

Alignment Procedure

This Receiver has been carefully aligned at the factory and should never require any more than a touch-up to retain the peak of its performance. If alignment is necessary, follow the instructions provided below with care.

For the alignment procedure, the equipment listed is required:

Non-metallic alignment tools, general Cement #5097 and #8282, or equivalents.

DC Vacuum-tube Voltmeter.

Signal Generator(s) capable of accurately producing unmodulated signals of:

60 KCS, 455 KCS, 3035 KCS, and RF ranging from .54 MCS to 30.0 MCS.

Alignment must be undertaken with the Receiver out of its cabinet. Remove

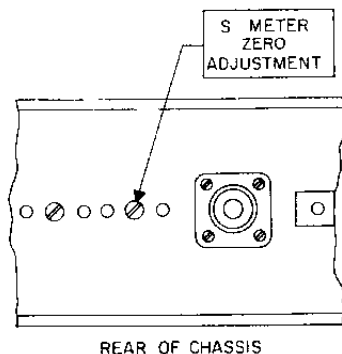
This is to permit access to both the top and bottom of the chassis.

Before operating the Receiver, adjust the "S" meter pointer screw on the front face of the meter to set the needle exactly over the zero mark on the scale.

Connect the speaker to the Receiver, plug the set into a source of power,

Band Selector.....7.85 - 15.35 mc band
Band Spread Tuning Dial (arbitrary).....100
AM/SSB/CW Selector.....AM
Side Band Selector.....U
Selectivity Selector......5Kcs
Slot Frequency..... Counter-clockwise
Slot Depth..... See AM Reception
Beat Frequency Oscillator..... 0
Noise Limiter..... Off
AVC..... Off
Antenna..... Center
Calibration Reset..... Center
Send-Receive Switch..... Receive
Audio & RF Gain..... Adjust to Test Requirements

After warm-up, set the RF gain control fully counterclockwise without actually turning the set off, and adjust the meter zero control at the rear of the Receiver chassis again for zero on the scale. The AVC switch must be set to a position other than "OFF" for the meter to read.



Set all of the front panel controls as shown in the illustration at the start of the alignment procedure. Changes to these settings will be required as the alignment progresses.

Except where noted in the diagrams, the coil slugs are set from the top of the can. Be careful that you are actually turning the proper slug; it is sometimes easy to be adjusting the wrong one, or even to be turning both at once if they happen to be close together inside the coil.

IF ALIGNMENT

Step 1. Connect the VTVM to the junction of L8 and C44 and chassis ground.

Connect the Signal Generator for the 60 KCS First Adjustments to the junction of C28 and T5 and chassis ground.

Apply an unmodulated 60 KCS, and set T6, T7, T8, T9, T10 and T11 for a maximum negative reading. Remember to reduce the I_f input signal level as necessary to maintain about -5 volts D.C.

Step 2. Turn the mode switch from AM to CW.

Check that the BFO is set to zero, then adjust T28 for zero beat as heard in the loud speaker.

Return the switch to AM.

Sideband SW to Both.

Selectivity SW to 3 kcs

- Step 3. Disconnect the Signal Generator from V5 and reconnect it to Pin 7 of V2.
- Apply on unmodulated 3035 kcs.
- Adjust L4, the top and bottom slugs of T5, T4, and T3, and the bottom slug of T2 and peak T1, for a maximum negative reading.
- Remember to reduce the IF input signal level as necessary to maintain about -5 volts.
- Step 4. Turn the Slot Frequency control to zero, and the Slot Depth control to its mid-position.
- Set L3 for minimum meter reading. It may be necessary to raise the IF input level to be sure of indicating the absolute minimum.
- Return the generator level and the Slot Frequency and Depth controls to their previous conditions.
- Step 5. For alignment of 455 kc/s IFs, leave the signal generator and VTVM as they were in Step 3 and adjust the top and bottom cores of T3, T4, and T5 for maximum negative reading of the VTVM. Remember to reduce the IF input signal level as necessary to maintain about -5 volts.

This completes the IF alignment procedure. For RF alignment continue with Step 6 below.

RF ALIGNMENT

- Step 6. All HF Oscillator and RF core adjustments are made from the top of the shield cans. RF trimmer adjustments are made from the bottom of the chassis.
- Connect the unmodulated signal generator to the antenna terminal and the generator output ground lead to the antenna ground terminal with the link closed.
- Turn the Band Switch to the .54 to 1.05 mc/s band and the Selectivity switch to 1 kc/s. Turn the SideBand Selector to Both.
- Set the Antenna control about 30 degrees to the left of vertical (approximately 10 o'clock) and the Main Tuning dial to .60 mc/s.
- Set the signal generator frequency to .60mc/s.

(Step 6 - con't.)

Make sure that the Band Spread adjustable indicator is set at the center marker and the Band Spread dial is set at 100 on the logging scale.

Adjust the top slug in T23, the top slug of T19, and the top slug of T12 for maximum negative reading of the VTVM.

Remember to adjust the generator output and RF gain control to maintain VTVM reading of approximately -5 volts.

Now adjust the top slug of T1 for maximum negative reading on the VTVM.

Set the Main Tuning dial to 1.0 mc/s and the generator frequency to 1.0 mc/s.

Adjust C144, C53 and the Antenna control for maximum negative reading of the VTVM.

Note that the range of the Antenna trimmer is 180 degrees and the control pointer is set for decreasing capacity from horizontal left.

Since the adjustments at each alignment frequency of the band reacts on the other, it is necessary to repeat the adjustments until no improvement is obtained. The final adjustments of the band should be the trimmers C144 and C53 at the high frequency alignment point.

Band Switch to 1.05 to 2.05 position

Adjust C145 and C54 and Ant. Comp. for maximum negative reading on the VTVM. Repeat the two frequency adjustments until no further improvement can be noted. Finish with the high frequency adjustments.

(Step 6 - Con't.)

Band Switch to 2.05 - 4.04 mc/s.

Dial and Generator to 2.1 mc/s.

Adjust T24, T14 and top of T20 for maximum negative reading

Dial and Generator to 4.0 mc/s.

Adjust C146, C55, and Ant. Comp. for maximum negative reading of the VTVM.

Repeat the two frequency adjustments until no further improvement can be noted. Finish with the high frequency adjustments.

Band Switch to 4.0 - 7.85 mc/s band.

Generator and dial to 4.0 mc/s.

Adjust T25, bottom slug of T20 and T15 for maximum negative reading on the VTVM.

Generator and dial to 7.85 mc/s.

Adjust C147, C56, and the Ant. Comp. for maximum negative reading on the VTVM. Repeat the two frequency adjustments until no further improvement can be noted. Finish with the high frequency adjustments.

Band Switch to 7.85 - 15.35 mc/s.

Generator and dial to 7.85 mc/s.

Adjust T26, Top of T21 and T16 for maximum negative reading of the VTVM.

Generator and dial to 15.0 mc/s.

Adjust C148, C57 and Ant. Comp. for maximum negative reading of the VTVM. Repeat the two frequency adjustments until no further improvement can be noted. Finish with the high frequency adjustments.

Band Switch to 15.35 - 30.0 mc/s band

Generator and dial to 15.7 mc/s.

Adjust T27, bottom of T21, and T17 for maximum negative reading of the VTVM.

Generator and dial to 30.0 mc/s.

Adjust C149, C58, and the Ant. Comp. for maximum negative reading of the VTVM. Repeat the two frequency adjustments until no further improvement can be noted. Finish with the high frequency adjustments.

"S" METER ADJUSTMENT

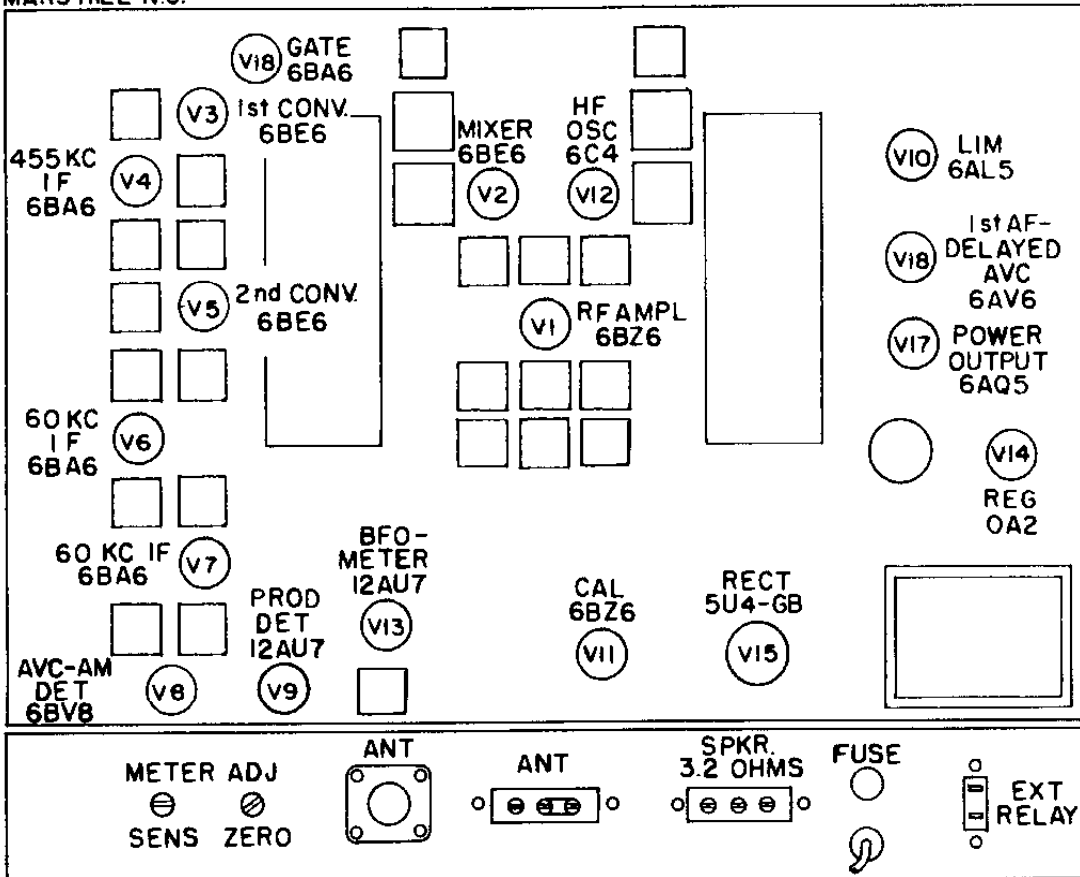
1. Turn receiver off, and if necessary adjust the mechanical zero of pointer with a small bladed screw driver.
 2. Turn receiver on, and allow 1/2 hour warm-up.
 3. Set Function Switch to receive and turn Sensitivity (R¹⁹) control counter-clockwise.
 4. Adjust meter "zero adjust potentiometer" R20 (rear of chassis) to zero.
 5. The meter sensitivity adjustment, R19, is set to obtain an S9 reading with 50 microvolts input with the RF gain control at max.
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NOTE

Usually, R19 will not require readjustment, since the factory setting will vary only slightly as a result of tube changes, ageing, etc. R19 should, therefore, be adjusted only in the event that it is desirable to make the meter more sensitive, or as part of the complete realignment procedure.

HAMMARLUND MFG. CO.
MARS HILL N.C.

