

## 174-230MHz TV Panel Arrays

### Product Description

This series of panel antennas is ideal for four sided array design to provide a customized coverage for single or multistation use in Band III. Model 656 series is horizontally polarized and provides a nominal gain of 11dBd. Construction from thick walled tube and solid steel bar gives a heavy duty panel which is designed for operation in very harsh environments. This design also ensures ideal hot dip galvanizing for optimum corrosion protection. Colours are available for aviation visibility and even further corrosion protection.

The coaxial feed system can be fully pressurized and features twin 'O' ring seals on the feed point insulators. The panels are tolerant of light icing (radomes are available for use under heavy icing conditions down to -40 degrees C) and have a very low VSWR (typically less than 1.05:1) over the entire 174 - 230MHz band depending on the system configuration.

These panels are ideal array elements having low sidelobes, low mutual couplings between panels and high power ratings across the full band. This results in complete antenna systems that have very wide VSWR and pattern bandwidth.

The ability to utilize larger tower cross sections allows support for a top mounted UHF antenna such as the PHP or PVP UHF antenna arrays. This provides a powerful combination for delivering DTV and/or DAB systems customized to suit the coverage requirements of the customer.



### Features

- Cyclone rated
- Rugged galvanized steel construction for maximum corrosion protection
- Stainless steel version available on request
- Low wind load
- Pressurizable coaxial feed
- Four sided array design
- Low VSWR full band operation
- Suitable for multistation use, DAB and DTV
- High power rating
- Ideal array element allowing for a variety of horizontal radiation patterns to suit most requirements, contact RFS for details
- Medium power, unpressurised version available
- Temperature range -40 to +60 degrees C available

### Antenna Specifications

<b>Model Number</b>	<b>656</b>
Frequency Range, MHz	174 - 230
Polarization	Horizontal
Number of Channels	Multichannel
Nominal Gain (Mid-band), dBd	11.0
Half Power Beamwidth Azimuth, degrees	66
Return Loss, dB	26
Input Connector	7-16 DIN; 7/8" EIA Flange
Power Rating, kW	3; 4
Impedance, ohms	50 unbalanced
Weight, kg (lb)	80 (177)
Mounting (Standard), mm (in)	4 x 12mm (1/2) bolts
Effective Area Front (full antenna), sq m (sq ft)	0.83 (8.90)
Effective Area Side (full antenna), sq m (sq ft)	1.06 (11.38)
Design Wind Speed (max), km/h (mph)	240 (150)
Pressurization Operational, kPa (psi)	10 - 25 (1.5 - 3.8) 7/8" EIA Version
Pressurization Test, kPa (psi)	100 (15) 7/8" EIA Version
Material - Insulators	PTFE
Material - Radiators	Hot Dipped Galvanised steel
Material - Reflecting	Screen Hot Dipped Galvanised steel



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Antenna Array Specifications

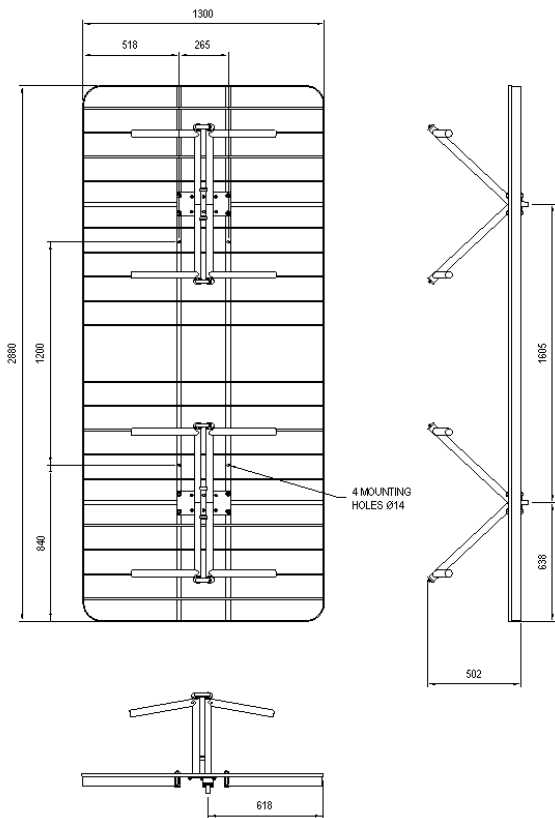
Number of bays	1				2				3			
	1	2	3	4	1	2	3	4	1	2	3	4
Panels per bay	1	2	3	4	1	2	3	4	1	2	3	4
Vertical Spacing between Bays (m)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
HRP Directivity (dBd)	7.0	4.5	2.7	1.8	7.0	4.5	2.7	1.8	7.0	4.5	2.7	1.8
VRP Directivity (dBd)	4.0	4.0	4.0	4.0	7.0	7.0	7.0	7.0	8.8	8.8	8.8	8.8
Gain (dbd)	11.0	8.6	6.7	5.8	14.1	11.6	9.8	8.9	15.8	13.3	11.5	10.6
Gain (times)	12.7	7.2	4.7	3.8	25.5	14.4	9.4	7.7	38.1	21.5	14.1	11.5
Weight (kg)	80	195	305	390	220	390	610	780	355	610	915	1170
Weight (lbs)	176	430	673	860	485	860	1345	1720	783	1345	2018	2580
Antenna Aperture L (m)	3.4	3.4	3.4	3.4	6.8	6.8	6.8	6.8	10.2	10.2	10.2	10.2
Antenna Aperture L (ft)	11	11	11	11	22	22	22	22	33	33	33	33
Effective area (m2)	1.1	2	3.1	4	2.2	4	6.2	8	3.3	6	9.3	12
Effective area (ft2)	11.8	21.5	33.4	43.1	23.7	43.1	66.7	86.1	35.5	64.6	100.1	129.2
Windload @ 50m/s (kN)	1.7	3.1	4.7	6.1	3.4	6.1	9.5	12.2	5.0	9.2	14.2	18.4
Windload @ 50m/s (lbs)	378	688	1066	1376	757	1376	2133	2752	1135	2064	3199	4127

