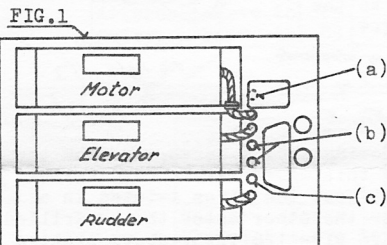


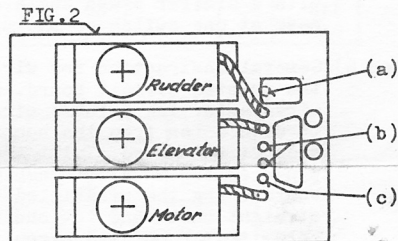
Installation Instruction for MUL-T CIRCUIT MASTER SPECIAL.

The printed circuit board for servo mounting.

Step 1) Select your servo arrangement. The board permits a number of different servo set-ups. Mark where the mounting holes for your own servo layout have to be (preferably on the - - - lines of the board). - Or use one of the following servo arrangements:



Servo set-up with 3 Bonner Transmitters side by side.
Holes marked with



Servo set-up with 3 proportional servos mounted side by side.

- Notes: (a) Grommet for power wires if no power plug is used.
(b) Grommets for receiver wires if no receiver plug is used.
(c) To aileron servo.

Drill servo mounting holes for the servo arrangement you selected.

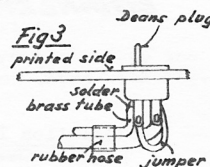
Step 2) Select location of switches, receiver plug and power plug if any.

- A) Switches, receiver plug and power plug mounted on the board. A convenient layout for two DPDT Mini Toggle switches, a 15 pin Cannon plug for the receiver and a 8 pin Deans plug for the power supply is marked on the board with Cut and drill holes. - Or use your own layout.
- B) Receiver wired direct, switches and power plug mounted on the board. Drill marked grommet holes (3/16 DIA.) for the receiver wires. Locate switches in the marked area.
- C) Switches separate mounted, receiver and power supply wired

Cont.

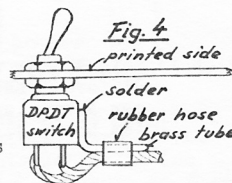
Step 2) direct or receiver plug and power plug not mounted on the board.
Drill \otimes marked grommet holes ($3/16$ DIA.) for the receiver wires.
Drill one grommet hole as shown with (a) on Fig.1 or Fig.2 for the power wires.

Step 3) Fit the board in your plane. Trim in width as required. Cut also in length, but provide enough space on the board for the mounting screws to the servo rails in the fuselage.

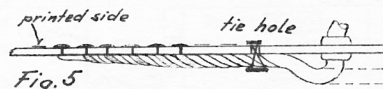


Step 4) Mount plugs and switches to the board.
See Fig.3 and 4.

Step 5) Wire power plug and switches. For the Deans plug we suggest to use two pins per battery wire for increased safety. Support the wires with a $1/16$ brass tube bent to an angle and soldered to one male pin as shown with Fig.3. Support also the wires to and from the switches with a similar brass angle soldered to the case of one switch as shown with Fig.4.



Step 6) General instruction for wiring to the printed circuit board. All wires enter the printed circuit through holes from the nonprinted side of the board. Twist the wires coming from a servo, or from the plugs or switches to a cable and tie this cable with thread to the board using the predrilled tie holes. Keep the wires twisted in a straight cable and let one wire after the other enter the predrilled holes to the printed circuit. Cut bare wire $1/8$ inch. above printed circuit. Bend wire ends over and solder them to the printed islands. Make a neat flat solder point. See Fig.5.



Step 7) For proportional systems:

Wires from receiver go to row D and E. Signal wire for rudder to E 10, for elevator to E 11, for aileron to D 11 and for motor to D 10. Check the instruction of the receiver manufacturer regarding required receiver voltage and connect to two of the points E 5, E 7, E 8, or E 9. Proceed with wires from receiver or receiver plug per Step 6).

