

ASSEMBLY MANUAL

For Your



Single Channel Receiver

26-28 mc
(50-54 MC)

kit

1ST EDITION

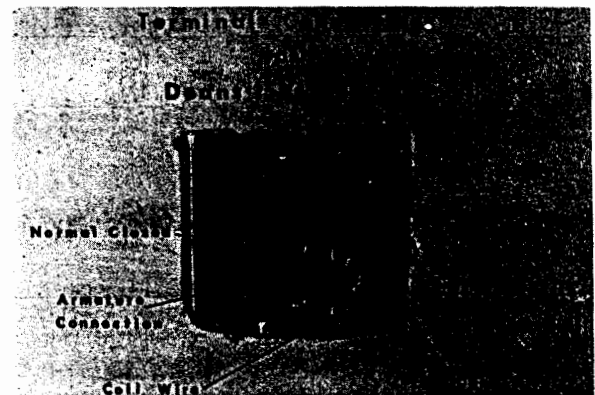
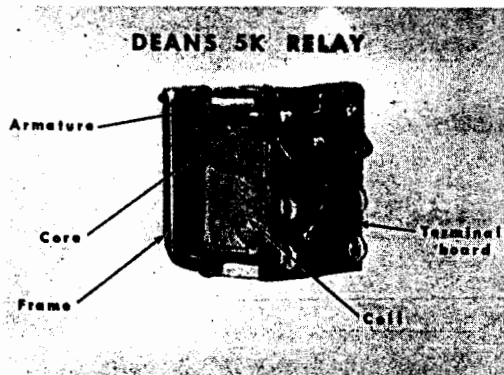
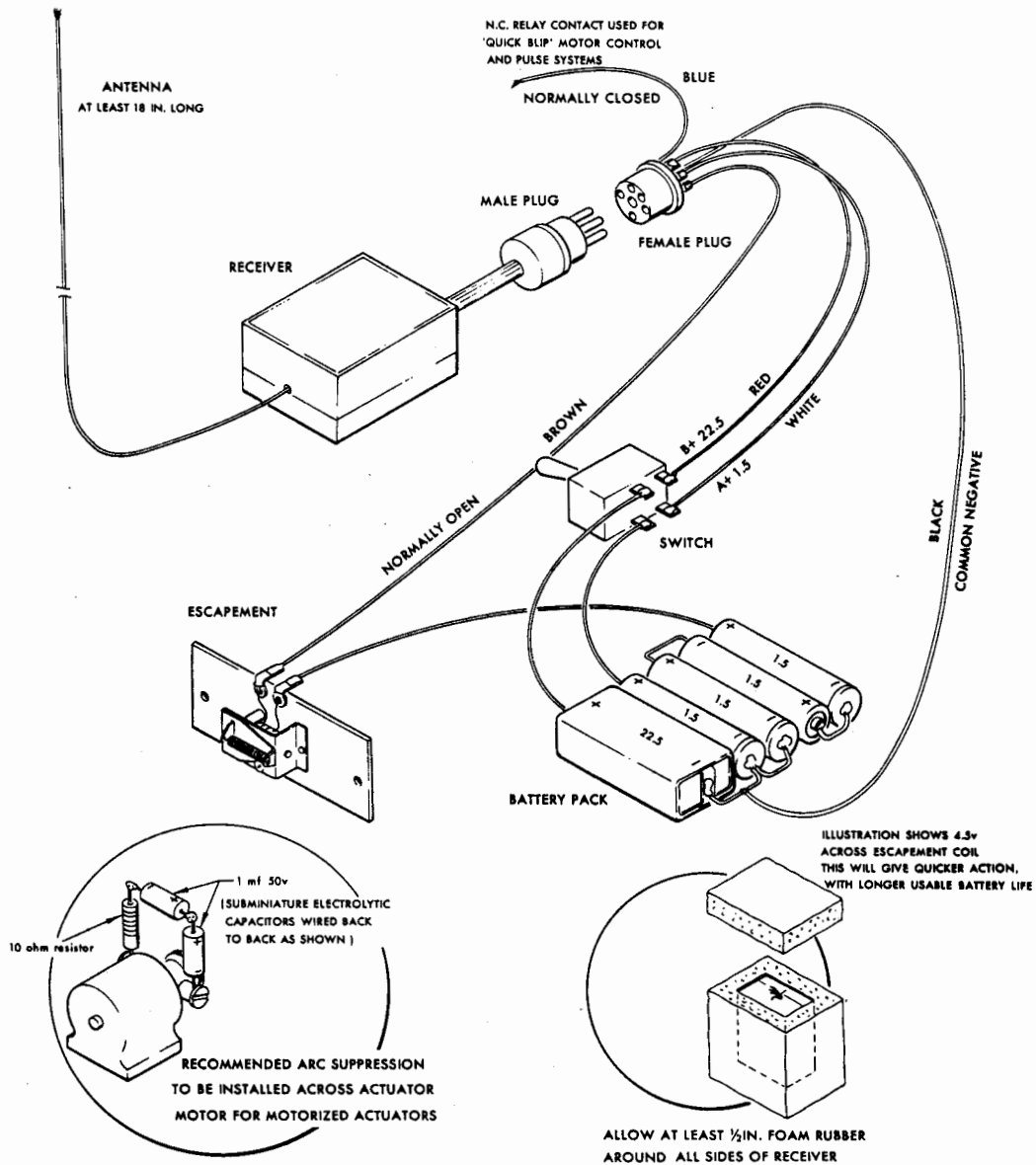
254

