



Antennas and pedestals for Air Traffic Control

Index

L-Band LVA Antennas and Rotary Pedestals for Secondary Surveillance Radar Systems (SSR)

- LVA Antennas:
 - 8-meter Antennas:
 - RSL-2730 2
 - RSL-2735+ 3
 - 4-meter Antennas:
 - RSL-2330+ 4
 - 2-meter Antennas:
 - RSL-2130
- Rotary Pedestals:
 - 8-meter LVA Antenna Rotary Pedestals
 - RT-210 5
 - RT-220 5
 - 2-meter LVA Antenna Rotary Pedestals
 - RT-211 6

S-Band Antennas and Rotary Pedestals for Primary Surveillance Radar Systems (PSR)

- Antennas:
 - RPS-3400 7
- Rotary Pedestals:
 - RT-120 8

LVA 8.6-meter Antenna - MSSR Air Traffic Control Systems

RSL-2735+ model is a large vertical aperture antenna for application on Monopulse Secondary Surveillance Radar Systems (MSSR). It operates at the L-band on the frequencies: 1030 MHz (interrogation) and 1090 MHz (reception and reply). It consists of a radiating column array properly fed with the necessary phase and amplitude tapers to achieve the requested radiation pattern performances.

The antenna has sum, difference and SLS channels, an enhanced elevation pattern, a sharp azimuth response and a low level of illumination to the ground. It allows the most optimized performance and capable to work in the most severe environmental conditions, but, allowing a low maintenance procedure

HIGH COVERAGE IN ELEVATION	REDUCED CONE OF SILENCE	LOW SIDE AND BACKLOBES	ENHANCED ELEVATION PAT
-------------------------------	----------------------------	---------------------------	---------------------------

This LVA antenna model improves the typical elevation pattern slope under the horizon, improving the performances of the antenna.

The high qualification applied tests validate the antenna model for civilian and military applications with 100% requirement compliance.

Electrical specifications

Frequency	1030 MHz (Tx) – 1090 MHz (Rx)
Peak gain	27 dBi
Beamwidth at 3 dB (H -plane)	2.4°
Polarization	Vertical
Horizon Slope	>1.8° dB/°
Number of columns	35 (front) + 1 (rear)
Impedance	50 W
VSWR	<1.5
Channels	3 (SUM, DIFF, OMNI)
Power handling (RMS/peak)	3 x 330W/10KW
Input Connectors type	3 x Type N socket
Transmission mode	Mode S and 5 compatible

Environmental & Mechanical specifications

Operational Temperature range	-40°C - +70°C
Relative Humidity	5% - 100%
Driving Rain	120 mm/h
Maximum Windspeed	160 Km/h (operation) 220 Km/h (survival)
Snow load	240 Kg/m ²
Ice loading	12.5 mm thickness (operation)
Dimensions (W x D x H)	8.1 x 1.9 x 1.1 m
Weight	450 Kg
Painting	Orange RAL 2004. Green RAL 6031 Other colors available under request



Mechanical Options

- Interface to a pedestal⁽¹⁾
- Interface to a PSR⁽²⁾ antenna

Accessories

- Band pass filter at the inputs

⁽¹⁾to RYMSA RT-210 or RT-220 models by default
⁽²⁾to RYMSA RPS-3400 model by default

LVA 8-meter Antenna - MSSR Air Traffic Control Systems

RSL-2730 model is a large vertical aperture antenna for application on Monopulse Secondary Surveillance Radar Systems (MSSR). It operates at the L-band on the frequencies: 1030 MHz (interrogation) and 1090 MHz (reception and reply). It consists of a radiating column array properly fed with the necessary phase and amplitude tapers to achieve requested the radiation pattern performances.

The antenna has Sum, Difference and SLS channels, a customized elevation pattern, a sharp azimuth response and a low level of illumination to the ground. It allows the most optimized performance and capable to work in the most severe environmental conditions, but, allowing a low maintenance procedure.

HIGH COVERAGE
IN ELEVATION

REDUCED CONE
OF SILENCE

LOW SIDE AND
BACKLOBES

The high qualification applied tests validate the antenna model for civilian and military applications with 100% requirement compliance.

