

SOLUTION GUIDE

Defense and Military Antennas



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RADIALL 
The next connexION



COMPANY Profile

Founded in 1952 in France, Radiall started as a family owned company making coaxial plugs. Today, Radiall is an international and global manufacturer of interconnect components including **RF coaxial connectors and cable assemblies, antennas, fiber optic components, microwave components, and multipin connectors** for the Automotive, Civil Aviation, Defense, Industrial, Medical, Space and Telecommunication markets.



QSE (Quality Safety Environment) POLICY

Radiall maintains a quality management system conforming to international standards, including for environmental protection. Our customers' recognition for the quality of our products and the sustainability of our company, demonstrates the efficiency of our quality system.



CERTIFICATIONS

Certified ISO 9001 since 1994, Radiall has a pro-active policy in terms of conforming to international standards. Today, all Radiall sites are certified to **ISO 9001:2000** and some

dedicated activities are AS9100 or TS 16949. Our process approach gives us the tool for continuous improvement in all our activities.



A major step in our environment policy was the **ISO 14001** certification in 2001 of the Voreppe plant. Radiall complies with European directives such as **RoHS** for hazardous substance restrictions and **EuP** for environmentally friendly designs for energy-using products.

Some Radiall product lines are on **MIL, ESA/SCC** Qualified Product Lists.

Radiall is consequently proud to be recognized by leading industrial customers for the quality of its service and products.



A WORLDWIDE ENGINEERING & MANUFACTURING CAPABILITY

With expertise centers and manufacturing locations in 3 continents. Radiall offers its customers, through 12 industrial sites, the proximity they need to obtain the best quality of service and delivery performance. Our facilities feature state of the art equipment for the many technologies involved in the design, manufacturing and assembly of interconnect products. Manufacturing plants based in **China, India, Tunisia** and **Mexico** give the opportunity to offer Radiall quality at competitive prices.

Technical information and sales contacts are available on: www.radiall.com

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Photographs by courtesy of the US "Department of Defense".

Need antenna solutions for your applications? Radiall offers a complete line of antennas for the modernization of the military market, as well as for the aeronautic and instrumentation markets.

ITAR COMPLIANCE

Radiall is committed to being compliant with the requirements of International traffic in Arms Regulations. From the securing of all controlled documents, to maintaining a database of released personnel, we are dedicated to insuring the protection of our clients.

Radiall operates two facilities for the design and manufacturing of antennas; one in France, serving customers for Europe and Asia, one in Connecticut, USA, serving customers in North America. Each facility is fully equipped with anechoic chamber and characterization instruments.

Our Antennas are designed to meet MIL-STD-810F.



MIL-STD-810F/IPC-610/DEF-STAN335



PROVEN RELIABILITY

Radiall is the premier innovator of antenna products for a wide variety of military and defense applications including: handheld radio, man-pack radio, unmanned aerial vehicles, unmanned ground vehicles, unattended ground sensors, GPS, low-power base stations and other antennas in support of the digital battlefield. Radiall supports also the aeronautics and instrumentation markets by providing a range of portable and low profile antennas.

RAPID PROTOTYPING SYNERGY

Each antenna design represents the best compromise between electrical and mechanical technologies. Our goal is to meet or exceed all design objectives of the customer. Special mechanical capabilities involve the use of advanced materials in the antenna design, including insert and over molded techniques.

Through our modular antenna concept, we are able to reduce our engineering cycle time and can provide models and prototypes to our customers in a short lead-time. Our mechanical design data is documented in three-dimensional models using SolidWORKS®.

The impact of the mechanical design is determined through a rigorous testing and validation process. Advanced electrical antenna design represents the core of our business. Superior electrical performance goals of each antenna design are paramount in meeting the total design objectives.



Electrical design progress from the theoretical to the practical through the use of advanced computer simulation, prototype and testing. With these two being balanced together, Radiall has the capability for rapid and accurate design prototyping. These capabilities are maintained on-site to allow quick response to new antenna development projects. Our use of high-technology tools for antenna performance simulation and three-dimensional modeling allow for accurate and durable designs to be developed in a fraction of the time required a few years ago. Full production capabilities further extend our ability to rapidly produce prototypes and first articles.



