

DEPARTMENT OF STATE POLICE
Richmond, Virginia
December 31, 2007

MEMO - 2007 - NO. 16

TO: All Sworn Employees
FROM: Colonel W. Steven Flaherty
SUBJECT: Speed Enforcement -- Radio Detection and Ranging (RADAR)
RADAR Detector Enforcement
Light Amplification by Stimulated Emission of Radiation (LASER)
Visual Average Speed Computer and Recorder (VASCAR)

MEMO - 2002 - NO. 3 dated May 7, 2002 is hereby cancelled

- I. In order that we may have uniform procedures for speed enforcement with RADAR, LASER, and VASCAR, please be governed by the following policies:
 - A. The tolerance policy concerning speed violations will be closely followed when an arrest is made or a summons issued whether the vehicle is checked by pace method, RADAR, LASER, or VASCAR.
 - B. Summons and arrest forms should show the exact speed indicated by the device being used. These forms should also indicate that the arrest was made or summons issued as a result of a check by RADAR, LASER, or VASCAR speed enforcement devices. For example: Speeding 63/55 (RADAR), when used in the stationary mode, Speeding 63/55 (M-RADAR), when used in moving mode. Vehicles checked by LASER equipment should read Speeding 63/55 (LASER). Vehicles checked by ground operated VASCAR should read Speeding 63/55 (VASCAR). Vehicles checked by aerial enforcement should read Speeding 63/55 (VASCAR-Aircraft).
 - C. RADAR, LASER or VASCAR will not routinely be operated in the stationary mode in reduced speed zones where the posted speed limit is 45 m.p.h. or less. This does not preclude the use of stationary RADAR or LASER to enforce the provisions of §46.2-878.1.
 1. The area first sergeant may authorize the operation of RADAR, LASER and VASCAR in the stationary mode in any reduced zone as described above when outside the corporate limits of any city or town, or on the interstate system inside the corporate limits of any city or town where it is determined a particular problem exists justifying the operation.
 2. The authorization should only be permitted for the time period required to alleviate the problem.
 - D. Positive identification of a target vehicle and visual confirmation of the speed displayed by the RADAR, LASER, or VASCAR is imperative. Whenever a doubt arises concerning the correct speed or identification of a vehicle which is checked by one of the speed devices, the case should be handled as any other case where the evidence is insufficient to warrant an arrest.

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II. RADAR

The following guidelines shall apply to RADAR for speed enforcement:

- A. RADAR equipment shall be checked for accuracy by the operator at the beginning and end of each shift of operation. The following checks should be completed prior to any enforcement action:
 1. Light segment test.
 2. Internal circuit test.
 3. 35 m.p.h. tuning fork in stationary mode.
 4. 65 m.p.h. tuning fork in stationary mode.
 5. Both tuning forks in moving mode.
 6. Both tuning forks for each antenna in Same Direction moving mode, if applicable.
 7. Speedometer comparison in verify mode at speeds of 20, 30, 40, 50, 60, 70 and 75 m.p.h.
- B. The antenna (RF head assembly) of the RADAR, when used in the stationary and moving mode, will be placed so that the path of the RADAR beam is unobstructed over the effective range of the instrument, and it shall be positioned so that consistent and stable readings will be displayed when vehicles pass through the area covered by the beam. The antenna assembly will be placed on the outside of the vehicle using brackets supplied for that purpose, except in cases where the vehicle has department installed internal mounting brackets. The Kustom Golden Eagle and Golden Eagle II models will be the only units operated with the antenna(s) inside the vehicle. The outside mounting restriction applies to early model Kustom Golden Eagle radar units with larger antennas (serial numbers beginning with the letters EK). The antenna(s) will be aimed straight and level. When using same direction RADAR (dual antennas), one antenna will be aimed forward and the other antenna aimed to the rear.
- C. RADAR equipment, when used in the stationary mode, may be used to check the speed of vehicles:
 1. Traveling in either direction on two-lane highways.
 2. Traveling in either direction on three-lane highways.
 3. Traveling in the same direction in no more than four adjacent lanes of a divided highway.
 4. Traveling in the same direction in two adjacent lanes of four-lane undivided highways.
- D. RADAR equipment, when used in the moving mode, may be used to check the speed of vehicles:
 1. Approaching/receding on two-lane highways.
 2. Approaching/receding in either lane of three-lane highways.
 3. Approaching/receding in either lane of four-lane undivided highways.
 4. Approaching/receding in either lane of divided highways if conditions permit.

