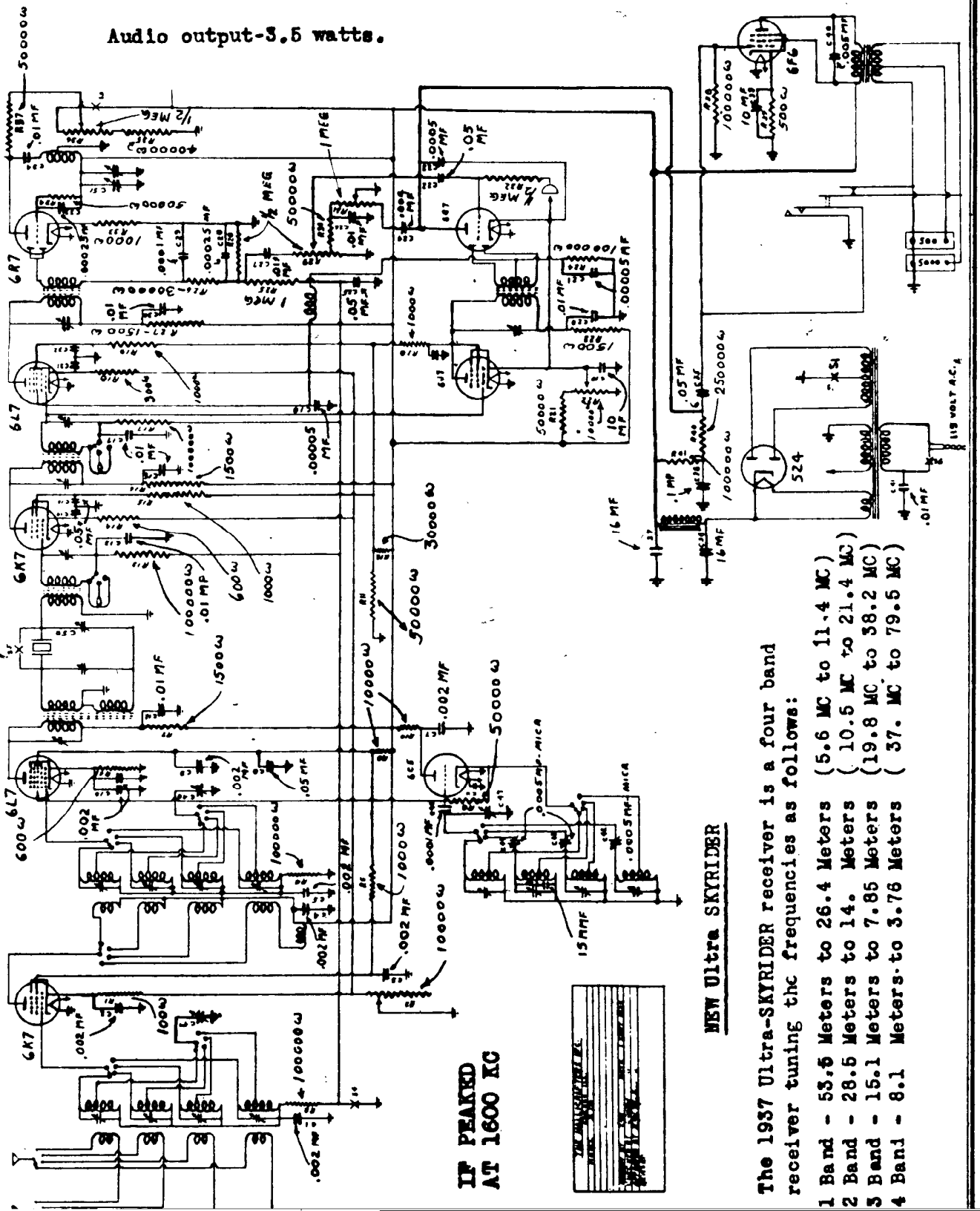
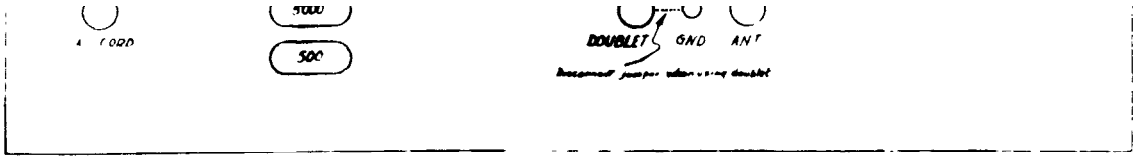
HALLICRAFTERS; INC.