Number of bays	4				6				8			
	1	2	3	4	1	2	3	4	1	2	3	4
Panels per bay	1	2	3	4	1	2	3	4	1	2	3	4
Vertical Spacing between Bays (m)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
HRP Directivity (dBd)	7.0	4.5	2.7	1.8	7.0	4.5	2.7	1.8	7.0	4.5	2.7	1.8
VRP Directivity (dBd)	9.7	9.7	9.7	9.7	11.4	11.4	11.4	11.4	12.6	12.6	12.6	12.6
Gain (dbd)	16.7	14.2	12.4	11.5	18.4	15.9	14.1	13.2	19.6	17.2	15.3	14.4
Gain (times)	47.0	26.5	17.4	14.2	69.5	39.2	25.7	21.0	92.0	51.9	34.0	27.8
Weight (kg)	440	780	1170	1510	660	1170	1730	2240	880	1560	2065	2745
Weight (lbs)	970	1720	2580	3330	1455	2580	3815	4939	1940	3440	4553	6053
Antenna Aperture L (m)	13.6	13.6	13.6	13.6	20.4	20.4	20.4	20.4	27.2	27.2	27.2	27.2
Antenna Aperture L (ft)	45	45	45	45	67	67	67	67	89	89	89	89
Effective area (m2)	4.4	8	12.4	16	6.6	12	18.6	24	8.8	16	24.8	32
Effective area (ft2)	47.4	86.1	133.5	172.2	71.0	129.2	200.2	258.3	94.7	172.2	266.9	344.4
Windload @ 50m/s (kN)	6.7	12.2	19.0	24.5	10.1	18.4	28.5	36.7	13.5	24.5	37.9	49.0
Windload @ 50m/s (lbs)	1513	2752	4265	5503	2270	4127	6398	8255	3027	5503	8530	11007

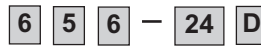
Note: Tower sections and interface steelwork antenna system to tower is not included in load calculations.

Antenna Panel Dimensions



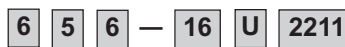
Nomenclature

Equal Split



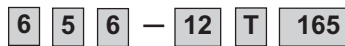
Number of faces: A=1, B=2, C=3, D=4, etc  
 Total number of Panels: 2, 4, 8, 12, 16 etc  
 656: Panel Series

Unequal Split



Power ratio per face  
 Unequal power ratio  
 Total number of Panels: 2, 4, 8, 12, 16  
 656: Panel Series

Thinned array

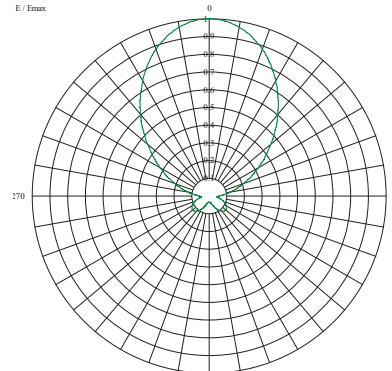
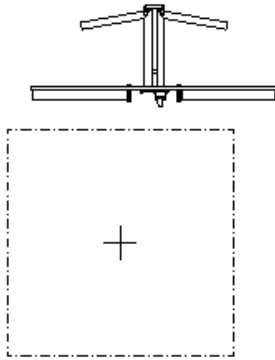


