745-0746-00
	820 DHMS, 10% TDL, 1/4	NCO TOTOLIN	1 01) 4)	145 0140 00
	WATT		1	
R9				
	SAME AS R4			
R10	SAME AS R2			
R11	RESISTOR, FXD, COMPOSITION	RC07GF392K	81349	745-0770-00
	3900 OHMS, 10% TOL, 1/4			
	WATT			
R12	RESISTOR, FXD, COMPOSITION	RC07GF391K	81349	745-0734-00
	390 DHMS, 10% TOL, 1/4			
	WATT			
R13	RESISTOR, FXD, COMPOSITION	RC07GF271K	81349	745-0728-00
	270 OHMS, 10% TOL, 1/4	NOOTOF2TIK	01347	142-0120-00
	WATT			
R14		01/ 5075317		
	RESISTOR, FXD, FILM	RN65D7501F	81349	705-7138-00
	7500 OHMS, 1% TOL,			
	1/2 WATT		1	
R15	RESISTOR, FXD, FILM	RN65D6191F	81349	705-7134-00
	6190 OHMS, 1% TOL, 1/2			
	WATT			
R16	RESISTOR, FXD, FILM	RN65D1781F	81349	705-7108-00
	1780 OHMS, 1% TOL, 1/2		01577	105 1100 00
	WATT			
R17	RESISTOR, FXD, FILM	RN65D2151F	81349	705-7112-00
	2.15K OHMS, 1% TOL, 1/2	KNOJUZIJIF	01349	100-1112-00
	WATT			
				1
	MALL			



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R36 R37 R38

R39

R40 841 R42 R43

R44

R45

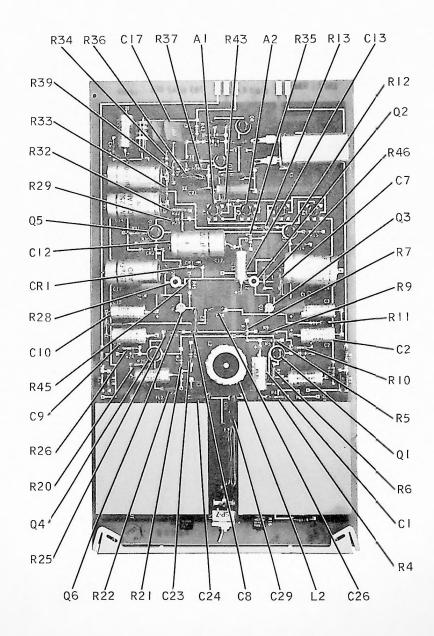
R46 R47

R48

R49

DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
RESISTOR, FXD, COMPOSITION 33K OHMS, 10% TOL, 1/4 WATT SAME AS R3	RC07GF333X	81349	745-0803-000
SAME AS R17 SAME AS R18 RESISTOR, FXD, COMPOSITION 10K OHMS, 10% TOL, 1/4 WATT SAME AS R6	RC07GF103K	81349	745-0785-000
SAME AS R6 RESISTOR, FXD, COMPOSITION 1.96K OHMS, 10% TOL, 1/4 WATT SAME AS R6	RN60D1961F	81349	705-6610-000
SAME AS R22 RESISTOR, FXD, COMPOSITION 27K DHMS, 10% TOL, 1/4 WATT	RCO7GF273K	81349	745-0800-000
SAME AS R22 RESISTOR, FXD, COMPOSITION 470 DHMS, 10% TOL, 1/4 WATT	RC07GF471K	81349	745-0737-000
SAME AS R1 RESISTOR, FXD, COMPOSITION 3300 OHMS, 10% TOL, 1/4 WATT	RC07GF332K	81349	745-0767-000
RESISTOR, FXD, COMPOSITION 1800 DHMS, 10% TOL, 1/4 WATT	RC07GF182K	81349	745-0758-000
RESISTOR, FXD, COMPOSITION 1.62K OHMS, 10% TOL, 1/4 WATT	RN60D1621F	81349	705-6606-000
SAME AS R11 RESISTOR, FXD, COMPOSITION 8200 OHMS, 10% TOL, 1/4 WATT SAME AS R8	RCO7GF822K	81349	745-0782-000
SAME AS R22 RESISTOR, FXD, COMPOSITION 220K OHMS, 10% TOL, 1/4 WATT	RCO7GF224K	81349	745-0833-000
RESISTOR, FXD, COMPOSITION 2700 OHMS, 10% TOL, 1/4 WATT	RCO7GF272K	81349	745-0764-000
RESISTOR, FXD, COMPOSITION 68 OHMS, 10% TOL, 1/4 WATT	RCO7GF680K	81349	745-0707-000
RESISTOR, FXD, COMPOSITION 33 OHMS, 10% TOL, 1/4 WATT SAME AS R22	RC07GF330K	81349	745-0695-000
RESISTOR, FXD, COMPOSITION 62K OHMS, 5% TOL, 1/8 WATT	RCR05G623J5	81349	745–1863–920
RESISTOR, FXD, COMPOSITION 180 OHMS, 10% TOL, 1/4 WATT	RC07GF181K	81349	745-0722-000
RESISTOR, FXD, COMPOSITION 180 OHMS, 10% TOL, 1/2 WATT	RCR20G181KS	81349	745-1321-000
RESISTOR, FXD, FILM 82.5K OHMS, 1% TOL, 1/4 WATT	RN60D8252F	81349	705-668 8- 000
RESISTOR, FXD, FILM 26.1 OHMS, 1% TOL, 1/4 WATT	RN60D2612F	81349	705-6664-000
RESISTOR, FXD, FILM 5110 OHMS, 1% TOL, 1/2 WATT	RN65D5111F	81349	705-7130-000
SAME AS R48			

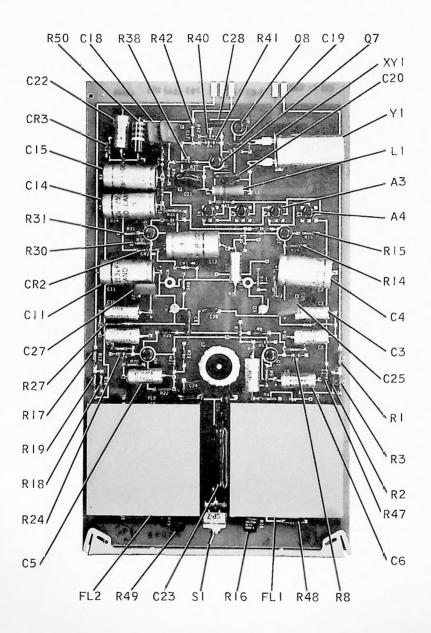
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R 50	RESISTOR, FXD, FILM 1330 OHMS, 1% TOL, 1/2 WATT	RN65D1331F	81349	705-7102-000
R51	SAME AS R32			
R52 S1	SAME AS R11 Switch, toggle	604	(0/10	244 5944 999
	SPST CONTACT ARRANGEMENT	SP4	60418	266-5064-000
52	SWITCH, TOGGLE SPDT CONTACT ARRANGEMENT	SP5	6 04 1 8	266-5065-000
Ŧ1	TRANSFORMER, AF OPEN FRAME, LEAD BROWN TO DRANGE 1.9K OHMS IMPEDANCE, LEAD YELLOW TO BLUE 600 OHMS IMPEDANCE, LEADS RED AND GREEN CENTER TAP, LEAD WHITE STATIC SHIELD	A16940	70674	677-0187-010
TP1 TP2	JACK, TIP WHITE SAME AS TP1	4877-125-9	17117	360-0434-100
TP3 TP4	SAME AS TP1 JACK, TIP BLACK	11J1043	82389	360-0434-010
				1



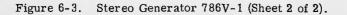
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Figure 6-3. Stereo Generator 786V-1 (Sheet 1 of 2).

6-13



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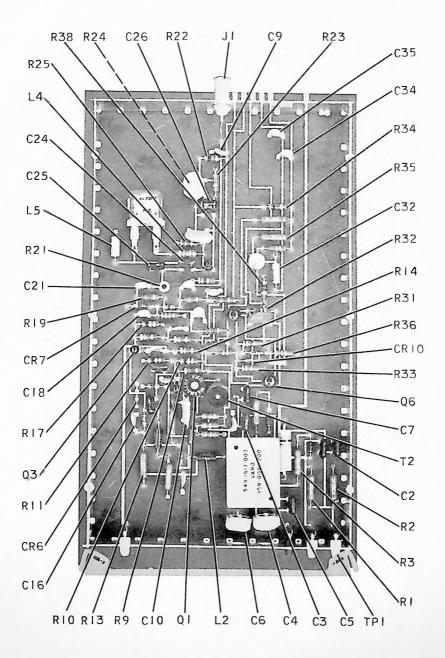
6-14

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	STERED GENERATOR 786V-1			772-533 <i>6</i> -0C1
<u>۵۱</u>	INTERGRATED CIRCUIT	SL3977	07263	351-7121-010
A2	INTERGRATED CIRCUIT	SL3979	07263	351-7121-030
43	SAME AS A2			
44 C 1	SAME AS AI CAPACITOR, FXD, ELECTROLYTIC	CS138F476M	81349	184-6231-000
	47 UF, 20% TOL, 35 VDC W			
C2 C3	SAME AS CI SAME AS CI			
C4	CAPACITOR, FXD, ELECTROLYTIC 1000 UF, PLUS 5C% MINUS 10%, 16 VDCW	C437ARE1000	73445	183-2355-090
C 5	SAME AS C1			
C6 C7	SAME AS C1 CAPACITOR, FXD, MICA	CM06F102J03	81349	912-3001-000
	1000 UUF, 5% TOL, 500 VDCW			
C8 C9	SAME AS C7 SAME AS C1			
C10	SAME AS CI			
C11	SAME AS C4			
C12	CAPACITJR, FXD, ELECTROLYTIC 250 UF, PLUS 50% MINUS 10%, 4C VDCW	C437 ARG250	73445	183-2355-150
C13	CAPACITOR, FXD, ELECTROLYTIC	CS13BF226 M	81349	184-6225-CCC
C14	22 UF, 20% TOL, 35 VDC W SAME AS C12			
C15	SAME AS C12			
C16	NOT USED	50154	54000	
C17	CAPACITJR, FXD, CERAMIC 2.2 UF, PLUS 80% MINUS 20%, 25 VDCH	5 C 1 5 A	56289	913-3812-000
C18	SAME AS C17	CHOC 53 30 103		
C19	CAPACITOR, FXD, MICA 33 UUF, 5% TOL, 500 VDCW	C MO5 E3 30 J03	81349	912-2780-000
C 20	CAPACITOR, FXD, MICA	CM06F821J03	81349	912-2995-000
C 2 1	820 UUF, 5% TOL, 5CO VDCW	CH0/ 5322 102	013/0	010 000 000
621	CAPACITOR, FXD, MICA 3300 UUF, 5% TOL, 500 VDCW	CM06F332J03	81349	912-3040-000
C22	SAME AS C1			
C23	CAPACITOR, FXD, MICA	C M08 F D303 F03	81349	912-3131-000
	30,000 UUF, 1% TOL, 500 VDCW			
C24	CAPACITOR, FXD, MICA	CM06FD392F03	81349	912-3044-000
car	3900 UUF, 1% TOL, 500 VDC W			
C25 C26	SAME AS C17 SAME AS C19			
C27	SAME AS C17			
C28	CAPACITOR, FXD, MICA	C M05 F470 J03	81349	912-2792-000
C 29	47 UUF, 5% TOL, 50C VDCW CAPACITOR, FXD, MICA	CM06F182G03	81349	912-3018-000
CD 2	1800 UUF, 2% TOL, 500 VOCW			
CR1 CR2	SEMICONDUCTOR DEVICE, DIODE SAME AS CR1	1 N914	07688	353-2906-000
CR3	SEMICONDUCTOR DEVICE, DIODE	1 N747 A	07688	353-2702-000
FL1	FILTER, LOW PASS	28-1240	06978	673-1167-010
FL2	15 KHZ CENTER FREQUENCY SAME AS FL1			
FL3	NETWORK, PRE-EMPHASIS	526-0016-010	95105	673-1158-010
FL4	FILTER, HIGH PASS	D11193	70674	673-1159-010
FL5	FILTER, LOW PASS	5220	17857	673-1162-020
L	CHOKE, RF 6800 UH, 5% TOL	MS90541-07	96906	240-2560-000
L2	INDUCTOR, RF			781-5329-001
01		20134.6.2	07600	353-0713-030
Q1	TRANSISTOR	2N3642	07688	352-0713-030

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
Q3	TRANSISTOR	2 N3153	12040	352-0776-010
C 4	SAME AS Q1			
Q5 Q6	SAME AS 01			
<u>9</u> 7	SAME AS Q3 SAME AS Q1			
QB	SAME AS Q1			
R1	RESISTOR, FXD, FILM 226 DHMS, 1% TOL, 1/8 WATT	RN55 D2260 F	81349	705-0965-000
R2 R3	SAME AS R1 RESISTOR, FXD, FILM 681 DHMS, 1% TOL, 1/8 WATT	RN55D6810F	81349	705-0988-000
R 4	RESISTOR, FXD, FILM 649 OHMS, 1% TOL, 1/8 WATT	RN55D6490F	81349	705-0987-00C
R5	RESISTOR, FXD, COMPOSITION 22K OHMS, 10% TOL, 1/4 WATT	RCO7GF223K	81349	745-0797-000
R6	RESISTOR, FXD, FILM 100 DHMS, 1% TOL, 1/8 WATT	RN5501000F	81349	705-0948-000
R7 R8	SAME AS R5 RESISTOR, FXD, COMPOSITION 3300 DHMS, 10 TOL, 1/4 WATT	RC07GF332K	81349	745-0767-000
R9	RESISTOR, FXD, FILM lok OHMS, 1% TOL, 1/8 WATT	8N55D1002F	81349	705-1C44-00C
R 10	RESISTOR, FXD, FILM 464 DHMS, 1% TDL, 1/8 WATT	RN5504640F	81349	705-0980-000
R 11	RESISTOR, FXD, FILM 61.9 DHMS, 1% TOL, 1/8 WATT	R N5 5 D6 1 R9 F	81349	705-0938-000
R12	RESISTOR, VAR, CERAMIC IX DHMS, 30% TOL, 1/2 WATT	62 PR1 K	73138	382-0008-070
813	RESISTOR, FXD, COMPOSITION 120X JHMS, 10% TOL, 1/4 WATT	RC07GF124K	81349	745-0824-000
214	RESISTOR, FXD, FILM 21.5K OHMS, 1% TOL,	RN55 D2 152 F	81349	705-106C-CCC
R 15	1/8 WATT RESISTOR, FXD, FILM 348 OHMS, 1% TOL, 1/8 WATT	RN55 D3 480 F	81349	705-0974-000
R16	RESISTOR, VAR, CERAMIC 20K DHMS, 30% TOL, 1/2 WATT	62PAR20K	73138	382-0008-450
R17	SAME AS R1	R N55 D2 150 F	81349	705-0964-000
R18	SAME AS R1			
R19	SAME AS R3	RN5507150F	81349	705-0989-000
R20 R21	SAME AS R4 SAME AS R5			
R22	SAME AS RE			
R23	SAME AS R5			
R24	SAME AS R8			
R25	SAME AS R9			
R26	SAME AS RIC			
R 27 R 28	SAME AS R11 SAME AS R12			
R29	SAME AS R12			
R 30	SAME AS R14			
R31	SAME AS R15			
R32	RESISTOR, FXD, FILM	RN60D6190F	81349	705-6586-0CC
833	619 OHMS, 1% TOL, 1/4 WATT RESISTOR, FXD, COMPOSITION 560 OHMS, 10% TOL, 1/4	RC07GF561K	81349	745-0740-000
834	WATTS RESISTOR, FXD, COMPOSITION	RCO7GF560K	81349	745-0704-000
R35	56 DHMS, 10% TOL, 1/4 WATT RESISTOR, FXD, COMPOSITION 470 DHMS, 10% TOL, 1/4 WATT	RC07GF471K	81349	745-0737-000
R36	RESISTOR, FXD, COMPOSITION 10K OHMS, 10% TOL, 1/4 WATT	RC07GF103K	81349	745-0785-COC

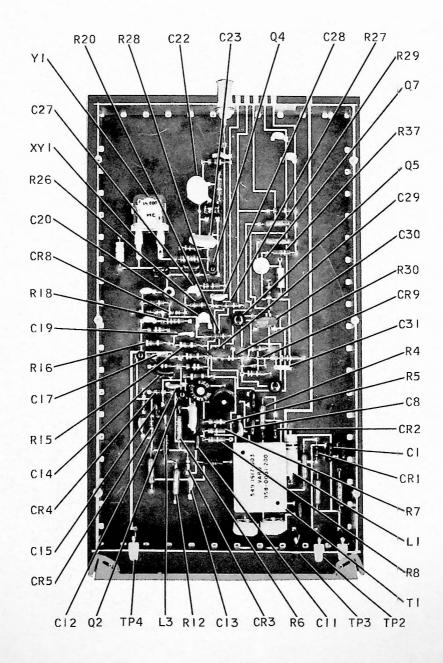
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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEI
R37	RESISTOR, FXD, COMPOSITION 68K OHMS, 10% TOL, 1/4	RC07 G F583 K	81349	745-0815-CCC
R 38	WATT RESISTOR, FXD, COMPOSITION 100 DHMS, 10% TOL, 1/4	RCO7GF101K	81349	745-0713-000
R 39	WATT RESISTOR, FXD, COMPOSITION 820 DHMS, 10% TOL, 174	8C07GF821K	81349	745-0746-0CC
K4 0	WATT RESISTOR, FXD, COMPOSITION 100K JHMS, 1C% TOL, 1/4	RCO7GF104K	81349	745-0221-00C
R41	WATT RESISTDR, FXD, COMPOSETION 3900 DHMS, 10% TOL, 174 WATT	RCO7GF392K	81349	745-C776-CCC
R42 R43	SAME AS R35 RESISTOR, FXD, COMPOSITION 680 DHMS, 10% TOL, 1/4 WATT	RC07GF681K	81349	745-0743-CCC
R44 R45	NOT USED RESISTOR, FXO, FILM 147 DHMS, 1% TOL, 1/8 WATT	RN5501470F	81349	705-0956-0CC
R46 R47 R48	SAME AS R45 SAME AS R35 RESISTOR, FXD, COMPOSITION 330 DHMS, 10% TOL, 1/4	RC07GF331K	81349	745-0731-000
R49	WATT RESISTOR, VAR, CERAMIC	62 PAR50	73138	382-0008-370
R 50	50 DHM S, 30% TOL, 1/2 WATT RESISTOR, FXD, COMPOSITION 180 DHMS, 10% TOL, 2 WATTS	RC42GF181K	81349	745-5621-000
S 1	SWITCH, TOGGLE SPOT CONTACT ARRANGEMENT	S P7	60418	266-5059-000
XYI	SOCKET, CRYSTAL 2 CONTACTS	8000 AG2	91506	292-0215-000
Υ1	CRYSTAL UNIT, QUARTZ	289-7095-020	71034	289-7095-02C



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Figure 6-4. AFC Discriminator (Sheet 1 of 2).



B502 530 Pb

Figure 6-4. AFC Discriminator (Sheet 2 of 2).

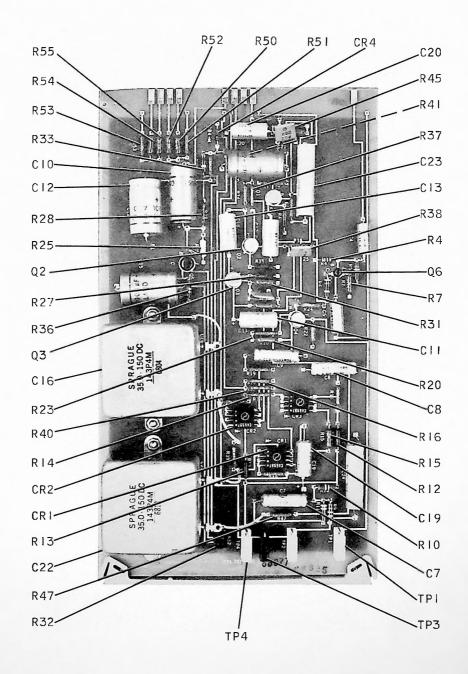
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	AFC DISCRIMINATOR			774-7097-001
CI	CAPACITOR, FXD, MICA 470 UUF, 5% TOL, 300 VOCW	DM15F471J03	72136	912-2864-000
C 2 C 3	SAME AS C1 CAPACITOR, FXD, MICA	CM05F221J03	81349	912-2840-000
C4	220 UUF, 5% TOL, 500 VDCW CAPACITOR, VAR, CERAMIC 4-12 UUF, 350 VDCW	3192-000-COP0-15	72982	917-1253-020
C 5	CAPACITOR, FXD, MICA 22 UUF, 5% TOL, 500 VDCW	CM05E220J03	81349	912-2768-000
C 6	CAPACITOR, VAR, CERAMIC 6-25 UUF, 350 VDCW	3192-000-C0P0-32	72982	917-1253-030
C7	CAPACITOR, FXD, MICA 75 UUF, 5% TOL, 500 VDCW	CM05ED750J03	81349	912-2807-00
C 8	CAPACITOR, FXD, CERAMIC 0.01 UF, PLUS 80% MINUS 20%, 100 VDCW	805-014X5V0103Z	72982	913-3680-000
C9 C10	SAMF AS C8 CAPACITOR, FXD, CERAMIC 0.1 UF, PLUS 80% MINUS 20%, 50 VDCW	33C41	56289	913-3886-000
C11 C12	SAME AS C5 SAME AS C8			
C13 C14	SAME AS C8 CAPACITOR, FXD, MICA	CM05E820J03	81349	912-2810-00
C15	82 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA 10 UUF, 5% TOL, 500 VDCW	DM15C100J01	72136	912-2753-00
C16	SAME AS C8			
C17 C18	SAME AS C8 CAPACITOR, FXD, CFRAMIC 1000 UUF, 20% TOL, 500 VDCW	4007341	01939	913-3009-00
C19 C20 C21 C22 C23	SAME AS C8 SAME AS C18 SAME AS C18 SAME AS C10 SAME AS C10			
C24	CAPACITOR, FXD, MICA 68 UUF, 5% TOL, 500 VDCW	CM05E680J03	81349	912-2804-00
C25	CAPACITOR, FXD, MICA 510 UUF, 5% TOL, 300 VCCW	CM15F511J03	72136	912-2867-00
C26 C27	CAPACITOR, FXD, MICA 180 UUF, 5% TOL, 500 VDCW SAME AS C18	CMC5F181J03	81349	912-2834-00
C28 C29	SAME AS C18 CAPACITOR, FXD, CERAMIC 3300 UUF, 20% TOL, 500 VDCW	CK624K332M	81349	913-1193-00
C30 C31	SAME AS C29 CAPACITOR, FXD, CERAMIC 10,000 UUF, 20% TOL, 200 VDCW	CK06CW103M	81349	913-4001-00
C 3 2	CAPACITOR, FXD, ELECTROLYTIC 2.2 UF, 10% TOL, 35 VDCH	CS128F225K	81349	184-6077-00
C33 C34	NOT USED SAME AS C18			
C35 CR1	SAME AS C18 SEMICONDUCTOR DEVICE, DIODE	FA2311U	07263	353-3593-01
CR2 CR3	SAME AS CRI SEMICONDUCTOR DEVICE, DIODE	1N270	07688	353-2018-00
CR4 Through	SAME AS CR3			
CR8 CR9 CR10	SEMICONDUCTOR DEVICE, DIODE	1N626	07688	353-2857-00
JI	SAME AS CR9 CONNECTOR, ELECTRICAL 1 CONTACT	UG1051U	80058	357-9210-00



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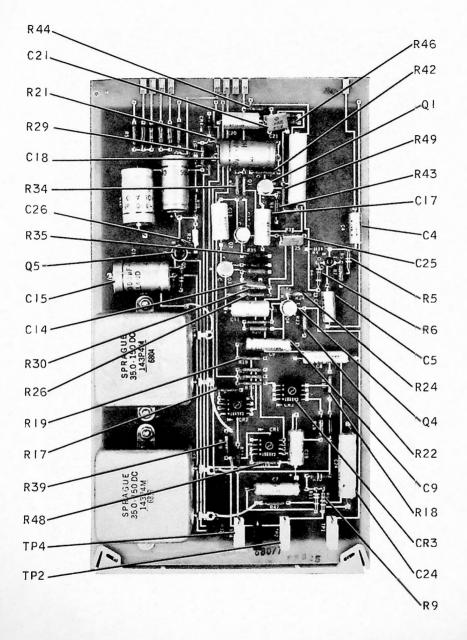
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
L1	CHOKE, RF	L T7 K209	81349	240-0193-000
L2	100 UH, 10% TOL COIL, RF	13950	03550	240-1996-110
L3	6.8 UH, 5% TOL Coil, RF	13949	03550	240-1996-100
L4	6.2 UH, 5% TOL COIL, RF 3.3 UH, 10% TOL	C7307	42190	240-0065-000
L5	COIL, RF 4.7 UH, 10% TOL	LT4K042	81349	240-0145-000
Q1 Q2	TRANSISTOR TRANSISTOR	2N708 2N4121	07688 07688	352-0322-000
Q3 Q4	SAME AS Q2 SAME AS Q2			
Q5 Q6	TRANSISTOR SAME AS Q5	2N3643	07688	352-0713-030
Q7 R1	TRANSISTOR RESISTOR, FXD, FILM 6810 OHMS, 1% FOL, 1/2 WATT	2N491 RN65D6811F	07688 81349	352-0116-000 705-7136-000
R2 R3	SAME AS R1 RESISTOR, FXD, FILM 110 OHMS, 1% TOL, 1/2 WATT	KN65D1100F	81349	705-7050-000
R4 R5	SAME AS R3 RESISTOR, FXD, COMPOSITION 150 OHMS, 10% TOL, 1/2 WATT	PC20GF151K	81349	745-1317-000
R6	RESISTOR, FXD, FILM 261 OHMS, 1% TOL, 1/2 WATT	RN65D2610F	81349	705-7068-000
R7	RESISTOR, FXD, COMPOSITION 1800 OHMS, 10% TOL, 1/2 WATT	RC20GF182K	81349	745-1363-000
R8 R9	SAME AS R7 RESISTOR, FXD, COMPOSITION 4700 OHMS, 10% TOL, 1/2 WATT	RC20GF472K	81349	745-1380-000
R10	RESISTOR, FXD, COMPOSITION 10K OHMS, 10% TOL, 1/2 WATT	RC20GF103K	81349	745-1394-000
R11 R12	SAME AS RIO RESISTOR, FXD, FILM 42.2 OHMS, 1% TOL, 1/2 WATT	RN65D42R2F	81349	705-7030-000
R13	RESISTOR, FXD, FILM 51-1 OHMS, 1% TOL, 1/2 HATT	RN65D51R1F	81349	705-7034-000
R14 R15	SAME AS R9 SAME AS R9			
R16 R17	SAME AS R9 SAME AS R10			
R18	RESISTOR, FXD, COMPOSITION 680 OHMS, 10% TOL, 1/2 WATT	RC20GF681K	81349	745-1345-000
R19	RESISTOR, FXD, COMPOSITION 2700 OHMS, 10% TOL, 1/2 WATT	KC20GF272K	81349	745-1370-000
R20 R21	SAME AS R19	100000		
	RESISTOR, VAR, CERMET 500 OHMS, 30% TOL, 1/2 WATT	62PR500	73138	382-0008-060
R22	RESISTOR, FXD, COMPOSITION 100 OHMS, 10% TOL, 1/2 WATT	RC20GF101K	81349	745-1310-000
R23	RESISTOR, FXD, COMPOSITION 8200 OHMS, 10% TOL, 1/2 WATT	RC20GFB22K	81349	745-1391-000
R24	RESISTOR, FXD, COMPOSITION 18K OHMS, 5% TOL, 1/2 WATT	RC20GF183J	81349	745-1404-000
R25	RESISTOR, FXD, COMPOSITION 6800 OHMS, 10% TOL, 1/2 WATT	RC20GF682K	81349	745-1387-000

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R26	SAME AS R19			
R27 R28	SAME AS R19 RESISTOR, FXD, COMPOSITION	RC20GF680K	81349	745-1303-000
R29	68 OHMS, 10% TOL, 1/2 WATT RESISTOR, FXD, FILM	RN65D1331F	81349	705-7102-000
	1.33K OHMS, 1% TOL, 1/2 WATT			
R 3 0	RESISTOR, FXD, COMPOSITION 15K OHMS, 10% TOL, 1/2 WATT	KC20GF153K	81349	745-1401-000
R 31	RESISTOR, FXD, COMPOSITION 3300 OHMS, 10% TOL, 1/2 WATT	RC20GF332K	81349	745-1373-000
R 32	SAME AS R30			
R33 R34	SAME AS R31 RESISTOR, FXD, COMPOSITION	RCZOGF102K	81349	745-1352-000
235	IK OHMS, 10% TOL, 1/2 WATT RESISTOR, FXD, FILM 56.2K OHMS, 1% TOL, 1/2	xN65D5622F	81349	705-7120-000
36	WATT RESISTOR, FXD, COMPOSITION 47K OHMS, 10% TOL, 1/2	RC20GF473K	81349	745-1422-000
837	WATT RESISTOR, FXD, COMPOSITION 220 OHMS, 10% TOL, 1/2	8C20GF221K	81349	745-1324-000
₹38	WATT RESISTOR, FXD, COMPOSITION 10 OHMS, 10% TOL, 1/2 WATT	RC20GF100K	81349	745-1268-000
F 1 F 2	TRANSFORMER TRANSFORMER			549-1617-003
TP1	JACK, TIP WHITE	SL490-458WHT	12615	306-2241-100
TP2 TP3	SAME AS TP1 JACK, TIP BLACK	SL490-458BLK	12615	306-2241-010
TP4 XY1	SAME AS TP1 SOCKET, CRYSTAL	8000463	0150/	202 2215 660
Y1	CRYSTAL UNIT, QUARTZ 14 MHZ FREQUENCY RANGE	8000AG2 S289-2743-00	91506 94148	292-0215-060 289-2743-000

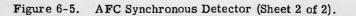


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Figure 6-5. AFC Synchronous Detector (Sheet 1 of 2).



B502 514 Pb



SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	AFC SYNCHRONOUS DETECTOR			774-7075-001
C1	NOT USED			
C2 C3	NOT USED NOT USED			
C4	CAPACITOR, FXD, ELECTROLYTIC	CS13BF156M	81349	184-6222-000
	15 UF, 20% TOL, 35 VDCW		UT J + J	104 0222 000
C5 C6	SAME AS C4 NOT USED			
C7	CAPACITOR, FXD, ELECTROLYTIC	CL37BL020MN3	81349	184-7929-000
	2 UF, 20% TOL, 75 VDCW	CEST DE CECTINS	01349	104 1929-000
83	CAPACITOR, FXD, ELECTROLYTIC	CL37BN5R5MN3	81.349	184-7918-000
C9	5.5 UF, 20% TOL, 30 VDCW SAME AS C8			
C10	CAPACITOR, FXD, ELECTROLYTIC	C437ARE1000	73445	183-2355-090
	1000 UF, PLUS 50% MINUS 10%,			105 2555 070
C11	16 VDCW	0000000000		
-11	CAPACITOR, FXD, ELECTROLYTIC 100 UF, 20% TOL, 20 VDCW	CS13BE107M	81.349	184-6190-000
C12	SAME AS C10			
C13	SAME AS C11	5015		
C14	CAPACITOR, FXD, CERAMIC 0.68 UF, PLUS 80% MINUS 20%,	5C12A	56289	913-3809-000
	25 VDCW			
C15	SAME AS C10			
C16	CAPACITOR, FXD, PAPER 35 UF, 20% TOL, 150 VDCW	143P4M	56289	951-2003-000
C17	SAME AS C11			
C18	CAPACITOR, FXD, ELECTROLYTIC	C437ARG250	81349	183-2355-150
	250 UF, PLUS 50% MINUS 10%,			
C19	40 VDCW CAPACITOR, FXD, ELECTROLYTIC	CS13BC227M	81349	184-6154-000
	220 UF, 20% TOL, 10 VDCW	COLDECENT	010+0	101 0131 000
C20	SAME AS C11		1.0	1
C21 C22	SAME AS C14 SAME AS C16			
C23	CAPACITOR, FXD, ELECTROLYTIC	S13691	56289	183-2151-000
	100 UF, PLUS 100% MINUS 10%,			
C24	10 VDCW CAPACITOR, FXD, ELECTROLYTIC	CI 27002000012	012(0	10/ 7750 000
CL I	20 UF, 20% TOL, 25 VDCW	CL37BG200MN3	81349	184-7258-000
C25	SAME AS C14			
C26	CAPACITOR, FXD, MICA	CM05F101J03	81349	912-2816-000
CR1	100 UUF, 5% TOL, 500 VDCW SEMICONDUCTOR DEVICE, DIODE	FA4000	07263	353-3271-000
CR2	SAME AS CR1		0.205	555 5211 000
CR3	SAME AS CR1			
CR4 Q1	SEMICONDUCTOR DEVICE, DIODE TRANSISTOR	1N718 2N1613	07688	353-2734-000
Q2	SAME AS Q1	2111013	01000	352-0349-000
Q3	SAME AS Q1			
Q4 Q5	SAME AS Q1 TRANSISTOR	28/250	07242	352-0773-030
Q6	TRANSISTOR	2N4250 2N3565	07263 07688	352-0773-030
R1	NOT USED			
R2 R3	NOT USED NOT USED			
R4	RESISTOR, FXD, COMPOSITION	RC07GF334K	81349	745-0839-000
	330K OHMS, 10% TOL, 1/4			
R5	WATT RESISTOR, FXD, COMPOSITION	RC20GF273K	81349	745-1412-000
	27K OHMS, 10% TOL, 1/2	AUZUGF213K	01349	145-1412-000
	WATT			
R6	RESISTOR, FXD, COMPOSITION	RC20GF472K	81349	745-1380-000
	4700 OHMS, 10% TOL, 1/2 WATT			
R7	RESISTOR, FXD, FILM	RN60C2870F	81349	705-6260-000
	287 OHMS, 1% TOL, 1/8 WATT			
R8 R9	RESISTOR, FXD, COMPOSITION	RC20GF184K	81349	745-1447-000
	180K OHMS, 10% TOL, 1/2	AULUGI IGHN	01347	143 1447-000

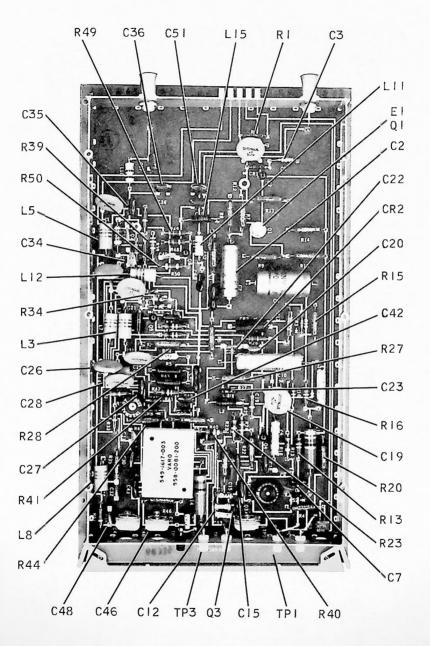
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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R10	RESISTOR, FXD, COMPOSITION 120k OHMS, 10% TOL, 1/2 WATT	RC20GF124K	81349	745-1440-000
R11 R12	SAME AS R5 RESISTOR, FXD, FILM 100K OHMS, 1% TOL, 1/4 WATT	RN60D1003F	81349	705-6692-000
R13 R14	SAME AS R12 RESISTOR, FXD, F1LM 9090 OHMS, 1% TOL, 1/4	RN60D9091F	81349	705-6642-000
R15	WATT RESISTOR, FXD, FILM 8250 OHMS, 1% TOL, 1/4 WATT	RN60D8251F	81349	705-6640-000
R16	RESISTOR, FXD, FILM 5620 OHMS, 1% TOL, 1/4 WATT	RN60D5621F	81349	705-6632-000
R17 R18	SAME AS R14 RESISTOR, FXD, FILM 2870 DHMS, 1% TOL, 1/4 WATT	RN60D2871F	81349	705-6618-000
R19 R20	SAME AS R18 RESISTOR, FXD, FILM 1470 OHMS, 1% TOL, 1/4	RN60D1471F	81349	705-6604-000
R21	WATT RESISTOR, FXD, COMPOSITION 820 OHMS, 10% TOL, 1/2 WATT	RC20GF821K	81349	745-1349-000
R22 R23	SAME AS R2O RESISTOR, FXD, FILM 38.3K OHMS, 1% TOL, 1/4	RN60D3832F	81349	705-6672-000
R 24	WATT RESISTOR, FXD, FILM 19.6K DHMS, 1% TOL, 1/4	RN60D1962F	81349	705-6658-000
R25	WATT RESISTOR, FXD, FILM 31.6K OHMS, 1% TOL, 1/4 WATT	RN60D3162F	81349	705-6668-000
R26	RESISTOR, FXD, FILM 7500 OHMS, 1% TOL, 1/4 WATT	RN60D7501F	81349	705-6638-000
R27	RESISTOR, FXD, FILM 422 OHMS, 1% TOL, 1/4 WATT	RN60D4220F	81349	705-6578-000
R28	RESISTOR, FXD, FILM 2610 OHMS, 1% TOL, 1/4 WATT	RN60D2611F	81349	705-6616-000
R29	RESISTOR, FXD, FILM 3160 OHMS, 1% TOL, 1/4 WATT	RN60D3161F	81349	705-6620-000
R30	RESISTOR, FXD, FILM 196K OHMS, 1% TOL, 1/4 WATT	RN60D1963F	81349	705-6706-000
R31	RESISTOR, FXD, FILM 14.7K, 1% TOL, 1/4 WATT	RN60D1472F	81349	705-6652-000
R32	RESISTOR, VAR 1K OHMS, 30% TOL, 1/2 WATT	62PAR1K	73138	382-0008-410
R33 R34	RESISTOR, FXD, COMPOSITION IK DHMS, 10% TOL, 1/2 WATT SAME AS R26	RC20GF102K	81349	745-1352-000
R35 R36	SAME AS R27 RESISTOR, FXD, COMPOSITION 10K OHMS, 10% TOL, 1/2 WATT	RC20GF103	81349	745-1394-000
R37 R38	SAME AS R30 SAME AS R31			

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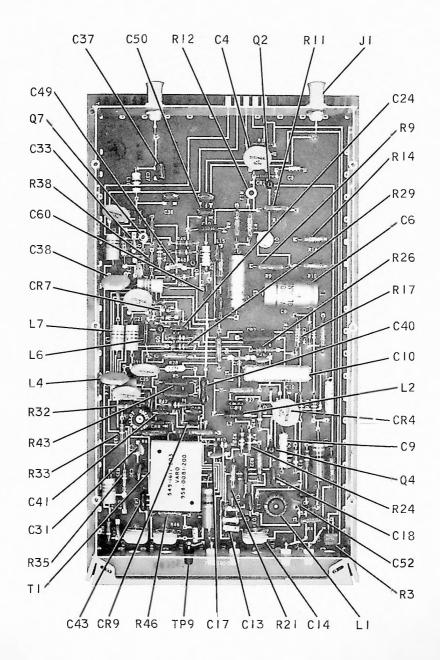
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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R39	RESISTOR, FXO, FILM 34.8K OHMS, 1% TOL, 1/4 WATT	RN60D3482F	81349	705-6670-000
R40	RESISTOR, FXD, FILM 3480 OHMS, 1% TOL, 1/4	RN60D3481F	81349	705-6622-000
R41	WATT RESISTOR, FXD, FILM 2150 OHMS, 1% TOL, 1/4 WATT	RN60D2151F	81349	705-6612-000
R42	SAME AS R26			
R43	SAME AS R27			
R44	RESISTOR, FXD, FILM 10K OHMS, 1% TOL, 1/4 WATT	RN60D1002F	81349	705-6644-000
R45	RESISTOR, FXD, FILM 178K OHMS, 1% TOL, 1/4 WATT	RN60D1783F	81349	705-6704-000
R46	SAME AS R31			
R47	SAME AS R39			
R48	RESISTOR, FXD, FILM 4640 OHMS, 1% TOL, 1/4 WATT	RN60D4641F	81349	705-6628-000
R49 R50	SAME AS R39	DIVODEDDIE	017/0	705 ((20.000
K 90	RESISTOR, FXD, F1LM 5110 OHMS, 1% TOL, 1/4 WATT	RN60D5111F	81349	705-6630-000
R51	RESISTOR, FXD, FILM 1330 OHMS, 1% TOL, 1/4 WATT	RN60D1331F	81349	705-6602-000
R52	SAME AS R50			
R53	SAME AS R51			
R54 R55	SAME AS R50 SAME AS R50			
TP1	JACK, TIP	4877-125-9	17117	360-0434-100
TP2	WHITE SAME AS TO:			
TP3	SAME AS TP1 JACK, TIP BLACK	4877-125-0	17117	360-0434-010
TP4	SAME AS TP1			

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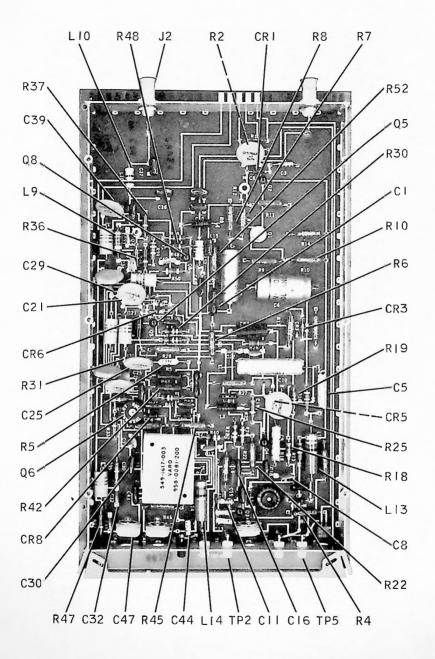
B502 539 Pb

Figure 6-6. FM Modulator (Sheet 1 of 3).



B502 539 Pb

Figure 6-6. FM Modulator (Sheet 2 of 3).



B502 539 Pb

Figure 6-6. FM Modulator (Sheet 3 of 3).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	FM MODULATOR			774-7160-001
C 1	CAPACITOR, FXD, MICA	CM06F222J03	81349	912-3025-000
C 2	2200 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, ELECTROLYTIC 100 UF, PLUS 50% MINUS 10%	C437ARG100	73445	183-2355-140
C3	40 VDCW CAPACITUR, FXD, ELECTROLYTIC	CS128F105K	81349	184-6071-000
C4	1 UF, 10% TOL, 35 VDCW CAPACITOR, FXD, CERAMIC 0.1 UF, PLUS 80% MINUS	33C41	56289	913-3886-000
C 5	20%, 50 VDCW CAPACITOR, FXD, ELECTROLYTIC 1 UF, PLUS 50% MINUS 15%,	CL25BQ010SP3	81349	184-7227-000
C 6	150 VDCW CAPACITOR, FXD, ELECTROLYTIC 250 UF, PLUS 503 MINUS	C437ARG250	73445	183-2355-150
C 7	10%, 40 VDCW CAPACITOR, FXD, MICA 100 UUF, 5% TOL, 500 VDCW	CM05F101J03	81349	912-2816-000
C 8	CAPACITUR, FXD, CERAMIC 0.01 UF, PLUS 80% MINUS	805-014X5V0103Z	72982	913-3680-000
C 9	20%, 100 VDCW CAPACITOR, FXD, ELECTROLYTIC 0.5 UF, PLUS 50% MINUS	CL378LOR5MN3	81349	184-7220-000
C10	15% TOL, 75 VDCW Capacitor, FXD, electrolytic 20 UF, Plus 75% Minus 20%,	CL378G200MN3	81349	184-7258-000
C11	25 VDCW CAPACITOR, FXD, CERAMIC 20 UUF, 2% TOL, 500 VDCW	CC205H200G	81349	916-0362-000
C12 C13	SAME AS C11 CAPACITOR, FXD, CERAMIC	CC20UJ100C	81349	916-0412-000
C14	10 UUF, 1/4% TOL, 500 VDCW CAPACITOR, VAR, CERAMIC 6-25 UUF, 350 VDCW	3192-000C0P0-32R	72982	917-1253-030
C15 C16	CAPACITOR, FXD, MICA 68 UUF, 5% TOL, 500 VDCW SAME AS C15	CMOSE680J03	81349	912-2804-000
C17 C18	SAME AS C8 CAPACITUR, FXD, MICA 220 UUF, 5% TOL, 500 VDCW	CM05F221J03	81349	912-2840-000
C19 C20 C21 C22	SAME AS C4 SAME AS C8 SAME AS C4 SAME AS C4			
C23	SAME AS C8 CAPACITOR, FXD, MICA 10 UUF, 5% TOL, 500 VDCW	OM15C100J01	72136	912-2753-000
C24	CAPACITOR, FXD, MICA 82 UUF, 5% TOL, 500 VDCW	CM05E820J03	81349	912-2810-000
C25 C26 C27	SAME AS C4 SAME AS C4 CAPACITOR, FXD, MICA	CM05E220J03	81349	912-2768-000
C28 C29 C30	22 UUF, 5% TOL, 500 VDCW SAME AS C4 SAME AS C8 SAME AS C15			
C31	CAPACITOR, FXD, CERAMIC 1000 UUF, 20% TOL, 1000 VDCW	CK604W102M	81349	913-1186-000
C 32 C 33	SAME AS CB Same as CB			
C34 C35	SAME AS C8 CAPACITOR, FXD, MICA	CM05E390J03	81349	912-2786-000
C36	39 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA 150 UUF, 5% TOL, 500 VDCW	CM05F151J03	81349	912-2828-000

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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
C37	SAME AS C36			
C38	SAME AS C4			
C39	SAME AS C4			
C40	CAPACITOR, FXD, MICA	CM06F561J03	81349	912-2983-000
C41	560 UUF, 5% TOL, 500 VDCW Capacitor, FXD, Mica	CM05E330J03	81349	912-2780-000
641	33 UUF, 5% TOL, 500 VDCW	01052550305	01040	512-2100-000
C42	SAME AS C41			
C43	SAME AS C18			
C44	SAME AS C11			
C45	NOT USED			
C46	CAPACITOR, VAR, CERAMIC	3192-000C0P0-20R	72982	917-1253-020
C47	4-12 UUF, 300 VDCW SAME AS C14			
C48	SAME AS CR			
C49	SAME AS C8			
C50	SAME AS C27			
651	CAPACITOR, FXD, MICA	CM05F271J03	81349	912-2846-000
	270 UUF, 5% TOL, 500 VDCW			
C52	SEMIDONDUCTOR DEVICE, DIODE	1N5146A	07688	922~6095-160
C53 THROUGH C59	NOT USED			
C60	SAME AS C24			
CRI	SEMICONDUCTOR DEVICE, DIODE	1N751A	07688	353-2710-000
CR2	SEMICONDUCTOR DEVICE, DIODE	SV3173	03877	353-3304-000
CR3	SEMICONDUCTOR DEVICE, DIODE	1N626	07688	353-2857-000
CR4	SEMICONDUCTOR DEVICE, DIODE SAME AS CR4	1N270	07688	353-2018-000
CR5 CR6	SAME AS CR4			
CR7	SAME AS CR4			
CR8	SEMICONDUCTOR DEVICE, DIODE	FA2311U	07263	353-3593-010
CR9	SAME AS CR8			
E1 J1	HEATSINK Connector, electrical 1 contact	2220B UG1051U	13103 09408	352-9950-060 357-9210-000
JZ	SAME AS JI			
L1	INDUCTOR, RF	1666-1734	81815	240-1529-010
	2.25 UH, 2% TOL			
L2	COIL, RF	13950	03550	240-1996-110
L3	6.8 UH, 5% TOL			
LS	COIL, RF 220 UH, 5% TOL	85217	99800	240-0198-000
L4	SAME AS L3			
L5	SAME AS L3			
16	COIL, RF	13949	03550	240-1996-100
	6.2 UH, 5% TOL			
L7	SAME AS L3			
L8 L9	SAME AS L3 Coil, rf	13958	03550	2/0 100/ 050
.,	3.3 UH, 5% TOL	13930	03550	240-1996-050
L10	COIL, RF	LT4K034	81349	240-0062-000
	1 UH, 10% TOL			2.2 0002 000
L11	SELECT L11 FROM THE			
	FOLLOWING LIST			
L11	COIL, RF	LT4K036	B1349	240-0063-000
	1-5 UH, 10% TOL INDUCTOR, RF	526-6700 00	05105	2/0 1520 000
	2.4 UH, 2% TOL	526-6799-00	95105	240-1529-000
	COIL, RF	LT7K208		240-0192-000
	82 UH, 10% TOL			
L12	SAME AS L3			
L13	COIL, RF	LT7K208	81349	240-0192-000
L14	82 UH, 10% TOL Coil, RF	1742275	04004	240-2715 240
	56 UH, 10% TOL	LT4K275	96906	240-2715-340
L15	COIL, RF	13956	13946	240-1996-070
	4.3 UH, 10% TOL			
Q1	TRANSISTOR			



