



MILITARY ANTENNA SYSTEMS



Moonraker Australia Pty. Ltd. A.C.N. 009 531 211

Tasmania Technopark, Dowsing Point 7010, Tasmania Australia

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MOONRAKER AUSTRALIA

Passively simulates marine or land based 10.7m/35ft high power antenna

Tests operation of TX and ATUs without radiating RF signal in a simulated operational situation

Ideal teaching or demonstration unit



TX/RX

ATU

MRAS

Reactances and Resistances

MHz	Magnitude	Phase	Real	Reactive
1.5	12.96	-87.0	23.3	-444.0
2.0	10.36	-86.0	23.0	-328.8
2.5	8.07	-85.3	20.7	-252.4
3.0	6.13	-84.3	20.1	-201.5
3.5	4.15	-82.4	21.3	-159.8
4.0	2.22	-81.9	18.2	-127.8
4.5	-0.59	-78.4	18.8	-91.5
5.0	-3.33	-73.2	19.7	-65.2
5.5	-6.80	-63.6	20.3	-40.9
6.0	-11.22	-37.3	21.9	-16.7
6.5	-11.82	18.7	24.3	8.2
7.0	-5.92	55.2	28.9	41.5
7.5	-1.85	64.0	35.4	72.6
8.0	1.21	67.5	44.0	106.2
8.5	4.13	68.5	59.0	149.7
9.0	6.85	67.2	85.3	202.8
9.5	9.75	64.0	134.7	276.2
10.0	13.50	53.9	278.8	382.3
12.0	16.00	-45.4	443.0	-449.3
14.0	8.43	-67.4	101.4	-243.7
16.0	3.87	-67.9	58.7	-144.7
18.0	0.24	-60.7	50.3	-89.7
20.0	-3.31	-26.1	61.3	-30.1
22.0	-2.08	-7.6	78.0	-10.4
24.0	1.96	-5.4	124.8	-11.8
26.0	2.23	-23.7	118.4	-52.0
28.0	-1.06	-24.9	80.3	-37.3
30.0	-2.78	3.6	72.5	4.6

$REAL = 100 * 10^{(M/20)} * \cos(P)$
 $REACTIVE = 100 * 10^{(M/20)} * \sin(P)$
 where M=Magnitude and P=Phase

The MRAS 1000 Antenna Simulator is designed to mimic the varying impedance characteristics of a 10.7 metre (35 foot) whip antenna, as commonly used on naval vessels world-wide, based on the application of typical inductive and capacitive reactances and resistances.

This is achieved across the entire MF/HF range from 1.6 to 30 MHz with 1kW continuous power input. The system is fully automatic and no band switching is required.

Easy and safe to operate, it is an ideal classroom aid in the training of HF communications operators or as a demonstration unit. The Antenna Simulator is also a useful aid to communications maintenance operations, making it possible to test the performance of transceivers and antenna tuning units without having to radiate a RF signal.

Designed as a stand alone unit, it may also be mounted on a standard 483mm (19in) rack with a front panel clearance of 266mm (10.5in). RF seals around the lid and all external components provide protection from electro-magnetic interference, and continuous forced air cooling dissipates heat due to RF energy applied to the unit.

On application of AC power, an indicator lamp shows that the unit is operational.

Technical Specifications

Frequency Range	1.6-30.0 MHz
Power Capability	1kW CW maximum
RF Interface (Input)	MRA-FT150 Feedthrough Insulator and earth lug
Environmental	10-40°C, 95% non-condensing humidity
AC Power Requirement	110-240v AC, single phase, 1.5A max, 50/60Hz
Size:	overall (w/d/h) 420 x 555 x 265mm (16.5 x 21.9 x 10.4 in)
	front panel (w/h) 482.6 x 265mm (19 x 10.4 in)
Weight: unit	22kg (48.4 lbs); packed 46kg (101.2 lbs)

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MOORED BUOY PLATFORM

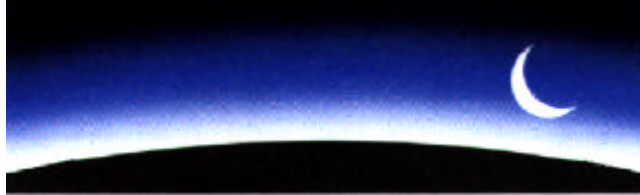


Development of type BM1000 moored buoy for RAN

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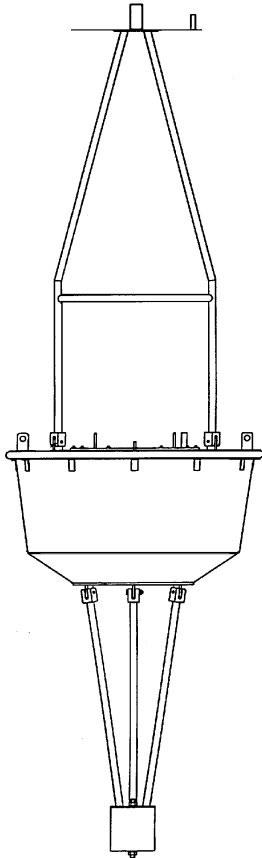
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MOONRAKER

Moored Buoy

type BM1000



The buoy is designed as a stable self contained and powered platform for supporting underwater equipment and providing a radio relay to another station.

The standard units feature quick assembly\disassembly of the counterweight and superstructure from the main hull section. The main hull can be supplied with separate watertight equipment and battery compartments. The floatation section of the hull is normally filled with a closed cell foam to assist floatation should the unit suffer damage causing water ingress. IP rated connectors are available for the interfacing of external electrical\ electronic equipment including sub-surface sensors.

The superstructure supports the navigation lighting and is also designed to support an antenna, radar reflector and extra solar panels for an onboard power supply. The hull shape is such that it provides a stable platform for the antenna and solar panels with minimal acoustic noise when moved by wind or wave action.

The mooring system provides for easy deployment and recovery with the first section of mooring line designed to resist shark attack. In addition, the buoy hull has a rubber buffer around its perimeter and is supplied with a floating recovery line. Lifting lugs to 1000 kg are fitted to the hull which allows a single point lift.

Specifications

- Various hull sizes to suit different payloads
- May be painted to most colours required (standard colour is yellow)
- Radar reflectors, IALA Compliance Top marks and antenna (s) may be fitted
- A battery compartment venting system is available
- Buoyancy compartment of hull filled with closed cell foam
- Watertight equipment compartment with sealed electrical connection to battery compartment
- Solar powered navigation light may be optionally fitted with adjustable flash sequence for different survey requirements
- Approximate overall weight of the standard buoy with superstructure and without counterweight attached is 68kg
- The system is designed for:
 - deployment and recovery up to Sea State 2
 - operation up to Sea State 4
 - survivability up to Sea State 6
- Certification of Testing of lifting points and mooring tackle is available
- Operational and maintenance documentation is provided
- Packing crate is designed for re-use.

Specifications subject to change 4/98

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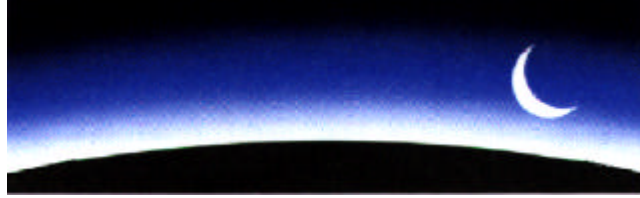
MARINE ANTENNA SYSTEMS



Top: HMAS Melbourne fires a missile
with Moonraker antennas laid down

Bottom: High power arc testing

Right: SAS assault craft

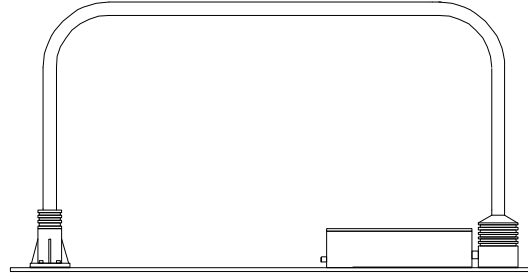


M O O N R A K E R

Type SL3-17



HF Near Vertical Incidence Skywave (NVIS) compact antenna system

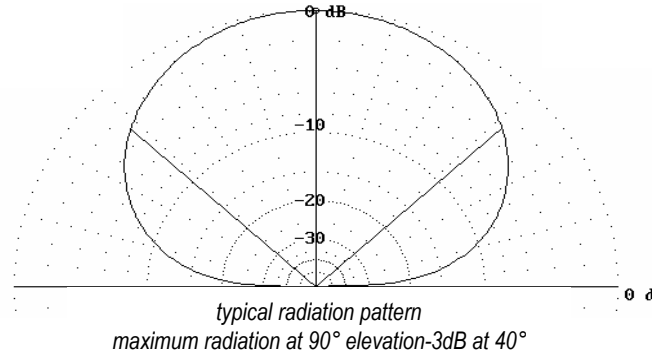


Designed to provide high performance close in HF communications for local area communications where the sky wave is not generally available due to the phenomenon of the skip zone.

The type SL3-17 system requires only low RF transmit power for full range with further reduction in power giving a localised communication zone for local fleet communications. It exhibits high angle radiation to permit communications in the 0 to 1200 km range. Tuning over the 3 to 17 MHz frequency range is automatic via the internal antenna tuning system. No transceiver interface is required. Tuning data is written to one of 500 non volatile memories allowing fast recall when making band changes making it suitable for some ALE data systems.

High performance is assured, even in environments subject to noise interference, due to the inherent filter qualities of the design, which combines automatic frequency tuning, a narrow bandwidth and excellent high angle radiation.

The system is of robust construction utilising heavy duty marine grade aluminium tubing to give a large low loss surface area for maximum radiating efficiency, and is fully marinised. Exterior metal surfaces are finished with high durability epoxy based coating, highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation.



SPECIFICATIONS

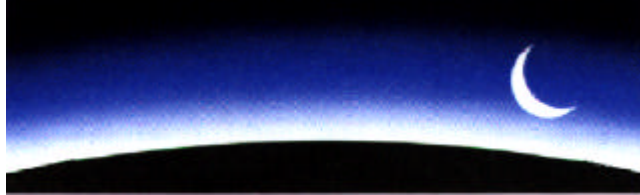
Frequency Range	3-17 MHz
Antenna Dimensions	1m high x 2m wide (3.3 x 6.6 ft)
Base Plate Dimensions	2000 x 400 mm (78.7 x 15.7 in) footprint
VSWR	< 2:1
Polarisation	Predominately Horizontal
Radiation Pattern	Hemispherical
Impedance	50 ohms nominal
Power Capability	Dependent upon ATU capability. Antenna up to 1kW CW
ATU (option)	Tuning time initial <2 seconds, recurrent <10 milli seconds; Power capability 150W PEP, 50W CW, 12V DC (24V option) at 900 mA
Weight	Antenna only: 40kg (88 lbs); Packed 75kg (165 lbs)
Packed Size	Wooden crate: 2070 x 1100 x 460 mm (81.5 x 43.5 x 181.1 in)

Specifications subject to change 04/10

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M O O N R A K E R

Type 122BB/S



High power capability broadband Naval HF whip antenna for ships over 50 metres (164 feet) and base stations

The type 122BB/s is a longer, higher gain version of the type 107BB/S, providing improvements of 2dB gain at lower (3.0:1) SWR. The 12 metre (40 ft) heavy duty free standing tactical whip has a continuous power capability of 5 kW. The system is intended for use in high power ECM (electronic counter measure) systems and designed to provide reliable high performance broadband communications for transmit and receive over the HF frequency band from 1 to 30 MHz without the use of an antenna coupler. With a suitable multicoupler, multiple transmitters may be used into the one antenna.

By installing a configuration of two whips sited 3 metres apart and connected via a two-way 50 Ω coupler to the transmitter, an improvement of 3dB at the lower end of the band is possible. Radiation is vertically polarised and omnidirectional in the azimuth plane.

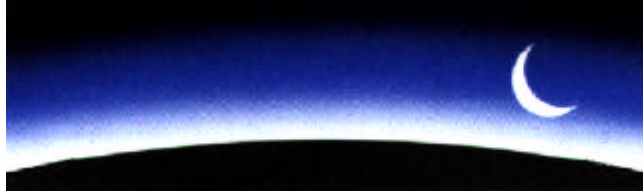
The system is extremely rugged, being designed to meet military standards for vibration (167-1 Type 1) and shock (901-1 Grade A). Construction is of heavy gauge marine grade aluminium alloy, creating a large low loss surface area for maximum radiating efficiency. The antenna is base mounted and designed to withstand wind speeds of up to 225 km/h (140 mph) without permanent deformation. Minimal maintenance is required.

For ease of transport, the radiator comprises two tapering sections which slip together and then fasten by bolts prior to being insulated against water ingress and sealed. The epoxy fibreglass base insulator uses the accepted international footprint for 10.7 metre (35ft) naval whips. The radiator and base flange are finished with a high durability based coating, which is highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation. This provides a high degree of strength ensuring a long operational life. Standard colour is navy silver grey with other colours to order.

Specifications

Frequency Range	1-30 MHz.
Overall Length (approx)	12 metres (40ft)
Radiator Diameter	127mm (8.25 in) tapering to 50.8mm (2 in) at tip
Base Diameter	344mm (13.5 in)
Impedance	50 Ω nominal
Power Capability	5kW CW
VSWR	<3.0:1
Pattern	Omnidirectional in azimuth plane
Polarisation	Vertical
Wind Survival	Designed to withstand wind velocities of 224 km/h (140 mph) without ice; ice loading 22kg/sq m (4.5 lbs/sq ft)
Temperature	-50 to +65 $^{\circ}$ C (-60 to +150 $^{\circ}$ F); 100% humidity (high temperature version under development)
Connector	LC type on base (side feed)
Mounting	Flange base with 8 equally spaced 17.5mm (0.69 in) holes on 273mm (10.75 in) circle, identical to current 107BB/S pattern
Weight	160 kg (350 lbs); packed 250kg (550 lbs)





MOONRAKER

Type 107B/1 - 107BS/1



**High power capability base mounted marine HF whip antenna
for naval vessels over 40 metres (130 feet) and base stations**

The type 107B/1 is a 10.7 metre (35 ft) heavy duty free standing whip antenna with a continuous power capability of 1 kW in the frequency range 1.6 to 30 MHz, designed to provide efficient and reliable communications for the professional/military services. Nato Stock Nos: 5985-66-137-0889 *base feed*, 5985-66-137-0890 *side feed*.

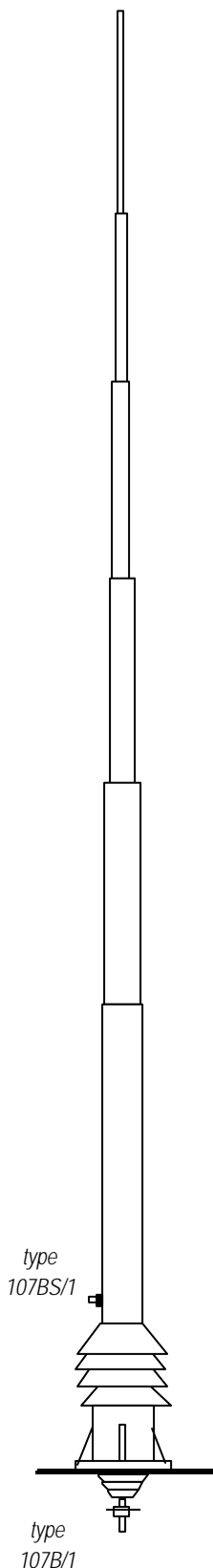
The antenna is base mounted and designed to withstand wind speeds of up to 240 km/h (150 mph) without permanent deformation. Construction is of heavy gauge marine grade aluminium alloy tubing, which provides a large low loss surface area for maximum radiating efficiency. The radiator and base flange are finished with a high durability epoxy based coating, highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation.

A high reliability corona shield forms part of the base insulator. This reduces the effects of flashover caused by rain and saltwater spray and permits a rapid recovery from saltwater induced short circuits caused by splashing. The corona shield neither burns nor leaves tracks even when subject to severe surface arcing. It is made from a flexible modified polymer moulded over the antenna base insulator and is consequently impact resistant. The physical shape of the shield is arranged to provide a long and broken path to further assist with low leakage of RF energy.

For ease of transport, the antenna breaks down into three sections which slip together on "O" ring seals and are secured by three stainless steel locking set screws. Joint sealing kits and a special grease are provided to prevent corrosion of the joint.

Specifications

HF Marine Band	1.6-30 MHz
Length	10.67 metres (35 ft)
Pattern	Omnidirectional
Polarisation	Vertical
Frequency Range	Unloaded, 1.6-30 MHz with suitable ATU
Power Capability	1 kW continuous
Construction of Radiator	Aluminium 3 sections: 3m, 3.8m and 4m approx. (9.8, 12.5 and 13ft)
Base Mounting	Aluminium casting with 8 equally spaced securing holes on 273mm (10.75in) diameter
Feed Connection	Upper side feed above corona shield (107BS/1), or lower feed below through deckmount (107B/1)
Wind Loading	Antenna survival : 240 km/h (150 mph), 65 m/sec
Packed Weight	85 kg (187.4 lbs) Antenna and base unpacked 47 kg (103.6 lbs)

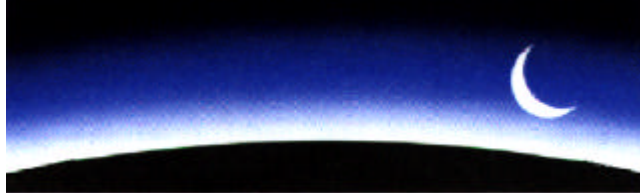


Specifications subject to change 7/99

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MOONRAKER

Type 23B/3C

**High power capability base mounted marine HF whip antenna
for military and professional vessels over 18 metres (60 feet)**

The type 23B/3C is a 7 metre (23 ft) heavy duty self supporting whip antenna with a continuous power capability up to 1 kW in the frequency range 1.6 to 30 MHz. It is designed to provide efficient and reliable communications in the professional and military services. NATO No. 5985/66/129/1426.