MODEL NO. HQ-180-

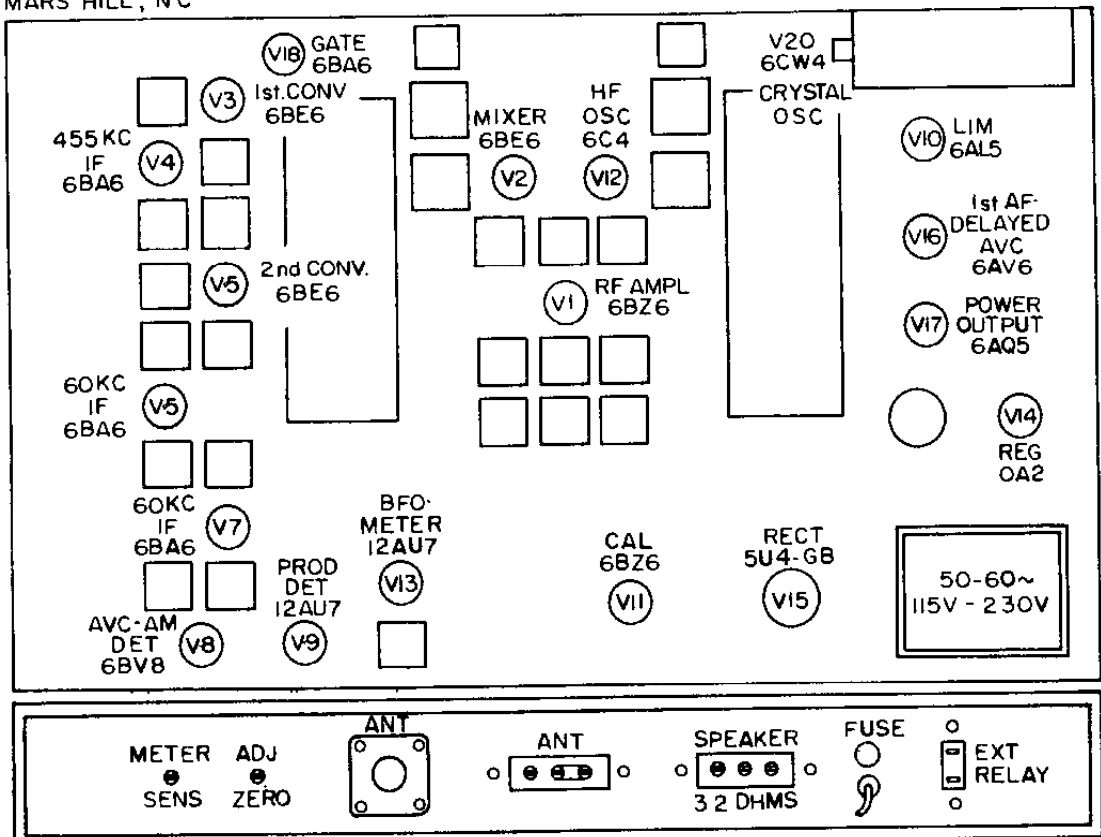


PT 26496

TUBE LOCATION LABEL

HAMMARLUND MFG CO
MARS HILL, N C

MODEL NO. HQ-180-XE

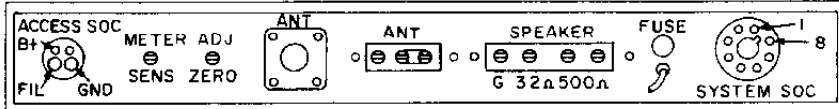
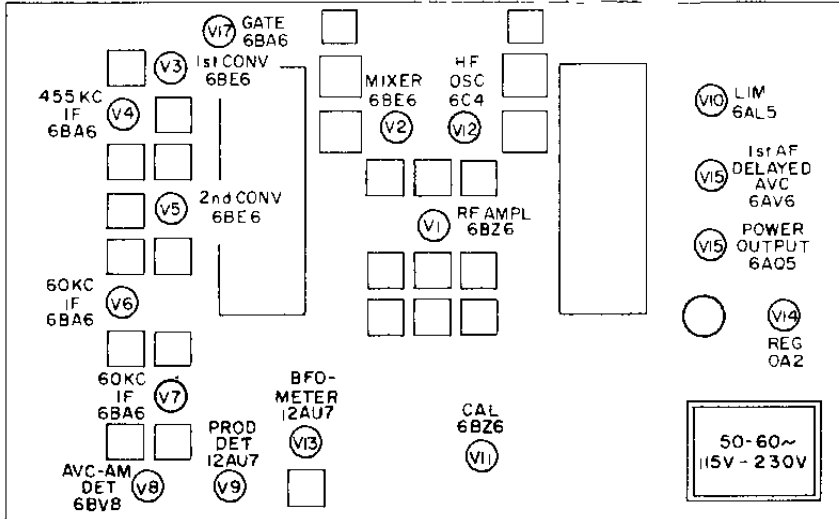


PT 39160-1

TUBE LOCATION LABEL

HAMMARLUND MFG. CO
MARS HILL, N C

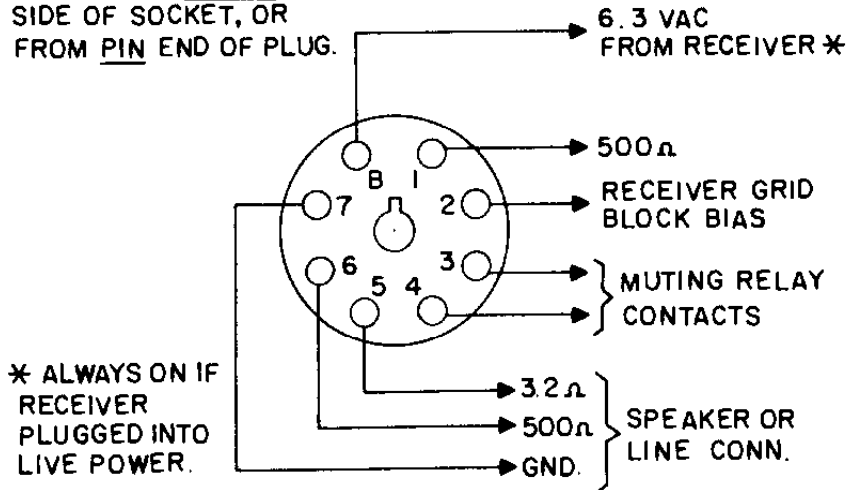
MODEL NO HQ-180-A



PT 2418 2 00009

TUBE LOCATION LABEL

VIEW FROM WIRING
SIDE OF SOCKET, OR
FROM PIN END OF PLUG.

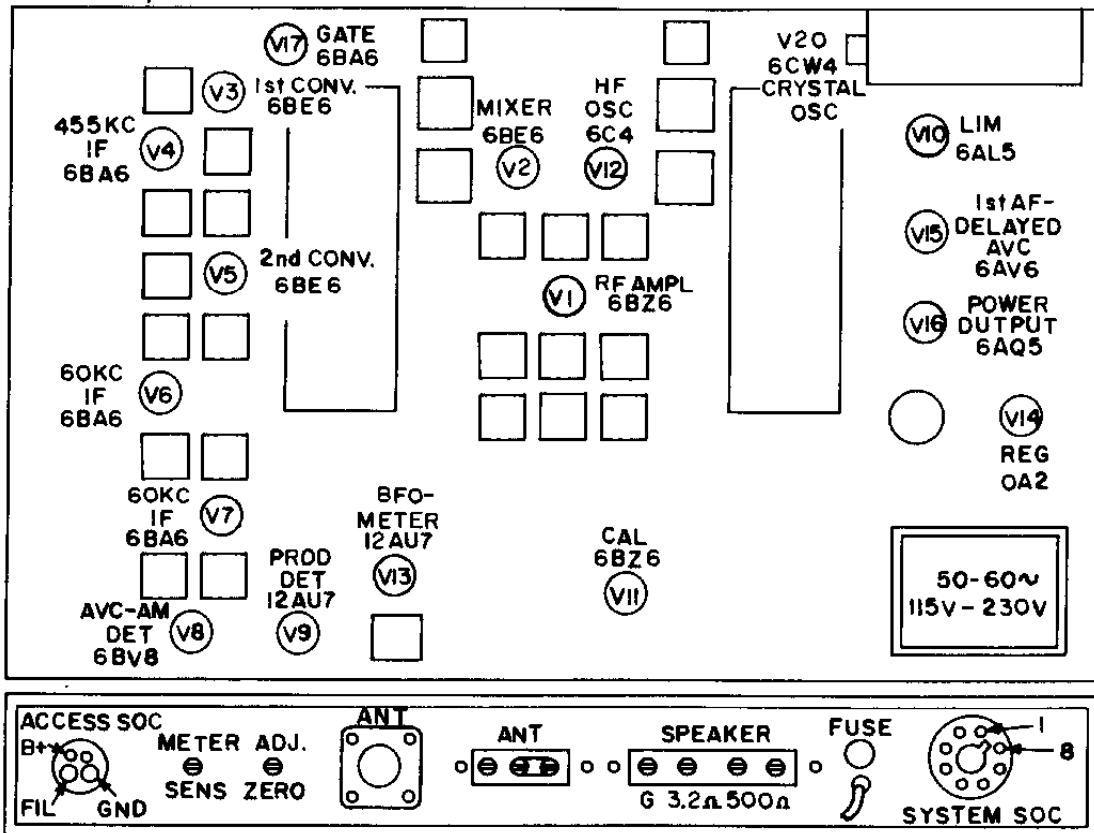


SYSTEM SOCKET CONNECTIONS

"A" SERIES ONLY

HAMMARLUND MFG. CO.
MARS HILL, N.C.

MODEL NO. HQ-1B0-AX



PT 2418 2-00010

TUBE LOCATION LABEL

HQ-18C

TABLE 1. TUBE SOCKET VOLTAGES
 Measured with VTVM, 117 Line Volts, No Antenna; Unless otherwise specified, Band and Dial 10 MC, AM, AVC OFF, 3KC
 Both Sidebands, Rec., Limiter Off, RF Gain Max., AF Gain Min.

TUBE	SOCKET PIN NUMBERS								
	1	2	3	4	5	6	7	8	9
V1 RF 6BZ6	0	1.5 RF 5.8(MIN)	6.3 AC	0	245	105	0	--	--
V2 MIXER #1 6BE6	-2.8 APPROX	1.35	0	6.3 AC	245	110	0	--	--
V3 MIXER #2 6BE6	-2.4 APPROX	2	0	6.3 AC	140	74 0(1 MC)	0	--	--
V4 IF AMP. 6BA6	0	0	6.3 AC	0	245	110	2.1 RF 29(MIN)	--	--
V5 MIXER #3 6BE6	-7.4 APPROX	0	0	6.3 AC	250	84	0	--	--
V6 IF AMP. 6BA6	0	0	6.3 AC	0	240	83	1.0	--	--
V7 IF AMP. 6BA6	0	0	6.3 AC	0	230	82	1.0	--	--
V8 DET. AVC 6BY8	5	0	235	0	--	--.24	0	0	-4
V9 PROD DET 12AU7	220(SSB)	0	7.0(SSB)	6.3 AC	6.3 AC	100(SSB)	0	7.0(SSB)	0
V10 LIMITER 6AL5	36(OFF) .24(MAX)	30(OFF) 0(MAX)	0	6.3 AC	36(OFF) .24(MAX)	0	30(OFF) 0(MAX)	--	--
V11 CAL. 6BZ6	-60(CAL) APPROX	9.0(CAL)	6.3 AC	0	75(CAL)	88(CAL)	9.0(CAL)	--	--
V12 HF OSC. 6CA	130	--	6.3 AC	0	130	-6.0	0	--	--
V13 BFO METER 12AU7	80	0	3.7	6.3 AC	6.3 AC	200(SSB)	125(SSB)	125(SSB)	0
V14 VOLT. REG. OA2	150	--	--	--	150	--	--	--	--
V15 RECT. 504-GB	6.3 AC TIE PT.	260	--	253 AC	245 TIE PT.	253 AC	117 AC TIE PT.	260	--
V16 AP AVC 6AV6	0	1.3	6.3 AC	0	0	0	115	--	--
V17 POWER AMP 6AQ5	0	13	6.3 AC	0	275	250	--	--	--
V18 IF GATE 6BA6	0	0	6.3 AC	0	140	88(1MC)	0 4(1MC)	--	--

HQ-180

TABLE 2. TUBE SOCKET RESISTANCES

Measured with VT Ohmeter; Power Plug and Antenna Disconnected; Unless otherwise specified, Band and Dial 10 MC, AM, AVC OFF, 3 KC Both Sidebands, Rec., Limiter Off, RF Gain Max., AF Gain Min.

TUBE	SOCKET PIN NUMBERS								
	1	2	3	4	5	6	7	8	9
V1 RF 6BZ6	480K	180 RF 1.7K(MIN)	--	0	19K	44K	0	--	--
V2 MIXER #1 6BE6	47K	160	0	--	21K	25K	0	--	--
V3 MIXER #2 6BE6	100K	470	0	--	21K	45K INP(1MC)	1.8	--	--
V4 IF AMP 6BA6	1.1 MEG	0	--	0	19K	33K	180 RF 10K(MIN)	--	--
V5 MIXER #3 6BE6	22K	.8	0	--	22K	44K	1.2 MEG	--	--
V6 IF AMP 6BA6	1.47 MEG	0	--	0	19K	61K	68	--	--
V7 IF AMP 6BA6	470K	0	--	0	20K	60K	68	--	--
V8 DET. AVC 6BY8	560	17	30K	0	--	47K	70	0	4.7K
V9 PROD DET 12AU7	INP 20K(SSB)	470K	820	--	--	55K	100K	820	0
V10 LIMITER 6AL5	210K	1.4 MEG 200K(LIM ON)	0	--	220K	0	1.5 MEG 470K(LIM ON)	--	--
V11 CAL. 6BZ6	470K	4.7K	--	0	INP 500K(CAL)	INP 110K(CAL)	4.7K	--	--
V12 HF OSC. 6C4	24K	--	--	0	24K	100K	27	--	--
V13 BFO METER 12AU7	17K	0	1K	--	--	INP 20K(SSB)	545K	47K	0
V14 VOLT. REG. 0A2	24K	--	--	--	24K	--	0	--	--
V15 RECT. 5U4-G8	--	20K	--	28	21K TIE PT.	30	AC LINE TIE PT.	20K	--
V16 AP AVC 6AV6	50 APPROX	5.8K	--	0	235K	235K	540K	--	--
V17 POWER AMP. 6AQ5	500K	430	--	0	22K	21K	500K	--	--
V18 IF GATE 6BA6	1.1 MEG	0	--	0	21K	INP 81K(1MC)	1K	--	--

HQ-180-XE

TABLE 1. TUBE SOCKET VOLTAGES

Measured with VTVM; 117 Line Volts, No Antenna; Unless otherwise specified, Band and Dial 10 MC, AM, AVC OFF, 3KC Both Sidebands, Rec., Limiter OFF, RF Gain Max., AP Gain Min.

