

SANTA CLARA COUNTY-OFFICE OF THE SHERIFF

Radar Operator (23300)

24-Hours

Objective: This course will provide peace officers with the skills and knowledge necessary to effectively operate radar guns that employ standard radar bandwidths (X-band, K-band, and Ka-band). This training includes practice of radar setup and use, minimizing perturbation factors, speed estimation skills, developing the requisite knowledge to defend radar use in court, and examples of moot court testimony.

**Expanded Course Outline**

**I. Introduction**

A. Course Schedule

1. Objective
2. Timeline
3. Location

B. Pretest

1. Assess existing knowledge
2. Identify target achievements for this class

**II. Speed and Enforcement**

A. Accidents and speed

1. Statistics
2. Impact of speed on stopping a vehicle

B. Your role – lowering speeds makes communities safer.

**III. Radar Technology**

A. How Radar works

1. Development of radar
2. Doppler and Doppler shift

B. Different radars

1. X-Band
2. K-Band
3. Ka-Band

C. Impact on beam length

1. Reflected
2. Absorbed
3. Refracted

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**IV. Laws and Court Decisions Related to Radar**

A. Legal elements

1. Basic speed law
2. Absolute speed law
3. Speed traps
4. Speed surveys
5. Radar standards

B. Court Cases

1. Cases serving judicial notice of Doppler radar as functional and accurate
2. Cases emphasizing proper operation and training

**V. Stationary Radar Operation**

A. Set up

1. Components
2. Mounting

B. Health issues with use

C. Testing the Radar Unit

1. Light segment test
2. Internal circuitry test
3. Tuning fork test

D. Use

1. Settings
2. Beam pattern and range
3. Range control
4. Hold function
5. Cosine effect and calculations
6. Target identification
7. Tracking history checklist
8. Site selection

**VI. Moving Mode Radar Operation**

A. Moving mode

1. Differences with stationary mode
2. Moving mode operation

B. Moving cosine effect

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1. Definition
  2. Calculation
  3. Examples
- C. Shadowing
1. Identification
  2. Elimination

VII. **Methods of Defeating Radar**

- A. Detectors
- B. Jammers

VIII. **Radar Effects**

- A. Ghost readings
  1. Definition
  2. Minimizing, eliminating effects
- B. Radio Frequency Interference (RFI)
  1. Definition
  2. Minimizing, eliminating effects
- C. Pulsating signal amplitude
  1. Definition
  2. Minimizing, eliminating effects
- D. Audio interference
  1. Definition
  2. Minimizing, eliminating effects
- E. Antenna issues
  1. Definition
  2. Minimizing, eliminating effects
- F. Motorcycle considerations
  1. Definition
  2. Minimizing, eliminating effects
- G. Weather
  1. Definition
  2. Minimizing, eliminating effects
- H. Heat build-up
  1. Definition
  2. Minimizing, eliminating effects

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- I. Power surge
  - 1. Definition
  - 2. Minimizing, eliminating effects
- J. Automatic Gain Control (ACG)
  - 1. Definition
  - 2. Minimizing, eliminating effects
- K. Panning
  - 1. Definition
  - 2. Minimizing, eliminating effects
- L. Batching
  - 1. Definition
  - 2. Minimizing, eliminating effects
- M. Shadowing
  - 1. Definition
  - 2. Minimizing, eliminating effects

IX. **Visual Speed and Range Determination**

- A. Elements involving range
  - 1. Range of device / vehicle
  - 2. Operational range of device
- B. Radar range
  - 1. Execution
  - 2. Analysis
- C. Vehicle range estimation
  - 1. From stationary vehicles
  - 2. From moving vehicles

X. **Radar Evidence Kit**

- A. Contents
  - 1. Licenses and certification documentation
  - 2. Logs
  - 3. Operators manuals
- B. Application
  - 1. Relevance to use in field
  - 2. Relevance to use in court

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- XI. **Practical Field Exercises**
  - A. Set-up and safety
    - 1. Instructors' responsibilities
    - 2. Students' responsibilities
    - 3. Instructions for practical field exercises
  - B. Exercise – students measure speed and range of a moving vehicle
    - 1. Radar set-up
    - 2. Radar use
    - 3. Measurement results
  - C. Debrief use and detection experience
  
- XII. **Moot Court**
  - A. Review of court videos
    - 1. Court participants
    - 2. Peace Officer responsibilities
  - B. Exercise – students roll play for actual future testimony
    - 1. Scenario set-up
    - 2. Peace Officer on the witness stand
  - C. Debrief of court experience
  
- XIII. **Course Conclusion**
  - A. Course / instructor evaluations
  - B. Certificate of completions

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**Hourly Distribution**

**3-Day format**

<b>DAY 1</b>	
<b>Time</b>	<b>Content</b>
0800-0900	Course Introduction / Pretest
0900-1030	Speed Enforcement and Radar Technology
1030-1200	Laws and Court Decisions
1200-1300	lunch
1300-1330	Prep and safety briefing for practical exercises
1330-1600	Stationary Radar Operation: set up / practice
1600-1700	Moving Radar Operations; differences with stationary radar operations
<b>DAY 2</b>	
<b>Time</b>	<b>Content</b>
0800-1100	Moving Radar Operations (cont.)
1100-1200	Radar Detectors and Jammers
1200-1300	lunch
1300-1500	Radar Effects
1500-1600	Visual Speed and range determination
1600-1700	Radar evidence kit
<b>DAY 3</b>	
<b>Time</b>	<b>Content</b>
0800-0930	Written Exam
0930-1030	Prep and safety briefing for practical exercises
1030-1230	Practice Field exercises
1230-1330	lunch
1330-1430	Field Exercise debrief
1430-1630	Moot Court exercises and debrief
1630-1700	Course conclusion, evaluations, certificates

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**2-Day format**

<b>DAY 1</b>	
<b>Time</b>	<b>Content</b>
0600-0700	Course Introduction/ Pretest
0700-0830	Speed Enforcement and Radar Technology
0830-1000	Laws and Court Decisions
1000-1030	Prep and safety briefing for practical exercises
1030-1200	Stationary Radar Operation: set up/ practice
1200-1300	lunch
1330-1500	Stationary Radar Operation practice cont.
1500-1900	Moving Radar Operations; differences with stationary radar operations
<b>DAY 2</b>	
<b>Time</b>	<b>Content</b>
0600-0700	Radar Detectors and Jammers
0700-0900	Radar Effects
0900-1000	Visual Speed and range determination
1000-1130	Radar evidence kit
1130-1200	Written exam
1200-1300	lunch
1300-1330	Prep and safety briefing for practical exercises
1330-1530	Practical Field exercises
1530-1630	Field Exercise debrief
1630-1830	Moot Court exercise and debrief
1830-1900	Course conclusion, evaluations, certificates