CR1K

ASSEMBLY MANUAL

FOR YOUR

ACE
SINGLE CHANNEL
RECEIVER

COMMANDER

Ace R/C Inc.

HIGGINSVILLE, MO. 64037

10/66

COMMANDER CRIK RECEIVER

Your Ace Commander Receiver kit is a single channel tone Radio Control design. It was originally presented in Popular Electronics, and is being made available to the home builder to allow you to duplicate this circuitry for your single channel equipment.

It requires tone modulation of from 500 to 800 cycles per optimum performance, and this can easily be provided by most transmitters available today.

Being of a relay type, it is a versatile unit, since it can be used with any of the proportional actuators that are available, such as the Rand LR3, without any modification.

By assembling your receiver you are assured of considerable savings, and yet can enjoy the fun of Radio Control. We give you step by step instructions, and also some trouble shooting information. We urge you to read and then re-read the helpful kit building information before beginning assembly, and study the schematics and the step by step instructions very carefully.

PARTS LIST

Before beginning the wiring of your Commander receiver kit, check the following parts list to make sure you have the required parts and to become familiar with them.

( ) 1 - 10 ohm 1/4 w. 10% resistor
( ) 1 - 100 ohm 1/4 w. 10% resistor
( ) 1 - 330 ohm 1/4 w. 10% resistor
( ) 1 - 470 ohm 1/4 w. 10% resistor
( ) 1 - 1K 1/4 w. 10% resistor
( ) 2 - 4.7K 1/4 w. 10% resistors
( ) 1 - 2N2180 transistor
( ) 2 - 2N2430 transistors
( ) 1 - 20 uhy RF choke
( ) 1 - Tuning coil
( ) 2 - Zebra transformers
( ) 1 - 100 ohm relay

( ) 1 - 10 pf NPO capacitor
( ) 2 - 68 pf NPO capacitors
( ) 3 - .01 mf disc capacitors
( ) 2 - .02 mf disc capacitors
( ) 1 - .001 mf disc capacitor
( ) 2 - 30 mf P.I. capacitors
( ) 1 - Printed Circuit base
( ) 1 - #1 plastic box
( ) 1 - Set of instructions
( ) 12" Red, black, white, blue, and brown hookup wire.
( ) 24" Antenna wire
( ) 18" Solder

Every effort is made to make sure your kit is complete. We reserve the right to make substitutions of some of the components (which will not affect performance of the unit), in the interest of getting your kit to you as quickly as possible. If there should be a shortage, please notify us at Ace R/C, Inc., immediately, and the component will be sent to you.

TUNING INSTRUCTIONS

Double check your receiver against the pictorial, schematic and instructions to make sure you have all parts placed correctly. Make sure that there are no solder bridges on the PC side of the base and that there are no parts shorting together.

