



520001-2
MDS-MMDS Transceiver
Description of Operation

The transmitter in the 520001-2 transceiver is a dual-conversion superhetrodyne frequency translator. The input frequency is 14.375 - 26.375 MHz with a first IF of 116 - 128 MHz and an output frequency in the MDS band (2150 - 2162 MHz). Input power is 0 dBm providing an output power of 20 dBm. The second LO (2278 MHz) is synthesized directly from a temperature compensated crystal oscillator using a phase-locked loop. Frequency stability is ± 10 kHz over the operating temperature range of -30 - +70 degrees C. This LO is then divided by 16 to provide the first LO at 142.375 MHz. The block diagram for the transmitter is shown in figure 1. A QPSK IF in the frequency range of 14.375 - 26.375 MHz is provided from a Hybrid Networks N231 cable modem. It's output power is adjustable in 1 dB steps from 8 to 58 dBmV. This power is adjusted by the professional installer onsite to provide a final average output power of +17 - +20 dBm. This signal is bandpass filtered by filter F1 (response shown in figure 2) and then upconverted to a first IF in the 116 - 128 MHz band. This IF is amplified and extensively filtered in order to reduce the image signal and spurious responses. The response of filters F2 and F4 are shown in figure 3 and F3 is shown in figure 4. This signal is then applied to mixer M2, bandpass filtered by filters F5 and F6 (figure 5), and amplified by amplifiers A2 - A4 to obtain the final signal for application to the antenna. The power amplifier A4 is a Motorola MRFIC1805 biased at 5 VDC @ 100 mA.. The output of the transmitter is applied to a circulator and a 24 dBi quasi log periodic antenna through a short length of RG-214 cable to complete the system.



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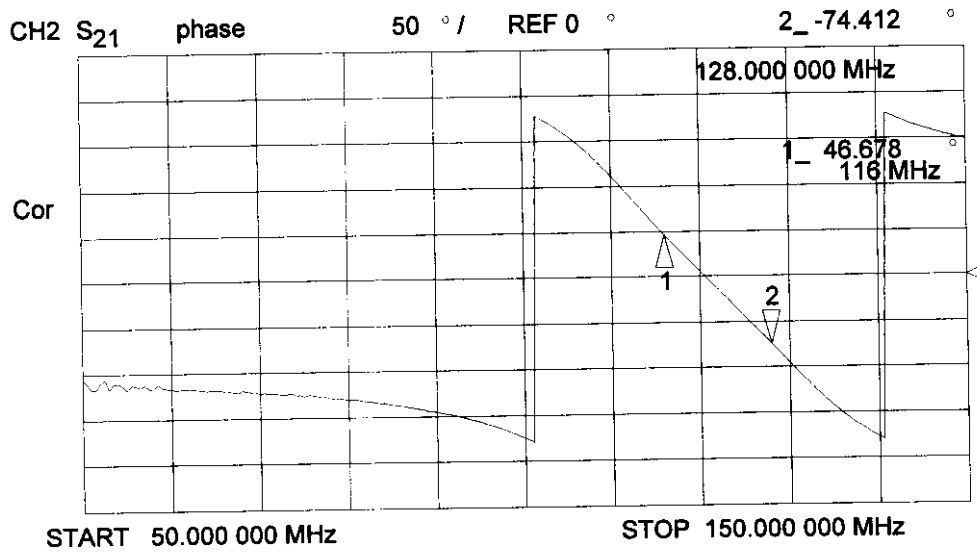
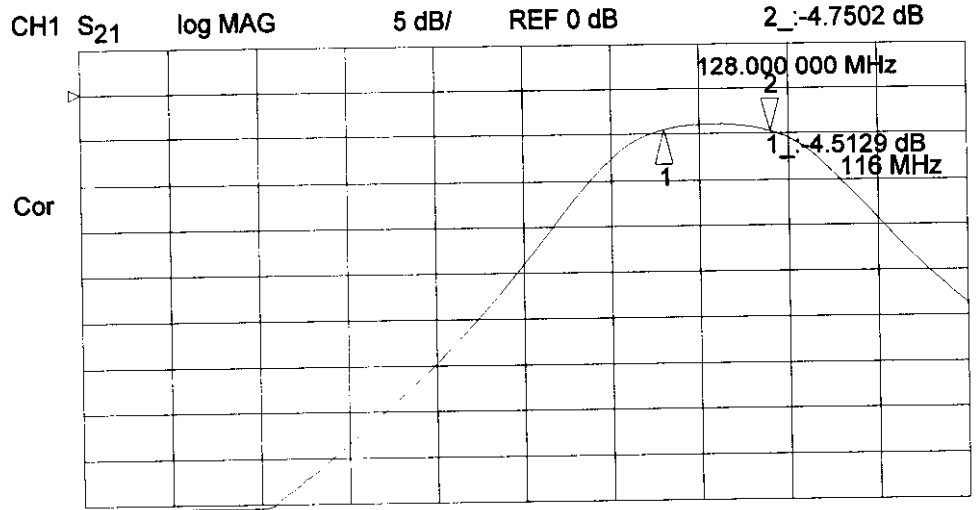


