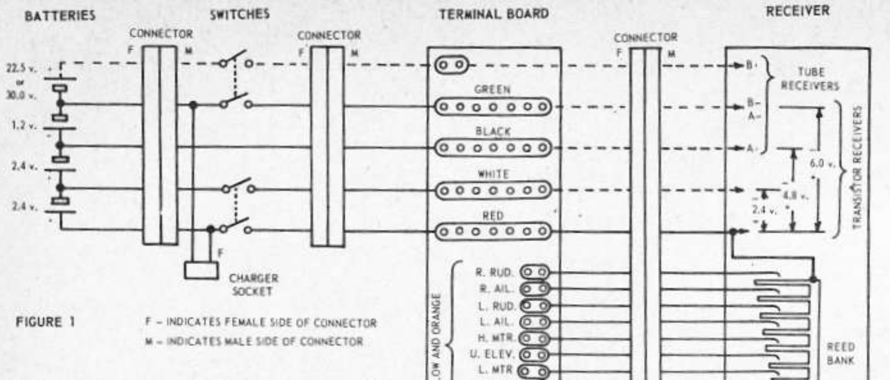
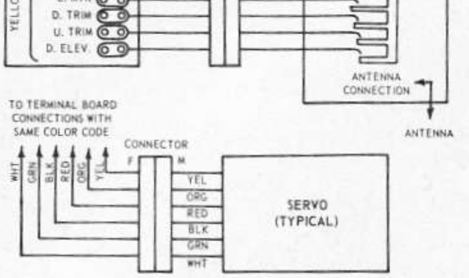


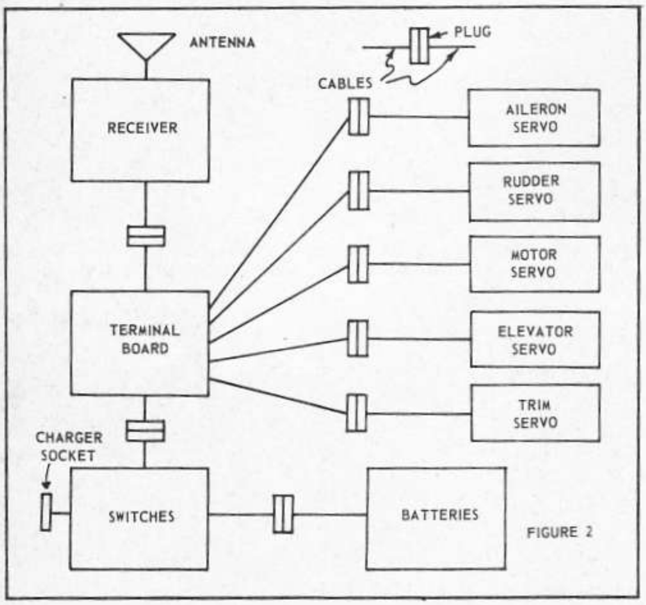


This figure is a generalized wiring diagram which is applicable to most multichannel-reed-type-installations. The "dashed" wiring is not used in all installations. Typically, the "B" voltage leads are not used with transistor receivers. Transistor receivers may require 2.4, 4.8 or 6.0 volts. These voltages may be obtained by connecting them between the red terminal and either the white, black or green terminal on the terminal board. This circuit shows the use of the maximum number of connectors; the text points out several ways of reducing the number. Note that the "terminal board" is built into some receivers. In cases where it is not, a printed circuit type board should be used; these are available commercially.

