

# Radio Frequency Systems

Your global partner for RF solutions



**RADIO FREQUENCY SYSTEMS**  
The Clear Choice®



# RFS: A worldwide leader in wireless and broadcast infrastructure



Radio Frequency Systems (RFS) is a worldwide designer and manufacturer of cable, antenna and tower systems, and active and passive RF conditioning modules. We provide comprehensive solutions for wireless and broadcast infrastructure.

As a global partner for RF solutions, RFS serves OEMs, distributors, systems integrators, operators and installers in the broadcast, wireless communications, land-mobile and microwave market sectors.

An ISO-compliant organization with manufacturing and customer-service facilities that span the globe, RFS offers cutting-edge engineering capabilities, superior field support and innovative product design.

RFS is committed to globally fulfilling the most demanding worldwide environmental protection directives and integrating green initiatives in all aspects of its business.



## Our markets, our customers

RFS addresses four main markets: wireless outdoor; wireless in-building and in-tunnel applications for transportation; broadcast; and defense. Although our customers face very different issues, we offer the specific capabilities our customers need:

➔ **Wireless operators and broadcast operators** need their networks to be robust, easy to install and environmentally friendly; they also seek to balance OPEX and CAPEX. RFS solutions help operators sleep well at night, by providing robust, cost-efficient systems that are easy to install and designed for evolving networks.

➔ **OEMs** span global markets and need suppliers that have the same footprint. RFS' products, systems and personnel can be found in every part of the world, enabling RFS to provide all the advantages of a global supplier.

➔ **RFS Channel Partners**, including systems integrators, distributors, value-added resellers, consultants and civil works contractors, want to make their offerings more comprehensive, more compelling and more competitive. They achieve this by adding the globally recognized and respected RFS name to their portfolio.





## A tradition of innovation

For over a century, RFS has been at the forefront of the wireless communication industry through its unwavering commitment to design and develop the world's most advanced technology in the field. Dedicated R&D teams, along with a privileged partnership with Bell Labs, are at the source of breakthroughs that are ensuring the mobility of an increasingly wireless world.

## A truly global company

With 8 manufacturing facilities, 5 R&D centers and over 30 sales offices and technical support centers around the world, RFS always meets its commitments, delivering a comprehensive range of premium products, systems and services. Its clients benefit from all the advantages of a global supplier, while relying on dedicated support from RFS' local staff in over 20 countries worldwide.

## Caring for the environment

At RFS, eco-sustainability is fundamental to our corporate culture. As a global group, we are committed to upholding the most stringent environmental, health and safety standards, and seek to integrate green initiatives in every aspect of our business. As your partner for eco-sustainable telecoms, RFS works with you to protect our planet.

## A guarantee of quality

From design to manufacture, ISO 9001 and ISO 14001 certification standards encompass all aspects of RFS' business worldwide. Every product RFS ships has stood up to the most stringent technical, environmental and quality control tests, continuously meeting and surpassing the expectations of a long list of wireless carriers, transportation and utility operators, and broadcasters.

## Excellence in services

Customers know they can count on RFS for comprehensive logistical capabilities, flawless execution and outstanding technical skills and support. The company's dedicated shipment coordinators, hotline staff and on-site engineers go well beyond mere technology, offering tailored solutions to meet even the most complex site-engineering and delivery challenges.



## The RFS mission

**Our mission is the design, manufacture and deployment worldwide of RF technology, systems and services. We are committed to meeting the highest quality standards for products and systems by applying advanced technologies in our manufacturing processes, project engineering and installation. We seek to be the preferred global supplier in wireless communications by serving our clients with superior customer service, state-of-the-art engineering capabilities, and innovative product solutions.**

# Innovating to meet customer needs

## Handling the surge in data traffic

RFS is at the frontier of wireless technology innovation, sustaining the boldest ventures to meet its customers' needs and to enhance the way people communicate and live.

