INSTRUCTION MANUAL *for* BADACO

MODEL 180R—Tone Receiver

MODEL 180T—Combination Transmitter

MANUFACTURED AND
FULLY GUARANTEED
By

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INSTRUCTIONS FOR "BADACO" TONE RECEIVER

MODEL 180R

The BADACO is the most dependable and easiest to operate radio control receiver on the American market today. It operates on the citizens band of 27,255 mc and is a non-selective Audio tone receiver. It differs from the regular carrier type receiver in that it requires a radio frequency carrier plus the proper tone to operate it. This feature makes the receiver virtually interference free. By following these simple instructions and remembering a few of the safe RC flying practices, you will be able to enjoy hundreds of trouble free flights.

1. UNPACKING INSTRUCTIONS

Remove receiver and tubes from packing and carefully insert tubes in proper sockets. You will note the sockets and tubes are plainly marked to avoid any mistakes.

2. TUBES

The BADACO Model 180R receiver uses one 3A5 and one 1U5. The 3A5 is a twin triode which is actually two tubes in one envelope. One half serves as the Super Regene detector and the other half serves as the relay tube. The 1U5 serves as a tone amplifier and tone detector. These are both low cost HARD TUBES and will give hundreds of hours of reliable service.

3. BATTERIES

The BADACO Model 180R receiver operates on 1½ volts "A" battery and 67½ volts "B" battery. For "A" supply use two medium size flashlight cells, three penlight batteries or one size D cell. When using two or more batteries for "A" supply be sure they are connected in parallel. For "B" supply, use a battery such as Burgess No. K45, 67½ volts, or Eveready No. 457, 67½ volts. Any comparable battery to the above mentioned may be used.

4. MINIMUM VOLTAGE

"A" 1.1 volts, "B" 57 volts. "B" batteries can be safely used as low as 53 volts when C1 is installed as shown in Fig. 1. While this receiver is extremely stable, reduced sensitivity and erratic performance may result if battery voltages are allowed to fall below these minimums.

4A. CONDENSER C1

C1 is an 8 to 10 mf electrolytic condenser rated at 100 or more volts. It is installed in ship wiring as shown in Fig. 1 and should be glued and tied well in place. Be sure to observe polarity. C1 is optional when receiver is used as shipped from factory but must be installed if receiver is modified as in paragraph 10.

5. WIRING

For wiring model, a good grade of insulated, stranded, copper wire, size #20 or #22 is recommended. **NEVER USE SOLID WIRE.** Solid wire is subject to vibration breakage. Solder all connections using only rosin core solder. Always make wiring as neat as possible. After wiring is completed and checked, securely glue to body of model. Wire according to Fig. 1. Any deviations from this method of hook up could result in improper operation of the receiver or cause damage to the tubes.

6. INSTALLATION KIT

The BADACO installation kit (available at extra cost) contains all wire, plugs and switches for complete installation.

7. MOUNTING

The BADACO receiver weighs only 3.3 ounces complete with relay and tubes. This light weight allows it to be mounted in any of the conventional methods. Good mounting not only makes for good operation of the receiver, but also protects it from hard landings or crashes. A small hole is conveniently located at each corner of the receiver to allow suspension by rubber bands. Receiver can also be mounted on sponge rubber. See Fig. 4 and Fig. 5 for several methods of mounting.

