INSTRUCTION MANUAL

FOR

TYPE RS-111-1B-17C RECEIVING SYSTEM

INTRODUCTION

The Type RS-111-1B-17C Receiving System is a modified Type RS-111-1B-12. The changes, including parts lists and schematic diagrams, are covered in Section VII at the rear of this manual.

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CEI DIVISION
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ADDENDA

The following changes should be incorporated in the electrical parts list and schematic diagrams for the RS-111-1B-12, where applicable.

Type 7163 490-1000-MC Tuner (A4).

Add C33 0.27 pF, ±10%, 500V QC (.27 pF, K) 95121

Add note "Nominal value, final value factory selected" to C33.

Show C33 wired across CR1.

Type 7233 2-MC Bandwidth IF Amplifier (A7)

Ref. Desig.	From	To	Mfr. Part No.	Mfr. Code
C26	Standoff	Feedthrough	FA5C-102W	Same
E2	Add	Terminal, Insulated	SFU-16	04013
R22	Add	200Ω, 5%, 1/4W	RCR07G201JS	81349
R23	Add	47kΩ, 5%, 1/4W	RCR07G473JS	81349

Show R23 from new E2 on chassis wall to junction of CR1 and A2R2 and A2C3.

Show R22 between C26 and A2Q2 emitter.

Type 8133 IF Amplifier Board No. 2 (A5A2).

Change CR1 through CR4 from 1N198 to 1N4449

Type 8232 Sweep Generator (A5A3).

Ref. Desig.	From	To	Mfr. Part No.	Mfr. Code
R34	680 kΩ	100 kΩ	RCR07G104JS	81349
R35	330 kΩ	100 kΩ	RCR07G104JS	81349

Part 13991 P. C. Board (A5A4A1).

Change C1 and C2 from 47 pF to 51 pF, 5%, 500V, CM04ED510J03, 81349

Type 7312 Video Amplifier (A9)

Change transistor type of Q1 from 2N697 to 2N929 on schematic diagram and parts list.

MFR Code 80131, C/N 220183

Type 8232 Sweep Generator (A5A3)

Ref. Desig.	From	To	Mfr. Part No.	Mfr. Code
R37, R39	220 k	240 k	RCR07G244JS	81349
R42	18 k	47 k	RCR07G473JS	81349

Type 7163 490-1000 MHz Tuner (A4)

Ref. Desig.	From	To	Mfr. Part No.	Mfr. Code
A3R2	1 k	10 k	RCR32G103JS	81349

Type 10710 FM Demodulator (A8A1 and A3A1)

Change transistor types of transistors Q5 and Q6 from 2N697 to 2N2222A on schematic diagrams and parts lists.

MFR Code 80131, C/N 110170

SECTION VII

SUPPLEMENT FOR RS-111-1B-17C

7.1 ELECTRICAL CHARACTERISTICS

The Type RS-111-1B-17C is a Type RS-111-1B-12 modified to operate with associated CEI Division equipment (Type DRO-302A Electronic Frequency Counter and Type DRX-1000-2 Digital Readout Extender). Changes in some of the electrical functions have been made for compatability with the associated equipment.

7.2 MECHANICAL CHARACTERISTICS

There are no changes to the front panel for the RS-111-1B-17C except for the nameplate. Seven jacks have been added to the rear panel. They are jacks J23 through J29. Each jack is marked according to its function. Jacks J4 and J5 have been removed.

7.3 CIRCUIT DESCRIPTION

The RS-111-1B-17C is unique because it provides all video outputs at one rear panel jack J3. The proper output is selected automatically according to the position of front panel switches S3, IF BANDWIDTH KC, and S2, the function selector. This was provided by the addition of switch section S2B-X and S3A-X, and relays K5 and K6.

Relay K3 has been added to enable the operator to remotely select an IF bandwidth of either 75 or 300 kc when the IF BANDWIDTH KC switch, S3, is in the 75 position.