The company has built a worldwide reputation for continuous innovation. RFS' solutions are the result of ongoing investments in R&D and a close working relationship with customers. This ensures that RFS products are designed to meet the demanding needs of network infrastructure today and the emerging communications requirements of tomorrow.

RFS innovations result in cost-effective, state-of-the-art solutions that are based on the company's unrivaled knowledge of wireless infrastructure and its clear vision of customer needs.



In the wireless infrastructure market, mobile operators are facing an explosion of demand for mobile broadband. At the same time, they are under heavy pressure to restrain operating expenditures (OPEX) and comply with new regulations on spectrum usage and power levels.

These challenges — particularly the surge in data traffic — have profound implications for the network. Mobile operators have to introduce new frequencies and implement re-banding, thus increasing spectrum complexity. They also must implement new technologies, such as Long-Term Evolution (LTE), Multiple-Input and Multiple-Output (MIMO), Remote Radio Head (RRH) and others.

Furthermore, mobile operators need to increase cell densification and ensure ubiquitous digital coverage, while implementing site sharing and improving power efficiency to keep a rein on costs.

RFS enables customers to meet these challenges with cost-effective, LTE-ready solutions for microwave antennas, wireless cell sites, and transportation environments. RFS provides complete wireless infrastructure solutions that enable an efficient evolutionary path to LTE, which offers the bandwidth, flexibility and service capabilities needed to support the coming surge in data traffic.



## Managing the digital switchover



In the broadcast and defense markets, the digital switchover (DSO) represents a major and ongoing challenge. For example, in the television sector, DSO is progressing on time, driven by regulatory requirements and the need to compete with cable and satellite services. In radio, DSO is progressing only gradually, whereas mobile TV has had limited market uptake so far.

The public safety sector, meanwhile, is actively moving towards digital and broadband systems. In parallel, the defense sector is shifting to network-centric warfare and is upgrading its aging radar systems.

To meet these challenges, RFS provides broadcast and defense solutions that enable the digital switchover. In the broadcast arena, for instance, RFS is helping customers exploit opportunities in Digital Terrestrial TV. In the defense field, RFS offers a range of high-frequency communications antennas and over-the-horizon radar solutions.

## Protecting the environment by building distributed architectures



Mobile operators are faced with a constant challenge to upgrade technology while reducing OPEX and CO<sub>2</sub> emissions. For these operators, wireless cell sites account for 70 to 80% of energy consumption, and are therefore a prime target for decreasing costs and carbon footprint alike.

Distributed architectures — based on remote radio head (RRH) technology — significantly reduce costs by avoiding losses from the traditional long RF cable runs at wireless sites. With RRH, the radio function is placed very close to the antennas.

RFS offers a range of innovative solutions to facilitate the deployment of distributed architectures at wireless cell sites, where the RRH is close to the antenna. These include hybrid optical fiber/DC power cables for new site deployments, as well as a series of converters for renovation of existing sites.

The company's integrated microwave antennas similarly ease the deployment of distributed radio architectures for transmission sites. For in-tunnel and in-building transportation environments, RFS offers a wide range of Passive Distributed Antenna Systems.

# RFS Products and Solutions

## Wireless cell site solutions

RFS provides a complete portfolio of outdoor cellular site solutions covering the entire RF chain, from base station antennas to diplexers and triplexers, from feeders and jumpers to tower solutions. These solutions are suitable for 2G, 3G and LTE, whatever the frequency band.



### Base Station Antennas

RFS provides state-of-the-art base station antenna solutions for different footprints, patterns, gains and tilt types, to suit all mobile standards in all frequency bands. Through design innovation at every stage, RFS secures best-in-class Passive InterModulation (PIM) performance for all of its base station antennas, connectors, cables, as well as for block construction, dipole construction and assembly, reflectors and final assembly.