MODEL S-10
Ultra Skyrider
Schematic



MODEL S-10

Socket, Trimmers



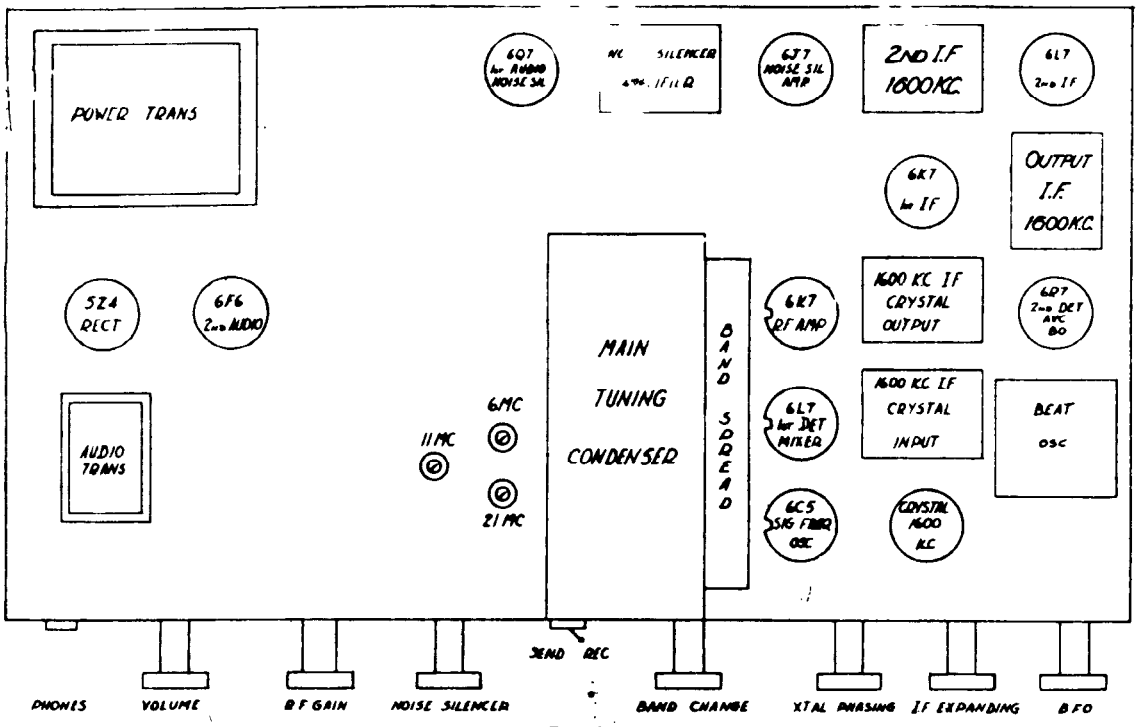


FIG. 4

The tubes used are ten of the METAL types as follows:-

6K7 - RF Amplifier - Pre-Selector
6L7 - 1st Detector - Mixer
6C5 - Signal Frequency Oscillator
6K7 - IF Amp lifier
6L7 - 2nd IF
6R7 - 2nd Detector - AVC - Beat Osc
6J7 - Noise Silencer Amp.
6Q7 - 1s t udio - Noise Silencer
6F6 - 2nd Audio Power Output Stage
5Z4 - Rectifier

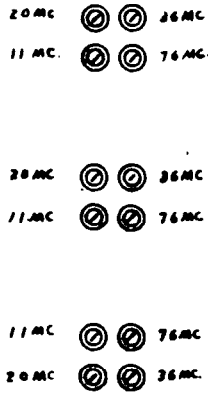
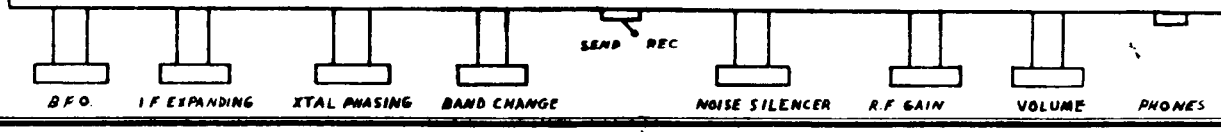
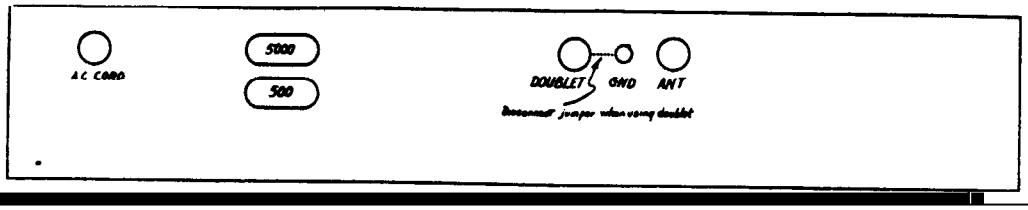