TUBE	SOCKET PIN NUMBERS								
	1	2	3	4	5	6	7	8	9
V1 RF 6BZ6	0	1.5 RF 5.8 (MIN)	6.3 AC	0	245	105	0	--	--
V2 MIXER #1 6BE6	-2.3 APPROX	1.35	0	6.3 AC	245	110	0	--	--
V3 MIXER #2 6BE6	-2.4 APPROX	2	0	6.3 AC	140	74 0 (1 MC)	0	--	--
V4 IF AMP. 6BA6	0	0	6.3 AC	0	245	110	2.1 RF 29 (MIN)	--	--
V5 MIXER #3 6BE6	-7.4 APPROX	0	0	6.3 AC	250	84	0	--	--
V6 IF AMP. 6BA6	0	0	6.3 AC	0	240	83	1.0	--	--
V7 IF AMP. 6BA6	0	0	6.3 AC	0	230	82	1.0	--	--
V8 DET. AVC 6BV8	5	0	235	0	--	-24	0	0	-4
V9 PROD DET 12AU7	220 (SSB)	0	7.0 (SSB)	6.3 AC	6.3 AC	100 (SSB)	0	7.0 (SSB)	0
V10 LIMITER 6AL5	36 (OFF) .24 (MAX)	30 (OFF) 0 (MAX)	0	6.3 AC	36 (OFF) .24 (MAX)	0	30 (OFF) 0 (MAX)	--	--
V11 CAL. 6BZ6	-60 (CAL) APPROX	9.0 (CAL)	6.3 AC	0	75 (CAL)	88 (CAL)	9.0 (CAL)	--	--
V12 HF OSC. 6C4	130	--	6.3 AC	0	130	-6.0	0	--	--
V13 BFO METER 12AU7	80	0	3.7	6.3 AC	6.3 AC	200 (SSB)	125 (SSB)	125 (SSB)	0
V14 VOLT. REG. OA2	150	--	--	--	150	--	--	--	--
V15 RECT. 5U4-GB	6.3 AC TIE PT.	260	--	253 AC	245 TIE PT	253 AC	117 AC TIE PT.	260	--
V16 AF AVC 6AV6	0	1.3	6.3 AC	0	0	0	115	--	--
V17 POWER AMP 6AQ5	0	13	6.3 AC	0	275	250	--	--	--
V18 IF GATE 6BA6	0	0	6.3 AC	0	140	88 (1 MC)	.02 4 (1 MC)	--	--

HQ-180-XE

TABLE 2. TUBE SOCKET RESISTANCES

Measured with VT Ohmmeter; Power Plug and Antenna Disconnected; Unless otherwise specified, Band and Dial 10 MC, AM, AVC OFF, 3 KC Both Sidebands, Rec., Limiter Off, RF Gain Max., AF Gain Min.

TUBE	SOCKET PIN NUMBERS								
	1	2	3	4	5	6	7	8	9
V1 RF 6BZ6	480K	180 RP 1.7K(MIN)	--	0	19K	44K	0	--	--
V2 MIXER #1 6BE6	47K	160	0	--	21K	25K	0	--	--
V3 MIXER #2 6BE6	100K	470	0	--	21K	45K INF(IMC)	1.8	--	--
V4 IF AMP 6BA6	1.1 MEG	0	--	0	19K	33K	180 RP 10K(MIN)	--	--
V5 MIXER #3 6BE6	22K	.8	0	--	22K	44K	1.2 MEG	--	--
V6 IF AMP 5BA6	1.47 MEG	0	--	0	19K	61K	68	--	--
V7 IF AMP 6BA6	470K	0	--	0	20K	60K	68	--	--
V8 DET. AVC 6BV8	560	17	30K	0	--	47K	70	0	4.7K
V9 PROD DET 12AU7	INF 20K(SSB)	470K	820	--	--	55K	100K	820	0
V10 LIMITER 6AL5	210K	1.4 MEG 200K(LIM ON)	0	--	220K	0	1.5 MEG 470K(LIM ON)	--	--
V11 CAL. 6BZ6	470K	4.7K	--	0	INF 500K(CAL)	INF 110K(CAL)	4.7K	--	--
V12 HF OSC. 6C4	24K	--	--	0	24K	100K	27	--	--
V13 BFO METER 12AU7	17K	0	1K	--	--	INF 20K(SSB)	545K	47K	0
V14 VOLT. REG. 0A2	24K	--	--	--	24K	--	0	--	--
V15 RECT. 50A-GB	--	20K	--	28	21K TIE PT.	30	AC LINE TIE PT.	20K	--
V16 AF AVC 6AV6	50 APPROX	5.6K	--	0	235K	235K	540K	--	--
V17 POWER AMP. 6AC5	500K	430	--	0	22K	21K	500K	--	--
V18 IF GATE 6BA6	1.1 MEG	0	--	0	21K	INF 61K(IMC)	1K	--	--

HQ-180-A

TABLE 2 TUBE SOCKET RESISTANCES

MEASURED WITH VT OHMMETER; POWER PLUG AND ANTENNA DISCONNECTED; UNLESS OTHERWISE SPECIFIED, BAND AND DIAL 10 MC, AM, AVC OFF, 3 KC BOTH SIDEBANDS, REC., LIMITER OFF, RF GAIN MAX., AF GAIN MIN.

TUBE	SOCKET PIN NUMBERS								
	1	2	3	4	5	6	7	8	9
V 1 6BZ6 RF	480K	180 RF 1.7K (min)	--	0	19K	44K	0	--	--
V 2 6BE6 Mixer #1	47K	160	0	--	21K	25K	0	--	--
V 3 6BE6 Mixer #2	100K	470	0	--	21K	45K Inf (1 mc)	1.8	--	--
V 4 6BA6 IF Amp	1.1 meg	0	--	0	19K	33K	180 RF 10K (min)	--	--
V 5 6BE5 Mixer #3	22K	.8	0	--	22K	44K	1.2 MEG	--	--
V 6 6BA6 IF Amp	1.47 MEG	0	--	0	19K	61K	68	--	--
V 7 6BA6 IF Amp	470K	0	--	0	20K	60K	68	--	--
V 8 6BV8 Det. AVC	560	17	30K	0	--	47K	70	0	4.7K
V 9 12AU7 Prod. Det	INF 20K (SSB)	470K	820	--	--	55K	100K	820	0
V 10 6AL5 Limiter	210K	1.4 MEG 200K (LIM ON)	0	--	220K	0	1.5 MEG 470K (LIM ON)	--	--
V 11 6BZ6 Cal.	470K	4.7K	--	0	INF 500K (CAL)	INF 1.0K (CAL)	4.7K	--	--
V 12 6C4 RF Osc	24K	--	--	0	24K	100K	27	--	--
V 13 12AU7 BFO Meter	17K	0	1K	--	--	INF 20K (SSB)	545K	47K	0
V 14 0A2 Volt. Reg.	24K	--	--	--	24K	--	0	--	--
V 15 6AV6 AF AVC	50 Approx.	5.6K	--	0	23K	23K	540K	--	--
V 16 6AQ5 Power Amp	500K	430	--	0	22K	21K	500K	--	--
V 17 6BA6 IF Gate	1.1 MEG	0	--	0	21K	INF 61K (MC)	1K	--	--
Systems Socket	0	2.0 MEG	B + 20K	B + 20K	0	∞	0	0	0
Acc Socket	0	∞	B + 20K	0	0				

HQ-180-AX

TABLE 1. TUBE SOCKET VOLTAGES

MEASURED WITH VTVM; 117 LINE VOLTS, NO ANTENNA; UNLESS OTHERWISE SPECIFIED, BAND AND DIAL 10 MC, AM, AVC OFF, 3 KC BOTH SIDEBANDS, REC., LIMITER OFF, RF GAIN MAX., AF GAIN MIN.

TUBE	SOCKET PIN NUMBERS								
	1	2	3	4	5	6	7	8	9
V 1 RF 6BZ6	0	1.5 RF 5.8 (min)	6.3 AC	0	245	105	0	--	--
V 2 Mixer #1 6BE6	-2.8 approx.	1.35	0	6.3 AC	245	110	0	--	--
V 3 Mixer #2 6BE6	-2.4 approx.	2	0	6.3 AC	250	74 0 (1 mc)	0	--	--
V 4 IP Amp 6BA6	0	0	6.3 AC	0	245	110	2.1 RF 29 (min)	--	--
V 5 Mixer #3 6BE6	-7.4 approx.	0	0	6.3 AC	250	84	0	--	--
V 6 IP Amp 6BA6	0	0	6.3 AC	0	240	83	1.0	--	--
V 7 IP Amp 6BA6	0	0	6.3 AC	0	230	82	1.0	--	--
V 8 DET AVC 6BV8	5	0	235	0	--	-.24	0	0	-4
V 9 Prod Det 12AU7	220 (SSB)	0	7.0 (SSB)	6.3 AC	6.3 AC	100 (SSB)	0	7.0 (SSB)	0
V 10 Limiter 6AL5	36 (off) .24 (max)	30 (off) 0 (max)	0	6.3 AC	36 (off) .24 (max)	0	30 (off) 0 (max)	--	--
V 11 Cal 6BZ6	-60 (cal) approx.	9.0 (cal)	6.3 AC	0	75 (cal)	88 (cal)	9.0 (cal)	--	--
V 12 HF Osc. 6C4	130	--	6.3 AC	0	130	-6.0	0	--	--
V 13 BFO Meter 12AU7	80	0	3.7	6.3 AC	6.3 AC	200 (SSB)	125 (SSB)	125 (SSB)	0
V 14 Volt. Reg. OA2	150	--	--	--	150	--	--	--	--
V 15 AF AVC 6AV6	0	1.3	6.3 AC	0	0	0	115	--	--
V 16 Power Amp 6AQ5	0	13	6.3 AC	0	275	250	--	--	--
V 17 IP Gate 6BA6	0	0	6.3 AC	0	250	88 (1 mc)	4 (1 mc)	--	--
Systems Socket	0	A.V.C.	105	105	0	0	0	6.3 V.A.C.	--
Ace Socket	0	0	300 v D.C.	6.3 V.A.C.	--	--	--	--	--

V20 6CW4 crystal dsc* Pin 2 78V4, Pin 4 8.6V-, Pin 8 .08V+, Pin 10 6.3V AC

* Readings taken with switch in crystal position with 3 MC crystal in use.

HQ-180-AX

TABLE 2 TUBE SOCKET RESISTANCES

MEASURED WITH VT OHMMETER; POWER PLUG AND ANTENNA DISCONNECTED; UNLESS OTHERWISE SPECIFIED, BAND AND DIAL 10 MC, AM, AVC OFF, 3 KC BOTH SIDEBANDS, REC., LIMITER OFF, RF GAIN MAX., AF GAIN MIN.

TUBE	SOCKET PIN NUMBERS								
	1	2	3	4	5	6	7	8	9
V 1 RF 6BZ6	480K	180 RF 1.7K (min)	--	0	19K	44K	0	--	--
V 2 Mixer #1 6BE6	47K	160	0	--	21K	25K	0	--	--
V 3 Mixer #2 6BE6	100K	470	0	--	21K	45K Inf (1 mc)	1.8	--	--
V 4 IF Amp 6BA6	1.1 meg	0	--	0	19K	33K	180 RF 10K (min)	--	--
V 5 Mixer #3 6BE6	22K	.8	0	--	22K	44K	1.2 MEG	--	--
V 6 IF Amp 6BA6	1.47 MEG	0	--	0	19K	61K	68	--	--
V 7 IF Amp 6BA6	470K	0	--	0	20K	60K	68	--	--
V 8 Det. AVC 6EV8	560	17	30K	0	--	47K	70	0	4.7K
V 9 Prod Det 12AU7	INF 20K (SSB)	470K	820	--	--	55K	100K	820	0
V 10 Limiter 6AL5	210K	1.4 MEG 200K (LIM ON)	0	--	220K	0	1.5 MEG 470K (LIM ON)	--	--
V 11 Cal. 6BZ6	470K	4.7K	--	0	INF 500K (CAL)	INF 110K (CAL)	4.7K	--	--
V 12 RF Osc 6C4	24K	--	--	0	24K	100K	27	--	--
V 13 ERO Meter 12AU7	17K	0	1K	--	--	INF 20K (SSB)	545K	47K	0
V 14 Volt. Reg. OA2	24K	--	--	--	24K	--	0	--	--
V 15 AF AVC 6AV6	50 Approx.	5.6K	--	0	235K	235K	540K	--	--
V 16 Power Amp 6AQ5	500K	430	--	0	22K	21K	500K	--	--
V 17 IF Gate 6BA6	1.1 MEG	0	--	0	21K	INF 61K (MC)	1K	--	--
Systems Socket	0	2.2 MEG	B + 20K	B + 20K	0	∞	0	0	
Ace Socket	0	∞	B + 20K	B + 20K	0				

V Pin 2 70K, Pin 4 100K, Pin 8 Infinity, Pin 10 .4 ohms

PARTS LIST HQ-180

<u>SCHEMATIC DESIGNATION</u>	<u>DESCRIPTION</u>	<u>HAMMARLUND PART NO.</u>
CAPACITORS		
C1, A-C	Variable, Main Tuning	T41604-G1
C2, A-I	Variable, Band Spread Tuning	T41604-G2
C3, C8, C31, C51, C157	Fixed, Silver - Dur Mica DM-15 100 mmf, 500 W. V. D. C.	K23006-1
C4, C5, C6, C7, C9, C28	Fixed, Ceramic Disc .01 mfd, 600 W. V. D. C.	M23034-19
C10, C11, C15, C17, C18, C21, C32, C41, C47, C75, C76, C124, C130, C133, C135, C139, C141, C152		
C12, C33, C36, C38, C40, C46, C136, C137	Fixed, Ceramic Disc .02 mfd, 600 W. V. D. C.	M23034-9
C13, C89, C97, C111	Fixed, Silver - Dur Mica DM-15 20 mmf, 500 W. V. D. C.	K23006-17
C113, C120, C123		
C14	Fixed, Silver - Dur Mica DM-15 860 mmf, 500 W. V. D. C.	K23027-6
C16, C93, C101	Fixed, Silver - Dur Mica DM-15 3 mmf, 500 W. V. D. C.	K23006-18
C103, C114		
C19, C20, C85	Fixed, Ceramic Disc, .04 mfd, 600 W. V. D. C.	K23034-12
C22, C27	Fixed, Ceramic Disc, .01 mfd, 10%, 1000 W. V. D. C.	K23034-25
C23	Fixed, Silver - Dur Mica DM-15, 15 mmf, 300 W. V. D. C.	K23006-35
C24	Fixed, Silver - Dur Mica DM-15, 1200 mmf, 500 W. V. D. C.	K23027-4
C25	Fixed, Mylar, .033 mfd, 200 W. V. D. C.	K23044-1
C26	Variable, Slot Tuning	K42041-1
C28, C104, C110, C115	Fixed, Silver - Dur Mica DM-15, 7 mmf, 500 W. V. D. C.	K23006-24
C117, C122		
C29	Fixed, Silver - Dur Mica DM-15, 780 mmf, 500 W. V. D. C.	K23006-39
C30, C63, C64, C78, C143	Fixed, Silver - Dur Mica DM-15, 47 mmf, 300 W. V. D. C.	K23006-47
C34, C37	Fixed, Silver - Dur Mica DM-15, 24 mmf, 500 W. V. D. C.	K23006-7
C35	Fixed, Ceramic Disc, Temp. Comp. 330N750	K23010-9
C39, C42	Fixed, Ceramic Disc, 500 mmf, 1000 W. V. D. C.	K23034-13
C43	Fixed, Silver - Dur Mica DM-15, 10 mmf, 500 W. V. D. C.	K23006-8
C44, C45	Fixed, Ceramic Disc, .002 mfd, 1000 W. V. D. C.	M23034-18
C48, C87, C131	Fixed, Dur-Paper, .1 mfd, 200 W. V. D. C.	K23045-3
C49, C95, C105	Fixed, Dur-Paper, .047 mfd, 400 W. V. D. C.	K23045-2
C50	Variable, Calibrator, 8-50 mmf	K23038-5
C52	Variable, Antenna Tuning	K34454-G24
C53, C54, C55, C56, C57, C58	Variable, Mica Trimmer, 1.5 - 20 mmf	K23043-6
C59	Fixed, Ceramic Disc, Temp. Comp. 27N470	K23010-26
C60	Fixed, Ceramic Disc, Temp. Comp. 27N220	K23010-25
C61	Fixed, Ceramic Disc, Temp. Comp. 27N470	K23010-23
C62	Fixed, Ceramic Disc, Temp. Comp. 27N750	K23010-24
C65	Fixed, Silver - Dur Mica DM-15, 60 mmf, 300 W. V. D. C.	K-23006-51
C66	Fixed, Silver - Dur Mica DM-15, 85 mmf, 500 W. V. D. C.	K23006-3

