



P-312X Transceiver Preamp

INSTRUCTIONS

All Band Preamplifier

The Palomar Engineers preamplifier may be added to most transceivers in the frequency range 1.8 to 54 MHz. It improves the gain, noise figure, spurious signal and image rejection of the receiver section. This all-new preamplifier has been designed specifically for use with a transceiver. Its sophisticated control circuitry permits it to be added to virtually any transceiver without modification. This is accomplished by the use of automatic antenna switching inside the preamplifier. When the preamplifier senses transmitter RF power, it automatically switches out of the amplifier mode and connects the antenna directly to the transceiver.

The preamplifier uses a tuned RF amplifier, covering all the amateur bands from 160 through 6 meters and, in addition, all foreign broadcasts, as well as other services within this frequency range. It employs a low noise dual gate FET transistor, providing a noise figure of 1.5 to 3.5 db, over the frequency range 1.8 to 54 MHz. The preamplifier will be found especially effective with those transceivers employing the Pi-output network of the transmitter section as the receiver RF stage input. Many transceivers of this type begin to suffer a noticeable decrease in sensitivity on 15 meters, and especially on 10 meters. The preamplifier will be most beneficial on these bands. The inclusion of 6 meters makes it useable with 6 meter transceivers.

INSTALLATION

1. Connect your antenna to the "ANT 1" jack on the preamplifier rear panel.
2. Run a coaxial cable from your transceiver antenna jack to the "RCVR" jack on the preamplifier rear panel.
3. Plug the preamplifier's power cord into a 117-v 60 Hz outlet.
4. If you use a linear amplifier with the transceiver connect it between the preamplifier and the antenna. The maximum power that can run through the preamplifier is 350 watts peak. So, do not ever connect it to the output of your linear.

OPERATION

1. After installing the preamplifier as described above, and with the preamplifier power switch in OFF position, the transceiver is connected directly to the antenna. Tune in a signal on the desired frequency band.
2. Turn the BAND switch to a position that includes the desired frequency. Turn the DELAY switch clockwise. Peak the signal with the TUNE control. Set the GAIN control for the desired amplification. The preamplifier is now in operation.

1923

Service Notes - P-312X

In the receive mode the relay is energized. When the transmitter goes on the circuit Q2, Q3, Q4, Q5 removes power to the relay, the relay opens and the transceiver is connected directly to the antenna.

However, the relay cannot open instantly. So for a few milliseconds transmitter power is applied to R7 and through T1 to Q1. Resistor R3 and diodes D3 & D4 are to protect Q1.

If the +12 vdc is not present, the preamplifier is always in transmit mode.

The most common failure of the preamplifier is that suddenly there is less gain (less signal to the receiver) when it is turned on than when it is turned off.

This is usually caused by the failure of either D3 or D4. Usually only one fails and it appears as a short. Sometimes Q1 fails but this is rare.

Except for this the preamplifier is trouble-free.

Circuit Description. When +12-v DC power is applied and S2 is turned on Q2, Q3 & Q4 are cut off. The +12-v through R16 turns Q5 on and the relay closes. The antenna is connected to S1A and R7 feeds the amplified signal to the transceiver. Q1 is a dual gate MOSFET and gives about 20 db gain. T1 is a matching transformer to match Q1 to the transceiver.

When the transmitter is turned on D7 & D8 give a positive DC bias to the base of Q2. Q2 goes on, Q3 goes on, Q4 goes on thus turning off Q5. The relay opens putting the preamplifier in transmit mode. After transmitting stops, the charge stored on C9 holds the preamplifier in transmit mode for a time depending on the setting of R14.

D10 prevents damage if the battery is hooked up backwards.

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