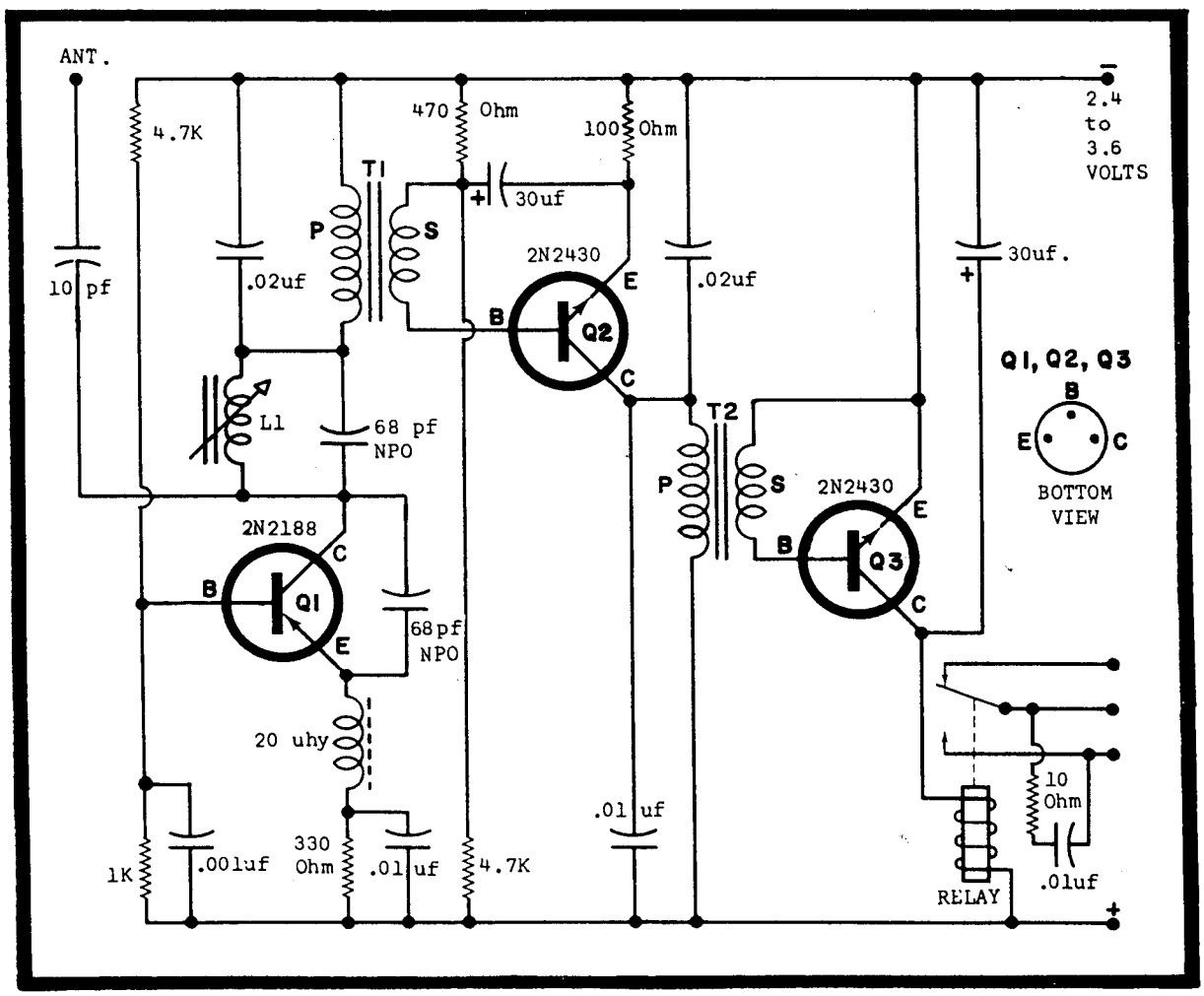
Connect the red wire from the receiver to the negative lead of a 0-50 milliameter. Connect the positive lead of the meter to the positive of the power supply (2.4 to 3.6 volts). Now connect the black lead of the receiver to the negative of the power supply. Your meter should read approximately 3 ma for 2.4 volts and 6 ma for 3.6 volts, with transmitter off. Turn transmitter on and tune the slug of the L1 coil for a slight dip in current. Now press the key of your transmitter for a tone, and your meter should read approximately 30 ma on 2.4 volts and 40 ma on 3.6 volts. Adjust tuning slug to obtain the highest milliampere reading.

