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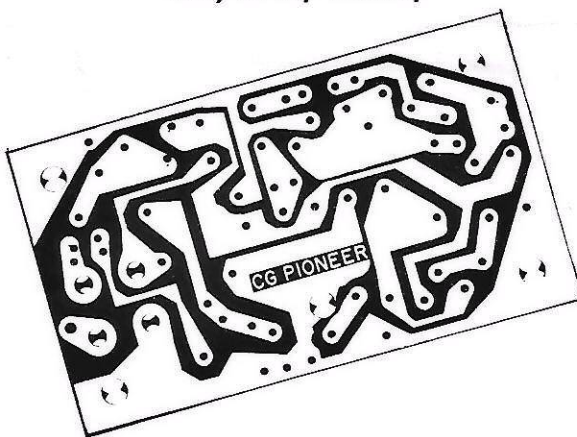
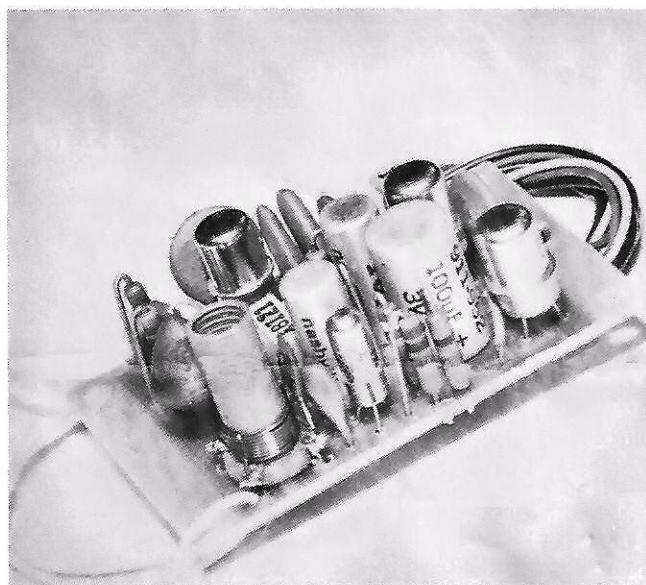
## Operating Instructions and Specifications for Pioneer Receiver

**Introduction:** The Pioneer, a single channel super-regenerative receiver, is a high quality, reliable unit. Low in cost and simple to install, the Pioneer is a good choice for the R/C novice. Its small size and lightweight enable it to be used in the smallest of R/C models.

**General Remarks:** A relayless receiver, the Pioneer uses a power transistor as the switching device to activate the escapement, thereby eliminating critical relay adjustments. The Pioneer has been tested with most escapements presently available and has performed well with all. The escapement should be provided with a coil having a minimum resistance of 5 ohms. For maximum sensitivity and reliable operation, the escapement should be adjusted for proper operation under a rubber band load with 2 volts applied. Bonner escapements are recommended for use with this receiver.

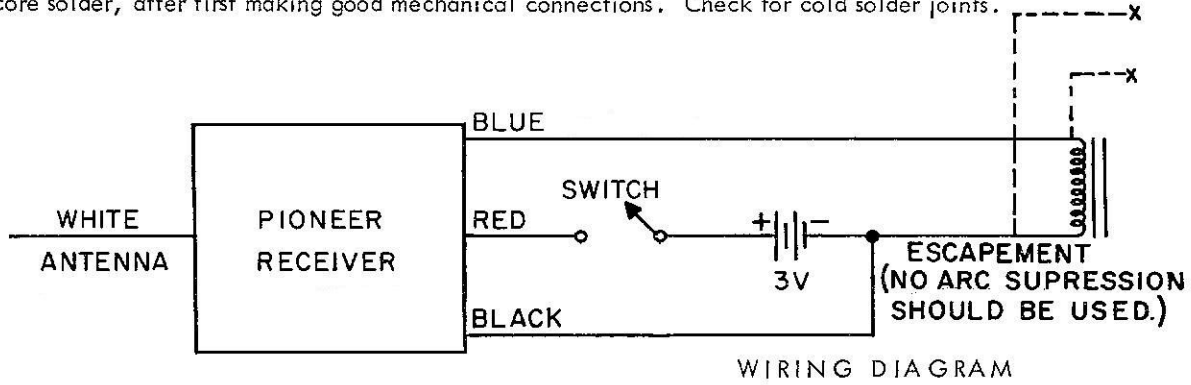
### Features:

- . . . . Relayless operation --- no vibration or contact problems
- . . . . Economical 3 volt operation --- no expensive batteries required as actuator uses same batteries
- . . . . Temperature stabilized, ultrasensitive super-regenerative detector --- selected temperature-compensating capacitors prevent detector tuning drift
- . . . . Ruggedized construction --- finest quality printed circuit construction
- . . . . Factory tuned and tested --- all CG R/C equipment carry 30 day warranty



**Receiver Mounting:** While the Pioneer may be mounted in any convenient position within the model, vertical mounting, with the base against the bulkhead is recommended. The receiver should be protected from severe impacts by placing foam rubber (approximately 1/2" thick) between the base and the bulkhead. Rubber bands loosely strapped over the receiver will hold it in place.

**Wiring:** Wire according to diagram (shown below). Solder all connections securely with a good grade of resin core solder, after first making good mechanical connections. Check for cold solder joints.

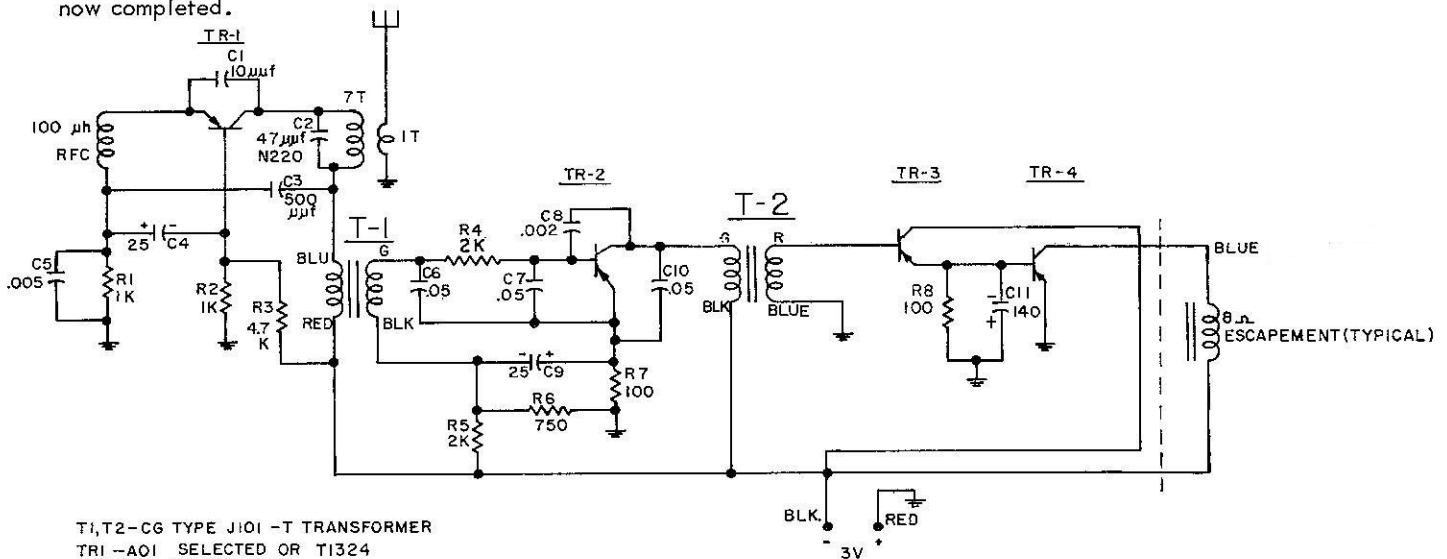


**Antenna:** The length of the antenna is not critical and may vary from 18" to 36"; shorter than 18" is inefficient and longer than 36" is inconvenient. Between 26" and 30", measured from the receiver, will provide satisfactory reception. A piece of piano wire, mounted vertically directly behind the wing, is recommended.

