

# INSTRUCTIONS

for  
Q X'er

R. L. DRAKE COMPANY

## I. GENERAL DESCRIPTION OF Q-X'ER

The Q-X'er is an attachment for a radio receiver. Its main purpose is to help discriminate between the wanted signal and interfering signals. The purpose is the same as for a crystal filter but the Q-X'er in operation is a much more effective device. Three modes of operation are provided for as follows :

1. **NOTCH** - With the selector switch set in the **NOTCH** position, a very sharp rejection notch may be tuned across the pass band of the receiver to eliminate an, interfering carrier or heterodyne. The general shape of the receiver pass band is unchanged and the notch is so sharp that it is almost imperceptible in the audio of the desired signal. See Fig. (1).
2. **BOOST** - With the selector switch set in the **BOOST** position again the general shape of the receiver pass band is unchanged (though lower in amplitude) but a sharp spike is imposed on top of the response. This spike may be tuned across the pass band to boost any single frequency. See Fig. (2). Generally, this position of the switch is used to boost the carrier of a weak phone or broadcast station to prevent distortion due to selective fading, etc.
3. **PEAK** - With the selector switch in the **PEAK** position the pass band of the receiver is narrowed to a very selective response only a few hundred cycles wide. Fig. (3). This is ideal for C. W. reception. The Q-X'er **TUNING** control can be used for a fine adjustment in tuning in the signal. (Tuning here does not change the Beat Frequency note).

In principle of operation, the Q-X'er is simple. It is a two terminal device shunted across an I. F. transformer 'in the receiver to act as a gate letting through the desired frequencies and stopping the undesired frequencies. The Q-X'er achieves its performance through the use of an efficient, stable Q multiplier circuit. The Q-X'er acts just like a resonant circuit with a Q of approximately 3000. This accounts for its sharp peak or notch.

It should be noted here that there are three tuned circuits involved in the operation: (1) in the I. F. transformer of the receiver, (2) the input coil of the Q-X'er which tunes out the capacity of the coax cable, and (3) the Q-X'er tuning circuit. For proper operation it is important that these three circuits be tuned to the same frequency. Follow the installation instructions carefully.

## II. INSTALLATION INSTRUCTIONS

1. Connect power to the Q-X'er as follows:

Green wire to one side of 6.3 V. heater supply  
White wire to other side of 6.3 V. heater supply  
Note: Neither green nor white wire is grounded in the Q-X'er so a heater supply with center tap ground or one side ground is 0. K. Current required is .3 amps.  
Red wire to B-t 100 to 300 VDC  
Current required is .25 to 2 ma.  
Black wire to Ground or B-.

This power can usually be taken from the accessory socket of the receiver or slicer. The Q-X'er cable is supplied with a 4 pin plug and socket for use when accessory socket is not available. When a power or accessory socket is available, remove the 4 pin plug which is supplied and replace it with one to match the accessory socket. DO NOT connect coax cable yet.

2. Turn on receiver (if it has variable I. F. selectivity, set for most selective position. If it has a crystal filter, leave it off.) Carefully tune in and center a steady carrier. ("S" meter will show a peak.) DO NOT change tuning again until Q-X'er is adjusted.
3. Slightly turn in each direction the adjusting screw on the 455 KC I. F. circuit to which the Q-X'er is to be connected to see that it is exactly peaked to the rest of the set. This tuned circuit is preferably the one at the plate of the mixer tube. Do not connect the Q-X'er to a low impedance point such as the grid following a crystal filter or the plate or grid end of a mechanical filter.
4. Connect the I. F. coax cable of the Q-X'er to the tuned circuit chosen above. As stated, the mixer plate is ingeneral the best spot. If an octal based tube is used, the connection can be made by removing the tube from the socket, slipping the loop on the cable over the plate pin, and replacing the tube in the socket. If a miniature tube is used, the coax connection should be made by soldering directly to the socket under the chassis. Connect the coax direct; do not use a series condenser.

5. Ground the shield of the I. F. coax cable to the chassis unless the receiver has a "hot" chassis as in an AC-DC set. In "hot" chassis receivers do not connect the shield; cut it off and tape the end to prevent accidental connection.
6. Remove two nuts on back of Q-X'er and pull off back cover and case.
7. Set Q-X'er switch to "OFF" position. Carefully adjust input coil, L2 (see fig. 5) for maximum "S" meter reading.
8. Set Q-X'er switch to PEAK. Set PEAK ADJ. control to a point just below oscillation. Rotate Q-X'er TUNING knob to peak carrier (maximum "S" meter reading). This should occur at the center of the Q-X'er tuning range. If it does not, adjust the screw on the shielded coil, L1 (see fig. 6), to peak the carrier at this point.  
 Note : These two coils in the Q-X'er are factory adjusted to 455 KC. Your adjustment takes care of any small deviation from 455 KC in the receiver I. F.
9. Replace cover and case. Q-X'er is now ready for use.

