Genesis VP Theory of Operation
FCC ID: HTRCR-1KD

When the operator presses the power switch it momentarily activates the logic regulator. After reset, the DSP processor boot loads its program and asserts a line keeping the logic regulator in the "on" state. The processor continuously monitors the keypad and trigger switch. When the trigger is pulled the processor activates the TX enable line turning the Gunn regulator on. Upon receiving power the Gunn oscillator section of the microwave transceiver generates a 5mW 25.125 GHz (nominal) NON signal. Some of the microwave power provides LO pumping for the receiver diodes and the horn/lens antenna radiates the remainder. If the radiated energy happens to strike a moving object, part of the energy will be reflected back towards the antenna. The frequency of the reflected energy is Doppler shifted proportional to its speed. This reflected energy is mixed at the receiver diodes extracting the Doppler shift. The placement of the receiver diodes is such that by apply appropriate DSP algorithms the direction of the object may be determined. The low level Doppler signal are amplified by the preamplifiers and digitized by a stereo A/D converter at a rate of 31.250 kHz. The DSP analyses the digital stream to determine if a valid target is present. If so the speed is displayed via the display board. It also generates an audio signal proportional to the signals Doppler shift via a D/A converter (U5). A digital code may also be sent out the serial port via the RS-232 converter (U16). If the radar gun is operated in the vicinity of a radio transmitter, the energy may interfere with the accuracy of the gun. The RFI Detect circuit (U15) monitors for such situations and disables the display when such conditions exist. The processor also monitors a 368Hz signal to verify it accuracy.