

# Broadband Antenna Experts



## Marine & Coastal Industry Guide



## Broadband Antenna Experts

### The Company

Poynting Antennas designs, manufactures and sells cellular antenna products and related equipment mainly to the telecommunications, broadcasting and related industries.

Established in 1990, Poynting has grown to become one of the leading antenna manufacturers in South Africa.

Poynting exists for advancing antenna applications: its name is derived from the Poynting vector, a directional measure of energy in an electromagnetic field.

Poynting was founded on the deep knowledge and understanding of the principles of electromagnetics, RF propagation, antenna design and development.

Poynting employees include graduate as well as professionally registered engineers with PhD doctorate level expert knowledge of the technology and the industry. Poynting has a legacy of innovative design and delivery with customers and partners worldwide.

### Footprint

Apart from South Africa, roughly 80% of total sales are International with the main markets being Europe, USA, Canada and Australia. International sales are fulfilled through long-standing distribution partners.

### Commitment to Quality

Poynting Antennas (Pty) Ltd is dedicated to ensure that its products and services fully meet the requirements of its customers at all times. Poynting has a legacy of innovation, design and fulfilment, taking pride in its solid ethical approach. Innovation and creative independence, team spirit and continual learning ensures the organisation can respond to challenges with agility.

### Innovation

Poynting holds extensive Intellectual Property (IP) with over 50 registered designs, patents and trademarks filed to differentiate our products from competitive offerings.

Poynting R&D is constantly on the edge of novel innovation.

### Operations

With production facilities in Samrand, South Africa (for specialised and unique products), Poynting has established satellite manufacturing facilities in Shenzhen China (90% of all antenna productions) with strict quality and manufacturing metrics to ensure the integrity of product performance. International logistics and high volume supply are further streamlined from Shenzhen, China.

### International Sales and Business Development

Poynting has embarked on a long term strategy to expand its reach into the international arena. Poynting opened its office with full representation in Germany focusing on deepening the approach in Europe, Scandinavia and Eastern Europe.

In April 2021 we opened offices and a warehouse in the USA and with this expansion Poynting will be able to accelerate our growth and take on the huge demand for broadband antennas in the region.

Poynting is continuously improving – a careful and selective approach for growth in new markets and regions. We seek to promote our products and solutions worldwide and therefore seek distributors in regions where our market share is still small. Servicing new customers better, expanding the business in “undiscovered” regions with new and exciting products.

**“Making Wireless Happen”, has become synonymous with Poynting.**

### Poynting - Marine & Coastal Solutions

Poynting offers a range of antennas that are designed specifically for marine environments where performance, quality, styling and weather protection is critical. This range of antennas is aimed at various types of marine applications, from; super yachts, commercial vessels, (river-) cruise ships, private yachts, towing-vessels and speed boats.

These antennas can also be used in other applications with harsh environments such as harbour buildings, buoys, pontoons, and smaller boats. Other areas where these models of the Poynting Marine antenna solutions will be ideal, include anywhere along the coast-line, lake sides and other high humid areas.

The marine range of antennas are designed within Poynting's customary requirements of high performance, wide bandwidth and exceptional quality.

This range is targeted at LTE and 5G reception at sea, as well as antennas to provide dual-band WiFi distribution at sea. Many of the marine antennas are 5G Ready, where they cover the 450MHz LTE/CDMA bands as well as the 3.5GHz LTE/CBRS bands which are starting to become available internationally.

With these antennas, the yacht owner will not need to replace or upgrade their antennas to benefit from this new technology and frequency bands.

A Poynting marine antenna will help reduce on-board communication costs significantly, reduce latency and ensure a stable and reliable connection to carrier base stations. Join thousands of satisfied marine customers and do not compromise on this crucial part of your communication system.

**"Making Wireless Happen", has become synonymous with Poynting.**



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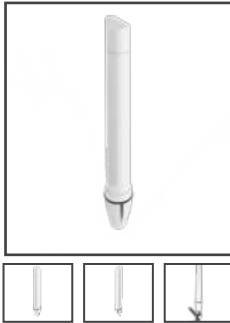
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TOP 5 TIPS FOR SELECTING AND  
INSTALLING MARINE ANTENNAS

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### OMNI-291

Primary Industry: **Marine & Coastal**  
Secondary Industry: **Commercial & Industrial; Farming & Agricultural**

