INSTALLATION AND OPERATING INSTRUCTIONS
HX-50 CODE #5 MODIFICATION KIT #9004-14-00001

INTRODUCTION

This Instruction Sheet contains all the necessary information for Installation of the Code #5 Modification Kit and changes to the Technical Description and Operating Instructions Manual. Prior to installation of the Code #5 modification, Code #4 modifications must be incorporated.

INSTALLATION

Step 1. Locate resistor R133 (470 Ω 1/2W) between pin 7 of V105 and ground and replace with a 430 uh choke. (L123)

2. Locate capacitor C193 (1000 pf button feed thru) next to neutralizing control, under final amplifier. Remove capacitor C193 and existing buss wire on T21 and C189. Install new buss wire between T21 and C189. Connect one end of 500 pf disc-ceramic capacitor to buss wire and the other end to the chassis.
3. Locate resistor R172 (15K Ω 2W) on terminal board TB3, near V108 and parallel with a 10K Ω 2W resistor. (R220)
4. Locate blue wire between pin 6 of V107 and coil K102 and replace with a 7K Ω 5W resistor. (R219)
5. Locate resistor R142 (3900 Ω 1W) near power transformer, between TB8 and bias control and parallel with a 1000 Ω 1W resistor. (R217)
6. Locate resistor R212 (180 Ω 1/2W) on TB2 near V108 and replace with a 22 Ω 1/2W resistor.
7. Locate resistor R213 (1500 Ω 1/2W) between pin 8 of V107 to ground and replace with 680 Ω 1/2W resistor.
   NOTE: After modification, measure idle current and change 680 Ω to 1000 Ω if over 3 MA.
8. Locate resistor R214 (91K Ω 2W) on TB2 near V108 and replace with two 25K Ω 5W resistors.
   NOTE: This may also be replaced with one 50K Ω 10W resistor.
9. Locate resistor R174 (1000 Ω 1W) and replace with a 470 Ω 2W resistor.
10. Locate the blue wire between L113 (2.5 mh) and the bias source (junction of R172, R220 and R177) on TB3. Remove this blue wire and install the 15" blue wire (furnished with the kit) from L113 to the arm of R143 (Bias adjust). Remove the jumper installed between the arm of R143 and the end of the pot which has the blue wire running to the bias source on TB3.
11. Mount a single lug tie strip so that the lug is near pin 5 of V109. Label this lug TB9.
12. Disconnect the three red wires from pin 5 of V109 and reconnect them to TB9.
13. Locate capacitor C162C and disconnect the two white/red wires. Re-route the one that comes from TB7 (junction of R141 and R157) and reconnect it to pin 5 of V109. Cut the other wire close to where it enters the cable.
14. Locate resistor R156 (4.7 Ω 2W) on TB2 near V108 and remove from unit.
15. Remove white/red wire from TB2 and cut it back to where it enters the cable.

16. Remove the 5R4 tube from its socket. Disconnect the yellow filament wires from socket pins 2 and 8 and tape the ends. Add four F10 diodes and four 680K 1/2W resistors to the underside of the 5R4 tube socket as shown on the drawing, taking care to keep clear of J103.
17. Add R218 a 12K ohm 10W resistor from C162B to TB9.
18. Add Zener Diode from TB9 to ground.
NOTE: Connect cathode end of Zener Diode to TB9.

After this modification has been completed, re-neutralization of the final amplifier and readjustment of the bias control is recommended. Refer to section 7-10 in the manual for re-neutralization of the final amplifier. Refer to sections 3-15 and 7-3 in the manual for readjustment of the BIAS CONTROL.

CHANGES TO TECHNICAL DESCRIPTION AND OPERATING INSTRUCTIONS MANUAL.

PAGE 14 CW TUNING

Change sub-paragraph 4-3-3 to read as follows:

Set METER switch to OUTPUT LEVEL and adjust the PA TUNING and PA LOAD controls for maximum meter deflection. (As the final amplifier stage is tuned, it will be necessary to re-adjust the METER SENS. control to keep the pointer on scale). Return the METER control to PA CATHODE and adjust the RF drive for 225 MA PA CATHODE current, except 10 meter operation where it should read 150 MA.

