R. S. ARAO

EXCITER SC-910E

SINGLE SIDEBAND COMMUNICATIONS EQUIPMENT

GENERAL DYNAMICS | ELECTRONICS

MILITARY PRODUCTS DIVISION—ROCHESTER

Operation And Service Instructions

for

EXCITER SC-910E

GENERAL DYNAMICS | ELECTRONICS

MILITARY PRODUCTS DIVISION—ROCHESTER

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CHAPTER I
GENERAL DESCRIPTION

1.1 DESCRIPTION

Exciter SC-910E (Exciter), is a self-contained, digitally-tuned, unit capable of generating single sideband, CW or compatible AM transmissions in the 2-to-30 megacycle range, at a power output of .25 watts. A total of 28,000 channels spaced one kilocycle apart are available.

1.1.1 The Exciter unit is housed in a moisture sealed case incorporating slides that permit removal of the chassis as well as tilting forward or backward at 90 degree angles for easy servicing. The chassis is fastened to the case with front mounted screws and internal shock pins.

1.1.2 The Exciter is 7 inches high, 17-3/8 inches wide and 18-1/8 inches deep (including panel controls and rear connectors), and weighs 55 pounds.

1.2 EQUIPMENT REQUIRED BUT NOT SUPPLIED

This equipment is designed to operate in conjunction with power amplifiers referenced in paragraph 1.4.

1.2.1 Other equipment required, but not furnished includes:
1. Connector—MS3106L36-8S(C)
2. Microphone, dynamic—Romwell No. 10367

1.3 QUICK REFERENCE DATA

Frequency Range	2 to 30 megacycles in 1 KC steps.
Modes of Operation	Lower sideband, upper sideband, independent sideband, frequency shift keying, CW and AM.
Power Input Requirements	115 volts AC, single phase, 48-1000 cycles, 47 watts.
Frequency Stability	1 part in 10^7 per week.
Recommended Antenna with Semi-Automatic Coupler SC-905C	15 foot probe.
Power Output	SSB .1 nominal .25 watt max.
Transmitter Spurious Responses	-60 DB.
2nd Harmonic	-50 DB.
SSB Carrier Supression	-50 DB.
SSB Undesired Sideband	-60 DB.
Intermodulation Distortion	-40 DB.
Output Impedance	52 ohms.
Audio Inputs	Carbon microphone. Dynamic microphone with preamplifier. 600 ohms balanced line.
Remote Audio Input	250 MV at 600 ohms min.

1.4 ASSOCIATED EQUIPMENT

The Exciter is designed to operate in a fixed station configuration in conjunction with: Radio Receiver SC-910R, Power Amplifiers SC-910A, SC-907 and SC-908, Antenna Coupler SC-905C (semi-automatic) or Antenna Coupler SC-909C (automatic).

1.5 INSTALLATION

1.5.1 Unpacking and Handling. Because the Exciter is an accurately calibrated piece of precision equipment, rough handling should be avoided. Extreme caution should be exercised when removing the unit from the packing container to prevent damaging the controls and connectors. Handles are provided on the front panel for lifting or carrying the equipment.

1.5.2 Power Requirements. The Exciter is designed for operation from 115 volts AC + 10% single phase. The supply voltage may have a frequency of 48-1000 cycles per second.

1.5.3 Installation Layout. The Exciter should be installed as close to the power amplifier as possible to minimize RF lead lengths. It may be table mounted or rack mounted in a standard 19-inch rack using adapter plates. AC power, remote control and audio connections should be made through J1 (see figure 1-1), using a type AN3106R36-8S(C) female connector, as indicated in figure 6-1. Exciter output is obtained through J5 using BNC connector type UG88/U and RG58 coaxial cable. An external frequency standard can be connected to J3 to synchronize the Exciter to an external 5 MC frequency. Alternately the internal frequency standard can be used to synchronize additional units or for test purposes using J4.

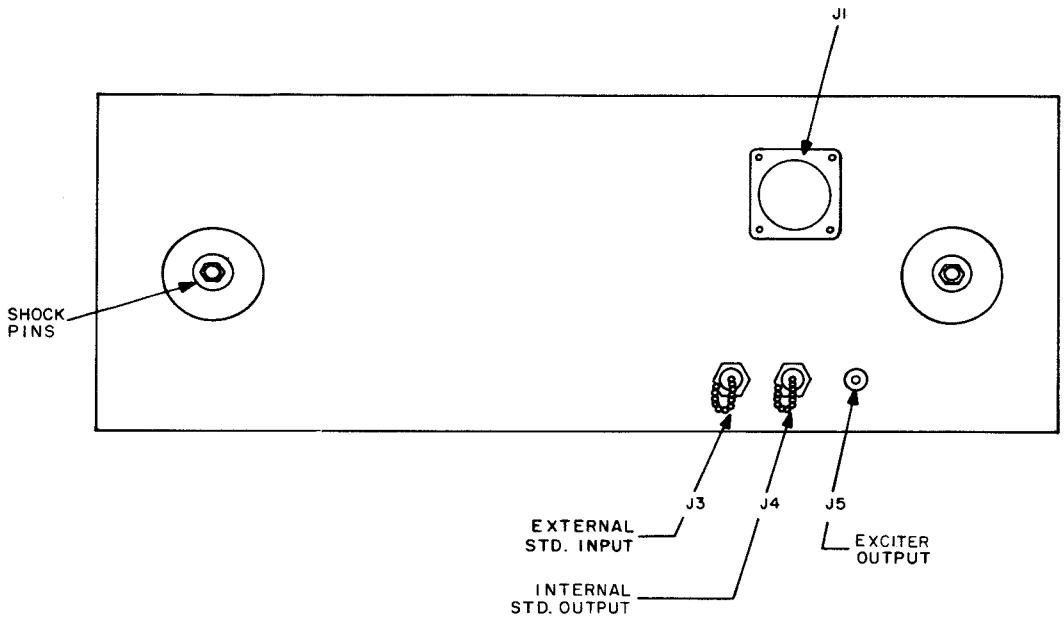


Figure 1-1. Exciter SC-910E, Rear View

NOTE

The Exciter case should be connected to the system ground using braid or buss wire to insure minimum radiation of internal frequencies.

1.5.4 Inspection and Adjustments. Because of the nature of the equipment, relocation should have no affect on adjustment. With the equipment in operating condition when packed, the only points to be checked before applying power are as follows:

1. Check for external damage such as damaged indicators, switches, lamps, and connectors.
2. Verify that all electronic plug-in assemblies are secured in their respective sockets.
3. Check that tubes V1 and V2, in the RF Amplifier, are secure in their respective sockets.

1.5.5 Interference Reduction. As a precaution against possible interference with or from the Exciter, operate with the unit drawer fully closed and with captive screws run-up tight. Verify that the Exciter is properly grounded. The use of shielded cables on all connections to J1 is recommended for maximum interference protection.

1.5.6 Preparation for Reshipment. Check to insure that all modules are securely fastened and tubes V1 and V2 are mounted using vibration proof shields provided. Turn MODE SELECTOR switch to OFF. If original container is available, repackage unit in the reverse order of uncrating.

1.5.6.1 If the original container is not available, proceed as follows:

1. Enclose the unit in a cardboard container. Use padding to protect the rear panel, front panel and both sides. Use large pads between connectors on rear panel and between front panel controls to protect from extreme pressure.
2. Place unit in a packing crate on a shock pad. Place shock pads around unit so it cannot move. Place shock pad on top of unit and secure crate cover.
3. Mark crate cover "OPEN THIS END".

CHAPTER II
OPERATORS SECTION

2.1 FUNCTIONAL OPERATION

2.1.1 General. Exciter SC-910E is designed to generate single sideband transmission of upper sideband (USB), lower sideband (LSB), or independent sideband (ISB) as well as conventional transmissions of frequency shift keying (FSK), CW and AM. The Exciter consists of a main frame, seven electronic plug-in assemblies, and a power supply. Power and Signal output connections are made to jacks mounted on the rear panel. All controls required for normal operation are located on the front panel. (See figure 2-1.) The unit may be operated remotely or locally.

2.1.2 Operation. Utilizing the Translator Synthesizer assemblies, the Exciter develops RF frequencies at a high degree of accuracy. The desired operating frequency is selected by operating the FREQUENCY MEGACYCLE dials to the proper setting. This information is digitally encoded and tunes the Exciter in one operation.

2.1.2.1 When transmitting voice communication (see figure 2-2), the audio input is applied to one of the two Transmitter Audio amplifiers, depending on the setting of the MODE SELECTOR switch. An audio compressor and AGC loop provide a constant level audio input to the Mode Selector subassembly. When transmitting independent sideband, both sidebands are used so both Transmitter Audio amplifiers are receiving audio input.

2.1.2.2 The MODE SELECTOR unit produces the 500 KC IF signal using two balanced modulators, one of which is selected by the MODE SELECTOR switch. For CW and AM operation, the carrier is re-inserted in the Transmitter IF unit by gating circuits in the Mode Selector unit.

2.1.2.3 When transmitting CW, the MODE SELECTOR switch disables the Transmitter Audio units and passes the keyed signals directly to the Mode Selector unit. Keying is accomplished by inserting the carrier IF frequency following the sideband filters.

2.1.2.4 The IF signal produced in the Mode Selector unit is amplified by Transmitter IF unit. Peak and average power control circuits, operated by control voltages from a power amplifier, control the overall gain of the IF signal.

2.1.2.5 In the RF Translator, the IF signal is converted to the HF intermediate signal using two mixers and associated bandpass.

