Pub. 246

TECHNICAL MANUAL
FOR
EXCITER T-827A/URT

ELETTRONICA MERIDIONALE

ELMER SpA

POMEZIA - ITALY

ELMER S.P.A.	PUB. 246 - TECHNICAL MANUAL FOR EXCITER T-827A/URT

ERRATA CORRIGE

Page	Row	from	to
1.7	1 from top	T-827/URT-MM	T-827A/URT
1.22	2 from bottom	3	2
3.15	5 " "	FKS	FSK
4.9	11 from top	compris	comprise
4.9	10 from bottom	R-1051/URR-MM	R-1051A/URR
4.27	2 from top	Preferences	References
4.27	9 " "	Temperature	Oven
4.27	9 " "	Control/circuit	Control/Buffer Amplifier circuit
4.31	2 from bottom	metrix 430/1	Metrix 430/C
4.31	1 " "	RG	RF
4.112	5 " "	C99	C49
4.115	11 from top	gage	gate
4.131	3 " "	of 100	of a 100
4.131	8 " "	banda	band
4.131	18 from bottom	by setting	by the setting
4.131	8 " "	R)	R4
4.170	8 " "	devepoled	developed
4.238	8 from top	+20Vdc 15	+20Vdc is
5.20	2 " "	from	out from
5.21	7 " "	(fig. 5.1.5)	(fig. 5.15)
5.65	Title Fig. 5.9	100 KC	100 Hz
5.250	5 from top	on page	on page 5.262
5.263	8 from bottom	6 h 40'	4 h 20'
5.263	7 " "	4 hrs	1 hrs
5.277	9 " "	from Radio Set Control	disregard
5.277	3 " "	from Radio Set Control	disregard
6.2	2 " "	(.............)	disregard

TABLE OF CONTENTS

SECTION 1 - GENERAL INFORMATION

SECTION 2 - INSTALLATION

SECTION 3 - OPERATION

SECTION 4 - TROUBLE SHOOTING

Pub. 246
December 1967
ORIGINAL

Pub. 246
December 1967
ORIGINAL

SECTION 5 - MAINTENANCE

SECTION 6 - PARTS LIST

LIST OF ILLUSTRATION

SECTION 1 - GENERAL INFORMATION

SECTION 2 - INSTALLATION

SECTION 3 - OPERATION

SECTION 4 - TROUBLE SHOOTING

Pub. 246
December 1967
ORIGINAL

Pub. 246
December 1967
ORIGINAL

SECTION 5 - MAINTENANCE

Pub. 246
December 1967
ORIGINAL

Pub. 246
December 1967
ORIGINAL

Pub. 246
December 1967
ORIGINAL

Pub. 246
December 1967
ORIGINAL

LIST OF TABLES

SECTION 1 - GENERAL INFORMATION

SECTION 3 - OPERATION

SECTION 4 - TROUBLE SHOOTING

SECTION 5 - MAINTENANCE

SECTION 1

GENERAL INFORMATION

1.1 - SCOPE

This Technical Manual describes Exciter T-827A/URT and covers installation, operating procedures, troubleshooting procedures, maintenance procedures and a parts list for this equipment.

1.2 - GENERAL DESCRIPTION

The Exciter T-827A/URT (Fig. 1.1) is a digitally tuned, single sideband (SSB) transmitter capable of transmitting on any one of 280.000 frequencies, spaced in 0.1 kilocycle (kc) increments, in the 2.0 to 29.9999-megacycle (mc) frequency range.

The T-827A/URT is capable of transmitting upper sideband (USB), lower sideband (LSB), continuous wave (CW), compatible amplitude modulated (compatible AM), frequency shift keyed (FSK), and independent sideband (ISB) signals.

The ISB mode of operation allows two different types of intelligence to be transmitted simultaneously.

The FSK mode is obtained by using suitable ancillary teletypewriter equipment.

Tone modulated continuous wave (MCW) and facsimile transmissions may also be made with the T-827A/URT.

The T-827A/URT is a low level transmitter, which produces a nominal

0.1 watt rf output, making it capable of driving a power amplifier such as the AM-3007/URT. In fig.1.2 a typical installation of the T-827A/URT in a 100W Receiver-Transmitter set is shown.

All circuits of the T-827A/URT (except two rf amplifier stages) use solid-state devices. These circuits are assembled into plug-in electronic assemblies (modules).

The frequency generation circuits, which are referenced to an ultra-stable master frequency standard with a stability better than 1 part in 10^8 per day provide an extremely stable transmitter output.

The T-827A/URT is housed in a metal case.

The front panel is secured to the case by six (6) captive screws.

The chassis is mounted to the case on two (2) roller-type slides (one on each side) to facilitate withdrawal from the case. When fully extended from the case, the chassis may be tilted upward 90 degrees for inspection on servicing.
All operating controls and indicators are mounted on the front panel. Handles, one on each side, are secured to the front panel to facilitate the withdrawal of the chassis from the case and for transporting the equipment.

The top side of the chassis contains the plug-in electronic assemblies, the bottom side the chain mechanism for tuning and the power supply (see fig.1.3, 1.4).

The T-727A/URT is intended primarily for use as a driver for a linear radio frequency power amplifier for ship and shore installations.

The T-827A/URT may be mounted in a standard 19-inch rack or may be stack mounted with other equipment. For shipboard installations, the T-827/URT-MM must be provided with appropriate shock and vibration isolation mounting.

1.3 REFERENCE DESIGNATIONS

Table 1-1 lists the reference designations for all electronic assemblies and subassemblies contained in the T-827A/URT. The layout of modular assemblies on the chassis is reported in fig.1.3. Fig.1.5 is a split-down diagram of all the component parts of the T-827A/URT Exciter.

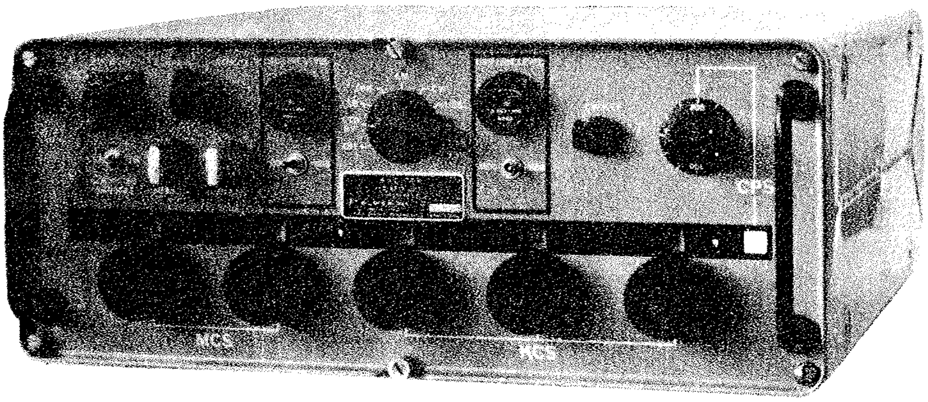


Figure 1-1. Radio Transmitter T-827A/URT. Overal View

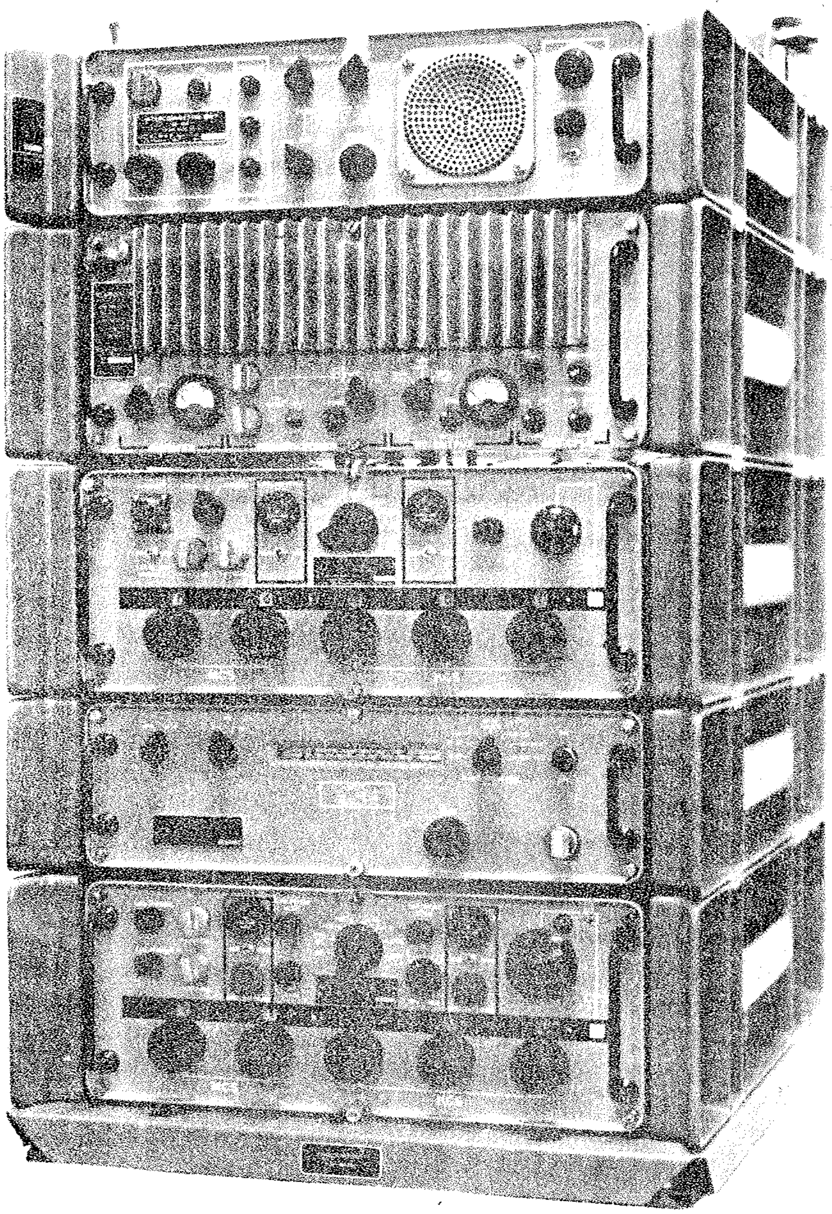


Fig. 1.2 - TYPICAL INSTALLATION IN RECEIVE-TRANSMITTER SET

1.4 - DESCRIPTION OF T-827/URT-MM

FUNCTION. The function of the T-827A/URT is to provide a USB, ISB, LSB, CW, FSK, or compatible AM rf signal of sufficient power to drive a power amplifier such as the AM-3007/URT. The operating frequency range of the T-827A/URT is from 2.0 to 29.9999 mc.

1.5 - REFERENCE DATA

The following data are the electrical characteristics of the T-827A /URT:

Frequency range:	2 ÷ 30 Mc/s
Tuning:	Digital in 0,1 Kc/s increments locked to Frequency Standard 280.000 channels
Modes:	USB, LSB, ISB, CW, FSK, Compatible AM, ISB/FSK
Frequency stability:	1 part in 10^8 per day
RF output:	100 milliwatts nominal, 250 milliwatts maximum into 50 ohms load
Output impedance:	50 ohms nominal
Carrier suppression:	Better than 50 db
Undesired sideband suppression:	Better than 50 db
Intermodulation:	Better than 40 db with respect to one tone
Audio input level:	200 mV nominal, into 600 ohm balanced line
Frequency response:	± 3 db from 300 to 3500 c/s
Audio compression:	Audio input of + 20 db above nominal shall not create undue distortion

Internal FSK:	± 425 c/s shift at center frequency of 2000 c/s or 2550 c/s
Power input:	115 Vac ± 10%, single phase; 48 to 450 c/s, 65 watts
Environmental conditions:	Per MIL-E-16400
Size:	Height: 7" Width: 17-3/8" Depth: 18-7/8"
Weight:	70 pounds.

1.6 - CRYSTAL TUBE AND TRANSISTOR COMPLEMENT

Tables 1-2, 1-3 and 1-4 list the crystal, the tube, transistor and diode complement of the T-827A/URT.

1.7 - EQUIPMENT SUPPLIED

The equipment supplied with the T-827A/URT is listed in table 1.5.

1.8 - EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED

The equipment and publications required but not supplied with the T-827A/URT are listed in table 1.6.

1.9 - EXTENDER TEST CABLE DATA

Table 1-7 is a list of pertinent extender test cable data for the T-827A/URT.

1.10 - PREPARATION FOR RESHIPMENT

To prepare the T-827A/URT for reshipment proceed as follows:

A) Ensure that all electronic assemblies are firmly seated.
Ensure that all vacuum tubes are mounted properly using vibration-proof shields provided.

B) Set Mode Selector switch at OFF.

C) For reshipment, use containers and packing materials similar to those originally used to ship the unit.

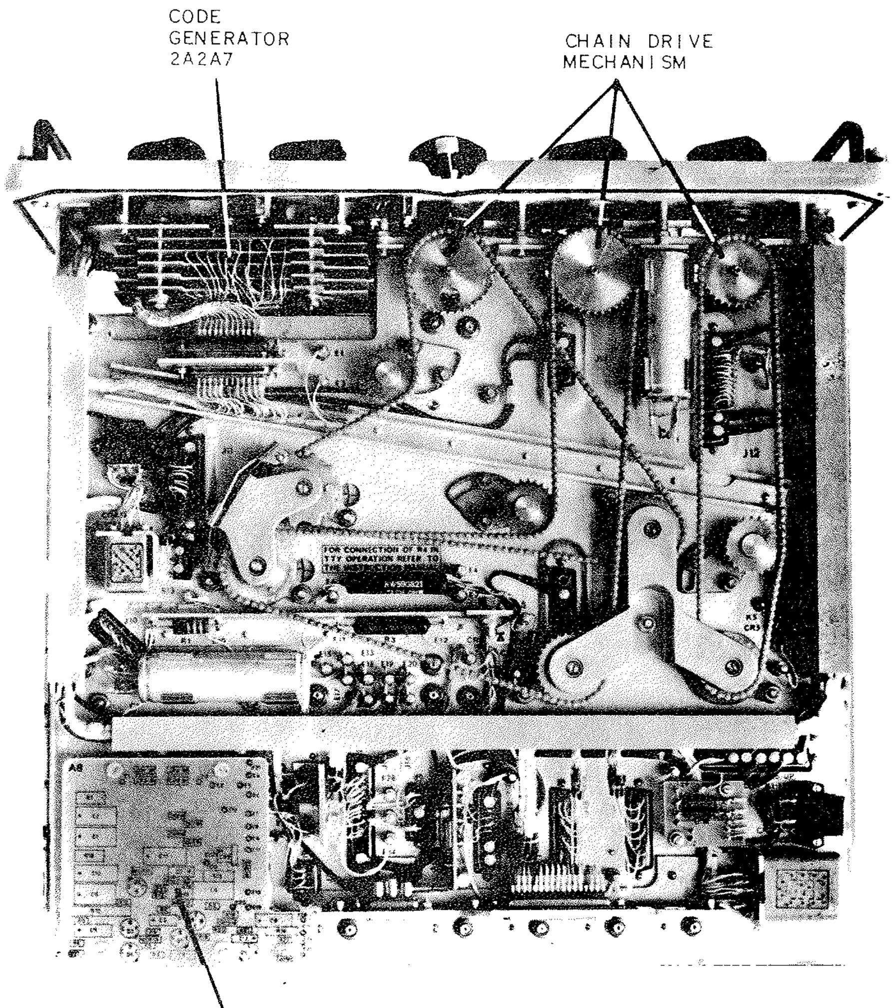


Figure 1-4. Radio Transmitter T-827A/URT, Bottom View, Case Removed

Table 1.1

RADIO TRANSMITTER T-827A/URT

REFERENCE DESIGNATIONS

ELECTRONIC ASSEMBLY OR SUBASSEMBLY	DESIGNATIONS
Case	2A1
Chassis and Front Panel	2A2
Transmitter Mode Selector	2A2A1
Transmitter Audio Amplifier	2A2A2
Transmitter Audio Amplifier	2A2A3
RF Amplifier	2A2A4
Frequency Standard	2A2A5
Translator/Synthesizer	2A2A6
MC Synthesizer	2A2A6A1
100 KC Synthesizer	2A2A6A2
1 and 10 KC Synthesizer	2A2A6A3
100 CPS Synthesizer	2A2A6A4
Spectrum Generator	2A2A6A5
RF Translator	2A2A6A6
Code Generator	2A2A7
Power Supply	2A2A8
FSK Tone Generator	2A2A9
Transmitter IF. Amplifier	2A2A12

Table 1.2

RADIO TRANSMITTER T-827A/URT

CRYSTAL COMPLEMENT

REF DESIG	TYPE OF CUT	CRYSTAL OSC FREQ (MC)	OPERATING TEMP RANGE	TOLERANCE (PERCENT)
A2A5A3Y1	AT	5.000000	84.5°C to 85.5°C	0.001
A2A6A1Y1	AT	2.498850	0°C to 75°C	0.003
A2A6A1Y2	AT	3.499720	0°C to 75°C	0.003
A2A6A1Y3	AT	4.499640	0°C to 75°C	0.003
A2A6A1Y4	AT	5.499640	0°C to 75°C	0.003
A2A6A1Y5	AT	7.499400	0°C to 75°C	0.003
A2A6A1Y6	AT	8.499320	0°C to 75°C	0.003
A2A6A1Y7	AT	9.499160	0°C to 75°C	0.003
A2A6A1Y8	AT	10.499160	0°C to 75°C	0.003
A2A6A1Y9	AT	11.499080	0°C to 75°C	0.003
A2A6A1Y10	AT	12.499000	0°C to 75°C	0.003
A2A6A1Y11	AT	14.498840	0°C to 75°C	0.003
A2A6A1Y12	AT	15.498760	0°C to 75°C	0.003
A2A6A1Y13	AT	16.498690	0°C to 75°C	0.003
A2A6A1Y14	AT	17.498600	0°C to 75°C	0.003
A2A6A1Y15	AT	18.498440	0°C to 75°C	0.003
A2A6A1Y16	AT	20.498360	0°C to 75°C	0.003
A2A6A1Y17	AT	23.498120	0°C to 75°C	0.003
A2A6A2Y1	AT	4.553	0°C to 75°C	0.003
A2A6A2Y2	AT	4.653	0°C to 75°C	0.003
A2A6A2Y3	AT	4.753	0°C to 75°C	0.003
A2A6A2Y4	AT	4.853	0°C to 75°C	0.003

(see next page)

Table 1.2 (Continued)

REF DESIG	TYPE OF CUT	CRYSTAL OSC FREQ (MC)	OPERATING TEMP RANGE	TOLERANCE (PERCENT)
A2A6A2Y5	AT	4.953	0°C to 75°C	0.003
A2A6A2Y6	AT	5.053	0°C to 75°C	0.003
A2A6A2Y7	AT	5.153	0°C to 75°C	0.003
A2A6A2Y8	AT	5.253	0°C to 75°C	0.003
A2A6A2Y9	AT	5.353	0°C to 75°C	0.003
A2A6A2Y10	AT	5.453	0°C to 75°C	0.003
A2A6A3Y1	AT	5.25	0°C to 75°C	0.003
A2A6A3Y2	AT	5.24	0°C to 75°C	0.003
A2A6A3Y3	AT	5.23	0°C to 75°C	0.003
A2A6A3Y4	AT	5.22	0°C to 75°C	0.003
A2A6A3Y5	AT	5.21	0°C to 75°C	0.003
A2A6A3Y6	AT	5.20	0°C to 75°C	0.003
A2A6A3Y7	AT	5.19	0°C to 75°C	0.003
A2A6A3Y8	AT	5.18	0°C to 75°C	0.003
A2A6A3Y9	AT	5.17	0°C to 75°C	0.003
A2A6A3Y10	AT	5.16	0°C to 75°C	0.003
A2A6A3Y11	AT	1.850	0°C to 75°C	0.003
A2A6A3Y12	AT	1.851	0°C to 75°C	0.003
A2A6A3Y13	AT	1.852	0°C to 75°C	0.003
A2A6A3Y14	AT	1.853	0°C to 75°C	0.003
A2A6A3Y15	AT	1.854	0°C to 75°C	0.003
A2A6A3Y16	AT	1.855	0°C to 75°C	0.003
A2A6A3Y17	AT	1.856	0°C to 75°C	0.003
A2A6A3Y18	AT	1.857	0°C to 75°C	0.003
A2A6A3Y19	AT	1.858	0°C to 75°C	0.003
A2A6A3Y20	AT	1.859	0°C to 75°C	0.003

Table 1.4

RADIO TRANSMITTER T-827A/URT

EQUIPMENT SUPPLIED

Q.TY	NAME	DESCRIPTION
1	Exciter T-827A/URT	T-827A/URT
3	Technical manual for Exciter T-827A/URT	Pub. 246

Table 1.5

EXCITER T-827A/URT

EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED

Q.TY	NAME	DESCRIPTION	REQUIRED USE	EQUIPMENTS CHARACTERISTICS
1	Shockmount	Elmer Dwg.1-01-06696	Shock and vibration dampening	
1	Mounting bracket	Elmer Dwg.2-12-06707	Mounting of the T-827A/URT to the shockmount or to other equipment	
1	Set of extension cables	W1 W2 W3	Connection between pluginassemblies and chassis	
1	Key		Local keying of the T-827A/URT	
1	Handset	H-169/U	Application of the audio signal to the Exciter	
1	Spectrum Analyzer	Panalyzor, Singer Mod. SB 12 BS or equiv.	Trouble shooting and maintenance procedures	Frequency range 100 c/s to 40Mc/s Resolution 10c/s to 1.8 Kc/s Sweep time 0.1÷30 sec Spectrum bandwidth 0÷100 kc/s 0÷2 kc/s with AFC

(see next page)

Table 1.5 (Continued)

Q.TY	NAME	DESCRIPTION	REQUIRED USE	EQUIPMENT CHARACTERISTICS
1	Oscilloscope	Tektronix, Mod. 546 or equiv.	Trouble shooting and maintenance procedures	Frequency: Dc to 50 mc Input impedance: 15 pF Sensitivity: 5 m V/cm to 20 V/cm
1	Frequency meter	HP, Mod. 5245-L (with plug-in Mod. HP Mod. 5261A or equiv.	Trouble shooting and maintenance procedures	Frequency range: 10c/s to 50 mc/s Accuracy: $\pm 3 \cdot 10^9$ Output frequency: 0.1c/s÷10MHz in decade steps
1	Multimeter	Metrix, Mod. 430/C or equiv.	Trouble snooting and maintenance procedures	Sensitivity: DC: 20000 ohm/V AC: 20000 ohm/V Accuracy DC: 20000 ohm/V AC: 20000 ohm/V
1	Frequency Standard	Motorola, Mod. S-1055A or equiv.	Trouble shooting and maintenance procedures	Outputs: 100 Kc/s, 5 Mc/s and 12 Kc/s Stability: $1/10^9$
1	Audio Signal Generator	HP, Mod. 200-CD or equiv.	Trouble shooting and maintenance procedures	Frequency range: 5 c/s to 600 Kc/s Accuracy: ± 2%

(see next page)

Table 1.5 (Continued)

Q.TY	NAME	DESCRIPTION	REQUIRED USE	EQUIPMENT CHARACTERISTICS
1	RF Voltmeter	Boonton, Mod. 91-H or equiv.	Trouble shooting and maintenance procedures	Input impedance: 20000 ohms/V at 500 Kc/s Voltage range: 1 mV to 3 V f.s. Frequency range: 20 Kc/s to 1200 Mc/s Accuracy: ± 3%
1	Power Supply	Elmer, Mod. SP-110 or equiv.	Trouble shooting and maintenance procedures	Output voltage: 0 to 400 Vdc Output current: 0 to 100 mA Power requirements: 220 Vca, 50 ÷ 60 c/s
1	RF signal Generator	HP, Mod. 606-A or equiv.	Trouble shooting and maintenance procedures	Frequency range: 50 kHz ÷ 65 Mc/s Frequency stability: 0.005% Output impedance: 50 ohms Output level: 0.1 μV to 3 V

(see next page)

Table 1.5 (Continued)

Q.TY	NAME	DESCRIPTION	REQUIRED USE	EQUIPMENT CHARACTERISTICS
1	Power Supply	Trygon, Mod. HR4 5B or equiv.	Trouble shooting and maintenance procedures	Output voltage: 0 to 40 Vdc Output current: 0 to 5 A Stability: ± 0.05% Power requirements: 105 ÷ 125 Vac 50 ÷ 60 c/s 200 ÷ 240 Vac 50 ÷ 60 c/s
1	Voltmeter	Bruel & Kjaer, Mod. 2006 or equiv.	Trouble shooting and maintenance procedures	Frequency range: 100 Kc/s to 230 Mc/s Voltage range: 50 μV to 50 V

Table 1.6

RADIO TRANSMITTER T-827A/URT

EXTENDER TEST CABLE DATA

REF DESIG	NAME	MATES WITH
W1	Cable Assembly	P2 on Mode Selector Electronic Assembly 2A2A1
W2	Cable Assembly	P1 on If. Amplifier Electronic Assembly 2A2A12
W7	Cable Assembly	P1 on Mode Selector Electronic Assembly 2A2A1

SECTION 2

INSTALLATION

2.1 - UNPACKING AND HANDLING

Caution must be taken when removing T-827A/URT from its packing container to prevent damage to the controls and connectors. Since the transmitter is an accurately calibrated precision equipment, rough handling must be avoided.

Aside from this, no special procedures need be followed when unpacking the transmitter.

2.2 - POWER REQUIREMENTS

The T-827A/URT is designed to operate from a nominal 115-vac, single phase, 48 to 450 cps. Power consumption is approx. 65 W.

2.3 - SITE SELECTION

In selecting an installation site, adequate consideration must be given to the space requirements.

This requirement will include space for servicing the slide-mounted equipment when extended from the case, shockmount deflection (when shockmounts are used), and cable bends, as well asconsiderations of proximity to associated equipment.

See figure 2.1 for the dimensions of the T-827A/URT.

2.4 - INSTALLATION REQUIREMENTS

The following factors should be considered when determining the proper location of the T-827A/URT:

a) Best operating conditions.

b) Ease of maintenance, adjustment of equipment, and replacement and repair of defective parts or complete units.

c) Possibility of interaction between units and other electronic equipment in the vicinity.

d) Critical and minimum cable length requirements.

e) Adequate heat dissipation.

f) Availability of an adequate ground.

2.5 - INSTALLATION

The T-827A/URT may be stack mounted with its associated RF power amplifier, using proper shock and vibration isolation for shipboard installations or mounted in a standard 19-inch rack.

Refer to the installation section in the technical manual for the associated RF power amplifier for stack mounting and shock isolation requirements. Adapter plates are used for mounting the T-827A/URT in a standard 19-inch rack.

For all required installation dimensions, see figure 2.1. For fabrication of the rack mounting adapter plates, see figure 2-2 for dimensional requirements.

Dimensional requirements for mounting brackets, which can be used for stack mounting with associated equipment on a shockmount, or for bolting to any horizontal surface, are shown in figure 2.3.

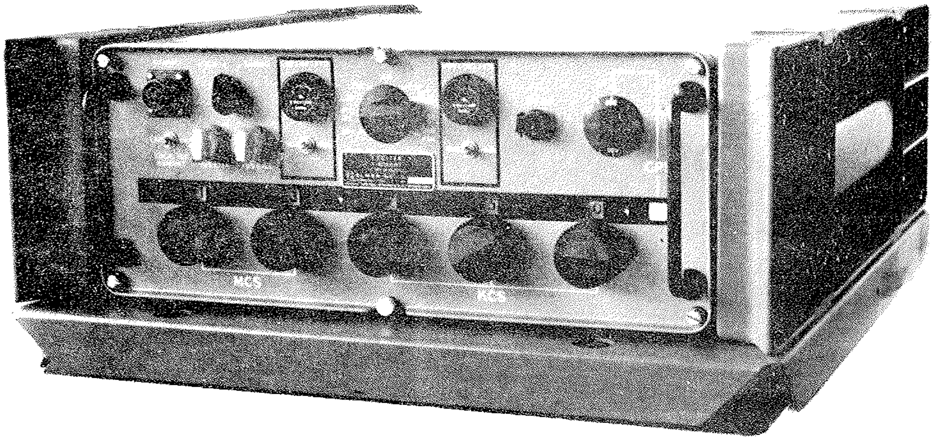


Figure 2-3. Radio Transmitter T-827A/URT, Schockmount Installation

WARNING

To avoid injury to personnel, do not overstress mounting bolts, since shock may cause them to shear.

2.6 - INTERCONNECTION

All connections are made at the rear of the T-827A/URT (Fig.2.4), with the exception of the local handset and the local CW key (if used). The handset is connected to the HANDSET connector on the front panel, and the CW key is connected to the CW KEY connector, also on the front panel.

If the T-827A/URT Exciter is installed as a single unit, make all connections as indicated in Fig. 2.5.

If the T-827A/URT is to be used in a SRT-100 Set or SRT-1.000 Set and so on, refer to the Technical Manual for the Set for interconnection instructions.

The T-827A/URT is shipped by the manufacturer with the internal frequency standard set at INT. If the setting has been changed subsequent to receipt from the manufacturer, and if the internal frequency standard of the T-827A/URT is to be used, proceed as follows:

a) Loosen front panel screws and slide chassis out from the case;

b) Set switch S1 (EXT/INT/COMP) on top of Frequency Standard Electronic Assembly at INT. This electronic assembly is located at right rear of chassis.

c) Slide chassis back into case and secure it.

If it is required to use the output from T-827A/URT internal Frequency Standard Electronic Assembly to operate another unit, proceed as follows:

a) Loosen the front panel screws and slide the T-827A/URT chassis out from the case;

b) Set switch S1 (EXT/INT/COMP) on top of the Frequency Standard Electronic Assembly at COMP. This electronic assembly is located at the right rear of the chassis;

c) Slide chassis back into case and secure it;

d) Connect cable between connector J24 (INT 5 Mc/s OUT) on the rear of the T-827A/URT and the frequency standard input connector of the other unit.

If it is required to use an external frequency for calibration of the T-827A/URT proceed as follows:

a) Connect the output of the external standard frequency generation to J25 (5 Mc/s EXT IN) on the rear of the T-827A/URT Exciter;

b) Loosen front panel screws and slide chassis out from the case;

c) Set switch S1 (COMP/INT/EXT) on the top of the Frequency Standard Assembly at EXT;

d) Slide chassis back into case and fasten front panel screws.

2.7 - INSPECTION AND ADJUSTMENT

A) Inspection

The T-827A/URT should be carefully checked for damage to indicators and switches and for loose hardware and knobs.

Make sure that all electronic assemblies are firmly seated and that tubes are properly secured in tube sockets.

Check connectors for dirt, damage to pins, and broken insulators.

Replace or repair as necessary.

B) Adjustment

The T-827A/URT must be installed as part of a system.

Refer to the system technical manual for post installation checkout procedure to ensure proper operation of the T-827A/URT.

Should any adjustments be found necessary, refer to the applicable procedures in Section 5 of this manual.

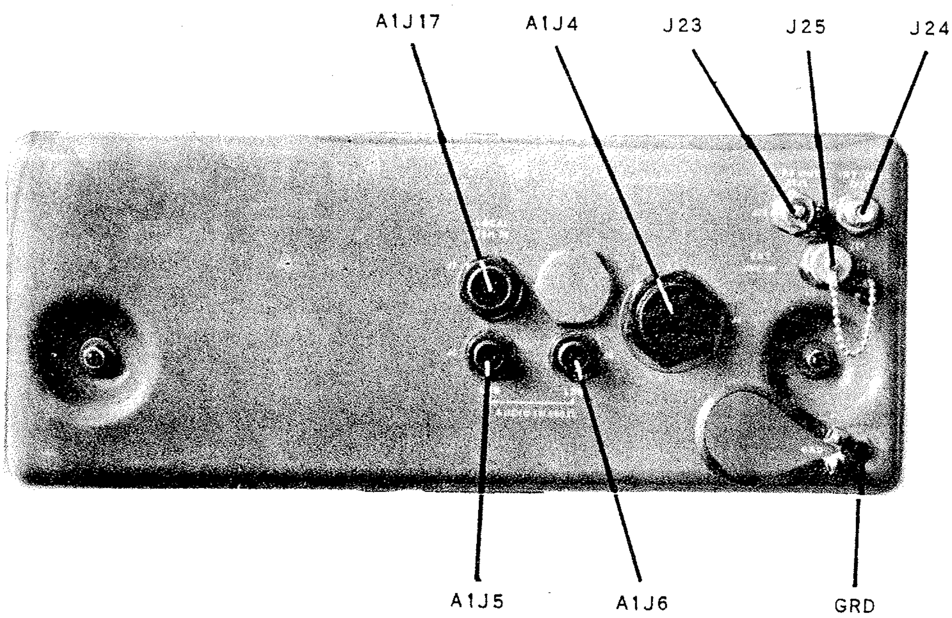


Figure 2-4. Radio Transmitter T-827A/URT, Rear View

Check that all cables are properly connected and that all fuses are in place.

2.8 - PERFORMANCE CHECKS

Perform the applicable operating procedures described in Section 3 to ensure proper installation.

2.9 - INTERFERENCE REDUCTION

As a precaution against interference, operate the T-827A/URT chassis and panel bolted securely to its case.

Check that proper ground connections have been made.

SECTION 3

OPERATION

3.1 - FUNCTIONAL OPERATION

3.1.1 - General

Exciter T-827A/URT is designed to provide upper sideband (USB), lower sideband (LSB), continuous wave (CW), compatible amplitude modulated (compatible AM), and frequency shift keyed (FSK) signals in the 2.0 to 29.999-megacycle (MC) frequency range. Nominal output level is 100 m W.

3.1.2 - Operation

Audio signals from the handset are applied to the Audio Amplifier Electronic Assembly in the T-827A/URT. The signals are amplified and coupled to the balanced modulator in the Mode Selector Electronic Assembly, where the audio signal is translated into an if. signal.

When compatible AM or CW transmission is used, the carrier is reinserted into the signal path in the IF. Amplifier Electronic Assembly.

The output from the IF. Amplifier Electronic Assembly is applied to the RF Translator Electronic Assembly, where it is translated to the desired rf output by mixing it with three injection frequencies in a triple conversion process.

The RF Amplifier Electronic Assembly, which provides the final stages of the transmitter, is digitally tuned and provides a nominal 100 m W output to the associated rf power amplifier.

When FSK transmission is used, the FSK Tone Generator Electronic Assembly is turned on.

Loop current from the ancillary teletypewriter (TTY) equipment produces a frequency shift output, which is centered on one of two selectable center frequencies, depending on the ancillary equipment used.

The output is applied to the USB Audio Amplifier Electronic Assembly, and from that point, the process is the same as described above.

The T-827A/URT is tuned by setting the MCS and KCS controls and the CPS switch on the front panel at the desired frequency.

An internal power supply converts the nominal 115 vac input to the necessary dc operating voltages.

3.2 - OPERATING PROCEDURE

When the T-827A/URT is to be used as part of SRT-100, SRT-1000, ST-1000 Sets, refer to Technical Manual for the Set.

3.2.1 - Description of operating controls, indicators and connectors

All controls and indicators required for normal operation of the T-827A/ /URT are located on the front panel (figure 3-1) and are listed in table 3.1.

3.2.2 - Sequence of operation

To operate the T-827A/URT, proceed as follows, using figure 3.1 as a guide:

A) Set transmitter Mode Selector switch (figure 3.1) at STD BY.

Set this switch prior to operation to allow T-827A/URT frequency standard to come up to temperature.

Allow a 20-minute warm-up period for general operation and at least a 60-minute warm-up period for optimum frequency stability.

B) Set Mode Selector switch at USB, LSB, or AM position for voice transmission.

C) Using MCS controls, KCS controls, and CPS switch on front panel of T-827A/URT, select desired operating frequency. Frequency selected will be displayed in the small windows above MCS and KCS controls.

D) Connect handset to HANDSET connector on front panel of T-827A/URT.

E) To transmit, press push-to-talk switch on handset.

F) When operating in the AM comp., FSK and USB modes, set USB/LSB switch at USB, when operating in the LSB modes to LSB.

G) To transmit on CW, set Mode Selector switch at CW. Connect CW key to CW Key jack on front panel of T-827A/URT and press key.

H) To transmit FSK with local teletypewriter equipment, set Mode Selector switch at FSK and connect teletypewriter loop and key lines to LOCAL FSK IN connector (J7) on rear of T-827A/URT case.

When these procedures are completed, proceed as follows:

1) Loosen screws on front panel of T-827A/URT and pull chassis out fully on slides.

2) Set CTR FREQ switch on top of FSK Tone Generator Electronic Assembly at desired center frequency (2000 or 2550 cps). The FSK Tone Generator Electronic Assembly is located just left of center at rear of chassis.

3) Release slide locks, slide chassis back into case, and secure it.

I) To transmit FSK and voice simultaneously, set Mode Selector switch at ISB/FSK. (FSK will be on USB; voice, on LSB). If operating locally, set USB/LSB switch at LSB.

J) To transmit two simultaneous voice or other audio transmissions from a remote location, set Mode Selector switch at ISB. One voice transmission will be on USB; the other voice transmission will be on LSB.

3.2.3 - Shutdown

Shutdown of the T-827A/URT is accomplished as follows:

Set Mode Selector switch at OFF.

3.3 - OPERATOR'S MAINTENANCE

3.3.1 - Operating checks and adjustments

When T-827A/URT is suspected of a malfunction, the operator should perform the following steps to determine the cause of the trouble.

a) Check that T-827A/URT-MCS and KCS controls are set at proper frequency.

b) Check that primary power is applied to unit.

c) Check all fuses; if any are open, associated indicator lamp will light. Replace open fuses.

d) Check all cables for breakage and check connectors for proper locations and proper seating.

e) If operator cannot locate the trouble, refer problem to maintenance personnel.

3.3.2 - Preventive maintenance

Preventive maintenance that can be performed by the operator is listed in table 3.2.

3.3.3 - Emergency maintenance

If the T-827A/URT malfunctions while a technician is not available, the operator should perform the following emergency repair procedures:

a) Try another mode of operation.

b) Perform steps a. through d. of paragraph 3.3.1.

c) Replace any damaged cables.

d) Loosen screws on front panel of the T-827A/URT and pull chassis out from case.

Performe following checks:

1) Check all electronic assemblies for proper seating.

2) Check vacuum tubes to see that filaments are lighted. If tubes in T-827A/URT are to be replaced, remove tube shield and pull tube out with a tube puller, using steady pressure straight up.

The dust cover over the electronic assembly can be removed if necessary.

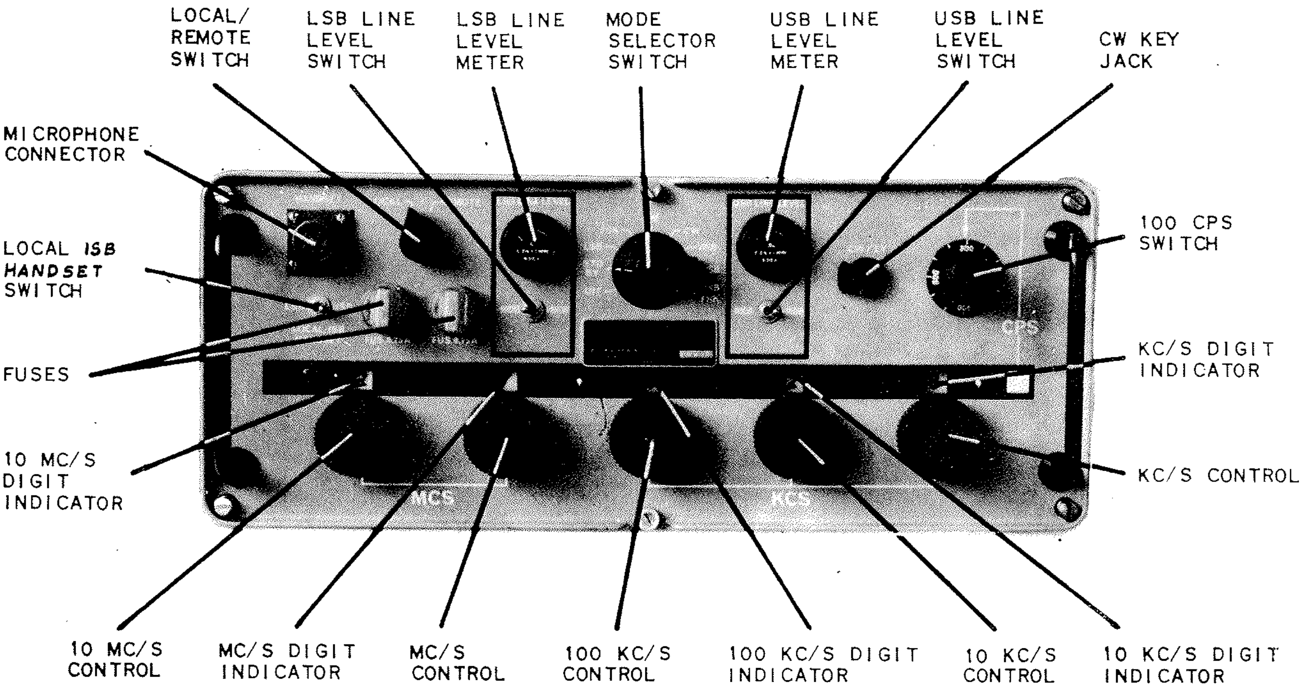


Figure 3-1. Radio Transmitter T-827A/URT
Front View With Control Description

Table 3.1

EXCITER T-827A/URT

OPERATING CONTROLS, INDICATORS AND CONNECTORS

<table>
<tr><th>CONTROL/INDICATOR CONNECTOR</th><th>REF DESIG</th><th colspan="2">FUNCTION</th></tr>
<tr><td rowspan="4">USB/LSB LOCAL ISB HANDSET switch</td><td rowspan="4">S9</td><td colspan="2">Selects channel of handset audio input and output</td></tr>
<tr><td>SWITCH POSITION</td><td>EQUIPMENT RESPONSE</td></tr>
<tr><td>LSB</td><td>Applies handset audio microphone and earphone to LSB channel</td></tr>
<tr><td>USB</td><td>Applies handset audio microphone and earphone to USB channel</td></tr>
<tr><td>HANDSET connector</td><td>J1</td><td colspan="2">Used to connect handset to T-827A/URT</td></tr>
<tr><td>FUSE (with indicator)</td><td>F1, DS1</td><td colspan="2">Protects T-827A/URT against overload; indicator glows when fuse is open</td></tr>
<tr><td>FUSE (with indicator)</td><td>F2, DS2</td><td colspan="2">Protects T-827A/URT against overload; indicator glows when fuse is open</td></tr>
</table>

(see next page)

Table 3.1 (Continued)

CONTROL/INDICATOR CONNECTOR	REF DESIG	FUNCTION	
LOCAL/REMOTE switch	S1	Selects local or remote key and input to T-827A/URT	
		SWITCH POSITION	EQUIPMENT RESPONSE
		LOCAL	T-827A/URT keying and input accomplished locally by operator
		REMOTE	T-827A/URT keying and input accomplished from a remote location
LSB LINE LEVEL switch	S10	Selects range for LSB LINE meter (M1)	
		SWITCH POSITION	EQUIPMENT RESPONSE
		-10 DB	10 db is subtracted from LSB LINE LEVEL meter (M1) indication
		+10 DB	10 db is added to LSB LINE LEVEL meter (M1) indication
LSB LINE LEVEL meter	M1	Indicates LSB audio input line level	

(see next page)

Table 3.1 (Continued)

CONTROL/INDICATOR CONNECTOR	REF DESIG	FUNCTION	
Mode Selector switch	S2	Selects T-827A/URT mode of operation	
		SWITCH POSITION	EQUIPMENT RESPONSE
		OFF	No power is applied
		STD BY	Energizes frequency standard and tube filaments
		LSB	T-827A/URT operates in LSB mode
		FSK	T-827A/URT operates in FSK mode (850 cps shift in USB bandpass)
		AM	T-827A/URT operates in compatible AM mode (USB modulation plus carrier)
		CW	T-827A/URT operates in CW mode. Transmitted frequency is at front panel frequency setting
		USB	T-827A/URT operates in USB mode
		ISB	T-827A/URT operates in ISB mode. Simultaneous transmissions on LSB and USB

(see next page)

Table 3.1 (Continued)

CONTROL/INDICATOR CONNECTOR	REF DESIG	FUNCTION	
		SWITCH POSITION	EQUIPMENT RESPONSE
		ISB/FSK	T-827A/URT transmits FSK on USB and voice on LSB, simultaneously
USB LINE LEVEL switch	S5	Selects range of USB LINE LEVEL meter (M2)	
		SWITCH POSITION	EQUIPMENT RESPONSE
		-10 DB	10 db is subtracted from USB LINE LEVEL meter (M2) indication
		+10 DB	10 db is added to USB LINE LEVEL meter (M2) indication
USB LINE LEVEL meter	M2	Indicates USB audio input line level	
CW KEY jack	J2	Used to connect local CW hand key to T-827A/URT	
CPS switch	S6	Increases T-827A/URT tuning capabilities	

(see next page)

Table 3.1 (Continued)

CONTROL/INDICATOR CONNECTOR	REF DESIG	FUNCTION	
		SWITCH POSITION	EQUIPMENT RESPONSE
		000	T-827A/URT is tuned to frequency indicated by MCS and KCS digit indicators
		100 to 900	T-827A/URT is tuned 100 to 900 cps above frequency indicated by MCS and KCS digit indicators
MCS control 10 mc	S3	Selects 10 mc digit of desired operating frequency; digit selected will be displayed in window above control	
1 mc	S4	Selects 1 mc digit of desired operating frequency; digit selected will be displayed in window above control	
KCS control 100 kc	S5/A2A6A2S1	Selects 100 kc digit of desired operating frequency; digit selected will be displayed in window above control	
10 kc	A2A6A3S1	Selects 10 kc digit of desired operating frequency; digit selected will be displayed in window above control	

(see next page)

Table 3.1 (Continued)

CONTROL/INDICATOR CONNECTOR	REF DESIG	FUNCTION	
1 kc	A2A6A3S2	Selects 1 kc digit of desired operating frequency; digit selected will be displayed in window above control	
Interlock switch (on the front panel rear)	S8	Disconnects 115 vac operating power from T-827A/URT when chassis is removed from case; can be defeated by pulling up switch actuator	
CARRIER REINSERTION switch (on Mode Selector Ass'y)	A1S1	Selects pilot carrier used to frequency lock associated receiver to T-827A/URT in LSB, ISB and USB modes	
		SWITCH POSITION	EQUIPMENT RESPONSE
		0	Maximum pilot carrier output provided
		-10	Pilot carrier output -10 db ± 2 db down from maximum
		-20	Pilot carrier output -20 db ± 2 db down from maximum
		∞	Pilot carrier output fully suppressed

(see next page)

Table 3.1 (Continued)

CONTROL/INDICATOR CONNECTOR	REF DESIG	FUNCTION	
CTR FREQ switch (on the FSK generator Ass'y)	A9S1	Selects center frequency for FSK mode of operation	
		SWITCH POSITION	EQUIPMENT RESPONSE
		2000	Provides center frequency of 2000 CPS for FKS mode
		2550	Provides center frequency of 2550 CPS for FSK mode

Table 3.2

EXCITER T-827A/URT

OPERATOR'S PREVENTIVE MAINTENANCE CHECKS

INSPECT FOR	REMEDY
Dust	Clean exterior with soft, lint-free cloth. Clean interior with brush, cloth or compressed air
Nicks, burrs, dents, scratches, or rust spot	Smooth burrs with a file. Sandpaper corrosion, rust, or scratches and refinish
Loose handles, mounting screws, or other hardware	Tighten loose hardware
Chain drive tension or binding	Oil lightly
Cable assemblies broken, frayed, or damaged	Repair or replace

SECTION 4

TROUBLE SHOOTING

4.1 - LOGICAL TROUBLE SHOOTING

The topics discussed in the following six paragraphs should be followed when trouble shooting Exciter T-827A/URT.

4.1.1 - Symptom recognition

Symptom recognition is the first step in the trouble-shooting procedure and is based on complete knowledge and understanding of equipment operating characteristics.

All equipment troubles are not the direct result of component failure; therefore, a trouble in the equipment is not always easy to recognize since all conditions of less than peak performance are not always apparent. This type of equipment trouble is usually discovered while accomplishing preventive maintenance procedures.

It is important that the "not so apparent" troubles, as well as the apparent troubles, be recognized.

4.1.2 - Symptom elaboration

After an equipment trouble has been recognized, all the available aids designed into the equipment should be used to elaborate further on the original trouble symptom.

Use of front panel controls and other built-in indicating or testing aids should provide better identification of the original trouble sympton

Also, checking or otherwise manipulating the operating controls may eliminate the trouble.

4.1.3 - **Listing probable faulty function**

The next step in logical trouble shooting is to formulate a number of "logical choices" as to the cause and the probable location (functional section) of the trouble.

The "logical choices" are decisions based on knowledge of equipment operation, full identification of the trouble symptom, and information contained in this manual.

The overall functional description and functional block diagram should be referred to when selecting possible faulty functional sections.

4.1.4 - **Localizing the faulty function**

For the greatest efficiency in localizing trouble, the functional sections selected by the "logical choices" methods should be tested in the order that will require the least time.

This requires a selection to determine which section to test first. The selection should be based on validity of the "logical choice" and the difficulties involved in making the necessary tests.

If the tests do not prove that one functional section is at fault, the next selection should be tested, and so until the faulty functional description and functional block diagram for each functional section as aids to this selection process.

Waveforms are included at significant check points on functional block diagrams to aid in isolating the faulty section.

Also, test data (such as information on control settings, critical adjustments and required test equipment) are supplied to augment the functional description and functional diagram for each functional section.

4.1.5 - Localizing trouble in the circuit

After the faulty functional section has been isolated, it is often necessary to make additional "logical choices" as to which group of circuit (within the functional section) is at fault.

Servicing block diagrams for individual functional circuit groups provide the signal flow and test location information needed to bracket and isolate the faulty circuit.

Functional descriptions, simplified schematics, and pertinent test data for individual circuits or groups of circuits comprising the functional section are all placed together in one area of the manual. Insofar as is practicable, this information is contained on facing pages.

Information that is too lengthy to be included in this arrangement is readily referenced from the test data portion of the trouble shooting information.

4.1.6 - Failure analysis

After the trouble (faulty component, misalignment, etc) has been located (but prior to performing corrective action), the procedures followed up to this point should be reviewed to determine exactly why the fault affected the equipment in the manner it did.

This review is usually necessary to make certain that the fault discovered is actually the cause of the malfunction, and not just the result of the malfunction.

4.2 - OVERALL FUNCTIONAL DESCRIPTION

4.2.1 - General

Exciter T-827A/URT accepts audio or coded intelligence and converts it to one of 280.000 possible operating radio frequencies in the 2.0 to 29.9999 Mc/s frequency range.

It is capable of operating in any of LSB, USB, ISB, CW, FSK and compatible AM modes of operation.

Tuning is accomplished digitally by means of six control knobs (Mc/s and Kc/s and cps) located on the front panel,and may be changed in 0.1 Kc/s increments.

In AM and SSB transmit modes of operation, the output from a microphone is applied to the T-827A/URT. The voice signals are amplified and are used to modulate a 500-kc local carrier, providing a 500-kc if.The resulting double sideband signal is filtered according to the mode of operation amplified, and converted by a triple-conversion process to the desired rf operating frequency. The rf signal is power amplified to a nominal 0.1-watt level.

In CW operation, the 500-kc local carrier is inserted directly into the if. amplifiers at a coded rate. The signal is further processed in the same manner as the voice signals in the AM or SSB modes of operation.

In FSK operation, the coded application of loop current is converted to audio frequencies representing marks and spaces. These audio signals are applied to the audio circuits of the T-827A/URT.

Thereafter, these signals are processed in the same manner as the voice signals in AM or SSB modes of operation.

Tuning the T-827A/URT to an operating frequency also generates a tuning code within the T-827A/URT which is used externally to tune the associated rf power amplifier (such as the AM/3007/URT) to the same operating frequency as the T-827A/URT.

The associated rf power amplifier feeds two dc control levels to the T-827A/URT to prevent its rf output from exceeding the predetermined level.

The T-827A/URT consists of nine plugin electronic assemblies and a power supply. These assemblies are: Mode Selector Electronics Assembly 2A2A1, Audio Amplifier Electronic Assemblies 2A2A2 and 2A2A3, RF Amplifier Electronic Assembly 2A2A4, Frequency Standard Electronic Assembly 2A2A5, Translator/Synthesizer Electronic Assembly 2A2A6, Code Generator Assembly 2A2A7, FSK Tone Generator Electronic Assembly 2A2A9 and IF Amplifier Electronic Assembly 2A2A12. (Assembly 2A2A6 consists of six electronic subassemblies.).

Figure 4.1 illustrates the functional groups comprising the T-827A/URT.

4.2.2 - **Main signal flow**

The main signal flow in the T-827A/URT originates in the 5-mc frequency standard. This circuit is housed in an oven assembly maintained at a nearly constant temperature of 85°C by the oven control circuit.

The 5-mc frequency standard produces an accurate, stable reference frequency, upon which all frequencies used in the T-827A/URT are based.

The accurate output from the 5-mc frequency standard is applied to a switching and compare circuit. An external 5-mc frequency may also be applied to this circuit.

The switching and compare circuit routes the internal or external 5-mc signal to the multiplier-divider circuits or to the compare circuit.

The compare circuit compares the internal 5-mc frequency with the external 5-mc frequency for an indication of the internal frequency accuracy.

The 5-mc output from the switching and compare circuit is applied to the multiplier-divider circuit, where it is converted to frequencies of 500 kc, 1 mc, and 10 mc.

All three frequencies are used in the mixing processes required to produce the injection frequencies used in the rf conversion process. The 500-kc frequency output from the multiplier-divider circuit also serves as the local carrier for the T-827A/URT.

The 5-mc frequency standard, oven control, switching and compare, and multiplier-divided circuits comprise Frequency Standard Electronic Assembly 2A2A5.

The 500-kc local carrier output from the multiplier-divider circuit is applied to the 500 kc if. amplifiers. These circuits amplify the 500-kc local carrier to a level suitable for use in the balanced modulators. There are two balanced modulators, identical except for output filtering. The balanced modulator used is selected according to the mode of operation.

One balanced modulator is used in the USB, FSK, AM, and ISB modes of operation. The other balanced modulator is used during the LSB and ISB modes of operation. Neither balanced modulator is used during the CW mode of operation.

Audio intelligence from the audio amplifier is applied to the appropriate balanced modulator to modulate the 500-kc local carrier, resulting in a double sideband signal without a carrier. The double sideband signal is filtered according to the mode of operation to remove either the LSB or USB portion of the signal.

The 500 kc if. amplifiers and the balanced modulators circuits comprise a part of Mode Selector Electronic Assembly 2A2A1. The other portion of this assembly is the control gates-sidetone oscillator circuit, which is functionally explained in paragraphs 4.2.3 and 4.2.4.

The 500-kc if. output from the balanced modulators is applied to the if. amplifiers. The if. amplifiers, which comprise IF. Amplifier Electronic Assembly 2A2A12, provide a 500-kc if. output at a level suitable for use in the low and mid-frequency mixers circuits.

The level of the 500-kc if. output from the if. amplifiers is prevented from exceeding a predetermined peak and average power level by application of the average power control (apc) and the peak power control (ppc) signals produced in the associated rf power amplifier.

The 500-kc local carrier is re-inserted into the 500-kc if. signal during the AM mode of operation in the if. amplifiers circuit. The unmodulated 500-kc if. signal for CW mode of operation is also produced by this circuit. The 500-kc carrier required in both the AM and CW modes of operation is applied to the if. amplifiers circuit by the control gates-sidetone oscillator circuit contained in Mode Selector Assembly 2A2A1.

The output from the if. amplifier circuit is applied to the low and mid-frequency mixers. These two mixer circuits, which comprise a part of Translator Electronic Subassembly 2A2A6A6, in conjunction with the high frequency mixer circuit portion of RF Amplifier Electronic Assembly 2A2A4, convert the 500-kc if. signal to the desired rf frequency by a triple conversion process.

The 500-kc if. signal is mixed with the 1- and 10-kc injection frequency by the low frequency mixer to produce a second if frequency between 2.8 and 2.9 mc. (Refer to paragraph 4.2.5). This frequency is filtered and applied to the mid-frequency mixer. The second if. is mixed with the 100-kc injection frequency by the mid-frequency mixer to produce a third if. between 19.5 and 20.5 mc or between 29.5 and 30.5 mc. (Refer to paragraph 4.2.5). The third if. used is determined by the hi/lo band control signal.

The output from the mid-frequency mixer is filtered and applied to the high frequency mixer. The third if. is mixed with the mc injection frequency by the high frequency mixer to produce the desired rf output frequency.

The output from the high frequency mixer is applied to the rf amplifiers, which amplify the rf frequency to a level suitable to drive the associated rf power amplifier. The input and output circuits of the rf amplifiers are automatically tuned by the tuning code produced by the code generator, according to the frequency of the desired operating channel. The high frequency mixer and the rf amplifiers compris the RF Amplifier Electronic Assembly 2A2A4.

4.2.3 - **Audio signal flow**

The intelligence applied to the T-827A/URT is either the coded keying for CW, the coded keying for FSK, or the audio for all other modes of operation.

The coded CW keying turns a gating circuit on and off in the control gates-sidetone oscillator circuit.

Each time the key is pressed, the gate is turned on, allowing the 500-kc local carrier to pass from the 500-kc amplifiers to the if. amplifiers.

Also, each time the CW key is pressed, the output of a sidetone oscillator is gated through to the sidetone line.

This sidetone signal is applied to the associated receiver (such as R-1051/URR-MM) enabling the operator to monitor the CW keying.

The audio output from the microphone is applied to the audio amplifiers in Audio Amplifier Electronic Assemblies 2A2A2 and 2A2A3. When operating in the USB, ISB, AM, or FSK modes of operation, the audio input is amplified by assembly 2A2A2 and is applied to the appropriate balanced modulator. When operating in the LSB and ISB modes of operation,the audio is amplified by assembly 2A2A3 and is applied to the appropriate balanced modulator. A gate for each assembly is turned on in the control gates sidetone oscillator, when the corresponding assembly is turned on. This gate allows the audio to pass as a sidetone signal to the associated receiver (Such as R-1051A/URR) , enabling the operator to monitor the respective transmission.

When operating in the FSK mode of operation, the coded TTY input is applied to the TTY generator in FSK Tone Generator Electronic Assembly 2A2A9. The TTY generator produces the required mark and space frequencies and applies them to Audio Amplifier Electronic Assembly 2A2A2.

The gate for re-inserting the 500-kc carrier into the if. signal during AM operation is also contained in the control gates sidetone oscillator circuit. This circuit also has a gating network for re-inserting a pilot local carrier into the if. signals during LSB, USB, or ISB operation.

The pilot carrier is used when operating with radio sets less stable than the T-827A/URT providing them with a carrier for frequency locking and demodulating.

4.2.4 - Frequency generation

The injection frequencies used in the first frequency conversion in the mixers circuits are generated within the 1 and 10-KC Synthesizer Electronic Subassembly 2A2A6A3.

This circuit consists of two crystal oscillators, each of which has ten possible output frequencies. The output from the 1-kc oscillator (1.850 mc to 1.859 mc, in 1-kc steps) is determined by the setting of the front panel 1-kc (KCS) control, and the output from the 10-kc oscillator (5.25 mc to 5.16 mc, in 10 kc steps) is determined by the setting of the front panel 10-kc (KCS) control.

The outputs from the two oscillators are subtractively mixed to produce one of 100 possible frequencies spaced at the 1-kc intervals between 3.301 and 3.400 mc. The output is applied to the low frequency mixer.

The injection frequencies used in the second frequency conversion in the second frequency conversion in the mixers circuit are generated within the 100-KC Synthesizer Electronic Subassembly 2A2A6A2. This circuit consists of a crystal oscillator, the output from which is one of ten frequencies spaced at 100-kc intervals between 4.553 and 5.453 mc. The output frequency is determined by the setting of the front panel

100 kc (KCS) control.

If a lo-band injection frequency is required (refer paragraph 4. 2. 5) the 17.847 mc output from the 17.857-mc mixer is additively mixed in the hi-band mixer with the output from the 100 kc oscillator (4.553 mc to 5.453 mc, in 100-kc steps) to provide a frequency in the 22.4 to 23.3 mc range. If a hi-band injection in required (refer to paragraph 4.2.5), the 27.847-mc output from the 27.847-mc mixer is additively mixed in the hi-band mixer with the output from the 100-kc oscillator (4.553 mc to 5.453 mc, in 100-kc steps) to provide a frequency in the 32.4 to 33.3 mc range. In either case, the resultant frequency is applied to the mid-frequency mixer.

The injection frequencies used in the third frequency conversion in the third frequency conversion in the mixers circuit are generated within the MC Synthesizer Electronic Subassembly 2A2A6A1. This circuit consists of a phase-locked crystal oscillator that is automatically tuned to produce one of seventeen frequencies between 2.5 mc and 23.5 mc.

The output is applied to the high frequency mixer. The output frequency is determined by the setting of the front panel MCS controls.

4.2.5 - **Error cancellation**

A combination of error cancelling loops and phase-locked loops is used in the frequency synthesizer circuits of the T-827A/URT to ensure that the injection frequencies applied to the mixers are correct.

The MC Synthesizer Electronic Subassembly (2A2A6A1) employs a phase-locked loop to ensure the accuracy of the mc injection frequencies.

The 1-mc output from the multiplier-divider in the Frequency Standard Electronic Assembly (2A2A5) is applied to the spectrum generator to produce a spectrum of frequencies spaced at 1-mc intervals between 1 mc and 25 mc. The output from the spectrum generator and the output from the mc oscillator are mixed. Any error in output from the mc oscillator is detected and an error voltage is produced. This error signal is applied to the mc oscillator to lock it to the correct frequency. The accuracy of the oscillator output is the same as that of the 5-mc frequency standard.

The 100-KC Synthesizer Electronic Subassembly (2A2A6A2) employs an error cancelling loop to ensure the accuracy of the 100-kc injection frequencies.

The 500-kc output from the multiplier-divider is applied to the 100-kc spectrum generator to produce a spectrum of frequencies spaced at 100-kc intervals between 15.3 mc and 16.2 mc.

The output from the 100-kc oscillator (4.553 mc to 5.453 mc, in 100-kc steps) is applied to the 10.747-mc mixer, where it is mixed with that spectrum point of the 100-kc spectrum which will result in an output of 10.747-mc.

The 10.747-mc signal is additively mixed with the 7.1-mc output from the 7.1-mc mixer to produce the 17.847-mc signal, which is used in one of two mixing processes. It is mixed with the 100-kc oscillator output to cancel any oscillator frequency error and produce the lo-band injection frequencies, or it is mixed with the 10-mc output from the multiplier-divider.

This mixing produces a 27.847-mc signal, which is mixed with the 100-kc oscillator output to cancel any oscillator frequency error and produce the hi-band injection frequencies.

The hi or lo-band of injection frequencies is determined by the voltage level on the hi/lo band control line output from the code generator.

If an error were present in the 100-kc oscillator output, it would be cancelled in this mixing scheme. This is accomplished as follows. Assume that the output from the oscillator should be 4.553 mc, but is 200 cycles high (4.5532-mc), and that the desired frequency output is 22.4 mc (in the lo-band).

The subtractive mixing of the oscillator output with whichever 100-kc spectrum point will produce an output as close as possible to 10.747 mc, results in a 10.7468-mc output (15.3 mc - 4.5532 = 10.7468 mc).

This signal is then additively mixed with the 7.1-mc signal, producing a 17.8468-mc output. The 17.8468-mc signal is then additively mixed with the oscillator output (17.8468 + 4.5532 mc = 22.4 mc), resulting in the desired 22.4-mc output.

Assume that the output from the oscillator should be 4.953 mc, but is 300 cycles low (4.9527 mc), and that the desired frequency output should be 32.8 mc (in the hi-band). Subtractively mixing the 100-kc spectrum point (15.7 mc) with the 4.9527-mc signal results in an output of 10.7473 mc. This signal is then mixed with the 7.1-mc signal, resulting in a frequency of 17.8473 mc.

The 17.8473-mc signal is further mixed with the 10-mc signal to obtain a frequency of 27.8473 mc, which is additively mixed with the 4.9527 mc output from the oscillator to obtain the required 32.8-mc output. Therefore, it can be seen that any error existing in the output from the 100 kc oscillator will be cancelled, resulting in the exact 100-kc injection frequency required.

Any error existing in the 1 and 10 kc oscillator is cancelled in the following manner.

The 100-kc pulses from the 100-kc spectrum are applied to the 10-kc spectrum generator producing an output from 3.82 to 3.91 mc in 10-kc increments.

The 10-kc spectrum generator also produces 10-kc pulses which are applied to the 1-kc spectrum generator to produce a spectrum of frequencies spaced at 1 kc intervals between 0.122 mc and 0.131 mc. The output from the 10-kc oscillator (5.25 mc to 5.16 mc, in 10-kc steps) is additively mixed with whichever spectrum point of the 10-kc spectrum will result in a frequency of 9.07 mc.

The output from the 1-kc oscillator (1.850 mc to 1.859 mc, in 1 kc steps) is additively mixed with whichever spectrum point of the 1-kc spectrum will result in a frequency of 1.981 mc.

The 1.981-mc and the 9.07-mc signals are then subtractively mixed, producing the 7.089-mc signal, which contains the errors of both oscillators.

The 1-kc spectrum generator also produces 1-kc pulses, which are applied to the 100 cps Synthesizer; these pulses are used to lock the output frequency of the 100-cps phase-locked oscillator to any of the ten frequencies spaced 1 kc/s in the 110-119 Kc/s range desired. With the front panel CPS switch in the 000 position, the output from the phase-locked oscillator is 110 kc and is locked to that exact frequency.

This 110-kc signal is divided by ten and applied to the 7.1 mc mixer, where it is additively mixed with the 7.089-mc output from the 7.089-mc mixer. The resulting 7.1-mc signal is then applied to the error loop of the 100-kc Synthesizer Electronic Subassembly (2A2A6A2). Therefore, if an error exists in the 1 or 10 kc oscillators, the same error will exist in the 100-kc injection frequencies. This error is then cancelled in the low and mid frequency mixers of the mixers circuit in the following manner.

Assume that the output from the 10-kc oscillator should be 5.25 mc, but is actually 5.2502. Also assume that the output from the 1-kc oscillator should be 1.852 mc but is actually 1.8521 mc.

Subtractively mixing these two frequencies results in an injection frequency to the low frequency to the low frequency mixer of 3.3981 mc, rather than the desired 3.3980 mc. Therefore, a 100 cycle error exists in the injection signal.

The additive mixing of the 5.2502-mc signal and the 10-kc spectrum point (3.82 mc) results in a frequency of a 9.0702 mc. The additive mixing of the 1.8521-mc signal and the 1-kc spectrum point (0.129) results in a frequency of 1.9811 mc. Subtractively mixing the 9.0702-mc and the 1.9811-mc signals results in a frequency of 7.0891 mc.

The 7.0891-mc signal is mixed with the 11-kc signal from the divide-by-ten circuits resulting in a frequency of 7.1001 mc,wich is mixed with the 10.747-mc signal to produce a frequency of 17.8471 mc. If the output from the 100-kc oscillator is assumed to be 4.553 mc, then the 100-kc injection frequency would be 22.4001 mc. The 100-kc injection is then also 100 cycles high. Therefore when the 1 and 10 kc injection frequency of 3.3981 mc (which is 100 cycles high) is substractively mixed in the low frequency mixer with the output from the mid frequency mixer (which is 100 cycles high), the error will be cancelled.

Therefore, since any error that exists in the 1 and 10 kc injection also exists in the 100-kc injection, the error is cancelled during the translation process.

The T-827A/URT can be tuned in 0.1-kc increments. This is accomplished by locking the output of the 100-cps oscillator to any of the ten frequencies spaced 1kc/s in the 110 Kc/s to 119 kc/s range. Assuming that the 100 cps oscillator is locked to 111 kc/s, when the 11.1 kc (after division by ten) is mixed with the 7.089-mc error frequency, a frequency of 7.1001 mc is obtained. Therefore, the 100-kc injection frequency will be 100 cps high. Thus, the output from the mid frequency mixer may be varied in 100 cps increments. The 111-kc output from the 100 cps oscillator is obtained with the cps switch is placed in the 100 position.

The 500-kc if is converted to the desired rf as follows.

Assume that the front panel controls are set for a frequency output of 13,492,500 cps. (See figure 4-2). The 1-and 10-kc injection is that frequency of the 10 kc oscillator corresponding to the 10-kc digit (9) minus that frequency of the 1 kc oscillator corresponding to the 1-kc digit (2). As shown on figure 4-2, this results in an injection frequency (5.16 mc minus 1.825 mc) of 3.308 mc which is subtractively mixed with the 500-kc if. in the low frequency mixer producing a second if. of 2.808 mc.

This signal is filtered and applied to the mid frequency mixer to be subtractively mixed with the 100-kc injection. To determine the 100-kc injection frequency, it must be first noted whether the mc digit to be used results in a hi or lo frequency. In this case, the selected mc digits (13) are in the hi-band. Therefore, the 100-kc injection must correspond. It also must be noted that the cps switch is in the 100 position. Therefore, the correct 100-kc injection frequency is 32.8005 mc.

When the 2.808 mc is subtractively mixed with the 32.0005 mc in the mid frequency mixer, the resulting third if. is 29.9925 mc. This frequency is filtered and applied to the high frequency mixer, where it is subtractively mixed with the mc injection corresponding to the selected mc digits (13).

This results in the desired output frequency of 13.4925 mc (29.9925 - - 16,5 = 13.4925). Similary, the 500-kc if. frequency can be translated to any one of the possible 280.000 operating frequencies.

4.2.6 - Power supply

The operating voltages for all circuits in the T-827A/URT are produced by Power Supply Assembly 2A2A8 (see figure 4.1).

The 105 to 125 vac primary power is converted to dc voltages of 110 vdc (rf amplifier tubes plate and screen supply), -30 vdc (rf amplifier tubes bias), and 28-vdc (general use).

The 28 vdc is also regulated to 20 vdc. The 20 vdc is used for operating voltage in the semiconductor circuits of the T-827A/URT.

4.2.7 - **Test data**

Pertinent references and applicable test data for the T-827A/URT are as follows:

1) References:

   a) Fig. 5.1 - Exciter T-827A/URT
      Chassis and Main Frame, Schematic diagram.

   b) Fig. 4.57- Exciter T-827A/URT
      Overall servicing block diagram.

2) Required test equipment:

   a) Oscilloscope, type Tektronix, mod. 546 or equiv.

   b) RF Signal Generator, type HP, mod. 606-A or equiv.

   c) Electronic multimeter, type Boonton, mod. 91-H or equiv.

   d) Electronic multimeter, type HP, mod. 400-H or equiv.

   e) Multimeter, type Metrix, mod. 430/C or equiv.

   f) Analyzer test set, type Singer, mod. Sb 12bS or equiv.

   g) Frequency meter, type HP, mod. 5245-L or equiv.

   h) Frequency standard generator, type Motorola, mod. S-1055A or equiv.

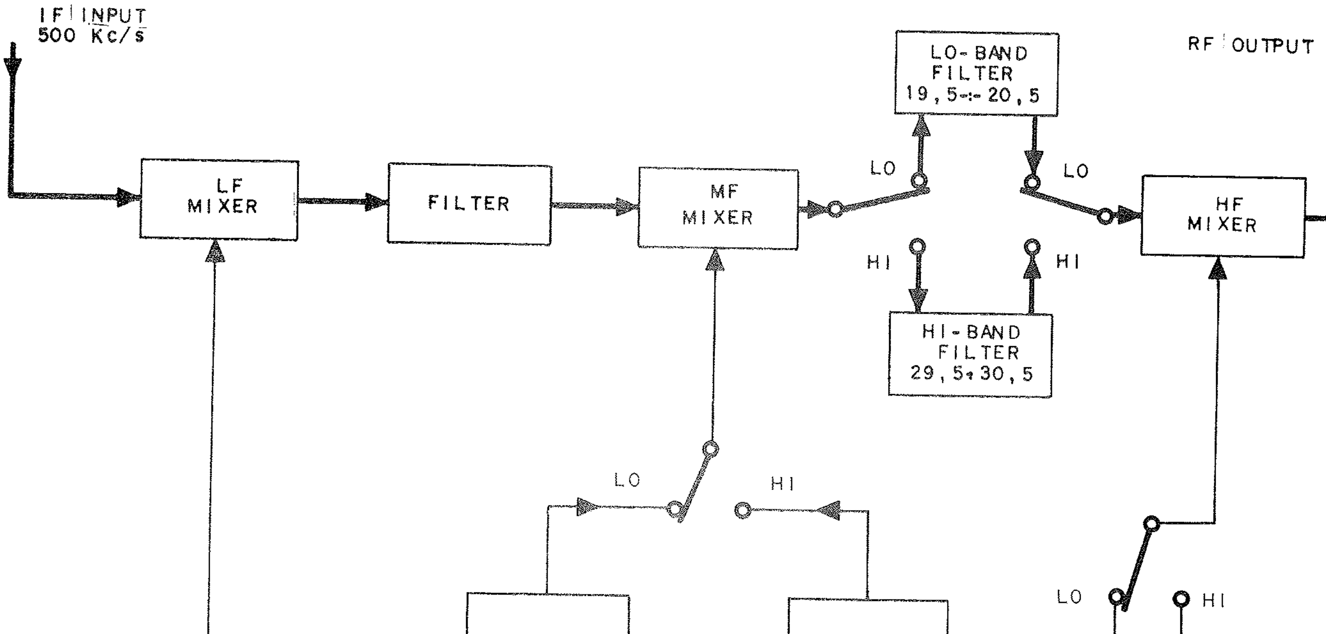
   i) Heterodyne voltmeter, type Bruel & Kjaer, mod. 2006 or equiv.

3) Power Supply 2A2A8 voltages:

   a) + 19,9 to + 20.1 Vdc

   b) + 27 to + 32 Vdc

   c) + 105 to + 115 Vdc



1 Kc/s	OSC 1 Kc/s	10 Kc/s	OSC 10 Kc/s	1&10Kc/s INJ. FREQ	100 Kc/s	OSC 100 Kc/s	LO-BAND 000÷900C/s 100cps STEPS	LO-BAND VERNIER	HI-BAND 000÷900c/s 100cps STEPS	HI-BAND VERNIER
0	1,850	0	5,25	3,400-3,391	0	4,553	22,4000-22,4009	22,3998-22,4012	32,4000-32,4009	32,3998-32,4012
1	1,851	1	5,24	3,390-3,381	1	4,653	22,5000-22,5009	22,4998-22,5012	32,5000-32,5009	32,4998-32,5012
2	1,852	2	5,23	3,380-3,371	2	4,753	22,6000-22,6009	22,5998-22,6912	32,6000-32,6009	32,5998-32,6012
3	1,853	3	5,22	3,370-3,361	3	4,853	22,7000-22,7009	22,6998-22,7012	32,7000-32,7009	32,6998-32,7012
4	1,854	4	5,21	3,360-3,351	4	4,953	22,8000-22,8009	22,7998-22,8012	32,8000-32,8009	32,7998-32,8012
5	1,855	5	5,20	3,350-3,341	5	5,053	22,9000-22,9009	22,8998-22,9012	32,9000-32,9009	32,8998-32,9012
6	1,856	6	5,19	3,340-3,331	6	5,153	23,0000-23,0009	22,9998-23,0012	33,0000-33,0009	32,9998-33,0012
7	1,857	7	5,18	3,330-3,321	7	5,253	23,1000-23,1009	23,0998-23,1012	33,1000-33,1009	33,0998-33,1012
8	1,858	8	5,17	3,320-3,311	8	5,353	23,2000-23,2009	23,1998-23,2012	33,2000-33,2009	33,1998-33,3012
9	1,859	9	5,16	3,310-3,301	9	5,453	23,3000-23,3009	23,2998-23,3012	33,3000-33,3009	33,2998-33,3012

Mc/s	LO BAND	HI BAND
2	17,5	
3	16,5	
4	15,5	
5	14,5	
6		23,5
7	12,5	
8	11,5	
9		20,5
10		19,5
11	8,5	
12	7,5	
13		16,5
14	5,5	
15	4,5	
16	3,5	
17		12,5
18		11,5
19		10,5
20		9,5
21		8,5
22	2,5	
23	3,5	
24		5,5
25		4,5
26		3,5
27	7,5	
28	8,5	
29	9,5	

Figure 4-2. Radio Transmitter T-827A/URT, Frequency Translation, Functional Block Diagram

4) Power output:

2.25 Vac (represents 0.1 W, with 150mV in).

5) Carrier suppression:

-50 db SSB, 0 db AM

6) Adjustment:

a) Audio gain (paragraph 5.1.2)

b) IF gain (paragraph 5.1.3)

c) 100 c/s output level adjustment (paragraph 5.1.6)

d) AM modulation percentage adjustement and carrier reinsertion check (paragraph 5.1.5)

e) Carrier balance (paragraph 5.1.4)

f) +20 Vdc regulator (paragraph 5.1.):

7) Components and test point locations:

a) Fig. 5.15 - Exciter T-827A/URT
Top view (case removed)

b) Fig. 5.17 - Exciter T-827A/URT
Bottom view (case removed)

4.3 - CIRCUIT DESCRIPTIONS

4.3.1 - 5 Mc/s Frequency Standard

A) - *Circuit description*

The 5 Mc/s frequency standard (figure 4.3) consists of an oscillator

(Q5) and a buffer amplifier (Q6).

These circuits, which form a part of Frequency Standard Electronic Assembly 2A2A5, provide an accurate 5.000000-mc signal used as a standard throughout the T-827A/URT. Assembly 2A2A5A2 is housed in an oven maintained ad a constant 85°C temperature by the oven control circuit.

The 5 mc frequency standard circuit is used during all modes of operation; a detailed description of this circuit follows.

The frequency of oscillator Q5 is 5.000000 mc as determined by the parallel resonant tuned circuit consisting of capacitor C7 and the primary of transformer T2. Oscillator frequency is controlled by the series resonant circuit consisting of parallel capacitors 2A2A5C1 and C10, and crystal Y1. To sustain oscillation, feedback for oscillator Q5 is obtained from a tap on the primary of transformer T2 and passed through trimmer capacitor 2A2A5C1, capacitors C10 and C9, and crystal Y1 to the emitter of oscillator Q5.

The series resonant circuit allows only a 5.000000-mc signal to pass, holding oscillator Q5 to oscillations at exactly 5 mc. The amplitude of oscillator Q5 output is limited by diodes CR5 and CR6. Stable operating voltages of 15 vdc and 7.5 vdc are assured by resistor R12 and two 7.5 volt Zener diodes CR3 and CR4 in series across the 28 vdc supply.

Base bias for oscillator Q5 is taken from the junction of Zener diodes CR3 and CR4 and is applied through resistor R14 to the base of oscillator Q5.
Capacitor C8 is the bypass capacitor.
Resistor R16 is the emitter load resistor.

The output from oscillator Q5 is coupled by transformer T2 to the base of buffer amplifier Q6, where it is amplified.

The output load for buffer amplifier Q6 is tuned transformer T3. A tap on the primary of transformer T3 supplies negative feedback to the emitter circuit of buffer amplifier Q6, assuring amplifier stability.

B) - *Test data*

Pertinent reference and applicable test data for the 5 Mc/s frequency standard are as follows:

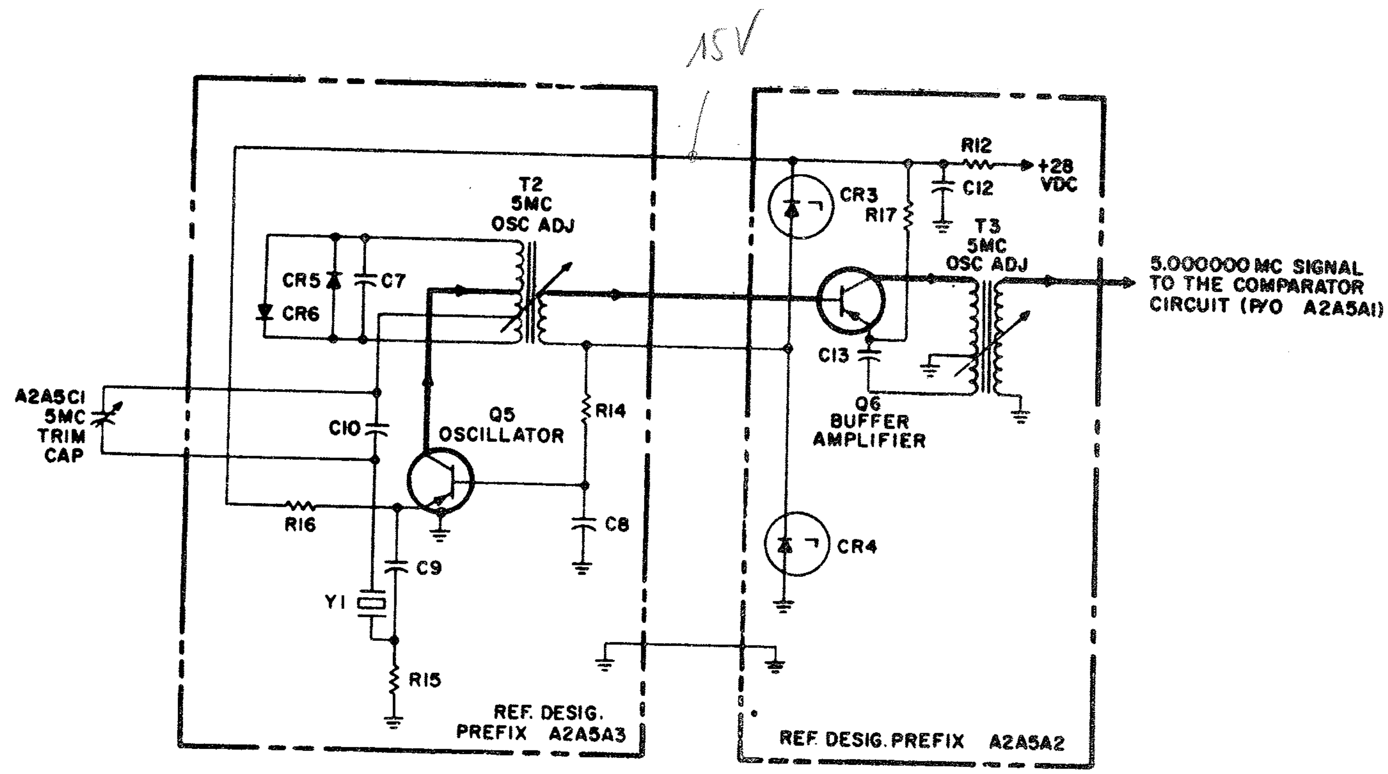


Figure 4-3 . 5 MC Frequency Standard, Simplified Schematic Diagram

cuit are as follows:

1) Preferences:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5-1.

b) Frequency Standard Electronic Assembly, Servicing Block Diagram, figure 4-58.

c) Frequency Standard Electronic Assembly, Schematic Diagram, figure 5-5.

d) Fig. 5.63 :- Temperature Control circuit.
Buffer Amplifier - Component location

2) Required Test Equipment:

a) RF Voltmeter, type Boonton, Mod. 91-H or equiv.

b) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.3 - **Comparator**

A) *Circuit description:*

The comparator (figure 4-5) consists of a buffer amplifier (Q5), a comparator stage (Q7), and an amplifier (Q6).

These circuits, which form a part of Frequency Standard Electronic Assembly 2A2A5, compare the 5.000000-mc signal received from the 5 mc frequency standard circuit with an accurate external 5-mc signal.
This function is required to determine and maintain the accuracy of the internal 5 mc frequency standard signal.

A detailed description of the operation of this circuit follows.

In the INT position of switch 2A2A5S1, the 5-mc signal from the 5 mc frequency standard is applied to buffer amplifier Q5 through 5 MC LEVEL ADJ potentiometer R22, contacts 2 and 4 of switch 2A2A5S1, and coupling capacitor C19. The amplified 5-mc signal output from this stage is applied to the 5-mc divide-by-five circuit through a portion of the primary winding of 5 MC ADJ transformer T5.

With switch 2A2A5S1 in the INT position, the 5-mc signal is also applied to the 5 mc multiply-by-two circuit. Base-bias for buffer amplifier Q5 is provided by voltage divider R19, R21. Negative feedback to the emitter of buffer amplifier Q5 is provided by transformer coupling the 5-mc output through the center tapped primary winding of 5 MC ADJ transformer T5 and capacitor C18. This feedback provides frequency stability for this amplification stage.

No 5 mc signal is applied to comparator Q7 and the subsequent amplifier Q6 when switch 2A2A5S1 is set at the INT position since contacts 7-8 of that switch are open. Resistor R17 is the output load resistor for the 5 mc signal.

Resistor R20 is the emitter resistor.

When switch 2A2A5S1 is in the EXT position, the externally supplied 5-mc signal is amplified by buffer exciter Q5 and applied the connector J24 on the rear panel of the stansmitter and to the 5 mc divide-by-five circuits in the same manner as described for the INT position. In a similar manner, the signal is directly coupled to the 5 mc multiply-by-two circuit through contacts 1 and 4 of switch 2A2A5S1.

Since contacts 7-8 are not closed, comparator Q7 and its associated amplifier Q6 are not operative. The internally generated 5-mc signal is compared with an externally supplied 5-mc standard when switch 2A2A5S1 is set at the COMP position. In this condition of operation, the 5-mc external signal is applied to the primary winding of transformer T6 from connector J25 on the rear panel of the transmitter, through isolating resistor R23.

Comparator Q7 and associated amplifier Q6 become operative since both the internal and external 5 mc signal are available to the circuit.

The amplitude of the externally applied signals is limited to approximately 300 milli-volts peak by the voltage divider network consisting of resistors R24, R25, and diode CR1. In the event that the frequencies of the two signals are different, the resulting difference frequency is coupled to the base of comparator Q7.

A portion of the output from comparator Q7 is dc coupled to the base of amplifier Q6 by voltage divider-collector load resistors R29 and R30.

The output of amplifier Q6 is developed across lamp DS1 in its emitter circuit, causing the lamp to flash at the difference frequency.

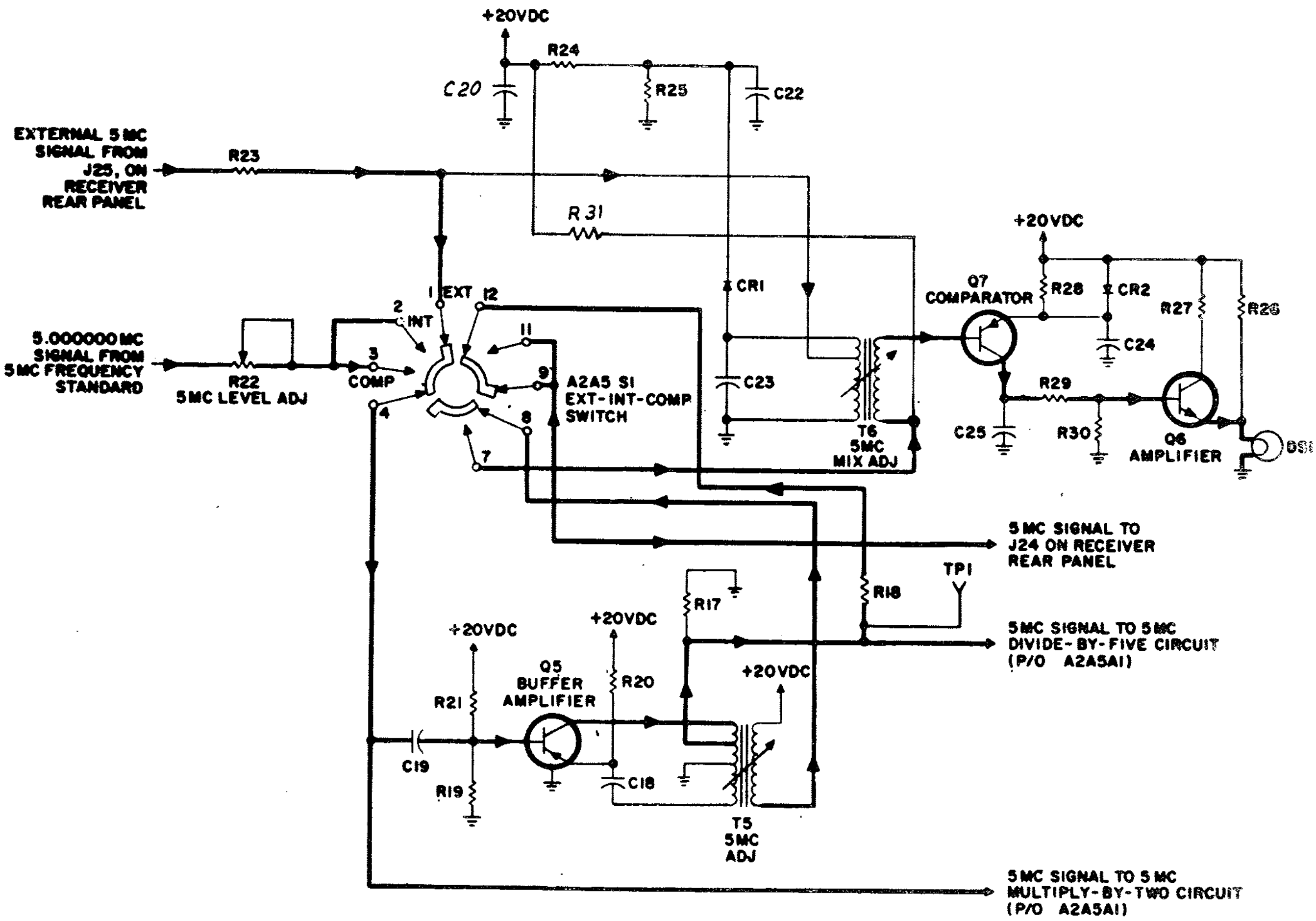


Figure 4-5. Comparator,
Simplified Schematic Diagram

Resistor R31 maintains comparator Q7 at cut-off when switch 2A2A5S1 is at either the INT or EXT positions. Resistor R28 is the emitter bias resistor, which is rf bypassed by capacitor C24.

Diode CR2 in the emitter circuit of comparator Q7 keeps the gain of the stage constant in spite of temperature variations. This control occurs because the resistance of diode CR2 varies with temperature change.

Capacitor C25 bypasses all mixing products except the difference frequency to ground. Resistor R27 is the collector dropping resistor for amplifier Q6. Resistor R26 is a bleeder resistor for stablizing the quiescent emitter bias for dc amplifier Q6.

B) - *Test data*

Pertinent references and applicable test data for the comparator circuit are as follows:

1) References:

a) Exciter T-827A/URT
Main Frame, Schematic Diagram, figure 5-1.

b) Frequency Standard Electronic Assembly, Servicing Block Diagram, figure 4-58.

c) Frequency Standard Electronic Assembly, Schematic Diagram, figure 5.5.

d) 5 MC Multiplier, Dividers and Comparator, (Component Side Down) Component and Test Point Location. Figure 5.62.

2) Required Test Equipment:

a) RF Voltmeter, type Boonton, mod. 91-H or equiv.

b) Multimeter, type metrix, mod. 430/1 or equiv.

c) RG Signal Generator, type HP, mod. 606-A.

4.3.4 - 5 mc Divide-by-five

A) - *Circuit description*

The 5-mc divide-by-five circuit (figure 4-6) consists of a 4 mc amplifier (Q2) and a 1 mc amplifier (Q3).

These circuits, which form a part of the multiplier-divider circuit group of Frequency Standard Electronic Assembly 2A2A5, derive a 1-mc signal for use in the spectrum generator mixer circuit of MC Synthesizer Electronic Subassembly 2A2A6A1 from the 5-mc signal from the comparator circuit.

A detail description of the operation of this circuit follows.

Amplifiers Q2 and Q3 form a regenerative closed loop to provide a 1-mc output.

At the instant power is applied, some circuit disturbance causes noise to be produced in the tuned outputs of amplifiers Q2 and Q3. The tuned output of amplifier Q3 allows only the 1 mc portion of the noise to pass. This low level 1-mc is applied to 4 mc amplifier Q2.

Amplifier Q2 is biased in a non-linear condition so that the fourth harmonic of the 1-mc is amplified.

The 4 mc is mixed with the 5-mc input, providing a 1-mc input to amplifier Q3. The 1 mc is amplified and applied to amplifier Q2.

This flywheel effect is repeated until a stable 1-mc output is produced which is locked to the 5 mc frequency standard.

The 5-mc signal, applied to the primary of transformer T2, is mixed with the 4-mc signal from the secondary, producing a 1-mc difference frequency. The 1-mc signal is coupled by capacitor C13 to the base of 1 mc amplifier Q3. The base bias for amplifier Q3 is provided by voltage divider R12, R11, R13.

The output load for 1 mc amplifier Q3 consists of the primary of transformer T3 and capacitors C11 and C12. This output circuit is tuned to 1 mc.

Capacitor C12 has a negative temperature coefficient to compensate for changes in the 1 mc amplifier caused by temperature changes.

The 1-mc signal is taken from a tap on the primary of transformer T3 and coupled to the base of 4 mc amplifier Q2 by capacitor C9.

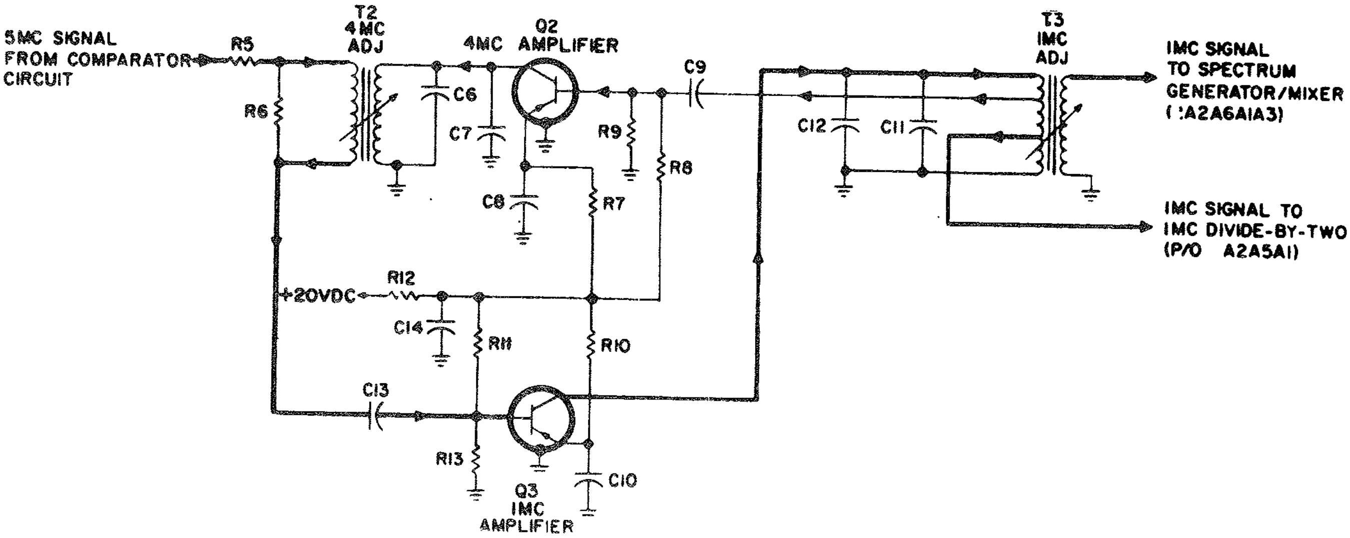


Figure 4-6. 5 MC Divide-By-Five, Simplified Schematic Diagram

Base bias for amplifier Q2 is provided by voltage divider R8, R9, R12. The output load for 4 mc amplifier Q2 consists of the primary of transformer T2 and capacitors C6 and C7.

This output circuit is tuned to 4 mc; capacitor C7 has a negative temperature coefficient to compensate for changes in the 4-mc amplifier output caused by temperature changes.

Resistors R7 and R10 are emitter bias resistors, which are rf bypassed by capacitors C8 and C10, respectively. Resistor R12 and capacitor C14 provide decoupling for amplifiers Q2 and Q3.

The two 1-mc outputs from the 5 mc divide-by-five circuits are taken from the primary and secondary of transformer T3 and applied to the 1 mc divide-by-two circuit and to the spectrum generator/mixer circuit in 1 MC Synthesizer Electronic Subassembly 2A2A6A1.

A) - *Test data*

Pertinent references and applicable test data for the 5 mc divide-by-five circuit are as follows:

1) References:

a) Exciter T-827A/URT
Main Frame, Schematic Diagram, Figure 5.1

b) Frequency Standard Electronic Assembly, Servicing Block Diagram, Figure 4.58

c) Frequency Standard Electronic Assembly, Schematic Diagram, Figure 5.5

d) 5 MC Multiplier, Divider and Comparator, (Component Side Down) Component and Test Point Location, figure 5.62

2) Required Test Equipment

a) RF Voltmeter, type Boonton, Mod. 91-H or equiv.

b) Multimeter, type Metrix, Mod. 430/1 or equiv.

c) RF Signal Generator, type HP, Mod. 606-A or equiv.

4.3.5 - 1 mc divide-by-two

A) - *Circuit description*

The 1 mc divide-by-two circuit produces a locked 500-kc signal from the locked 1-mc signal from the 5 mc divide-by-five circuit.

The circuit consists of 500 kc amplifier Q1, in a regenerative oscillator configuration (figure 4-7) and forms a part of the multiplier-divider circuit group of Frequency Standard Electronic Assembly 2A2A5.

The 500-kc signal is the local carrier used in the 500 kc if. amplifiers circuit 2A2A1A4 and triggers 100 kc spectrum generator circuit 2A2A6A5A1. The following paragraph describes the operation of the 1 mc divide-by-two circuit in detail.

With no 1-mc input, the 1 mc divide-by-two circuit will not oscillate. When the 1-mc signal is applied through isolating resistor R4, the feedback winding of transformer T1, and coupling capacitor C4 and appears at the base of 500 kc oscillator Q1, the transistor will be biased on. At this time, noise is produced due to the transistor being turned on. Since transformer T1 is tuned to 500 kc, the 500-kc portion of this noise passes through transformer T1 and mixes with the 1-mc signal producing a 500 kc difference frequency.

This difference is amplified by 500 kc amplifier Q1 and again applied to transformer T1, thereby sustaining oscillations.

Resistor R2 is the base bias resistor. Resistor R1 is the emitter resistor, which is rf bypassed by capacitor C1. Resistor R3 and capacitors C2 and C3 provide decoupling for 500 kc amplifier Q1. The 500 kc output is taken from the secondary of transformer T1 and applied to the 500 kc if. amplifiers circuit 2A2A1A4 and to the 100 kc spectrum generator circuit 2A2A6A5A1.

B) - *Test data*

Pertinent references and applicable test data for the 1 mc divide-by-two circuit are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5-1.

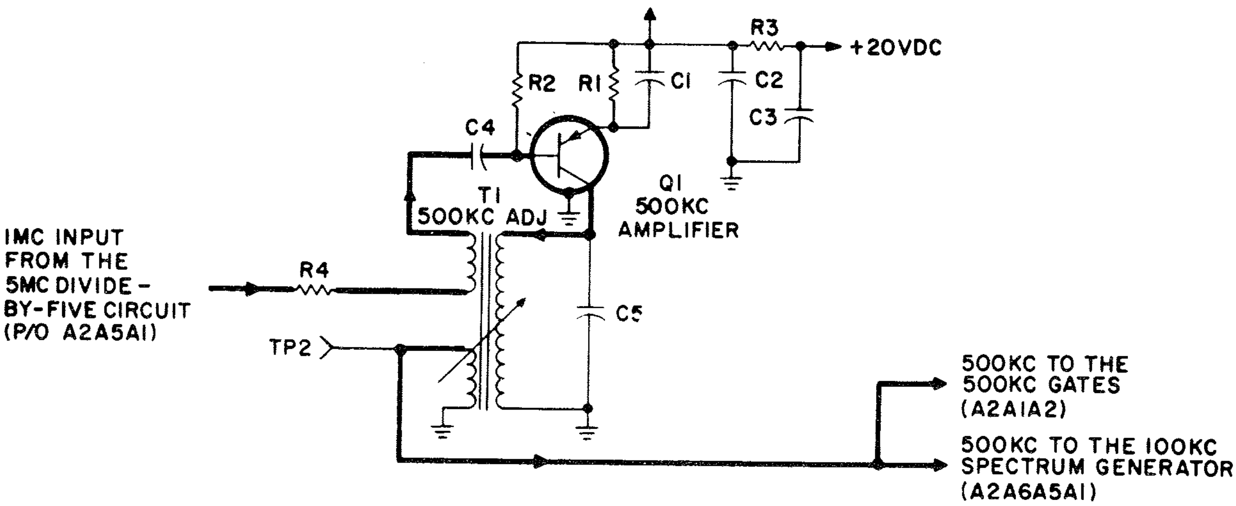


Figure 4-7. 1 MC Divide-By-Two, Simplified Schematic Diagram

b) Frequency Standard Electronic Assembly, Servicing Block Diagram, figure 4-58.

c) Frequency Standard Electronic Assembly, Schematic Diagram, figure 5.5.

d) 5 MC Multiplier, Dividers and Comparator, (Component Side Down) Component and Test Point Locations, figure 5.62.

2) Required Test Equipement

a) RF Voltmeter, type Boonton, mod. 91-H or equiv.

b) Multimeter, type metrix, mod. 430/1 or equiv.

c) RF Signal Generator, type HP, mod. 606-A or equiv.

4.3.6 - 500 kc amplifier

A) - *Circuit description*

The 500 kc amplifier (figure 4-8) consists of a diode gating circuit (CR11) and two amplifiers (Q6 and Q7).

These circuits, which form a part of Mode Selector Electronic Assembly 2A2A1, amplify the 500-kc output from the 1 mc divide-by-two circuit in Frequency Standard Electronic Assembly 2A2A5 to a level suitable for use in balanced modulators 2A2A1A1 and 2A2A1A2.

The gating circuit prevents application of the 500-kc signal to the amplifiers during CW operation.

Amplifier Q6 is used during the USB, AM, and FSK modes of operation, and amplifier Q7 is used during the LSB mode of operation.

Both amplifiers are used during the ISB mode of operation.

A detailed description of the operation of this circuit follows.

ISB Operation. The 500-kc signal is coupled to the anode of gating diode CR11 by capacitor C26. This gate is forward-biased as a result of the positive 18 vdc on the anode and the positive 10 vdc on the cathode. The two biases are instantaneous voltages, developed for all modes of operation except CW by voltage dividers R53, R54, and R55, R56.

Positive 20 vdc is applied to the dividers from the front panel Mode Selector switch. When gate CR11 is conducting, both biases are approximately the same. The difference is the voltage drop caused by the forward resistance of the diode. Since gate CR11 is forward-biased, it will conduct, allowing the 500-kc signal to pass and be coupled by capacitors C27 and C30 to the bases of amplifiers Q6 and Q7, respectively.

Operating voltage for amplifier Q6 is developed from the positive 20 vdc applied to voltage divider R57, R58 and emitter resistor R59 from the Mode Selector switch on the front panel.

The amplified 500-kc output from amplifier Q6 is developed across the tuned tank circuit consisting of capacitor C28 and the primary of transformer T3.

The 500-kc signal is coupled to balanced modulator 2A2A1A1 by transformer T3.

Operating voltage for amplifier Q7 is developed from the positive 20 vdc applied to voltage divider R60, R61, and emitter resistor R62 from the Mode Selector switch on the front panel.

The amplified 500-kc output from amplifier Q7 is developed across the tuned tank circuit consisting of capacitor C31 and the primary of transformer T4. The 500-kc signal is coupled to balanced modulator 2A2A1A2 by transformer T4.

USB, AM, FSK Operation. When the Mode Selector switch on the front panel is set at USB, AM, or FSK position, the positive 20 vdc operating voltage for Q7 is removed. The remaining circuits function as described above.

LSB Operation. When the Mode Selector switch on the front panel is set at the LSB position, the positive 20 vdc operating voltage for amplifier Q6 is removed. The remaining circuits function as described in paragraph above.

CW Operation. When the Mode Selector switch on the front panel is set at the CW position, the operating voltage for the amplifiers and the anode bias for gate CR11 is removed. The 10 vdc cathode bias on CR11 is still applied. Therefore, CR11 will be reversebiased.

1) References:

a) Fig. 5.1 - Exciter T-827A/URT
Chassis and main frame, schematic diagram.

b) Fig. 4.58 - Frequency Standard Electronic Assembly - Servicing block diagram.

c) Fig. 5.5 - Frequency Standard Electronic Assembly - Schematic diagram.

d) Fig. 5.64 - 5 Mc/s Oscillator
Component location

e) Fig. 5.61 - Frequency Standard Assembly
Front view, heater disassembled

f) Fig. 5.63 - Temperature control circuit/Buffer Amplifier

2) Required test equipment:

a) Frequency Standard, type Motorola, mod. S-1055A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Frequency meter, type HP, mod. 5245-L or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.2 - **Oven control**

A) *Circuit description*

The oven control (figure 4-4) consists of an oscillator (Q1, Q2), an emitter follower (Q3), a dc power amplifier 2A2A5Q1, and an oven heater (2A2A5HR1).

These circuits, which form a part of Frequency Standard Electronic Assembly 2A2A5, maintain the 5-mc crystal oven at a constant 85°C (185°F) temperature. The oven control circuit is used during all modes of operation.

A detailed description of the operation of this circuit follows.

The frequency of oscillator Q1, Q2 is approximately 18 kc, as determined by the tuned circuit consisting of capacitor C2 and the primary of transformer T1.

The feedback for oscillator Q1, Q2 is produced by a bridge consisting of the center-tapped secondary of transformer T1 acting as two of the bridge legs. Resistor 2A2A5R1 and thermistor 2A2A5RT1, thermistor RT2, resistor R18, resistor R7 act ad the other two legs. This bridge is designed to balance when thermistor 2A2A5RT1 is at 85°C.

Thermistor 2A2A5RT1 is physically mounted underneath heater 2A2A5HR1.

The bridge will never become balanced due to heat lost to the surroundings; therefore, the oscillator will never stop oscillating.

Emitter resistor R2 provides self bias for oscillator Q1. Capacitor C1 functions as an emitter bypass capacitor. Emitter resistors R3, R4, and R6 provide self bias for oscillator Q2. The dc bias is also taken from the junction of resistors R4 and R6 and applied through the secondary of transformer T1 and resistor 2A2A5R1 to the base of oscillator Q1.

Capacitors C3 and C4 are emitter bypass capacitors.

The 18-kc signal is taken from a tap on the primary of transformer T1 and coupled through capacitor C5 to the base of emitter follower Q3, where it is rectified.

Capacitor C6 smoothes the rectified signal. Diode CR2 protects emitter follower Q3 against excessive reverse-bias on the base-emitter junction. When the base voltage attempts to go more negative than the emitter voltage, diode CR2 will be forward-biased, thereby keeping the base voltage at the same level as the emitter follower Q3; the dc signal is applied to the base of dc power amplifier 2A2A5Q1 to control current through heater 2A2A5HR1 in the emitter circuit of dc power amplifier 2A2A5Q1, and thereby, the temperature of the oven.

The current is directly proportional to the unbalance caused in the bridge circuit, which determines the output signal amplitude of oscillator Q1, Q2.

Stable operating voltages for oscillator Q1, Q2 are provided by resistor R11 and Zener diode CR1.

B).- *Test data*

Pertinent references and applicable test data for the oven control cir-

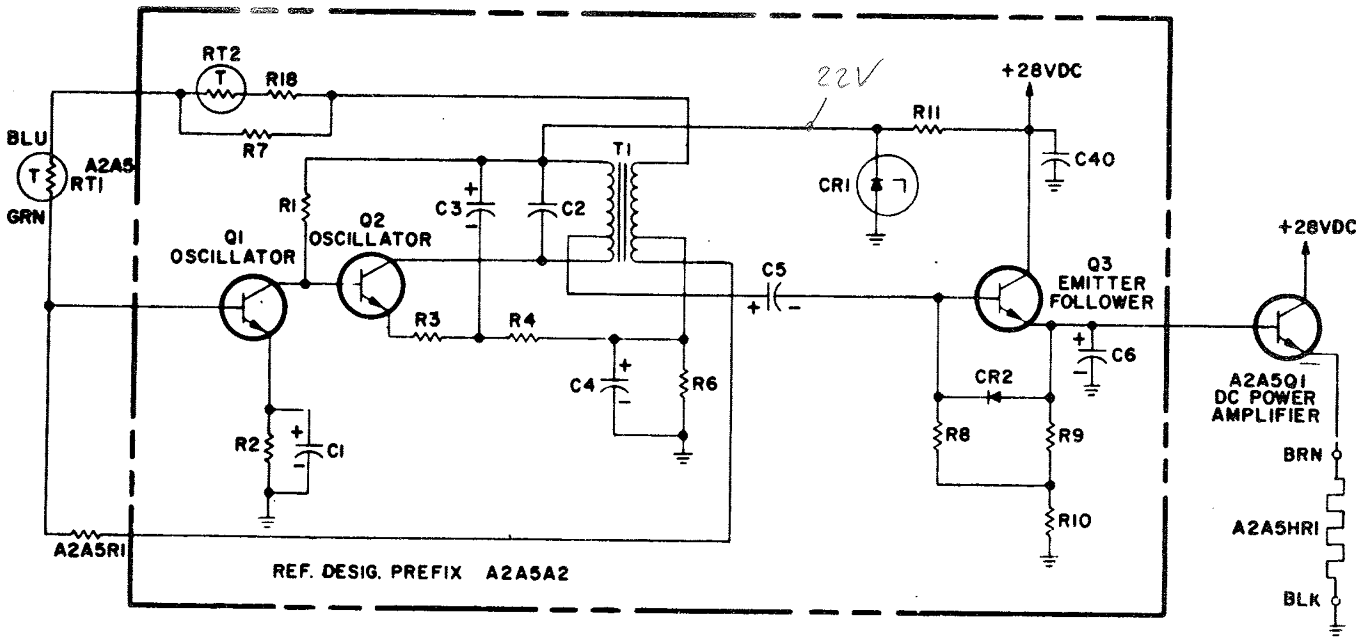
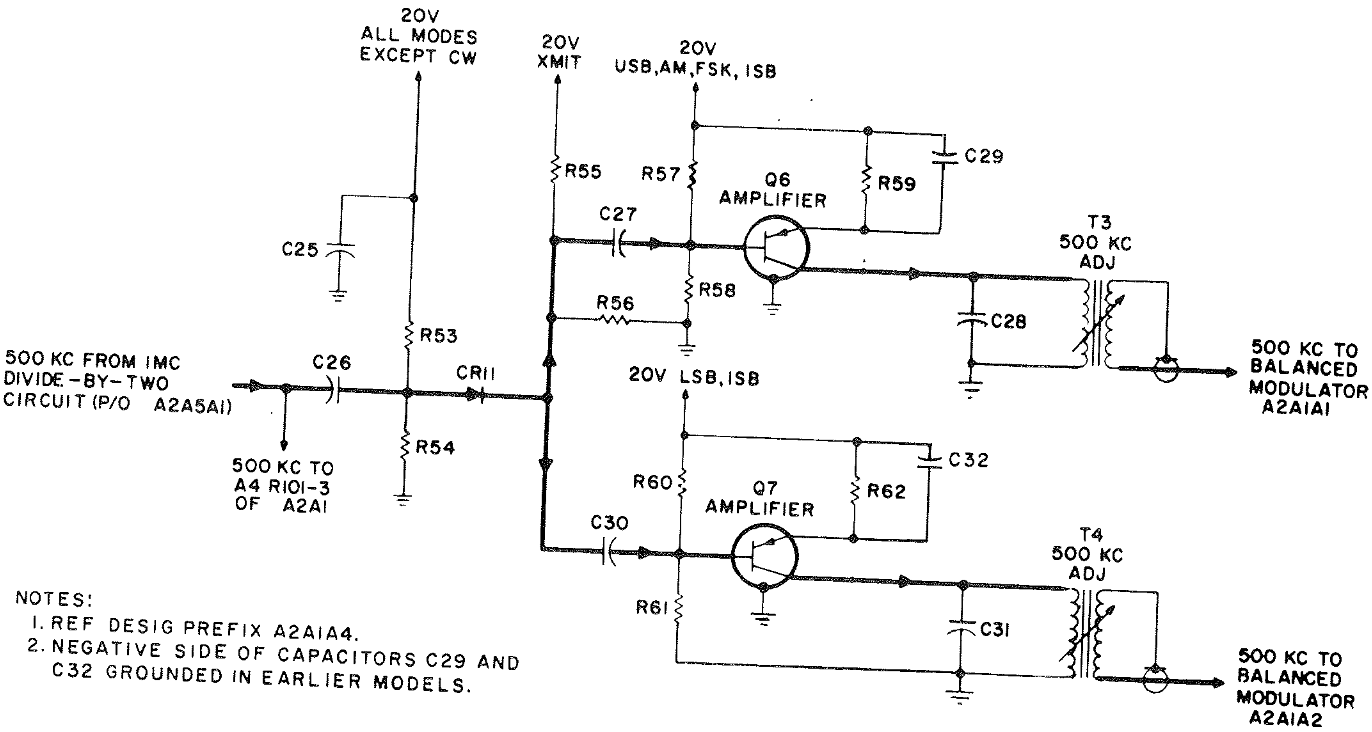


Figure 4-4. Oven Control, Simplified Schematic Diagram



NOTES:
1. REF DESIG PREFIX A2A1A4.
2. NEGATIVE SIDE OF CAPACITORS C29 AND C32 GROUNDED IN EARLIER MODELS.

Figure 4-8. Radio Transmitter T-827A/URT, 500 KC Amplifiers, Simplified Schematic Diagram

B) - *Test data*

Pertinent references and applicabile test data for the 500 kc amplifier circuit are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5-1.

b) Mode Selector Electronic Assembly, Servicing Block Diagram, figure 4-59.

c) Mode Selector Electronic Assembly, Schematic Diagram, figure 5-2.

d) Mode Selector Electronic Assembly, Adjustment paragraph 5.2.5 (E)

e) 500 KC Amplifiers/Gates and Sidetone Oscillator/Gates, Component and Test Point Location, figure 5.29.

2) Required Test Equipment:

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.7 - **Balanced Modulator**

A) - *Circuit description*

The balanced modulator (figure 4-9) consists of a balanced resistive input network (R21, R22, R23, R24, R25), diode bridge (R27, CR5; R29, CR6; R28, CR7; R30, CR8), and a balanced reactive output network (C13, C14, C15, C16, C17, R31, R32, R33, R34, and the primary of T2).

There are two balanced modulator circuits used; 2A1 and 2A2 (figure 5-2) These circuits, which form a part of Mode Selector Electronic Assembly 2A2A1, modulate the 500-kc if. carrier with the desired intelligence.

A balanced modulator is a device for obtaining the sideband components of modulation without passing the carrier. Balanced modulator 2A1 is used during the USB, AM, and FSK modes of operation. Balanced modulator 2A2 is used during the LSB mode of operation. Both balanced modulators are used during the ISB mode of operation.

A detailed description of the operation of 2A1 follows.

The 500-kc output from 500 kc amplifier 2A4Q6 is applied to the center of the balanced resistive input network. Balancing resistor R23 is adjusted to compensate for the tolerance of fixed resistors R21, R22, R24, and R25. Proper adjustment of resistor R23 insures that the resistance from the center to either side of the resistive input network will be equal (balanced).

The output from this network is applied to one side of the diode bridge and the intelligence is applied to the other side. Each arm of the diode bridge has a 100-ohm precision resistor in series with the respective diode,

Since the forward resistance of the diode is small, the resistance of each arm will be effectively 100 ohms, thereby balancing the bridge.

The audio voltage across the bridge varies in frequency and amplitude. When the instantaneous polarity of the audio signal is positive, diode CR6 conducts; when the audio signal goes instantaneously negative, diode CR5 conducts. Therefore, the output from the diode bridge will consist of two sidebands with a suppressed carrier.

The two sidebands are coupled to the primary of transformer T2 by capacitors C16 and C17. Resistors R31, R32, R33, and R34 provide resistive balance from the center to either side of the output of the balanced modulator circuit. Capacitors C13, C14, and C15 tune the primary of transformer T2.

Balancing resistor R23 and tuning capacitor C15 provide resistive and reactive balance in the balanced modulator circuit, insuring a high degree of carrier suppression. Transformer T2 couples the double sideband signal to isolation amplifier A3Q2. Resistor A3R35 is the terminating resistor for transformer T2.

Balanced modulator 2A2 is identical to balanced modulator 2A1. The 500-kc signal is applied to balanced modulator A2 from 500 kc amplifier 2A4Q7.

The output from balanced modulator A2 is developed across transformer

T1, which also couples it to isolation amplifier A3Q1. Resistor 2A3R15 is a damping resistor for transformer T1.

B) - *Test data*

Pertinent references and applicable test data for the balanced modulators are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5-1.

b) Mode Selector Electronic Assembly, Servicing Block Diagram, figure 4-59.

c) Mode Selector Electronic Assembly, Schematic Diagram, figure 5-2.

d) Mode Selector Electronic Assembly, Adjustment, paragraph 5. 2. 5 (E).

e) LSB Balanced Modulator (Foil Side Up), Component and Test Point Location, figure 5.27.

f) USB Balanced Modulator (Foil Side Up), Component and Test Point Location, figure 5.26.

g) Fig. 5-24 - Mode Selector Electronic Assembly - Component Location.

2) Required Test Equipment

a) RF Signal Generator, type, mod 606-A or equiv.

b) Audio Signal Generator, type HP, Mod. 200 CD.

c) RF Voltmeter, type Boonton, mod. 91-H or equiv.

d) Spectrum Analyzer Test Set, type Singer, mod. Sb 12bS.

4.3.8 - Isolation Amplifier/Filter

A) - *Circuit description*

The isolation amplifier/filter (figure 4-10) consists of an isolation amplifier (Q2) and a filter (FL2).

A similar circuit (Q1 and FL1) is also used (figure 5-2). Each of these circuits, which form a part of Mode Selector Electronic Assembly 2A2A1, isolate the associated balanced modulator from the filter, provide amplification for the output of the balanced modulator, filter the undesired sideband from the double sideband output from the balanced modulator, and provide additional suppression of the 500 kc carrier.

The carrier should be 50-db below the desired sideband at the output of the filter. Isolation amplifier Q2 and filter FL2 are used during the FSK, USB, and AM modes of operation, Isolation amplifier Q1 and filter FL1 are used during the LSB mode of operation. Both amplifiers and filters are used during the ISB mode of operation.

A detailed description of the operation of this circuit follows.

The output from balanced modulator A1 is coupled to the base of isolation amplifier Q2 by capacitor C18.

Operating voltage for amplifier Q2 is developed from the 20 vdc applied to voltage divider R36, R37 and emitter resistor R38 by the Mode Selector switch on the front panel (USB, ISB, AM, and FSK positions).

Unbypassed emitter resistor R39 provides a small amount of degeneration to improve the stability of the circuit. Isolation amplifier Q2 provides amplification for the double sideband output from the balanced modulator. This amplification is required because of the insertion loss of the filter. The output from isolation amplifier Q2 is coupled to the input of filter FL2 by capacitor C21.

Filter FL2 is a mechanical filter that passes only the upper sideband portion of the double sideband output of isolation amplifier Q2. During FSK operation, the square wave used to modulate the 500-kc carrier is filtered so that only that portion of the if. that is modulated by the fundamental frequency of the square wave passes. Coupler capacitor C21 is selected to provide a 500-kc series resonant input circuit for the filter.

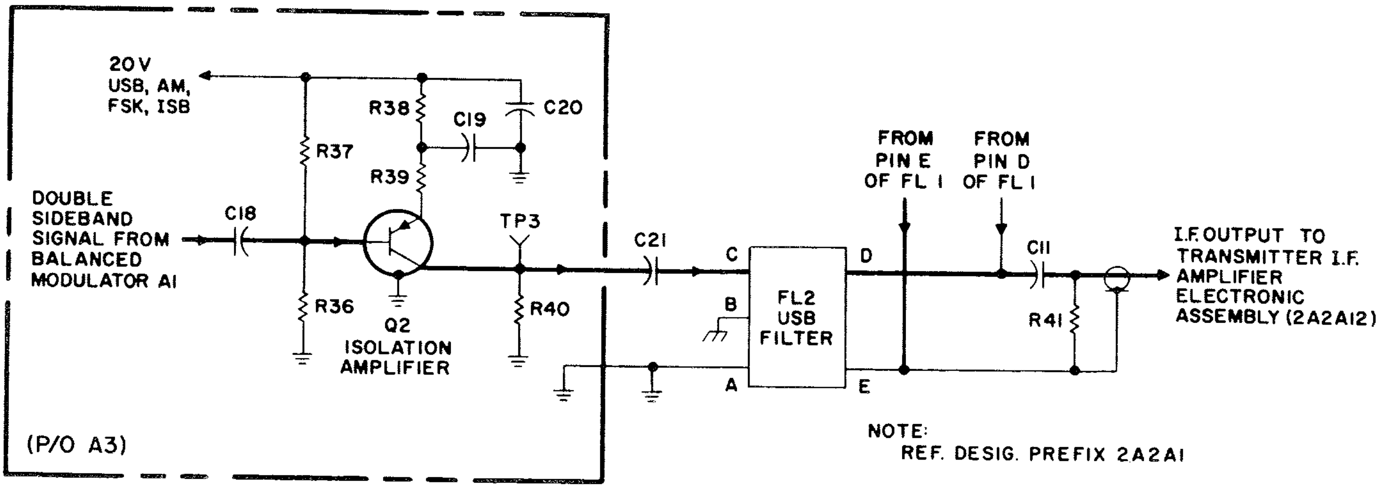


Figure 4-10. Isolation Amplifier/Filter, Simplified Schematic Diagram

Isolation amplifier Q1 (figure 5-2) is identical to isolation amplifier Q2. The operating voltage for Q1 is only applied during LSB or ISB modes of operation.

The 500-kc if. output from balanced modulator A2 is applied to isolation amplifier Q1, which provides the amplification required to drive filter FL1.

Filter FL1 passes only the lower sideband portion of the double sideband output from isolation amplifier Q1.

The output from filter FL1 or FL2, or from both filters, is coupled to the if. amplifiers in IF. Amplifier Electronic Assembly 2A2A12 by capacitor C11. Resistor R41 provides the necessary resistive termination for the two filters.

B) - *Test data*

Pertinent references and applicable test data for the isolation amplifier/filter circuit are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5-1.

b) Mode Selector Electronic Assembly, Servicing Block Diagram, figure 4-59.

c) Mode Selector Electronic Assembly, Schematic Diagram, figure 5.2

d) Isolation Amplifiers (Foil Side Up), Component and Test Point Location, figure 5.28.

e) Mode Selector Electronic Assembly, Right Side, Component and Test Point Location, figure 5.24.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) Audio Signal Generator, type HP, mod. 200 CD or equiv.

c) Spectrum Analyzer, Test Set, type Singer, mod. Sb 12 bs or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.9.- Peak power controlled IF. amplifier

A) .- *Circuit description*

The peak power controlled if. amplifier (figure 4-11) consists of an emitter follower (Q1) and an if. amplifier (Q2).

These circuits, which form a part of IF. Amplifier Electronic Assembly 2A2A12, prevent the peak power of the if. amplifier from exceeding a predetermined level and thereby limit the peak power of the associated rf power amplifier.

A detailed description of the operation of this circuit follows.

The if. signal from the isolation amplifier/filter circuit in Mode Selector Electronic Assembly 2A2A1 is coupled through capacitor C1 to the base of if. amplifier Q2.

The base bias for if. amplifier Q2 is provided by 20 vdc applied to voltage divider R2, R10, R12.

Since resistor R12 is also in the emitter circuit of emitter follower Q1, any increase in the emitter current of emitter follower Q1 increases the voltage across resistor R12 and capacitor C3.

This increases the base voltage on if. amplifier Q2, which decreases the forward bias from emitter to base of if. amplifier Q2, thereby decreasing the gain of the stage. Emitter current in emitter follower Q1 will flow when voltages of sufficient amplitude are received at the PPC input.

These voltages are supplied by the PPC circuit in the associated rf power amplifier.

The PPC voltages are applied to the base of emitter follower Q1, forward-biasing it and causing emitter current to charge capacitor C3. This action raises the voltage level on the base of if. amplifier Q2, decreasing its forward bias, and therefore the gain of the stage.

The output from if. amplifier Q2 is developed across a 500-kc tuned circuit consisting of the primary of transformer T1 and capacitor C5.

When the T-827A/URT is operating in the compatible AM or CW mode, a 500-kc carrier signal from the carrier re-insertion circuits in Mode Selector Electronic Assembly 2A2A1 is reinserted into the if. signal at the collector of if. amplifier Q2. The pilot carrier, when used, is also applied to the collector of if. amplifier Q2 for reinsertion.

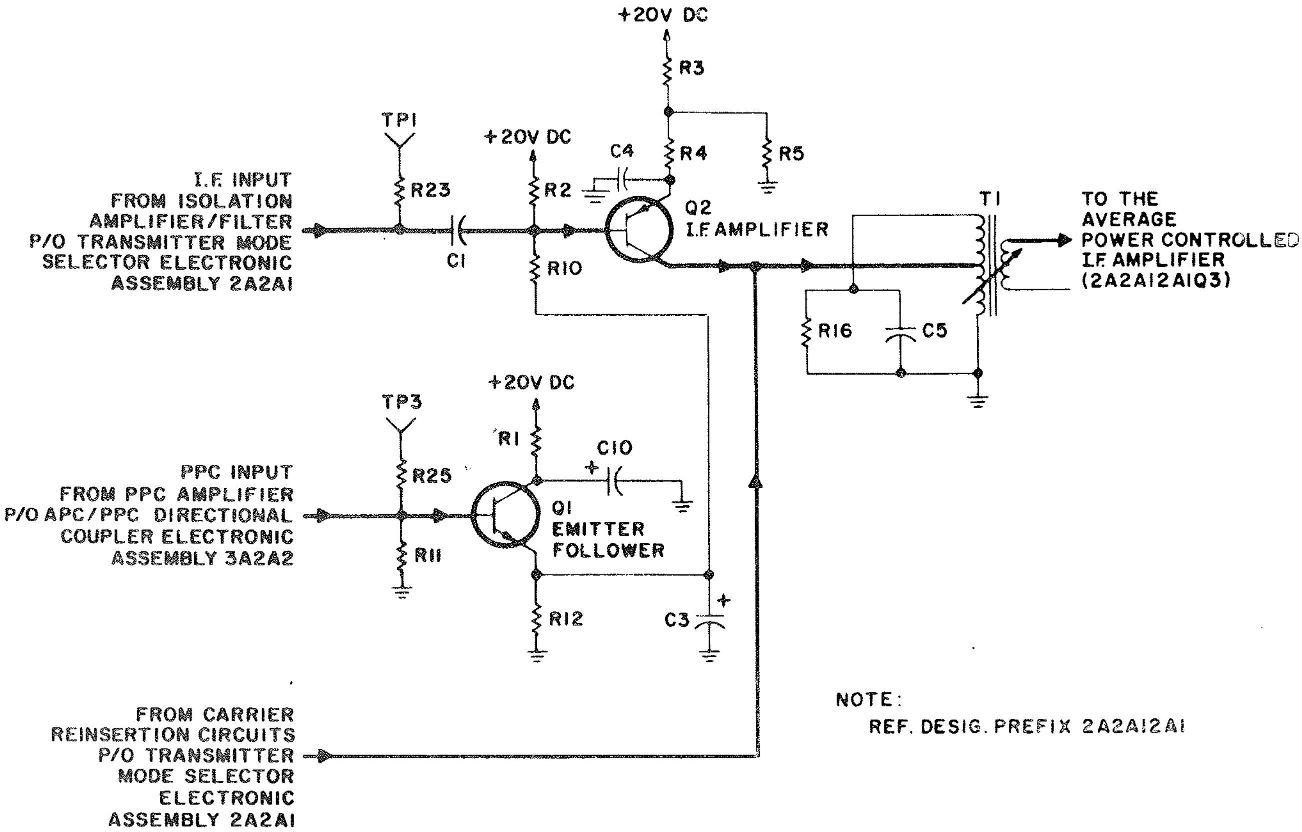


Figure 4-11. Peak Power Controlled IF. Amplifier, Simplified Schematic Diagram

B) - *Test data*

Pertinent references and applicable test data for the peak power controlled if. amplifier circuit are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5-1.

b) IF. Amplifier Electronic Assembly, Servicing Block Diagram, figure 4-60.

c) IF. Amplifier Electronic Assembly, Schematic Diagram, figure 5.14.

d) IF. Amplifier Electronic Assembly 2A2A12, Adjustments, paragraph 5.2.4 (D)

e) IF. Amplifier, (Foil Side Up), Component and Test Point Location, figure 5.105.

2) Required Test Equipment:

a) Multimeter, type Metrix, mod. 430/C or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

4.3.10 - Average power controlled IF. amplifier

A) - *Circuit description*

The average power controlled if. amplifier (figure 4-12) consists of emitter follower (Q4) and an if. amplifier (Q3).

These circuits, which form a part of IF. Amplifier Electronic Assembly 2A2A12, control the amplitude of the 500-kc if. signal in accordance with the average power of the output signal of the associated rf power amplifier.

A detailed description of the operation of this circuit follows.

The if. signal from the peak power controlled if.amplifier Q2 is applied to the base of if. amplifier Q3 through transformer T1.

The base bias for if. amplifier Q3 is provided by 20 vdc applied to voltage divider R6, R15, R13, R17. The bias may be manually adjusted with potentiometer R15.

The emitter current in emitter follower Q4 will flow when voltages of sufficient amplitude are received at the APC input. These voltages are supplied by the APC circuit in the associated if. power amplifier. The APC voltages are applied to the base of emitter follower Q4, forward-biasing the transistor and causing emitter current to flow through resistor R14.

The APC input signal will not affect if. amplifier Q3 until the magnitude of the signal is sufficient to cause enough emitter current to flow through resistor R14 so that the voltage across resistor R14 will exceed the voltage across resistor R17.

This condition will forward-bias diode CR1, causing the voltage across resistor R17 to rise to nearly the same level as the voltage across resistor R14.

Raising the voltage across resistor R17 causes the base bias voltage on if. amplifier Q3 to rise, thereby reducing the base-to-emitter forward-bias, resulting in a decrease in gain for the stage.

The output from if. amplifier Q3 is developed across the 500-kc tuned circuit consisting of the primary of transformer T2 and capacitor C8.

B) - *Test data*

Pertinent references and applicable test data for the average power controlled if. amplifier circuit are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5-1.

b) IF. Amplifier Electronic Assembly, Servicing Block Diagram, figure 4.60.

c) IF. Amplifier Electronic Assembly, Schematic Diagram, figure 5.14

d) IF. Amplifier Electronic Assembly 2A2A12, Adjustment, paragraph 5.2.4 (D)

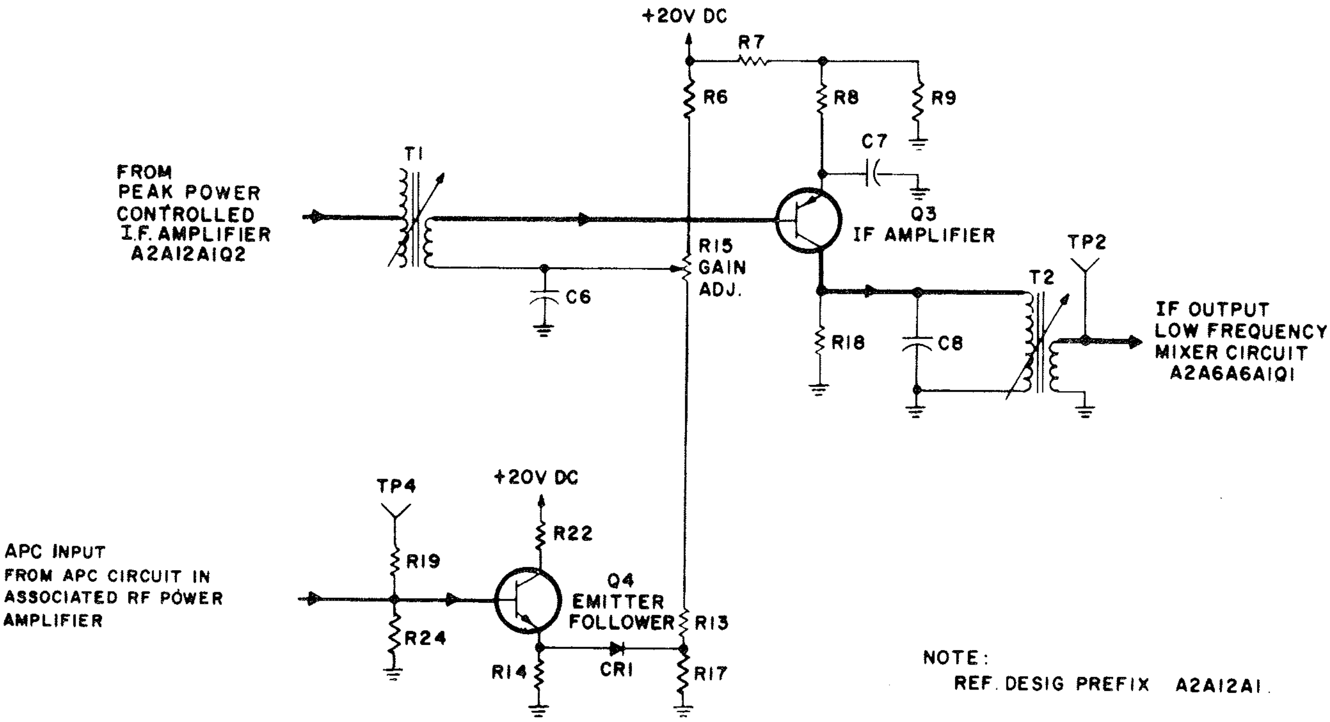


Figure 4-12. Average Power Controlled IF. Amplifier, Simplified Schematic Diagram

e) IF. Amplifier (Foil Side μp) Component and Test Point Location, figure 5.105.

2) Required Test Equipment

a) Multimeter, type Metrix, mod. 430/C or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

4.3.11 - Low frequency mixer

A) - *Circuit description*

The low frequency mixer (figure 4-13) consists of the first transmitter mixer (Q5) and an emitter follower (Q7).

These circuits, which form a part of RF Translator Electronic Subassembly 2A2A6A6, mix the 500-kc if. signal from the average power controlled if. amplifier in IF. Amplifier Electronic Assembly 2A2A12 with the 1 and 10-kc injection from 1 and 10 kc output and blanker circuit 2A2A6A3A3, producing a second intermediate frequency between 2.8 and 2.9 mc.

A detailed description of the operation of this circuit follows.

The 1 and 10-kc injection signal is coupled through capacitor C26 to the base of emitter follower Q7.

The base bias for emitter follower Q7 is produced from the 20 vdc applied to voltage divider R25, R23, R24. The emitter follower isolates the 1 and 10 kc output and blanker circuit from first transmitter mixer Q5 and provides a low impedance source to the emitter circuit of the mixer.

The 1 and 10-kc injection signal covers the range of 3.301 to 3.400 mc in 1 kc steps.

The output from emitter follower Q7 is coupled through capacitor C28 and resistor R38 to the emitter of first transmitter mixer Q5. The 500 kc if. input signal is coupled through capacitor C40 to the base of first transmitter mixer Q5. The base bias for first transmitter mixer Q5 is provided by 20 vdc applied to voltage divider R34, R36, R37.

Filter FL3, which has a bandwidth from 2.8 to 2.9 mc, is in the output circuit of first transmitter mixer Q5. This filter will reject all the products from the mixer except the desired difference frequency.

Inductors L4 and L5 decouple the 10-vdc line. Diode CR6 is forward-biased through resistor R40, inductor L4, and filter FL3.

The output from filter FL3 passes through diode CR6 and is coupled through capacitor C45 to the mid frequency mixer circuit.

Resistor R41 supplies the ac load required for filter FL3. Capacitor C15 dc isolates resistor R41.

B) - *Test data*

Pertinent references and applicable test data for the low frequency mixer are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5-1.

b) RF Translator Electronic Subassembly, Servicing Block Diagram, figure 4-61.

c) RF Translator Electronic Subassembly, Schematic Diagram, figure 5.11.

d) RF Translator (Component Side Down), Component and Test Point Location, figure 5.101

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) Heterodyne Voltmeter, type Bruel and Kjaer, mod. 2006 or equiv.

c) Multimeter type Metrix, mod. 430/C or equiv.

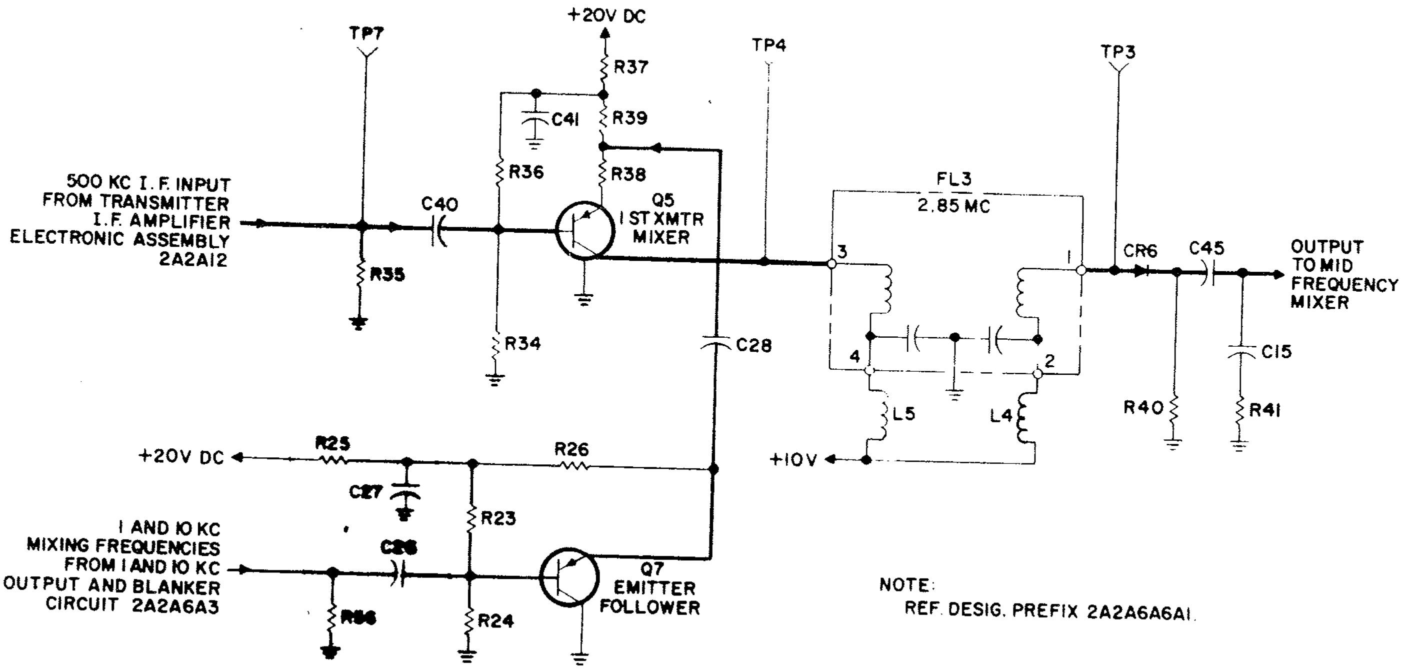


Figure 4-13. Low Frequency Mixer, Simplified Schematic Diagram

4.3.12.- **Mid frequency mixer**

A) - *Circuit description*

The mid frequency mixer (figure 4-14) consists of the second transmitter mixer (Q4) and two emitter followers (Q1 and Q9).

These circuits, which form a part of RF Translator Electronic Subassembly 2A2A6A6, mix the signal from the low frequency mixer with the 100-kc injection from hi-band/lo-band mixer/amplifier in 100 KC Synthesizer Electronic Subassembly 2A2A6A2.

A detailed description of the operation of this circuit follows.

The 100-kc mixing frequencies signal is coupled by capacitor C23 to the base of emitter follower Q9. The base bias for emitter follower Q9 is provided by 20 vdc applied to voltage divider R14, R15, R17.

The emitter follower isolates the hi-band/lo-band mixer/amplifier circuit from second transmitter mixer Q4 and provides a low impedance source to the mixer.

The frequency of the 100-kc mixing frequencies signal is in 100-kc steps between 22.4 to 23.3 mc or 32.4 to 33.3 mc, depending on the potential on the hi/lo band control line.

The output from emitter follower Q9 is coupled through capacitor C24 and resistor R46 to the emitter of second transmitter mixer Q4.

The input from the low frequency mixer (2.8 to 2.9 M c/s) applied to the base of second transmitter mixer Q4. The base bias for second transmitter mixer Q4 is provided by 20 vdc applied to voltage divider R44, R43, R42.

The output circuit of second transmitter mixer Q4 consists of 20 mc filter FL1 and 30 mc filter FL2; each has a band-width of 1 mc (19.5 to 20.5 mc and 29.5 to 30.5 mc, respectively).

When the hi/lo band control line is at ground potential (as determined by the code generator), diode CR7 is forward-biased by the 10 vdc applied through inductor L3 and resistor R50. Diode CR2 is also forward-biased by 10 vdc applied through inductor L2 and resistor R49. In this condition, the output from the second transmitter mixer is coupled through capacitor C12 to 30 mc filter FL2, where all mixing products except the desired difference frequency are rejected.

The output from 30 mc filter FL2 is coupled through capacitor C10 to the base of emitter follower Q1 since diode CR1 is forward-biased by 20 vdc applied through resistor R2 and inductor L2. When the hi/lo band control line is at 20 vdc, diode CR4 is forward-biased by 20 vdc applied through inductor L1 and resistor R47. Diode CR3 is also forward-biased by 20 vdc applied through inductor L1 and resistor R48.

In this condition, the output from the second transmitter mixer is coupled through capacitor C11 to 20 mc filter FL1, where all mixing products except the desired difference frequency are rejected. The output from 20 mc filter FL1 is coupled through capacitor C9 to the base of emitter follower Q1 since diode CR1 is forward-biased by 20 vdc applied through resistor R2.

Resistor R3 supplies the ac load that is required by filters FL1 and FL2. Capacitor C2 dc isolates resistor R3. The output from emitter follower Q1 is coupled through capacitor C1 to the high frequency mixer in RF Amplifier Electronic Assembly 2A2A4.

B) - *Test data*

Pertinent references and applicable test data for the mid frequency mixer are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) RF Translator Electronic Subassembly, Servicing Block Diagram, figure 4.61.

c) RF Translator Electronic Subassembly, Schematic Diagram, figure 5.11

d) RF Translator (Component Side Down), Component Test Point Location, figure 5.101.

2) Required Test Equipment:

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.13 - **High frequency mixer/amplifier**

A) - *Circuit description*

The high frequency mixer/amplifier (figure 4.15) consists of an amplifier (2A2A4A38Q1), a mixer (2A2A4A38Q2) and an emitter follower (2A2A6A6A1Q8).

These circuits, which form a part of RF Amplifier Electronic Assembly 2A2A4 and RF Translator Electronic Subassembly 2A2A6A6, mix the signal from the mid frequency mixer circuit with the mc injection from the mc oscillator circuit in MC Synthesizer Electronic Subassembly 2A2A6A1.

A detailed description of the operation of this circuit follows.

The reference designation prefix for the components named in this paragraph is 2A2A6A6A1, unless otherwise noted.

The mc mixing frequencies signal is coupled through capacitor C21 to the base of emitter follower Q8.

Resistor R55 is the load for the mc mixing frequencies.

Base bias is provided by 20 vdc applied to voltage divider R10, R11, R13,

The emitter follower isolates the mc oscillator circuit (2A2A6A1A1) from mixer 2A2A4A38Q2 and provides a low impedance source for the emitter circuit of the mixer.

The mc mixing frequencies signal consists of a frequency in the 2.5 to 23.5-mc range.

The output from emitter follower Q8 is coupled through capacitors C7 and 2A2A4A38C4 to the base of mixer 2A2A4A38Q2.

The reference designation prefix for the components named in this paragraph is 2A2A4A38, unless otherwise noted.

The input signal from the mid frequency, mixer circuit is coupled to the base of amplifier Q1 by capacitor C1.

Base bias is provided by 20 vdc applied to voltage divider R2, R3.

The output from amplifier Q1 is coupled to the base of mixer Q2 by capacitor C3.

The mc injection signal and the signal from amplifier Q1 are subtractively mixed and applied to the rf amplifier A2A4V1 circuit. The base bias is provided by 20 vdc applied to voltage divider R7, R8.

B) - *Test data*

Pertinent references for the high frequency mixer/amplifier are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5-1.

b) RF Amplifier Electronic Assembly, Servicing Block Diagram, figure 4.62.

c) RF Translator Electronic Subassembly, Servicing Block Diagram, figure 4.61.

d) RF Amplifier Electronic Assembly, Schematic Diagram, figure 5.4.

e) RF Translator Electronic Subassembly, Schematic Diagram, figure 5.11.

f) HF Mixer/Amplifier (Foil Side Up), Component and Test Point Location, figure 5.37.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) Heterodyne Voltmeter, type Bruel and Kjaer, mod. 2006 or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

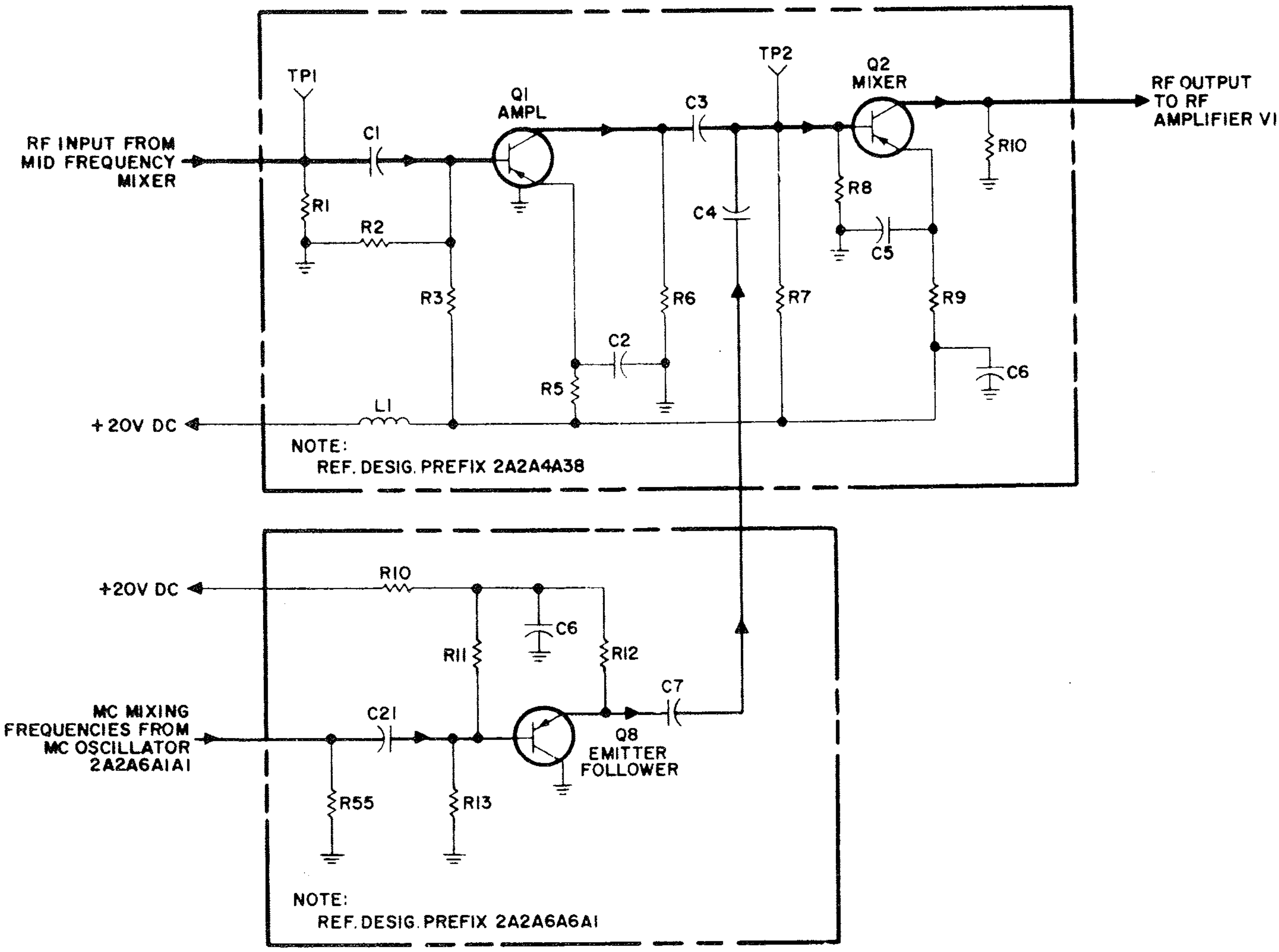


Figure 4-15. High Frequency Mixer, Simplified Schematic Diagram

4.3.14 - RF Amplifier V1

A) - *Circuit description*

RF Amplifier V1 (figure 4.16), which forms a part of RF Amplifier Electronic Assembly 2A2A4, amplifies the rf signal from the high frequency mixer/amplifier circuit for application to rf amplifier V2.

A detailed description of the operation of this circuit follows.

The signal from the high frequency mixer/amplifier circuit passes through contacts 2 and 5 of relay A38K1 and is applied to the secondary of transformer T1 in the megacycle assembly. The megacycle assembly is made up of a double-tuned circuit with capacity coupling.

The secondary of transformer T1 forms part of a parallel tuned circuit. The other part consists of capacitor C2 in series with a capacitance network composed of capacitors C19 and C20 and the capacitors on circuit board assemblies A30 and A31.

The signal is coupled from transformer T1 to inductor T2 by capacitor C1. Inductor T2 forms part of a parallel tuned circuit.

The other part consists of capacitor C3 in series with a capacitance network composed of capacitors C8 and C9 and the capacitors on circuit board assemblies A32 and A33.

A separate megacycle assembly (A2 through A29) is automatically switched into the circuit for each setting of the front panel MCS controls (2 through 29 mc). The values of the components of these assemblies are shown in chart C on figure 5.4-

For each of the ten settings of the 100 kc (KCS) control, different combinations of capacitors on the A30 and A33 assemblies (C1 through C9 and C10 through C19, respectively) are switched into the circuit. The values of these componets are shown in chart B on figure 5.4.

Also, for each of the ten settings of the 10 kc (KCS) control, different capacitors on assemblies A31 and A32 (C1 through C9) are switched into the circuit. The values of these components are skown in chart A on figure 5.4.

From the megacycle assembly, the signal passes through parasitic suppressor FL1 and is coupled through capacitor C1 to the control grid of rf amplifier V1.

Screen voltage (110 vdc) for rf amplifier V1 is applied through decoupling resistor A1R4. Plate voltage (110 vdc) for rf amplifier V1 is applied through decoupling resistor A1R4 and transformer T3.

The cathode bias for rf amplifier V1 is developed across resistors R2 and A1R3.

The output circuit for rf amplifier V1 consists of inductor T3 and capacitor C4 in series with a capacitance network comprised of capacitors C11 and C12 and the capacitors on circuit board assemblies A34 and A35.

These components form a parallel tuned circuit.

When transmit/receive relay 2A2K3 is deenergized (receive mode), the negative lead of capacitor 2A2A8C7 is connected through resistor 2A2A8R13 and through contacts 13 and 6 of the relay to ground.

When transmit/receive relay 2A2K3 is energized (transmit mode), the negative lead of capacitor 2A2A8C7 is connected through resistor 2A2A8R13 and through contacts 13 and 5 of relay to -30 vdc.

At the instant of energizing capacitor 2A2A8C7 will present a short circuit (due to the fact there was no previous charge); therefore, the -30 vdc will be applied through voltage divider A1R1, A1R2 and resistor R1 to the grid of rf amplifier V1, which cuts off the stage.

As the charge on capacitor 2A2A8C7 builds up through resistor 2A2A8R12 and 2A2A8R13, the dc voltage on the grid of rf amplifier V1 will approach zero, thereby permitting the stage to function.

The reason for this action is that the controlled build up of excitation to the associated rf power amplifier matches the response time of the system feedback loop controlling transmitted power and thereby prevents large bursts of output at the first instant of transmit operation.

The signal, after being amplified by rf amplifier V1, is applied to the second rf amplifier V2 circuit.

B) - *Test data*

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) RF Amplifier Electronic Assembly, Servicing Block Diagram, figure 4.62.

c) RF Amplifier Electronic Assembly, Schematic Diagram, figure 5.4.

d) RF Amplifier Bias Circuit, (Foil Side Up), Component Location, figure 5.36.

e) 100 KC Rotor Assembly (Component Side Down), Component Location, figure 5.57.

f) 10 KC Rotor Assembly (Component Side Down), Component Location, figure 5.55.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Electronic Multimeter, type HP, mod. 410-B or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.15 - RF Amplifier V2

A) - *Circuit description*

RF amplifier V2 circuit (figure 4.17), which forms a part of RF Amplifier Electronic Assembly 2A2A4, amplifies the rf signal from rf amplifier V1 to a level suitable for driving the associated rf power amplifier.

A detailed description of the operation of this circuit follows.

The signal from rf amplifier V1 is coupled through capacitor C5, passes through parasitic suppressor FL2, and is applied to the control grid of rf amplifier V2.

Screen voltage (110 vdc) for rf amplifier V2 is applied through decoupling resistor A1R6. Plate voltage (110 vdc) for rf amplifier V2 is applied through decoupling resistor A1R6, the primary rf transformer T4, and parasitic suppressor FL3.

Capacitor C7 is an RF bypass. The cathode bias for rf amplifier V2 is developed across resistor A1R5.

The output circuit for rf amplifier V2 consists of transformer T4 and capacitor C5 in series with a capacitance network comprised of capacitors C13 and C14 and the capacitors on circuit board assemblies A37 and A36. These components form a parallel tuned circuit.

See paragraph 4.3.14 for a discussion of this tuned circuit, except note that the 100 kc capacitors are located on assembly A37 and the 10 kc capacitors are located on assembly A36.

B) - *Test data*

Pertinent references for the rf amplifier V2 circuit are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) RF Amplifier Electronic Assembly, Servicing Block Diagram, figure 4.62.

c) RF Amplifier Electronic Assembly, Schematic Diagram, figure 5.4.

d) RF Amplifier Bias Circuit (Foil Side Up), Component Location, figure 5.36.

e) 10 KC Rotor Assemblies (Component Side Down), Component Location, figure 5.60.

f) 100 Kc Rotor Assemblies (Component Side Down), Component Location, figure 5.58

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

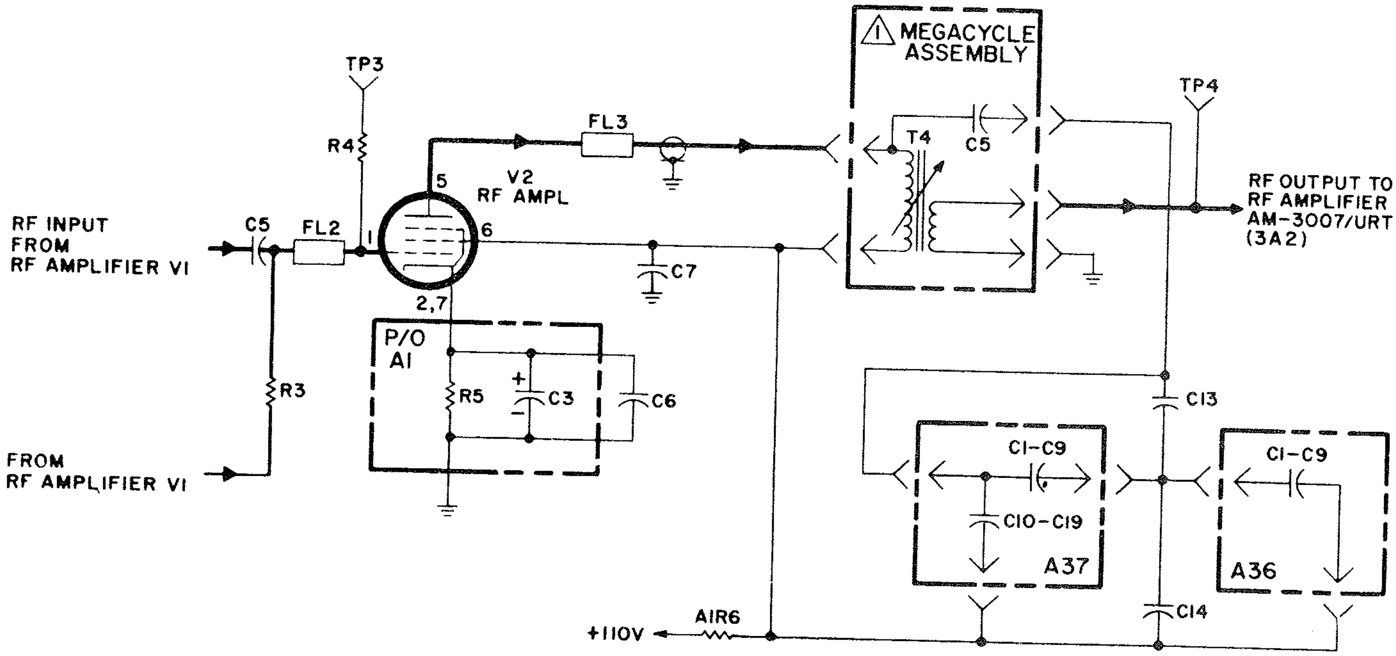


Figure 4-17. RF Amplifier V2, Simplified Schematic Diagram

The positive feedback (collector to emitter) required to sustain oscillation for the period during which a "mark" is present at the input terminals, is developed by voltage divider network C1, C2.

When a "space" (0 ma.) is present at the input to the TTY mark generator and isolation oscillator, transistor Q1 is turned off.

B) - *Test data*

Pertinent references and applicable test data for the TTY mark generator are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) FSK Tone Generator Electronic Assembly, Schematic Diagram, figure 5.13.

c) FSK Tone Generator Electronic Assembly Servicing Block Diagram, figure 4.63.

d) FSK Tone Generator (Foil Side Up), Component and Test Point Location, figure 5.103.

2) Required Test Equipment

a) Oscilloscope, type Tektronix, mod. 546 or equiv.

b) Frequency Meter, type HP, mod. 5245-L or equiv.

c) Multimeter type Metrix, mod. 430/C or equiv.

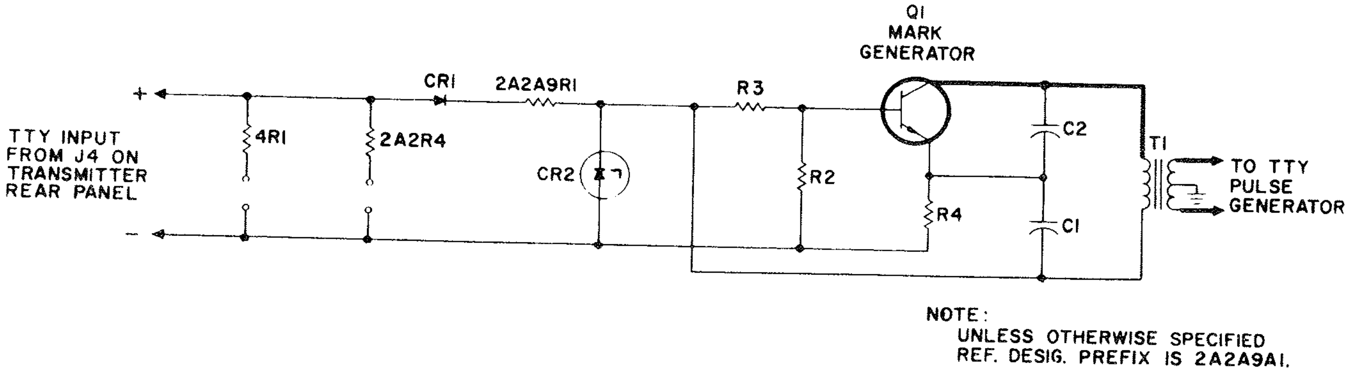


Figure 4-18. TTY Mark Generator and Line Isolator Oscillator, Simplified Schematic Diagram

4.3.17 - TTY Pulse Generator

A) - *Circuit description.*

The TTY pulse generator (figure 4.19) consists of a switch (Q2) and a relaxation oscillator (Q3, Q4).

This circuit, which forms a part of FSK Tone Generator Electronic Assembly 2A2A9, produces two series of trigger pulses to the TTY frequency divider, the repetition rates of which are representative of either a "space" or a "mark". Each series is generated around a different discrete center frequency.

A detailed description of the operation of the TTY pulse generator follows.

The positive 20 vdc applied to the TTY pulse generator from the Mode Selector switch on the front panel is regulated to 18 vdc by Zener diode CR5, which draws enough current in addition to the load current to maintain a 2-volt drop across resistor R6.

Capacitor C4 maintains a nearly constant charge, thereby providing additional regulation for the 18 vdc. Voltage divider R16, R17 develops the base bias for pulse generator Q3 from the regulated 18 vdc output from Zener diode CR5. Voltage divider R14, R15 develops the base bias for pulse generator Q4 from the regulated 18 vdc output from Zener diode CR5.

With switch S1 in the 2550 cps position, relaxation oscillator Q3, Q4 is free-running at the "space" repetition rate of 4250 cps.

When transistor Q3 is conducting, transistor Q4 is also conducting, charging capacitor C5 until the voltage across it equals the base voltage of transistor Q3. At this time transistor Q3 is back-biased and turns off.

When transistor Q3 turns off, the base voltage on transistor Q4 will increase to the same level as the voltage on the emitter, turning it off.

With both transistors Q3 and Q4 turned off, capacitor C5 discharges through resistors R13 and R11. When the voltage across capacitor C5 decreases to less than the base voltage of transistor Q3, transistor Q3 will turn back on.

When transistor Q3 turns back on, the voltage on the base of transistor Q4 will decrease to less than the emitter voltage, and it will turn on. The output at the collector of transistor Q4 is applied to the base of transistor Q3 through voltage divider R17, R18. Therefore, this turn-on/turn-off procedure is sustained at the desired 4250-rate.

When a "mark" is applied to the input, the a-c output from the TTY mark generator and line isolation oscillator is coupled to diodes CR3 and CR4 by transformer T1. Regardless of signal polarity, the signal is rectified by either diode CR3 or CR4, and the resulting dc voltage is developed across resistor R5.

Capacitor C3 smoothes the rectified voltage output from diode CR3 or CR4. The voltage developed across resistor R5 is applied to voltage divider R28, R7, which develops the base bias for switch Q2. With this voltage on the base of switch Q2, it is forward-biased and conducts, effectively placing ground on one side of resistor R12. This ground parallels resistors R12 and R13, and the resulting change in the discharge time constant for capacitor C5 shifts the repetition rate of relaxation oscillator Q3, Q4 to 5950 pps. As soon as the "mark" is removed from the base of transistor Q2, the frequency of oscillator Q3, Q4 returns to the "space" repetition rate of 4250 pps.

With switch S1 in the 2000-cps position, the "space" repetition rate of relaxation oscillator Q3, Q4 is 3150 pps. When a "mark" is applied to the base of switch Q2, the repetition rate is shifted to 4850 pps.

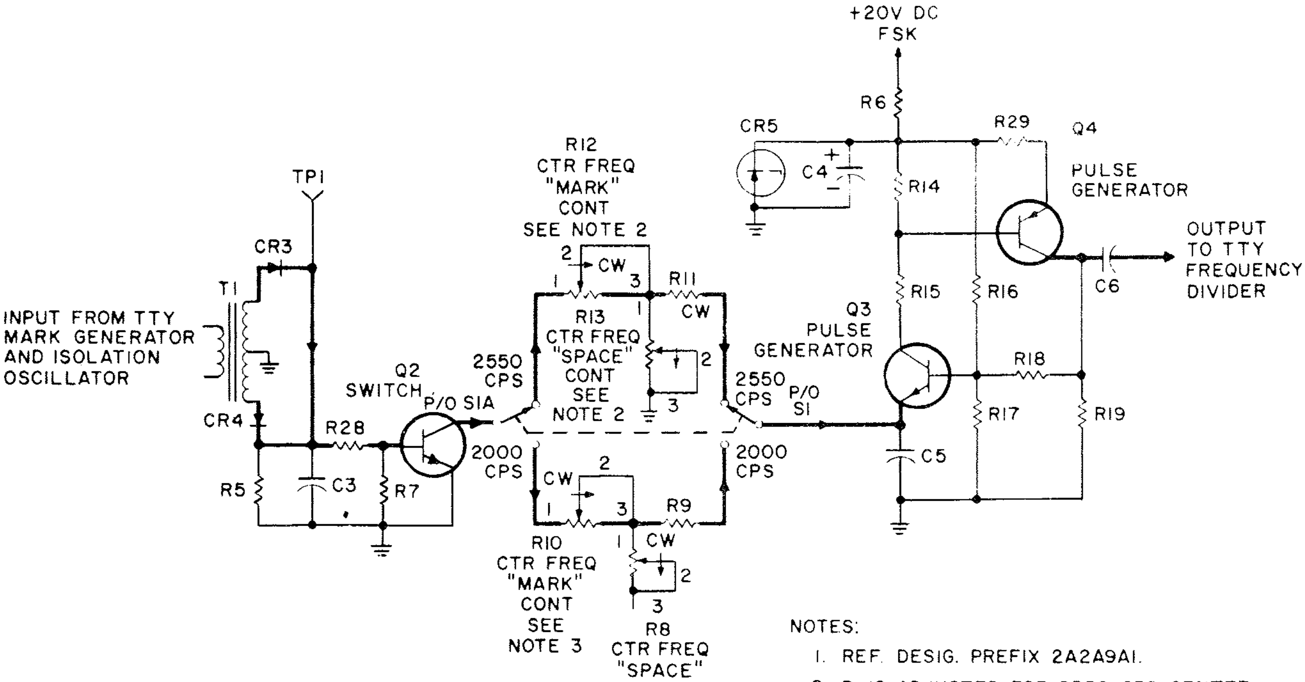
When the "mark" is removed from the base of switch Q2, the repetition rate of relaxation oscillator Q3, Q4 returns to 3150 pps. The negative sawtooth pulses present at the collector of transistor Q4 are coupled to the TTY frequency divider by capacitor C6.

B) *Test data*

Pertinent references and applicable test data for the TTY pulse generator are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.



NOTES:

1. REF. DESIG. PREFIX 2A2A9A1.
2. R-12 ADJUSTED FOR 2550 CPS CENTER FREQUENCY "MARK" (2975 CPS). R13 ADJUSTED FOR 2550 CPS CENTER FREQUENCY "SPACE" (2125 CPS).
3. R-10 ADJUSTED FOR 2000 CPS CENTER FREQUENCY "MARK" (2425 CPS). R-8 ADJUSTED FOR 2000 CPS CENTER FREQUENCY "SPACE" (1575 CPS).

Figure 4-19. TTY Pulse Generator, Simplified Schematic Diagram

b) FSK Tone Generator Electronic Assembly, Schematic Diagram, figure 5.13.

c) FSK Tone Generator Electronic Assembly, Servicing Block Diagram, figure 4.63.

d) FSK Tone Generator (Foil Side Up), Component and Test Point Location, figure 5.103.

2) Required Test Equipment

a) Oscilloscope, type Tektronix, mod. 546 or equiv.

b) Frequency Meter, type HP, mod. 5245-L or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.18.- **TTY Frequency divider**

A) - *Circuit description*

The TTY frequency divider (Fig. 4.20) is a bistable multivibrator consisting of two transistors (Q5 and Q6).

This circuit, which forms a part of FSK Tone Generator Electronic Assembly 2A2A9, divides the output from the TTY pulse generator by two, producing a series of pulses having a 50 per cent duty cycle. The 50 per cent duty cycle is required to ensure that the even harmonics are not generated in the FSK tone output.

A detailed description of the operation of the TTY frequency divider follows.

The output from the TTY pulse generator is coupled to steering diodes CR7 and CR8 by capacitor C6. Assuming that transistor Q6 is turned on and transistor Q5 is turned off, the negative portion of the input pulse applied to the base of transistor Q6 (through diode CR8, resistor R24, and capacitor C8) will turn off transistor Q6.

With transistor Q6 turned off, the voltage on the base of transistor Q5 becomes more positive, thus turning on transistor Q5. Capacitor C7 discharges through diodes CR7 and CR6.

When the next negative pulse is applied it is coupled through diode CR7, resistor R21, and capacitor C7 to the base of transistor Q5, turning the transistor off.

Capacitor C8 will now discharge through diodes CR8 and CR6. Therefore, transistor Q5 provides one output pulse for every two pulses applied to the input of the TTY frequency divider. The pulsed output at the collector of transistor Q5, which has a 50 per cent duty cycle, is coupled to the TTY pulse shaper by capacitor C11.

Diode CR6 aids recovery of the circuit by providing a low resistance path through which capacitors C7 and C8 can discharge. The diode also prevents loading of the input pulses.

B) .- *Test data*

Pertinent references and applicable test data for the TTY frequency divider are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) FSK Tone Generator Electronic Assembly, Schematic Diagram, figure 5.13.

c) FSK Tone Generator Electronic Assembly, Servicing Block Diagram, figure 4.63

d) FSK Tone Generator (Foil Side Up), Component and Test Point Location, figure 5.103.

2) Required Test Equipment

a) Oscilloscope, type Tektronix, mod. 546 or equiv.

b) Frequency Meter, type HP, mod. 5245-L or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

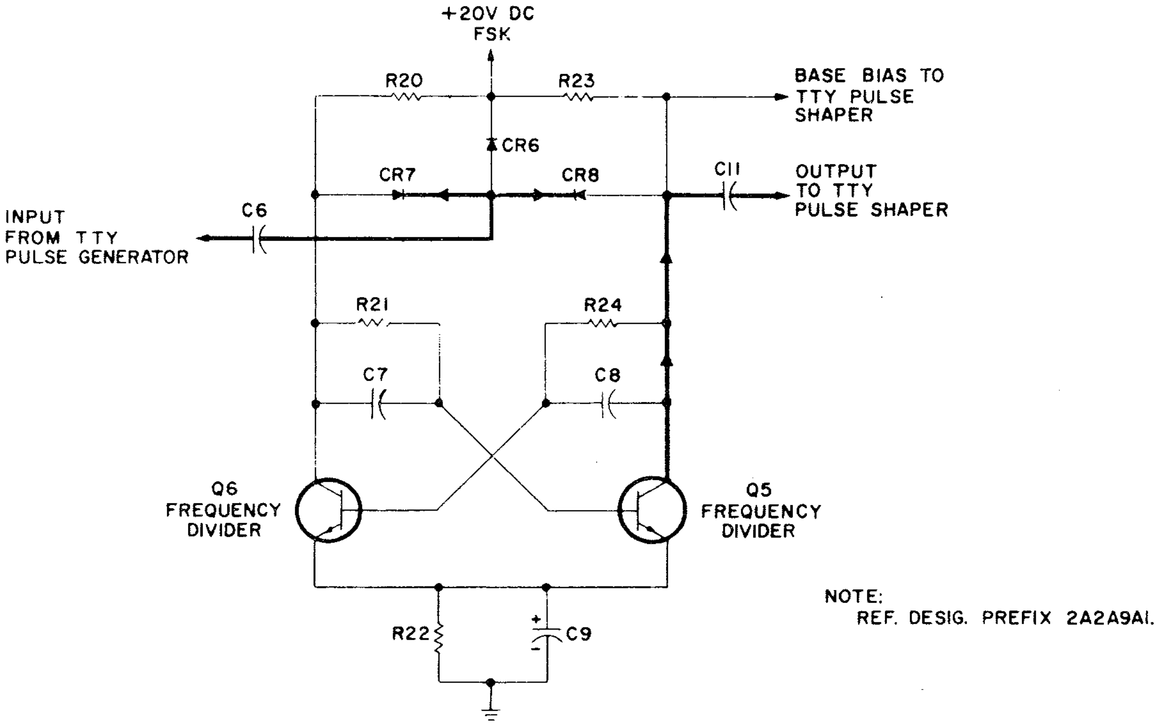


Figure 4-20. TTY Frequency Divider, Simplified Schematic Diagram

4.3.19.- TTY Pulse Shaper

A) .- *Circuit description*

The TTY pulse shaper (figure 4.21) is a squaring amplifier consisting of one transistor (Q7).

This circuit, which forms a part of FSK Tone Generator Assembly 2A2A9, shapes the pulsed output from the TTY frequency divider to form a good square wave output.

A detailed description of the operation of the TTY pulse shaper follows.

When the output from the TTY frequency divider is coupled to the base of squaring amplifier Q7 by capacitor C11, amplifier Q7 is driven into saturation, thus producing a square-wave output. The amplitude of the square wave is controlled by the setting of potentiometer R26.

The base bias for squaring amplifier Q7 is applied from the TTY frequency divider through resistor R27

The square-wave output is coupled by capacitor C10 to the Mode Selector switch on the front panel.

The square-wave output is applied through the selector switch to Audio Amplifier Electronic Assembly 2A2A2, where it is amplified and applied to balanced modulator A1 in Mode Selector Electronic Assembly 2A2A1 to modulate the 500-kc carrier during the FSK mode of operation.

The odd harmonics are eliminated from the FSK tone output by the sideband filter in the Mode Selector Electronic Assembly.

B) - *Test data*

Pertinent references and applicable test data for the TTY pulse shaper are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) FSK Tone Generator Electronic Assembly, Schematic Diagram, figure 5.13.

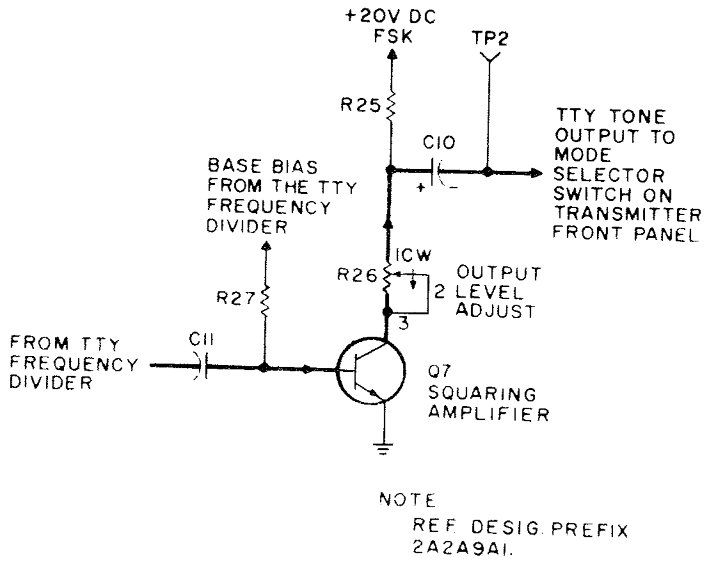


Figure 4-21. TTY Pulse Shaper, Simplified Schematic Diagram

c) FSK Tone Generator Electronic Assembly, Servicing Block Assembly, figure 4.63.

d) FSK Tone Generator (Foil Side Up), Component and Test Point Location figure 5.103.

2) Required Test Equipment

a) Oscilloscope, type Tektronix, mod. 546 or equiv.

b) Frequency Meter, type HP, mod. 5245-L or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.20 - **Audio Amplifiers**

A) - *Circuit description*

The Audio amplifiers (figure 4.22) consist of two audio amplification circuits (Q1 and Q4), two emitter follower isolation stages (Q3 and Q5) and a speech compression circuit (T2, CR1, RV1, RV2, and Q2). These circuits, which form a part of Audio Amplifier Electronic Assemblies 2A2A2 and 2A2A3, provide a constant usable audio input signal to the balanced modulator circuits. The speech compression circuit reduces the peak-to-average ratio of voice signals to maintain a constant average percentage of modulation above 60 per cent.

The emitter followers are used for isolation and impedance matching. The circuits of Audio Amplifier Electronic Assembly 2A2A2 are used duting the USB, AM, and FSK modes of operation. The circuits of Audio Amplifier Electronic Assembly 2A2A3 are used during the LSB mode of operation.

The circuits of both electronic assemblies are used during the ISB mode of operation.

A detailed description of the operation of these circuits follows.

The remote audio signals are applied to the primary of transformer T1, which is a balanced (grounded center tap) or unbalanced (open center tap) 600-ohm line input.

The local audio signals are applied to the secondary of transformer T1, which is an unbalanced input.

Transformer T1 couples the audio to potentiometer R11, which establishes the level of the audio signals coupled to the base of amplifier Q1 by capacitor C2.

The audio is also coupled to the USB LINE LEVEL meter switch or LSB LINE LEVEL meter switch for application to the corresponding meter amplifier circuit.

The parallel-series combination of resistors R12, R1, and R11 provides on approximate 600-ohm terminating resistance for transformer T1.

Resistor 2A2A8R15, which is bypassed by capacitor 2A2A8C9, limits the dc current flow through the microphone.

The applied audio signals are raised in level by amplifier Q1 and are developed across the primary of transformer T2.

A small amount of degeneration (produced by resistor R3) increases the stability of the circuit. The operating voltage for amplifier Q1 is developed by voltage divider R2, R13 and emitter resistors R3 and R4 from the positive 20 vdc applied from the Mode Selector switch on the front panel.

The amplified audio voltage at the output of amplifier Q1 is coupled to the base of agc amplifier Q2 by transformer T2. The audio voltage is detected by agc amplifier Q2 and the resulting dc voltage is developed across resistor R16 and varistors RV1 and RV2.

(A varistor is a voltage-sensitive device, the resistance of which varies inversely with the applied voltage).

Diode CR1 protects the base-emitter junction of agc amplifier Q2 against excessive reverse bias. Filter C5 smoothes the compression effect of varistors RV1 and RV2 and also filters the dc voltage output from agc amplifier Q2.

As the input audio voltage increases, the resistance of varistors RV1 and RV2 decreases, and as the input audio voltage decreases, the resistance of varistors RV1 and RV2 increases.

Therefore, since the resistance of varistors RV1 and RV2 varies inversely with the input audio voltage, the output from voltage divider R15, RV1, and RV2 is maintained at a nearly constant level.

As far as the audio signal is concerned, RV1 and RV2 are in parallel and constitutes the lower leg of the voltage divider.

The operating voltage for emitter follower Q2 is applied directly from the Mode Selector switch on the front panel.

