



ORBIT

ELECTRONICS

11612 ANABEL • JE 4-0170  
GARDEN GROVE, CALIF.



## FOREWORD

In the past few years, radio control has grown from a hobby only for the gifted few, to a sport enjoyed by thousands the world over.

At the same time, radio itself has undergone a great change, beginning with the old gas tube single channel receiver of yesteryear and progressing to the present day, very compact multi-channel units.

The development of transistors played a large part in this evolution. Their small size, low operating voltages, and long life, have allowed the size of equipment to be greatly reduced while the dependability and life span have been increased.

Not satisfied with the older gas tube receivers, the founders of Orbit Electronics set out to develop the best equipment possible. We have, in a sense, grown with the business, for as new and more compact parts became available, we quickly adopted them into the equipment.

Today, Orbit Electronics offers you the finest and most advanced radio control equipment available. Operating on the examination-free frequency of 26.995 mcs., the Orbit single and multi-channel receivers and transmitters offer dependable operation with a standard of reliability that is acclaimed the world over. They are easily identified by their distinctive black cases bearing the popular ORBIT insignia.

It will always be the purpose of Orbit Electronics to bring you the finest equipment possible. Each day, new advances are being made in the field of radio. Where possible, they will be incorporated into Orbit equipment.

You are, truly, UP TO DATE and OUT IN FRONT with Orbit.

## RECEIVER INFORMATION – GENERAL

The ORBIT tone receiver, as in the transmitter, is enclosed in a durable lightweight case of black anodized aluminum. The components are so fitted into the printed circuit board as to form a neat and compact package. Tuning is accomplished quickly and accurately via the single tuning slug in the antenna coil. For all its lightness and compactness, the ORBIT receiver is nevertheless very rugged and can be depended upon to perform under the most adverse conditions since all ORBIT receivers are Temperature Stabilized. Resonant reeds are employed in ORBIT multi-channel receivers to separate the tones.

## TRANSMITTER INFORMATION – GENERAL

The hand-held crystal-controlled ORBIT tone transmitter is enclosed in a heavy duty black anodized case. It features complete stability of tones with no drift occurring as the battery voltage drops. When turned on, the brightness of the indicator lamp on the control panel will reveal the strength of the carrier and thus provide a visual means of tuning without the need for a meter. The effective range of this powerful unit is well beyond the visual range of your model. The rear cover of the transmitter case is easily removed for installing batteries or tuning. Each ORBIT transmitter comes equipped with a chrome-plated telescoping antenna which mounts firmly to the top of the case and is quickly removed when not in use.



## SINGLE CHANNEL RECEIVER

Price . . . . . \$34.95

The ORBIT I tone receiver uses 3 transistors and a subminiature tube in its circuit. The receiver is tuned for 26.995 mcs. at the factory, however there is a tuning range of from 26 to 30 mcs. The tube is used in the detector circuit to provide stability under extreme weather conditions, high temperatures, and varying battery voltages. This receiver features dependability, light weight, easy mounting, crash resistance and low battery drain. The weight of the completely enclosed receiver is 2¼ ounces. Battery drain is a mere 10 mills filament, and 0.6 mills B+. This receiver can be operated by any tone transmitter on 26.995 mcs. that transmits a 350 to 700 cycle tone with 80 to 100% modulation. However, the use of the ORBIT I tone transmitter will enable you to get the most from your ORBIT I receiver.

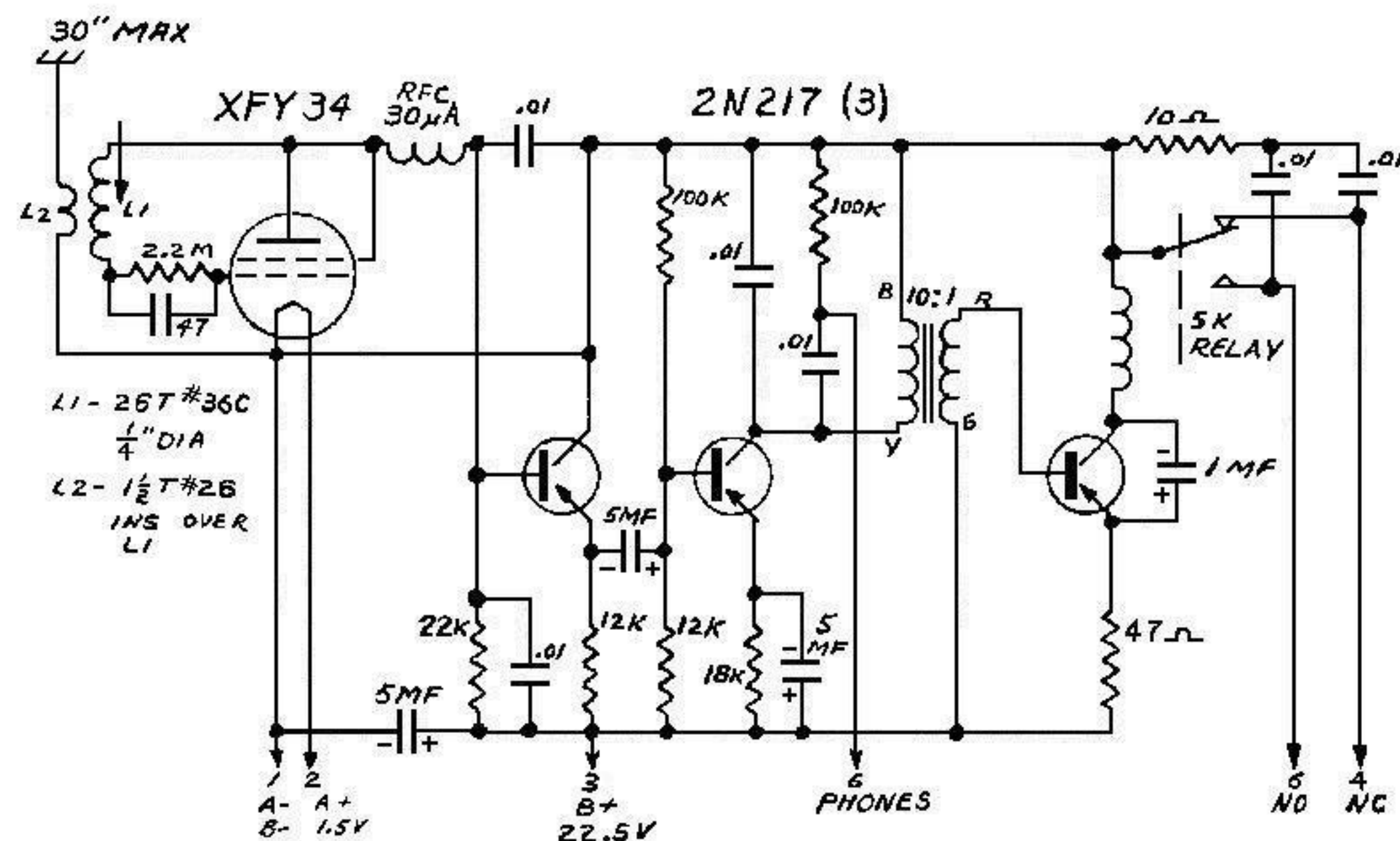
Size - 1.5/8" x 2 1/4" x 1"

## Battery Requirements

1 ea. Burgess Y15, U15 or equivalent 22½ volt battery

1 ea. Burgess Z or equivalent 1½ volt pencil cell

ORBIT SINGLE CHANNEL TONE RECEIVER



# SINGLE CHANNEL TRANSMITTER

Price . . . . . \$29.95

The ORBIT single channel transmitter features a positive action push button switch and a neon tuning eye to indicate the strength of the carrier being transmitted. The transmitter has 100% modulation, and transmits a 500 cycle tone on its 26.995 mcs. carrier. The battery requirements are 135 volts for the B+ and 1½ volts for the filament A+. The batteries are held firmly in the bottom of the transmitter case by a sponge pad on the back cover. This transmitter was designed for use with the ORBIT I tone receiver.