SCHEMATIC
DESIGNATION

DESCRIPTION

HAMMARLUND
PART NO.

C67	Fixed, Silver - Dur Mica DM-15, 150 mmf, 300 W. V. D. C.	K23006-53
C68, C80	Fixed, Silver - Dur Mica DM-15, 220 mmf, 500 W. V. D. C.	K23006-10
C69	Fixed, Silver - Dur Mica DM-15, 180 mmf, 300 W. V. D. C.	K23006-60
C70	Fixed, Silver - Dur Mica DM-15, 333 mmf, 300 W. V. D. C.	K23006-61
C71	Fixed, Silver - Dur Mica DM-15, 673 mmf, 300 W. V. D. C.	K23006-57
C72	Fixed, Silver - Dur Mica DM-15, 1030 mmf, 300 W. V. D. C.	K23027-19
C73	Fixed, Silver - Dur Mica DM-15, 363 mmf, 300 W. V. D. C.	K23006-76
C74	Fixed, Silver - Dur Mica DM-15, 438 mmf, 300 W. V. D. C.	K23006-75
C77	Fixed, Ceramic Disc, Temp. Comp. 100N470	K23010-30
C79	Variable, Crystal Phasing 1.5-9.1 mmf	K23057-1
C61	Fixed, Silver - Dur Mica DM-15, 1000 mmf, 300 W. V. D. C.	K23027-9
C82, A-D	Fixed, Electrolytic, 60-40-40-40 mfd	K15504-71
C63, C84	Fixed, Ceramic Disc, .01 mfd, 1400 W. V. D. C.	K23034-26
C66, C94	Fixed, Silver - Dur Mica DM-15, 31 mmf, 500 W. V. D. C.	K23006-15
C66, C90, C96, C98	Fixed, Silver - Dur Mica DM-15, 29 mmf, 500 W. V. D. C.	K23006-16
C91, C99	Fixed, Silver - Dur Mica DM-15, 28 mmf, 500 W. V. D. C.	K23006-19
C92, C100	Fixed, Silver - Dur Mica DM-15, 27 mmf, 500 W. V. D. C.	K23006-20
C102, C109, C116, C153	Fixed, Silver - Dur Mica DM-15, 9 mmf, 500 W. V. D. C.	K23006-21
C154, C155		
C106	Fixed, Silver - Dur Mica DM-15, 10 mmf, 500 W. V. D. C.	K23006-22
C107, C116	Fixed, Silver - Dur Mica DM-15, 14 mmf, 500 W. V. D. C.	K23006-25
C108, C119	Fixed, Silver - Dur Mica DM-15, 21 mmf, 500 W. V. D. C.	K23006-26
C112, C121	Fixed, Silver - Dur Mica DM-15, 16 mmf, 500 W. V. D. C.	K23006-23
C125	Fixed, Silver - Dur Mica DM-15, 47 mmf, 500 W. V. D. C.	K23006-6
C126, C127	Fixed, Mylar, .01 mfd, 400 W. V. D. C.	K23044-2
C126	Fixed, Ceramic Disc, .001 mfd, 500 W. V. D. C.	K2304-30
C129	Variable, BFO, 100 mmf	K11730-G9
C132	Fixed, Ceramic Disc, .005 mfd, 1000 W. V. D. C.	M23034-10
C134	Fixed, Silver - Dur Mica DM-15, 2 mmf, 500 W. V. D. C.	K23006-37
C136	Fixed, Ceramic Temp. Comp. 47N750	K23061-26J
C140	Fixed, electrolytic, 20 mfd, 25 W. V. D. C.	K23091-1
C142	Fixed, Ceramic Disc, Temp. Comp. 440N750	K23010-27
C144, C145, C146	Variable, Cylindrical Trimmer, 1-8 mmf	K23006-2
C147, C146, C149		
C150	Fixed, Ceramic Disc, Temp. Comp. 110N750	K23010-5
C151	Fixed, Ceramic Disc, Temp. Comp. 500N1500	K23010-29
C156	Variable, Vernier Tuning 24uuf	K42187-G1

SPECIAL ASSEMBLIES

	Crystal panel, clock window	M36877-1
CMC	Clock, Telechron auto-timer (60 cycle operation)	K36674-G2
CMC	Clock, Telechron auto-timer (50 cycle operation)	K36674-G3
M1	Meter "S" (carrier level)	K-26149-5
Y1	Quartz crystal, 2.560 Mcs	K36972-2
Y2	Quartz crystal, 100.0 Kcs	K36661-1
Y3	Crystal 3035 Kcs	K26461-1
Z1	RC printed network (Calibrator)	K36961-1
Z2	RC printed network (Audio)	K36646-1

SCHEMATIC
DESIGNATION

DESCRIPTION

HAMMARLUND
PART NO.

COILS

L1, L9, L10	RF Choke, 2.5 millihenry	K15627-1
L2	Bifilar Coil	K42032-1
L3	Slot Filter Coil	K42034-1
L4	Passband Tuning Coil	K26301-1
L5, L7, L8	RF Choke, 330 millihenries	K42019-1
L6	Filter Choke, 8.0 henries	K26302-1

RESISTORS

R1, R16, R41, R82, R95	10K ohms, 1/2 w., 10%	K19309-73
R2, R9, R12,	1K ohms, 1/2 w., 10%	K19309-49
R17, R47, R62, R99		
R3, R57	6.8K ohms, 1/2 w., 10%	K19309-69
R4	10 ohms, 1/2 w., 10%	K19309-1
R5, R14, R80	180 ohms, 1/2 w., 5%	K19309-260
R6	Variable, 1.5K ohms, dual with R15 and S3	K38940-1
R7, R42, R49, R65, R70	47K ohms, 1/2 w., 10%	K19309-89
R72, R73, R75, R84, R100		
R8	160 ohms, 1/2 w., 5%	K19309-199
R10, R13, R18, R27, R36	100K ohms, 1/2 w., 10%	K19309-97
R40, R51, R74, R106, R107		
R11, R29, R97, R101	22K ohms, 1/2 w., 10%	K19309-61
R15	Variable, 10K ohms, part of R6	
R19	Variable, 1.5K ohms, meter sens. adj.	K15379-2
R20	Variable, 300 ohms, meter zero adj.	K15379-1
R21	22K ohms, 1 w., 10%	K19310-81
R22	820 ohms, 1/2 w., 5%	K19309-266
R23, R44	1 megohm, 1/2 w., 10%	K19309-121
R24	120 ohms, 1/2 w., 5%	K19309-258
R25	39 ohms, 1/2 w., 5%	K19309-253
R26	Variable, 200 ohms, slot depth	K15368-7
R28, R43, R45,	220K ohms, 1/2 w., 10%	K19309-105
R48, R68, R71		
R30, R32, R37, R46, R76	470K ohms, 1/2 w., 10%	K19309-113
R85, R91, R93, R104		
R31, R33	68 ohms, 1/2 w., 10%	K19309-21
R34	560 ohms, 1/2 w., 10%	K19309-43
R35	1K ohms, 1w., 10%	K19310-49
R39	820 ohms, 1/2 w., 10%	K19309-47
R50	20 ohms, 1/2 w., 5%	K19309-188
R52	10 ohms, 1/2 w., 5%	K19309-246
R53	2K ohms, 10 w., 10%	K19337-5
R54	680 ohms, 1/2 w., 10%	K19309-45
R55	3K ohms, 1/2 w., 5%	K19309-212
R56	15K ohms, 1/2 w., 10%	K19309-77
R58	27K ohms, 2 w., 10%	K19304-52

<u>SCHEMATIC DESIGNATION</u>	<u>DESCRIPTION</u>	<u>HAMMARLUND PART NO.</u>
R59, R63, R69	2.2K ohms, 1/2 w., 10%	K19309-57
R60, R61, R66, R67	330K, ohms, 1/2 w., 10%	K19309-109
R65	270 ohms, 1/2 w., 10%	K19309-35
R77	27 ohms, 1/2 w., 10%	K19309-11
R78	Variable, 500K ohms, limiter includes 61	K15378-3
R79	Variable, 1 megohm, audio gain	K26218-3
R81	1.5K, 1 w., 10%	K19310-53
R88	4.7 megohms, 1/2 w., 10%	K19309-137
R89	6.2K ohms, 1/2 w., 5%	K19309-176
R90	3.6K ohms, 1/2 w., 5%	K19309-179
R92	5.6K ohms, 1/2 w., 10%	K19309-87
R94	68 ohms, 1/2 w., 5%	K19309-256
R96	4.7K ohms, 1/2 w., 10%	K19309-85
R102	2.2 megohm, 1/2 w., 10%	K19309-129
R103	13K ohms, 1 w., 10%	K19310-227
R105	11K ohms, 1/2 w., 5%	K19309-215

SWITCHES

S1	Noise Limiter ON-OFF (Part of R78)	
S2A	Switch Wafer, Ant. primary	K26472-3
S2B, C	Switch Wafer, Ant. sec. mixer grid	K26472-2
S2D	Switch Wafer, RF Plate	K26472-1
S2E, S2F, S2G	HF Oscillator Switch Assembly	K26480-1
S3	AC ON-OFF (Part of R6 and R15)	
S4	Send-Receive-Calibrate	K26452-1
S5	Selectivity	K26296-1
S6	Sideband	K26303-1
S7	AM-SSB/CW	K42037-2
S8	AVC	K26309-2

TRANSFORMERS

T1	Transformer, Mixer Plate 3035 and 455 KC	K26474-2
T2	IF Transformer, Crystal Grid	K26473-1
T3	IF Transformer, 355 Kcs	K38829-2
T4, T5	IF Transformer, 455 Kcs	K38946-1
T6, T7, T8, T9	IF Transformer, 60 KCS	K42005-1
T10, T11		
T12	Antenna Transformer, .54 to 1.05 Mcs	K26455-1
T13	Antenna Transformer, 1.05 to 2.05 Mcs	K26456-1
T14	Antenna Transformer, 2.05 to 4.04 Mcs	K26457-1
T15	Antenna Transformer, 4.0 to 7.85 Mcs	K26458-1
T16	Antenna Transformer, 7.85 to 15.35 Mcs	K26459-1

SCHEMATIC
DESIGNATION

DESCRIPTION

HAMMARLUND
PART NO.