### Transmission Lines

RFS offers a comprehensive transmission line portfolio to fit every need. Its corrugated CELLFLEX® and CELLFLEX® Lite duo — the most advanced transmission line family in the industry — are foam dielectric copper or aluminum cables that combine remarkable flexibility with high strength and superior electrical performance. The RFS portfolio of hybrid cabling and connection products (HYBRIFLEX™ and DC-FIT™) lowers the cost of distributed base station architectures that use Remote Radio Heads (RRH), while simplifying the process.



### Site Optimization Products

RFS offers cutting-edge combining solutions (diplexers and triplexers), tower mounted amplifiers, remote electrical tilt technology and co-location filtering solutions. The company's proven portfolio covers the full range of the most common bands, applications and emerging technologies, with products that offer premium performance and feature lightweight, cost-reducing solutions.

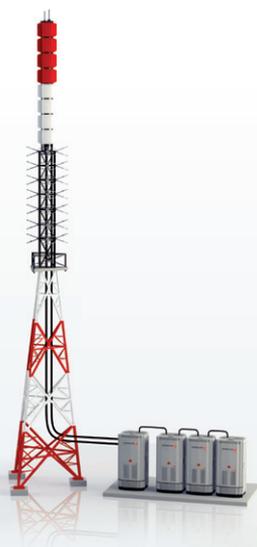


## Microwave antenna systems



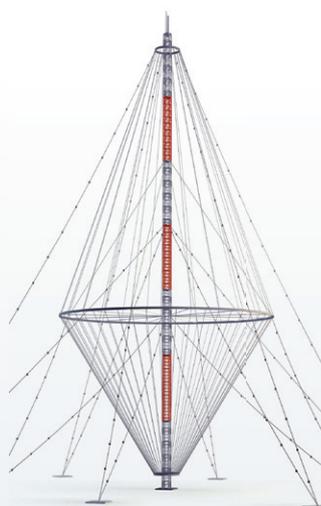
RFS offers end-to-end microwave antenna systems, with a comprehensive suite of innovative microwave antennas, elliptical waveguides and accessories, which feature unsurpassed mechanical robustness and electrical performance, engineering excellence, and global service and support. It's a total package solution for rapid deployment, maximum efficiency and minimized total cost of ownership.

## Broadcast



RFS provides the most comprehensive range of end-to-end RF broadcast systems on the market, with solutions for fixed television; analog and digital radio; as well as mobile TV, covering all spectrum options (VHF, UHF, L-band and S-Band). Every system is optimized to achieve the best possible performance and reliability and minimize the total cost of ownership.

## HF & Defense



RFS offers a complete range of HF communication antennas, including tactical antennas, broadband monopoles, horizontal, vertical and rotatable log periodics, biconical dipoles, standard and tandem deltas and HF shortwave broadcast antennas. It also offers ionospheric sounding systems, HF surface wave radar systems and antenna switching matrices, as well as system design, integration and commissioning.

## Transportation



RFS provides innovative communications solutions for the world's metros, railways, road tunnels, mines, ships and airports. It offers the most advanced active, passive and hybrid RF distribution systems for in-tunnel coverage, in-building station and terminal coverage and outdoor trackside and roadside coverage.

**For more information, please contact  
the nearest RFS sales office:**

**Southern Europe, Middle East, Africa & India**

[www.rfsworld.com/sales/semesai](http://www.rfsworld.com/sales/semesai)

**Northern Europe**

[www.rfsworld.com/sales/euno](http://www.rfsworld.com/sales/euno)

**Latin America**

[www.rfsworld.com/sales/latam](http://www.rfsworld.com/sales/latam)

**North America**

[www.rfsworld.com/sales/na](http://www.rfsworld.com/sales/na)

**Asia Pacific**

[www.rfsworld.com/sales/apac](http://www.rfsworld.com/sales/apac)

**[www.rfsworld.com](http://www.rfsworld.com)**

**RADIO FREQUENCY SYSTEMS**  
The Clear Choice®

