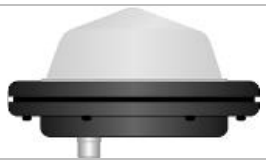
GPS Antenna Location and Installation (2015)

GPS ANTENNA EXAMPLES

V460
GPS / GLO L1 / L2 and L-band antenna

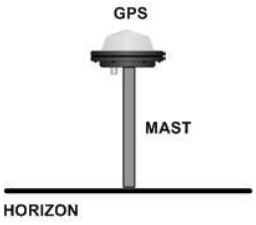


AD491
GPS / GLO L1 / L2 and L-band antenna

GA-530 combined GPS L1/L2 L-band & Marine beacon (IALA) antenna

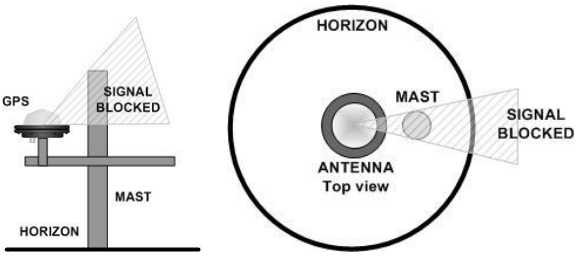
GOOD ANTENNA LOCATION REQUIRED

- Antenna needs a clear view of the sky all round and down to the horizon.
- We need to track satellites down to a few degrees above the horizon.
- At least four or five satellites are needed for a good position fix. At times when only five or six satellites are in view above the horizon every one is important.

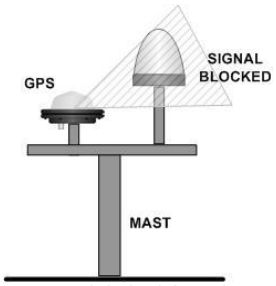


IDEAL ANTENNA LOCATION - CLEAR VIEW OF THE SKY

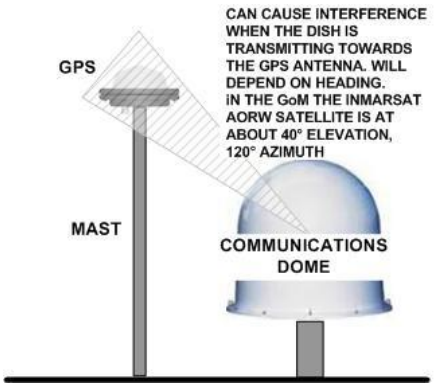
POOR ANTENNA LOCATION EXAMPLES



ANTENNA TOO CLOSE TO A MAST OR OTHER OBSTRUCTION



ANTENNA TOO CLOSE TO ANOTHER, HIGHER ANTENNA



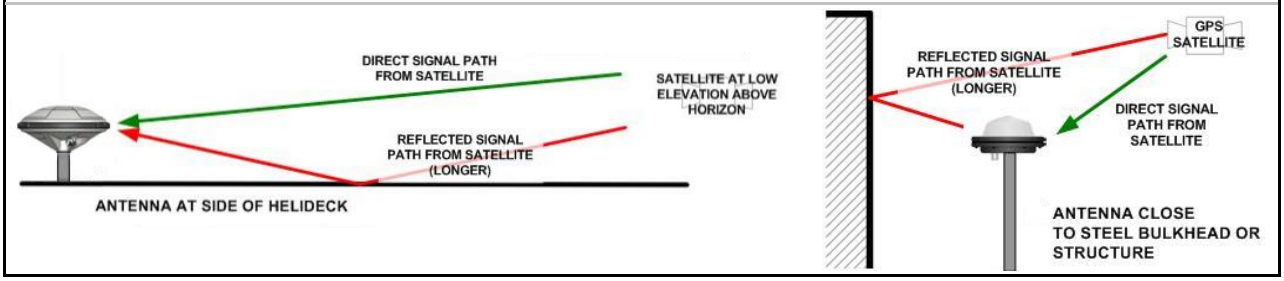
LOWER COMMUNICATION DOME WITH POTENTIAL TO TRANSMIT TOWARDS GPS ANTENNA AND CAUSE INTERFERENCE

Note: The GPS 'L1' frequency is approximately 1575 MHz, GPS L2 is approximately 1227 MHz. Signals are totally blocked by any metal object in the signal path.

GPS Antenna Location and Installation

AVOID REFLECTED GPS SIGNALS

- Usually called 'multipath' signals
- Path length from the GPS satellite is increased which increases the computed range from the satellite. May cause an error or instability in the position calculation.
- Effect can vary rapidly as satellite elevation and azimuth change.



GPS ANTENNA CABLES

- Use only good quality coaxial cable with properly fitted coaxial connectors
- Avoid sharp bends in the cable
- Avoid cuts in the cable casing
- Secure the cable so that there is no weight on the antenna connector
- Tape external connections with self-amalgamating tape to keep out water

APPROXIMATE MAXIMUM CABLE LENGTHS FOR OPTIMAL RESULTS (without the use of a GPS in-line amplifier) Note: GPS L2 signals are transmitted at a lower power level than the L1 signals. Therefore a lower loss cable is required with dual frequency receiver systems.	**Single frequency (L1 only) GPS** Required cable loss <12dB at L1	**Dual frequency (L1/L2) GPS** Required cable loss <8dB at L2
RG58 ¼" coax	**60 feet**	**45 feet**
RG213 ½" coax	**125 feet**	**110 feet**
LMR400 3/8**" coax (inner aluminium screen, special connectors)**	**235 feet**	**175 feet**
LMR600 ½" coax (inner aluminium screen, special connectors)	**350 feet**	**300 feet**
LDF4-50 ½" semi-rigid coax (uses special connectors)	**425 feet**	**360 feet**
Note: maximum cable length will partly depend on the electrical environment in which the cable runs. As far as possible keep antenna cables separate from other cables which may cause interference. Power cables, radio transmitter cables, Inmarsat and Vsat cables, are examples.		

POSSIBLE SOURCES OF GPS SIGNAL INTERFERENCE	
From onboard vessel	• Communications domes, as shown above • Television antenna amplifiers • Satellite television domes • Any transmitting antenna closer than a few inches • A faulty GPS antenna within a few inches. They can radiate. Keep GPS antennas at least three feet apart if possible • Radar scanner at the same height and close
From onshore or near platforms	• Television transmitters • High power radar • Microwave data links