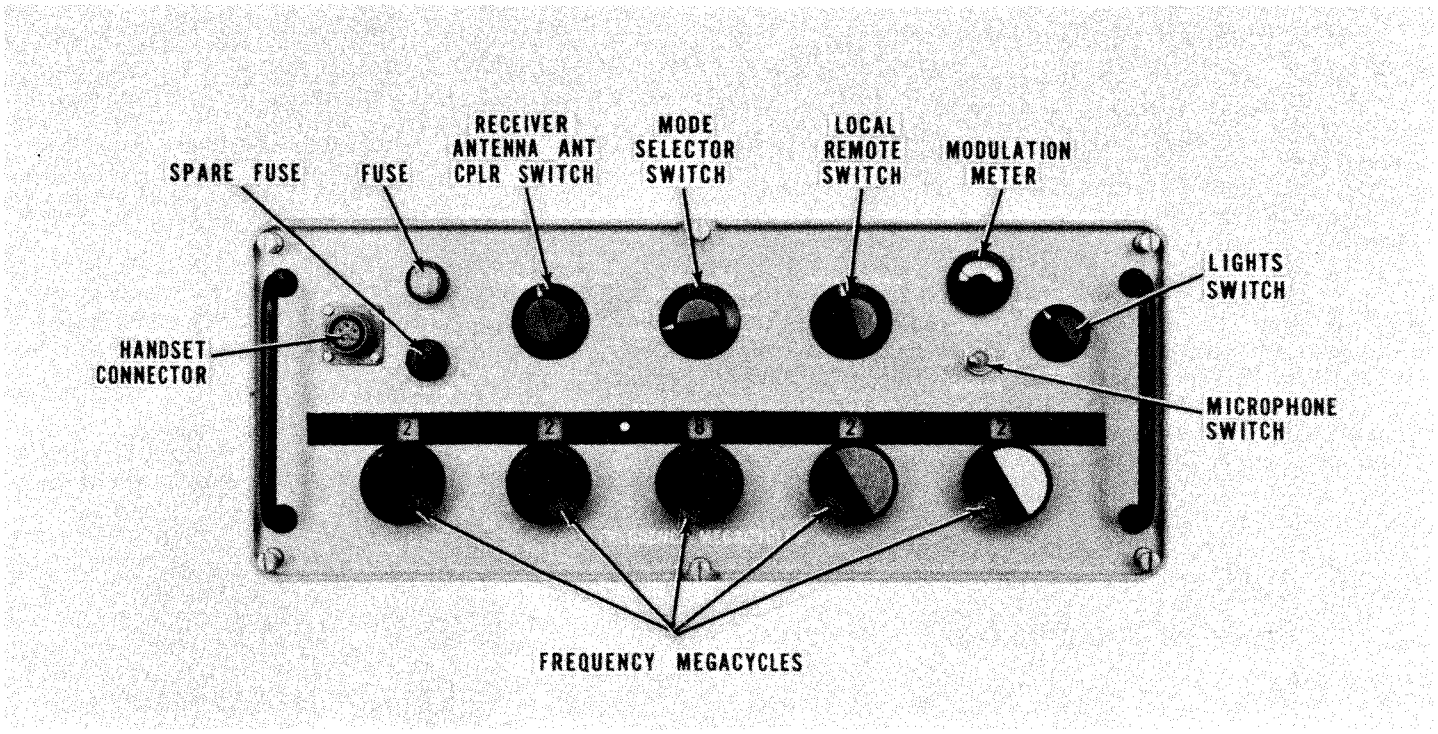


Figure 2-1. Exciter SC-910E, Front View

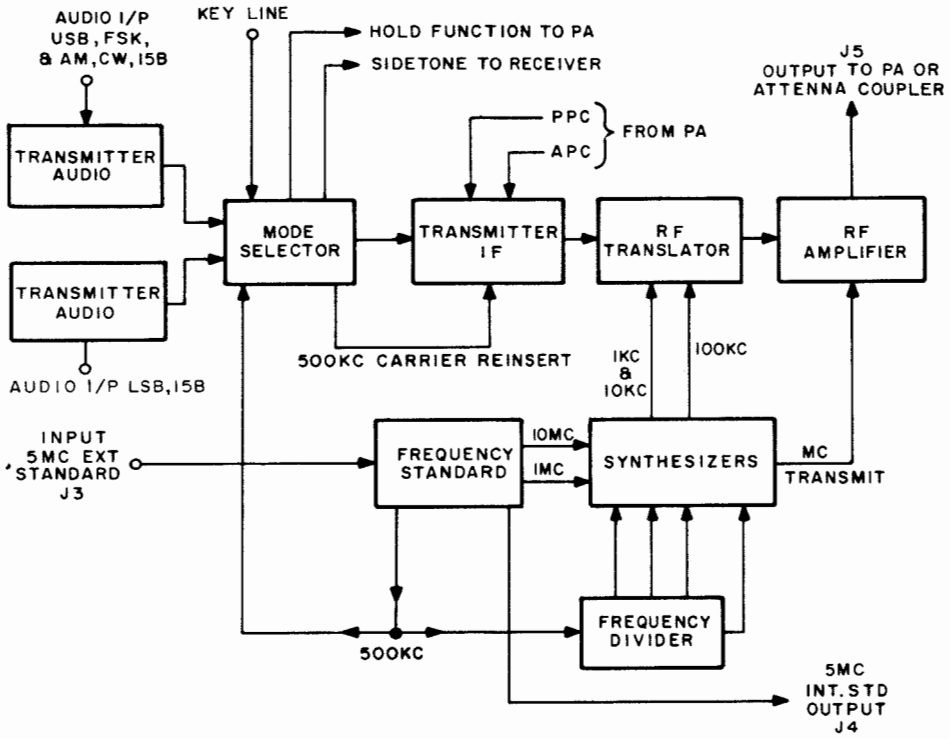


Figure 2-2. Exciter SC-910E, Block Diagram

2.1.2.6 Injection frequencies, developed in the frequency synthesizer, are used as injections for the mixers in the translation process. These frequencies are selected by the FREQUENCY MEGACYCLE dials and are synchronized to the standard frequency using error cancelling techniques.

2.1.2.7 The HF intermediate frequency is applied to the RF amplifier module where it is mixed with the MC injection frequency from the MC synthesizer. The desired RF output frequency is passed through the two RF amplifiers in conjunction with four digitally tuned circuits to produce the 1/4 watt output into a 50-ohm impedance.

2.1.2.8 The digital encoding switches produce mechanical and electrical tuning information used internally within the Exciter as well as band switching information for the associated power amplifier. Within the Exciter, information is used to select the proper combination of injection frequencies applied to the RF translator. Separate information controls the RF amplifier turret and digital capacitors.

2.1.2.9 A self-contained power supply converts the 115-volt AC supply voltage to the proper AC and DC operating voltages.

2.2 DESCRIPTION OF CONTROLS AND INDICATORS

All the controls and indicators necessary to operate the Exciter are mounted on the front panel. (See figure 2-1.) The controls and indicators are listed in table 2-1.

TABLE 2-1

EXCITER SC-910E, CONTROLS AND INDICATORS

Control	Nomenclature	Function
HANDSET jack	J2	Provides connection for microphone and push-to-talk switch.
FUSE	F1	Overload protection for primary of transformers.
Fuse Indicator	DS3	Lights when fuse is blown.
SPARE FUSE holder	XF2	Holds spare fuse.
RECEIVE switch	S10	In ANTENNA position, bypasses the antenna coupler allowing duplex operation. In ANT CPLR position, routes all RF through the coupler.

TABLE 2-1 (Cont.)

EXCITER SC-910E, CONTROLS AND INDICATORS

Control	Nomenclature	Function
MODE SELECTOR switch	S8	Selects OFF, STD BY (standby), or mode of operation i.e., USB, LSB, FSK, ISB, CW or AM.
LOCAL REMOTE switch	S9	Selects microphone operation, (LOCAL) or REMOTE operation with a standard remote unit.
MODULATION meter	M1	Reads power output of an external power amplifier. Otherwise, is inoperative.
MICROPHONE switch	S11	Operative only when ISB is selected. Places microphone audio on either upper or lower sideband.
LIGHTS switch	S6	Controls brilliance of the dial lamps.
FREQUENCY MEGACYCLE dials		Selects operating frequency in digital form (encoders).

2.3 OPERATING PROCEDURES

To operate the Exciter, proceed as follows:

1. Place the MODE SELECTOR switch in the STD BY position.
2. Allow a five minute warm-up period.
3. Connect power amplifier to Exciter output jack, J5. If low power emission is desired, connect an antenna coupler to J5.

WARNING

Do not operate the Exciter without a load connected to the RF output jack, J5.

2.3.1 Voice Transmission using Local Control.
1. Place MODE SELECTOR Switch in USB, LSB or AM position.
2. Place LOCAL/REMOTE switch in LOCAL position.
3. Set FREQUENCY MEGACYCLE dials to desired operating frequency.
4. Set RECEIVER ANTENNA COUPLER switch to ANTENNA if duplex operation is desired. Set to ANTENNA COUPLER position if operation on the same frequency is desired.
5. Depress push-to-talk switch and begin transmitting.

2.3.2 Independent Sideband Transmission using Local Control.
1. Place MODE SELECTOR switch in ISB position.
2. Place MICROPHONE switch to LSB position to transmit with microphone on lower sideband.
3. Connect other audio source (250 MV at 600 ohms) to pins g and h on J1. See figure 6-13.
4. Depress push-to-talk button and begin transmitting.

2.3.3 CW Transmission using Local Control.
1. Connect LOCAL CW key to P1, pins v and e.
2. Place MODE SELECTOR switch to CW.
3. Operate key to begin transmitting.

2.3.4 FSK Transmission using Local Control.
1. Connect FSK signal to P1, pins r and t.
2. Place MODE SELECTOR switch to FSK.
3. Apply FSK signal.

2.3.5 Remote Operation.
1. To operate in REMOTE control, connect remote unit, and key and FSK inputs, as illustrated in figure 6-13.
2. Place LOCAL/REMOTE switch to REMOTE position.
3. Determine REMOTE operating mode and set MODE SELECTOR switch to desired mode.

2.4 SHUTDOWN PROCEDURES

2.4.1 To shut down the equipment, place the MODE SELECTOR switch in the OFF position.

2.4.2 If the equipment is to be used intermittently, place the MODE SELECTOR switch to the STD BY position.

CHAPTER III

PREVENTIVE MAINTENANCE

3.1 GENERAL

The Exciter SC-910E is a precision instrument and will require very little maintenance. Table 3-1 lists the preventive maintenance checks that should be performed on a regular monthly basis.

TABLE 3-1

EXCITER SC-910E, PREVENTIVE MAINTENANCE CHECKS

Inspect for	Remedy
Dust	Clean exterior with soft-lintless cloth. Clean interior with brush, cloth and suction.
Nicks, burrs, dents, scratches or rust spots.	Smooth burrs with a file, sandpaper rust or scratches and repaint.
Smooth operation of drawer slides and cams.	Clean with trichlorethylene.
Loose or broken handles, mounting screws or other hardware.	Repair or replace defective parts.
Broken lugs, frayed leads, split, chipped or broken components.	Repair or replace defective parts.
Solder joints.	Resolder connections.
Cable assemblies broken, frayed or damaged.	Repair or replace.
Interlock switches bent or broken.	Replace.
Circuit boards cracked.	Replace.
Wiring damaged.	Repair or replace.
Chain drive.	Oil lightly.
Vacuum tubes.	Check with tube tester. Replace if necessary.

CHAPTER IV

TROUBLE-SHOOTING

4.1 GENERAL

This chapter contains information pertaining to trouble-shooting the Exciter. Test equipment required, control settings, system trouble-shooting, and functional trouble-shooting are presented in tabular form.

4.2 TEST EQUIPMENT AND SPECIAL TOOLS

Test equipment required for trouble-shooting the Exciter is listed in table 4-1. Standard hand tools are the only tools required.

TABLE 4-1

EXCITER SC-910E, TEST EQUIPMENT REQUIRED

Common Name	Model and Manufacturer	Alternate
VTVM	Hewlett-Packard, Model 400D	Any alternate may be used.
Multimeter	Triplett	Alternate may be used.
RF Meter	Boonton, Model 91CA	None.
Load 50 ohm	Bird Mfg., Model 32	Alternate may be used.
Audio Oscillator	Hewlett-Packard, Model 500	Alternate may be used.
Frequency Counter	Hewlett-Packard, Model 524B	Alternate may be used.

4.3 CONTROL SETTINGS

Make the following initial control settings preparatory to trouble-shooting the Exciter:

TABLE 4-2

EXCITER SC-910E, INITIAL CONTROL SETTINGS

Control	Location	Setting
MODE SELECTOR switch	Exciter Front Panel	STD BY
	NOTE Allow a five (5) minute warmup period	
MICROPHONE switch	Exciter Front Panel	LSB
Local/Remote switch	Exciter Front Panel	Local

NOTE

When operating the unit with the chassis extended from the case, cheat the interlock by hooking the vertical arm to the wiper and pulling the wiper up.