The 23B/3C is base mounted and designed to withstand constant wind speeds up to 250 km/h (156 mph) without permanent deformation effects. Construction is of heavy gauge marine grade aluminium alloy tubing to give a large low loss surface area for maximum radiating efficiency, fully protected by a high durability epoxy based coating resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation. Standard colour is silver grey.

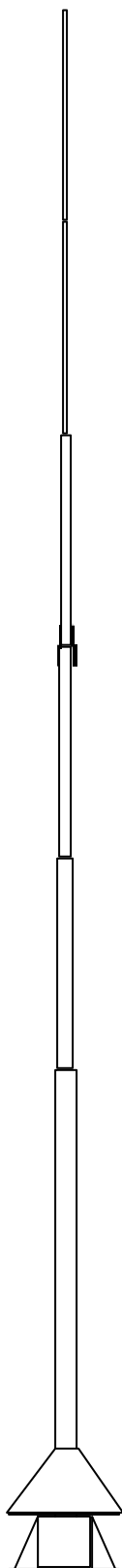
A high reliability corona shield forming part of the base insulator reduces the effects of flashover caused by saltwater spray and permits a rapid recovery from saltwater induced short circuits caused by splashing. The shield neither burns nor leaves tracks, even when subject to severe surface arcing, and is impact resistant, being moulded onto the antenna using a flexible modified polymer. The physical shape of the shield is arranged to provide a long and broken path to further assist with low leakage of RF energy.

For ease of transport, the antenna breaks down into two sections [base 3.76m (12.3 ft); top 3.35m (11 ft)] which slip together and fasten with four stainless steel locking screws.

Specifications

HF Marine Band	1.6-30 MHz
Length	7.0 metres (23 ft)
Pattern	Omnidirectional
Polarisation	Vertical
Frequency Range	Unloaded 1.6-30 MHz with suitable ATU
Wind Loading	8.8 kg at 100 km/h (19.5 lbs at 60 mph); 20 kg at 150 km/h (44 lbs at 94 mph); Antenna survival : 250 km/h (156 mph)
Power Capability	Up to 1 kW continuous
Base Insulator	>25 kV insulator flash over voltage (test conditions: antenna dry)
Radiator	Total radiating surface: 5,500 sq cm (5.9 sq ft)
Mountings	Cast aluminium alloy base flange and support tube with integral base insulator, O ring seal and corona shield, silicone joint shroud
Base Mount Finish	Epoxy based enamel
Connection	1/4 in Whitworth stainless steel stud and lock nuts direct to antenna
Packed Weight	20 kg (44 lbs) with mountings Antenna and base unpacked 10 kg (22 lbs)

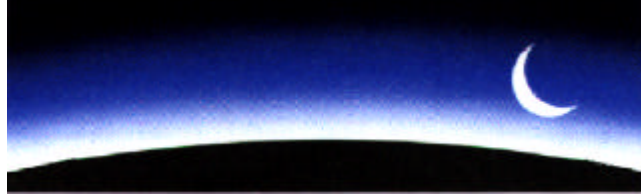
Specifications subject to change 07/08



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M O O N R A K E R

Type 23L/D

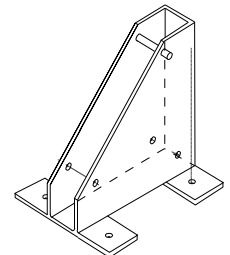
**High power HF antenna for vessels over 18 metres (60 feet)
with laydown facility for horizontal operation to overcome skip zone
problems**

Designed to permit easy adjustment of antenna polarisation and to provide higher efficiency communications in the transmit and receive modes for professional ocean going vessels where higher power and environmental capability is required. The antenna utilises our heavy duty aluminium laydown mount which permits the antenna to be operated in both horizontal (for high angle radiation) and vertical (low angle radiation) positions.

The type 23L/D is a 7 metre (23 ft) heavy duty self supporting whip antenna with a power capability of 800W PEP in the frequency range 1.6 to 30 MHz. The antenna is designed to withstand winds to 240 km/h (150 mph) without permanent deformation effects, being a version of the military type 23B/3C. It has minimal tip deflection which is very important when operating in the horizontal mode whilst the vessel is underway.

Construction is of heavy gauge marine grade tempered aluminium alloy tubing, providing a large, low loss radiating surface, fully protected by a high durability epoxy based coating resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation. Standard colour is silver grey (other colours to order). The base insulator is nylon with stainless steel connection. A low loss loading coil 2.75 m (9 ft) from the top is available as an option. For ease of transport, the antenna breaks down into 2 sections [base 3.76m (12.3 ft); top 3.35m (11 ft)] which slip together and fasten with 3 stainless steel locking screws.

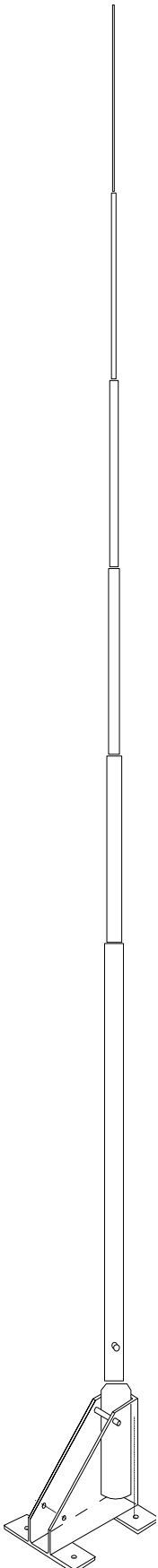
The system is designed with an easy quick lock pin so that lowering and erection can be carried out by one man. Simply releasing the pin and swinging the antenna (8kg) to the new position. The locking pin and lock are secured by safety wires. Ideally, for best high angle radiation, the antenna, when horizontal, should be as far above the deck below as possible, particularly when above a metal deck.



SPECIFICATIONS

HF Marine Band	1.6-30 MHz
Length	7.0 metres (23 ft)
Pattern	Omnidirectional
Polarisation	Vertical or horizontal (high angle)
Frequency Range	Pretuned to 4.6 MHz or, unloaded, 1.6-30 MHz with suitable ATU
Wind Loading	8.8 kg at 100 km/h (19.5 lbs at 60 mph); 20 kg at 150 km/h (44 lbs at 94 mph). Antenna survival : 250 km/h (156 mph)
Power Capability	800W PEP unloaded top sections; 500 w PEP 4.6 MHz top sections
Radiator	Total radiating surface: 5,500 sq cm (5.9 sq ft)
Mountings	Aluminium alloy angled base support which may be bolted directly to the deck 250mm x 60mm x 250mm high (9.8 x 2.4 x 9.8 in) (supplied) and 4 x 10mm 3/8 in bolts (not supplied).
Base Mount Finish	Epoxy based enamel
Connection	6mm Whitworth stainless steel stud and lock nuts direct to side of antenna
Packed Weight	Antenna: 8.5kg (18.7lbs); Mount 2kg (4.4lbs)

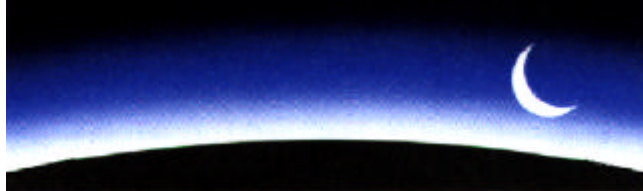
Specifications subject to change 6/10



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MOONRAKER

Type 29W



Marine HF Antenna for large vessels over 18 metres (60 feet)

Designed to provide extremely high radiating efficiency for the professional user on the marine communications channels from 2-30 MHz.

The 29W is a highly efficient, self supporting whip which maximises performance both in the transmit and receive modes, thus requiring less operating power.

Construction is of heavy gauge marine grade aluminium alloy tubing to give a large low loss surface area for maximum radiating efficiency. The antenna is coated with a high durability epoxy based coating, for full protection from the marine environment, and coloured black (option of white) for maximum protection from ultra violet radiation. Fittings are of nylon and stainless steel with low loss loading coils and/or traps 2.75 metres (9 ft) from the top.

For ease of transport it breaks down into three sections, the largest of which is 3.65 metres (12 ft).

It is available unloaded, resonant at a single frequency (the highest to be used - normally 2.6, 4.6 or 6.3 MHz), or resonant at three frequencies (4.6, 8.3 and 12.4 MHz). For operation on frequencies lower than the resonant frequency the difference is made up in the ATU.

Specifications

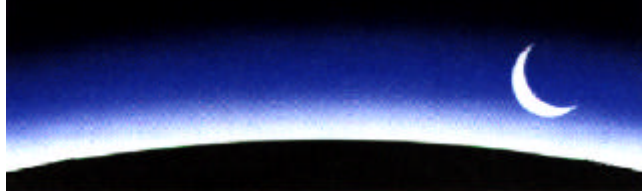
HF Marine Band	2-30 MHz
Length	8.8 metres (29 ft)
Pattern	Omnidirectional
Polarisation	Vertical
Base Diameter	32mm (1.25 in)
Frequency Range	Pretuned to frequency or frequencies required, or unloaded 2-30 MHz with suitable ATU
Wind Loading	10.4 kg at 100 km/h (22.9 lbs at 60 mph) 17.6 kg at 130 km/h (38.7 lbs at 81 mph)
Power Capability	1 kW PEP for normal loaded or unloaded top sections; 500 W PEP for trapped top sections; higher power to order
Mountings	Two 100mm (4 in) nylon clamp type insulators, 50mm (2 in) diameter, threaded to take 1/2 inch Whitworth bolt (not supplied); insulator spacing not less than 1.4 m (4.5 ft)
Connection	Silicone insulated flexible cable tail 2.5 m long (8 ft) 56/0.3 tinned copper; length should not exceed that provided for correct operation on the higher frequencies
Packed Weight	8 kg (17.6 lbs) with mountings

Specifications subject to change 9/96

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MOONRAKER

Type 22W



Marine HF antenna for vessels over 10.5 metres (34.5 feet)

Designed to give high radiating efficiency in demanding service conditions, especially in the 2-13 MHz range.

The 22W, a scaled down model of the 29W, is self supporting and provides high efficiency performance on medium size vessels (over 10.5m) where an 8.8 metre (29 ft) whip is not suitable, such as high speed craft.

Heavy gauge aluminium alloy tubing, coated with black (optional white) high durability epoxy based coating, resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation, provides a large low loss radiating surface. Fittings are of nylon and stainless steel. Low loss loading coils and/or traps 4 metres (13 ft) from the base are used.

The antenna is assembled from three easily transportable sections, the largest of which is 2.7m (9 ft) long.

It is available unloaded, resonant at a single frequency (the highest to be used - normally 2.6, 4.6 or 6.3 MHz), or resonant at two frequencies (8.3 and 12.4 MHz or 4.6 and 8.3 MHz). For operation on other frequencies, the difference is made up in the ATU.

Specifications

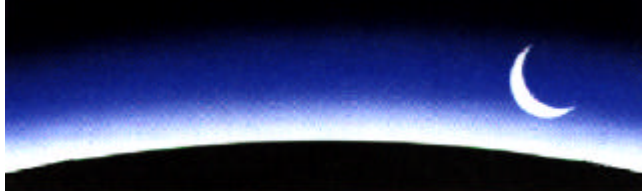
HF Marine Band	2-30 MHz
Length	6.7 metres (22 ft)
Pattern	Omnidirectional
Polarisation	Vertical
Base Diameter	32mm (1.25 in)
Frequency Range	Pretuned to frequency or frequencies required, or unloaded 2-30 MHz with suitable ATU
Wind Loading	7.7 kg at 100 km/h (16.9 lbs at 60 mph) 13.0 kg at 130 km/h (28.6 lbs at 81 mph)
Power Capability	1 kW PEP for normal loaded or unloaded top sections; 500 W PEP for trapped top sections; higher power to order
Mountings	Two 100mm (4 in) nylon clamp type insulators, 50mm (2 in) diameter, threaded to take 1/4 inch Whitworth bolt (not supplied); insulator spacing not less than 0.9 m (3 ft)
Connection	Silicone insulated flexible cable tail 2.5 m long (8 ft) 56/0.3 tinned copper; length should not exceed that provided for correct operation on the higher frequencies
Packed Weight	7.25 kg (15.95 lbs) with mountings

Specifications subject to change 11/97

Moonraker Australia Pty. Ltd. A.C.N. 009 531 211

Tasmania Technopark, Dowsing Point 7010, Tasmania Australia

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MOONRAKER

Type 18W

Marine HF antenna for vessels over 9 metres (30 feet)

Designed as a high efficiency compact whip, in both the transmit and receive modes, for professional use in the HF Band range from 2-30 MHz.

The 18W, a 5.5m (18ft) heavy duty whip, is comprised of two sections [base: 3.65m (12ft); top: 1.85m (6ft)] which slip together and fasten with 2 stainless steel self tapping screws.

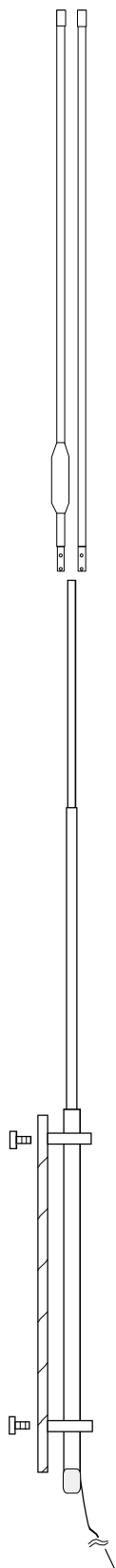
It is constructed from marine grade tempered aluminium alloy which provides a large low loss radiating surface and is fully protected by a high durability epoxy based coating resistant to chemical attack, abrasion and the effects of ultra-violet radiation. Standard colour is black with white available as a option. Fittings are of nylon and stainless steel with low loss coils and/or traps.

It is available unloaded, resonant at a single frequency (the highest to be used, normally 2.6, 4.6, 6.3, 8.3 or 10 MHz) or resonant at two frequencies (8.3 and 12.4 MHz). For operation on frequencies lower than the resonant frequency, the difference is made up in the ATU.

SPECIFICATIONS

HF Marine Band	2-30 MHz
Length	5.5 metres (18 ft)
Pattern	Omnidirectional
Polarisation	Vertical
Base Diameter	23mm (0.875 in)
Frequency Range	Pretuned to frequency or frequencies required, or unloaded 2-30 MHz with suitable ATU
Wind Loading	4.9 kg at 100 km/h (10.8 lbs at 60 mph) 8.3 kg at 130 km/h (18.3 lbs at 81 mph)
Power Capability	800W PEP for unloaded top sections, 600W PEP for normal loaded top sections; 400W PEP for trapped top sections; higher power to order
Mountings	Two 63mm (2.5 in) nylon clamp type insulators, 35mm (1.375 in) diameter, threaded to take 3/8 inch UNC Whitworth bolt (not supplied). Minimum insulator spacing not less than 60cm (2 ft)
Connection	Silicone insulated flexible cable tail 2m long (6.5 ft) 56/0.3 tinned copper; length should not exceed that provided for correct operation on the higher frequencies
Packed Weight	4 kg (8.8 lbs) with mountings

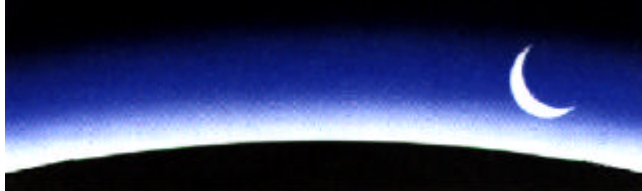
Specifications subject to change 01/06



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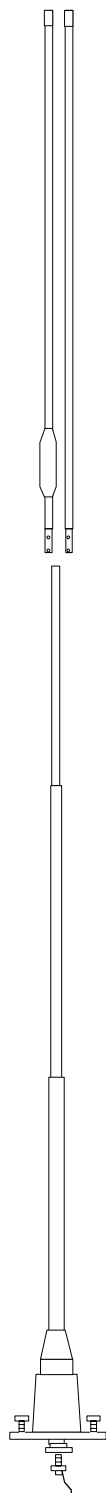
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MOONRAKER

Type 18B

Marine HF antenna for vessels over 11 metres (36 feet)



A 5.5 metre (18ft) heavy duty whip, similar to type 18W, designed to provide highly efficient communications in the HF Band range from 2-30 MHz, both in the transmit and receive modes, where deck mounting is required.

Specially suitable for large yachts, the 18B is neatly mounted by means of a nylon base insulator with chrome bronze flange support and stainless steel bolt deck feed through insulator [fits decks to 19mm ($\frac{3}{4}$) thick], which allows direct underdeck connection.

The antenna is constructed from tempered aluminium alloy tubing and is protected by a high durability epoxy based coating resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation. To facilitate transport, the antenna breaks down into two sections [base: 3.65m (12ft); top: 1.85m (6ft)], which screw together on a self locking taper which slip together and fasten with 2 stainless steel self tapping screws.

It is available unloaded or resonant at a single frequency (the highest to be used, normally 2.6, 4.6, 6.3, 8.3 or 10 MHz). For operation on frequencies other than the resonant frequency, the difference is made up in the ATU.

