

#6074

DECODER KIT

\$14.95

RAND
MANUFACTURING CO., INC.

8909 HUBBELL AVE., DETROIT, MICH. 48228

This is a two stage unit that is used in our DUAL PAK and includes an integrated circuit.

Its action is as follows: First, it detects the change in rate by sampling the signal from the rudder switcher. This is then converted to a change in width which is fed into a switcher as used in the rudder actuating circuit. For full control, the unit is designed to use pulse rates of 10 cps for up elevator, 16 cps neutral and 22 cps for full down elevator.

The unit is designed to operate from a 3.0 to 3.6 volt supply and because there are two actuators in use, it is necessary to use a larger capacity battery of at least 1 amp/hr. and we recommend the RAND #7001, 3.6 volt, 1 amp/hr. Battery Pack. The actuators in the GG PAK and DUAL PAK use 3.0 volt Mitsumi motors and if this unit is to be used on a converted LR-3, HR-1 or HR-2 then as these actuators use a 1.5 volt motor, the current must be reduced by inserting a 1.8 ohm resistor in the motor leads. This extra resistor is included in the kit and actually reduces the actuator power a little, but there is still more than sufficient power for model control. Good soldered joints are needed all the way through the construction and an iron with a small tip of around 1/16 inch is best to avoid land bridges. After each component is installed, carefully cut the surplus leads off as close to the circuit as possible. DO NOT CLIP THE LEADS OF THE TRANSISTORS OR INTEGRATED CIRCUIT UNTIL THEY ARE SOLDERED INTO POSITION.

ASSEMBLY — Refer to diagrams 1, 2, 3, and 4.

Use only the solder provided, which is a resin-cored 60/40 grade.

1. Install transistor 2N4354 in holes 4 Collector, 13 Base, 5 Emitter.
2. Install transistor 2N3569 in holes 2 Collector, 1 Base, 7 Emitter.
3. Install small transistor 2N4275 in holes 32 Collector, 21 Base, 20 Emitter. Make certain it is as close to the board as possible.
4. Install small transistor 2N4257 in holes 23 Collector, 22 Base, 16 Emitter. Pull it tight to the board as well.
5. Install transistor 2N4354 in holes 19 Collector, 31 Base, 33 Emitter. Note that this one is "Piggy-backed" over the 2N4275 with its legs spread.
6. In a similar way install transistor 2N3569 in holes 18 Collector, 10 Base, 24 Emitter.
7. Take the resistors and bend one lead of each as in diagram 5. Note that they are installed with one end tight to the board.
8. Install the 47 ohm resistor (YELLOW, VIOLET, BLACK) with the long lead in hole 11 and the body down in hole 12.
9. Install the 22 ohm resistor (RED, RED, BLACK) with the long lead in hole 15 and the body down in hole 6.
10. Install the 100 ohm resistor, (BROWN, BLACK, BROWN) with the long lead in hole 34 and the body down in hole 30.
11. Install the 8.2K resistor, (GREY, RED, RED) with the long lead in hole 47 and the body down in hole 28.
12. Take the resistor and BLACK capacitor that are twisted together and bend the ends as on figure 5. These are the pre-calibrated components that set the timing of the integrated circuit for a nominal 16 cps.
13. Install the 5R6uf capacitor with the wire from the domed end in hole 39 and the flat end down on the board in hole 42.
14. Install the timing resistor with its long lead in hole 40 and the body down in hole 35.
15. Install the .47uf capacitor in holes 48 and 27.
16. Install the second .47uf capacitor in holes 8 and 25.
17. Next take the integrated circuit 91428 and note that there is a small flat on its curved edge. It is installed so that the pin by the flat, is in hole 44. DOUBLE CHECK this before soldering.

18. Cut a 4" length of WHITE wire and solder into hole 17.
19. Cut a 4" length of BLACK wire and solder into hole 3. Twist these wires together for later connection to the motor.
20. Cut a 3" length of BLACK wire and solder into hole 9.
21. Cut a 3" length of WHITE wire and solder into hole 26.
22. Cut a 3" length of RED wire and solder into hole 14.
23. Neatly twist these wires together and trim the ends equal for connection to the 4 pin plug supplied. See diagram 6. Do not forget the sleeving.
24. Use a fine sanding disc, a fine cut file or a sheet of emery cloth on a flat surface to flatten the solder lumps and remove the sharp wire ends.
25. Now use a small brush dipped in lacquer thinner to remove the surplus flux and clean the board until it is bright.
26. Carefully examine the assembly for cold solder joints and bridge lands.
27. Finally double check component positioning.