4.4 SYSTEM TROUBLE-SHOOTING

Follow the instructions in Table 4-3 to determine if there is trouble in the system.

TABLE 4-3

EXCITER SC-910E, SYSTEM TROUBLE-SHOOTING CHART

Step	Action	Normal Indication	Abnormal Indication Procedure
1.	Connect a 50-ohm dummy load to J5. Connect an RF meter to the load. Place MODE SELECTOR switch in USB position. Depress push-to-talk button.	0 volts.	See table 4-4.
2.	Depress push-to-talk button and speak into microphone.	Fluctuation of meter at 1.7 volts.	See table 4-4.

TABLE 4-3 (Cont.)

EXCITER SC-910E, SYSTEM TROUBLE-SHOOTING CHART

Step	Action	Normal Indication	Abnormal Indication Procedure
3.	Place MODE SELECTOR switch in AN position. Depress push-to-talk button.	0 volts.	See table 4-4.
4.	Depress push-to-talk button and speak into microphone.	Fluctuating 1.7 volts.	See table 4-4.
5.	Place MODE SELECTOR switch in CW position. Depress key.	Fluctuating 1.7 volts.	See table 4-4.
6.	Place MODE SELECTOR switch in LSB position. Depress push-to-talk button.	0 volts	See table 4-4.
7.	Depress push-to-talk button and speak into microphone.	1.7 volts fluctuating.	See table 4-4.
8.	Place MODE SELECTOR switch in ISB position. Place MICROPHONE switch in USB position. Depress push-to-talk button.	0 volts.	See table 4-4.
9.	Depress push-to-talk button. Speak into microphone.	1.7 volts fluctuating.	See table 4-4.
10.	Place MODE SELECTOR switch in ISB. Place MICROPHONE switch to LSB position. Depress push-to-talk button.	0 volts.	See table 4-4.
11.	Depress push-to-talk button and speak into microphone.	1.7 volts fluctuating.	See table 4-4.
12.	Connect 50-ohm load to J4. Connect RF meter across load.	100 MV/minimum	See table 4-4.

4.5 FUNCTIONAL TROUBLE-SHOOTING

Use table 4-4 to trouble-shoot the Exciter for a defective assembly. Locate the assemblies using figure 4-1 and the test points using figure 4-2.

TABLE 4-4

EXCITER SC-910E, FUNCTIONAL TROUBLE-SHOOTING CHART

Step	Preliminary Action	Normal Indication	Next Step
1.	Connect the output terminals of the audio oscillator to pins d and h on J1. Place LOCAL/REMOTE switch to REMOTE. Short pins e and v on J1. Place MODE SELECTOR to LSB. Adjust the output of the audio oscillator to 1000 CPS at 225 MW. Connect the RF meter probe to TP14 (LSB).	55 MV	If indication is normal, proceed to next step. If abnormal reading is obtained, perform continuity check of main frame wiring. (See figure 6-1 for schematic diagram of this electronic assembly.)
2.	Connect the RF meter probe to TP 15 (LSB).	200 MV	If indication is normal, proceed to next step. If abnormal reading is obtained, trouble-shoot the Transmitter Audio electronic assembly. (See figure 6-2 for schematic diagram of this electronic assembly.)
3.	Connect the output terminals of the audio oscillator to J1, pins k and n. Place MODE SELECTOR switch in USB. Set audio oscillator output to 1000 CPS at 225 MW. Connect RF meter probe to TP 14 (USB).	55 MV	If indication is normal, proceed to next step. If abnormal reading is obtained, perform continuity check of main frame wiring. (See figure 6-1 for schematic diagram of this electronic assembly.)
4.	Connect meter probe to TP 15 (USB).	200 MV	If indication is normal, proceed to next step. If abnormal reading is obtained, trouble-shoot the Transmitter Audio electronic assembly. (See figure 6-2 for schematic diagram of this electronic assembly.)
5.	Connect RF meter probe to TP 5 (USB).	100 MV	If indication is normal, proceed to next step. If abnormal reading is obtained, trouble-shoot the MODE SELECTOR electronic assembly. (See figure 6-4 for schematic diagram of this electronic assembly.)
6.	Place MODE SELECTOR Switch in LSB. Connect Boonton, Model 91C, meter probe to TP 6.	100 MV	If indication is normal, proceed to next step. If abnormal reading is obtained, trouble-shoot the MODE SELECTOR electronic assembly. (See figure 6-4 for schematic diagram of this electronic assembly.)
7.	Connect Boonton, Model 91C, meter probe, and a Hewlett-Packard counter, Model 524B, with head Model 526A to TP 7.	200 MV	If indication is normal, proceed to next step. If abnormal reading is obtained, trouble-shoot the frequency standard electronic assembly. (See figure 6-11 for schematic diagram of this electronic assembly.)
8.	Connect Boonton, Model 91C, meter probe, and a Hewlett-Packard counter Model 524B, with head Model 526A to TP 8.	100 MV/MIV 5 MC	If indication is normal, proceed to next step. If abnormal reading is obtained, trouble-shoot the frequency standard electronic assembly. (See figure 6-11 for schematic diagram of this electronic assembly.)

TABLE 4-4. (Cont.)

EXCITER SC-910E, FUNCTIONAL TROUBLE-SHOOTING CHART

Step	Preliminary Action	Normal Indication	Next Step
9.	Connect Boonton, Model 91C, meter probe to TP 11.	30 MV	If indication is normal, proceed to next step. If abnormal reading is obtained, replace the Transmitter IF electronic assembly. (See figure 6-3 for schematic diagram of this electronic assembly.)
10.	Connect VTVM probe to TP 12. NOTE If Exciter is used with Power Amplifier when tests are performed, readings will be correct as shown. If Exciter is being tested without a Power Amplifier, readings will be zero.	0 to 1/2 VDC	If indication is normal, proceed to next step. If abnormal reading is obtained, trouble-shoot PPC network in the PA unit if used.
11.	Connect VTVM probe to TP 13.	3-1/2 to 4-1/2 VDC	If indication is normal, proceed to next step. If abnormal reading is obtained, trouble-shoot APC network in PA unit, if used.
12.	Connect Boonton, Model 91C, meter probe to TP 1.	10 MV	If indication is normal, proceed to next step. If abnormal reading is obtained, replace the Translator Synthesizer electronic assembly, figure 6-5.
13.	Connect Boonton, Model 91C, meter to the 50-ohm load at the rear of Exciter unit. (See figure 1-1.)	1.7 V	If indication is normal, proceed to next step. If abnormal reading is obtained, replace the RF Amplifier electronic assembly. (See figure 6-12.)