Changing length of I. F. coax cable will cause detuning of L2. If the length must be changed, L2 must be re-tuned as in Step 7 of "Installation Instructions". We recommend that the unit be adjusted and operated as shipped before a change in cable length is attempted.

### III. OPERATING INSTRUCTIONS

**Finding the Notch** - When you first use your Q-X'er, you will probably have trouble locating the notch. The NOTCH ADJ. control is a balancing adjustment for which there is only one correct setting. This setting will give maximum rejection for all conditions. For good notching, the NOTCH ADJ. control must be set to within about 1/16" of this point.

To set NOTCH ADJ. control for the first time follow these instructions:

1. Locate the approximate setting of the TUNING dial for some stable heterodyne by using the BOOST or PEAK position.
2. Turn switch to NOTCH and carefully turn the NOTCH ADJ. control until some rejection of the heterodyne is observed.
3. Slight adjustment alternately of TUNING and NOTCH ADJ. will give maximum rejection of the heterodyne.
4. Leave the NOTCH ADJ. control set at this position. It will give best notching over the entire tuning range of the Q-X'er and probably never need to be changed very much.

## Notching Out a Heterodyne

1. Tune in desired signal with Q-X'er switch "OFF".
2. Switch to NOTCH and turn TUNING knob to the point where the heterodyne disappears. No need to touch the NOTCH ADJ. control if it has been previously set properly.  
Note: The heterodyne is caused by a beat between the desired carrier and the interfering carrier. The removal of either will stop the heterodyne but if you notch out the carrier of the desired signal, the audio will become greatly distorted.
3. If the interfering carrier drifts in frequency, follow it with the Q-X'er TUNING; do not retune receiver. This flexibility is a distinct advantage over the crystal filter; i. e., you tune receiver for best signal; tune Q-X'er to remove interference.

## Boosting Weak Carrier of AM Signal

1. Tune in signal with Q-X'er OFF.
2. Switch Q-X'er to BOOST and set Q-X'er TUNING at the signal carrier as indicated by a peak "S" meter reading or the point where the background noise drops away.
3. Turn up PEAK ADJ. control to the desired degree of boost. Maximum boost occurs just before Q-X'er goes into oscillation.
4. Adjust receiver gain control for desired audio level.

## P e a k i n g

1. Tune in a signal.
2. Switch Q-X'er to PEAK.
3. Tune Q-X'er to signal by noting a marked increase in signal level.
4. Set PEAK ADJ. for desired shapeness of response. Sharpest peak occurs just below point where Q-X'er goes into oscillation.
5. Q-X'er TUNING control can be used for a fine adjustment in tuning a signal.

#### IV. MAINTENANCE

The Q-X'er circuit differs from other Q multiplier circuits published in that the degeneration tube is neutralized. This is factory adjusted by varying the spacing between a pair of ceramic disc capacitors. If these capacitors are moved, this adjustment is lost and operation is impaired in the notch position by a peak which will appear on one side of the notch. (It is also possible to get this unwanted peak if L2 is not adjusted properly in Step 7.) Therefore, it is not recommended that repairs be attempted other than replacing the tube.

Factory repair service is available to put your Q-X'er in "like new" condition for \$1.00 plus parts and postage.

