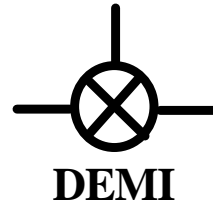


# Design Note



To: Owners of 1296-144 transverters and transverter kits  
From: DEMI R&D Dept.  
DN#: 003 Parts kit # DN003K  
Date: August 15, 2002  
Re: Excessive Local Oscillator feed through power on TXRF and RXIF ports

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## Description of problem

The 1296-144 transverter was designed for a minimum spurious output of -45dBC. Combinations of component tolerances and printed circuit board filters have caused this specification to creep upward over time. It became a more serious problem after the mixers that are used in the transverters began exhibiting a poor LO to RF and LO to IF isolation. Symptoms such as transmitted output power without IF drive and high levels of local oscillator power on the RXIF signal could be detected. Operating a stock transverter with these symptoms may go undetected, but they will become enhanced when adding an external power amplifier to the transmit side of the transverter or adding additional gain to the receive IF line.

## Circuit Change Description

1. Changing the RF prime LRMS-4 mixer to a MCL RMS-11F will solve most of the problems. Originally, the transverter was designed to use RMS-11F. Due to availability and its difficulty of soldering, the mixer was changed to the RF Prime part. These RF Prime mixers were every bit as good as the original MCL part. But recently we have found some defective units showing up in our assembled product. They will also be found in our kits. They are random failures causing the isolation to drop off more than 20 dB. We suspect a manufacturing problem at RF prime.

2. To further enhance the performance of the spurious response of the 1296-144 transverters, a change in oscillator frequency has been implemented into the latest design. This design change, to a certain extent, may be incorporated into the earlier versions of the 1296-144 transverter. We have changed the 96 MHz oscillator to 192 MHz. This will now only produce a harmonic every 192 MHz. instead of every 96 MHz.  $1152 + 96 = 1248$ . This is the harmonic being amplified and not filtered out by the transmit chain. This is also the harmonic that bleeds through the defective mixer. The circuit change is not complicated but requires approximately adding or changing 12 components then re-tuning the local oscillator to frequency.

A complete kit of parts and instructions are available under part number DN003K. This is a easy modification if you have assembled a kit. It can be done without removing the circuit board from the enclosure. Down East Microwave Inc. is also offering a upgrade to all factory assembled transverters. This modification cannot be performed to a transverter with a second oscillator for satellite operation and crystals are only available for 1296 operation. All further units sold will be of the new design. Further enhancements in the new design will be included. Please review the 1296-144 product description for details.

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