Change sub-paragraph 4-3-4 to read as follows:

If necessary, re-adjust the RF DRIVE level and repeat the above tuning procedure until the PA TUNING and PA LOAD controls are set for maximum output (meter switch to OUTPUT LEVEL) while maintaining the PA cathode current at 225 MA.

In sub-paragraph 4-3-5, change RF output level at the 180 MA to read 225 MA.

PAGE 15 SSB TUNING

Change sub-paragraph 4-4-1 to read as follows:

Tune up the transmitter to a PA CATHODE CURRENT of 250 MA, (except on 10 meters where the limit is 200 MA), then set the METER SENS. control for 0 db reference on the OUTPUT LEVEL position.

Change sub-paragraph 4-4-3 to read as follows:

While monitoring the transmission on the OUTPUT LEVEL meter, adjust the AF

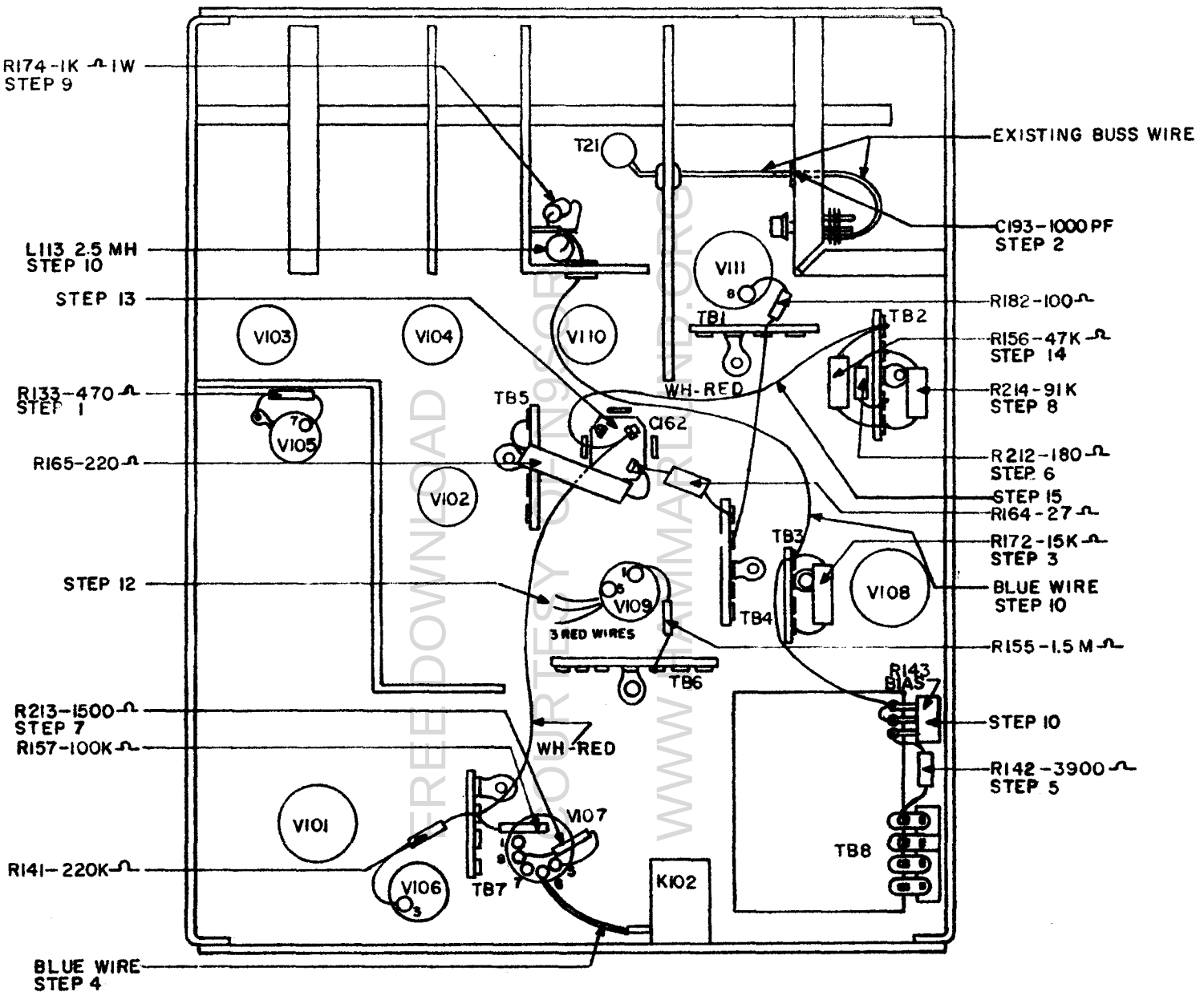
LEVEL control for the required audio gain which does not produce peak flattening or overload distortion of the output signal. Note: The output meter damping factor prevents the output level meter from indicating 0 db reference on voice peaks. The meter will indicate approximately 1/2 to 3/4 full scale with voice excitation. A higher reading may cause distortion.