Frequency:	450-470; 698-960; 1710-2700 MHz
Max Gain:	7dBi
Radiation Pattern:	Omni-Directional
MIMO:	SISO
Size (LxWxD):	560mm x Ø75mm (excl. BRKT-40)
Connector Type:	N-Type (F)



4G LTE 450 MHz



### OMNI-400

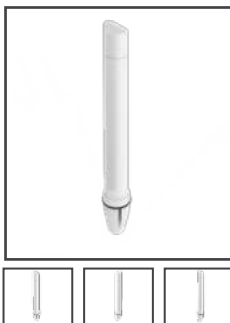
Primary Industry: **Marine & Coastal**  
Secondary Industry: **Commercial & Industrial; IoT, M2M & Smart Meters; Farming & Agricultural**

Frequency:	698-960; 1710-2170; 2300-2700 MHz
Max Gain:	7.5dBi
Radiation Pattern:	Omni-Directional
MIMO:	SISO
Size (LxWxD):	555mm x Ø75mm (excl. BRKT-40)



4G LTE IoT

(Not available in Europe)



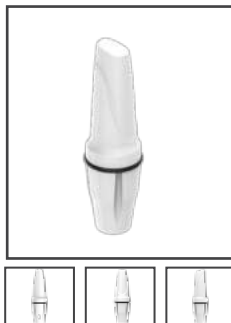
### OMNI-402

Primary Industry: **Marine & Coastal**  
Secondary Industry: **Commercial & Industrial; IoT, M2M & Smart Meters; Farming & Agricultural**

Frequency:	410-470; 698-960; 1710-2700; 3400-3800 MHz
Max Gain:	6.2dBi
Radiation Pattern:	Omni-Directional
MIMO:	2X2 MIMO
Size (LxWxD):	750mm x Ø75mm (excl. BRKT-40)



4G LTE 5G CBR5 450 MHz 2X2 MIMO



### OMNI-403

Primary Industry: **Marine & Coastal**  
Secondary Industry: **Commercial & Industrial; IoT, M2M & Smart Meters; Farming & Agricultural**

Frequency:	698-960; 1710-2170; 2300-2700 MHz
Max Gain:	5dBi
Radiation Pattern:	Omni-Directional
MIMO:	SISO
Size (LxWxD):	252mm x Ø75mm (excl. BRKT-40)



### OMNI-404

Primary Industry: **Marine & Coastal**  
Secondary Industry: **Commercial & Industrial; IoT, M2M & Smart Meters; Farming & Agricultural**

Frequency:	698-960; 1710-2700; 3400-3800 MHz
Max Gain:	2dBi
Radiation Pattern:	Omni-Directional
MIMO:	SISO
Size (LxWxD):	252mm x Ø75mm (excl. BRKT-40)



**NEW  
PRODUCT**



### OMNI-414

Primary Industry: **Marine & Coastal**  
Secondary Industry: **Commercial & Industrial; IoT, M2M & Smart Meters; Farming & Agricultural**

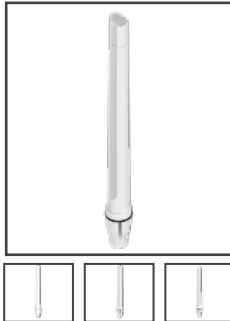
Frequency:	617 - 3800 MHz
Max Gain:	3.5 dBi
Radiation Pattern:	Omni-Directional
MIMO:	4x4 MIMO
Size (LxWxD):	646 mm x Ø75mm (excl. BRKT-40)



Available **Q4 2021 / Q1 2022**



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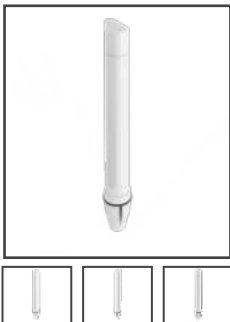
### OMNI-493

Primary Industry: **Marine & Coastal**  
Secondary Industry: **Commercial & Industrial; IoT, M2M & Smart Meters; Farming & Agricultural**

Frequency:	617-960; 1427-1517; 1710 -2700; 3400-3800 MHz
Max Gain:	9dBi
Radiation Pattern:	Omni-Directional
MIMO:	SISO
Size (LxWxD):	646 mm x Ø75 mm (excl. BRKT-40)



4G LTE 5G 3.5G CBRS B71



### OMNI-496

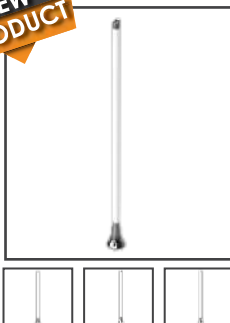
Primary Industry: **Marine & Coastal**  
Secondary Industry: **Commercial & Industrial; IoT, M2M & Smart Meters; Farming & Agricultural**

