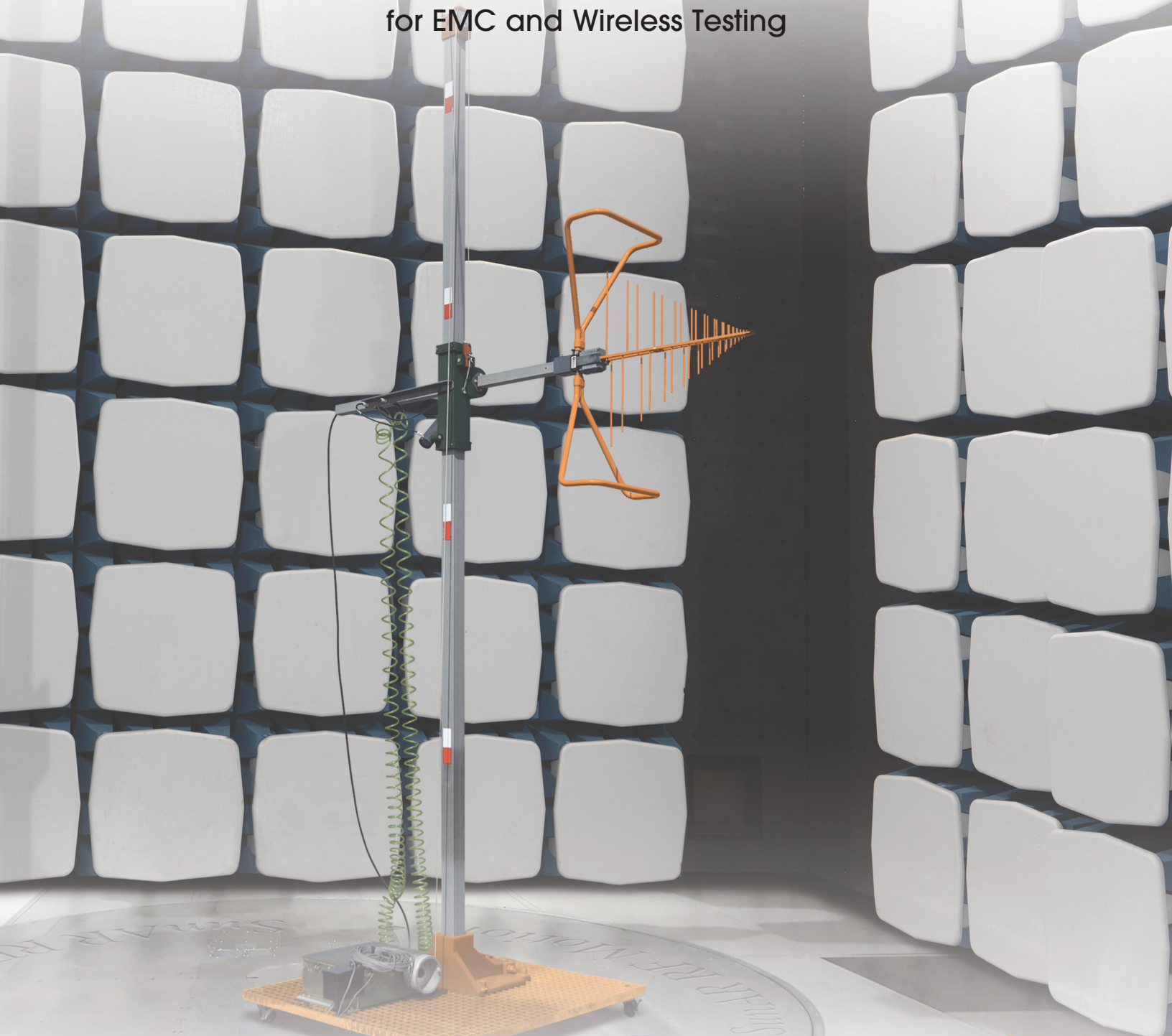




# High Performance, High Quality Positioning Equipment & Antennas

for EMC and Wireless Testing



# SunAR RF Motion

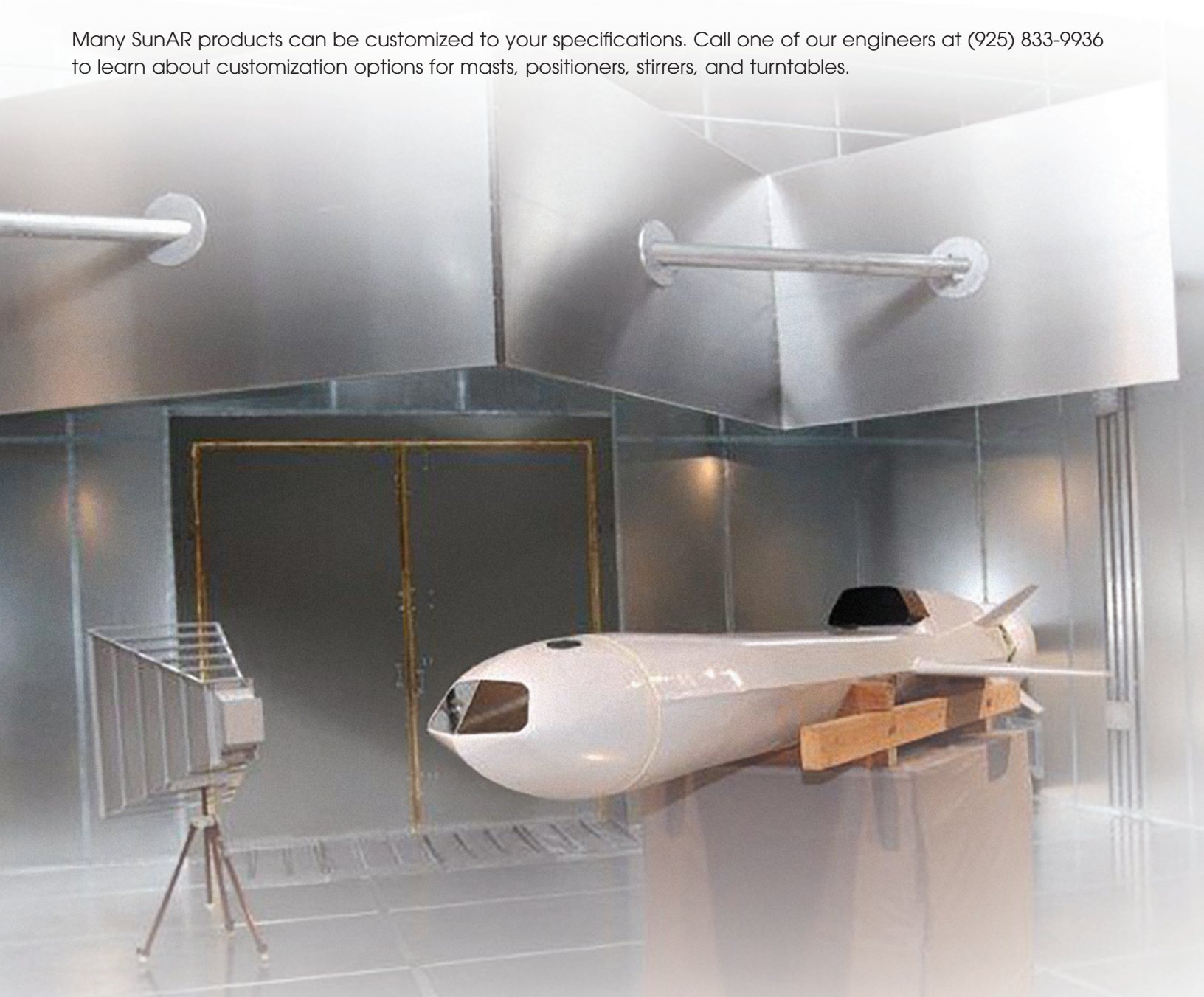
## Manufacturers of Positioning Equipment and Antennas for EMC and Wireless Testing

The SunAR RF Motion product line includes precision positioners for EMC testing, antenna measurements, and OTA testing; antennas for EMC and wireless testing, distributed antenna systems (DAS); turntables; and reverberation system design and stirrers for EMC, shielding effectiveness and OTA testing. Formerly known as Sunol Sciences, the Dublin, CA-based company has built a reputation for providing reliable, high performance and high-quality products; characteristics that make it a perfect fit for AR.