Ace Radio Control

BOX 301

HIGGINSVILLE, MISSOURI

RECEIVER RELAY HAS A 1mf ELECTROLYTIC CAPACITOR ACROSS N.O. CONTACT AND RELAY FRAME FOR ARC SUPPRESSION. BE SURE TO HOOK UP ESCAPEMENT OR ACTUATOR BATTERIES WITH POLARITY AS SHOWN.



Your Ace Kraft Receiver Kit is a refinement of the original Kraft Audio Receiver. In theory, your Kraft receiver is a vacuum tube superregen detector, followed by 2 stages of audio amplification via transistors, feeding into a relay coupled transistor, which pulls in on receipt of the audio modulated signal. It may be used with escapements, in which event the hookup shown in pictorial form in these instructions should be used.

With $4\frac{1}{2}$ volts of escapement batteries, the use of $1/4$ " flat rubber is recommended. It also is capable of following fast pulsing, and with a relay this means almost any actuator may be used. Follow the instructions of the actuator manufacturer for the correct hookup.

Now follow the instructions in the step by step with ultra care and detail. If you do, your Kraft Receiver should provide many hours of fun. Important: Follow step by step. These instructions have been carefully written and any attempt to bypass or shortcut will usually end in a receiver which does not perform correctly. Any shortcuts and you're on your own!

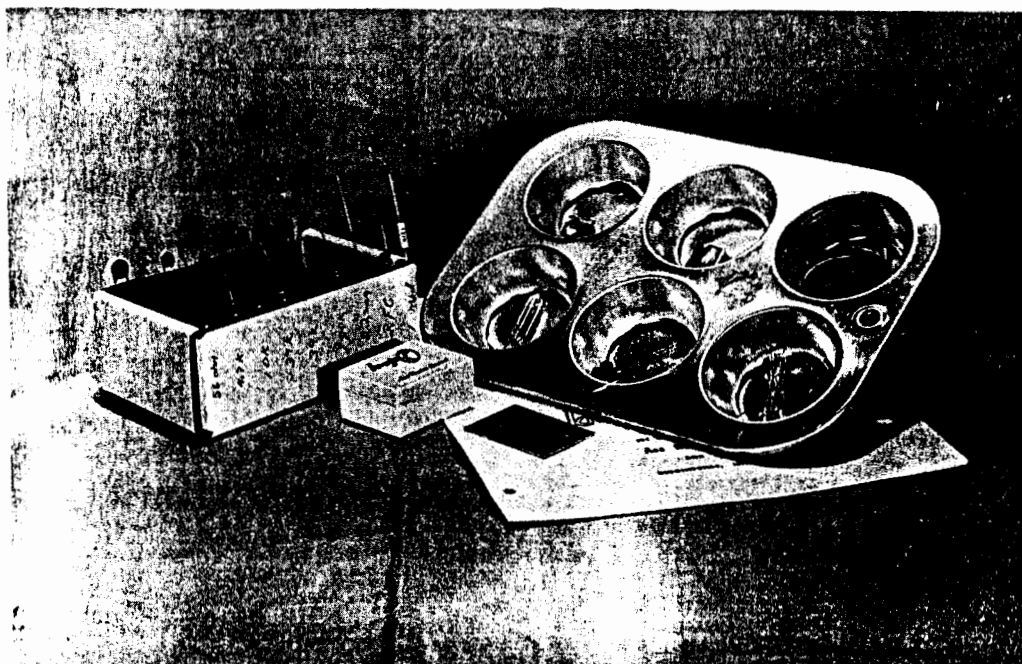
UNPACK YOUR KIT CAREFULLY AND CHECK EACH PART AGAINST THE PARTS LIST. In so doing, you will become acquainted with the parts. If some shortage or parts damage is found, return the parts list with your NAME AND ADDRESS to Ace Radio Control, Box 301, Higginsville, Missouri for correction.

