

impedance in the front end. So, let's get rid of the front end! Easily done, just unplug P36 and connect an antenna input to TP4. This is now going nearly directly into the mixer stage. Without some kind of preselector the set will now overload easily, but using my own Interface unit (with the MW tuner section described in the Tech column Aug 7/82 DXM) as the "new" front end, the 515 performed very, very well. Sensitivity is now excellent and it now "likes" both the R7 splitter and my RAI unit--no impedance problems. On DX-peditions it's often possible to feed the antenna direct to the mixer as signals aren't enough to cause overload, thus allowing the memory unit to permit instant checks of suspected DX channels. Memory is somewhat inconvenient to use on MW when the stock (or other) preselector is used, as the preselector must be retuned with each new MW channel recalled from the memory.

However, before it could be taken on DX-peditions it had to be converted for DC operation, a complex task. Mine is now set up for two 12 volt battery operation, with a car battery for one, and a 20 amp/hr Gel Cell for the other. Draw is 1.6 amps from the car battery and .6 A from the smaller cell. This gives over 30 hours of use.

Having used the noise blanker in my FRG-7700 (didn't get the NB in the R-7) and being generally pleased with its performance on some forms of powerline noise, etc., I expected the one in the 515 to be at least equal. Since the Russian Woodpecker doesn't get into the MW bands, we'll not mention it! In many cases, the blanker in the 515 "smeared" the noise, actually making it worse! Removing R256 helped, but the circuit seemed to need more sensitivity, so R113 was changed to 4.7k. Now the blanker works as it should, although it could still use more amplification in the noise detection circuit. I installed scope jacks on TP15 and TR13 (collector) to observe NB action. The noise detector works well but some of the detected noise is too small to trigger the blanker. Still, performance is good, with 20-40 dB of blanking on appropriate signals.

Other things that needed to be changed on the 515 included the very tight and binding main tuning dial. Replacement of the end-bearing washer in the shaft encoder with a slightly thinner one reduced the drag and made the dial a marvel of smoothness!

Applying power to the R-7 will cause the frequency to come up in a predetermined band, although the VFO will remain where it was (has to--it's mechanical). But the 515 forgets about the VFO and just comes on the even MHz, unless the memory is engaged. Instructions are supplied to install a "keep-alive" battery system. Not having a small battery to fit in, I opted for an easier solution; just use a good low leakage capacitor in place of the battery. Current draw is extremely small and the capacitor I used keeps the circuit alive for at least 24 hours. Use from 10 to 100 uF can't remember the exact size I used, but it's not critical. Note: this has nothing to do with the battery back-up for the 96 channel memory unit.

Test Results

1) 50 km SE of Edmonton, about equidistant from all the Edmonton stations and super strong (and broad) CFCW-790. 790 was 80 dB over S9 on the R-7, with other signals being in the 50-60 dB over S-9 range. This caused the R-7 severe problems on all channels. The 515 fared much better with its internal preselector, but had trouble near 790 from preselector overload. With the outboard tuner, neither set had any trouble, and with the 515, a large improvement in the readability of weak signals was noted, about 2-4 S units. Both sets had a severe image of CFCW-790 on 650, but the tuner eliminated that also.

2) 150 km SSE of Edmonton near Stettler. Signals were much weaker here, none over 50 dB over S9, and many in the 35-45 dB range (this with a 200' longwire). I would call this a rural location, typical of many areas. Most channels were OK but both sets had a few problem ones. The 515 had bad IM on 830 and 1200/1210; and just a trace on 660. The R-7 had severe IM on 660 but just a trace on the others. Both sets seemed equally sensitive, but the 515 and outboard tuner combo improved signals by a few S units as before. The longwire fed directly into the 515 mixer produced IM on most channels.

Conclusions

Personally, I much prefer my own version of the 515, especially with the outboard antenna tuner modification. The versatility of the "endless" tuning system and the 96 channel memory allow me to cover many more potential DX frequencies. Since my DX interests are not limited to MW, the 515 allows the maximum in coverage, especially important when you're on a DX-pedition. However, if I had to live with the stock NRD, I'd be quite



NRD-515 vs. R-7.....MW PERFORMANCE AND MODIFICATIONS

by Don Moman

"...the NRD-515 and R-7A compliment each other unusually well--off-times, one's shortcomings is the other's virtue. It's hard to conceive of a more estimable DX "shack" than one equipped with a Drake R-7A plus a Japan Radio NRD-515..." That's what Larry Magne commented in his series of reviews in the 1982 WRTH, and there's no need to go through all the features of both sets; Larry's article does an excellent job. In fact, now would be a good time to re-read it!