T17	Antenna Transformer, 15.35 to 30 Mcs	K26460-1
T19	RF Transformer, .54-1.05 and 1.05-2.05 mcs	K26461-1
T20	RF Transformer, 2.05-4.04 and 4.0-7.85 mcs	K26462-1
T21	RF Transformer, 7.85-15.35 and 15.35-30 mcs	K26463-1
T23	Osc Coils .54 to 1.05 and 1.05 to 2.05 mcs	K26464-1
T24	Osc Coil 2.05 to 4.04 Mcs	K26465-1
T25	Osc Coil 4.0 to 7.85 mcs	K26466-1
T26	Osc Coil 7.85 to 15.35 mcs	K26467-1
T27	Osc Coil 15.35 to 30 mcs	K26468-1
T28	BPO Transformer, 60 Kcs	K42005-4
T29	Audio Output Transformer	K38828-1
T30	Power Transformer 117 V.A.C.	P26305-1
T30E	Power Transformer 115-230 V Export Model	P26305-2

MISCELLANEOUS

E1	Fuse, holder	K15923-1
F1	Fuse, 3 Amp. type 3 AGC	K15928-8
I1, I2, I3	Lamp, pilot No. 47, 6.3 V. .15A	K16004-1
J1	External Relay Receptacle	K35013-1
J2	Phone Jack	K35608-1
J3	Antenna Connector, SO-239	K16111-1

OPTIONAL ACCESSORIES

Telechron Clock Assembly Conversion
Kits including instructions for converting
model HQ-180 to Model HQ-180C are listed
as follows:

24 Hour Clock Kit (115V/230V - 50 cycles)
24 Hour Clock Kit (115V/230V - 60 cycles)
Loudspeaker assembly in cabinet
matched to the Models HQ-180, HQ-180C
and HQ-180E

PL26380-G3
PL26380-G4
PL26394-G1

ADDENDA TO PARTS LIST
FOR HQ-180XE

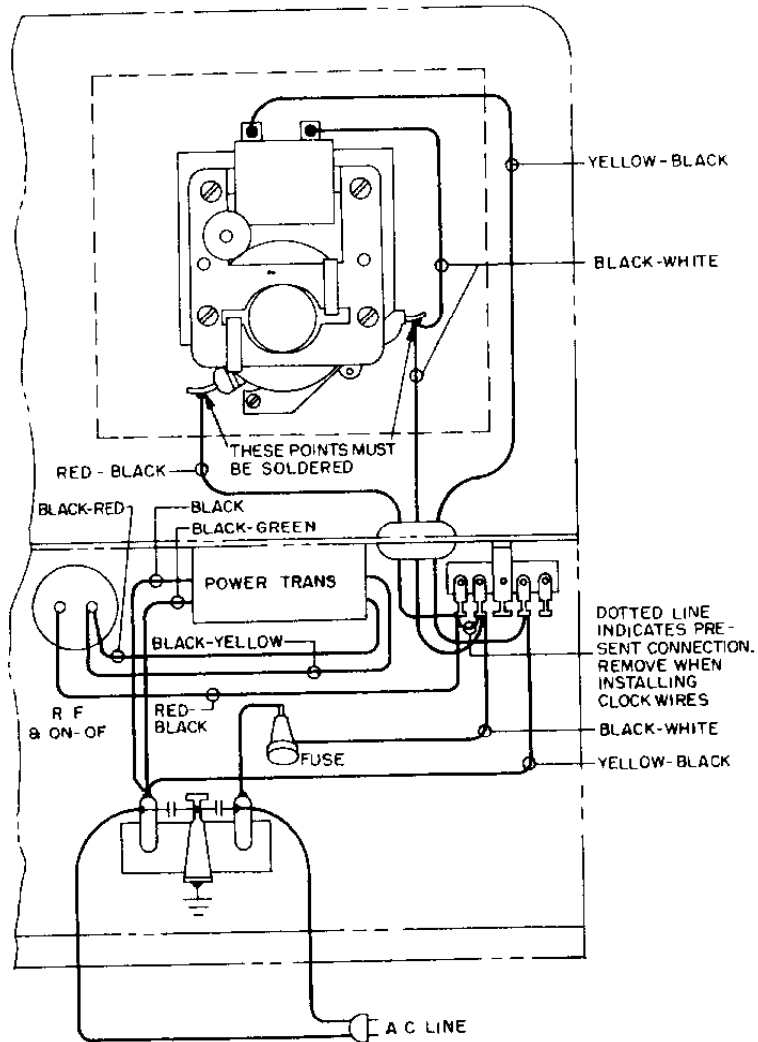
<u>SCHEMATIC DESIGNATION</u>	<u>DESCRIPTION</u>	<u>HAMMARLUND PART NO.</u>
C158	Cap Fixed, Electrolytic, 200 mfd, 25V DC NP	K23925-1
C159	Cap Fixed, Dur-Mica DM-15, 25 mmf ± 5%, 500V	K23006-142
C160	Cap Fixed, Ceramic Disc, .005 mfd -80 - 20%, 500V	M23034-37
CR1	Diode, Silicon (in 1490)	K41212-1
K1	Relay, Amps	K40404-1
R108	Res. 100K ohms, 1/2 w., ± 10%	K19309-97
R109	Res. 62K ohms, 1/2 w., ± 5%	K19309-183
R110	Res. 16K ohms, 1/2 w., ± 5%	K19309-217
R111	Res. 22 ohms, 1 w., ± 10%	K19310-9
S9	Switch, Crystal Selector	K39145-1

ADDENDA TO PARTS LIST
FOR HQ-180A

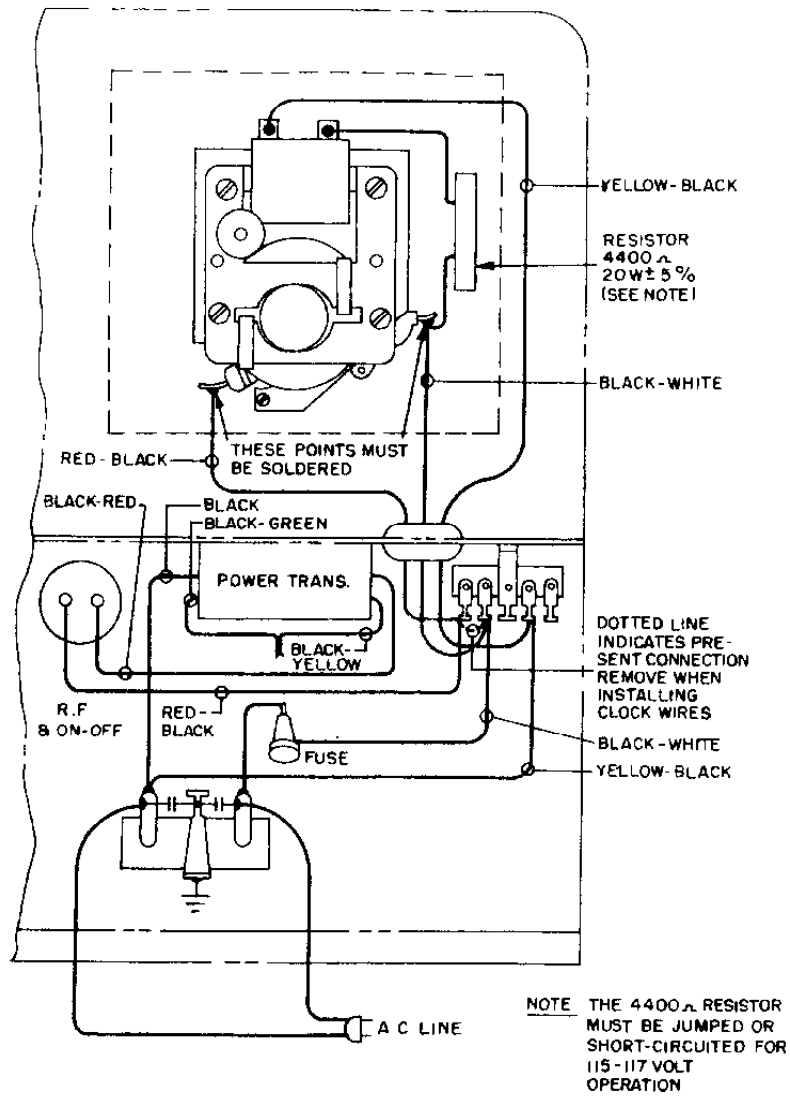
<u>SCHEMATIC DESIGNATION</u>	<u>DESCRIPTION</u>	<u>HAMMARLUND PART NO.</u>
CR2, CR3	Rectifier, Silicon (CER72C) 800 PIV, 255	M41215-3
F1	Fuse, 1-1/2 Amp Type 3 AGC for 50-60 Cycles 230V operation	K15928-6
J1	Socket (8 pin) (System Socket)	K16083-1
J4	Connector Female (Accessory Socket)	K41138-1
S2E, F, G	HF Oscillator Switch Assem.	K26480-1
S7	Switch (AM-SSB-CW)	K52033-1
T18	Power Transformer	P26305-4
T22	Filament Transformer	K39224-2
T29	Output Transformer	K38828-2
C161	Capacitor, Fixed, Dur-Mica DM-15, 47 mmf, 300V	K23006-47

ADDENDA TO PARTS LIST
FOR HQ-180AX

<u>SCHEMATIC DESIGNATION</u>	<u>DESCRIPTION</u>	<u>HAMMARLUND PART NO.</u>
CR2, CR3	Rectifier, Silicon (CER72C) 800 PIV, 255	M41215-3
F1	Fuse 1-1/2 Amp Type 3 AGC for 50-60 Cycles 230V Operation	K15928-6
J1	Socket (8 pin) (System Socket)	K16083-1
J4	Connector Female (Accessory Socket)	K41138-1
S2E, F, G	HF Oscillator Switch Assem.	K26480-1
S7	Switch (AM-SSB-CW)	K52033-1
T18	Power Transformer	P26305-4
T22	Filament Transformer	K39224-2
T29	Output Transformer	K38828-2
C161	Capacitor, Fixed, Dur-Mica DM-15, 47 mmf, 300V	K23006-47



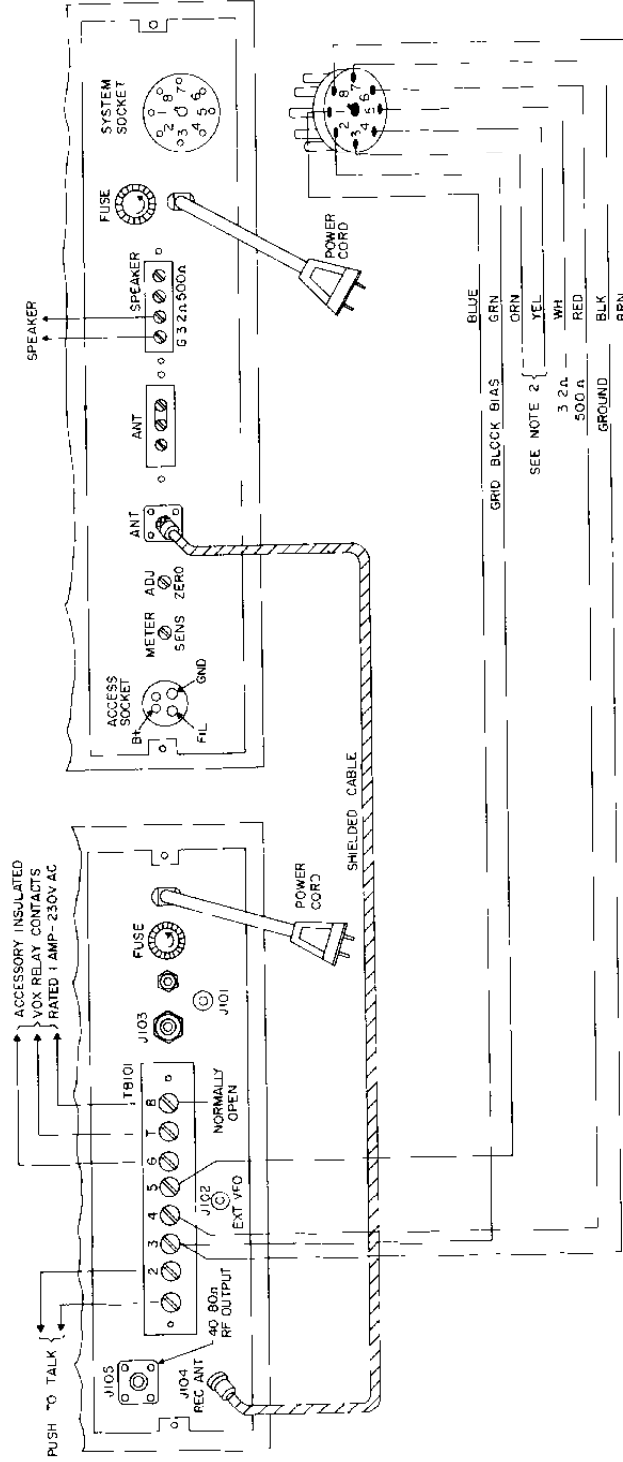
**CLOCK INSTALLATION HQ-170 & HQ-180
115V 50 OR 60~**



