DRTXM2 Highway Advisory Radio Transmitter

Functional Description

This document gives a functional description of the Highway Information Systems, Inc. DRTXM2 AM transmitter designed for highway advisory radio applications.

A. Audio Input, Limiter, and Low-Pass Filter

As shown in the upper left part of the Block Diagram, the audio signal from an external source (such as a digital recorder player) is input to the **audio interface** circuit which provides switching and amplification functions. The audio signal is then fed to an **audio limiter**, which prevents over modulation. This is followed by a three-pole low-pass **audio filter** which conforms to the FCC specification that between 3 kHz and 20 kHz the attenuation be 60 $\log_{10}(f/3)$, where f is the audio frequency in kHz.

B. RF Oscillator and Divider

As shown in the lower left part of the Block Diagram, a **crystal oscillator** is used to generate a stable frequency at a multiple of the transmitters output frequency. The output of the oscillator is then passed through a **frequency divider** circuit. For example as shown in the diagram, a 12.880 MHz crystal oscillator is used in conjunction with a divide-by-eight logic circuit to produce a stable and symmetric RF frequency of 1.610 MHz.

C. Modulator and Driver Stage

The audio signal from the limiter and low pass filter are fed to the **modulator** stage which is then fed to the **class D driver** stage along with the RF signal from the frequency divider circuit.

D. RF Output Filter

The modulated output of the driver stage passes through a seven-element low-pass **RF output filter** to attenuate harmonics to the FCC specification of better than 53 dB below 10 Watts. The filtered signal is terminated at the UHF-type antenna output connector.

E. Meter

A built in **front-panel meter** is provided to allow measurements of forward power, reflected power, and VSWR. This meter uses a 20 LED bar-graph display and a front-panel switch to select the function.