FIG. 5




A.C. CORD
5000
500
DOUBLET
GND
ANT
Disconnect jumper when using doublet

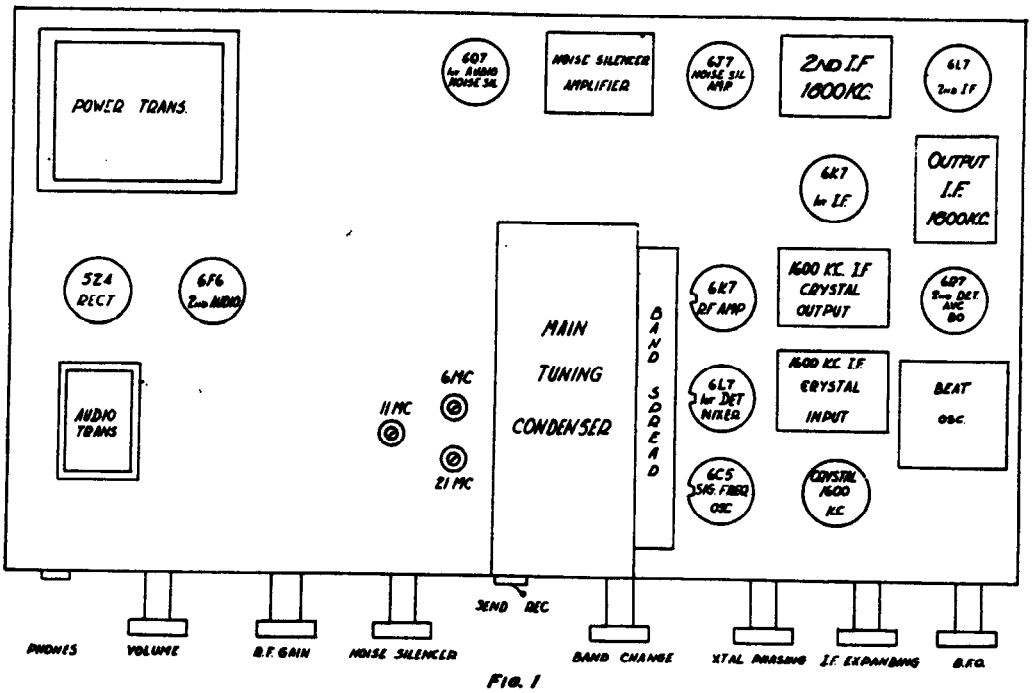

POWER TRANS.
6Q7 1st AUDIO NOISE SIL
NOISE SILENCER AMPLIFIER
6J7 NOISE SIL AMP
2ND I.F. 1600 KC.
6L7 2nd I.F.
OUTPUT I.F. 1600 KC.
6K7 1st I.F.
5Z4 RECT.
6F6 2nd AUDIO
MAIN TUNING CONDENSER
BAND SPREAD
6K7 R.F. AMP
1600 KC. I.F. CRYSTAL OUTPUT
6Q7 2nd DET. AMC AVC
AUDIO TRANS.
6MC
11MC
21 MC
6L7 1st DET MIXER
1600 KC. I.F. CRYSTAL INPUT
BEAT OSC.
6C5 SAG. FREQ OSC.
CRYSTAL 1600 KC.
SEND REC
PHONES
VOLUME
R.F. GAIN
NOISE SILENCER
BAND CHANGE
XTAL PHASING
I.F. EXPANDING
B.F.O.