NOTE: Hole 29 is not used.

INSTALLATION:

Make up a connecting harness from one piece each RED, WHITE, BLACK and solder to a 4 pin plug as in diagram 7. This is connected to the RUDDER SWITCHER as shown in diagram 8. RED in hole 25, BLACK in hole 16 and WHITE in hole 20. Connect the actuator motor to the short BLACK and WHITE wires; shorten them if possible.

Use contact glue or RAND Double-Sided Tape (#1006, 1007) to mount the decoder onto the actuator. If you have a 1.5 volt motor in it, then you must install the 1.8 ohm resistor in one of the motor leads.

In the kit we are including two RAND Springs #6032 which you must use if you are intending to convert a LR-3 for the higher pulse system. These are to replace the standard springs in the LR-3 only. You can also remove the motor control lever and intermediate gear from the actuator designated for elevator control and on both converted LR-3's you can remove the elevator plates but make up some distance pieces to fill in the space left on the pins. You can leave the elevator plates in action if you like, but they must not be coupled to the surfaces.

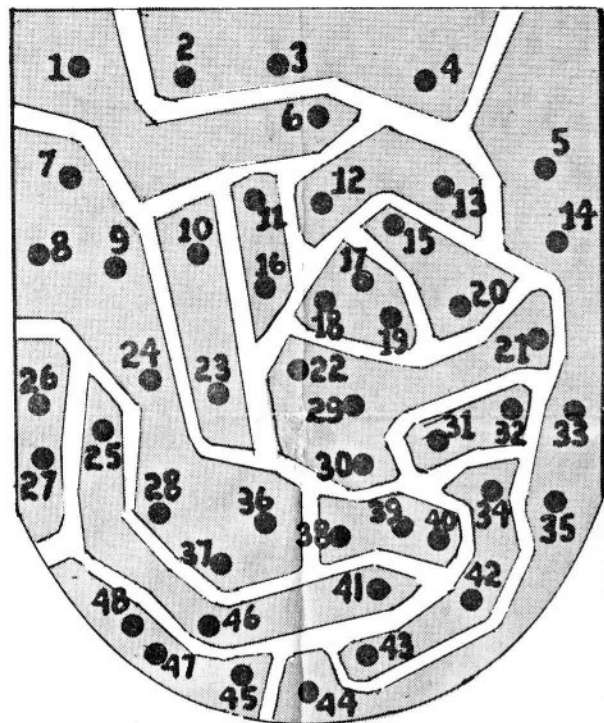
Your transmitter must be adjusted to give the correct stick movement for actuator deflection without causing "go-around" at the extreme stick positions. This might mean making a simple mask to limit the stick movement if there is no provision in the transmitter circuitry for changing the control ratios.

SERVICE

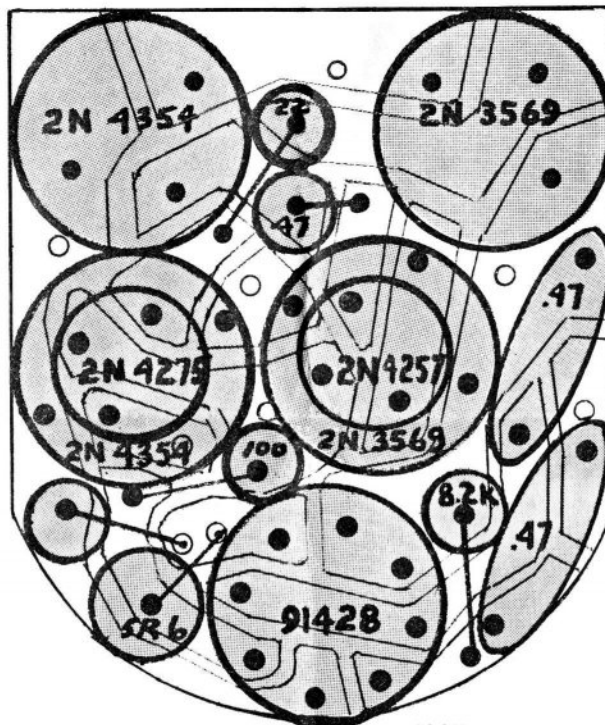
All the components in this kit have been very carefully checked out against our production standards on the assembly line. Due to the delicate nature of the semi-conductors, we cannot cover them with a warranty, but we do offer a service on units requiring attention. Decoders can be returned to us for repair for a minimum handling charge of \$5.00. Components extra.

