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Ameco PCB Sr. Transceiver Preamplifier Owner's Manual
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INSTRUCTION MANUAL



Division of Aerotron, Inc.
P. O. Box 6527
Raleigh, North Carolina 27608

CITIZENS BAND TRANSCEIVER PREAMPLIFIER

DELUXE BASE STATION MODEL
FOR AM OR SSB TRANSCEIVERS

PCB-Sr.

PCB-Sr.
INSTRUCTION MANUAL

The Ameco model PCB-Sr. is a preamplifier that can be added to any Citizens Band transceiver, AM or SSB, to improve the weak signal performance of the receiver section. The PCB-Sr. can be connected without internal modification to the transceiver

The installation is made simple by the sophisticated electronic keying circuit which controls the switching that feeds the transmitter signal directly to the antenna and passes the received signal through the preamplifier before it goes to the receiver section of the Transceiver. When the transceiver is transmitting, the "ON THE AIR" sign in the preamplifier lights up.

The PCB-Sr. uses a Metal Oxide Semiconductor Dual Gate Field Effect Transistor (MOSFET) as the RF amplifying device. The TUNING control on the front panel tunes the input and output circuits. Tuned input and output circuits permit improvements in gain, noise figure, image and spurious rejection.

The PCB-Sr. provides for the use of an additional receiver, with relay connections to disable the auxiliary receiver during transmissions. This allows the user to monitor the selected channel while tuning other channels with the auxiliary receiver.

The PCB-Sr. is designed for use on 117 volts AC, 60 Hz, only.

The input and output impedances are 50 ohms to match any CB Transceiver.

INSTALLATION

To install the PCB-Sr.:

1. Disconnect the CB transceiver from the AC line and the antenna.
2. Connect the antenna cable to the ANTENNA jack on the PCB-Sr.
3. Connect PL-259 from the PCB-Sr. to the ANTENNA jack on the transceiver.
4. Connect the AC line plug from the transceiver to the TRANSCEIVER outlet on the PCB-Sr.
5. Other equipment may be plugged into the other outlets, as marked, the CLOCK outlet is on at all times. The other three outlets are controlled by the POWER switch.
6. Insert the PCB-Sr. line plug into the AC line.

NOTE

DO NOT plug the transceiver into the wall outlet.
It must be connected to the TRANSCEIVER outlet on
the PCB-Sr.

OPERATION

Turn ON the power switches on the transceiver and the PCB-Sr. The PCB-Sr. switch will control the transceiver. The transceiver switch can be left in the ON position at all times so only one switch has to be operated. With the PREAMP switch in the

PREAMP position, the preamplifier in the PCB-Sr. is connected between the antenna and the receiver.

Select the channel desired and adjust the TUNING knob on the PCB-Sr. for maximum signal strength by ear, or, if the transceiver has an S-meter, tune for maximum swing on the meter. This tuning will be satisfactory for at least three consecutive channels. If another channel is selected, retune the TUNING control.

The GAIN control should be turned fully clockwise. When a very strong signal from another channel causes interference with reception, the GAIN control may be turned counterclockwise to reduce the interference. Interference can also be reduced by readjusting the TUNING control. When communicating with a strong local station, the preamplifier is not needed, slide the PREAMP switch to the OUT position. The PCB-Sr. is most useful on weak signals.

INSTALLATION OF AN AUXILLIARY RECEIVER

To connect an auxiliary receiver, it is necessary to run a coaxial line from the AUX RCVR auto radio-type jack, on the rear of the PCB-Sr., to the receiver. An auto radio-type plug is supplied with the PCB-Sr., and a coaxial cable of the RG58/U type should be installed as follows:

1. Remove outer vinyl covering for 1-7/8 inches.
2. Strip braid and inner insulation off center conductor 7/8 inch.
3. Push braid back to form a bead all around.
4. Insert center conductor through pin until braid is against end of plug.
5. Bend center conductor to hold plug in place.
6. Roll braid between fingers to roll it over the end of the plug for about 1/6 inch.
7. Solder the braid to the four tabs of the plug.
8. Solder the center conductor to the pin and cut off excess wire.

After installation of the above, the PCB-Sr. will feed the second receiver as well as the transceiver. This will make it possible to receive and transmit on separate frequencies when using the PCB-Sr. or to scout the band without disturbing the setting of the channel selector of the transceiver. The rear of the PCB-Sr. has three terminals (designated AUX CONTACTS) for muting the second receiver. This is highly desirable when transmitting so that noise and signals do not ride through on the transmitter audio. Under certain conditions, feedback also might develop, particularly with certain relative frequency settings between the transceiver and the second receiver. Before connecting the muting terminals, it will be necessary to determine from the receiver Instruction Manual if normally-closed contacts for reception, the terminals marked COM and NC should be connected to the muting terminals. Those receivers requiring normally-open contacts for reception, will require that the leads be connected to COM and NO terminals. Most receivers, however, use normally-closed contacts for receiving, which open during transmit. After wiring in the muting contacts to the second receiver, each time the transceiver transmitter section is actuated, the second receiver should silence.

