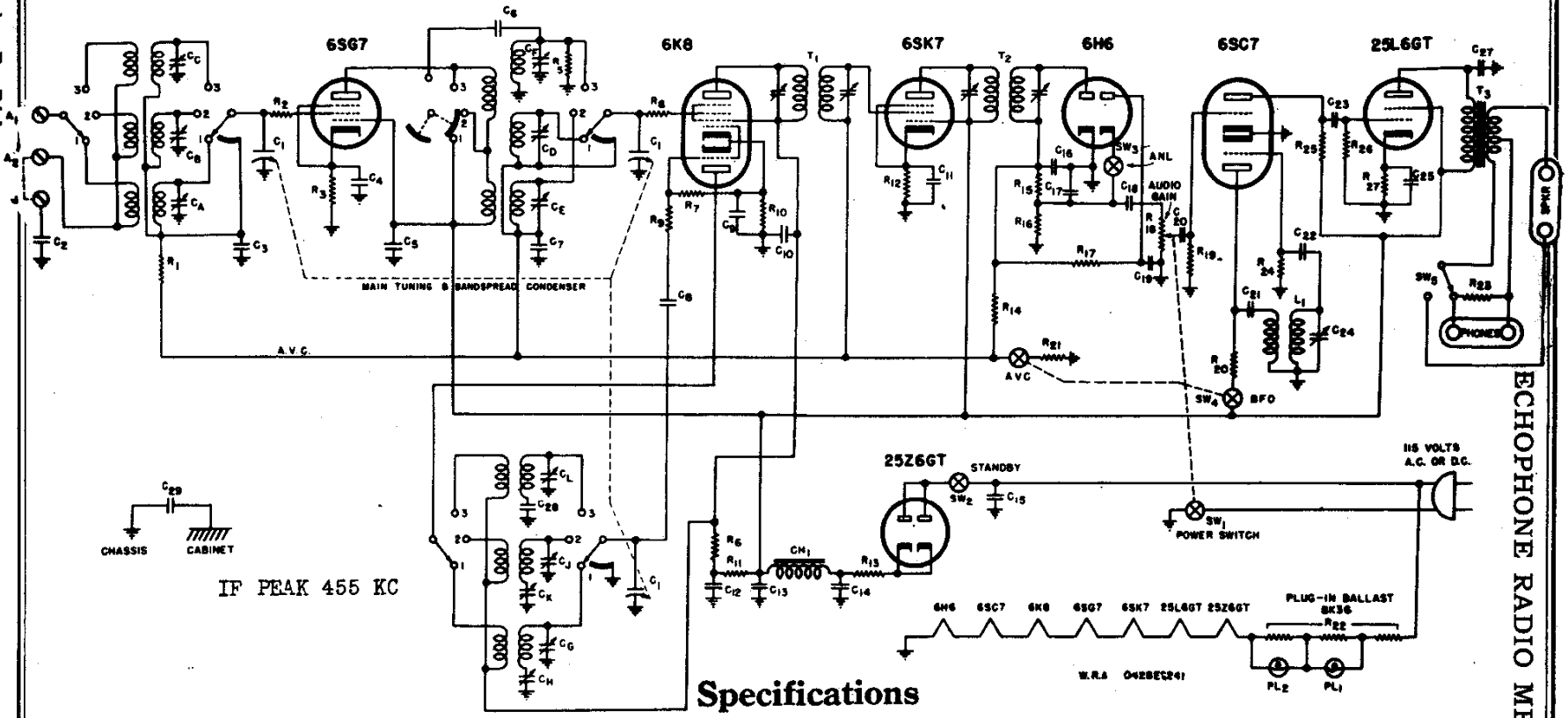


Specifications

TUBES -

1 - 6SG7 R.F. Amplifier
1 - 6K8 Mixer - H.F. Oscillator
1 - 6SK7 I.F. Amplifier
1 - 6H6 2nd Detector-AVC-ANL
1 - 6SC7 BFO - 1st Audio
1 - 25L6GT Audio Output
1 - 25Z6GT Rectifier
1 - BK36 Ballast Tube

Power Consumption - 40 Watts
Power Source - 115 volts AC or DC
Power Output - One watt undistorted
Intermediate Frequency - 455 KC
Frequency Range - 550 KC to 30 mc.