- E. The automatic lock, manual lock, and high-speed lock features on the RADAR unit will not be used when being operated for enforcement purposes.
- F. The RADAR equipment will not be operated when the low voltage indicator is visible.
- G. Care should be exercised when handling and transporting the RADAR devices. Display units will not be left on the dash when not in use, unless completely covered by a solid white towel. Antennas will not be left on the outside of the vehicle when not in use.
- H. If the RADAR fails to pass the tests for accuracy as set forth in paragraph II-A, or if it fails to perform satisfactorily, it should be removed from service and transported to Administrative Headquarters for repair.
 - 1. The sworn employee shall complete a Trouble Report, SP-33, summarizing the problem and submit the report with the RADAR equipment.
 - 2. When maintenance is performed on the RADAR equipment, a Maintenance Record, SP-96, shall be completed by the state police communications technician performing the maintenance. The SP-96 shall be kept on file in the RADAR Repair Shop at Administration Headquarters.
- I. No arrests will be made when a target vehicle's speed reading is obtained under the following conditions:
 - 1. The patrol car is exceeding the posted speed limit.
 - 2. The patrol car is obviously accelerating or slowing down. * BATCHING *
 - 3. The RADAR is not set in the proper mode for the operation being conducted.
 - 4. The audio feature on the RADAR is not being used.
 - 5. While any radio transmitter in the vehicle is being operated.
 - 6. While the antenna (RF head assembly) of the RADAR is inside the vehicle, except as noted in Section II, Paragraph B of this memo.
- J. The need for technical or expert testimony in court should be anticipated and requests forwarded through channels to the Director of Administrative and Support Services. Such requests should be accompanied by a completed court questionnaire, which has been provided for that purpose. A copy of the questionnaire should reach the communications officer at least three weeks prior to the trial date.
- K. RADAR tuning forks will be submitted to division radio shops for a calibration test once every six months. The tuning fork data is recorded on a Certificate of Tuning Fork Accuracy Test form (SP-151b). The original SP-151b is signed by the state police communications technician performing the calibration check, notarized, and maintained on file in the Communications Division at Administrative Headquarters.
- L. Due to safety concerns sworn employees shall not work RADAR during inclement weather. Inclement weather shall be defined by any falling precipitation. During falling precipitation, the antenna (RF head assembly) of the RADAR will be removed from the outside of the vehicle and placed inside the vehicle, safeguarding it until weather conditions permit the mounting of the antenna outside the vehicle.

- M. Sworn employees shall not work stationary RADAR upon the paved shoulders of the highway. An exception to this policy shall only apply to sworn employees operating RADAR in Division VII. The Area First Sergeant will have the authority to select certain locations where sworn employees may operate stationary RADAR upon the paved shoulder of the highway. Safety will be considered with each location, and all must meet the approval of the area first sergeant prior to enforcement action. This restriction does not apply to sworn employees specifically assigned to and working in highway construction/work zones.

Neither will this restriction preclude working RADAR in zones specifically constructed by the Virginia Department of Transportation for crash investigation/enforcement where officer safety is not a factor, if approved by the area first sergeant.

- N. Each sworn employee must ensure that his/her certification as a RADAR operator remains current in order to operate RADAR for enforcement purposes.