The RANGE switch has the added function of switching on the Type DRX-1000-2 Digital Readout Extender in the 235-500 mc and 490-1000 mc positions.

7.3.1 The Type 71292 30-60 mc Tuner reference designation prefix A1, replaces the Type 7165 30-60 mc Tuner. The only difference between the two tuners is a capacitor value change in the fine tuning circuit. This enables the tuner to function with DAFC supplied by the DRO-302A Electronic Frequency Counter.

7.3.2 The Type 71293 60-300 mc Tuner reference designation prefix A2, replaces the Type 7164 60-300 mc Tuner. The change described in paragraph 7.3.1 is also applicable to this tuner.

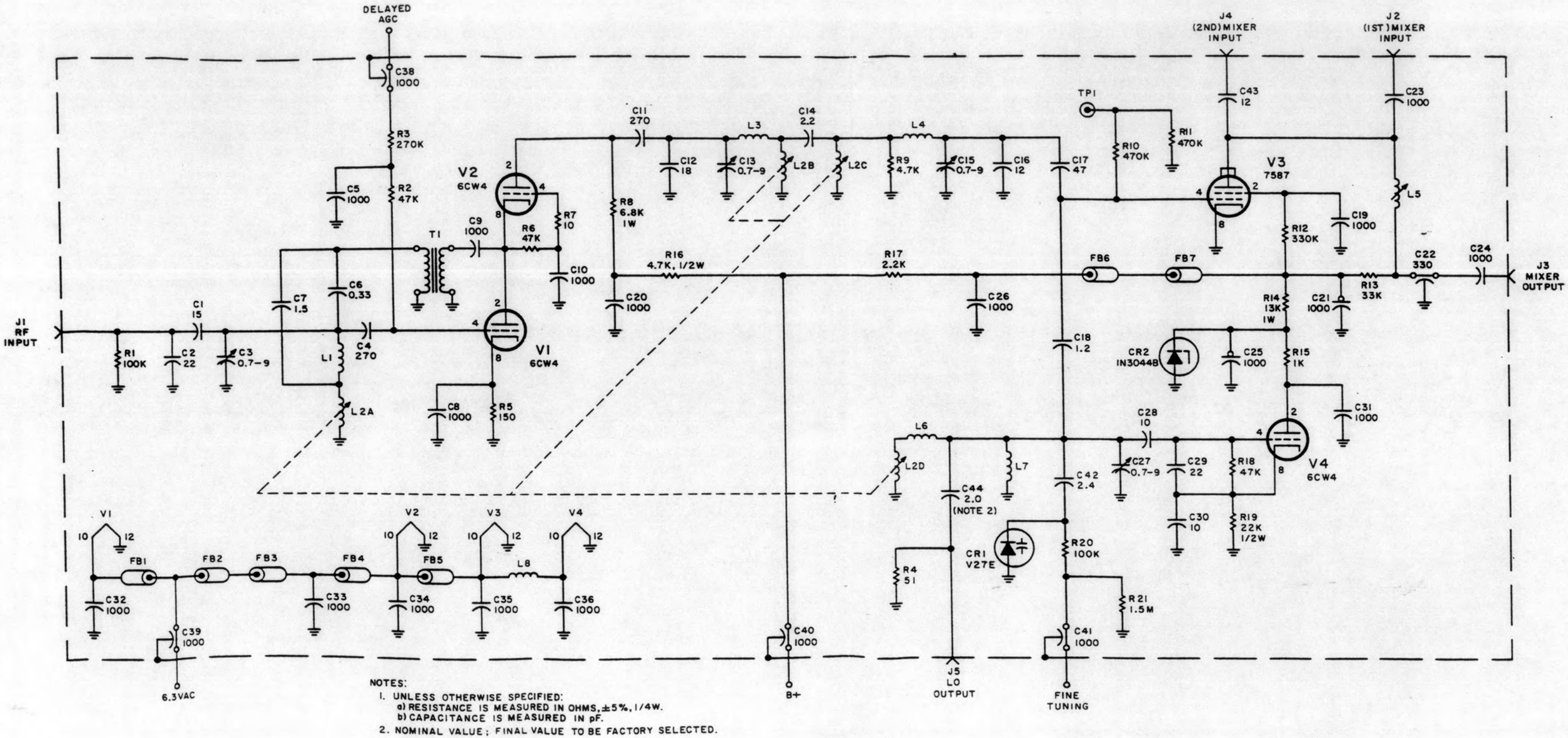
7.3.3 The Type 72121 IF Amplifier, reference designation prefix A7, replaces the Type 7233 IF Amplifier. The changes to the amplifier consist of the addition of capacitors C67 and C78, resistor R69, and jack J3. The addition of these components provides a predetection, 21.4 mc wideband IF output at rear panel jack J23.

