

# Mode-S Conversion Instructions For Norsat 2500 MMDS Downconverter

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This document is intended to provide the user with simple information to modify the Norsat 2500 Downconverter to receive Amateur Radio 2.4ghz frequencies.



Open the back of the downconverter by removing the 8 aluminum screws from the back of the case. Be careful to choose a philips head driver that properly fits the screw head. (These screws are made of soft material and are easily damaged if care is not used in their removal) These modifications will not require the removal of the internal circuit board from the case.

The first goal is to cover the internal filter section of the circuit board with PTFE tape. This filter resides in the top right quadrant. To do this, make a pattern that fits over the filter in the manner illustrated in figure 3. I have found that using a portion of the PTFE's backing strip works well for this. Cut the pattern to fit over only the filter strip lines. Do not cover any surface mount components.



Once satisfied, apply the PTFE to the pattern you've made and trim the tape to the pattern edges. Carefully apply the PTFE over the filter to complete the process.

This modification alone has proven to increase gain by up to 4dB (at 2400mhz using .010" thick PTFE) and decreased the NF by 0.4dB.

In its original form, a signal at 2401Mhz will be converted to 123Mhz Output. If you chose to modify the Norsat 2500 for 145Mhz IF, you will need an 8.8125Mhz crystal to facilitate this modification. The stock Norsat 2500 crystal has been analyzed by International Crystal Manufacturing (<http://www.icmfg.com>) and is available under catalog number 746067 in the 8.8125Mhz frequency. Changing this crystal will not require removal of the downconverter's printed circuit board.



Locate the original crystal at the bottom left of the downconverter. Gently pull the crystal upward while touching the leads with your solder iron. Clean the holes with a solder sucker or wick to prepare them for the new crystal.

Once you have installed the crystal into the case, the modifications to your Norsat 2500 downconverter are completed. Check the rubber seal to make sure it's positioned properly. Then replace the back cover and install the screws taking care to prevent stripping them in the holes.



It's always nice to document the changes you've made to the unit. I also do this on the inside cover.

The author would like to recognize Edward "Ward" Hall – WCOY for sharing his modification techniques so that so many amateurs could take advantage of these inexpensive downconverters. Thanks Ward!