

# RFS - One Stop Shop of Innovation

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June 2015

**RADIO FREQUENCY SYSTEMS**  
The Clear Choice®

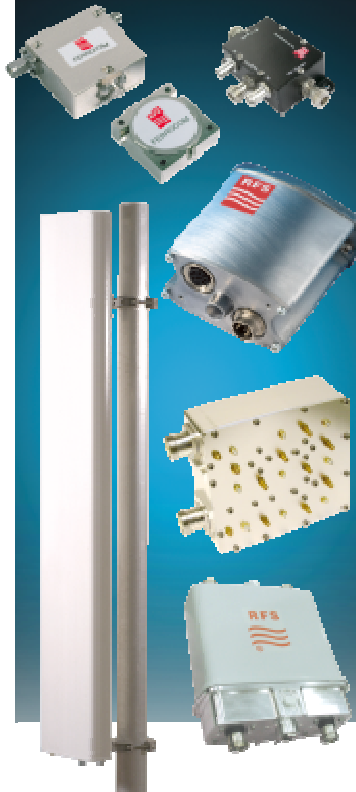




## RFS Product Lines

### WIRELESS INFRASTRUCTURE SOLUTIONS

Base Station Antennas  
& RF Conditioning



### RF TRANSMISSION & DISTRIBUTION

Transmission Lines



Wireless Indoor  
Solutions



### RADIO LINK NETWORKS

Microwave Antennas



### BROADCAST & DEFENSE

TV, Radio, HF &  
Defense, Towers







## RFS Manufacturing Facilities





## RFS end-to-end solutions



WIRELESS | MOBILE RADIO | MICROWAVE | IN-TUNNEL | IN-BUILDING | TV & RADIO | HF & DEFENSE

### Global solutions

- 7 manufacturing centres-of-excellence (Germany, France, USA, Brazil, China, India and Australia)
- Represented on six continents
- 20+ technical support and sales offices

### Innovative solutions

- At the forefront of RF technology
- Proven quality & reliability
- Renowned technical leader for over half a century

### Cost-effective solutions

- Lightweight
- Scalable and flexible
- Future-proof
- Optimized end-to-end

☉ True total life-cycle value, guaranteeing  
**maximized return on investment**

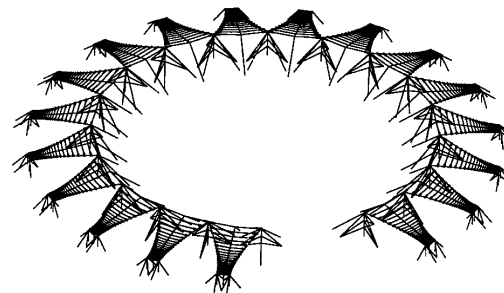
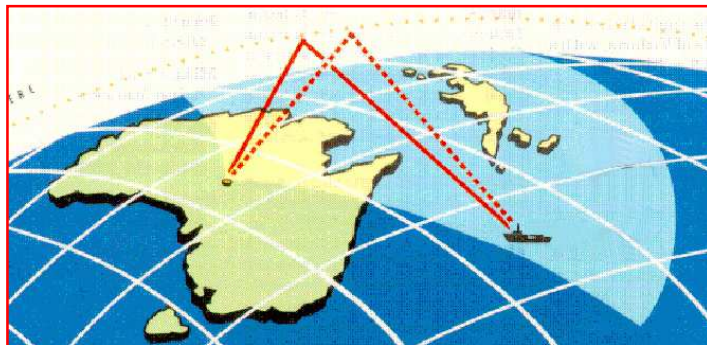


## RFS Australia - HF & Defense Systems

- Range of HF antennas for military, government and communication applications
- Fixed and tactical HF antennas are both available
- Standard designs, plus made to order systems
- Turnkey installations

### ➔ Proven HF experience & know-how

RFS has been the primary supplier of antenna systems and components for many major HF projects





## RFS Australia - HF & Defense Systems



### ➡ The Australian *Sky-Wave radar project* (the world's largest antenna systems installation in the past decade)

- 3 Individual Transmit arrays.
- Each array consists of 14 Low Band Log Periodic antennas and 28 High Band Log Periodic Antennas.
- Each array covers an area 0.5 miles long by 0.2 miles wide.
- 3 Individual Receiver arrays.
- Each array consists of 960 antennas.
- Each array length 1.9 miles long.
- 5 year project
- USD 30M





