

NRD 535 and NRD 525 comments and modifications

Background:

I have modified a few NRD 515's and a lot of 525's and some 535's for Swedish DX-ers. I have also used the Eskab boards for several of those modifications.

During the last years I have had several contacts with Dallas Lankford regarding the NRD receivers. He is very skilled in modifying receivers and has suggested a lot of very good modifications in DX-News and DX-Monitor. As Dallas Lankford is an avid MW DX-er, his modifications are aimed mostly to the MW-dxers preferring relatively broad selectivity. But a lot of DX-ers out there also listen to shortwave transmissions and some of them prefer tighter bandwidths.

Due to the low level of the discussions in the newsgroup rec.radio.shortwave most of the time, the last time Dallas Lankford was contributing to the list with some very good points, he was not treated with respect and therefore I choose not to share my findings with the rest of the newsgroup readers.

NRD 535

Digital Noise:

I tried out 4 units of the 535 equipped with ECSS and BWC before and after making any modifications.

On the MW band the 535 was a good performer, but when switching over to shortwave, digital noise appeared on SW, getting more and more apparent when tuning upwards from about 8 - 10 MHz.

Most of the noise comes from the chassis and is also transmitted through the headline cord. I tried every way to get rid of the noise but it was impossible. Not even a long coaxial antenna input will help.

The only reason I could think of, is that the RF-board is placed too close to the chassis and will pick up the digital noise in some curious way. On the 525 the RF-board is positioned as number two from the short side and located about 50 mm in from the chassis. The 525 is almost clean from this type of digital noise. The only way to get a similar noise from the 525, is to put the antenna inside the unit close to the loop 1 or loop 2 boards or close to the display board.

BWC-control:

I didn't like the BWC control. The 855 kHz tone was noticeable on all 4 units not only on that frequency but also when the BWC control was turned. The selectivity from the BWC X-tal filter was also much too broad. I think the BWC control degrades the whole unit.

Not even changing FL1 to a 8-pole crystal filter and changing FL2 to CFX455I helped. Even more of the noise was evident.

AVC-mod:

I also changed the AVC by shorting out one section of R105 so the total resistance was 500 K. R103 and R104 was changed to 100K. After that the AVC was functioning very well in both FAST and SLOW.

So I decided to return all of the 535:s back to the sales company and with the help of Harm Broers in Malmoe found a good used NRD 525 in Berlin.

Conclusion:

I consider the 515 and also the 525 as some of the best receivers available, especially after performing some necessary modifications on them.

NRD 525:

The arrester diodes are removed and replaced with a 10 mH choke and a neon bulb.

The AVC is modified, R105 is shorted out - giving 1 Mohm from the remaining R106.

I have modified the units with the Eskab AVC board, PCB121 - and added one very important modification to this board. It is necessary to replace the 1uF tantal capacitor with a 10000 pF ceramic. Otherwise the recovery time will be far to slow. This board also cleans up the distorsion from the BFO.

Instead of installing the Eskab AVC board, you could as well change both R103 and R104 to 100K each, and short out R105, giving 1 Mohm at the remaining R106 (exact value should be tried out for proper recovery time in AM and SSB.)

Then I have changed the filters mostly to get a more quiet receiver, but also to get better ultimate selectivity by careful cascading.

FL 1 is changed to Eskab 8-pole crystal filter (10-12 kHz @ 6dB).

FL 2 is changed to a CFX455I (4,5 kHz @ 6dB)

FL3 is a CFK455I (4,5 kHz @ 6dB)

FL4 is YTK 2,4 crystal filter

FL5 is YTK 1,8 crystal filter

FL6 is YTK 1,0 crystal filter

To get rid of the wide band noise, I have put in the Eskab PLAM board just ahead of the detector. Here I have soldered in some excellent ceramic filters, cascading the ones above as follows:

Eskab board FL3 = CFK455I

Eskab board FL4 = CFJ455K4

Eskab board FL5 = CFJ455K5

Eskab board FL6 = CFJ455K5

On this board it is also very important to install 20K resistors on both sides of the filters (= R25, R26, R16, R17, R40 and R41). Otherwise the impedance will not be correct and the selectivity curves will show heavy ripple.

I am aware that this is close to what Dallas Lankford calls "the emperors new clothes" regarding the selectivity - but you should listen to how quiet the receiver is. It does feel good to know you have done the utmost!

(A very good combination regarding AUX is to place a CFJ455K5 at FL6 cascaded with a CFK455I at the Eskab board FL6. This combination gives about 3 kHz @ 6dB.)

I know that selectivity is very subjective. It is very easy to change the combinations of filters to get other bandwidths for each position. I mostly listen with WIDE (4 kHz @ 6 dB) or INTER (2,4 @ 6 dB). I really miss a good 3 kHz combination and will in the future change the filters in the AUX slot.

From the Eskab board you also have access to the PLAM facility - but I never use this mode. If properly aligned, the ordinary SSB is more than stable enough.

Finally I have made a careful alignment of the total receiver. Especially the master oscillator must be set exactly on zero. Then you can take full advantage of the extreme stability.

If anybody needs additional information, feel free to contact me via E-mail.

Regards

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