FIG. 1

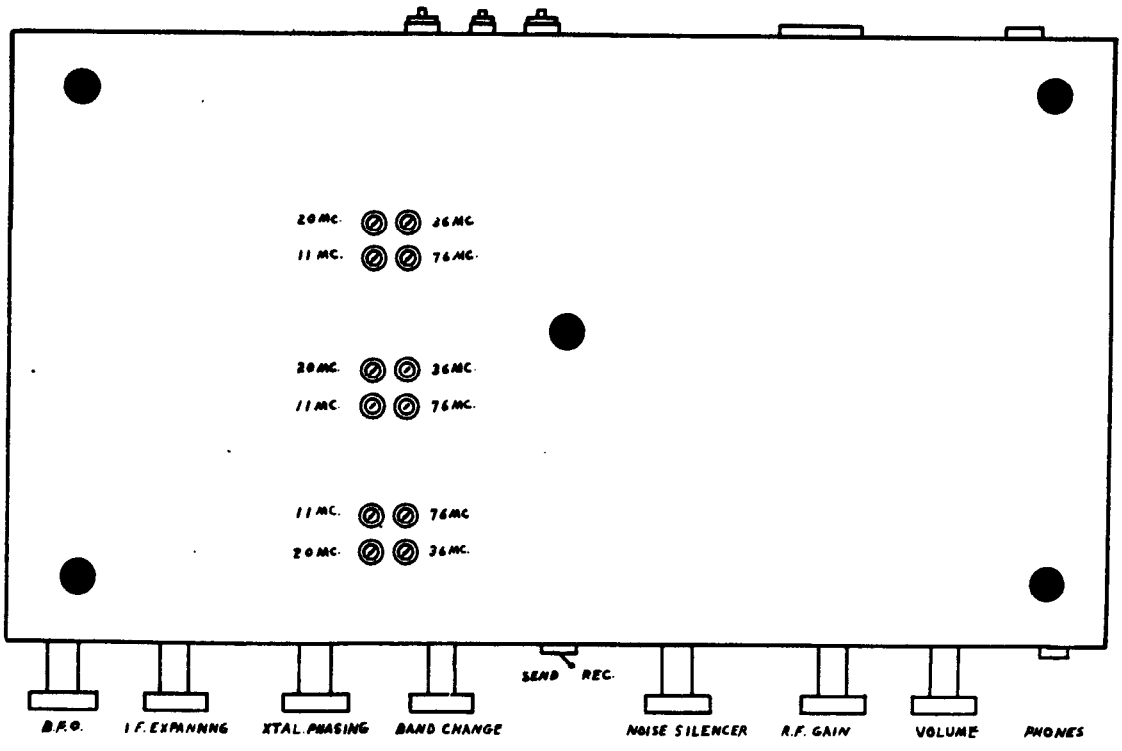

20 MC.
26 MC.
11 MC.
76 MC.
20 MC.
26 MC.
11 MC.
76 MC.
11 MC.
76 MC.
20 MC.
26 MC.
SEND
REC.
B.F.O.
I.F. EXPANNNG
XTAL. PHASING
BAND CHANGE
NOISE SILENCER
R.F. GAIN
VOLUME
PHONES