III. RADAR Detector Enforcement

Section 46.2-1079 of the Code of Virginia makes it unlawful for any person to operate a motor vehicle on the highways of the Commonwealth of Virginia when the vehicle is equipped with a RADAR detector. An Attorney General's Opinion rendered June 13, 1978, identifies the minimum action that should be taken by the police officer who sights the RADAR detection device in a motor vehicle operated on the highways in order to prove his or her case. These actions include the following:

- A. Determine that the vehicle has an available power source to which the detector can be connected, i.e., adapter cigarette lighter plug or other electrical connection.
- B. Determine that the detector device was accessible (not disabled operationally or locked in a trunk or elsewhere unavailable for use).
- C. Plug the detector into the power source and determine that the detector is activated.
- D. Test the device in front of a RADAR unit, preferably at the scene, if possible; but if not possible at the scene, test the device in front of a RADAR before the trial date to determine that RADAR activates the device.
- E. Present the foregoing proof along with any other pertinent facts necessary to establish that the accused operated upon the highway a motor vehicle equipped with a device to detect the presence of police RADAR used for measuring the speed of motor vehicles.

These actions should be taken by all sworn employees when law enforcement action is invoked for violation of this statute.

IV. LASER

*The following guidelines shall apply to the use of LASER for speed enforcement. For purposes of this policy, the use of the word LIDAR (Light Detection and Ranging) should be considered the same as LASER.

- A. LASER units are to be utilized by only those sworn employees who have been properly trained, and have successfully completed a 16 hour (minimum) course of instruction with a written examination.
- B. Summons and arrest forms should show the exact speed indicated by the LASER unit. The distance at which the violator's speed was obtained will be retained by the sworn employee for court purposes.

~~C.~~ The LASER unit will be checked for accuracy by the operator at the beginning and ending of each shift of operation. The following checks should be completed prior to any enforcement action:

1. Power-on internal self-test.
2. Manual self-test.
3. Vertical and horizontal sight alignment test.
4. Distance Calibration

Calibration sites will be established for area offices where LASER units are assigned. The location of each calibration site will be left to the discretion of the area first sergeant. It is recommended that calibration sites be established at locations with limited public access such as, but not limited to, area offices, division headquarters, VDOT sites (with the cooperation of the Department of Transportation), and local law enforcement stations. These sites will consist of two predetermined distances of 50 and 100 feet that will be measured from an outside wall of a building to a permanent mark designating each distance. The sworn employee using the LASER will calibrate the device from each distance. The first time the sworn employee utilizes a particular calibration site, the sworn employee shall confirm each distance with the issued 100 foot measuring tape prior to enforcement action. The sworn employee will document both measurements and retain for court purposes. These distances need only be measured with the issued 100 foot tape once. It is not necessary to confirm the distance each time the LASER is being used.

- D. When selecting a sight location to operate the laser unit for speed enforcement, sworn employees will consider factors such as officer safety, roadway alignment, and a clear line of sight of target vehicles.
- E. LASER will not be operated in inclement weather. This is to include rain, snow, fog, or any other condition that may prevent the proper return of the LASER beam to the unit.
- F. The LASER may be operated from inside or outside of the patrol vehicle. If operating the LASER unit from inside the vehicle, sworn employees will position their vehicle off the paved portion of the roadway and shoulder. The LASER should be positioned so that the beam is pointed forward and would travel through a lowered side window. Unless authorized by the manufacturer and the Department, LASER will not be operated through the windshield or any other glass in the vehicle. When operating the LASER unit from outside the patrol vehicle, sworn employees will not stand on any segment of the paved roadway or paved shoulder. Sworn employees will not step in or stand on the roadway in an attempt to stop a violator.
- G. This LASER equipment is designed for stationary speed enforcement only. LASER equipment may be used to check the speed of vehicles:
 1. Approaching/receding on two-lane highways.
 2. Approaching/receding in either lane of three-lane highways.
 3. Approaching/receding in either lane of four-lane undivided highways.
 4. Approaching/receding in either lane of divided highways if conditions permit.

~~N.~~ Proper tracking history for the LASER unit shall include:

1. Visual estimation
2. Audio tone
3. Speed readout correlation
4. Direction of travel of the target vehicle

Positive identification of the target vehicle and visual confirmation of the speed displayed by the LASER is imperative.

