ARA has supplied a wide range of antenna systems for use in Permanent, Semi-permanent, Mobile and Tactical applications.

Typical applications for these systems include:

- SPECTRUM MANAGEMENT,
- SIGNAL INTELLIGENCE (SIGINT),
- SEARCH AND SURVEILLANCE,
- DIRECTION FINDING (DF),
- RCS MEASUREMENT,
- ECM REQUIREMENTS,
- RADAR SYSTEM SIMULATORS,
- ELECTROMAGNETIC COMPATIBILITY TESTING,
- SATELLITE TRACKING, and
- SATELLITE NEWS GATHERING (SNG)

Integrated Antenna Systems offer:

- CONSTRUCTION FOR USE IN EXTREME ENVIRONMENTAL CONDITIONS
- EASY INSTALLATION AND SET UP
- COMPACT SIZE
- MODULAR DESIGN
- ADAPTABLE FOR CUSTOM APPLICATIONS
- HIGH GAIN, DIRECTIONAL ANTENNAS
- EXTREMELY BROADBAND OMNI ANTENNAS
- LINEAR AND CIRCULAR POLARIZATIONS
- CUSTOM MOUNTING
- POSITIONING SUB SYSTEMS

### INTEGRATION AND MOUNTING

**Antenna Sub-systems**

**Positioning Sub-systems**

**Switching and Controls**

**Controllers**
INTEGRATED ANTENNA SYSTEMS

Integrated antenna systems are constructed using a building block approach and incorporate various customer-defined options. Special antennas are tailored to specific system requirements. For example, to determine the angle of arrival of incoming RF signals, a direction finding antenna may be supplied with dynamically balanced pedestals rotating at speeds up to 200 rpm. Also, for Search and Surveillance applications, directional antennas may be supplied with elevation over azimuth (EL/AZ) or azimuth (AZ) only pedestals rotating at 2 to 3 rpm.

Mobile and Tactical intercept antenna systems use our extremely broadband E-field and H-field active antennas and our collapsible antennas for quick assembly and disassembly.

ARA series antenna systems are broadband RF signal intercept systems covering the frequency range from 10kHz to 18GHz. These antennas are designed for semi-permanent installations and for tactical radio monitoring applications. Since these antennas are constructed using a building block approach, various models are available covering different frequency ranges for intercepting linear, dual linear and circularly polarized RF signals.

SAS-118/DP series antennas are designed for RF signal interception over a broad frequency band, 1-18 GHz. These antennas intercept vertical, horizontal and circular polarization signals. SAS-118/DP antennas with a passive broadband field may be used for generating high electric fields at any frequency in the band.

DFA series antennas are available for finding the direction of incoming signals over a very broad frequency range.
ARA series antenna systems are broadband RF signal intercept systems covering the frequency range from 10 kHz to 18GHz. These antennas are designed for semi-permanent installations and for tactical radio monitoring applications. Since these antennas are constructed using a building block approach, various models are available covering different frequency ranges for intercepting linear, dual linear and circularly polarized RF signals.

Typical antenna systems include horizontally and vertically polarized omni-directional antennas up to 18GHz and medium to high gain linear or dual-polarized directional antennas up to 18GHz. Azimuth rotators are included as a part of the system for full 360° coverage.

A complete antenna system package includes all required antennas, a tower with guy ropes and other installation hardware, an azimuth rotator with remote controller, a connector panel to access outputs from the various antennas and any required tools for assembly or disassembly.

ARA series antennas can be easily disassembled into a compact package for transportation and then reassembled in the field with the supplied tools. The antenna system, when disassembled, can be stored in the reusable crates supplied.

ARA 01300 antenna system is designed for the semi-permanent or the tactical intercept of vertical and horizontally polarized signals from 10 KHz to 3GHz. Omni intercepts below 20MHz are limited to vertically polarized signals only. ARA 01301 is an upgraded version of ARA 01300 where the omni intercept of horizontally polarized signals is extended down to 1.5MHz.

ARA 0118 extends the frequency range of the intercept antenna system to 18GHz. It can intercept horizontally and vertically polarized signals from 1.5MHz to 18GHz and vertically polarized signals from 10 KHz to 18GHz.

ARA – 218/D is a 20MHz to 18GHz rotatable directional intercept-only antenna system and ARA – 011801/OD is a 10 KHz to 18GHz omni-directional intercept system.
### EXTREMELY BROADBAND RF SIGNAL INERCEPT ANTENNA