## RFS Australia - Broadcast Systems

### ➔ Complete portfolio of passive components

ANTENNAS TV  
BAND IV/V PANEL ARRAY



BAND III PANEL ARRAY



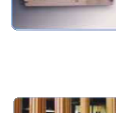
HELIFLEX® AIR CABLE  
CONNECTORS, ACCESSORIES



COMPONENTS PATCH PANEL



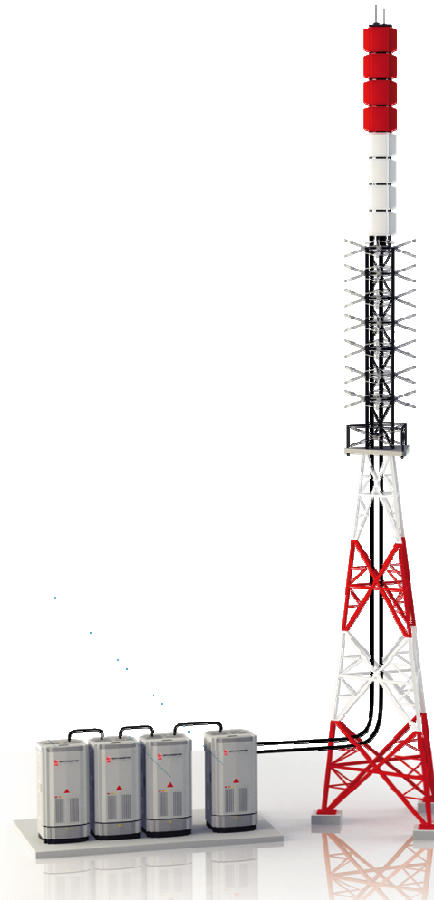
DEHYDRATORS



COMBINERS



DIGITAL RF SYSTEM  
MONITORING RIGID LINE



➔ 40 years of design and development experience.

➔ The most comprehensive range of end-to-end premium performance broadcast systems with solutions for:

- FM & DAB
- VHF TV
- UHF TV



## Broadcast Antennas

### ➔ Comprehensive range

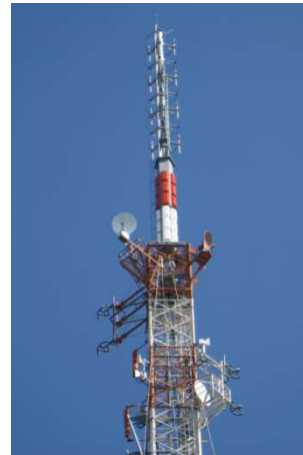
- Panel arrays, slot arrays, dipole arrays, superturnstile antennas
- top or side mount antennas

### ➔ Customised antenna solution

- Patterns tailored to meet any coverage requirement
- To suit a range of towers and mounting arrangements

### ➔ Fully featured

- RFS antennas are broadband and are designed to support multiple channels considering the bandwidth as well as the cumulated power and voltage.







## Transmission Lines - HELIFLEX® and CELLFLEX®

### ➔ RFS air and foam dielectric feeder cables

- RFS has manufactured HELIFLEX® feeder cables for the broadcast and HF industries for over 50 years.
- Sizes from 3/8-inch up to 9-inch





## Broadcast Combiners

➔ RFS specialises in combining solutions that allow broadcasters to maximize value from their broadband antenna systems investment.

➔ **Combining solutions:**

- Available for FM & DAB radio as well as digital and analogue television

➔ **DTV adjacent channel combining**

- RFS is a pioneer in the development of adjacent channel combining for the addition of digital television services

➔ **Compact UHF waveguide combiner**

- RFS UHF waveguide combiner has the most compact footprint of any waveguide combiner on the market

➔ **Broad power range**

- High and low power solutions are available from less than 10W up to 240kW





## Broadcast Patch Panels

### ➔ Customised design

- Patch panels are made to order, but a range of standard panels are available

### ➔ Rapid release U-Link

- RFS uses the rapid release U Link for ease of operation and reliability

### ➔ Patch panel options

- Power and VSWR monitoring
- Active MIMIC on the touch screen displays
- Motorised coaxial switches
- Automatic and remote capability



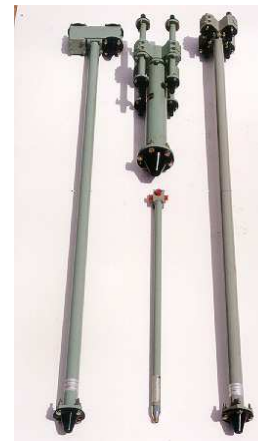




## Broadcast RF ancillary components

➔ RFS manufactures a complete range of components to complete the installation of any RF system.