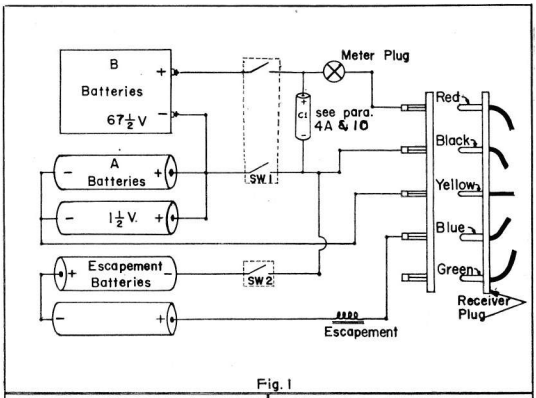

Fig. 1

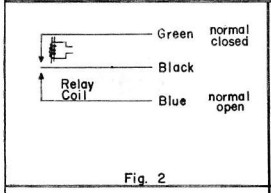

Fig. 2

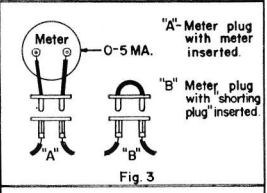

Fig. 3

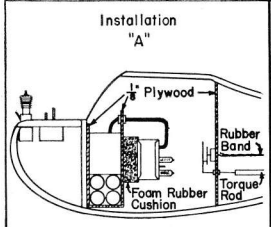

Fig. 4

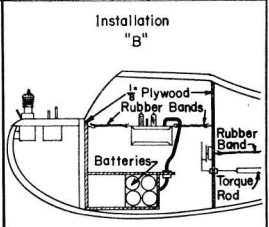

Fig. 5

CHART 1

Symptom	*Probable Cause and Remedy*
1. Does not draw current (no meter reading).	Dead "A" batteries, dead "B" batteries, or both tubes burned out or bad. Broken wire, bad switch or bad meter.
2. Draws current but does not dip on signal.	Bad 1U5 or 3A5. Needs tuning. Transmitter not operating.
3. Draws low current, unstable but dips on signal.	Low batteries, probably "B" battery.
4. Draws .5 Ma. or less.	Bad 3A5 or completely dead "B" batteries.
5. Meter dips on signal but escapement does not work.	Check escapement battery voltage. Check for broken wire to escapement or dirty relay points.
6. Chatters when motor runs, works when motor is off.	Low "B" batteries. Loose connection in wiring, poor mounting, or mounted too rigidly.

7. In case of any difficulty not covered by the above instructions, please contact BADACO Mfg. Co., 2801 Penick St., Shreveport, La.

8. RELAY

The BADACO Model 180R receiver uses a 5529Y NEOMATIC relay. This relay is adjusted at our factory and should not be tampered with. The contact points should be cleaned about every 35 flights. To clean points, carefully pull a small piece of slick bond paper between them once or twice. Relay wiring is shown in Fig. 2. The BLACK wire from the receiver (common for A+, B−, and escapement minus) is connected to the center or leaf of the relay. The BLUE wire is connected to the bottom or normally open relay point, and is used for standard escapements. The GREEN wire is connected to the top or normally closed point and is used with actuators and servos such as the DeBolt Multi-Servo.

9. TRANSMITTER REQUIREMENTS

The BADACO Model 180R receiver is designed to work as a matched unit with the BADACO Model 180T transmitter. Maximum results will be had when the two are used together. However, the receiver can be used with any transmitter meeting the following requirements: 27,255 Mc, tone 100 to 600 CPS, and modulated 95% or more. (Constant carrier is not necessary but may be used if desired.) If receiver is to be used with a 27,255 Mc transmitter of less than 95% modulation, the receiver must then be modified as explained in paragraph 10.

10. MODIFICATION

To modify the BADACO Model 180R receiver to operate with transmitter modulating less than 95%, remove bottom cover from receiver and locate BLUE condenser on 1U5 socket. Neatly cut this condenser out and replace bottom cover. The receiver will now operate with transmitters modulating as low as 65% with tones from 100 to 1200 CPS. AFTER MODIFICATION CONSTANT CARRIER MUST BE USED AND C1 MUST BE INSTALLED IN SHIP WIRING AS SHOWN IN FIGURE 1 AND PARAGRAPH 4A.

11. TUNING AND OPERATION

The BADACO Model 180R receiver is simple to tune and easy to operate. Due to the unique design it is not sensitive to body capacity and is non-critical to antenna length. An antenna approximately 25" long is recommended. To tune your BADACO receiver a tuning wand is recommended. However, a screwdriver can be used. Tuning slug is plainly marked TUNE. Follow tuning procedure below.

(a) After wiring has been DOUBLE CHECKED, see Fig. 1, plug receiver into socket.

(b) Plug antenna into socket marked ANT.

(c) Plug any good 0-3 or 0-5 Milliampere meter into meter plug and turn receiver switch on. Receiver should draw approximately 2.9 Ma. Do not be alarmed if this reading should vary several tenths of a milliamphere higher or lower as even new battery voltages vary. If receiver has been modified as in paragraph 10 it will not draw rated current until it has been tuned and is receiving constant carrier.

(d) Key tone transmitter and turn receiver TUNE slug in or out until meter dips. This receiver has been tuned at the factory and only a slight adjustment should be necessary.

(e) Now walk out approximately 100 yards or more and tune for greatest dip. Tune completely through dip and then back slug to center of dip. This is the most sensitive setting.

(f) Pull the meter out and insert "SHORTING PLUG" in its place. (Receiver will not operate without a shorting plug.) See Fig. 3 for details on shorting plug.

(g) Start motor and turn on receiver switches. Turn on transmitter and check all control surfaces for proper operation before launching model. NEVER ATTEMPT TO FLY UNLESS ALL CONTROLS ARE WORKING PERFECTLY WITH THE MOTOR RUNNING.

(h) Should receiver not operate properly after the above has been completed, refer to chart 1.