CUSTOM HIGH TO LOW PRODUCTION

Radiall can quickly satisfy most antenna requirements. Full custom design is a ready option when the design parameters are highly specific or have proprietary intent. Working closely with our customers, we bring projects to completion on target and often within compressed time schedules.

With years of experience in design projects, Radiall has the ability to work with customers to quickly determine their needs.

Each new antenna design begins with careful development of the mechanical and electrical performance objectives. A proposal is then prepared detailing feasibility, timing and unique costs. When applicable, design times and costs are quoted in "not to exceed" limits.

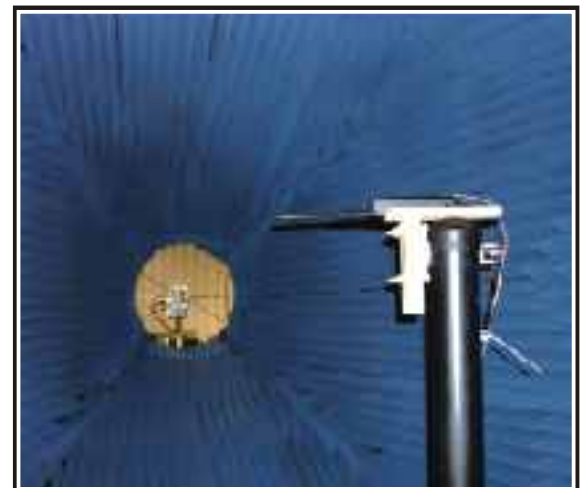


VALUE ADDED SERVICE, COMPLETE RF TESTING

Radiall maintains a fully equipped, aerospace-rated environmental test facility with the capability to validate designs through exposure to all extreme conditions. Test & qualification capabilities include: corrosion, salt, mist, industrial atmosphere gas, humidity, high temperature endurance and thermal shocks. Measurement capabilities include: axial ratio, 3D-radiation diagrams, gain, magnitude and phase center, efficiency and direct or cross polarization.

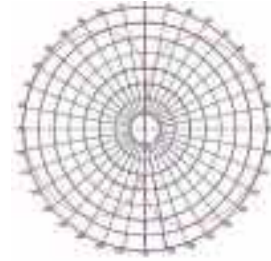
- Two anechoic chambers operating from 100 MHz to 13.5GHz
- Vectorial network analyzers
- Control of positioning axis device.

We sell testing services for your antennas.



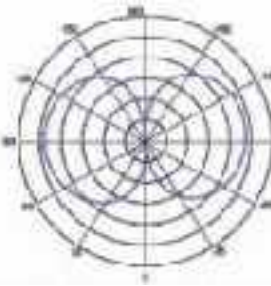
HANDHELD ANTENNAS

FLEXIBLE VHF BLADE ANTENNA



Construction	Frequency	Weight
<ul style="list-style-type: none"> • 1meter blade antennas • Flexible gooseneck assembly • Water resistant to 20 meters • Length: 1200 mm approx 	<ul style="list-style-type: none"> • VHF frequency band from 30-512 MHz 	<ul style="list-style-type: none"> • From 7oz. to 9oz

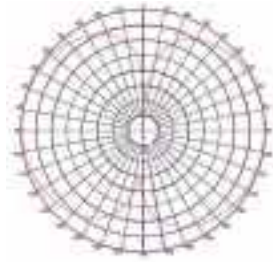
FULLY OVERMOLDED BROADBAND



Construction	Frequency	Weight
<ul style="list-style-type: none"> • Flexible, rugged whip 	<ul style="list-style-type: none"> • Wide range of frequencies from 30-512 MHz 	<ul style="list-style-type: none"> • From 2.5 oz to 3.9 oz