Electrical specifications

Frequency	1030 MHz (Tx) – 1090 MHz (Rx)
Peak gain	27 dBi
Beamwidth at 3 dB (H -plane)	2.4°
Polarization	Vertical
Horizon Slope	>1.6° dB/°
Number of columns	33 (front) + 1 (rear)
Impedance	50 W
VSWR	<1.5
Channels	3 (SUM, DIFF, OMNI)
Power handling (RMS/peak)	3 x 330W/10KW
Input Connectors type	3 x Type N socket
Transmission mode	Mode S and 5 compatible



Environmental & Mechanical specifications

Operational Temperature range	-40°C - +60°C
Relative Humidity	5% - 100%
Driving Rain	60 mm/h
Maximum Windspeed	160 Km/h (operation) 220 Km/h (survival)
Snow load	200 Kg/m ²
Ice loading	12.7 mm thickness (operation)
Dimensions (W x D x H)	8.1 x 1.6 x 1.1 m
Weight	405 Kg
Painting	Orange RAL 2004. Green RAL 6031 Other colors available under request

Mechanical Options

Interface to a pedestal⁽¹⁾

Interface to a PSR⁽²⁾ antenna

Accessories

Band pass filters at the inputs

⁽¹⁾to RYMSA RT-210 or RT-220 models by default

⁽²⁾to RYMSA RPS-3400 model by default

LVA 4-meter foldable Antenna - MSSR Air Traffic Control Systems

RSL-2330+ model is a vertical aperture antenna of compact size, foldable or detachable and excellent performances for application on Monopulse Secondary Surveillance Radar systems (MSSR). It operates at the L-band on the frequencies: 1030 MHz (interrogation) and 1090 MHz (reception and reply). It consists of a radiating column array properly fed with the necessary phase and amplitude tapers to achieve the requested radiation pattern performances.

It can be folded or disassembled for transportation (minimizing its dimensions) and folded out or assembled for operation on temporary or transportable missions. Due to his size, it is particularly suited to the installation on a primary radar antenna with an optimum load and weight.

The antenna has sum, difference and SLS channels, a enhanced elevation pattern, a sharp azimuth response and a low level of illumination to the ground. It allows the most optimized performance and capable to work in the most severe environmental conditions, but, allowing a low maintenance procedure.

COMPACT SIZE

TRANSPORTABLE
SYSTEMS

FOLDED OR DETACHABLE
FOR TRANSPORTATION

ENHANCED
ELECTRICAL SPECS

This antenna enhances some key specifications comparing to the standard models as the Sum Σ channel gain of the antenna, crosspolarization factor between the Sum Σ and the Difference Δ channels, the elevation patten below the horizon slope and vertical pattern first lobe supression.

The high qualification applied tests validate the antenna model for civillian and military applications with 100% requirement compliance

Electrical specifications

Frequency	1030 MHz (Tx) – 1090 MHz (Rx)
Peak gain	23 dBi
Beamwidth at 3 dB (H -plane)	$\leq 4.6^\circ$
Polarization	Vertical
Horizon Slope	$> 0.8 \text{ dB}/^\circ$
Number of columns	17 (front) + 1 (patch at rear)
Impedance	50 W
VSWR	< 1.5
Channels	3 (SUM, DIFF, OMNI)
Power handling (RMS)	330W (sum), 10W (diff), 100W (omni)
Power handling (peak)	10KW
Input Connectors type	3 x Type N socket
Transmission mode	Mode S and 5 compatible



Environmental & Mechanical specifications

Operational Temperature range	-55°C - +70°C	
Relative Humidity	5% - 100%	
Driving Rain	120 mm/h	
Maximum Windspeed	160 Km/h (operation) 220 Km/h (survival)	
Snow load	240 Kg/m	
Ice loading	12.5 mm thickness	
Dimensions (W x D x H)	4.0 x 0.40 x 1.1 m	
Dimensions for transport (W x D x H)	Foldable	2.5 x 0.64 x 1.1 m
	Detachable	2.3 x 0.40 x 1.1 (central 1 pcs) 0.9 x 0.36 x 1.1 (lateral 2 pcs)
Weight	95 Kg	
Painting	Orange RAL 2004. Green RAL 6031 Other colors available under request	

