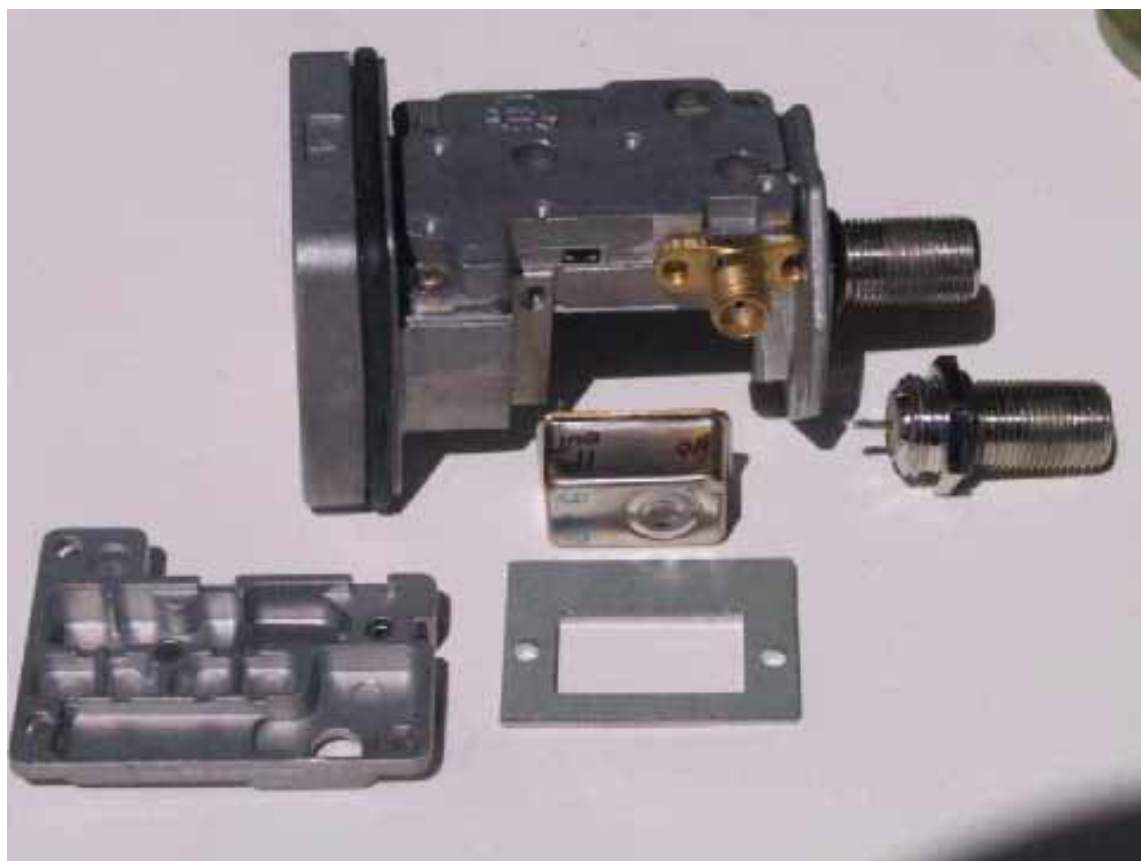


The Channel Master 11.7 to 12.2 GHZ LNB Conversion to 10.368 GHZ

As the LNB pre amp input is waveguide input multi-stage it provides an almost minimum loss connection to the microwave antenna system. This allows for a very low noise front end connected as close as you can get to the antenna as you can get. This conversion from satellite LNB operation to Amateur 10 Ghz operation is quite easy. The benefits are many. First the amplifier is pre tested as a unit with its internal DRO LO source mixing the 11.7 to 12.2 Ghz down to the 1 to 1.5 Ghz input to a converter located on your TV set for normal reception. These units operate with dc and IF (1 to 1.5 GHZ) sharing the same coax from the LNB to this converter input. Voltage requirements are any voltage from +10 to about +24 volts co-shares the coax cable to the LNB coax center and negative on the coax braid. There is diode polarity protection and a 7808 voltage regulator internal. Typical system Noise figure is .8 to 1.2 Db typical.