**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th></th>
<th><strong>ARA – 01300</strong></th>
<th><strong>ARA – 01301</strong></th>
<th><strong>ARA – 0118</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td>10KHz – 3GHz</td>
<td>10KHz – 3GHz</td>
<td>10KHz – 18GHz</td>
</tr>
<tr>
<td><strong>OMNI COVERAGE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontally Polarized</td>
<td>20 – 3000MHz</td>
<td>1.5MHz – 3GHz</td>
<td>20MHz – 18GHz</td>
</tr>
<tr>
<td>Vertically Polarized</td>
<td>10KHz – 3GHz</td>
<td>10KHz – 3GHz</td>
<td>10KHz – 18GHz</td>
</tr>
<tr>
<td><strong>ROTATABLE DIRECTIONAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontally Polarized</td>
<td>20MHz – 3GHz</td>
<td>20MHz – 3GHz</td>
<td>20MHz – 18GHz</td>
</tr>
<tr>
<td>Vertically Polarized</td>
<td>20MHz – 3GHz</td>
<td>20MHz – 3GHz</td>
<td>20MHz – 18GHz</td>
</tr>
<tr>
<td><strong>No of Antennas</strong></td>
<td>6</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td><strong>No of Ports</strong></td>
<td>9</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td><strong>Radius of Rotation</strong></td>
<td>&lt; 7’</td>
<td>&lt; 7’</td>
<td>&lt; 7’</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>35’</td>
<td>35’</td>
<td>35’</td>
</tr>
<tr>
<td><strong>Weight approx</strong></td>
<td>≈ 400lbs</td>
<td>≈ 400lbs</td>
<td>400lbs</td>
</tr>
<tr>
<td><strong>No of Crates</strong></td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Weight with Crates approx.</strong></td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
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<table>
<thead>
<tr>
<th></th>
<th><strong>ARA – 218/D</strong></th>
<th><strong>ARA – 01801/OD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coverage</strong></td>
<td>Rotatable Directional</td>
<td>Omni Directional</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>20MHz – 18GHz</td>
<td>1.5MHz – 18GHz</td>
</tr>
<tr>
<td>Horizontally Polarized</td>
<td>20MHz – 18GHz</td>
<td>20MHz – 18GHz</td>
</tr>
<tr>
<td>Vertically Polarized</td>
<td>20MHz – 18GHz</td>
<td>20MHz – 18GHz</td>
</tr>
<tr>
<td><strong>No of Antennas</strong></td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td><strong>No of Ports</strong></td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td><strong>Radius of Radiation</strong></td>
<td>&lt; 7’</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>33’</td>
<td>24’</td>
</tr>
<tr>
<td><strong>Weight approx.</strong></td>
<td>400lbs</td>
<td>220lbs</td>
</tr>
</tbody>
</table>

**Operating Temp:** - 40 to + 50°C  
**Max Wind Speed:** 160 kph (no ice deposit)  
**MTBF:** ≥ 15,000h  
**Azimuth Rotation:** ± 360 degrees
ARA – 01300

The six antennas that collect the RF signals for ARA – 01300 are:

1) The **LPC-8100/C** is a dual polarized log-periodic dipole array capable of transmitting and receiving linearly and circularly polarized electric fields from 80 to 1000 MHz.

2) The **LPC-560/101** is a lightweight medium-gain log periodic array designed to transmit or receive over the frequency range from 500 MHz to 6000 MHz. It is a dual polarized antenna, with separate ports for vertically and horizontally polarized signals.

3) The **SAS-230/12RL2** is a broadband omnidirectional antenna for interception and measurement of vertically polarized signals from 20MHz to 3GHz and beyond. Several other **SAS series** antennas in this frequency range are also available with latching or failsafe switches and RF limiters for use in high field environments. (See **SAS-230 series** antennas datasheet).

4) The **ADC-2300/12RL2** is a low noise omnidirectional antenna. It is designed for broadband measurements of horizontally polarized electric field intensity at frequencies from 20 – 3000 MHz. Like the **SAS-230**, the **ADC-230 series** antennas are available with failsafe switches and limiters.

5) The **ADA-120/101** is a low-noise receive-only antenna. It is designed for accurate measurements of the electric-field intensity at frequencies from 10 kHz to 200 MHz. A broadband balun gives the antenna nearly perfect balance over its full frequency range of operation. The **ADA-120/101** can therefore be used without a ground plane.
6) The **PNA-2010/101** is a dual-polarized antenna designed for receive-only applications. It has wide-beam unidirectional patterns in both azimuth and elevation over the frequency range of 20-100 MHz. The excellent electrical balance of all the dipoles with respect to ground helps greatly to reject locally-generated (common mode) noise interference. The deep null at the rear of the pattern can be used effectively to select against a strong signal from a selected direction.

**SHIPPING**

The complete **ARA-01300** antenna system is shipped in five reusable crates (41x41x44 (Crate 1), 149x32x32 (Crate 2 & 3), 117x24x28 (Crate 4) and 179x29x28 (Crate 5)) – all dimensions in inches). The total shipping weight is around 2950 lbs., for all crates shown below.

**ARA-01301**

**ARA-01301** includes the six antennas used in the **ARA-01300** and an additional omni-directional antenna, (model **ADC-120**) for intercepting horizontally polarized signals in the frequency range of 1.5MHz to 30MHz.

**ARA-0118**

In **ARA-0118**, the highband cross log-periodic (**LPC-560**) is replaced with a broader band dual polarized log-periodic **LPC-118** covering the frequency range from 1 to 18 GHz.

In addition, a seventh antenna, model **BSB-118/S** is added to the mast. The **BSB-118/S** is a slant polarized omni-directional antenna covering the frequency range from 1 to 18 GHz. It is ideal for intercepting circular, as well as horizontally and vertically polarized signals.

**ARA-218/D**

The **ARA-218/D** system utilizes all three directional antennas (**LPC-118**, **LPC-8100** and **PNA-2010/101**) used in the **ARA-0118**.

**ARA-01801/D**

This system uses all four omni-directional antennas (**SAS-230**, **ADC-2300**, **ADA-120/101** and **BSB-118/S**) used in the **ARA-0118**. In addition, an omni-directional antenna, model **ADC-120** is included to extend the frequency range for intercepting horizontally polarized signals down to 1.5MHz.
The **SAS-2300TH** is an RF intercept and DF antenna system covering the frequency range from 20 MHz to 3 GHz. It comprises a broadband omni directional antenna (20 to 2000 MHz, LO Band) and a high gain directional antenna (1 to 3 GHz, HI Band). The integrated antenna system is mounted on a remote-controlled azimuth rotator. The complete antenna system, including RF electronics, is enclosed in a low-loss flat-top radome. The antenna system is designed to be mounted on a mast, and is designed for use in a military marine environment.

