INSTRUCTIONS FOR INSTALLATION AND OPERATION OF MODEL RL–6 RECEIVER

CITIZEN-SHIP RADIO CORPORATION
810 EAST 64TH STREET
INDIANAPOLIS, INDIANA

INDEX FOR RL–6 RECEIVER INSTRUCTIONS

NOTE:

Disregard Paragraphs A and B under Section 2 in these instructions.

Wiring of this receiver has been modified for use with the new CITIZEN-SHIP TCB and TLB Servos, and with other servos that require that the receiver reed bank frame be completely separate from the receiver circuitry.

If this receiver is used with CITIZEN-SHIP TNA or TCA Servos, the red and white striped wire from the receiver reed bank should be connected to the receiver battery negative wire at the receiver or at a plug.

1. INSTRUCTIONS FOR INSTALLATION AND OPERATION OF MODEL RL–6 RECEIVER.

A. Your CITIZEN-SHIP RL–6 Receiver is a highly selective, miniaturized, relayless, all transistor superheterodyne 6 channel high tone reed receiver. It will operate on any of the six F.C.C. radio control frequencies from 26.995 through 27.255 with no interference from a transmitter on any of the other five frequencies.

B. This receiver is designed to operate with the CITIZEN-SHIP SL–6 Transmitter. The transmitter must have the proper crystal inserted in the crystal holder and be tuned for the frequency which your receiver is adjusted to receive.

The RL–6 Receiver is designed to operate one channel at a time with the CITIZEN-SHIP SL–6 Transmitter. Receivers may function simultaneously (two channels together) when used with CITIZEN-SHIP TMS Transmitter. However, the RL–6 was not designed nor intended for simultaneous operation. Reed frequencies of the RL–6 match those of the TMS for ailerons, motor, and elevator control.

C. The RL–6 Receiver is shipped adjusted and tuned for reception on the frequency which is stamped on the box and on the bottom of the case. The frequency of the crystal in the receiver is not the frequency at which the set will operate, since the receiver crystal is always 0.455mc lower than the frequency of the transmitter. Example: If you have a receiver tuned for 27.145, the receiver crystal should read 26.690 (i.e.: 27.145 - .455 = 26.690).

2. TRANSISTOR SERVO ACTUATORS REQUIRED.

A. The RL–6 Relayless Receiver is designed to operate three CITIZEN-SHIP TCB or TLB Actuators. Wiring for servos is clearly shown in servo instructions and should be closely followed and integrated with receiver wiring.

If this receiver is used with CITIZEN-SHIP TNA or TCA servos, the red and white striped wire from the receiver reed bank should be connected to the receiver battery negative wire (black) at the receiver or at the plug.

B. Except for the fact that competitive servos require an extra bias battery, they are wired similarly to CITIZEN-SHIP TCB and TLB Servos, and no changes in the receiver wiring are necessary.

3. CRYSTALS AND SELECTION OF OPERATING FREQUENCY OF RECEIVER.

A. If you desire to select another of the available 27mc frequencies, and feel that you can not or do not wish to do the work yourself, you may ship the set to CITIZEN-SHIP and we will exchange crystals and realign and retest the set for $3.50. (The receiver crystal is soldered into place, and although eyelets are provided to facilitate resoldering a different crystal, care must be used not to injure the circuit board.) Your transmitter will also need to have the crystal changed to match your receiver. Instructions with your CITIZEN-SHIP Transmitter describe this change. If you prefer to ship the set to us for this work, charges will be $2.50 for it also. No transmitters other than CITIZEN-SHIP manufactured will be adjusted.

B. WARNING! It is absolutely essential to obtain crystals of the correct frequency and tolerance. Because of the selectivity of the receiver, the crystals must be ground to a tolerance of .0025%.