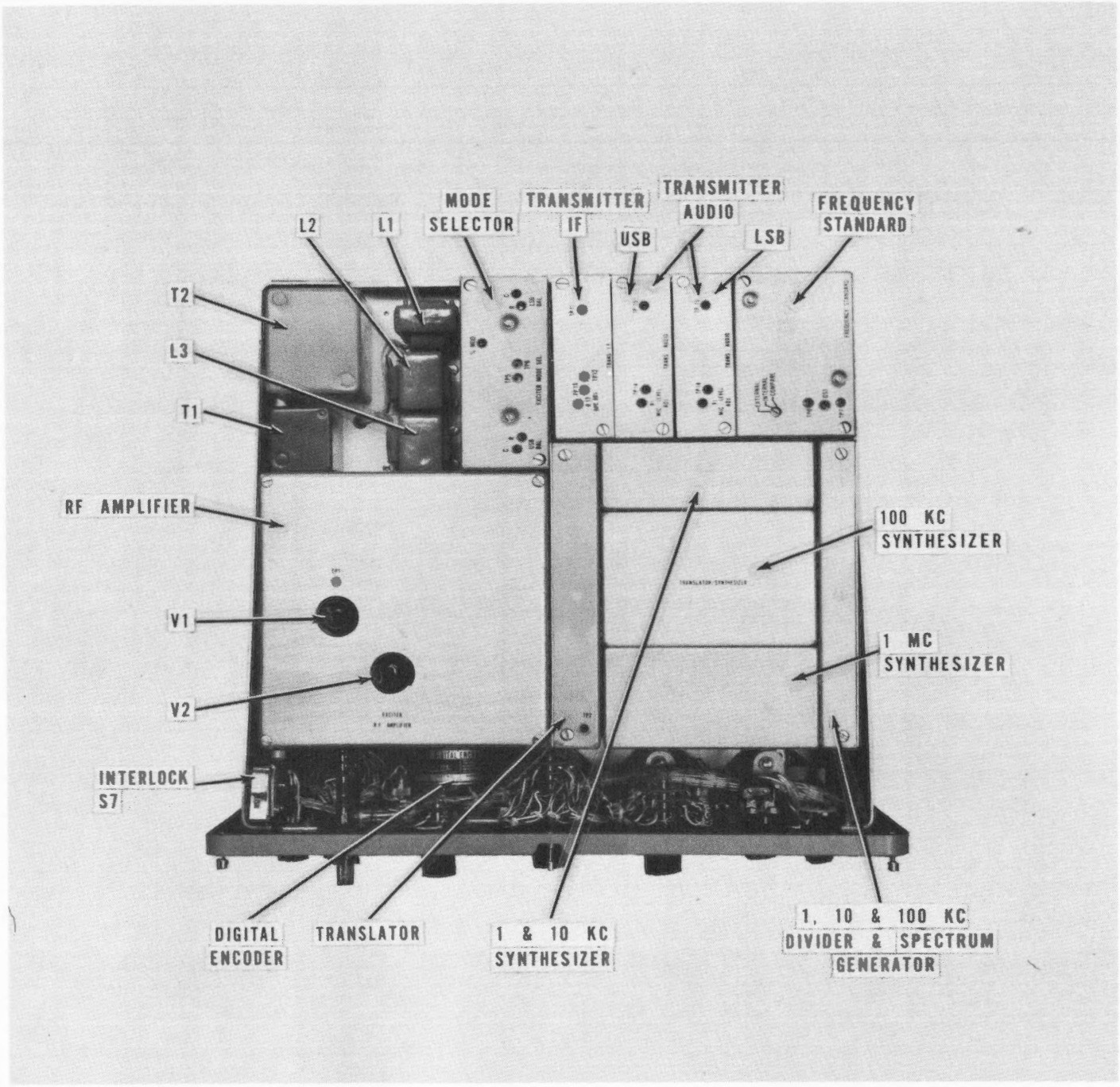


Figure 4-1. Exciter SC-910E, Component Location

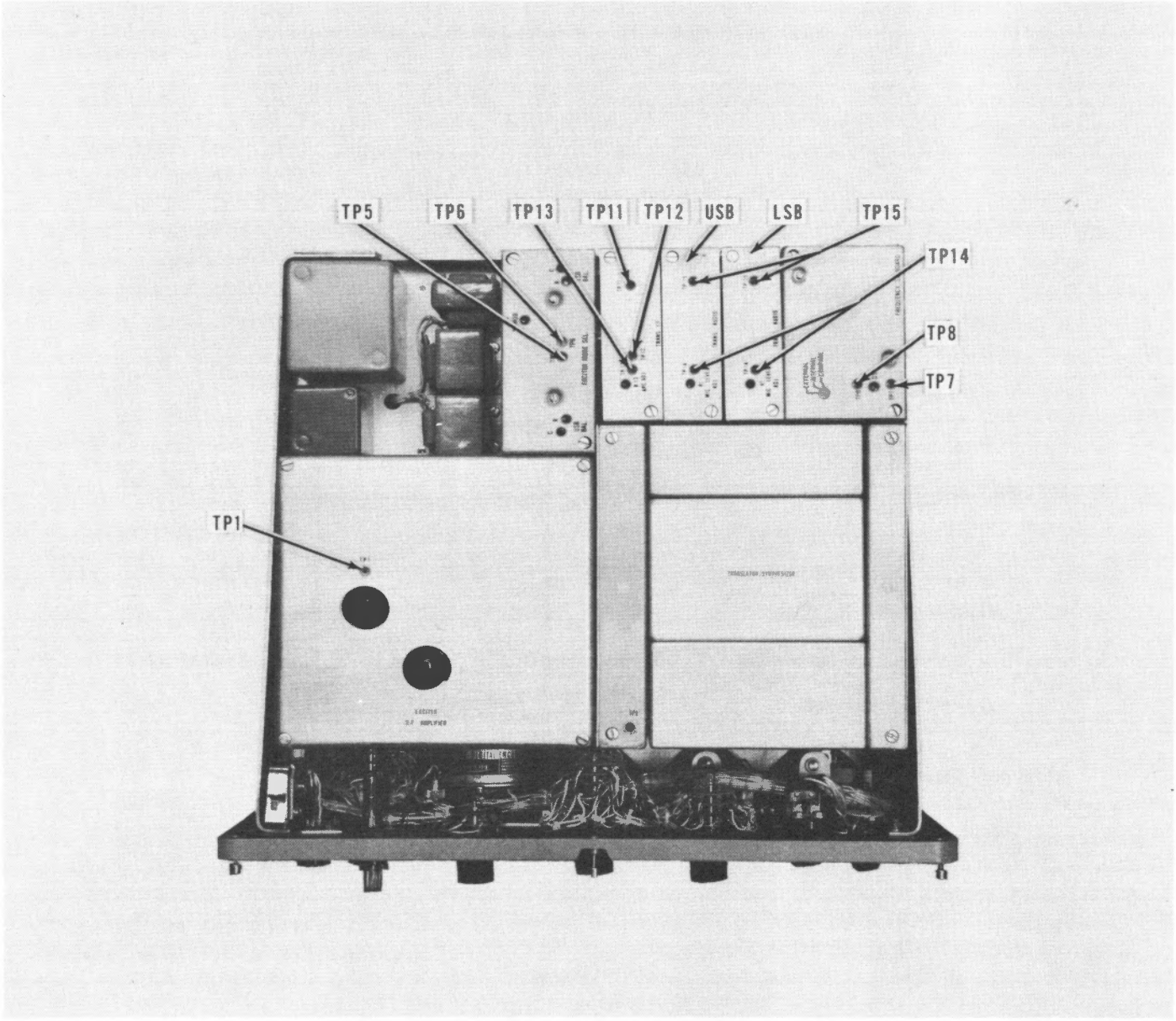


Figure 4-2. Exciter SC-910E, Test Point Location

CHAPTER V
REPLACEABLE PARTS

(Replaceable Parts to be supplied at a later date.)

CHAPTER VI

SCHEMATIC DIAGRAMS

6.1 GENERAL

This chapter contains a complete set of schematic diagrams for Exciter SC-910E.

TABLE 6-1

EXCITER SC-910E, SCHEMATIC DIAGRAMS

Figure No.	Title
6-1	Exciter SC-910E, Main Frame, Schematic Diagram
6-2	Exciter SC-910E, Transmitter Audio, Schematic Diagram
6-3	Exciter SC-910E, Transmitter IF, Schematic Diagram
6-4	Exciter SC-910E, Mode Selector, Schematic Diagram
6-5	Exciter SC-910E, Translator Synthesizer, Schematic Diagram
6-6	Exciter SC-910E, RF Translator, Schematic Diagram
6-7	Exciter SC-910E, 100 KC Synthesizer, Schematic Diagram
6-8	Exciter SC-910E, 1 and 10 KC Synthesizer, Schematic Diagram
6-9	Exciter SC-910E, 1, 10 and 100 KC Divider and Spectrum Generator, Schematic Diagram
6-10	Exciter SC-910E, 1 MC Synthesizer, Schematic Diagram
6-11	Exciter SC-910E, Frequency Standard, Schematic Diagram
6-12	Exciter SC-910E, RF Amplifier, Schematic Diagram
6-13	Exciter SC-910E, Interconnection Diagram

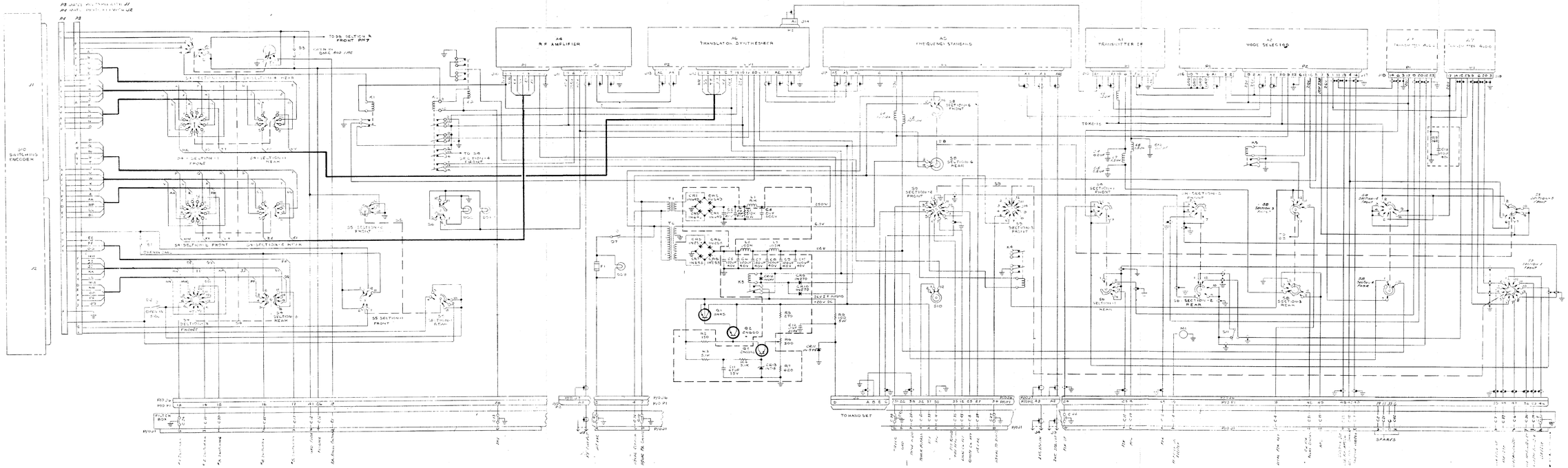
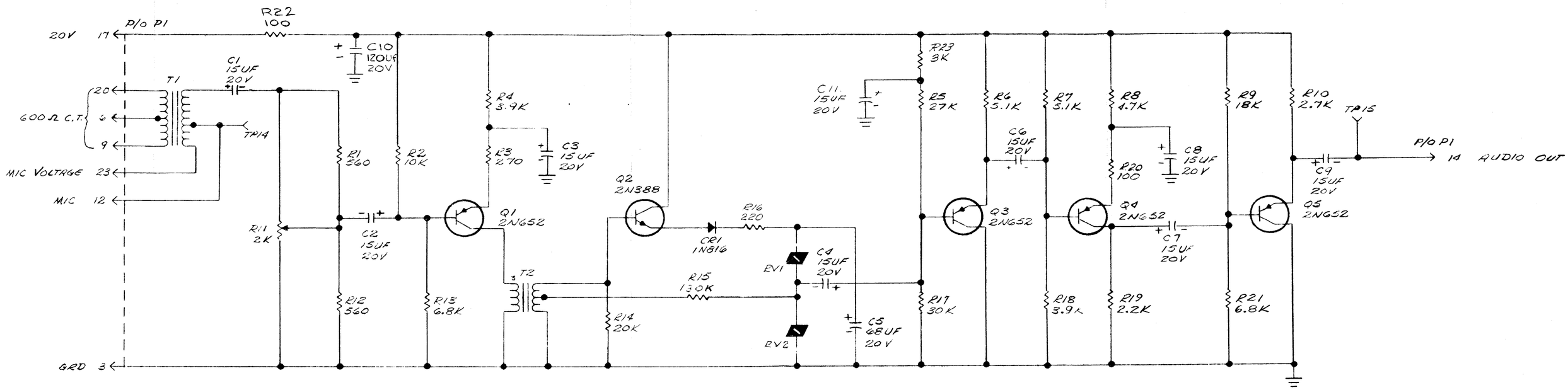


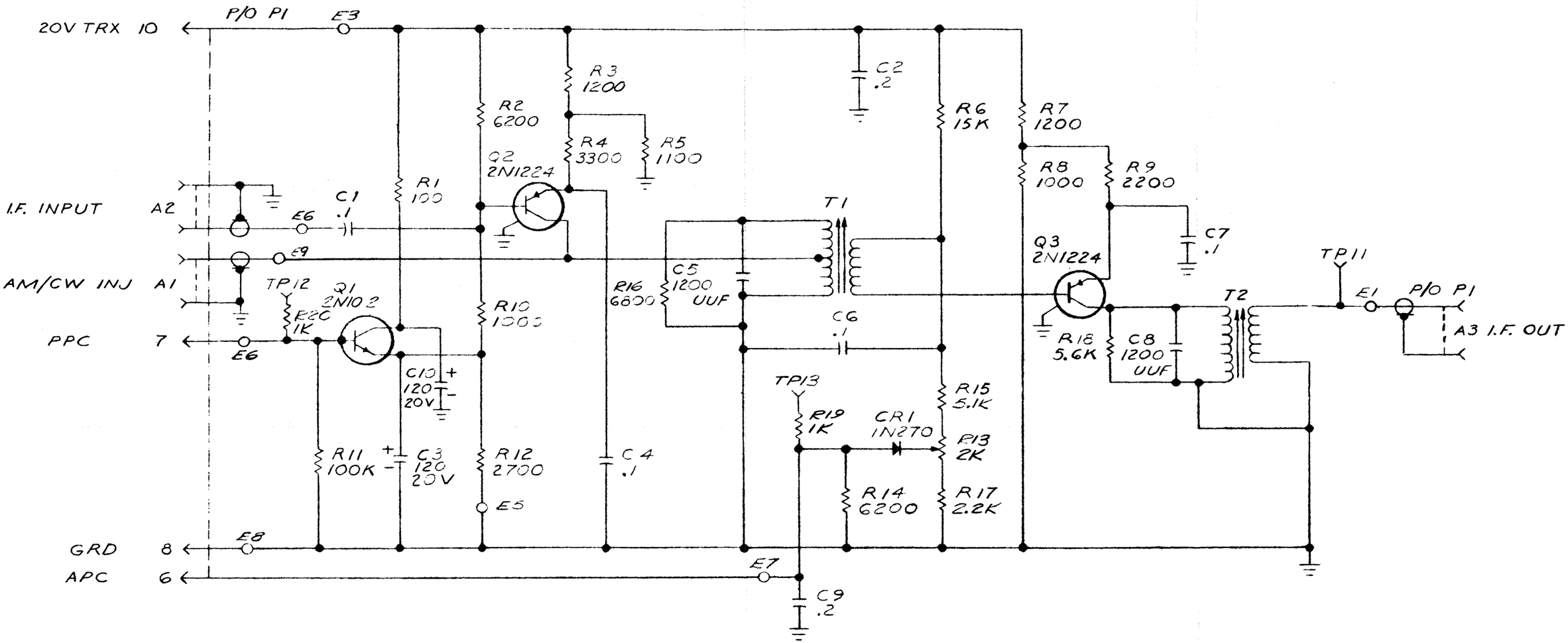
Figure 6-1. Exciter SC-910E, Main Frame, Schematic Diagram