### Product Overview

- Full line of standard products
- Scalable designs for specific applications
- Turntables
- Antenna masts / positioners / stands
- Reverberation chamber stirrers
- Antennas
  - EMC and wireless testing
  - Distributed antenna systems (DAS)
- System controllers

Many SunAR products can be customized to your specifications. Call one of our engineers at (925) 833-9936 to learn about customization options for masts, positioners, stirrers, and turntables.



# Reverberation Chamber Stirrers and Tuners

## Features

- Proven designs
- Scalable designs for existing chambers
- High performance
- High precision
- No detectable shakedown
- Servo-motor driven
- Variable speed
- Linear or s-curve acceleration
- Fully programmable
- Manual or automated operation
- Homing function
- Stirring-only models available

# System Controllers

## SC110V

- .01 cm or degree resolution
- TTL Triggering

## Features

The Model SC100V system controller provides fully independent control of up to three positioning devices and three auxiliary devices.

## Configuration Options

Purchase one, two, or three module units; each module has one channel of full device control plus one auxiliary channel.



# Turntables

## Flush Mount Turntables For EMC Testing

### Features

- Advanced, low-maintenance grounding scheme
- Pit ring with self-cleaning ground plane interface (optional square interface)
- Exceeds site attenuation requirements
- Positioning switch located at turntable
- Variable speed standard
- Custom sizes and load ratings available
- All metal construction
- Variety of deck-mounted component options
- Precision —  $<.5^\circ$  (greater precision optional)
- Manual and remote operation
- Gear driven
- Scan or continuous rotation
- Extremely low maintenance
- Adjustable height
- Fiber-optic interface

### Flush Mount Turntables – Standard Models

Model Number (VS-variable speed)	Diameter, m (ft.)	Distributed Load, kg (lb.)	Caster Load,* kg (lb.)	Min. Pit Depth, mm (in.) **
FM410VS	1.2 (4.0)	500 (1,100)	125 (275)	300 (11.8)
FM1505VS	1.5 (4.9)	500 (1,100)	125 (275)	300 (11.8)
FM1511VS	1.5 (4.9)	1,000 (2,200)	250 (550)	300 (11.8)
FM2005VS	2.0 (6.6)	500 (1,100)	125 (275)	300 (11.8)
FM2011VS	2.0 (6.6)	1,000 (2,200)	250 (550)	300 (11.8)
FM2022VS	2.0 (6.6)	2,000 (4,400)	500 (1,100)	300 (11.8)
FM2044VS	2.0 (6.6)	4,000 (8,800)	1,000 (2,200)	410 (16)
FM2066VS	2.0 (6.6)	6,000 (13,200)	1,500 (3,300)	410 (16)
FM2522VS	2.5 (8.2)	2,000 (4,400)	500 (1,100)	300 (11.8)
FM2544VS	2.5 (8.2)	4,000 (8,800)	1,000 (2,200)	410 (16)
FM3022VS	3.0 (9.8)	2,000 (4,400)	500 (1,100)	300 (11.8)
FM3044VS	3.0 (9.8)	4,000 (8,800)	1,000 (2,200)	410 (16)
FM3066VS	3.0 (9.8)	6,000 (13,200)	1,500 (3,300)	410 (16)
FM4044VS	4.0 (13.1)	4,000 (8,800)	1,000 (2,200)	460 (18)
FM4066VS	4.0 (13.1)	6,000 (13,200)	1,500 (3,300)	460 (18)
FM5044VS	5.0 (16.4)	4,000 (8,800)	1,000 (2,200)	460 (18)
FM5066VS	5.0 (16.4)	7,000 (15,400)	1,750 (3,850)	460 (18)
FM7066VS	7.0 (23.0)	6,000 (13,200)	1,500 (3,300)	460 (18)

\* Caster Load is defined as the load evenly distributed on four casters, each separated by at least 46 cm (18 in.)