Both omni and directional antennas are integrated with separate electronic boxes which include low noise amplifiers, RF limiters and attenuators to increase the dynamic range of the antenna system and support its operation in a high EMC field environment. A limiter protects the antenna electronics and user equipment from unexpected high power interfering signals. The **SAS-2300TH** is protected from high field intensity levels up to 70V/m in the 30 MHz to 2 GHz band and up to 20V/m for signals above 2 GHz.

**SAS-2300TH** interfaces include two RF connectors and three 19-pin control connectors.

The positioner/antenna control unit ACU-3D-12 is in a 19” rack mountable chassis. The control rack is either managed in local mode, on its front panel, or in a remote mode through a dedicated PC application. Both modes are active simultaneously. Both azimuth positioning and RF switching functions are controlled via controller.

The **SAS-2300TH** and related electronics and control units comply with **MIL-STD-461E** requirements for an above-deck configuration of the antenna equipment, and below dish for the controller unit. It comes in the standard radome color of White.
## SPECIFICATIONS: Electrical

<table>
<thead>
<tr>
<th></th>
<th>Omni Antenna (Lo Band)</th>
<th>Directional Antenna (Hi Band)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency (MHz)</strong></td>
<td>30 – 2000</td>
<td>1000 – 3000</td>
</tr>
<tr>
<td><strong>Polarization</strong></td>
<td>Vertical</td>
<td>Vertical</td>
</tr>
<tr>
<td><strong>Sensitivity (MDS)</strong></td>
<td>See Curve</td>
<td>≤ 10 dBµV/m</td>
</tr>
<tr>
<td><strong>Antenna Factor</strong></td>
<td>(without Amplifier)</td>
<td>See Curve</td>
</tr>
<tr>
<td><strong>VSWR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Attenuator</td>
<td>≤ 1.8 above 150MHz</td>
<td>≤ 1.8</td>
</tr>
<tr>
<td></td>
<td>≤ 4 below 150MHz</td>
<td></td>
</tr>
<tr>
<td>with Amplifier</td>
<td>≤ 2.7 above 150MHz</td>
<td>≤ 2.5</td>
</tr>
<tr>
<td></td>
<td>≤ 4 below 150MHz</td>
<td></td>
</tr>
<tr>
<td><strong>Max Admissible field</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 30 MHz</td>
<td>200V/m</td>
<td>200V/m</td>
</tr>
<tr>
<td>Between 30 MHz to 2 GHz</td>
<td>70V/m</td>
<td>70V/m</td>
</tr>
<tr>
<td>Above 2 GHz</td>
<td>20V/m</td>
<td>20V/m</td>
</tr>
<tr>
<td><strong>Max Output Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(with Amplifier or with Attenuator)</td>
<td>1W</td>
<td>1W</td>
</tr>
<tr>
<td><strong>Gain</strong></td>
<td>≥ +2dBi at 2GHz</td>
<td>≥ +16dBi at 3GHz</td>
</tr>
<tr>
<td></td>
<td>≥ -10dBi at 100MHz</td>
<td>≥ +12dBi at 2GHz</td>
</tr>
<tr>
<td></td>
<td>≥ -20dBi at 30MHz</td>
<td>≥ +7dBi at 1GHz</td>
</tr>
<tr>
<td><strong>Gain Flatness</strong></td>
<td>≤ 1dB over 20MHz</td>
<td>≤ 1dB over 20MHz</td>
</tr>
<tr>
<td><strong>Radiation Pattern</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azimuth</td>
<td>≥ 360° within 4dB variation</td>
<td>≥ 15° at 3000MHz</td>
</tr>
<tr>
<td></td>
<td>≥ 20° at 2000MHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥ 35° at 1000MHz</td>
<td></td>
</tr>
<tr>
<td>Elevation</td>
<td>≥ ±35°</td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥ 20° at 3000MHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥ 30° at 2000MHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥ 40° at 1000MHz</td>
<td></td>
</tr>
</tbody>
</table>

![Sensitivity (MDS)](image1.png)

![Antenna Factor (without Amplifier)](image2.png)
AC SUPPLY:

230V, 45Hz – 65Hz, ≤ 250VA

LOW BAND ELECTRONIC BOX:

**with Amplifier « ON »**

- Gain : ≥ 10dB
- Noise Figure : ≤ 6dB from 30MHz to 100MHz ; ≤ 2dB above 100MHz
- Output IP3 : ≥ 20dBm
- Output IP2 : ≥ 25dBm

**with Amplifier « OFF »**

- Gain : ≥ -4dB
- Noise Figure : ≤ 4dB
- Output IP3 : ≥ 20dBm
- Output IP2 : ≥ 50dBm

HIGH BAND ELECTRONIC BOX:

**with Amplifier « ON »**

- Gain : ≥ 10dB
- Noise Figure : ≤ 3dB
- Output IP3 : ≥ 15dBm
- Output IP2 : ≥ 30dBm

**with Amplifier « OFF »**

- Gain : ≥ -4dB
- Noise Figure : ≤ 4dB
- Output IP3 : ≥ 15dBm
- Output IP2 : ≥ 42dBm

**Mechanical:**

**Antenna**

- **Weight:** 45 Kg
- **Dimensions:** Height 1200mm, Diameter: 890mm
- **Mounting:** 8 x ¼ - 20 tapped holes with countersink on a circle of diameter 17.75". This mounting is designed to assure water protection of the antenna system and also the mechanical constraints (vibration, shock) at the top of the mast.