- RFS HCA Lite Connectors
- Rigid line products and accessories
- Power splitters
- Directional and 3dB couplers
- Monitoring systems
- Pressurization equipment





## Digital Era – new & improved products

- ➔ **Cutting edge developments for DTV in the last decade**
- ➔ **Low footprint adjacent channel waveguide combiners**
- ➔ **UHF Panels for 5-sided and multisided arrays**
- ➔ **Reduced wind load profile UHF panels – 40% wind drag reduction**
- ➔ **PeakPower+ UHF filters with BCAT™ tuning software**
- ➔ **Variable Polarisation Technology – with new PCP and PEP panels**
- ➔ **Supporting software packages**



## Digital Era – new & improved products

### ➔ Low footprint adjacent channel waveguide combiner

On the 7<sup>th</sup> of January 2009 National Academy of Television Arts and Sciences has honored RFS with **Tech Emmy Award** for its pioneering work on adjacent channel combiners for TV broadcasting.



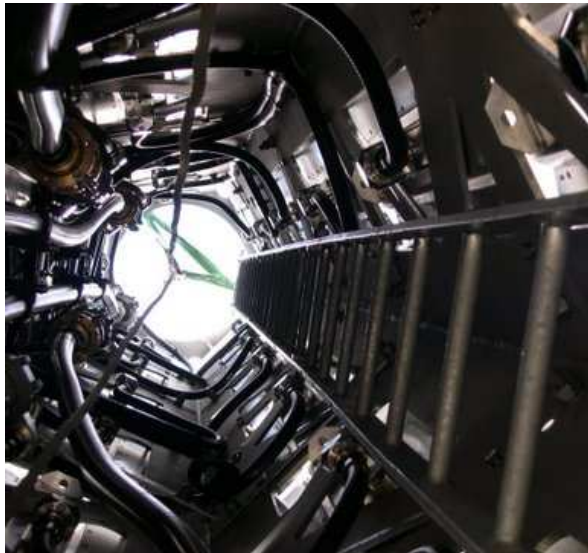




## Digital Era – new & improved products

### ➡ PHP5S Panel – developed on request of British customers

- Installed on pentagonal columns
- Increased climbing space inside antenna
- Only RFS is capable of delivering wideband five sided column covering full UHF!



Presely



Wenvoe

### ➡ Many UK sites are equipped with RFS antennas on the pentagonal columns

Divis  
Oxford  
Sandy Heath  
Belmont  
Waltham

Sutton Coldfield  
The Wrekin  
Stockland Hill  
Tacolneston  
Presely



## Digital Era – new & improved products

### ➔ Reduced wind load UHF Panel with the streamlined radome

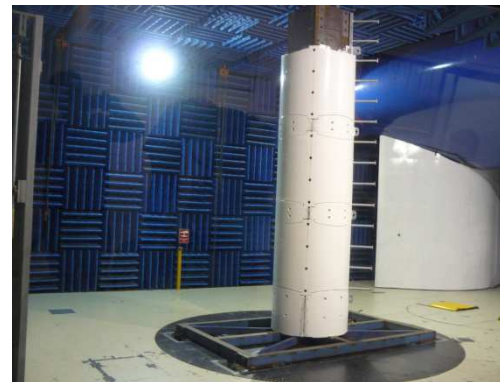
- Up to 40% reduction in the wind loading of the antenna column
- Verified by testing in the wind tunnel at university in Melbourne
- Systems deployed in Italy, Philippines and Australia