The transmitter should then be talked up to an indicated plate current of 150 MA. Since the meter movement indicates average current, the peak (or instantaneous) values will be approximately twice that value. As the high voltage applied to the PA stage is in the vicinity of 700 volts, the peak envelope power input will be 200 watts.

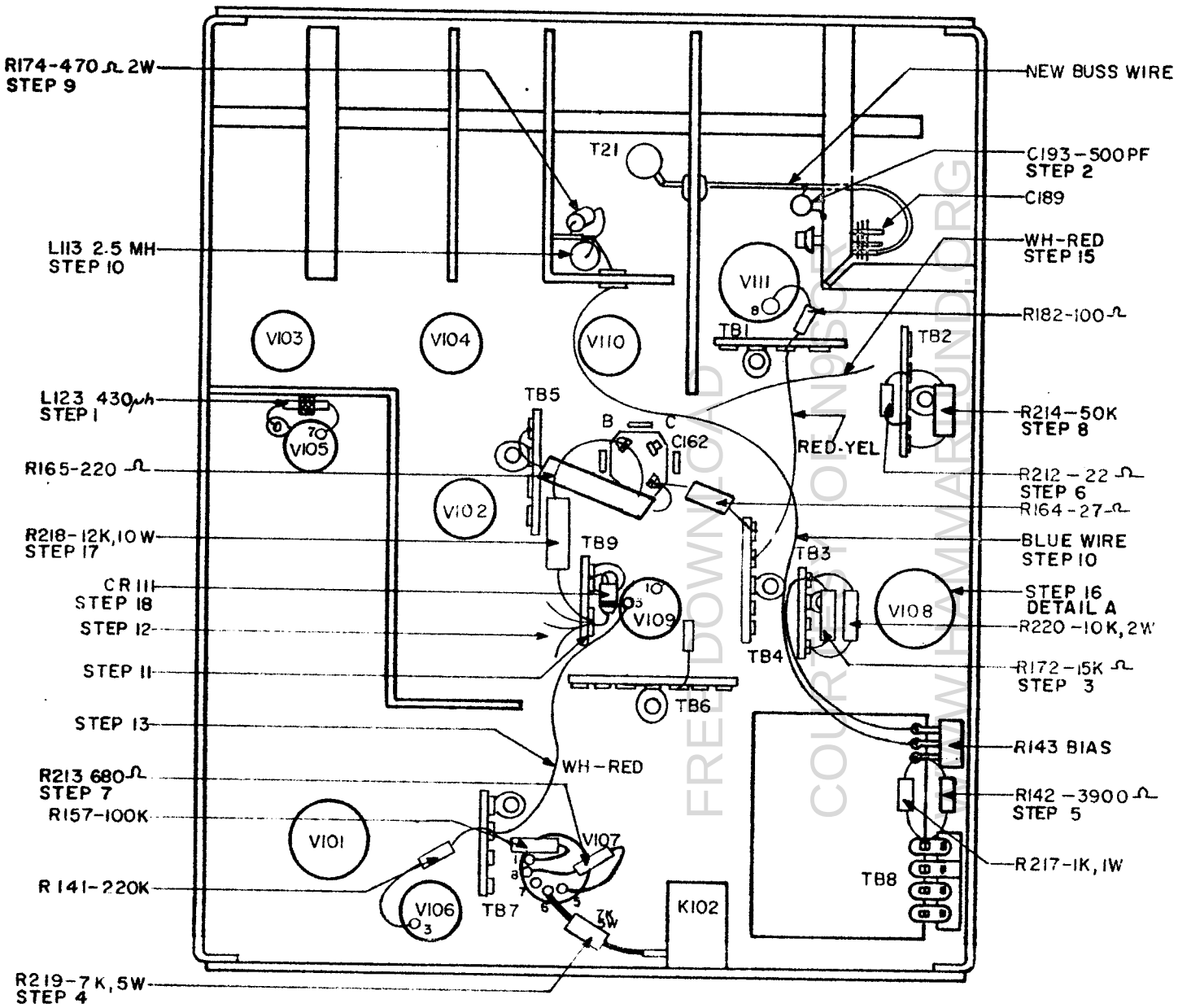
For best performance, all single sideband transmitters should be adjusted and loaded with the aid of an oscilloscope or similar instantaneous reading instrument. When such an instrument is available, a single tone input should produce a meter reading of 150 MA, as the output tuning and loading controls are adjusted for linear performance (no flattopping).