**Note: Please complete and return the enclosed registration card.**

**R.L. DRAKE COMPANY**

**18 E. CENTRAL AVENUE**

**MIAMISBURG, OHIO**

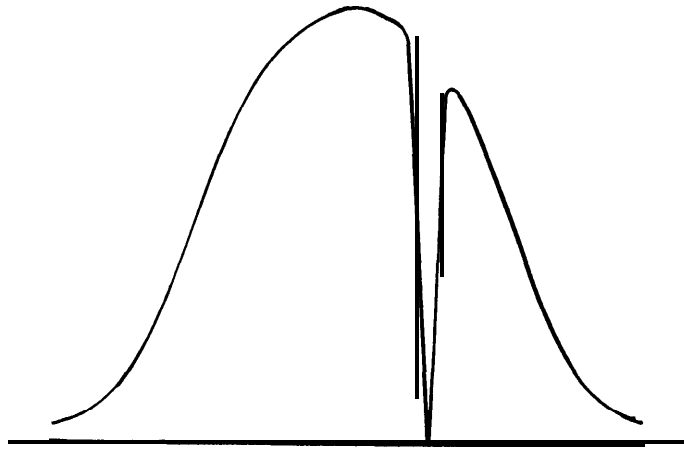


Fig. : Effect of NOTCH on Receiver Selectivity

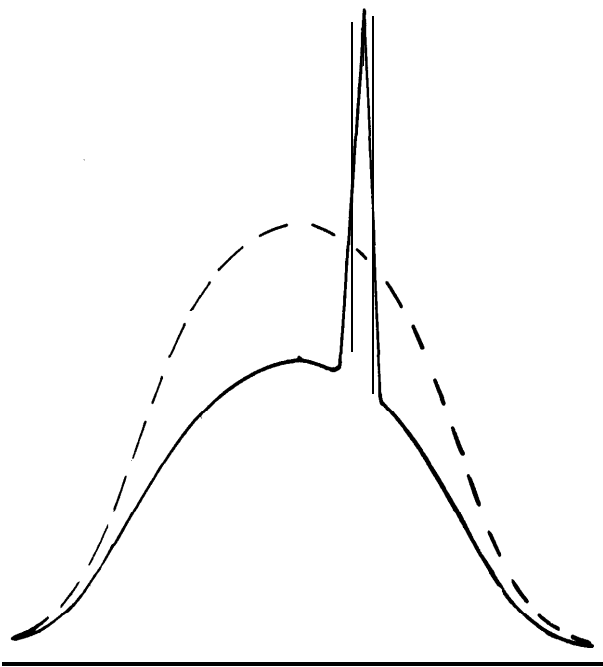