The audio output from voltage divider R15, RV1 and RV2 is coupled to the base of emitter follower Q3 by capacitor C4.

Emitter follower Q3 is an isolation stage which prevents loading of voltage divider R15, RV1 and RV2.

The operating voltage for emitter follower Q3 is developed by voltage divider R23, R5, R17 and emitter resistor R6 from the positive 20 vdc applied from the Mode Selector switch on the front panel.

The output audio signals from emitter follower Q3, developed across resistor R6, are coupled to the base of amplifier Q4 by capacitor C6. The applied signals are raised in level by amplifier Q4 and developed across collector resistor R19.

A small amount of degeneration, produced by resistor R20, increases the stability of the circuit. The operating voltage for amplifier Q4 is developed by voltage divider R7, R18 and emitter resistors R8 and R20 from the positive 20 vdc applied from the Mode Selector switch on the front panel.

The amplified output signals from amplifier Q4 are coupled to the base of emitter follower Q5 by capacitor C7. Emitter follower Q5 provides the audio amplifier circuit with a low impedance output. The operating voltage for emitter follower Q5 is developed by voltage divider R9, R21 and emitter resistor R10 from the positive 20 vdc applied from the Mode Selector switch on the front panel.

The audio output signals from emitter follower Q5, developed across resistor R10, are coupled to one of the balanced modulator circuits by capacitor C9.

The output from Audio Amplifier Electronic Assembly 2A2A2 are coupled to balanced modulator 2A1. The outputs from Audio Amplifier Electronic Assembly 2A2A3 are coupled to balanced modulator 2A2.

B) :- *Test data*

Pertinent references and applicable test data for the audio amp ifiers circuit are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) Audio Amplifier Electronic Assembly, Servicing Block Diagram, figure 4.64.

c) Audio Amplifier Electronic Assembly, Schematic Diagram, figure 5.3.

d) Audio Amplifier (Foil Side Up), Component and Test Point Location, figure 5.31.

2) Required Test Equipment

a) Audio signal generator, type HP, mod. 200-CD or equiv.

b) Multimeter, type Metrix, mod. 430/C or equiv.

c) Electronic Multimeter, type HP, mod. 400-H or equiv.

4.3.21.- **CW Carrier reinsertion gate**

A).- *Circuit description*

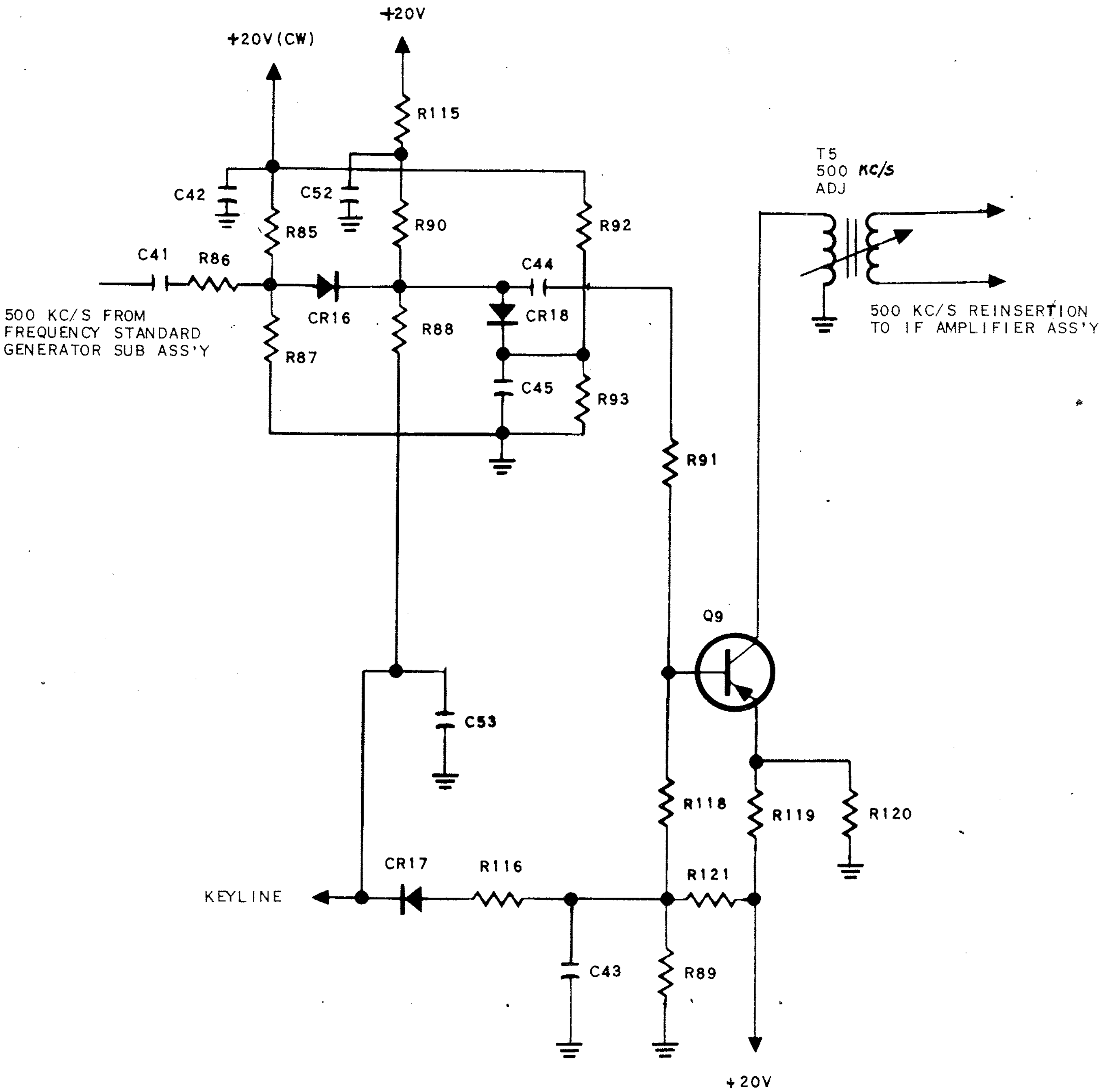
The CW carrier reinsertion gate (figure 4.23) consists of three gating circuits (CR16, CR17, CR18), and a transistor stage (Q9).

These circuits, which form a part of Mode Selector Electronic Assembly A2A1, gate the 500-kc local carrier into if. amplifiers for re-insertion during the CW mode of operation.

A detailed description of the operation of the CW carrier reinsertion gate circuit follows.

The 500-kc signal (from Frequency Standard Electronic Assembly 2A2A5) is coupled through capacitor C41 and isolating resistor R86 to the anode of gate CR16.

A positive 13.3-vdc anode bias is developed on gate CR16 by voltage divider R85, R87 from the positive 20 vdc applied from the Mode Selector switch (set at CW position) on the front panel. The cathode of diode



NOTE:
REF. DESIG. PREFIX 2A2A4

Figure 4-23. CW Carrier Reinsertion Gate, Simplified Schematic Diagram

CR16 is biased at approximately 10 vdc by voltage divider R88, R90.

When a gate is conducting both the biases are approximately the same; the difference is the voltage drop caused by the forward resistance of the diode. Thus, when the transmitter is on CW, gate CR16 is forward-biased and conducts, allowing the 500-kc signal to be applied to the base of transistor Q9.

Operating voltages for Q9 are derived from the +20 Vdc voltage applied to voltage dividers R121, R89 and R119, R120 by the Mode Selector switch on the front panel.

In the "Key up" condition the emitter voltage is lower than the base voltage, Q9 is cut off and no 500 Kc/s carrier is applied to the IF/ Amplifier stages.

When the Key is pressed down, this results in a voltage drop at the base of Q9 which switches Q9 into conduction the 500 Kc/s carrier is amplified and routed, through transformer T5, to PPC IF/Amplifier stage.

In all other modes of operation, diode CR16 is back-biased, and CR18 is forward biased, which prevents the 500 Kc/s carrier from being applied to the base of Q9.

B) - *Test data*

Pertinent references and applicable test data for the CW carrier reinsertion gate circuit are as follows:

1) References:

a) Fig. 5.1 - Exciter T-827A/URT
Chassis and Frame, Schematic diagram

b) Mode Selector Electronic Assembly, Servicing Block Diagram, figure 4.59.

c) Mode Selector Electronic Assembly, Schematic Diagram, figure 5.2.

d) Mode Selector Electronic Assembly, Adjustment, paragraph 5.2.5 E).

e) 500 KC Amplifiers/Gates and Sidetone Oscillator/Gates, (Foil Side Up) Component and Test Point Location, figure 5.29.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.22.- CW Sidetone Oscillator/Gate

A).- *Circuit description*

The CW sidetone oscillator/gate (figure 4.24) consists of a phase shift oscillator (Q8) and a gating diode (CR13).

These circuits, which form a part of Mode Selector Electronic Assembly 2A2A1, produce an audio tone that is applied to the associated receiver, enabling the operator to monitor the keying when operating in the CW mode of operation.

A detailed description of the operation of the CW sidetone oscillator/gate circuit follows.

Since the signal between base and collector is reversed 180 degrees in phase in a common emitter phase-shift oscillator, an additional 180-degree phase shift is necessary to keep the feed-back signal (from output to input) positive.

The phase shift occurs in an RC network consisting of three sections, each contributing a 60-degree phase shift at the frequency of oscillation.

In figure 4.24, the three RC sections are R68 and C36, R67, and C35, and R66 and C34. When operating in the CW mode, operating voltage for this circuit is developed from the 20 vdc applied to voltage divider R65, R64, RT1 and emitter resistor R63 from the Mode Selector switch on the front panel.

Thermistor RT1 stabilizes the circuit for any ambient temperature changes. Voltage divider R69, R70 determines the level of the audio tone (approximately 1 kc) produced by phase-shift oscillator Q8 and coupled to the cathode of gate CR13 by capacitor C37.

When the transmitter is not keyed for CW operation, gate CR13 is reverse-biased as a result of the positive 13.2 vdc on the cathode and the positive 10 vdc on the anode.

The two biases are developed by voltage dividers R71, R74 and R75, R76

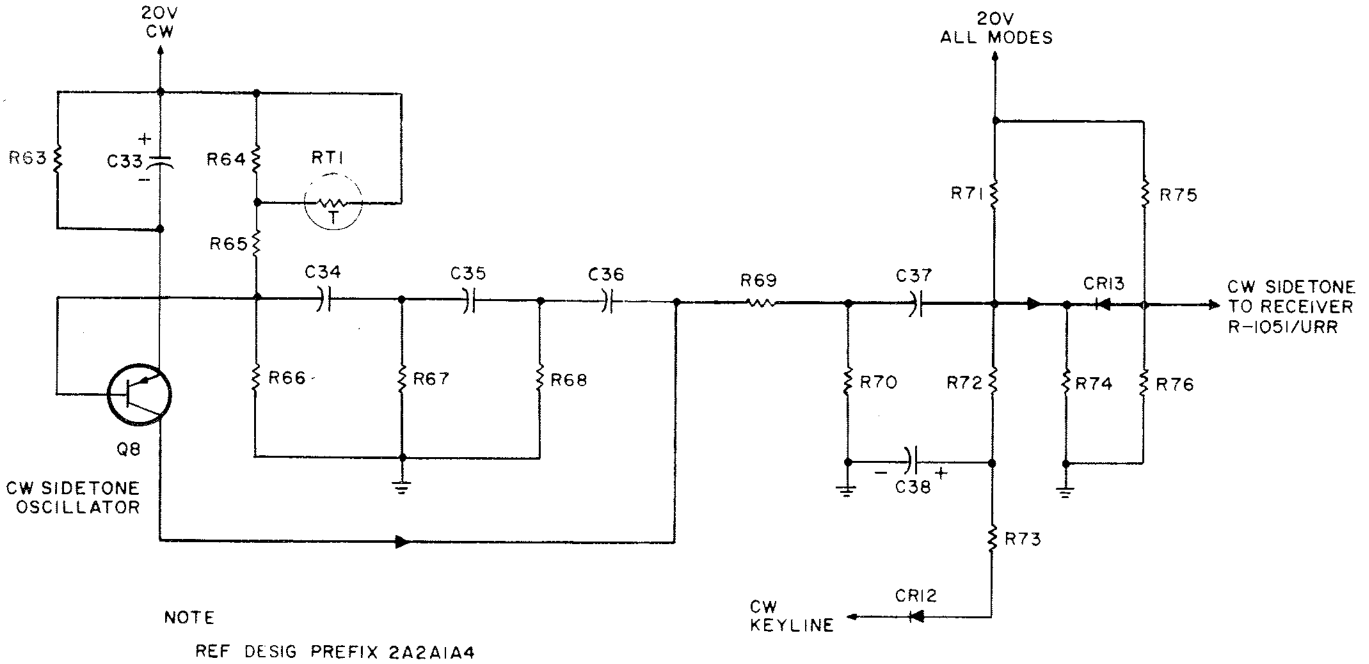


Figure 4-24. CW Sidetone Oscillator/Gates, Simplified Schematic Diagram

from the positive 20 vdc applied from the power supply on the main frame of the Exciter. Each time the CW key is depressed, ground is applied through diode CR12 to resistor R73. This causes the cathode bias drop to 8.3 vdc. This instantaneous bias voltage is developed by the new voltage divider, consisting of R71 and the parallel combination of R72, R73 and R74.

Since the anode of the diode is still biased at 10 vdc, gate CR13 becomes forward-biased and conducts allowing the audio output of phase-shift oscillator Q8 to pass.

When gate CR13 conducts, both biases are approximately equal. The difference in biases is the voltage drop caused by the forward resistance of the diode. The audio tone is applied to the associated receiver (such as R-1051A/URR) where it is amplified in the audio amplifiers and applied to the headset and the 600-ohm USB audio output line. This tone allows the operator to monitor the keying when operating in the CW mode of operation.

B) - *Test data*

Pertinent references and applicable test data for the CW sidetone oscillator/gate circuit are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) Mode Selector Electronic Assembly, Servicing Block Diagram, figure 4.59.

c) Mode Selector Electronic Assembly, Schematic Diagram, figure 5.2.

d) 500 KC Amplifiers/Gates and Sidetone Oscillator/Gates (Foil Side Up) Component and Test Point Location, figure 5.29.

2) Required Test Equipment

a) Rf Voltmeter, type Boonton, mod. 91-H or equiv.

b) Frequency Meter, type HP, mod. 5245-L or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.23 - **Sidetone gates**

A) - *Circuit description*

Sidetone gates CR14 and CR15 (figure 4-25), which form a part of Mode Selector Assembly 2A2A1, gate the audio intelligence to the associated receiver (such ad R-1051A/URR) to enable the operator to monitor the transmissions. Gate CR14 is used during the USB, AM and FSK modes of operation. Gate CR15 is used during the LSB mode of operation.

Both gates are used during the ISB mode of operation.

A detailed description of the operation of this circuit follows.

The USB audio applied to balanced modulator A1, from Audio Amplifier Electronic Assembly 2A2A2, is coupled to the anode of gate CR14 through coupling capacitor C39 and isolating resistor R77. This gate will be forward-biased in the USB, AM, FSK, or ISB modes of operation by the positive 16.7 vdc on the anode and the positive 10 vdc on the cathode.

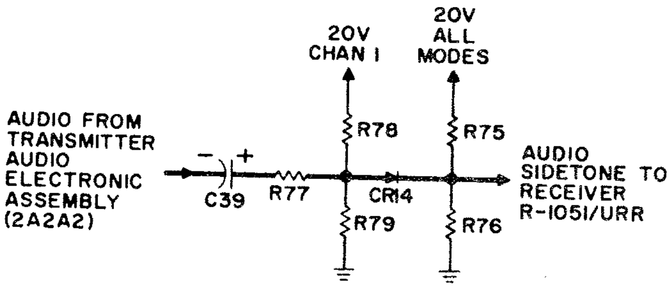
The two biases are instantaneous voltages, which are developed from the positive 20 vdc applied to the voltage divider R78, R79 and R75, R76 by the Mode Selector switch on the front panel. When gate CR14 is conducting, both biases are approximately equal. The difference in biases is the voltage drop caused by the forward resistance of the diode.

The gate is forward-biased and will conduct, allowing the audio to pass. This audio is applied to the associated receiver where it is amplified by the audio amplifier and applied to the headset and the USB 600 - ohm audio output line.

This allows the operator to monitor the USB audio intelligence being transmitted.

The LSB audio applied to balanced modulator A2, from Audio Amplifier Electronic Assembly 2A2A3, is coupled to the anode of gate CR15 through coupling capacitor C-40 and isolating resistor R80. This gate will be forward-biased in the LSB or ISB modes of operation by the positive 16.7 vdc on the anode and the positive 10 vdc on the cathode.

The two biases are instantaneoud voltages, which are developed from the positive 20 vdc applied to the voltage dividers R81, R82 and R83, R84 by the mode Selector switch on the front panel. When gate CR15 is conducting, both biases are approximately equal. The difference in biases is



NOTE:
REF. DESIG. PREFIX
2A2A1A4.

Figure 4-25. Sidetone Gates, Simplified Schematic Diagram

the voltage drop caused by the forward resistance of the diode.

The gate is forward-biased and will conduct, allowing the audio to pass. This audio is applied to the associated receiver where it is amplified by the audio amplifier and applied to the headset and the LSB 600-ohm audio output line.

This allows the operator to monitor the LSB audio intelligence being transmitted.

B) - *Test data*

Pertinent references and applicable test data for the sidetone gate circuit are as follows:

1) References

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) Mode Selector Electronic Assembly, Servicing Block Diagram, figure 4.59.

c) Mode Selector Electronic Assembly, Schematic Diagram, figure 5.2.

d) 500 KC Amplifiers/Gates and Sidetone Oscillator/Gates (Foil Side Up) Component and Test Point Location, figure 5.29.

2) Required Test Equipment

a) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.24 - **AM carrier reinsertion gate**

A) - *Circuit description*

The AM carrier reinsertion gate circuit (figure 4.26), consists of three gating circuits (CR19, CR20, CR21).

These circuits, which form a part of Mode Selector Electronic Assembly 2A2A1, gate the 500-kc local carrier into the peak power controlled if. amplifier circuit for reinsertion into the if, signal during the AM mode of operation.

Gate CR20 is biased on in all modes of operation except AM, to prevent any leakage from this circuit when it is not being used. Gate CR21 provides dc isolation between the two 20-vdc lines when gate CR20 is biased on.

A detailed description of the operation of the AM carrier reinsertion gate follows.

The 500-kc signal from 1 mc divide-by-two circuit (part of 2A2A5A1) is applied to potentiometer R101. The potentiometer sets the percentage of modulation of the AM signal.

The output from the potentiometer is coupled to voltage divider R95, R96 by capacitor C46. Gate CR19 is forward-biased during AM operation with an anode bias of 16.7 dvc and a cathode bias of 13.3 vdc.

These two biases are instantaneous voltages which are developed by voltage dividers R94, R96 and R98, R97 from the positive 20 vdc applied from the Mode Selector switch on the front panel. When a gate is conducting, both biases are approximately equal. The difference in biases is the voltage drop caused by the forward resistance of the diode.

Since gate CR19 is forward-biases, it will conduct, allowing the 500-kc signal to pass. The 500-kc signal is coupled to the primary of transformer T5 by capacitor C47. Transformer T5 couples the 500-kc carrier to the peak power controlled if. amplifiers for reinsertion into the if. signal.

In each mode of operation, the cathode of gate CR19 is biased at 13.3 vdc. This bias also serves as the anode bias for gate CR20.

Since gate CR21 is forward-biased only in AM operation, the anode will be open during the other modes of operation.

Therefore, the cathode of gate CR20 is at zero voltage. As a result, gate CR20 will be forward-biased and will conduct, effectively shorting gate CR19 to ground through capacitor C99. This ensures that any leakage through gate CR19 will be by-passed to ground whenever the transmitter is not being operated in the AM mode.

When the transmitter is placed in the AM mode of operation, the anode of gate CR21 is biased at 20 vdc applied from the Mode Selector switch on

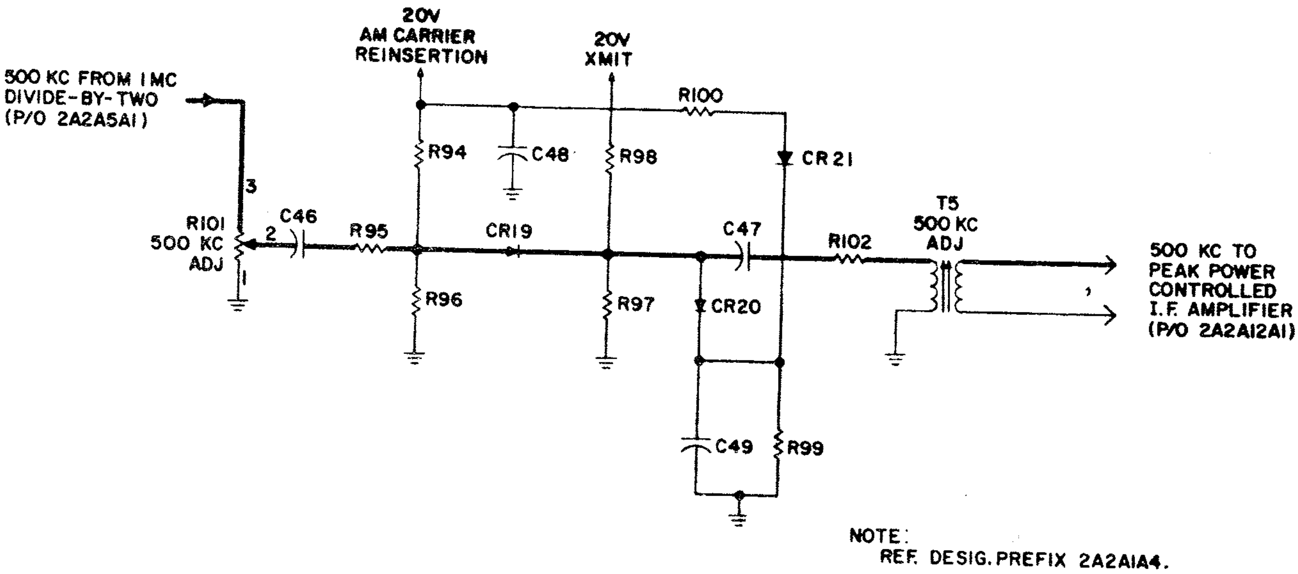


Figure 4-26. AM Carrier Reinsertion Gate, Simplified Schematic Diagram

the front panel.

Since there is no voltage on the cathode of gate CR21, it is forward-biased and thus conducts. When gate CR21 conducts, the cathode of gate CR20 is biased at 16.5 vdc.

This bias is developed by voltage divider R99, R100 from the positive 20 vdc applied from the Mode Selector switch on the front panel. Since the anode of gate CR20 is biased at 13.3 vdc, it will be reverse-biased and prevent the 500-kc signal from being shunted to ground.

B) - *Test data*

Pertinent references and applicable test data for the AM carrier reinsertion gage circuit are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) Mode Selector Electronic Assembly, Servicing Block Diagram, figure 4.59.

c) Mode Selector Electronic Assembly, Schematic Diagram, figure 5.2.

2) Required Test Equipment

a) RF Signal Generator, type Boonton, mod. 91-H or equiv.

b) RF Voltmeter, type HP, mod. 5245-L or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.25 - **Carrier reinsertion level control**

A) - *Circuit description*

The carrier reinsertion level control (figure 4.27) consists of a gating circuit (CR19) and a variable attenuator circuit (S1).

These circuits, which form a part of Mode Selector Electronic Assembly

3A3A1, provide a pilot carrier for reinsertion into the rf. signal to enable other radio sets with less stability than the T-827A/URT Exciter to receive transmission from the T-827A/URT. This carrier is used in these receivers for frequency-locking and demodulating.

These circuits provide a pilot carrier, when required, for the LSB, ISB, or USB modes of operation.

The 500-kc signal is coupled from the center of potentiometer R101 to voltage divider R110, R112 by capacitor C50. Potentiometer R101 is set so that the carrier is the same magnitude as the sideband when switch S1 is placed in the zero suppression position.

The voltage divider limits the level of the 500-kc signal that is applied to the anode of gate CR100.

During the USB, ISB, or LSB modes of operation, gate CR100 is forward-biased by the positive 16.7 vdc anode bias and the positive 13.3 vdc cathode bias.

The two biases are instantaneous voltages, which are developed by voltage dividers R110, R111 and R108, R109 from the positive 20 vdc applied through contacts 11, and 10, 9, or 8 of switch S1.

When gate CR110 is conducting, both biases are approximately equal. The difference in biases is the voltage drop caused by the forward resistance of the diode. Since gate CR100 is forward-biased, it will conduct, allowing the 500-kc signal to pass.

The output from gate CR100 is coupled to one of three attenuator circuits by capacitor C51. The attenuator circuit used depends upon the position of switch S1. When switch S1 is set at the 0 DB, -10 DB, or -20 DB suppression position, the 500-kc signal is applied through the respective attenuator network and contacts 2, 3, or 4 and 5 of switch S1 to transformer T5. Transformer T5 couples the 500-kc signal to the peak power controlled if. amplifier for reinsertion into the if. signal.

B) *Test data*

Pertinent references and applicable test data for the carrier reinsertion level control circuit are as follows;

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) Mode Selector Electronic Assembly, Schematic Diagram, figure 4.59.

c) Mode Selector Electronic Assembly, Schematic Diagram, figure 5.2.

d) Mode Selector Electronic Assembly, Adjustments, paragraph 5.2.5.E

e) 500 Kc Amplifiers/Gates and Sidetone Oscillator/Gates (Foil Side Up) Component and Test Point Location, figure 5.29.

f) Mode Selector Electronic Assembly, Left Side, Component Location, figure 5.25.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.26 - 5.15 to 5.25 MC oscillator

A) - *Circuit description*

The 5.16 to 5.25 mc oscillator (figure 4.28) consists of 10 kc (KCS) crystal switch (2A2A6A3S1), a limiter circuit (CR1, CR2), an oscillator (Q1), and a buffer amplifier (Q2).

These circuits, which form a part of 1 and 10 KC Synthesizer Electronic Subassembly 2A2A6A3, produce one of ten outputs in 10-kc steps over the frequency range of 5.16 through 5.25 mc for use in 1 and 10 kc output and blanker 2A2A6A3A3, and the 9.07 mc error mixer (part of 2A2A6A3A4). These circuits function in all modes of operation.

A detailed description of the operation of this circuit follows.

The operating frequency of the modified crystal-controlled Colpitts (Pierce) oscillator (Q1) is determined by the selection of any one ten crystals (2A2A6A3Y1 through Y10) by switch 2A2A6A3S1.

Selection is accomplished by positioning the 10 Kc/s control on the front panel. Operating voltage for the oscillator is derived from main frame power supply 2A2A8. Base bias for oscillator Q1 is developed by voltage divider R1, R2.

The output of oscillator Q1 is controlled by diodes CR1 and CR2.

The negative-going limit of the signal is established by the anode bias on diode CR1 (developed by voltage divider R3, R11, RT1),minus the drop of diode CR1.

The positive-going limit of the signal is established by the cathode bias on diode CR2 (developed by voltage divider R12, R13) plus the drop of diode CR2. Therefore, the peak-to-peak amplitude of the signal is limited by the established dc reference levels.

As the temperature of the circuit varies, the forward drop across diodes CR1 and CR2 varies. This would result in variations in the signal amplitude without temperature compensation.

Thermistor RT1 varies the anode bias of CR1 in accordance with temperature changes. Therefore, the negative-going limit of the signal is shifted so that the limiting region is constant. This ensures that the amplitude of the signal does not vary with changes in temperature.

Capacitors C5 and C8 are rf bypass capacitors. Capacitor C2 is used for dc blocking and is also used with capacitors C1, C3, and C4 to form the required feedback network.

Resistor R7 provides degeneration to increase the stability of oscillator Q1. The output of oscillator Q1 is developed across emitter resistor R4 and is coupled to the base of buffer amplifier Q2 by capacitor C6.

Voltage divider R6, R8 develops the base bias for buffer amplifier Q2 from the positive 20 vdc.

A resonant circuit consisting of the primary of transformer T1 and capacitor C10 provides the collector load for the amplifier.

Resistor R5 is used to load the tank circuit to provide uniform gain over the range of frequencies developed by the oscillator.Resistor R9, in the emitter circuit, provides degenerative feedback to stabilize the gain and increase the input impedance of amplifier Q2, thereby preventing loading of oscillator Q1.

Resistor R10 is the emitter bias resistor, which is rf bypassed by capacitor C9. Resistor R14 and capacitor C7 provide decoupling for oscillator Q1 and buffer amplifier Q2.

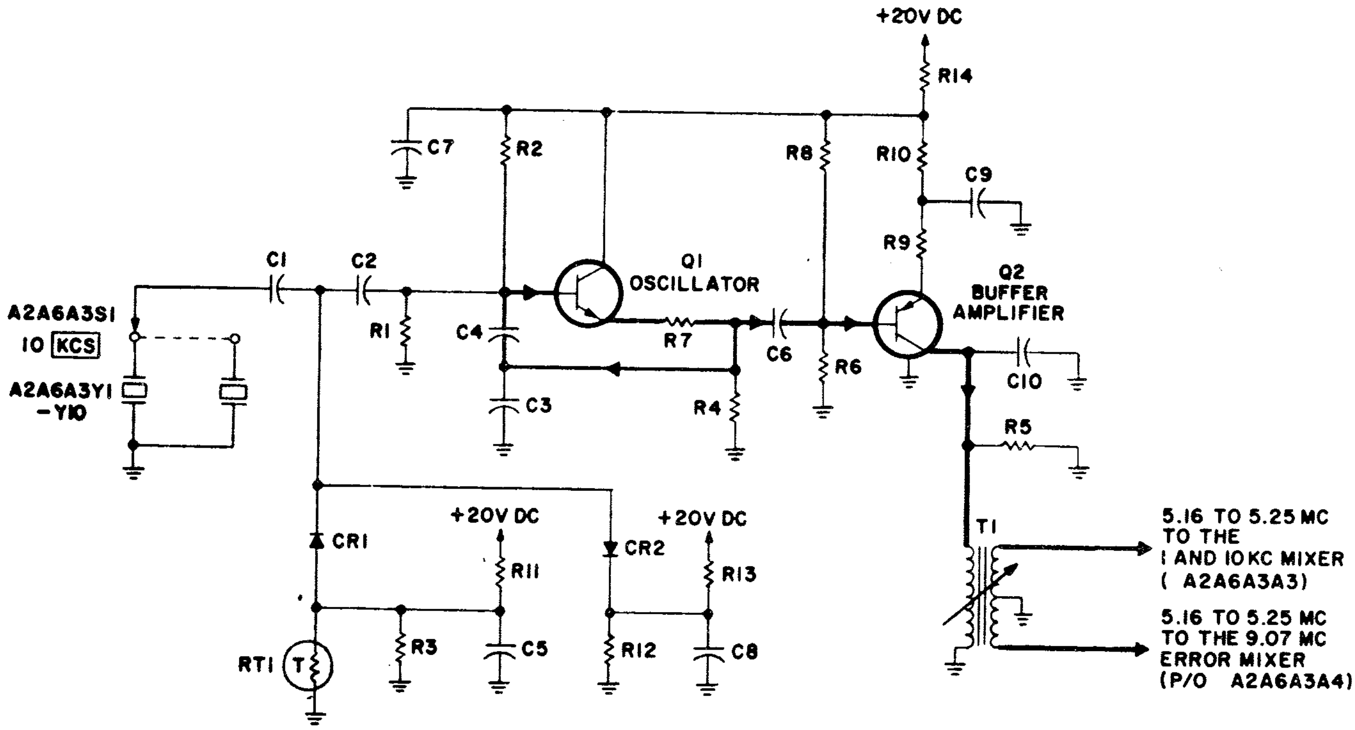


Figure 4-28. 5.16 to 5.25 MC Oscillator, Simplified Schematic Diagram

The output of amplifier Q2 is coupled to the 1 and 10 kc output and blanker circuit and to the 9.07 mc error mixer circuit by the secondary of transformer T1.

B) - *Test data*

Pertinent references and applicable test data for the 5.16 to 5.25 mc oscillator are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) 1 and 10 KC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.65.

c) 1 and 10 KC Synthesizer Electronic Subassembly, Schematic Diagram figure 5.8.

d) 5.16 to 5.25 MC Oscillator (Foil Side Up), and Test Point Location figure 5.82.

2) Required Test Equipment

a) Frequency Meter, type HP, mod. 5245-L or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

e) Heterodyne Voltmeter, type Bruel and Kjaer, mod. 2006 or equiv.

4.3.27 - 1.850 to 1.859 Mc/s Oscillator

A) - *Circuit description*

The 1.850 to 1.859 Mc/s Oscillator (Fig. 4.29 consists of 1 kcs crystal switch (2A2A6A3S2), a limiter (CR1, CR2), an oscillator (Q1), and a buffer amplifier (Q2).

These circuits, which form a part of 1 and 10 KC Synthesizer Electronic Subassembly 2A2A6A3, produce one of ten outputs, in 1-kc steps, over the frequency range of 1.850 through 1.859 mc for use in 1 and 10 kc output and blanker 2A2A6A3A3, and the 1.981 mc error mixer (part of 2A2A6A3A4).

The operation of the 1.850 to 1.859 mc oscillator is identical to that of the 5.16 to 5.25 mc oscillator. (Refer to paragraph 4.3.26 for details of circuit operation).

B) - *Test data*

Pertinent references and applicable test data for the 1.850 to 1.859 mc/s oscillator are as follows:

1) References

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) 1 and 10 KC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.65

c) 1 and 10 KC Synthesizer Electronic Subassembly, Schematic Diagram figure 5.8.

d) 1.850 to 1.859 MC Oscillator, (Foil Side Up) Component and Test Point Location, figure 5.83.

2) Required Test Equipment

a) Frequency Meter, type HP, mod. 5245-L or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

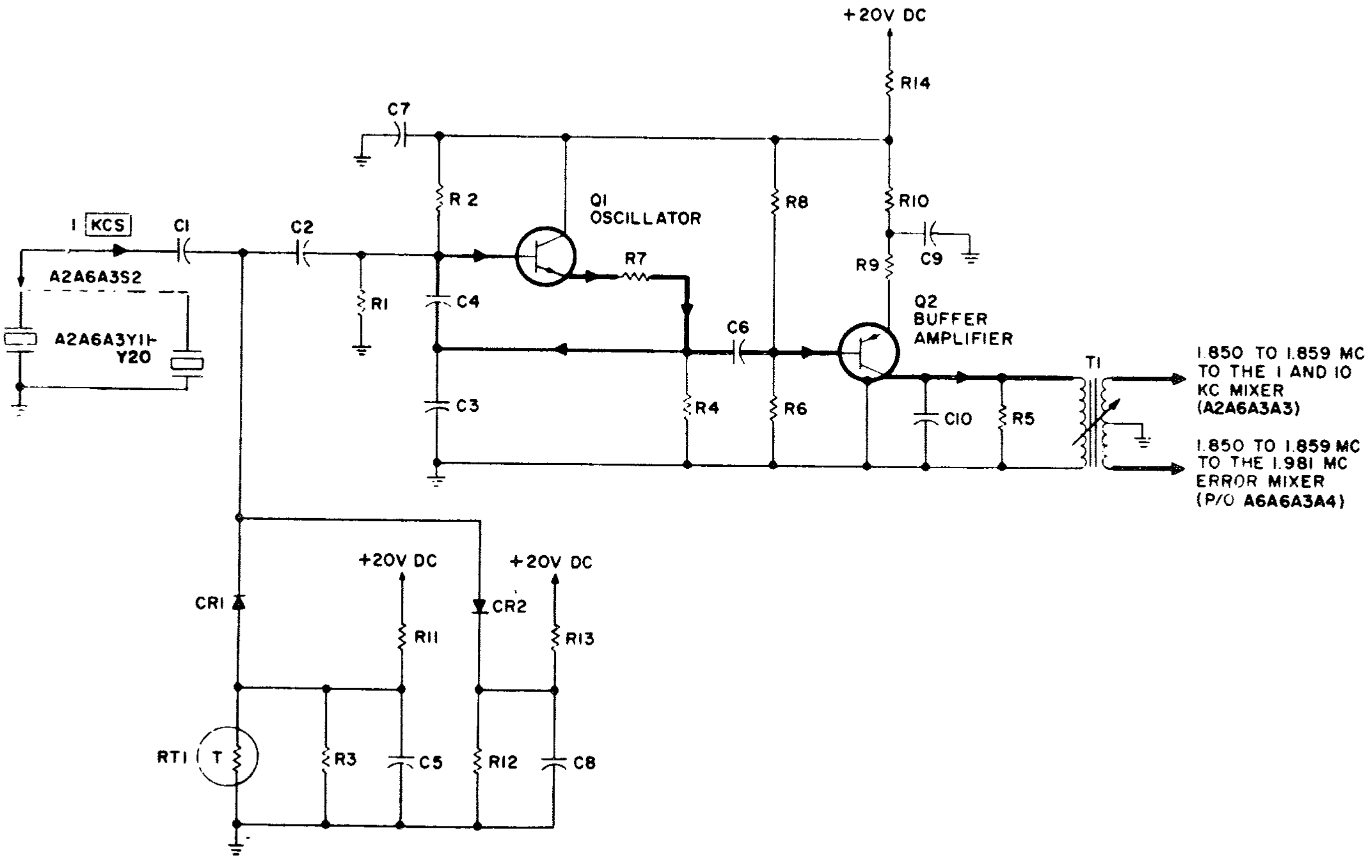


Figure 4-29 1.850 to 1.859 MC Oscillator, Simplified Schematic Diagram

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

e) Heterodyne Voltmeter, type Bruel and Kjaer, mod. 2006 or equiv.

4.3.28 - **1 and 10 Kc/s mixer**

A) - *Circuit description.*

The 1 and 10 kc/s mixer circuit (figure 4-30) consists of a mixer (Q11) and a four-section filter (C48-L5, C49-L6, C51-L7, and C54 and the primary of transformer T3 with coupling capacitors C56, C50 and C52).

These circuits, which form a part of 1 and 10 Kc/s Synthesizer Electronic Subassembly 2A2A6A3, subtractively mix the signal from the 1.850 to 1.859 mc oscillator with the signal from the 5.16 to 5.25 mc oscillator, producing the 1 and 10 kc injection signal (3.301 to 3.400 mc in 1-kc steps) for use in the low frequency mixer.

A detailed description of the operation of this circuit follows.

The signal from the 1.850 to 1.859 mc oscillator is applied through resistor 2A2A6A3A2R16 to resistor 2A2A6A3A1R16.

The signal from the 5.16 to 5.25 mc oscillator is also applied to resistor 2A2A6A3A1R16 through capacitor 2A2A6A3A1C11. This capacitor provided a low impedance to the 5.16 to 5.25 mc/s signal and a high impedance to the 1.850 to 1.859 mc signal; therefore, the 5.16 to 5.25 mc oscillator will not load the 1.850 to 1.859 mc signal.

The two input signals are coupled from resistor 2A2A6A3A1R16 through capacitor C55 to the base of mixer Q11.

The base bias is provided by voltage divider R47, R.54. Resistor R52 provides a small amount of degeneration to improve the stability of mixer Q11.

Resistor R48 is the emitter bias resistor, which is rf bypassed by capacitor C47. Resistor R49 and capacitor C46 provide decoupling for mixer Q11. The output circuit of mixer Q11 is four-section filter. The filter has a bandwidth of 100 kc (3.3 to 3.4 mc) and sufficient selectivity to attenuate any frequency outside this band.

Capacitors C56, C50, and C52 are an integral part of the filter and couple the signal between sections of the filter; therefore, the four section filter will pass only the difference of the 1.850 to 1.859 mc and 5.16 to 5.25 mc signals (3.301 to 3.400 mc, in 1 kc steps).

The signal from the four-section filter is coupled through transformer T3 and applied to the low frequency mixer.

B) - *Test data*

Pertinent references and applicable test data for the 1 and 10 kc output and blanker are as follows:

1) References:

   a) Exciter T-827A/URT
      Chassis and Main Frame, Schematic Diagram, figure 5.1

   b) 1 and 10 KC Synthesizer, Electronic Subassembly, Servicing Block Diagram, figure 4-65.

   c) 1 and 10 KC Synthesizer Electronic Subassembly, Schematic Diagram figure 5.8.

   d) 1 and 10 KC Output and Blanker (Foil Side Up), Component and Test Point Location, figure 5.85.

2) Required Test Equipment

   a) RF Signal Generator, type HP, mod. 606-A or equiv.

   b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

   c) Oscilloscope, type Tektronix, mod. 546 or equiv.

   d) Heterodyne Voltmeter, type Bruel and Kjaer, mod. 2006 or equiv.

   e) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.29.- **4.553 to 5.453 Mc/s Oscillator**

A).- *Circuit description*

The 4.553 to 5.453 Mc/s Oscillator (Fig.4.31) consists of 100 Kc/s crystal switch (2A2A6A2S1), a limiter (CR1, CR2), an oscillator (Q1), and an emitter follower (Q2). These circuits, which form a part of 100 KC Synthesizer Electronic Subassembly 2A2A6A2, produce one of ten outputs in 100-kc steps over the frequency range of 4.553 through 5.453 mc for use in hi-band/lo-banda mixer/amplifier 2A2A6A2A4 and 10.747 mc mixer 2A2A6A2A2. These circuits are used in all modes of operation.

A detailed description of the operation of the 4.553 to 5.453 mc oscillator follows.

The operating voltage for the 4.553 to 5.453 mc oscillator is derived from main frame power supply 2A2A8.

Resistor R12 and capacitor C8 provide decoupling to prevent any interaction with other circuits connected to the 20 vdc supply line.

Base bias for oscillator Q1 is developed by voltage divider R5,R7. The output frequency of oscillator Q1 is determined by setting of the 100 kc control (2A2A6A2S1) on the front panel.

This switch (2A2A6A2S1) connects the correct crystal (2A2A6A2Y1 through Y10) into the circuit of oscillator Q1 in accordance with the desired 100-kc digit of the operating frequency. The output of oscillator Q1 is controlled by diodes CR1 and CR2.

The negative-going limit of the signal is established by the anode bias on diode CR1 (developed by voltage divider R1, R2, RT1) minus the drop of diode CR1.

The positive-going limit of the signal is established by the cathode bias on diode CR2 (developed by voltage divider R3, R) plus the drop of diode CR2. Therefore, the peak-to-peak amplitude of the signal is limited by the established dc reference levels.

As the temperature of the circuit varies, the forward drop of diodes CR1 and CR2 varies. This would result in variations in the signal amplitude without temperature compensation.

Thermistor RT1 varies the anode bias of diode CR1 in accordance with temperature changes. Therefore, the negative-going limit of the signal is shifted so that the limiting region is constant. This ensures that the amplitude of the signal does not vary with changes in temperature.

Capacitors C2 and C3 are rf bypass capacitors. Capacitor C4 is used for dc blocking and is also used with capacitors C1, C5, and C6 to form the required feedback network. Resistor R8 provides degeneration to increase the stability of oscillator Q1.

The output of oscillator Q1 is developed across emitter resistor R6 and is coupled to the base of emitter follower Q2 by capacitor C7.

The base bias for emitter follower Q2 is developed by voltage divider R9, R10 from the 20 vdc. Emitter follower Q2 is used to isolate the oscillator from the succeeding circuits. The output of emitter follower Q2 is developed across emitter resistor R11 and coupled to the hi-band/lo-band mixer/amplifier and to the 10.747 mc mixer by capacitor C9.

Resistors R13 and R14 are isolating resistors. Capacitor C10 provides a low impedance to ground for the other signals used in the hi-band/lo-band mixer/amplifier, preventing these signals from being coupled into the 10.747 mc mixer.

B) - *Test data*

Pertinent references and applicable test data for the 4.553 to 5.453 mc oscillator are as follows:

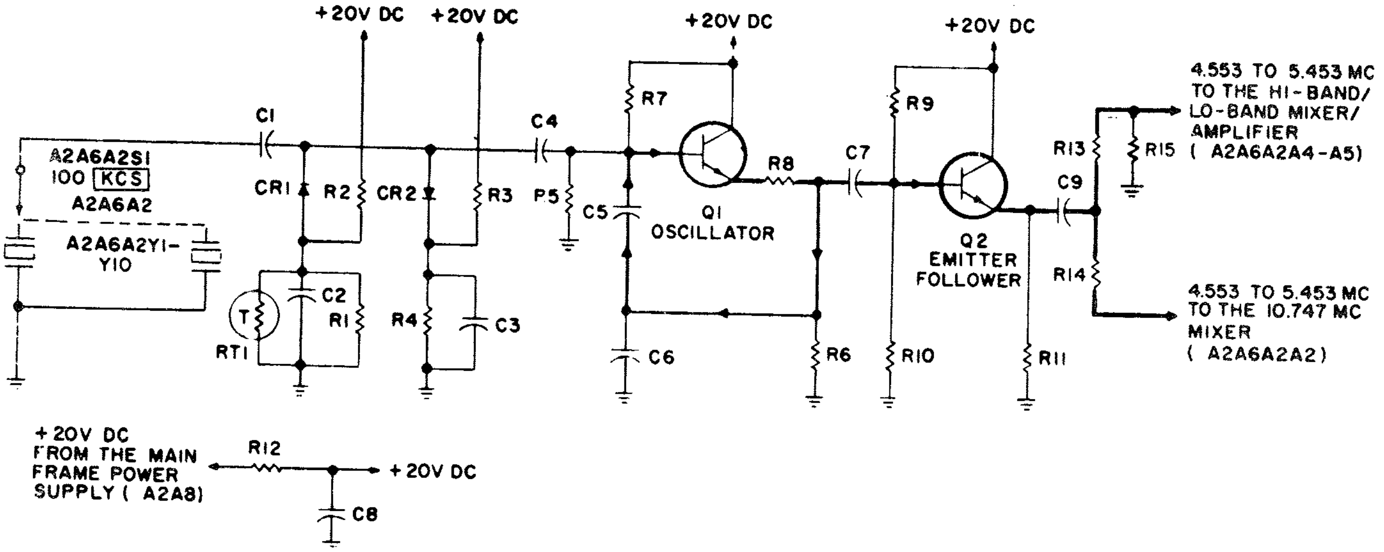
1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schemating Diagram, figure 5.1.

b) 100 KC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.66.

c) 100 KC Synthesizer Electronic Subassembly, Schematic Diagram, figure 5.7.

d) 4.553 MC to 5.453 MC Oscillator (Foil Side Up), Component Location, figure 5.72.



NOTE:
REF. DESIG. PREFIX A2A6A2A1.

Figure 4-31. 4.553 to 5.453 MC Oscillator, Simplified Schematic Diagram

2) Required Test Equipment

a) Frequency Meter, type HP, mod. 5245-L or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

d) Heterodyne Voltmeter, type Bruel and Kyaer, mod. 2006 or equiv.

e) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.30 - **Hi-band/lo-band Mixer/Amplifier**

A) - *Circuit description*

The hi-band/lo-band mixer/amplifier (figure 4-32) consists of two mixers (A4Q1 and A4Q2), two trap amplifiers (A4Q3 and A4Q4), and an emitter follower (A5Q1).

These circuits, which form a part of 100 KC Synthesizer Electronic Subassembly 2A2A6A2, produce either a high (hi) band of injection frequencies (32.4 to 33.3 mc), or a low (lo) band of injection frequencies (22.4 to 23.3 mc), which is used in the mid-frequency mixer of RF translator Electronic Subassembly 2A2A6A6.

The output of these circuits is also used in 10.747 mc mixer agc circuit 2A2A6A2A5 to develop the agc voltage which controls the gain of 10.747 mc mixer 2A2A6A2A2. These circuits are used in all modes of operation.

A detailed description of the operation of the hi-band/lo-band mixer/amplifier follows.

Only half of the hi-band/lo-band mixer/amplifier circuits are on at any one time, depending on whether the hi (32.4 to 33.3 mc) or lo (22.4 to 23.3 mc) band is required for mixing in RF Translator Electronic Subassembly 2A2A6A6.

The hi-band circuits will be discussed first. Unless otherwise noted, all components referenced are located on the A4 assembly.

The 27.847 mc output from the 17.847/27.847 mc mixer is coupled to the base of mixer Q1 by capacitor C22.

The output from the 4.553 to 5.453 mc oscillator is coupled to the emitter of mixer Q1 by capacitor C1. When the hi/lo band control line is at ground potential, base bias will be provided for mixer Q1 and trap amplifier Q3 by voltage divider R4, R6 and voltage divider R13, R14, respectively.

Resistor R1 is the emitter resistor. Capacitor C4 is an rf bypass capacitor.

At the same time, mixer Q2 and trap amplifier Q4 will by rendered inoperative by the ground potentials applied to the emitter and base bias circuits from the hi/lo band control line.

The output of mixer Q1 is a frequency in the 32.4-to-33.3-mc band. All other products of the mixer, except for a small amount of the 27.847-mc component, are eliminated by the triple-tuned filter composed of inductors L1 and L2, transformer T1 and capacitors C7, C10, C11, C14, and C15.

From the triple-tuned filter, the signal is coupled through capacitor C18 to the base of amplifier Q3. The emitter circuit of trap amplifier Q3 (capacitor C20 and inductor L3) is parallel-tuned to 27.847 mc.

At 27.847 mc, the trap provides degeneration to effectively eliminate the 27.847-mc component from the output signal.

Resistor R11 and capacitor C27 provide decoupling for trap amplifier Q3. Resistor R17 is the emitter bias resistor, which is rf bypassed by capacitor C23.

The output of trap amplifier Q3 is coupled by capacitor A5C1 to the base of emitter follower A5Q1. The output of emitter follower A5Q1 is also applied to 10.747 mc mixer agc 2A2A6A2A5.

The lo-band circuits are identical to the hi-band circuits. When the hi/lo band control line is at 20 vdc, operating voltages are applied to the emitter and bases of mixer Q2 and trap amplifier Q4.

At the same time, the 20 vdc is applied to the bases of mixer Q1 and trap amplifier Q3, thereby providing back bias for the transistors, since the emitters are also at 20 vdc.

The 17.847-mc output from the 17.847 mc mixer is coupled to the base of mixer Q2 by capacitor C6. The output from the 4.553 to 5.453 mc oscillator is coupled to the emitter of mixer Q2 by capacitor C2.

The output of mixer Q2 is a frequency in the 22.4-to-23.3-mc band. All other products of the mixer, except for a small amount of 17.847-mc component, are eliminated by the triple-tuned filter composed of inductors L4 and L5, transformer T2, and capacitors C9, C12, C13 and C16, and C17.

From the triple-tuned filter, the signal is coupled by capacitor C19 to the base of trap amplifier Q4. The emitter circuit of trap amplifier Q4 is parallel-tuned to 17.847 mc to eliminate the 17.847-mc signal.

The output of trap amplifier Q4 is isolated by resistor R23, and is coupled by capacitor A5C2 to the base of emitter follower A5Q1.

The output of emitter follower A5Q1 is applied to 10.747 mc mixer agc 2A2A6A2A5 and the mid-frequency mixer in the RF Translator Electronic Subassembly 2A2A6A6.

B) - *Test data*

Pertinent references and applicable test data for the hi-band/ lo-band mixer/amplifier circuit are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, figure 5.1.

b) 100 Kc/s Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.66.

c) 100 Kc/s Synthesizer Electronic Subassembly, Schematic Diagram, figure 5.7.

d) Hi-Band/Lo/Band Mixer/Amplifier (Foil Side Up), Component and Test Point Location, figure 5.78.

e) 10.747 MC Mixer AGC (Foil Side Up) Component and Test Point Location figure 5.80.

2) Required Test Equipment:

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

d) Heterodyne Voltmeter, type Bruel and Kjaer, mod. 2006 or equiv.

e) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.31 - MC Oscillator

A) - *Circuit description*

The mc oscillator (figure 4.33) consists of an oscillator (Q1), a wide-band amplifier (Q2) and two emitter followers (Q3 and Q4).

These circuits, which form a part of MC Synthesizer Electronic Subassembly 2A2A6A1, provide 17 discrete frequencies (2.5 to 23.5 mc) for use in the high frequency mixer.

A detailed description of the operation of the mc oscillator follows.

Oscillator Q1 is a modified, crystal-controlled Colpitts (Pierce) oscillator used with crystals 2A2A6A1Y1 through 2A2A6A1Y17 to cover a frequency range from 2.5 to 23.5 mc in 17 discrete steps.

Due to the wide frequency range required, it is necessary to select a capacitor (2A2A6A1C1 through 2A2A6A1C17) in the feedback network for each crystal and thus provide a uniform output level.

The oscillator feedback network consists of capacitors C21, C24, and 2A2A6A1C1 through 2A2A6A1C17, voltage-variable capacitor CR3 and a crystal (2A2A6A1Y1 through 2A2A6A1Y17).

Voltage-variable capacitor CR3 provides the necessary control for correcting any error in the frequency of oscillator Q1. Resistor R2 references voltage-variable capacitor CR3 to 20 vdc. The error voltage from the error detector/amplifier passes through resistor R1 to voltage variable capacitor CR3, where it changes the capacity and the resonant frequency of the circuit until the circuit resonates at the correct frequency.

Capacitor C21 compensates for variations in the oscillator frequency caused by temperature changes. Since capacitor C21 is in the oscillator feedback path, the temperature coefficient of C24 will affect the output amplitude of oscillator Q1. To compensate for this, a temperature-compensating capacitor is used as capacitor C24.

Base bias for oscillator Q1 is developed by voltage divider L2, R7, R8.

The output of oscillator Q1 is controlled by diodes CR1 and CR2. The positive-going limit of the signal is established by the cathode bias on diode CR1 (developed by voltage divider R3, R4) plus the drop of diode CR1. The negative-going limit of the signal is established by the anode bias on diode CR2 (developed by voltage divider R5, R6, RT1) minus the drop of diode CR2; therefore, the peak-to-peak amplitude of the signal is limited by the established dc reference levels.

As the temperature of the circuit varies, the forward drop of diodes CR1 and CR2 varies. This would result in variations in the signal amplitude without temperature compensation. Thermistor RT1 varies the anode bias of diode CR2 in accordance with the temperature changes and the negative-going limit for the signal is shifted so that the limiting region is constant. This action ensures that the amplitude of the signal does not vary with changes in temperature.

Capacitors C19 and C23 are rf bypass capacitors. Resistor R10 provides degeneration to improve the stability of oscillator Q1.

The output of oscillator Q1 is developed across emitter resistor R10 and inductor L3. The output of oscillator Q1 is coupled to the base of wideband amplifier Q2 by capacitor C26.

The base bias for wideband amplifier Q2 is developed by voltage divider R11, R13, from the 20 vdc. Emitter resistor R14 is unbypassed to provide the necessary degeneration, producing wide bandwidth, and uniform gain for this stage.

Stages Q3 and Q4 are cascaded, direct-coupled emitter followers that provide the required low source impedance for driving the error loop and thehigh-frequency mixer.

Capacitor C28 couples the signal from emitter resistor R16 to the high-frequency mixer. Resistors R17 and R18 are isolation resistors.

B) - *Test data*

Pertinent references and applicable test data for the mc oscillator are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) MC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.67.

c) MC Synthesizer Electronic Subassembly, Schematic Diagram, figure 5.6.

d) MC Oscillator (Foil Side Up), Component and Test Point Location, figure 5.68.

2) Required Test Equipment

a) Frequency Meter, type HP, mod. 5245-L or equiv.

b) RF Voltmeter, type HP, mod. 91-H or equiv.

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

d) Heterodyne Voltmeter, type Bruel and Kjaer mod. 2006 or equiv.

e) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.32 - **MC Spectrum Generator**

A) - *Circuit description*

The mc spectrum generator (figure 4.34) consists of three shaper amplifiers (Q1, Q2, and Q3). These circuits, which form a part of 1 MC Synthesizer Electronic Subassembly 2A2A6A1, provide a spectrum of frequencies from 1 to 25 mc in 1-mc steps for use in the mc error mixer.

A detailed description of the operation of the circuits follows.

These circuits operate from the positive 10 vdc derived by zener diode CR1 and series resistor R1 from the positive 20 vdc.

The 1-mc input is applied to inductor L2 through resistor R33. Resistor R33 prevents loading of the 5 mc divide-by-five circuit. Inductor L2 functions as an autotransformer, raising the level of the 1-mc signal and applying it to the diode clipper consisting of diode CR3 and resistor R5.

Inductor L2 is tuned to 1 mc by capacitor C3. The diode clipper removes the positive portion of the 1-mc signal. The remaining negative portion is coupled through capacitor C2 to the base of shaper amplifier Q1, driving it into saturation. Diode CR2 protects shaper amplifier Q1 against excessive reverse bias on the base-emitter junction.

When the base voltage attempts to go more positive than the emitter voltage, diode CR2 will be forward-biased, thereby clamping the base voltage.

The emitter voltage is determined by voltage divider R3, R4 and by the average current drawn by shaper amplifier Q1. The output of shaper amplifier Q1 is a positive-going waveform with a fast rise time. This output is developed across collector resistor R6 and applied through capacitor C5 to the base of shaper amplifier Q2. The positive-going waveform drives shaper amplifier Q2 into saturation, producing a negative-going waveform at the collector of Q2.

Capacitor C6 provides emitter peaking, which results in an overshoot on the output waveform.

The output of shaper amplifier Q2 is coupled through capacitor C8 to the base of shaper amplifier Q3. The output of shaper amplifier Q2 is differentiated at the base of shaper amplifier Q3 by the time constant formed by the output impedance of shaper amplifier Q2, capacitor C8, and the input impedance of shaper amplifier Q3. The negative-going portion of this signal drives shaper amplifier Q3 into saturation.

Diode CR4, like diode CR2, is a protective device which is also used to clamp the positive portions of the input signal.

Resistor R15 limits the collector current of shaper amplifier Q3 and minimizes the variations in the saturation characteristics of the amplifier. The output of shaper amplifier Q3 is developed across an LR differentiating network consisting of resistor R15 and inductor L3. The output of shaper amplifier Q3 is taken across inductor L3.

The network consisting of diode CR5, resistor R17 and resistor R22 forms a diode clipper circuit that eliminates the negative portion of the output across inductor L3. Resistors R17 and R22 also form an attenuator with the output taken across resistor R22. The output obtained is a positive pulse that provides a uniform spectrum from 1 mc to 25 mc.

This output is applied to the mc error mixer.

B) .- *Test data*

Pertinent references and applicable test data for the mc spectrum generator are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) MC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4-67.

c) MC Synthesizer Electronic Subassembly, Schematic Diagram, figure 5.6.

d) Spectrum Generator/Mixer (Foil Side Up), Component and Test Point Location, figure 5.70.

2) Required Test Equipment:

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

e) Heterodyne Voltmeter, type Bruel and Kjaer, mod. 2006 or equiv.

4.3.33 .- **MC Error Mixer**

A) .- *Circuit description*

The mc error mixer (figure 4.35) consists of an isolation amplifier (Q5), an emitter follower (Q6) and a mixer (Q4).

These circuits which form a part of MC Synthesizer Electronic Subassembly 2A2A6A1, mix the signal from the mc oscillator with the signal from the mc spectrum generator.

An error signal is produced that, in the locked condition, is proportional to the phase relationship between the spectrum and the oscillator

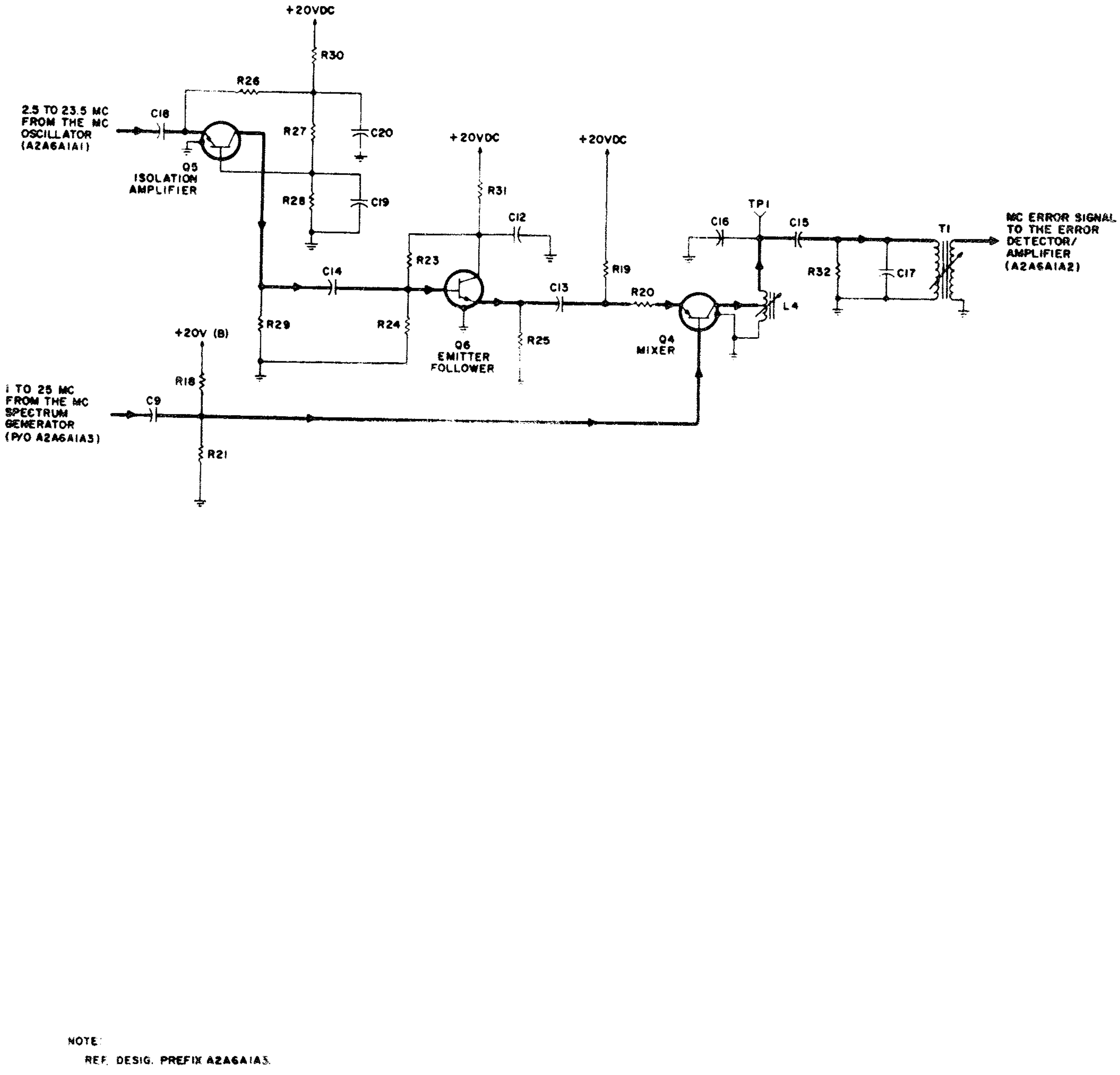


Figure 4-35. MC Error Mixer, Simplified Schematic Diagram

output.

A detailed description of the operation of the circuits follows.

The input from the mc oscillator is coupled through capacitor C18 to the emitter of isolation amplifier Q5. Isolation amplifier Q5 is used in a grounded-base amplifier configuration, which provides high reverse attenuation to the output products of mixer Q4, preventing them from appearing in the output from the mc oscillator.

Base bias for isolation amplifier Q5 is provided by voltage divider R27, R28, resistor R30 and capacitor C20 are used for decoupling.

The output of isolation amplifier Q5 is taken across collector resistor R29 and is coupled through capacitor C14 to the base of emitter follower Q6; base bias for Q6 is provided by voltage divider R23, R24. Resistor R31 and capacitor C12 are used for decoupling.

Emitter follower Q6 provides a low source impedance to mixer Q4 and prevents loading of isolation amplifier Q5.

The output of emitter follower Q6 is coupled through capacitor C13 to the emitter of mixer Q4. The signal from the mc spectrum generator is coupled through capacitor C9 to the base of mixer Q4.

Base bias for mixer Q4 is provided by voltage divider R18, R21. Resistor R20 provides a small amount of degeneration to stabilize mixer Q4. The output circuit of mixer Q4 is a double-tuned circuit consisting of inductor L4, capacitors C16, C15 and C17, resistor R32, and transformer T1, which is tuned to 1.5 mc.

When there is a frequency error, the signal from the mc oscillator is mixed with the two spectrum points that are within approximately ±1.5 mc of the oscillator frequency.

The output of mixer Q4 includes two frequencies (one less than 1.5 mc and one more than 1.5 Mc) if the mc oscillator has an error. When the mc oscillator is locked, only one frequency is present, since the frequency, of the oscillator, ±the spectrum points, is 1.5 mc.

For example, assume that the mc oscillator frequency is 11.499 mc; therefore, the two closest spectrum points will be 10 and 13 mc. These frequencies of 1.499 and 1.501 mc.

It can be seen that when the mc oscillator is exactly 11.5 mc, the two difference frequencies will be identical (1.5 mc).

The double tuned output circuits attenuates all mixing products except the difference frequencies. The output of the double-tuned filter is coupled through transformer T1 to the error detector/amplifier

B) - *Test data*

Pertinent references and applicable test data for the mc error mixer are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) MC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.67.

c) MC Syntehsizer Electronic Subassembly, Schematic Diagram, figure 5.6.

d) Spectrum Generator/Mixer (Foil Side Up), Component and Test Point Location, figure 5.70.

2) Required Test Equipment:

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

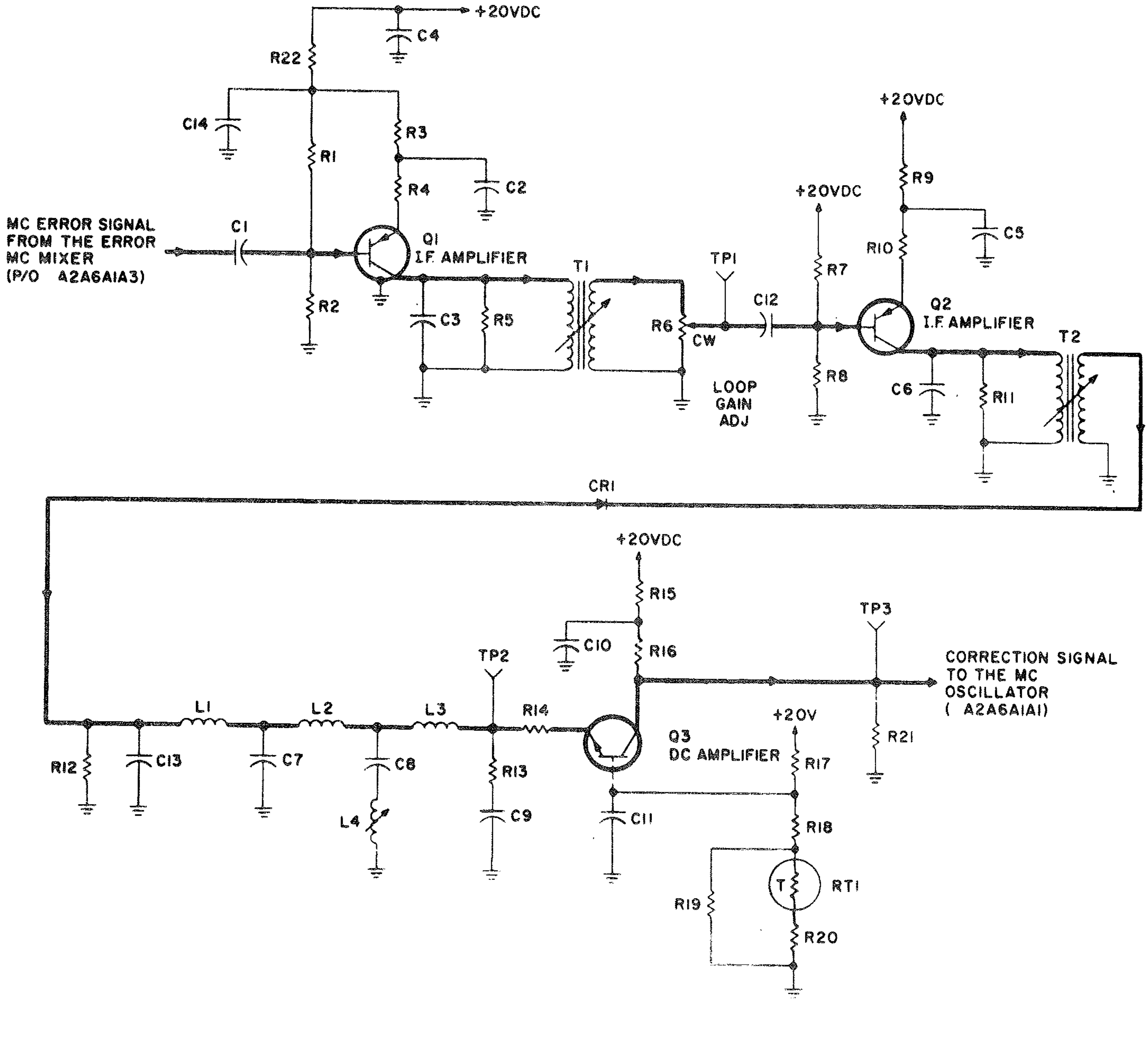
d) Multimeter, type Metrix, mod. 430/C or equiv.

e) Heterodyne Voltmeter, type Bruel and Kjaer, mod. 2006 or equiv.

4.3.34 - **Error detector/amplifier**

A) - *Circuit description*

The error detector/amplifier (figure 4.36) consists of two if. amplifiers (Q1 and Q2) and a dc amplifier (Q3). These circuits, which form a part of MC Synthesizer Electronic Subassembly 2A2A6A1, amplify and



NOTE:
REF. DESIG. PREFIX A2A6A1A2.

Figure 4-36. Error Detector/Amplifier, Simplified Schematic Diagram

detect the mc error signal, producing a correction signal for subsequent application to the mc oscillator.

A detailed description of the operation of this circuit follows.

The signal from the error mixer is coupled through capacitor C1 to the base of if. amplifier Q1.

The base bias for amplifier Q1 is provided by voltage divider R1, R2. Resistor R22 and capacitor C14 are used for decoupling. Resistor R4 provides a small amount of degeneration to add to the stability of if. amplifier Q1.

The output load of if. amplifier Q1 is a 1.5-mc tuned circuit consisting of capacitor C3 and transformer T1.

Resistor R5 loads the tank circuit sufficiently to insure uniformity. The output signal of if. amplifier Q1 is coupled through transformer T1 to potentiometer R6, which is used to adjust the gain of the phase lock loop.

The output from the wiper of this potentiometer is coupled through capacitor C12 to the base of if. amplifier Q2.

The base bias for if. amplifier Q2 is provided by voltage divider R7, R8. Resistor R10 provides a small amount of degeneration to add to the stability of if. amplifier Q2.

The output load of if. amplifier Q2 is a 1.5-mc tuned circuit consisting of capacitor C6 and transformer T2. Resistor R11 loads the tank circuit sufficiently to insure uniformity.

The output signal of if. amplifier Q2 is coupled through transformer T2 and applied to a diode detector circuit. The diode detector circuit consists of diode CR1, resistor R12, and capacitor C13.

The output of the diode detector is filtered by a network consisting of a composite of a constant-k section and an m-derived section. The constant-k section consists of capacitor C7, inductor L1, and a portion of inductor L2. The m-derived section consists of inductors L3 and L4, capacitor C8, amd the remaining portion of inductor L2.

Variable inductor L4 compensates for the tolerance of the components used in the m-derived section.

Resistor R13 and capacitor C9 form the termination of the filter. The output of this filter is applied to the emitter of dc amplifier Q3. Resistor R14 provides a small amount of degeneration to add to the stability of dc amplifier Q3. Base bias for dc amplifier Q3 is provided by voltage divider R17, R18, R19, R20, R21.

Thermistor RT1 varies the bias with temperature to compensate for changes in the base-to-emitter voltage of dc amplifier Q3 which result from temperature changes.

The network consisting of resistors R15 and R16, and capacitor C10 serves as the collector load for dc amplifier Q3 and is used as a lag network for the phase-locked loop, which decreases the noise output and increases the stability.

Resistor R21 prevents the collector voltage of dc amplifier Q3 from rising above 19 vdc and forward-biasing voltage-variable capacitor 2A2A6A1A1CR3. The error voltage taken from the collector of dc amplifier Q3 is applied to the mc oscillator.

B) - *Test data*

Pertinent references and applicable test data for the error detector/amplifier are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) MC Synthesizer Electronic Subassembly, Schematic Diagram, figure 5.6.

c) MC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.67.

d) Error Detector/Amplifier (Foil Side Up), Component and Test Point Location, figure 5.69.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

e) Heterodyne Voltmeter, type Bruel and Kjaer, mod. 2006 or equiv.

4.3.35 - 100 KC spectrum generator

A) - *Circuit description*

The 100-kc spectrum generator (figure 4.37) consists off a trigger amplifier (Q1), a divide-by-five multivibrator (Q2 and Q3), a gate amplifier (Q4), a keyed oscillator (Q5), an amplifier (Q6), and a double tuned filter (L5 and T2). This circuit, which forms a part of Spectrum Generator Electronic Subassembly 2A2A6A5, produces a spectrum of frequencies between 15.3 and 16.2 mc.

This spectrum is applied to 10.747 mc mixer of 2A2A6A2 to produce the 10.747 mc reference frequency used for error cancellation in the 100 kc mixing frequency scheme. This circuit also provides the 100 kc trigger pulses to 10-kc spectrum generator 2A6A5A2. The 100-kc spectrum generator is used in all modes of operation.

A detailed description of the operation of the 100-kc spectrum generator follows.

The input to the 100-kc spectrum generator is the 500-kc sinusoidal output from 1 mc divide-by-two circuit 2A2A5A1. This signal is applied to autotransformer L2, where it is stepped up and in turn coupled to the base of trigger amplifier Q1 by capacitor C3.

A positive 20 vdc is applied to the 100-kc spectrum generator in all modes of operation from power supply 2A2A8 (located on the main frame).

The positive 20 vdc is regulated to 10 vdc by Zener diode CR1, which draws enough current in addition to the current drawn by the load to maintain a 10 vdc drop across R1. This regulated 10 vdc is used to provide a stable supply for trigger amplifier Q1 and multivibrator Q2,Q3.

The negative halves of the 500 kc signal, applied to the base of trigger amplifier Q1, are of sufficient magnitude to drive it into saturation. This results in the collector of trigger amplifier Q1 being switched between zero (non-conducting) and 9,0 vdc (saturated).

The small drop (1 volt) is caused by the small forward resistance of the diode and the collector-to-emitter resistance of the transistor. Diode CR2 provides temperature compensation for trigger amplifier Q1 and aids in the shaping of the positive output triggers.

Resistor R2 is the base-return resistor, providing capacitor C3 with a discharge path. The output pulses of trigger amplifier Q1 are developed across resistor R3 and are differentiated by capacitor C4 and the input impedance of divide-by-five multivibrator Q2, Q3. This results in a series of 500-kc positive and negative triggers to multivibrator Q2, Q3.

Divide-by-five multivibrator Q2, Q3 is an astable multivibrator, which is locked at a 500-kc rate. Refer to timing diagram, figure 4.37 B for the following detailed discussion of multivibrator Q2, Q3.

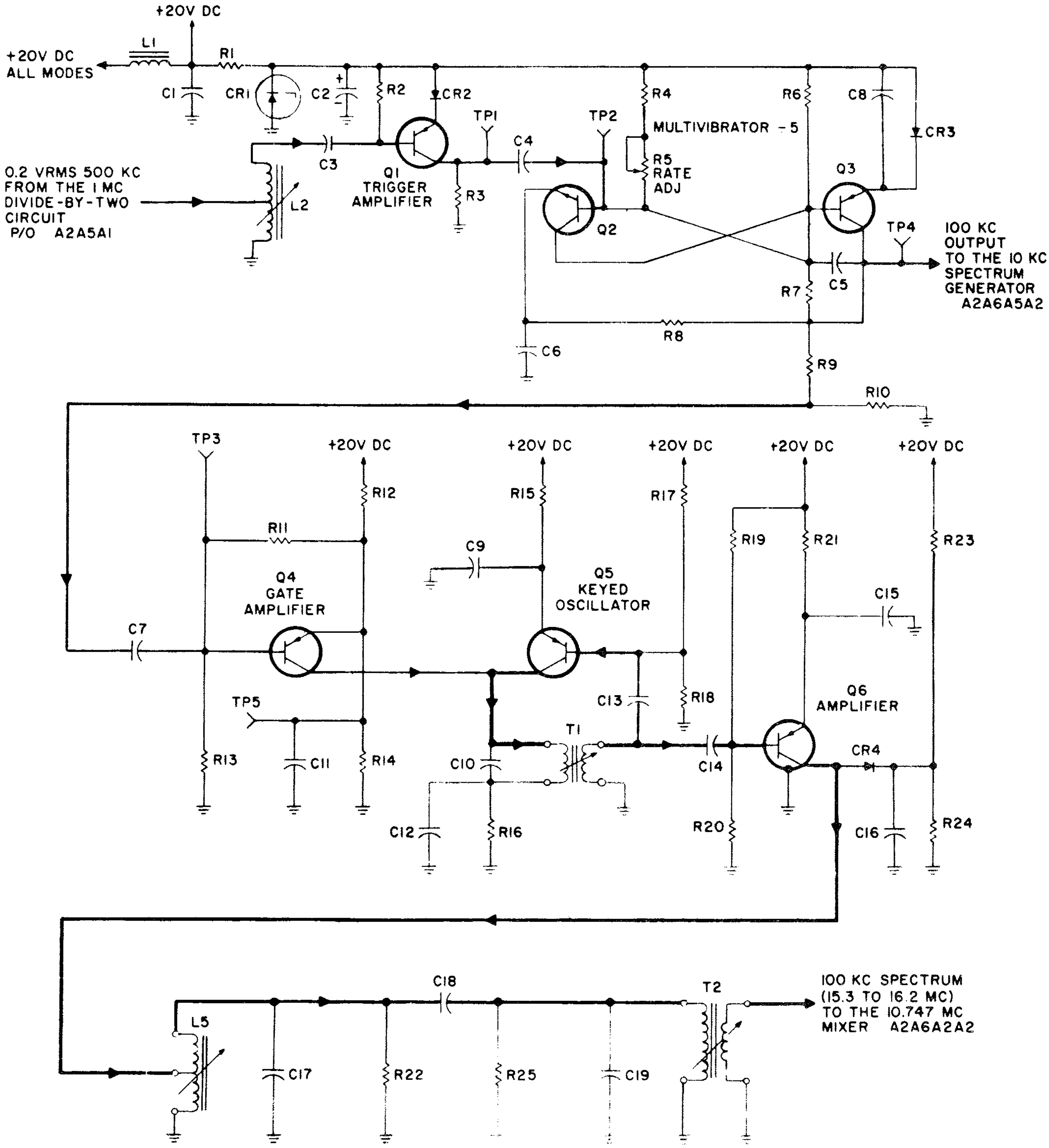
Multivibrator Q2, Q3 is free-running until locked by the 500-kc input trigger pulses from trigger amplifier Q1.

Assume that a positive trigger pulse is applied to the base of transistor Q2 and that transistors Q2 and Q3 are cutoff. The collector of transistor Q2 and the base of transistor Q3 are at the voltage supply level (10 Vdc) at this time. When the input pulse causes transistor Q2 to conduct, a voltage drop is developed across resistor R6, decreasing the voltage on the base of transistor Q3. Since the emitter of transistor Q3 is essentially at the supply voltage level (when it is cutoff), it becomes forward-biased and conducts.

This causes the collector of transistor Q3 to go from 0 volts (no conduction) to approximately 9 volts. The 1 volt drop from the 10 vdc supply voltage level is caused by the small forward drop of diode CR3 and the collector-to-emitter drop of transistor Q3. The base-voltage divider for transistor Q2 (R4, R5, R7) now has the 9 vdc (collector voltage of transistor Q3) on one end and the 10 vdc supply voltage on the other end. This causes transistor Q2 to become saturated. Therefore transistors Q2 and Q3 are both conducting and are in saturation. Capacitor C6 now charges through two paths.

One path is through transistor Q2 and resistors R4, R5, and R6. The other path is through resistor R8, transistor Q3, and diode CR3.

As capacitor C6 charges, the emitter voltage of transistor Q2 increases, resulting in a decrease of forward bias on transistor Q2. This reduces the collector current of transistor Q2, resulting in a decreased drop across resistor R6. Therefore, the base voltage on transistor Q3 will



NOTE
REF. DESIG. PREFIX A2A6A5A1

Pub. 246
December 1967
ORIGINAL

Figure 4.37a 100 KC Spectrum Generator, Simplified Schematic Diagram

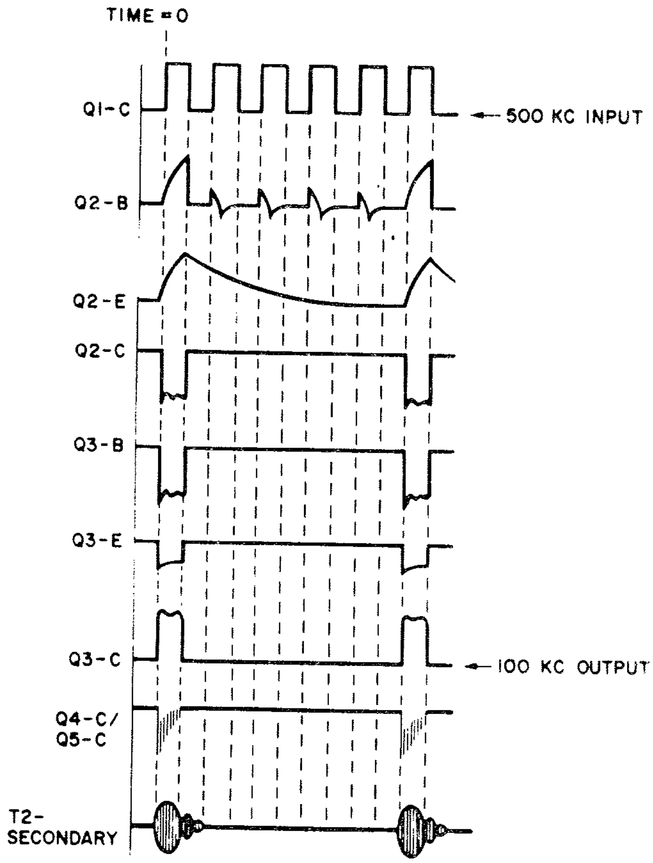


Figure 4-37b Divide-By-Five Multivibrator, Timing Diagram

start to go positive, resulting in a decrease of its forward bias. The collector current of transistor Q3 then begins to decrease as the forward bias decreases.

Therefore, the collector voltage of transistor Q3 begins to decrease, increasing the voltage across the base voltage divider of transistor Q2. This reduces the forward bias of transistor Q2 even more.

This regeneration brings transistors Q2 and Q3 out of saturation and continues until they are both cut off.

Capacitor C6 now starts to discharge through resistors R10,R9, and R8. During this discharge period, the positive and negative trigger pulses are still applied to the base of transistor Q2, but are not of sufficient amplitude to forward-bias and turn on transistor Q2. When transistors Q2 and Q3 are cut off, the base bias of transistor Q2 is determined by voltage divider R4, R5, R7, R9, R10. The emitter voltage of transistor Q2 is the charge on capacitor C6. Therefore, capacitor C6 has to discharge to such a level that when a positive trigger pulse is applied to the base of transistor Q2, it starts conducting.

The time constant of the RC network consisting of C6, R8, R9, and R10 is fixed such that resistor R5 can be used to adjust the bias on transistor Q2, allowing every sixth positive trigger pulse, after the initial trigger pulse, to turn transistor Q2 on. When this occurs, the collector voltage on transistor Q2 will again drop, and the regeneration process described above will be repeated. Thus, the process of regeneration occurs before the natural period has been completed as the result of every sixth positive trigger pulse on the base of transistor Q2. This results in an output (collector of transistor Q3) that is exactly one-fifth of the input trigger pulse rate.

The 100-kc signal present on the collector of transistor Q3 is applied to the 10 kc spectrum generator.

Capacitor C8 prevents any degeneration in the circuit as a result of the small forward resistance of diode CR3. Capacitor C5 speeds up the application of the pulses from the collector of transistor Q3 to the base of transistor Q2.

The 100-kc output signal of multivibrator Q2, Q3, which is developed across voltage divider R9, R10, is coupled to the base of gate amplifier Q4 by capacitor C7.

During the off time of multivibrator Q2, Q3, gate amplifier Q4 is forward-biased and in saturation. Forward-bias voltage for gate amplifier Q4 is developed by voltage dividers R12, R14, and R12, R11, R13 from the positive 20 vdc applied from main frame power supply 2A2A8. Capacitor C11 is the emitter bypass capacitor. When gate amplifier Q4 conducts, the base is at approximately 10.1 vdc and the emitter is at approximately 10.3 vdc, the drop being caused by the small emitter-to-base resistance.

With gate amplifier Q4 in saturation, the tank circuit (capacitor C10 and the primary of transformer T1) of keyed oscillator Q5 will be heavily loaded by the small collector-to-emitter resistance of gate amplifier Q4, preventing regeneration. When a positive pulse is coupled to the base of gate amplifier Q4, it is reversed-biased and cut off for the duration of the pulse.

This removes the load from the tank circuit of keyed oscillator Q5, permitting it to oscillate at is natural frequency. Resistor R16 limits the current flow through gate amplifier Q4 when it is in saturation.

Voltage divider R17, R18 and emitter resistor R15 develop bias voltage for oscillator Q5 from the positive 20 vdc applied from the power supply on the main frame. Capacitor C9 is the emitter bypass capacitor. When the load created by the conduction of gate amplifier Q4 is removed from the tank circuit of keyed oscillator Q5, the tank circuit will produce an 0.8- microsecond sinusoidal burst of frequencies. This results in a spectrum of frequencies centered around the free-running frequency of keyed oscillator Q5.

The desired spectrum consists of ten spectrum points, which are below the free-running (center) frequency of keyed oscillator Q5, separated by the 100-kc keying rate.

The secondary of transformer T1 and capacitor C13 provide the required feedback path for keyed oscillator Q5, so that the necessary loop gain can be developed to sustain oscillations.

Capacitor C12 is an rf bypass for resistor R16 at the output frequency of keyed oscillator Q5.

The spectrum output of the tank circuit is coupled to the base of amplifier Q6 by capacitor C14. Operating voltage for amplifier Q6 is developed by voltage divider R19, R20 and emitter resistor R21 from the positive 20 vdc applied from the power supply on the main frame.

The output of amplifier Q6 is limited by diode CR4. The amount of limiting is adjusted by selecting the value of resistor R24. Resistors R23 and R24 form a voltage divider for developing the cathode bias on limiter CR4. Capacitors C15 and C16 are bypass capacitors.

The output of amplifier Q6 us developed across a tuned circuit consisting of capacitor C17 and inductor L5. Resistor R22 increases the band-width of the tuned circuit and ensures uniformity.

The output of tuned circuit L5, C17 is coupled by capacitor C18 to another tuned circuit consisting of capacitor C19 and the primary of transformer T2. Resistor R25 increases the bandwidth of this tuned circuit. The pass-band of these two tuned filters is sufficient to pass the desired 15.3-to-16.2-mc spectrum, but has sufficient selectivity to eliminate all the undesired harmonics and products produced by keyed oscillator Q5.

The output of the 100 kc spectrum generator is coupled to 10.747 mc mixer 2A2A6A2A2.

B) - *Test data*

Pertinent references and applicable test data for the 100 kc spectrum generator are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) Spectrum Generator Electronic Subassembly, Servicing Block Diagram, figure 4.68.

c) Spectrum Generator Electronic Subassembly, Schematic Diagram, figure 5.10.

d) 100 Kc Spectrum Generator (Foil Side Up), Component and Test Point Location, figure 5.95.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) Oscilloscope, type Tektronix, mod. 546 or equiv.

c) RF Voltmeter, type Boonton, mod. 91-H or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.36.- **10.747 Mc/s Mixer**

A).- *Circuit description*

The 10.747 Mc/s Mixer (Fig. 4.38) consists of an isolation amplifier (Q2), a mixer (Q1), and a 10.747 mc crystal filter (FL1).

These circuits, which form a part of 100 KC Synthesizer Electronic Subassembly 2A2A6A2, produce a 10.747-mc output at a level suitable for use in 17.847/27.848 mc mixer 2A2A6A2A3. These circuits are used in all modes of operation.

A detailed description of the operation of the 10.747 mc mixer follows.

The 4.553 to 5.453 mc output from the 4.553 to 5.453 mc oscillator is coupled to the emitter of isolation amplifier Q2 by capacitor C7. Voltage divider R4, R5 and emitter resistor R7 derive operating voltage for isolation amplifier Q2 from the positive 20-vdc supply line.

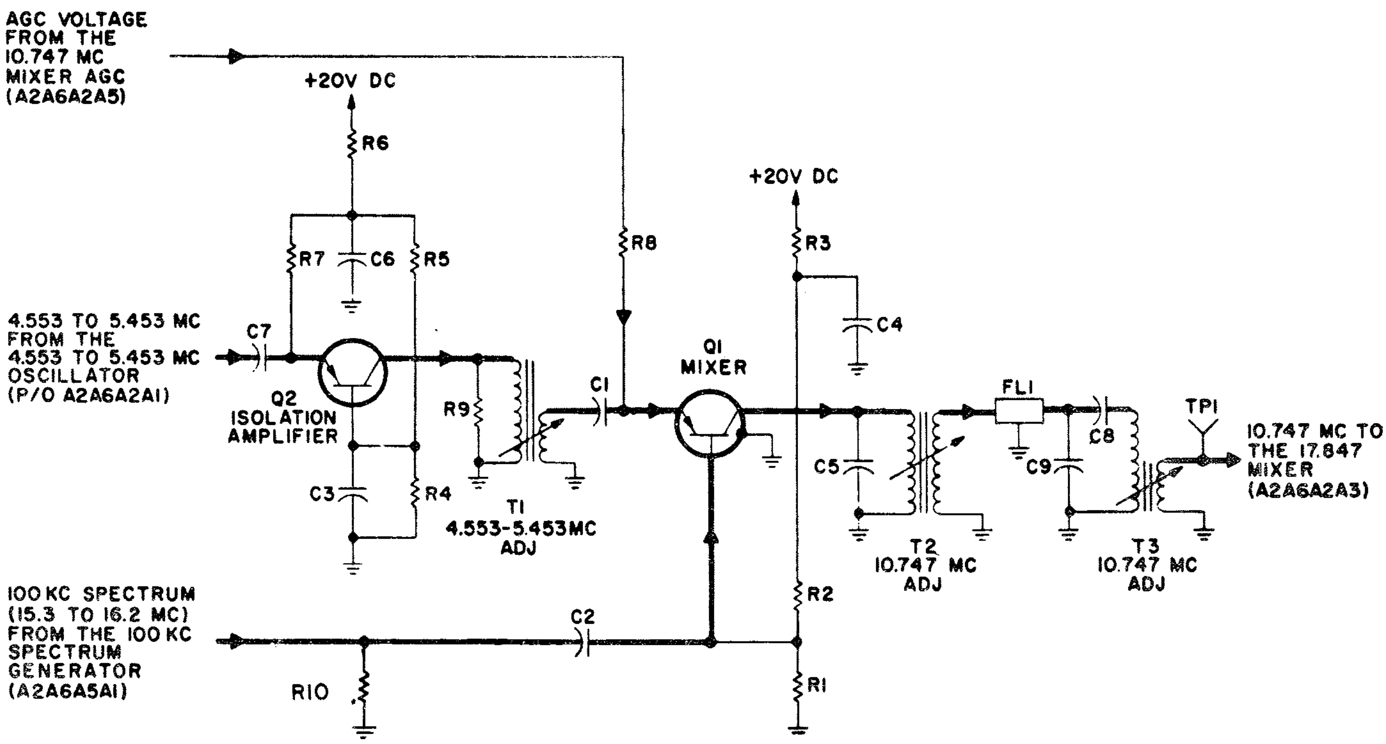
Resistor R6 and capacitor C6 provide decoupling to prevent any interaction with other circuits connected to the positive 20-vdc supply line. Capacitor C3 is an rf bypass capacitor.

Isolation amplifier Q2 is a grounded-base amplifier, which prevents the spectrum frequencies and mixer products in mixer Q1 from being fed back into the hi-band/lo-band mixer/amplifier circuits via the 4.553 to 5.453 mc oscillator circuits.

The output of isolation amplifier Q2 is developed across the primary of transformer T1. Resistor R9 ensures the uniformity of the signal developed across transformer T1.

The 4.553 to 5.453 mc output of isolation amplifier Q2 is coupled to the emitter of mixer Q1 by capacitor C1.

The 100-kc spectrum (15.3 to 16.2 mc) from the 100 kc spectrum generator is coupled to the base of mixer Q1 by capacitor C2. Voltage divider R1, R2 derives base bias for mixer Q1 from the positive 20-vdc supply line. Resistor R3 and capacitor C4 provide decoupling to prevent any



NOTE:
REF. DESIG. PREFIX A2A6A2A2.

Figure 4-38. 10.747 MC Mixer, Simplified Schematic Diagram

interaction with the other circuits connected to the positive 20-vdc supply line.

The emitter bias for mixer Q1 is developed from the output of the 10.747 mc mixer agc circuit by emitter resistor R8. The agc voltage is a variable voltage that controls the amount of forward-biasing, and thereby, the gain of mixer Q1.

The frequency from the 4.553 to 4.453 mc oscillator is mixed with each of the ten spectrum points applied by the 100 kc spectrum generator. The resulting mixing products are developed across a tuned circuit consisting of capacitor C5 and the primary of transformer T2. This circuit is tuned to 10.747 mc, the desired mixer product.

Transformer T2 couples the output of mixer Q1 to filter FL1. Filter FL1 is a 10.747-mc crystal lattice filter which eliminates all other mixing products. The 10.747 mc output of filter FL1 is developed across the tuned circuit consisting of capacitors C8 and C9 and the primary of transformer T3. The output of the 10.747 mc mixer circuit is coupled to 10.847/27.847 mc mixer 2A2A6A2A3 by transformer T3.

B) - *Test data*

Pertinent references and applicable test data for the 10.747 mc mixer are ad follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) 100 KC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.66.

c) 100 KC Synthesizer Electronic Subassembly, Schematic Diagram, figure 5.7

d) 10.747 MC Mixer (Foil Side Up), Component and Test Point Location, figure 5.74.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.37 - **10.747 MC Mixer AGC**

A) - *Circuit description*

The 10.747 mc mixer AGC (figure 4.39) consists of two agc amplifiers (Q2 and Q3) and a detector (Q4). These circuits, which form a part of 100 KC Synthesizer Electronic Subassembly 2A2A6A2, produce an agc voltage which is used to control the gain of mixer Q1 in the 10.747 mc mixer (2A2A6A2A2).

These circuits are used in all modes of operation.

A detailed description of the operation of the 10.747 mc mixer agc circuit follows.

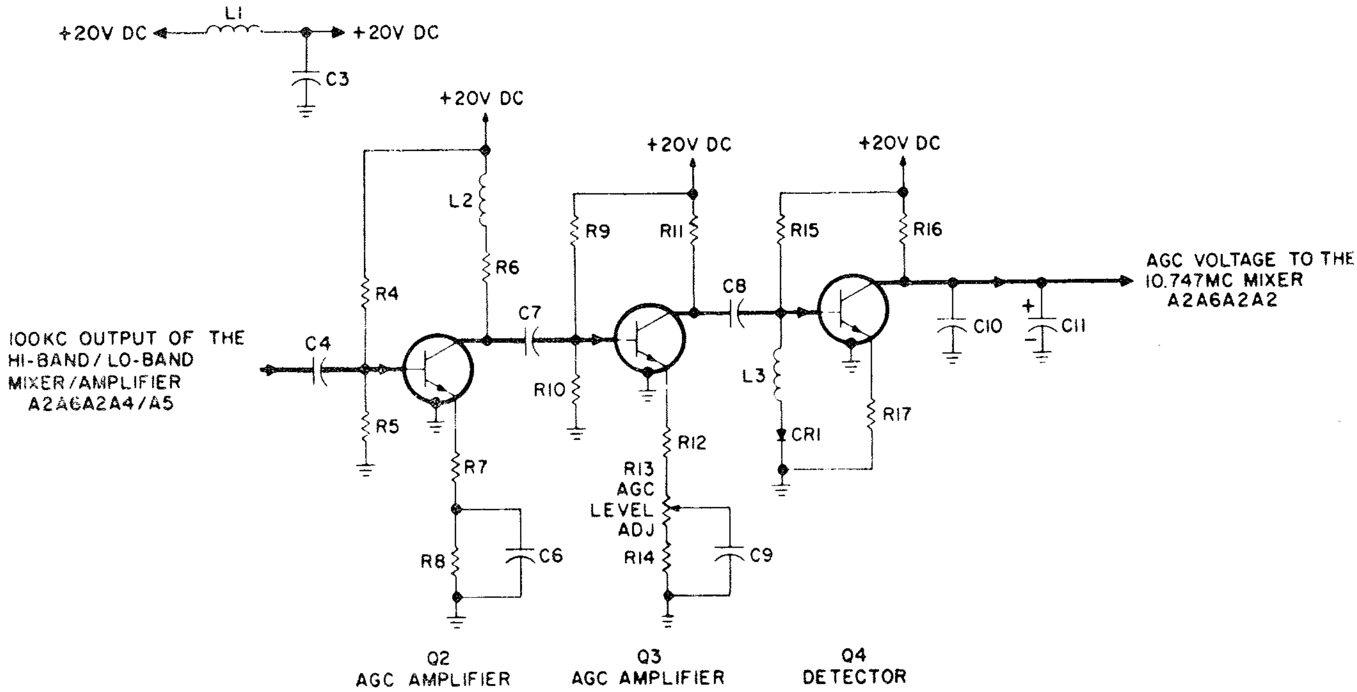
The 22.4 to 23.3 mc or 32.4 to 33.3 mc output from the hi-band/lo-band mixer/amplifiers is coupled to the base of agc amplifier Q2 by capacitor C4.

Voltage divider R4, R5 derives bias voltage for agc amplifier Q2 from the positive 20-vdc supply line. Inductor L2 is a peaking coil which compensates for high frequency roll-off, and provides for uniform output for both the hi-band and lo-band mixing frequencies. Resistor R7 develops enough degeneration to flatten the frequency response and provide stability.

Resistor R8 is the emitter resistor, which is rf bypassed by capacitor C6. The output of agc amplifier Q2 is devepoled across resistor R6 and inductor L2 and is coupled to the base of agc amplifier Q3 by capacitor C7.

Voltage divider R9, R10 derives bias voltage for agc amplifier Q3 from the positive 20-vdc supply line. Resistors R12 and R13 develop degeneration for increasing stability and controlling the agc loop gain. The gain of agc amplifier Q3 is set by adjusting potentiometer R13.

Resistor R14 is the emitter resistor, which is rf bypassed by capacitor C9. The output of agc amplifier Q3 is developed across resistor R11 and



NOTE:
REF DESIG PREFIX A2A6A2A5

Figure 4-39 10.747 MC Mixer AGC, Simplified Schematic Diagram

is coupled to the base of detector Q4 by capacitor C8.

Resistor R15, inductor L3, and diode CR1 derive bias voltage to detector Q4 from the positive 20-vdc supply line. Inductor L3 provides a high ac input impedance and a low dc resistance. This prevents any output loading of agc amplifier Q3. Diode CR1 compensates for temperature variations in the base-to-emitter circuit of detector Q4.

Resistor R17 provides a small amount of degeneration to improve the stability of detector Q4. With no signal applied, detector Q4 is non-conducting. The positive portions of the applied signal forward-bias the base-to-emitter diode of detector Q4, causing current to flow. Capacitor C11 starts to charge to the 20 vdc when there is no collector current in detector Q4.

When collector current starts to flow, the collector voltage drops, causing capacitors C10 and C11 to discharge through transistor Q4. Once the output of agc amplifier Q3 reaches a steady-state condition, each input cycle sustains the charge on capacitors C10 and C11, preventing fluctuations in the dc output voltage.

Since this circuit forms a closed loop with all the other circuits of the 100 KC Synthesizer Electronic Subassembly, the gain of all circuits will reach a steady state condition, thus maintaining constant outputs from detector Q4, and hi-band/lo-band mixer/amplifier 2A2A6A2A4/A5, respectively.

B) - *Test data*

Pertinent references and applicable test data for the 10.747 mc mixer are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) 100 KC Synthesizer Electronic Subassembly, Schematic Diagram, figure 4.66.

c) 100 KC Synthesizer Electronic Subassembly, Schematic Diagram, figure 5.7.

d) 10.747 MC Mixer AGC (Foil Side Up), Component and Test Point Location, figure 5.69.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) Oscilloscope, type Tektronix, mod. 546 or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.38 - **5 MC Multiply-By-Two**

A) - *Circuit description*

The 5 mc multiply-by-two circuit (figure 4.40) doubles the frequency of the 5-mc input signal obtained from switch 2A2A5S1 in the comparator circuit for subsequent use in 17.847/27.847 mc mixer 2A2A6A2A3. This circuit consists of a 10 mc amplifier (Q4), which forms a part of Frequency Standard Electronic Assembly 2A2A5.

A detailed description of the operation of the circuit follows.

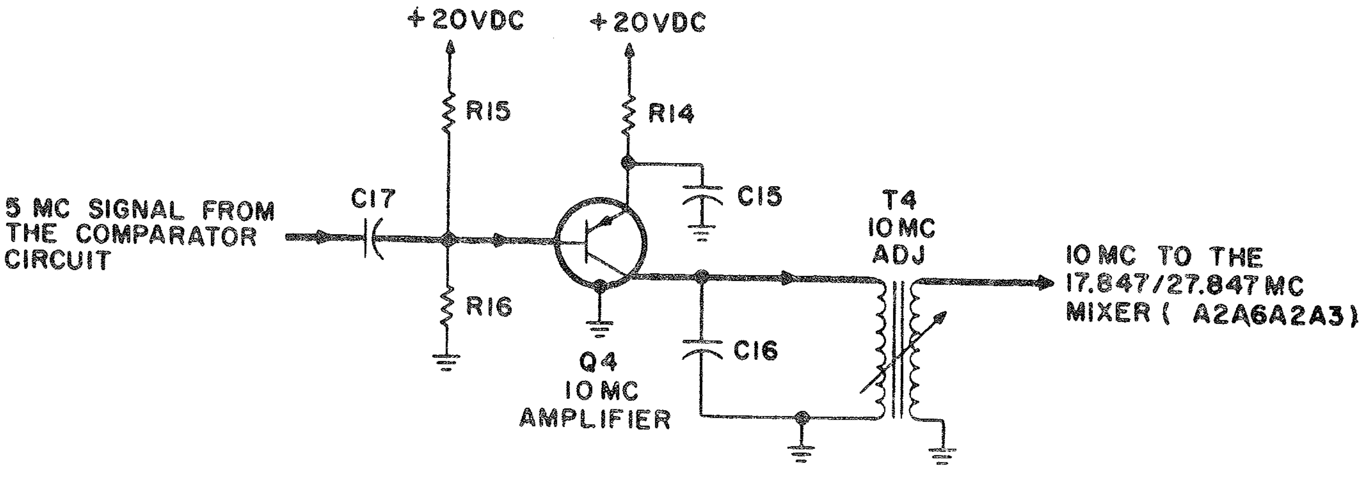
The 5-mc input signal from the comparator circuit is coupled to the base of 10 mc amplifier Q4 by capacitor C17. Bias for the base of amplifier Q4 is provided by voltage divider R15, R16. Resistor R14 is the emitter resistor, which is rf bypassed by capacitor C15.

The output tuned circuit consisting of the primary of transformer T4 and capacitor C16, is tuned to 10 mc.

Since this stage is biased to produce non-linear amplification, the second harmonic (10 mc) of the 5-mc signal is produced and amplified. The 10-mc signal is coupled through transformer T4 and applied to the 17.847/27.847 mc mixer.

B) *Test data*

Pertinent references and applicable test data for the 5 mc multiply-by two circuit are as follows:



NOTE:
REF. DESIG. PREFIX A2A5A1.

Figure 4 40. 5 MC Multiply-By-Two, Simplified Schematic Diagram

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic diagram, figure 5.1.

b) Frequency standard Electronic Assembly, Servicing Block Diagram, figure 4.58.

c) Frequency Standard Electronic Assembly, Schematic Diagram, figure 5.5.

d) 5 MC Multiplier Divider, and Comparator (Component Side Down) Component and Test Point Location, figure 5.62.

2) Required Test Equipment

a) RF Voltmeter, type Boonton, mod. 91-H or equiv.

b) Multimeter, type metrix, mod. 430/C or equiv.

c) RF Signal Generator, type HP, mod. 606-A or equiv.

4.3.39 - **17.847/27.847 MC Mixer**

A) - *Circuit description*

The 17.847/27.847 mc mixer (figure 4.41) consists of two mixers (Q1 and Q2), a gating circuit (CR1, CR3), a 17.847 mc filter (Y1), and a 27.847 mc filter (Y2).

These circuits, which form a part of 100 KC Synthesizer Electronic Subassembly 2A6A2, produce either a 17.847 mc or 27.847 mc frequency for use in the mixing circuits of the hi-band/lo-band mixer/amplifier. These circuits are used in all modes of operation.

A detailed description of the operation of the 17.847/27.847 mc mixer follows.

The 7.1-mc output from the 7.1 mc mixer is coupled to the emitter of mixer Q1 by capacitor C5. The 10.747-mc output from 10.747 mc mixer 2A2A6A2A2 is coupled to the base of mixer Q1 by capacitor C1.

Voltage divider R1, R2 and emitter resistor R4 derive operating voltage for mixer Q1 from the positive 20-vdc supply line. Resistor R3 and capacitor C6 provide decoupling to prevent interaction with the other circuits connected to the 20 vdc supply line.

Resistor R16 is the terminating resistor to the 7.1-mc input signal. Mixer Q1 mixes the two input signals and develops the resulting mixing products across the tuned circuit consisting of capacitor C7 and the primary of transformer T1. The circuit is tuned to 17.847 mc, the desired additive product.

The output of mixer Q1 is coupled to a crystal filter consisting of transformers T1 and T2, capacitors C8 and C9, and crystal Y1.

Crystal Y1, series-resonant a 17.847 mc., passes the desired additive mixing product. Since the crystal can also be parallel resonated with its own shunt capacitance. capacitor C8 and the bottom half of the primary of transformer T2 are adjusted to cancel the effect of this shunt capacitance.

The output of the filter is coupled to the hi-band/lo-band mixer/amplifier (when the lo-band of mixing frequencies is required) and to the base of mixer Q2 (when the hi-band of mixing frequencies is required) by transformer T2.

Resistor R5 terminates the crystal filter.

The 10-mc signal from the 5 mc multiply-by-two circuit (part of 2A2A5A1) is coupled to the anode of diode CR1 by capacitor C15.

Zener diode CR2 regulates the positive 20 vdc to 10 vdc by drawing enough current in addition to the load current to maintain a 10 vdc drop across resistor R12. This 10 vdc is applied to the cathode of diode CR3 and to the anode of diode CR1 through isolating resistor R11.

When the lo-band output is required, 20 vdc is applied to resistors R6, R10 and R14.

Voltage divider R6, R7 which produces the base bias, of mixer Q2, then has 20 vdc applied to both ends. Thus, mixer Q2 is biased off when the lo-band of frequencies is being used.

The lo-band positive 20 vdc is also applied through resistor R10 to the cathode of diode CR1. Therefore, when the lo-band of frequencies is being used, diode CR1 is back-biased, preventing the 10 mc signal from passing.

The lo-band positive 20 vdc is also applied to the anode of diode CR3 through resistor R14. Consequently, diode CR3 is forward-biased and conducts. The 10 mc signal is then allowed to pass through capacitor C16 to load resistor R13.

Therefore, resistor R13 loads the 10 mc signal when the lo-band mixing frequencies are required.

When the hi-band mixing frequencies are required, a ground is applied to resistors R14, R10, and R6. The ground is applied through isolating resistors R14 and R10 to diodes DR3, and CR1, respectively. This back-biases diode CR3 and forward-biases diode CR1.

When diode CR1 is forward-biased, it conducts, allowing the 10 mc signal to pass. The 10 mc signal is coupled to the emitter of mixer Q2 by capacitor C13.

Voltage divider R6, R7 and emitter resistor R9 derive operating voltage for mixer Q2 from the positive 20-vdc supply line.

Resistor R8 and capacitor C11 provide decoupling to prevent interaction with other circuits connected to the positive 20 vdc supply line.

Capacitor C12 is the emitter bypass capacitor.

The 17.847-mc output of the crystal filter is coupled to the base of mixer Q2 by capacitor C10.

The 17.847-mc and 10-mc signals are mixed, and the resulting products are developed across the tuned circuit consisting of capacitor C18 and the primary of transformer T3.

This circuit is tuned to 27.847 mc, which is the desired additive mixer product. Transformer T3 couples the output of mixer Q2 to a crystal filter, consisting of crystal Y2, transformers T3 and T4, and capacitors C19 and C20. Each of these components has the same function as its corresponding component in the 17.847 mc crystal filter.

Resistor R15 is the termination for the crystal filter. The output of this crystal filter is coupled to the hi-band/lo-band mixer/ amplifier by transformer T4.

B) - *Test data*

Pertinent references and applicable test data for the 17.847/27.847 mc mixer are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1

b) 100 KC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.66.

c) 100 KC Synthesizer Electronic Subassembly, Schematic Diagram, figure 5.7.

d) 17.847/27.847 MC Mixer (Foil Side Up), Component and Test Point Location, figure 5.76.

2) Required Test Equipment

a) RF Voltmeter, type Boonton, mod. 91-H or equiv.

b) Frequency Meter, type HP, mod. 5245-L or equiv.

c) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.40 - **10 KC spectrum generator**

A) - *Circuit description*

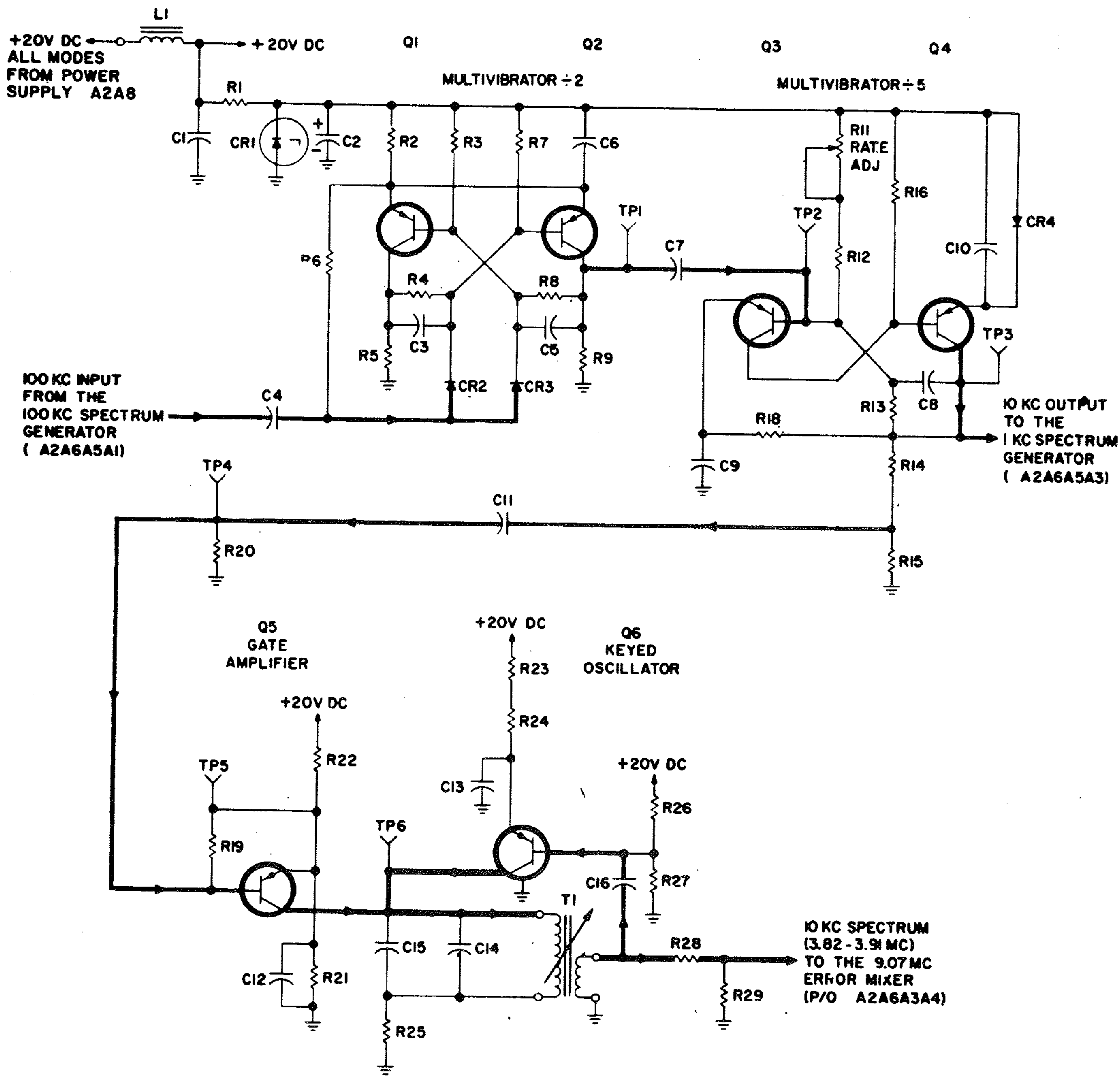
The 10 kc spectrum generator (figure 4.42) consists of a divide-by-two multivibrator (Q3, Q4), a gate amplifier (Q5), and a keyed oscillator (Q6).

These circuits, which form a part of Spectrum Generator Electronic Subassembly 2A2A6A5, produce a spectrum of frequencies between 3.82 and 3.91 mc. This frequency spectrum is applied to the 9.07 mc error mixer (part of 2A2A6A3A4) to produce the reference frequencies used in the error cancelling scheme.

These circuits also provide the 10-kc trigger pulses to the 1 kc spectrum generator. The 10 kc spectrum generator is used in all modes of operation.

A detailed description of the operation of this circuit follows:

The input to the 10 kc spectrum generator is the 100-kc pulsed output



NOTE:
REF. DESIG. PREFIX A2A6A5A2.

Figure 4-42. 10 KC Spectrum Generator, Simplified Schematic Diagram

of the 100 kc spectrum generator. Positive 20 vdc from main frame power supply 2A2A8 is applied to the 10 kc spectrum generator in all modes of operation.

The positive 20 vdc is regulated to 10 vdc by Zener diode CR1, which draws enough current in addition to the current drawn by the load to maintain a 10-vdc drop across resistor R1.

This 10 vdc is used to provide a stable supply voltage for divide-by-two multivibrator Q1, Q2 and divide-by-five multivibrator Q3, Q4.

Divide-by-two multivibrator Q1, Q2 is a conventional bistable multivibrator that produces one output pulse for every two input pulses. The 100-kc input pulses are differentiated by capacitor C4 and the input impedance of multivibrator Q1, Q2.

The resulting positive triggers are directed to the saturated transistor of divide-by-two multivibrator Q1, Q2 by steering diodes CR2 and CR3. This cuts off the saturated transistor and starts the process of regeneration.

Resistor R6 references the anodes of steering diodes CR2 and CR3 at the same potential as the emitters of transistors Q1 and Q2 and provides the return path for capacitor C4.

The output of divide-by-two multivibrator Q1,Q2 is a 50-kc square wave, This signal is differentiated by capacitor C7 and the input impedance of divide-by-five multivibrator Q3, Q4. The resulting positive pulses are used to trigger divide-by-five multivibrators Q3, Q4.

Divide-by-five multivibrator Q3, Q4 is identical to divide - by - five multivibrator Q2, Q3 in the 100 kc spectrum generator (refer to paragraph 4.3.35), except for circuit time constants.

The 10-kc output signal of divide-by-five multivibrator Q3, Q4 is applied directly to the 1 kc spectrum generator. The 10-kc output signal of divide-by-five multivibrator Q3, Q4 is divided by resistors R14 and R15 and coupled to the base of gate amplifier Q5 by capacitor C11. Gate Amplifier Q5 is identical to the gate amplifier in the 100 kc spectrum generator. Gate amplifier Q5 turns keyed oscillator Q6 on and off at a 10-kc repetition rate. Keyed oscillator Q6 is identical to keyed oscillator Q5 in the 100 kc spectrum generator.

The output of keyed oscillator Q6 is a 0.7-microsecond sinusoidal burst of frequencies with a 10-kc repetition rate. This results in a 3.2-to-

3.91-mc frequency spectrum with a 10-kc separation between spectrum points.

The output of keyed oscillator Q6 is divided by resistors R28 and R29 and applied to the 9.07 mc error mixer (part of 2A2A6A3A4).

B) - *Test data*

Pertinent references and applicable test data for the 10 kc spectrum generator are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) Spectrum Generator Electronic Subassembly, Servicing Block Diagram, figure 4.68.

c) Spectrum Generator Electronic Subassembly, Schematic Diagram, figure 5.10.

d) 10 kc Spectrum Generator (Foil Side Up), Component and Test Point Location, figure 5.97.

2) Required Test Equipment:

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

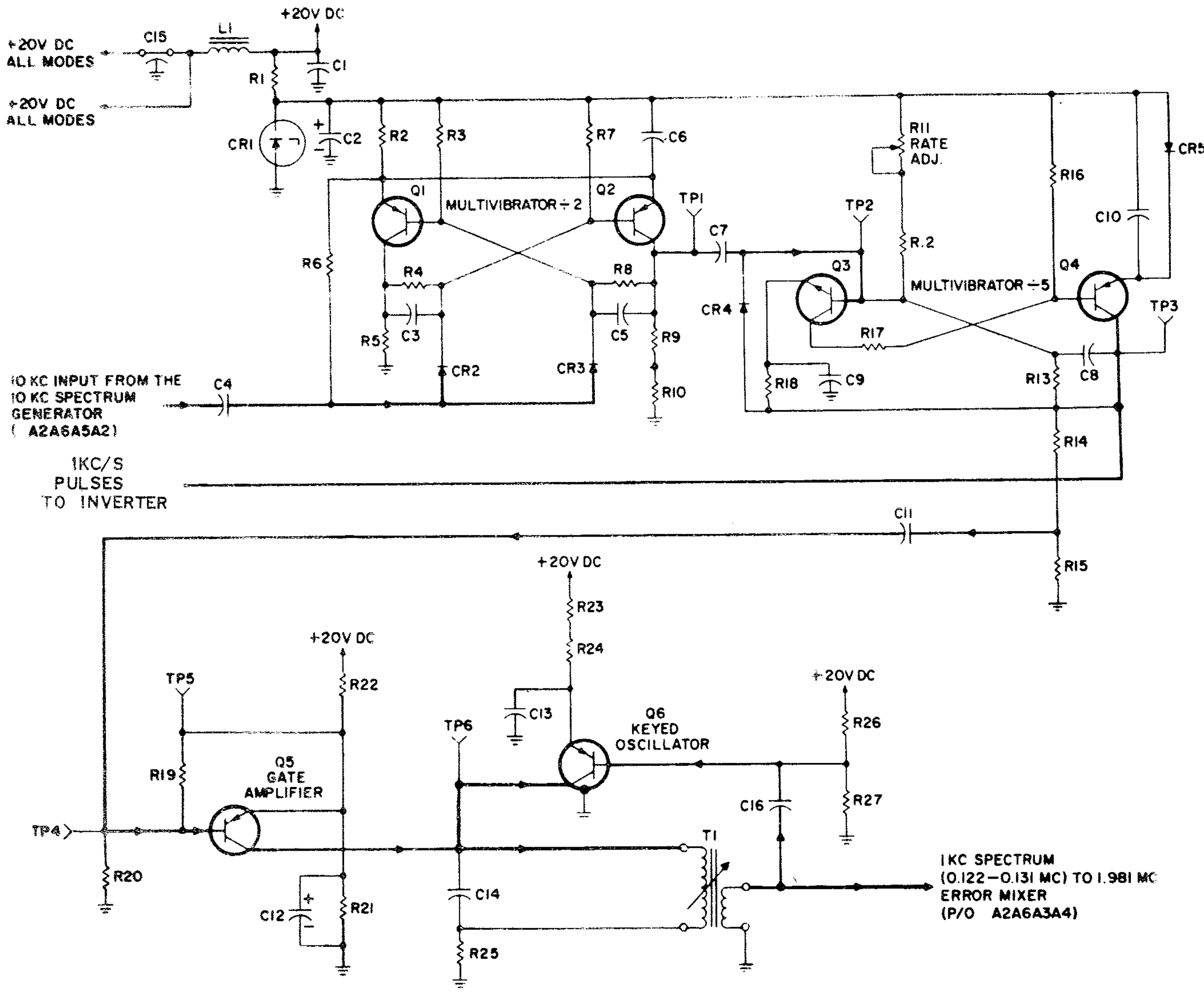
d) Frequency Meter, type HP, mod. 5245-L or equiv.

e) Multimeter, type metrix, mod. 430/C or equiv.

4.3.41 - **1 KC spectrum generator**

A) - *Circuit description*

The 1 kc spectrum generator (figure 4.43) consists of a divide-by-two multivibrator (Q1, Q2), a divide-by-five multivibrator (Q3,Q4), a gate



NOTE
REF. DESIG. PREFIX A2A6A5A3

Figure 4-43 1 KC Spectrum Generator, Simplified Schematic Diagram

amplifier (Q5), and a keyed oscillator (Q6).

These circuits which form a part of Spectrum Generator Electronic Subassembly 2A2A6A5, produce a spectrum of frequencies between 0.122 and 0.131 mc. This frequency spectrum is applied to the 1.981 mc error mixer (part of 2A2A6A3A4) to produce the reference frequencies used in the error cancellation scheme.

These circuits also provide the 1 Kc pulse which, after being applied to an inverter stage, is utilized in the 100 cps synthesizer to lock the 100 cps oscillator.

A detailed description of the operation of the 1 kc spectrum generator follows.

The input to the 1 kc spectrum generator is the 10-kc pulse output of the 10 kc spectrum generator.

This input signal is differentiated by capacitor C4 and the input impedance of divide-by-two multivibrator Q1, Q2.

The resulting positive pulses are used to trigger divide-by-two multivibrator Q1. Q2. Operation is similar to that of divide-by-two multivibrator Q1,Q2 in the 10 kc spectrum generator (refer to paragraph 4.3.40).

The 5-kc pulsed output of the divide-by-two multivibrator is divided by voltage divider R9, R10 and applied to the 5 kc spectrum generator as trigger pulses. The 5-kc pulse output of divide-by-two multivibrator Q1, Q2 is differentiated by capacitor C7 and the input impedance of divide-by-five multivibrator Q3, Q4.

Diode CR4 provides a fast turn-on time for transistor Q3 and holds transistor Q3 in saturation during its conduction period.

Divide-by-five multivibrator Q3, Q4 is identical to divide-by-five multivibrator Q3, Q4 in the 100 kc spectrum generator (refer to paragraph 4.3.35), except for circuit time constants.

The 1-kc pulse output of divide-by-five multivibrator Q3,Q4 is coupled to the IKC inverter and to the base of gate amplifier Q5. Gate amplifier Q5 is identical to gate amplifier Q4 in the 100 kc spectrum generator.

Gate amplifier Q5 turns keyed oscillator Q6 on and off at a 1-kc repetition rate. Keyed oscillator Q6 is identical to keyed oscillator Q5 in the 100 kc spectrum generator.

The output of keyed oscillator Q6 is a 10-microsecond sinusoidal burst of frequencies filtered by L2 and C17.

This results in a 0.122-to-0.131-mc frequency spectrum with a 1-kc separation between spectrum points.

B) .- *Test data*

Pertinent references and applicable test data for the 1 kc spectrum generator are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1

b) Spectrum Generator Electronic Subassembly, Servicing Block Diagram, figure 4.68.

c) Spectrum Generator Electronic Subassembly, Schematic Diagram, figure 5.10.

d) 1 KC Spectrum Generator (Foil Side Up), Component and Test Point Location, figure 5.98.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Oscilloscope, type Tektronix, mod. 546 or equiv.

d) Frequency Meter, type HP, mod. 5245-L or equiv.

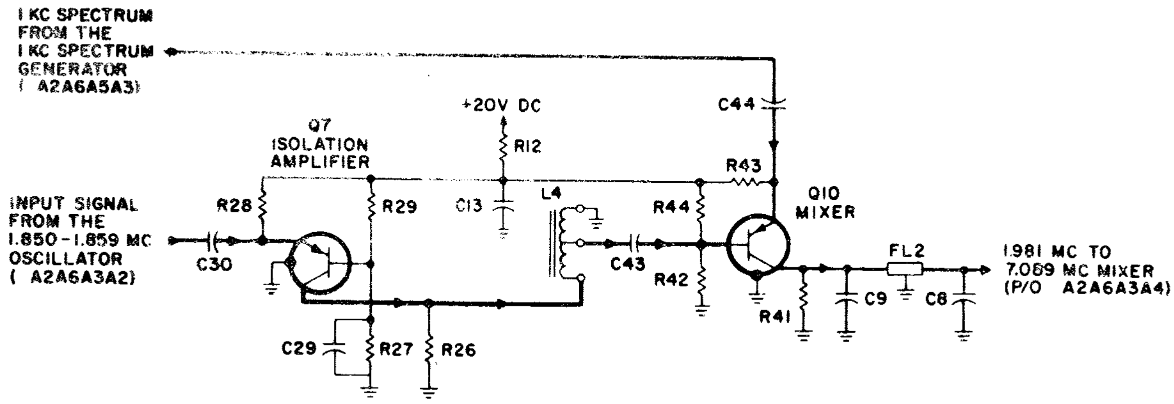
e) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.42.- 1.981 MC Error Mixer

A) .- *Circuit description*

The 1.981 mc error mixer (figure 4.44) consists of an isolation amplifier (Q7), a mixer (Q10), and a 1.981 mc filter (FL2).

These circuits, which form a part of the 1 and 10 KC Synthesizer Elec-



NOTE:
REF. DESIG. PREFIX A2A6A3A4.

Figure 4-44. 1.981 MC Error Mixer, Simplified Schematic Diagram

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic diagram, Fig. 5.1

b) 1 and 10 KC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.65.

c) 1 and 10 KC Synthesizer Electronic Subassembly, Schematic Diagram figure 5.8.

d) 1 and 10 Kc Error Mixer, Component location, figure 5.87.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Frequency Meter, type HP, mod. 5245-L or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.43 - 9.07 MC Error Mixer

A) - *Circuit description*

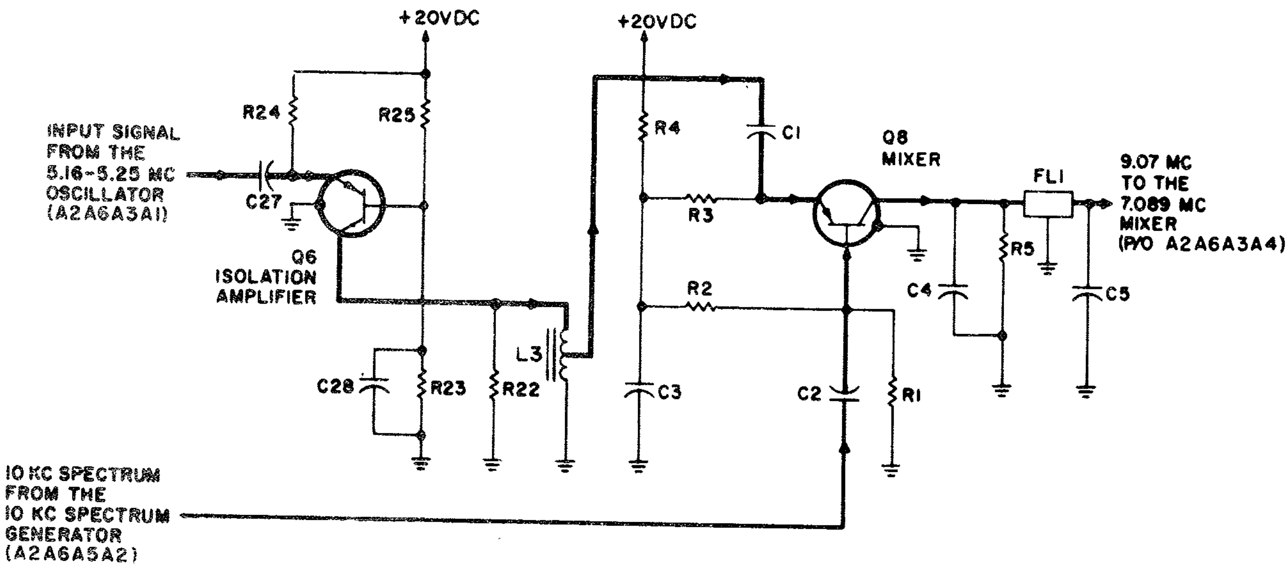
The 9.07 mc error mixer (figure 4.45) consists of an isolation amplifier (Q6), a mixer (Q8), and a 9.07 mc filter (FL1).

These circuits, which form a part of 1 and 10 KC Synthesizer Electronic Subassembly 2A2A6A3, mix the output signal from the 5.16 to 5.25 mc oscillator with one of the 10-kc spectrum points to produce the 9.07-mc product signal for use in the 7.089 mc mixer. This circuit is identical (except for a few component values and degeneration resistor R31) to the 1.981 mc error mixer.

Refer to paragraph 4.3.42 for details of circuit operation.

B) - *Test data*

Pertinent references and applicable test data for the 9.07 mc error mixer are as follows:



NOTE:
REF. DESIG. PREFIX A2A6A3A4.

Figure 4-45. 9.07 MC Error Mixer, Simplified Schematic Diagram

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) 1 and 10 KC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.65.

c) 1 and 10 KC Synthesizer Electronic Subassembly, Schematic Diagram figure 5.8

d) 1 and 10 KC Error Mixer (Component and Test Point Location, figure 5.87.

2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Frequency Meter, type HP, mod. 5245-L or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.44 - 7.089 MC Mixer

A) - *Circuit description.*

Mixer Q9 circuit (figure 4.46), which forms a part of 1 and 10 KC Synthesizer Electronic Subassembly 2A2A6A3, mixes the 1.981-mc signal from the 1.981 mc error mixer with the 9.07-mc signal from the 9.07 error mixer to produce the 7.089 mc error signal for use in the 7.1 mc mixer of 100 CPS Synthesizer Electronic Subassembly 2A2A6A4.

A detailed description of the operation of the circuit follows.

The 1.981-mc signal is coupled through capacitor C7 and isolating resistor R7 to the base of mixer Q9. The 9.07-mc signal is coupled through capacitor C6 and isolating resistor R6 to the base of mixer Q9.

Since the outputs of the 1.981 mc error mixer and the 9.07 mc error mixer are combined at the base of mixer Q9, the output termination for the corresponding mixer filters is located in the 7.089 mc mixer.

This termination consists of resistors R6 and R7, capacitors C5, C6, C7, and C8, and the input impedance of mixer Q9, and the output impedance of the respective filters.

Voltage divider R9, R8 provides base bias for mixer Q9. Resistor R11 and capacitor C11 provide decoupling for mixer Q9. The output circuit of mixer Q9 is a 7.089-mc tuned circuit consisting of capacitor C10 and transformer T1. All mixing products except the difference frequency (7.089 mc) are attenuated by the output circuit of mixer Q9.

The 7.089-mc signal is coupled through transformer T1 to the 7.1 mc mixer circuit in 100 CPS Synthesizer Electronic Subassembly 2A2A6A4.

B) - *Test data*

Pertinent references and applicable test data for the 7.089 mc mixer are as follows:

1) References:

a) Exciter T-827A/URT
Chassis and Main Frame, Schematic Diagram, figure 5.1.

b) 1 and 10 KC Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.65.

c) 1 and 10 KC Synthesizer Electronic Subassembly, Schematic Diagram figure 5.8.

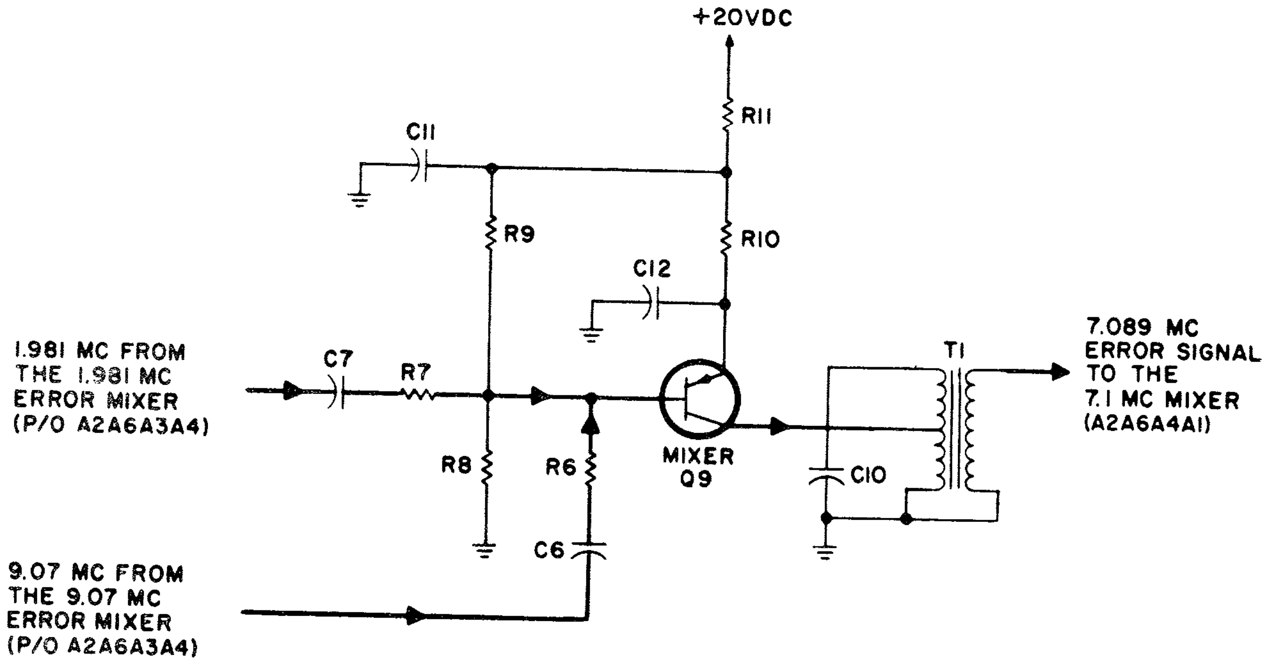
2) Required Test Equipment

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Frequency Meter, type HP, mod. 5245-L or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.



NOTE:

REF. DESIG. PREFIX A2A6A3A4.

Figure 4-46. 7.089 MC Mixer, Simplified Schematic Diagram

4.3.45 - 1 Kc/s pulse inverter

A) *Circuit description*

The 1 Kc/s pulse inverter (Fig. 4.47) consists of an over-driven amplifier stage (Q1); this circuit, which form a part of Spectrum Generator Subassembly (2A2A6A5), produces rectangular pulses at 1 Kc/s frequency, utilized to lock the 100 c/s oscillator frequency.

The 1 Kc/s pulse inverter is used for all modes of operation. A detailed description of the operation of this circuit follows.

The input signal to the 1 Kc/s pulse inverter is the 1 Kc/s pulse waveform from the divide-by-five multivibrator (Q3, Q4) in the 1 Kc/s Spectrum Generator 1A2A6A5A3.

Base bias of Amplifier Q1 provides that, when no input pulse is applied, Q1 is cut off; the collector voltage is clamped to a value lower than the +20 V collector operating voltage by voltage divider R2, R3.

When a pulse is applied to the input, Q1 is switched on to saturation and the collector voltage drops to a value close to zero.

Resistor R4 in series to the base of Q1 prevents loading of the divider by-five multivibrator input.

Resistor R1 and capacitor C1 provide decoupling of the DC voltage source.

The 1 Kc/s pulses at the output of the inverter circuit are applied to the phase detector circuit in the 100 c/s Synthesizer.

B) *Test data*

Pertinent references and applicable test data for the 1 Kc/s pulse inverter are reported below.

1) References:

a) Exciter T-827A/URT Main Frame, Schematic Diagram, Figure 5.1

b) Spectrum Generator Subassembly, Servicing Block Diagram, Fig. 4.68

c) Spectrum Generator Subassembly, Schematic Diagram, Figure 5.10

d) 1 Kc/s pulse inverter, Component Location, Figure 5.99

2) Required Test Equipment:

a) RF Generator, type HP, Mod. 606 or equiv.

b) Electronic voltmeter, type Boonton, Mod. 91-H or equiv.

c) Frequency Meter, type HP, Mod. 5245-L or equiv.

d) Oscilloscope, type Tektronix, Mod. 546 or equiv.

e) Multimeter, type Metrix, Mod. 430/C or equiv.

4.3.46 - **100 c/s Oscillator**

A) *Circuit description*

The 100 c/s Oscillator circuit (Fig. 4.48a) consists of an amplifier stage (Q1), a Clapp oscillator stage (Q2) and a buffer stage (Q3).

The 100 c/s Oscillator circuit, which is a part of the 100 c/s Synthesizer Subassembly produces any one of the ten frequencies spaced 1 Kc/s in the frequency range from 110 Kc/s to 119 Kc/s depending upon the setting of the c/s control on the front panel.

The phase-locking circuits of the 100 c/s oscillator (preset divider and phase detector) provide that the frequency generated has the same stability of the 5 Mc/s standard frequency.

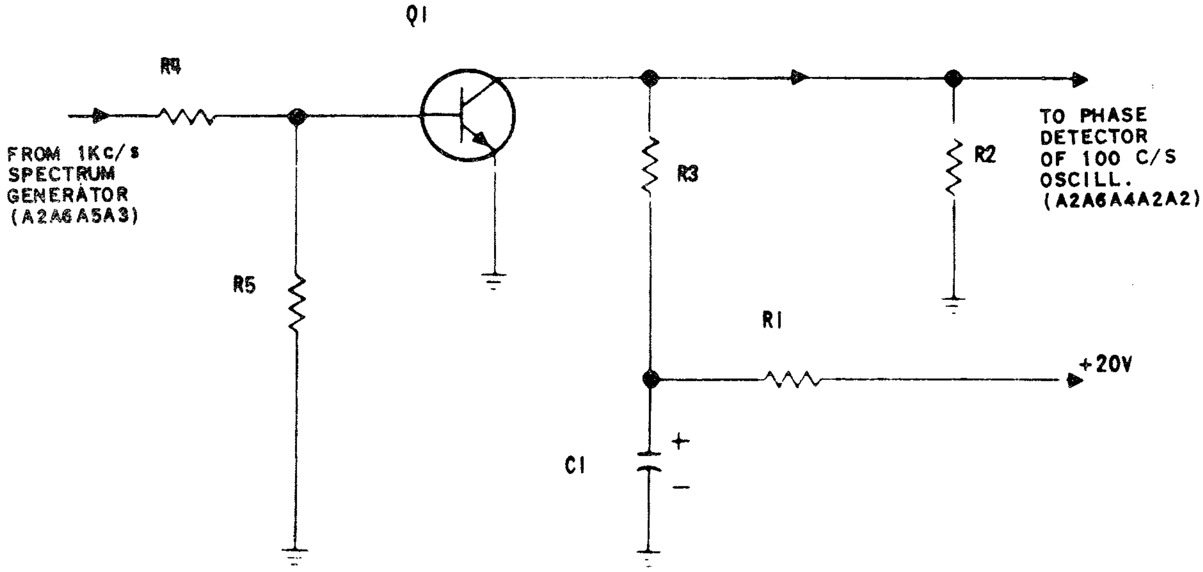
A detailed description of the 100 c/s oscillator operation follows.

The +20 V voltage necessary for the operation of all circuits of the 100 c/s oscillator id provided by Power Supply Assembly (A2A2A8); this voltage is applied to Zener diode CR1 to obtain a +15V regulated voltage.

Capacitor C1 filters the +15 V regulated voltage across Zener diode CR1.

The tank circuit of Clapp oscillator Q2 comprises transformer T1, capacitors C9, C10, C11, C13, C14, C5 and varicaps CR7, CR8 and CR9.

Capacitor C14 is selected to adjust the center frequency of the oscillator, capacitor C15 has a negative temperature coefficient which pro-



NOTE:
REF. DESIG. PREFIX A2A6A5A4

Fig. 4-47 - Pulse Inverter
Simplified Schematic Diagram

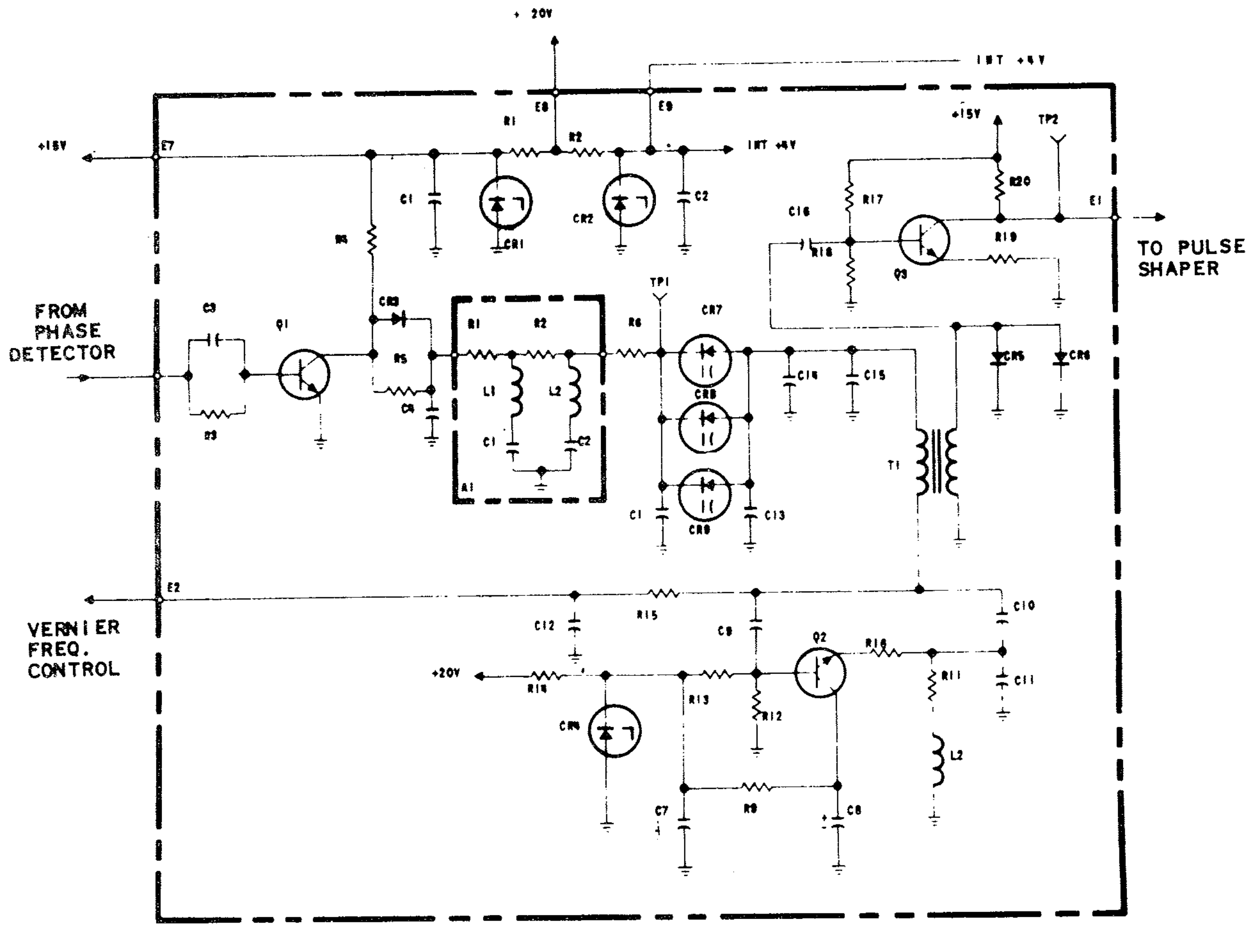


Fig. 4-48a - 100C/S Oscillator
Simplified Schematic Diagram

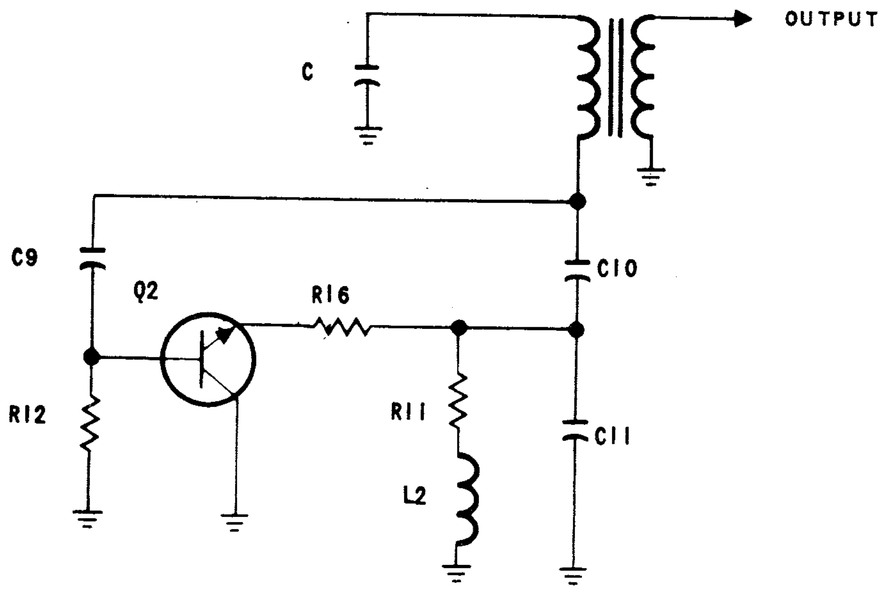


Fig. 4-48b - 100 C/S Oscillator
Equivalent Circuit.

vides compensation for changes of ambient temperature. Changes of the oscillator frequency are obtained by varying the control voltage applied to the varicaps; this voltage is generated in the phase detector for all locked frequencies in the 110-119 Kc/s range.

The parallel and series combination of all capacitors results in a single variable capacity (C1) as shown in the equivalent circuit in Fig. 4.48b.

When the operating voltage is applied, oscillator Q2 oscillates on any of the ten frequencies 110, 111 ...., 119 Kc/s, depending upon the setting of the c/s control on the front panel. This frequency is locked to the 5 Mc/s standard frequency by the phase-locking circuits.

In the R-1051A/URR receiver version of the 100 cps Synthesizer a vernier control provides continuous tuning of the oscillator over the 108-122 Kc/s range; in this case the phase-locking circuits are disabled and the generated frequency is not locked to the 5 Mc/s standard.

The oscillator output is applied to limiting diodes CR5, CR6 and successively, through capacitor C16, to the base of amplifier stage Q3.

The output from Q3 as developed across resistor R20 is applied through capacitor C13, to the base of pulse shaper Q6.

B) *Test data*

Pertinent references and required test equipment for the 100 c/s oscillator are reported below.

1) References:

a) Exciter T-827A/URT Main Frame, Schematic Diagram, Figure 5.1

b) 100 c/s Synthesizer Subassembly, Servicing Block Diagram, Figure 4.69.

c) 100 c/s Synthesizer Subassembly, Schematic Diagram, Figure 5.9

d) 100 c/s Oscillator, Component Location, Figure 5.90

2) Required Test Equipment:

a) Spectrum Generator Subassembly A2A6A5

b) Power Supply, type Trygon, Mod. HR-40-5B or equiv.

c) Frequency meter, type HP, Mod. 5245-L or equiv.

d) Electronic voltmeter, type Boonton, Mod. 91-H or equiv.

e) Multimeter, type Metrix, Mod. 430/C or equiv.

4.3.47 - **Pulse shaper**

A) *Circuit description*

The pulse shaper, (fig. 4.49) which forms a part of the 100c/s Synthesizer Subassembly, consists of a Schmitt trigger circuit. The 110, ..., 119 Kc/s sinusoidal output from the 100 c/s oscillator is applied to the pulse shaper to be transformed into pulses having a steep leading edge, utilized to drive the divider-by-ten circuit and the preset divider circuit.

Operating voltages are adjusted for the followings condition:

during the negative-going half-wave of the input signal, transitor A1Q6 is off and transistor A1Q5 is on; during the positive-going half wave of the input signal as soon as a threshold level is exceeded, transistors A1Q6 is instantly triggered into conduction and A1Q5 is turned off.

The trigger operation of the circuit derives from the regenerative action of resistor R32 in the emitter circuits of Q6 and Q5.

A1Q6 stays on and A1Q5 stays off until input signal positive half-wave crosses the threshold level again; at this moment the circuit is triggered into the alternate condition (A1Q6 off and A1Q5 on).

The waveform at the output of the pulse shaper circuit consist of sharp negative pulses having the same frequency of the input signal.

B) *Test data*

Pertinent references and applicable test data for the 1 Kc/s pulse shaper are as follows:

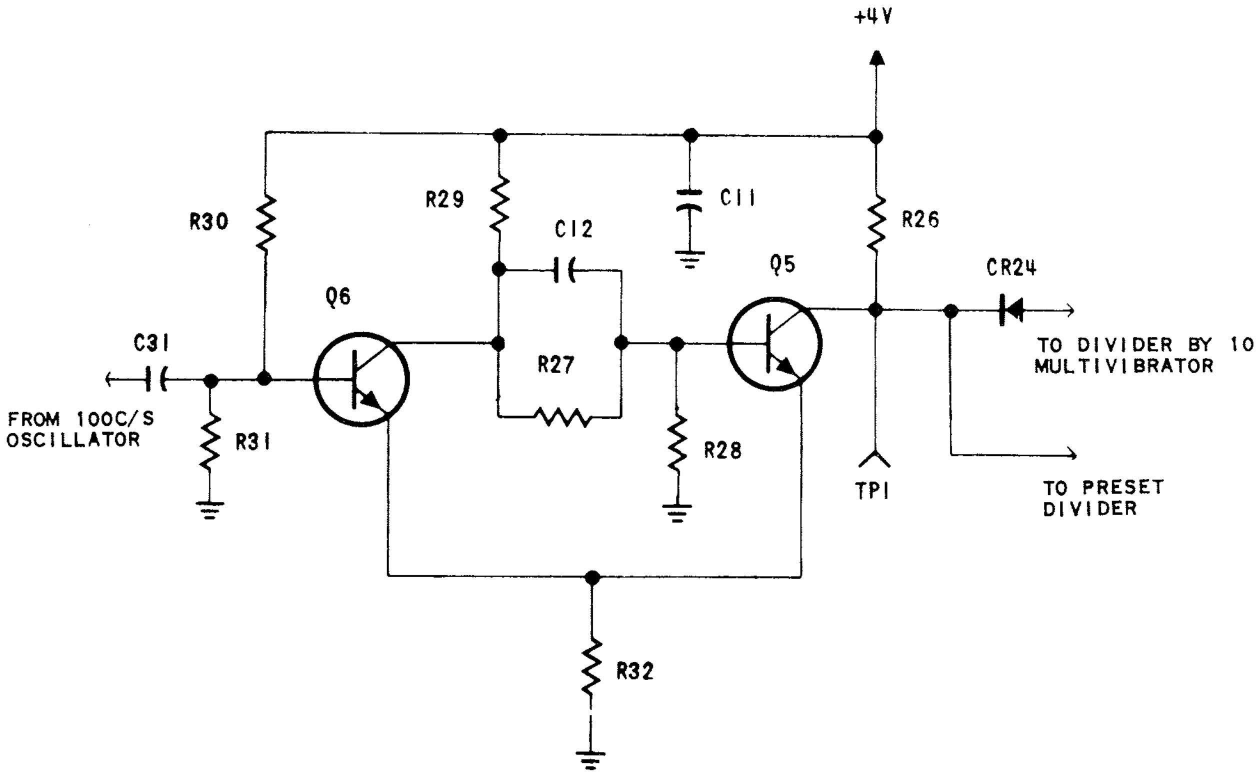


Fig. 4-49 Pulse Shaper
Simplified Schematic Diagram

1) References:

a) Exciter T-827A/URT Main Frame, Schematic Diagram, Figure 5.1

b) 100 c/s Synthesizer Subassembly, Servicing Block Diagram, Figure 4.69.

c) 100 c/s Synthesizer Subassembly - Schematic Diagram, Figure 5.9

d) Divider Circuits, Component Location, Figure 5.92

2) Required Test equipment:

a) Spectrum Generator Subassembly (A2A6A5).

b) Power Supply, type Trygon, Mod. HR 40-5B or equiv.

c) Frequency meter, type HP, Mod. 5245-L or equiv.

d) RF Voltmeter, type Boonton, Mod. 91-H or equiv.

e) Multimeter, type Metrix, Mod. 430/C or equiv.

4.3.48 - **Preset divider**

A) *Circuit description*

The preset divider (Fig. 4.50) comprises eight flip-flop stages, a preset circuit and a reset circuit.

These circuits form a divider which can be preset to divide the frequency of the input pulses (from shaper circuit) by any integer between 110 and 119, depending upon the position of the c/s switch, on the front panel.

The divider chain consists of a divide by ten (flip-flops A1A5 through A1A8) followed by a divider by eleven (flip-flops A1A8 through A1A12).

A detailed description of the circuit operation follows.

In simplified block diagram of Figure 4.50, any block represents a flip-flop stage; diodes of the preset and reset circuits are also shown in the figure.

It is assumed that the initial condition of all flip-flop stages is as follows:

Transistor 1 (left side of flip-flop) "off" and transistor 2 (right side of flip-flop) "on"; this condition is denoted as "flip-flop off" and the reverse condition as "flip-flop on".

In the following description it is also assumed that the preset circuit is set to divide by 110; this requires that the four wires connected to the preset diodes are open (c/s switch on the front panel at 000).

The 110 Kc/s to 119 Kc/s pulses from the pulse shaper are applied to flip-flop A5 which divides by two the frequency of these pulses. A division by five follows, accomplished by the A6, A7 and A8 group, according to the scheme described by the table below.

Pulse from:

A5	A6	A7	A8
1	OFF	ON	OFF
2	OFF	OFF	ON
3	OFF	ON	ON
4	ON	OFF	OFF
5	OFF	OFF	OFF

Under the assumed initial conditions diode CR14 is forward biased and pulses, 1, 2, 3 and 4 from flip-flop A5 are applied to the A7 and A8 cascaded stages to produce one output pulse from A8; this pulse is applied to A6 which is therefore switched from OFF to ON.

This back-biases diode CR14 and the fifth pulse from A5 is applied to A6 to produce a second switching (ON to OFF); summing up, five pulses from A5 produce one pulse from A6, as required.

The output pulse from A6 is applied to the cascaded flip-flops A9, A10, A11, A12. A simple computation shows that after eleven pulses from A6, flip flops A9, A10 and A12 are "ON"; as this places a ground potential on the coincidence line connected to the base of transistor Q1, normally off Q1 is switched on and a pulse is generated which resets all flip-flops to the initial conditions.

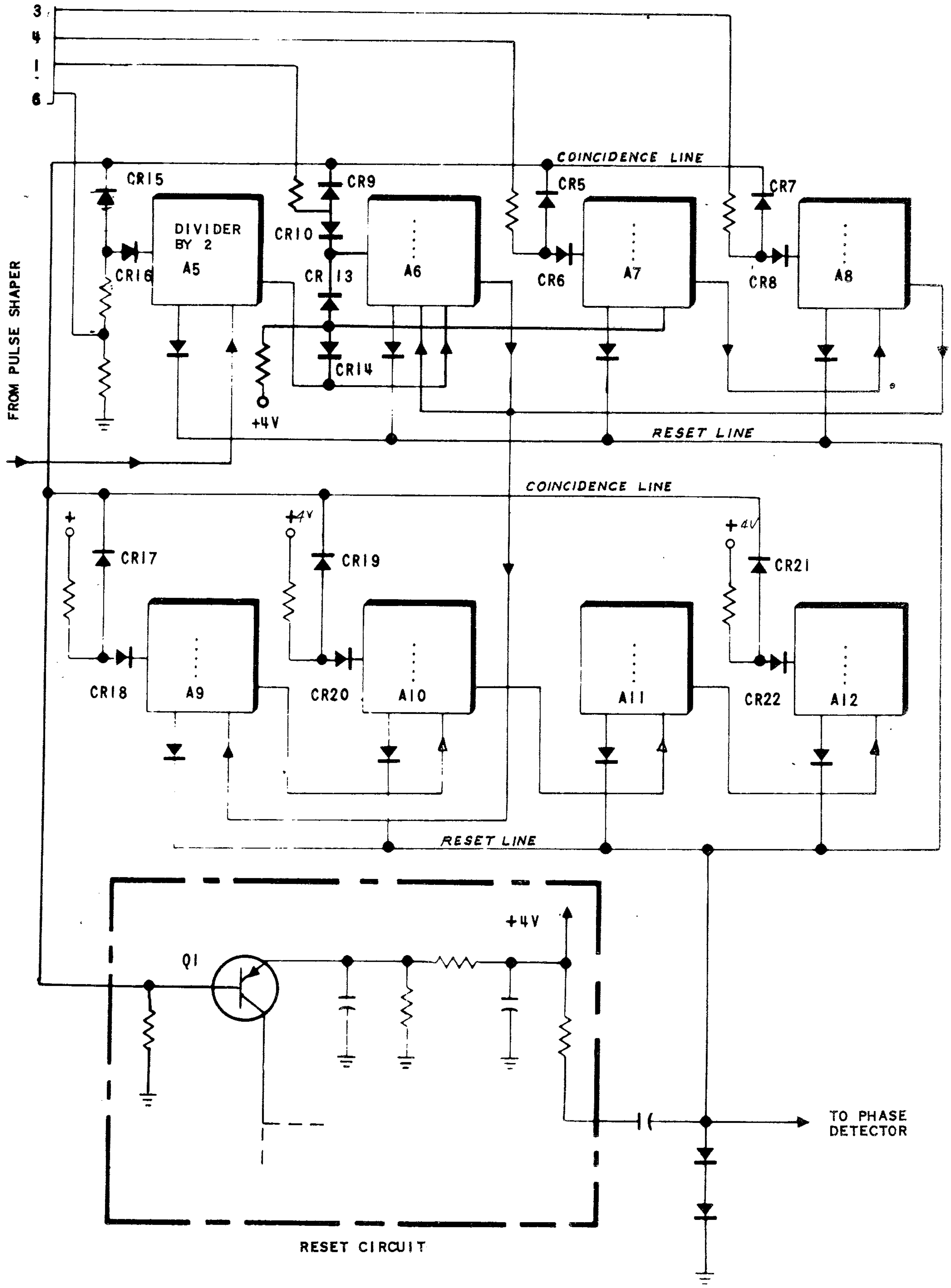


Fig. 4-50 - Preset Divider Blok Diagram

The reset pulse is also applied to the phase detector.

From the above description it results that, under the assumed initial conditions, after a count of 110 is reached at the input of the preset divider, one pulse is generated at the output.

Division by any integer from 110 to 119 is accomplished by connecting one or more preset wires to a +4 V voltage according to a coded combination determined by the 100 c/s control on the front panel.

For example, when preset wire 4 is connected to +4 V, after a count of 110 is reached, the reset circuit is not actuated since a +4 V voltage is present on the coincidence line.

To actuate the reset circuit an additional number of input pulses is required, necessary to switch A7 from OFF to ON and therefore to establish a ground potential at anode of CR5.

By a proper combination of the preset wires the number of additional pulses can be varied from 1 to 9.

The reset circuit consists of two overdriven amplifier stages A1Q1 and 1A1Q2 which generate a pulse suitable to trigger delayed multivibrator A1Q3 and A1Q4.

This multivibrator generates a negative pulse with a delay of two microseconds, utilized to reset all the flip-flops of the preset divider.

The operation of the entire phase-locking loop of the 100 c/s oscillator is outlined in the example reported below (c/s switch on the front panel set at 000).

It is assumed that the 100 c/s oscillator frequency has a 0,2 Kc/s error (110.2 Kc/s instead of 110 Kc/s). This 110.2 Kc/s sinusoidal oscillation is transformed into a pulsed waveform and applied to the preset divider which, under the assumed initial conditions (c/s switch at 000), divides by 110; the 1.02 Kc/s pulses at the output of the preset divider are applied, through capacitors A2A2C3 and A2A2C4, to the phase detector of the phase-locking loop.

The phase detector also receives, through capacitor 2A2C6 the 1 Kc/s pulses locked to the 5 Mc/s standard frequency.

By comparing the 1 Kc/s locked pulses and the 1.02 Kc/s pulses an error voltage is produced which is amplified by stage A2Q1 and filtered by filter network on circuit board A2A1 (Fig. 4.43a).

This filtering action produces a saw-tooth voltage which is applied to varicaps A2CR7, A2CR8, A2CR9 in the 100 c/s oscillator tank circuit; the oscillator frequency varies accordingly until the correct value is reached.

From that moment on the frequency is locked to the correct value by the continuing action of the phase-locking loop.

B) *Test data*

Pertinent references and applicable test data for the preset divider are reported below.

1) References:

a) Exciter T-827A/URT, Main Frame, Schematic Diagram, Figure 5.1

b) 100 c/s Synthesizer Subassembly, Servicing Block Diagram, Figure 4.69

c) 100 c/s Synthesizer Subassembly, Schematic Diagram, Figure 5.9

d) 100 c/s Oscillator, Component Location, Figure 5.90

2) Required Test Equipment:

a) Spectrum Generator Subassembly

b) Power Supply, type Trygon, Mod. HR40-5B or equiv.

c) Frequency counter, type HP, Mod. 5245-L or equiv.

d) RF Voltmeter, type Boonton, Mod. 91-H or equiv.

e) Multimeter, type Metrix, Mod. 430/C or equiv.

4.3.49 - **Phase detector**

A) *Circuit description*

The phase detector circuit (Fig. 4.51) consists of a bistable multivibrator.

This circuit, which forms a part of the 100 c/s Synthesizer Subassembly, compares the frequency of the 1 Kc/s locked pulses from the pulse inverter to the frequency of the output pulses from the preset divider

A detailed description of the operation of the phase detector circuit follows.

Since the pulses have negative polarity when a 1 Kc/s pulse from the pulse inverter is applied to Q2, Q2 is switched "off" and Q1 "on"; this condition is reversed to Q2 "on" and Q1 "off" when a preset divider pulse is applied. The phase detector output is therefore represented by a pulse waveform; the pulse duration is strictly dependent on the frequency relationship between the 1 Kc/s pulses and preset divider pulses.

If the two frequencies coincide, the pulse duration and the average value of the pulse waveform at the output of the phase detector are constant; any difference between the two frequencies results in output pulses having variable duration and variable average value, as shown in Figure 4.52.

The output pulses from the phase detector are applied to a filter network to obtain a voltage representative of the average value of the pulse waveform.

This voltage is applied to varicaps A2CR7, A2CR8 and A2CR9 to control the 100 c/s Oscillator frequency, such to annul any frequency difference between the 1 Kc/s pulses and the preset divider pulses.

B) *Test data*

Pertinent references and applicable test equipment for the phase detector circuit are described below.

1) References:

a) Exciter T-827A/URT, Main Frame, Schematic Diagram, Figure 5.1

b) 100 c/s Synthesizer Subassembly, Servicing Block Diagram, Figure 4.69

c) 100 c/s Synthesizer Subassembly, Schematic Diagram, Fig. 5.9.

d) 100 c/s Oscillator, Component Location, Figure 5.90.

2) Required Test Equipment

a) Spectrum Generator Subassembly

b) Power Supply, type Trygon, Mod. HR 40-5B or equiv.

c) Frequency counter, type HP, Mod. 5245-L or equiv.

d) RF Voltmeter, type Boonton, Mod. 91-H or equiv.

e) Multimeter, type Metrix, Mod. 430/C or equiv.

4.3.50 - **Divide by-ten-Multivibration**

A) *Circuit description*

The divide-by-ten multivibration circuit (Fig.4.53) consist of a divide-by-five circuit (A1A1, A1A3 and A1A4) and a divide-by-two circuit (A1A2).

These circuits which form a part of 100 c/s Synthesizer Electronic Subassembly A2A2A6A4, divide the 100 Kc/s to 119 Kc/s output from the 100 c/s Oscillator A2A2A6A4A3 by ten to provide the 11 Kc/s to 11.9 Kc/s signal utilized in the 7.1 Mc/s mixer A2A2A6A4A3.

These circuits are used in all modes of operation.

The following paragraph describe the operation of the divide - by - ten multivibrator in detail.

The operating voltage for the divide-by-ten multivibrators in the positive 4 Vdc output from Zener diode CR2. (see fig. 5.9).

Zener diode CR2 provides a regulated 4 Vdc power source by drawing enough current to drop the positive 20 Vdc output from the main frame power supply A2A2A8 to 4 Vdc.

The sinusoidal output from the 100 c/s oscillation is the input signal for the divide-by-ten multivibration

Flip-flops A1A3, A1A4 and A1A1 compose three conventional bistable multivibrators which are connected in a divide-by-five configuration.

Flip-flop A1A2 divides the output from this circuit by two.

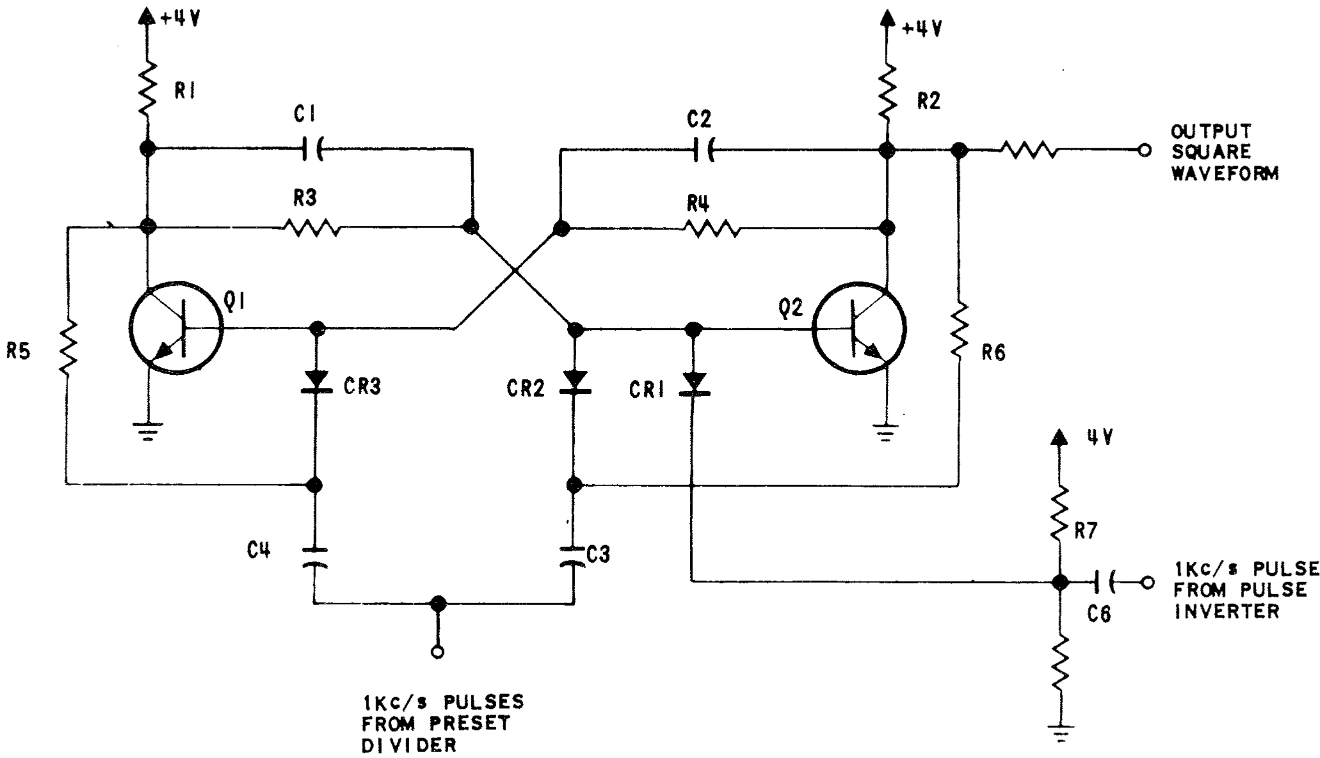


Fig. 4-51 Phase Detector
Simplified Schematic Diagram

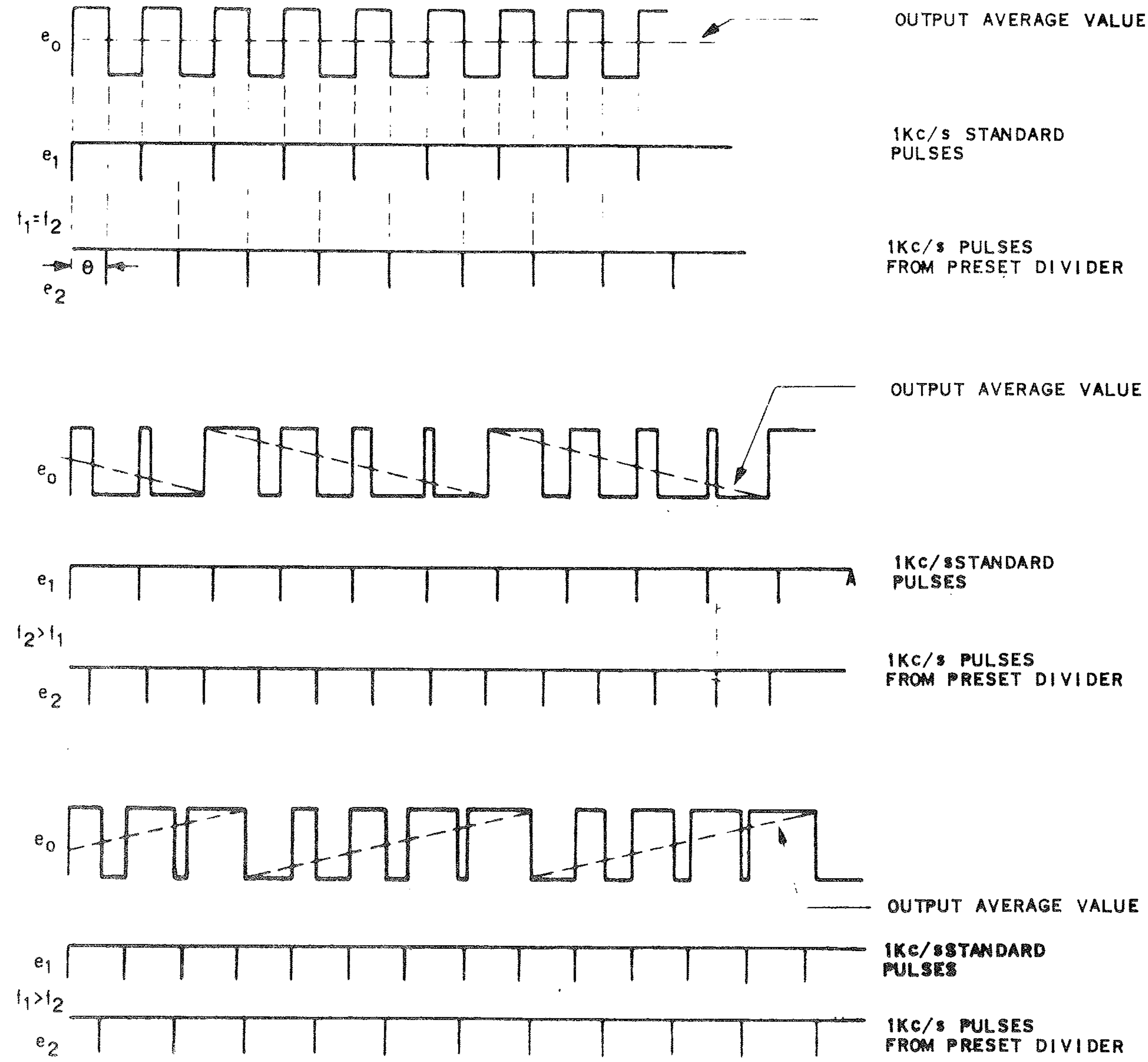


Fig. 4-52 - Phase Detector Output Waveforms

Refer to Figure 4.53 and table 4.1 for the following description.

Assume that transistors of flip-flops A1A1, A1A2, A1A3 and A1A4 are in the condition shown by the start condition line of table 4.1.

The first input pulse from the pulse shaper switches transistor A3Q1 to cutoff and transistors A3Q2 to saturation, producing a positive swing at the collector of transistor A3Q1. This pulse has no effect on the following flip-flops which remain in the initial condition.

The second input pulse switches A3Q2 to cut-off and A3Q1 to saturation producing a negative swing at the output of A3Q1; this switches A1A4 from the initial condition to the alternate condition.

This results in a positive swing at the output of A1A4, which has no effect on A1A3.

Proceding in similar manner for the following input pulses, it is seen that after five pulses the three flip-flops of the divider by five group (A1A1, A1A3 and A1A4) are back to the initial condition and that the divider-by-two flip-flop A1A2 has switched from the initial condition to the the alternate condition.

After a count of ten is reached, all four flip-flops are in the initial condition; this scheme therefore provides one output pulse for every ten input,pulses.

B) *Test data*

Applicable references and test equipment for the divider-by-ten are reported below:

1) References:

a) Exciter T-827A/URT, Main Frame, Schematic Diagram, Figure 5.1.

b) 100 c/s Synthesizer Subassembly, Servicing Block Diagram, Figure 4.69.

c) 100 c/s Synthesizer Subassembly, Schematic Diagram, Figure 5.9.

d) Divide-by-ten Multivibrator, Test Point and Component Location Figure 5.92.

2) Required Test Equipment

a) RF Generator, type HP, Mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, Mod. 91-H or equiv.

c) Frequency counter, type HP, Mod. 5245-L or equiv.

d) Multimeter, type Metrix, Mod. 430/C or equiv.

4.3.51 - **7.1 MC Mixer**

A) *Circuit description*

The 7.1 mixer (figure 4.54) consists of two amplifiers (Q3 and Q5), a mixer (Q1), two emitter followers (Q2 and Q4), and a 7.1 mc crystal filter (FL1).

These circuits, which form a part of 100 CPS Synthesizer Electronic Subassembly A2A6A4, mix the 11-kc to 11.9-kc output from divide-by-ten multivibrator with the 7.089-mc output from 7.089 mc mixer A2A6A3A4 to produce a nominal 7.1-mc output with the level suitable for use in 17.847/27.847 mixer A2A6A2A3. These circuits are used in all of the modes of operation.

A detailed description of the operation of the 7.1 mc mixer follows.

The 11Kc to 11.9Kc (at 1Kc increments)output from the divide-by-ten multivibrator is coupled to the base of amplifier Q5 by capacitor C20. The operating voltage for amplifier Q5 is developed by voltage divider R25, R26 and emitter resistors R23 and R24 from the positive 20 vdc supply line.

Decoupling is provided by capacitor C19 and resistor R21 to prevent interaction with the other circuits connected to the positive 20 vdc supply line.

Capacitor C18 is the emitter bypass capacitor of amplifier Q5. The amplified output signals from amplifier Q5 are developed across a tuned circuit consisting of capacitor C17 and the primary of transformer T2. Resistor R22 increase the bandwidth of transformer T2.

The sinusoidal output from amplifier Q5 is coupled to the base of emitter follower Q4 by capacitor C16.

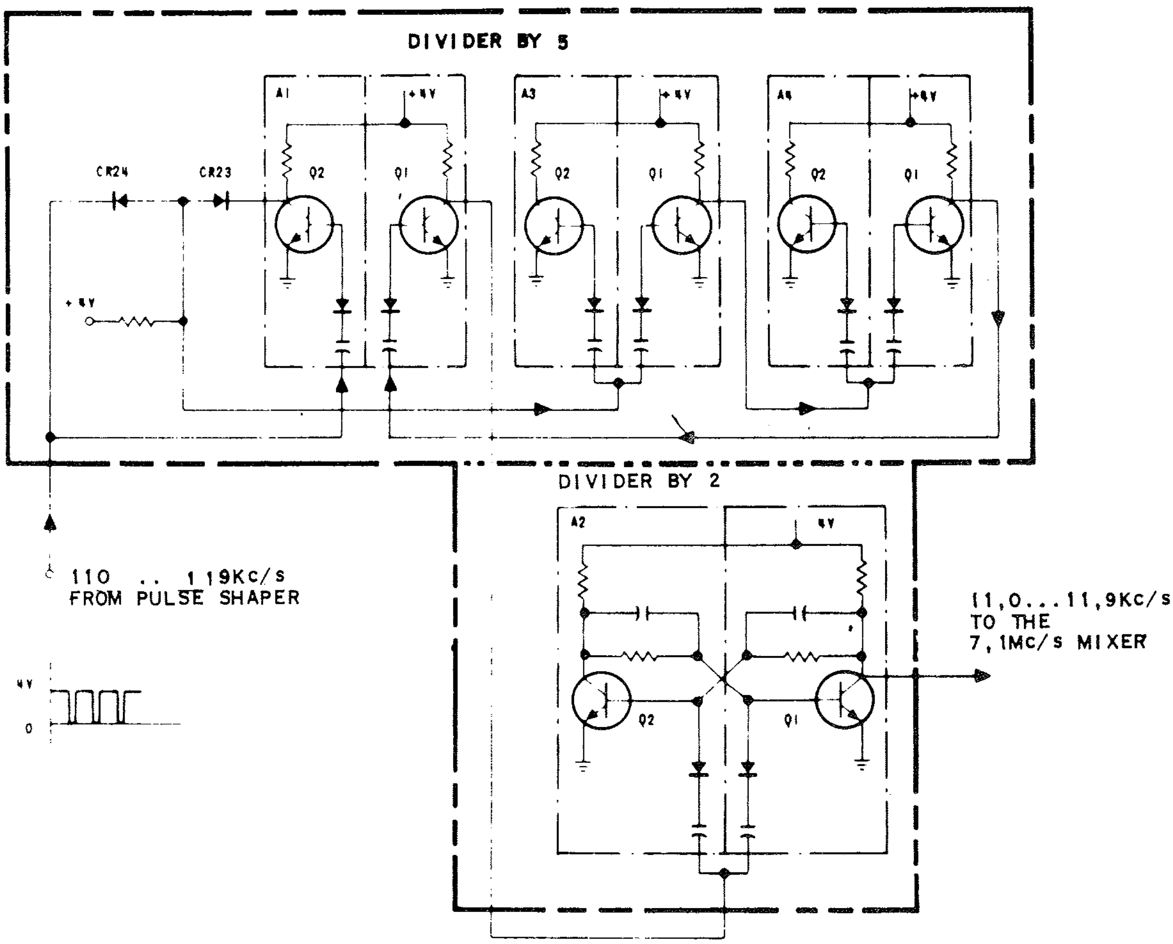


Fig. 4-53 - Divider By 10 Multivibrator
Simplified Schematic Diagram

The operating voltage for emitter follower Q4 is developed by voltage divider R19, R20. Resistor R18 and capacitor C15 provide decoupling to prevent interaction with the other circuits connected to the positive 20 vdc supply line.