NOTES :-

1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATION WITH THE UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH.
2. UNLESS OTHERWISE SPECIFIED:
   a. ALL RESISTORS ARE OHMS
   b. ALL RESISTORS ARE 1/4W, 5%

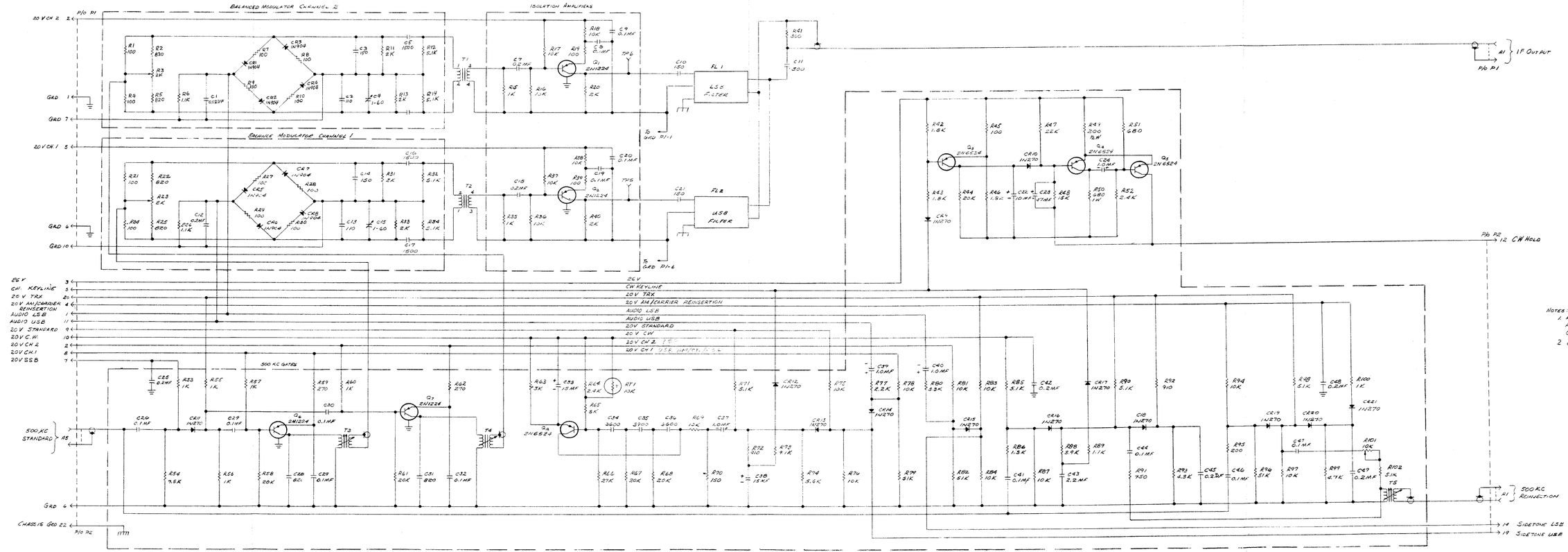
Figure 6-2. Exciter SC-910E, Transmitter Audio, Schematic Diagram



NOTES:

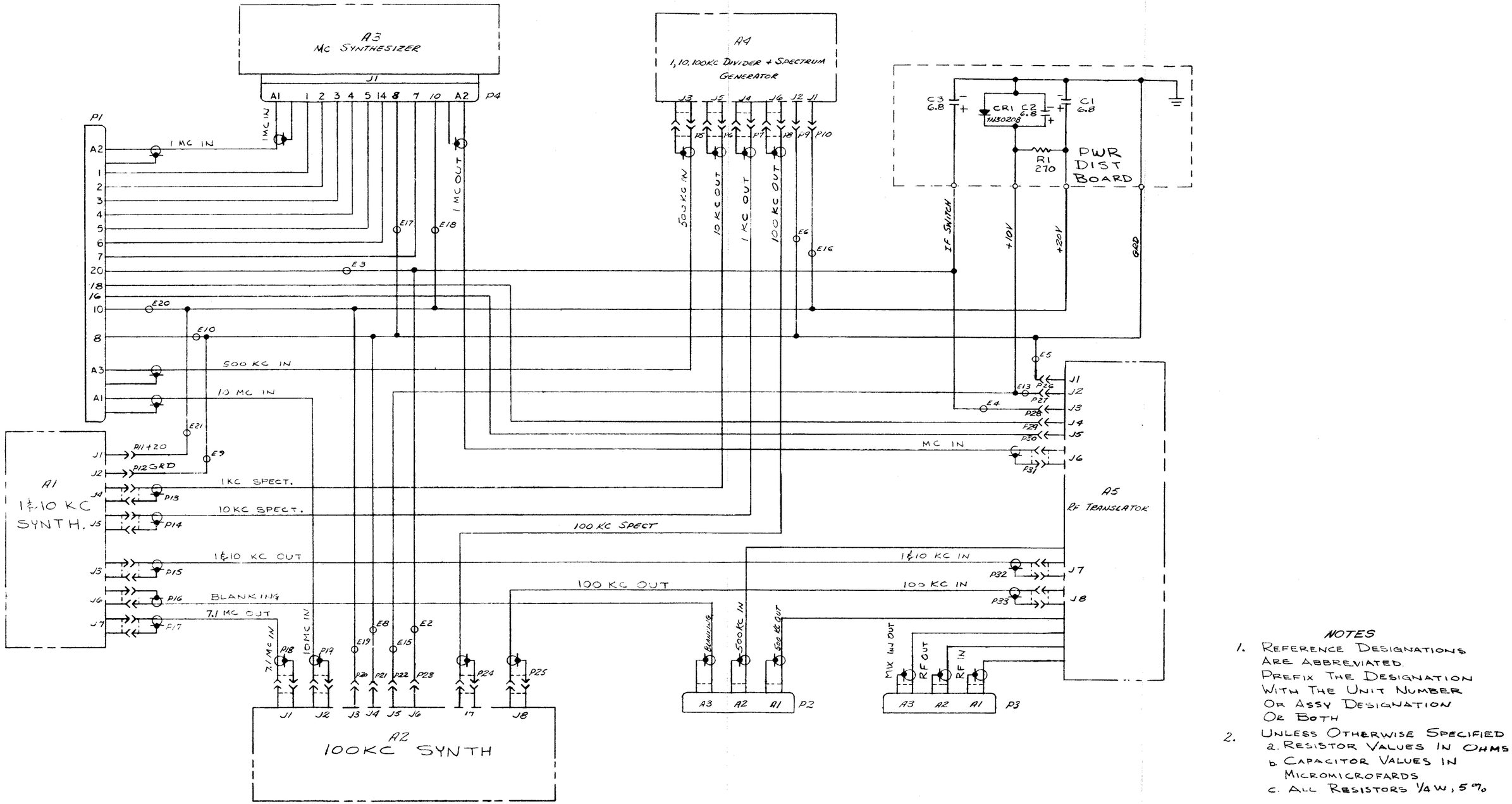
1. REFERENCE DESIGNATIONS ARE ABBREVIATED PREFIX THE DESIGNATION WITH UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH.
2. UNLESS OTHERWISE SPECIFIED:
   a. ALL RESISTORS ARE IN OHMS
   b. ALL RESISTORS ARE 1/4W, 5%
   c. ALL CAPACITORS ARE MICRO FARADS

Figure 6-3. Exciter SC-910E, Transmitter IF, Schematic Diagram



NOTES:
1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATION WITH THE UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH.
2. UNLESS OTHERWISE SPECIFIED:
   a. RESISTOR VALUES ARE IN OHMS
   b. CAPACITOR VALUES ARE IN MICRO-MICRO-FARADS
   c. ALL RESISTORS ½ W, 5%

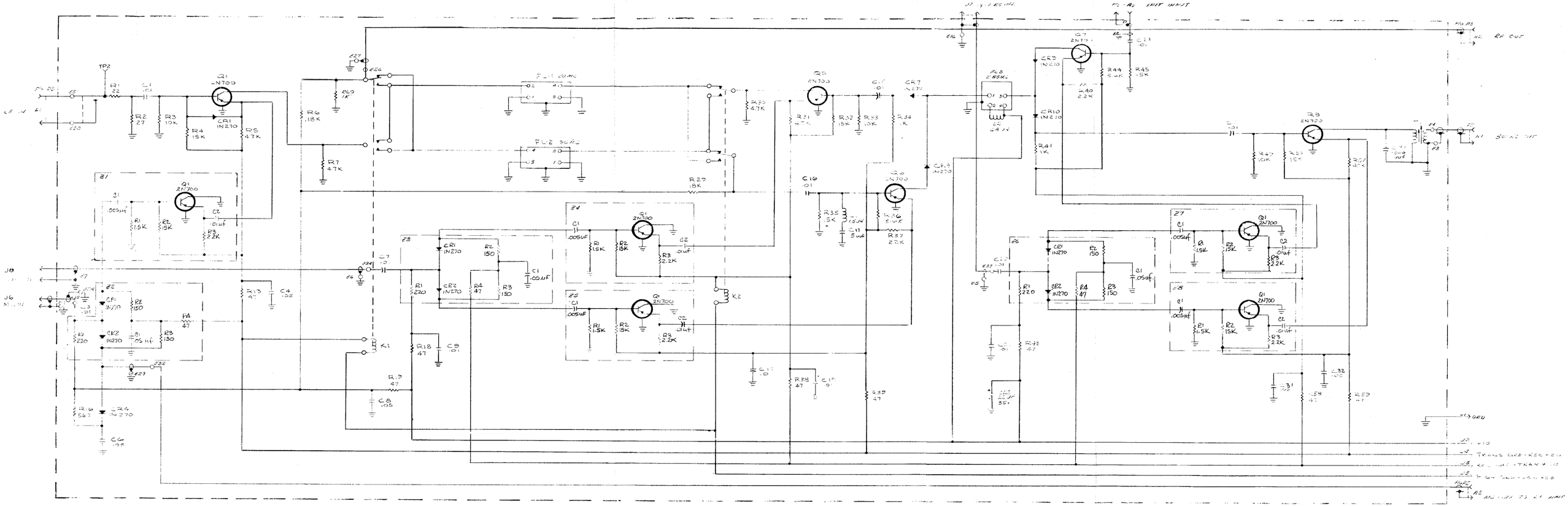
Figure 6-4. Exciter SC-910E, Mode Selector, Schematic Diagram



