

House Transportation Committee Public Hearing

April 4, 2018

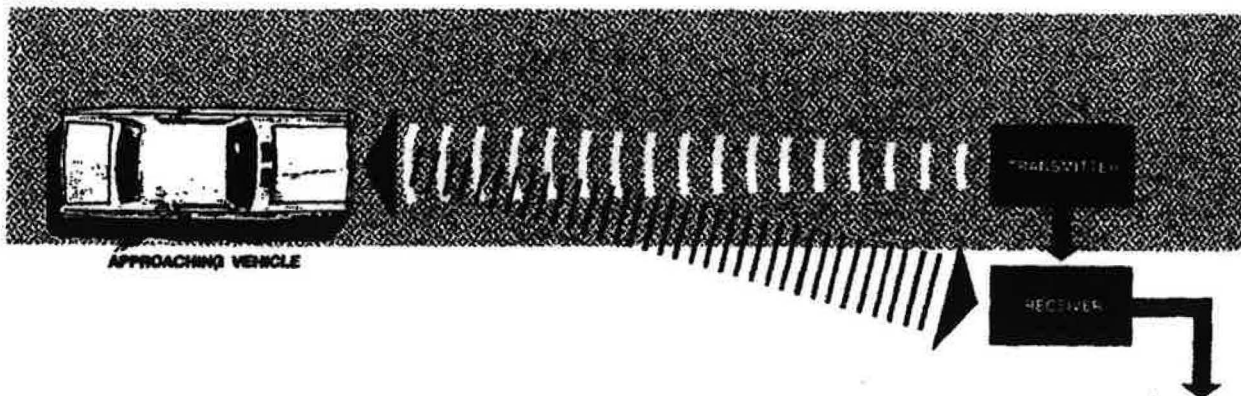
John B. Mancke, Esq.

Thank you for the opportunity to present my testimony here today to discuss the issue of local police using radar for speed enforcement. I will also comment on H. B. 2148 and S. B. 251. My name is John B. Mancke, and I am a licensed attorney having retired from active law practice in 2013. For 43 years, my legal practice consisted primarily of defense of motor vehicle violations throughout the Commonwealth of Pennsylvania. I have been a licensed radar operator for over 30 years and have defended thousands of speeding cases throughout my career.

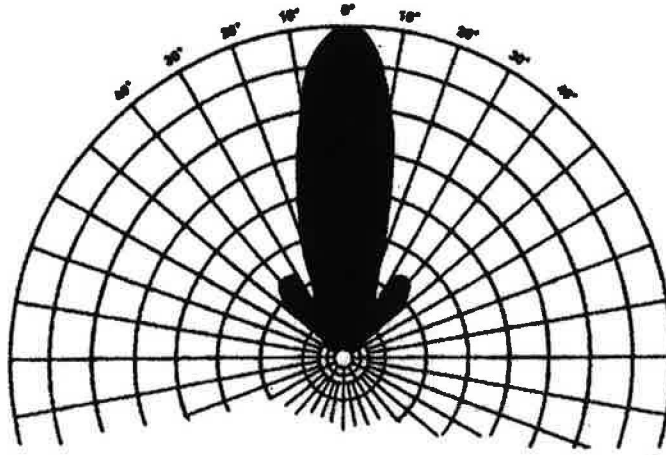
I have had the opportunity to lecture on speeding and motor vehicle matters for the Pennsylvania Bar Institute, the Pennsylvania Association of Criminal Defense Attorneys, the Pennsylvania Conference of State Trial Judges, the Pennsylvania Fraternal Order of Police, the National Fraternal Order of Police, Penn State Dickinson School of Law, and Widener University School of Law. Additionally, I have written extensively about motor vehicle law, authoring over 50 articles, including "It's all in the Timing: A Look at the New Speed Timing Devices," which was published in Trooper Magazine, and the book *Defense of Speeding Cases in Pennsylvania*.

While it is tempting to suggest that it is easy to simply point and shoot a radar gun at a moving target, a quick review of how radar works suggests otherwise. Most basically, the term "radar" is an acronym for Radio Detection And Ranging. A police radar system is comprised of a transmitter and a receiver which uses the Doppler principle that compares the shifted frequency of the reflection of the moving object to the original frequency of the transmitted beam. From the difference, the radar unit calculates speed which is then displayed on the screen.

The radar system both transmits and receives. In a stationary radar system, the transmitter remains still while the monitored vehicle is the receiver in motion. Once the transmitted beam reflects off the monitored vehicle, it becomes a transmitter in motion, sending the radio wave back to the stationary receiver. The transmitted frequency is established and the receiver notes the difference in frequency.