7.3.4 The Type 72120 IF Amplifier, reference designation prefix A8, replaces the Type 7245 IF Amplifier. The changes to the amplifier consist of the addition of capacitor C30, resistors R18 and R21, and jack J5. The addition of these components provides a predetection, 21.4 mc narrowband IF output at rear panel jack J24.

7.3.5 The Type 79407 AFC Amplifier, reference designation prefix A16, is an added subassembly. This circuit acts as a buffer between the local oscillators of the tuners and the DAFC (Digital Automatic Frequency Control) circuits in the Type DRO-302A Counter. The BFO TUNING and FINE TUNING voltage is fed through resistor R5 on the AFC

amplifier board and then to the RF tuner in operation. The frequency of the local oscillator in the selected tuner can be changed in two ways. The adjustment of front panel potentiometers R2 and R4 will provide vernier tuning of the LO. Also, by enabling the DAFC from the counter the frequency of the LO is automatically controlled (within the limits of the DAFC). This control voltage is fed through emitter follower Q1 and resistor R4 of the AFC Amplifier.

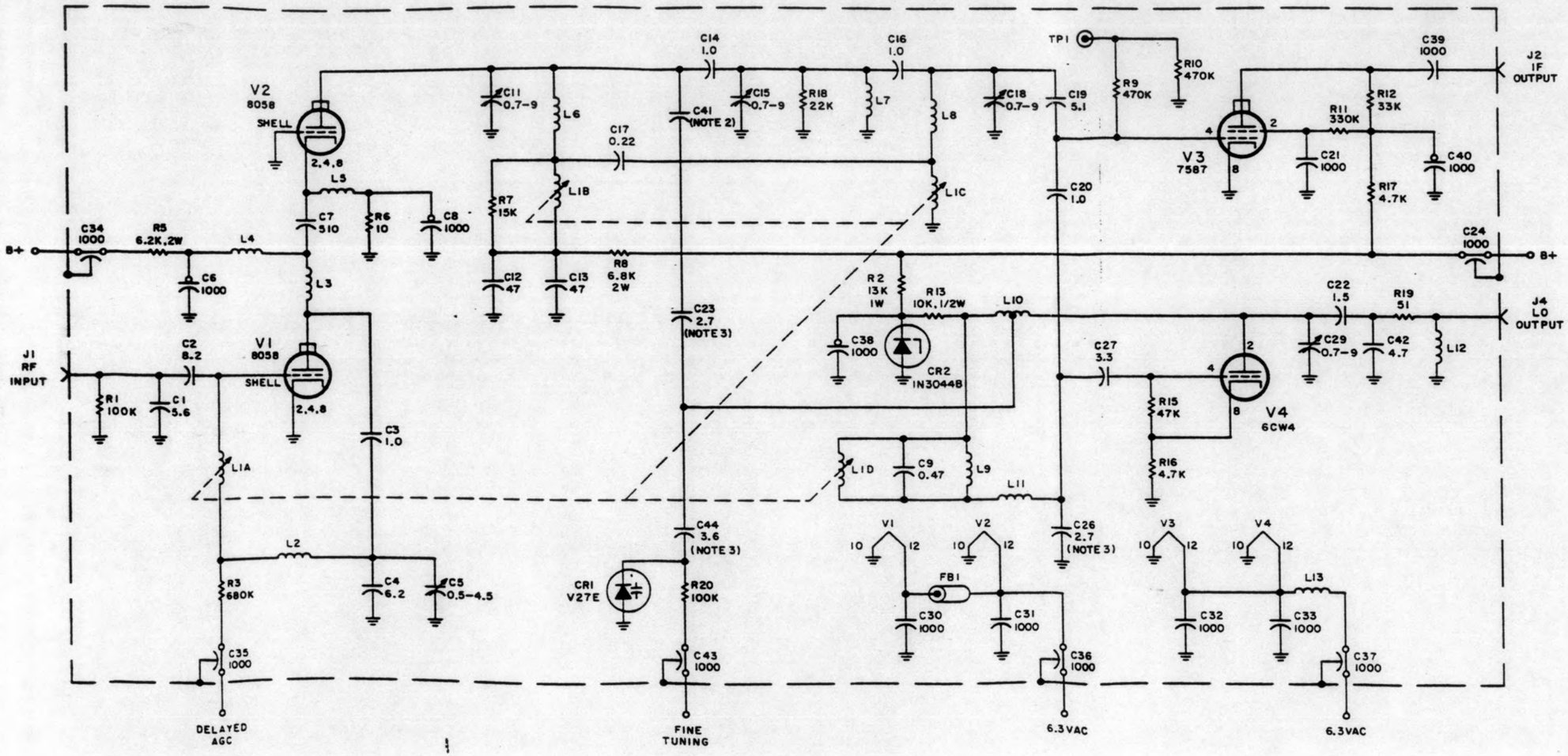
7.3.5.1 The DAFC operation is described in this paragraph using the 30-60 mc tuner. This explanation is completely applicable to all the tuners. Assume that the 30-60 mc tuner is tuned to 045.000 mc; the DAFC of the Type DRO-302A Counter is enabled and the last digit is selected to be 0. If the tuner should drift to 045.001 mc the DAFC circuits sense the change. At this point the output of the DAFC, which is nominally +10V, begins to go negative. This reduces the reverse bias of varactor CR1 in the tuner. Thus, the capacitance of CR1 increases. This, in turn, begins to tune the local oscillator to a lower frequency. When the LO frequency reaches 045.000 mc the DAFC holds at this point until it senses another change. The holding range of the DAFC is approximately 0.1 percent of the tuned frequency.



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS MEASURED IN pF.
2. NOMINAL VALUE; FINAL VALUE TO BE FACTORY SELECTED.