### ➔ Mitigate the requirement of the tower strengthening when the antenna system is replaced for the new Digital TV

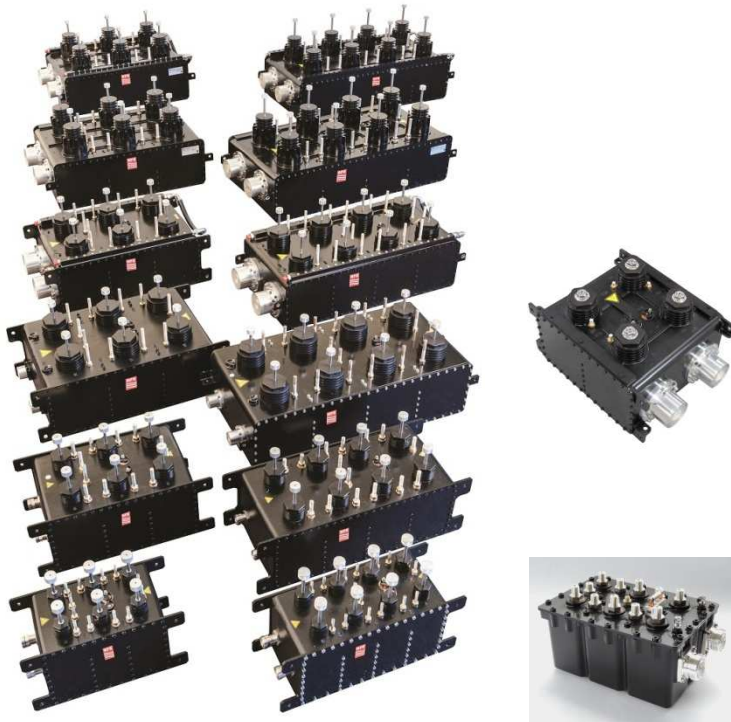
### ➔ Lighter tower may be constructed to support the new DTV antenna

### ➔ Significant cost reduction for the customers in the project realization





## Digital Era – new & improved products



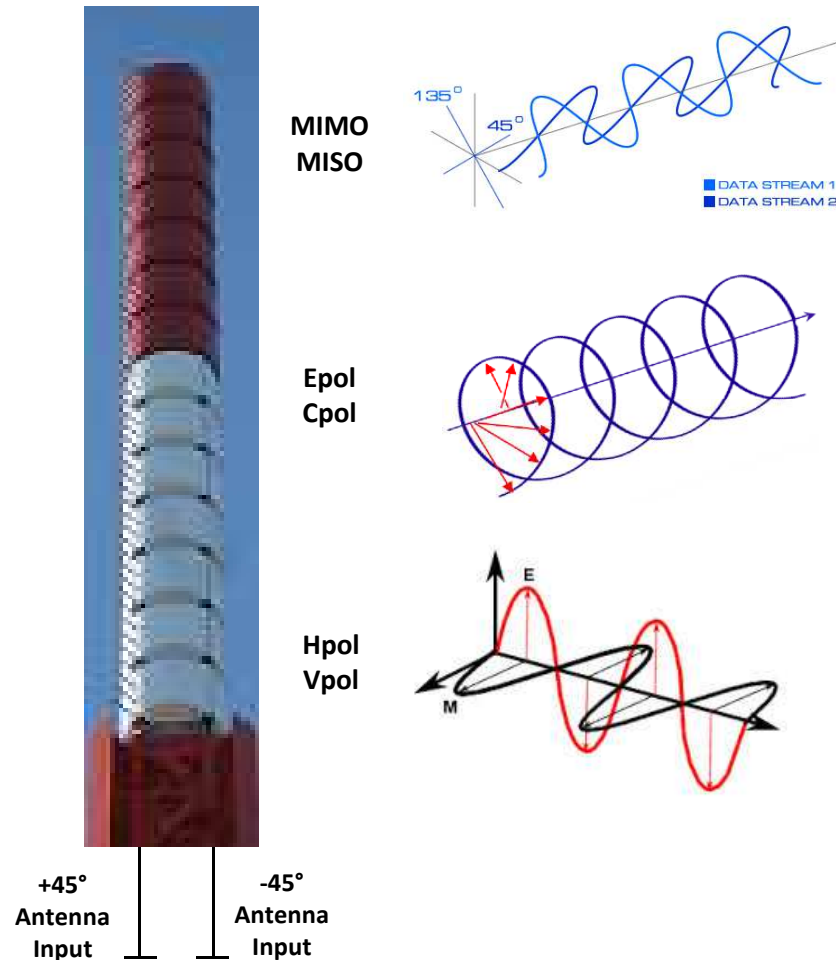
### ➞ Peak Power+™ UHF Mask Filters

- **Lowest Insertion Loss on the market**  
(filters operate cooler than ever)
- **Highest Peak Power Ratings**  
(perfect for high altitude applications)
- **Critical mask tuning with 6-pole filters already**
- **Output power range from 100W to 50kW**  
(double to the competitors largest filters)
- **Filter tuning easier than ever! – tune in the field**  
(courtesy of RFS BCAT)