FIG. 2

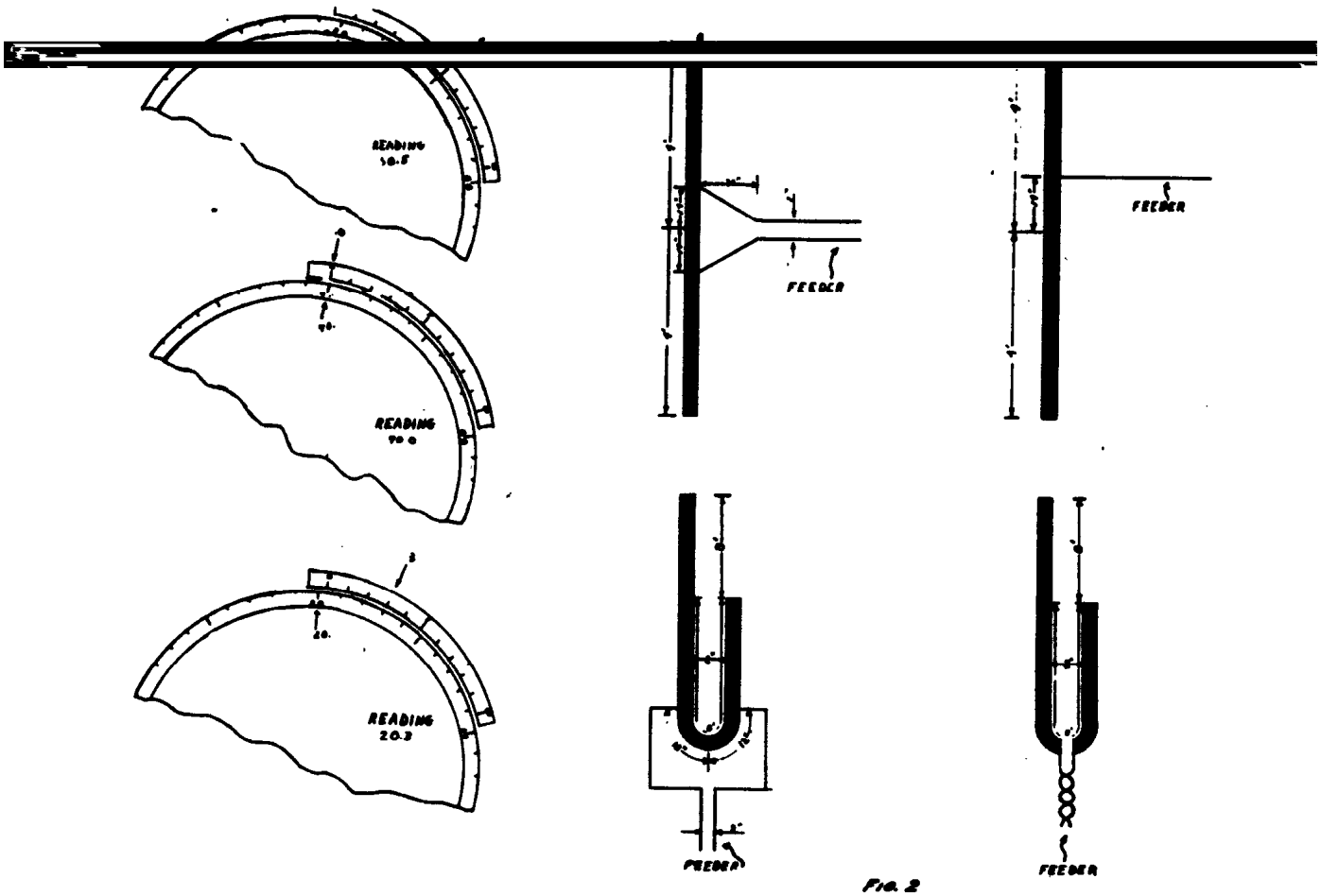

READING
READING
90 °
READING
20.3
FEEDER
FEEDER
FEEDER
FEEDER

Fig. 2

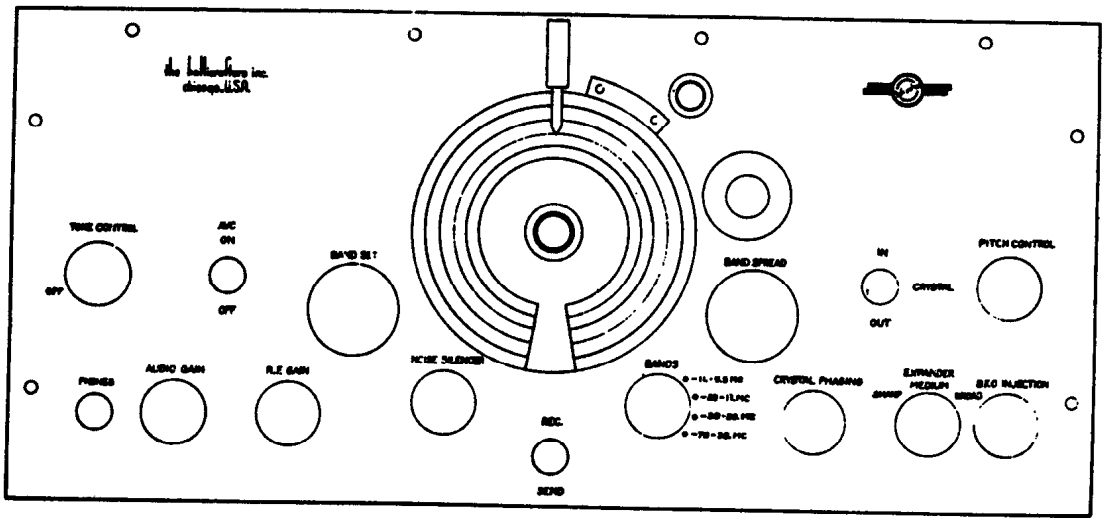

TUNE CONTROL
OFF
AVC
ON
OFF
BAND SET
BAND SPREAD
IN
CRYSTAL
OUT
PITCH CONTROL
PHONES
AUDIO GAIN
R.F. GAIN
NOISE SILENCER
BANDS
CRYSTAL PHASING
EXPANDER
MEDIUM
BFO INJECTION
REC.
SEND