ALIGNMENT

Unless tampered with, the PCB-Sr. should never need realignment.

Equipment Required:

Standard signal generator, with a 50 ohm termination on the output cable.
CB transceiver
General coverage receiver with S-meter
Standing wave bridge or Bird Thru line Wattmeter
50 ohm dummy load.

1. Preset the adjustments as follows: The trimmer capacitors on the gang $1/4$ turn from tight, the cores in the two coils about half-way into the windings.
2. Connect the PCB-Sr. and the CB transceiver as shown in Figure 2.
3. Check all functions. Gain may be low if much out of alignment but strong signals should be heard.
4. Disconnect the CB transceiver and connect the receiver.
5. Disconnect the antenna and connect the signal generator to the PCB-Sr.
6. Set the PCB-Sr. dial to zero.
7. Tune the signal generator to 26.5 MHz. Use 30% modulation, if desired.
8. Tune the receiver to the signal.
9. Adjust the two trimmer capacitors on the gang for maximum on the receiver S-meter. Keep the output from the signal generator as low as possible for all adjustments.
10. Tune the PCB-Sr. to 10, the signal generator to 30.2 MHz and the receiver to that signal.
11. Adjust the cores in the two coils for maximum.
12. Repeat steps 6 through 10 until the readjustment is negligible. Usually twice is sufficient.

THIS COMPLETES THE PREAMPLIFIER ALIGNMENT.

There is an adjustment to cancel out the standing wave ratio disturbance produced by the relay in the antenna circuit. Adjust as follows:

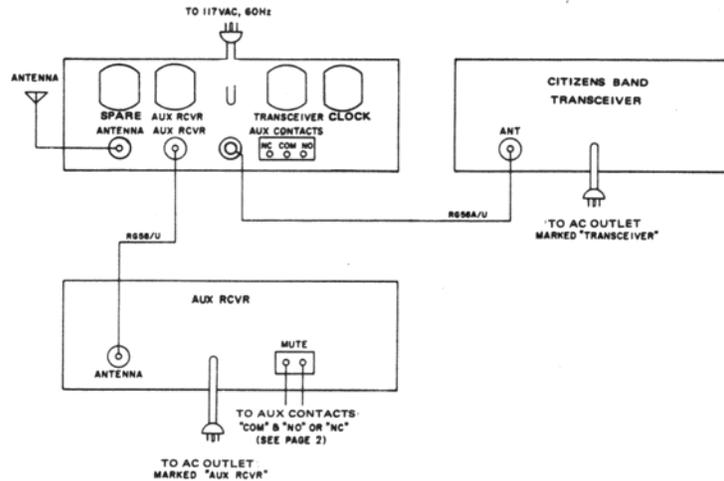
1. Connect the PCB-Sr. cable with PL-259 plug to the output jack on the standing wave bridge or wattmeter.
2. Connect the standing wave bridge or wattmeter input jack to the CB transceiver antenna jack.
3. Connect the 50 ohm load to the ANTENNA jack on the PCB-Sr.
4. Turn both units on.
5. Check the forward power from the transmitter. When OK, continue.
6. Switch to reflected power on the bridge or wattmeter.
7. Adjust the trimmer capacitor under the PCB-Sr. relay for minimum reflected power. Normally it can be reduced to less than 1.2 SWR.

NOTE UNDER NO CIRCUMSTANCES SHOULD THIS ADJUSTMENT BE MADE BY ANY OTHER METHOD.

