Agenda

• What is Radar Video Surveillance (RVS)?
• Why use RVS?
• Is RVS only for Radar?
• What types of sensor technology can be integrated into RVS?
Radar is Mature Technology

- Radar uses radio waves for detection of objects
- It is an acronym **Radio Detection and Ranging**
- Radar has been in use since WWII
- It is used for many varying applications such as weather, speed enforcement, process level sensors, air traffic control, maritime traffic monitoring, military applications, ground mapping, and of course SECURITY!
Radar Video Surveillance (RVS)

Sensors
- Marine Radar
- AIS
- Ground Radar

Situational Awareness Processor

Track, Display, Prioritize

Security Systems

Detect

Patented Technology

Respond

GPS

US Patent 7250853
### Object Detection – CCTV vs. Radar

<table>
<thead>
<tr>
<th>Variables</th>
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<tbody>
<tr>
<td>Horizontal Pixels</td>
<td>640</td>
<td></td>
<td></td>
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<tr>
<td>Min Feet/Pixel</td>
<td>2</td>
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### Performance Calculations

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<tr>
<th>FOV (deg)</th>
<th>49</th>
<th>36</th>
<th>18</th>
<th>12</th>
<th>9</th>
<th>6</th>
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<tbody>
<tr>
<td>Range (ft)</td>
<td>351</td>
<td>492</td>
<td>1010</td>
<td>1522</td>
<td>2033</td>
<td>3053</td>
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<tr>
<td>Design Range (ft)</td>
<td>281</td>
<td>394</td>
<td>808</td>
<td>1218</td>
<td>1626</td>
<td>2442</td>
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<tr>
<td>Cameras Req. for 360</td>
<td>8</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>60</td>
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</tbody>
</table>

- **36 deg, 400 ft.**
- **18 deg, 800 ft.**
- **6 deg, 2400 ft.**

For 400 Feet:
- 10 Short Range Cameras

For 2400 Feet:
- 60 Long Range Cameras

For 3 NM (18,000 Feet):
- 1 Radar
Video Analytics vs. Radar Detection

- 26 cameras for detection
- Partial coverage
- Extensive set up, tuning
- Daylight operation only
- Highly susceptible to weather
- $450K + $60K Maintenance

- 1 radar for detection
- Substantially more coverage
- Less set up, maintenance
- 24 hour detection
- Less susceptible to weather
- $250K + $20K Maintenance
Waterside Sensors

- **Radar**
  - 4kW to 25kW
  - 4’ to 9’ Antenna
  - < 1 mbps Bandwidth
  - 25° Vertical Beamwidth
  - Effective Range 1 - 6 NM

- **AIS**
  - Required for 65’ + Commercial Vessels
  - Filters Commercial Activity from Radar Returns
  - < 1kbps Bandwidth
  - Effective Range 15 – 40 NM
Ground Sensors

- **Radar**
  - 350m, 700m, 1400m, 2800m
  - Fast scan – 1 rev per sec
  - All weather operation
  - Detects people walking or crawling

- **GPS**
  - 900 mHz, Cellular, or Satellite
  - 900 mHz approx. 3 mi Range
  - Vehicle Mounted or Personnel Carried

- **ADS-B**
  - 1090 mHz Extended Squitter
  - Air Traffic Depiction

- **Fence line Sensors**
  - Fibersensys
  - SouthwestMicrowave
  - Senstar
  - QuinetiQ
RVS Simplified Block Diagram

- RVS Client
- Marine Radar
- Ground Radar
- RVS Subnet
- Video Server
- ProWatch Server
- RVS Server (Optional)

Video Response:
Surveillance Cameras,
Thermal Imaging Cameras
What can you do with RVS?

- Multiple Sensor Inputs
- Distributed Operation
- Data Fusion
- GIS Mapping
- User Defined Alarm Zones
- AIS Filtering
- GPS Filtering

- User Defined Rules
- Threat Prioritization
- MARSEC Levels
- Operator Alarms
- Manual Control
- Camera Compatibility
- Look Here
RVS Operator Interface
Fully Scalable GIS Map
Camera Management
Target Summary
Configurations and Rules