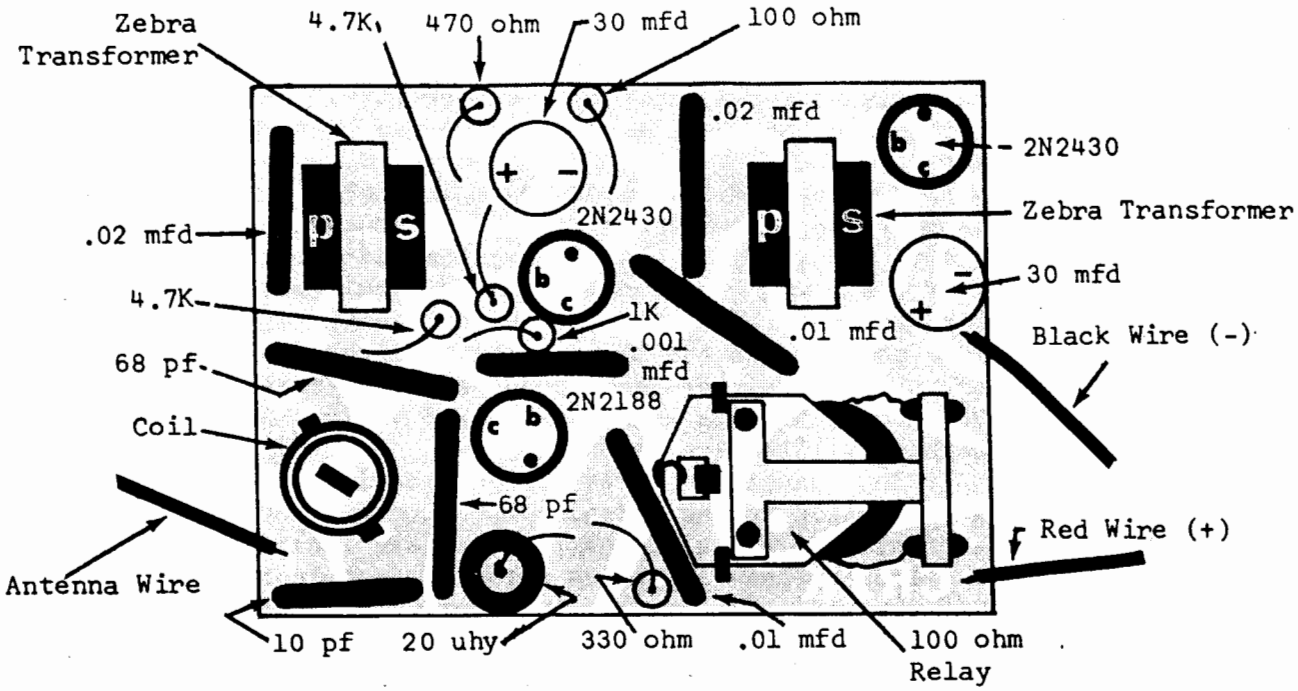
Wire in the relay connection wires for your application. Most generally you will make a connection to the normally open contact and to the armature.

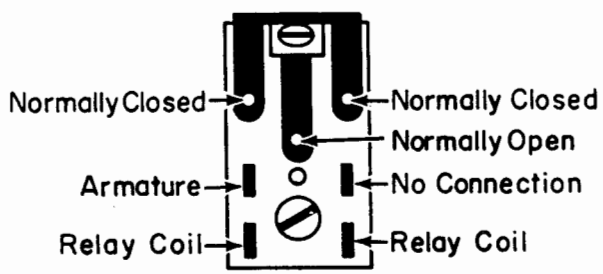
A .01 disc capacitor and a 10 ohm resistor are included in your kit for arc suppression. Connect them in series between armature and the normally open contact. If you will also be using the normally closed contact, as in proportional, you will need to put another .01 and 10 ohm resistor across these points.

Always double check tuning after installation in your craft. Ground range of this receiver with a Commander transmitter will be about 1/4 mile.

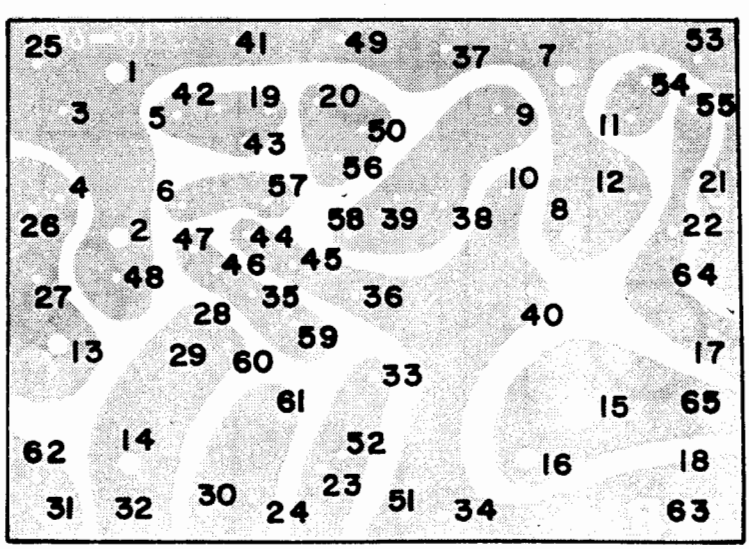
Happy landings!