\*\* Low-profile models, custom sizes and weight capacities available – consult factory

## Surface Mount Turntables

### Features

- No pit required
- Indoor/outdoor
- Non-slip drive belt
- Cable access between turntable top and bottom
- Fiber-optic interface
- Self-cleaning, fixed rollers
- Non-conductive
- No drive shaft increases position accuracy
- Variable speed standard
- Motor box to table separation optional and customer specified
- $<0.5^\circ$  position accuracy
- Electrically-shielded motor box

### Surface Mount Turntables – Standard Models

Model Number	Diameter	Running Load	Table Top Height
SM46C	1.2 m (4 ft.)	800 lb.	2 in. (5 cm)
SM411C	1.2 m (4 ft.)	1,100 lb.	3 in. (7.6 cm)
SM2015C	2 m	1,500 lb.	3 in. (7.6 cm)



## FS121

### Free-Space Turntable

#### Features

- 12 in. diameter deck
- Non-conductive deck and riser
- 36 in. height (customer specified)
- EUT load rating: 10 lb.
- Variable speed: 0–6 rpm
- Soft start/stop
- <math><1^\circ</math> resolution and repeatability
- Low RF cross section
- Portable
- RS-232 control from PC
- Hollow riser tube for cable access
- Simple ASCII command set
- Precision stepper motor drive
- Electromechanical home switch
- 120 or 230 VAC, 50–60 Hz

#### Options

- Fiber-optic interface

## FS-241

### Free-Space Turntable

#### Features

- Diameter: 24 in. (custom diameters available)
- Height at deck: to be specified by customer (15 in.–96 in.)
- Distributed load capacity: ~45 kg (100 lb.)
- Rotation speed: Variable at 0.5, 1.0, 2.0, ~2.2 rpm (custom speeds available)
- Speed may be selected either by pushing a single button on the front panel of the System Controller or by sending a command to the System Controller via the GPIB port (customized control available)
- Position resolution: <math><0.25^\circ</math>
- All material beyond the motor box is nonconductive
- Cables may be routed between the rotating deck and its base
- Power requirement: 115 VAC / 230 VAC, 50/60 Hz, single phase, 4A

Model FS121  
Free-Space Turntable



# Antennas

SunAR RF Motion antennas feature an innovative design philosophy that makes them the practical choice for EMC testing. New manufacturing techniques simplify assembly and minimize the use of hardware, creating an electrically-stable measuring instrument that stays in calibration and holds up to the environment.

## JB Series

### Broadband EMC Test Antennas

30 MHz–6 GHz

#### Applications

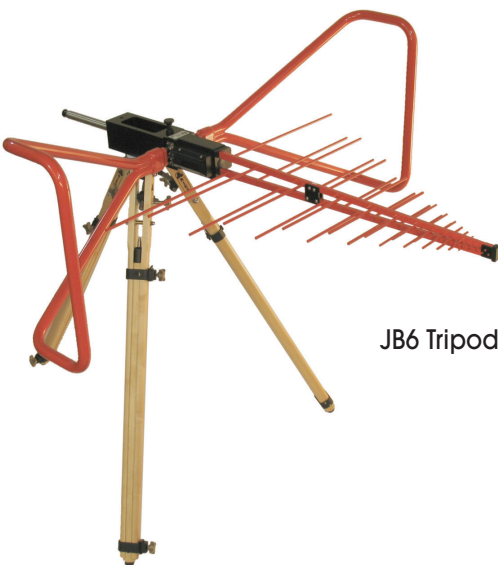
- Radiated Emissions
- Radiated Immunity
- Pre-Scan/Full Compliance