Frequency:	2400-2500; 3300-3800; 5000-6000 MHz
Max Gain:	7.5dBi
Radiation Pattern:	Omni-Directional
MIMO:	SISO
Size (LxWxD):	560mm x Ø75mm (excl. BRKT-40)



5G IoT M2M Wi-Fi

NEW  
PRODUCT



### OMNI-902

Primary Industry: **Marine & Coastal**

Frequency:	617 - 4200 MHz
Max Gain:	9dBi
Radiation Pattern:	Omni-Directional
MIMO:	2x2 MIMO (2 x 5G/LTE)
Size (LxWxD):	1654mm x Ø145mm



4G LTE 5G B71 3.5G CBRS 2x2 MIMO

Available Q1/Q2 2022

## Broadband Antenna Experts

**NEW  
PRODUCT**



### OMNI-904

Primary Industry: *Marine & Coastal*

Frequency:	617 – 4200 MHz
Max Gain:	3.5dBi & 9dBi
Radiation Pattern:	Omni-Directional
MIMO:	4x4 MIMO (2x2 + 2x2 5G/LTE)
Size (LxWxD):	1654mm x Ø145mm

Available **Q1/Q2 2022**



**NEW  
PRODUCT**



### OMNI-914

Primary Industry: *Marine & Coastal*

Frequency:	617 – 4200 MHz
Max Gain:	9dBi
Radiation Pattern:	Omni-Directional
MIMO:	4x4 MIMO
Size (LxWxD):	2454mm x Ø145mm

Available **Q1/Q2 2022**



### PUCK-2-W

Primary Industry: *Transport & Mobility; Marine & Coastal; Commercial & Industrial; Mining & Tunnelling; IoT, M2M & Smart Meters; Farming & Agricultural*

Frequency:	698-960; 1710-2700; 3200-3800 MHz
Max Gain:	6dBi
Radiation Pattern:	Omni-Directional
MIMO:	2X2 MIMO - 2-in-1 Antenna: 2 x LTE
Size (LxWxD):	Ø99.3mm x 36mm





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### PUCK-5-W

Primary Industry: Transport & Mobility; Marine & Coastal; Commercial & Industrial; Mining & Tunnelling; IoT, M2M & Smart Meters; Farming & Agricultural

Frequency:	698-960; 1710-2700; 3200-3800; 5000-6000 MHz
Max Gain:	7.5dBi
Radiation Pattern:	Omni-Directional
MIMO:	5-in-1 Antenna: 2 x LTE, 2 x Wi-Fi, 1 x GPS
Size (LxWxD):	Ø99.3mm x 36mm



### PUCK-12-W

Primary Industry: Transport & Mobility; Marine & Coastal; Commercial & Industrial; Mining & Tunnelling; IoT, M2M & Smart Meters; Farming & Agricultural

Frequency:	2400-2500; 5000-6000 MHz
Max Gain:	7.5dBi Wi-Fi
Radiation Pattern:	Omni-Directional
MIMO:	2-in-1 Antenna: 2 x Wi-Fi
Size (LxWxD):	Ø99.3mm x 36mm





## MIMO-3

Primary Industry: Transport & Mobility; Marine & Coastal; Farming & Agricultural  
Secondary Industry: Mining & Tunnelling; IoT, M2M & Smart Meters

Frequency:	410-470; 698-960; 1710-2700; 3400-3800; 5000-6000 MHz
Max Gain:	6dBi
Radiation Pattern:	Omni-Directional
MIMO:	2x2 MIMO
Size (LxWxD):	253mm x 144mm x 128mm



variants

MIMO-3-12	MIMO-3-13	MIMO-3-15 (Available in Black)
2-in-1 Antenna 2 x LTE;	3-in-1 Antenna 2 x LTE; 1 x GPS Glonass	5-in-1 Antenna 2 x LTE; 2 x Wi-Fi; 1 x GPS Glonass
410-470, 698-960, 1710-2700, 3400-3800, 5000-6000 MHz		
6.0dBi - Omni Directional (2x2 MIMO)		



## MIMO-3

Primary Industry: Transport & Mobility; Marine & Coastal; Farming & Agricultural  
Secondary Industry: Mining & Tunnelling; IoT, M2M & Smart Meters

