



TUNING MANUAL

PASS REJECT DUPLEXER TUNING PROCEDURE:



Figure 1

There are three adjustable parameters found in a pass reject duplexer:

- **TX, RX frequencies**
- **Insertion loss**
- **Rejection**

Each of these parameters is labeled in Figure 2 and Figure 3.

Figure 2 is obtained by connecting the connector labelled Hi and the connector labelled ANT in Figure 1 to the two port of VNA. Port labeled Lo should be terminated by a 50 Ohm load.

Figure 3 is obtained by connecting the connector labelled Lo and the connector labelled ANT in Figure 1 to the two port of VNA. Port labeled Hi should be terminated by a 50 Ohm load.

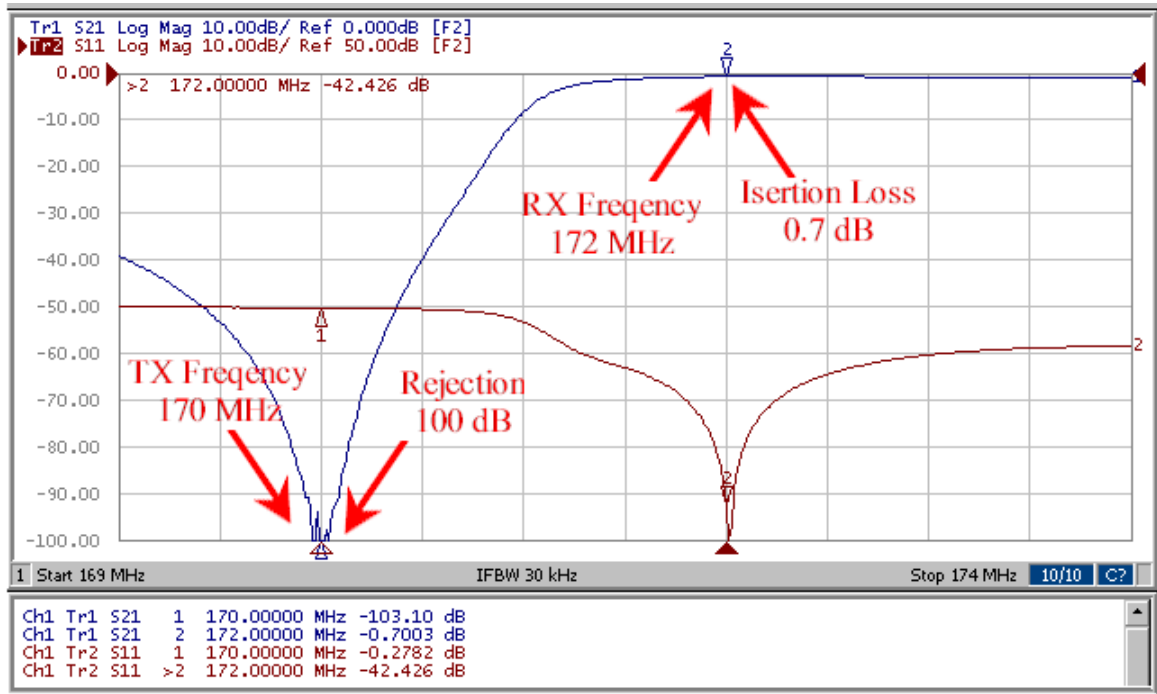


Figure 2

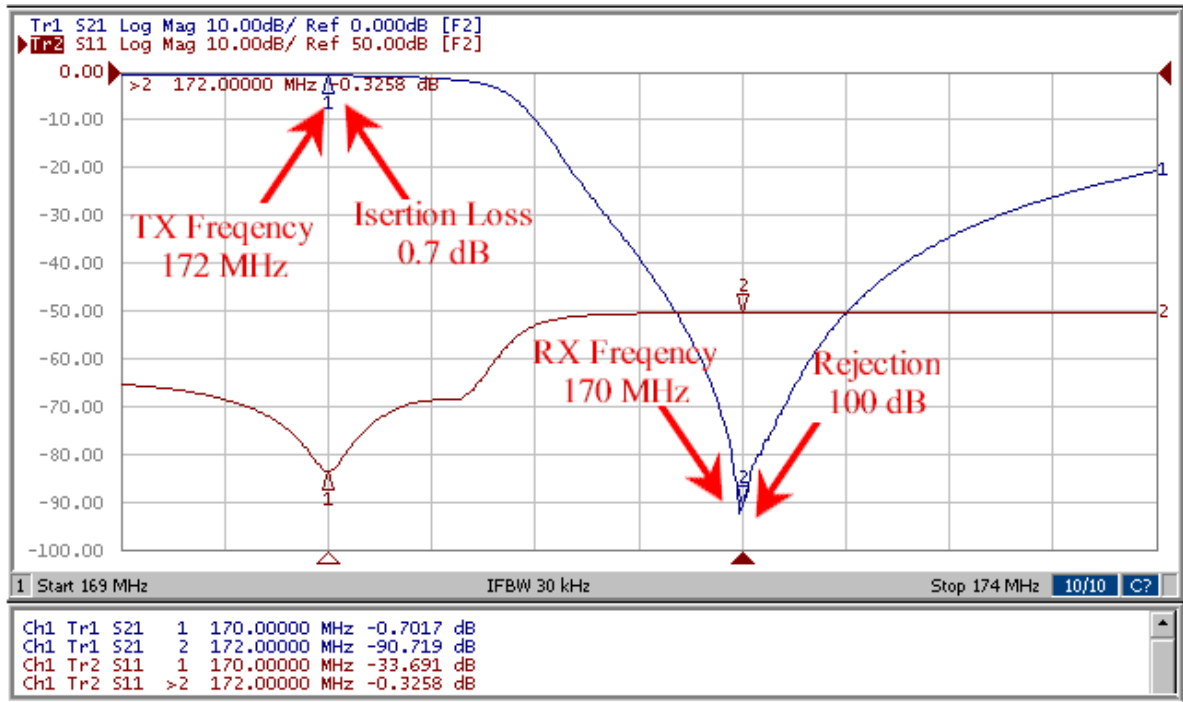


Figure 3

Schematic Symbol

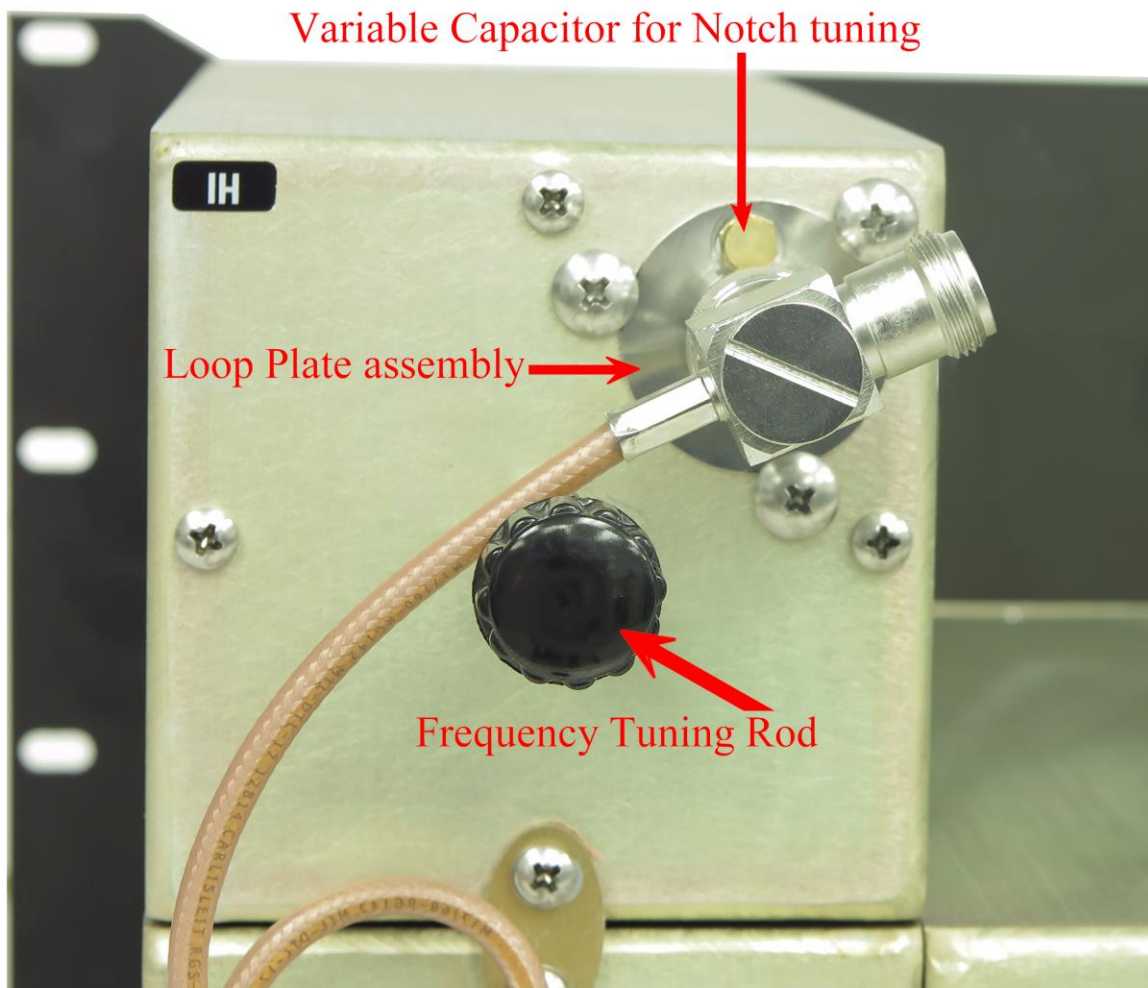
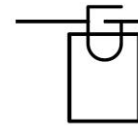


