

# Enforcement Radars, Lasers, Radar Detector-Detectors and Breathalyzers

Greg Speakman

VA3OMP

# Radars

- Uses Doppler technology
- Must know target history
- Used to enforce Provincial statutes
- Depending on the model, radars can be stationary or moving and they can be non-directional or directional
- Used in vehicles, handhelds and speed trailers (directional).

# Radars

- **Antennas - Select**
- **Ka-Band**
- IACP type VI
- Nominal transmission frequency 35.50GHz +/- 100MHz
- Nominal horizontal beamwidth 12 degrees
- Polarization Circular
- Nominal microwave power output 15mW
- Maximum aperture power density <2mW/cm<sub>2</sub>

- **K-Band**
- IACP type IV
- Nominal transmission frequency 24.150GHz +/- 50MHz
- Nominal horizontal beamwidth 12 degrees
- Polarization Circular
- Nominal microwave power output 7mW
- Maximum aperture power density <math><1\text{mW}/\text{cm}^2</math>

- **Antenna – Directional**
- **K-Band Directional**
- IACP type IV
- Nominal transmission frequency 24.150GHz +/- 50MHz
- Nominal horizontal beamwidth 12 degrees
- Polarization Horizontal
- Nominal microwave power output 7mW
- Maximum aperture power density <1mW/cm<sub>2</sub>

# Laser

- Technology used is LIDAR – Light Detection and Ranging. It measures the time it takes from the LIDAR to the target vehicle and return (pulsed time-of-flight).
- This technology has been used by the aviation industry for years.
- Only stationary
- Moving LIDAR is expected in about 2 years

# LIDAR cont.../

- Used to enforce Provincial Statues
- One target at a time
- Very accurate

# Radar Detector-Detectors

- Made in Australia
- Picks up on the oscillator of the Radar Detectors
- Simple to use
- Govern by the province

# Breathalyzers

- Two technologies are used
  - IR
  - Fuel Cell
- Most instruments only use one technology
- There are instruments that use both technologies
- Roadside Screening Devices uses Fuel Cells
- Desktop instruments uses either and sometimes both technologies

# Breathalyzers - Legal

- Any Peace Officer, as defined by the Criminal Code, if he/she **believes and forms the opinion** that a driver of a motor vehicle/boat/etc, ability to operate such a vehicle is impaired by alcohol or drug, may demand the operator provide samples of breath for a road side screener or qualified breath tech and approved instrument.

# Breath Legal Cont.../

- Road Side Screen
  - 50 mgs of alcohol per 100 mls of blood – Warning
  - 100 mgs of alcohol (though Criminal Code states 80 mgs-tolerances) per 100 mls of blood – Fail
  - If fail then driver is taken to a qualified breath tech and approved instrument.
  - Above is Criminal Code
  - Some provinces have Provincial statues to prosecute for Warnings. B.C. has such a law and the Warning Level is set for 60 mgs of alcohol per 100 mls of blood.

# Breath Legal Cont.../

- Qualified breath tech and approved instrument
  - Driver is charged under Criminal Code for results of 100 mgs of alcohol per 100 mls of blood or higher.
  - 50-99 mgs of alcohol per 100 mls of blood – temporary suspensions can be issued

# Roadside Screener

- Davtech sells and services the Intoximeters AS IV
- Calibrated monthly by the using agency and yearly maintenance by Davtech
- Used by health professionals, DOT, labour and enforcement
- Currently Canada does not use them for evidentiary uses but are used extensively in the States

# Roadside Screener Cont../

- Non-enforcement agencies have models that gives BrAC readings
- Enforcement agencies have the DWF (Digi Warn Fail) model
- Instrument does not check for mouth alcohol or interfering substance

# Desktop Breathalyzers

- Mainly used by enforcement agencies.
- Used for evidentiary purposes
- Yearly maintenance by Davtech
- For every test, the instrument is checked against a sober breath and a known alcohol content, a wet bath or dry gas, before subject is tested
- Instrument is purged before each stage

# IR

- Infrared (IR) sensors are inherently cross-sensitive to several breath constituents and a non-linear analytical device, making IR less attractive to use as the primary analytical system.
- The IR sensor, however, does have several capabilities that the fuel cell sensor does not possess. The most important of these is that the IR sensor is able to make continuous determinations of alcohol concentration thus allowing the Intox EC/IR II to monitor a breath sample in (near) real time. This helps determine the correct moment at which to take a sample of the breath and analyze it.