FOR PARTS LIST SEE NEXT PAGE

MODEL EC-2

ECHOPHONE RADIO MFG. CO.

RESISTORS

SYMBOL	OHMS	WATTAGE	SYMBOL	OHMS	WATTAGE
R_1	250,000	1/3	16	250,000	1/3
2	30	1/3	17	1 meg	1/3
3	200	1/3	18	500,000	Audio Gain #25-048
5	10,000	1/3			
6	300	1/3	19	5 meg	1/3
7	50,000	1/3	20	10,000	1/3
8	30	1/3	21	150	1/3
9	100	1/3	22	Ballast Resistor	BK 36
10	300	1/3			
11	1,000	1/3	23	300	1/2
12	200	1/3	24	50,000	1/3
13	15	1/2	25	250,000	1/3
14	3 meg	1/3	26	500,000	1/3
15	100,000	1/3	27	150	1/3

CONDENSERS

SYMBOL	CAPACITY	VOLTAGE	TYPE	SYMBOL	CAPACITY	VOLTAGE	TYPE
C_1	Main tuning and bandspread			15	.02 mfd	400	Paper
2	.01 mfd	400	Paper	16	100 mmf		Mica
3	.05 mfd	200	Paper	17	100 mmf		Mica
4	.05 mfd	200	Paper	18	.01 mfd	400	Paper
5	.1 mfd	200	Paper	19	.05 mfd	200	Paper
6	5-6½ mmf		Ceramicon	20	.005 mfd	400	Paper
7	.05 mfd	200	Paper	21	.01 mfd	200	Paper
8	25 mmf		Mica	22	100 mfd	#44-055	
9	.05 mfd	200	Paper	23	.01 mfd	400	Paper
10	.02 mfd	200	Paper	24	450 mmf	#44-055	
11	0.1 mfd	200	Paper	25	10 mfd	25	Electrolytic
12	30 mfd	150	Electrolytic	27	.02 mfd	600	Paper
13	30 mfd	150	Electrolytic	28	.0054 mfd		Mica
14	40 mfd	150	Electrolytic	29	0.1 mfd	200	Paper

Alignment Procedure

EQUIPMENT NEEDED FOR ALIGNING AND PRELIMINARY ADJUSTMENTS:

An all wave signal generator which will provide an accurately calibrated signal at the test frequencies listed.
Output indicating meter
Non-metallic screw driver
Dummy antenna 400 ohm, 200 mmf. and 0.1 mfd.
Connect signal generator ground to ground terminal (G) of receiver.
Set bandspread at 100.
Connect output meter across primary of output transformer.
Gain controls - Maximum all adjustments.

I.F. ALIGNMENT

Connect 0.1 mfd. dummy antenna between high side of generator and 6K8 grid.
Set signal generator to 455 kc.
Adjust all trimmers on T_1, T_2 and T_3 for maximum output.
Adjust the BFO control to give the desired beat note with the 455 kc I.F. signal. This adjustment, C24, is located under chassis.

