ECHOPHONE RADIO CORPORATION
201 East Twenty-Sixth Street
Chicago, U.S.A.

INSTRUCTIONS FOR INSTALLATION, OPERATION AND SERVICE

MODEL EC 1
Echophone Commercial

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6 TUBE AC-DC THREE BAND 545KC-30.5 MC RADIO RECEIVER

Installing The Radio

IMPORTANT: This receiver, unless otherwise marked, must be operated from 115-125 volts - 50/60 cycles - Alternating Current, or the same D.C. voltage. If you are in doubt, phone your electric light company. Be sure all tubes are in their sockets before inserting plug in receptacle. If the set does not operate in one minute when connected to direct current, reverse the power plug in the receptacle. DO NOT remove the chassis from the cabinet without first removing the power plug from the light socket.

ANTENNA: This receiver will require a piece of wire connected to A-1 terminal of the antenna terminal strip appearing on the rear apron of the receiver's chassis. Very satisfactory operation of the receiver throughout its 3 band tuning range will be secured by using an outside antenna approximately 50 to 75 feet long including leadin. This antenna should be erected as high as possible and removed from surrounding objects. Be sure the antenna is insulated from the ground at all points. For minimum interference it should be at right angles to street car lines, power lines and other electrical apparatus in the vicinity. When using this type of antenna the jumper between A2 and G terminals should remain connected. A doublet antenna can be used and should be connected to terminals A1 - A2. The jumper can remain connected between A2 and G or removed depending upon its favorable effect on reception. A ground can be connected to the G terminal and should be used only when it materially improves the operation of the receiver.

TUBES: The Model EC-1 receiver is shipped from the factory with the tubes in their proper sockets. The types of tubes required and the position of these tubes are clearly shown in the top chassis drawing. Each tube has the type number stamped on it. Should it be necessary to replace any tubes

insert the center guide pin on the tube base into the center hole in the socket. Rotate the tube until the key on the guide pin drops into the notched portion of the socket hole. Push down on the tube until its base is flush with the socket.

Operating The Radio

CONTROLS

VOLUME: The ON-OFF switch is a part of the Volume Control. Turning the 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 light which indirectly lights the dial scale will indicate when the receiver is connected to its source of power.

MAIN TUNING: After the receiver has reached operating temperature and sound is coming from the loud speaker, the main tuning control, when rotated, will adjust the receiver to any frequency throughout its tuning range indicated on the translucent dial.

BAND SWITCH: Turning this knob connects the proper coils in the circuit to receive the desired frequencies. The frequencies covered by each band are:

Band 1 - 545 kc to 2100 kc

In this range you will hear broadcast stations, police, aircraft, amateurs and other services.

Band 2 - 2.10 mc to 8.15 mc

This range covers marine, aircraft and amateur frequencies as well as international short wave broadcast transmissions. Operation on the high frequency end of this band will be better after nightfall.

Band 3 - 7.9 mc to 30.5 mc

Most satisfactory operation on this band will be during the daylight hours. Only stations removed by a considerable distance from your location will be heard due to high frequency "skip effect". Commercial, short wave broadcast, aircraft, mobile broadcast, police and amateur signals will be heard on this band.

BANDSPREAD: This control will be of most help on the higher frequencies covered by bands 2 and 3. The bandspread control varies in much smaller quantities the capacity of the main tuning condenser. For fine adjustment the bandspread control will prove to be of great help. When this control is adjusted a pointer moves horizontally in front of a numbered scale which is at the bottom of the main dial. This scale can be used for reference points and should be used in conjunction with the logging scale appearing on the outer edge of the main dial. **NOTE:** The bandspread pointer should be left at 0 if the main dial calibration is to be accurate. When the bandspread control is used the main tuning dial pointer should be left at a frequency slightly higher than the desired signal - operating the bandspread control will then enable you to easily and accurately tune in the signal.

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

BFO - ON-OFF: CODE-VOICE switch in the ON position disconnects the automatic volume control or AVC circuit and also supplies a beat note for the copying of code or CW stations. This feature will be of help in locating weak broadcasting or phone signals. After they are located the switch should be thrown to the VOICE position which will remove the BFO whistle.

NOTE: The EC-1 Receiver can be used as a test code oscillator by connecting a Mackey in series with the phones. The BFO switch should be placed in the CODE position and a broadcast station carrier tuned in. Operation of the key will then provide a signal which will sound like CW code transmission.

STANDBY: This switch is used should the receiver be operated in conjunction with a transmitter and makes the receiver inoperative during transmission periods by removing the plate voltage from the tubes.

Should at any time your receiver become inoperative check -

First: See that the tubes are in their sockets correctly. Make sure the tubes are lighted by seeing if the filament is hot in the glass tubes. If the metal tubes are warm it can be assumed they are operating.