SPECIFICATIONS

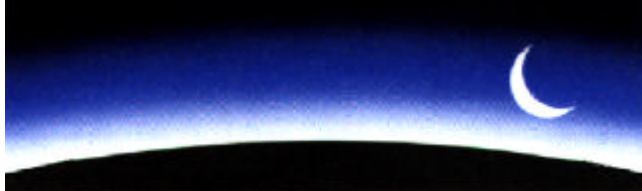
HF Marine Band	2-30 MHz
Length	5.5 metres (18 ft)
Pattern	Omnidirectional
Polarisation	Vertical
Base Diameter	25.4cm (1 in) (radiator)
Frequency Range	Pretuned to frequency or frequencies required, or unloaded 2-30 MHz with suitable ATU
Wind Loading	4.9 kg at 100 km/h (10.8 lbs at 60 mph) 8.3 kg at 130 km/h (18.3 lbs at 81 mph)
Power Capability	800W PEP for unloaded top sections, 600W PEP for normal loaded top sections; 400W PEP for trapped top sections; higher power to order
Mounting	One integral base insulator and 12.7cm (5 in) chrome bronze flange with 'O' ring seal between insulator and flange, and 4 x 6.75mm (17/64 in) mounting holes (bolts not supplied). Centre feed through hole 15.8mm (5/8 in) dia.
Connection	Underdeck to lug on feedthrough bolt
Packed Weight	5 kg (11 lbs) with mounting

Specifications subject to change 01/06

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M O O N R A K E R

Type 15W

Marine HF antenna for vessels over 5.5 metres (18 feet)

Designed to provide high efficiency communications in both the transmit and receive modes for professional use in the HF Band range from 2-30 MHz where a larger antenna may not be fitted.

The 15W is a compact 4.6m (15ft) whip, easily assembled from two sections (base: 2.7m (9ft); top: 1.85m (6ft)) which slip together and fasten with 2 stainless steel self tapping screws.

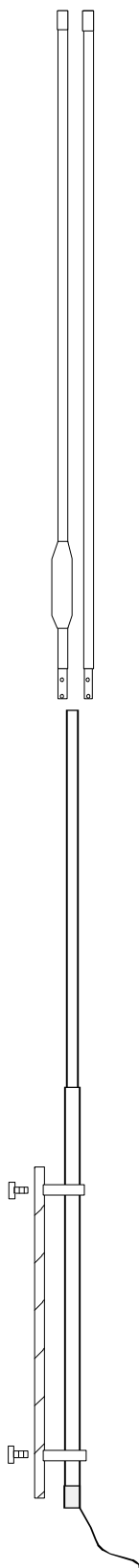
Construction is of marine grade tempered aluminium alloy, which provides a large low loss radiating surface, fully protected from the marine environment by a high durability epoxy based coating resistant to chemical attack, abrasion and the effects of ultra-violet radiation. Fittings are of nylon and stainless steel with low loss coils.

It is available unloaded or resonant at a single frequency (the highest to be used, normally 2.6, 4.6, 6.3, 8.3 or 10 MHz). For operation on frequencies lower than the resonant frequency, the difference is made up in the ATU.

SPECIFICATIONS

HF Marine Band	2-30 MHz
Length	4.6 metres (15 ft)
Pattern	Omnidirectional
Polarisation	Vertical
Base Diameter	20mm ($\frac{3}{4}$ in)
Frequency Range	Pretuned to frequency, or unloaded 2-30 MHz with suitable ATU
Wind Loading	3.5 kg at 100 km/h (7.7 lbs at 60 mph) 5.9 kg at 130 km/h (13 lbs at 81 mph)
Power Capability	500W PEP for unloaded top sections, 300W PEP for normal loaded top sections; higher power to order
Mountings	Two 63mm (2.5 in) nylon clamp type insulators, 35mm (1.375 in) diameter, threaded to take an M10 bolt (not supplied); insulator spacing not less than 45cm (1.5 ft)
Connection	Silicone insulated flexible cable tail 2m long (6.5 ft) 56/0.3 tinned copper; length should not exceed that provided for correct operation on the higher frequencies
Packed Weight	3 kg (6.6 lbs) with mountings

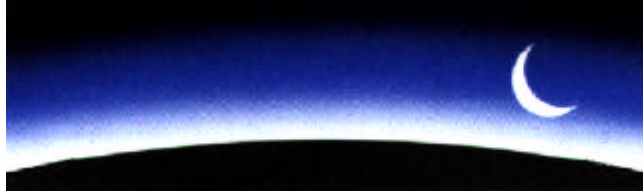
Specifications subject to change 09/08



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MOONRAKER

Type 12S/R



Marine HF antenna for vessels where permanent mounting is not possible or not required

Easily and quickly assembled or removed, this demountable whip is especially suitable for trailed craft or as an emergency antenna where a wire to masthead system is used, such as a backstay on yachts. Two sections of 1.85m (6ft) which may be easily stored below deck, screw together on a self locking taper and then into a permanently deck mounted feedthrough insulator to provide instant, efficient communications in the HF Band range from 2-30 MHz.

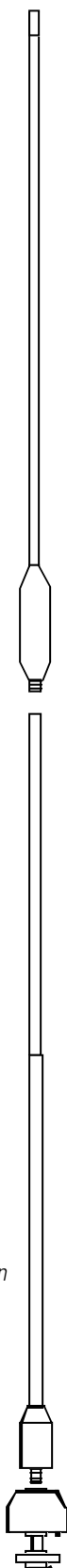
Antenna construction comprises light-weight marine grade tempered aluminium alloy tubing with black (optionally white) PVC coating for maximum protection from the marine environment and ultra violet radiation. The deckmount is of high density polyethylene with chromed bronze insert and stainless steel mounting bolt. Fittings are of nylon, stainless steel and chromed bronze with low loss coils.

A backstay connection kit is available so that the deckmount may be used as a deck feedthrough insulator to feed a backstay antenna. If dismasted, the backstay connection may be removed and the whip antenna screwed into the deckmount. It is available unloaded or resonant at a single frequency (the highest to be used, normally 2.6, 4.6, 6.3, 8.3 or 10 MHz). For operation on frequencies lower than the resonant frequency, the difference is made up in the ATU.

SPECIFICATIONS

HF Marine Band	2-30 MHz
Length	3.65 metres (12 ft)
Pattern	Omnidirectional
Polarisation	Vertical
Base Diameter	70mm (2.75 in)
Frequency Range	Pretuned to frequency, or unloaded 2-30 MHz with suitable ATU
Wind Loading	2.6 kg at 100 km/h (5.7 lbs at 60 mph) 4.4 kg at 130 km/h (9.7 lbs at 81 mph)
Power Capability	400W PEP for unloaded top sections, 250W PEP for normal loaded top sections; higher power to order
Mountings	One high density polyethylene deckmount 70mm diameter (2.75 in) with chromed bronze insert and stainless steel mounting bolt, mounting hole 25mm (1 in), fitting decks to 19mm ($\frac{3}{4}$ in) thick.
Connection	Underdeck to lug on mounting bolt
Packed Weight	2.5 kg (5.5 lbs) with mountings

*Backstay
Connection
Kit*

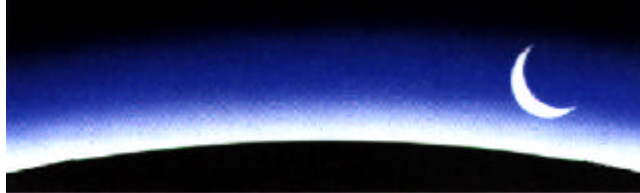


Specifications subject to change 11/97

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MOONRAKER

Type MD



For marine or land communications in the VHF Band

A half wave dipole radiator, designed to give efficient VHF performance in both the transmit and receive modes.

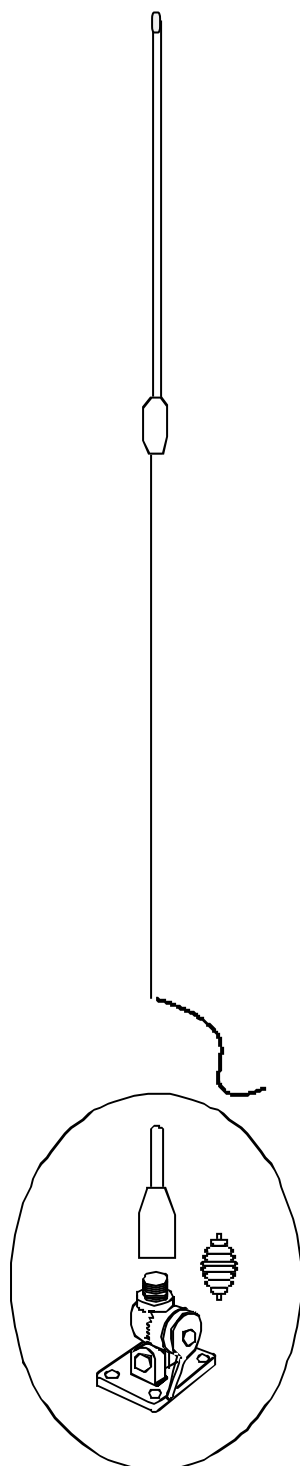
The MD is lightweight, unobtrusive and easily mounted, being constructed of marine grade, low corrosion, tempered aluminium tubing. The radiator is completely coated with black (option of white) PVC to provide maximum protection from the marine environment, ultra-violet radiation and precipitation static. the mounting tube is epoxy base coated. All metal parts are at DC earth potential for static discharge and fittings are of nylon and stainless steel.

Mounting may be effected either by two nylon clamp type insulators, 12 mm metric bolt, or by a swingdown mount with base adapter. Other methods, such as stainless steel hose clamps, may be used provided that the mounting tube is not damaged. A stainless steel spring mount is also available as an option for landing barges and vessels negotiating overhanging branches in small rivers and creeks.

It may be supplied tuned to any frequency in the VHF High or Low/Mid Bands. If required for marine use, it is normally supplied resonant at 156.8 MHz (Channel 16). A collapsible portable version is also available on special order for emergency services (type MD Portable).

Specifications

VHF Band	High Band: 146-180 MHz	Low/Mid Band: 40-145 MHz
Overall Length	1.59metres (5.48 ft), approx	2.54 metres (8.3 ft), approx
Radiator Length	0.9 metres (3 ft), approx	1.73 metres (5.6 ft), approx
Radiator Diameter	12.7mm (0.5 in)	12.7mm (0.5 in)
Mounting Tube Length	0.53 metres (1.75ft)	
Mounting Tube Dia	23mm (0.88 in)	
Pattern	Omnidirectional, maximum radiation 90° to radiator	
Polarisation	Vertical	
Frequency Range	Pretuned to specified VHF band frequency. Normally 156.8 MHz (Channel 16) or 77 MHz. Other frequencies to order.	
Bandwidth	7 MHz	
VSWR	Better than 1.2:1 at centre frequency	
Gain	2.2 dBi	
Impedance	50Ω nominal	
Wind Loading	1.64 kg at 100 km/h (3.6 lbs at 60 mph); 3 kg at 130 km/h (6.6 lbs at 81 mph)	2.3 kg at 100 km/h (5 lbs at 60 mph); 4.17 kg at 130 km/h (9.2 lbs at 81 mph)
Power Capability	80 watts	
Mountings	Either: two 63 mm (2.5 in) nylon clamp type insulators, 35 mm diameter (1 3/8 in), threaded to take M10 set screw ; stainless steel swingdown mount (1" thread) adjustable in both planes; or 12mm metric bolt (not supplied)	
Connection	5 metres RG58 co-axial cable with PL259 (UHF) plug, UHF or N Type female connector fitted in base of mounting tube (specify)	
Packed Weight	2 kg (4.4 lbs)	



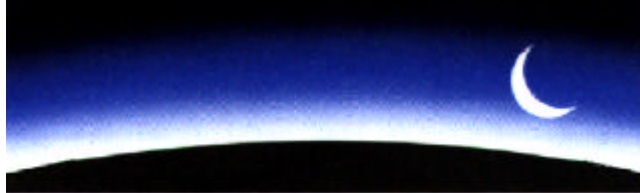
Mounting options

Specifications subject to change 02/05

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MOONRAKER

Type MD-G3



High Gain Broadband Collinear for marine or land VHF Marine Band communications

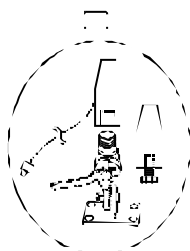
A rugged lightweight 5/8 wave ground independent collinear to give efficient and dependable performance.

The type MD-G3 has been designed as a robust, high gain antenna system and is ideally suited for base station and marine mobile use. It is constructed of marine grade, low corrosion, tempered aluminium alloy tubing which is completely coated with black (option of white) PVC to provide maximum protection from harsh environments and ultra-violet radiation. all metal parts are at DC earth potential for static discharge and fittings are of nylon and chromed bronze.

Mounting is easily effected by way of nylon side mount insulators,(or by straps or clamps to mast or tower section), by 12mm metric base bolt or by a heavy duty stainless steel swingdown mount adjustable in two planes.

Specifications

VHF Band	150-170 MHz
Overall Length	2.78 metres (9.12 ft)
Base Section Diameter	22.24 (7/8 in)
Top Section Diameter	10 mm (0.4 in)
Pattern	Omnidirectional
Polarisation	Vertical
Frequency Range	Standard Version: full marine band 156-162 MHz
Bandwidth	7 MHz at <1.5:1 VSWR; 20 MHz at <2:1 VSWR
Gain	5 dBi
Impedance	50Ω nominal
Wind Loading	2.35 kg at 100 km/h (5.2 lbs at 60 mph) 3.56 kg at 120 km/h (7.8 lbs at 75 mph)
Power Capability	75 watts
Mountings	Either two 63 mm (2.5 in) nylon clamp type insulators, 35 mm diameter (1 3/8 in), threaded to take M10 set screw, or heavy duty galvanised hose clamps (recommended spacing not less than 25 cm (9.8 in) apart); stainless steel swingdown mount (1" thread) adjustable in both planes (not supplied); or base mounted 12mm metric bolt (not supplied).
Connection	5 metres RG58 coaxial cable with PL259 (UHF) connector; or female N Type connector permanently fitted in base of mounting tube (sidemount type)
Packed Weight	3 kg (6.6 lbs)



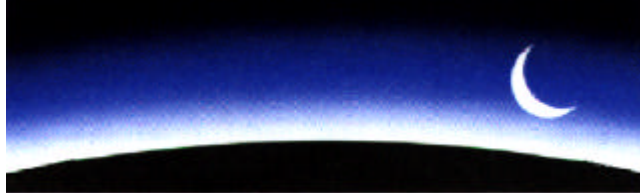
Mounting
options

Specifications subject to change 5/04

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MOONRAKER

Type MD Portable

To extend the range of VHF handheld radios

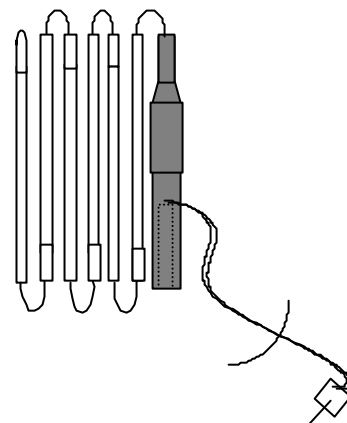
A collapsible half wave dipole radiator, designed to provide efficient VHF performance in both the transmit and receive modes in remote fringe areas for hand held transceivers where the standard short "rubber duckie" antenna is limiting range.

The MD Portable is ideal for remote area operators relying on VHF communications in difficult locations, especially emergency services, police, forestry and mining industry personnel. It is lightweight and fits easily into a back pack. The system makes use of the existing transceiver RF connector and a shock cord system to enable fast deployment and increase communications range in the field, then collapses to 320mm (12.5in) sections. Erect, antenna length varies from 1.3m (high band) to 2.2m (mid band) (4.3 to 7.2 ft). Additional height can be achieved to hoist the antenna above any obstructions, (forest canopy, areas in radio shadow, and the like) by inserting a pole or stick in the hollow antenna base.

The antenna radiator is constructed of marine grade, low corrosion, stainless steel. All metal parts are at DC earth potential for static discharge and fittings are of nylon and chrome brass. An internal isolator within the marine grade aluminium mounting pole protects the antenna feed connection from poles or sticks inserted to support the antenna.

It may be supplied tuned to any frequency in the VHF High or Low/Mid Bands and comes with 2m (6.6ft) of coaxial cable and connector. The number of sections varies with frequency.

Please note that this antenna requires the transceiver to have a coaxial antenna connector for the standard short rubber duckie antenna.



Specifications

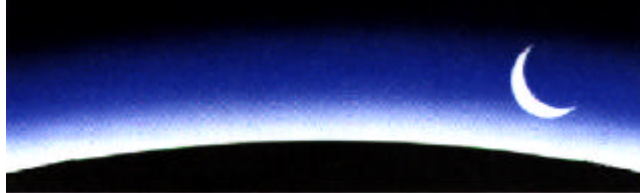
VHF Band	High Band: 146-180 MHz	Low/Mid Band: 70-145 MHz
Overall Length	1.3metres (4.3 ft), approx	2.2 metres (7.2 ft), approx
Radiator Length	0.9 metres (3 ft), approx	1.73 metres (5.6 ft), approx
Radiator Diameter	6.4mm (0.25 in)	
Mounting Tube	22.23mm (7/8 in) Diameter	
Pattern	Omnidirectional, maximum radiation 90° to radiator	
Polarisation	Vertical	
Frequency Range	Pretuned to any specified VHF band frequency.	
Bandwidth	7 MHz	
VSWR	Better than 1.2:1 at centre frequency	
Gain	2.2 dBi	
Impedance	50Ω nominal	
Power Capability	60 watts	
Mountings	Hand held or via pole/stick inserted in base tube	
Connection	2 metres RG58 co-axial cable with PL259 (UHF) plug, BNC, TNC, etc. (specify to suit transceiver)	
Weight	Unpacked: 300g (10.6 ozs); Packed: 440g (14 ozs)	

Specifications subject to change 11/05

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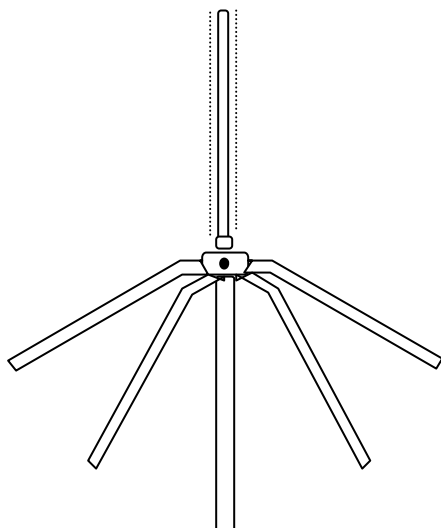


MOONRAKER TYPE GP



AIRCRAFT AND MARINE BAND VHF COMMUNICATIONS

A rugged long life quarter wave ground plane antenna providing a wide bandwidth for base station, ground to air and marine band shipboard communications.