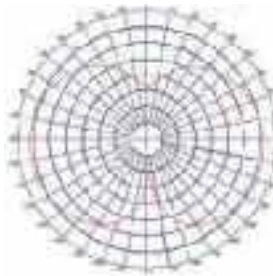
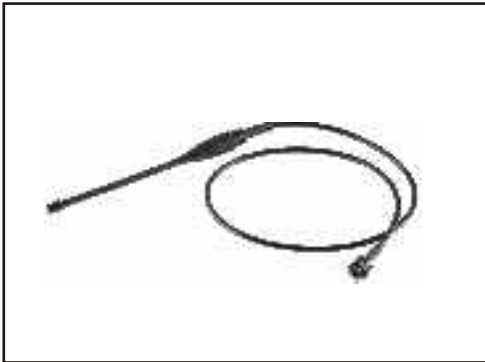
HANDHELD ANTENNAS

TAPE



Construction	Frequency
• Tape blade	• Typically UHF Band

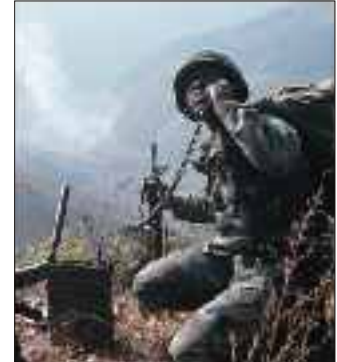
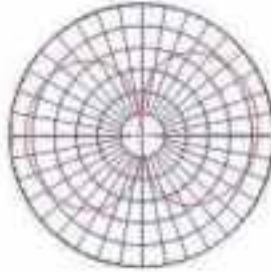
PORTABLE / REMOTE



Construction	Frequency
• Over molded design	• Range or frequencies from 225 to 1000 MHz

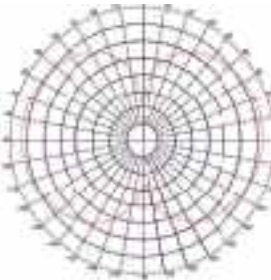
MAN PORTABLE ANTENNAS

MAN-PACK CONFIGURATION



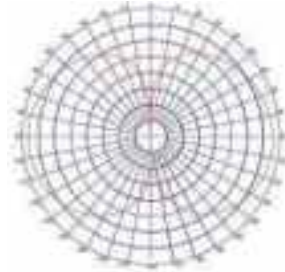
Construction	Frequency
<ul style="list-style-type: none"> • Night Stick w/ Ball joint • Rugged design • Pivots 90°/ Ball joint or spring joint articulation 	<ul style="list-style-type: none"> • VHF/UHF Band

MONOPOLE ANTENNA WITH GOOSENECK



Construction	Frequency
<ul style="list-style-type: none"> • Monopole Antenna with Gooseneck Articulation 	<ul style="list-style-type: none"> • 100-512 MHz

SHRINK TUBE ANTENNA



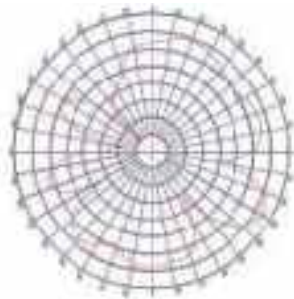
Construction	Frequency	Application
<ul style="list-style-type: none">• Flexible design• Flexible materials	<ul style="list-style-type: none">• Typical frequency range: 330-390 MHz	<ul style="list-style-type: none">• Snaps to radio• For Man Portable or Backpack combat search and rescue Radios

DIPPED ANTENNA



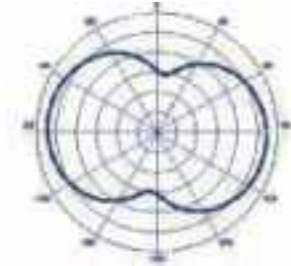
Construction	Frequency	Application
<ul style="list-style-type: none"> Whip Dipped Low Profile Low visibility design 	<ul style="list-style-type: none"> Variety of frequency bands: 138-174 MHz TNC and 406-470 MHz TNC 	<ul style="list-style-type: none"> Unmanned sensors Munitions systems UAV's

RIGHT ANGLE AND STRAIGHT DIPOLE



Construction	Frequency	Weight	Application
<ul style="list-style-type: none"> Dipole Swivel Mtg 	<ul style="list-style-type: none"> 1400/1800 MHz 	<ul style="list-style-type: none"> 29 grms and 1.4 oz 	<ul style="list-style-type: none"> UAV and ground Station Tactical data link