PARTS LIST

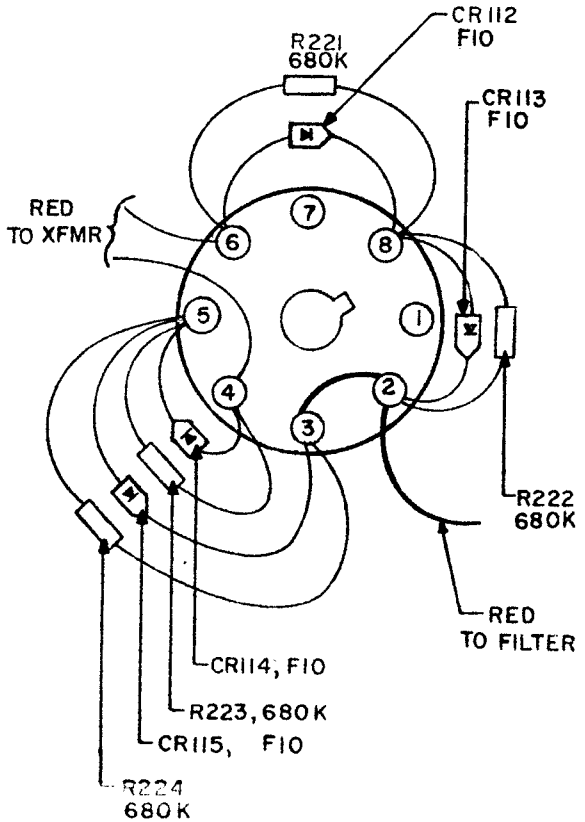
SCHEMATIC DESIGNATION	HAMMARLUND PART NO.	DESCRIPTION
C193	1509-01-01006	Capacitor, Disc Ceramic, 500 pf
CR111	4833-01-00002	Zener Diode
CR112, CR113, CR114, CR115	4808-01-00004	F10 Diode
L123	1803-01-00052	Choke 430 uh
R174	4705-01-00928	Resistor, 470 Ω, 2W, 10%
R212	4703-01-00312	Resistor, 22 Ω, 1/2W
R213	4703-01-00330	Resistor, 680 Ω, 1/2W
R214	4714-01-01014	Resistor, 25K, 10W
R217	4704-01-00632	Resistor, 1K, 1W
R218	4714-02-01013	Resistor, 12K, 10W
R219	4713-02-00004	Resistor, 7K, 5W
R220	4705-01-00944	Resistor, 10K, 2W
R221, R222, R223, R224	4703-01-00366	Resistor, 680K, 1/2W, 10%
TB9	2885-01-00024	Terminal Strip (1 Term.)
	6006-01-00024	Wire, #20 Red/Yellow 2" Lg.
	6003-01-00008	Wire, #14 Buss 5" Lg.
	6006-02-00166	Wire, #20 Blue 15" Lg.