#### Features

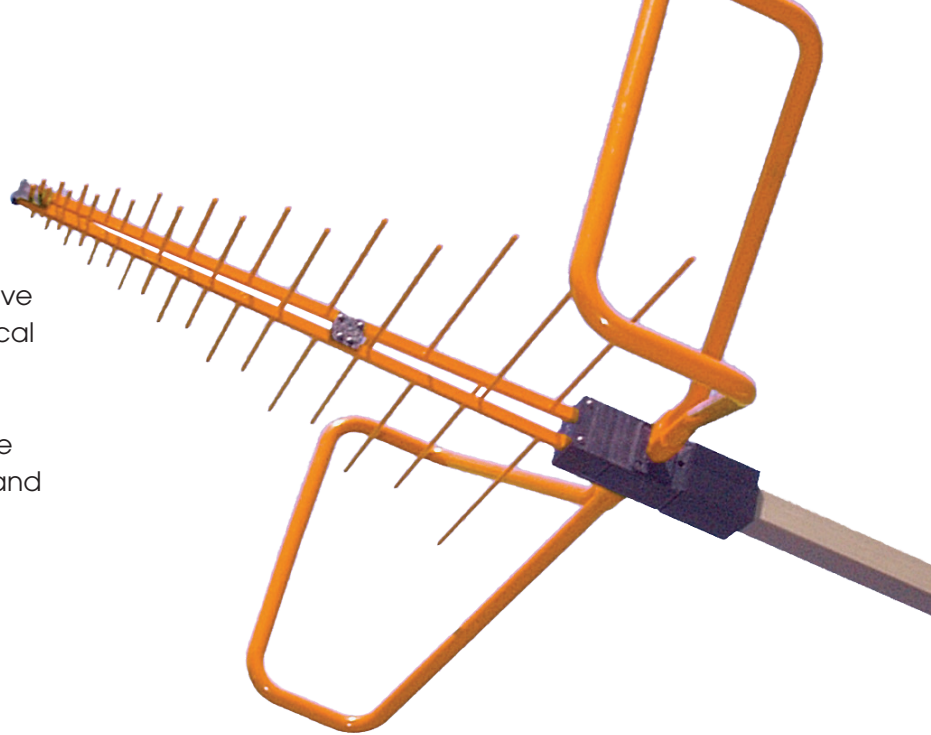
SunAR RF Motion JB Series antennas are compact, high-performance instruments designed for EMC emissions and immunity testing. The broadband characteristics of these antennas enable them to operate over a wide frequency range—a must for automated test environments. Innovative design and manufacturing techniques result in long-lasting strength and mechanical integrity. The result is an electrically-stable measuring instrument that maintains calibration over extended use.

### Broadband EMC Test Antennas

JB Series Antennas	Frequency Range
JB1	30–2,000 MHz
JB3	30–3,000 MHz
JB6	30–6,000 MHz



JB6 Tripod



## LP Series

### Log-Periodic EMC Antennas

30 MHz–5 GHz

#### Applications

- Radiated Emissions
- Radiated Immunity
- Pre-Scan/Full Compliance

#### Features

SunAR RF Motion log-periodic antenna booms are made from a custom aluminum extrusion that reduces the number of parts at the front of the antenna, resulting in a stronger, more stable feedpoint. The unique shape allows for a larger feed cable to be used, which significantly increases the maximum power rating. Dipole elements are permanently attached to the boom by a construction technique that maintains excellent electrical characteristics for the life of the antenna. A tough powder-coat finish with UV inhibitors seals the aluminum structure and protects it from sunlight and moisture. Includes individual A2LA accredited calibration.

### Log-Periodic Antennas — 200 MHz–2, 3, 5 GHz

LP Series Antennas	Frequency Range
LP1	2 GHz
LP3	3 GHz
LP6	6 GHz

**LP80, LP100**  
**Directional Antennas**

80 MHz–3 GHz  
 100 MHz–3 GHz

**Applications**

- EMC Radiated Emissions
- EMC Radiated Immunity
- Signal Monitoring and Detection

**Features**

Model LP80 & LP100 are directional antennas designed for transmitting and receiving RF signals from 80 or 100 MHz to 3 GHz. The broadband characteristics of the log-periodic structure enable it to operate with a nearly constant gain and radiation pattern over the entire frequency range.

Innovative design and manufacturing techniques result in long-lasting strength and performance. The antenna boom is made from a custom aluminum extrusion that reduces the number of mechanical RF junctions. Dipole elements are attached to the boom by a technique that maintains excellent electrical characteristics for the life of the antenna. A tough powder-coat finish with UV inhibitors seals the aluminum structure and protects it from sunlight and moisture.

The LP80 & LP100 have a rear tube that allows polarization adjustments without changing antenna height. This also minimizes the effect of the RF cable by keeping it well behind the antenna elements. The SNAP! mount provides a secure interface to antenna positioning towers. It locks the antenna in place and prevents unwanted rotation during polarization changes.