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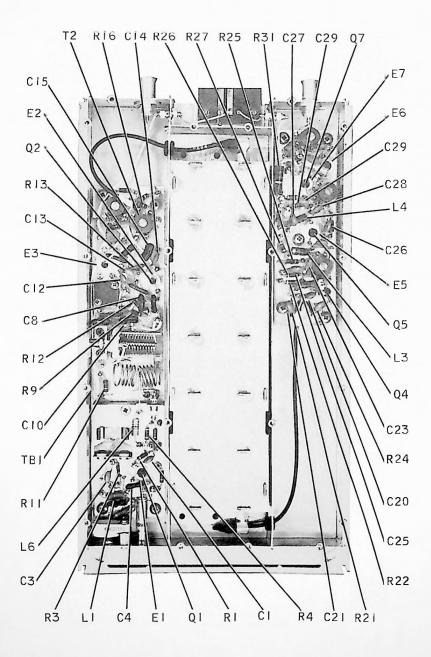
02 TRANSISTOR 2N4121 03 SAME AS 02 2N708 04 SAME AS 02 2N708 05 SAME AS 02 2N708 06 TRANSISTOR, FXD, FILM RN60D12 07 SAME AS 02 2N708 08 SAME AS 02 2N708 09 SAME AS 02 2N708 01 L2.1K 0HMS, 12 TOL, 1/4 RN60D12 12.1K 0HMS, 103 TOL, 1/2 WATT RC20GF4 8 SOO OHMS, 103 TOL, 1/2 WATT R4 RESISTOR, FXD, FILM RN65D34 348 0HMS, 13 TOL, 1/2 WATT RN65D34 3480 OHMS, 13 TOL, 1/2 WATT RN65D34 3480 OHMS, 13 TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D34 3480 OHMS, 13 TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D34 3480 OHMS, 13 TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 10K OHMS, 13 TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 10K OHMS, 13 TOL, 1/2 WATT	212F	07688 04713	352-0743-01
03 SAME AS 02 04 SAME AS 02 05 SAME AS 02 06 TRANSISTOR 07 SAME AS 02 08 SAME AS 02 09 SAME AS 02 01 SAME AS 02 02 R1 RESISTOR, FXD, FILM RN60D12 12.1K 0HMS, 1% TOL, 1/4 WATT RC20GF6 030 OHMS, 10% TOL, 1/2 WATT R2 RESISTOR, FXD, FILM RC20GF6 040 OHMS, 10% TOL, 1/2 WATT R3 RESISTOR, FXD, FILM RN65D34 3480 0HMS, 1% TOL, 1/2 WATT RN65D34 3480 0HMS, 1% TOL, 1/2 WATT RN65D34 3480 0HMS, 1% TOL, 1/2 WATT RN65D4 4220 0HMS, 1% TOL, 1/2 WATT RN65D4 4220 0HMS, 1% TOL, 1/2 WATT RN65D1 100 HMS, 1% TOL, 1/2 WATT RN65D1 110 K 0HMS, 1% TOL, 1/2 WATT RN65D1 1210 0HMS, 1% TOL, 1/2 WATT RN65D1 1210 0HMS, 1% TOL, 1	212F		352-0743-01
Q4 SAME AS Q2 Q5 SAME AS Q2 Q5 SAME AS Q2 Q6 TRANSISTOR 2N708 Q7 SAME AS Q6 Q8 SAME AS Q6 Q8 Q8 SAME AS Q6 Q8 SAME AS Q6 Q8 Q8 SAME AS Q6 Q8 SAME AS Q6 Q8 Q1 L2.1K OHMS, 1% TOL, 1/4 RN60D12 12.1K OHMS, 10% TOL, 1/2 WATT R2 RESISTOR, FXD, COMPOSITION RC20GF6 680 OHMS, 10% TOL, 1/2 WATT R3 RESISTOR, FXD, FILM RC20GF6 500 OHMS, 30% TOL, 1/2 WATT R4 RESISTOR, FXD, FILM RN65D34 348 OHMS, 1% TOL, 1/2 WATT R5 SELECT R5 FROM THE FOLLOWING LIST RN65D34 J348 OHMS, 1% TOL, 1/2 WATT RN65D34 A220 OHMS, 1% TOL, 1/2 WATT RN65D34 A220 OHMS, 1% TOL, 1/2 WATT RN65D14 R5ISTOR, FXD, FILM RN65D14 100 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 IOC OHMS, 1% TOL, 1/2	212F	04713	
05 SAME AS 02 2N708 06 TRANSISTOR 2N708 07 SAME AS 02 R R1 RESISTOR, FXD, FILM RN60D12 12.1K 0HMS, 1% TOL, 1/4 WATT R2 RESISTOR, FXD, COMPOSITION RC20GF4 680 0HMS, 10% TOL, 1/2 WATT R3 RESISTOR, VAR, CERAMIC 62PAR50 900 0HMS, 30% TOL, 1/2 WATT R4 RESISTOR, FXD, FILM RN65D34 3480 0HMS, 1% TOL, 1/2 WATT R5 SELECT R5 FROM THE FOLLOWING LIST R1 RESISTOR, FXD, FILM RN65D34 3480 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D44 4220 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 1210 0HMS, 1% TOL, 1/2 WATT R6 RESISTOR, FXD, FILM RN65D14 1210 0HMS, 1% TOL, 1/2 WATT R1 RESISTOR, FXD, FILM RN65D14 1210 0HMS, 1% TOL, 1/2 WATT R6 RESISTOR, FXD, FILM </td <td>212F</td> <td>04713</td> <td></td>	212F	04713	
Q6TRANSISTOR SAME AS Q62N708Q7SAME AS Q6R1Q8SAME AS Q2R1RESISTOR, FXD, FILM 12.1K OHMS, 1% TOL, 1/4RN60D12WATTRESISTOR, FXD, COMPOSITION 680 OHMS, 10% TOL, 1/2RC20GF4R3RESISTOR, FXD, COMPOSITION 	212F	04713	
Q7 SAME AS Q6 Q8 SAME AS Q2 R1 RESISTOR, FXD, FILM RN60D12 Q1 12.1k OHMS, 1% TOL, 1/4 RN60D12 WATT RESISTOR, FXD, COMPOSITION RC20GF4 G80 OHMS, 10% TOL, 1/2 WATT RC20GF4 R2 RESISTOR, FXD, COMPOSITION RC20GF4 G80 OHMS, 10% TOL, 1/2 WATT RC20GF4 R3 RESISTOR, FXD, COMPOSITION RC20GF4 G80 OHMS, 10% TOL, 1/2 WATT RN65D34 R4 RESISTOR, FXD, FILM RN65D34 S10 OHMS, 1% TOL, 1/2 WATT RN65D34 R5 SELECT R5 FROM THE FOLLOWING RIST RESISTOR, FXD, FILM RN65D34 S400 OHMS, 1% TOL, 1/2 WATT RN65D34 S400 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D34 S400 OHMS, 1% TOL, 1/2 RN65D34 S110 OHMS, 1% TOL, 1/2 WATT RN65D34 S10L, 1/2 RN65D34 S10 OHMS, 1% TOL, 1/2 <thw< td=""><td>212F</td><td>04/15</td><td>252 0222 00</td></thw<>	212F	04/15	252 0222 00
08 SAME AS 02 RN60D12 R1 RESISTOR, FXD, FILM RN60D12 12.1K 0HMS, 1% T0L, 1/4 WATT RN60D12 R2 RESISTOR, FXD, COMPOSITION RC20GF4 680 0HMS, 10% T0L, 1/2 WATT RC20GF4 R3 RESISTOR, VAR, CERAMIC 62PAR50 500 0HMS, 30% T0L, 1/2 WATT RN65D34 348 0HMS, 1% T0L, 1/2 WATT RN65D34 348 0HMS, 1% T0L, 1/2 WATT RN65D34 348 0HMS, 1% T0L, 1/2 WATT R5 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM RN65D34 3480 0HMS, 1% T0L, 1/2 WATT RESISTOR, FXD, FILM RN65D4 4220 0HMS, 1% T0L, 1/2 WATT RESISTOR, FXD, FILM RN65D14 4220 0HMS, 1% T0L, 1/2 RN65D14 10K 0HMS, 1% T0L, 1/2 RN65D14 10K 0HMS, 1% T0L, 1/2 RN65D14 10K 0HMS, 1% T0L, 1/2 RN65D14 100K 0HMS, 1% T0L, 1/2 RN65D14 100K 0HMS, 1% T0L, 1/2 RN65D14 100K 0HMS, 1% T0L, 1/2	212F	L	352-0322-00
R1 RESISTOR, FXD, FILM RN60D12 12.1K 0HMS, 1% TOL, 1/4 WATT RC20GF6 600 0HMS, 10% TOL, 1/2 WATT RC20GF6 R3 RESISTOR, FXD, COMPOSITION RC20GF6 600 0HMS, 10% TOL, 1/2 WATT RC30GF6 R4 RESISTOR, VAR, CERAMIC 62PAR50 S00 0HMS, 30% TOL, 1/2 WATT RN65D34 348 0HMS, 1% TOL, 1/2 WATT RN65D34 348 0HMS, 1% TOL, 1/2 WATT RN65D34 348 0HMS, 1% TOL, 1/2 WATT RN65D34 3480 0HMS, 1% TOL, 1/2 WATT RN65D34 4220 0HMS, 1% TOL, 1/2 WATT RN65D34 RESISTOR, FXD, FILM RN65D34 YATT RESISTOR, FXD, FILM RN65D14 YATT RESISTOR, FXD, FILM RN65D14 YATT R6515TOR, FXD, FILM RN65D14 YATT R1 RESISTOR, FXD, FILM	212F		
12.1K OHMS, 1% TOL, 1/4 WATT R2 RESISTOR, FXD, COMPOSITION RC20GF6 680 OHMS, 10% TOL, 1/2 WATT R R3 RESISTOR, VAR, CERAMIC 62PAR50 S00 OHMS, 30% TOL, 1/2 WATT R R4 RESISTOR, FXD, FILM RN65D34 348 OHMS, 1% TOL, 1/2 WATT RN65D34 3480 OHMS, 1% TOL, 1/2 WATT R5 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM RN65D34 3480 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D44 4220 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 4220 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 10K OHMS, 1% TOL, 1/2 WATT R6 RESISTOR, FXD, FILM RN65D14 1210 OHMS, 1% TOL, 1/2 WATT R7 RESISTOR, FXD, FILM RN65D14 100K OHMS, 1% TOL, 1/2 WATT R8 RESISTOR, FXD, FILM RN65D14 100K OHMS, 1% TOL, 1/	212F	01240	705 4440 00
WATT RESISTOR, FXD, COMPOSITION RC20GF4 680 OHMS, 103 TOL, 1/2 WATT RC20GF4 WATT RSISTOR, VAR, CERAMIC 62PAR50 S00 OHMS, 303 TOL, 1/2 WATT RATT R3 RESISTOR, FXD, FILM RN65D34 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM RN65D34 S480 OHMS, 13 TOL, 1/2 WATT RN65D34 S480 OHMS, 13 TOL, 1/2 WATT RN65D34 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM RN65D34 3480 OHMS, 13 TOL, 1/2 WATT RN65D34 3480 OHMS, 13 TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D4 4220 OHMS, 13 TOL, 1/2 WATT RN65D4 WATT RESISTOR, FXD, FILM RN65D1 100 HMS, 13 TOL, 1/2 WATT R6 RESISTOR, FXD, FILM RN65D1 100 HMS, 13 TOL, 1/2 WATT R7 RESISTOR, FXD, FILM RN65D1 100 HMS, 13 TOL, 1/2 WATT R8 RESISTOR, FXD, FILM RN65D1 13.3K OHMS, 13 TOL, 1/2 WATT RN65D1 13.3		81349	705-6648-00
R2 RESISTOR, FXD, COMPOSITION 680 OHMS, 10% TOL, 1/2 WATT RC20GF4 R3 RESISTOR, VAR, CERAMIC 500 OHMS, 30% TOL, 1/2 WATT G2PAR50 R4 RESISTOR, FXD, FILM 348 OHMS, 1% TOL, 1/2 WATT R5 RN65D34 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM A3480 OHMS, 1% TOL, 1/2 WATT RN65D34 R5 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM A3480 OHMS, 1% TOL, 1/2 WATT RN65D34 R65 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM RESISTOR, FXD, FILM R100 KOHMS, 1% TOL, 1/2 WATT R1 RN65D10 R6 RESISTOR, FXD, FILM RESISTOR, FXD, FILM R100 KOHMS, 1% TOL, 1/2 WATT RN65D10 R10 RESISTOR, FXD, FILM R10 RESISTOR, FXD, FILM R10 RESISTOR, FXD, FILM R11 RESISTOR, FXD, FILM R11 RESISTOR, FXD, FILM R11 RESISTOR, FXD, FILM R11 RESISTOR, FXD, FILM R12 RESISTOR, FXD, FILM R13 RESISTOR, FXD, FILM R13 RESISTOR, FXD, FILM R14 RN65D2 COMMS, 1% TOL, 1/2 WATT RN65D2 R100 OHMS, 1% TOL, 1/2 WATT R14 RESISTOR, FXD, FILM R14 RN65D1 R2650 OHMS, 1% TOL, 1/2 WATT RN65D1 R00 OHMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM R16 RN65D1 R2670 OHMS, 1% TOL, 1/2 WATT RN65D1 R2670 OHMS, 1% TOL, 1/2 WATT			
680 0HMS, 10% TOL, 1/2 WATT R3 RESISTOR, VAR, CERAMIC 62PAR50 S00 0HMS, 30% TOL, 1/2 WATT RN65D34 R4 RESISTOR, FXO, FILM RN65D34 S48 0HMS, 1% TOL, 1/2 WATT RN65D34 R5 SELECT R5 FROM THE FOLLOWING LIST R5 SELECT R5 FROM THE FOLLOWING LIST R6SISTOR, FXD, FILM RN65D34 3480 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D44 4220 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 4220 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 10K 0HMS, 1% TOL, 1/2 WATT R6 RESISTOR, FXD, FILM RN65D14 10K 0HMS, 1% TOL, 1/2 WATT RN65D14 10K 0HMS, 1% TOL, 1/2 WATT RN65D14 10K 0HMS, 1% TOL, 1/2 WATT RN65D14 1210 0HMS, 1% TOL, 1/2 WATT RN65D14 1210 0HMS, 1% TOL, 1/2 WATT RN65D14 136 0HMS, 1% TOL, 1/2 WATT	681K	81349	745-1345-00
WATT 62PAR50 R3 RESISTOR, VAR, CERAMIC 62PAR50 S00 OHMS, 303 TOL, 1/2 WATT R R4 RESISTOR, FXO, FILM RN65D34 348 OHMS, 13 TOL, 1/2 WATT RN65D34 R5 SELECT R5 FROM THE FOLLOWING LIST LIST RESISTOR, FXD, FILM RN65D34 3480 OHMS, 13 TOL, 1/2 WATT RN65D34 WATT RESISTOR, FXD, FILM RN65D34 3480 OHMS, 13 TOL, 1/2 WATT RN65D34 WATT RESISTOR, FXD, FILM RN65D44 4220 OHMS, 13 TOL, 1/2 WATT RN65D14 RESISTOR, FXD, FILM RN65D14 106 OHMS, 13 TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 100K OHMS, 13 TOL, 1/2 WATT RN65D14 R1210 RESISTOR, FXD, FILM RN65D14 RN65D14 R1210 RESISTOR, FXD, FILM RN65D14		01517	115 1515 00
R3 RESISTOR, VAR, CERAMIC 62PAR50 S00 OHMS, 30T TOL, 1/2 WATT R4 RESISTOR, FXD, FILM RN65D34 348 OHMS, 1% TOL, 1/2 WATT RN65D34 R5 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM RN65D34 3480 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D44 4220 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D44 4220 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 4220 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 4220 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D14 1210 OHMS, 1% TOL, 1/2 WATT R6 RESISTOR, FXD, FILM RN65D14 100K OHMS, 1% TOL, 1/2 WATT RN65D14 13.6 OHMS, 1% TOL, 1/2 WATT			
500 OHMS, 30% TOL, 1/2 WATT NATT R4 RESISTOR, FXD, FILM RN65D34 348 OHMS, 1% TOL, 1/2 WATT RN65D34 R5 SELECT R5 FROM THE FOLLOWING LIST RN65D34 R5 SELECT R5 FROM THE FOLLOWING LIST RN65D34 R65ISTOR, FXD, FILM RN65D34 3480 OHMS, 1% TOL, 1/2 RN65D34 3480 OHMS, 1% TOL, 1/2 RN65D44 4220 OHMS, 1% TOL, 1/2 RN65D44 4220 OHMS, 1% TOL, 1/2 RN65D5 5110 OHMS, 1% TOL, 1/2 RN65D14 R65ISTOR, FXD, FILM RN65D14 1210 OHMS, 1% TOL, 1/2 WATT RN65D14 R7 RESISTOR, FXD, FILM RN65D14 100K OHMS, 1% TOL, 1/2 WATT RN65D14 R8 RESISTOR, FXD, FILM RN65D14 R10 RESISTOR, FXD, FILM RN65D14 R11 RESISTOR, FXD, FILM RN65D14 R12 MATT RN65D14 R13 RESISTOR, FXD, FILM RN65D14 R14 RESISTOR, FXD, FILM RN65D5 S110 OHMS, 1% TOL, 1/2 MATT </td <td>00</td> <td>73138</td> <td>382-0008-40</td>	00	73138	382-0008-40
WATT Resistor, FXD, FILM RN65D34 R5 SELECT R5 FROM THE FOLLOWING LIST RN65D34 R5 SELECT R5 FROM THE FOLLOWING LIST RN65D34 R65ISTOR, FXD, FILM RN65D34 3480 OHMS, 1% TOL, 1/2 RN65D34 R65ISTOR, FXD, FILM RN65D34 3480 OHMS, 1% TOL, 1/2 RN65D34 WATT RESISTOR, FXD, FILM RN65D34 R4220 OHMS, 1% TOL, 1/2 WATT RN65D34 R4220 OHMS, 1% TOL, 1/2 WATT RN65D34 R6SISTOR, FXD, FILM RN65D14 4220 OHMS, 1% TOL, 1/2 RN65D14 IOK OHMS, 1% TOL, 1/2 WATT RN65D14 100K OHMS, 1% TOL, 1/2 RN65D14 R6 RESISTOR, FXD, FILM RN65D14 RN65D14 IOK OHMS, 1% TOL, 1/2 WATT RN65D14 R7 RESISTOR, FXD, FILM RN65D14 NATT R8 RESISTOR, FXD, FILM RN65D14 R8 RESISTOR, FXD, FILM RN65D14 R10 RESISTOR, FXD, FILM RN65D14 R11 RESISTOR, FXD, FILM RN65D14			
348 OHMS, 1% TOL, 1/2 WATT R5 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM RN65034 3480 OHMS, 1% TOL, 1/2 WATT RN65044 WATT RESISTOR, FXD, FILM RN65044 4220 OHMS, 1% TOL, 1/2 WATT RN6505 S110 OHMS, 1% TOL, 1/2 WATT RN65014 RESISTOR, FXD, FILM RN65014 RN65014 10K OHMS, 1% TOL, 1/2 WATT RN65014 R6 RESISTOR, FXD, FILM RN65014 10K OHMS, 1% TOL, 1/2 WATT RN65014 R7 RESISTOR, FXD, FILM RN65014 100K OHMS, 1% TOL, 1/2 WATT RN65014 R8 RESISTOR, FXD, FILM RN65014 R9 RESISTOR, FXD, FILM RN65014 R10 RESISTOR, FXD, FILM RN65014 R11 RESISTOR, FXD, FILM RN6505 S110 OHMS, 1% TOL, 1/2 WATT RN6505 S110 OHMS, 1% TOL, 1/2 WATT RN6505 S110 OHMS, 1% TOL, 1/2 WATT RN6505 S110 OHM			
348 OHMS, 1% TOL, 1/2 WATT R5 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM RN65034 3480 OHMS, 1% TOL, 1/2 WATT RN65044 WATT RESISTOR, FXD, FILM RN65044 4220 OHMS, 1% TOL, 1/2 WATT RN6505 S110 OHMS, 1% TOL, 1/2 WATT RN65014 RESISTOR, FXD, FILM RN65014 RN65014 10K OHMS, 1% TOL, 1/2 WATT RN65014 R6 RESISTOR, FXD, FILM RN65014 10K OHMS, 1% TOL, 1/2 WATT RN65014 R7 RESISTOR, FXD, FILM RN65014 100K OHMS, 1% TOL, 1/2 WATT RN65014 R8 RESISTOR, FXD, FILM RN65014 R9 RESISTOR, FXD, FILM RN65014 R10 RESISTOR, FXD, FILM RN65014 R11 RESISTOR, FXD, FILM RN6505 S110 OHMS, 1% TOL, 1/2 WATT RN6505 S110 OHMS, 1% TOL, 1/2 WATT RN6505 S110 OHMS, 1% TOL, 1/2 WATT RN6505 S110 OHM	480F	81349	705-7074-00
R5 SELECT R5 FROM THE FOLLOWING LIST RESISTOR, FXD, FILM RN65D34 3480 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D43 4220 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D43 4220 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D13 5110 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D13 10K OHMS, 1% TOL, 1/2 WATT RN65D13 1210 OHMS, 1% TOL, 1/2 WATT RN65D14 100K OHMS, 1% TOL, 1/2 RN65D14 13.3K OHMS, 1% TOL, 1/2 RN65D15 110 RESISTOR, FXD, FILM RN65D2 13 RESISTOR, FXD, COMPOSITION RC20GF			
LIST RESISTOR, FXD, FILM RN65D34 3480 OHMS, 1% TOL, 1/2 WATT RN65D44 4220 OHMS, 1% TOL, 1/2 WATT RN65D44 4220 OHMS, 1% TOL, 1/2 WATT RN65D5 S110 OHMS, 1% TOL, 1/2 WATT RN65D14 RESISTOR, FXD, FILM RN65D14 RN65D14 10K OHMS, 1% TOL, 1/2 WATT RN65D14 R6 RESISTOR, FXD, FILM RN65D14 10K OHMS, 1% TOL, 1/2 WATT RN65D14 R7 RESISTOR, FXD, FILM RN65D14 100K OHMS, 1% TOL, 1/2 WATT RN65D14 R8 RESISTOR, FXD, FILM RN65D14 NATT RN65D14 RN65D14 R10 RESISTOR, FXD, FILM RN65D14 R11 RESISTOR, FXD, FILM RN65D14 R12 RESISTOR, FXD, FILM RN65D15 S110 OHMS, 1% TOL, 1/2 WATT RN65D2 R11 RESISTOR, FXD, FILM RN65D2 S110 OHMS, 1% TOL, 1/2 WATT RN65D2 R11 RESISTOR, FXD, COMPOSITION <td< td=""><td></td><td></td><td></td></td<>			
3480 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D42 4220 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D5 5110 OHMS, 1% TOL, 1/2 RN65D12 wATT RESISTOR, FXD, FILM RN65D12 wATT RESISTOR, FXD, FILM RN65D12 10K OHMS, 1% TOL, 1/2 WATT RN65D12 1210 OHMS, 1% TOL, 1/2 WATT RN65D12 1210 OHMS, 1% TOL, 1/2 WATT RN65D12 1210 OHMS, 1% TOL, 1/2 RN65D12 1210 OHMS, 1% TOL, 1/2 RN65D12 1210 OHMS, 1% TOL, 1/2 RN65D12 100K OHMS, 1% TOL, 1/2 RN65D12 100K OHMS, 1% TOL, 1/2 RN65D12 100K OHMS, 1% TOL, 1/2 WATT RN65D12 13.3K OHMS, 1% TOL, 1/2 WATT RN65D12 13.3K OHMS, 1% TOL, 1/2 WATT RN65D12 13.3K OHMS, 1% TOL, 1/2 WATT RN65D2 9 RESISTOR, FXD, FILM RN65D2 11 RESISTOR, FXD, FILM RN65D2 13.3K OHMS, 1% TOL, 1/2 WATT RN65D2 13 RESISTOR, FXD, FILM RN65D2 13 RESISTOR, FXD, FILM			
3480 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D42 4220 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D5 5110 OHMS, 1% TOL, 1/2 RN65D12 wATT RESISTOR, FXD, FILM RN65D12 wATT RESISTOR, FXD, FILM RN65D12 10K OHMS, 1% TOL, 1/2 WATT RN65D12 1210 OHMS, 1% TOL, 1/2 WATT RN65D12 1210 OHMS, 1% TOL, 1/2 WATT RN65D12 1210 OHMS, 1% TOL, 1/2 RN65D12 1210 OHMS, 1% TOL, 1/2 RN65D12 1210 OHMS, 1% TOL, 1/2 RN65D12 100K OHMS, 1% TOL, 1/2 RN65D12 100K OHMS, 1% TOL, 1/2 RN65D12 100K OHMS, 1% TOL, 1/2 WATT RN65D12 13.3K OHMS, 1% TOL, 1/2 WATT RN65D12 13.3K OHMS, 1% TOL, 1/2 WATT RN65D12 13.3K OHMS, 1% TOL, 1/2 WATT RN65D2 9 RESISTOR, FXD, FILM RN65D2 11 RESISTOR, FXD, FILM RN65D2 13.3K OHMS, 1% TOL, 1/2 WATT RN65D2 13 RESISTOR, FXD, FILM RN65D2 13 RESISTOR, FXD, FILM	481F	81349	705-7122-00
WATT RESISTOR, FXD, FILM RN65D4; 4220 0HMS, 1% TOL, 1/2 WATT RN65D4; 4220 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D1; 100 0HMS, 1% TOL, 1/2 WATT RN65D1; 100 0HMS, 1% TOL, 1/2 WATT R6 RESISTOR, FXD, FILM RN65D1; 1210 0HMS, 1% TOL, 1/2 WATT RN65D1; 1210 0HMS, 1% TOL, 1/2 R7 RESISTOR, FXD, FILM RN65D1; 100K 0HMS, 1% TOL, 1/2 RN65D1; 100K 0HMS, 1% TOL, 1/2 R8 RESISTOR, FXD, FILM RN65D1; 100K 0HMS, 1% TOL, 1/2 RN65D1; 100K 0HMS, 1% TOL, 1/2 R10 RESISTOR, FXD, FILM RN65D1; 13.3K 0HMS, 1% TOL, 1/2 WATT RN65D1; 13.3K 0HMS, 1% TOL, 1/2 R11 RESISTOR, FXD, FILM RN65D1; 13.3K 0HMS, 1% TOL, 1/2 RN65D1; 13.3K 0HMS, 1% TOL, 1/2 R11 RESISTOR, FXD, FILM RN65D1; 13.3K 0HMS, 1% TOL, 1/2 RN65D1; 13.3K 0HMS, 1% TOL, 1/2 R11 RESISTOR, FXD, FILM RN65D2 S0K, 30% TOL, 1/2 R05D5; 5110 0HMS, 10% TOL, 1/2 R13 RESISTOR, FXD, FILM RC20GF R065D2 S0K, 30% TOL, 1/2 R05D2 WATT R14 RESISTOR, FXD, FILM RN65D1 10.6K 0HMS, 1% TOL, 1/2 R05D1 R15 RESISTOR, FXD, FILM RN65D1 10.6K 0HM			
4220 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65DS 5110 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D1 10K 0HMS, 1% TOL, 1/2 WATT R6 RESISTOR, FXD, FILM RN65D1 1210 0HMS, 1% TOL, 1/2 WATT R7 RESISTOR, FXD, FILM RN65D1 100K 0HMS, 1% TOL, 1/2 WATT R7 RESISTOR, FXD, FILM RN65D1 100K 0HMS, 1% TOL, 1/2 WATT R8 RESISTOR, FXD, FILM RN65D1 7.5K 0HMS, 1% TOL, 1/2 WATT R9 RESISTOR, FXD, FILM RN65D1 13.6 0HMS, 1% TOL, 1/2 WATT RN65D1 R10 RESISTOR, FXD, FILM RN65D1 13.3K 0HMS, 1% TOL, 1/2 WATT RN65D1 R11 RESISTOR, FXD, FILM RN65D5 S110 0HMS, 1% TOL, 1/2 WATT RN65D5 S110 0HMS, 1% TOL, 1/2 WATT RN65D2 2070			
4220 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65DS 5110 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D1 10K 0HMS, 1% TOL, 1/2 WATT R6 RESISTOR, FXD, FILM RN65D1 1210 0HMS, 1% TOL, 1/2 WATT R7 RESISTOR, FXD, FILM RN65D1 100K 0HMS, 1% TOL, 1/2 WATT R7 RESISTOR, FXD, FILM RN65D1 100K 0HMS, 1% TOL, 1/2 WATT R8 RESISTOR, FXD, FILM RN65D1 7.5K 0HMS, 1% TOL, 1/2 WATT R9 RESISTOR, FXD, FILM RN65D1 13.6 0HMS, 1% TOL, 1/2 WATT RN65D1 R10 RESISTOR, FXD, FILM RN65D1 13.3K 0HMS, 1% TOL, 1/2 WATT RN65D1 R11 RESISTOR, FXD, FILM RN65D5 S110 0HMS, 1% TOL, 1/2 WATT RN65D5 S110 0HMS, 1% TOL, 1/2 WATT RN65D2 2070	221F	81349	705-7126-00
WATT RESISTOR, FXD, FILM RN65DS 5110 OHMS, 1% TOL, 1/2 RN65D1 910 OHMS, 1% TOL, 1/2 RN65D1 10K OHMS, 1% TOL, 1/2 WATT RN65D1 1210 OHMS, 1% TOL, 1/2 RN65D1 100K OHMS, 1% TOL, 1/2 RN65D1 13.3K OHMS, 1% TOL, 1/2 RN65D1 13.3K OHMS, 1% TOL, 1/2 RN65D5 110 OHMS, 1% TOL, 1/2 RN65D5 110 OHMS, 1% TOL, 1/2 RN65D5 111 RESISTOR, FXD, FILM RN65D5 112 RESISTOR, FXD, GOMPOSITION RC20GF 100K OHMS, 10% TOL, 1/2 RN65D2 2870 OHMS, 1% TOL, 1/2 RN65D2 2870 OHMS, 1% TOL, 1/2 RN65D1 10.6K OHMS, 1% T		01517	
5110 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D1 10K 0HMS, 1% TOL, 1/2 WATT RN65D1 1210 0HMS, 1% TOL, 1/2 RN65D1 100K 0HMS, 1% TOL, 1/2 RN65D1 13.3K 0HMS, 1% TOL, 1/2 RN65D1 13.3K 0HMS, 1% TOL, 1/2 RN65D1 13.3K 0HMS, 1% TOL, 1/2 RN65D5 5110 0HMS, 1% TOL, 1/2 RN65D2 2070 0HMS, 1% TOL, 1/2			
5110 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RESISTOR, FXD, FILM R6 RESISTOR, FXD, FILM R1210 0HMS, 1% TOL, 1/2 WATT R7 R5SISTOR, FXD, FILM R0K 0HMS, 1% TOL, 1/2 WATT R7 R5SISTOR, FXD, FILM R0K 0HMS, 1% TOL, 1/2 WATT R8 RESISTOR, FXD, FILM R0K 0HMS, 1% TOL, 1/2 WATT R8 RESISTOR, FXD, FILM R0K 0HMS, 1% TOL, 1/2 WATT R10 RESISTOR, FXD, FILM R10 RESISTOR, FXD, FILM R11 RESISTOR, FXD, FILM R11 RESISTOR, FXD, FILM R11 RESISTOR, FXD, FILM R12 WATT R13 RESISTOR, FXD, FILM R14 RESISTOR, FXD, FILM R15 RESISTOR, FXD, FILM R14 RESISTOR, FXD, FILM R15 RESISTOR, FXD, FILM R16 RESISTOR, FXD, FILM <td< td=""><td>111F</td><td>81349</td><td>705-7130-00</td></td<>	111F	81349	705-7130-00
RESISTOR, FXD, FILM RN65D1 10K 0HMS, 1% TOL, 1/2 WATT RN65D1 1210 0HMS, 1% TOL, 1/2 RN65D1 WATT RSISTOR, FXD, FILM RN65D1 R7 RESISTOR, FXD, FILM RN65D1 100K 0HMS, 1% TOL, 1/2 WATT RN65D1 R8 RESISTOR, FXD, FILM RN65D1 7.5K 0HMS, 1% TOL, 1/2 WATT RN65D3 816 0HMS, 1% TOL, 1/2 WATT RN65D1 818 RESISTOR, FXD, FILM RN65D3 816 0HMS, 1% TOL, 1/2 WATT RN65D1 813 RESISTOR, FXD, FILM RN65D5 9110 0HMS, 1% TOL, 1/2 WATT RN65D5 8111 RESISTOR, FXD, FILM RN65D5 9110 0HMS, 1% TOL, 1/2 WATT RN65D5 8120 50K, 30% TOL, 1/2 WATT RN65D2 813 RESISTOR, FXD, FILM RN65D2 90.4K OHMS, 1% TOL, 1/		0	
10K 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D1 1210 0HMS, 1% TOL, 1/2 WATT RN65D1 R7 RESISTOR, FXD, FILM RN65D1 100K 0HMS, 1% TOL, 1/2 WATT RN65D1 R8 RESISTOR, FXD, FILM RN65D7 7.5K 0HMS, 1% TOL, 1/2 WATT RN65D7 7.5K 0HMS, 1% TOL, 1/2 WATT RN65D3 8 RESISTOR, FXD, FILM RN65D3 316 0HMS, 1% TOL, 1/2 WATT RN65D1 8 RESISTOR, FXD, FILM RN65D1 13.3K 0HMS, 1% TOL, 1/2 WATT RN65D1 811 RESISTOR, FXD, FILM RN65D5 5110 0HMS, 1% TOL, 1/2 WATT RN65D5 8110 0HMS, 1% TOL, 1/2 WATT RN65D5 812 RESISTOR, FXD, FILM RN65D5 90K 0HMS, 1% TOL, 1/2 WATT RN65D2 813 RESISTOR, FXD, COMPOSITION RC20GF 100K 0HMS, 1% TOL, 1/2 WATT RN65D1 1100 K DHMS, 1% TOL, 1/2 WATT RN65D1 10.6 K HMS, 1% TOL, 1/2 WATT R14 <td></td> <td></td> <td></td>			
10K 0HMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM RN65D1 1210 0HMS, 1% TOL, 1/2 WATT RN65D1 R7 RESISTOR, FXD, FILM RN65D1 100K 0HMS, 1% TOL, 1/2 WATT RN65D1 R8 RESISTOR, FXD, FILM RN65D7 7.5K 0HMS, 1% TOL, 1/2 WATT RN65D7 7.5K 0HMS, 1% TOL, 1/2 WATT RN65D3 8 RESISTOR, FXD, FILM RN65D3 316 0HMS, 1% TOL, 1/2 WATT RN65D1 8 RESISTOR, FXD, FILM RN65D1 13.3K 0HMS, 1% TOL, 1/2 WATT RN65D1 811 RESISTOR, FXD, FILM RN65D5 5110 0HMS, 1% TOL, 1/2 WATT RN65D5 8110 0HMS, 1% TOL, 1/2 WATT RN65D5 812 RESISTOR, FXD, FILM RN65D5 90K 0HMS, 1% TOL, 1/2 WATT RN65D2 813 RESISTOR, FXD, COMPOSITION RC20GF 100K 0HMS, 1% TOL, 1/2 WATT RN65D1 1100 K DHMS, 1% TOL, 1/2 WATT RN65D1 10.6 K HMS, 1% TOL, 1/2 WATT R14 <td>002F</td> <td>81349</td> <td>705-7144-00</td>	002F	81349	705-7144-00
R6 RESISTOR, FXD, FILM RN65D1: 1210 0HMS, 1% TOL, 1/2 WATT R7 RESISTOR, FXD, FILM RN65D1: 100K 0HMS, 1% TOL, 1/2 WATT R8 RESISTOR, FXD, FILM RN65D7: 7.5K 0HMS, 1% TOL, 1/2 WATT R9 RESISTOR, FXD, FILM RN65D3 316 0HMS, 1% TOL, 1/2 WATT R10 RESISTOR, FXD, FILM RN65D1: 13.3K 0HMS, 1% TOL, 1/2 WATT R11 RESISTOR, FXD, FILM RN65D5 5110 0HMS, 1% TOL, 1/2 WATT R11 RESISTOR, FXD, FILM RN65D5 5110 0HMS, 1% TOL, 1/2 WATT R12 RESISTOR, FXD, FILM RN65D5 5110 0HMS, 1% TOL, 1/2 WATT R13 RESISTOR, FXD, COMPOSITION RC20GF 100K 0HMS, 10% TOL, 1/2 WATT R14 RESISTOR, FXD, FILM RN65D2 2070 0HMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM RN65D1 10.6K 0HMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM RN65D1 10.6K 0HMS, 1% TOL,		01517	105 1211 0
1210 0HMS, 1% TOL, 1/2 WATT R7 RESISTOR, FXD, FILM RN65D1 100K 0HMS, 1% TOL, 1/2 WATT RN65D1 NATT RESISTOR, FXD, FILM RN65D1 R8 RESISTOR, FXD, FILM RN65D7 7.5K 0HMS, 1% TOL, 1/2 WATT RN65D1 89 RESISTOR, FXD, FILM RN65D3 316 0HMS, 1% TOL, 1/2 WATT RN65D1 13.3K 0HMS, 1% TOL, 1/2 WATT R10 RESISTOR, FXD, FILM RN65D1 13.3K 0HMS, 1% TOL, 1/2 WATT RN65D5 S110 0HMS, 1% TOL, 1/2 WATT R11 RESISTOR, FXD, FILM RN65D5 S110 0HMS, 1% TOL, 1/2 WATT R12 RESISTOR, FXD, CERAMIC 62PR50 S0K, 30% TOL, 1/2 WATT RC20GF 100K 0HMS, 10% TOL, 1/2 WATT R13 RESISTOR, FXD, FILM RN65D2 2070 0HMS, 1% TOL, 1/2 WATT R14 RESISTOR, FXD, FILM RN65D1 10.6K 0HMS, 1% TOL, 1/2 WATT RN65D1 10.6K 0HMS, 1% TOL, 1/2 WATT RN65D1 10.6K 0HMS, 1% TOL, 1/2 WATT RN65D1 10.6K 0HMS	211E	81349	705-7100-00
WATT RASISTOR, FXD, FILM RN65D10 100K 0HMS, 1% TOL, 1/2 WATT RN65D10 88 RESISTOR, FXD, FILM RN65D7 7.5K 0HMS, 1% TOL, 1/2 WATT RN65D3 89 RESISTOR, FXD, FILM RN65D3 316 0HMS, 1% TOL, 1/2 WATT RN65D11 810 RESISTOR, FXD, FILM RN65D11 13.3K 0HMS, 1% TOL, 1/2 WATT RN65D11 13.3K 0HMS, 1% TOL, 1/2 WATT RN65D5 110 RESISTOR, FXD, FILM RN65D5 13.3K 0HMS, 1% TOL, 1/2 WATT RN65D5 8110 RESISTOR, FXD, FILM RN65D5 9110 OHMS, 1% TOL, 1/2 WATT 812 RESISTOR, FXD, CERAMIC 62PR501 50K, 30% TOL, 1/2 WATT S0K, 30% TOL, 1/2 WATT 813 RESISTOR, FXD, COMPOSITION RC20GF 100K DHMS, 1% TOL, 1/2 WATT RN65D1 2870 OHMS, 1% TOL, 1/2 WATT RN65D1 19.6K OHMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM RN65D1 19.6K OHMS, 1% TOL, 1/2 WATT <td></td> <td></td> <td>105 1100 0</td>			105 1100 0
R7 RESISTOR, FXD, FILM RN65D1 100K 0HMS, 1% TOL, 1/2 WATT R8 RESISTOR, FXD, FILM RN65D7 7.5K 0HMS, 1% TOL, 1/2 RN65D3 316 0HMS, 1% TOL, 1/2 WATT RN65D1 13.3K 0HMS, 1% TOL, 1/2 RN65D1 13.3K 0HMS, 1% TOL, 1/2 RN65D5 5110 0HMS, 10% TOL, 1/2 RN65D2 50K, 30% TOL, 1/2 RN65D2 2070 0HMS, 1% TOL, 1/2 RN65D2 2070 0HMS, 1% TOL, 1/2 RN65D1 10.6 KHMS, 1% TOL, 1/2 RN65D1 10.6 KHMS, 1% TOL, 1/2 WATT RN65D1 10.6 KHMS, 1% TOL, 1/2 WATT RN65D1			
100K 0HMS, 1% TOL, 1/2 MATT R8 RESISTOR, FXD, FILM 7.5K 0HMS, 1% TOL, 1/2 WATT R9 RESISTOR, FXD, FILM R10 RESISTOR, FXD, FILM R10 RESISTOR, FXD, FILM R11 RESISTOR, FXD, FILM R12 RESISTOR, FXD, FILM R13 RESISTOR, FXD, CERAMIC SOK, 30% TOL, 1/2 WATT RC20GF 100K DHMS, 1% TOL, 1/2 WATT R13 RESISTOR, FXD, FILM RN65D2 2070 OHMS, 1% TOL, 1/2 WATT R14 RESISTOR, FXD, FILM RN65D1 10.6K OHMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM RN65D1 10.6K OHMS, 1% TOL, 1/2 WATT RN65D1 10.6K OHMS, 1% TOL, 1/2 WATT RN65D1 10.6K OHMS, 1	003F	81349	705-7192-00
WATT RESISTOR, FXD, FILM RN65D7 7.5K OHMS, 1% TOL, 1/2 WATT RN65D3 89 RESISTOR, FXD, FILM RN65D3 316 OHMS, 1% TOL, 1/2 WATT RN65D1 13.3K OHMS, 1% TOL, 1/2 WATT RN65D1 13.3K OHMS, 1% TOL, 1/2 WATT RN65D1 13.3K OHMS, 1% TOL, 1/2 WATT R11 RESISTOR, FXD, FILM RN65D5 5110 OHMS, 1% TOL, 1/2 WATT R12 RESISTOR, VAR, CERAMIC 62PR50 50K, 30% TOL, 1/2 WATT RC20GF 100K OHMS, 10% TOL, 1/2 RC20GF 100K OHMS, 13% TOL, 1/2 WATT R14 RESISTOR, FXD, FILM RN65D2 2070 OHMS, 13% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM RN65D1 19.6K OHMS, 13% TOL, 1/2 WATT RN65D1 19.6K OHMS			
7.5K OHMS, 1% TOL, 1/2 NATT R9 RESISTOR, FXD, FILM RN65D3 316 OHMS, 1% TOL, 1/2 WATT RN65D1 13.3K OHMS, 1% TOL, 1/2 RN65D1 13.3K OHMS, 1% TOL, 1/2 RN65D1 WATT RN65D1 R10 RESISTOR, FXD, FILM RN65D1 13.3K OHMS, 1% TOL, 1/2 RN65D1 WATT RN65D5 S110 OHMS, 1% TOL, 1/2 RN65D2 S0K, 30% TOL, 1/2 RN65D2 WATT R14 RESISTOR, FXD, FILM RN65D2 2070 OHMS, 1% TOL, 1/2 WATT RN65D1 10.6K OHMS, 1% TOL, 1/2 WATT RN65D1 10.6K OHMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM RN65D1 10.6K OHMS, 1% TOL, 1/2 WATT RN65D1 10.6K OHMS, 1% TOL, 1/2 WATT R16 RESISTOR, FXD, COMPOSITION RC20GF			
7.5K OHMS, 1% TOL, 1/2 wATT R9 RESISTOR, FXD, FILM R10 RESISTOR, FXD, FILM R10 RESISTOR, FXD, FILM R11 RESISTOR, FXD, FILM R12 WATT R13 RESISTOR, FXD, FILM R14 RESISTOR, FXD, FILM R13 RESISTOR, FXD, COMPOSITION R14 RESISTOR, FXD, FILM R14 RESISTOR, FXD, FILM R14 RESISTOR, FXD, FILM R15 RESISTOR, FXD, FILM R16 RESISTOR, FXD, FXD, COMPOSITION R2870 OHMS, 1% TOL, 1/2 WATT RN65D1 100K DHMS, 1% TOL, 1/2 WATT R14 RESISTOR, FXD, FILM RN65D2 2870 OHMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM RN65D1 100-6K DHMS, 1% TOL, 1/2 WATT RN65D1 100-6K OHMS, 1% TOL, 1/2 WATT RN65D1 100-6K OHMS, 1% TOL, 1/2 WATT RN65D1 110-6K OHMS, 1% TOL, 1/2 WATT RN65D1	501F	81349	705-7138-0
R9 RESISTOR, FXD, FILM 316 OHMS, 1% TOL, 1/2 WATT RN65D3 R10 RESISTOR, FXD, FILM 13.3K OHMS, 1% TOL, 1/2 WATT RN65D1 R11 RESISTOR, FXD, FILM MATT RN65D5 S110 OHMS, 1% TOL, 1/2 WATT RN65D5 R12 RESISTOR, VAR, CERAMIC 50K, 30% TOL, 1/2 WATT 62PR50 R13 RESISTOR, FXD, COMPOSITION NATT RC20GF R14 RESISTOR, FXD, FILM 2870 OHMS, 1% TOL, 1/2 WATT RN65D2 R15 RESISTOR, FXD, FILM 19.6K OHMS, 1% TOL, 1/2 WATT RN65D1 R15 RESISTOR, FXD, COMPOSITION 19.6K OHMS, 1% TOL, 1/2 WATT RN65D1 R16 RESISTOR, FXD, COMPOSITION RC20GF			
316 OHMS, 1% TOL, 1/2 WATT R10 RESISTOR, FX0, FILM RN65D1 13.3K OHMS, 1% TOL, 1/2 NATT R11 RESISTOR, FXD, FILM RN65D5 5110 OHMS, 1% TOL, 1/2 WATT R12 RESISTOR, VAR, CERAMIC 62PR501 50K, 30% TOL, 1/2 WATT S0K, 30% TOL, 1/2 R13 RESISTOR, FXD, COMPOSITION RC20GF 100K DHMS, 10% TOL, 1/2 WATT R14 RESISTOR, FXD, FILM RN65D2 2870 OHMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM RN65D1 19.6K OHMS, 1% TOL, 1/2 WATT RN65D1 R16 RESISTOR, FXD, COMPOSITION RC20GF			
316 OHMS, 1% TOL, 1/2 WATT R10 RESISTOR, FX0, FILM RN65D1 13.3K OHMS, 1% TOL, 1/2 NATT R11 RESISTOR, FXD, FILM RN65D5 5110 OHMS, 1% TOL, 1/2 WATT R12 RESISTOR, VAR, CERAMIC 62PR501 50K, 30% TOL, 1/2 WATT S0K, 30% TOL, 1/2 R13 RESISTOR, FXD, COMPOSITION RC20GF 100K DHMS, 10% TOL, 1/2 WATT R14 RESISTOR, FXD, FILM RN65D2 2870 OHMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM RN65D1 19.6K OHMS, 1% TOL, 1/2 WATT RN65D1 R16 RESISTOR, FXD, COMPOSITION RC20GF	160F	81349	705-7072-0
R10 RESISTOR, FXD, FILM RN65D1 13.3K OHMS, 1% TOL, 1/2 WATT RN65D5 WATT RSISTOR, FXD, FILM RN65D5 S110 OHMS, 1% TOL, 1/2 WATT RN65D5 S110 OHMS, 1% TOL, 1/2 WATT RN65D5 R11 RESISTOR, FXD, FILM RN65D5 S110 OHMS, 1% TOL, 1/2 WATT RN65D5 R12 RESISTOR, VAR, CERAMIC 62PR501 S0K, 30% TOL, 1/2 WATT RC20GF 100K OHMS, 10% TOL, 1/2 R13 RESISTOR, FXD, FILM RN65D2 2870 OHMS, 1% TOL, 1/2 WATT RN65D2 R14 RESISTOR, FXD, FILM RN65D1 10.6K OHMS, 1% TOL, 1/2 WATT RN65D1			
13.3K OHMS, 1% TOL, 1/2 WATT R11 RESISTOR, FXD, FILM RN65D5 5110 OHMS, 1% TOL, 1/2 WATT RN65D5 R12 RESISTOR, VAR, CERAMIC 62PR50 50K, 30% TOL, 1/2 WATT RC20GF 100K DHMS, 10% TOL, 1/2 RC20GF 100K DHMS, 10% TOL, 1/2 RN65D2 2070 OHMS, 1% TOL, 1/2 RN65D2 WATT R14 RESISTOR, FXD, FILM RN65D1 10.6K OHMS, 1% TOL, 1/2 WATT RN65D1 1.9.6K OHMS, 1% TOL, 1/2 WATT R16 RESISTOR, FXD, COMPOSITION RC20GF	332F	81349	705-7150-0
R11 RESISTOR, FXD, FILM RN65D5 5110 OHMS, 1% TOL, 1/2 WATT R12 R12 RESISTOR, VAR, CERAMIC 62PR501 50K, 30% TOL, 1/2 WATT 50K, 30% TOL, 1/2 WATT 62PR501 R13 RESISTOR, FXD, COMPOSITION RC20GF 100K DHMS, 10% TOL, 1/2 WATT R14 R14 RESISTOR, FXD, FILM RN65D2 2870 OHMS, 1% TOL, 1/2 WATT R15 R15 RESISTOR, FXD, FILM RN65D1 19-6K OHMS, 1% TOL, 1/2 WATT R16 RESISTOR, FXD, COMPOSITION RC20GF			
5110 OHMS, 1% TOL, 1/2 WATT R12 RESISTOR, VAR, CERAMIC 62PR50 50K, 30% TOL, 1/2 WATT 100K DHMS, 10% TOL, 1/2 8200 R13 RESISTOR, FXD, COMPOSITION RC20GF 100K DHMS, 10% TOL, 1/2 WATT 814 R14 RESISTOR, FXD, FILM RN65D2 2870 OHMS, 1% TOL, 1/2 WATT 815 R15 RESISTOR, FXD, FILM RN65D1 19.6K OHMS, 1% TOL, 1/2 WATT RN65D1 19.6K OHMS, 1% TOL, 1/2 WATT R16 RESISTOR, FXD, COMPOSITION RC20GF			
5110 OHMS, 1% TOL, 1/2 WATT R12 RESISTOR, VAR, CERAMIC 62PR501 50K, 30% TOL, 1/2 WATT 50K, 30% TOL, 1/2 WATT 82000000000000000000000000000000000000	111F	81349	705-7130-0
R12 RESISTOR, VAR, CERAMIC 62PR50 50K, 30% TOL, 1/2 WATT 50K, 30% TOL, 1/2 WATT 80% TOL, 1/2 WATT R13 RESISTOR, FXD, COMPOSITION RC20GF 100K DHMS, 10% TOL, 1/2 WATT 80% TOL, 1/2 WATT R14 RESISTOR, FXD, FILM RN65D2 2070 OHMS, 1% TOL, 1/2 WATT 815 R15 RESISTOR, FXD, FILM RN65D1 19.6K OHMS, 1% TOL, 1/2 WATT 816 R16 RESISTOR, FXD, COMPOSITION RC20GF			
50K, 30% TDL, 1/2 WATT RL R13 RESISTOR, FXD, COMPOSITION RC20GF 100K DHMS, 10% TDL, 1/2 WATT R14 RESISTOR, FXD, FILM RN65D2 2870 DHMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM RN65D1 19-6K DHMS, 1% TOL, 1/2 WATT R16 RESISTOR, FXD, COMPOSITION RC20GF			
R13 RESISTOR, FXD, COMPOSITION 100K DHMS, 10% TOL, 1/2 WATT RC20GF R14 RESISTOR, FXD, FILM 2870 DHMS, 1% TOL, 1/2 WATT RN65D2 R15 RESISTOR, FXD, FILM 19-6K DHMS, 1% TOL, 1/2 WATT RN65D1 R16 RESISTOR, FXD, COMPOSITION RC20GF	ĸ	73138	382-0008-1
R13 RESISTOR, FXD, COMPOSITION 100K DHMS, 10% TOL, 1/2 WATT RC20GF R14 RESISTOR, FXD, FILM 2870 DHMS, 1% TOL, 1/2 WATT RN65D2 R15 RESISTOR, FXD, FILM 19-6K DHMS, 1% TOL, 1/2 WATT RN65D1 R16 RESISTOR, FXD, COMPOSITION RC20GF			
100K DHMS, 10% TOL, 1/2 WATT Resistor, FXD, FILM RN65D2 2870 DHMS, 1% TOL, 1/2 WATT RN65D1 2000 R15 RESISTOR, FXD, FILM RN65D1 19.6K DHMS, 1% TOL, 1/2 WATT R16 RESISTOR, FXD, COMPOSITION	104K	81349	745-1436-0
R14 RESISTOR, FXD, FILM RN65D2 2870 OHMS, 1% TOL, 1/2 HATT R15 RESISTOR, FXD, FILM RN65D1 19.6K OHMS, 1% TOL, 1/2 WATT R16			
2870 DHMS, 1% TOL, 1/2 HATT R15 RESISTOR, FXD, FILM RN65D1 19-6K DHMS, 1% TOL, 1/2 WATT R16 R16 RESISTOR, FXD, COMPOSITION RC20GF			
2870 OHMS, 1% TOL, 1/2 WATT R15 RESISTOR, FXD, FILM 19.6K OHMS, 1% TOL, 1/2 WATT R16 RESISTOR, FXD, COMPOSITION	871F	81349	705-7118-0
WATT RATT R15 RESISTOR, FXD, FILM RN65D1 19.6K DHMS, 1% TOL, 1/2 WATT R16 R16 RESISTOR, FXD, COMPOSITION RC20GF			
R16 RESISTOR, FXD, COMPOSITION RC20GF			
R16 RESISTOR, FXD, COMPOSITION RC20GF	902F	81349	705-7158-0
	473K	81349	745-1422-0
47K OHMS, 10% TOL, 1/2			
WATT			
R17 SELECT R17 FROM THE			
FOLLOWING LIST			
RESISTOR, FXD, FILM RN65D1	.001F	81349	705-7096-0
1K OHMS, 1% TOL, 1/2 WATT			
RESISTOR, FXD, FILM RN65D1	.961F	81349	705-7110-0
1960 OHMS, 1% TOL, 1/2			
WATT			

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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	RESISTOR, FXD, FILM 3160 OHMS, 1% TOL, 1/2	RN65D3161F	81349	705-7120-00
	WATT RESISTOR, FXD, FILM 4220 OHMS, 1% TOL, 1/2 WATT	RN65D4221F	81349	705-7126-00
R18	RESISTOR, FXD, COMPOSITION 1K OHMS, 10% TOL, 1/2 WATT	RC20GF102K	81349	745-1352-00
R19	RESISTOR, FXD, COMPOSITION 27K OHMS, 10% TOL, 1/2	RC20GF273K	81349	745-1412-00
R20	WATT RESISTOR, FXD, FILM 21.5K OHMS, 1% TOL, 1/2 WATT	RN65D2152F	81349	705-7160-00
R21	RESISTOR, FXD, FILM 12.1K OHMS, 1% TOL, 1/2 WATT	RN6501212F	81349	705-7148-0
R22	RESISTOR, FXD, FILM 2610 DHMS, 1% TOL, 1/2 WATT	RN65D2611F	81349	705-7116-00
R23	RESISTOR, FXD, COMPOSITION 10K OHMS, 10% TOL, 1/2 WATT	8C20GF103K	81349	745-1394-00
R24	RESISTOR, FXD, COMPOSITION 5600 DHMS, 10% TOL, 1/2	RC20GF562K	81349	745-1384-0
R25	WATT RESISTOR, FXD, COMPOSITION 1500 OHMS, 10% TOL, 1/2	RC20GF152K	81349	745-1359-0
R26	WATT RESISTOR, FXD, COMPOSITION 1800 OHMS, 10% TOL, 1/2	RC20GF182K	81349	745-1363-0
R27	WATT RESISTOR, FXD, FILM 51.1 OHMS, 1% TOL, 1/2	RN65D51R1F	81349	705-7034-0
R28	WATT RESISTOR, FXD, FILM 42-2 OHMS, 1% TOL, 1/4 WATT	RN65D42R2F	81349	705-7030-0
R29	SAME AS R23			
R30	SAME AS R23			
R31	RESISTOR, FXD, COMPOSITION 4700 OHMS, 10% TOL, 1/2 WATT	RC20GF472K	81349	745-1380-0
R32	SAME AS R26			
R33 R34	SAME AS R26 RESISTOR, FXD, FILM	RN65D2610F	81349	705-7068-0
R35	261 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM 220 OHMS, 10% TOL, 1/2	RC20GF221K	81349	745-1324-0
R36	WATT SAME AS R26			
R37	RESISTOR, FXD, COMPOSITION 2200 OHMS, 10% TOL, 1/2	RC20GF222K	81349	745-1366-0
R38	WATT RESISTOR, FXD, COMPOSITION 22 OHMS, 10% TOL, 1/2	RC20GF220K	81349	745-1282-0
R39	WATT RESISTOR, FXD, COMPOSITION 390 OHMS, 10% TOL, 1/2	RC20GF391K	81349	745-1335-0
840	WATT SAME AS R13			
R41	SAME AS R13			
R42	RESISTOR, FXD, FILM 1100 OHMS, 1% TOL, 1/2 WATT	RN65D1101F	81349	7057098-0
R43	SAME AS R42			
R44	RESISTOR, FXD, FILM 1960 OHMS, 1% TOL, 1/2 WATT	RN65D1961F	81349	705-7110-00

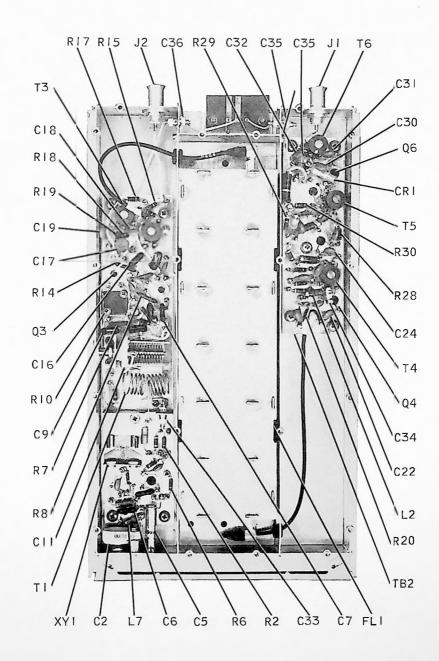


R45 SAME AS R44 R16 R151STOR, FXD, FILM RN65D8251F B1349 705-71 R47 RESISTOR, FXD, COMPOSITION RC20GF151K B1349 745-13 150 DHMS, 10% TOL, 1/2 RC20GF682K B1349 745-13 wATT R48 RESISTOR, FXD, COMPOSITION RC20GF682K B1349 745-13 R48 RESISTOR, FXD, COMPOSITION RC20GF682K B1349 745-13 wATT WATT R49 SAME AS R48 R51 R00 OHMS, 10% TOL, 1/2 R0650682K B1349 745-13 wATT R49 SAME AS R48 R51 R01 USE0 RC20GF682K B1349 745-13 R52 RESISTOR, FXD, FILM RC20GF682K B1349 705-70 68.1 OHMS, 12 TOL, 1/2 WATT RN65D68R1F B1349 705-70 68.1 OHMS, 12 TOL, 1/2 WATT R14 R149 705-70 68.1 OHMS, 12 TOL, 1/2 WATT R15 S1490-458 12615 306-22 TP1 JACK, TIP SL490-458 12615 306-22 S1490-468 12615 306-22 TP5	17-000 87-000 40-000 17-003 41-100
R47 RESISTOR, FXD, COMPOSITION RC20GF151K 81349 745-13 150 OHMS, 10% TOL, 1/2 WATT RC20GF682K 81349 745-13 R48 RESISTOR, FXD, COMPOSITION RC20GF682K 81349 745-13 R48 RESISTOR, FXD, COMPOSITION RC20GF682K 81349 745-13 6800 OHMS, 10% TOL, 1/2 WATT RC20GF682K 81349 745-13 WATT SAME AS R48 RS0 SAME AS R48 81349 745-13 R51 NOT USED RS2 RESISTOR, FXD, FILM RN65D68R1F 81349 705-70 68.1 OHMS, 1% TOL, 1/2 WATT SL490-458 12615 306-22 WATT T1 TRANSFORMER SL490-458 12615 306-22 TP1 JACK, TIP SL490-468 12615 306-22 WHTE TP3 SAME AS TP1 TP4 JACK, TIP SL490-468 12615 306-22 BLACK SL490-468 12615 306-22 306-22 306-22	87-000 40-000 17-003 41-100
R48 RESISTOR, FXD, COMPOSITION RC20GF682K 81349 745-13 6800 OHMS, 10% TOL, 1/2 WATT 745-13 745-13 R49 SAME AS R48 81349 745-13 R50 SAME AS R31 81349 745-13 R51 NOT USED 81349 705-70 68.1 OHMS, 1% TOL, 1/2 81349 705-70 68.1 OHMS, 1% TOL, 1/2 WATT 549-16 T1 TRANSFORMER 549-16 TP1 JACK, TIP SL490-458 12615 TP2 SAME AS TP1 793 TP4 JACK, TIP SL490-468 12615 BLACK SL490-468 12615 306-22	40-000 1 7 -003 41-100
R49 SAME AS R48 R50 SAME AS R31 R51 NOT USED R52 RESISTOR, FXD, FILM R52 RESISTOR, FXD, FILM WATT T1 T1 TRANSFORMER WHITE SL490-458 TP2 SAME AS TP1 TP3 SAME AS TP1 TP4 JACK, TIP BLACK SL490-468	17-003 41-100
R52 RESISTOR, FXD, FILM RN65D6BR1F 81349 705-70 68-1 0HMS, 1% TOL, 1/2 WATT 549-16 T1 TRANSFORMER 549-16 TP1 JACK, TIP SL490-458 12615 TP2 SAME AS TP1 705-70 TP3 SAME AS TP1 549-16 TP4 JACK, TIP SL490-468 12615 BLACK SL490-468 12615 306-22	17-003 41-100
T1 TRANSFORMER 549-16 TP1 JACK, TIP SL490-458 12615 WHITE SL490-458 12615 306-22 TP2 SAME AS TP1 TP3 SAME AS TP1 TP4 JACK, TIP SL490-468 12615 BLACK SL490-468 12615 306-22	41-100
TP3 SAME AS TP1 TP4 JACK, TIP BLACK SL490-468 12615 306-22	41-010
TP5 SAME AS TP1	



B502 512 Pb

Figure 6-7. RF Mixer (Sheet 1 of 2).



B502 512 Pb

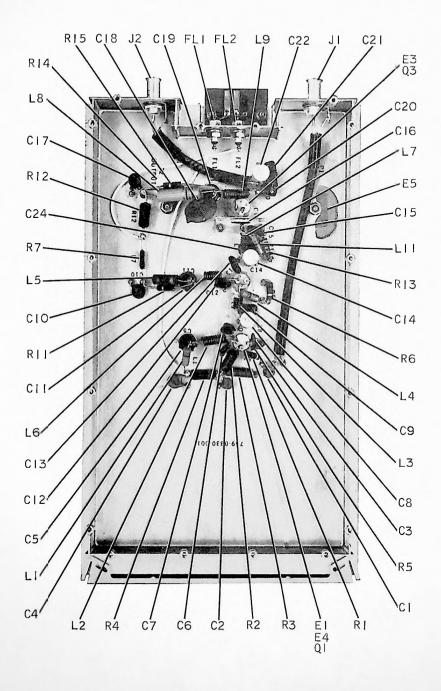
Figure 6-7. RF Mixer (Sheet 2 of 2).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	RF MIXER			781-5380-001
C1	CAPACITOR, FXD, CERAMIC 1000 UUF, 20% TOL,	40C73A1	01939	913-3009-000
C2	500 VDCW CAPACITOR, VAR, GLASS 1-30 UUF, 750 VDCW	PC40H300	81349	922-3036-370
C3 C4	SAME AS C1 CAPACITOR, FXD, MICA	CM05C100K03	81349	912-2754-000
C5 C6	10 UUF, 10% TOL, 500 VDCW CAPACITOR, VAR, GLASS 0.8-18 UUF, 1K VDCW SAME AS C4	VC23G	73899	922-0437-000
C7 C8 C9	SAME AS C4 CAPACITOR, FXD, MICA 18 UUF, 10% TOL, 500 VDCW SAME AS C8	CM05C180K03	81349	912-2763-000
C10 C11 C12	SAME AS C4 CAPACITOR, VAR, AIR 3-9.8 UUF, 1250 VDCW SAME AS C1	160-211-35	74970	922-0046-000
C13 C14	SAME AS C1 CAPACITOR, FXD, CERAMIC 0.01 UF, PLUS 80% MINUS 20%, 100 VDCW	805-14X5V0103Z	72982	913-3680-000
C15 C16 C17	CAPACITOR, FXD, MICA 33 UUF, 5% TOL, 500 VDCW SAME AS C15 SAME AS C14	CM05E330J03	81349	912-2780-000
C18 THROUGH C21 C22 C23 C24 C25 C26 C27	SAME AS C1 CAPACITOR, FXD, CERAMIC 3300 UUF, 20% TDL, 100 VDCW SAME AS C1 SAME AS C1 SAME AS C1 SAME AS C1 SAME AS C22	NP12BX332M	96733	913-3278-310
THROUGH C32 C33	SAME AS C1 CAPACITOR, FXD, CERAMIC 1000 UUF, GMV TOL,	2465-008W5T0102P	72982	913-3208-000
C34 C35	500 VDCW CAPACITOR, FXD, CERAMIC 1.5 UUF, 33% TOL, 500 VDCW SAME AS C33	CC20CK1R5D	81349	916-0073-000
C36 CR1 E1 E2	SAME AS C33 SEMICONDUCTOR DEVICE, DIODE HOLDER, TRANSISTOR	1N3018B T1533	07688 98291	353-3123-000 352-9509-000
THROUGH E7	SAME AS E1	-		
FL1	SELECT FL1 FROM THE FOLLOWING LIST FILTER, HIGH BAND FILTER, LOW-BAND CONNECTOR, ELECTRICAL	UG1051U	80058	781-5343-001 781-5344-001 357-9210-000
J2 L1	SAME AS J1 COIL, RF	MS18130-6	81349	240-1566-000
L2	0.68 UH, 10% TOL COIL, RF 0.22 UH, 20% TOL	MS18130-1	81349	240-1563-000
L4 L5	SAME AS L2 SAME AS L2 CDIL, RF 2.20 UH, 10% TOL	MS18130-12	81349	240-1572-000

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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
L6	COIL, RF	MS18130-1	81349	240-1562-000
	0.15 UH, 20% TOL			
L7	SAME AS LO			
21	TRANSISTOR	2N4258	07263	352-0848-020
22 23	TRANSISTOR SAME AS Q2	2N4416	22229	352-0756-010
25 24	TRANSISTOR	2N3563	07688	352-0630-010
25	SAME AS Q4	English		572 0050 010
26	SAME AS Q4		}	
27	SAME AS Q4			
21	RESISTOR, FXD, COMPOSITION 2200 OHMS, 10% TOL, 1/4 WATT	RC07GF222K	81349	745-0761-000
22	RESISTOR, FXD, COMPOSITION 4700 OHMS, 10% TOL, 1/4	RC07GF472K	81349	745-0773-000
	WATT			
R3	RESISTOR, FXD, COMPOSITION 1800 DHMS, 10% TOL, 1/4 WATT	RCO7GF182K	81349	745-0758-000
R4	RESISTOR, FXD, COMPOSITION 180 OHMS, 10% TOL, 1/4 WATT	RCO7GF181K	81349	745-0722-000
R 5	NOT USED			
R 6	RESISTOR, FXD, COMPOSITION 820 OHMS, 10% TOL, 1/4 WATT	RC07GF821K	81349	745-0746-000
27	RESISTOR, FXD, FILM 2150 DHMS, 1% TOL, 1/4 WATT	RN60D2151F	81349	705-6612-000
R 8	SAME AS R7		{	
29	RESISTOR, FXD, COMPOSITION 6800 DHMS, 10% TDL, 1/4	RC07GF682K	81349	745-0779-000
R10	WATT RESISTOR, VAR	RT22C2L502	81349	381-1721-120
R11	5K OHMS, 5% TOL, 3/4 WATT RESISTOR, FXD, COMPOSITION 5600 OHMS, 10% TOL, 1/4	RCO7GF562K	81349	745-0776-000
012	WATT SAME AS BO			
R12 R13	SAME AS R9 SAME AS R7			
R14	SAME AS RT			
R15	RESISTOR, FXD, COMPOSITION 33 OHMS, 10% TOL, 1/4 WATT	RC07GF330K	81349	745-0695-000
R16	SAME AS R15			
R17	RESISTOR, FXD, COMPOSITION 22 OHMS, 10% TOL, 1/4 WATT	RC07GF220K	81349	745-0689-000
R18	RESISTOR, FXD, COMPOSITION 680 OHMS, 10% TOL, 1/4 WATT	RC07GF681K	81349	745-0743-000
R19	RESISTOR, FXD, COMPOSITION 270 DHMS, 10% TOL, 1/4	RC07GF271K	81349	745-0728-000
R20	HATT RESISTOR, FXD, COMPOSITION 150 OHMS, 10% TOL, 1/4	RC07GF151K	81349	745-0719-000
R21	SAME AS R2			
R22	SAME AS RZ			
23	NOT USED			
24	SAME AS R6			
25	SAME AS R6			
26	SAME AS R2			
R27	SAME AS R2			
R28 R29	SAME AS R6 SAME AS R6			
R29 R30	SAME AS RE			
31	RESISTOR, FXD, COMPOSITION 270 DHMS, 10% TOL, 1 WATT	RC32GF271K	81349	745-3328-000

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R32	RESISTOR, FXD, COMPOSITION 100 DHMS, 10% TOL, 1/4	RCO7GF101K	81349	745-0713-000
	TTAW			
T1	TRANSFORMER			781-5376-001
T2 T3	TRANSFORMER TRANSFORMER			781-5290-001
T 4	TRANSFORMER			781-5372-001
T5	TRANSFORMER			781-5373-001
T6	TRANSFORMER			781-5374-001
TB1	BOARD, FABRICATED			781-5358-001
T82 Y1	BOARD, FABRICATED NOTE: REFER TO TABLE 5-4, PAGE 5-6			781-5352-001
XY1	SOCKET, CRYSTAL	8000AG20	91506	292-0305-010



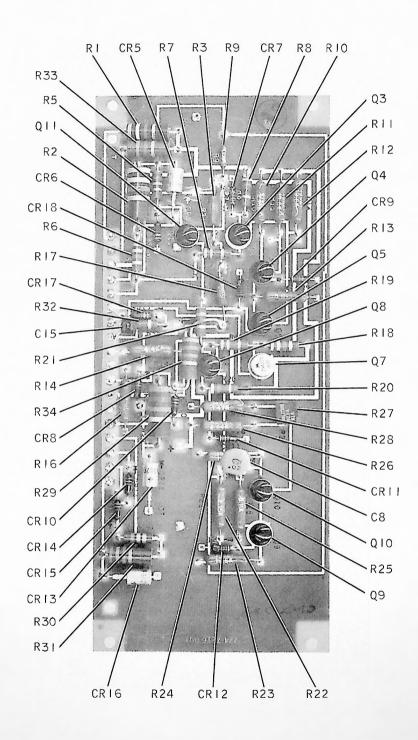
8502 0538 Pb

Figure 6-8. Power Amplifier.

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	POWER AMPLIFIER			769-0830-001
C1	CAPACITOR, FXD, CERAMIC 680 UUF, 20% TOL, 1000	CK60AW681M	81349	913-1194-000
C2	VDCW CAPACITOR, FXD, CERAMIC 470 UUF, 20% TOL, 500 VDCW	CK60AX471M	81349	913-1189-000
C3 C4	SAME AS C2 CAPACITOR, FXD, CERAMIC 0.01 UF, PLUS 80 MINUS	805-014X5V0103Z	72982	912-3680-000
C 5	20%, 100 VDCW CAPACITOR, FXD, MICA 1000 UUF, 5% TOL, 500 VDCW	CB21PE102J	81349	912-4115-330
C6	CAPACITOR, FXD, MICA 15 UUF, 5% TOL, 500 VDCW	DM15C150J01	72136	912-2759-000
C7 C8	SAME AS C6 CAPACITOR, VAR, CERAMIC 5.5-18 UUF, PLUS 2% MINUS	538011C0P092R	72982	917-1222-000
C 9	2.5%, 350 VDCW CAPACITOR, FXD, MICA 33 UUF, 10% TOL, 500 VDCW	DM30F562K03	72136	912-2781-000
C10 C11 C12	SAME AS C4 SAME AS C5 CAPACITOR, FXD, MICA	DM15C100J01	72136	912-2753-000
C13	10 UUF, 5% TOL, 500 VDCW Capacitor, FXD, Mica 18 UUF, 5% Tol, 500 VDCW	DM15C180J01	72136	912-2762-000
C14 C15	SAME AS C8 CAPACITOR, FXD, MICA 82 UUF, 5% TOL, 500 VDCW	CM05ED820J03	81349	912-2810-000
C16	CAPACITOR, FXD, MICA 500 UUF, 20% TOL, 500 VDCW	M23-500M	53021	912-0667-000
C17 C18	SAME AS C4 CAPACITOR, FXD, CERAMIC 0.1 UF, PLUS 80% MINUS 20% 200 VDCW	825-213X5V0104Z	72982	913-3681-000
C19 C20	SAME AS C5 CAPACITOR, FXD, MICA 110 UUF, 5% TOL, 500 VDCW	CM05F111J03	81349	912-2819-000
C21 C22	CAPACITOR, FXD, MICA 27 UUF, 5% TOL, 500 VDCW SAME AS C8	CM05E270J03	81349	912-2774-000
C23 C24	NOT USED CAPACITOR, FXD, MICA 22 UUF, 10% TOL, 500 VDCW	D155E220K0	00853	912-2769-000
E1 E2 E3	INSULATOR, TRANSISTOR INSULATOR, TRANSISTOR SAME AS E2	XB021667-5 T1529	98291 98291	352-9800-070 352-9800-010
E4	HEATSINK	TXP0508B	98978	352-9555-030
E5 FL1	HEATSINK FILTER, RADIO INTERFERENCE 1300 UUF, GMV TOL, 200 VDCW	6156-7 10201050	13103 72982	352-9612-010 241-0332-000
FL2 J1	SAME AS FL1 Connector, electrical 1 contact	UG1051U	80058	357-9210-000
J2 L1	SAME AS J1 Coil, RF 1 UH, 10% Tol	M\$75008-28	96906	240-1590-000
L2	COIL, RF			776-1882-001 776-1910-001
L3 L4	COIL, RF COIL, RF	MS75008-21	96906	240-1585-000
L5	0.15 UH, 20% TOL Coil, RF	MS16222-5	96906	240-1654-000
L6 L7	2.2 UH, 10% TOL Coil, RF Coil, RF			776-1911-001 776-1912-001

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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
L8	COIL, RF	MS16231-1	96906	240-1605-000
L9	1.2 UH, 10% TOL COIL, RF			776-1883-001
L10 L11	NOT USED SAME AS L4			
Q1 Q2	TRANSISTOR TRANSISTOR	2N3866 2N3375	07688 07688	352-0671-010
Q3	TRANSISTOR	2N5102	02735	352-0747-010
R1	RESISTOR, FXD, COMPOSITION 39 OHMS, 10% TOL, 1/2 WATT	RC20GF390K	81349	745-1293-000
R2	RESISTOR, FXD, WIRE WOUND 22 OHMS, 5% TOL, 3 WATTS	RW69V220	81349	747-5327-000
R3	RESISTOR, FXD, FILM 23.7 OHMS, 1% TOL, 1/2 WATT	RN65D23R7F	81349	705-7018-000
R4	RESISTOR, FXD, WIRE WOUND	RW69V271	81349	747-5349-000
R5	270 DHMS, 5% TOL, 3 WATTS RESISTOR, FXD, FILM	RN60D10R0F	81349	705-6500-000
R6	10 OHMS, 1% TOL, 1/4 WATT RESISTOR, FXD, COMPOSITION 100 OHMS, 10% TOL, 1/2	RC20GF101K	81349	745-1310-000
R7	WATT RESISTOR, FXD, WIRE WOUND 2 OHMS, 1% TOL, 1.25 WATT	RS1A73-2R00-1PCT	91637	747-4230-300
R 8 R 9	NOT USED NOT USED			
R10 R11	NOT USED RESISTOR, FXD, COMPOSITION	RC20GF100K	81349	745-1268-000
	10 OHMS, 10% TOL, 1/2 WATT			
R12	RESISTOR, FXD, WIRE WOUND 0.5 OHM, 1% TOL, 2.5 WATT	RSM2COR500F	91637	746-9457-000
R13	RESISTOR, FXD, COMPOSITION 4.7 OHMS, 5% TOL, 1/2 WATT	GBT1-2 4-7-5	75042	745-6279-000
R14 R15	SAME AS R11 SAME AS R11			



B502 541 Pb

Figure 6-9. Power Supply Regulator.