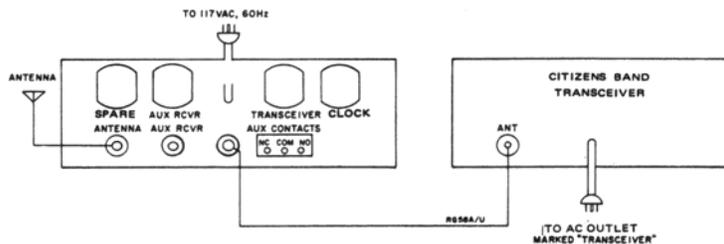
PARTS LIST

COMPONENT BOARD ASSEMBLY		
CAPACITORS		
C1	.01 uf Disc	1508-1005-004
C2	.01 uf Disc	1508-1005-004
C3	100 pf, Disc	1501-1003-003
C4	.1 uf Disc	1508-1006-003
C5	.0015 uf Disc	1510-1504-003
C6	.47 uf Flat Film	1529-4706-002
C7	220 uf/16V Electrolytic	1518-2209-018
RESISTORS		
R1	220k ohm 1/2W	4701-2206-001
R2	100 ohm 1/4 W	4704-1003-001
R3	68 ohm 1/2 W	4701-6802-001
R4	10k ohm 1/2W	4701-1005-001
R5	10k ohm 1/2 W	4701-1005-001
R6	1 Meg ohm 1/2W	4701-1007-001
R7	270k ohm 1/2W	4701-2706-001
R8	4.7k ohm, 1/2 W	4701-4704-001
R9	10k ohm, 1/2 W	4701-1005-001
R10	7.5 ohm 5W, WW	4714-7501-001
SEMICONDUCTORS		
Q1	40673, FET	4812-0000-001
Q2	2N5226, Transistor	4811-0000-028
Q3	2N2923, Transistor	4811-0000-008
Q4	2N5225, Transistor	4811-0000-027
Q5	2N5225, Transistor	4811-0000-027
CR1	1N4009, Diode	4803-0000-004
CR2	1N4009, Diode	4803-0000-004
CR3	1N34A, Diode	4804-0001-001
CR4	1N34A, Diode	4804-0001-001
CR5	1N4383, Diode	4803-0000-019
CR6	1N4383, Diode	4803-0000-019
CR7	1N4383, Diode	4803-0000-019
MISCELLANEOUS		
	Printed Circuit Board	1710-1639-016

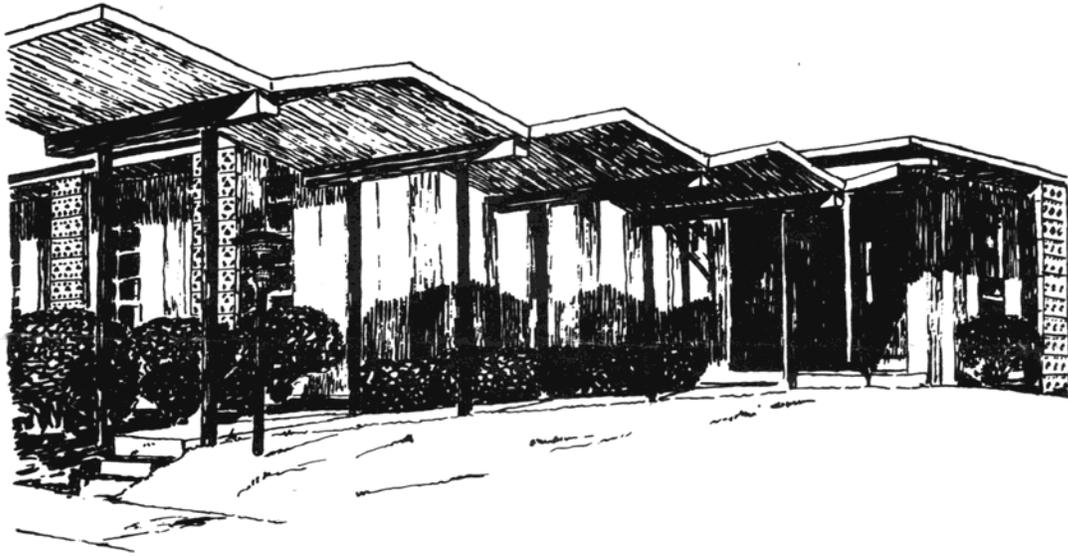
Item	Description	Part No
PREAMP ASSEMBLY		
CAPACITORS		
C101	2-35 pf Trimmer	1573-3502-002
C102	5 pf Disc	1501-5001-007
C103	7-22 pf Air Variable	1569-2202-001
C104	10 pf NPO Disc	1501-1002-001
C105	.01 uf, 50V, Disc	1508-1005-004
C106	22 pf, NPO Disc	1501-2202-007
C107	5 pf Disc	1501-5001-007
C108	.01 uf, 1400 V Disc	1505-1005-001
C109	.01 uf, 1400 V Disc	1505-1005-001
RESISTORS		
R101	100 ohm 1/2W	4701-1003-003
R102	4.7k ohm 1/4W	4704-4704-001
R103	100k pot., L.T.	4731-1006-019
SEMICONDUCTORS		
CR101	Diode, 1N4009	4803-0000-004
CR102	Diode, 1N4009	4803-0000-004
MISCELLANEOUS		
DS101	Sign Lamp	3950-0000-005
DS102	Pilot Lamp Ass'y	3901-0000-004
J101	Jack, Coax SO239	2111-0000-101
J102	Jack, Motorola	2111-0000-005
J103	AC Outlet, Dual with ground	2181-0000-005
J104	AC Outlet, Dual with ground	2181-0000-005
P101	Plug, coax, PL-259	2110-0000-001
	Coax adapter, UG-175/U	2112-0000-001
K101	Relay, 4PDT, 12VDC	4506-0000-001
L101	Coil, 6 1/2 T, CS1-9 Mod.	1801-0000-042
L102	Coil, 6 1/2 T, CS1-9 Mod.	1801-0000-042
S101	Switch, slide DPDT	5133-0000-002
S102	Switch, slide DPDT	5133-0000-002
T101	Transformer, power	5610-1601-030
	Knob, 1.25" Diameter	2409-0000-019
	Knob, .75" Diameter	2409-0000-020



INSTALLATION DIAGRAM - FIGURE 1



INSTALLATION DIAGRAM - FIGURE 2



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