Fig. 3

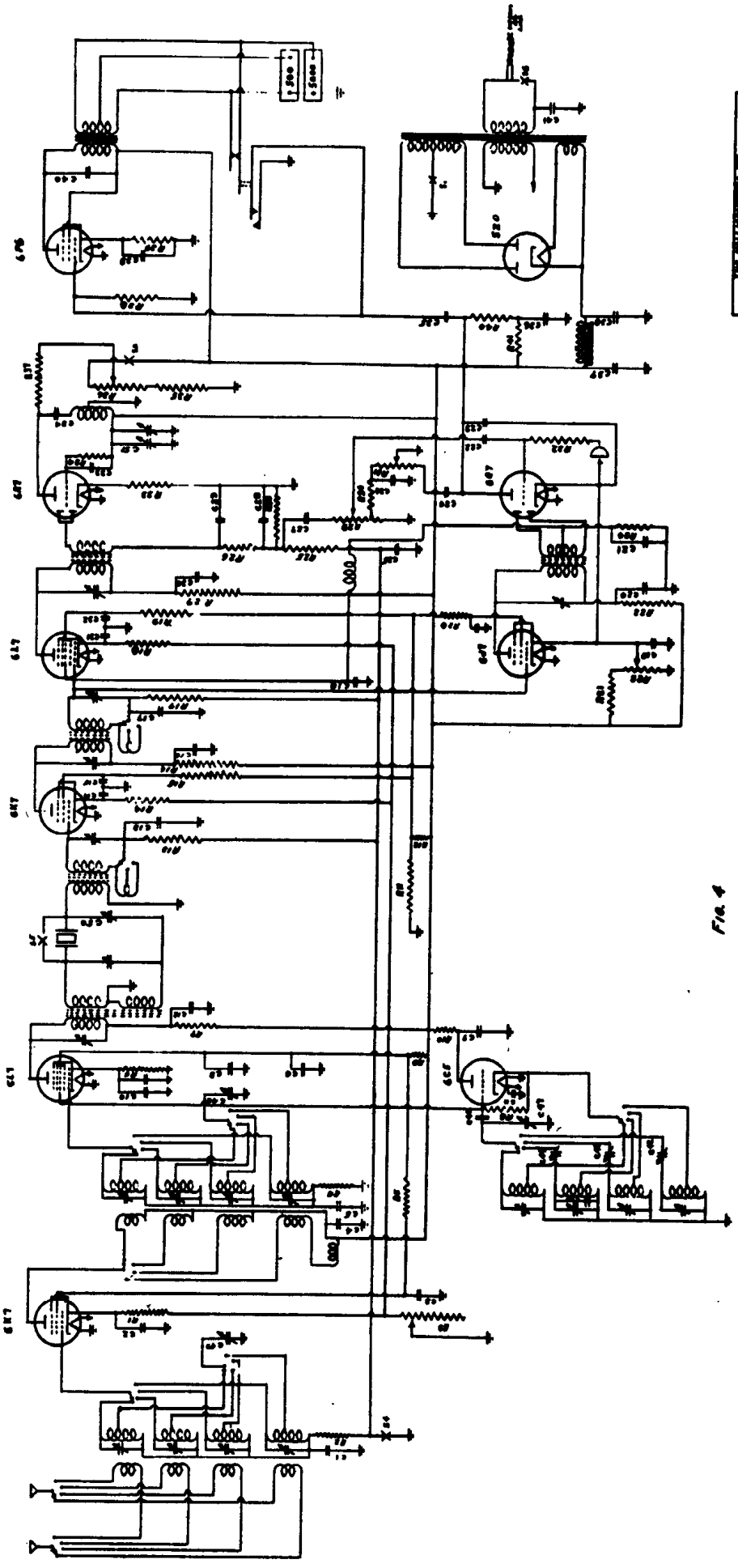


FIG. 4

SYMBOLS - MODEL S-10

Resistors

NO.	VALUE OHMS	RATING WATTS	TOL.	PART NO.
R2	100,000	1/3	20%	2093
R3	10,000	RF Gain		2511
R4	100,000	1/3	20%	2093
R5	1000	1/3	20%	2033
R6	600	1/3	10%	2308
R7	1500	1/3	20%	2039
R8	50,000	1/3	20%	2084
R9	10,000	2	20%	2433
R10	10,000	2	20%	2433
R11	50,000	1	20%	2082
R12	30,000	2	10%	2436
R13	100,000	1/3	20%	2093
R14	300	1/3	10%	2220
R15	1000	1/3	20%	2033
R16	1500	1/3	20%	2039
R17	100,000	1/3	20%	2093
R18	300	1/3	10%	2220
R19	1000	1/3	20%	2033
R20	1000	1/3	20%	2033
R21	50,000	1	20%	2082
R22	10,000	Noise Silencer		2511
R23	1500	1/3	20%	2039
R24	100,000	1/3	20%	2093
R25	1 Meg	1/3	20%	2108
R26	30,000	1/3	20%	2078
R27	15000	1/3	20%	2039
R28	500,000	1/3	20%	2084
R29	500,000	Volume Control		2512
R30	50,000	1/3	20%	2084
R31	1 Meg	Tone Control		2513
R32	500,000	1/3	20%	2102
R33	1000	1/3	20%	2033
R34	50,000	1/3	20%	2084
R35	40,000	1/3	20%	2081
R36	500,000	BFO Injection		2514
R37	50,000	1/3	20%	2084
R38	100,000	1/3	20%	2093
R39	500	Candohm	10%	2419
R40	250000	1/3	20%	2099
R41	100,000	1/3	20%	2093