Step 8) For reed systems:

Connect receiver wires to printed circuit. Proceed with wires coming from the receiver plug or from the receiver direct per Step 6). Use tie holes D and E. Connect receiver plus and minus and the reed bank frame wire per instruction of the receiver manufacturer. Provided on the board for these wires are E5, E7, E8, D8. Connect reed wires per Table 1

Wire from reed for	Push wire through hole
Rudder right	D10
Rudder left	D11
Elevator up	E11
Elevator down	E12
Motor high	E10
Motor low	E 9
Aileron right	D 3
Aileron left	D 4

Table 1

Step 9) Connect your power supply as shown on Table 2 for reed systems and as shown on Table 3 and 4 for proportional systems. Use tie holes H & K for these wires coming from the switches or the power plug and proceed per Step 6).

Table 2

Wire from battery	Color	Push through hole
-4.5V	green	K 5
-3 V	black	K 6
common	white	K 7
+3 V	red	K 8

Wire from	Power supply	to	K9	Reference voltage	K7	K8	K6	Servo voltage	K5	Signal
Rudder servo	to	H9			H7	H8	H6		H5	H10
Elevator servo	to	G9			G7	G8	G6		G5	G11
Aileron servo	to	C9			C7	C8	C6		C5	C11
Motor servo	to	B9			B7	B8	B6		B5	B10

Table 3

Wire from	Power supply	to	K9	Servo voltage	K7	K8	Signal
Rudder servo	to	H9			H7	H8	H10
Elevator servo	to	G9			G7	G8	G11
Aileron servo	to	C9			C7	C8	C11
Motor servo	to	B9			B7	B8	B10

Table 4

Step 10) Insert grommets into grommet holes where required. Place servos on the printed side of the board. Push twisted servo wires through grommets as shown with Fig.1 or Fig.2. Remove servos and proceed per Step 6). For proportional systems connect servo wires to printed circuit per Table 3 or Table 4. For reed systems use Table 5. See also Fig.6.

*) This is the row of holes to be used. The green, black, white, and red wire from each servo have to be pushed through holes of this row corresponding to the colors of the wires from the power supply.

Note: Exchange orange and yellow wire on the board to reverse control action.

Fig 6

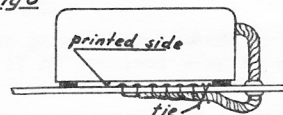


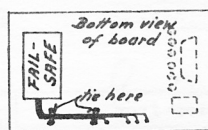
Table 5

Wire from servo for	Push wire through hole	
	orange	yellow
Rudder	B 10	11
Elevator	G 11	12
Motor	H 9	10
Aileron	C 3	4

Step 11) Hookup of auxiliary devices:

- A) Servo overdrive. Use holes 4E, 4F and 4G, 4H for connecting the two additional wires coming from the servo with the switcher board and the servo with the overdrive.
- B) FAIL-SAFE. Glue FAIL-SAFE unit with a foam rubber pad to the not printed side of the board at the location shown with Fig.7. Connect per Step 6) using holes:
5 L for the green wire.
8 L for the red wire.
9 L for the yellow wire.
10L for the purple wire.
Connect reed bank frame wire from receiver to 10 K.

Fig 7



- Step 12) Clean printed side of the board with dope thinner or gasoline. Apply a heavy coat of clear dope over the printed part of the board. Cover printed part of board with furnished insulation sheet and mount servos permanently to the board. (We suggest to fasten the wires inside each servo with Pliobond). There should be enough clearance between servo case and solder points. Raise servos with one or two washers between servo grommet and board if necessary.
- Step 13) Secure all wires on the underside of the board and on plugs and switches with Pliobond.

This is another product from FLY-TRONICS ENGINEERING the company devoted to make your flying safer, better and easier. If you have followed these instructions carefully you will be sure to enjoy the added safety and ease of installation this board affords you.