Figure 3
Bandpass Filter F1

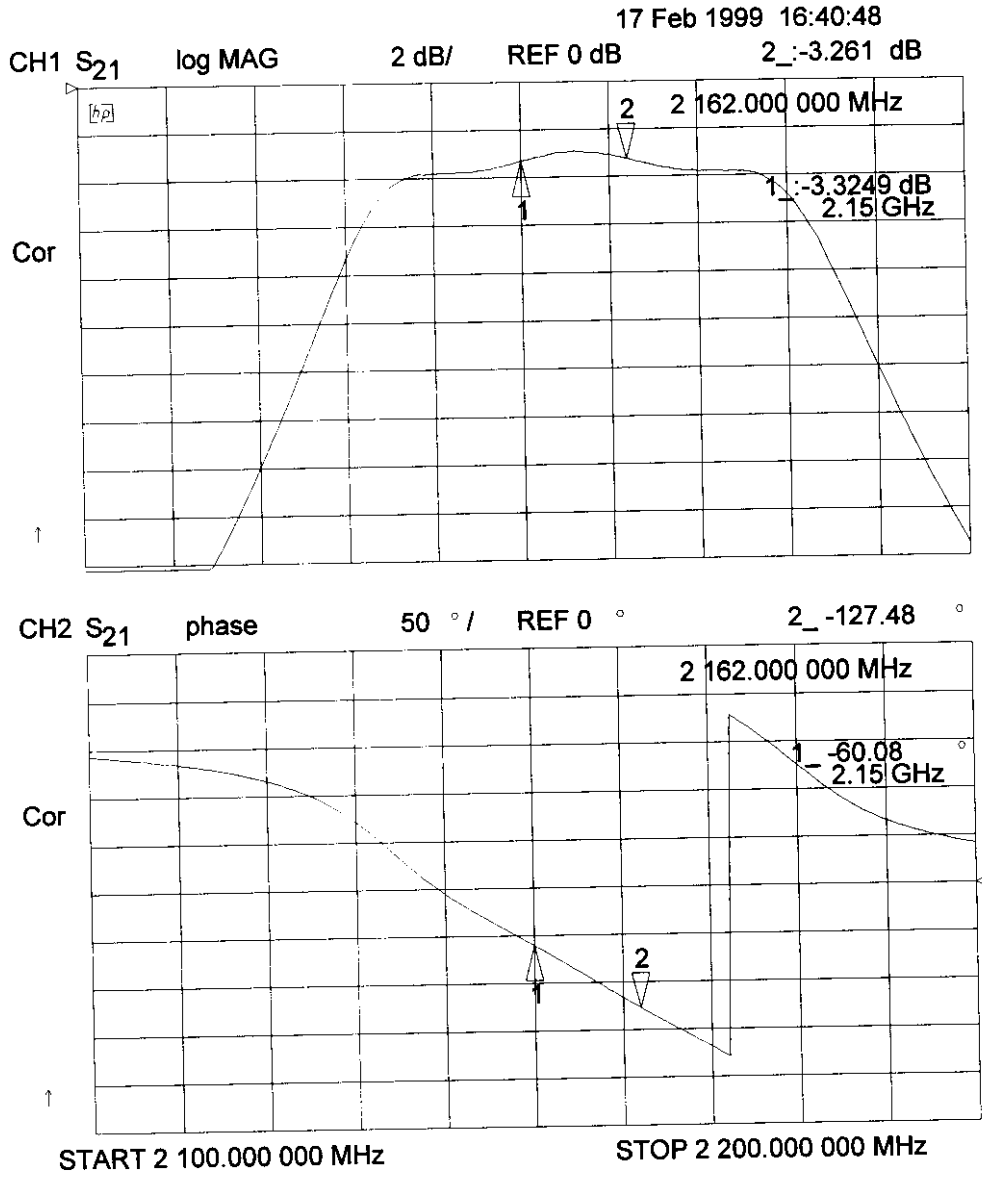


Figure 5
