ARIC modulator

The modulating waveform is a pair of baseband signals representing the inphase (I) and quadrature (Q) information of the QPSK signal. The waveforms are digitally generated. L-C lowpass filters after the DACs attenuate the sampling images and clock spurs.

Conversion to IF is done directly using a monolithic integrated quadrature modulator IC containing the mixers and LO 90 degree phase splitter. The LO is generated at the carrier frequency by a frequency synthesizer programmable over the IF range of 950 -2050 MHz. The synthesizer is referenced to a 12 MHz TCXO with+/- 2.5 ppm stability over the temperature range 0 to 70 degree C.

IF filters are very wide relative to the channel width of 36 MHz and attenuate harmonics of the carrier. The filter stopband is switchable to maintain suppression of the second harmonic as the carrier is tuned over the IF band.

The tuner output level is maintained by a control loop monitoring a temperature compensated schottky diode detector. The loop maintains the carrier at a constant level over the IF band. The final output level from the tuner is controllable in 2 dB steps from +8 to -22 dBm via a digital attenuator.