Mechanical Options

Interface to a pedestal or PSR antenna

Accessories

Band pass filter at the inputs

LVA 2.6-meter Antenna - MSSR Air Traffic Control Systems

RSL-2130 model is a vertical aperture antenna with a very compact size and excellent performances for application on Monopulse Secondary Surveillance Radar systems. The antenna operates at the L-band on the frequencies: 1030 MHz (interrogation) and 1090 MHz (reception and reply). It consists of a radiating column array properly fed with the necessary phase and amplitude tapers to achieve the requested radiation pattern performances.

The antenna complies with naval environmental specifications, so that, it is fully suitable for operation on ships as well as on ground locations both fixed and, especially, transportable ones.

The antenna has sum, difference and SLS channels, a customized elevation pattern, a sharp azimuth response and a low level of illumination to the ground. It allows the most optimized performance and capable to work in the most severe environmental conditions, but, allowing a low maintenance procedure

VERY COMPACT
SIZE

TRANSPORTABLE
SYSTEMS

NAVAL
APPLICATIONS

The high qualification applied tests validate the antenna model for civilian and military applications with 100% requirement compliance.

Electrical specifications

Frequency	1030 MHz (Tx) – 1090 MHz (Rx)
Peak gain	21 dBi
Beamwidth at 3 dB (H -plane)	≤ 7.3°
Polarization	Vertical
Horizon Slope	>0.5° dB/°
Number of columns	13 (front) + 1 (patch at rear)
Impedance	50 W
VSWR	<1.5
Channels	3 (SUM, DIFF, OMNI)
Power handling (RMS/peak)	3 x 150W/3.5KW
Input Connectors type	3 x Type N socket
Transmission mode	Mode S and 5 compatible



Environmental & Mechanical specifications

Operational Temperature range	-40°C - +60°C
Relative Humidity	5% - 100%
Driving Rain	60 mm/h
Maximum Windspeed	160 Km/h (operation) 220 Km/h (survival)
Snow load	22 Kg/m ²
Ice or snow loading	10 mm thickness
Dimensions (W x D x H)	2.6 x 1.5 x 0.3 m
Weight	142 Kg
Painting	Orange RAL 2004. Green RAL 6031 Other colors available under request
Water Ingress	IP 56

Mechanical Options

Interface to a pedestal⁽¹⁾

Accessories

Band pass filters at the inputs

⁽¹⁾to RYMSA RT-211 model by default

Rotating pedestal - Especially suitable for LVA 8-meter antennas

RYMSA RF offers two models of turning pedestals especially suitable to be used on MSSR systems for the rotation of the LVA 8m and 8.6m antennas, whenever the latter is intended to be installed as a stand-alone unit.

The pedestals are designed to be used on stringent environmental conditions with very reduced maintenance tasks.

The high qualification applied tests validate the rotating pedestal models for civilian and military applications with 100% requirement compliance in addition to enhanced mechanical specifications

RT-210 model is single drive, while RT-220 is dual drive. The pedestals offer an excellent azimuth accuracy by means of the use of encoders, and they are delivered including the pedestal itself and the control cabinet unit.

Mechanical Specifications

Drive Mode	Single (RT -210 model) Double (RT -220 model)
Angular speed	5-15 rpm
Angular Error	+/- 0.1°
Encoder Resolution	14 bits
Channels	3 channels (SUM, DIFF, OMNI)
Operational temperature range	-40°C to +60°C (outdoors unit) -20°C tot +55°C (control cabinet)
Relative Humidity	5% - 100% (outdoors parts) 5% - 95% (control cabinet)
Driving Rain	<60 mm/h
Snow load	<220 kg/m ²
Ice loading	<12 mm radial thickness
Weight	<450 kg (RT-210) <630 kg (RT-220)
Dimensions [ØxH]	1 x 1.26 m
Weight (control cabinet)	<65 kg (RT-210) <105 kg (RT-220)
Dimensions [LxHxD] (control cabinet)	0.6x0.8x0.3 m (RT-210) 0.6x1.2x0.3 m (RT-220)
Painting	Orange RAL 2004. Green RAL 6031 Other colors available under request