The GP is designed to meet both civil aviation and military specifications including use in shipboard and harsh industrial environments. The antenna is suitable for operation in cyclonic areas to wind speeds of 230 km/h (144 mph).

Constructed from marine grade, low corrosion, tempered aluminium tubing with an overall finish of a high durability epoxy based coating resistant to chemical attack, abrasion and the effects of ozone and ultra violet radiation. Standard colour is black (other colours optional). The standard coating insulates against precipitation static. A PVC coating to further reduce the effects of precipitation static is available as an option. The antenna elements are DC grounded. Special frequency bands are available to order.

The RF connection is via an "N" type receptacle (female) in the base of the antenna mounting tube. Mounting may be by way of clamps (optional) fitted to the mounting tube.

Specifications

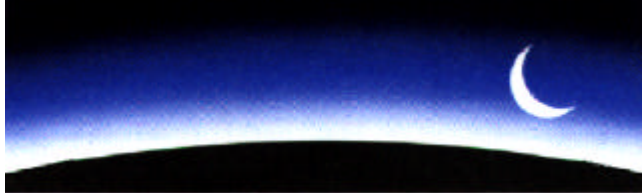
VHF Band		Aircraft Band	High Band*
Overall Height		1285mm (50.6 in)	1155mm (45.5 in)
Radiator	Height	600mm (23.6 in)	470mm (18.5 in)
	Diameter	22.23mm (0.875 in)	22.23mm (0.875 in)
Mounting Tube	Length	660mm (26 in)	660mm (26 in)
	Diameter	32mm (1.26 in)	32mm (1.26 in)
Radials	Diameter	19.08mm (0.75 in)	19.08mm (0.75 in)
Pattern		Omnidirectional	Omnidirectional
Polarisation		Vertical	Vertical
Frequency Band		118-137 MHz	150-168 MHz
Bandwidth		19 MHz	18 MHz
VSWR		1.2:1 at centre frequency	1.2:1 at centre frequency
Impedance		50 Ohms (nominal)	50 Ohms (nominal)
Wind Loading at 230 km/h		21.6kg (47.6 lb)	15.04kg (33.2 lb)
Temperature (Operating)		-42° to +60°C	-42° to +60°C
Power Capability		300 watts	300 watts
Connection		N type receptacle (SO239 option)	N type receptacle (SO239 option)
Mounting		By way of clamps around mounting tube (option)	By way of clamps around mounting tube (option)
Packed Weight		2kg (4.4 lb)	2kg (4.4 lb)

Specifications subject to change 3/00

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MOONRAKER

Type MDA

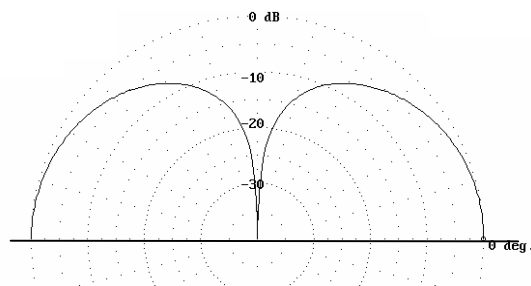
**For aircraft band communications in the VHF Band
Surface to Air**

The MDA is a broadband, high strength, vertically polarised ground independent dipole antenna, designed for use in the marine mobile and fixed land environments.

Housed within the antenna is an integral passive matching network, ensuring efficient broadband coverage together with a low VSWR for the entire civil aeronautical VHF communications band. The system is DC grounded

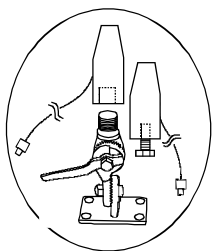
The antenna is constructed using marine grade, low corrosion, tempered aluminium tubing which is completely coated with black (option white) PVC to provide maximum environmental protection, including the effects of ultra violet radiation.

It can be supplied for side mounting using galvanised steel clamps or base mounting via a 12mm bolt or rugged multi-angled swingdown mount.



Specifications

Frequency Range	VHF Aircraft Band 118-137 MHz
Bandwidth	19 MHz
VSWR	Typically <1.5:1; <2:1 at band edges
Radiation	Linear vertical with high angle radiation
Pattern	Omnidirectional
Gain	+2 dBi
Polarisation	Vertical
Impedance	50 Ω nominal
Overall Length	1.5 metres (4.9 ft)
Radiator Diameter	34.5mm (7/8 inch)
Wind Survival	Designed to withstand wind velocities of 160 km/h (100 mph) no ice and 80 km/h (50 mph) with 25mm (1 inch) radial ice build up
Power Capability	50w Continuous
Mountings	Either two 63 mm (2.5 in) nylon clamp type insulators, 35 mm diameter (1 3/8 in), threaded to take M10 set screw, or heavy duty galvanised hose clamps (recommended spacing not less than 25 cm (9.8 in) apart); stainless steel swingdown mount (1" thread) adjustable in both planes (not supplied); or base mounted 12mm metric bolt (not supplied).
Connection	N Type, BNC or TNC with 5m RG58 coaxial cable base and swingdown versions only, connector in base sidemount version
Packed Weight	3 kg (6.6 lbs)



Specifications subject to change 08/08

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Type MMD30100

Broadband Marine Dipole Antenna for VHF Naval communications



The MMD30100 is a rugged, tactical dipole system, designed to provide wideband omnidirectional transmit and receive communications over the 30-100 MHz VHF military tactical band.

Radiation is vertically polarised and is omnidirectional in the azimuth plane providing excellent communications with minimum signal attenuation.

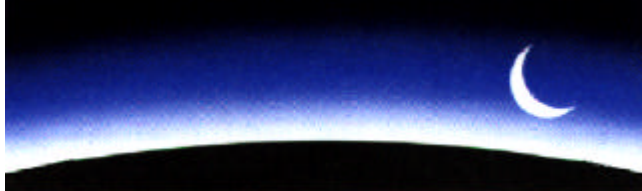
Construction is lightweight yet extremely rugged, being designed to meet military standards for humidity (81-E, Procedure III), vibration (167-1 Type 1) and shock (901-1 Grade A). This ensures a high degree of strength ensuring a long operational life.

Both the antenna elements and base flange are of aluminium, the elements being encapsulated within a heavy duty fibreglass radome which isolates them from the environment to minimise problems associated with static discharge. The system is fully marinised, being finished with a high durability coating, highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation. Standard colour is navy silver grey with other colours to order.

Specifications

Frequency Range	30-100 MHz.
Overall Length (approx)	2.82 metres (9.25 ft)
Radiator Diameter	140mm (5.5 in)
Base Diameter	216mm (8.5 in)
Impedance	50W nominal
Power Capability	500W CW; 1kW PEP
Gain	0dBi
VSWR	2.5:1 maximum
Pattern	Omnidirectional in azimuth plane
Polarisation	Vertical
Wind Survival	Designed to withstand wind velocities of 192 km/h (120 mph) no ice
Temperature	-50 to +65°C (-60 to +150°F)
Connector	N type
Mounting	Aluminium flange base with 8 equally spaced 14mm (0.562 in) holes on 184mm (7.25 in) circle
Weight	16.8kg (37 lbs); packed 38kg (83.6 lbs)

Specifications subject to change 01/08



MOONRAKER

Type MMD 3088



Broadband VHF Military Marine Mobile Antenna System

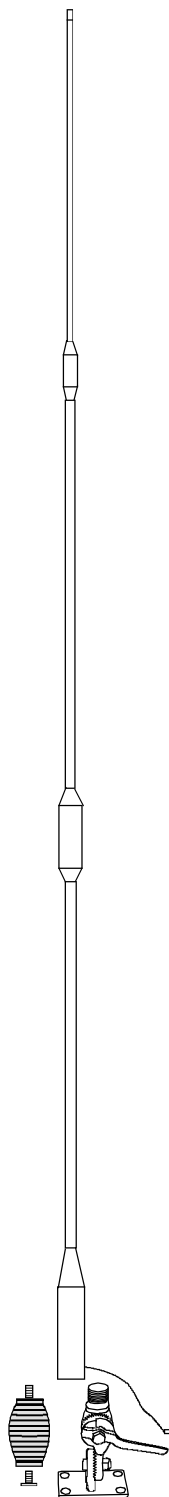
A rugged, ground independent centre fed dipole antenna giving broadband transmitting and receiving performance across the VHF military band from 30 to 88 MHz with minimum signal attenuation.

The antenna system is designed to work without a ground plane. The coaxial cable connection is DC isolated from the antenna ground to guard against electrolysis.

Radiation is vertically polarised and is omnidirectional in the azimuth plane.

Construction is from marine grade, low corrosion tempered aluminium alloy tubing, completely coated with black PVC to provide maximum protection from the harsh marine environment and ultra-violet radiation.

The base mounting section housing the matching unit is 'O' ring sealed with attachment connection via a ½ inch Whitworth or 12mm metric thread in base, or stainless steel spring fitted to base, or stainless steel swingdown mount (1 inch thread).



Specifications

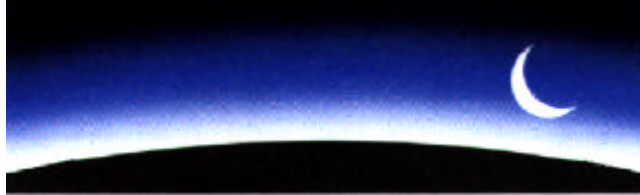
Frequency Range	30-88 MHz.
Overall Length (approx)	3.2m (10.5ft)
Radiator Diameter	23mm (7/8 in) tapering to 12.7mm (1/2in)
Base Diameter	44mm (1.73 in)
Impedance	50Ω nominal
Power Capability	100w continuous
Gain (approx)	better than -10 dBi at 30 MHz, -1.5 dBi at 60 MHz, +1.0 dBi at 88 MHz
VSWR	<3.5:1
Pattern	Omnidirectional
Polarisation	Vertical
Wind Survival	Designed to withstand wind velocities of 160 km/h (100 mph) no ice and 80 km/h (50 mph) with 25mm (1 in) radial ice build up
Connector	as required; please specify
Mounting	Via ½ in Whit or 12mm metric thread in base, stainless steel spring fitted to base; or stainless steel swingdown mount (specify). Sidemount version to order.
Weight	Antenna only 2kg (4.4 lbs); packed 3kg (6.6 lbs)

Specifications subject to change 05/10

Moonraker Australia Pty. Ltd. A.B.N. 57 009 531 211

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M O O N R A K E R

Type BCA200-1300



Wideband Omnidirectional UHF Tactical System



The BCA200-1300 is designed to provide wideband omnidirectional tactical communications for bands in the 150-1300 MHz frequency range. It provides excellent ground to ground as well as ground/sea to air communication. With the BCA200-1300 system only one antenna is now required where multiple antennas were required previously to cover the VHF marine band and UHF and Link 16 tactical bands. The system has particular application for military and para military services.

The principle of operation is that of an omnidirectional biconical wideband system comprising two conical conductors with a common axis and vertex. Band separation filters are used at the transceiver, so that there is a single feed coaxial cable to the antenna.

The antenna has been designed to yield a low VSWR over the entire range. Radiation characteristics designed to minimise the effects of the movement of a vessel at sea

Polarisation is slant linear so that both horizontally and vertically polarised signals can be received.

The antenna features two flat plane conical radiators constructed from non ferrous metal with a composite fibre collar and is fully marinised for use at sea. The surface is coated with a high durability epoxy based coating for full protection from the environment and ultra violet radiation. Standard colour is military APO grey with other colours to order.

A high quality band stop filter to reduce effects from nearby radars is available as an option.

Specifications

Frequency Range	150-1300 MHz, including 150-157 MHz marine band and 225-400 MHz and 960-1215 LINK 16 tactical bands
Azimuth Coverage	360°
Polarisation	Slant polarised giving horizontal and vertical patterns
Gain	-1.7 to 4.1 dBi over frequency range
VSWR	<2:1 over frequency range, typically 1.5:1
Impedance (output)	50Ω (nominal)
Power Capability	500W CW
Connection	N type coaxial connector (female) in base at centre
Overall Dimensions	589mm (23.2 in) (h) x 400mm (15.75 in) (dia)
Mounting Base Required	300mm (11.8 in) dia
Mounting	8 off M6 x 1 x 25mm stainless steel studs equally spaced on a 250mm circle NB coaxial connection is in centre of base
Wind Survival	185 km/h (116mph)
Weight (Antenna only)	6.8 kg (14.96 lbs); packed: 16 kg (35.2 lbs)

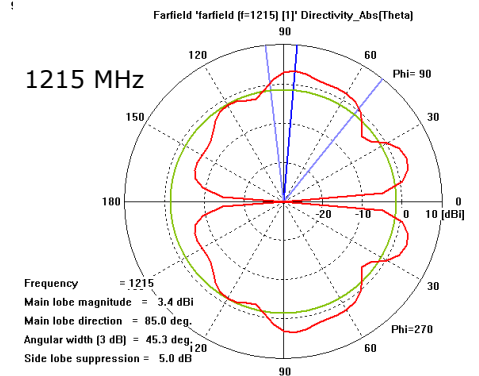
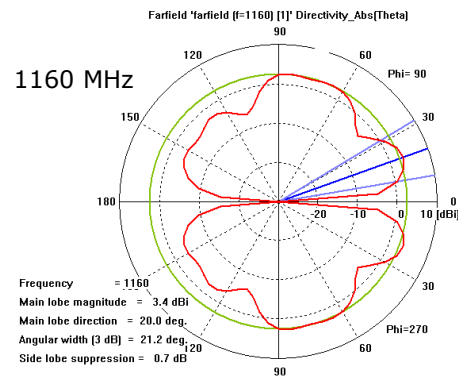
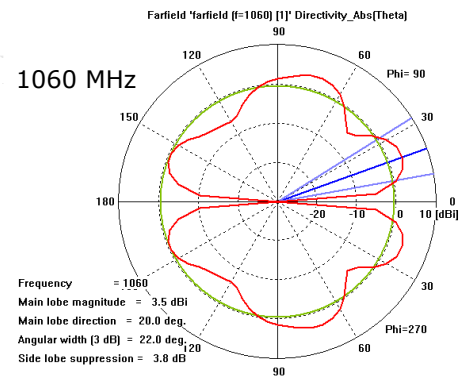
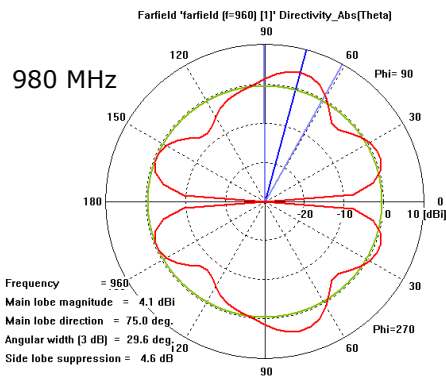
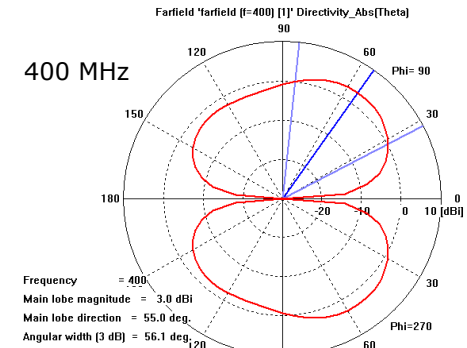
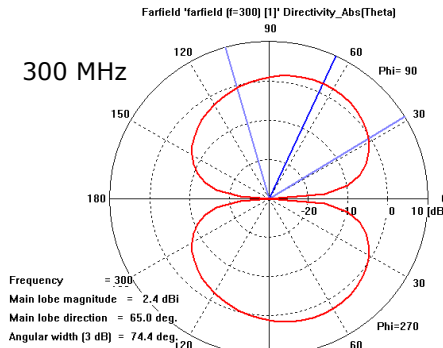
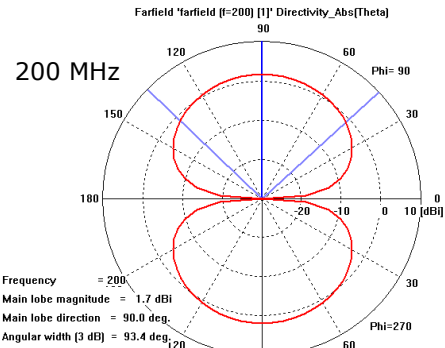
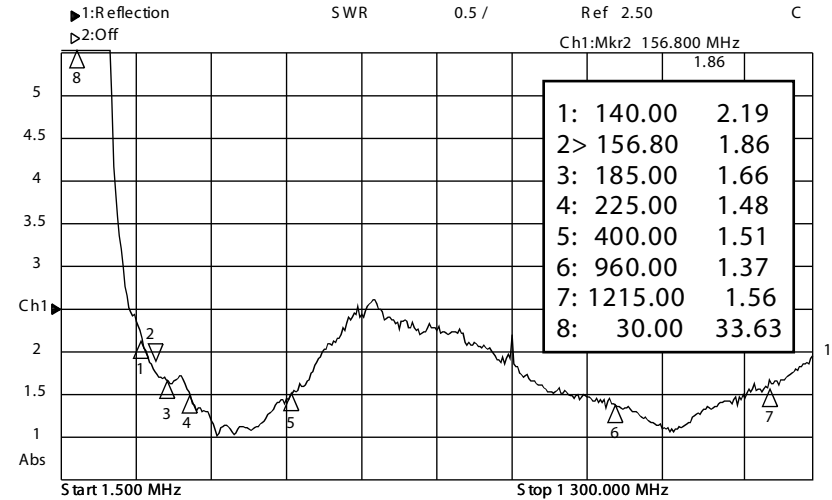
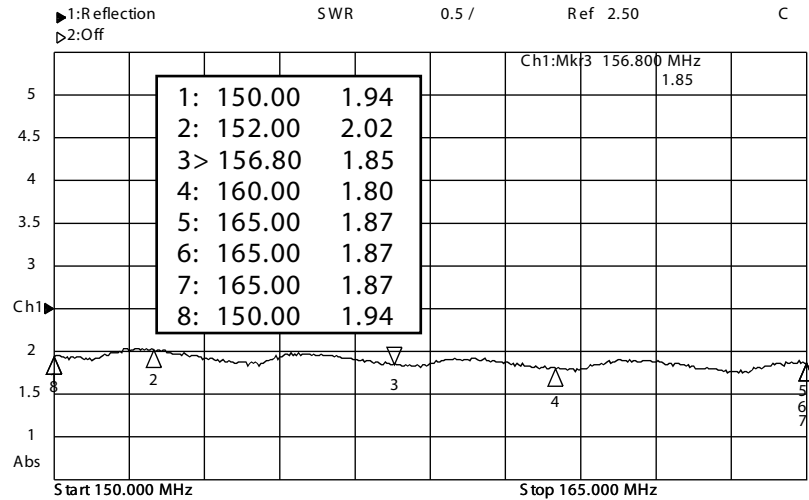
Specifications subject to change 06/07

