



## **Technique of fine tuning of duplexer DPRE4-6VL which has been adjusted at a factory, but undergone out of adjustment.**

RX -145.150 MHz and TX 145.750 MHz.

Duplex filter DPRE4-6VL takes place full adjustment for a manufacturer and goes on sale adjusted and ready to work.

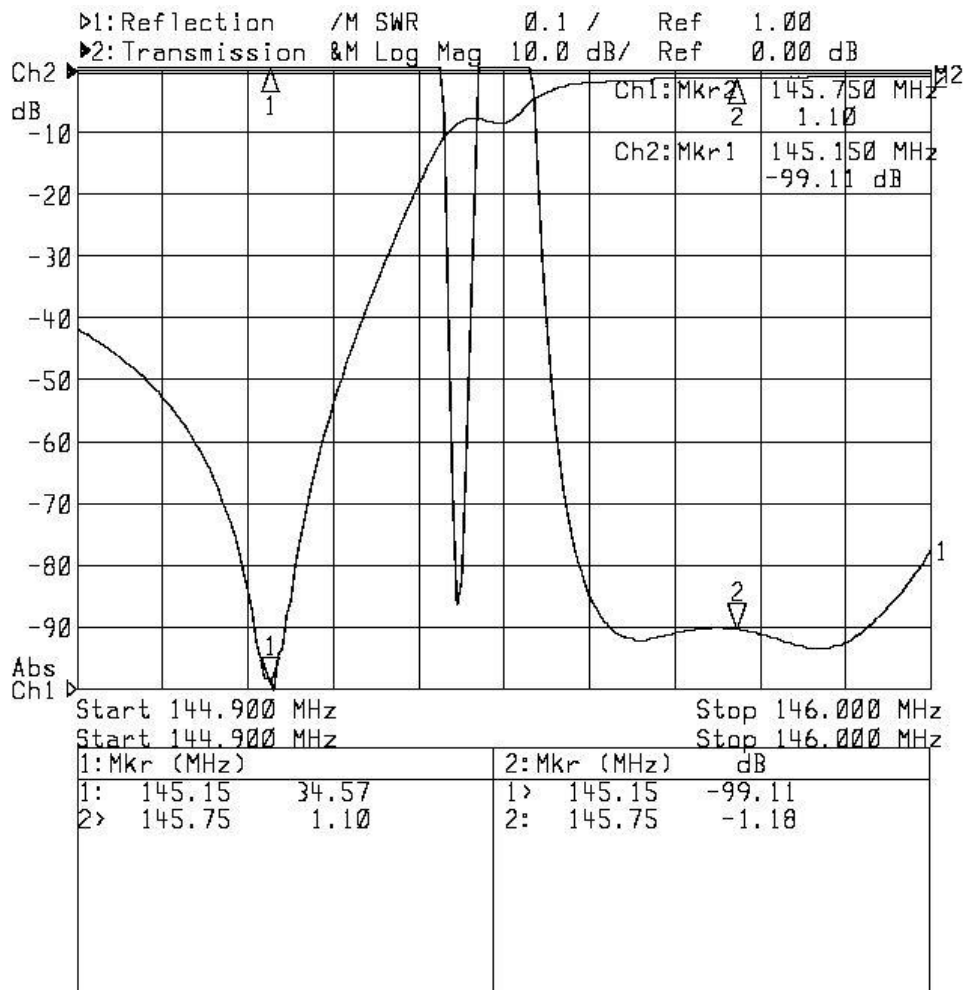
If necessary to reconstruct on other frequency it is necessary to understand a principle of adjustment and to follow below specified to rules.

The duplex filter consist of two independent bandpass-bandreject filters.