Banpass Filters F5,F6

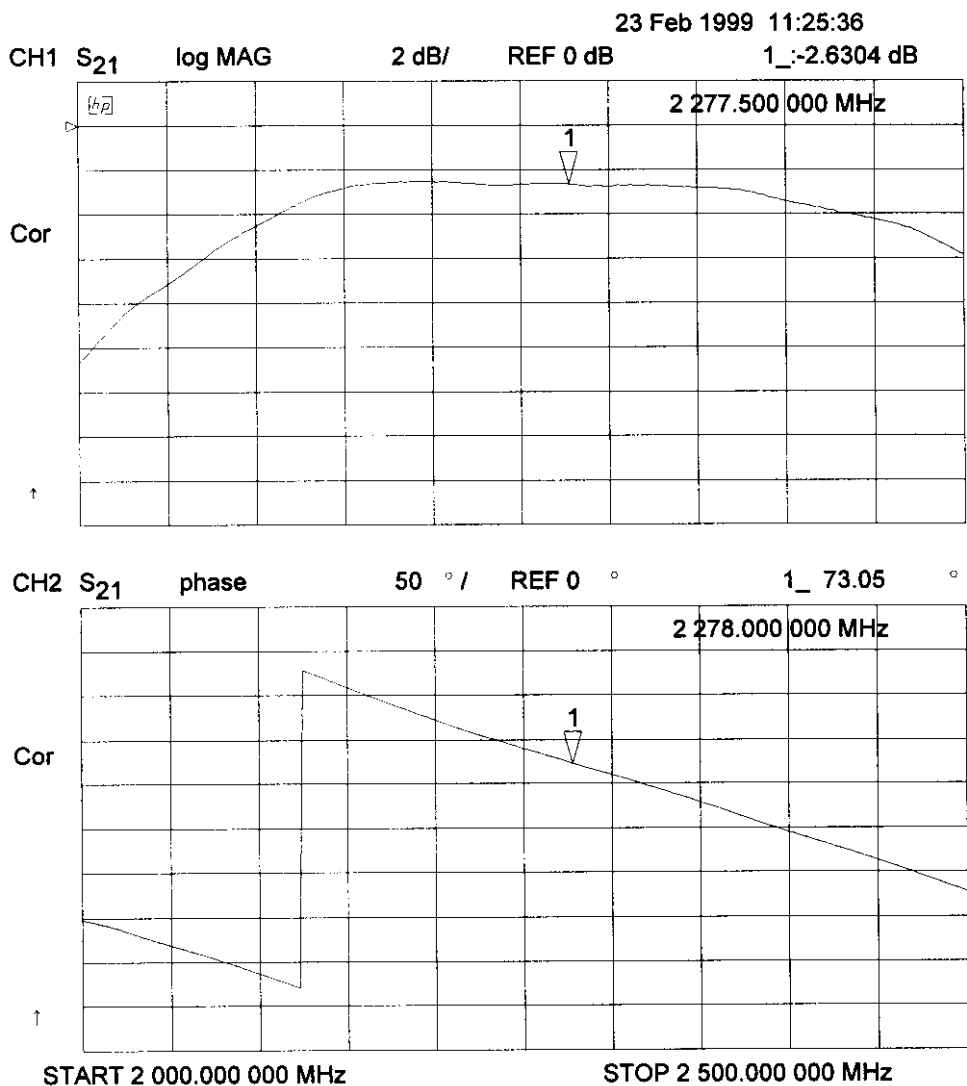


Figure 6
LO Filter F7