In order to get your kit to you as quickly as possible, we occasionally have to make a slight parts substitution. These are all carefully checked and will be found to work as satisfactorily as the original parts specified. They will be found to be minor in nature and are mentioned only to avoid confusion.

If you're ready to go, do so by:

1. Lay out all parts so that they are readily available.
2. Have at hand the basic tools you will need: Long nose pliers, side cutters, wire stripping tool for stripping insulation, a 25 or $37\frac{1}{2}$ watt soldering iron of the Ungar type, solder for printed circuit work of the Ersin type, and a tuning wand.

Many kit builders find it helpful to separate the various parts into convenient categories. Moulded egg cartons or muffin tins make nice trays for small parts. Resistors and capacitors may be placed with their lead ends inserted in the edge of a piece of cardboard until they are needed. Values may be written on the cardboard next to each component. The photo gives you an idea of the method which may be used.

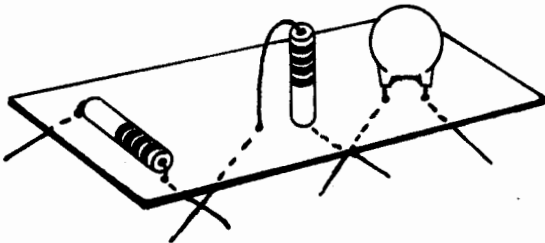


CIRCUIT BOARD WIRING AND SOLDERING TECHNIQUES

Before attempting any work on the circuit board, buff it lightly with steel wool. It has been coated with a flux, but perspiration from the hands may cause soldering difficulties. Read the instructions carefully. It is only necessary to observe a few basic precautions which will insure proper operation of the receiver when it is first hooked up.

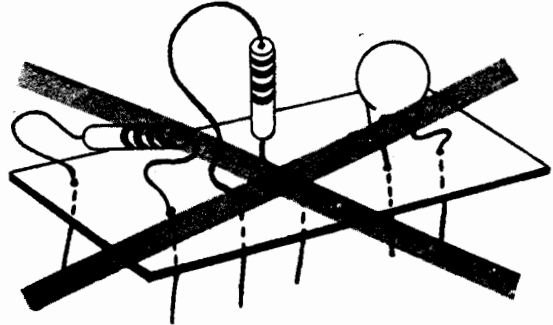
Proper mounting of components on the board is essential. A good general rule to follow is that all components should be mounted as tightly to the board as possible. All leads should be kept short to minimize stray capacity effects. The foregoing applies to all parts EXCEPT transistors. Mount these so they are about $\frac{1}{4}$ " above the board, so a heat sink may be used.

PROPER MOUNTING

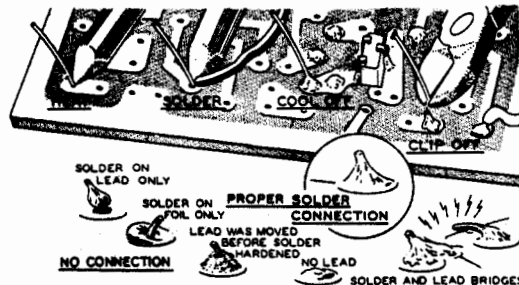


Spread the leads of each component as it is mounted so that it will be locked in place while it is soldered

INCORRECT MOUNTING



Mount the components as nearly flush to the board as possible.



The actual technique of soldering leads to the PC board is really simple. Position the tip of the soldering iron so that it firmly contacts both the circuit board laminate and the wire to be soldered. Remove the solder as soon as it begins to melt and flow over the foil. Then, remove the iron. Care must be used to avoid overheating. If a soldering gun MUST be used, use every care to avoid overheating. This can ruin the entire project.