Second: Be sure there is power at the socket. This can be checked by inserting the plug from a lamp to see whether the lamp lights.

Third: If the receiver is being used on direct current, reverse the plug.

Fourth: Check antenna to see whether it is in good order and not grounded at some point. See that the antenna wire is properly connected to the antenna terminal on the rear of the receiver.

Fifth: Test the tubes by taking them to a radio dealer in your vicinity.

Sixth: If the receiver still fails to perform then get in touch with the distributor from whom you purchased the receiver and acquaint him with your difficulties.

Service Data For Professional Service Men

TUBES: The tube complement of the Model EC1 communications receiver consists of the following tubes:

1 - 12K8	converter
1 - 12SK7	IF amplifier
1 - 12SQ7	2nd Detector, AVC, 1st audio
1 - 35L6GT	output amplifier
1 - 12J5	beat oscillator
1 - 35Z5	rectifier

CAUTION: The chassis is above ground so always disconnect the line cord from the house current when working on it. The chassis need not be removed from the cabinet because it can be worked on by removing the top and bottom plates. For safetys sake - no trimming or padding adjustments can be made until the bottom plate has been removed.

Specifications

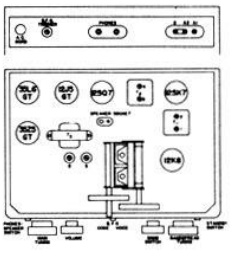
Power Consumption	35 watt
Power Output	600 milliwatts undistorted
Sensitivity (for .05 watts output)	20 microvolts average
Selectivity	54 kc at 1000 times down at 1000 kc
Frequency Range	545 kc to 30.5 mc
Intermediate Frequency	455 kc
Speaker	5 inch PM dynamic

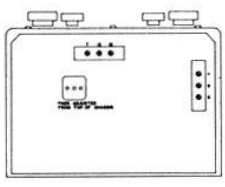
Alignment Procedure

EQUIPMENT NEEDED FOR ALIGNING:

* An all wave signal generator which will provide an accurately calibrated signal at test frequencies listed.
* Output indicating meter.
* Non-metallic screw driver.
* Dummy antennas 400 ohm, 200 mmfd and .1 mfd.
* Volume control - Maximum all adjustments.
* Connect B - of radio chassis to ground post of signal generator through .1 mfd. condenser.
* Connect Dummy antenna value in series with generator output lead.
* Connect output meter across primary of output transformer.
* Allow chassis and signal generator to "heat up" for several minutes.

BAND	Signal Generator Frequency Setting	Signal Generator Dummy Antenna	Pad	Trimmers	Adjustment
I.F.	455 kc	.1 mfd.	none	# 1-2-3-4 on top of IF can	Adjust to maximum output
1	600 kc	200 mmf	#5	none	maximum output
	1800 kc	200 mmf	none	#6-7	maximum output
2	2.5 mc	400 ohm	#8	none	maximum output
	7.0 mc	400 ohm	none	#9-10	
3	no padding condenser on this band				
	28 mc	400 ohm		#11-12	maximum output





RESISTORS MODEL EC1

NO.	OHMS	WATTAGE
R1	50,000	1/4
2	300	1/4
3	2,000,000	1/4
4	400	1/4
5	50,000	1/4
6	500,000	Volume
7	10,000,000	1/4
8	250,000	1/4
9	100,000	1/4
10	500,000	1/4
11	150	1/4
12	7,500	1-1/2
13	15	1/4
14	750	1-1/2
15	25	1/4
16	300	1/2
17	50,000	1/4
18	500	1/4

CONDENSERS MODEL EC1

NO.	CAPACITY	VOLTAGE	TYPE
C1	530 mmf	Main tuning	
2		Band Spread	
3	.01 mfd	400	Paper
4	.05 mfd	200	Paper
5	.02 mfd	400	Paper
6	.05 mfd	200	Paper
7	100 mmf		Mica
8	100 mmf		Mica
9	.005 mfd	200	Paper
10	10 mmf		Twisted Pair
11	.01 mfd	400	Paper
12	.05 mfd	200	Paper
13	20. mfd	25	Elect.Filter
14	.01 mfd	400	Paper
15	30. mfd	150	Elect.Filter
16	40. mfd	150	Elect.Filter
17	.02 mfd	400	Paper
18	.25 mfd	200	Paper
19	150 mmf	Section of C24	
20	.05 mfd	200	Paper
21	50 mmf		Mica
22	600 mmf	Pad	#1 Band
23	1,900 mmf	Pad	#2 Band
24	450 mmf	BFO Trimer	

SCHEMATIC DIAGRAM - ECHOPHONE COMMERCIAL - MODEL EC-1