**CLOCK INSTALLATION HQ-170 & HQ-180
230V 50 OR 60 ~**

HX-50 TRANSMITTER

HQ-180A RECEIVER

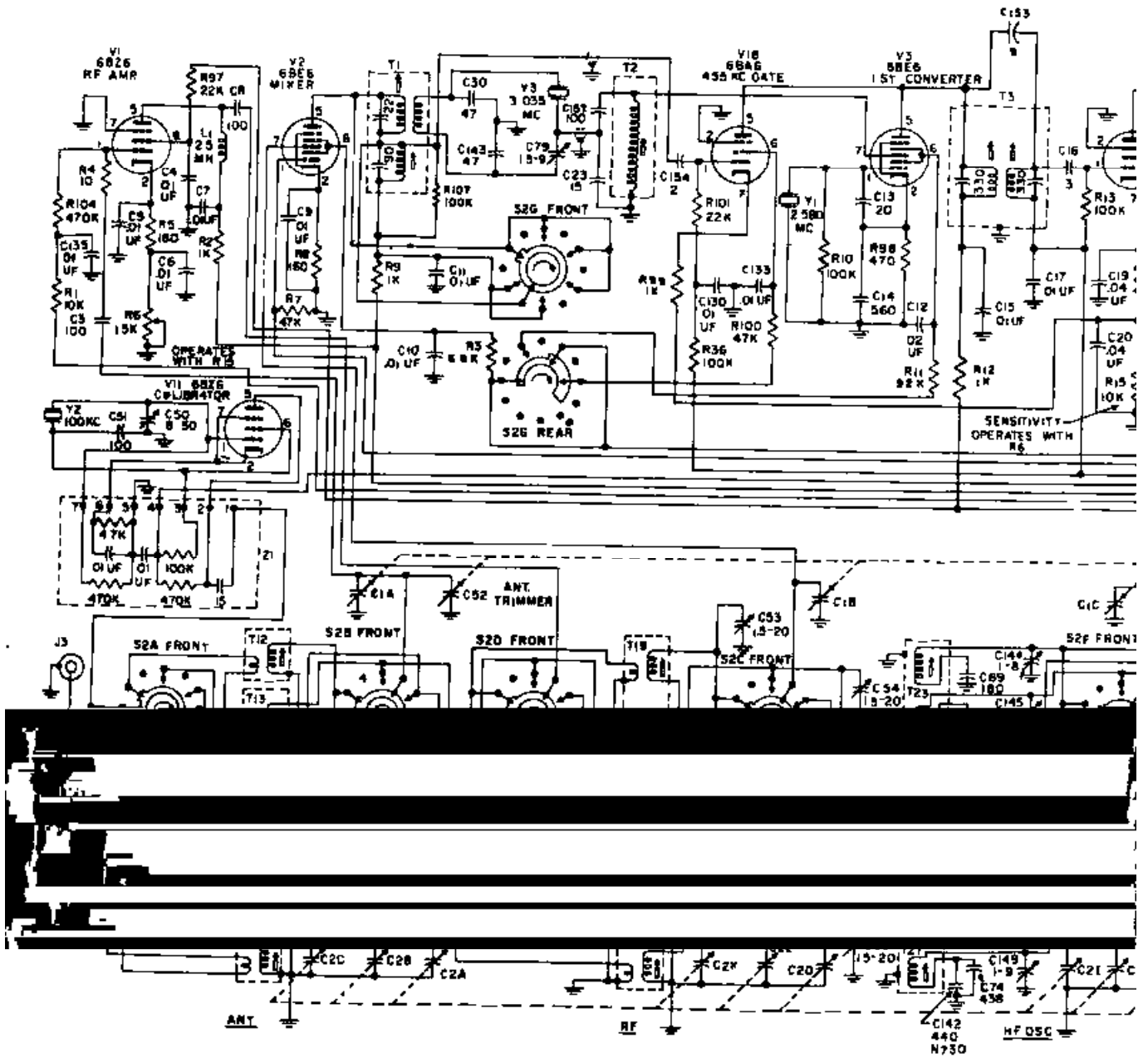


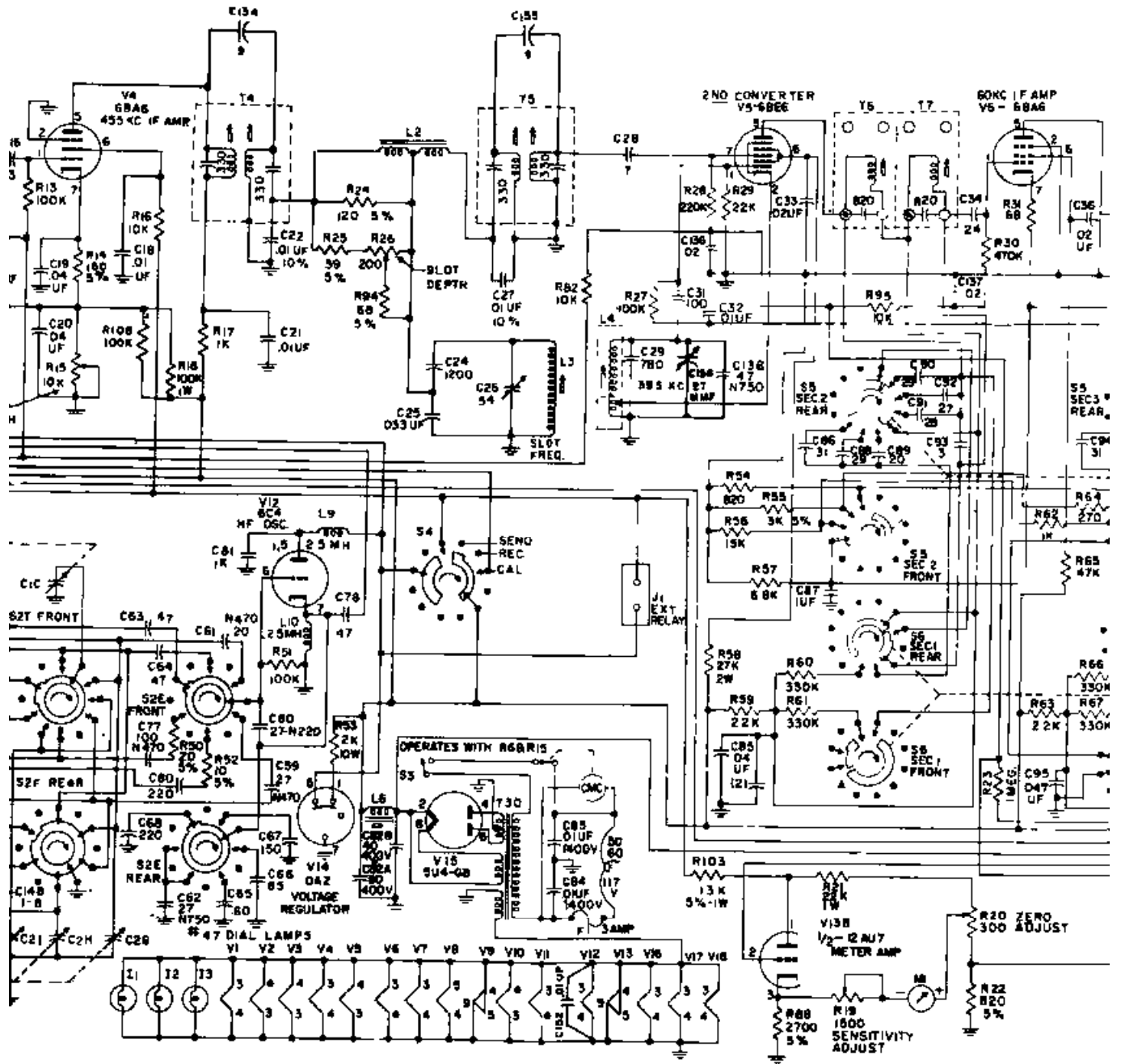
NOTES

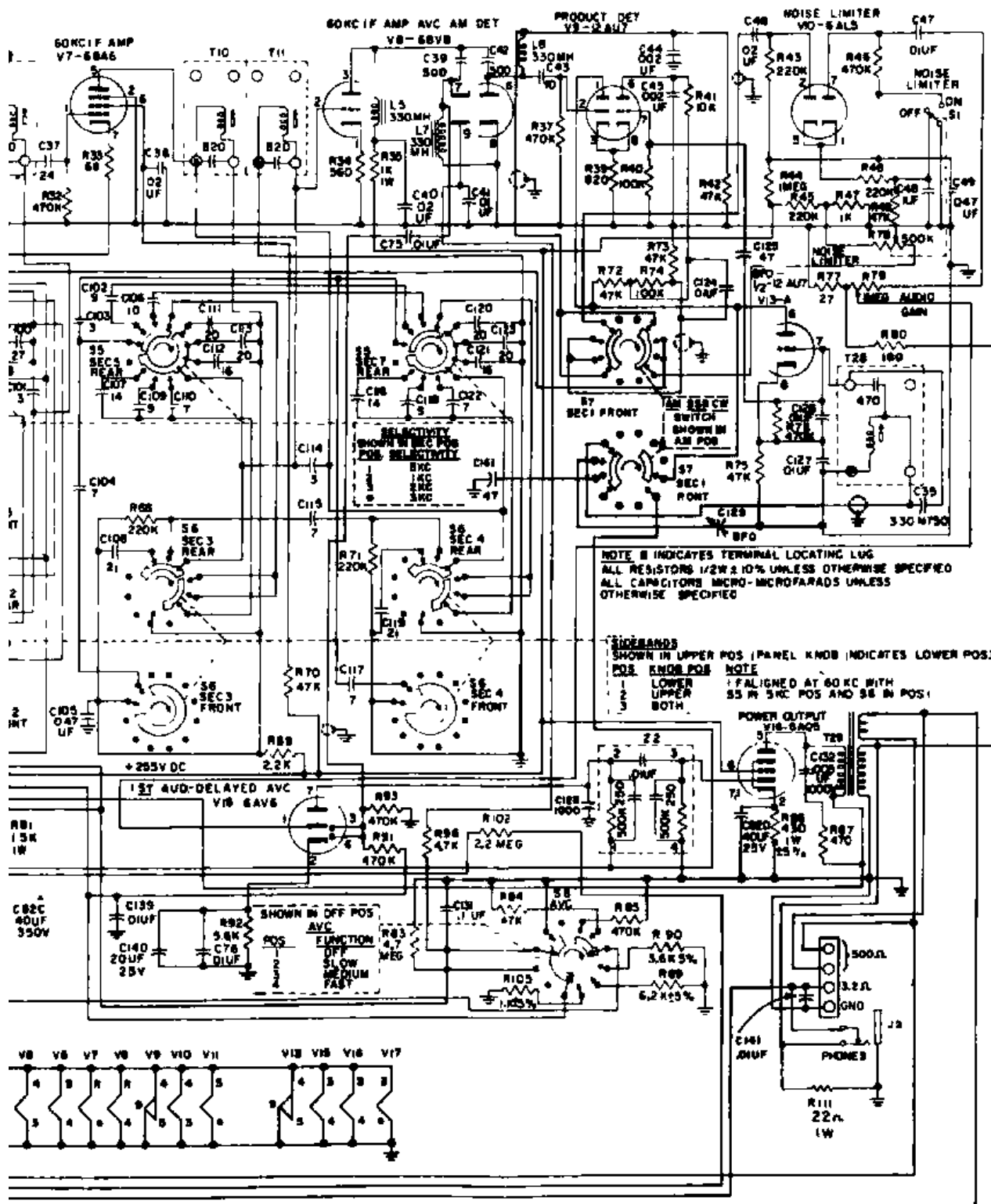
- 1 HOOK UP SHOWN IS USING GRID BLOCK BIAS TO THE HQ-180 AX
- 2 IF RELAY SWITCHING IS DESIRED
 - a DISCONNECT GRID BLOCK BIAS (GREEN LEAD) FROM PIN 5 OF TB101
 - b WIRE ORANGE LEAD TO PIN T AND YELLOW LEAD TO PIN B
- 3 IF GRID BLOCK BIAS IS USED, RELAY CONTACTS, PINS 6 & 7 ON HX-50 MAY BE USED FOR OTHER FUNCTIONS. THESE ARE NORMALLY CLOSED

- 4 WHEN USING VOX CONTROL OF THE HX-50 TRANSMITTER, PIN 101 OF THE HQ 180A OR HQ180AX RECEIVERS SYSTEM SOCKET SHOULD BE CONNECTED TO PIN NO 3 OF HX-50 TERMINAL BOARD AS SHOWN IN DIAGRAM

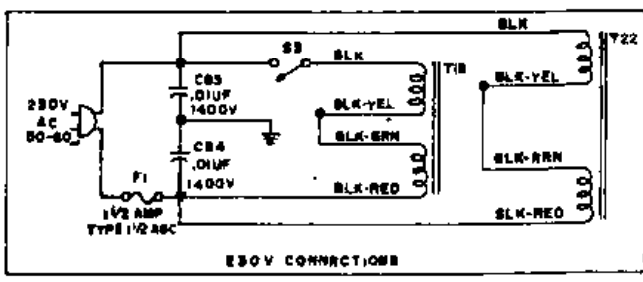
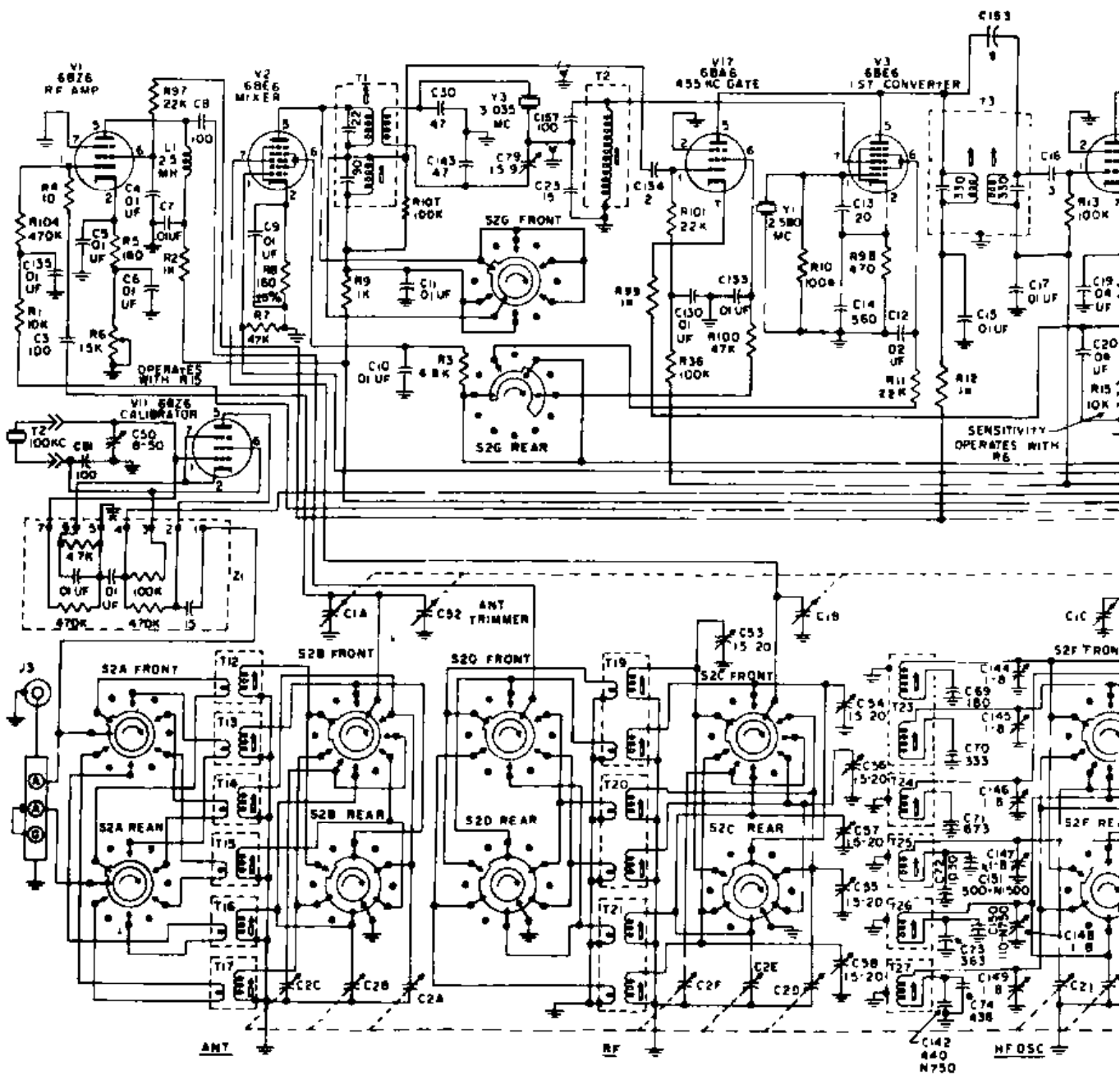
SUGGESTED INTERCONNECTIONS
(HX 50 HQ-180 AX)

