

**Newport Beach Police Department**  
**Radar Operator**  
**Course Number: 6830-23300**  
**24 Hour Course**  
**Revised: November 12, 2020**

**Purpose:** The purpose of this course is to provide training on the technical use of electronic speed measuring devices using radar for speed and distance measuring.

**Course Objectives:** The student will:

1. Review the history and theory of radar
2. Examine the technical use of radar and its place in law enforcement
3. Review the legal use of radar and its importance in court
4. Learn to recognize the components of stationary and moving radar systems
5. Study the characteristics and functions of radar components
6. Evaluate the effects of radar use
7. Learn the techniques for verification of the calibration of the radar
8. Provide the student with tools and information to continue using radar confidently and efficiently.

**A. Speed and Enforcement**

1. Instructor's background and expertise
2. Course overview
3. Speed and Enforcement

**B. History and Theory**

1. Review history and theory of radar
2. Discuss why radar is used
3. Provide tools and information to continue using radar confidently and efficiently

**C. Pre-Test Evaluation**

1. Determine student's knowledge of radar and its uses

**D. Laws and Court Decisions**

1. Landmark case decisions, Federal and State
2. Impact of cases on local law enforcement
3. 40802 (b) VC and why it is not Case law or the only guidelines for training
4. Courtroom prep and testimony

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**E. Stationary Radar Operation**

1. Scientific Principles and the Doppler Theory
2. Components
  - a. Counting unit
  - b. Antenna
  - c. Power Source
3. Installation
  - a. Cord Placement
  - b. Cable connections
4. Power supply
  - a. Types of plugs
  - b. Direct hook-up
  - c. Types of cables
  - d. Batteries
5. Low-voltage warnings
  - a. Flashing decimal
  - b. Dimming read-out
  - c. Low-volt read-out
6. Effects of low voltage
  - a. Reduced range
  - b. Unaccountable readings
7. Antenna mounting
  - a. Use bracket
  - b. Keep clear of obstructions
  - c. Secure with Velcro
  - d. Keep clear of counting unit
  - e. Keep leads short
8. Counting Unit
  - a. Accessible
  - b. Clear of antenna bracket
9. Audio set
  - a. Doppler as an assistance to tracking
  - b. Volume control
10. Auto locks and alarms
  - a. Not to be used
11. Operation - Stationary
  - a. Beam configuration
    - 1) Lobes
    - 2) Beam width
    - 3) Manufacturers specifications statements

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- b. Beam width formula
    - 1)  $2 \times D \times \tan 1/2 L$
  - c. Zone of influence
  - d. Beam range/Beam testing
12. Cosine effect
13. Target identification
- a. Target size
  - b. Radar sensitivity
  - c. Target speed
  - d. Auto gain circuitry
  - e. Tracking history (VAR)
  - f. Doppler (audio tape)
  - g. Site selection for operation

**F. Moving Radar Operation**

- 1. Components
  - a. Counting unit
  - b. Antenna
  - c. Power source
- 2. Installation
  - a. Cords
  - b. Power Supply
  - c. Types of hook-ups
- 3. How target speed is determined in moving mode
- 4. Effects of shadowing, batching (brief overview)
- 5. Elements of tracking history checklist (VARs)
- 6. Cosine error and its effects
- 7. Low and high Doppler filters
- 8. Subtraction and addition

**G. Stationary Radar Effects**

- 1. Cosine error
  - a. How to prevent and control
- 2. Multiple signals
  - a. Recognizing several signals
- 3. Random frequency interference
- 4. Panning
  - a. How to avoid and recognize

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**H. Moving Radar Effects**

1. Batching
  - a. How the counting unit works
2. Shadowing
  - a. Reflective vehicles in your path that may affect readings
3. Radio Frequency Interference
  - a. Choosing your environment
4. Feedback
  - a. Avoid with proper set-up
5. Cosine
  - a. Reflective surfaces and relative movement

**I. Visual Speed Determination, Practical Exercises and Field Training**

1. Test, set-up, operation and troubleshooting devices
2. Visual speed estimations

**J. Radar Evidence and Courtroom Testimony**

1. California vehicle code 40802 (b) and why it is not Case law or the only guidelines for training
2. Courtroom prep and testimony

**K. Course Review**

1. Course presentation
2. Formula review
3. Question/answer period

**L. Written Examination**

1. Final exam
2. Class critique