**Control Rack**

- **Weight:** ≤ 6kg
- **Dimensions:** 19” Rack (2U) x 12” deep

**Connector Disposition at the bottom of the SAS2300TH**
RF INTERCEPT AND DF ANTENNA SYSTEMS

ROLLING/PITCHING
- Antenna can operate under ±45° conditions in every direction without damage.

ENVIRONMENTAL: Control Rack

OPERATING:
- Low temperature: 0°C to 40°C
- Humidity: +40°C, 95% relative humidity

NON-OPERATING:
- Low temperature: -40°C to 70°C
- Humidity: +40°C, 95% relative humidity

ENVIRONMENTAL: Antenna

OPERATING:
- Temperature: -20°C to +50°C
- Damp heat: +40°C, 95% relative humidity
- SAS-2300TH meets or exceeds the requirements set for equipment installed on the deck of a naval vessel for seawater seal, vibration and salt spray.
- Wind resistance: 186 km/h for up to 30 minutes
- Icing: 1 cm with winds up to 100 km/h for 30 minutes.

NON-OPERATING:
- Low temperature: -40°C to +70°C
- Humidity: +40°C, 95% relative humidity
ACU-3D-12 Controller

The ACU-3D-12 Controller has been tested and qualified for military use using MIL-STD-810E (Environmental Test Methods), MIL-STD-461E (Control of Electromagnetic Interference) and MIL-STD-1399 (Electric Power for Shipboard).

The ACU-3D-12 Controller permits the operation of the rotator in the following modes:

♦ Semi-automatic Positioning
♦ Manual Positioning with ACCU-TRAK joystick
♦ User Defined Step Interval

All modes of operation are easily selected via keys on the front-panel. The 4 x 40 yellow backlit LCD display provides a clear indication of positioner status, control and user input.

Semi-automatic positioning allows for user-desired input for each axis via the front-panel keypad and monitors the progress of the positioner towards its destination.

Manual positioning is accomplished for each axis via a unique ‘ACCU-TRAK’ joystick which allows for precise speed and direction movement.

Step positioning provides the user a means to move devices in an incremental fashion. Increments are user selected between 0.1 degrees and the maximum device range of motion. See Section 7B for more controller information.

ACU-3D-12 Technical Data

Remote interfaces  RS – 232, 422 and 485
Display  4x 40 characters
Voltage  110 VAC
Current consumption  3.5 A (Max)
Temperature range  0°C – 40°C
Weight  25 lbs.
SAS-118DP series antenna systems offer an instantaneous frequency band of operation from 1 GHz to 18 GHz for RF signal intercept search and DF applications. These antenna systems may be used for intercepting signals of different polarizations (Horizontal, Vertical, Circular or Slant) with an appropriate feed option.

A SAS-118DP antenna system is comprised of a reflector (parabolic or shaped), an RF feed system, a single- or dual-axis positioner and associated remote controllers. Collapsible lightweight reflectors made from composite materials are also available for tactical and military applications. These reflectors can be disassembled into multiple panels for easy storage and transportation and reassembled in the field (see our CPRA series antennas and SAS-118DP/CC4-05 RF intercept system).

SAS-118DP series antennas may be mounted on ground based or shipborne fixed platforms. These antenna systems may also be attached to telescopic masts or tripods for tactical and mobile applications. Special mounting brackets and plates for attaching a telescopic mast to a wall or to the back of a truck are available upon request.

The RF feed system for a SAS-118DP series reflector antenna includes:

a) a broadband linearly polarized log periodic feed with a polarization rotator; or,

b) a broadband cross log periodic feed with or without an integrated LNA, and a polarization switching network.

**FEED OPTIONS:**

<table>
<thead>
<tr>
<th>FEED</th>
<th>TYPE</th>
<th>POLARIZATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>LPD – 118/R</td>
<td>Log-Periodic with a Polarization rotator</td>
</tr>
<tr>
<td>02</td>
<td>LPD – 118/RA</td>
<td>Log-Periodic with a Polarization Rotator and a Pre-Amplifier</td>
</tr>
<tr>
<td>03</td>
<td>LPC – 118</td>
<td>Cross Log Periodic</td>
</tr>
<tr>
<td>04</td>
<td>LPC – 118/AA</td>
<td>Cross Log Periodic with 2 Pre-Amplifiers</td>
</tr>
<tr>
<td>05</td>
<td>LPC – 118/SA</td>
<td>Cross Log Periodic with pol. Switching and a Pre Amplifier</td>
</tr>
<tr>
<td>06</td>
<td>LPC – 118/HS</td>
<td>Cross Log Periodic with Polarization Switching network</td>
</tr>
<tr>
<td>07</td>
<td>LPC –118/HAS</td>
<td>Cross Log Periodic with active Polarization Switching Network</td>
</tr>
</tbody>
</table>
REFLECTOR OPTIONS:

A SAS-118DP series antenna will include one of the following reflectors:

a) an aluminum parabolic reflector ranging in diameter from 0.9m(3ft) to 2.4m(8ft).

b) a lightweight composite material reflector available in diameters 0.6m (2ft) to 1.8m (6ft).

c) a set of aluminum or lightweight composite material reflector panels which assemble to form a parabolic reflector ranging in diameter from 30" to 72".

d) an ELPAR reflector (elliptical in vertical plane, and parabolic in horizontal plane) or a shaped reflector.