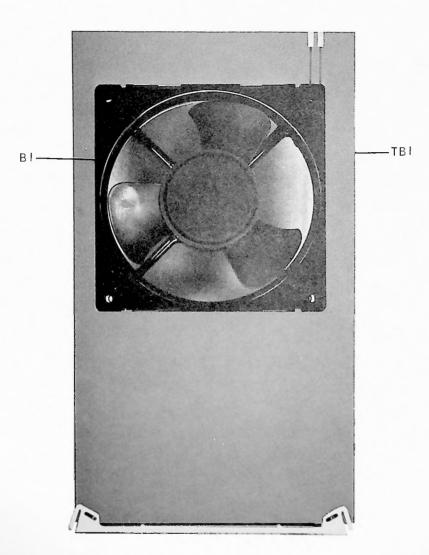
6-43

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	POWER SUPPLY REGULATOR			77 4-7216-000
C1 THROUGH	NOT USED			
C5				
C6	CAPACITOR, FXD, ELECTROLYTIC 56 UF, 20% TOL, 75 VDCW	109D566X0075T2	56289	184-7793-000
C7	CAPACITOR, FXD, ELECTROLYTIC 150 UF, 20% TOL, 30 VDCW	109D157X0030T2	56289	184-7796-000
C8	CAPACITOR, FXD, CERAMIC 0.02 UF, PLUS 60% MINUS 40%, 250 VDCW	20C109	01939	913-2097-000
C9	SAME AS CB			
C10 THROUGH C14	NOT USED		1027	
C15	CAPACITOR, FXD, CERAMIC 0.1 UF, 10% TOL,	СК05ВХ104К	81349	913-5019-000
CR1 Through CR4	NOT USED			
CR5	SEMICONDUCTOR DEVICE, DIODE	1N3027B	81349	353-3057-000
CR6 CR7	SEMICONDUCTOR DEVICE, DIODE SEMICONDUCTOR DEVICE, DIODE	1N645 1N758A	07688 07688	353-2607-000 353-2724-000
CR8 CR9	NOT USED Semiconductor device, diode			353-2712-000
CR10	SAME AS CR6	1N752A	07688	353-2712-000
CR11 CR12	SAME AS CR7 SAME AS CR9			
CR13 CR14	SEMICONDUCTOR DEVICE, DIODE SAME AS CR6	1N3020B	07688	353-3125-000
CR15	SAME AS CR6			
CR16 CR17	SAME AS CR13 SAME AS CR6			
CR18 Q1	SEMICONDUCTOR DEVICE, DIODE NOT USED	1N755A	07688	353-2718-000
Q2 Q3	NOT USED TRANSISTOR	2N3569	07688	352-0629-030
Q4	SAME AS Q3	203505	01000	552 0025 050
Q5 Q6	SAME AS Q3 NOT USED			
Q7 Q8	TRANSISTOR	2N4235	07688	352-0695-040
THROUGH	SAME AS Q3			
Q11 R1	RESISTOR, FXD, COMPOSITION 390 DHMS, 10% TOL, 1 WATT	RC32GF391K	81349	745-3335-000
R2	RESISTOR, FXD, COMPOSITION 330 OHMS, 10% TOL, 2 WATTS	RC42GF331K	81349	745-5631-000
R3	RESISTOR, FXD, FILM 46.4 OHMS, 1% TOL, 1/2	RN65D46R4F	81349	705-7032-000
R4	NOT USED			
R5	RESISTOR, FXD, COMPOSITION 27K OHMS, 10% TOL, 1/2 WATT	RC20GF273K	81349	745-1412-000
R6	RESISTOR, FXD, COMPOSITION 330 OHMS, 10% TOL, 1/2 WATT	RC20GF331K	81349	745-1331-000
R7	RESISTOR, FXD, COMPOSITION 3300 OHMS, 10% TOL, 1/2 WATT	RC20GF332K	81349	745-1373-000
R8	RESISTOR, FXD, COMPOSITION 4700 DHMS, 10% TOL, 1/2	RC20GF472K	81349	745-1380-000
R9	WATT RESISTOR, FXD, COMPOSITION 15K OHMS, 10% TOL, 1/2 WATT	RC20GF153K	81349	745-1401-000



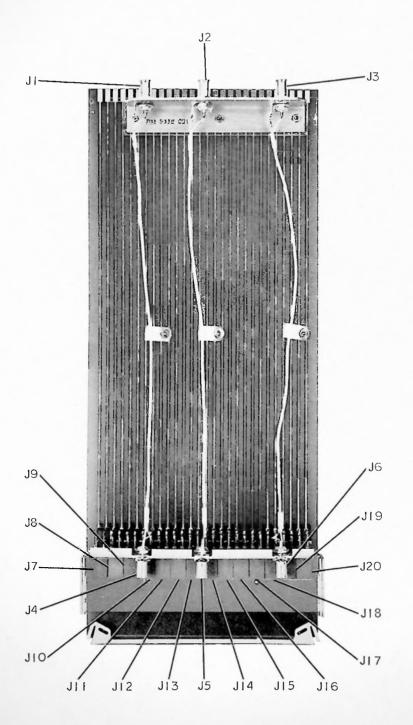
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R10 R11 R12	RESISTOR, FXD, FILM 2150 DHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM 19.6K CHMS, 1% TOL, 1/2 WATT	RN65D2151F RN65D1920F	81349 81349	705-7112-000 705-7158-000
THROUGH R33 R34	NOT USED RESISTOR, FXD, FILM 681 OHMS, 1% TOL, 1/2 WATT	RN65D6810F	81349	705-7088-000

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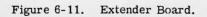


B502 532 Pb

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	FAN			783-7049-001
B1 TB1	FAN, TUBEAXIAL O.16-AMP, 115 VAC BOARD, FABRICATED	20-244-2301	82887	009-1829-020 786-1248-001



8502 531 Pb



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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	EXTENDER BOARD			781-5365-001
J 1 J 2	CONVECTOR, ELECTRICAL 1 CONTACT SAME AS J1	UG1051U	80058	357-9210-000
13 14 15	SAME AS JI CONVECTOR, ELECTRICAL I CONTACT SAME AS J4	UG1 05 0 AU	80058	357-9211-000
16 17 18	SAME AS J4 CONVECTOR, ELECTRICAL 2 CONTACTS	375430-9010	91662	372-2425-010
T PROUGE J 20	SAME AS J7			

J.

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	MANUFACTURERS CODES			
CODE	MANUFACTURER			
00853	SANGAMO ELECTRIC CO S CAROLINA DIV			
01002	PICKENS, S.C. GENERAL ELECTRIC CO CAPACITOR DEPT			
01939	HUDSON FALLS, N.Y. SPRAGUE ELECTRIC CO OF WISCONSIN			
02288	GRAFTON, WISC ALLIED CONTROL CO INC PLANTSVILLE, CONN			
02660	AMPHENOL CORP BROADVIEW, ILL.			
02735	RADIO CORP OF AMERICA SOLID STATE AND RECEIVING TUBE DIVISION SOMERVILLE, N.J.			
03550	VANGUARD ELECTRONICS CO INGLEWOOD, CALIF			
03877	TRANSISTRON ELECTRONIC WAKEFIELD, MASS.			
04009	ARROW-HART AND HEGEMAN ELECTRIC CO HARTFORD, CONN			
04713	MOTOROLA SEMICONDUCTOR PRODUCTS INC			
06978	PHOENIX, ARIZ ALADDIN ELECTRONICS DIV OF ALADDIN INDUSTRIES, INC. 705 MURFREESBORD ROAD			
07263	NASHVILLE, TN 37210 FAIRCHILD CAMERA AND INSTRUMENT CORP SEMICONDUCTOR DIV			
07388	MOUNTAINVIEW, CALIF TOROTEL, INC. 13402 S 71 HIGHWAY			
07688	GRANDVIEW, MO 64030 MILITARY SPECIFICATIONS			
09408	STAR-TRONICS INC GEORGETOWN, MASS.			
12040 12615	NATIONAL SEMICONDUCTOR CORP DANBURY, CONN U.S. TERMINALS INC			
13103	CINCINNATI, OHIO			
16352	DALLAS, TX COMPUTER DIODE CORP			
17117	LODI, N.J. ELECTRONIC MOULDING CORP			
22229	PANTUCKET, R.I. UNION CARBIDE CORP LINDE DIV			
42190	MOUNTAIN VIEW, CALIF THE MUTER CO			
53021	CHICAGO, ILL. SANGAMO ELECTRIC CO SPRINGFIELD, ILL.			
56289	SPRAGUE ELECTRIC CO NORTH ADAMS, MASS.			
60418	THE TORSION BALANCE CO CLIFTON, N.J.			
70309 70674	ALLIED CONTROL CO INC NEW YORK, N.Y. ADC PRODUCTS INC			
	MINNEAPOLIS, MINN			

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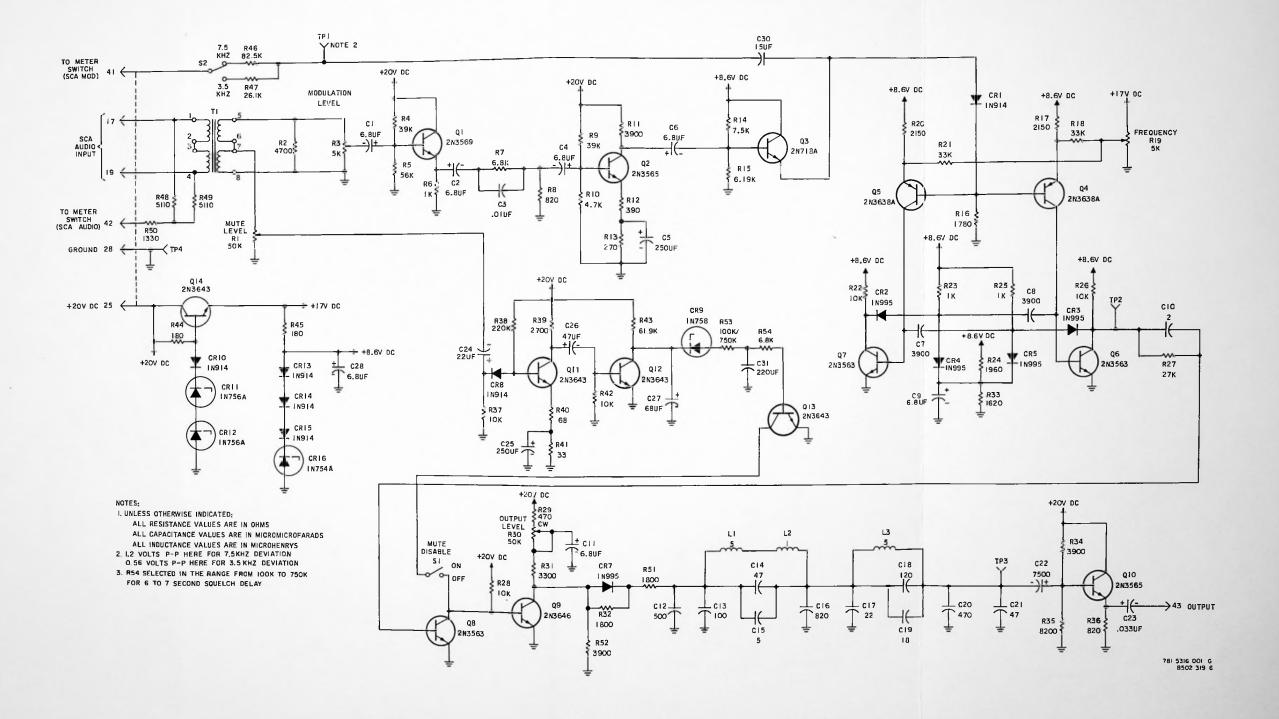
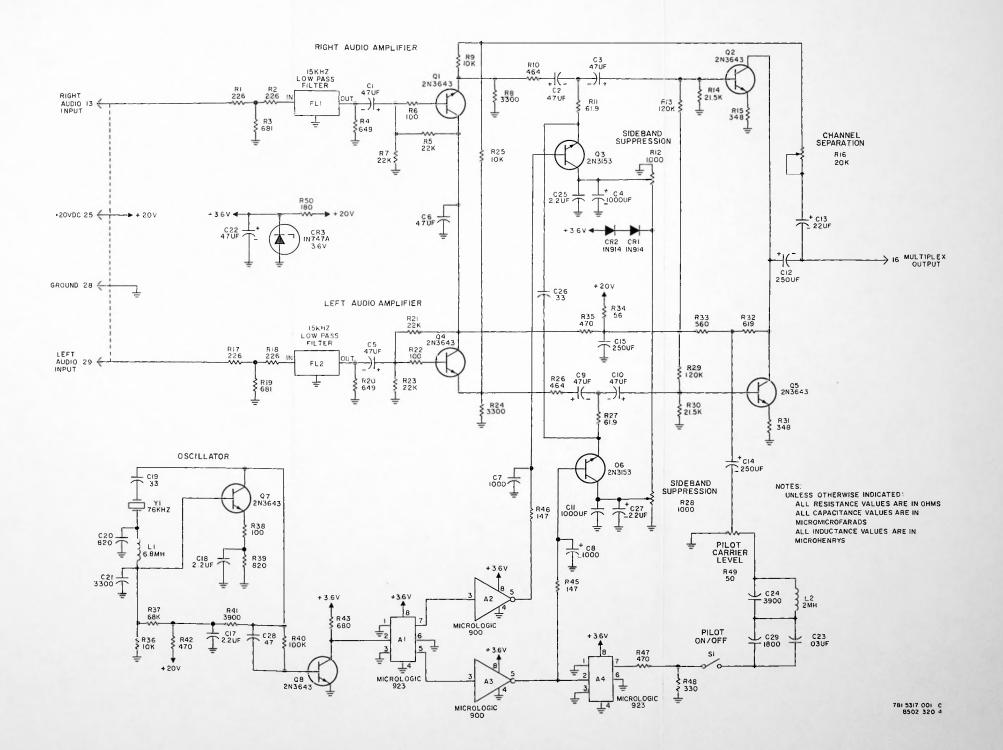


Figure 7-3. 786W-1 SCA Generator (A1), Schematic Diagram.



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Figure 7-4. 786V-1 Stereo Generator (A2), Schematic Diagram.

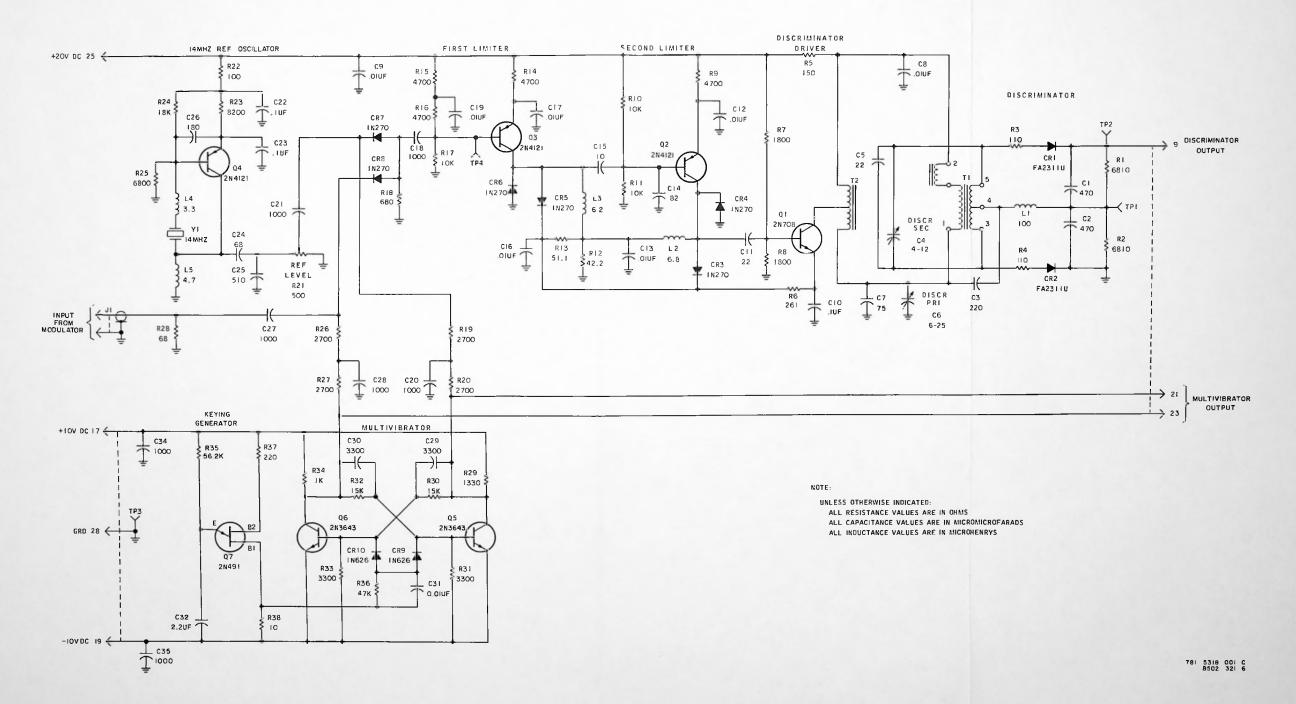
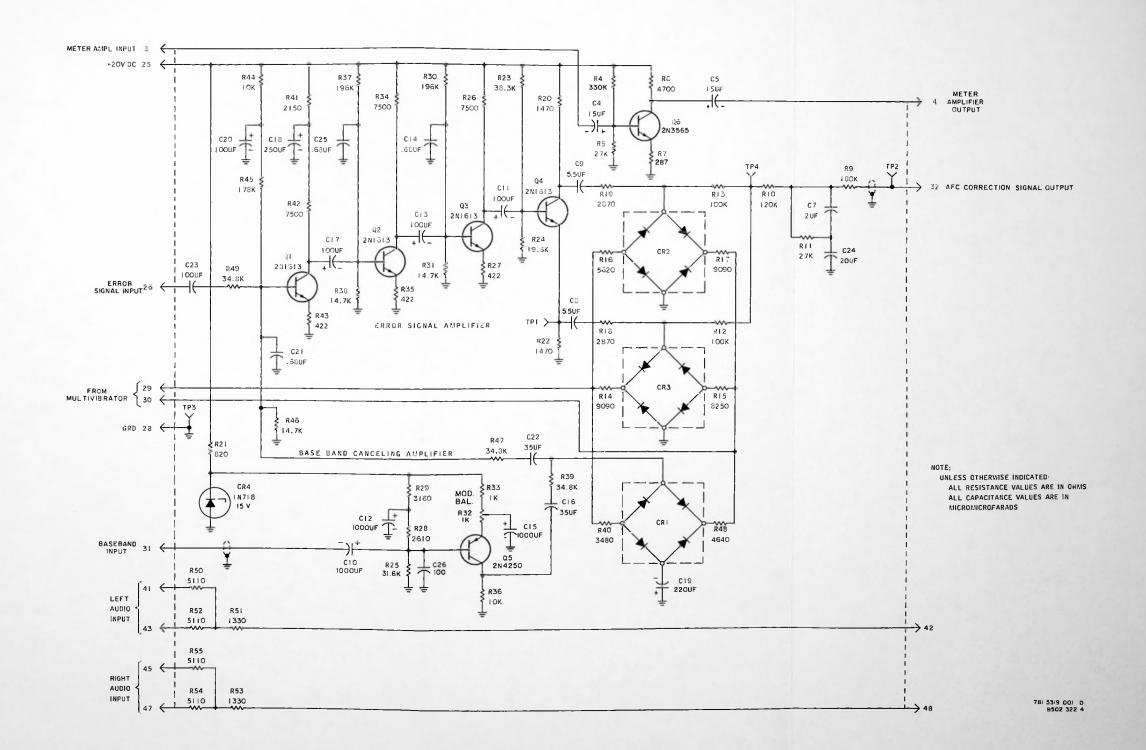
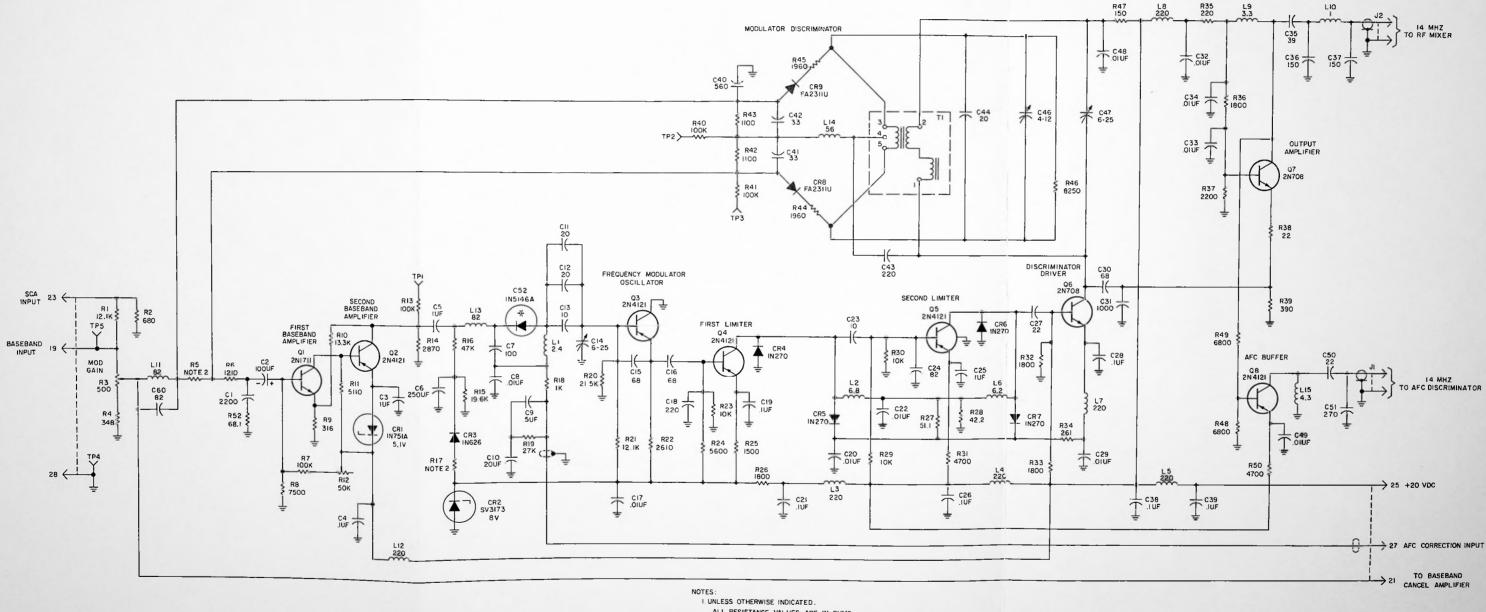


Figure 7-5. AFC Discriminator (A3), Schematic Diagram.



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Figure 7-6. AFC Synchronous Detector (A4), Schematic Diagram.



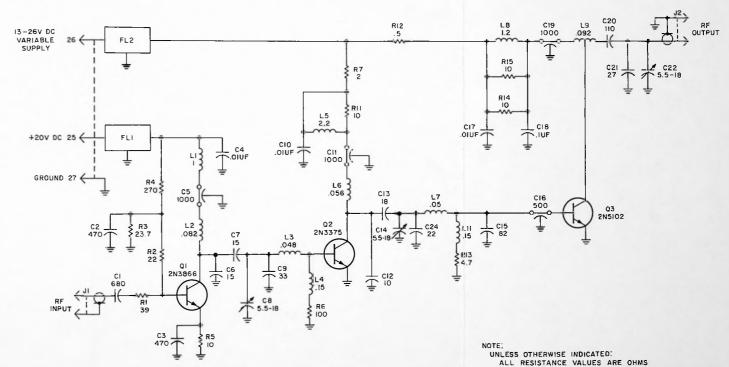
ALL RESISTANCE VALUES ARE IN OHMS

ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS ALL INDUCTANCE VALUES ARE IN MICROHENRYS

2. SELECTED IN PRODUCTION

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Figure 7-7. FM Modulator (A5), Schematic Diagram.



NOTE. UNLESS OTHERWISE INDICATED: ALL RESISTANCE VALUES ARE OHMS ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS ALL INDUCTANCE VALUES ARE IN MICROHENRYS 781 5322 001 A B502 324 4

Figure 7-9. Power Amplifier (A7), Schematic Diagram.

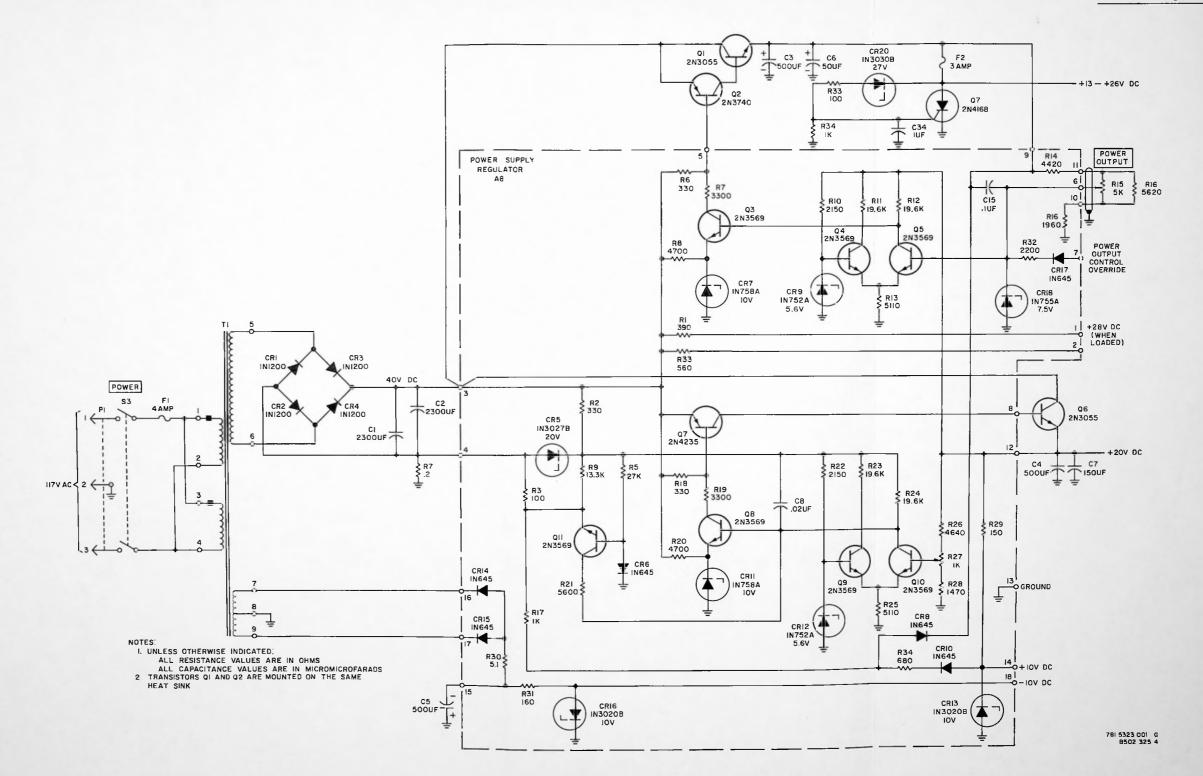


Figure 7-10. Power Supply (A8), Schematic Diagram.

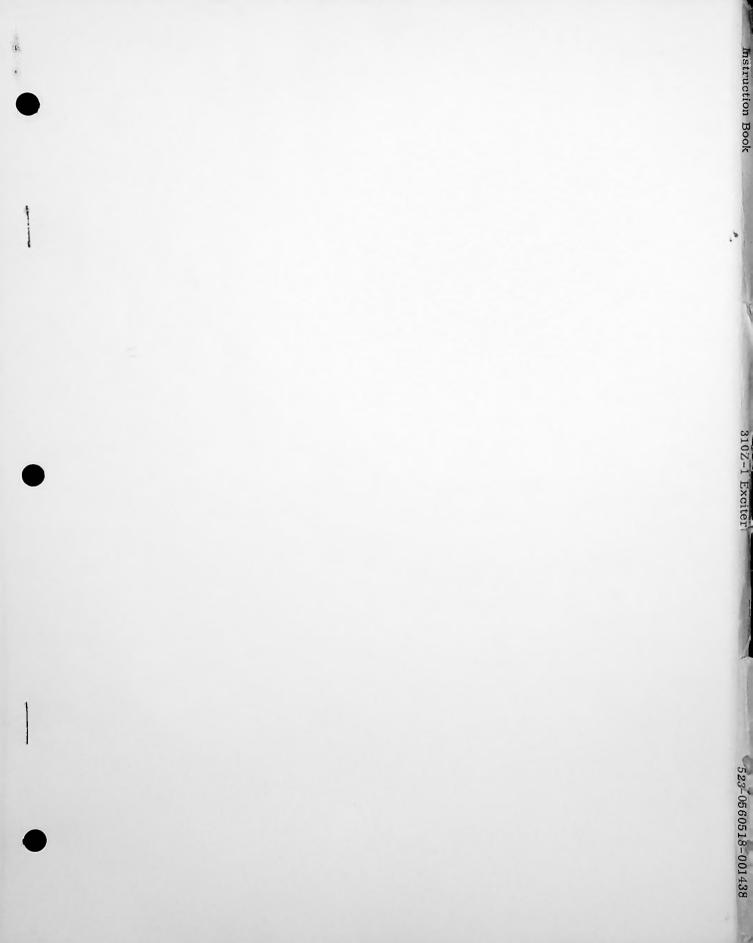


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glossary

- Crosstalk An undesired signal occurring in the main channel (or stereo subchannel) caused by an electrical signal in the stereo subchannel (or main channel).
- FM stereophonic broadcast The transmission of a stereophonic program by a single FM broadcast station utilizing the main channel and a stereophonic subchannel.
- Left (or right) signal The electrical output of a microphone or combination of microphones placed so as to convey the intensity, time, and location of sounds originating from areas predominately to the listener's left (or right) of the center of the performing area.
- Left (or right) stereophonic channel The left (or right) signal as electrically reproduced in the reception of FM stereophonic broadcasts.
- Main channel The band of frequencies from 50 to 15,000 Hz which frequency modulate the main carrier.
- Pilot carrier A subcarrier serving as a control signal for use in the reception of FM stereophonic broadcasts.
- Stereophonic separation The radio of the electrical signal caused in the right (or left) stereophonic channel to the electrical signal caused in the left (or right) stereophonic channel by the transmission of only a right (or left) signal.
- Stereophonic subchannel The band of frequencies from 23 to 53 kHz containing the suppressed stereophonic subcarrier and its associated AM sidebands.
- 100-percent modulation 75-kHz deviation of the main carrier.
- SCA Subsidiary Communication Authorization. The authorization to transmit background music that is multiplexed on FM broadcast.

Multiplex - The simultaneous transmission of two or more programs or signals over a single rf channel.

general description 4 4 4 -1 ingicia METER SCA AUDIO ADDITOVU ADDITOVU ADDITOVU ADDITOVU MODULATION POWER CONTROLLED AGAIN STERED P 1 - 04 2 0 - orr . . 5 3 8502 493 Pt

Figure 1-1. 310Z-1 FM Broadcast Exciter.

section 1 general description

1.1 INTRODUCTION

The 310Z-1 is an FM broadcast exciter (figure 1-1) that provides a frequency-modulated signal in the 88- to 108-MHz range (exact frequency as specified by the customer) for further amplification or direct transmission. It is a solid-state exciter which can be manually adjusted to provide a minimum output of 10 watts and a maximum output of 20 watts. The 310Z-1 exciter is prewired to accept two optional plug-in modules which perform stereo generation and SCA generation so that the 310Z-1 can perform any or all of the functions required of an FM broadcast exciter. The optional 786W-1 SCA Generator enables background music to be transmitted at 67 kHz multiplexed on an FM broadcast. The optional 786V-1 Stereo Generator allows broadcasting compatible time division multiplex stereo.

1.2 PHYSICAL DESCRIPTION

The 310Z-1 exciter is 19 inches wide, 10.5 inches high, and 15 inches deep, weighs approximately 40 pounds, and is designed for mounting in a standard 19-inch equipment rack. Six plug-in circuit cards contain most of the circuitry. Controls, audio filters, and power supply components are mounted on the chassis. A card cage secured to the chassis provides receptacles for the plugin cards. A removable front panel provides access to the cards. The connector for the rf signal output and the connector for the ac power input as well as the terminal strip for audio inputs are located on the back of the exciter. Built-in shielding prevents radiation and interference.

1.3 FUNCTIONAL DESCRIPTION

The functional units of the 310Z-1 FM Broadcast Exciter are: an FM modulator, an afc discriminator, an afc synchronous detector, an rf mixer, and a power amplifier. In addition, a stereo generator and an SCA generator are optional units which may be included as part of the 310Z-1. Each of these major functional units is constructed as a plug-in module, and the 310Z-1 is prewired so that the stereo generator and the SCA generator plug-in modules can be added at any time.

When the 310Z-1 is used only for monaural broadcasts (without the optional SCA generator or stereo generator), the audio input is applied to the baseband amplifier of the FM modulator through the required audio processing circuits. A 14-MHz oscillator is modulated to full deviation by the input. A discriminator detects this FM signal and applies the detected audio as negative feedback to the baseband amplifier to minimize noise and distortion. This FM signal is also applied to the afc discriminator which, in conjunction with the afc synchronous detector, maintains the oscillator output frequency at 14 MHz. The modulation is removed from the error correction voltage by synchronously adding an out-of-phase baseband signal to the discriminator output so that the deviation effects are canceled.

The output frequency selected from the frequency range of 88 to 108 MHz is generated by mixing the 14-MHz output with the output from the 74to 94-MHz crystal oscillator in the balanced mixer. The balanced mixer output frequency is the sum of the crystal oscillator frequency and the 14-MHz FM signal. This station output frequency signal is filtered and amplified to provide 10 to 20 watts of output power.

When the stereo generator is used, the exciter functions the same as described above with the exception that left and right audio inputs are applied to the stereo generator through separate preemphasis and shaping networks. These audio signals are multiplexed to provide the baseband signal which is filtered and applied to the FM modulator. When the SCA generator is used, the SCA audio input is amplified and used to frequency modulate a 67-kHz subcarrier oscillator. The FM SCA output is filtered and applied to the FM modulator.

1.4 OPTIONAL EQUIPMENT

Both the 786V-1 Stereo Generator and the 786W-1 SCA Generator are customer options. The exciter

general description

may be purchased without either of these, for monophonic broadcasting.

1.5 TECHNICAL CHARACTERISTICS

The technical characteristics for the 310Z-1 are listed below, and have been divided into four lists: (1) general characteristics which apply to all 310Z-1 exciters, (2) those characteristics which apply to the 310Z-1 when it is used for monaural FM, (3) those characteristics which apply to the 310Z-1 when it is used for stereo FM with the 786V-1 Stereo Generator, and (4) those characteristics which apply to the 310Z-1when it is used for SCA transmission with the 786W-1 SCA Generator.

1.5.1 General

Ambient Temperature Range: +15° to +55°C

Ambient Humidity Range: Up to 95%

Maximum Altitude: 7500 ft

Input Power Requirement: 117 volts ac, $\pm 10\%$, single-phase, 50/60 Hz

RF Power Output: 10 to 20 watts

Output Impedance: 50 to 70 ohms, unbalanced

Output Frequency Range: 88 to 108 MHz, crystal controlled

Crystal installed and exciter adjusted at factory to meet customer requirement

Carrier Frequency Stability: Within ± 1 kHz with ac line voltage of $\pm 15\%$ and temperature range of 0° to +55°C

Harmonic and Spurious Radiation:

Any emission appearing on a frequency removed from the carrier by between 120 and 240 kHz, inclusive is attenuated at least 30 db below the level of the unmodulated carrier

Any emission appearing on a frequency removed from the carrier by more than 240 kHz up to and including 600 kHz is attenuated at least 35 db below the level of the unmodulated carrier

Any emission appearing on a frequency removed from the carrier by more than 600 kHz is attenuated at least 80 db below the level of the unmodulated carrier, with the exception of harmonics of the rf carrier

Type of Modulation: Direct frequency modulation

Modulating Frequencies: 50 Hz to 75 kHz

FM Noise Level: 65 db below 100% modulation

AM Noise Level: 55 db below carrier level

1.5.2 Monaural FM

Audio Input Impedances: Monaural (left channel) 600 ohms balanced

SCA 600 ohms balanced

Audio Input Levels: Monaural 10 ±2 dbm for 100% modulation

SCA 6 to 15 dbm, adjustable from 0% to 10% modulation

Frequency Response: Standard 75-microsecond preemphasis

Distortion: Not more than 0.5%

1.5.3 Stereo FM With 786V-1

Audio Input Impedances: Left Channel 600 ohms balanced

Right Channel 600 ohms balanced

Audio Input Levels: Left Channel +10 ±2 dbm for 100% modulation Right Channel +10 ±2 dbm for 100% modulation

Frequency Response: Standard 75-microsecond preemphasis for both right and left channels

Distortion: 1.0% for 50-Hz to 15-kHz audio modulation

Stereophonic Subcarrier and Pilot Carrier Phasing:

When used with 786V-1 Stereo Generator or equivalent, phase difference between the stereophonic subcarrier and pilot carrier is within the limits required for channel separation of more than 35 db with audio modulating frequencies of 50 Hz to 15 kHz

Stereo Channel Separation: At least 35 db, 50 Hz to 15 kHz

Crosstalk:

At least 40 db below either single-channel level $% \left[{\left[{{{\left[{{{\rm{b}}} \right]}_{{\rm{c}}}_{{\rm{c}}}} \right]}_{{\rm{c}}}} \right]} \right]$

38-kHz Stereo Subcarrier Suppression:40 db below 90% modulation of the main carrier

Pilot Carrier Frequency: 19 kHz ±2 Hz

Pilot Carrier Level: Adjustable from 0% to 15% modulation of main carrier 1.5.4 SCA FM With 786W-1

Audio Input Impedance: 600 ohms, balanced

- Audio Input Level: +6 to +15 dbm, adjustable from 0% to 10% modulation
- SCA Subcarrier Center Frequency: 67 kHz
- SCA Frequency Modulation of Main Carrier: Adjustable from 10% to 30%
- SCA Generator Center Frequency Stability: Within $\pm 0.5\%$
- Frequency Response: Standard 75-microsecond preemphasis

FM Noise Level: Less than -55 db

Distortion: 1.0% for 50 to 15 Hz with 3.5-kHz deviation

1.0% for 50 to 5 Hz with 7.5-kHz deviation

2.0% for 50 Hz to 15 kHz with 7.5-kHz deviation

Crosstalk:

Crosstalk from main channel and stereo subchannel into the SCA channel shall be 40 db below 10% modulation of the main channel

section 2 installation

2.1 GENERAL

Remove all packing material carefully. Check equipment against shipping invoices and records. Inspect the unit for damaged or missing components. Check for free movement of front panel controls. Any claims for damage should be filed promptly with the transportation agency. If such claims are to be filed, all packing material must be retained. Store the factory shipping container for future use.

2.2 PREINSTALLATION

Make sure that all plug-in filters and cards are securely plugged in. Refer to Section 6, Parts List for locations.



If the 786V-1 Stereo Generator is not to be installed, right channel filters FL-3 and FL-4 are not required.

2.3 WIRING

2.3.1 Audio Input Connections

Use only balanced 600-ohm audio inputs to the 310Z-1. Use only twisted, shielded pairs for input cables. (See figure 2-1.)

- a. Monaural Inputs Connect the monaural audio input line to TB1-1 and TB1-3. Connect the cable shield to TB1-2. (See figure 2-2.)
- b. Stereophonic Inputs Connect the left channel audio input line to TB1-1 and TB1-3. (See figure 2-2.) Connect the cable shield to TB1-2. Connect the right channel audio input line to TB1-4 and TB1-6. Connect the cable shield to TB1-5. Be sure that the 786V-1 Stereo Generator is plugged into the 310Z-1.
- c. SCA Inputs Connect the SCA audio input to TB1-7 and TB1-9. Connect the cable shield to TB1-8. Be sure that the 786W-1 SCA Generator is plugged into the 310Z-1. Set the 786W-1 METER switch to 3.6 kHz or

7.5 kHz, depending on the deviation to be used. Set the 786W-1 MUTE ENABLE switch to ON.

2.3.2 Stereo Remote Control

If stereo remote control is desired, connect the leads from the station remote control switch to TB1-10 and TB1-11 (ground).

2.3.3 RF Output

Connect a coaxial cable from the transmitter rf input to the exciter rf output jack, J1.

2.3.4 Input Power

Connect the ac line cord between P1 on the exciter and 117 volts ac.



Do not operate the 310Z -1 exciter without a load connected to the rf output, and do not operate the exciter over any extended period of time into a vswr greater than 2:1. To guard against such operation, steps should be taken during installation, as outlined in paragraph 2.3.5.

2.3.5 Power Control Override

A voltage should be connected to TB1-12 of the 310Z-1 to protect the exciter output transistors when the exciter is operated without a load. A dc voltage source (+12 to +35 volts) is connected to TB1-12 so that when no plate voltage is present in the transmitter, the dc voltage is applied to the power regulator card; and as a result the exciter output power is reduced to a sale level.

If the override voltage is not available directly from the transmitter with which the exciter is being used, the +35 volts provided at TB1-13 of the exciter may be connected through a relay so that it is applied whenever plate voltage is removed from the power amplifier stage in the transmitter.

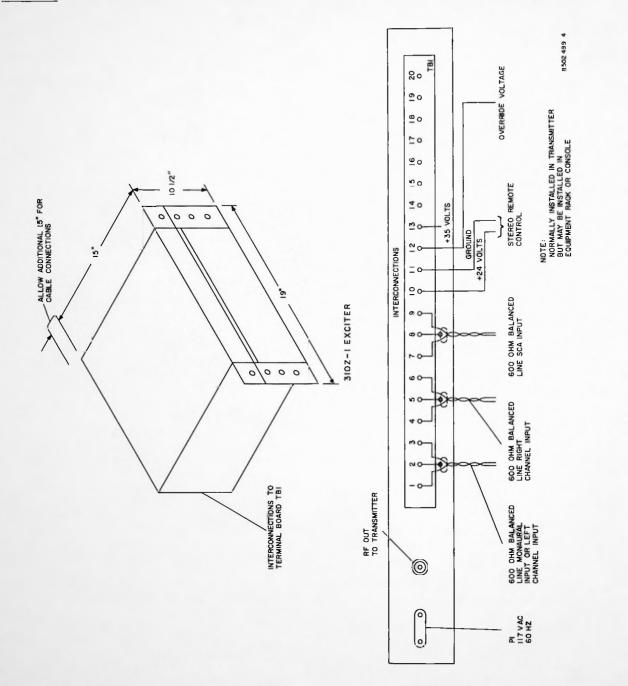


Figure 2-1. 310Z-1 FM Broadcast Exciter, Outline Dimensions and Installation Details.

installation

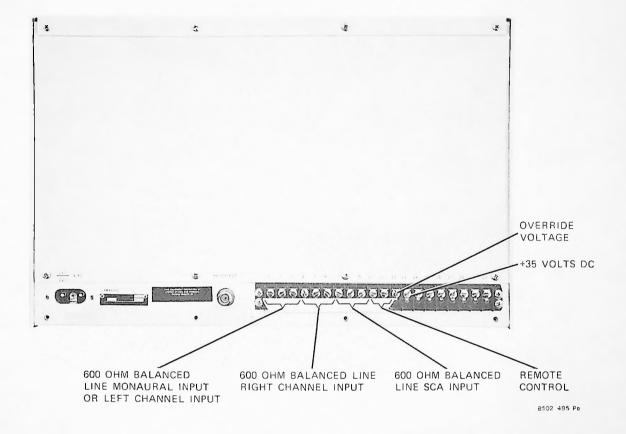


Figure 2-2. 310Z-1 FM Broadcast Exciter, External Connections.

2.4 INITIAL CHECKS

The 310Z-1 exciter is carefully adjusted and inspected at the factory and no special tests or adjustments are required upon installation. However, once the exciter has been installed in the transmitter or other broadcast system, the transmitter should be checked to ensure that it is operating.

2.5 OUTPUT FREQUENCY CHANGE

The output frequency of the 310Z-1 is crystal controlled and can be changed to any desired frequency between 88 and 108 MHz. To change the exciter frequency, refer to paragraph 5.8.

$\frac{\text{section } 3}{\text{operation}}$

3.1 GENERAL

Only the three front panel switches and the vu meter on the front panel of the exciter (figure 3-1) are used during normal operation. Refer to table 3-1. After the exciter has been placed in operation, it is necessary only to check meter indications from time to time to ensure that the exciter is operating properly.

3.2 NORMAL TURN-ON PROCEDURE

- a. Place POWER switch to ON.
- Set MODULATION switch to LEFT, RIGHT, or STEREO, depending on the type of modulation desired.
- c. Make sure that exciter is functioning correctly by placing METER switch in each position and ensuring that the vu meter indicates 0 ±1 vu in each switch position.

Note

If monaural operation is used, the left audio input channel is normally used for the audio input with the MODULATION switch in the LEFT position. To use the left channel for monaural operation, filters FL1 and FL2 must be installed. To use the right audio input, filters FL3 and FL4 must be installed. For stereo operation all four filters must be installed.

3.3 ALTERNATE TURN-ON PROCEDURE

When the 310Z-1 is used in a Collins transmitter having automatic sequencing circuits, the POWER switch is normally left in the ON position and the exciter is turned on and off by the power sequencing circuits of the transmitter.

3.4 STEREO/MONAURAL REMOTE SWITCHING

When it is desired to switch the exciter from monaural to stereo from a remote location, a stereo on/off switch is connected between pins 10 and 11 of terminal board TB1. This switch will then control relay K1 so that remote switching can be used as long as the MODULATION switch is in either the LEFT or RIGHT position. The STEREO position overrides the remote stereo OFF position.

Table 3-1. 310Z-1 FM Broadcast Exciter, Front Panel Controls and Indicators.

REFERENCE DESIGNATION (Figure 3-1)	CONTROL OR INDICATOR	FUNCTION
S1	MODULATION .	Selects either the left audio input to be broadcast monaurally (LEFT), or the right audio input to be broadcast monaurally (RIGHT), or the left and right audio inputs to be broadcast stereophonically (STEREO).
M1/S2	METER	The vu meter, in conjunction with the METER function switch S2, per- mits monitoring of the various audio inputs and the output from the 310Z-1 exciter. Refer to table 3-2.
S3	POWER	Controls the application of 117 vac to the exciter.

operation

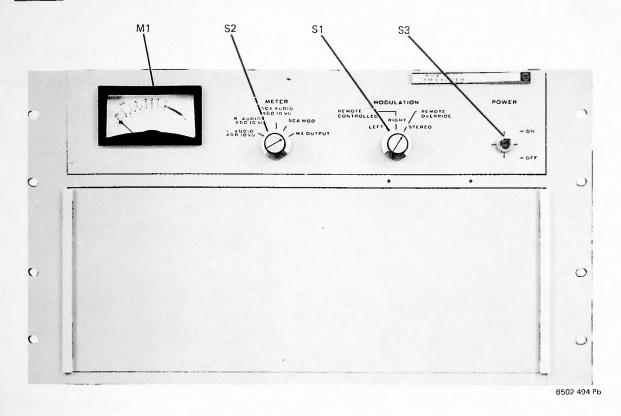


Figure 3-1. 310Z-1 FM Broadcast Exciter, Front Panel Controls and Indicators.

POSITION OF METER SWITCH S2	FUNCTION	METER INDICATION
L AUDIO ADD 10 VU R AUDIO	Left channel audio input level Right channel audio	-1 to +1 vu -1 to +1 vu
ADD 10 VU	input level	
SCA AUDIO ADD 10 VU	SCA audio input level	-1 to +1 vu
SCA MOD	Amount of deviation of SCA subcarrier	0 ±1 vu. With switch S2 on the 786W-1 SCA Generator card in the 7.5-kHz position, 0-vu indi- cation means that the SCA audio input is causing ±7.5-kHz devia- tion of the subcarrier. With S2 on the 786W-1 card in the ±3.5- kHz position, 0 vu indicates a 3.5-kHz deviation of the sub- carrier.
MX OUTPUT	Level of baseband signal to the FM modulator	-1 to +1 vu

Table 3-2.	310Z-1 FM	Broadcast Exciter	, Typical Meter	Indications.
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section 4 principles of operation

4.1 GENERAL

The 310Z-1 exciter produces a frequencymodulated output for driving a power amplifier in an FM broadcast transmitter. The 310Z-1 employs the direct method of frequency modulation. The optional 786V-1 Stereo Generator produces signals which meet all FCC requirements for stereophonic broadcasting. The optional 786W-1 SCA generator produces an FM subcarrier for broadcasting background music under an FCC Subsidiary Communications Authorization.

4.2 BLOCK DIAGRAM DISCUSSION

Refer to figure 4-1 (simplified block diagram) and figure 7-1 (detail block diagram) during the following discussion. The major circuits of the 310Z-1 are contained on plug-in modules; and as shown on figure 4-1, these modules are the major blocks of the 310Z-1 exciter. When an exciter is used for monaural broadcasting without the optional modules, the monaural input is normally applied to the audio processing circuits and then directly to the modulator module as the baseband signal. Since the remaining circuits operate the same for either monaural or stereophonic and SCA broadcasting, the block diagram discussion covers a complete exciter with the optional modules.

The left and right audio input signals are applied through the audio frequency circuits as the modulation input to the balanced modulator of the stereo generator. These signals are used to modulate two 38-kHz subcarrier signals which are 180° out of phase. As a result, the 38-kHz carrier is canceled so that the modulator output consists of only the two modulation frequencies and the desired modulation sidebands of the carrier frequency. One component is directly proportional to the sum of the two audio signals (L + R), and the other component is a doublesideband signal (L - R). The output from the balanced modulator is combined with the 19-kHz pilot carrier. Signal generation within the stereo generator is described in paragraph 4.3.

The output from the stereo generator is passed through a 53-kHz low-pass filter and then combined with the output from the SCA generator (if used) to produce the baseband signal. The 19-kHz pilot carrier is derived in the stereo generator by routing one of the 38-kHz subcarrier signals to a divide-by-2 circuit to produce the 19-kHz pilot carrier which is phase-locked to the 38-kHz signals. The baseband signal is then applied to the baseband amplifiers in the modulator and the baseband cancel amplifier in the afc synchronous detector.

The SCA audio input is applied to an audio transformer in the SCA generator, routed through a preemphasis network, amplified, and used to frequency modulate the 67-kHz center frequency subcarrier. The audio input is also monitored by a carrier mute circuit which removes the SCA output whenever the audio input drops below the selected mute level.

The input to the modulator module is the baseband signal which modulates the 14-MHz carrier. This baseband signal may consist simply of the monaural audio signal or it may be a composite signal consisting of the L + R, L - R, 19-kHz pilot carrier, and the 67-kHz SCA signals, depending on the type of broadcast being employed. A portion of the FM output signal, which is routed to a modulator discriminator circuit from the modulator, applies a negative feedback to the baseband amplifier to reduce noise and distortion. The FM output from the modulator is then applied to the rf mixer.

The center frequency of the modulator oscillator is maintained at 14 MHz by the afc circuits of the afc discriminator and the synchronous detector. The afc discriminator compares the output frequency from the modulator with the output from a 14-MHz reference oscillator and derives an error signal. The afc synchronous detector uses this error signal from the discriminator to develop a voltage that will correct the frequency drift of the 14-MHz oscillator output.

principles of operation

The rf mixer develops the desired output frequency by the heterodyne action, mixing the frequency-modulated 14-MHz signal with the signal from a crystal-controlled oscillator. The sum of 14 MHz and the customer-selected crystal frequency is the FM output frequency (88 to 108 MHz). The output from the rf mixer is applied to the 3-stage rf amplifier which raises the signal to the desired output power level of 10 to 20 watts.

4.3 STEREO GENERATOR

The 786V-1 Stereo Generator performs the conversion of stereophonic input signals to an output which conforms to the standards approved by the FCC for transmission of stereophonic signals. In order to provide a realistic stereo effect, the 786V-1 maintains the difference in time delay and signal amplitude from the sound source to both the right and left channel microphones through the entire stereo system. Channel separation, which is the isolation between the two channels, is held to greater than 35 db by the 786V-1 to enhance the stereo effect to the listener. The following paragraphs discuss stereophonic signal generation and the principles of operation of the 786V-1 Stereo Generator.

1.3.1 Signals Required

The FCC requires that stereophonic FM broadcast signals be compatible, which means that the signals may be detected by either a monophonic or stereophonic receiver. To satisfy this and other requirements of the FCC, the signals and frequencies generated must be as shown in figure 4-2. In monophonic receivers only the L + R (left plus right) audio frequency component of the signal, called the main channel, is used. The L - R (left minus right) component of the baseband signal, called the subchannel, is a difference signal only and is comprised of sidebands of a 38-kHz suppressed subcarrier. This difference component and the 19-kHz pilot carrier signal are reduced by the deemphasis network of the monophonic receiver.

In FM stereophonic receivers all signals shown in figure 4-2 are detected and used. The L - Rsubchannel and L + R main channel signals are mixed, added, and subtracted to separate them into left and right audio signals. The 19-kHz pilot carrier signal is doubled in the receiver to regenerate the 38-kHz suppressed subcarrier which is used to demodulate the stereo signal. By this means, proper phase relationship is maintained between main channel and subchannel frequencies and between the left and right audio channels.

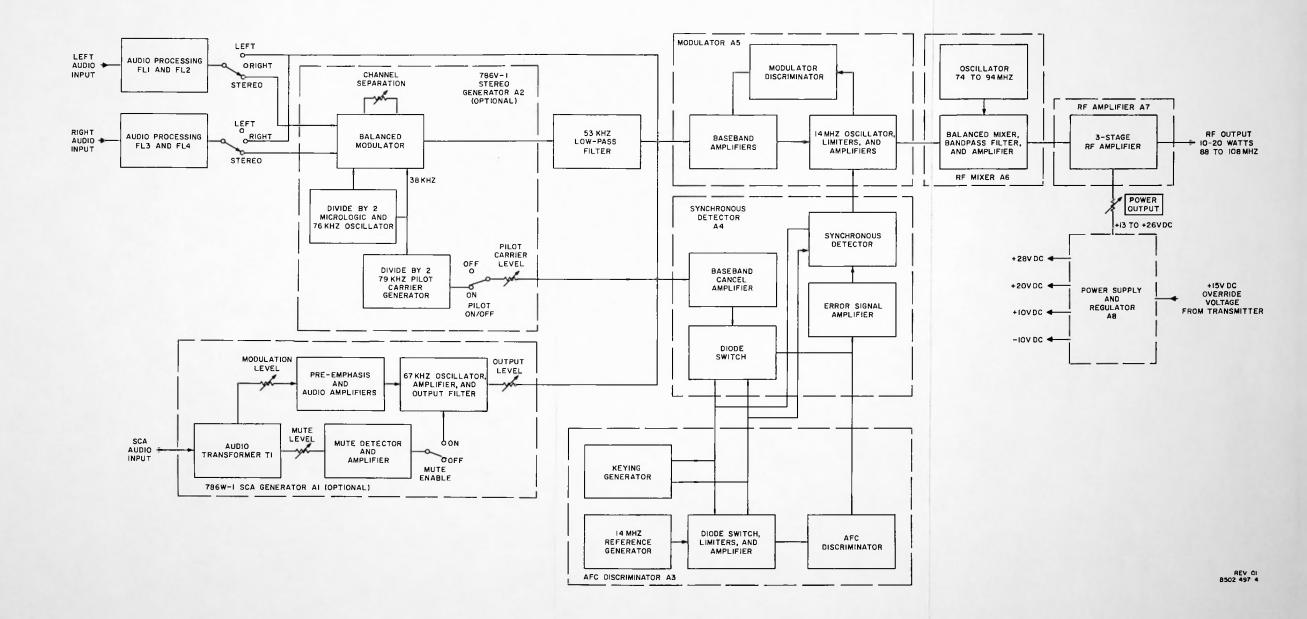
After the L + R and L - R signals have been generated, any interaction or exchange of information between the main channel (L + R) and the subchannel (L - R) represents crosstalk, which deteriorates the signals and has the effect of adding noise. In stereo transmitting systems, crosstalk must be kept at least 40 db below either signal-channel level.

To maintain 30-db channel separation, as required by the FCC, for the condition of an input into one channel only, the main channel and stereo subchannel signals must have equal peak amplitude, within approximately 0.3 db, and the envelope of the subchannel signal must cross the zero level simultaneously with the main channel signal, within approximately $\pm 3^{\circ}$.

4.3.2 Method of Signal Generation in 786V-1 Stereo Generator

The 786V-1 generates the spectrum of signals shown in figure 4-2 by the time-division multiplex method. The basic system operating principle is shown in figure 4-3. The left and right audio channels are switched into the link (used alternately) at a 38-kHz rate. If the receiver switching rate is synchronized with the transmitter switching rate, the original left and right audio signals are detected. In the receiver the frequency of the 19-kHz pilot carrier is doubled to synchronize the receiver to the transmitter. It is important that the switching frequency in both the stereo generator and the receiver be of the same phase to retain the identity of the left and right audio signals. In the 786V-1 generator a crystalcontrolled oscillator is used to generate a 76-kHz signal. This 76-kHz signal is divided by 2 in a micrologic flip-flop circuit; and by using both the logic 1 and the logic 0 outputs of the flip-flop, two 38-kHz square waves are obtained which will be exactly 180° out of phase. One of the 38-kHz square-wave signals is used to trigger another micrologic flip-flop (A4) to obtain a phase-locked 19-kHz pilot carrier signal.

To generate the baseband stereo signals, the 786V-1 Stereo Generator utilizes the basic circuits and functions of a balanced modulator. Refer to figure 4-1, the exciter block diagram, for component relationship and signal flow; refer to figure 7-4, the stereo generator schematic,



3

Figure 4-1. 310Z-1 FM Broadcast Exciter, Simplified Block Diagram.

4 - 3/4 - 4

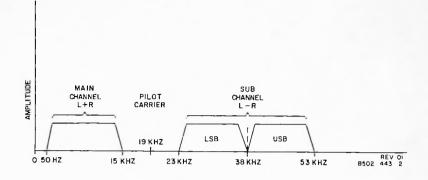


Figure 4-2. Spectrum of Signals in Stereo Baseband Audio.

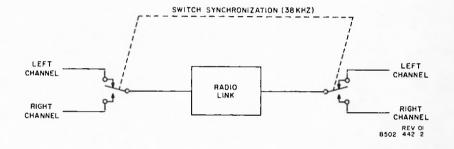


Figure 4-3. Elementary Time-Division Multiplex System.

for circuit detail. Although transistors Q2 and Q5 and their associated circuits function as a balanced modulator, several additional considerations affect the overall operation of the circuits to produce the desired stereo output signal. Separate input channels couple the two different modulating audio signals, L and R (left and right), to the modulator. Emitter follower Q1 applies the right audio signal to the balance modulator, and emitter follower Q4 couples the left audio signal to the balanced modulator. The 38-kHz subcarrier signals are applied to the balanced modulator transistor switches, Q3 and Q6. Because the two 38-kHz signals are of opposite phase, modulator transistors Q2 and Q5 are switched on and off at 38 kHz. Furthermore, when the outputs from Q2 and Q5 are combined, the subcarrier signals cancel and the 38-kHz subcarrier does not appear in the output signal. Transistor Q2 conducts during one half-cycle of the subcarrier frequency, and during this half-cycle one excursion of the square wave is modulated by the audio signal in the right channel. During the next half-cycle of the subcarrier, Q5 conducts and the next excursion of the square wave is modulated by the audio signal in the left channel. As stated previously, the 38-kHz subcarrier signals are balanced out in the modulator, and only the two modulating audio frequencies and the desired modulation sidebands of the carrier frequency are combined in the output.

4.3.3 Analysis of Signals Generated

It can be demonstrated by mathematical analysis that if a square wave is modulated alternately by two audio signals, two significant components are in the resultant signal. One component is directly proportional to the sum of the two audio signals (L + R), and the other component is a doublesideband (DSB) signal centered on the switching frequency, or subcarrier frequency (38 kHz). Mathematical analysis in detail is hardly within the scope of this manual. One other fact derived

principles of operation

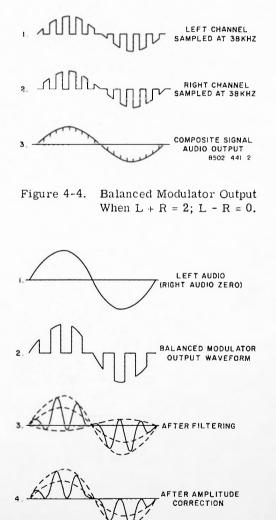
from such analysis is necessary, however, to an understanding of the 786V-1 operation. Because the peak amplitude of the fundamental sine-wave components of a square wave is $\frac{4}{\pi}$ times the peak amplitude of the square wave itself, the L - R component mentioned above is $\frac{4}{\pi}$ times the L + R component.

To make L + R = L - R, as required by the FCC, small portions of the L and R signals are added directly in the 786V-1, shunted around the balanced modulator through R9, R25, R16, and C13, and added to the modulator output.

Development of the FCC required signal in the 786V-1 may also be demonstrated by an analysis of the waveforms generated. Figure 4-4 represents the circuit operation when the inputs to each of the audio channels (L and R) are identical sine waves. On one half-cycle of the square-wave switching frequency (subcarrier frequency), Q5 conducts and the L signal is utilized (or sampled). On the next half-cycle, Q2 conducts and the R signal is utilized. Expressing the same action in a different way, on one half-cycle of the switching frequency an excursion of the subcarrier square wave is modulated by the left channel audio signal; and on the next half-cycle the next excursion of the subcarrier square wave is modulated by the right channel audio signal. As may be seen in figure 4-4, the 38-kHz subcarrier switching frequency is balanced out, and with equal sinewave input to both audio channels (L - R = sine)wave) no sidebands are generated. The spikes shown on the composite sine wave in the third illustration of figure 4-4 are caused by imperfect switching and must be filtered out. The output of the modulator is then a sine wave identical to the original sine-wave input in either channel (L - R or $\frac{L+R}{2}$). Equal sine-wave input seldom occurs in an actual broadcast but is shown here for

an actual broadcast but is shown here for analysis.

Figure 4-5 shows the balanced modulator output when L = 1 and R = 0. The output of the balanced modulator is an audio component plus DSB components centered on the switching frequency, and odd harmonics. When the odd harmonics are filtered out by a phase-linear low-pass filter, the third waveform results. The audio component is then increased by $\frac{4}{\pi}$ and the fourth illustration results. Figure 4-6 shows the time-division multiplex signal when L = -R, or L + R = 0, and L - R = 2L (or 2R). The composite waveform from the balanced modulator is shown in the third illustration. This waveform is composed of equal but opposite audio components, DSB components centered on the switching frequency, and odd harmonics. The audio components balance out; and when the odd harmonics are removed by filtering, the waveform in the fourth illustration results. This waveform is a DSB signal which equals L - R as required.



8502 445 2

Figure 4-5. Balanced Modulator Output When L + R = 1; L - R = 1.

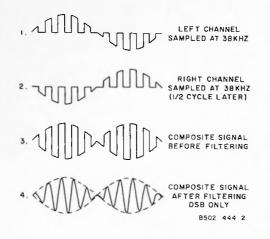


Figure 4-6. Balanced Modulator Output When L + R = 0; L - R = 2.

Perhaps the relationship of the L + R and L - Rsignals should be noted again here in connection with the above analysis. The L + R main channel component of the composite signal represents the sound which would be heard if only one microphone is used for input, and it is also the sound which would be heard from a monophonic receiver tuned to a stereo broadcast. The L - R component is a difference signal only. It may be a positive value, may be equal to zero, or may be a negative value (in the case where R is greater than L). When the composite signal is detected in a stereo receiver which is exactly synchronized with the transmitter, the L + R component is split and routed to both left and right audio channels in the receiver. The L - R difference signal is split also, and in effect is added to the left channel audio component and subtracted from the right. The result is $\frac{1}{2}(L + R) + \frac{1}{2}(L - R) = L$ in the left channel, and $\frac{1}{2}(L + R) - \frac{1}{2}(L - R) = R$, in the right channel. In this way the receiver gives a perfect reproduction of the stereo input to the transmitter.

4.3.4 Circuit Analysis

Both left and right audio signals are fed through preemphasis networks in the exciter before application to the right and left audio inputs of the stereo generator, connector pins 13 and 29, (figure 7-4). Within the generator the left and right audio channels are identical. The audio

signals are fed through 15-kHz low-pass filters (FL1 and FL2), which sharply attenuate frequencies above 15 kHz. From FL1, capacitor C1 couples the right audio signal to the base of emitter follower Q1 and then to the modulator at the junction of resistors R9 and R10. The right channel audio signal is divided so that the signal through R9 adds to the left channel signal and the signal through R10 modulates the 38-kHz subcarrier. A similar circuit couples the left audio signal to emitter follower Q6 and to the other side of the balanced modulator at the junction of resistors R25 and R26. The signal through R25 adds to the right channel signal (through R9) and is routed around the modulator to increase the L + R component of the modulator output. Variable resistor R16 provides a control for the amplitude of the L + R component to control channel separation.