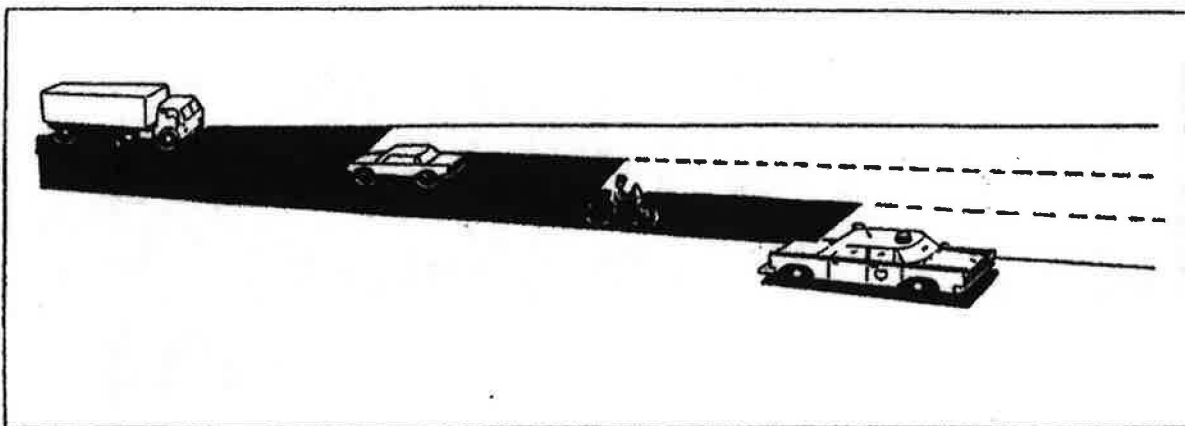
In a perfect world, that would be the end of our conversation, and we could conclude that any police officer should be able to use radar. The world we live in is not perfect, however, and radar remains a far-from-perfect tool for traffic enforcement. For example, there is no sight on a radar gun that can be specifically aimed at a specific target. A radar gun has a loosely defined beam width of 12-18 degrees. In the simplest terms, a cone-shaped beam is created, but the pattern of sensitivity is an elliptical pattern.



Identification of a target vehicle is a primary problem for accurate reading, and can be influenced by:

- Target size
- Target shape
- Target composition
- Target position
- Target speed

**Comparison of Vehicle Size and Equal Radar Beam Strength from Radar Antenna at Various Distances**



Echoing the challenges of correct target vehicle identification, The Northwestern University Traffic Institute suggests that the radar operator should use a minimum of three seconds in vehicle spacing, and that a radar operator “should not attempt to take readings where vehicles are spaced less than three seconds apart or when vehicles are traveling side by side.” This problem is magnified in urban congested areas.

In addition to the vehicle identification issue, radar is affected by interference, which generally can be divided into two groups: natural and man-made interference. For example, birds in flight, heavy rain or snow can affect the reading; air-conditioning and heating fans in the patrol vehicle can cause a reading to be displayed.

Radar, as it has been used in Pennsylvania, has not always been used in accordance with State Police Field Regulations or in accordance with acceptable radar principles. For example, radar has incorrectly been used in the following ways:

- Transmitting through closed windows, creating the possibility of refraction
- Transmitting in close proximity to active heating and air-conditioning fans in the police vehicle, creating interference and a reading
- Transmitting in congested areas without three-second intervals between vehicles, creating target identification problems
- Transmitting into side- or rear-view mirrors, bouncing the beam back to obtain a reading from a vehicle approaching from the rear, creating refraction and identification problems

These remarks highlight that any legislation must include a specific and detailed curriculum of training for all officers using radar to protect the public from misuse of radar. In a PSP Department Radar Operations Directive regarding courtroom testimony, the following appears:

3. When establishing an accurate tracking history, members shall include the following: an estimate of the target vehicle speed, observations from the radar zone of influence, the unit’s audio pitch, and the speed display on the digital readout. Members shall NOT provide testimony regarding the theory of radar, internal electronics, or the science involved in the operation of radar; this requires scientific, technical, or other specialized knowledge.

However, without requiring knowledge of the theory of radar or any understanding of the science involved in the operation of radar it is impossible to protect the public from misuse.

The Pa. Superior Court has discussed radar and noted:

...Speed is determined by measuring the change in frequency caused by the interfering object. All computations are effected electronically. Radar contains inherent dangers of inaccuracy if not carefully used. It is subject to interference by objects in the environment or by power sources other than the moving vehicle being checked... Thus, the measurement of speed by radar can be and frequently is distorted by objects in the environment or by another moving vehicle.