Parabolic Aluminum Reflectors, Single Section

<table>
<thead>
<tr>
<th>Reflector Size Ft (M)</th>
<th>Recommended Positioners</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS – 118 DP/A3</td>
<td>AEC-60</td>
</tr>
<tr>
<td>SAS – 118 DP/A4</td>
<td>AEC-60</td>
</tr>
<tr>
<td>SAS – 118 DP/A6</td>
<td>AEP - 250 / AER - 250</td>
</tr>
<tr>
<td>SAS – 118 DP/A8</td>
<td>AEP - 250 / AER - 250</td>
</tr>
</tbody>
</table>

Parabolic Composite material Reflector

<table>
<thead>
<tr>
<th>Reflector Size Ft (M)</th>
<th>Recommended Positioners</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS – 118 DP/C2</td>
<td>AEC-60</td>
</tr>
<tr>
<td>SAS – 118 DP/C3</td>
<td>AEC-60</td>
</tr>
<tr>
<td>SAS – 118 DP/C4</td>
<td>AEC-60</td>
</tr>
</tbody>
</table>

Parabolic Reflector, Multisection

<table>
<thead>
<tr>
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<th>Material</th>
<th># Sections</th>
<th>Recommended Positioners</th>
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</thead>
<tbody>
<tr>
<td>SAS – 118 DP/CA3</td>
<td>Aluminum</td>
<td>4</td>
<td>AEC-60</td>
</tr>
<tr>
<td>SAS – 118 DP/CA6</td>
<td>Aluminum</td>
<td>7</td>
<td>AEP - 250 / AER - 250</td>
</tr>
<tr>
<td>SAS – 118 DP/CC4</td>
<td>Composite</td>
<td>7</td>
<td>AEC-60</td>
</tr>
<tr>
<td>SAS – 118 DP/CC6</td>
<td>Composite</td>
<td>11</td>
<td>AEP - 250 / AER - 250</td>
</tr>
</tbody>
</table>

Shaped Reflectors

<table>
<thead>
<tr>
<th>Reflector Size Ft (M)</th>
<th>Material</th>
<th>Reflector Type</th>
<th>Recommended Positioners</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS – 118 DP/EP4</td>
<td>Composite</td>
<td>ELPAR</td>
<td>AEC-60</td>
</tr>
<tr>
<td>SAS – 118 DP/SE</td>
<td>Composite</td>
<td>Truncated Parabola</td>
<td>AEC-60</td>
</tr>
</tbody>
</table>

SPECIFICATIONS:

Telephone      Fax
1-301-937-8888  1-301-937-2796 (MD)
1-877-ARA-SALE   1-781-829-4590 (MA)
sales@ara-inc.com
WWW.ARA-INC.COM
SAS-118DP/CC4-05: RF Intercept antenna system with collapsible multisection reflector, feed option '05' and a 2-axis positioner (AEC – 60C)

Frequency: 1 to 18 GHz
Reflector Size: 1.2m (4ft)
No. of Panels: 7
Polarization: Dual Linear (H & V)
Gain (without LNA): 15 to 35 dB Typical
3 dB Beamwidth: 25° to 2 deg
VSWR (without LNA): 3.0:1 Max.
Azimuth Positioning: ± 200°
Elevation Positioning: -20° to 90°
Positioning Accuracy: 0.1°
Velocity: 1 to 25°/sec
Acceleration: 1 - 25° sec2
Power input: 48V DC (Positioner)

220V AC, 50/60 Hz (Controller)

Elevation over Azimuth Positioner: AEC-60C
Controller: ACU-3C-22
Power Supply: PS42V20A-36 (Optional)

Weight:
Antenna: 9kg
Positioner: 48kg
Controller: 5.5kg

Operational temperature range: -10° to 50°C
Wind Loading (operating): 85km/hr
Relative Humidity: 0 to 100%

OPTIONS:
1) 2 Rugged Cases for Antenna system
2) TP-9, Heavy duty Tripod
3) Case for Tripod, TP-9
4) Telescopic Mast
BROADBAND SPINNING ANTENNA SYSTEM WITH SHAPED REFLECTORS

The SAS-118 DP/SE-07 is a 1-18 GHz antenna system for search and intercept applications. A hybrid switching system provides V, H, Left Hand Circular and Right Hand Circular polarizations.

The truncated parabolic reflector provides independent control of radiation patterns in elevation and azimuth. Complete assembly includes the antenna with a dual polarized feed, RF switching LNA network, an azimuth positioner capable of continuous rotation at rates of 0 – 60 RPM and manually adjustable elevation of the antenna and a controller.

Other configurations of this antenna include truncated parabolic reflectors ranging in diameter from 0.9m to 3.0m or shaped ELPAR reflectors (elliptically shaped in vertical plane and parabolically shaped in horizontal plane, see Model SAS-118 DP/EP4-07) and azimuth positioners appropriately matched with the size of the reflector. ELPAR reflectors provide constant Beamwidth in elevation plane and increasingly narrowing Beamwidth with frequency in azimuth.