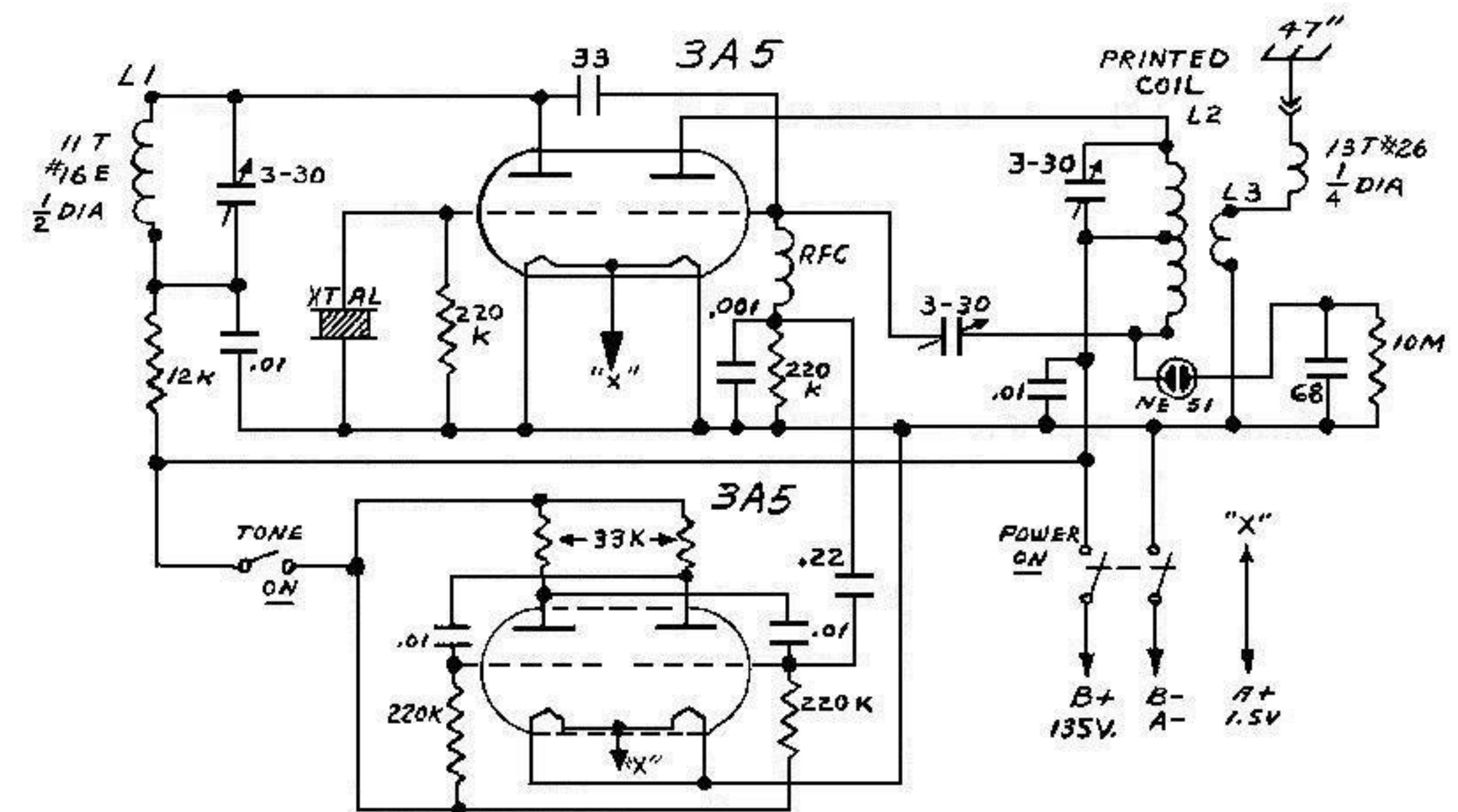
Size - 3" x 6" x 7<sup>3</sup>/<sub>4</sub>"

## Battery Requirements

2 ea. Burgess XX45 or equivalent 67½ volt batteries

1 ea. Burgess 4F or equivalent 1½ volt battery

ORBIT SINGLE CHANNEL TONE TRANSMITTER.





## MULTI CHANNEL RECEIVERS

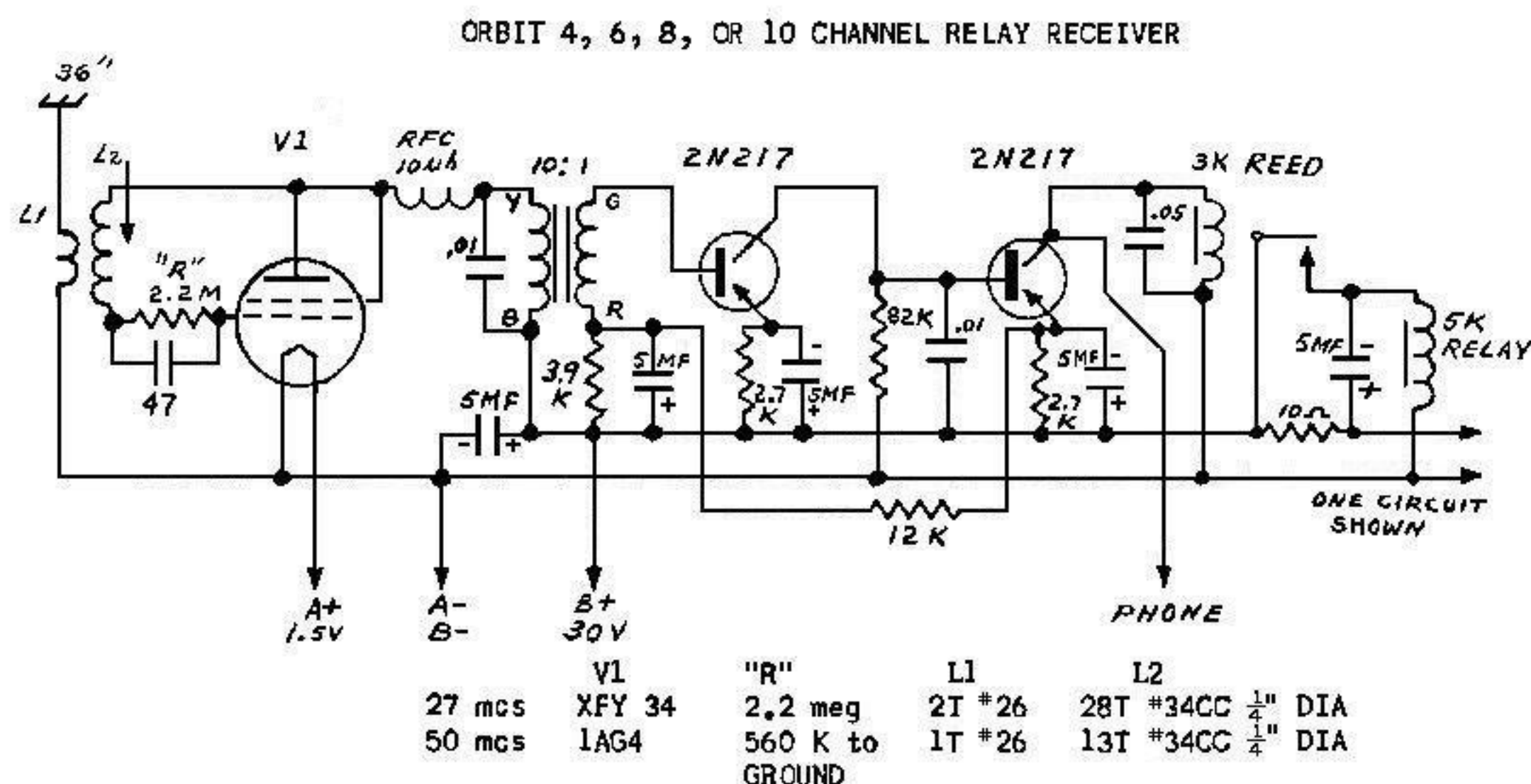
4 Channel Receiver . . . . .	\$ 59.50
4 Channel Receiver and Transmitter Combo . . . . .	\$ 99.50
6 Channel Receiver . . . . .	\$107.50
8 Channel Receiver . . . . .	\$119.50
10 Channel Receiver . . . . .	\$149.50

The sensitive, transistorized, ORBIT tone receiver employs the latest design, using resonant reeds for audio-channel separation. One detector tube and two transistors are used in the circuit. A tube is used in the first stage for stability and has a 10 mill filament drain. The total idling current is approximately 2.0 mills. The reed bank and relays are completely accessible when the cover is removed, and protected from damage when replaced. The tuning procedure is quick and simple. The battery complement weighs only 1½ ounces.

