Observation Without Limits (OWL) is a commercially focused business formed by Dynetics, a Leidos company, to develop, deliver, and support the GroundAware family of 2D and 3D digital multi-beamforming radar products. OWL is co-located with Dynetics and its 2,500+ staff members working from state-of-the-art R&D facilities in Huntsville, Alabama, and other U.S. sites. Dynetics delivers complex products and services, leveraging capabilities from design, prototyping, and testing to manufacturing and sustainment.

Founded in 1974 to innovate radar for defense and intelligence customers, Dynetics today serves a range of government and commercial customers with radar and other sensor technologies, weapons technology, strike systems, intelligence solutions, space solutions, unmanned systems, automotive solutions, and cyber/IT solutions.

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RADAR AREA SURVEILLANCE SYSTEM

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 31 00 (MasterFormat 2020)	**Intrusion Detection**
28 31 21	**Area and Perimeter Intrusion Detection**
28 31 21.13	**Microwave Area and Perimeter Intrusion Detection Systems**

Notes to Specifier:

1. Where several alternative parameters or specifications exist, or where, the specifier has the option of inserting text, such choices are presented in **<bold text>.**

2. Explanatory notes and comments are presented in *colored* text.

RADAR AREA SURVEILLANCE SYSTEM

PART 1 GENERAL

1.01 SUMMARY

A Section includes a 3D digital multi-beam forming radar system automating real-time detection, tracking, classification, and response for 120 degree situational awareness of an outdoor area out to fifteen kilometers (km).

B Related Requirements

1. 28 06 30 Schedules for Security Detection Alarm. and Monitoring
2. 28 21 00 Surveillance Cameras
3. 28 23 00 Video Management System
4. 28 31 21 Intrusion Detection Interfaces
5. 28 51 15.15 Information Interfaces to Security Detection Alarm. and Monitoring

1.02 REFERENCES

A Abbreviations

1. FOV – Field of View

B Definitions

1. S-Band - An IEEE-defined portion of the frequency spectrum from 2 to 4 GHz (wavelength 15 cm to 7.5cm).

C Reference Standards

1. Environmental: International Electrotechnical Commission (IEC) – Ingress Protection Rating IP65
2. EMC: CE/FCC Class A, according to EN 55022 & EN 55024 EN 50155:2007
3. Shock: IEC60068-2-27
4. Vibration: IEC60068-2-64
5. ONVIF – Profile S

1.03 SUBMITTALS

A Product Data

1. Manufacturer’s printed or electronic data sheets
2. Manufacturer’s installation and operation manuals

1.04 QUALIFICATIONS

A Manufacturer shall have a minimum of five years’ experience in manufacturing ground-based radar area surveillance systems.

B Contractor shall have a minimum of 5 years’ experience in the installation, configuration, and support of ground surveillance radar, video surveillance, or access control systems, along with certification from the Manufacturer for the installation, configuration, training, and support of the radar product.

1.05 WARRANTY

A Manufacturer shall provide a one year limited warranty from date of delivery for the system to conform materially to the specifications and to be free of defects in material and workmanship.

B The Manufacturer shall offer an extended 12 month warranty option.

END OF SECTION

PART 2 PRODUCTS

2.01 EQUIPMENT

A Manufacturer: Observation Without Limits (OWL)
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Web: www.owlknows.com
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B Models: GA9120

C Alternates: None

2.02 DESCRIPTION

A The radar area surveillance system ("radar system") shall be a three-dimensional digital, pulsed Doppler multi-beam forming radar system automating real-time detection, tracking, classification, and response for 120 degree situational awareness of an outdoor area out to fifteen kilometers (km).

B The radar system shall transmit S-band radio frequency signals, digitize and process the received returns, identify detections, cluster detections to identify tracks, and associate tracks with feature data that can be used to classify the object.

C The radar system, upon detection of moving object, shall send an alarm or ignore the event, based on system configuration.

D The radar system shall have the ability to integrate with IP cameras and Video Management Systems (VMS) using ONVIF protocol.

Consult factory for list of approved integrations.

E Performance:

1. Range resolution: 10m (32.8'), or 20m (65.6'), adjustable
2. Instrumented range: 100 m to 15 km
3. The radar system shall provide target classification to distinguish among humans, animals, vehicles, aircraft, and drones, with the following nominal detection ranges:
   a. Large Aircraft: 15 km
   b. Vehicle: 13 km
   c. Walker: 8 km
   d. Drone: 5 km (DJI Phantom IV)

Achieving maximum detection ranges requires sufficient mounting height and line of sight, especially for ground targets.