Panels per face  
 Thinned array  
 Total number of Panels: 2, 4, 8, 12, 16  
 656: Panel Series

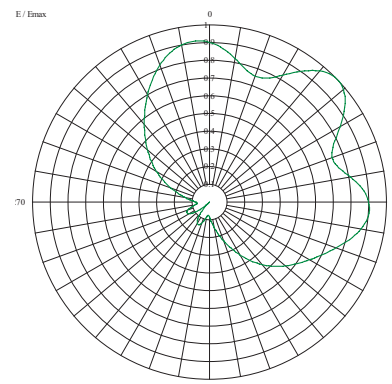
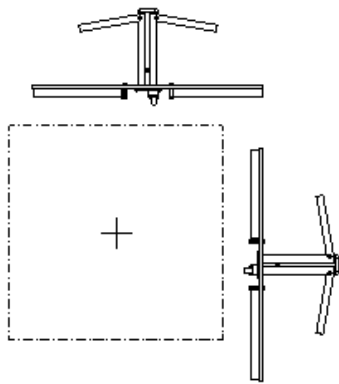
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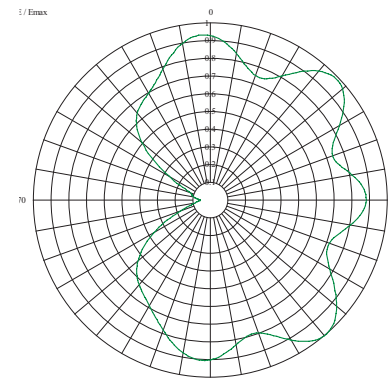
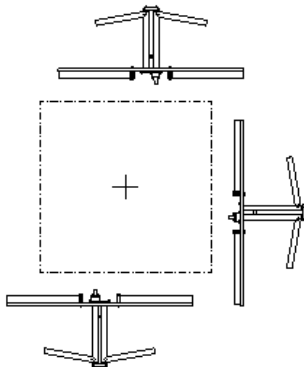
Horizontal patterns



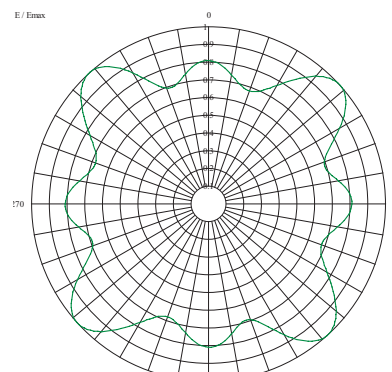
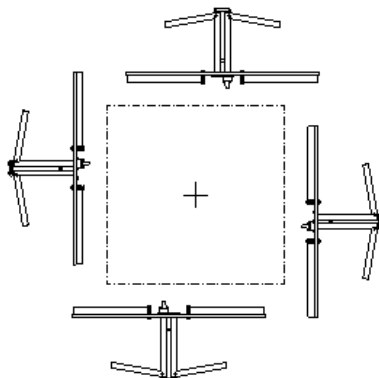
HRP 656-A 202MHz 7.03dBd