Polarization: Dual Linear, or Dual Circular
Gain
10dB @ 1GHz
35dB @ 10GHz
40dB @ 18GHz
Beamwidth (3dB):
Azimuth: 1° – 17°
Elevation: 2° – 35°
Reflector:
Type: Parabolic
Size: 1.2m x 0.6m
Feed Mounting: Quick Mounting with 3-Spares
Environmental: Weather Tight / Sealed
130 km/h wind speed

Positioning:
Azimuth: 0-60 RPM
Manual and computer control,
Controller allows speed adjustment,
Sectorial and fixed positioning modes,
Sweep between 2 positions
Elevation: Manual, -10° /+30°
Azimuth Rotator: AEC-60
Controller: ACU-3C-22 Polarization
controlled by the same controller used for controlling position.
Power Supply: PS42V20A-3C (Optional)
Color: Marine Grey
Weight of Antenna: 15kg.
SAS-126/A3/M is a tactical antenna system for direction finding (DF) and/or spectrum management applications. It covers the frequency range from 1GHz to 26GHz in a single band. The system includes a partially collapsible reflector, with an extremely broadband log periodic feed, mounted on a two axis (elevation over azimuth) positioner and a heavy duty tripod. SAS-126/A3/M is designed for use in tactical and military environments.

**SPECIFICATIONS:**

- **Frequency Range:** 1.0-26.0GHz Min.
- **VSWR (Typical):** 3 : 1
- **Reflector Size:** 0.9m
- **Gain, dBi linear (Typical):** 14 - 35 dBi
- **NF typical:** 4 dB
- **3 db Beamwidth:** 23° - 1°
- **Polarization:** Linear (adjustable)
- **Connector:** SMA-Female
- **Impedance:** 50 Ohms
- **Azimuth Positioning:** ± 200°
- **Elevation Positioning:** - 20° to 90°
- **Positioning Accuracy:** 0.1°
- **Velocity:** 1 to 25°/sec
- **Acceleration:** 1 - 25°/sec2
- **Power input:** 48V DC (Positioner) 220V AC, 50/60 Hz (Controller)

**Elevation over Azimuth Positioner:** AEC – 60C

**Controller:** ACU – 3C

**Weight:**
- Positioner: 34kg
- Controller: 5.5kg
- Antenna: 10kg

**Operational temperature range:** -10° to 50°C

**Wind Loading (operating):** 85km/hr

**Relative Humidity:** 0 to 100%

**OPTIONS:**

1) TP-9, Heavy Duty Tripod
2) Carrying Cases
3) Telescopic Mast
4) PS42V20A-3C, 48V Power Supply
The **SAS-0518** is a broadband direction finding antenna system covering 0.5 to 18 GHz. The frequency range is covered by two antennas: 0.5-2GHz (LO Band) and 2-18GHz (HI Band).

The complete antenna system consists of a low band LPD antenna, a high band reflector antenna, an antenna support and tilting structure, a high-speed rotator, the bolt-down flanged mounting base, a radome, a rack mountable digital controller unit, a multi-conductor control cable and a coaxial RF cable.

The antenna system also includes RF electronics comprising LNA's, limiters and switches to select either band, and operate the antenna in high field environments and/or improve the dynamic range.

The rotation unit uses a smart motor that is capable of speeds up to 200rpm as well as sweeping between prompted angles. A single remote controller is used to control the rotating unit and RF switching for the LNA bypass mode. The control cable between the positioner and the controller, **ACU-3D-14-30**, includes the frequency switching line (to switch between the high and the low band), the LNA bypass line and the positioner motor control lines. Controls may also be provided via a computer interface.

The HI band antenna uses a shaped beam ELPAR reflector. This reflector design eliminates the need for an elevation positioner by maintaining the elevation beamwidth to be relatively constant over a broad frequency range. The shaped reflector design is ideal for use when the antenna is mounted on platforms experiencing pitch and roll motion. The system is protected by a low loss radome for use outdoors and for military, naval and marine applications.

**OPTIONS:**

1) **LO band extended to 300MHz (Model SAS-0518/E).**

2) Bulkhead mount cables for use in mobile installation. These cables allow the extension of device connectors to a wall in the vehicle for ease of installation.

3) Remote control interfaces:
   a) **RS – 232/485/422** interface with **DB-9** connector
   b) Fiber optic interface
   c) **GPIB** interface with **IEEE-488** connector
DIRECTION FINDING (DF)  
ANTENNA 0.5-18 GHz

SPECIFICATIONS: SAS-0518

MECHANICAL:

Height: 54 inches  
Diameter: 40 inches  
Weight: 85 lbs (40 kgs)

ELECTRICAL:

Frequency Range:  
Directional: 0.5 to 18 GHz  
Omnidirectional: 0.5 to 18 GHz

Impedance: 50Ω nominal  
VSWR: 2:1 maximum

Power:  
Directional: 125W CW (0.5 to 2GHz)  
Omnidirectional: 10W CW (2 to 18 GHz)

Polarization: 45° Slant Linear

Pattern:  
LO Band: 3dB azimuth BW=110° nominal  
3dB elevation BW=70° nominal  
HI Band: 3dB azimuth BW≤20°  
3dB elevation BW≥30°

Gain:  
LO Band: 7.5 dBi typical  
HI Band: 12 to 22 dBi typical

Rotation: ≤ 200 rpm adjustable  
(Directionantenna) Sectorial sweeping capabilities  
Pointing resolution 0.1°  
Pointing accuracy = +/-0.1°

Control Cables: 3/8” diameter, pair shielded  
RF Cable: ¼” dia. 20m low-loss

RF Connectors: SMA female  
Power Connectors: MS-3112E12-10P on the positioner  
MS-3112E12-10S on the controller
The **BSB-0518/C3275** is a 0.5 – 18 GHz antenna system for search and locates RF signal intercept systems. It integrates capabilities of our **SAS-0518** directional finding system and extremely broadband slant polarized omni antenna **BSB-0518** in a single package.