SYMBOLS - MODEL S-10

Condensers

No.	Value	Type	Rating Volts	Tol.	Part No.
C1	.002	Mica	600	5%	4312
C2	.002	Mica	600	20%	4013
C3	.002	"	600	20%	4013
C4	.002	"	600	20%	4013
C5	.002	"	600	5%	4312
C6	.05	Paper	400	20%	4105
C7	.002	Mica	600	20%	4013
C8	.05	Paper	400	20%	4105
C9	.002	Mica	600	20%	4013
C10	.002	"	600	20%	4013
C11	.002	"	600	20%	4013
C12	.01	Paper	400	5%	4114
C13	.01	"	200	5%	4115
C14	.05	"	200	20%	4104
C15	.05	"	400	20%	4105
C16	.01	"	400	5%	4114
C17	.01	"	200	5%	4115
C18	.00005	Mica	600	20%	4001
C19	10 mfd	Elec.	50V		4203
C20	.01	Paper	400	5%	4114
C21	.00005	Mica	600	20%	4023
C22	.05	Paper	200	20%	4104
C23	.0005	Mica	600	20%	4009
C24	.004	Paper	400	20%	4018
C25	.05	Paper	200	20%	4104
C26	.01	"	200	20%	4100
C27	.01	"	200	20%	4100
C28	.00025	Mica	600	20%	4007
C29	.0001	"	600	20%	4003
C30	.01	Paper	400	5%	4114
C31	.05	"	200	20%	4104
C32	.05	"	400	20%	4105
C33	.00025	Mica	600	20%	4007
C34	.01	Paper	400	20%	4101
C35	.05	"	400	20%	4105
C36	.1	"	400	20%	4101
C37	16 mfd	Elec.	350		4216
C38	16 mfd	"	350		4216
C39	10 mfd	"	50		4203
C40	.005	Paper	600	20%	4020
C41	.01	Paper	400	20%	4101
C42	.0005	Var.Mica			4402
C43	.0005	" "			4403
C44	.0005	" "			4402
C45	.000015	Mica	600	20%	4022
C46	.0001	"	600	20%	4003
C47	Front Sec. Var. Cond.				48-010
C48	Middle " " "				48-010
C49	Rear " " "				48-010
C50	25 mmf	Var. Air.			48-012
C51	5mmf	" "			48-013

Intermediate Frequency Alignment

If the Rcvr. is equipped with a x-tal. use the x-tal. in a separate osc. If the Rcvr. is not an SX-10 model set the signal generator for 1600Kc output.

Before I.F. or R.F. alignment see that:

I.F. Selectivity is in the "Sharp" position.
B.F.O. switch is off.
Audio gain control is set at maximum.
R.F. gain control is set at maximum.
A.V.C. switch is off.
Crystal switch is off.
Crystal phasing condenser is adjusted for maximum noise level.
Noise silencer control set at 50% rotation.

DO NOT REMOVE THE BOTTOM PLATE FROM THE CHASSIS.

Remove 6C5 Oscillator tube from its socket and connect generator output directly to the grid of the 6L7 1st detector.

As an output indicator it is suggested a 0-3 volt A.C. Voltmeter be connected across the speaker voice coil.

Align all I.F. trimmers for maximum output.

To adjust noise silencer circuit, set generator for a strong signal (200MV). Slowly turn noise silencer control until there is a noticeable dip in the output meter. Now the trimmer on the noise silencer can directly behind the main tuning gang should be tuned for a dip. Adjust noise silencer control and trimmer until maximum rejection of signal is obtained. After this adjustment has been reached set the noise silencer control at a position where rejection of signal just starts to take place. Now retrim the plate trimmer of 2nd I.F. (see which is plate trimmer by shorting trim screw against can for a spark.) The I.F. alignment of the Rcvr. is now complete.