C. Crystals must be used in pairs as follows:

TRANSMITTER CRYSTAL FREQ.	RECEIVER CRYSTAL FREQ.
26.995	26.540
27.045	26.590
27.095	26.640
27.145	26.690
27.195	26.740
27.255	26.800

4. MOUNTING RECEIVER.

A. The receiver should be mounted vertically by wrapping it completely in 1/2 to 1'' thick sponge rubber (all six sides so it is completely floating) with the bottom of the set (printed circuit side)

toward the front of the plane. When so enclosed it will withstand very hard shocks or crashes.

Second choice is on side so reeds point up.

Least desirable position is horizontal mounting with printed circuit base down. This position is the worst for sympathetic reed vibration with the engine running.

5. WIRING RECEIVER.

A. Wiring the receiver is very simple as it uses only one 9 Volt transistor radio battery. (See Par. 6). Red wire is connected to the plus battery terminal and black wire to minus through an off-on single pole single throw switch. (See Figure 1).

6. BATTERY REQUIREMENTS.

A. Since the set is all transistorized, only a 9 Volt battery supply is required. Nine Volts has been used in this set as it is also the standard voltage adopted by the transistor industry. (Do not use more than 9 Volts or transistors may be harmed.) Three useful battery sizes are currently available:
Burgess 2U6 or Eveready 216 – Weight 1 - 1/4 oz.
Burgess P6M or Eveready 226 – Weight 1 - 3/4 oz.
Burgess 2N6 or Eveready 246 – Weight 4 oz.
For extended life, two batteries may be connected in parallel. Minus to minus and plus to plus.

Furnished with the Receiver is a battery clip to fit the first and third battery sizes. Battery may be soldered in if desired.

7. END USE OF BATTERIES.

A. The battery should be replaced when voltage reaches 7.5 – 8 Volts with set on and signal being sent from transmitter. Servo operation may be completely satisfactory at lower voltages, but range will be reduced.

8. ANTENNA.

A. Several arrangements of antenna are possible. With a superheterodyne receiver, the longer the antenna the better the range. An additional length of wire must be added to the antenna wire provided to give an over all length of approximately 30 inches. This may be a stiff steel wire mounted vertically or flexible wire may be stretched from the receiver to the top of the rudder fin. It is also satisfactory to run the antenna inside the fuselage from the set to the rear. Leave some slack in the antenna lead into the receiver, but do not wind this lead in and around other wiring as range might be reduced.

9. RETUNING AND ADJUSTING.

A. The RL-6 Receiver is tuned and adjusted at the factory. Only the antenna coil may need adjustment after installation in the plane and connection to the plane's antenna. If ground range is adequate, 2 to 2 – 1/2 blocks, retuning is not necessary nor recommended.

B. Assuming that the proper voltages have been connected to the receiver, connect a pair of head phones from the green wire to ground (red wire) as shown in Figure 1. Make sure that the transmitter you are using is equipped with the correct crystal to go with the frequency of the receiver.

C. With the transmitter turned on, you should hear a tone in the head phones when any control is signaled. If you hear nothing, recheck your crystal frequencies and make sure the set is wired properly. DO NOT START ADJUSTING ALL THE COILS on the assumption that they are out of tune. We know they were properly adjusted at the factory.

D. Now remove the antenna from the transmitter. Place transmitter as far away from the receiver as a signal can be heard. This may be from 2 to 20 feet. See Figure 1 again for location of antenna coil adjustment. Using an all-bakelite screw driver or wooden dowel sharpened to a wedge-shape, turn the antenna coil core back and forth until the loudest signal is heard. Receiver current is at a maximum of approximately 15 – 20 MA when strongest signal is being received. Final adjustment of this coil must be made with the cover on, as the setting is different with the cover off and on for this coil only.

E. If the signal can be heard with the antenna out and the transmitter five or ten feet away, it is inadvisable to make any further adjustments. If, however, the set seems definitely weak, and this can only be ascertained on a distance check with the antenna in the transmitter, it is permissable to remove the cover from the set and readjust the IF coils for the loudest signal in the same man-

ner that you adjusted the antenna coil. Never turn these cores more than an eighth of a turn, because if more adjustment than that is necessary it means the crystals are wrong. It is advisable to mark the location of each coil adjustment before beginning as it is easy to get confused.