Use only the amount of solder required. Excessive solder increases the prospect of having a bridge between foil lands or plugging holes which should be left for future components. If solder is flowed between two adjacent pieces of copper, it may be removed by heating with the iron and then brushing away quickly with a soft cloth. In the event that a hole is filled, apply heat from the iron and clear by immediately pushing the lead of a resistor through the hole from the opposite side and withdrawing the lead before the solder hardens. Do not force. In cases where the foil does become damaged, repairs can generally be made with little difficulty. A break in the foil can be rejoined with a small piece of bare wire.

The following steps are in a logical order to enable you to complete your receiver with the least possible confusion. Read each step or component placement guide before beginning the actual work. Also, it is well to read ahead a few numbers to familiarize yourself with the general operation. When the step is completed, check it off in the (). This will help to prevent errors if there is an interruption in your building. Some builders also like to mark each step in colored pencil on the Pictorial as it is added.

The steps directing the installation of resistors include color codes to minimize error.

By following these step by step instructions and the pictorial layout, this Kraft receiver can be assembled with very little trouble. Solder all connections as they are made unless otherwise stated

- () Mount the 10K-1K transformer in holes 43 and 62.
- () Insert the secondary lead from the transformer into hole 63.
- () Insert the secondary lead from the transformer into hole 30.
- () Insert the primary lead from the transformer into hole 26.
- () Insert the primary lead from the transformer into hole 42.
- () Insert a .02 mfd capacitor into holes 31 and 41.
- () Insert a 100K resistor (brown, black, yellow) into holes 33 and 39 with the resistor standing over hole 33.
- () Insert a .001 mfd capacitor into holes 32 and 24.
- () Insert a .01 mfd capacitor into holes 34 and 35.
- () Insert a 39K resistor (orange, white, orange) "22K resistor 'red, red, orange'" into holes 36 and 37 with the resistor standing over hole 36.
- () Insert a 39K resistor (orange, white, orange) into holes 52 and 53 with the resistor standing upright over hole 53.
- () Insert the RFC into holes 18 and 25 with the RFC standing upright over hole 18.
- () Insert a 2.2 meg resistor (red, red, green) into holes 4 and 7 with the resistor standing upright over hole 4.
- () Insert a 47 mmf NPO capacitor into holes 3 and 6.
- () Insert a 2.2 mmf NPO "1 mmf NPO" capacitor into holes 8 and 21.

When you receive your receiver kit the tuning coil has been wound for you with the Solder-Eze wire which, by applying the soldering iron and solder, the insulation melts and the wire may be soldered to the lug. This should be done before soldering the tuning coil onto the printed circuit board.

- () Insert the tuning coil into holes 20 and 23.
 - () Insert a 1 mfd electrolytic PI capacitor into holes 58 and 59 with the negative lead inserting into hole 58 and the positive lead into hole 59.
 - () Insert a 10K resistor (brown, black, orange) into holes 54 and 60 with the resistor standing upright over hole 60.
 - () Insert a 14 mfd electrolytic PI capacitor into holes 55 and 61 with the negative lead inserting into hole 55 and the positive lead inserting into hole 61.
 - () Insert a 6.8K resistor (blue, grey, red) into holes 65 and 56 with the resistor standing upright over hole 65.
- NOTE: This resistor may be varied between 6.8K and 10K depending on desired sensitivity.
- () Insert a 56 ohm resistor (green, blue, black) into holes 64 and 57 with the resistor standing upright over hole 64.
 - () Insert a 1 mfd electrolytic PI capacitor into holes 44 and 45 with the negative lead inserting into hole 45 and the positive lead inserting into hole 44.
 - () Mount the 5K relay in holes 46 and 47 with the mounting screw through hole 46 and the lock lug in hole 47.
 - () Connect a jumper wire from one relay coil lug to hole 29. Refer to relay pictorial.
 - () Connect a jumper wire from the other relay coil lug to hole 28. Refer to the relay Pictorial.

- () Insert the negative lead from the 1 mfd ceramic electrolytic capacitor into hole 16 with the capacitor standing over the hole. Connect the positive lead to the normal open lug of the relay.

When soldering transistors and tubes, use long nose pliers or some other object on the leads to act as heat sinks to prevent ruining the transistors and tube.

- () Insert one of the transistors into holes 11, 17, and 27 with the collector lead inserting into hole 11, the base lead inserting into hole 17, and the emitter lead inserting into hole 27.
- () Insert one of the transistors into holes 40, 48, and 51 with the collector lead inserting into hole 40, the base lead inserting into hole 48, and the emitter lead inserting into hole 51.
- () Insert one of the transistors into holes 38, 49, and 50 with the collector lead inserting into hole 38, the base lead inserting into hole 49, and the emitter lead inserting into hole 50.

