

LNB modification: Megasat Diavolo

for the Amsat downconverter

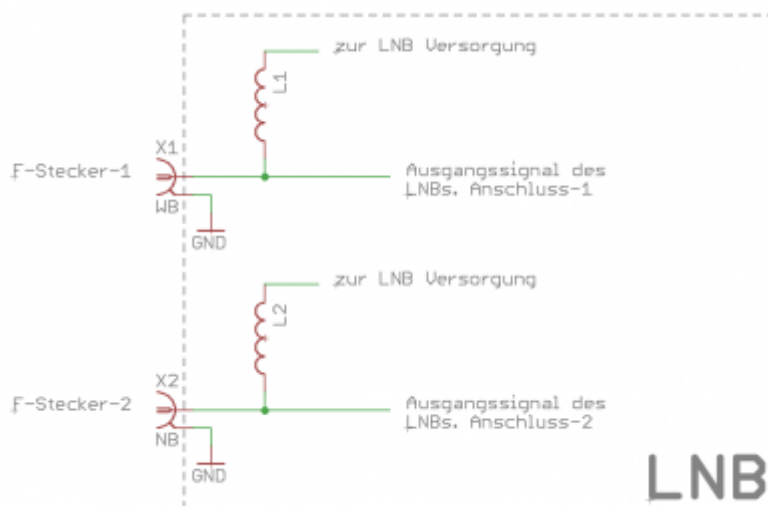
The Amsat downconverter has 2 LNB connections. One is used for the NB (SSB) transponder, the second for the WB (DATV) transponder.

The required supply voltage of 14V or 18V is already fed into both connections. In addition, the Amsat downconverter feeds the reference frequency for the LNB (24.25 or 26 MHz) into the WB connection.

A corresponding decoupling must be installed in the LNB, which is shown here using the Megasat Diavolo as an example.

Schematic diagram:

This is what an LNB looks like internally:



If you open an LNB, you can see the feed chokes L1 and L2 directly behind the connectors. These are printed directly on the circuit board as meander-shaped conductor tracks.

The reception signal from the LNB is routed directly to the connectors.

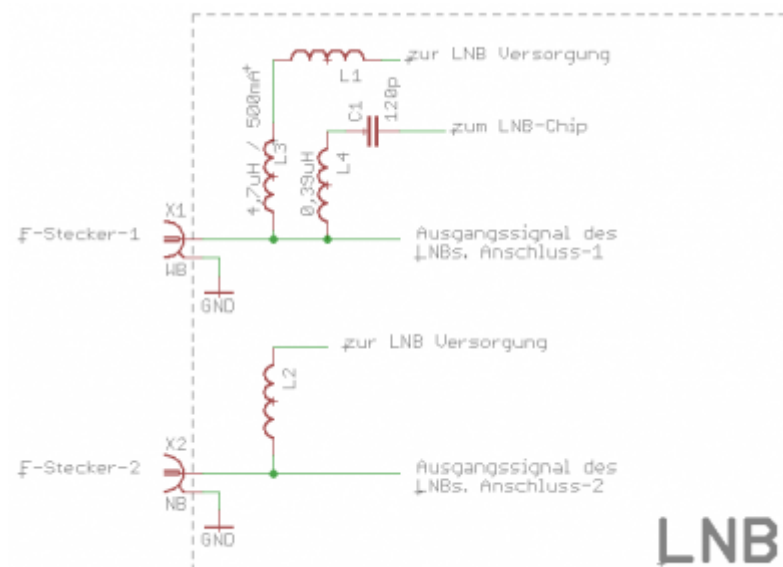
Modification:

There are two things to do:

1. The existing LNB feed choke has an inductance that is far too small for the reference frequency of approx. 25 MHz and must therefore be increased.
2. We would like to decouple the reference frequency of approx. 25 MHz, for this purpose a series resonant circuit is built in, which only lets this one frequency through.

We ONLY make this modification to the WB connector (which of the two connectors it is does not matter). We leave the other connector unchanged.

Circuit diagram with built-in modification:



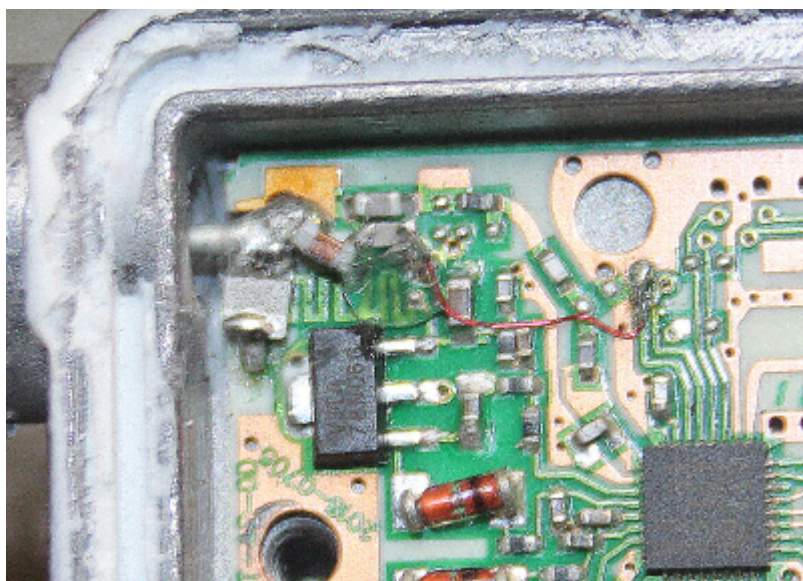
Modification of only one connector, which we select as we wish, but then permanently label it with WB so that it can also be easily recognized from the outside.

Required components:

1 pc. SMD choke 4.7µH that can withstand up to 500mA 1 pc. SMD choke 330nH or 390nH, any load capacity, size 0805 or 1008 1 pc. SMD capacitor 120pF size 0603

Installation of the additional three components:

the installation is not for the faint of heart or bad eyesight. Anyone who does not have SMD experience and a good working magnifier or microscope should seek help.



additional feed choke:

note the original choke, the meandering conductor track. This is scratched through right next to the

connector. You can't see that in the picture because this separation point is below the additional throttle. This additional choke with 4.7uH is in the picture the light gray part that is soldered down from the plug. It is soldered to the plug at the top and to the track choke at the bottom. So now we have connected the 4.7uH choke and the conductor track choke in series.

Series resonant circuit:

to the right of the connector is the 390nH choke. It is soldered to the connector on the left and hangs freely in the air on the right just above the conductor track. The 120pF capacitor is soldered right next to it and also hangs in the air. A thin red wire goes from the right connection of the capacitor.

The freely hanging components are secured with a tiny drop of hot glue.

You must not build too high so that the lid of the LNB is still closed.

Connection of the reference frequency:

First you remove the 25 (or 27) MHz crystal. This is often difficult to achieve. If it is not possible to unsolder the quartz, cut through the conductor tracks leading to its connections.

The red, thin wire above carries the reference frequency which comes from the downconverter. This must now be connected to the LNB chip.

Unfortunately there are several different internal LNB circuits.

Here I am referring to LNBs which use the MT230 chip. The connection for the reference frequency is pin 14. Look for the point on the chip (pin 1) and count counterclockwise to 14. This pin 14 must originally have been connected to the quartz, which you can check with an ohmmeter.

Once you have found pin 14, connect it to the red wire.

If you have an LNB without MT230, you have to look for the right connection yourself. In any case, it is one of the two quartz connections. If necessary, you have to try which one it is.

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