4 channel receiver - size 1½" x 2" x 3"	Weight - 5 oz.
6 channel receiver - size 2" x 2" x 2-7/8"	Weight - 7 oz.
8 channel receiver - size 2" x 2" x 3-3/8"	Weight - 8 oz.
10 channel receiver - size 2" x 2" x 3-3/4"	Weight - 10 oz.

## Battery Requirements

1 ea Burgess U20 or equivalent 30 volt hearing-aid battery  
1 ea Burgess Z 1½ volt pencil cell or equivalent



## MULTI CHANNEL TRANSMITTERS

4 Channel Transmitter . . . . .	\$ 49.50
6 Channel Transmitter . . . . .	\$ 93.50
8 Channel Transmitter . . . . .	\$ 98.50
10 Channel Transmitter . . . . .	\$108.50

The ORBIT multi-channel transmitters offer the ultimate in deluxe equipment. From the non-simultaneous 4 channel up through the simultaneous 6, 8, and 10 channel, your ORBIT transmitter will give the utmost in dependability, stability, and durability. Using only top quality parts and the very latest in electronic design, your ORBIT assures you many years of reliable operation. Individual lever switch control to separate commands give an ease of operation that eliminates confusion on the part of the beginner multi flyer.

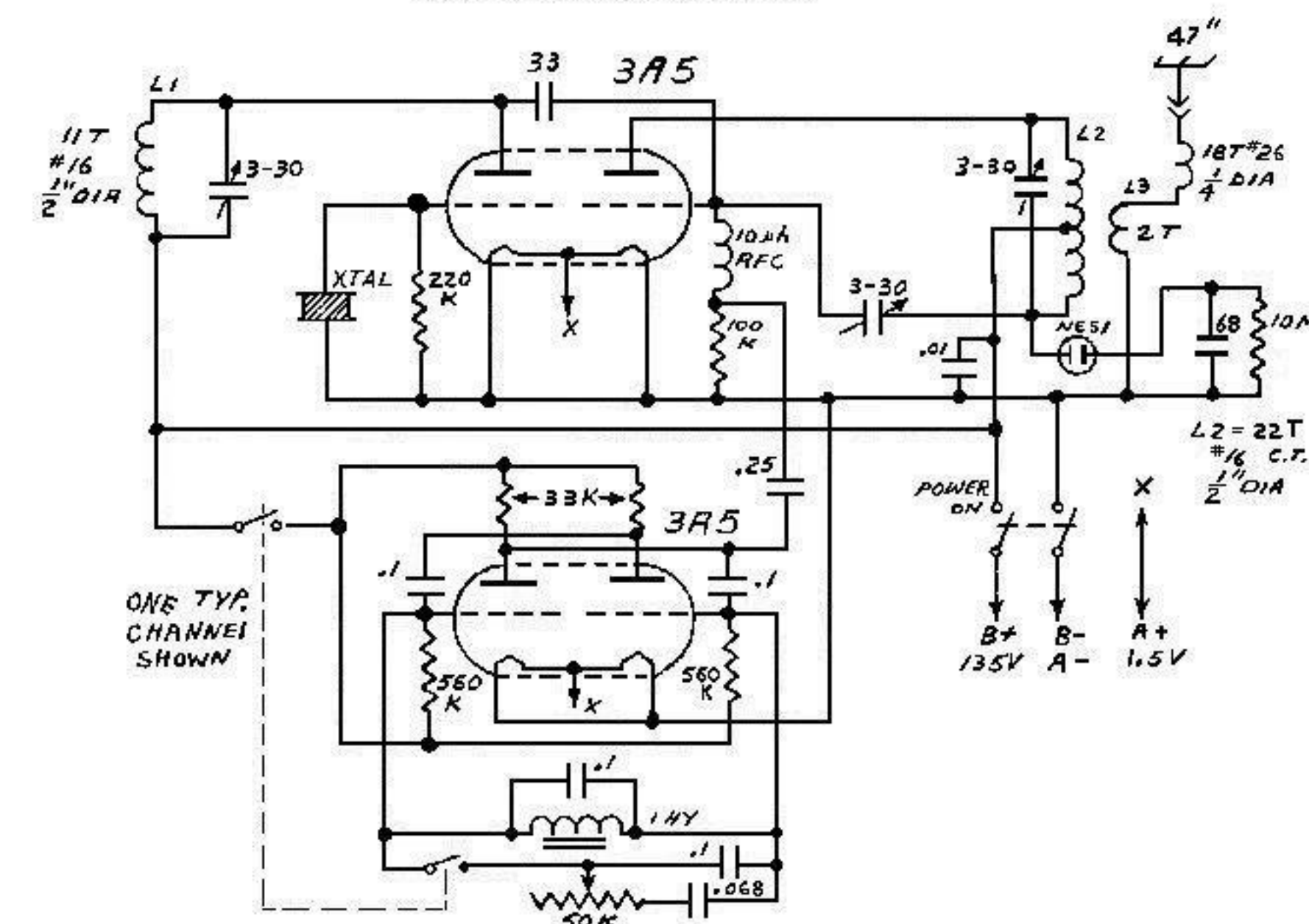
Size - 4 Channel transmitter - 3" x 6" x 7-3/4"  
6, 8, 10 " transmitter - 3-3/8" x 6-7/8" x 9 1/2"

### Battery Requirements - All

2 ea Burgess XX45 or equivalent 67½ volt batteries  
1 ea Burgess 4F or equivalent 1½ volt battery

## ORBIT NON-SIMULTANEOUS 4 CHANNEL TRANSMITTER

ORBIT 4 CHANNEL TRANSMITTER





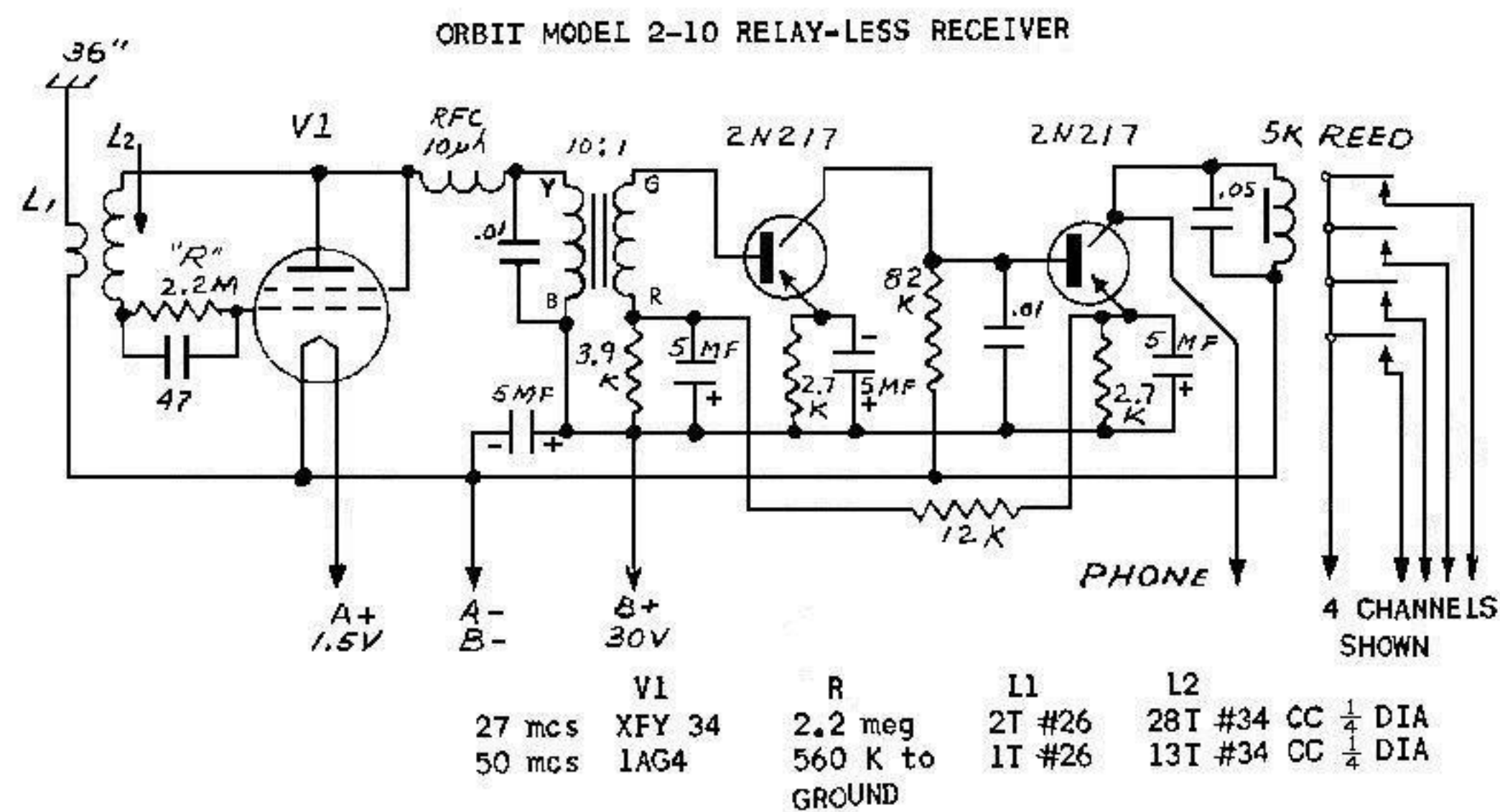
## MODEL 2-10 10 CHANNEL RELAYLESS RECEIVER