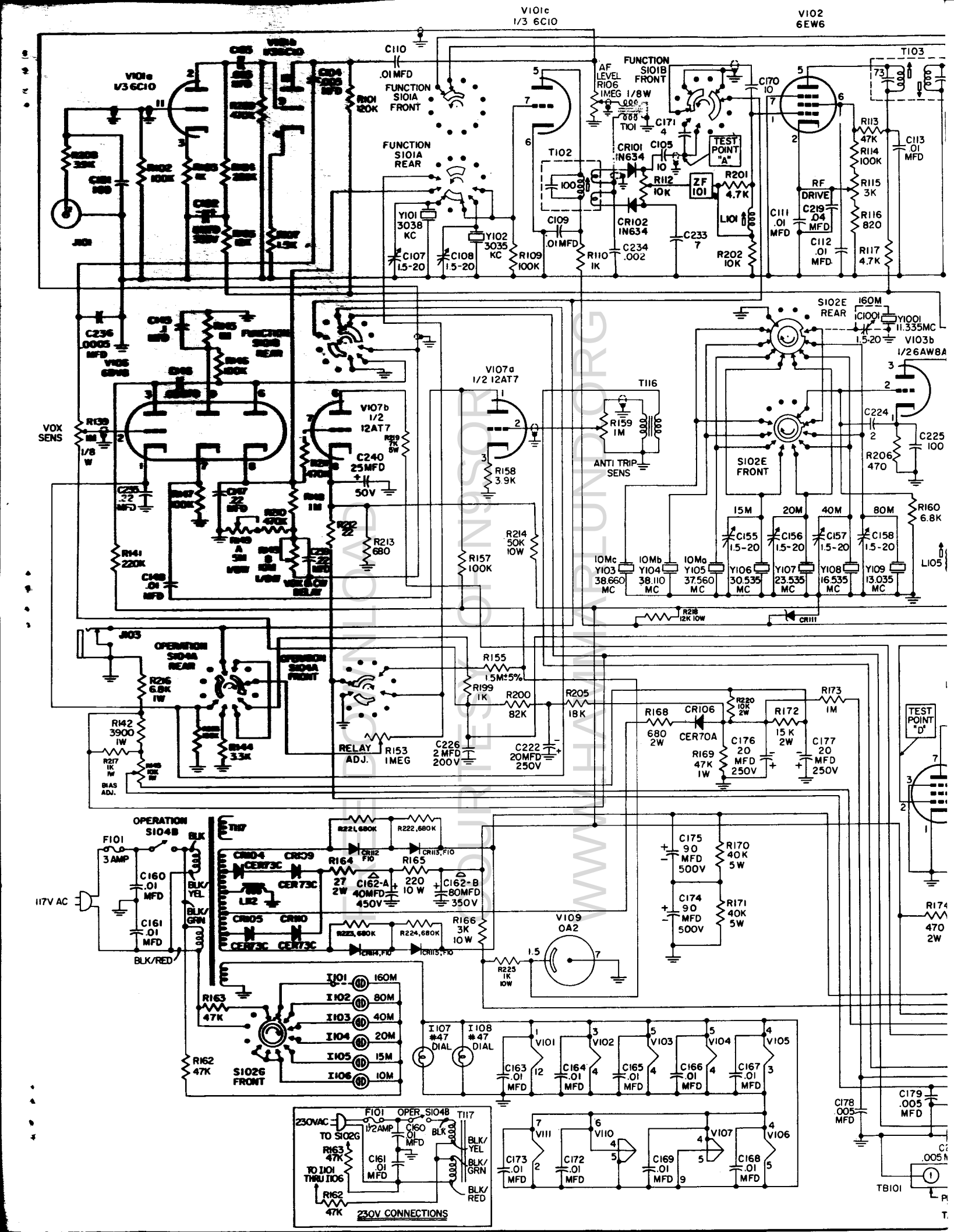
HX-50
BEFORE
CODE #5 MODIFICATION

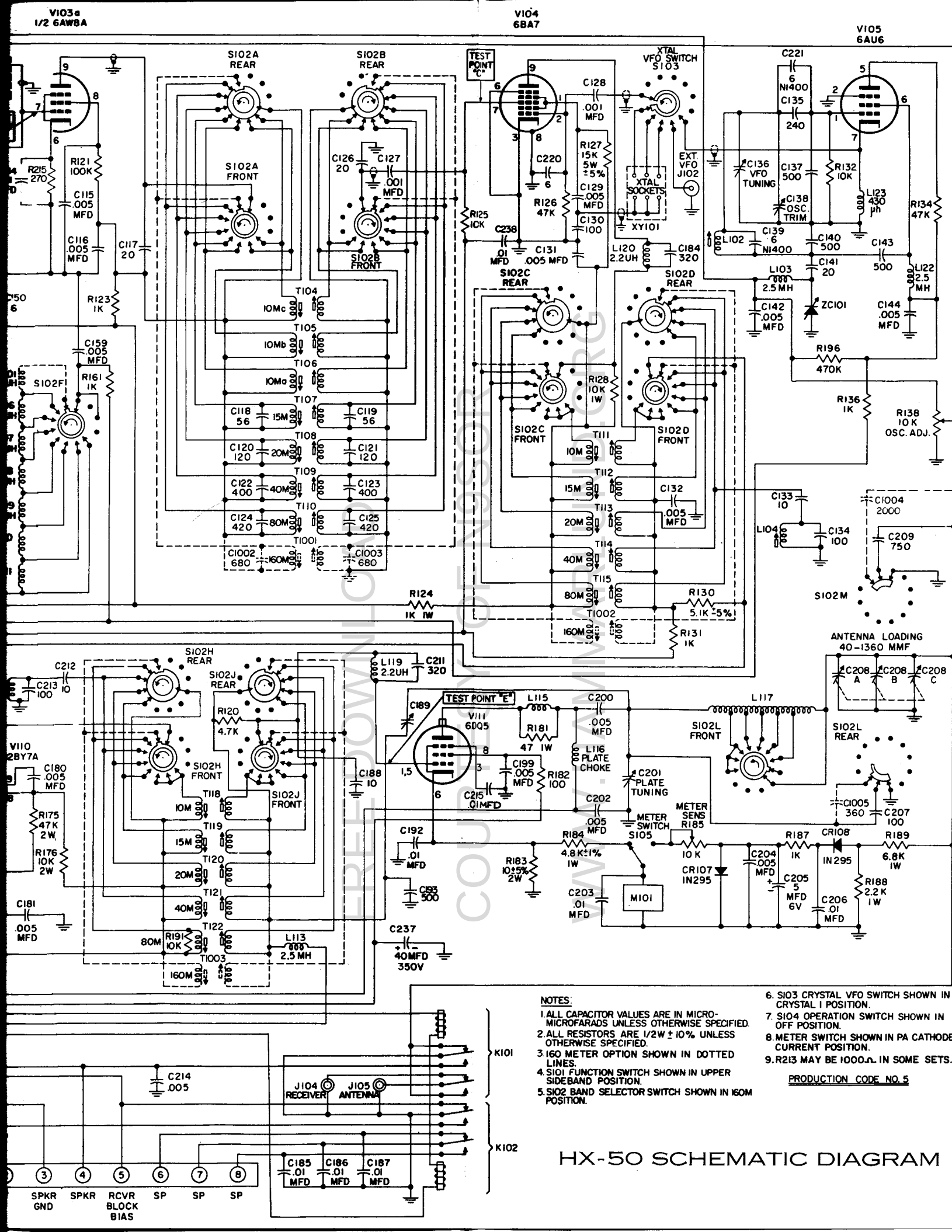


HX-50
AFTER
CODE #5 MODIFICATION



DETAIL A


V101c 1/3 6C10
V102 6EW6
V101a 1/3 6C10
V107a 1/2 12AT7
V107b 1/2 12AT7
V103b 1/26AW8A
T103
T102
T116
C110 .01 MFD
FUNCTION S101A FRONT
FUNCTION S101A REAR
FUNCTION S101B FRONT
AF LEVEL R106 1MEG 1/8W
TEST POINT "A"
TEST POINT "D"
CR101 1N634
CR102 1N634
ZF 101
RF DRIVE
R101 120K
R109 100K
R110 1K
R112 10K
R201 4.7K
R202 10K
R113 47K
R114 100K
R115 3K
R116 820
R117 4.7K
C105 10
C109 .01MFD
C111 .01 MFD
C112 .01 MFD
C113 .01 MFD
C170 10
C171 4
C219 .04 MFD
C233 7
C234 .002
Y101 3038 KC
Y102 3035 KC
C107 1.5-20
C108 1.5-20
L101
S102E REAR
S102E FRONT
160M
Y1001 11.335MC
C1001 1.5-20
C224
C225 100
R206 470
R160 6.8K
15M
20M
40M
80M
C155 1.5-20
C156 1.5-20
C157 1.5-20
C158 1.5-20
10Mc Y103 38.660 MC
10Mb Y104 38.110 MC
10Ma Y105 37.560 MC
Y106 30.535 MC