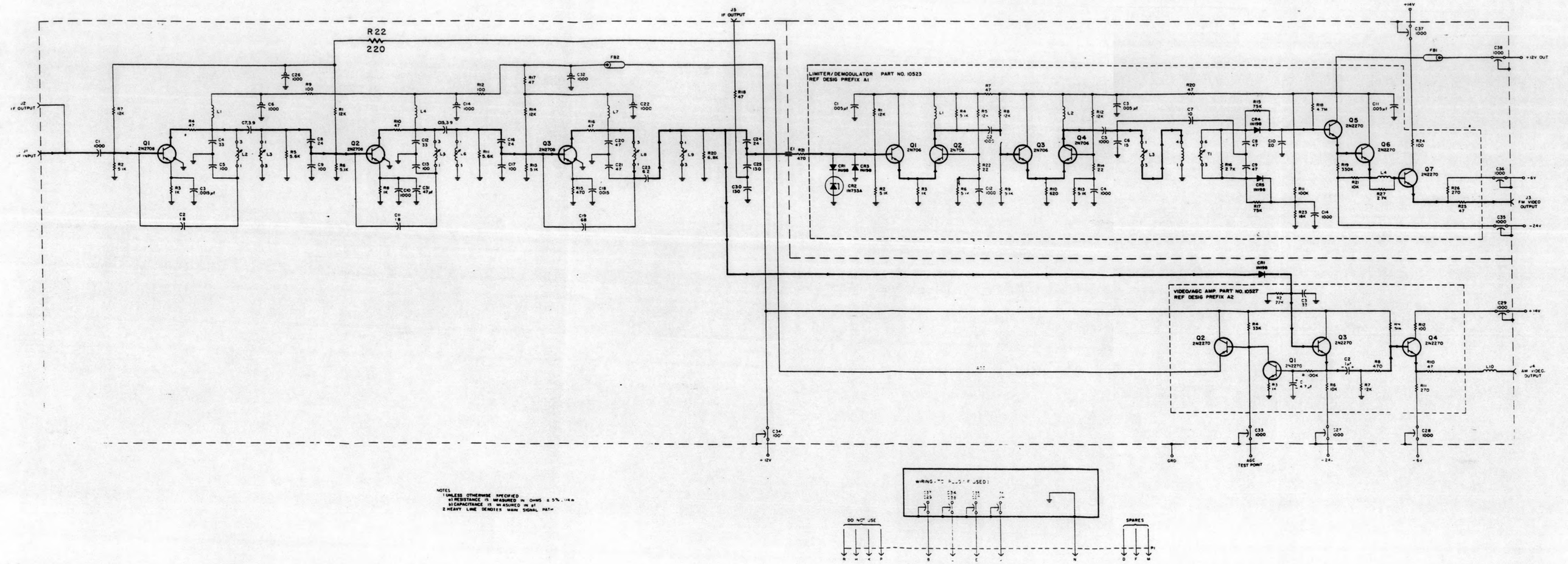
Figure 7-1. Type 7292 30-60 MC Tuner, Schematic Diagram



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS MEASURED IN pF.
2. PART OF CIRCUIT BOARD, CEI TYPE 1101.
3. NOMINAL VALUE; FINAL VALUE TO BE FACTORY SELECTED.

Figure 7-2. Type 7129S 60-300 MC Tuner, Schematic Diagram



NOTES:
1. UNLESS OTHERWISE SPECIFIED
   a) RESISTANCE IS MEASURED IN OHMS ± 5%, 1/4 w
   b) CAPACITANCE IS MEASURED IN μf
2. HEAVY LINE DENOTES MAIN SIGNAL PATH