**BSB-0518/C3275** is enclosed in a low loss radome for use outdoors in military, naval and marine environments. See separate datasheets for more details on **SAS-0518** and **BSB-0518** (part of omnidirectional antennas datasheets).

**SPECIFICATIONS:**

**Frequency:** 0.5 to 18 GHz

**Impedance:** 50 ohm Nominal

**VSWR:**

**Polarization:** 45° Slant Linear

**Radiation Pattern:**
- For Directional antenna
  - 0.5 to 2 GHz: 3dB azimuth BW=110° nominal
  - 2 to 18 GHz: 3dB azimuth BW≤20°
  - 3dB elevation BW=70° nominal
  - 3dB elevation BW≥30°

**Gain:**
- For Directional antenna
  - 0.5 to 2 GHz: 7.5 dBi typical
  - 2 to 18 GHz: 12 to 22 dBi typical
- For Slant pol.
- Omni antenna: 0 dBi typical

**RF Connectors:** SMA – f

**Power Connectors:** MS-3112E12-10P on the positioner MS-3112E12-10S on the controller

**Dimensions:** 73” high X 41” diameter (at base)

**Power Connectors:** 315 lbs.
The **DFA-118/CO4** antenna system is ideally suited for RF direction finding and tactical applications. It is comprised of a collapsible reflector antenna, a positioner with remote controller, a telescopic mast and a power supply. The complete system is stored and transported in a molded transit case.

The RF feed system for the reflector antenna consists of an adjustable linearly polarized feed, a feed rotator for polarization adjustment up to 90° in incremental steps as small as 0.1° and a low noise amplifier (LNA). The LNA may be remotely switched in and out of the RF path.

The collapsible reflector antenna is designed with quick release fasteners for easy set-up and breakdown. The 1.2 meter reflector consists of multiple petals that are connected around a center hub.

The positioner, model **AEC-60C**, is an elevation over azimuth positioning system designed for high accuracy applications. The controller, model **ACU-3C-22**, is a general purpose computerized control system. It interfaces and instructs the positioner on movements, speeds and accelerations. The same controller is used to command the feed rotator. The **ACU-3C-22** is a 19” rack mountable unit which is located inside the vehicle (or control room). A power supply, model **PS42V20A-OF**, powers the positioner.

The pneumatic telescopic mast, model **NY7/C3173**, may be attached to a vehicle with brackets. It is supplied with an optional safety switch which indicates the mast is fully seated and the vehicle is safe to move.

**SPECIFICATIONS:** DFA-118/CO4

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Polarization</th>
<th>VSWR Typical</th>
<th>Gain Typical</th>
<th>3 dB Beam Width</th>
<th># of Bands</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 18 GHz</td>
<td>Linear, adjustable</td>
<td>3.0:1</td>
<td>15 to 38 dB</td>
<td>20° to 1.5°</td>
<td>1</td>
</tr>
</tbody>
</table>

**ANTENNA REFLECTOR SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>Size</th>
<th>Weight</th>
<th>Material</th>
<th>Operational Temperature</th>
<th>Relative Humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 Meter</td>
<td>8.1 Kgs</td>
<td>Composite</td>
<td>-10° to 50°C</td>
<td>0% to 100%</td>
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POSITIONER PHYSICAL SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Size</th>
<th>Weight</th>
<th>Material</th>
<th>Operational Temperature</th>
<th>Humidity</th>
<th>Power Input</th>
<th>Wind Speed Operating</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 x 20 x 18</td>
<td>47.5 Kgs</td>
<td>Aluminum</td>
<td>-10°C to 50°C</td>
<td>0% to 100%</td>
<td>48 Vdc</td>
<td>83 Km/hr</td>
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</table>

POSITIONER OPERATING SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Load Capacity</th>
<th>Travel Azimuth Axis</th>
<th>Travel Elevation Axis</th>
<th>Maximum Velocity</th>
<th>Maximum Acceleration</th>
<th>Positional Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>34 Kgs</td>
<td>± 200°</td>
<td>-20° to 90°</td>
<td>1-25°/sec</td>
<td>1-25°/sec2</td>
<td>0.1°</td>
</tr>
</tbody>
</table>

CONTROLLER SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Size</th>
<th>Weight</th>
<th>Material</th>
<th>Volts</th>
<th>Operating Temperature</th>
<th>Humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 x 19 x 12 inch</td>
<td>5.5 Kgs</td>
<td>Aluminum</td>
<td>220V ± 10% 50/60 Hz</td>
<td>0-50°C</td>
<td>90% Non-Condensing</td>
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MAST SPECIFICATIONS:

<table>
<thead>
<tr>
<th>Height Extended</th>
<th>Number of sections</th>
<th>Vertical Head Load</th>
<th>Max Wind Speed</th>
<th>Maximum Inclination</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.7M</td>
<td>6</td>
<td>120 Kgs</td>
<td>150 kph</td>
<td>&lt;5°</td>
</tr>
</tbody>
</table>
MOBILE SATELLITE SYSTEMS

The **MSS** series of portable antenna positioner systems were designed for autonomous acquisition of SATCOM Ku band signals. These GPS based systems can be used to acquire signals at any location on any flat or moderately inclined surface. The MSS has a 3 axis positioner (azimuth, elevation and Orbital Arc Tilt) and has provisions for a 4th polarization axis by rotating the feedhorn.