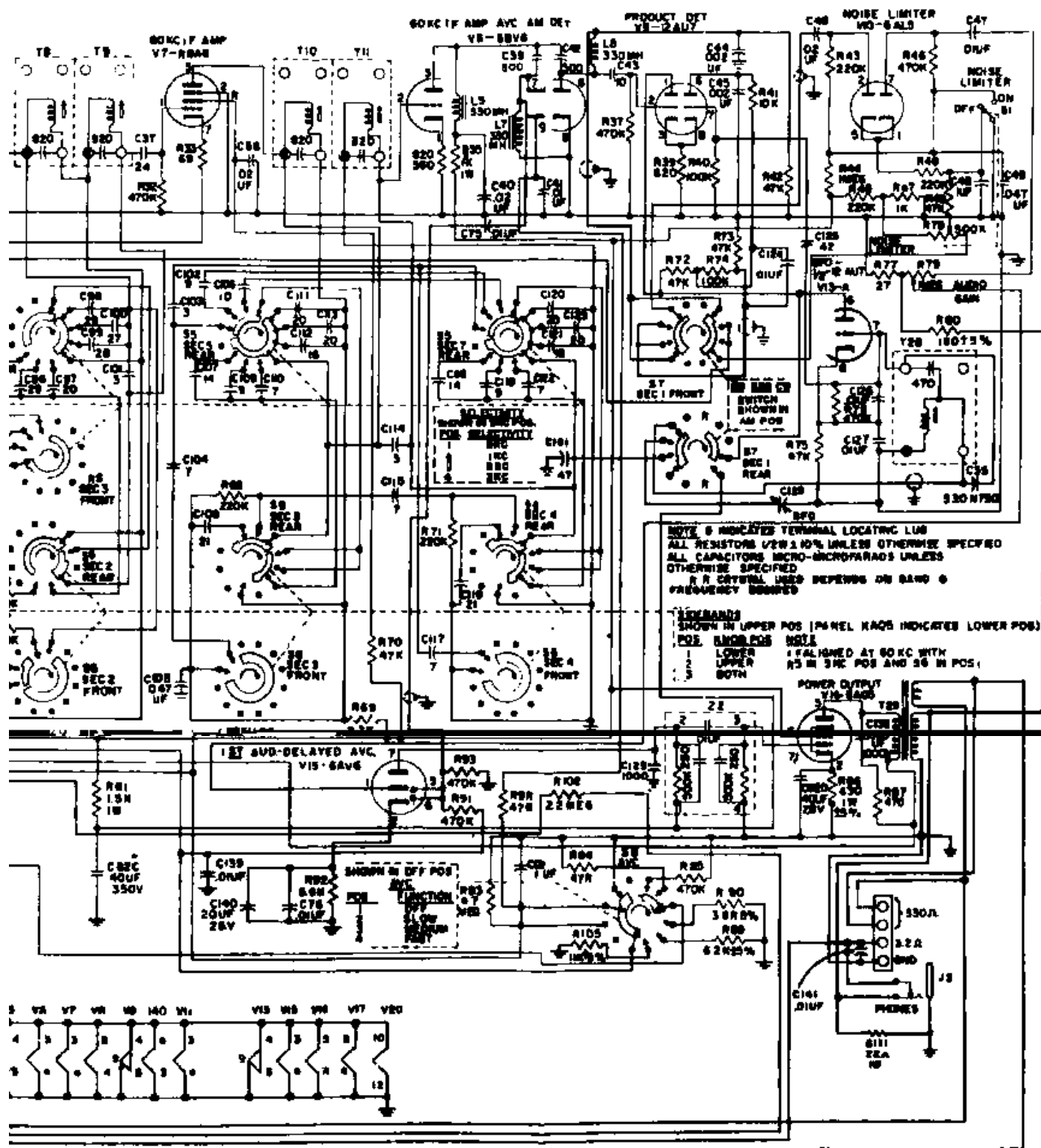




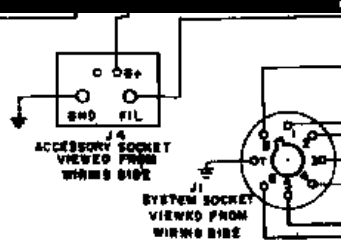
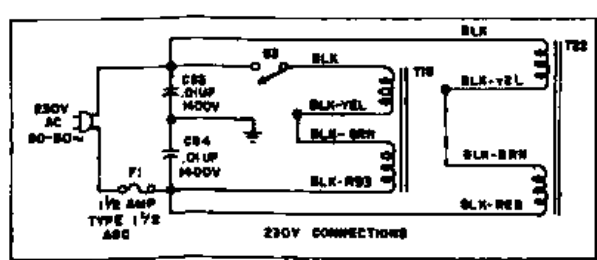
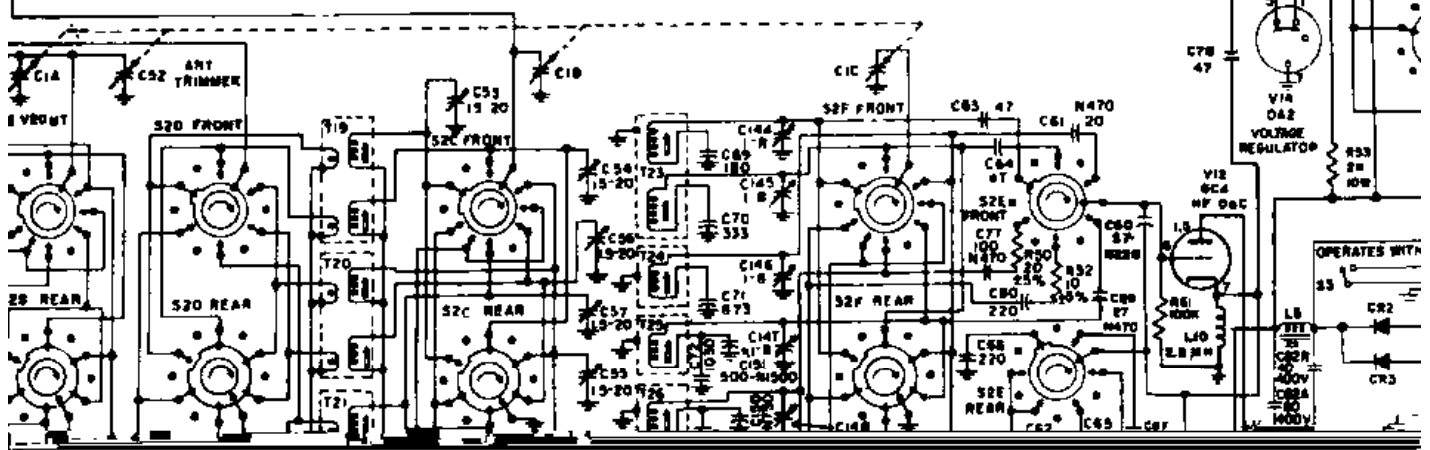
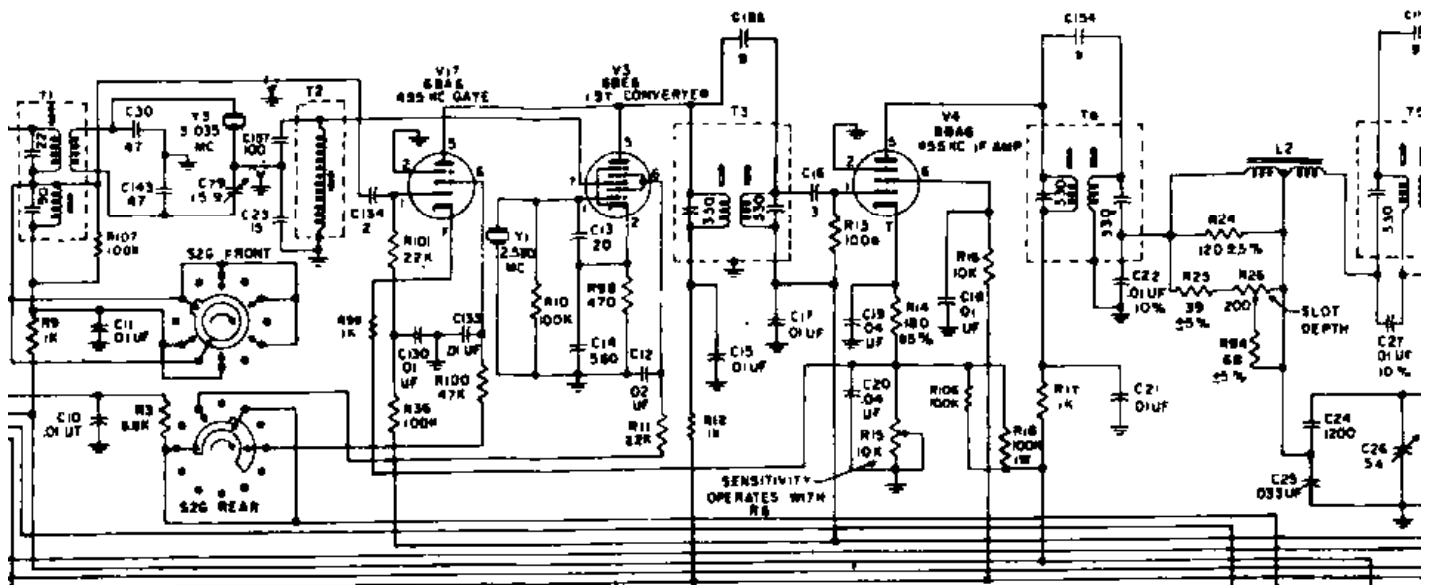


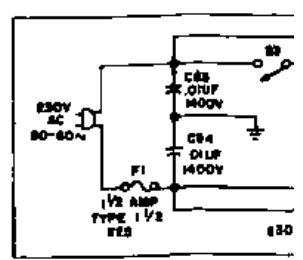
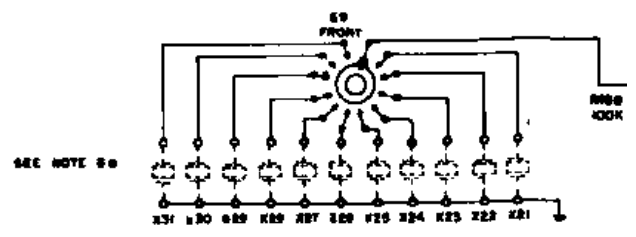
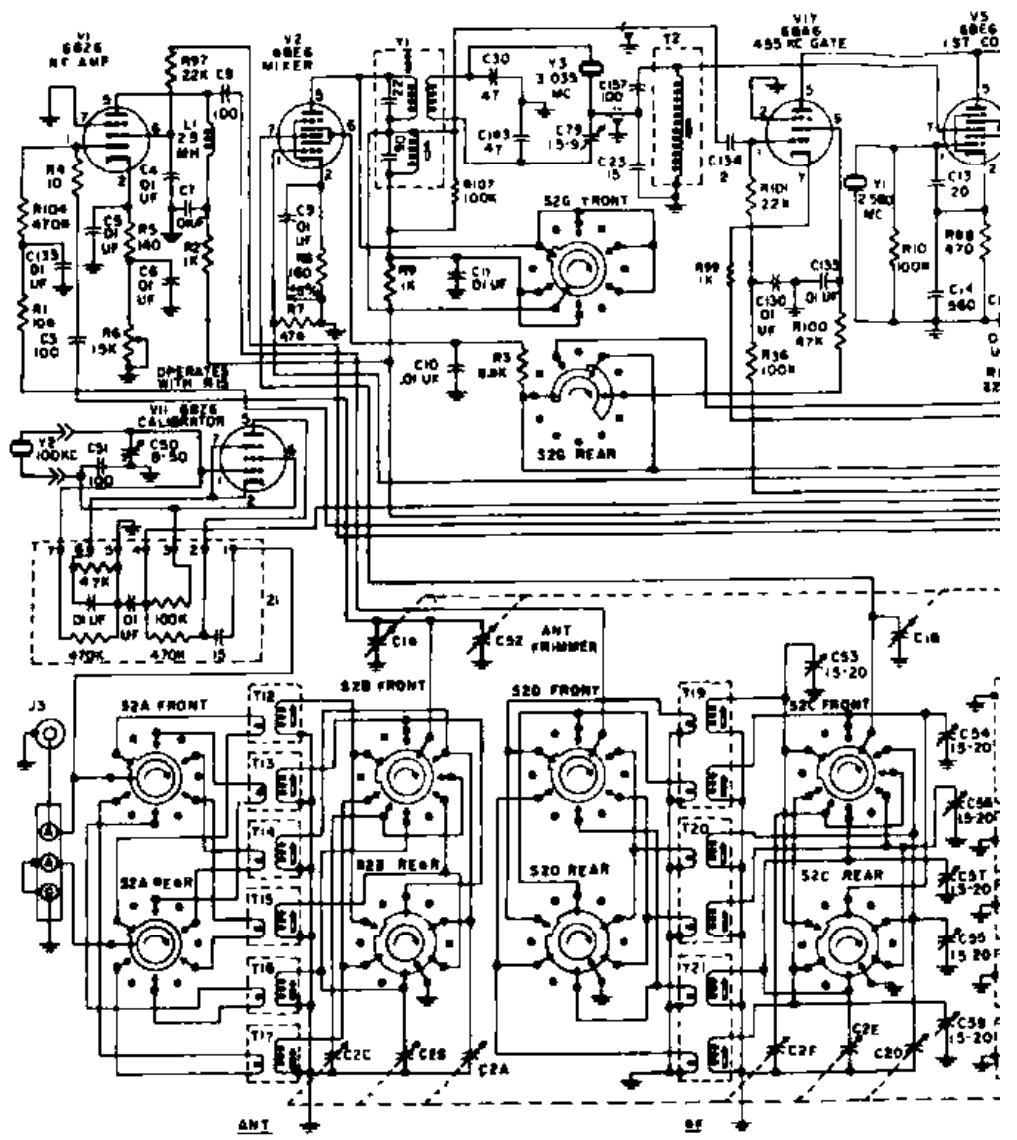
SCHMATIC DIAGRAM, HQ-180A