**LP Series**  
 Directional Antennas  
 80 MHz – 6 GHz

**LP60**  
**Directional Antennas**

400 MHz–6 GHz

**Applications**

- EMC and wireless testing
- Site survey
- In situ testing

**Features**

Our low-profile directional antennas are designed for EMC and wireless testing applications from 400 MHz to 6 GHz and beyond. These antennas are etched on a low-loss microwave substrate. The broadband, log-periodic structure enables operation over a very wide frequency range with constant gain. Innovative design and manufacturing techniques result in long-lasting performance.

A stainless steel rear mounting tube aids in mounting and handling. An optional Polarization Mount (pictured) is available for use with a tripod or permanent fixture. Kits available.

**Directional Antennas**

Model	Frequency Range	Typical Gain
LP430	400 MHz–3 GHz	5 dBi
LP460	400 MHz–6 GHz	5 dBi
LP6530	650 MHz–3 GHz	7 dBi
LP760	700 MHz–6 GHz	6 dBi
LP60	1.3–6 GHz	6 dBi

# Antennas (Continued)

## PD Series

### Precision Dipole Antennas

450 MHz–3 GHz

#### Applications

- Signal Injection
- EMC and Wireless Testing
- Signal Monitoring and Detection

#### Features

Our PD Series Precision Dipoles are narrowband, resonant antennas that are designed for transmitting and receiving RF signals at specific frequencies. They are manufactured in accordance with ANSI/AAMI PC69:2000. Each dipole is one-half wavelength long at its frequency of operation and contains a series-parallel coaxial stub balun that meets rigid specifications. Dipoles cut to custom frequencies are available upon request.

An optional polarization mount is available for use with a tripod or permanent fixture.

#### Precision Dipole Antennas

Model	Center Freq.
PD450	450 MHz
PD600	600 MHz
PD800	800 MHz
PD825	825 MHz
PD850	850 MHz
PD875	875 MHz
PD900	900 MHz
PD930	930 MHz
PD1500	1,500 MHz
PD1610	1,610 MHz
PD1850	1,850 MHz
PD1910	1,910 MHz
PD2450	2,450 MHz
PD3000	3,000 MHz



## DRH Series

### Broadband Horn Antennas

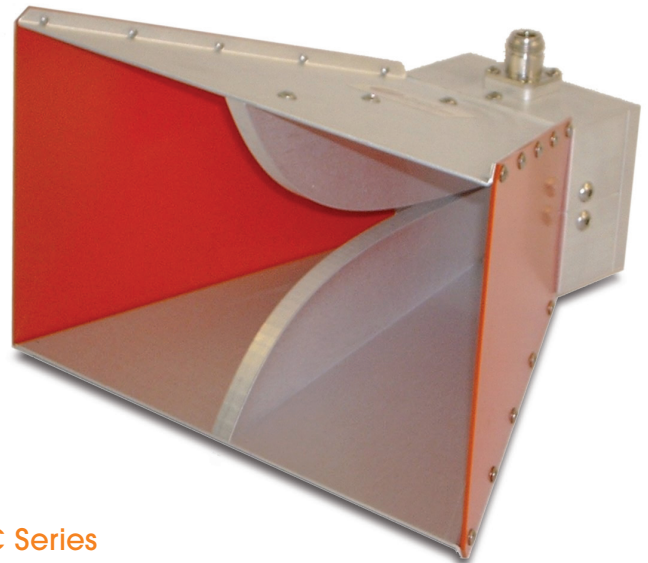
1 GHz–40 GHz

#### Applications

- Radiated Emissions
- Radiated Immunity
- Pre-Scan/Full Compliance

#### Features

SunAR RF Motion double-ridged horn antennas are ideal for high power radar stations, phased array and broadband jamming systems as well as for RFI/EMI testing. Due to the wide beam width, the DRH Series are compliant with many military and commercial emissions standards. They are compact and lightweight for easy mobility yet tough enough to withstand the extra demands of outdoor use.



