

K3VK

ASSEMBLY MANUAL

For Your

Ace Kraft Relayless

Single Channel Receiver

26-28 mc



Ace R/C, Inc.

BOX 301
HIGGINSVILLE, MISSOURI

HELPFUL KIT BUILDING INFORMATION

Before you attempt to build your Ace R/C kit it would be most helpful to have you read the entire instruction manual through to thoroughly familiarize yourself with the general procedure. You will note the use of photographs and drawings throughout the instructions

This is offered primarily for the novice and will be definite assistance to those who lack a thorough knowledge of approved construction techniques. Even the advanced R/C enthusiast may benefit by a brief review of this material before proceeding with the construction of this kit. In the actual mechanical assembly of components for the chassis and related equipment it is important that the procedure as developed in the instructions be followed. Make sure that tube sockets are properly mounted in respect to the pin numbering location. The construction of Ace R/C kits does not necessarily require the use of a lot of specialized equipment and only basic tools in almost every R/C fan's home workshop are required. A good quality electric soldering iron is essential. A good supply of rosin core type solder of the Ersin Multi Core or similar type is recommended. Never use a separate flux, paste, or acid solder in any electronic work. The use of a long nose plier and a diagonal or side cutters is recommended. A small screwdriver will prove adequate although several additional assorted screwdrivers will be helpful.

When following wiring procedure make your leads as short and direct as possible. When removing insulation from the end of a length of hook up wire it is not necessary to expose more than 1/4" of wire. Excessive insulation removal may cause a short circuit condition in respect to near by components.

In mounting parts, such as resistors and capacitors trim off all excess lead lengths so that the components may be installed in a direct point to point manner. If necessary, use spaghetti over the exposed wires that may short to nearby wiring.

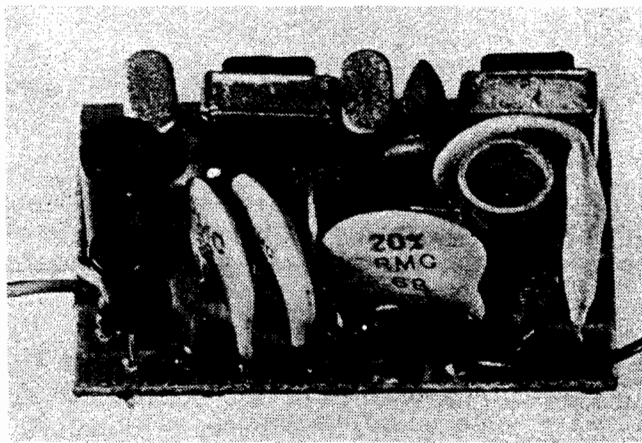
It is highly recommended that the parts layout as shown in the construction manual be followed exactly. The desirability of this arrangement was carefully determined through construction of a series of test models.

Much of the performance of an R/C kit depends upon the degree of workmanship used in making solder connections. Proper soldered connections are not difficult to make but it is advisable to observe some simple precautions. Before a connection is to be soldered the connection itself should be bright, clean, and free of excess solder. Use enough heat to thoroughly flow the solder smoothly into the joint. Excessive use of solder is to be avoided. Also avoid a flux flooding condition which could conceivably cause a leak between adjacent terminals

A check list of parts has been prepared for you and will be found in your kit. This contains a list of all components found in your kit. It is advisable for you after you have thoroughly studied the drawings, pictures, and instructions to check this list of components to make sure that all parts are in the kit.

In the event of a shortage please return the parts list to Ace Radio Control, Inc, Box 301, Higginsville, Missouri, detailing which parts you were short.

Best of luck on your R/C adventures.



PARTS LIST

CAPACITORS

- 2 () .001 mf disc
- 1 () .01 mf tubular
- 2 () .03 mf disc
- 2 () 68 pf disc
- 1 () 70 mf P.I.

RESISTORS

- 2 () 1K (brown, black, red)
- 2 () 4.7K (yellow, violet, red)
- 1 () 100 ohm (brown, black, brown)
- 1 () 680 ohm (blue, grey, brown)

TRANSISTORS

- 1 () T6058
- 2 () 2N229 (type) (gold or silver)
- 1 () SFT 323

RFC

- 1 () 36 uhy

TRANSFORMERS

- 2 () 10K to 1K

WIRE

- 10 inches red, white, and black
- 24 inches antenna wire
- 12 inches solder

MISCELLANEOUS

- 1 () K3VK PC board
- 1 () Set instructions

TUNING COIL

- 1 () 5 1/2 turns #26 on CFS 1/4

While every effort is made to pack your kit with 100% complete parts, with human fallability being what it is errors can occur. In the event of shortage, please return the parts list to Ace R/C, Inc., Box 301, Higginsville, Missouri, detailing which parts you were short. We must have your parts list in order to make a replacement. This will also help us in eliminating future errors.

