

# HP-RAA 2/2

## Turnable Shortwave Antenna System



Thomson provides high-performance antenna systems for radio broadcasting backed by more than half a century of leadership in the market.

Mastering structural, mechanical and electrical aspects of antenna engineering, Thomson is now presenting the new, unique HP-RAA 2/2 (High Performance Rotatable Antenna Array) shortwave antenna system optimized for near distant coverage (1000 km to 4000 km) in analog AM or digital DRM modes.

The first HP-RAA dates back to the 1980's, when Thomson revolutionized the industry with the introduction of this legendary shortwave broadcasting antenna system (HP-RAA4/4). This antenna is still the most versatile, powerful and efficient system of its kind today.

Enabling the shortest lead time to start off worldwide coverage, the HP-RAA 2/2 is not only flexible but also sturdy enough to withstand the most extreme weather conditions.

The system covers all shortwave broadcast bands from 6-26 MHz.

### A New Standard in Antenna Design

A back-to-back arrangement of a low band and a high band curtain antenna equipped with a reflector screen, the Thomson HP-RAA 2/2 offers a 360 degree azimuth at the touch of your finger tip and is optimized for digital DRM broadcasting.

Compared to a classical log periodic dipole antenna (LPD), which can be used to service similar coverage areas, the HP-RAA 2/2 offers a highly efficient solution for shortwave coverage.

The results of an investigation of the efficiency of the two different systems shows that the HP-RAA 2/2 has up to 45% higher efficiency of the radiated power into a defined target area.

### Benefit from Thomson Advanced Technology

Based on the Thomson Rigid Dipole Technology, the HP-RAA is an example of leading antenna technology specifically designed to meet high demands on reliability, maintainability and cost-efficient operation.

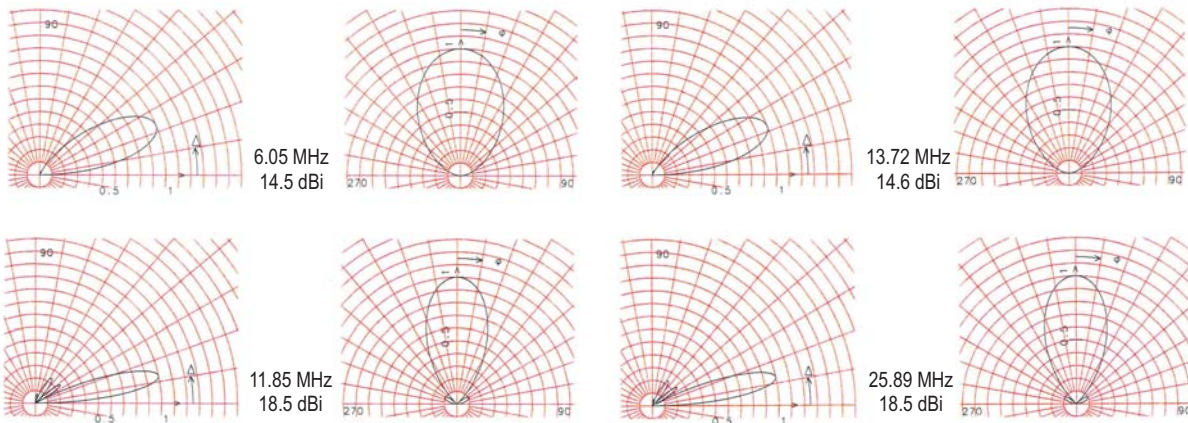
The HP-RAA is the most flexible antenna system today with respect to choice of coverage area and frequency.

The extensive key features of this new product make it an attractive choice for broadcasters who think ahead in order to profit from important cost savings from day one of project start-up and throughout the entire system lifetime.