This side view should give you a better idea where the SMA connector can be mounted. Or you can use a second option to cut a mounting plate to same size and bolt mounting holes as the plate viewed here. This plate held the DRO in to the LNB main body, (shown in center bottom). Use this new plate to mount a SMA connector and feed-through capacitor on this new plate, with two plate mounting screws.

These LNB amplifiers come in several design schemes. Most have markings indicating original tested performance specs of NOISE FIGURE tested and so individual marked in the .9 to 1.2 DB NF range. These surplus units are pulls from service and have been tested for basic performance on a system level. For operational functionality.



Modification is quite easy. Remove the yellow cover by removing the type "F" connector nut. Slight pressure on the "F" connector will push out the LNB from the yellow case. On one side of the LNB there is a module that looks like a TTL crystal oscillator with a metal side cover held in place by two screws. Remove the two screws the metal plate over the oscillator module. Then remove the five screws holding down the top cover over the microwave amp part of the LNB. Unsolder two pins connected to the pc board from the oscillator module, one on top and one on the underside of the LNB. This will remove the DRO microwave oscillator and mixer assembly. It is not required in the conversion. Notice that on the underside of the top metal cover plate there two arches in the metal underside where two top pins of the DRO connected to the upper pc board where the LNA circuitry resides.

At the spot where you unsoldered the DRO oscillator on top is where a SMA connector will be attached. At this point (sma connector connection) and the output of the 2nd stage amplifier there is a filter that is dc isolated from the last stage amplifier and the point where the SMA connector connects. (Same place where you unsoldered the Dro oscillator / mixer. Remove all of the filter elements except a center width of copper on the pc board, where a new trace same width as filter traces, Connects the last stage output to the filter to the trace where the SMA connects. Cut away a suitable opening in this line to insert a 1 to 2 pf microwave chip capacitor to provide dc isolation between the last amp stage and the output.

The SMA connector can be mounted on a metal plate the same size as the one removed that held the DRO oscillator in place originally. Use the same mounting screw holes to mount this plate and attach a 2 hole SMA connector being very careful to be accurate in positioning the connector on the strip-line ckt board trace. Allow clearance for the top cover with it's arch that should give clearance for the SMA pin to go under the cover plate hole. If need be file away additional clearance in the underside shield plate for the LNA's SMA connector clearance to prevent shorting to ground. Another method of mounting the SMA connector is to solder the center pin directly on the output trace and push up the 2 hold connector to the flat

surface on the LNA body to get as close as possible to the housing side. Solder the center SMA pin on the output trace that connects to the 1-2 pf chip capacitor.

Now solder the ground part of the SMA connector to the ground foil on the edge of the pc board. Do not over solder as you need clearance for the to shield cover to fit allowing the ARCH to clear the SMA center pin and still provide rigid mounting for the SMA connector. It's not as rigid as the mounting plate scheme, but it's a alternative to use in you modification options. Last remove the type "F" output connector and replace it with a feed through capacitor of miniature size and solder to the trace where the "F" connector was unsoldered this will now be the new +12 volt dc power for the modified LNA. The waveguide input flange is WR-75 and will fit up to WR-90 waveguide switches by drilling out the four mounting holes through the back of the flange mount on the LNA and cutting away the outside edge allowing a screw to fit the pattern of the WR-90 flange. The 4 bolt's will hold the mis matched waveguide fittings together with little trouble. It has been shown that as little as two screws will hold the LNA to a WR-90 waveguide fitting with great rigidity.



Here is a full side view of the Channel Master LNB depicting the DRO removed along with a second top cover plate and DRO mounting plate and coax "F" connector. The "F" connector is removed and replaced with a feed through capacitor to bring dc only to the connection previously soldered to the "F" connector, mounting of the feed through cap not critical. The DRO oscillator was removed in this picture but where the top left pin of the DRO module is soldered to on the top LNA part of the pc board it is replaced with the center pin of the SMA connector.

This mod was the result of several amateurs pooling efforts and making this project work.. Ed W6OYJ, Pete W6DXJ, Kerry N6IZW and myself Chuck WB6IGP. All members of the San Diego Microwave Group. Recently a quantity of these LNB amplifiers along with several other types of slightly different configurations were obtained and will be made available to other amateurs. Please direct questions to Chuck WB6IGP at clhough@pacbell.net for further information.

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