The MSS system control unit can be accessed locally using the front panel controls or can it be controlled remotely via serial interface (RS-232, RS-422, RS-485)

Accessories include an integrated controller, suite case configuration and a variety of different size antennas and frequencies.
<table>
<thead>
<tr>
<th>MODEL</th>
<th>MSS-90</th>
<th>MSS-90C</th>
<th>MSS-120</th>
<th>MSS-150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflector Diameter</td>
<td>.9M</td>
<td>.9M</td>
<td>1.2M</td>
<td>1.5M</td>
</tr>
<tr>
<td>Frequency (GHz)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TX</td>
<td>13.75 -14.5</td>
<td>13.75 -14.5</td>
<td>13.75 -14.5</td>
<td>13.75 -14.5</td>
</tr>
<tr>
<td>RX</td>
<td>10.95 - 12.75</td>
<td>10.95 - 12.75</td>
<td>10.95 - 12.75</td>
<td>10.95 - 12.75</td>
</tr>
<tr>
<td>GAIN (dBi)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TX</td>
<td>41.5</td>
<td>41.5</td>
<td>43</td>
<td>46.5</td>
</tr>
<tr>
<td>RX</td>
<td>40.5</td>
<td>40.5</td>
<td>41.5</td>
<td>45</td>
</tr>
<tr>
<td>VSWR</td>
<td>1.5:1</td>
<td>1.5:1</td>
<td>1.3:1</td>
<td>1.3:1</td>
</tr>
<tr>
<td>Range of Motion (degree)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevation</td>
<td>-10 to +190</td>
<td>-10 to +190</td>
<td>-10 to +190</td>
<td>-10 to +190</td>
</tr>
<tr>
<td>Azimuth</td>
<td>+/-180</td>
<td>+/-180</td>
<td>+/-180</td>
<td>+/-180</td>
</tr>
<tr>
<td>Tilt</td>
<td>+/-90</td>
<td>+/-90</td>
<td>+/-90</td>
<td>+/-90</td>
</tr>
<tr>
<td>Polarization</td>
<td>+/-90</td>
<td>+/-90</td>
<td>+/-90</td>
<td>+/-90</td>
</tr>
<tr>
<td>Accuracy</td>
<td>+/- 0.2 deg</td>
<td>+/- 0.2 deg</td>
<td>+/- 0.2 deg</td>
<td>+/- 0.1 deg</td>
</tr>
<tr>
<td>Controller Style</td>
<td>Remote</td>
<td>Integral</td>
<td>Remote</td>
<td>Remote</td>
</tr>
<tr>
<td>Power</td>
<td>120V 2A</td>
<td>120V 2A</td>
<td>120V 4A</td>
<td>120V 8A</td>
</tr>
<tr>
<td></td>
<td>RS-422</td>
<td>RS-422</td>
<td>RS-422</td>
<td>RS-422</td>
</tr>
<tr>
<td></td>
<td>RS-485</td>
<td>RS-485</td>
<td>RS-485</td>
<td>RS-485</td>
</tr>
<tr>
<td>Weight (lbs)</td>
<td>80</td>
<td>70</td>
<td>90</td>
<td>120</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-6C to +45C</td>
<td>-6C to +45C</td>
<td>-6C to +45C</td>
<td>-6C to +45C</td>
</tr>
<tr>
<td>Humidity</td>
<td>0 to 100%</td>
<td>0 to 100%</td>
<td>0 to 100%</td>
<td>0 to 100%</td>
</tr>
<tr>
<td>Windload</td>
<td>30 MPH</td>
<td>30 MPH</td>
<td>30 MPH</td>
<td>30 MPH</td>
</tr>
<tr>
<td>Regulatory Compliance</td>
<td>ETSI UK90CM</td>
<td>ETSI</td>
<td>INTELSAT/FCC</td>
<td>INTELSAT/FCC</td>
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<tr>
<td></td>
<td>EUTELSAT</td>
<td>EUTELSAT</td>
<td>EUTELSAT</td>
<td>EUTELSAT</td>
</tr>
<tr>
<td>Antenna Type</td>
<td>Offset Prime focus</td>
<td>Offset Cassegrain</td>
<td>Offset Prime focus</td>
<td>Offset Prime focus</td>
</tr>
</tbody>
</table>
TRAILER SYSTEMS

The TR antenna system series are mobile systems that combine various antennas and masts onto trailers. These systems are used for temporary antenna sites and provide flexibility of deployment.

The mast is winch-operated and can be held at constant height for extended periods. The trailers have extendable outriggers for stability and the masts have guy wires for increased wind loads.

ARA can provide these trailers with a variety of standard and custom antennas. ARA can provide options of remote computer control, height positioning and RF cables.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>TR-20-LCA-2010/A</th>
<th>TR-70-LPC-6240</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mast Height</td>
<td>20 feet</td>
<td>70 feet</td>
</tr>
<tr>
<td>Antenna</td>
<td>4 element array of dual polarized Log Periodic antennas</td>
<td>Dual polarized Log Periodic antenna</td>
</tr>
<tr>
<td>Frequency</td>
<td>240-1000 MHz</td>
<td>60-240 MHz</td>
</tr>
<tr>
<td>Gain</td>
<td>10-12 dBi</td>
<td>6 dBi</td>
</tr>
<tr>
<td>Power</td>
<td>500W CW</td>
<td>500W CW</td>
</tr>
<tr>
<td>Input</td>
<td>N-female</td>
<td>N-female</td>
</tr>
</tbody>
</table>