Best of luck on your R/C adventures.

INTRODUCTION

These instructions are to assist you in every way to complete your kit with the least possible chance for error. We suggest you retain this manual in your files for future reference, both for the use and maintenance of your Kraft equipment.

UNPACK YOUR KIT CAREFULLY AND CHECK EACH PART AGAINST THE PARTS LIST. In so doing, you will become acquainted with the parts. While every effort is made to pack your kit with 100% complete parts, with human fallability being what it is, errors can and will occur. In the event of a shortage please return the parts list to:

Ace R/C, Inc.
Box 301
Higginsville, Missouri, 64037

Give details which parts you were short. We must have your parts list in order to make a replacement. This will also identify for us in what department the error occurred.

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 they will 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:

1. Lay out all parts so that they are readily available.
2. Have at hand the basic tools you will need;
 - a. Long nose pliers
 - b. Side cutters
 - c. Wire stripping tool for stripping insulation.
 - d. A 25 or 37 1/2 watt soldering iron of the pencil type.
 - e. Solder for printed circuit work of the Ersin type.
 - f. A tuning wand.

1-2-3, LET'S GO --

The following steps are in a logical 1--2--3 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 code to minimize error.

WE HAVE FOUND FROM EXPERIENCE THAT UNLESS THE TRANSISTORS, PARTICULARLY THE 2N229 TYPE, ARE INSTALLED WITH ABOUT 1/4" LEAD LENGTHS BETWEEN THE TRANSISTORS AND THE P.C. BOARD, AND A HEAT SINK USED WHEN SOLDERING, THEIR LIFE WILL BE GREATLY REDUCED..

STEP BY STEP INSTRUCTIONS

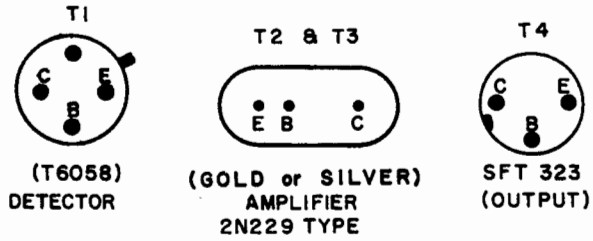
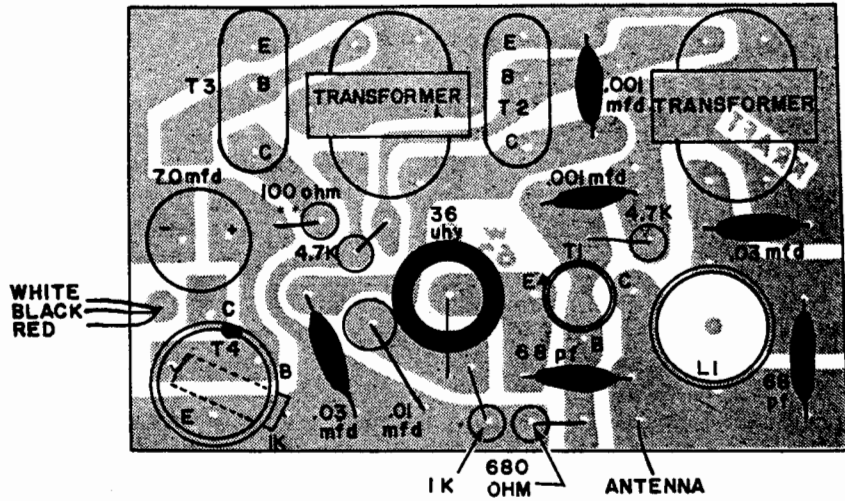
1. () Insert a 2N229 type transistor in holes 1, 13 and 14, with the emitter in hole 1, the base in hole 13, and the collector in hole 14. When soldering transistors in the circuit, use some type of heat sink to prevent damage to the transistors.
2. () Insert a 2N229 type transistor in holes 4, 10 and 15, with the emitter in hole 4, the base in hole 10, and the collector in hole 15. When soldering transistors in the circuit, use some type of heat sink to prevent damage to the transistors.
3. () Insert a 1K resistor (brown, black, red), in holes 56 and 58.
4. () Insert a T6058 transistor in holes 38, 39 and 47, with the emitter in hole 38, the base in hole 47, and the collector in hole 39. Use heat sinks when soldering.
5. () Mount one transformer in holes 11 and 12 with the primary leads in holes 17 and 18, and the secondary leads in holes 2 and 3. Solder the mounting lugs to the proper holes.
6. () Mount the other transformer in holes 8 and 9, with the primary leads in holes 21 and 22 and the secondary leads in holes 6 and 7. Solder mounting lugs to proper holes.