Figure 4

Figure 4 shows the three parts in each cavity that we can change to tune the parameters. The most important are:

- the Tuning Rod that we can move up and down to shift the frequency and;
- the Variable Capacitor to change the notch location.

The best way of tuning a duplexer is using a duplexer already tuned close to the operating frequencies and adjust these frequencies by using the Tuning Rod and the Variable Capacitor.

Turning the Loop Assembly allows to change the insertion loss and, in some cases, it can improve the return loss. Tuning should be always done by an experienced technician.

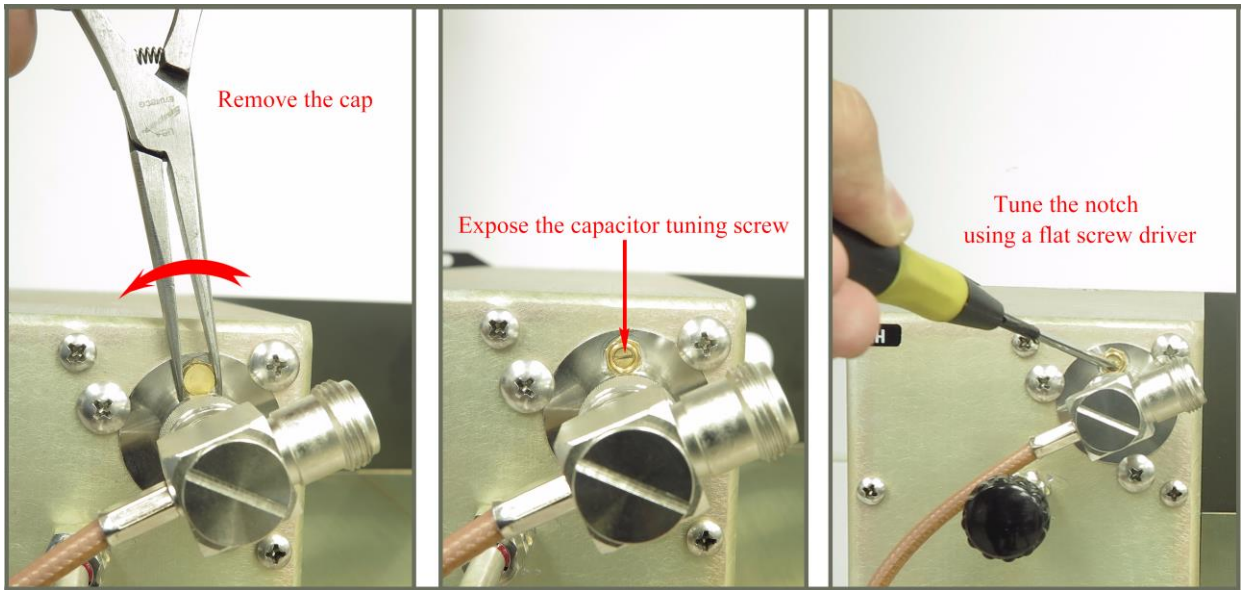


Figure 5

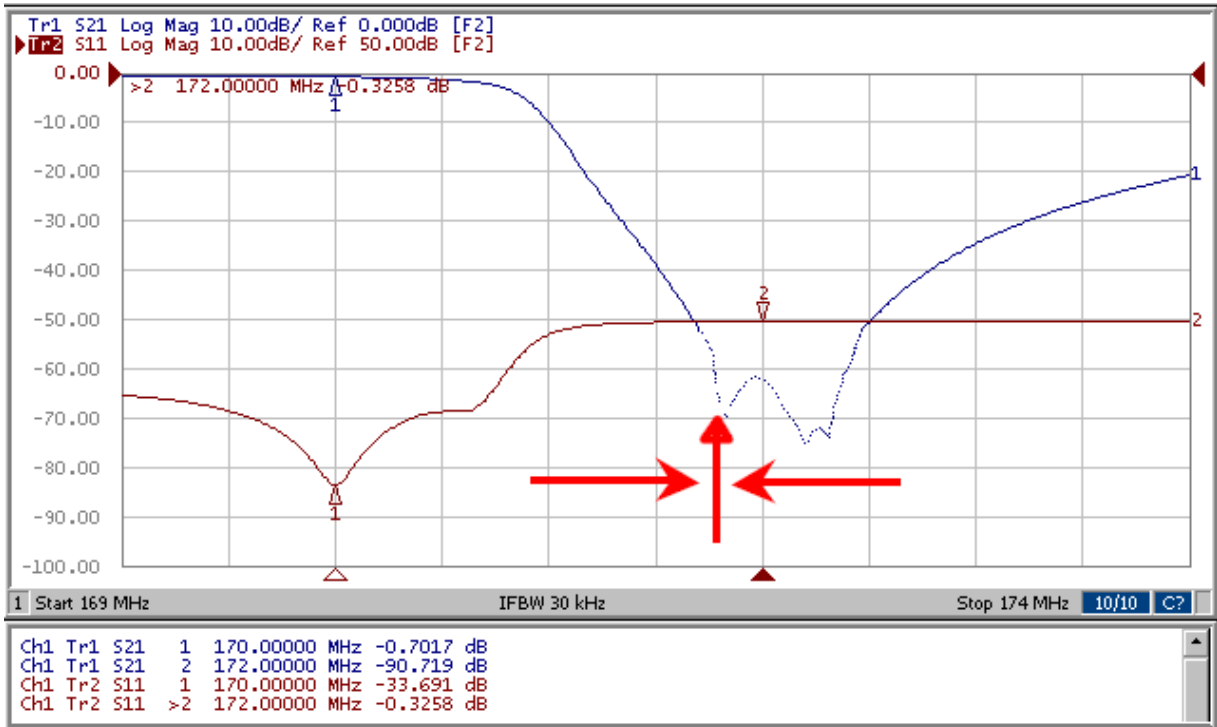


Figure 6

To tune the notch follow the steps in Figure 5. One notch is associated to one cavity. By tuning each variable capacitor in each cavity, you can bring the rejection to the appropriate frequency. You can increase the bandwidth, if needed, as shown in Figure 6.