Model 2-10 Relayless Receiver . . . . . \$69.95  
Above with Power Pack and Charger . . . . . \$99.50

The ORBIT Model 2-10 Relayless Receiver is the ultimate in compactness and dependability. Using the tried and proven ORBIT tube detector-or-transistor amplifier in the familiar temperature compensated circuit to drive the reeds, it allows you to utilize 2, 4, 6, 8, or 10 channels, as dictated by your needs; hence the name — 2-10. Signals generated by the reeds are sent to transistorized amplifier-driver units contained within the servo cases, and operate the servo motor directly. Total receiver current is approximately 2.0 mills. Tuning procedure is quick and simple.

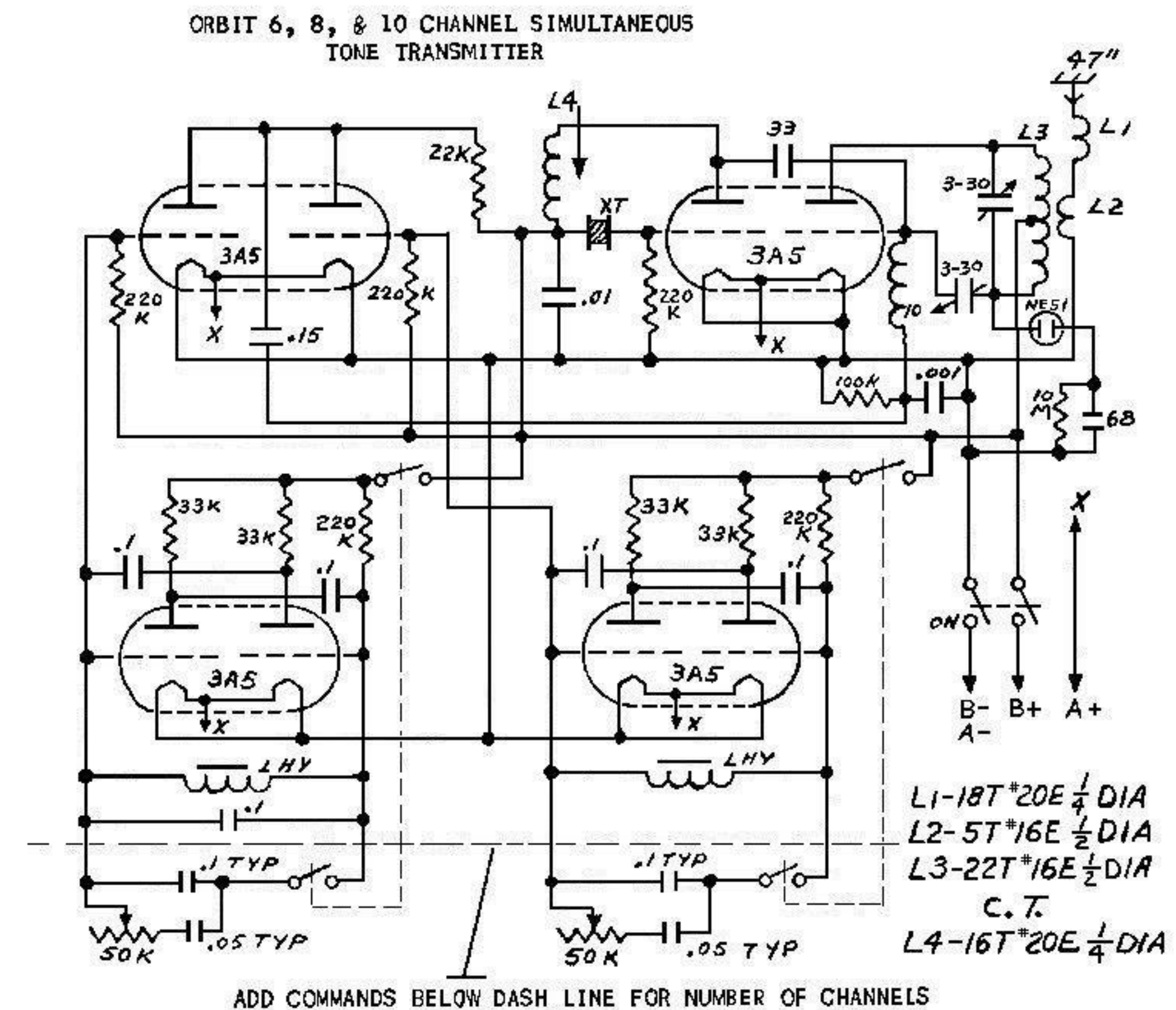
Size - 2 1/4" x 2" x 1"

Weight - 4 ounces



## SIMULTANEOUS MULTI-CHANNEL TRANSMITTERS

For the perfect companion to the multi-channel receivers, the ORBIT simultaneous multi transmitter is the leading choice. Incorporating all of the deluxe features outlined on previous pages, your ORBIT multi transmitter is a symbol of the highest quality, and the greatest value in the control transmitter field. With an unmatched stability of carrier and tone, your ORBIT transmitter assures you of complete dependability under the most rigorous conditions.





## TRANSMITTER PARTS

R. F. Chokes .....	\$ .45	each
Metal Chassis - 6, 8 or 10 channel.....	4.95	"
Case, Punched, Anodized, Screened - 6, 8 or 10 channel....	6.95	"
Case, Punched, Anodized, Screened-single or 4 channel ....	4.95	"
33 mmf. and 01 mf condensers.....	.20	"
Metalized Condensers .....	.60	"
Toroid Coils (in bakelite cases) .....	7.80	"
Tube Sockets.....	.25	"
Potentiometers .....	.85	"
Control Switches (lever action).....	2.45	"
Antenna (chrome plated) .....	3.95	"
Crystal Socket.....	.25	"
Crystal 26.995.....	2.95	"
Resistors .....	.10	"
Variable Condenser .....	.45	"
Set of Wound Tank Coils & Variable Condenser .....	1.95	"
Pot Board with terminal tie post mounted .....	3.95	"
"A" Battery Plug .....	.10	"
"B" Battery Plugs .....	.15	pair
Battery Box .....	2.50	each
On & Off Switch (dp st) .....	.85	"
Neon Indicator Bulb .....	.25	"
Hook-up Wire & Hardware .....	1.95	"
#3A5 Tubes.....	1.95	"
Printed Circuit Board (single or four channel) .....	3.95	"
Push Button (single channel) .....	.85	"