Independent they become under condition of when the opposite filter becomes "invisible" for next. And it occurs provided that the connected cable has on the end infinitely high resistance on measured frequency. Such effect possesses  $\frac{1}{4}$ -waves cable, short-circuited on the opposite end. In the working adjusted duplexer such condition is created owing to adjustment the level of reject. In fact the level of reject - it that other, as short circuit and full reflection of a signal. But while the duplexer is not adjusted, such condition is not difficult for creating, having short-circuited the first cable, near to an antenna socket. For this purpose it is necessary to warm up a powerful soldering iron lid of a T-shaped connector and temporarily to remove it. A copper foil or the screen from a cable to short-circuit a cable. Now we precisely know, that this filter does not influence in any way on opposite (on pass frequencies opposite!)

For adjustment of a duplexer it is necessary to use Network Analyzer with a dynamic range not less than 100 dB and an opportunity of simultaneous research of two modes Transmission and Reflection. For example, devices HP 8712, 8714, 8753 and similar. Having connected filter TX to calibrated to the device we start to reduce resonances, achieving schedule VSWR and the characteristics identical to the schedule:





On a levels of reject you can not pay attention, they are adjusted at the last moment. If coupling loops have been installed at a factory and more them did not twist, in no event them do not twist!!! Intercavity connections are already installed and then the

result will be achieved very quickly.

If intercavity connections have been changed, it is necessary operating with all three screws and three rotary platforms to achieve first of all typical VSWR, bringing necessary losses and arranging resonances the screw. When the desirable characteristic will be received, it is possible to make more exact fine tuning the level of reject, rotating a screw-driver slot of capacitor.