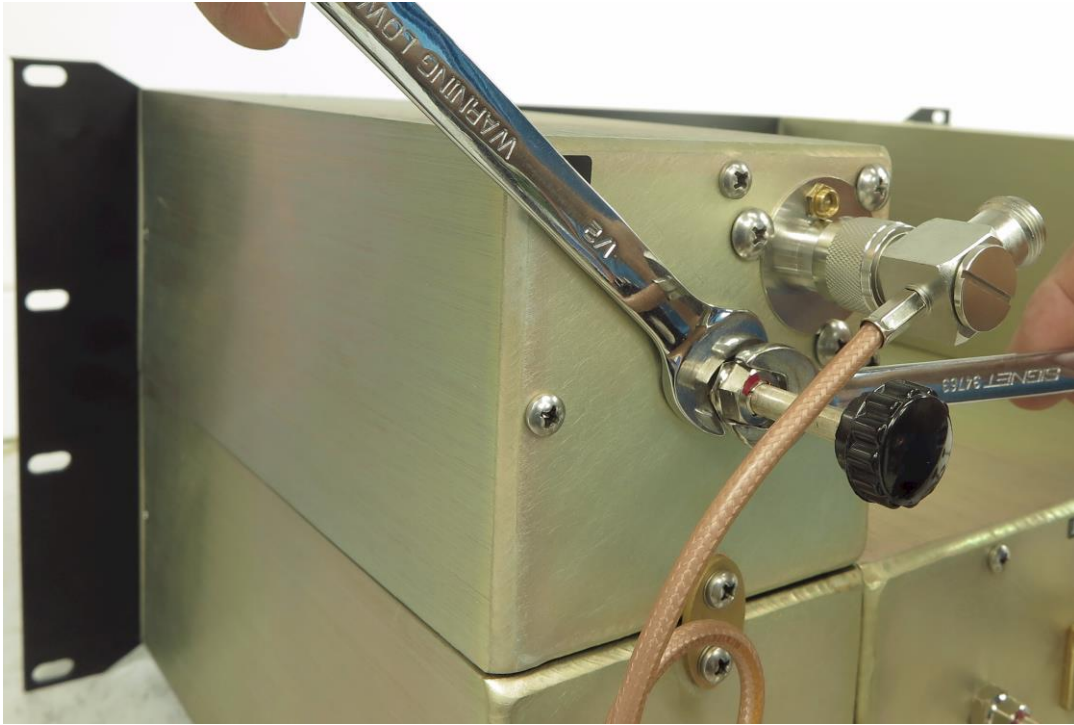


Figure 7

To tune the frequency use one 1/2 wrench to hold firmly the resonator structure and one 7/16 wrench to unscrew the nut holding the tuning rod.

By moving the tuning rod up and down, you can shift the frequency of the resonator as shown in Figure 8. Once finished, pass to the next cavity. When tuning is done, tight firmly all nuts.

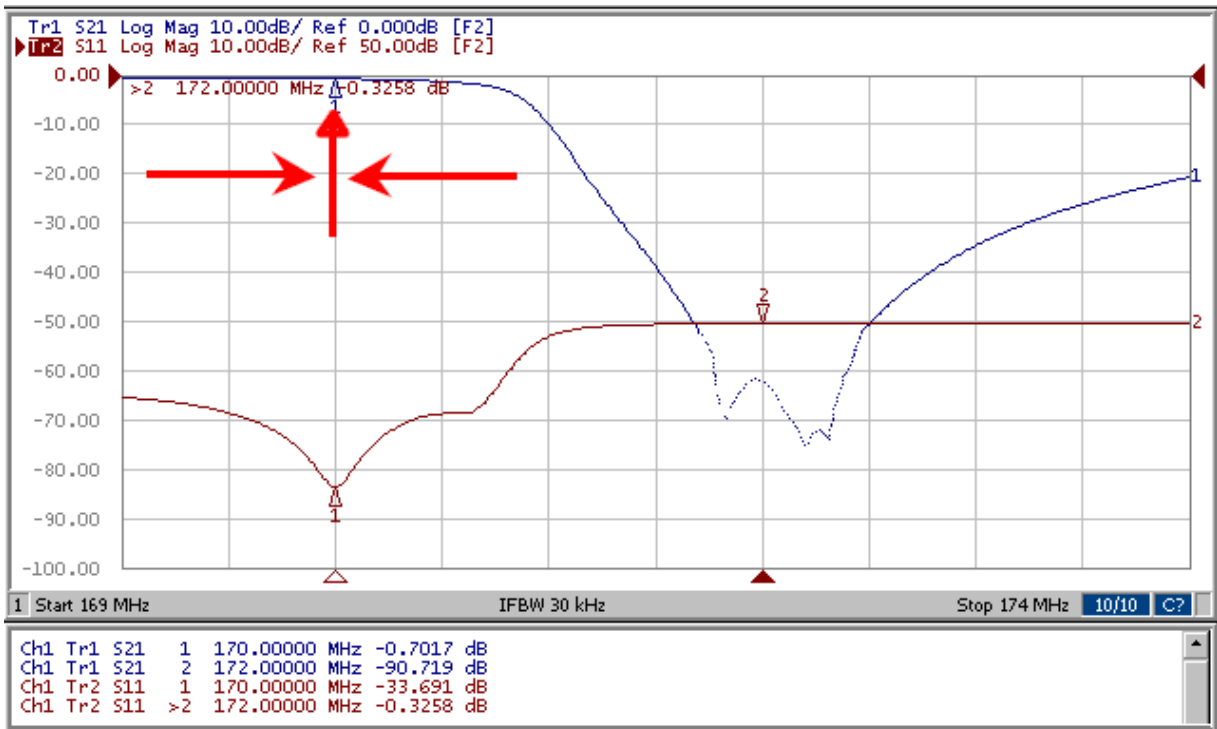


Figure 8