

FM1 White Paper

The FM1 uses a patented Analog and Digital/DSP FM tuner architecture to maximize reception quality and sonic performance from traditional FM stations. The FM1 front end uses an advanced CMOS device that integrates the analog tuner front end with Delta-Sigma Bandpass analog to digital converters. The output of these Bandpass converters is fed into an advanced DSP core that performs the IF Filtration and Demodulation to extract the audio signal. The output of the DSP is a 24bit-48KS/s I2S digital audio data stream, see Figure 2 below.

This approach combines the best of traditional analog FM with the tremendous advantages of DSP in performing extremely accurate filters. These DSP filters have Zero Drift and require no calibration, and effectively add no additional noise or drift that would compromise the audio signal. These DSP filters also allow high levels of selectivity, sensitivity and subtle blending of the Stereo signal to extract the best sound quality from weak or difficult FM signals. The highly accurate low jitter Ultra-Clock used in the FM1 also insures that both the front end tuner electronics and the internal high dynamic range DAC perform at their best.

The I2S data stream is sent to our internal 119dB dynamic range DAC to convert the audio signal to analog to drive a standard audio preamp or integrated amplifier. Also we output a 24/96 digital data stream to feed an external DAC. This approach allows one of our DAC/Control centers such as the DAC2.5 or DAC3.5VB to function as the main control element in a complete system, moving the D/A conversion closer to the loudspeaker and preserving dynamic range and performance.

The advanced FM1 Tuner front end also permits reception of RDS/RBDS data, Signal Strength indication and preserves performance in difficult urban and ex-urban environments. Simple and accurate tuning for each frequency is also guaranteed by design, simplifying the reception of all available stations. The resulting performance allows you to easily hear the original quality of the source transmission.

bel canto

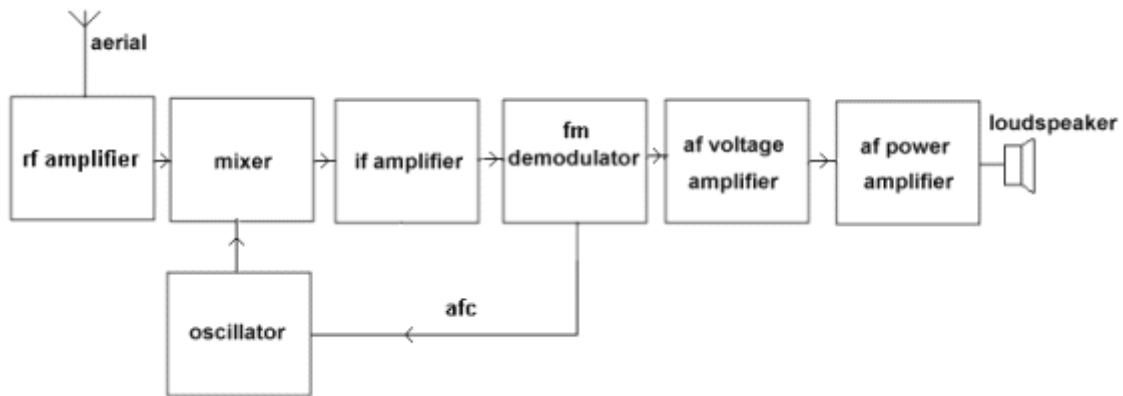


Figure 1. Traditional Analog FM receiver

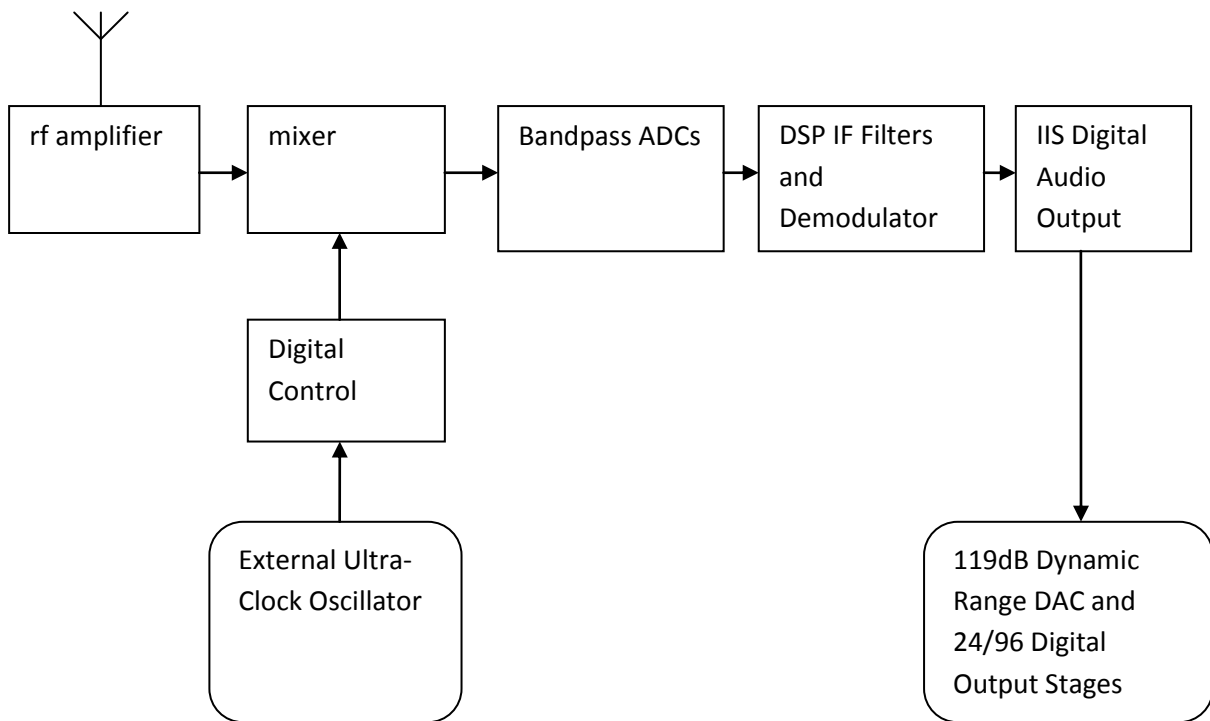


Figure 2. Bel Canto FM1 Tuner Architecture with DSP Based IF Filters and Demodulation