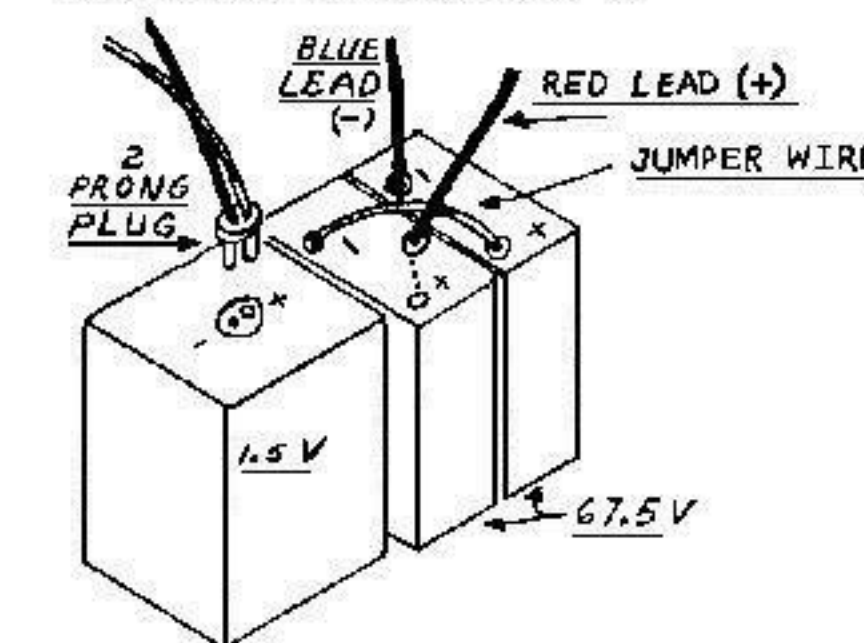
## RECEIVER PARTS

Tank Coil (wound).....	.90	each
All Electrolytic Condensers .....	.75	"
Resistors .....	.10	"
Condensers .....	.20	"
Detector Tube.....	2.45	"
Transistors (selected).....	2.45	"
R. F. Choke .....	.45	"
Transformer .....	4.95	"
Chassis (punched for 6, 8 or 10 channel) .....	1.60	"
Case (aluminum - for 6, 8 or 10 channel) .....	4.30	"
Case (aluminum for four channel).....	2.95	"
Case (aluminum for single channel).....	1.95	"
Hardware (for 6, 8 or 10 channel) .....	2.65	"
Relays .....	4.25	"
Printed Circuit Board (for single channel) .....	2.95	"
Printed Circuit Board (for four channel) .....	3.95	"
Printed Circuit Board (for 6, 8 or 10 channel) .....	4.95	"
Reed Bank - 4 channel \$8.95 - 6 channel \$17.50 .....		"
Reed Bank - 8 channel \$19.75 - 10 channel \$22.50 .....		"

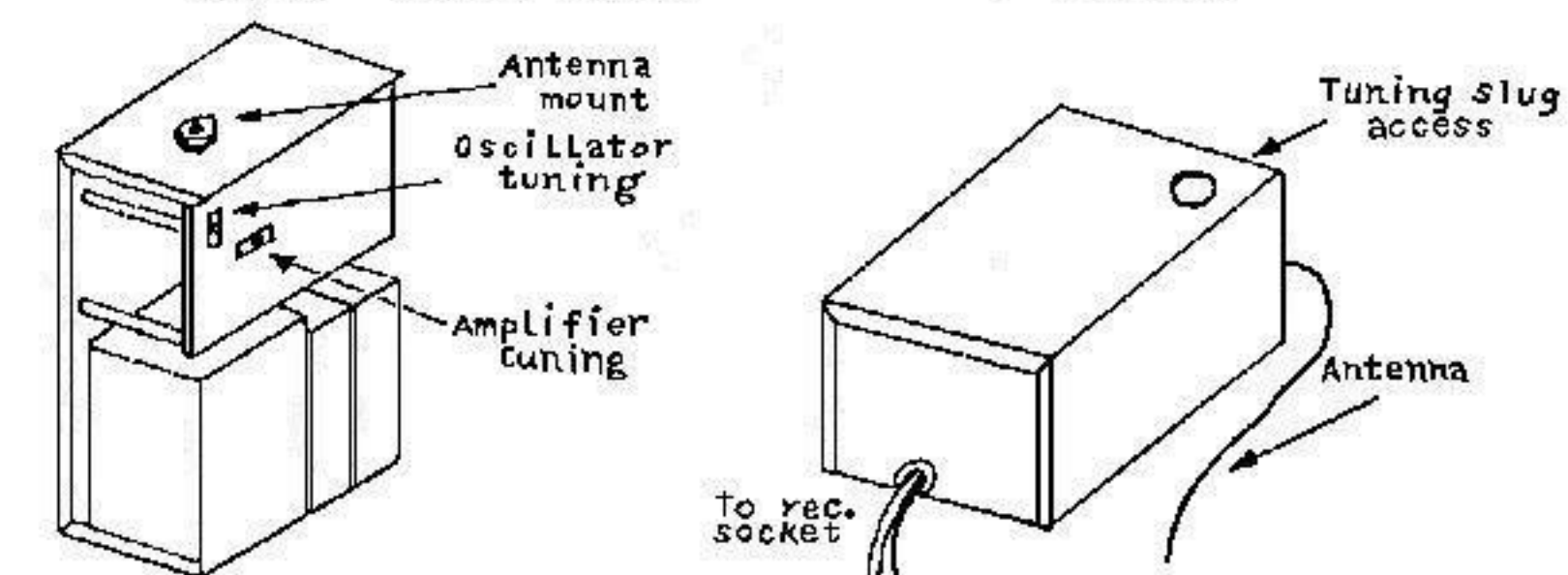
## BATTERY INSTALLATION - TRANSMITTER

Remove the rear cover by taking out the six sheet metal screws located on each side of the case and slide off the rear cover. The rear cover of the single and 4 channel transmitters has a sponge pad attached which keeps the batteries firmly in place. The 6, 8, and 10 channel transmitters are equipped with a metal receptacle with a strap at the rear which serves the same purpose. To install or remove batteries on these transmitters, unfasten and remove the rear battery strap by depressing the side plates inward to disengage the flanged connections. Note that the pressure plate on the rear cover is used to hold the 1½ volt battery in position. Now connect the two-prong plug into the 1½ volt battery socket. Then connect the remaining leads to the 67½ volt batteries as illustrated. Replace the rear battery strap. Turn on the transmitter by the toggle switch on the front panel. The indicator light should glow brightly since all transmitters are tuned at the factory prior to shipment; however, it may be necessary to retune until maximum brightness of the indicator light is obtained.

TRANSMITTER BATTERY HOOK-UP



LAYOUT - SINGLE CHANNEL TRANSMITTER AND RECEIVER





## TUNING THE TRANSMITTER

Install the antenna and extend fully. Turn on the transmitter. On single channel transmitter, press push button. On 4 channel transmitter, press rudder lever. On 6, 8, and 10 channel transmitter, press both rudder and elevator levers simultaneously. At the same time, using a non-metallic screwdriver to prevent detuning when screwdriver is removed, follow this procedure:

1. Turn #11 screw clockwise until the indicator light goes out. Turn counter-clockwise  $\frac{1}{4}$  turn past position light comes on.
2. Turn #12 screw in both directions until the indicator light shows peak brightness.

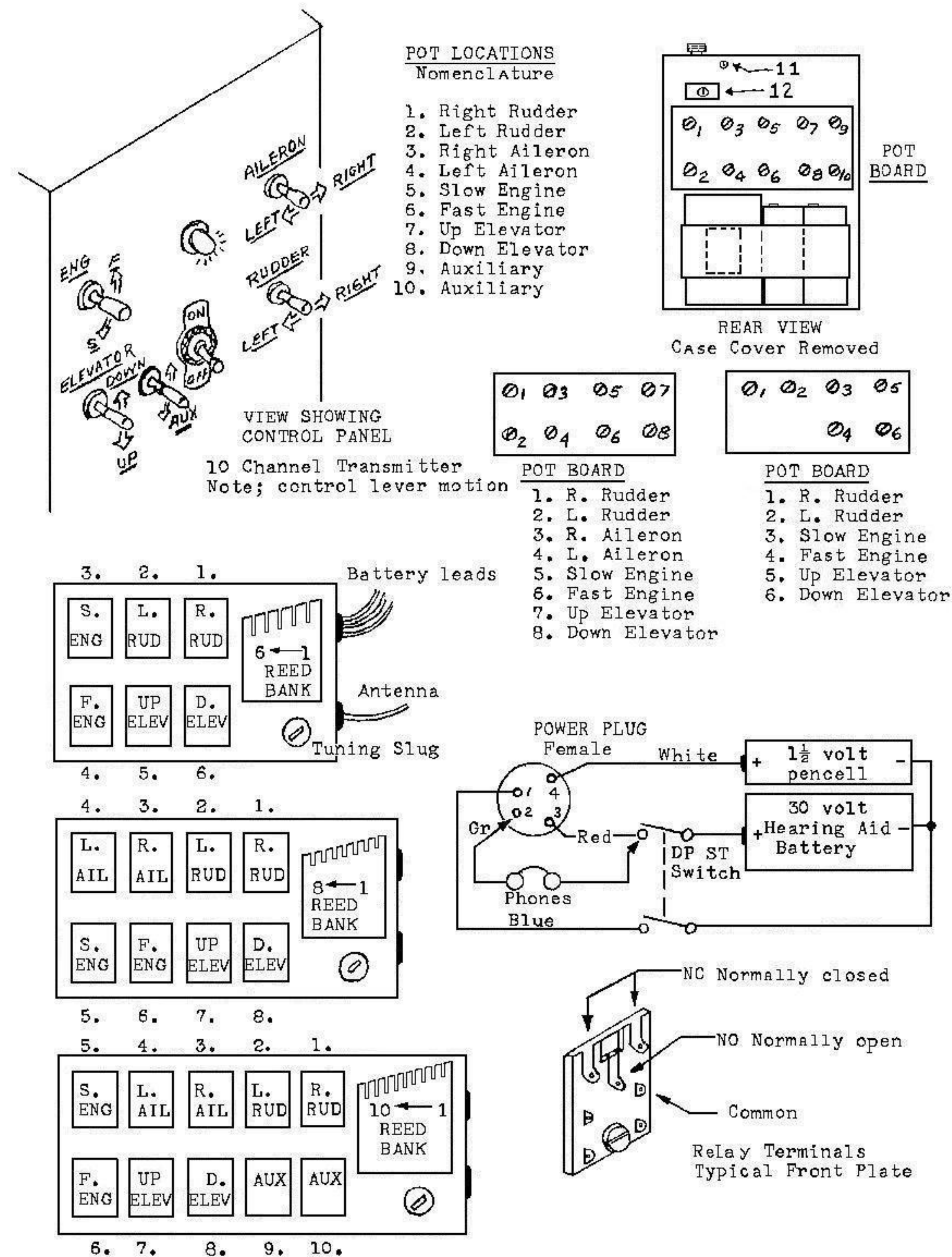
You are now tuned to a maximum output (RF)