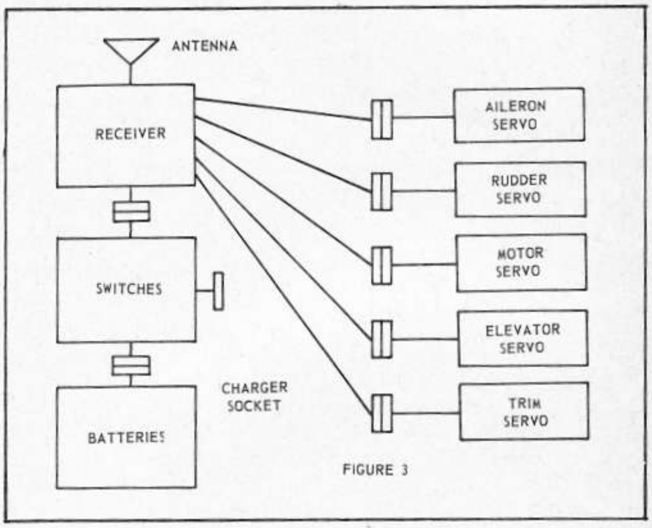
WIRING REED INSTALLATIONS

By GEORGE A. WILSON

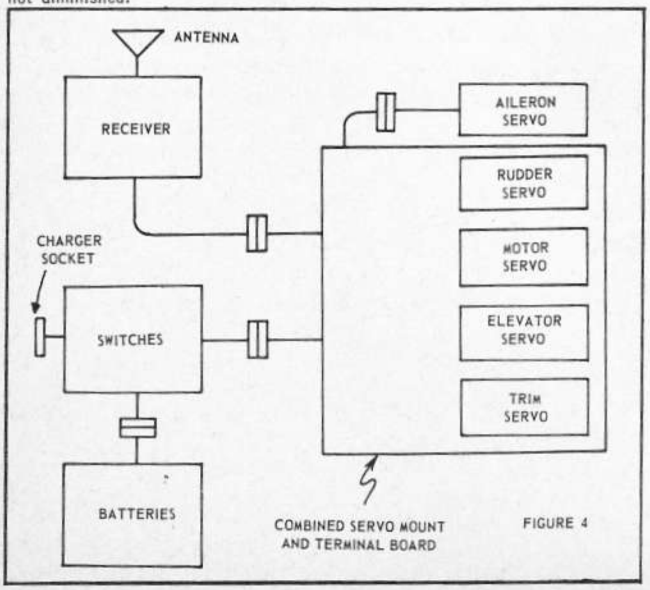
A how-to article that should be part of every rc'ers technical file of informative data. Simplified instructions that take the builder beyond even the manufacturer's instructions and equip. wiring diagrams.



This method of multichannel reed system cabling may be used when a terminal board is included in the receiver. In this case the plug and connector with the largest number of pins is eliminated and the flexibility of the installation is not diminished.



The most general type of multichannel reed system cabling is shown in this figure. This diagram relates directly to the wiring diagram on Figure 1.



This method of multichannel reed system cabling is based on a commercially available servo mounting board which includes a printed circuit type terminal board. The number of connectors is minimized using this scheme.

► If you are approaching the change to a multichannel reed control system, the information in this article will help you make an easy and successful transition. The basic methods of arranging the wires between the various units are discussed and considerable detail is given on the wiring itself.

The literature has included many fine articles on installing R/C equipment in airplanes. But, in most cases, these articles have stopped abruptly when they arrived at the actual wiring diagrams and have referred the ofttimes bewildered modeler to the manufacturer's instructions. Into this area (where angels apparently fear to tread) we will take the plunge. The diagrams and discussion that follow illustrate the general wiring requirements and several specific applications of these general requirements.

The diagrams are meant to be applicable to a wide range of equipment types and manufacturers. The common color coding for transmite servos is shown. This code may be converted to agree with other types of servos by observing the voltages and polarities of the battery connections and connecting other servos appropriately.

(*Continued on page* 42)

Wiring Reed Installations

(*Continued from page* 32)

PLUGS & CONNECTORS

After pricing miniature plugs and connectors, many people must ask themselves why should connectors be used at all. Their question is given further impetus when 1.)

(*Continued on page* 46)

the difficulty of soldering these little devices is considered, and 2.) the fact that connectors are major sources of failure is weighed. The answer to how many connectors to use is up to the individual and the particular installation. Basically, connectors are used: 1.) To allow shifting servos, receivers and batteries to be used in different airplanes 2.) To allow replacement or servicing servos, receivers or batteries 3.) To allow removing parts of the airplane that include RC gear, e.g., the wing when it includes an aileron servo.

If you have a permanent installation or require absolutely minimum weight, eliminate all the connectors that you can. But, if you are like most of us who have more than one airplane and only one set of electronics, use connectors and buy the best ones you can afford.

THE BASIC WIRING DIAGRAM

Figure 1 is a typical wiring diagram applicable to most multichannel reed installations. Double connectors are provided at the switches to allow removal of batteries and the terminal board without removing the switches. The terminal board provides a convenient, neat method of making the many connections required to tie the receiver, switches and servos together. Mid-air solder joints should be avoided for many reasons, the most important being the low probability of obtaining joints which will stand up under vibration.