SENSOR ANTENNA



Construction	Frequency	Weight	Application
<ul style="list-style-type: none"> • Sensor Low Profile 	<ul style="list-style-type: none"> • 36-174 MHz TNC 	<ul style="list-style-type: none"> • 1.5 oz 	<ul style="list-style-type: none"> • For unattended Ground Sensor

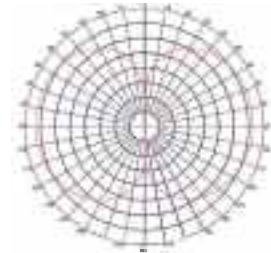
SINGLE AND MULTIBAND PORTABLE GPS



Construction	Frequency	Weight	Application
<ul style="list-style-type: none"> • Low profile package designs • Customizable gain and electrical parameters • Internal or externally mounted to any system • Single cable and connector 	<ul style="list-style-type: none"> • L1/L2 	<ul style="list-style-type: none"> • 70 grms 	<ul style="list-style-type: none"> • For networked soldier applications • GPS L1 L2 Passive & Active • GPS L1 Passive & active

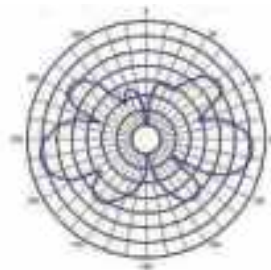
VEHICULAR ANTENNAS

VEHICLE MOUNT



Construction	Frequency
<ul style="list-style-type: none"> • Rugged design • Ball joint articulation • Spring loaded base 	<ul style="list-style-type: none"> • VHF/UHF MHz

COLINEAR ARRAY ANTENNA



Construction	Frequency	Weight	Application
<ul style="list-style-type: none"> • Spring Mount Base • Direct Connector Mast Mount 	<ul style="list-style-type: none"> • 1800 MHz Dual-Band 	<ul style="list-style-type: none"> • 665 grms 	<ul style="list-style-type: none"> • Unmanned ground Vehicle Networking operations

PMR ANTENNAS



Construction	Frequency	Application
<ul style="list-style-type: none"> • Ultra rugged antennas • Monopole construction • Length: from 45 to 90mm • Feeding: Contact or coaxial 	<ul style="list-style-type: none"> • From 380 MHz to 500 MHz (bandwidth from 30 to 50 MHz) 	<ul style="list-style-type: none"> • Homeland security

DIPOLE OVER MOLDED ANTENNA



Construction	Frequency	Application
<ul style="list-style-type: none"> • Ultra rugged antennas • Sleeve Dipole • SMA connector type • Length: less than 65 mm 	<ul style="list-style-type: none"> • 2.4-2.5 GHz 	<ul style="list-style-type: none"> • Handheld

SMART ARRAY ANTENNAS



Construction	Frequency	Application
<ul style="list-style-type: none"> • Beam steered antennas • Phased array antennas • Active and passive steering circuits with various commutation matrix • Sectorial, Omni-directional 	<ul style="list-style-type: none"> • L-band 	<ul style="list-style-type: none"> • Custom

INTERCONNECT FOR EXTERNAL ANTENNAS

Standard connector interface: SMA TNC, and BNC

All connectors are available in standard, reverse polarity or custom configuration. Specific corrosion resistant plating such as cadmium or black chromium is also available. Please consult our product catalogs.

Antenna side: straight, right angle or articulated plugs and jacks designed to connect the antenna on the equipment either directly or via a pigtail.

Equipment side: wide range of panel receptacles in bulkhead or flange mounts. We also offer very robust waterproof designs for outdoor applications.

QLF® quick lock interface: QMA, QN

These new interfaces are very popular among users for their quick and easy connection system. In addition, they are 360 degree rotatable while maintaining the electrical performance.

Radio switch

Radiall design custom switching connectors to allow an operator to easily switch between a device antenna and a remote antenna.

Dust caps

Designed to protect the interface when the antenna is not connected.