Emitter follower Q4 provides a low impedance source for mixer Q1. The output from emitter follower Q4 is developed across resistor R17 and coupled to the emitter of mixer Q1 by capacitor C14.

The operating voltage for mixer Q1 is developed from the positive 20 vdc supply line by emitter resistor R4 and voltage divider R1, R2.

Resistor R3 and capacitor C3 provide decoupling to prevent interaction with the other circuits connected to the positive 20 vdc supply line. Capacitor C4 is the emitter bypass capacitor.

Due to the large difference in frequency between the two inputs, resistor R5 develops a small amount of degeneration to increase the stability of mixer Q1.

The 7.089-mc output from 7.089 mc mixer A2A6A3A4 is coupled to the base of mixer Q1, by capacitor C2. Transistor Q1 mixes one of ten frequencies 11.0 Kc/s to 11.9 Kc/s with the 7.089-mc signal, providing one of ten outputs. If the 11 kc is used, the mixing products are 11 kc, 7.089 mc, 7.078 mc, and 7.1 mc. If the 11.9 kc is used, the mixing products are 11.9 kc, 7.089 mc, 7.0771 mc, and 7.1009 mc. One of these two groups of mixing products is developed across resistor R6.

The signals developed across resistor R6 are applied to filter FL1. Filter FL1 is very selective, allowing only the 7.1 mc, to 7.1009 signal to pass.

Capacitor C5 and resistor R6, and capacitor C6 and resistor R7 form the input and output terminations, respectively, for crystal filter FL1. The output from filter FL1 is coupled to the base of emitter follower Q2 by capacitor C7.

The operating voltage for emitter follower Q2 is developed from the positive 20 vdc supply line by voltage divider R8, R9 and emitter resistor R11.

Resistor R10 and capacitor C8 provide decoupling to prevent interaction with the other circuits connected to the positive 20 vdc supply line.

Emitter follower Q2 isolates filter FL1 to prevent it from being adversely loaded by amplifier Q3. The output from emitter follower Q2 is developed across resistor R11 and is coupled to the base of amplifier Q3 by capacitor C10.

The operating voltage for amplifier Q3 is developed by voltage divider R14, R15 and emitter resistor R13. Resistor R12 and capacitor C9 provide decoupling to prevent interaction with the other circuits connected to the positive 20 vdc supply line. Capacitor C12 is the emitter bypass capacitor.

The amount of gain provided by amplifier Q3 is controlled by adjusting the amount of degeneration developed by potentiometer R16. The amplified output from amplifier Q3 is developed across the tuned circuit consisting of capacitor C11 and the primary of transformer T1 and is applied to 17.847/27.847 mixer 2A2A6A2A3.

B) *Test data*

Pertinent references and applicable test data for the 7.1 mc mixer are as follows:

1) References:

a) Exciter T-827A/URT, Chassis and Main Frame, Schematic Diagram, Figure 5.1.

b) 100 CPS Synthesizer Electronic Subassembly, Servicing Block Diagram, figure 4.69.

c) 100 CPS Synthesizer Electronic Subassembly, Schematic Diagram, figure 5.9

d) 7.1 MC Mixer (Foil Side Up), Components and Test Panel Location, figure 5.94

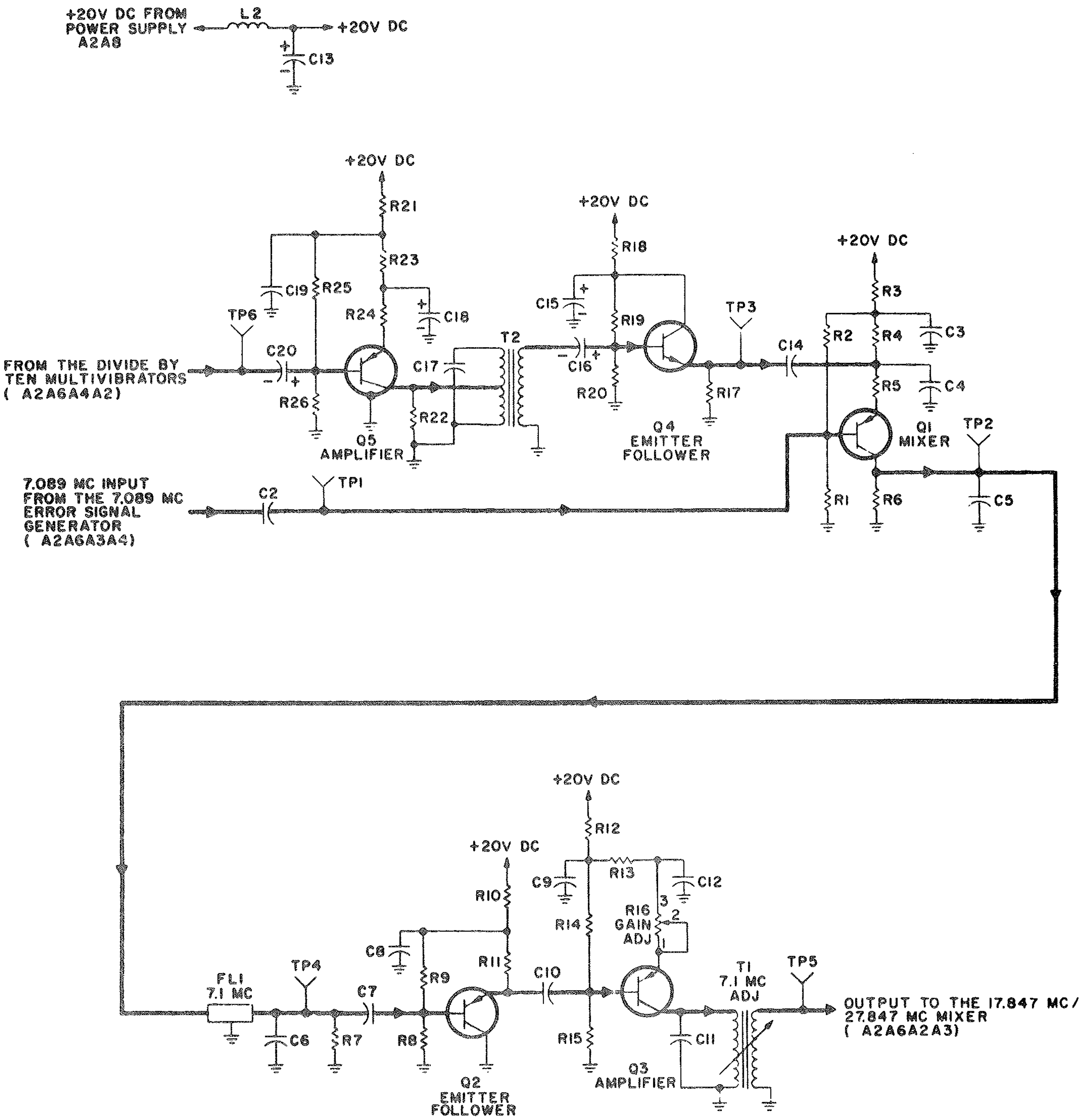
2) Required Test Equipment:

a) RF Signal Generator, type HP, mod. 606-A or equiv.

b) RF Voltmeter, type Boonton, mod. 91-H or equiv.

c) Frequency Meter, type HP, mod. 5245-L or equiv.

d) Multimeter, type Metrix, mod. 430/C or equiv.



NOTE:
REF. DESIG. PREFIX A2A6A4A3

Figure 4-54 7.1 MC Mixer,
Simplified Schematic Diagram

4.3.52 - Power Supply

A) *Circuit description*

The power supply (figure 4.55a)consists of the +110 vdc supply, the +28 vdc supply, and the regulated + 20 vdc supply.

These circuits, which form a part of the Main Frame 2A2, supply operating power to all the circuits in the T-827A/URT.

A detailed description of the power supply follows.

All power is derived from the nominal 115 vac line, which is applied through switches 2A2S8, 2A2S2 and fuses 2A2F1, 2A2F2 to the primary of power transformer 2A2T1.

Indicator lamps 2A2DS1 and 2A2DS2 will light if respective fuses, 2A2F1 and 2A2F2, open. The primary of transformer 2A2T1 is tapped so that in locations where line voltages differ slightly from the normal 115 vac on a reasonably permanent basis, the difference can be compensated by reconnecting to a new tap.

The 6.3 vac from terminals 13 and 14 on the secondary of transformer 2A2T1 powers the filaments of rf amplifiers V1 and V2 in RF Amplifier Electronic Assembly 2A2A4.

The output from terminals 7 and 8 of A2T1 is applied to a bridge rectifier consisting of diodes CR1 through CR4. The rectifier output is applied to a choke input filter consisting of choke 2A2L1 and capacitor 2A2C1.

The output from the choke input filter (+110 vdc) is used as the plate and screen voltage supply in the RF Amplifier Electronic Assembly 2A2A4

Resistor 2A2R1 is a bleeder load for the +110 vdc. The output from terminals 9 and 10 of transformer 2A2T1 is applied to a bridge rectifier consisting of diodes CR5 through CR8. The rectifier output is applied to a choke input filter consisting of choke 2A2L2 and capacitors C1 and C2.

The output from the choke input filter (+28 vdc) is used in the RF Amplifier Frequency Standard, LSB and USB Audio amplifiers, and Translator/Synthesizer Electronic Assembly.

The regulated +20-vdc supply is derived from the +28-volt source.

Resistor 2A2R2 is the bleeder load for the +28 vdc.

The regulated +20 vdc supply (figure 4.55) consists of series regulator A2Q1, dc amplifiers Q1 and Q2, comparators Q3 and Q4, 12 vdc Zener diode CR12 and 4.7 vdc Zener diode CR13.

This circuit provides a constant +20 vdc regardless of the load. The input voltage of +28 vdc is applied to the collector of series regulator A2Q1 through contacts 7 and 6 on front of section C of switch A2S2 (set to any position other than OFF or STD BY) and contacts 8 and 6 of relay 2A2K1.

If the MCS controls are set to the 00 or 01 position, a ground is applied to relay 2A2K1.

The relay is energized and thereby inhibits the output of the regulated 20 vdc supply unless the operating frequency is 2.0 to 30.0 mc. The collector-to-emitter resistance is inversely proportional to the amount of base-to-emitter current.

The +20 vdc output voltage is selected by adjusting Output Voltage Control R10, which controls the bias voltage on comparator Q4. The bias voltage determines the amount of emitter current flow, thereby determining the voltage across the emitter resistor R8.

Since the bias voltage on the base of comparator Q3 is held constant by Zener diode CR13, the collector current flow will be determined by the emitter voltage.

The emitter of comparator Q3 is connected to the emitter of comparator Q4; therefore, the collector current of comparator Q3 will be controlled by the bias voltage on comparator Q4.

The collector current flow of dc amplifier Q2 is controlled by the collector voltage on comparator Q3 since the base voltage is held constant by Zener diode CR12.

The collector current of dc amplifier Q1 is controlled by the collector current of dc amplifier Q2. The collector current through resistor R2 determines the bias voltage on the base of series regulator A2Q1 which determines the emitter-to collector resistance.

To understand fully the operation of the regulated +20 vdc supply, assume that some of the load on the +20 vdc has been removed. This condition causes the +20 vdc to rise. This rise increases the base-bias voltage of comparator Q4, thereby increasing the voltage across resistor R8. This increase results in a decrease in the base - to - emitter voltage of comparator Q3, thereby causing an increase in collector voltage.

Since the emitter of dc amplifier Q2 is connected to the collector of comparator Q3 and the base voltage is held constant by Zener diode CR12 the increase in collector voltage in comparator Q3 causes the collector current to decrease in dc amplifier Q2.

Since the collector of dc amplifier Q2 is connected to the base of dc amplifier Q1, the decrease in collector current in dc amplifier Q2 causes a decrease in collector current in dc amplifier Q1.

Since the collector of dc amplifier Q1 is connected to the base of series regulator 2A2Q1 through resistor R2, a decrease in collector current in dc amplifier Q1 causes the collector-to-emitter resistance to increase, thereby causing the voltage to fall back to +20 vdc.

Resistor R2 acts as a parasitic suppressor.

Diode CR11 provides circuit protection in the event the +20 vdc line becomes grounded. Normally, diode CR11 is back-biased due to the +20vdc on its anode and +12 vdc on its cathode. If the +20 vdc line becomes grounded, the diode will become forward-biased, dropping the base of dc amplifier Q2 to ground potential and preventing damaging current flow in dc amplifiers Q1 and Q2.

In the Power Supply Assembly 2A2A8 a CW hold circuit is comprised, consisting of two switching transistor stages (Q5,Q6) and a CW hold relay.

The function of this circuit is to ensure that the first CW pulse has sufficient duration to actuate the APC and PPC controls of the AM-3007/URT Power Amplifier associated to the T-827A/URT Exciter.

The circuit acts as an electronic switch in parallel to the CW key (Figure 4.55b); as the key itself, the switch is either an open circuit or a closure to ground.

The first CW pulse, no matter how short is its duration, determines a closure of this switch for a time of 200 milliseconds. This time is sufficient to ensure that the APC and PPC voltages in the associated Power Amplifier reach the normal operating values, therefore preventing outburst of RF power from the Amplifier.

For all the following pulses, the CW hold circuit is disabled.

A detailed description of the operation of this circuit follows.

In absence of CW keying (key up), both terminals of relay K5 are at +28 V; therefore K5 is not energized and contact 6 is on position 8. In these conditions RECEIVE/TRANSMIT relay K3 is also not energized and a +28 V is applied to resistors R21, R22; the values of the two resistors are such that a +20Vdc 15 present at the connection of R21,R22 and C12.

Since Q5 is cut-off, no current flows through R17 and a +20 V is also present at the connection of R17, R20 and C12; therefore both terminals of C12 are at the same potential.

Transistor Q6, driven by Q5, is also cut-off and its collector is at +28 V. This voltage is present on the line connected to the CW gates in the Mode Selector Assembly; this prevents the 500 Kc/s CW carrier from being applied to the IF Amplifiers for reinsertion.

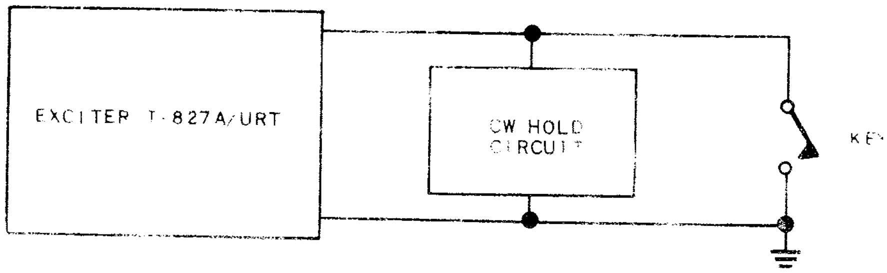
When the key is pressed down to generate the first CW pulse, the above conditions are altered as follows:

- relay K5 is energized and in the same time capacitors C10 and C11 charge up through resistor R16.
- Contact 6 of relay K5 is switched to position 1 and relay K3 is energized.

  In the same time resistor R22 is connected to ground; this results in a ground pulse applied to the base of Q5 which switches Q5 to conduction. Transistor Q6, driven by Q5, also conducts and its collector voltage drops to a value close to ground; this voltage enables the CW gates in the Mode Selector Assembly to pass the 500 Kc/s CW carrier to the IF Amplifier Assembly.

  The RF output from the T-827A/URT Exciter is applied to the associated AM-3007/URT-MM RF Amplifier and the APC and PPC voltages build up to reach the normal operating values; this requires approximately 200 milliseconds.

  In case the duration of the first CW pulse is shorter than 200 milliseconds, the CW hold circuit acts to increase the pulse duration to the required value.



(b

Figure 4-55b CW Hold Circuit, Simplified Schematic Diagram Showing Basic Operation

This action takes place since relay K5 stays energized by the discharge of capacitors C10 and C11.

The hold-on time is given by the charge of capacitor C12 to +20 Vdc to which corresponds a cut-off condition for transistor Q5 and subsequently of Q6; by selecting proper values for C12 and charging resistors this time can be set to 200 milliseconds.

Self-holding time of relay K5 is 2 secs approx, a value higher than the CW Keying period. For all the following CW pulses relay K5 stays energized, capacitor C12 is charged and Q5 and Q6 are cut-off.

The CW hold circuit is therefore disabled and the ground potential to the CW gates line is applied directly by the key.

In Fig. 4.55c waveforms are reported showing the operation of the CW hold circuit.

B) *Test data*

Pertinent references and applicable test data for the power supply are reported.

1) References:

a) Fig. 5.1 - Exciter T-827A/URT
Schematic diagram

b) Fig. 5.20 - Power Supply, Component location

c) Par. 5.1.1 - Adjustment on the +20 V stabilizer

2) Required test equipment

a) Tester, type Metrix, Mod. 430/C or equiv.

b) Oscilloscope, type Tektronix, Mod. 546 or equiv.

4.3.53 - **Tuning**

A) *Circuit description*

The tuning circuit (figure 4.56) consists of code generator 2A2A7; turret decoder switch S1, motor B1, and relay K1 in RF Amplifier Electronic Assembly 2A2A4; crystal switch S1, motor B1, and relay K1 in MC Synthesizer Electronic Subassembly 2A2A6A1; hi/lo filter relay 2A 2K2; and tune relay 2A2K1.

Code generator 2A2A7 provides the source for coding schemes based on frequency tuning, by which the balance of the tuning circuit functions. (Refer to table 4.2 for all pertinent tuning codes). For each frequency tuned, 2A2A7 provides three separate five-line coded tuning circuits, a hi/lo filter relay control line, and a tune relay control line

One of the five-line tuning circuits is used to position the turret assembly in RF Amplifier Electronic Assembly 2A2A4, one is used to position the crystal switch in MC Synthesizer Subassembly 2A2A6A1, and one is used to position the turret in the associated rf power amplifier.

A detailed description of the tuning circuits of the T-827A/URT follows:

Switches S3, S4 in A2A7 are controlled by the 10 MCS and 1 MCS controls on the front panel of the T-827A/URT.

Adjusting the 10 MCS and 1 MCS controls arranges switches S3, S4 in a corresponding configuration which provides code generator outputs for three separate five-line coded circuits and the control lines for the hi/lo filter relay and the tune relay. In addition, any adjustment of the 10 MCS or 1 MCS controls provides a momentary ground pulse on an output line for external control purposes. The five-line coding schemes consist of the presence of a ground or an open circuit of each of the five code lines, with the individual condition being dependent on frequency.

If the frequency is set at 2 mc, for example, a "master" circuit in switches S3, S4 produces the five-line code of 10100 for tuning the turret assembly of RF Amplifier Electronic 2A2A4.

(The "1" represents ground and the "0" represents an open circuit.)

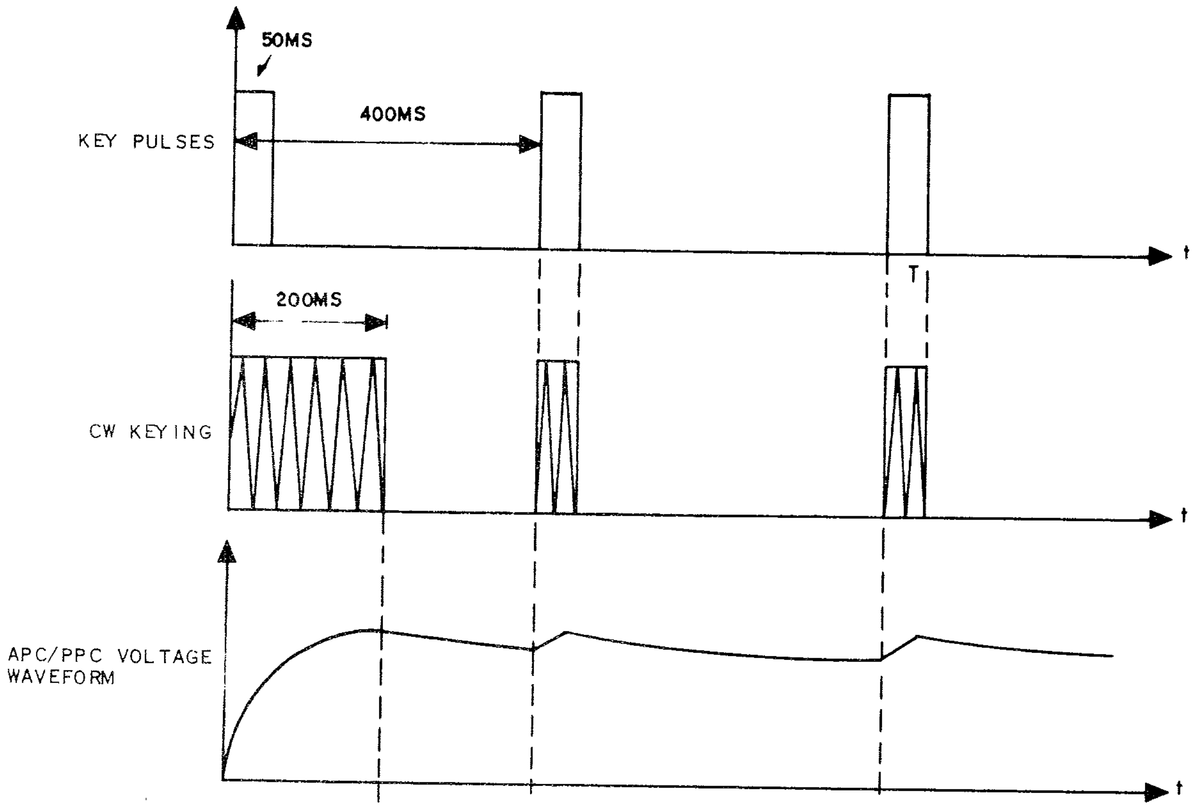


Figure 4-55c CW Hold Circuit Waveform

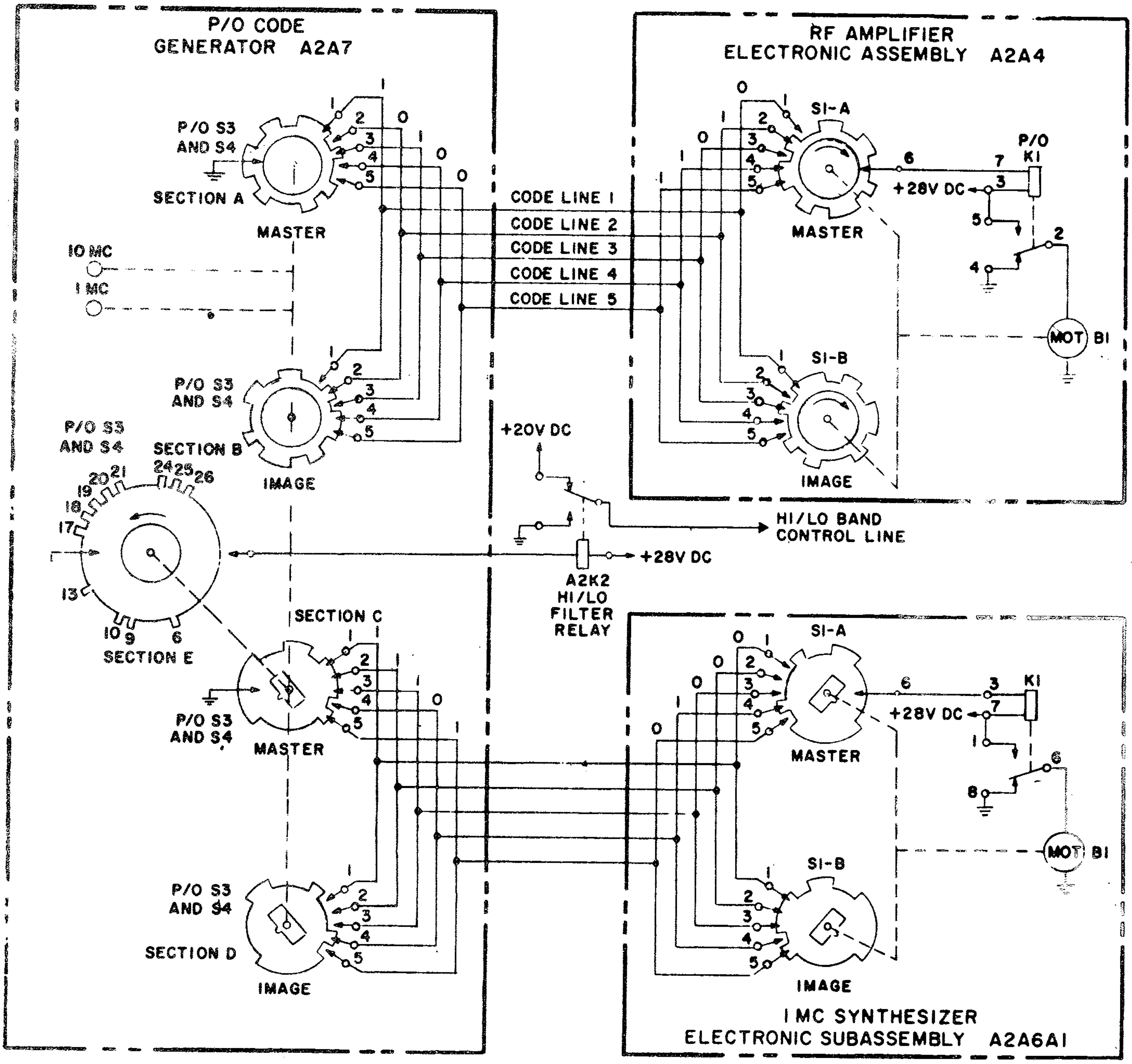


Figure 4-56 Tuning
Simplified Schematic Diagram

Code 10100 is applied to the "master" of switch S1 in 2A2A4, which in turn provides a path for code grounds to be used to energize relay K1.

With relay K1 energized, +28 vdc is applied to motor B1, which rotates switch S1 until the "master" of S1 reaches a position that produces the complement of the applied code (that is, 01011).

When the complementary position is reached, the ground path through the "master" of S1 is broken and relay K1 deenergizes. With relay K1 deenergized, a ground is applied to motor B1 in place of the +28 vdc and the motor is braked.

The manner in which the MC Synthesizer Electronic Subassembly five-line code is generated and used to position the crystal switch is similar to that described above for the RF Amplifier Electronic Assembly.

The five-line code used for positioning the turret in the associated rf power amplifier is also generated in a manner similar to the other five-line codes, with the following exception.

For frequency settings of 2 mc or 3 mc only, the "master" of switches S3, S4 (associated rf power amplifier circuit) is so arranged as to provide a change in the output code when the 100 KCS control is set at 5 or above. That is, the code will change from 00001 (for 2 mc) to 00011 (for 2.5 mc) or from 00111 (for 3 mc) to 01111 (for 3.5 mc).

This change is due to a ground being established by the digit 5 (or above) at switch S5 and routed through switches S3, S4 to output code line 4 (for 2.5 mc) or to code line (for 3.5 mc). (Refer to the technical manual of the associated rf power amplifier for further information concerning the turret assembly).

The "image" portions of switches S3, S4 in 2A2A7, switch S1 in 2A2A4 and switch S1 in 2A2A6A1 are the opposite configurations of their "master" portions that is, all contacts appearing as opens or grounds at the "master" appear as grounds or opens, respectively, at the "image". The use of "images" provide the overall tuning circuit with supplemental ground paths to permit expanded useable code combinations.

Hi/lo filter relay 2A2K2 controls hi/lo band circuits in RF Translator Electronic Subassembly 2A2A6A6 and 100 KC Synthesizer Electronic Subassembly 2A2A6A2. The code for control of relay A2K2 is generated by

Table 4.2

TUNING CODE CHART

MCS and 100 KCS CONTROLS SETTING	A2A4 CODE LINES 1	2	3	4	5	A2A6A1 CODE LINES 1	2	3	4	5
2	1	0	1	0	0	1	1	1	0	1
3	0	1	0	0	0	1	0	1	1	1
4	1	0	0	0	1	1	1	0	1	1
5	0	0	0	1	1	0	1	1	0	1
6	0	0	1	1	0	0	1	0	0	0
7	0	1	1	0	1	1	0	0	1	1
8	1	1	0	1	1	1	1	0	0	1
9	1	0	1	1	0	1	0	1	0	0
10	0	1	1	0	0	1	1	0	1	0
11	1	1	0	0	0	0	0	1	1	1
12	1	0	0	0	0	0	0	0	1	1
13	0	0	0	0	1	1	0	1	1	1
14	0	0	0	1	0	0	1	1	1	0
15	0	0	1	0	1	0	0	1	1	0
16	0	1	0	1	1	1	1	1	1	0
17	1	0	1	1	1	1	0	0	1	1
18	0	1	1	1	1	1	1	0	0	1
19	1	1	1	1	0	1	1	1	0	0
20	1	1	1	0	0	0	1	1	1	1
21	1	1	0	0	1	0	0	1	1	1
22	1	0	0	1	0	0	0	0	0	1
23	0	0	1	0	0	1	1	1	1	0
24	0	1	0	0	1	0	1	1	1	0
25	1	0	0	1	1	0	0	1	1	0
26	0	0	1	1	1	1	1	1	1	0
27	0	1	1	1	0	0	0	0	1	1
28	1	1	1	0	1	0	0	1	1	1
29	1	1	0	1	0	0	1	1	1	1

Pub. 246
December 1967
ORIGINAL

portions of switches S3, S4 in A2A7 when the frequency is set at 6, 9, 10, 13, 17, 18, 19, 20, 21, 24, 25 or 26 mc.

At any of these frequencies, a ground is applied from switches S3, S4 to relay 2A2K2 causing 2A2K2 to become energized. With relay 2A2K2 energized, a ground is placed on the hi/lo band control line for use in the hi circuits.

In the unenergized condition, relay 2A2K2 provides +20 vdc to the hi/lo band control line for use in the lo circuits.

Tune relay 2A2K1 disables the regulated +20 vdc source when the 10 MCS and 1 MCS controls are set in the 00 or 01 positions. The code for controlling relay A2K1 is generated by switches S3, S4 in 2A2A7.

These positions (00 or 01) establish a ground path which is used to energize relay 2A2K1. With relay 2A2K1 energized, the +28 vdc source to series regulator transistor 2A2Q1 is brokenk with the result that the regulated +20 vdc source is disabled and transmission cannot take place.

B) *Test data*

Pertinent references and applicable test data for the tuning circuits are as follows:

1) References:

a) Exciter T-827A/URT, Chassis and Main Frame, Schematic Diagram, Figure 5.1

b) RF Amplifier Electronic Assembly, Schematic Diagram, Figure 5.4

c) MC Synthesizer Electronic Subassembly, Schematic Diagram, Figure 5.6

d) RF Amplifier Electronic Assembly, Front and Left Side, Component Location, Figure 5.32

e) RF Amplifier Electronic Assembly, Rear and Right Side, Component Location, Figure 5.33

f) RF Amplifier Electronic Assembly, Turret Removed, Front and Left Side, Component and Test Point Location, Figure 5.34

g) RF Amplifier Electronic Assembly, Turret removed, Rear and Right

Side, Component Location, Figure 5.35

h) MC Synthesizer Electronic Subassembly, Front View, Component Location, Figure 5.66

i) MC Synthesizer Electronic Subassembly, Rear View, Component Location, Figure 5.67.

j) Code Generator Electronic Assembly, Component Location, Fig. 5.106

2) Required test equipment:

a) Multimeter, type Metrix, mod. 430/C or equiv.

4.3.54 - **Control Switching**

A) *Circuit description*

The control switching circuits (see figure 5.1) consist of switches S1, S2, S7, S8, and S9 and relays K1, K3, K4, and K5. These circuits, which form a part of Main Frame 2A2, energize and key the circuits required for each mode of operation. The following paragraph describe the control switching circuits in detail.

All components described in the following have the reference designation prefix 2A2.

Primary power (115 vac) for the T-827A/URT is normally received, via the associated rf power amplifier (such as AM-3007/URT) or interconnection box, at pins R and S at the rear of the unit. In the NORM position of AUX/NORM switch (S7), the 115 vac is routed in interlock switch S8.

If desired, primary power may be routed directly to the T-827A/URT by setting the AUX/NORM switch (S7) to the AUX position and connecting the primary power to pins A and C of connector J3 on the rear of the T-827A/URT, thus bypassing the associated rf power amplifier or interconnection box.

From interlock switch S8, one side of the 115-vac line (J4-S) is passed through fuse F1 and from there goes to contact 6 on the front part of Section A of Mode Selector switch (S2), which is an open circuit in the

OFF position. The other side of the 115-vac line (J4-R) is routed from interlock switch S8 to contact 10 on the front part of section B of Mode Selector switch (S2), which is also an open circuit in the OFF position.

In the STD-BY position of Mode Selector switch (S2), the one side of the 115 vac line J4-S is routed to terminal 6 of power transformer T1. The other side of the 115-vac line, which is switched through section B of switch (S2), is routed from contact 11 through fuse F2 and to terminal 1 of transformer T1, thus completing the power input circuit of the T-827A/URT and energizing transformer T1.

In the following positions of Mode Selector switch (S2), the T-827 A / URT is energized and ready for operation. In any "ON" position of switch S2, such as USB or CW, one side of the 115 vac line is routed through contacts 10 and 12 of the front part of section B of switch S2 to contact 10 of the rear part of section B of LOCAL/REMOTE switch (S1), and also to pin n of connector J4 on the rear of the T-827A/URT. The 115-vac signal at pin n of connector J4 may be used, if required, to turn on circuits in associated equipment such as the rf power amplifier. In the REMOTE position of the LOCAL/REMOTE switch(S1), the 115 vac is routed through contact 8 to pin U of connector J4 on the rear of the T-827A/URT where it may be used if required, to turn on remote control equipment.

In the STD-BY position of Mode Selector switch (S2), the 6.3 vac, the 110-vdc, and the 28-vdc power supplies are energized.

The 28 vdc is routed to Frequency Standard Electronic Assembly 2A2A5 where the 5 mc oscillator and its associated oven and temperature control circuits are energized. The +28 vdc is routed to ground pulse relay K6 and to contacts 1, 4, 7 and 9 on the front part of section C of switch S2.

In the OFF and STD-BY positions of Mode Selector switch (S2), the +28 vdc is not switched; however, in the "ON" position of switch S2, the 28 vdc is routed to the remaining 28-vdc relays and also to contact 8 of tune relay K1. When tune relay K1 is de-energized, the 28 vdc is fed via contacts 8 and 6 to the 20 vdc regulator (refer to paragraph 4.3.49) which produces the 20-vdc B+ supply used in most of the electronic assemblies. Tune relay K1 is energized by placing a ground on pin 3. The purpose of tune relay K1 is two-fold.

If either the motor in RF Amplifier Electronic Assembly 2A2A4 or the motor in MC Synthesizer Electronic Subassembly 2A2A6A1 is energized, indicating a frequency change, a ground is applied to pin 3 of tune relay K1 from the energized motor relay. This energizes tune relay K1, removing the 28 vdc from the regulator circuit and conseguently removing the +20 vdc from the electronic assemblies.

The ground key line is also routed through normally closed contacts 4 and 2 of tune relay K1, These contacts are broken during the tuning time, so that transmit/receive relay K3 cannot be energized while the motors are tuning. If the MCS controls are placed in the 00 or 01 mc position, the code generator applied a ground to pin 3, energizing tune relay K1, making the T-827A/URT inoperative.

From the power supply, the 6.3-vac line is routed directly to RF Amplifier Electronic Assembly 2A2A4, where it is used as heater voltage for rf amplifier tubes V1 and V2. The +110-vdc power supply is used as a plate supply for rf amplifier tubes V1 and V2 in RF Amplifier Electronic Assembly 2A2A4, and is routed through contacts 14 and 7 of transmit/receive relay K3. Transmit/receive relay K3 is energized, when the T-827A/URT is keyed from any of the various key lines, by grounding pin 9. The circuitry of transmit/receive relay K3 is designed to normally operate via an interlock circuit which ties in associated equipment such as a receiver or an antenna coupler (such as the CU-937/UR). Thus, 28 vdc is applied to transmit/receive relay K3 via pin J of connector J4 on the rear of the T-827A/URT. In simplex mode of operation, a transmit/receive relay in the associated receiver can be used to mute the receiver during transmit periods. Transmit/receive relay K3 is energized by a ground signal at pin 9 whenever the T-827A/URT is keyed from any of the various lines. If the associated antenna coupler is disconnected, the power source for transmit/receive relay K3 is broken and K3 cannot operate. This feature prevents accidental keying of the T-827A/URT without a tuned load terminating the associated rf power amplifier.

(If the AM-3007/URT is used, the interlock circuit for transmit/receive relay K3 may be disabled when it is desired to operate the system into a 50-ohm load or directly into a 50-ohm antenna. In this case, the 28 vdc is provided at pin J of connector J4 when the Antenna Interlock/ Override switch in the AM-3007/URTis set at Override).

In addition to switching the +110 vdc to RF Amplifier Electronic Assembly 2A2A4, transmit/receive relay K3 also switches 20 vdc to Translator/ Synthesizer Electronic Assembly 2A2A6 in the key down position. This 20 vdc is routed via contacts 4 and 12 to pin 16 of connector J12, placing the various circuits in Translator/Synthesizer Electronic Assembly 2A 2A6 in the transmit mode. This transmit control 20 vdc is also routed from contact 12 of transmit/receive relay K3 to RF Amplifier Electronic Assembly 2A2A4 and Mode Selector Electronic Assembly A1 to energize diode gates and other circuits used only when the T-827A/URT is keyed.

B) *Test data*

B.1 - *Switching functions for local/remote switch S1*

The following description contains the information on the switching functions for LOCALE/REMOTE switch S1. All components in the following tables have the reference designation prefix A2. Switch parts are abbreviated in the following tables, for example: S1-A-F means the front part of section A of switch S1 and S1-B-R means the rear part of section B of switch S1.

B.1.1 - *LOCAL Position of LOCAL/REMOTE Switch S1*

Table 4.3 contains information concerning voltage routing through LOCAL/REMOTE switch S1 in LOCAL.

B.1.2 - *REMOTE Position of LOCAL/REMOTE Switch S1*

Table 4.4 contains information concerning voltage routing through LOCAL/REMOTE switch S1 in the REMOTE position.

B.2 - *Switching functions for Mode Selector Switch S2*

The following description contains switching functions information for Mode Selector switch S2. All components in the following tables have the reference designation prefix A2. Switch parts are abbreviated in the following tables, for example: S2-A-R means the rear part of section A of switch S2 and S2-C-F means the front part of Section

C of switch S2.

B.2.1 - *LSB Position of Mode Selector Switch S2*

Table 4-5 contains information concerning voltage routing through Mode Selector switch S2 in the LSB mode of operation.

B.2.2 - *FSK Position of Mode Selector Switch S2*

Table 4-6 contains information concerning voltage routing through Mode Selector switch S2 in the FSK mode of operation.

B.2.3 - *AM Position of Mode Selector Switch S2*

Table 4-7 contains information concerning voltage routing through Mode Selector switch S2 in the AM mode of operation.

B.2.4 - *CW Position of Mode Selector Switch S2*

Table 4-8 contains information concerning voltage routing through Mode Selector switch S2 in the CW mode of operation.

B.2.5 - *USB Position of Mode Selector Switch S2*

Table 4-9 contains information concerning voltage routing through Mode Selector switch S2 in the USB mode of operation.

B.2.6. - *IBS Position of Mode Selector Switch S2*

Table 4-10 contains information concerning voltage routing through Mode Selector switch S2 in the ISB mode of operation.

B.2.7 - *ISB/FSK Position of Mode Selector Switch S2*

Table 4-11 contains information concerning voltage routing through MODE SELECTOR Switch S2 in the ISB/FSK mode of operation.

Table 4.3

LOCAL/REMOTE SWITCH S1,

LOCAL POSITION

FUNCTION	FROM	THROUGH SWITCH	THROUGH CONTACTS	TO
Local TTY Input (+)	J7-B	S1-A-F	2 and 5	J20-2
Local TTY Input (-)	J7-C	S1-A-F	10 and 1	J20-3
+12 vdc Keyline Input	J1-E	S1-B-F	2 and 5	K4-7
Mike Audio Input	J1-C	S1-B-F	1 and 10	S2-B-R-10 and S2-A-R-8
+28 vdc	S2-C-F-3 and S2-C-F-11	S1-B-F	9 and 6	E11(R3)
Local FSK Key Input	J7-A	S1-B-R	3 and 6	S2-B-R-2
CW Key	J2-3	S1-B-R	11 and 2	S2-C-R-9

Table 4-4

LOCAL/REMOTE SWITCH S1,

REMOTE POSITION

FUNCTION	FROM	THROUGH		TO
		SWITCH	CONTACTS	
Remote TTY Input (+)	J4-BB	S1-A-F	3 and 5	J20-2
Remote TTY Input (-)	J4-t	S1-A-F	11 and 1	J20-3
Remote 600 ohm LSB/ISB Input	J4-g	S1-A-F	7 and 9	J19-20
Remote 600 ohm LSB/ISB Input	J4-f	S1-A-R	12 and 2	J19-9
Remote 600 ohm USB/AM/ ISB Input	J4-q	S1-A-R	4 and 6	S2-C-R-10
Remote 600 ohm USB/AM/ ISB Input	J4-r	S1-A-R	8 and 10	S2-D-F-5 and 6
PTT + 12 vdc Keyline	J4-k	S1-B-F	3 and 5	K4-7
CW/FSK Keyline Input				
(FSK)	J4-c	S1-B-R	4 and 6	S2-B-R-2
(CW)	J4-c	S1-B-R	12 and 2	S2-C-R-9
Remote 115 vac	J4-U	S1-B-R	8 and 10	S2-B-F-12

Table 4.5

MODE SELECTOR SWITCH S2,

LSB POSITION

FUNCTION	FROM	THROUGH		TO
		SWITCH	CONTACTS	
Xmit +20 vdc	K3-12 (E 13)	S2-A-R	3 and 2	J17-2, J16-2 and J-19-17
			3 and 4	J17-7
Mike Audio Input	S1-B-F-10	S2-A-R	8 and 9	J19-12
+28 vdc	+28 vdc supply	S2-C-F	9 and 11	S1-B-F-9 and E23
GRD Keyline	K1-2	S2-D-R	3 and 12	J4-K

Table 4.6

MODE SELECTOR SWITCH S2,

FSK POSITION

FUNCTION	FROM	THROUGH		TO
		SWITCH	CONTACTS	
Xmit +20 vdc	K3-12 (E13)	S2-A-F	12 and 10	J20-1
Xmit +20 vdc	K3-12 (E13)	S2-A-R	3 and 4	J17-7
			3 and 5	J17-8, J16-5 and J18-17
Local/Remote FSK Key	S1-B-R-6	S2-B-R	2 and 4	K4-4
GRD	ground	S2-C-R	2, 3 and 6	J4-G and J-18-9
FSK Audio	J20-4	S2-D-F	2 and 4	J18-20

Table 4.7

MODE SELECTOR SWITCH S2

AM POSITION

FUNCTION	FROM	THROUGH SWITCH	CONTACTS	TO
Xmit +20 vdc	K3-12 (E13)	S2-A-F	1 and 11	J17-4
Xmit +20 vdc	K3-12 (E13)	S2-A-R	3 and 4	J17-7
			3 and 5	J17-8, J16-5 and J18-17
Mike Audio Input	S1-B-F-10	S2-B-R	10 and 11	J-18-12
+28 vdc	+28 vdc supply	S2-C-F	1 and 11	S1-B-F-9 and E23
Remote Audio Input	S1-A-R-6	S2-C-R	10 and 8	J18-9
Remote Audio Input	S1-A-R-10	S2-D-F	5 and 3	J18-20
GRD Keyline	K1-2 (E35)	S2-D-R	5 and 12	J4-K

Table 4.8

MODE SELECTOR SWITCH S2

CW POSITION

FUNCTION	FROM	THROUGH		TO
		SWITCH	CONTACTS	
Xmit +20 vdc	K3-12 (13)	S2-A-F	12 and 2	J17-10
CW/FSK GRD	S2-C-R-4	S2-B-R	6 and 4	K4-4
CW/FSK GRD	K5-6	S2-C-R	3, 4 and 8	S2-B-R-6 and J18-9
Local/Remote CW Key	S1-B-R-2	S2-C-R	9 and 11	J17-5 and A8-11
Remote Audio Input	S1-A-R-10	S2-D-F	6 and 4	J18-20

Table 4.9

MODE SELECTOR SWITCH S2

USB POSITION

FUNCTION	FROM	THROUGH		TO
		SWITCH	CONTACTS	
Xmit +20 vdc	K3-12 (E13)	S2-A-R	3 and 4	J17-7
Xmit +20 vdc	K3-12 (E13)	S2-A-R	6 and 5	J17-8, J16-5 and J18-17
Mike Audio Input	S1-B-F-10	S2-B-R	10 and 11	J18-12
+28 vdc	+28 vdc supply	S2-C-F	1 and 3	S1-B-F-9 and E23
Remote Audio Input	S1-A-R-6	S2-C-R	10 and 12	J18-9
Remote Audio Input	S1-A-R-10	S2-D-F	5 and 7	J18-20
GRD Keyline	K1-2 (E35)	S2-D-R	9 and 12	J4-K

Table 4.10

MODE SELECTOR SWITCH S2

ISB POSITION

FUNCTION	FROM	THROUGH		TO
		SWITCH	CONTACTS	
Xmit +20 vdc	K3-12 (E13)	S2-A-R	3 and 2	J17-10
			3 and 4	J17-7
			3 and 5	J17-8, J16-5 and J18-17
Mike Audio Input	S1-B-F-10	S2-B-R	10 and 12	S9-6
+28 vdc	+28 vdc supply	S2-C-F	4 and 3	S1-B-F-9 and E23
Remote Audio Input	S1-A-R-6	S2-C-R	10 and 6	J18-9
Remote Audio Input	S1-A-R-10	S2-D-F	6 and 8	J18-20
GRD Keyline	K1-2 (E35)	S2-D-R	10 and 12	J4-K

Table 4-11

MODE SELECTOR SWITCH S2

ISB/FSK POSITION

FUNCTION	FROM	THROUGH		TO
		SWITCH	CONTACTS	
Xmit +20 vdc	K3-12 (E13)	S2-A-F	3 and 5	J20-1
Mike Audio Input	S1-B-F-10	S2-A-R	8 and 9	J19-12
Xmit +20 vdc	K3-12 (E13)	S2-A-R	3 and 2	J17-10
			3 and 4	J17-7
			3 and 5	17-8, J16-5 and J18-17
Local/Remote FSK Key	S1-B-R-6	S2-B-R	2 and 4	K4-4
+28 vdc	+28 vdc supply	S2-C-F	4 and 3	S1-B-F-9 and E23
GRD	ground (E39)	S2-C-R	2 and 12	J18-9
FSK Audio	J20-4	S2-D-F	9 and 7	J18-20
GRD Keyline	K1-2 (E35)	S2-D-R	11 and 12	J4-K

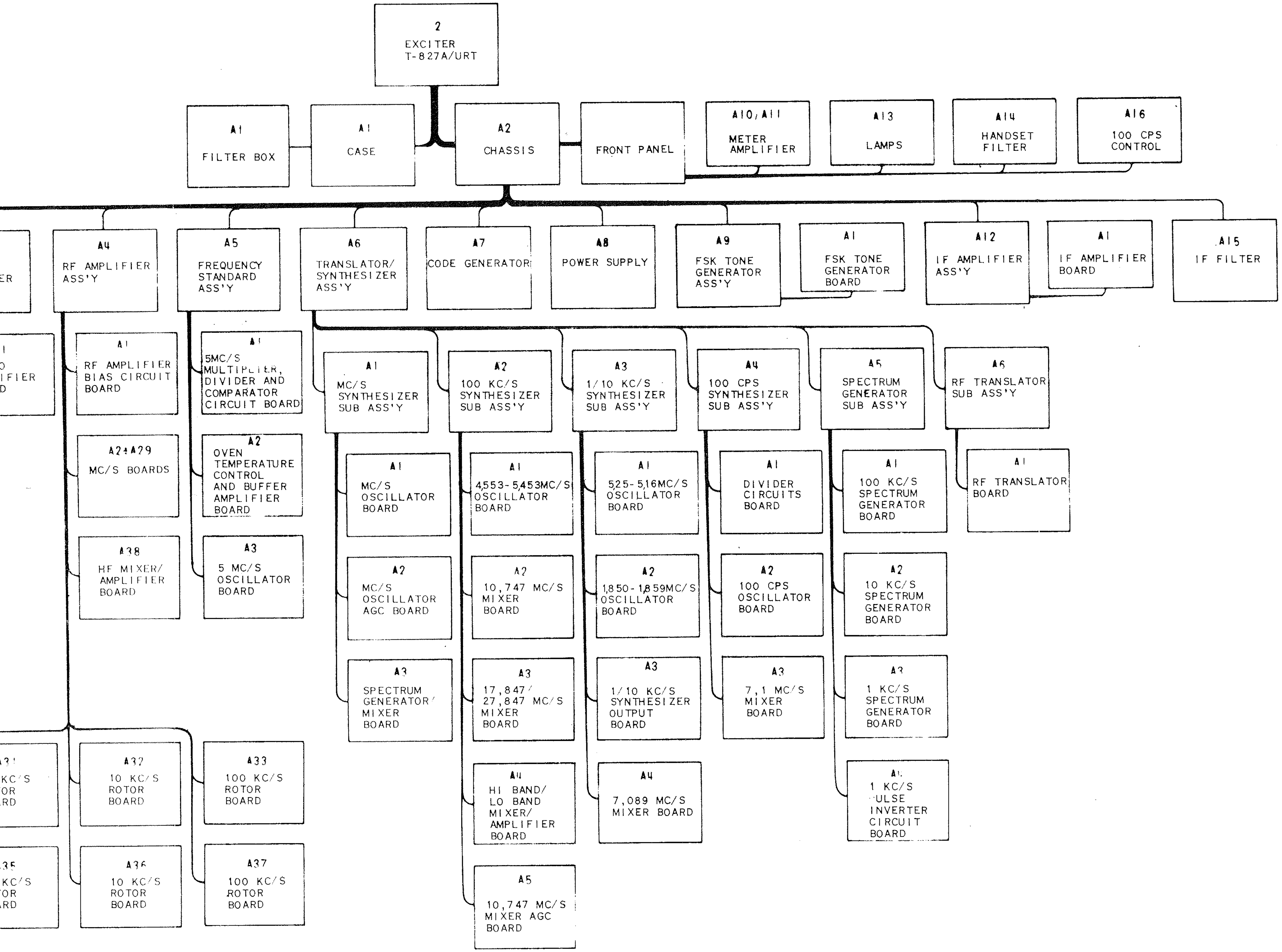


Figure 1-5. Radio Transmitter T-827A/URT
Split-Down Schematic Diagram
Showing Component Parts

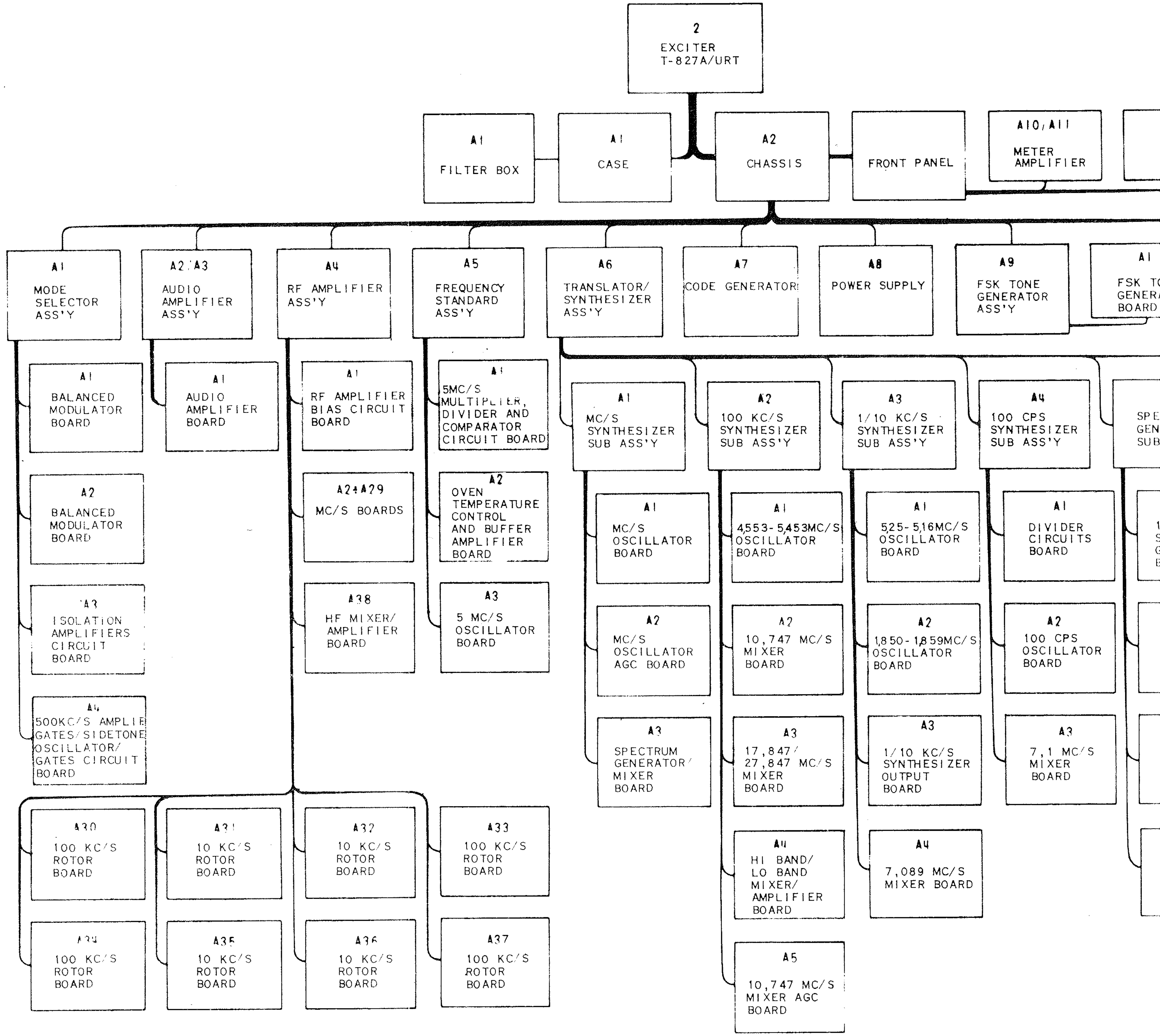

2
EXCITER
T-827A/URT
A1
FILTER BOX
A1
CASE
A2
CHASSIS
FRONT PANEL
A10/A11
METER
AMPLIFIER
A1
MODE
SELECTOR
ASS'Y
A2/A3
AUDIO
AMPLIFIER
ASS'Y
A4
RF AMPLIFIER
ASS'Y
A5
FREQUENCY
STANDARD
ASS'Y
A6
TRANSLATOR/
SYNTHESIZER
ASS'Y
A7
CODE GENERATOR
A8
POWER SUPPLY
A9
FSK TONE
GENERATOR
ASS'Y
A1
BALANCED
MODULATOR
BOARD
A2
BALANCED
MODULATOR
BOARD
A3
ISOLATION
AMPLIFIERS
CIRCUIT
BOARD
A4
500KC/S AMPLIF
GATES/SIDETONE
OSCILLATOR/
GATES CIRCUIT
BOARD
A1
AUDIO
AMPLIFIER
BOARD
A1
RF AMPLIFIER
BIAS CIRCUIT
BOARD
A2+A29
MC/S BOARDS
A38
HF MIXER/
AMPLIFIER
BOARD
A1
5MC/S
MULTIPLIER,
DIVIDER AND
COMPARATOR
CIRCUIT BOARD
A2
OVEN
TEMPERATURE
CONTROL
AND BUFFER
AMPLIFIER
BOARD
A3
5 MC/S
OSCILLATOR
BOARD
A30
100 KC/S
ROTOR
BOARD
A31
10 KC/S
ROTOR
BOARD
A32
10 KC/S
ROTOR
BOARD
A33
100 KC/S
ROTOR
BOARD
A34
100 KC/S
ROTOR
BOARD
A35
10 KC/S
ROTOR
BOARD
A36
10 KC/S
ROTOR
BOARD
A37
100 KC/S
ROTOR
BOARD
A1
MC/S
SYNTHESIZER
SUB ASS'Y
A2
100 KC/S
SYNTHESIZER
SUB ASS'Y
A3
1/10 KC/S
SYNTHESIZER
SUB ASS'Y
A4
100 CPS
SYNTHESIZER
SUB ASS'Y
A1
MC/S
OSCILLATOR
BOARD
A2
MC/S
OSCILLATOR
AGC BOARD
A3
SPECTRUM
GENERATOR/
MIXER
BOARD
A1
4,553-5,453MC/S
OSCILLATOR
BOARD
A2
10,747 MC/S
MIXER
BOARD
A3
17,847/
27,847 MC/S
MIXER
BOARD
A4
HI BAND/
LO BAND
MIXER/
AMPLIFIER
BOARD
A5
10,747 MC/S
MIXER AGC
BOARD
A1
525-5,16MC/S
OSCILLATOR
BOARD
A2
1,850-1,859MC/S
OSCILLATOR
BOARD
A3
1/10 KC/S
SYNTHESIZER
OUTPUT
BOARD
A4
7,089 MC/S
MIXER BOARD
A1
DIVIDER
CIRCUITS
BOARD
A2
100 CPS
OSCILLATOR
BOARD
A3
7,1 MC/S
MIXER
BOARD

Table 1.3a Transistors and Tube Complement

2A2A6A4																														
Q6	A1A1 Q1	A1A1 Q2	A1A2 Q1	A1A2 Q2	A1A3 Q1	A1A3 Q2	A1A4 Q1	A1A4 Q2	A1A5 Q1	A1A5 Q2	A1A6 Q1	A1A6 Q2	A1A7 Q1	A1A7 Q2	A1A8 Q1	A1A8 Q2	A1A9 Q1	A1A9 Q2	A1A10 Q1	A1A10 Q2	A1A11 Q1	A1A11 Q2	A1A12 Q1	A1A12 Q2	A2 Q1	A2 Q2	A2 Q3	A2A2 Q1	A2A2 Q2	A3 Q4

2A2A6A5										2A2A6A6					2A2A8			2A2A9			2A2A10	2A2A11	2A2A12	
																					Q1	Q1		
															Q2	Q3	Q4							
A1 Q4																								
A1 Q2	A2 Q3	A3 Q3	A4 Q1															A1 Q1	A1 Q3	A1 Q7				
										A1 Q1	A1 Q7	A1 Q8	A1 Q9											
A1 Q1	A1 Q3	A2 Q1	A2 Q2	A2 Q4	A2 Q5	A3 Q1	A3 Q2	A3 Q4	A3 Q5															
A1 Q5	A2 Q6	A3 Q6	A1 Q6							A1 Q2	A1 Q3	A1 Q4	A1 Q5	A1 Q6										
															Q5			A1 Q4						
																							A1 Q2	A1 Q3
																							A1 Q1	
															Q1 Q6			A1 Q2	A1 Q5	A1 Q6			A1 Q4	

2A2	CHASSIS
2A2A1	MODE SELECTOR ASS'Y
2A2A2	TRANSMITTER AUDIO AMPLIF. ASS'Y
2A2A3	TRANSMITTER AUDIO AMPLIF. ASS'Y
2A2A4	RF AMPLIFIER ASS'Y
2A2A5	FREQUENCY STANDARD ASS'Y
2A2A6A1	1Mc/s SYNTHESIZER SUB-ASS'Y
2A2A6A2	100kc/s SYNTHESIZER SUB-ASS'Y
2A2A6A3	1/10kc/s SYNTHESIZER SUB-ASS'Y
2A2A6A4	100c/s SYNTHESIZER SUB-ASS'Y
2A2A6A5	SPECTRUM GENERATOR SUB-AS'Y
2A2A6A6	RF TRANSLATOR SUB-ASS'Y
2A2A8	POWER SUPPLY
2A2A9	FSK GENERATOR ASS'Y
2A2A11	METER AMPLIFIER BOARD
2A2A12	TRANSMITTER IF AMPLIFIER ASS'Y

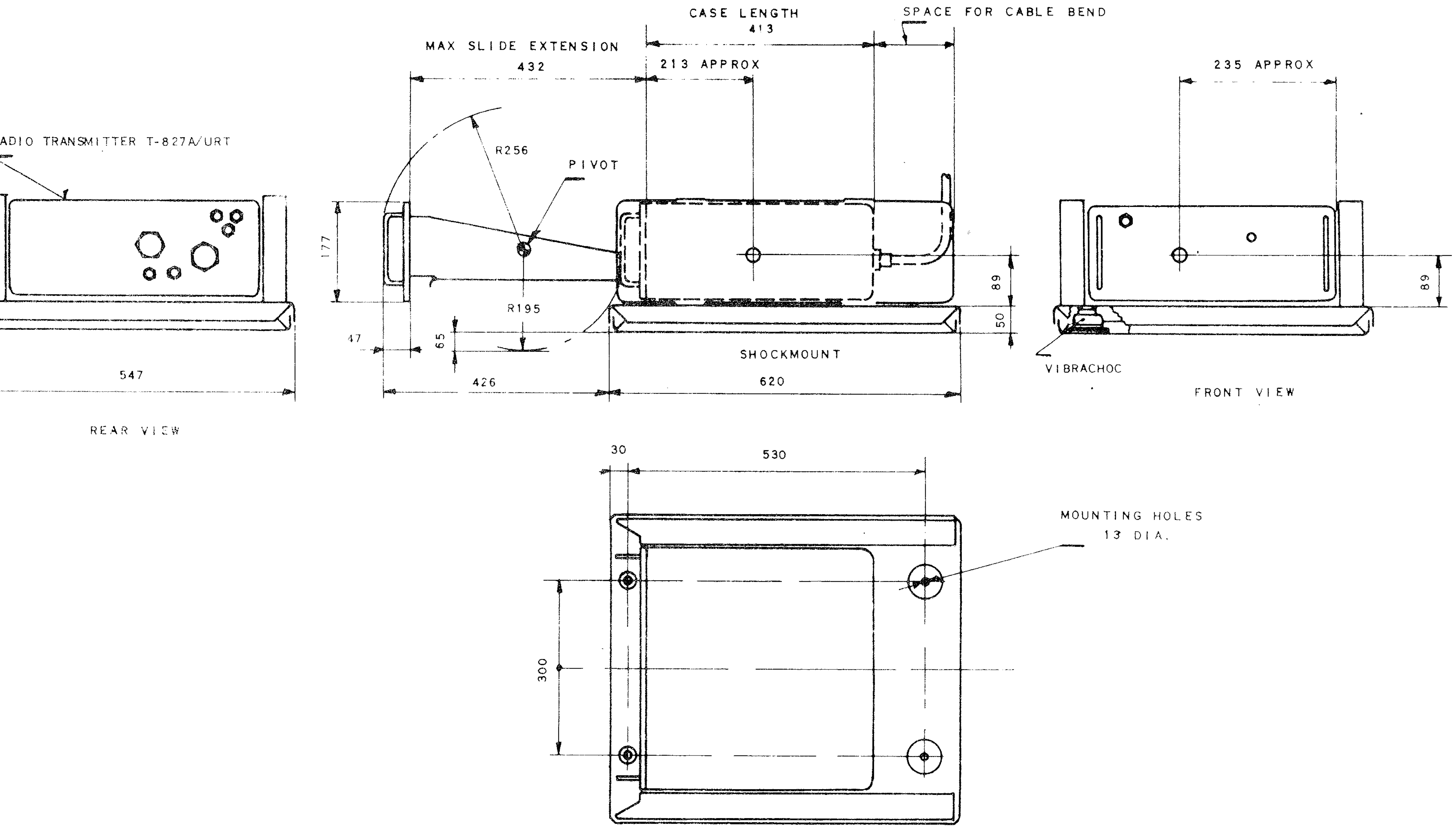
		2A2	2A2A1	2A2A2/ 2A2A3	2A2A4	2A2A5	2A2A6A1	2A2A6A2	2A2A6A3	2A2A6A4	
TRANSISTORS	2N328A										
	2N332					A2 Q6					
	2N333					A2 Q3					
	2N388			A1 Q2		A2 Q2, A2 Q1					
	2N652A										
	2N697										
	2N700						A3 Q5		A423 Q6, A422 Q7, A421 Q10		
	2N705										A1 Q4
	2N706									A1 Q2, A1 Q3, A1 Q4, A1 Q5, A1 Q6, A1A1 Q1, A1A1 Q2, A1A2 Q1, A1A2 Q2, A1A3 Q1, A1A3 Q2, A1A4 Q1, A1A4 Q2, A1A5 Q1, A1A5 Q2, A1A6 Q1, A1A6 Q2, A1A7 Q1, A1A7 Q2, A1A8 Q1, A1A8 Q2, A1A9 Q1, A1A9 Q2, A1A10 Q1, A1A10 Q2, A1A11 Q1, A1A11 Q2, A1A12 Q1, A1A12 Q2, A2 Q1, A2 Q2, A2 Q3, A2A2 Q1, A2A2 Q2, A3 Q4	A1 Q2, A2 Q3
	2N1142				A3B Q2					A3 Q2, A3 Q3	
	2N1301								A3 Q12		A1 Q1, A1 Q3, A2
	2N3127				A3B Q1		A3 Q4	A3 Q1, A2 Q1, A2 Q2, A3 Q2, A4 Q1, A4 Q2, A4 Q3, A4Q4 A5Q1	A4 Q9	A3 Q1	A1 Q5, A2 Q6, A3
	2N964A						A3 Q1, A3 Q3			A1 Q1	
	2N1117A					Q1					
	2N1131										
	2N1132										
	2N1183A										
	2N2906 / 2N1208	Q1	A4 Q9								
	2N1224		A3 Q1, A3 Q2								
	2N1225		A4 Q7, A4 Q6			A1Q1 A1Q2, A1 Q3, A1 Q4, A1 Q5, A1 Q7, A2 Q6, A3 Q5	A2 Q1, A2 Q2		A1 Q2, A2 Q2, A3 Q11	A3 Q5	
	2N2222						A2 Q3	A1 Q1, A1 Q2			
	2N2501						A3 Q2		A1 Q1, A2 Q1		
	2N2708						A1 Q1, A1 Q2, A1 Q3, A1 Q4, A3 Q6	A5 Q2, A5 Q3, A5 Q4			
	2N652			A1 Q1, A1 Q3, A1 Q4, A1 Q5							
	2N1012										
	2N1613										
	2N4036										
TUBE	6AN5WA				V2						
	6B76				V1						

Table 1.3b Diode Complement

2A5	2A2A6A1	2A2A6A2	2A2A6A3	2A2A6A4	2A2A6A5	2A2A6A6	2A2A8	2A2A9	2A2A12	2A2A16
CR2	A3 CR2, A3 CR3, A3 CR4	A3 CR1, A3 CR3			A2 CR2, A2 CR3, A3 CR2, A3 CR3	A1 CR[illegible], A1 CR2, A1 CR3, A1 CR4, A1 CR5, A1 CR6, A1 CR7, A1 CR8	CR11, CR14, CR15		A1 CR1	
								A1 CR1, A1 CR3, A1 CR4, A1 CR6, A1 CR7, A1 CR8		
							CR9			
							CR1, CR2, CR3, CR4, CR5, CR6, CR7, CR8			
				A2 CR2						CR1
							CR13			
	A3 CR1	A3 CR2		A2 CR4	A1 CR1, A2 CR1, A3 CR1	A1 CR11				
CR3, A2 CR4										
CR1					A1 CR2, A1 CR3, A2 CR4, A3 CR5					
							CR12			
								A1 CR5		
CR1										
								A1 CR2		
CR3, A3CR6, A1CR2	A1 CR1, A1 CR2	A1 CR1, A1 CR2, A5 CR1	A1 CR1, A1 CR2, A2 CR1, A2 CR2		A1 CR4, A3 CR4	A1 CR9, A1 CR10				
				A1A8 CR2, A1A8 CR3, A1A9 CR1, A1A9 CR2, A1A9 CR3, A1A10 CR1, A1A10 CR2, A1A10 CR3, A1A11 CR1, A1A11 CR2, A1A11 CR3, A1A12 CR1, A1A12 CR2, A1A12 CR3, A2 CR3, A2A2 CR1, A2A2 CR2, A2A2 CR3						
				A1A1 CR3, A1A2 CR1, A1A2 CR2, A1A2 CR3, A1A3 CR1, A1A3 CR2, A1A3 CR3, A1A4 CR1, A1A4 CR2, A1A4 CR3, A1A5 CR1, A1A5 CR2, A1A5 CR3, A1A6 CR1, A1A6 CR2, A1A6 CR3, A1A7 CR1, A1A7 CR2, A1A7 CR3, A1A8 CR1						
				A1 CR5, A1 CR6, A1 CR7, A1 CR8, A1 CR9, A1 CR10, A1 CR13, A1 CR14, A1 CR15, A1 CR16, A1 CR17, A1 CR18, A1 CR19, A1 CR20, A1 CR21, A1 CR22, A1 CR23, A1 CR24, A1A1 CR1, A1A1 CR2						
				A2 CR5, A2 CR6						
	A3 CR3									
				A2 CR7, A2 CR8, A2 CR9						
	A1 CR3									
			A3 CR7							
				A2 CR1						
							CR10			

2A2	CHASSIS
2A2A1	MODE SELECTOR ASS'Y
2A2A2	TRANSMITTER AUDIO AMPLIF. ASS'Y
2A2A3	TRANSMITTER AUDIO AMPLIF. ASS'Y
2A2A5	FREQUENCY STANDARD ASS'Y
2A2A6A1	1Mc/s SYNTHESIZER SUB-ASS'Y
2A2A6A2	100Kc/s SYNTHESIZER SUB-ASS'Y
2A2A6A3	1/10kc/s SYNTHESIZER SUB-ASS'Y
2A2A6A4	100c/s SYNTHESIZER SUB-ASS'Y
2A2A6A5	SPECTRUM GENERATOR SUB-AS'Y
2A2A6A6	RF TRANSLATOR SUB-ASS'Y
2A2A8	POWER SUPPLY
2A2A9	FSK GENERATOR ASS'Y
2A2A12	TRANSMITTER IF AMPLIFIER ASS'Y
2A2A16	4 VDC POWER SUPPLY

	2A2	2A2A1	2A2A2/2A2A3	2A2A5	2A2A6A1	2A2A6A2	2A2A6A3	2A2A6A4	2A2A6A5	2A2A6A6
1N270		A4 CR11; A4 CR12; A4 CR14; A4 CR15; A4 CR16; A4 CR17; A4 CR18; A4 CR19; A4 CR20; A4 CR21; A4 CR10		A2 CR2	A3 CR2; A3 CR3; A3 CR4	A3 CR1; A3 CR3			A2 CR2; A2 CR3; A3 CR2; A3 CR3	A1 [illegible]; A1 CR2; A1 CR3; A1 CR4; A1 CR5
1N457										
1N538	CR7									
1N649	CR1; CR2; CR3; CR4; CR5; CR6; CR9									
1N748								A2 CR2		
1N750A										
1N758A					A3 CR1	A3 CR2		A2 CR4	A1 CR1; A2 CR1; A3 CR1	A1 CR11
1N775A				A2 CR3; A2 CR4						
1N816			A1 CR1	A1 CR1					A1 CR2; A1 CR3; A2 CR4; A3 CR5	
1N904		A1 CR5; A1 CR6; A1 CR7; A1 CR8; A2 CR1; A2 CR2; A2 CR3; A2 CR4								
1N961B										
1N963B										
1N967B										
1N969B				A2 CR1						
1N1594	CR8									
1N3026B										
1N3063				A3 CR5; A3CR6 A1CR2	A1 CR1; A1 CR2	A1 CR1; A1 CR2; A5 CR1	A1 CR1; A1 CR2; A2 CR1; A2 CR2		A1 CR4; A3 CR4	A1 CR9; A1 CR10
1N3064		A4 CR13						A1A8 CR2; A1A8 CR3; A1A9 CR1; A1A9 CR2; A1A9 CR3; A1A10 CR1; A1A10 CR2; A1A10 CR3; A1A11 CR1; A1A11 CR2; A1A11 CR3; A1A12 CR1; A1A12 CR2; A1A12 CR3; A2 CR3; A2A2 CR1; A2A2 CR2; A2A2 CR3		
1N3064								A1A1 CR3; A1A2 CR1; A1A2 CR2; A1A2 CR3; A1A3 CR1; A1A3 CR2; A1A3 CR3; A1A4 CR1; A1A4 CR2; A1A4 CR3; A1A5 CR1; A1A5 CR2; A1A5 CR3; A1A6 CR1; A1A6 CR2; A1A6 CR3; A1A7 CR1; A1A7 CR2; A1A7 CR3; A1A8 CR1		
								A1 CR5; A1 CR6; A1 CR7; A1 CR8; A1 CR9; A1 CR10; A1 CR13; A1 CR14; A1 CR15; A1 CR16; A1 CR17; A1 CR18; A1 CR19; A1 CR20; A1 CR21; A1 CR22; A1 CR23; A1 CR24; A1A1 CR1; A1A1 CR2		
RD2728								A2 CR5; A2 CR6		
1N3600					A3 CR3					
HC7005B								A2 CR7; A2 CR8; A2 CR9		
HC7060B					A1 CR3					
HD6730							A3 CR7			
DT30319C								A2 CR1		
1X9222										

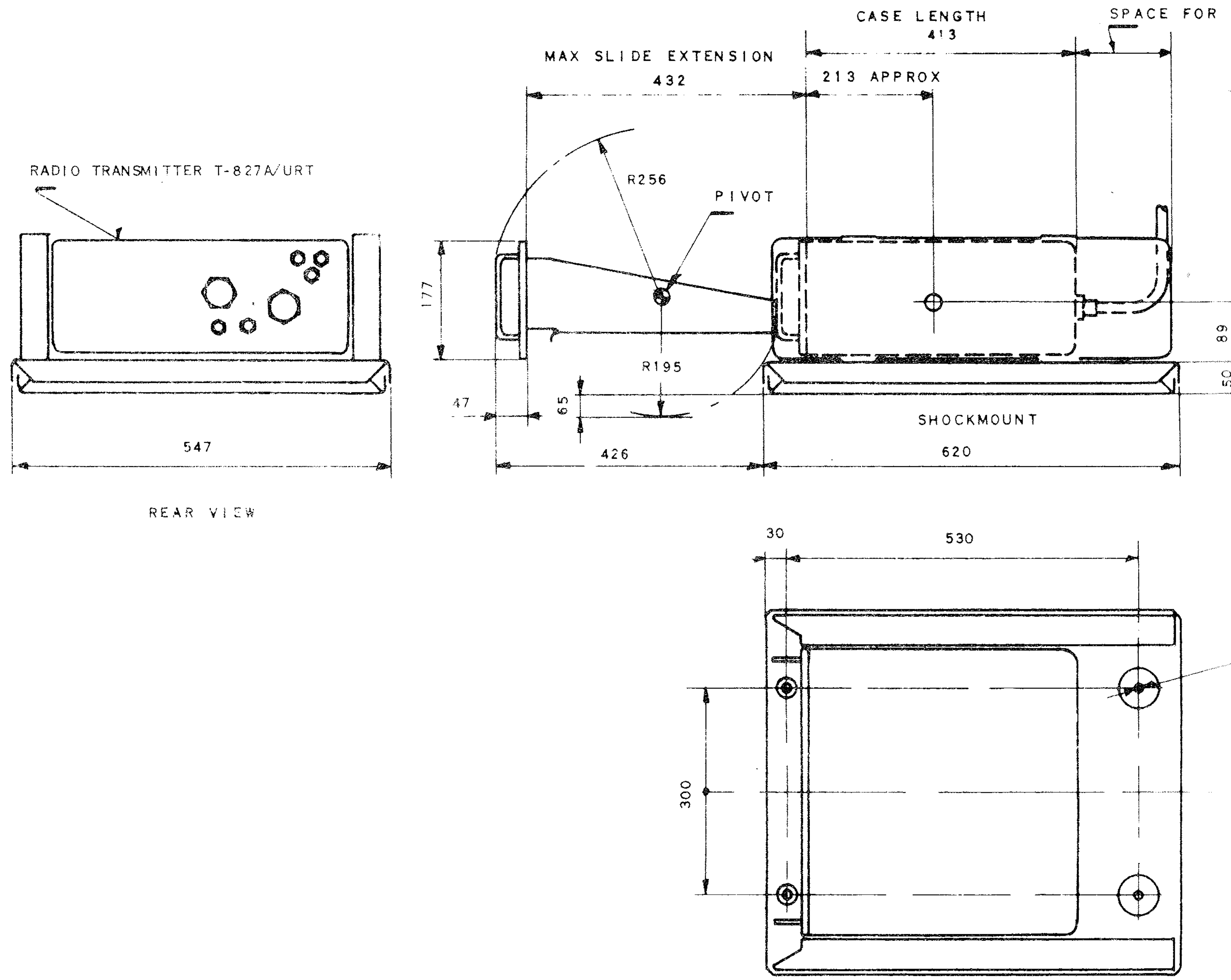


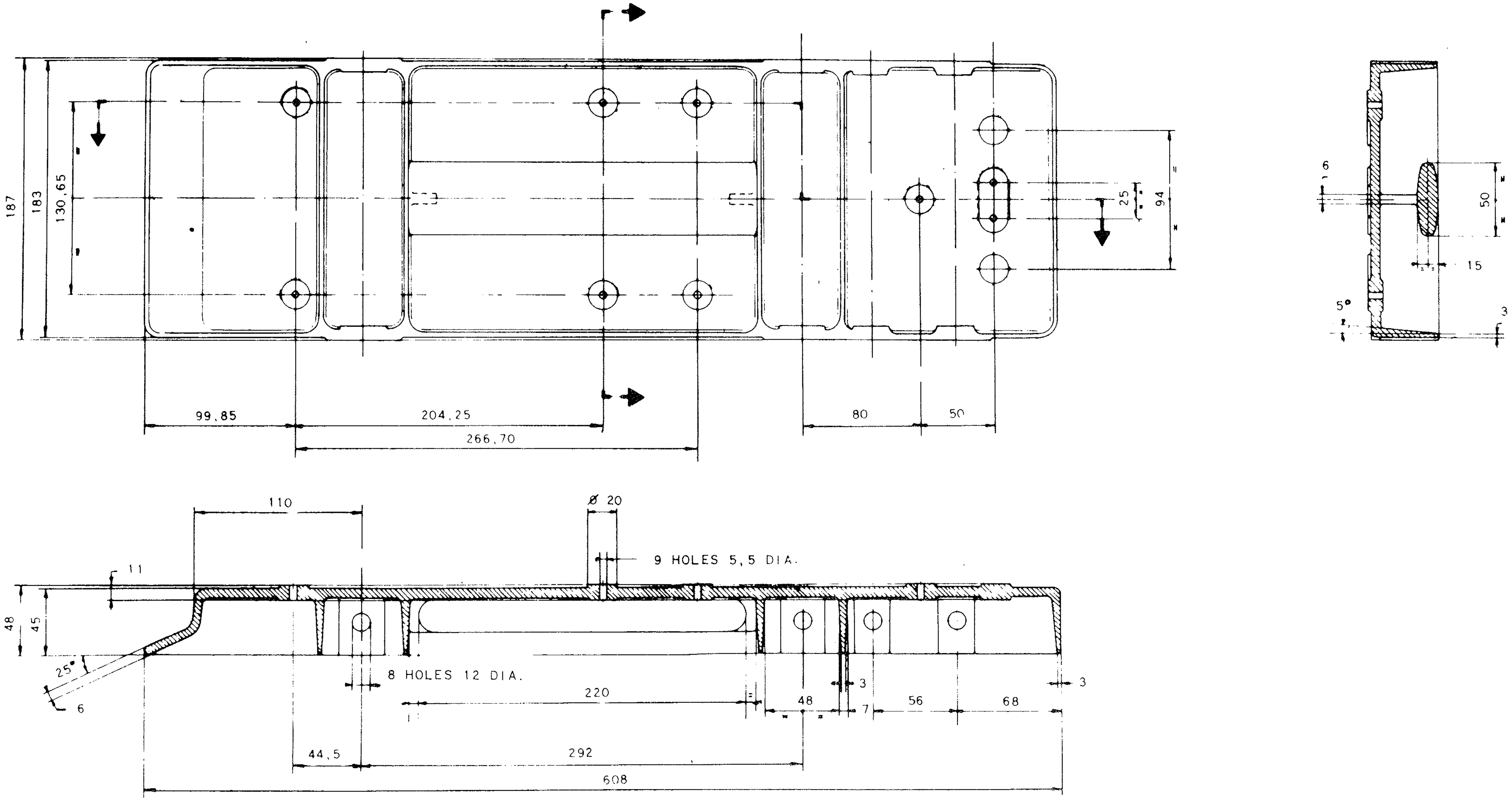
NOTES:

1: SHOCKMOUNT IS USED ONLY WHEN THE RECEIVER IS INSTALLED AS A SINGLE UNIT.

2: ALL DIMENSIONS IN MM.

Figure 2-1. Radio Transmitter T-827A/URT, Dimensions


RADIO TRANSMITTER T-827A/URT
547
REAR VIEW
MAX SLIDE EXTENSION
432
CASE LENGTH
413
SPACE FOR
213 APPROX
R256
PIVOT
177
R195
47
65
426
SHOCKMOUNT
620
89
50
30
530
300



NOTE: ALL DIMENSIONS IN MM

Figure 2-2. Radio Transmitter T-827A/URT, Mounting Bracket for Rack Mounting

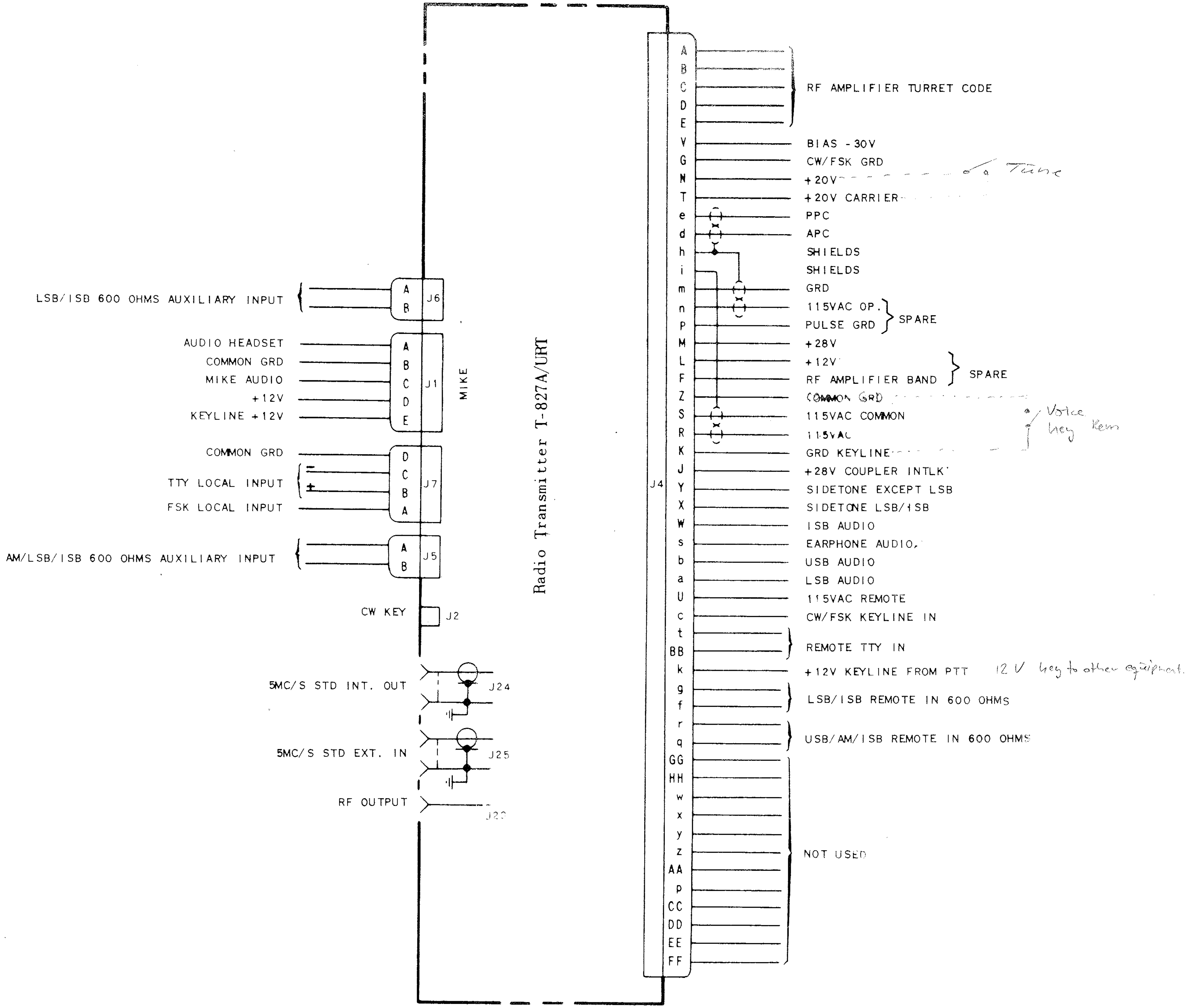


Figure 2-5. Radio Transmitter T-827A/URT
Connector Wiring Diagram

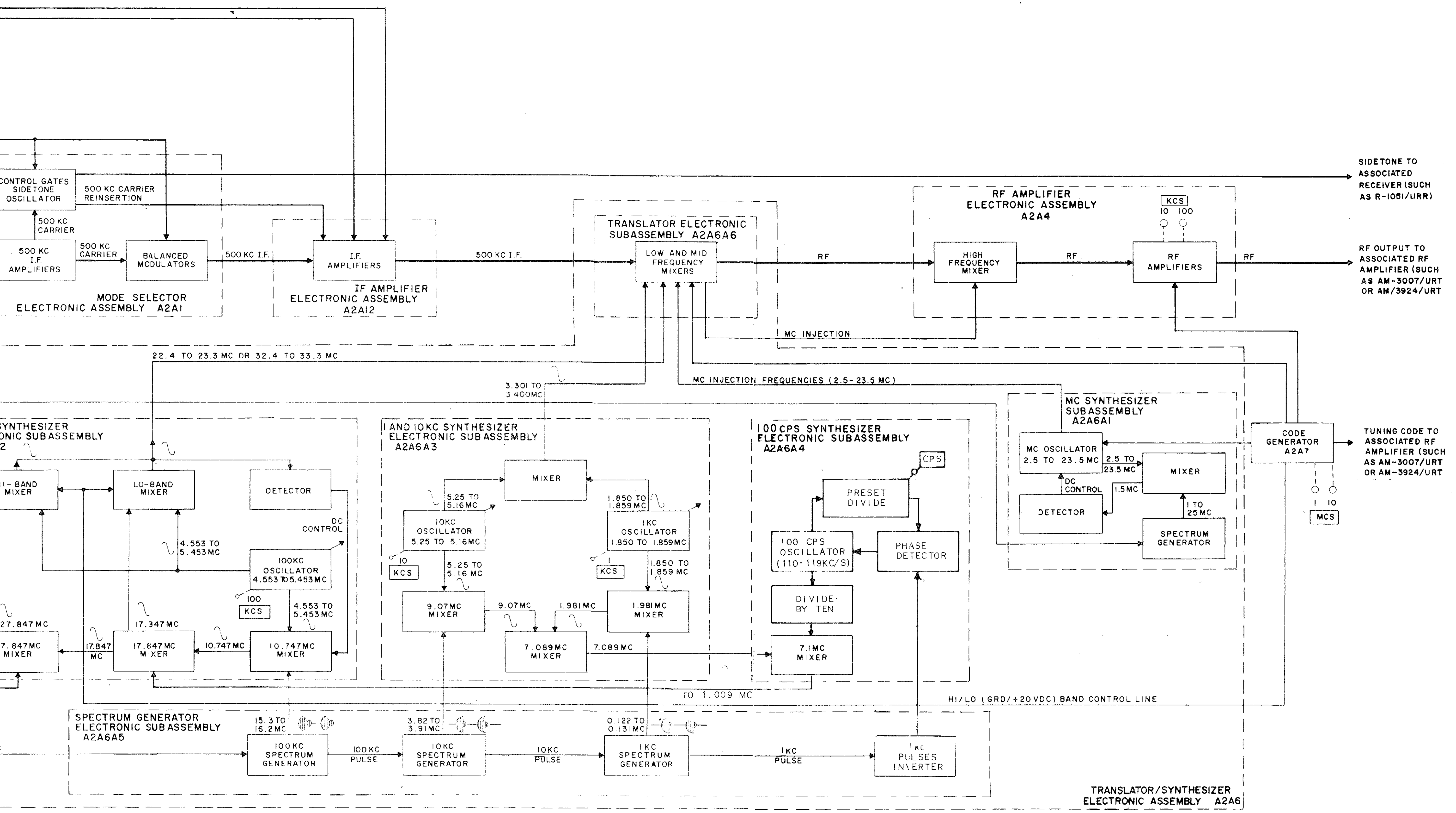
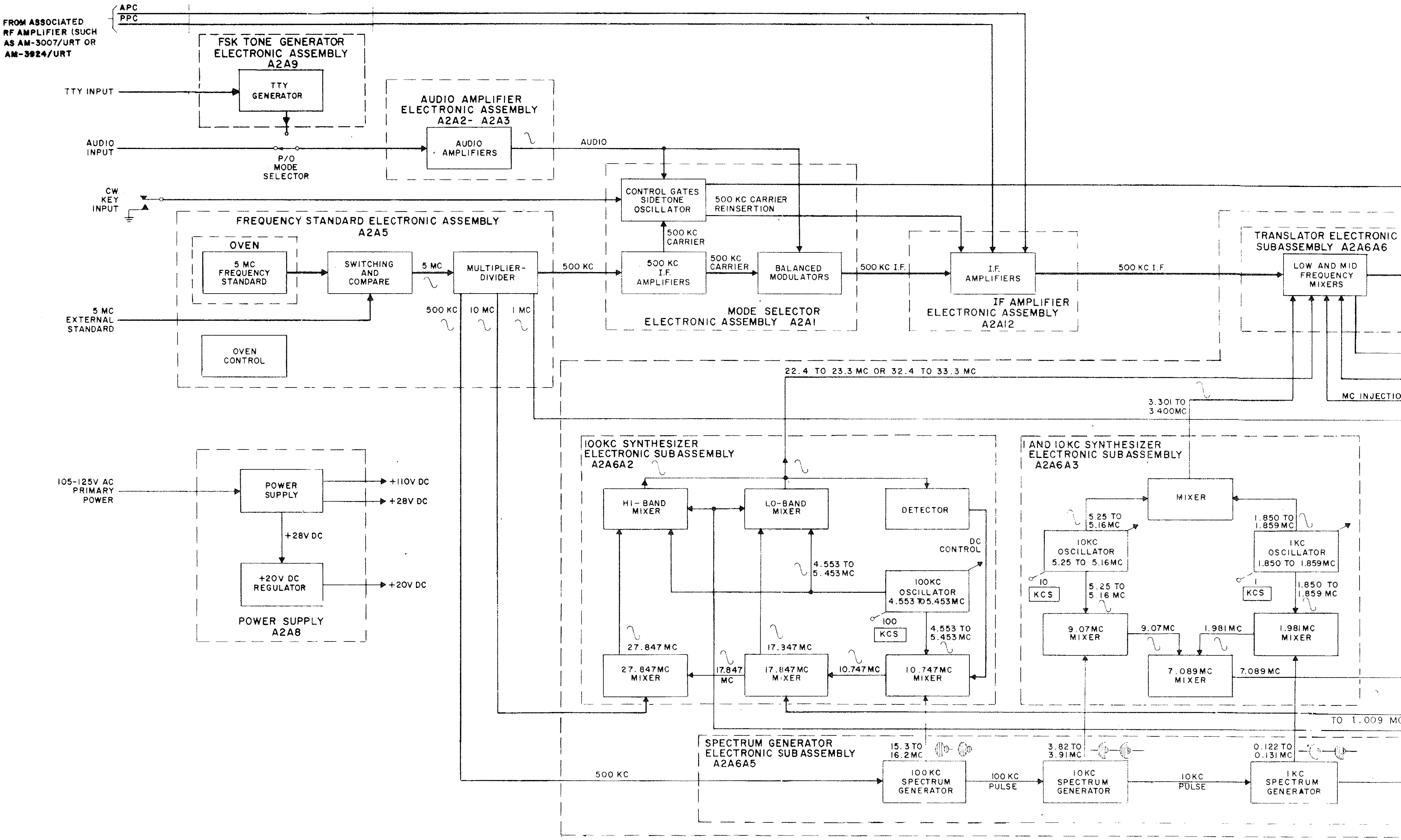


Figure 4-1. Radio Transmitter T-827A/URT, Functional Block Diagram



FROM ASSOCIATED RF AMPLIFIER (SUCH AS AM-3007/URT OR AM-3924/URT
APC
PPC
FSK TONE GENERATOR ELECTRONIC ASSEMBLY A2A9
TTY INPUT
TTY GENERATOR
AUDIO AMPLIFIER ELECTRONIC ASSEMBLY A2A2- A2A3
AUDIO INPUT
P/O MODE SELECTOR
AUDIO AMPLIFIERS
AUDIO
CW KEY INPUT
CONTROL GATES SIDETONE OSCILLATOR
500 KC CARRIER REINSERTION
500 KC CARRIER
FREQUENCY STANDARD ELECTRONIC ASSEMBLY A2A5
OVEN
5 MC FREQUENCY STANDARD
SWITCHING AND COMPARE
5 MC
MULTIPLIER-DIVIDER
500 KC
500 KC I.F. AMPLIFIERS
500 KC CARRIER
BALANCED MODULATORS
500 KC I.F.
I.F. AMPLIFIERS
500 KC I.F.
TRANSLATOR ELECTRONIC SUBASSEMBLY A2A6A6
LOW AND MID FREQUENCY MIXERS
IF AMPLIFIER ELECTRONIC ASSEMBLY A2A12
MODE SELECTOR ELECTRONIC ASSEMBLY A2A1
5 MC EXTERNAL STANDARD
500 KC
10 MC
1 MC
OVEN CONTROL
22.4 TO 23.3 MC OR 32.4 TO 33.3 MC
3.301 TO 3.400MC
MC INJECTIO
105-125V AC PRIMARY POWER
POWER SUPPLY
+110V DC
+28V DC
+28V DC
+20V DC REGULATOR
+20V DC
POWER SUPPLY A2A8
100KC SYNTHESIZER ELECTRONIC SUBASSEMBLY A2A6A2
HI-BAND MIXER
LO-BAND MIXER
DETECTOR
DC CONTROL
4.553 TO 5.453 MC
100KC OSCILLATOR 4.553 TO 5.453MC
100
KCS
4.553 TO 5.453MC
27.847 MC
17.347 MC
27.847MC MIXER
17.847 MC
17.847MC MIXER
10.747MC
10.747MC MIXER
1 AND 10KC SYNTHESIZER ELECTRONIC SUBASSEMBLY A2A6A3
MIXER
5.25 TO 5.16MC
1.850 TO 1.859MC
10KC OSCILLATOR 5.25 TO 5.16MC
1KC OSCILLATOR 1.850 TO 1.859MC
10
KCS
1
KCS
5.25 TO 5.16 MC
1.850 TO 1.859 MC
9.07MC MIXER
9.07MC
1.981MC
1.981MC MIXER
7.089MC MIXER
7.089MC
TO 1.009 MC
SPECTRUM GENERATOR ELECTRONIC SUBASSEMBLY A2A6A5
500 KC
15.3 TO 16.2MC
100KC SPECTRUM GENERATOR
100KC PULSE
3.82 TO 3.91MC
10KC SPECTRUM GENERATOR
10KC PULSE
0.122 TO 0.131MC
1KC SPECTRUM GENERATOR

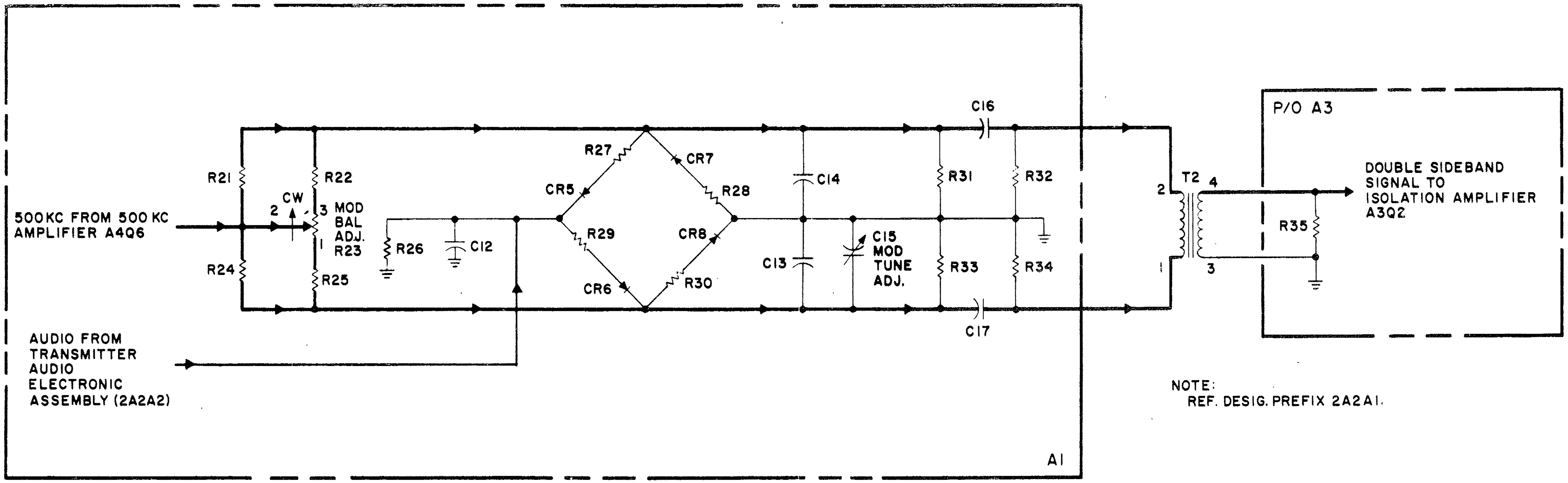
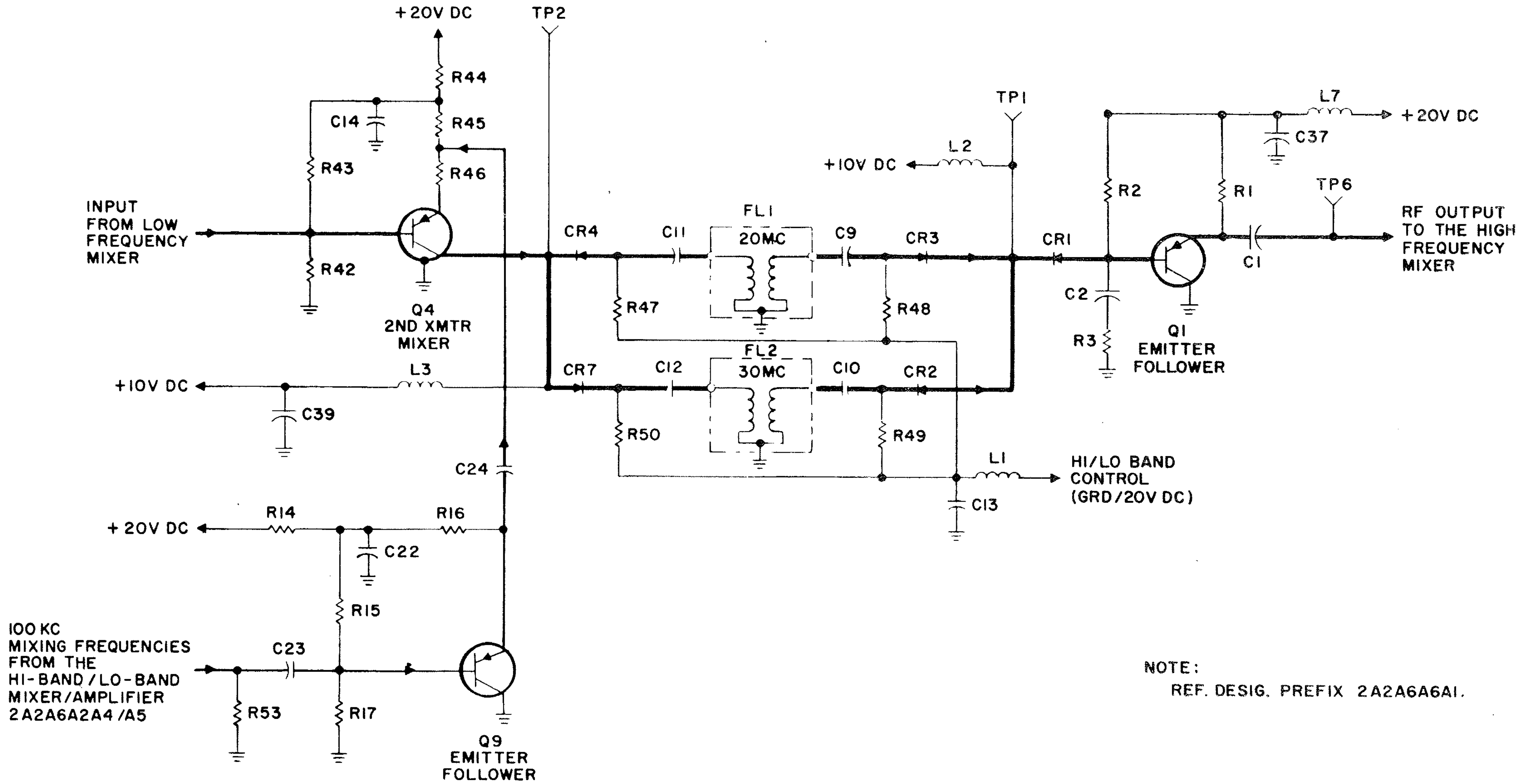
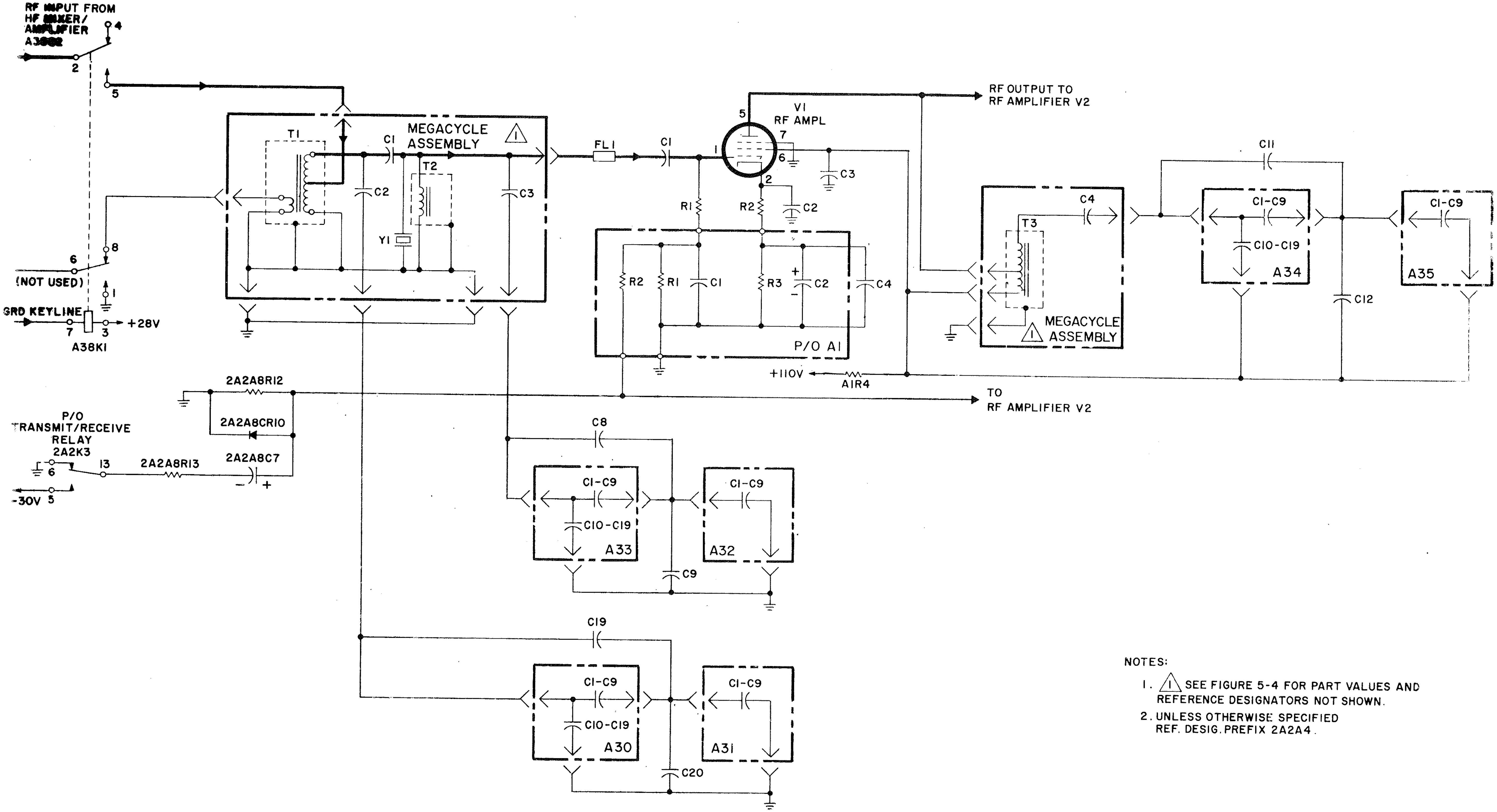


Figure 4-9. **Balanced Modulator, Simplified Schematic Diagram**



NOTE:
REF. DESIG. PREFIX 2A2A6A6A1.

Figure 4-14. Mid Frequency Mixer, Simplified Schematic Diagram



NOTES:

1. SEE FIGURE 5-4 FOR PART VALUES AND REFERENCE DESIGNATORS NOT SHOWN.
2. UNLESS OTHERWISE SPECIFIED REF. DESIG. PREFIX 2A2A4.

Pub. 246
December 1967
ORIGINAL

Figure 4-16. RF Amplifier V1, Simplified Schematic Diagram

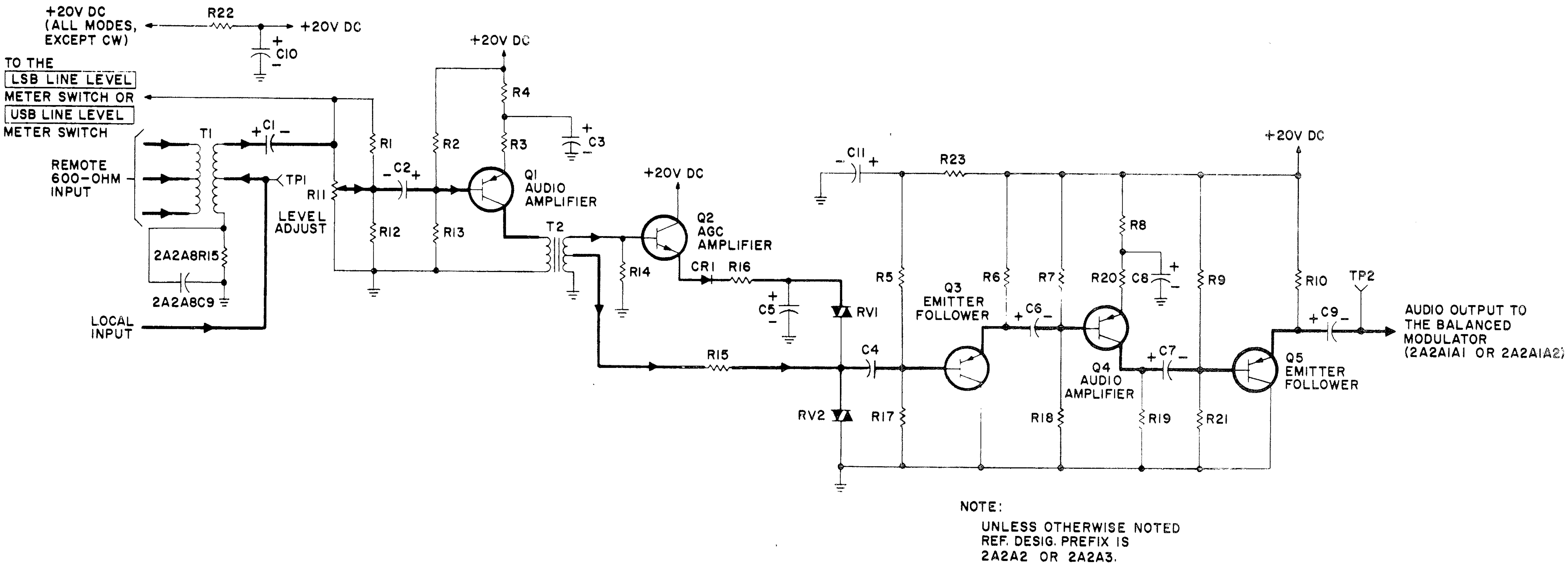


Figure 4-22. Audio Amplifier, Simplified Schematic Diagram

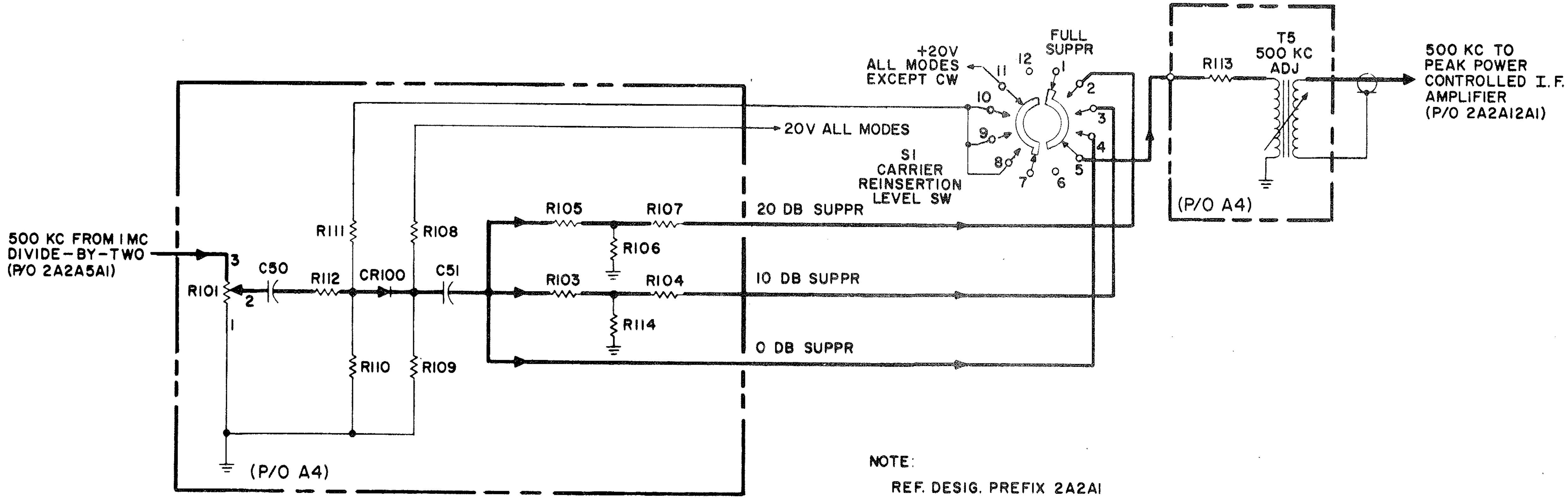
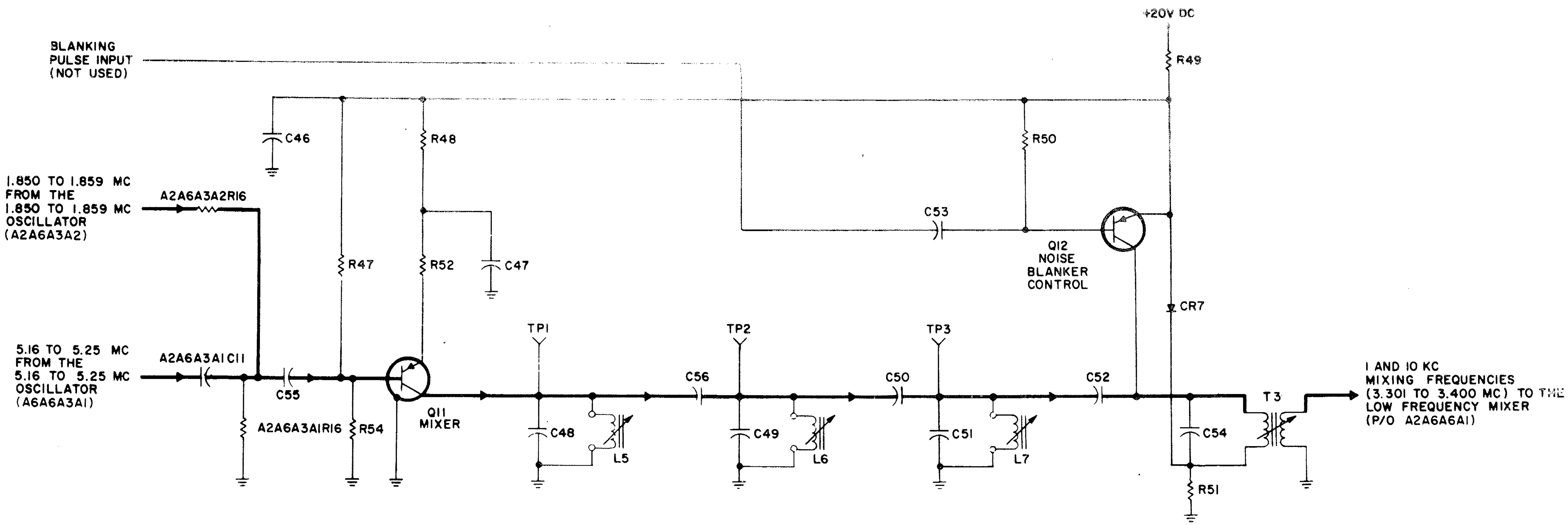


Figure 4-27. Carrier Reinsertion Level Control, Simplified Schematic Diagram



NOTE:
UNLESS OTHERWISE NOTED, REF. DESIG.
PREFIX IS A2A6A3A3

Figure 4-30. 1 and 10 KC Mixer, Simplified Schematic Diagram

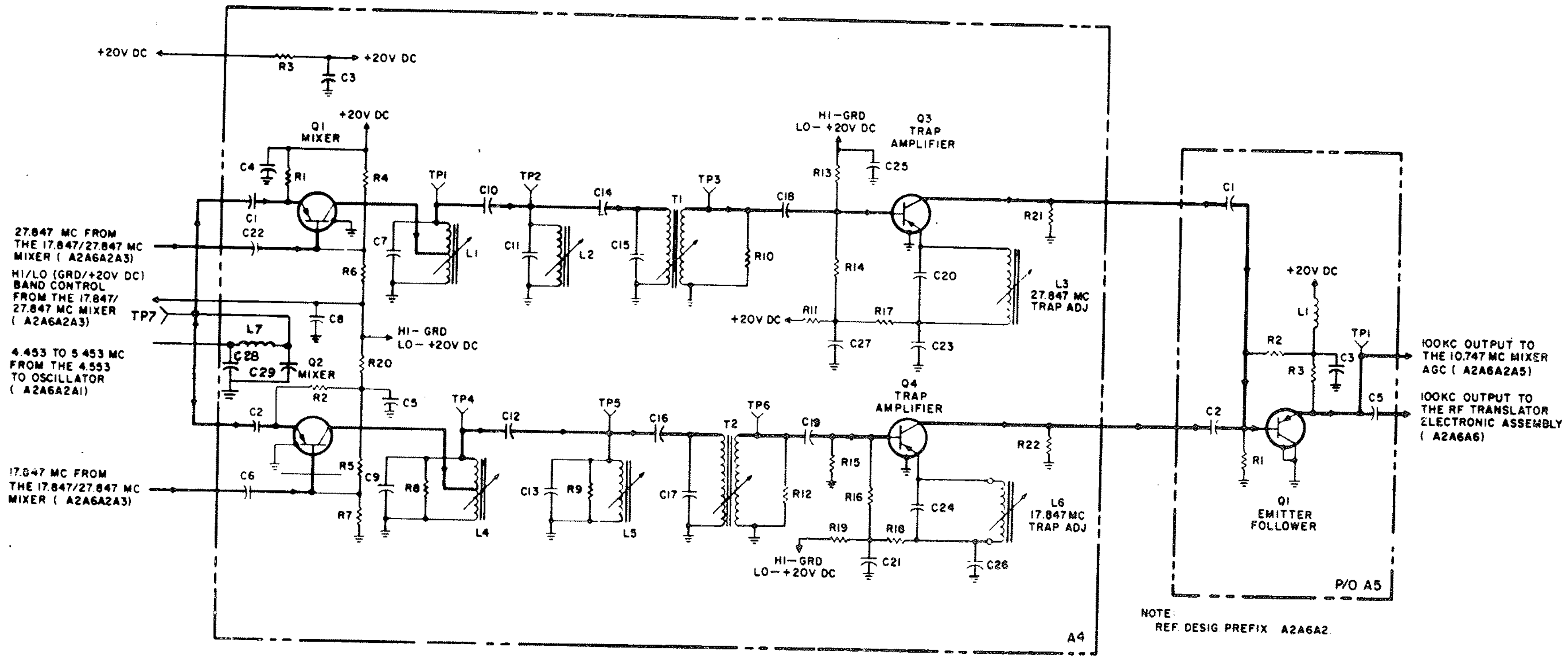


Figure 4-32. **Hi-Band/Lo-Band Mixer/Amplifier, Simplified Schematic Diagram**

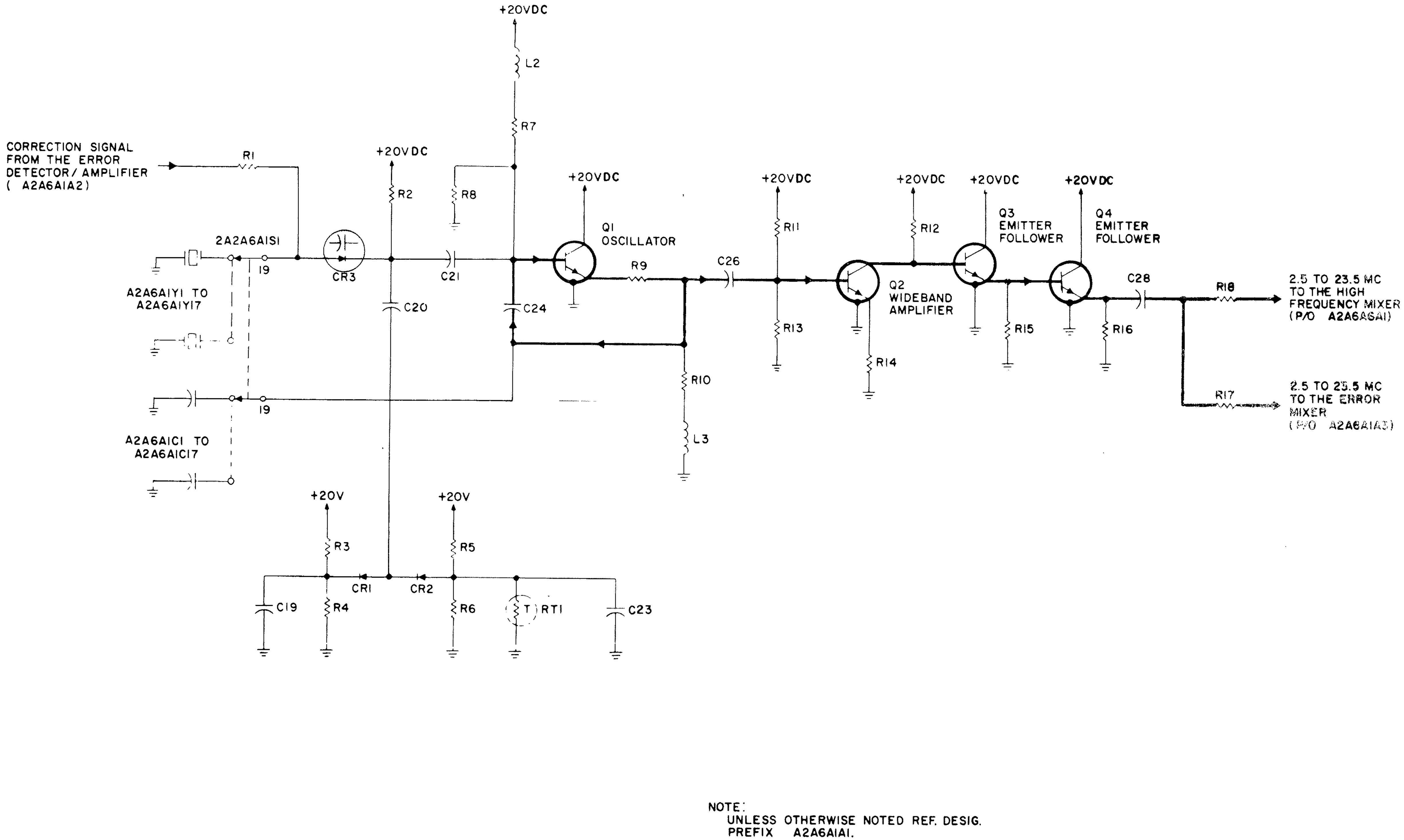
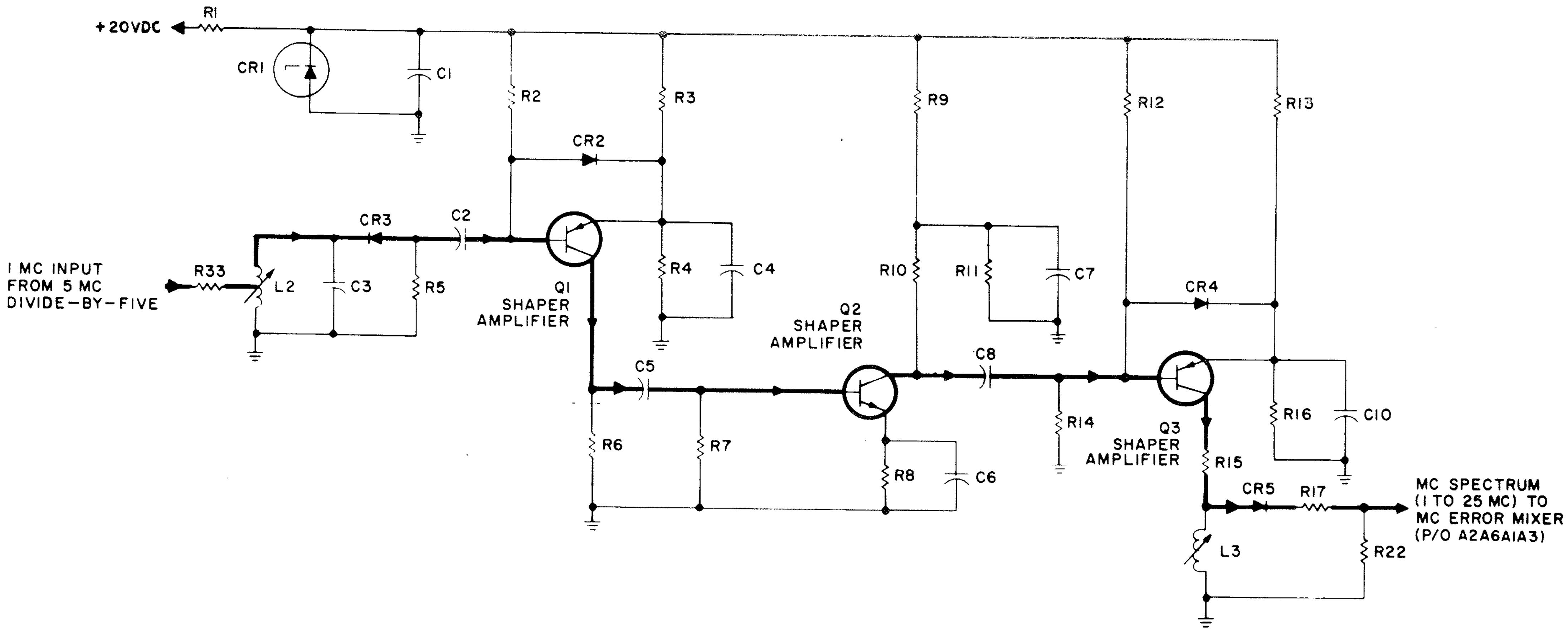


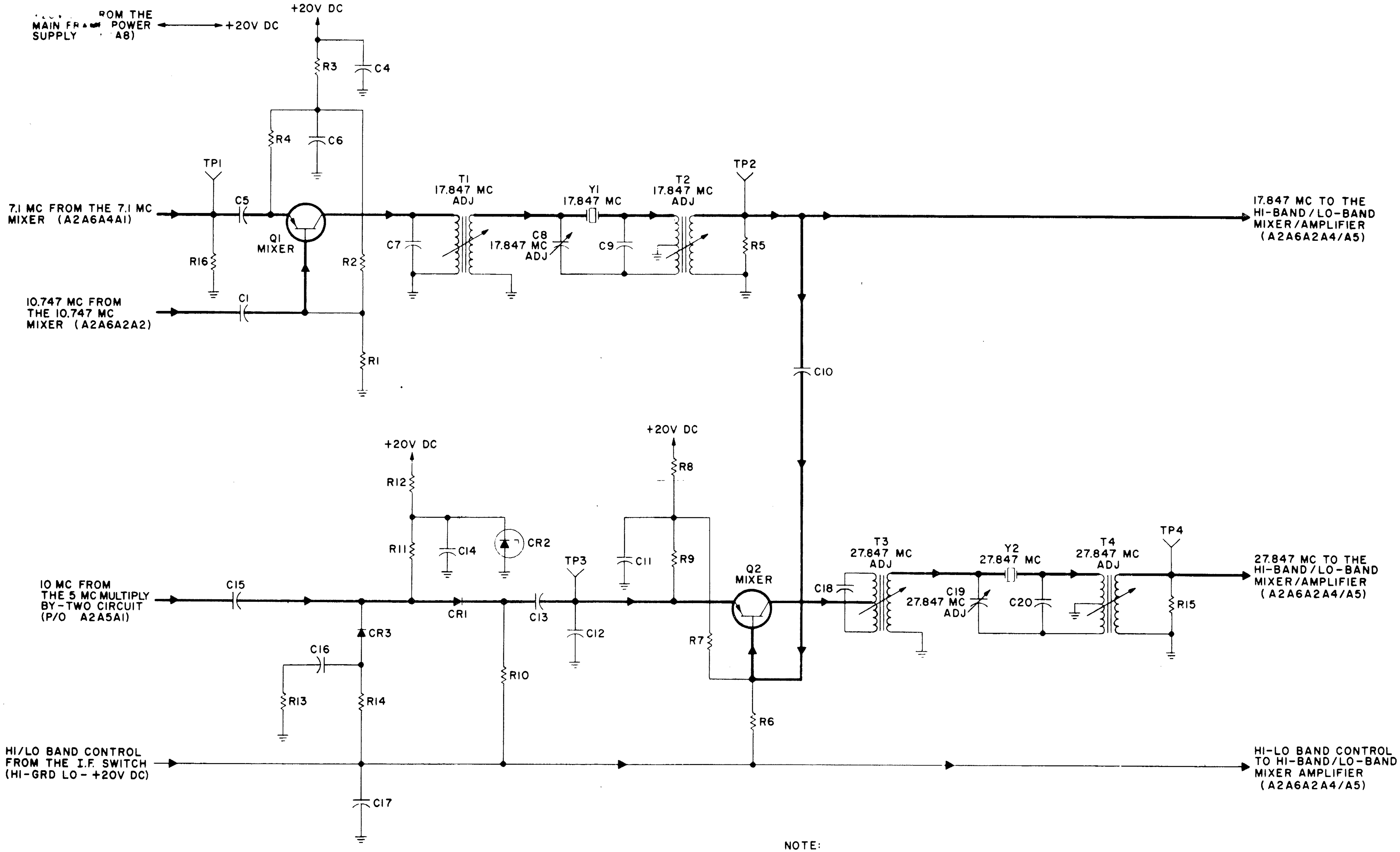
Figure 4-33. MC Oscillator, Simplified Schematic Diagram



NOTE:

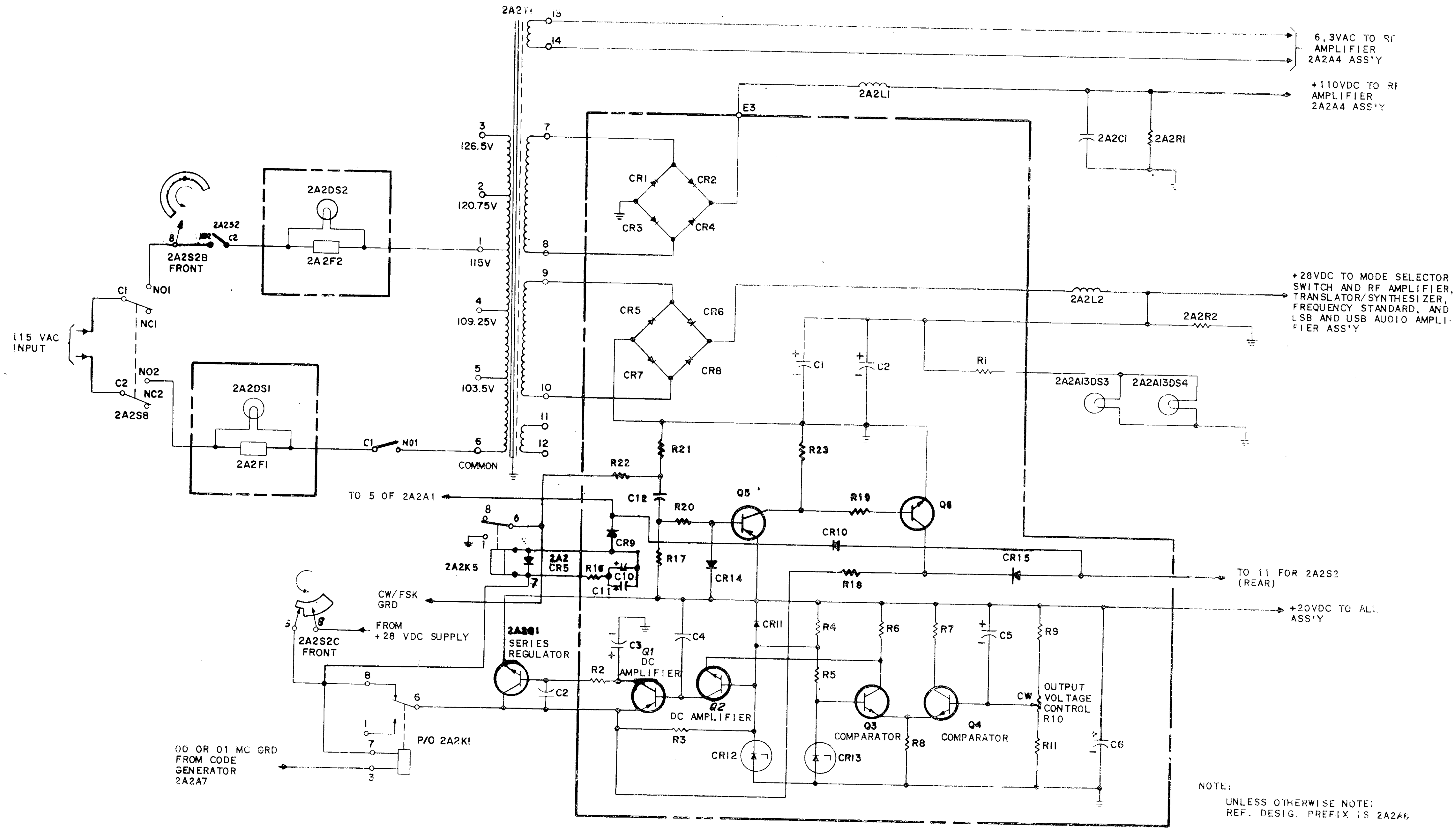
REF. DESIG. PREFIX A2A6A1A3.

Figure 4-34. MC Spectrum Generator, Simplified Schematic Diagram



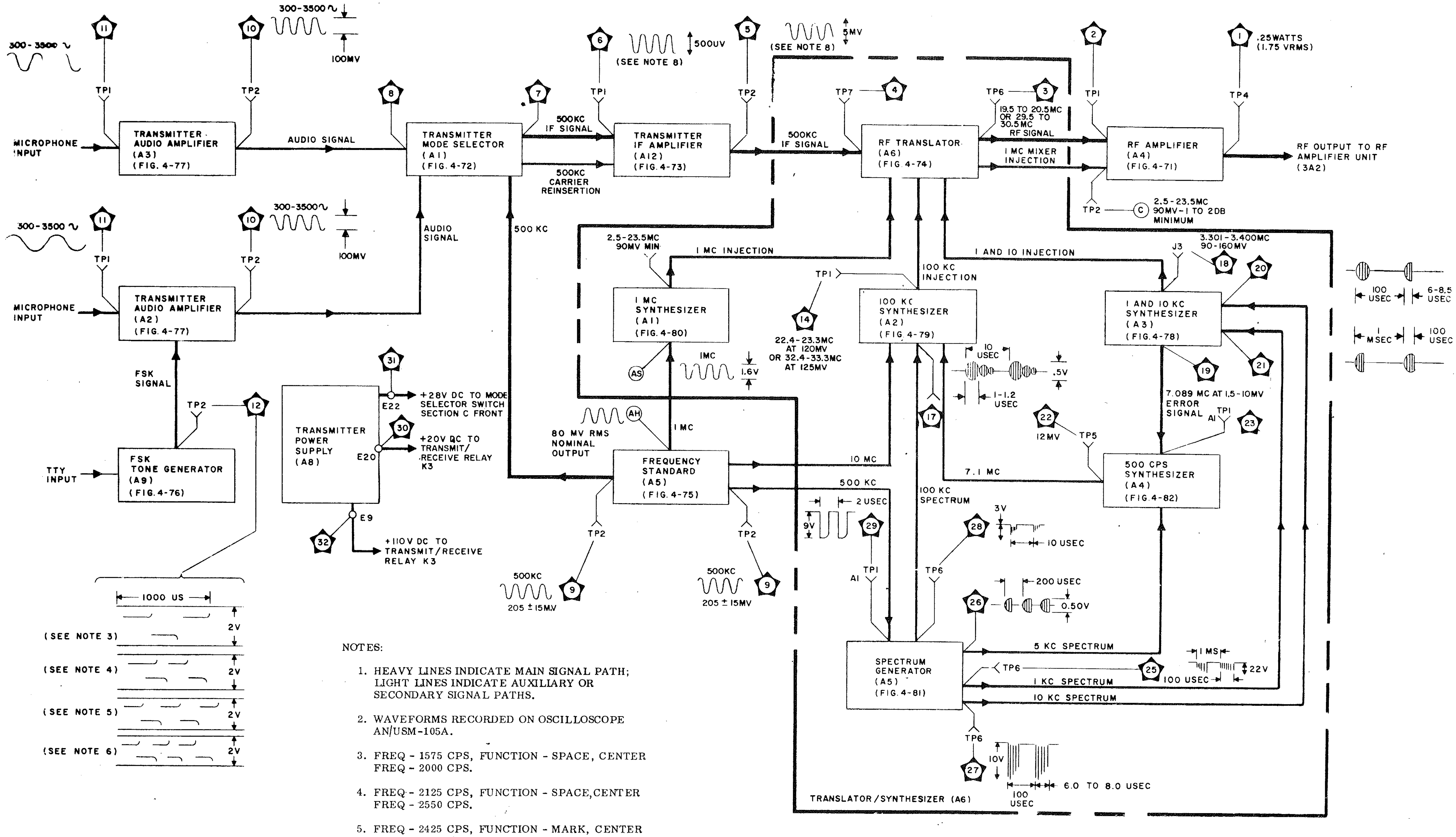
NOTE:
REF. DESIG. PREFIX A2A6A2A3.

Figure 4-41. 17.847/27.847 MC Mixer, Simplified Schematic Diagram



CR 5-6-7-8 = 1N 3612
EKVIVALENT = 1N 649

Figure 4-55a Power Supply, Simplified Schematic Diagram

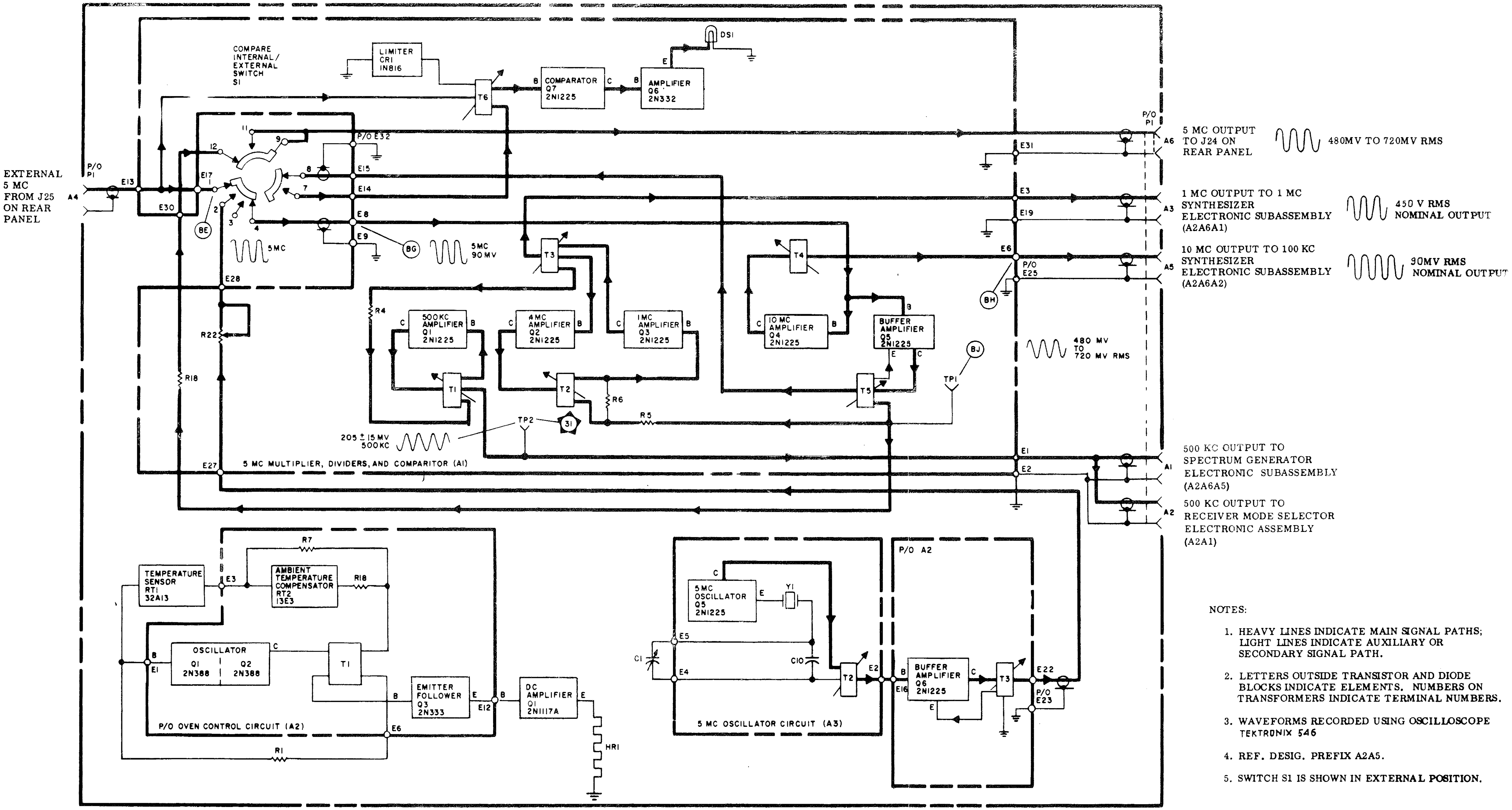


NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATH; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.
2. WAVEFORMS RECORDED ON OSCILLOSCOPE AN/USM-105A.
3. FREQ - 1575 CPS, FUNCTION - SPACE, CENTER FREQ - 2000 CPS.
4. FREQ - 2125 CPS, FUNCTION - SPACE, CENTER FREQ - 2550 CPS.
5. FREQ - 2425 CPS, FUNCTION - MARK, CENTER FREQ - 2000 CPS.
6. FREQ - 2975 CPS, FUNCTION - MARK, CENTER FREQ - 2550 CPS.
7. NOMINAL OUTPUT 100 MV RMS - SINGLE TONE 150 MV INPUT AT PINS 20 AND 9 OF CONNECTOR P1.
8. AM MODE, CARRIER, WITH NO MODULATION.

Pub. 246
December 1967
ORIGINAL

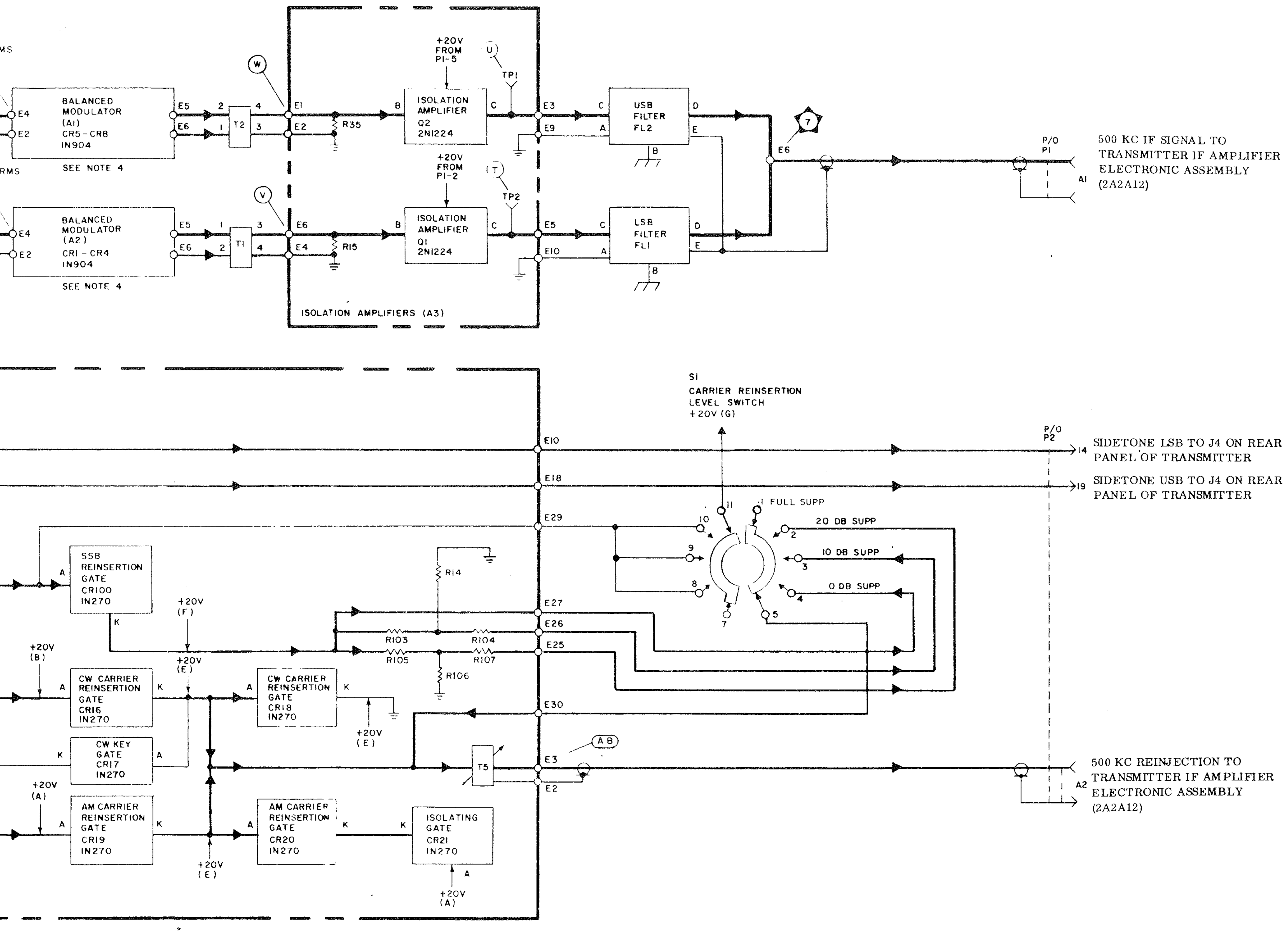
Figure 4-57. Radio Transmitter T-827A/URT, Overall Servicing Diagram



NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATHS; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATH.
2. LETTERS OUTSIDE TRANSISTOR AND DIODE BLOCKS INDICATE ELEMENTS. NUMBERS ON TRANSFORMERS INDICATE TERMINAL NUMBERS.
3. WAVEFORMS RECORDED USING OSCILLOSCOPE TEKTRONIX 546
4. REF. DESIG. PREFIX A2A5.
5. SWITCH S1 IS SHOWN IN EXTERNAL POSITION.

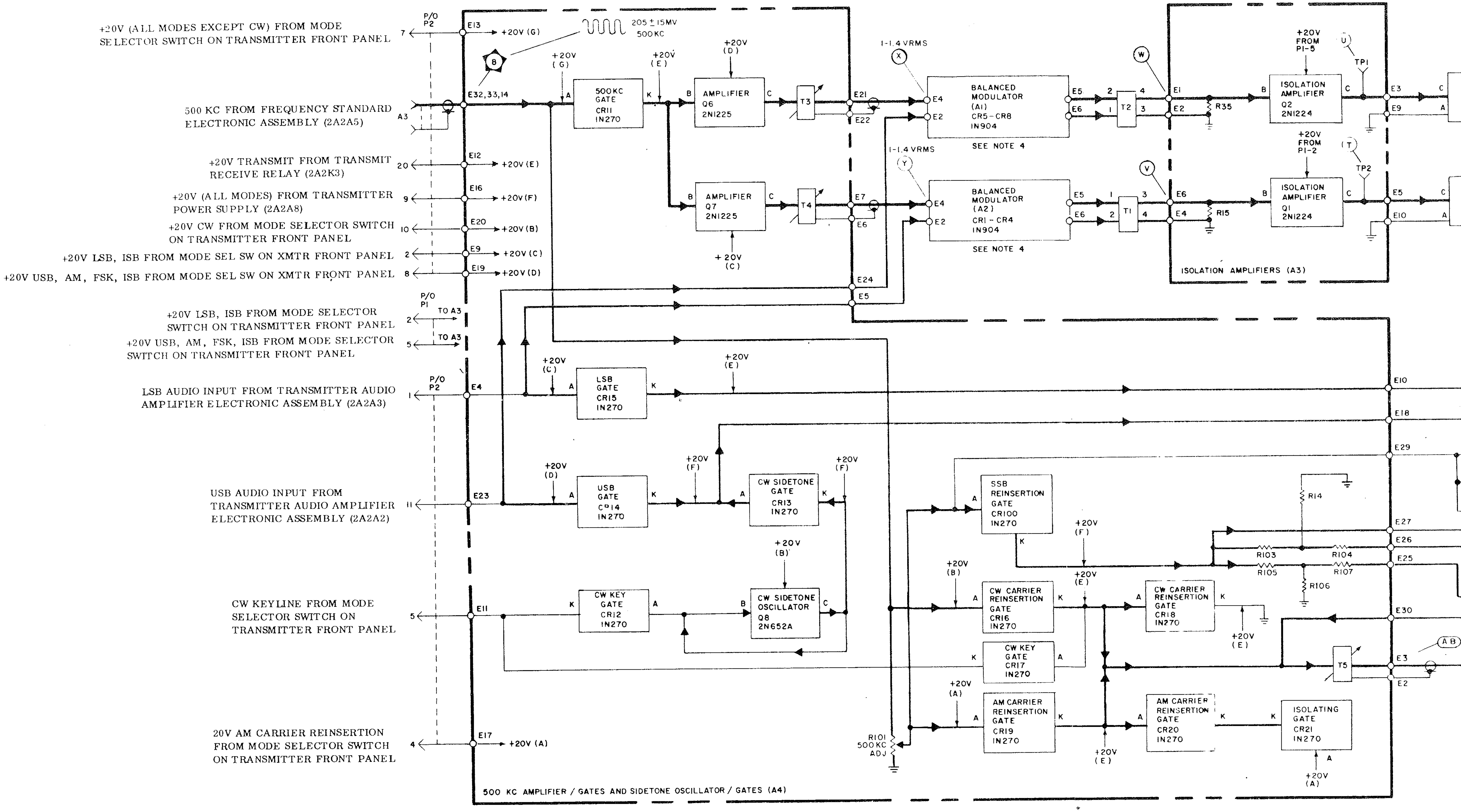
Figure 4-58 Frequency Standard Electronic Assembly, Servicing Block Diagram



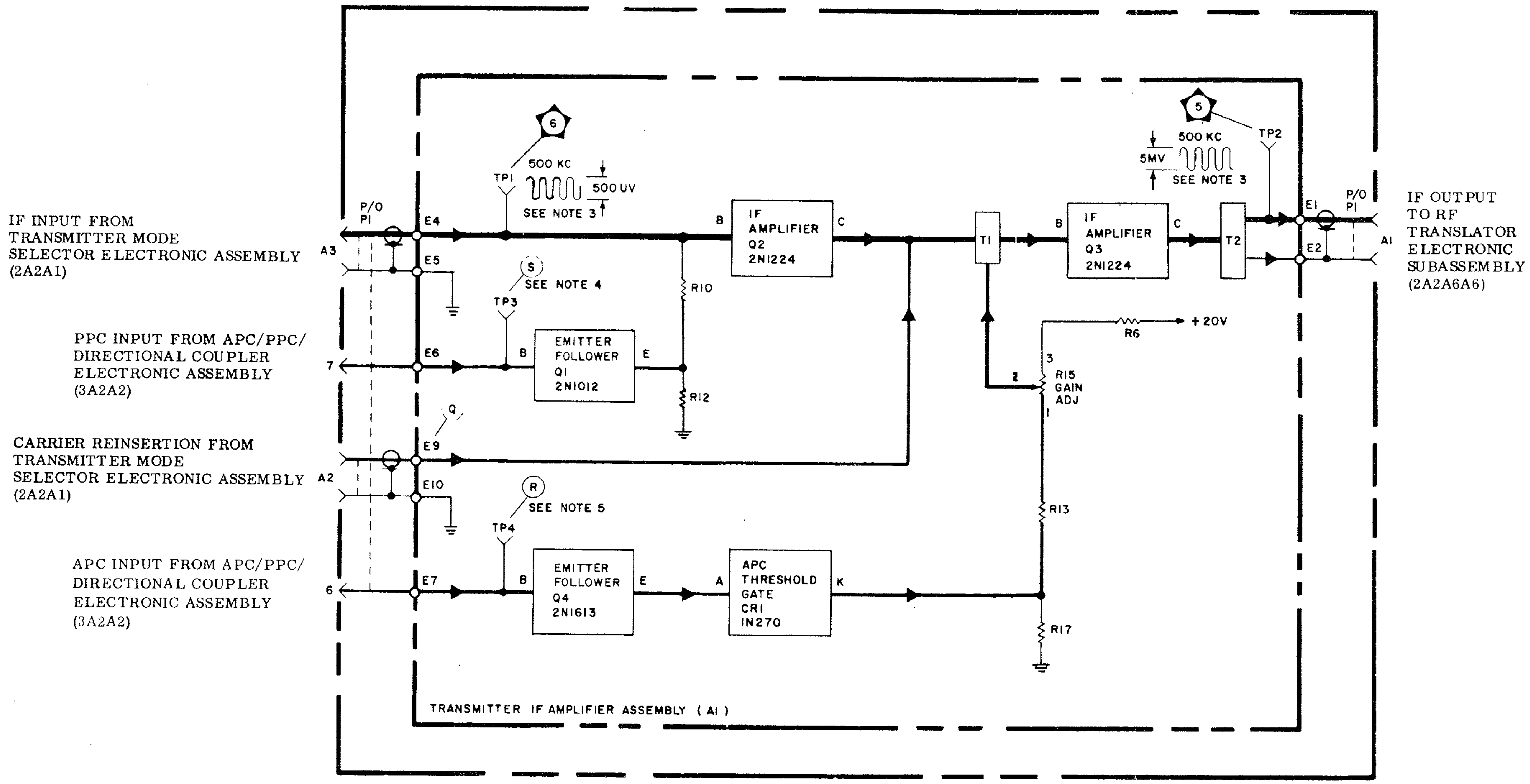
NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATHS; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.
2. LETTERS OUTSIDE TRANSISTOR AND DIODE BLOCKS INDICATE ELEMENT. NUMBERS ON TRANSFORMERS INDICATE TERMINAL NUMBERS.
3. THE INPUT AT P1-2, 5 AND P2-2, 4, 7, 8, 9, 10, AND 20 ARE GATE CONTROL SIGNALS. THE APPLICATIONS OF THESE ARE INDICATED ON THIS DIAGRAM BY --►
4. SEE FIGURE 5-6 FOR A DETAILED SCHEMATIC OF BALANCED MODULATOR.
5. ALL VOLTAGES ARE DC UNLESS OTHERWISE SPECIFIED.
6. REF. DESIG. PREFIX 2A2A1.

Fig. 4-59. Mode Selector Electronic Assembly, Servicing Block Diagram



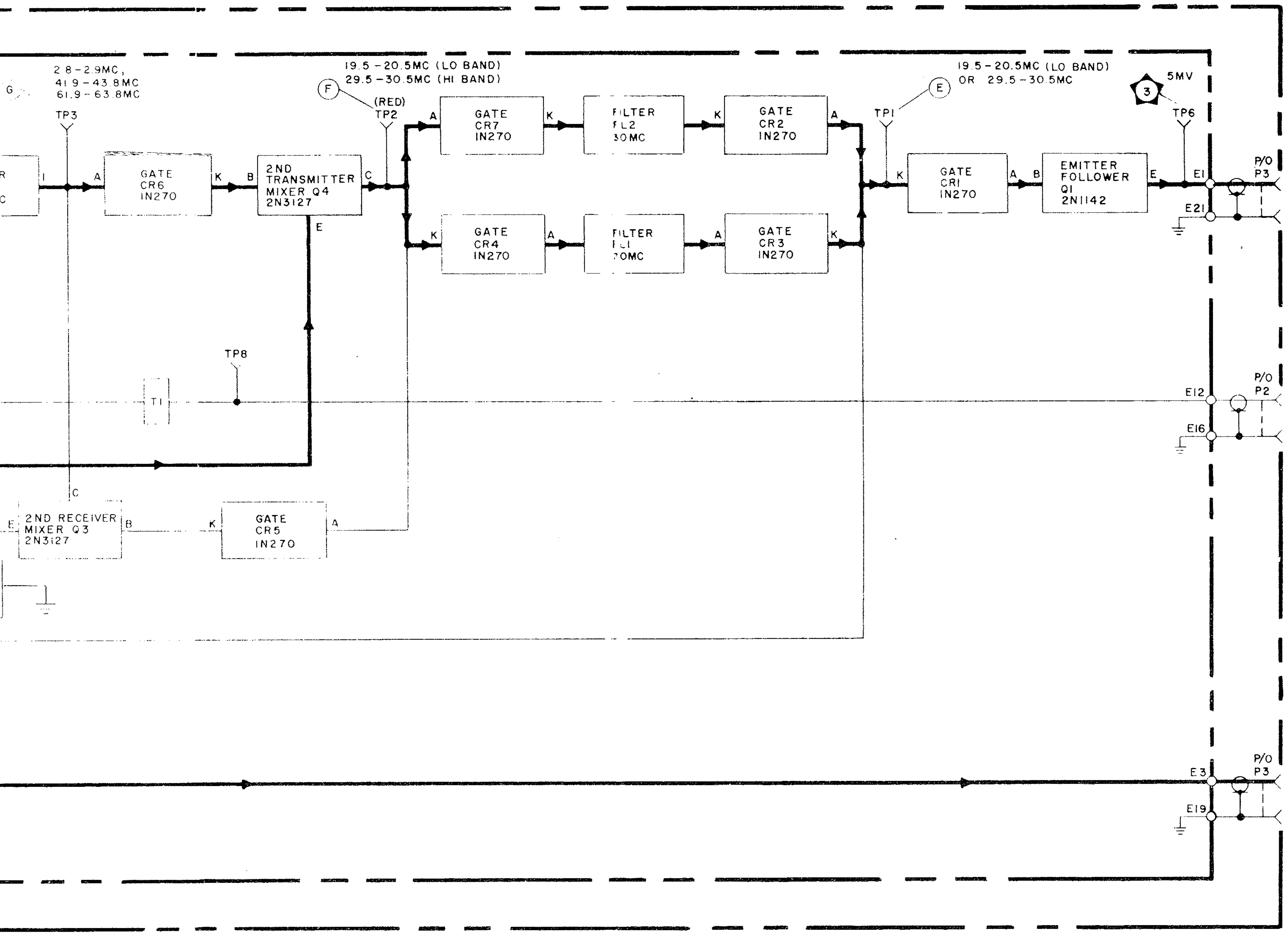
+20V (ALL MODES EXCEPT CW) FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
500 KC FROM FREQUENCY STANDARD ELECTRONIC ASSEMBLY (2A2A5)
+20V TRANSMIT FROM TRANSMIT RECEIVE RELAY (2A2K3)
+20V (ALL MODES) FROM TRANSMITTER POWER SUPPLY (2A2A8)
+20V CW FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
+20V LSB, ISB FROM MODE SEL SW ON XMTR FRONT PANEL
+20V USB, AM, FSK, ISB FROM MODE SEL SW ON XMTR FRONT PANEL
+20V LSB, ISB FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
+20V USB, AM, FSK, ISB FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
LSB AUDIO INPUT FROM TRANSMITTER AUDIO AMPLIFIER ELECTRONIC ASSEMBLY (2A2A3)
USB AUDIO INPUT FROM TRANSMITTER AUDIO AMPLIFIER ELECTRONIC ASSEMBLY (2A2A2)
CW KEYLINE FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
20V AM CARRIER REINSERTION FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
P/O P2
P/O P1
TO A3
205 ± 15MV 500KC
500KC GATE CR11 1N270
AMPLIFIER Q6 2N1225
AMPLIFIER Q7 2N1225
T3
T4
1-1.4 VRMS
BALANCED MODULATOR (A1) CR5-CR8 1N904
BALANCED MODULATOR (A2) CR1-CR4 1N904
SEE NOTE 4
T2
T1
R35
R15
+20V FROM P1-5
+20V FROM P1-2
ISOLATION AMPLIFIER Q2 2N1224
ISOLATION AMPLIFIER Q1 2N1224
TP1
TP2
ISOLATION AMPLIFIERS (A3)
LSB GATE CR15 1N270
USB GATE CR14 1N270
CW SIDETONE GATE CR13 1N270
CW KEY GATE CR12 1N270
CW SIDETONE OSCILLATOR Q8 2N652A
SSB REINSERTION GATE CR100 1N270
CW CARRIER REINSERTION GATE CR16 1N270
CW KEY GATE CR17 1N270
AM CARRIER REINSERTION GATE CR19 1N270
CW CARRIER REINSERTION GATE CR18 1N270
AM CARRIER REINSERTION GATE CR20 1N270
ISOLATING GATE CR21 1N270
R14
R103
R104
R105
R107
R106
R101 500KC ADJ
T5
500 KC AMPLIFIER / GATES AND SIDETONE OSCILLATOR / GATES (A4)



NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATHS; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.
2. LETTERS OUTSIDE TRANSISTOR AND DIODE BLOCKS INDICATE ELEMENT.
3. AM MODE, CARRIER, WITH NO MODULATION.
4. VOLTAGE AT THIS POINT (TP3) IS A FUNCTION OF THE DRIVE LEVEL TO THE OUTPUT STAGE OF THE AM-3007/URT. UNDER CONDITION OF NO DRIVE OR INSUFFICIENT DRIVE TO DRAW GRID CURRENT IN THE FINAL STAGE, (TP3) IS NOMINALLY AT 5V DC. APPLICATION OF MODULATION TO THE FINAL STAGE, OF SUFFICIENT AMPLITUDE TO DRAW GRID CURRENT, WILL SUPERIMPOSE GRID CURRENT PULSES ON THE LINE.
5. TP4 WILL SHOW 0V DC UNLESS AM-3007/URT HAS RF OUTPUT. IN AM MODE, WITH 25W RF OUTPUT FROM AM-3007/URT, TP4 WILL SHOW +5.2 TO +5.8V DC.
6. WAVEFORMS RECORDED USING OSCILLOSCOPE AN/USM-105A.
7. ALL VOLTAGES DC UNLESS OTHERWISE SPECIFIED.
8. REF. DESIG. PREFIX 2A2A12.

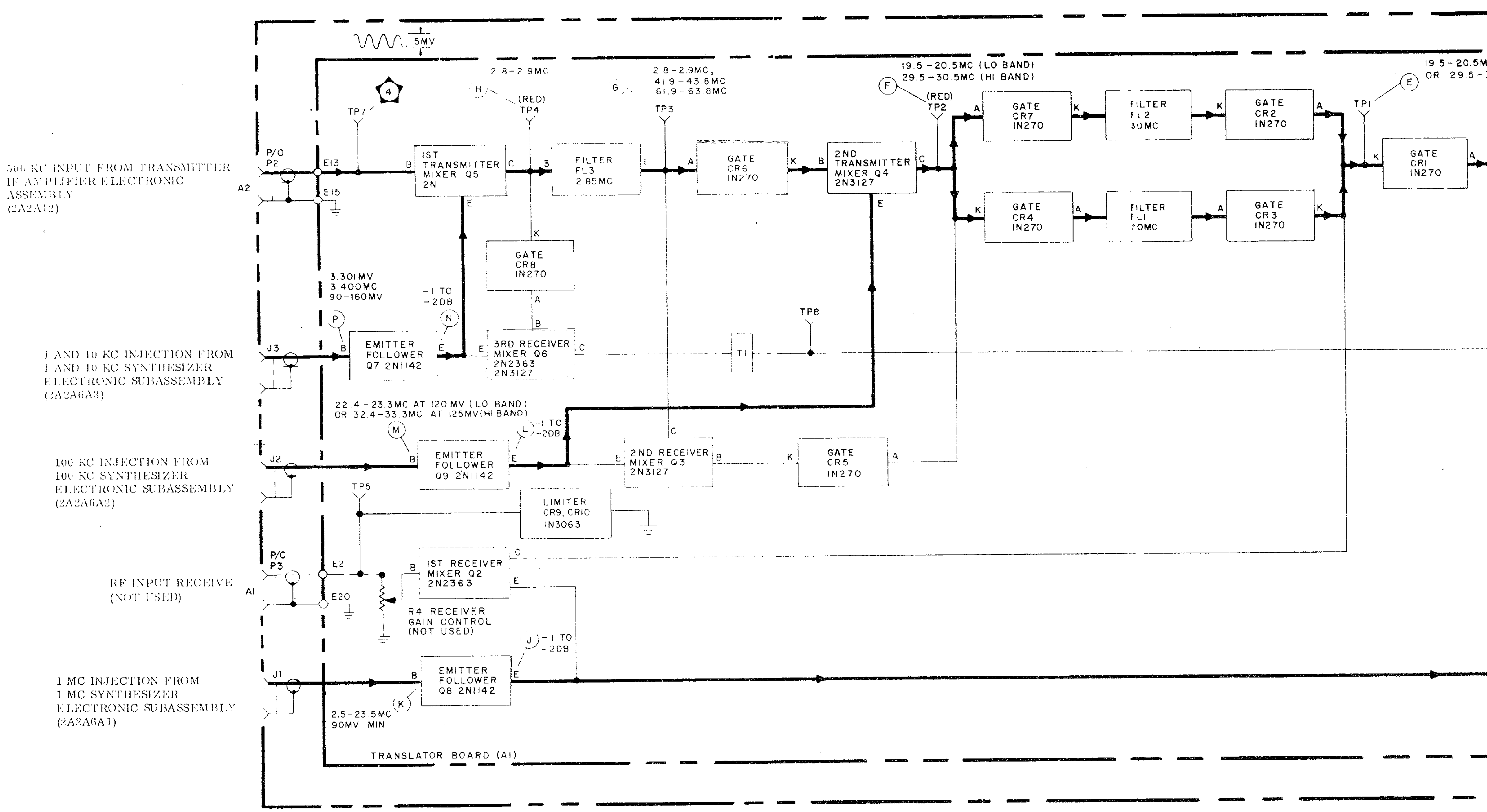
Figure 4-60. IF. Amplifier Electronic Assembly, Servicing Block Diagram



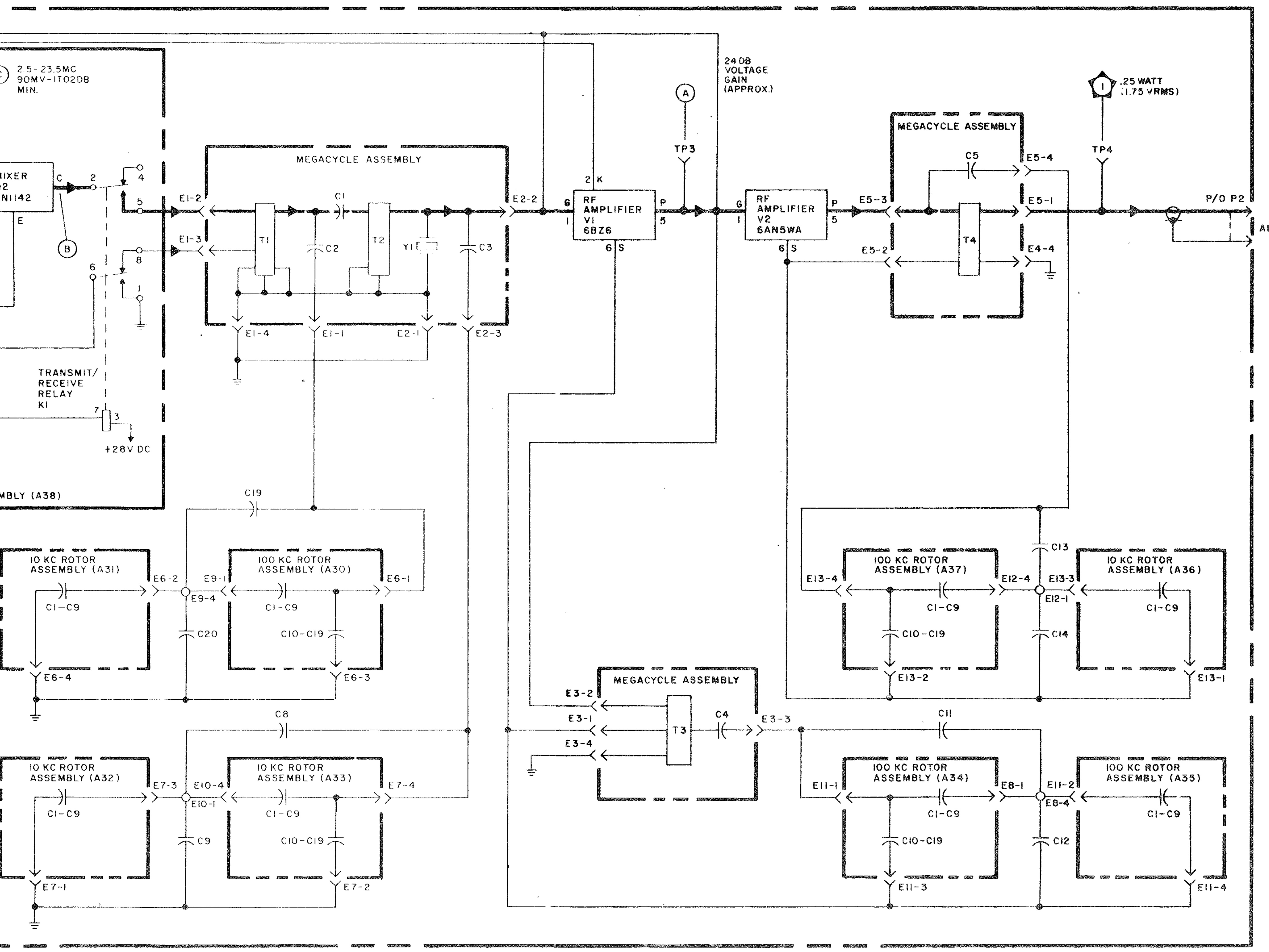
NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATHS; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.
2. LETTERS OUTSIDE TRANSISTOR AND DIODE BLOCKS INDICATE ELEMENTS.
3. REF. DESIG. PREFIX 2A2A6A6.

Figure 4-61. RF Translator Electronic Subassembly, Servicing Block Diagram



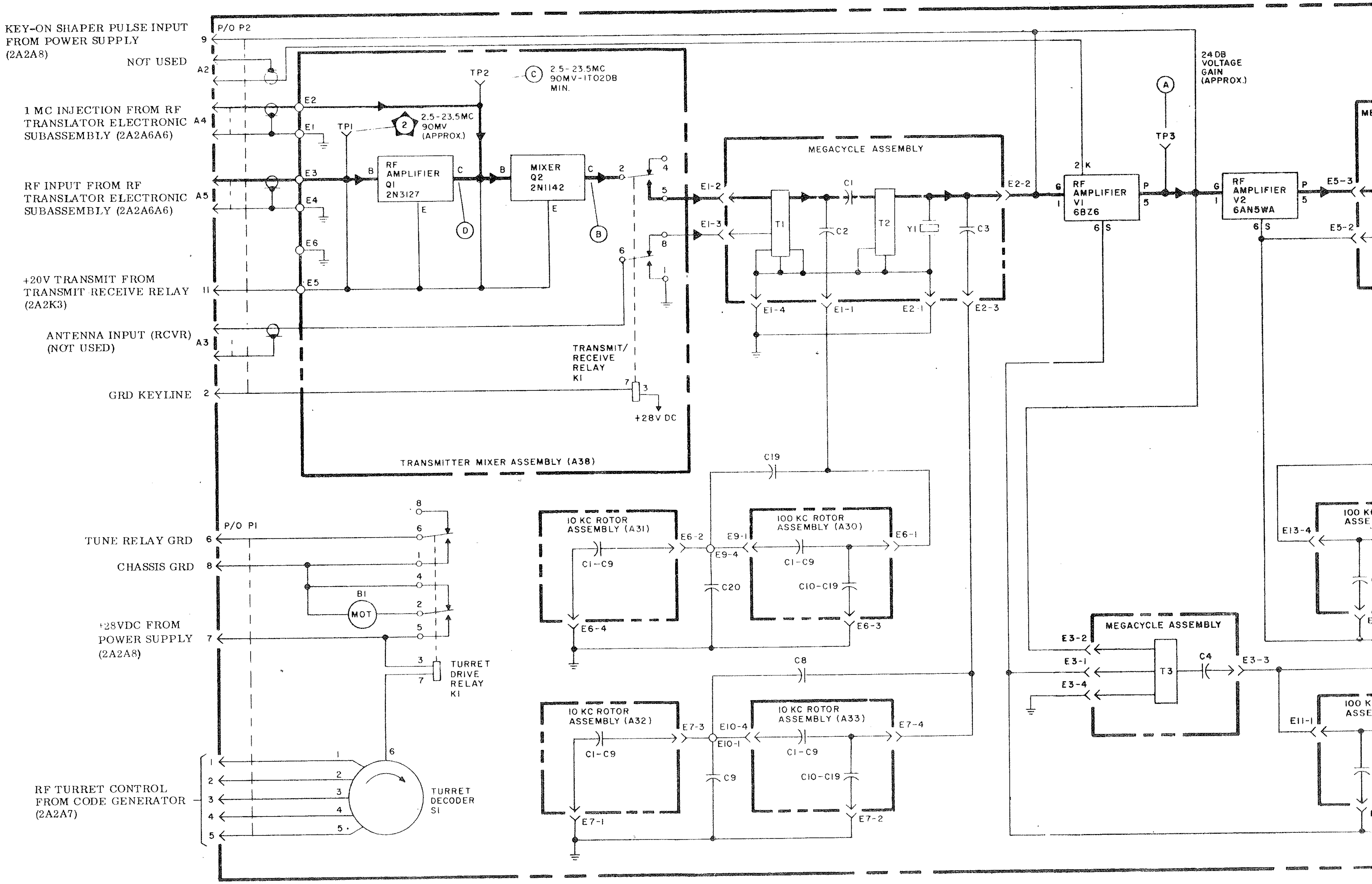
500 KC INPUT FROM TRANSMITTER IF AMPLIFIER ELECTRONIC ASSEMBLY (2A2A12)
1 AND 10 KC INJECTION FROM 1 AND 10 KC SYNTHESIZER ELECTRONIC SUBASSEMBLY (2A2A6A3)
100 KC INJECTION FROM 100 KC SYNTHESIZER ELECTRONIC SUBASSEMBLY (2A2A6A2)
RF INPUT RECEIVE (NOT USED)
1 MC INJECTION FROM 1 MC SYNTHESIZER ELECTRONIC SUBASSEMBLY (2A2A6A1)
P/O P2
P/O P3
A2
A1
J3
J2
J1
E13
E15
E2
E20
5MV
TP7
TP4
TP3
TP2
TP1
TP5
TP8
(RED)
2.8-2.9MC
2.8-2.9MC, 41.9-43.8MC 61.9-63.8MC
19.5-20.5MC (LO BAND) 29.5-30.5MC (HI BAND)
IST TRANSMITTER MIXER Q5 2N
FILTER FL3 2.85MC
GATE CR6 IN270
2ND TRANSMITTER MIXER Q4 2N3127
GATE CR7 IN270
FILTER FL2 30MC
GATE CR2 IN270
GATE CR4 IN270
FILTER FL1 70MC
GATE CR3 IN270
GATE CR1 IN270
GATE CR8 IN270
3.301MV 3.400MC 90-160MV
-1 TO -2DB
EMITTER FOLLOWER Q7 2N1142
3RD RECEIVER MIXER Q6 2N2363 2N3127
T1
22.4-23.3MC AT 120 MV (LO BAND) OR 32.4-33.3MC AT 125MV (HI BAND)
EMITTER FOLLOWER Q9 2N1142
2ND RECEIVER MIXER Q3 2N3127
GATE CR5 IN270
LIMITER CR9, CR10 IN3063
IST RECEIVER MIXER Q2 2N2363
R4 RECEIVER GAIN CONTROL (NOT USED)
EMITTER FOLLOWER Q8 2N1142
2.5-23.5MC 90MV MIN
TRANSLATOR BOARD (A1)



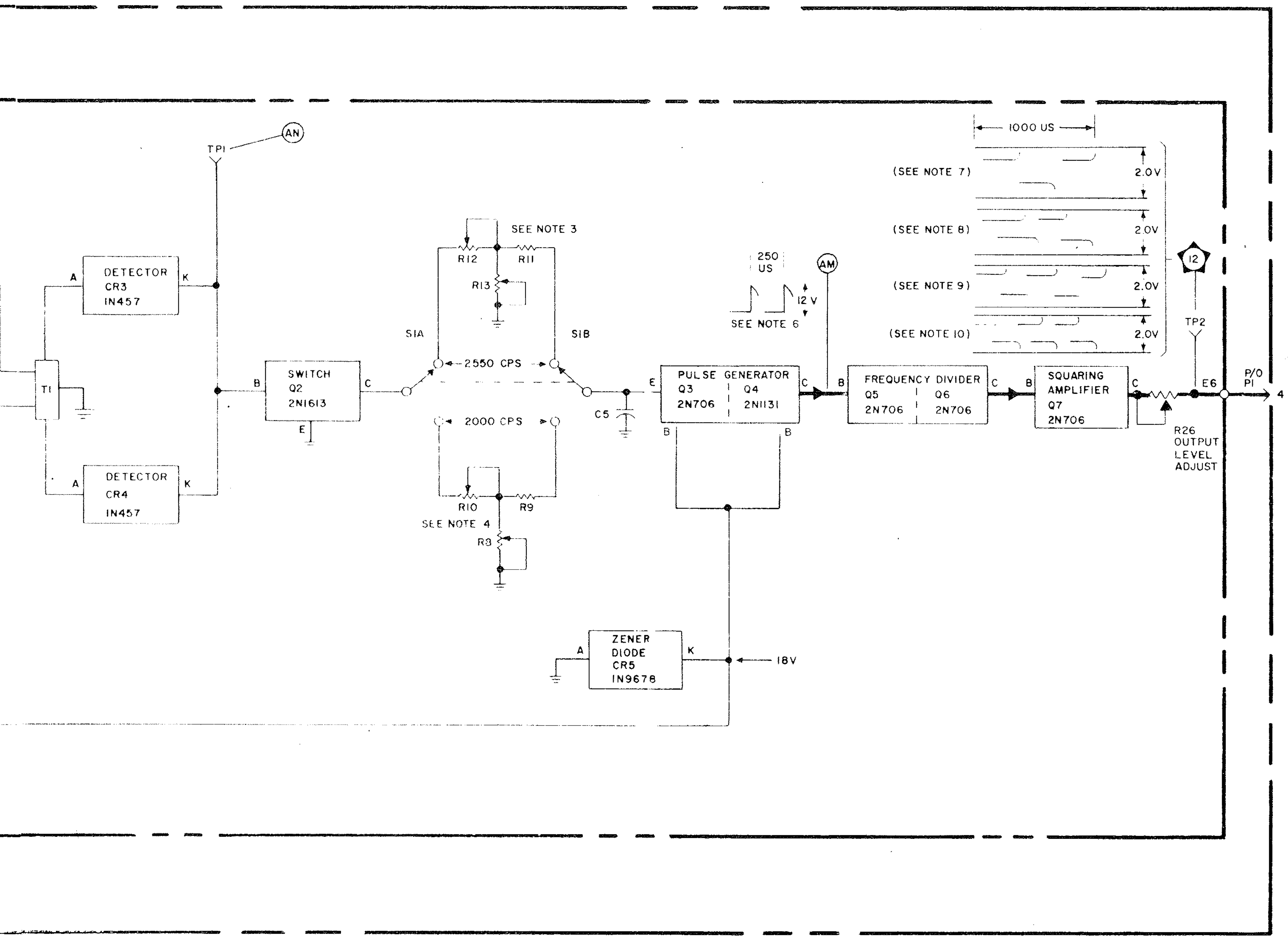
NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATHS; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.
2. LETTERS OUTSIDE TRANSISTOR AND TUBE BLOCKS INDICATE ELEMENT.
3. ALL VOLTAGES ARE DC UNLESS OTHERWISE SPECIFIED.
4. REF. DESIG. PREFIX 2A2A4.

