

## THEORY OF OPERATION

The radar transceiver uses an advanced PHEMT oscillator to generate a continuous wave (CW) signal centered at 24.125 GHz, which is transmitted via a planar antenna. A very small portion of the signal is reflected off of an object, such as a vehicle, back to the transceiver. Due to the Doppler effect, the frequency of the reflected signal is slightly offset and proportional to the speed of the object. When this reflected signal is mixed with the signal that is transmitted a difference signal in the audio range results. The mixer uses an in phase, quadrature phase approach so that the direction of the object can be eventually be determined by a Digital Signal Processor. The eventual determined directions are object moving towards the radar head or object moving away from radar head. This signal is gained and filtered appropriately and then converted to a digital signal for digital signal processing to determine the direction and speed. A digital string is output to a RS232 port suitable for some sort of external controller or computer to convert for a display or some other purpose. See the block diagram on the following page.