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TECHNICAL DATA

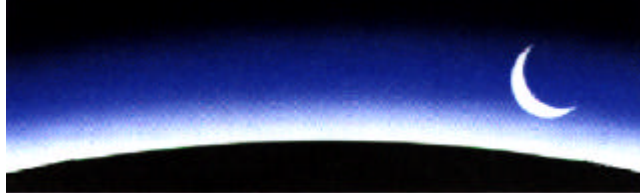


LAND ANTENNA SYSTEMS

LAND ANTENNA SYSTEMS



Manpack and Battle Whips

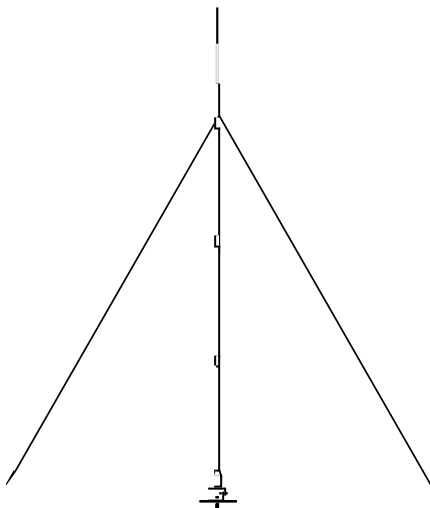


M O O N R A K E R

Type 9.5M

HF base station antenna system

Designed for permanent or temporary installation on buildings or on open ground to provide long distance communications whether in remote areas or in the city.



The 9.5M is practical to transport and easily erected and dismantled by the individual, being assembled from 2m (6.5ft) lengths. Roof mounting in city locations is both convenient and unobtrusive. Tempered corrosion resistant aluminium alloy tubing 32mm (1.25in) at base, tapering to 16mm (5/8in) at top, provides a large low loss radiating surface and, when trapped and/or loaded, extreme high efficiency is achieved. A low loss polypropylene insulator is fitted at the base.

The guy point, 6m (20ft) from the base, suspends one set of four electrically transparent Dyneema core guys, 4mm (11/64in) in diameter. The guy point is of aluminium and fastenings are of stainless steel. A hot dip galvanised steel adjustable angle base plate and ground spike with provision for attaching ground radials is used for open ground installations and for roof building erection, a hot dip galvanised adjustable steel bracket is supplied.

The antenna is usually supplied unloaded and self resonant at approximately 7.5 MHz but may be supplied trapped and/or loaded for high efficiency multi-frequency operation. An antenna tuning unit is normally required, and, for efficient operation, a low impedance ground plane or earth mat system is necessary. When erected on open ground, at least four wire radials extending as far as practicable from the base are desirable, especially in dry ground conditions, and for building erection, metal roofing or ground plane radials are recommended. An antenna tuning unit is normally required. Roof ground plane or earth mat systems are options, as are tuned top sections and lightning protection units. (See type LPU for details.)

SPECIFICATIONS

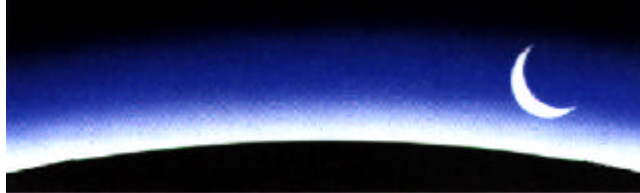
HF Band	2-30 MHz
Length	9.5m (32ft)
Pattern	Omnidirectional
Polarisation	Vertical
Guy Spread	Recommended not less than 3m (9.75ft) radius
Guy Tension	Recommended 4kg (8.8 lbs)
Frequency Range	Pretuned to frequency or frequencies required, or, unloaded 2-30 MHz. A suitable ATU is required.
Wind Loading at guy point	8.2kg at 100 km/h (18.04 lbs at 60 mph) 13.9kg at 130 km/h (30.6 lbs at 81 mph)
Vertical Force on Base at Minimum Guy Spread	25kg at 100 km/h (55 lbs at 60 mph) 40kg at 130 km/h (88 lbs at 81 mph)
Power Capability	1kW PEP for normal loaded top sections; 500w PEP for trapped top sections; 1kW PEP for unloaded top sections.
Mountings	On open ground: adjustable angle ground plate, 300 x 300 x 5mm (12 x 12 x 3/16 in) with ground spike and provision for connection of earth mat radials; On buildings: adjustable angle bracket. Both mountings are supplied in kit form.
Connection	Cable Lug at base of antenna
Packed Weight	Antenna: with ground mount 11.0kg (24.2 lbs); with building mount 8.0kg (17.6 lbs). Ground Plane 4.0kg (8.8 lbs) Earth Mat 6.0kg (13.3 lbs)

Specifications subject to change 03/09

Moonraker Australia Pty. Ltd. A.B.N. 57 009 531 211

Tasmania Technopark, Dowsing Point 7010, Tasmania Australia

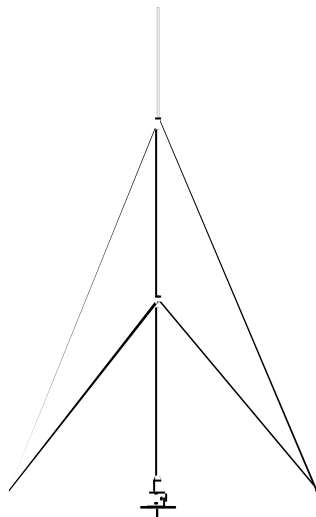
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MOONRAKER

Type 32H/S

HF base station antenna system for tropical and high wind locations



Designed to meet the specifications of military, government and semi-government authorities for locations subject to tropical atmospheres and high winds up to 240 km/h (150 mph).

The 32H/S may be mounted on buildings or direct on the ground and is easily assembled from two 3.6m (11.75ft) and one 2.6m (8.5ft) lengths. The basic mast radiator, normally in natural aluminium finish, may be finished with a high durability epoxy based coating resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation. A horn gap overvoltage lightning protection system (type LPU) is available.

Two sets of four electrically transparent Dyneema core guys, 4mm (11/64in) diameter, are fastened at 3.65m (12ft) and 7.3m (24ft) from the base of the mast and may be anchored by four 205mm (8in) square hot dip galvanised plates with 12.5mm (1/2in) dia x 760mm (30in) long eyebolts, nuts and terminating thimbles (Optional). Guys in stainless steel rope with insulators are also optional.

For building mounting, a hot dip galvanised adjustable steel bracket, suitable for erection at any angle, is supplied. A ground plane kit which comprises four 12m (39.5ft) x 7/1.04 stranded hard drawn copper wires, complete with end insulators, outer end anchor lugs and racket attachment bolt is optional. Ground mounting is by way of a hot dip galvanised square steel plate, earth spike and adjustable angle bracket incorporating connections for ground radials and lightning arrestor. Also available is an earth mat kit of four 12m (39.5ft) long 7/1.04 hard drawn bare copper wires with 0.6m (2ft) x 12.5mm (1/2in) outer end spikes and inner end bolts which may be attached to the plate.

The antenna is usually supplied unloaded and self resonant at approximately 7.5 MHz but may be supplied trapped and/or loaded for high efficiency multi-frequency operation. An antenna tuning unit is normally required, and, for efficient operation, a low impedance ground plane or earth mat system is necessary.

SPECIFICATIONS

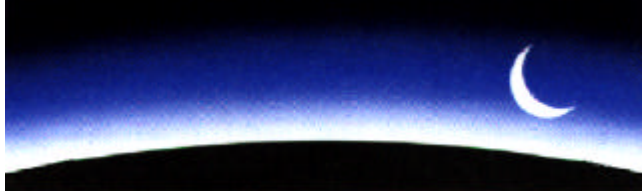
HF Band	2-30 MHz
Length	9.5m (32ft)
Pattern	Omnidirectional
Polarisation	Vertical
Guy Spread	Recommended not less than 4m (13ft) radius in high wind areas
Guy Tension	Recommended 4kg (8.8 lbs)
Frequency Range	Pretuned to frequency or frequencies required, or, unloaded 2-30 MHz. A suitable ATU is required.
Wind Loading	Total projected area: 0.29 sq m: Total wind loading 57kg at 200 km/h (125 lbs at 125 mph); Total wind loading 83kg at 240 km/h (183 lbs at 150 mph)
Power Capability	1kW PEP for normal loaded top sections; 500w PEP for trapped top sections; 1kW PEP for unloaded top sections
Mountings	On open ground: adjustable angle ground plate, 300 x 300 x 5mm (12 x 12 x 3/16 in) with spike, 300 x 16mm (12 x 5/8in); On buildings: adjustable angle bracket. Both mountings are supplied in kit form.
Connection	1m (3ft) HV silicone insulated 56/0.30 flexible tinned copper cable tail permanently fastened to base of radiator
Packed Weight	Antenna: with ground mount 13.5kg (29.8 lbs); with building mount 11.5kg (25.3 lbs). Ground Plane 4.0kg (8.8 lbs) Earth Mat 6.0kg (13.3 lbs) Anchor Kit 11.0kg (24.2 lbs) Lightning Protection Unit 1.5kg (3.3 lbs)

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Specifications subject to change 03/09

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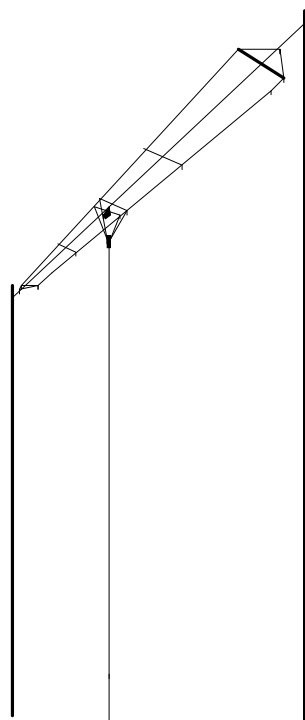


MOONRAKER

Type HF FD 2-30

HF folded dipole broadband base station antennas

Designed as an efficient HF broadband base station system for short to medium range communications without the need for an antenna coupler.



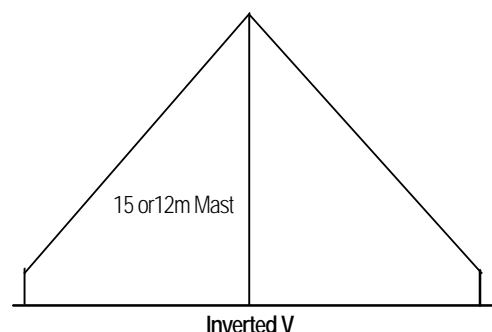
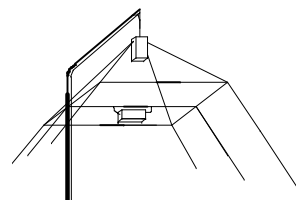
horizontal

The HF FD 2-30 antenna systems are easily erected in either a horizontal configuration between two towers or masts (not supplied) or in the space saving *inverted v* configuration from a single tower or mast (Moonraker type 15GM is suitable), with a horizontal support stand-off, gibbet, at the top.

The standard power capability is 250W PEP. Higher power 1kW PEP and 1kW CW versions are also available.

Radiating elements are of heavy duty stainless steel wire rope for strength and long life, even in corrosive atmospheres. Fittings and connections are of stainless steel with high quality insulators. Spreaders are of heavy duty UV stabilised material. Internal antenna components are completely encapsulated for protection from water ingress and insects.

The system provides efficient communications over the MF/HF range from 2.0 to 30 MHz for the full version and 3.0 to 30 MHz for the compact version.



SPECIFICATIONS

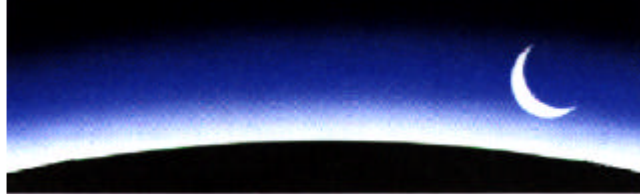
Frequency Range	2-30 MHz full version; 3-30 MHz compact version
Impedance	50 Ω (nominal)
VSWR	Typically <1.8:1 2-16 MHz; 2:1 16-30 MHz (50m full version horizontal), as measured at the input to 30m coaxial feeder
Power Capability	100w CW 250w PEP; high power 250w CW/1kW PEP, and 1kW CW/2kW PEP available
Connection	Via coaxial cable (not supplied) to SO239 socket on balun box
Antenna Lengths	50m (167ft) full version; 30m (98ft) compact version
Recommended Mast/Tower Height	Mast/tower: 50m full version 12-15m (40-50ft); 30m compact version 9-12m (30-40ft); 9m (30ft) minimum; two required for horizontal configuration. Horizontal support gibbet (for inverted V) 800mm (2.6ft) out from top of mast.
Mast/Tower Spacing	Horizontal: 50m/15m Mast 52m (170 ft) minimum; 30m/12m Mast 32, (105ft); Inverted V: 50m/15m Mast 44m (144ft); 30m/12m Mast 22m (72ft)
Gain (peak)	better than 5dBi full version
Wind Rating	200 km/h (120 mph), higher ratings available
Packed Weight	8 kg (17.6 lbs) full version
Packed Size	167x21 x 17 cm (65.8 x 8.3 x 2.5 in)

Specifications subject to change 9/08

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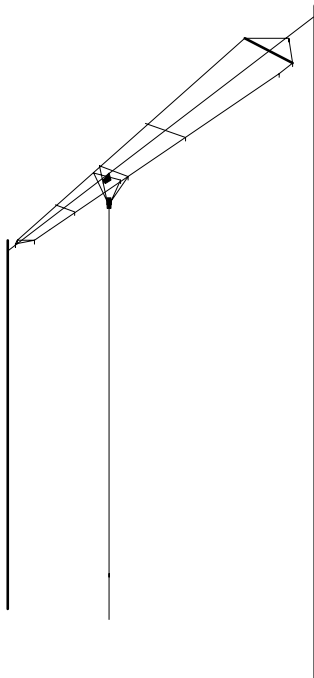
MOONRAKER

Type HF FD 2-30 1kW

High Power HF folded dipole broadband base station antenna

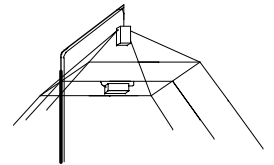
Designed as an efficient HF broadband base station system for short to medium range communications without the need for an antenna coupler.

The HF FD 2-30 1kW CW antenna system is easily erected in either a horizontal configuration between two towers or masts (not supplied) or in the space saving *inverted v* configuration from a single tower or mast, with a horizontal support stand-off, gibbet, at the top.



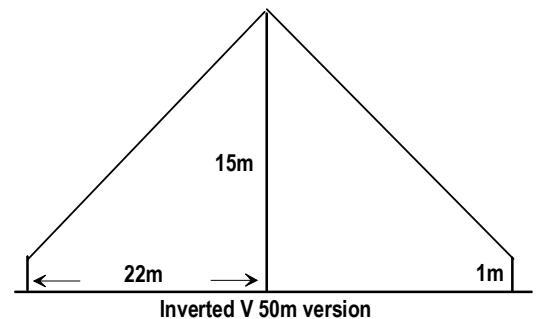
horizontal

The antenna is rated at 1kW continuous power or 2kW PEP. The radiating elements are of heavy duty stainless steel wire rope for strength and long life, even in corrosive atmospheres. The fittings and connections are of stainless steel with high quality insulators. Spreaders are of heavy duty UV stabilised material.



Internal antenna components are completely encapsulated or enclosed for protection from the environment.

The system provides efficient communications over the MF/HF range from 2.0 to 30 MHz with low (typically <2.5:1) SWR as measured at the input to 30m coaxial feeder.