Figure 4-62. RF Amplifier Electronic Assembly, Servicing Block Diagram



KEY-ON SHAPER PULSE INPUT FROM POWER SUPPLY (2A2A8)
NOT USED
1 MC INJECTION FROM RF TRANSLATOR ELECTRONIC SUBASSEMBLY (2A2A6A6)
RF INPUT FROM RF TRANSLATOR ELECTRONIC SUBASSEMBLY (2A2A6A6)
+20V TRANSMIT FROM TRANSMIT RECEIVE RELAY (2A2K3)
ANTENNA INPUT (RCVR) (NOT USED)
GRD KEYLINE
TUNE RELAY GRD
CHASSIS GRD
+28VDC FROM POWER SUPPLY (2A2A8)
RF TURRET CONTROL FROM CODE GENERATOR (2A2A7)
P/O P2
P/O P1
TP2
2.5-23.5MC 90MV-1TO2DB MIN.
TP1
2.5-23.5MC 90MV (APPROX.)
RF AMPLIFIER Q1 2N3127
MIXER Q2 2N1142
TRANSMIT/ RECEIVE RELAY K1
+28V DC
TRANSMITTER MIXER ASSEMBLY (A38)
MEGACYCLE ASSEMBLY
24 DB VOLTAGE GAIN (APPROX.)
TP3
RF AMPLIFIER V1 6BZ6
RF AMPLIFIER V2 6AN5WA
10 KC ROTOR ASSEMBLY (A31)
100 KC ROTOR ASSEMBLY (A30)
10 KC ROTOR ASSEMBLY (A32)
10 KC ROTOR ASSEMBLY (A33)
C1-C9
C10-C19
C19
C20
C8
C9
C4
T3
MOT
TURRET DRIVE RELAY K1
TURRET DECODER S1



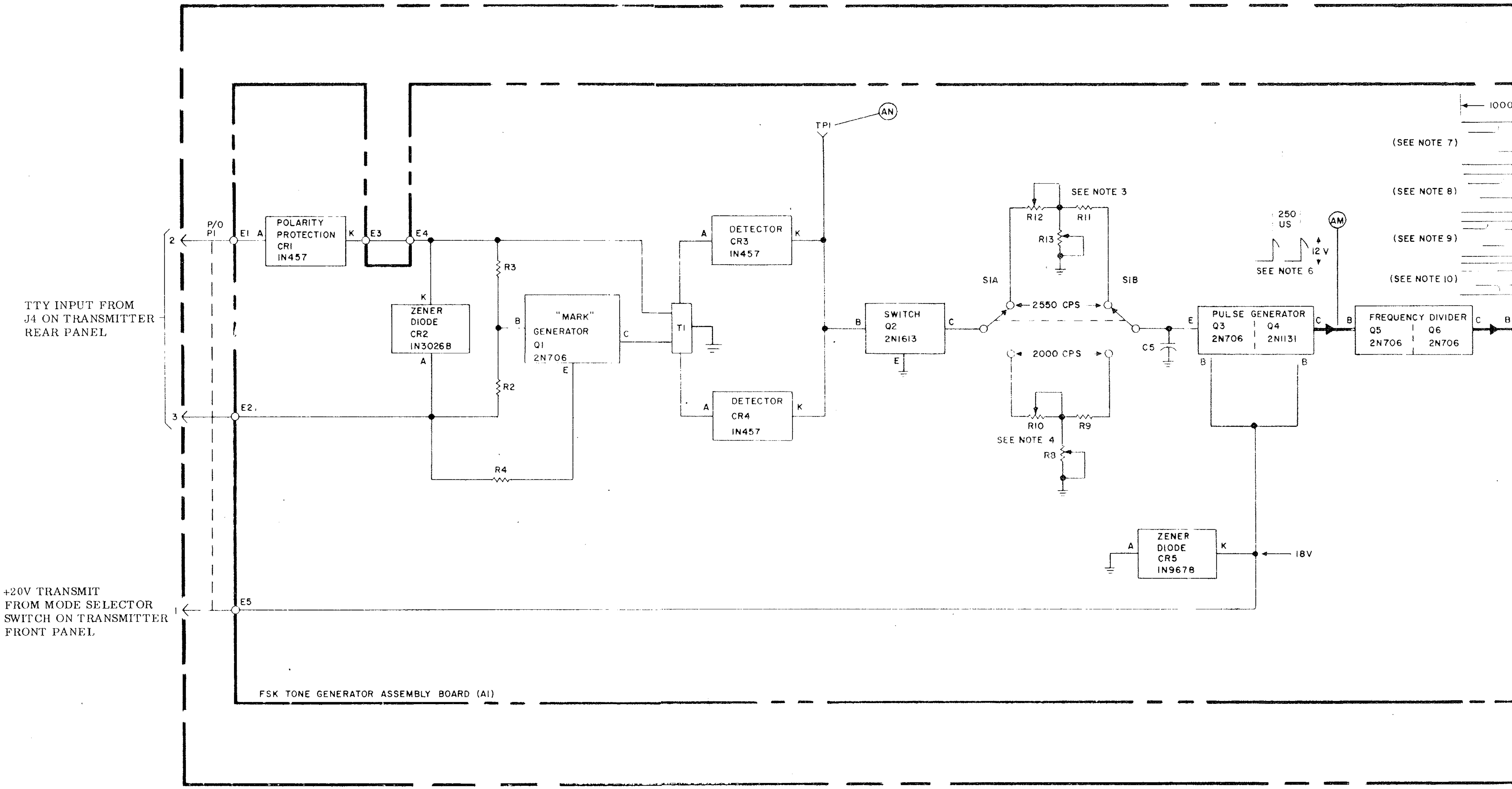
TTY TONE OUTPUT TO MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL

NOTES:

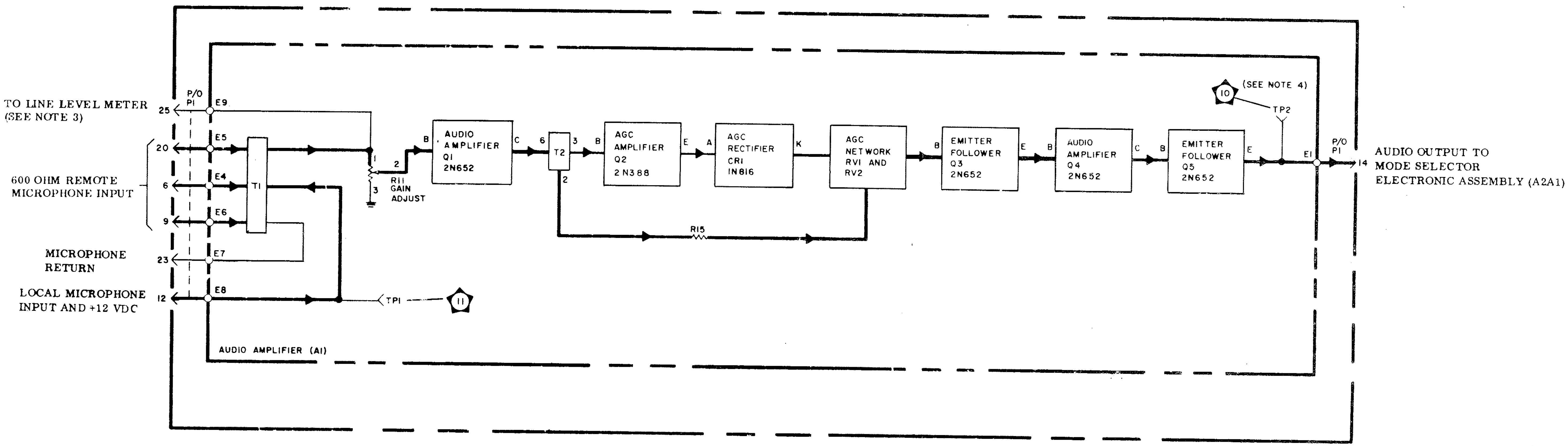
1. HEAVY LINES INDICATE MAIN SIGNAL PATHS.
2. LETTERS OUTSIDE OF TRANSISTOR AND DIODE BLOCKS INDICATE ELEMENTS.
3. R-12 ADJUSTED FOR 2550 CPS CENTER FREQ "MARK" (2975 CPS)
   R-13 ADJUSTED FOR 2550 CPS CENTER FREQ "SPACE" (2125 CPS).
4. R-10 ADJUSTED FOR 2000 CPS CENTER FREQ "MARK" (2425 CPS)
   R-8 ADJUSTED FOR 2000 CPS CENTER FREQ "SPACE" (1575 CPS).
5. WAVEFORMS RECORDED ON OSCILLOSCOPE AN/USM-105A.
6. COLLECTOR OF Q4 TTY FUNCTION: SPACE
   OSCILLOSCOPE SETTING: 0.5 V/CM X 10, 100 USEC/CM.

   NOTES 7, 8, 9, 10 APPLY TO WAVEFORM AT TP2.
   OSCILLOSCOPE SETTING: 0.5V/CM X 10, 100 USEC/CM.
7. FREQ - 1575 CPS, FUNCTION - SPACE, CENTER FREQ - 2000 CPS.
8. FREQ - 2125 CPS, FUNCTION - SPACE, CENTER FREQ - 2550 CPS.
9. FREQ - 2425 CPS, FUNCTION - MARK, CENTER FREQ - 2000 CPS.
10. FREQ - 2975 CPS, FUNCTION - MARK, CENTER FREQ - 2550 CPS.
11. REF. DESIG. PREFIX 2A2A9.

Figure 4-63. FSK Tone Generator Electronic Assembly, Servicing Block Diagram



TTY INPUT FROM
J4 ON TRANSMITTER
REAR PANEL
+20V TRANSMIT
FROM MODE SELECTOR
SWITCH ON TRANSMITTER
FRONT PANEL
P/O P1
E1
E2
E3
E4
E5
POLARITY PROTECTION CR1 1N457
ZENER DIODE CR2 1N3026B
R3
R2
R4
"MARK" GENERATOR Q1 2N706
T1
TP1
AN
DETECTOR CR3 1N457
DETECTOR CR4 1N457
SWITCH Q2 2N1613
S1A
S1B
2550 CPS
2000 CPS
R12
R11
R13
SEE NOTE 3
R10
R9
SEE NOTE 4
R8
C5
250 US
12 V
SEE NOTE 6
AM
PULSE GENERATOR Q3 2N706 Q4 2N1131
FREQUENCY DIVIDER Q5 2N706 Q6 2N706
ZENER DIODE CR5 1N9678
18V
(SEE NOTE 7)
(SEE NOTE 8)
(SEE NOTE 9)
(SEE NOTE 10)
FSK TONE GENERATOR ASSEMBLY BOARD (A1)



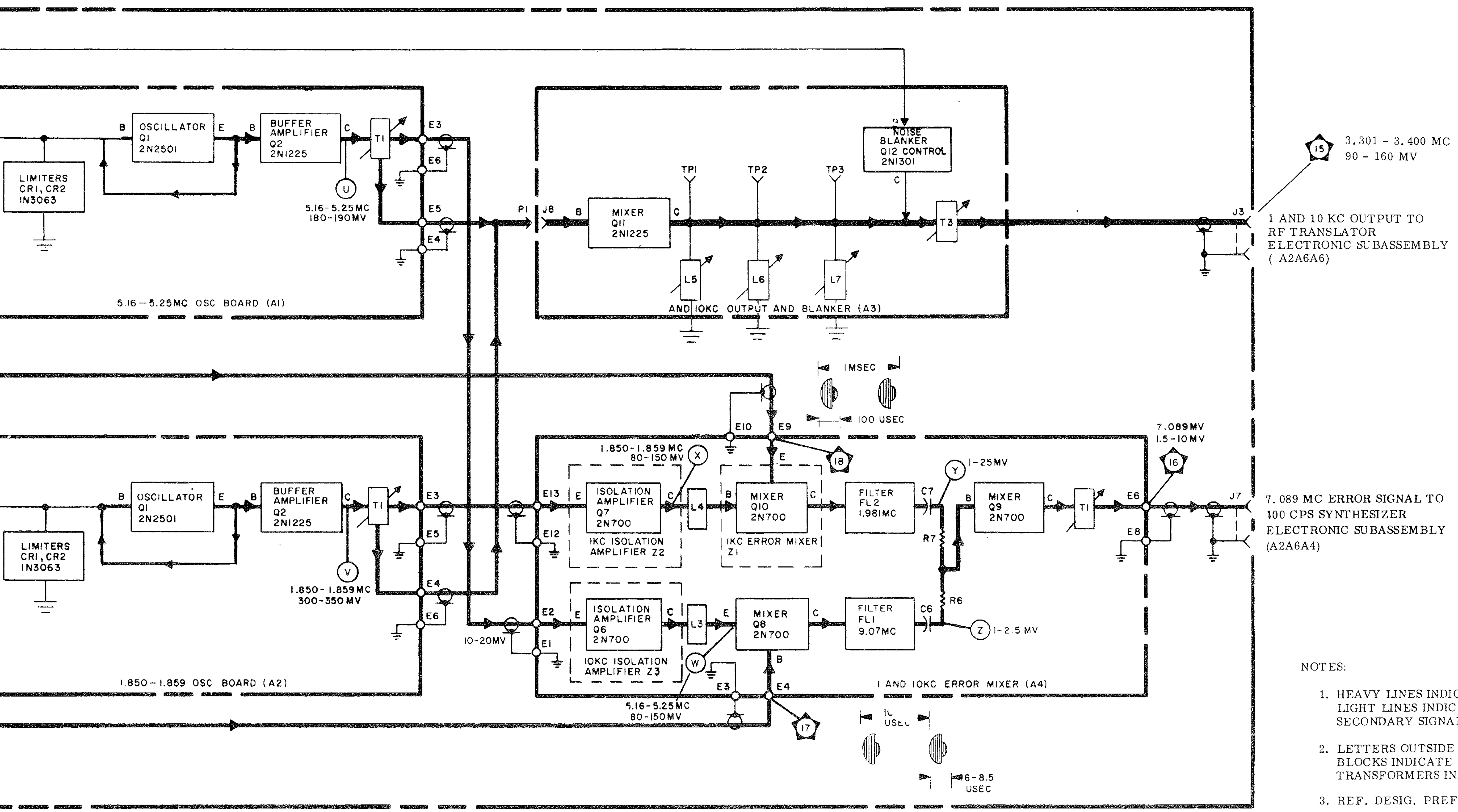
CAUTION

WHEN MAKING RESISTANCE CHECKS AT SEMI-CONDUCTOR DEVICES, USE ONLY THE HIGHER SCALES OF THE MULTI-METER SO AS TO AVOID UNINTENTIONAL DAMAGE TO THE SEMI-CONDUCTOR DEVICE DUE TO THE METERS INTERNAL VOLTAGE

NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATHS; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.
2. LETTERS OUTSIDE TRANSISTOR AND DIODE BLOCKS INDICATE ELEMENT. NUMBERS ON TRANSFORMERS INDICATE TERMINAL NUMBERS.
3. DURING LSB OPERATION THE AUDIO LEVEL AT P1-25 IS OBSERVED ON THE LSB LINE LEVEL METER (M1). DURING USB OPERATION THE AUDIO LEVEL AT P1-25 IS OBSERVED ON THE USB LINE LEVEL METER (M2).
4. NOMINAL OUTPUT 100MV RMS - SINGLE TONE 150MV INPUT AT PINS 20 AND 9 OF CONNECTOR P1.
5. REF. DESIG. PREFIX A2A2 AND A2A3.

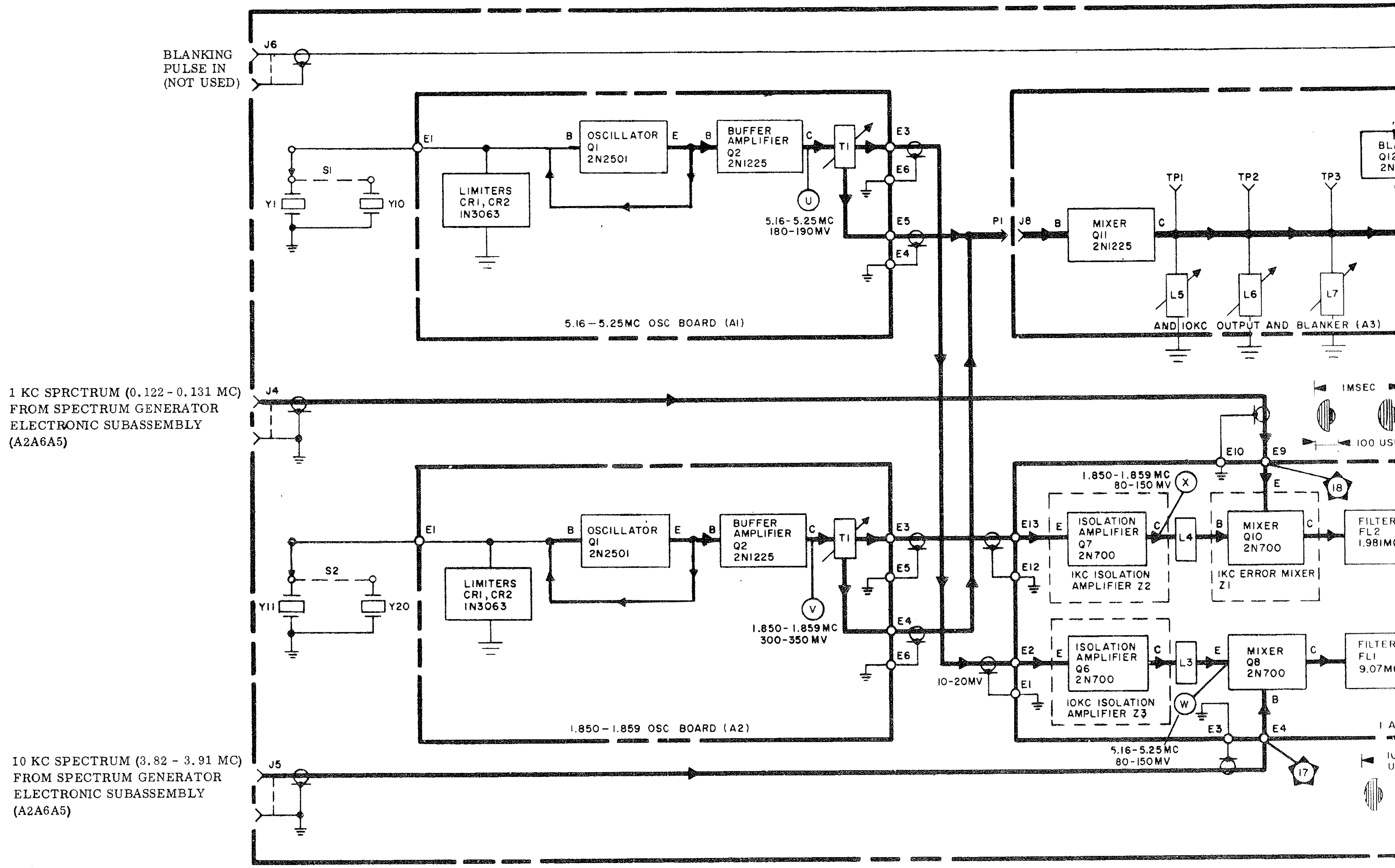
Figure 4-64. Audio Amplifier Electronic Assembly, Servicing Block Diagram



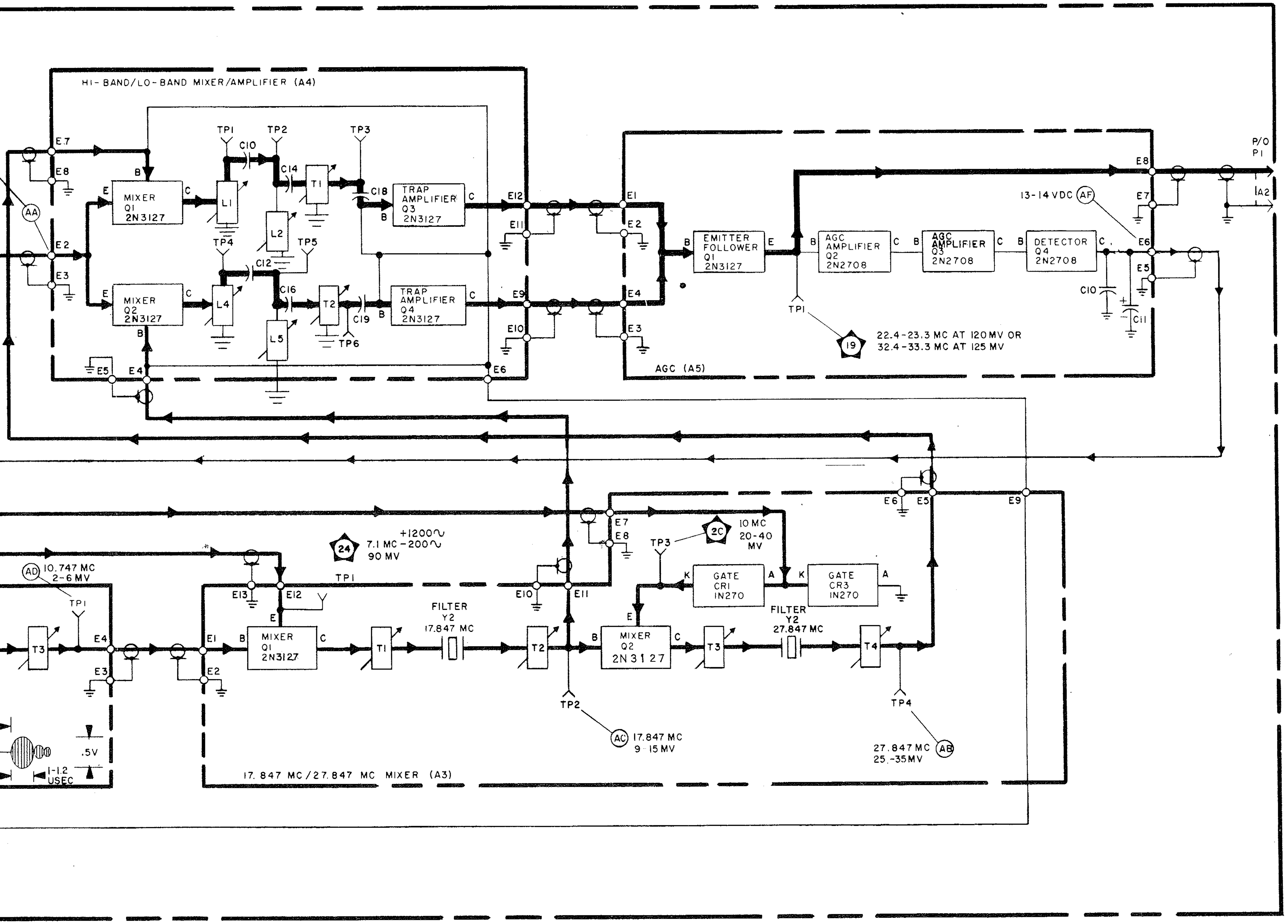
NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATHS; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.
2. LETTERS OUTSIDE TRANSISTOR AND DIODE BLOCKS INDICATE ELEMENTS. NUMBERS ON TRANSFORMERS INDICATE TERMINAL NUMBERS.
3. REF. DESIG. PREFIX A2A6A3

Figure 4-65 1 and 10 KC Synthesizer Electronic Subassembly, Servicing Block Diagram



BLANKING PULSE IN (NOT USED)
J6
1 KC SPRCTRUM (0.122 - 0.131 MC) FROM SPECTRUM GENERATOR ELECTRONIC SUBASSEMBLY (A2A6A5)
J4
10 KC SPECTRUM (3.82 - 3.91 MC) FROM SPECTRUM GENERATOR ELECTRONIC SUBASSEMBLY (A2A6A5)
J5
OSCILLATOR Q1 2N2501
BUFFER AMPLIFIER Q2 2N1225
LIMITERS CR1, CR2 1N3063
S1
Y1
Y10
S2
Y11
Y20
T1
5.16-5.25MC 180-190MV
5.16 — 5.25MC OSC BOARD (A1)
1.850-1.859MC 300-350MV
1.850 - 1.859 OSC BOARD (A2)
10-20MV
P1
J8
MIXER Q11 2N1225
TP1
TP2
TP3
L5
L6
L7
AND 10KC OUTPUT AND BLANKER (A3)
1MSEC
100 USE
1.850-1.859 MC 80-150 MV
ISOLATION AMPLIFIER Q7 2N700
1KC ISOLATION AMPLIFIER Z2
L4
MIXER Q10 2N700
1KC ERROR MIXER Z1
ISOLATION AMPLIFIER Q6 2N700
10KC ISOLATION AMPLIFIER Z3
L3
MIXER Q8 2N700
5.16-5.25MC 80-150MV
FILTER FL2 1.981MC
FILTER FL1 9.07MC

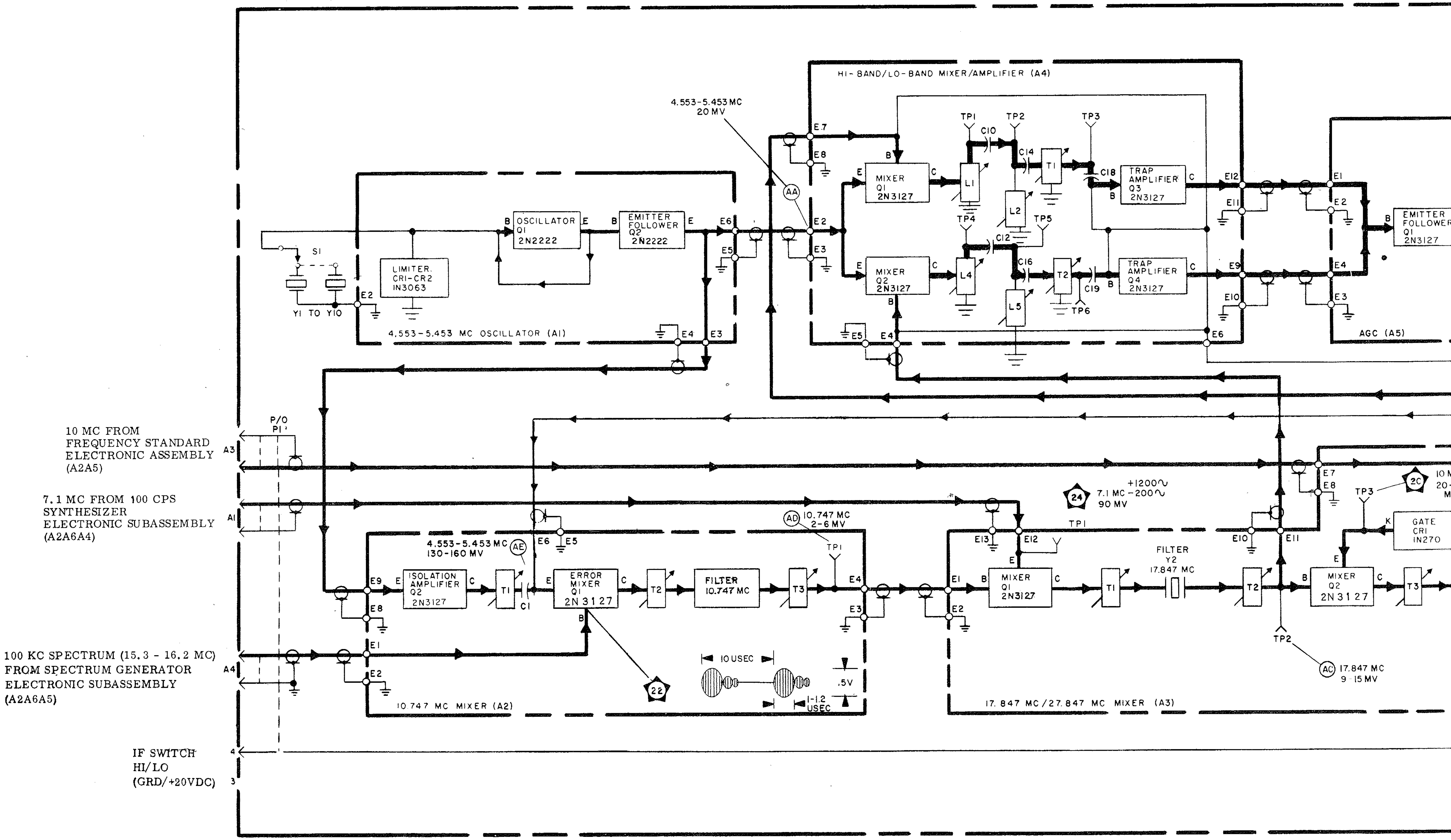


100 KC OUTPUT TO
RF TRANSLATOR
ELECTRONIC ASSEMBLY
(A2A6A6)

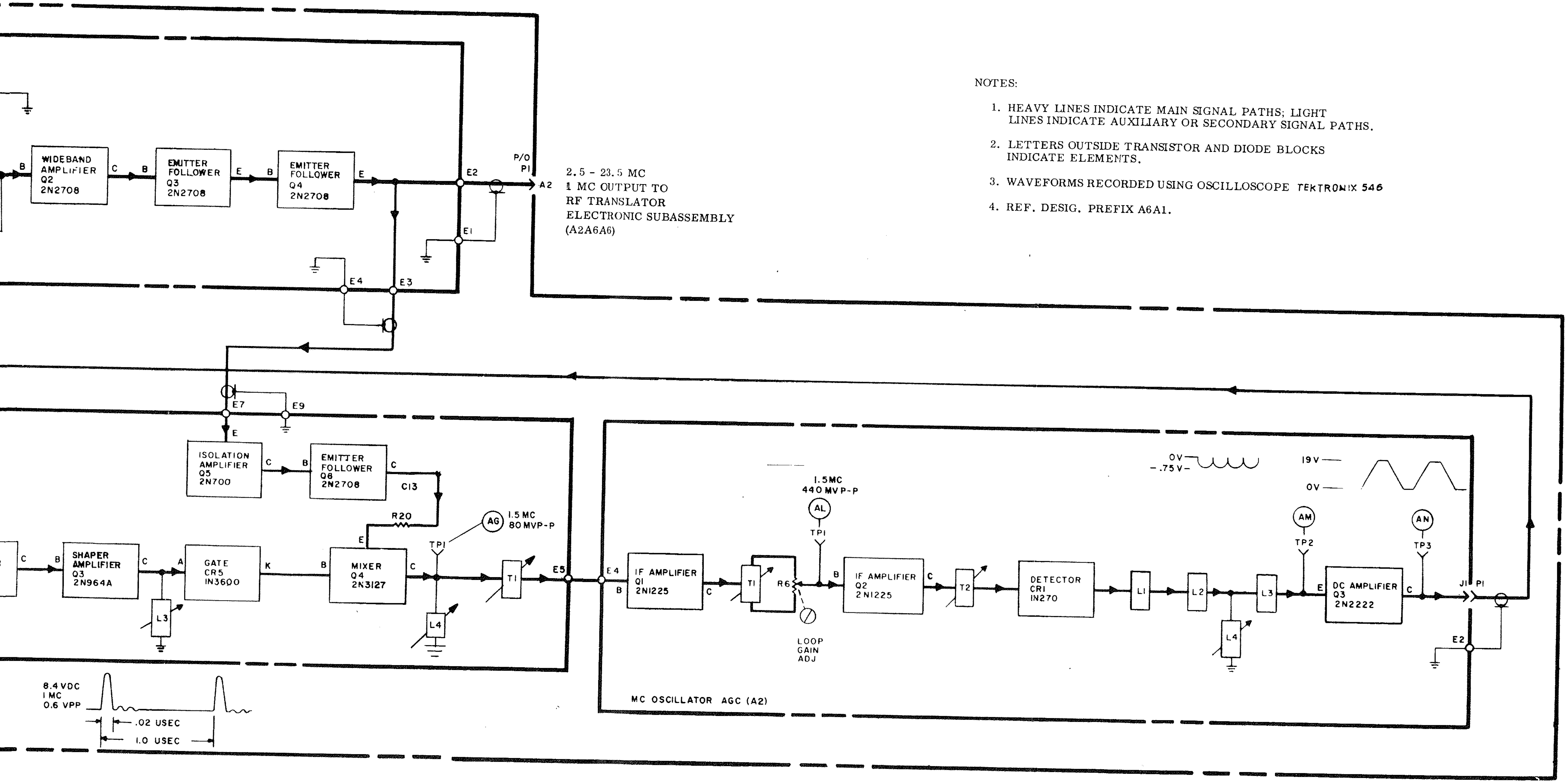
NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATHS; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.
2. LETTERS OUTSIDE TRANSISTOR AND DIODE BLOCKS INDICATE ELEMENTS.
3. REF. DESIG. PREFIX A2A6A2.

Figure 4-66 100 KC Synthesizer Electronic Subassembly, Servicing Block Diagram



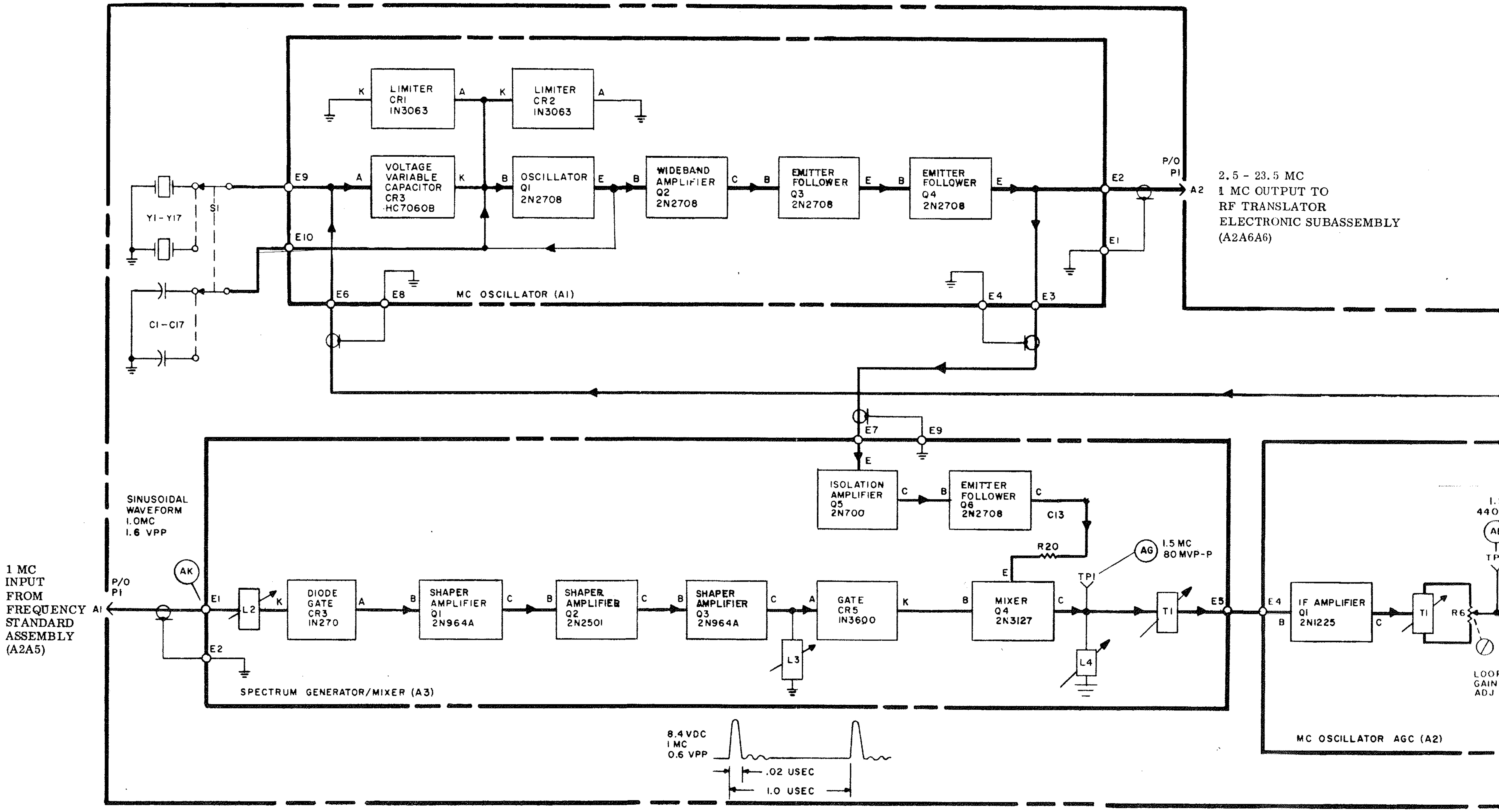
HI-BAND/LO-BAND MIXER/AMPLIFIER (A4)
4.553-5.453 MC
20 MV
MIXER
Q1
2N3127
MIXER
Q2
2N3127
TRAP
AMPLIFIER
Q3
2N3127
TRAP
AMPLIFIER
Q4
2N3127
EMITTER
FOLLOWER
Q1
2N3127
AGC (A5)
OSCILLATOR
Q1
2N2222
EMITTER
FOLLOWER
Q2
2N2222
LIMITER
CR1-CR2
IN3063
S1
Y1 TO Y10
4.553-5.453 MC OSCILLATOR (A1)
P/O
P1
10 MC FROM
FREQUENCY STANDARD
ELECTRONIC ASSEMBLY
(A2A5)
7.1 MC FROM 100 CPS
SYNTHESIZER
ELECTRONIC SUBASSEMBLY
(A2A6A4)
100 KC SPECTRUM (15.3 - 16.2 MC)
FROM SPECTRUM GENERATOR
ELECTRONIC SUBASSEMBLY
(A2A6A5)
IF SWITCH
HI/LO
(GRD/+20VDC)
4.553-5.453 MC
130-160 MV
ISOLATION
AMPLIFIER
Q2
2N3127
ERROR
MIXER
Q1
2N3127
FILTER
10.747 MC
10.747 MC
2-6 MV
10 USEC
.5V
1-1.2
USEC
10.747 MC MIXER (A2)
+1200∿
7.1 MC -200∿
90 MV
MIXER
Q1
2N3127
FILTER
Y2
17.847 MC
MIXER
Q2
2N3127
GATE
CR1
IN270
17.847 MC
9-15 MV
17.847 MC/27.847 MC MIXER (A3)



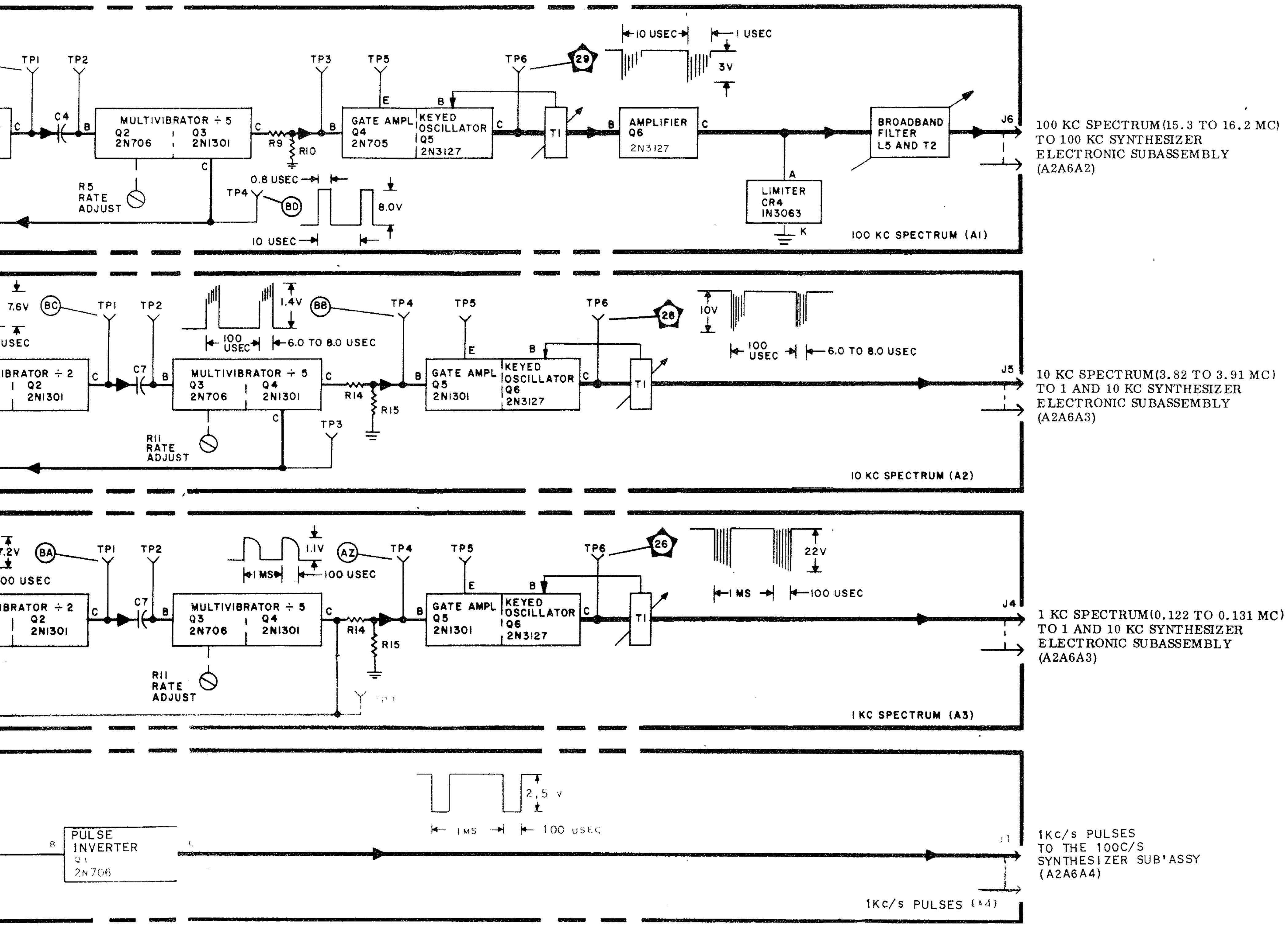
NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATHS; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.
2. LETTERS OUTSIDE TRANSISTOR AND DIODE BLOCKS INDICATE ELEMENTS.
3. WAVEFORMS RECORDED USING OSCILLOSCOPE TEKTRONIX 546
4. REF. DESIG. PREFIX A6A1.

Figure 4-67 1 MC Synthesizer Electronic Subassembly, Servicing Block Diagram



LIMITER CR1 1N3063
LIMITER CR2 1N3063
VOLTAGE VARIABLE CAPACITOR CR3 HC7060B
OSCILLATOR Q1 2N2708
WIDEBAND AMPLIFIER Q2 2N2708
EMITTER FOLLOWER Q3 2N2708
EMITTER FOLLOWER Q4 2N2708
Y1 - Y17
S1
C1 - C17
MC OSCILLATOR (A1)
P/O P1
2.5 - 23.5 MC
1 MC OUTPUT TO
RF TRANSLATOR
ELECTRONIC SUBASSEMBLY
(A2A6A6)
ISOLATION AMPLIFIER Q5 2N700
EMITTER FOLLOWER Q6 2N2708
C13
R20
1.5 MC
80 MVP-P
SINUSOIDAL WAVEFORM
1.0MC
1.6 VPP
1 MC
INPUT
FROM
FREQUENCY
STANDARD
ASSEMBLY
(A2A5)
DIODE GATE CR3 1N270
SHAPER AMPLIFIER Q1 2N964A
SHAPER AMPLIFIER Q2 2N2501
SHAPER AMPLIFIER Q3 2N964A
GATE CR5 1N3600
MIXER Q4 2N3127
SPECTRUM GENERATOR/MIXER (A3)
IF AMPLIFIER Q1 2N1225
LOOP GAIN ADJ
MC OSCILLATOR AGC (A2)
8.4 VDC
1 MC
0.6 VPP
.02 USEC
1.0 USEC

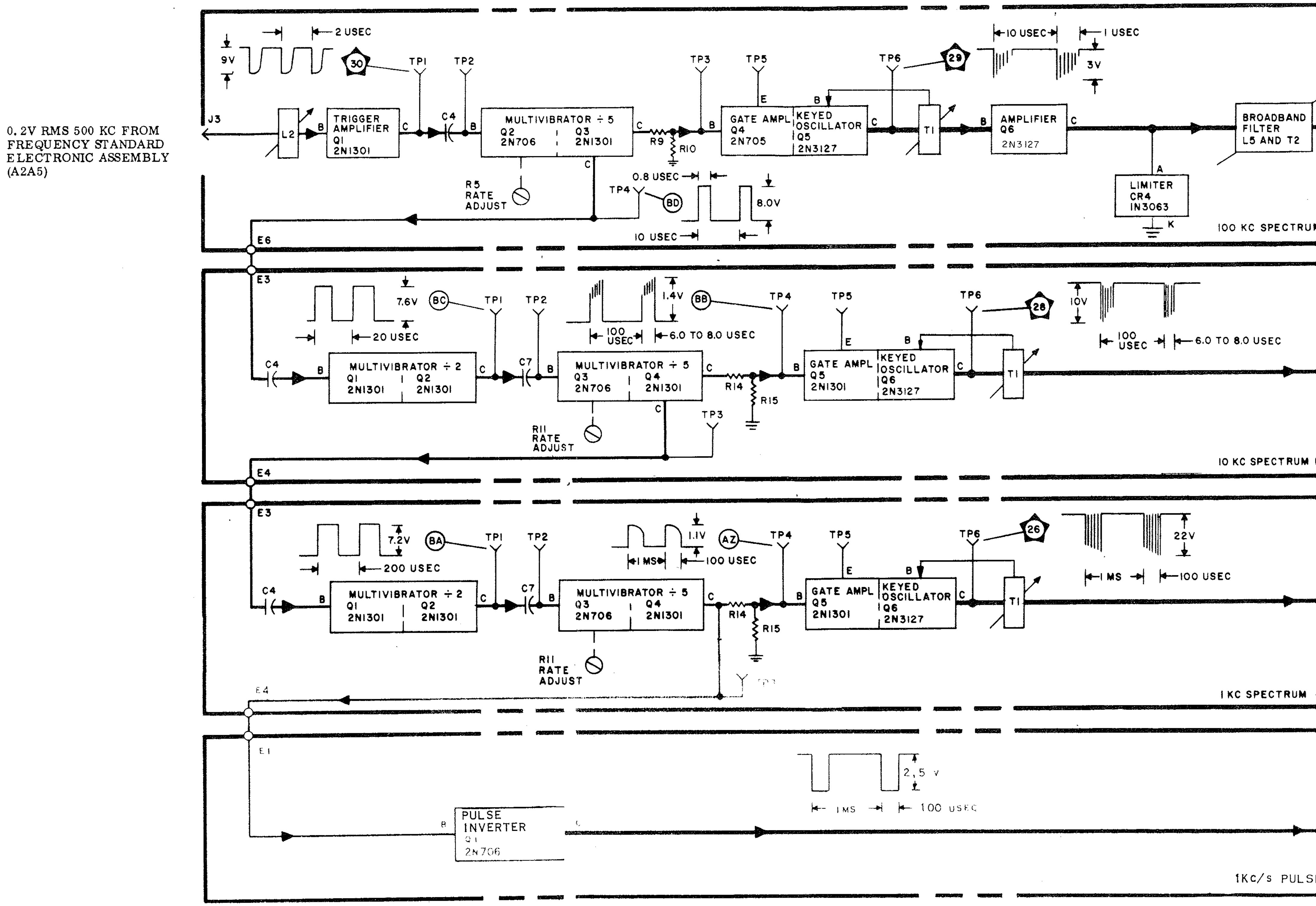


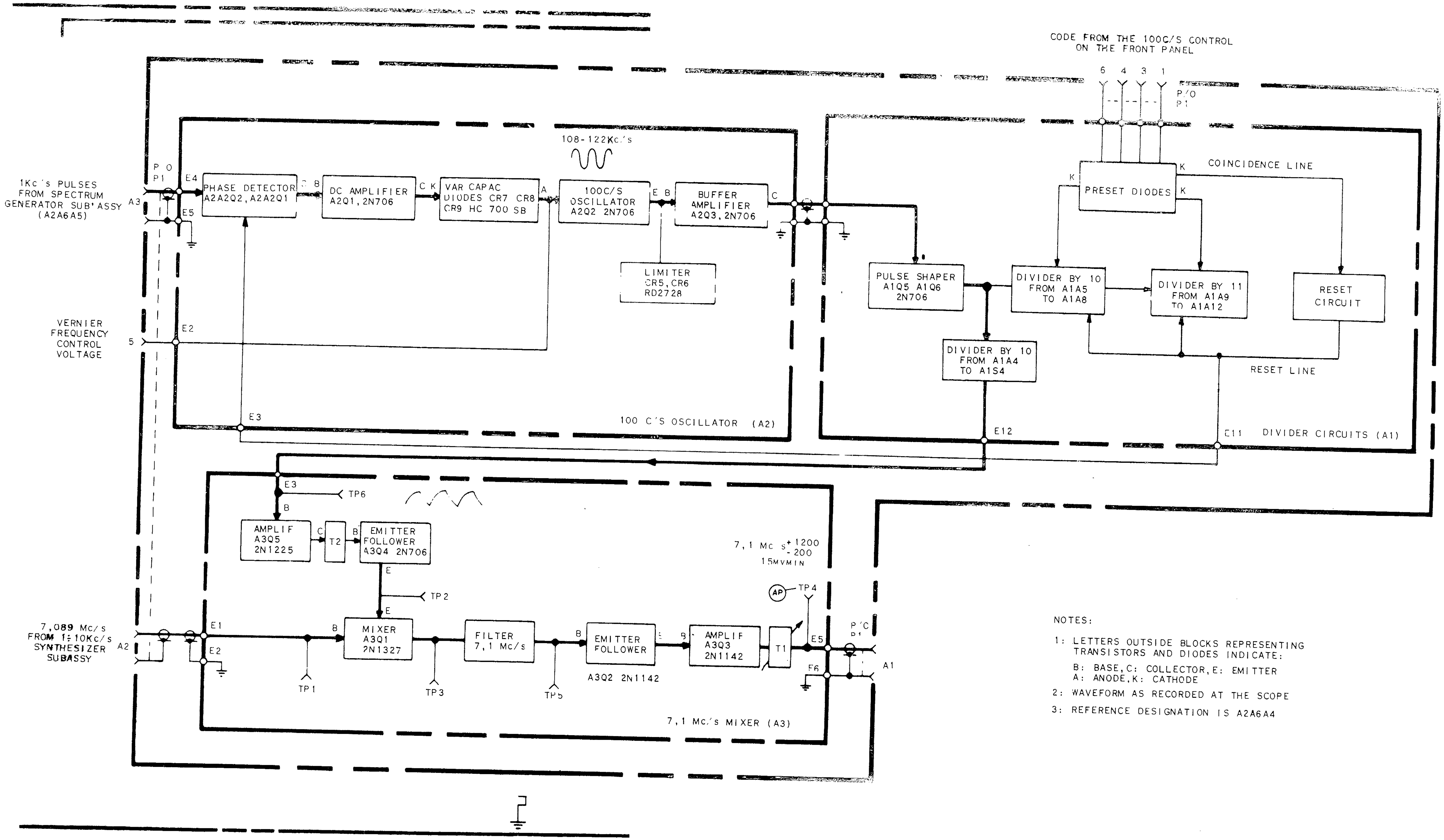
NOTES:

1. HEAVY LINES INDICATE MAIN SIGNAL PATHS; LIGHT LINES INDICATE AUXILIARY OR SECONDARY SIGNAL PATHS.
2. LETTERS OUTSIDE TRANSISTOR AND DIODE BLOCKS INDICATE ELEMENTS.
3. WAVEFORMS RECORDED USING OSCILLOSCOPE TEKTRONIX 546
4. REF. DESIG. PREFIX A6A5

Figure 4-68 Spectrum Generator Electronic Subassembly, Servicing Block Diagram

E
T


0.2V RMS 500 KC FROM FREQUENCY STANDARD ELECTRONIC ASSEMBLY (A2A5)
J3
L2
TRIGGER AMPLIFIER Q1 2N1301
9V
2 USEC
30
TP1
TP2
C4
MULTIVIBRATOR ÷ 5 Q2 2N706 Q3 2N1301
R5 RATE ADJUST
R9
R10
TP3
TP4
BD
0.8 USEC
8.0V
10 USEC
TP5
GATE AMPL Q4 2N705
KEYED OSCILLATOR Q5 2N3127
TP6
29
10 USEC
1 USEC
3V
T1
AMPLIFIER Q6 2N3127
BROADBAND FILTER L5 AND T2
LIMITER CR4 IN3063
100 KC SPECTRU
E6
E3
7.6V
BC
20 USEC
MULTIVIBRATOR ÷ 2 Q1 2N1301 Q2 2N1301
C7
1.4V
BB
100 USEC
6.0 TO 8.0 USEC
MULTIVIBRATOR ÷ 5 Q3 2N706 Q4 2N1301
R14
R15
R11 RATE ADJUST
GATE AMPL Q5 2N1301
KEYED OSCILLATOR Q6 2N3127
28
10V
10 KC SPECTRUM
E4
7.2V
BA
200 USEC
1.1V
AZ
1 MS
100 USEC
26
22V
1 KC SPECTRUM
E1
2.5 V
PULSE INVERTER Q1 2N706
1Kc/s PULS



NOTES:

1: LETTERS OUTSIDE BLOCKS REPRESENTING TRANSISTORS AND DIODES INDICATE:
   B: BASE, C: COLLECTOR, E: EMITTER
   A: ANODE, K: CATHODE
2: WAVEFORM AS RECORDED AT THE SCOPE
3: REFERENCE DESIGNATION IS A2A6A4

Fig. 4-69 - 100 C/S Synthesizer Sub Ass'y Servicing Block Diagram

ELMER S.P.A.	PUB. 246 - TECHNICAL MANUAL FOR EXCITER T-827A/URT

ERRATA CORRIGE

Page	Row	from	to
1.7	1 from top	T-827/URT-MM	T-827A/URT
1.22	2 from bottom	3	2
3.15	5 " "	FKS	FSK
4.9	11 from top	compris	comprise
4.9	10 from bottom	R-1051/URR-MM	R-1051A/URR
4.27	2 from top	Preferences	References
4.27	9 " "	Temperature	Oven
4.27	9 " "	Control/circuit	Control/Buffer Amplifier circuit
4.31	2 from bottom	metrix 430/1	Metrix 430/C
4.31	1 " "	RG	RF
4.112	5 " "	C99	C49
4.115	11 from top	gage	gate
4.131	3 " "	of 100	of a 100
4.131	8 " "	banda	band
4.131	18 from bottom	by setting	by the setting
4.131	8 " "	R)	R4
4.170	8 " "	devepoled	developed
4.238	8 from top	+20Vdc 15	+20Vdc is
5.20	2 " "	from	out from
5.21	7 " "	(fig. 5.1.5)	(fig. 5.15)
5.65	Title Fig. 5.9	100 KC	100 Hz
5.250	5 from top	on page	on page 5.262
5.263	8 from bottom	6 h 40'	4 h 20'
5.263	7 " "	4 hrs	1 hrs
5.277	9 " "	from Radio Set Control	disregard
5.277	3 " "	from Radio Set Control	disregard
6.2	2 " "	(.............)	disregard

SECTION 5

MAINTENANCE

5.1 - TUNING AND ADJUSTMENT

5.1.1 - 20-volt regulator circuit adjustment

Power Supply Electronic Assembly A8 provides a regulated 20-vdc output that must be adjusted if the voltage varies 0.1 volt above or below 20 vdc.

A) *Test Equipment*

Multimeter, type Metrix, mod. 430/C or equiv. is required to perform this adjustment.

B) *Control Settings*

Prior to adjusting the 20 vdc regulator circuit, set the T-827A/URT front panel control as follows:

a) Mode Selector switch: STD BY.

b) Operating frequency: 02.000 mc/s.

c) LOCAL/REMOTE switch: LOCAL.

C) *Test Set-up*

Connect the equipment as follows:

a) Loosen the front panel screws on the Radio Transmitter T-827A/URT and slide the chassis from the case. Tilt the chassis 90 degrees to expose the bottom.

b) Pull interlock switch S8 up and back to defeat the chassis interlock.

c) Tilt the chassis 90° to expose bottom.

d) Set Multimeter, type Metrix, mod. 430/C or equiv. for 30 Vdc f.s.

e) Connect the positive lead of the multimeter to TP 31 on bottom of T-827A/URT chassis (figure 5.17).

f) Connect the negative lead to chassis ground.

D) *Instructions*

To adjust the 20 Vdc regulator circuit, proceed as follows:

a) Set the T-827A/URT Mode Selector switch at AM.

b) Key the T-827A/URT. Adjust potentiometer R10 (figure 5.20) for indication of 20 + 0.1 Vdc on the multimeter.

c) Unkey the T-827A/URT. Set the Mode Selector switch at OFF.

d) Disconnect the multimeter.

e) Tilt the chassis back to horizontal, slide it into the case, and tighten the front panel screws.

5.1.2 - **Audio gain adjustment**

An audio level adjustment must be made to the Audio Amplifier Electronic Assemblies A2 and A3 (figure 5.15) to provide the proper audio output level to the balanced modulators.

A) *Test Equipment*

The following test equipment is required to adjust the audio gain.

a) Audio Signal Generator, type Singer, mod. TTG-2.

b) Electronic Multimeter, type HP, mod. 400-D.

c) Dummy Load, type Bird, mod. 82.

B) *Control Settings*

Set the T-827A/URT front panel controls as follows:

a) Operating frequency: 29.000 mc

b) USB LINE LEVEL: +10 db

c) LOCAL/REMOTE switch: REMOTE

C) *Instructions*

To adjust the audio gain, proceed as follows:

a) Loosen T-827A/URT front-panel screws and slide chassis out from case.

b) Disconnect rf output cable from connector J23 (RF OUT 50Ω) on the rear of the T-827A/URT and connect the dummy load, type Bird, mod. 82 to J23 in its place. (See figure 5.19)

c) Set up the TTG-2 for singletone operation, and connect it to connector 2A1J5 (AUDIO IN 600Ω, USB) on the rear of the T-827A/URT. (See figure 5.19).
Tune the audio signal generator to 1000 cps, and adjust its output level to 150 mV.

d) Apply main power to equipment and set Mode Selector switch to USB.

e) Key the T-827A/URT.

f) Connect the HP-400-D to TP 10 on the Audio Amplifier Electronic Assembly A2 (See figure 5.15).

g) Adjust GAIN ADJ potentiometer 2A2R11 (figure 5.15) until the HP-400-D reads 100 mv.

h) Disconnect TTG-2 from connector 2A1J5 and connect it to connector 2A1J6 (AUDIO IN 600Ω, LSB) on the rear of the T-827A/URT. (See figure 5.19).

i) Set Mode Selector switch at LSB.

j) Connect the HP-400-D to TP 10 on Audio Amplifier Electronic Assembly A3. (See figure 5.15).

k) Adjust GAIN ADJ potentiometer A3R11 (figure 5.15) until the HP-400-D reads 100 mv.

l) Set the Mode Selector switch at OFF. Disconnect the test equipment.

Slide the chassis into the case and tighten the front panel screws on the T-827A/URT.

m) Reconnect the rf input cable removed in step 5.1.2 C) b).

5.1.3 - **IF. gain adjustment**

The if. gain must be adjusted in the IF Amplifier Electronic Assembly A12 (figure 5.15) in order to provide the proper 500 kc if. output level to the Translator Electronic Subassembly.

A) *Test Equipment*

The following test equipment is required to adjust the if. gain.

a) Audio Signal Generator, type Singer, mod. TTG-2.

b) Electronic Multimeter, type HP, mod. 410-B.

c) Electronic Multimeter, type HP, mod. 400-D.

d) Dummy Load, type Bird, mod. 82.

e) Coaxial T-Connector, HP11042A.

B) *Control Settings*

Set the T-827A/URT front panel control as follows:

a) Operating frequency: 26.000 mc

b) LOCAL/REMOTE switch: REMOTE

C) *Instructions*

To adjust the if. gain, proceed as follows:

a) Loosen T-827A/URT front panel screws and slide chassis out from case.

b) Disconnect rf output cable from connector J23 (RF out 50 Ω) on the rear of the T-827A/URT. Connect coaxial-T connector to dummy load and connect the dummy load Bird 82 to connector J23. Connect the 410-B to the coaxial-T connector at the dummy load. Set the 410-B to indicate 10 volts full scale.

c) Set up the TTG-2 for single-tone operation, and connect it to connector 2A1J5 (AUDIO IN 600Ω USB) on the rear of the T-827A/URT. Tune the TTG-2 to 1000 cps and adjust its output level to 150 mv.

d) Apply main power to the equipment and set Mode Selector switch to USB.

e) Key the T-827A/URT.

f) Adjust GAIN ADJ potentiometer 2A12R15 (figure 5.15) until the HP-410-B indicates 2.5 volts.

g) Tune the operating frequency of the T-827A/URT from 26.00 to 26.900 mc in 100 kc steps by rotating the 100 kc control to each setting from 0 to 9. Note the output level on the HP-410-B each time the frequency is changed. If an indication falls below 2.5 volts for any frequency or frequencies, repeat step f. for the weakest frequency.

h) Set the Mode Selector switch at OFF. Disconnect the test equipment. Slide the chassis into the case and tighten the front panel screws on the T-827A/URT.

i) Reconnect the rf output cable removed in step b. above.

5.1.4 - **Carrier Balance adjustment**

Adjustments to USB CARRIER BAL controls (2A1R23 and 2A1C15) and to LSB CARRIER BAL controls (2A1R3 and 2A1C4) in the balanced modulator circuits of Mode Selector Electronic Assembly A1 (figure 5.15) are required in order to provide the proper resistive and reactive balances to secure a high degree of carrier suppression.

A) *Test Equipment*

The following test equipment is required to adjust the carrier balance.

a) Spectrum Analyzer, type Singer SB-12-BS.

b) Electronic Multimeter, type HP, mod. 410-B.

c) Electronic Multimeter, type HP, mod. 400-D.

d) Audio Signal Generator, type Singer, mod. TTG-2.

e) Coaxial T-Connector, HP11042A.

B) *Control Settings*

Set the T-827A/URT front panel controls as follows:

a) Operating frequency: 02.100 mc

b) LOCAL/REMOTE switch: REMOTE

C) *Instructions*

To adjust the carrier balance, proceed as follows:

a) Loosen front panel screws of T-827A/URT and slide chassis out from case.

b) Disconnect the rf output cable from connector J23 (RF OUT 50Ω) on the rear of the T-827A/URT. (See figure 5.19). Connect coaxial T-connector to J23 and reconnect the rf output cable (to coaxial T-connector).

c) Connect the HP-410-B to the coaxial T-connector at J23 and set it to read 3 volts full scale.

d) Set up the TTG-2 for single-tone operation and connect it to connector J5 (AUDIO IN 600Ω USB) on the rear of the T-827A/URT. (See figure 5.19). Tune the TTG-2 to 1000 cps and set its output to 150 mv. (Use HP-400-D for this purpose).

e) Apply main power to equipment and set Mode Selector switch to USB.

f) Key the T-827A/URT, and check the rf output reading on HP-410-B. The reading should be approximately 1 volt.

g) Disconnect the HP-410-B from the coaxial T-connector and connect the SB-12-BS in its place.

h) Tune the Sb-12-bS to 02.100 mc.

i) Key the T-827A/URT.

j) While observing the presentation on the CRT of the SB-12-BS, alternately adjust the USB CARRIER BAL controls (2A1R23 and 2A1C15 (figure 5.15) until the carrier level is 50 db down from the USB component of the signal.

k) Set Mode Selector switch to LSB and connect TTG-2 to connector 2A1J6 on rear of T-827A/URT.

l) Repeat steps i) and j) above substituting the adjustment of the LSB

CARRIER BAL controls 2A1R3 and 2A1C4 (figure 5.15) in place of USB CARRIER BAL controls.

m) Set the Mode Selector switch at OFF. Disconnect the test equipment. Slide the chassis into the case and tighten the front panel screws on the T-827A/URT.

5.1.5 - AM modulation percentage adjustment and carrier reinsertion check

In Mode Selector Electronic Assembly A1 (figure 5.15), the % MOD potentiometer (A1R101) must be adjusted to establish the proper percentage of modulation of an am. signal, and the settings of CARRIER REINSERTION switch (A1S1) must be checked to determine that carrier reinsertion is at the proper level.

A) *Test Equipment*

The following test equipment is required to perform the am. modulation percentage adjustment and carrier reinsertion check.

a) Spectrum Analyzer, type Singer, mod. SB-12-BS
b) Electronic Multimeter, type HP, mod. 410-B
c) Electronic Multimeter, type HP, mod. 400-D
d) Audio Signal Generator, type Singer mod. TTG-2
e) Coaxial T-connector, HP11042A.

B) *Control Settings*

Set the T-827A/URT front panel controls as follows:

a) Operating frequency: 02.100 mc
b) LOCAL/REMOTE switch: REMOTE

C) *Instructions*

To perform the am. modulation percentage adjustment and the carrier reinsertion check, proceed as follows:

a) Loosen front panel screws of T-827A/URT and slide chassis out from case.

b) Disconnect the rf output cable from connector J23 (RF OUT 50Ω) on the rear of the T-827A/URT. Connect coaxial T-connector to J23 and reconnect the rf output cable (to coaxial T-connector). (See figure 5.19).

c) Connect the HP-410-B to the coaxial T-connector at J23 and set it to read 3 volts full scale.

d) Set up the TTG-2 for singletone operation, and connect it to connector 2A1J5 (AUDIO IN 600Ω USB) on the rear of the T-827A/URT. (See figure 5.19). Tune the TTG-2 to 1000 cps and adjust its output to 150 mv.

e) Apply main power to equipment and set Mode Selector switch to USB.

f) Key the T-827A/URT and check that the rf reading on the HP-410-B is approximately 1 volt.

g) Disconnect the HP-410-B from the coaxial T-connector and connect the SB-12-BS in its place.

h) Tune the SB-12-BS to 02.100 mc.

i) Key T-827A/URT and ensure that the CARRIER REINSERTION switch 2A1S1 (figure 5.15) is set at infinity ∞. Check that carrier level observed in the SB-12-BS is 50 db down from USB component in signal.

j) Set Mode Selector switch to AM.

k) Adjust % MOD potentiometer 2A1R101 (figure 5.15) until carrier level observed on spectrum and USB component level are equal in amplitude.

l) Set Mode Selector switch at USB and check that carrier disappears.

m) Set CARRIER REINSERTION switch 2A1S1 (figure 5.15) at 0 and check that carrier reappears with level equal in amplitude to USB component level, ±2 db.

n) Set CARRIER REINSERTION switch at -10 and check that carrier level is 10 db ±2 db down from the USB component level.

o) Set CARRIER REINSERTION switch at -20 and check that carrier level is 20 db±2db down from the USB component level of step m.

p) Return CARRIER REINSERTION switch to the ∞ position.

q) Set the Mode Selector switch at OFF. Disconnect the test equipment. Slide the chassis into the case and tighten the front panel screws on the T-827A/URT.

r) Reconnect rf output cable removed in step b above.

5.1.6 - 100 c/s Synthesizer output level adjustment

A) *Test equipment:*

Heterodyne Voltmeter, type Bruel and Kjaer, mod. 2006 or equiv.

B) *Control settings:*

Set T-827A/URT control as described below:

a) Mode Selector switch (S2) to USB

b) Tuning controls for operation at 2.000 Mc/s

c) LOCAL/REMOTE switch to REMOTE

d) Interlock switch (S8) pulled up.

C) *Instructions:*

a) Perform all procedures for calibration of Heterodyne Voltmeter, type Bruel and Kjare, mod. 2006 or equiv.

b) Connect the probe of the voltmeter to test point TP4 on the 100 c/s Synthesizer; tune the voltmeter for a maximum reading at 7,1 Mc/s

c) Rotate 10 Kc/s and 1 Kc/s knobs on the T-827A/URT front panel to obtain a minimum reading on the voltmeter

d) Rotate the 100 c/s knob on the T-827A/URT front panel to obtain a lower minimum on the voltmeter

e) Leave tuning knobs at positions determined by steps c), d) and adjust R16 (through hole provided on the top side of the 100 c/s Synthesizer) to obtain a 15 mV reading on the voltmeter

f) Turn the equipment off and disconnect voltmeter.

5.2 - REPAIR

5.2.1 - RF Amplifier Electronic Assembly 2A2A4

5.2.1.1 - Operational check

Use the following procedure to determine whether RF Amplifier Electronic Assembly A4 (figure 5.15) is operating properly.

A) *Test Equipment*

a) Electronic Multimeter, type HP, mod. 410-B

b) Dummy Load, type Bird, mod. 82

c) Coaxial T-Connector, HP11042A

B) *Instructions*

a) Disconnect the rf output cable from connector J23 (RF OUT 50 Ω) on the rear of the T-827A/URT. Connect coaxial T-connector to dummy load and connect dummy load to J23. Connect the HP-410-B to the coaxial T-connector at the dummy load. (See figure 5.19).

b) Apply main power to equipment and set Mode Selector switch on T-827A/URT to AM.

c) Adjust operating frequency to each of the frequencies listed below and by T-827A/URT.

Check that the indication on the HP-410-B is not less than 1.85 volts (67.5 mw) for any frequency.

In mc	10.910 and 10.990	20.010 and 20.990
	11.010 and 11.990	21.010 and 21.990
2.010 and 2.990	12.010 and 12.990	22.010 and 22.990
3.010 and 3.990	13.010 and 13.990	23.010 and 23.990
4.010 and 4.990	14.010 and 14.990	24.010 and 24.990
5.010 and 5.990	15.010 and 15.990	25.010 and 26.990
6.010 and 6.990	16.010 and 16.990	26.010 and 26.990
7.010 and 7.990	17.010 and 17.990	27.010 and 27.990
8.010 and 8.990	18.010 and 18.990	28.010 and 28.990
9.010 and 9.990	19.010 and 19.990	29.010 and 29.990

a) Set Mode Selector switch at OFF.

b) If it is determined that the RF Amplifier Electronic Assembly is defective, proceed as described in Replacement, below.

C) *Replacement*

Aboard ship, replace a defective RF Amplifier Electronic Assembly A4 with a spare assembly in accordance with the following procedures. (See figures 5.15 and 5.16 for component locations).

a) Check that T-827A/URT Mode Selector switch is set at OFF.

b) Set the front panel KCS controls for 111.

c) Loosen the front panel screws on the T-827A/URT and slide the chassis from the case.

d) The RF Amplifier Electronic Assembly is located in the front left corner of the T-827A/URT chassis. Loosen the four fastening screws at the corners of the electronic assembly and lift it from the chassis.

e) The coupler slots on the chassis (figure 5.16) should be perpendicular to the front panel, with the 100 kc and the 10 kc controls on the front panel in the "1" position. If the slots are not aligned properly, refer to steps j. (5) and (7) below for the proper alignment procedures.

f) On the spare electronic assembly, position both shaft couplers on the bottom of the electronic assembly to the "1" position. (Coupler index pins pointing toward the front of the chassis when the module is in its normal installed position).

g) Set the spare electronic assembly in position in the T-827A/URT chassis (electronic assembly connectors plug into J10 and J11 on chassis).

h) Press lightly on top of the electronic assembly and rotate both the 100 kc and the 10 kc controls on the front panel to 9, and back to 0.

i) When it has been determined that the couplers on the bottom of the electronic assembly are fully engaged with the chassis couplers, tighten the four fastening screws at the corners of the electronic assembly.

j) Check for optimum shaft coupler adjustment as follows:

(1) Perform partial operational check specified in step D).

(2) With the T-827A/URT keyed, rock the 100 kc control back and forth through the normal detent position for "1". The rf output, as indicated on the multimeter should drop off on each side as the control is rocked away from the normal detent position.

(3) If, as the control is rocked back and forth, the rf output drops off on each side at points equidistant from the detent position, the shaft coupler adjustment is correct.

(4) If the indication on the HP-410-B drops off sooner on one side of the detent position than the other, release the control and turn off the T-827A/URT.

(5) Tilt the T-827A/URT chassis up 90 degrees to expose the bottom. Determine, by observing the action of the chain drive, which way the coupler shaft should be rotated to correct the error.

(6) Loosen the setscrew on the hub clamp of the coupler gear nearest the front panel on the sprocket assembly directly underneath the RF Amplifier Electronic Assembly (figure 5.17).

(7) Insert a screwdriver into the coupler adjustment (slot at the end of the coupler shaft).

(8) Repeat steps (2) through (7) above, checking the operation of the 10 kc control and making adjustments as necessary to the rear coupler of the sprocket assembly under the RF Amplifier Electronic Assembly.

k) Turn off the T-827A/URT. Disconnect the test equipment and reconnect rf output cable from associated rf amplifier.

D) *Partial Operational Check*

The following partial operational check is for use with step C): j).

E) *Test Equipment*

a) Electronic Multimeter type HP, mod. 410-B

b) Dummy load, type Bird, mod. 82

c) Coaxial T-Connector, HP 11042A.

F) *Instructions*

a) Disconnect the rf output cable from connector J23 (RF OUT 50Ω) on the rear of the T-827A/URT. Connect coaxial T-connector to dummy load and connect dummy load to J23. Connect the HP-410-B to the coaxial T-connector at the dummy load. (See figure 5.19).

b) Set the operating frequency to 2.111 mc and set the Mode Selector switch at AM. Apply main power to equipment.

c) Key T-827A/URT.

d) Check that the indication on the HP-410-B is not less than 1.85 volts.

5.2.2 - Frequency Standard Electronic Assembly 2A2A5

5.2.2.1 - Operational checks

Use either of the following procedures (method A or method B) to determine whether Frequency Standard Electronic Assembly 2A2A5 is operating properly and to make any required adjustments.

Method A is a check for the frequency accuracy of the 5 mc oscillator circuit; method B provides a more extensive check of Frequency Standard Electronic Assembly 2A2A5 and is therefore the preferred method.

A) *Method A.*

1) *Test Equipment*

Frequency Standard Motorola S-1055-A is required to perform this method of adjustment.

2) *Instructions*

a) Loosen front panel screws on T-827A/URT and slide chassis out from case.

b) Connect the 5 MC OUTPUT connector on S-1055-A to connector J25 (EXT 5 MC IN) on the rear of the T-827A/URT. (See figure 5.19)

c) Defeat interlock switch on T-827A/URT by pushing back and pulling up.

d) Apply main power to equipment and set Mode Selector switch to STD BY. Allow a four-hour warm-up period for the T-827A/URT and test equipment.

e) Set the EXT/INT/COMP switch 2A5S1 (figure 5.15) on top of the Frequency Standard Electronic Assembly to COMP.

f) Observe indicator lamp 2A5DS1 (figure 5.15) on top of the Frequency Standard Electronic Assembly A5. When the 5 mc oscillator circuit is properly adjusted, 2A5DS1 will not flicker but will change in brilliance at a rate no greater than once every 20 seconds. When the circuit is improperly adjusted 2A5DS1 will flicker at a rate equal to the rate of error. The higher the frequency of the error the more difficult the error detection by 2A5DS1 will become, (due to the inability of 2A5DS1 to follow rapid fluctuation of the higher frequencies). If the circuit is properly adjusted, proceed to step j. If the circuit is improperly adjusted, proceed to step g.

g) Remove the dust cover from the Frequency Standard Electronic Assembly.

h) Adjust capacitor C1 (figure 5.61) on top of the Frequency Standard Electronic Assembly A5 until the indicator lamp remains lighted and changes briliance at a rate no greater than once in 20 seconds.

i) Replace the dust cover.

j) Set the EXT/INT/COMP switch to the setting required for operation (EXT. or INT).

k) Set Mode Selector switch to OFF. Disconnect the test equipment. Slide the chassis into the case and tighten the front panel screws on the T-827A/URT.

l) If it determined that the Frequency Standard Electronic Assembly A5 is defective, proceed, as described in Replacement, below.

B) *Method B*

1) *Test Equipment*

a) Frequency Standard type Motorola, mod. S-1055-A.

b) Frequency Meter type HP, mod. 5245-L

c) RF Voltmeter type Boonton, mod. 91-H.

2) *Instructions*

a) Loosen front panel screws on T-827A/URT and slide chassis out from case.

b) Connect the 100-kc output from the S-1055-A to the HP-5245-L external frequency standard input jack.

c) Adjust operating frequency of T-827A/URT to 02.000 mc or above. Set front panel CPS switch to 000.

d) Defeat interlock switch by pushing back and pulling up.

e) Apply main power to equipment and set Mode Selector switch to USB.

f) If the EXT/INT/COMP switch A5S1 (figure 5.15) on Frequency Standard Electronic Assembly A5 is not at the INT position, set this switch at INT.

g) Allow a four-hour warm-up period for the T-827A/URT and the test equipment.

h) Connect the HP-5245-L to test point TP AJ in Frequency Standard Electronic Assembly A5 (figure 5.15) and set frequency meter time base for 10-second intervals. Observe HP-5245-L for ten counts. The frequency should be 5 mc, ± 0.1 cps.

i) Connect HP-5245-L to test point TP 9 in Frequency Standard Electronic Assembly A5 (figure 5.15) and observe HP-5245-L for ten counts. The frequency should be 500 kc.

NOTE

No error should be detectable in this reading.

j) If frequencies measured at test points TP AJ and TP 9 (steps h and i) are correct, proceed to step l). If frequencies measured at test points TP AJ and TP 9 are incorrect, proceed to step k).

k) Adjust the frequency as follows:

(1) Remove screws and lift off dust cover of frequency Standard Assembly A 5. (See figure 5.15).

(2) Adjust capacitor C1 on top of Frequency Standard Electronic Assembly A5 (figure 5.15) until the frequency, as read at test point TP AJ is 5Mc + 0.0 cps, -0.1 cps. Recheck frequency at test point TP 9.

(3) Replace dust cover.

l) Connect the Boonton 91-H to test point TP (AJ) and measure the voltage. The voltage should be a minimum of 480 mv.

m) Connect the Boonton 91-H to test point TP (9) and measure the voltage. The voltage should be between 150 and 250 mv.

n) Set the EXT/INT/COMP switch to the position required for operation (EXT or INT).

o) Set Mode Selector switch at OFF. Disconnect the test equipment. Slide the chassis into the case and tighten the front panel screws on the T-827A/URT.

p) If it is determined that the Frequency Standard Electronic Assembly is defective, proceed as described in Replacement, below.

3) *Replacement*

Aboard ship, replace a defective Frequency Standard Electronic Assembly A5 with a spare assembly in accordance with the following procedures. See figures 5.15 and 5.16 for component locations.

a) Check that T-827A/URT Mode Selector switch is set at OFF.

b) Loosen the front panel screws on the T-827A/URT and slide the chassis from the case.

c) The Frequency Standard Electronic Assembly is located in the right rear corner of the T-827A/URT chassis. Loosen the two corner fastening screws on top of the Frequency Standard Electronic Assembly and lift it from the chassis.

d) Plug the spare Frequency Standard Electronic Assembly into J9 on the chassis (figure 5.16) by aligning the guide pin holes on the base of the Frequency Standard Electronic Assembly with the guide pins on the chassis and pushing it into place.

e) Tighten the two corner fastening screws on top.

f) Slide the chassis back into the case and tighten the front panel screws.

5.2.3 - Translator/Synthesizer Electronic Assembly 2A2A6

5.2.3.1 - Operational Check

Use the following procedure to determine whether Translator/Synthesizer Electronic Assembly A6 is operating properly. (See figure 5.15).

A) *Test Equipment*

a) RF Voltmeter, type Boonton, mod. 91-H

b) Oscilloscope, type Tektronix, mod. 546

B) *Instructions*

a) Loosen front panel screws on T-827A/URT and slide chassis out from case.

b) Disconnect the rf output cable from connector J23 (RF OUT 50Ω) on the rear of the T-827A/URT. (See figure 5.19).

c) Apply main power and set Mode Selector switch at AM.

d) Check gain of translator as follows:

(1) Key T-827A/URT.

(2) Establish a reference level by connecting the Boonton 91-H to test point TP (4) (figure 5.15) on RF Translator Electronic Subassembly, and noting the db indication.

(3) Connect the RF Voltmeter 91-H to test point TP (3) (figure 5.15) on the RF Translator Electronic Subassembly.

(4) Adjust the operating frequency of the T-827A/URT to each of the frequencies listed below, and check that the db indication of each frequency is in accordance with the level specified.

(Indication should be not less than the db reference level for the frequencies listed below).

In mc	In mc
5.000,000	5.333,000
5.111,000	5.444,000
5.222,000	6.555,500

(Indication should be not less than 1 db below reference level for the frequencies listed below).

In mc

6,666,500
6,777,500
6,888,500
6,999,500

e) Proceed to step f. and g. below, conducting both steps simultaneously.

f) Check gain of megacycle synthesizer as follows:

(1) Do not key T-827A/URT for this check.

(2) Connect the RF Voltmeter to test point TP (C) (figure 5.15) on RF Amplifier Electronic Assembly A4.

(3) Adjust the operating frequency sequentially from 2 mc through 29 mc (MCS digits only, not KCS digits). Check that the indication on the RF Voltmeter is a minimum of 80 mv for each frequency.

g) Check megacycle synthesizer phase locking as follows:

(1) Adjust the Oscillascope, Tektronix 546 as listed below and connect to test point TP (AV) (figure 5.15) on Megacycle Synthesizer Electronic Subassembly.

Vertical amplifier: DC
Vertical positioning: 0 volts
Vertical gain: full deflection with +20 vdc input
Sweep: internal at 1 milli-second per centimeter

(2) Set EXT/INT/COMP switch 2A5S1 (figure 5.15) at EXT and check that the vertical trace on the Oscilloscope rises to approximately 19 vdc. Set EXT/INT/COMP switch at INT and check that the trace drops to a level between +5 and +17 vdc.

(3) Adjust the operating frequency of the T-827A/URT sequentially from 2 through 29 mc (MCS digits only, not KCS digits). For each frequency, check the Oscilloscope trace for occurrence of normal phase locking between +5 and +17 vdc and random noise content of not more than +0.5 volts. If modulation appears on dc trace, it is an indication that the loop is unable to reach phase lock, and the subassembly is de-

Pub. 246
December 1967
ORIGINAL

fective.

h) If is determined that the Translator/Synthesizer Electronic Assembly A6 is defective, proceed to paragraph C, below.

C) *Replacement*

Aboard ship, replace a defective Translator/Synthesizer Electronic Assembly A6 with a spare assembly in accordance with the following procedures. (See figures 5.15 and 5.16 for component location).

a) Loosen the front panel screws on the T-827A/URT and slide the chassis from the case. Rotate KCS controls to 1.

b) The Translator/Synthesizer Electronic Assembly is located at the right front of the chassis. Loosen the four fastening screws at the corners of the electronic assembly and carefully lift it out.

c) Rotate KCS controls to 0. Check that slot in chassis couplers points toward and perpendicular to the rear chassis panel. If not, refer to paragraph 5.2.1.1 C) - j), step (6) and (7).

d) Rotate the couplers on the bottom of spare electronic assembly to 0 position.

e) Apply slight finger pressure on top of the electronic assembly and rotate the KCS controls to 9 and back to 0. When it has been determined that the couplers on the bottom of the electronic assembly are fully engaged with the chassis couplers, tighten the four fastening screws at the corners of the electronic assembly.

f) Slide the chassis back into the case and tighten the front panel screws.

5.2.4 - IF. Amplifier Electronic Assembly 2A2A12

The following paragraphs provide instructions for removal, cleaning, repair and adjustment of the IF. Amplifier Electronic Assembly 2A2A12.

Removal

To remove the IF. Amplifier Electronic Assembly 2A12 (figure 5.15), proceed as follows:

a) Loosen the front panel screws on the T-827A/URT and slide the chassis from the case.

b) The IF. Amplifier Electronic Assembly is located in the rear-center of the chassis. Loosen the two corner fastening screws on the top of the electronic assembly and lift it from the chassis.

c) Loosen the Dzus fastener on the side of the dust covers and lift off the dust covers.

A) *Test Equipment*

The following test equipment is required to adjust the IF.Amplifier Electronic Assembly after repair:

a) Dummy Load, type Bird, mod. 82

b) Electronic Multimeter, type HP, mod. 410-B

c) Cable Assembly W2

d) Rf voltmeter, type Boonton, mod. 91-H

e) Audio Signal Generator, type Singer, mod. TTG-2

f) Electronic Multimeter, type HP, mod. 400-D

g) Coaxial T-Connector HP 11042A

B) *Repair*

Clean the electronic assembly of dust and foreign matter with compressed air. Inspect the entire electronic assembly for defective components, frayed wiring, burned electrical components, loose connections or connectors. See figures 5.104 and 5.105 for component location.

C) *Reassembly*

After repair, replace any connections removed.

D) *Adjustment*

If any electrical components were replaced in the electronic assembly, adjust the electronic assembly as follows:

a) Connect cable assembly W2 to J15 on T-827A/URT chassis (figure 5.16).

b) Connect cable assembly W2 to P1 on bottom of electronic assembly (dust covers removed).

c) Disconnect rf output cable from connector J23 (RF OUT 50Ω) on the rear of the T-827A/URT. (See figure 5.15).

d) Set Mode Selector switch at AM and LOCAL/REMOTE switch at REMOTE. Set MCS and KCS controls for 26.000 mc.

e) Connect the Boonton 91-H to TP (5) on electronic assembly (fig. 5.1.5).

f) Key T-827A/URT.

g) Tune transformers T1 and T2 on electronic assembly (figure 5.105) for peak indication on the 91-H of approximately 10 mv.

h) Set Mode Selector switch at USB.

i) Connect the TTG-2 to connector 2A1J5 (USB AUDIO IN 600Ω) on rear of T-827A/URT. (See figure 5.19). Set up the TTG-2 for single-tone operation and tune it to 1000 cps at 150 mv. (Use the HP-400-D for this purpose).

j) While observing 91-H adjust GAIN ADJ (R15) on electronic assembly (figure 5.105) until it is determined that 20 mv can be measured at TP (5).

k) Set Mode Selector switch at OFF. Disconnect the 91-H but leave the TTG-2 connected. Disconnect extender cable from chassis and electronic assembly.

l) Replace dust cover on electronic assembly. Plug electronic assembly into connector J15 on chassis. (See figure 5.16).

m) Perform if. gain adjustment specified in paragraph 5.1.3.

5.2.5 - Mode Selector Electronic Assembly 2A2A1

The following paragraphs contain the necessary information for the removal, cleaning, repair, and adjustment of the Mode Selector Electronic Assembly 2A2A1.

A) *Removal*

To remove the Mode Selector Electronic Assembly A1 (figure 5.15) proceed as follows:

a) Loosen the front panel screws on the T-827A/URT and slide the chassis from the case.

b) The Mode Selector Electronic Assembly is located in the center-rear of the main chassis. Loosen the two corner fastening screws on top of the electronic assembly and lift the assembly from the chassis.

c) Remove the two screws from the top of the Mode Selector Electronic Assembly and lift the dust cover.

B) *Test Equipment*

The following test equipment is required to adjust the Mode Selector Electronic Assembly, after repair.

a) Cable assemblies W1 and W7.

NOTE

Due to the critical nature of the adjustments, the cable assemblies should not be used to adjust the balanced modulators.

b) Electronic Multimeter, type HP, mod. 410-B

c) Audio Signal Generator, type Singer, mod. TTG-2

d) Spectrum Analyzer, type Singer, mod. SB-12-BS

e) Rf voltmeter, type Boonton, mod. 91-H

f) Electronic Multimeter, type HP, mod. 400-D

g) Coaxial T-connector HP 11042 A.

C) *Repair*

Clean the electronic assembly of dust and foreign matter with compressed air. Inspect the entire electronic assembly for defective components, frayed wiring, burned electrical components, and loose connections or connectors (see figures 5.25 through 5.29 for component location).

D) *Reassembly*

After repair, replace any connections removed.

E) *Adjustment*

After repair, adjust the Mode Selector Electronic Assembly as follows:

a) Connect cable assemblies W1 and W7 to J17 and J16 on chassis (figure 5.16), respectively.

b) Connect cable assembly W1 to P2 on the bottom of the electronic assembly (dust cover removed). Connect cable assembly W7 to P1 on the electronic assembly.

c) Apply main power to equipment. Set Mode Selector switch at ISB position and LOCAL/REMOTE switch to LOCAL.

d) Connect RF Voltmeter, 91-H to TP (X) on electronic assembly (figure 5.26). Tune transformer T3 (figure 5.29) for peak indication on rf voltmeter.

e) Connect rf voltmeter to TP (Y) on electronic assembly (figure 5.27). Tune transformer T4 (figure 5.29) for peak indication on rf voltmeter.

f) Set Mode Selector switch at AM.

g) Connect rf voltmeter to TP (AB) on electronic assembly (figure 5.29). Tune transformer T5 (figure 5.29) for peak indication on rf voltmeter.

h) Disconnect the 91-H Remove cable assemblies from chassis and electronic assembly.

i) Replace dust cover on electronic assembly.

j) Plug electronic assembly into J16 and J17 in chassis. (See figure 5.16).

k) Perform the carrier balance adjustment specified in paragraph 5.1.4 and the AM modulation percentage adjustment and carrier reinsertion check specified in paragraph 5.1.5.

5.2.6 - Audio Amplifier Electronic Assemblies 2A2A2 and 2A2A3

The following paragraphs contain the necessary information for the removal, cleaning, repair, and adjustment of the Audio Amplifier Electronic Assemblies. There are two Audio Amplifier Electronic Assemblies mounted side-by-side on the rear of the T-827A/URT main chassis. The two assemblies are identical and are interchangeable.

A) *Removal*

To remove either Audio Amplifier Electronic Assembly A2 or A3 (figure 5.15), proceed as follows:

a) Loosen the front panel screws on the T-827A/URT and pull the chassis from the case.

b) Loosen the two corner fastening screws on the top of assembly and lift the assembly from the chassis.

c) Loosen the Dzus fastener on the bottom of each side dust cover and list the dust covers from the assembly.

B) *Test Equipment*

The following test equipment is required to adjust the Audio Amplifier Electronic Assembly, after repair.

a) Audio Signal Generator, type Singer, mod. TTG-2

b) Electronic Multimeter, type HP, mod. 400-D

c) Dummy Load, type Bird, mod. 82

C) *Repair*

Clean the electronic assembly of dust and foreign matter with compressed air. Inspect the entire electronic assembly for defective components, frayed wiring, burned electrical components, loose connections or connectors (see figures 5.30 and 5.31 for component location).

D) *Reassembly*

After repair, replace any connections removed, then replace the dust covers. Plug the A2 electronic assembly into J18 (figure 5.16) on the T-827A/URT chassis. Plug A3 into J19. Tighten the two corner fastening screws on the tops of the electronic assemblies.

E) *Adjustment*

If any electrical components were replaced in the electronic assembly, it will be necessary to adjust the circuits after repair. Perform audio gain adjustment as apecified in paragraph 5.1.2.

5.2.7 - FSK Tone Generator Electronic Assembly Y2A2A9

The following paragraphs contain the necessary information for the removal, cleaning, repair, and adjustment of FSK Tone Generator Electronic Assembly.

A) *Removal*

To remove the FSK Tone Generator Electronic Assembly A9 (figure 5.15), proceed as follows:

a) Loosen the front panel screws on the T-827A/URT and pull the chassis from the case.

b) The FSK Tone Generator Electronic Assembly is located on the rear of the T-827A/URT main chassis. Loosen the two corner fastening screws on the electronic assembly and lift it from the case.

c) Lay the FSK Tone Generator Electronic Assembly on its side, remove the three dust cover screws, and lift off the dust cover.

B) *Test Equipment*

The following test equipment is required to repair the FSK Tone Generator Electronic Assembly and for performing any necessary adjustments after repair.

a) Oscilloscope, type Tektronix, mod. 546

b) Frequency Meter, type HP, mod. 5245-L

c) Dummy Load, type Bird, mod. 82

d) TTY Equipment

C) *Repair*

Clean the electronic assembly of dust and foreign matter with compressed air. Inspect the entire electronic assembly for defective components, frayed wiring, burned electrical components, loose connections or connectors (see figures 5.102 and 5.103 for component location).

D) *Reassembly*

After repair, replace any connections removed, then replace the dust cover.

E) *Adjustment*

If electrical components were replaced in the electronic assembly, it is necessary to adjust the circuits. To adjust the circuits after repair, proceed as follows:

a) Place the FSK Tone Generator Electronic Assembly in the proper position in the T-827A/URT chassis.

b) Disconnect rf output cable from connector J23 (RF OUT 50Ω) on the rear of the T-827A/URT, and connect dummy load to connector J23 in its place. (See figure 5.19).

c) Apply main power to the equipment. Set the T-827A/URT controls as follows:

   (1) Mode Selector switch: FSK.

   (2) USB LINE LEVEL switch: ±10DB.

   (3) Operating frequency: 02.000 mc.

   (4) LOCAL/REMOTE switch: REMOTE.

   (5) Interlock switch: pulled up.

d) Connect the TTY equipment to the system. Energize the TTY equipment.

e) Connect the Oscilloscope to TP 12 (figure 5.15) on the FSK Tone Generator Electronic Assembly. Set oscilloscope as follows:

   (1) Sweep speed: 5 usec/cm.

   (2) Vertical deflection: 0.5 v/cm.

   (3) Trigger: internal.

   (4) Input: AC.

f) Set the potentiometers marked 2125 CPS (A9R13), 2975 CPS (A9R12), 2425 CPS (A9R10), and 1575 CPS (A9R8), on the top of electronic assembly (figure 5.15) at midrange.

g) Key the T-827A/URT.

h) Adjust OUTPUT LEVEL potentiometer 2A9R26 (figure 5.15) on electronic assembly for an indication of 1.0 volts peak-to-peak ±0.1 volt on the oscilloscope.

i) Disconnect Oscilloscope from TP 12 (Figure 5.15).

j) Connect Frequency Meter 5245-L to TP 12 (figure 5.15).

k) Set the CTR FREQ switch A9S1 (figure 5.15) on electronic assembly at 2000. Set the TTY equipment for "a mark" condition.

l) Adjust the 2425 CPS potentiometer A9R10 (figure 5.15) for an indication of 2425 ± 5 cps on the HP-5245-L meter.

m) Depress the "break" button on the TTY equipment. Adjust the 1575 CPS potentiometer A9R8 (figure 5.15) for an indication of 1575 ± 5 cps on the frequency meter.

n) Set the CTR FREQ switch A9S1 on electronic assembly at 2550. Adjust the 2125 CPS potentiometer A9R13 (figure 5.15) for an indication of 2125 ± 5 cps on the HP-5245-L.

o) Set the TTY equipment for a "mark" condition.

p) Adjust the 2975 CPS potentiometer A9R12 (figure 5.15) for an indication of 2975 ± 5 cps.

q) Set Mode Selector switch at OFF. Disconnect the test equipment. Reconnect the RF output cable removed in step b. above. Slide chassis into the case and tighten the front panel screws on the T-827A/URT.

5.3 - EMERGENCY MAINTENANCE FOR ELECTRONIC ASSEMBLIES

Audio Amplifier Electronic Assemblies 2A2A2 and 2A2A3 function identically and are interchangeable. If it is essential that the transmitter be operated in USB, AM, or FSK modes of operation and Audio Amplifier Electronic Assembly 2A2A2 malfunctions, replace it with Audio Amplifier Electronic Assembly 2A2A3.

If LSB mode of operation is desired and Audio Amplifier Electronic Assembly 2A2A3 malfunctions, replace it with Audio Amplifier Electronic Assembly 2A2A2. Both electronic assemblies must be functioning properly for ISB mode of operation.

If the 5 mc oscillator in the Frequency Standard Electronic Assembly malfunctions, refer to Section 2 for patching the 5 mc output from another source into the malfunctioning unit.

5.4 - CHAIN, DRIVE MECHANISM

This paragraph provides instructions for removing the drive chains and for removing and disassembling the sprocket assemblies on the bottom of the T-827A/URT chassis.

A) *Removal*

Removal of these components can be accomplished with the chassis in place on the slide mechanisms.

To remove the drive chains and sprocket assemblies, proceed as follows, using figure 5.17 as a guide:

a) Turn off power to T-827A/URT. Loosen front panel screws and slide chassis out from case.

b) Remove RF Amplifier and Translator/Synthesizer Electronic Assemblies from chassis.

c) Tilt chassis 90 degrees to expose bottom.

d) To remove drive chains, proceed as follows:

(1) Loosen the three chain tension idler gears and slide away from chains.

(2) Locate keeper clip on each drive chain. Carefully remove keeper clips and unthread chains.

e) Remove four nuts securing dual and triple sprocket assemblies to chassis and lift off sprocket assemblies.

f) To disassemble the sprocket assemblies, remove the two retaining rings located inside the assembly housing and secured around shaft. Loosen coupler from end opposite coupler. Separate sprocket assembly parts as they clear shaft.

B) *Repair*

To repair a defective sprocket assembly, proceed as follows:

a) Wipe all disassembled parts with dry, lint-free cloth.

b) Inspect all parts for damage. Replace worn parts.

c) Replace metal springs if they no longer provide proper tension between associated parts.

d) Replace both coupler and shaft if shaft is scored.

e) Replace detent springs if bent so that too much or too little tension results.

f) Replace hub-clamps if it is evident during equipment operation that proper clamping action was not being maintained. This would be indicated by low output intermittent frequency selection (100,10 or 1 kc digits) or off frequency.

C) *Reassembly*

To reassemble the sprocket assemblies, and to install the sprocket assemblies and drive chains onto bottom of chassis after repair, proceed as follows:

a) Reassemble sprocket assemblies using new retaining rings in place of those that were removed. Do not tighten hub-clamp setscrews.

b) Secure sprocket assemblies in their respective positions on chassis with the four appropriate nuts.

c) Thread drive chains onto gears. Fasten ends of each chain together with keeper clip.

D) *Adjustments*

After reassembly, the chain drive mechanism must be adjusted to assure proper relationship between the front panel KCS controls, the couplers and their respective detent spring position in the sprocket assemblies.

E) *Drive chain adjustment*

To obtain proper positioning of the front panel KCS controls with respect to the full or "seated" position of the detent spring, adjust the position of the drive chain as follows:

a) Replace RF Amplifier and Translator/Synthesizer Electronic Assemblies. Make sure that all couplers are engaged properly.

b) For each KCS control, take slack out of associated drive chain by holding associated chain tension idler gear against chain. If digit is centered in window, tighten chain tension idler gear in that position and proceed to step F). If digit is not centered in window, proceed as follows:

(1) Release chain tension idler gear and slide away from chain.

(2) Lift drive chain away from gears and shift entire chain to a position where front panel control and digit above control,remain fairly stationary when chain is tightened. In most cases, the trial-and-error method must be used to determine the proper chain position.

(3) When the drive chain is positioned properly,tighten chain tension idler gear securely against chain.

c) The dual sprocket assembly provides a means for making a finer adjustment for the 100 kc and 10 kc controls. To make the fine adjustment, proceed as follows:

(1) Rotate the 100 kc and 10 kc controls and observe the detent action of the dual sprocket assembly. Proper detent action is displayed by relatively smooth rotation of controls with full detent or "seating" action. If necessary, remove a spacer from under detent spring to increase the spring tension or add a spacer to reduce spring tension.

(2) If digit is still not centered fully in window when detent spring is "seated" fully, loosen the two hex-head screws on wheel index engaged with detent spring. Wheel index provides the "seating" position for the detent spring.

(3) Press firmly on detent spring above roller. Do not allow wheel index to rotate.

(4) Rotate front panel control until digit is exactly centered in window as desired.

(5) Release front panel control and detent spring. If digit moves from center of window, repeat steps (3) through (5).When digit is centered exactly in window, tighten hex-head screws on wheel index.

F) *Coupler adjustment*

Once the drive chains have been adjusted to provide optimum detent positioning, the sprocket assembly couplers which are operated by the KCS controls, must be adjusted for proper electrical-mechanical alignment between the electronic assemblies and the chain drive mechanism. To adjust the couplers, proceed as follows:

a) Remove RF Amplifier and Translator/Synthesizer Electronic Assemblies from chassis.

b) Rotate 100 kc and 10 kc controls to 1. Insert screw-driver in coupler adjustments in dual sprocket assembly (figure 5.17) and rotate couplers so that each coupler points toward and is perpendicular to the front panel.

c) Tighten hub-clamp setscrews on dual sprocket assembly.

d) Rotate 100 kc, 10 kc and 1 kc controls to 0. Insert screw-driver in respective coupler adjustments in triple sprocket assembly (figure 5.17) and rotate couplers so that each coupler slot points toward and is perpendicular to the rear panel.

e) Tighten hub-lamp setscrews on triple sprocket assembly.

f) Rotate KCS controls to 1. Replace RF Amplifier and Translator/Synthesizer Electronic assemblies. Restore T-827A/URT to normal operating condition.

Table 5.1

EXCITER T-827A/URT

SPARE CONNECTOR PINS AND SPARE FILTERS

SPARE CONNECTOR PINS	2A1A1J4	FILTER CAP.	2A1P1 - 2A2J21
2A2J11 - 2A2P1	-j	C30	-30
-9	-u	C18	-18
2A2J12 - 2A2P1	-v	C29	-29
-13	-H	C39	-39
-15			
-17			

PARTS LOCATION INDEX Fig. 5-2

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C10	19B	A2R5	10C	A4C44	8E	A4R78	14G
C11	21D	A2R6	11B	A4C45	8E	A4R79	14G
C21	19D	A2R7	12B	A4C46	6F	A4R80	13F
FL1	20B	A2R8	13B	A4C47	8F	A4R81	13F
FL2	20D	A2R9	12B	A4C48	4B	A4R82	13F
P1	3F, 3G, 16E	A2R10	12C	A4C49	8G	A4R83	14F
P2	3A, 3B, 3C,	A2R11	14B	A4C50	6H	A4R84	14F
	3D, 3E, 3I	A2R12	15B	A4C51	7H	A4R85	6E
	16F, 16H, 22D	A2R13	14B	A4C52	7E	A4R86	6E
R41	21D	A2R14	15B	A4C53	11F	A4R87	6E
S1	10G	A3C7	17B	A4CR11	6B	A4R88	7E
T1	16B	A3C8	18B	A4CR12	14I	A4R89	10E
T2	16D	A3C9	18A	A4CR13	15H	A4R90	7E
A1C12	11D	A3C18	17D	A4CR14	15G	A4R91	8E
A1C13	13D	A3C19	18C	A4CR15	14F	A4R92	8E
A1C14	13D	A3C20	18C	A4CR16	7E	A4R93	8E
A1C15	14D	A3Q1	17B	A4CR17	10F	A4R94	6F
A1C16	14C	A3Q2	17D	A4CR18	8E	A4R95	6F
A1C17	14D	A3R15	16B	A4CR19	7F	A4R96	6G
A1CR5	12D	A3R16	17B	A4CR20	8G	A4R97	7G
A1CR6	12D	A3R17	17B	A4CR21	7G	A4R98	7F
A1CR7	12C	A3R18	17A	A4CR100	7H	A4R99	8G
A1CR8	13D	A3R19	17B	A4Q6	7C	A4R100	7G
A1R21	10C	A3R20	18B	A4Q7	7B	A4R101	5G
A1R22	10C	A3R35	16D	A4Q8	13H	A4R102	8F
A1R23	10D	A3R36	17D	A4Q9	11F	A4R103	8H
A1R24	10D	A3R37	17C	A4R53	6B	A4R104	9H
A1R25	10D	A3R38	17C	A4R54	6C	A4R105	8H
A1R26	11D	A3R39	17C	A4R55	6B	A4R106	8H
A1R27	12C	A3R40	18D	A4R56	6C	A4R107	9H
A1R28	13D	A3TP2	18B	A4R57	7C	A4R108	7H
A1R29	12D	A3TP3	18D	A4R58	7D	A4R109	7H
A1R30	12D	A4C25	5B	A4R59	8C	A4R110	6H
A1R31	14D	A4C26	5B	A4R60	7A	A4R111	6H
A1R32	15D	A4C27	7C	A4R61	7B	A4R112	6H
A1R33	14D	A4C28	8C	A4R62	8A	A4R113	9F
A1R34	15D	A4C29	8C	A4R63	13H	A4R114	8H
A2C1	11C	A4C30	7B	A4R64	13H	A4R115	7D
A2C2	13B	A4C31	8B	A4R65	13H	A4R116	10E
A2C3	13B	A4C32	8B	A4R66	13H		
A2C4	14B	A4C33	14H	A4R67	13H	A4R118	10E
A2C5	14B	A4C34	13H	A4R68	12H	A4R119	10F
A2C6	14C	A4C35	12H	A4R69	14H	A4R120	11F
A2CR1	12B	A4C36	12H	A4R70	14H	A4R121	10E
A2CR2	12C	A4C37	14H	A4R71	14H	A4RT1	13H
A2CR3	12B	A4C38	14I	A4R72	14H	A4J3	9C
A2CR4	13B	A4C39	13G	A4R73	14I	A4T4	9B
A2R1	10B	A4C40	12F	A4R74	15H	A4T5	15E
A2R2	10B	A4C41	6E	A4R75	15G		
A2R3	10B	A4C42	6E	A4R76	15H		
A2R4	10C	A4C43	10E	A4R77	13G		

PARTS LOCATION INDEX
FOR FIG. 5.4

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
B1	6G	R3	15C	A2T2	11B	A34C10	18E
C1	12B	S1-S2	5H	thru		thru	
C2	12C	TP4	19A	A29T2		A34C19	
C3	14B	V1	4E,13B	A2T3	15E	A35C1	19E
C4	14C	V2	4E,5B	thru		thru	
C5	15B	A1C1	13C	A29T3		A35C9	
C6	16C	A1C2	14C	A2T4	17A	A36C1	20C
C7	16B	A1C3	16B	thru		thru	
C8	12E	A1R1	12C	A29T4		A36C9	
C9	13F	A1R2	12C	A9Y1	11C	A37C1	19C
C10	14E	A1R3	13C	A10Y1	11C	thru	
C11	18D	A1R4	14E	A19Y1	11C	A37C9	
C12	18E	A1R5	15B	A30C1	12H	A37C10	19C
C13	19B	A1R6	16D	thru		thru	
C14	20C	A2C1	10B	A30C9		A37C19	
C15	3E	thru		A30C10	12H	A38C1	4B
C16	3E	A29C1		thru		A38C2	5C
C17	5E	A2C2	10C	A30C19		A38C3	6B
C18	5E	thru		A31C1	13H	A38C4	6A
C19	12G	A29C3		thru		A38C5	6B
C20	12H	A2C3	11C	A31C9		A38C6	7C
FL1	12B	thru		A32C1	13F	A38K1	8D
FL2	15B	A29C3		thru		A38L1	4C
FL3	16A	A2C4	16D	A32C9		A38Q1	5B
K1	7G	thru		A33C1	12F	A38Q2	6B
P1	3F, 3G, 3H	A29C4		thru		A38R1	4B
P2	3A, 3B, 3C	A2C5	18A	A33C9		A38R2	4B
	3D, 3E, 3F	thru		A33C10	12F	A38R3	4B
	19B	A29C5		thru		A38R5	5C
R1	13C	A2T1	9B	A33C19		A38R6	5B
R2	13C	thru		A34C1	18E	A38R7	6B
		A29T1		thru		A38R8	6B
				A34C9		A38R9	7B
						A38R10	7B
						A38TP1	4A
						A38TP2	6A

PARTS LOCATION INDEX
FOR FIG.5.5

REF DESIG	LOC
C1	5D
P1	4C,4B,4F 21D,21E,21G, 21H
HR1	10D
Q1	11H
R1	5I
RT1	5G
S1	12C
A1C1	19F
A1C2	19F
A1C3	20F
A1C4	18F
A1C5	19G
A1C6	16E
A1C7	16E
A1C8	16F
A1C9	17E
A1C10	16G
A1C11	18E
A1C12	17E
A1C13	15G
A1C14	16F
A1C15	13G
A1C16	13H
A1C17	12H
A1C18	13F
A1C19	12F
A1C20	12B
A1C21	11B
A1C22	14B
A1C23	14C
A1C24	16C
A1C25	15D
A1C26	11F
A1CR1	14C
A1CR2	16C
A1DS1	17D
A1L1	11F
A1L2	11A
A1Q1	19F
A1Q2	16E
A1Q3	16G
A1Q4	13H
A1Q5	13F
A1Q6	16D
A1Q7	15C
A1R1	19F
A1R2	18F
A1R3	19F
A1R4	18F
A1R5	15E
A1R6	15E
A1R7	16F
A1R8	17E
A1R9	16E
A1R10	16F
A1R11	16F
A1R12	15F
A1R13	16G
A1R14	13G
A1R15	12G
A1R16	12H
A1R17	13E
A1R18	13D
A1R19	12F
A1R20	13E
A1R21	12E
A1R22	11C
A1R23	11B
A1R24	13B
A1R25	13B
A1R26	16C
A1R27	16C
A1R28	15C
A1R29	15D
A1R30	16D
A1T1	18G
A1T2	15E
A1T3	18E
A1T4	14H
A1T5	14F
A1T6	14C
A1TP1	14E
A1TP2	18G
A2C1	6H
A2C2	7G
A2C3	7G
A2C4	8H
A2C5	8G
A2C6	10H
A2C12	9C
A2C13	9D
A2C40	10G
A2CR1	9G
A2CR2	10H
A2CR3	8C
A2CR4	8E
A2Q1	6G
A2Q2	7G
A2Q3	10G
A2Q6	9D
A2R1	6G
A2R2	6H
A2R3	7H
A2R4	7H
A2R6	8H
A2R7	6G
A2R8	9H
A2R9	10H
A2R10	10H
A2R11	9G
A2R12	9C
A2R17	9C
A2R18	6F
A2RT2	6F
A2T1	8G
A2T3	9D
A3C7	6C
A3C8	7E
A3C9	6E
A3C10	6D
A3CR5	6C
A3CR6	6D
A3Q5	7D
A3R14	7D
A3R15	6E
A3R16	6E
A3T2	7C
A3Y1	6E

PARTS LOCATION INDEX
FOR FIG. 5.6

REF DESIG	LOC
B1	3F
C1 ÷ C17	4C
C18	4G
C19	16E
K1	3E, 3D
L1	4G
L2	15E
P1	2D, 2E, 4G, 12C
S1	3E, 4C, 4E
Y1 ÷ Y17	4C
A1C18	11B
A1C19	5B
A1C20	6B
A1C21	7C
A1C23	7B
A1C24	8C
A1C25	11B
A1C26	9C
A1C27	10B
A1C28	11C
A1CR1	6A
A1CR2	6A
A1CR3	5C
A1L1	11A
A1L2	8B
A1L3	9C
A1Q1	8C
A1Q2	9C
A1Q3	10C
A1Q4	11C
A1R1	5D
A1R2	5B
A1R3	5A
A1R4	6B
A1R5	7A
A1R6	7B
A1R7	8B
A1R8	7B

REF DESIG	LOC
A1R9	8C
A1R10	9C
A1R11	9B
A1R12	10B
A1R13	9C
A1R14	9C
A1R15	10C
A1R16	11C
A1R17	11C
A1R18	12C
A1RT1	6B
A2C1	15G
A2C2	16F
A2C3	16G
A2C4	16F
A2C5	19G
A2C6	19G
A2C7	21G
A2C8	21G
A2C9	21H
A2C10	21F
A2C11	22H
A2C12	18G
A2C13	20G
A2C14	15F
A2CR1	20G
A2J1	23G
A2J2	22F
A2L1	20G
A2L2	21G
A2L3	21G
A2L4	21H
A2P1	23G
A2P2	22F
A2Q1	16G
A2Q2	19G
A2Q3	22G
A2R1	16F
A2R2	16G
A2R3	16F
A2R4	16F
A2R5	16G
A2R6	17G
A2R7	18G
A2R8	18G

REF DESIG	LOC
A2R9	19F
A2R10	19G
A2R11	19G
A2R12	20G
A2R13	21G
A2R14	22G
A2R15	22F
A2R16	22G
A2R17	22G
A2R18	22H
A2R19	22H
A2R20	22H
A2R21	23G
A2R22	15F
A2RT1	22H
A2T1	18G
A2T2	19G
A2TP1	18G
A2TP2	21G
A2TP3	23F
A3C1	6F
A3C2	6G
A3C3	5G
A3C4	7G
A3C5	7G
A3C6	8H
A3C7	8G
A3C8	8G
A3C9	10H
A3C10	10G
A3C11	5F
A3C12	12G
A3C13	12G
A3C14	11G
A3C15	13G
A3C16	13G
A3C17	14G
A3C18	10F
A3C19	11G
A3C20	11F
A3CR1	5F
A3CR2	7G
A3CR3	6G
A3CR4	9G
A3CR5	10H

REF DESIG	LOC
A3L1	5F
A3L2	5G
A3L3	9H
A3L4	13G
A3Q1	7G
A3Q2	8G
A3Q3	9G
A3Q4	13G
A3Q5	10F
A3Q6	11G
A3R1	5F
A3R2	6F
A3R3	7F
A3R4	7G
A3R5	6G
A3R6	7G
A3R7	7G
A3R8	8H
A3R9	8F
A3R10	8G
A3R11	8G
A3R12	9F
A3R13	9F
A3R14	9G
A3R15	9G
A3R16	9G
A3R17	10H
A3R18	11G
A3R19	12G
A3R20	12G
A3R21	11H
A3R22	10H
A3R23	11G
A3R24	11G
A3R25	12G
A3R26	10F
A3R27	10F
A3R28	10G
A3R29	10G
A3R30	10F
A3R31	11F
A3R32	14G
A3R33	5G
A3T1	13G
A3TP1	13F

[illegible] INDEX
[illegible] FIG. 5.7

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
P1	2E, 2F,	A2R10	3H	A3Y1	14G	A4R16	14D
	2H, 2I,	A2T1	6G	A3Y2	20F	A4R17	14C
	22B	A2T2	8G	A4C1	9B	A4R18	14E
S1	2C	A2T3	9G	A4C2	9D	A4R19	13E
Y1 ÷ Y10	2C	A2TP1	9G	A4C3	9A	A4R20	10C
A1C1	3C	A3C1	11H	A4C4	9B	A4R21	15B
A1C2	3D	A3C2	21I	A4C5	10C	A4R22	15D
A1C3	4C	A3C3	20I	A4C6	9D	A4T1	12B
A1C4	5C	A3C4	11H	A4C7	10B	A4T2	13D
A1C5	5C	A3C5	12G	A4C8	10C	A4TP1	10B
A1C6	5C	A3C6	12H	A4C9	10D	A4TP2	11B
A1C7	6C	A3C7	13H	A4C10	11B	A4TP3	13B
A1C8	4D	A3C8	14H	A4C11	11B	A4TP4	11D
A1C9	7C	A3C9	14H	A4C12	11D	A4TP5	12D
A1C10	8C	A3C10	16G	A4C13	11D	A4TP6	13D
A1CR1	3C	A3C11	17H	A4C14	12B	A5C1	17B
A1CR2	4C	A3C12	17H	A4C15	12B	A5C2	17D
A1Q1	5C	A3C13	17G	A4C16	12D	A5C3	21C
A1Q2	7C	A3C14	18H	A4C17	12D	A5C4	18C
A1R1	4C	A3C15	18G	A4C18	13B	A5C5	18B
A1R2	4C	A3C16	19H	A4C19	13D	A5C6	19D
A1R3	4C	A3C17	20G	A4C20	14B	A5C7	19C
A1R4	4C	A3C18	19G	A4C21	14E	A5C8	20C
A1R5	5C	A3C19	20G	A4C22	9B	A5C9	20D
A1R6	6C	A3C20	20G	A4C23	14C	A5C10	21C
A1R7	5B	A3CR1	18H	A4C24	14D	A5C11	21C
A1R8	6C	A3CR2	18H	A4C25	14C	A5CR1	20D
A1R9	6B	A3CR3	19H	A4C26	15E	A5L1	21B
A1R10	6C	A3Q1	12H	A4C27	14C	A5L2	19C
A1R11	7C	A3Q2	16G	A4C28	11B	A5L3	20C
A1R12	3D	A3R1	11H	A4C29	11B	A5Q1	17D
A1R13	8C	A3R2	12H	A4L1	15B	A5Q2	18C
A1R14	7C	A3R3	11H	A4L2	11D	A5Q3	19C
A1RT1	3C	A3R4	12H	A4L3	12D	A5Q4	20C
A2C1	6G	A3R5	15H	A4L4	15D	A5R1	17D
A2C2	6H	A3R6	16G	A4L5	10B	A5R2	17C
A2C3	5G	A3R7	16H	A4L6	10D	A5R3	17C
A2C4	7H	A3R8	16H	A4L7	14B	A5R4	18C
A2C5	7G	A3R9	17H	A4Q1	14D	A5R5	18D
A2C6	4G	A3R10	18G	A4Q2	9B	A5R6	19C
A2C7	4G	A3R11	18H	A4Q3	10C	A5R7	19D
A2C8	9G	A3R12	18H	A4Q4	9A	A5R8	19D
A2C9	8G	A3R13	19H	A4R1	10B	A5R9	19C
A2FL1	8G	A3R14	19G	A4R2	10D	A5R10	19D
A2Q1	7H	A3R15	21G	A4R3	10B	A5R11	20C
A2Q2	5G	A3R16	12G	A4R4	10D	A5R12	19D
A2R1	7H	A3T1	13H	A4R5	10D	A5R13	19D
A2R2	7H	A3T2	15H	A4R6	12D	A5R14	19D
A2R3	7H	A3T3	19G	A4R7	13B	A5R15	20C
A2R4	5G	A3T4	21G	A4R8	13C	A5R16	21C
A2R5	4G	A3TP1	12G	A4R9	13D	A5R17	20D
A2R6	4G	A3TP2	15G	A4R10	14B	A5TP1	18D
A2R7	4G	A3TP3	17G	A4R11	14B		
A2R8	6F	A3TP4	21F	A4R12	14D		
A2R9	5G			A4R13			
				A4R14			
				A4R15			

PARTS LOCATION INDEX
FOR FIG. 5.8

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C25	3E	A1R8	6B	A2R16	8G	A4C7	17G	A4Z3C27	14F
C26	3E	A1R9	7B	A2RT1	4H	A4C8	15G	A4Z3C28	15F
J1	3D	A1R10	7B	A2T1	8G	A4C9	14G	A4Z3Q6	15F
J3	15C	A1R11	4D	A3C46	10B	A4C10	19G	A4Z3R22	16F
J4	3E	A1R12	5D	A3C47	10C	A4C11	18F	A4Z3R23	15F
J5	3I	A1R13	5C	A3C48	10C	A4C12	19G	A4Z3R24	15F
J6	3A	A1R14	7A	A3C49	11C	A4C13	12G	A4Z3R25	15F
J7	21G	A1R15	8C	A3C50	12C	A4FL1	18H		
P1	9C	A1R16	8C	A3C51	12C	A4FL2	15G		
P2	9A	A1RT1	4D	A3C52	13C	A4L3	17F		
S1	2B	A1T1	8C	A3C53	13A	A4L4	12G		
S2	2G	A2C1	4G	A3C54	13C	A4Q8	17H		
Y1	2C,	A2C2	4G	A3C55	10C	A4Q9	19G		
÷	3C	A2C3	5G	A3C56	11C	A4R1	17I		
Y10		A2C4	5G	A3CR7	13C	A4R2	16H		
Y11	2G,	A2C5	4H	A3J8	9C	A4R3	16H		
÷	3G	A2C6	6G	A3J9	9A	A4R4	16H		
Y20		A2C7	4F	A3J10	9D	A4R5	17H		
A1C1	4B	A2C8	5H	A3L5	11C	A4R6	19H		
A1C2	4B	A2C9	7F	A3L6	12C	A4R7	18G		
A1C3	5C	A2C10	7G	A3L7	12C	A4R8	18G		
A1C4	5C	A2CR1	4H	A3Q11	10C	A4R9	18F		
A1C5	4D	A2CR2	5H	A3Q12	13B	A4R10	19F		
A1C6	6B	A2Q1	5E	A3R47	10B	A4R11	19F		
A1C7	4B	A2Q2	6G	A3R48	10B	A4R12	12F		
A1C8	5D	A2R1	4G	A3R49	13B	A4T1	20G		
A1C9	7B	A2R2	5F	A3R50	12B	A4Z1C43	13G		
A1C10	7C	A2R3	4H	A3R51	13D	A4Z1C44	13F		
A1C11	8C	A2R4	6G	A3R52	10C	A4Z1Q10	13G		
A1CR1	4C	A2R5	7G	A3R54	10C	A4Z1R41	13G		
A1CR2	5C	A2R6	6G	A3T3	14C	A4Z1R42	13G		
A1Q1	5B	A2R7	5G	A3TP1	10C	A4Z1R43	13F		
A1Q2	6B	A2R8	6F	A3TP2	11C	A4Z1R44	13G		
A1R1	4B	A2R9	7F	A3TP3	12C	A4Z2C29	11H		
A1R2	5B	A2R10	7F	A4C1	16G	A4Z2C30	10G		
A1R3	4B	A2R11	4H	A4C2	17I	A4Z2Q7	10G		
A1R4	6C	A2R12	5H	A4C3	16I	A4Z2R26	11G		
A1R5	7C	A2R13	5H	A4C4	17H	A4Z2R27	10H		
A1R6	6C	A2R14	7F	A4C5	19H	A4Z2R28	10G		
A1R7	5B	A2R15	8G	A4C6	19H	A4Z2R29	11G		

PARTS LOCATION INDEX
FOR FIG. 5.10

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
A1C1	3D	A1R12	7G	A2Q2	8B	A3C7	13E	A3R22	16D
A1C2	4D	A1R13	7H	A2Q3	11B	A3C8	14E	A3R23	18D
A1C3	4E	A1R14	7H	A2Q4	10B	A3C9	15F	A3R24	17D
A1C4	5E	A1R15	8G	A2Q5	12B	A3C10	14D	A3R25	17F
A1C5	6E	A1R16	8H	A2Q6	13B	A3C11	15F	A3R26	18D
A1C6	7F	A1R17	9G	A2R1	7A	A3C12	16E	A3R27	19E
A1C7	7H	A1R18	9G	A2R2	7A	A3C13	17D	A3T1	18E
A1C8	6D	A1R19	9G	A2R3	8A	A3C14	17E	A3TP1	13E
A1C9	8G	A1R20	9H	A2R4	8B	A3C15	11D	A3TP2	14E
A1C10	8H	A1R21	9G	A2R5	7C	A3C16	18E	A3TP3	14E
A1C11	8H	A1R22	11I	A2R6	7B	A3CR1	11D	A3TP4	16F
A1C12	8H	A1R23	10G	A2R7	8A	A3CR2	12F	A3TP5	16D
A1C13	9H	A1R24	10I	A2R8	8B	A3CR3	13F	A3TP6	17E
A1C14	9H	A1R25	11I	A2R9	9B	A3CR4	15F	A4C1	16H
A1C15	9H	A1T1	8H	A2R11	10A	A3CR5	14E	A4J1	19H
A1C16	9I	A1T2	12H	A2R12	10B	A3J2	10D	A4Q1	16G
A1C17	11I	A1TP1	5E	A2R13	10B	A3J4	19E	A4R1	16H
A1C18	11H	A1TP2	6E	A2R14	10C	A3L1	11D	A4R2	17H
A1C19	12I	A1TP3	7G	A2R15	10C	A3Q1	12E	A4R3	15G
A1CR1	4D	A1TP4	7F	A2R16	10A	A3Q2	13E	A4R4	14H
A1CR2	5D	A1TP5	7H	A2R18	10C	A3Q3	15E	A4R5	15H
A1CR3	5D	A1TP6	8G	A2R19	11B	A3Q4	14E		
A1CR4	9H	A2C1	6A	A2R20	11C	A3Q5	16E		
A1J3	3E	A2C2	7A	A2R21	12B	A3Q6	17E		
A1J6	13I	A2C3	8B	A2R22	12A	A3R1	11D		
A1L1	3D	A2C4	8C	A2R23	13A	A3R2	12D		
A1L2	4E	A2C5	8B	A2R24	13A	A3R3	12D		
A1L5	10H	A2C6	9A	A2R25	12C	A3R4	12E		
A1Q1	5E	A2C7	9B	A2R26	14A	A3R5	12F		
A1Q2	7E	A2C8	10B	A2R27	14B	A3R6	12E		
A1Q3	6E	A2C9	11C	A2R28	14B	A3R7	13D		
A1Q4	7H	A2C10	9A	A2R29	14B	A3R8	13E		
A1Q5	8G	A2C11	10C	A2T1	13B	A3R9	13F		
A1Q6	9H	A2C12	12B	A2TP1	9B	A3R10	13F		
A1R1	3D	A2C13	13A	A2TP2	9B	A3R11	15D		
A1R2	4D	A2C14	13B	A2TP3	9B	A3R12	15E		
A1R3	5E	A2C15	12B	A2TP4	11C	A3R13	14F		
A1R4	7D	A2C16	14B	A2TP5	11A	A3R14	14F		
A1R5	7D	A2CR1	7A	A2TP6	12B	A3R15	14F		
A1R6	6D	A2CR2	8C	A3C1	12D	A3R16	14E		
A1R7	6E	A2CR3	8C	A3C2	12D	A3R17	15E		
A1R8	7F	A2CR4	9A	A3C3	12F	A3R18	15F		
A1R9	6G	A2J5	15B	A3C4	11F	A3R19	16E		
A1R10	6H	A2L1	6A	A3C5	13E	A3R20	16F		
A1R11	7G	A2Q1	7B	A3C6	13D	A3R21	16E		

PART LOCATION INDEX

Fig. 5.11

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
P2	2B, 2E	A1CR4	13B	A1R15	11E
P3	19B, 19F, 19H	A1CR5	11C	A1R16	12E
A1C1	18B	A1CR6	9B	A1R17	10G
A1C2	17C	A1CR7	13C	A1R18	10E
A1C3	17B	A1CR8	6C	A1R19	10E
A1C4	14F	A1CR9	18E	A1R20	11D
A1C5	17F	A1CR10	17E	A1R21	11D
A1C6	8E	A1CR11	16H	A1R22	11E
A1C7	16G	A1FL1	14B	A1R23	5G
A1C8	15G	A1FL2	14C	A1R24	5H
A1C9	14B	A1FL3	7B	A1R25	4G
A1C10	14C	A1J1	3F	A1R26	5G
A1C11	13B	A1J2	3G	A1R27	16H
A1C12	13C	A1J3	3G	A1R28	6E
A1C13	18D	A1J4	18D	A1R29	5E
A1C14	11B	A1J5	3C	A1R30	5E
A1C15	10B	A1J6	18H	A1R31	5D
A1C16	5D	A1J7	18B	A1R32	5D
A1C17	9D	A1L1	18D	A1R33	5C
A1C18	10E	A1L2	16E	A1R34	5C
A1C19	11D	A1L3	10C	A1R35	4B
A1C20	11F	A1L4	8C	A1R36	5B
A1C21	4F	A1L5	7C	A1R37	6A
A1C22	11E	A1L6	3C	A1R38	6B
A1C23	10G	A1L7	18B	A1R39	6B
A1C24	12D	A1L8	18H	A1R40	[illegible]B
A1C25	12E	A1L9	11E	A1R41	[illegible]C
A1C26	5G	A1Q1	17B	A1R42	[illegible]B
A1C27	5G	A1Q2	16E	A1R43	11B
A1C28	6D	A1Q3	11E	A1R44	12A
A1C29	6E	A1Q4	12B	A1R45	12B
A1C30	6E	A1Q5	5B	A1R46	12B
A1C31	5E	A1Q6	5E	A1R47	13C
A1C32	4E	A1Q7	5G	A1R48	14C
A1C33	17H	A1Q8	8F	A1R49	14C
A1C34	17H	A1Q9	12F	A1R50	13C
A1C35	17H	A1R1	18B	A1R51	11D
A1C36	17H	A1R2	17B	A1R52	18F
A1C37	18B	A1R3	17C	A1R53	10G
A1C38	4D	A1R4	17F	A1R54	10E
A1C39	10C	A1R5	17F	A1R55	3F
A1C40	5B	A1R6	14E	A1R56	4H
A1C41	5B	A1R7	15E	A1T1	4E
A1C42	17D	A1R8	14E	A1TP1	16B
A1C43	17D	A1R9	15F	A1TP2	12B
A1C45	10B	A1R10	'7E	A1TP3	9B
A1C46	3D	A1R11	7E	A1TP4	6B
A1CR1	17B	A1R12	8E	A1TP5	18E
A1CR2	16C	A1R13	4F	A1TP6	18B
A1CR3	16B	A1R14	11D	A1TP7	4B
				A1TP8	3E

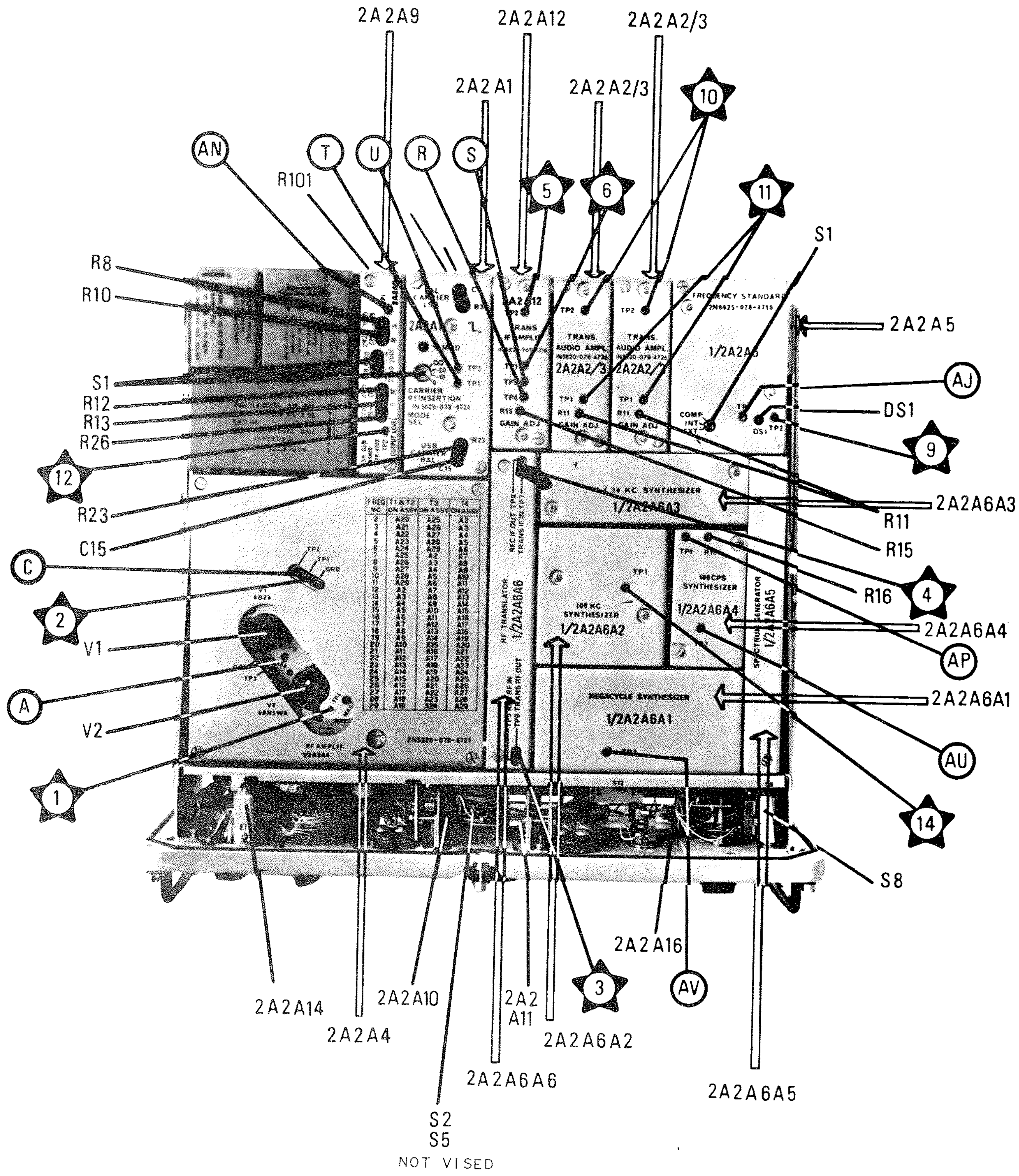
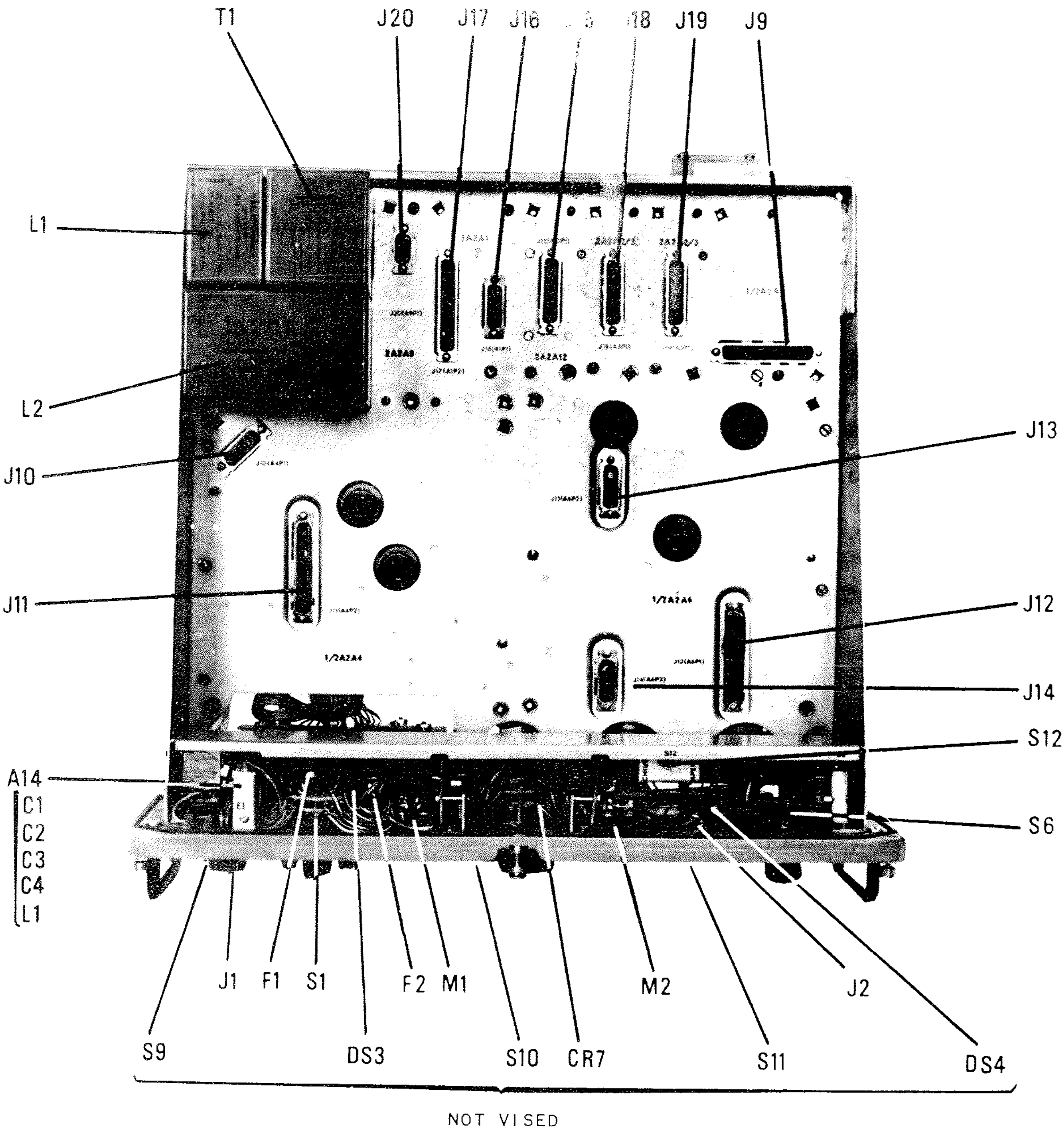
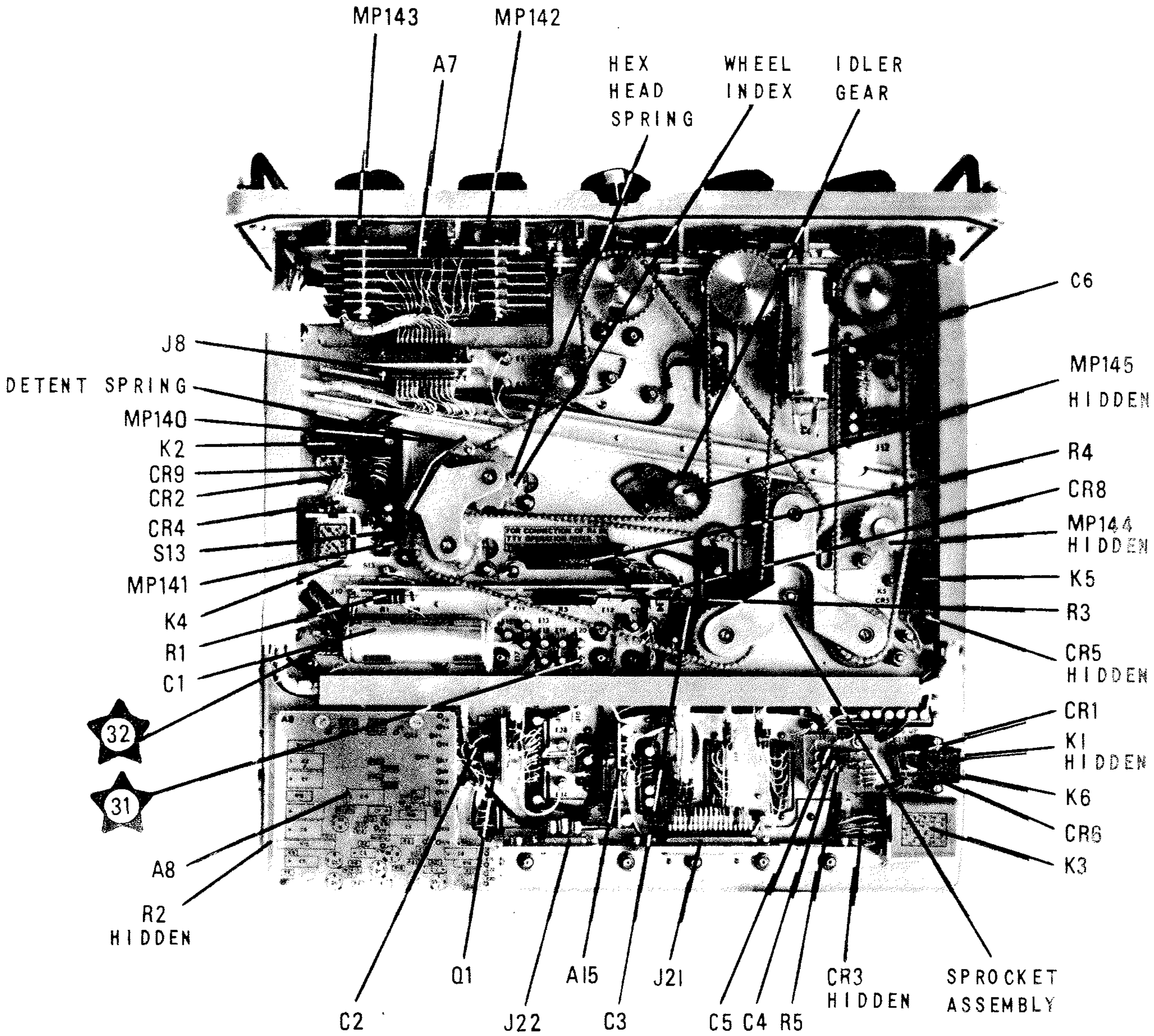


Figure 5-15. Radio Transmitter T-827A/URT, Top View, Case Removed, Component and Test Point Location



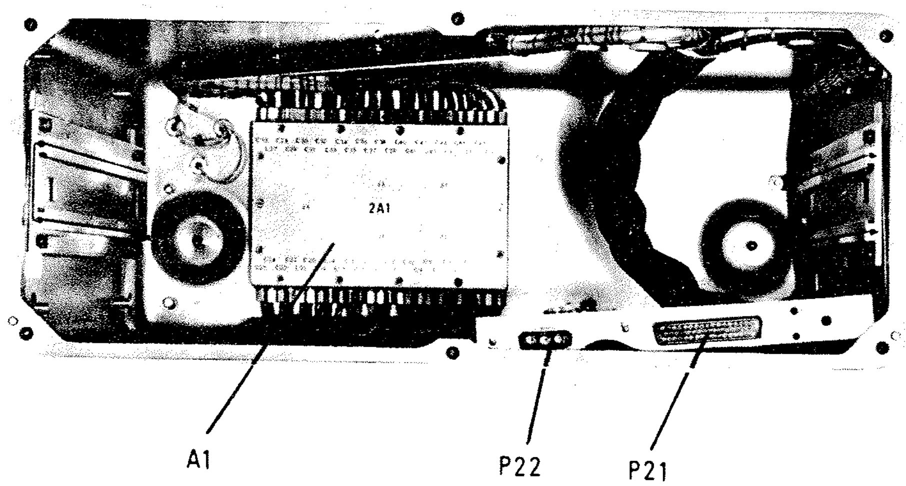
NOTE:
REF. DESIG. PREFIX 2A2

Figure 5-16. Radio Transmitter T-827A/URT, Chassis, Top View



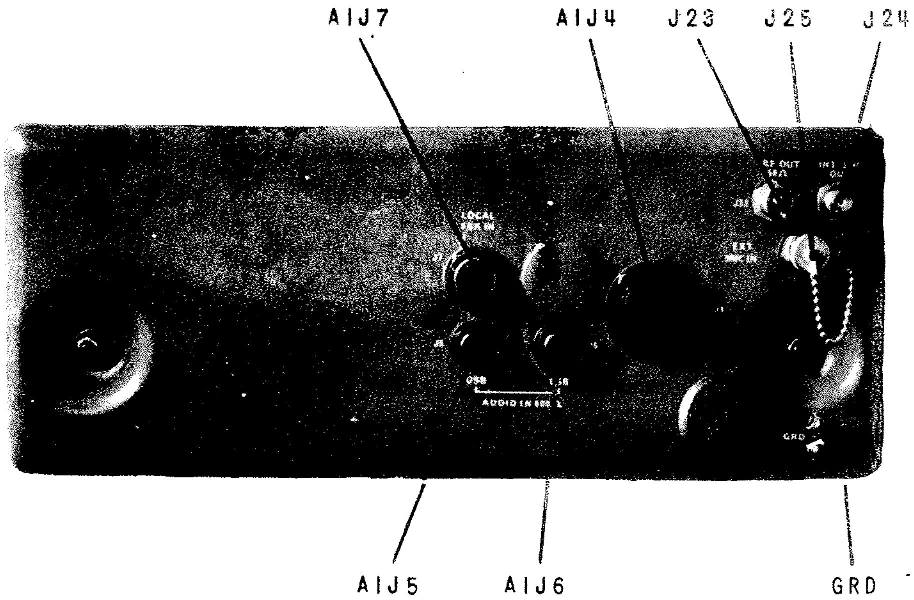
NOTE:
REF. DESIG. PREFIX 2A2

Figure 5-17. Radio Transmitter T-827A/URT, Bottom View, Component and Test Point Location



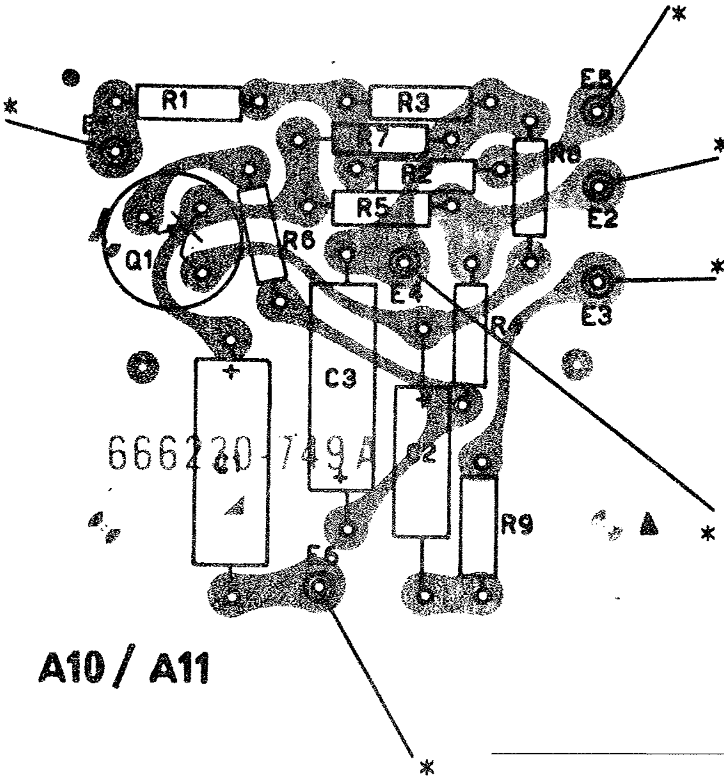
NOTE:
REF. DESIG. PREFIX 2A1

Figure 5-18. Radio Transmitter T-827A/URT, Case, Inside View, Component Location



NOTE:
REF. DESIG. PREFIX 2A1

Figure 5-19. Radio Transmitter T-827A/URT, Case, Rear View, Component Location

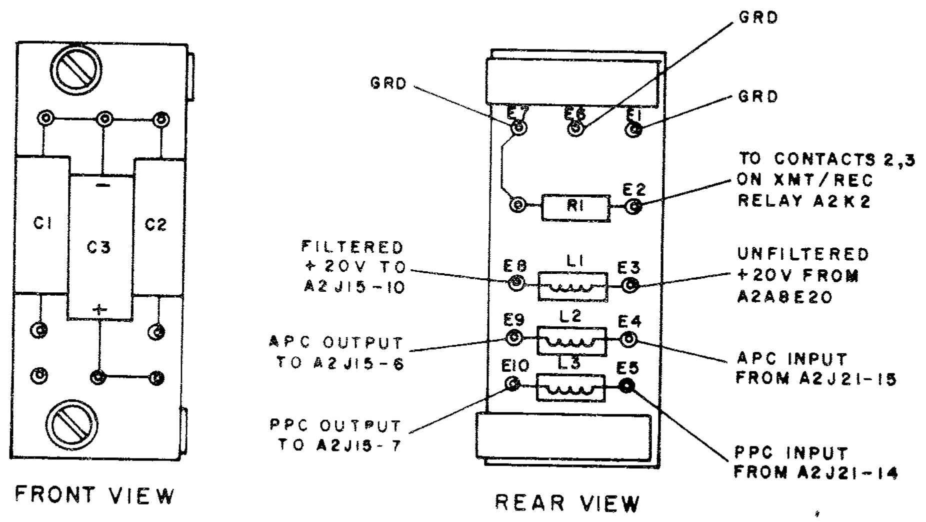


NOTES:

1. COMPONENT REF. DESIG. PREFIX A2
2. THIS DRAWING REFLECTS FOIL PATTERN OF EARLIER MODELS. CURRENT MODEL CONTAINS SLIGHT ALTERATIONS IN FOIL PATTERN BUT IS ELECTRICALLY IDENTICAL.
3. * REFER TO TABLE BELOW FOR THESE CONNECTIONS

A2A10	ORIGIN/DESTINATION	A2A11	ORIGIN/DESTINATION
E1	LSB AUDIO OUTPUT TO A2S10-6	E1	USB AUDIO OUTPUT TO A2S11-6
E2	+ 20V FROM A2A8E20	E2	+ 20V FROM A2A8E20
E3	OUTPUT TO A2M1-1, 0.744VRMS FOR METER FULL SCALE DEFLECTION	E3	OUTPUT TO A2M2-1, 0.744VRMS FOR METER FULL SCALE DEFLECTION
E4	TO A2E40 GROUND	E4	TO A2E37 GROUND
E5	LSB AUDIO INPUT FROM A2S10-1	E5	USB AUDIO INPUT FROM A2S11-1
E6	LSB AUDIO INPUT FROM A2S10-3	E6	USB AUDIO INPUT FROM A2S11-3

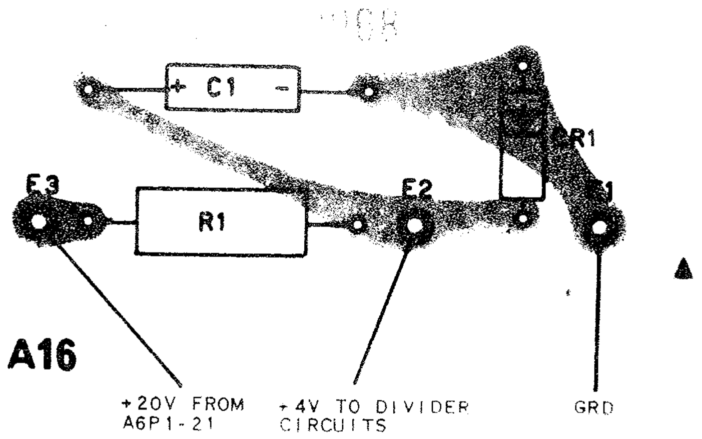
Figure 5-21. Meter Amplifier (Foil Side Up), Component Location



A15

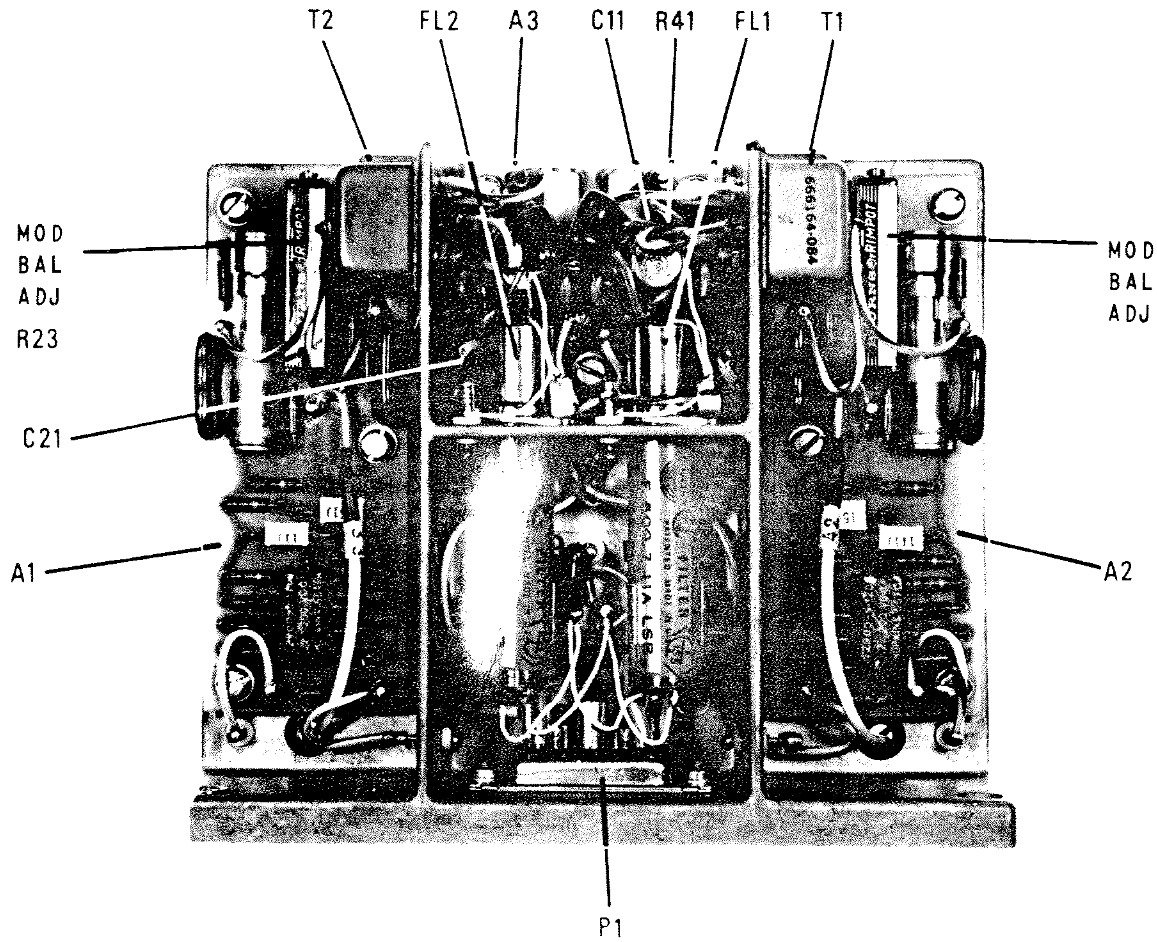
NOTE:
COMPONENT REF DESIG
PREFIX A2

Figure 5-22. IF. Filter, Component Location



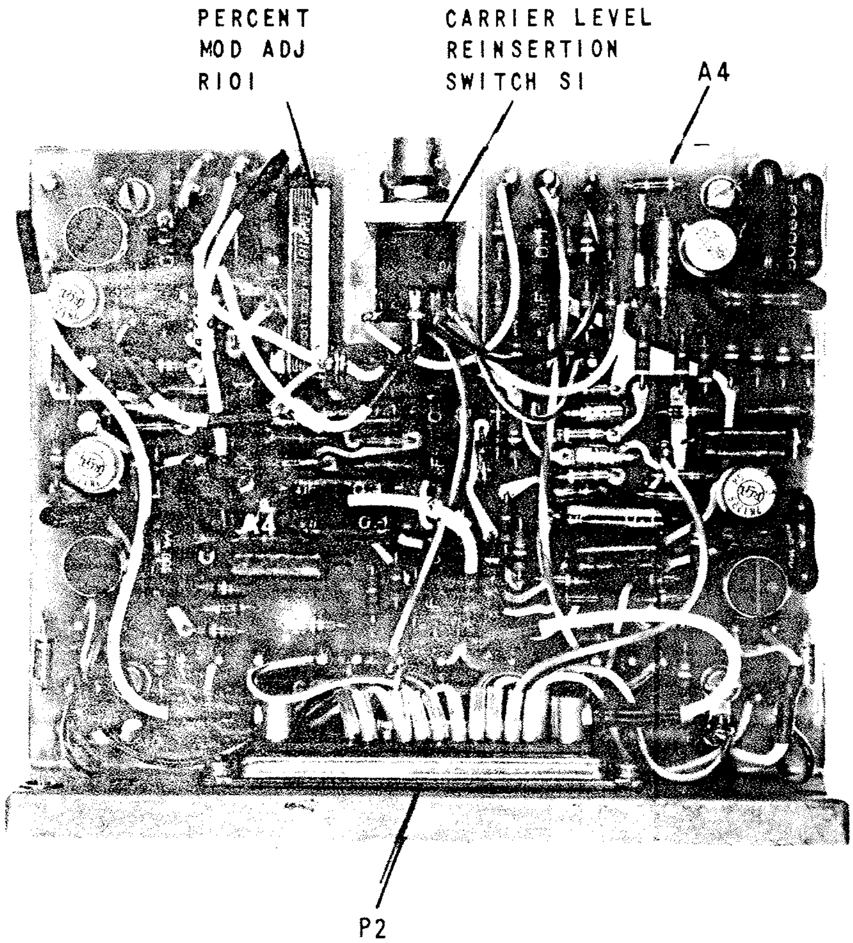
NOTE:
REF DESIG. PREFIX 2A

Figure 5-23 100CPS Control Board
(Foil Side Up)
Component Location



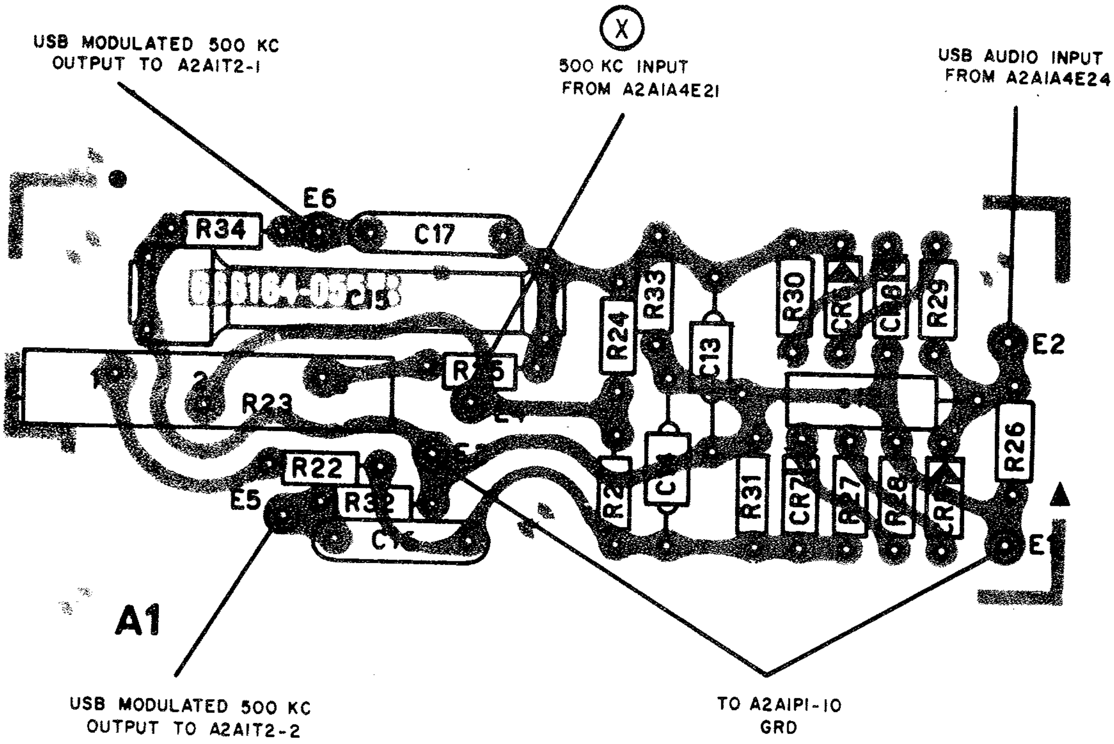
NOTE:
REF. DESIG. PREFIX 2A2A1

Figure 5-24. Mode Selector Electronic Assembly, Right Side, Component Location



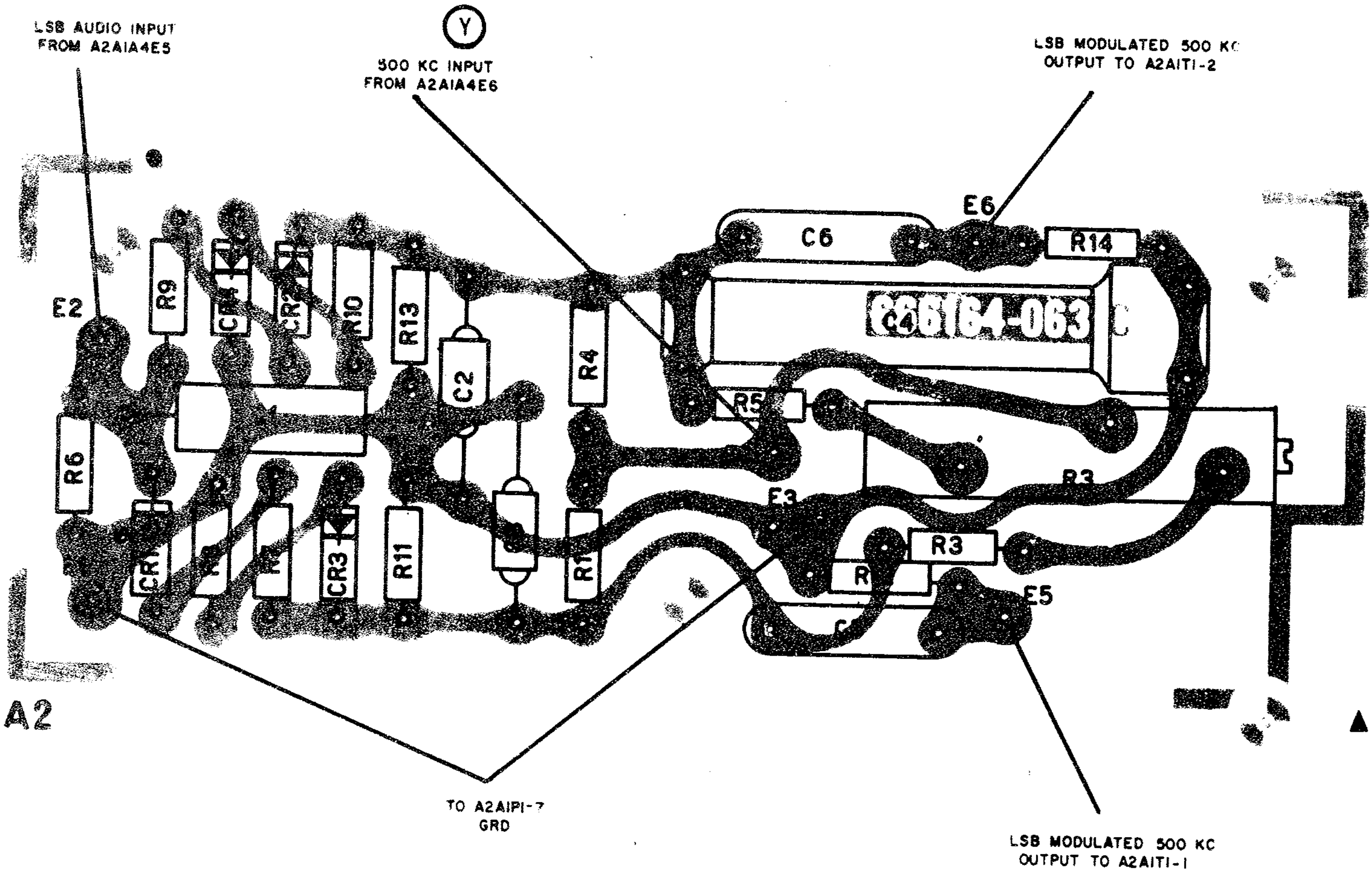
NOTE:
REF. DESIG. PREFIX 2A2A1

Figure 5-25. Mode Selector Electronic Assembly, Left Side, Component Location



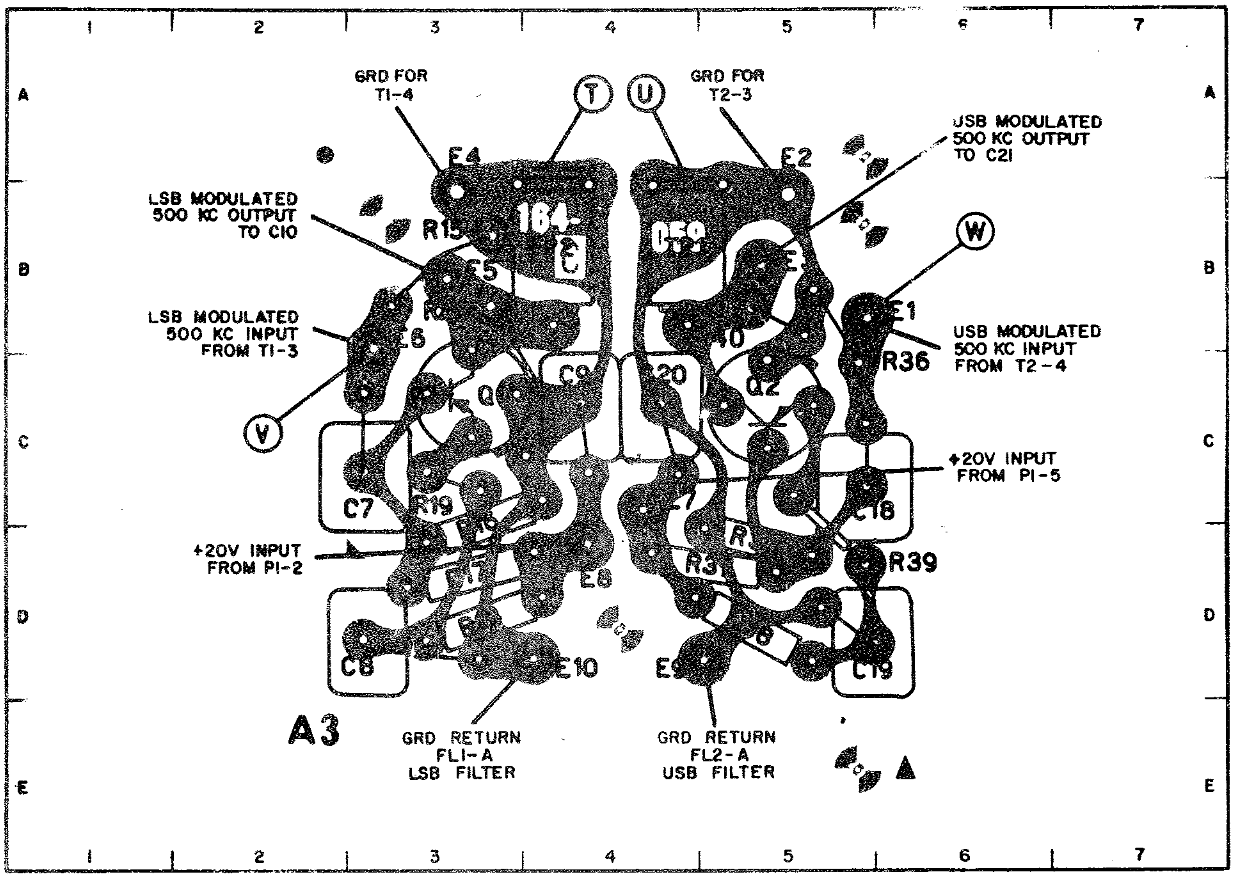
NOTE:
COMPONENT REF. DESIG. PREFIX A2A1

Figure 5-26. USB Balanced Modulator (Foil Side Up), Component and Test Point Location



NOTE:
COMPONENT REF DESIG PREFIX A2A1

Figure 5-27. LSB Balanced Modulator (Foil Side Up), Component and Test Point Location

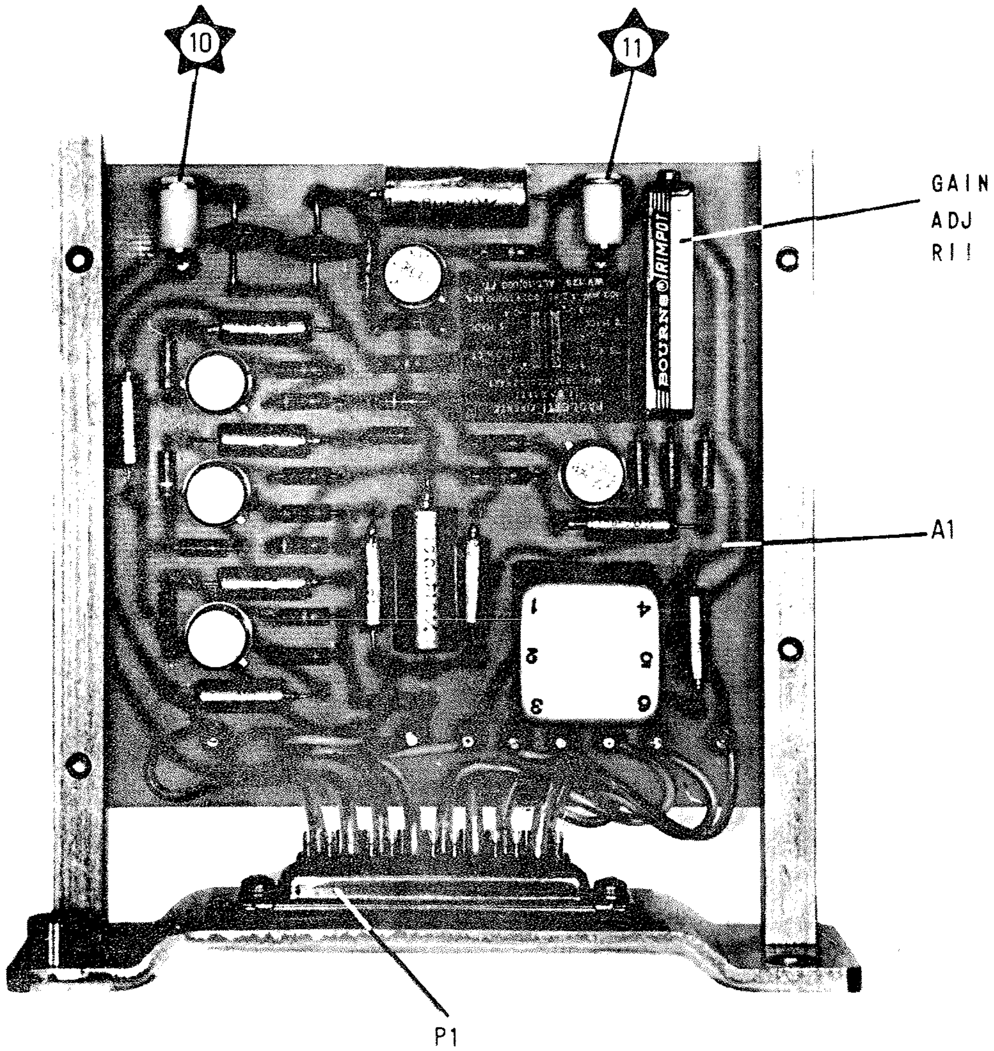


NOTE:
REF. DESIG. PREFIX 2A2A1.

