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UPGRADING THE REALISTIC DX150/160 RECEIVERS

The DX150A/150B/160 receivers are widely recognized due to their being distributed by Radio Shack. But, like so many multi-band receivers, their performance leaves a bit to be desired on BCB. These radios employ a ferrite loop as a BCB antenna, and it is really not very sensitive. Running an amplified loop or a longwire to the Al antenna terminal of the receiver will haul in weaker signals (although there may be overload problems with an untuned longwire), and some have found that amplified loops give all the sensitivity needed when DXing the BCB with this receiver.

If you want to use an unamplified loop with your DX150/160, perhaps this trick of Colin Newell's will help you out. Remove the pressboard back to the radio and note the position of the ferrite loop antenna mounted on the chassis of the receiver. Take any small unshielded coil such as a ferrite loop from a pocket radio, (if your junkbox is limited, the J.W. Miller #6300 will do) and mount it on the pressboard any way you like, so that it is parallel with and near to the internal loop of the radio. A simple way is to drill four holes in the pressboard and tie the coil on with twist ties or insulated solid hook-up wire.



The two leads of the coil can be run out through the board to terminate in alligator clips, or you can be fancy and mount an antenna terminal of some kind to the back of the receiver. The leads from the loop antenna are connected to the two leads from the coil. If you are not satisfied with running your amplified loop to the regular antenna terminals you could try this trick, but you may have to move the coupling coil out of the plane of the internal loop to avoid overloading problems. Running a longwire and ground to such a set-up is not recommended because (you guessed it) your local stations will probably overload the receiver.

The internal loop of these receivers may, however, blunt the nulls of your external loop antenna. If you don't mind not being able to listen to your receiver on BCB without an external antenna, you may try the following:

On the DX150A and 150B, disconnect all wires leading to the ferrite loop and remove the loop. On the DX160, disconnect only those wires associated with the medium wave coil (band B). These are the 4 wires on the right hand coil, looking from the rear of the receiver. While you're at it, remove coil L13 and capacitor Cl associated with the medium wave coil (L1 and Cl in the DX160). Obtain an adjustable BCB ferrite coil such as the J.W. Miller #6300 and mount it in the hole conveniently left in the antenna coil section on the DX150A and B, next to L2.

Ralph Sanserino in an article in SPEEDX suggested that you may mount the new coil with brackets in an existing hole near the power transformer in the DX160 which does not have the convenient mounting hole found in the 150 series. A clearance hole for the adjusting screw may be needed in the rear panel.

Assuming that you now have the new coil mounted, wrap about six turns of insulated solid hook-up wire around this coil. (If you use an unamplified loop or a short longwire more turns may be necessary for good sensitivity. Experiment.) One end of this insulated wire goes to the bandswitch terminal which Ll3 (Ll in the DX160) was formerly connected to the other end goes to the common wire connecting the other antenna coils to one side of the RF gain control. The actual terminals of the new coil are connected to ground on one side and, on the other, to the bandswitch terminal formerly connected to the internal ferrite loop. In other words, this new coil is wired in exactly the same way as the internal ferrite loop was, only omitting Ll3-Cl (Ll-Cl in DX160).

You may still find overloading problems using a good longwire on BCB, however. An antenna tuner such as the one Brian Sherwood describes on p. 49 may well be necessary. Alignment of the new coil follows the procedure described in the service manual.

One thing I've found helpful in getting rid of overload and cross-modulation problem in a receiver is to place a potentiometer across the antenna terminals of a receiver to cu down on the amount of signal finding its way to the RF amplifier and mixer of the radio. The DX 150/160 receivers have such a control as part of their circuitry, but unfortunately it is ganged with another pot which varies the circuit gain of the RF and IF stages. This ganged pot is labelled "RF gain" on the front panel. However, it is fairly easy to discor nect the circuit gain part (VR2 on the schematic) of the dual RF gain control, replacing it with either another 2 k Ω potentiometer or simply with a 2 k Ω fixed resistor to ground. The AGC voltage can then be taken from R26 (R28 in the DX150B and 160) and the new 2 k Ω resistor as shown in the AGC amplifier diagram:



This means the receiver is running at full gain most of the time (often for the best, as the receiver amplifies most linearly at maximum RF and IF gain), though the AGC will come into play on stronger signals. The only manual RF gain will be at the antenna. You may find that you have to turn the "new" RF gain control down quite far on strong BCB signals in order to find a null on the S-meter when using your loop. This is due to the S-meter's tendency to "pin" at rather low signal strengths. Replacing R22 (R24 in the DX150B and 160), a 3.3 k Ω resistor, with a 5.6 k Ω reduces this pinning effect somewhat.

Also, one little thing. If you find really bad cross modulation all over the BCB and even up to 3 or 4 mHz on the next band, consider replacing D1 and D2, the front end protection diodes; I used silicon IN914's rather than the germanium IN50's and a lot of the problems disappeared. Mine is a second-hand DX150A--I don't know if the diodes went peculiar from some static discharge before I got the radio or what. I haven't noticed any such problem on either the DX150B or DX160 that I've tried.

Another problem with the DX150/160 is its selectivity, which is pretty broad. Replacing the ceramic filter "MF" isn't easily done due to the 70 k Ω input impedance of the device; the better ceramic and mechanical filters have about a 2 k Ω input impedance.

The easiest thing to do is add emitter bypass ceramic IF filters to the IF amplifier of the receiver. These will make the receiver sharper in its tuning, but not mechanical filter class by any means. Below is a schematic of the IF strip. Replace the emitter bypass capacitors (circled) with either Vernitron TF-OIA's (from Radio West) or MuRata BFB455D's (from Gilfer) transfilters.



Oh yes...obviously you will need a schematic to follow some of these directions. There is one in the owner's manual for the receiver, but if you're going to really get into tinkering with the radio, a service manual would be advisable. You can probably order one from your local Radio Shack store (don't bother in Canada), or get one from the customer service division at their Fort Worth headquarters.

(NHP and Ralph Sanserino)

Note: Apparently some DX160's were built using shielded antenna coils on BCB and LW rather than the ferrite antenna. If yours is one of these, then of course replacing the ferrite antenna is unnecessary