HRP 656-B 202MHz 4.54dBd



HRP 656-C 202MHz 2.71dBd

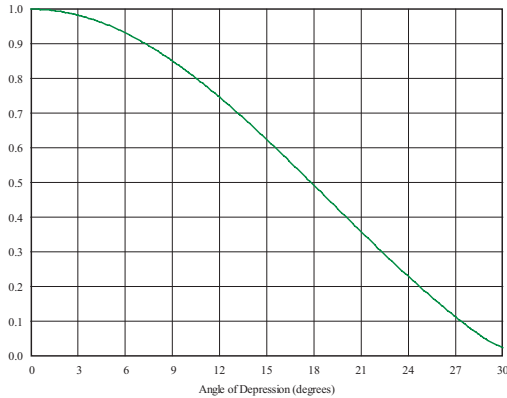


HRP 656-D 202MHz 1.83dBd

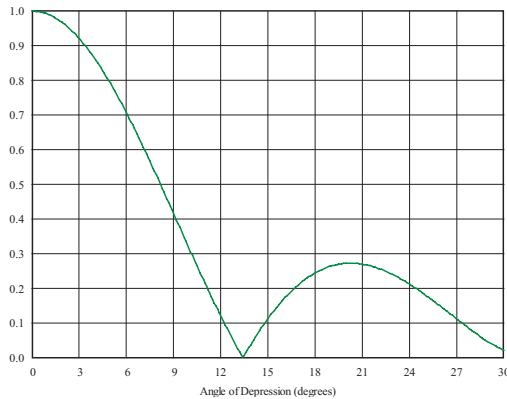
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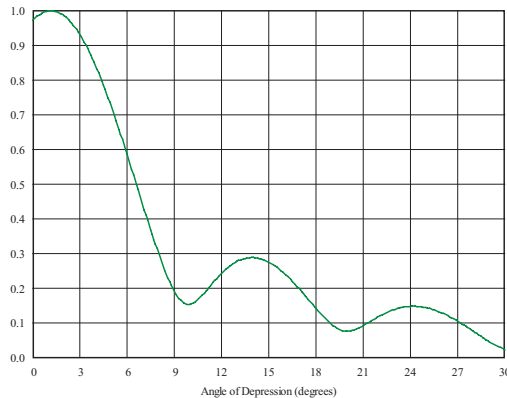
Vertical patterns



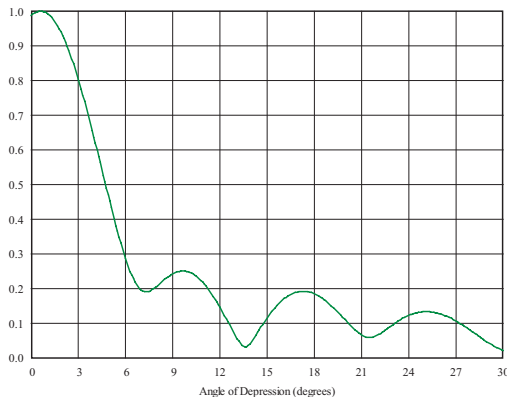
**VRP 656-1 202MHz 4.01dBd**



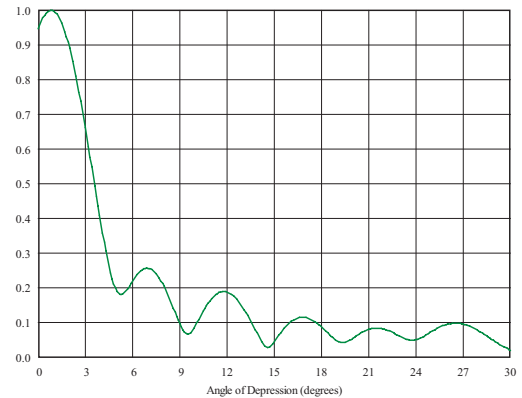
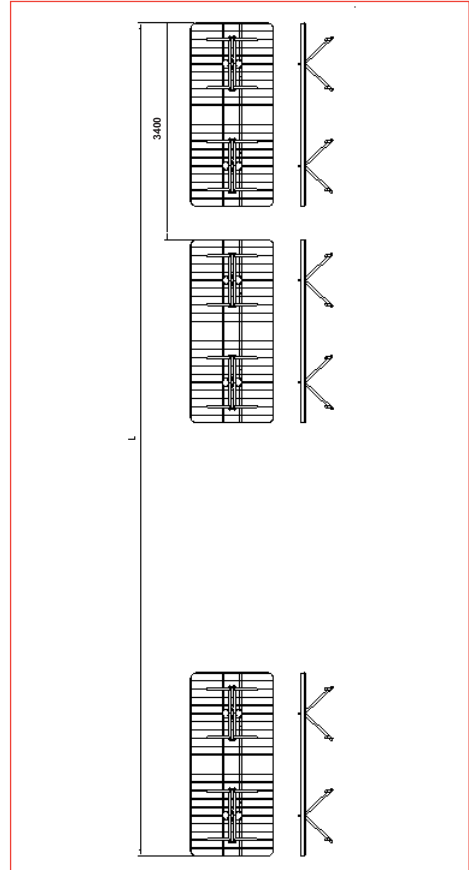
**VRP 656-2 202MHz 7.04Bd**



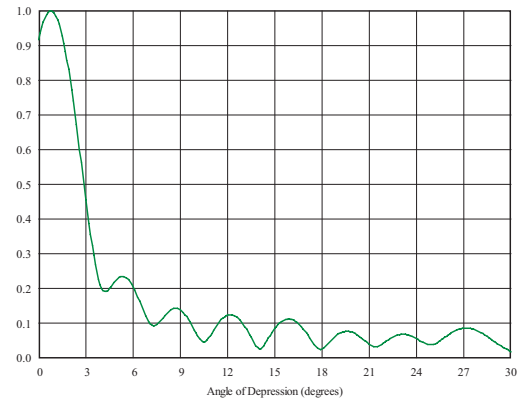
**VRP 656-3 202MHz 8.46dBd**



**VRP 656-4 202MHz 9.69dBd**



**VRP 656-6 202MHz 11.39dBd**



**VRP 656-8 202MHz 12.61dBd**

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