The 38-kHz subcarrier signals for the balanced modulator are produced from the output of the 76-kHz oscillator, transistor Q7 and its associated circuits. The oscillator frequency is controlled by crystal Y1, and after amplification by amplifier Q8 the 76-kHz signal triggers a flipflop (micrologic A1). By using both the logic 1 and the logic 0 from this flip-flop, two 38-kHz signals are obtained which are 180° apart in phase. The output signals from flip-flop A1 are first amplified by the inverters (micrologics A2 and A3) and then applied to the modulator through transistor switches Q3 and Q6. Capacitor C26 helps maintain balance between Q3 and Q6 and improves the switching operation. The 38-kHz signals combine with the right and left channel audio signals at the base of Q2 and Q5 respectively. As a result, Q2 and Q5 alternately conduct at a 38-kHz rate and produce the stereo signals which are coupled through C12. The 38-kHz output from micrologic inverter A3 triggers micrologic flipflop A4. With both the set side (pin 1) and the reset side (pin 3) of the flip-flop grounded, the flip-flop functions as a complementary flip-flop. Thus, the output from the logic 1 side (pin 7) is a 19-kHz signal which is phase-locked to the 38-kHz subcarrier signals. The 19-kHz pilot carrier signal is routed through the PILOT CARRIER switch (S1) to a filter network (C29, C23, L2, and C24) which removes the undesired third harmonic of 19 kHz. From the filter the signal is fed through potentiometer R49, which provides control of the pilot carrier amplitude, through capacitor C14 and a resistor network to the output of the balanced modulator.

principles of operation

Bypass capacitors C25 and C4 provide an ac ground for any signal through Q3 when the transistor conducts. Similar capacitors (C27 and C11) perform the same function in relation to Q6. Potentiometers R12 and R28 provide a means for adjusting the sideband suppression. Of special importance in this circuit is suppression of the 76-kHz harmonics of the 38-kHz subcarrier. The L - R double-sideband signal from the balanced modulator and the 19-kHz pilot carrier signal are combined and capacitor C12 couples the combined signal to the multiplex output, connector pin 16. The L + R amplitude correction from R16 through C13, adds to the signal coupled through C12, to form the composite stereo baseband signal at the multiplex output.

4.4 SCA GENERATOR

1.1.1 General

Signals from the SCA generator become part of the audio baseband signal which is used to modulate the carrier. The subcarrier oscillator is a free-running multivibrator which generates a 67kHz center frequency that is frequency modulated by the SCA audio input signal. During normal stereo broadcast operation, modulation is limited to +3.5-kHz deviation to avoid interference with the stereo frequencies in the baseband signal. During monophonic broadcasts, ±7.5-kHz deviation is used. The modulation output from the oscillator is filtered to remove unwanted harmonics. Refer to figure 4-1, the exciter block diagram, for component relationship and signal flow; refer to figure 7-3, SCA generator schematic for circuit detail.

4.4.2 Circuit Analysis

The SCA audio input is applied to the SCA generator through connector pins 17 and 19 (figure 7-3). The main signal path is through T1 to the audio amplifier Q2, but a portion of the input signal is also applied through S2 to the SCA audio input of the vu meter, and through the mute level control (potentiometer R1) to the carrier mute circuits.

Modulation level control R3 selects the SCA audio input level which is coupled through C1 to impedance-matching emitter follower Q1. A standard 75-microsecond preemphasis network (consisting of R7, R8, and C3) and capacitor C4 couple the input signal to the audio amplifier Q2. Capacitor C30 and switch S2 couple the amplified audio signal to the modulation input of the w meter. Switch S2 selects the correct attenuation (R46 or R47) of the modulation input signal to provide a 0-vu indication for either 3.5-kHz or 7.5-kHz frequency deviation. The audio signal used to modulate the subcarrier frequency is applied through CR1 to the subcarrier oscillator circuit. Transistors Q4 through Q7 and their associated circuits comprise the astable multivibrator circuit which generates the 67-kHz center frequency subcarrier. Deviation of the subcarrier frequency, as adjusted by modulation level control R3, is within the range selected (±3.5 kHz or ±7.5 kHz). The modulated rf output from the oscillator is coupled through C10 and R3 to the base of amplifier Q8.

The carrier mute circuit is connected to the collector circuit of amplifier Q8 through MUTE ENABLE switch S1. Whenever the carrier mute circuit is being used (normally) and the audio input level drops below the level selected by MUTE LEVEL control R1, the output from the SCA generator is grounded at the collector of Q8. Positive pulses that are normally applied to the base of Q12 are removed and Q12 is turned off. As a result, C27 charges through R43 toward +20 volts; and when a potential of +10 volts is reached (in 3 seconds), diode CR9 breaks down and a positive voltage is applied to the base of Q13. Consequently, the collector of Q13 is at ground potential and this ground is applied through S1 to the collector of Q8.

Assuming that the input level is greater than the threshold level selected by MUTE LEVEL control R1, the modulated signal from the subcarrier oscillator is amplified by the direct-coupled amplifier (Q8 and Q9) and applied through CR7, R32, and R51 to the filter network. Capacitors C12 through C21 and inductors L1 through L3 comprise a 2-section band-shaping filter which removes the unwanted harmonics of the 67-kHz subcarrier. Capacitor C22 couples the filtered signal to emitter follower Q10, which provides a low-output impedance to feed the SCA subcarrier signal through capacitor C23 and connector pin 43 to the input of the FM modulator card of the exciter.

4.5 FM MODULATOR

The FM modulator card of the 310Z-1 exciter uses the direct method of frequency modulation. The modulating signal combines with the audio baseband signal through pin 19 (figure 7-7) and the SCA signal through pin 23 (if SCA is used). If only stereo is being broadcast, the audio baseband signal may contain frequencies ranging from 50 Hz to approximately 53 kHz. If an SCA signal is included, the baseband frequency range extends upward to approximately 70.5 kHz. Consequently, broadband amplifiers are used throughout the FM modulator circuits.

The audio baseband signal is fed through potentiometer R3, which provides a control for the level of the signal to the modulated oscillator. From R3 the baseband signal is fed through C5 to the input of the oscillator. Voltage-sensitive capacitor C52 has a capacitance which changes with variations of the input signal, thus controlling the frequency of the oscillator and providing frequency deviation of \pm 75 kHz for 100-percent modulation. The Q3 and associated components comprise the modulated oscillator which develops a center frequency of 14 MHz.

Zener diode CR2 maintains a constant de potential at the cathode of voltage-sensitive capacitor C52. An afc correction signal is fed through L1, R18, and pin 27 to the anode of C52. If the oscillator center frequency drifts below 14 MHz, the afc circuit develops a positive dc voltage (see paragraph 4.6.2) which is applied to C52, and the oscillator frequency is driven back toward 14 MHz. If the center frequency drifts upward, a negative voltage is applied to C52.

The 14-MHz FM signal from Q3 is fed to the first limiter, Q4. The first and second limiters, Q4 and Q5, clip the signal fed through them, and remove any amplitude modulation. Q6 is a discriminator driver which feeds a signal to the output amplifier, Q7, and to the modulator discriminator circuit.

The purpose of the discriminator on the FM modulator card is to complete an audio feedback loop which suppresses distortion, incidental noise, and transient carrier offset in the FM modulator circuits. The discriminator circuit provides negative feedback with fidelity over the range of frequencies handled. The discriminator demodulates the 14-MHz FM signal and develops an inverted baseband signal which is detected in diodes CR8 and CR9 and fed back to opposite sides of R6, in the input circuit of the first baseband amplifier.

The amplifier output signal from Q7 is filtered and then coupled through J1 to the rf mixer card. The output from Q7 is also coupled to Q8. The output from Q8 is filtered and fed through J2 to the afc discriminator card.

4.6 AUTOMATIC FREQUENCY CONTROL

The automatic frequency control (afc) of the 310Z-1 maintains the center frequency of the modulator oscillator at 14 MHz. The afc discriminator compares the output frequency from the modulator with the output from a 14-MHz crystal-controlled reference oscillator, and derives an error signal that is proportional in magnitude and polarity to the magnitude and direction of the difference in frequency of these two signals. The afc synchronous detector develops from the error signal a correction voltage that is used to correct the modulator oscillator. The afc discriminator uses a 5-Hz square-wave switching signal, generated by a keying generatormultivibrator circuit, to compare the two signals. This switching signal causes the discriminator to sample first one frequency and then the other. The afc circuits correct for frequency drift of the modulator oscillator and maintain stability of the center frequency of the exciter output within ±1 kHz.

4.6.1 AFC Discriminator Card

A 14-MHz crystal, Y1 (figure 7-5), controls the output frequency of the reference oscillator comprised of transistor Q4 and associated circuits. Capacitor C24 couples the output of Q4 to potentiometer R21 (REF LEVEL), which controls the 14-MHz reference signal level. From R21 the reference signal is coupled through C21 and is sampled on alternate half-cycles of the 5-Hz signal from the keying generator-multivibrator circuit. Diode CR7 is a gate for the 14-MHz reference signal. Contact J1 is the input for the 14-MHz FM signal from the FM modulator card. This signal is coupled through C27 and is sampled on alternate half-cycles (180° phase difference from the sampled 14-MHz reference signal) of the 5 Hz from the multivibrator circuit. Diode CR8 is the gate for this output. Transistors Q7, Q6, Q5, and associated circuits comprise the keying generator-multivibrator circuit which generates two 5-Hz square-wave signals equal in amplitude but opposite in phase. The signal from one multivibrator output is coupled through R27 and R26, combined with the signal from the FM modulator card, and applied to CR8. The signal in the other multivibrator output is coupled through a similar circuit, combined with the signal from the reference oscillator, and fed to CR7.

Diodes CR7 and CR8 are a gating switch which is controlled by the 5-Hz square-wave signals. During one half-cycle of the square wave, the signal from the oscillator is coupled through CR7 and C18 and to the first limiter, Q3. During the next half-cycle of the square wave, the signal from the FM modulator card is coupled through CR8 and C18 and to Q3. The first and second limiters, Q3 and Q2, clip the signal and remove any amplitude variations. The output of Q2 is a signal which for 1/10 second (one half-cycle of the 5-Hz square wave) represents the frequency of the reference oscillator, and for the next 1/10second represents the frequency of the FM oscillator output. The output of Q2 is coupled through C11 to the discriminator driver, transistor Q1. The output of Q1, through transformer T2, drives a conventional discriminator, comprised of T1, CR1, CR2, and associated circuits. Capacitors C6 and C4 are variable to allow tuning of the discriminator transformer primary and secondary windings. Provided the signal from the FM modulator carries no frequency modulation, the output of the discriminator at connector pin 8 is a 5-Hz square wave proportional in amplitude to the frequency drift, or error, of the FM modulator. The polarity of the square wave depends on the direction of drift, or error.

When the FM modulator is modulated by a baseband audio signal, the baseband audio signal is fed around the discriminator to a baseband cancellation circuit on the afc synchronous detector card, and added in opposite phase to the detector output. This action assures that the output of the discriminator at pin 9 is a true difference signal related to the modulator center frequency, when the FM modulator is modulated by a baseband audio signal. This circuit will be identified and discussed with the afc synchronous detector (paragraph 4.6.2).

A signal from one multivibrator output is coupled through pin 21, and a signal from the other output through pin 23. These signals key the circuits of the afc synchronous detector, and synchronize the detector with the afc discriminator.

4.6.2 AFC Synchronous Detector

The signal through connector pin 26 (figure 7-6) is the output of the afc discriminator discussed above, and is coupled to the error signal amplifiers, which consist of three stages, Q1, Q2, and Q3. The output of the discriminator is a 5-Hz square-wave error signal with amplitude pro-

portional to the magnitude of the frequency error, and with a polarity dependent upon the direction of error.

From Q3 the amplified error signal is coupled to phase splitter Q4. Capacitor C9 couples one square-wave error signal from the collector of Q4 to CR2. Capacitor C8 couples an equal signal of opposite phase from the emitter of Q4 to CR3. Both CR2 and CR3 are synchronous bridge detectors with nearly similar functions, but the internal diode elements of CR2 are connected in opposite polarity to those of CR3. Two other signals are connected through pins 29 and 30, each to an opposite side of both CR2 and CR3. These two signals are outputs of the discriminator multivibrator, and are 5-Hz square waves of equal amplitude and opposite polarity. One of these signals is always the same polarity as one output of Q4; the other signal is the polarity of the opposite output of Q4. The polarity of the error signal determines which multivibrator signal is in step with a given output of Q4. Because the signals from the multivibrator are equal and opposite, they cancel in the detector circuit (do not appear in the output) but function as keying signals for CR2 and CR3.

Diode CR2 conducts on one half-cycle of its input signal and produces a pulsating dc output. CR3 does the same thing, but because of the opposite phase of their input signals and the action of the keying signals from the multivibrator, the two detectors conduct during alternating time intervals and produce dc voltages of the same polarity. If no FM modulation effect is present in the error signal, and if the error signal remains constant, then the dc voltage pulses from CR2 and CR3, applied in sequence to the junction of R13 and R10, are equal. These pulses are filtered by R10, R11, C24, C7, and R9 to provide a relatively constant dc output.

As mentioned in the discussion of the discriminator, frequency modulation of the FM modulator output may affect the output of the discriminator, so that this output is not a true reflection of modulator frequency drift. Any such modulation effect is amplified proportionate to the error signal in Q1, Q2, and Q3, and results in an input to Q4 which is largely false.

The baseband cancellation circuit cancels the effect of frequency modulation on the error signal. A baseband audio signal is fed through pin 31 and capacitor C10 to the base of amplifier Q5. It will also be noted that the keying signals from the multivibrator are fed to opposite sides of

CR1, through R40 and R48. Capacitor C16 couples the audio output from Q5 to CR1. CR1 acts as a switch and shunts the audio to ground on alternate half-cycles of the 5-Hz square wave from the multivibrator. During the other half-cycle, capacitor C22 and resistor R47 couple the signal to the base of Q1 where it is subtracted (added as a negative quantity) from the error signal input from the afc discriminator card. This action cancels the effect of the frequency modulation of the error signal. Because frequency modulation affects only that portion of the error signal (one half-cycle) which relates to the output of the FM modulator, the output of CR1 must be subtracted only during this particular half-cycle. These effects are accomplished through interaction of the keying signals from the multivibrator and the keying signal coupled through C22.

When the modulation balance control (R35) is properly adjusted, the combined and filtered output of CR2, CR3, and CR1 provides an accurate dc correction voltage. This signal is coupled through pin 32 to the input of the FM modulator. When the frequency of the modulator drifts, the correction voltage always tends to drive it back toward the frequency of the reference oscillator.

4.7 RF MIXER

The primary function of the rf mixer is to convert the 14-MHz FM signal from the FM modulator to an FM signal having the desired station output frequency (88- to 108-MHz). This is accomplished by heterodyne action, mixing the 14-MHz signal with the output of a crystalcontrolled oscillator. The crystalused is selected at the Collins factory for a resonant frequency which equals the desired station output frequency minus 14 MHz. This frequency is between 74 and 94 MHz, and the desired output frequency is produced by heterodyning.

Transistor Q1 (figure 7-8) and associated components comprise the oscillator which is controlled by crystal Y1 to provide the 74- to 94-MHz signal. This signal is fed through transformer T1 to the balanced mixer (Q2 and Q3). The 14-MHz signal from the FM modulator is coupled to the mixer through T2. The mixer output signal (88- to 108-MHz) is routed through transformer T3 to a bandpass filter which shapes the signal and removes unwanted mixer products. From the filter, the signal is amplified in Q4 and Q5 and applied through transformer T5 to a push-pull output amplifier, Q6 and Q7. The output is coupled through transformer T6 to the output jack, J1. At this point, the signal is the frequencymodulated 88- to 108-MHz signal to be routed to the power amplifier card.

4.8 POWER AMPLIFIER

The power amplifier card of the 310Z-1 contains a broadband, solid-state, 3-stage power amplifier. The FM signal from the rf mixer is amplified to provide an rf output power level of 10 to 20 watts.

The first amplifier stage (Q1, figure 7-9) receives the FM input signal (through jack J1) and operates as a class A amplifier, using 20-volt dc power supplied through filter FL1. The second and third stages (Q2 and Q3) operate as class C amplifiers so that greater efficiency is obtained. All three amplifier stages are set for gain saturation, which is permissible with an FM input signal and provides higher efficiency. Both Q2 and Q3 use a variable 13- to 26-volt dc power input through FL2. The rf output power level of the amplifier (adjustable from 10 to 20 watts) is controlled by the level of this variable dc power, which is adjustable by the POWER CONTROL adjustment mounted under the card cage front panel. The power amplifier output is coupled through J2 to J1 on the exciter main chassis.

4.9 POWER SUPPLY AND REGULATOR

The solid-state power supply and regulator card of the 310Z-1 provides closely regulated dc power at the levels required for operation of the other cards and modules of the exciter. These levels include -10 volts, +10 volts, +20 volts, +28 volts, and a variable +13- to +26-volt supply. The level of the variable supply at pin 9 (figure 7-10) is controlled by power control potentiometer R15, which is located under the card cage front panel, and which in turn controls the rf output power level of the power amplifier card.

Exciter components may be damaged if the exciter is operated with no load or if it is operated into a vswr greater than 2:1. To avoid the danger of such operation, an output control override is provided. This positive voltage (+15 to +35 volts dc) is connected, through a relay circuit controlled by the transmitter. This override voltage is applied to pin 7, breaks down zener diode CR18, lowers the voltage at the base of Q5, and stops all current flow except leakage current through Q3, Q2, and Q1. A +15 volts applied to pin 7 effectively lowers the output voltage at pin 9 to less than 1 volt.

section 5 maintenance

5.1 GENERAL

The 310Z -1 FM Broadcast Exciter, which contains all solid-state circuits, has been carefully inspected and adjusted at the factory by skilled technicians using special test equipment. Therefore, the 310Z -1 should not be readjusted as part of routine maintenance procedures, but instead should be readjusted only after trouble has definitely been traced to misadjustment. When the 310Z -1 is readjusted, adjustments should be performed in accordance with the procedures outlined in paragraph 5.6 using the recommended test equipment listed in table 5-1.

To ensure peak performance and maximum service life, a regular schedule of routine maintenance should be carried out. For the 310Z-1 this routine maintenance should consist only of cleaning and inspecting, and should occasionally include a check of the minimum performance standards for the 310Z-1 in accordance with paragraph 5.7.

Caution

The 310Z-1 exciter should not be operated without a load connected to the rf output, and should not be operated over any extended period of time into vswr greater than 2:1.

5.2 CLEANING

Clean the 310Z-1 whenever a perceptible quantity of dust accumulates at any point inside the equipment. A solvent consisting of the following mixture may be used as a cleaning material.

Methylene chloride, 25 percent

Perchlorethylene, 5 percent

Drycleaning solvent, 70 percent by volume

Use the following procedure:

a. Remove dust from chassis, panels, and components with a soft-bristled brush.

ITEM	MANUFACTURERS DESIGNATION
Wideband FM modulation monitor	Collins 900C-3, part no. 758-5812-001
Distortion and noise meter	Hewlett-Packard 334A
Audio vtvm	Hewlett-Packard 400L
Vtvm	Hewlett-Packard 410B
Radio Receiver	Collins 51S-1
Wattmeter	Sierra 164B with 181A/250 plug-in element
Stereo test circuit	Fabricated per figure 5-3
Low-distortion af signal generator	Hewlett-Packard 206A
Oscilloscope	Tektronix 581A
Vertical amplifier	Tektronix type 81
Rf voltmeter	Boonton 91-C
Crosstalk test circuit	Fabricated per figure 5-6
FM frequency monitor	Collins 54N-1
SCA monitor	Collins 900F-1
Wave analyzer	Hewlett-Packard 302A

Table 5-1. Required Test Equipment.

- b. Clean flat surfaces and accessible areas with a lintless cloth moistened with solvent, removing any foreign matter adhering to the equipment. Dry with a clean, dry, lintless cloth.
- c. Wash switch contacts and the less accessible areas with solvent lightly applied with a small soft-bristled brush.
- d. Use a burnishing tool on relay contacts if contacts are corroded or pitted. Apply solvent lightly to relay contacts with a small softbristled brush. Dry with a clean, dry, softbristled brush.
- e. Use a dry, oil-free jet of air to remove any dust accumulated on the modules, circuit cards, in the card cage, or on components located in the area above the cage.

5.3 LUBRICATION

No lubrication is required.

5.4 INSPECTION

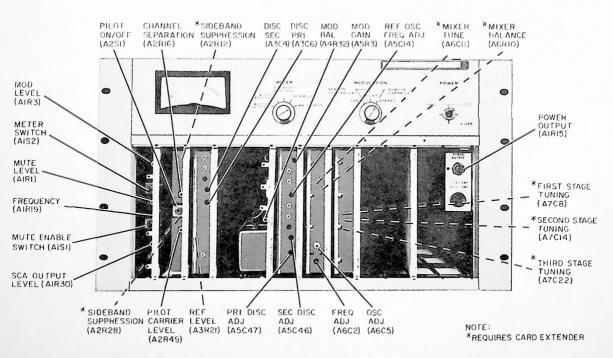
Perform periodic visual inspection of the 310Z-1 at least once each month. Inspect all metal parts for rust, corrosion, and general deterioration. Check circuit cards, wiring, and components for signs of overheating. Check the blower and cabinet fan for normal operation. Check all operating controls for smoothness of operation. Check all connections.

5.5 TEST EQUIPMENT REQUIRED

The test equipment listed in table 5-1, or its equivalent, is required to perform the adjustment and test procedures given in this section.

5.6 ALIGNMENT AND ADJUSTMENT

The maintenance controls for the 310Z-1 that are referenced in the following procedures are shown on figure 5-1 and their function is described in table 5-2.



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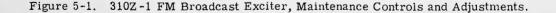
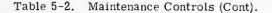


Table 5-2. Maintenance Controls.

CONTROL	FUNCTION
Power output R15	Controls the amount of collector voltage
	applied the rf output transistors.
86W-1 SCA Generator card A1	
R3 – modulation level	Sets the SCA audio input levels to the SCA modulator.
R1 - mute level	Sets the minimum audio level that will acti- vate the SCA subcarrier mute circuit.
R30 - output level	Sets the SCA subcarrier output level.
R19 - frequency	Sets the SCA subcarrier frequency.
86V-1 Stereo Generator card A2	
R12 - sideband suppression	Sets the switching point of Q3.
R28 - sideband suppression	Sets the switching point of Q6.
R16 - channel separation	Sets the level of the 1 + R signal from Q1 and Q4 applied to the multiply output to give proper levels for good stereo channel generation.
S1 - MUTE ENABLE switch	ON position enables mute circuit to remove the 67-kHz SCA oscillator output when there is no SCA audio input. OFF position disables mute circuit for maintenance.
R49 - pilot carrier level	Sets the level of the 19-kHz pilot carrier applied to the multiplex output.
S1 - PILOT ON/OFF switch	Switches the 19-kHz pilot carrier to the multiplex output.
Afe discriminator card A3	
R21 - reference level	Sets the level of the 14-MHz crystal oscil- lator input to the first limiter.
C6 - DISC PRI	Tunes the primary of the discriminator transformer.
C4 - DISC SEC	Tunes the secondary of the discriminator transformer.
Afc synchronous detector card A4	
R35 - MOD BAL	Sets the output level of the baseband canceling amplifier.
FM modulator card A5	
R3 - MOD GAIN	Sets the baseband input level into the FM modulator.
R12	Sets the base bias on transistor Q1.
C14	Sets the center frequency of the 14-MHz frequency modulator oscillator.
C47	Tunes the primary of the modulator dis- criminator transformer.
C46	Tunes the secondary of the modulator discriminator transformer.
Rf mixer A6	
C2 - trimmer capacitor	Adjusts oscillator frequency.
C5 - collector tuning	Tunes collector load to oscillator frequency.
C11 - mixer tune	Tunes input to mixer circuit.
R10 - mixer balance	Sets Q2 gate current equal to Q3 gate current.

CONTROL	FUNCTION	
Power amplifier card A7		
C8	Tunes the collector of Q1.	
C14	Tunes the collector of Q2.	
C22	Tunes the collector of Q3.	
Power supply regulator A8		
R27	Sets output level of +20-vdc regulator.	
S2 - 7.5-kHz/3.5-kHz SCA deviation switch	7.5-kHz position causes vu meter to indicate 0 v in SCA MOD position when SCA subcarrier deviation is 7.5 kHz.	
	 5-kHz position causes vu meter to indicate 0 v in SCA MOD position when SCA subcarrier deviation is 3.5 kHz. 	



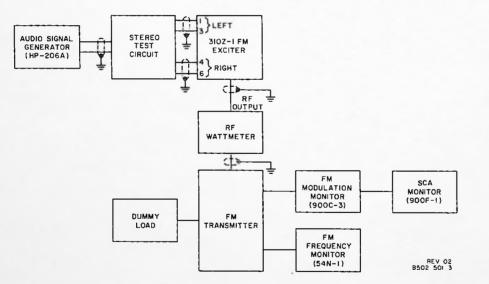


Figure 5-2. Test Equipment Connections to 310Z-1 for Adjustment and Test Procedures.

Caution

Do not attempt to make any adjustment to the 310Z-1 unless trouble has been definitely traced to misadjustment and the recommended test equipment is available.

5.6.1 Power Supply Checks and Adjustments

a. Remove exciter from transmitter or equip-

ment rack, remove top cover, and connect equipment as shown in figures 5-2 and 5-3.

- b. Locate capacitor C4 (see figure 6-1, sheet 3) and connect a vtvm across it (20-volt dc midscale range).
- c. Place POWER switch to ON, and adjust A8R27 until vtvm indicates +20 ±1 volts.
- d. Place POWER switch to OFF, and remove power amplifier card.

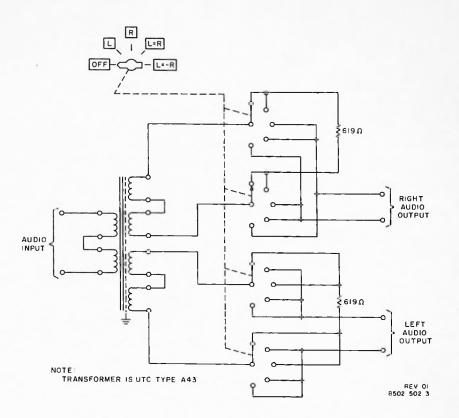


Figure 5-3. Stereo Test Circuit, Schematic Diagram.

- e. Connect vtvm across capacitor C3 and place POWER switch to ON.
- f. Vtvm indication should be between ± 13 and ± 26 volts dc.
- g. Mark position of POWER OUTPUT adjustment (R15), and then turn it fully clockwise.
 Vtvm should indicate +24 to +27 volts dc.
- h. Turn POWER OUTPUT adjustment fully counterclockwise and ensure that vtvm indicates +10 to +13 volts dc.
- i. Connect vtvm between A8-14 and ground, and ensure that vtvm indicates +10 volts dc.
- j. Connect vtvm between A8-18 and ground, and ensure that vtvm indicates -10 volts dc.
- k. Return POWER OUTPUT adjustment to its original position, place POWER switch to OFF, and remove vtvm.
- 1. Replace top cover and power amplifier card.

5.6.2 Oscillator Alignment (FM Modulator)

- a. Connect the equipment as shown in figure 5-2 and 5-3.
- b. Place MUTE ENABLE switch (located on SCA generator card) to ON.

- c. Place 19-kHz PILOT CARRIER switch (located on stereo generator card) to OFF. Turn stereo test switch to off.
- d. Connect a jumper between A4TP3 and A4TP4 on synchronous detector card.
- e. Connect a receiver (Collins 51S or equivalent) to a short antenna placed near A5Q3 at the back of FM modulator card.
- f. Tune receiver to exactly 14.0 MHz.
- g. Place POWER switch to ON, and adjust A5C14 for 14.0 MHz.

5.6.3 Discriminator Alignment (FM Modulator)

- a. With equipment still connected as shown in figure 5-2, connect vtvm to test point A5TP2.
- b. Adjust A5C47 for a maximum indication on vtvm.
- c. Connect vtvm (0.1-volt dc range) to test point A5TP3, and ensure that level at A5TP3 can be varied from a positive level to a negative level by adjusting A5C46.
- d. Adjust A5C46 until vtvm indicates 0 \pm 0.1 volt dc.

maintenance

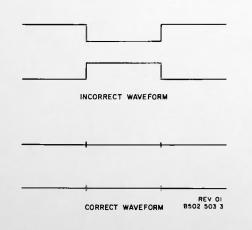
- e. Connect vtvm (15-volt dc range) to test point A5TP1 and adjust A5R12 for +7.5 volts dc.
- f. Remove the jumper from A4TP3 and A4TP4 on synchronous detector card.
- g. Place MUTE ENABLE switch to ON.

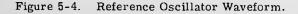
5.6.4 Discriminator Alignment (AFC Discriminator)

- a. Connect equipment as shown in figure 5-2.
- b. Remove afc discriminator card from card cage, install extender card, and install afc discriminator card on card extender.
- c. Remove cover from afc discriminator card and disconnect one end of resistor A3R32.
- d. Connect oscilloscope to A3TP4.
- e. Place POWER switch to ON and adjust A3R21 for a maximum level.
- f. Connect vtvm to A3TP1 and adjust A3C6 for a maximum indication on vtvm.
- g. Connect vtvm to A3TP2 and ensure that level at A3TP2 can be varied from a positive level to a negative level by adjusting A3C4.
- h. Adjust A3C4 for a 0 \pm 0.1-volt dc indication on vtvm.
- i. Reconnect resistor A3R32.

5.6.5 Reference Oscillator Level Adjustment (AFC Discriminator)

- a. Connect oscilloscope to A3TP4 with external trigger lead connected to the collector of A3Q5.
- b. Place POWER switch to ON, and adjust A3R21 until equal amplitudes of alternate signals are obtained as shown in figure 5-4.





c. Place POWER switch to OFF, remove extender card, and replace afc discriminator card in card cage.

5.6.6 Oscillator Tuning (RF Mixer)

- a. Connect equipment as shown in figure 5-2.
- b. Place rf mixer card on extender card and remove cover from rf mixer.
- c. Place POWER switch to ON, and touch probe of rf voltmeter to primary of transformer A6T1 (approximately 1/2 inch above ground).
- d. Adjust A6C5 for a maximum indication on rf voltmeter.
- e. Adjust A6C2 until correct station frequency is indicated on frequency monitor (Collins 54N-1 or equivalent).

Note

If oscillator cannot be adjusted on frequency by A6C2, also adjust A6C5.

5.6.7 Mixer Tuning (RF Mixer)

- a. Ensure that power amplifier card is installed.
- b. Replace cover on rf mixer card, and connect rf voltmeter to rf mixer output A6J1.
- c. Adjust A6C11 for maximum output.

5.6.8 RF Mixer Balance

- a. Connect audio oscilloscope (HP130C or equivalent) to FM modulator monitor (Collins 900C-3) WIDEBAND output.
- b. Increase sensitivity of oscilloscope until 100-kHz signal can be observed.
- c. Adjust MIXER BALANCE control A7R11 for a minimum 100-kHz signal on oscilloscope.

5.6.9 RF Modulator Sensitivity

- a. Connect vtvm to A5TP5 on FM modulator card.
- b. Place MODULATION switch on 310Z-1 to LEFT and stereo test circuit switch to L. (See figure 5-3.)
- c. Adjust audio oscillator (HP206A or equivalent) for an output of 400 Hz and 100 ± 2 mv rms on vtvm.
- d. Turn MODULATION METER switch on FM modulator monitor to MAIN CHAN MOD.
- e. Adjust A5R3 to obtain an indication of 100percent main channel modulation on FM modulator monitor.

5.6.10 Baseband Cancel Amplifier Adjustment (AFC Synchronous Detector)

- a. Place afc synchronous detector card on extender card.
- b. Set MODULATION switch on 310Z-1 to LEFT and stereo test circuit switch to I.
- c. Adjust audio oscillator to a frequency of 50 Hz and 100-percent modulation as indicated on FM modulation monitor.
- d. Turn A4R32 on afc synchronous detector card fully counterclockwise.
- e. Connect jumper from A4TP3 to A4TP4.
- f. Connect oscilloscope (Tektronix 581A or equivalent) to A4TP4, and observe the 50-Hz audio on one half-cycle of 5-Hz signal.
- g. Adjust A4R32 slowly clockwise to minimize 50-Hz audio signal.
- h. Remove card extender and replace afc synchronous detector card in card cage.

5.6.11 SCA Generator Output Level Adjustment

- a. With equipment connected as shown in figure 5-2, set MODULATOR METER switch on FM modulation monitor to SCA MOD.
- b. Place MUTE ENABLE switch (on SCA generator card) to OFF.
- c. Adjust OUTPUT LEVEL control R30 for 10-percent modulation as indicated on the 0- to 30-percent scale on FM modulator monitor.
- d. Turn MUTE ENABLE switch to ON and note that indication on the FM modulation monitor decreases to zero.

5.6.12 SCA Generator Frequency Adjustment

- a. With equipment connected as shown in figure 5-2, turn stereo test circuit switch to OFF.
- b. Check the SCA output frequency as indicated on the SCA frequency monitor (Collins 900F-1 or equivalent).
- c. Adjust A1R19 until SCA frequency monitor indicates 67 kHz.

5.6.13 Stereo Generator Adjustment

- a. Connect equipment as shown in figure 5-2.
- b. Set MODULATION switch on 310Z-1 front panel to STERO.
- c. Set MODULATION METER switch on FM modulator monitor to TOTAL MOD.
- d. Place 19-kHz PILOT CARRIER switch on stereo generator card to OFF.

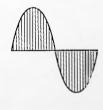
- e. Turn stereo test circuit (figure 5-3) switch to L position (left modulation only).
- f. Set audio oscillator (HP206A or equivalent) to 5000 Hz and adjust the output amplitude for 100-percent total modulation on FM modulation monitor.
- g. Connect oscilloscope (HP130C or equivalent) to A5TP5 on FM modulator card.
- h. Adjust channel separation control A2R16 on stereo generator for perfect stereo signal as observed on oscilloscope. (See figure 5-5.)



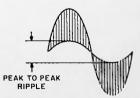
A perfect stereo signal is indicated by a straight baseline with the oscilloscope dc coupled, vertical sensitivity set to 2 mv/cm, and external triggering applied from audio oscillator.

5.7 MINIMUM PERFORMANCE STANDARDS

The 310Z - 1 should be tested in accordance with the following procedures after alignment and adjustment. In addition the following tests should be used to determine if the 310Z - 1 is operating properly. Table 5-3 lists those tests which are applicable to monaural, stereo, and SCA functions of the 310Z - 1. If it is desired to test the 310Z - 1 for monaural only, perform only those tests listed in table 5-3 for monaural, etc.



PERFECT SIGNAL



IMPERFECT SIGNAL REV 01 B502 500 3

Figure 5-5. Stereo Waveforms.

MONAURAL (para. no.)	STEREO (para. no.)	SCA (para. no.)	TEST
5.7.1	5.7.1	5.7.1	Output frequency
5.7.2	5.7.2	5.7.2	Frequency stability
5.7.3	5.7.3	5.7.3	Output power
5.7.4	5.7.4	5.7.4	Afc loop test
	5.7.5		Remote control
5.7.6	5.7.6	5.7.6	AM noise
5.7.7	5.7.7	5.7.7	FM noise
5.7.8			Frequency response (monaural)
			Harmonic distortion (monaural)
	5.7.10		Frequency response (stereo)
	5.7.11		Harmonic distortion (stereo)
	5.7.12		Subcarrier suppression
	5.7.13		Channel separation
	5.7.14		Main-to-subchannel crosstalk
	5.7.15		Subchannel-to-main crosstalk
		5.7.16	SCA input test
		5.7.17	SCA noise test
		5.7.18	SCA mute test
		5.7.19	SCA harmonic distortion
		5.7.20	SCA frequency response

Table 5-3. Tests Applicable to Broadcast Mode.

5.7.1 Output Frequency

- a. Connect the equipment as shown in figure 5-2, and turn stereo test circuit switch to OFF.
- b. Place PGWER switch to ON and measure output frequency.
- c. If the output frequency is incorrect (should be the customer-selected frequency of 88 to 108 MHz), readjust the rf mixer circuits as outlined in paragraph 5.6.6.

5.7.2 Frequency Stability

- a. With the equipment connected as shown in figure 5-6, turn stereo test circuit switch to L.
- b. Adjust the audio oscillator output for 50 Hz.
- c. Set output level for 100-percent main channel modulation on FM modulation monitor (Collins 900C-3 or equivalent).
- d. Output frequency should be ± 500 Hz of desired station frequency.

5.7.3 Output Power

- a. Connect equipment as shown in figure 5-2.
- b. Adjust OUTPUT POWER control until rf wattmeter indicates output of 10 watts.
- c. Adjust OUTPUT POWER control until rf wattmeter indicates an output of 20 watts.

5.7.4 AFC Loop Test

- a. Connect a receiver (Collins 51S or equivalent) to a short antenna and place it near A5Q3 in the back of the FM modulator card.
- b. Tune receiver to exactly 14.0 MHz and note that a pulsed tone is heard.
- c. Place stereo test circuit switch to OFF and connect a jumper between test points A4TP3 and A4TP4 on the synchronous detector card.
- d. Pulse tone should increase in pitch until it cannot be heard.
- e. Remove jumper and note that pitch of pulsed tone decreases to a zero beat.

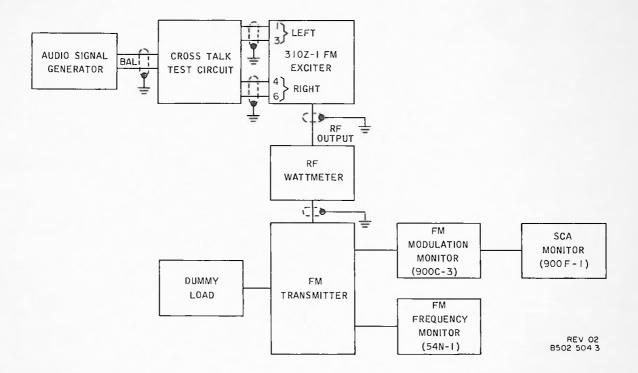


Figure 5-6. Test Equipment Connections to 310Z-1 Exciter for Crosstalk Test.

5.7.5 Remote Control Circuit Test

- a. With the equipment connected as shown in figure 5-2, set the stereo test switch to OFF.
- b. Turn the MODULATION switch on the 310Z-1 to LEFT.
- c. Turn the METER switch on the FM modulation monitor (Collins 900C-3) to PILOT MOD.
- d. Place 19-kHz PILOT switch A2S1 on the stereo generator card to ON.
- e. Ensure that there is no indication on the FM modulation monitor.
- f. Turn MODULATION switch on 310Z-1 to RIGHT and observe that there is no meter reading on the FM modulation monitor.
- g. Connect a jumper between terminals TB1-10 and TB1-11 on the rear panel of the 310Z-1.
- h. Observe that meter indicates approximately 8.5 percent on the FM modulation monitor.
- i. Place 19-kHz PILOT switch A2S1 on the stereo generator to OFF.

5.7.6 AM Noise

a. Connect the equipment as shown in figure 5-2.

- b. Turn the METER switch on the FM modulation monitor to RF LEVEL and adjust the RF LEVEL control for 100 percent on the front panel meter.
- Connect audio voltmeter (HP400L) to the AM NOISE jack on the FM modulation monitor.
- d. Ensure that the indicated noise level on the voltmeter is no more than 1.78 mv rms.

5.7.7 FM Noise

- a. Connect the equipment as shown in figure 5-2.
- b. Turn MODULATION switch on 310Z-1 to LEFT.
- c. Turn MODULATION METER switch on the FM modulation monitor to TOTAL MOD.
 d. Turn stereo test circuit switch to L.
- d. Turn stereo test circuit switch to L.
- e. Set output of audio oscillator to 400 Hz and 100-percent modulation as indicated on the FM modulation monitor.
- f. Turn DECIBELS switch on FM modulation monitor to 0 and METER switch to MAIN CHAN AUDIO.
- g. Turn METER ADJUST control until 0 db is indicated on FM modulation monitor front panel meter.

- h. Remove 400-Hz monaural input signal and turn the DECIBELS switch clockwise until a reading is observed on the meter.
- i. The main channel FM noise is the algebraic sum of the DECIBELS switch and the meter indication, and should be no more than -65 db.
- j. Turn METER switch to SUB CHAN AUDIO.
- k. The subchannel FM noise is the algebraic sum of the DECIBELS switch setting and the meter indication, and it should be no more than -65 db.

5.7.8 Frequency Response (Monaural)

- a. With the equipment connected as shown in figure 5-2, set the MODULATION switch on the 310Z-1 to LEFT and the stereo test circuit switch to L.
- b. Set the audio generator (HP206A or equivalent) for a frequency of 50 Hz.
- c. Place DE-EMPHASIS switch on FM modulation monitor to OUT.
- d. Adjust the output of the audio generator for 100-percent main channel modulation as indicated on the FM modulation monitor.
- e. Vary the audio generator and maintain 100percent modulation for frequencies of 100, 400, 1000, 5000, 7500, 10,000 and 15,000 Hz.
- f. Ensure that attenuator settings for each frequency are within the limits of the 75 microsecond preemphasis curve as defined by the FCC.

5.7.9 Harmonic Distortion (Monaural)

- a. Connect the equipment as shown in figure 5-2.
- b. Turn MODULATION switch on the 310Z-1 to the LEFT position.
- c. Turn MODULATION METER switch on the FM modulation monitor (900C-3) to TOTAL MOD and the DE-EMPHASIS switch to OUT.
- d. Turn stereo test circuit switch to L.
- e. Set the audio oscillator (HP206A) to 50 Hz, and adjust the output amplitude for 100percent total modulation on the FM modulation monitor.
- f. Turn MODULATION METER switch on FM modulation monitor to MAIN CHAN AUDIO.
- g. Connect distortion meter (HP334A or equivalent) to the DISTORTION METER jack on the FM modulation monitor.
- h. Ensure that the distortion meter indication is not more than 0.5 percent.
- i. Repeat steps e. through h. for modulating frequencies of 100, 400, 1000, 5000, 7500, 10,000 and 15,000 Hz.

5.7.10 Frequency Response (Stereo)

- a. With equipment connected as shown in figure 5-2, set the MODULATION switch on the 310Z-1 to LEFT and the stereo test circuit switch to STEREO.
- b. Turn on 19-kHz pilot.
- c. Repeat steps b. through f. of paragraph 5.7.8.
- d. Place MODULATION switch on 310Z-1 to RIGHT.
- e. Repeat steps b. through f. of paragraph 5.7.8.

5.7.11 Harmonic Distortion (Stereo)

- a. With equipment connected as shown in figure 5-2, place PILOT CARRIER switch to ON.
- b. Turn MODULATION switch on 310Z-1 to STEREO.
- c. Turn MODULATION METER switch on 900C-3 to TOTAL MOD, and place DE-EMPHASIS switch to OUT.
- d. Set switch on stereo test circuit (figure 5-3) to L = R.
- e. Set audio oscillator (HP206A) to 50 Hz, and adjust output amplitude for 100-percent total modulation on 900C-3.
- f. Connect distortion meter (HP334A or equivalent) to LEFT AUDIO jack on the 900C-3.
- g. Measure and record total distortion for modulating frequencies of 50, 100, 400, 1000, 5000, 7500, 10,000 and 15,000 Hz. Maintain modulation on 900C-3 at 100 percent for all frequencies, and distortion should be not more than 1.0 percent.
- h. Connect distortion meter to RIGHT AUDIO jack on 900C-3 and repeat step g.

5.7.12 Subcarrier Suppression

- a. With equipment connected as shown in figure 5-2, place PILOT CARRIER switch to OFF.
- b. Ensure that there is no input to the SCA generator of the 310Z-1 exciter.
- c. Turn DECIBELS switch on FM modulation monitor to 0.
- d. Turn METER switch on FM modulation monitor to TOTAL MOD.
- e. Adjust the audio generator for a frequency of 15,000 Hz, and adjust the amplitude for 90-percent modulation indication on the FM modulation monitor.
- f. Turn METER switch on FM modulation monitor to MAIN CHAN AUDIO, and adjust METER ADJUST control until meter indicates 0 db.

- g. Turn METER switch on FM modulation monitor to SUBCAR, and rotate the DECIBELS switch in a clockwise direction until a meter indication is observed.
- h. The setting of the DECIBELS switch indicates the subcarrier suppression; it should be at least -40 db.

5.7.13 Channel Separation

It is recommended that the channel separation test be performed using the Collins 900C-3 FM Modulation Monitor; however, channel separation can also be checked using an oscilloscope and following the procedure outlined in paragraph 5.7.13.2.

5.7.13.1 Channel Separation Test Using 900C-3

- a. Connect equipment as shown in figure 5-2.
- b. Turn MODULATION switch on front panel of 310Z-1 to STEREO.
- c. Turn MODULATION METER switch on FM modulation monitor (900C-3) to TOTAL MOD.
- d. Place 19-kHz PILOT CARRIER switch A2A1 to ON.
- e. Turn stereo test circuit switch to L.
- f. Set audio generator (HP206A) to 5000 Hz, and adjust output amplitude for 100-percent total modulation on FM modulation monitor.
- g. Set METER switch on front panel of FM modulation monitor to LEFT AUDIO.
- h. Set DECIBELS switch on front panel of FM modulation monitor to 0, and turn METER ADJUST control until an indication of 0 db is obtained on the front panel meter.
- i. Switch from left channel modulation to right channel modulation, and turn DECIBELS switch in a clockwise direction until an indication is observed on the front panel meter.
- j. Adjust A2R16 for best channel separation indicated on meter. The channel separation is the algebraic sum of the DECIBELS switch setting and the meter indication.
- Repeat steps f. through j. for frequencies of 50, 100, 400, 1000, 5000, 7500, 10,000 and 15,000 Hz, except do not readjust A2A16.
- 1. To obtain channel separation measurements with audio applied to the right channel and measurements taken in the left channel, repeat steps e. through i. and substitute left for right and right for left where these instructions are indicated, but do not readjust A2R16.

5.7.13.2 Channel Separation Test Using Oscilloscope

- a. Connect the shipment as shown in figure 5-2.
- b. Turn the MODULATION switch on the front of the 310Z-1 to the STEREO position.
- c. Turn MODULATION METER switch on the FM modulation monitor (900C-3) to TOTAL MOD.
- d. Place the 19-kHz PILOT CARRIER switch A2A1 to OFF.
- e. Turn stereo test circuit switch to L.
- f. Set audio oscillator (HP206A) to 5000 Hz and adjust the output amplitude for 100-percent total modulation on the FM modulator monitor.
- g. Connect an oscilloscope (HP130C) to A5TP5 on the FM modulator card.
- h. Adjust the channel separation control A2R16 for a perfect stereo signal as observed on the oscilloscope. See figure 5-4.

Note

A perfect signal is indicated by a straight baseline with the oscilloscope dc coupled, vertical sensitivity set to 2 mv/cm, and external triggering applied from the audio oscillator.

- i. Connect the oscilloscope (HP130C) to the WIDEBAND output jack on the FM modulation monitor.
- j. Adjust the audio generator output for 400-mv p-p signal on the oscilloscope.
- k. Increase the vertical sensitivity on the oscilloscope to 5 mv/cm, and ensure that the ripple on the baseline is not more than 7.0 mv p-p.
- 1. Repeat steps f. through k. for frequencies of 50, 100, 1000, 7500, 10,000 and 15,000 Hz, except the channel separation control should not be readjusted.
- m. Turn stereo test switch to R, and repeat steps f. through l. Do not readjust the channel separation control.

5.7.14 Main Channel to Subchannel Crosstalk

- a. Connect the equipment as shown in figure 5-6. The crosstalk test circuit shown on figure 5-7 must be fabricated for this test.
- b. Set the crosstalk test circuit switch to MAIN and the FREQ RANGE SELECT switch to 50/400.
- c. Turn the MODULATION switch on the 310Z-1 to STEREO.

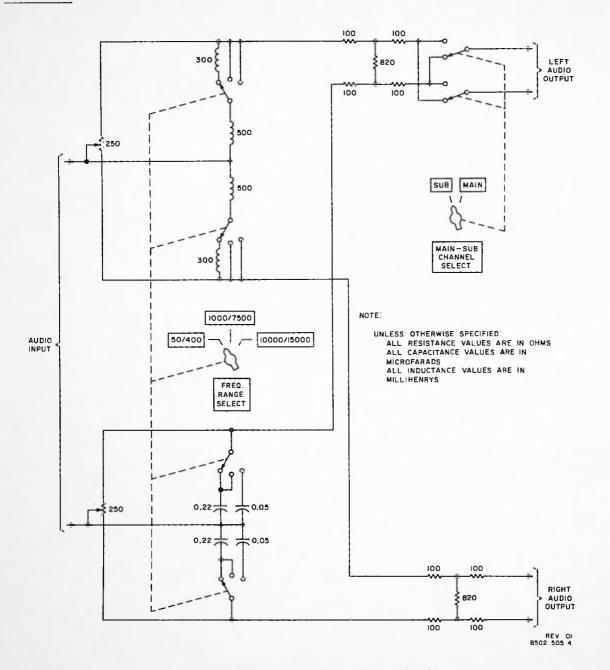


Figure 5-7. Crosstalk Test Circuit, Schematic Diagram.

- d. Adjust the audio generator (HP206A or equivalent) to a frequency of 50 Hz, and adjust the output level for 90-percent main channel modulation as indicated on the FM modulation monitor.
- e. On the FM modulation monitor, place the METER switch to MAIN CHAN AUDIO, turn the DECIBELS switch to 0, and turn the METER ADJUST control until 0 db is indicated on the meter.

- f. Turn METER switch to SUB CHAN AUDIO, and turn DECIBELS switch clockwise until an indication on the front panel meter of the FM modulation monitor is observed.
- g. Turn adjustments on crosstalk test circuit until a null is observed on the FM modulation monitor meter.



These adjustments are critical and require special attenation to achieve the proper null.

- h. Crosstalk is the algebraic sum of the DECIBELS switch setting and the meter indication. The main channel into subchannel crosstalk should be not more than -40 db from 50 to 15,000 Hz.
- Repeat the above procedure for frequencies of 100, 400, 1000, 5000, 7500, 10,000 and 15,000 Hz. Ensure that the proper frequency range is selected by the FREQRANGE SELECT switch of the crosstalk test circuit.

5.7.15 Subchannel to Main Channel Crosstalk

- a. With the test equipment connected as shown in figure 5-6, set the crosstalk test circuit switch to SUB and the FREQ RANGE SELECT switch to 50/400.
- b. Adjust the audio generator (HP206A or equivalent) to a frequency of 50 Hz, and adjust the output level for 90-percent subchannel modulation as indicated on the FM modulation monitor.
- c. Turn METER switch to MAIN CHAN AUDIO, and turn DECIBELS switch clockwise until an indication is observed.

5.7.16 SCA Input Test

- a. With the equipment connected as shown in figure 5-2, place the MODULATION METER switch on the FM modulation monitor to SCA MOD.
- b. Place MUTE ENABLE switch (on SCA generator card) to OFF.
- c. Place POWER switch to ON, and adjust SCA OUTPUT LEVEL control A1R30 for an indication of 10-percent modulation on the 0to 30-percent scale on the meter of the FM modulation monitor.

5.7.17 SCA Noise Test

a. With equipment connected as in figure 5-2, place MUTE DISABLE switch to OFF.

- b. Connect audio generator (HP206A) to SCA input terminals (TB1-7 and TB1-9) of exciter.
- c. Set the audio generator for a frequency of 400 Hz and an output level of +10 dbm.
- d. Connect ac voltmeter (HP403B) across the audio output (TB1-1 and TB1-2) of the SCA modulation monitor (900F-1).
- e. Record the 400-Hz reference signal level as indicated on the ac voltmeter.
- f. Remove the SCA input signal from the 310Z-1 exciter, and increase the sensitivity of the cated.
- g. The difference between the levels recorded in steps e. and f. should be not less than 55 db.

5.7.18 SCA Mute Circuit Test

- a. Connect equipment as shown in figure 5-2.
- b. Connect audio signal generator (HP206A) to terminals TB1-7 and TB1-9.
- c. Place PILOT CARRIER switch on stereo generator card to OFF.
- d. Turn stereo test circuit switch to OFF.
- e. Adjust audio signal generator connected to terminals TB1-7 and TB1-9 for 400 Hz at 6 dbm.
- f. Turn MUTE LEVEL control A1R1 fully counterclockwise.
- g. Observe the SCA subcarrier level on the SCA monitor.
- h. Place MUTE ENABLE switch to ON.
- i. After a few seconds, note that the SCA subcarrier level is still indicated on SCA monitor.
- j. Remove input to SCA generator card, and observe that SCA subcarrier indicated on SCA monitor is (decreased to zero) within 3 to 4 seconds.
- k. Adjust audio signal generator for 400 Hz at 6-dbm input to exciter.
- 1. Adjust attenuator on signal generator to reduce input level 30 db.
- m. Observe the SCA subcarrier on SCA monitor, and ensure that is still present after 3 to 4 seconds indicating that mute circuit did not cut off carrier.
- n. Remove audio signal generator.

5.7.19 SCA Harmonic Distortion

a. With equipment connected as shown in figure 5-2, connect a wave analyzer (HP302A or equivalent) to the audio output of the SCA monitor.



- b. Connect audio signal generator to SCA input terminals on exciter, and adjust audio generator frequency to 50 Hz.
- c. Adjust audio signal generator output to obtain a 425 mv rms at TP1 of the SCA card.
- d. On the wave analyzer, set the ABSOLUTE/ RELATIVE switch to RELATIVE, set MAX INPUT VOLTAGE to .3, and set RANGE switch to -10 db.
- e. Tune wave analyzer to 50 Hz and adjust REF ADJUST for 0 db.
- f. Measure the level of the second harmonic (100 Hz) and third harmonic (150 Hz) below the 0-db reference level. Harmonic levels should be not more than -43 db.
- g. Tune signal generator and wave analyzer to 1000 Hz and adjust REF ADJUST for 0 db.
- Measure level of second and third harmonics. Harmonic levels should be not more than -43 db.
- i. Repeat steps g. and h. for 5000 Hz.
- k. Repeat steps g. and h. for 10,000 Hz. Harmonic levels should be not more than -37 db.
- 1. Repeat steps g. and h. for 15,000 Hz. Harmonic levels should be not more than -37 db.

5.7.20 SCA Frequency Response

a. With equipment connected as in figure 5-2, place the PILOT CARRIER switch on stereo generator card to OFF.

- b. Connect audio generator (HP206A) to SCA input terminals (TB1-7 and TB1-9) of exciter.
- c. Turn stereo test circuit switch to OFF.
 d. Turn METER switch on SCA modulation monitor (900F-1) to SCA modulation monaural mode.
- e. Set audio generator frequency to 50 Hz, and adjust output amplitude for 7.5-kHz deviation on the SCA modulaton monitor.
- f. While maintaining the 7.5-kHz deviation, vary the audio generator frequency to 100, 400, 1000, and 5000 Hz. The audio generator attenuator settings for each frequency should follow the 75-microsecond preemphasis curve as specified by the FCC. See figure 5-8.

5.8 FREQUENCY CHANGE

If it is desired to change the output frequency of the 310Z-1, crystal A6Y1 located in the oscillator compartment on the rf mixer must be changed. Table 5-4 lists the channel frequency versus crystal frequency and the Collins part number for each crystal.

5.9 WIRE LIST

A complete list of the point-to-point wiring within the 310Z-1 FM Broadcast Exciter is included in table 5-5.

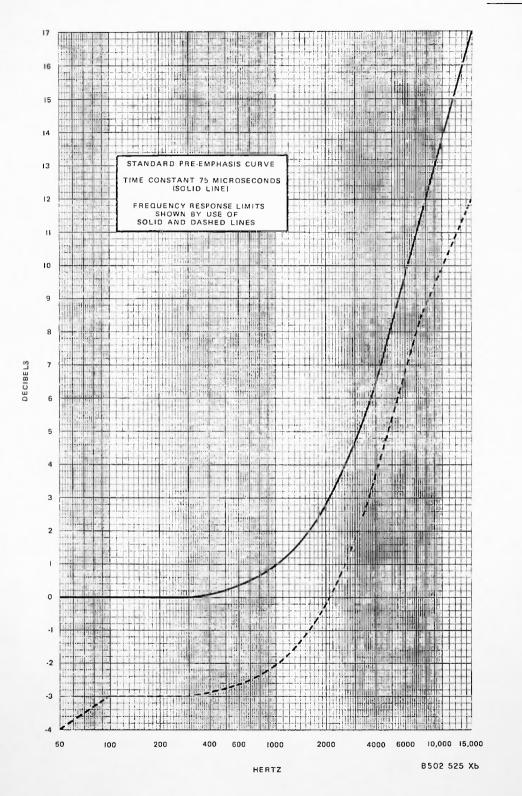


Figure 5-8. Standard Preemphasis Curve.

		Table 5-4. Cryst			
CHANNEL FREQ (MHz)	CRYSTAL FREQ (MHz)	COLLINS PART NUMBER	CHANNEL FREQ (MHz)	CRYSTAL FREQ (MHz)	COLLINS PART NUMBER
88.1	74.10000	289-2744-00	96.1	82.10000	289-2784-00
88.3	74.30000	289-2745-00	96.3	82.30000	289-2785-00
88.5	74.50000	289-2746-00	96.5	82.50000	289-2786-00
88.7	74.70000	289-2747-00	96.7	82.70000	289-2787-00
			96.9	82.90000	289-2788-00
88.9	74.90000	289-2748-00	90.9	82.90000	209-2788-00
89.1	75.10000	289-2749-00	97.1	83.10000	289-2789-00
89.3	75.30000	289-2750-00	97.3	83.30000	289-2790-00
89.5	75.50000	289-2751-00	97.5	83.50000	289-2791-00
89.7	75.70000	289-2752-00	97.7	83.70000	289-2792-00
89.9	75.90000	289-2753-00	97.9	83.90000	289-2793-00
00.1	FC 10000	000 0554 00	0.0.1	84,10000	289-2794-00
90.1 90.3	76.10000 76.30000	289-2754-00 289-2755-00	98.1 98.3	84.30000	289-2795-00
90.5			98.5	84.50000	289-2796-00
	76.50000	289-2756-00			
90.7	76.70000	289-2757-00	98.7	84.70000	289-2797-00
90.9	76.90000	289-2758-00	98.9	84.90000	289-2798-00
91.1	77.10000	289-2759-00	99.1	85.10000	289-2799-00
91.3	77.30000	289-2760-00	99.3	85.30000	289-2800-00
91.5	77.50000	289-2761-00	99.5	85.50000	289-2801-00
91.7	77,70000	289-2762-00	99.7	85.70000	289-2802-00
91.9	77.90000	289-2763-00	99.9	85.90000	289-2803-00
92.1	78.10000	289-2764-00	100.1	86,10000	289-2804-00
92.3	78.30000	289-2765-00	100.3	86.30000	289-2805-00
92.5	78.50000	289-2766-00	100.5	86.50000	289-2806-00
92.7	78.70000	289-2767-00	100.7	86.70000	289-2807-00
92.9	78.90000	289-2768-00	100.9	86.90000	289-2808-00
93.1	79.10000	289-2769-00	101.1	87.10000	289-2809-00
93.3	79.30000	289-2770-00	101.3	87,30000	289-2810-00
93.5	79.50000	289-2771-00	101.5	87.50000	289-2811-00
93.7	79.70000	289-2772-00	101.7	87.70000	289-2812-00
93.9	79.90000	289-2773-00	101.9	87.90000	289-2813-00
94.1	80,10000	289-2774-00	102.1	88.10000	289-2814-00
94.3	80,30000	289-2775-00	102.3	88.30000	289-2815-00
94.5	80.50000	289-2776-00	102.5	88.50000	289-2816-00
94.7	80.70000	289-2777-00	102.7	88.70000	289-2817-00
94.9	80.90000	289-2778-00	102.9	88.90000	289-2818-00
95.1	81.10000	289-2779-00	103.1	89.10000	289-2819-00
95.3	81.30000	289-2780-00	103.3	89.30000	289-2820-00
95.5	81.50000	289-2781-00	103.5	89.50000	289-2821-00
95.7	81.70000	289-2782-00	103.7	89.70000	289-2822-00
95.9	81.90000	289-2783-00	103.9	89.90000	289-2823-00
L		1	I		1

Table 5-4. Crystal Part Numbers.

CHANNEL FREQ (MHz)	CRYSTAL FREQ (MHz)	COLLINS PART NUMBER	CHANNEL FREQ (MHz)	CRYSTAL FREQ (MHz)	COLLINS PART NUMBER
104.1 104.3 104.5 104.7 104.9	90.10000 90.30000 90.50000 90.70000 90.90000	289-2824-00 289-2825-00 289-2826-00 289-2827-00 289-2828-00	106.1 106.3 106.5 106.7 106.9	92.10000 92.30000 92.50000 92.70000 92.90000	289-2834-00 289-2835-00 289-2836-00 289-2836-00 289-2837-00 289-2838-00
105.1 105.3 105.5 105.7 105.9	91.10000 91.30000 91.50000 91.70000 91.90000	289-2829-00 289-2830-00 289-2831-00 289-2832-00 289-2833-00	107.1 107.3 107.5 107.7 107.9	93.10000 93.30000 93.50000 93.70000 93.90000	289-2839-00 289-2840-00 289-2841-00 289-2842-00 289-2843-00

Table 5-4. Crystal Part Numbers (Cont).