**Batteries:** Two 1-1/2 volt dry cells or CG V0 series rechargeable button cell batteries, either two V0-250 or two V0-500, may be used for powering the Pioneer and the escapement. Pen cells are normally adequate for lightweight installations, however medium batteries, size "C", may be used if desired. Dry cell batteries should be replaced when the voltage drops to 2.2 volts under load.

**Escapements:** Either a simple or compound type of escapement may be used. The DC resistance of the escapement coil should be at least 5 ohms. For reliable operation, the escapement should be adjusted under a rubber band load with 2 volts applied. It is advisable to use the lightest weight rubber possible and to fly with no more turns than necessary; 3/16" rubber with approximately 150 turns is suggested for the average installation. Heavier rubber and/or more turns increases the puff-in voltage required to operate the escapement.

**Tuning:** The Pioneer is quickly and easily tuned. Connect a voltmeter (0 to 3 or 0 to 10 scale) across the escapement at the points indicated by X's on the wiring diagram. The voltage across the escapement should be kept above 2 volts during tuning and the leads from the voltmeter should be kept as short as possible. Remove the antenna from the transmitter (Venus or T-12) and place the open antenna hole close to the receiver antenna. Key the transmitter, an upscale reading should be observed on the voltmeter. Tune the detector coil by rotating the slug with an all plastic tuning wand for a maximum reading on the voltmeter. Move the transmitter away from the receiver antenna until the output voltage drops to approximately 2 volts. Refine tuning adjustment for maximum reading. Tuning is now completed.



T1, T2 - CG TYPE J101 - T TRANSFORMER  
 TR1 - AO1 SELECTED OR T1324  
 TR2, TR3 - 2N223  
 TR4 - 2N226

NOTE:  
 1. UNLESS OTHERWISE SPECIFIED RESISTANCE  
 & CAPACITANCE EXPRESSED IN OHMS & MICROFARADS.

Specifications:

<u>Sensitivity:</u>	1.5 microvolts nominal
<u>Audio Frequency Modulation:</u>	250 cps minimum 500 cps optimum 800 cps maximum
<u>Operating Temperature Range:</u>	+20°F to +120°F (using 3 volt supply and Bonner S/N escapement)
<u>Escapement Current:</u>	Single escapement (8 ohm coil) 360 ma. at 3 volts (nominal)
<u>Escapement Voltage:</u>	Escapement voltage delivered by the Pioneer when a. operated on 3 volts: 5 microvolts input, 2.9 volts across escapement (nominal). 2 microvolts input, 2.75 volts across escapement (nominal) b. operated on CG V0 Series batteries - either two V0-.250 or two V0-.500, 2.4 volts nominal. 5 microvolts input, 2.3 volts across escapement (nominal). 2 microvolts input, 2 volts across escapement (nominal)

Note: Average loss across switching transistor 0.15 volt

Idle Current:

No transmitter carrier:	20 ma. at $\pm 70^\circ\text{F}$ (nominal)
Transmitter carrier on:	4 to 7 ma. (nominal)

<u>Operating Voltage:</u>	2.2 volts minimum 3.1 volts maximum
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<u>Tuning Range:</u>	26 to 29 mc
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Transmitter Requirements:

<u>Frequency:</u>	Any standard Citizen's Radio Band frequency (excluding 465 mc.) Normally operated on 27.255 mc
<u>Audio Modulation Frequency:</u>	250 to 800 cps
<u>Percent Modulation:</u>	80% or better

Note: CG Venus or T-12 Transmitters are recommended

<u>Length:</u>	2-5/8"
<u>Width:</u>	1-1/2"
<u>Height:</u>	7/8"
<u>Weight:</u>	1-1/8 ounces

Warranty: Our standard written 30-day warranty card accompanies each unit. F & M Electronics, Inc. maintains a fully trained staff for the prompt repair of CG equipment. All repair charges are itemized and nominally priced.