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 PC lands. It is recommended you pre-tin the two leads before inserting them into the holes in the PC board.

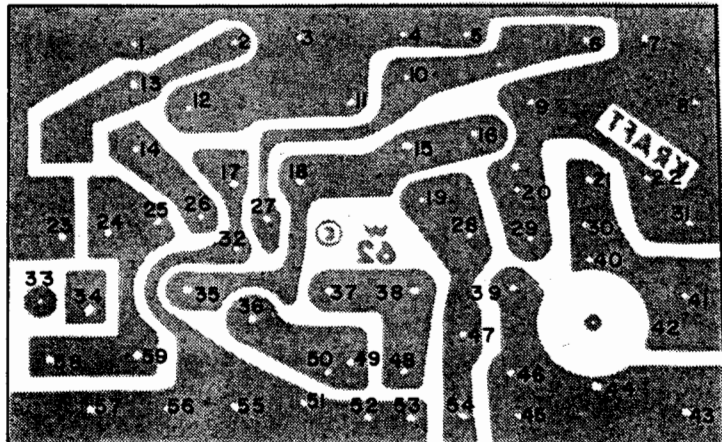
7. () Mount the tuning coil in hole 42 and insert leads into holes 40 and 44.
8. () Insert a .001 mfd (1K) capacitor in holes 5 and 16.
9. () Insert a .001 mfd (1K) capacitor in holes 19 and 20.
10. () Insert a .03 mfd capacitor in holes 30 and 31.
11. () Insert a 68 pf capacitor in holes 46 and 48.
12. () Insert a 68 pf capacitor in holes 41 and 43.
13. () Insert a .01 mfd tubular capacitor in holes 36 and 51.

14. () Insert a .03 mfd capacitor in holes 35 and 55.
15. () Insert the negative lead of the 70 mfd electrolytic capacitor in hole 23 and the positive lead in hole 24.
16. () Insert a 4.7K resistor (yellow, violet, red), in holes 28 and 29 standing upright over hole 29.
17. () Insert a 680 ohm resistor (blue, grey, brown) in holes 53 and 54 standing upright over hole 53.
18. () Insert a 1K resistor (brown, black, red), in holes 49 and 52 standing upright over hole 52.
19. () Insert a SFT 323 transistor in holes 57, 59 and 34, with the emitter in hole 57, the base in hole 59, and the collector in hole 34. When soldering transistor in the circuit, use some type of heat sink to prevent damage to the transistor.
20. () Insert a 4.7K resistor (yellow, violet, red), in holes 32 and 27 standing upright over hole 32.
21. () Insert a 100 ohm resistor (brown, black, brown) in holes 25 and 26 standing upright over hole 26.
22. () Insert a 36 uhy RFC coil (black) in holes 37 and 50 with the RFC standing upright over the hole 37.
23. () Strip 1/8" insulation from one end of the red, black, white, and antenna wires, tin with solder before proceeding with the next step.
24. () Insert the antenna wire through hole 45 and solder on copper land with connections 43 & 44.
25. () Solder the red wire to the copper land with connections 56 and 57.
26. () Solder the white wire to the copper land with connections 34.
27. () Solder the black wire to the copper land with connections 23.
28. () Insert the red, white and black wires and run through hole 33.

Consult the schematic for hook up pictorial on making your installation in your aircraft. You will also see a suggested battery box reprint from FLYING MODELS.



Transistor lead placement as viewed from the bottom.



SERVICE TIPS

This completes the wiring of your K3VK kit. Double check all your soldering connections and make sure that they have all been made.

Hook up your unit with an escapement as shown on the schematic. Use a Transmitter of Kraft type (400-500 CPS), the receiver will work only with this type of transmitter. Extend the antenna fully, turn on the transmitter and depress key. Turn the slug of L1 until escapement clicks in. Repeat tuning process until you are able to get mid-point of tuning range. Now collapse the antenna and repeat the process of tuning. If operation is still satisfactory, take the antenna off the transmitter and fine tune the receiver for operation of the escapement at a range of 5 or 6 feet. You will have a ground check in excess of 400 yards.

IMPORTANT: If the K3VK or any relayless receiver is to be used with an add on switcher for proportional control use, it must be remembered that the drain on the batteries is constant! If the actuating device drains 300 ma, with the relayless set up THIS IS CONSTANT FROM ONE SET OF BATTERIES. Unlike the two battery set up, this requires consideration when setting unit up in a plane, and nickel cadmium cells should be considered. Pen cell batteries are NOT recommended for this use.