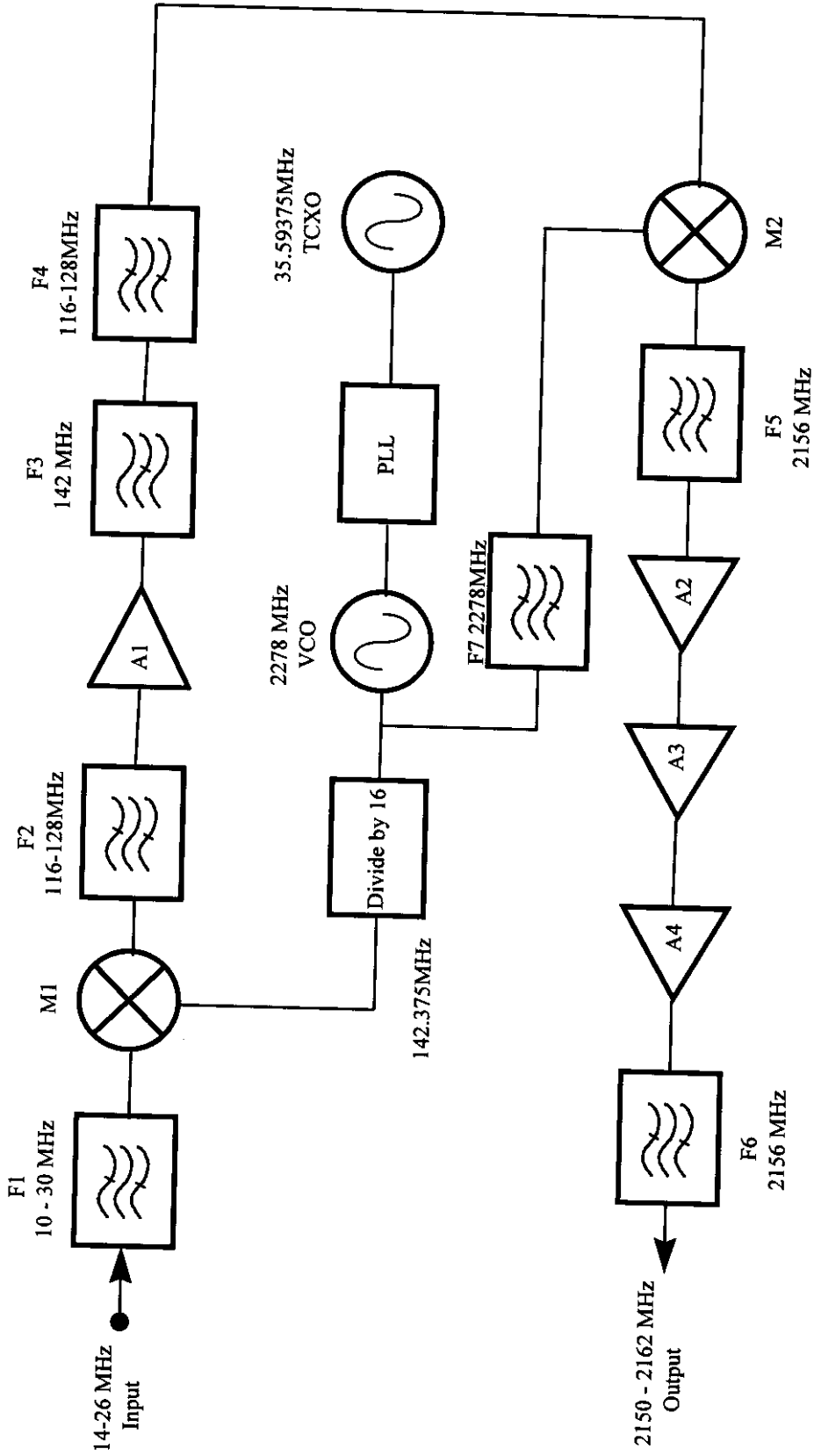
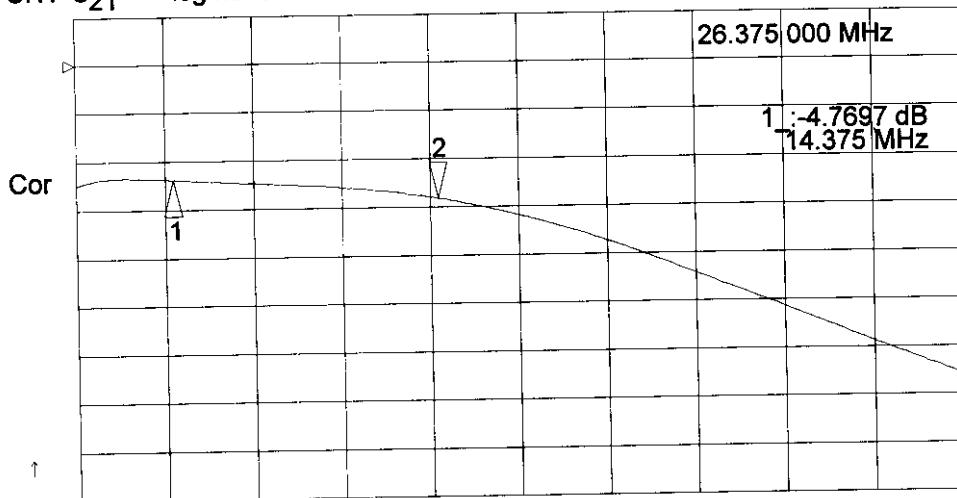