WIRE NJ.	WIRE CODE	CONNECTION	CGNNECTION	FUNCTION
204	RU58	A1J1	A7J2	RF UUT
•13A	026TVSJ9	A117	T3.17	SCA IN
.138	D26TVSJ6	A119	T6.19	SCA IN
44	A22TAD1S7XXX	Al15	S289	INPUT
.40	AZOPBOJXSXXX	A125	٨225	+20V
207	AZOPBD0X0XXX	A128	A223	GRD
.46	A2 GPB00%1XXX	A128	T3111	6x0
•• 25	SHIELD	Al28	E-26	GRD
15	SHIELD	A128	E.25	GRD
.17	422TA01S6XXX	A141	S2A12	SCA MPD.
.16	A22T401S5XXX	A142	S2B1	AUDIO LV
.20	A22TA0159XXX	AL43	A523	SCA UUT
.205	SHIELD	AI-END-NC	L.17	SHIELD
544.	SHIELD	A1-END-NC	S2-E23	SHIELU
.175	SHIELD	AI-END-NC	S2-E27	SHIELD
.165	SHIELD	AI-ENC-NC	S2-E28	SHIELD
.135	SHIELD	A1-END-NC	T3.1d	SHIELU
1	A22TAU153XXX	A213	517	RIGHT IN
3	A22TA01S2XXX	A216	XFL5-3	MX. OUT
•39	A2 0P BOOX8XXX	A225	А 3 - . 25	+20V
.40	A2 09BUDX8XXX	A225	A. 1- 25	+20V
203	A2CPBOGX0XXX	A223	A328	GRD
35	SHIELD	A223	SHIELD	GRD

WIRE NO.	WIRE CCDE	CONNECTION	CONNECTION	FUNCT ION
207	A2 OPBC0X0XXX	A223	A125	GRD
•• 2	A22TA01S1XXX	A2.	S111	LEFT IN
•24	RG196/U	A3Jl	A5Jl	AFC DUT
.21	A2 2 T A0 1 S 5 X X X	A39	A420	DISC OUT
.41	A2 OP BC 0X7 XXX	A317	A814	+10V
• 42	AZOPBODX3XXX	A319	A812	-10V
•23	A22PB00X2XXX	A321	A430	MVB OUT
• 22	A2 2 P 6 0 C X 1 X X X	A323	A423	MVB DUT
• 36	A20PECOX8XXX	A325	A425	+20V
• 39	A2 OP 600 X3 X X X	A325	A225	+20V
209	AZUPPJOX0XXX	A	A428	GRD
208	AZCPBCDXDXXX	A328	A 228	G3D
.215	SHIELD	A3-END-NC	é.17	SHIELU
53	AZZTACIS3XXX	A43	S 2A11	NI XW
.19	A22TA01S4XXX	A44	S 2811	MX. JUT
.38	A2 OPHODXSXXX	A425	A325	+20V
.37	A2 OPPOOXRXXX	A425	A525	+20V
•21	A22TA01S5XXX	A425	A33	DISC OUT
210	A2 OPECOXOXXX	A4 28	A528	GRD
209	A2 OP ROOXOXXX	A428	A 3 28	0XD
.22	A22PBCJX1XXX	A429	A 323	AVB OUT
•23	A22PB03X2XXX	A430	A321	MVB UUT
.27	A22TAC1S6XXX	A431	A521	AUD.CNCL

(Cont
List
Wire
5-5.
Table

WIRE NO.	WIRE CODE	CONNECTION	CONNECTION	FUNCTION
213	A2 2PC 00X9XXX	A432	A527	AFC
	D2 6TVSJ9	A441	TB.13	AIGHT IN
46	D26TVSJ6	A441	S287	LEFT IN
46	D26TVSJ9	A442	S2 b1	LEFT OUT
••5A	D26TVSJ9	A45	TR.16	LEFT IN
.108	D26TVSJ6	A445	S288	RIGHT IN
• 5 E	UZGTVSJö	A4.	TB.14	LEFT IN
-10A	D26TVSJ9	A443	S 2H 2	R OUT
•• 55	SHIELC	A4-END-NC	TB.15	CUD
75	SHIELD	A4-END-VC	Td12	GRD
.105	SHIELD	A4-END-NC	S2-E27	SHIELD
•27S	SHIELD	A4-END-NC	£.17	SHIELD
.195	SHIELD	A4-END-NC	S 2-E28	SHIELD
•24	R6196/U	A	A3J1	AFC DUT
205	RG196/U	A5J2	A 5 J2	OUT -MXR
4 • •	A22TA01S3XXX	A519	К19	BASEBDIN
•27	AZZTA01S6XXX	A521	A431	AUD.CNCL
.20	AZZTAG1S9XXX	A523	A143	SCA DUT
.37	A20PBU0X8XXX	A525	A425	+20V
•36	AZOPBOOX8XXX	A525	A 5 25	+20V
213	A22PBC0X9XXX	A527	A432	AFC
210	AZUPBOOXOXXX	A528	A42E	GTD
211	AZOPBOUXUXXX	A523	A	GRD

WIRE ND.	WIRE CCDE	CONNECTION	CONVECTION	FUNCTION
·· 4S	SHIELD	A5-END-NC	E.20	GRD
206	R6196/U	A6JI	A6Jl	OUT - IN
205	RG196/U	A6J1	A6JI	OUT - IN
205	N/96138	A6J2	A5J2	OUT -MXR
240	620BA00XX XXX	A625	A626	JUMPER
•35	A2 OPBOOX8 XXX	A625	A725	+20V
•36	A2 0PB00X8XXX	A 5 25	A525	+ 20V
240	32 UBACOXXXXX	A626	A625	JUMPER
212	A2 CP RCOX0 XXX	A627	A.J.727	GRD
211	A2 OPP JOXO XXX	A627	A526	GRD
204	RG 58	A7J2	AIJ1	RF DUT
•35	A2 UPB COX8 XXX	A725	A625	+20V
•34	A20PB00X8XXX	A725	A 812	+20V
•29	A2 CPBCDX3 XXX	A726	Q1-E	13-26V
212	AZGPBCOXOXXX	A727	A627	GRD
.86	A2 OPBOOXO XXX	A727	A 613	GRD
.33	42 2P BC 0X9 XXX	A31	XK14	+28V
.71	A20PB00X9XXX	A83	É6	+40 VDC
•72	A20PB00X9XXX	A33	Q6-C	+40 VDC
.87	A2CPBOCX9CXX	Ad 4	E2	+40 COMM
•59	A22PB00X6XXX	A5	Q2-E	DC CON V
•70	A22PBC0X2XXX	A6	R.152	
6	A22TA01S5XXX	A87	TB112	PWR CONT

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(Cont)
List
Wire
5-5.
Table

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WIRE NO.	WIRE CUDE	CONJECTION	CONNECTION	FUNCTION
• 34	A22PB00X91XX	A88	ц6-в	
• 56	A7 2PRCOX1XXX	A65	г9	13-26VDC
• 63	A22P50CX4XXX	A31C	R.151	
• 59	AZZPBCUX5XXX	A311	R.153	
•51	AZOPPCOX3XXX	A812	r5	+20V
•34	AZOPBOJXSXXX	A312	A725	+20V
• 86	AZ OPBCOXOXXX	Ad13	A727	GRD
.85	A2 GPBUOXCXXX	A513	é.11	GRD
.41	A20PB00X7XXX	AS14	A317	+10V
• 33	A2 2PB00X93XX	A815	t3	
- 31	A20PBC0X902X	Ad16	TB.17	6 VAC IN
• 82	A20PBC0X96XX	A817	TB.19	6 VAC IN
.42	A2 OPBOOX3XXX	A816	A319	-10V
\$46.	SHIELD	A 5END-NC	TE111	SHIELD
• 95	A22P600X1XXX	A949	T11	117 VAC
.96	A22PBO0X2XXX	A951	T14	117 VAC
219	A22PB00X9XXX	CR1A	CR2C	JUMPER
•79	AZOPECNX8XXX	CR1A	T16	AC
217	A22PB00X9XXX	CK1C	CK3C	JUMPES
•74	A2 UPBODX4XXX	CR1C	E7	+40 VUC
•75	A20PB00X4XXX	CK 2 A	£1	+40 COMM
218	A2 2PB00X9XXX	CR24	CR4A	JUMPER
219	A22PB00X9XXX	CRZC	CK1A	JUMPER

FUNCTION	AC	JUMPER	JUMPER	JUMPER	JUMPER	+40 COMM	JUMPEK		JUMPER	+40 COMM			GRD			+20V	+20V		140 VDC	JUMPER	JUMPER	+40 VDC	
CONNECTION	T15	CR4C	CR1C	CR2A	CR3A	C82A	t 2	E7(+)	č1	A 8 4	A815	Ē4(+)	t.10	E3(-)	t5(+)	A 312	06-E	t4(-)	A 83	E7	E6	CK1C	E1(-)
CONNECTION	CK3A	CR3A	CR3C	CR4A	CR4C	E1	ē1	E1(-)	E • • 2	с, .	Ē3	E3(-)	fi4	Ē4(+)	E4(-)	ri5	F. • 5	E5(+)	Е6		E7	E7	E7(+)
WIRE CCDE	A2 OPBC DX1 XXX	A22PE00X9XXX	A22PBGJX9XXX	A22PB00X9XXX	A22PB00X9XXX	A20PR0CX4XXX	B2 JTM0 DXXXXX	CAPACITOR	B20TMG0XXXXX	A2 UP ROUX9 DXX	A22P000X93XX	CAFACITOR	B2 UBAJUXXXXX	CAPACITOR	CAPACITOR	A2 3 P BO 0 X 8 X X X	A2.0PRG3XBXXX	CAPACITOR	A2 UPB00X9XXX	E2 CTMGUXXXXX	B207M00XXXXX	A20PB00X4XXX	CAPACITUR
WIRE NO.	.77	216	217	218	216	.75	220	C. 1	226	.87	.83	C.5	228	C. 5	C.4	.51	. 52	C. 4	.71	227	227	•74	c. 1

5-23

(Cont).	
List	
Wire	
5-5.	
Table	

WIRE ND.	WIRE CODE	COMMECTION	CONNECTION	FUNCTION
229	B2084C0XXXXX	E • • 8	E.11	GRD
C.3	CAPACITCR	E3(-)	t9(+)	
•55	A22PB00X1XXX	E9	Q1-E	13-26VDC
•56	A22PB00X1XXX	E9	A9	13-26VDC
C.3	CAPACITOR	E9(+)	EB(-)	
228	320BA00XXXXX	E.10	t4	GRD
229	B263A03XXXXX	E.11	E8	GRD
,÷7	AZOFBOJXJXXX	E.11	T18	CT GRD
.85	AZCPECOXUXXX	E.11	AS13	GRD
204S	SHIELD	E.12	GRD	SHIELD
205S	SHIELG	ɕ13	E.14	GRD
2055	SHIELD	E.14	E.13	GRD
206S	SHIELD	E.15	E.16	GRD
2065	SHIELD	E.ló	E.15	GRD
.245	SHIELD	E.17	E 18	GKD
.215	SHIELD	E.17	A3-END-NC	SHIELD
.205	SHIELU	E.17	AI-END-NC	SHIELD
•27S	SHIELD	E.17	A4-END-NC	SHIELD
.535	SHIELD	č.17	S 2-END-NC	SHIELU
•24S	SHIELD	E.13	E.17	GRD
221	B20TM00XXXXX	E.19	FL46	GRD
45	SHIELD	E.20	A5-END-NC	GRD
223	B2 OT MOOXXXXX	ɕ21	FL2b	GRD

WIRE NO.	WIRE CCDE	CONNECTION	CONNECTION	FUNCTION
230	B2DTMDCXXXXX	E. 22	FL31	68 D
231	BZOTMCOXXXXX	É. 23	fl11	630
233	B2CTM09XXXXX	E. 24	FL51	GRD
15	SHIELD	E . 25	A128	GRD
25	SHIELD	6. 26	A123	GKD
R. 3	RESISTOR	E. 20	S15	
237	A2 OPBO CX0XXX	E.20	5285	GRD
231	B20TM00XXXXX	۴۱۱	c. 23	GRD
494.	D2 6TVSJ9	FLl4	FL23	CONN
.734	D26TVSJ9	FL15	Tdl3	L AUDIO
89E	U26TVSJ6	FL16	FL25	
.89S	SHIELD	FL1-F23	FL2-E21	SHIELD
222	S20TMO0XXXXX	FL21	FL26	GRD
59A	026TVSJ9	FL23	FL14	CONN
398	D26TVSJ6	FL25		
222	RZGTHOOXXXXX	FL26	FL21	GKD
223	B2.0TMUDXXXXX			GRD
39S	SHIELD		FL1-E23	SHIELO
230	82 DT MOOXXXXX			GRD
.938	D26TV5J6	۴۲۰۰3-۰۰3		R AUDIO
A59.	02 6TVS J 9	FL35		R AUDIU
935	SHIELD	FL3-E.22	1815	63 D
22.0	BZOTMOCXXXXX	۴۲۰۰٬۹۰۰۰۱	FL46	GRD

(Cont).
Wire List
Table 5-5.

WIRE NO.	WIRE CODE	CONNECTION	CONVECTION	FUNCTION
	320TM00XXXXX	FL45	E.19	GRD
	B20TH00XXXXX	FL45	PL41	GRD
	620TMOOXXXXX	FL51	E.24	GRD
	BZUBAJOXXXXX	FL51	FL58	GRO
	RESISTOR	FL56	FL58	
	RESISTUR	FL53	FL56	
	B2 UBAO UXXXXX	FL58	FL51	CR D
.575	SHIELD	FL5-ENDNC	S1-E25	SHIELD
255	SHIELD	FL5-FNDNC	XFL4-E20	SHIELU
56 ••	SHIELD	GRD	S2-E27	GRD
204S	SHIELD	GRU	E.12	SHIELD
•••	A22TA01S3XXX	K19	A519	BASEBGIN
	A22TA0154XXX	MIN	528- 12	METER -
	A22TA0154XXX	M1P	S2B6	METER +
•925	SHIELD	MI-END-NC	S2B-E28	SHIELD
• 91S	SIIIELD	M1-END-NC	S2-E28	SHIELD
	A20PBGCX3XXX	P 1 1	S 34	AC HOT
	A2 0PBCUX6XXX	P12	S32	AC NEUT
	A22PB00X9XXX	21-3	u2-C	JUMPER
	A20PE00X9XXX	G1-C	Q6-C	201 04+
	A2 2P 800X9XXX	Q1-C	Q2-E	JUMPER
	A20PB00X3XXX	Q1-E	A726	13-26V
	A22PH00X1XXX	GI-E	E9	13-26VDC

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FUNCTION	DC CON V	JUMPER	JUMPER		+40 VUC	+40 VUC	+20V							JUMPER	JUMPER	CONN	CONN	CONN		JUMPER			RIGHT IN
CONNECTION	A5	01-3	Q1-C	A 8 8	q1-C	A83	E5	A d10	R.153	A86	R.151	A811	S110	S12	S11	XFL5-6	XFL5-6	XK1 B	516	5110	É. 26	S15	A213
C DNN ECTIDN	G2-6	62-C	40 - E	68	26-C	Q6-C	Q6-E	R.151	R.151	R.152	R.153	R.153	S11	S11	SL2	S13	513	S14	S15	S15	Sl5	S16	S17
WIRE CCDE	A22PB00X6XXX	A22PE00X9XXX	A2.2PE00X9XXX	A22PB00X91XX	A2 UP600X9XXX	A20PB00X9XXX	A2CPBUDXSXXX	A22PR00X4XXX	RéSISTOR	A22PB00X2XXX	RESISTOR	A22PE00X5XXX	RESISTOR	B22BA03XXXX	622BACOXXXXX	A22TA01S5XXX	A22TA01S5XXX	A20TAC1S8XXX	RESISTOR	B22TM00XXXXX	RĒSISTOR	RESISTOR	A227A0153XXX
WIRE NO.	65.	215	214	•84	.76	.72	• 52	• Ó 8	R16	.70	816	•69	R.1	234	234	.48	-57	• 50	8. 2	235	R. 3	R. 2	

(Cont).
Wire List
Table 5-5.

WI RE NO.	WIRE CODE	CONNECTION	CONNECTION	FUNCTION
64*	A22TA01S6XXX	S17	XK17	CONN
R. 4	RESISTUR	S19	S110	
235	BZZTMOOXXXXX	S110	515	JUMPER
R. 1	RESISTOR	S110	S11	
8.4	RESISTOR	5110	S19	
• 2	A22TAC1S1XXX	S111	A229	LEFT IN
•15	A22TA91S4XXX	S111	XK13	CONN.
74.	AZZTACISZXXX	S112	XK1-11	CONN
.47S	SHIELD	S1-E25	XK1-END-NC	SHIELD
.155	SHIELD	S1-E25	XK1-END-NC	SHIELD
.57S	SHIELD	S1-E25	FL5-ENDNC	SHIELD
•485	SHIELD	S1-E26	XK1-END-NC	SHIELD
•50S	SHIELD	S1-E26	XK1-END-NC	SHIELD
.49S	SHIELD	S1-E26	XK1-END-NC	SHIELD
.535	SHIELD	SZ-END-NC	E.17	SHIELU
.185	SHIELD	S2-E27	XFL4-E20	GRD
S6	SHIELD	S2-E27	GRD	GRD
.175	SHIELD	S2-E27	AI-END-NC	SHIELD
.105	SHIELD	S2-E27	A4-END-NC	SHIELD
.195	SHIELD	S2-E28	A4-END-NC	SHIELD
.44S	SHIELD	S • • 2-E28	A1-END-NC	SHIELD
.915	SHIELD	S2-E28	MI-ENU-NC	SHIELD
.165	SHIELD	S2-E28	A1-END-NC	SHIELD

WIRE ND.	WIRE CODE	C UNN ECT I DN	CONNECTION	FUNCTION
239	A2 2PB00X9 XXX	S2A1	S 2A6	JUMPER
R. 6	RESISTOR	S 2 A 4	S284	
.18	A22TA01S7XXX	S2A5	XK19	CONN.
239	A22PB00X9XXX	S2A6	S 2A1	JUMPER
• 53	A227A0153XXX	S2A11	A43	NI XW
.17	A227A0136XXX	S2 <i>b</i> 12	A141	SCA MPD.
.16	AZZTAD1S5XXX	S2E1	A.1-42	AUDIO LV
₩6	D26TVSJ9	S2B1	A442	LEFT OUT
.10A	D2 6T VSJ 9	S2B2	A448	R OUT
236	B22BAD0XXXXX	S2E4	S2B4	JUMPER
R.6	RESISTOR	S2B4	S2A4	
236	B22BA00XXXXX	S2E4	S284	JUMPER
237	AZOPBOOXGXXX	S2E5	E.28	GRD
16.	A22TA0154XXX	S2E6	MIP	METER +
96 •••	D25TVSJ6	S267	A441	LEFT IN
.108	D26TVSJ6	S 2 E 8	A445	RIGHT IN
.44	AZZTAOISTXXX	S. 2 E9	A119	INPUT
238	R22EAOUXXXXX	S2B10	S 2B11	JUMP ER
238	B22BA06XXXXX	S2E11	S2b10	JUMPER
•19	A22TA0154XXX	S2811	A44	MX. OUT
-92	A22TA01S4 XXX	S28- 12	M1N	METER -
•925	SHIELD	S2P-E29	M1-END-NC	SHIELD
.62	A2 0P 30 0 X 2 X X X	S31	T14	AC NEUT

5-29

WIRE	WIRE CODE	CONNECTION	CONNECTION	FUNCTION
.60	A2 OPB00X6XXX	S	P.12	AC NEUT
•63	A20PB00X9XXX	S33	XF12	AC HOT
.61	A20PB00X3XXX	S34	P11	AC HOT
35	SHIELD	SHIELD	A .2- 28	GRD
224	B2CTMODXXXXX	T11	T11	JUMPER
224	B20TM00XXXXX	T11	T11	JUMPER
•64	A20PB00X9XXX	T11	XF1~1	AC FUSED
•95	A22PB00X1XXX	T11	A949	117 VAC
225	B20TM00XXXXX	T12	Tl4	JUMPER
•62	A2 0P B00X2XXX	T14	S31	AC NEUT
225	B2 OT MO O X X X X X	T14	T12	JUMPER
•96	A2 2PB00 X2 X X X	Tl4	A951	117 VAC
.77	A20PB00X1XXX	I15	CR3A	AC
.79	AZOPBOOXBXXX	T16	CR1A	AC
.67	AZOPBOOXOXXX	T18	E.11	CT GRD
.788	D26TVSJ9	TBll	XFL1-3	L AUDID
C. 6	CAPACITOR	TBll	TB12	
C. 7	CAPACITCR	TB12	TB13	
C. 6	CAPACITOR	TBl2	TB11	
.785	SHIELD	TB12	XFL1-E23	GRD
201	AZOPBOJXOXXX	TB12	TB15	GRD
75	SHIELD	T812	A4-END-NC	GRD
.78A	D26TVSJ9	TB13	FL15	L AUDID

FUNCTION		R AUDIO				GRD	GRD	GRU	R AUDIO					GRD	GRD		STRD RMT	GRD	GRD	SHIELD	PWR CONT	RIGHT IN	LEFT IN
CONNECTION	TB12	FL33	TB15	TB14	T316	FL3-E22	TB18	TB12	FL35	TB15	TB18	TB19	T817	TB111	TB15	TB18	XK11	Tb18	A126	A 8-END-NC	A87	A441	A447
CONNECTION	T8l3	T814	TB14	TB15	TB15	TB15	TBl5	TB15	T816	TB16	TB17	TB18	TB18	TBIS	TB18	T819	TB110	T6111	TB111	TBlll	TB112	TB.13	TB.14
WIRE CODE CO	CAPACITUR TB	D26TVSJ6 TB	CAPACITOR	CAPACITOR TB	CAPACITOR TB	SHIELD TB	A2 OPBOGXOXXX TB	A20PB03X0XXX TB	D26TVSJ9 T8	CAPACITOR	CAPACITOR	CAPACITOR TB	CAPACITOR TB	A20PE00X0XXX T8	A2 CPB00X0XXX T8	CAPACITOR T8	A22PB00X6XXX TB	A20PBJOXCXXX TB	A2 UPB00X1XXX TB	SHIELD TB	A22TAG1S5XXX TB	D26TVSJ9 TB	D26TVSJ6 TB.
WIRE NG.	C. 7	.938	C. 8	С. В	C. 9	269.	202	201	.93A	C. 9	C10	C1 1	C10	203	202	C11	•54	203	•46	\$46.	.94	A7	56

5-31

(Cont
Wire List
5-5
Table

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WIRE NO.	WIRE CODE	CONNECTION	CONNECT I ON	FUNCTION
55	SHIELD	TB.15	A4-END-NC	GRD
••54	D26TVSJ9	TB.16	A445	LEFT IN
.31	A20PB00X902X	T8.17	A816	6 VAC IN
.134	D26TVSJ9	TB.17	A117	SCA IN
.135	SHIELD	TB.18	A I-END-NC	SHIELD
•82	A2 0PB00X96XX	TB.19	A817	6 VAC IN
-138	D26TVSJ6	TB.19	A119	SCA IN
•64	A2 OP BO 0 X 9 X X X	XF11	Tl1	AC FUSED
• 63	A20PB00X9XXX	XF12	533	AC HOT
.785	SHIELD	XFL1-E23	Tb12	GRD
.7.88	D26TVSJ9	XFL1-3	TB11	L AUDIO
.735	SHIELD	XFL2-E21	XK1-END-NC	SHIELD
•73	A22TA0154XXX	XFL2-4	ХК1-12	L AUDIO
.655	SHIELD	XFL3-E22	XFL4-E19	SHIELD
.654	D26TVSJ9	XFL3-4	XFL4-3	CONN
•658	D26TVSJ6	XFL3-6	XFL4-5	NNGO
•58S	SHIELD	XFL4-E19	XK1-END-NC	SHIELD
.655	SHIELD	XFL4-E19	XFL 3-E22	SHIELD
.185	SHIELD	XFL4-E20	S2-E27	GRD
•25S	SHIELD	XFL4-E20	FL5-ENDNC	SHIELD
•65A	D26TVSJ9	XFL4-3	XFL3-4	CONN
•58	A22TA01S1XXX	XFL4-4	XK16	R AUDIO
•658	D26TVSJ6	XFL4-5	XFL3-6	CONN

	CONNECTION	A216
Wire List (Cont).		
Table 5-5.	NO	

WIRE NO.	WIRE CODE	CONNECTION	CONNECTION	FUNCTION
••3	42 2 T A 0 1 S 2 X X X	XFL5-3	A216	MX. DUT
• 4 B	A22TA0155XXX	XFL5-6	S13	CONN
-57	A22TA0155XXX	XFL5-0	S13	CONN
•25	A22TA01S5XXX	XFL5-6	XK1-10	CONN
•54	A22PBC0X6XXX	XK 11	18110	STRO RMT
.15	A22TA0154XXX	XK13	S111	CONN.
•33	A22PB00X9XXX	XK14	A81	+28V
•58	A22TA0151XXX	XK16	XFL4-4	R AUDIO
64-	A2 27 A0156XXX	XK17	S17	CONN
• 50	A2CTA01S8XXX	XK18	S14	CONN
.18	A22TA01S7XXX	XK 19	S. 2A5	.NNOO
.49S	SHIELD	XK1-END-NC	S1-E26	SHIELD
• 585	SHIELU	XKI-END-NC	XFL4-E19	SHIELD
\$05°	SHIELD	XK 1- END-NC	S1-E26	SHIELD
.735	SHIELD	XK1-END-NC	XFL 2-E21	SHIELD
•47S	SHIELD	XK1-END-NC	S1-£25	SHIELD
.155	SHIELD	XK 1-END-NC	S1-E25	SHIELD
•485	SHIELD	XK1-END-NC	S1-E26	SHIELD
• 25	A22TA0155XXX	XK1-10	XFL5-6	CONN
-47	A22TAU152XXX	XK 1–11	S112	CONN
.73	A22TA0154XXX	XK 1-12	XFL2-4	L AUDIO

section 6 parts list

6.1 GENERAL

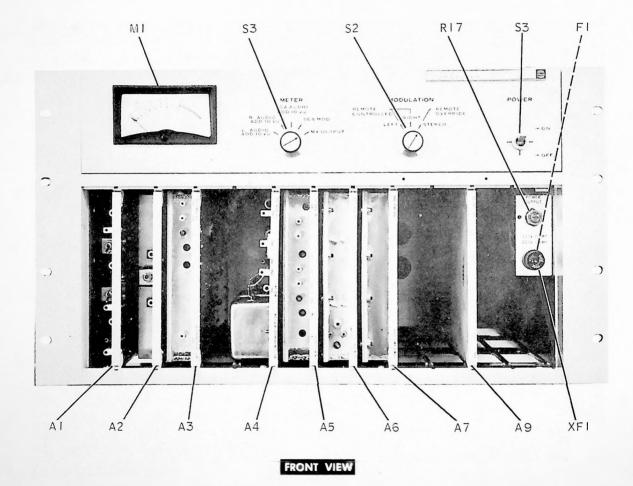
This section contains a list of all replaceable electrical, electronic, and critical mechanical parts for the 310Z-1 FM EXCITER.

The manufacturers' codes appearing in the Mfr Code column of the parts list are listed in numerical order at the end of the parts list. The code list provides the manufacturer's name and address as shown in the Federal Supply Code for Manufacturers' Handbook H4-1. Manufacturers not listed in Handbook H4-1 are assigned a 5-letter code and appear first in the code list.

6.2 LIST OF EQUIPMENT

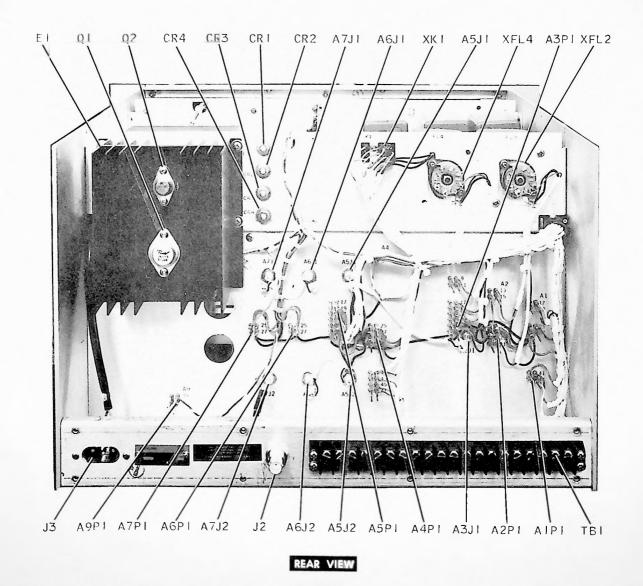
Page

310Z -1 FM Exciter	6-2
SCA Generator 786W-1	6-7
Stereo Generator 786V-1	6-13
AFC Discriminator	6-18
AFC Synchronous Detector	6-23
FM Modulator	6-28
RF Mixer	6-36
Power Amplifier	6-40
Power Supply Regulator	6-43
Fan	6-46
Extender Board	6-48



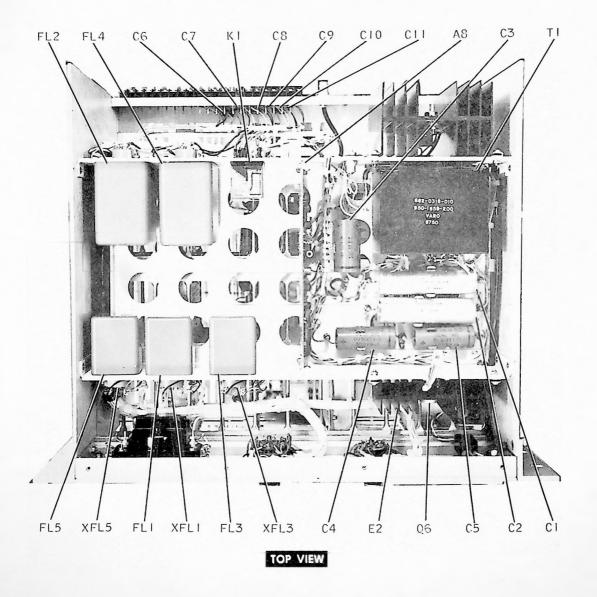
B502 498 Pb

Figure 6-1. 310Z-1 FM Exciter (Sheet 1 of 3).



B502 508 Pb

Figure 6-1. 310Z-1 FM Exciter (Sheet 2 of 3).



B502 507 Pb

Figure 6-1. 310Z-1 FM Exciter (Sheet 3 of 3).

6-4

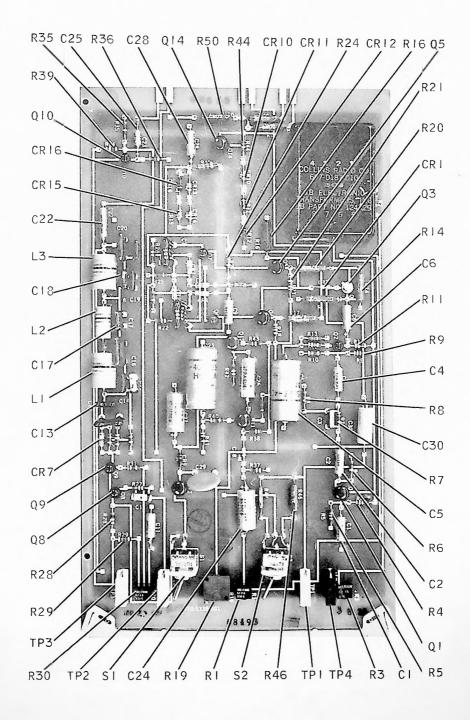
parts .	list
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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	3102-1 FM EXCITER			522-4687-001
A1	SCA GENERATOR 786W-1			772-5338-001
Alpi	SEE BREAKDOWN ON PAGE 6-7 CONNECTOR, ELECTRICAL -QTY 3-	375430-9010	91662	372-2425-010
A2	4 CONTACTS STERED GENERATOR 786V-1 SEE BREAKDOWN ON PAGE 6-13			772-5336-001
A2P1 A3	SAME AS A1P1 AFC DISCRIMINATUR SEE BREAKDOWN ON PAGE 6-18			774-7097-001
A3J1	CONNECTOR, ELECTRICAL 1 CONTACT			372-9211-000
A3P1	CONNECTUR, ELECTRICAL -OTY 4- 4 CONTACTS	375430-9010	91662	372-2425-010
Α4	AFC SYNCHRONOUS DETECTOR 6-23 SEE BREAKDUWN ON PAGE			774-7075-001
A4P1	CONNECTOR, ELECTRICAL -OTY 6- 4 CONTACTS	375430-9010	91662	372-2425-010
A5	FM MODULATOR SEE BREAKDOWN ON PAGE 6-28			774-7160-001
A5J2	SAME AS A3J1 SAME AS A3J1			
A5P1 A6	SAME AS A1P1 RF MIXER SEE BREAKDUWN ON PAGE 6-36			781-5380-001
A6J1 A6J2	SAME AS A3J1 SAME AS A3J1			
A6P1	CONNECTOR, ELECTRICAL 4 CONTACTS	375430-9010	91662	372-2425-010
Α7	POWER AMPLIFIER SEE BREAKDOWN ON PAGE 6-40			769-0830-001
A7J1 A7J2	SAME AS A3J1 SAME AS A3J1			
A7P1	SAME AS A6P1			
8 8	POWER SUPPLY REGULATOR			774-7216-001
A9	SEE BREAKDOWN ON PAGE 6-43 FAN SEE BREAKDOWN ON PAGE 6-46			783-7049-001
A9P1 A10	SAME AS A6P1 EXTENDER BOARD			781-5365-001
C1	SEE BREAKDOWN UN PAGE 6-48 CAPACITOR, FXD, ELECTROLYTIC 2300 UF, PLUS 75% MINUS 10%, 40 VDCW	601D238G040JT4	56289	183-1282-050
C2 C3	SAME AS C1 CAPACITOR, FXD, ELECTROLYTIC 500 UF, PLUS 100% MINUS 10%, 50 VDCW			183-1309-000
C4	CAPACITOR, FXD, ELECTROLYTIC 500 UF, PLUS 100% MINUS 10%, 25 VDCW	D25447	56289	183-1306-000
C5 C6	SAME AS C4 CAPACITOR, FXD, MICA 4700 UUF, 5% TOL, 500 VDCW	CM06F472J03	81349	912-3052-000
C7 THROUGH C11	SAME AS C6			
CR1 CR2 CR3	SEMICONDUCTOR DEVICE, DIODE SAME AS CRI SAME AS CRI	1N1200	07688	3 53- 1721-000
CR4 E1 E2	SAME AS CR1 HEATSINK HEATSINK, TRANSISTOR	6403B2	13103	776-1855-001 352-959 7-01 0
F1	FUSE, CARTRIDGE 2-AMP, 130 VAC/DC	GBB2	71400	264-0928-040

parts list

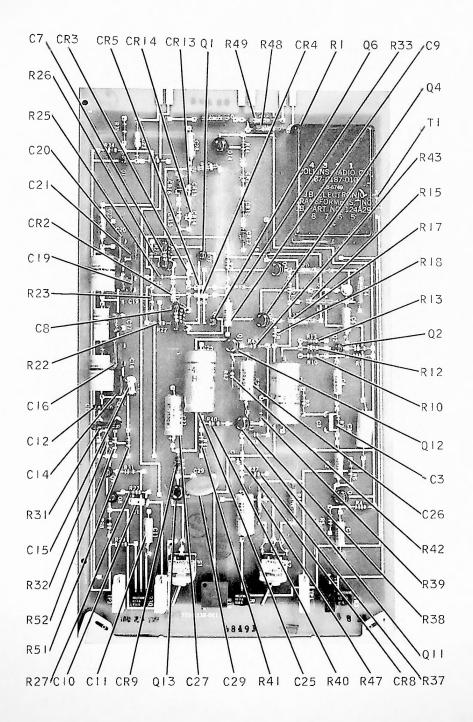
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
FL1 FL2 FL3	NETWORK, PRE-EMPHASIS Filter, High Pass Same as fl1	526-0016-010 D11193	95105 70674	673-1158-010 673-1159-010
FL4 FL5 J1	SAME AS FL2 FILTER, LOW PASS CONNECTOR, ELECTRICAL	5220 UG1050AU	17857 80058	673-1162-020 357-9211-000
J2	1 CONTACT Connector, electrical	10083000075	94375	357-9248-000
13	1 CONTACT CONNECTOR, ELECTRICAL 3 CONTACTS	1065-1	87930	368-0207-010
К1	RELAY, ARMATURE 4C CONTACT ARRANGEMENT	T154CCCC24VDC	70309	970-2106-000
M1	METER, AUDIO LEVEL	36-0276-0000	80105	456-0056-000
01	TRANSISTOR	2N3505	07688	352-0583-010
Q2	TRANSISTOR	2N3740	07688	352-0695-010
03	NOT USED	2.113.110	0.000	552 0075 010
04	NOT USED			
Q5	NOT USED			
06				
	SAME AS OI	BN(002(105	01240	705 (5(0.000
R1	RESISTOR, FXD, FILM	RN60D2610F	81349	705-6568-000
	261 OHMS, 1% TOL, 1/4 WATT			
R2	SAME AS R1			
R3	RESISTOR, FXD, FILM	RN60D5620F	81349	705-6584-000
	562 UHMS, 1% TOL, 1/4 WATT			
R4	SAME AS R1			
R5	RESISTOR, FXD, COMPOSITION 100K OHMS, 10% TDL, 1/4 WATT	RC07GF104K	81349	745-0821-000
R6				
THROUGH	NOT USED			
R15				
R16	RESISTOR, FXD, FILM 5620 OHMS, 1% TOL, 1/2 WATT	RN65D5621F	81349	705-7132-000
R17	RESISTOR, VAR, COMPOSITION 5K OHMS, 20% TOL, 1/4 WATT	LL6059	71450	376-4729-000
S 1	SWITCH, ROTARY, WAFER 3 POLE, 3 POSITION, 1 SECTION	233065A1	76854	259-1866-010
S2	SWITCH, ROTARY, WAFER 2 POLE, 5 POSITION 2 SECTIUNS	264752N1	76854	259-2328-030
\$3	SWITCH, TOGGLE DPST CONTACT ARRANGEMENT	81024SP	04009	266-5376-010
TI	TRANSFORMER, AF, STEP-DOWN 115/230 VOLTS TO 28 VOLTS	950-1669-200	83003	662-0318-010
fB1	BOARD, TERMINAL 20 TERMINALS	670A3000-20	75382	367-1852-200
XF1	FUSEHOLDER 30-AMP CURRENT RATING	нкрн	71400	265-1171-000
XFL1	SOCKET, ELECTRON TUBE 8 CONTACTS	88-8TM	02660	220-1005-000
XFL2 THROUGH XFL5	SAME AS XFL1			
XK1	SOCKET, RELAY 16 CUNTACTS	30055-2	02288	220-1471-000

parts list



B502 515 Pb

Figure 6-2. SCA Generator 786W-1 (Sheet 1 of 2).



B502 515 Pb

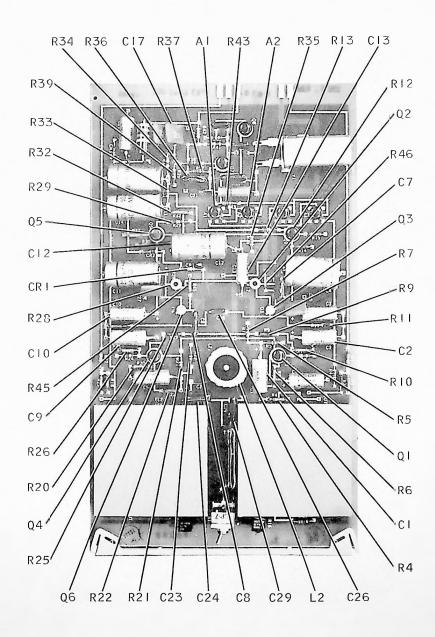
Figure 6-2. SCA Generator 786W-1 (Sheet 2 of 2).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	SCA GENERATOR 786W-1			772-5338-001
CI	CAPACITOR, FXD, ELECTROLYTIC	CS13BF685M	81349	184-6216-000
C2	6-8 UF, 20% TOL, 35 VDCW			
C3	SAME AS C1 CAPACITOR, FXD, FILM	65F10AA103	01002	933-0854-000
	0.01 UF, 10% TOL, 50 VOCW			
C4 C5	SAME AS C1 CAPACITOR, FXD, ELECTROLYTIC 250 UF, PLUS 50%, MINUS 10%, 40 VDCW	C437ARG250	73445	183-2355-150
C6 C7	SAME AS C1 CAPACITOR, FXD, MICA	CM06FD392J03	81349	912-3046-000
	3900 UUF, 5% TOL, 500 VDCW		01517	
C8 C9	SAME AS C7 SAME AS C1			
C10	CAPACITOR, FXD, CERAMIC 2 UUF, 1/2 UUF TOL, 500 VDCW	CC2OCKO2OD	81349	916-0076-000
C11 C12	SAME AS C1 CAPACITOR, FXD, MICA	DM19E501J03	72136	912-2977-000
C13	500 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA	CM05F101J03	81349	912-2816-000
C14	100 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA	CM05F470J03	81349	912-2792-000
	47 UUF, 5% TOL, 500 VDCW			
C15	CAPACITOR, FXD, CERAMIC 5 UUF, 1/2 UUF TOL, 500	CC20CH050D	81349	916-0118-000
C16	CAPACITOR, FXD, MICA	CM06F821J03	81349	912-2995-00
C17	820 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA	CM05E220J03	81349	912-2768-00
C18	22 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA	CM05F121J03	81349	912-2822-00
C19	120 UUF, 5% TOL, 500 VOCW CAPACITOR, FXD, MICA	CM05C180K03	81349	912-2763-00
	18 UUF, 10% TOL, 500 VDCW			
C20	CAPACITOR, FXD, MICA 470 UUF, 5% TOL, 500 VDCW	CM06F471J03	81349	912-2974-00
C21 C22	SAME AS C14 CAPACITOR, FXD, ELECTROLYTIC	151D752X0075w2	56289	184-9062-04
000	0.0075 UF, 20% TOL, 75 VDCW			
C23	CAPACITOR, FXD, ELECTROLYTIC	C\$13BJ333M	81349	184-6326-58
	0.033 UF, 20% TAL, 100 VDCW			
C24	CAPACITOR, FXD, ELECTROLYTIC	C\$13BG226M	81349	184-6257-00
C25	22 UF, 20% TOL, 50 VDCW SAME AS C5			
C26	CAPACITOR, FXD, ELECTROLYTIC	CS13BF476M	81349	184-6231-00
C27	47 UF, 20% TOL, 35 VDCW SAME AS C26			
C28	SAME AS C1			
C29	CAPACITOR, FXD, CERAMIC	36C175A	01939	913-3013-00
C30	0.01 UF, 20% TDL, 500 VDCW CAPACITOR, FXD, ELECTROLYTIC	CS13BF156M	81349	184-6222-00
6.0.1	15 UF, 20% TOL, 35 VDCW	11016	07/00	352_2004_00
CR1 CR2	SEMICONDUCTOR DEVICE, DIDDE SEMICONDUCTOR DEVICE, DIDDE	1N914 1N995	07688	353-2906-00
CR3	SAME AS CR2			
CR4	SAME AS CR2			
CR5	SAME AS CR2			
CR6 CR7	NOT USED SAME AS CR2			
CR8	SAME AS CRI			
CR9	SEMICONDUCTOR DEVICE, DIODE	1N758	07688	353-2723-00
CR10	SAME AS CR1 SEMICONDUCTOR DEVICE, DIODE	1N756	07688	353-2719-00
CR11	SEMICUMPORTOR DEVICE, DIODE	TIMEDO	01000	535-2119-00

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
CR12	SAME AS CR11			
CR13	SAME AS CR1			
CR14	SAME AS CR1			
CR15	SAME AS CR1			
CR16	SEMICONDUCTOR DEVICE, DIODE	1N754A	07688	353-2981-000
LI	CHOKE, RF	3500-40	99800	240-0843-000
	5000 UH, 10% TOL			
L2	COIL, RF	3500-32	99800	240-0839-000
	1000 UH, 10% TOL			
L3	SAME AS L1			
Q1	TRANSISTOR	2N3569	07688	352-0629-030
02	TRANSISTOR	2N3565	07688	352-0638-010
Q3	TRANSISTOR	2N718A	07688	352-0318-000
04	TRANSISTOR	2N3638A	07688	352-0636-020
95	SAME AS Q4	21150551		
Q6	TRANSISTOR	2N3563	07688	352-0630-010
07	SAME AS 96	210505	0,000	352 0050 010
08	SAME AS Q6	2112646	07600	252 0/00 010
09	TRANSISTOR	2N3646	07688	352-0680-010
010	SAME AS Q2			
011	TRANSISTOR	2N3643	07688	352-0713-030
Q12	SAME AS Q11			
Q13	SAME AS Q11			
Q14	SAME AS 011			
R1	RESISTOR, VAR, CERAMIC	62PAR50K	73138	382-0012-130
	50K OHMS, 30% TOL,	oc. miloon		
	1/2 WATT			
R2	RESISTOR, FXD, COMPOSITION	RC07GF472K	81349	745-0773-000
KZ		RCUIGF412N	01347	149-0119-000
	4700 DHMS, 10% TDL, 1/4			
	WATT			
R 3	RESISTOR, VAR, CERAMIC	62PAR5K	73138	382-0012-090
	5K DHMS, 30% TOL, 1/2 WATT			
R 4	RESISTOR, FXD, COMPOSITION	RCO7GF393K	81349	745-0806-000
	39K OHMS, 10% TOL, 1/4			
	WATT			
R5	RESISTOR, FXD, COMPOSITION	RC07GF563K	81349	745-0812-000
	56K OHMS, 10% TOL, 1/4			
	WATT			
R6	RESISTOR, FXD, COMPOSITION	RC07GF102K	81349	745-0749-000
		REGISTIOZK	01545	143-0149 000
07	1K OHMS, 10% TOL, 1/4 WATT	00000000		746 0770 000
R7	RESISTOR, FXD, COMPOSITION	RCO7GF682K	81349	745-0779-000
	6800 OHMS, 10% TOL, 1/4			
	WATT			
RŮ	RESISTOR, FXD, COMPOSITION	RC07GF821K	81349	745~0746-000
	820 OHMS, 10% TOL, 1/4			
	WATT			
R 9	SAME AS R4			
R10	SAME AS R2			
R11	RESISTOR, EXD, COMPOSITION	RC07GF392K	81349	745-0770-000
	3900 DHMS, 10% TDL, 1/4	100101 372 K	01549	143 0110 000
012	WATT CYD COUDOCLTION	000000000		
R12	RESISTOR, FXD, COMPOSITION	RC07GF391K	81349	745-0734-000
	390 DHMS, 10% TOL, 1/4			
	WATT			
R13	RESISTOR, FXD, COMPOSITION	PC07GF271K	81349	745-0728-000
	270 DHMS, 10% TOL, 1/4			
	WATT			
R14	RESISTOR, FXD, FILM	RN65D7501F	81349	705-7138-000
	7500 OHMS, 1% TOL,			
	1/2 WATT			
R15	RESISTOR, FXD, FILM	RN6506191F	81349	705-7134-000
		KNOJDOTATE	01349	105-1154-000
	6190 DHMS, 1% TOL, 1/2			
014	WATT STOLEND	0.000		705 7165 51
R16	RESISTOR, FXD, FILM	RN65D1781F	81349	705-7108-000
	1780 DHMS, 1% TUL, 1/2			
	WATT			
R17	RESISTOR, FXD, FILM	RN65D2151F	81349	705-7112-000
	2.15K DHMS, 1% TOL, 1/2			
	WATT			

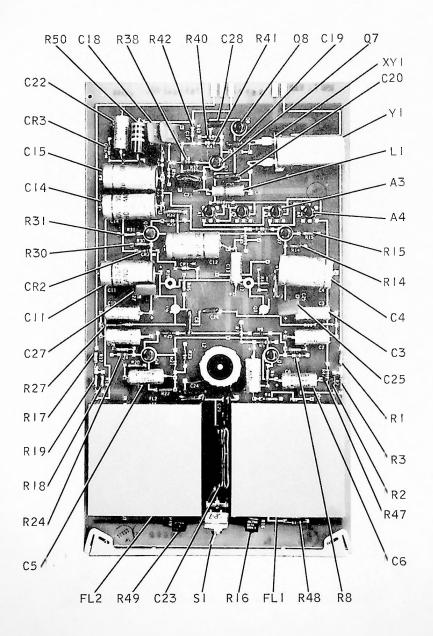
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
R18	RESISTOR, FXD, COMPOSITION 33K OHMS, 10% TOL, 1/4 WATT	RC07GF333X	81349	745-0803-000
R19	RESISTOR, VAR, WIRE WOUND 5K OHMS, 0.16% TOL, 3/4 WATT	RT22C2P502	81349	381-1721-060
R20	SAME AS R17			
R21	SAME AS R18			
R22	RESISTOR, FXD, COMPOSITION 10K OHMS, 10% TOL, 1/4 WATT	RCO7GF103K	81349	745-0785-000
R23 R24	SAME AS R6 RESISTOR, FXD, COMPOSITION 1.96K OHMS, 10% TOL, 1/4 WATT	RN60D1961F	81349	705-6610-000
R25	SAME AS R6			
R26 R27	SAME AS R22 RESISTUR, FXD, COMPOSITION 27K UHMS, 10% TOL, 1/4 WATT	RCO7GF273K	81349	745-0800-000
R28	SAME AS R22			
R 2 9	RESISTOR, FXD, COMPOSITION 470 OHMS, 10% TOL, 1/4 WATT	RC07GF471K	81349	745-0737-000
R30 R31	SAME AS R1 RESISTOR, FXD, COMPOSITION 3300 DHMS, 10 TDL, 1/4	RC07GF332K	81349	745-0767-000
R32	WATT RESISTOR, FXD, COMPOSITION 1800 DHMS, 10% TOL, 1/4 WATT	KCO7GF182K	81349	745-0758-000
R33	RESISTOR, FXD, COMPOSITION 1.62K DHMS, 10% TOL, 1/4 WATT	RN60D1621F	81349	705-6606-000
R34	SAME AS R11			
835	RFSISTOR, FXD, COMPOSITION 8200 OHMS, 10% TOL, 1/4 WATT	RCO7GF822K	81349	745-0782-000
R36	SAME AS R8			
R 3 7 R 3 6	SAME AS R22 RESISTOR, FXD, COMPOSITION 220K OHMS, 10% TOL, 1/4	RCO7GF224K	81349	745-0833-000
K39	WATT RESISTOR, FXD, COMPOSITION 2700 OHMS, 10% TOL, 1/4 WATT	RCD7GF272K	81349	745-0764-000
R40	RESISTOR, FXD, COMPOSITION	RC07GF680K	81349	745-0707-000
R41	68 OHMS, 10% TOL, 1/4 WATT RESISTOR, FXD, COMPOSITION 33 OHMS, 10% TJL, 1/4 WATY	RCO7GF330K	81349	745-0695-000
R42	SAME AS R22			
R43	RESISTOR, FXD, COMPOSITION 100K OHMS, 10% TOL, 1/4 WATT	२С07GF104 К	81349	745-0821-000
R 4 4	RESISTOR, FXD, CUMPOSITION 180 DHMS, 10% TOL, 1/4 WATT	3C07GF181K	81349	745-0722-000
R45	RESISTOR, FXD, COMPOSITION 220 OHMS, 10% TOL, 1/4 WATT	RC07GF221K	81349	745-0725-000
R46	RESISTOR, FXD, FILM	RL42S123G	81349	745-7188-000
R 4 7	12K DHMS, 2% TOL, 2 WATTS RESISTOR, FXD, FILM 28.7K OHMS, 2% TOL, 2 WATTS	KN65D2872F	81349	705-7166-000
R 4 8	RESISTOR, FXD, FILM 5110 OHMS, 1% TOL, 1/2 WATT	RN6505111F	81349	705-7130-000
R49	SAME AS R48			

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R50	RESISTOR, FXD, FILM 1330 DHMS, 1% TOL, 1/2 WATT	RN65D1331F	81349	705-7102-000
R51 R52 S1	SAME AS R32 SAME AS R11 SWITCH, TOGGLE	584	60418	266-5064-000
S2	SPST CONTACT ARRANGEMENT SWITCH, TOGGLE	MS24659-21D	96906	266-5065-000
τı	DPDT CONTACT ARRANGEMENT TRANSFORMER, AF OPEN FRAME, LEAD BROWN TO ORANGE 1.9K OHMS IMPEDANCE, LEAD YELLOW TO BLUE 600 OHMS IMPEDANCE, LEADS RED AND GREEN CENTER TAP, LEAD WHITE STATIC SHIELD	л16940	70674	677-0187-010
TP1 TP2	JACK, TIP WHITE SAME AS TP1	4877-125-9	17117	360-0434-100
TP3 TP4	SAME AS TP1 JACK, TIP BLACK	11J1043	82389	360-0434-010

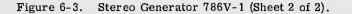


B502 513 Pb

Figure 6-3. Stereo Generator 786V-1 (Sheet 1 of 2).



B502 513 Pb



6-14

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	STERED GENERATOR 786V-1			770 5204 004
	STEVES GENERATOR TOOV I			772-5336-001
△1	INTERGRATED CIRCUIT	SL3977	07263	351-7121-010
42	INTERGRATED CIRCUIT	SL3979	07263	351-7121-030
АЗ А4	SAME AS A2 SAME AS A1			
C 1	CAPACITOR, FXD, ELECTROLYTIC 47 UF, 20% TOL, 35 VDCW	CS138F476 M	81349	184-6231-OCC
C2	SAME AS CI			
C3 C4 C5	SAME AS C1 CAPACITIR, FXD, ELECTROLYTIC 10CO UF, PLUS 5C% MINUS 10%, 16 VDCW SAME AS C1	C437ARE1000	73445	183-2355-09C
C6	SAME AS CI			
C7 C8	CAPACITOR, FXD, MICA 1000 UUF, 5% TOL, 500 VDCW SAME AS C7	CM06F102J03	81349	912-300I-OCC
C9	SAME AS CI			
C 10	SAME AS CI			
C11	SAME AS C4			
C12	CAPACITOR, FXD, ELECTROLYTIC 250 UF, PLUS 50% MINUS 10%, 4C VDCW	C437 4RG250	73445	183-2355-15C
C13	CAPACITOR, EXD, ELECTROLYTIC 22 UE, 2C# TOL, 35 VOCW	CS138F226 M	81349	184-6225-000
C14 C15	SAME AS C12 SAME AS C12			
C16	NOT USED			
C17	CAPACITOR, FXD, CERAMIC 2.2 UF, PLUS 80% MINUS 20%, 25 VDCW	5C15A	56289	913-3812-0CC
C13	SAME AS C17	C. 10 C C 2 10 10 2	0.10/0	010 0700 000
C19	CAPACITOR, EXD, MICA 33 UUF, 5% TOL, 500 VOCW	C MO5 E3 30 J0 3	81349	912-2780-000
C20	CAPACITOR, FXD, MICA 820 UUF, 5% TOL, 500 VDCW	C M06 F 82 1 J 0 3	81349	912-2995-000
021	CAPACITOR, EXD, MICA 3300 UUF, 5% TOL, BOC VDCW SAME AS CI	C M06 F 3 3 2 J 0 3	81349	912-3040-000
C23	CAPACITOR, EXD, MICA 30,000 UUF, Lº TOL,	C 1408 F 0303 F03	81349	912-3131-000
624	500 VDCW CAPACITOR, FXD, MICA 3900 DUF, 1% TOL, 500 VDCW	C M06 F D392 F03	81349	912-3044-000
025	SAME AS C17			
C26 C27	SAME AS C19 SAME AS C17			
CZA	CAPACITOR, FXD, MICA 47 UUF, 5% TOL, 500 VDCW	CM05F470J03	81349	912-2792-000
C27	CAPACITOR, EXD, MICA 1800 UUF, 2% IDL, 500 V9CW	CM06F182G03	81349	912-3018-000
CR1	SEMICONDUCION DEVICE, DIODE	1 N914	07638	352-2906-000
CR2 CR3	SAME AS CRI Semiconductor device, didde	1 N747 A	07688	353-2702-000
FLI	FILTER, LOW PASS 1500 HZ CENTER FREQUENCY			673-1167-CIC
FL 2 L 1	SAME AS FL 1 CHOKE, RF	₩S90541-07	96906	240-2560-000
12	6300 UH, 5% TOL INDUCTOR, RF			781-5329-0C1
01	2.055 MH	2 N3642	07688	352-0713-03C
01 02	TRANSISTOR SAME AS 01	210042	01000	572-0115-050
C3	TRANSISTOR	2 N3153	12040	352-0776-010

2 N3153

12040

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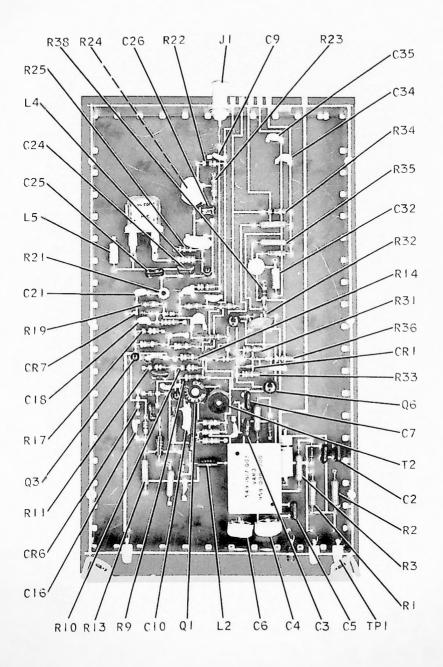
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1