Electrical Specifications

Frequency	1010 – 1100 MHz
Rotary Join	3 channels (SUM, DIFF, OMNI)
Insertion Loss	<0.5 dB
VSWR	<1.2
RF Input Connectors	3 x type N socket
RF Power Handling (RMS/Peak)	200W / 10 KW
Isolation between channel	>50 dB
Power supply	40VAC+/-10%, 50/60Hz
Max. Power Consumption	12KVA

Mechanical accessories

Interface to any LVA 8m antennas⁽¹⁾

Interface to the existing supporting structure

¹⁾to RYMSA RSL-2730 and RSL-2735+ models by default

Rotating pedestal - Especially suitable for LVA 2.6-meter antennas

RYMSA RF offers a turning pedestals especially suitable to be used on MSSR systems for the rotation of the LVA 2.6m antenna, whenever the latter is intended to be installed as a stand-alone unit.

The pedestals are designed to be used on stringent environmental conditions with very reduced maintenance tasks.

The high qualification applied tests validate the rotating pedestals models for civilian and military applications with 100% requirement compliance in addition to enhanced mechanical specifications

The pedestals offer an excellent azimuth accuracy by means of the use of encoders, and they are delivered including the pedestal itself and the control cabinet unit.

Mechanical Specifications

Drive Mode	Single
Angular speed	6-60 rpm
Angular Error	+/- 0.1°
Encoder Resolution	14 bits
Channels	3 channels (SUM, DIFF, OMNI)
Operational temperature range	-40°C to +60°C (outdoors unit) -20°C to +55°C (control cabinet)
Relative Humidity	5% - 100% (outdoors parts) 5% - 95% (control cabinet)
Driving Rain	<60 mm/h
Snow load	<22 kg/m ²
Ice loading	<10 mm radial thickness
Weight	<180 kg
Dimensions [ØxH]	0.72 x 0.66 m
Weight (control cabinet)	<45 kg
Dimensions [LxHxD] (control cabinet)	0.48(19'')x0.4x0.47 m
Painting	Orange RAL 2004. Green RAL 6031 Grey RAL 7042 Other colors available under request



Electrical Specifications

Frequency	1010 – 1100 MHz
Rotary Join	3 channels (SUM, DIFF, OMNI)
Insertion Loss	<0.7 dB
VSWR	<1.2
RF Input Connectors	3 x type N socket
RF Power Handling (RMS/Peak)	200W / 10 KW
Isolation between channel	>50 dB
Power supply	40VAC+/-10%, 50/60Hz
Max. Power Consumption	3KVA

Mechanical accessories

Interface to any LVA 2.6m antennas⁽¹⁾

Interface to the existing supporting structure

⁽¹⁾to RYMSA RSL-2130 model by default

PSR S-band Antenna - PSR Air Traffic Control

RPS3400 model is a parabolic reflector antenna for application on Primary Surveillance Radar Systems (PSR). It operates at the S-Band on the frequencies: 2700 – 2900 MHz. It consists of a double curved reflector properly fed by two horns to achieve two beams with performances based on a cosec² coverage diagram.

The antenna has Hi and Low target and Hi and Low weather channels with a customized elevation pattern. It allows the most optimized performance and capable to work in the most severe environmental conditions, but, allowing a low maintenance procedure

VERY COMPACT
SIZE

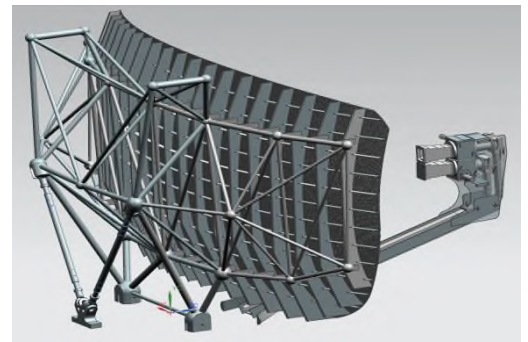
DOUBLE -CURVATURE
REFLECTOR COSEC²

DUAL
POLARIZED

The high qualification applied tests validate the antenna model for civilian and military applications with 100% requirement compliance.