Frequency:	410-470; 698-960; 1710-2700; 3400-3800; 5000-6000 MHz
Max Gain:	6dBi
Radiation Pattern:	Omni-Directional
MIMO:	4X4 MIMO
Size (LxWxD):	253mm x 144mm x 128mm



variants

MIMO-3-14	MIMO-3-17 (Available in Black)
5-in-1 Antenna 4 x LTE; 1 x GPS Glonass	7-in-1 Antenna 4 x LTE; 2 x Wi-Fi; 1 x GPS Glonass
410-470, 698-960, 1710-2700, 3400-3800, 5000-6000 MHz	
6.0dBi - Omni Directional (4x4 MIMO)	

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### WLAN-60

Primary Industry: **Commercial & Industrial**  
Secondary Industry: **Marine & Coastal; Mining & Tunnelling; IoT, M2M & Smart Meters; Farming & Agricultural**

Frequency:	2400-2500; 3300-3800; 5000-6000 MHz
Max Gain:	18dBi
Radiation Pattern:	Uni-Directional
MIMO:	SISO
Size (LxWxD):	240mm x 240mm x 60mm



3.5G  
CDMA  
Wi-Fi  
IEEE 802.11n



### WLAN-61

Primary Industry: **Commercial & Industrial**  
Secondary Industry: **Marine & Coastal; Mining & Tunnelling; IoT, M2M & Smart Meters; Farming & Agricultural**

Frequency:	2400-2500; 5000-6000 MHz
Max Gain:	11dBi
Radiation Pattern:	Uni-Directional
MIMO:	4X4 MIMO
Size (LxWxD):	240mm x 240mm x 60mm



Wi-Fi  
IEEE 802.11n  
4X4 MIMO

## OPTIONAL ACCESSORIES

### BRKT - 37 -V2



Heavy Duty Stainless Steel Marine Flat Mount  
Antenna Bracket 1"-141  
for OMNI 291, OMNI-400 series

### BRKT - 38



Heavy Duty Stainless Steel Marine Ratchet  
Rail Mount Antenna Bracket  
for OMNI 291, OMNI-400 series





### BRKT - 39



Heavy Duty Stainless Steel Marine Mount  
Antenna Bracket 1"-141  
for OMNI 291, OMNI-400 series

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### CABLES

CAB		
CAB-47		CAB, 5m HDF-195 Low Loss cable N(m) to SMA(m)
CAB-49		CAB, 10m HDF-195 Low Loss cable N(m) to SMA(m)
CAB-92		5m twin HDF-195 Low Loss Cable SMA(m)-SMA(f)
CAB-109		10m twin HDF-195 Low Loss Cable SMA(m)-SMA(f)
CAB-143	A-CAB-143	3m Twin Pair HDF195 White with SMA(m) to SMA(f) Gold plated
CAB-144	A-CAB-144	5m Twin Pair HDF195 White with SMA(m) to SMA(f) Gold plated
CAB-147	A-CAB-147	3m HDF195 White with N(m) to SMA(m) Nickel plated
CAB-148	A-CAB-148	5m HDF195 White with N(m) to SMA(m) Nickel plated
CAB-149	A-CAB-149	8m HDF195 White with N(m) to SMA(m) Nickel plated
CAB-150	A-CAB-150	10m HDF195 White with N(m) to SMA(m) Nickel plated

### TOP 5 TIPS FOR SELECTING AND INSTALLING MARINE ANTENNAS

**Tip #1:** Look for an Antenna with a good Vertical (Elevation) Receive Angle

 **Selection Criteria:** Good Horizontal Vertical (Elevation) Send/Receive Angle

The major consideration for turbulent seas is of course the Pitch and Roll of the Vessel. This places a demand on the 'Elevation' or 'vertical aperture' of the Antenna/s installed on the Vessel.

Figure 1. Shows the relevance of Pitch and Roll in turbulent seas to the Elevation (Vertical aperture) of the Antenna. So, no matter how rough the Seas may get, we'll keep you connected.

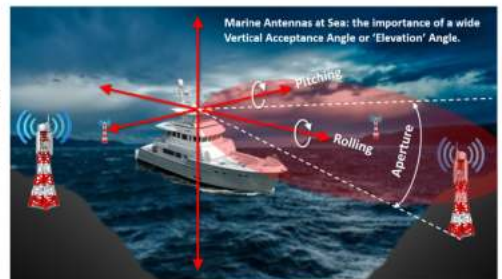


Figure 1. Good elevation aperture of an Antenna saves the day when trying to communicate in rough waters.