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C7	3C	E3	5B	Q1	3C	R35	5C
C8	3D	E4	3B	Q2	5C	R36	5D
C9	4C	E5	3B	R15	3B	R37	5D
C18	6C	E6	3C	R16	3D	R38	5D
C19	6D	E7	4C	R17	3D	R39	5D
C20	4C	E8	4D	R18	3D	R40	5B
E1	5B	E9	5D	R19	3C	TP1	4B
E2	5B	E10	4D	R20	3B	TP2	4B

Figure 5-28. Isolation Amplifiers (Foil Side Up), Component and Test Point Location



NOTE:
REF. DESIG. PREFIX 2A2A2 OR 2A2A3

Figure 5-30. Audio Amplifier Electronic Assembly, Component Location

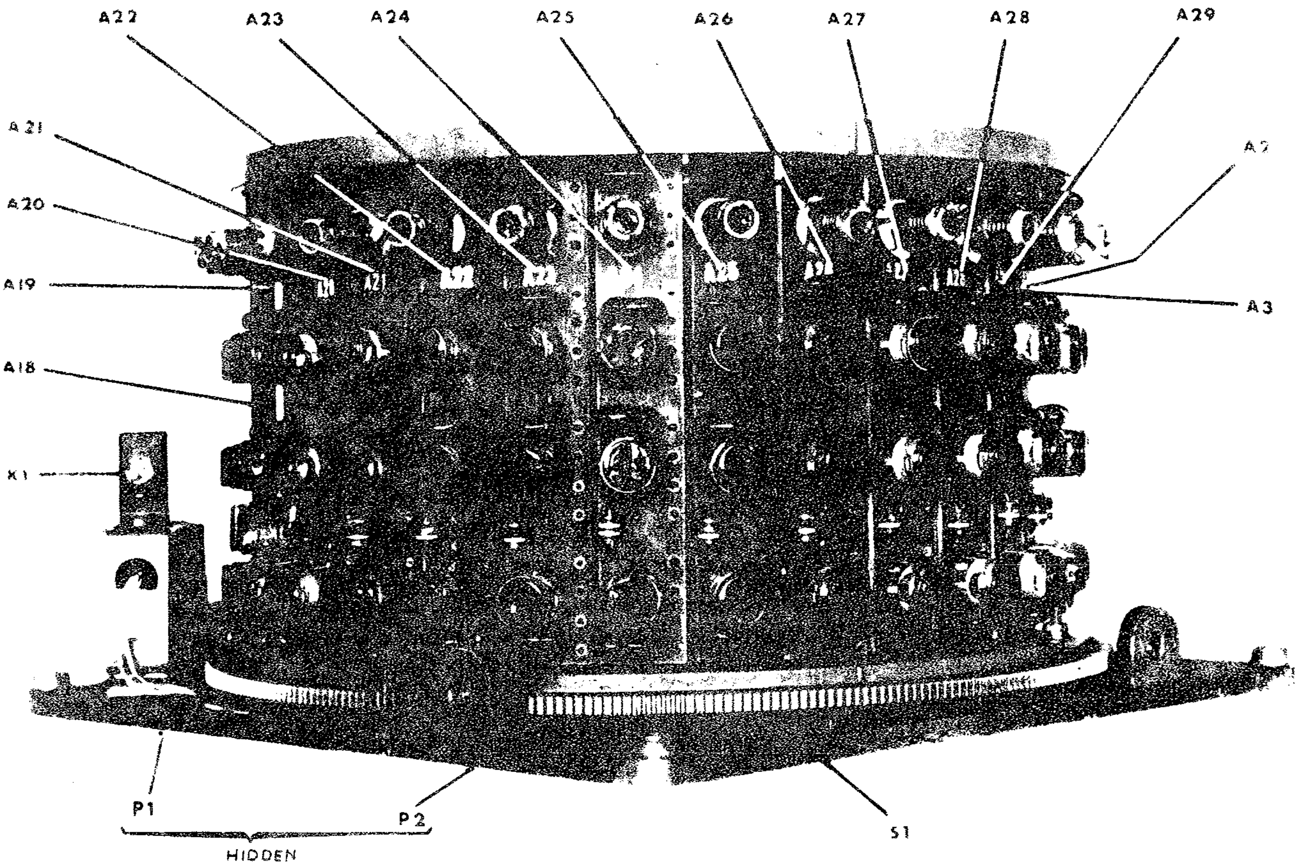
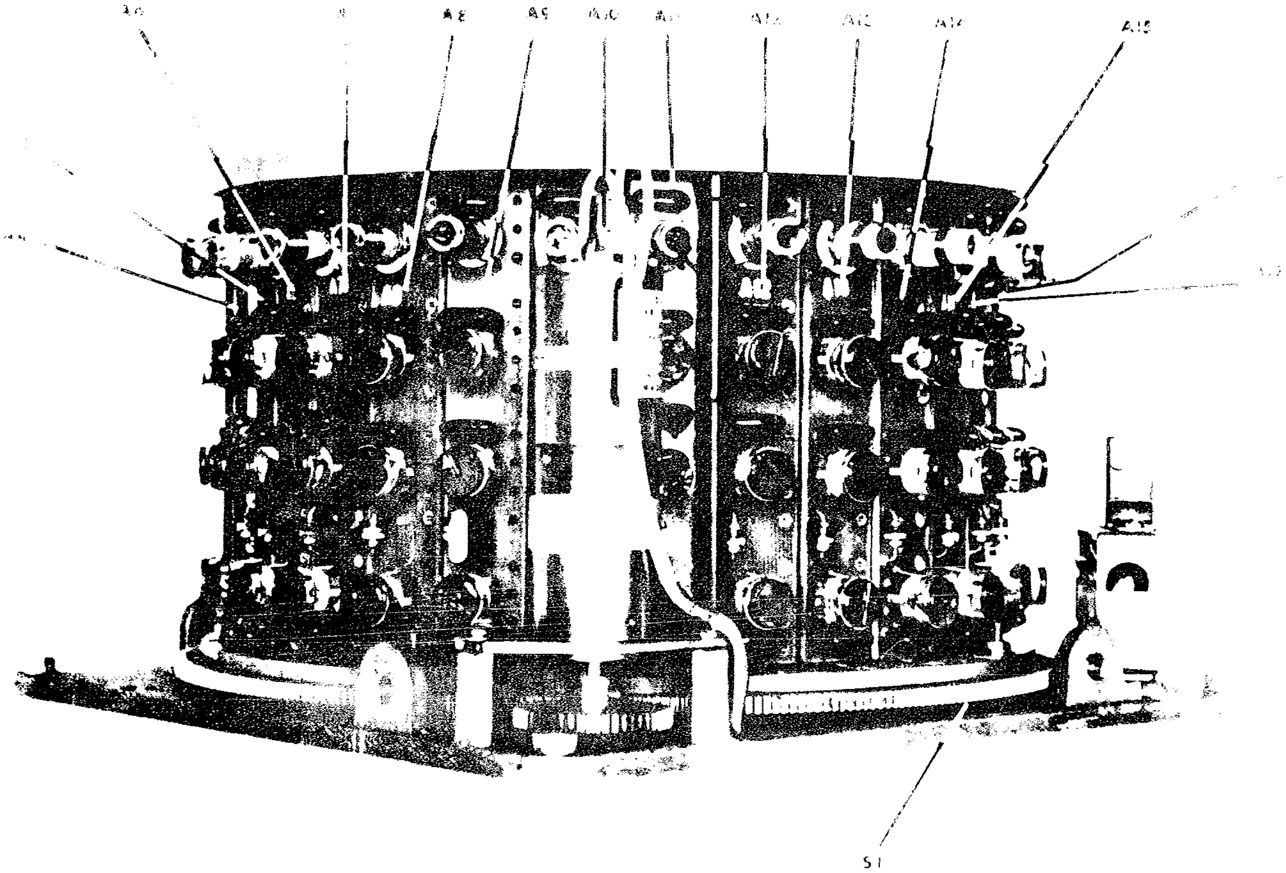


Figure 5-32. RF Amplifier Electronic Assembly, Front and Left Side, Component Locatio



NOTE:
REF DESIG PREFIX A2A4

Figure 5-33. RF Amplifier Electronic Assembly, Rear and Right Side, Component Location

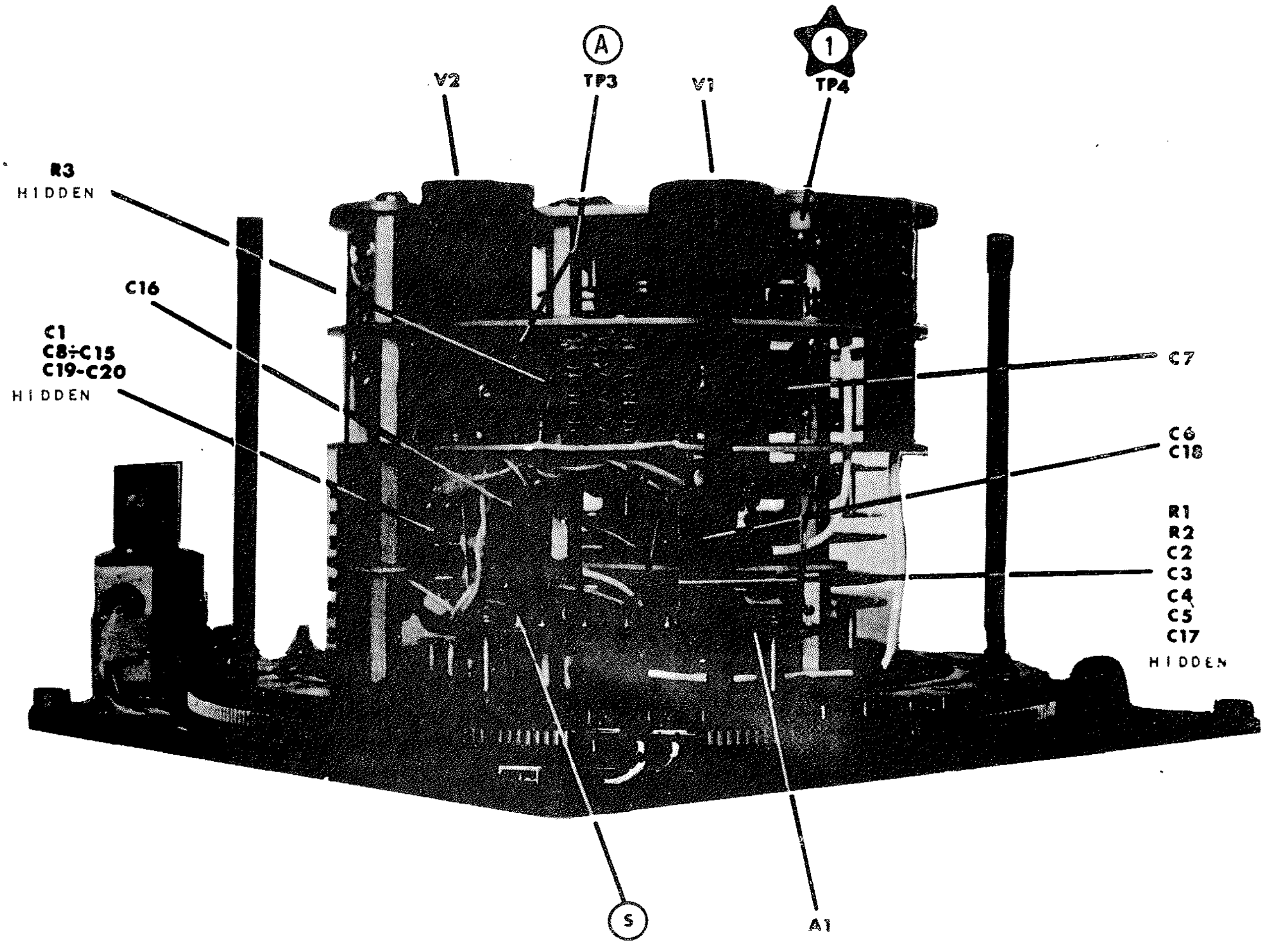


Figure 5-34. RF Amplifier Electronic Assembly, Turret Removed, Front and Left Sid Component and Test Point Locatio

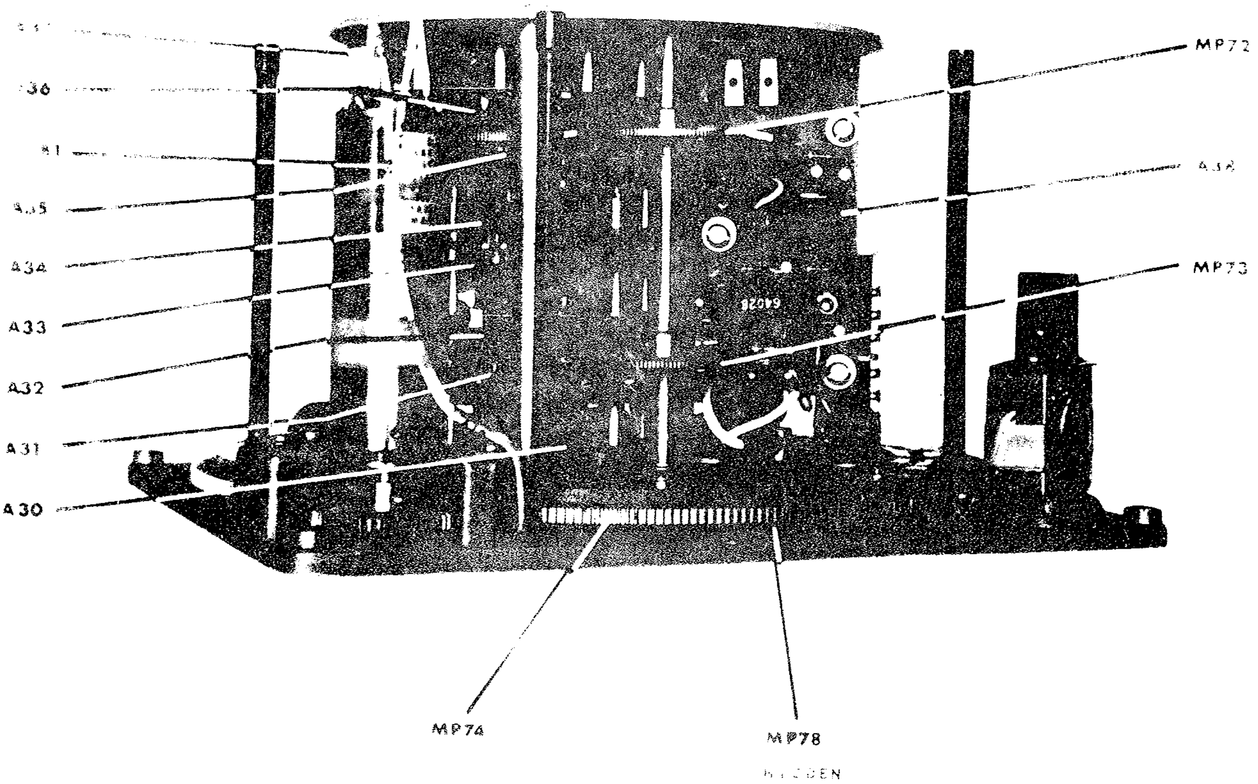
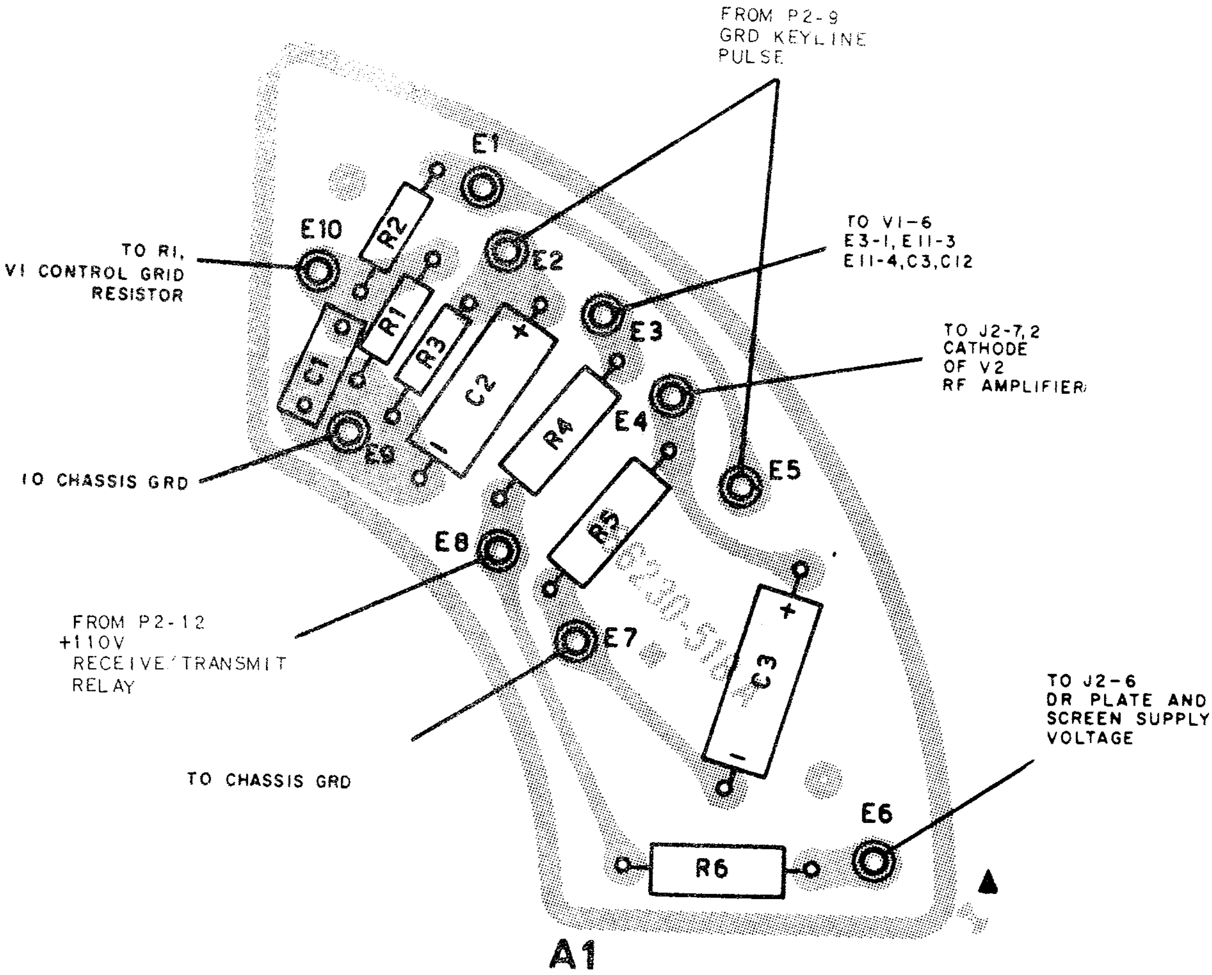
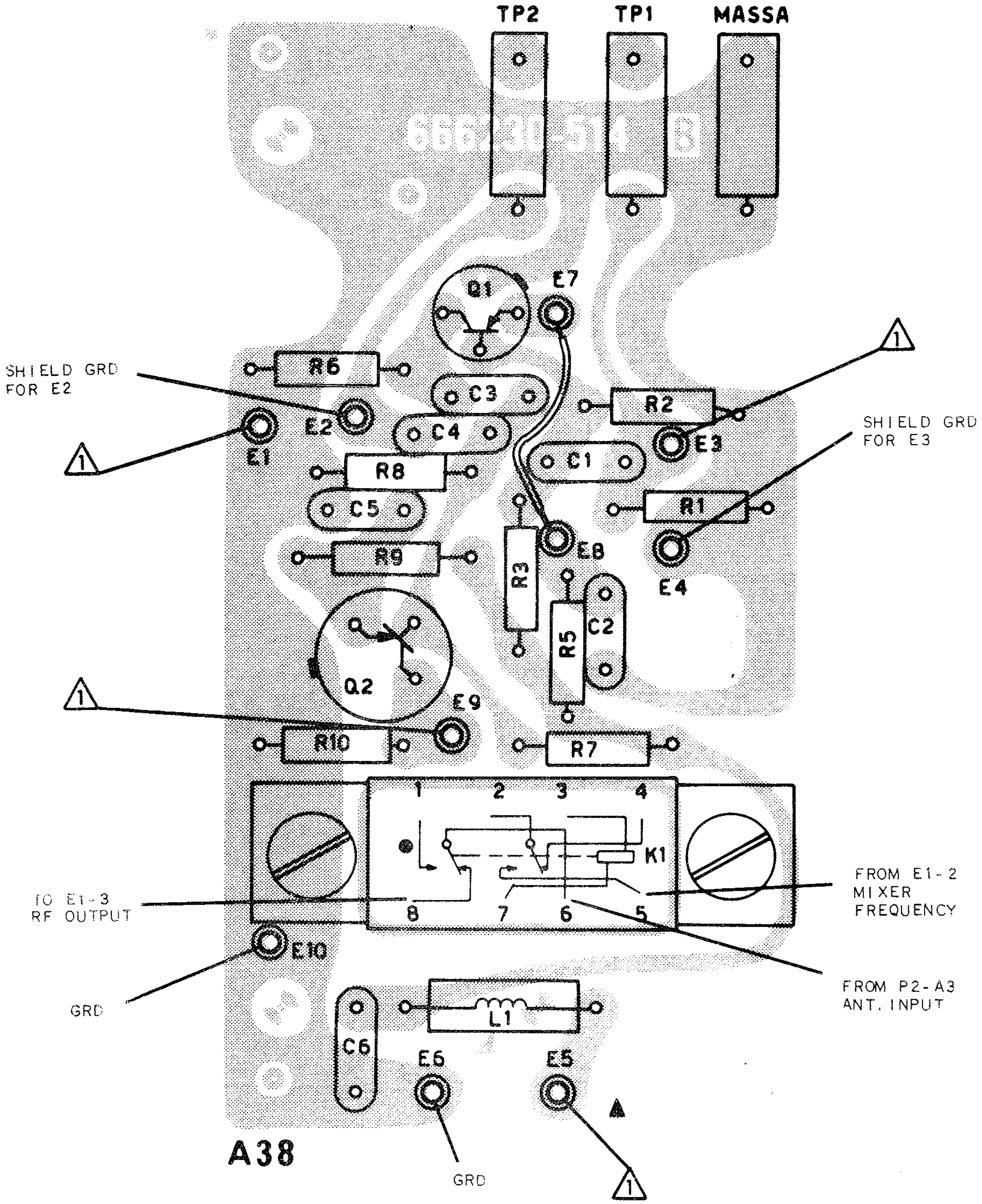


Figure 5-35. RF Amplifier Electronic Assembly, Turret Removed, Rear and Right Side, Component Location



NOTE:
REF. DESIG. PREFIX A2A4.

Figure 5-36. RF Amplifier Bias Circuit (Foil Side Up), Component Location



NOTES: DESIG PREFIX A2A4

△1 NOT USED IN RECEIVER

Figure 5-37. HF Mixer/Amplifier (Foil Side Up), Component Location

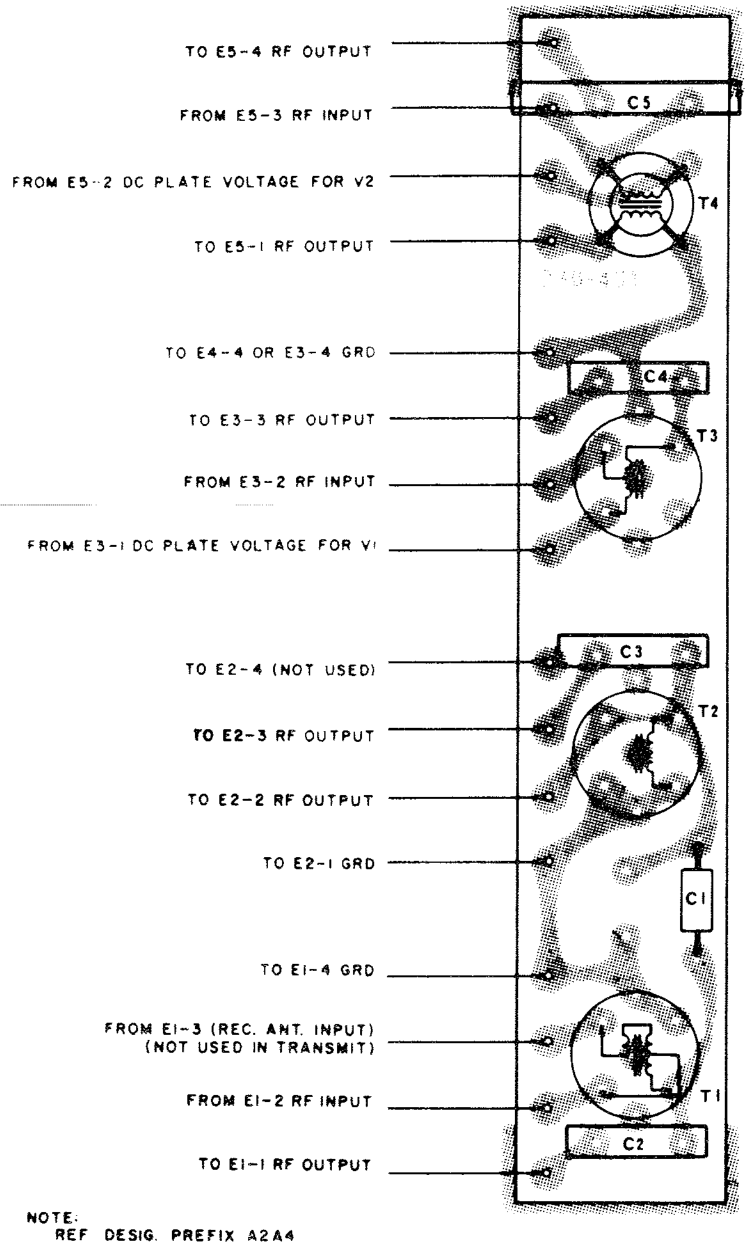
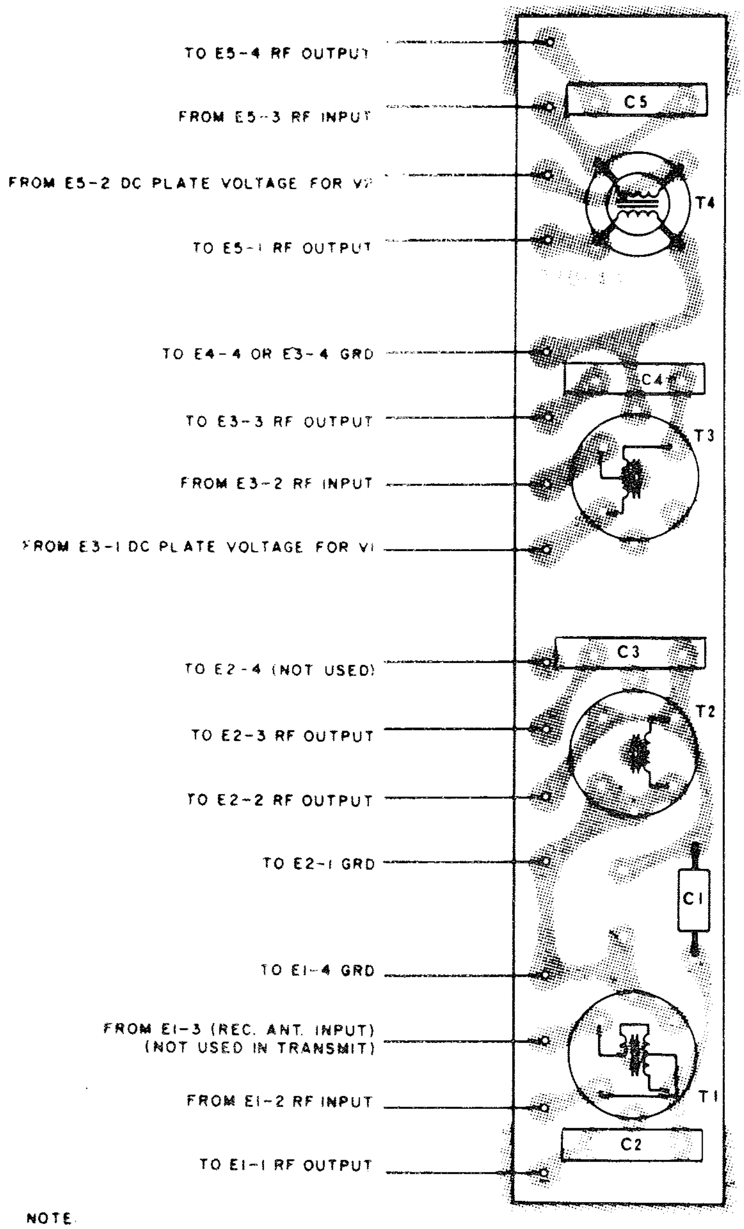
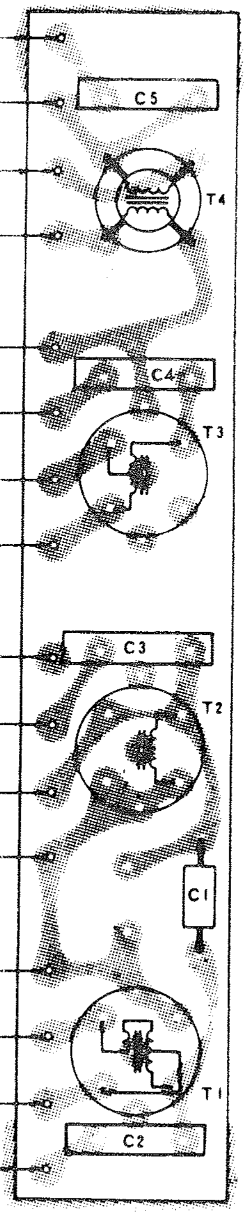


Figure 5-38. Megacycle Assembly A3 (Foil Side Up) Component Location



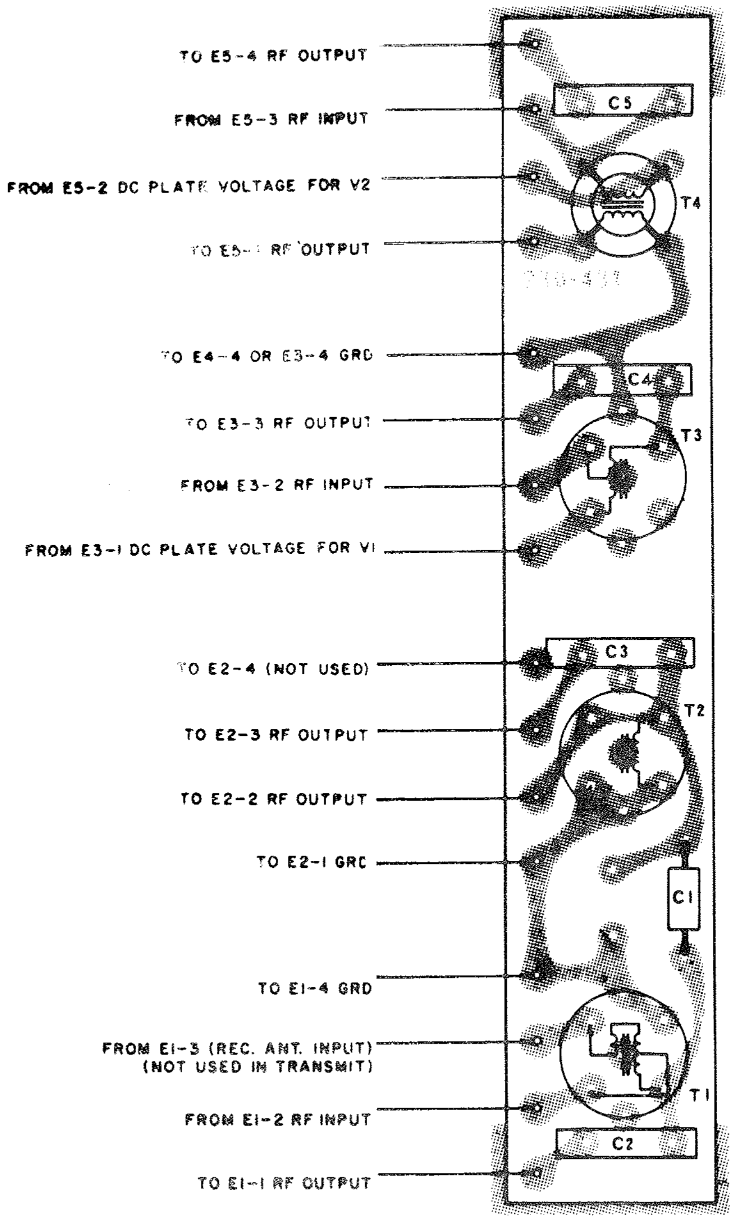
NOTE
REF DESIG PREFIX A2A4

Figure 5-39. Receiver IF./Audio Amplifier Electronic Assembly, Servicing Block Diagram



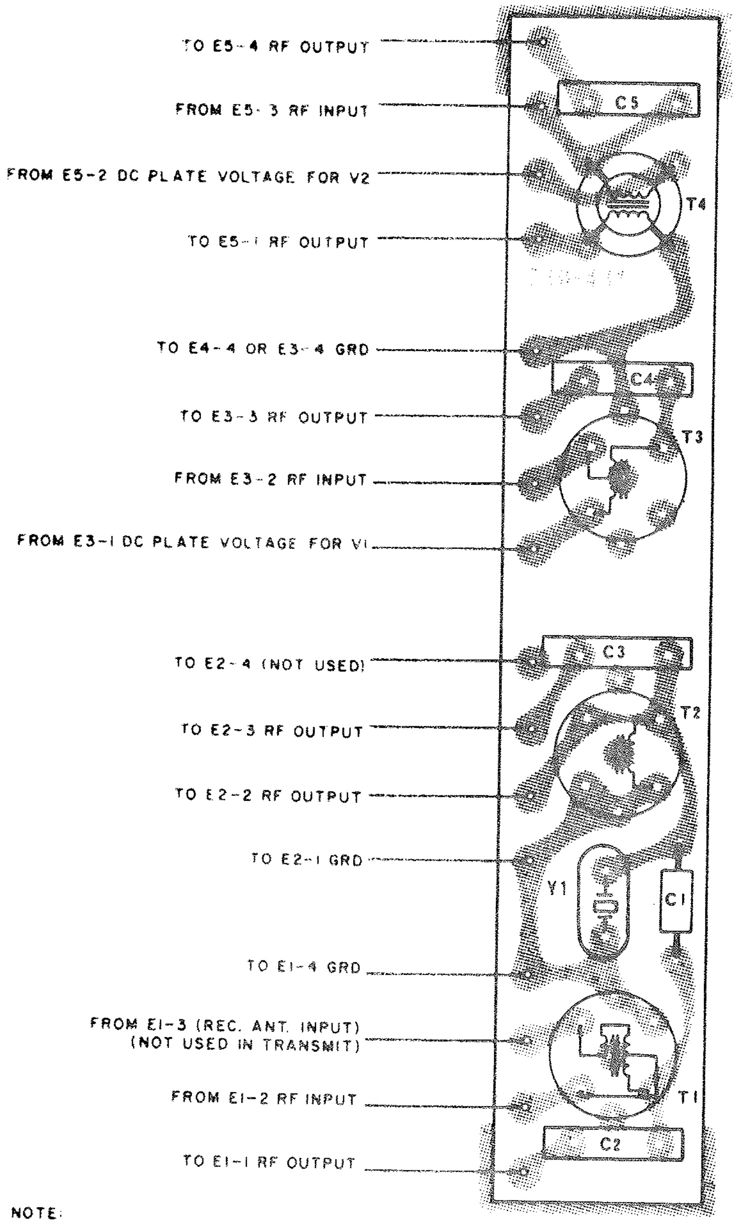
NOTE:
REF DESIG PREFIX A2A4

Figure 5-40. Megacycle Assembly A5, A8, or A29 (Foil Side Up), Component Location



NOTE:
REF. DESIG. PREFIX A2A4.

Figure 5-41. Megacycle Assembly A6 or A7 (Foil Side Up), Component



NOTE:
REF. DESIG. PREFIX A2A4.

Figure 5-42. Megacycle Assembly A9 (Foil Side Up), Component Location

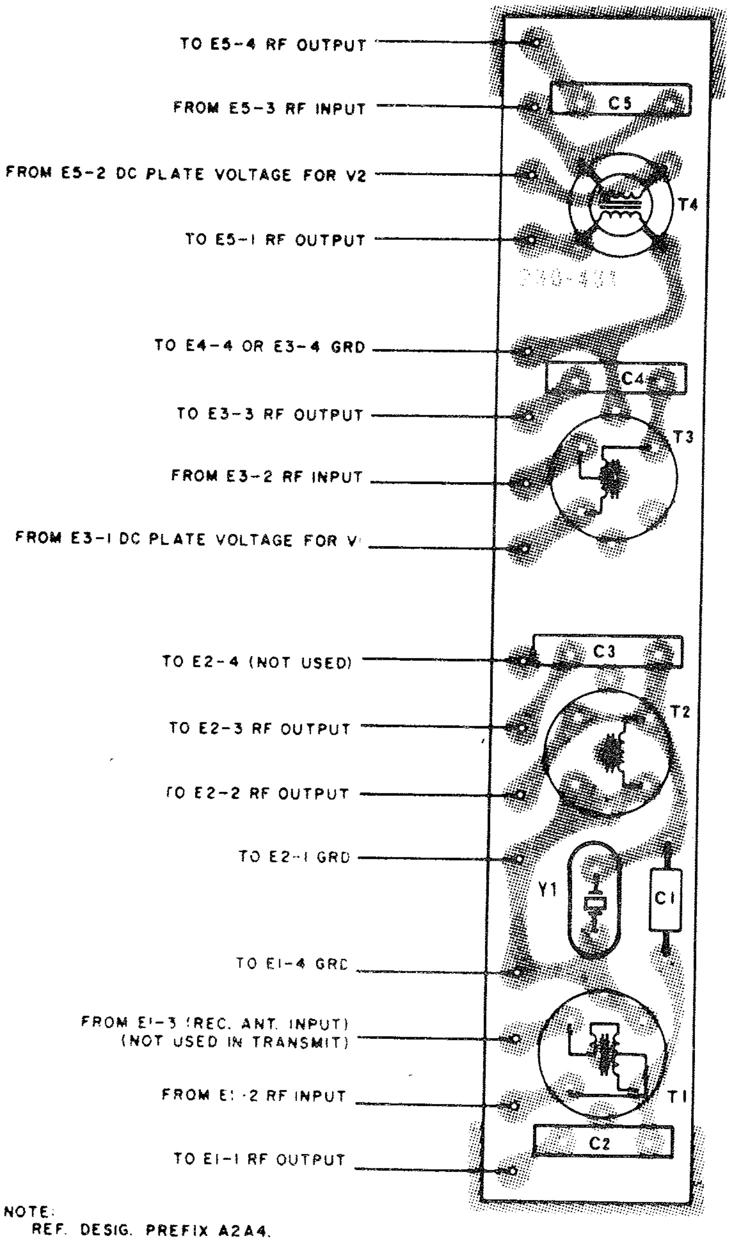


Figure 5-43. Megacycle Assembly A10 (Foil Side Up), Component Location

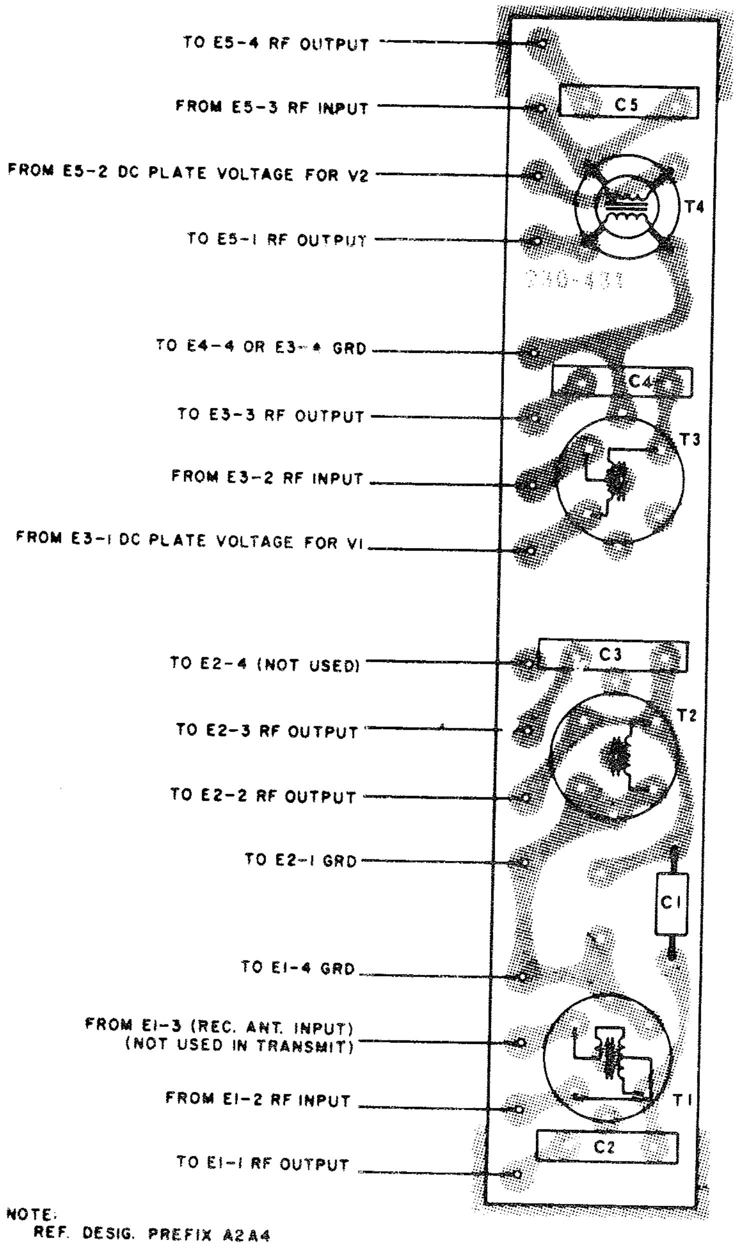


Figure 5-44. Megacycle Assembly A11, A15, or A16 (Foil Side Up), Component Location

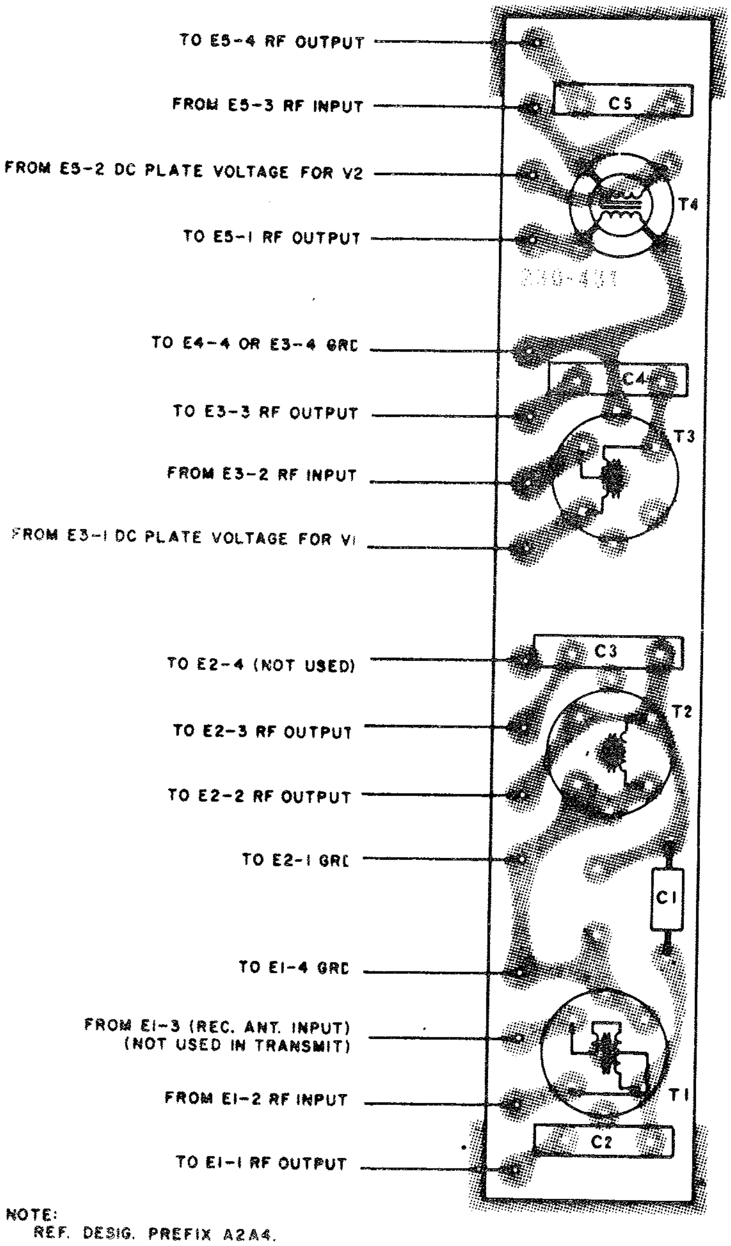


Figure 5-45. Megacycle Assembly A12, A13, or A23 (Foil Side Up), Component Location

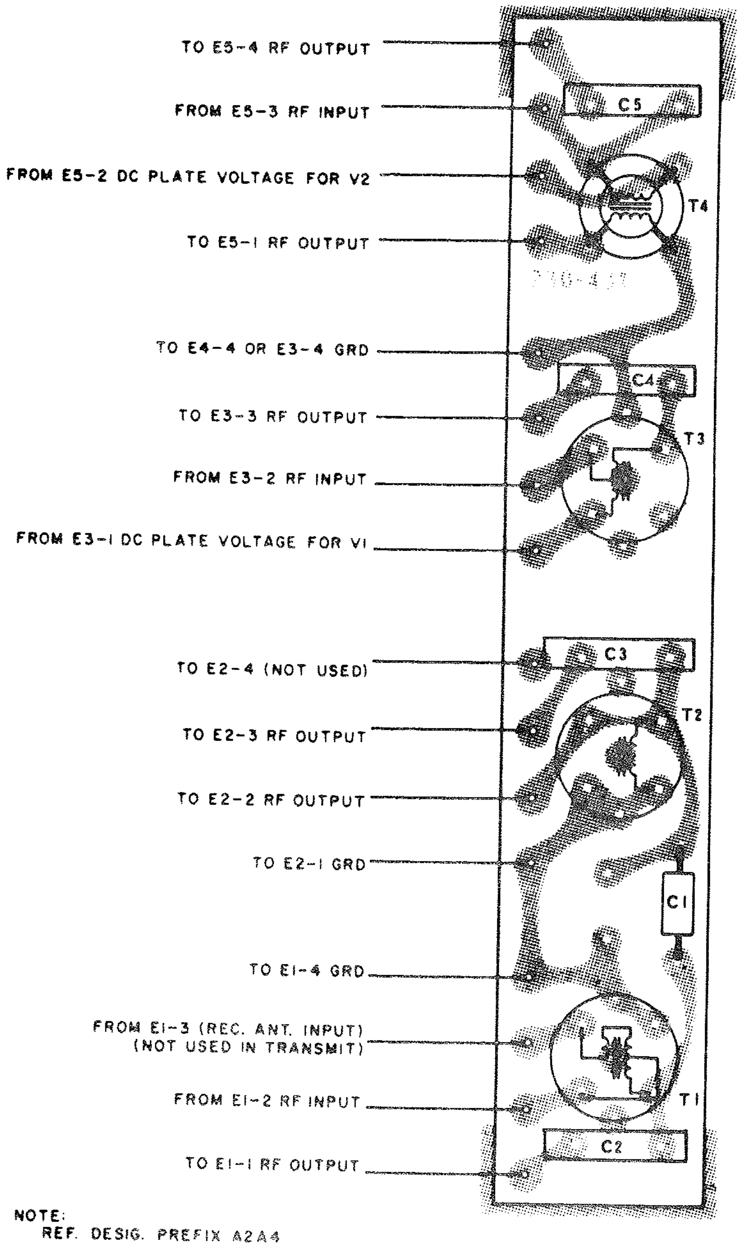


Figure 5-46. Megacycle Assembly A17
(Foil Side Up), Component Location

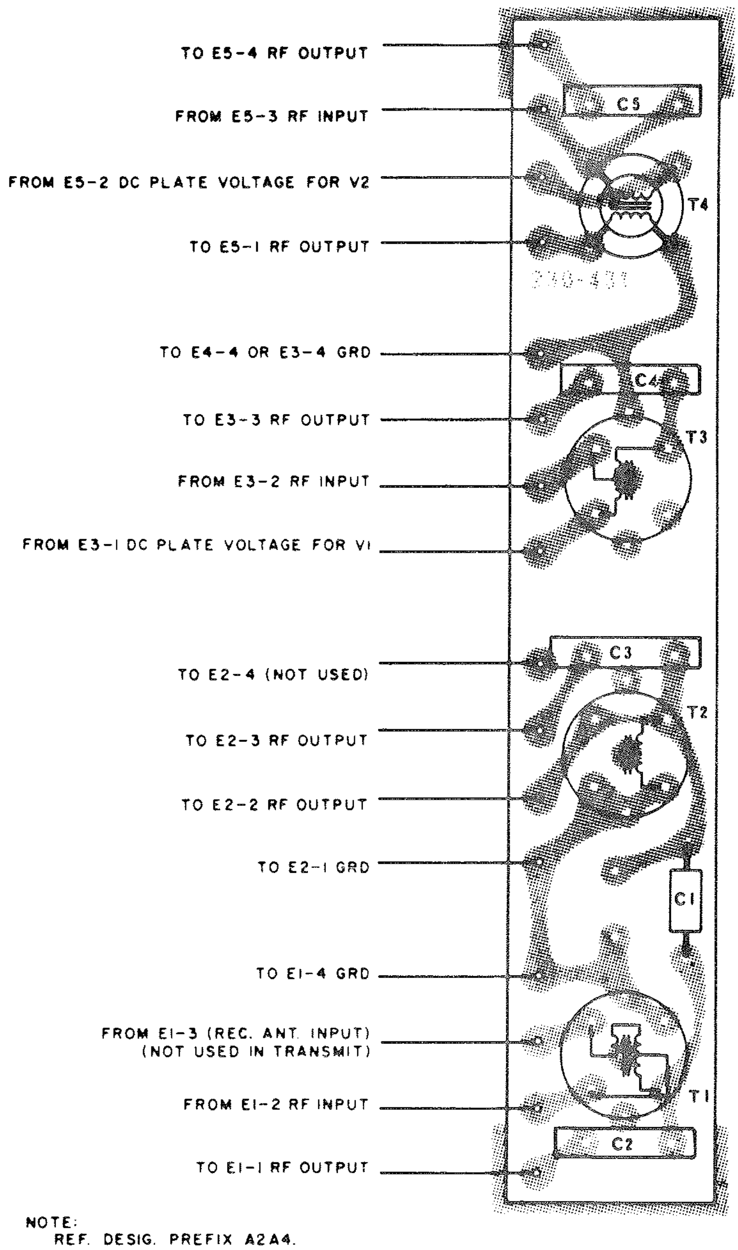
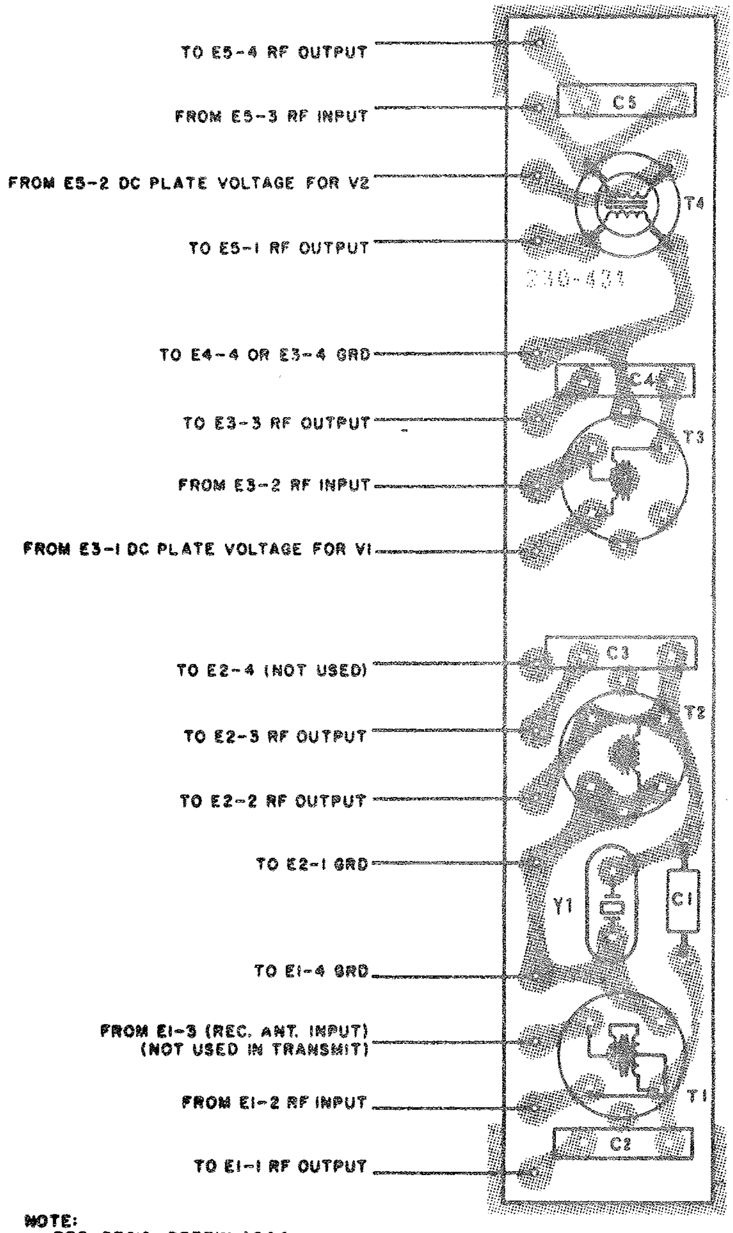
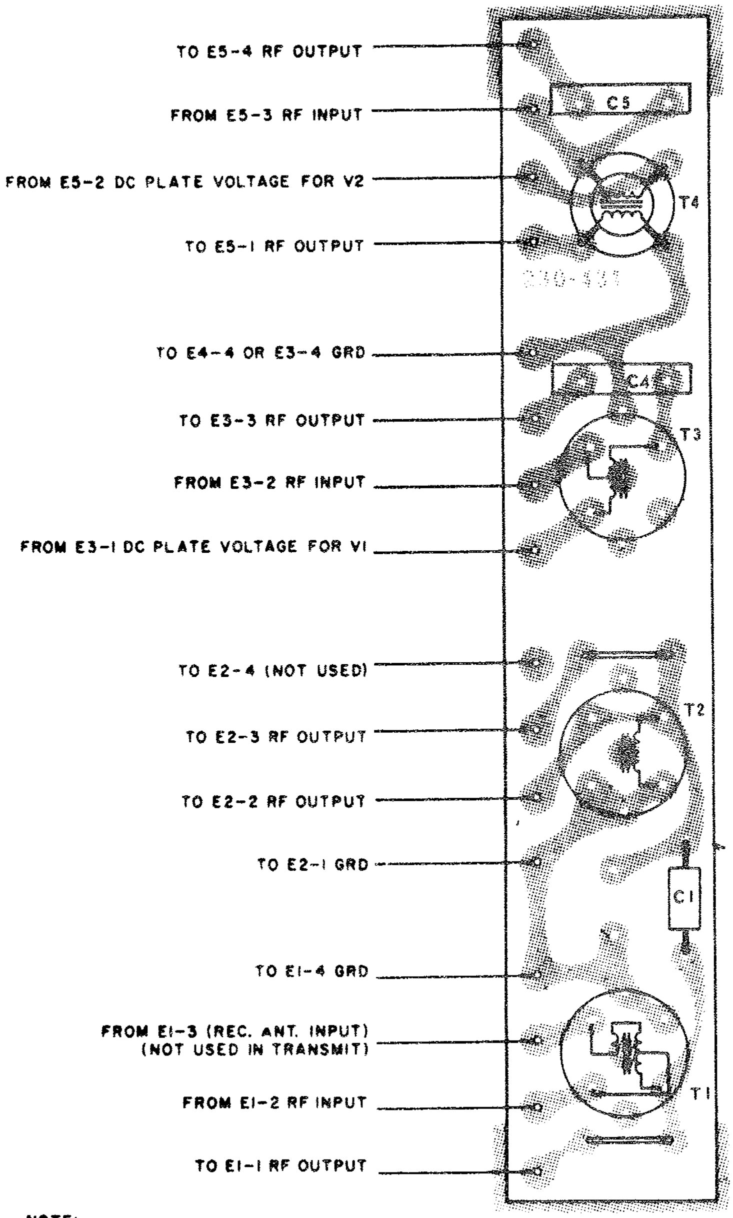


Figure 5-47. Megacycle Assembly A18
(Foil Side Up), Component Locatio



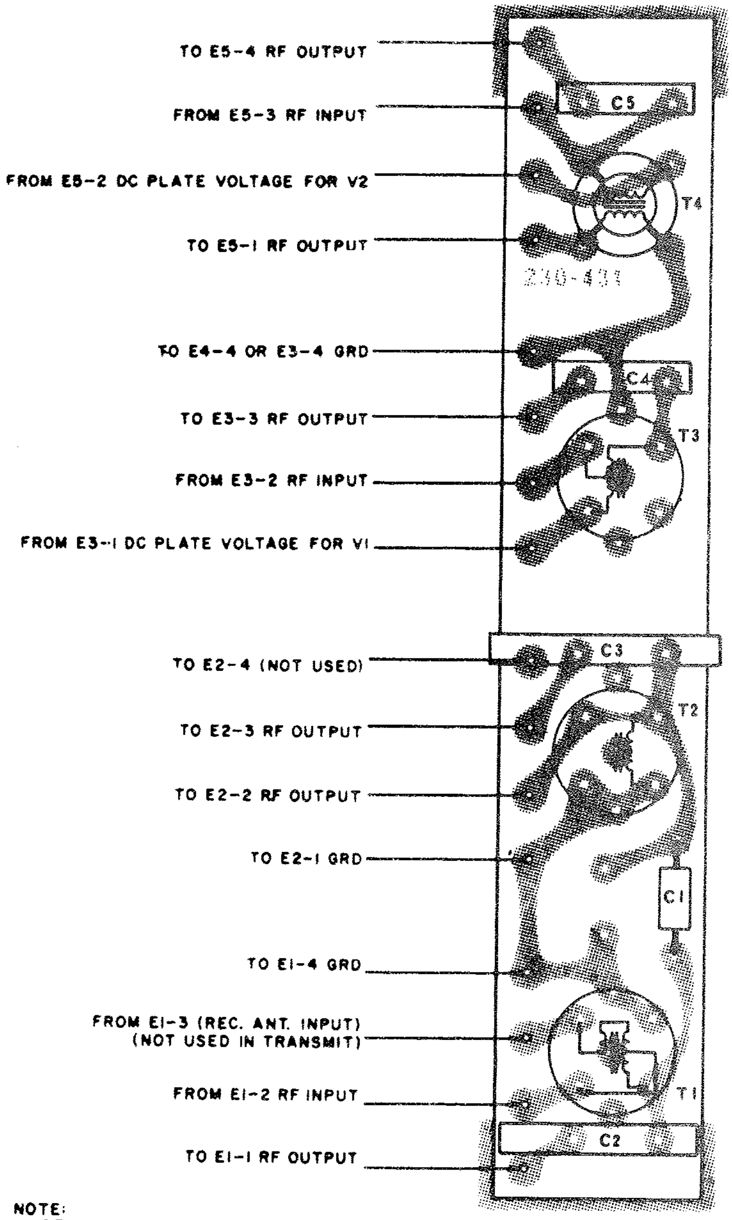
NOTE:
REF. DESIG. PREFIX A2A4.

Figure 5-48. Megacycle Assembly A19
(Foil Side Up), Component Location



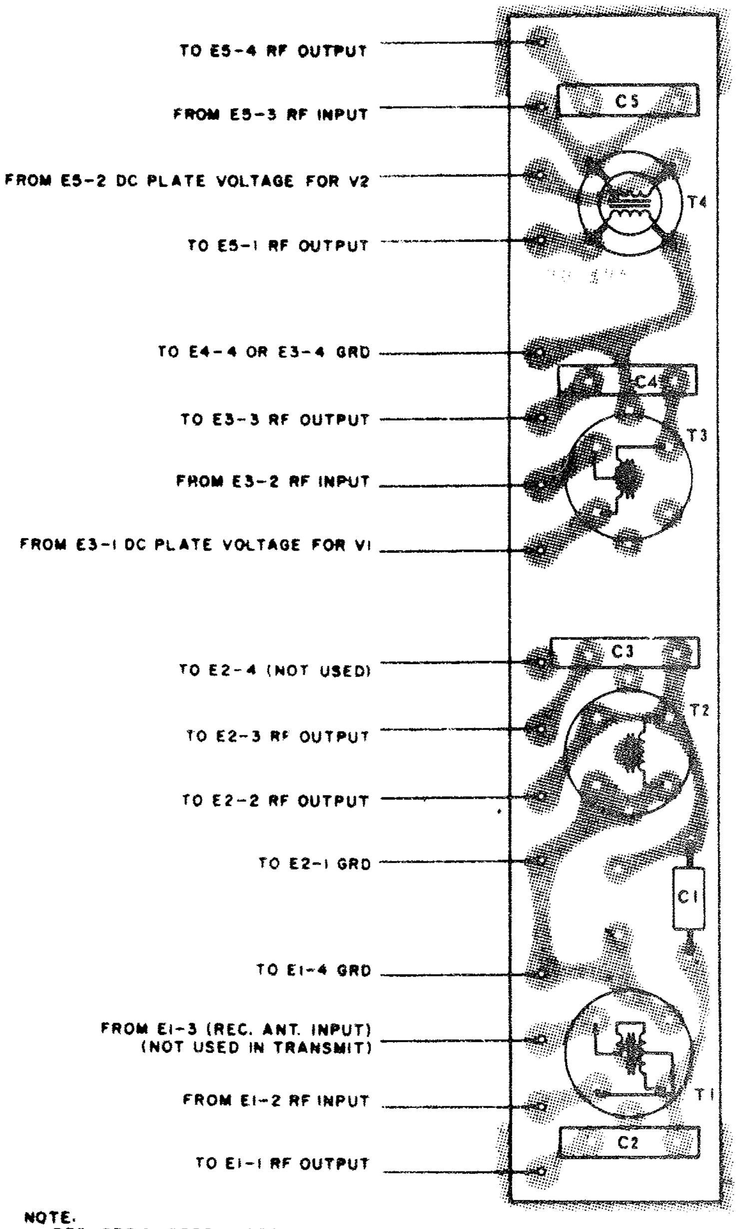
NOTE:
REF. DESIG. PREFIX A2A4

Figure 5-49. Megacycle Assembly A20 (Foil Side Up), Component Location



NOTE:
REF. DESIG. PREFIX A2A4

Figure 5-50. Megacycle Assembly A2A4
(Foil Side Up), Component Location



NOTE.
REF DESIG PREFIX A2A4

Figure 5-51. Megacycle Assembly A24, A27, or A28 (Foil Side Up), Component Location

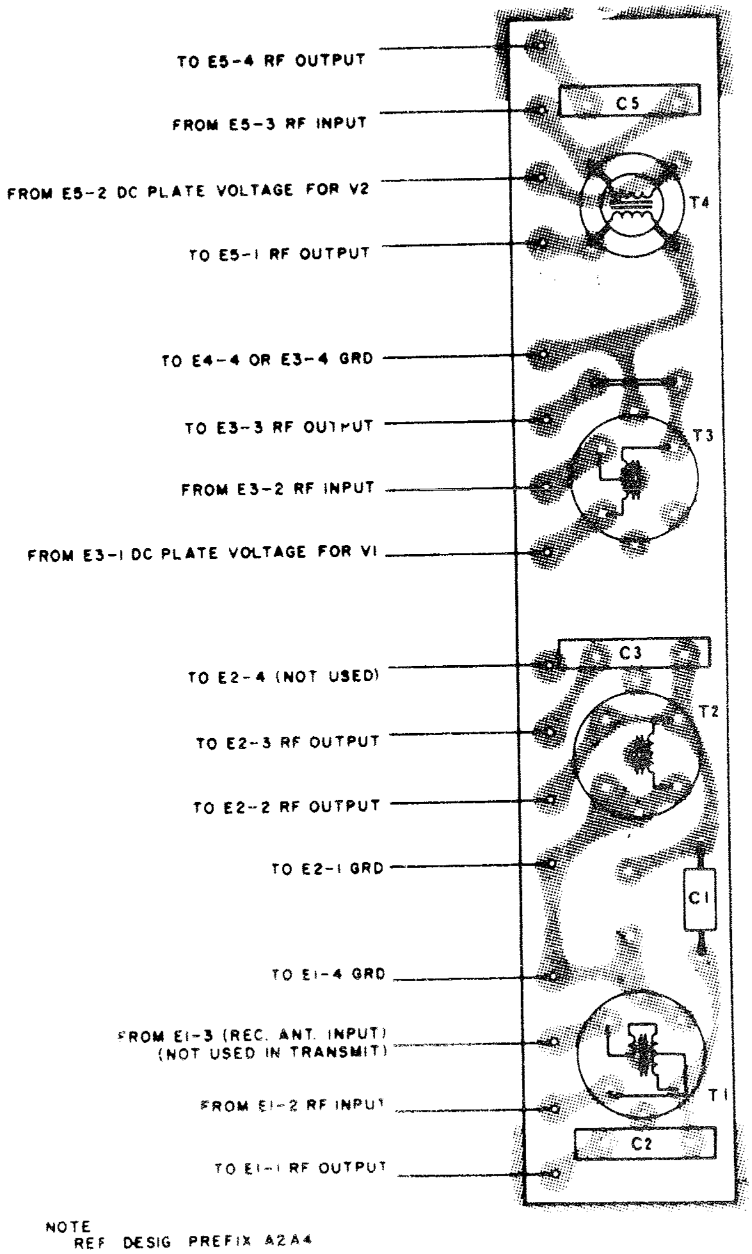
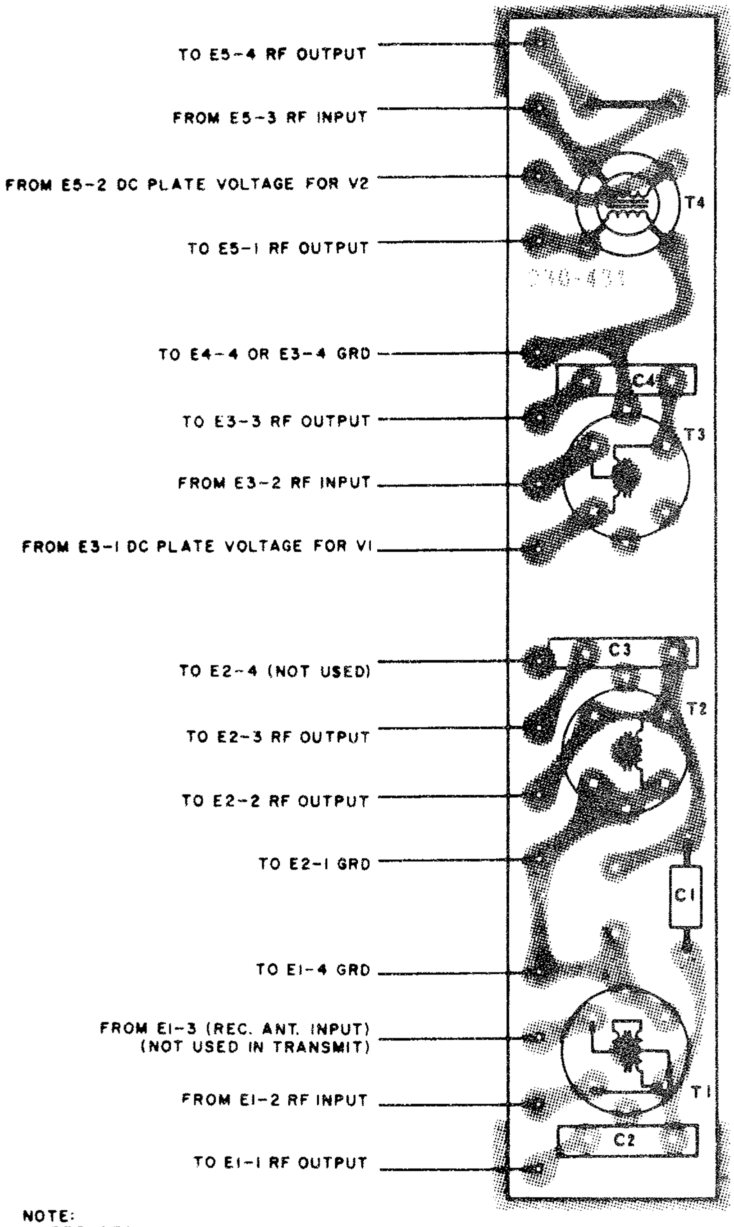
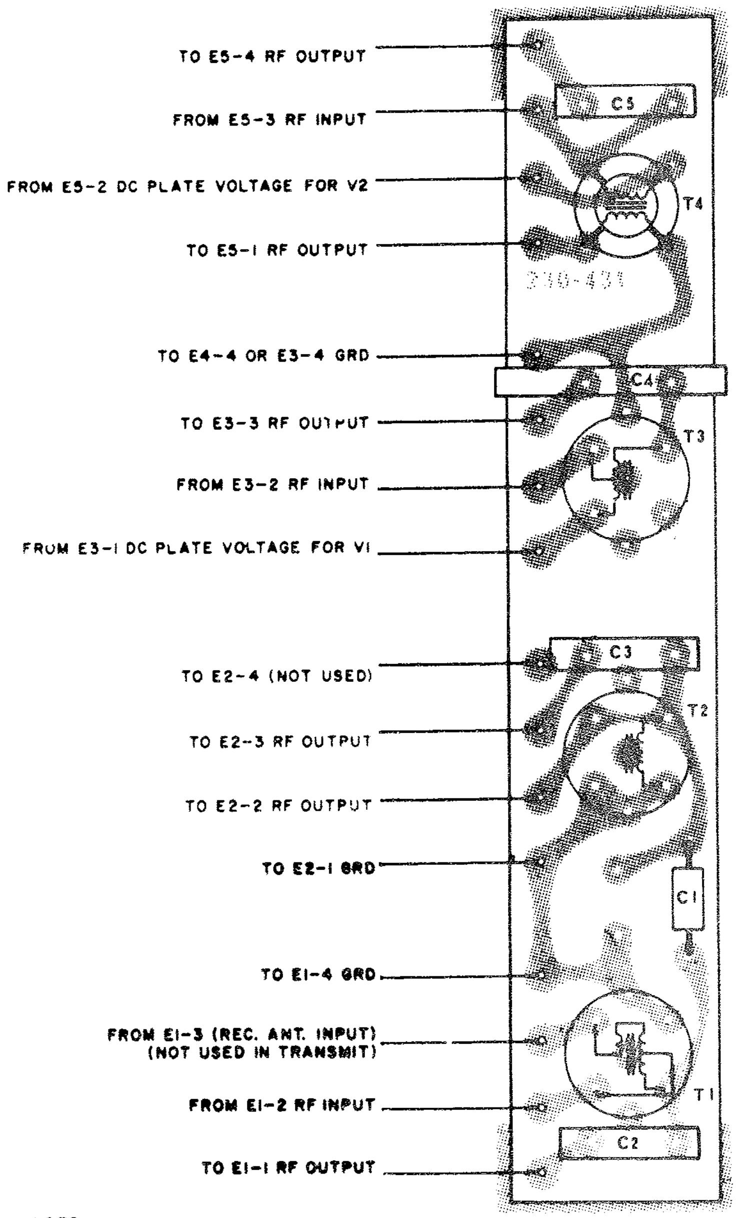


Figure 5-52 Megacycle Assembly A25 (Foil Side Up), Component Location



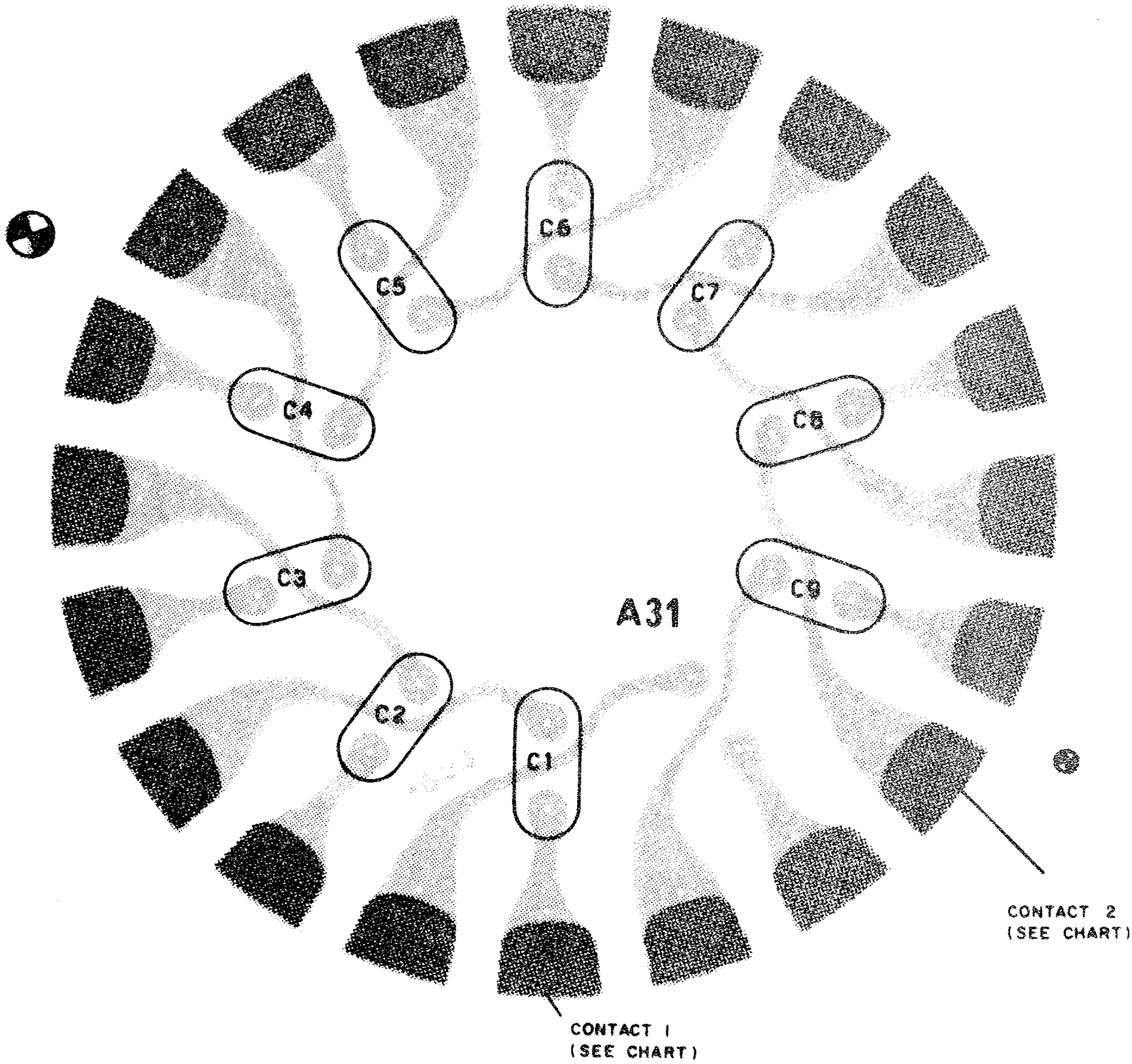
NOTE:
REF. DESIG. PREFIX A2A4.

Figure 5-53. Megacycle Assembly A2 (Foil Side Up), Component Location



NOTE:
REF. DESIG. PREFIX A2A4.

Figure 5-54. Megacycle Assembly A26 (Foil Side Up), Component Location

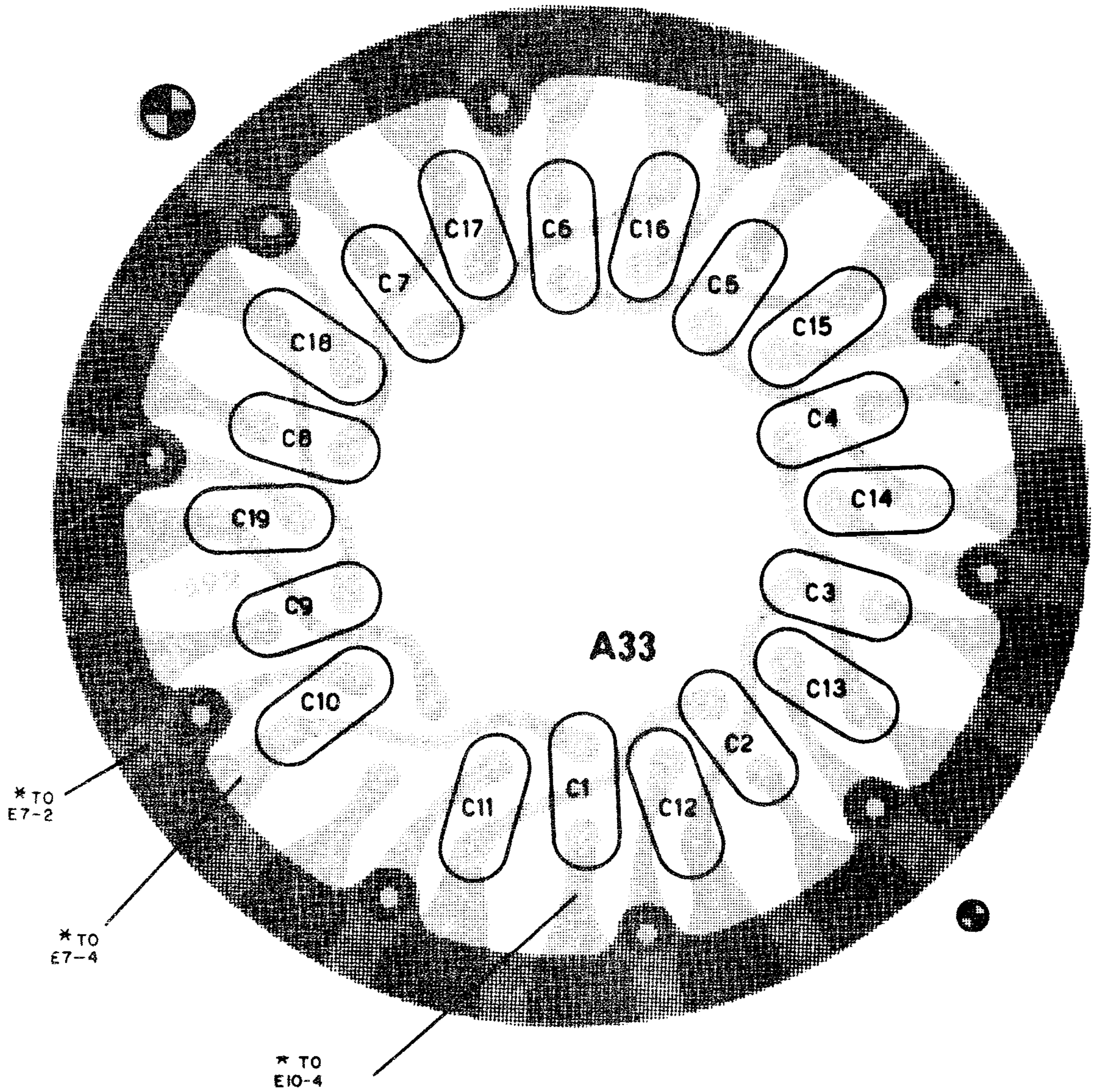


NOTES:
1. REF. DESIG. PREFIX A2A4.
2. TYPICAL CONFIGURATION FOR 10 KC ROTOR ASSEMBLY BOARDS A31, A32 AND A35. SEE CHART BELOW FOR CONTACT TERMINATIONS.

C1	.00MC
C2	.01MC
C3	.02MC
C4	.03MC
C5	.04MC
C6	.05MC
C7	.06MC
C8	.07MC
C9	.08MC

TURRET CONTACT TERMINATIONS FOR C1, TYPICAL OF EACH OF THE 10 POSITIONS OF THE TURRET			
	BOARD A31	BOARD A32	BOARD A35
CONTACT 1	CONNECTS TO E6-2	CONNECTS TO E7-1	CONNECTS TO E11-2
CONTACT 2	CONNECTS TO E6-4	CONNECTS TO E7-3	CONNECTS TO E11-4

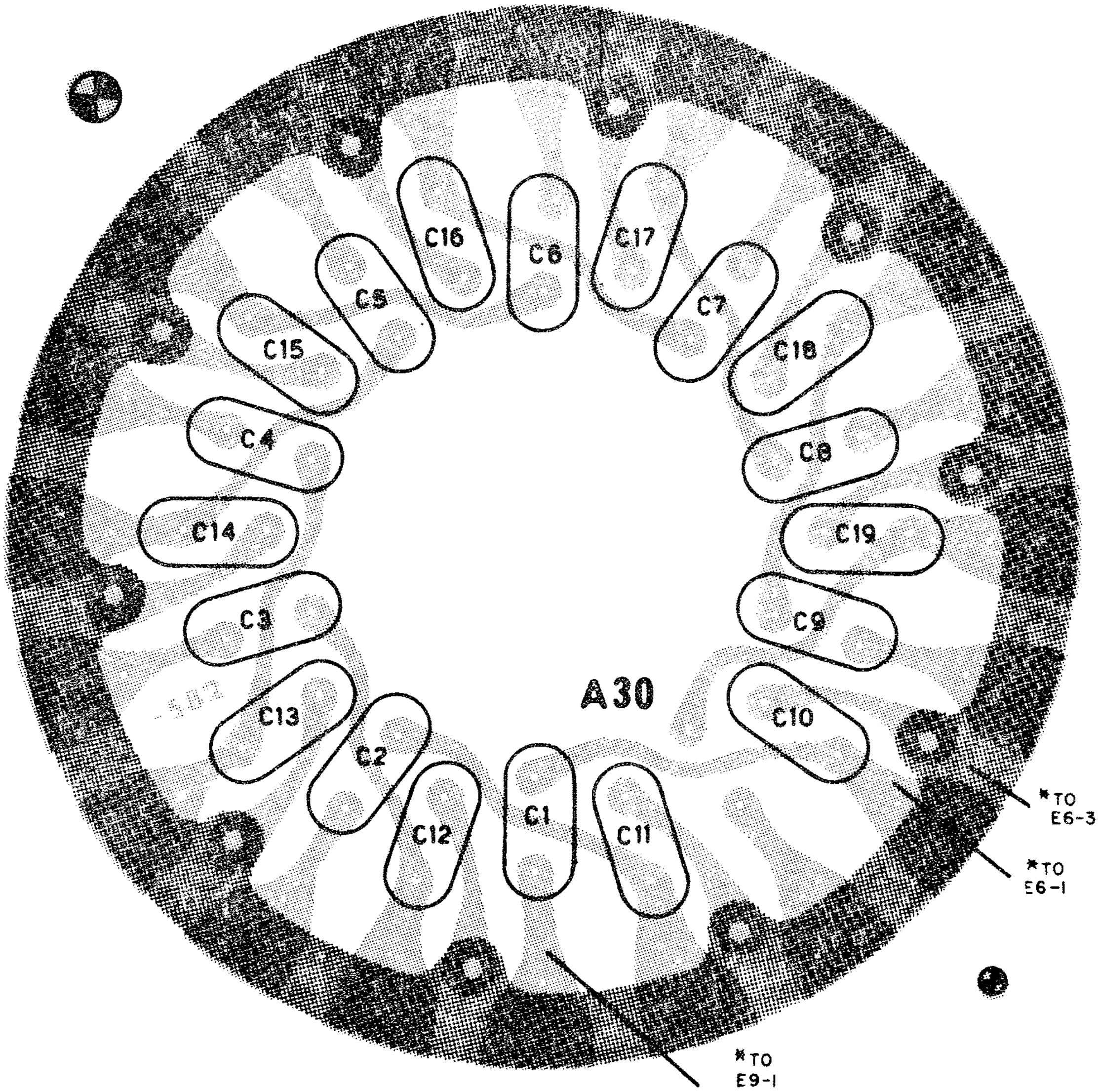
Figure 5-55. 10 KC Rotor Assembly A31 (Component Side Down), Component Location



NOTES:
1. REF. DESIG. PREFIX A2A4
2. * TURRET CONTACT TERMINATIONS FOR C1/C10, TYPICAL OF EACH OF THE 10 POSITIONS OF THE TURRET, SEE CHART.

C1/C10	.00 MC
C2/C11	.10 MC
C3/C12	.20 MC
C4/C13	.30 MC
C5/C14	.40 MC
C6/C15	.50 MC
C7/C16	.60 MC
C8/C17	.70 MC
C9/C18	.80 MC
C19	.90 MC

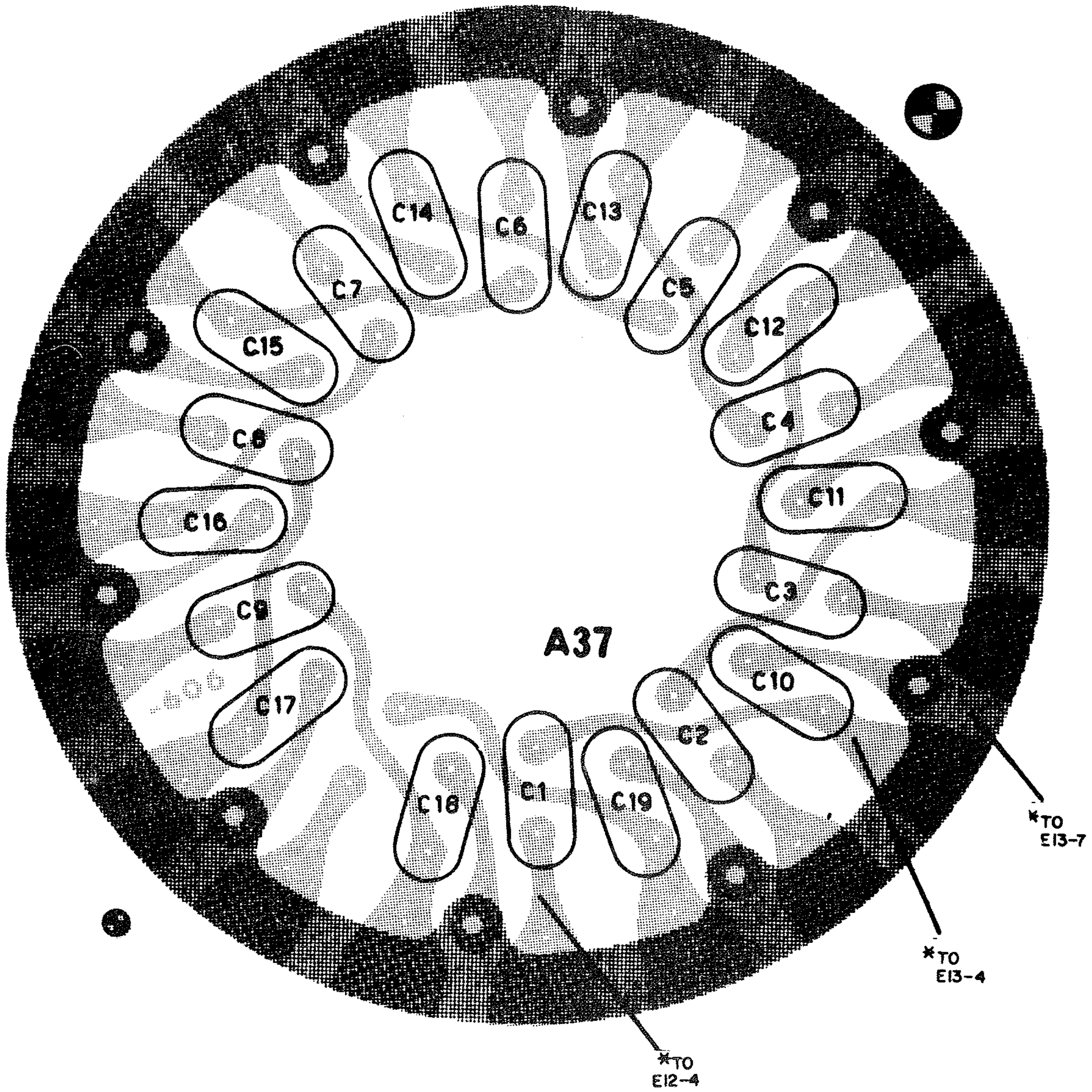
Figure 5-56. **100 KC Rotor Assembly A33 (Component Side Down), Component Location**



NOTES:
1. REF. DESIG. PREFIX A2A4.
2. * TURRET CONTACT TERMINATIONS FOR C1/C10 TYPICAL OF EACH OF THE 10 TURRET POSITIONS. SEE CHART.

C1/C10	.00 MC
C2/C11	.10 MC
C3/C12	.20 MC
C4/C13	.30 MC
C5/C14	.40 MC
C6/C15	.50 MC
C7/C16	.60 MC
C8/C17	.70 MC
C9/C18	.80 MC
C19	.90 MC

Figure 5-57. 100 KC Rotor Assembly A30 (Component Side Down), Component Location

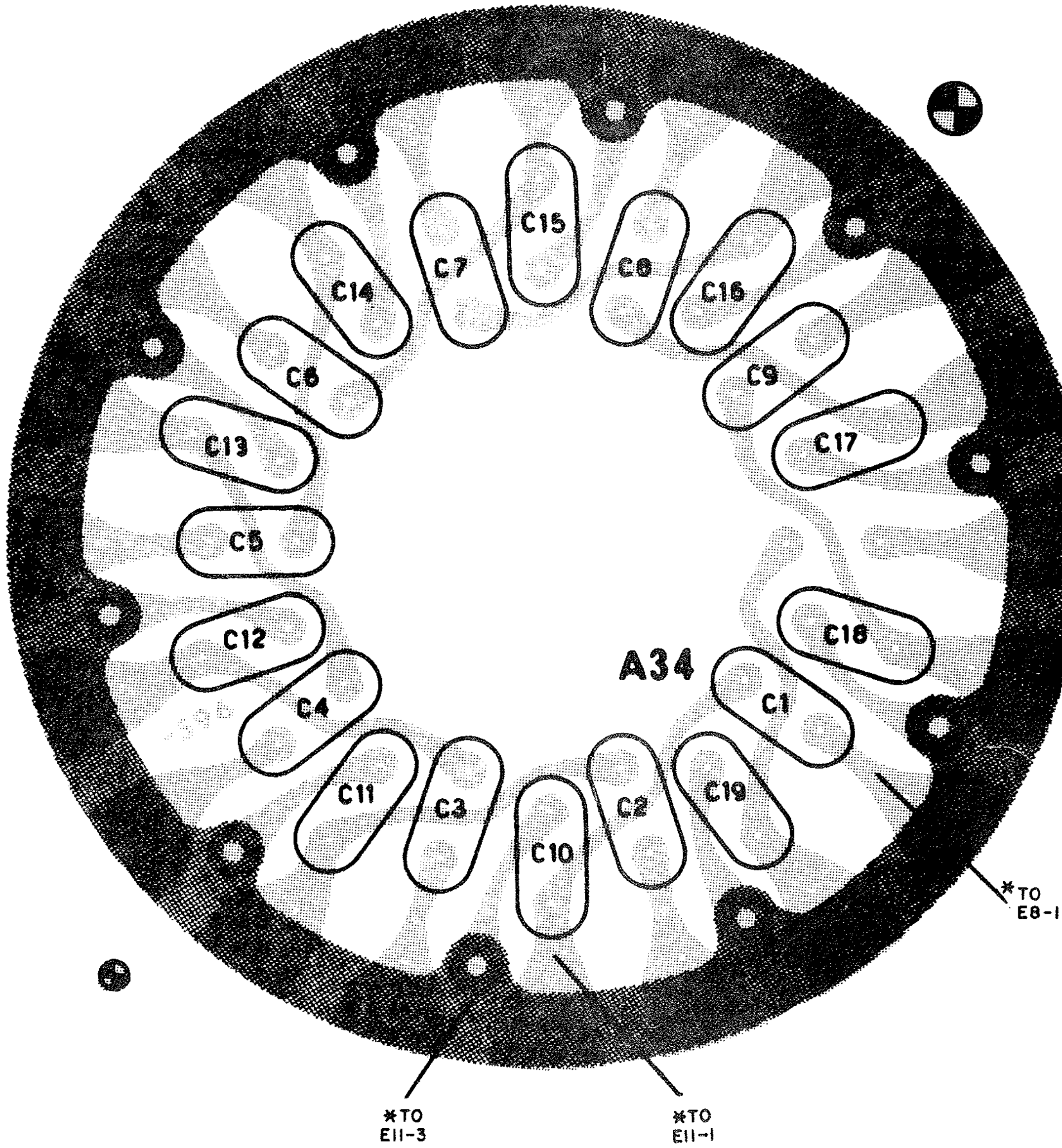


NOTES:

1. REF. DESIG. PREFIX 2A2A4
2. *TURRET CONTACT TERMINATIONS FOR C1/C10, TYPICAL FOR EACH OF THE 10 POSITIONS OF THE TURRET. SEE CHART BELOW.

C1/C10	.00 MC
C2/C11	.10 MC
C3/C12	.20 MC
C4/C13	.30 MC
C5/C14	.40 MC
C6/C15	.50 MC
C7/C16	.60 MC
C8/C17	.70 MC
C9/C18	.80 MC
C19	.90 MC

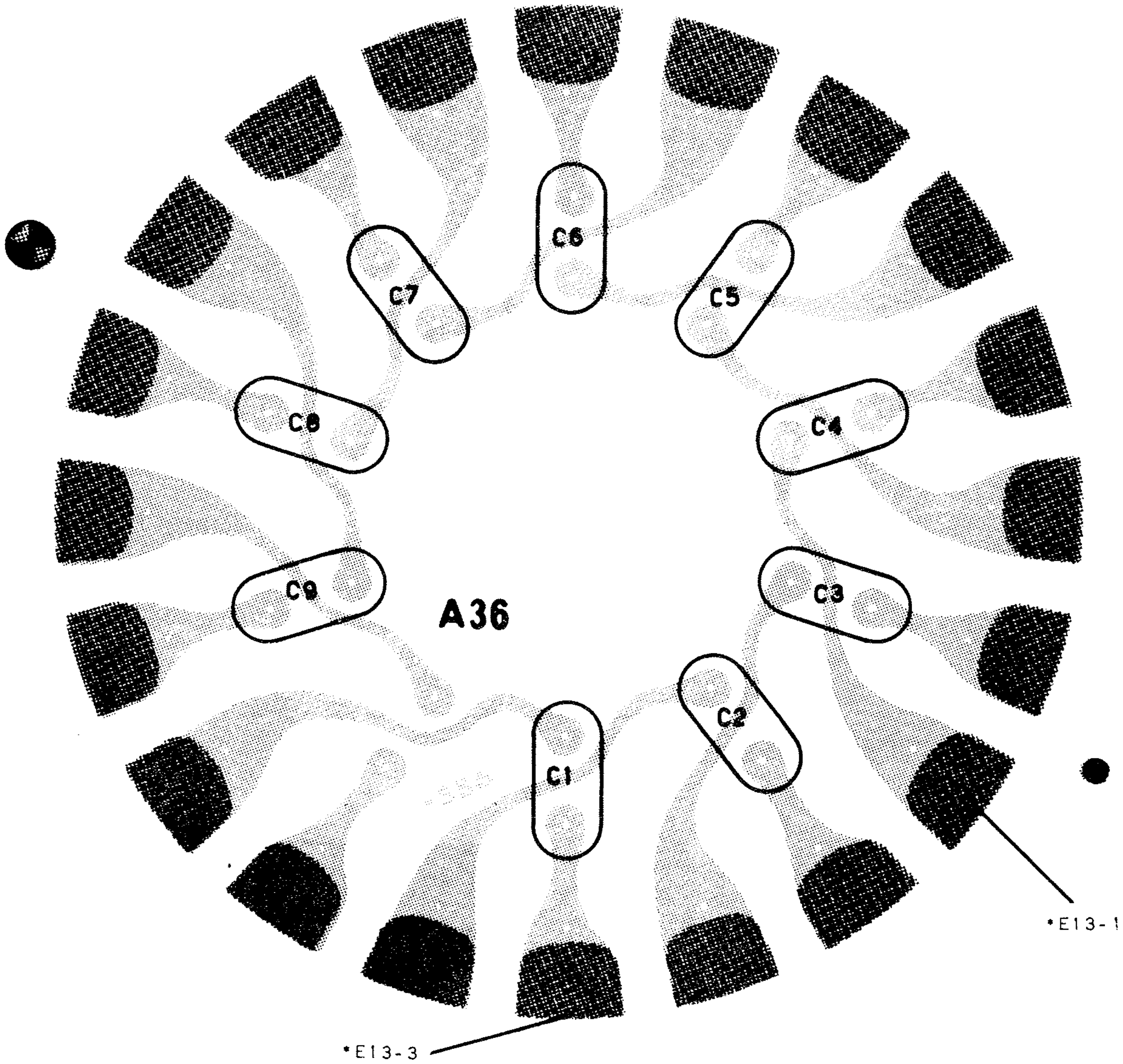
Figure 5-58. 100 KC Rotor Assembly A37 (Component Side Down), Component Location



NOTES:
1. REF. DESIG. PREFIX A2A4.
2. * TURRET CONTACT TERMINATIONS FOR C1/C10, TYPICAL OF EACH OF THE 10 POSITIONS OF THE TURRET, SEE CHART.

C1/C10	.00 MC
C2/C11	.10 MC
C3/C12	.20 MC
C4/C13	.30 MC
C5/C14	.40 MC
C6/C15	.50 MC
C7/C16	.60 MC
C8/C17	.70 MC
C9/C18	.80 MC
C19	.90 MC

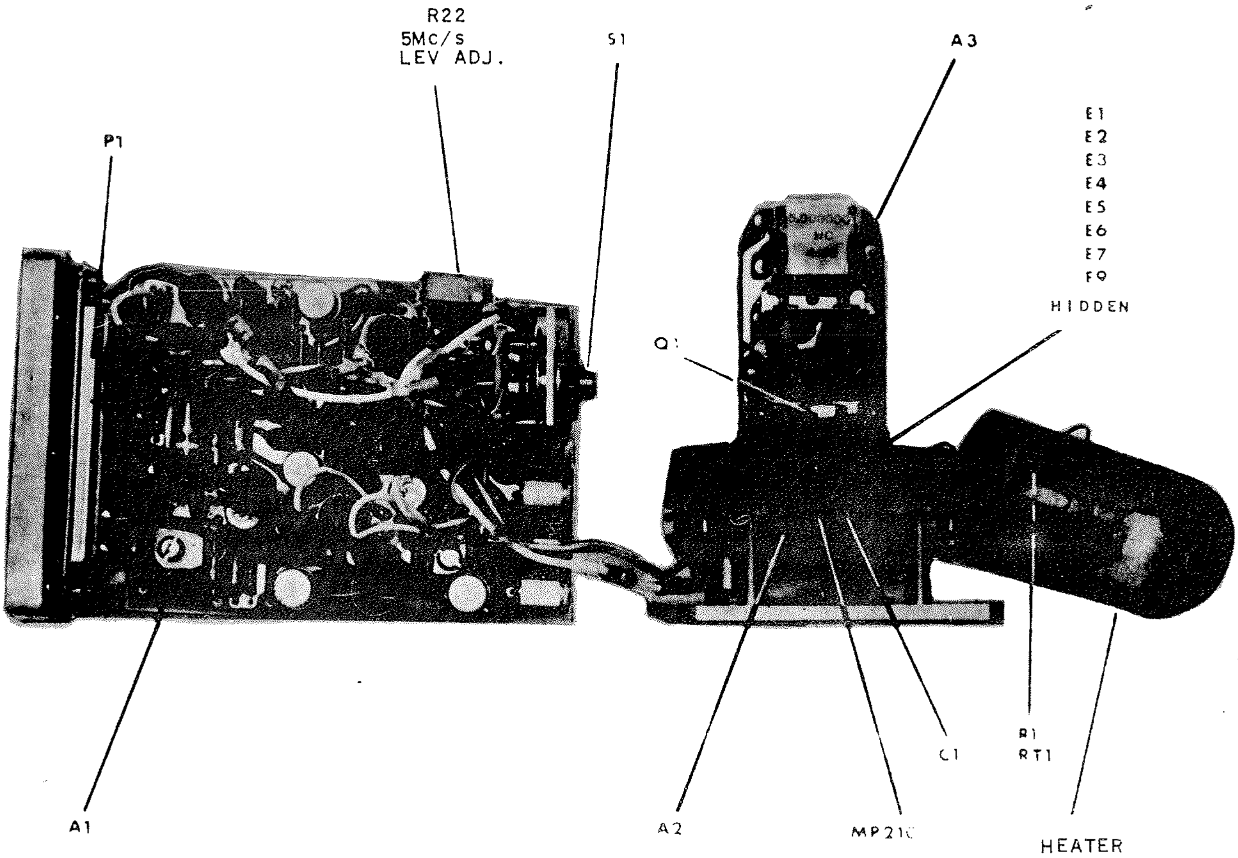
Figure 5-59. **100 KC Rotor Assembly A34 (Component Side Down), Component Location**



NOTES:
1. REF. DESIG. PREFIX 2A2A4
2. *TURRET CONTACT TERMINATIONS FOR C1/C10, TYPICAL OF EACH OF THE 10 POSITIONS OF THE TURRET. SEE CHART BELOW.

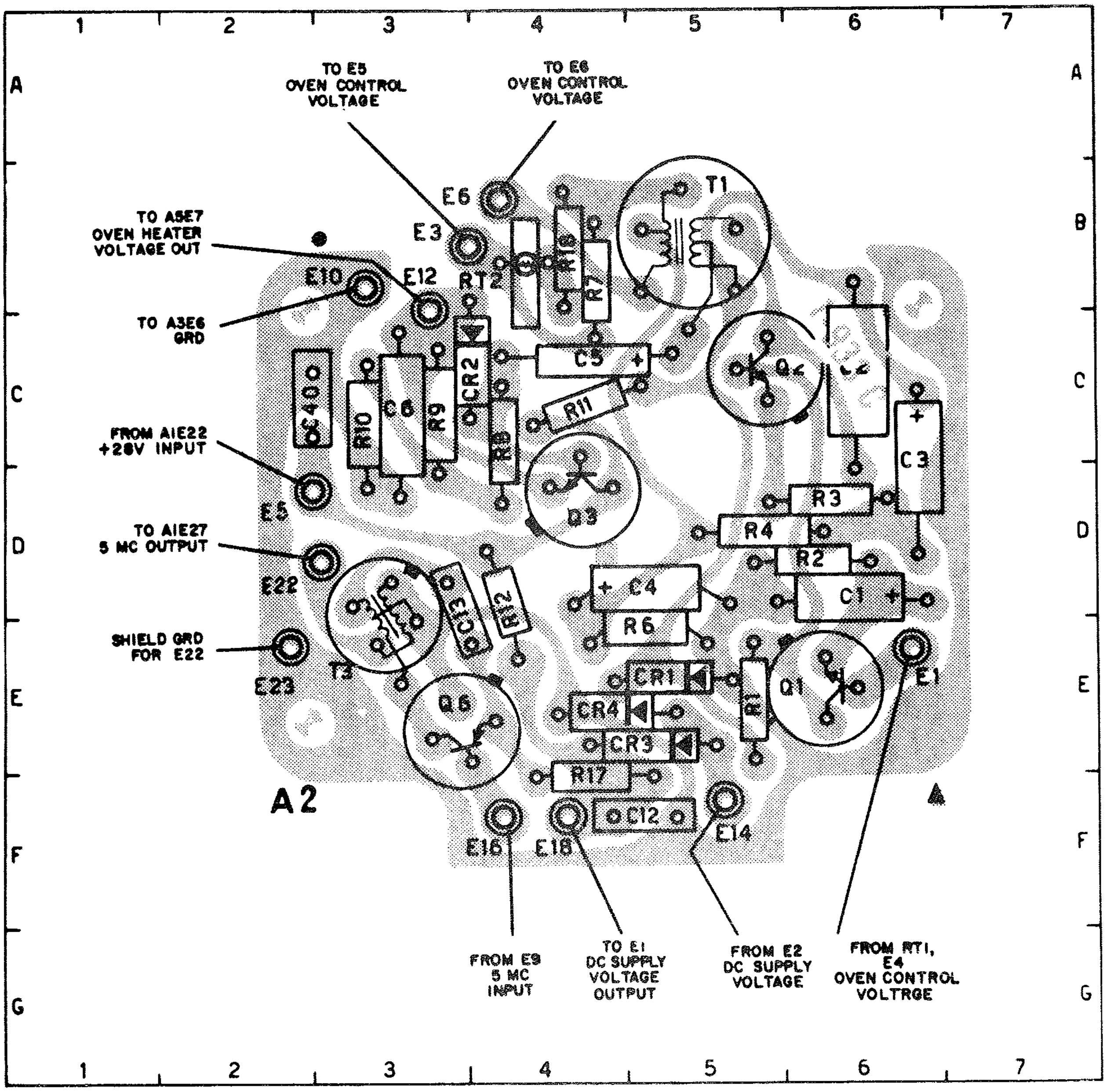
C1	.00MC
C2	.01MC
C3	.02MC
C4	.03MC
C5	.04MC
C6	.05MC
C7	.06MC
C8	.07MC
C9	.08MC

Figure 5-60. 10 KC Rotor Assembly A36 (Component Side Down), Component Location



NOTE:
REF. DESIG. PREFIX A2A5

Figure 5-61. Frequency Standard Electronic Assembly, Front View (Oven Disassembled), Component Location

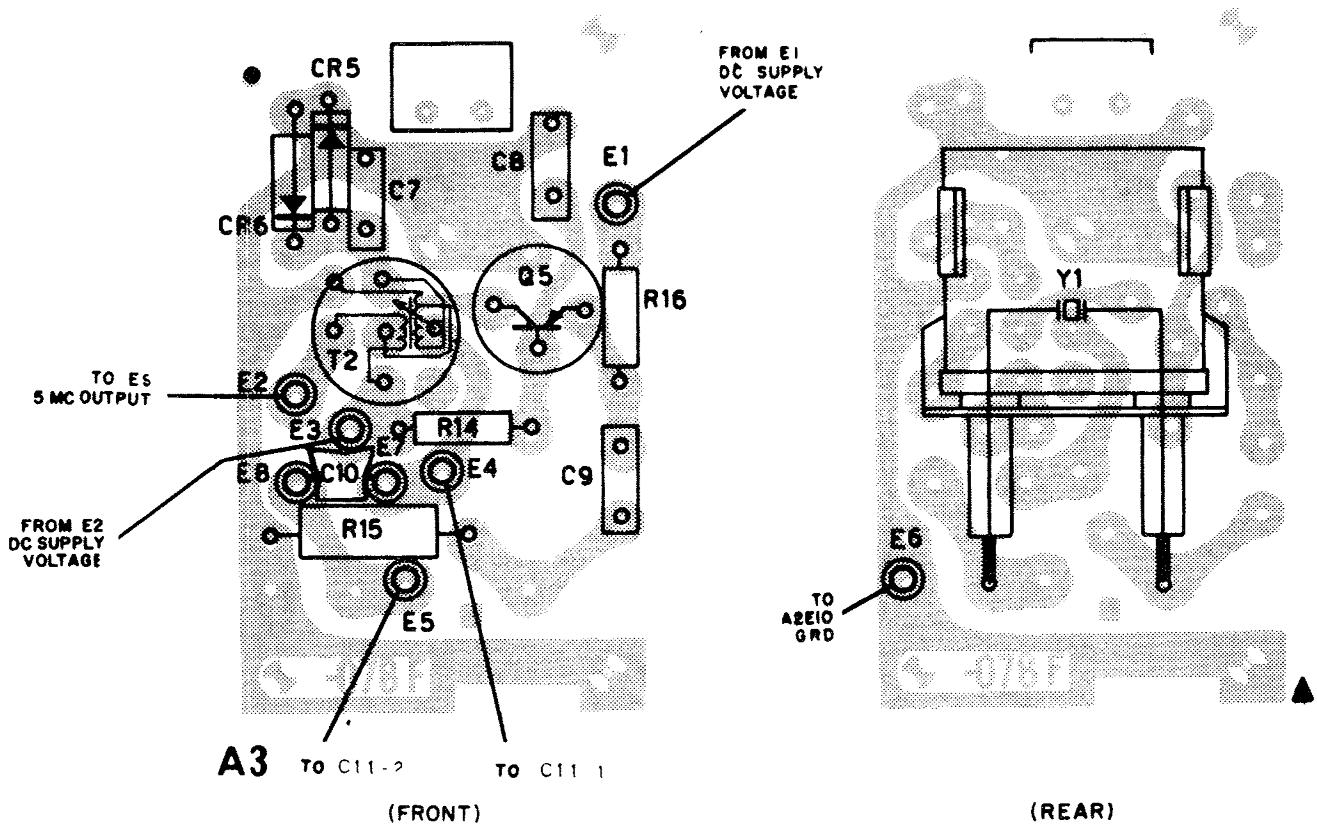


NOTE:
REF. DESIG. PREFIX A2A5.

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	6D	CR1	5E	E12	3B	Q6	3E	R10	3C
C2	6C	CR2	4C	E14	5F	R1	5E	R11	4C
C3	6D	CR3	5E	E16	4F	R2	6D	R12	4D
C4	5D	CR4	4E	E18	4F	R3	6D	R17	4F
C5	4C	E1	6E	E22	3D	R4	5D	R18	4B
C6	3C	E3	4B	E23	2D	R6	5E	RT2	4B
C12	5F	E5	3D	Q1	6E	R7	4B	T1	5B
C13	4D	E6	4B	Q2	5C	R8	4C	T3	3D
C40	3C	E10	3B	Q3	4D	R9	3C		

Figure 5-63. Oven Control and Buffer Amplifier (Foil Side Up), Component Location



NOTE:
REF. DESIG. PREFIX 2A2A5.

Figure 5-64. 5 MC Oscillator (Foil Side Up), Component Location

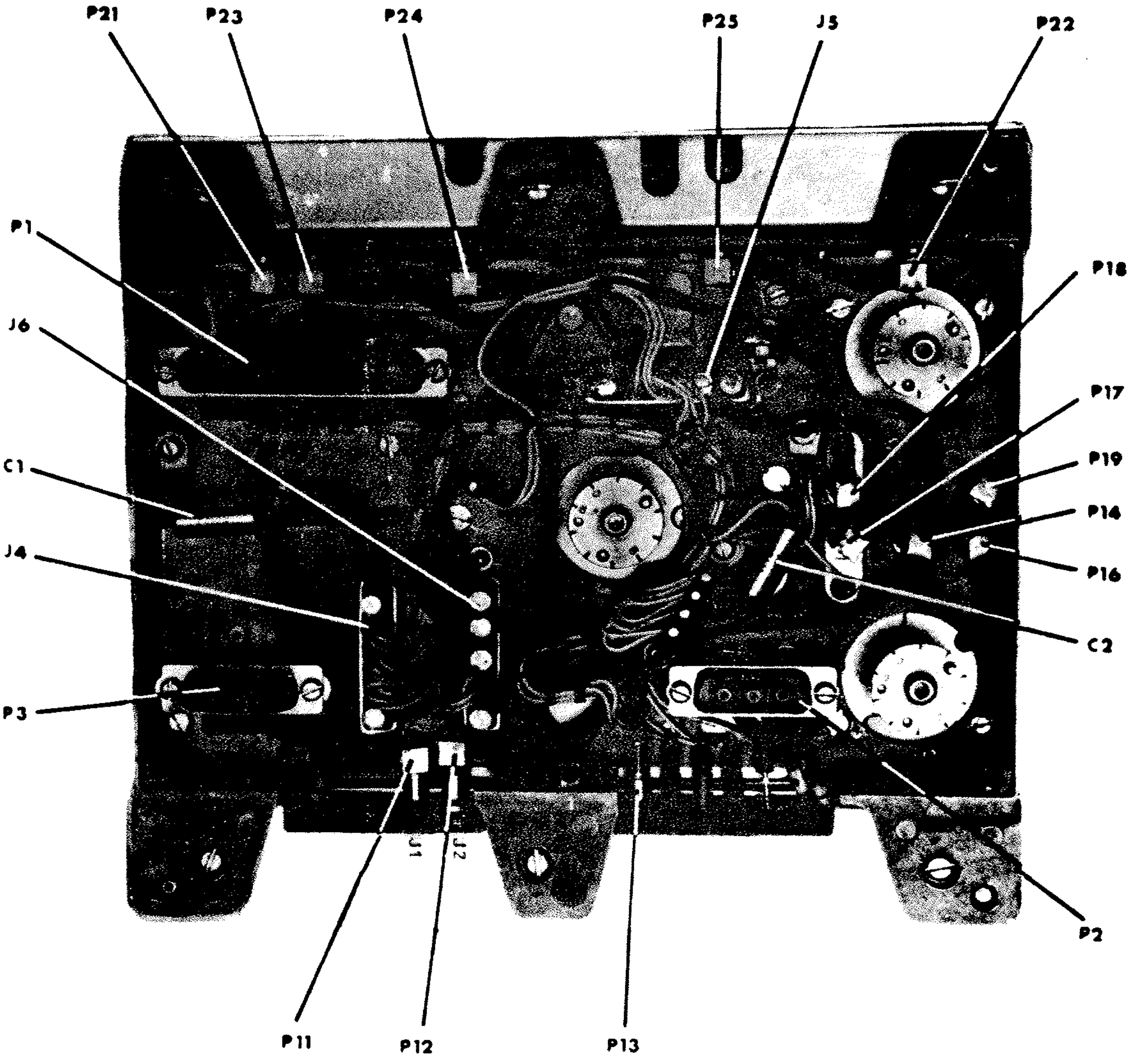
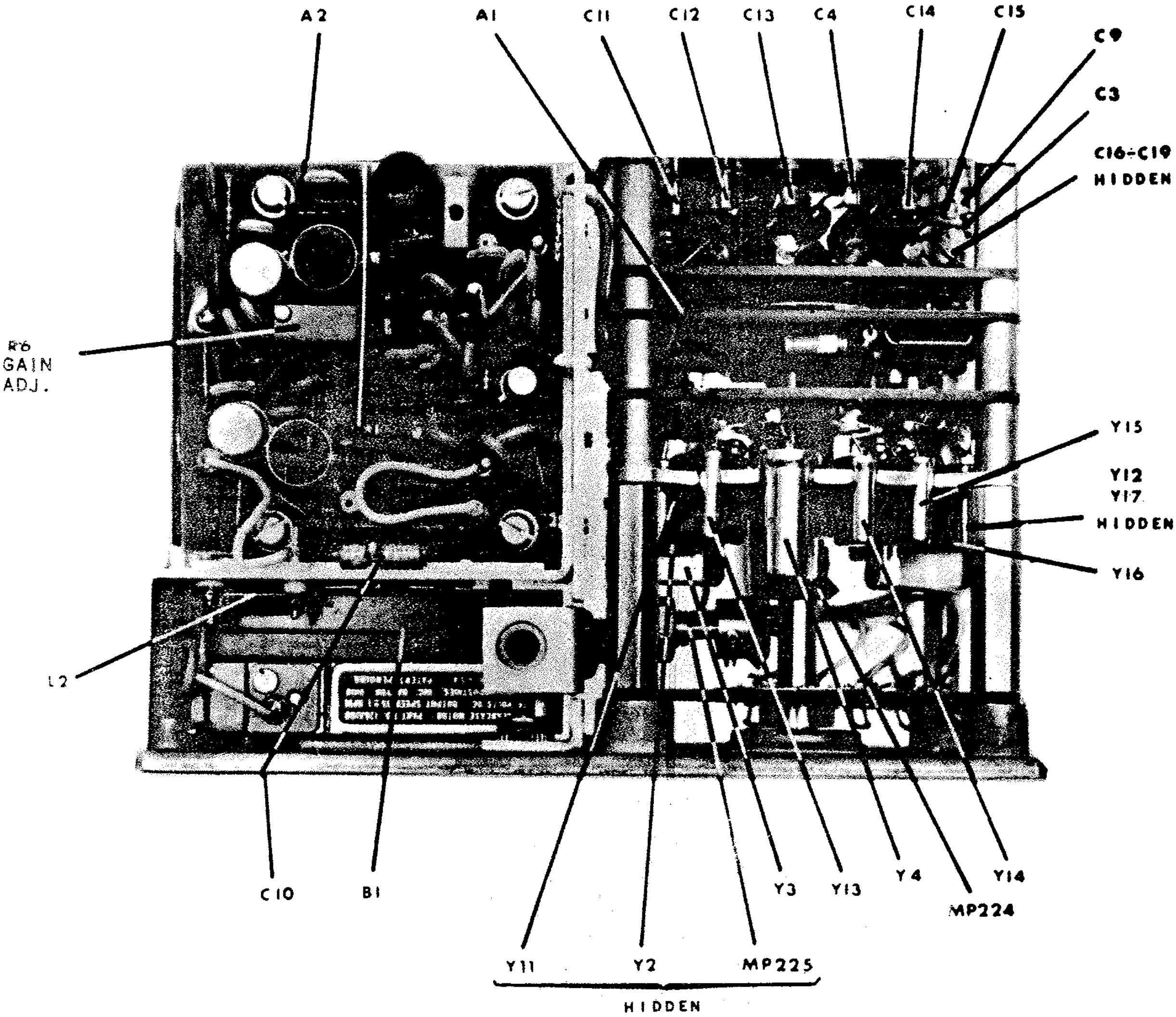
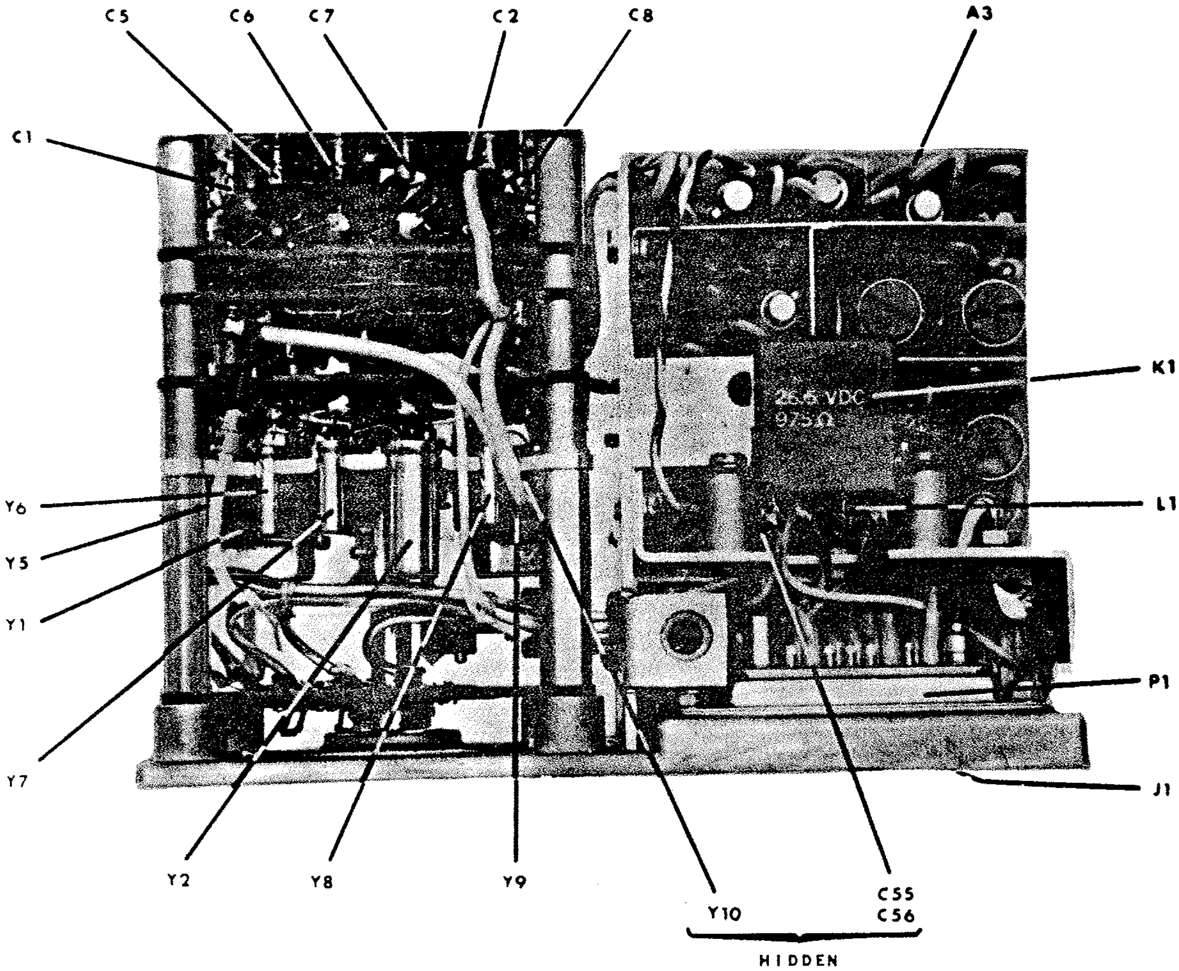


Figure 5-65. Translator/Synthesizer Electronic Assembly, Bottom View, Component Location



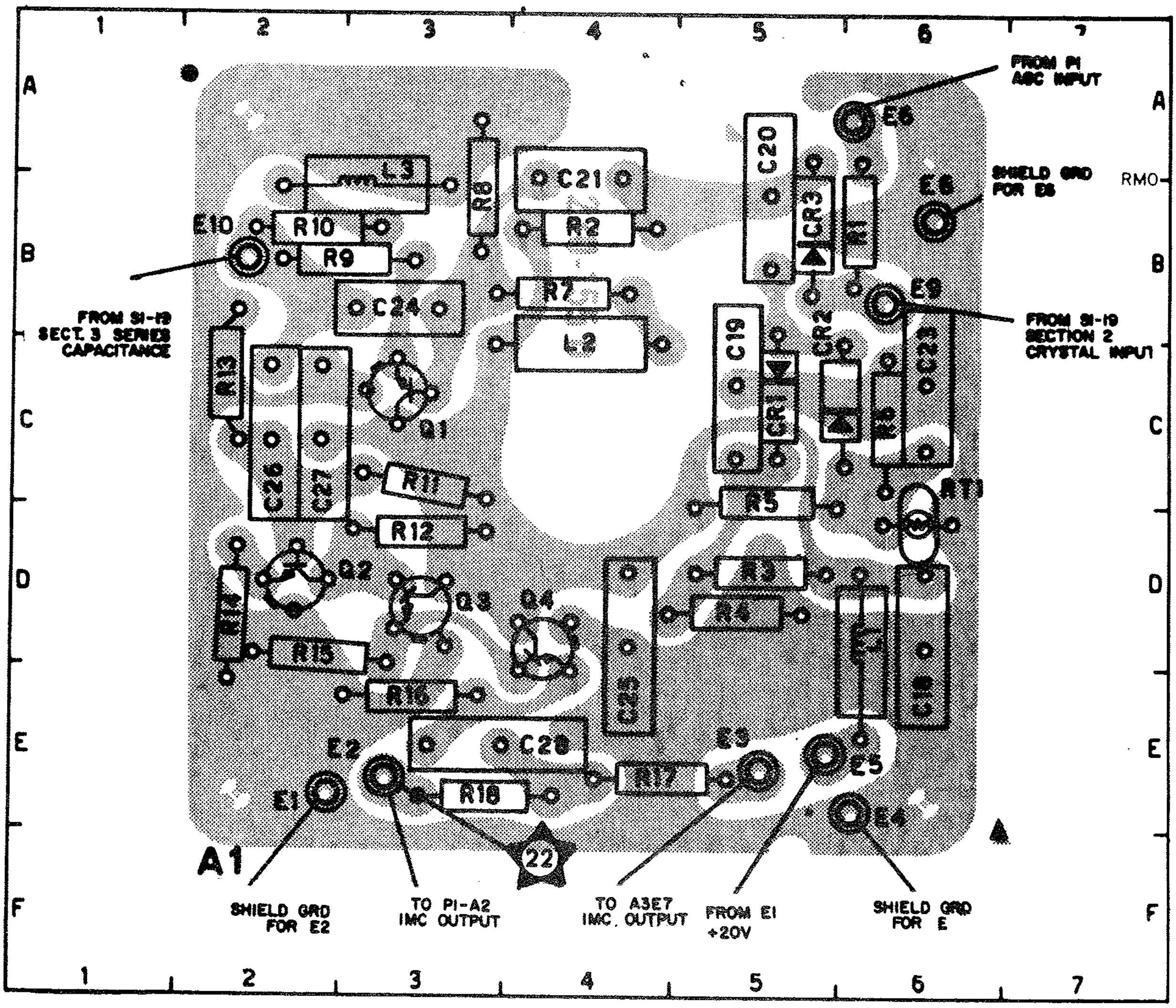
NOTE:
REF. DESIG. PREFIX A2A6A1

Figure 5-66. 1 MC Synthesizer Electronic Subassembly
Front View, Component Location



REF. DESIG. PREFIX
A2A6A1

Figure 5-67. 1 MC Synthesizer Electronic Subassem
Rear View, Component Location

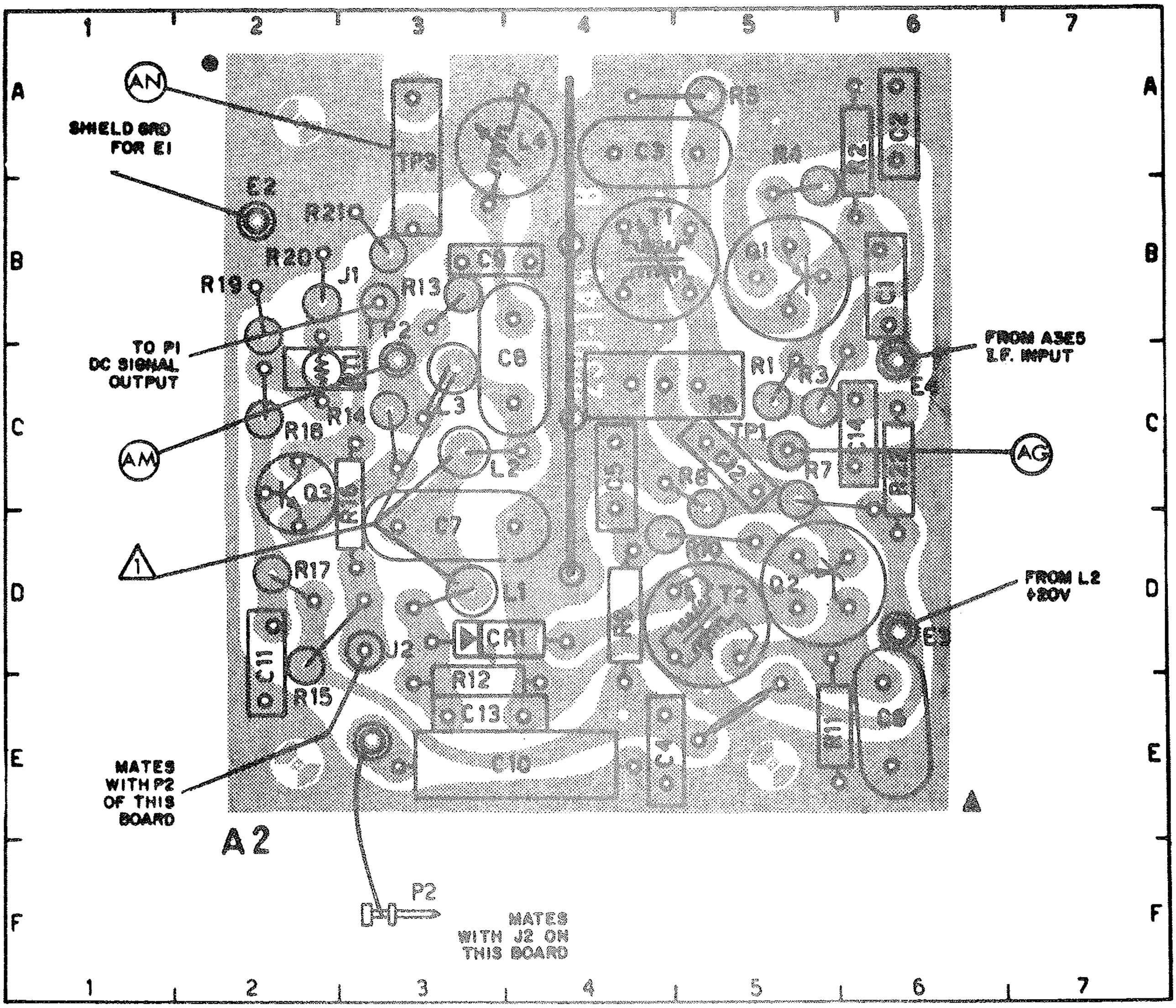


PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C18	6D	CR3	5B	L3	3A	R8	3B
C19	5C	E1	2E	Q1	3C	R9	3B
C20	5B	E2	3E	Q2	2D	R10	2B
C21	4B	E3	5E	Q3	3D	R11	3C
C23	6C	E4	6E	Q4	4D	R12	3D
C24	3B	E5	5E	R1	6B	R13	2C
C25	4D	E6	6A	R2	4B	R14	2D
C26	2C	E8	6B	R3	5D	R15	2D
C27	2C	E9	6B	R4	5D	R16	3E
C28	4E	E10	2B	R5	5C	R17	4E
CR1	5C	L1	6D	R6	6C	R18	3E
CR2	6C	L2	4B	R7	4B	RT1	6D

NOTE:
REF. DESIG. PREFIX A2A6A1.

Figure 5-68. MC Oscillator (Foil Side Up), Component Location

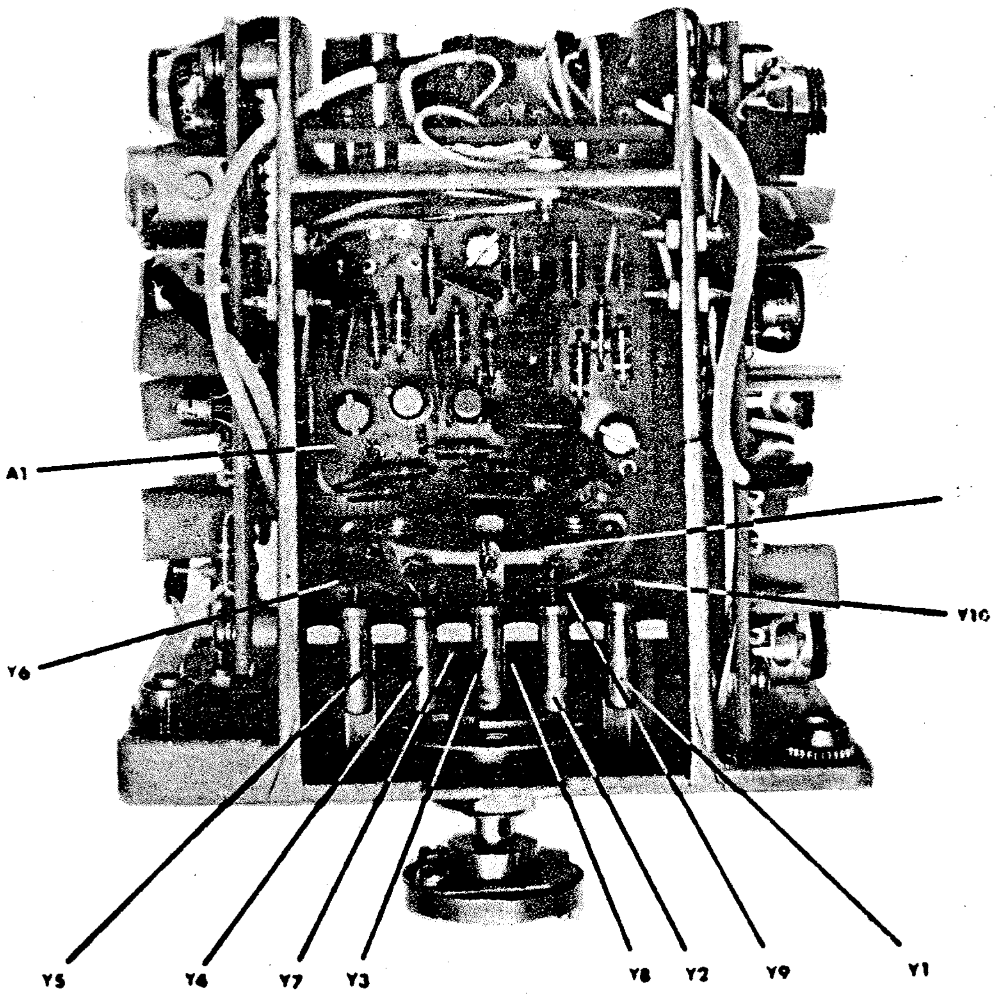


PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	6B	CR1	4D	R1	5C	R15	2D
C2	6A	E2	2B	R2	6A	R16	3C
C3	4A	E3	6D	R3	5C	R17	2D
C4	4E	E4	6C	R4	5B	R18	2C
C5	4C	J1	3B	R5	5A	R19	2B
C6	6E	J2	3D	A6	4C	R20	2B
C7	3D	L1	3D	R7	5C	R21	3B
C8	4C	L2	3C	R8	5D	R22	6C
C9	3B	L3	3C	R9	4D	RT1	2C
C10	4E	L4	3A	R10	4D	T1	4B
C11	2D	P2	3F	R11	5E	T2	5D
C12	5C	Q1	5B	R12	3E	TP1	5C
C13	3E	Q2	5D	R13	3B	TP2	3C
C14	6C	Q3	2C	R14	3C	TP3	3A

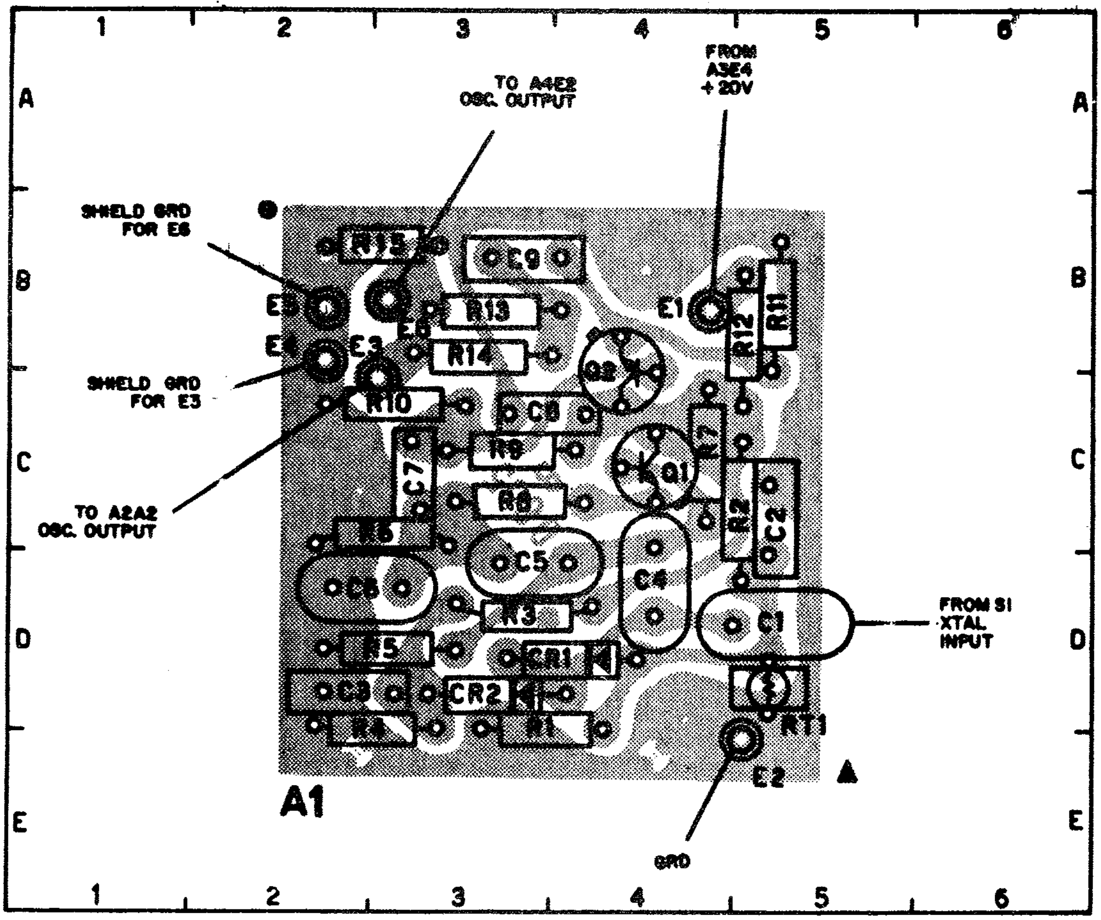
NOTES:
1. REF. DESIG. PREFIX A2A6A1.
2. △1 ⌒⌒⌒ VERTICALLY MOUNTED INDUCTORS

Figure 5-69. MC Oscillator AGC (Foil Side Up), Component and Test Point Location



NOTE:
REF. DESIG. PREFIX

Figure 5-71. 100 KC Synthesizer Electronic Subassembl
Right Side, Component Location

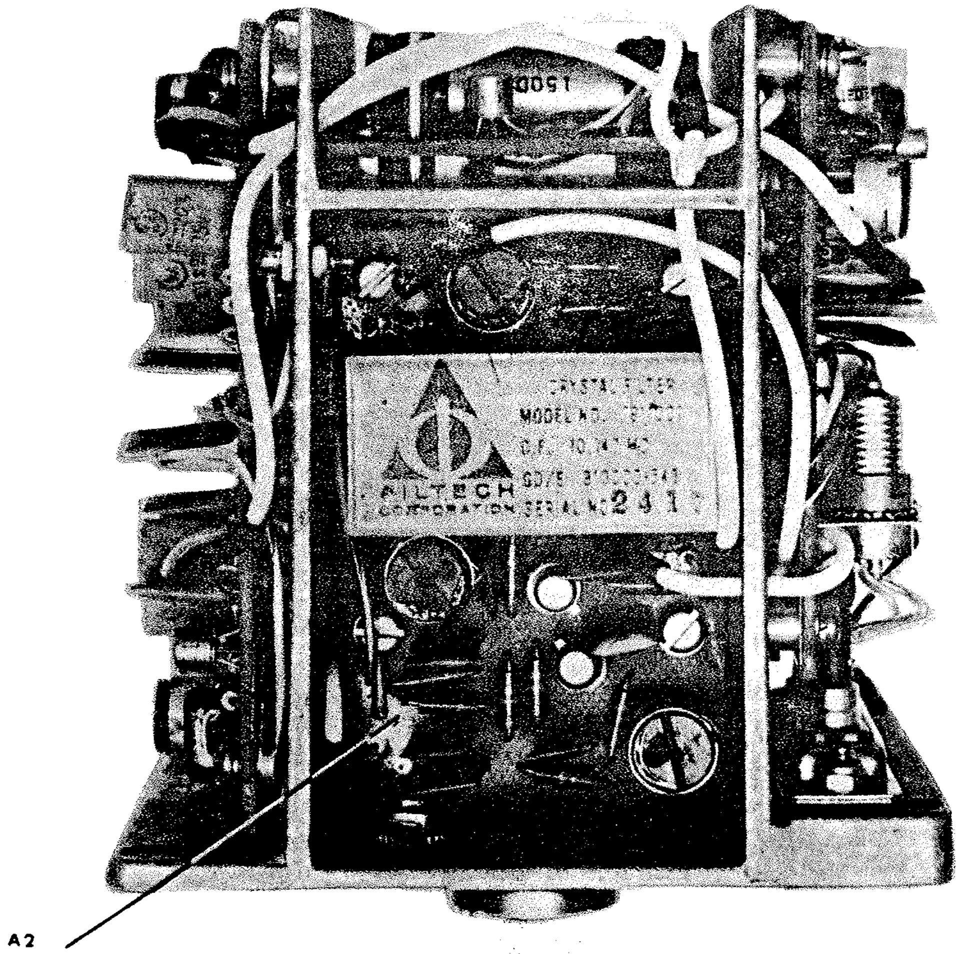


PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	5D	C10	3B	Q1	4C	R8	3C
C2	5C	CR1	4D	Q2	4B	R9	3C
C3	2D	CR2	3D	R1	4E	R10	3C
C4	4D	E1	4B	R2	5C	R11	5B
C5	3C	E2	5E	R3	3D	R12	5B
C6	2D	E3	3B	R4	3E	R13	3B
C7	3C	E4	2B	R5	3D	R14	3B
C8	4C	E5	2B	R6	3C	RT1	5D
C9	3B	E6	3B	R7	4C		

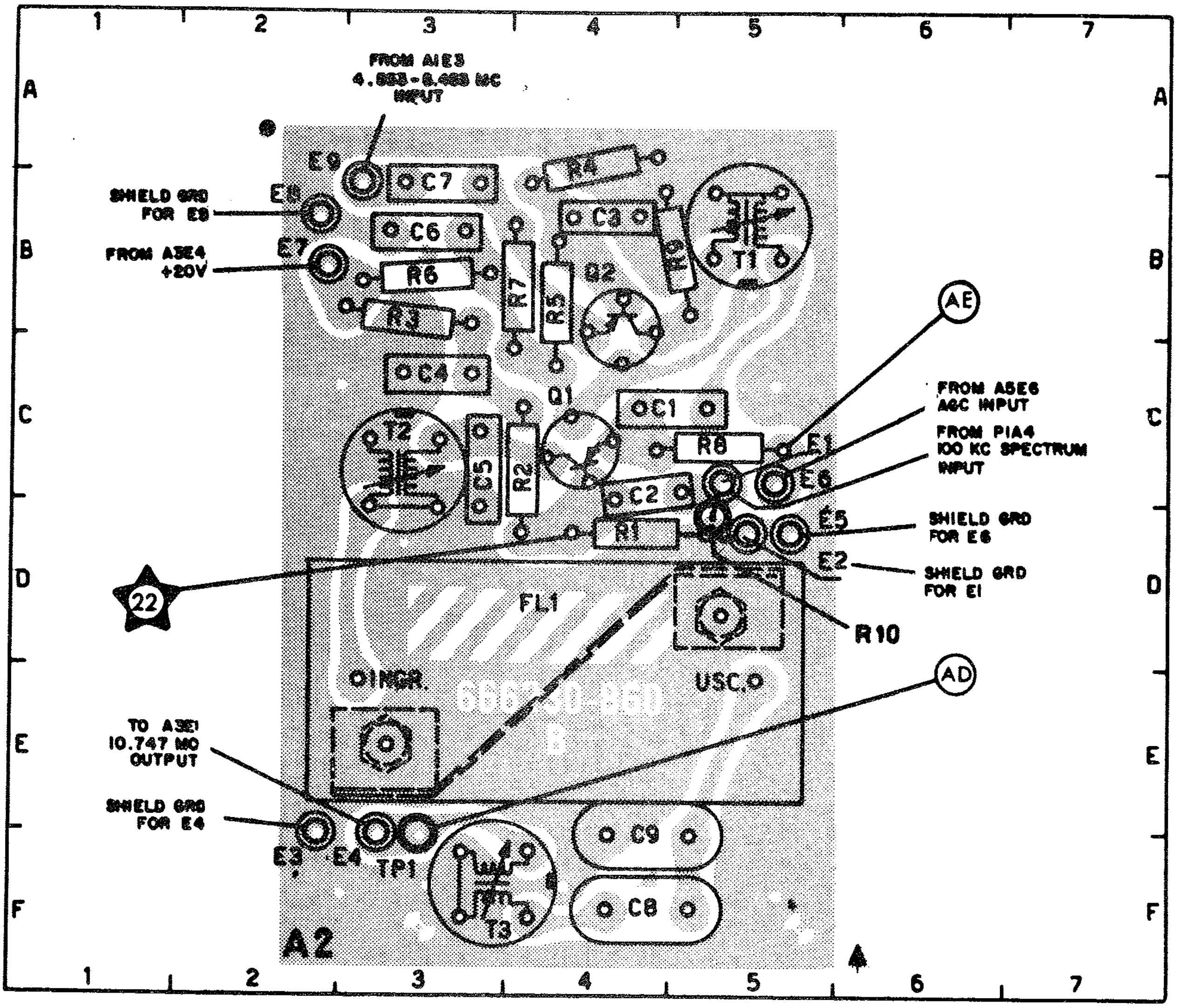
NOTE:
REF. DESIG. PREFIX A2A6A2.

Figure 5-72 4.553 MC to 5.453 MC Oscillator (Foil Side Up), Component Location



NOTE:
REF. DESIG. PREFIX A2A6A2

Figure 5-73. 100 KC Synthesizer Electronic Subassembly, Left Side, Component Location

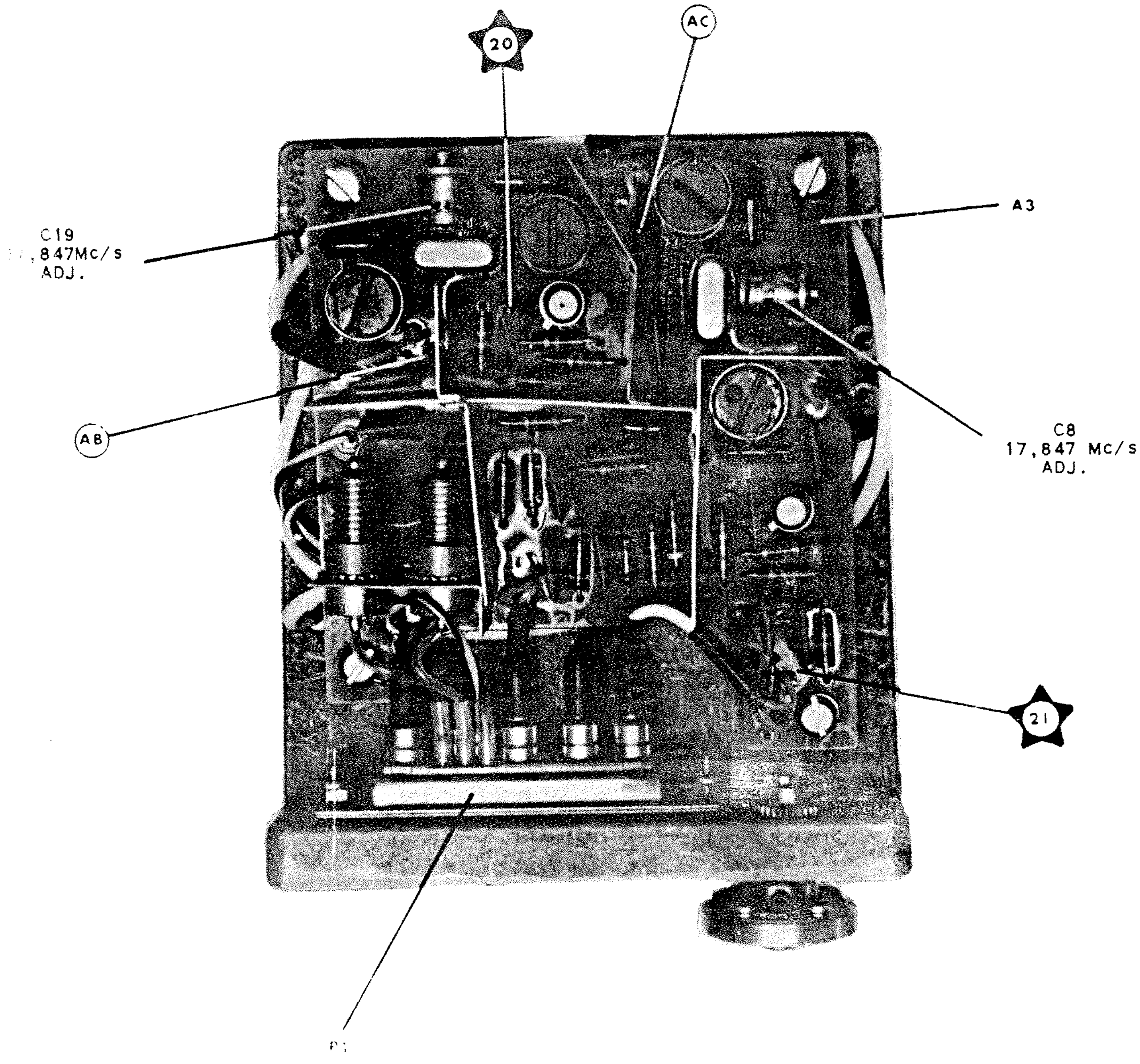


PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	5C	E1	5C	FL1	4D	R7	4B
C2	5C	E2	5D	Q1	4C	R8	5C
C3	4B	E3	3E	Q2	4B	R9	5B
C4	3B	E4	3E	R1	4C	R10	5D
C5	4C	E5	6C	R2	4C	T1	5B
C6	3B	E6	5C	R3	3B	T2	3C
C7	3A	E7	3B	R4	4A	T3	4F
C8	5F	E8	3B	R5	4B	TP1	3E
C9	5E	E9	3A	R6	3B		

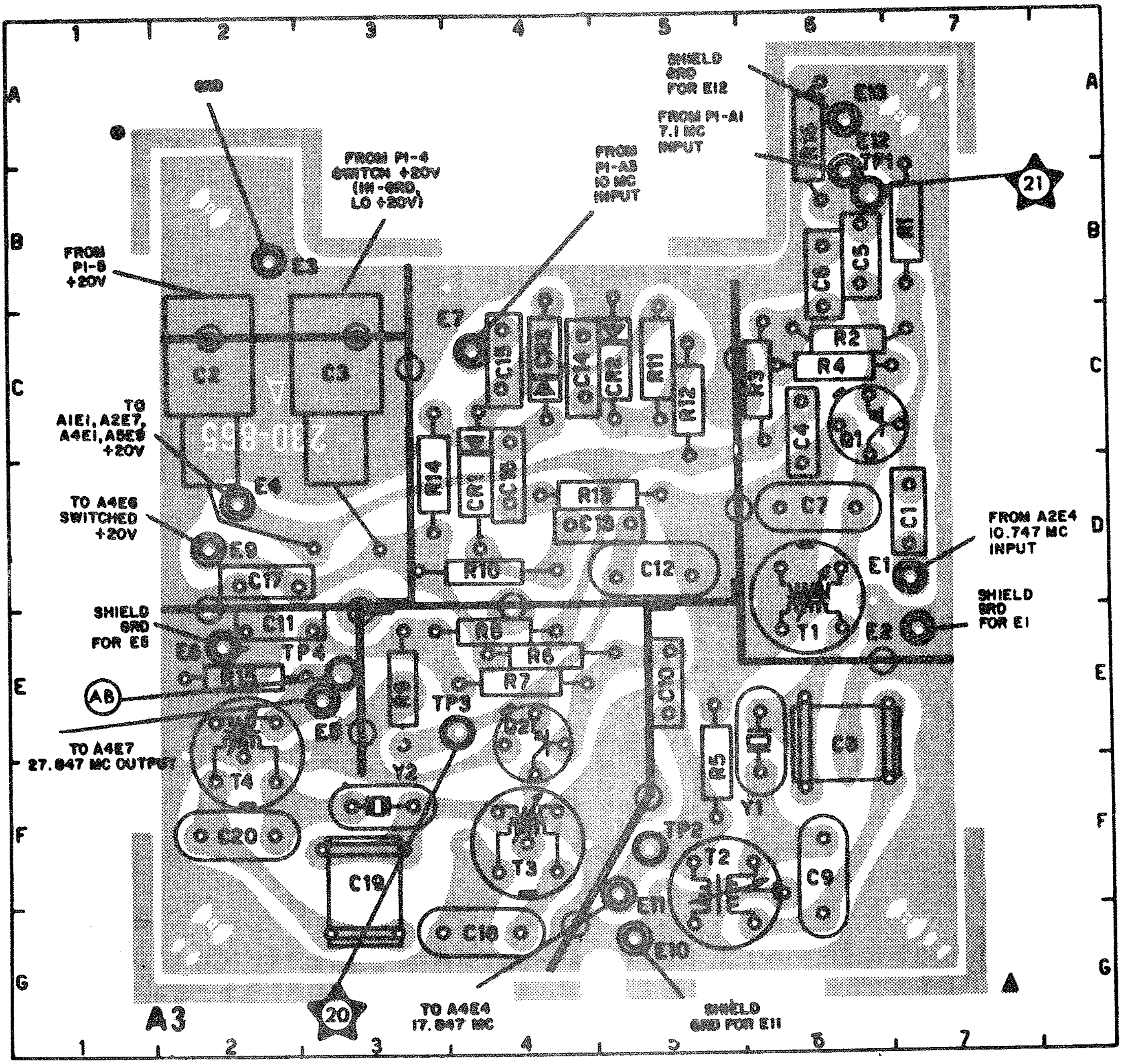
NOTE:
REF. DESIG. PREFIX A2A6A2.

Figure 5-74 10.747 MC Mixer (Foil Side Up), Component and Test Point Location



NOTE:
REF. DESIG. PREFIX A2A6A2

Figure 5-75 100 KC Synthesizer Electronic Subassembly, Front View, Component Location

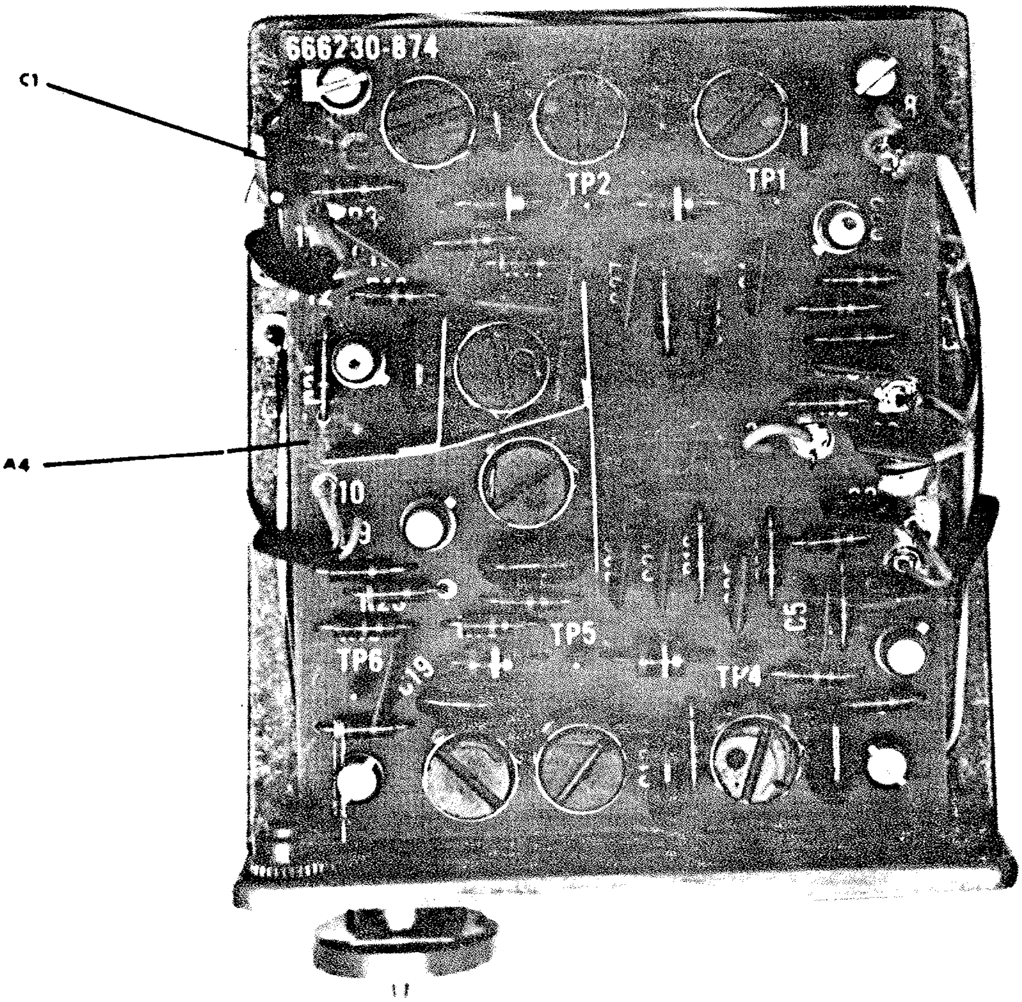


PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	7D	C12	5D	CR3	4C	E11	5F	R7	4E	T2	5F
C2	2C	C13	4D	E1	7D	E12	6B	R8	4E	T3	4F
C3	3C	C14	4C	E2	7E	E13	6A	R9	3E	T4	2E
C4	6C	C15	4C	E3	2B	Q1	6C	R10	4D	TP1	6B
C5	6B	C16	4D	E4	2D	Q2	4E	R11	5C	TP2	5F
C6	6B	C17	2D	E5	3E	R1	7B	R12	5C	TP3	4E
C7	6D	C18	4G	E6	2E	R2	6C	R13	4D	TP4	3E
C8	6E	C19	3F	E7	4C	R3	6C	R14	3D	Y1	6E
C9	6F	C20	2F	E8	3B	R4	6C	R15	2E	Y2	3F
C10	5E	CR1	4D	E9	2D	R5	5E	R16	6A		
C11	2E	CR2	5C	E10	5G	R6	4E	T1	6D		

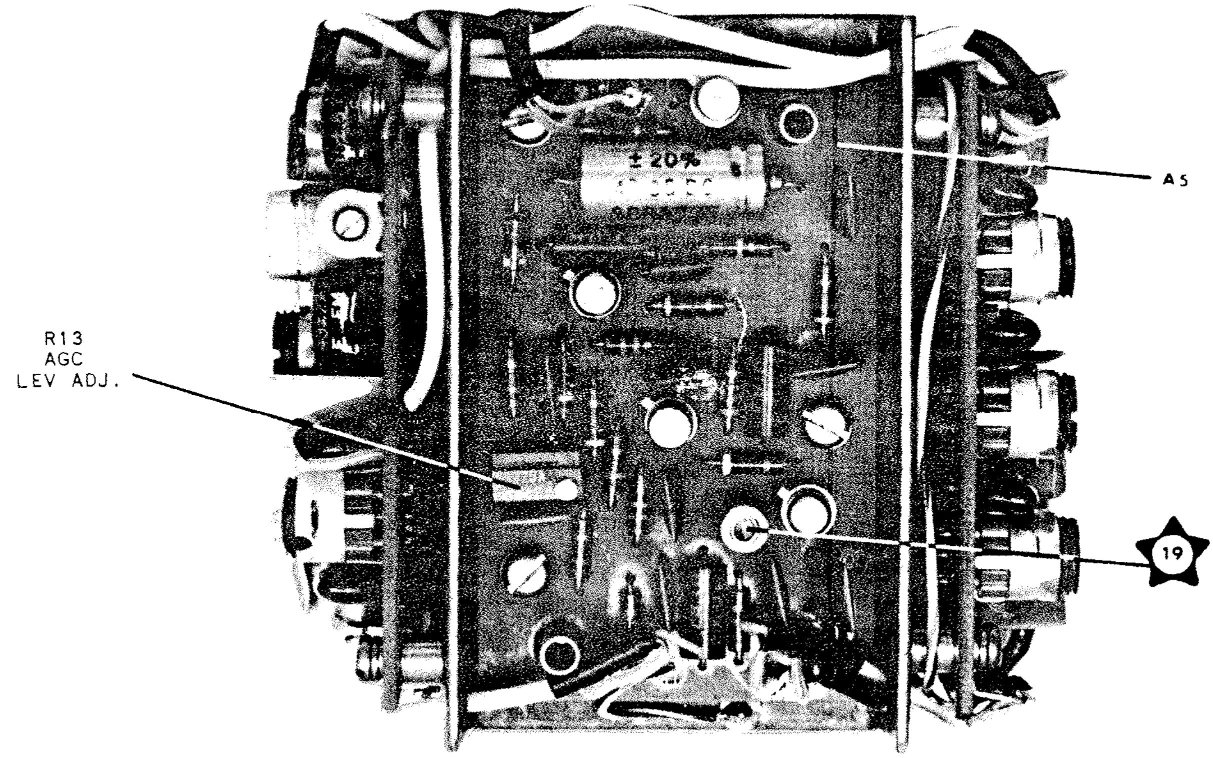
NOTE:
REF. DESIG. PREFIX A2A6A2.

Figure 5-76. 17.847/27.847 MC Mixer (Foil Side Up), Component and Test Point Location



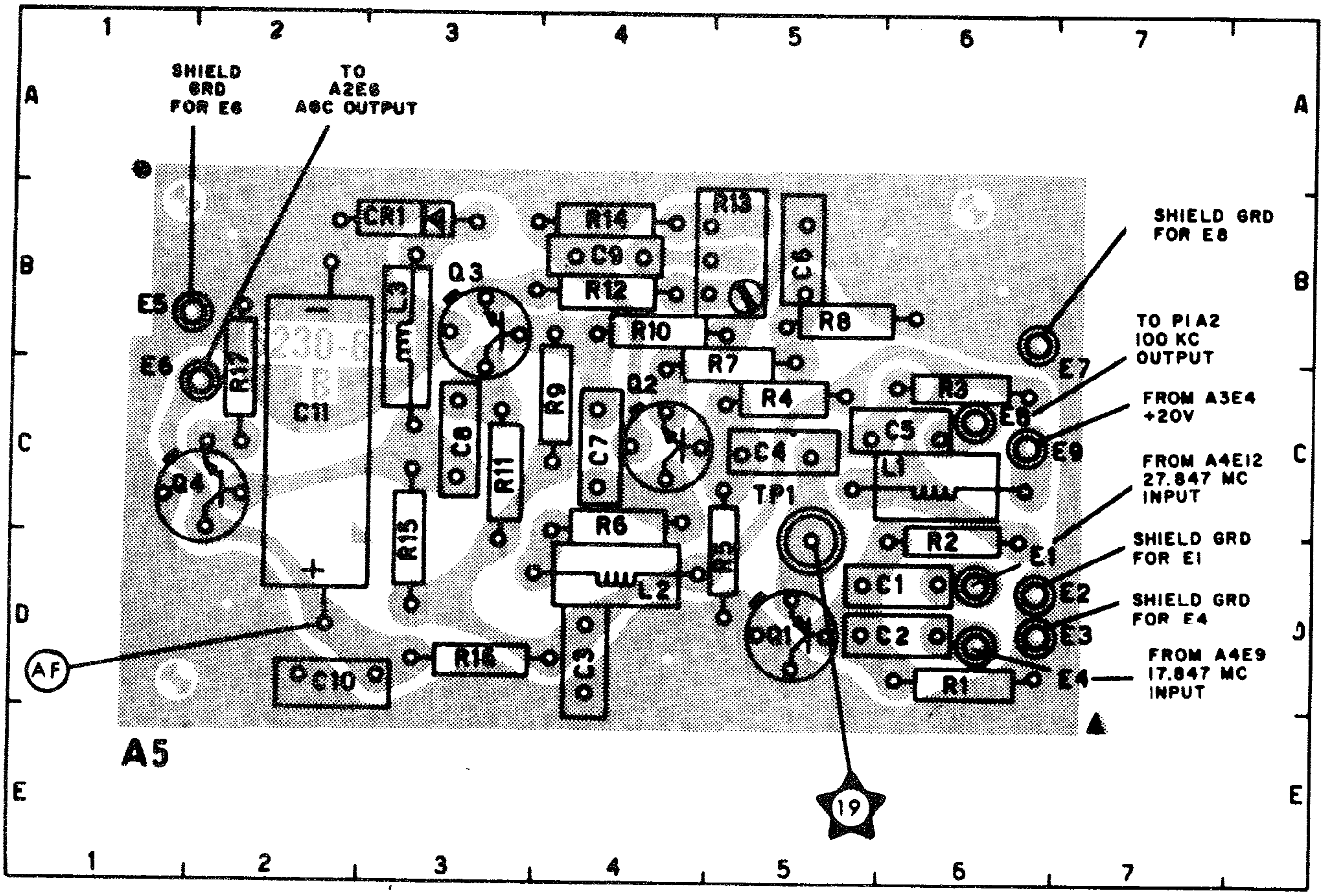
NOTE:
REF. DESIG. PREFIX A2A6A2

Figure 5-77 100 KC Synthesizer Electronic Subassembly, Rear View, Component Location



NOTE:
REF. DESIG. PREFIX A, A6A2

Figure 5-79. 100 KC Synthesizer Electronic Subassembly, Top View, Component Location

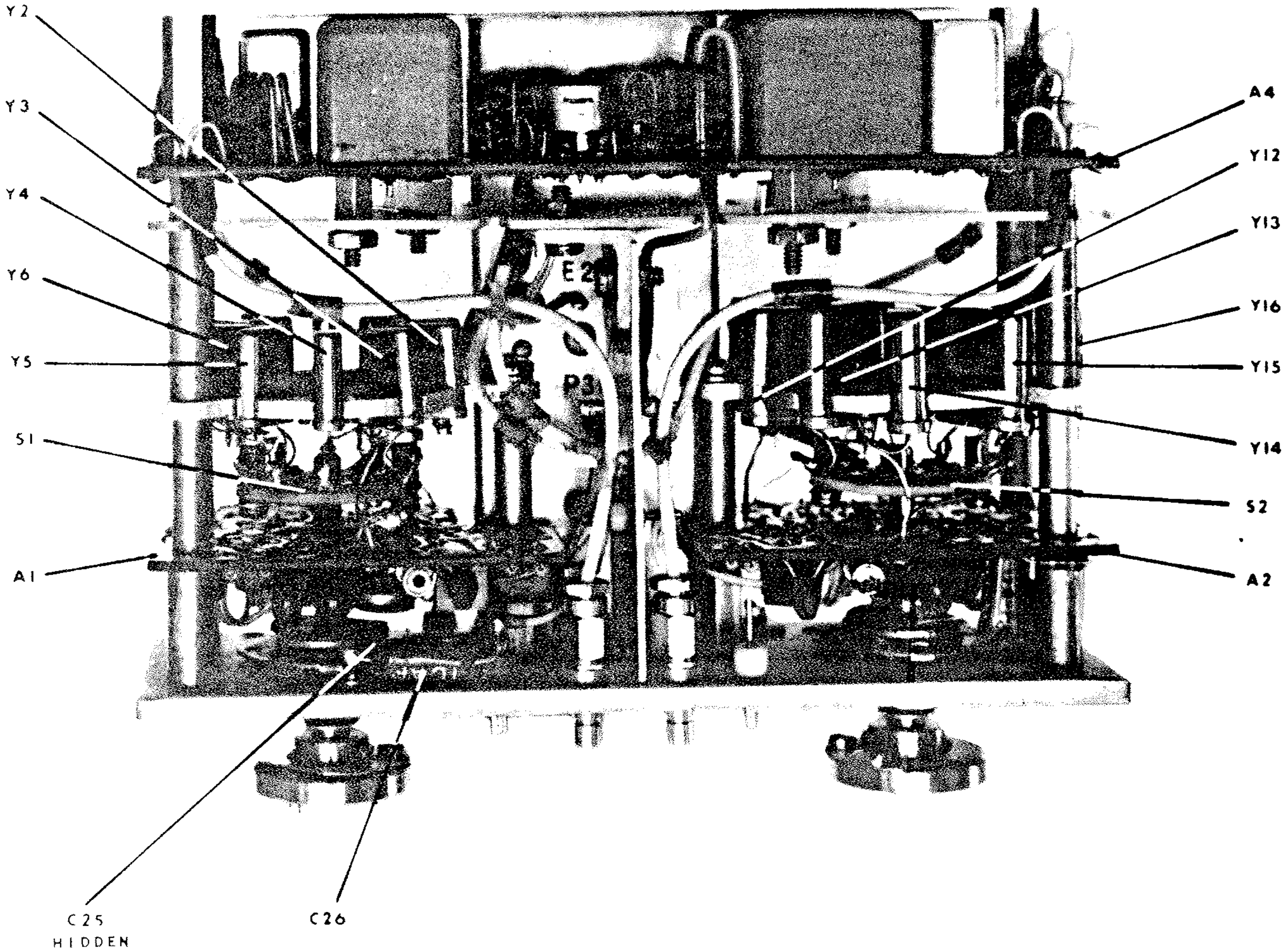


PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	D6	E1	D6	Q1	D5	R9	C4
C2	D6	E2	D6	Q2	C4	R10	B4
C3	D4	E3	D6	Q3	B3	R11	C3
C4	C5	E4	D6	Q4	C1	R12	B4
C5	C6	E5	B1	R1	D6	R13	B5
C6	B5	E6	C1	R2	D6	R14	B4
C7	C4	E7	B6	R3	C6	R15	D3
C8	C3	E8	C6	R4	C5	R16	D3
C9	B4	E9	C6	R5	D5	R17	C2
C10	D2	L1	C6	R6	C4	TP1	D5
C11	C2	L2	D4	R7	C5		
CR1	B3	L3	B3	R8	B5		

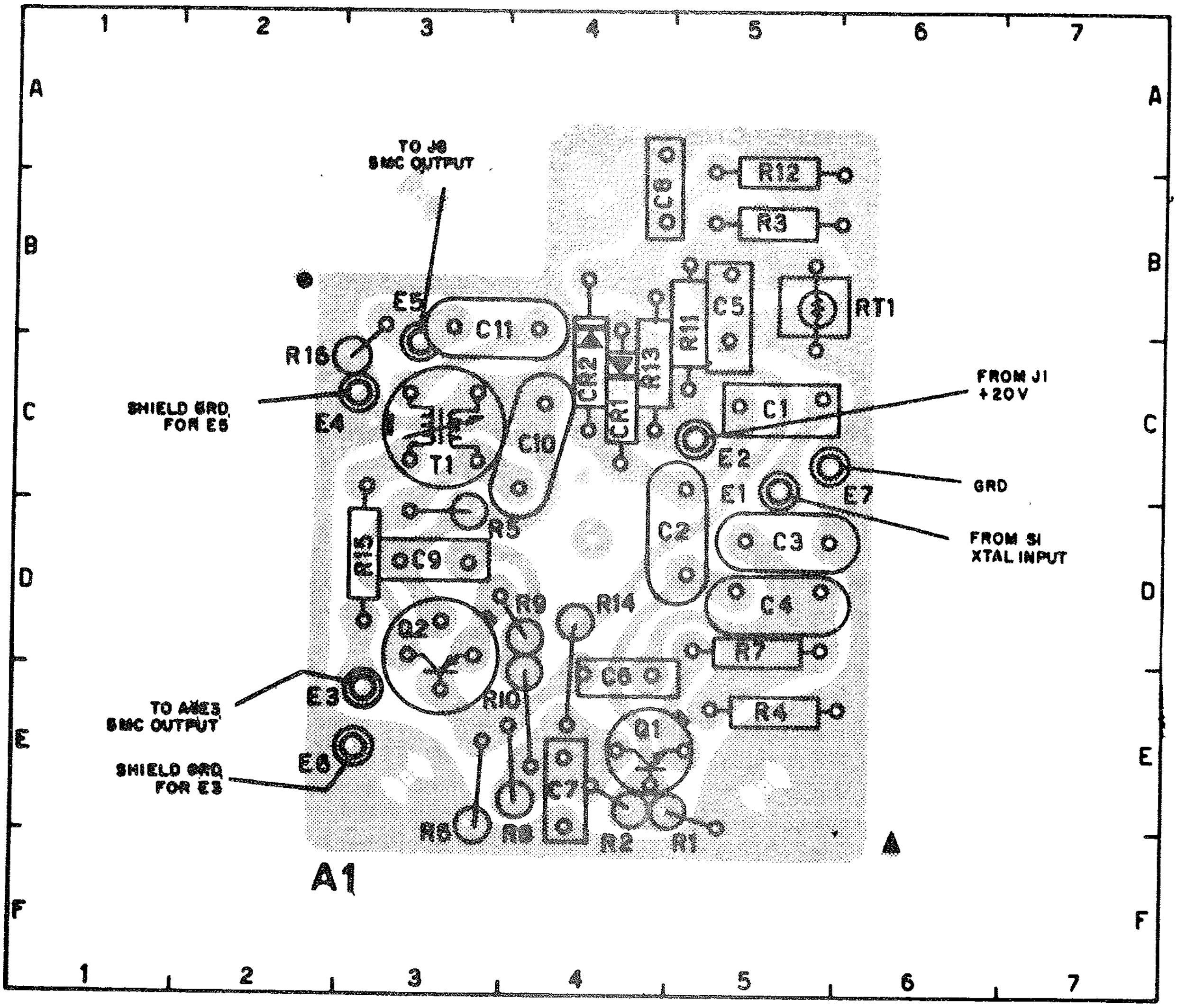
NOTE:
REF. DESIG. PREFIX A2A6A2.

Figure 5-80. 10.747 MC Mixer AGC (Foil Side Up), Component and Test Point Location



NOTE:
REF DESIG x A2A6A3

Figure 5-81. 1 and 10 KC Synthesizer Electronic Subassembly, Front View, Component Location

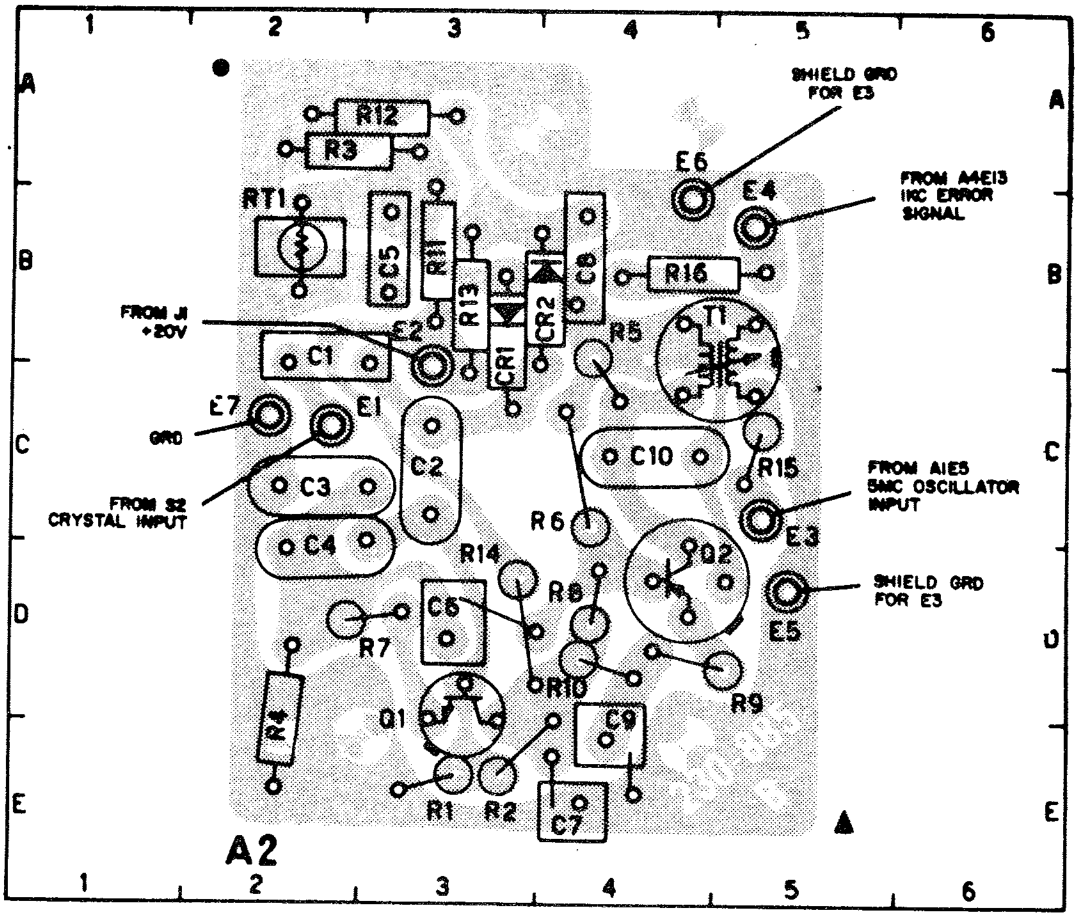


PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	5C	C11	3B	Q1	4E	R9	4D
C2	4D	CR1	4C	Q2	3D	R10	4E
C3	5D	CR2	4C	R1	5E	R11	5B
C4	5D	E1	5C	R2	4E	R12	5A
C5	5B	E2	5C	R3	5B	R13	4C
C6	4E	E3	3E	R4	5E	R14	4D
C7	4E	E4	3C	R5	3D	R15	3D
C8	4B	E5	3C	R6	3E	R16	2C
C9	3D	E6	3E	R7	5D	RT1	5B
C10	4C	E7	5C	R8	4E	T1	3C

NOTE:
REF. DESIG. PREFIX A2A6A3.

Figure 5-82. 5.25 MC to 5.16 MC Oscillator (Foil Side Up), Component and Test Point Location

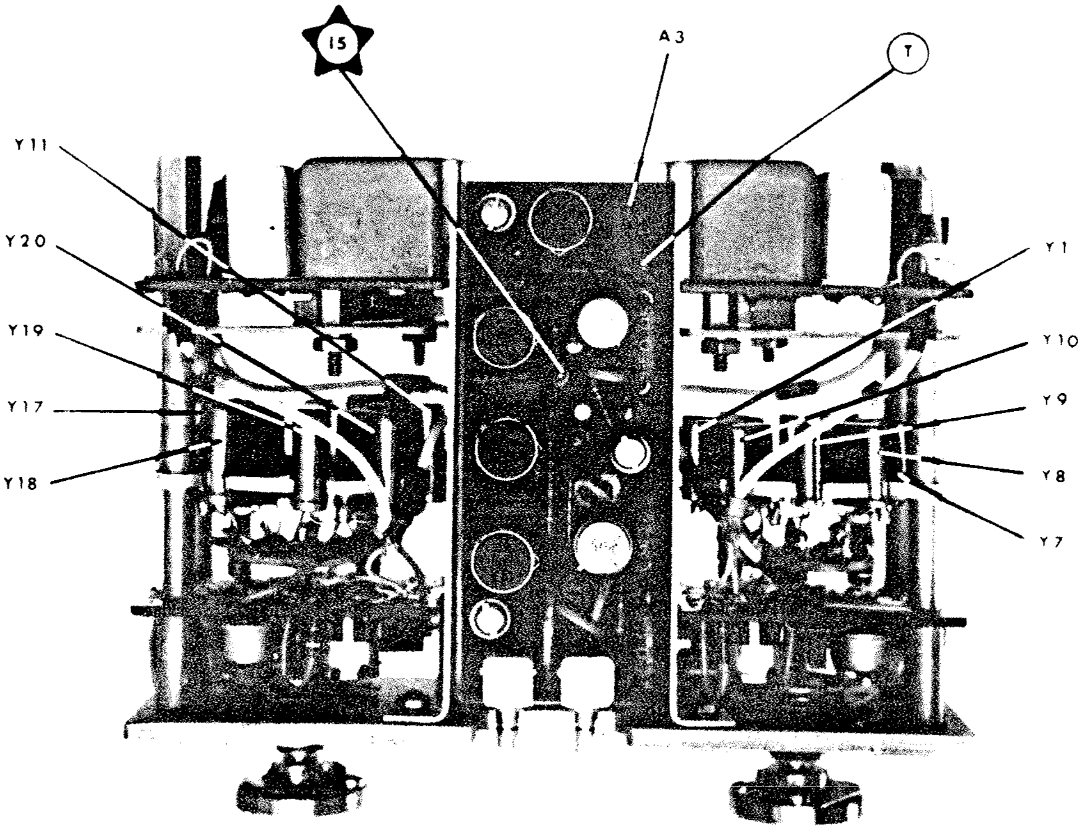


PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	2B	CR1	3B	R1	3E	R11	3B
C2	3C	CR2	4B	R2	3E	R12	3A
C3	2C	E1	2C	R3	3A	R13	3B
C4	2D	E2	3B	R4	2D	R14	4D
C5	3B	E3	5B	R5	4B	R15	4B
C6	3D	E4	5D	R6	4C	R16	5C
C7	4E	E5	4B	R7	2D	RT1	2B
C8	4B	E6	5D	R8	4D	T1	5B
C9	4D	Q1	3D	R9	5D		
C10	4C	Q2	4D	R10	4D		

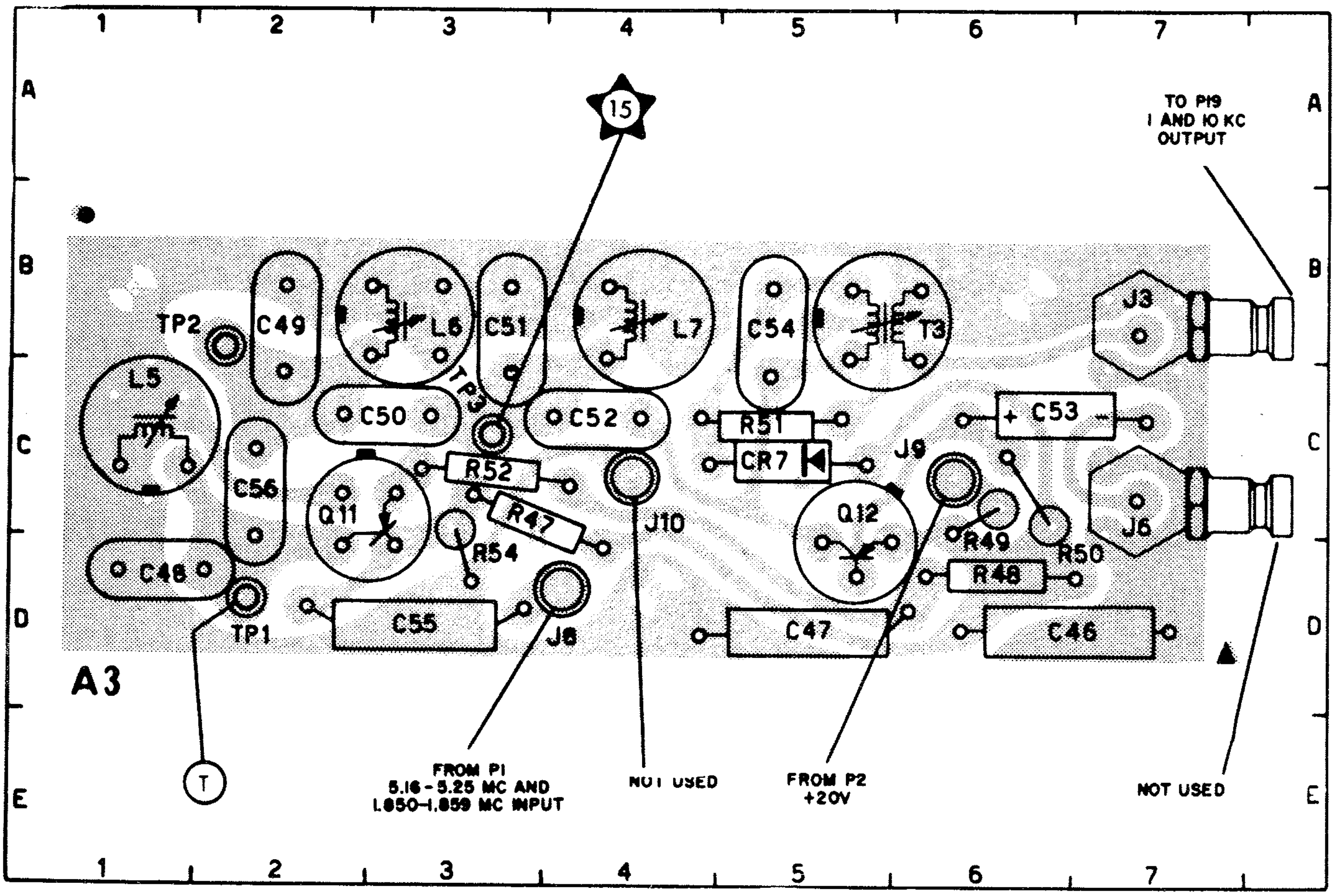
NOTE:
REF. DESIG. PREFIX A2A6A3.