Switching connectors: Moebius, MC-Card

Designed to be used as a snap-on remote antenna connection for handheld devices. The switching connector achieves high RF performance and high durability.

INTERCONNECT FOR EMBEDDED ANTENNAS

PCB standard connectors: MMBX, MMCX, MCX, SSMB, SMP

Wide range of solder pins or SMT receptacles in straight or right angle configurations to be mounted on internal PCBs. Please consult our catalogs.

PCB pressure connectors: UMP

UMP is the smallest board to cable connector with 3 levels of retention and 3 different heights. The lock version cannot be disconnected without a specific tool, allowing a high security of connexion.



A global range

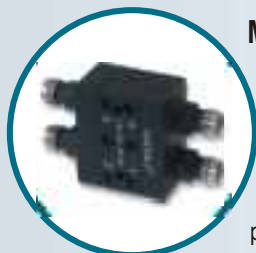
To meet your needs



ANTENNAS

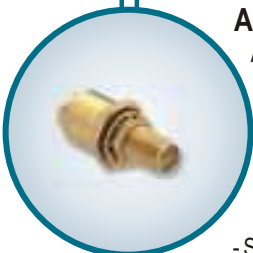
RADIALL develops and produces antennas for frequencies from 27 MHz to 6 GHz.

- Technologies used: wire, patch, printed, wire-plate, PIFA
- Numerous types of antennas: single pole, dipole, network, passive or active (with LNA), adaptable and intelligent, outdoor or integrated.



MICROWAVE COMPONENTS

Wide range of coaxial terminations and attenuators using standard interfaces (SMA, QMA, N, QN...) from low (1W) to high power (100W) and new cable load solution, chip terminations up to 18 GHz, hybrid or directional SMT couplers up to connectorized couplers, lightning protectors, detectors, rotary joints, phase shifters, DC Blocks...



AEP CONNECTORS

AEP, a Radiall US subsidiary, design RF connectors for the demanding requirements of military field radio and avionics systems:

- Coaxial waterproof connectors with a unique system of sealing.
- MIL-PRF-39012 QPL connectors
- SSMB and SSMC superior connectors
- SLB Self Aligning connector system.



MULTIPIN CONNECTORS

The range includes rack and panel connectors (Arinc 404 & MIL-C-81659B DSX, Arinc 600 NSX & SW280WS1 BPX, EN3682/MIL-C-83527 MPX JN1123 TCX), modular connector (EPX A & B), compatible with a large variety of contacts : signal, power, RF, data bus, fiber optic, quadrx and twinax.

A range of wire to wire and wire to board is also available: B & MCSR duty connectors, M, MM, MB, MBC rectangular miniature series, MMC.



FIBER OPTIC CONNECTORS

Wide range of interconnect solutions, including standard connector interfaces for multimode and singlemode fiber (LC, SC, FC, ST...) as well as connectors and terminations for harsh environment applications (aeronautic, military, naval, medical, railway...). Great flexibility for custom design.



MICROWAVE SUB-SYSTEMS

We design Filters, Duplexers, Splitters and Combiners, Switching matrix, interconnection racks and enclosures, Custom assemblies, ...

Our expertise includes Microwave passive systems design, Mechanical integration to customer environment, Thermal management, Cabling, wiring, harnessing, ...



HARNESSES

The combination of design and manufacturing of RF and microwave cables as well as multipin connectors (EPX, ARINC 404 and 600) allows Radiall to be a specialist of harnesses for on-board (aeronautic, navy...) or land (railways, removed antenna...) equipment or communications systems. All types of contacts can be used and mixed such as signal, power, RF, quadrx, fiber optic...



RF & MICROWAVE CABLE ASSEMBLIES

RG, Eco-Friendly, Handformable, Semi-rigid, SHF Ultra-low loss (General Interconnect, Outdoor, Airframe phase matching large choice of interfaces, Lightweight), ...



RF & MICROWAVE SWITCHES

Wide range of coaxial switching products for commercial, military and instrumentation applications. Available with a large choice of interfaces (SMA, QMA, N, ...), from DC to 40 GHz.