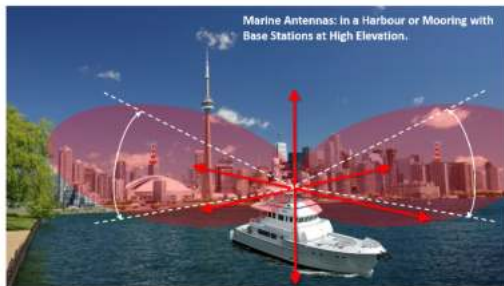


Figure 2. - Keep your Internet 'streaming' 'constant' so your 'Harbour Party's' music won't be interrupted.

However, 'Elevation' of the Antenna is however just as important when the Vessel is moored in a location like a Harbour or other protected location where the Base Stations are elevated above the position of the mooring.

Refer to Figure 2. which depicts the challenge of Base Stations located at higher elevation/s around moorings.

Many of the waterways such as for instance the Rhine River waterway has highly elevated Shores necessitating Base Stations to be erected high above the waterway. This similarly places a demand on a large Elevation aperture for the Antenna.

Figure 3. depicts such a scenario.

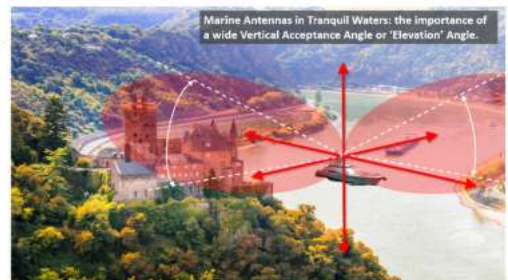


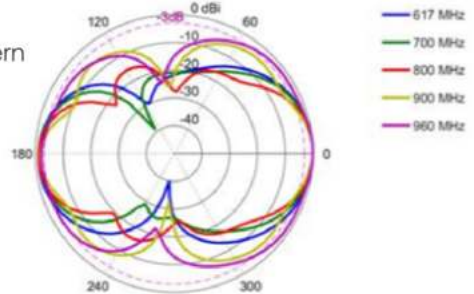
Figure 3. Your trip along inland waterways will be memorable for you and your Social Media friends, you will stay connected.



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At Poynting Antennas, we go to great lengths to ensure that an appropriate Elevation (or 'vertical aperture') an Antenna is maintained across all the frequency bands used by modern data communications systems.

All our documentation depicts the ACTUAL, measured in our Anechoic Chamber, results of our Antennas. At Poynting we design our Antennas with best-in-class Radiation Pattern to ensure that a Marine Vessel will have the best possible connection no matter the circumstance.



If the Marine vessel travel out to sea or further distance away from the Base Stations, consideration should be given to Space Diversity in the Vertical Plane.



**In Summary: Elevation - Check your Marine Antenna's ability to receive a good 'vertical' signal optimising reception performance when**

- In rough Seas when your Vessel is Pitching and Rolling
- In a Harbour or on a mooring with Base Stations located at higher elevation
- Travelling in calm waters but with Base Stations located at higher elevation than the Vessel

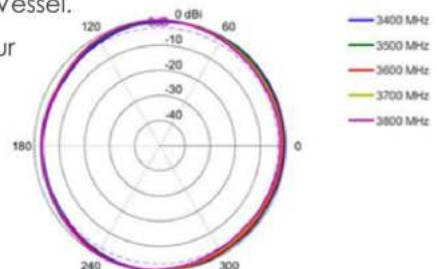
**Tip #2: Your Marine Antenna's ability to receive a good signal from ANY direction your Vessel may be travelling, also known as an Antennas' Azimuth**



**Selection Criteria: Good Horizontal (Azimuth, 360°) Send/Receive Angle**

The mobility of a Marine Vessel provides a challenge to the receiving Antenna. The Azimuth of an Antenna is the Horizontal Radiation Pattern which really just refers to the Antennas ability to receive a good signal from any direction i.e., allows the reception of signals 360° around the Vessel.

Imagine the frustration of approaching a harbour and relying on signal from a LTE, 4G, 5G Tower on Starboard, for example 37° and suddenly, due to an anomaly in the Antenna's ability to receive a good signal from that direction, you lose approach information for the Electronic Chart Display and Information System (ECDIS).