Figure 7-3. Type 72121 IF Amplifier, Schematic Diagram

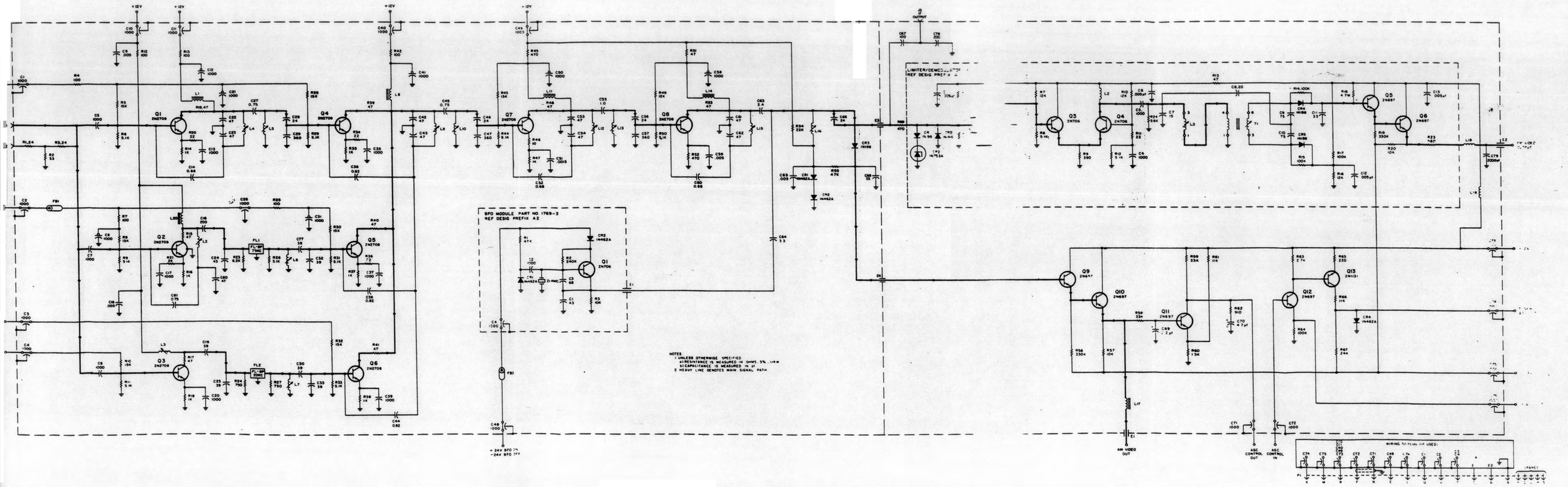
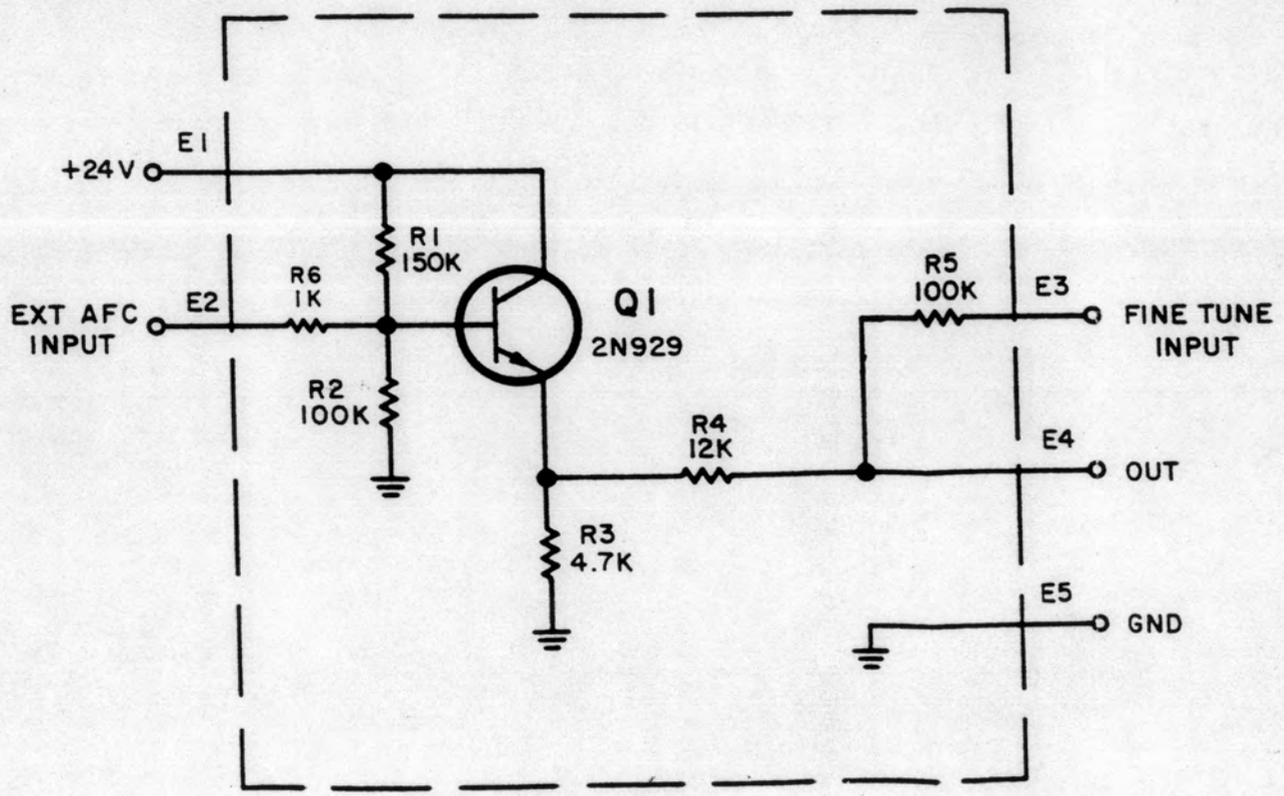


Figure 7-4. Type 72120 IF Amplifier, Schematic Diagram



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a. RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.