Y107 23.535 MC
Y108 16.535 MC
Y109 13.035 MC
L105
R218 12K 10W
CR111
VOX SENS R139 1M 1/8 W
C236 .0005 MFD
C240 25MFD 50V
R219 7K 5W
R158 3.9K
ANTI TRIP SENS
R159 1M
R157 100K
R214 50K 10W
R213 680
R141 220K
C148 .01 MFD
C235 .22 MFD
R142 3900 1W
R144 3.3K
R217 1K 1W
BIAS ADJ.
J103
OPERATION S104A REAR
OPERATION S104A FRONT
R216 6.8K 1W
RELAY ADJ.
R153 1MEG
R155 1.5M±5%
R199 1K
R200 82K
R205 18K
C226 2 MFD 200V
C222 20MFD 250V
R168 680 2W
CR106 CER70A
R220 10K 2W
R172 15K 2W
R173 1M
R169 47K 1W
C176 20 MFD 250V
C177 20 MFD 250V
OPERATION S104B
F101 3 AMP
117V AC
C160 .01 MFD
C161 .01 MFD
BLK
BLK/YEL
BLK/GRN
BLK/RED
T117
CR104 CER73C
CR109 CER73C
CR105 CER73C
CR110 CER73C
LI12
R221 680K
R222 680K
R223 680K
R224 680K
CR112 F10
CR113 F10
CR114 F10
CR115 F10
R164 27 2W
R165 220 10W
C162-A 40MFD 450V
C162-B 80MFD 350V
R166 3K 10W
R225 1K 10W
V109 0A2
C175 90 MFD 500V
C174 90 MFD 500V
R170 40K 5W
R171 40K 5W
