

# Radar / Laser Gun Interfacing To Video Systems

## Introduction

Speed radar and laser guns are primarily used in law enforcement to detect the speed of a passing vehicle. With the introduction of video recording systems in police vehicles it has been natural requirement to interface the speed gun with the video system. This will produce an indisputable video recording of the actual vehicle along with the speed of the vehicle overlayed in the video simultaneously. Review in court or reviewed at the scene, lends itself to higher prosecution rates therefore high revenues for the police department.

## Radar Gun Basics

A speed radar gun is basically a mini-radar that normally detects objects in one direction. The gun emits a burst of high frequency radio waves in the Gigahertz range. The electronics computes the amount of time it takes for those radio waves to travel to a vehicle, reflect back from the vehicle and return to the source. Doing this many times per second will allow the electronics to compute the change in position of the vehicle per second. This data is then converted to miles per hour. Sophisticated signal processing, error detection, multi-direction detection, multi target discrimination, portability are some of the features that make one manufacturer's product different in the marketplace. Laser guns do basically the same thing as radar guns but they use Laser light to compute the vehicle speed.

## Radar Gun Design

Radar guns have been around for many years and have improved greatly in performance and safety from the early units. Most of the early units had LED readouts and a discrete design. This means all the electronics was TTL and transistors with no microprocessors on board. The readouts were driven directly and the units had no direct digital output for use as the interface to the video system. Some radar guns had wired remote units with an auxiliary display that can be interfaced by an additional black box. As the technology progressed, remote units got more sophisticated with serial control and finally the actual radar units started appearing with RS-232 direct outputs.

## Video Interfacing

Once the data from the radar gun is converted to a readable format this data can be sent to the device that overlays the data onto the video picture. Some manufacturers of video systems incorporate this feature within their system or make it an option. For systems that do not have this feature, an add on box or text inserter called the VSI-Pro is required. Most all video systems use standard video cameras that send video signals to the VCR or DVR. The text inserter is placed between the camera and the VCR. When the data from the radar is valid the text inserter then superimposes it on the video picture just like the scores of modern sports programs. This inclusion of a text inserter into the video path has no effect on the rest of the system since the text inserter merely appends the data to the existing video signal. The standard data input to most text inserters is the industry standard RS-232. When the radar gun outputs this format, it can be directly connected to the text inserter and no other black box is required.

## Radar Interfacing

Since older units and some current models of radar guns do not have an RS-232 output, they require an additional black box or RG2RS for conversion of the radar gun signals to the industry standard

RS-232. Various connection techniques exist, but the most popular is emulating or tapping the data to the remote hand held control. Whatever data is then displayable on the remote unit will be converted to RS-232 and sent to the text inserter for display. As mentioned before when the radar gun outputs RS-232, this data can directly go to the text inserter.

### **Radar Gun Calibration**

Radar gun calibration has to do with the accuracy of signals transmitted and received. Since the radar gun interface merely taps the electronic data, it is impossible for any interface to affect the gun calibration. Some manufacturers void the warranty or will not guarantee calibration when a third party interface is installed. This policy has no technical grounds for enforcement but is merely a deterrent for the customer to buy the radar gun manufacturer's video system and appropriate interface.

### **DVR Systems**

The newer model recording systems use DVR or Digital Video Recorders. These DVRs can accept the digital data from the Radar or Laser Speed Gun directly. The overlay can be optional but all the data is stored as an associated data file along with the audio/video recording. This allows fast or remote data search to find speeds, T/D or user license plate numbers or other data quickly and form a play list to review those incidents that meet the search criteria. This advanced feature makes producing court ready records quick and easy.

### **Summary**

In short, all car police video systems can be retrofitted with a radar gun interface. This is only true of course if the radar gun has an available interface. The text inserter portion can be retrofitted on any in car video system. The cost effectiveness of improving the conviction rate of speed offenders and reducing the in court time will quickly pay back the small investment of a radar gun interface, if a police department has already invested in radar guns and have the video system in place.