### TUNING TRANSMITTER TONES TO THE RECEIVER REEDS

This tuning procedure applies to; 4, 6, 8, and 10 channel equipment. The tuning "pots" (potentiometers) are located on the large micarta panel in the back of the transmitter. The transmitter tones are tuned at the factory, however, the following procedure is used in the event further adjustments are found necessary:

1. On the transmitter, hold a control lever on and adjust the the corresponding pot screw until the correct reed stops driving (turning clockwise), then turn the screw in the counter-clockwise direction until the reed starts driving again. Leave the pot screw in this position and tune each control in the same manner. This procedure is for the 4 channel transmitter only.
2. On the 6, 8, and 10 channel transmitters (simultaneous) hold the rudder control lever at one position while tuning the elevator or engine pots and then hold the elevator control lever at one position while tuning the aileron or rudder pots. Tune in the same manner as described in (1) above.

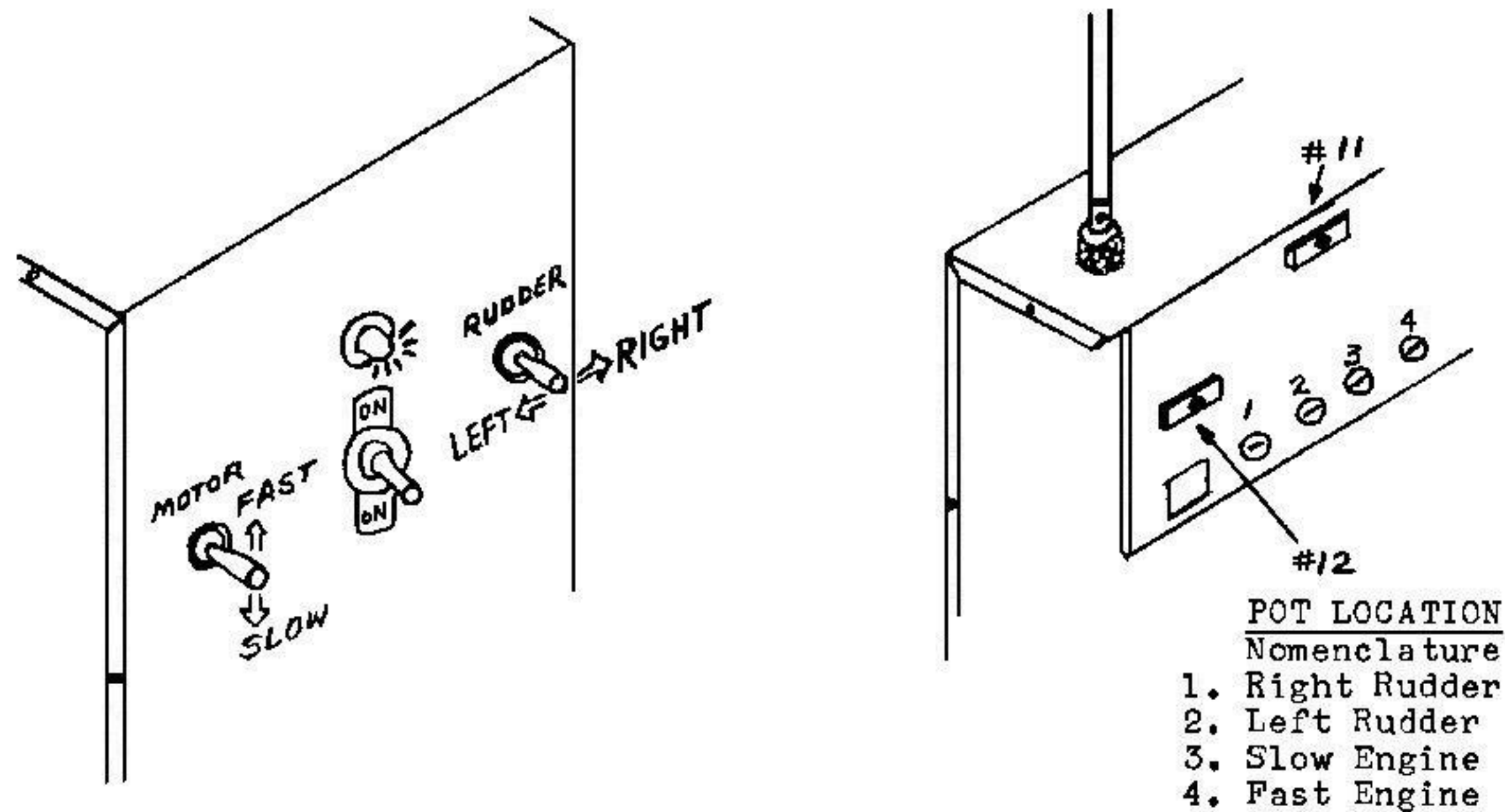
The transmitter tones are now tuned to the receiver reeds and simultaneous control is available by operating either of the two control levers on one side of the panel control simultaneously with either of the control levers on the opposite side of the panel. You will find that simultaneous use of one engine control lever and one position of aileron control will cause the receiver to chatter; however, this should not cause any trouble since these two controls are rarely used at the same instant while flying.



As a precautionary measure during tune-up, disconnect servo's since damage could occur if the two reeds on the same control should drive at the same time.



#### 4 CHANNEL TRANSMITTER



#### WIRING AND TUNING THE RECEIVER

**CAUTION:** Improper wiring of the receiver socket can damage the receiver. Check wiring carefully before plugging in the battery power.