- I. When a speed violation is obtained by an employee using the LASER, that employee will handle the stop and take the necessary enforcement action. Chase vehicles will not be used (i.e. One unit obtaining the speed violation using the LASER, while additional units handle the stop and necessary enforcement action.)
- J. The Time Distance mode will not be used for speed enforcement purposes.
- K. When using the LASER for speed enforcement purposes, both the speed and range displays shall be utilized.
- L. If the LASER fails to pass the tests for accuracy as set forth in paragraph IV. B. or fails to perform satisfactorily; it should be removed from service and transported to Administrative Headquarters for repair.
 1. The sworn employee shall complete a Trouble Report, SP-33, summarizing the problem and submit the report with the LASER equipment.
 2. Required maintenance shall be performed by the manufacturer and documented on the Maintenance Record, SP-96, by a State Police Communications Technician. The SP-96 shall be kept on file in the RADAR Repair Shop at Administrative Headquarters.
- M. No arrests will be made when a target vehicle's speed reading is obtained under the following conditions:
 1. The range display is not being used in conjunction with the speed display.
 2. The audio feature on the LASER is not being used.
 3. The LASER is not set in the proper mode of operation.
- N. Care should be exercised when handling and transporting the LASER equipment. The unit should not be left unattended in the patrol vehicle or exposed to extreme weather elements for an extended period of time. Before storing the LASER back into the case, the handle should be carefully detached from the unit.
- O. Requests for technical or expert testimony should be forwarded through channels to the Director of Administrative and Support Services. A copy of the request should be forwarded to the communications officer at least three weeks prior to that trial date.
- P. The violator shall not be permitted to observe the reading on the LASER unit.

V. VASCAR

The following guidelines shall apply to the use of VASCAR for speed enforcement. (For purposes of this policy, the use of the word VASCAR, VASCAR Plus or VASCAR Plus III is to be considered the same. VASCAR Plus, which is used by this Department, is an improved model of the original VASCAR.)

- A. VASCAR is to be utilized by only those sworn employees who have been properly trained, using the Manufacturer's Operator's Training Manual, and have successfully completed a 40-hour (minimum) course of instruction with a written examination and a field certification test.
- B. Summons and arrest forms should show the speed indicated by the VASCAR unit. These forms should also indicate that the arrest was made or summons issued as a result of a check by VASCAR. The speed indicated will be rounded down to the next full number as displayed by the VASCAR unit. For example: 65.7 miles per hour in a 55 mile per hour zone will be rounded down to show 65 in a 55 mile per hour zone (VASCAR). A permanent record of the exact speed indicated by the VASCAR (example: 65.7) should be kept for purposes of proper evidentiary procedures. In addition, the distance checked and the time recorded between the reference points, as well as the reference points, should also be recorded. This information should be kept in the form of notes by the sworn employee, but should not be recorded on the violator's, court's, or DMV's copies of the Uniform Traffic Summons.
- C. VASCAR will be calibrated to the vehicle each day at the beginning and end of the sworn employee's shift as provided in the paragraphs below depending upon the particular VASCAR unit being used. Calibration will be done in accordance with the manufacturer's established guidelines and procedures.

I. Calibration of VASCAR Unit to Patrol Vehicle

First, you must personally lay out a quarter mile calibration course. This will be done on a straight, flat roadway with low traffic volume, ¼ of a mile in length. If available, a VDOT pre-measured site course may be used. Follow the step-by-step procedure below starting just prior to entering the calibration course:

- a. Turn Power Switch "OFF".
- b. Set Thumbwheel Switch to all 0's. (There is no Thumbwheel on the VASCAR Plus III unit.)
When using the VASCAR Plus III unit turn the Distance Switch to "ON".
- c. Turn Power Switch "ON" (display will show all 8's).
- d. Set Thumbwheel Switch to 02500. When using the VASCAR Plus III unit turn the Distance Switch to "Off."
- e. Drive through course with black distance switch "ON" at start and "OFF" at end. Calibration number will show on display.
- f. Put calibration number on Thumbwheel. Switches - Turn power switch "OFF", then "ON". Display will show all 0's. The unit is now calibrated to the patrol vehicle.

When using the VASCAR Plus unit, press the "STORE" button to store the calibration. Turn the Power Switch to "OFF" and then "ON" to verify the stored number. The unit is now calibration to the patrol vehicle.