SPECIFICATIONS

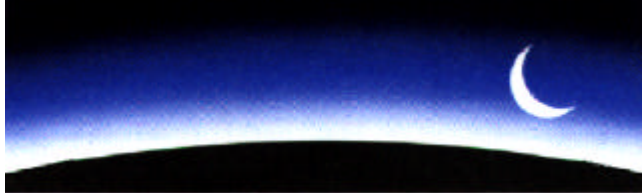
Frequency Range	2-30 MHz full version
Impedance	50 Ω (nominal)
VSWR	TYPICALLY <2.5:1 across the frequency range (maximum 3.5:1, depending on installation), as measured at the input to 30m coaxial feeder
Power Capability	1kW CW (continuous), 2kW PEP
Connection	via coaxial cable (not supplied) to N Type socket on balun box
Antenna Lengths	Radiator: 50m (167ft)
Recommended Mast/Tower Height	Mast/tower: 12-15m (40-50ft); two required for horizontal configuration.
Mast/Tower Spacing	Horizontal support gibbet (for inverted V) 800mm (2.6ft) from top of mast. Horizontal: 15m Mast 52m (170 ft) minimum; Inverted V: 15m Mast 44m (144ft)
Gain (peak)	Better than 5dBi
Wind Rating	240 km/h (150 mph), higher ratings available
Packed Weight	18 kg (39.6 lbs)
Packed Size	1 x 166 x 21 x 16 cm (65.4 x 8.3 x 6.3 ins) 1 x 44 x 41 x 30 cm (17.3 x 16.1 x 11.8 ins)

Specifications subject to change 9/05

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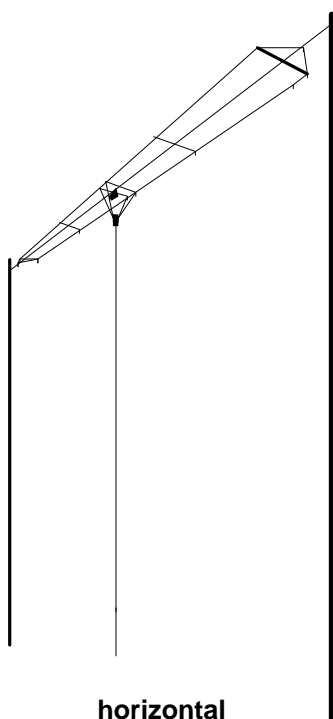
MOONRAKER



Type HF FD 2-30 1kW PEP

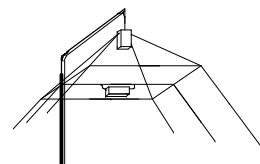
High Power HF folded dipole broadband base station antenna

Designed as an efficient HF broadband base station system for short to medium range communications without the need for an antenna coupler.



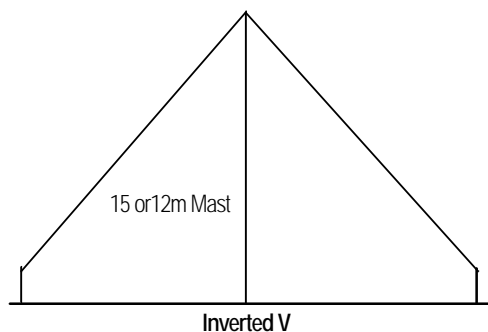
The HF FD 2-30 1kW PEP antenna system is easily erected in either a horizontal configuration between two towers or masts (not supplied) or in the space saving *inverted v* configuration from a single tower or mast, with a horizontal support stand-off, gibbet, at the top.

The antenna is rated at 1kWPEP or 250W CW. The radiating elements are of heavy duty stainless steel wire rope for strength and long life, even in corrosive atmospheres. The fittings and connections are of stainless steel with high quality insulators. Spreaders are of heavy duty UV stabilised material.



Internal antenna components are completely encapsulated or enclosed for protection from the environment.

The system provides efficient communications over the MF/HF range from 2.0 to 30 MHz with low (typically <2.0:1) SWR as measured at the input to 30m coaxial feeder.



SPECIFICATIONS

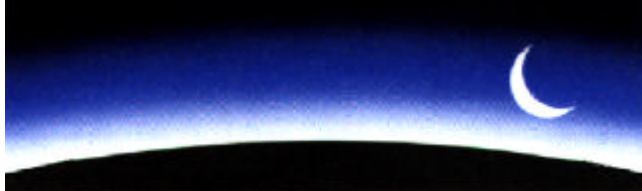
Frequency Range	2-30 MHz full version; 3-30 MHz compact version
Impedance	50 W (nominal)
VSWR	Typically <2.0:1 across the frequency range, as measured at the input to 30m coaxial feeder
Power Capability	1kW PEP, 200W CW (continuous)
Connection	Via coaxial cable (not supplied) to N Type socket on balun box
Antenna Lengths	Radiator: 50m (167ft) full version or 30m (98ft) compact version
Recommended Mast/Tower Height	Mast/tower: 50m full version 12-15m (40-50ft); 30m compact version 9-12m (30-40ft); 9m (30ft) minimum; two required for horizontal configuration. Horizontal support gibbet (for inverted V) 800mm (2.6ft) out from top of mast.
Mast/Tower Spacing	Horizontal: 50m/15m Mast 52m (170 ft) minimum; 30m/12m Mast 32, (105ft); Inverted V: 50m/15m Mast 44m (144ft); 30m/12m Mast 22m (72ft)
Gain (peak)	Better than 5dBi
Wind Rating	240 km/h (150 mph), higher ratings available
Packed Weight	14 kg (30.8 lbs), cubic weight 10kg (22 lbs)
Packed Size	1 x 167 x 21 x 17 cm (65.8 x 8.3 x 2.5 ins) 1 x 50 x 25 x 10 cm (19.7 x 9.8 x 3.9 ins)

Specifications subject to change 9/08

Moonraker Australia Pty. Ltd. A.B.N. 57 009 531 211

Tasmania Technopark, Dowsing Point 7010, Tasmania Australia

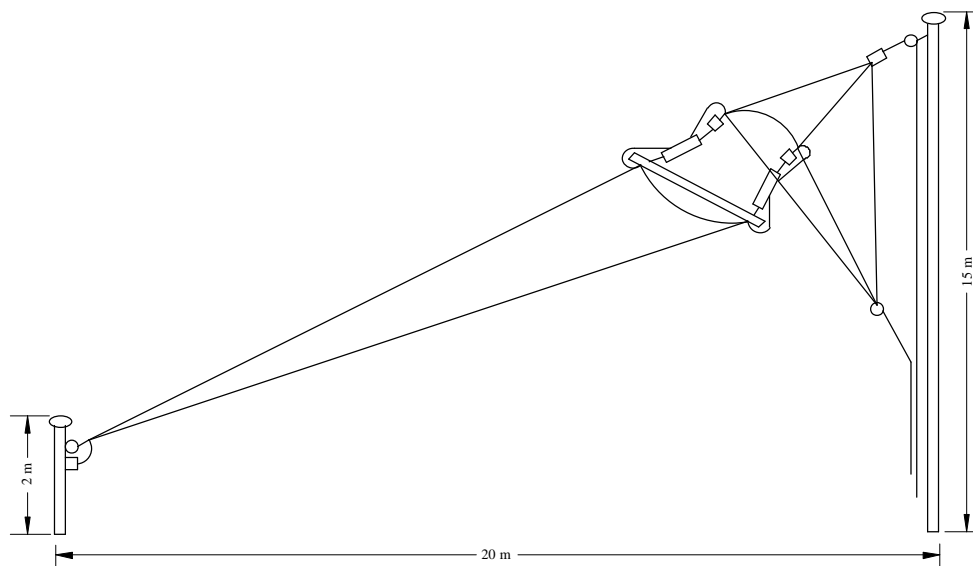
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M O O N R A K E R

Type HFB D/S

HF semi delta base station antenna for short to medium range communications



The semi-delta antenna system is designed for base station use by professional and commercial users of the HF band where an economical broadband system is required. Being simple to erect it exhibits an omnidirectional high angle radiation pattern for communications up to 1700 kilometres, dependent upon ionospheric conditions.

Except for the main support mast, earth stake for the lower end and coaxial cable between the antenna and transceiver, the system is supplied complete with all hardware, transformer balun, and a halyard and pulley to raise the antenna on the main support mast. Cable and connectors are available on request. The main mast may be provided by a free standing guyed mast, a windmill tower, or similar suitable support structure. The antenna should be erected over clear ground. It is not normally suited to roof top installations.

SPECIFICATIONS

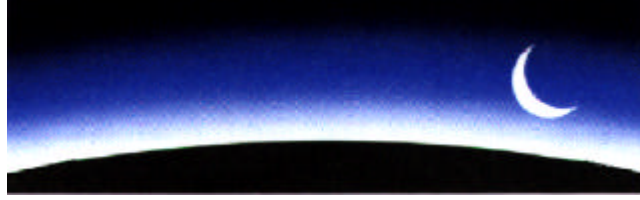
Frequency Range	2-14 MHz
Pattern	High angle omnidirectional (azimuth plane)
Impedance	50 Ω (nominal)
VSWR	1.8:1, 2.5:1 maximum, dependent upon earth conditions
Radiation Pattern	High angle omnidirectional (azimuth)
Power Capability	150W CW/400w PEP, higher power to order
Connection	UHF socket on connection box at lower end
Packed Weight	9 kg (19.8 lbs)

Specifications subject to change 11/09

Moonraker Australia Pty. Ltd. A.B.N. 57 009 531 211

Tasmania Technopark, Dowsing Point 7010, Tasmania Australia

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M O O N R A K E R

Type VL2-30

Compact HF NVIS vehicle semi-loop antenna system

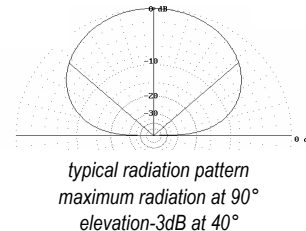


The VL2-30 is designed to provide high performance continuous close in omnidirectional communications with no skip zone.

The system requires only low RF transmit power to achieve continuous communications in the 0-1200 km range. By using high angle radiation and just the 3-17 MHz frequency band, it operates as a NVIS (near vertical incidence skywave) antenna to provide reliable low noise communications. This mode is particularly useful communicating over hills or mountain ranges, where, for security reasons, long range radiation methods are undesirable.

The system uses either the vehicle's metal roof (minimum of 2000mm (79 in long) or the optional 2000 x 330 x 6 mm (79 x 13 x ¼ in) lightweight aluminium base plate either mounted directly onto the vehicle or using the optional fully adjustable strap end cross bars, plus either your transceiver's antenna tuning unit (ATU), suitably housed, or the optional ATU from Moonraker. The ATU may be mounted remotely from the antenna, but close by. Ideally it should be mounted on the base plate. Tuning over the band is automatic via the ATU with ALE possible, dependent upon the ATU itself. High performance is assured, even in environments subject to noise interference due to the inherent filter qualities of the design, which combines automatic frequency tuning, a narrow bandwidth and excellent NVIS propagation of the signal. An optional EMP/Overvoltage system is available for the antenna feedpoint.

For ease of transport the stainless steel antenna radiator breaks down into two short sections, each with end support insulated devices. When installed and not in use it may be laid flat on the vehicle roof via the unique lift and lay down joints. Shock absorbing springs are used to assist survival when objects strike the radiator. Exterior metal surfaces are finished in drab olive colour (other colours to order) with a high durability epoxy based coating, highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation.



SPECIFICATIONS

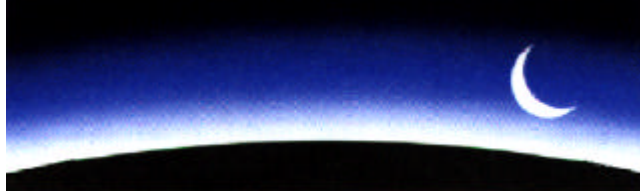
Frequency Range, Overall	2-30 MHz
NVIS Band	3-17 MHz
Radiation Pattern	Hemispherical
VSWR	<2:1, typically 1.6:1 2-30 MHz with suitable ATU
Power Capability	150W CW, 300W PEP, dependent upon ATU capability
EMP/Overvoltage System (option)	45kV 1.2/50 micro second (rise/fall times) voltage pulse, 5kA 8/20 microsecond current pulse.
Antenna Dimensions	1000mm (39.3 in) height to top of radiator at centre; 1880mm (74 in) centre spacing between base insulators; 85mm (3.35 in) diameter base insulators
Base Plate (optional)	2000 x 330 x 6mm (79 x 13 x ¼ in)
ATU (option)	Tuning time initial <2 seconds, recurrent <10 milli seconds; Power capability 150W PEP, 50W CW, 12V DC (24V option) at 900 mA
Weight	Antenna only: 2.2kg (4.8 lbs)

Specifications subject to change 07/09

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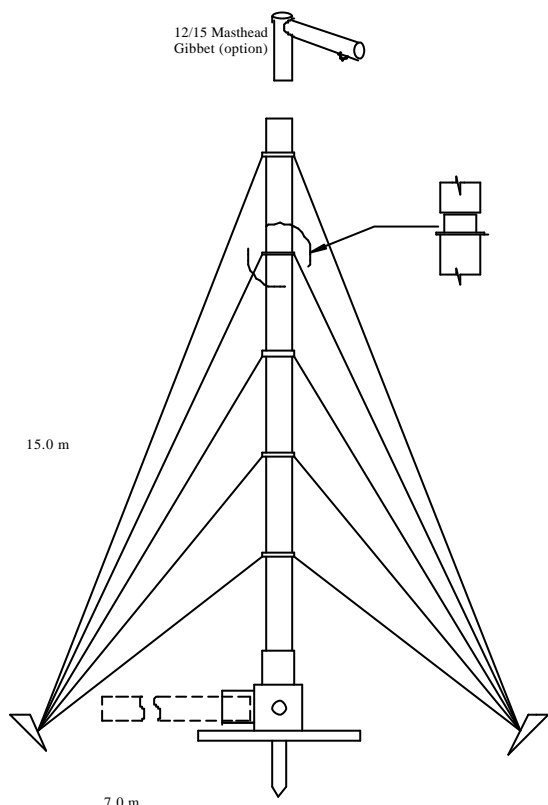
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MOONRAKER

Types 15 GM – 12GM

Guyed Portable Mast/Antenna Systems



Moonraker types 15GM and 12GM Portable Masts are designed to support wire antennas, such as our HF types FD230 and HFB D/S Semi Delta Antenna, and VHF/UHF verticals, such as our type MD HB-G3 VHF colinear in wind speeds up to 144 km/h (90 mph – 40m/s). Other types including yagis may also be supported. An optional Masthead Gibbet, type 12/15GMG is available to permit the suspension of HF wire antennas in the inverted V configuration.

Lightweight, yet sturdy, this versatile mast system is constructed from heavy duty marine grade aluminium tubing. Each section is 3.0 metres (9.8ft) in length for ease of transportation. It is available in two lengths 15m (50ft), type 15GM and 12m (40ft), type 12GM. Both masts are supplied with ground plate and halyard pulley with Dyneema rope guys.

A gin pole makes for easy erection by two men. To facilitate fast deployment, slip joints are utilised so that each section slides simply into the next. An optional erection kit, type 12/15GME, with a set of 4 triangular guy stakes, 3.65m (12ft) gin pole and accessories is available.

Specifications

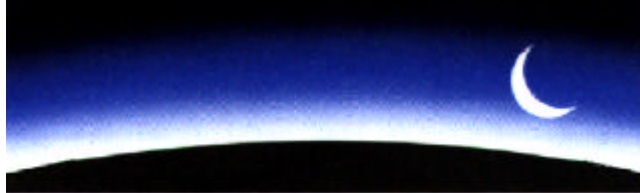
	type 12GM	Type 15GM
Height	12 metres (40ft)	15 metres (50ft)
Guy Radius	6 metres (20ft)	7 metres (23ft)
Number of Guys	4 x 4 sets	5 x 4 sets
Wind Loading	144 km/h (90 mph) with 12kg (26.4 lbs) headload	144 km/h (90 mph) with 12kg (26.4 lbs) headload
Weight of Mast (including guys, ground plate, ground spike, angled elbow and U bracket)	28.4kg (62.5 lbs) unpacked 34.4kg (75.7 lbs) packed	34.5kg (76 lbs) unpacked 42kg (92.5 lbs) packed
Weight of Masthead Gibbet (option)	1.5kg (3.3 lbs) unpacked, 2kg (4.4 lbs) packed	
Weight of Erection Kit (option)	10.5kg (23.1 lbs) unpacked, 13.5kg (29.7 lbs) packed	

Specifications subject to change 10/08

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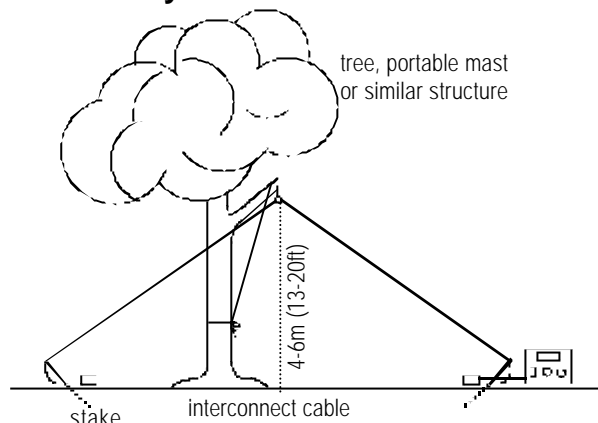


MOONRAKER

Type HF M2-30P



Tactical Military Man Pack HF Broadband Antenna



Designed to provide a compact efficient tactical HF broadband portable antenna for short to medium range communications without the need for an antenna coupler.

The HF M2-30P antenna system packs up small and is easily deployed in the space saving *inverted v* configuration from a single central support, such as a mast, tree, building or similar structure. An optional Moonraker type 6MPM portable mast is available and ideal for easy erection. A throwing line, weight and spool are provided for fast deployment when using a tree or for a halyard when using a mast.

The radiating element and interconnecting cable are constructed from Kevlar strengthened, tinned copper braided wire with PVC coating in drab olive colour to provide maximum durability, camouflage and performance. The antenna is supplied complete with matching device and integral coaxial connector, 10 metres (32.8ft) of coaxial cable (to transceiver), a balancing network, two support stakes and 30 metres (98ft) of interconnect cable. A hammer is optional. The antenna and throwing line/halyard are supplied on fast deployment spools.

The system provides efficient communications over the HF range from 2 to 30 MHz. Water resistant instructions are also included, packed in a military style drab olive or camouflage pattern Army (AUS) 6557 pack.