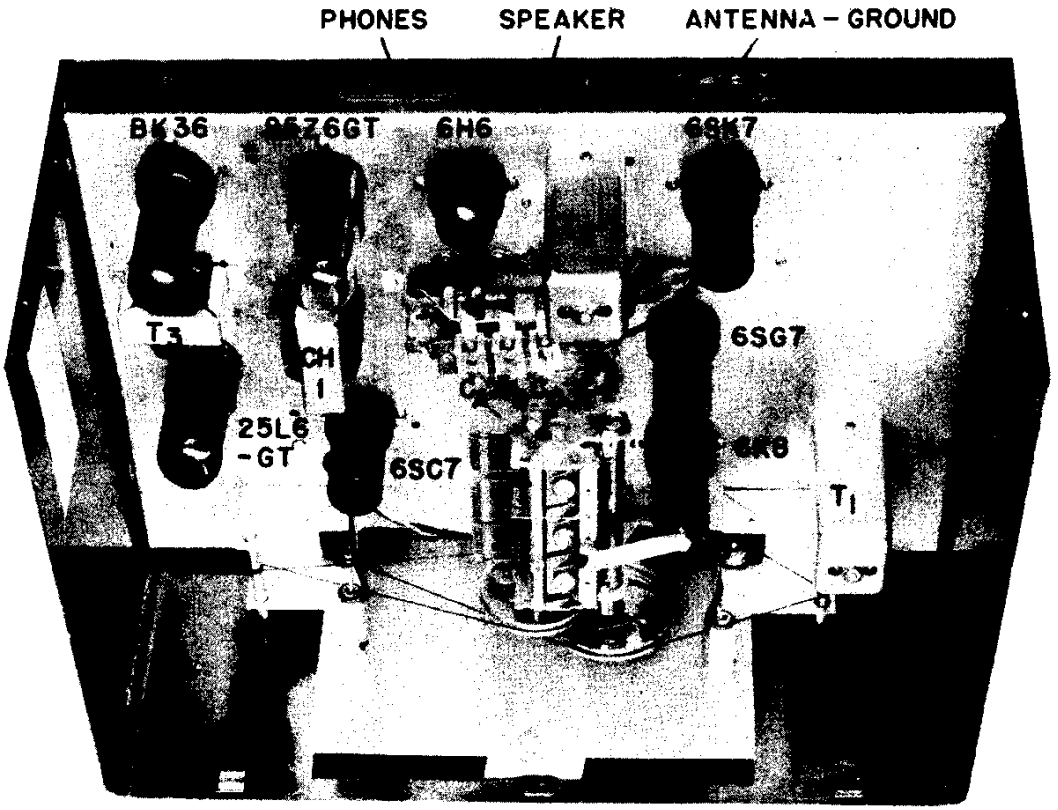
R. F. ALIGNMENT

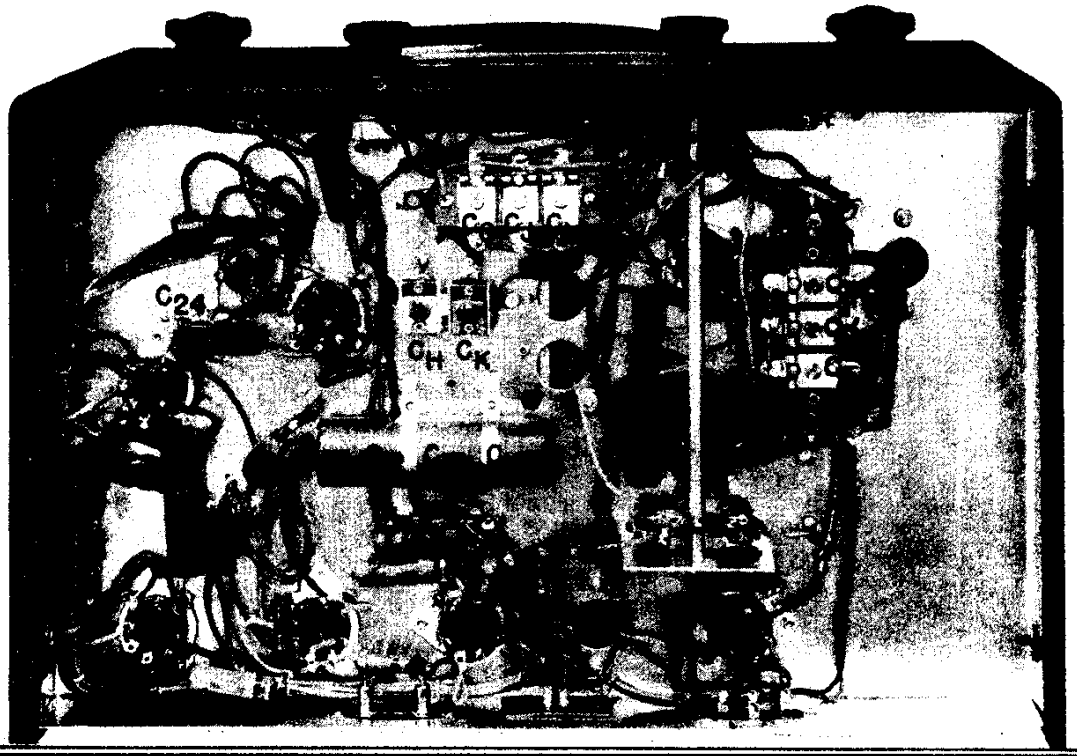
The following table indicates R.F. alignment procedure.