Electrical specifications

Frequency	2700 -2900 MHz
Low Beam Gain	≥34 dBi
High Beam Gain	≥32.5 dBi
Weather Channel Gain (Low and High Beam)	≥32.5 dB (low), ≥31.5 dBi (high)
Beamwidth at 3 dB (H -plane)	≤ 1.4°
Elevation Coverage	>50°
Polarization	Linear or Circular
Tilt Range	From -3° to +6°
VSWR ⁽¹⁾	<1.35 <1.5 (weather)
Channels	4 (High/Low Target and Weather)
Peak Power handling	30 KW (pf 10%)
Input Connectors type	Hi/Low Target: WG (WR284) Hi/Low weather: type N socket



Environmental & Mechanical specifications

Operational Temperature range	-40°C - +70°C
Relative Humidity	5% - 100%
Driving Rain (without wind ⁽¹⁾)	350 mm/h
Maximum Windspeed (without ice ⁽²⁾)	160 Km/h (operation) 220 Km/h (survival)
Ice loading	12.5 mm thickness (operation)
Dimensions (W x D x H)	5.1x3.0x4.3 m
Weight	1000 Kg
Painting	Orange RAL 2004. Green RAL 6031 Other colors available

Mechanical Included

Interface to a pedestal⁽¹⁾

⁽¹⁾ Ask RYMSA for specified values with wind

⁽²⁾ Ask RYMSA for specified values with ice

⁽¹⁾ to RYMSA RT-110

Rotating pedestal - Especially suitable for RSP or PSR-MSSR antennas

RYMSA RF offers a turning pedestals especially suitable to be used on PSR or PSR-MSSR systems for the rotation of the Primary and Secondary Radar antenna (as option).

The pedestals are designed to be used on stringent environmental conditions with very reduced maintenance tasks.

The high qualification applied tests validate the rotating pedestals models for civilian and military applications with 100% requirement compliance in addition to enhanced mechanical specifications

The pedestals offer an excellent azimuth accuracy by means of the use of encoders, and they are delivered including the pedestal itself and the control cabinet unit.

Mechanical Specifications

Drive Mode	Dual
Angular speed	5-15 rpm
Angular Error	+/- 0.1°
Encoder Resolution	14 bits
Channels	4 channels 3 channels (as option)
Operational temperature range	-40°C to +60°C (outdoors unit) -20°C to +55°C (control cabinet)
Relative Humidity	100% (outdoors parts) 95% (control cabinet)
Driving Rain	<60 mm/h
Snow load	<200 kg/m ²
Ice loading	<12.5 mm radial thickness
Weight	2000 kg
Dimensions [ØxH]	1.6 x 1.9 m
Weight (control cabinet)	120 kg
Dimensions [LxHxD] (control cabinet)	0.8x1.2x0.3 m
Painting	Orange RAL 2004. Green RAL 6031 Grey RAL 7042 Other colors available under request



Electrical Specifications

Frequency	2700 – 2900 MHz & 1010 – 1100 MHz (optionally)
Rotary Join	4 channels 3 channels (as option)
Insertion Loss	<0.15 - 0.95 dB (depending on the channel)
VSWR	<1.2 – 1.3 (depending on the channel)
RF Input Connectors	2 x WG (WR284), 2 x type N socket 3 x type N socket (optionally)
RF Power Handling (Peak)	30 KW
Power supply	400VAC triphase +/-10%, 50/60Hz
Max. Power Consumption	14KVA

Mechanical accessories

Interface to any PSR antennas⁽¹⁾

Interface to the existing supporting structure

⁽¹⁾to RYMSA RPS-3400 model by default