SPECIFICATIONS

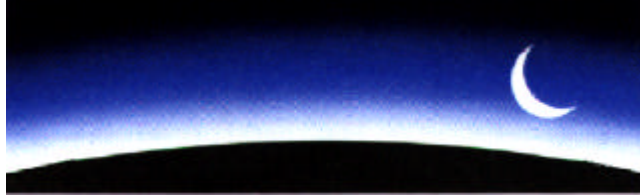
Antenna Length	30m (98ft)
Frequency Range	2-30 MHz
Impedance	50 Ω (nominal)
VSWR	<2.5:1
Radiation Pattern	High angle omnidirectional (azimuth)
Power Capability	50w CW, 100w PEP
Connector	BNC type coaxial
Connection	via 10m (32.8 ft) coaxial cable
Recommended Height	4m (13ft) minimum at centre is preferable (tree or mast)
Gain (maximum)	better than 4dBi (dependent upon erected configuration)
Wind Rating	200 km/h (125 mph)
System Weight	including pack: 3.6kg (7.92 lbs); including pack and hammer 4.3kg (9.46 lbs)
Pack Size (approx)	400x300x200mm (15.7x11.8x7.9 in)

Specifications subject to change 4/02

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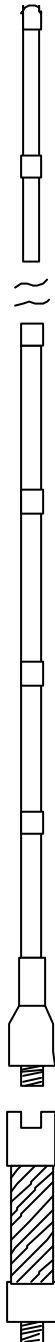
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MOONRAKER

Type TLW

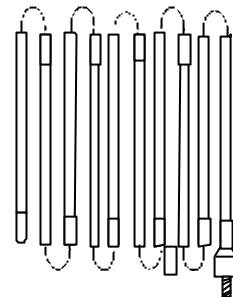
**Designed for improved manpack communications
in paramilitary tactical situations**



The HF Lightweight is both compact and easy to carry, being constructed from ten lightweight tubular sections with flared ends that socket together in seconds. The larger diameter lower four sections provide added stability.

The system features an internal shock cord system, which constrains the sections and facilitates fast deployment in the field. It makes use of the existing transceiver or ATU RF screw connector. The antenna is broken down easily into 300mm (11.8in) lengths. The overall height when erected is 3.0 metres (9.8ft). A flexible gooseneck is available as an option.

Connection to the radio may be via a screw connector at the radio ATU interface or via the optional gooseneck coupling.



Specifications

Frequency Band	HF 2-30 MHz (with suitable radio/tuner)
Element Length	Extended: 3m (9.85ft) approx. {3.14m (10.3ft) with gooseneck}; Disassembled: 320mm (12.6in) approx.
Base Connection (Antenna)	Stainless steel threaded stud 3/8 in x 26 TIP or 8mm x 1mm (specify other threads to order)
Optional Gooseneck Coupling	Screw connection to radio (specify thread)
Gooseneck Length	200mm (7.9in) approx.
Colour and Finish	Drab olive green or black polyurethane paint (specify)
Polarisation	Vertical (typical)
Weight	Antenna: 320g (11.3 ozs); optional gooseneck 120g (7 ozs)

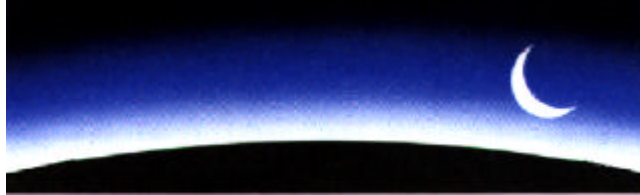
**Optional
Gooseneck
Coupling**

Specifications subject to change 9/02

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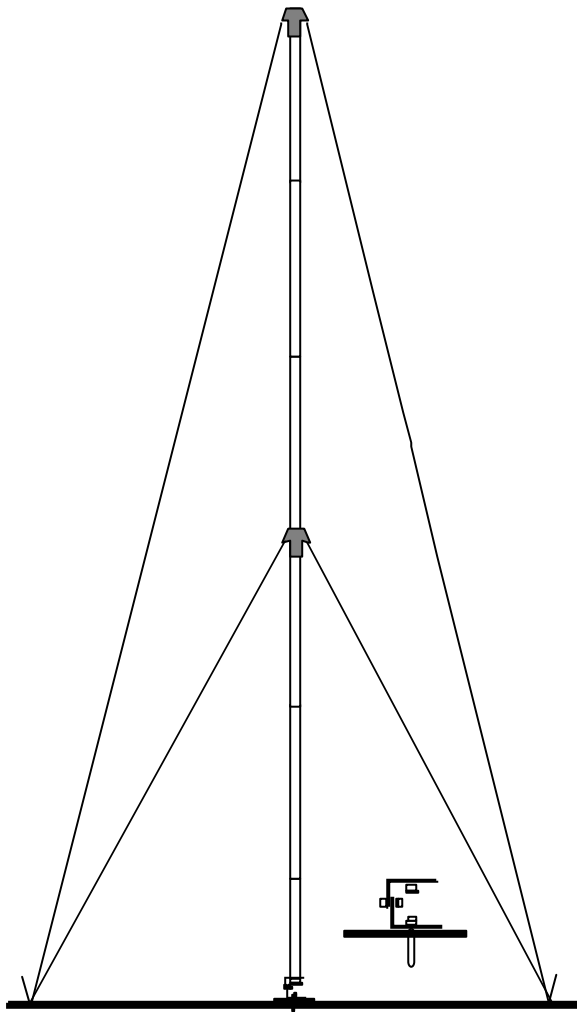
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MOONRAKER

Type 9MPM

Tactical Portable Mast / HF Antenna System (Nato No. 5985/66/107/9535)



The Moonraker Portable Mast is designed to support wire antennas, such as the HF M2-30P, in situations where temporary radio communications are required.

Constructed from 32mm (1.25in) corrosion resistant tempered aluminium, protected by a high durability epoxy based coating resistant to chemical attack, abrasion and the effects of ozone and ultra violet radiation, in six 1.5 metre (4.9 ft) slip together lengths, it is both lightweight and easy to erect and transport.

The mast is supplied complete with two sets of four 4mm (3/16 in) polyethylene braided cord guys, aluminium guy tensioners, cast aluminium guy fittings and stainless steel halyard pulley, guy stakes, hammer and heavy duty canvas carry bag.

A nylon standoff insulator and connection screw at the base permit the mast to be used as a vertical antenna, if required. A range of frequencies between 6.6 and 30 MHz may be achieved by varying the mast length by removing mast sections. Note that an earth system is usually required for efficiency.

For ease of erection the mast is supported on an adjustable angle mount fitted to a flat ground plate and location spike.

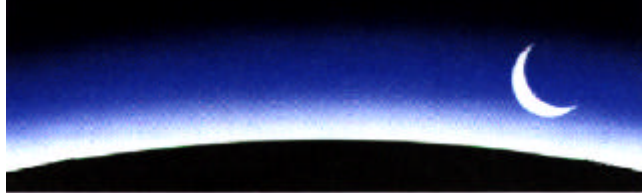
Specifications

Height	9m (29.5ft)
Minimum Guy Spread	Not less than 5m (16ft) radius
Guy Tension	Recommended 3 kg (6.6 lbs)
Halyard Tension	14kg (30.8 lbs) maximum at 90° to top of mast
Downward Pressure on Base	Up to 50kg (110 lbs) depending on guy and halyard tensions and wind velocity
Colour	Military drab olive green
Wind Loading	9.3 kg at 80 km/h (20.5 lbs at 50 mph) 5.3 kg at 60 km/h (11.7 lbs at 37 mph)
Weight	Mast plus guys, fittings and canvas carry bag: 13.5 kg (29.7 lbs)

Moonraker Australia Pty. Ltd. A.C.N. 009 531 211 Specifications subject to change 6/02

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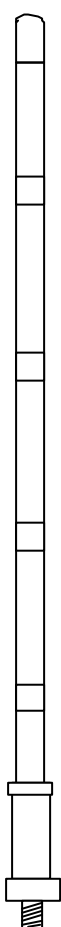


M O O N R A K E R



Battle Whip Antenna

Designed for VHF manpack communications
in tactical situations



The Battle Whip can withstand the rigors of rough handling and the tough environments expected in battlefield conditions when attached to a manpack radio. The design is similar to US Army specifications AS-3683/PRC.

The system comprises a multi blade type antenna radiating element with screw connect and a re-positionable gooseneck coupling assembly with either coaxial or screw connector at the radio interface.

An optional small lightweight *camouflage* pattern satchel, as per Army (Aust) 6557, is also available.

Specifications

Frequency Band	VHF 30-88 MHz
Element Length	790mm (31 in) approx (without gooseneck)
Element	Construction from corrosion resistant multiple spring steel leaf material
Base Connection (Antenna)	Via silver plated threaded stud; joint between element and stud moulded synthetic flexible material
Gooseneck Coupling (option)	Coaxial or screw connection to radio (specify) allows antenna to be positioned to suit operator
Gooseneck Length	280mm (11in) approx.
Colour and Finish	Drab olive green (CARC MILC 46168 or Army (Aust) 6461 polyurethane paint
Polarisation	Vertical (typical)
Carry Case (Option)	Lightweight patterned material to Army (Aust) 6557 with an overall size of 440 x 50 x 40 mm (17.3x2x1.6 in) approx.

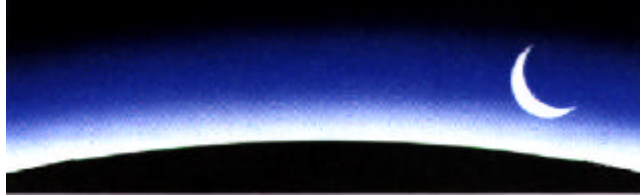
Weight 120g (4 oz), antenna only

Specifications subject to change 9/98

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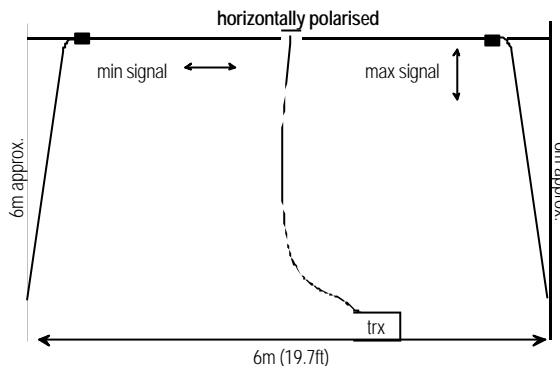


M O O N R A K E R



Type VHF Lightweight Dipole

Designed for temporary quick erection base station use in the field

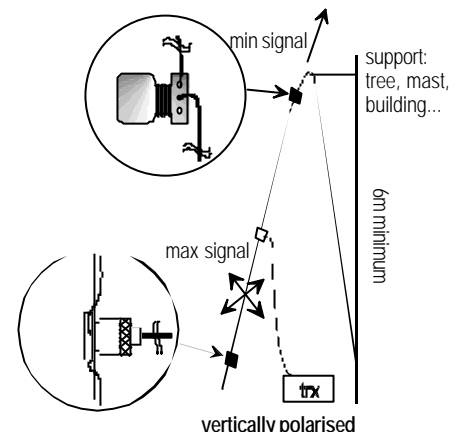


The antenna is based upon a centre fed wire dipole and is adjustable over the complete 30-88 MHz frequency band. It consists of a centre loaded antenna coupler, two separate bobbins loaded with Kevlar strengthened, tinned copper braided wire with PVC coating in drab olive colour to provide maximum durability, camouflage and performance. The wires are marked out for differing frequencies over their length.

There are two fast deployment reels containing the guy or halyard ropes, complete with throwing weights, which are used to suspend or support each end of the antenna elements. Also included is a 12m (40ft) coaxial connecting cable, with connectors and a ground stake.

The antenna is designed to be used as either a vertical or horizontally polarised system.

The system is packed in a small lightweight *camouflage* pattern, as per Army (Aust) 6557, satchel complete with waterproof instructions and shoulder strap.



Specifications

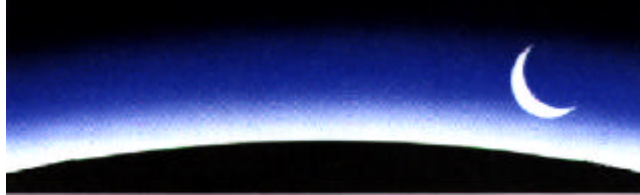
Frequency Range	VHF 30-88 MHz
Element Lengths	Adjustable from 2.5m to 0.8m (8.2-2.6 ft) [overall 5 to 1.6 m (16.4-5.3 ft)]
Element Material	Kevlar fibre strengthened tinned copper PVC coated flexible wire
Element Colour	Drab olive green
Halyard Ropes	2 x 25m (82ft), dark green colour
Connecting Cable	12m (39ft) RD58CU coaxial cable
Connectors	Coaxial BNC at transceiver end (options)
Polarisation	Either vertical or horizontal
RF Power	25w (max.)
Impedance	50Ω nominal (at adjusted frequency)
Pack Size (Satchel)	85x250x220mm (3.3x9.8x8.7 in) approx.
System Weight	1.8kg (4 lbs)

Specifications subject to change 2/01

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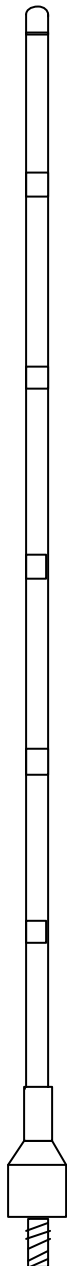


MOONRAKER



Type VHF Small Lightweight Whip Antenna

Designed for improved manpack communications
in tactical situations

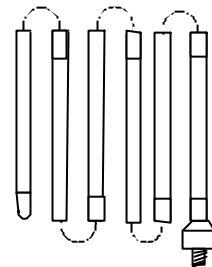


The Small Lightweight Whip is both compact and easy to carry. Similar in specifications to Army ASF500, it is constructed from six lightweight tubular sections with long wearing ends that socket together.

The system makes use of the existing transceiver RF connector and a spring loaded shock cord system to facilitate fast deployment in the field. The sections are constrained by an internal shock cord. This method allows the antenna to be broken down easily from either end. The overall height of 1.56 metres (5.1ft) collapses to 310mm (16in) lengths. Deployment in the field is simple and fast.

The antenna gives increased communications range against the battle whip style when conditions allow it to be fitted. Connection to the radio may be via a gooseneck coupling with either a coaxial or screw connector at the radio interface.

An optional small lightweight *camouflage* pattern (as per Army (Aust) 6557) satchel is also available.



Specifications

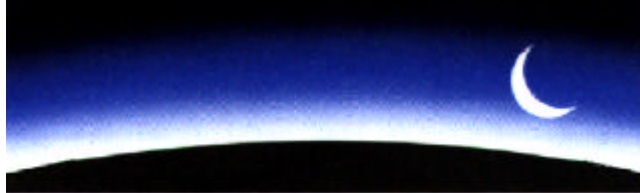
Frequency Band	VHF 30-88 MHz
Element Length	Extended: 1.56m (5.1Ft) approx. Disassembled: 310mm (16in) approx.
Base Connection (Antenna)	Stainless steel threaded stud
Gooseneck Coupling (option)	Coaxial or screw connection to radio (specify) allows antenna to be optimally positioned
Gooseneck Length	280mm (11in) approx.
Colour and Finish	Drab olive green . The antenna is finished with a high durability epoxy based coating, highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation.
Polarisation	Vertical (typical)
Carry Case (option)	Lightweight patterned material to Army (Aust) 6557 with an overall size of 340x50x40mm (13.4x2x1.6 in) approx.

Specifications subject to change 6/09

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MOONRAKER

Type MW3088

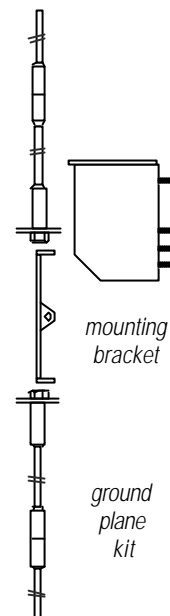


Broadband VHF Tactical Military Land Mobile Antenna System

A rugged broadband end fed dipole antenna designed to provide high performance wideband communications from 30 to 88 MHz in the military tactical environment with minimum signal attenuation.

The Moonraker MW3088 is designed to withstand demanding environments experienced by military vehicles in battlefield conditions, and is also suitable for base station use. It is fully compatible with standard NATO specifications. The system works against a ground plane, that can be provided by the vehicle chassis. The design is suitable to be used with both frequency agile and fixed frequency transceivers. No matching or tuning is required. Radiation is vertically polarised and omnidirectional in the azimuth plane. Over voltage lightning protection is built in.

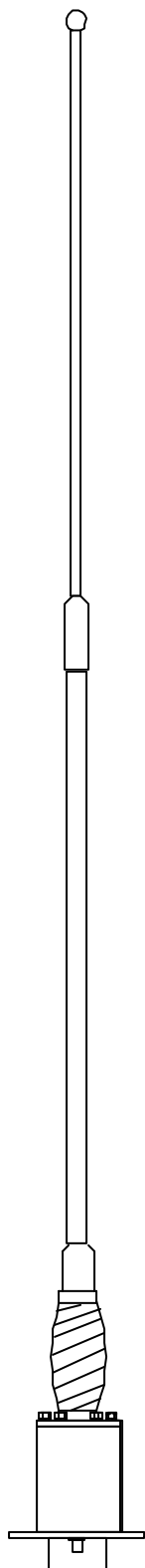
The antenna radiator is in two sections. Construction is from high strength composite rod fitted with a copper mesh element, fully coated and insulated with a high durability epoxy based coating highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation. Normal finish is drab olive green with other colours to order (including desert sand). The antenna base is both flexible and shock resistant, being comprised of high durability black nylon together with a heavy duty stainless steel barrel spring. It houses the integral passive matching network and provides feedthrough insulation. Fittings are of aluminium alloy.