Figure 7-5. Type 7940 AFC Amplifier, Schematic Diagram

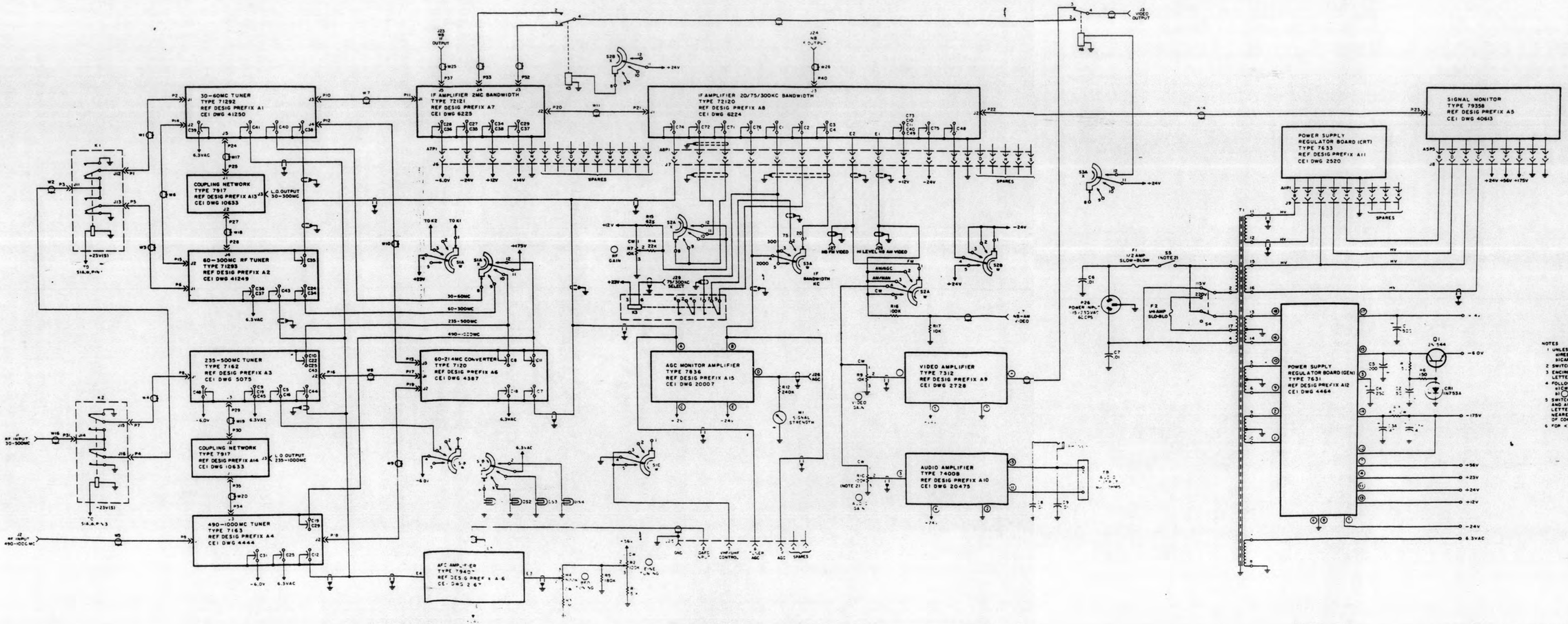


Figure 7-6. Type RS-111-1B-17C Main Chassis, Schematic Diagram