INSTRUCTIONS FOR "BADACO" TRANSMITTER

MODEL 180T

You now own one of the most dependable and versatile transmitters on the American market today. It operates on the citizens band of 27.255 Mc. A unique feature, the "SCOTCHMAN PLUG", allows the BADACO Model 180T transmitter three methods of operation: 1. Straight carrier operation. 2. Tone modulated carrier operation. 3. Multi-Channel operation with addition of the BADACO Model 180 MC PLUG IN control box, available at extra cost.

1. UNPACKING INSTRUCTIONS

Remove transmitter from packing box. Open rear of transmitter and remove tubes and crystal packed therein. Remove antenna from mailing tube. Carefully insert tubes and crystal in proper sockets. You will note the sockets and tubes are plainly marked in order to avoid mistakes. Looking at rear of transmitter the 3A4 goes on the right, the 3A5 on the left, and the crystal in the center socket. Slide antenna into antenna socket on top of transmitter.

2. TUBES

The BADACO Model 180T transmitter uses one 3A5 and one 3A4. The 3A5 is a twin triode used in a multi-vibrator circuit as a tone modulator. The 3A4 is a pentode used as crystal oscillator and RF output.

3. BATTERIES

The BADACO Model 180T transmitter operates on one 1½ volt "A" battery such as Burgess 4F or Eveready No. 742, or similar battery, and two 67½ volt (135 total) such as Burgess XX45, or Eveready No. 467, or similar battery.

4. INSERTING BATTERIES

Insert two prong plug into "A" battery. Now snap "B" leads onto "B" batteries. Place the two "B" batteries in bottom of transmitter and place "A" battery above "B" batteries as shown in Fig. T1. Replacing back locks batteries into place. MINIMUM OPERATING VOLTAGES: "A" battery 1.1 volts, "B" batteries 110 volts, or when carrier INDICATOR bulb becomes unstable.

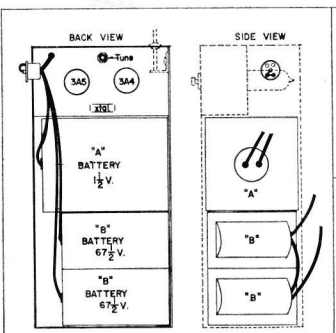

FIG. T1

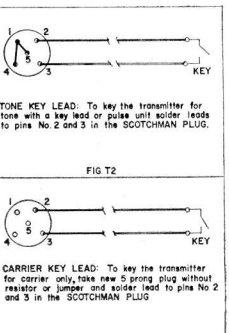

FIG. T3

5. TUNING

Tuning screw is located in the top center of the transmitter chassis above crystal, and is marked TUNE. Always extend antenna to full length before tuning. This is a hand held transmitter and should be tuned in the hand. This transmitter has been thoroughly tested and tuned with the crystal and tubes that are included. However, due to extremely rough handling which these units sometimes receive in transportation, minor adjustments may be required. Turn on switch and press KEY. Now turn tuning screw in or out until indicator bulb burns brightest. After maximum brilliance is obtained turn screw counter clockwise about one-fourth turn. This stabilizes transmitter. Should bulb flicker or go out when transmitter is held in different positions, turn screw counter clockwise slightly. If transmitter is used on ground or car with keying lead it may be necessary to slightly retune.

6. SCOTCHMAN PLUG

The Scotchman plug is located on the right side of the transmitter. For straight carrier operation you remove the Scotchman Plug. For tone operation insert the plug. Keying the transmitter remains the same for carrier or tone operation. For Multi-Channel operation remove Scotchman Plug and insert plug from BADACO Model 180 MC control box. Optional equipment at extra cost available in two to six channel. No rewiring or changing of the transmitter is required. The Scotchman Plug also makes it convenient for use of a keying lead or pulse unit. Keying lead or pulse unit is available at extra cost. If other than BADACO keying or pulse equipment is used, attach as shown in Fig. T2 or T3.

7. LICENSE

BADACO Model 180T transmitter operated on 27.255 mc which is examination free. However, it is necessary to fill out the enclosed FCC form #505 and mail to your nearest FCC office.

8. OPERATION

The BADACO Model 180T transmitter has been designed small in size and light in weight for convenient operation. To operate turn SWITCH up to ON position. (This turns on the tube filaments—pressing KEY transmits signals.)

TRANSMITTER AND RECEIVER WARRANTY

This BADACO Model 180R receiver and 180T transmitter is warranted for a period of 90 days from date of purchase against defects in workmanship and materials. Equipment must be returned to BADACO Mfg. Co. for warranty repairs. The guarantee herein shall not apply to any equipment or parts thereof which have been subject to alteration, misuse, accident or negligence. BADACO Mfg. Co. is under no obligation to extend this warranty to any equipment for which a BADACO warranty registration card has not been completed and mailed to the Company within fifteen (15) days after date of purchase. Any factory service or repairs after warranty expires can be obtained at our factory at the rate of $2.50 per unit labor charge plus parts.