fig. 1
Transmitter Block Diagram

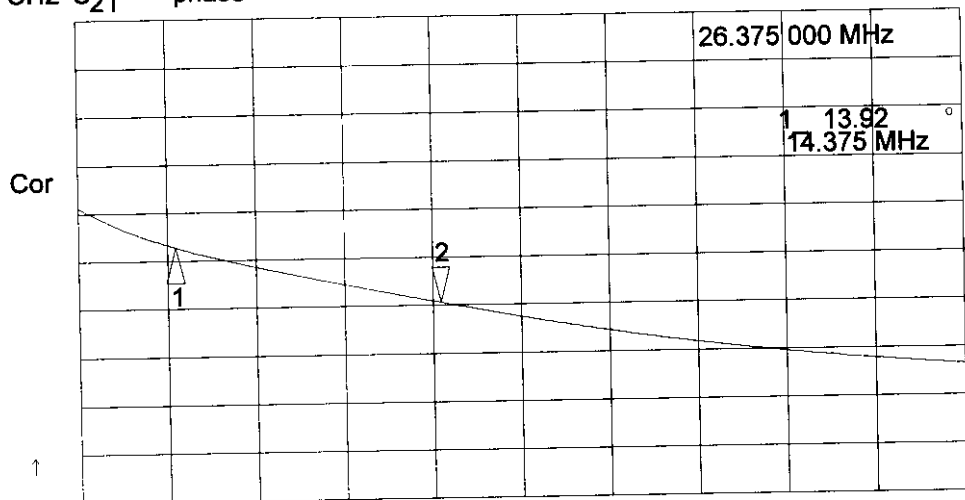


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CH1 S₂₁ log MAG 2 dB/ REF 0 dB 2_ -5.6337 dB



CH2 S₂₁ phase 50 °/ REF 0 ° 2_ -47.164 °



START 10.000 000 MHz

STOP 50.000 000 MHz

Figure 2
Bandpass Filter F1