F. The oscillator coil adjustment has been made at the factory and should never need retuning.

10. GENERAL INFORMATION.

A. The normal function of this receiver is to give multiple control of a model aircraft and permits the use of rudder, elevator, and motor speed. Some modelers may want to substitute ailerons or elevator trim for rudder or motor control. (It is also possible, of course, to use this equipment in a model boat or car.)

B. When used in a model plane with the functions listed above, experience indicates that certain reeds be used for certain functions. They are as follows:

	NORMAL CONTROL	ALTERNATE CONTROL
1.	Right Rudder – Highest Tone	Right Aileron
2.	Left Rudder	Left Aileron
3.	High Motor	Down Trim
4.	Low Motor	Up Trim
5.	Down Elevator	
6.	Up Elevator – Lowest Tone.	

C. See Figure 1 for identification of reeds. The reeds must be connected as shown in Figure 1 to conform to the nomenclature of the controls on the transmitter.

D. The reeds should not be adjusted unless made inoperative or unreliable by a crash landing. If a reed can be seen to be vibrating but the associated servo control is not operating, it may be that the screw is not contacting the reed properly. It is permissable to turn the tiny reed screw up to 1/2 turn clockwise (do not screw in and out at random).

WARRANTY

Your CITIZEN-SHIP RL–6 Receiver is warranted by the manufacturer to be free from defects in material and workmanship. However, the transistors are known to be operative from testing of the set, and we cannot guarantee them against damage caused by incorrect voltage.

Any receiver failing to operate within 30 days after date of purchase will be repaired or replaced free of charge upon being returned to the factory. This warranty does not apply to failure of operation due to exhausted or improper use of batteries.

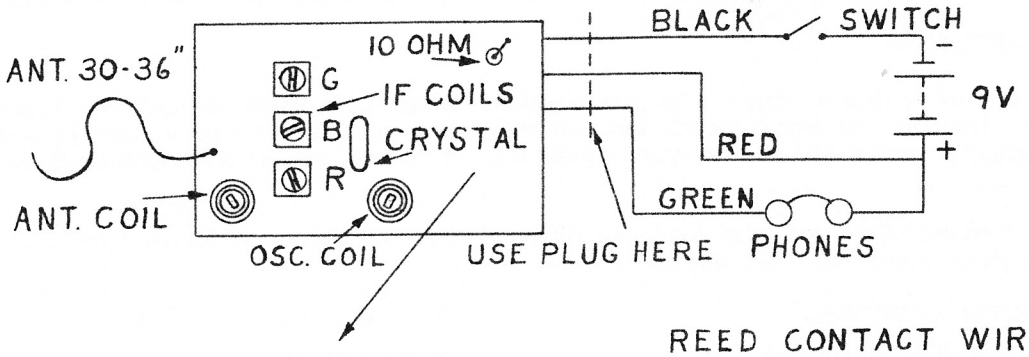
If your receiver is damaged in shipment, you should file a claim with the carrier immediately upon noting the damage.

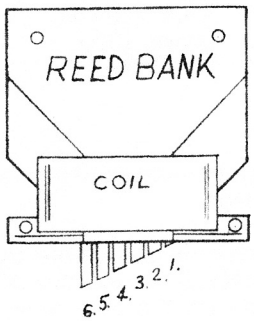
This Warranty does not apply if, in our judgment, the receiver has been tampered with or received abusive treatment beyond that encountered in normal usage.