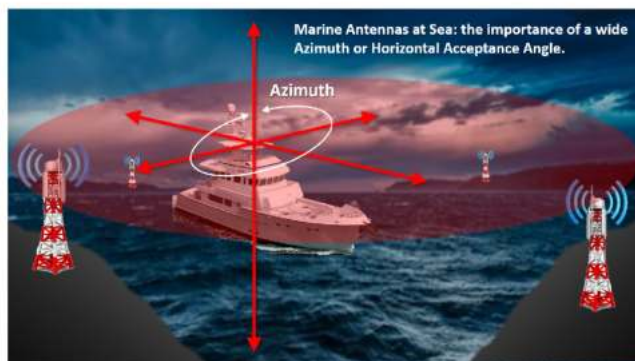


Figure 4. Good Horizontal (Azimuth) reception will ensure good reception regardless of direction of travel.

At Poynting our design Engineers use the latest software and we test our Antennas in our Anechoic chamber to give you the best possible 'all-round' connectivity and total performance over longer distances from the shore, in every direction.

So, no matter whether you're coming- or going, Poynting will keep you connected over longer distances over any Water Body, be it the Ocean, a Lake or a River with Communication Towers high up on the Embankment, we've got you covered.

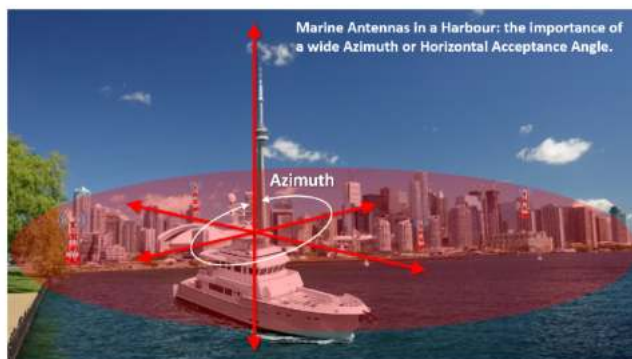


Figure 5. Often Multiple Base Station are located around Harbours. A proper Horizontal Radiation Pattern will ensure the best possible reception when you are moored or traveling in Harbours or in protected waters close to Coastal Cities.

## Broadband Antenna Experts

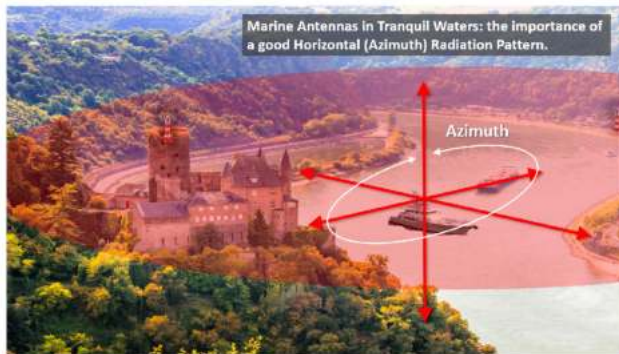



Figure 6. Even when traversing inland waterways, multiple Base Stations are deployed along the Riverbanks. It is important that the Navigation System, Cloud Servers and your on-board music does not get interrupted.

 **In Summary: Azimuth- or Horizontal Radiation - Check your Marine Antenna's ability to send/receive a good signal optimising reception performance when**

- Travelling in ANY Direction (Bearing)
- In a Harbour or on a mooring with Base Stations located all around the Vessel.
- Travelling in calm waters but with Base Stations located at many different positions in every direction.

**Tip #3: Durability.** (Will last in the Marine environment; was designed for Marine use)

 **Selection Criteria:** An Antenna that performs well, also in the durability department.

One of the most frustrating scenarios when on the water is communication breakdown due to a broken or failing Antenna.

Figure 7. Mishaps happen but you don't want your Antenna to be the cause of it!





IP 68



-40°C to +80°C

All Poynting Marine Antennas are at least IP65 rated which means it can withstand the harsh elements of the Oceans giving you peace-of-mind that the likelihood of your Antenna failing you due to physical damage is very remote indeed.



**In Summary: Reliable Antennas; look for an Antenna that specifies (and achieves) the following:**

- Mechanical Stability; being able to 'take the knocks' associated with a Marine Vessel environment.
- Marine Weatherproof; able to withstand the Harsh Environment of Saltwater Sea Spray and still function to its full capability.