NOTES

1. Reference designations are abbreviated. Prefix the designation with the unit number or assy designation or both
2. Unless otherwise specified
   a. Resistor values in ohms
   b. Capacitor values in microfarads
   c. All resistors 1/2 W, 5%

Figure 6-5. Exciter SC-910E, Translator Synthesizer, Schematic Diagram



Notes:

1. Reference Designations are abbreviated. Prefix the designation with the unit number or assembly it is part of, or both.
2. Unless otherwise specified:
   a. Resistor values in Ohms
   b. Capacitor values in microfarads
   c. All resistors 1/4 w, 5%

Figure 6-6. Exciter SC-910E, RF Translator, Schematic Diagram

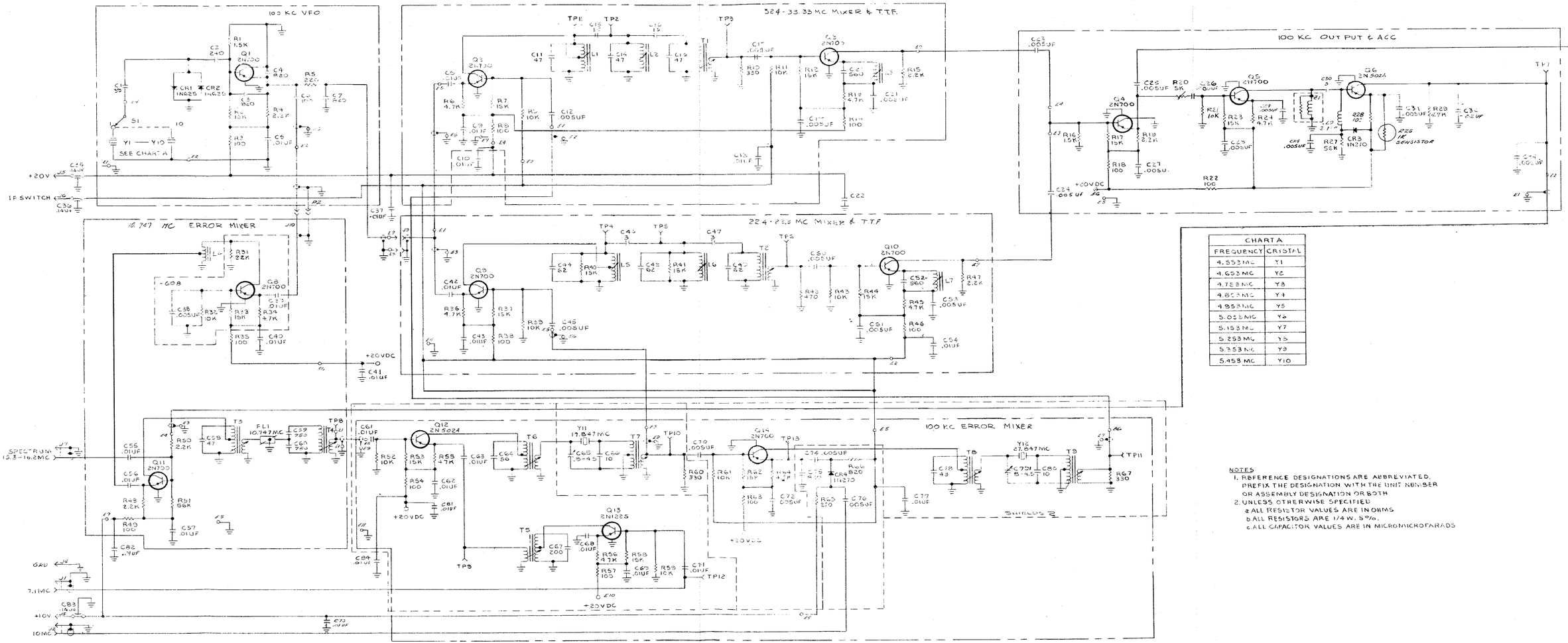


CHART A	
FREQUENCY	CRISTAL
4.553 MC	Y1
4.653 MC	Y2
4.753 MC	Y3
4.853 MC	Y4
4.953 MC	Y5
5.053 MC	Y6
5.153 MC	Y7
5.253 MC	Y8
5.353 MC	Y9
5.453 MC	Y10

NOTES
1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATION WITH THE UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH
2. UNLESS OTHERWISE SPECIFIED
   a. ALL RESISTOR VALUES ARE IN OHMS
   b. ALL RESISTORS ARE 1/4 W. 5%.
   c. ALL CAPACITOR VALUES ARE IN MICROMICROFARADS

Figure 6-7. Exciter SC-910E, 100 KC Synthesizer, Schematic Diagram

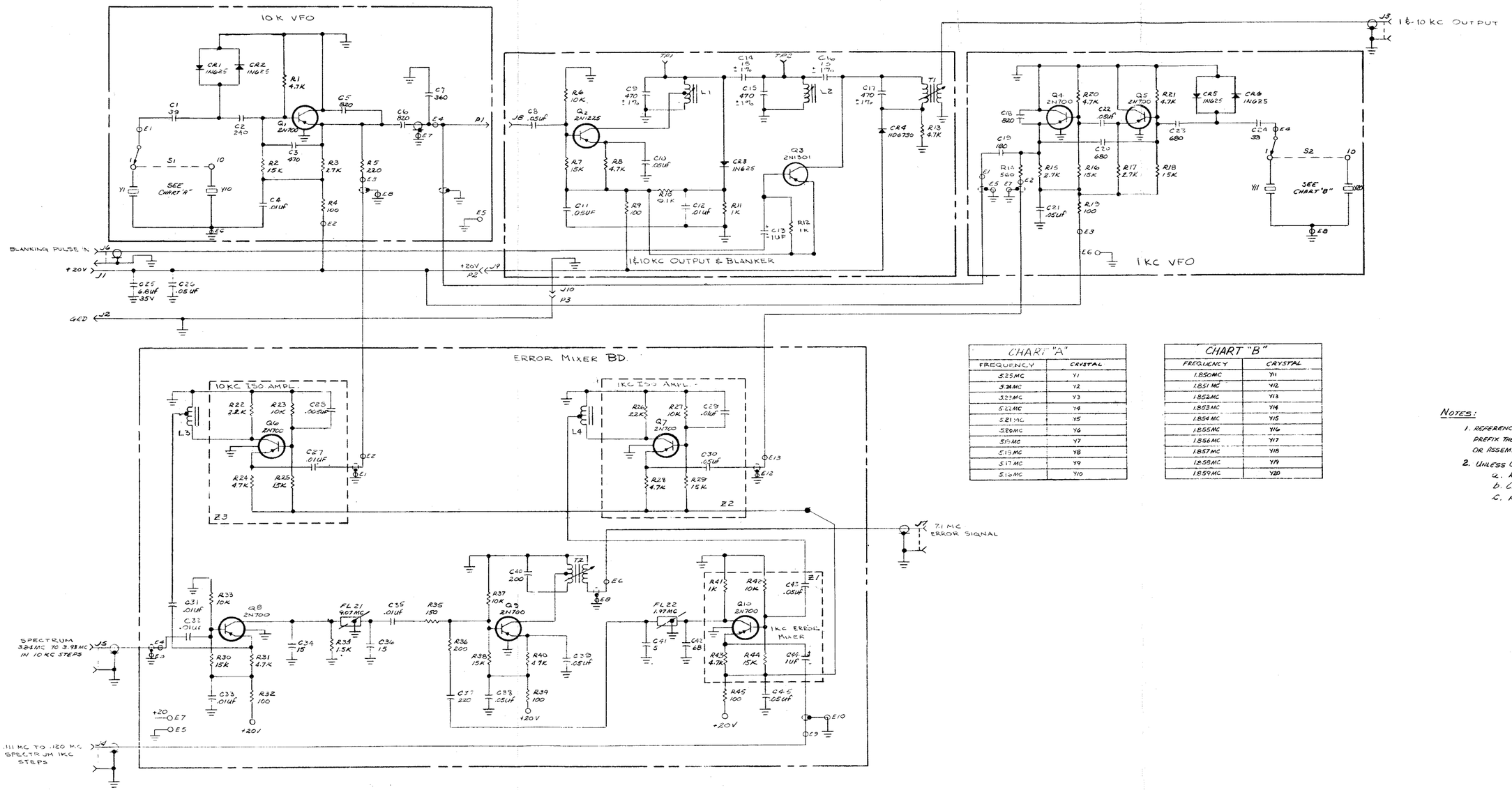


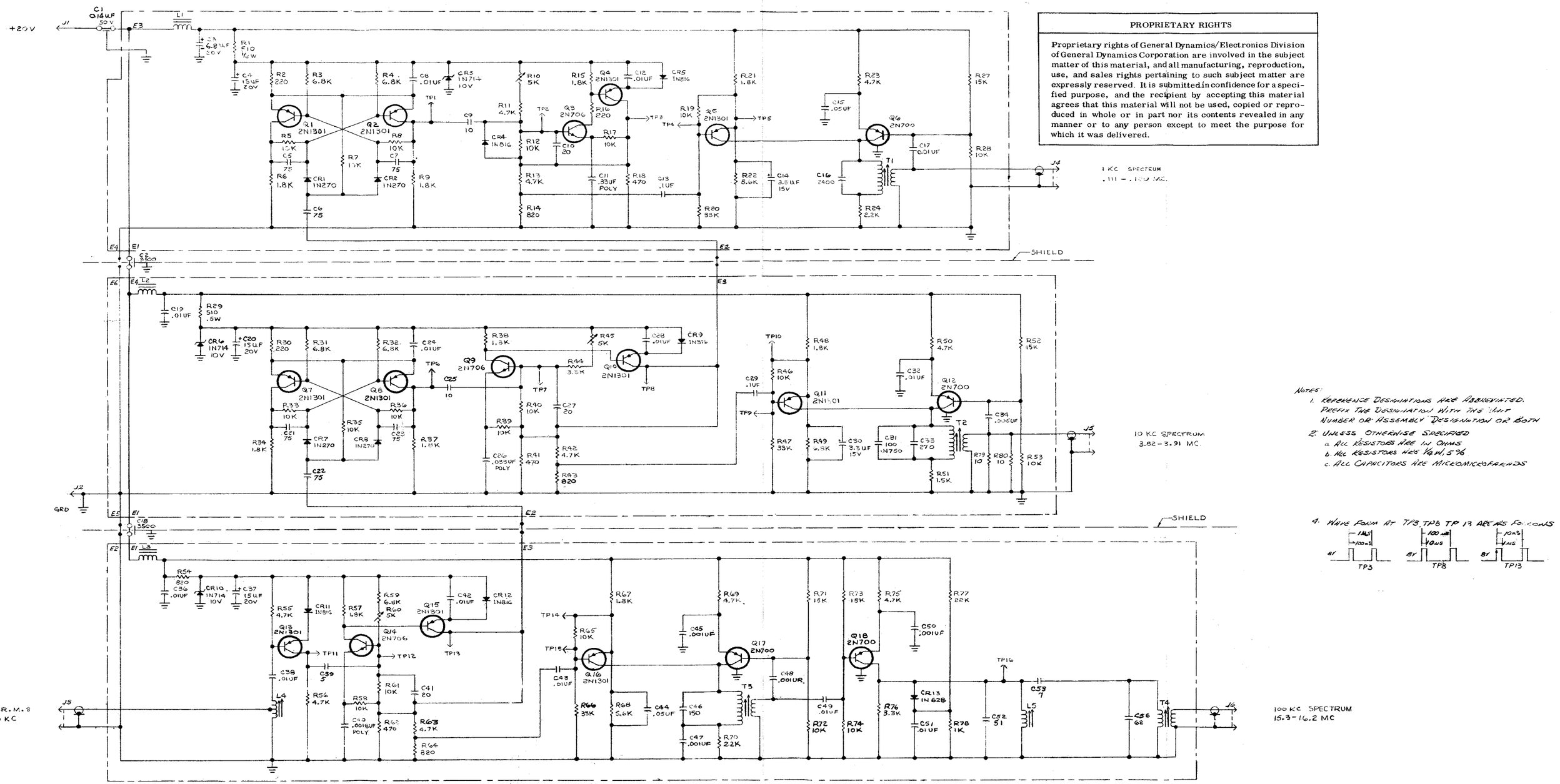
CHART "A"	
FREQUENCY	CRYSTAL
5.25 MC	Y1
5.24 MC	Y2
5.23 MC	Y3
5.22 MC	Y4
5.21 MC	Y5
5.20 MC	Y6
5.15 MC	Y7
5.13 MC	Y8
5.17 MC	Y9
5.16 MC	Y10