#6074 DECODER KIT CHECK LIST

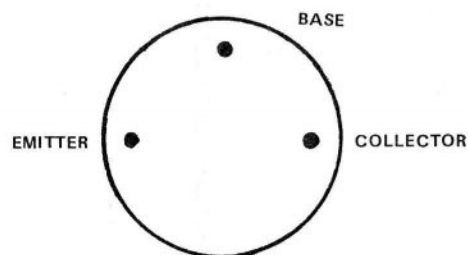
- 1 Circuit Board
- 2 Transistors 2N4354
- 2 Transistors 2N3569
- 1 Transistor 2N4275
- 1 Transistor 2N4257
- 1 Integrated Circuit 91428
- 1 Resistor 22 ohm.
- 1 Resistor 100 ohm.
- 1 Resistor 47 ohm.
- 1 Resistor 8.2K ohm.
- 1 Resistor 1.8 ohm.
- 2 Disc Ceramic Capacitors .47 mfd.
- 1 Matched set of timing capacitor and resistor.
- 1 4-Pin plug and socket
- Sleeving, solder, wire
- 2 #6032 Springs.



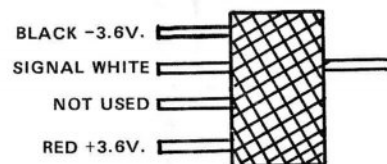
1 CIRCUIT SIDE



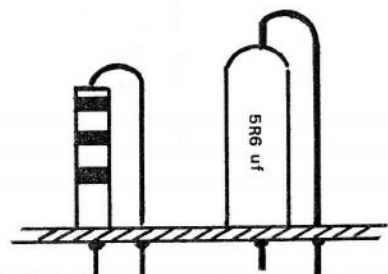
2 COMPONENT SIDE



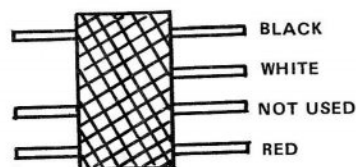
4 VIEW ALONG LEADS OF TRANSISTOR



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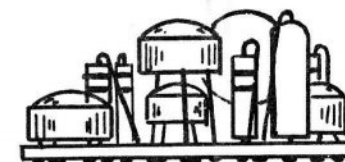


5 RESISTOR & CARACITOR INSTALLATION

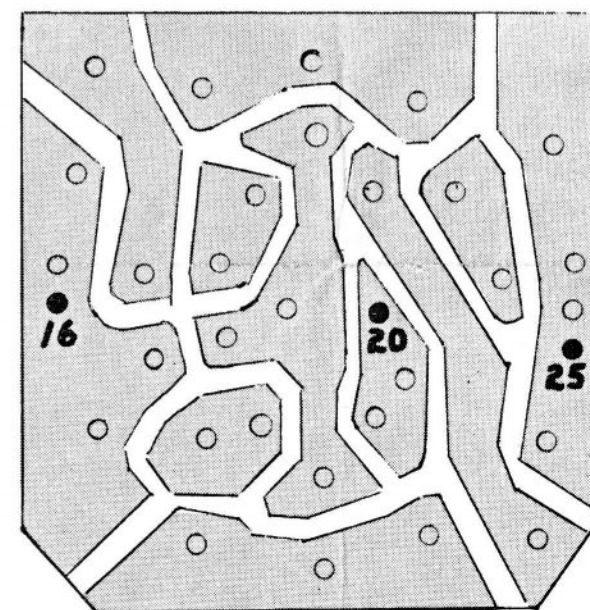


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DIAGRAM FOR #6074 DECODER KIT



3 APPROXIMATE SIDE VIEW OF DECODER



8 RUDDER SWITCHER CIRCUIT SIDE