R.F. Alignment

Check dial - at maximum capacity of gang condenser the dial should stop so that "0" on the dial is opposite "5" on Vernier scale; the pointer which indicates bands should then be on the black line. of the dial.

Put the 6C5 tube back in its socket.

Connect generator output through a 400 ohm resistor to antenna and ground posts on Rcvr. (Jumper should remain connected.)

Be sure band spread condenser is set at 200 degrees or minimum capacity position.

Set generator for 100 meg output signal at maximum output of generator. During alignment back off on R.F. gain control or the gain on the generator once the signal is heard. Leave the audio gain control in maximum position at all times.

Set band switch at highest frequency range: 38-79 Mc. Check 40 Mc. on dial for calibration.

If no signal is heard at 40 Mc. and a good signal is heard at 50 Mc. try changing the 6C5 osc. tube until one which will oscillate at 40 Mc. is obtained. It may be necessary to try various makes of tubes until a good one is obtained.

After signal is heard at 40 Mc., reset dial to 60 Mc. Now adjust the 60 Mc. trimmer in osc. section until signal is heard.

Reset dial to approximately 63 Mc. and check dor image. If image is heard at 63 Mc. you are on the right side. Note- Image is on the high freq. side on this hand.

Return dial to 60 Mc. and peak R.F. and Ant. 60 Mc. trimmers for greatest output.

Now go back to 40 Mc. and make sure you are getting a good signal.

While R.F. and Ant. trimmers are being peaked the main tuning gang should be rocked back and forth

Change bandswitch to position covering 20-38 Mc.
Set generator for 6 Mc. signal.
Set dial at 20 Mc.
Adjust 20 Mc. padder on top of chassis until signal is heard.
Reset dial to 36 Mc.
Adjust 36 Mc. trimmer in osc. section until signal is heard.
Now peak R.F. and Ant. trimmers for maximum output, rocking main tuning gang while peaking.
Recheck at 20 Mc. for calibration. A signal should also be heard at 24, 30 and 36 Mc., using 6 Mc. signal input.

Set band switch to position covering 11-20 Mc. position.
Set signal generator for 11 Mc. output.
Set dial for 11 Mc. Adjust osc. padder on top of chassis for signal.
Set generator for 20 Mc. signal.
Set dial for 20 Mc. Adjust osc. trimmer in osc. section until signal is heard.
Now adjust R.F. and Ant. trimmers for maximum output, Rocking main tuning gang while peaking.
Go back and re-check at 11 Mc.

Set band switch to position covering 5.5-11 Mc.
Set generator for 6 Mc. output.
Set dial to 6 Mc.
Adjust 6 Mc. padder on top of chassis for signal.
Set generator for 11 Mc.
Set dial to 11 Mc. Adjust osc. trimmer in osc. section until signal is heard.
Now peak R.F. and Ant. trimmers for maximum output, rocking main tuning gang while peaking.

It may be necessary to go through the above procedure on each band two or three times before maximum performance is secured. A small change at one end of each band will affect the other end.

Crystal Filter Input Transformer

This transformer is made up of 3 coils phased in such a relation that maximum signal is impressed upon the low inductance primary of the 2nd I.F. transformer. The crystal and crystal phasing circuit is inserted between these transformers in crystal phasing condenser cause single signal action to take place - this action varies by the setting of the crystal phasing condenser - when switch is at "out" position the signal is impressed directly on the second transformer.

The crystal filter output output transformer has a set-up ratio so that the voltage impressed on the grid of 6K7, I.F. amplifier, is increased over the normal I.F. transformer connections. By the use of a transformer the grid circuit of this tube is tuned to the I.F. frequency so that greater selectivity is achieved, than if a choke coil is used to supply this tube.

Tube Lineup and Base Connections

Tube	Use	E_p	E_{sg}	E_{gl}	R_p	R_{gl}	E_{pd1}	E_{pd2}
6K7	R.F. Amp.	256	186	Cap	0	.1Meg.	—	—
6L7	1st Det.-Mixer	255	120		1.5K	.1M	—	—
6C5	Osc.	180	—	5	.01M	.05M	—	—
6K7	1st I.F.	245		Cap	1.5K	.1M	—	—
6L7	2nd I.F.	255	95		1.5K	.1M	—	—
6R7	2nd Det.-AVC-BFO	80			.05M	.05M	0	0
6J7	Noise silencer	217	95		1.5K	.1M	—	—
6Q7	N.S. Amp.- 1st Audio	125-185			4.25M	—	0	95
6F6	Audio Output	233	250		0	.1M	—	—

5Z4 Rectifier D.C. Voltage Output 258 to all circuits connections.