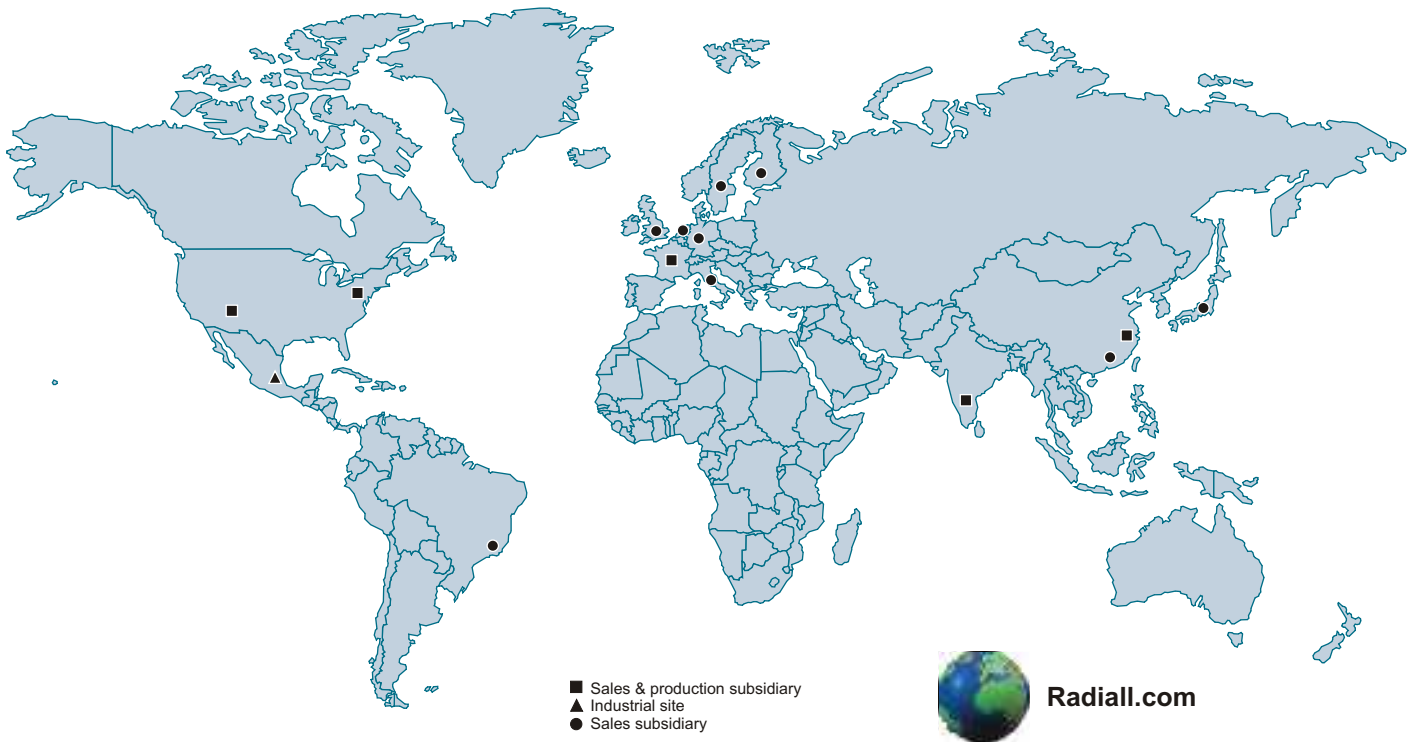
Main products:

- Standard RAMSES series.
- PLATINUM series with high repeatability (0.03dB) on insertion loss during 10 million actuations.
- Subminiature SPnT up to 26.5 GHz.
- SMT high power micro-SPDT.



RF COAXIAL CONNECTORS

The widest range of coaxial connectors in the world from microminiature (UMP) to standard connectors (7/16) covering the frequency range of DC to 65 GHz mixing standardized and custom interfaces (UMP, IMP, MMS, MMT, QMA, QN, MMBX).



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For the above countries, please contact the local agent or RADIALL at info@radiall.com

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This information is intended as a guide only. To ensure a continuing policy of product improvement, Radiall reserves the right to modify its specifications without prior notification.