## BC Series

### EMC Biconical Antennas

30 MHz–300 MHz

#### Applications

- Radiated Emissions
- Radiated Immunity
- Pre-Scan/Full Compliance

#### Features

SunAR RF Motion antennas feature an innovative design philosophy that makes them the practical choice for EMC testing. New manufacturing techniques simplify assembly and minimize the use of hardware, creating an electrically-stable measuring instrument that stays in calibration and holds up to the environment.



# DAS: Distributed Antenna Systems

SunAR RF Motion broadband directional antennas are designed for transmitting and receiving wireless communications signals. The broadband characteristics of the log-periodic structure enable it to operate over a very wide frequency range with constant gain. Our innovative design and manufacturing techniques result in long-lasting strength and performance.

Our standard directional antenna features a log-periodic structure and includes dipole elements and a universal mounting bracket for easy installation. Its metal alloy construction reduces the number of mechanical RF junctions and keeps PIM (Passive Intermodulation) to a minimum. Permanently attached dipole elements allow a stronger, more stable feedpoint with a low VSWR. The radome cover (UL94VO flame rated) and optional UV-inhibiting powder-coat finish offer exceptional protection.

Our low-profile directional antennas are etched onto low-loss microwave substrate material with options for outdoor rated and half inch thick water-resistant housing. Dielectric and reactive loading of the antenna elements reduce the overall size of certain models. For these, the antenna is mounted in a protective housing that is only 1 cm thick. Every low-profile directional antenna is designed with four mounting holes for simple installation on to any flat nonconductive surface, such as an office wall or ceiling. Contact our factory for guidance on mounting antennas to concrete or other surfaces.

## Applications

- Distributed Antenna Systems (DAS)
- Cellular
- Wi-Fi
- Public Safety Bands

## Broadband Directional Antennas

Model	Frequency Range	Typical Gain
LP425	400 MHz-3 GHz	7 dBi
LP425PCB	400 MHz-3 GHz	5.5 dBi
LP425PCB-O-DIN	400 MHz-3 GHz	5.5 dBi
LP460PCB	400 MHz-6 GHz	5-6 dBi
LP6530PCB	650 MHz-3 GHz	7 dBi
LP6560PCB	650 MHz-6 GHz	6 dBi



**Model LP6530PCB**  
Broadband 650 MHz - 3 GHz  
Directional DAS Antenna



**Model LP425**  
Broadband 400 MHz - 3 GHz  
Directional DAS Antenna

# Antenna Masts & Positioners

## TWR99, TWR95

### Motorized Antenna Positioning Towers

#### Standard/Compact Antenna Towers

##### Features

- 1–2.5 m (TWR99) and 1–4 m (TWR95) antenna height standard, 1–6 m optional
- Electric height adjustment
- 1 cm height resolution, 0.1 m/sec speed
- Low-stretch polyester rope suspension (750 lb. breaking strength)
- Pneumatic polarization, 0–90°, standard (70–150 PSI CDA required), ¼ in. NPT male hose needed
- Safety brake
- Zero maintenance
- Total height (2.5 m scan): 116 in. (~295 cm)
- Total height (4 m scan): ~180 in. (~457 cm)
- Absolutely no conductive material above motor box
- Strong, stable construction
- Fiber-optic interface standard (62.5/125 duplex ST)
- Height and polarization switches located at tower
- Molded one-piece foot and trolley for greater strength, durability
- Easy assembly/disassembly
- Maximum antenna load (may require counterweight):
  - TWR95: 35 lb. (~16 kg)
  - TWR99: 30 lb. (~14 kg)
- 120 V/230 VAC, 50/60 Hz, 6A/2x4A
- TWR95 base size: 48 in. x 48 in. (1.2 m x 1.2 m)
- TWR99 base size: 30 in. x 36 in. (.76 m x .76 m)
- Custom sizes and configurations available

## TLT2

### Bore-Sight Antenna Positioning Tower

SunAR RF Motion Antenna Positioning Towers feature innovative design and manufacturing concepts that result in great ruggedness, durability and performance at a competitive price. The new Model TLT2 provides a very stable platform for the largest and smallest EMC test antennas of all types. Variable speed with soft start & stop.