At a minimum, the parameters of the training should be established by statute to include:

1. A minimum number of hours of training
2. A set curriculum of relevant training topics
3. Required hands-on training
4. Requirements for hiring instructors, which would prevent any conflict of interest. For example, instructors should be independent experts in their field, not current law enforcement officers, in order to eliminate any tie to financial gain for the employer of the training officer
5. A required written test, with a minimum score needed to pass
6. Public access to training/instruction manuals, as well as public access to field regulations or user instructions
7. A prohibition against intentional concealment applicable to all police officers

Previously I provided a suggested 17-hour radar training course, which I have attached.

Many, including some municipal police officers, feel there are adequate speed timing devices currently available to local police departments. Additionally, I believe there is no need to make lidar part of the discussion. The additional costs, including equipment and training, are not worth the benefit of lidar.

If, however, radar is to be added for local police, then H. B. 2148 is far better than S. B. 251 in protecting the public from abuse and misuse of radar. H. B. 2148 provides for a pilot program with defined standards and criteria for radar use. Compliance with these standards will also be monitored.

Part of any speed enforcement program requires public confidence in its integrity and any legislation should provide for this. For example, the protection against "station averaging", provided in H. B. 2148, is important to protect the motorist from the misuse of speed timing enforcement. S. B. 251 lacks many of the protections afforded to the public that are provided by H. B. 2148.

I, however, renew my earlier requests that legislation include specific statutory language dictating the length of training, the topics to be covered, requirements for hiring instructors, a written test with a minimum score to pass, and providing public access to any and all training/instruction or user manuals and access to any field regulations. These additional requirements enhance public confidence in police use of radar.

I hope that my comments will assist the legislature in its review of the various proposals involving local police and the use of radar for traffic enforcement.

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Hon. Jerry L. Nailor  
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Dear Jerry:

This is in response to your request for amendments that will address the concerns that I have expressed about local police departments being allowed to use radar. To begin with, my concern is that all officers, including the state police, should be properly trained on the use of radar. Currently, the state police are specifically instructed when they are being cross-examined that they are not to provide testimony regarding the "theory of radar" or the "science involved in the operation of radar." This is wrong in my opinion since any police officer using radar must understand the theory of radar and the science involved in the operation in order to properly use the unit.

I am therefore suggesting, as outlined below, that all police officers receive training that is in conformity with the National Highway Traffic Safety Administration (NHTSA) basic training program in radar speed measurement. I have altered their basic curriculum and the training time involved because, by my proposal, no moving radar would be authorized unless there was an amendment by the legislature. Therefore, you will note below that my proposal recommends the use of radar in a stationary position only and that current members of the Pennsylvania state police would be exempted from any training requirements, however six months after the effective date of any amendment, newly employed Pennsylvania state police officers would also have to undergo the suggested training.

As it relates to local police, all local police would be required to complete the training course which would require a minimum of 17 hours of training using the specific curriculum which mirrors the NHTSA suggestions.

Add the following to §3368(c)(2):

(c)(2): Except as otherwise provided in paragraph (3), electronic devices such as radio-microwave devices (commonly referred to as electronic speed meters or radar) may be used only in a stationary position:

- (i) By members of the Pennsylvania State Police. However, six months after the effective date of this amendment, a newly employed member of the Pennsylvania State Police shall undergo the training outlined in §3362(c)(ii)(a), as provided hereafter, prior to being authorized to use radio-microwave devices under this subsection.


Add the following to proposed §3368(c)(2)(ii):

(ii)(a) The training course referred to above in §3368(c)(2)(i), (ii) shall at a minimum include 17 hours of training which course of training shall include the following curriculum:

1. Overview and Introduction
2. Speed offenses and speed enforcement
3. Basic Principles of Radar Speed Measurement to, at a minimum, include:
  - a. Radar's development and fundamental concepts
  - b. Doppler Principle
  - c. Principles of stationary radar
  - d. Target vehicle identification
  - e. Factors affecting radar operation
  - f. "Jamming" and detection of radar
  - g. review and summary
4. Legal and Operation Considerations
5. Operation of Specific Radar Devices - Classroom segment
6. Moot Court
7. Operation of Specific Radar Instruments - Field Training
8. Course Summary

I hope this is of some assistance to you and should you have any questions, please do not hesitate to contact me.

Very truly yours,



John B. Mancke

JBM/hrc