The collector lead on the transistors is the lead which is next to the red line.

- () Insert the tube into holes 1, 5, 9, and 19 with tube pins 1 and 2 inserting into hole 19, tube pin 3 inserting into hole 9, tube pin 4 inserting into hole 5, and tube pin 5 inserting into hole 1. The red dot on the tube is next to tube pin 1.
- () Insert a 24 inch length of flexible wire for the antenna into hole 22.
- () Insert a length of red flexible hookup wire through hole 14 and then insert into hole 15. This wire will connect to positive 22.5 volts.
- () Insert a length of black flexible hookup wire through hole 14 and then insert into hole 12. This wire will connect to negative 22.5 volts and negative 1.5 volts.
- () Insert a length of white flexible hookup wire through hole 14 and then insert into hole 13. This wire will connect to positive 1.5 volts.

PARTS LIST FOR KRAFT RECEIVER

RESISTORS

- 1 6.8k (blue, gray, red)
- 1 56 ohm (green, blue, black)
- 2 10K (brown, black, orange)
- 2 39K "1 39K" (orange, white, orange)
- 1 100K (brown, black, yellow)
- 1 2.2 Meg (red, red, green)
- 1 "22K (red, red, Orange)"

CAPACITORS

- 1 2.2mmf N.P.O. "1 1mmf N.P.O."
- 1 47mmf N.P.O.
- 1 .01mfd disc
- 1 .001mfd disc
- 1 1mfd Cer. Electrolytic
- 2 1mfd PI Electrolytic
- 1 14mfd PI Electrolytic
- 1 .02mfd

TRANSISTORS

- 3 2N224

R.F.C.

- 1 20 uhy "1 10 uhy"

PARTS INCLOSED BY " " ARE FOR 50 - 54 mc OPERATION

COIL

- 1 36t #30 on SPC2 "1 18t #26 on SPC2"

TRANSFORMER

- 1 10K-1K

RELAY

- 1 Deans 5K

WIRE

- 10" Red, Black, Brown, White, & Blue
- 24" Antenna Wire
- 12" Solder

TUBE

- 1 6007 "1 1AG4"

MISCELLANEOUS

- 1 Kraft PC board
- 1 Screened plastic box
- 1 Set of instructions

SERVICE INFORMATION

If, after applying the information contained in this manual and your best efforts, your Ace R/C kit does not give you the proper performance, we suggest you take advantage of the facilities of our Servicenter, at Box 301, Higginsville, Missouri, #64037.

The Ace Servicenter is manned by personnel that has been trained in the art of servicing R/C equipment. There are problems encountered in R/C equipment that are not encountered in ordinary Radio and Television, and these problems may be difficult for the ordinary Radio and TV Serviceman to spot, unless he has personal knowledge acquired from personal use of R/C equipment.

The service charge will be a reasonable fee plus the replacement of defective components, if in the judgment of the Ace Technician, they were good to begin with. If, in his judgment, they were faulty as you received the kit, they will be replaced without any additional charge.

Service applies only to completed equipment which has been constructed in accordance with the instructions as contained in this manual. Equipment which has been modified, may sometimes not be accepted for service. IF THERE IS EVIDENCE OF ACID CORE SOLDER OR PASTE FLUXES, THE EQUIPMENT WILL BE RETURNED WITHOUT ANY ATTEMPT TO REPAIR --since such an attempt would be a waste of time.

Attach a tag with your name and address to the equipment when it is returned for service. Pack carefully in a carton large enough to contain enough packing so that no damage from handling in the mails will result. Include with the transmitter a letter stating briefly what in your opinion is wrong with the equipment.

On the outside of the parcel be sure to include your name and address. Use a mailing tag, and plainly write in the following address:

Ace Service Center
Box 301
Higginsville, Missouri
#64037

On the package itself, because of your letter, write "Letter enclosed" and add a stamp to cover the postage for this, in addition to the postage the package requires under regular parcel post rates. If available, add stickers such as "Fragile" or "Handle With Care". Your unit will be given prompt attention. If repairs required appear to be extensive, you will be contacted by the Servicenter before further work is done to obtain your authorization. There is a minimum of \$3.00 plus postage for service work. Parts required will be additional. This minimum is for simple single channel equipment. Multi and proportional rates are higher.

Ace R/C, Inc.

BOX 301
HIGGINSVILLE, MISSOURI