##### Features

- New trolley guide concept enhances azimuthal stability
- Dual load carriers give rigid, stable elevation under heaviest loads
- Stable boom extension allows proper focal point placement for any size antenna without moving tower
- Monolithic construction of major components results in unbreakable lifetime utility
- Absence of conductive material above the motor box minimizes the electro-magnetic cross section and minimizes coupling to antennas
- Materials are selected for resistance to UV radiation and resistance to water absorption
- Standard model is operated by a single, standard controller channel
- Developed for indoor and outdoor use

## TLT3

### Bore-Sight Antenna Positioning Tower

SunAR RF Motion Antenna Positioning Towers feature innovative design and manufacturing concepts that result in great ruggedness, durability and performance at a competitive price.

##### Features

- EUT distance: 1 m (worst case)
- Calibration point height: 4 m
- Tower height: 15 ft. 3 in.
- Taller towers for larger antennas available (contact us)

##### Arbitrary setup parameters

- EUT distance
- Bore-sight initiation height

## APS-1, APS-1EMP Antenna Positioner Stands

### Features

- Adjustable leveling casters
- Hard stops at 1, 1.5 and 2 m
- Fine height adjust
- Adjustable calibration point
- Remote controlled polarization
- Lightweight
- Disassembles easily
- Exceptionally stable

## EL75, ELAZ75 Elevation over Azimuth Positioners

### Features

- Allows for heavy EUT loads in both elevation (75 lb.) & azimuth (600 lb.)
- Variable speed in both elevation & azimuth
- Continuous rotation allowed in both elevation & azimuth (with optional components)
- Low RF cross-section materials above drive units
- Portable (no permanent installation necessary)
- Remote azimuth drive option
- Height customer-defined
- Fiber-optic connections to controller (requires SC104V or SC110V System Controller)
- GPIB full control
- Custom EUT mounts



### Request Service

For an applications engineer, call  
800-933-8181 or email  
[applications@arworld.us](mailto:applications@arworld.us)

Direct-to-Service, call  
925-833-9936 or email  
[sunarinfo@arworld.us](mailto:sunarinfo@arworld.us)

# AR's Competitive Edge

At AR, there's no substitute for customer responsiveness. It's the foundation of our business and the AR value that's recognized around the globe. It's one of the key reasons AR has become the worldwide leader in EMC, wireless and beyond.

AR products do more, last longer, work harder, and make your job easier. And that gives you a fierce competitive edge. Only AR delivers innovative technology, advanced design, quality build & workmanship, mismatch capability, durability & longevity, less cost per watt, and a worldwide support network that's here for you today and tomorrow.

With the combined resources of all the AR companies, we simply have more of the best people making the products to overcome your toughest challenges.

## SunAR RF Motion

- Positioning equipment, turntables, and towers
- Distributed antenna systems
- Reverberation chamber stirrers
- EMC test antennas

## AR RF/Microwave Instrumentation

- RF solid state amplifiers 1–50,000 watts, dc to 1 GHz
- Microwave amplifiers 1–10,000 watts, 0.8 to 50 GHz
- Antennas to 15,000 watts input power, 10 kHz to 50 GHz
- RF conducted immunity test systems
- EMC test software
- EMC & RF test accessories
- Power measuring equipment
- Positioning equipment
- Chambers
- Accessories

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## AR Modular RF

- Tactical booster RF amplifiers for military radios
- RF amplifiers and modules for industrial, medical, scientific and communication applications
- RF rack mount amplifiers for industrial, medical, scientific and communication applications

## AR Europe

- Offering a complete line of RF products and testing solutions for the European market

Want to know more about AR? Need help with any RF solutions or testing procedures?

Here's how to reach AR and get all the help you need:

[www.arworld.us](http://www.arworld.us)

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AR United Kingdom +44 1908 282766

AR RF/Microwave Instrumentation is ISO Certified.



## AR Global Promise

*The AR warranty is more than just a warranty, it's a promise, backed by a knowledgeable support team that's always there for you to help solve any problems and answer any questions, today and tomorrow. AR warrants its amplifiers, antennas, test systems, power meters, field monitoring equipment, conducted immunity generators, couplers and tripods to be free of defects in materials and workmanship for a period of three years from date of shipment. Vacuum, traveling wave tubes and powerheads carry a one year warranty.*