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. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATION WITH THE UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH.
2. UNLESS OTHERWISE SPECIFIED:
   a. RESISTOR VALUES ARE IN OHMS.
   b. CAPACITOR VALUES ARE IN MICROMICROFARADS.
   c. ALL RESISTORS 1/4 W, 5%.

Figure 6-8. Exciter SC-910E, 1 and 10 KC Synthesizer, Schematic Diagram



NOTES:

1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATION WITH THE UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH
2. UNLESS OTHERWISE SPECIFIED
   a. ALL RESISTORS ARE IN OHMS
   b. ALL RESISTORS ARE 1/2 W, 5%
   c. ALL CAPACITORS ARE MICROMICROFARADS
4. WAVE FORM AT TP3, TP8, TP13 APPEARS AS SHOWN

Figure 6-9. Exciter SC-910E, 1, 10 and 100 KC Divider and Spectrum Generator, Schematic Diagram

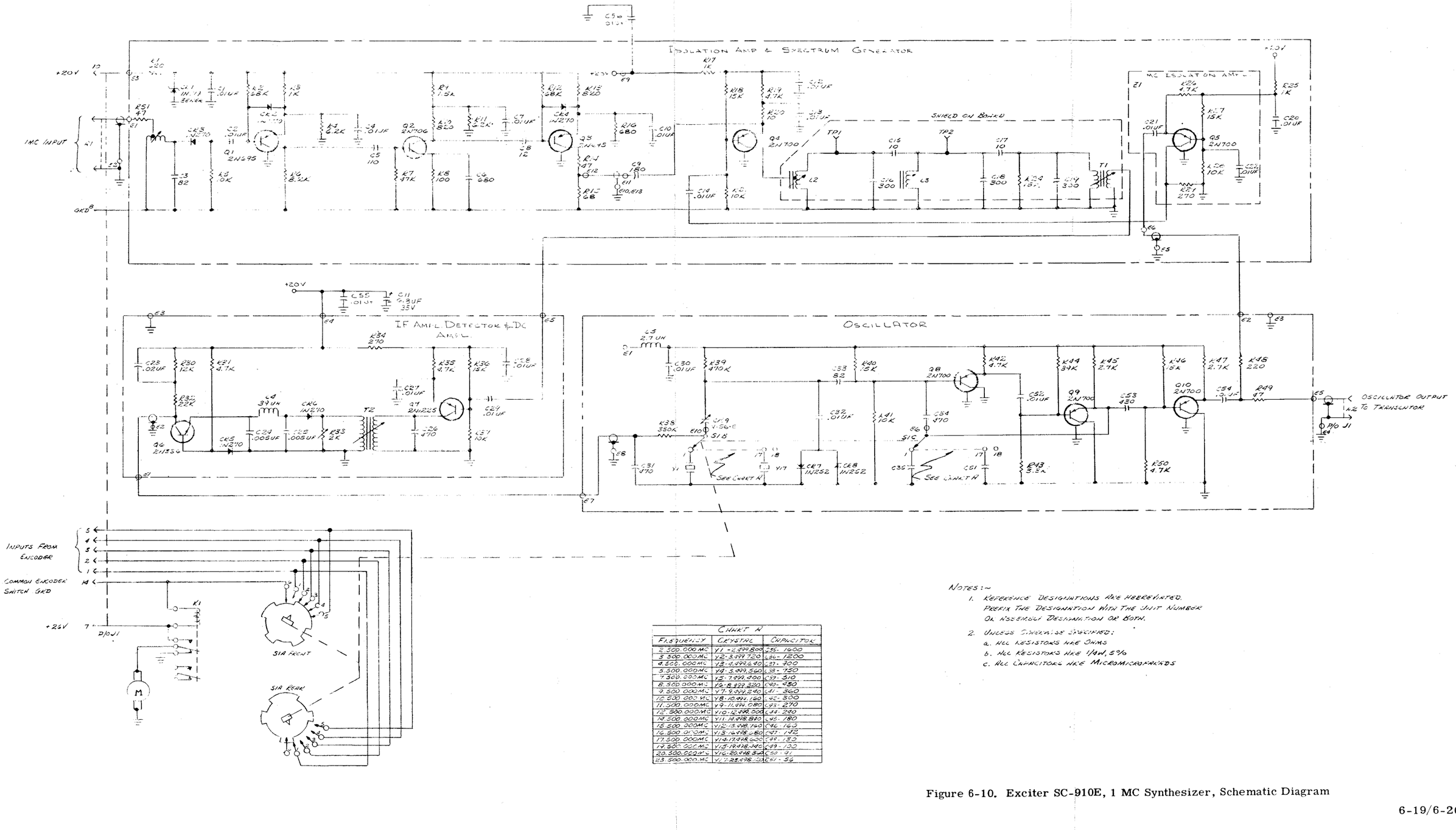
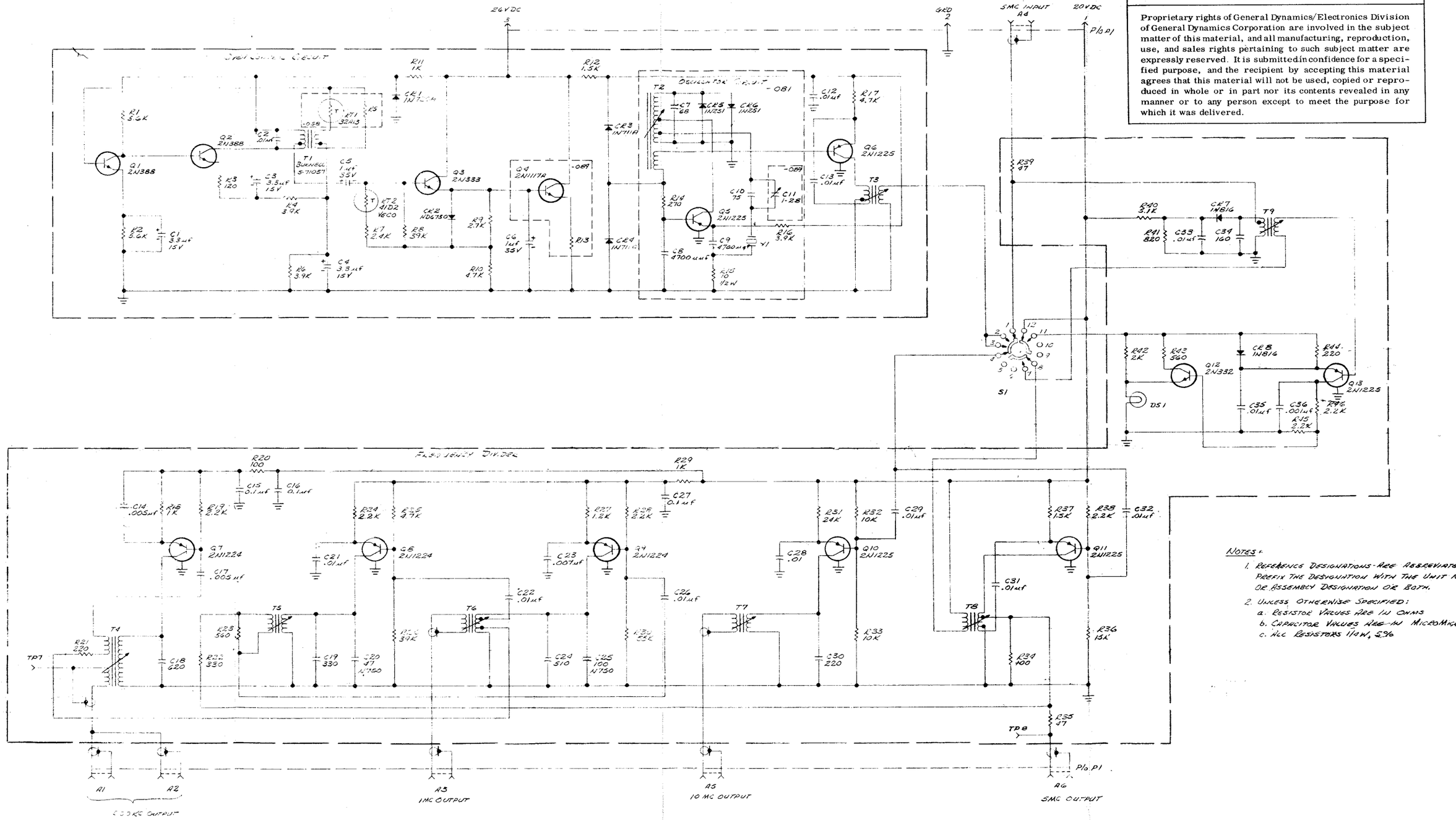


CHART A		
FREQUENCY	CRYSTAL	CAPACITOR
2.500.000 MC	Y1 - 2.499.800	C36 - 1600
3.500.000 MC	Y2 - 3.499.720	C46 - 1200
4.500.000 MC	Y3 - 4.499.640	C47 - 700
5.500.000 MC	Y4 - 5.499.560	C38 - 750
7.500.000 MC	Y5 - 7.499.400	C39 - 510
8.500.000 MC	Y6 - 8.499.320	C40 - 450
9.500.000 MC	Y7 - 9.499.240	C41 - 360
10.500.000 MC	Y8 - 10.499.160	C42 - 300
11.500.000 MC	Y9 - 11.499.080	C43 - 270
12.500.000 MC	Y10 - 12.499.000	C44 - 240
14.500.000 MC	Y11 - 14.498.840	C45 - 180
15.500.000 MC	Y12 - 15.498.760	C48 - 160
16.500.000 MC	Y13 - 16.498.680	C49 - 142
17.500.000 MC	Y14 - 17.498.600	C98 - 130
19.500.000 MC	Y15 - 19.498.440	C99 - 100
20.500.000 MC	Y16 - 20.498.360	C50 - 91
23.500.000 MC	Y17 - 23.498.200	C51 - 56