Figure 5-83. 1.850 MC to 1.859 MC Oscillator (Foil Side Up), Component and Test Point Location



NOTE:
REF. DESIG. PREFIX A2A6A3

Figure 5-84. 1 and 10 KC Synthesizer Electronic Subassembly, Rear View Component Location

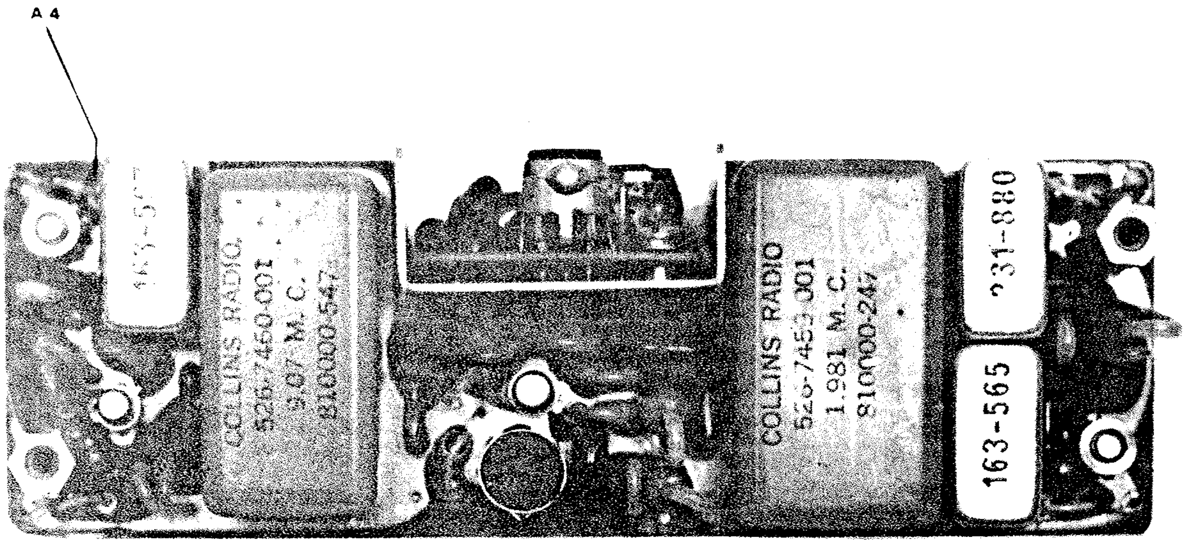


PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C46	7D	CR7	5C	R47	3C
C47	5D	J3	7B	R48	6D
C48	1D	J6	7C	R49	6C
C49	2B	J8	4D	R50	6C
C50	2C	J9	6C	R51	5C
C51	3B	J10	4C	R52	3C
C52	4C	L5	1C	R54	3C
C53	6C	L6	3B	T3	5B
C54	5B	L7	4B	TP1	2D
C55	3D	Q11	2C	TP2	2B
C56	2C	Q12	5D	TP3	3C

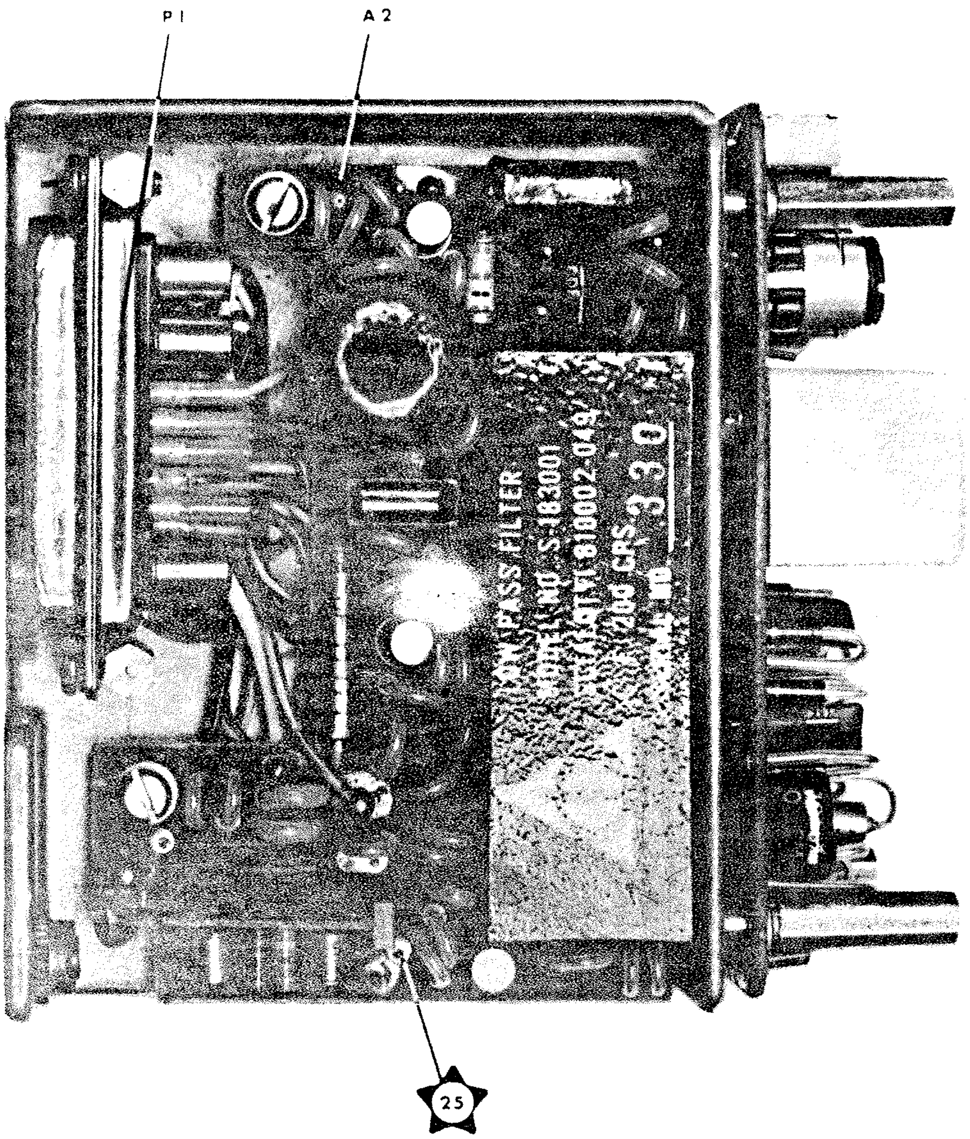
NOTE:
REF. DESIG. PREFIX A2A6A3.

Figure 5-85. 1 and 10 KC Synthesizer Output Circuit (Foil Side Up), Component and Test Point Location



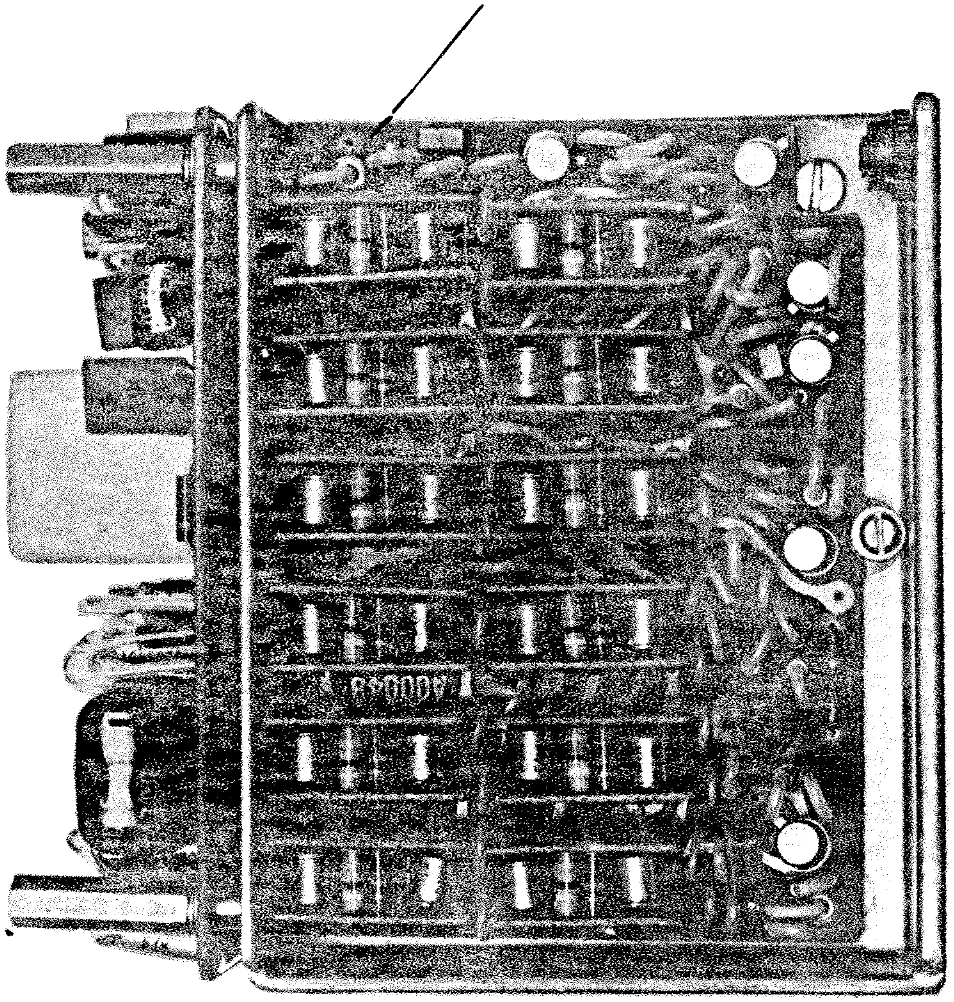
NOTE:
REF. DESIG. PREFIX A2A6A3

Figure 5-86 1 and 10 KC Synthesizer Electronic Subassembly, Top View, Component Location



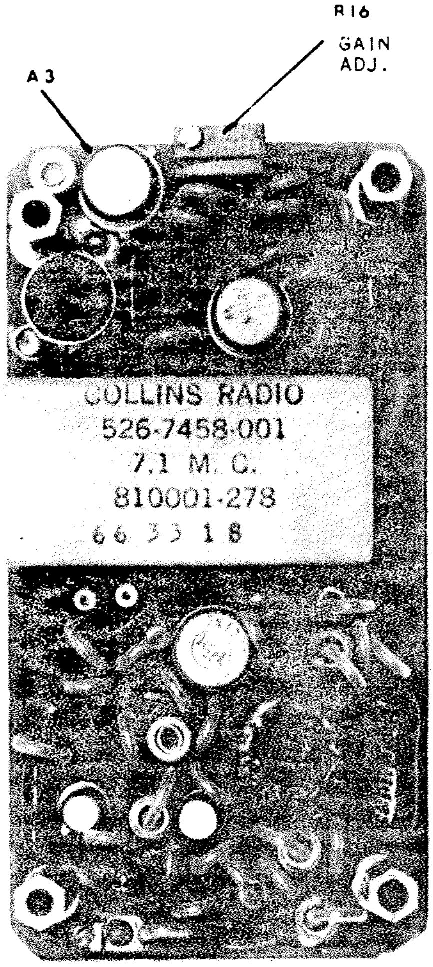
NOTE:
REF. DESIG. PREFIX A2A6A4

Figure 5-89. 100 CPS Synthesizer Electronic Subassembly, Left Side,



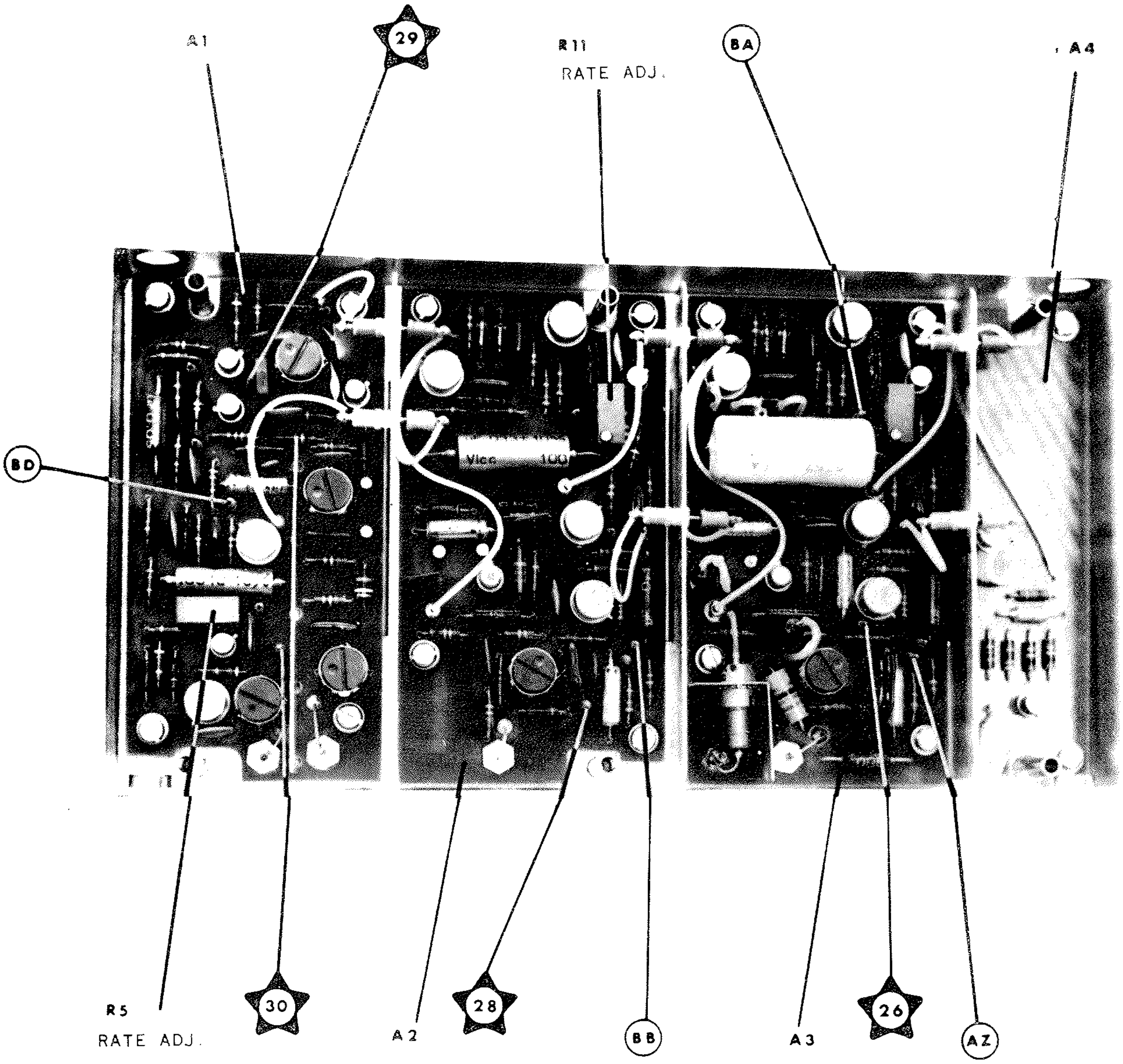
NOTE:
REF. DESIG. PREFIX A.A.A1

Figure 5-91. 100 CPS Synthesizer Electronic Subassembly, Right Side, Component Location



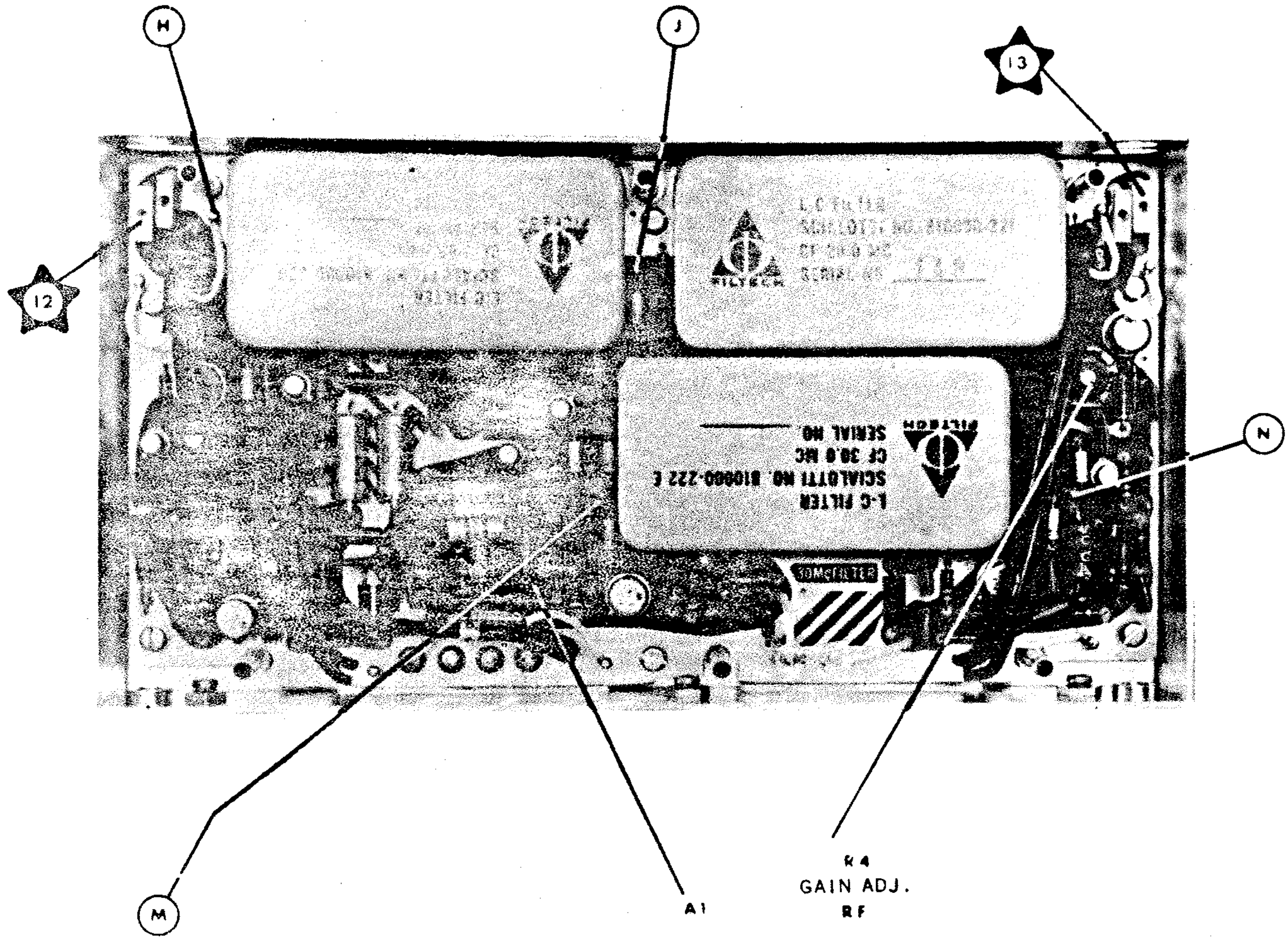
NOTE:
REF. DESIG. PREFIX [illegible]

Figure 5-93. 100 CPS Synthesizer Electronic Subassembly, Front View, Component Location



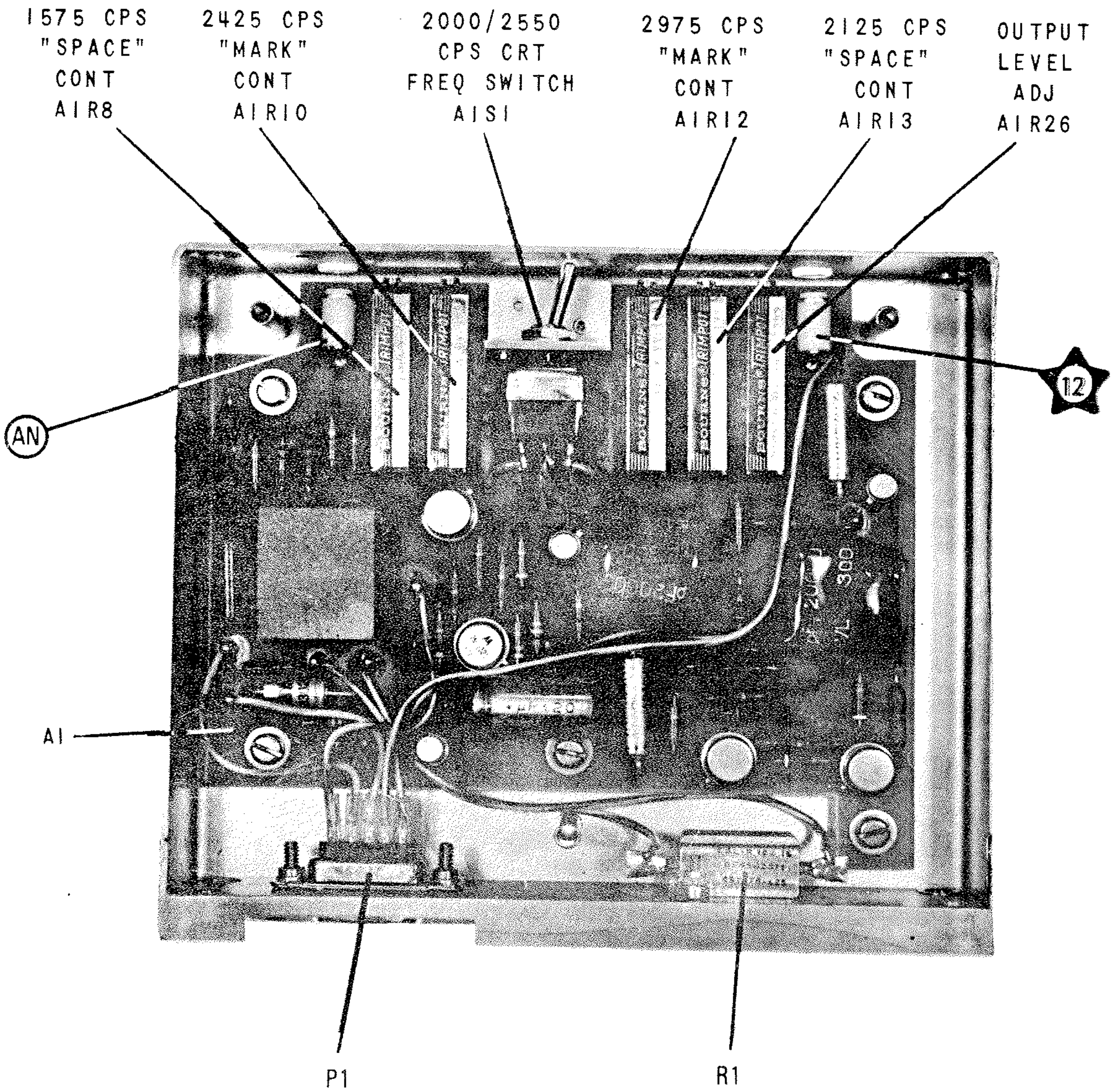
NOTE:
REF. DESIG. PREFIX A2A6A5

Figure 5-95. Spectrum Generator Electronic Subassembly, Component Location



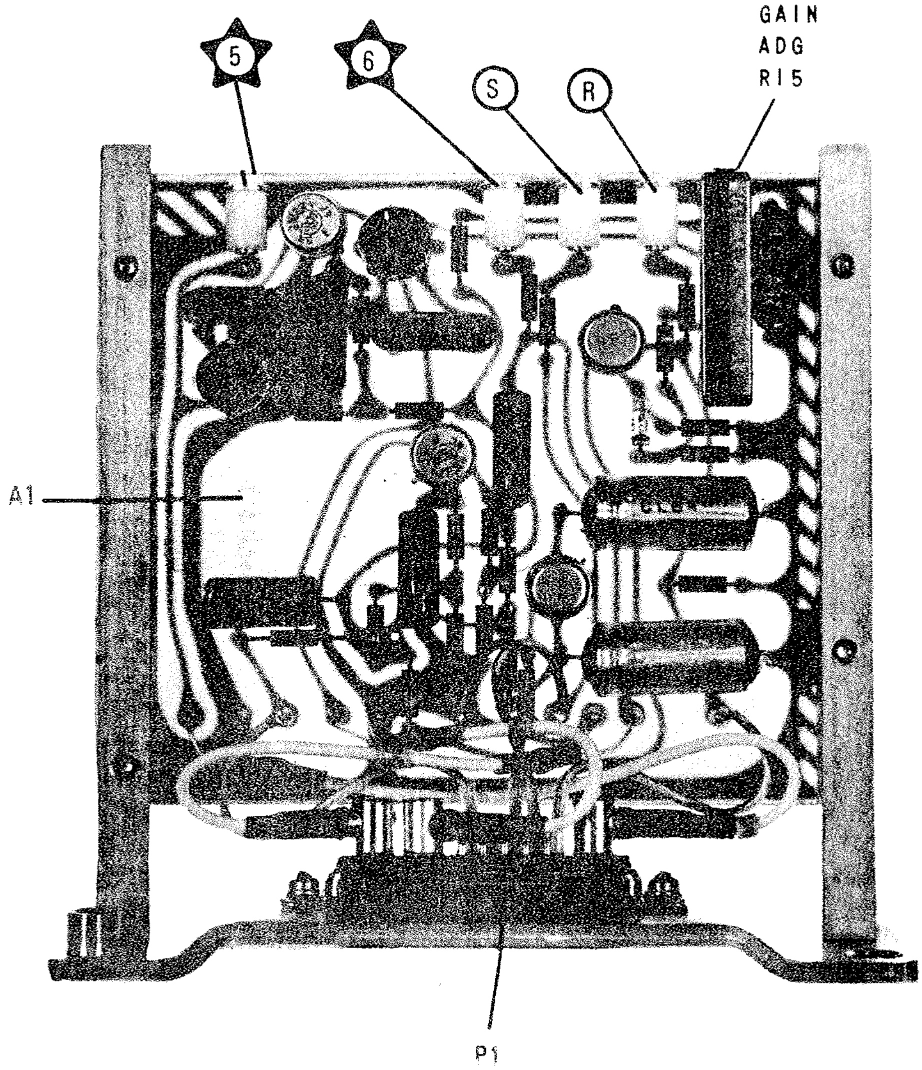
NOTE:
REF. DESIG. PREFIX A2A6A6

Figure 5-100. RF Translator Electronic Subassembly, Component Location



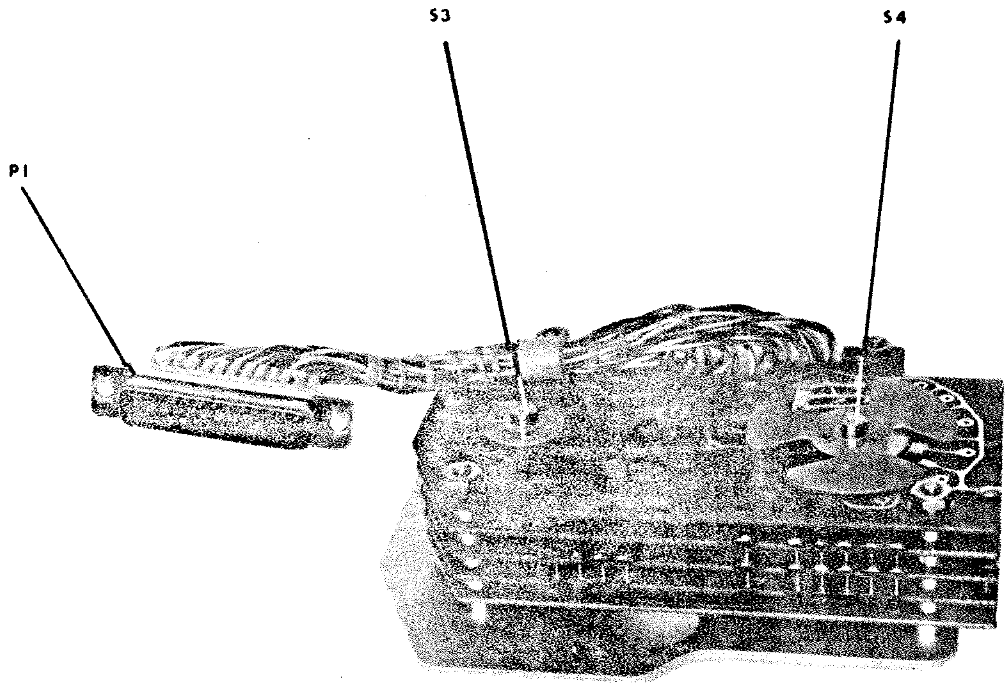
NOTE:
REF. DESIG. PREFIX 2A2A9

Figure 5-102. FSK Tone Generator Electronic Assembly, Component Location



NOTE:
REF. DESIG. PREFIX 2A2A12

Figure 5-104 IF. Amplifier Electronic Assembly, Component and Test Point Location



NOTE:
REF. DESIG. PREFIX A2A7

Figure 5-106. Code Generator Electronic Assembly, Component Location

5.5 - PREVENTIVE MAINTENANCE

5.5.1 - General

The purpose of this book is to describe a series of specially developed preventive-maintenance procedures which, when performed as directed, will reveal areas of subnormal performance and provide for effective mechanical and electrical maintenance of the equipment.

Those procedures designated "Reference Standards Tests" are accomplished by the installing activity when the specified equipment is operating properly to provide a series of reference standards which collectively represent normal performance.

Comparison of the results of the schedules tests with the reference standards, and proper analysis and correction of any abnormal results, will insure proper equipment performance and serve to avert impending failure during the service life of the equipment.

5.5.1.1 - Reference Standards Tests

The tests for establishing the reference standards are given in the list of "Reference Standards Tests" on page 5.252. The procedures for performing the tests are located throughout the text portion of the book, and are referred to in the list.

5.5.1.2 - Preventive-Maintenance Procedures

The preventive-maintenance procedures are presented in procedural tables with accompanying illustrations, and are to be performed by the equipment operator or maintenance technician as scheduled; most procedures are scheduled for regular periods (daily, weekly, quarterly, etc).

Accompanying each schedules step, or group of steps that requires the recording of a measurement, is a two-year chart.

At the top of each procedural table is a list of operating conditions and control settings which apply to the entire table unless noted otherwise in the procedure of a given step. After performing the procedures, return all operating controls, switches, etc, to their original positions. Step numbers on illustrations correspond to the procedural step numbers to which they relate.

5.5.1.3 - Test Equipment and the Estimated Time Required to Perform the Maintenance Schedules

The test equipment and the estimated time required to perform the maintenance schedules are itemized on page

5.5.2 - **Instructions**

Record on both the cover and title page the serial number, and, if applicable, the model number of the equipment to which this book is assigned.

5.5.2.1 - At Time of Installation or Equipment Overhaul (To be accomplished by experienced technical personnel)

Establish the reference standards upon receipt of this book, and re-establish them after each equipment overhaul. Before establishing the reference standards, check the equipment thoroughly to insure that it is operating within its design capabilities. Record the input voltage and frequency to the equipment, and make the prescribed tests listed on page 5.252. Record the results in the spaces provided in the procedural tables for the appropriate steps. Explicitly follow all instructions so that the reference standards obtained provide for valid comparisons when the preventive-maintenance values are subsequently compared with them.

NOTE: The reference standard tolerances indicate the maximum and minimum limits of a test within which satisfactory operation can be expected for units of the same model. The tolerances are not to be construed as absolute limits, since they are not necessarily developed from a complete evaluation. However, if any tolerance appears unreasonable when compared to the result of the test, the accomplishment of the test shall be certified as accurate by an Electronics Engineer, and the qualified Authority shall be so notified by a note on the completed Reference Standards Summary Sheet.

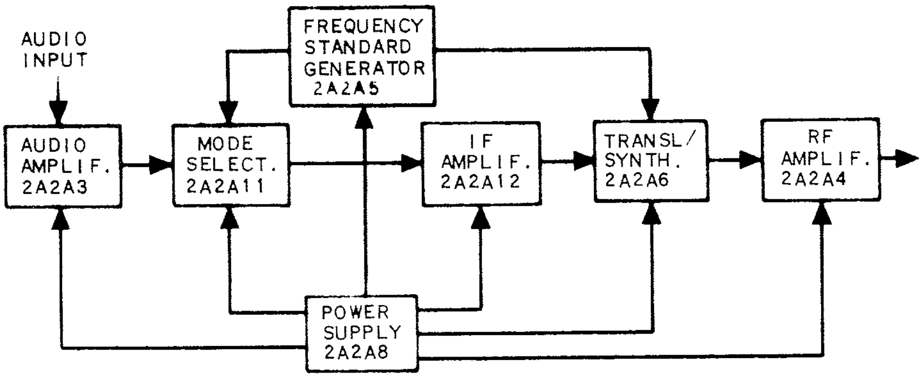


Figure 5-107 Radio Transmitter T-827A/URT, Simplified Schematic Diagram

5.5.2.2 - Scheduled Maintenance (To be accomplished by the operating activity)

Use this book to augment the preventive-maintenance schedule.

Upon completion of each test, log and/or compare the results with the reference standard. Comparison of a given indication with indications previously obtained, and with the reference standard, will quickly reveal any significant change. Significant changes or indications which vary progressively each time the check is made indicate improper equipment operation or impending failure, and corrective measures should be taken. Slight frequency drift should not be construed as an indication of circuit degradation.

5.5.2.3 - Field Changes

Enter field change information concerning changes made on the equipment subsequent to publication of this Maintenance Standards Book on table 5.16. When the affected step is a reference standard test, obtain and enter a new reference standard.

5.5.2.4 - When It is Impractical To Perform Scheduled Maintenance

Enter justification or applicable code letter on the schedule, as appropriate, whenever non-compliance with the schedule js justified, and reschedule as early as possible.

Table 5.2

REFERENCE STANDARDS TEST

ACTION REQUIRED	REFER TO STEP
Record power supply dc output voltages.	(M1)
Record USB carrier suppression.	(M2)
Record LSB carrier suppression.	(M3)
Record USB rf output.	(M4)
Record AM rf output.	(M5)
Record LSB rf output.	(M6)
Record transmitting frequencies of T-827A/URT.	(M7)
Record FSK frequencies.	(S1)

Table 5.3

EXCITER T-827A/URT

REFERENCE STANDARDS TESTS AND RELATIVE MODULAR ASSEMBLIES

SECTION	ACTION REQUIRED	REFER TO STEP
RF Amplifier	Record RF output on USB, LSB, AM	M4 M5 M6
FSK Tone Generator	Record output frequencies of the FSK Tone Generator	S1
Translator/ Synthesizer	Record transmission frequencies of the T-827A/URT	M7
Mode Selector	Record USB carrier suppression Record LSB carrier suppression	M2 M3
Power Supply	Record dc operating voltages	M1

Table 5.4

RECORD TABLES FOR MONTHLY STEPS

STEP M1

1ST YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M1												
Initial												

2ND YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M1												
Initial												

Pub. 246
December 1967
ORIGINAL

Table 5.5

RECORD TABLES FOR MONTHLY STEPS

STEP M2

1ST YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M2												
Initial												

2ND YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M2												
Initial												

Table 5.6

RECORD TABLES FOR MONTHLY STEPS

STEP M3

1ST YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M3												
Initial												

2ND YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M3												
Initial												

Table 5.7

RECORD TABLES FOR MONTHLY STEPS

STEP M4

1ST YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M4												
Initial												

2ND YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M4												
Initial												

Table 5.8

RECORD TABLES FOR MONTHLY STEPS

STEP M5

1ST YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M5												
Initial												

2ND YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M5												
Initial												

Table 5.9

RECORD TABLES FOR MONTHLY STEPS

STEP M6

1ST YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M6												
Initial												

2ND YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M6												
Initial												

Table 5.10

RECORD TABLES FOR MONTHLY STEPS

STEP M7

1ST YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M7												
Initial												

2ND YEAR OF OPERATION

MONTH YEAR	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__	19__
Step												
M7												
Initial												

Table 5.11

RECORD TABLES FOR SEMI-ANNUALLY STEP S1

STEP S1

1ST YEAR OF OPERATION

MONTH YEAR	19____	19____
STEP		
S1		
INITIAL		

2ND YEAR OF OPERATION

MONTH YEAR	19____	19____
STEP		
S1		
INITIAL		

Table 5.12

LIST OF TEST EQUIPMENT

TEST PARAMETERS AND ACCURACIES	TEST EQUIPMENT REQUIRED		PERIOD		
	CATEGORY	TYPE	M	Q	S
Voltages: 2 to 100 Vrms, Accuracy: ±2%, Frequency Response: 2 to 30 mc	Electronic Multimeter	HP-410B or equiv.	X		
Voltages: 5 to 1000 Vdc, Accuracy: ±3%	Multimeter	Metrix 430/C	X		
Voltages: 0 to 250 mV, Frequency Response: 1000 to 2000 cps, Accuracy: ±3%	Electronic Multimeter	HP-400H or equiv.	X		
Frequency: 1000 cps, Output level: 25 to 150 mV, Output Impedance: 600 ohms	Audio Signal Generator	HP-200D or equiv.	X		
Frequency: 100 kc: 5 mc, Output Level: 0.5V, Stability: 1 part in 10^8	Frequency Standard	Motorola S-1055-A	X		X
Frequency range: 2 to 30 mc	Frequency Meter	Hp-5245-L or equiv.	X		X
Frequencies: 2 to 30 mc, Output Level: 2 to 3 volts, Modulation: CW	Signal Generator	HP-606A or equiv.	X		
Power Rating: 25 to 50 watts, Frequency: 2 to 30 mc, Resistance: 50 ohms	Electrical Dummy Load	Bird Model 82 or equiv.	X		X
Sweep Width: 7 kc, Resolution: 100 cps, Frequency: 2 to 30 mc,	Analyzer Test Set: Spectrum Analyzer	Panoramic Panalyzer SB-12bS	X		X
	Tuning Head		X		X
Frequencies: 1 kc to 3 kc, Output level: 150 mV Output: Two-Tone	Two-Tone Generator	TTG-2 or equiv.	X		X

Table 5.13

TIME SCHEDULE *

SCHEDULE	TIME REQUIRED	
	EST	ACTUAL
M1	20 min	
M2	30 min	
M3	20 min	
M4	20 min	
M5	25 min	
M6	25 min	
M7	2 hrs	
S1	1 hrs	

TOTAL TIME **

SCHEDULE	EST	ACTUAL
Monthly	6 h.40'	
Semi-Anually	4 hrs	

* Estimated time is based only on making the test connections and performing the written procedures.

** Estimated time is based on the consecutive performance of all tests for each time periods (eg. monthly); this includes time for concurrent warm-up of test equipment, calibration and major adjustments, but does not include time required to draw or return test equipment.

Table 5.14

REFERENCE STANDARDS SUMMARY

Input Voltage .... vac

Input Frequency ...... cps
(when Reference Standards
Test are accomplished)

Date ....

Serial No. ....

Installed In (Ship or Station) ....

Record on this summary sheet the reference standards that have been entered in this book.

Step				Step		
M1	(a)	....	vdc	(i)	....	mc
	(b)	....	vdc	(j)	....	mc
	(c)	....	vdc	(k)	....	mc
M2		....	db	(l)	....	mc
				(m)	....	mc
M3		....	db	(n)	....	mc
M4		....	vac	(o)	....	mc
				(p)	....	mc
M5		....	vac	(q)	....	mc
M6		....	vac	(r)	....	mc
				(s)	....	mc
M7	(a)	....	mc	(t)	....	mc
	(b)	....	mc	(u)	....	mc
	(c)	....	mc	(v)	....	mc
	(d)	....	mc	(w)	....	mc
	(e)	....	mc	(x)	....	mc
	(f)	....	mc	(y)	....	mc
	(g)	....	mc	(z)	....	mc
	(h)	....	mc			

(see next page)

Table 5.14 (continued)

Step

S1 (a) .... mc
(b) .... mc
(c) .... mc
(d) .... mc

List all Field Changes which have been accomplished on this equipment

....

....

Reference Standards performed by ....

Approved by .... Title-Position .... Activity ....

Table 5.15

REFERENCE STANDARDS SUMMARY

Input Voltage .... vac

Input Frequency ...... cps
(when Reference Standards
Tests are accomplished)

Date ....

Serial No. ....

Installed In (Ship or Station) ....

Record on this summary sheet the reference standards that have been entered in this book.

Step				Step	
M1	(a)	....	vdc	(i)	mc
	(b)	....	vdc	(j)	mc
	(c)	....	vdc	(k)	mc
M2		....	db	(l)	mc
M3		....	db	(m)	mc
M4		....	vac	(n)	mc
M5		....	vac	(o)	mc
M6		....	vac	(p)	mc
M7	(a)	....	mc	(q)	mc
	(b)	....	mc	(r)	mc
	(c)	....	mc	(s)	mc
	(d)	....	mc	(t)	mc
	(e)	....	mc	(u)	mc
	(f)	....	mc	(v)	mc
	(g)	....	mc	(w)	mc
	(h)	....	mc	(x)	mc
				(y)	mc
				(z)	mc

(see next page)

Table 5.15 (continued)

Step

S1 (a) .... mc
(b) .... mc
(c) .... mc
(d) .... mc

List all Field Changes which have been accomplished on this equipment

....

....

Reference Standards performed by ....

Approved by .... Title-Position .... Activity ....

Table 5.16

REVISIONS

CHANGE NO.	FLD. CHGS. CONSIDERED	STEPS AFFECTED	EFFECT IF FIELD CHANGE IS NOT ACCOMPLISHED	DATE ENTERED

Table 5.17

REASONS FOR VARIATIONS OF THE TIME SCHEDULE

CODE	JUSTIFICATION
CO	Equipment in continuous operation
E	Emergency (power failure, drills, etc)
IP	In port
NR	Emission or mode not required
NR(H)	Not required on the basis of equipment history and usage
O	Equipment undergoing overhaul
R	Equipment under repair
RIM	For the reason stated in the margin (state reason in margin)
SO	Submerged operations
TENA	Test Equipment not available
UFT	An unnecessarily frequent test; the period has been changed to a ________ check (state period of accomplishment). Report to Type Commander.
W	Weather conditions

5.5.3 - Special procedures

5.5.3.1 - Placing the equipment in full operation

A) *General*

When the instructions under Operating Conditions and Control Settings call for T-827A/URT to be in full operation, all controls should be set as follows:

a) Set Mode Selector switch (S2): OFF.

b) Set CPS switch: 000

c) Set LOCAL/REMOTE switch: LOCAL.

d) Set USB LINE LEVEL switch: -10DB.

e) Set LSB LINE LEVEL switch: -10DB.

B) *Turn-On Procedure*

NOTE: If T-827A/URT is to be operated with the chassis out of the case, defeat chassis interlock by pulling interlock switch (S8) back and up. Interlock switch is located at top-right of the chassis behind front panel.

(1) Set rf amplifier PRIMARY POWER circuit breaker at ON.

(2) Set transmitter Mode Selector switch (S2) at STD BY. Allow a 15-minute warm-up period.

(3) Set transmitter Mode Selector switch (S2) at AM.

(4) Select operating frequency using transmitter MCS, KCS and cps controls.

NOTE: The operation frequency is expressed in megacycles throughout this technical manual.

C) *Turn-Off Procedure*

To turn power off, set transmitter and Mode Selector switch at OFF.

5.5.4 - **Test data**

5.5.4.1 - Step M1 (Fig. 5.108)

OPERATING CONDITIONS AND CONTROL SETTINGS:

T-827A/URT in full operation, at 05.000 mc, transmitter chassis pulled out from case Interlock switch (S8): pulled up

STEP NO.	ACTION REQUIRED	READ INDICATION ON	REFERENCE STANDARD
(M1)	Measure dc output voltages from Transmitter Power Supply Electronic Assembly (2A2A8)	Multimeter type Metrix Mod. 430/C or equiv.	(a) ________ vdc (+19 to +21) (b) ________ vdc (+27 to +32) (c) ________ vdc (+105 to +115)
	PROCEDURE: Tilt chassis 90 degrees to expose bottom. Key T-827A/URT. Set multimeter to indicate 40 vdc full-scale. Connect positive lead of multimeter at point (a) in illustration. Record voltage reading at (a) in Reference Standard column. Connect positive lead of multimeter at point (b). Record voltage reading at (b) in Reference Standard column. WARNING *High voltage is involved in the next measurement* Set multimeter to indicate 200 vdc full-scale. Connect positive lead of multimeter at point (c). Record voltage reading at (c) in Reference Standard column.		

5.5.4.2 - Steps M2 and M3

OPERATING CONDITIONS AND CONTROL SETTINGS

T-827A/URT in full operations, transmitter controls set as follows:

Mode Selector switch (S2): USB
Operating frequency: 02.100 mc
LOCAL/REMOTE switch: REMOTE

STEP NO.	ACTION REQUIRED	READ INDICATION ON	REFERENCE STANDARD
(M2)	Check carrier balance of Transmitter (USB) Mode Selector Electronic Assembly (2A2A1)	Spectrum Analyzer type Singer mod. Sb-12-bS	______________ db (-50 min)
	PROCEDURE: Connect test equipment as shown in illustration. Tune two-tone generator to single tone, 1000 cps and set for output level of 150 mv. Tune tuning head to 2.100 mc. Record db level of carrier with respect to USB component level. Leave equipment connected and proceed to step (M3).		
(M3)	Check carrier balance of Transmitter (LSB) Mode Selector Electronic Assembly (2A2A1)	Spectrum Analyzer type Singer mod. Sb-12-bS	______________ db (-50 min)
	PROCEDURE: Connect two-tone generator as shown at (b) in illustration. Record db level of carrier with respect to LSB component level.		

Pub. 246
December 1967
ORIGINAL

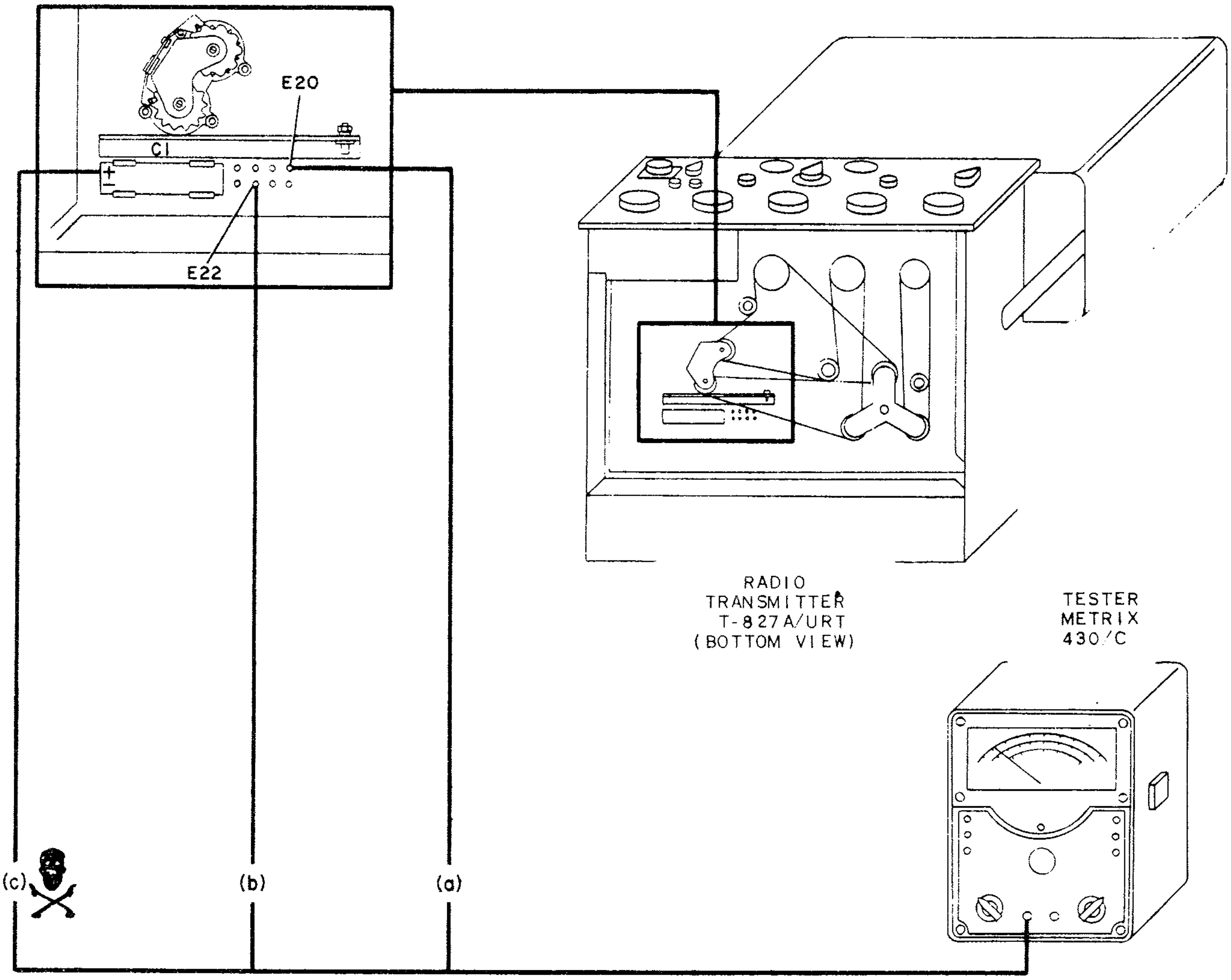


Figure 5-108. Step M1
Connection Between Exciter
And Test Equipment

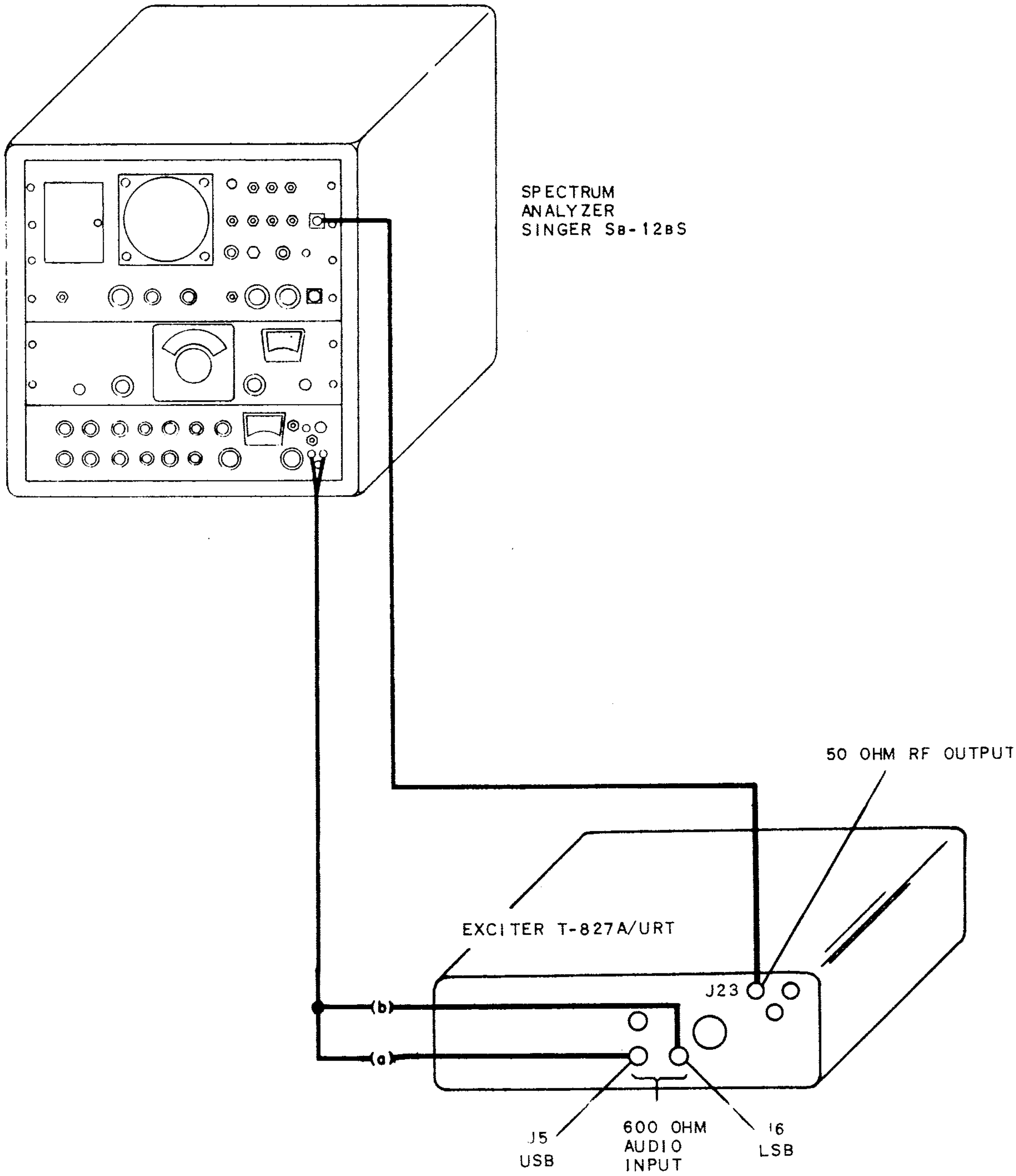


Figure 5-109. Step M2 And M3 Connection Between Exciter And Test Equipment

5.5.4.3 - Step M4 and M5

OPERATING CONDITIONS AND CONTROL SETTINGS

T-827A/URT in full operation, transmitter controls set as follows:

Mode Selector switch (S2): USB

Operating frequency: 02.100 mc

LOCAL/REMOTE switch: REMOTE

STEP NO.	ACTION REQUIRED	READ INDICATION ON	REFERENCE STANDARD
(M4)	Measure rf output from T-827A/URT in USB mode of operation	Electronic Multimeter type HP, mod. 410-B	______ vac (2.25 min)
	PROCEDURE: Connect output from audio signal generator to J5 (AUDIO IN 600 Ω USB) on the rear of the T-827A/URT. Ground terminal of electronic multimeter through 50-ohm resistor and connect electronic multimeter lead to J23 (RF OUT 50 Ω) on rear of T-827A/URT. Tune audio signal generator to 1000 cps and set for output level of 150 mv. Set electronic multimeter to indicate 10 vac full-scale. Key T-827A/URT from Radio Set Control. Record voltage reading of electronic multimeter.		
(M5)	Measure rf output from T-827A/URT in AM mode of operation.	Electronic Multimeter type HP, mod. 410-B	______ vac (2.25 min)
	PROCEDURE: Set Mode Selector switch (S2) at AM. Disconnect audio signal generator from T-827A/URT. Key T-827A/URT from Radio Set Control and record voltage reading of electronic multimeter. Leave equipment connected and proceed to step (M6).		

5.5.4.4 - Step M6

OPERATING CONDITIONS AND CONTROL SETTINGS

T-827A/URT in full operation, transmitter controls set as follows:

Mode Selector switch (S2): LSB
Operating frequency: 02.000 mc
LOCAL/REMOTE switch: REMOTE

STEP NO.	ACTION REQUIRED	READ INDICATION ON	REFERENCE STANDARD
(M6)	Measure rf output from T-827A/URT in LSB mode of operation.	Electronic Multimeter type HP, mod. 410-B	______ vac (2.25 min)
	PROCEDURE: Connect audio signal generator to J6 (AUDIO IN 600 Ω LSB) on rear of T-827A/URT. Tune audio signal generator to 1000 cps and set for an output level of 150 mv. Set electronic multimeter to indicate 10 vac full-scale. Key T-827A/URT. Record voltage reading of electronic multimeter.		

5.5.4.5 - Step M7

OPERATING CONDITIONS AND CONTROL SETTINGS

T-827A/URT in full operation, transmitter controls set as follows:

Mode Selector switch (S2): AM

Operating frequency: 02.000 mc

LOCAL/REMOTE switch: REMOTE

STEP NO.	ACTION REQUIRED	READ INDICATION ON	REFERENCE STANDARD
(M7)	Measure transmitting frequency of T-827A/URT	Frequency Meter, type HP mod. 5245-L	02.000mc (a) ______ mc 03.111mc (b) ______ mc 04.222mc (c) ______ mc 05.333mc (d) ______ mc 06.444mc (e) ______ mc 07.555mc (f) ______ mc 08.666mc (g) ______ mc 09.777mc (h) ______ mc 10.888mc (i) ______ mc 11.999mc (j) ______ mc 12.000mc (k) ______ mc 14.000mc (l) ______ mc 15.000mc (m) ______ mc 16.000mc (n) ______ mc 19.000mc (o) ______ mc 20.000mc (p) ______ mc
	PROCEDURE: Connect equipment as shown in illustration. Set frequency standard for output level of approximately 0.5 volts. Key T-827A/URT. Record frequency reading of frequency meter at (a) in Reference Standard column. Tune T-827A/URT to each of the frequencies listed in Reference Standard column (b) through (z). Record frequency reading below appropriate frequency in Reference Standard column.		

(see next page)

5.5.4.5 *(continued)*

	21.000mc (q) ________ mc 22.000mc (r) ________ mc 23.000mc (s) ________ mc 24.000mc (t) ________ mc 25.000mc (u) ________ mc 26.000mc (v) ________ mc 27.000mc (w) ________ mc

Pub. 246
December 1967
ORIGINAL

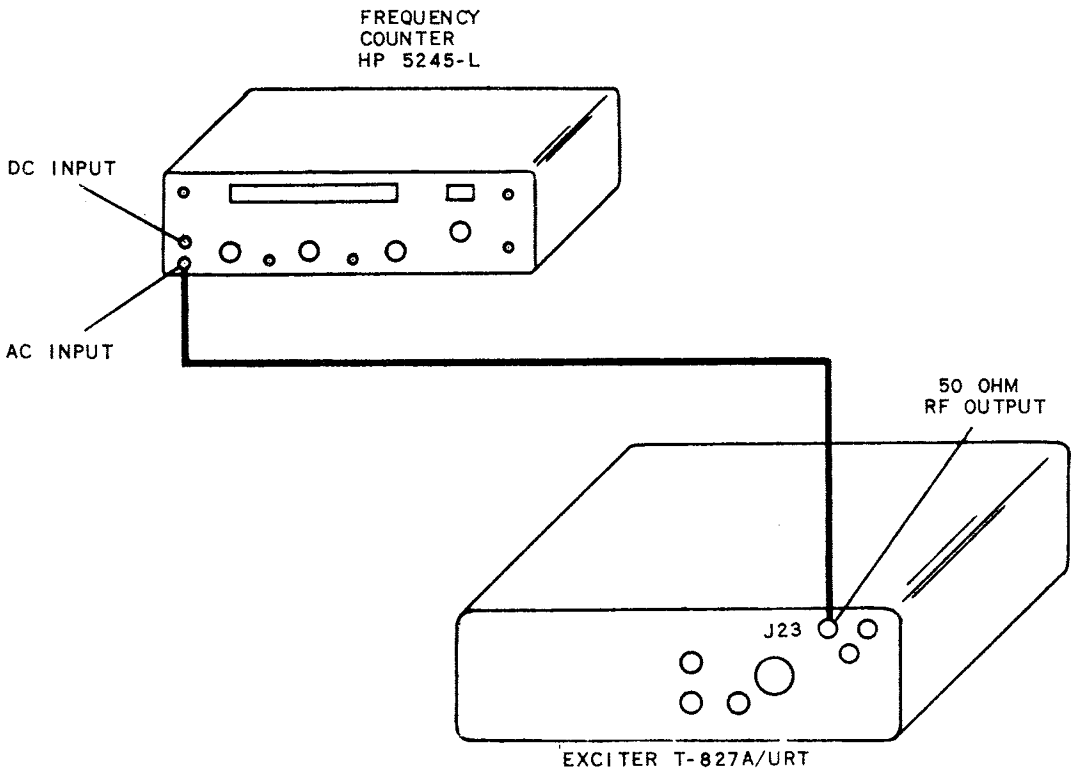


Figure 5-110. Step M7
Connection Between Exciter
And Test Equipment

5.5.5 - Quarterly steps

5.5.5.1 - Step QI

OPERATING CONDITIONS AND CONTROL SETTINGS

T-827A/URT turned off, chassis pulled out from case

STEP NO.	ACTION REQUIRED
(Q1)	Clean, inspect and lubricate chain drive system. PROCEDURE: Tilt T-827A/URT 90 degrees to expose bottom. Rotate each KCS control on front panel through all positions. Check drive chains for excessive slack resulting in excessive play in control. Check that gears rotate evenly, without slipping, from one position to another. To correct slack in a drive chain, loosen nuts on chain tension adjustment (shown at (a) in illustration) associated with drive chain. Slide idler gear on chain tension adjustment against drive chain and tighten nuts. Check that all screws and hardware on gear assemblies are tightened securely. Inspect gears and drive chains for damage, noticeable wear, or discoloration (rust or corrosion on gears or drive chains indicates improper lubrication). Place small amount of MIL-G-3278 lubricant on gear teeth as shown at (b) if slight rust or corrosion discoloration exists. (It is not necessary to lubricate drive chains). Replace any gear that is badly discolored or damaged. Lubricate new gear.

5.5.6 - Semi-Anually Steps

5.5.6.1 - Step S1

OPERATING CONDITIONS AND CONTROL SETTINGS

T-827A/URT chassis pulled out from case, transmitter controls set as follows:

Mode Selector switch (S2): FSK
Operating Frequency: 02.000 mc
LOCAL/REMOTE switch: REMOTE
Interlock switch (S8): pulled up

<table>
<tr><th>STEP NO.</th><th>ACTION REQUIRED</th><th>READ INDICATION ON</th><th>REFERENCE STANDARD</th></tr>
<tr><td rowspan="2">(S1)</td><td>Check FSK Tone Generator Electronic Assembly frequencies</td><td>Frequency Meter type HP mod. 5245-L</td><td rowspan="2">(a)__________ mc
(2.002425
±0.000121)

(b)__________ mc
(2.001575
±0.000078)

(c)__________ mc
(2.002125
±0.000116)

(d)__________ mc
(2.002975
±0.000147)</td></tr>
<tr><td colspan="2">PROCEDURE: Connect equipment as shown in illustration Energize TTY equipment and set for "mark" condition. Key T-827A/URT from TTY equipment. Set CTR FREQ switch on FSK Tone Generator Electronic Assembly at 2000. Record frequency meter indication at (a) in Reference Standard column. Depress BREAK button on TTY equipment. Record frequency meter indication at (b) in Reference Standard column. Set CTR FREQ switch on FSK Tone Generator Electronic Assembly at 2550. Record frequency meter indication at (c) in Reference Standard column. Release BREAK button on TTY equipment. Record frequency meter indication at (d) in Reference Standard column.</td></tr>
</table>

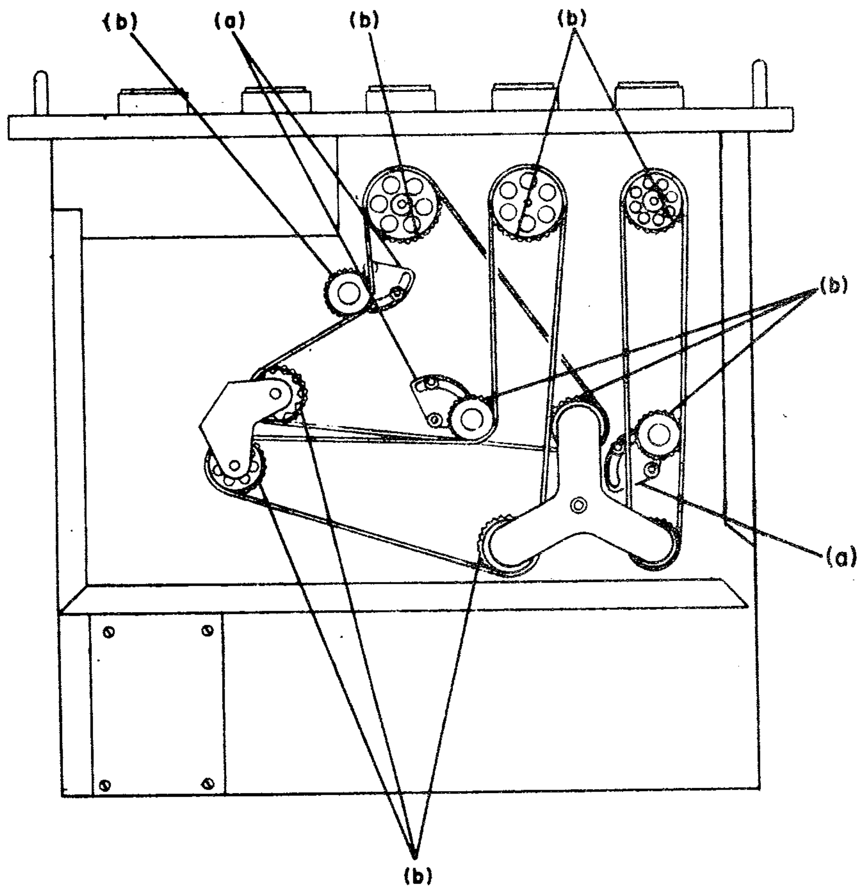


Figure 5-111. Step Q1
Bottom View of Exciter Chassis
Showing Chain Drive Mechanism

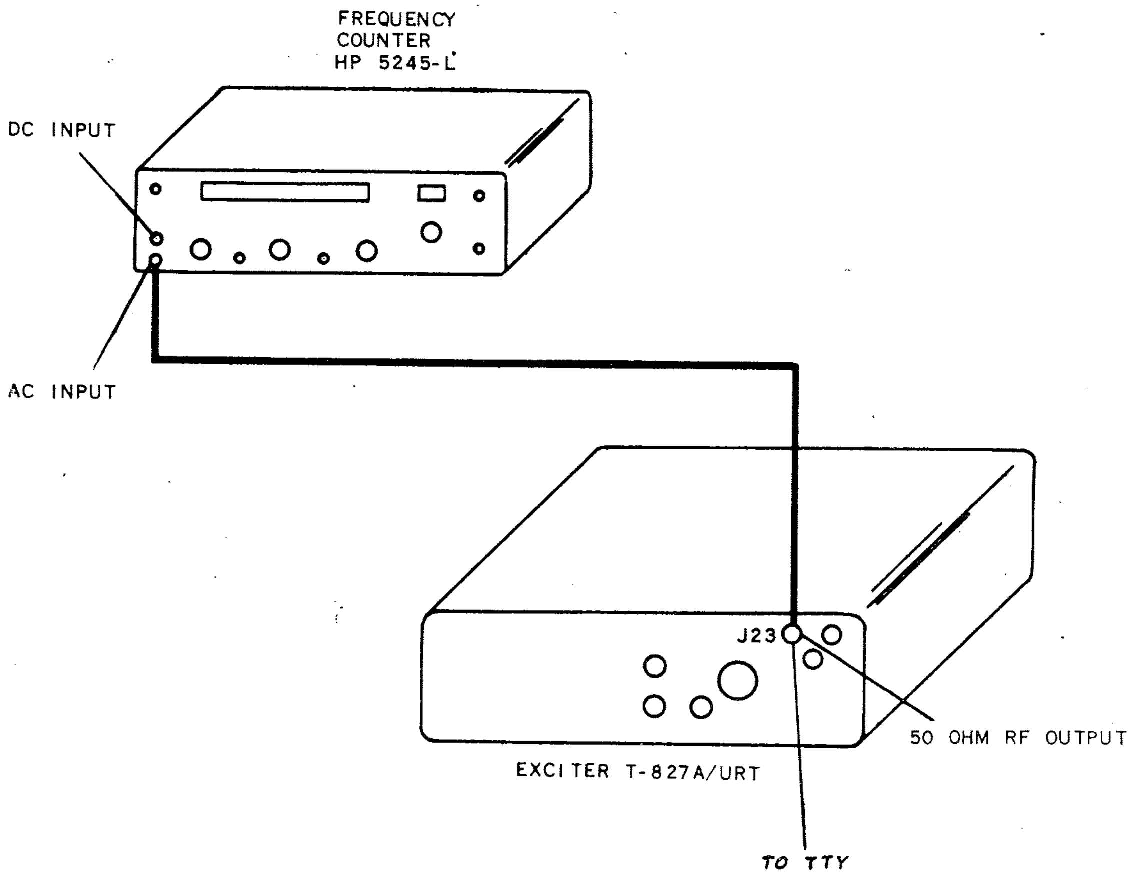


Figure 5-112. Step S1
Connection Between Exciter
And Test Equipment

SECTION 6

PARTS LIST

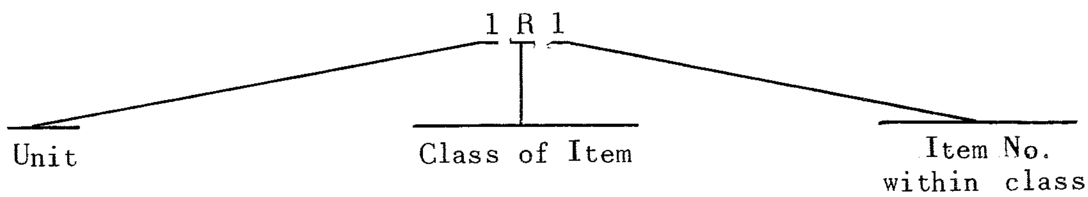
6.1 - INTRODUCTION

A) *Reference designations*

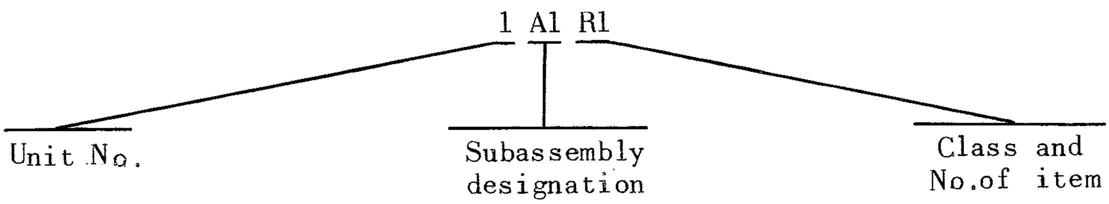
The unit numbering method of assigning reference designations has been used to identify units, assemblies, subassemblies, and parts.

This method has been expanded as much as necessary to adequately cover the various degrees of subdivision of the equipment. Examples of this unit numbering method and typical expansions of the same are illustrated by the following:

Example 1:

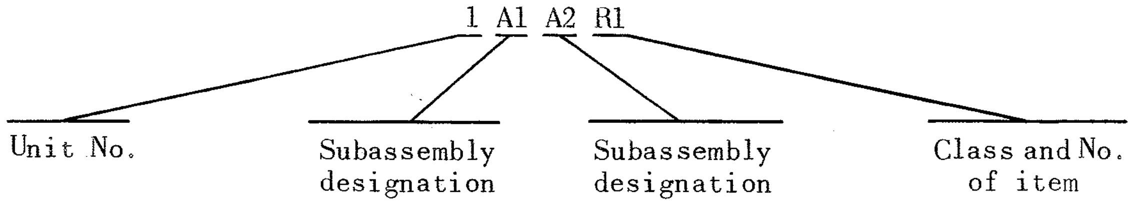


Example 2:



Read as: First (1) resistor (R) of first (1) subassembly (A) of fourth (4) unit.

Example 3:



Read as: First (1) resistor (R) of second (2) subassembly (A) of first (1) subassembly (A) of third (3) unit.

B) *Ref desig prefix.*

Partial reference designations are used on the equipment and illustrations. The partial reference designations consist of the class letter (s) and the identifying item number. The complete reference designations may be obtained by placing the proper prefix before the partial reference designations. Prefixes are provided on illustrations following the notation "REF DESIG PREFIX".

6.2 - **List of units**

In the following pages a list of the units comprising the equipment is reported. The list is divided into assemblies and sub-assemblies.

For each unit is following data are given:

1) Complete reference designation
2) Description
3) Supplier
4) ELMER drawing number, if applicable

Notice

Orders for spare parts must contain the following data:

1) Complete reference designation
2) Short description (only the underlined words of the full description are necessary).

6.2.1 - **Case (2A1)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
	Exciter T-827A/URT	5-18
2A1	Exciter case	
2A1J23	Connector receptacle, coax 1 contact P/N BNC-JB-F-21,Mfr.CANNON, 559998-269	5-19
2A1J24	As 2A1J23	5-19
2A1J25	Connector receptacle, coax 1 contact P/N N-JB-F-21, Mfr, CANNON, 559998-271	5-19
2A1P21	Connector receptacle, 50 contacts, P/N DDSMF-50S-C31, Mfr.CANNON, 555407-142	
2A1P22	Connector receptacle, coax 3 contact P/N DAMF-3W3S-C31, Mfr.CANNON, 555146-161	
2A1A1C1	Capacitor fixed, ceramic, per MIL-C-11015 1000 pF, ±20%, 50 VDC, type CK70AW102M	5-18
2A1A1C2	As 2A1A1C1	5-18
2A1A1C3	As 2A1A1C1	5-18
2A1A1C4	As 2A1A1C1	5-18
2A1A1C5	As 2A1A1C1	5-18
2A1A1C6	As 2A1A1C1	5-18
2A1A1C7	As 2A1A1C1	5-18
2A1A1C8	As 2A1A1C1	5-18
2A1A1C9	As 2A1A1C1	5-18
2A1A1C10	As 2A1A1C1	5-18
2A1A1C11	As 2A1A1C1	5-18
2A1A1C12	As 2A1A1C1	5-18
2A1A1C13	As 2A1A1C1	5-18
2A1A1C14	As 2A1A1C1	5-18

(Cont'd)

6.2.1 - Case (2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A1A1C15	As 2A1A1C1	5-18
2A1A1C16	As 2A1A1C1	5-18
2A1A1C17	As 2A1A1C1	5-18
2A1A1C18	As 2A1A1C1	5-18
2A1A1C19	As 2A1A1C1	5-18
2A1A1C20	As 2A1A1C1	5-18
2A1A1C21	As 2A1A1C1	5-18
2A1A1C22	As 2A1A1C1	5-18
2A1A1C23	As 2A1A1C1	5-18
2A1A1C24	As 2A1A1C1	5-18
2A1A1C25	As 2A1A1C1	5-18
2A1A1C26	As 2A1A1C1	5-18
2A1A1C27	As 2A1A1C1	5-18
2A1A1C28	As 2A1A1C1	5-18
2A1A1C29	As 2A1A1C1	5-18
2A1A1C30	As 2A1A1C1	5-18
2A1A1C31	As 2A1A1C1	5-18
2A1A1C32	As 2A1A1C1	5-18
2A1A1C33	As 3A1A1C1	5-18
2A1A1C34	As 2A1A1C1	5-18
2A1A1C35	As 2A1A1C1	5-18
2A1A1C36	As 2A1A1C1	5-18
2A1A1C37	As 2A1A1C1	5-18
2A1A1C38	As 2A1A1C1	5-18
2A1A1C38	As 2A1A1C1	5-18

(cont'd)

6.2.1 - Case (2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A1A1C39	As 2A1A1C1	5-18
2A1A1C40	As 2A1A1C1	5-18
2A1A1C41	As 2A1A1C1	5-18
2A1A1C42	As 2A1A1C1	5-18
2A1A1C43	As 2A1A1C1	5-18
2A1A1C44	As 2A1A1C1	5-18
2A1A1C45	As 2A1A1C1	5-18
2A1A1C46	As 2A1A1C1	5-18
2A1A1C47	As 2A1A1C1	5-18
2A1A1C48	As 2A1A1C1	5-18
2A1A1C49	As 2A1A1C1	5-18
2A1A1C50	As 2A1A1C1	5-18
2A1A1J4	Connector plug, 55 contacts P/N PT07A-22-55P, Mfr.BENDIX, 555408-524	5-19
2A1A1J5	Connector plug, 2 contacts, per MIL-C-5015, type MS33680-2P, MFr. BENDIX, 555404-986	5-19
2A1A1J6	As 2A1A1J5	5-19
2A1A1J7	Connector plug, 4 contacts,per MIL-C-5015, type MS33682-4P, Mfr.BENDIX, 555404-513	

6.2.2 - **Chassis (2A2)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2	Chassis and front panel, P/N 666230-035, Mfr. ELMER	5-19
2A2CR1	Semiconductor diode, type 1N649, Mfr. HUGHES, 666163-710	5-17
2A2CR2	As 2A2CR1	5-17
2A2CR3	As 2A2CR1	5-17
2A2CR4	As 2A2CR1	5-17
2A2CR5	As 2A2CR1	5-17
2A2CR6	As 2A2CR1	5-17
2A2CR7	Semiconductor diode, type 1N538, Mfr. HUGHES, 666163-704	
2A2CR8	Semiconductor diode, type 1N1594, Mfr. IRCI, 666163-720	5-17
2A2CR9	As 2A2CR1	5-17
2A2C1	Capacitor fixed, per MIL-C-62, type CE31C900J, 696106-900	5-17
2A2C2	Capacitor fixed, metalized paper, 0,01 µF, ±20%, 200 VDC, P/N 72900-2, Mfr. HOPKINS, 666164-911	5-17
2A2C3	Capacitor fixed, metalized paper, 0,1 µF, ±20%, 200 VDC, P/N 72900-4, Mfr. HOPKINS, 666164-913	5-17
2A2C4	As 2A2C3	5-17
2A2C5	As 2A2C3	5-17
2A2F1	Fuse, per MIL-F-15160, type FO2A250V3/4A-S, Mfr. LITTLEFUSE, 694009-3171	5-16
2A2F2	As 2A2F1	5-16

(cont'd)

6.2.2 - Chassis (2A2) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2J1	Connector per MIL-C-5015, 5 contacts type MS3102R-14S-5-S, Mfr. AMPHENOL, 696475-015	5-16
2A2J8	Connector receptacle, 25 pin contacts, P/N DBMS-25S-C31, Mfr. CANNON, 555407-022	5-17
2A2J9	Connector receptacle, 7 pin contacts and 6 coax, P/N DCMF-13W-6S1C-31, Mfr. CANNON, 555146-583	5-16
2A2J10	Connector receptacle, 15 pin contacts, P/N DASMF-15-2S, Mfr. CANNON, 555407-212	5-16
2A2J11	Connector receptacle, 12 pin contacts and 5 coax, P/N DCMF-17WS1C-31, Mfr. CANNON, 555146-585	5-16
2A2J12	Connector receptacle, 22 pin contacts and 3 coax, P/N DCMF-25W3S1C-31, Mfr. CANNON, 555146-584	5-16
2A2J13	Connector receptacle, 3 coax contacts P/N D MF-3W3S2C-31, Mfr. CANNON, 555146-561	5-16
2A2J14	As 2A2J13	5-16
2A2J15	Connector receptacle, 10 pin contacts and 3 coax, P/N DBMF-13WS2C-31, Mfr. CANNON, 555146-571	5-16
2A2J16	Connector receptacle, 10 pin contacts and 1 coax, P/N DAM-11W1S1C-31, Mfr. CANNON, 555146-563	5-16
2A2J17	As 2A2J12	5-16
2A2J18	Connector receptacle, 25 pin contacts P/N DBSMF-25-S, Mfr. CANNON, 555407-222	5-16

(Cont'd)

6.2.2 - Chassis (2A2) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2J19	As 2A2J18	5-16
2A2J20	Connector receptacle, 9 pin contacts, P/N DESM-9S-S, Mfr. CANNON, 555407-202	5-16
2A2J21	Connector plug, 50 pin contacts, P/N DDSM-50P, Mfr. CANNON, 555407-041	5-17
2A2J22	Connector plug, 3 coax contacts, P/N DAM-3W3PC31, Mfr. CANNON, 555146-011	5-17
2A2K1	Relay, P/N 2F-2427, Mfr. HI-G, 555251-017	5-17
2A2K2	As 2A2K1	5-17
2A2K3	Relay, P/N TO-7047, Mfr. PHILIPS, 555252-001	5-17
2A2K4	Relay, P/N VG7031, Mfr. PHILIPS, 555252-002	5-17
2A2K5	Relay, P/N 2BC-1971, Mfr. HI-G, 555251-018	5-17
2A2K6	As 2A2K1	5-17
2A2L1	Coil, 15 H min., 75 mA, P/N A 14514 Mfr. MAGNETI CONTROLS, 810000-457	5-16
2A2L2	Coil, 480 mH, min., 1,2A max, Mfr. IRVINGTON, 810000-458	5-16
2A2M1	Audio level meter, P/N 3201-210, Mfr. INTERNATIONAL INSTRUMENTS, 555270-002	5-16
2A2M2	As 2A2M1	5-16
2A2Q1	Transistor, type 2N1209, Mfr. BENDIX, 555222-109	5-17

(Cont'd)

6.2.2 - Chassis (2A2) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2R1	Resistor, per MIL-R-11, 13000 ohm, ±5%, 2 W, type RC42GF133J, Mfr. A.BRADLEY, 699006-133	5-17
2A2R2	Resistor, per MIL-R-18546, 332 ohm, ±3%, 5 W, type RH-5-338H130B, Mfr. DALE, 554390-338	5-17
2A2R3	Resistor, per MIL-R-26, 100 ohm, ±5%, 7 W, type RW55V101, Mfr. SOVCOR, 697106-101	5-17
2A2R4	Resistor, per MIL-R-26, 820 ohm, ±5% 10 W, type RW566821, Mfr. SOVCOR, 697132-821	5-17
2A2R5	Resistor, per MIL-R-11, 2200 ohm ±5%, 1/4 W, type RC07GF22J, Mfr. A.BRADLEY, 697344-222	5-17
2A2S1	Switch rotary, type SR-02-N30BIMP, Mfr. OAK, 810001-462	5-16
2A2S7	Switch per MIL-S-3950, type MS35059-23, Mfr. MICROSWITCH, 694065-023	5-16
2A2S9	Switch toggle, type TW2150, Mfr. CONTROL SWITCH, 810000-528	5-16
2A2S10	As 2A2S9	5-16
2A2S11	As 2A2S9	5-16
2A2S12	As 2A2S9	5-16
2A2S13	Microswitch, Mfr. HONEYWELL, 4-27-04888	5-16
2A2T1	Transformer, per MIL-I-87A, type TF4RX03YY, Mfr. CALEDOMA, 810000-456	5-16

6.2.3 - **Mode Selector (2A2A1)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1	Mode Selector switch, P/N 666230-047 Mfr. ELMER	5-15
2A2A1C10	Capacitor fixed mica, 130 μ μF, ±2%, 300 VDC, P/N DM15E131G300V, Mfr. ELECTROMOTIVE, 694694-131	5-24
2A2A1C10	Capacitor fixed mica, 150 μ μF, ±2%, 300 VDC, P/N DM15E151G300V, Mfr. ELECTROMOTIVE, 694694-151	5-24
2A2A1C10	Capacitor fixed mica, 142 μ μF, ±2%, 300 VDC, P/N DM15F1420G300V, Mfr. ELECTROMOTIVE, 666162-710	5-24
2A2A1C11	Capacitor fixed mica, 300 μ μF, ±2%, 300 VDC, P/N DM15E301G300V, Mfr. ELECTROMOTIVE, 694694-301	5-24
2A2A1C21	As 2A2A1C10	5-24
2A2A1C21	As 2A2A1C10	5-24
2A2A1C21	As 2A2A1C10	5-24
2A2A1SFL1	Filter band-pass, 500 KC, P/N 526-9584-010, Mfr. COLLINS, 4-27-07796	5-24
2A2A1SFL2	Filter band-pass, 500 KC, P/N 526-9583-010, Mfr. COLLINS, 4-27-07797	5-24
2A2A1LFL1	Filter band-pass, 500 KC, P/N 526-941100, Mfr.COLLINS, 666162-472	5-24
2A2A1LFL2	Filter band-pass, 500 KC, P/N 526-9420-00, Mfr.COLLINS,666612-474	5-24

(Cont'd)

Pub. 246
December 1967
ORIGINAL

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1P1	Connector plug, 10 pin contacts and 1 coax, P/N DAM-11W1PC-31-F115, Mfr. CANNON, 555146-413	5-24
2A2A1P2	Connector plug, 22 pin contacts and 3 coax, P/N DCM-25W3PC-31-F115, Mfr. CANNON, 555146-434	5-25
2A2A1R41	Resistor, per MIL-R-11, 300 ohm, ±5%, 1/4 W, type RC07GF301J, Mfr. A.BRADLEY, 697344-301	5-24
2A2A1S1	Switch rotary, per MIL-S-3786A, P/N 810000-205, Mfr. OAK	5-25
2A2A1T1	RF Transformer, P/N 11210, Mfr. FORBEST WAGNER, 666164-084	5-24
2A2A1T2	As 2A2A1T1	5-24
2A2A1A1CR5-CR8	Diode quad, 1N904, Mfr. HUGHES, 666163-241	5-26
2A2A1A1C12	Capacitor fixed, metalized, paper 0,2 μF, ±20%, 200 VDCW, type P22D, Mfr. HOPKINS, 666164-914	5-26
2A2A1A1C13	Capacitor fixed, per MIL-C-11272, 110 pF, ±5%, 500 VAC, type CY13C111J, Mfr. VITRAMON, 695902-111	5-26
2A2A1A1C14	Capacitor fixed, per MIL-C-11277, 150 pF, ±5%, 500 VDC, type CY13C151J, Mfr. VITRAMON, 695902-151	5-26
2A2A1A1C15	Capacitor variable, air, 1 - 60 μ μF, 1000 VDC, type VCJ-1079, Mfr. JFD, 552188-026	5-26

(Cont'd)

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1A1C16	Capacitor fixed, mica, 1500 μ μF, ±2%, 500 VDC, type DM20E152G550V, Mfr. ELECTROMOTIVE, 694723-152	5-26
2A2A1A1C17	As 2A2A1A1C16	5-26
2A2A1A1R21	Resistor, per MIL-R-11, 100 ohm, ±5%, 1/4 W, type RC07GF101J, Mfr. A.BRADLEY, 697344-101	5-26
2A2A1A1R22	Resistor, per MIL-R-11, 820 ohm, ±5%, 1/4 W, type RC07GF821J, Mfr. A.BRADLEY, 697344-821	5-26
2A2A1A1R23	Resistor variable, 2000 ohm, ±10%, 0,8 W, type 236P-1-202, Mfr. BOURNS, 554627-202	5-26
2A2A1A1R24	As 2A2A1A1R21	5-26
2A2A1A1R25	As 2A2A1A1R22	5-26
2A2A1A1R26	Resistor, per MIL-R-11, 1100 ohm, ±5%, 1/4 W, type RC07GF112J, Mfr. A.BRADLEY, 697344-112	5-26
2A2A1A1R27	As 2A2A1A1R21	5-26
2A2A1A1R28	As 2A2A1A1R21	5-26
2A2A1A1R29	As 2A2A1A1R21	5-26
2A2A1A1R20	As 2A2A1A1R21	5-26
2A2A1A1R31	Resistor, per MIL-R-11, 2000 ohm, ±5%, 1/4 W, type RC07GF202J, Mfr. A. BRADLEY, 697344-202	5-26
2A2A1A1R32	Resistor, per MIL-R-11, 5100 ohm, ±5%, 1/4 W, type RC07GF512J, Mfr. A.BRADLEY, 697344-512	5-26

(Cont'd)

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1A1R33	As 2A2A1A1R31	5-26
2A2A1A1R34	As 2A2A1A1R32	5-26
2A2A1A2CR1-CR4	As 2A2A1A1CR5-CR8	5-27
2A2A1C2C1	As 2A2A1A1C12	5-27
2A2A1A2C2	As 2A2A1A1C13	5-27
2A2A1A2C3	As 2A2A1A1C14	5-27
2A2A1A2C4	As 2A2A1A1C15	5-27
2A2A1A2C5	As 2A2A1A1C16	5-27
2A2A1A2C6	As 2A2A1A1C16	5-27
2A2A1A2R1	As 2A2A1A1R21	5-27
2A2A1A2R2	As 2A2A1A1AR22	5-27
2A2A1A2R3	As 2A2A1A1R23	5-27
2A2A1A2R4	As 2A2A1A1R21	5-27
2A2A1A2R5	As 2A2A1A1R22	5-27
2A2A1A2R6	As 2A2A1A1R26	5-27
2A2A1A2R7	As 2A2A1A1R21	5-27
2A2A1A2R8	As 2A2A1A1R21	5-27
2A2A1A2R9	As 2A2A1A1R21	5-27
2A2A1A2R10	As 2A2A1A1R21	5-27
2A2A1A2R11	As 2A2A1A1R31	5-27
2A2A1A2R12	As 2A2A1A1R32	5-27
2A2A1A2R13	As 2A2A1A1R31	5-27
2A2A1A2R14	As 2A2A1A1R32	5-27
2A2A1A3C7	As 2A2A1A1C12	5-28
2A2A1A3C8	As 2A2C3	5-28

(Cont'd)

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1A3C9	As 2A2C3	5-28
2A2A1A3C18	As 2A2A1A1C12	5-28
2A2A1A3C19	As 2A2C3	5-28
2A2A1A3C20	As 2A2C3	5-28
2A2A1A3Q1	Transistor, type 2N1224, Mfr. R.C.A., 666163-393	5-28
2A2A1A3Q2	As 2A2A1A3Q1	5-28
2A2A1A3R15	Resistor, per MIL-R-11, 1000 ohm, ±5%, 1/4 W, type RC07GF102J, Mfr. A.BRADLEY 697344-102	
2A2A1A3R16	Resistor, per MIL-R-11, 10000 ohm, ±5%, 1/4 W, type RC07GF103J, Mfr. A.BRADLEY, 697344-103	5-28
2A2A1A3R17	As 2A2A1A3R16	5-28
2A2A1A3R18	As 2A2A1A3R16	5-28
2A2A1A3R19	Resistor, per MIL-R-11, 220 ohm, ±5%, 1/4 W, type RC07GF221J, Mfr. A.BRADLEY, 697344-221	5-28
2A2A1A3R20	As 2A2A1A1R31	5-28
2A2A1A3R35	As 2A2A1A3R15	5-28
2A2A1A3R36	As 2A2A1A3R16	5-28
2A2A1A3R37	As 2A2A1A3R16	5-28
2A2A1A3R38	As 2A2A1A3R16	5-28
2A2A1A3R39	As 2A2A1A3R19	5-28
2A2A1A3R40	As 2A2A1A1R31	5-28
2A2A1A4CR11	Diode, semiconductor, per MIL-S-19500/200 type 1N270, Mfr. R.C.A., 666163-703	5-29

(Cont'd)

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1A4CR12	As 2A2A1A4CR11	5-29
2A2A1A4CR13	Diode, semiconductor, type 1N3063, Mfr. HUGHES, 666163-732	5-29
2A2A1A4CR14	As 2A2A1A4CR11	5-29
2A2A1A4CR15	As 2A2A1A4CR11	5-29
2A2A1A4CR16	As 2A2A1A4CR11	5-29
2A2A1A4CR17	As 2A2A1A4CR11	5-29
2A2A1A4CR18	As 2A2A1A4CR11	5-29
2A2A1A4CR19	As 2A2A1A4CR11	5-29
2A2A1A4CR20	As 2A2A1A4CR11	5-29
2A2A1A4CR21	As 2A2A1A4CR11	5-29
2A2A1A4CR100	As 2A2A1A4CR11	5-29
2A2A1A4CR25	As 2A2A1A1C12	5-29
2A2A1A4C26	As 2A2C3	5-29
2A2A1A4C27	As 2A2C3	5-29
2A2A1A4C28	Capacitor, fixed, mica, 820 μ μF, ±2% 300 VDC, type DM15E821G300V, Mfr. ELECTROMOTIVE, 694696-821	5-29
2A2A1A4C29	Capacitor, mica, 3300 pF, ±2%, 500 VDC, type CM06F-332C03, Mfr. CDE, 698131-332	5-29
2A2A1A4C30	As 2A2C3	5-29
2A2A1A4C31	As 2A2A1A4C28	5-29
2A2A1A4C32	As 2A2A1A4C29	5-29
2A2A1A4C33	Capacitor, electrolytic, 15 μF, ±20%, 20 VDC, type 150D156X0020B2, Mfr. SPRAGUE, 696122-156	5-29

(Cont'd)

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1A4C34	Capacitor, fixed, mica, 3600 $\mu\mu$F, ±2%, 500 VDC, type DM20E362G500V, Mfr. ELECTROMOTIVE, 694723-362	5-29
2A2A1A4C35	Capacitor, fixed, mica, 3900 $\mu\mu$F, ±2%, 500 VDC, type DM20E392G500V, Mfr. ELECTROMOTIVE, 694723-392	5-29
2A2A1A4C36	As 2A2A1A4C34	5-29
2A2A1A4C37	Capacitor, electrolytic, 1 μF, ±20%, 20 VDC, type 150D225X0020A2, Mfr. SPRAGUE, 696122-225	5-29
2A2A1A4C39	As 2A2A1A4C37	5-29
2A2A1A4C40	As 2A2A1A4C37	5-29
2A2A1A4C41	As 2A2C3	5-29
2A2A1A4C42	As 2A2A1A1C12	5-29
2A2A1A4C43	As 2A2A1A4C38	5-29
2A2A1A4C44	As 2A2C3	5-29
2A2A1A4C45	As 2A2A1A1C12	5-29
2A2A1A4C46	As 2A2C3	5-29
2A2A1A4C47	As 2A2C3	5-29
2A2A1A4C48	As 2A2A1A1C12	5-29
2A2A1A4C49	As 2A2A1A1C12	5-29
2A2A1A4C50	As 2A2C3	5-29
2A2A1A4C51	As 2A2C3	5-29
2A2A1A4C52	As 2A2A1A1C12	5-29
2A2A1A4C53	As 2A2A1A1C12	5-29
2A2A1A4Q6	Transistor, type 2N1225, Mfr. R.C.A., 666163-391	5-29

(Cont'd)

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1A4Q7	As 2A2A1A4Q6	5-29
2A2A1A4Q8	Transistor, type 2N652, Mfr. MOTOROLA, 666163-384	5-29
2A2A1A4Q9	As 2A2A1A4Q6	5-29
2A2A1A4RT1	Thermistor, 10000 ohm, 25°C, type QB41J1, Mfr. FENWALL, 666164-071	5-29
2A2A1A4R53	As 2A2A1A3R15	5-29
2A2A1A4R54	Resistor, per MIL-R-11, 7500 ohm, ±5%, 1/4 W, type RC07GF752J, Mfr. A. BRADLEY, 697344-752	5-29
2A2A1A4R55	As 2A2A1A3R15	5-29
2A2A1A4R56	As 2A2A1A3R15	5-29
2A2A1A4R57	As 2A2A1A3R15	5-29
2A2A1A4R58	Resistor, per MIL-R-11, 20000 ohm, ±5%, 1/4 W, type RC07GF203J, Mfr. A. BRADLEY, 697344-203	5-29
2A2A1A4R59	Resistor, per MIL-R-11, 390 ohm, ±5%, 1/4 W, type RC07GF391J, Mfr. A. BRADLEY, 697344-391	5-29
2A2A1A4R60	As 2A2A1A3R15	5-29
2A2A1A4R61	As 2A2A1A4R58	5-29
2A2A1A4R62	As 2A2A1A4R59	5-29
2A2A1A4R63	Resistor, per MIL-R-11, 3000 ohm, ±5%, 1/4 W, type RC07GF302J, Mfr. A. BRADLEY, 697344-302	5-29
2A2A1A4R64	Resistor, per MIL-R-11, 2400 ohm, ±5%, 1/4 W, type RC07GF242J, Mfr. A. BRADLEY, 697344-242	5-29

(Cont'd)

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1A4R65	As 2A2A1A4R63	5-29
2A2A1A4R66	Resistor, per MIL-R-11, 27000 ohm, ±5%, 1/4 W, type RC07GF273J, Mfr. A. BRADLEY, 697344-273	5-29
2A2A1A4R67	As 2A2A1A4R58	5-29
2A2A1A4R68	As 2A2A1A4R58	5-29
2A2A1A4R69	As 2A2A1A3R16	5-29
2A2A1A4R70	Resistor, per MIL-R-11, 150 ohm, ±5%, 1/4 W, type RC07GF151J, Mfr. A. BRADLEY, 697344-151	5-29
2A2A1A4R71	As 2A2A1A1R32	5-29
2A2A1A4R72	Resistor, per MIL-R-11, 910 ohm, ±5%, 1/4 W, type RC07GF911J, Mfr. A. BRADLEY, 697344-911	5-29
2A2A1A4R73	Resistor, per MIL-R-11, 4700 ohm, ±5%, 1/4 W, type RC07GF472	5-29
2A2A1A4R74	As 2A2A1A3R16	5-29
2A2A1A4R75	As 2A2A1A3R16	5-29
2A2A1A4R76	As 2A2A1A3R16	5-29
2A2A1A4R77	As 2A2R5	5-29
2A2A1A4R78	As 2A2A1A3R16	5-29
2A2A1A4R79	Resistor per MIL-R-11, 51000 ohm, ±5%, 1/4 W, type RC07GF513J, Mfr. A. BRADLEY 697344-513	5-29
2A2A1A4R80	As 2A2R5	5-29
2A2A1A4R81	As 2A2A1A3R16	5-29
2A2A1A4R82	As 2A2A1A4R79	5-29

(Cont'd)

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1A4R83	As 2A2A1A3R16	5-29
2A2A1A4R84	As 2A2A1A3R16	5-29
2A2A1A4R85	As 2A2A1A1R32	5-29
2A2A1A4R86	Resistor per MIL-R-11, 8200 ohm, ±5%, 1/4 W, type RCO7GF822J, Mfr. A. BRADLEY, 697344-822	5-29
2A2A1A4R87	As 2A2A1A3R16	5-29
2A2A1A4R88	As 2A2A1A1R32	5-29
2A2A1A4R89	As 2A2A1A4R15	5-29
2A2A1A4R90	As 2A2A1A1R32	5-29
2A2A1A4R91	Resistor, per MIL-R-11, 750 onm, ±5%, 1/4 W, type RCO7GF751J, Mfr. A. BRADLEY, 697344-751	5-29
2A2A1A4R92	As 2A2A1A4R72	5-29
2A2A1A4R93	Resistor, per MIL-R-11, 4300 ohm, ±5%, 1/4 W, type RCO7GF432J, Mfr. A. BRADLEY, 697344-432	5-29
2A2A1A4R94	As 2A2A1A3R16	5-29
2A2A1A4R95	Resistor, per MIL-R-11, 200 ohm, ±5%, 1/4 W, type RCO7GF201J, Mfr. A. BRADLEY, 697344-201	5-29
2A2A1A4R96	As 2A2A1A4R79	5-29
2A2A1A4R79	As 2A2A1A3R16	5-29
2A2A1A4R98	As 2A2A1A1R32	5-29
2A2A1A4R99	As 2A2A1A4R73	5-29
2A2A1A4R100	As 2A2A1A3R15	5-29

(Cont'd)

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1A4R101	Resistor, variable, 10000 ohm, ±5%, 0,8 W, type 236P-1-103, Mfr. BOURNS, 554627-103	5-29
2A2A1A4R102	As 2A2A1A4R54	5-29
2A2A1A4R103	Resistor per MIL-R-11, 2700 ohm, ±5%,1/4W, type RC07GF272J, Mfr. A. BRADLEY, 697344-272	5-29
2A2A1A4R104	As 2A2A1A4R103	5-29
2A2A1A4R105	As 2A2A1A4R93	5-29
2A2A1A4R106	As 2A2A1A3R15	5-29
2A2A1A4R107	As 2A2A1A4R93	5-29
2A2A1A4R108	As 2A2A1A1R32	5-29
2A2A1A4R109	As 2A2A1A3R16	5-29
2A2A1A4R110	As 2A2A1A4R79	5-29
2A2A1A4R111	As 2A2A1A3R16	5-29
2A2A1A4R112	As 2A2A1A4R95	5-29
2A2A1A4R113	As 2A2A1A1R32	5-29
2A2A1A4R114	Resistor per MIL-R-11, 3600 ohm, ±5%,1/4W, type RC07GF362J, Mfr. A. BRADLEY, 697344-362	5-29
2A2A1A4R115	As 2A2A1A1R21	5-29
2A2A1A4R116	As 2A2A1A1R22	5-29
2A2A1A4R117	Resistor, per MIL-R-11, 560 ohm, ±5%,1/4W, type RC07GF561J, Mfr. A. BRADLEY, 697344-561	5-29
2A2A1A4R118	Resistor, per MIL-R-11, 30000 ohm,±5%,1/4W, type RC07GF303J, Mfr. A. BRADLEY, 697344-303	5-29

(Cont'd)

6.2.3 - Mode Selector (2A2A1) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A1A4R119	Resistor, per MIL-R-11, 1800 ohm, ±5%,1/4W, type RC07GF182J, Mfr. A. BRADLEY, 697344-182	5-29
2A2A1A4R120	Resistor, per MIL-R-11, 680 ohm, ±5%, 1/4W, type RC07GF681J, Mfr. A. BRADLEY, 697344-681	5-29
2A2A1A4R121	Resistor, per MIL-R-11, 1800 ohm, ±5%,1/4W, type RC07GF182J, Mfr. A. BRADLEY, 697344-182	5-29
2A2A1A4R121	Resistor, per MIL-R-11, 2000 ohm, ±5%,1/4W, type RC07GF202J, Mfr. A. BRADLEY 697344-202	5-29
2A2A1A4R121	Resistor, per MIL-R-11, 2200 ohm, ±5%,1/4W, type RC07GF222J, Mfr. A. BRADLEY, 697344-222	5-29
2A2A1A4T3	Transformer RF, Mfr. ELMER, 666165-469	5-29
2A2A1A4T5	Transformer RF, Mfr. ELMER, 666230-023	5-29

6.2.4 - **Audio Amplifier (2A2A2)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A2	Audio Amplifier Assembly, P/N 666230-043, Mfr. ELMER,	5-15
2A2A2P1	Connector plug, 25 pin contacts, type DBM25P, Mfr. CANNON, 555146-424	5-30
2A2A2A1CR1	Diode, semiconductor, type 1N816, Mfr. MOTOROLA, 666163-717	5-31
2A2A2A1C1	As 2A2A1A4C33	5-31
2A2A2A1C2	As 2A2A1A4C33	5-31
2A2A2A1C3	As 2A2A1A4C33	5-31
2A2A2A1C4	As 3S3S1A4C33	5-31
2A2A2A1C5	Capacitor, electrolytic, 68 μF, ±20%, 20 VDC, type 150 D686X0020R2,696122-686	5-31
2A2A2A1C6	As 2A2A1A4C33	5-31
2A2A2A1C7	As 2A2A1A4C33	5-31
2A2A2A1C8	As 2A2A1A4C33	5-31
2A2A2A1C9	As 2A2A1A4C33	5-31
2A2A2A1C10	Capacitor, electrolytic, 120 μF, ±10%, 20 VDC, type SCM12HP9920A2, Mfr. TEXAS INSTR., 666164-017	5-31
2A2A2A1C11	As 2A2A1A4C33	5-31
2A2A2A1Q1	As 2A2A1A4Q8	5-31
2A2A2A1Q2	Transistor, type 2N388, Mfr. R.C.A., 666163-379	5-31
2A2A2A1Q3	As 2A2A1A4Q8	5-31
2A2A2A1Q4	As 2A2A1A4Q8	5-31
2A2A2A1Q5	As 2A2A1A4Q8	5-31

(Cont'd)

6.2.4 - Audio Amplifier (2A2A2) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A2A1RV1	Varistor, type 694BN3125K, Mfr. CARBORUNDUM, 666164-019	5-31
2A2A2A1RV2	As 2A2A2A1RV1	5-31
2A2A2A1R1	As 2A2A1A4R117	5-31
2A2A2A1R2	As 2A2A1A3R16	5-31
2A2A2A1R3	Resistor, per MIL-R-11, 270 ohm, ±5%, 1/4 W, type RC07GF271J, Mfr. A. BRADLEY, 697344-271	5-31
2A2A2A1R4	Resistor, per MIL-R-11, 3900 ohm, ±5%, 1/4W, type RC07GF392J, Mfr. A. BRADLEY, 697344-392	5-31
2A2A2A1R5	As 2A2A1A4R66	5-31
2A2A2A1R6	As 2A2A1A1R32	5-31
2A2A2A1R7	As 2A2A1A1R32	5-31
2A2A2A1R8	As 2A2A1A4R73	5-31
2A2A2A1R9	Resistor, per MIL-R-11, 18000 ohm, ±5%, 1/4W, type RC07GF183J, Mfr. A. BRADLEY, 697344-183	5-31
2A2A2A1R10	As 2A2A1A4R103	5-31
2A2A2A1R11	As 2A2A1A1R23	5-31
2A2A2A1R12	As 2A2A1A4R117	5-31
2A2A2A1R13	Resistor, per MIL-R-11, 6800 ohm, ±5%, 1/4W, type RC07GF682J, Mfr. A. BRADLEY, 697344-682	5-31
2A2A2A1R14	As 2A2A1A4R58	5-31
2A2A2A1R15	Resistor, per MIL-R-11,130000 ohm, ±5%, 1/4W, type RC07GF134J, Mfr. A. BRADLEY, 697344-134	5-31

(Cont'd)

6.2.4 - Audio Amplifier (2A2A2) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A2A1R16	As 2A2A1A3R19	5-31
2A2A2A1R17	As 2A2A1A4R118	5-31
2A2A2A1R18	As 2A2A2A1R4	5-31
2A2A2A1R19	As 2A2A1A4R77	5-31
2A2A2A1R20	As 2A2A1R41	5-31
2A2A2A1R21	As 2A2A2A1R13	5-31
2A2A2A1R22	As 2A2A1A1R21	5-31
2A2A2A1R23	As 2A2A1A4R63	5-31
2A2A2A1T1	Transformer AF, type TF5RX16ZZ, Mfr. N.Y. TRANSFORMER, CO., 666164-029	5-31
2A2A2A1T2	Transformer AF, type M4162, Mfr. MICROTRAN, 666166-423	5-31

6.2.5 - **Audio Amplifier (2A2A3)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A3	Audio Amplifier P/N 666230-043, Mfr.ELMER	5-15
2A2A3P1	As 2A2A2P1	5-30
2A2A3A1CR1	As 2A2A2A1CR1	5-31
2A2A3A1C1	As 2A2A1A4C33	5-31
2A2A3A1C2	As 2A2A1A4C33	5-31
2A2A3A1C3	As 2A2A1A4C33	5-31
2A2A3A1C4	As 2A2A1A4C33	5-31
2A2A3A1C5	As 2A2A2A1C5	5-31
2A2A3A1C6	As 2A2A1A4C33	5-31
2A2A3A1C7	As 2A2A1A4C33	5-31
2A2A3A1C8	As 2A2A1A4C33	5-31
2A2A3A1C9	As 2A2A1A4C33	5-31
2A2A3A1C10	As 2A2A2A1C10	5-31
2A2A3A1C11	As 2A2A1A4C33	5-31
2A2A3A1Q1	As 2A2A1A4Q8	5-31
2A2A3A1Q2	As 2A2A2A1Q2	5-31
2A2A3A1Q3	As 2A2A1A4Q8	5-31
2A2A3A1Q4	As 2A2A1A4Q8	5-31
2A2A3A1Q5	As 2A2A1A4Q8	5-31
2A2A3A1RV1	As 2A2A2A1RV1	5-31
2A2A3A1RV2	As 2A2A2A1RV1	5-31
2A2A3A1R1	As 2A2A1A4R117	5-31
2A2A3A1R2	As 2A2A1A3R16	5-31
2A2A3A1R3	As 2A2A2A1R3	5-31
2A2A3A1R4	As 2A2A2A1R4	5-31

(Cont'd)

6.2.5 - Audio Amplifier (2A2A3) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A3A1R5	As 2A2A1A4R66	5-31
2A2A3A1R6	As 2A2A1A1R32	5-31
2A2A3A1R7	As 2A2A1A1R32	5-31
2A2A3A1R8	As 2A2A1A4R73	5-31
2A2A3A1R9	As 2A2A2A1R9	5-31
2A2A3A1R10	As 2A2A1A4R103	5-31
2A2A3A1R11	As 2A2A1A1R23	5-31
2A2A4A1R12	As 2A2A1A4R117	5-31
2A2A3A1R13	As 2A2A2A1R13	5-31
2A2A3A1R14	As 2A2A1A4R58	5-31
2A2A3A1R15	As 2A2A2A1R15	5-31
2A2A3A1R16	As 2A2A1A3R19	5-31
2A2A3A1R17	As 2A2A1A4R118	5-31
2A2A3A1R18	As 2A2A2A1R4	5-31
2A2A3A1R19	As 2A2A1A4R77	5-31
2A2A3A1R20	As 2A2A1R41	5-31
2A2A3A1R21	As 2A2A2A1R13	5-31
2A2A3A1R22	As 2A2A1A1R21	5-31
2A2A3A1R23	As 2A2A1A4R63	5-31
2A2A3A1T1	As 2A2A2A1T1	5-31
2A2A3A1T2	As 2A2A2A1T2	5-31

6.2.6 - RF Amplifier (2A2A4)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4	Amplifier RF, P/N 666230-019, Mfr. ELMER	5-15
2A2A4B1	Motor DC, per MIL-M-8609A, 26 VDC, 240 mA, P/N 43A333, Mfr. GLOBE, 666162-554	5-35
2A2A4C1	Capacitor, fixed, ceramic, 0,01 μF, ±20%, 75 VDC, P/N SSM-DI-88, Mfr. GLENCO, 666163-275	5-34
2A2A4C2	As 2A2A4C1	5-34
2A2A4C3	Capacitor, per MIL-C-11015, 10 KpF, ±20%, 500 VDC, type CK63AW103M, Mfr. ERIE, 69814-103	5-34
2A2A4C4	As 2A2A4C1	5-34
2A2A4C5	Capacitor, fixed, mica, 330 μ μF, ±5%, 500 VDC, P/N DM15F331J500V, Mfr. ELECTROMOTIVE, 694728-331	5-34
2A2A4C6	As 2A2A4C1	5-34
2A2A4C7	As 2A2A4C3	5-34
2A2A4C8	Capacitor, fixed, mica, 356 μ μF, ± ½%, 500 VDC, P/N DM15F3560D500V, Mfr. ELECTROMOTIVE, 552282-356	5-34
2A2A4C9	Capacitor, fixed, mica, 775 μ μF, ± ½%, 300 VDC, P/N DM15F7750D300V, Mfr. ELECTROMOTIVE, 552282-775	5-34
2A2A4C10	As 2A2A4C1	5-34
2A2A4C11	As 2A2A4C8	5-34
2A2A4C12	As 2A2A4C9	5-34
2A2A4C13	As 2A2A4C8	5-34
2A2A4C14	As 2A2A4C9	5-34

(cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4C15	As 2A2A4C1	5-34
2A2A4C16	As 2A2A4C1	5-34
2A2A4C17	As 2A2A4C1	5-34
2A2A4C18	As 2A2A4C1	5-34
2A2A4C19	Capacitor, fixed, mica, 369 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15F3690D500V, Mfr. ELECTROMOTIVE, 552282-369	5-34
2A2A4C20	Capacitor, fixed, mica, 784 $\mu\mu$F, ± ½%, 300 VDC, P/N DM15F840D300V, Mfr. ELECTROMOTIVE, 552282-784	5-34
2A2A4K1	Relay armature electromagnetic, hermetically sealed, 2F2426, Mfr. HI-G, 555251-015	5-32
2A2A4P1	Connector, plug, 15 pin contacts, P/N DAM15PC31, Mfr. CANNON, 555146-014	5-32
2A2A4P2	Connector, plug, 12 pin contacts and 5 coax, type DCM17W5PC31F115, Mfr. CANNON, 555146-435	5-32
2A2A4R1	Resistor, per MIL-R-11, 47 Kohm, ± 5%, 1/4W, type RC07GF473J, Mfr. A.BRADLEY, 697344-473	5-34
2A2A4R2	Resistor, per MIL-R-11, 51 ohm ±5%, 1/4W, type RC07GF501J, Mfr. A. BRADLEY, 697344-510	5-34
2A2A4R3	Resistor, per MIL-R-11, 6200 ohm, ±5%, 1/4W, type RC07GF622J, Mfr. A. BRADLEY, 697344-622	5-34
2A2A4V1	Tube electronic, per MIL-E-1, type 6BZ6, Mfr. R.C.A., 694045-150	5-34

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4V2	Tube, electronic, per MIL-E-1-839C, type 6AN5WA, Mfr. R.C.A.,694045-123	5-34
2A2A3A1C1	As 2A2A4C1	5-36
2A2A4A1C2	As 2A2A1A4C33	5-36
2A2A4A1C3	As 2A2A1A4C33	5-36
2A2A4A1R1	Resistor, per MIL-R-11, 62 Kohm, ±5%,1/4W, type RC07GF623J, Mfr. A. BRADLEY 697344-623	5-36
2A2A4A1R2	Resistor, per MIL-3-11, 75 K, ± 5%, 1/4 W, type RC07GF753J, Mfr. A. BRADLEY, 697344-753	5-36
2A2A4A1R3	As 2A2A1A4R70	5-36
2A2A4A1R4	Resistor, per MIL-R-11, 620 ohm, ±5%,1/2W, type RC20GF621J, Mfr. A. BRADLEY 689000-621	5-36
2A2A4A1R5	Resistor, per MIL-R-11, 180 ohm, ±5%,1/2W, type RC20GF181J, Mfr. A. BRADLEY, 689000-181	5-36
2A2A4A1R6	Resistor, per MIL-R-11, 120 ohm, ±5%,1/2W, type RC20GF121J, Mfr. A. BRADLEY, 689000-121	5-36
2A2A4A2	Tuning strip, 2 Mc/s, Mfr. ELMER, P/N 666230-286	5-32
2A2A4A2C1	Capacitor, fixed, ceramic, 2,2 $\mu\mu$F, ±5%, 500 VDC, P/N GA2R2J500V, Mfr. STACKPOLE, 552169-030	5-53
2A2A4A2C2	Capacitor, fixed, mica, 126 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15F1260D500V, Mfr. ELECTROMOTIVE, 552282-126	5-53

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A2C3	Capacitor, fixed, mica, 132 μ μF, ±½%, 500 VDC, P/N DM15F1320D500V, Mfr. ELECTROMOTIVE, 552282-132	5-53
2A2A4A2C4	Capacitor, fixed, mica, 250 μ μF, ±½%, 500 VDC, P/N DM15F2500D500V, Mfr. ELECTROMOTIVE, 552282-250	5-53
2A2A4A2T1	Transformer, RF variable, 12 Mc/s, 115,3 μ μF, Mfr. ELMER, P/N 666230-324	5-53
2A2A4A2T2	Transformer, RF variable, 12 Mc/s, 135,3 μ μF, Mfr. ELMER, P/N 666230-352	5-53
2A2A4A2T3	Transformer, RF variable, 7 Mc/s, 197 μ μF, Mfr. ELMER, P/N 666230-375	5-53
2A2A4A2T4	Transformer, RF variable, 2 Mc/s 754 μ μF, Mfr. ELMER, P/N 666230-398	5-53
2A2A4A3	Tuning strip, 3 Mc/s, Mfr. ELMER, P/N 666230-287	5-32
2A2A4A3C1	Capacitor, fixed, ceramic, 2,00 μ μF, ±5%, 500 VDC, P/N GA2ROJ500V, Mfr. STACKPOLE, 552169-029	5-38
2A2A4A3C2	Capacitor, fixed, ceramic, 115 μ μF, ±½%, 500 VDC, P/N DM15F1150D500V, Mfr. ELECTROMOTIVE, 552282-115	5-38
2A2A4A3C3	Capacitor, fixed, mica, 120 μ μF, ±½%, 500 VDC, P/N DM15F1200D500V, Mfr. ELECTROMOTIVE, 552282-120	5-38
2A2A4A3C4	Capacitor, fixed, mica, 208 μ μF, ±½%, 500 VDC, P/N DM15F2080D500V, Mfr. ELECTROMOTIVE, 552282-208	5-38

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A3C5	Capacitor, fixed, mica, 1253 μ μF, ±½3, 300 VDC, P/N DM15F1253D300V, Mfr. ELECTROMOTIVE, 810000-212	5-38
2A2A4A3T1	Transformer, RF variable, 13 Mc/s, 106,1 μ μF, Mfr. ELMER, P/N 666230-325	5-38
2A2A4A3T3	Transformer, RF variable, 8 Mc/s, 171,9 μ μF, Mfr. ELMER, P/N 666230-396	5-38
2A2A4A3T4	Transformer, RF variable, 3 Mc/s, 482 μ μF, Mfr. ELMER, P/N 666230-399	5-38
2A2A4A4	Tuning strip, 4 Mc/s, Mfr. ELMER, P/N 666230-288	5-32
2A2A4A4C1	As 2A2A4A3C1	5-39
2A2A4A4C2	Capacitor, fixed, mica, 105 μ μF, ± ½%, 500 VDC, P/N DM 15F1050D500V, Mfr. ELECTROMOTIVE, 552282-105	5-39
2A2A4A4C3	Capacitor, fixed, mica, 111 μ μF, ± ½%, 500 VDC, P/N DM15F1110D500V, Mfr. ELECTROMOTIVE, 552282-111	5-39
2A2A4A4C4	Capacitor, fixed, mica, 179 μ μF, ± ½% 500 VDC, P/N DM15F1790D500V, Mfr. ELECTROMOTIVE, 552282-179	5-39
2A2A4A4C5	Capacitor, fixed, mica, 629 μ μF, ± ½%, 300 VDC, P/N DM15F6290D300V, Mfr. ELECTROMOTIVE, 552282-629	5-39
2A2A4A4T1	Transformer, RF variable, 14 Mc/s 97,9 μ μF, Mfr. ELMER, P/N 809000-266, 666230-326	5-39
2A2A4A4T2	Transformer,RF variable, 14 Mc/s,119,5 μ μF, Mfr.ELMER, P/N 809000-322, 666230-354	5-39

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A4T3	Transformer, RF variable, 9 Mc/s, 152,3 μ μF, Mfr. ELMER, P/N 809000-288, 666230-376	5-39
2A2A4A4T4	Transformer, RF variable, 4 Mc/s, 358 μ μF, Mfr. ELMER, P/N 809000-203, 666230-400	5-39
2A2A4A5C1	As 2A2A4A3C1	5-40
2A2A4A5C2	Capacitor, fixed, mica, 97 μ μF, ± 1%, 500 VDC, P/N DM15F970F500V, Mfr. ELECTROMOTIVE, 552285-097	5-40
2A2A4A5C3	Capacitor, fixed, mica, 103 μ μF, ±½%, 500 VDC, P/N DM15F1030D500V, Mfr. ELECTROMOTIVE, 552282-103	5-40
2A2A4A5C4	Capacitor, fixed, mica, 157 μ μF, ±½%, 500 VDC, P/N DM15F1570D500V, Mfr. ELECTROMOTIVE, 552282--157	5-40
2A2A4A5C5	Capacitor, fixed, mica, 422 μ μF, ±½%, 300 VDC, P/N DM15F4220D300V, Mfr. ELECTROMOTIVE, 552282-422	5-40
2A2A4A5T1	Transformer, RF variable, 15 Mc/s, 92 μ μF, Mfr. ELMER, P/N 666230-327	5-40
2A2A4A5T2	Transformer, RF variable, 15 Mc/s, 113,4 μ μF, Mfr. ELMER, P/N 666230-355	5-40
2A2A4A5T3	Transformer, RF variable, 10 Mc/s, 138 μ μF, Mfr. ELMER, P/N 666230-377	5-40
2A2A4A5T4	Transformer, RF variable, 5 Mc/s, 286 μ μF, Mfr. ELMER, P/N 666230-401	5-40
2A2A4A6	Tuning strip, 5 Mc/s, Mfr. ELMER, P/N 666230-290	5-32

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A6C1	As 2A2A4A3C1	5-41
2A2A4A6C2	Capacitor, fixed, mica, 91 μ μF, ± 1%, 500 VDC, P/N DM15E910F500V, Mfr. ELECTROMOTIVE, 552295-091	5-41
2A2A4A6C3	Capacitor, fixed, mica, 96 μ μF, ± 1%, 500 VDC, P/N DM15F960F500V, Mfr. ELECTROMOTIVE, 552282-096	5-41
2A2A4A6C4	Capacitor, fixed, mica, 14 μ μF, ± ½%, 500 VDC, P/N DM15F1400D500V, Mfr. ELECTROMOTIVE, 552282-140	5-41
2A2A4A6C5	Capacitor, fixed, mica, 318 μ μF, ± ½%, 500 VDC, P/N DM15F3180D500V, Mfr. ELECTROMOTIVE, 552282-318	5-41
2A2A4A6T1	Transformer, RF variable, 16 Mc/s, 86,9 μ μF, Mfr. ELMER, P/N 666230-328	5-41
2A2A4A6T2	Transformer, RF variable, 16 Mc/s, 107,1 μ μF, Mfr. ELMER, P/N 666230-365	5-41
2A2A4A6T3	Transformer, RF variable, 11 Mc/s 126,5 μ μF, Mfr. ELMER, P/N 666230-378	5-41
2A2A4A6T4	Transformer, RF variable, 6 Mc/s, 240 μ μF, Mfr. ELMER, P/N 666230-402	5-41
2A2A4A7	Tuning strip, 7 Mc/s, Mfr. ELMER, P/N 666230-291	5-41
2A2A4A7C1	As 2A2A4A3C1	5-41
2A2A4A7C2	Capacitor, fixed, mica, 85 μ μF, ± 1%, 500 VDC, P/N DM15F850F500V, Mfr. ELECTROMOTIVE, 552285-085	5-41

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A7C3	Capacitor, fixed, mica, 90 $\mu\mu$F, ± 1%, 500 VDC, P/N DM15F900F500V, Mfr. ELECTROMOTIVE, 552285-090	5-41
2A2A4A7C4	As 2A2A4A2C2	5-41
2A2A4A7C5	Capacitor, fixed, mica, 256 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15F2560D500V, Mfr. ELECTROMOTIVE, 552282-256	5-41
2A2A4A7T1	Transformer, RF variable, 17 Mc/s, 81,3 $\mu\mu$F, Mfr. ELMER, P/N 666230-329	5-41
2A2A4A7T2	Transformer,RF variable, 18 Mc/s, 101,7 $\mu\mu$F, Mfr. ELMER, P/N 666230-357	5-41
2A2A4A7T3	Transformer, RF variable, 12 Mc/s, 116,4 $\mu\mu$F, Mfr. ELMER, P/N 666230-379	5-41
2A2A4A7T4	Transformer, RF variable, 7 Mc/s 208 $\mu\mu$F, Mfr. ELMER, P/N 666230-403	5-41
2A2A4A8	Tuning strip, 8 Mc/s, Mfr. ELMER, P/N 666230-292	5-33
2A2A4A8C1	Capacitor, fixed, mica, 1,8 $\mu\mu$F, ± 5%, 500 VDC, P/N GA1R8J500V, Mfr. STACKPOLE, 552169-028	5-40
2A2A4A8C2	Capacitor, fixed, mica, 80 $\mu\mu$F, ± 1%, 500 VDC, P/N DM15E800F500V, Mfr. ELECTROMOTIVE, 552285-080	5-40
2A2A4A8C3	As 2A2A4A7C2	5-40
2A2A4A8C4	As 2A2A4A3C2	5-40
2A2A4A8C5	Capacitor, fixed, mica 214 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15F2140D500V, Mfr. ELECTROMOTIVE, 552282-214	5-40

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A8T1	Transformer, RF variable, 18 Mc/s, 77,9 μ μF, Mfr. ELMER, P/N 666230-330	5-40
2A2A4A8T2	Transformer, RF variable, 18 Mc/s, 97,6 μ μF, Mfr. ELMER, P/N 666230-358	5-40
2A2A4A8T3	Transformer, RF variable, 13 Mc/s, 107,8 μ μF. Mfr, ELMER, P/N 666230-380	5-40
2A2A4A8T4	Transformer, RF variable, 8 Mc/s, 185 μ μF, Mfr. ELMER, P/N 666230-404	5-40
2A2A4A9	Tuning strip, 9 Mc/s, Mfr. ELMER, P/N 666230-293	5-33
2A2A4A9C1	As 2A2A4A8C1	5-42
2A2A4A9C2	Capacitor, fixed, mica, 75 μ μF, ± 1%, 500 VDC, P/N DM15E750D500V, Mfr. ELECTROMOTIVE, 552285-075	5-42
2A2A4A9C3	As 2A2A4A8C2	5-42
2A2A4A9C4	As 2A2A4A4C2	5-42
2A2A4A9C5	Capacitor, fixed, mica, 185 μ μF, ± ½%, 500 VDC, P/N DM 15F1850D500V, Mfr. ELECTROMOTIVE, 552282-185	5-42
2A2A4A9T1	Transformer, RF variable, 19 Mc/s, 73,6 μ μF, Mfr. ELMER, P/N 666230-331	5-42
2A2A4A9T2	Transformer, RF variable, 19 Mc/s, 93 μ μF, Mfr. ELMER, P/N 666230-359	5-42
2A2A4A9T3	Transformer, RF variable, 14 Mc/s, 99,4 μ μF, Mfr. ELMER, P/N 666230-381	5-42
2A2A4A9T4	Transformer, RF variable, 9 Mc/s, 166 μ μF, Mfr. ELMER, P/N 666230-405	5-42

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A9Y1	Crystal, per MIL-C-3098B, 21 Mc/s Mc COY ELECT., P/N 666162-598	5-42
2A2A4A10	Tuning strip, 10 Mc/s, Mfr. ELMER, P-N 666230-294	5-33
2A2A4A10C1	As 2A1A4A8C1	5-43
2A2A4A10C2	Capacitor, fixed, mica, 71 μ μF, ± 1%, 500 VDC, P/N DM15E720F500V, Mfr. ELECTROMOTIVE, 552285-071	5-43
2A2A4A10C3	Capacitor, fixed, mica, 76 μ μF, ± 1%, 500 VDC, P/N DM15E760F500V, Mfr. ELECTROMOTIVE, 552285-076	5-43
2A2A4A10C4	As 2A2A4A5C2	5-43
2A2A4A10C5	Capacitor, fixed, mica, 163 μ μF, ± ½%, 500 VDC, P/N DM15F1630D500V, Mfr. ELECTROMOTIVE, 552282-163	5-43
2A2A4A10T1	Transformer, RF variable, 20 Mc/s, 69,9 μ μF, Mfr. ELMER, P/N 666230-332	5-43
2A2A4A10T2	Transformer, RF variable, 20 Mc/s, 90,3 μ μF, Mfr. ELMER, P/N 666230-360	5-43
2A2A4A10T3	Transformer, RF variable, 15 Mc/s, 93,5 μ μF, Mfr. ELMER, P/N 666230-382	5-43
2A2A4A10T4	Transformer, RF variable, 10 Mc/s, 152 μ μF, Mfr. ELMER, P/N 666230-406	5-43
2A2A4A10Y1	Crystal, per MIL-C-3098B, 19,000 Mc/s, Mfr. Mc COY ELECT., P/N 666162-597	5-43
2A2A4A11	Tuning strip, 11 Mc/s, Mfr. ELMER, P/N 666230-295	5-33
2A2A4A11C1	As 2A2A4A3C1	5-44

(Cont'd)

6.2.6 - *RF Amplifier (2A2A4) (Cont'd)*

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A11C2	Capacitor, fixed, mica, 67 μ μF, ± 1%, 500 VDC, P/N DM15E670F500V, Mfr. ELECTROMOTIVE, 552285-067	5-44
2A2A4A11C3	Capacitor, fixed, mica, 73 μ μF, ± 1%, 500 VDC, P/N DM15E730F500V, Mfr. ELECTROMOTIVE, 552285-073	5-44
2A2A3A11C4	As 2A2A4A6C2	5-44
2A2A4A11C5	Capacitor, fixed, mica, 146 μ μF, ± ½%, 500 VDC, P/N DM15F1460D500V, Mfr. ELECTROMOTIVE, 552282-146	5-44
2A2A4A11T1	Transformer, RF variable, 21 Mc/s, 66,7 μ μF, Mfr. ELMER, P/N 666230-333	5-44
2A2A4A11T2	Transformer, RF variable, 21 Mc/s, 88 μ μF, Mfr. ELMER, P/N 666230-361	5-44
2A2A4A11T3	Transformer, RF variable, 16 Mc/s, 88,5 μ μF, Mfr. ELMER, P/N 666230-383	5-44
2A2A4A11T4	Transformer, RF variable, 11 Mc/s, 140 μ μF, Mfr. ELMER, P/N 666230-407	5-44
2A2A4A12	Tuning, strip, 12 Mc/s, Mfr. ELMER, P/N 666230-296	5-33
2A2A4A12C1	As 2A2A4A3C1	5-45
2A2A4A12C2	Capacitor, fixed, mica, 64 μ μF, ± 1%, 500 VDC, P/N DM15E640F500V, Mfr. ELECTROMOTIVE, 552285-064	5-45
2A2A4A12C3	Capacitor, fixed, mica, 68 μ μF, ± 1%, 500 VDC, P/N DM 15E680F500V, Mfr. ELECTROMOTIVE, 552285-068	5-45
2A2A4A12C4	As 2A2A4A7C2	5-45

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A12C5	As 2A2A4A2C3	5-45
2A2A4A12T1	Transformer, RF variable, 22 Mc/s, 64,2 μ μF, Mfr. ELMER, P/N 666230-334	5-45
2A2A4A12T2	Transformer, RF variable, 22 Mc/s, 82,7 μ μF, Mfr. ELMER, P/N 666230-362	5-45
2A2A4A12T3	Transformer, RF variable, 17 Mc/s, 83,7 μ μF, Mfr. ELMER, P/N 666230-384	5-45
2A2A4A12T4	Transformer, RF variable, 12 Mc/s, 130 μ μF, Mfr. ELMER, P/N 666230-408	5-45
2A2A4A16	Tuning strip, 16 Mc/s, Mfr. ELMER, P/N 666230-300	5-33
2A2A4A16C1	As 2A2A4A3C1	5-36
2A2A4A16C2	Capacitor, fixed, mica, 54 μ μF, ± 1%, 500 VDC, P/N DM15E540F500V, Mfr. ELECTROMOTIVE, 552285-054	5-36
2A2A4A16C3	Capacitor, fixed, mica, 59 μ μF, ± 1%, 500 VDC, P/N DM15E590F500V, Mfr. ELECTROMOTIVE, 552285-059	5-36
2A2A4A16C4	As 2A2A4A11C2	5-36
2A2A4A16C5	As 2A2A4A6C3	5-36
2A2A4A16T1	Transformer, RF variable, 26 Mc/s, 55,9 μ μF, Mfr. ELMER, P/N 666230/338	5-36
2A2A4A16T2	Transformer, RF variable, 26 Mc/s 75,9 μ μF, Mfr. ELMER, P/N 666230-366	5-36
2A2A4A16T3	Transformer, RF variable, 21 Mc/s, 70,2 μ μF, Mfr. ELMER, P/N 666230-388	5-36
2A2A4A16T4	Transformer, RF variable, 16 Mc/s, 103 μ μF, Mfr. ELMER, P/N 666230-412	5-36

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A13	Tuning strip, 13 Mc/s, Mfr. ELMER, P/N 666230-297	5-33
2A2A4A13C1	As 2A2A4A3C1	5-45
2A2A4A13C2	Capacitor, fixed, mica, 61 μ μF, ± 1%, 500VDC, P/N DM15E610F500V, Mfr. ELECTROMOTIVE, 552285-061	5-45
2A2A4A13C3	Capacitor, fixed, mica, 66 μ μF, ± 1%, 500 VDC, P/N DM15E660E500V, Mfr. ELECTROMOTIVE, 552285-066	5-45
2A2A4A13C4	As 2A2A4A8C2	5-45
2A2A4A13C5	As 2A2A4A3C3	5-45
2A2A4A13T1	Transformer, RF variable, 23 Mc/s, 81,1 μ μF, Mfr. ELMER, P/N 666230-363	5-45
2A2A4A13T3	Transformer, RF variable, 18 Mc/s 80,2 μ μF, Mfr. ELMER, P/N 666230-385	5-45
2A2A4A13T4	Transformer, RF variable, 13 Mc/s, 122 μ μF, Mfr. ELMER, P/N 666230-409	5-45
2A2A4A14	Tuning strip, 14 Mc/s, Mfr. ELMER, P/N 66230-298	5-33
2A2A4A14C1	As 2A2A4A3C1	5-39
2A2A4A14C2	Capacitor, fixed, mica, 58 μ μF, ± 1% 500 VDC, P/N DM15E450F500V, Mfr. ELECTROMOTIVE, 552285-058	5-39
2A2A4A14C3	Capacitor, fixed mica, 63 μ μF, ± 1%, 500 VDC, P/N DM15E630F500V, Mfr. ELECTROMOTIVE, 552285-063	5-39
2A2A4A14C4	As 2A2A4A9C2	5-39

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A14C5	As 2A2A4A4C3	5-39
2A2A4A14T1	Transformer, RF variable, 24 Mc/s, 59,1 μ μF, Mfr. ELMER, P/N 666230-336	5-39
2A2A4A14T2	Transformer, RF variable, 24 Mc/s, 78,9 μ μF, Mfr. ELMER, P/N 666230-364	5-39
2A2A4A14T3	Transformer, RF variable, 19 Mc/s, 76 μ μF, Mfr. ELMER, P/N 666230-386	5-39
2A2A4A14T4	Transformer, RF variable, 14 Mc/s 115 μ μF, Mfr. ELMER, P/N 666230-410	5-39
2A2A4A15	Tuning strip, 15 Mc/s, Mfr. ELMER, P/N 666230-299	5-33
2A2A4A15C1	As 2A2A4A3C1	5-44
2A2A4A15C2	Capacitor, fixed, mica, 56 μ μF, ± 1%, 500 VDC, P/N DM15E560F500V, Mfr. ELECTROMOTIVE, 552285-056	5-44
2A2A4A15C3	As 2A2A4A13C2	5-44
2A2A4A15C4	As 2A2A4A10C2	5-44
2A2A4A15C5	As 2A2A4A5C3	5-44
2A2A4A15T1	Transformer, RF variable, 25 Mc/s, 57,4 μ μF, Mfr. ELMER, P/N 666230-337	5-44
2A2A4A15T2	Transformer, RF variable, 25 Mc/s, 76,6 μ μF, Mfr. ELMER, P/N 666230-365	5-44
2A2A4A15T3	Transformer, RF variable, 20 Mc/s, 72,6 μ μF, Mfr. ELMER, P/N 666230-387	5-44
2A2A4A15T4	Transformer, RF variable, 15 Mc/s, 109 μ μF, Mfr. ELMER, P/N 666230-411	5-44
2A2A4A17	Tuning strip, 17 Mc/s, Mfr. ELMER, P/N 666230-301	5-33

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A17C1	As 2A2A4A3C1	5-46
2A2A4A17C2	Capacitor, fixed, mica, 52 $\mu\mu$F, ± 1%, 500 VDC, P/N DM15E520F500V, Mfr. ELECTROMOTIVE, 552285-052	5-46
2A2A4A17C3	Capacitor, fixed, mica, 57 $\mu\mu$F, ±0,5%, 500 VDC, P/N DM15E570F500V, Mfr. ELECTROMOTIVE, 552285-057	5-46
2A2A4A17C4	As 2A2A4A12C2	5-46
2A2A4A17C5	As 2A2A4A7C3	5-46
2A2A4A17T1	Transformer, RF variable, 27 Mc/s, 54,5 $\mu\mu$F, Mfr. ELMER, P/N 666230-339	5-46
2A2A4A17T2	Transformer, RF variable, 27 Mc/s, 73,9 $\mu\mu$F, Mfr. ELMER, P/N 666230-367	5-46
2A2A4A17T3	Transformer, RF variable, 22 Mc/s, 67,6 $\mu\mu$F, Mfr. ELMER, P/N 666230-389	5-46
2A2A4A17T4	Transformer, RF variable, 17 Mc/s, 98,8 $\mu\mu$F, Mfr. ELMER, P/N 666230-413	5-46
2A2A4A18	Tuning strip, 18 Mc/s, Mfr. ELMER, P/N 666230-302	5-33
2A2A4A18C1	As 2A2A4A3C1	5-47
2A2A4A18C2	Capacitor, fixed, mica, 50 $\mu\mu$F, ± 1%, 500 VDC, P/N DM15E500F500V, Mfr. ELECTROMOTIVE, 552285-050	5-47
2A2A4A18C3	Capacitor, fixed, mica, 55 $\mu\mu$F, ± 1%, 500 VDC, P/N DM15E550F500V, Mfr. ELECTROMOTIVE, 552285-055	5-47
2A2A4A18C4	As 2A2A4A13C2	5-47

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A18C5	As 2A2A4A7C2	5-47
2A2A4A18T1	Transformer, RF variable, 28 Mc/s, 52,6 μ μF, Mfr. ELMER, P/N 666230-340	5-47
2A2A4A18T2	Transformer, RF variable, 28 Mc/s, 71,9 μ μF, Mfr. ELMER, P/N 666230-368	5-47
2A2A4A18T3	Transformer, RF variable, 23 Mc/s 64,8 μ μF, Mfr. ELMER, P/N 666230-390	5-47
2A2A4A18T4	Transformer, RF variable, 18 Mc/s, 94,6 μ μF, Mfr. ELMER, P/N 666230-414	5-47
2A2A4A19	Tuning strip, 19 Mc/s, Mfr. ELMER, P/N 666230-303	5-33
2A2A4A19C1	As 2A2A4A3C1	5-48
2A2A4A19C2	Capacitor, fixed, mica, 48 μ μF, ± 1%, 500 VDC, P/N DM15E480F500V, Mfr. ELECTROMOTIVE, 552285-048	5-48
2A2A4A19C3	Capacitor, fixed, mica, 53 μ μF, ± 1%, 500 VDC, P/N DM15E530F500V, Mfr. ELECTROMOTIVE, 552285-053	5-48
2A2A4A19C4	As 2A2A4A14C2	5-48
2A2A4A19C5	As 2A2A4A8C2	5-48
2A2A4A19T1	Transformer, RF variable, 29 Mc/s, 50,4 μ μF, Mfr. ELMER, P/N 666230-341	5-48
2A2A4A19T2	Transformer, variable, RF, 29 Mc/s, 68,7 μ μF, Mfr. ELMER, P/N 666230-369	5-48
2A2A4A19T3	Transformer, RF variable, 24 Mc/s, 62,6 μ μF, Mfr. ELMER, P/N 666230-397	5-48
2A2A4A19T4	Transformer, RF variable, 19 Mc/s, 90,0 μ μF, Mfr. ELMER, P/N 666230-415	5-48

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A19Y1	Crystal, per MIL-C-3098B, 28,500 Mc/s, Mfr. Mc COY ELECT., P/N 666162-599	5-48
2A2A4A20	Tuning strip, 20 Mc/s, Mfr. ELMER, P/N 666230-304	5-33
2A2A4A20C1	Capacitor, fixed, mica, 9,1 μ μF, ± 5%, 500 VDC, P/N 552169-045, Mfr. STACKPOLE	5-49
2A2A4A20C4	As 2A2A4A15C2	5-49
2A2A4A20C5	As 2A2A4A10C3	5-49
2A2A4A20T1	Transformer, RF variable, 2 Mc/s 763,5 μ μF, Mfr. ELMER, P/N 666230-314	5-49
2A2A4A20T2	Transformer, RF variable, 2 Mc/s, 763,5 μ μF, Mfr. ELMER, P/N 666230-342	5-49
2A2A4A20T3	Transformer, RF variable, 25 Mc/s, 61,3 μ μF, Mfr. ELMER, P/N 666230-338	5-49
2A2A4A20T4	Transformer, RF variable, 20 Mc/s, 87,6 μ μF, Mfr. ELMER, P/N 666230-416	5-49
2A2A4A21	Tuning strip, 21 Mc/s, Mfr. ELMER, P/N 666230-305	5-33
2A2A4A21C1	Capacitor, fixed, mica, 6,2 μ μF, ± 5%, 500 VDC, P/N GA6,2-5%, Mfr. STACKPOLE 552169-041	5-50
2A2A4A21C2	Capacitor, fixed, mica, 1247 μ μF, ± ½%, 500 VDC, P/N DM20F1247D300V, Mfr. ELECTROMOTIVE, 810000-213	5-50
2A2A4A21C3	As 2A2A4A3C5	5-50
2A2A4A21C4	As 2A2A4A16C2	5-50
2A2A4A21C5	As 2A2A4A11C3	5-50

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A21T1	Transformer, RF variable, 3 Mc/s, 480,8 μ μF, Mfr. ELMER, P/N 666230-315	5-50
2A2A4A21T2	Transformer, RF variable, 3 Mc/s, 492,2 μ μF, Mfr. ELMER, P/N 666230-343	5-50
2A2A4A21T3	Transformer, RF variable, 26 Mc/s, 60,4 μ μF, Mfr. ELMER, P/N 666230-392	5-50
2A2A4A21T4	Transformer, RF variable, 21 Mc/s, 84,6 μ μF, Mfr. ELMER, P/N 666230-417	5-50
2A2A4A22	Tuning strip, 22 Mc/s, Mfr. ELMER, P/N 666230-306	5-32
2A2A4A22C1	Capacitor, fixed, mica, 5,6 μ μF, ± 5%, 500 VDC, P/N GA5,6-5%, Mfr. STACKPOLE 552169-040	5-39
2A2A4A22C2	Capacitor, fixed, mica, 623 μ μF, ± ½%, 300 VDC, P/N DM15F6230D300V, Mfr. ELECTROMOTIVE, 552282-623	5-39
2A2A4A22C3	As 2A2A4A4C5	5-39
2A2A4A22C4	As 2A2A4A17C2	5-39
2A2A4A22C5	As 2A2A4A12C3	5-39
2A2A4A22T1	Transformer, RF variable, 4 Mc/s, 354,2 μ μF, Mfr. ELMER, P/N 666230-316	5-39
2A2A4A22T2	Transformer, RF variable, 4 Mc/s, 369,9 μ μF, Mfr. ELMER, P/N 666230-344	5-39
2A2A4A22T3	Transformer, RF variable, 27 Mc/s, 59,7 μ μF, Mfr. ELMER, P/N 666230-393	5-39
2A2A4A22T4	Transformer, RF variable, 22 Mc/s 81,8 μ μF, Mfr. ELMER, P/N 666230-418	5-39
2A2A4A23	Tuning strip, 23 Mc/s, Mfr. ELMER, P/N 666230-307	5-32

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A23C1	Capacitor, fixed, mica, 5,1 μμF, ± 5%, 500 VDC, P/N GA5R1J500V, Mfr. STACKPOLE 552169-039	5-45
2A2A4A23C2	Capacitor, fixed, mica, 416 μμF, ± ½%, 300 VDC, P/N DM15F4160D300V, Mfr. ELECTROMOTIVE, 552282-416	5-45
2A2A4A23C3	As 2A2A4A5C5	5-45
2A2A4A23C4	As 2A2A3A18C2	5-45
2A2A4A23T1	Transformer, RF variable, 5 Mc/s, 281,5 μμF, Mfr. ELMER, P/N 666230-317	5-45
2A2A4A23T2	Transformer, RF variable, 5 Mc/s, 297,4 μμF, Mfr. ELMER, P/N 666230-345	5-45
2A2A4A23T3	Transformer, RF variable, 28 Mc/s, 58,9 μμF, Mfr. ELMER, P/N 666230-394	5-45
2A2A4A23T4	Transformer, RF variable, 23 Mc/s, 79,3 μμF, Mfr. ELMER, P/N 666230-419	5-45
2A2A4A24	Tuning strip, 24 Mc/s, Mfr. ELMER, P/N 666230-308	5-32
2A2A4A24C1	Capacitor, fixed, mica, 3,9 μμF, ± 5%, 500 VDC, P/N GA3R9J500V, Mfr. STACKPOLE, 552169-036	5-51
2A2A4A24C2	Capacitor, fixed, mica, 312 μμF, ± ½%, 500 VDC, P/N DM15F3120D500V, Mfr. ELECTROMOTIVE, 552282-312	5-51
2A2A4A24C3	As 2A2A4A6C5	5-51
2A2A4A24C4	As 2A2A4A19C2	5-51
2A2A4A24C5	As 2A2A4A14C3	5-51

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A24T1	Transformer, RF variable, 6 Mc/s, 232,5 μ μF, Mfr. ELMER, P/N 666230-318	5-51
2A2A4A24T2	Transformer, RF variable, 6 Mc/s, 250,6 μ μF, Mfr. ELMER, P/N 666230-346	5-51
2A2A4A24T3	Transformer, RF variable, 29 Mc/s, 57,3 μ μF, Mfr. ELMER, P/N 666230-395	5-51
2A2A4A24T4	Transformer, RF variable, 24 Mc/s, 77,0 μ μF, Mfr. ELMER, P/N 666230-420	5-51
2A2A4A25	Tuning strip, 25 Mc/s, Mfr. ELMER, P/N 666230-309	5-32
2A2A4A25C1	Capacitor, fixed, mica 3,3 μ μF, ± 5%, 500 VDC, P/N GA3R3J500V, Mfr. STACKPOLE, 552169-034	5-52
2A2A4A25C2	As 2A2A4A2C4	5-52
2A2A4A25C3	As 2A2A4A7C5	5-52
2A2A4A25C5	As 2A2A4A13C2	5-52
2A2A4A25T1	Transformer, RF variable, 7 Mc/s, 197,2 μ μF, Mfr. ELMER, P/N 666230-319	5-52
2A2A4A25T2	Transformer, RF variable, 7 Mc/s, 216,2 μ μF, Mfr. ELMER, P/N 666230-347	5-52
2A2A4A25T3	Transformer, RF variable, 2 Mc/s, 750,0 μ μF, Mfr. ELMER, P/N 666230-370	5-52
2A2A4A25T4	Transformer, RF variable, 25 Mc/s, 4,9 μ μF, Mfr. ELMER, P/N 666230-421	5-52
2A2A4A26	Tuning strip, 26 Mc/s, Mfr. ELMER, P/N 666230-310	5-32
2A2A4A26C1	As 2A2A6A2A4C12	5-54

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A26C2	As 2A2A4A3C4	5-54
2A2A4A26C3	As 2A2A4A8C5	5-54
2A2A4A26C4	As 2A2A4A21C2	5-54
2A2A4A26C5	As 2A2A4A16C3	5-54
2A2A4A26T1	Transformer, RF variable, 8 Mc/s, 171,7 μ μF, Mfr. ELMER, P/N 666230-320	5-54
2A2A4A26T2	Transformer, RF variable, 8 Mc/s, 191,1 μ μF, Mfr. ELMER, P/N 666230-348	5-54
2A2A4A26T3	Transformer, RF variable, 3 Mc/s, 474,0 μ μF, Mfr. ELMER, P/N 666230/371	5-54
2A2A4A26T4	Transformer, RF variable, 26 Mc/s, 72,9 μ μF, Mfr. ELMER, P/N 666230-422	5-54
2A2A4A27	Tuning strip, 27 Mc/s, Mfr. ELMER, P/N 666230-311	5-32
2A2A4A27C1	Capacitor, fixed, mica, 2,7 μ μF, ± 5%, 500 VDC, P/N GA2R7J500V, Mfr. STACKPOLE, 552169-032	5-51
2A2A4A27C2	As 2A2A4A4C4	5-51
2A2A4A27C3	As 2A2A4A9C5	5-51
2A2A4A27C4	As 2A2A4A22C2	5-51
2A2A4A27C5	As 2A2A4A17C3	5-51
2A2A4A27T1	Transformer, RF variable, 9 Mc/s, 151,7 μ μF, Mfr. ELMER, P/N 666230-321	5-51
2A2A4A27T2	Transformer, RF variable, 9 Mc/s, 173,3 μ μF, Mfr. ELMER, P/N 666230-349	5-51
2A2A4A27T3	Transformer, RF variable, 4 Mc/s, 350,0 μ μF, Mfr. ELMER, P/N 666230-372	5-51

(Cont'd)

6.2.6 - RF Amplifier 6.2.6 (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A27T4	Transformer, RF variable, 27 Mc/s, 71,0 μ μF, Mfr. ELMER, P/N 666230-423	5-51
2A2A4A28	Tuning strip, 28 Mc/s, Mfr. ELMER, P/N 666230-312	5-32
2A2A4A28C1	As 2A2A4A27C1	5-51
2A2A4A28C2	As 2A2A4A5C4	5-51
2A2A4A28C3	As 2A2A4A10C5	5-51
2A2A4A28C4	As 2A2A4A23C2	5-51
2A2A4A28C5	As 2A2A4A18C3	5-51
2A2A4A28T1	Transformer, RF variable, 10 Mc/s, 137,8 μ μF, Mfr. ELMER, P/N 666230-322	5-51
2A2A4A28T2	Transformer, RF variable, 10 Mc/s, 158,4 μ μF, Mfr. ELMER, P/N 666230-350	5-51
2A2A4A28T3	Transformer, RF variable, 5 Mc/s, 279 μ μF, Mfr. ELMER, P/N 666230-373	5-51
2A2A4A28T4	Transformer, RF variable, 28 Mc/s, 69,5 μ μF, Mfr. ELMER, P/N 666230-424	5-51
2A2A4A29	Tuning strip, 29 Mc/s, Mfr. ELMER, P/N 666230-313	5-32
2A2A4A29C1	Capacitor, fixed, mica, 2,4 μ μF, ± 5%, 500 VDC, P/N GA2R4J500V, Mfr. STACKPOLE, 552169-031	5-40
2A2A4A29C2	As 2A2A4A6C4	5-40
2A2A4A29C3	As 2A2A4A11C5	5-40
2A2A4A29C4	As 2A2A4A24C2	5-40
2A2A4A29C5	As 2A2A4A19C3	5-40

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A29T1	Transformer, RF variable, 11 Mc/s, 125,9 μ μF, Mfr. ELMER, P/N 666230-323	5-40
2A2A4A29T2	Transformer, RF variable, 11 Mc/s, 145,7 μ μF, Mfr. ELMER, P/N 666230-351	5-40
2A2A4A29T3	Transformer, RF variable, 6 Mc/s, 230,0 μ μF, Mfr. ELMER, P/N 666230-374	5-40
2A2A4A29T4	Transformer, RF variable, 29 Mc/s, 67,8 μ μF, Mfr. ELMER, P/N 666230-425	5-40
2A2A4A30C1	Capacitor, fixed, mica, 545 μ μF, ±½%, 300 VDC, P/N DM15F5450D300V, Mfr. ELECTROMOTIVE, 552282-545	5-57
2A2A4A30C2	Capacitor, fixed, mica, 426 μ μF, ± ½%, 300 VDC, P/N DM15F4260D300V, Mfr. ELECTROMOTIVE, 552282-426	5-57
2A2A4A30C3	Capacitor, fixed, mica, 332 μ μF, ± ½%, 500 VDC, P/N DM15F3320D500V, Mfr. ELECTROMOTIVE, 552282-332	5-57
2A2A4A30C4	Capacitor, fixed, mica, 257 μ μF, ± ½%, 500 VDC, P/N DM15F2570D500V, Mfr. ELECTROMOTIVE, 552282-257	5-57
2A2A4A30C5	Capacitor, fixed, mica, 195 μ μF, ± ½%, 500 VDC, P/N DM15F1950D500V, Mfr. ELECTROMOTIVE, 552282-195	5-57
2A2A4A30C6	Capacitor, fixed, mica, 143 μ μF, ± ½%, 500 VDC, P/N DM15F1430D500V, Mfr. ELECTROMOTIVE, 552282-143	5-57
2A2A4A30C7	Capacitor, fixed, mica, 99 μ μF, ± 1%, 500 VDC, P/N DM15F990F500V, Mfr. ELECTROMOTIVE, 552285-099	5-57

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A30C8	As 2A2A4A13C2	5-57
2A2A4A30C9	Capacitor, fixed, mica, 29 μ μF, ± 1%, 500 VDC, P/N DM15E290F500V, Mfr. ELECTROMOTIVE, 552285-029	5-57
2A2A4A30C10	Capacitor, fixed, mica, 253 μ μF, ± ½%, 500 VDC, P/N DM15F2530D500V, Mfr. ELECTROMOTIVE, 552285-029	5-57
2A2A4A30C10	Capacitor, fixed, mica, 253 μ μF, ± ½%, 500 VDC, P/N DM15F2530D500V, Mfr. ELECTROMOTIVE, 552282-253	5-57
2A2A4A30C11	Capacitor, fixed, mica, 219 μ μF, ± ½%, 500 VDC, P/N DM15F2190D500V, Mfr. ELECTROMOTIVE, 552282-219	5-57
2A2A4A30C12	Capacitor, fixed, mica, 190 μ μF, ± ½%, 500 VDC, P/N DM15F1900D500V, Mfr. ELECTROMOTIVE, 552282-190	5-57
2A2A4A30C13	Capacitor, fixed, mica, 165 μ μF, ± ½%, 500 VDC, P/N DM15F1650D500V, Mfr. ELECTROMOTIVE, 552282-165	5-57
2A2A4A30C14	Capacitor, fixed, mica, 144 μ μF, ± ½%, 500 VDC, P/N DM15F1400D500V, Mfr. ELECTROMOTIVE, 552282-144	5-57
2A2A4A30C15	Capacitor, fixed, mica, 125 μ μF, ± ½%, 500 VDC, P/N DM15F1250D500V, Mfr. ELECTROMOTIVE, 552282-125	5-57
2A2A4A30C16	Capacitor, fixed, mica, 109 μ μF, ± ½%, 500 VDC, P/N DM15F1090D500V, Mfr. ELECTROMOTIVE, 552282-109	5-57

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A30C17	Capacitor, fixed, mica, 95 $\mu\mu$F, ± 1%, 500 VDC, P/N DM15F950F500V, Mfr. ELECTROMOTIVE, 552285-095	5-57
2A2A4A30C18	Capacitor, fixed, mica, 83 $\mu\mu$F, ± 1%, 500 VDC, P/N DM15E830F500V, Mfr. ELECTROMOTIVE, 552285-083	5-57
2A2A4A30C19	Capacitor, fixed, mica, 74 $\mu\mu$F, ± 1%, 500 VDC, P/N DM15E740F500V, Mfr. ELECTROMOTIVE, 552285-074	5-57
2A2A4A31C1	As 2A2A4A2C4	5-55
2A2A4A31C2	Capacitor, fixed, mica, 215 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15E2150D500V, Mfr. ELECTROMOTIVE, 552282-215	5-55
2A2A4A31C3	Capacitor, fixed, mica, 183 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15F1830D500V, Mfr. ELECTROMOTIVE, 552282-183	5-55
2A2A4A31C4	Capacitor, fixed, mica, 153 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15F1530D500V, Mfr. ELECTROMOTIVE, 552282-153	5-55
2A2A4A31C5	Capacitor, fixed, mica, 124 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15F1240D500V, Mfr. ELECTROMOTIVE, 552282-124	5-55
2A2A4A31C6	As 2A2A4A6C3	5-55
2A2A4A31C7	Capacitor, fixed, mica, 70 $\mu\mu$F, ± 1%, 500 VDC, P/N DM15E700F500V, Mfr. ELECTROMOTIVE, 552285-070	5-55
2A2A4A31C8	Capacitor, fixed, mica, 45 $\mu\mu$F, ± 1%, 500 VDC, P/N DM15E450F500V, Mfr. ELECTROMOTIVE, 552285-045	5-55

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A31C9	Capacitor, fixed, mica, 22 μ μF, ± 1%, 500 VDC, P/N DM15C220F500V, Mfr. ELECTROMOTIVE, 552285-022	5-55
2A2A4A32C1	Capacitor, fixed, mica, 260 μ μF, ± ½%, 500 VDC, P/N DM15F2600D500V, Mfr. ELECTROMOTIVE, 552282-260	5-55
2A2A4A32C2	Capacitor, fixed, mica, 224 μ μF, ± ½%, 500 VDC, P/N DM15F2240D500V, Mfr. ELECTROMOTIVE, 552282-224	5-55
2A2A4A32C3	As 2A2A4A30C12	5-55
2A2A4A32C4	Capacitor, fixed, mica, 158 μ μF, ± ½%, 500 VDC, P/N DM15F1580D500V, Mfr. ELECTROMOTIVE, 552282-158	5-55
2A2A4A32C5	Capacitor, fixed, mica, 128 μ μF, ± ½%, 500 VDC, P/N DM15F1280D500V, Mfr. ELECTROMOTIVE, 552282-128	5-55
2A2A4A32C6	As 2A2A4A30C7	5-55
2A2A4A32C7	Capacitor, fixed, mica, 72 μ μF, ± 1%, 500 VDC, P/N DM15E720F500V, Mfr. ELECTROMOTIVE, 552285-072	5-55
2A2A4A32C8	Capacitor, fixed, mica, 47 μ μF, ± 1%, 500 VDC, P/N DM15R470F500V, Mfr. ELECTROMOTIVE, 552285-047	5-55
2A2A4A32C9	Capacitor, fixed, mica, 23 μ μF, ± 1%, 500 VDC, P/N DM15E230F500V, Mfr. ELECTROMOTIVE, 552285-023	5-55
2A2A4A33C1	Capacitor, fixed, mica, 517 μ μF, ± ½%, 300 VDC, P/N DM15F5170D300V, Mfr. ELECTROMOTIVE, 552282-517	5-56

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A33C2	Capacitor, fixed, mica, 405 μ μF, ± ½%, 300 VDC, P/N DM15F4050D300V, Mfr. ELECTROMOTIVE, 552282-405	5-56
2A2A4A33C3	Capacitor, fixed, mica, 316 μ μF, ± ½%, 500 VDC, P/N DM15F3160D500V, Mfr. ELECTROMOTIVE, 552282-316	5-56
2A2A4A33C4	Capacitor, fixed, mica, 245 μ μF, ± ½%, 500 VDC, P/N DM15F2450D500V, Mfr. ELECTROMOTIVE, 552282-245	5-56
2A2A4A33C5	Capacitor, fixed, mica, 186 μ μF, ± ½%, 500 VDC, P/N DM 15F1860D500V, Mfr. ELECTROMOTIVE, 552282-186	5-56
2A2A4A33C6	Capacitor, fixed, mica, 137 μ μF, ± ½%, 500 VDC, P/N DM15F1370D500V, Mfr. ELECTROMOTIVE, 552282-137	5-56
2A2A4A33C7	As 2A2A4A30C17	5-56
2A2A4A33C8	As 2A2A4A16C3	5-56
2A2A4A33C9	Capacitor, fixed, mica, 28 μ μF, ± 1%, 500 VDC, P/N DM15E280F500V, Mfr. ELECTROMOTIVE, 552285-028	5-56
2A2A4A33C10	As 2A2A4A30C4	5-56
2A2A4A33C11	Capacitor, fixed, mica, 222 μ μF, ± ½%, 500 VDC, P/N DM15F2220D500V, Mfr. ELECTROMOTIVE, 552282-222	5-56
2A2A4A33C12	Capacitor, fixed, mica, 193 μ μF, ± ½%, 500 VDC, P/N DM15F1930D500V, Mfr. ELECTROMOTIVE, 552282-193	5-56

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A33C13	Capacitor, fixed, mica, 167 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15F1670D500V, Mfr. ELECTROMOTIVE, 552282-167	5-56
2A2A4A33C14	As 2A2A4A11C5	5-56
2A2A4A33C15	Capacitor, fixed, mica, 127 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15F1270D500V, Mfr. ELECTROMOTIVE, 552282-127	5-56
2A2A4A33C16	Capacitor, fixed, mica, 110 $\mu\mu$F, ± ½%, 500 VDC, P/N DM15F1100D500V, Mfr. ELECTROMOTIVE, 552282-110	5-56
2A2A4A33C17	As 2A2A4A6C3	5-56
2A2A4A33C18	As 2A2A4A30C18	5-56
2A2A4A33C19	As 2A2A4A30C19	5-56
2A2A4A34C1	As 2A2A4A33C1	5-59
2A2A4A34C2	As 2A2A4A33C2	5-59
2A2A4A34C3	As 2A2A4A33C3	5-59
2A2A4A34C4	As 2A2A4A33C4	5-59
2A2A4A34C5	As 2A2A4A33C5	5-59
2A2A4A34C6	As 2A2A4A33C6	5-59
2A2A4A34C7	As 2A2A4A33C17	5-59
2A2A4A34C8	As 2A2A4A16C3	5-59
2A2A4A34C9	As 2A2A4A33C9	5-59
2A2A4A34C10	As 2A2A4A30C4	5-59
2A2A4A34C11	As 2A2A4A33C11	5-59
2A2A4A34C12	As 2A2A4A33C12	5-59
2A2A4A34C13	As 2A2A4A33C13	5-59

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A34C14	As 2A2A4A11C5	5-59
2A2A4A34C15	As 2A2A4A33C15	5-59
2A2A4A34C16	As 2A2A4A33C16	5-59
2A2A4A34C17	As 2A2A4A6C3	5-59
2A2A4A34C18	As 2A2A4A30C18	5-59
2A2A4A34C19	As 2A2A4A30C19	5-59
2A2A4A34C1	As 2A2A4A32C1	5-55
2A2A4A35C2	As 2A2A4A32C2	5-55
2A2A4A35C3	As 2A2A4A30C12	5-55
2A2A4A35C4	As 2A2A4A32C4	5-55
2A2A4A35C5	As 2A2A4A32C5	5-55
2A2A4A35C6	As 2A2A4A30C7	5-55
2A2A4A35C7	As 2A2A4A32C7	5-55
2A2A4A35C8	As 2A2A4A32C8	5-55
2A2A4A35C9	As 2A2A4A32C9	5-55
2A2A4A36C1	As 2A2A4A32C1	5-55
2A2A4A36C2	As 2A2A4A32C2	5-55
2A2A4A36C3	As 2A2A4A30C12	5-55
2A2A4A36C4	As 2A2A4A32C4	5-55
2A2A4A36C5	As 2A2A4A32C5	5-55
2A2A4A36C6	As 2A2A4A30C7	5-55
2A2A4A36C7	As 2A2A4A32C7	5-55
2A2A4A36C8	As 2A2A4A32C8	5-55
2A2A4A36C9	As 2A2A4A32C9	5-55

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A37C1	As 2A2A4A33C1	5-58
2A2A4A37C2	As 2A2A4A33C2	5-58
2A2A4A37C3	As 2A2A4A33C3	5-58
2A2A4A37C4	As 2A2A4A33C4	5-58
2A2A4A37C5	As 2A2A4A33C5	5-58
2A2A4A37C6	As 2A2A4A33C6	5-58
2A2A4A37C7	As 2A2A4A30C17	5-58
2A2A4A37C8	As 2A2A4A16C3	5-58
2A2A4A37C9	As 2A2A4A33C9	5-58
2A2A4A37C10	As 2A2A4A30C4	5-58
2A2A4A37C11	As 2A2A4A33C11	5-58
2A2A4A37C12	As 2A2A4A33C12	5-58
2A2A4A37C13	As 2A2A4A33C13	5-58
2A2A4A37C14	As 2A2A3A11C5	5-58
2A2A4A37C15	As 2A2A4A33C15	5-58
2A2A4A37C16	As 2A2A4A33C16	5-58
2A2A4A37C17	As 2A2A4A6C3	5-58
2A2A4A37C18	As 2A2A4A30C18	5-58
2A2A4A37C19	As 2A2A4A30C19	5-58
2A2A4A38C1	As 2A2A4C1	5-37
2A2A4A38C2	As 2A2A4C1	5-37
2A2A4A38C3	As 2A2A2A2C26	5-37
2A2A4A38C4	As 2A2A2A2C26	5-37

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A38C5	Capacitor, fixed, ceramic, per MIL-C-11015, 2,220 μ μF, ± 10%, 200 VDC, P/N CK06CW222K, Mfr. ERIE, 698103-222	5-37
2A2A4A38C6	As 2A2A4C1	5-37
2A2A4A38K1	As 2A2A4K1	5-37
2A2A4A38L1	Inductor, RF, iron core, 240 μH, ± 5%, 790 Mc/s, Mfr. 99800; P/N 1537-94, DELEVAN, 698010-094	5-37
2A2A4A38Q1	Transistor, type 2N3127, (SELECTED), MOTOROLA, 810000-659	5-37
2A2A4A38Q2	Transistor, per MIL-S-19500/87, type 2N1142, Mfr. MOTOROLA, 555223-142	5-37
2A2A4A38R1	As 2A2A4R2	5-37
2A2A4A38R2	As 2A2A2A1R13	5-37
2A2A4A38R3	Resistor, per MIL-R-11, 13 Kohm, ± 5%, 1/4 W, type RC07GF-133J, Mfr. A. BRADLEY, 697344-133	5-37
2A2A4A38R5	As 2A2A2A1R13	5-37
2A2A4A38R6	Resistor, per MIL-R-11, 470 ohm, ± 5%, 1/4 W, type RC07GF471J, Mfr. A. BRADLEY, 697344-471	5-37
2A2A4A38R7	Resistor, per MIL-R-11, 12000 ohm, ± 5%, 1/4 W, type RC07GF123J, Mfr. A. BRADLEY, 697344-123	5-37

(Cont'd)

6.2.6 - RF Amplifier (2A2A4) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A4A38R8	As 2A2A2A1R13	5-37
2A2A4A38R9	As 2A2A1A4R199	5-37
2A2A4A38R10	As 2A2A1A4R73	5-37

6.2.7 - **Frequency Standard Generator (2A2A5)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A5	Frequency Standard Generator, Mfr. ELMER, P/N 666231-006	5-15
2A2A5C1	Capacitor, variable, per NIL-C-14409B, 1 - 28 $\mu\mu$F, 1000 VDC, P/N VCJ711, LFD, 666163-260	5-58
2A2A5P1	Connector, plug, 7 pin contacts, and 6 coax, P/N DCM13W6PC-31-F115, Mfr. CANNON, 555146-433	5-58
2A2A5RT1	Thermistor, 2000, ± 20%, 25°C, P/N 20503-1220-81-537, Mfr. KEYSTONE CARBON, 666163-054	5-58
2A2A5Q1	Transistor, type 2N1117/A, Mfr. RCA, 555223-117	5-58
2A2A5R1	Resistor, fixed, wirewound, per MIL-R-26C, P/N RS-1/2-270, RS-1/2-255, RS-1/2-240, RS-1/2,360, RS-1/2-285, RS-1/2-345, RS-1/2 330, RS-1/2-315, RS-1/2-300, MFR. DALE, 666163-/^{xx} (SUITABLE VALUE)	5-58
2A2A5S1	Switch, rotary, 3 positions, 2 amp. 28 VDC, Mfr. OAK, P/N 666163-057	5-58
2A2A5A1CR1	As 2A2A1A4CR13	5-58
2A2A5A1CR2	As 2A2A1A4CR13	5-62
2A2A5A1C1	Capacitor, fixed, ceramic, 0,005 μF, ± 20%, 75 VDC, P/N SSM-005-35, Mfr. GLENCO, 666163-276	5-62
2A2A5A1C2	Capacitor, fixed, metalized paper, 0,1 μF, ± 20%, 500 VDC, P/N T2901, Mfr. HOPKINS, 666164-916	5-62

(Cont'd)

6.2.7 - Frequency Standard Generator (2A2A5) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A5A1C3	As 2A2A5A1C2	5-62
2A2A5A1C4	As 2A2A5A1C1	5-62
2A2A5A1C5	Capacitor, fixed, ceramic, 681 μ μF, ± 1%, 300 VDC, P/N DM15F681G300V, Mfr. ELECTROMOTIVE, 552285-681	5-62
2A2A5A1C6	Capacitor, fixed, mica, 330 μ μF, ± 2%, 300 VDC, P/N DM15E331G300V, Mfr. ELECTROMOTIVE, 694694-381	5-62
2A2A5A1C7	Capacitor, fixed, ceramic, 47 μ μF, ± 5%, 75 VDC, P/N MINU47J, Mfr. GLENCO, 552145-470	5-62
2A2A5A1C8	As 2A2A4C1	5-62
2A2A5A1C9	Capacitor, fixed, ceramic, 0,01 μF, 100% - 20%, P/N K4000N-01Z, Mfr. GLENCO 552136-103	5-62
2A2A5A1C10	Capacitor, fixed, metalized paper, 0,007 μF, ± 20%, 200 VDC, P/N T2900-6 Mfr. HOPKINS, 666164-915	5-62
2A2A5A1C11	Capacitor, fixed, mica, 510 μ μF, ± 2%, P/N DM15E411G300V, Mfr. ELECTROMOTIVE, 694694-511	5-62
2A2A5A1C12	Capacitor, fixed, ceramic, 100 μ μF, ± 5%, 75 VDC, P/N MINU100J, Mfr. GLENCO, 552145-101	5-62
2A2A5A1C13	As 2A2A5A1C9	5-62
2A2A5A1C14	As 2A2A5A1C2	5-62
2A2A5A1C15	As 2A2A5A1C9	5-62

(Cont'd)

6.2.7 - Frequency Standard Generator (2A2A5) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A5A1C16	Capacitor, fixed, mica, 220 μ μF, ± 2%, VDC, P/N DM15E221G300V, Mfr. ELECTROMOTIVE, 694694-221	5-62
2A2A5A1C17	As 2A2A5A1C9	5-62
2A2A5A1C18	As 2A2A5A1C9	5-62
2A2A5A1C19	As 2A2A5A1C9	5-62
2A2A5A1C20	As 2A2A4C1	5-62
2A2A5A1C21	As 2A2A4C1	5-62
2A2A5A1C22	As 2A2A4C1	5-62
2A2A5A1C23	Capacitor, fixed, mica, 160 μ μF, ± 2%, 300 VDC, P/N DM15E161G300V, Mfr. ELECTROMOTIVE, 694694-161	5-62
2A2A5A1C24	As 2A2A5A1C9	5-62
2A2A5A1C25	Capacitor, fixed, ceramic, 0,001 μF, ± 20%, 75 VDC, P/N K1200M-001M, Mfr. GLENCO, 552137-102	5-62
2A2A5A1C26	As 2A2A4C1	5-62
2A2A5A1DS1	Lamp, filament, 10V 35 mA, Mfr. SYLVANIA LIGHTING, 555054-121	5-62
2A2A5A1L1	Inductor, RF, 39 μH, ± 10%, P/N 1537-746, Mfr. JEFFERS, GD694031-040	5-62
2A2A5A1L2	Inductor, RF, 1500 μH, ± 10%, P/N 1537-746, Mfr. DELEVAN, GD696011-153	5-62
2A2A5A1Q1	Transistor, type 2N1225 (SELECTED) Mfr. RCA, 810000-628	5-62
2A2A5A1Q2	As 2A2A5A1Q1	5-62

(Cont'd)

6.2.7 - Frequency Standard Generator (2A2A5) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A5A1Q3	As 2A2A5A1Q3	5-62
2A2A5A1Q4	As 2A2A1A4Q6	5-62
2A2A5A1Q5	As 2A2A1A4Q6	5-62
2A2A5A1Q6	Transformer, type 2N332, T.I. 555221-232	5-62
2A2A5A1Q7	As 2A2A1A4Q6	5-62
2A2A5A1R1	As 2A2A1A3R15	5-62
2A2A5A1R2	As 2A2R5	5-62
2A2A5A1R3	As 2A2A1A1R21	5-62
2A2A5A1R4	Resistor, per MIL-R-11, 220 ohm, ± 5%, 1/4 W, type RC07GF221J, Mfr. A. BRADLEY, 697344-221	5-62
2A2A5A1R5	Resistor, per MIL-R-11, 300 ohm, ± 5%, 1/4 W, type RC07GF331J, Mfr. A. BRADLEY, 697344-331	5-62
2A2A5A1R6	As 2A2A1A4R117	5-62
2A2A5A1R7	As 2A2A5	5-62
2A2A5A1R8	As 2A2A1A4R73	5-62
2A2A5A1R9	Resistor, per MIL-R-11, 39 Kohm, ± 5%, 1/4 W, type RC07GF393J, Mfr. A. BRADLEY, 697344-393	5-62
2A2A5A1R10	Resistor, per MIL-R-11, 1200 ohm, ± 5%, 1/4 W, type RC07GF393J, Mfr. A. BRADLEY, 697344-393	5-62
2A2A5A1R11	As 2A2R5	5-62
2A2A4A1R12	As 2A2A1A3R15	5-62

(Cont'd)

6.2.7 - Frequency Standard Generator (2A2A5) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A5A1R13	Resistor, per MIL-R-11, 56 K, ± 5%, 1/4W type RC07GF563J, Mfr. A. BRADLEY, 697344-563	5-62
2A2A5A1R14	Resistor, per MIL-R-11, 24 Kohm, ± 5%, 1/4 W, type RC07GF243J, Mfr. A. BRADLEY, 697344-243	5-62
2A2A5A1R15	As 2A2A1A3R16	5-62
2A2A5A1R16	As 2A2A1A3R16	5-62
2A2A5A1R17	As 2A2A1A1R21	5-62
2A2A5A1R18	Resistor, per MIL-R-11, 47 ohm, ± 5%, 1/4 W, type RC07GF470J, Mfr. A. BRADLEY, 697344-470	5-62
2A2A5A1R19	Resistor, per MIL-R-11, 15 Kohm, ± 5%, 1/4 W, type RC07GF153J, Mfr. A. BRADLEY, 697344-153	5-62
2A2A5A1R20	Resistor, per MIL-R-11, 1500 ohm, ± 5%, 1/4 W, type RC07GF152J, Mfr. A. BRADLEY, 697344-152	5-62
2A2A5A1R21	As 2A2R5	5-62
2A2A5A1R22	Resistor, variable, per MIL-R-27208, 500 ohm, ± 5%, 1W, P/N 3250W-1-501, Mfr. BOURNS, 554650-501	5-62
2A2A5A1R23	As 2A2A5A1R18	5-62
2A2A5A1R24	As 2A2A1A1R32	5-62
2A2A5A1R25	As 2A2A1A1R22	5-62
2A2A5A1R26	As 2A2A1A1R31	5-62
2A2A5A1R27	As 2A2A1A4R117	5-62

(Cont'd)

6.2.7 - Frequency Standard Generator (2A2A5) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A5A1R28	As 2A2A5A1R4	5-62
2A2A5A1R29	As 2A2R5	5-62
2A2A5A1R30	As 2A2R5	5-62
2A2A5A1R31	As 2A2A1A3R15	5-62
2A2A5A1T1	Transformer, RF, 500 Kc/s, Mfr. ELMER, P/N 666163-067	5-62
2A2A5A1T2	Transformer, RF, 4 Mc/s, Mfr. ELMER, P/N 666163-066	5-62
2A2A5A1T3	Transformer, RF, 1 Mc/s, Mfr. ELMER, P/N 666163-065	5-62
2A2A5A1T4	Transformer, RF, 10 Mc/s, Mfr. ELMER, P/N 666163-064	5-62
2A2A5A1T5	Transformer, RF, 2 Mc/s, Mfr. ELMER, P/N 666163-063	5-62
2A2A5A1T6	Transformer, RF, 5 Mc/s, Mfr. ELMER, P/N 666163-062	5-62
2A2A5A2CR1	Diode, semiconductor, type 1N969B, Mfr. SGS, 555080-169	5-63
2A2A5A2CR2	As 2A2A1A4CR1	5-63
2A2A5A2CR3	Diode, semiconductor, type 1N75A, Mfr. SGS, 555294-155	5-63
2A2A5A2CR4	As 2A2A5A2CR3	5-63
2A2A5A2C1	Capacitor, fixed, electrolytic, 3,3 μF, ± 20%, 15 VDC, P/N 150D335X0015A2, Mfr. SPRAGUE, 691621-335	5-63
2A2A5A2C2	As 2A2C2	5-63
2A2A5A2C3	As 2A2A5A2C1	5-63

(Cont'd)

6.2.7 - *Frequency Standard Generator (2A2A5) (Cont'd)*

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A5A2C4	As 2A2A5A2C1	5-63
2A2A5A2C5	As 2A2A6A3A3C53	5-63
2A2A5A2C6	As 2A2A5A2C5	5-63
2A2A5A2C12	As 2A2A4C1	5-63
2A2A5A2C13	As 2A2A4C1	5-63
2A2A5A2C40	As 2A2A4C1	5-63
2A2A5A2Q1	Transistor, type 2M388, Mfr. R.C.A., 666163-379	5-63
2A2A5A2Q2	As 2A2A5A2Q1	5-63
2A2A5A2Q3	Transistor, type 2N333, T.I.I, 666163-377	5-63
2A2A5A2Q6	As 2A2A1A4Q6	5-63
2A2A5A2RT2	Thermistor, 2,5 ohm, ± 10%, 25°C P/N 13-E3, RL4003-15, 6-73-57, Mfr. KEYSTONE CARBON, 810000-627	5-63
2A2A5A2R1	As 2A2A6A2A2R2	5-63
2A2A5A2R2	As 2A2A6A2A2R2	5-63
2A2A5A2R3	Resistor, per MIL-R-11, 120 ohm, ± 5%, 1/4 W, type RC07GF121J, Mfr. A. BRADLEY, 697344-121	5-63
2A2A5A2R4	As 2A2A2A1R4	5-63
2A2A5A2R6	As 2A2A2A1R4	5-63
2A2A5A2R7	Resistor, per MIL-R-11, 43 ohm, ± 5%, 1/4 W, type RC07GF430J, Mfr. A. BRADLEY, 697344-430	5-63
2A2A5A2R8	As 2A2A5A1R19	5-63

(Cont'd)

6.2.7 - Frequency Standard Generator (2A2A5) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A5A2R9	As 2A2A1A4R103	5-63
2A2A5A2R10	As 2A2A6A2A2R2	5-63
2A2A5A2R11	As 2A2A1A3R15	5-63
2A2A5A2R12	As 2A2A5A1R20	5-63
2A2A5A2R17	As 2A2A1A4R73	5-63
2A2A5A2R8	Resistor, fixed, composition, per MIL-R-11, 27 ohm, ± 5%, 1/4 W, Mfr. A. BRADLEY, 697344-270	5-63
2A2A5A2T1	Transformer, RF, 18 Kc/s, P/N S-71057, Mfr. BURNELL, 666163-056	5-63
2A2A5A2T3	Transformer, RF, 2 Mc/s, Mfr. ELMER, P/N 666163-068, 909000-399	5-63
2A2A5A3CR5	As 2A2A1A4CR13	5-64
2A2A5A3CR6	As 2A2A1A4CR13	5-64
2A2A5A3C7	Capacitor, fixed, ceramic, 68 μ μF, ± 5%, 75 VDC, P/N GTC-75-R-68J, Mfr. GLENCO, 666163-053	5-64
2A2A5A3C8	Capacitor, fixed, ceramic, 4700 μ μF, ± 20%, 200 VDC, P/N CK06CW472-M, 698104-472, Mfr. ERIE	5-64
2A2A5A3C9	As 2A2A5A2C1	5-64
2A2A5A3C10	Capacitor, mica, type: DM15E330C300V, DM15E470C300V, DM15E560C300V, DM15E620C300V, DM15E680C300V, DM15E750C300V, DM15E820C300V, Mfr. ELECTROMOTIVE, 694694/xx (SUITABLE VALUE)	5-64
2A2A5A3Q5	As 2A2A1A4Q6	5-64

(Cont'd)

6.2.7 - Frequency Standard Generator (2A2A5) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A5A3R14	Resistor, per MIL-R-11, 270 ohm, ± 5%, 1/4 W, type RC07GF271J, Mfr. A. BRADLEY, 697344-271	5-64
2A2A5A3R15	Resistor, per MIL-R-11, 22 ohm, ± 5%, 1/4 W, type RC20GF220J, Mfr. A. BRADLEY, 689000-220	5-64
2A2A5A3R16	As 2A2A2A1R4	5-64
2A2A5A3T2	Transformer, RF, 5 Mc/s, Mfr. ELMER, 666163-048, 809000-392	5-64
2A2A5A3Y1	Crystal, 5 Mc/s, ± 0,001%, Mfr. ROGERS, ELEC., P/N 666163-049	5-64

6.2.8 - **Translator/Synthesizer (2A2A6)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6	Translator/Synthesizer, Mfr. ELMER, A00023-001	5-65
2A2A6C1	Capacitor, fixed, electrolytic, 47 μF, ± 20%, 35 V, CS13AF470M, Mfr. CDE, 696184-470	5-65
2A2A6J4	As 2A2A6C1	5-65
2A2A6J4	Connector, receptacle, 15 pin contacts and 2 coax, P/N DBMF-17W2S2C31, Mfr. CANNON, 555146-572	5-65
2A2A6J5	As 2A2J16	5-65
2A2A5J6	As 2A2J17	5-65
2A2A6P1	As 2A2A2P1	5-65
2A2A6P2	As 2A2J22	5-65
2A2A6P3	As 2A2J22	5-65
2A2A6P11	Connector, L-bend, 1 coax, type CRIMP, P/N 5754, Mfr. SEALECTRO, 559998-410	
2A2A6P12	As 2A2A6P11	5-65
2A2A6P13	Connector, 1 contact, type "CRIMP", Mfr. MICON ELECTR. P/N 9246, 559998-299	5-65
2A2A6P14	As 2A2A6P11	5-65
2A2A6P16	As 2A2A6P11	5-65
2A2A6P17	As 2A2A6P11	5-65
2A2A6P18	As 2A2A6P11	5-65
2A2A6P19	Connector, L-bend, 1 coax, type "CRIMP" P/N 5561, Mfr. SEALECTRO, 559998-093	5-65

(Cont'd)

6.2.8 - Translator/Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6P21	As 2A2A6P19	5-65
2A2A6P22	As 2A2A6P11	5-65
2A2A6P23	As 2A2A6P14	5-65
2A2A6P24	As 2A2A6P11	5-65
2A2A6P25	As 2A2A6P11	5-65