4. Field of View:
   a. Azimuth: 120˚
      1) Accuracy: .25˚
   b. Elevation: 12 ˚ to 90˚ selectable (max ranges above are quoted for 12° elevation FOV
      1) Accuracy: .5˚ - 2˚, depending on selected elevation FOV
5. Minimum detectable velocity: 0.25-1 mph

F The radar system shall have customizable alarm zones with automatic response triggers.

G The radar system shall employ passive heating and cooling.

H The radar system shall consist of two primary subsystems, as follows:

1. radar sensor assembly

2. system control module

2.03 DETAILED SPECIFICATIONS

A Radar Sensor Assembly

1. Architecture: Simultaneous multiple beams
2. Processing type: Pulsed Doppler
3. Total Frequency band: S band - 3.0 to 3.3 GHz
   a. Selectable bands:
      1) lower band (3.0-3.1 GHz): 4 calibrated
      2) upper band (3.1-3.3 GHz): 6 calibrated
4. Software defined update rate: 1 Hz - 5 Hz
5. Communication: Ethernet via RJ-45 connector
6. Electrical
   a. Power Draw: <200 W per face @ 120/240 VAC
7. Physical
   a. Enclosure: Environmentally sealed
   b. Mounting: Pole or wall
   c. Weight: 90 lbs. (40.8 kg)
   d. Dimensions (l x w x h): 91.4 cm x 53.3 cm x 22.9 cm (36” x 21” x 9”)
   e. Operating Temperature: –20°C to +50°C (–4°F to +122°F)
   f. Storage Temperature: –40°C to +85°C (–40°F to +185°F)
   g. Connection: RJ-45 via supplied cable

B System Control Module (SCM)

1. The SCM shall consist of an enclosure assembly that contains a Nuvo-7006LP fan-less Controller, 24 VDC power supply, 48 VDC/10A power supply, Single-Port CAT5 Power over Ethernet (PoE) Midspan/Injector, and Web Controlled DIN Relay.
2. Controller
   a. The controller’s processor shall have the ability to accept CPU’s from Intel 6th-Gen Core™ i7/i5/i3.
   b. Communications
      1) Network – 2 x Gigabit Ethernet with option for 6 x Gigabit Ethernet ports
      2) USB – 4 x USB 3.0 plus 4 x USB 2.0
   c. Protocols: TCP, UDP, FTP, HTTP, HTTPS
   d. Memory: Up to 32GB DDR4-2133 SDRAM
   e. Operating Temperature: –20°C to +70°C (–4°F to +158°F)
3. 24 VDC Power Supply
   a. The 24 VDC power supply shall provide voltage to the system controller and web-controlled relay.
   b. Surge protection: integral gas-filled
4. Web-controlled DIN Relay
   a. The DIN relay shall provide the capability of rebooting, starting, or stopping attached equipment remotely via a wired or wireless network connection.

5. Web Interface – The controller's web interface shall present the following menu items and features when accessed:
    1) Server configuration
        a) includes: IP setting, site information, time settings
    2) User management
        a) includes adding and deleting users, user rights and credentials
    3) Camera management
        a) includes: adding and removing cameras, camera locations, camera control, and inclusion zones
    4) Radar management
        a) includes adding and removing radar assemblies, radar location, and radar movement
    5) Process management
        a) includes; group and individual processes currently running
    6) Integration management
        a) includes: management of camera/VMS integration settings, radar status messages, alarm zone messages,
    7) Track display

END OF SECTION

PART 3 EXECUTION

3.01 INSTALLATION

A Contractor shall follow Manufacturers recommended installation and safety guidelines, including:

1. Do not stand within established radiation hazard (RADHAZ) boundary during transmission.
2. Do not stand in the direct path of the antenna or work on the antenna when power is on.
3. Do not stand closer than 8.0 meters to the antenna when the transmitter is operating. RF electromagnetic radiation can cause serious burns and injury.
4. Shut off transmitting power before beginning work on equipment.

B Contractor personnel shall comply with all applicable state and local licensing requirements.

3.02 STORAGE

A Contractor shall follow temperature and humidity storage ratings published by the Manufacturer.

3.03 TRAINING

A The Contractor shall provide a training session on the radar system at time of onsite installation.

END OF SECTION