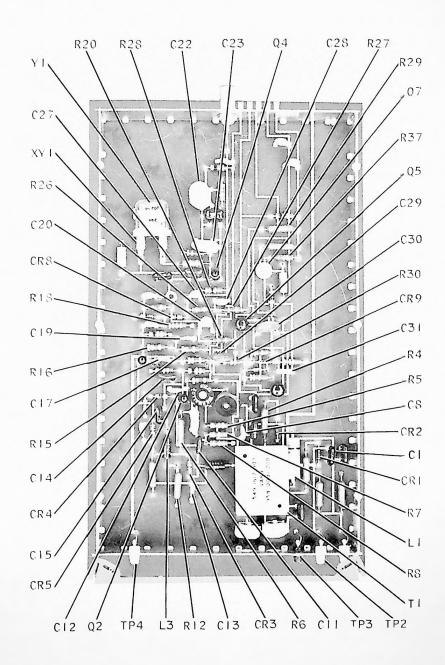
226 DrMS, 12 TOL, 1/8 WATT RNS5D6810F B1349 705-098 83 RESISTOL, FXD, FILM RNS5D6810F B1349 705-098 84 RESISTOL, FXD, FILM PMS5D6490F B1349 705-098 84 RESISTOL, FXD, FILM PMS5D6490F B1349 705-098 85 RESISTOL, FXD, COMPOSITION RC07GF323K B1349 745-079 84 MATT RNS5D1000F B1349 745-076 84 MATT RNS5D1000F B1349 745-076 84 MATT RNS5D1000F B1349 745-076 84 MATT RNS5D1000F B1349 765-074 85 RESISTOL, FXD, FILM RNS5D1002F B1349 765-076 810 RESISTOL, FXD, FILM RNS5D61002F B1349 765-076 811 RESISTOL, FXD, FILM RNS5D61002F B1349 765-076 811 RESISTOL, FXD, FILM RNS5D61002F B1349 765-076 811 RESISTOL, FXD, FILM RNS5D6180F B1349 <t< th=""><th>SYMBOL</th><th>DESCRIPTION</th><th>MANUFACTURER'S PART NUMBER</th><th>MFR CODE</th><th>COLLINS PART NUMBE</th></t<>	SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
G8 SAME AS 01 R1 RESISTOR, FXD, FILM 226 JHMS, 12 TOL, 1/B MATT R2 RNS5D2260F 81349 705-096 R2 SAME AS R1 R51STOR, FXD, FILM R51STOR, FXD, FILM R51STOR, FXD, FILM R51STOR, FXD, FILM R51STOR, FXD, FILM R6 RNS5D6400F 81349 705-096 R4 R51STOR, FXD, FILM R51STOR, FXD, FILM R6 RCS1STOR, FXD, FILM R6 RCS1STOR, FXD, FILM R6 RCS1STOR, FXD, FILM R6 RCS1STOR, FXD, FILM R6 RNS5D1000F 81349 765-094 R7 SAME AS R5 RCS1STOR, FXD, FILM R6 RCS1STOR, FXD, FILM R6 RNS5D1000F 81349 765-074 R10 RESISTOR, FXD, FILM R10 RNS5D1002F 81349 765-074 R10 RESISTOR, FXD, FILM R10 RNS5D1002F 81349 705-064 R11 RCS1STOR, FXD, FILM R13 RNS5D61002F 81349 705-062 R11 RCS1STOR, FXD, FILM R13 RNS5D6180F 81349 705-062 R11 RCS1STOR, FXD, FILM R14 RNS5D6180F 81349 705-062 R11 RCS1STOR, FXD, FILM R14 RNS5D3480F 81349 705-062 R14 RES1STOR, FXD, FILM R14 RNS5D348					
R1 RESISTRA, FXD, FILM RNS5D2260F 81349 705-096 R2 SAME AS RI RNS5D2260F 81349 705-096 R3 RESISTRA, FXD, FILM RNS5D6810F 81349 705-096 R4 RESISTRA, FXD, FILM RNS5D6490F 81349 705-096 R5 RESISTRA, FXD, FILM PN55D6490F 81349 705-096 R5 RESISTRA, FXD, FILM RNS5D1000F 81349 705-096 R6 RESISTRA, FXD, FILM RNS5D1000F 81349 705-096 R7 SAME AS RE RNS5D1000F 81349 705-096 R6 RESISTRA, FXD, FILM RNS5D1000F 81349 705-096 R7 SAME AS RE RNS5D1000F 81349 705-066 R1 RESISTRA, FXD, FILM RNS5D1002F 81349 705-066 R1 RESISTRA, FXD, FILM RNS5D1002F 81349 705-067 R11 RESISTRA, FXD, FILM RNS5D6102F 81349 705-067 R11 RESISTRA, FXD, FILM RNS5D6102F 81349 705-067 R11 RESISTRA, FXD, FILM <t< td=""><td>7</td><td>SAME AS Q1</td><td></td><td></td><td></td></t<>	7	SAME AS Q1			
226 3H% (A) TOL, 1/8 HATT RNS506810F B1349 705-098 83 RESISTOR, FXD, FILM RNS506810F B1349 705-098 84 ASTITA, FXD, FILM RNS506810F B1349 705-098 84 ASTITA, FXD, FILM RNS506400F B1349 705-098 84 ASTITA, FXD, FILM RC070F223K B1349 705-094 84 ASTITA, FXD, FILM RC070F322K B1349 705-094 84 ASTITA, FXD, FILM RNS501000F B1349 705-094 87 SAME AS RE RSISTOR, FXD, FILM RNS501002F B1349 705-076 8100 DHNS, 12 TOL, 1/8 HATT RNS501002F B1349 705-076 8100 DHNS, 12 TOL, 1/4 HATT RNS501002F B1349 705-076 811 RESISTOR, FXD, FILM RNS506100F B1349 705-076 8100 RESITOR, FXD, FILM RNS50640F B1349 705-076 8111 RESISTOR, FXD, FILM RNS5061PF B1349 705-076 8120 DHNS, 12 TOL, RASTOR, FXD, FILM RNS502150F </td <td></td> <td></td> <td></td> <td></td> <td></td>					
R2 SAME AS R1 RN55D6B10F B1349 705-098 R4 R51ST31, FXD, FILM RN55D6B10F B1349 705-098 R4 R51ST32, FXD, FILM PN55D6490F B1349 705-098 R5 R51ST32, FXD, FILM PN55D6490F B1349 705-094 R5 R51ST32, FXD, FILM RC076F223K B1349 705-094 R4 R51ST32, FXD, FILM RN55D1000F B1349 705-094 R4 R51ST32, FXD, FILM RN55D1000F B1349 705-094 R4 R51ST32, FXD, FILM RN55D1002F B1349 705-076 R4 R51ST32, FXD, FILM RN55D1002F B1349 705-076 R10 RESIST37, FXD, FILM RN55D1002F B1349 705-076 R11 RESIST37, FXD, FILM RN55D6109F B1349 705-062 R11 RESIST37, FXD, COMPOSITION RC070F124K B1349 705-062 R11 RESIST37, FXD, FILM RN55D2150F B1349 705-062 R12 RESIST37, FXD, FILM	21		RN55 D2260 F	81349	705-0965-000
R5 R551513, FXD, FLM RNS5D6610F 81349 705-098 R4 R551513, FXD, FLM PNS5D6490F 81349 705-098 R5 R551513, FXD, FLM PNS5D6490F 81349 705-098 R5 R551513, FXD, FLM RC076F223K 81349 705-098 R6 R51513, FXD, FLM RN55D1000F 81349 705-094 R6 R51513, FXD, FLM RN55D1000F 81349 705-094 R6 R51513, FXD, FLM RN55D1000F 81349 705-094 R7 100 0HMS, 12 TDL, 1/8 MATT RN55D1002F 81349 705-164 R11 R515133, FXD, FLM RN55D1002F 81349 705-068 R11 RESIST34, FXD, FLM RN55D1002F 81349 705-068 R11 RESIST34, FXD, FLM RN55D1002F 81349 705-068 R11 RESIST34, FXD, FLM RN55D102F 81349 705-068 R12 RESIST34, FXD, FLM RN55D102F 81349 705-068 R12 R2515737, FXD, FLM RN5					
R4 R51 174%, 1% TDL, 1/8 WATT PN5506490 F 81349 T05-056 R5 R51ST3, FXD, FLLM PN5506490 F 81349 745-079 R5 R2SIST3, FXD, FLLM RC076F223K 81349 745-079 R6 RESIST3, FXD, FLLM RC076F223K 81349 765-094 R6 RESIST3, FXD, FLLM RN55D1000 F 81349 765-094 R7 SAME AS R5 81340 765-074 81349 765-074 R7 SAME AS R5 R1 RUL, 1/8 WATT RN55D1000F 81349 765-074 R10 RESIST3, FXD, FLLM RN55D4640F 81349 705-064 81349 705-056 R11 RESIST3, FXD, FLLM RN55D6107F 81349 705-058 61349 705-058 R11 RESIST3, FXD, FLLM RN55D6107F 81349 705-058 R11 RESIST3, FXD, FLLM RN55D2152F 81349 705-058 R12 RESIST3, FXD, FLLM RN55D2152F 81349 705-059 R12 RESIST3, FXD, FLM			RN55D6810F	81349	705-0988-000
P4 RFSIT32, FXD, FILM PMS506490F 81349 T05-038 R5 RESIST3, FXD, COMPCSITION RC07GF223K 81349 745-079 R6 RESIST3, FXD, FILM RK07GF223K 81349 745-079 R6 RESIST3, FXD, FILM RK07GF223K 81349 745-079 R6 RESIST3, FXD, FILM RK07GF32K 81349 745-079 R7 SAME AS R5 81349 745-076 81349 705-094 80 SAME AS R5 81349 705-094 81349 705-104 81 RFSIST3, FXD, FILM RK07GF332K 81349 705-104 98 RFSISTA, FXD, FILM RK05501002F 81349 705-062 8100 MATT RK551002F 81349 705-062 811 RESISTA, FXD, FILM RK05501002F 81349 705-063 811 RESISTA, FXD, FILM RK0506189F 81349 705-063 811 RESISTA, FXD, FILM RK0502152F 81349 705-062 1200 MAT				012.17	
RESIST2R, FXD, COMPCSITION 2XX DHWS, 10X TOL, 1/4 WATT RC07GF223K 81349 745-079 P6 RESIST3R, FXD, FILM 100 DHWS, 1X TOL, 1/8 WATT RN55D1000F 81349 765-094 P7 SAWE AS R5 81349 765-094 P8 RESIST3R, FXD, FILM MATT RN55D1000F 81349 765-094 P9 RFSIST3R, FXD, FILM MATT RN55D1002F 81349 765-094 P10 RESIST3R, FXD, FILM MATT RN55D1002F 81349 705-094 P10 RESIST3R, FXD, FILM MATT RN55D1002F 81349 705-094 P11 RESIST3R, FXD, FILM K515T3R, FXD, FILM RN55D6189F 81349 705-053 P11 RESIST3R, FXD, CENAMIC 62PR1K 73138 382-000 P212 RESIST3R, FXD, CENAMIC 62PR1K 73138 382-000 P313 RESIST3R, FXD, FILM RN55D2152F 81349 705-057 P4 MATT RN55D2152F 81349 705-054 P4 P451ST3R, FXD, FILM RN55D2152F 81349 705-057 P4 P451ST3R, FXD, FILM RN55D2150F 81349 705-057 P4 P451ST3R, FXD, FILM PN55D2150F 81349 705-057 P4 P451ST3R, FXD, FILM PN55D7150F	24		PN5506490F	81349	705-0987-000
22X Disk 102 TOL, 1/4 RN55D1000F B1349 TO5-094 R7 SAME AS R5 R100, NHX, 112 RUL, 1/8 RN55D1000F B1349 745-076 3300 JHMS, 10 TOL, 1/4 R055D1002F B1349 745-076 3300 JHMS, 10 TOL, 1/4 RN55D1002F B1349 705-104 10X JHMS, 112 TOL, 1/4 RN55D1002F B1349 705-104 10X SHMS, 12 TOL, 1/4 RN55D1002F B1349 705-104 10X JHMS, 12 TOL, 1/4 RN55D1002F B1349 705-058 10X RESIST3X, FXD, FILM RN55D6189F B1349 705-058 11 RESIST3X, WAY, CERAMIC 62PR1X 73138 382-000 12 RESIST3X, FXD, COMPOSITION RC07GF124K B1349 705-067 12 RESIST3X, FXD, FILM RN55D3480F B1349 705-067 12 RESIST3X, FXD, FILM RN55D3480F B1349 705-067 14 RESIST3X, FXD, FILM RN55D3480F					
NATT RATT RNS5D1000F 81349 705-094 R7 SAME AS RE RNS5D1000F 81349 705-094 "8 RESIST3R, FXD, FILM RO7GF332K 81349 745-076 "300 DHMS, 12 TOL, 1/4 WATT RNS5D1002F 81349 705-104 "9 RESIST3R, FXD, FILM RNS5D1002F 81349 705-064 "10 RESIST3R, FXD, FILM RNS5D1002F 81349 705-064 "10 RESIST3R, FXD, FILM RNS5D1002F 81349 705-064 "11 RESIST3R, FXD, FILM RNS5D64640F 81349 705-063 "11 RESIST3R, FXD, COMPOSITION RO7GF124K 81349 705-063 "12 RESIST3R, FXD, FILM RNS5D1610F 81349 705-064 "12 RESIST3R, FXD, FILM RNS5D1021F 81349 705-064 "14 RESIST3R, FXD, FILM RNS5D1021F 81349 705-064 "14 RESIST3R, FXD, FILM RNS5D1021F 81349 705-064 "14 RESIST3R, FXD, FILM RNS5D150F	35		RC07GF223K	81349	745-0797-000
P6 RESISTRAT, FKD, FILM RNS5D1000F 81349 705-094 100 DHMS, 12 TOL, 1/8 HATT RNS5D1002F 81349 745-076 98 RESISTRAT, FKD, COMPOSITION RC07GF332K 81349 705-074 107 MATT RNS5D1002F 81349 705-074 108 DHMS, 12 TOL, 1/8 HATT RNS5D1002F 81349 705-056 108 DHMS, 12 TOL, 1/8 HATT RNS5D1002F 81349 705-056 108 RESISTRA, FKD, FILM RNS5D1002F 81349 705-056 100 RESISTRA, FKD, FILM RNS5D1002F 81349 705-056 101 RESISTRA, FKD, FILM RNS5D1002F 81349 705-058 102 RESISTRA, FKD, FILM RNS5D1002F 81349 705-058 114 RESISTRA, FKD, COMPOSITION RC07GF124K 81349 705-164 120 HAS, 13 TOL, 1/4 RNS5D2152F 81349 705-164 121 RESISTRA, FKD, FILM RNS5D2150F 81349 705-097 124 RESISTRA, FKD, FILM RNS5D2150F 81349 705-097 124 RESISTRA, FKD, FILM RNS5D2150F 81349 705-097 124 RESISTRA, FKD, FILM RNS5D7150F 81349 705-097 </td <td></td> <td></td> <td></td> <td></td> <td></td>					
100 0 HWS, 12 TOL, 1/8 HATT RC07GF332K 81349 745-076 3300 JHMS, 10 TOL, 1/4 HATT RC07GF332K 81349 745-076 3300 JHS, 10 TOL, 1/4 HAT RN55D1002F 81349 705-104 10 RESISTOR, FXD, FILM RN55D4640F 81349 705-058 464 0HMS, 13 TOL, 1/8 WATT RN55D4640F 81349 705-058 464 0HMS, 13 TOL, 1/8 WATT RN55D640F 81349 705-058 464 0HMS, 13 TOL, 1/8 WATT RN55D6180F 81349 705-058 464 0HMS, 13 TOL, 1/8 WATT RN55D6180F 81349 705-058 11 RESISTOR, FXD, FILM RN55D2152F 81349 705-067 12 RESISTOR, FXD, FILM RN55D2152F 81349 705-067 12 RATA RNS, 13 TOL, 1/8 KATT 81349 705-067 12 RATA RNS 13 TOL, 1/8 KATT 81349 705-067 12 RATA RNS 13 TOL, 1/8 KATT 81349 705-067 12 RATA RNS 13 TOL, 1/8 KATT 81349 705-067 13 RESISTOR, FXD, FILM RNS5D2150F 81349 <td< td=""><td>R6</td><td></td><td>8N55 D1000 F</td><td>81349</td><td>705-0948-000</td></td<>	R6		8N55 D1000 F	81349	705-0948-000
R7 SAME AS R5 R07GF332K 81349 745-076 98 R5IST37, FXD, COMPOSITION R07GF332K 81349 705-074 99 RFSIST37, FXD, FILM RN55D1002F 81349 705-076 100 JWAS, 12 TOL, 1/4 WATT RN55D1002F 81349 705-076 810 RESIST37, FXD, FILM RN55D6640F 81349 705-076 100 JWAS, 12 TOL, 1/4 WATT RN55D61P0F 81349 705-076 11 RESISTOR, FXD, CERAWIC 62PRIX 73138 382-000 12 RESISTOR, VAR, CERAWIC 62PRIX 73138 382-000 12 RESISTOR, FXD, COMPOSITION RC07GF124K 81349 705-062 120 HWS, 12 TOL, 1/4 RN55D2152F 81349 705-064 124 RESISTOR, FXD, FILM RN55D2152F 81349 705-067 124 RESISTOR, FXD, FILM RN55D2150F 81349 705-0697 124 RESISTOR, FXD, FILM RN55D2150F 81349 705-0697 124 RESISTOR, FXD, FILM RN55D7150F 81349 705-0697 <td></td> <td></td> <td></td> <td>01517</td> <td></td>				01517	
3300 JHMS, 10 TOL, 1/4 WATT RA55 D1002F 81349 705-104 R10 RESISTDR, FXD, FILM RA55 D1002F 81349 705-058 R11 RESISTDR, FXD, FILM RN55 D1640F 81349 705-058 R11 RESISTDR, FXD, FILM RN55 D1640F 81349 705-058 R11 RESISTDR, FXD, FILM RN55 D1640F 81349 705-058 R11 RESISTDR, FXD, CDMPOSITION RN55 D2161F 81349 705-053 R12 RESISTDR, FXD, FILM RN55 D2152F 81349 705-062 R12 RESISTDR, FXD, FILM RN55 D2152F 81349 705-075 R14 PESISTDR, FXD, FILM RN55 D2152F 81349 705-076 R14 RESISTDR, FXD, FILM RN55 D2150F 81349 705-057 R15 RESISTDR, FXD, FILM RN55 D2150F 81349 705-056 R15 RESISTDR, FXD, FILM RN55 D2150F 81349 705-056 R15 RESISTDR, FXD, FILM RN55 D2150F 81349 705-056 <	R 7				
WATT RASISTRA, FXD, FILM RASISTRA, FXD, FILM RASISTRA, FXD, FILM RASSD1002F 81349 705-164 R10 RESISTRA, FXD, FILM RASSD1002F 81349 705-058 R11 RESISTRA, FXD, FILM RASSD6189F 81349 705-058 R11 RESISTRA, FXD, FILM RNS5D6189F 81349 705-058 R11 RESISTRA, FXD, CERAMIC 62PRLK 73138 382-000 1/2 WATT RESISTRA, FXD, COMPOSITION RC07GF124K 81349 705-062 1/2 WAT RESISTRA, FXD, COMPOSITION RC07GF124K 81349 705-062 1/2 WAT RESISTRA, FXD, CERAMIC 62PRLK 73138 382-000 1/2 WAT RESISTRA, FXD, FILM RN5502152F 81349 705-067 1/4 WAT RESISTRA, FXD, FILM RN5502150F 81349 705-067 1/2 WAT RESISTRA, FXD, FILM RN5502150F 81349 705-067 1/2 WAT RESISTRA, FXD, FILM RN5502150F 81349 705-056 1/17 WAT RESISTRA, FXD, FILM RN550715	8		RC07GF332K	81349	745-0767-000
"9 RFSIST3, FXD, FILM RAS5D1002F 81349 705-164 100 Nessist32, FXD, FILM RAS5D1002F 81349 705-164 R10 RESIST3, FXD, FILM RAS5D1640F 81349 705-058 R11 RESIST3, FXD, FILM RAS5D1640F 81349 705-058 R11 RESIST3, FXD, FILM RAS5D1640F 81349 705-058 R11 RESIST3, FXD, FILM RAS5D1640F 81349 705-058 1/2 WATT RAST 81349 705-058 1/2 RESIST3, FXD, COMPOSITION RC07GF124K 81349 745-082 1/2 WATT RAST 81349 705-106 1/2 WATT RAST 81349 705-106 1/2 WATT RAST 81349 705-067 1/4 WATT RAST 81349 705-077 1/4 RAST 81349 705-067 81349 705-067 1/4 WATT RAST 81349 705-067 81349 705-067 1/4 RAST 815 814 715					
IOK DWMS, 12 IOL, 1/8 MATT RN55D4640F 81349 705-CS8 R11 RESISTOR, FXD, FILM RN55D61R9F 81349 705-CS8 R11 RESISTOR, FXD, FILM RN55D61R9F 81349 705-CS8 R11 RESISTOR, VA2, CERAMIC 62 PRIK 73138 382-C00 I/2 RESISTOR, VA2, CERAMIC 62 PRIK 73138 382-C00 I/2 WATT 745-022 745-022 1/2 RESISTOR, FXD, COMPOSITION RC07GF124K 81349 705-064 MAT VEX.DHMS, 12 TOL, 1/4 RN5502152F 81349 705-067 1/4 MAT RN55D3480F 81349 705-067 7138 322-000 1/4 MAT RN55D3480F 81349 705-067 7138 322-000 1/4 MAT RN55D3480F 81349 705-067 7138 322-000 10K DHS, 12 TOL, 1/4 RN55D2150F 81349 705-057 116 RESISTDA, FXD, FILM	20		PN55 D10025	01240	705-1044-000
810 RESISTOR, FALM RN5504640F 81349 705-058 811 RESISTOR, FXD, FILM RN55061R9F 81349 705-058 811 RESISTOR, FXD, FILM RN55061R9F 81349 705-058 912 RESISTOR, FXRD, FILM RN55061R9F 81349 705-053 112 RESISTOR, FXRD, FILM RN55061R9F 81349 705-053 112 RESISTOR, FXRD, FILM RN5502152F 81349 705-052 114 PESISTOR, FXD, FILM RN5502152F 81349 705-106 114 PESISTOR, FXD, FILM RN5503480F 81349 705-067 114 PESISTOR, FXD, FILM RN5503480F 81349 705-067 114 PESISTOR, FXD, FILM RN5502150F 81349 705-067 116 RESISTOR, FXD, FILM RN5502150F 81349 705-056 117 PESISTOR, FXD, FILM RN5507150F 81349 705-056 118 SMF AS R1 RN5507150F 81349 705-056 119 PESISTOR, FXD, FILM RN5507150F 81349 705-056 1215 SMF A	19		RNJJUIUUZE	01749	105-1044-000
464 0HMS, 12 TOL, 1/8 WATT RN55 D61 R9 F 81349 705-053 811 RESISTOR, FX0, FILM RN55 D61 R9 F 81349 705-053 912 RESISTOR, VA2, CERAMIC 62 PRLK 73138 382-000 112 RESISTOR, VA2, CERAMIC 62 PRLK 73138 382-000 112 RESISTOR, FX0, COMPOSITION RC07GF124K 81349 745-082 114 2155 RESISTOR, FX0, FILM RN55 02152F 81349 705-106 114 PESISTOR, FX0, FILM RN55 D3480F 81349 705-097 116 RESISTOR, FX0, FILM RN55 D2150F 81349 705-097 117 PESISTOR, FX0, FILM RN55 D2150F 81349 705-097 117 PESISTOR, FX0, FILM RN55 D2150F 81349 705-097 117 PESISTOR, FX0, FILM RN55 D2150F 81349 705-097	R10		RN55 04640 F	81349	705-0980-000
61.9 JPMS, 1% TOL, 1/P MATT 212 RESIST31, VAR, CERAMIC 62 PRLX 73138 382-C00 1X JPMS, 30% TOL, 1/2 WATT 62 PRLX 73138 382-C00 1X JPMS, 10% TOL, 1/2 WATT RC07GF124K 81349 745-082 120X JPMS, 10% TOL, 1/4 RN5502152F 81349 705-166 121X PRO, FILM RN5502152F 81349 705-166 14 PESIST37, FXD, FILM RN5502152F 81349 705-097 348 DUMS, 1% TOL, 1/8 WATT RN5502150F 81349 705-097 348 DUMS, 1% TOL, 1/8 WATT RN5502150F 81349 705-097 316 RESIST34, FXD, FILM RN5502150F 81349 705-096 117 PESIST34, FXD, FILM RN5507150F 81349 705-096 318 SAME AS R1 TOL, 1/8 WATT RN5507150F 81349 705-096 319 SAME AS R5 R2 SAME AS R5 R2 SAME AS R6 R349 705-096 321 SAME AS R1 TOL, 1/8 WATT RN5507150F 81349 705-096					
1/P HATT 62 PRLX 73136 382-000 212 RESISTDI, VAP, CERAMIC IS JHMS, 302 TOL, 1/2 WATT 62 PRLX 73136 382-000 213 RESISTDI, FXD, COMPOSITION IS JHKS, 1C2 TOL, 1/4 RC07GF124K 81349 745-082 212X JHMS, 1C2 TOL, 1/4 WATT RN5502152F 81349 705-106 21.5K DHMS, 12 TOL, 1/A WATT RN5502152F 81349 705-067 348 DHMS, 12 TOL, 1/8 WATT RN5503480F 81349 705-067 116 RESISTDR, FXD, FILM 1/2 WATT RN5502150F 81349 705-067 117 PESISTDR, FXD, FILM 1/2 WATT RN5502150F 81349 705-056 117 PESISTR, FXD, FILM 1/2 WATT RN5502150F 81349 705-056 118 SAME AS R17 RN5507150F 81349 705-056 1217 PAME AS R17 RN5507150F 81349 705-056 1217 SAME AS R4 RN5507150F 81349 705-056 1217 SAME AS R12 SAME AS R4 R17 R18 R14 R14 12	R 1 I	RESISTOR, FXD, FILM	RN55 D6 1 R9 F	81349	705-0938-000
212 RESISTD3, WAP, CERAMIC 62PR1K 73136 382-000 1K JHMS, 30% TOL, 1/2 WATT RC07GF124K 81349 745-082 213 RESISTD3, FXD, COMPOSITION RC07GF124K 81349 745-082 214 RESISTD3, FXD, FILM RN5502152F 81349 705-106 21.5K JHMS, 1K TOL, I/A MATT RN5502152F 81349 705-067 348 DHMS, 1% TOL, I/A WATT RN5502152F 81349 705-077 348 DHMS, 1% TOL, I/A WATT RN5502152F 81349 705-097 348 DHMS, 1% TOL, 1/8 WATT RN5502150F 81349 705-097 348 DHMS, 1% TOL, 1/8 WATT RN5502150F 81349 705-096 717 PESISTD3, FXD, FILM RN5502150F 81349 705-096 718 SAME AS R17 RN5507150F 81349 705-096 718 SAME AS R1 RUD, 1/8 WATT RN5507150F 81349 705-056 722 SAME AS R5 R6 81349 705-056 81349 705-056 723 SAME AS R16 R1349 705-056 81349 705-056 <td></td> <td></td> <td></td> <td></td> <td></td>					
1X JHX 5, 30% TOL, 1/2 WATT R13 RESISTOR, FXD, COMPOSITION RC07GF124K 81349 745-082 120X JHMS, 12% TOL, 1/4 WATT RN5502152F 81349 705-166 21.5% DHMS, 1% TOL, 1/8 RN5502152F 81349 705-166 21.5% DHMS, 1% TOL, 1/8 RN5502152F 81349 705-097 348 DHMS, 1% TOL, 1/8 RN5502152F 81349 705-097 348 DHMS, 1% TOL, 1/8 RN5502150F 81349 705-097 316 RESISTDR, FXD, FILM RN5502150F 81349 705-097 317 PESISTDR, FXD, FILM RN5502150F 81349 705-096 117 PESISTDR, FXD, FILM RN5502150F 81349 705-096 118 SAME AS R17 RN5507150F 81349 705-096 217 SAME AS R4 RN5507150F 81349 705-056 328 SAME AS R4 R4 R18 R14 R21 343 SAME AS R12 SAME R4 R1349 705-056 328 SAME				72120	202 0000 030
1/2 WATT RC07GF124K 81349 745-082 2120 DHM S, 102 TOL, 1/4 RC07GF124K 81349 745-082 114 2FSISTD3, FXD, FILM RN5502152F 81349 705-166 114 2FSISTD3, FXD, FILM RN5502152F 81349 705-166 117 RESISTD3, FXD, FILM RN5502152F 81349 705-097 348 DHMS, 12 TOL, 1/8 WATT RN5502152F 81349 705-097 348 DHMS, 12 TOL, 1/8 WATT RN5502150F 81349 705-097 348 DHMS, 12 TOL, 1/8 WATT RN5502150F 81349 705-097 348 DHMS, 12 TOL, 1/8 WATT RN5502150F 81349 705-096 117 PESISTD3, FXD, FILM RN5507150F 81349 705-097 118 SAME AS R17 RN5507150F 81349 705-096 120 SAME AS R15 R11 RN5507150F 81349 705-056 121 SAME AS R5 R22 SAME AS R16 R14 R17 121 SAME AS R16 R19 705-056 81349 705-056 122 SAME AS R16 R23 SAME AS R16 <	12		52 PRL K	73138	382-0008-070
R12 RESISTR, FXD, COMPOSITION 1200 JHMS, 102 TOL, 1/4 WATT RC07GF124K 81349 745-082 114 RESISTR, FXD, FILM AATT RN5502152F 81349 705-106 114 RESISTR, FXD, FILM AATT RN5502152F 81349 705-067 115 RESISTR, FXD, FILM AATT RN5503480F 81349 705-097 116 RESISTR, FXD, FILM AATT RN5502152F 81349 705-097 116 RESISTR, FXD, FILM AATT RN5502150F 81349 705-097 116 RESISTR, FXD, FILM AATT RN5502150F 81349 705-096 117 PESISTR, FXD, FILM AATT RN5502150F 81349 705-096 117 RESISTRA, FXD, FILM ATT RN5507150F 81349 705-096 117 RESISTRA, FXD, FILM ATT RN5507150F 81349 705-096 117 RESISTRA, FXD, FILM ATT RN5507150F 81349 705-096 118 SAME AS R4 R4 <t< td=""><td></td><td></td><td></td><td></td><td></td></t<>					
120x JHMS, 10% TOL, 1/4 WATT RN5502152F 81349 705-106 21.5K JHMS, 1% TOL, JA MATT RN5502152F 81349 705-106 815 RESISTDR, FX0, FILM RN5503480F 81349 705-097 348 DHMS, 1% TOL, JA WATT RSTSTDR, VAR, CERAMIC 62 PARIOK 73138 382-000 10K DHMS, 30% TOL, JZ WATT RSTSTDR, VAR, CERAMIC 62 PARIOK 73138 382-000 117 RESISTDR, VAR, CERAMIC 62 PARIOK 73138 382-000 118 RMSS, 30% TOL, JZ WATT RN55 D2150F 81349 705-096 8119 SAME AS R17 RN55 D7150F 81349 705-096 8119 SAME AS R5 SAME AS R5 SAME AS R5 SAME AS R5 822 SAME AS R16 RN55 D7150F 81349 705-056 823 SAME AS R16 RS5 81349 705-056 824 SAME AS R17 RN55 D7150F 81349 705-056 823 SAME AS R16 RS1373, FXD, FILM RN6006190F 81349 705-056 823	R13		RC07GF124K	81349	745-0824-000
14 QESISTDR, FXD, FILM 21.5K DHMS, 1% TOL, 1/8 WATT RN5502152F B1349 705-164 115 RESISTDR, FXD, FILM 348 DHMS, 1% TOL, 1/8 WATT RN5503480F B1349 705-097 116 RESISTDR, FXD, FILM 416 RN5503480F B1349 705-097 116 RESISTDR, FXD, FILM 417 RN5502150F B1349 705-097 117 PESISTDR, FXD, FILM 215 DHMS, 1% TOL, 1/8 WATT RN5502150F B1349 705-096 119 SAME AS R17 RN5507150F B1349 705-097 117 PESISTDR, FXD, FILM RN5507150F B1349 705-097 117 RCSISTDR, FXD, FILM RN5507150F B1349 705-097 118 SAME AS R5 RN6507150F B1349 705-097 119 SAME AS R5 R RN5507150F B1349 705-097 119 SAME AS R5 R R R R R 210 SAME AS R5 R R R R R R 122 SAME AS R11 R R R R <td></td> <td></td> <td></td> <td></td> <td></td>					
21.5K DHMS, 1K TOL, 1/8 WATT 1/8 WATT 1/8 WATT RESISTOR, FXD, FILM RN55 D3480F 81349 705-097 348 DHMS, 1% TOL, 1/8 WATT 62 PARLOK 106 HKS, 30% TOL, 117 215 DHMS, 1% TOL, 1/8 WATT 118 SAME AS R17 8119 705-096 118 SAME AS R17 8119 RN55 D2150F 81349 705-096 118 SAME AS R17 819 705-096 715 DHMS, 1% TOL, 1/8 WATT 81349 705-096 715 DHMS, 1% TOL, 1/8 WATT 820 SAME AS R4 721 SAME AS R4 823 SAME AS R5 824 SAME AS R5 825 SAME AS R10 826 SAME AS R10 827 SAME AS R12 828 SAME AS R12 829 SAME AS R15 829 SAME AS R16 831 SAME AS R15 832 RESISTOR, FXD, FILM 8133 RESISTOR, FXD, COMPOSI TION					
1/4 WATT RESISTOR, FXD, FILM RN55 D3480F 81349 705-097 348 0HMS, 1% TOL, 1/8 WATT 62 PARIOK 7138 382-000 S16 RESISTOR, VAR, CERAMIC 10K 0HKS, 30% TOL, 1/2 WATT 62 PARIOK 73138 382-000 117 PESISTOR, FXD, FILM 62 PARIOK 73138 382-000 117 PESISTOR, FXD, FILM RN55 D2150F 81349 705-096 319 RFSISTOR, FXD, FILM RN55 D2150F 81349 705-096 319 RFSISTOR, FXD, FILM RN55 D7150F 81349 705-096 319 RFSISTOR, FXD, FILM RN55 D7150F 81349 705-096 3117 RFSISTOR, FXD, FILM RN55 D7150F 81349 705-096 322 SAME AS R5 SAME AS R6 SAME AS R12 SAME AS R12 320 SAME AS R14 SAME AS R15 SAME AS R13 321 RESISTOR, FXD, FILM RN60D6190F 81349 705-656 322 RESISTOR, FXD, COMPOSITION RC07GF561K 81349 745-076 333 RESIST	:14		RN5502152F	81349	705-1060-000
115 RESISTOR, FXD, FILM RN55D3480F 81349 705-097 348 0:MMS, 12 TOL, 1/8 WATT 62PAR10K 73138 382-000 316 10K 0HMS, 30% TOL, 1/2 WATT 62PAR10K 73138 382-000 117 215 0HMS, 12 TOL, 1/8 WATT RN5502150F 81349 705-096 118 SAME AS R17 RN5507150F 81349 705-096 119 RSTST37, FXD, FILM RN5507150F 81349 705-096 120 SAME AS R4 R4 RN5507150F 81349 705-056 121 SAME AS R4 R4<					
348 DHMS, 12 TOL, 1/8 KATT 62 PARIOK 73138 382-000 100 DHMS, 30% TOL, 1/2 WATT 62 PARIOK 73138 382-000 117 PESISTDA, FXO, FILM RN55 D2150 F 81349 705-096 118 SAME AS R17 RN55 D7150 F 81349 705-096 119 RFSISTDA, FXD, FILM RN55 D7150 F 81349 705-096 118 SAME AS R17 RN55 D7150 F 81349 705-058 120 SAME AS R4 RN55 D7150 F 81349 705-058 121 SAME AS R4 RN55 D7150 F 81349 705-058 122 SAME AS R4 RA R17 R17 121 SAME AS R5 R4 R4 R1 R1349 705-058 122 SAME AS R4 R4 R1 R1349 705-058 122 SAME AS R5 R4 R4 R1 R1 123 SAME AS R12 R4 R4 R1 R4 R1 122 SAME AS R13 R4 R1 R1 R4 R1 R1 R1 R1	0.15		PN55 03 680 F	81340	705-0974-000
16 RESISTOR, VAR, CERAMIC 10K DHMS, 30% TOL, 1/2 WATT 62PAR10K 73138 382-000 117 PESISTOR, FXD, FILM 215 DHMS, 1% TOL, 1/8 WATT RN55 D2150 F 81349 705-096 118 SAME AS R17 RN55 D7150 F 81349 705-058 119 RESISTOR, FXD, FILM 715 D1MS, 1% TOL, 1/8 WATT RN55 D7150 F 81349 705-058 120 SAME AS R4 22 SAME AS R5 81349 705-058 122 SAME AS R5 81349 705-058 81349 705-058 123 SAME AS R10 SAME AS R11 81349 705-658 81349 705-658 133 RESISTOR, FXD, FILM RN60D6190F 81349 705-658 81349 705-658 133 RESISTOR, FXD, COMPOSITION RC07GF561K 81349 745-074 133 RESISTOR, FXD, COMPOSITION RC07GF560K <td< td=""><td></td><td></td><td>31091034001</td><td>01549</td><td>105 0371-000</td></td<>			31091034001	01549	105 0371-000
1/2 WATT RN55 D2150F 81349 705-096 R17 PESISTDA, FXD, FILM RN55 D2150F 81349 705-096 R19 SAME AS R17 RN55 D2150F 81349 705-096 R19 SAME AS R17 RN55 D7150F 81349 705-096 R19 R*51STD4, FXD, FILM RN55 D7150F 81349 705-096 R20 SAME AS R4 RN55 D7150F 81349 705-096 R21 SAME AS R5 R4 RN55 D7150F 81349 705-096 R21 SAME AS R4 R6 R14 R15 R14 R15 R14 R14 R14 R14 R14 R14 R14 R14 R14 R15 R14 R15 R14 R15 R14 R14 R15 R14 <t< td=""><td>:16</td><td></td><td>62 PAR10 K</td><td>73138</td><td>382-0008-440</td></t<>	:16		62 PAR10 K	73138	382-0008-440
17 2.ESIST32, FXD, FILM RN55D2150F 81349 705-096 215 DHMS, 1% TOL, 1/8 WATT RN55D7150F 81349 705-096 819 715 DHMS, 1% TOL, 1/8 WATT RN55D7150F 81349 705-096 810 715 DHMS, 1% TOL, 1/8 WATT RN55D7150F 81349 705-096 8120 SAME AS R4 SAME AS R5 R17 R19 RN55D7150F 81349 705-096 820 SAME AS R4 SAME AS R5 R17 RN55D7150F 81349 705-096 822 SAME AS R4 R6 R17 R18 R17 R18 R1349 705-096 822 SAME AS R4 R6 R16 R1349 705-096 823 SAME AS R5 R2 SAME AS R10 R10 R11 R11 R11 R2 R11 R2 R11 R2 R2 SAME AS R12 R11 R2 R2 SAME AS R13 R11 R2 R11 R2 R2 R11 R2 R2 R2 R11 R2 R2 R11 R2 R2 R2		10K OHMS, 3C% TOL,			
215 DHMS, 12 TOL, 1/8 WATT 0100 000000000000000000000000000000000					
R1H SAME AS R17 R19 RFSISTOR, FXD, FILM R19 RFSISTOR, FXD, FILM R20 SAME AS R4 721 SAME AS R4 721 SAME AS R5 R22 SAME AS R5 R22 SAME AS R6 R23 SAME AS R6 R24 SAME AS R7 R25 SAME AS R6 R26 SAME AS R10 R27 SAME AS R11 R20 SAME AS R12 R29 SAME AS R13 R31 SAME AS R15 R32 RESISTD3, FXD, FILM R411 RC07GF561K R33 RESISTD3, FXD, COMPOSITION R607GF560K 81349 745-074 %33 RESISTD3, FXD, COMPOSITION R607GF560K 81349 745-076 56 JHM S, 102 TOL, 1/4 WATT %34 RESISTD3, FXD, COMPUSITION R607GF560K 81349 745-076 S6 JHM S, 102 TOL, 1/4 WATT %35 RESISTD3, FXD, COMPUSI TION R607GF560K 81349	217		RN55 D2 150 F	81349	705-0964-000
R19 RESISTOR, FX0, FILM RN55D7150F 81349 705-05P R20 SAME AS R4 SAME AS R4 R4 R15 R15 R21 SAME AS R4 SAME AS R4 R15 R15 R15 R21 SAME AS R4 SAME AS R4 R15 R15 R15 R15 R22 SAME AS R5 SAME AS R5 R16 R15 R15 R15 R15 R22 SAME AS R5 SAME AS R5 R24 SAME AS R5 R25 SAME AS R5 R26 SAME AS R10 R27 SAME AS R11 R27 SAME AS R12 R26 SAME AS R12 R27 SAME AS R12 R26 SAME AS R12 R27 SAME AS R13 R11 SAME AS R12 R27 SAME AS R12 R27 SAME AS R13 R26 SAME AS R13 R26 R31 SAME AS R14 R31 SAME AS R15 R32 R26 SAME AS R15 R33 R5IST03, FXD, COMPOSI TION RC07GF561K 81349 745-074 R33 RESIST03, FXD, COMPOSI TION RC07GF560K 81349 745-074 R34 RESIST03, FXD, COMPOSI TION RC07GF560K	919				
715 DHMS, 1% TOL, 1/8 WATY 010 TOL R20 SAME AS R4 ?21 SAME AS R5 ?22 SAME AS R5 ?23 SAME AS R5 ?24 SAME AS R5 ?25 SAME AS R5 ?26 SAME AS R5 ?27 SAME AS R10 ?27 SAME AS R11 ?20 SAME AS R12 ?31 SAME AS R14 ?32 RESISTD2, FXD, FILM RESISTD3, FXD, COMPOSITION RC07GF561K ?33 RESISTD3, FXD, COMPOSITION ?34 RESISTD3, FXD, COMPUSITION ?35 RESISTD3, FXD, COMPUSITION ?36 RESISTD3, FXD, COMPUSITION ?37 RESISTD3, FXD, COMPUSITION ?38 RESISTD3, FXD, COMPUSITION ?39 RESISTD3, FXD, COMPUSITION ?30 RESISTD3, FXD, COMPUSITION ?35 RESISTD3, FXD,			8N55D7150F	81349	705-0585-000
R20 SAME AS R4 ?21 SAME AS R5 ?22 SAME AS R5 ?22 SAME AS R5 ?23 SAME AS R5 ?24 SAME AS R5 ?25 SAME AS R5 ?26 SAME AS R10 ?27 SAME AS R10 ?28 SAME AS R11 ?20 SAME AS R12 ?29 SAME AS R13 ?30 SAME AS R14 ?31 SAME AS R15 ?32 RESISTD2, FXD, FILM ?33 RESISTD3, FXD, COMPOSITION ?34 RESISTD3, FXD, COMPOSITION ?34 RESISTD3, FXD, COMPUSITION ?35 RESISTD3, FXD, COMPUSITION ?36 RESISTD3, FXD, COMPUSITION ?37 RESISTD3, FXD, COMPUSITION ?38 RESISTD3, FXD, COMPUSITION ?39 RESISTD3, FXD, COMPUSITION ?34 RESISTD3, FXD, COMPUSITION ?35 RESISTD3, FXD, COMPUSITION ?36 RESISTD3, FXD, COMPUSITION ?37 RESISTD3, FXD, COMPUSITION ?38 RESISTD3, FXD, COMPUSITION <td< td=""><td></td><td></td><td>10001001</td><td>01545</td><td>105-0305-000</td></td<>			10001001	01545	105-0305-000
R22 SAME AS Ré R23 SAME AS R5 R24 SAME AS R5 R25 SAME AS R5 R26 SAME AS R10 R27 SAME AS R10 R20 SAME AS R12 R20 SAME AS R13 R20 SAME AS R13 R20 SAME AS R13 R31 SAME AS R15 R32 RESIST01, FXD, FILM R41 R13 R42 Resiston, FXD, COMPOSITION R41 Resiston, FXD, COMPOSITION R42 Resiston, FXD, COMPOSITION R42 Resiston, FXD, COMPOSITION R44 Resiston, FXD, COMPOSITION R45 Resiston, FXD, COMPOSITION R45 Resiston, FXD, COMPOSITION	R 20				
R23 SAME AS R5 R24 SAME AS R8 R25 SAME AS R5 R26 SAME AS R10 R27 SAME AS R10 R27 SAME AS R11 R20 SAME AS R12 R29 SAME AS R13 R31 SAME AS R14 R31 SAME AS R15 R32 RESISTD2, FXD, FILM R51STD3, FXD, COMPOSITION RC07GF561K 81349 745-074 S60 DHMS, 1% TDL, 1/4 WATT Y34 RESISTD1, FXD, COMPOSITION RESISTD3, FXD, COMPOSITION RC07GF560K 81349 745-070 S6 DHMS, 10% TDL, 1/4 RC07GF560K 81349 745-070 S6 DHMS, 10% TDL, 1/4 RC07GF560K 81349 745-070 S6 DHMS, 10% TDL, 1/4 RC07GF560K 81349 745-070 S6 SHMS, 10% TOL, 1/4 RC07GF560K 81349 745-070 S6 SHMS, 10% TOL, 1/4 RC07GF471K 81349 745-070 S6 THMS, 10% TOL, 1/4 RC07GF471K					
324 SAME AS R9 R25 SAME AS R5 R26 SAME AS R10 R27 SAME AS R10 R27 SAME AS R10 R20 SAME AS R11 R20 SAME AS R12 R29 SAME AS R15 R31 SAME AS R15 R32 RESISTD2, FXD, FILM R01 JMMS, 1% TDL, 1/4 WATT R33 RESISTD3, FXD, COMPOSITION R60 JMMS, 10% TOL, 1/4 WATTS "34 RESISTD3, FXD, COMPOSITION R65 JMMS, 10% TOL, 1/4 WATTS "34 RESISTD3, FXD, COMPUSITION R65 JMMS, 10% TOL, 1/4 WATTS "34 RESISTD3, FXD, COMPUSITION R607GF560K 81349 745-070 56 JMMS, 10% TOL, 1/4 WATT "35 RESISTD3, FXD, COMPUSITION R607GF471K 81349 745-070 56 JMMS, 10% TOL, 1/4					
R25 SAME AS R5 R26 SAME AS R1C R27 SAME AS R1C R20 SAME AS R11 R20 SAME AS R12 R29 SAME AS R13 R30 SAME AS R14 R31 SAME AS R15 *32 RESISTD3, FXD, FILM RESISTD3, FXD, COMPOSITION RC07GF561K 81349 745-074 *34 RESISTD3, FXD, COMPUSITION RESISTD3, FXD, COMPUSITION RC07GF560K 81349 745-076 56 JHMS, 10% TOL, 1/4 WATT *35 RESISTD3, FXD, COMPUSITION RESISTD3, FXD, COMPUSITION RC07GF471K 81349 745-075 470 JHMS, 10% TOL, 1/4				1	
R26 SAME AS RIC R27 SAME AS RIC R27 SAME AS RIC R20 SAME AS RIC R29 SAME AS RIC R30 SAME AS RIA R31 SAME AS RIA R41 SAME AS RIA R31 SAME AS RIA R31 SAME AS RIA R41 RESISTDR, FXD, FILM R41 RESISTOR, FXD, COMPOSITION R41 RESISTOR R41 RESISTOR R42 RESISTOR R42 RESISTOR R42 RESISTOR R44 RES					
R27 SAME AS R11 320 SAME AS R12 R29 SAME AS R13 R30 SAME AS R14 R31 SAME AS R15 9.32 RESIST32, FXD, FILM R13 SAME AS R15 9.32 RESIST32, FXD, FILM R13 SAME AS R15 9.32 RESIST32, FXD, COMPOSITION RESIST32, FXD, COMPOSITION RC07GF561K 81349 745-074 560 JHM S, 10% TOL, 1/4 WATTS RESIST31, FXD, COMPUSITION 734 RESIST31, FXD, COMPUSITION RESIST32, FXD, COMPUSITION RC07GF560K 81349 745-070 56 JHM S, 10% TOL, 1/4 735 RESIST32, FXD, COMPUSITION RESIST32, FXD, COMPUSITION RC07GF471K 81349 745-070 56 JHM S, 10% TOL, 1/4					
220 SAME AS R12 P29 SAME AS R13 R30 SAME AS R14 R31 SAME AS R15 *32 RESISTDR, FXD, FILM RESISTDR, FXD, COMPOSITION RC07GF561K 81349 745-074 *34 RESISTDR, FXD, COMPUSITION *34 RESISTDR, FXD, COMPUSITION *34 RESISTDR, FXD, COMPUSITION *35 RESISTDR, FXD, COMPUSITION *36 RESISTDR, FXD, COMPUSITION *37 RESISTDR, FXD, COMPUSITION *38 RESISTDR, FXD, COMPUSITION *39 RESISTDR, FXD, COMPUSITION *39 RESISTDR, FXD, COMPUSITION *39 RESISTDR, FXD, COMPUSITION *30 RESISTDR, FXD, COMPUSITION *31 RESISTDR, FXD, COMPUSITION *32 RESISTDR, FXD, COMPUSITION *34 RESISTDR, FXD, COMPUSITION *35 RESISTDR, FXD, COMPUSITION *36 RESISTDR, FXD, COMPUSITION *37 RESISTDR					
R30 SAME AS R14 R31 SAME AS R15 P32 RESISTD3, FXD, FILM R13 RESISTD3, FXD, FILM R13 RESISTD3, FXD, FILM R133 RESISTD3, FXD, COMPOSITION R133 RESISTD3, FXD, COMPOSITION R134 RESISTD3, FXD, COMPOSITION R134 RESISTD3, FXD, COMPOSITION R134 RESISTD3, FXD, COMPUSITION R251 R251 R270 R070 R251 R070 R270 R070 R251 R070 R270 R070 R270					
R31 SAME AS R15 932 RESISTD3, FXD, FILM RN60D6190F 81349 705-658 619 DHMS, 1% TDL, 1/4 WATT RC07GF561K 81349 745-074 133 RESISTD3, FXD, COMPOSITION RC07GF561K 81349 745-074 134 RESISTD3, FXD, COMPUSITION RC07GF560K 81349 745-074 134 RESISTD3, FXD, COMPUSITION RC07GF560K 81349 745-076 135 RESISTD3, FXD, COMPUSITION RC07GF471K 81349 745-076 135 RESISTD3, FXD, COMPUSITION RC07GF471K 81349 745-076					
9.32 RESISTOR, FXD, FILM RN60D6190F 81349 705-658 619 DHMS, 1% TOL, 1/4 WATT RC07GF561K 81349 745-074 133 RESISTOR, FXD, COMPOSITION RC07GF561K 81349 745-074 34 RESISTOR, FXD, COMPUSITION RC07GF560K 81349 745-070 56 DHMS, 10% TOL, 1/4 WATTS RC07GF560K 81349 745-070 35 RESISTOR, FXD, COMPUSITION RC07GF471K 81349 745-070					
619 DIMS, 1% TDL, 1/4 WATT 133 RESISTDR, FXD, COMPOSITION RC07GF561K 81349 745-074 134 RESISTDR, FXD, COMPUSITION RC07GF560K 81349 745-070 134 RESISTDR, FXD, COMPUSITION RC07GF560K 81349 745-070 135 RESISTDR, FXD, COMPUSITION RC07GF471K 81349 745-070 135 RESISTDR, FXD, COMPUSITION RC07GF471K 81349 745-070			Phéopé loos	012/0	705 4504 000
133 RESISTOR, FXD, COMPOSITION RC07GF561K 81349 745-074 560 DHMS, 10% TOL, 1/4 WATTS 81349 745-074 "34 RESISTOR, FXD, COMPUSITION RC07GF560K 81349 745-076 56 DHMS, 10% TOL, 1/4 RC07GF560K 81349 745-076 56 DHMS, 10% TOL, 1/4 WATT RC07GF560K 81349 745-076 735 RESISTOR, FXD, COMPOSITION RC07GF471K 81349 745-075			KUDD DO LAOF	01349	705-6586-000
560 DHMS, 10% TOL, 1/4 WATTS "34 RESISTOR, FXD, COMPUSITION S6 DHMS, 10% TOL, 1/4 WATT "35 RESISTOR, FXD, COMPOSITION RC07GF560K 81349 745-070 935 RESISTOR, FXD, COMPOSITION 470 DHMS, 10% TOL, 1/4	133		RC07GE561K	81349	745-0740-000
WATTS Resistor, FXD, COMPUSITION RC07GF560K 81349 745-070 '36 DHMS, 100 TOL, 1/4 WATT RC07GF560K 81349 745-070 '35 RESISTOR, FXD, COMPOSITION RC07GF471K 81349 745-070 '36 HMS, 10% TOL, 1/4 RC07GF471K 81349 745-070					
56 JHM S, 107 TOL, 1/4 WATT 035 RESISTDR, FXD, COMPOSITION RC07GF471K 81349 745-C73 470 JHM S, 10% TOL, 1/4 RC07GF471K 81349 745-C73		WATTS			
Resistor, FXD, composition RC076F471K 81349 745-073 470 DHMS, 10% TOL, 1/4 745-073 745-073	134		RC07GF560K	81349	745-0704-000
470 JHMS, 10% TOL, 1/4					
	35		RC07GF471K	81349	745-0737-000
		470 JHMS, 10% 10L, 174 WATT			
	36		RC07GF103K	81349	745-0785-000
104 DHMS, 102 TOL, 1/4					

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEI
837	RESISTOR, EXD, COMPOSITION 684 OHMS, 10% TOL, 174 WATT	RC07GF583K	81349	745-0815-CCC
R 38	RESISTOR, FXD, COMPOSITION 100 DHMS, 10% TOL, 174	RC07GF101K	81349	745-0713-000
R 3 7	WATT RESISTOR, FXD, COMPOSITION 820 DHMS, 10% TOL, 1/4	RC07GF821K	81349	745-0746-000
民40	WATT RESISTOR, FXD, COMPOSITION 1000 DHMS, 10% TOL, 1/4	RC07GF104K	81349	745-0821-CCC
041	WATT RESISTDR, FXD, COMPOSITION 3900 DHMS, 10% TOL, 174 WATT	PC076F392K	81349	745-0770-000
R42 743	SAME AS R35 RESISTIX, FXD, COMPUSITION 680 OHMS, 10% TOL, 1/4 WATT	RC07GF681K	81349	745-0743-CCC
R44 R45	NOT USED RESISTOR, FYD, FILM 147 DHMS, 1% TOL, 1/8 WATT	885501470F	81349	705-C956-CCC
F46 F47 F46	SAME AS R45 SAME AS R35 R5SIST37, FX0, COMPOSITION 330 DHMS, 10% TOL, 174	RC07GF331K	81349	745-0731-000
949	NATT RESISTOR, VAR, CERAMIC 50 DHMS, 307 TOL, 1/2 WATT	52 PAR50	7 3 1 3 8	382-CCOE-37C
850	RESISTOR, FXD, COMPOSITION 180 DHMS, 107 TOL, 2 WATTS	RC42GF181K	81349	745-5621-CCC
S 1 XY i	SWITCH, TOGGLE SPOT CONTACT ARRANGEMENT SOCKET, CRYSTAL	5 P7 8000 AG2	60418 91506	266-5059-00C 292-0215-00C
Υ1	2 CONTACTS CRYSTAL UNIT, QUARTZ	289-7095-020	71034	289-7095-C2C



B502 530 Pb

Figure 6-4. AFC Discriminator (Sheet 1 of 2).



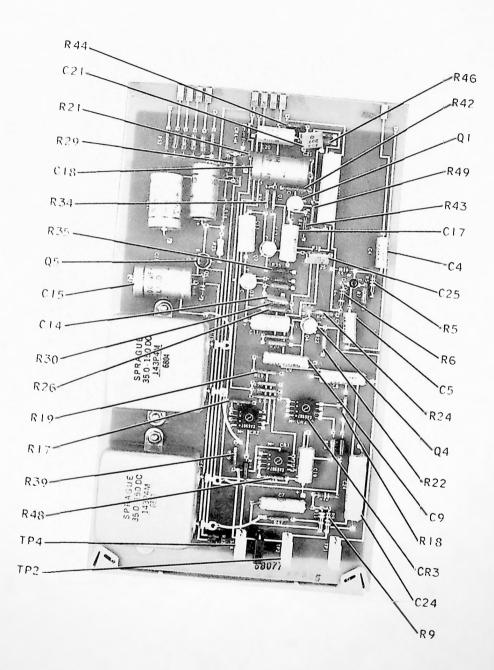
B502 530 Pb

Figure 6-4. AFC Discriminator (Sheet 2 of 2).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	AFC DISCRIMINATOR			774-7097-001
C 1	CAPACITOR, FXU, MICA 470 UUF, 5% TOL, 300 VDCW	DM15F471J03	72136	912-2864-000
C2	SAME AS C1	CN055221102		912-2840-000
C 3	CAPACITOR, FXD, MICA 220 UUF, 5% TOL, 500 VDCW	CM05F221J03	81349	912-2840-000
C4	CAPACITOR, VAR, CERAMIC 4-12 UUF, 350 VDCW	3192-000-C0P0-15 R	72982	917-1253-020
C 5	CAPACITOR, FXD, MICA 22 UUF, 5% TOL, 500 VDCW	CM05E220J03	81349	912-2768-000
C6	CAPACITOR, VAR, CERAMIC	3192-000-C0P0-32	72982	917-1253-030
C7	6-25 UUF, 350 VDCW CAPACITOR, FXD, MICA	CM05ED750J03	81349	912-2807-000
C 8	75 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, CERAMIC 0.01 UF, PLUS 80% MINUS 20%, 100 VDCW	805-014X5V0103Z	72982	913-3680-000
C9 C10	SAME AS C8 CAPACITOR, FXD, CERAMIC 0-01 UF, PLUS 80% MINUS 20%, 50 VDCW	33C41	56289	913-3886-000
C11	SAME AS C5			
C12 C13	SAME AS CB SAME AS CB			
C14	CAPACITOR, FXD, MICA	CM05E820J03	81349	912-2810-00
C15	82 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA	DM15C100J01	72136	912-2753-00
	10 UUF, 5% TOL, 500 VDCW			
C16	SAME AS C8			
C17 C18	SAME AS C8 CAPACITOR, FXD, CERAMIC 1000 UUF, 20% TOL, 500 VDCH	4007341	01939	913-3009-00
C19	SAME AS C8			
C20	SAME AS C18			
C21 C22	SAME AS C18			
C23	SAME AS CIO			
C24	CAPACITOR, FXD, MICA	CM05E680J03	81349	912-2804-00
	68 UUF, 5% TOL, 500 VDCW	000000000000000000000000000000000000000	70104	010 00/7 00
C25	CAPACITOR, FXD, MICA 510 UUF, 5% TOL, 300 VDCW	DM15F511J03	72136	912-2867-00
C26	CAPACITOR, FXD, MICA 180 UUF, 5% TOL, 500 VDCW	CM05F181J03	81349	912-2834-00
C27	SAME AS C18		ļ	
C28 C29	SAME AS C18 CAPACITOR, FXD, CERAMIC 3300 UUF, 20% TOL, 500	CK62AW332M	81349	913-1193-00
c	VDCW			
C30 C31	SAME AS C29 CAPACITOR, FXD, CERAMIC	CK06CW103M	81349	913-4001-00
	10,000 UUF, 20% TOL, 200		01017	
C32	CAPACITOR, FXD, ELECTROLYTIC 2.2 UF, 10% TOL, 35 VDCW	CS12BF225K	81349	184-6077-00
C33	NOT USED			
C34 C35	SAME AS C18 SAME AS C18			
CRI	SEMICONDUCTOR DEVICE, DIODE	FA2311U	07263	353-3593-01
CR2	SAME AS CR1			
CR3 CR4	SEMICONDUCTOR DEVICE, DIODE	1N270	07688	353-2018-00
THROUGH Crb	SAME AS CR3			
CR9	SEMICONDUCTOR DEVICE, DIODE	1N626	07688	353-2857-00
CR10 J1	SAME AS CR9 Connector, Electrical 1 Contact	UG1051U	80058	357-9210-00

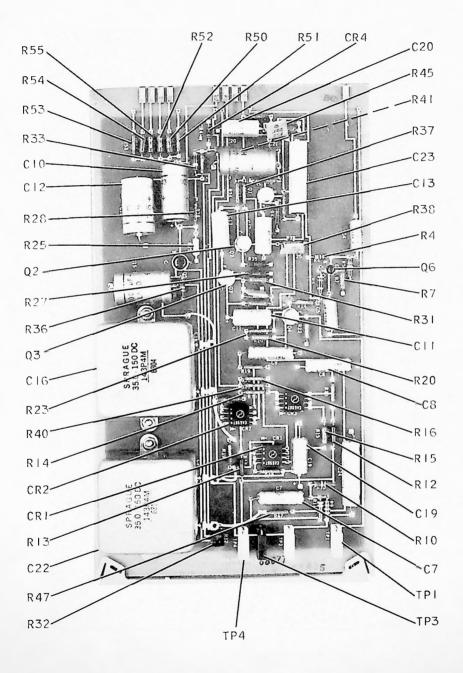
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEI
LI	CHOKE, RF	LT7K209	81349	240-0193-000
L2	1000 UH, 10% TOL COIL, RF	13950	03550	240-1996-110
L3	6.8 UH, 5% TOL COIL, RF	13949	03550	240-1996-100
L4	6.2 UH, 5% TOL COIL, RF	C7307	42190	240-0065-000
L5	3.3 UH, 10% TOL COIL, RF 4.7 UH, 10% TOL	LT4K042	81349	240-0145-000
Q1 Q2	TRANSISTOR	2N741 2N4121	07688 07688	352-0322-000 352-0743-010
Q3 Q4	SAME AS Q2 SAME AS Q2		0.000	552 0145 010
Q5 Q6	TRANSISTOR SAME AS Q5	2N3643	07688	352-0713-030
Q7 R1	TRANSISTOR RESISTOR, FXD, FILM	2N491 RN65D6811F	07688 81349	352-0116-000
	6810 OHMS, 1% TOL, 1/2 WATT	RNG5500111	01345	105-1158-000
R2 R3	SAME AS R1 RESISTOR, FXD, FILM 110 OHMS, 1% TOL, 1/2 WATT	RN65D1100F	81349	705-7050-000
R4 R5	SAME AS R3 RESISTOR, FXD, COMPOSITION 150 OHMS, 10% TOL, 1/2 WATT	RC206F151K	81349	745-1317-000
R6	RESISTOR, FXD, FILM 261 DHMS, 1% TOL, 1/2 WATT	RN65D2610F	81349	705-7068-000
R7	RESISTOR, FXD, COMPOSITION 1800 DHMS, 107 TOL, 1/2 WATT	RC20GF182K	81349	745-1363-000
R8 R9	SAME AS R7 RESISTOR, FXD, COMPOSITION 4700 OHMS, 10% TOL, 1/2 WATT	RC20GF472K	81349	745-1380-000
R10	RESISTOR, FXD, COMPOSITION 10K OHMS, 10% TOL, 1/2 WATT	RC20GF103K	81349	745-1394-000
R11 R12	SAME AS R10 RESISTOR, FXD, FILM 42.2 OHMS, 1% TOL, 1/2 WATT	RN65D42R2F	81349	705-7030-000
R13	RESISTOR, FXD, FILM 51.1 OHMS, 1% TOL, 1/2 WATT	RN65D51R1F	81349	705-7034-000
R14 R15	SAME AS R9 SAME AS R9			
R16 R17	SAME AS R9 SAME AS R10			
R18	RESISTOR, FXD, COMPOSITION 680 OHMS, 10% TOL, 1/2	RC20GF681K	81349	745-1345-000
R19	WATT RESISTOR, FXD, COMPOSITION 2700 OHMS, 10% TOL, 1/2 WATT	KC20GF272K	81349	745-1370-000
R20 R21	SAME AS R19 RESISTOR, VAR, CERMET 500 DHMS, 30% TOL, 1/2	62PR500	73138	382-0008-060
R22	WATT RESISTOR, FXD, COMPOSITION 100 DHMS, 10% TOL, 1/2 WATT	RC20GF101K	81349	745-1310-000
R23	RESISTOR, FXD, COMPOSITION 8200 OHMS, 10% TOL, 1/2 WATT	RC20GF822K	81349	745-1391-000
R24	RESISTOR, FXD, COMPOSITION	RC20GF183J	81349	745-1404-000
R25	18K OHMS, 5% TOL, 1/2 WATT RESISTOR, FXD, COMPOSITION 6800 OHMS, 10% TOL, 1/2 WATT	RC20GF682K	81349	745-1387-000

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	SAME AS R19			
R26 R27	SAME AS R19			
R28	RESISTOR, FXD, COMPOSITION 68 OHMS, 10% TOL, 1/2 WATT	RC20GF680K	81349	745-1303-000
R29	RESISTOR, FXD, FILM 1.33K OHMS, 1% TOL, 1/2	RN65D1331F	81349	705-7102-000
30	HATT RESISTOR, FXD, COMPOSITION 15K OHMS, 10% TOL, 1/2	RC20GF153K	81349	745-1401-000
831	WATT RESISTOR, FXD, COMPOSITION 3300 OHMS, 10% TOL, 1/2	RC20GF332K	81349	745-1373-000
32	WATT SAME AS R30			
33	SAME AS R31			
34	RESISTOR, FXD, COMPOSITION 1K OHMS, 10% TOL, 1/2 WATT	RC20GF102K	81349	745-1352-000
35	RESISTOR, FXD, FILM 56.2K OHMS, 1% TOL, 1/2	RN65D5622F	81349	705-7180-000
36	WATT RESISTOR, FXD, COMPOSITION 47K OHMS, 10% TOL, 1/2	RC20GF473K	81349	745-1422-000
37	WATT RESISTOR, FXD, COMPOSITION 220 OHMS, 10% TOL, 1/2	RC20GF221K	81349	745~1324-000
838	WATT RESISTOR, FXD, COMPOSITION 10 OHMS, 10% TOL, 1/2 WATT	RC20GF100K	81349	745~1268-000
11	TRANSFORMER			549-1617-003
T 2 T P 1	TRANSFORMER JACK, TIP	SL490-458WHT	12615	549-1589-002 306-2241-100
T P 2	WHITE SAME AS TP1			
TP3	JACK, TIP	SL490-458BLK	12615	306-2241-010
TP4	BLACK SAME AS TP1			
KY1	SOCKET, CRYSTAL	8000AG2	91506	292-0215-000
11	CRYSTAL UNIT, QUARTZ 14 MHZ FREQUENCY RANGE	5289-2743-00	94148	289-2743-000



B502 514 Pb

Figure 6-5. AFC Synchronous Detector (Sheet 1 of 2).



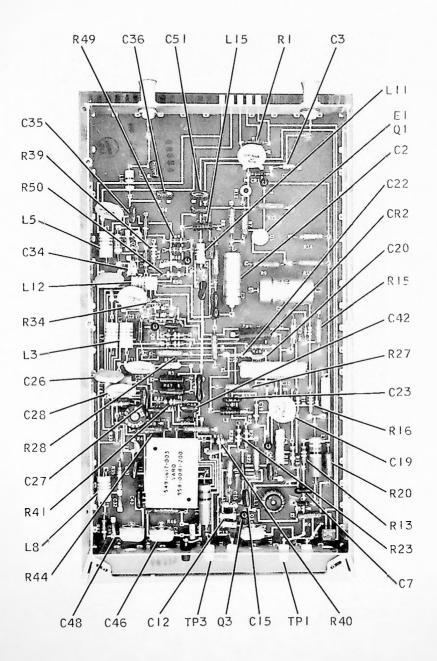
B502 514 Pb

Figure 6-5. AFC Synchronous Detector (Sheet 2 of 2).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	AFC SYNCHRONOUS DETECTOR			774-7075-001
C1	NOT USED			
C2	NOT USED			
C3	NOT USED	6612061574		
C 4	CAPACITOR, FXD, ELECTROLYTIC	CS138F156M	81349	184-6222-000
65	SAME AS C4		{	
C6	NOT USED			
C7	CAPACITOR, FXD, ELECTROLYTIC	CL378L020MN3	81349	184-7929-000
C 8	2 UF, 20% TOL, 75 VDCW	CL 2 TONGO CHUR		
Ca	CAPACITOR, FXD, ELECTROLYTIC 5.5 UF, 20% TOL, 30 VDCW	CL37BN5R5MN3	81349	184-7918-000
C9	SAME AS C8			
C10	CAPACITUR, FXD, ELECTROLYTIC	C437ARG250	73445	183-2355-150
	250 UF, PLUS 50% MINUS			
	10%, 40 VDCH			
C11	CAPACITOR, FXD, ELECTROLYTIC	CS138E107M	81349	184-6190-000
C12	100 UF, 20% TOL, 20 VDCW CAPACITOR, FXD, ELECTROLYTIC	C437ARE1000	73445	183-2355-090
012	1000 UF, PLUS 50% MINUS	CASTAREIODO		103-2355-090
	1C%, 16 VDCW			
C13	SAME AS CIL			
C14	CAPACITOR, FXD, CERAMIC	5C12A	56289	913-3809-000
	0.68 UF, PLUS 80% MINUS 20%, 25 VDCW			
C15	SAME AS C12			
C16	CAPACITOR, FXD, PAPER	143P4M	56289	951-2003-000
	35 UF, 20% TOL, 150 VDCW			
C17	SAME AS C11			
C18 C19	SAME AS CIO	C\$129C227M	81349	184-6154-000
019	CAPACITOR, FXD, ELECTROLYTIC 220 UF, 20% TOL, 10 VDCW	CS13BC227M	01349	184-0154-000
C20	SAME AS C11			
C 2 1	SAME AS C14			
C22	SAME AS C16			
C23	CAPACITOR, FXD, ELECTROLYTIC 1CO UF, PLUS 100% MINUS	\$13691	56289	183-2151-000
	104, 10 VDCW			
C24	CAPACITOR, FXD, ELECTROLYTIC	CL378G200MN3	81349	184-7258-000
	20 UF, 20% TOL, 25 VDCW			
C25	SAME AS C14			
CR1 CR2	SEMICONDUCTOR DEVICE, DIODE	FA4000	07263	353-3271-000
CR3	SAME AS CRI			
CR4	SEMICONCUCTOR DEVICE, DIODE	1N718	07688	353-2734-000
QL	TRANSISTOR	2N1613	07688	352-0349-000
02	SAME AS Q1			
Q3 Q4	SAME AS Q1 SAME AS Q1			
05	TRANSISTOR	2N4250	07263	352-0773-030
Q6	TRANSISTOR	2N3565	07688	352-0638-010
R1	NOT USED			
R2	NOT USED			
R3 R4	NCT USED RESISTOR, FXD, COMPOSITION	RC07GF334K	81349	745-0839-000
	330K DHMS, 10% TOL, 1/4	NOUTO STA	0.517	. 12 0007 000
	WATT			
R 5	RESISTOR, FXD, COMPOSITION	RC20GF273K	81349	745-1412-000
	27K OHMS, 10% TOL, 1/2			
R6	WATT RESISTOR, FXD, COMPOSITION	RC20GF472K	81349	745-1380-000
NO	4700 0HMS, 10% TOL, 1/2	NUZUUI HIZN	01347	19 1900-000
	WATT			
R7	RESISTOR, FXD, FILM	RN60C2870F	81349	705-6260-000
	287 OHMS, 1% TOL, 1/8 WATT			
R.8	NOT USED	DCDDCCLOUK	012/0	745 1447 000
R9	RESISTOR, FXD, COMPOSITION	RC20GF184K	81349	745-1447-000
	180K OHMS, 10% TOL, 1/2			

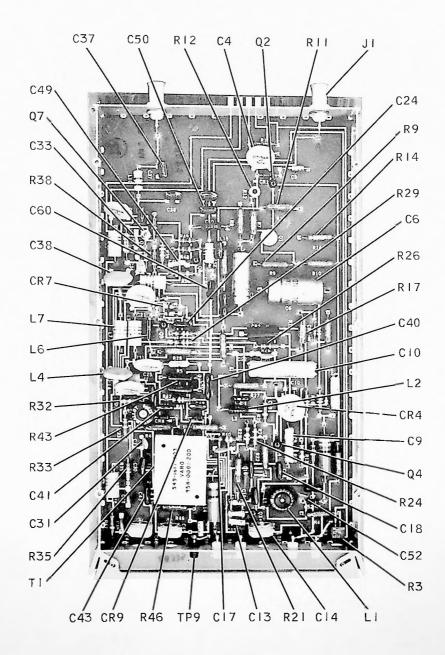
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R10	RESISTOR, FXD, COMPOSITION 120K OHMS, 10% TOL, 1/2	RC206F124K	81349	745-1440-000
R11	WATT RESISTOR, FXD, COMPOSITION 27K OHMS, 10% TOL, 1/2	RC20GF273K	81349	745-1412-000
R12	RESISTOR, FXD, FILM 100K OHMS, 1% TOL, 1/4 WATT	RN60D1003F	81349	705-6692-000
R13	SAME AS R12			
R14	RESISTOR, FXD, FILM 9090 OHMS, 1% TOL, 1/4 WATT	RN60D9091F	81349	705-6642-000
R15	RESISTOR, FXD, FILM 8250 OHMS, 1% TOL, 1/4 WATT	RN60D8251F	81349	705-6640-000
R16	RESISTOR, FXD, FILM 5620 OHMS, 1% TOL, 1/4 WATT	RN60D5621F	81349	705-6632-000
R17 R18	SAME AS R14 RESISTOR, FXD, FILM 2870 OHMS, 1% TOL, 1/4	RN60D2871F	81349	705-6618-000
R19	WATT SAME AS R18		}	
R20	RESISTOR, FXD, FILM 1470 OHMS, 1% TOL, 1/4 WATT	RN60D1471F	81349	705-6604-000
R21	RESISTOR, FXD, COMPOSITION 820 OHMS, 10% TOL, 1/2 WATT	RC20GF821K	81349	745-1349-000
R22	SAME AS R20			
R23	RESISTOR, FXD, FILM 38-3K OHMS, 1% TOL, 1/4 WATT	RN60D3832F	81349	705-6672-000
R24	RESISTOR, FXD, FILM 19.6K OHMS, 1% TOL, 1/4 WATT	RN60D1962F	81349	705-6658-000
R25	RESISTOR, FXD, FILM 31-6K OHMS, 1% TOL, 1/4 WATT	RN60D3162F	81349	705-6668-000
R26	RESISTOR, FXD, FILM 7500 OHMS, 1% TOL, 1/4 WATT	RN6007501F	81349	705-6638-000
R27	RESISTOR, FXD, FILM	RN60D4220F	81349	705-6578-000
R28	422 OHMS, 1% TOL, 1/4 WATT RESISTOR, FXD, FILM 2610 OHMS, 1% TOL, 1/4	RN60D2611F	81349	705-6616-000
R29	WATT RESISTOR, FXD, FILM 3160 OHMS, 1% TOL, 1/4	RN60D3161F	81349	705-6620-000
R30	WATT RESISTOR, FXD, FILM 196K OHMS, 1% TOL, 1/4	RN60D1963F	81349	705-6706-000
R 3 1	WATT RESISTOR, FXD, FILM	RN60D1472F	81349	705-6652-000
R32	14.7K, 1% TOL, 1/4 WATT RESISTOR, VAR	62PAR1K	73138	382-0008-410
R33	1K OHMS, 30% TOL, 1/2 WATT RESISTOR, FXD, COMPOSITION 1K OHMS, 10% TOL, 1/2 WATT	RC20GF102K	81349	745-1352-000
R34	SAME AS R26			
R35 R36	SAME AS R27 RESISTOR, FXD, COMPOSITION 10K OHMS, 10% TOL, 1/2 WATT	RC20GF103	81349	745-1394-000
R37 R38	SAME AS R30 SAME AS R31			

120		PART NUMBER	CODE	COLLINS PART NUMBER
R39	RESISTOR, FXD, FILM 34.8K OHMS, 1% TOL, 1/4	RN60D3482F	81349	705-6670-000
R40	WATT RESISTOR, FXD, FILM 3480 OHMS, 1% TOL, 1/4	RN60D3481F	81349	705-6622-000
R41	WATT RESISTOR, FXD, FILM 2150 OHMS, 1% TOL, 1/4 WATT	RN6002151F	81349	705-6612-000
R42	SAME AS R26			
R43 R44	SAME AS R27 RESISTOR, FXD, FILM 10K OHMS, 1% TOL, 1/4 WATT	RN60D1002F	81349	705-6644-000
R45	RESISTOR, FXD, FILM 178K OHMS, 1% TOL, 1/4	RN60D1783F	81349	705-6704-000
0//	WATT			
R46 R47	SAME AS R31 SAME AS R39			
R48	RESISTOR, FXD, FILM 4640 OHMS, 1% TOL, 1/4 WATT	RN60D4641F	81349	705-6628-000
R49 R50	SAME AS R39 RESISTOR, FXD, FILM 5110 OHMS, 1% TOL, 1/4	RN60D5111F	81349	705-6630-000
R51	WATT RESISTOR, FXD, FILM 1330 OHMS, 1% TOL, 1/4	RN60D1331F	81349	705-6602-000
R 52	SAME AS R50			
R52	SAME AS ROU			A CONTRACTOR
R54	SAME AS R50			
R55	SAME AS R50			
TP1	JACK, TIP WHITE	4877-125-9	17117	360-0434-100
TP2 TP3	SAME AS TP1 JACK, TIP	4877-125-0	17117	360-0434-010
TP4	BLACK SAME AS TP1			



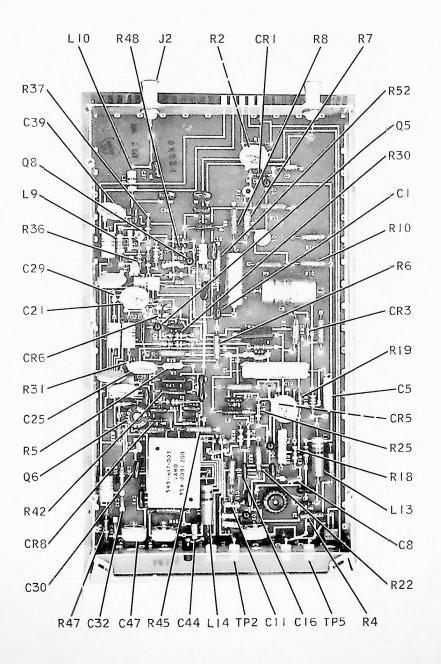
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Figure 6-6. FM Modulator (Sheet 1 of 3).