When soldering wires to plugs, it is most important that spaghetti tubing—or preferably "heat shrink" tubing—be used over the solder joint. Use a piece of tubing about one-half an inch long. The tubing will prevent short circuits and will reduce bending and consequent breaking of the wires near the solder joints.

Terminal boards are available commercially or can be made of printed circuit board material. The author uses vinyl electrician's tape as a "resist" material when making simple printed circuits like those required for terminal boards.

All cables should be laced to reduce the vibration that occurs more easily in single wires than in a group of wires laced together. A convenient lacing material is nylon dental tape. Dental "floss" is o.k. but the tape does a better job. Whenever practical, lace your cables directly to the circuit board, switch or other component. The shorter the length from the point where cable branches into individual wires to the solder joints, the less susceptible the solder joints are to failure caused by vibration. Avoid cables with enough wires in them to make the cable stiff and hard to manage. In this case, it's best to make two or more cables of that group of wires to maintain flexibility.

Note that the charger socket is connected ahead of the on-off switches. This is done to insure that the receiver and servos can be disconnected while the batteries are being charged. Needless to say, it would be dangerous to charge the batteries with the receiver and servos connected since the receiver and servos could be seriously overvoltaged if the batteries become open circuited. Typically, this could happen if one battery were removed for inspection during the charging process. Some charging circuits call for closed-circuit jacks which automatically open the receiver/servo circuit when the charger plug is inserted. If you use such a circuit, be very careful that you don't build in "sneak" circuits that result from not disconnecting *all* of the battery voltages.

THE BASIC CABLING SYSTEM

Figure 2 illustrates the actual cables that result from wiring an airplane in accordance with the wiring diagram in Figure 1. Notice that in a cabling diagram, each line between units is in reality a group of wires laced together to form a "cable."

This type of diagram is handy when you are laying out the airplane installation because it provides an orderly way to estimate and record the lengths of the various cables.

Bryce Peterson's article in the March-April 1964 issue of the Radio Control Modeler ("Printed Circuit Board For Multi-Installation") presented an interesting variation of this cabling system that included the switches in the terminal board. This variation eliminates the connectors associated with the switches but makes it necessary to give special attention to the method of operating the switches.

CABLING WHEN THE RECEIVER INCLUDES THE TERMINAL BOARD

Some receivers provide a terminal board as part of the receiver. This situation is illustrated in Figure 3. It has the major advantage of eliminating the largest connector shown in Figures 1 and 2—the receiver connector itself. This feature can be built into receivers which do not have it by attaching the terminal board to the receiver and wiring directly from the receiver to the terminal board. Commercial units are available that can be used for this purpose.

CABLING THE SERVO MOUNT/TERMINAL BOARD

Figure 4 illustrates a system which incorporates most of the wiring into a board which also serves as a mount for the servos. The mounting/terminal board is commercially available or could be made using printed circuit techniques. This system reduces complication considerably and eliminates four of the connectors normally required for servos.

To summarize—First, choose the system of cabling you plan to use and plan the lengths of the various cables leaving enough slack to allow for installation and removal. Obtain the best miniature connectors you can afford and carefully solder the cables to them and to the terminal board. Lace the cables and tie them down to terminal board and other components to prevent vibration. Finally, after the components and cables are installed in the airplane, "tie" them to the airplane structure to prevent them from vibrating excessively. If you follow these rules, you should come up with a dependable installation that you will be proud of.

Foreign Notes

(*Continued from page* 4)

been told that wind and rain just didn't happen there . . Of course, there's bad weather and BAD weather . . Even so, it sounds like they imported some genuine contest weather from Ye Merrie England. Apparently, the first day dawned calm and cool, but then the wind rose and brought intermittent showers with it. According to "Flysheet," bulletin of the Cape Radio Flyers, the second day gave the organizers a heart attack. Skies were overcast and the wind was blustery and fierce. Rain fell periodically throughout the day and the conditions, at one time, even put a stop to the R/C multi. Of course, this sort of weather couldn't last, though, and, on the third day, contestants were rewarded with, quote, conditions that were as near perfect as possible.

The meet was, this year, held in Cape Town, the free-flight and control-line events being run by the Western Province Model Aircraft Club, while the Cape Radio Flyers ran the radio-control classes. Events included unrestricted rubber, A/1, A/2 and H/L glider on the first day, Wakefield, ½A power, unrestricted power and unrestricted glider on the second day, FAI power, combat and stunt on the third day and FAI teamrace and B teamrace on the fourth and last day. The R/C events were on the second and third days and consisted of