## Antenna Feature, Your Benefit

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|---|---|
| <ul style="list-style-type: none"> <li>● Rotates to cover a 360° coverage angle<br/>→ BENEFIT: Complete flexibility in coverage area with a single antenna structure</li> <li>● High antenna gain [14 dBi - 19 dBi]<br/>→ BENEFIT: Optimized ratio of energy consumption to field strength</li> <li>● System maintainability ( No guy wire system, Easy access to main parts, Minimized number of insulators)<br/>→ BENEFIT: Low life cycle costs, High reliability, High availability</li> <li>● Small footprint<br/>→ BENEFIT: Reduced space requirements</li> <li>● Special design allows quick installation and minimum foundation<br/>→ BENEFIT: Faster implementation time</li> </ul> | <ul style="list-style-type: none"> <li>● Covers all shortwave broadcast bands [6-26 MHz]<br/>→ BENEFIT: Full shortwave bandwidth with only one antenna</li> <li>● High front-to-back ratio<br/>→ BENEFIT: Minimum radiation towards random, undesired areas</li> <li>● Perfect DC grounding<br/>→ BENEFIT: Electro-static grounding of entire structure, Safe access, Increased availability thanks to optimal lightning protection</li> <li>● Sturdy rigid dipole design<br/>→ BENEFIT: Safe operation under worst conditions</li> <li>● Full DRM compatibility<br/>→ BENEFIT: High flexibility to meet future developments and needs</li> </ul> |
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### Typical Antenna Radiation Patterns [low and high bands]



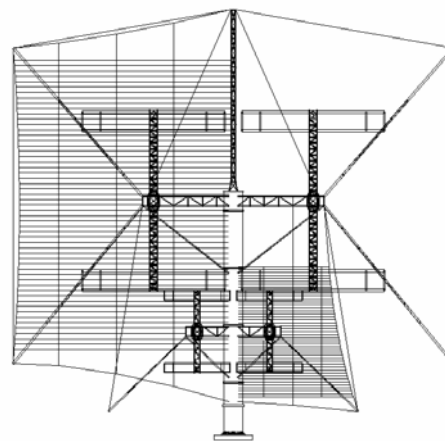
### Specifications

#### Antenna System Parameter

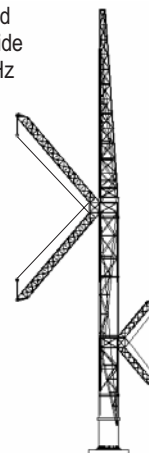
Array antenna type HR 2/2	6 - 11 MHz as per WARC '92; 13 - 26 MHz as per WARC '92
Antenna polarization	horizontal
Typical antenna gain	14 dBi - 19 dBi
Front-to-back ratio of antenna pattern	> 20 dBi
Antenna input impedance	300 Ohms (balanced)
Power handling capability	up to 500 kW plus 120% AM
Antenna VSWR	≤ 1.5 for WARC '92 bands
All dipoles	fully DC grounded
Supporting structure and reflector screen	fully DC grounded
Antenna rotation	max. rotation (which never takes more than 180°) in less than 3 minutes
Antenna width	approx. 45m
Antenna height	approx. 45m
Antenna weight	approx. 60 tons
Survival wind speed	240 km/h
Corrosion protection	hot dip galvanized steel
Day time aviation obstruction marking	optional: red/orange and white paint
Night time aviation obstruction lighting	optional as per ICAO Recommendations

#### Antenna Support Structure

Steel quality of supporting elements	hot dip galvanized steel
Central (vertical) support beam	tubular steel, with climbing ladder; optional: safety rail
Horizontal support beam	tubular steel, with walk on facilities; optional: safety rail
Inclined dipole support beams	tubular steel, with walk on facilities; optional: safety rail
Dipoles	tubular steel
Reflector support beams (needles)	tubular steel, with walk on facilities; optional: safety rail
Antenna feed lines	copper wire / copper tubes /low loss ceramic insulators
Reflector screen	supporting wires: copperweld; other wires: copper ropes
Bolts and nuts	for major support elements: high tensile others: hot dip galvanized



Low Band antenna side  
6 - 11 MHz



High Band antenna side  
13 - 26 MHz

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