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1	Synthesizer, 1 Mc/s, Mfr. ELMER, P/N 666230-767	5-15
2A2A6A1B1	Motor DC, per MIL-M-86094, 0,5 A, 26 VDC P/N 128A100, Mfr. GLOBE, 666163-435	5-66
2A2A6A1C1	Capacitor, fixed, mica, 1300 $\mu\mu$F, ± 2%, 500 VDC, P/N DM19F132G500V, Mfr. ELECTROMOTIVE, 695188-132	5-67
2A2A6A1C2	Capacitor, fixed, mica, 1000 $\mu\mu$F, ± 2%, 500 VDC, P/N DM19F102G500V, Mfr. ELECTROMOTIVE, 695188-102	5-67
2A2A6A1C3	Capacitor, fixed, mica, 820 pF, ± 2%, 300 VDC, P/N DM15E821G300V, Mfr. ELECTROMOTIVE, 694694-821	5-66
2A2A6A1C4	Capacitor, fixed, mica, 680 $\mu\mu$F, ± 2%, 300 VDC, P/N DM15E681G300V, Mfr. ELECTROMOTIVE, 694694-681	5-66
2A2A6A1C5	Capacitor, fixed, mica, 501 $\mu\mu$F, ± 1%, 300 VDC, P/N DM15F501G300V, Mfr. ELECTROMOTIVE, 552285-501	5-67
2A2A6A1C6	Capacitor, fixed, mica, 430 $\mu\mu$F, ± 2%, 300 VDC, P/N DM15E431G300V, Mfr. ELECTROMOTIVE, 694694-431	5-67
2A2A6A1C7	Capacitor, fixed, mica, 360 $\mu\mu$F, ± 2%, 300 VDC, P/N DM15E361G300V, Mfr. ELECTROMOTIVE, 694694-361	5-67
2A2A6A1C8	As 2A2A1C11	5-67
2A2A6A1C9	Capacitor, fixed, mica, 270 $\mu\mu$F, ± 2%, 300 VDC, P/N DM15E271G300V, Mfr. ELECTROMOTIVE	5-66

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1C10	Capacitor, fixed, mica, 240 μ μF, ± 2%, 300 VDC, P/N DM15E241G300V, Mfr. ELECTROMOTIVE,	5-66
2A2A6A1C11	Capacitor, fixed, mica, 200 μ μF, ± 2%, 300 VDC, P/N DM15E201G300V, Mfr. ELECTROMOTIVE, 694694-201	5-66
2A2A6A1C12	Capacitor, fixed, mica, 180 μ μF, ± 2%, 300 VDC, P/N DM15E181G300V, Mfr. ELECTROMOTIVE, 694694-181	5-66
2A2A6A1C13	As 2A2A5A1C23	5-66
2A2A6A1C14	As 2A2A5A1C23	5-66
2A2A6A1C15	Capacitor, fixed, mica, 115 μ μF, ± 1%, 500 VDC, P/N DM15F115F500V, Mfr. ELECTROMOTIVE, 552285-115	5-66
2A2A6A1C16	Capacitor, fixed, mica, 110 μ μF, ± 2%, 300 VDC, P/N DM15E111G300V, Mfr. ELECTROMOTIVE, 694694-111	5-66
2A2A6A1C17	Capacitor, fixed, mica, 75 pF, ± 2%, 300 VDC, P/N DM15E750G300V, Mfr. ELECTROMOTIVE, 694694-750	5-66
2A2A6A1C18	As 2A2A4C1	5-66
2A2A6A1C19	Capacitor, electrolytic, 6,8 μF, ± 20%, 35 VDC, P/N 150D685X0035VZ, Mfr. SPRAGUE, 696124-685	5-66
2A2A6A1K1	As 2A2A4K1	5-67
2A2A6A1L1	Inductor, RF, 1000 μH, ± 10%, P/N 1537-744, Mfr. DELEVAN, GD696011-103	5-67

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1L2	As 2A2A6A1L1	5-66
2A2A6A1P1	Connector, plug, 15 pin contacts, and 2 coax, P/N DBM17W2PC-31, Mfr. CANNON 555146-022	5-67
2A2A6A1Y1	Crystal, per MIL-C-3098-C, 2499,850 Kc/s, Mfr. Mc COY ELECTRIC. P/N 810000-393	5-67
2A2A6A1Y2	Crystal, per MIL-C-3098-C, 3499-720 Kc/s, Mfr. Mc COY ELECTRIC. P/N 810000-394	5-67
2A2A6A1Y3	Crystal, per MIL-C-3098-C, 4499-640 Kc/s, Mfr. Mc COY ELECTRIC. P/N 810000-395	5-66
2A2A6A1Y4	Crystal, per MIL-C-3098-C, 5499-56 Kc/s, Mfr. Mc COY ELECTRIC. P/N 810000-396	5-66
2A2A6A1Y5	Crystal, per MIL-C-3098-C, 7499,4 Kc/s Mfr. Mc COY ELECTRIC., P/N 810000-397	5-67
2A2A6A1Y6	Crystal, per MIL-C-3098-C, 8499,32 Kc/s, Mfr. Mc COY ELECTRIC. P/N 810000-398	5-67
2A2A6A1Y7	Crystal, per MIL-C-3098-C, 9499,24 Kc/s, Mfr. Mc COY ELECTRIC., P/N 81000-399	5-67
2A2A6A1Y8	Crystal, per MIL-C-3098-C, 10499,16 Kc/s, Mfr. Mc COY ELECTRIC., P/N 810000-400	5-67

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1Y9	Crystal, per MIL-C-3098-C, 11499 Kc/s Mfr. Mc COY ELECTRIC., P/N 810000-401	5-67
2A2A6A1Y10	Crystal, per MIL-C-3098-C, 12499 Kc/s, Mfr. Mc COY ELECTRIC, P/N 810000-402	5-67
2A2A6A1Y11	Crystal, per MIL-C-3098-C, 1448,84 Kc/s, Mfr. Mc COY ELECTRIC., P/N 810000-403	5-66
2A2A6A1Y12	Crystal, per MIL-C-3098,-C, 15498,76 Kc/s, Mfr. Mc COY ELECTRIC., P/N 810000-404	5-66
2A2A6A1Y13	Crystal, per MIL-C-3098-C, 16498,68 Kc/s, Mfr. Mc COY ELECTRIC., P/N 810000-405	5-66
2A2A6A1Y14	Crystal, per MIL-C-3098-C, 17498 Kc/s, Mfr. Mc COY ELECTRIC., P/N 810000-406	5-66
2A2A6A1Y15	Crystal per MIL-C-3098-C, 19498,44 Kc/s, Mfr. Mc COY ELECTRIC., P/N 810000-407	5-66
2A2A6A1Y16	Crystal, per MIL-C-3098-C, 20498,36 Kc/s, Mfr. Mc COY ELECTRIC, P/N 810000-408	5-66
2A2A6A1Y17	Crystal, per MIL-C-3098-C, 23498,12 Kc/s, Mfr. Mc COY ELECTRIC., P/N 810000409	5-66
2A2A6A1A1CR1	As 2A2A1A4CR13	5-68

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1A1CR2	As 2A2A1A4CR13	5-68
2A2A6A1A1C43	Diode, semiconductor, VARICAP, P/N V-56EB, Mfr. HUGHES, 666163-420	5-68
2A2A6A1A1C18	Capacitor, fixed, ceramic, 0,01 μF, 100 VDC, P/N C80R-01-GMV, Mfr. AEROVOX, 666163-438	5-68
2A2A6A1A1C19	As 2A2A6A1A1C18	5-68
2A2A6A1A1C20	As 2A2A6A1A1C18	5-68
2A2A6A1A1C21	Capacitor, fixed, ceramic, 82 μμF, ± 2%, 500 VDC, P/N 301-N5600-82-2, Mfr. ERIE, 810000-557	5-68
2A2A6A1A1C23	As 2A2A6A1A1C18	5-68
2A2A6A1A1C24	Capacitor, fixed, ceramic, 430 μ μF, ± 2%, 500 VDC, P/N 301-N5600-430-2, Mfr. ERIE, 810000-558	5-68
2A2A6A1A1C25	As 2A2A6A1A1C18	5-68
2A2A6A1A1C26	As 2A2A6A1A1C18	5-68
2A2A6A1A1C27	As 2A2A6A1A1C18	5-68
2A2A6A1A1C28	As 2A2A6A1A1C18	5-68
2A2A6A1A1L1	As 2A2A6A1L1	5-68
2A2A6A1A1L2	Inductor, RF, 43 MHz, 22,0 μH, P/N 810000-527, DELEVAN	5-68
2A2A6A1A1L3	As 2A2A6A1A1L2	5-68
2A2A6A1A1Q1	Transistor, type 2N2708, R.C.A., 555245-108	5-68
2A2A6A1A1Q2	As 2A2A6A1A1Q1	5-68

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1A1Q3	As 2A2A6A1A1Q1	5-68
2A2A6A1A1Q4	As 2A2A6A1A1Q1	5-68
2A2A6A1A1RT1	Thermistor, 397,5 ohm, ± 10%, 25°C, P/N RL2012-248-73-S3, Mfr. KEYSTONE, 810000-522	5-68
2A2A6A1A1R1	Resistor, per MIL-R-11, 220 Kohm, ± 5%, 1/4 W, type RC07GF224J, Mfr. A. BRADLEY, 697344-224	5-68
2A2A6A1A1R2	Resistor, per MIL-R-11, 470 Kohm, ± 5%, 1/4 W, type RC07GF474J, Mfr. A. BRADLEY, 697344-474	5-68
2A2A6A1A1R3	Resistor, per MIL-R-11, 13 Kohm, ± 5%, 1/4 W, type RC07GF133J, Mfr. A. BRADLEY, 697344-133	5-68
2A2A6A1A1R4	As 2A2A1A4R95	5-68
2A2A6A1A1R5	As 2A2A6A1A1R3	5-68
2A2A6A1A1R6	Resistor, per MIL-R-11, 390 ohm, ± 5%, 1/4 W, type RC07GF391J, Mfr. A. BRADLEY, 697344-391	5-68
2A2A6A1A1R7	As 2A2A1A4R73	5-68
2A2A6A1A1R8	As 2A2A5A1R19	5-68
2A2A6A1A1R9	Resistor, per MIL-R-11, 10 ohm, ± 5%, 1/4 W, type RC07GF100J, Mfr. A. BRADLEY 697344-100	5-68
2A2A6A1A1R10	As 2A2A1A4R119	5-68
2A2A6A1A1R11	As 2A2A2A1R9	5-68
2A2A6A1A1R12	Resistor, per MIL-R-11, 910 ohm, ±5%, 1/4W, type RC07GF911J, Mfr. A. BRADLEY, 697344-911	5-68

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1A1R13	Resistor, per MIL-R-11, 10 Kohm, ± 5%, 1/4 W, type RC07GF103J, Mfr. A. BRADLEY, 697344-103	5-68
2A2A6A1A1R14	Resistor, per MIL-R-11, 620 ohm, ± 5%, 1/4 W, type RC07GF621J, Mfr. A. BRADLEY, 697344-621	5-68
2A2A6A1A1R15	Resistor, per MIL-R-11, 2200 ohm, ± 5%, 1/4 W, type RC07GF222J, Mfr. A. BRADLEY, 697344-222	5-68
2A2A6A1A1R16	As 2A2A1A4R119	5-68
2A2A6A1A1R17	As 2A2A5A1R4	5-68
2A2A6A1A1R18	As 2A2A5A1R18	5-68
2A2A6A1A2CR1	As 2A2A1A4CR11	5-68
2A2A6A1A2C1	As 2A2A4C1	5-68
2A2A6A1A2C2	As 2A2A4C1	5-69
2A2A6A1A2C3	Capacitor, fixed, mica, 620 $\mu\mu$F, ± 2%, 300 VDC, P/N DM15E621G300V, ELECTROMOTIVE, 694694-621	5-69
2A2A6A1A2C4	As 2A2A4C1	5-69
2A2A6A1A2C5	As 2A2A4C1	5-69
2A2A6A1A2C6	As 2A2A6A1A2C3	5-69
2A2A6A1A2C7	Capacitor, fixed, mica, 1000 $\mu\mu$F, ± 5%, 500 VDC, P/N DM20E102J500V, Mfr. ELECTROMOTIVE, 694723-102	5-69
2A2A6A1A2C8	As 2A2A6A1A2C3	5-69
2A2A6A1A2C9	As 2A2A4C1	5-69
2A2A6A1A2C10	As 2A2C3	5-69

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1A2C11	As 2A2A4C1	5-69
2A2A6A1A2C12	As 2A2A4C1	5-69
2A2A6A1A2C13	As 2A2A5A1C1	5-69
2A2A6A1A2C14	As 2A2A4C1	5-69
2A2A6A1A2L1	Inductor, RF, 39 μH, ± 10%, P/N 1537-727 Mfr. DELEVAN, 696011-391	5-69
2A2A6A1A2L2	Inductor, RF, 68 μH, ± 10%, P/N 1537-730, Mfr. DELEVAN, GD696011-681	5-69
2A2A6A1A2L3	Inductor, RF, 27 μH, ± 10%, P/N 1537-725, Mfr. DELEVAN, GD696011-271	5-68
2A2A6A1A2L4	Inductor, choke, 15 μH, 260 mA, P/N 64215-22, VANGUARD, 810000-545	5-68
2A2A6A1A2Q1	As 2A2A1A4Q6	5-69
2A2A6A1A2Q2	As 2A2A1A4Q6	5-69
2A2A6A1A2Q3	Transistor, type, 2N2222, Mfr. MOTOROLA, 555243-122	5-69
2A2A6A1A2RT1	As 2A2A6A1A1RT1	5-69
2A2A6A1A2R1	As 2A2A5A1R19	5-69
2A2A6A1A2R2	As 2A2A1A3R16	5-69
2A2A6A1A2R3	As 2A2A1A4R73	5-69
2A2A6A1A2R4	As 2A2A1A1R21	5-69
2A2A6A1A2R5	Resistor, per MIL-R-11, 22 Kohm, ± 5%, 1/4 W, type RC07GF223J, Mfr. A. BRADLEY, 697344-223	5-69
2A2A6A1A2R6	Resistor variable, per MIL-R-27208, 200 ohm, ± 5%, 1W, P/N 3250W-1-201, Mfr. BOURNS, 554650-201	5-69

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1A2R7	As 2A2A1A3R16	5-69
2A2A6A1A2R8	As 2A2A5A1R19	5-69
2A2A6A1A2R9	As 2A2A2A1R4	5-69
2A2A6A1A2R10	As 2A2A1A1R21	5-69
2A2A6A1A2R11	As 2A2A6A1A2R5	5-69
2A2A6A1A2R12	As 2A2A6A1A1R15	5-69
2A2A6A1A2R13	As 2A2A5A3R14	5-69
2A2A6A1A2R14	Resistor per MIL-R-11,510 ohm ± 5%, 1/4 W, type RC07GF511J, Mfr. A. BRADLEY, 697344-511	5-69
2A2A6A1A2R15	As 2A2A6A1A1R3	5-69
2A2A6A1A2R16	As 2A2A6A1A1R3	5-69
2A2A6A1A2R17	As 2A2A2A1R9	5-69
2A2A6A1A2R18	Resistor, per MIL-R-11, 130 ohm, ± 5%, 1/4 W, type RC07GF131J, Mfr. A. BRADLEY, 697344-131	5-69
2A2A6A1A2R19	As 2A2A6A1A1R6	5-69
2A2A6A1A2R20	Resistor, per MIL-R-11, 75 ohm, ± 5%, 1/4 W, type RC07GF750J, Mfr. A. BRADLEY, 697344-750	5-69
2A2A6A1A2R21	As 2A2A6A1A1R2	5-69
2A2A6A1A2R22	As 2A2A1A1R21	5-69
2A2A6A1A2T1	Transformer RF, 1,5 Mc/s, 18,15 μH, Mfr. ELMER, P/N 666231-902	5-69
2A2A6A1A2T2	Transformer, RF, 1,5 Mc/s, Mfr, ELMER, P/N 666231-903	5-69

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1A2CR1	Diode, semiconductor, per MIL-S-19500, type 1N758A, Mfr. SGS, 555294-158	5-69
2A2A6A1A3CR2	As 2A2A1A4CR11	5-70
2A2A6A1A3CR3	As 2A2A1A4CR11	5-70
2A2A6A1A3CR4	As 2A2A1A4CR11	5-70
2A2A6A1A3CR5	Diode semiconductor, type 1N3600 SGS, 555287-100	5-70
2A2A6A1A3C1	As 2A2A4C1	5-70
2A2A6A1A3C2	As 2A2A4C1	5-70
2A2A6A1A3C3	As 2A2A6A1C16	5-70
2A2A6A1A3C4	As 2A2A4C1	5-70
2A2A6A1A3C5	As 2A2A6A1C16	5-70
2A2A6A1A3C6	As 2A2A6A1C4	5-70
2A2A6A1A3C7	As 2A2A4C1	5-70
2A2A6A1A3C8	Capacitor, fixed, mica, 10 μ μF, ± 5%, 500 VDC, P/N DM15C100J500V, Mfr. ELECTROMOTIVE, 694728-100	5-70
2A2A6A1A3C9	As 2A2A4C1	5-70
2A2A6A1A3C10	As 2A2C3	5-70
2A2A6A1A3C11	As 2A2A4C1	5-70
2A2A6A1A3C12	As 2A2A4C1	5-70
2A2A6A1A3C13	As 2A2C3	5-70
2A2A6A1A3C14	As 2A2C3	5-70
2A2A6A1A3C15	Capacitor, fixed, mica, 10 μ μF, ± 5%, 300 VDC, P/N DM15C100J300V, Mfr. ELECTROMOTIVE, 666162-720	5-70

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1A3C16	As 2A2A1C11	5-70
2A2A6A1A3C17	As 2A2A1C11	5-70
2A2A6A1A3C18	As 2A2A4C1	5-70
2A2A6A1A3C19	As 2A2A4C1	5-70
2A2A6A1A3C20	As 2A2A4C1	5-70
2A2A6A1A3L1	As 2A2A6A1L1	5-70
2A2A6A1A3L2	Inductor RF, 790 Kc/s, 200 μH, Mfr. ELMER, P/N 809000-417	5-70
2A2A6A1A3L3	Inductor, choke, 0,47 μH, 1,2 A, P/N 64047-22, Mfr. VANGUARD, 810000-544	5-70
2A2A6A1A3L4	Inductor, RF, 2,5 Mc/s, 38 μH, Mfr. ELMER, P/N 809000-420	5-70
2A2A6A1A3Q1	Transistor, per MIL-S-19500/258A P/N 2N964A, R.C.A., 555244-164	5-70
2A2A6A1A3Q2	Transistor, type 2N2501, Mfr. MOTOROLA, 555242-101	5-70
2A2A6A1A3Q3	As 2A2A6A1A3Q1	5-70
2A2A6A1A3Q4	As 2A2A4A38Q1	5-70
2A2A6A1A3Q5	As 2A2A4A38Q1	5-70
2A2A6A1A3Q6	As 2A2A6A1A1Q1	5-70
2A2A6A1A3R1	Resistor, per MIL-R-11, 510 ohm, ± 5%, 1/2 W, type RC29GF511J, Mfr. A. BRADLEY, 699000-511	5-70
2A2A6A1A3R2	Resistor, per MIL-R-11, 68 Kohm, ± 5%, 1/4 W, type RC07GF683J, Mfr. A. BRADLEY, 697344-683	5-70
2A2A6A1A3R3	As 2A2A1A3R15	5-70

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1A3R4	As 2A2A4R3	5-70
2A2A6A1A3R5	As 2A2A1A3R16	5-70
2A2A6A1A3R6	Resistor, per MIL-R-11, 8200 ohm, ± 5%, 1/4 W, type RC07GF822J, Mfr. A. BRADLEY, 697344-822	5-70
2A2A6A1A3R7	As 2A2A4R1	5-70
2A2A6A1A3R8	As 2A2A1A1R21	5-70
2A2A6A1A3R9	As 2A2A5A1R20	5-70
2A2A6A1A3R10	Resistor, per MIL-R-11 680 ohm, ± 5%, 1/4 W, type RC07GF681J, Mfr. A. BRADLEY, 697344-681	5-70
2A2A6A1A3R11	As 2A2A4R3	5-70
2A2A6A1A3R12	As 2A2A6A1A3R2	5-70
2A2A6A1A3R13	As 2A2A6A1A2R4	5-70
2A2A6A1A3R14	Resistor, per MIL-R-11, 33 Kohm, ± 5%, 1/4 W, type RC07GF444J, Mfr. A. BRADLEY, 697344-333	5-70
2A2A6A1A3R15	Resistor, per MIL-R-11, 39 ohm, ± 5%, 1/4 W, type RC07GF390J, Mfr. A. BRADLEY 697344-390	5-70
2A2A6A1A3R16	As 2A2A6A1A2R10	5-70
2A2A6A1A3R17	As 2A2A1A1R21	5-70
2A2A6A1A3R18	As 2A2A5A1R19	5-70
2A2A6A1A3R19	As 2A2A1A4R73	5-70
2A2A6A1A3R20	Resistor, per MIL-R-11, 30 ohm, ± 5%, 1/4 W, type RC07GF300J, Mfr. A. BRADLEY, 697344-300	5-70

(Cont'd)

6.2.8.1 - 1 Mc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A1A3R21	As 2A2A1A3R16	5-70
2A2A6A1A3R22	As 2A2A5A1R18	5-70
2A2A6A1A3R23	As 2A2A5A1R19	5-70
2A2A6A1A3R24	As 2A2A5A1R19	5-70
2A2A6A1A3R25	As 2A2A6A1A1R15	5-70
2A2A6A1A3R26	As 2A2A1A4R73	5-70
2A2A6A1A3R27	As 2A2A5A1R19	5-70
2A2A6A1A3R28	As 2A2A1A3R16	5-70
2A2A6A1A3R29	As 2A2A1A4R70	5-70
2A2A6A1A3R30	As 2A2A1A3R15	5-70
2A2A6A1A3R31	As 2A2A1A1R21	5-70
2A2A6A1A3R32	As 2A2A5A1R19	5-70
2A2A6A1A3R33	As 2A2A5A1R18	5-70
2A2A6A1A3T1	Transformer RF, 2,5 MHz, 38 μH, Mfr. ELMER, P/N 666163-349, 809000-418	5-70

6.2.8.2 - 100 Kc/s Synthesizer

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2	Synthesizer, 100 Kc/s, Mfr. ELMER, P/N 666230-626	5-15
2A2A6A2C1	As 2A2A6A3A1C5	5-75
2A2A6A2P1	Connector, plug, 6 pin contacts and 4 coax, P/N DBM-9W4PC-31, Mfr. CANNON, 555146-025	5-75
2A2A6A2A1	Switch, section, 1 pole, 10 positions, per MIL-S-3786, Mfr. OAK, 666163-515	5-73
2A2A6A2Y1	Crystal, per MIL-C-3098-B, 4,653 Mc/s, Mfr. Mc COY ELECTRIC., P/N 666163-670	5-73
2A2A6A2Y2	Crystal, per MIL-C-3098B, 4,653 Mc/s, Mfr. Mc COY ELECTRIC., P/N 666163-671	5-73
2A2A6A2Y3	Crystal, per MIL-C-3098B, 4,753 Mc/s, Mfr. Mc COY RLECTRIC., P/N 666163-672	5-73
2A2A6A2Y4	Crystal, per MIL-C-3098B, 4,853 Mc/s, Mfr. Mc COY ELECTRIC., P/N 666163-673	5-73
2A2A6A2Y5	Crystal, per MIL-C-3098B, 4,953 Mc/s, Mfr. Mc COY ELECTRIC., P/N 666163-674	5-73
2A2A6A2Y6	Crystal, per MIL-C-3098B, 5,053 Mc/s, Mfr. Mc COY ELECTRIC., P/N 666163-675	5-73
2A2A6A2Y7	Crystal, per MIL-C-3098B, 5,153 Mc/s, Mfr. Mc COY ELECTRIC., P/N 666163-676	5-73
2A2A6A2Y8	Crystal, per MIL-C-3098B, 5,253 Mc/s, Mfr. Mc COY ELECTRIC., P/N 666163-677	5-73
2A2A6A2Y9	Crystal, per MIL-C-3098B, 5,353 Mc/s, Mfr. Mc COY ELECTRIC., P/N 666163-678	5-73
2A2A6A2Y10	Crystal, per MIL-C-3098B, 5,453 Mc/s, Mfr. Mc COY ELECTRIC., P/N 666163-679	5-73

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A1CR1	As 2A2A1A4CR13	5-72
2A2A6A2A1CR2	As 2A2A1A4CR13	5-72
2A2A6A2A1C1	Capacitor, fixed, mica, 36 μ μF, ± 2%, 300 VDC, P/N DM15E360G300V, Mfr. ELECTROMOTIVE, 694694-360	5-72
2A2A6A2A1C2	As 2A2A4C1	5-72
2A2A6A2A1C3	As 2A2A4C1	5-72
2A2A6A2A1C4	As 2A2A6A1C9	5-72
2A2A6A2A1C5	As 2A2A6A1C3	5-72
2A2A6A2A1C6	As 2A2A6A1C7	5-72
2A2A6A2A1C7	As 2A2A4C1	5-72
2A2A6A2A1C8	As 2A2A4C1	5-72
2A2A6A2A1C9	As 2A2A4C1	5-72
2A2A6A2A1C10	As 2A2A6A1C3	5-72
2A2A6A2A1Q1	As 2A2A6A1A3Q2	5-72
2A2A6A2A1Q2	As 2A2A6A1A3Q2	5-72
2A2A6A2A1RT1	As 2A2A6A1A1RT1	5-72
2A2A6A2A1R1	As 2A2A6A1A1R6	5-72
2A2A6A2A1R2	As 2A2A6A1A1R3	5-72
2A2A6A2A1R3	As 2A2A6A1A1R3	5-72
2A2A6A2A1R4	As 2A2A1A3R95	5-72
2A2A6A2A1R5	As 2A2A5A1R19	5-72
2A2A6A2A1R6	As 2A2A1A3R15	5-72
2A2A6A2A1R7	As 2A2A5A1R19	5-72
2A2A6A2A1R8	Resistor, fixed,, per MIL-R-11, 5,10 ohm,±5%, 1/4W, Mfr. A. BRADLEY, 666231-644	5-72

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A1R9	As 2A2A5A1R19	5-72
2A2A6A2A1R10	As 2A2A5A1R19	5-72
2A2A6A2A1R11	As 2A2A1A3R15	5-72
2A2A6A2A1R12	As 2A2A1A1R21	5-72
2A2A6A2A1R13	As 2A2A1A4R117	5-72
2A2A6A2A1R14	Resistor, per MIL-R-11, 430 ohm ± 5%, 1/4 W, type RC07GF431J, Mfr: A. BRADLEY, 697233-431	5-72
2A2A6A2A2C1	As 2A2A4C1	5-74
2A2A6A2A2C2	As 2A2A4C1	5-74
2A2A6A2A2C3	As 2A2A4C1	5-74
2A2A6A2A2C4	As 2A2A4C1	5-74
2A2A6A2A2C5	Capacitor, fixed, ceramic, 47 $\mu\mu$F, ± 5%, 75 VDC P/N MINC47J, GLENCO, 552151-470	5-74
2A2A6A2A2C6	As 2A2A4C1	5-74
2A2A6A2A2C7	As 2A2A4C1	5-74
2A2A6A2A2C8	Capacitor, fixed, mica, 750 $\mu\mu$F, ± 2%, 300 VDC, P/N DM15E751G300V, Mfr. ELECTROMOTIVE, 694694-751	5-74
2A2A6A2A2C9	As 2A2A6A2A2C8	5-74
2A2A6A2A2FL1	Filter, band-pass, 800 Hz, P/N 7911007, FLTCH, 810000-548	5-74
2A2A6A2A2Q1	As 2A2A4A38Q1	5-74
2A2A6A2A2Q2	As 2A2A4A38Q1	5-74
2A2A6A2A2R1	As 2A2A6A1A1R3	5-74

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A2R2	Resistor per MIL-R-11, 5600 ohm, ± 5%, 1/4 W, type RC07GF562J, Mfr. A. BRADLEY, 697344-562	5-74
2A2A6A2A2R3	As 2A2A1A1R21	5-74
2A2A6A2A2R4	As 2A2A1A3R16	5-74
2A2A6A2A2R5	As 2A2A5A1R19	5-74
2A2A6A2A2R6	As 2A2A1A1R21	5-74
2A2A6A2A2R7	As 2A2A1A3R16	5-74
2A2A6A2A2R8	As 2A2A1A1R32	5-74
2A2A6A2A2R9	As 2A2A6A1A1R15	5-74
2A2A6A2A2T1	Transformer, RF, 2,5 Mc/s, 37 μF, Mfr. ELMER, P/N 666231-905	5-74
2A2A6A2A2T2	Transformer, RF, 10,747 Mc/s, 50,5 μ μF, Mfr. ELMER, P/N 666231-906	5-74
2A2A6A2A2T3	Transformer, RF, 25 Mc/s, 0,59 μH, Mfr. ELMER, P/N 666163-368	5-74
2A2A6A2A3CR1	As 2A2A1A4CR1	5-76
2A2A6A2A3CR2	As 2A2A6A1A3CR1	5-76
2A2A6A2A3CR3	As 2A2A1A4CR11	5-76
2A2A6A2A3C1	As 2A2A4C1	5-76
2A2A6A2A3C2	Capacitor, fixed, electrolytic 6,8 μF ± 20% 35VDC, P/N 180D685X0035, Mfr. SPRAGUE, 553149- 685	5-76
2A2A6A2A3C3	As 2A2A6A2A3C2	5-76
2A2A6A2A3C4	As 2A2A4C1	5-76
2A2A6A2A3C5	As 2A2A4C1	5-76

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A3C6	As 2A2A4C1	5-76
2A2A6A2A3C7	Capacitor, fixed, mica, 56 μμF, ± 2%, 300 VDC, P/N DM15E560G300V, Mfr. ELECTROMOTIVE, 694694-560	5-76
2A2A6A2A3C8	Capacitor, variable, glass, per MIL-C-14409 0,8 - 4,5 pF, 750 VDC, P/N VC10GW, Mfr. JFD, 4-27-04867/023	5-76
2A2A6A2A3C9	As 2A2A6A1A3C15	5-76
2A2A6A2A3C10	As 2A2A4C1	5-76
2A2A6A2A3C11	As 2A2A4C1	5-76
2A2A6A2A3C12	As 2A2A6A1C3	5-76
2A2A6A2A3C13	As 2A2A4C1	5-76
2A2A6A2A3C14	As 2A2A4C1	5-76
2A2A6A2A3C15	As 2A2A4C1	5-76
2A2A6A2A3C16	As 2A2A4C1	5-76
2A2A6A2A3C17	As 2A2A4C1	5-76
2A2A6A2A3C18	Capacitor, fixed, mica, 43 μμF, ± 2%, 300 VDC, P/N DM15E430G300V, Mfr. ELECTROMOTIVE, 694694-430	5-76
2A2A6A2A3C19	As 2A2A6A2A3C8	5-76
2A2A6A2A3C20	As 2A2A6A1A3C15	5-76
2A2A6A2A3Q1	As 2A2A4A38Q1	5-76
2A2A6A2A3Q2	As 2A2A4A38Q1	5-76
2A2A6A2A3R1	As 2A2A1A3R16	5-76
2A2A6A2A3R2	As 2A2A5A1R19	5-76
2A2A6A2A3R3	As 2A2A1A1R21	5-76

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A3R4	As 2A2A1A4R73	5-76
2A2A6A2A3R5	As 2A2A5A1R5	5-76
2A2A6A2A3R6	As 2A2A1A3R16	5-76
2A2A6A2A3R7	As 2A2A5A1R19	5-76
2A2A6A2A3R8	As 2A2A1A1R21	5-76
2A2A6A2A3R9	As 2A2A1A3R16	5-76
2A2A6A2A3R10	As 2A2A1A1R22	5-76
2A2A6A2A3R11	As 2A2A5A3R14	5-76
2A2A6A2A3R12	As 2A2A6A1A1R12	5-76
2A2A6A2A3R13	As 2A2A4R2	5-76
2A2A6A2A3R14	As 2A2A1A1R31	5-76
2A2A6A2A3R15	As 2A2A5A1R5	5-76
2A2A6A2A3R16	Resistor, per MIL-R-11, 300 ohm, ± 5%, 1/4 W, type RC07GF301J, Mfr. A. BRADLEY, 697344-301	5-76
2A2A6A2A3T1	Transformer, RF, 7,8 Mc/s, 1,32 μH, Mfr. ELMER, P/N 666231-909	5-76
2A2A6A2A3T2	Transformer, RF, 7,9 Mc/s, 5,19 μH, Mfr. ELMER, P/N 666163-371	5-76
2A2A6A2A3T3	Transformer, RF, 25 Mc/s, 0,8 μH, Mfr. ELMER, P/N 666163-372	5-76
2A2A6A2A3T4	Transformer, RF, 3,350 Mc/s, 2,46 μH, Mfr. ELMER, P/N 666163-373	5-76
2A2A6A2A3Y1	Crystal, per MIL-C-3098B, 17845 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-642	5-76

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A3Y2	Crystal, per MIL-C-3098B, 27845 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-643	5-76
2A2A6A2A4C1	As 2A2A4C1	5-78
2A2A6A2A4C2	As 2A2A4C1	5-78
2A2A6A2A4C3	As 2A2A4C1	5-78
2A2A6A2A4C4	As 2A2A4C1	5-78
2A2A6A2A4C5	As 2A2A4C1	5-78
2A2A6A2A4C6	As 2A2A4C1	5-78
2A2A6A2A4C7	Capacitor, fixed, mica, 47 μ μF, ± 2%, 300 VDC, P/N DM15E470G300J, Mfr. ELECTROMOTIVE, 694694-470	5-78
2A2A6A2A4C8	As 2A2A4C1	5-78
2A2A6A2A4C9	Capacitor, fixed, ceramic, 62 μ μF, ± 2%, 300 VDC, P/N DM15E620G300V, Mfr. ELECTROMOTIVE, 694694-620	5-78
2A2A6A2A4C10	Capacitor, fixed, ceramic, 1,5 μ μF, ± 5%, 500 VDC, P/N GA1R5J500V, Mfr. STACKPOLE, 552169-026	5-78
2A2A6A2A4C11	As 2A2A6A2A4C7	5-78
2A2A6A2A4C12	Capacitor, fixed, ceramic, 3,0 μ μF, ± 5%, 500 VDC, P/N GA3R0J500V, Mfr. STACKPOLE, 552169-033	5-78
2A2A6A2A4C13	As 2A2A6A2A4C9	5-78
2A2A6A2A4C14	As 2A2A6A2A4C10	5-78
2A2A6A2A4C15	As 2A2A6A2A4C7	5-78
2A2A6A2A4C16	As 2A2A6A2A4C12	5-78

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A4C17	As 2A2A6A2A4C9	5-78
2A2A6A2A4C18	As 2A2A4C1	5-78
2A2A6A2A4C19	As 2A2A4C1	5-78
2A2A6A2A4C20	Capacitor, fixed, mica, 510 μμF, ± 2%, 300 VDC, P/N DM15E511G300V, Mfr. ELECTROMOTIVE, 694694-511	5-78
2A2A6A2A4C21	As 2A2A4C1	5-78
2A2A6A2A4C22	As 2A2A4C1	5-78
2A2A6A2A4C23	As 2A2A4C1	5-78
2A2A6A2A4C24	Capacitor, fixed, mica, 560 μμF, ± 2%, 300 VDC, P/N DM15E561G300V, Mfr. ELECTROMOTIVE, 694694-561	5-78
2A2A6A2A4C25	As 2A2A4C1	5-78
2A2A6A2A4C26	As 2A2A4C1	5-78
2A2A6A2A4C27	As 2A2A4C1	5-78
2A2A6A2A4L1	Transformer, RF, 25 Mc/s, 0,5 μH, Mfr. ELMER, P/N 809000-409	5-78
2A2A6A2A4L2	Inductor, RF, Mfr. ELMER, P/N 666163-341, 809000-410	5-78
2A2A6A2A4L3	Inductor, RF, Mfr. ELMER, P/N 666163-342, 809000-411	5-78
2A2A6A2A3L4	Transformer, RF, 25 Mc/s, 0,78 μH, Mfr. ELMER, P/N 809000-412	5-78
2A2A6A2A4L5	Inductor, RF, Mfr. ELMER, P/N 666163-344, 809000-413	5-78
2A2A6A2A4L6	Inductor, RF Mfr. ELMER, P/N 666273-076, 809000-056	5-78

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A4Q1	As 2A2A4A38Q1	5-78
2A2A6A2A4Q2	As 2A2A4A38Q1	5-78
2A2A6A2A4Q3	As 2A2A4A38Q1	5-78
2A2A6A2A4Q4	As 2A2A4A38Q1	5-78
2A2A6A2A4R1	As 2A2A1A3R16	5-78
2A2A6A2A4R2	As 2A2A1A3R16	5-78
2A2A6A2A4R3	As 2A2A1A1R21	5-78
2A2A6A2A4R4	As 2A2A5A1R19	5-78
2A2A6A2A4R5	As 2A2A5A1R19	5-78
2A2A6A2A4R6	As 2A2A1A3R16	5-78
2A2A6A2A4R7	As 2A2A1A3R16	5-78
2A2A6A2A4R8	As 2A2A5A1R19	5-78
2A2A6A2A4R9	As 2A2A5A1R19	5-78
2A2A6A2A4R10	As 2A2A5A1R5	5-78
2A2A6A2A4R11	As 2A2A1A1R21	5-78
2A2A6A2A4R12	As 2A2A4A38R6	5-78
2A2A6A2A4R13	As 2A2A1A3R16	5-78
2A2A6A2A4R14	As 2A2A5A1R19	5-78
2A2A6A2A4R15	As 2A2A1A3R16	5-78
2A2A6A2A4R16	As 2A2A5A1R19	5-78
2A2A6A2A4R17	As 2A2A1A3R16	5-78
2A2A6A2A4R18	As 2A2A1A3R16	5-78
2A2A6A2A4R19	As 2A2A1A1R21	5-78
2A2A6A2A4R20	As 2A2A1A1R21	5-78

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A4R21	As 2A2A6A1A1R15	5-78
2A2A6A2A4R22	As 2A2A6A1A1R15	5-78
2A2A6A2A4T1	Transformer RF, 25 MHz, 0,49 μH, Mfr. ELMER, P/N 809000-382, 666163-365	5-78
2A2A6A2A4T2	Transformer, RF, 25 MHz, 0,78 μH Mfr. ELMER, P/N 809000-383, 666163-366	5-78
2A2A6A2A4CR1	As 2A2A1A4CR13	5-80
2A2A6A2A5C1	As 2A2A4C1	5-80
2A2A6A2A5C2	As 2A2A4C1	5-80
2A2A6A2A5C3	As 2A2A4C1	5-80
2A2A6A2A5C4	As 2A2A4C1	5-80
2A2A6A2A5C5	As 2A2A4C1	5-80
2A2A6A2A5C6	As 2A2A4C1	5-80
2A2A6A2A5C7	As 2A2A4C1	5-80
2A2A6A2A5C8	As 2A2A4C1	5-80
2A2A6A2A5C9	As 2A2A4C1	5-80
2A2A6A2A5C10	As 2A2A4C1	5-80
2A2A6A2A5C11	Capacitor, fixed, tantalum, 47 μ μF, ± 20%, 35 VDC, P/N 150D476X0035S2, Mfr. SPRAGUE, 696124-476	5-80
2A2A6A2A5L1	As 2A2A6A1A2L3	5-80
2A2A6A2A5L2	Inductor, RF, 3,3 μF, ± 10%, P/N 1537-714, Mfr. DELEVAN, GD 696011-330	5-80
2A2A6A2A4L3	As 2A2A6A1A2L3	5-80
2A2A6A2A5Q1	As 2A2A4A38Q1	5-80

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A5Q2	As 2A2A6A1A1Q1	5-80
2A2A6A2A5Q3	As 2A2A6A1A1Q1	5-80
2A2A6A2A5Q4	As 2A2A6A1A1Q1	5-80
2A2A6A1A5R1	As 2A2A2A1R13	5-80
2A2A6A2A5R2	As 2A2A5A1R19	5-80
2A2A6A2A5R3	As 2A2A6A1A1R15	5-80
2A2A6A2A5R4	As 2A2A6A1A1R3	5-80
2A2A6A2A5R5	Resistor, per MIL-R-11, 9100 ohm, ± 5%, 1/4 W, type RC07GF912J, Mfr. A. BRADLEY, 697344-912	5-80
2A2A6A2A5R6	As 2A2A4A38R6	5-80
2A2A6A2A5R7	Resistor, per MIL-R-11, 240 ohm, ± 5%, 1/4 W, type RC07GF241J, Mfr. A.BRADLEY, 697344-241	5-80
2A2A6A2A5R8	As 2A2A1A4R119	5-80
2A2A6A2A4R9	As 2A2A6A1A1R3	5-80
2A2A6A2A5R10	As 2A2A6A2A5R5	5-80
2A2A6A2A5R11	As 2A2A4A38R6	5-80
2A2A6A2A5R12	As 2A2A6A1AR6	5-80
2A2A6A2A5R13	Resistor, variable, 200 ohm, ± 5%, 1 W, 500 VDC, P/N 328W-1-201, Mfr. BOURNS, 554649-201	5-80
2A2A6A2A5R14	Resistor, per MIL-R-11, 1600 ohm, ± 5%, 1/4 W, type RC07GF162J, Mfr. A. BRADLEY 697344-162	5-80

(Cont'd)

6.2.8.2 - 100 Kc/s Synthesizer (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A5R15	Resistor, per MIL-R-11, 100 Kohm, ± 5%, 1/4 W, type RC07GF104J, Mfr. A, BRADLEY 697344-104	5-80
2A2A6A2A5R16	As 2A2A1A4R73	5-80
2A2A6A2A5R17	Resistor, per MIL-R-11, ± 5%, 1/4 W, type RC07GF200J, Mfr. A. BRADLEY, 697344-200	5-80

6.2.8.3 - 1/10 Kc/s Synthesizer Subassembly (2A2A6)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A3	Synthesizer, 1/10 Kc/s, Mfr. ELMER, P/N 666230-635	5-15
2A2A6A2C25	As 2A2A6A1C19	5-81
2A2A6A3C26	Capacitor, fixed, metalized paper, 0,05 µF, ±20%, 200 VDC, P/N T2900-1, Mfr. HOPKINS, 666164-910	5-81
2A2A6A3J4	Connector coax, P/N 3113, Mfr. SEALECTRO, 559998-083	5-88
2A2A6A3J5	As 2A2A6A3J4	5-88
2A2A6A3J7	As 2A2A6A3J4	5-88
2A2A6A3Y1	Crystal, per MIL-C-3098B, 5250 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-689	5-84
2A2A6A3Y2	Crystal, per MIL-C-3098B, 5240 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-688	5-81
2A2A6A3Y3	Crystal, per MIL-C-3098B, 5230 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-687	5-81
2A2A6A3Y4	Crystal, per MIL-C-3098B, 5220 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-686	5-81
2A2A6A3Y5	Crystal, per MIL-C-3098B, 5210 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-685	5-81
2A2A6A3Y6	Crystal, per MIL-C-3098B, 5200 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-684	5-81
2A2A6A3Y7	Crystal, per MIL-C-3098B, 5190 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-683	5-84
2A2A6A3Y8	Crystal, per MIL-C-3098B, 5180 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-682	5-84
2A2A6A3Y9	Crystal, per MIL-C-3098B, 5170 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-681	5-84

(Cont'd)

6.2.8.3 - 1/10 Kc/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A3Y10	Crystal, per MIL-C-3098B, 5160 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-680	5-84
2A2A6A3Y11	Crystal, per MIL-C-3098B, 1850 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-690	5-84
2A2A6A3Y12	Crystal, per MIL-C-3098B, 1851 Kc/s, Mfr. Mc COY ELECTRIC, P/N 666163-691	5-81
2A2A6A3Y13	Crystal, per MIL-C-3098B, 1852 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-692	5-81
2A2A6A3Y14	Crystal, per MIL-C-3098B, 1853 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-693	5-81
2A2A6A3Y15	Crystal, per MIL-C-3098B, 1854 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-694	5-81
2A2A6A3Y16	Crystal, per MIL-C-3098B, 1855 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-695	5-81
2A2A6A3Y17	Crystal, per MIL-C-3098B, 1856 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-696	5-84
2A2A6A3Y18	Crystal, per MIL-C-3098B, 1857 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-697	5-84
2A2A6A3Y19	Crystal, per MIL-C-3098B, 1858 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-698	5-84
2A2A6A3Y20	Crystal, per MIL-C-3098B, 1959 Kc/s, Mfr. Mc COY ELECTRIC., P/N 666163-698	5-84
2A2A6A3A1CR1	As 2A2A1A4CR13	5-82
2A2A6A3A1CR2	As 2A2A1A4CR13	5-82
2A2A6A3A1C1	Capacitor, fixed, ceramic, 33 μ μF, ± 2%, 500 VDC, P/N 301-N2200-33-2, Mfr. ERIE, 810000-859	5-82

(Cont'd)

6.2.8.3 - 1/10 Kc/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A2A1C2	As 2A2A6A1C9	5-82
2A2A6A3A1C3	As 2A2A6A1C7	5-82
2A2A6A3A1C4	As 2A2A6A1C3	5-82
2A2A6A3A1C5	Capacitor, fixed, ceramic, per MIL-C-11015, 10.000 μ μF, ± 20%, 200 VDC, type MIL CK06CW103M, 698104-103, Mfr. ERIE	5-82
2A2A6A2A1C6	As 2A2A6A3A1C5	5-82
2A2A6A3A1C7	As 2A2A6A3A1C5	5-82
2A2A6A3A1C8	As 2A2A6A3A1C5	5-82
2A2A6A3A1C9	As 2A2A6A3A1C5	5-82
2A2A6A3A1C10	As 2A2A6A1C11	5-82
2A2A6A3A1C11	As 2A2A6A1C10	5-82
2A2A6A3A1Q1	As 2A2A6A1A3Q2	5-82
2A2A6A3A1Q2	As 2A2A1A4Q6	5-82
2A2A6A2A1RT1	As 2A2A6A1A1RT1	5-82
2A2A6A3A1R1	Resistor, per MIL-R-11, 20 K, ± 5%, 1/4 W, type RC07GF203J, Mfr. A. BRADLEY, 697344-203	5-82
2A2A6A3A1R2	Resistor, per MIL-R-11, 12 Kohm, ± 5%, 1/4 W, type RC07GF123J, Mfr. A. BRADLEY, 697344-123	5-82
2A2A6A3A1R3	As 2A2A6A1A1R6	5-82
2A2A6A3A1R4	Resistor, per MIL-R-11, 1300 ohm, ± 5%, 1/4 W, type RC07GF132J, Mfr. A. BRADLEY, 697344-132	5-82
2A2A6A3A1R5	As 2A2A5A1R19	5-82

(Cont'd)

6.2.8.3 - 1/10 Kc/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A3A1R6	As 2A2A5A1R19	5-82
2A2A6A3A1R7	As 2A2A6A2A1R8	5-82
2A2A6A3A1R8	As 2A2A1A3R16	5-82
2A2A6A3A1R9	As 2A2A6A1A1R6	5-82
2A2A6A3A1R10	As 2A2A6A1A1R6	5-82
2A2A6A3A1R11	As 2A2A6A1A1R3	5-82
2A2A6A3A1R12	As 2A2A1A4R95	5-82
2A2A6A3A1R13	As 2A2A6A1A1R3	5-82
2A2A6A3A1R14	As 2A2A1A1R21	5-82
2A2A6A3A1R15	As 2A2A1A1R22	5-82
2A2A6A3A1R16	As 2A2A1A1R21	5-82
2A2A6A3A1T1	Transformer, RF, 7,9 Mc/s, 4,2 - 4,9 μH, Mfr. ELMER, P/N 666231-904	5-82
2A2A6A3A2CR1	As 2A2A1A4CR13	5-83
2A2A6A3A2CR2	As 2A2A1A4CR13	5-83
2A2A6A3A2C1	Capacitor, fixed, ceramic, 43 μ μF, ± 2% 500 VDC, P/N 301-N5600-43 ± 2, Mfr. ERIE, 810000-556	5-83
2A2A6A3A2C2	As 2A2A6A1C10	5-83
2A2A6A3A2C3	As 2A2A6A2A2C8	5-83
2A2A6A3A2C4	As 2A2A6A1A2C3	5-83
2A2A6A3A2C5	As 2A2A6A3A1C5	5-83
2A2A6A3A2C6	As 2A2A6A3C26	5-83
2A2A6A3A2C7	As 2A2A6A3C26	5-83
2A2A6A3A2C8	As 2A2A6A3A1C5	5-83

(Cont'd)

6.2.8.3 - 1/10 Kc/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A3A2C9	As 2A2A6A3C26	5-83
2A2A6A3A2C10	As 2A2A6A1A1C8	5-83
2A2A6A3A2Q1	As 2A2A6A1A3Q2	5-83
2A2A6A3A2Q2	As 2A2A1A4Q6	5-83
2A2A6A3A2RT1	As 2A2A6A1A1RT1	5-83
2A2A6A3A2R1	As 2A2A6A3A1R1	5-83
2A2A6A3A2R2	As 2A2A6A3A1R2	5-83
2A2A6A3A2R3	As 2A2A6A1A1R6	5-83
2A2A6A3A2R4	As 2A2A6A3A1R4	5-83
2A2A6A3A2R5	As 2A2A6A1A3R14	5-83
2A2A6A3A2R6	As 2A2A5A1R16	5-83
2A2A6A3A2R7	As 2A2A6A1A1R9	5-83
2A2A6A3A2R8	As 2A2A1A3R16	5-83
2A2A6A3A2R9	As 2A2A6A1A2R14	5-83
2A2A6A3A2R10	As 2A2A1A4R73	5-83
2A2A6A3A2R11	As 2A2A6A1A1R3	5-83
2A2A6A3A2R12	As 2A2A1A4R95	5-83
2A2A6A3A2R13	As 2A2A6A1A1R3	5-83
2A2A6A3A2R14	As 2A2A1A1R21	5-83
2A2A6A3A2R15	As 2A2A6A1A1R6	5-83
2A2A6A3A2R16	As 2A2A6A2A5R7	5-83
2A2A6A3A2T1	Transformer, RF, 7,9 Mc/s, 10 - 11,5 H, Mfr. ELMER, P/N 809000-243, 666231-907	5-83
2A2A6A3A3CR7	Diode, semiconductor, type HD6730, Mfr. GENERAL ELECTRIC., 666163-092	5-85

(Cont'd)

6.2.8.3 - 1/10 Kc/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A3A3C46	As 2A2A6A3C26	5-85
2A2A6A3A3C47	As 2A2A6A3C26	5-85
2A2A6A3A3C48	Capacitor, fixed, mica, 470 μ μF, ± 1%, 300 VDC, P/N DM15E471F300V, Mfr. ELECTROMOTIVE, 694693-471	5-85
2A2A6A3A3C49	As 2A2A6A3A3C48	5-85
2A2A6A3A3C50	Capacitor, fixed, mica, 15 μ μF, ± 0,5%, 300 VDC, P/N DM15C150F300V, Mfr. ELECTROMOTIVE, 666162-722	5-85
2A2A6A3A3C51	As 2A2A6A2A3C48	5-85
2A2A6A3A3C52	As 2A2A6A3A3C50	5-85
2A2A6A3A3C53	Capacitor, electrolytic, P/N 150D105X 35A2, Mfr. SPRAGUE, 696125-105	5-85
2A2A6A3A3C54	As 2A2A6A3A3C48	5-85
2A2A6A3A3C55	As 2A2A6A3C26	5-85
2A2A6A3A3C56	As 2A2A6A3A3C50	5-85
2A2A6A3A3J3	Connector, coax, L-bend, P/N 3108, Mfr. SEALECTRO, 559998-079	5-85
2A2A6A3A3J6	As 2A2A6A3A3J3	5-85
2A2A6A3A3L5	Inductor, RF, Mfr. ELMER, P/N 666163-904, 809000-425	5-85
2A2A6A3A3L6	Inductor, RF Mfr. ELMER, P/N 666163-902, 809000-426	5-85
2A2A6A3A3L7	As 2A2A6A3A3L6	5-85
2A2A6A3A3Q11	As 2A2A1A4Q6	5-85
2A2A6A3A3Q12	Transistor, type 2N1301, Mfr. R.C.A., 666163-395	5-85

(Cont'd)

6.2.8.3 - 1/10 Kc/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A3A3R47	As 2A2A5A1R19	5-85
2A2A6A3A3R48	As 2A2A1A4R73	5-85
2A2A6A3A3R49	As 2A2A1A1R21	5-85
2A2A6A3A3R50	As 2A2A1A3R15	5-85
2A2A6A3A3R51	As 2A2A1A4R73	5-85
2A2A6A3A3R52	Resistor, per MIL-R-11, type: RC07GF190J, RC07GF390J, RC07GF150J, RC07GF360J RC07GF120J, RC07GF330J, RC07GF300J, RC07GF270J, RC07GF240J, RC07GF220J, RC07GF200J, Mfr. A. BRADLEY, 697344/xx (SUITABLE VALUE)	5-85
2A2A6A3A3R54	As 2A2A1A3R16	5-85
2A2A6A3A3T3	Transformer, RF, 3,350 Mc/s 4,61 μH, Mfr. ELMER, P/N 666163-901	5-85
2A2A6A3A4C1	As 2A2A4C1	5-87
2A2A6A3A4C2	As 2A2A4C1	5-87
2A2A6A3A4C3	As 2A2A4C1	5-87
2A2A6A3A4C4	Capacitor, fixed, mica, 15 μ μF, ± 5%, 500 VDC, P/N DM15C150J500V, Mfr. ELECTROMOTIVE, 694728-150	5-87
2A2A6A3A4C5	As 2A2A6A3A4C4	5-87
2A2A6A3A4C6	As 2A2A4C1	5-87
2A2A6A3A4C7	Capacitor, fixed, mica, 220 μ μF, ± 2%, 300 VDC, P/N DM15E221G300V, Mfr. ELECTROMOTIVE, 694694-221	5-87
2A2A6A3A4C8	Capacitor, fixed, mica, 5 μ μF, ± 5%, 500 VDC, P/N DM15C050J500V, Mfr. ELECTROMOTIVE, 694728-050	5-87

(Cont'd)

6.2.8.3 - 1/10 Kc/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A3A4C9	Capacitor, fixed, mica, 68 $\mu\mu F$, ± 2%, 300 VDC, P/N DM15E680G300V, Mfr. ELECTROMOTIVE, 694694-680	5-87
2A2A6A3A4C10	As 2A2A6A1C11	5-87
2A2A6A3A4C11	As 2A2A6A3C26	5-87
2A2A6A3A4C12	As 2A2A6A3C26	5-87
2A2A6A3A4C13	As 2A2A6A3C26	5-87
2A2A6A3A4FL1	Filter, band-pass, 9,07 Mc/s, P/N 790900, Mfr. FILTCH, 810000-547	5-87
2A2A6A3A4FL2	Filter, band-pass, 19809 - 9811 Mc/s, P/N 797109, 810000-247	5-87
2A2A6A3A4Q8	Transistor, type 2N700 (SELECTED), Mfr. MOTOROLA, 810001-418	5-87
2A2A6A3A4Q9	As 2A2A4A38Q1	5-87
2A2A6A3A4R1	As 2A2A1A3R16	5-87
2A2A6A3A4R2	As 2A2A5A1R19	5-87
2A2A6A3A4R3	As 2A2A1A4R73	5-87
2A2A6A3A4R4	As 2A2A1A1R21	5-87
2A2A6A3A4R5	As 2A2A5A1R20	5-87
2A2A6A3A4R6	As 2A2A1A4R70	5-87
2A2A6A3A4R7	As 2A2A1A4R95	5-87
2A2A6A3A4R8	As 2A2A1A3R16	5-87
2A2A6A3A4R9	As 2A2A5A1R19	5-87
2A2A6A3A4R10	As 2A2A1A4R73	5-87
2A2A6A3A4R11	As 2A2A1A1R21	5-87
2A2A6A3A4R12	As 2A2A1A1R21	5-87

(Cont'd)

Pub. 246
December 1967
ORIGINAL

6.2.8.3 - 1/10 Kc/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A3A4T1	Transformer, RF, 7,9 Mc/s, 2,25 μH, Mfr. ELMER, P/N 666163-396	5-87
2A2A6A3A4Z1	Mixer 1 Kc/s Mfr. ELMER, P/N 666163-565	5-87
2A2A6A3A4Z1C43	As 2A2A6A3C26	5-87
2A2A6A3A4Z1C44	As 2A2A6A3A3C53	5-87
2A2A6A3A4Z1Q10	As 2A2A4A38Q1	5-87
2A2A6A3A4Z1R41	As 2A2A1A3R15	5-87
2A2A6A3A4Z1R42	As 2A2A1A3R16	5-87
2A2A6A3A4Z1R43	As 2A2A1A4R73	5-87
2A2A6A3A4Z1R44	As 2A2A5A1R19	5-87
2A2A6A3A4Z2	Amplifier, Isolation, Mfr. ELMER, P/N 666231-880	5-87
2A2A6A3A4Z2C29	As 2A2C2	5-87
2A2A6A3A4Z2C30	As 2A2A6A3C26	5-87
2A2A6A3A4Z2Q7	As 2A2A5A38Q1	5-87
2A2A6A3A4Z2R26	As 2A2A6A1A1R15	5-87
2A2A6A3A4Z2R27	As 2A2A1A3R16	5-87
2A2A6A3A4Z2R28	As 2A2A1A4R73	5-87
2A2A6A3A4Z2R29	As 2A2A5A1R19	5-87
2A2A6A3A4Z3	Amplifier, Isolation, Mfr. ELMER, P/N 666163-567	5-87
2A2A6A3A4Z3C27	As 2A2C2	5-87
2A2A6A3A4Z3C28	Capacitor, fixed, metalized paper, 0,005 μ μF, ± 20%, 200 VDC, P/N T2900-3 Mfr. HOPKINS, 666164-912	5-87

(Cont'd)

6.2.8.3 - 1/10 Kc/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A3A4Z3Q6	As 2A2A4A38Q1	5-87
2A2A6A3A4Z3R22	As 2A2A6A1A1R15	5-87
2A2A6A3A4Z3R23	As 2A2A1A3R16	5-87
2A2A6A3A4Z3R24	As 2A2A1A4R73	5-87
2A2A6A3A4Z3R25	As 2A2A5A1R19	5-87

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4	Synthesizer, 100 c/s, Mfr. ELMER, P/N A00024-001	5-15
2A2A6A4P1	Connector, 10 pin contacts, 3 coax, P/N DBM13W3PC-31, Mfr. CANNON, 555146-021	5-89
2A2A6A4A1CR1	Diode, semiconductor, per MIL-S-19500-144, Mfr. SGS	5-92
2A2A6A4A1CR2	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR3	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR4	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR5	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR6	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR7	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR8	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR9	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR9	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR10	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR11	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR12	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR13	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR14	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR15	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR16	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR17	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR18	As 2A2A6A4A1CR1	5-92

(Cont'd)

6.2.8.4 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1CR19	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR20	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR21	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR22	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR23	As 2A2A6A4A1CR1	5-92
2A2A6A4A1CR24	As 2A2A6A4A1CR1	5-92
2A2A6A4A1C1	Capacitor, per MIL-C-26655, 1 µF, ± 20%, 35 VDC, CS13AF010M, Mfr. CDE	5-92
2A2A6A4A1C2	As 2A2A6A4A1C1	5-92
2A2A6A4A1C3	Capacitor, ceramic, per MIL-C-11015, 33 µF, ± 10%, 100 VDC, P/N MC70A330AK-HI-Q, Mfr. AEROVOX, 810001-264	5-92
2A2A6A4A1C4	Capacitor, ceramic, per MIL-C-11015, 1000 pF, ± 10%, 200 VDC, CK05CW102K, Mfr. ERIE	5-92
2A2A6A4A1C5	As 2A2A6A4A1C3	5-92
2A2A6A4A1C6	As 2A2A4C1	5-92
2A2A6A4A1C7	As 2A2A4C1	5-92
2A2A6A4A1C8	As 2A2A4C1	5-92
2A2A6A4A1C9	As 2A2A4C1	5-92
2A2A6A4A1C10	As 2A2A4C1	5-92
2A2A6A4A1C11	As 2A2A6A4A1C1	5-92
2A2A6A4A1C12	As 2A2A6A4A1C3	5-92
2A2A6A4A1C13	Capacitor, ceramic, per MIL-C-11015, 270 pF, ± 10%, 200 VDC, CK05CW271K, Mfr. ERIE	5-92

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1Q1	Transistor, per MIL-S-19500/258A, type NAVY, 2N964A, Mfr. MOTOROLA	5-92
2A2A6A4A1Q2	Transistor, per MIL-S-19500/120B, type 2N706, Mfr. R.C.A.	5-92
2A2A6A4A1Q3	As 2A2A6A4A1Q2	5-92
2A2A6A4A1Q4	As 2A2A6A4A1Q2	5-92
2A2A6A4A1Q5	As 2A2A6A4A1Q2	5-92
2A2A6A4A1Q6	As 2A2A6A4A1Q2	5-92
2A2A6A4A1R1	As 2A2A1A4R117	5-92
2A2A6A4A1R2	Resistor, per MIL-R-11,750 ohm, ± 5%, 1/4 W, type RC07GF751J, Mfr. A. BRADLEY, 697344-751	5-92
2A2A6A4A1R3	As 2A2A6A3A1R2	5-92
2A2A6A4A1R4	As 2A2A1A3R15	5-92
2A2A6A4A1R5	As 2A2A6A1A1R9	5-92
2A2A6A4A1R6	As 2A2A5A1R5	5-92
2A2A6A4A1R7	As 2A2A6A1A1R15	5-92
2A2A6A4A1R8	As 2A2A1A4R117	5-92
2A2A6A4A1R9	As 2A2A6A1A1R3	5-92
2A2A6A4A1R10	As 2A2A6A1A1R3	5-92
2A2A6A4A1R11	As 2A2A6A2A2R2	5-92
2A2A6A4A1R12	As 2A2A1A4R117	5-92
2A2A6A4A1R13	As 2A2A1A3R16	5-92
2A2A6A4A1R14	As 2A2A6A2A5R15	5-92
2A2A6A4A1R15	Resistor, per MIL-R-11-3300 ohm ± 5%, 1/4W type RC07GF332J, Mfr. A. BRADLEY, 697344-332	5-92

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1R16	As 2A2A6A2A5R15	5-92
2A2A6A4A1R17	As 2A2A6A4A1R15	5-92
2A2A6A4A1R18	As 2A2A6A2A5R15	5-92
2A2A6A4A1R19	As 2A2A6A4A1R15	5-92
2A2A6A4A1R20	As 2A2A6A2A5R15	5-92
2A2A6A4A1R21	As 2A2A6A2A2R2	5-92
2A2A6A4A1R22	As 2A2A6A4A1R15	5-92
2A2A6A4A1R23	As 2A2A6A4A1R15	5-92
2A2A6A4A1R24	As 2A2A6A4A1R15	5-92
2A2A6A4A1R25	As 2A2A6A2A2R2	5-92
2A2A6A4A1R26	As 2A2A1A4R117	5-92
2A2A6A4A1R27	As 2A2A6A1A1R15	5-92
2A2A6A4A1R28	As 2A2A1A3R16	5-92
2A2A6A4A1R29	As 2A2A1A4R117	5-92
2A2A6A4A1R30	As 2A2A6A3A1R1	5-92
2A2A6A4A1R31	As 2A2A1A3R16	5-92
2A2A6A4A1R32	Resistor, per MIL-R-11, 56 ohm, ± 5%, 1/4 W, type RC07GF560J, Mfr. A. BRADLEY, 697344-560	5-92
2A2A6A4A1R33	As 2A2A6A2A2R2	5-92
2A2A6A4A1R34	As 2A2A6A4A1R15	5-92
2A2A6A4A1A1	FLIP FLOP, Unit, Mfr. ELMER, P/N A00055-001	5-92
2A2A6A4A1A2	As 2A2A6A4A1A1	5-92
2A2A6A4A1A3	As 2A2A6A4A1A1	5-92

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1A4	As 2A2A6A4A1A1	5-92
2A2A6A4A1A5	As 2A2A6A4A1A1	5-92
2A2A6A4A1A6	As 2A2A6A4A1A1	5-92
2A2A6A4A1A7	As 2A2A6A4A1A1	5-92
2A2A6A4A1A8	As 2A2A6A4A1A1	5-92
2A2A6A4A1A9	As 2A2A6A4A1A1	5-92
2A2A6A4A1A10	As 2A2A6A4A1A1	5-92
2A2A6A4A1A11	As 2A2A6A4A1A1	5-92
2A2A6A4A1A12	As 2A2A6A4A1A1	5-92
2A2A6A4A1A1C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A2C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A3C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A4C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A5C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A6C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A7C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A8C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A9C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A10C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A11C1	As 2A2A6A4A1C3	5-92
2A2A6A4A1A1C2	As 2A2A6A4A1C3	5-92
2A2A6A4A1A2C2	As 2A2A6A4A1C3	5-92
2A2A6A4A1A3C2	As 2A2A6A4A1C3	5-92
2A2A6A4A1A4C2	As 2A2A6A4A1C3	5-92
2A2A6A4A1A5C2	As 2A2A6A4A1C3	5-92

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1A6C2	As 2A2A6A4A1C3	5-92
2A2A6A4A1A7C2	As 2A2A6A4A1C3	5-92
2A2A6A4A1A8C2	As 2A2A6A3A1C3	5-92
2A2A6A4A1A9C2	As 2A2A6A4A1C3	5-92
2A2A6A4A1A10C2	As 2A2A6A4A1C3	5-92
2A2A6A4A1A11C2	As 2A2A6A4A1C3	5-92
2A2A6A4A1A12C2	As 2A2A6A4A1C3	5-92
2A2A6A4A1A1C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A2C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A3C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A4C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A5C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A6C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A7C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A8C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A9C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A10C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A11C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A12C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A1C4	As 2A2A6A4A1C3	5-92
2A2A6A4A1A2C4	As 2A2A6A4A1C3	5-92
2A2A6A4A1A3C4	As 2A2A6A4A1C3	5-92
2A2A6A4A1A4C4	As 2A2A6A4A1C3	5-92
2A2A6A4A1A5C4	As 2A2A6A4A1C3	5-92
2A2A6A4A1A6C4	As 2A2A6A4A1C3	5-92

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1A7C4	As 2A2A6A4A1C3	5-92
2A2A6A4A1A8C4	As 2A2A6A4A1C3	5-92
2A2A6A4A1A9C4	As 2A2A6A4A1C3	5-92
2A2A6A4A1A10C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A11C3	As 2A2A6A4A1C3	5-92
2A2A6A4A1A12C4	As 2A2A6A4A1C3	5-92
2A2A6A4A1A1CR1	Diode, per MIL-S-19500/144, type NAVY 1N3064, Mfr. SGS	5-92
2A2A6A4A1A2CR1	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A3CR1	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A4C41	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A4CR1	As. 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A6CR1	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A6CR1	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A7CR1	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A8CR1	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A9CR1	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A10CR1	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A11CR1	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A12CR1	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A1CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A2CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A3CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A4CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A5CR2	As 2A2A6A4A1A1CR1	5-92

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1A6CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A7CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A8CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A9CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A10CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A11CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A12CR2	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A1CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A2CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A3CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A4CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A5CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A6CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A7CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A8CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A9CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A10CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A11CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A12CR3	As 2A2A6A4A1A1CR1	5-92
2A2A6A4A1A1Q1	Transistor, per MIL-S-19500/120B, type JAN 2N706, Mfr. R.C.A.	5-92
2A2A6A4A1A2Q1	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A3Q1	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A4Q1	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A5Q1	As 2A2A6A4A1A1Q1	5-92

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1A6Q1	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A7Q1	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A8Q1	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A9Q1	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A10Q1	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A11Q1	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A12Q1	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A1Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A2Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A3Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A4Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A5Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A6Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A7Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A8Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A9Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A10Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A11Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A12Q2	As 2A2A6A4A1A1Q1	5-92
2A2A6A4A1A1R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A2R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A3R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A4R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A5R1	As 2A2A6A1A1R15	5-92

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1A6R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A7R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A8R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A9R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A10R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A11R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A12R1	As 2A2A6A1A1R15	5-92
2A2A6A4A1A1R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A2R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A3R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A4R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A5R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A6R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A7R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A8R2	As 2A2A6A4A1R15	5-92
2A2A6A4A1A9R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A10R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A11R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A12R2	As 2A2A6A1A1R15	5-92
2A2A6A4A1A1R3	As 2A2A5A1R19	5-92
2A2A6A4A1A2R3	As 2A2A5A1R19	5-92
2A2A6A4A1A3R3	As 2A2A5A1R19	5-92
2A2A6A4A1A4R3	As 2A2A5A1R19	5-92
2A2A6A4A1A5R3	As 2A2A5A1R19	5-92
2A2A6A4A1A6R3	As 2A2A5A1R19	5-92

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1A7R3	As 2A2A5A1R19	5-92
2A2A6A4A1A8R3	As 2A2A5A1R19	5-92
2A2A6A4A1A9R3	As 2A2A5A1R19	5-92
2A2A6A2A1A10R3	As 2A2A5A1R19	5-92
2A2A6A4A1A11R3	As 2A2A5A1R19	5-92
2A2A6A4A1A12R3	As 2A2A5A1R19	5-92
2A2A6A4A1A1R4	As 2A2A5A1R19	5-92
2A2A6A4A1A2R4	As 2A2A5A1R19	5-92
2A2A6A4A1A3R4	As 2A2A5A1R19	5-92
2A2A6A4A1A4R4	As 2A2A5A1R19	5-92
2A2A6A4A1A5R4	As 2A2A5A1R19	5-92
2A2A6A4A1A6R4	As 2A2A5A1R19	5-92
2A2A6A4A1A7R4	As 2A2A5A1R19	5-92
2A2A6A4A1A8R4	As 2A2A5A1R19	5-92
2A2A6A4A1A9R4	As 2A2A5A1R19	5-92
2A2A6A4A1A10R4	As 2A2A5A1R19	5-92
2A2A6A4A1A11R4	As 2A2A5A1R19	5-92
2A2A6A4A1A12R4	As 2A2A5A1R19	5-92
2A2A6A4A1A1R5	As 2A2A1A3R16	5-92
2A2A6A4A1A2R5	As 2A2A1A3R16	5-92
2A2A6A4A1A3R5	As 2A2A1A3R16	5-92
2A2A6A4A1A4R5	As 2A2A1A3R16	5-92
2A2A6A4A1A5R5	As 2A2A1A3R16	5-92
2A2A6A4A1A6R5	As 2A2A1A3R16	5-92
2A2A6A4A1A7R5	As 2A2A1A3R16	5-92

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A1A8R5	As 2A2A1A3R16	5-92
2A2A6A4A1A9R5	As 2A2A1A3R16	5-92
2A2A6A4A1A10R5	As 2A2A1A3R16	5-92
2A2A6A4A1A11R5	As 2A2A1A3R16	5-92
2A2A6A4A1A12R5	As 2A2A1A3R16	5-92
2A2A6A4A1A1R6	As 2A2A1A3R16	5-92
2A2A6A4A1A2R6	As 2A2A1A3R16	5-92
2A2A6A4A1A3R6	As 2A2A1A3R16	5-92
2A2A6A4A1A4R6	As 2A2A1A3R16	5-92
2A2A6A4A1A5R6	As 2A2A1A3R16	5-92
2A2A4A6A1A6R6	As 2A2A1A3R16	5-92
2A2A6A4A1A7R6	As 2A2A1A3R16	5-92
2A2A6A4A1A8R6	As 2A2A1A3R16	5-92
2A2A6A4A1A9R6	As 2A2A1A3R16	5-92
2A2A6A4A1A10R6	As 2A2A1A3R16	5-92
2A2A6A4A1A11R6	As 2A2A1A3R16	5-92
2A2A6A4A1A12R6	As 2A2A1A3R16	5-92
2A2A6A4A2CR1	Diode, semiconductor, P/N DT30319C, Mfr. DICKSON, 810000-582	5-90
2A2A6A4A2CR2	Diode, semiconductor, per MIL-E-1, type NAVY 1N748AM, Mfr. IRCI	5-90
2A2A6A4A2CR3	As 2A2A6A4A1CR1	5-90
2A2A6A4A2XR4	Diode, semiconductor, per MIL-E-1, type NAVY 1N758A, Mfr. IRCI	5-90
2A2A6A4A2CR5	Diode, semiconductor, P/N RD2728, Mfr. RAYTHEON, 810000-584	5-90

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF.DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A2CR6	As 2A2A6A4A2CR5	5-90
2A2A6A4A2CR7	Diode, semiconductor, P/N HC7005B, Mfr. HUGHES, 810000-583	5-90
2A2A6A4A2CR8	As 2A2A6A4A2CR7	5-90
2A2A6A4A2CR9	As 2A2A6A4A2CR7	5-90
2A2A6A4A2C1	As 2A2A6A4A1C1	5-90
2A2A6A4A2C2	As 2A2A6A4A1C1	5-90
2A2A6A4A2C3	As 2A2A6A4A1C3	5-90
2A2A6A4A2C4	Capacitor, per MIL-C-26655, 0,47 μF, ± 20%, 35 VDC, CS13AFR47M, Mfr. CDE	5-90
2A2A6A4A2C5	Capacitor, fixed, metalized paper, 0,2 μF, ± 20%, 200 VDC, P/N T-2900-5, Mfr. HOPKINS, 666164-914	5-90
2A2A6A4A2C6	As 2A2A6A4A1C13	5-90
2A2A6A4A2C7	As 2A2A4C1	5-90
2A2A6A4A2C8	As 2A2A6A4A1C1	5-90
2A2A6A4A2C9	As 2A2A4C1	5-90
2A2A6A4A2C10	Capacitor, metalized paper, 0,047 μF, ± 10%, 100 VDC, P/N 2D2E1-473E, Mfr. ELECTRON PRODUCTS, 562039-473	5-90
2A2A6A4A2C11	Capacitor, metalized,paper, 0,01 μF, ± 10%, 100 VDC, P/N WL1-103-E-ISC, Mfr. ELECTRON PRODUCTS, 550197-103	5-90
2A2A6A4A2C12	As 2A2A4C1	5-90
2A2A6A4A2C13	Capacitor, fixed, mica, 150 $\mu\mu$F, ± 2%, 300 VDC, P/N DM15E151G300V, Mfr. ELECTROMOTIVE, 694694-151	5-90

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A2C14	Capacitor, per MIL-C-5, type CN05C050K03, - CN05C180K93, Dwg. 698133/050 ÷ 180, CN05E200J03 ÷ CN05E240J03 Dwg. 698132/200 ÷ 240 CN05E270G03 ÷ CN05E620G03 Dwg. 698131/270 ÷ 620 (SUITABLE VALUE)	5-90
2A2A6A4A2C15	Capacitor, fixed, ceramic, 43 pF, ± 3%, 500 VDC, P/N 301-S3B-430H, Mfr. ERIE, 810001-266	5-90
2A2A6A4A2C16	Capacitor, fixed, ceramic, per MIL-C-11015, 100 pF, ± 10%, 100 VDC, type CK12AX101K, Mfr. ERIE	5-90
2A2A6A4A2FL1	Filter, AF, 6 dB INS. LOSS. 200 cps 600 ohm; P/N 526-2929-010, Mfr. COLLINS, A00064	5-90
2A2A6A4A2L2	Inductor, RF, per MIL-C-15305, 150.000 μF, ± 20%, P/N 7875, Mfr. VANGUARD, 696011-155	5-90
2A2A6A4A2Q1	As 2A2A6A4A1Q2	5-90
2A2A6A4A2Q2	As 2A2A6A4A1Q2	5-90
2A2A6A4A2Q3	As 2A2A6A4A1Q2	5-90
2A2A6A4A2R1	As 2A2A5A3R14	5-90
2A2A6A4A2R2	As 2A2A1A1R26	5-90
2A2A6A4A2R3	As 2A2A6A4A2R2	5-90
2A2A6A4A1R4	As 2A2A1A1R31	5-90
2A2A6A4A2R5	As 2A2A6A3A1R4	5-90
2A2A6A4A2R6	As 2A2A6A4A1R15	5-90
2A2A6A4A2R7	As 2A2A1A3R16	5-90

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A2R8	As 2A2A1A4R103	5-90
2A2A6A4A2R9	As 2A2A1A1R21	5-90
2A2A6A4A2R10	As 2A2A1A1R26	5-90
2A2A6A4A2R11	As 2A2A1A1R21	5-90
2A2A6A4A2R12	As 2A2A6A1A3R14	5-90
2A2A6A4A2R13	As 2A2A6A1A3R14	5-90
2A2A6A4A2R14	As 2A2A1A4R117	5-90
2A2A6A4A2R15	Resistor per MIL-R-11, 36 K, ± 5%, 1/4W, type RC07GF363J, Mfr. A. BRADLEY, 697344-363	5-90
2A2A6A4A2R16	As 2A2A6A1A3R20	5-90
2A2A6A4A2R17	As 2A2A4R1	5-90
2A2A6A4A2R18	As 2A2A2A1R13	5-90
2A2A6A4A2R19	As 2A2A1A4R70	5-90
2A2A6A4A2R20	As 2A2A1A4R119	5-90
2A2A6A4A2T1	Transformer, RF, 110 Kc/s, 520 $\mu \mu$F, Mfr. ELMER, P/N A00095	5-90
2A2A6A4A2A2	Detector, phase, Mfr. ELMER, P/N A00055-001	5-90
2A2A6A4A2A2CR1	Diode, semiconductor, type 1N3064, Mfr. SGS, 666163-731	5-90
2A2A6A4A2A2CR2	As 2A2A6A4A2A2CR1	5-90
2A2A6A4A2A2CR3	As 2A2A6A4A2A2CR1	5-90
2A2A6A4A2A2C1	As 2A2A6A4A1C3	5-90
2A2A6A4A2A2C2	As 2A2A6A4A1C3	5-90
2A2A6A4A2A2C3	As 2A2A6A4A1C3	5-90

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A2A2C4	As 2A2A6A4A1C3	5-90
2A2A6A4A2A2Q1	As 2A2A6A4A1A1Q1	5-90
2A2A6A4A2A2Q2	As 2A2A6A4A1A1Q1	5-90
2A2A6A4A2A2R1	As 2A2A6A1A1R15	5-90
2A2A6A4A2A2R2	As 2A2A6A1A1R15	5-90
2A2A6A4A2A2R3	As 2A2A5A1R19	5-90
2A2A6A4A2A2R4	As 2A2A5A1R19	5-90
2A2A6A4A2A2R5	As 2A2A1A3R16	5-90
2A2A6A4A2A2R6	As 2A2A1A3R16	5-90
2A2A6A4A3C2	As 2A2A4C1	5-94
2A2A6A4A3C3	As 2A2A4C1	5-94
2A2A6A4A3C4	As 2A2A4C1	5-94
2A2A6A4A3C5	Capacitor, fixed, mica, 10 μ μF, ± 1%, 500 VDC, P/N DM15C010F500V, Mfr. ELECTROMOTIVE, 552285-010	5-94
2A2A6A4A3C6	As 2A2A6A4A3C5	5-94
2A2A6A4A3C7	As 2A2A4C1	5-94
2A2A6A4A3C8	As 2A2A4C1	5-94
2A2A6A4A3C9	As 2A2A4C1	5-94
2A2A6A4A3C10	As 2A2A4C1	5-94
2A2A6A4A3C11	As 2A2A6A3A2C48	5-94
2A2A6A4A3C12	As 2A2A4C1	5-94
2A2A6A4A3C13	Capacitor, per MIL-C-26655, 6,8 μF, ± 2%, 35 VDC, type CS13AF6R8M, 696184-068, Mfr. CDE	5-94

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A3C14	Capacitor, per MIL-C-26655, 2,2 μF, ± 20%, 35 VDC, type CS13AF2R2M, 696184-022, Mfr. CDE	5-94
2A2A6A4A3C15	As 2A2A6A4A1C1	5-94
2A2A6A4A3C16	As 2A2A6A4A3C14	5-94
2A2A6A4A3C17	Capacitor, per MIL-C-5, 4300 pF ± 2%, 500 VDC, P/N CM06F432G03 698131-432, Mfr. ICAR	5-94
2A2A6A4A3C18	As 2A2A6A4A3C14	5-94
2A2A6A4A3C19	As 2A2A6A4A1C1	5-94
2A2A6A4A3C20	As 2A2A6A4A1C1	5-94
2A2A6A4A3C21	As 2A2A4C1	5-94
2A2A6A4A3C22	As 2A2A5C1	5-94
2A2A6A4A3FL1	Filter, band-pass, 7.1MHz, P/N 767701 Mfr. FILTCH, 810001-278	5-94
2A2A6A4A3L2	As 2A2A6A1L1	5-94
2A2A6A4A3Q1	As 2A2A4A38Q1	5-94
2A2A6A4A3Q2	Transistor, per MIL-S-19500/87 type NAVY 2N1142, Mfr. MOTOROLA	5-94
2A2A6A4A3Q3	As 2A2A6A4A3Q2	5-94
2A2A6A4A3Q4	As 2A2A6A4A1Q2	5-94
2A2A6A4A3Q5	Transistor, per MIL-S-19500/189 type SIGC2N1225, Mfr. R.C.A.	5-94
2A2A6A4A3R1	As 2A2A1A3R16	5-94
2A2A6A4A3R2	As 2A2A5A1R19	5-94
2A2A6A4A3R3	As 2A2A5A1R18	5-94

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A3R4	As 2A2A1A3R73	5-94
2A2A6A4A3R5	As 2A2A6A1A4R20	5-94
2A2A6A4A3R6	As 2A2A6A1A1R14	5-94
2A2A6A4A3R7	As 2A2A6A1A1R14	5-94
2A2A6A4A3R8	As 2A2A1A3R16	5-94
2A2A6A4A3R9	As 2A2A5A1R19	5-94
2A2A6A4A2R10	As 2A2A5A1R18	5-94
2A2A6A4A3R11	As 2A2A6A4A1R15	5-94
2A2A6A4A3R12	As 2A2A5A1R18	5-94
2A2A6A4A3R13	As 2A2A5A1R10	5-94
2A2A6A4A3R14	As 2A2A1A3R16	5-94
2A2A6A4A3R15	As 2A2A5A1R19	5-94
2A2A6A4A3R16	As 2A2A6A2A5R13	5-94
2A2A6A4A3R17	As 2A2A6A1A1R15	5-94
2A2A6A4A3R18	As 2A2A1A1R21	5-94
2A2A6A4A3R19	As 2A2A1A3R16	5-94
2A2A6A4A3R20	As 2A2A5A1R19	5-94
2A2A6A4A3R21	As 2A2A1A1R21	5-94
2A2A6A4A3R22	As 2A2A6A1A3R6	5-94
2A2A6A4A3R23	As 2A2A1A4R103	5-94
2A2A6A4A3R24	As 2A2A5A1R10	5-94
2A2A6A4A3R25	As 2A2A1A3R16	5-94
2A2A6A4A3R26	Resistor, per MIL-R-11, 27 Kohm ± 5%, 1/4W, type RC07GF273J, Mfr. A. BRADLEY, 697344-273	5-94

(Cont'd)

6.2.8.4 - 100 c/s Synthesizer Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A4A3R27	As 2A2A1A1R21	5-94
2A2A6A4A3R28	As 2A2A6A1A1R15	5-94
2A2A6A4A3R29	As 2A2A6A1A1R15	5-94
2A2A6A4A3T1	Transformer, RF, 7,9 Mc/s, 1,0 ÷ 1,18 μH, Mfr. ELMER, 666231-908	5-94
2A2A6A4A3T2	Transformer, RF, 11,5 kHz, Mfr. ELMER, 666231-911	5-94

6.2.8.5 - Spectrum Generator Subassembly (2A2A6)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A5	Spectrum Generator, Mfr. ELMER, P/N 666230-652	5-15
2A2A6A5A1CR1	As 2A2A6A1A3CR1	5-96
2A2A6A5A1CR2	Diode, semiconductor, type 1N816, Mfr. MOTOROLA, 666163-717	5-96
2A2A6A5A1CR3	As 2A2A6A5A1CR2	5-96
2A2A6A5A1CR4	As 2A2A1A4CR13	5-96
2A2A6A5A1C1	As 2A2A4C1	5-96
2A2A6A5A1C2	As 2A2A1A4C33	5-96
2A2A6A5A1C3	As 2A2A4C1	5-96
2A2A6A5A1C4	Capacitor, fixed, mica, 5 μ μF, ± 10%, 500 VDC, P/N DM15C050K500V, Mfr. ELECTROMOTIVE, 694729-050	5-96
2A2A6A5A1C5	Capacitor, fixed, mica, 20 μ μF, ± 2%, 300 VDC, P/N DM15E300G300V, Mfr. ELECTROMOTIVE, 694694-200	5-96
2A2A6A5A1C6	Capacitor, fixed, Polistyrene, 0,0018 μF, ± 10%, 100 VDC, P/N 1P1182K, Mfr. HOPKINS, 666164-922	5-96
2A2A6A5A1C7	As 2A2A4C1	5-96
2A2A6A5A1C8	As 2A2A4C1	5-96
2A2A6A5A1C9	Capacitor, fixed, ceramic, 0,001 μF, ± 20%, 75 VDC, P/N K1200M-001M, Mfr. GLENCO, 552137-102	5-96
2A2A6A5A1C10	Capacitor, ceramic, per MIL-C-20, 120 pF, ± 2%, 150 VDC, CC64UH121G, 698822-121, Mfr. CDE	5-96

(Cont'd)

6.2.8.5 - Spectrum Generator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A5A1C11	As 2A2A6A3C26	5-96
2A2A6A5A1C12	As 2A2A6A5A1C9	5-96
2A2A6A5A1C13	Capacitor, fixed, ceramic, 0,002 μF, ± 20%, 75 VDC, P/N K1200M-002M, 552137-202, Mfr. GLENCO	5-96
2A2A6A5A1C14	As 2A2A4C1	5-96
2A2A6A5A1C15	As 2A2A4C1	5-96
2A2A6A5A1C16	As 2A2A4C1	5-96
2A2A6A5A1C17	Capacitor, fixed, mica, 33 μμF, ± 2%, 300 VDC, P/N DM15E330G300V, Mfr. ELECTROMOTIVE, 694694-330	5-96
2A2A6A5A1C18	As 2A2A6A2A4C12	5-96
2A2A6A5A1C19	As 2A2A6A2A1C1	5-96
2A2A6A5A1J3	Connector, per MIL-G-45204, 1 contact, P/N 3102, Mfr. SEALECTRO, 559998-073	5-96
2A2A6A5A1J6	As 2A2A6A5A1J3	5-96
2A2A6A5A1L1	As 2A2A6A1L1	5-96
2A2A6A5A1L2	Transformer, RF, 250 Kc/s, 2800 μH, Mfr. ELMER, P/N 666163-353	5-96
2A2A6A5A1L5	Transformer, RF, 7,9 Mc/s, Mfr. ELMER, P/N 666231-901	5-96
2A2A6A5A1Q1	As 2A2A6A3A3Q12	5-96
2A2A6A5A1Q2	Transistor, type 2N706, Mfr. R.C.A. 666163-388	5-96
2A2A6A5A1Q3	As 2A2A6A3A3Q12	5-96
2A2A6A5A1Q4	Transistor, type 2N705, Mfr. MOTOROLA, 555236-105	5-96

(Cont'd)

6.2.8.5 - Spectrum Generator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A5A1Q5	As 2A2A5A38Q1	5-96
2A2A6A5A1Q6	As 2A2A4A38Q1	5-96
2A2A6A5A1R1	As 2A2A1A1R22	5-96
2A2A6A5A1R2	As 2A2A1A4R73	5-96
2A2A6A5A1R3	As 2A2A1A4R73	5-96
2A2A6A5A1R4	As 2A2A2A1R13	5-96
2A2A6A5A1R5	Resistor, variable, per MIL-R-27208, 5000 ohm, ± 5%, 1 W, P/N 3250W-1-502, Mfr. BOURNS, 554650-502	5-96
2A2A6A5A1R6	As 2A2A1A4R119	5-92
2A2A6A5A1R7	As 2A2A1A3R16	5-92
2A2A6A5A1R8	As 2A2A1A3R16	5-92
2A2A6A5A1R9	Resistor, per MIL-R-11, 360 ohm, ± 5%, 1/4 W, type RC07GF361J, Mfr. A. BRADLEY 697344-361	5-92
2A2A6A5A1R10	Resistor, per MIL-R-11, 62 ohm, ± 5%, 1/4 W, type RC07GF620J, Mfr. A.BRADLEY, 697344-620	5-92
2A2A6A5A1R11	As 2A2A1A3R16	5-92
2A2A6A5A1R12	As 2A2A1A4R119	5-92
2A2A6A5A1R13	As 2A2A6A1A3R14	5-92
2A2A6A5A1R14	As 2A2A6A2A2R2	5-92
2A2A6A5A1R15	As 2A2A1A4R73	5-92
2A2A6A5A1R16	As 2A2A6A1A1R15	5-92
2A2A6A5A1R17	As 2A2A5A1R19	5-92
2A2A6A5A1R18	As 2A2A1A3R16	5-92

(Cont'd)

6.2.8.5 - Spectrum Generator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A5A1R19	As 2A2A5A1R19	5-92
2A2A6A5A1R20	As 2A2A1A3R16	5-92
2A2A6A5A1R21	As 2A2A1A4R73	5-92
2A2A6A5A1R22	As 2A2A2A1R9	5-92
2A2A6A5A1R23	As 2A2A6A1A2R5	5-92
2A2A6A5A1R24	Resistor per MIL-R-11, type RC07GF391J, RC07GF471J, RC07GF821J, RC07GF681J, RC07GF561J, RC07GF102J, RC07GF122J, RC07GF152J, RC07GF182J, RC07GF222J, RC07GF272J, RC07GF682J, RC07GF822J, RC07GF562J, RC07GF432J, RC07GF392J, RC07GF332J, RC07GF622J, RC07GF512J, RC07GF472J, Mfr. A.BRADLEY, 697344/xx (SUITABLE VALUE)	5-92
2A2A6A5A1R25	As 2A2A2A1R9	5-92
2A2A6A5A1T1	Transformer RF, 25 Mc/s 0,625 μH Mfr. ELMER, P/N 666163-354	5-92
2A2A6A5A1T2	Transformer RF, 7,9 Mc/s 2,41-2,56 μH Mfr. ELMER, P/N 666231-900	5-92
2A2A6A5A2CR1	As 2A2A6A1A3CR1	5-97
2A2A6A5A2CR2	As 2A2A1A4CR11	5-97
2A2A6A5A2CR3	As 2A2A1A4CR11	5-97
2A2A6A5A2CR4	As 2A2A6A5A1CR2	5-97
2A2A6A5A2C1	As 2A2A4C1	5-97
2A2A6A5A2C2	As 2A2A1A4C33	5-97
2A2A6A5A2C3	As 2A2A6A1C17	5-97

(Cont'd)

6.2.8.5 - Spectrum Generator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A5A2C4	As 2A2A6A1C17	5-97
2A2A6A5A2C5	As 2A2A5A1C17	5-97
2A2A6A5A2C6	As 2A2A4C1	5-97
2A2A6A5A2C7	As 2A2A6A1A3C8	5-97
2A2A6A5A2C8	As 2A2A6A5A1C5	5-97
2A2A6A5A2C9	Capacitor, fixed, Polystyrene, 0,033 μF, ± 10%, 100 VDC, P/N IP1333K Mfr. HOPKINS, 666164-918	5-97
2A2A6A5A2C10	As 2A2A4C1	5-97
2A2A6A5A2C11	As 2A2C3	5-97
2A2A6A5A2C12	Capacitor, fixed, electrolytic, 3,3 μF ± 20%, 35 VDC, P/N 150D335X0035B2 Mfr. SPRAGUE, 696124-335	5-97
2A2A6A5A2C13	As 2A2A4C1	5-97
2A2A6A5A2C14	As 2A2A6A1C9	5-97
2A2A6A5A2C15	As 2A2A5A1C12	5-97
2A2A6A5A2C16	As 2A2A5A1C1	5-97
2A2A6A5A2J5	As 2A2A6A5A1J3	5-97
2A2A6A5A2L1	As 2A2A6A1L1	5-97
2A2A6A5A2Q1	As 2A2A6A3A3Q12	5-97
2A2A6A5A2Q2	As 2A2A6A3A3Q12	5-97
2A2A6A5A2Q3	As 2A2A6A5A1Q2	5-97
2A2A6A5A2Q4	As 2A2A6A3A3Q12	5-97
2A2A6A5A2Q5	As 2A2A6A3A3Q12	5-97
2A2A6A5A2Q6	As 2A2A4A38Q1	5-97

(Cont'd)

6.2.8.5 - Spectrum Generator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A5A2R1	As 2A2A6A1A3R1	5-97
2A2A6A5A2R2	As 2A2A5A1R4	5-97
2A2A6A5A2R3	As 2A2A2A1R13	5-97
2A2A6A5A2R4	As 2A2A1A3R16	5-97
2A2A6A5A2R5	As 2A2A1A4R119	5-97
2A2A6A5A2R6	As 2A2A1A3R16	5-97
2A2A6A5A2R7	As 2A2A2A1R13	5-97
2A2A6A5A2R8	As 2A2A1A3R16	5-97
2A2A6A5A2R9	As 2A2A1A4R119	5-97
2A2A6A5A2R11	As 2A2A6A5A1R5	5-97
2A2A6A5A2R12	As 2A2A6A4A1R15	5-97
2A2A6A5A2R13	As 2A2A1A3R16	5-97
2A2A6A5A2R14	As 2A2A6A5A1R9	5-97
2A2A6A5A2R15	As 2A2A6A5A1R10	5-97
2A2A6A5A2R16	As 2A2A1A4R119	5-97
2A2A6A5A2R18	As 2A2A1A3R16	5-97
2A2A6A5A2R19	As 2A2A1A3R16	5-97
2A2A6A5A2R20	As 2A2A6A1A3R14	5-97
2A2A6A5A1R21	As 2A2A2A1R13	5-97
2A2A6A5A2R22	As 2A2A1A4R119	5-97
2A2A6A5A2R23	As 2A2A5A1R20	5-97

(Cont'd)

6.2.8.5 - Spectrum Generator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A5A2R24	Resistor per MIL-R-11, type RC07GF102J, RC07GF122J, RC07GF152J, RC07GF182J, RC07GF222J, RC07GF272J, RC07GF682J, RC07GF822J, RC07GF562J, RC07GF432J, RC07GF392J, RC07GF332J, RC07GF622J, RC07GF512J, RC07GF472J, RC07GF752J, Mfr. A. BRADLEY, 697344/xx, (SUITABLE VALUE)	5-97
2A2A6A5A2R25	As 2A2A5A1R20	5-97
2A2A6A5A2R26	As 2A2A5A1R19	5-97
2A2A6A5A2R27	As 2A2A1A3R16	5-97
2A2A6A5A2R28	As 2A2A6A2A1R8	5-97
2A2A6A5A2R29	As 2A2A6A5A2R9	5-97
2A2A6A5A2R30	As 2A2A6A1A3R15	5-97
2A2A6A5A2T1	Transformer, RF, 7,9 Mc/s 4,53 μH Mfr. ELMER, P/N 666163-358	5-97
2A2A6A5A3CR1	As 2A2A6A1A3CR1	5-98
2A2A6A5A3CR2	As 2A2A1A4CR11	5-98
2A2A6A5A3CR3	As 2A2A1A4CR11	5-98
2A2A6A5A3CR4	As 2A2A1A4CR13	5-98
2A2A6A5A3CR5	As 2A2A6A5A1CR2	5-98
2A2A6A5A3C1	As 2A2A6A1C19	5-98
2A2A6A5A3C2	As 2A2A1A4C33	5-98
2A2A6A5A3C3	As 2A2A6A1C17	5-98
2A2A6A5A3C4	As 2A2A5A1C17	5-98

(Cont'd)

6.2.8.5 - Spectrum Generator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A5A3C5	As 2A2A6A1C17	5-98
2A2A6A5A3C6	As 2A2A4C1	5-98
2A2A6A5A3C7	As 2A2A6A1A3C8	5-98
2A2A6A5A3C8	As 2A2A6A5A1C5	5-98
2A2A6A5A3C9	Capacitor, fixed, Polystyrene, 0,33 µF ±10% 100 VDC, P/N P331PFSK, Mfr. HOPKINS, 666164-923	5-98
2A2A6A5A3C10	As 2A2A4C1	5-98
2A2A6A5A3C11	As 2A2C2	5-98
2A2A6A5A3C12	As 2A2A6A5A2C12	5-98
2A2A6A5A3C13	As 2A2A6A3C26	5-98
2A2A6A5A3C14	Capacitor, per MIL-C-5, 1600 pF ± 2%, 500 VDC, type CN06F162G03, 698131-162, Mfr. ICAR	5-98
2A2A6A5A3C15	As 2A2A6A2A3C2	5-98
2A2A6A5A3C16	As 2A2A6A3C26	5-98
2A2A6A5A3C17	As 2A2A6A3A4Z3C28	5-98
2A2A6A5A3J4	As 2A2A6A5A1J3	5-98
2A2A6A5A3L1	As 2A2A6A1L1	5-98
2A2A6A5A3L2	Inductor, RF, per MIL-C-15305, 27 µH ± 10%, type LT4K051, Mfr. VANGUARD 696013-045	5-98
2A2A6A5A3Q1	As 2A2A6A3A3Q12	5-98
2A2A6A5A3Q2	As 2A2A6A3A3Q12	5-98
2A2A6A5A3Q3	As 2A2A6A5A1Q2	5-98
2A2A6A5A3Q4	As 2A2A6A3A3Q12	5-98

(Cont'd)

6.2.8.5 - Spectrum Generator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A5A3Q5	As 2A2A6A3A3Q12	5-98
2A2A6A5A3Q6	As 2A2A4A38Q1	5-98
2A2A6A5A3R1	As 2A2A6A1A3R1	5-98
2A2A6A5A3R2	As 2A2A5A1R4	5-98
2A2A6A5A3R3	As 2A2A2A1R13	5-98
2A2A6A5A3R4	As 2A2A1A3R16	5-98
2A2A6A5A3R5	As 2A2A1A4R119	5-98
2A2A6A5A3R6	As 2A2A1A3R16	5-98
2A2A6A5A3R7	As 2A2A2A1R13	5-98
2A2A6A5A3R8	As 2A2A1A3R16	5-98
2A2A6A5A3R9	As 2A2A6A1A3R10	5-98
2A2A6A5A3R10	As 2A2A6A3A1R4	5-98
2A2A6A5A3R11	As 2A2A6A5A1R5	5-98
2A2A6A5A3R12	As 2A2A1A4R73	5-98
2A2A6A5A3R13	As 2A2A1A3R16	5-98
2A2A6A5A3R14	As 2A2A6A5A1R9	5-98
2A2A6A5A3R15	As 2A2A6A5A1R10	5-98
2A2A6A5A3R16	As 2A2A1A4R119	5-98
2A2A6A5A3R17	As 2A2A5A1R4	5-98
2A2A6A5A3R18	As 2A2A1A3R16	5-98
2A2A6A5A3R19	As 2A2A1A3R16	5-98
2A2A6A5A3R20	As 2A2A6A1A4R14	5-98
2A2A6A5A3R21	As 2A2A6A2A2R2	5-98
2A2A6A5A3R22	As 2A2A1A4R119	5-98
2A2A6A5A3R23	As 2A2A5A1R20	5-98

(Cont'd)

6.2.8.5 - Spectrum Generator Subassembly (2A2A6) (Cont'd)

REF.DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A5A3R24	As 2A2A6A5A2R24	5-98
2A2A6A5A3R25	As 2A2A6A1A1R15	5-98
2A2A6A5A3R26	As 2A2A5A1R19	5-98
2A2A6A5A3R27	As 2A2A1A3R16	5-98
2A2A6A5A3T1	Transformer, RF 250 Kc/s 1000 μH Mfr. ELMER, P/N 666163-140, 809000-432	5-98
2A2A6A5A4C1	As 2A2A6A4A1C1	5-99
2A2A6A5A4J1	As 2A2A6A5A1J3	5-99
2A2A6A5A4Q1	As 2A2A6A4Q1Q2	5-99
2A2A6A5A4R1	As 2A2A1A1R21	5-99
2A2A6A5A4R2	As 2A2A1A4R117	5-99
2A2A6A5A4R3	As 2A2A1A4R114	5-99
2A2A6A5A4R4	As 2A2A1A3R16	5-99
2A2A6A5A4R5	As 2A2A1A3R16	5-99

6.2.8.6 - RF Translator Subassembly (2A2A6)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A6	Translator, RF. Mfr. ELMER, P/N 666230-660	5-15
2A2A6A6A1	Translator, RF, MFR. ELMER, P/N 666230-944	5-100
2A2A6A6A1CR1	Diode, semiconductor, per MIL-S-19500/200 type 1N270, Mfr. HUGHES, 666231-396	5-101
2A2A6A6A1CR2	As 2A2A6A6A1CR1	5-101
2A2A6A6A1CR3	As 2A2A6A6A1CR1	5-101
2A2A6A6A1CR4	As 2A2A6A6A1CR1	5-101
2A2A6A6A1CR5	As 2A2A6A6A1CR1	5-101
2A2A6A6A1CR6	As 2A2A6A6A1CR1	5-101
2A2A6A6A1CR7	As 2A2A6A6A1CR1	5-101
2A2A6A6A1CR8	As 2A2A6A6A1CR1	5-101
2A2A6A6A1CR9	As 2A2A1A4CR13	5-101
2A2A6A6A1CR10	As 2A2A1A4CR13	5-101
2A2A6A6A1CR11	As 2A2A6A1A3CR1	5-101
2A2A6A6A1C1	As 2A2A6A3C26	5-101
2A2A6A6A1C2	As 2A2A4C1	5-101
2A2A6A6A1C3	As 2A2A2A2C26	5-101
2A2A6A6A1C4	As 2A2A4C1	5-101
2A2A6A6A1C5	As 2A2A4C1	5-101
2A2A6A6A1C6	As 2A2A4C1	5-101
2A2A6A6A1C7	As 2A2A4C1	5-101
2A2A6A6A1C8	As 2A2A6A1C2	5-101
2A2A6A6A1C9	As 2A2A4C1	5-101

(Cont'd)

6.2.8.6 - RF Translator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A6A1C10	As 2A2A4C1	5-101
2A2A6A6A1C11	As 2A2A4C1	5-101
2A2A6A6A1C12	As 2A2A4C1	5-101
2A2A6A6A1C13	As 2A2A4C1	5-101
2A2A6A6A1C14	As 2A2A4C1	5-101
2A2A6A6A1C15	As 2A2A4C1	5-101
2A2A6A6A1C16	As 2A2A4C1	5-101
2A2A6A6A1C17	As 2A2A4C1	5-101
2A2A6A6A1C18	As 2A2A4C1	5-101
2A2A6A6A1C19	As 2A2A4C1	5-101
2A2A6A6A1C20	As 2A2A6A3A4C8	5-101
2A2A6A6A1C21	As 2A2A4C1	5-101
2A2A6A6A1C22	As 2A2A4C1	5-101
2A2A6A6A1C23	As 2A2A4C1	5-101
2A2A6A6A1C24	As 2A2A6A3C26	5-101
2A2A6A6A1C25	As 2A2A6A3C26	5-101
2A2A6A6A1C26	As 2A2A4C1	5-101
2A2A6A6A1C27	As 2A2A4C1	5-101
2A2A6A6A1C28	As 2A2A6A3C26	5-101
2A2A6A6A1C29	As 2A2A6A3C26	5-101
2A2A6A6A1C30	As 2A2A4C1	5-101
2A2A6A6A1C31	As 2A2A4C1	5-101
2A2A6A6A1C32	Capacitor, per MIL-C-5, 1500 pF, ± 2%, 500 VDC, type CM06F152G03, Mfr. ICAR, 698131-152	5-101

(Cont'd)

6.2.8.6 - RF Translator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A6A1C33	Capacitor, fixed, electrolytic, 15 μF, ± 20%, 35 VDC, P/N 150D156X0035R2, Mfr. SPRAGUE, 696124-156	5-101
2A2A6A6A1C34	As 2A2A4C1	5-101
2A2A6A6A1C35	As 2A2A4C1	5-101
2A2A6A6A1C36	As 2A2A6A6A1C33	5-101
2A2A6A6A1C37	As 2A2A4C1	5-101
2A2A6A6A1C38	As 2A2A4C1	5-101
2A2A6A6A1C39	As 2A2A4C1	5-101
2A2A6A6A1C40	As 2A2A4C1	5-101
2A2A6A6A1C41	As 2A2A4C1	5-101
2A2A6A6A1C42	As 2A2A4C1	5-101
2A2A6A6A1C43	As 2A2A4C1	5-101
2A2A6A6A1C45	As 2A2A4C1	5-101
2A2A6A6A1C46	As 2A2A4C1	5-101
2A2A6A6A1FL1	Filter, band-pass, 19,5 - 20,5 Mc/s P/N 526-2924-010, Mfr. COLLINS, 810000-221	5-101
2A2A6A6A1FL2	Filter, band pass, 29,5 - 30,5 Mc/s P/N 526-2925-010, Mfr. COLLINS, 810000-222	5-101
2A2A6A6A1FL3	Filter, band-pass, center frequency, 2,85 Mc/s, P/N 526-2923-010, Mfr. COLLINS, 810000-220	5-101
2A2A6A6A1J1	As 2A2A6A5A1J3	5-101
2A2A6A6A1J2	As 2A2A6A5A1J3	5-101

(Cont'd)

6.2.8.6 - RF Translator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A6A1J3	As 2A2A6A5A1J3	5-101
2A2A6A6A1L1	As 2A2A6A1L1	5-101
2A2A6A6A1L2	As 2A2A6A1A1L2	5-101
2A2A6A6A1L3	As 2A2A6A1A1L2	5-101
2A2A6A6A1L4	As 2A2A6A1L1	5-101
2A2A6A6A1L5	As 2A2A6A1L1	5-101
2A2A6A6A1L6	As 2A2A6A1L1	5-101
2A2A6A6A1L7	As 2A2A6A1L1	5-101
2A2A6A6A1L8	As 2A2A6A1L1	5-101
2A2A6A6A1L9	Inductor RF, Mc/s, 1,50 μH ± 10% P/N 10100-32	5-101
2A2A6A6A1Q1	As 2A2A4A38Q2	5-101
2A2A6A6A1Q2	As 2A2A4A38Q1	5-101
2A2A6A6A1Q3	As 2A2A4A38Q1	5-101
2A2A6A6A1Q4	As 2A2A4A38Q1	5-101
2A2A6A6A1Q5	As 2A2A4A38Q1	5-101
2A2A6A6A1Q6	As 2A2A4A38Q1	5-101
2A2A6A6A1Q7	As 2A2A4A38Q2	5-101
2A2A6A6A1Q8	As 2A2A4A38Q2	5-101
2A2A6A6A1Q9	As 2A2A4A38Q2	5-101
2A2A6A6A1R1	As 2A2A5A1R20	5-101
2A2A6A6A1R2	As 2A2A1A4R73	5-101
2A2A6A6A1R3	As 2A2A6A6A2A3R16	5-101
2A2A6A6A1R4	Resistor, variable per MIL-R-94B, 100 ohm ± 20% 1/4W, P/N FM101M Mfr. A.BRADLEY, 810000-350	5-101

(Cont'd)

6.2.8.6 - RF Translator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A6A1R5	As 2A2A6A3A1R2	5-101
2A2A6A6A1R6	As 2A2A5A1R18	5-101
2A2A6A6A1R7	As 2A2A1A1R31	5-101
2A2A6A6A1R8	Resistor, per MIL-R-11, type RC07GF100J, RC07GF220J, Mfr. A. BRADLEY 697344/xx (Suitable Value)	5-101
2A2A6A6A1R9	As 2A2A6A4A1R15	5-101
2A2A6A6A1R10	As 2A2A5A1R18	5-101
2A2A6A6A1R11	As 2A2A5A1R19	5-101
2A2A6A6A1R12	As 2A2A5A1R20	5-101
2A2A6A6A1R13	As 2A2A6A4A1R15	5-101
2A2A6A6A1R14	As 2A2A5A1R18	5-101
2A2A6A6A1R15	As 2A2A5A1R19	5-101
2A2A6A6A1R16	As 2A2A5A1R20	5-101
2A2A6A6A1R17	As 2A2A6A4A1R15	5-101
2A2A6A6A1R18	As 2A2A5A3R14	5-101
2A2A6A6A1R19	As 2A2A6A3A1R2	5-101
2A2A6A6A1R20	As 2A2A5A1R18	5-101
2A2A6A6A1R21	As 2A2A1A1R31	5-101
2A2A6A6A1R22	Resistor, per MIL-R-11, 15 ohm ± 5%, 1/4 W, type RC07GF150J, Mfr. A. BRADLEY, 697344-150	5-101
2A2A6A6A1R23	As 2A2A5A1R19	5-101
2A2A6A6A1R24	As 2A2A6A4A1R15	5-101
2A2A6A6A1R25	As 2A2A5A1R18	5-101

(Cont'd)

6.2.8.6 - RF Translator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A6A1R26	As 2A2A5A1R20	5-101
2A2A6A6A1R27	Resistor, fixed, per MIL-R-11, 750 ohm ± 5%, 1/2W, type RC20GF751J, Mfr. A. BRADLEY, 698000-751	5-101
2A2A6A6A1R28	As 2A2A5A3R14	5-101
2A2A6A6A1R29	As 2A2A1A3R16	5-101
2A2A6A6A1R30	As 2A2A6A1A1R9	5-101
2A2A6A6A1R31	As 2A2A1A4R73	5-101
2A2A6A6A1R32	As 2A2A5A1R19	5-101
2A2A6A6A1R33	As 2A2A1A4R73	5-101
2A2A6A6A1R34	As 2A2A6A3A1R2	5-101
2A2A6A6A1R35	As 2A2A5A3R14	5-101
2A2A6A6A1R36	As 2A2A6A4A1R15	5-101
2A2A6A6A1R37	As 2A2A5A1R18	5-101
2A2A6A6A1R38	Resistor per MIL-R-11, type RC07GF2R7J, RC07GF3R6J, RC07GF5R1J, RC07GF100J, RC07GF150J, RC07GF200J, RC07GF300J, RC07GF470J, Mfr. A. BRADLEY, 697344/xx, 666231/xx (Suitable Value)	5-101
2A2A6A6A1R39	As 2A2A1A1R31	5-101
2A2A6A6A1R40	As 2A2A1A4R73	5-101
2A2A6A6A1R41	As 2A2A5A3R14	5-101
2A2A6A6A1R42	Resistor, per MIL-R-11, 11 Kohm ± 5%, 1/4 W, type RC07GF113J, Mfr. A. BRADLEY, 697344-113	5-101
2A2A6A6A1R43	As 2A2A2A1R4	5-101

(Cont'd)

6.2.8.6 - RF Translator Subassembly (2A2A6) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A6A6A1R44	As 2A2A5A1R18	5-101
2A2A6A6A1R45	As 2A2A1A1R31	5-101
2A2A6A6A1R46	As 2A2A6A1A1R9	5-101
2A2A6A6A1R47	As 2A2A1A4R73	5-101
2A2A6A6A1R48	As 2A2A1A4R73	5-101
2A2A6A6A1R49	As 2A2A1A4R73	5-101
2A2A6A6A1R50	As 2A2A1A4R73	5-101
2A2A6A6A1R51	As 2A2A1A4R73	5-101
2A2A6A6A1R52	As 2A2A1A4R23	5-101
2A2A6A6A1R53	As 2A2A1A1R21	5-101
2A2A6A6A1R54	As 2A2A6A4A1R15	5-101
2A2A6A6A1R55	As 2A2A1A1R21	5-101
2A2A6A6A1R56	As 2A2A1A1R21	5-101
2A2A6A6A1T1	Transformer, RF, 2500 Kc/s 78 μH, Mfr. ELMER, P/N 666163-360	5-101

6.2.9 - **Code Generator (2A2A6)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A7P1	Connector, plug, 25 pin contacts, type DBSM25P, Mfr. CANNON, 555407-021	5-106

6.2.10 - **Power Supply (2A2A8)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A8CR1	As 2A2CR1	5-20
2A2A8CR2	As 2A2CR1	5-20
2A2A8CR3	As 2A2CR1	5-20
2A2A8CR4	As 2A2CR1	5-20
2A2A8CR5	Diode, semiconductor, type 1N3612, =1N649 Mfr. UNITRODE, 555287-112	5-20
2A2A8CR6	As 2A2A8CR5	5-20
2A2A8CR7	As 2A2A8CR5	5-20
2A2A8CR8	As 2A2A8CR5	5-20
2A2A8CR9	As 2A2CR7	5-20
2A2A8CR10	Diode, semiconductor, type 1X9222, Mfr. SGS, 4-27-06652	
2A2A8CR11	As 2A2A1A4CR11	5-20
2A2A8CR12	Diode, semiconductor, type 1N963B, Mfr. IRCI, 555080-163	5-20
2A2A8CR13	Diode, semiconductor, type 1N750A, Mfr. HUGHES, 555294-150	5-20
2A2A8CR14	As 2A2A1A4CR11	5-20
2A2A8CR15	As 2A2A1A4CR11	5-20
2A2A8C1	Capacitor, fixed, electrolytic, per MIL-C-3965B, 120 μF, ± 75%-15%, 40 VDC, type TO314, Mfr. ITT, 810000-190	5-20
2A2A8C2	As 2A2A8C1	5-20
2A2A8C3	As 2A2A6A2C25	5-20
2A2A8C4	Capacitor, fixed, mica, 820 $\mu\mu$F, ± 2%, 300 VDC, type DM15F821G300V, Mfr. ELECTROMOTIVE, 694701-821	5-20

(Cont'd)

6.2.10 - Power Supply (2A2A8) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A8C5	As 2A2A6A6A1C33	5-20
2A2A8C6	As 2A2A8C1	5-20
2A2A8C7	As 2A2A6A3C25	5-20
2A2A8C8	As 2A2A6A6A1C33	5-20
2A2A8C9	As 2A2A8C1	5-20
2A2A8C10	As 2A2A6A2A5C11	5-20
2A2A8C11	As 2A2A6A2A5C11	5-20
2A2A8C12	As 2A2A6A3C25	5-20
2A2A8Q1	Transistor, type 2N1131, Mfr. MOTOROLA, 696579-131	5-20
2A2A8Q2	Transistor, type 2N697, Mfr. R.C.A., 555227-197	5-20
2A2A8Q3	As 2A2A8Q2	5-20
2A2A8Q4	As 2A2A8Q2	5-20
2A2A8Q5	As 2A2A8Q1	5-20
2A2A8Q6	Transistor, type 2N1613, Mfr. SGS, 696583-113	5-20
2A2A8R1	Resistor, per MIL-R-11, 91 ohm, ± 5%, 1 W, type RC32GF910T, Mfr. A. BRADLEY, 689000-910	5-20
2A2A8R2	As 2A2A5A1R18	5-20
2A2A8R3	As 2A2A1A4R73	5-20
2A2A8R4	As 2A2A1A1R22	5-20
2A2A8R5	As 2A2A6A1A3R10	5-20
2A2A8R6	As 2A2A1A4R73	5-20
2A2A8R7	As 2A2A1A4R73	5-20

(Cont'd)

6.2.10 - Power Supply (2A2A8) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A8R8	As 2A2A1A3R15	5-20
2A2A8R9	As 2A2A5A1R20	5-20
2A2A8R10	Resistor variable, 500 ohm, ± 5%, type 224P-1-501; Mfr, BOURNS, 554644-501	5-20
2A2A8R11	As 2A2A5A1R5	5-20
2A2A8R12	As 2A2A1A4R79	5-20
2A2A8R13	As 2A2R5	5-20
2A2A8R14	Resistor, per MIL-R-11, 180 ohm, ± 5%, 1 W, type RC32GF181J, Mfr. A. BRADLEY, 698011-181	5-20
2A2A8R15	Resistor, per MIL-R-11, 160 ohm, ± 5%, 1 W, type RC23GF161J, Mfr. A. BRADLEY, 698011-161	5-20
2A2A8R16	Resistor, per MIL-R-11, 220 ohm, ± 5%, 1 W, type RC23GF221J, Mfr. A. BRADLEY, 698011-221	5-20
2A2A8R17	As 2A2A6A1A3R14	5-20
2A2A8R18	As 2A2R5	5-20
2A2A8R19	As 2A2A1A3R16	5-20
2A2A8R20	As 2A2A1A3R16	5-20
2A2A8R21	As 2A2A1A1R32	5-20
2A2A8R22	As 2A2A1A4R114	5-20
2A2A8R23	As 2A2A1A1R32	5-20
2A2A8R24	As 2A2A6A4A2R15	5-20

6.2.11 - **FSK Tone Generator (2A2A9)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A9	FSK Tone Generator, Mfr. ELMER, 666230-051	5-15
2A2A9P1	Connector, 9 pin contacts, type DESM-9PF115, Mfr. CANNON, 555407-301	5-102
2A2A9R1	Resistor, per MIL-R-18546, 2670 ohm, ± 1%, 10 W, type RE65G2671, Mfr. DALE, 697376-425	5-102
2A2A9A1CR1	Diode, semiconductor, per MIL-S-19500-193 type 1N457, Mfr. HUGHES, 694037-146	5-103
2A2A9A1CR2	Diode, semiconductor, type 1N3026B, Mfr. MOTOROLA, 555293-126	5-103
2A2A9A1CR3	As 2A2A9A1CR1	5-103
2A2A9A1CR4	As 2A2A9A1CR1	5-103
2A2A9A1CR5	Diode, semiconductor, type 1N967B, Mfr. MOTOROLA, 555080-167	5-103
2A2A9A1CR6	As 2A2A9A1CR1	5-103
2A2A9A1CR7	As 2A2A9A1CR1	5-103
2A2A9A1CR8	As 2A2A9A1CR1	5-103
2A2A8A1C1	Capacitor, fixed, ceramic, 20000 $\mu\mu$F ± 20%, 100 VDC, type C80V203AM, Mfr. AEROVOX, 810000-195	5-103
2A2A9A1C2	Capacitor, fixed, ceramic, 10 KpF, ±20%, 100 VDC, type C80V103AM, Mfr. AEROVOX, 810000-194	5-103
2A2A9A1C3	Capacitor, fixed, ceramic, 50000 $\mu\mu$F, ± 20%, 100 VDC, type C80V503AM, Mfr. AEROVOX, 810000-196	5-103

(Cont'd)

6.2.11 - FSK Tone Generator (2A2A9) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A9A1C4	As 2A2A8C1	5-103
2A2A9A1C5	Capacitor, fixed, mica, 20000 $\mu\mu$F, ± 1%, 300 VDC, type DM30F203F300V, Mfr. ELECTROMOTIVE, 810000-198	5-103
2A2A9A1C6	As 2A2A9A1C1	5-103
2A2A9A1C7	As 2A2A9A1C1	5-103
2A2A9A1C8	As 2A2A9A1C1	5-103
2A2A9A1C9	Capacitor, electrolytic, 100 μF, ± 20%, 10 VDC, type 150D107X0010R2, Mfr. SPRAGUE, 696120-107	5-103
2A2A9A1C10	Capacitor, electrolytic, 10 μF, ± 20%, 35 VDC, type 150D106X0035R2, Mfr. SPRAGUE, 696124-106	5-103
2A2A9A1C11	As 2A2A9A1C5	5-103
2A2A9A1Q1	As 2A2A6A5A1Q2	5-103
2A2A9A1Q2	As 2A2A8Q6	5-103
2A2A9A1Q3	As 2A2A6A5A1Q2	5-103
2A2A9A1Q4	As 2A2A8Q1	5-103
2A2A9A1Q5	As 2A2A8Q6	5-103
2A2A9A1Q6	As 2A2A8Q6	5-103
2A2A9A1Q7	As 2A2A6A5A1Q2	5-103
2A2A9A1R2	As 2A2A1A3R16	5-103
2A2A9A1R3	As 2A2A6A5A1R14	5-103
2A2A9A1R4	As 2A2A1A4R64	5-103
2A2A9A1R5	As 2A2R5	5-103
2A2A9A1R6	As 2A2A1R41	5-103

(Cont'd)

6.2.11 - FSK Tone Generator (2A2A9) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A9A1R7	As 2A2A1A1R32	5-103
2A2A9A1R8	As 2A2A1A4R101	5-103
2A2A9A1R9	Resistor, wirewound, 8200 ohm, ± 1%, 2 W, type SB1W822F, Mfr. SAGE, 554586-822	5-103
2A2A9A1R10	As 2A2A1A1R23	5-103
2A2A9A1R11	Resistor, wirewound, 6500 ohm, ± 1%, 2 W, type SB1W652F, Mfr. SAGE, 562028-652	5-103
2A2A9A1R12	As 2A2A1A1R23	5-103
2A2A9A1R13	Resistor, variable, 5000 ohm, ± 10%, type 236P-1-502, Mfr. BOURNS, 554627-502	5-103
2A2A9A1R14	As 2A2A1A3R16	5-103
2A2A9A1R15	As 2A2A5A1R18	5-103
2A2A9A1R16	As 2A2A6A5A1R14	5-103
2A2A9A1R17	As 2A2A1A1R31	5-103
2A2A9A1R18	As 2A2A1A1R31	5-103
2A2A9A1R19	As 2A2A1A3R15	5-103
2A2A9A1R20	As 2A2A1A1R31	5-103
2A2A9A1R21	As 2A2A6A2A5R10	5-103
2A2A9A1R22	As 2A2A6A1A2R14	5-103
2A2A9A1E23	As 2A2A1A1R31	5-103
2A2A9A1R24	As 2A2A6A2A5R10	5-103
2A2A9A1R25	As 2A2A6A1A1R14	5-103
2A2A9A1R26	As 2A2A1A4R101	5-103

(Cont'd)

6.2.11 - FSK Tone Generator (2A2A9) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A9A1R27	As 2A2A1A4R58	5-103
2A2A9A1R28	As 2A2A5A1R10	5-103
2A2A9A1R29	As 2A2A6A1A1R14	5-103
2A2A9A1S1	Switch, per MIL-S-8834, type MS24656-23, Mfr. CUTLER HAMMER, 555363-003	5-103
2A2A9A1T1	Transformer, RF, P/N 666231-615 Mfr. ELMER	5-103

6.2.12 - **Amplifier, Meter (2A2A10)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A10C1	As 2A2A1A4C33	5-21
2A2A10C2	Capacitor, electrolytic, 1 μF, ± 20%, 35V, type CS13AF910M, Mfr. PAE, 696184-010	5-21
2A2A10C3	As 2A2A1A4C33	5-21
2A2A10Q1	As 2A2A1A4Q8	5-21
2A2A10R1	As 2A2A1A1R21	5-21
2A2A10R2	As 2A2A1A4R114	5-21
2A2A10R3	As 2A2A6A1A2R14	5-21
2A2A10R4	As 2A2A2A1R4	5-21
2A2A10R5	As 2A2A1A3R16	5-21
2A2A10R6	As 2A2A1A4R117	5-21
2A2A10R7	As 2A2A1A4R66	5-21
2A2A10R8	As 2A2A1A4R99	5-21
2A2A10R9	As 2A2A1A4R114	5-21

6.2.13 - Amplifier, Meter (2A2A11)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A11C1	As 2A2A1A4C33	5-21
2A2A11C2	As 2A2A10C2	5-21
2A2A11C3	As 2A2A1A4C33	5-21
2A2A11Q1	As 2A2A1A4Q8	5-21
2A2A11R1	As 2A2A1A1R21	5-21
2A2A11R2	As 2A2A1A4R114	5-21
2A2A11R3	As 2A2A6A1A2R14	5-21
2A2A11R4	As 2A2A2A1R4	5-21
2A2A11R5	As 2A2A1A3R16	5-21
2A2A11R6	As 2A2A1A4R117	5-21
2A2A11R7	As 2A2A1A4R66	5-21
2A2A11R8	As 2A2A1A4R99	5-21
2A2A11R9	As 2A2A1A4R114	5-21

6.2.14 - **IF Amplifier Assembly (2A2A12)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A12	IF Amplifier Module, Dwg, 666230-039, Mfr. ELMER,	5-15
2A2A12P1	Connector, 10 pin contacts, 3 coax, type D3M-13W3P, Mfr, CANNON, Dwg. 555246-421	5-104
2A2A12A1CR1	As 2A2A1A4CR11	5-105
2A2A12A1C1	As 2A2C3	5-105
2A2A12A1C2	As 2A2A1A1C12	5-105
2A2A12A1C3	As 2A2A8C1	5-105
2A2A12A1C4	As 2A2C3	5-105
2A2A12A1C5	Capacitor, fixed, mica, 1200 $\mu\mu$F, ± 5%, 500 VDC, type DM20E122J500V, Mfr. ELECTROMOTIVE, 694724-122	5-105
2A2A12A1C6	As 2A2C3	5-105
2A2A12A1C7	As 2A2C3	5-105
2A2A12A1C8	As 2A2A12A1C5	5-105
2A2A12A1C10	As 2A2A8C1	5-105
2A2A12A1Q1	Transistor, type 2N1012, Mfr. ELECTRONICS CORP. 666163-389	5-105
2A2A12A1Q2	As 2A2A1A3Q1	5-105
2A2A12A1Q3	As 2A2A1A3Q1	5-105
2A2A12A1Q4	As 2A2A8Q6	5-105
2A2A12A1R1	As 2A2A1A1R21	5-105
2A2A12A1R2	As 2A2A2A1R13	5-105
2A2A12A1R3	As 2A2A5A1R10	5-105
2A2A12A1R4	As 2A2A6A4A1R15	5-105

(Cont'd)

6.2.14 - IF Amplifier Assembly (2A2A12) (Cont'd)

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A12A1R5	As 2A2A1A1R26	5-105
2A2A12A1R6	As 2A2A1A4R86	5-105
2A2A12A1R7	As 2A2A5A1R10	5-105
2A2A12A1R8	As 2A2A1A3R15	5-105
2A2A12A1R9	As 2A2A1A3R15	5-105
2A2A12A1R10	As 2A2A1A3R15	5-105
2A2A12A1R11	As 2A2A6A2A5R15	5-105
2A2A12A1R12	As 2A2A1A4R103	5-105
2A2A12A1R13	As 2A2A2A1R4	5-105
2A2A12A1R14	As 2A2A6A6A1R42	5-105
2A2A12A1R15	As 2A2A9A1R13	5-105
2A2A12A1R16	As 2A2A2A1R13	5-105
2A2A12A1R17	As 2A2A6A4A1R15	5-105
2A2A12A1R18	As 2A2A5A2R1	5-105
2A2A12A1R19	As 2A2A1A3R15	5-105
2A2A12A1R21	As 2A2A6A3A3R52	5-105
2A2A12A1R22	As 2A2A1A1R21	5-105
2A2A12A1R23	As 2A2A1A3R15	5-105
2A2A12A1R24	As 2A2A6A1A1R1	5-105
2A2A12A1R25	As 2A2A1A3R15	5-105
2A2A12A1T1	Transformer, FI, 500 Kc/s, P/N 666163-968, Mfr. ELMER	5-105
2A2A12A1T2	Transformer, FI, 500 Kc/s, P/N 666163-969, Mfr. ELMER	5-105

6.2.15 - **Light Indicator Assembly (2A2A13)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A13DS3	Light, Indicator, 28 Volt, 0,04A, Mfr. GRIMES, 810001-567	5-16
2A2A13DS4	As 2A2A13DS3	5-16

6.2.16 - **Handset, Filter Box (2A2A14)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A14C1	Capacitor, fixed, ceramic, 4000 $\mu\mu$F, ± 20%, 500 VDC, type 2445-000, Mfr. ERIE, 666164-928	5-16
2A2A14C2	As 2A2A14C1	5-16
2A2A14C3	As 2A2A1A1C12	5-16
2A2A14C4	As 2A2C2	5-16
2A2A14L1	As 2A2A5A1L2	5-16

6.2.17 - **IF Filter (2A2A15)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A15C1	As 2A2A1A1C12	5-22
2A2A15C2	As 2A2A1A1C12	5-22
2A2A15C3	Capacitor, electrolytic, 100 μF, ± 20%, type 150D107X0020S2, Mfr. SPRAGUE, 696122-107	5-22
2A2A15L1	As 2A2A3A1L2	5-22
2A2A15L2	As 2A5A5A1L2	5-22
2A2A15L3	As 2A2A5A1L2	5-22
2A2A15R1	As 2A2A6A1A3R1	5-22

6.2.18 - **Power Supply 4 VDC (2A2A16)**

REF. DESIG.	NAME AND DESCRIPTION	FIG. NO
2A2A16R1	Resistor, per MIL-R-11, 390 ohm, ± 5%, 1 W, type RC32GF391J, Mfr. A. BRADLEY, 698011-391	5-23
2A2A16C1	As 2A2A6A4A1C1	5-23
2A2A16CR1	Diode, semiconductor, per MIL-E-1, type USN-1N748AM, Mfr. HUGHES	5-23

PARTS LOCATION INDEX Fig. 5-1

REF DESIG	LOC
2A1J23	24A
2A1J24	6B
2A1J25	2B
2A1P1(P21)	3C,3D,3E, 3F,3G,3H, 3I,6H,10B, 10C,22C, 22D,22E, 30A,30B, 30C,30D, 30E,30F, 30G,30H, 35A,35H, 35L,36E
2A1P2(P22)	3B,6B,23A
2A1A1C1	29D
2A1A1C2	29D
2A1A1C3	36I
2A1A1C4	36E
2A1A1C5	2G
2A1A1C6	29H
2A1A1C7	29A
2A1A1C8	2D
2A1A1C9	29B
2A1A1C10	2E
2A1A1C11	2D
2A1A1C12	24C
2A1A1C13	29G
2A1A1C14	2C
2A1A1C15	2C
2A1A1C16	29C
2A1A1C17	10C
2A1A1C19	2I
2A1A1C20	6H
2A1A1C21	29A
2A1A1C22	2G
2A1A1C23	24E
2A1A1C24	36H
2A1A1C25	36I
2A1A1C26	24E
2A1A1C27	29H
2A1A1C28	24E
2A1A1C31	24D
2A1A1C32	11B
2A1A1C33	24D
2A1A1C34	2F
2A1A1C35	24D
2A1A1C36	29F

REF DESIG	LOC
2A1A1C37	36A
2A1A1C38	2H
2A1A1C40	2C
2A1A1C41	29C
2A1A1C43	29E
2A1A1C44	29G
2A1A1C45	29C
2A1A1C46	29D
2A1A1C47	2I
2A1A1C48	2H
2A1A1C49	2G
2A1A1C50	29H
2A1A1J3	28D,28H
2A1A1J4	2C,2D,2E, 2F,2G,2H, 2I,6I,11B, 24C,24D,24E, 28A,28B,28C, 28D,28E,28G, 28H,37A,37E, 37F,37G,37H, 37I
2A1A1J5	2F
2A1A1J6	2D
2A1A1J7	2G,2H,2I,28I
C1	35C
C2	33F
C3	31I
C4	4B
C5	3B
CR1	31E
CR2	20G
CR3	32C
CR4	5G
CR5	11F
CR6	32G
CR7	21C
CR8	32I
CR9	20G
DS1	32D
DS2	32D
F1	32D
F2	32C
J1	2E 2F,37A, 37B,37I
J2	2I
J5	13A
J8	20E,20F,21E, 21F,22E,22F
J9	3B,4B,5B

REF DESIG	LOC
J10	20B,21B
J11	19A,19B,20B, 21B,22A,22B
J12	13D,13F,14C, 16F,17F,18C, 18D,18E,18F
J13	14A
J14	18A,18B
J15	11A,11B, 12B,13B
J16	7B,10A
J17	7A,8B, 9B,10B
J18	7F,8F
J19	7D,7E, 8D,8E
J20	5G,5H
J21	3C,3D,3E,3F, 3G,3H,3I,6H, 10B,10C,22C, 22D,22E,30A, 30B,30C,30D, 30F,30G,30H, 34A,34H,34I, 36E
J22	3B,6B,23A
K1	32E
K1A	32F
K1B	5G
K2	19G
K2A	19E
K2B	19G
K3	32C
K3(A,B)	19C
K3C	31G
K3D	34C
K4	5G
K5	12F
K5A	6G
K6	32G
K6A	34I
L1	34C
L2	35D
M1	12G
M2	12H
Q1	33F
R1	35C
R2	36D
R3	31H
R4	3H
R5	30G

REF DESIG	LOC
S1	16I
S1A(Front)	4H,5D
S1A Retro	3D,3E,3F
S1B(Front)	3G,4E,31G
S1B Retro	4I,30C
S2	19H
S2A(Front)	10D,32D
S2A Retro	5E,10E
S2B(Front)	31D
S2B Retro	6E
S2C(Front)	32H
S2C Retro	6G
S2D(Front)	4F
S2D Retro	21C
S3	23F
S4	23F
S5(Front)	22F
S5 Retro	21F
S6	16G
S8	31D
S9	32A
S10	9F
S12	21D
S13	27E
S11	8H
T1	33C
A1P1	7B,10A
A1P2	7A,8B, 9B,10B
A2P1	7F,8F
A3P1	7D,8D
A4P1	20B,21B
A4P2	19A,19B,20B, 21B,22A,22B
A5P1	3B,4B,5A,5B
A6C1	18C
A6C2	16B
A6J4	17E,17F,18F
A6J5	16D,16E
A6J6	16C,16D,17C
A6P1	13D,13F,14C, 16F,17F,18C, 18D,18E,18F
A6P2	14A,15F,18B
A6P3	14B,18A,18B
A6P7	16B
A6P8	17B
A6P9	17B
A6P10	17B

REF DESIG	LOC
A6P11	17B
A6P12	16B
A6P13	15B
A6P14	15D
A6P15	15D
A6P16	15D
A6P17	15D
A6P18	15D
A6P19	15C
A6P21	14D
A6P22	14E
A6P23	14C
A6P24	14D
A6P25	14D
A6P26	14E
A6A1P1	17E,17F,18F
A6A2P1	16C,17C
A6A3J1	15D
A6A3J3	15D
A6A3J4	15D
A6A3J5	15D
A6A4J6	15D
A6A3J7	15D
A6A4P1	16E
A6A5J1	14E
A6A5J2	14E
A6A5J3	14D
A6A5J4	14D
A6A5J5	14D
A6A5J6	14D
A6A6J1	17B
A6A6J2	16B
A6A6J3	15B
A6A6J4	17B
A6A6J5	17B
A6A6J6	16B
A6A6J7	17B
A7P8	20E,20F,21E, 21F,22E,22F
A8C1	34D
A8C2	34D
A8C3	33E
A8C4	34E
A8C5	36E
A8C6	36E
A8C7	34G
A8C8	34G
A8C9	34C
A8C10	10F

REF DESIG	LOC
A8C11	10F
A8C12	34E
A8CR1	33C
A8CR2	34C
A8CR3	33C
A8CR4	34C
A8CR5	33D
A8CR6	34D
A8CR7	33D
A8CR8	34D
A8CR9	10E
A8CR10	10F
A8CR11	34F
A8CR12	34F
A8CR13	35F
A8CR14	34E
A8CR15	33E
A8Q1	34F
A8Q2	34F
A8Q3	35F
A8Q4	35F
A8Q5	34E
A8Q6	34E
A8R1	35D
A8R2	33F
A8R3	34F
A8R4	35E
A8R5	35F
A8R6	35E
A8R7	35E
A8R8	35F
A8R9	36E
A8R10	36F
A8R11	36F
A8R12	34F
A8R13	33G
A8R14	33G
A8R15	34C
A8R16	11F
A8R17	33E
A8R18	34E
A8R19	34E
A8R20	33E
A8R21	34E
A8R22	33E
A8R23	34E
A8R24	33F
A9P1	5H

REF DESIG	LOC
A10C1	10G
A10C2	11G
A10C3	12F
A10Q1	11G
A10R1	10F
A10R2	10G
A10R3	10F
A10R4	11F
A10R5	11F
A10R6	11F
A10R7	10G
A10R8	11G
A10R9	12G
A11C1	10I
A11C2	11I
A11C3	12H
A11Q1	11H
A11R1	10H
A11R2	10H
A11R3	10H
A11R4	11H
A11R5	11H
A11R6	11H
A11R7	10I
A11R8	11I
A11R9	12I
A12P1	11A,11B, 13A,13B
A13DS3	36D
A13DS4	37D
A14C1	32I
A14C2	3E
A14C3	33I
A14C4	2E
A14L1	2E
A15C1	11D
A15C2	12D
A15C3	12D
A15L1	12C
A15L2	12C
A15L3	12D
A15R1	19D
A16C1	14G
A16CR1	14G
A16R1	14G

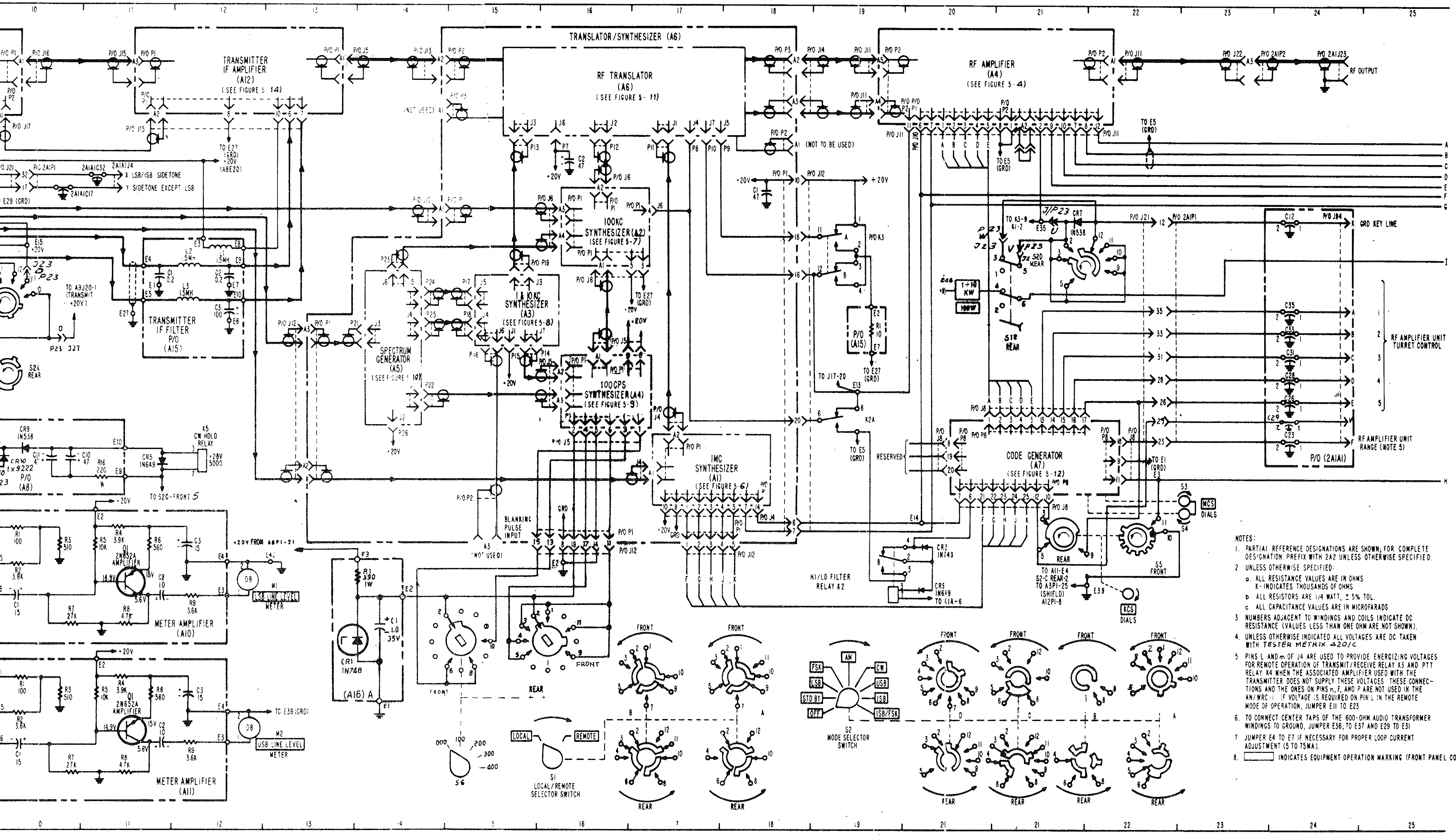
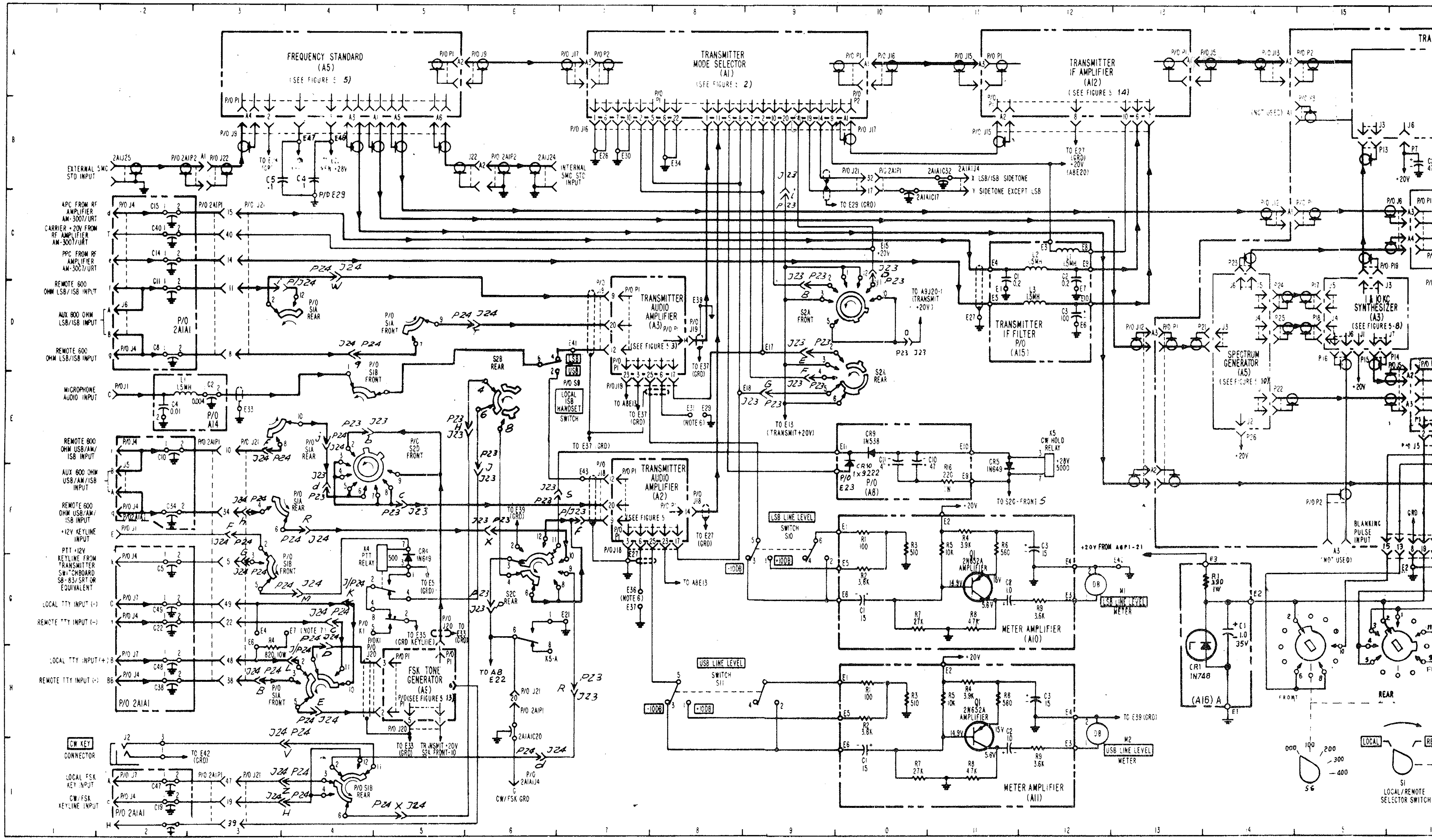


Figure 5-1. Radio Transmitter T-827A/URT, Chassis and Main Frame, Schematic Diagram (Sheet 1 of 2)


FREQUENCY STANDARD (A5)
TRANSMITTER MODE SELECTOR (A1)
TRANSMITTER IF AMPLIFIER (A12)
EXTERNAL 5MC STD INPUT
INTERNAL 5MC STD INPUT
APC FROM RF AMPLIFIER AM-3007/URT
CARRIER +20V FROM RF AMPLIFIER AM-3007/URT
PPC FROM RF AMPLIFIER AM-3007/URT
REMOTE 600 OHM LSB/ISB INPUT
AUX 600 OHM LSB/ISB INPUT
MICROPHONE AUDIO INPUT
REMOTE 600 OHM USB/AM/ISB INPUT
AUX 600 OHM USB/AM/ISB INPUT
+12V KEYLINE INPUT
LOCAL TTY INPUT (-)
REMOTE TTY INPUT (-)
LOCAL TTY INPUT (+)
REMOTE TTY INPUT (+)
CW KEY CONNECTOR
LOCAL FSK KEY INPUT
CW/FSK KEYLINE INPUT
TRANSMITTER AUDIO AMPLIFIER (A3)
TRANSMITTER AUDIO AMPLIFIER (A2)
TRANSMITTER IF FILTER P/O (A15)
LOCAL ISB HANDSET SWITCH
FSK TONE GENERATOR (A5)
CW HOLD RELAY
LSB LINE LEVEL SWITCH S10
USB LINE LEVEL SWITCH S11
METER AMPLIFIER (A10)
METER AMPLIFIER (A11)
LSB LINE LEVEL METER
USB LINE LEVEL METER
SPECTRUM GENERATOR (A5)
1 & 10 KC SYNTHESIZER (A3)
BLANKING PULSE INPUT
(A16) A
REAR
S1 LOCAL/REMOTE SELECTOR SWITCH

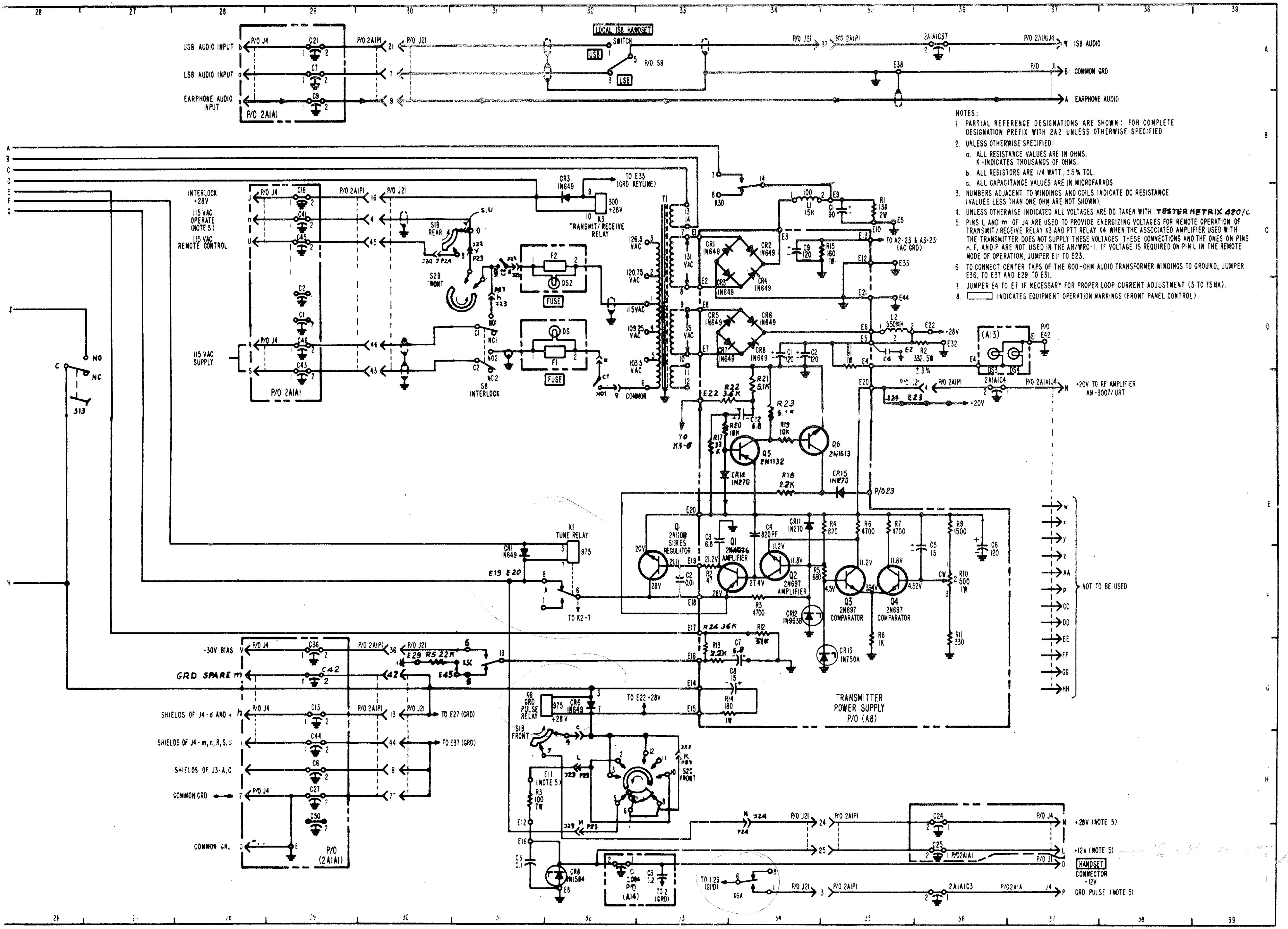


Figure 5-1. Radio Transmitter T-827A/URT Chassis and Main Frame, Schematic Diagram (Sheet 2 of 2)

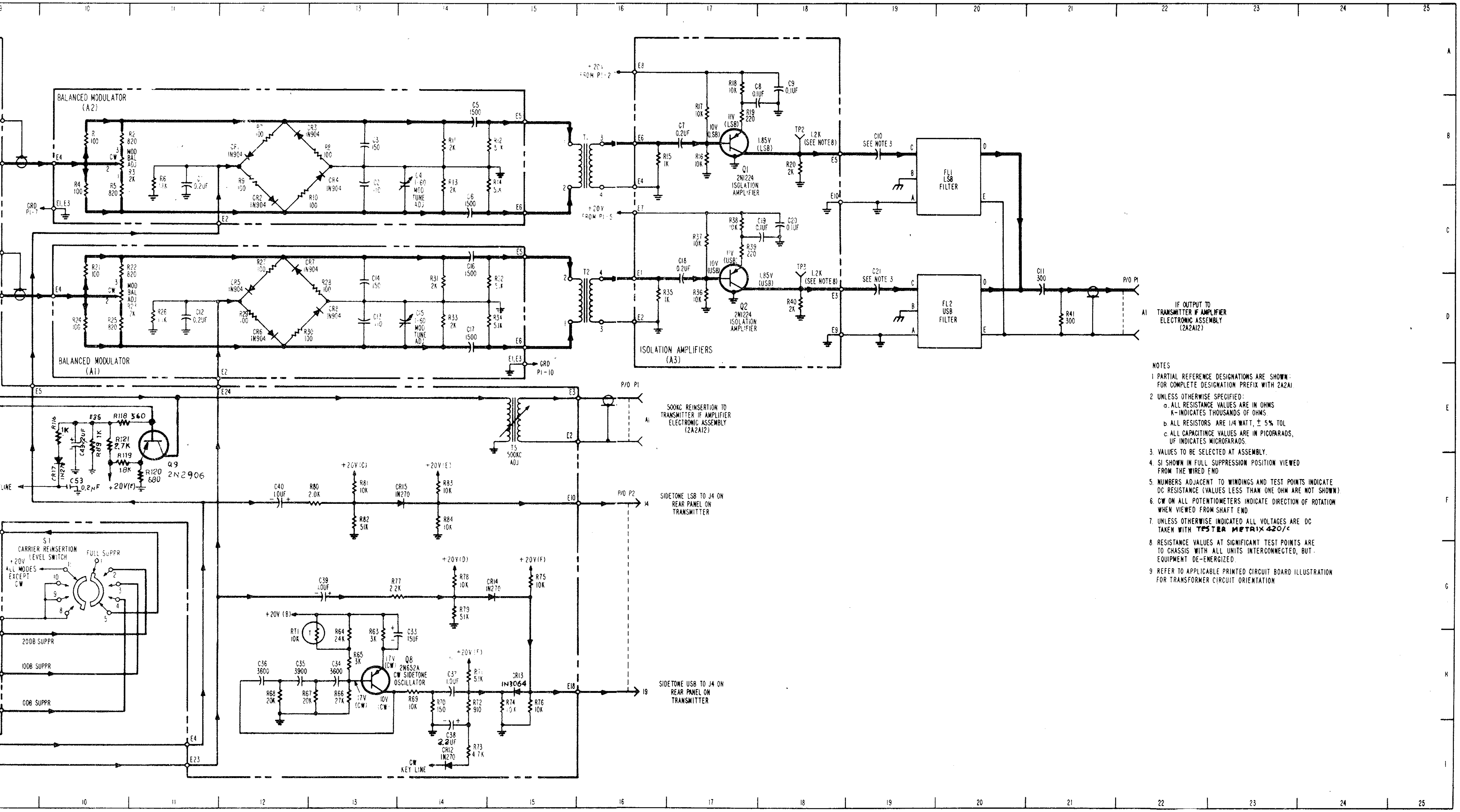
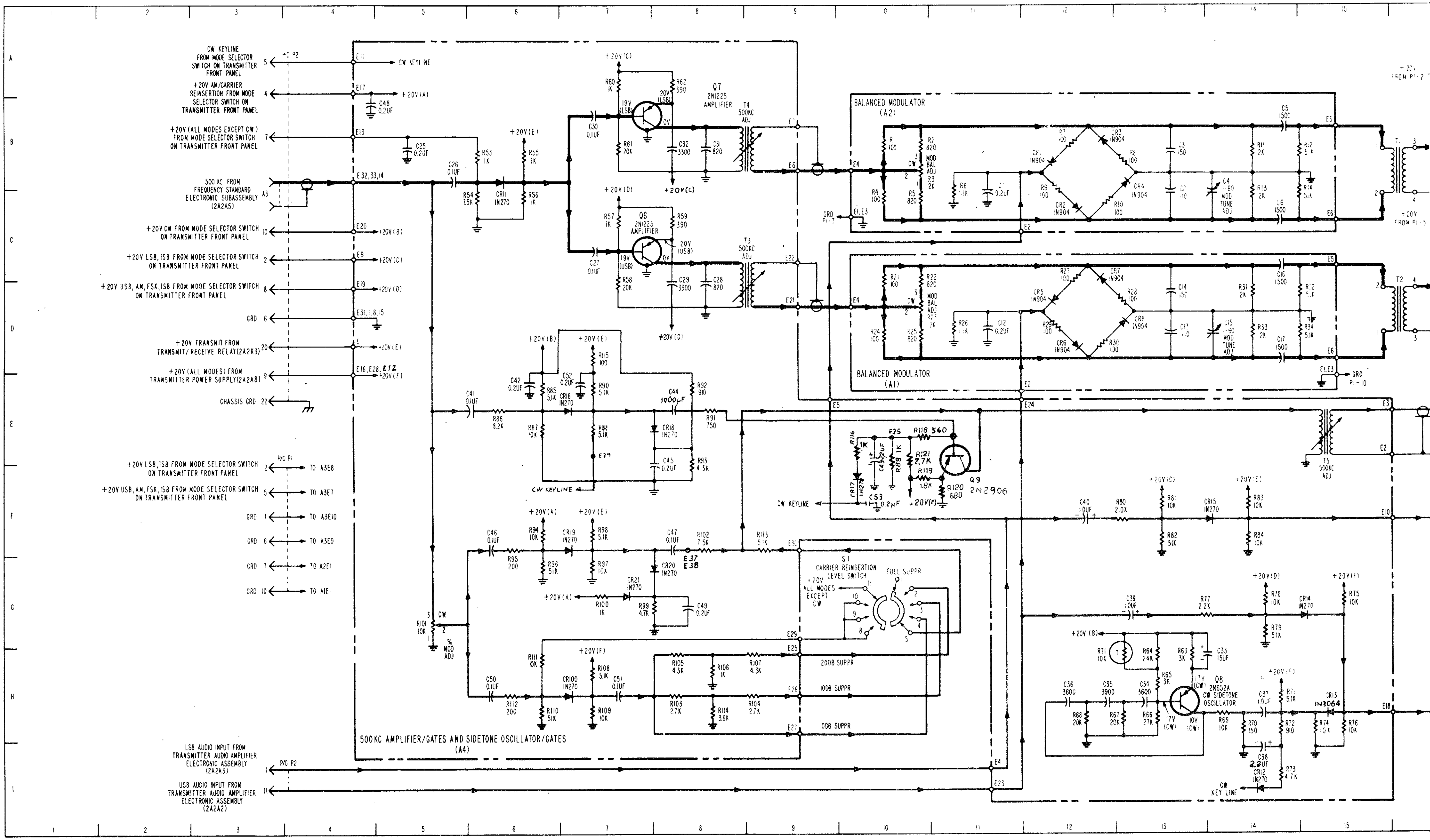
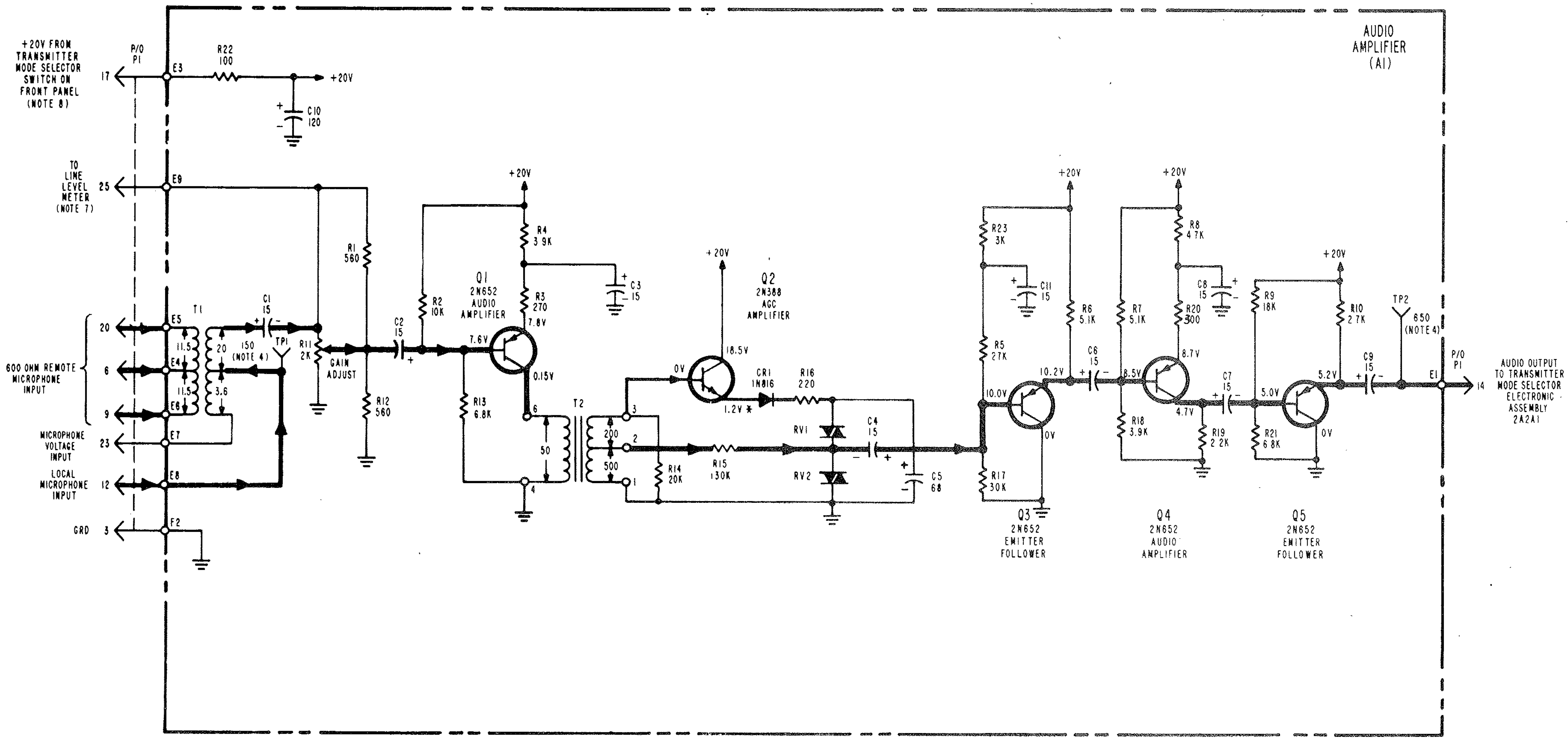


Figure 5-2. Mode Selector Electronic Assembly, Schematic Diagram

Pub. 246
December 1967
ORIGINAL

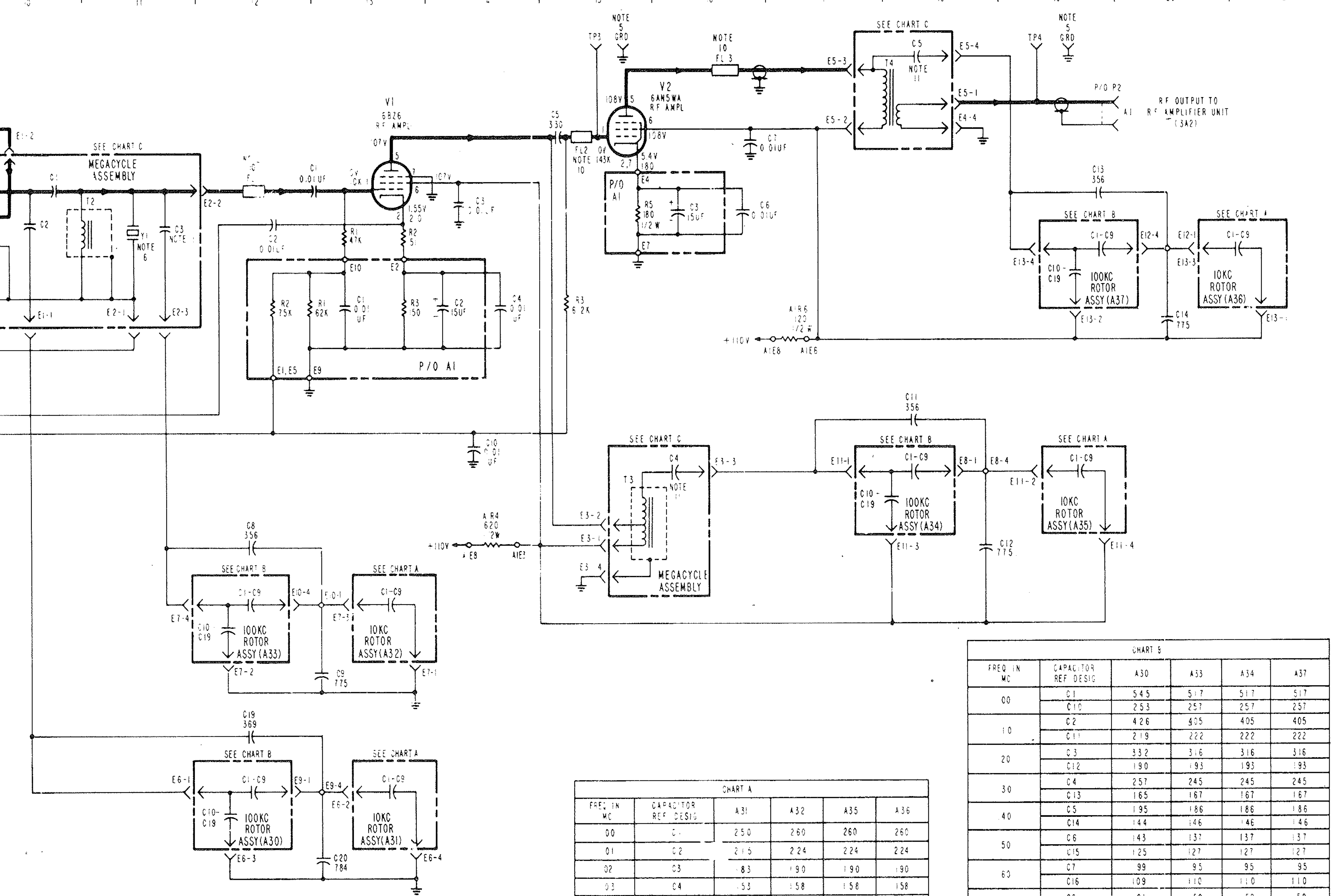

CW KEYLINE FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
+20V AM/CARRIER REINSERTION FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
+20V (ALL MODES EXCEPT CW) FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
500 KC FROM FREQUENCY STANDARD ELECTRONIC SUBASSEMBLY (2A2A5)
+20V CW FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
+20V LSB, ISB FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
+20V USB, AM, FSK, ISB FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
GRD
+20V TRANSMIT FROM TRANSMIT/RECEIVE RELAY (2A2K3)
+20V (ALL MODES) FROM TRANSMITTER POWER SUPPLY (2A2A8)
CHASSIS GRD
+20V LSB, ISB FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
+20V USB, AM, FSK, ISB FROM MODE SELECTOR SWITCH ON TRANSMITTER FRONT PANEL
LSB AUDIO INPUT FROM TRANSMITTER AUDIO AMPLIFIER ELECTRONIC ASSEMBLY (2A2A3)
USB AUDIO INPUT FROM TRANSMITTER AUDIO AMPLIFIER ELECTRONIC ASSEMBLY (2A2A2)
Q7 2N1225 AMPLIFIER
Q6 2N1225 AMPLIFIER
T4 500KC ADJ
T3 500KC ADJ
BALANCED MODULATOR (A2)
BALANCED MODULATOR (A1)
Q9 2N2906
S1 CARRIER REINSERTION LEVEL SWITCH
FULL SUPPR
20DB SUPPR
10DB SUPPR
0DB SUPPR
Q8 2N652A CW SIDETONE OSCILLATOR
T5 500KC ADJ
CW KEYLINE
500KC AMPLIFIER/GATES AND SIDETONE OSCILLATOR/GATES (A4)



NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE DESIGNATION PREFIX WITH 2A2A2 OR 2A2A3
2. UNLESS OTHERWISE SPECIFIED:
   a. ALL RESISTANCE VALUES ARE IN OHMS. K-INDICATES THOUSANDS OF OHMS
   b. ALL RESISTORS ARE 1/4 WATT, ± 5% TOLERENCE
   c. ALL CAPACITANCE VALUES ARE IN MICROFARADS
3. NUMBERS ADJACENT TO WINDINGS AND TEST POINTS INDICATE DC RESISTANCE (VALUES LESS THAN ONE OHM ARE NOT SHOWN).
4. RESISTANCE VALUES AT SIGNIFICANT TEST POINTS ARE TO CHASSIS WITH ALL UNITS INTERCONNECTED BUT EQUIPMENT DE-ENERGIZED.
5. * EMITTER VOLTAGE VARIES WITH INPUT. A READING OF 1.2V OBTAINED WITH A 55MV INPUT AT PINS 12 AND 23.
6. UNLESS OTHERWISE INDICATED [illegible] ARE DC TAKEN WITH *TESTER METRIX 420/c*
7. DURING LSB OPERATION THE AUDIO [illegible] IS OBSERVED ON THE LSB LINE LEVEL METER (M1) DURING USB OPERATION THE AUDIO LEVEL AT P1-25 IS OBSERVED ON THE USB LINE LEVEL METER (M2)
8. DURING LSB OPERATION +20V LSB/ISB IS PRESENT AT P1-17 DURING USB OPERATION +20V USB/AM/FSK/ISB IS PRESENT AT P1-17
9. REFER TO APPLICABLE PRINTED CIRCUIT BOARD ILLUSTRATION FOR TRANSFORMER CIRCUIT ORIENTATION.

Figure 5-3. Audio Amplifier Electronic Assembly, Schematic Diagram



NOTES

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION PREFIX WITH 2A2A4
2. UNLESS OTHERWISE SPECIFIED:
   a. ALL RESISTANCE VALUES ARE IN OHMS K-INDICATES THOUSANDS OF OHMS.
   b. ALL RESISTORS ARE 1/4 WATT, ± 5% TOL
   c. ALL CAPACITANCE VALUES ARE IN PICOFARADS, UF INDICATES MICROFARADS.
3. NUMBERS ADJACENT TO COILS AND TEST POINTS INDICATE DC RESISTANCE (VALUES LESS THAN ONE OHM ARE NOT SHOWN).
4. ALL RESISTANCE READINGS TAKEN WITH RF AMPLIFIER ELECTRONIC ASSEMBLY REMOVED FROM CHASSIS AND REFERENCED TO GROUND.
5. DURING MEASUREMENT AT A TEST POINT USE GROUND MARKED ADJACENT TO TEST POINT.
6. CRYSTAL Y1 USED ONLY ON ASSEMBLIES A9, A10 AND A19.
7. S1 SHOWN IN 2MC POSITION.
8. P2-A2 IS WIRED BUT NOT USED IN AN/WRC-1 SYSTEM.
9. CAPACITORS IN CHARTS A,B, AND C WHICH ARE 100PF AND GREATER ARE 1/2%. CAPACITORS LESS THAN 100PF ARE 1%, EXCEPT C1 IN CHART C WHICH IS 5%.
10. FL1, FL2, AND FL3 ARE PARASITIC SUPPRESSORS.
11. NOT USED IN MC POSITION.
12. [illegible] DC, TAKEN WITH TESTER METRIX 420/c
13. [illegible] STRATION FOR TRANSFORMER CIRCUIT ORIENTATION.