R174 470 2W
R163 47K
R162 47K
S102G FRONT
I101 160M
I102 80M
I103 40M
I104 20M
I105 15M
I106 10M
I107 #47 DIAL
I108 #47 DIAL
V101 V102 V103 V104 V105
V108 V110 V107 V106
C163 .01 MFD
C164 .01 MFD
C165 .01 MFD
C166 .01 MFD
C167 .01 MFD
C173 .01 MFD
C172 .01 MFD
C169 .01 MFD
C168 .01 MFD
C178 .005 MFD
C179 .005 MFD
TB101
230VAC
TO S102G
TO I101 THRU I106
230V CONNECTIONS



NOTES:

1. ALL CAPACITOR VALUES ARE IN MICRO-MICROFARADS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS ARE 1/2W ± 10% UNLESS OTHERWISE SPECIFIED.
3. 160 METER OPTION SHOWN IN DOTTED LINES.
4. S101 FUNCTION SWITCH SHOWN IN UPPER SIDEBAND POSITION.
5. S102 BAND SELECTOR SWITCH SHOWN IN 160M POSITION.
6. S103 CRYSTAL VFO SWITCH SHOWN IN CRYSTAL I POSITION.
7. S104 OPERATION SWITCH SHOWN IN OFF POSITION.
8. METER SWITCH SHOWN IN PA CATHODE CURRENT POSITION.
9. R213 MAY BE 1000Ω IN SOME SETS.

PRODUCTION CODE NO. 5

HX-50 SCHEMATIC DIAGRAM