2. Daily Calibration Procedure

- a. Turn Power Switch "OFF". (Except when using the VASCAR Plus III unit)
- b. Set Thumbwheel Switch to all 0's. (There is no Thumbwheel on VASCAR Plus III units)
- c. Turn Power Switch "ON" (display will show all 8's).

When using the VASCAR Plus III unit, verify the calibration number. All 0's should appear in the distance window and 0.03 should appear in the time window.

- d. Turn Power Switch "OFF". Set Thumbwheel Switch to calibration number.
 - e. Turn Power Switch "ON".
 - f. Drive through your measured quarter mile course with both time and distance switch "ON" at the beginning and "OFF" at the end. Push distance recall button and read the displayed distance in the VASCAR unit. A reading of +1/4 of one percent is acceptable. EXAMPLE, for a 1/4 mile (0.2500) course, the reading should be between 0.2506 and 0.2494. If a reading outside this range is obtained, the sworn employee must re-calibrate the VASCAR unit to the patrol vehicle, as outlined in the calibration procedures above.
3. Speedometer Comparison - While traveling at a constant speed, activate both "Time" and "Distance" switches "ON" simultaneously and then turn them "OFF" simultaneously which will reflect the speed of the patrol vehicle and should verify the speedometer reading. This verification check will be made at speeds of 5 mph above and 5 mph below the posted speed limit.

To perform the speedometer verification when using VASCAR in Department Aircraft, a patrol vehicle will travel at speeds of 5 mph above and 5 mph below the posted speed limit over a quarter mile portion of a VDOT pre-measured site course. The patrol vehicle operator will relay the speed reading on the patrol vehicle speedometer via the State Police radio to the VASCAR operator in the aircraft. Having timed the patrol vehicle through the quarter mile course by activating the Time Switch "ON" as the patrol vehicle entered the course and "OFF" as it exited the course, the VASCAR operator will verify the speed of the patrol vehicle. The maximum deviation between the VASCAR speed reading and the speedometer reading shall be plus or minus one mile per hour.

- D. If the VASCAR unit will not calibrate, or verify when compared with the patrol vehicle speedometer as stated above, the unit will be taken out of service and returned to Administrative Headquarters for repairs.
 1. The sworn employee shall complete a Trouble Report, SP-33, summarizing the problem and submit the report with the VASCAR equipment.
 2. Required maintenance shall be performed by the manufacturer and documented on the Maintenance Record, SP-96, by a state police communications technician. The SP-96 shall be kept on file in the RADAR Repair Shop at Administrative Headquarters.
- E. The VASCAR unit will only be used in four basic methods for checking speed and only during daylight hours.
 1. Following target vehicles.
 2. Parking after "Driving in a distance".

3. Dialing in a pre-measured distance.
4. Target vehicle approaching patrol vehicle from rear.

F. The following minimum distances shall be used in the four basic methods for checking speed:

1. When checking the speed of a target vehicle 45 mph and below, a distance of not less than 528 feet (1/10 mile) will be used.
2. When checking the speed of a target vehicle above 45 mph, a distance of not less than 1,320 feet (1/4 mile) will be used.
3. The operator should be certain that the number of pulses recalled for the violation meet the minimum distances required for the speed.

G. The violator shall not be permitted to observe the reading on the VASCAR unit.

H. The need for technical or expert testimony in court should be anticipated and requests in letter form forwarded through channels to the director of Administrative and Support Services. A copy of the request should be forwarded to the communications officer at least three weeks prior to the trial date.

VI. ATTACHMENTS:

1. Memorandum from Mr. L. G. Dorrier, Jr., Director, Department of Criminal Justice Services, Training Requirements for Radar Operators and Instructors providing Radar Training.
2. Letters dated July 2, 1990, and July 20, 1990, from Mr. Edward J. Gillikin, Sr., CPPO, C.P.M., Manager, Specifications and Quality Control, Department of General Services.
CPPO, C.P.M., Manager, Specifications and Quality Control, Department of General Services.
3. Approved Traffic RADAR Equipment
4. Approved Traffic LIDAR Equipment (05/02/01)
5. Specifications for Lidar Speed Measurement Devices

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Attachments