NOTES:-

1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATION WITH THE UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH.
2. UNLESS OTHERWISE SPECIFIED:
   a. ALL RESISTORS ARE OHMS
   b. ALL RESISTORS ARE 1/4W, 5%
   c. ALL CAPACITORS ARE MICROMICROFARADS

Figure 6-10. Exciter SC-910E, 1 MC Synthesizer, Schematic Diagram



NOTES:

1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATION WITH THE UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH.
2. UNLESS OTHERWISE SPECIFIED:
   a. RESISTOR VALUES ARE IN OHMS
   b. CAPACITOR VALUES ARE IN MICROMICROFARADS
   c. ALL RESISTORS 1/4W, 5%

Figure 6-11. Exciter SC-910E, Frequency Standard, Schematic Diagram

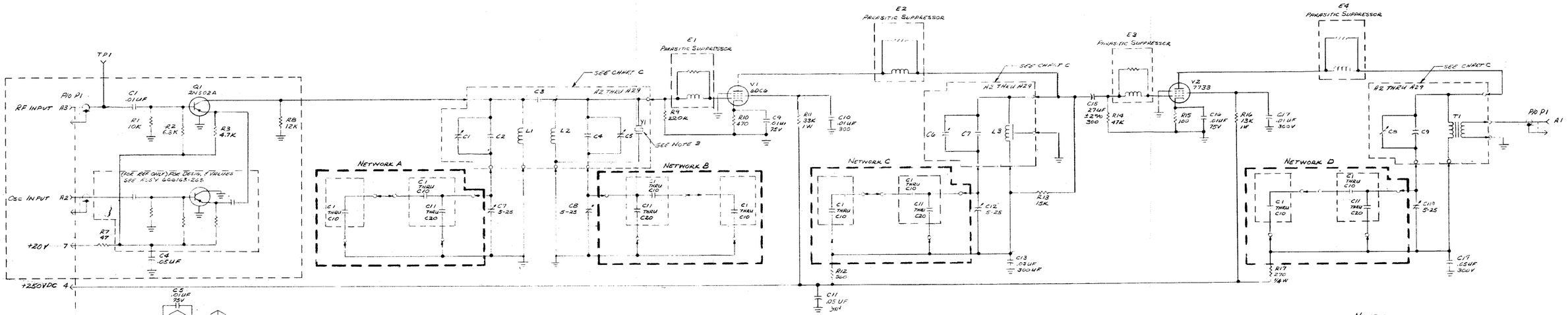


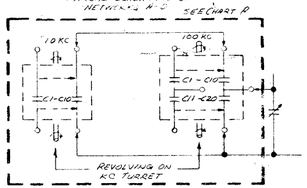
CHART A

FREQ MC	CH ASSY	REF DESIG	NETWORK A CH VALUE	NETWORK B CH VALUE	NETWORK C CH VALUE	NETWORK D CH VALUE
.00	A1		1034	1034	1036	1034
.01	A2		998	998	998	998
.02	A3		967	964	962	964
.03	A4		936	932	928	932
.04	A5		907	902	897	902
.05	A6		879	874	867	874
.06	A7		852	847	839	847
.07	A8		828	821	812	821
.08	A9		805	797	787	797
.09	A10		783	774	763	774
.10	A11		914	874	828	874
	A12		243	246	252	246
	A13		795	761	724	761
.10	A14		209	212	216	212
	A15		701	673	641	673
.20	A16		180	183	186	183
	A17		626	601	574	601
.30	A18		155	157	160	157
	A19		564	542	519	542
.40	A20		133	135	137	135
	A21		512	492	473	492
.50	A22		116	117	118	117
	A23		468	451	433	451
.60	A24		97	101	101	101
	A25		430	415	398	415
.70	A26		86	86	86	86
	A27		398	384	369	384
.80	A28		73	73	73	73
	A29		369	357	343	357
.90	A30		62	62	62	62

10KC

100KC

TYPICAL SCHEMATIC OF NETWORKS A-D SEE CHART D



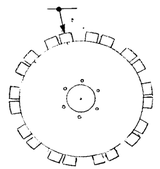


CHART C

FREQ MC	CH ASSY	C2	CH ASSY	C3	CH ASSY	C4	CH ASSY	C7	CH ASSY	C9
2	A2	SHORTED	A10	12	A2	SHORTED	A2	SHORTED	A7	SHORTED
3	A3	1243	A9	9	A3	1249	A3	1256	A8	1249
4	A4	619	A8	6	A4	626	A4	632	A9	626
5	A5	412	A7	6	A5	418	A5	424	A10	418
6	A6	308	A6	5	A6	314	A6	320	A11	314
7	A7	246	A5	4	A7	252	A7	258	A12	252
8	A8	204	A4	4	A8	209	A8	217	A13	207
9	A9	174	A3	3.3	A9	180	A9	187	A14	180
10	A10	152	A2	3	A10	160	A10	165	A15	160
11	A11	137	A1	2.7	A11	142	A11	147	A16	142
12	A12	122	A12	2.7	A12	128	A12	133	A17	128
13	A13	112	A13	2.7	A13	116	A13	122	A18	116
14	A14	101	A14	2.4	A14	105	A14	112	A19	106
15	A15	93	A15	2.4	A15	97	A15	103	A20	97
16	A16	86	A16	2.4	A16	93	A16	97	A21	93
17	A17	81	A17	2.4	A17	86	A17	90	A22	86
18	A18	75	A18	2.4	A18	81	A18	86	A23	81
19	A19	70	A19	2.4	A19	75	A19	81	A24	75
20	A20	67	A20	2.4	A20	73	A20	789	A25	73
21	A21	62	A21	2.4	A21	70	A21	73	A26	70
22	A22	62	A22	2.4	A21	65	A22	70	A27	65
23	A23	57	A23	2.4	A23	62	A23	67	A28	62
24	A24	53	A24	2.7	A24	62	A24	65	A29	62
25	A25	51	A25	2.4	A25	57	A25	62	A2	57
26	A26	49	A26	2.4	A26	55	A26	62	A3	55
27	A27	47	A27	2.4	A27	53	A27	57	A4	53
28	A28	47	A28	2.7	A28	51	A28	55	A5	51
29	A29	44	A29	2.7	A29	49	A29	51	A6	49

NOTES:
1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATION WITH THE UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH.
2. UNLESS OTHERWISE SPECIFIED.
   A. RESISTOR VALUES IN OHMS
   B. CAPACITOR VALUES IN MICRO-MICRO FARADS.
   C. RESISTORS ARE 1/2W, 5%.
3. CRYSTAL USED ONLY AT 19, 20, AND 29 MC

Figure 6-12. Exciter SC-910E, RF Amplifier, Schematic Diagram

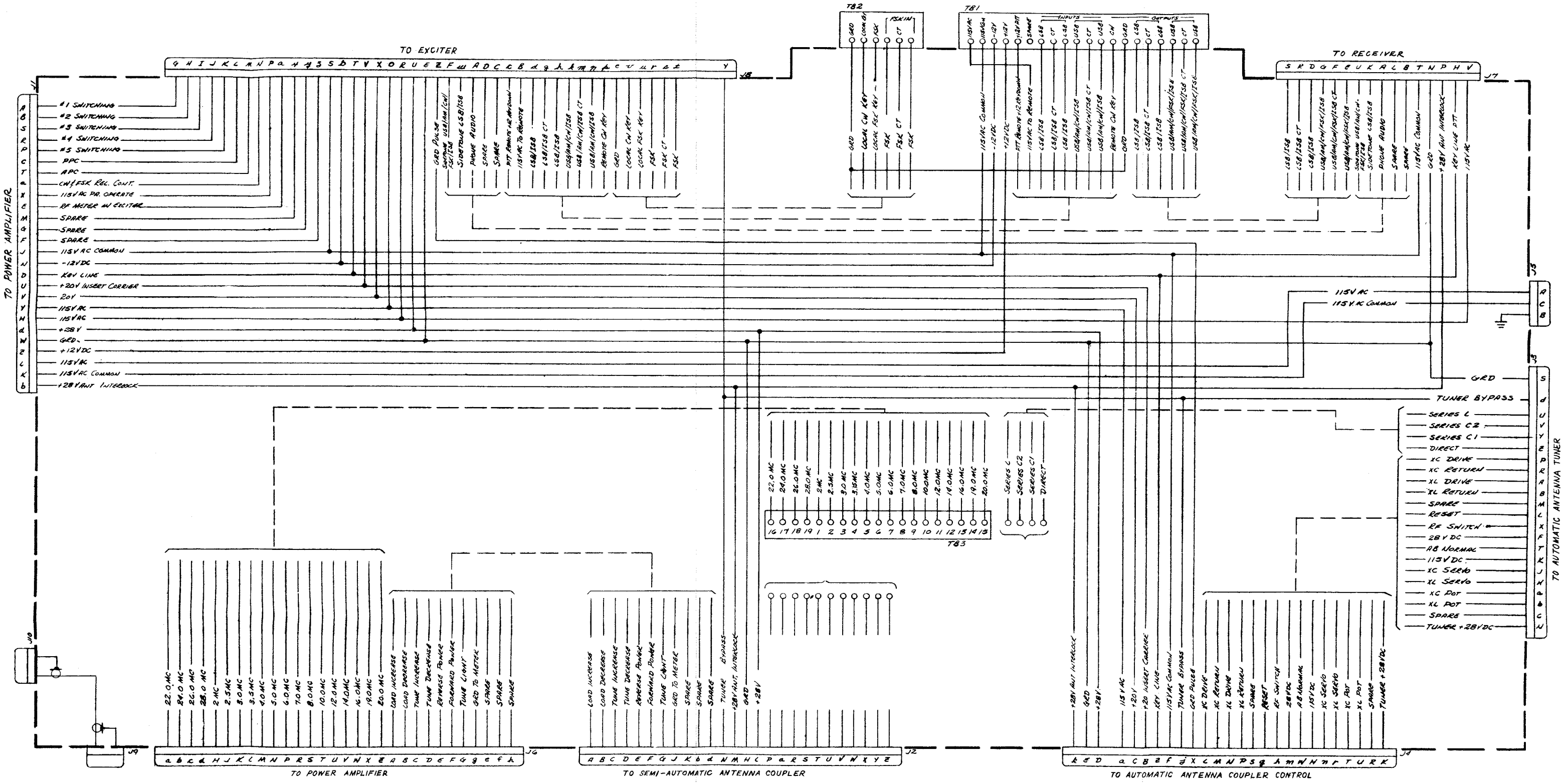


Figure 6-13. Exciter SC-910E, Interconnection Diagram