Band	Signal Generator Frequency Setting	Signal Generator Dummy Antenna	Pad	Trimmers	Adjustment
1	600 kc	200 mmf	C_H	none	maximum output
	1800 kc	200 mmf	none	C_A C_E C_G	maximum output
2	2.5 mc	400 ohm	C_K	none	maximum output
	7.0 mc	400 ohm	none	C_B C_D C_J	
3	no padding condenser on this band				
	28 mc	400 ohm		C_C C_F C_L	maximum output

ECHOPHONE RADIO MFG. CO.

MODEL EC-2





IMPORTANT:- This receiver, unless otherwise marked, must be operated from 115-125 volts - Alternating OR Direct Current power. If the set does not operate in one minute when connected to Direct Current, reverse the power plug in the receptacle.

Make sure the antenna is now grounded at some point, and is securely connected to the antenna terminal.

The speaker wires may not be plugged into the speaker terminal strip. Be sure the PHONES-SPKR switch is in the SPKR position and the STANDBY switch is in the RECEIVE position.

ANTENNA:- A wire approximately 50 to 75 feet long, including the leadin, will provide very satisfactory reception throughout the tuning range of the receiver. It should be connected to the A_1 terminal of the antenna terminal strip located on the rear apron of the chassis; the jumper between A_2 and G should remain in place. A good antenna of this type should be erected as high as possible; insulated from ground, and at right angles to interference producing power lines. A ground connected to the G terminal may be used if it is found to materially improve the operation of the receiver. DO NOT GROUND CHASSIS DIRECT.

A doublet antenna should be connected to terminals A_1 and A_2. The jumper may remain connected between A_2 and G or removed depending upon its favorable effect on reception.

NOTE:- If a ground is used it should always be connected to the G terminal, NEVER to the chassis itself.

CONTROLS & THEIR FUNCTIONS:

A.F. GAIN:- The ON-OFF switch is part of the A.F. Gain Control. Turning this knob to the right turns the receiver ON and increases the volume. Turning it all the way to the left decreases the volume until the switch clicks and the receiver goes off. The pilot lights indirectly illuminate the dial scale when the power is on.

MAIN TUNING:- The main tuning control, when rotated, will tune the receiver to any frequency throughout its range.

BAND SWITCH:- Turning this knob connects the proper coils in the circuit to tune the desired frequency range.

Band 1 - 550 to 2100 K.C.
Band 2 - 2.1 to 8.1 M.C.
Band 3 - 8 to 30 M.C.

BAND SPREAD TUNING:- The band spread control acts as an electrical vernier on the main tuning condenser. The 80, 40, 20 and 10 meter amateur bands are calibrated on the band spread scale together with a logging scale. To use these amateur band calibrations it is necessary that careful adjustment of the main tuning pointer be made; the most convenient way being to set the BAND SPREAD TUNING pointer to your transmitter frequency or some known receiver frequency, then adjust the MAIN TUNING pointer until the signal is heard. If this is not possible it will be necessary to locate the bands by setting the main tuning pointer at the high frequency end of the desired amateur band; then adjust the band spread pointer until amateur signals are heard. The band may then be scanned by the BAND SPREAD TUNING to check the calibration. Slight readjustment of the main tuning may be necessary for best accuracy of the BAND SPREAD scale.

"STDBY-RECEIVE"- This switch must be in the RECEIVE position for normal operation of the receiver. The STANDBY position renders the EC-2 inoperative for standby purposes.

BFO-ON-OFF:- This switch removes the AVC and places the BEAT FREQUENCY OSCILLATOR in operation for the reception of CW signals, and for locating weak DX signals.

ANL-ON-OFF:- The AUTOMATIC NOISE LIMITER switch will effectively minimize ignition and similar types of interference which would be objectionable to short wave reception.