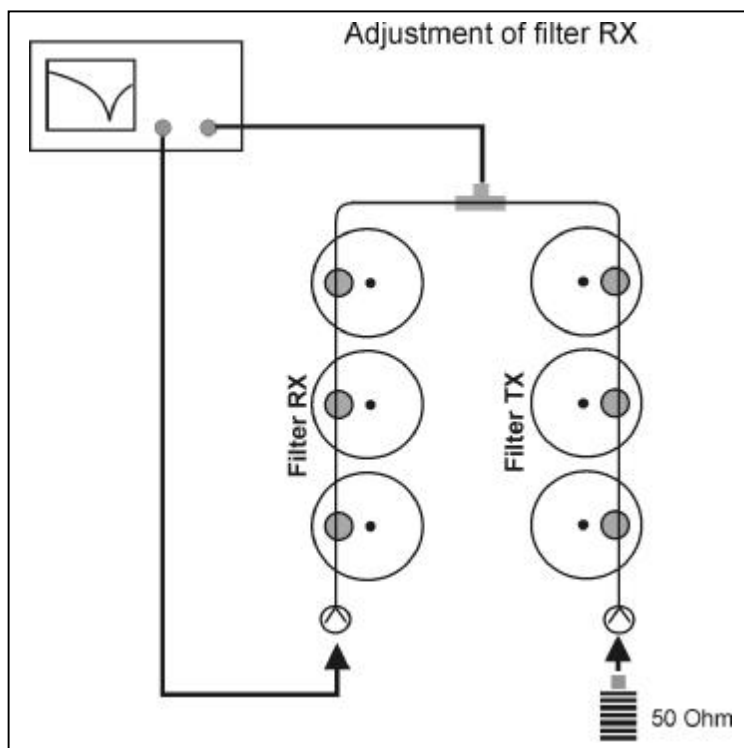
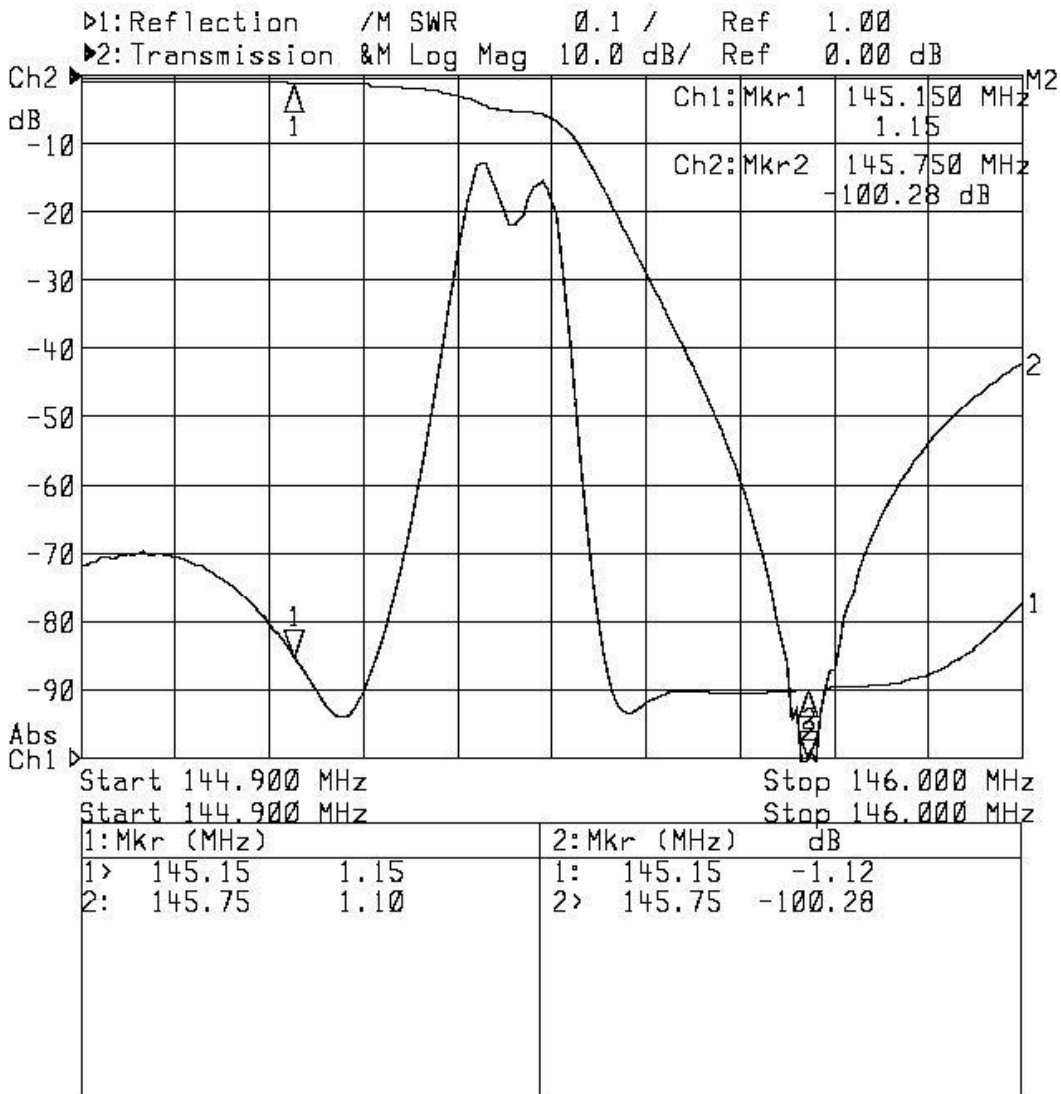


Figure 1.



Adjustment of the second RX-filter is made precisely also. Take off short-circuit, connect the device. Attach 50-ohm loading on an input of the free (already adjusted) filter. Now it is possible not short-circuit an opposite cable as the level of reject at the next filter it is already adjusted and provides necessary to us short-circuit.

Precisely also releasing counternuts of screws of adjustment by a wrench and rotating invar adjusting screws achieve schedule VSWR and Duplex curves response, similar to figure:



After achievement of similar characteristics do not forget to tighten a counternut, supervising on the device the characteristic and keeping the adjusting screw. Take off loading 50 Ohm. The duplexer is ready to work. It is necessary to consider, that adjustment of filters was made on a "ideal" 50 Ohm of internal loading of the device, therefore it is desirable to check up VSWR all circuit "duplexer-aerial" in real conditions and probably slightly to arrange VSWR near to the transmitter a coupling loop.



Figure 2.