B502 539 Pb

Figure 6-6. FM Modulator (Sheet 2 of 3).



B502 539 Pb

Figure 6-6. FM Modulator (Sheet 3 of 3).

C1 CAI C2 CAI C3 CAI C4 CAI C5 CAI C6 CAI C7 CAI C8 CA C9 CAI C11 CA C12 CAI C13 CA C14 CA C15 CA C16 SA C17 SA C20 SA C21 SA C22 SA C23 CA	MUDULATOR ACITOR, FXD, MICA 200 UUF, 5% TOL, 500 VDCW ACITOR, FXD, ELECTROLYTIC 00 UF, PLUS 50% MINUS 10% 00 VDCW ACITOR, FXD, ELECTROLYTIC UF, 10% TOL, 35 VDCW ACITOR, FXD, CERAMIC 0.01 UF, PLUS 80% MINUS 10%, 50 VDCW ACITOR, FXD, ELECTROLYTIC UF, PLUS 50% MINUS 15%, 50 VDCW ACITOR, FXD, ELECTROLYTIC 250 UF, PLUS 50% MINUS 00%, 40 VDCW ACITOR, FXD, MICA 00 UUF, 5% TOL, 500 VDCW ACITOR, FXD, ELECTROLYTIC 001 UF, PLUS 80% MINUS 10%, 100 VDCW ACITOR, FXD, ELECTROLYTIC 0.5 UF, PLUS 50% MINUS 10%, 100 VDCW ACITOR, FXD, ELECTROLYTIC 0.5 UF, PLUS 50% MINUS 10%, 100 VDCW ACITOR, FXD, ELECTROLYTIC 0.5 UF, PLUS 50% MINUS 10% ACITOR, FXD, ELECTROLYTIC 0.5 UF, PLUS 50% MINUS 10% ACITOR, FXD, ELECTROLYTIC 0.5 UF, PLUS 75% MINUS 20%, 26 VDCW ACITOR, FXD, CERAMIC 20 UUF, 2% TOL, 500 VDCW ACITOR, FXD, CERAMIC 20 UUF, 2% TOL, 500 VDCW ACITOR, FXD, CERAMIC	CM06F222J03 C437ARG100 CS12BF105K 33C41 CL25B0010SP3 C437ARG250 CM05F101J03 805-014X5V01032 CL37BL0R5MN3 CL37BG200MN3 CC20SH200G	81349 73445 81349 56289 81349 73445 81349 72982 81349 81349	774-7160-00 912-3025-000 183-2355-140 913-3886-000 184-7227-000 183-2355-150 912-2816-000 913-3680-000 184-7220-000 184-7258-000
C2 CA C3 CA C4 CA C5 CA C5 CA C6 CA C7 CA C8 CA C9 CA C10 CA C11 CA C12 CA C13 CA C14 CA C15 CA C14 CA C15 CA C16 SA C17 SA C20 SA C21 SA C22 SA C23 CA	2200 UUF, 5% TOL, 500 VDCW ACITOR, FXD, ELECTROLYTIC .00 UF, PLUS 50% MINUS 10% ACITOR, FXD, ELECTROLYTIC .UF, 10% TOL, 35 VDCW ACITOR, FXD, CERAMIC .01 UF, PLUS 80% MINUS 20%, 50 VDCW ACITOR, FXD, ELECTROLYTIC .UF, PLUS 50% MINUS 15%, .50 VDCW ACITOR, FXD, ELECTROLYTIC .50 UDCW ACITOR, FXD, ELECTROLYTIC .00 UF, PLUS 50% MINUS .00%, 40 VDCW ACITOR, FXD, MICA .00 UUF, 5% TOL, 500 VDCW ACITOR, FXD, ELECTROLYTIC .01 UF, PLUS 80% MINUS .02%, 100 VDCW ACITOR, FXD, ELECTROLYTIC .50 UF, PLUS 50% MINUS .02%, 100 VDCW ACITOR, FXD, ELECTROLYTIC .50 UF, PLUS 50% MINUS .5% TUL, 75 VDCW ACITOR, FXD, ELECTROLYTIC .5 UF, PLUS 75% MINUS 20%, .50 VDCW ACITOR, FXD, CERAMIC .00 UF, PLUS 75% MINUS 20%, .50 VDCW	C437ARG100 CS12BF105K 33C41 CL25B0010SP3 C437ARG250 CM05F101J03 805-014X5V01032 CL37BL0R5MN3 CL37BG200MN3	73445 81349 56289 81349 73445 81349 72982 81349	183-2355-14(184-6071-00(913-3886-00(184-7227-00(183-2355-15(912-2816-00(913-3680-00(184-7220-00(
C2 CA1 C3 CA1 C4 CA1 C5 CA1 C6 CA1 C7 CA1 C8 CA C9 CA1 C10 CA C11 CA C12 CA C13 CA C14 CA C15 CA C14 CA C15 CA C16 SA C17 SA C20 SA C21 SA C22 SA C23 CA	ACITOR, FXD, ELECTROLYTIC OO UF, PLUS 50% MINUS 10% OO VDCW ACITOR, FXD, ELECTROLYTIC UF, 10% TOL, 35 VDCW PACITOR, FXD, CFRAMIC O.OI UF, PLUS 80% MINUS O%, 50 VDCW PACITOR, FXD, ELECTROLYTIC UF, PLUS 50% MINUS 15%, 50 VDCW PACITOR, FXD, ELECTROLYTIC 50 UF, PLUS 50% MINUS O%, 40 VDCW PACITOR, FXD, MICA OO UUF, S% TOL, 500 VDCW PACITOR, FXD, ELECTROLYTIC 00% 100 VDCW PACITOR, FXD, ELECTROLYTIC 00% 100 VDCW PACITOR, FXD, ELECTROLYTIC 00% 100 VDCW PACITOR, FXD, ELECTROLYTIC 00% 100 VDCW PACITOR, FXD, ELECTROLYTIC 00 UF, PLUS 50% MINUS 15% TUL, 75 VDCW PACITOR, FXD, ELECTROLYTIC 00 UF, PLUS 75% MINUS 20%, PACITOR, FXD, CFRAMIC 00 UF, FXD, CFRAMIC 00 UF, PLUS 75% MINUS 20%, PACITOR, FXD, CFRAMIC 00 UUF, 2% TOL, 500 VDCW	CS12BF105K 33C41 CL25B0010SP3 C437ARG250 CM05F101J03 805-014X5V01032 CL37BL0R5MN3 CL37BG200MN3	81349 56289 81349 73445 81349 72982 81349	184-6071-000 913-3886-000 184-7227-000 183-2355-150 912-2816-000 913-3680-000 184-7220-000
C3 CAI C4 CAI C5 CAI C6 CAI C7 CAI C8 CA C9 CAI C10 CA C11 CA C12 CA C13 CA C14 CA C15 CA C14 CA C15 CA C17 SA C20 SA C21 SA C22 SA C23 CA	PACITOR, FXD, ELECTROLYTIC UF, 10% TOL, 35 VDCW PACITOR, FXD, CERAMIC 0.01 UF, PLUS 80% MINUS 20%, 50 VDCW PACITOR, FXD, ELECTROLYTIC UF, PLUS 50% MINUS 15%, 50 VDCW PACITOR, FXD, ELECTROLYTIC 0.01 UF, PLUS 50% MINUS 15%, 50 VDCW PACITOR, FXD, ELECTROLYTIC 250 UF, PLUS 50% MINUS 0.04, 40 VDCW ACITOR, FXD, MICA 0.00 UUF, 5% TOL, 500 VDCW ACITOR, FXD, CERAMIC 0.01 UF, PLUS 80% MINUS 0.02, 100 VDCW PACITOR, FXD, ELECTROLYTIC 0.5 UF, PLUS 50% MINUS 15% TUL, 75 VDCW PACITOR, FXD, ELECTROLYTIC 0.5 UF, PLUS 75% MINUS 20%, 2.5 VDCW ACITUR, FXD, CERAMIC 20 UF, PLUS 75% MINUS 20%, 25 VDCW ACITUR, FXD, CERAMIC 20 UF, PLUS 75% MINUS 20%, 25 VDCW	33C41 CL25B0010SP3 C437ARG250 CM05F101J03 805-014X5V01032 CL37BL0R5MN3 CL37BG200MN3	56289 81349 73445 81349 72982 81349	913-3886-000 184-7227-000 183-2355-150 912-2816-000 913-3680-000 184-7220-000
C4 CAI C5 CAI C6 CAI C7 CAI C8 CA C9 CAI C10 CA C11 CA C12 CA C13 CA C14 CA C15 CA C16 SA C17 SA C19 SA C20 SA C21 SA C22 CA C23 CA	PACITOR, FXD, CERAMIC 1.01 UF, PLUS 80% MINUS 20%, 50 VDCW 20%, 50 VDCW 20%, 50 VDCW PACITOR, FXD, ELECTROLYTIC 200 UF, PLUS 50% MINUS 200 UF, FXD, ELECTROLYTIC 200 UF, FXD, MICA 200 UUF, FXD, CERAMIC 201 UF, PLUS 80% MINUS 20%, 100 VDCW 20%, 100 VD	CL25B0010SP3 C437ARG250 CM05F101J03 805-014X5V01032 CL37BLOR5MN3 CL37BG200MN3	81349 73445 81349 72982 81349	184-7227-000 183-2355-150 912-2816-000 913-3680-000 184-7220-000
C5 CA1 C6 CA1 C7 CA1 C8 CA C9 CA1 C10 CA C11 CA C12 CA C13 CA C14 CA C15 CA C16 CA C17 CA C18 CA C19 CA C11 CA C12 CA C13 CA C14 CA C15 CA C16 SA C17 SA C20 SA C21 SA C22 SA C23 CA	PACITOR, FXD, ELECTROLYTIC UF, PLUS 50% MINUS 15%, 50 VDCW ACITOR, FXD, ELECTROLYTIC 50 UF, PLUS 50% MINUS 0%, 40 VDCW ACITOR, FXD, MICA 00 UUF, 5% TOL, 500 VDCW ACITOR, FXD, CERAMIC 00 UF, PLUS 80% MINUS 0%, 100 VDCW ACITOR, FXD, ELECTROLYTIC 0.5 UF, PLUS 50% MINUS 15% TOL, 75 VDCW ACITOR, FXD, ELECTROLYTIC 00 UF, PLUS 75% MINUS 20%, 25 VDCW ACITOR, FXD, CERAMIC 20 UUF, 2% TOL, 500 VDCW	C437ARG250 CM05F101J03 805-014X5V01032 CL378LOR5MN3 CL378G200MN3	73445 81349 72982 81349	183-2355-150 912-2816-000 913-3680-000 184-7220-000
C6 CAI C7 CAI C8 CA C9 CAI C10 CA C11 CA C12 CA C13 CA C14 CA C15 CA C17 SA C19 SA C20 SA C21 SA C22 SA C23 CA	PACITOR, FXD, ELECTROLYTIC 50 UF, PLUS 50% MINUS 10%, 40 VDCW ACITOR, FXD, MICA 100 UUF, 5% TOL, 500 VDCW ACITOR, FXD, CERAMIC 100 VDCW PACITOR, FXD, ELECTROLYTIC 15% TUL, 75 VDCW ACITOR, FXD, ELECTROLYTIC 15% TUL, 75% MINUS 15% TUL, 75% MINUS 20%, 15% VDCW ACITUR, FXD, CERAMIC 100 UF, PLUS 75% VDCW 100 UF, PX TOL, 500 VDCW	CM05F101J03 805-014X5V01032 CL378L0R5MN3 CL378G200MN3	81349 72982 81349	912-2816-000 913-3680-000 184-7220-000
C7 CAI C8 CA C9 CAI C10 CA C11 CA C12 CA C13 CA C14 CA C15 CA C16 CA C17 CA C17 SA C17 SA C20 SA C21 SA C22 SA C23 CA	PACITOR, FXD, MICA 200 UUF, 5% TOL, 500 VDCW PACITOR, FXD, CERAMIC 201 UF, PLUS 80% MINUS 202, 100 VDCW ACITOR, FXD, ELECTROLYTIC 205 UF, PLUS 50% MINUS 205 UF, PLUS 50% MINUS 206 UTOR, FXD, ELECTROLYTIC 207 DF, PLUS 50% MINUS 208 MINUS 208 MINUS 209 MINUS 208 MINUS 209 MINUS 200 MF, PLUS 75% MINUS 200 MF, PLUS 75% MINUS 200 MF, PLUS 75% MINUS 200 MINUS 2	805-014X5V01032 CL37BLOR5MN3 CL37BG200MN3	72982 81349	913-3680-000 184-7220-000
C8 CA C9 CA C10 CA C11 CA C12 CA C13 CA C14 CA C15 CA C16 SA C17 SA C18 CA C19 SA C20 SA C21 SA C22 SA C23 CA	PACITOR, FXD, CERAMIC 2.01 UF, PLUS 80% MINUS 20%, 100 VDCW PACITOR, FXD, ELECIROLYTIC 2.5 UF, PLUS 50% MINUS 2.5% TUL, 75 VDCW PACITOR, FXD, ELECTROLYTIC 20 UF, PLUS 75% MINUS 20%, 2.5 VDCW PACITOR, FXD, CERAMIC 20 UUF, 2% TOL, 500 VDCW	CL378LOR5MN3 CL378G200MN3	81349	184-7220-000
C9 CA C10 CA C11 CA C12 CA C13 CA C14 CA C15 CA C16 SA C17 SA C19 SA C20 SA C21 SA C22 SA C23 CA	PACITOR, FXD, ELECTROLYTIC 5.5 UF, PLUS 50% MINUS 15% TUL, 75 VDCW PACITOR, FXD, ELECTROLYTIC 20 UF, PLUS 75% MINUS 20%, 25 VDCW 26 UTUR, FXD, CERAMIC 20 UUF, 2% TOL, 500 VDCW	CL378G200MN3		
C10 CA C11 CA C12 CA C13 CA C14 CA C15 CA C16 SA C17 SA C19 SA C20 SA C21 SA C22 SA C23 CA	PACITOR, FXD, ELECTROLYTIC 20 UF, PLUS 75% MINUS 20%, 25 VDCW 26 VDCW 20 UUF, FXD, CERAMIC 20 UUF, 2% TOL, 500 VDCW		81349	184-7258-000
C11 CA C12 CA C13 CA C14 CA C15 CA C16 SA C17 SA C19 SA C20 SA C21 SA C22 SA C23 CA C24 CA	PACITUR, FXD, CERAMIC 20 UUF, 2% TOL, 500 VDCW	CC205H200G		
C12 CA C13 CA C14 CA C15 CA C16 SA C17 SA C18 CA C19 SA C20 SA C21 SA C22 SA C23 CA C24 CA			81349	916-0362-000
C13 CA C14 CA C15 CA C16 SA C17 SA C19 SA C20 SA C21 SA C22 SA C23 CA C24 CA		CC205H200G	81349	916-0362-000
C14 CA C15 CA C16 SA C17 SA C18 CA C19 SA C20 SA C21 SA C22 SA C23 CA C24 CA	PACITUR, FXD, CERAMIC	CC20UJ100C	81349	916-0412-000
C15 CA C16 SA C17 SA C18 CA C19 SA C20 SA C21 SA C22 SA C23 CA C24 CA	LO UUF, 174% TOL, 500 VDCW PACITOR, VAR, CFRAMIC 525 UUF, 350 VDCW	3192-000C0P0-32R	72989	917-1253-03
C17 SA C18 CA C19 SA C20 SA C21 SA C22 SA C23 CA C24 CA	PACITOR, FXD, MICA 58 UUF, 5% TOL, 500 VDCW 46 AS C15	CM05E680J03	81349	912-2804-00
C19 SA C20 SA C21 SA C22 SA C23 CA C24 CA	ME AS C8			
C20 SA C21 SA C22 SA C23 CA C24 CA	PACITUR, FXD, MICA 220 UUF, 5% TOL, 500 VOCW 46 AS C4	CM05F221J03	81349	912-2840-00
C22 SA C23 CA C24 CA	AL AS CE			
C23 CA C24 CA	1E AS C4			
C24 CA	ME AS C8 PACITUR, EXD, MICA	DM15C100J01	72136	912-2753-00
	10 UUF, 5% TOL, 500 VDCW PACITOR, FXD, MICA 82 UUF, 5% TOL, 500 VDCW	CM05E820J03	81349	912-2810-00
	ME AS C4			
C27 CA	ME AS C4 PACITOR, FXD, MICA 22 UUF, 5% TOL, 500 VDCW	CM05E220J03	81349	912-2768-00
	ME AS C4			
	ME AS CB			
C31 CA	ME AS C15 PACITOR, FXD, CERAMIC 1000 UUF, 20% TOL, 1000 VDCW	CK604W102M	81349	913-1186-00
	ME AS CB			
C 33 SA	15 15 60			
	ME AS C8	CM05E390J03	P12/0	912-2794-00
C 35 CA C 36 CA	ME AS CB ME AS C8 PACITOR, FXD, MICA	0.00076390303	81349	912-2786-00

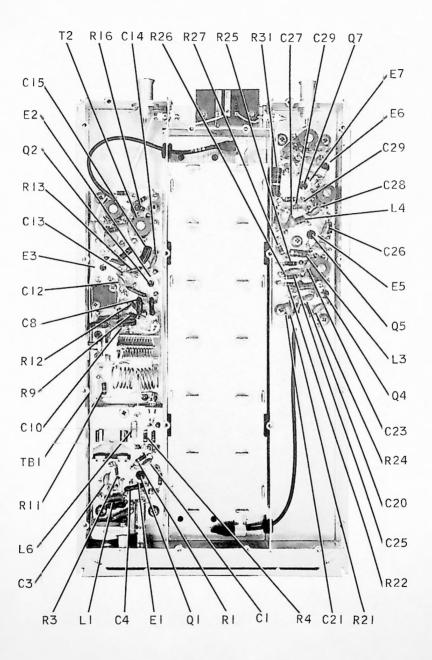
CODE PART NUMBER CODE PART NUMBER C37 SAME AS C36 C38 SAME AS C4 SAME AS C4 C38 SAME AS C4 C40 CA02CITOR, FD, NTCA CM06F561J03 81349 912-2983-0 C41 CAPACITOR, FXD, NTCA CM05E330J03 81349 912-2983-0 C42 SAME AS C6 C44 SAME AS C61 CM05E330J03 81349 912-2780-0 C42 SAME AS C61 CM05E330J03 81349 912-2780-0 72982 917-1253-0 C42 SAME AS C61 SAME AS C61 SAME AS C63 72982 917-1253-0 C43 SAME AS C6 C4-12 UU, 300 VDCH S192-000C0P0-208 72982 917-1253-0 C44 SAME AS C6 SAME AS C6 S400 VDCH S192-2000C0P0-208 72982 917-1253-0 C55 SEMICONDUCTOR DEVICE, DIODE IN5146A 07688 922-609-1 333-3304-0 C560 SAME AS C7 S100 VDCH IN5146A 07688 953-257-0 C679 SAME AS C44 S240-000		DESCRIPTION	MANUFACTURER'S	MFR	COLLINS
C3B SAME AS C4 CM06F961J03 B1349 912-2983-0 C4G CAPACITOR, FXD, MICA CM06F961J03 B1349 912-2983-0 C41 CAPACITOR, FXD, MICA CM06F961J03 B1349 912-2983-0 C42 SAME AS C1 CM06F961J03 B1349 912-2983-0 C43 SAME AS C1 CM06F961J03 B1349 912-2780-0 C44 SAME AS C1 CM06F961J03 B1349 912-2780-0 C43 SAME AS C1 SI92-000C0P0-208 72982 917-1253-0 C44 SAME AS C14 C47 SI92-000C0P0-208 72982 917-1253-0 C47 SAME AS C14 C47 SI92-000C0P0-208 72982 917-1253-0 C47 SAME AS C14 C47 SI92-000C0P0-208 72982 912-2846-0 C50 SAME AS C14 C47 SI92-000C0P0-208 72982 912-2846-0 C51 CAPACITOR, FXD, MICA CM057271J03 B1349 912-2846-0 C52 SFMIONDUCTOR DEVICE, DIODE IN751A 07688	SYMBOL	DESCRIPTION	PART NUMBER	CODE	PART NUMBER
C38 SAME AS C4 CM06F961J03 B1349 912-2983-0 C40 CAPACITOR, FX0.MICA CM06F961J03 B1349 912-2983-0 C41 CAPACITOR, FX0.MICA CM05F30J03 B1349 912-2983-0 C42 SAME AS C11 CM05F30J03 B1349 912-2780-0 C43 SAME AS C18 CM05F30J03 B1349 912-2780-0 C44 SAME AS C18 CAPACITOR, VAR, CERAMIC 3192-000C0P0-208 72982 917-1253-0 C47 SAME AS C14 C47 SAME AS C24 CM05F271J03 B1349 912-2846-0 C50 SAME AS C27 CAPACITOR, VAR, CERAMIC 3192-000C0P0-208 72982 917-1253-0 C51 CAPACITOR, FX0, MICA CM05F271J03 B1349 912-2846-0 C52 SEMICONDUCTOR DEVICE, DIDDE IN5146A 07688 953-2710-0 C53 SEMICONDUCTOR DEVICE, DIDDE IN751A 07688 353-287-0 C64 SEMICONDUCTOR DEVICE, DIDDE IN751A 07688 353-287-0 C78 SAME AS C74					
C38 SAME AS C4 CM06F561J03 B1349 912-2983-0 C46 CAPACITOR, FX0, MICA CM06F561J03 B1349 912-2983-0 C41 CAPACITOR, FX0, MICA CM05F330J03 B1349 912-2983-0 C42 SAME AS C18 CM05F330J03 B1349 912-2780-0 C43 SAME AS C18 CM05F330J03 B1349 912-2780-0 C44 SAME AS C18 CM05F271J03 B1349 912-2846-0 C47 SAME AS C14 CM05F271J03 B1349 912-2846-0 C47 SAME AS C24 CM05F271J03 B1349 912-2846-0 C50 SAME AS C27 CM05F271J03 B1349 912-2846-0 C51 CAPACITOR, FXD, MICA CM05F271J03 B1349 912-2846-0 C52 SEMICONDUCTOR DEVICE, DIDDE IN5146A 07688 353-2710-0 C53 SAME AS C24 CM05F271J03 B1349 912-2846-0 C64 SAME AS C24 CM05F271J03 B1349 912-2846-0 C53 SAME AS C24 <t< td=""><td>637</td><td>SAME AS C36</td><td></td><td></td><td></td></t<>	637	SAME AS C36			
C46 CAPACITOR, FX0, MICA CM06F561J03 B1349 912-2983-C C41 CAPACITOR, FX0, MICA CM06F561J03 B1349 912-2780-C C42 SAME AS C41 CM05F30J03 B1349 912-2780-C C43 SAME AS C41 SAME AS C11 CM05F30J03 B1349 912-2780-C C44 SAME AS C11 SAME AS C14 S192-000C0P0-208 72982 917-1253-C C47 SAME AS C14 SAME AS C14 S192-000C0P0-208 72982 917-1253-C C47 SAME AS C14 SAME AS C14 S192-000C0P0-208 72982 917-1253-C C47 SAME AS C14 S192-000C0P0-208 72982 917-1253-C C47 SAME AS C14 S192-000C0P0-208 72982 917-1253-C C47 SAME AS C14 S1000 CM05F271J03 B1349 912-2846-C C53 SME AS C17 S1000 CM05F271J03 B1349 912-2846-C C53 SME AS C14 S1000 CM05F271J03 B1349 912-2846-C C53					
560 UUF, 557 TOL, 500 CM05E330J03 81349 912-2780-0 C41 CAPACITOR, FX0, HICA CM05E330J03 81349 912-2780-0 C42 SAME AS C41 Japace Japace Japace Japace C43 SAME AS C18 C41 Japace Japace Japace Japace C44 SAME AS C18 C41 Japace Japace <td< td=""><td></td><td></td><td></td><td></td><td></td></td<>					
C41 CAPACITOR, FXD, MICA CM05E330.03 81349 912-2780-0 C42 SAME AS C41 CM05E330.03 81349 912-2780-0 C42 SAME AS C18 SAME AS C14 SAME AS C14 SAME AS C4 SAME AS C6 SAME AS	C40		CM06F561J03	81349	912-2983-000
C42 SAME AS C41 3AME AS C18 3192-000C0P0-208 72982 917-1253-0 C44 SAME AS C11 3192-000C0P0-208 72982 917-1253-0 C45 AME AS C14 3192-000C0P0-208 72982 917-1253-0 C47 SAME AS C14 344 344 344 344 C48 SAME AS C3 CM05F271J03 81349 912-2846-0 C47 SAME AS C3 CM05F271J03 81349 912-2846-0 C52 SEMIDONDUCTOR DEVICE, DIODE IN751A 07688 353-2710-0 C53 GEO GEO SAME AS C24 GR1 SEMICONDUCTOR DEVICE, DIODE IN751A 07688 353-2710-0 C73 SEMICONDUCTOR DEVICE, DIODE IN751A 07688 353-2710-0 353-2857-0 C73 SEMICONDUCTOR DEVICE, DIODE IN751A 07688 353-2710-0 C74 SEMICONDUCTOR DEVICE, DIODE IN620 07688 353-2857-0 C74 SEMICONDUCTOR DEVICE, DIODE IN620 07688 353-2857-0 C74 <td>C41</td> <td></td> <td>CM05E330J03</td> <td>81349</td> <td>912-2780-000</td>	C41		CM05E330J03	81349	912-2780-000
C43 C44 SAME AS C11 C44 C45 NDT USED SIP2-000C0P0-20R 72982 917-1253-0 C47 C45 C46 C46 C47 C47 C47 C47 C47 C47 C47 C47 C47 C47					
C44 SAME AS C11 NOT USED 3192-0000C0P0-20R 72982 917-1253-0 C45 CAPACITOR, VAR, CERANIC 3192-0000C0P0-20R 72982 917-1253-0 C47 SAME AS C14 SAME AS C3 SAME AS C4 SAME AS C6 SAME AS C6 C49 SAME AS C7 NUCA CM05F271J03 81349 912-2846-0 C51 CA7DITOR, FX TOL, SUD VOCH CM05F271J03 81349 912-2846-0 C52 SEMIDONOUTOR DEVICE, DIODE IN5146A O7668 353-2710-0 C53 SAME AS C24 SEMICONDUCTOR DEVICE, DIODE IN751A O7688 353-2710-0 C53 SEMICONDUCTOR DEVICE, DIODE IN751A O7688 353-2710-0 C64 SEMICONDUCTOR DEVICE, DIODE IN751A O7688 353-2710-0 C74 SEMICONDUCTOR DEVICE, DIODE IN70 O7688 353-2710-0 C74 SEMICONDUCTOR DEVICE, DIODE IN70 O7688 353-2708-0 C74 SEMICANDUCTOR DEVICE, DIODE IN70 O7688 357-930-0 C74 SAME AS C4 <td></td> <td></td> <td></td> <td></td> <td></td>					
C45 NOT USED 3192-000C0P0-208 72982 917-1253-0 C46 CAPACITOR, VAR, CERAMIC 3192-000C0P0-208 72982 917-1253-0 C47 SAME AS C8 C 647 648 SAME AS C8 917-1253-0 C48 SAME AS C8 C 649 SAME AS C8 917-1253-0 C51 CAPACITOR, FAR, MICA CM05F271J03 81349 912-2846-0 C52 SEMIDONOUCTOR DEVICE, DIODE INS146A 07688 922-6095-1 C53 GAPACITOR, FAR, TOLDE INS146A 07688 353-2710-0 C54 SEMICONOUCTOR DEVICE, DIODE INS26 07688 353-2710-0 C64 SEMICONOUCTOR DEVICE, DIODE INS26 07688 353-2710-0 C78 SEMICONOUCTOR DEVICE, DIODE INS26 07688 353-2710-0 C78 SEMICONOUCTOR DEVICE, DIODE INS26 07688 353-2018-0 C78 SEMICONOUCTOR DEVICE, DIODE INS26 07688 353-2018-0 C78 SEMICONOUCTOR DEVICE, DIODE INS27 <td< td=""><td></td><td></td><td></td><td></td><td></td></td<>					
4-12 UUF, 300 VDCW C47 SAME AS C14 C48 SAME AS C8 C50 SAME AS C8 C51 CAPACITOR, FXD, MICA CM05F271J03 81349 912-2846-0 C52 SFMIDONDUCTOR DEVICE, DIDDE INS146A 07688 922-6095-1 C53 SFMIDONDUCTOR DEVICE, DIDDE INS146A 07688 353-2710-0 C54 SFMIDONDUCTOR DEVICE, DIDDE INS146A 07688 353-2710-0 C63 SAME AS C24 07688 353-2710-0 07688 353-2710-0 C64 SFMICONDUCTOR DEVICE, DIDDE INS26 07688 353-2785-0 C67 SAME AS C84 CR7 SAME AS C84 07688 353-2018-0 C78 SEMICONDUCTOR DEVICE, DIDDE IN270 07688 353-2018-0 C78 SAME AS C84 CR7 SAME AS C84 2200 13103 352-959-0 C78 SEMICONDUCTOR DEVICE, DIDDE FA2311U 07263 353-3593-0 1303 352-959-0 1 CONNECTOR, ELECTRICAL	C45	NOT USED			
C47 SAME AS C14 C48 SAME AS C6 C49 SAME AS C6 C40057271J03 81349 912-2846-0 C50 CAPACITOR, FXD, MICA CM05F271J03 81349 912-2846-0 C51 CAPACITOR, FXD, MICA CM05F271J03 81349 912-2846-0 C52 SEMIDONDUCIOR DEVICE, DIODE IN5146 07688 922-6095-1 C53 SEMIDONDUCIOR DEVICE, DIODE IN751A 07688 953-2710-0 C59 SEMIDONDUCIOR DEVICE, DIODE IN751A 07688 953-2710-0 C60 SAME AS C24 C764 953-393-0 07688 353-2710-0 C62 SEMIDONDUCIOR DEVICE, DIODE IN751A 07688 353-2710-0 C63 SAME AS C24 DIODE IN270 07688 353-2710-0 C64 SEMICONDUCIOR DEVICE, DIODE IN270 07688 353-2710-0 C76 SAME AS C84 CR7 SAME AS C84 CR7 SAME AS C84 CR7 SAME AS C84 CR7 SAME AS C74 C749 SAME AS C74 C7400	C46	CAPACITOR, VAR, CERAMIC	3192-000C0P0-20R	72982	917-1253-020
C48 SAME AS C8 C49 SAME AS C8 C50 SAME AS C27 CMOSF271J03 81349 912-2846-C C51 CAPACITOR, FXD, MICA CMOSF271J03 81349 922-6095-1 C52 SEMIDONUCTOR DEVICE, DIODE INS146A 07688 922-6095-1 C53 SEMICONDUCTOR DEVICE, DIODE IN751A 07688 353-2710-C C63 SAME AS C24 CR1 SEMICONDUCTOR DEVICE, DIODE IN751A 07688 353-2710-C C73 SEMICONDUCTOR DEVICE, DIODE IN720 07688 353-2019-C CR4 SEMICONDUCTOR DEVICE, DIODE IN226 07688 353-2019-C CR5 SAME AS CR4 CR7 SAME AS CR4 07688 353-2019-C CR7 SAME AS CR4 Z2209 13103 352-9950-C C01 CONTACT Z40 H, 22 TOL UG1051U 09408 357-9210-C 1 CONTACT Z40 H, 22 TOL UG1051U 09408 357-9210-C 1 INDUCTOR, RF 13950 03550 2	C47				
C50 SAME AS C27 CM05F271J03 B1349 912-2846-C C51 CAPACITOR, FXD, MICA CM05F271J03 B1349 912-2846-C C53 SFM100NUCTOR DEVICE, DIODE INS146A 07688 922-6095-1 C53 SFM100NUCTOR DEVICE, DIODE INS146A 07688 353-2710-C C63 SFM100NUCTOR DEVICE, DIODE INS71A 07688 353-2710-C C64 SFM100NUCTOR DEVICE, DIODE IN751A 07688 353-2710-C C65 SAME AS C24 07688 353-2710-C 07688 353-2710-C C75 SFM100NUCTOR DEVICE, DIODE IN751A 07688 353-2710-C C76 SFM10NUCTOR DEVICE, DIODE IN270 07688 353-2701-C C76 SAME AS CR4 D7688 353-2701-C 07688 353-2701-C C76 SAME AS CR4 D7688 353-2701-C 07688 353-2701-C C76 SAME AS CR4 D7688 353-2701-C 07688 353-2701-C C76 SAME AS CR4 D7688 J113<		SAME AS C8			
C51 CAPACITOR, FXD, MICA 270 UUF, 5X TOL CM05F271J03 81349 912-2846-C C52 SFMIDONDUCTOR DEVICE, DIODE INS146A 07688 922-6095-1 C53 MRRNUGH, NOT USEO INS146A 07688 922-6095-1 C59 SFMIDONDUCTOR DEVICE, DIODE INS14 07688 353-2710-C C60 SAME AS C24 03877 353-3304-C CR1 SEMICONDUCTOR DEVICE, DIODE SN173 03877 353-3304-C CR2 SEMICONDUCTOR DEVICE, DIODE IN751A 07688 353-2687-C CR4 SEMICONDUCTOR DEVICE, DIODE IN270 07688 353-2695-C CR6 SAME AS CR4 CR7 SAME AS CR4 2200 13103 352-959-C CR1 SEMICONDUCTOR, FEECRICAL U09408 357-79210-C					
270 UUF, 52 TOL, 500 VOCW 1N5146A 07688 922-6095-1 C53 THRUGH C59 C60 C60 C61 C63 C63 C63 C63 C64 C64 C64 C64 C65 SAME AS C24 C64 C65 SAME AS C24 C64 C65 SAME AS C24 C65 SAME AS C24 C66 SAME AS C24 C66 SAME AS C64 C67 SAME AS C64 C67 SAME AS C64 C67 SAME AS C64 C67 SAME AS C64 C67 SAME AS C64 C69 SAME AS C74 C69 SAME AS C74 C60 SAME AS C74 C60 SAME AS C74 C60 SAME AS C74 C60 SAME AS C74 C74 SAME AS C74 C74 SAME AS C74 C74 SAME AS C74 C74 SAME AS C74 SAME AS C74 C74 SAME AS C74 SAME AS C74 C74 SAME AS C74 SAME AS C74 SAME AS C74 C74 SAME AS C74 SAME AS C74 SA			CM055271103	91260	012-2944-000
C53 THRDUGH C59 C60 NUT USED NUT USED NUT USED C61 C61 C62 C62 C63 SAME AS C24 SEMICONDUCTOR DEVICE, DIDDE SV3173 0.3877 0.3877 0.3873304-C 0.3877 0.38373304-C C72 C73 C74 SEMICONDUCTOR DEVICE, DIDDE C74 SAME AS C74 C74 SAME AS C74 SAME AS C74 C74 SAME AS C74 SAME AS C74 C74 SAME AS C74 C74 SAME AS C74 SAME AS C74 C74 SAME AS C74 SAME	CJI		CHO3F2 11305	01349	912-2848-000
THRUGH NDT USED C59 SAME AS C24 C22 SEMICONDUCTOR DEVICE, DIODE IN751A 07688 353-2710-C C22 SEMICONDUCTOR DEVICE, DIODE SV3173 03877 353-330-C C43 SEMICONDUCTOR DEVICE, DIODE IN626 07688 353-2687-C C44 SEMICONDUCTOR DEVICE, DIODE IN626 07688 353-2018-C C45 SAME AS C64 22208 13103 352-993-C C68 SAME AS C64 22208 13103 352-993-C C69 SAME AS C64 22208 13103 352-993-C C69 SAME AS C64 22008 13103 352-993-C J1 CONNECTOR, ELECTRICAL UG1051U 09408 357-9210-C J2 SAME AS J1 240-1529-C 240-1529-C L2 COTL RF 13950 03550 240-198-C L3 COTL RF 13949 03550 240-198-C L4 SAME AS L3 IS IS IS L5		SEMIDONDUCTOR DEVICE, DIODE	1N5146A	07688	922-6095-160
C59 C50 SAME AS C24 INT51A O76.88 359-2710-0 CA1 SEMICONDUCTOR DEVICE, DIDDE SV3173 O3877 353-3304-0 CA2 SEMICONDUCTOR DEVICE, DIDDE SV3173 O3877 353-2018-0 CA3 SEMICONDUCTOR DEVICE, DIDDE IN626 O7688 353-2018-0 CA4 SEMICONDUCTOR DEVICE, DIDDE IN626 O7688 353-2018-0 CA4 SEMICONDUCTOR DEVICE, DIDDE IN270 O7688 353-2018-0 CA6 SAME AS CR4 L L D7688 353-2018-0 CA6 SAME AS CR4 L L D7688 353-2018-0 CA6 SAME AS CR4 L L D7688 353-2018-0 L1 CONTACT DEVICE, DIDDE FA2311U 07263 353-3593-0 L1 CONTACT LCA0401010 D7688 353-2018-0 353-2018-0 L1 CONTACT LCA04010 D7688 353-2018-0 353-2018-0 L1 CONTACT RF 13950					
C60 SAME AS C24 IN751A O7688 353-2710-C CR1 SEMICONDUCTOR DEVICE, DIDDE IN751A O7688 353-2010-C CR3 SEMICONDUCTOR DEVICE, DIDDE IN626 O7688 353-2010-C CR4 SEMICONDUCTOR DEVICE, DIDDE IN626 O7688 353-2010-C CR4 SEMICONDUCTOR DEVICE, DIDDE IN270 O7688 353-2010-C CR5 SAME AS CR4 SEMICONDUCTOR DEVICE, DIDDE FA2311U 07263 353-3593-C CR7 SAME AS CR4 SEMICONDUCTOR DEVICE, DIDDE FA2311U 07263 353-3593-C CR7 SAME AS CR4 Z208 13103 352-9950-C J1 CONNECTOR, ELECTRICAL UG1051U 09408 357-9210-C J2 SAME AS J1 IN00CTOR, RF 526-6799-00 95105 240-1529-C L1 INDUCTOR, RF 13950 03550 240-198-D L2 COIL, RF 13949 03550 240-1996-D L3 COIL, RF 13949 03550 240-1996-D		401 0320			
CR2 SEMICONDUCTOR DEVICE, DIODE \$\overline{3}3373 \$\overline{3}3377 \$\overline{3}353-3304-C CR3 SEMICONDUCTOR DEVICE, DIODE 1N826 \$\overline{3}353-2687-C CR4 SEMICONDUCTOR DEVICE, DIODE 1N826 \$\overline{3}353-2687-C CR5 SAME AS CR4 1N270 \$\overline{3}53-2687-C CR6 SAME AS CR4 1N270 \$\overline{3}73-353-2687-C CR7 SAME AS CR4 1N270 \$\overline{3}75-3539-C CR7 SAME AS CR4 1N270 \$\overline{3}75-3593-C CR7 SAME AS CR4 1N270 \$\overline{3}75-3593-C CR7 SAME AS CR4 13103 \$\overline{3}53-3593-C CR7 SAME AS CR4 13103 \$\overline{3}57-9210-C J1 CONNECTOR, ELECTRICAL UG1051U 09408 \$\overline{3}57-9210-C J2 SAME AS J1 1100100 100100 \$\overline{3}57-9210-C \$\overline{3}240-1529-C L1 INDUCTOR, RF 526-6799-00 95105 240-1996-1 L3 COIL, RF 13949 03550 240-1996-1 L4 SAME AS L3 13949 0	C60				
CR3 SEMICONDUCTOR DEVICE, DIODE IN026 O7688 353-2857-C CR4 SEMICONDUCTOR DEVICE, DIODE IN270 O7688 353-2018-C CR5 SAME AS CR4 IN270 O7688 353-2018-C CR6 SAME AS CR4 IN270 O7688 353-2018-C CR6 SAME AS CR4 IN270 O7688 353-2018-C CR7 SAME AS CR4 UG1051U O7688 353-2018-C J1 CONTACT UG1051U 09408 357-9210-C J2 SAME AS J3 IS 131950 03550 240-192-C L2 COIL, RF I3950 03550 240-198-C 131946 03550 240-198-C L3 COIL, RF					353-2710-000
CR4 SEMICONDUCTOR DEVICE, DIDDE IN270 07688 353-2018-0 CR5 SAME AS CR4 SAME AS CR4 SAME AS CR4 Staticonuctor Staticonuctor CR7 SAME AS CR4 SEMICONDUCTOR DEVICE, DIDDE FA2311U 07688 353-3593-0 CR9 SAME AS CR4 UG1051U 07608 353-3593-0 CR9 SAME AS CR5 22208 13103 352-9950-0 J1 CONNECTOR, ELECTRICAL UG1051U 09408 357-9210-0 J2 SAME AS J1 UG1051U 09408 357-9210-0 L1 INDUCTOR, RF 526-6799-00 95105 240-1529-0 J2 SAME AS J1 I3950 03550 240-198-0 L2 COIL, RF I3950 03550 240-198-0 L3 COIL, RF I3949 03550 240-198-0 L4 SAME AS L3 IS217 99800 240-0062-0 L5 SAME AS L3 IS3946 03550 240-1996-0 L6 COIL, RF I3946 03550 240-1996-0 L10 COIL, RF I3946<					1
CR6 SAME AS CR4 CR7 SAME AS CR4 CR9 SAME AS CR4 CR9 SAME AS CR4 L1 HEATSINK J1 CONNECTOR, ELECTRICAL UG1051U 09408 J2 SAME AS J1 L1 INDUCTOR, RF J2 SAME AS J1 L1 INDUCTOR, RF L2 COIL, RF J2 SAME AS L3 L3 COIL, RF J3 COUL, RF L4 SAME AS L3 L5 SAME AS L3 L5 SAME AS L3 L6 COIL, RF J2 SAME AS L3 L5 SAME AS L3 L6 COIL, RF L7 SAME AS L3 L8 SAME AS L3 L9 COIL, RF J1 L14 SECT L11 FROM THE FOLLOWING LIST LT4K036 L11 COIL, RF J2 SAME AS L3 L11 COIL, RF J2 SAME AS L3 L					353-2018-000
CR7 SAME AS CR4 FA2311U 07263 353-3593-0 CR9 SAME AS CR6 13103 352-9950-0 357-3593-0 E1 HEATSINK 22208 13103 352-9950-0 J1 CONNECTOR, ELECTRICAL UG1051U 09408 357-7210-0 J2 SAME AS J1 UG1051U 09408 357-7210-0 L1 INDUCTOR, RF 526-6799-00 95105 240-192-0 L2 COIL, RF 13950 03550 240-198-0 L4 SAME AS L3 13949 03550 240-1996-0 L7 SAME AS L3 13946 03550 240-1996-0 L7 SAME AS L3 13946 03550 240-0062-0 L10	-				
CRH SEMICONDUCTOR DEVICE, DIODE FA2311U 07263 353-3593-0 CR9 SAME AS CR6 22208 13103 352-9950-0 J1 CONNECTOR, ELECTRICAL UG1051U 09408 357-9210-0 J2 SAME AS J1 UG1051U 09408 357-9210-0 J2 SAME AS J1 UG1051U 09408 357-9210-0 L1 INDUCTOR, RF 526-6799-00 95105 240-1529-0 L2 COIL, RF 13950 03550 240-1996-1 6.8 UH, 52 TOL IS217 99800 240-0198-0 L4 SAME AS L3 IS217 99800 240-1996-1 L4 SAME AS L3 IS2 IS217 99800 240-1996-0 L1 SAME AS L3 IS2 IS20000 240-1996-0 IS200					
CR9 SAME AS CRB 22208 13103 352-9950-0 L1 CONNECTOR, ELECTRICAL UG1051U 09408 357-9210-0 L2 CONTACT 1 09408 357-9210-0 L1 INDUCTOR, RF 526-6799-00 95105 240-1529-0 L2 COIL, RF 13950 03550 240-1996-1 L3 COIL, RF 13950 03550 240-198-0 L4 SAME AS L3 1 15220 240-198-0 L5 SAME AS L3 1 13949 03550 240-198-0 L6 COIL, RF 13949 03550 240-198-0 L7 SAME AS L3 1 13949 03550 240-1996-1 L7 SAME AS L3 1 13949 03550 240-1996-0 L7 SAME AS L3 1 13946 03550 240-1996-0 L10 COIL, RF 13946 03550 240-1996-0 L10 COIL, RF 13946 03550 240-1996-0 L11 SECT L11 FROM THE FOLLOWING LIST LT4K036 81349 <td></td> <td></td> <td>FA2311U</td> <td>07263</td> <td>353-3593-010</td>			FA2311U	07263	353-3593-010
J1 CONNECTOR, ELECTRICAL UG1051U 09408 357-9210-0 J2 SAME AS J1 1 09408 357-9210-0 J2 SAME AS J1 1 09408 357-9210-0 L1 INDUCTOR, RF 526-6799-00 95105 240-1529-0 L2 C01L, RF 13950 03550 240-1996-1 L3 C01L, RF 13950 03550 240-0198-0 L4 SAME AS L3 1 13949 03550 240-1996-1 L4 SAME AS L3 1 13949 03550 240-1996-1 L4 SAME AS L3 1 13949 03550 240-1996-1 L4 SAME AS L3 1 13949 03550 240-1996-0 L7 SAME AS L3 1 13946 03550 240-1996-0 L7 SAME AS L3 1 13946 03550 240-1996-0 L7 SAME AS L3 1 13946 03550 240-1996-0 L10 C01L, RF L74K036 81349 240-0063-0 L11 SELECT L11 FROM THE <t< td=""><td></td><td></td><td>1 ALSTIC</td><td>0.205</td><td></td></t<>			1 ALSTIC	0.205	
J2 SAME AS J1 L1 INDUCTOR, RF 2.4 UH, 23 TOL 13950 L2 COIL, RF 6.8 UH, 53 TOL 13950 C01L, RF 13950 2.4 UH, 53 TOL 13950 C01L, RF 13950 2.20 UH, 53 TOL 185217 2.20 UH, 53 TOL 185217 2.4 UH, 53 TOL 185217 2.5 SAME AS L3 13949 L6 COIL, RF 2.4 UH, 53 TOL 13949 2.4 UH, 53 TOL 13949 2.4 UH, 53 TOL 13946 C01L, RF 13946 2.4 UH, 53 TOL 13946 C01L, RF 13946 10 C01L, RF 110 C01L, RF 120 C01L, RF 121 SAME AS L3 121 SAME AS L3 122 SAME AS L3 131 COIL, RF 14 COIL, RF 15 COIL, RF 16 COIL, RF 17 SAME AS L3 18 COIL, RF <tr< td=""><td></td><td></td><td></td><td></td><td>352-9950-060</td></tr<>					352-9950-060
J2 SAME AS J1 526-6799-00 95105 240-1529-0 L2 COIL, RF 13950 03550 240-1996-1 L3 COIL, RF 13950 03550 240-1996-1 L3 COIL, RF 13950 03550 240-1996-1 L4 SAME AS L3 13949 03550 240-1996-1 L5 SAME AS L3 13949 03550 240-1996-1 L6 COIL, RF 13949 03550 240-1996-1 L7 SAME AS L3 13949 03550 240-1996-1 L7 SAME AS L3 13949 03550 240-1996-0 L7 SAME AS L3 13949 03550 240-1996-0 L7 SAME AS L3 13949 03550 240-1996-0 L7 SAME AS L3 13946 03550 240-1996-0 L10 COIL, RF L14K034 81349 240-0063-0 L11 SELECT L11 FROM THE FOLLOWING LIST 11 240-1529-0 L11 COIL, RF S26-6799-00 95105 240-1529-0 L12 SAME AS L3<	JI		UG10510	09408	357-9210-000
2.4 UH, 23 TOL 13950 03550 240-1996-1 L2 COLL, RF 13950 03550 240-1996-1 L3 COL, RF 18217 99800 240-0198-0 L4 SAME AS L3 13949 03550 240-1996-1 L5 SAME AS L3 13949 03550 240-1996-1 L6 COLL, RF 13949 03550 240-1996-1 L7 SAME AS L3 13949 03550 240-1996-1 L7 SAME AS L3 13946 03550 240-1996-0 L7 SAME AS L3 13946 03550 240-1996-0 L9 COLL, RF L74K034 81349 240-0062-0 L10 COLL, RF S26-6799-00 95105 240-152-0 L11 COLL, RF S240-192-0 240-0192-0 240-0192-0 L12 SAME AS L3 LT7K208	J2				
L2 COIL, RF 13950 03550 240-1996-1 L3 COIL, RF 185217 99800 240-0198-0 L4 SAME AS L3 13949 03550 240-1996-1 L4 SAME AS L3 13949 03550 240-1996-1 L4 SAME AS L3 13949 03550 240-1996-1 L5 SAME AS L3 13949 03550 240-1996-1 L6 COIL, RF 13946 03550 240-1996-0 L7 SAME AS L3 13946 03550 240-1996-0 L7 SAME AS L3 13946 03550 240-1996-0 L7 SAME AS L3 13946 03550 240-1996-0 L9 COIL, RF 13946 03550 240-1996-0 L10 COIL, RF LT4K034 81349 240-0063-0 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0192-0 L11 COIL, RF 526-6799-00 95105 240-1529-0 240-0192-0 L12 SAME AS L3 LT7K208 81349 240-0192-0 <td< td=""><td>L 1</td><td></td><td>526-6799-00</td><td>95105</td><td>240-1529-000</td></td<>	L 1		526-6799-00	95105	240-1529-000
6.8 UH, 5% TOL IIS217 99800 240-0198-0 L3 COLL, RF IIS217 99800 240-0198-0 L4 SAME AS L3 IIS217 99800 240-0198-0 L4 SAME AS L3 IIS217 99800 240-0198-0 L5 SAME AS L3 IIS949 03550 240-1996-0 L6 COIL, RF IIS949 03550 240-1996-0 L7 SAME AS L3 IIS946 03550 240-1996-0 L9 COIL, RF IIS946 03550 240-0062-0 L10 COIL, RF IIS4036 81349 240-0062-0 L11 SELECT L11 FROM THE FOLLOWING LIST IIS00CTOR, RF 220-0063-0 L11 COIL, RF S20+, 102 TOL IITK208 81349 240-0192-0 L12 SAME AS L3 IIII COIL, RF IITK208 81349 <td< td=""><td>1.2</td><td></td><td>13950</td><td>03550</td><td>260-1996-110</td></td<>	1.2		13950	03550	260-1996-110
L3 C01L, RF IIS217 99800 240-0198-0 220 UH, 5% TOL 13949 03550 240-1996-0 L5 SAME AS L3 13949 03550 240-1996-0 L6 C01L, RF 13949 03550 240-1996-0 L7 SAME AS L3 13949 03550 240-1996-0 L7 SAME AS L3 13946 03550 240-1996-0 L8 SAME AS L3 L 13946 03550 240-1996-0 L9 C01L, RF L74K034 81349 240-0062-0 L10 C01L, RF L74K036 81349 240-0062-0 L11 SELECT L11 FROM THE FOLLOWING LIST L74K036 81349 240-0063-0 L11 C01L, RF L74K036 81349 240-0192-0 240-1529-0 L11 C01L, RF L77K208 81349 240-0192-0 L12 SAME AS L3 L L77K208 81349 240-0192-0 L12 SAME AS L3 L L L77K208 81349 240-0192-0 L12 SAME AS L3 L			19950	03710	240-1990-110
L4 SAME AS L3 L5 SAME AS L3 L6 COIL, RF 2.4 UH, 5% TOL L7 SAME AS L3 L8 SAME AS L3 L9 COIL, RF 10 COIL, RF L10 COIL, RF L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 L11 COIL, RF L11 COIL, RF L11 COIL, RF L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 L11 COIL, RF L11 COIL, RF L11 COIL, RF L11 COIL, RF L12 SAME AS L3 L13 COIL, RF L14 COIL, RF L13 COIL, RF L14 COIL, RF L13 COIL, RF L14 COIL, RF L15 COIL, RF L14 COIL, RF L15 COIL, RF <td>L 3</td> <td>COIL, RF</td> <td>135217</td> <td>99800</td> <td>240-0198-000</td>	L 3	COIL, RF	135217	99800	240-0198-000
L5 SAME AS L3 13949 03550 240-1996-1 L6 COIL, RF 13949 03550 240-1996-1 L7 SAME AS L3 13946 03550 240-1996-0 L8 SAME AS L3 13946 03550 240-1996-0 L9 COIL, RF 13946 03550 240-1996-0 L10 COIL, RF L14K034 81349 240-0062-0 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0063-0 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0063-0 L11 COIL, RF LT4K036 81349 240-0163-0 L11 COIL, RF S26-6799-00 95105 240-1529-0 L12 SAME AS L3 LT7K208 240-0192-0 L13 COIL, RF LT7K208 81349 240-0192-0 L14 COIL, RF LT7K207 81349 240-0191-0 L14 COIL, RF L17K207 81349 240-0191-0 L15 COIL, RF L3956 03550 240-1996-0 <td>14</td> <td></td> <td></td> <td></td> <td></td>	14				
L6 COIL, RF 13949 03550 240-1996-1 L7 SAME AS L3 13949 03550 240-1996-1 L8 SAME AS L3 13946 03550 240-1996-0 L9 COIL, RF 13946 03550 240-1996-0 L10 COIL, RF 13946 03550 240-1996-0 L10 COIL, RF LT4K034 81349 240-0062-0 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0063-0 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0063-0 L11 COIL, RF LT4K036 81349 240-0063-0 L11 COIL, RF LT4K036 81349 240-0063-0 L12 SAME AS L3 LT7K208 81349 240-0192-0 B2 UH, 10% TOL LT7K208 81349 240-0192-0 B2 UH, 10% TOL LT7K207 81349 240-0192-0 B2 UH, 10% TOL LT7K207 81349 240-0192-0 B2 UH, 10% TOL LT7K207 81349 <t< td=""><td></td><td></td><td></td><td></td><td></td></t<>					
L7 SAME AS L3 L8 SAME AS L3 L9 COIL, RF 4.3 UH, 5% TOL L10 COIL, RF 1 UH, 10% TOL L11 SELECT L11 FROM THE FOLLOWING LIST L11 COIL, RF L11 COIL, RF L11 COIL, RF L11 COIL, RF L11 COIL, RF L11 COIL, RF L12 SAME AS L3 L13 COIL, RF L12 SAME AS L3 L13 COIL, RF L14 COIL, RF L15 UH, 10% TOL L12 SAME AS L3 L13 COIL, RF L14 COIL, RF L15 SAME AS L3 L15 COIL, RF L17 K208 SI349 240-0192-0 82 UH, 10% TOL L17 K208 SI349 240-0192-0 82 UH, 10% TOL L17 K207 SI349 240-0191-0 56 UH, 10% TOL L15 COIL, RF L13 COIL, RF L14 COIL, RF L15 COIL, RF L15 COIL, RF L17 K207 SI349 240-0191-0 S6 UH, 10% TOL L15 COIL, RF L13956 03550 240-1996-0			13949	03550	240-1996-100
L8 SAME AS L3 13946 03550 240-1996-0 L9 COIL, RF 13946 03550 240-1996-0 L10 COIL, RF LT4K034 81349 240-0062-0 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0063-0 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0063-0 L11 COIL, RF LT4K036 81349 240-0063-0 L11 COIL, RF LT4K036 81349 240-0063-0 L12 SAME AS L3 LT7K208 240-0192-0 B2 UH, 10% TOL LT7K208 81349 240-0192-0 B2 UH, 10% TOL B1349 240-0192-0 81349 240-0192-0 L12 SAME AS L3 LT7K208 81349 240-0192-0 B2 UH, 10% TOL LT7K207 81349 240-0192-0 B2 UH, 10% TOL LT7K207 81349 240-0191-0 L14 COIL, RF LT7K207 81349 240-0191-0 L15 COIL, RF 13956 03550 240-1996-0					
L9 COIL, RF 13946 03550 240-1996-0 L10 COIL, RF LT4K034 81349 240-0062-0 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0063-0 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0063-0 L11 COIL, RF LT4K036 81349 240-0063-0 L11 COIL, RF LT4K036 81349 240-0063-0 L12 SAME AS L3 LT7K208 240-1529-0 COIL, RF LT7K208 240-0192-0 82 UH, 10% TOL LT7K208 81349 240-0192-0 82 UH, 10% TOL LT7K207 81349 240-0192-0 L14 COIL, RF LT7K207 81349 240-0191-0 L14 COIL, RF LT7K207 81349 240-0191-0 L15 COIL, RF 13956 03550 240-1996-0					
L10 COIL, RF LT4K034 81349 240-0062-0 L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0063-0 L11 COIL, RF LT4K036 81349 240-0063-0 1.5 UH, 10% TUL LT4K036 81349 240-0063-0 1.5 UH, 10% TUL LT4K036 81349 240-0063-0 1.5 UH, 10% TUL S26-6799-00 95105 240-1529-0 2.4 UH, 2% TOL LT7K208 240-0192-0 82 UH, 10% TOL LT7K208 81349 240-0192-0 82 UH, 10% TOL LT7K207 81349 240-0191-0 56 UH, 10% TOL LT7K207 81349 240-0191-0 515 COIL, RF 13956 03550 240-1996-0			13946	03550	240-1996-030
1 UH, 10% TOL L11 SELECT L11 FROM THE FOLLOWING LIST L11 COIL, RF 1.5 UH, 10% TÚL INDUCTOR, RF 2.4 UH, 2% TOL COIL, RF 2.4 UH, 2% TOL COIL, RF 82 UH, 10% TOL L13 COIL, RF 82 UH, 10% TOL L14 COIL, RF 113 COIL, RF 114 COIL, RF 115 COIL, RF 13956 03550 240-0191-0		4.3 UH, 5% TOL			
L11 SELECT L11 FROM THE FOLLOWING LIST LT4K036 81349 240-0063-0 L11 COIL, RF LT4K036 81349 240-0063-0 L11 COIL, RF 526-6799-00 95105 240-1529-0 L12 SAME AS L3 LT7K208 240-0192-0 L13 COIL, RF LT7K208 81349 240-0192-0 L14 COIL, RF LT7K207 81349 240-0191-0 L15 COIL, RF 13956 03550 240-1996-0	L10		LT4K034	81349	240-0062-000
FOLLOWING LIST LT4K036 81349 240-0063-0 1.5 UH, 10% TÚL 1.5 UH, 10% TÚL 526-6799-00 95105 240-1529-0 1.00UCTOR, RF 526-6799-00 95105 240-0192-0 2.4 UH, 2% TOL LT7K208 240-0192-0 82 UH, 10% TOL 117K208 81349 240-0192-0 82 UH, 10% TOL LT7K208 81349 240-0192-0 82 UH, 10% TOL LT7K207 81349 240-0191-0 82 UH, 10% TOL LT7K207 81349 240-0191-0 55 UH, 10% TOL 13956 03550 240-1996-0	L11				
1.5 UH, 10% TÚL 526-6799-00 95105 240-1529-0 INDUCTOR, RF 526-6799-00 95105 240-1529-0 2.4 UH, 2% TOL LT7K208 240-0192-0 82 UH, 10% TOL LT7K208 81349 240-0192-0 113 COIL, RF LT7K208 81349 240-0192-0 82 UH, 10% TOL B1349 240-0191-0 340-0191-0 L14 COIL, RF LT7K207 81349 240-0191-0 L15 COIL, RF 13956 03550 240-1996-0		FOLLOWING LIST			
INDUCTOR, RF 526-6799-00 95105 240-1529-0 2.4 UH, 2% TOL LT7K208 240-0192-0 COIL, RF LT7K208 240-0192-0 82 UH, 10% TOL 81349 240-0192-0 L12 SAME AS L3 LT7K208 81349 L13 COIL, RF LT7K208 81349 20H, 10% TOL LT7K207 81349 240-0191-0 56 UH, 10% TOL 13956 03550 240-1996-0	LII		LT4K036	81349	240-0063-000
2.4 UH. 2% TOL COIL, RF LT7K208 240-0192-0 82 UH, 10% TOL 82 UH, 10% TOL LT7K208 81349 240-0192-0 113 COIL, RF LT7K208 81349 240-0192-0 82 UH, 10% TOL 82 UH, 10% TOL LT7K208 81349 240-0192-0 114 COIL, RF LT7K207 81349 240-0191-0 56 UH, 10% TOL 13956 03550 240-1996-0			526-6799-00	95105	240-1529-000
82 UH, 10% TOL L12 SAME AS L3 L13 COIL, RF 82 UH, 10% TOL L14 COIL, RF L15 COIL, RF L15 COIL, RF		2.4 UH. 2% TOL			
L12 SAME AS L3 LT7K208 81349 240-0192-0 B2 UH, 10% TOL LT7K207 81349 240-0191-0 L14 COIL, RF LT7K207 81349 240-0191-0 L15 COIL, RF LT7K207 81349 240-0191-0			LT7K208		240-0192-000
L13 COIL, RF LT7K208 81349 240-0192-0 82 UH, 10% TOL LT7K207 81349 240-0191-0 L14 COIL, RF LT7K207 81349 240-0191-0 56 UH, 10% TOL LT7K207 81349 240-0191-0 L15 COIL, RF 13956 03550 240-1996-0	L12				
L14 COIL, RF LT7K207 81349 240-0191-0 56 UH, 10% TOL L15 COIL, RF 13956 03550 240-1996-0	L13	COIL, RF	LT7K208	81349	240-0192-000
56 UH, 10% TOL L15 COIL, RF 13956 03550	114		1 77/202	017/0	240-0101 000
L15 COIL, RF 13956 03550 240–1996–0	L14		L17K207	81349	240-0191-000
6.2 HH- 10% TOI	L15	COIL, RF	13956	03550	240-1996-070
	01	6.2 UH, 10% TOL	\$4430	07242	352-0373 000
01 TRANSISTOR S4639 07263 352-0373-0		TRANSISTUR	54039	01263	352-0373-000