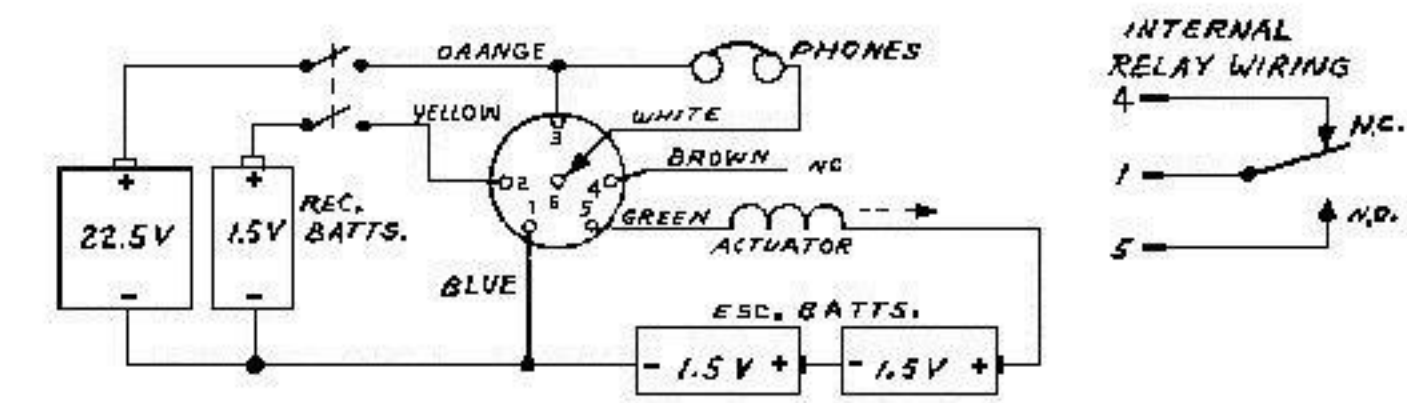
#### SINGLE CHANNEL

Connect the batteries to the receiver socket (supplied with the receiver), and extend the receiver antenna. Use at least 14 strand wire and rosin-core solder for wiring the socket. The receiver can be tuned with a 0-5 milliammeter or with headphones. Tune as follows:

1. Connect actuator (escapement, servo, etc., to relay terminal on the socket (NO, NC, and COMMON) as per actuator manufacturer's instructions.)
2. Plug receiver into socket and turn on switch.

**NOTE:** Receiver may cycle through when turned on. This is normal.

#### SINGLE CHANNEL RECEIVER HOOK-UP



#### TUNING WITH HEADPHONES

1. Connect headphones to receiver as per figure above.
2. Turn transmitter on during tuning.
3. Using a non-metallic screwdriver, turn receiver tuning slug, either way until the hissing noise stops.

**NOTE:** The receiver has been tuned at the factory and the hiss may stop when transmitter is on.

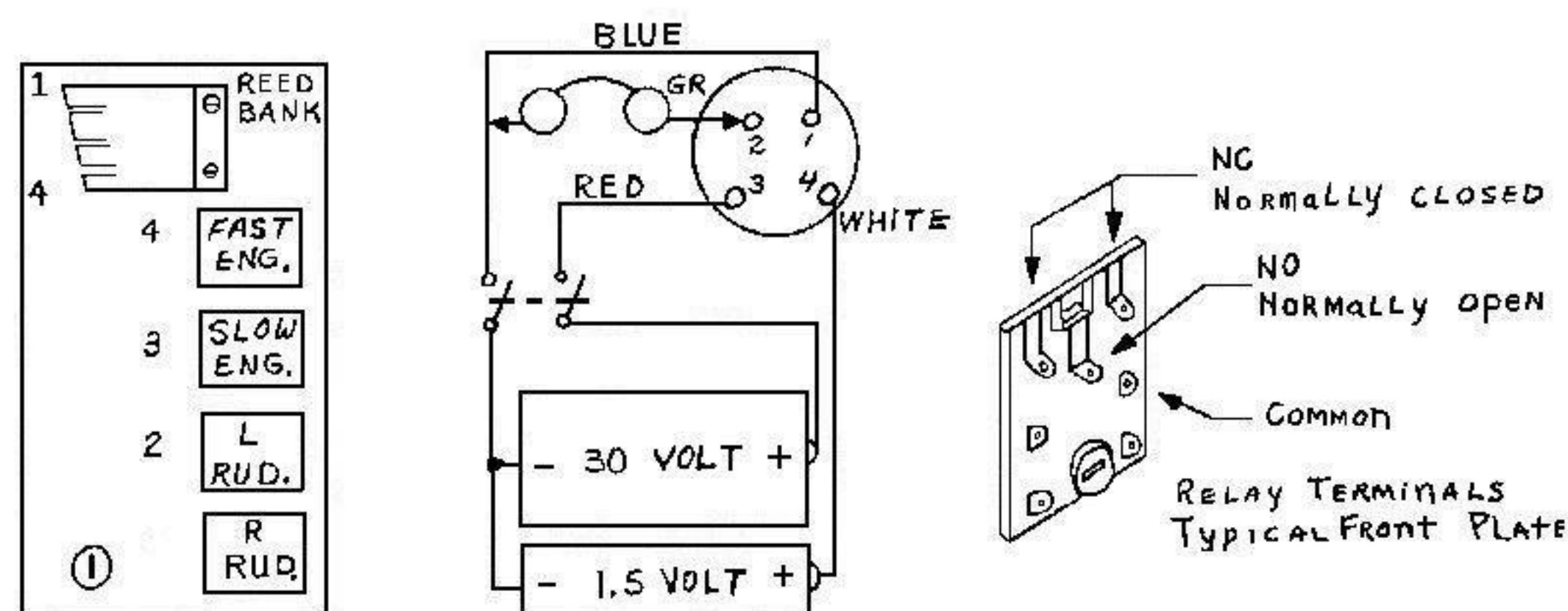
4. Turn tuning slug counter-clockwise until hiss starts and note position. Then turn tuning slug clockwise until hiss starts again and note position.
5. Turn tuning slug counter-clockwise to mid-way between the two points.
6. Turn off both transmitter and receiver.

#### TUNING WITH METER - optional

1. After completing preliminary steps 1. and 2., plug a 0-5 milliammeter in the circuit meter jack in series with B plus.
2. The receiver should idle at about 1 1/4 ma.
3. Turn on transmitter and tune receiver until idle current drops to about 0.6 ma.
4. Turn tuning slug both ways to determine the points where a rise is noted. (Note both points).
5. Push transmitter push button. Receiver current should rise to about 4 1/2 ma.
6. Turn off both transmitter and receiver.
7. Repeat tuning procedure at a range of about one city block to insure maximum efficiency and range before flying.



#### 4 CHANNEL RECEIVER HOOK-UP



#### MULTI CHANNEL

Solder-connect the battery leads to the receiver socket (supplied with the receiver) as shown in figure above. Each terminal is numbered on the socket. When wiring, use high-grade insulated wire having at least 14 strands. Use only rosin-core solder at all soldering points. Remove the transmitter antenna and tune receiver as follows:

1. Extend the receiver antenna.
2. Turn on both the transmitter and receiver.
3. Depress one of the control levers on the transmitter, thus sending a tone to the receiver.
4. Using a non-metallic screwdriver, turn the slotted tuning slug of the receiver in both directions until a reed in the receiver begins to drive (reed vibration).
5. Turn the tuning slug first one way until the reed stops driving, and then the other way until the reed stops driving again.
6. Now, adjust the tuning slug mid-way between these two settings.

NOTE: The adjusting screws on the reed bank should not require re-adjustments unless damaged in some way. These screws should always be set so as to pass maximum current to the receiver relays.

After all radio equipment is installed, make a range check. The distance of one city block is suggested and is sufficient. Have an assistant send a control to the receiver while you repeat steps 4, 5, 6, with the transmitter antenna connected and fully extended. This will insure accurate tuning for operation.

Due to the power of the transmitter and sensitivity of the receiver, the receiver may tend to become swamped (receives signal which is too strong). This sometimes occurs at very close range. This condition can be remedied by putting your hand on the transmitter antenna, thus reducing the output and preventing the swamping.

#### WIRING SERVOS TO THE RECEIVER RELAYS

Since each manufacturer may prescribe unlike servo hookups, it is suggested that you refer to the wiring instruction supplied with each servo. The figure shows a typical relay terminal board.

The different terminals are identified. Only three of these terminals are normally used for the servo hookup. These are identified as NO (normally open), NC (normally closed), and COMMON (center contact). When soldering to these connections, use only enough heat to insure a good joint. Excessive heating may cause the relay contacts to sag out of their proper adjustments.

#### CHECKING THE BATTERY

Low batteries may cause loss of simultaneous control. Low batteries may sometimes be the cause of the indicator light being dim.

