



Rigid Dipole Antennas

Leading the Industry
For the Best Signal-on-Air

New Shortwave Antenna Solution



AHR 1/1/0.2 Rigid Dipole Antenna (Picture by courtesy of RTL Luxembourg)

Thomson goes Digital

As one of the most cost-effective, reliable technologies available today, shortwave broadcasting is the favored medium for reaching listeners beyond thousands of kilometers around the globe.

The introduction of the new digital AM technology, known under the brand name "DRM", has invested the AM bands with attractive new options. Depending on the choice of transmitter and antenna system, broadcasters can service listeners in crystal clear, near FM quality from an own home base and independent of satellite and cable networks.

Behind every great signal-on-air is a well-designed antenna. Thomson offers a variety of antennas to fit a wide range of customer needs.

Structural Concept

The Thomson Rigid Dipole Technology combines design principles as implemented in rotatable shortwave antenna systems with all the advantages of curtain antennas. The resulting integrated system consists of folded rigid dipoles of stainless steel and a self-supporting structure with central shaft.

The radiating elements of the antenna are integrated into the structure such that no insulation is needed in any structural parts. The rigid broadband folded dipoles are directly attached to the steel structure, providing in addition a full static grounding of the antenna itself. This also provides for additional safety with respect to lightning impact, thunderstorms, typhoons or hurricanes.

The RF feedlines are directly accessible from catwalks on the crossarms of the steel structure.



RF Feed line and catwalks

System Maintainability

The components of the rigid dipole antenna are easily accessible. The system maintainability is greatly simplified due to the fact that the antenna has no moving parts, like halyards, steel ropes, counterweights etc.



View of central support structure

The RF components themselves are quite robust, easy to maintain and highly reliable. Therefore it is evident that the system has a very high availability with extraordinarily long MTBF [Mean Time Between Failure] and very short MTTR [Mean Time To Repair].

Cost-Effective Design

The Rigid Dipole Antenna has a remarkably small footprint and allows installation even on smallest estates. There is no need of extensive and complex guy ropes including insulations and foundations.

The special design of these antenna systems ensures that the installation by mobile crane can be accomplished in amazingly short time.

As economists know, the least expensive solution is not always the most cost effective one. An investment in radio broadcasting equipment is cost effective when

- ease of operation,
- performance,
- reliability,
- maintainability and
- expected life time

all add up to make an attractive package.

The Thomson rigid dipole antenna system is an example of leading antenna technology designed to meet exactly such cost of ownership requirements.

Optimized Antenna Design for DRM Coverage

Technical Highlights

- Back-to-back arrangement of a low band and a high band curtain antenna, each with its own reflector screen
- High antenna gain up to 24 dBi depending on configuration
- Perfect DC grounding:
 - Minimized number of insulators [spacer, hanger, supports]
 - Electro-static grounding of entire structure
 - Optimum lightning protection
- Lowest possible life cycle cost, optimized maintainability
- Optimized RF performance
- Small footprint
- Installation with shortest time, minimum of required foundations
- Reliable operation even under worst environmental conditions
- DRM compatibility



Optimized Radiation Characteristics for DRM

A leading European broadcaster recently selected the Thomson Rigid Dipole System to implement the broadcast of regular DRM shortwave programs on 6095 kHz. Since they intend to broadcast on one frequency only, Thomson proposed the AHR 1/1/h model.

The AHR 1/1/0.2 antenna is specifically shaped to achieve an optimized radiation characteristic with regard to 6095 kHz DRM coverage of Germany.

That's why Thomson designed and implemented suitable reflector and dipole properties.

Customized Solutions

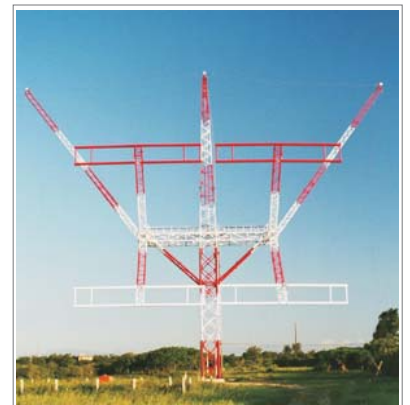
Thomson customizes rigid dipole solutions to fit specific broadcaster needs. Important design criteria, such as number of dipoles and the layout of the antenna feeding, depend on the desired coverage range and specific radiation characteristics as well as the required beam slewing performance and frequency range.



View of the dipole



Dipole feed point



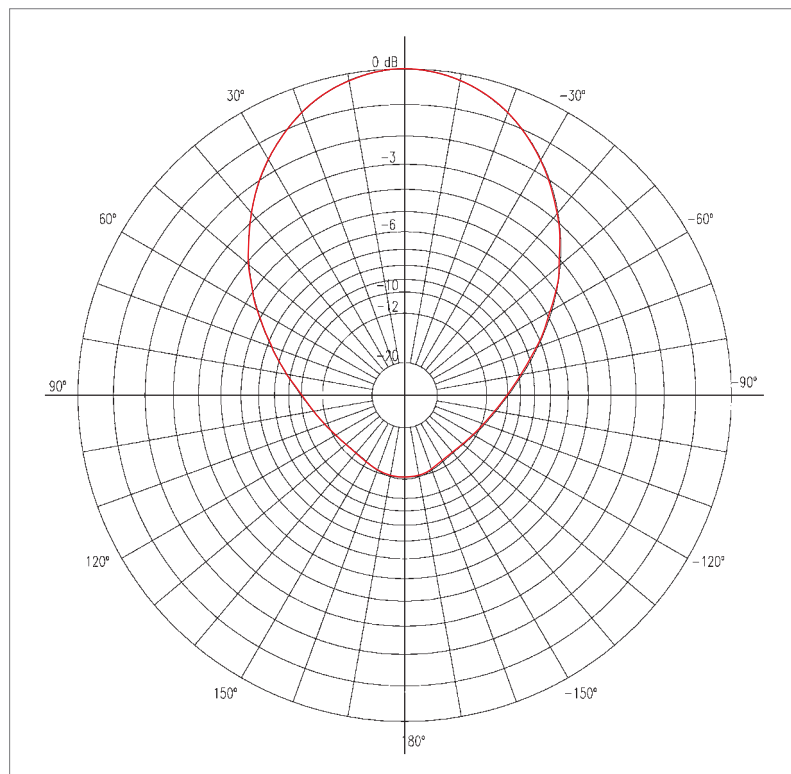
AHR 2/2/0.3

Overview of Rigid Dipole Antennas

Antenna Type	Range [in km]				Frequency Range	Radiation Pattern	Typical Gain [dBi]
	Up to 1300	1000 to 4000	2000 to 6000	3000 to 8000			
AHR 1/1/h [Fixed Curtain]	X				single specified frequency	directional	12 - 13
AHR(S) 2/2/h [Fixed Curtain]		X			up to six adjacent frequency bands	directional	14 - 16
AHR(S) 4/2/h [Fixed Curtain]			X		up to six adjacent frequency bands	directional	15 - 21
AHR(S) 4/4/h [Fixed Curtain]				X	up to six adjacent frequency bands	directional	18 - 24

The height [h] is according specific performance requirements.

The stated range is assuming single-hop transmission and can be seen as a rough guideline for design purposes. In any case the range is dependent on specific ionospheric propagation conditions.



AHR 1/1/h: Radiation pattern optimized for DRM near range coverage

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