CITIZEN-SHIP RADIO CORPORATION
810 East 64th Street
Indianapolis, Indiana 46220

RL-6 WIRING DIAGRAM

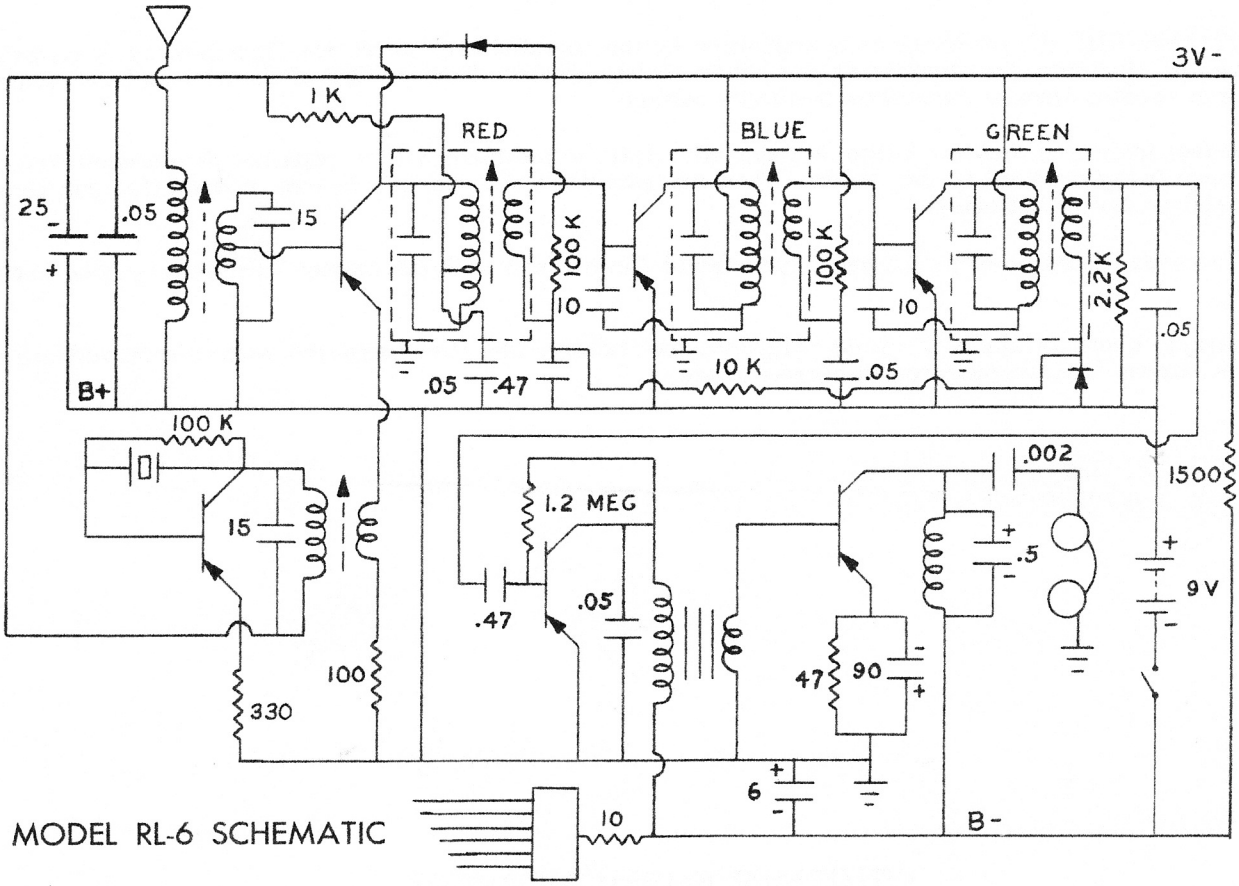
FIG 1





REED CONTACT WIRES

1. RIGHT RUDDER - WHITE
2. LEFT RUDDER - WHITE
3. HIGH MOTOR - YELLOW
4. LOW MOTOR - YELLOW
5. DOWN ELEVATOR - ORANGE
6. UP ELEVATOR - ORANGE



MODEL RL-6 SCHEMATIC

RL-6 & ZR-10 INSTALLATION .GRAM WITH TCB & TLB SERVOS

CITIZEN-SHIP RADIO CORPORATION