CHART C

FREQ IN MC	ON ASSY	C1	ON ASSY	C2	ON ASSY	C3	ON ASSY	C4	ON ASSY	C5
2	A20	91	A20	SHORT	A20	SHORT	A25	SHORT	A2	SHORT
3	A21	62	A21	1247	A21	1253	A26	1247	A3	1253
4	A22	56	A22	623	A22	629	A21	623	A4	629
5	A23	51	A23	416	A23	422	A28	416	A5	422
6	A24	39	A24	312	A24	318	A29	312	A6	318
7	A25	33	A25	250	A25	256	A2	250	A7	256
8	A26	30	A26	208	A26	214	A3	208	A8	214
9	A27	27	A27	179	A27	185	A4	179	A9	185
10	A28	27	A28	157	A28	163	A5	157	A10	163
11	A29	24	A29	140	A29	146	A6	140	A11	146
12	A2	22	A2	126	A2	132	A7	126	A12	132
13	A3	20	A3	115	A3	120	A8	115	A13	120
14	A4	20	A4	105	A4	111	A9	105	A14	111
15	A5	20	A5	97	A5	103	A10	97	A15	103
16	A6	20	A6	91	A6	96	A11	91	A16	96
17	A7	20	A7	85	A7	90	A12	85	A17	90
18	A8	18	A8	80	A8	85	A13	80	A18	85
19	A9	18	A9	75	A9	80	A14	75	A19	80
20	A10	18	A10	71	A10	76	A15	71	A20	76
21	A11	20	A11	67	A11	73	A16	67	A21	73
22	A12	20	A12	64	A12	68	A17	64	A22	68
23	A13	20	A13	61	A13	66	A18	[illegible]	A23	66
24	A14	2.0	A14	58	A14	63	A19	58	A24	63
25	A15	20	A15	56	A15	61	A20	56	A25	[illegible]
26	A16	20	A16	54	A16	59	A21	54	A26	59
27	A17	20	A17	52	A17	57	A22	52	A27	57
28	A18	20	A18	50	A18	55	A23	50	A28	55
29	A19	20	A19	48	A19	53	A24	48	A29	53

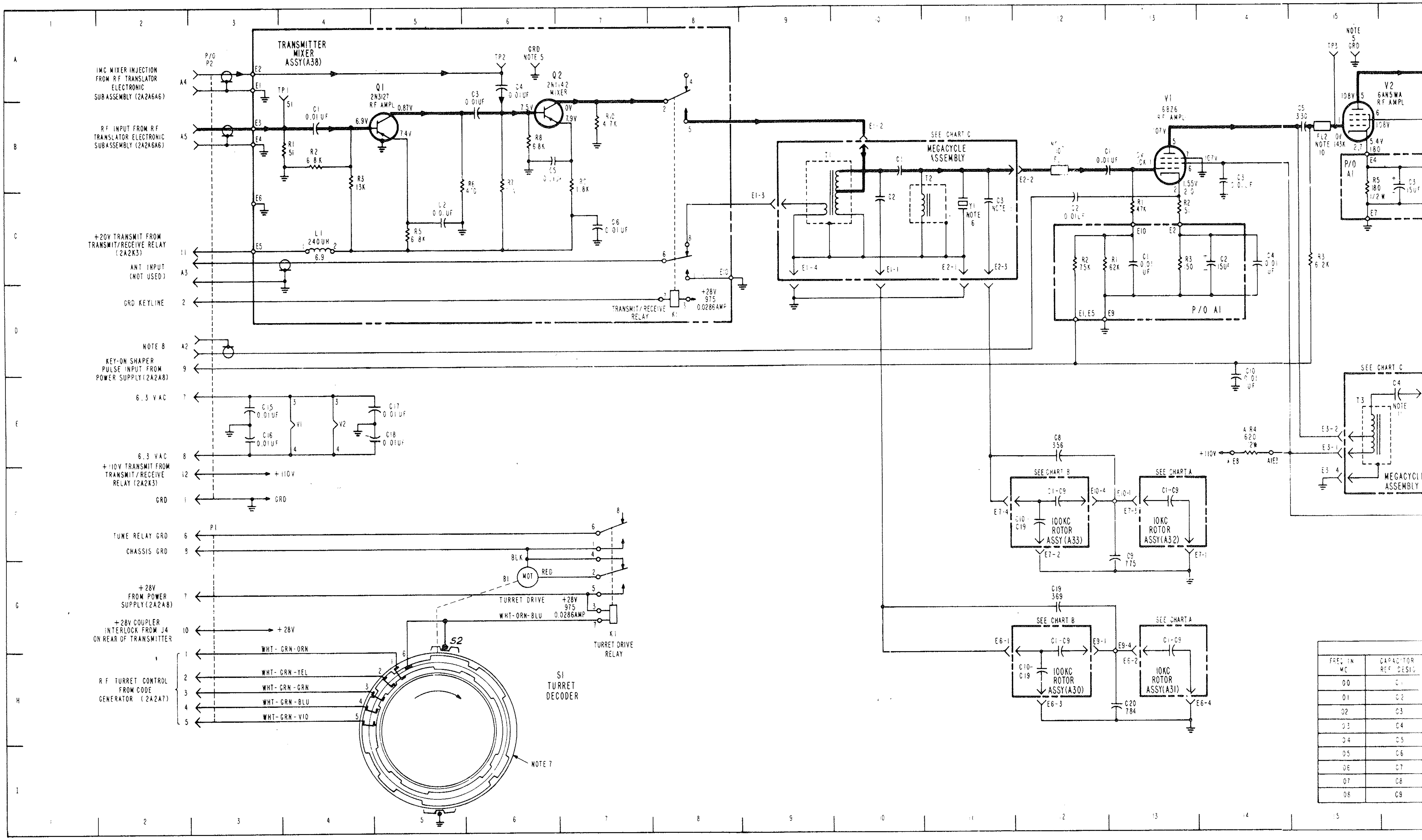
CHART B

FREQ IN MC	CAPACITOR REF DESIG	A30	A33	A34	A37
00	C1	545	517	517	517
	C10	253	257	257	257
10	C2	426	405	405	405
	C11	219	222	222	222
20	C3	332	316	316	316
	C12	190	193	193	193
30	C4	257	245	245	245
	C13	165	167	167	167
40	C5	195	186	186	186
	C14	144	146	146	146
50	C6	143	137	137	137
	C15	125	127	127	127
60	C7	99	95	95	95
	C16	109	110	110	110
70	C8	61	59	59	59
	C17	95	96	96	96
80	C9	29	28	28	28
	C18	83	83	83	83
90	C19	74	74	74	74

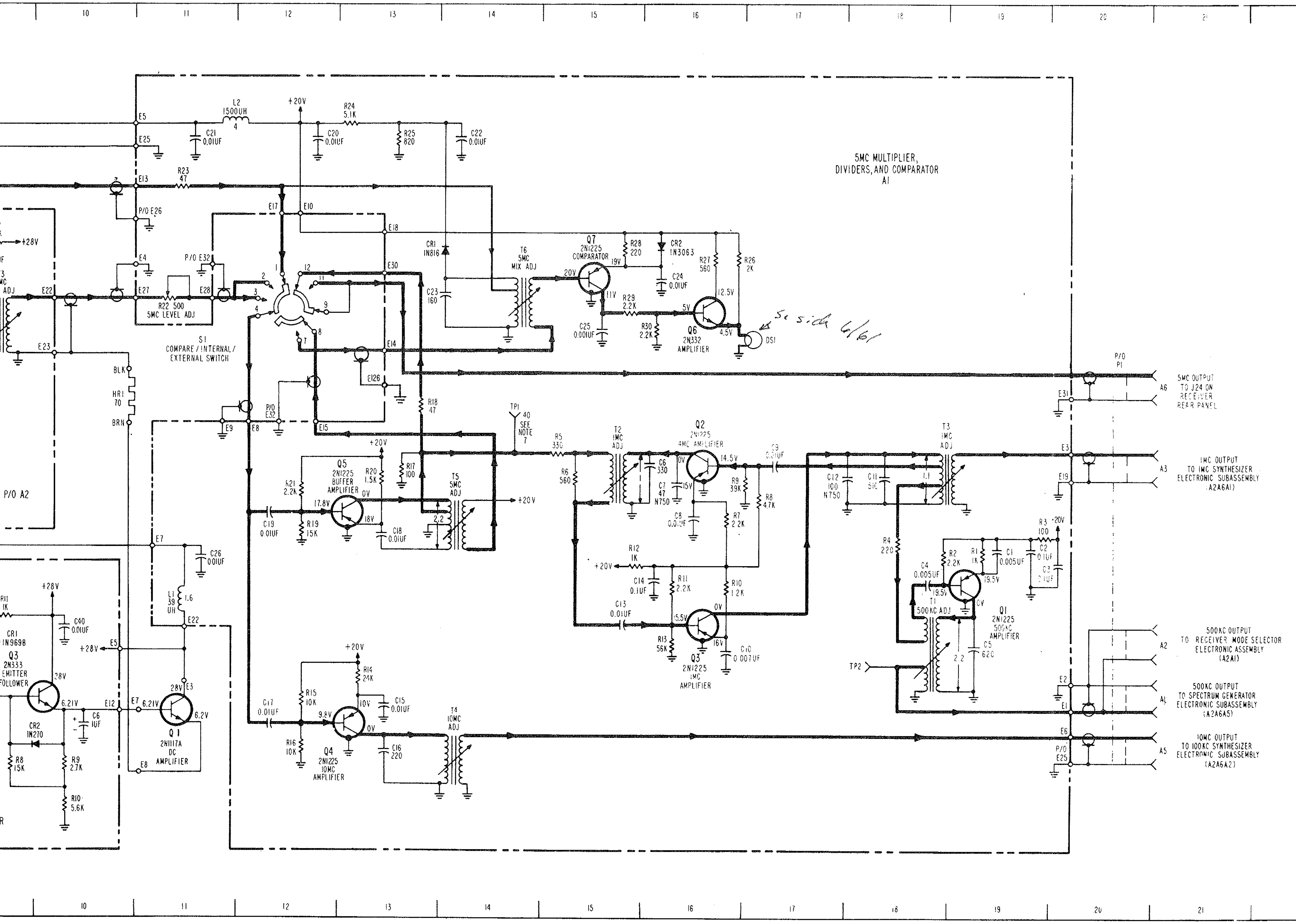
CHART A

FREQ IN MC	CAPACITOR REF DESIG	A31	A32	A35	A36
00	C1	250	260	260	260
01	C2	215	224	224	224
02	C3	183	190	190	190
03	C4	153	158	158	158
04	C5	124	128	128	128
05	C6	96	99	99	99
06	C7	70	72	72	72
07	C8	45	47	47	47
08	C9	22	23	23	23

Figure 5-4. RF Amplifier Electronic Assembly, Schematic Diagram



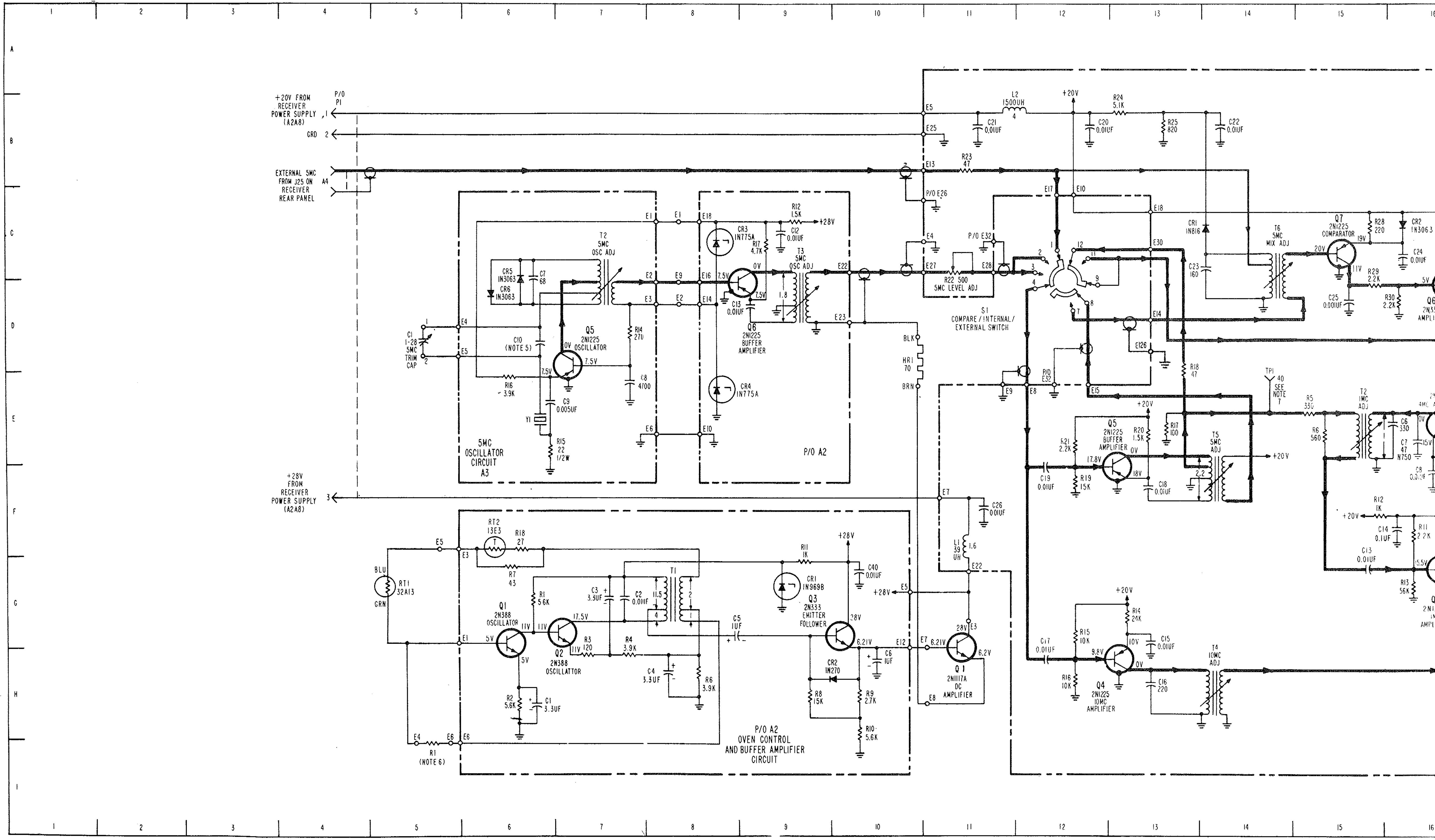
FREQ IN MC	CAPACITOR REF DESIG
00	C1
01	C2
02	C3
03	C4
04	C5
05	C6
06	C7
07	C8
08	C9



NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION PREFIX WITH A2A5
2. UNLESS OTHERWISE SPECIFIED:
   a. ALL RESISTANCE VALUES ARE IN OHMS K-INDICATES THOUSANDS OF OHMS.
   b. ALL RESISTORS ARE 1/4 WATT, ±5% TOL.
   c. ALL CAPACITANCE VALUES ARE IN PICOFARADS UF INDICATES MICROFARADS.
3. NUMBERS ADJACENT TO WINDINGS, COILS, AND TEST POINTS INDICATE DC RESISTANCE (VALUES LESS THAN ONE OHM ARE NOT SHOWN).
4. UNLESS OTHERWISE INDICATED ALL VOLTAGES ARE DC TAKEN WITH **TESTER METRIX 430/C**
5. VALUE OF THIS CAPACITOR IS 56, 62, 68, 75 OR 82 PICOFARADS, SELECTION IS DETERMINED AT TIME OF ASSEMBLY.
6. VALUE OF THIS RESISTOR IS 240 THROUGH 360 OHMS, SELECTION IS DETERMINED AT TIME OF ASSEMBLY.
7. RESISTANCE VALUES AT SIGNIFICANT TEST POINTS ARE TO CHASSIS WITH ALL UNITS INTERCONNECTED, BUT EQUIPMENT DE-ENERGIZED.
8. REFER TO APPLICABLE PRINTED CIRCUIT BOARD ILLUSTRATION FOR TRANSFORMER CIRCUIT ORIENTATION
9. AS SHOWN, SWITCH S1 IS IN THE EXTERNAL POSITION (FULLY CW AS VIEWED FROM TOP)

Figure 5-5. Frequency Standard Electronic Assembly, Schematic Diagram



+20V FROM RECEIVER POWER SUPPLY (A2A8)
P/O P1
GRD
EXTERNAL 5MC FROM J25 ON RECEIVER REAR PANEL
A4
+28V FROM RECEIVER POWER SUPPLY (A2A8)
C1 1-28 5MC TRIM CAP
CR5 1N3063
CR6 1N3063
C7 68
T2 5MC OSC ADJ
C10 (NOTE 5)
Q5 2N1225 OSCILLATOR
R16 3.9K
C9 0.005UF
Y1
R15 22 1/2W
R14 270
C8 4700
5MC OSCILLATOR CIRCUIT A3
CR3 1N775A
R17 4.7K
R12 1.5K
C12 0.01UF
C13 0.01UF
Q6 2N1225 BUFFER AMPLIFIER
T3 5MC OSC ADJ
CR4 1N775A
P/O A2
BLK
HR1 70
BRN
R23 47
L2 1500UH
C21 0.01UF
C20 0.01UF
R24 5.1K
R25 820
C22 0.01UF
P/O E26
P/O E32
R22 500 5MC LEVEL ADJ
S1 COMPARE/INTERNAL/EXTERNAL SWITCH
CR1 1N816
C23 160
T6 5MC MIX ADJ
Q7 2N1225 COMPARATOR
R28 220
CR2 1N3063
C24 0.01UF
R29 2.2K
C25 0.001UF
R30 2.2K
R18 47
TP1 SEE NOTE 7
R5 330
R6 560
T2 1MC ADJ
C6 330
C7 47 N750
Q5 2N1225 BUFFER AMPLIFIER
R20 1.5K
R17 100
R21 2.2K
C19 0.01UF
R19 15K
C18 0.01UF
T5 5MC ADJ
R12 1K
C14 0.1UF
R11 2.2K
C13 0.01UF
R13 56K
C26 0.01UF
L1 39 UH
Q1 2N1117A DC AMPLIFIER
R15 10K
R14 24K
C15 0.01UF
C17 0.01UF
R16 10K
Q4 2N1225 10MC AMPLIFIER
C16 220
T4 10MC ADJ
RT2 13E3
R18 27
R7 43
RT1 32A13
BLU
GRN
Q1 2N388 OSCILLATOR
R1 5.6K
Q2 2N388 OSCILLATOR
C3 3.3UF
C2 0.01UF
T1
R3 120
R4 3.9K
C4 3.3UF
R6 3.9K
R2 5.6K
C1 3.3UF
R11 1K
C40 0.01UF
CR1 1N969B
Q3 2N333 EMITTER FOLLOWER
C5 1UF
CR2 1N270
C6 1UF
R8 15K
R9 2.7K
R10 5.6K
R1 (NOTE 6)
P/O A2 OVEN CONTROL AND BUFFER AMPLIFIER CIRCUIT

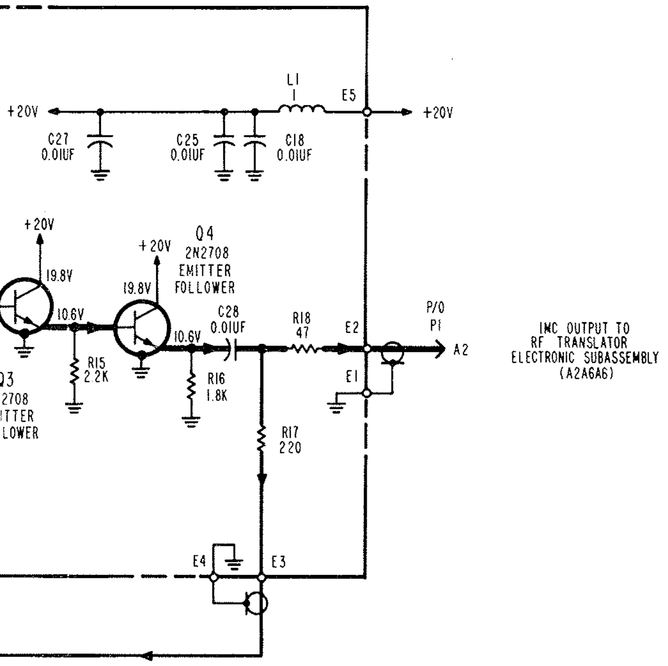


CHART A						CHART A				
FREQ	Y1 TO Y9		C1 TO C9			FREQ	Y10 TO Y17		C10 TO C17	
2.5	Y1	2,499,850	C1	1300 PF		12.5	Y10	12,499,000	C10	240 PF
3.5	Y2	3,499,720	C2	1000 PF		14.5	Y11	14,498,840	C11	200 PF
4.5	Y3	4,499,640	C3	820 PF		15.5	Y12	15,498,760	C12	180 PF
5.5	Y4	5,499,560	C4	680 PF		16.5	Y13	16,498,680	C13	160 PF
7.5	Y5	7,499,400	C5	500 PF		17.5	Y14	17,498,600	C14	160 PF
8.5	Y6	8,499,320	C6	430 PF		19.5	Y15	18,498,440	C15	115 PF
9.5	Y7	9,499,240	C7	360 PF		20.5	Y16	20,498,360	C16	110 PF
10.5	Y8	10,499,160	C8	300 PF		23.5	Y17	23,498,120	C17	75 PF
11.5	Y9	11,499,080	C9	270 PF						

NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION PREFIX WITH A2A6A1.
2. UNLESS OTHERWISE SPECIFIED:
   a - ALL RESISTANCE VALUES ARE IN OHMS K - INDICATES THOUSANDS OF OHMS.
   b - ALL RESISTORS ARE 1/4 WATT, ±5% TOL.
   c - ALL CAPACITANCE VALUES ARE IN PICOFARADS UF - INDICATES THOUSANDS OF OHMS.
   d - INDUCTANCE VALUES ARE IN MICROHENRIES.
3. UNLESS OTHERWISE SPECIFIED ALL VOLTAGES ARE DC TAKEN WITH TESTER METRIX 430/C
4. REFER TO APPLICABLE PRINTED CIRCUIT BOARD ILLUSTRATION FOR TRANSFORMER CIRCUIT ORIENTATION.
5. READINGS ARE FOR A PARTICULAR LOCKING VOLTAGE OF THE OSCILLATOR.

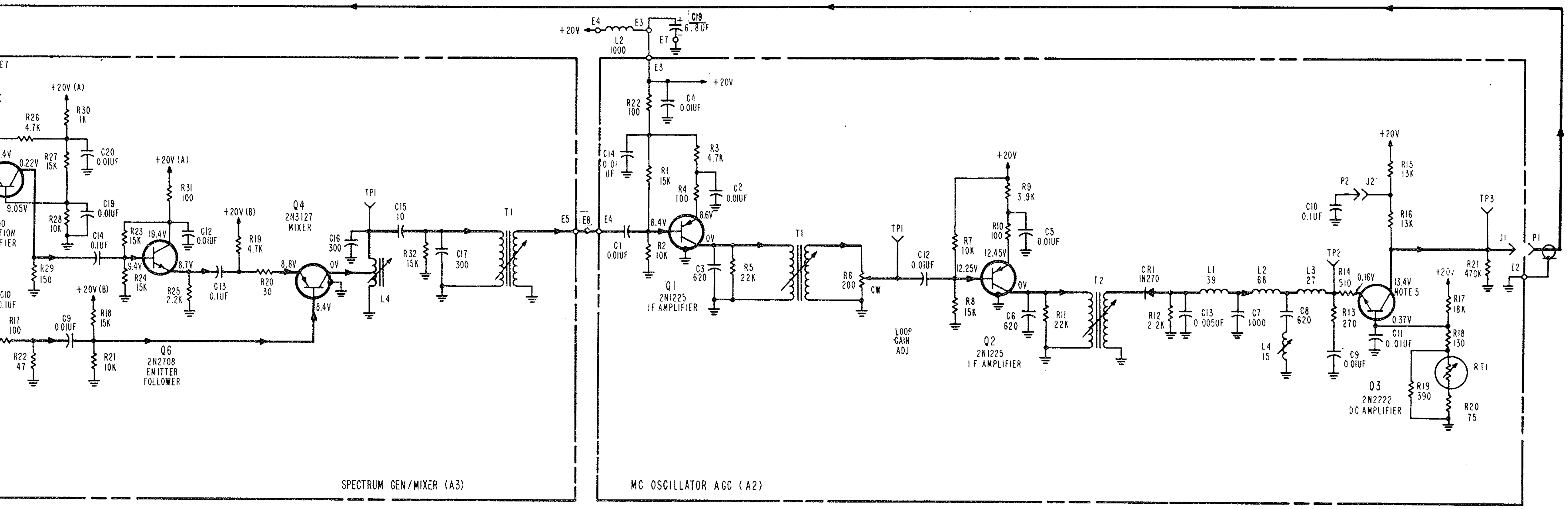
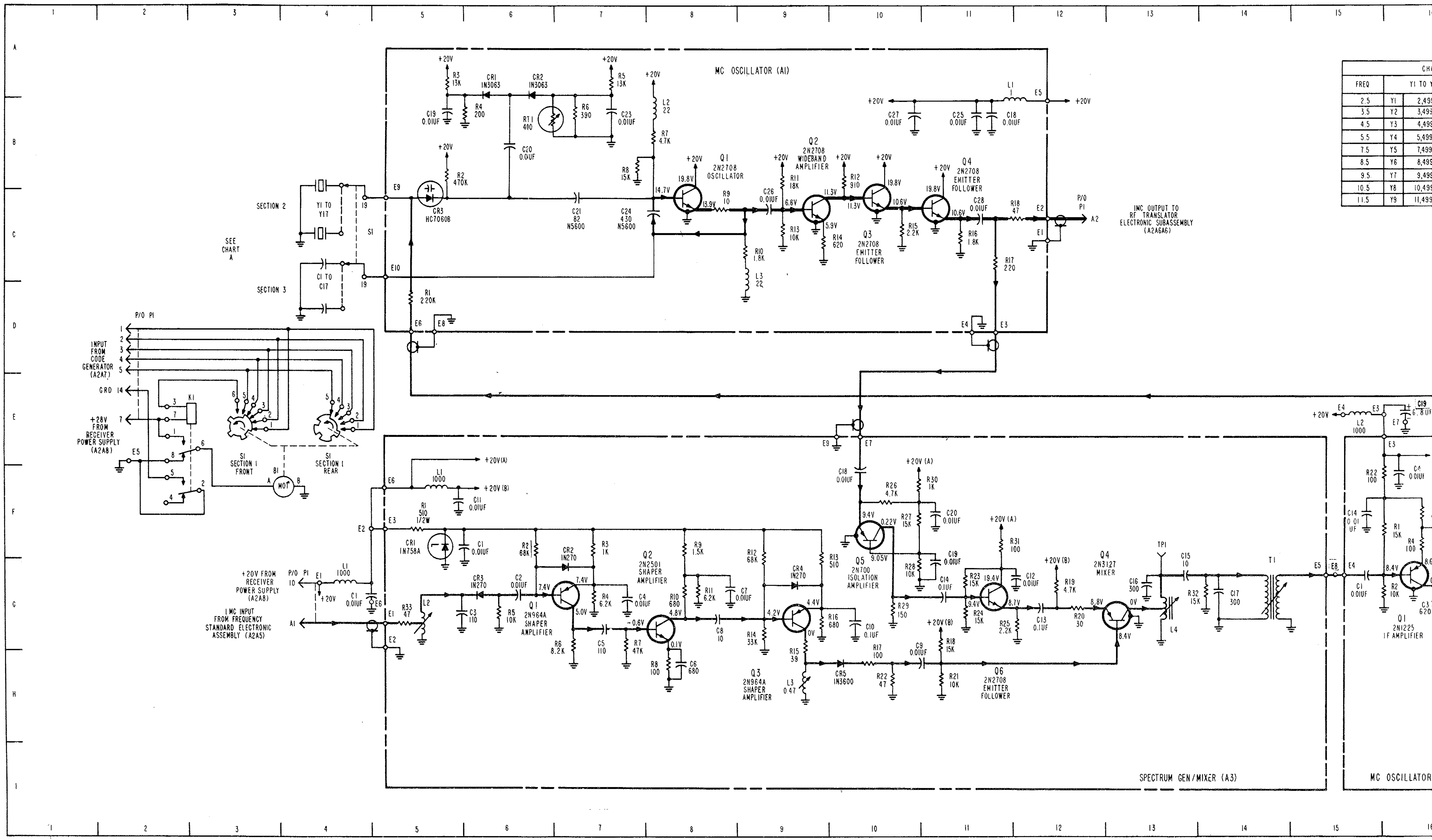
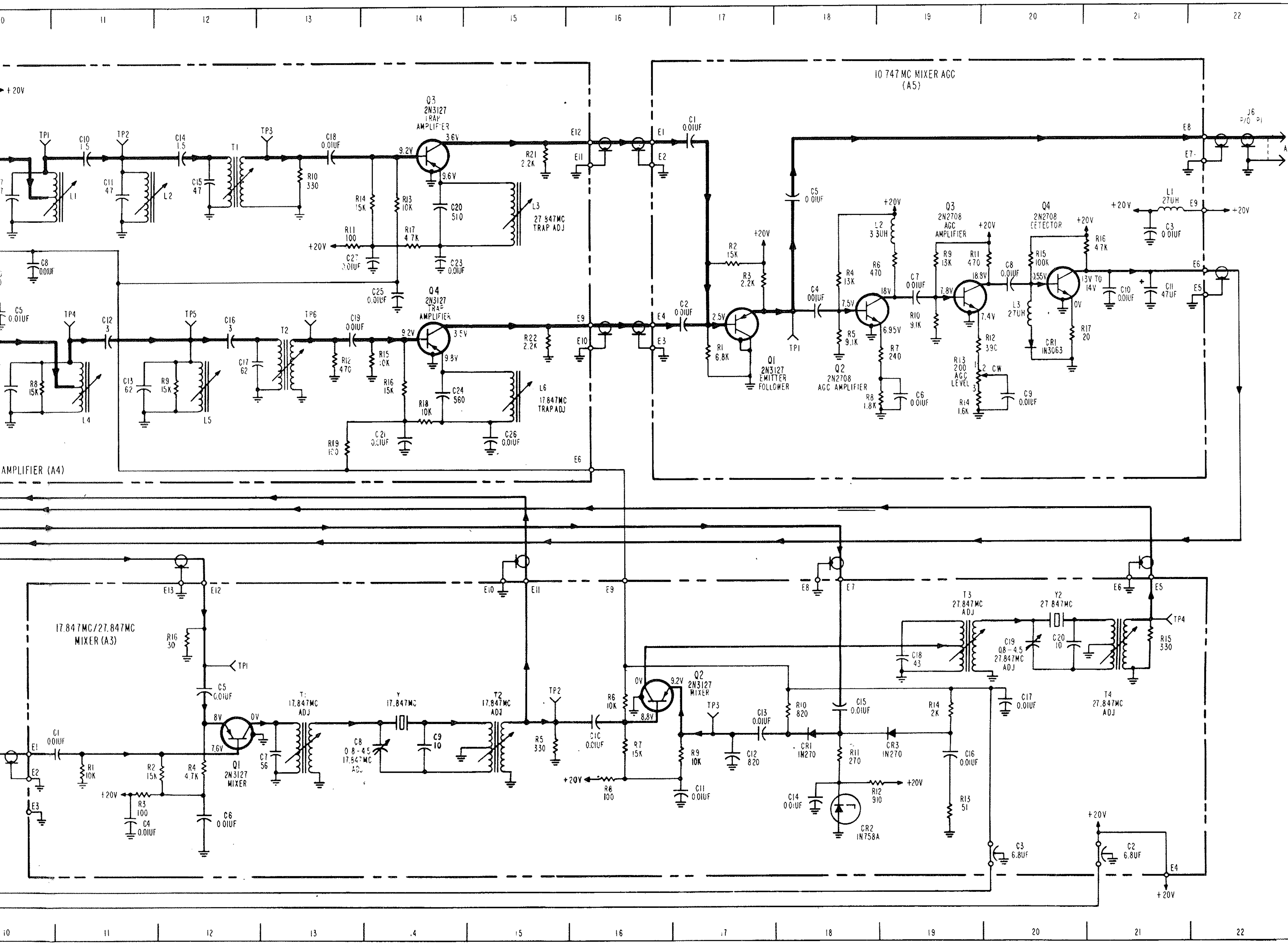


Figure 5-6. 1 MC Synthesizer Electronic Subassembly, Schematic Diagram



CHA		
FREQ	Y1 TO Y	
2.5	Y1	2,499
3.5	Y2	3,499
4.5	Y3	4,499
5.5	Y4	5,499
7.5	Y5	7,499
8.5	Y6	8,499
9.5	Y7	9,499
10.5	Y8	10,499
11.5	Y9	11,499



NOTES:

1 PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION PREFIX WITH A2A6A2.

2. UNLESS OTHERWISE SPECIFIED:
   a. ALL RESISTANCE VALUES ARE IN OHMS K-INDICATES THOUSANDS OF OHMS.
   b. ALL RESISTORS ARE 1/4 WATT, ±5% TOL.
   c. ALL CAPACITANCE VALUES ARE IN PICOFARADS UF INDICATES MICROFARADS.

3 CW ON THE POTENTIOMETERS INDICATE DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END.

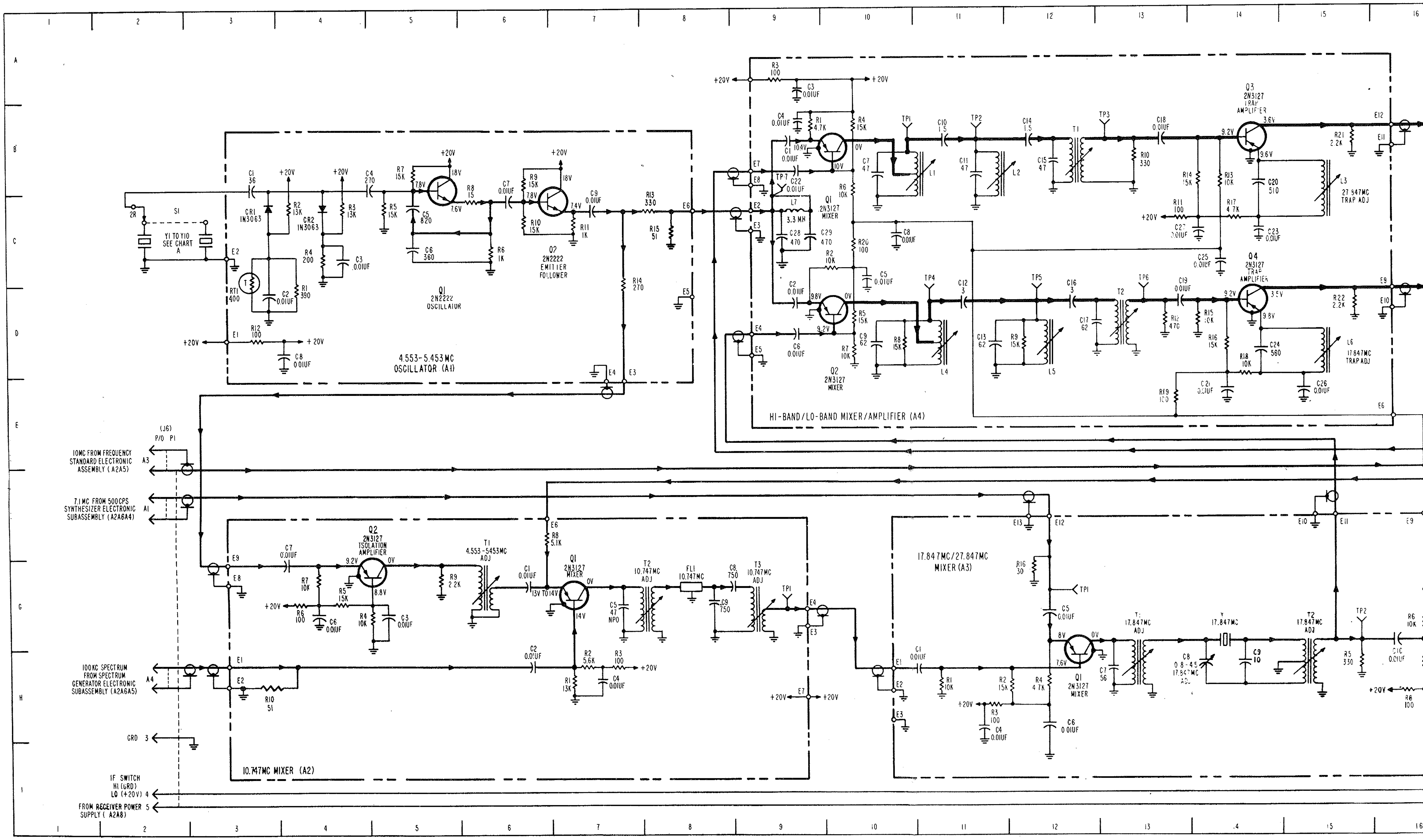
4. UNLESS OTHERWISE INDICATED ALL VOLTAGES ARE DC TAKEN WITH TESTER METRIX 43D/C

5 REFER TO APPLICABLE PRINTED CIRCUIT BOARD ILLUSTRATION FOR TRANSFORMER CIRCUIT ORIENTATION.

CHART A

FREQUENCY	CRYSTAL	100KC POS
4.553 MC	Y1	0
4.653 MC	Y2	1
4.753 MC	Y3	2
4.853 MC	Y4	3
4.953 MC	Y5	4
5.053 MC	Y6	5
5.153 MC	Y7	6
5.253 MC	Y8	7
5.353 MC	Y9	8
5.453 MC	Y10	9

Figure 5-7. 100 KC Synthesizer Electronic Subassembly, Schematic Diagram



4.553-5.453MC OSCILLATOR (A1)
HI-BAND/LO-BAND MIXER/AMPLIFIER (A4)
10.747MC MIXER (A2)
17.847MC/27.847MC MIXER (A3)
10MC FROM FREQUENCY STANDARD ELECTRONIC ASSEMBLY (A2A5)
7.1MC FROM 500CPS SYNTHESIZER ELECTRONIC SUBASSEMBLY (A2A6A4)
100KC SPECTRUM FROM SPECTRUM GENERATOR ELECTRONIC SUBASSEMBLY (A2A6A5)
GRD
IF SWITCH HI (GRD) LO (+20V)
FROM RECEIVER POWER SUPPLY (A2A8)
Y1 TO Y10 SEE CHART A
Q1 2N2222 OSCILLATOR
Q2 2N2222 EMITTER FOLLOWER
Q1 2N3127 MIXER
Q2 2N3127 MIXER
Q3 2N3127 TRAP AMPLIFIER
Q4 2N3127 TRAP AMPLIFIER
27.847MC TRAP ADJ
17.847MC TRAP ADJ
Q2 2N3127 ISOLATION AMPLIFIER
T1 4.553-5.453MC ADJ
T2 10.747MC ADJ
FL1 10.747MC
T3 10.747MC ADJ
T1 17.847MC ADJ
Y 17.847MC
T2 17.847MC ADJ

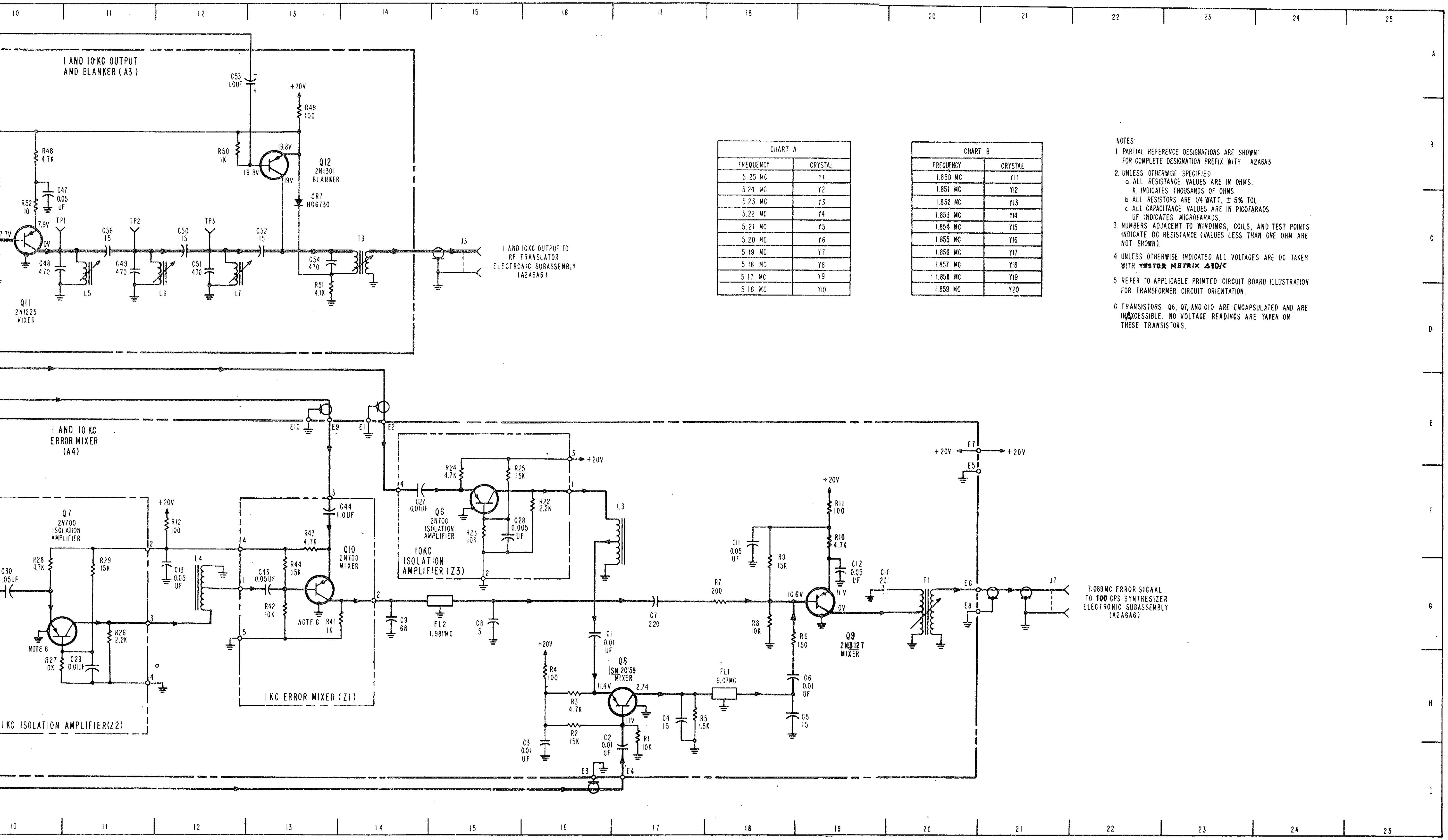


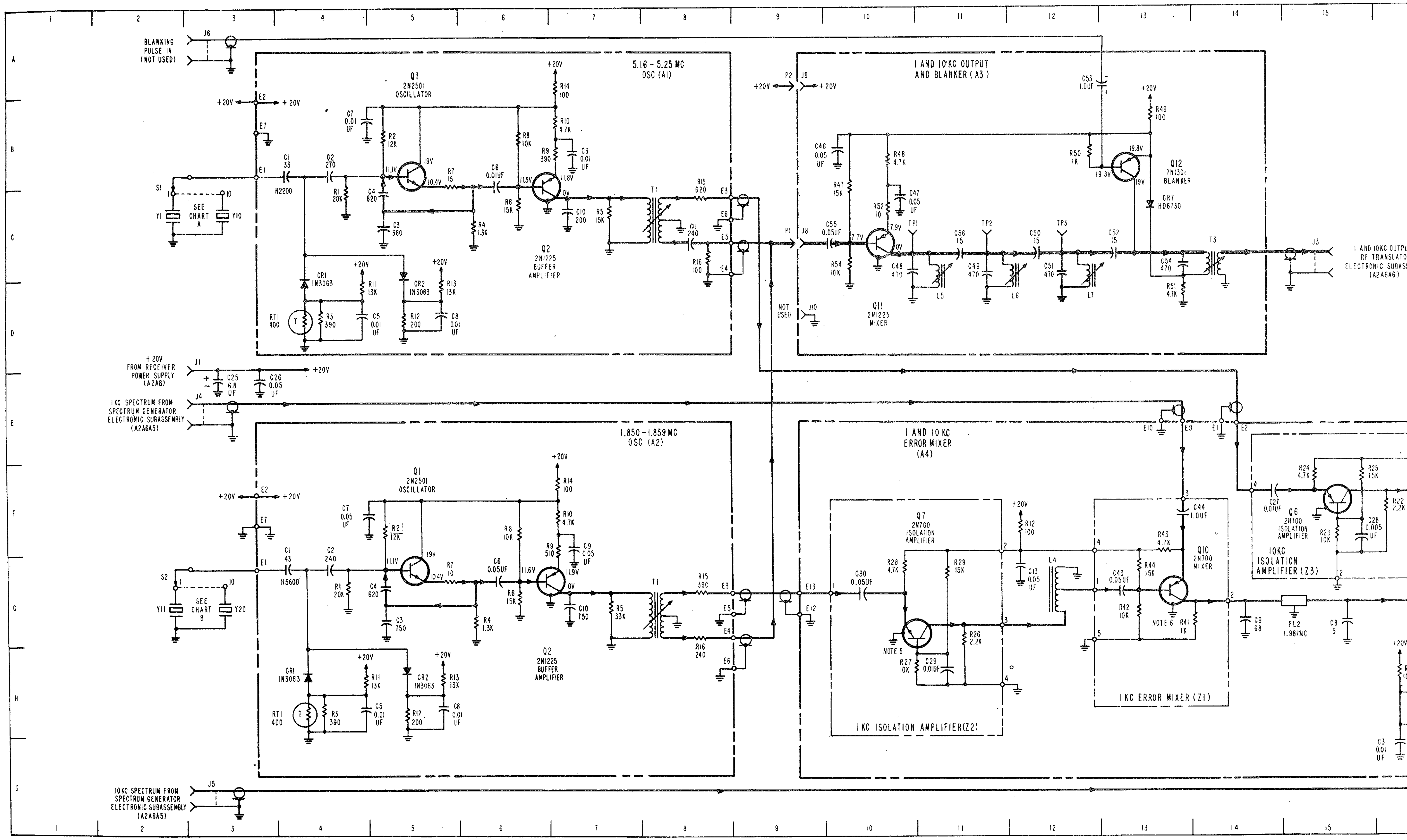
CHART A	
FREQUENCY	CRYSTAL
5.25 MC	Y1
5.24 MC	Y2
5.23 MC	Y3
5.22 MC	Y4
5.21 MC	Y5
5.20 MC	Y6
5.19 MC	Y7
5.18 MC	Y8
5.17 MC	Y9
5.16 MC	Y10

CHART B	
FREQUENCY	CRYSTAL
1.850 MC	Y11
1.851 MC	Y12
1.852 MC	Y13
1.853 MC	Y14
1.854 MC	Y15
1.855 MC	Y16
1.856 MC	Y17
1.857 MC	Y18
1.858 MC	Y19
1.859 MC	Y20

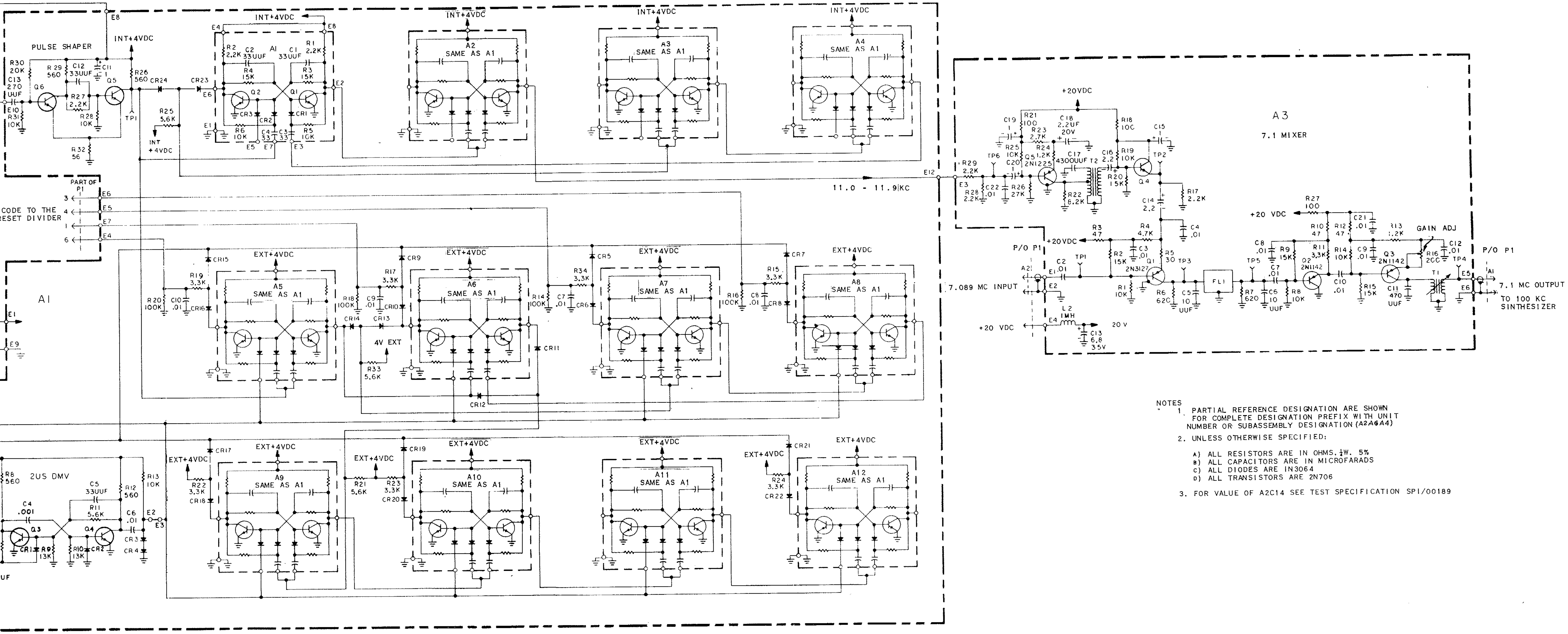
NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION PREFIX WITH A2A6A3
2. UNLESS OTHERWISE SPECIFIED
   a. ALL RESISTANCE VALUES ARE IN OHMS. K. INDICATES THOUSANDS OF OHMS.
   b. ALL RESISTORS ARE 1/4 WATT, ± 5% TOL
   c. ALL CAPACITANCE VALUES ARE IN PICOFARADS UF INDICATES MICROFARADS.
3. NUMBERS ADJACENT TO WINDINGS, COILS, AND TEST POINTS INDICATE DC RESISTANCE (VALUES LESS THAN ONE OHM ARE NOT SHOWN).
4. UNLESS OTHERWISE INDICATED ALL VOLTAGES ARE DC TAKEN WITH TESTER METRIX 430/C
5. REFER TO APPLICABLE PRINTED CIRCUIT BOARD ILLUSTRATION FOR TRANSFORMER CIRCUIT ORIENTATION.
6. TRANSISTORS Q6, Q7, AND Q10 ARE ENCAPSULATED AND ARE INACCESSIBLE. NO VOLTAGE READINGS ARE TAKEN ON THESE TRANSISTORS.

Figure 5-8. 1 and 10 KC Synthesizer Electronic Subassembly, Schematic Diagram

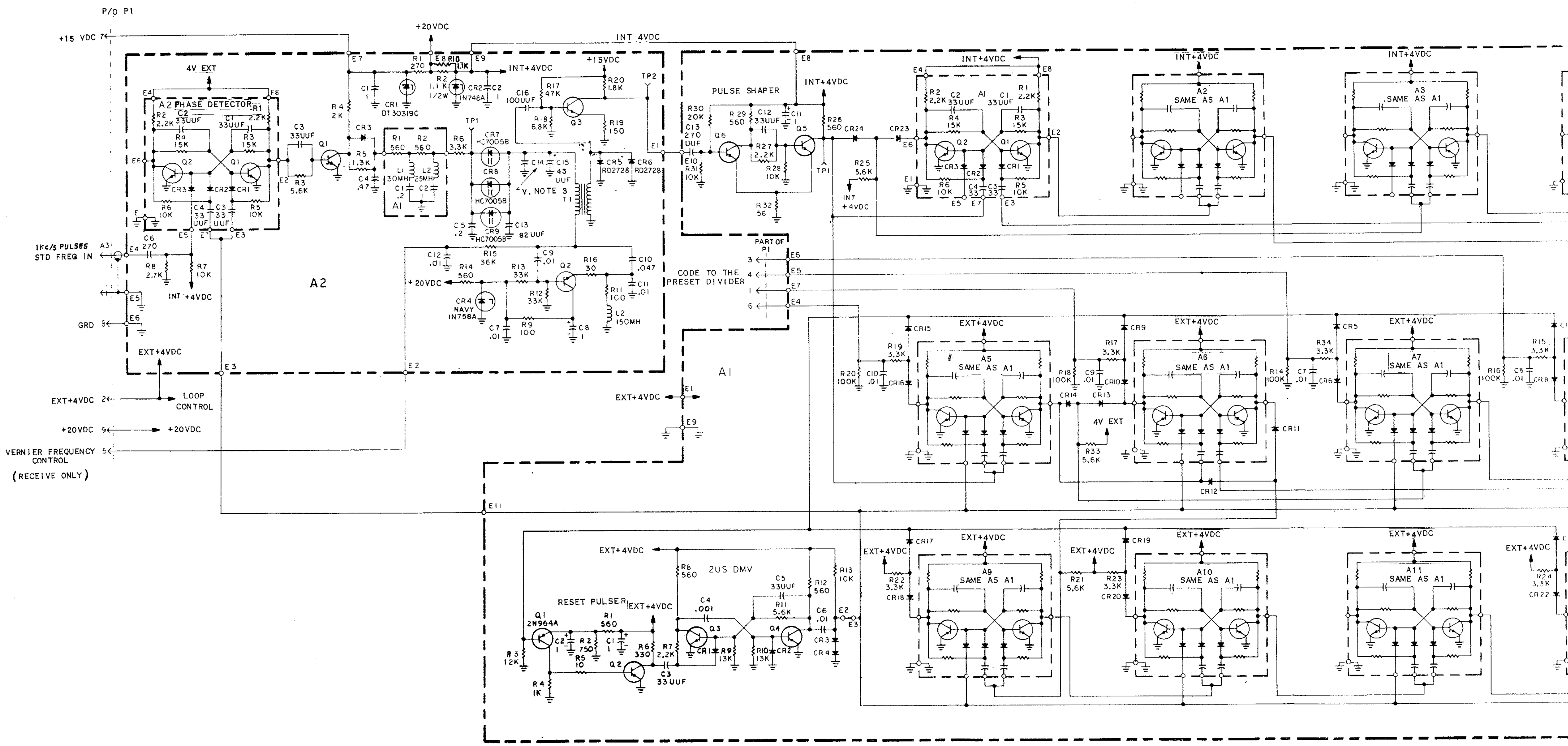


BLANKING PULSE IN (NOT USED)
5.16 - 5.25 MC OSC (A1)
Q1 2N2501 OSCILLATOR
Q2 2N1225 BUFFER AMPLIFIER
1 AND 10 KC OUTPUT AND BLANKER (A3)
Q11 2N1225 MIXER
Q12 2N1301 BLANKER
NOT USED
SEE CHART A
+20V FROM RECEIVER POWER SUPPLY (A2A8)
1KC SPECTRUM FROM SPECTRUM GENERATOR ELECTRONIC SUBASSEMBLY (A2A6A5)
1.850 - 1.859 MC OSC (A2)
SEE CHART B
1 AND 10 KC ERROR MIXER (A4)
Q7 2N700 ISOLATION AMPLIFIER
1 KC ISOLATION AMPLIFIER (Z2)
Q10 2N700 MIXER
1 KC ERROR MIXER (Z1)
Q6 2N700 ISOLATION AMPLIFIER
10KC ISOLATION AMPLIFIER (Z3)
FL2 1.981MC
10KC SPECTRUM FROM SPECTRUM GENERATOR ELECTRONIC SUBASSEMBLY (A2A6A5)

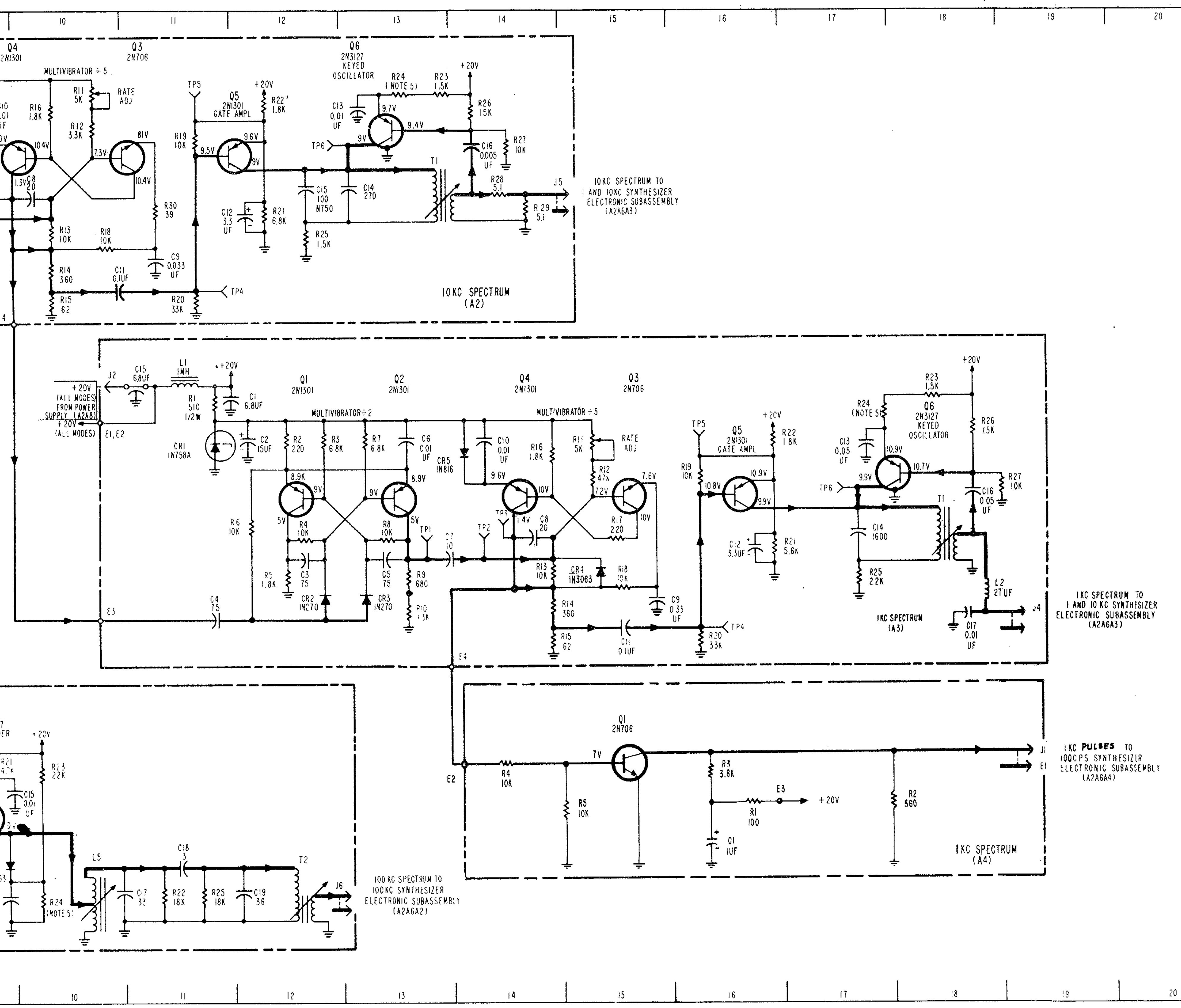


NOTES
1. PARTIAL REFERENCE DESIGNATION ARE SHOWN FOR COMPLETE DESIGNATION PREFIX WITH UNIT NUMBER OR SUBASSEMBLY DESIGNATION (A2A6A4)
2. UNLESS OTHERWISE SPECIFIED:
   A) ALL RESISTORS ARE IN OHMS, ½W, 5%
   B) ALL CAPACITORS ARE IN MICROFARADS
   C) ALL DIODES ARE IN3064
   D) ALL TRANSISTORS ARE 2N706
3. FOR VALUE OF A2C14 SEE TEST SPECIFICATION SPI/00189

Figure 5-9. 100 KC Synthesizer Electronic Subassembly, Schematic Diagram



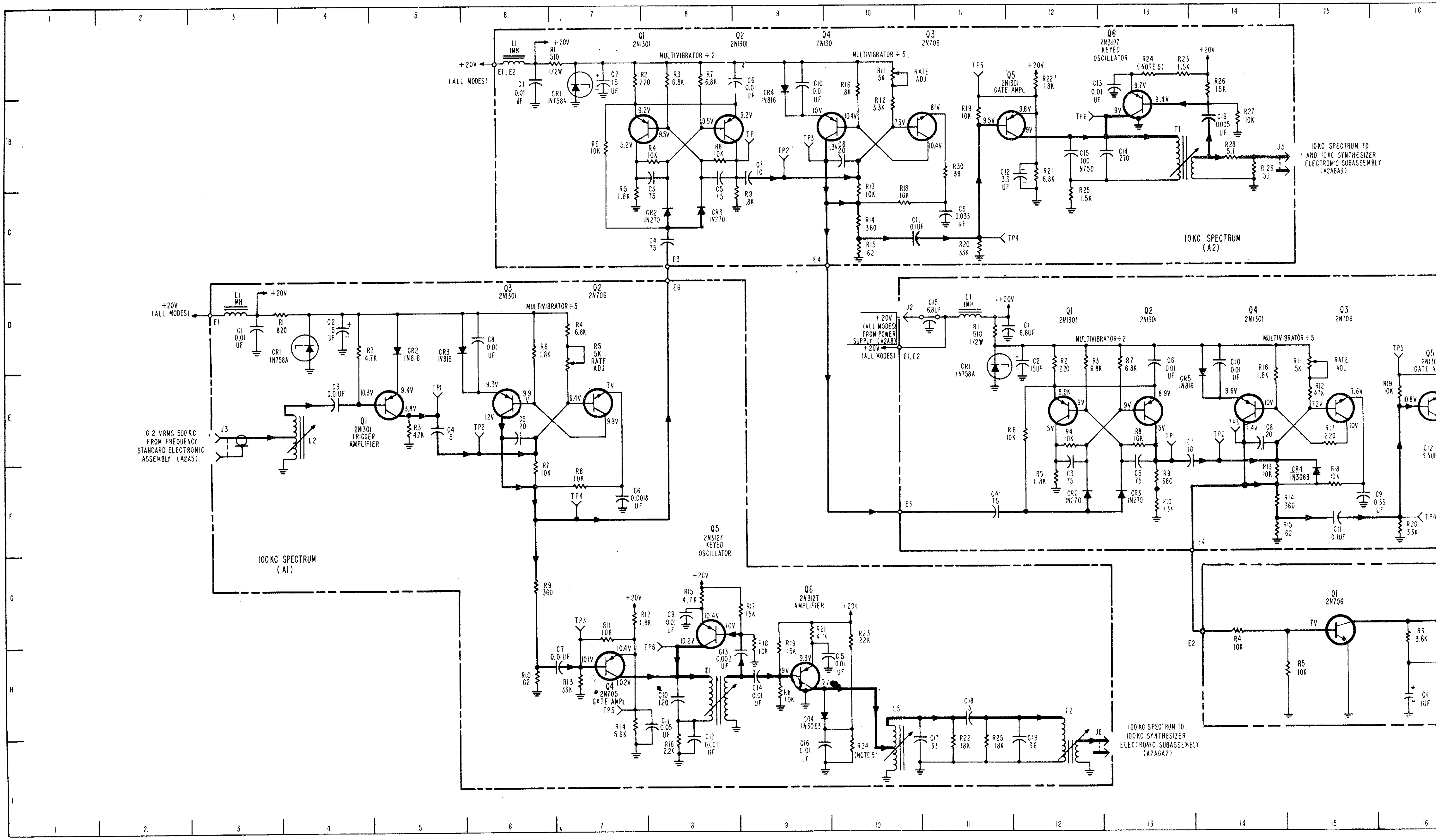
P/O P1
+15 VDC
+20VDC
INT 4VDC
A2 PHASE DETECTOR
4V EXT
PULSE SHAPER
INT+4VDC
+15VDC
1Kc/s PULSES STD FREQ IN
GRD
EXT+4VDC
LOOP CONTROL
+20VDC
VERNIER FREQUENCY CONTROL
(RECEIVE ONLY)
A2
A1
V. NOTE 3
CODE TO THE PRESET DIVIDER
PART OF P1
A2 SAME AS A1
A3 SAME AS A1
A5 SAME AS A1
A6 SAME AS A1
A7 SAME AS A1
A9 SAME AS A1
A10 SAME AS A1
A11 SAME AS A1
EXT+4VDC
RESET PULSER
2US DMV
2N964A



NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION PREFIX WITH A2A6A5.
2. UNLESS OTHERWISE SPECIFIED:
   a. ALL RESISTANCE VALUES ARE IN OHMS, K-INDICATES THOUSANDS OF OHMS.
   b. ALL RESISTORS ARE 1/4 WATT, ±5% TOL.
   c. ALL CAPACITANCE VALUES ARE IN PICOFARADS, UUF INDICATES MICROFARADS.
3. UNLESS OTHERWISE INDICATED ALL ALL VOLTAGES ARE DC TAKEN WITH **TESTER METRIX 430/C**
4. REFER TO APPLICABLE PRINTED CIRCUIT BOARD ILLUSTRATIONS FOR TRANSFORMER CIRCUIT ORIENTATION.
5. R11 AND R24 SELECTED FROM VALUES BETWEEN 1.0K AND 5.1K OHMS.

Figure 5-10. Spectrum Generator Electronic Subassembly, Schematic Diagram



10KC SPECTRUM (A2)
MULTIVIBRATOR ÷ 2
MULTIVIBRATOR ÷ 5
Q1 2N1301
Q2 2N1301
Q4 2N1301
Q3 2N706
Q5 2N1301 GATE AMPL
Q6 2N3127 KEYED OSCILLATOR
+20V (ALL MODES)
10KC SPECTRUM TO 1 AND 10KC SYNTHESIZER ELECTRONIC SUBASSEMBLY (A2A6A3)
100KC SPECTRUM (A1)
0.2 VRMS 500KC FROM FREQUENCY STANDARD ELECTRONIC ASSEMBLY (A2A5)
Q1 2N1301 TRIGGER AMPLIFIER
Q3 2N1301
Q2 2N706
Q5 2N3127 KEYED OSCILLATOR
Q4 2N705 GATE AMPL
Q6 2N3127 AMPLIFIER
100KC SPECTRUM TO 100KC SYNTHESIZER ELECTRONIC SUBASSEMBLY (A2A6A2)
+20V (ALL MODES) FROM POWER SUPPLY (A2A8)
+20V (ALL MODES)
Q1 2N706

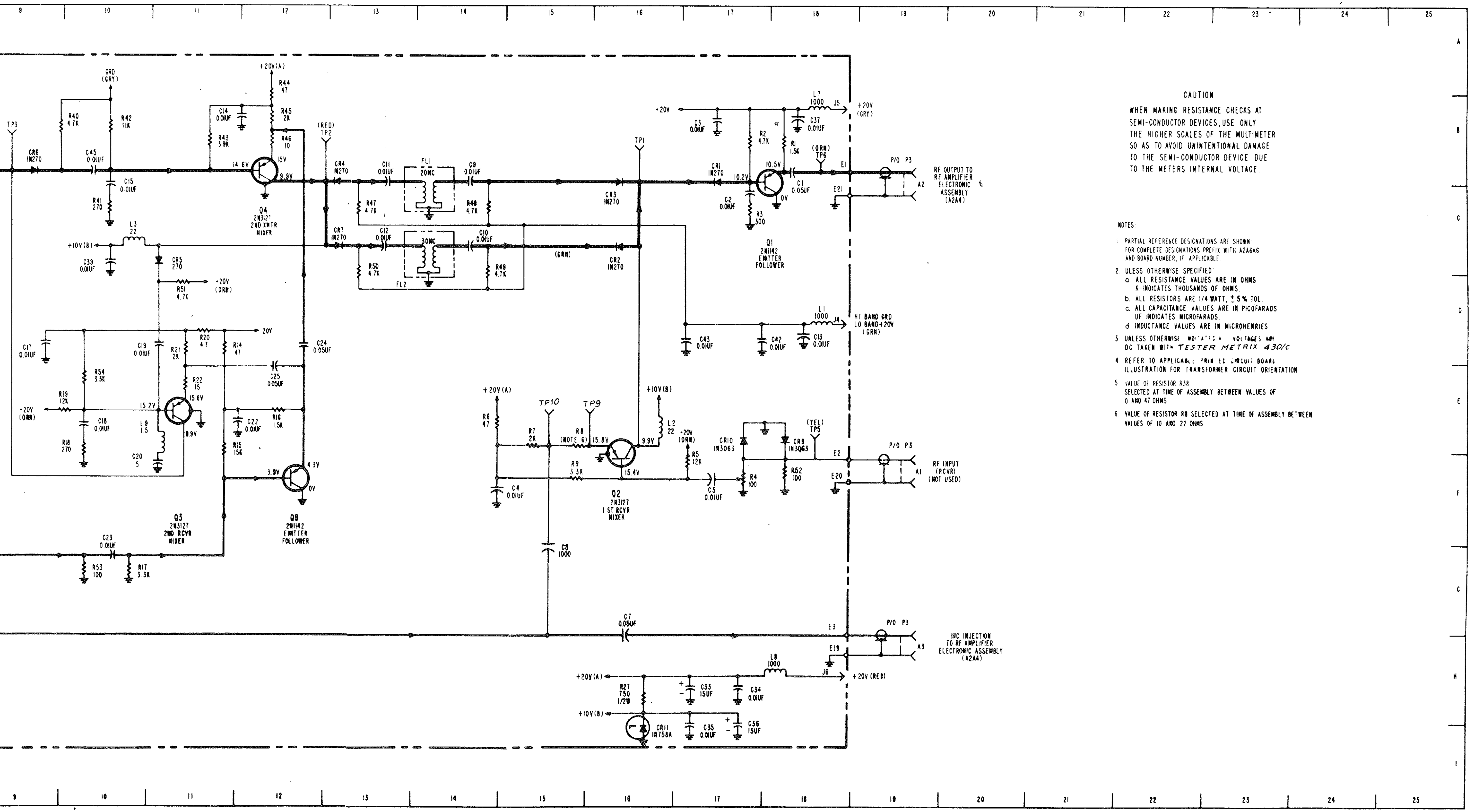
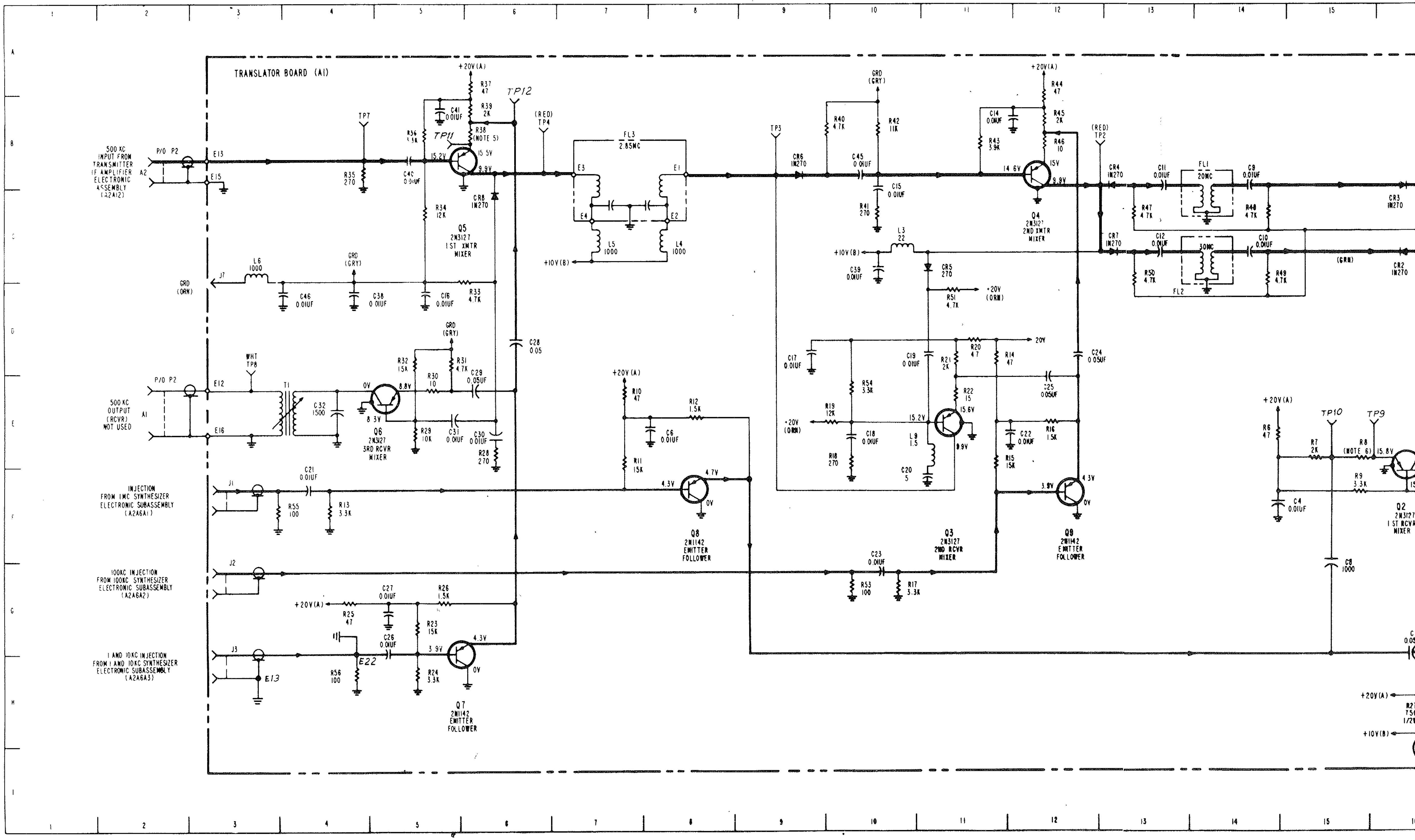
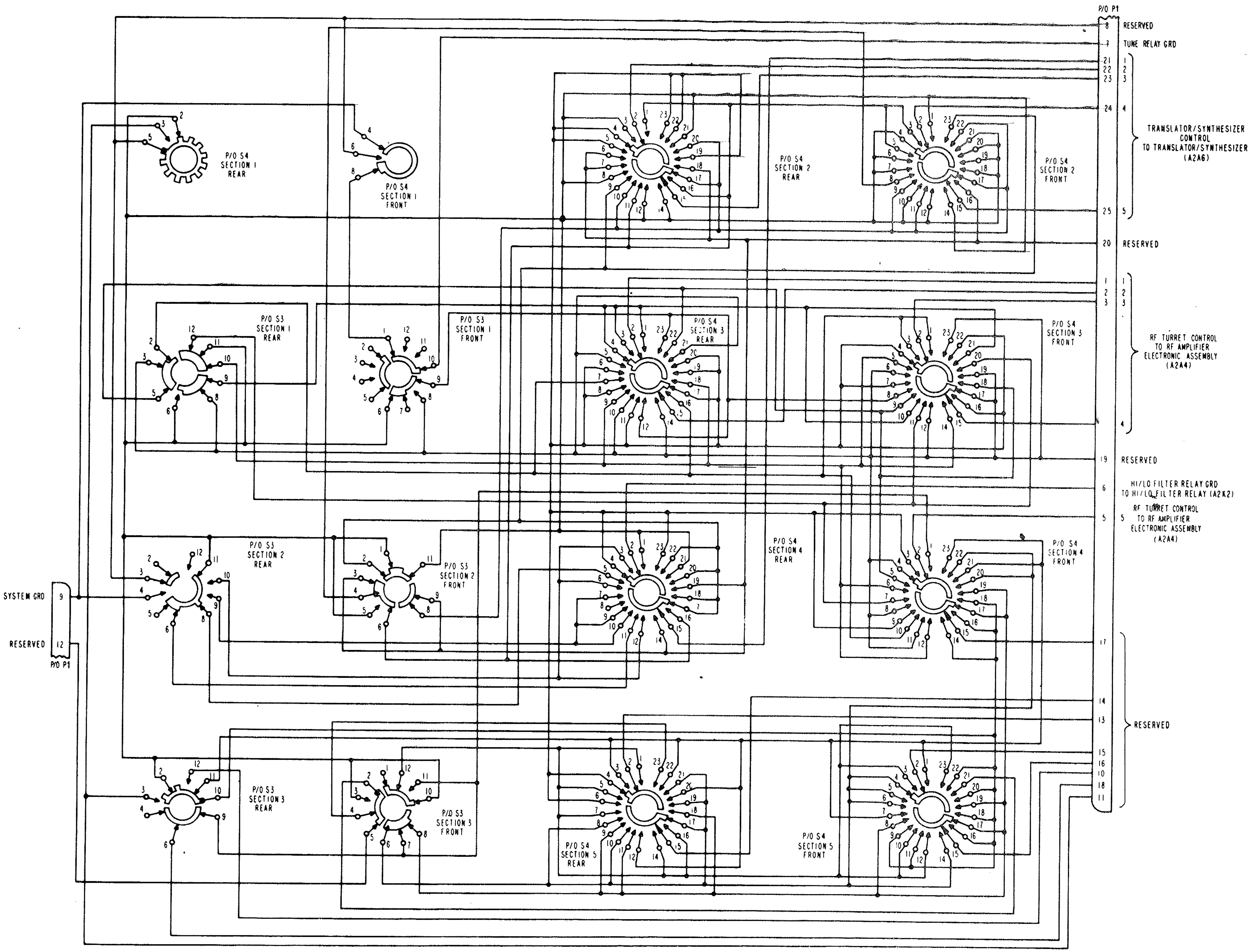


Figure 5-11. RF Translator Electronic Subassembly, Schematic Diagram

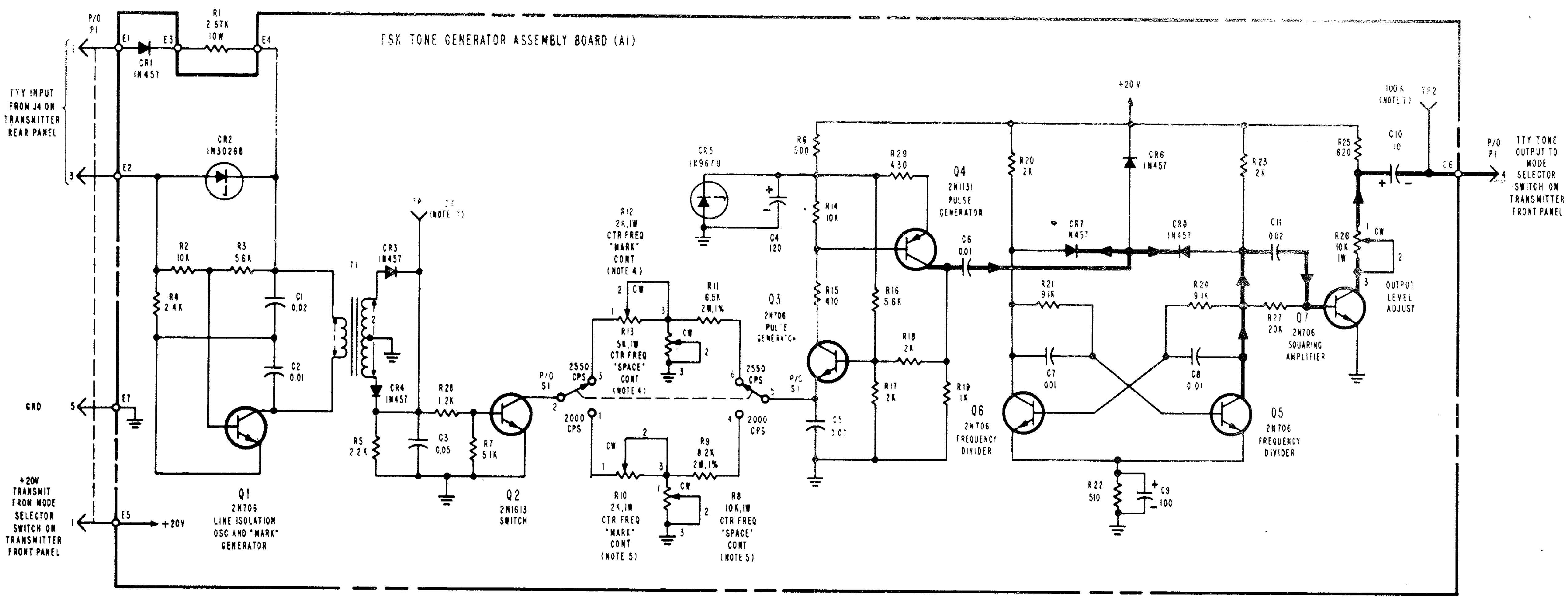


TRANSLATOR BOARD (A1)
500 KC INPUT FROM TRANSMITTER IF AMPLIFIER ELECTRONIC ASSEMBLY (A2A12)
P/O P2
A2
E13
E15
TP7
TP11
TP12
(RED) TP4
+20V (A)
R37 47
C41 0.01UF
R39 2K
R38 (NOTE 5)
R36
R35 270
C40 0.01UF
15.2V
15.5V
9.9V
CR8 IN270
R34 12K
Q5 2N3127 1ST XMTR MIXER
FL3 2.85MC
E3
E1
E4
E2
L5 1000
L4 1000
+10V (B)
GRD (ORN)
J7
L6 1000
C46 0.01UF
GRD (GRY)
C38 0.01UF
C16 0.01UF
R33 4.7K
C28 0.05
500 KC OUTPUT (RCVR) NOT USED
A1
E12
E16
WHT TP8
T1
C32 1500
Q6 2N3127 3RD RCVR MIXER
R32 15K
R31 4.7K
R30 10
C29 0.05UF
R29 10K
C31 0.01UF
C30 0.01UF
R28 270
INJECTION FROM 1MC SYNTHESIZER ELECTRONIC SUBASSEMBLY (A2A6A1)
J1
C21 0.01UF
R55 100
R13 3.3K
+20V (A)
R10 47
R12 1.5K
C6 0.01UF
R11 15K
4.3V
4.7V
Q8 2N1142 EMITTER FOLLOWER
100KC INJECTION FROM 100KC SYNTHESIZER ELECTRONIC SUBASSEMBLY (A2A6A2)
J2
1 AND 10KC INJECTION FROM 1 AND 10KC SYNTHESIZER ELECTRONIC SUBASSEMBLY (A2A6A3)
J3
E13
E22
C27 0.01UF
R26 1.5K
R25 47
R23 15K
C26 0.01UF
R56 100
R24 3.3K
3.9V
Q7 2N1142 EMITTER FOLLOWER
GRD (GRY)
TP3
CR6 IN270
R40 4.7K
R42 11K
C45 0.01UF
C15 0.01UF
R41 270
L3 22
C39 0.01UF
CR5 270
R51 4.7K
+20V (ORN)
C17 0.01UF
R54 3.3K
R19 12K
C18 0.01UF
R18 270
C19 0.01UF
R21 2K
R20 47
R14 47
R22 15
15.2V
15.6V
9.9V
L9 1.5
C20 5
C22 0.01UF
R16 15K
R15 15K
C25 0.05UF
C24 0.05UF
C23 0.01UF
R53 100
R17 3.3K
Q3 2N3127 2ND RCVR MIXER
Q9 2N1142 EMITTER FOLLOWER
3.8V
4.3V
R44 47
C14 0.01UF
R45 2K
R43 3.9K
R46 10
14.6V
15V
9.8V
Q4 2N3127 2ND XMTR MIXER
(RED) TP2
CR4 IN270
C11 0.01UF
FL1 20MC
C8 0.01UF
R47 4.7K
R48 4.7K
CR7 IN270
C12 0.01UF
30MC
C10 0.01UF
R50 4.7K
R49 4.7K
FL2
CR3 IN270
CR2 IN270
(GRN)
+20V (A)
R6 47
TP10
TP9
R7 2K
R8 (NOTE 6)
15.8V
R9 3.3K
C4 0.01UF
Q2 2N3127 1ST RCVR MIXER
C8 1000
+20V (A)
+10V (B)



NOTES.
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION PREFIX WITH 2A2A7
2. SWITCH SECTIONS VIEWS ARE SHOWN FROM THE REAR AND ARE IN 00 MC POSITION.
3. ROTATION IN ALL VIEWS IS CCW IN 30 DEGREE THROWS TO MAXIMUM POSITION OF 29MC.
4. OPERATE GRD LINE IS DISABLED IN POSITIONS 00 AND 01 MC.

Figure 5-12. Code Generator Electronic Assembly, Schematic Diagram

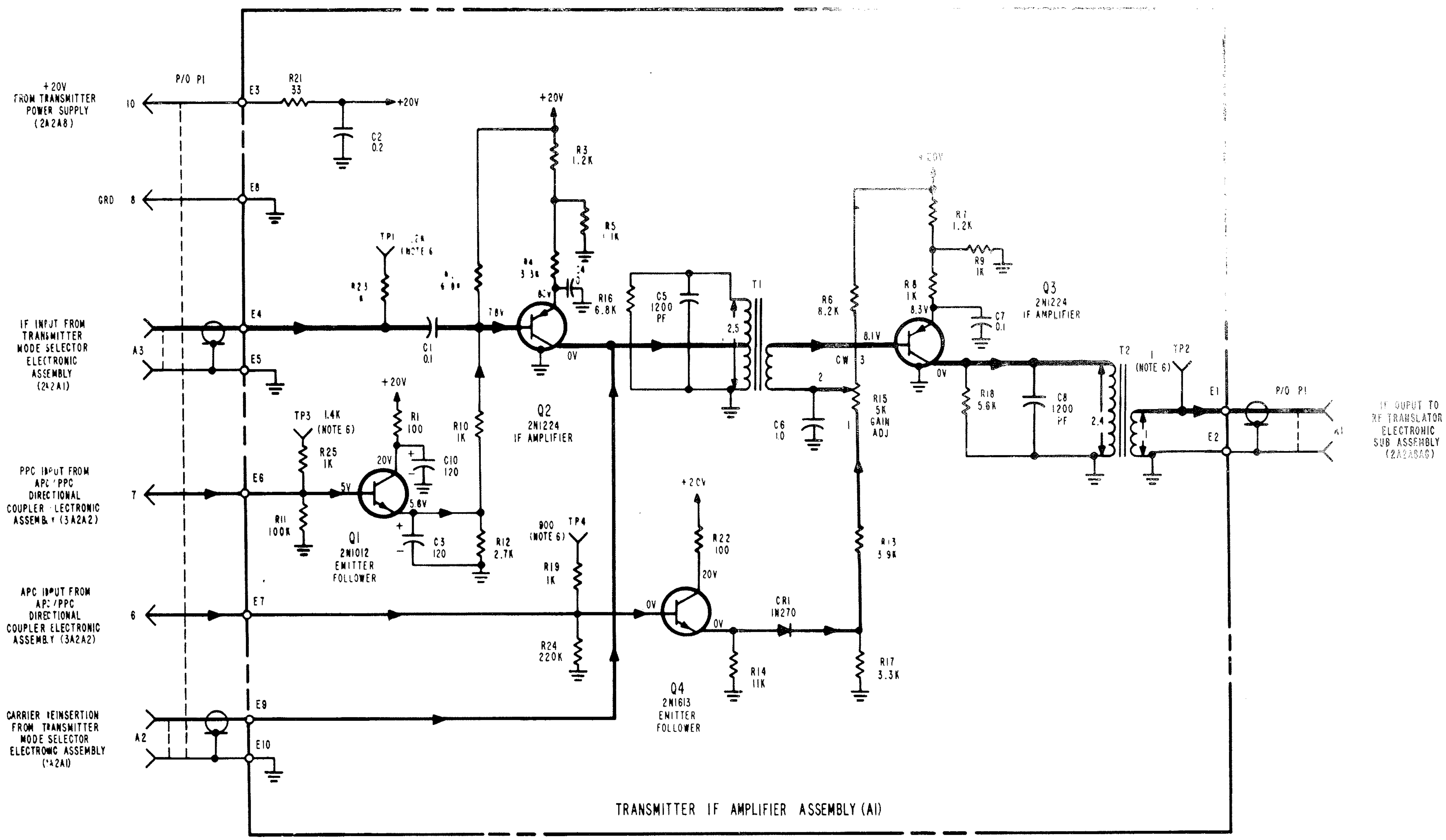


NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR COMPLETE DESIGNATION PREFIX WITH 2A2A9
2. UNLESS OTHERWISE SPECIFIED:
   A. ALL RESISTANCE VALUES ARE IN OHMS K- INDICATES THOUSANDS OF OHMS
   B. ALL RESISTORS ARE 1/4 WATT, ± 5% TOL
   C. ALL CAPACITANCE VALUES ARE IN MICROFARADS
3. CW [illegible]
4. A1R12 ADJUSTED FOR 2550 CPS CENTER FREQ "MARK" (2975 CPS)
   A1R13 ADJUSTED FOR 2550 CPS CENTER FREQ "SPACE" (2125 CPS)
5. A1R10 ADJUSTED FOR 2000 CPS CENTER FREQ "MARK" (2425 CPS)
   A1R8 ADJUSTED FOR 2000 CPS CENTER FREQ "SPACE" (1575 CPS)
6. NUMBERS ADJACENT TO WINDINGS AND TEST POINTS INDICATE DC RESISTANCE
7. RESISTANCE VALUES AT SIGNIFICANT TEST POINTS ARE TO CHASSIS WITH ALL UNITS INTERCONNECTED, BUT EQUIPMENT DE-ENERGIZED
8. REFER TO APPLICABLE PRINTED CIRCUIT BOARD ILLUSTRATION FOR TRANSFORMER CIRCUIT ORIENTATION

Pub. 246
December 1967
ORIGINAL

Figure 5-13. FSK Tone Generator Electronic Assembly, Schematic Diagram



NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION PREFIX WITH 2A2A12
2. UNLESS OTHERWISE SPECIFIED:
   a- ALL RESISTANCE VALUES ARE IN OHMS K-INDICATES THOUSANDS OF OHMS.
   b- ALL RESISTORS ARE 1/4 WATT, ±5% TOL.
   c- ALL CAPACITANCE VALUES ARE IN MICROFARADS, PF INDICATES PICOFARADS.
3. NUMBERS ADJACENT TO WINDINGS AND TEST POINTS INDICATE DC RESISTANCE (VALUES LESS THAN ONE OHM ARE NOT SHOWN).
4. CW ON ALL POTENTIOMETERS INDICATE DIRECTION OF ROTATION WHEN VIEWED FROM SHAFT END
5. UNLESS OTHERWISE INDICATED ALL VOLTAGES ARE DC TAKEN WITH MULTIMETER AN/PSM-4
6. RESISTANCE VALUES AT SIGNIFICANT TEST POINTS ARE TO CHASSIS WITH ALL UNITS INTERCONNECTED BUT EQUIPMENT NOT ENERGIZED.
7. REFER TO APPLICABLE PRINTED CIRCUIT BOARD ILLUSTRATION FOR TRANSFORMER CIRCUIT ORIENTATION.

Figure 5-14. IF. Amplifier Electronic Assembly, Schematic Diagram

PART LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC
C1	10D	E14	2G
C2	10C	E15	2H
C3	7G	E16	7E
C4	7I	E17	7F
C5	10H	E18	4G
C6	10F	E19	7G
C7	7E	E20	2I
C8	3G	E21	4A
C9	5F	E22	2H
C10	10F	E23	5G
C11	7E	Q1	7G
C12	4H	Q2	9F
CR1	8A	Q3	9H
CR2	7A	Q4	9I
CR3	8B	Q5	4I
CR4	7B	Q6	6G
CR5	7D	R1	10C
CR6	7D	R2	7G
CR7	7D	R3	5G
CR8	7C	R4	8I
CR9	5E	R5	8H
CR10	4E	R6	11H
CR11	8E	R7	11I
CR12	7G	R8	8H
CR13	8H	R9	11G
CR14	3I	R10	10G
CR15	5H	R11	9G
E1	9B	R12	8E
E2	6B	R13	7F
E3	6B	R14	2H
E4	4B	R15	5F
E5	4B	R16	10E
E6	4B	R17	3F
E7	4C	R18	5G
E8	4D	R19	6H
E9	4D	R20	3I
E10	6E	R21	4H
E11	4E	R22	3H
E12	5C	R23	5H
E13	4E	R24	8F

NOTE:
REF. DESIG. PREFIX 2A2

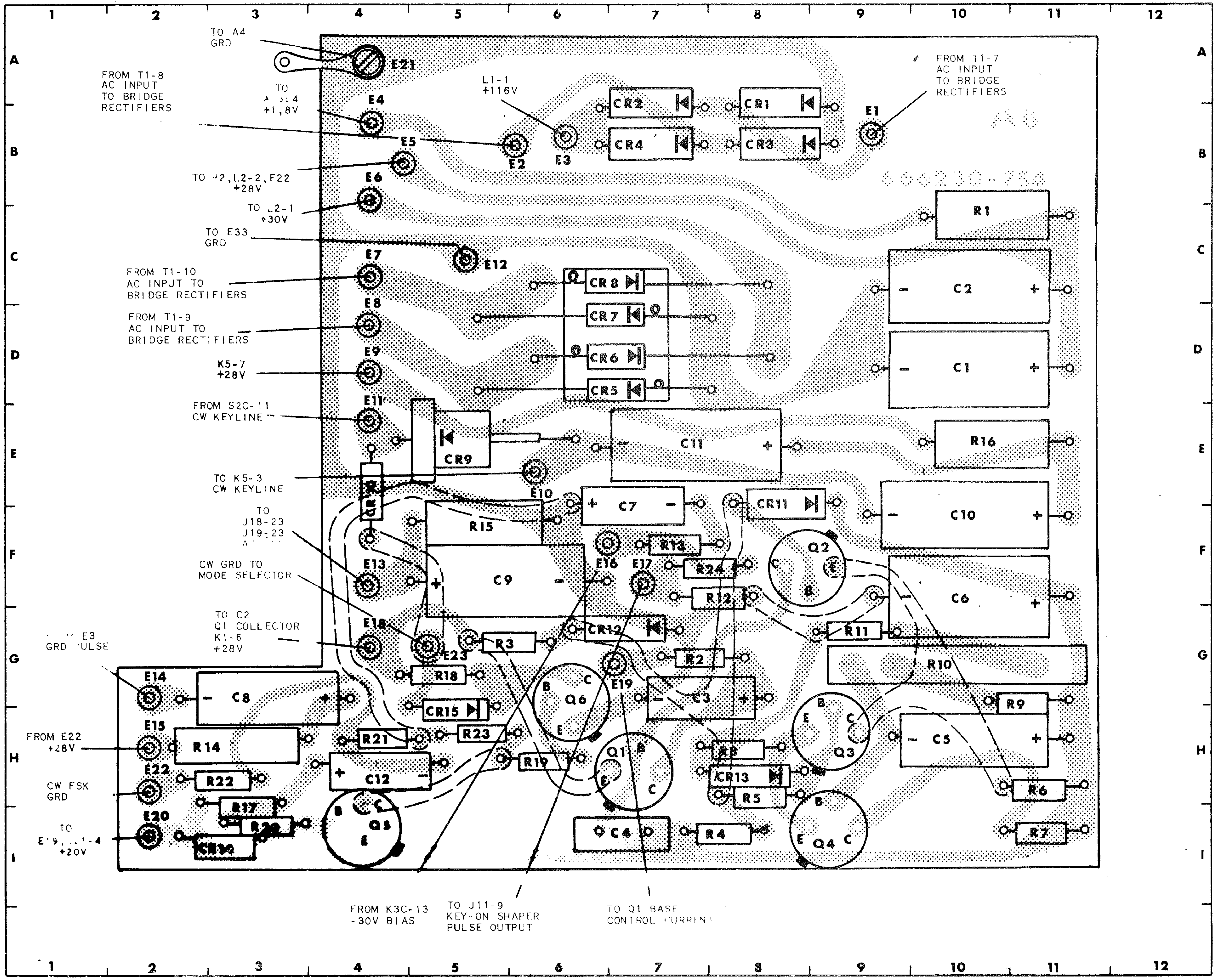
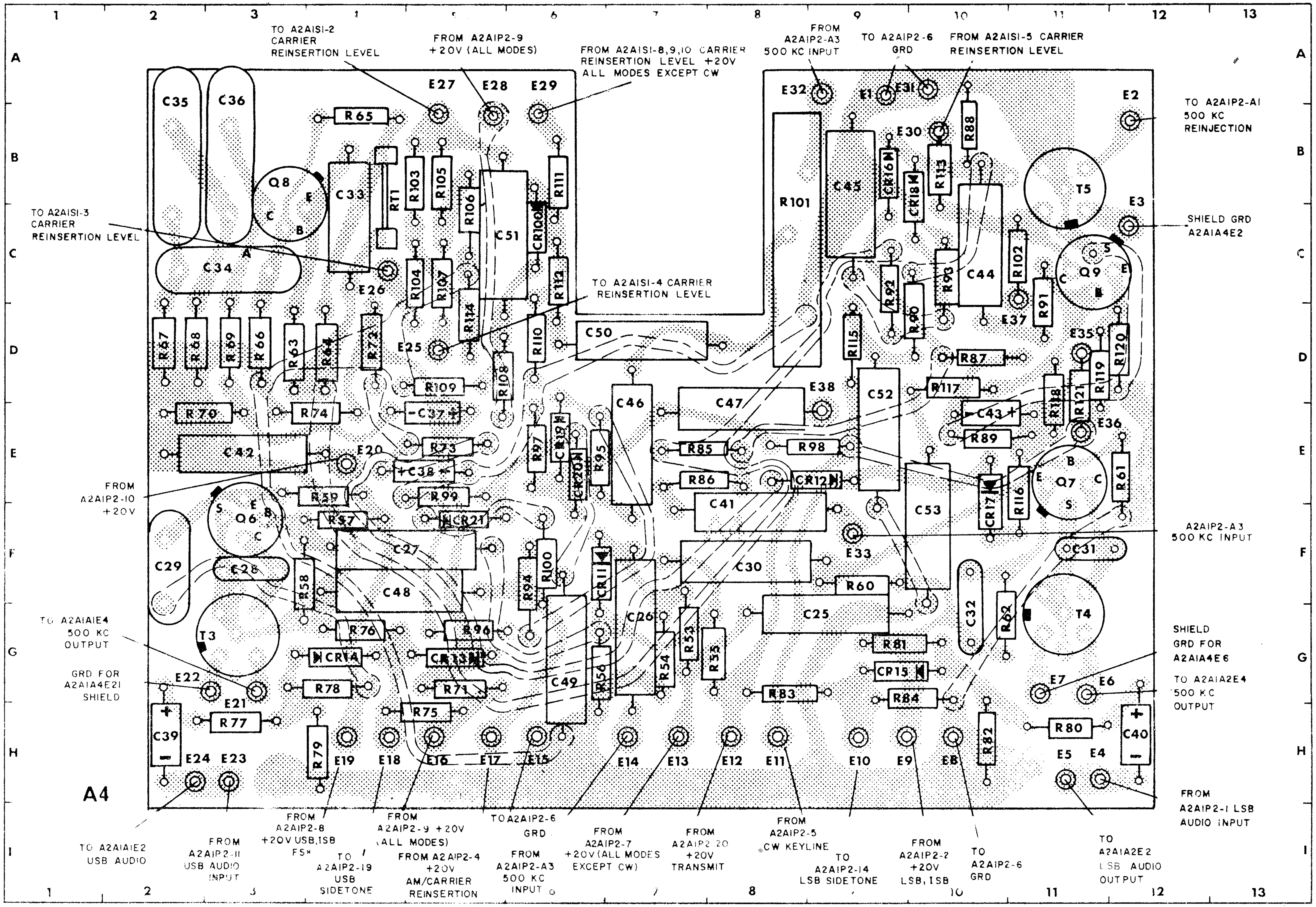


Figure 5-20. Power Supply (Foil Side Up), Component and Test Point Location

REF. DESIG.	LOC
R94	6F
R95	6E
R96	5G
R97	6E
R98	9E
R99	5E
R100	6F
R101	8C
R102	11C
R103	5B
R104	5C
R105	5B
R106	5C
R107	5C
R108	5D
R109	5D
R110	6D
R111	6B
R112	6C
R113	10B
R114	5D
R115	9D
R116	11E
R117	10D
R118	11D
R119	11D
R120	12D
R121	11D
RT1	4B
T3	3G
T4	11G
T5	11B

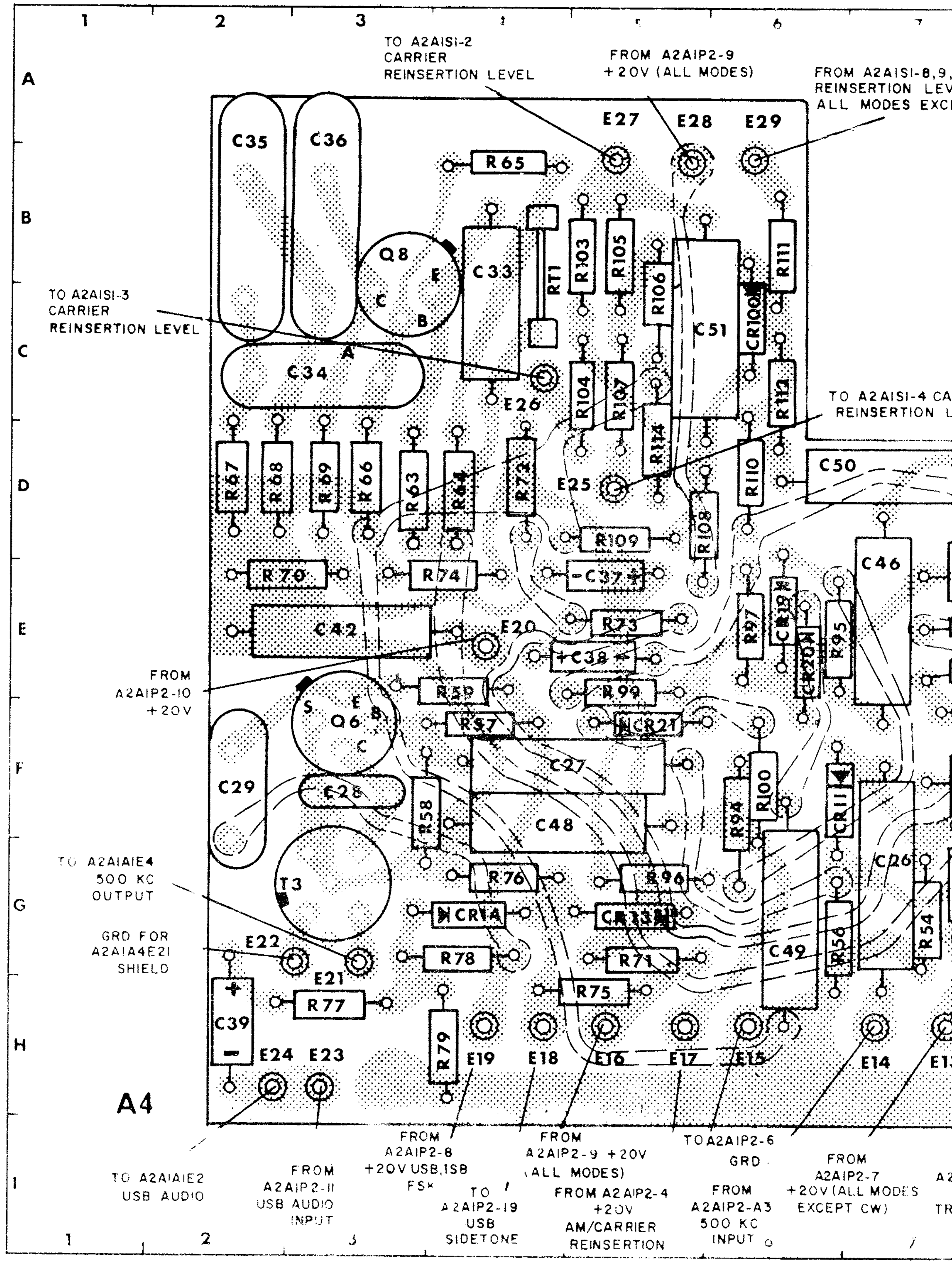


NOTES
1. COMPONENT REF. DESIG. PREFIX A2A1

Figure 5-29. 500 KC Amplifiers/Gates and Sidetone Oscillator/Gates (Foil Side Up), Component and Test Point Location

PARTS LOCATION INDEX

REF. DESIG.	LOC.	REF. DESIG.	LOC.	REF. DESIG.	LOC.	REF. DESIG.	LOC
C25	9G	E1	9A	R53	7G	R94	6F
C26	7G	E2	12B	R54	7G	R95	6E
C27	4F	E3	12C	R55	8G	R96	5G
C28	3F	E4	11H	R56	6G	R97	6E
C29	2F	E5	11H	R57	4F	R98	9E
C30	8F	E6	11G	R58	3F	R99	5E
C31	11F	E7	11G	R59	4E	R100	6F
C32	10G	E8	10H	R60	9F	R101	8C
C33	4B	E9	9H	R61	12E	R102	11C
C34	3C	E10	9H	R62	10G	R103	5B
C35	2B	E11	8H	R63	3D	R104	5C
C36	3B	E12	8H	R64	4D	R105	5B
C37	5E	E13	7H	R65	4B	R106	5C
C38	5E	E14	7H	R66	3D	R107	5C
C38	2H	E15	6H	R67	2D	R108	5D
C40	12H	E16	5H	R68	2D	R109	5D
C41	8F	E17	5H	R69	3D	R110	6D
C42	3E	E18	4H	R70	2E	R111	6B
C43	10E	E19	4H	R71	5G	R112	6C
C44	10C	E20	4E	R72	4D	R113	10B
C45	9B	E21	3G	R73	5E	R114	5D
C46	7E	E22	3G	R74	4E	R115	9D
C47	8E	E23	3H	R75	5H	R116	11E
C48	4F	E24	2H	R76	4G	R117	10D
C49	6G	E25	5D	R77	3H	R118	11D
C50	7D	E26	4C	R78	4G	R119	11D
C51	5C	E27	5B	R79	4H	R120	12D
C52	9D	E28	5B	R80	11H	R121	11D
C53	10F	E29	6B	R81	9G	RT1	4B
CR11	6F	E30	10B	R82	10H	T3	3G
CR12	9E	E31	10A	R83	8G	T4	11G
CR13	5G	E32	8A	R84	9G	T5	11B
CR14	4G	E33	9F	R85	7E		
CR15	9G	E35	11D	R86	7E		
CR16	9B	E36	11E	R87	10D		
CR17	10F	E37	11C	R88	10B		
CR18	10B	E38	9E	R89	10E		
CR19	6E	Q6	3F	R90	10D		
CR20	6E	Q7	11E	R91	11D		
CR21	5F	Q8	3B	R92	9C		
CR100	6C	Q9	11C	R93	10C		



NOTES
1. COMPONENT

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC
C1	2F	R3	5D
C2	3E	R4	6D
C3	5F	R5	7D
C4	7C	R6	6D
C5	5B	R7	7E
C6	7D	R8	7F
C7	7F	R9	7F
C8	6F	R10	7G
C9	7G	R11	3C
C10	5F	R12	3E
C11	9D	R13	3E
CR1	6C	R14	4B
E1	8H	R15	6D
E2	6H	R16	6C
E3	6H	R17	8D
E4	5H	R18	8E
E5	4H	R19	8F
E6	4H	R20	7E
E7	3H	R21	8F
E8	2H	R22	6G
E9	3H	R23	7D
Q1	4E	RV1	7B
Q2	5C	RV2	7B
Q3	8D	T1	4F
Q4	8E	T2	4C
Q5	8F	TP1	3B
R1	2E	TP2	8B
R2	5E		

NOTES:
1. REF. DESIG. PREFIX 2A2.
2. ⚠1 THESE TEST POINTS ARE THE SAME FOR BOTH 2A2A2A1 AND 2A2A3A1.

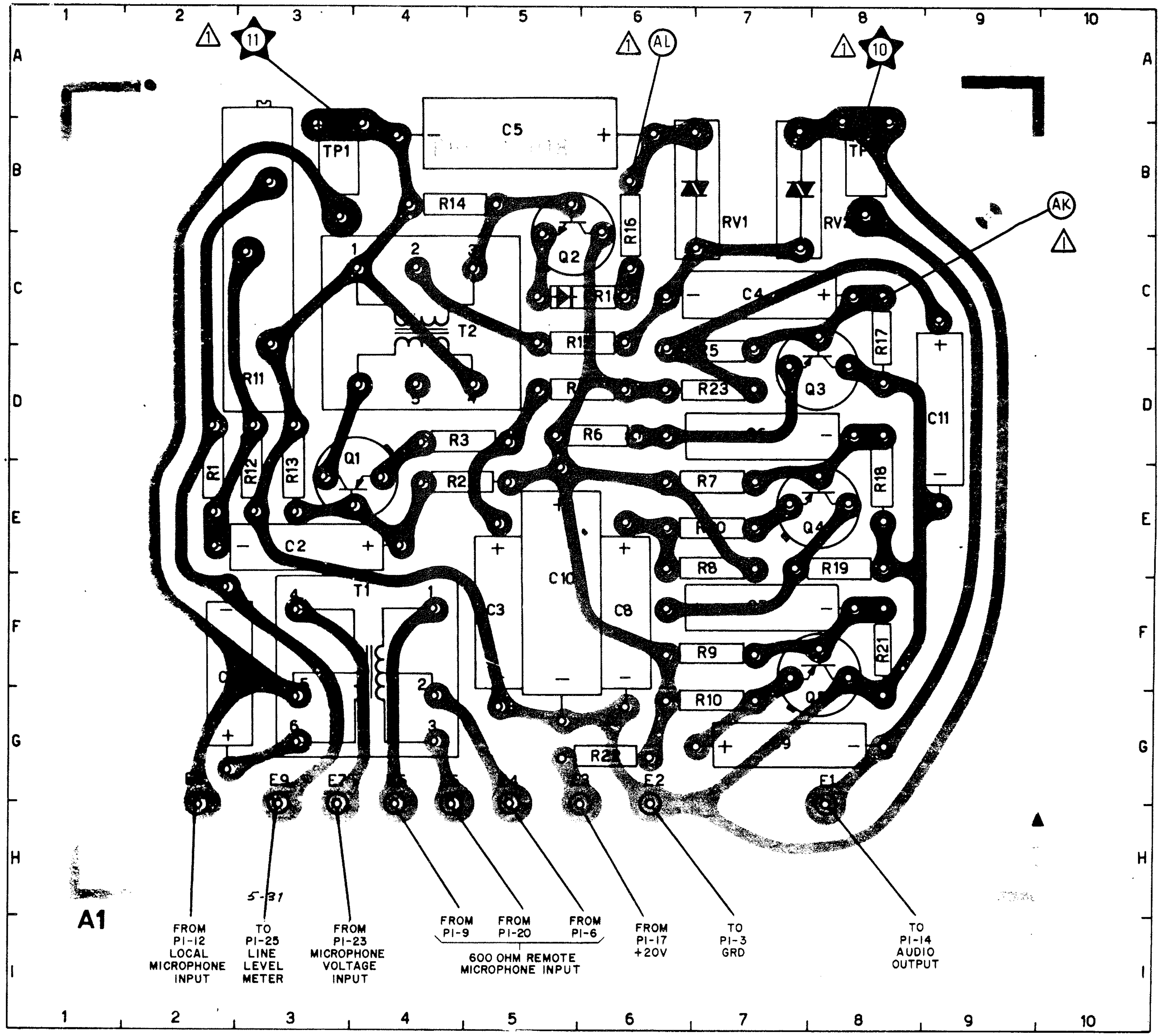
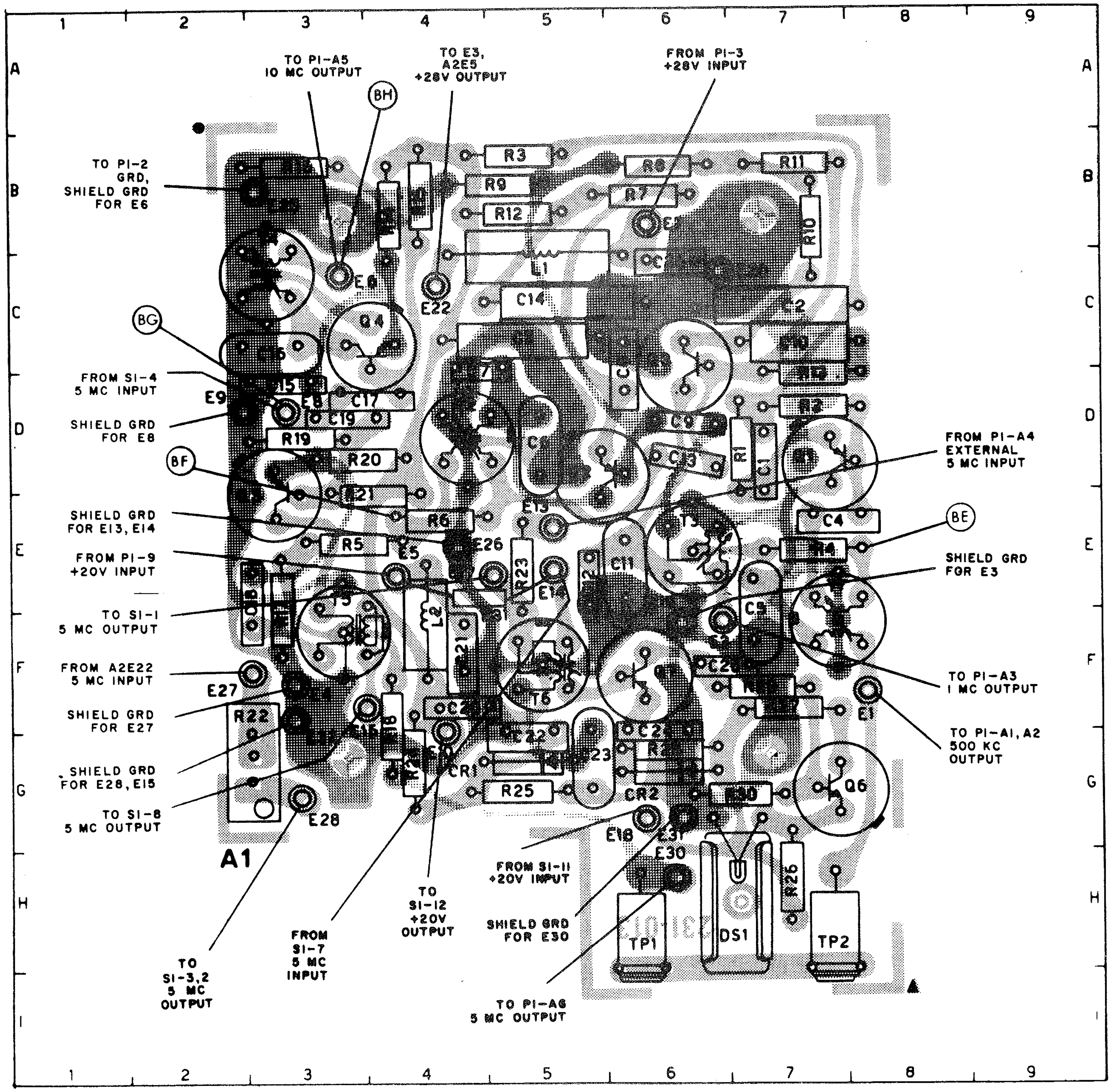


Figure 5-31. Audio Amplifier (Foil Side Up), Component and Test Point Location

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC
C1	7D	E30	6H
C2	7C	E31	6G
C3	5C	E32	3F
C4	7E	L1	5C
C5	7F	L2	4F
C6	5D	Q1	7D
C7	4D	Q2	6D
C8	6D	Q3	6C
C9	6D	Q4	4C
C10	7C	Q5	3E
C11	6E	Q6	7G
C12	5E	Q7	6F
C13	6D	R1	7D
C14	5C	R2	7D
C15	3D	R3	5B
C16	3C	R4	7E
C17	4D	R5	3E
C18	3E	R6	4E
C19	3D	R7	6B
C20	4F	R8	6B
C21	4F	R9	5B
C22	5G	R10	7B
C23	5G	R11	7B
C24	6G	R12	5B
C25	6F	R13	7D
C26	6C	R14	4B
CR1	5G	R15	4B
CR2	6G	R16	3B
DS1	7H	R17	3E
E1	8F	R18	4G
E3	6F	R19	3D
E4	3F	R20	3D
E5	4E	R21	4E
E6	3C	R22	3G
E7	6B	R23	5E
E8	3D	R24	4G
E9	2D	R25	5G
E10	4G	R26	7H
E13	5E	R27	7F
E14	5E	R28	6G
E15	3F	R29	7F
E17	5E	R30	7G
E18	6G	R31	4E
E19	6F	T1	7F
E20	6C	T2	4D
E22	4C	T3	6E
E25	3B	T4	3C
E26	4E	T5	3F
E27	3F	T6	5F
E28	3G	TP1	6H
		TP2	7H



NOTE:
REF. DESIG. PREFIX A2A5.

Figure 5-62. 5 MC Multiplier, Dividers, and Comparator (Foil Side Up), Component Location

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	5B	CR1	5B	Q5	5F	R19	2E
C2	5C	CR2	5B	Q6	3F	R20	3E
C3	6D	CR3	5C	R1	2B	R21	3D
C4	4C	CR4	2C	R2	5B	R22	2D
C5	4C	CR5	2D	R3	4B	R23	3F
C6	4D	E1	6B	R4	4B	R24	3F
C7	4B	E2	6B	R5	5D	R25	2F
C8	3C	E3	2B	R6	5C	R26	5F
C9	2D	E5	6E	R7	3C	R27	5F
C10	2B	E6	3F	R8	4D	R28	6F
C11	2E	E7	6F	R9	4B	R29	5F
C12	2F	E9	6F	R10	3B	R30	4F
C13	2F	L1	2F	R11	4B	R31	2F
C14	4F	L2	6C	R12	3B	R32	6E
C15	5E	L3	3D	R13	2B	R33	6C
C16	4E	L4	5E	R14	3C	T1	6E
C17	5E	Q1	5C	R15	2C	TP1	5E
C18	6F	Q2	3C	R16	2C		
C19	6F	Q3	2C	R17	2C		
C20	5F	Q4	3E	R18	3E		

NOTES:

1. REF. DESIG. PREFIX A2A6A1.
2. /1\ —⌒⌒⌒— VERTICALLY MOUNTED INDUCTOR.
3. /2\ ——◄—— VERTICALLY MOUNTED DIODE ANODE TO BOARD.

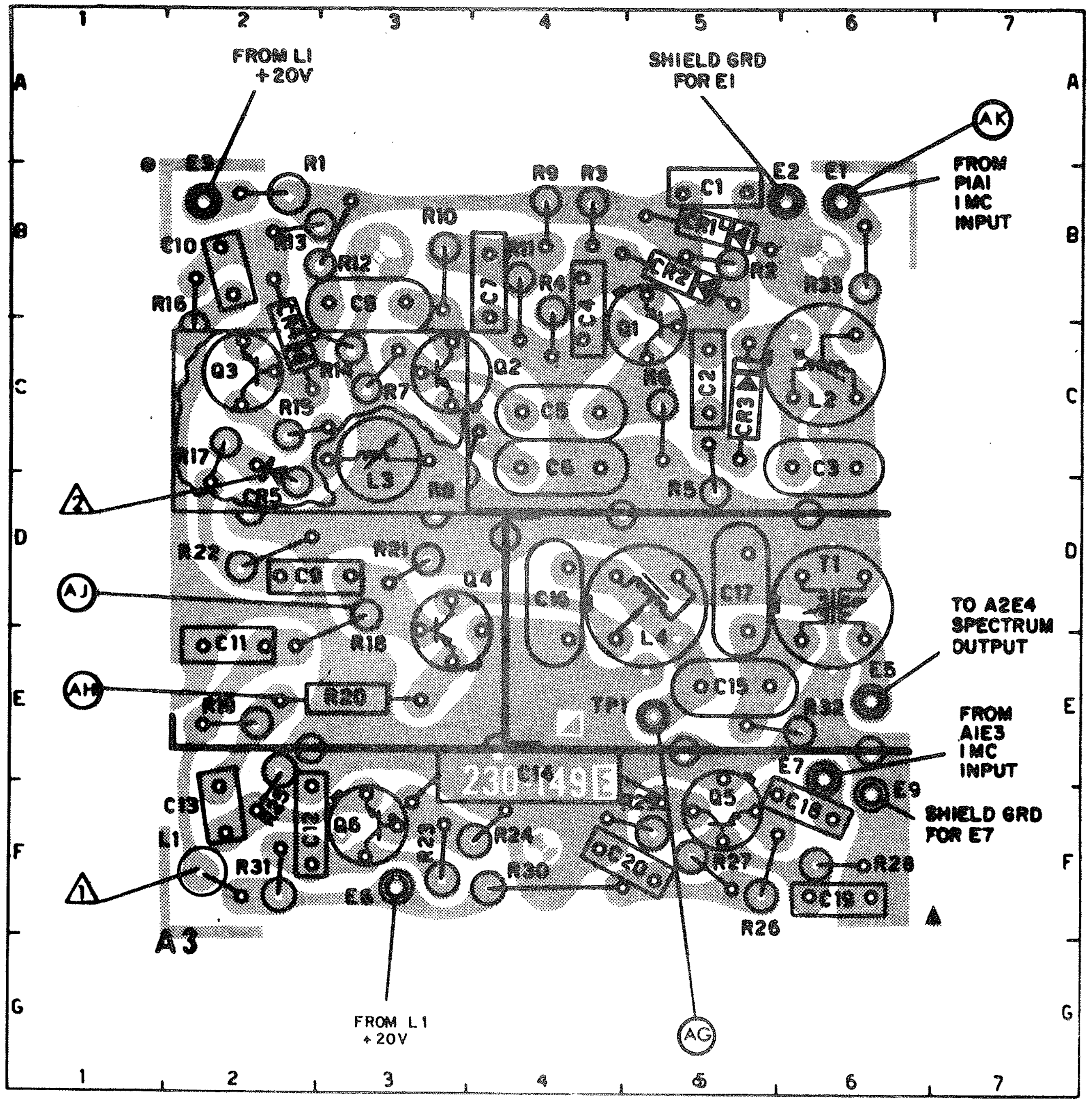
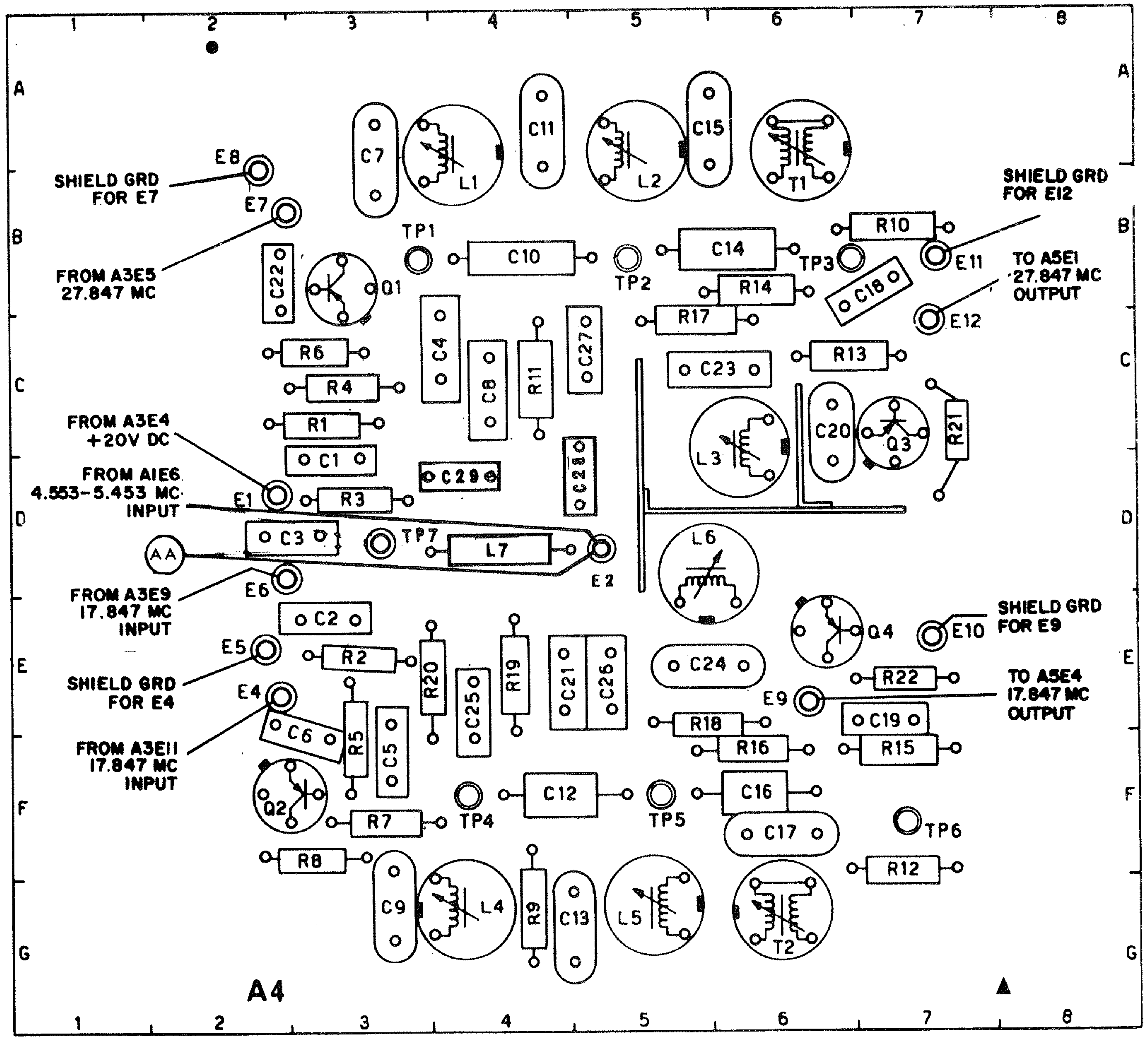


Figure 5-70. Spectrum Generator/Mixer (Foil Side Up), Component and Test Point Location

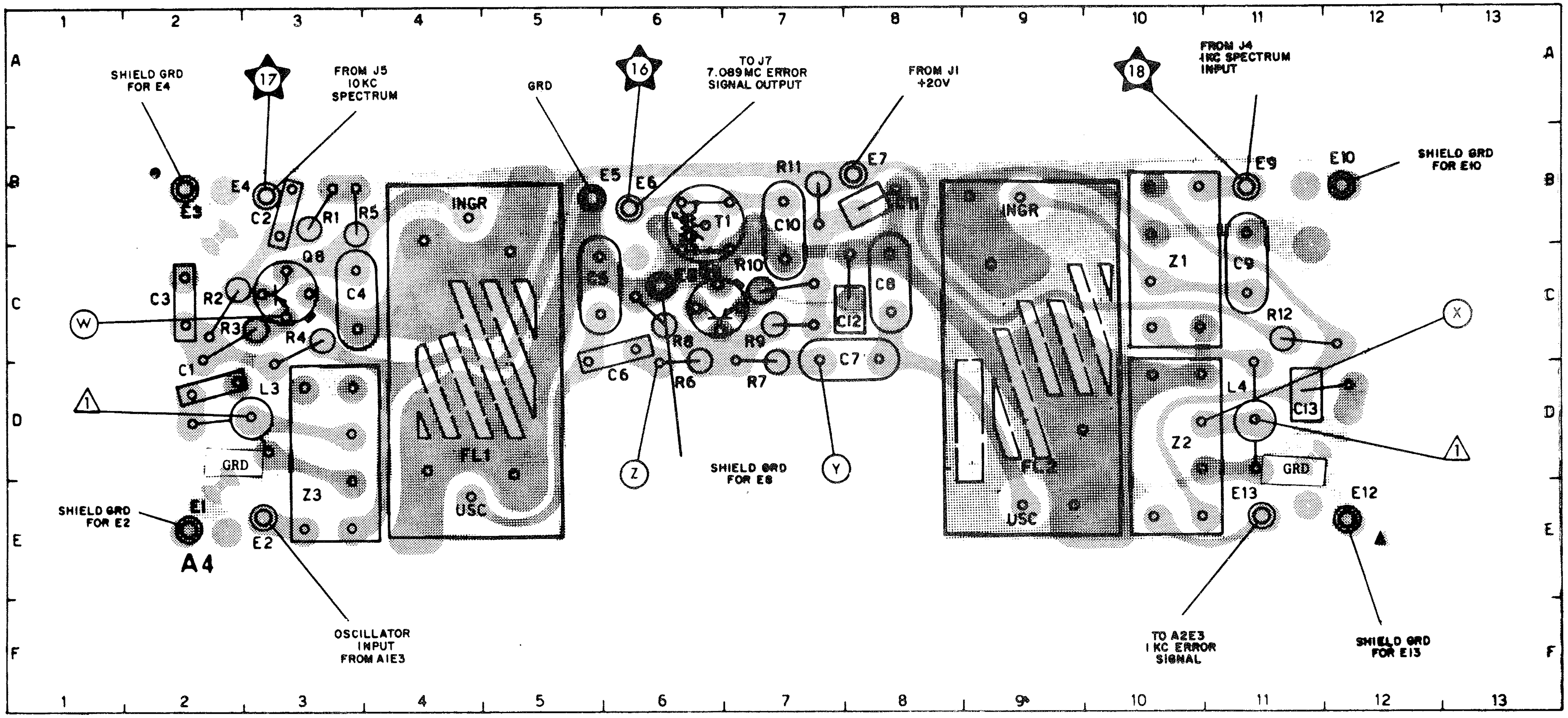
PARTS LOCATION INDEX

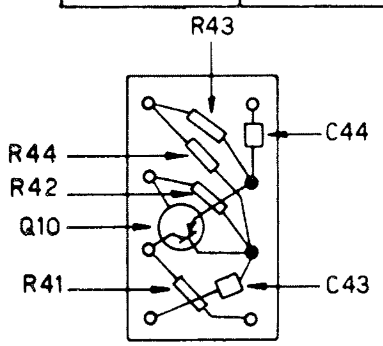
REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	3D	E1	2D	R6	3C
C2	3E	E2	5D	R7	3F
C3	2D	E3	3D	R8	3F
C4	4C	E4	2E	R9	4G
C5	3F	E5	2E	R10	7B
C6	2E	E6	2D	R11	4C
C7	3A	E7	2B	R12	7F
C8	4C	E8	2B	R13	6C
C9	3G	E9	6E	R14	6B
C10	4B	E10	7E	R15	7F
C11	4A	E11	7B	R16	6F
C12	4F	E12	7C	R17	5C
C13	4G	L1	4A	R18	5E
C14	6B	L2	5A	R19	4E
C15	5A	L3	6C	R20	3E
C16	6F	L4	4G	R21	7C
C17	6F	L5	5G	R22	7E
C18	7B	L6	5D	T1	6A
C19	7E	L7	4D	T2	6G
C20	6C	Q1	3B	TP1	3B
C21	4E	Q2	2F	TP2	5B
C22	2B	Q3	7C	TP3	6B
C23	5C	Q4	6E	TP4	4F
C24	5E	R1	3C	TP5	5F
C25	4E	R2	3E	TP6	7F
C26	5E	R3	3D	TP7	3D
C27	5C	R4	3C		
C28	5D	R5	3E		
C29	4D				



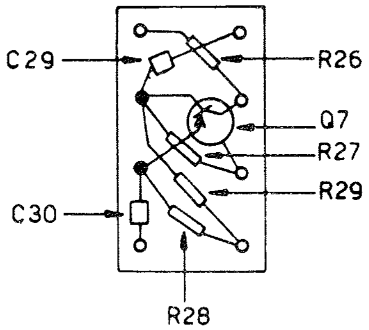
NOTE:
REF. DESIG. PREFIX A2A6A2.

Figure 5-78 Hi-Band/Lo-Band Mixer/Amplifier (Foil Side Up), Component and Test Point Location

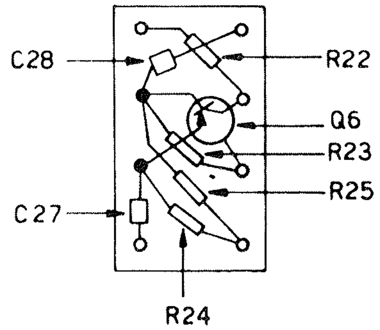




Z1

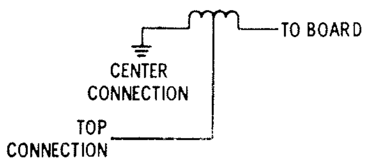


Z2



Z3

NOTES:
1. REF. DESIG. PREFIX A2A6A3.
2. ⚠1 VERTICALLY MOUNTED INDUCTORS.



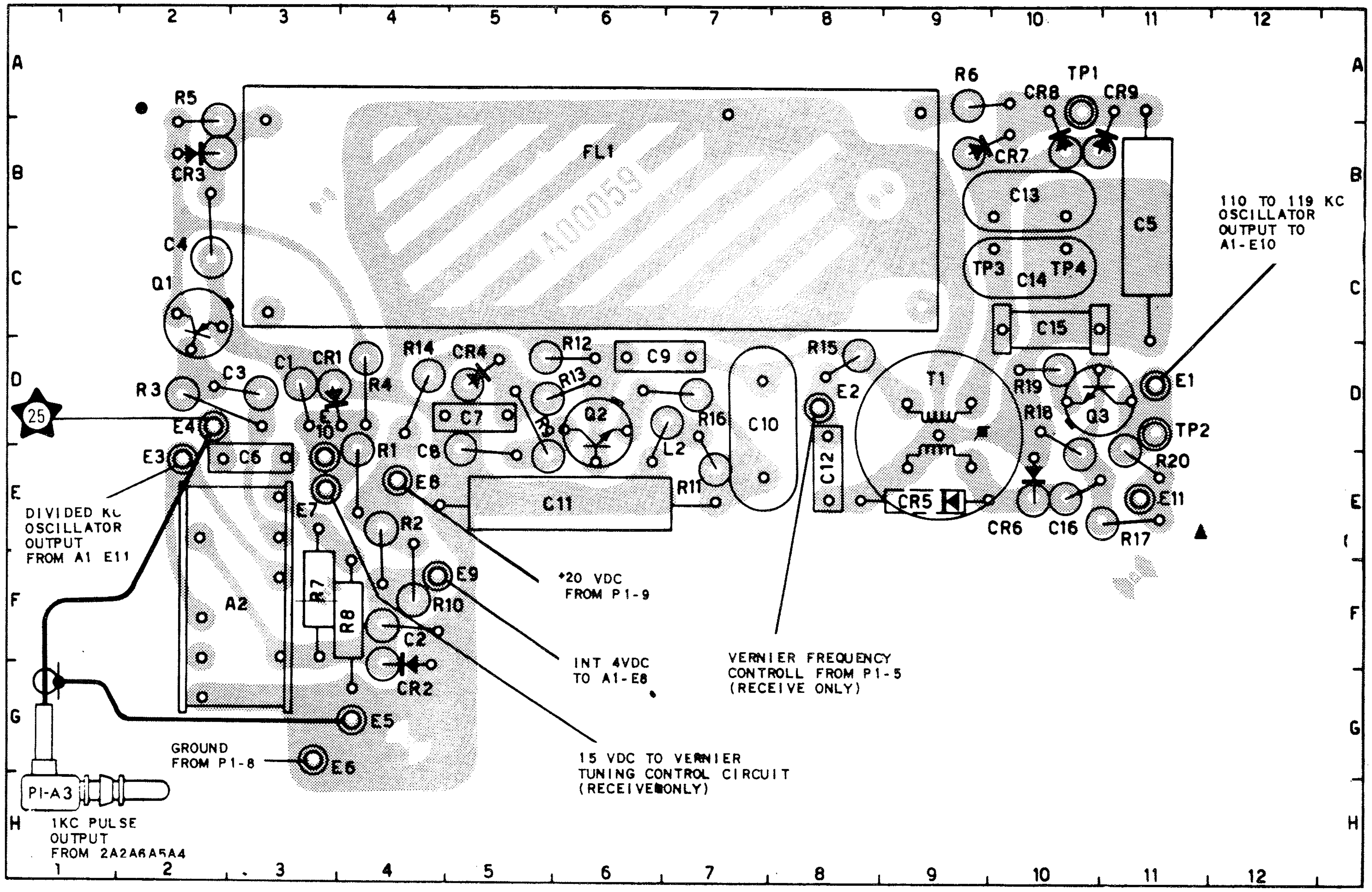
PARTS LOCATION INDEX

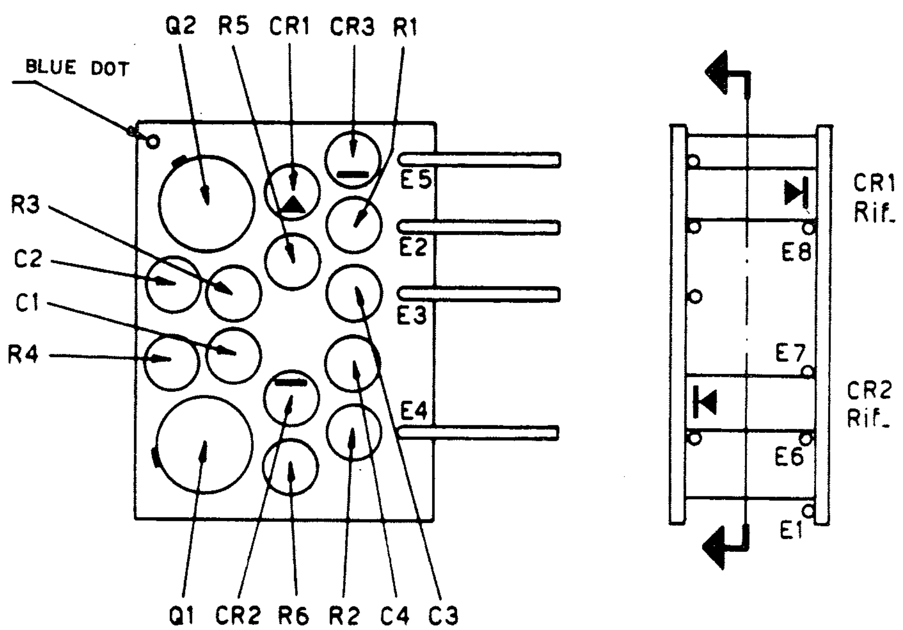
REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	2D	C13	11D	E13	11E	R6	6D
C2	3B	E1	2E	FL1	4C	R7	7D
C3	2C	E2	3E	FL2	9D	R8	6C
C4	3C	E3	2B	L3	3D	R9	7C
C5	6C	E4	3B	L4	11D	R10	7C
C6	6C	E5	5B	Q8	3C	R11	7B
C7	8D	E6	6B	Q9	7C	R12	11C
C8	8C	E7	8B	R1	3B	T1	6B
C9	11C	E8	6C	R2	2C	Z1	10C
C10	7B	E9	11B	R3	3C	Z2	10D
C11	8B	E10	12B	R4	3C	Z3	3D
C12	8C	E12	12E	R5	3B		

Figure 5-87. 7.089 MC Mixer (Foil Side Up), Component and Test Point Location

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC
C1	3D	R1	4D
C2	4F	R2	4E
C3	3D	R3	2D
C4	2C	R4	4D
C5	11C	R5	2B
C6	3E	R6	9A
C7	5D	R7	3F
C8	5D	R8	4F
C9	6D	R9	5D
C10	8D	R10	4E
C11	6E	R11	7E
C12	8E	R12	6D
C13	10B	R13	6D
C14	10C	R14	4D
C15	10C	R15	8D
C16	10E	R16	7D
CR1	4D	R17	11E
CR2	4F	R18	10E
CR3	2B	R19	10D
CR4	5D	R20	11E
CR5	9E	T1	9D
CR6	10E	TP1	10B
CR7	9B	TP2	11D
CR8	10B	TP3	10C
CR9	10B	TP4	10C
E1	11D	A2C1	SEE FIGURES BELOW FOR COMPONENT LOCATION
E2	8D	A2C2	
E3	2E	A2C3	
E4	2D	A2C4	
E5	4G	A2CR1	
E6	3G	A2CR2	
E7	3E	A2CR3	
E8	4E	A2Q1	
E9	4F	A2Q2	
E10	3D	A2R1	
E11	11E	A2R2	
FL1	6B	A2R3	
L2	7D	A2R4	
Q1	2C	A2R5	
Q2	6D	A2R6	
Q3	10D		





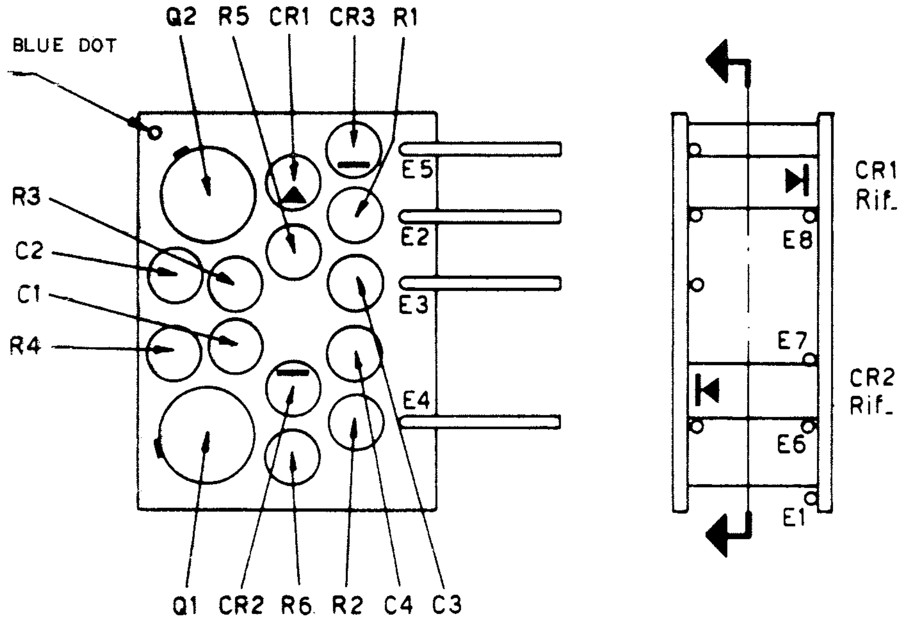
A2

NOTE:
REF. DESIG. PREFIX A2A6A4

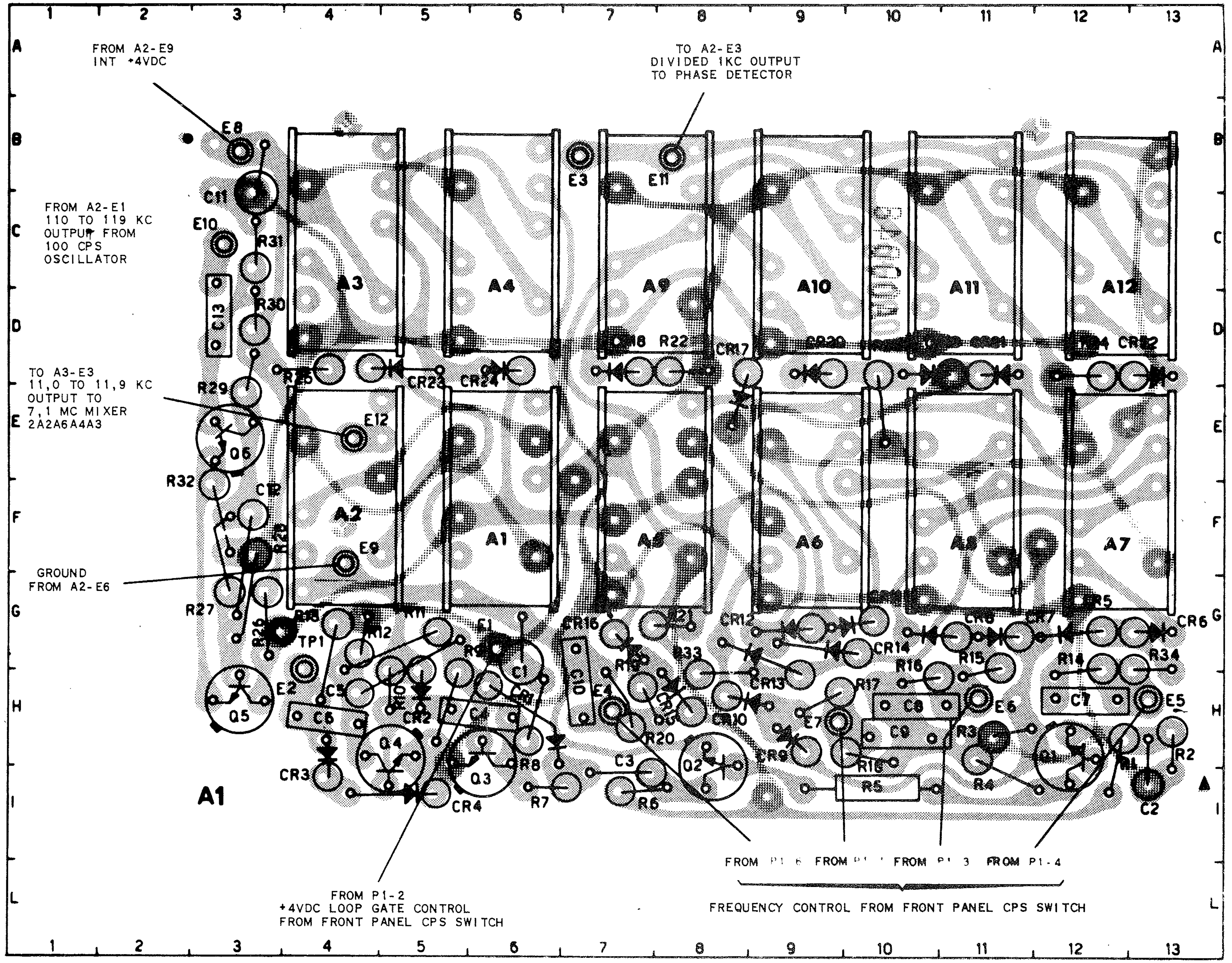
Figure 5-90. 100 CPS Oscillator (Foil Side Up), Component and Test Point Location

DISPOSIZIONE TOPOGRAFICA DEI COMPONENTI

SIMBOLO CIRCUIT.	POSIZ.	SIMBOLO CIRCUIT.	POSIZ.	SIMBOLO CIRCUIT.	POSIZ.
C1	6G	CR23	5D	R16	10H
C2	13I	CR24	6D	R17	9H
C3	7I	E1	6G	R18	10H
C4	6H	E2	4G	R19	7H
C5	4H	E3	7B	R20	7H
C6	4H	E4	7H	R21	8G
C7	12H	E5	13H	R22	8D
C8	10H	E6	11H	R23	10D
C9	10H	E7	9H	R24	12D
C10	7H	E8	3B	R25	4D
C11	3C	E9	4F	R26	3G
C12	3F	E10	3C	R27	3G
C13	3D	E11	8B	R28	3F
CR1	6H	E12	4E	R29	3E
CR2	5H	Q1	12H	R30	3D
CR3	4I	Q2	8H	R31	3C
CR4	5I	Q3	6I	R32	3F
CR5	12G	Q4	5H	R33	8G
CR6	13G	Q5	3H	R34	13G
CR7	11G	Q6	3E	TP1	4G
CR8	10G	R1	12H	A1÷A12C1	
CR9	9H	R2	13H	A1÷A12C2	
CR10	8H	R3	11H	A1÷A12C3	
CR11	10G	R4	11H	A1÷A12C4	
CR12	8G	R5	10I	A1÷A12CR1	
CR13	9H	R6	7I	A1÷A12CR2	SEE FIGURES BELOW FOR COMPONENT LOCATION
CR14	10G	R7	6I	A1÷A12CR3	
CR15	8H	R8	6H	A1÷A12Q1	
CR16	7G	R9	5G	A1÷A12Q2	
CR17	8E	R10	5H	A1÷A12R1	
CR18	7D	R11	5G	A1÷A12R2	
CR19	10D	R12	4G	A1-A12R3	
CR20	9D	R13	4G	A1-A12R4	
CR21	11D	R14	12G	A1-A12R5	
CR22	13D	R15	11G	A1-A12R6	



A1 ÷ A12

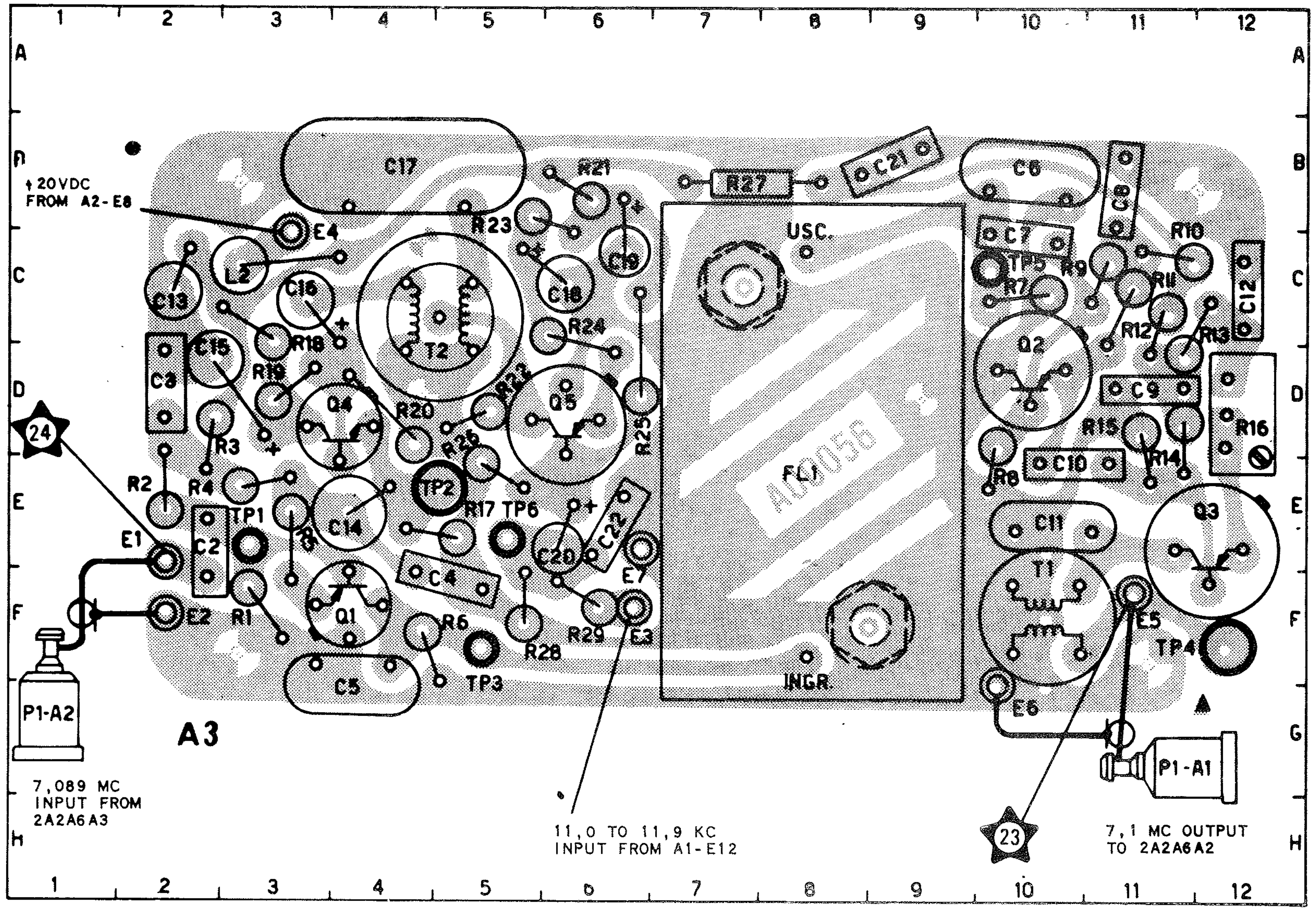


NOTE:
REF. DESIG. PREFIX A2A6A4

Figure 5-92 Preset divider (Foil side up) Component Location

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC
C2	2E	R2	2E
C3	2D	R3	2D
C4	5F	R4	3E
C5	4G	R5	3E
C6	10B	R6	4F
C7	10C	R7	10C
C8	11B	R8	10D
C9	11D	R9	11C
C10	10E	R10	11C
C11	10E	R11	11C
C12	12C	R12	11C
C13	2C	R13	11D
C14	4E	R14	11D
C15	3D	R15	11D
C16	3C	R16	12D
C17	4B	R17	5E
C18	6C	R18	3C
C19	6C	R19	3D
C20	6E	R20	4D
C21	9B	R21	6B
C22	6E	R22	5D
FL1	8D	R23	5B
L2	3C	R24	5C
Q1	4F	R25	6D
Q2	10D	R26	5E
Q3	11E	R27	7B
Q4	4D	R28	5F
Q5	6D	R29	6F
E1	2F	T1	10F
E2	2F	T2	4C
E3	7F	TP1	3E
E4	3B	TP2	4E
E5	11F	TP3	5F
E6	10G	TP4	12F
E7	7E	TP5	10C
R1	3F	TP6	5E

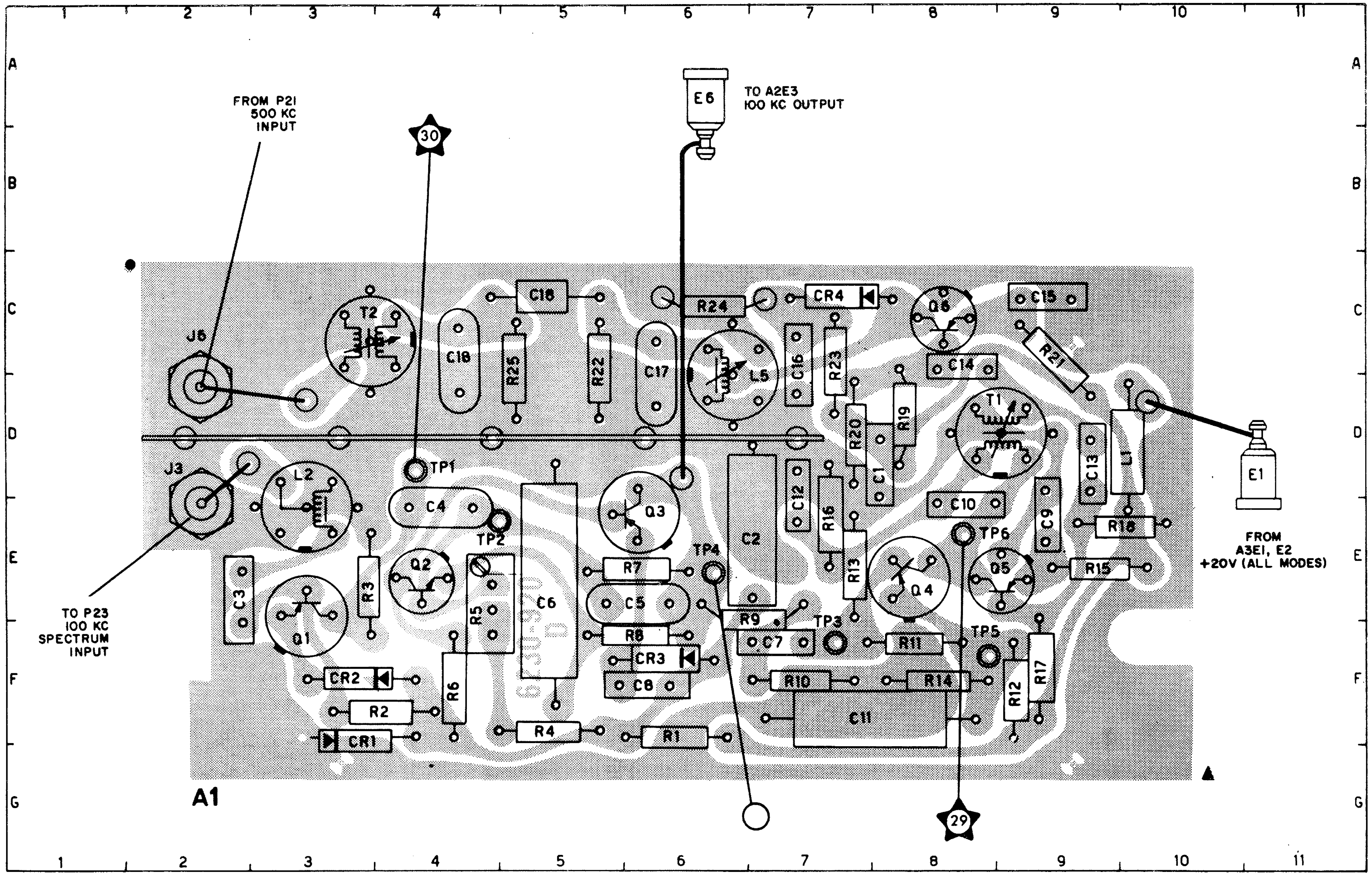


NOTE:
REF. DESIG. PREFIX A2A6A4

Figure 5-94. 7.1 MC Mixer (Foil Side Up), Component and Test Point Location

PARTS LOCATION INDEX

REF DESIG	LOC	REF DESIG	LOC	REF DESIG	LOC
C1	7D	E1	11D	R11	8F
C2	6E	E6	6A	R12	9F
C3	2E	J3	2D	R13	7E
C4	4D	J6	2C	R14	8F
C5	6E	L1	9D	R15	9E
C6	5E	L2	3D	R16	7E
C7	7F	L5	6C	R17	9F
C8	6F	Q1	3E	R18	9E
C9	8E	Q2	4E	R19	8D
C10	8D	Q3	6D	R20	7D
C11	7F	Q4	8E	R21	9C
C12	7D	Q5	8E	R22	5C
C13	9D	Q6	8C	R23	7C
C14	8C	R1	6F	R24	6C
C15	9C	R2	3F	R25	5C
C16	7C	R3	3E	T1	8D
C17	6C	R4	5F	T2	3C
C18	5C	R5	4E	TP1	4D
C19	4C	R6	4F	TP2	4E
CR1	3F	R7	6E	TP3	7E
CR2	3F	R8	6E	TP4	6E
CR3	6F	R9	6E	TP5	8F
CR4	7C	R10	7F	TP6	8E



NOTE:
REF. DESIG. PREFIX A2A6A5.

Figure 5-96. 100 KC Spectrum Generator (Foil Side Up), Component and Test Point Location

PARTS LOCATION INDEX

REF. DESIG	LOC	REF DESIG	LOC
C1	6E	R2	2F
C2	5D	R3	2E
C3	2D	R4	3D
C4	2C	R5	3D
C5	2E	R6	1D
C6	2F	R7	2F
C7	2F	R8	2E
C8	4G	R9	3D
C9	4D	R11	3F
C10	5E	R12	3F
C11	6G	R13	4G
C12	8F	R14	5F
C13	6C	R15	5F
C14	7F	R16	5E
C15	7F	R18	4F
C16	7D	R19	7G
CR1	4D	R20	6F
CR2	2D	R21	8G
CR3	2D	R22	7F
CR4	4E	R23	6E
E1	4H	R24	5C
E2	6B	R25	8E
E3	3B	R26	7E
E4	5H	R27	7D
J5	9D	R28	7D
L1	6D	R29	8D
Q1	2D	T1	7E
Q2	1F	TP1	3F
Q3	2G	TP2	2G
Q4	5F	TP3	5F
Q5	6F	TP4	7G
Q6	6D	TP5	7F
R1	6E	TP6	8F

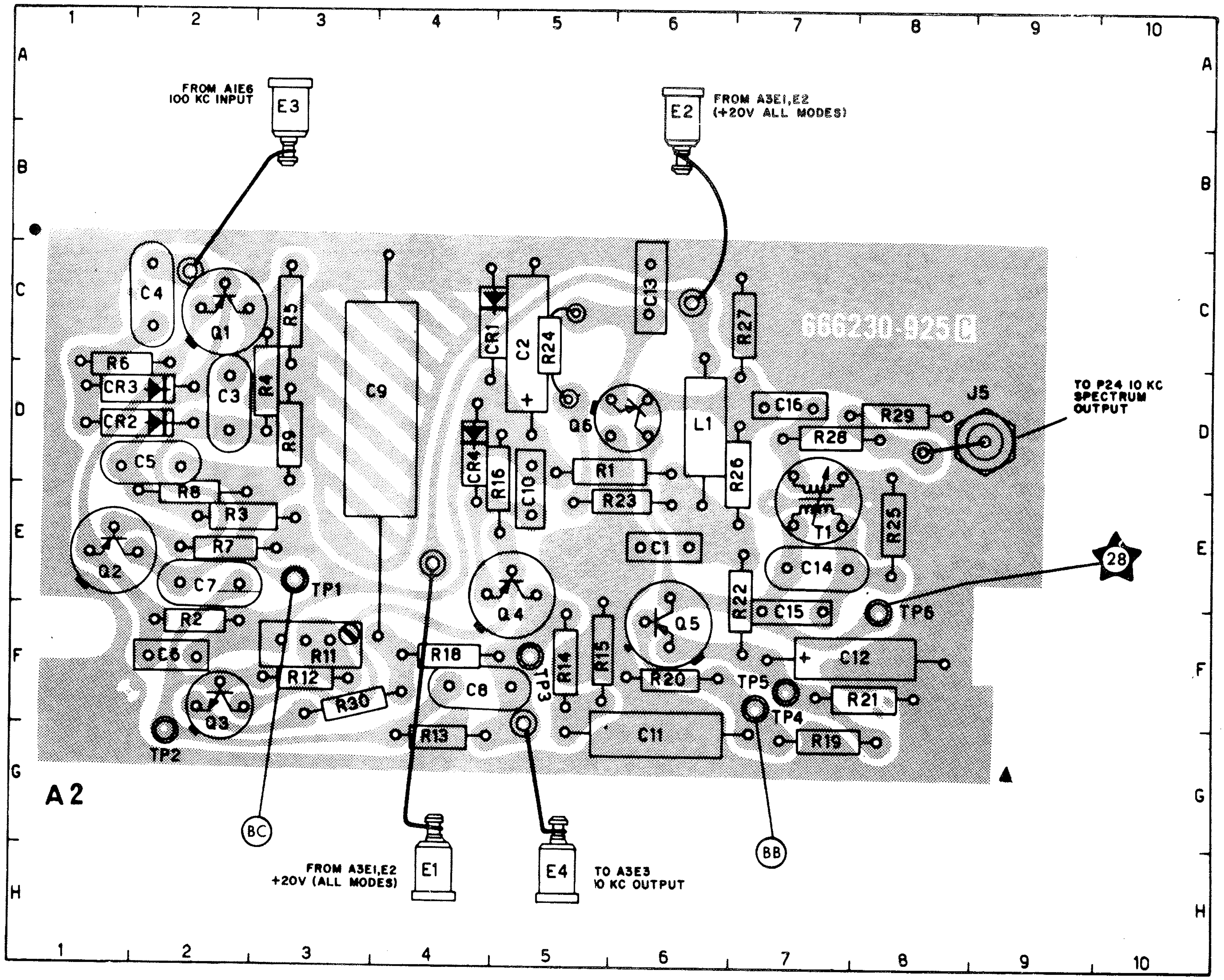


Figure 5-97. 10 KC Spectrum Generator (Foil Side Up), Component and Test Point Location

DISPOSIZIONE TOPOGRAFICA DEI COMPONENTI

SIMBOLO CIRCUIT.	POSIZ.	SIMBOLO CIRCUIT.	POSIZ.
C1	6E	R2	2E
C2	5C	R3	2E
C3	2D	R4	3C
C4	2C	R5	3B
C5	2D	R6	1C
C6	2F	R7	2E
C7	2E	R8	2D
C8	4F	R9	3D
C9	4D	R10	3C
C10	5D	R11	3E
C11	6F	R12	3F
C12	8F	R13	4F
C13	6C	R14	5F
C14	7E	R15	5F
C15	8C	R16	5D
C16	7D	R17	3F
C17	9E	R18	4F
CR1	4C	R19	7F
CR2	2D	R20	6F
CR3	2C	R21	8F
CR4	4F	R22	7E
CR5	4D	R23	6D
E1	3H	R24	5C
E2	6A	R25	8D
E3	2A	R26	7D
E4	5H	R27	7C
J4	9D	T1	7D
L1	6D	TP1	3E
L2	8D	TP2	2F
Q1	2C	TP3	5F
Q2	1E	TP4	7F
Q3	2F	TP5	7F
Q4	5E	TP6	6E
Q5	6E		
Q6	6D		
R1	6D		

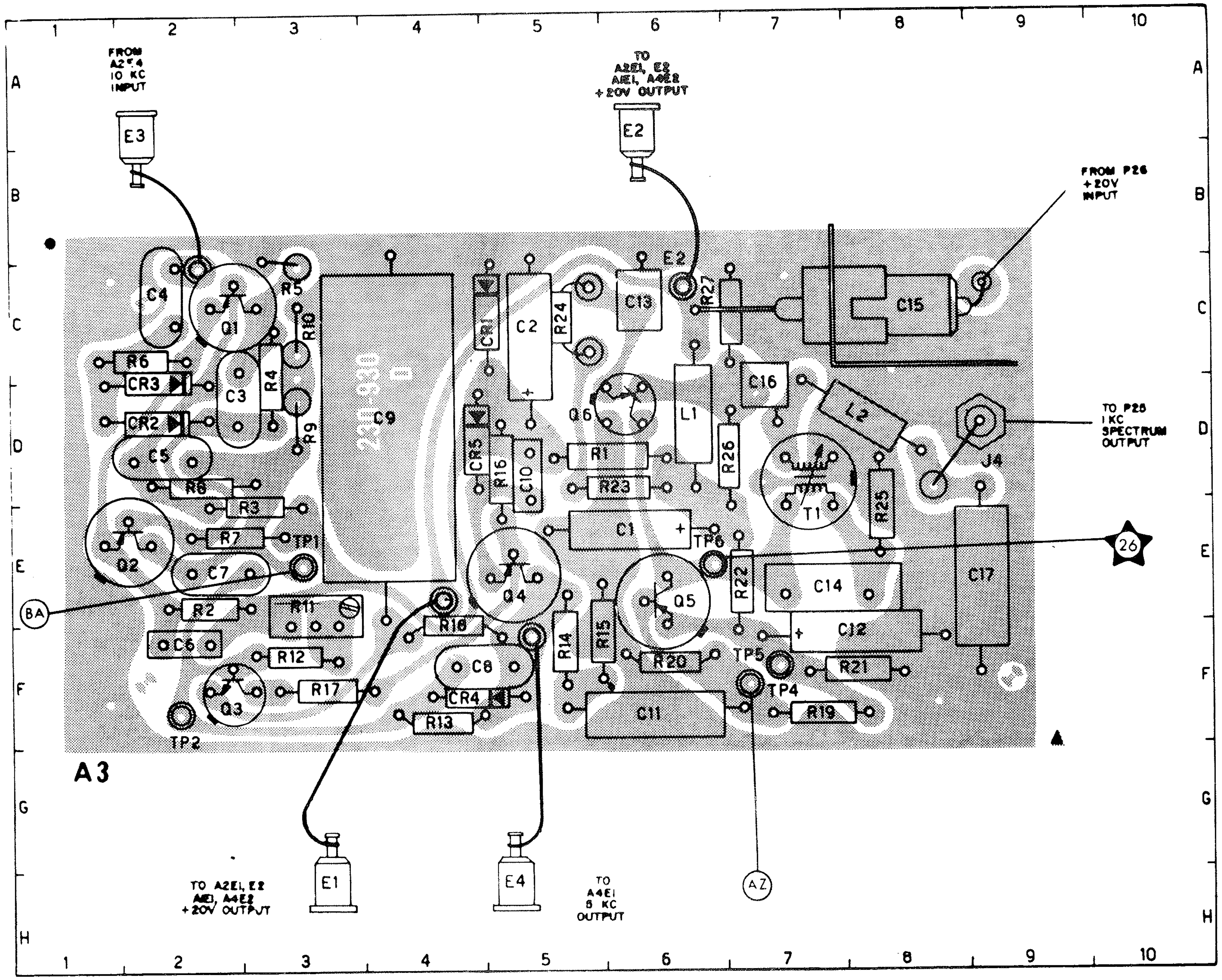
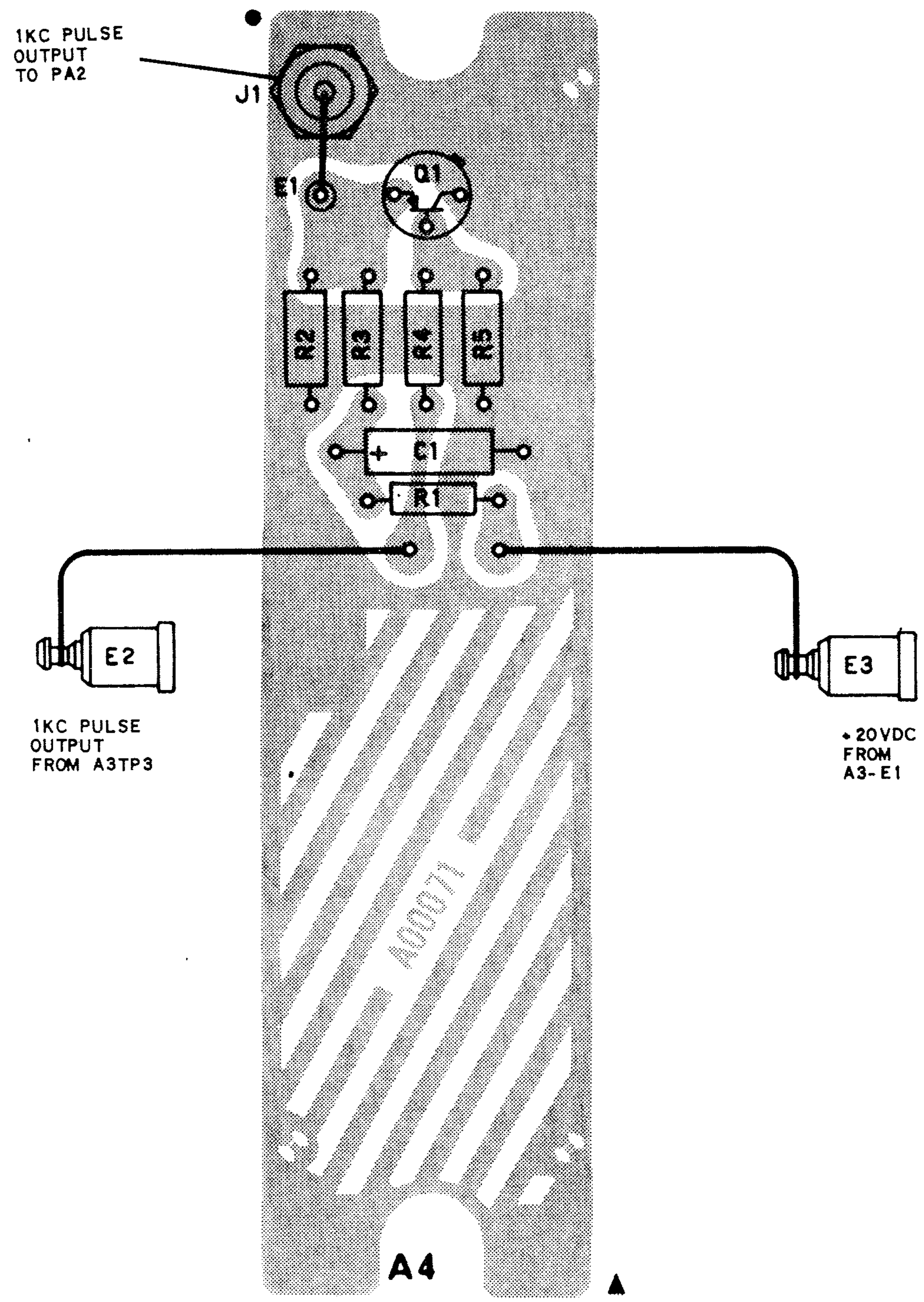
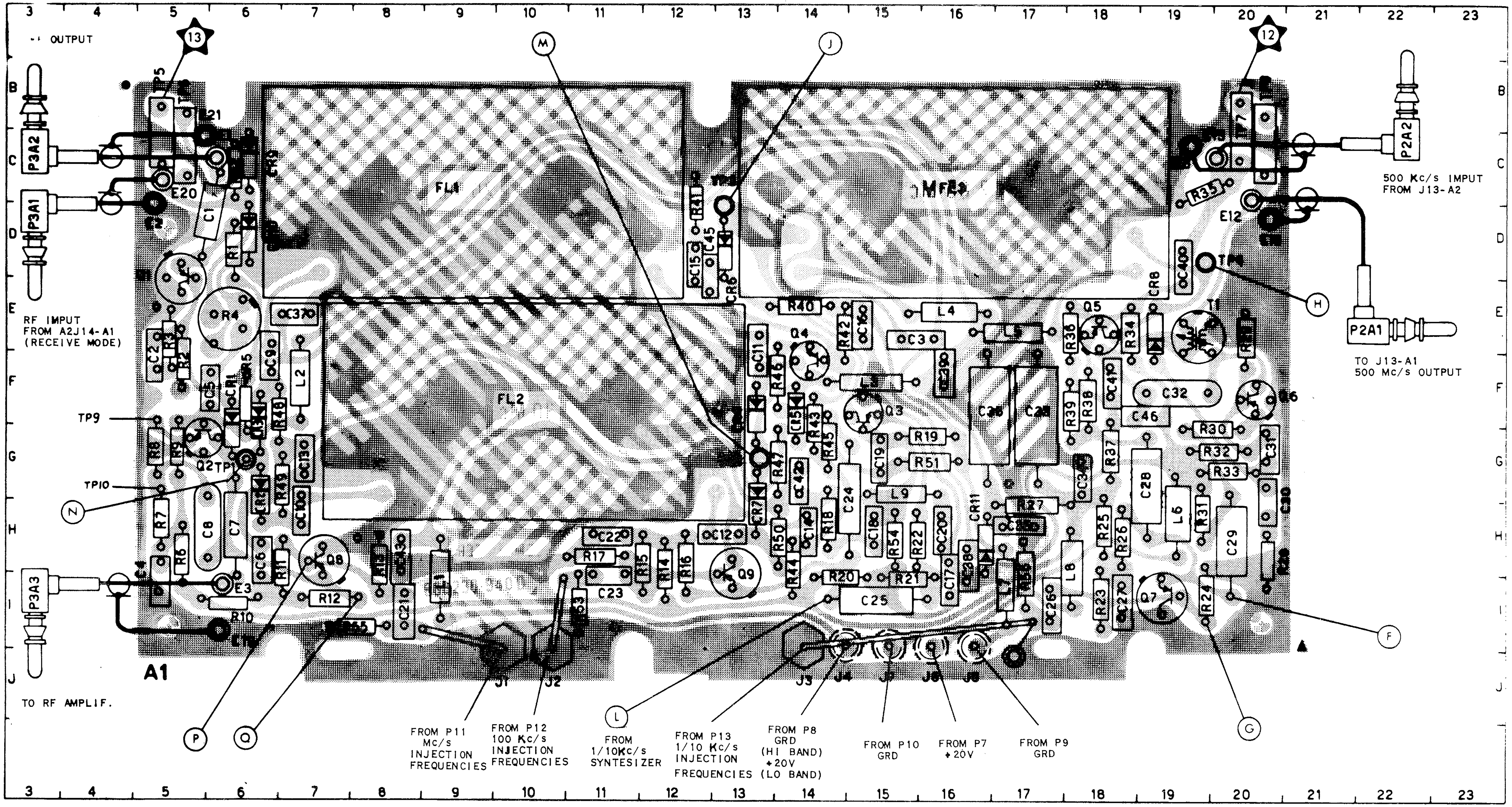


Figure 5-98. 1 KC Spectrum Generator (Foil Side Up), Component and Test Point Location



NOTE:
REF. DESIG. PREFIX A2A6A5

Figure 5.99 1Kc Pulse Inverter (Foil Side Up) Component Location

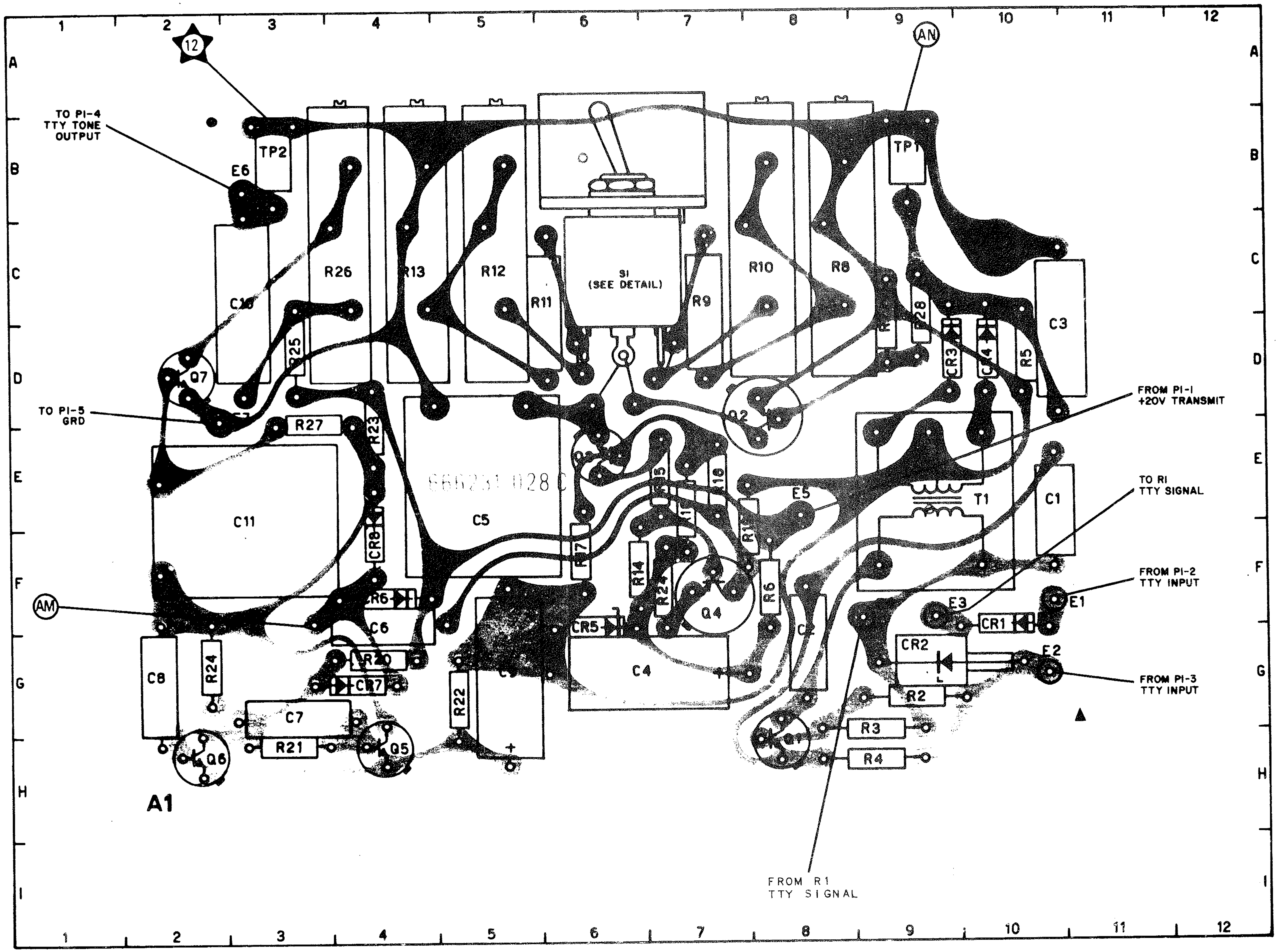


NOTE:
REF. DESIG. PREFIX A2A6A6

Figure 5-101. RF Translator (Foil Side Up), Component and Test Point Location

TE:
REF. DESIG. PREFIX 2A2A9.

REF DESIG	LOC	REF DESIG	LOC
C1	11E	R2	9G
C2	8G	R3	9H
C3	11D	R4	9H
C4	7G	R5	10D
C5	5E	R6	8F
C6	4G	R7	9C
C7	3G	R8	9C
C8	2G	R9	7C
C9	5G	R10	8C
C10	3C	R11	6C
C11	3F	R12	5C
CR1	10F	R13	4C
CR2	9G	R14	7F
CR3	10D	R15	7E
CR4	10D	R16	7E
CR5	6F	R17	6F
CR6	4F	R18	7E
CR7	4G	R19	8F
CR8	4F	R20	4G
E1	11F	R21	3H
E2	11G	R22	5G
E3	9F	R23	4E
E4	9F	R24	2G
E5	8E	R25	3D
E6	3B	R26	4C
E7	3D	R27	3E
Q1	8H	R28	9C
Q2	8D	R29	7F
Q3	6E	S1	6C
Q4	7F	T1	9E
Q5	4H	TP1	9B
Q6	2H	TP2	3B
Q7	2D		



CONTACT DETAIL
SWITCH S1

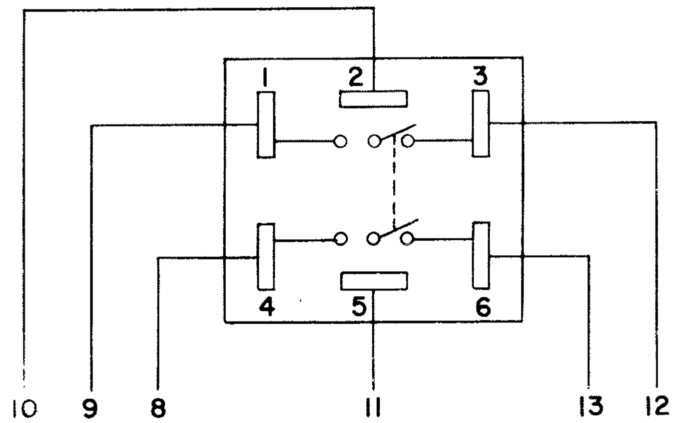


Figure 5-103 FSK Tone Generator (Foil Side Up), Component and Test Point Location

NOTE:
1. COMPONENT REF. DESIG. PREFIX A2A12

PARTS LOCATION INDEX

REF. DESIG.	LOC.	REF. DESIG.	LOC.
C1	5D	R4	5E
C2	7F	R5	5F
C3	3E	R6	5B
C4	6F	R7	6D
C5	6C	R8	6C
C6	2B	R9	7D
C7	7C	R10	5E
C8	8C	R11	5G
C10	3G	R12	5F
CR1	3D	R13	3C
E1	8G	R14	3D
E2	8G	R15	3C
E3	7G	R16	6C
E4	3G	R17	3D
E5	4G	R18	8C
E6	4G	R19	3C
E7	3G	R21	7F
E8	5G	R22	6G
E9	7G	R23	5C
E10	6G	R24	3F
Q1	4F	R25	4C
Q2	6D	T1	6B
Q3	7B	T2	8D
Q4	4C	TP1	5B
R1	5G	TP2	8B
R2	5F	TP3	4B
R3	6F	TP4	3B

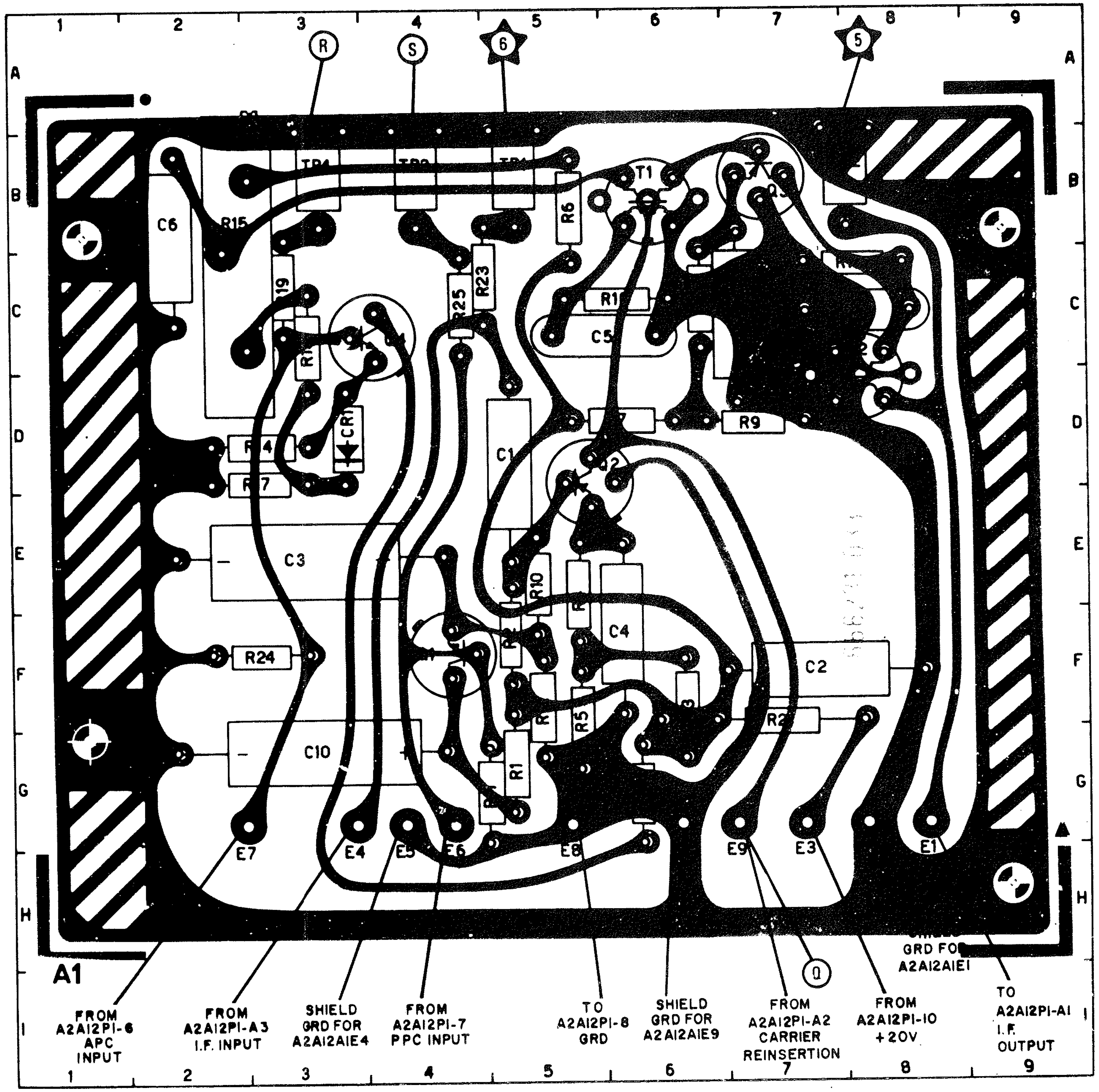


Figure 5-105 IF. Amplifier (Foil Side Up), Component and Test Point Location