

Microwave and Satellite Modems with AFC

6/1/04

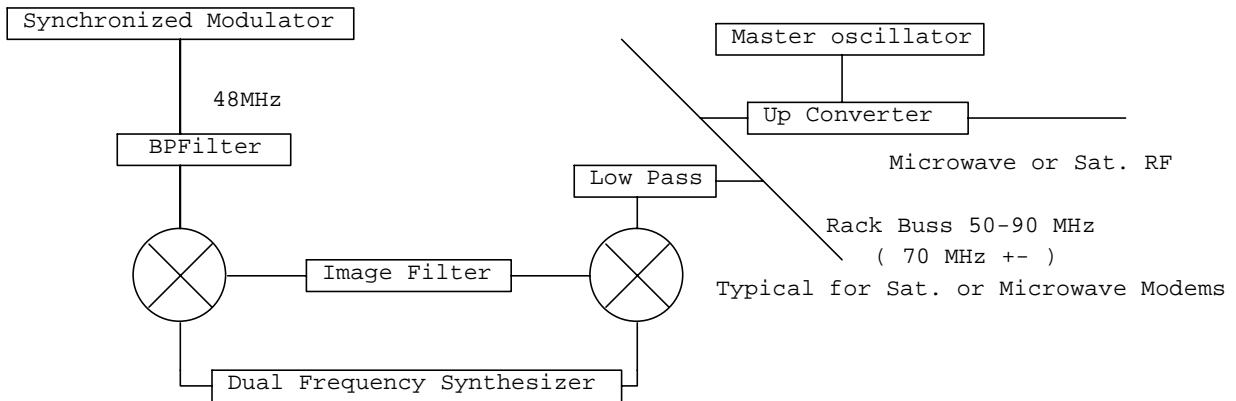


Fig. 1. Assuming the typical Microwave or Sat. feed has an IF frequency of 70+- MHz, the circuit of Figure 1 converts a fixed 48 MHz MSB signal to a frequency that can be placed anywhere within the modem band. The Image filter should be above 600 MHz. A Cellular diplexer at 835 MHz has been used satisfactorily. More than 12 cycles of converted frequency are required per cycle of 48 MHz IF frequency.

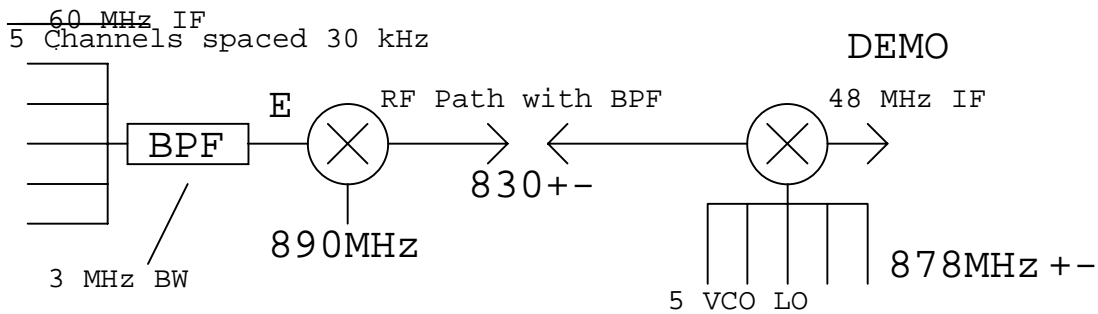


Figure 2. The receiver modem will have the desired signal somewhere between 50 and 90 MHz. This needs to be converted to a fixed IF frequency for detection. A dual frequency synthesizer is required. This circuit makes no provision for temperature or Doppler shift.

Figure 3 shows a method that will lock the receiver to the incoming frequency. This can be as much as 300 kHz off after a stage or two of Microwave repeaters, or over 1 kHz for some Doppler shifts. Voltage tunable TCXO blocks are available for the synthesizer reference.

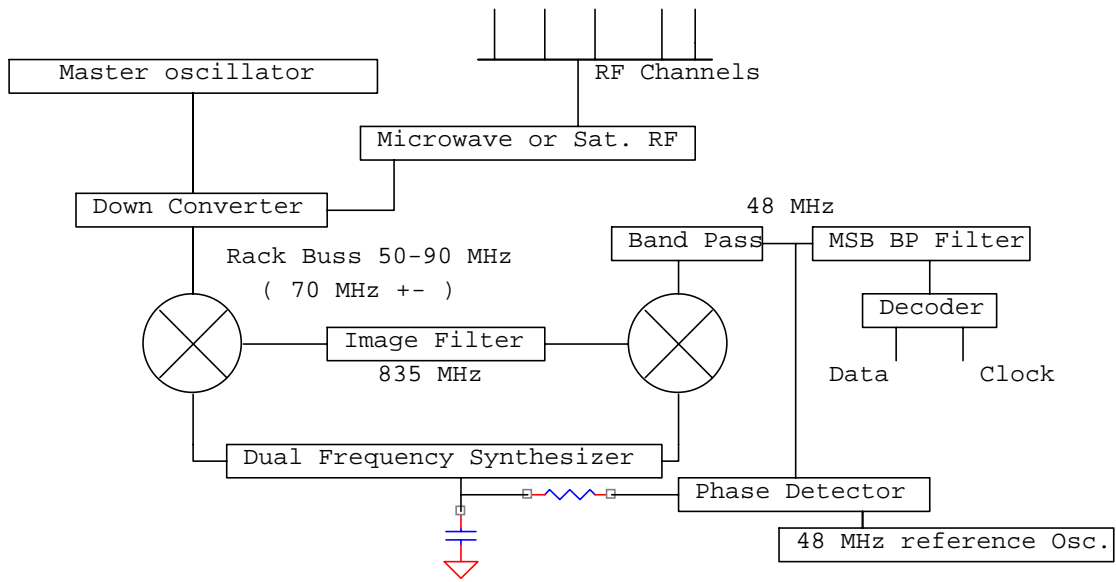


Figure 3. Automatic Frequency tracking to compensate for Doppler and temperature drift.