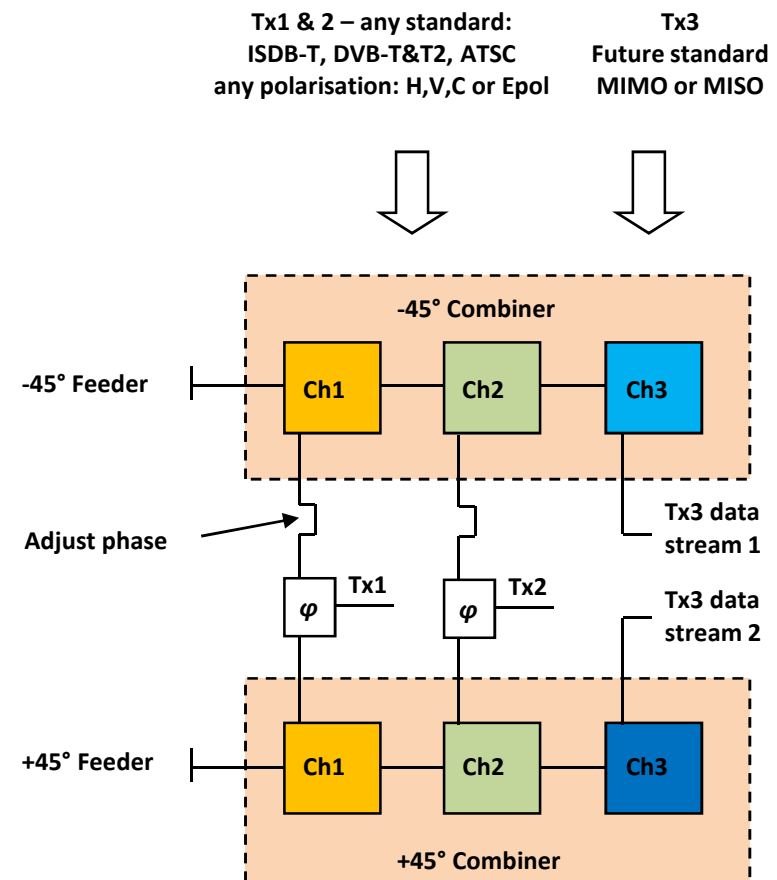
### ➞ Supporting OEMs with the Transmitter Mask Filters



# Digital Era – Variable Polarisation Technology



## ➡ Polarisation agile Antennas

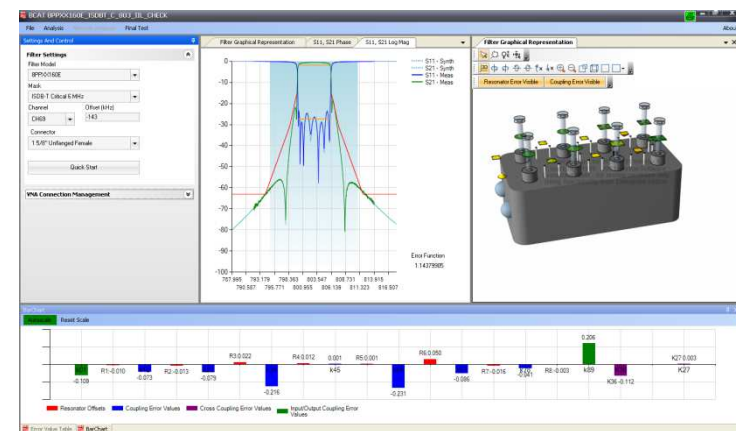




## Digital Era – supporting software

### ➡ Broadcast Computer Aided Tuning

- Result of extensive R&D effort
- Expert tuning without an expert
- Tuning to critical mask in 0.5 hour !!
- Last minute changes? No problem!
- All RFS PP+ filters supported
- Some call it 'a Game changer'...
- **Now supports balanced combiner tuning!**





## Digital Era – System Integration

**RFS has commenced integration of systems from Head-end to Antenna; for customers using world renowned partners for transmitters, head-end, monitoring and STL links.**

**RFS is capable of**

- a. Analyse the requirement of the customer and advice the system architecture,**
- b. Work with equipment suppliers to integrate the system as suitable to the customer**
- c. Carry out integration of systems**
- d. Provide integrated systems built as containerised solutions**
- e. Provide installation and commissioning of systems from head-end to Antenna.**
- f. Assist customers with training and maintenance of systems.**





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