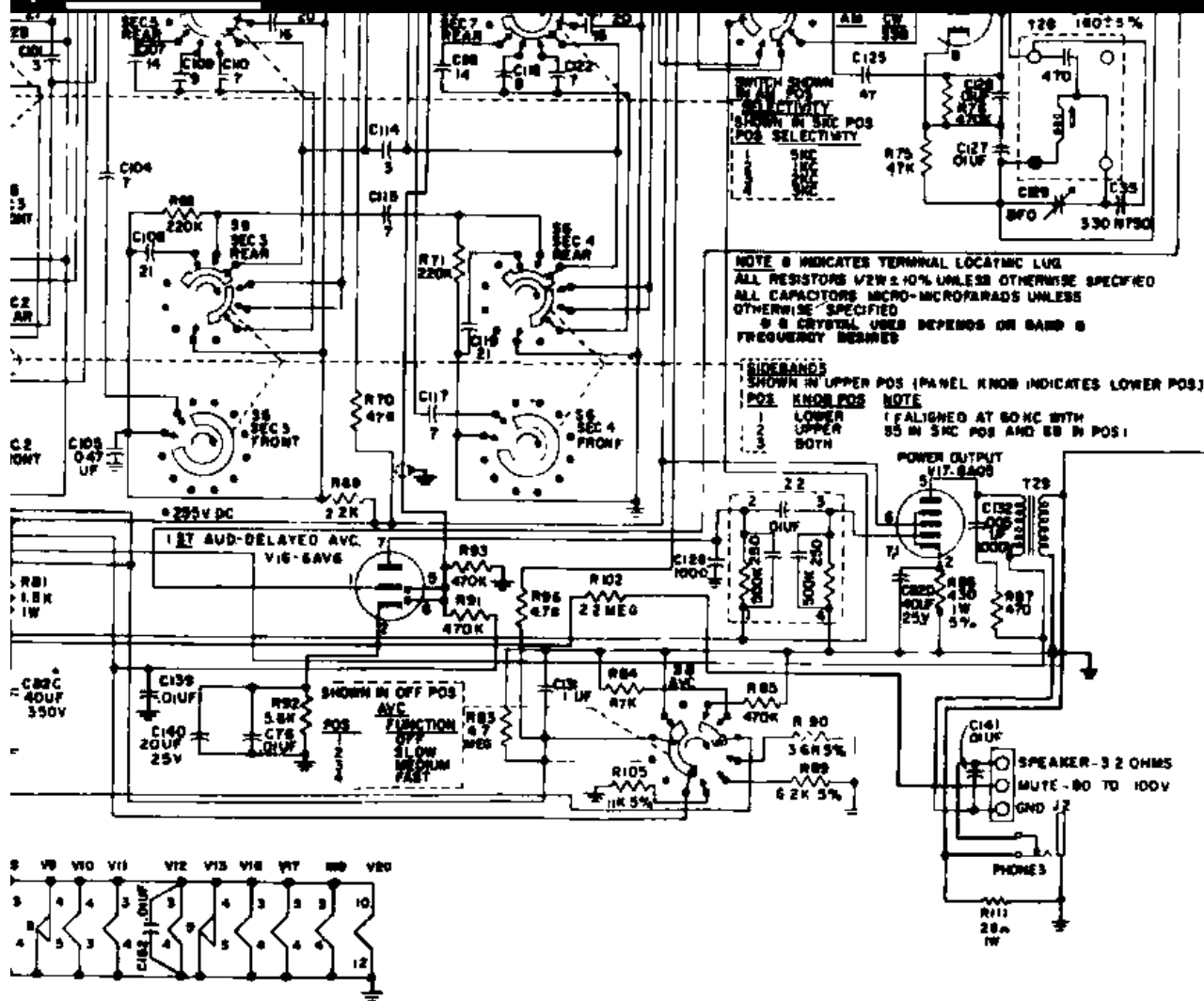
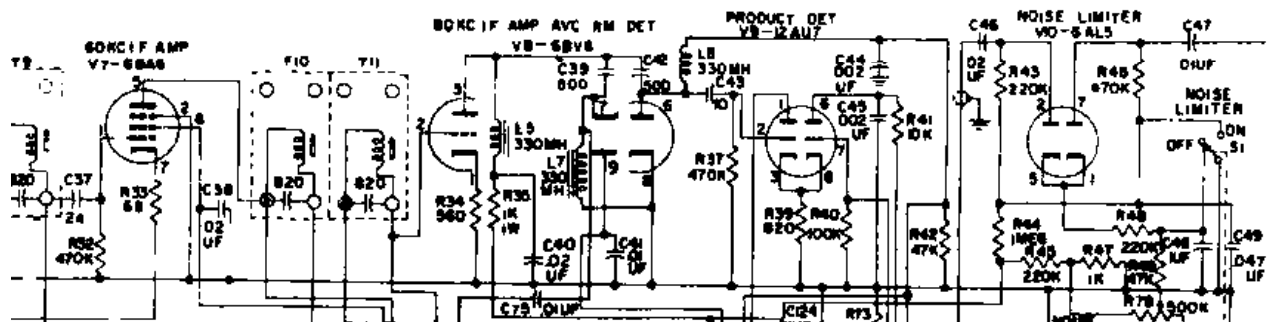




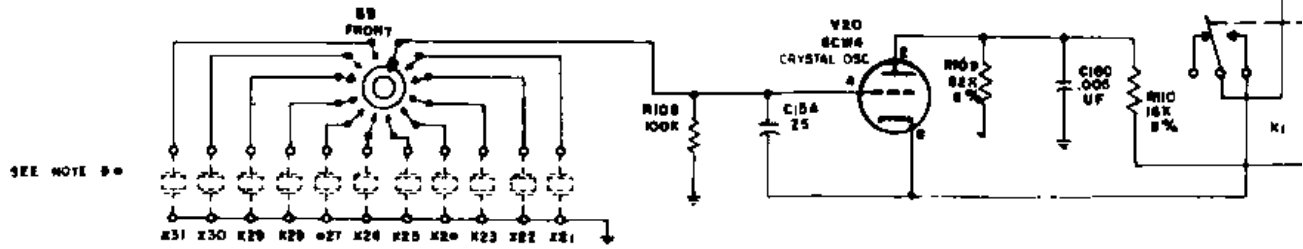
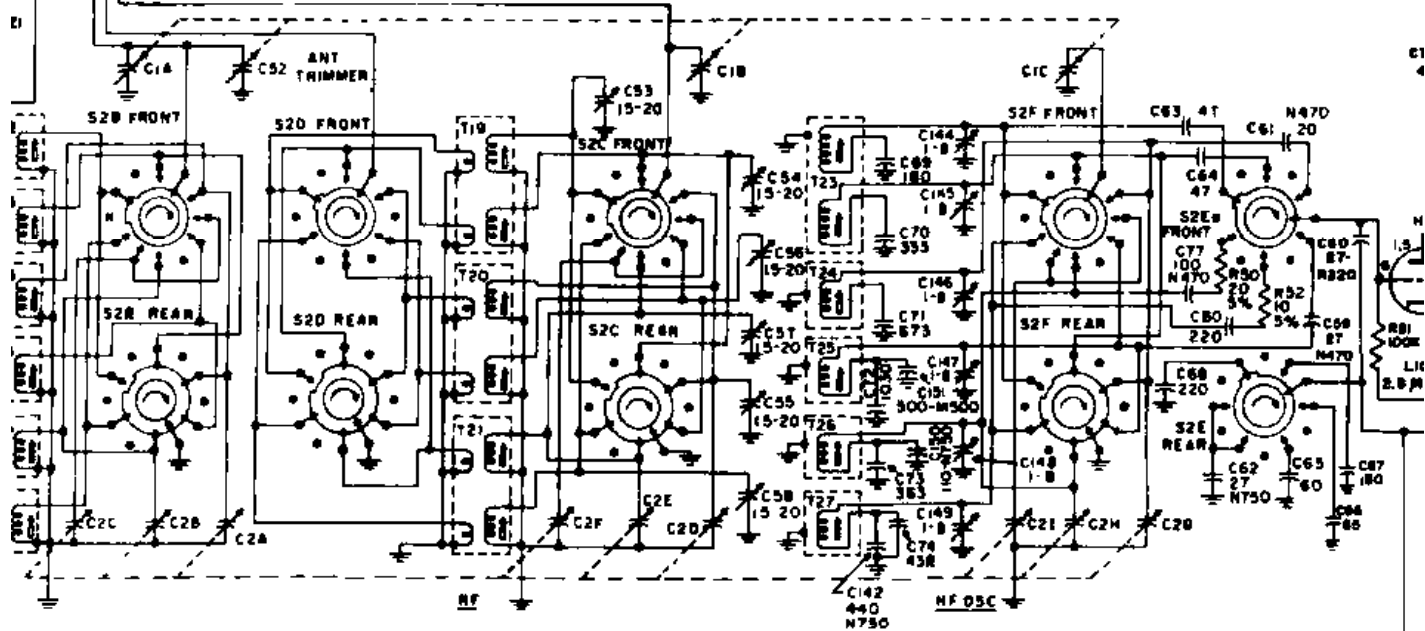
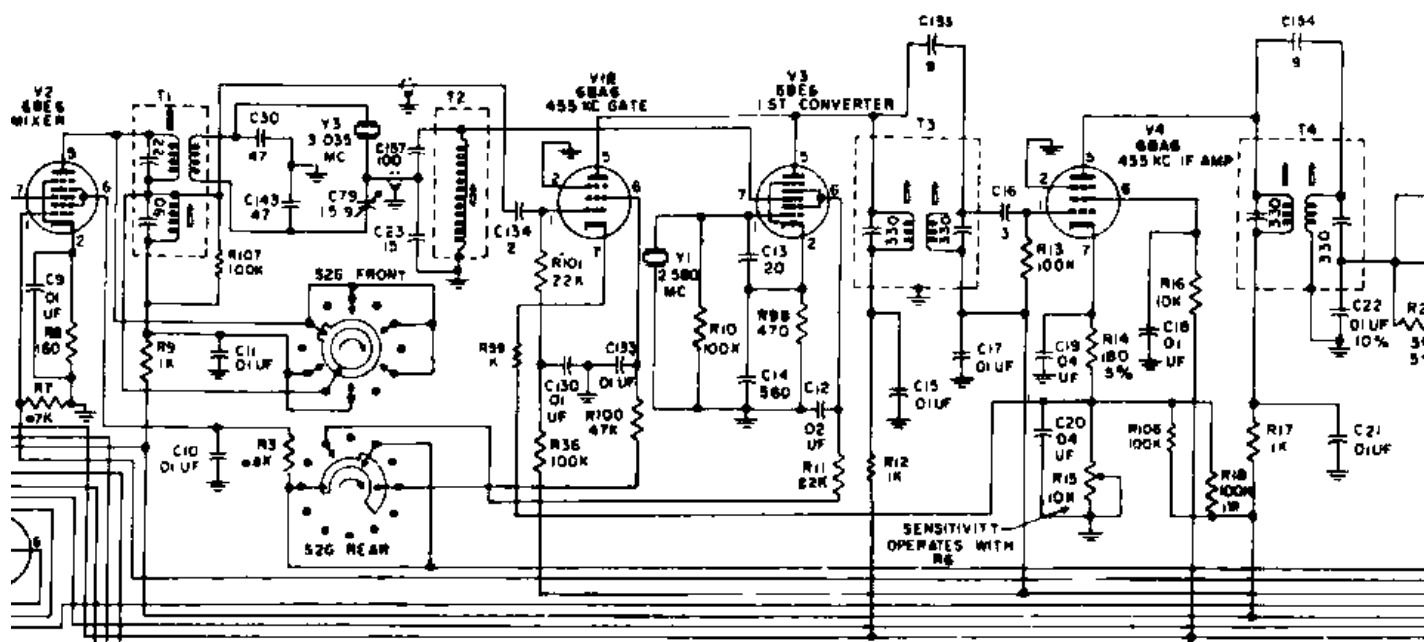
SCHMATIC DIAGRAM, HQ-180AX







SCHEMATIC DIAGRAM, HQ-180XE



SEE NOTE 9

- X31 X30 X29 X28 X27 X26 X25 X24 X23 X22 X21

