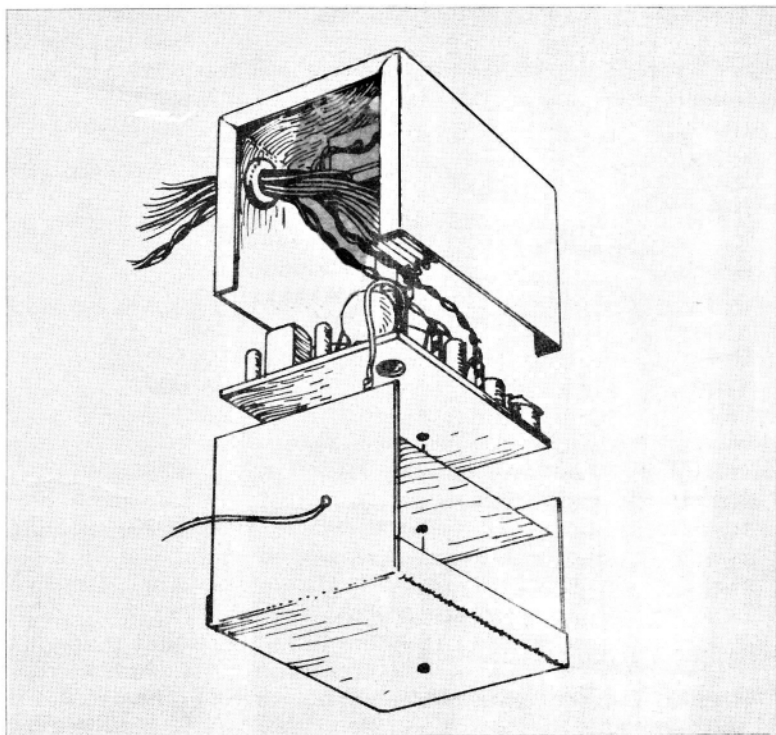


CONTROLAIRE KIT ASSEMBLY TIPS



by JACK PORT

Kit Assembly Tips

Never start actual kit construction until you have first read all of the instructions. This applies to expert as well as novice as complete familiarization will minimize the possibility of a mistake. All of us have the human factor so let this be your guide.

Parts (Component) Identification

The best way to identify the parts is by reference to the pictorials. The resistors have color bands on them for identification. Different bands specify different values of resistance. The silver and gold bands are tolerance marks and they should not be confused with the identification strips.

| Color | Digit | Multiplier |
|----------|---------------|---------------|
| Black | 0 | 1 |
| Brown | 1 | 10 |
| Red | 2 | 100 |
| Orange | 3 | 1000 |
| Yellow | 4 | 10,000 |
| Green | 5 | 100,000 |
| Blue | 6 | 1,000,000 |
| Violet | 7 | 10,000,000 |
| Gray | 8 | 100,000,000 |
| White | 9 | 1,000,000,000 |
| Gold | 5% Tolerance | 0.1 |
| Silver | 10% Tolerance | 0.01 |
| No Color | 20% Tolerance | |

Example: Take a resistor yellow, violet, orange, silver. Refer to chart — first digit (yellow) would be (4). Second digit is (violet) and is (7). So, we have 47 times the multiplier (orange) or (1000). This is a 47000 ohm resistor. The silver band means the tolerance is plus or minus 10%.

Components other than resistors have the values marked on them or the component can be identified by comparison of physical features with the pictorials sketches provided with your kit.