**Tip #4: SELECTING: Future Proof. (Will work now and for years to come!)**

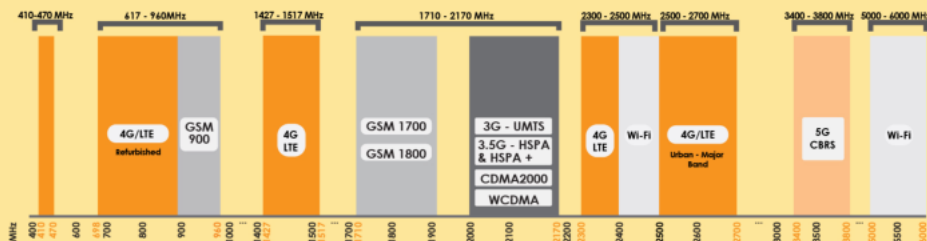


Selection Criteria: Send/Receive on all the Frequencies Now and for the Foreseeable Future.

The deployment of Base Stations by Network Operators is a very dynamic undertaking. This means that Mobile Network Operators and Internet Service Providers are continuously upgrading their Services and one such aspect is the Frequency Bands for newer services.

This could mean that the Antenna you buy today may not be able to receive newly deployed services due to limited coverage of future Frequency Bands chosen by the Service Operator. At Poynting we design our Antennas to cover all the possible Frequency Bands likely to be used far into the future.

### Overview of the more common Cellular & Wi-Fi Bands:



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At Poynting we understand the necessity of being able to use one, good quality Antenna that will adequately cover ALL the Frequency Bands with good performance across the entire Radio Frequency spectrum protecting your investment for years to come.

 **In Summary: Future Proof Antennas; look for an Antenna that specifies (and achieves) the following:**

- Frequency Range: Covers all the Frequency Bands currently being used as well as the 'up-and-coming' Frequency Bands being prepared for future Radio Communication from Internet Service Providers.
- Make sure that the Antenna performs within its Gain Specifications in all of these Frequency Bands and, as with Tip#1 and Tip#2, has good performance in Gain, Elevation- and Azimuth at all the Frequencies listed as its Operational Frequencies.

**Tip #5: INSTALLATION:** Consider the installation cable losses.

 **Selection Criteria:** Choose an Antenna Designer/Manufacturer that really understands Radio Frequency.

Keeping cable losses to a minimum is extremely important. At Poynting, we supply you with all the necessary 'know-how' on Antenna mounting options and how to make sure your Antenna performs at its best.

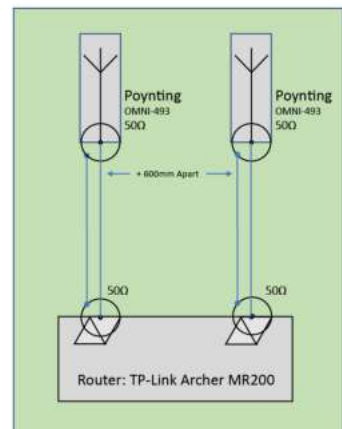
Space Diversity, as mentioned before, is another installation consideration where placement and distance between Router and Antenna needs to be considered.

### Example of Poynting Antenna assessment for client.

POYNTING ANTENNAS TECHNICAL ASSESSMENT #4.  
(Recommendation)

In order to get the best possible performance from your Poynting Antenna, I have compiled the Scenarios below:

- These Scenarios detail the use of two OMNI-493 Antennas. If at all possible, within spatial constraints, this installation should be considered. Apart from the huge advantage in limiting the losses introduced by the Splitter another HUGE advantage is the SPACE DIVERSITY ADVANTAGE.
- SPACE DIVERSITY in a MIMO Router like the TP-Link Archer MR 200 allows the capabilities of receiving two separate radio channels to be realised with typically HUGE improvement in performance.
- NOTE: HDF 195 Cable is "easier" to work with hence its use in the Scenarios.





The Table below (using 10m cable) summarises the 4 x Scenarios: Splitter vs. 2 x Antennas

### SUMMARY:

- The 'practical Scenario', using HDF-195 Cable and two Outside Antennas has between 6x and 7x better performance even before MIMO/Space Diversity is taken into account.
- Our experience is that MIMO can further increase the performance of the Router by at least 2x.