Well, I've used them both for some time now, both in the shack and on a variety of DX-peditions. The close proximity of several 50 kw locals makes DX'ing a real challenge, and neither the R-7 or NRD-515 come close to withstanding the several volts of RF my longwire gathers! Obviously, a passive loop antenna is the only solution that is useful, other than using some kind of RF selectivity ahead of the set. However, both sets also show moderate signs of overload in "rural" locations. More on that later.

First off in the comparison, I'll mention some of the low and high points of each set, with the MW DXer in mind.

NRD-515

--extremely easy to use when configured with the optional memory unit, and even more so with the remote key-pad control. "Continuous" tuning.

--very pleasant audio in 6 kHz mode, quite muffled in the 2.3 kHz mode.

--no pass band tuning in AM mode

--digital noise from tuning dial, but only if optional memory unit is plugged in. Much worse on some portions of the higher SW spectrum.

--MW preselector overloads on strong signals (creates its own intermodulation distortion (IMD)). This is caused by the variable-capacitance diodes used to tune the preselector, which can't always handle the voltage swings that strong MW signals generate. Problem is worse at low end of ECB.

--doesn't run on 12 volts and is hard to modify for 24 volt power, but it can be done.

MODIFICATIONS

Drake R-7.....I've only made a few, relatively unimportant mods to mine. Minor things like a non-detachable AC cord and poor antenna connectors were the first to go! Much effort has gone into getting rid of the "birdies" on MW, but it hasn't been totally eliminated. Much of the noise goes away when the counter is switched off, indicating the multiplexing of the display is part of the problem. Shielding and/or removing the cabinet top has helped, but it's impossible to use a loop nearby when the top is off!

JRC NRD-515...As received, in the factory version, the 515 was useless for MW DX'ing here. Obviously, the arrester diodes were creating IMD, so out they went! (ed: perhaps a Transitrapp surge protector could be installed) Better, but the MW preselector would now create severe IMD when peaked near a strong signal. Not only that, but it was lossy too. Also, when used with the 50 ohm splitter in the R-7, the 515 virtually shorted out the signal and made it impossible to use with the R-7's otherwise useful antenna splitter. Other sets work fine. It also didn't "like" my own MW tuner (very high insertion loss) so I decided there must be something unusual about the

R-7

--MW broken up into three 500 kHz segments which make fast scanning inconvenient. Not all frequencies are covered with equal sensitivity, due to the pass bands of the RF filters being designed for hams, not MW DXers!

--Synchro-Phase selectable sideband system is excellent for "splits" and allows one to make the most of the excellent selectivity characteristics. Also very good on ECSS (exalted carrier selectable sideband) reception, better than the NRD

---12 volt power input is standard.

--notch filter is useful, but the depth is only about 40 dB, much less than is really needed (and is found on the older SPR-4)

--digital circuitry creates weak "birdies" on MW, annoying when searching for hets.

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unhappy with it! Not everyone may experience the problems I've described, but if you have, then I'd like to know what you did to cure them!

In choosing the 515 over the R-7, I willingly acknowledge the superior "DX-ability" of the R-7. But in the real world the R-7's edge is rarely clear-cut, and often is negligible. The Synchro-AM system is highly desirable, and with the excellent IF filters available, the system is very versatile in combatting interference. But the 515 isn't far behind, and for those willing to some of the mods I've mentioned, I feel the 515 is the more desirable of the two, especially if one has interests beyond MW. The MW only DXer might prefer the R-7, particularly if he can't modify the NRD-515 however.

One last comment. Both of these sets are well over US\$1000. Are they that much better than the under \$1000 sets--like the R-1000 and FRG-7700? Likely not, especially if one DXes with a loop or uses a good MW tuner. Recently the ICOM IC-R70 has been introduced, similar in many ways to the R-7 (still no Synchro-AM though). It's basically the receiver portion of the IC720 transceiver, which I've used briefly. If it performs like the 720 did, it would be very desirable, and is about half the price of the NRD-515 and R-7!

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