Transmitter battery "A"	(1½ volts	—	1.1 volt minimum)
Transmitter battery "B"	(135 volts	—	100 volts minimum)
Receiver battery "A"	(1½ volts	—	1.1 volt minimum)
Receiver battery "B"	(30 volts	—	20 volts minimum)

#### FACTORY SERVICE

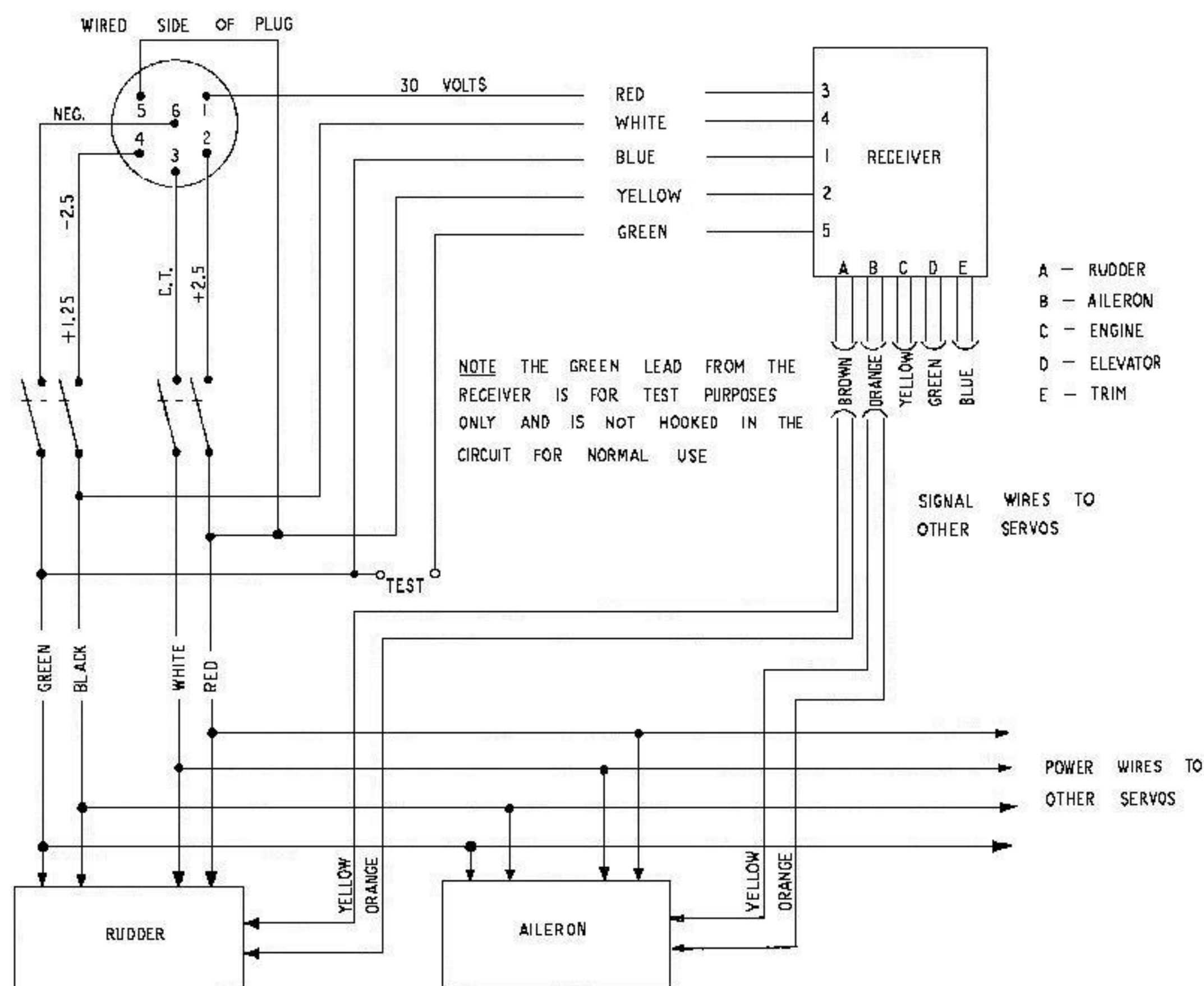
The factory will repair and tune your damaged ORBIT equipment for a minimum charge of \$2.00 each, plus parts. Upon request, an estimate of repair costs will be furnished for your approval prior to proceeding with repair.

ORBIT ELECTRONICS  
PHONE JE. 4-0170

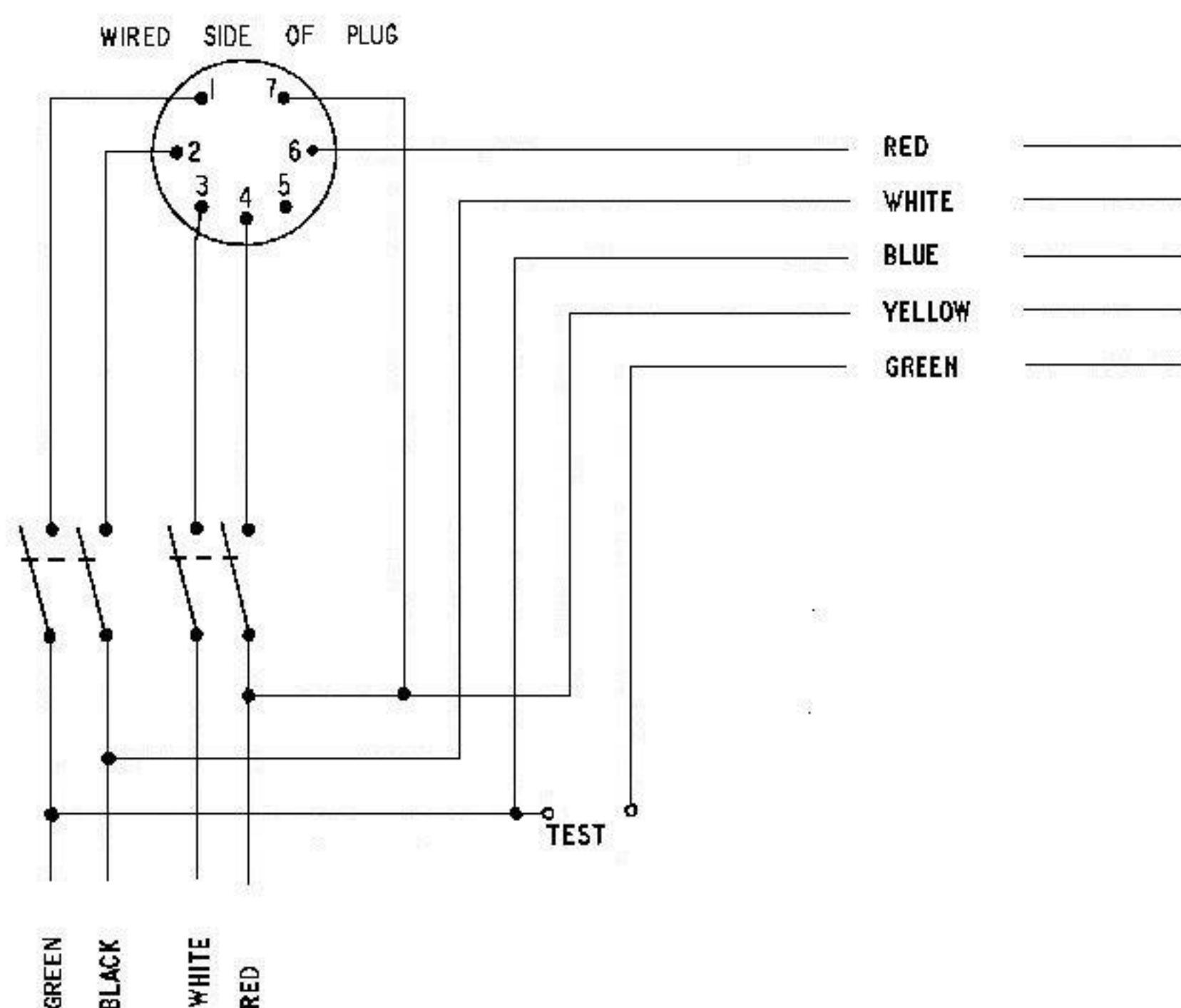
GARDEN GROVE, CALIF.  
11612 Anabel Ave.



# Wiring Schematic for Model 2-10 System



WIRING DIAGRAM FOR OLD STYLE PLUG & SOCKET  
5830 PACK



## NOTE

The manufacturer warrants that this transmitting equipment, when used in the manner prescribed in the accompanying instructions, will meet all F.C.C. requirements regarding frequency stability, emission, etc.

## GUARANTEE AND REGISTRATION

A Guarantee and Registration Certificate is furnished with each purchase of ORBIT equipment. This certificate should be filled out and returned to the factory immediately upon receipt. No charge will be made for service rendered under the guarantee. We are not responsible for any damage which occurs during shipment. We ship all units SPECIAL HANDLING at our expense and well-packed. Your postal insurance will protect you. With multi-channel equipment, the transmitter and receiver should both be sent in to permit factory tuning. Tubes and transistors are not covered under this guarantee.



