**Vacaville Police Department**

**LIDAR Operator**

**8-Hour**

*(P.O.S.T. COURSE OUTLINE)*

*Statement of Purpose:* The purpose of this training program is to improve the effectiveness of speed enforcement through the proper and efficient use of Laser / Lidar speed measurement instruments and to meet the training requirements of CVC 40802.

1. Introduction
	1. Classroom familiarization
		1. Facility rules
		2. Break areas
	2. Course breakdown and schedule
		1. Course topics
		2. Hour allotment
	3. Instructor Introduction/Background
	4. Radar review
		1. Radar Pre-test
2. Scientific Principles of Lidar Speed Measurement
	1. Lidar
		1. Definition
		2. Laser energy
		3. How Lidar works
		4. Health considerations
	2. Characteristics of the Lidar Signal
		1. Signal speed
		2. Wavelength
		3. Frequency
	3. Behaviors of Lidar
		1. Reflected, refracted, absorbed
	4. Cosine effect
3. Lidar vs. Other Speed Measuring Devices
	1. Prima Facie
		1. 22352 VC
		2. 22350 VC
	2. Maximums
		1. 22349 VC
		2. 22356 VC
		3. 22406 VC
4. History of Radar
	1. General history
		1. Types of radar
	2. CHP history
		1. Testing
		2. Future of radar in the department
5. Physical Properties of Radar
	1. Radio waves
		1. Microwave radiation
		2. Speed
		3. Frequency
			1. K, Ka
		4. Wavelength
	2. Beam characteristics
		1. Conical
		2. 85% directed forward
		3. Side lobes
		4. Operations range
		5. Transmitted beam angle
		6. Beam width calculations
	3. Doppler principle - stationary
		1. Doppler shift
		2. Cycles per second
	4. Doppler principle – moving
		1. Closing rate speed
6. Effects
	1. Cosine (stationary)
	2. Cosine (moving)
	3. Shadow
	4. Nichols
	5. Billboard
	6. Scanning
	7. Harmonics
	8. Weather
	9. Mirrors/reflection
	10. Batching
	11. Other interference
	12. Old technology effects
		1. Feedback/panning
		2. Auto gain
		3. Power-on or power surge
		4. Radio frequency interference (RFI)
	13. Recognizing effects
		1. Momentary in nature
		2. No supportive evidence
	14. Tracking history
		1. Visual estimation
		2. Target in beam
		3. Doppler tone
		4. Reading on radar unit
		5. Speedometer check (moving mode only)
	15. Target acquisition
		1. Reflective capability
		2. Speed
		3. Distance
		4. Position
		5. Relative size to distance
7. Equipment Operation
	1. ABCs
		1. Equipment connections
	2. Mounting requirements
		1. Safety
	3. Individual equipment operation
		1. Applied Concepts Stalker Dual
		2. Basic
		3. DSR
		4. Decatur Genesis
		5. Applies Concepts Stalker ATR
	4. Operational Safety
		1. Microwave exposure
8. Patrol techniques and tactics
	1. Safety
		1. Turns and entering traffic
		2. Multitasking
		3. Relation of your patrol vehicle to other vehicles
		4. Showing violator speed readings
	2. Tactics
		1. Position in line of traffic
		2. Geography
		3. Environmental
		4. Using RF hold
9. Traffic surveys and speed traps
	1. Surveys
		1. Process
		2. Caltrans
		3. County or City
		4. 85% percentile or critical speed
	2. Speed traps
		1. 40802 VC
		2. Radar enforcement without survey
		3. Timing vehicle over distance
10. Case Law
	1. Validity of the Doppler Principle
		1. State v. Dantonio (New Jersey)
	2. Operator training and qualifications
		1. Honeycutt v. Kentucky
		2. Florida v. Aguilera
		3. People v. Hanson
	3. Surveys
		1. People v. DiFiore
		2. People v. Goulet
	4. Accuracy
		1. State v. Tomanelli
	5. Additional Case Law
11. Radar Evidence
	1. Subpoenas
	2. Standard documents
		1. Operator certificate (CHP 195)
		2. Speedometer calibration
		3. Vehicle information
		4. IACP Certificate
	3. Departmental specific documents
		1. Radar Calibration Log (CHP 99B)
		2. Range and Speed Determination test (CHP 99A)
12. Additional Radar Information
	1. Distance calculations
	2. Departmental FCC license
	3. Radar/Lidar jammers
		1. Types
		2. Laws regarding use
13. Courtroom Testimony
	1. Officer’s notes
	2. Testimony
	3. Mock Trial
14. Practical Exercise
	1. Safety
	2. Equipment operation
	3. Visual speed and range determinations
15. Review
16. Final Examination