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
Q2	TRANSISTOR	2N4121	07688	352-0743-010
Q3	SAME AS Q2	214121	01000	552-0745-010
04	SAME AS Q2			
05 Q6	SAME AS Q2 TRANSISTOR	MM2181	04713	352-0322-000
Q7	SAME AS Q6		04115	552 0522 000
08 R1	SAME AS Q2 RESISTOR, FXD, FILM 12.1K OHMS, 1% TOL, 1/4	KN60D1212F	81349	705-6648-000
R 2	WATT RESISTOR, FXD, COMPOSITION 690 DHMS, 10% TOL, 1/2	RC20GF681K	81349	745-1345-000
R3	WATT RESISTOR, VAR, CERAMIC 500 DHMS, 30% TOL, 1/2	62PAR500	73138	382-0008-400
	WATT STOLEN STUR			
R4 R5	RESISTOR, FXD, FILM 348 OHMS, 1% TOL, 1/2 WATT SELECT R5 FROM THE FOLLOWING LIST	RN65D3480F	81349	705-7074-000
	RESISTOR, FXD, FILM 3480 DHMS, 1% TOL, 1/2	RN65D3481F	81349	705-7122-000
	WATT RESISTOR, FXD, FILM 4220 OHMS, 1% TOL, 1/2 WATT	RN65D4221F	81349	705-7126-000
	RESISTOR, FXD, FILM 5110 OHMS, 1% TOL, 1/2 WATT	RN65DS111F	81349	705-7130-000
	RESISTOR, FXD, FILM	RN6501002F	81349	705-7144-000
	IOK OHMS, 1% TOL, 1/2 WATT	004/5012115	012/0	705 7100 000
<i>к</i> 6	RESISTOR, FXD, FILM 1210 OHMS, 1% TOL, 1/2 WATT	RN65D1211F	81349	705-7100-000
R 7	RESISTUR, FXD, FILM 100K OHMS, 1% TOL, 1/2 WATT	RN65D1003F	81349	705-7192-000
K 8	RESISTOR, FXD, FILM 7.5K OHMS, 1% TOL, 1/2 WATT	RN6507501F	81349	705-7138-000
к9	RESISTOR, FXD, FILM	RN65D3160F	81349	705-7072-000
R10	316 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM 13.3K OHMS, 1% TOL, 1/2	RN65D1332F	81349	705-7150-000
К 11	WATT RESISTOR, FXD, FILM 5110 OHMS, 1% TOL, 1/2	RN65D5111F	81349	705-7130-000
R12	WATT RESISTOR, VAR, CERAMIC	62PR50K	73138	382-0008-130
к13	50K, 30% TOL, 1/2 WATT RESISTUR, FXD, COMPOSITION 100K OHMS, 10% TOL, 1/2	RC20GF104K	81349	745-1436-000
214	WAIT RESISTOR, FXD, FILM 2870 OHMS, 1% TOL, 1/2 WATT	RN65D2871F	81349	705-7118-000
4 I 5	RESISTOR, FXD, FILM	RN65D1902F	81349	705-7158-000
816	19K OHMS, 1% TOL, 1/2 WATT RESISTUR, FXD, COMPASITION 47K OHMS, 10% TOL, 1/2	RC20GF473K	81349	745-1422-000
R17	WATT SELECT R17 FROM THE FOLLOWING LIST			
	FOLLOWING LIST RESISTOR, FXD, FILM	RN65D1001F	81349	705-7096-000
	IK OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, FILM 1960 OHMS, 1% TOL, 1/2 WATT	RN65U1961F	81349	705-7110-000

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEF
	RESISTOR, FXD, FILM 3160 OHMS, 1% TOL, 1/2	RN65D3161F	81349	705-7120-000
	WATT RESISTOR, FXD, FILM 4220 OHMS, 1% TOL, 1/2 WATT	RN65D4221F	81349	705-7126-000
R18	RESISTOR, FXD, COMPOSITION 1K OHMS, 10% TOL, 1/2 WATT	RC20GF102K	81349	745-1352-000
R19	RESISTOR, FXD, COMPOSITION 27K OHMS, 10% TOL, 1/2 WATT	RC20GF273K	81349	745-1412-000
R20	RESISTOR, FXD, FILM 21.5K OHMS, 1% TOL, 1/2 WATT	RN65D2152F	81349	705-7160-000
R 2 1	RESISTOR, FXD, FILM 12.1K OHMS, 1% TOL, 1/2 WATT	RN6501212F	81349	705-7148-000
R22	RESISTOR, FXD, FILM 2610 OHMS, 1% TOL, 1/2 WATT	RN65D2611F	81349	705-7116-000
R23	RESISTOR, FXD, COMPOSITION IOK OHMS, 10% TOL, 1/2 WATT	RC20GF103K	81349	745-1394-000
¥24	RESISTOR, FXD, COMPOSITION 5600 OHMS, 10% TOL, 1/2 WATT	RC20GF562K	81349	745-1384-000
P. 25	RESISTOR, FXD, COMPOSITION 1500 OHMS, 10% TOL, 1/2 WATT	RC20GF152K	81349	745-1359-000
R26	RESISTOR, FXD, COMPOSITION 1800 OHMS, 10% TOL, 1/2 WATT	RC20GF182K	81349	745-1363-000
R 2 7	RESISTOR, FXD, FILM 51.1 CHMS, 1% TOL, 1/2 WATT	RN65D51R1F	81349	705-7034-000
P.28	RESISTOR, FXD, FILM 42.2 OHMS, 1% TOL, 1/4 WATT	RN65D42R2F	81349	705-7030-000
829	SAME AS R23			
P.30	SAME AS R23			
R 31	RESISTUR, FXD, COMPOSITION 4700 DHMS, 10% TOL, 1/2 WATT	RC20GF472K	81349	745-1380-00
9.32	SAME AS R26			
P.33 R.34	SAME AS R26 RESISTOR, FXD, FILM 261 OHMS, 1% TOL, 1/2 WATT	KN6502610F	81349	705-7068-00
R35	RESISTOR, FXD, FILM 220 UHMS, 10% TOL, 1/2 WATT	RC20GF221K	81349	745-1324-00
K36 R37	SAME AS R26 RESISTOR, FXD, COMPOSITION 2200 OHMS, 10% TOL, 1/2	RC20GF222K	81349	745-1366-00
КЗ Б	WAIT RESISTOR, FXD, COMPOSITION 22 DHMS, 10% TOL, 1/2	RC20GF220K	81349	745-1282-00
£39	WAIT RESISTOR, FXD, COMPOSITION 390 UHMS, 10% TOL, 1/2 WATT	RC20GF391K	81349	745-1335-00
R4C	SAME AS R13			
R41	SAME AS R13			
R42	RESISTOR, FXD, FILM 1100 GHMS, 1% TOL, 1/2 WATT	₽N6501101F	81349	705-7098-00
R43 R44	SAME AS R42 RESISTOR, FXD, FILM 1960 OHMS, 1% TOL, 1/2 WATT	RN65D1961F	81349	705-7110-00

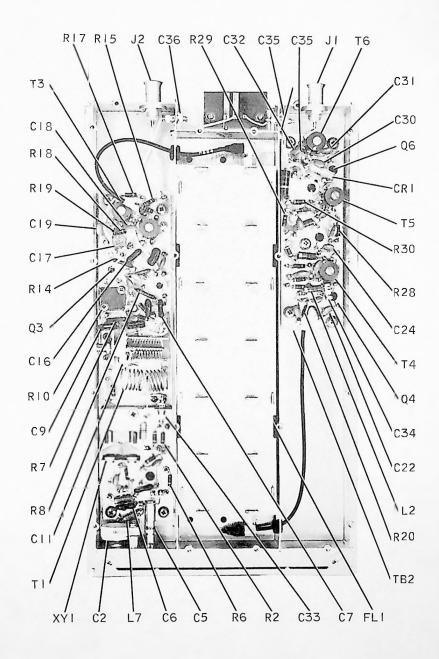
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
R45 R46	SAME AS R44 RESISTOR, FXD, FILM	RN6508251F	81349	705-7140-00
R47	8250 OHMS, 1% TOL, 1/2 WATT RESISTOR, FXD, COMPOSITION			
	150 OHMS, 10% TOL, 1/2 WATT	RC20GF151K	81349	745-1317-00
R48	RESISTOR, FXD, COMPOSITION 6800 OHMS, 10% TOL, 1/2 WATT	RC20GF682K	81349	745-1387-00
R49 R50	SAME AS R48 SAME AS R31			
R51 R52	NOT USED RESISTOR, FXD, FILM 68.1 OHMS, 1% TOL, 1/2 WATT	RN65D68R1F	81349	705- 7 040-00
T 1 T P 1	TRANSFORMER JACK, TIP WHITE	SL490-458	12615	549-1617-00 306-2241-10
TP2	SAME AS TP1			
TP3 TP4	SAME AS TP1 JACK, TIP BLACK	SL490-468	12615	306-2241-01
TP5	SAME AS TPL			

1



B502 512 Pb

Figure 6-7. RF Mixer (Sheet 1 of 2).

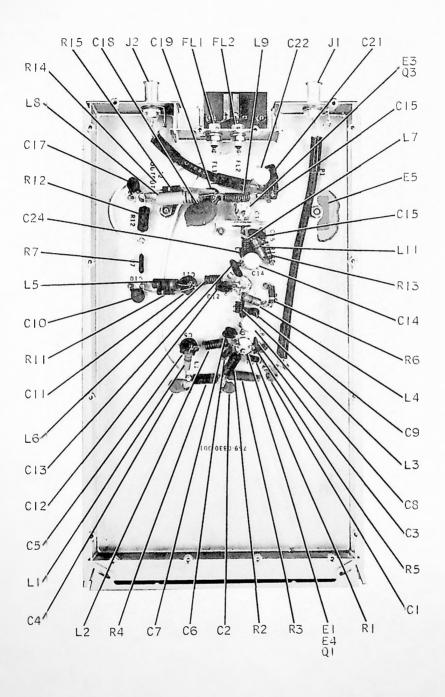


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Figure 6-7. RF Mixer (Sheet 2 of 2).

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	RF MIXER			781-5380-001
C 1	CAPACITOR, FXD, CERAMIC 1000 UUF, 20% TOL,	40C73A1	01939	913-3009-000
C 2	500 VDCW CAPACITOR, VAR, CERAMIC 4-30 UUF, 50 VDCW	CV11C300	81349	917-9005-000
C3 C4	SAME AS C1 Capacitor, FXD, Mica	CM05C100K03	81349	912-2754-000
C 5	10 UUF, 10% TDL, 500 VDCW CAPACITOR, VAR, GLASS 0.8-18 UUF, 1K VDCW	VC23G	73899	922-0437-000
C6 C7	SAME AS C4 SAME AS C4			
C8 C9	CAPACITOR, FXD, MICA 18 UUF, 10% TOL, 500 VDCW SAME AS CB	CM05C180K03	81349	912-2763-000
C10 C11 C12	SAME AS C4 CAPACITOR, VAR, AIR 3-9.8 UUF, 1250 VDCW SAME AS C1	160-211-35	74970	922-0046-000
C13 C14	SAME AS C1 CAPACITOR, FXD, CERAMIC 0.01 UF, PLUS 80% MINUS 20%, 100 VDCW	805-14×5v01032	72982	913-3680-000
C15	CAPACITOR, FXD, MICA 33 UUF, 5% TOL, 500 VDCW	CM05E330J03	81349	912-2780-000
C16 C17 C18	SAME AS C15 SAME AS C14			
THROUGH C32	SAME AS C1			
C33	CAPACITOR, FXD, CERAMIC 1000 UUF, GMV TOL, 500 VDCW	2465-008W5T0102P	72982	913-3208-000
C34 C35	CAPACATOR, FXD, CERAMIC 1.5 UUF, 33% TOL, 500 VDCW SAME AS C33	CC20CK1R5D	81349	916-0073-000
C36	SAME AS C33			
CR1 E1 E2	SEMICONDUCTOR DEVICE, DIODE HOLDER, TRANSISTOR	1N3018B T1533	07688 98291	353-3123-000 352-9509-000
THROUGH E7	SAME AS EL			
FL1	SELECT FL1 FROM THE FOLLOWING LIST FILTER, HIGH BAND			781-5343-001
	FILTER, LOW BAND			781-5344-001
J1	CONNECTOR, ELECTRICAL	UG1051U	80058	357-9210-000
J2 L1	SAME AS J1 COIL, RF 0.68 UH, 10% TOL	MS18130-6	96906	240-1566-000
L2	COIL, RF 0.22 UH, 20% TOL	MS18130-1	96906	240-1572-000
L3 L4	SAME AS L2			
15	SAME AS L2 COIL, RF 2.20 UH, 10% TOL	MS18130-12	96906	240-1572-000
L6	COIL, RF 0.22 UH, 20% TOL	MS18130-2	96906	240-1563-000
L7	SAME AS L6			
Q1 02	TRANSISTOR	2N4258	07263	352-0848-020
Q2 Q3	TRANSISTOR SAME AS Q2	2N4416	22229	352-0756-010
04	TRANSISTOR	2N3563	07688	352-0630-010
05	SAME AS Q4			
Q6 07	SAME AS Q4			
97	SAME AS 04			

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
Rl	RESISTOR, FXD, COMPOSITION 2200 OHMS, 10% TOL, 1/4	RC07GF222K	81349	745-0761-000
R 2	WATT RESISTOR, FXD, COMPOSITION 4700 OHMS, 10% TOL, 1/4	RCO7GF472K	81349	745-0773-000
R3	WATT RESISTOR, FXD, COMPOSITION 1800 OHMS, 10% TOL, 1/4	RC07GF182K	81349	745-0758-000
R4	WATT RESISTOR, FXD, COMPOSITION 180 OHMS, 10% TOL, 1/4	RC07GF181K	81349	745-0722-CCC
0.5	NOT USED			
R5 R6	RESISTOR, FXD, COMPOSITION 820 OHMS, 10% TOL, 1/4	RC07GF821K	81349	745-0746-000
R7	WATT RESISTOR, FXD, FILM 2150 DHMS, 1% TOL, 1/4 WATT	RN6002151F	81349	705-6612-000
R8 R9	SAME AS R7 RESISTOR, FXD, COMPOSITION 6800 OHMS, 10% TOL, 1/4	RC07GF682K	81349	745-0779-000
R10	WATT RESISTOR, VAR	RT22C2L502	81349	381-1721-120
R11	5K OHMS, 5% TOL, 3/4 WATT RESISTOR, FXD, COMPOSITION 5600 OHMS, 10% TOL, 1/4	RC07GF562K	81349	745-0776-000
R12	SAME AS R9			
R13	SAME AS R7			
R14 R15	SAME AS R7 RESISTOR, FXD, COMPOSITION 33 OHMS, 10% TOL, 1/4 WATT	RC07GF330K	81349	745-0695-000
R16	SAME AS R15			
R17	RESISTOR, FXD, COMPOSITION 22 OHMS, 10% TOL, 1/4 WATT	RC07GF220K	81349	745-0689-000
R18	RESISTOR, FXD, COMPOSITION 680 OHMS, 10% TOL, 1/4 WATT	RCO7GF681K	81349	745-0743-000
R19	RESISTOR, FXD, COMPOSITION 270 OHMS, 10% TOL, 1/4 WATT	RCO7GF271K	81349	745-0728-000
R20	RESISTOR, FXD, COMPOSITION 150 OHMS, 10% TOL, 1/4 WATT	RCO7GF151K	81349	745-0719-000
R21	SAME AS R2			
R22	SAME AS R2			
R23 R24	SAME AS R6			
R25	SAME AS R6			
R26	SAME AS R2			
R27 R28	SAME AS R2 SAME AS R6			
R29	SAME AS RO			
R30	SAME AS R2			
R31	RESISTOR, FXD, COMPOSITION	RC32GF271K	81349	745-3328-000
R32	270 OHMS, 10% TOL, 1 WATT RESISTOR, FXD, COMPOSITION 100 OHMS, 10% TOL, 1/4 WATT	RC07GF101K	81349	745-0713-000
τ1	TRANSFORMER			781-5376-001
T2	TRANSFORMER			781-5389-001
Т3	TRANSFORMER			781-5371-001
T4	TRANSFORMER			781-5372-001
T5				781-5373-001
Т6 ТВ1	TRANSFORMER BOARD, FABRICATED			781-5374-001
TB2	BOARD, FABRICATED			781-5352-001
XYI	SOCKET, CRYSTAL	8000AG20	9150.6	292-0305-010

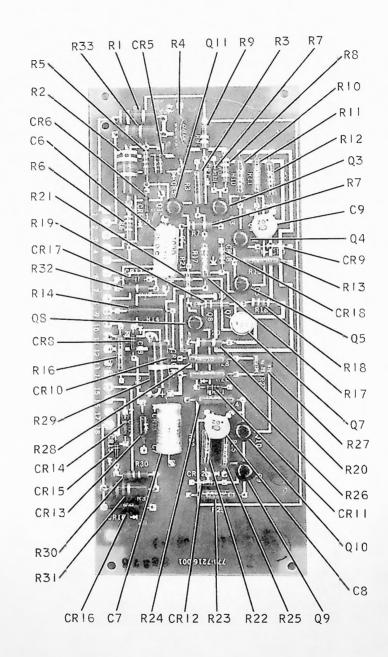


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Figure 6-8. Power Amplifier.

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBE
	POWER AMPLIFIER			769-0830-001
C 1	CAPACITOR, FXD, CERAMIC 680 UUF, 20% TOL, 1000	CK60AW681M	81349	913-1194-000
C 2	VDCW CAPACITOR, FXD, CERAMIC 470 UUF, 20% TOL, 500 VDCW	CK60AX471M	81349	913-1189-000
C 3 C 4	SAME AS C2 CAPACITOR, FXD, CERAMIC 0.01 UF, PLUS 80 MINUS	805-014X5V0103Z	72982	912-3680-000
C 5	20%, 100 VDCW CAPACITOR, FXD, MICA 1000 UUF, 5% TOL, 500 VDCW	CB21PE102J	81349	912-4115-33
C6	CAPACITOR, FXD, MICA 15 UUF, 5% TOL, 500 VDCW	DM15C150J01	72136	912-2759-00
C7 C8	SAME AS C6 CAPACITOR, VAR, CERAMIC 5.5-18 UUF, PLUS 2% MINUS	538011C0P092R	72982	917-1222-00
C9	2.5%, 350 VDCW CAPACITOR, FXD, MICA 33 UUF, 10% TOL, 500 VDCW	DM30F562K03	72136	912-2781-00
C 1 0 C 1 1	SAME AS C4 SAME AS C5			
612	CAPACITOR, FXD, MICA 10 UUF, 5% TOL, 500 VDCW	DM15C100J01	72136	912-2753-00
C13	CAPACITOR, FXD, MICA 18 UUF, 5% TOL, 500 VDCW	DM15C180J01	72136	912-2762-00
C14 C15	SAME AS C8 CAPACITOR, FXD, MICA	CM05ED820J03	81349	912-2810-00
C16	82 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA 1500 UUF, 20% TOL, 500 VDCW	M23-500M	53021	912-0667-00
C17 C18	SAME AS C4 CAPACITOR, FXD, CERAMIC 0.1 UUF, PLUS 80% MINUS 20%, 200 VDCW	805-213X5V0104Z	72982	913-3681-00
C19 C20	SAME AS C5 CAPACITOR, FXD, MICA	CM05F111J03	81349	912-2819-00
C21	110 UUF, 5% TOL, 500 VDCW CAPACITOR, FXD, MICA 27 UUF, 5% TOL, 500 VDCW	CM05E270J03	81349	912-2774-00
C22 C23 C24	SAME AS C8 NOT USED CAPACITOR, FXD, MICA 22 UUF, 10% TOL, 500 VDCW	D155E220K0	00853	912-2769-00
E1 E2 E3	INSULATOR, TRANSISTOR INSULATOR, TRANSISTOR SAME AS E2	XB021667-5 T1529	98291 98291	352-9800-0 352-9800-0
E4	HEATSINK	TXP0508B	98978 13103	352-9555-0
E5 FL1	HEATSINK FILTER, RADIO INTERFERENCE 1300 UUF, GMV TOL, 200 VDCW	6156-7 10201050	72982	352-9612-0 241-0332-0
FL2 J1	SAME AS FL1 CONNECTOR, ELECTRICAL 1 CONTACT	UG1051U	80058	357-9210-0
J2 L1	SAME AS J1 COIL, RF 1 UH, 10% TOL	MS75008-28	96906	240-1590-0
L2	COIL, RF			776-1882-0
L3 L4	COIL, RF COIL, RF	MS75008-21	96906	240-1585-0
L5	0.15 UH, 20% TOL Coil, RF	MS16222-5	96906	240-1654-0
L6	2.2 UH, 10% TOL Coil, RF		,0,00	776-1911-0
L7	COIL, RF			776-1912-0

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
L8 L9	COIL, RF 1.2 UH, 10% TOL COIL, RF NOT USED	MS16231-1	96906	240-1605-000 776-1883-001
L9 L10 L11 Q1 Q2 Q3 R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15	COIL, RF NOT USED SAME AS L4 TRANSISTOR TRANSISTOR RESISTOR, FXD, COMPOSITION 39 OHMS, 10% TOL, 1/2 WATI RESISTOR, FXD, WIRE WOUND 22 OHMS, 5% TOL, 3 WATTS RESISTOR, FXD, WIRE WOUND 270 OHMS, 1% TOL, 1/2 WAT RESISTOR, FXD, FILM 10 OHMS, 1% TOL, 1/4 WATT RESISTOR, FXD, COMPOSITION 100 OHMS, 10% TOL, 1/2 WAT RESISTOR, FXD, WIRE WOUND 2 OHMS, 1% TOL, 1.25 WATT NOT USED NOT USED NOT USED RESISTOR, FXD, COMPOSITION 10 OHMS, 10% TOL, 1/2 WATT RESISTOR, FXD, WIRE WOUND 0.5 OHM, 1% TOL, 2.5 WATT SAME AS R11 SAME AS R11	2N3866 2N3375 2N5102 RC20GF390K RW69V220 RN65D23R7F RW69V271 RN60D10R0F RC20GF101K RS1A73-2R00-1PCT RC20GF100K RSM2C0R500F GBT1-2 4-7-5	07688 02735 81349 81349 81349 81349 81349 91637 75042	776-1883-001 352-0671-010 352-0747-010 745-1293-000 747-5327-000 705-7018-000 747-5349-000 705-6500-000 745-1310-000 745-1268-000 745-1268-000 745-6279-000

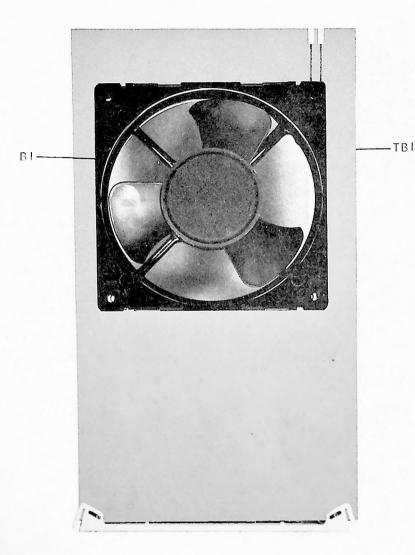


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Figure 6-9. Power Supply Regulator.

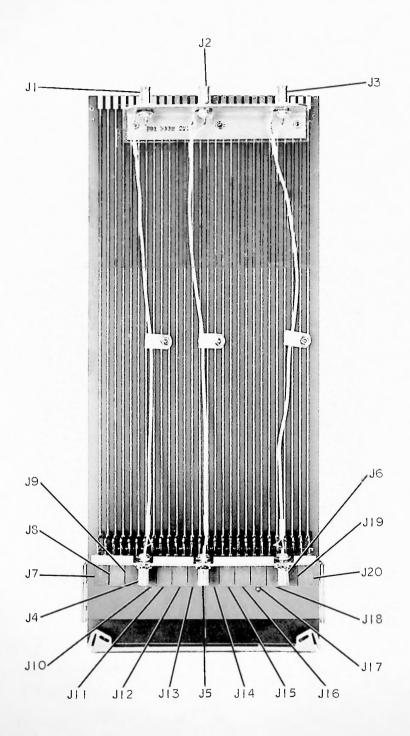
SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEI
	POWER SUPPLY REGULATOR			774-7216-000
C1 THROUGH	NOT USED			
C 5				
C6	CAPACITOR, FXD, ELECTROLYTIC 56 UF, 20% TOL, 75 VDCW	109D566x0075T2	56289	184-7793-000
C7	CAPACITOR, FXD, ELECTROLYTIC	109D157X0030T2	56289	184-7796-000
C 8	150 UF, 20% TOL, 30 VDCW CAPACITOR, FXD, CERAMIC 0.02 UF, PLUS 60% MINUS	20C109	01939	913-2097-000
<u></u>	40%, 250 VDCW			
C9 CR1	SAME AS CB			
THROUGH	NOT USED			
CR4 CR5	SEMICONDUCTOR DEVICE, DIODE	1N3027B	81349	353-3057-00
CR6 CR7	SEMICONDUCTOR DEVICE, DIODE SEMICONDUCTOR DEVICE, DIODE	1N645 1N758A	07688 07688	353-2607-00
CR8	SAME AS CR6	INIJOA		
CR9 CR10	SEMICONDUCTOR DEVICE, DIODE SEMICONDUCTOR DEVICE, DIODE	1N752A 1N645	07688 07688	353-2712-00
CR11	SAME AS CR7	11043	01000	555 2001 00
CR12 CR13	SAME AS CR9 Semiconductor device, didde	1N3020B	07688	353-3125-00
CR14	SAME AS CR6	INSOLUB	01000	555 5125 00
CR15 CR16	SAME AS CR6 SAME AS CR13			
CR17	SAME AS CR6			
CR18 Q1	SEMICONDUCTOR DEVICE, DIDDE NOT USED	1N755A	07688	353-2718-00
Q2	NOT USED			
Q3 Q4	TRANSISTOR SAME AS Q3	2N3569	07688	352-0629-03
Q5 Q6	SAME AS Q3 NOT USED			
Q7	TRANSISTOR	2N4235	07688	352-0695-04
Q8 Through Q11	SAME AS Q3			
R1	RESISTOR, FXD, COMPOSITION	RC32GF391K	81349	745-3335-00
R2	390 OHMS, 10% TOL, 1 WATT RESISTOR, FXD, COMPOSITION	RC42GF331K	81349	745-5631-00
	330 OHMS, 10% TOL, 2 WATTS			
R3	RESISTOR, FXD, FILM 46.4 OHMS, 1% TOL, 1/2 WATT	RN65D46R4F	81349	705-7032-00
R4	RESISTOR, FXD, WIRE WOUND	RSM2R2000G	91637	747-9651-00
R5	0-2 OHM 3% TOL, 3 WATTS RESISTOR, FXD, COMPOSITION 18K OHMS, 10% TOL, 1/2	RC20GF183K	81349	745-1405-00
Rő	WATT RESISTOR, FXD, COMPOSITION 330 OHMS, 10% TOL, 1/2	RC20GF331K	81349	745-1331-00
R7	WATT RESISTOR, FXD, COMPOSITION 3300 OHMS, 10% TOL, 1/2	RC20GF332K	81349	745-1373-00
R8	WATT RESISTOR, FXD, COMPOSITION 4700 OHMS, 10% TOL, 1/2	RC20GF472K	81349	745-1380-00
R9	WATT RESISTOR, FXD, COMPOSITION 15K OHMS, 10% TOL, 1/2	RC20GF153K	81349	745-1401-00
R10	WATT RESISTOR, FXD, FILM 2150 OHMS, 1% TOL, 1/2 WATT	RN65D2151F	81349	705-7112-00

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
R11	RESISTOR, FXD, FILM 19K OHMS, 1% TOL, 1/2 WATT	RN65D1902F	81349	705-7158-000
R12 R13	SAME AS R11 RESISTOR, FXD, FILM 5110 OHMS, 1% TOL, 1/2	RN65D5111F	81349	705-7130-000
R14	WATT RESISTOR, FXD, FILM 4.42K OHMS, 1% TOL, 1/2 WATT	RN65D4421F	81349	705-7127-000
R15	NOT USED			
R16	RESISTOR, FXD, FILM 1960 DHMS, 1% TOL, 1/2 WATT	RN65D1961F	81349	705-7110-000
R17	RESISTOR, FXD, FILM 464 OHMS, 1% TOL, 1/2 WATT	RN65D4640F	81349	705-7080-000
R18 R19	SAME AS R6			
R20	SAME AS R7 SAME AS R8			
R21	RESISTOR, FXD, COMPOSITION 5600 DHMS, 10% TOL, 1/2 WATT	RC20GF562K	81349	745-1384-000
R22	SAME AS RIO			
R23	SAME AS R11			
R24 R25	SAME AS R11 SAME AS R13			
R26	SAME AS KIS RESISTOR, FXD, FILM 4640 DHMS, 1% TOL, 1/2 WATT	RN65D4641F	81349	705-7128-000
R27	RESISTOR, VAR	62PAR1K	73138	382-0008-41
R28	1K, 30% TOL, 1/2 WATT RESISTOR, FXD, FILM 1470 OHMS, 1% TOL, 1/2	RN65D1411F	81349	705-7104-00
R29	WATT RESISTOR, FXD, COMPOSITION 150 OHMS, 10% TOL, 2 WATTS	RC42GF151K	81349	745-5617-00
R 30	RESISTOR, FXD, COMPOSITION	RC20GF5R1J	81349	745-1544-00
R 3 1	5.1 OHMS, 5% TOL, 1/2 WATT RESISTOR, FXD, COMPOSITION 160 OHMS, 5% TOL, 1 WATT	RC32GF161J	81349	745-3319-00
R 32	RESISTOR, FXD, COMPOSITION 2200 DHMS, 10% TOL, 1/2	RC20GF222K	81349	745-1366-00
R 33	WATT RESISTOR, FXD, COMPOSITION 560 OHMS, 10% TOL, 1 WATT	RC32GF561K	81349	745-3342-00



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SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	FAN			783-7049-001
B1 TB1	FAN, TUBEAXIAL 0.16-AMP, 115 VAC BOARD, FABRICATED	20-244-2301	82887	009-1829-020 786-1248-001
				5



B502 531 Pb

Figure 6-11. Extender Board.

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	EXTENDER BOARD			781-5365-0C1
J 1 J 2	CONNECTOR, ELECTRICAL 1 CONTACT SAME AS J1	UG1051U	80058	357-921C-0CC
.13 .14 .15	SAME AS JI CONNECTOR, ELECTRICAL I CONTACT SAME AS J4	UG1 05 0 AU	80058	357-5211-000
78 74 74	SAME AS J4 CONNECTOR, FLECTRICAL 2 CONTACTS	375430-9010	91662	372-2425-010
T HROUGH J 20	SAME AS J7			

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBER
	MANUFACTURERS CODES			
CODE	MANUFACTURER			
00853	SANGAMO ELECTRIC CO S CAROLINA DIV			
01002	PICKENS, S.C. GENERAL ELECTRIC CO CAPACITOR DEPT			
01939	HUDSON FALLS, N.Y. Sprague Electric Co of Misconsin			
02288	GRAFTON, WISC ALLIED CONTROL CO INC PLANTSVILLE, CONN			
02660	AMPHENOL CORP BROADVIEW, ILL.			
02735	RADID CORP OF AMERICA SOLID STATE AND RECEIVING TUBE DIVISION SOMERVILLE, N.J.			
03550	VANGUARD ELECTRONICS CO Inglewood, calif			
03877	TRANSISTRON ELECTRONIC WAKEFIELD, MASS.			
04009	ARROW-HART AND HEGEMAN ELECTRIC CO HARTFORD, CONN			
04713	MOTOROLA SEMICONDUCTOR PRODUCTS INC PHOENIX, ARIZ			
07263	FAIRCHILD CAMERA AND INSTRUMENT CORP SEMICONDUCTOR DIV MOUNTAIN VIEW, CALIF			
07688	MILITARY SPECIFICATIONS			
09408	STAR-TRONICS INC			
12040	GEORGETOWN, MASS. NATIONAL SEMICONDUCTOR CORP DANBURY, CONN			
12615	U.S. TERMINALS INC CINCINNATI, DHID			
13103	THERMALLOY CO DALLAS, TEX			
16352	COMPUTER DIDDE CORP LODI, N.J. ELECTRONIC MOULDING CORP			
17857	PANTUCKET, R.I. Karkar electronics inc			
22229	SAN FRANSISCO, CALIF UNION CARBIDE CORP LINDE DIV			
42190	MOUNTAIN VIEW, CALIF THE MUTER CO CHICAGO, ILL.			
53021	SANGAMO ELECTRIC CO SPRINGFIELD, ILL.			
56289	SPRAGUE ELECTRIC CO NORTH ADAMS, MASS.			
60418 70309	THE TORSION BALANCE CO CLIFTON, N.J. ALLIED CONTROL CO INC			
70674	NEW YORK, N.Y. Adc products inc			
71034	MINNEAPOLIS, MINN BLILEY ELECTRIC CO INC ERIE, PA,			

SYMBOL	DESCRIPTION	MANUFACTURER'S PART NUMBER	MFR CODE	COLLINS PART NUMBEI
71400	BUSSMANN MFG DIV DF			
	MCGRAW-EDISON CO			
71450	ST LOUIS, MO CTS CORP			
11430	ELKHART, IND			
72136	THE ELECTRO MOTIVE MFG CO INC			
72982	WILL IMANTIC, CONN ERIE TECHNOLÜGICAL PRODUCTS INC			
73138	ERIE, PA BECKMAN INSTRUMENTS INC			
73445	HELIPOY DIVISION FULLERTON, CALIF AMPEREX ELECTRONIC CORP			
73899	HICKSVILLE LONG ISLAND, N.Y.			
79079	J F D ELECTRONICS CO A DIVISION OF STRATFORD RETREAT HOUSE			
7/070	BROOKLYN, N.Y.			
74970	E F JOHNSON CO WASECA, MINN			
75042	I R C INC			
75382	PHILADELPHIA, PA.			
	KULKA ELECTRIC CORP MI VERNON, N.Y.			
76854	DAK MEG CO CRYSTAL LAKE, ILL.			
80058	MILITARY SPECIFICATIONS			
80105	BOLLER AND CHIVENS INC PASADENA, CALIF			
80145	A P I INSTRUMENTS CO CHESTERLAND, OHIO			
81349	MILITARY SPECIFICATIONS			
82389	SWITCH CRAFT INC CHICAGO, ILL.			
83003	VARO INC			
87930	GARLAND, TEX			
	TOWER MEG CORP			
91506	LATROBE, PA AUGAT INC ATTLEBORO, MASS.			
91637	DALE ELECTRONICS INC Columbus, Nebr			
91662 94148	ELCO CORP WILLOW GROVE, PA. SCIENTIFIC ELECTRONIC			
	PRODUCTS INC Loveland, Colu			
94375	AUTOMATIC METAL PRODUCTS BROOKLYN, N.Y.			
95105	COLLINS RADIO CO INFORMATION SCIENCE CENTER			
96906	NEWPORT BEACH, CALIF MILITARY SPECIFICATIONS			
98291	SEALECTRIC CORP			
	MAMARONECK, N.Y.			
98978	INTERNATIONAL ELECTRONIC RESEARCH CORP BURBANK, CALIF			
99800	DELEVAN ELECTRONICS CORP AURORA, N.Y.			

section 7 schematic diagrams

schematic diagrams

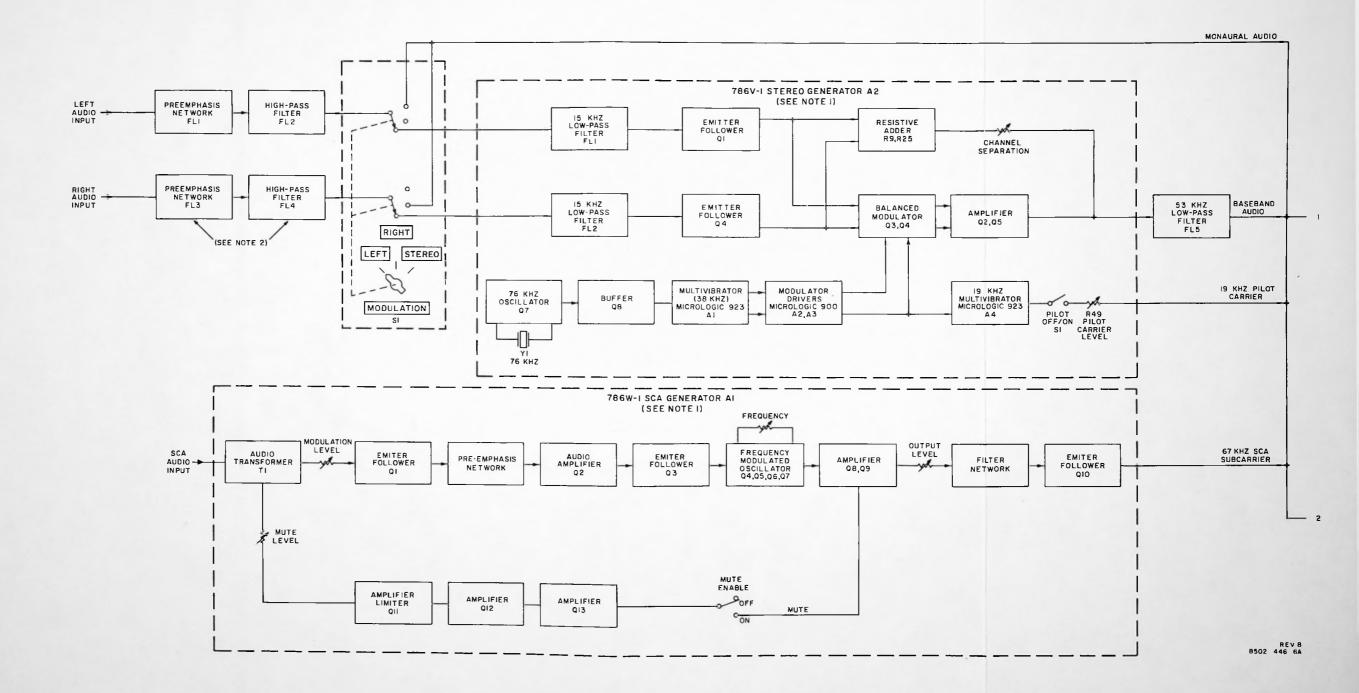


Figure 7-1. 310Z-1 FM Broadcast Exciter, Detail Block Diagram (Sheet 1 of 2).

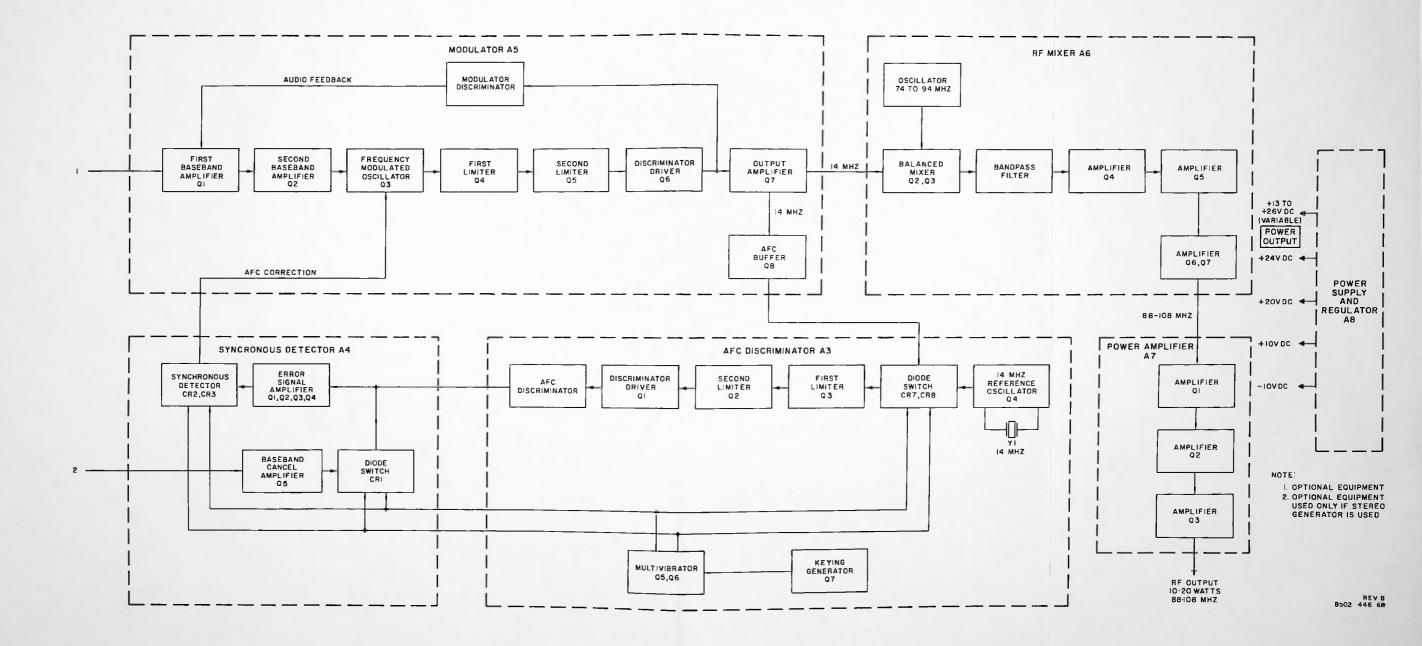


Figure 7-1. 310Z-1 FM Broadcast Exciter, Detail Block Diagram (Sheet 2 of 2).

7-5/7-6

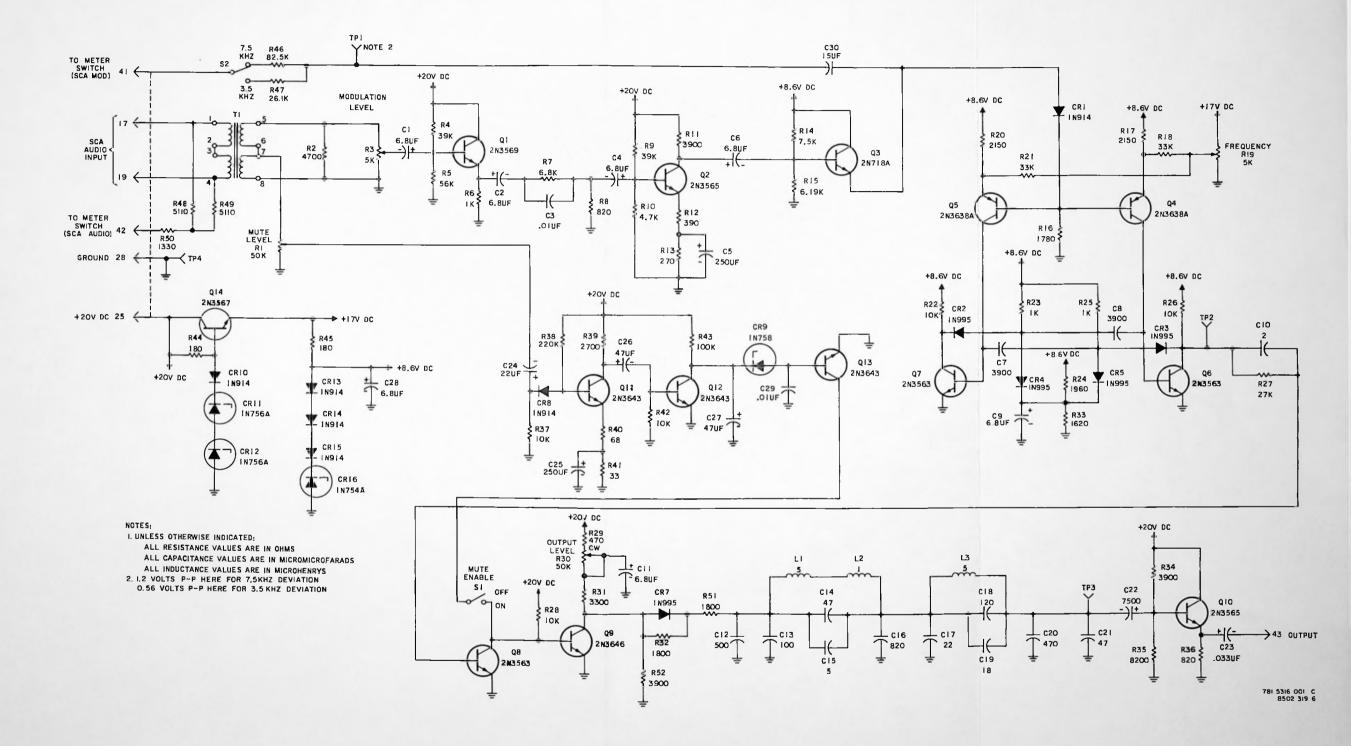
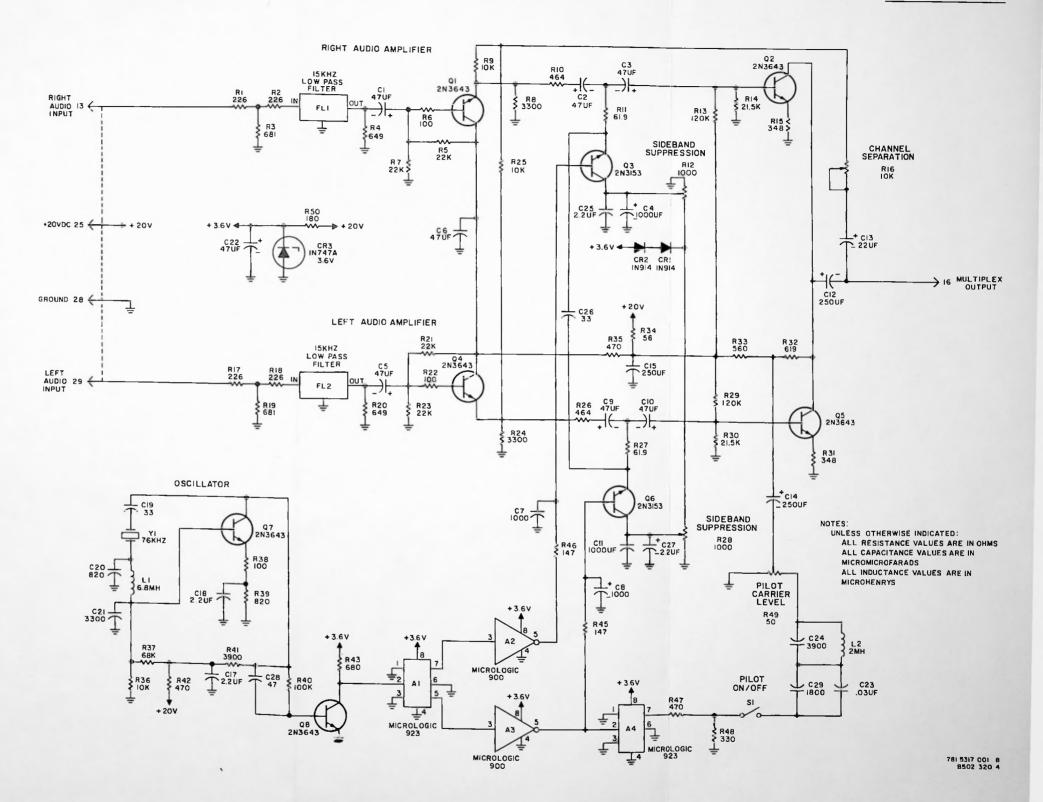


Figure 7-3. 786W-1 SCA Generator (A1), Schematic Diagram.



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Figure 7-4. 786V-1 Stereo Generator (A2), Schematic Diagram.

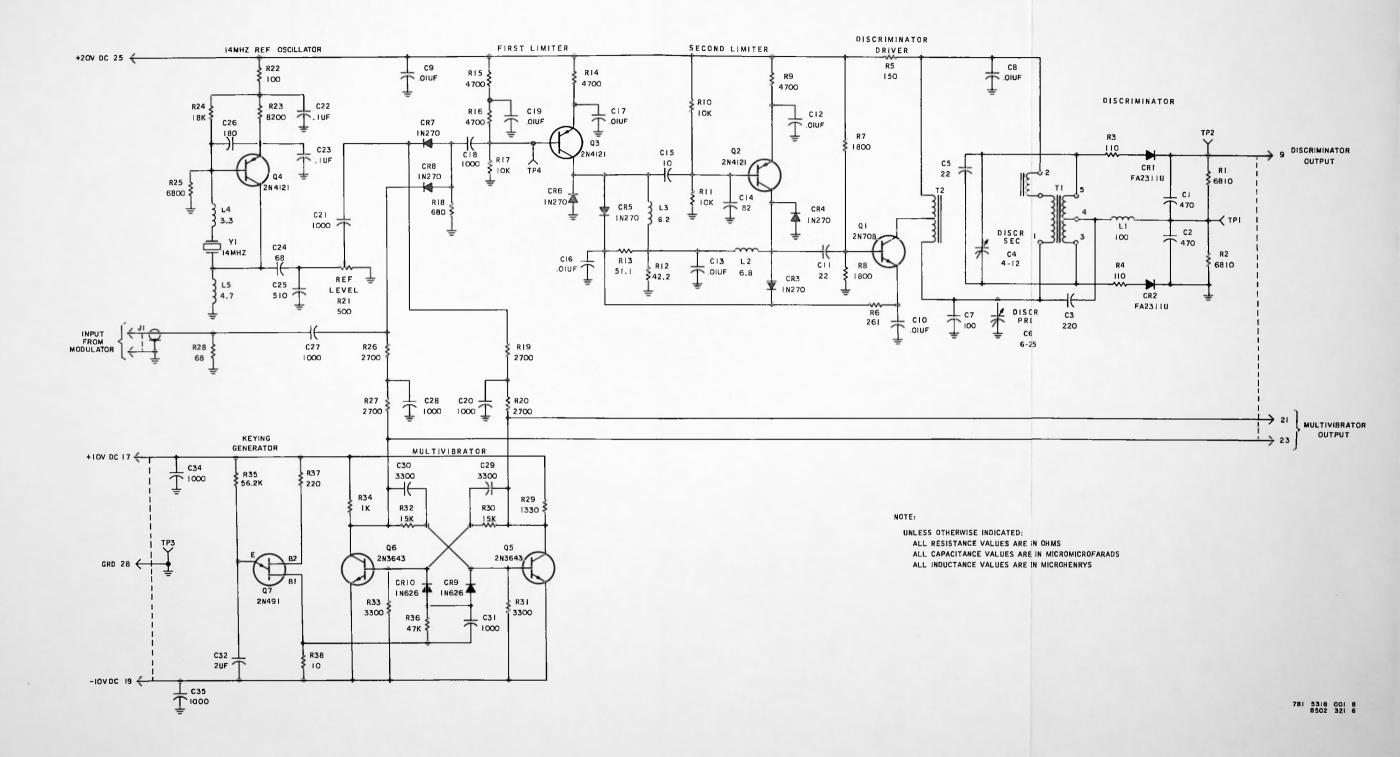


Figure 7-5. AFC Discriminator (A3), Schematic Diagram.

7-13/7-14

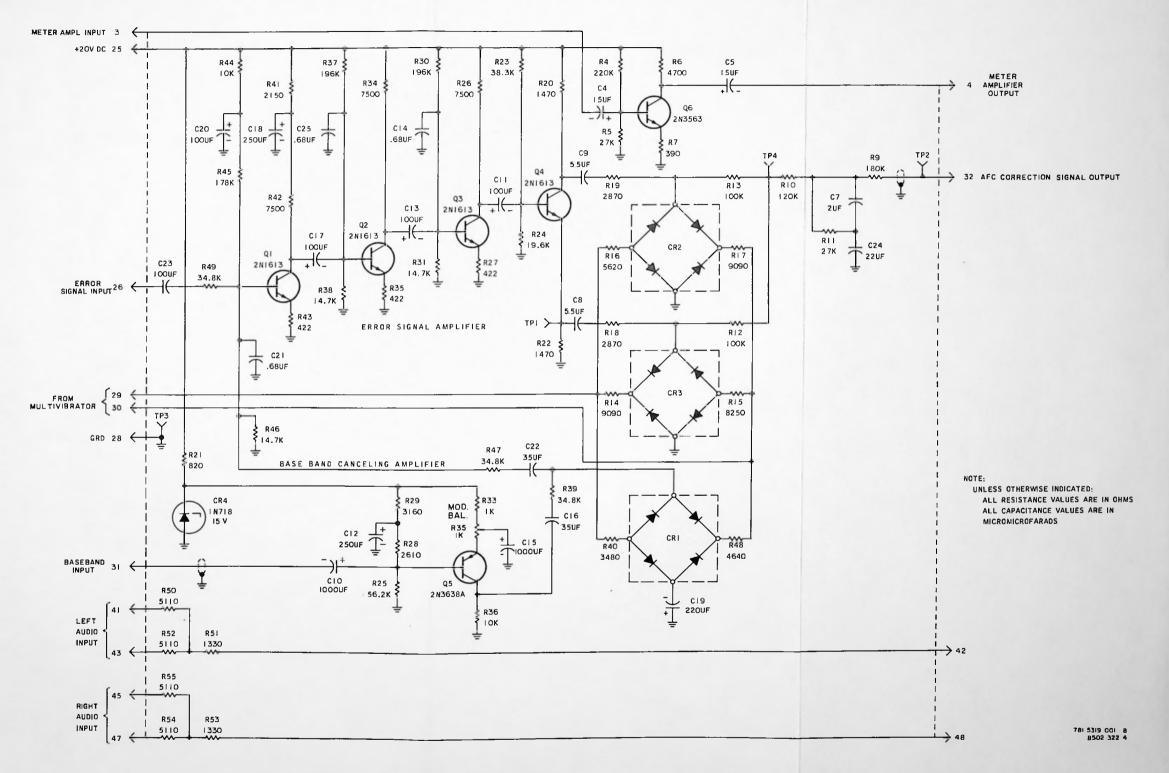
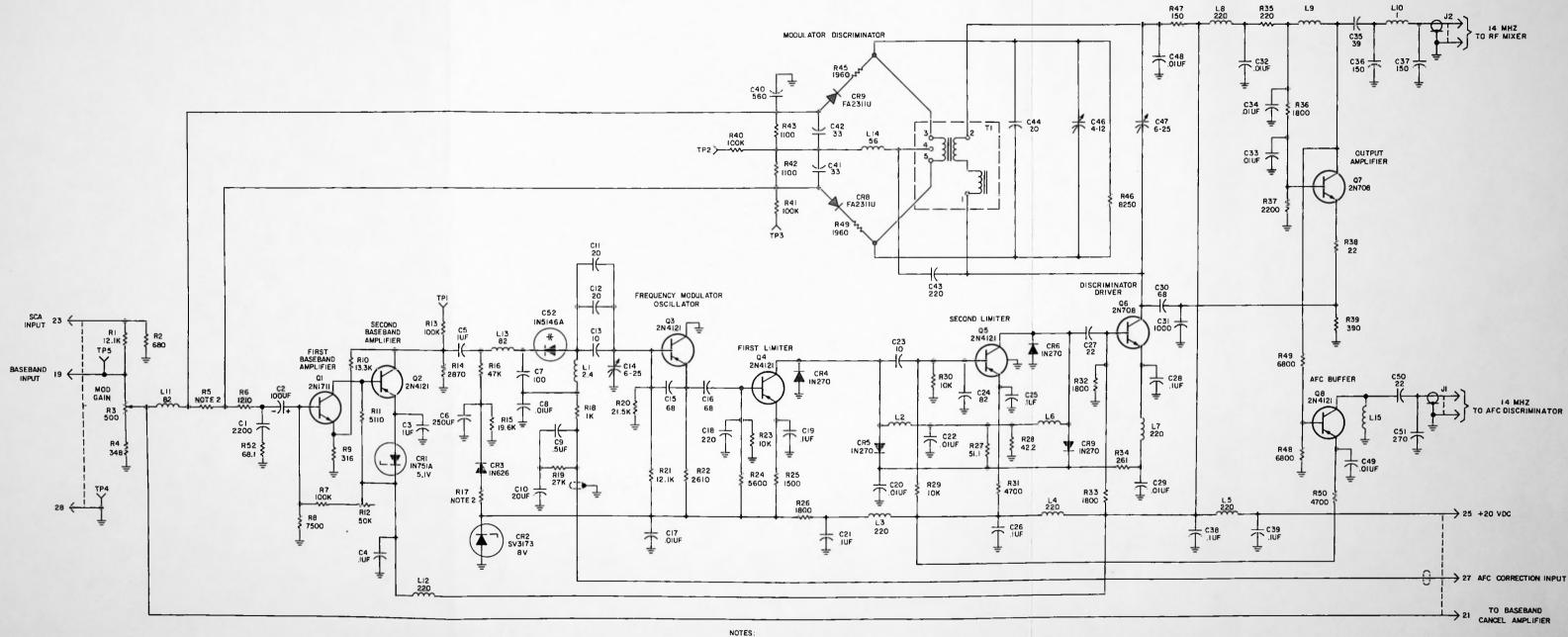


Figure 7-6. AFC Synchronous Detector (A4), Schematic Diagram.



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I UNLESS OTHERWISE INDICATED:

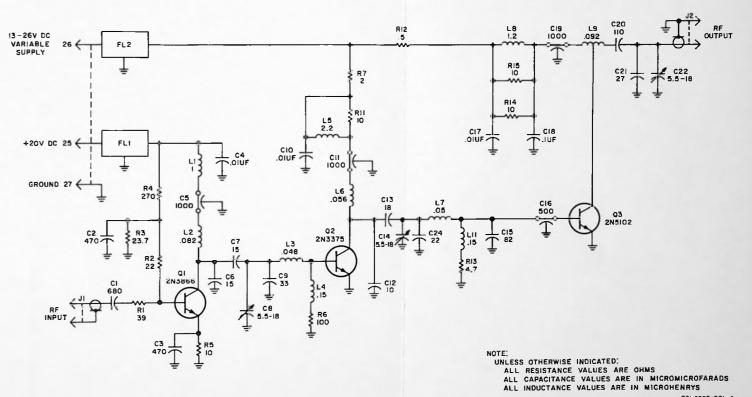
ALL RESISTANCE VALUES ARE IN OHMS ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS

ALL INDUCTANCE VALUES ARE IN MICROHENRYS

2. SELECTED IN PRODUCTION

781 5320 001 B 8502 323 6

Figure 7-7. FM Modulator (A5), Schematic Diagram.



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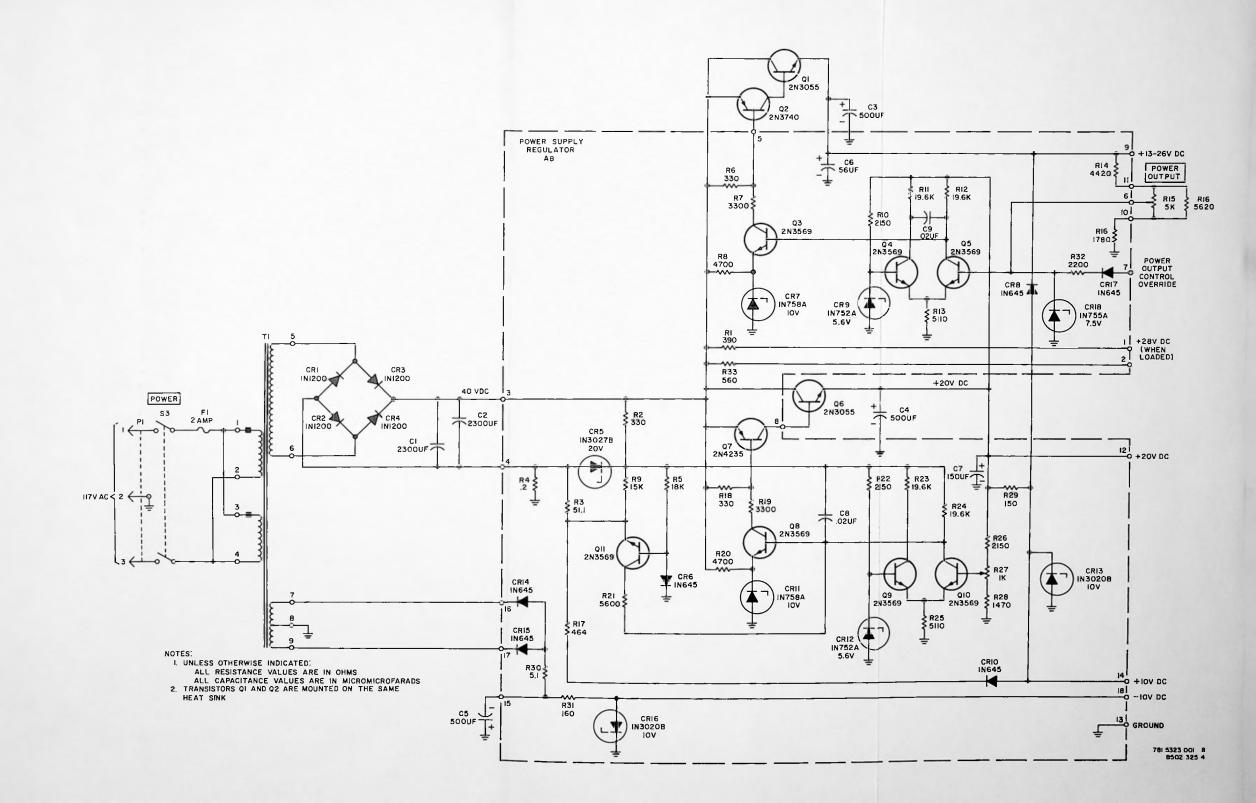
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4

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781 5322 001 A 8502 324 4

Figure 7-9. Power Amplifier (A7), Schematic Diagram.



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Figure 7-10. Power Supply (A8), Schematic Diagram.