Fig.2 Effect of BOOST

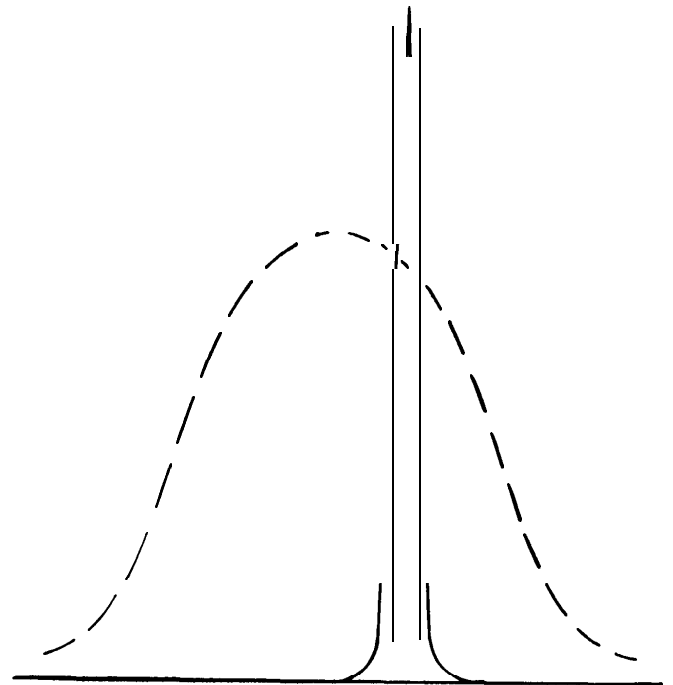


Fig. 3 Effect of PEAK

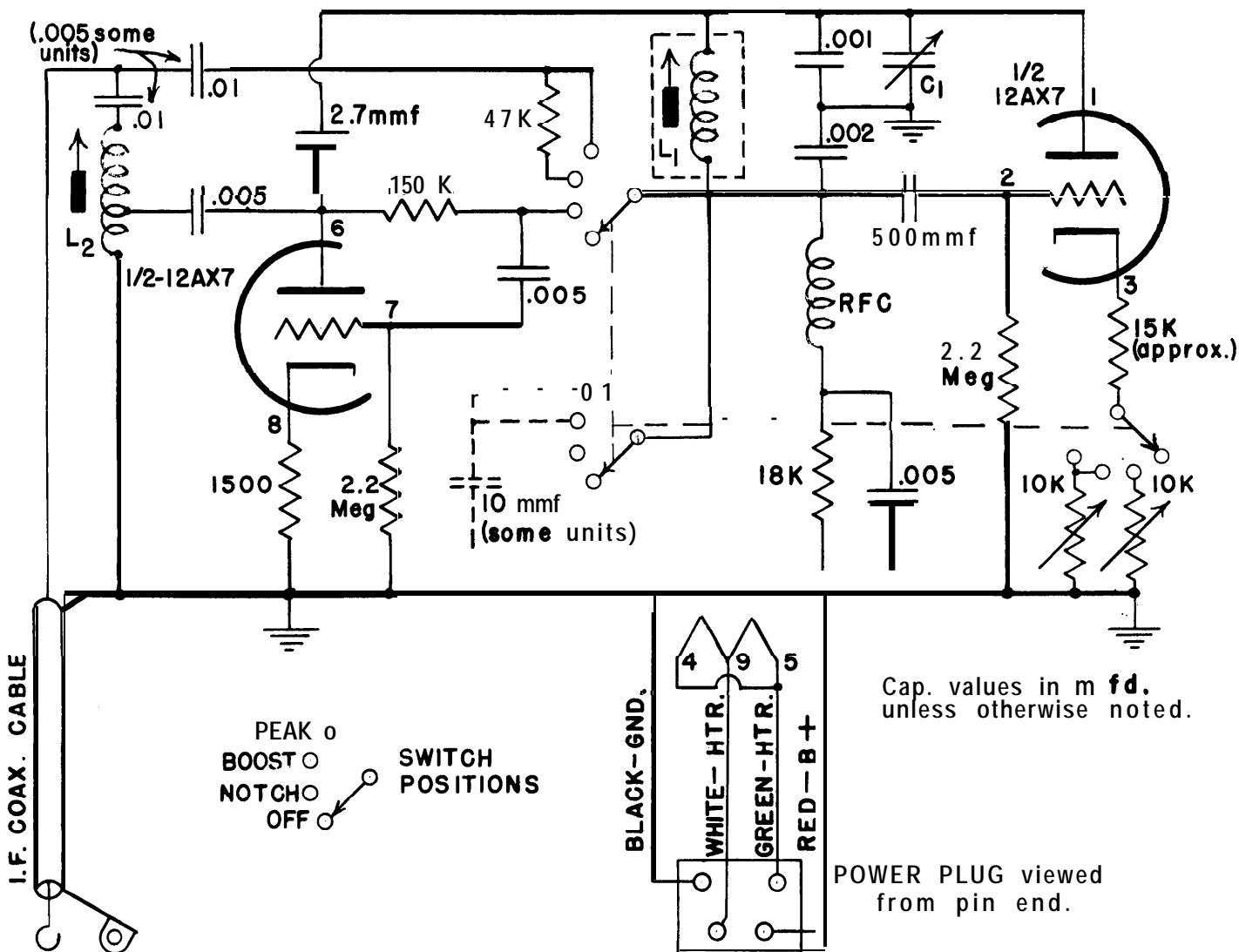


Fig. 4 Schematic Diagram of QX'er

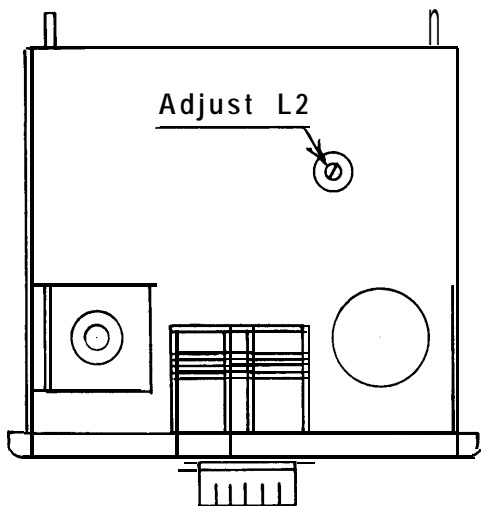


Fig. 5 Bottom of QX'er

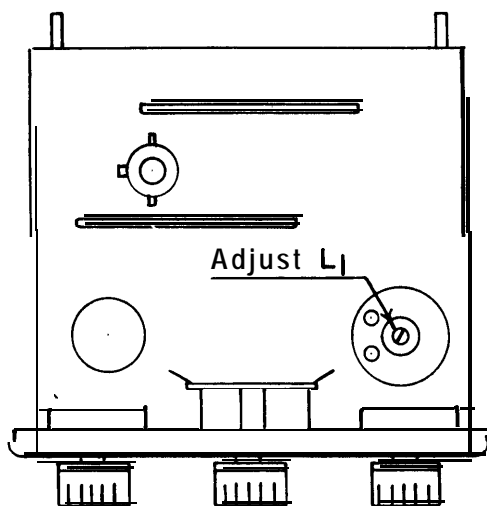


Fig. 6 Top of QX'er