Relay Connections



STEP BY STEP INSTRUCTIONS

Before soldering any of the components onto the base, use a fine grade of steel wool and lightly rub the copper side of the PC base.

In the following instructions mount all components as close to the base as possible except for the three transistors. When soldering any transistor you should leave about 1/4" leads so that a heat sink may be used to prevent heat damage. The coil has been wound but the ends have not been soldered to the coil lugs. The wire is Solder-Eze type, heat the wire and the lug with the soldering iron and apply solder, as soon as the solder flows onto the wire the insulation has melted and the wire is soldered to the lug. After the relay is installed on the base there must be a jumper wire from the coil lugs to the respective hole installed. When installing the electrolitic capacitors, transistors, and transformers, make sure the proper lead is installed in the proper hole, or the receiver will not work. On the rest of the components it should be just a matter of inserting the leads in the holes and soldering after each step. Clip all leads as close to the base as possible.

The plastic case provided may be used to house the receiver in when installed in the model for dust protection.

COMMANDER RECEIVER

( ) Zebra transformer in holes 1, 2, 3, 4, 5, and 6.
- ( ) Transformer lugs in holes 1 and 2.
- ( ) Primary leads in holes 3 and 4.
- ( ) Secondary leads in holes 5 and 6.

( ) Zebra transformer in holes 7, 8, 9, 10, 11, and 12.
- ( ) Transformer lugs in holes 7 and 8.
- ( ) Primary leads in holes 9 and 10.
- ( ) Secondary leads in holes 11 and 12.

( ) Tuning coil in holes 13 and 14.
- ( ) Your tuning coil as received has been wound with Solder-Eze wire, by applying heat and solder to each lug of the coil the insulation will melt and the wire will be soldered to the lug.

( ) Relay in holes 15, 16, 17, and 18.
- ( ) Relay mounting screw in hole 15.
- ( ) Relay key lug in hole 16.
- ( ) Jumper wires from holes 17 and 18 to the respective coil lug.

( ) 30 mf P.I. capacitor in holes 19 and 20.
- ( ) Positive lead in hole 19.
- ( ) Negative lead in hole 20.

( ) 30 mf P.I. capacitor in holes 21 and 22.
- ( ) Negative lead in hole 21.
- ( ) Positive lead in hole 22.

( ) 20 uhy choke in holes 23 and 24.

( ) .02 mf capacitor in holes 25 and 26.

( ) 68 pf capacitor in holes 27 and 28.

( ) 68 pf capacitor in holes 29 and 30.

( ) 10 pf capacitor in holes 31 and 32.

( ) .01 mf capacitor in holes 33 and 34.

( ) .001 mf capacitor in holes 35 and 36.

( ) .02 mf capacitor in holes 37 and 38.

( ) .01 mf capacitor in holes 39 and 40.

( ) 470 ohm (yellow, violet, brown) resistor in holes 41 and 42.

( ) 4.7K (yellow, violet, red) resistor in hole 43 and 44.

( ) 1K (brown, black, red) resistor in holes 45 and 46.

( ) 4.7K (yellow, violet, red) resistor in holes 47 and 48.

( ) 100 ohm (brown, black, brown) resistor in holes 49 and 50.

( ) 330 ohm (orange, orange, brown) resistor in holes 51 and 52.

( ) 2N2430 transistor in holes 53, 54, and 55.
  ( ) Emitter in hole 53.
  ( ) Base in hole 54.
  ( ) Collector in hole 55.

( ) 2N2430 transistor in holes 56, 57, and 58.
  ( ) Emitter in hole 56.
  ( ) Base in hole 57.
  ( ) Collector in hole 58.

( ) 2N2188 transistor in holes 59, 60, and 61.
  ( ) Emitter in hole 61.
  ( ) Base in hole 59.
  ( ) Collector in hole 60.

( ) Antenna wire in hole 62. (Strip and tin 1/8" insulation from one end of the 24" wire and insert from the component side of the base and solder.)

( ) Red wire in hole 63. (Install same as antenna wire) This is the positive of the 2.4 to 3.6 volt battery supply.

( ) Black wire in hole 64. (Install as the two above wires) This is the negative of the 2.4 to 3.6 volt battery supply.

( ) Hole 65 may be used for a connection from the relay armature or you may solder a wire directly to the relay frame lug.