Frequency	Cables Router <-> Splitter			Splitter	Cables Router <-> Antenna			Antenna OMNI-493	Net Gain/Loss	TOTAL	Effective Outside Antenna GAIN	Improvement over Scenario 1	Factor Improvement
	Cable Loss/m	Cable Length	Cable Loss	Splitter Loss	Cable Loss/m	Cable Length	Cable Loss	Antenna Gain	Net Gain	Outside/ Inside*	Total Net Gain/Loss		
Scenario 1: Using 1 x Poynting OMNI-493 with HDF-195 Cable													
900 MHz	0.363 dB/m	1 m	-0.362 dB	-3.00 dB	0.362 dB/m	4 m	-1.448 dB	6 dBi	1.19 dB	14 dB	15.19 dB	N/A	N/A
1800 MHz	0.514 dB/m	1 m	-0.514 dB	-3.00 dB	0.514 dB/m	4 m	-2.056 dB	6 dBi	0.43 dB	14 dB	14.43 dB	N/A	N/A
2400 MHz	0.593 dB/m	1 m	-0.593 dB	-3.00 dB	0.593 dB/m	4 m	-2.132 dB	9 dBi	3.335 dB	14 dB	17.335 dB	N/A	N/A
3000 MHz	0.603 dB/m	1 m	-0.603 dB	-3.00 dB	0.603 dB/m	4 m	-2.412 dB	8 dBi	1.985 dB	14 dB	15.985 dB	N/A	N/A
Scenario 2: Using 1 x Poynting OMNI-493 with LMR-400 Cable													
900 MHz	0.1274 dB/m	1 m	-0.1274 dB	-3.00 dB	0.1274 dB/m	4 m	-0.5096 dB	6 dBi	2.363 dB	14 dB	16.363 dB	1.173 dB	0.693 X
1800 MHz	0.1855 dB/m	1 m	-0.1855 dB	-3.00 dB	0.1855 dB/m	4 m	-0.742 dB	6 dBi	2.0725 dB	14 dB	16.0725 dB	1.643 dB	2.155 X
2400 MHz	0.2175 dB/m	1 m	-0.2175 dB	-3.00 dB	0.2175 dB/m	4 m	-0.87 dB	9 dBi	4.9125 dB	14 dB	18.9125 dB	1.578 dB	1.980 X
3000 MHz	0.2464 dB/m	1 m	-0.2464 dB	-3.00 dB	0.2464 dB/m	4 m	-0.9856 dB	8 dBi	3.768 dB	14 dB	17.768 dB	1.783 dB	2.512 X
Scenario 6: Using 2 x Poynting OMNI-493 with HDF-195 Cable													
900 MHz	0.363 dB/m	0 m	0 dB	0.00 dB	0.363 dB/m	5 m	-1.81 dB	6 dBi	4.19 dB	14 dB	18.19 dB	3.000 dB	4.771 X
1800 MHz	0.514 dB/m	0 m	0 dB	0.00 dB	0.514 dB/m	5 m	-2.57 dB	6 dBi	3.43 dB	14 dB	17.43 dB	3.000 dB	4.771 X
2400 MHz	0.593 dB/m	0 m	0 dB	0.00 dB	0.593 dB/m	5 m	-2.665 dB	9 dBi	6.335 dB	14 dB	20.335 dB	3.000 dB	4.771 X
3000 MHz	0.603 dB/m	0 m	0 dB	0.00 dB	0.603 dB/m	5 m	-3.015 dB	8 dBi	4.985 dB	14 dB	18.985 dB	3.000 dB	4.771 X
Scenario 7: Using 2 x Poynting OMNI-493 with LMR-400 Cable													
900 MHz	0.1274 dB/m	0 m	0 dB	0.00 dB	0.1274 dB/m	5 m	-0.637 dB	6 dBi	5.363 dB	14 dB	19.363 dB	4.173 dB	6.204 X
1800 MHz	0.1855 dB/m	0 m	0 dB	0.00 dB	0.1855 dB/m	5 m	-0.9275 dB	7 dBi	6.0725 dB	14 dB	20.0725 dB	5.643 dB	7.515 X
2400 MHz	0.2175 dB/m	0 m	0 dB	0.00 dB	0.2175 dB/m	5 m	-1.0875 dB	7 dBi	5.9125 dB	14 dB	19.9125 dB	2.578 dB	4.112 X
3000 MHz	0.2464 dB/m	0 m	0 dB	0.00 dB	0.2464 dB/m	5 m	-1.232 dB	8 dBi	6.768 dB	14 dB	20.768 dB	4.783 dB	6.797 X

\* Assumes an Outside vs. Inside the Building differential of 14dB



**In Summary: Installation Considerations; look for a Partner that understands Antennas and its Installation issues such as Cable Length, Brackets, Positioning etc.**

- Understanding the reasons for Antenna's not performing Optimally.
- How to fix such issues that you may have.
- Listening to customer feedback and suggesting helping where new ideas could improve their Radio Communication connection / performance.