PHONES - SPKR:- On the rear apron of the chassis will be found two phone tip jacks. Headphones may remain permanently connected to the receiver. The PHONES-SPKR switch makes it possible to select either.

CONTROLS & THEIR FUNCTIONS:

A.F. GAIN:- The ON-OFF switch is part of the A.F. Gain Control. Turning this knob to the right turns the receiver ON and increases the volume. Turning it all the way to the left decreases the volume until the switch clicks and the receiver goes off. The pilot lights indirectly illuminate the dial scale when the power is on.

MAIN TUNING:- The main tuning control, when rotated, will tune the receiver to any frequency throughout its range.

R.F. GAIN:- This control adjusts the sensitivity of the receiver by varying the cathode bias on the R.F. and I.F. amplifier. Maximum sensitivity will be obtained when this control is rotated as far as it will go to the right.

BAND SWITCH:- Turning this knob connects the proper coils in the circuit to tune the desired frequency range.

Band 1 - 550 to 2100 K.C.
Band 2 - 2.1 to 8.1 M.C.
Band 3 - 8 to 30 M.C.

BAND SPREAD TUNING:- The band spread control acts as an electrical vernier on the main tuning condenser. The 80, 40, 20 and 10 meter amateur bands are calibrated on the band spread scale together with a logging scale. To use these amateur band calibrations it is necessary that careful adjustment of the main tuning pointer be made; the most convenient way being to set the BAND SPREAD TUNING pointer to your transmitter frequency or some known receiver frequency, then adjust the MAIN TUNING pointer until the signal is heard. If this is not possible it will be necessary to locate the bands by setting the main tuning pointer at the high frequency end of the desired amateur band; then adjust the band spread pointer until amateur signals are heard. The band may then be scanned by the BAND SPREAD TUNING to check the calibration. Slight readjustment of the main tuning may be necessary for best accuracy of the BAND SPREAD scale.

"STDBY-RECEIVE-MONITOR"- This switch must be in the RECEIVE position for normal operation of the receiver. The STANDBY position renders the EC-3 inoperative for standby purposes. The MONITOR position places the CW MONITOR in operation to allow the C.W. operator to listen to his keying.

BFO-ON-OFF:- This switch removes the AVC and places the BEAT FREQUENCY OSCILLATOR in operation for the reception of CW signals, and for locating weak DX signals. Code signal intensity should be adjusted by the R.F. GAIN CONTROL.

PITCH CONTROL:- Allows adjustment of the beat note obtained from the BEAT OSCILLATOR to a pitch most pleasing to the listener.

ANL-ON-OFF:- The AUTOMATIC NOISE LIMITER switch will effectively minimize ignition and similar types of interference which would be objectionable to short wave reception. Best results are obtained with the R.F. Gain full on and the A.F. Gain set near minimum.

Amateurs who operate on C.W. will find the MONITOR circuit in the Ec-3 an aid to easier and more efficient operating

A short wire must be connected to the single MONITOR PICKUP TERMINAL at the rear of the receiver to allow a small amount of R.F. energy to be picked up from the transmitter by the monitor circuit. The length of this wire and its proximity to the transmitter can only be determined experimently, because it depends entirely on the power of your transmitter. Too much coupling is indicated by a raspy note when the monitor circuit is in operation.

The value of the "CRYSTAL SHARP" SELECTIVITY position will be apparent when it is desired to receive CW signals on any of the amateur bands. The tremendous sideband interference encountered will be reduced to a minimum when the SELECTIVITY knob is in the "CRYSTAL SHARP" position and the CRYSTAL PHASING control is adjusted for maximum reduction of unwanted signals. Since tuning becomes easier with decreasing selectivity the receiver should not be set at a SELECTIVITY greater than is necessary. Thus, for best fidelity on the Broadcast band the SELECTIVITY should be "IF BROAD". For amateur phone work the SELECTIVITY may be "IF SHARP" or

SELECTIVITY:- This switch allows four step selectivity to meet all receiving requirements.

CRYSTAL PHASING:- This control is in the circuit only when the SELECTIVITY switch is in the "CRYSTAL SHARP" or "CRYSTAL BROAD" positions. The function of the PHASING control is to eliminate the unwanted interfering sideband signal.