Soldering

Probably the greatest limiting factor in the proper assembly of this kit is your ability to make a good soldered connection. Soldering is not difficult but a few basic facts should be known. In all radio work only special radio type solders should be used. These contain a rosin type flux within the core of the solder and are noncorrosive. In your kit there is supplied a quantity of 60/40 "Ersin Multicore" or "Kesters Resin Five" solder. The 60/40 means solder composition of 60% tin and 40% lead and melts at a relative low heat. If you should run short and cannot obtain the above solder, be sure you at least obtain a rosin core product. Do not use acid core solders or paste type flux as, by doing so, serious

corrosion can result and voids any guarantee extended on this kit. As a soldering iron, the size should be limited to the delicacy of the work involved. For all etched circuit board work, (small Rx for instance) the "Unger Soldering Pencil" equipped with 37½ watt heat element and 1/8" chisel pointed tip is best recommended. For larger work involving more mass (not on receivers), an iron such as the "Wen, Model 100" soldering gun would be best but, in all cases, limit the heat to not more than 100 watts. Excess heat is very damaging. Components such as resistors, condensers, transistors, can even change electrical value if overheated as well as boiling the actual solder joint that ruins its adhesive qualities. The best procedure to follow when making a soldered joint is to apply the tip of the iron to the joint, then apply solder so the flux and solder can melt into the joint at the same time. The iron should be applied only long enough for the solder to flow into and around the joint, then removed. Keep in mind that the flux within the core of the solder is equally important as solder and heat to make a good connection. The flux cleanses the joint and allows for good solder adhesion. Even though a joint and component are initially clean, the application of heat starts an immediate oxidation that tends to dirty the joint, if no flux is available to cleanse the joint, a poor connection will result. Never attempt to solder a joint by carrying molten solder to the joint on the tip of your iron. In the process of doing so, the flux disappears in smoke and none is left for the joint. A good solder joint has a smooth shiny appearance. Here are some tips to help you recognize a poor joint. If excessive heat or insufficient flux is being used, an immediate oxidation will take place creating a condition where the solder adheres more to the tip of the iron than to the joint. This produces a frosty tipped joint, the tip being formed as the iron is pulled away. To correct, use less heat and more flux. Another condition is one of insufficient heat, this produces a bumpy frosted joint but usually one of flux flooding. Both joints are mechanically and electrically insecure and should be avoided.

Inspection of Component Leads

Inspect the leads of all resistors, condensers, coils, etc., for a condition of cleanliness before being used. Although parts are purchased new they do tend to oxidize in storage. If a lead is initially dirty, the problem involved is one of solder adhesion. If you try to solder a dirty lead you will probably use too much heat. This only aggravates the problem. You get the excess heat by holding the iron on longer than you would if the leads were clean to start with. If lead cleanliness is doubtful on any component, scrape it lightly with a pen knife to insure its condition for proper soldering.

Wired Connections

In other than etched circuit board work, do not rely on just a solder bond to hold a part secure to its connection. All wiring and component parts leads should be wrapped or crimped to their respective terminals, before soldering, to create a good mechanical joint. Parts such as condensers, resistors, chokes, etc., should have their excess lead length trimmed so they can be installed in a direct point to point manner between terminals as shown in the pictorials. Bare leads that could possibly short to one another should be insulated with spaghetti tubing.

Etched Circuit Board

If your kit was supplied with an etched circuit board, the copper pattern will have to be cleaned just prior to its use. To protect the copper laminate during storage the photo resist material, used during its manufacture, has been left on the copper. To clean, scrub the board vigorously with steel wool until the copper is bright and shiny. After cleaning, refrain from excessive handling of the copper laminate as oils from the hands will initiate corrosive action. Soldering to the board is close work, but it is not necessarily delicate. Extreme amounts of heat should be avoided to prevent loosening of the copper laminate from the board. After all parts are installed or during the assembly steps, coat all bare copper areas not yet soldered with a light coat of solder to protect the board in use. If you have cleaned your board to a sparkle finish, the solder will flow very easily and only a minimum of heat need be used. When assembling parts to a very small circuit board, a magnifying glass can be a very useful tool.

Polarity Of Components

When you are installing electrolytic capacitors and diodes you must observe the polarity of the part. These parts have plus and minus terminals and you must connect them according to their polarity correctly in the circuit.