After the receiver has been completely wired and tested, the receiver coil should be glued securely to the PC board so that it will not break the leads in hard landings. Do not glue the tuning slug to the coil form.

We sincerely believe that this new Kraft design will afford you many hours of R/C fun. Happy Landings!



TROUBLE SHOOTING

In troubleshooting your K3VK receiver the first thing that should be done is to check the PC side of the kit for shorts and bad or loose solder joints. This seems to be simple in nature but has been proven that this has fixed many service jobs.

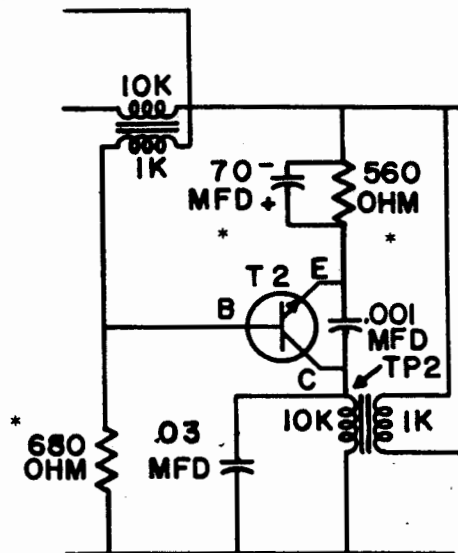
Below is a list of several symptoms and their cures. If the escapement pulls in but appears to be weak, take a VOM and check the voltage across the escapement, the voltage should be 1.75 volts or more at range. With only carrier on the voltage should not exceed .5 volts, and with no carrier the voltage should not exceed 1 volt. If your reading with tone was less than 1.75 volts this may be caused by either of two things, a weak SFT 323 transistor or a weak 2N229 transistor in the second stage. If the voltage is over .5 volts with carrier or over 1 volt with no carrier this trouble is caused by the SFT 323 transistor. Another problem that may occur is the escapement pulling in when no tone is applied, this may be caused by the SFT 323 transistor or the 2N229 transistor in the third stage or the 70 mf PI electrolytic capacitor. If the receiver will not superregenerate, the trouble may be caused by the T6058 transistor, the 2N229 transistor in the

second stage, or the 68 pf capacitor across the coil L1. The DC resistance of the transformers may also cause this problem. These can be checked with an ohmmeter. The resistance across the primary should be approximately 1K ohm and approximately 100 - 150 ohm across the secondary.

When a transmitter of 500 CPS or more is used the CPS of the receiver must be raised to match the transmitter. This may be accomplished by replacing the .03 mf in holes 35 and 55 to a .02 mf.

Another thing to try is interchanging the two 2N229 type transistors, or if you have a transistor checker the 2N229 with the highest beta should be placed in the front end of the receiver.

By changing the base bias resistor 4.7K on transistor T2 to a 680 ohm and installing a 560 ohm resistor in series to ground with a 70 mf electrolytic capacitor in parallel the temperature range of the K3VK receiver will be lowered from approximately 40° F. to 100° F. down to approximately 10° F. to 75° F.

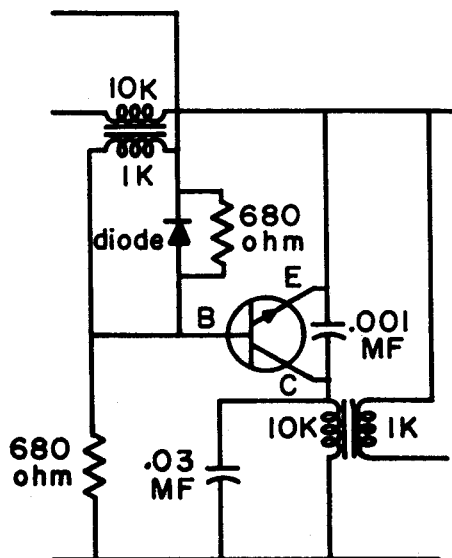


For warm weather use, re-install the 4.7K and short out the 70 mf - 560 ohm combination.

NOTE: This receiver must be used with a 400 CPS transmitter.

* These three (3) extra components are not included in the K3VK receiver kit.

The circuit shown below is for use in your receiver when the weather is so hot that your receiver will not work. This will be in the vicinity 100° F. or above. In most instances this circuit will have to be removed when the temperature is below 100° F. The diode and resistor combination is not furnished with the K3VK kit.



It is recommended that for battery power, Alkaline batteries or Nickle Cadmium batteries be used in place of regular pencils. The regular pencils may drain too fast, especially in pulse applications.

NOTES