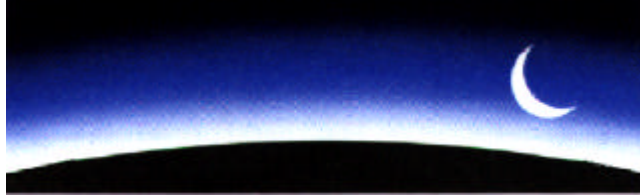


For installations where a suitable ground plane is not available, an optional ground plane kit of 4 x 2.8 metre (9.2ft) radials can be provided. Brackets are available for vehicle and mast mounting. The ground plane is used in conjunction with the mast mounting kit. For marine mobile or base station operations we recommend our specially designed ground independent type MMD3088.

Specifications

Frequency Range	30-88 MHz.
Overall Length	2638mm (8.65ft) approx.
Radiator Diameter	Top section 10mm (0.4in) tapering to 20mm (0.8 in); bottom section 20mm (0.8 in)
Base Diameter	90mm (3.5 in)
Impedance	50 nominal
Power Capability	100W CW
Gain (approx)	-5 dBi at 30 MHz, +1.0 dBi at 88 MHz
VSWR	<3.5:1
Pattern	Omnidirectional
Polarisation	Vertical Linear
Connector	Standard type BNC female; other types to order
Mounting	NATO standard base mounting assembly: 140mm dia flange with 4 x 11mm holes drilled on 114.3mm dia pitch circle. Incorporates s/steel barrel spring. 3/8 in stainless steel mounting bolts provided.
Mounting Brackets (option)	Dimensions: 220 (h) x 150 (w) x 150 (d) mm (8.7 x 5.9 x 5.9 in) Mast Mount: 2 x 1/4in x 2 1/4in dia U bolts (supplied); Vehicle Mount:: 8 x 8mm bolts (not supplied)





M O O N R A K E R



Type MMD2400

Broadband Marine Dipole Antenna for UHF tactical air band communications



The MMD2400 is a rugged, tactical dipole system, designed to provide wideband omnidirectional transmit and receive communications over the 225-400 MHz military aviation tactical band.

Radiation is vertically polarised and is omnidirectional in the azimuth plane providing excellent ground to ground as well as ground/sea to air communications with minimum signal attenuation.

Construction is lightweight yet extremely rugged, being designed to meet military standards for humidity (810E Procedure III), vibration (167-1 Type 1) and shock (901-1 Grade A). This ensures a high degree of strength ensuring a long operational life.

The aluminium antenna elements are encapsulated within a heavy duty fibreglass radome and isolated from the environment by an aluminium base flange to minimise problems associated with static discharge. The antenna is fully marinised, being finished with a high durability coating, highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation. Standard colour is navy silver grey with other colours to order.

Specifications

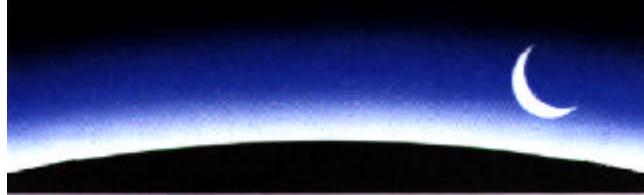
Frequency Range	225-400 MHz.
Overall Length (approx)	710mm (28 in)
Radiator Diameter	82.5mm (3.24 in)
Base Diameter	133mm (5.25 in)
Impedance	50Ω nominal
Power Capability	500W CW; 800W PEP
Gain	2dBi
VSWR	<2.0:1 ; typically 1.5:1
Pattern	Omnidirectional
Polarisation	Vertical
Wind Survival	Designed to withstand wind velocities of 190 km/h (120 mph) no ice
Temperature	-50 to +65°C (-60 to +150°F)
Connector	N type in centre of base
Mounting	Aluminium flange base with 4 equally spaced 9mm (0.354 in) holes on 117.5mm (4.6 in) circle
Weight	2.5kg (5.5 lbs); packed 7.5kg (16.5 lbs)

Specifications subject to change 06/06

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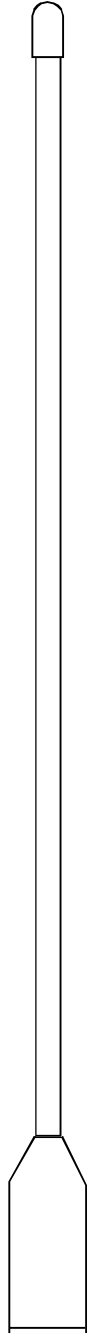
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MOONRAKER

Type MBH 3090

VHF military broadband tactical system for hand held and back pack transceivers where short range reliable communications are required in those close tactical situations where long whips and even battle whips hinder operations.



A high endurance broadband helical antenna designed to provide efficient and reliable VHF omni-directional communications for military services in the 30 to 90 MHz band.

Rugged, lightweight and unobtrusive, the type MBH3090 helical antenna is designed for long life. Overall height is just 400mm (15.7in)

The helix is constructed from heavy gauge copper wire which is protected by black thermoplastic pressure tubing. The covering, which presents a hard but smooth outer finish, completely seals the antenna and protects the helix from damage enabling the antenna to withstand the rugged requirements of military use. It is stiff enough to stand upright yet flexible enough to bend into a U shape. Standard colour is black.

Specifications

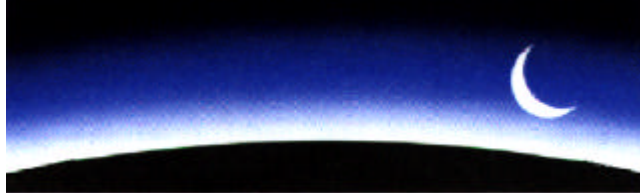
Frequency Range	30-90 MHz
Overall Length	400mm (15.7in), including base connector
Radiator Length	335mm (13.2in)
Radiator Diameter	6mm (¼in)
Base Diameter	20mm (¾ in)
Pattern	Omnidirectional
Power Capability	10w PEP
Polarisation	Vertical
VSWR	Better than 2.8:1 over frequency range (Typically <2.5:1)
Impedance	50Ω nominal
Connection	Special coaxial TNC male fitting built into base of antenna. (Other types available). Connects direct to a similar female connector on transceiver. Note that base of antenna is 25-40mm (1-1.6") diameter dependent on connector type. Please discuss specific requirements of your military transceiver's antenna connection at time of order. Note: BNC type not available
Weight	100g (3.5 oz)

Specifications subject to change 04/05

Moonraker Australia Pty. Ltd. A.B.N. 57 009 531 211

Tasmania Technopark, Dowsing Point 7010, Tasmania Australia

Website: www.moonraker.com.au Telephone 61 (0)3 6273 1533 Fax: 61 (0)3 6273 1749 Email: radiocom@moonraker.com.au



MOONRAKER

Type MD Portable



To extend the range of VHF handheld radios

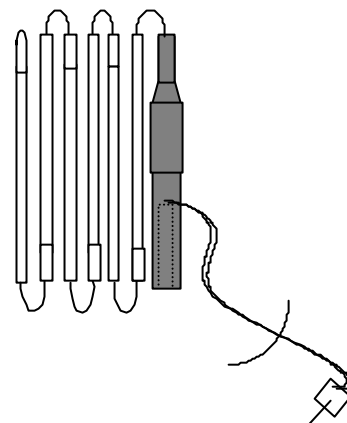
A collapsible half wave dipole radiator, designed to provide efficient VHF performance in both the transmit and receive modes in remote fringe areas for hand held transceivers where the standard short "rubber duckie" antenna is limiting range.

The MD Portable is ideal for remote area operators relying on VHF communications in difficult locations, especially emergency services, police, forestry and mining industry personnel. It is lightweight and fits easily into a back pack. The system makes use of the existing transceiver RF connector and a shock cord system to enable fast deployment and increase communications range in the field, then collapses to 320mm (12.5in) sections. Erect, antenna length varies from 1.3m (high band) to 2.2m (mid band) (4.3 to 7.2 ft). Additional height can be achieved to hoist the antenna above any obstructions, (forest canopy, areas in radio shadow, and the like) by inserting a pole or stick in the hollow antenna base.

The antenna radiator is constructed of marine grade, low corrosion, stainless steel. All metal parts are at DC earth potential for static discharge and fittings are of nylon and chrome brass. An internal isolator within the marine grade aluminium mounting pole protects the antenna feed connection from poles or sticks inserted to support the antenna.

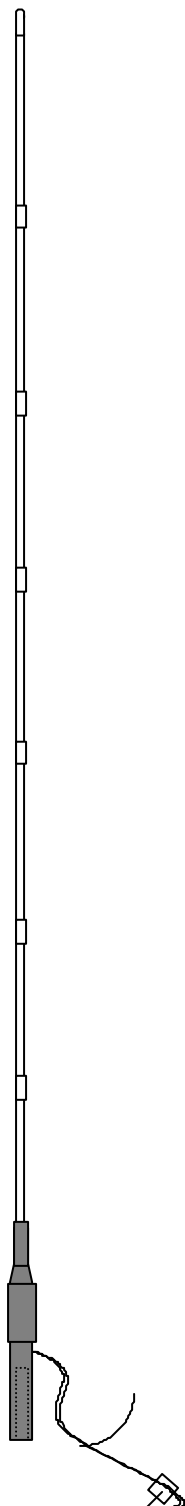
It may be supplied tuned to any frequency in the VHF High or Low/Mid Bands and comes with 2m (6.6ft) of coaxial cable and connector. The number of sections varies with frequency.

Please note that this antenna requires the transceiver to have a coaxial antenna connector for the standard short rubber duckie antenna.



Specifications

VHF Band	High Band: 146-180 MHz	Low/Mid Band: 70-145 MHz
Overall Length	1.3metres (4.3 ft), approx	2.2 metres (7.2 ft), approx
Radiator Length	0.9 metres (3 ft), approx	1.73 metres (5.6 ft), approx
Radiator Diameter	6.4mm (0.25 in)	
Mounting Tube	22.23mm (7/8 in) Diameter	
Pattern	Omnidirectional, maximum radiation 90° to radiator	
Polarisation	Vertical	
Frequency Range	Pretuned to any specified VHF band frequency.	
Bandwidth	7 MHz	
VSWR	Better than 1.2:1 at centre frequency	
Gain	2.2 dBi	
Impedance	50Ω nominal	
Power Capability	60 watts	
Mountings	Hand held or via pole/stick inserted in base tube	
Connection	2 metres RG58 co-axial cable with PL259 (UHF) plug, BNC, TNC, etc. (specify to suit transceiver)	
Weight	Unpacked: 300g (10.6 ozs); Packed: 440g (14 ozs)	

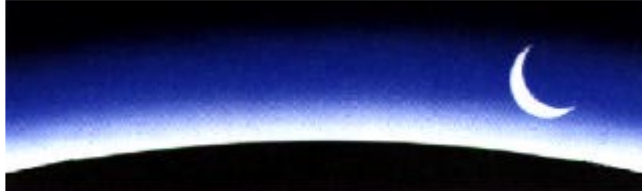


Specifications subject to change 11/05

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MOONRAKER

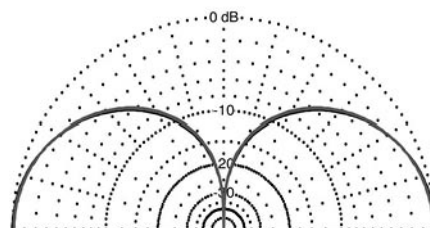
Type MDA Portable

Broadband VHF Surface to Air communications for Portable Transceivers



The MDA Portable is ideal for mobile and remote area operators using VHF Air Band communications.

The vertically polarised, ground independent centre fed dipole system offers excellent broadband performance both in transmit and receive modes across the band. The system has an integral passive matching network housed within the antenna. Radiation features beam tilt, being designed to maximise high angles for surface to air communications.



The system makes use of the existing transceiver coaxial RF connection and a shock cord system to enable fast deployment and increase communications range in the field. Antenna height ranges from 1.25m (4.1 ft) when fully extended to 460 mm (18.1 in) when collapsed.. Additional height can be achieved to raise the antenna above any obstructions, (forest canopy, areas in radio shadow, and the like) by inserting a pole or stick in the hollow antenna base. It is lightweight and fits easily into a back pack.

The 3 sections of the antenna break down into a 460mm (18.1 in) length when not deployed. Construction is of marine grade, low corrosion aluminium and stainless steel, finished with PVC and a high durability epoxy based coating, highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation. It is supplied with 1.35m (4.4ft) of coaxial cable and connector. All metal parts are at DC earth potential for static discharge and fittings are of nylon and chrome brass.

Please note that this antenna requires the transceiver to have a 50 ohm coaxial antenna connector for correct operation.

Specifications

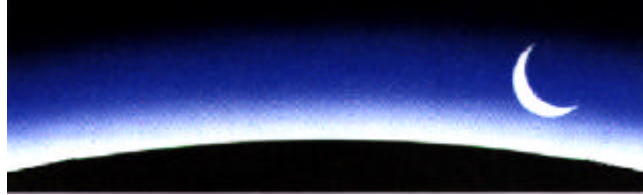
VHF Band	VHF Air Band 118-137 MHz
Frequency Range	Broadband over 118-137 MHz range.
Overall Length	1.25 metres (4.1 ft),
Radiator Length	1.13 metres (3.7 ft), approx
Radiator Diameter	Ranging from 9.5 mm (0.375 in) at base to 8 mm (0.313 in)
Mounting Tube	22.23mm (0.87 in) Diameter
Pattern	Omnidirectional (azimuth), linear vertical with high angle radiation (elevation)
Polarisation	Vertical
VSWR	typically <2:1
Gain	2.2 dBi
Impedance	50Ω nominal
Power Capability	25W CW
Mountings	Hand held or via pole/stick inserted in base tube
Connection	1.35 metres RG174 co-axial cable with PL259 (UHF) plug, BNC, TNC, etc. (specify to suit transceiver)
Weight	Unpacked: 390g (13.8 ozs); Packed: 500g (17.6 ozs)

Specifications subject to change 10/08

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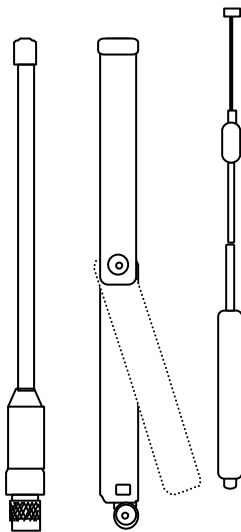
MOONRAKER

Type PLB



VHF/UHF Flexible 3 or 5 Frequency Antenna System for Personal Locator Beacon and EPIRB marine and airborne emergency communications

A series of ground dependent monopole antennas designed to provide efficient and reliable VHF/UHF omni-directional communications, being compliant with military and COSPAS-SARSAT requirements.



Left: EPIRB type
Centre: folding type
Right: telescopic type

Modern EPIRBs transmit on 121.5, 243 and 406 MHz, the internationally agreed distress frequencies monitored by satellite as well as by military and civilian transport aircraft and ships, to provide accurate positioning and facilitate rescue. As these transmitters have limited power supplies maximum efficiency is all important. Moonraker PLB antennas are designed with this in mind to assist with extension of battery life and hence the opportunity for rescue of the user.

The antennas are lightweight, unobtrusive and easily mounted. When not in use, they are designed to either telescope or fold down, dependent upon type, so as to fit with the particular manufacturer's PLB. Versions are also available for fitting into the seat of an aircraft, together with a three frequency EPIRB type.

Construction of all types is from materials to suit the environment they have to survive in. Standard units are typically manufactured from marine grade materials.

Rugged and lightweight, PLB antennas are completely sealed for maximum protection from the marine environment, airborne dust and sand and ultra violet radiation. They are designed to be resistant to vibration, shock, and damage due to accidental transit dropping or striking of overhead objects while being carried by the operator, and will provide reliable performance even after stored for extended periods prior to deployment.

Specifications

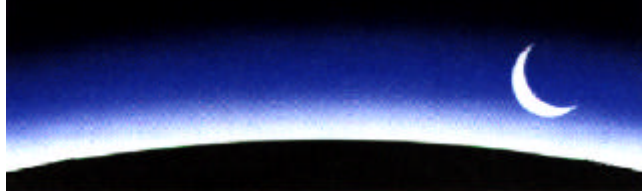
VHF/UHF Band	121-407 MHz
Length	300mm (11.8 in), dependent upon type)
Base Dimensions	Dependent upon antenna and PLB type
Pattern	Omnidirectional
Polarisation	Vertical
Frequency Range	International Distress Frequencies 121.5, 123.1 and 406.025 MHz, including 243.0, 282.8 MHz when required
VSWR	Meets or exceeds COSPAS SARSAT specifications
Gain	Unity
Impedance	50Ω nominal
Mounting & Connection	To suit manufacturer's requirements
Weight	EPIRB type 60g folding type 60g (2.1 oz) telescopic type 40g (1.4 oz)

Specifications subject to change 6/98

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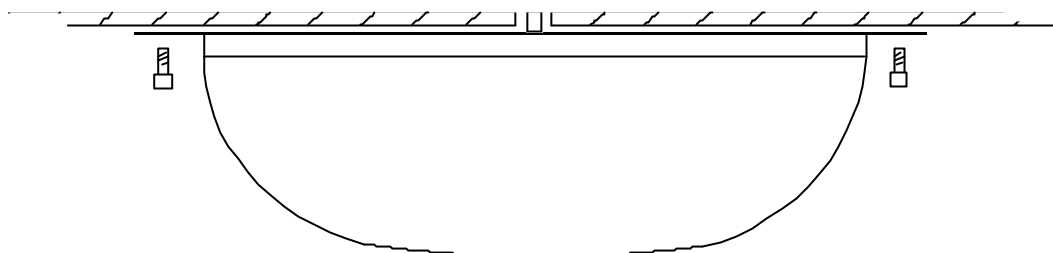


MOONRAKER

Type CMGP



Low Profile Disguise VHF or UHF Radome Enclosed Antenna System



The Moonraker type CMGP is designed to provide efficient VHF or UHF communications where visual impact or covert requirements restrict the use of standard antenna systems. Shopping centres, hospitals, airports, railway stations and hotels are typical locations for these antennas.

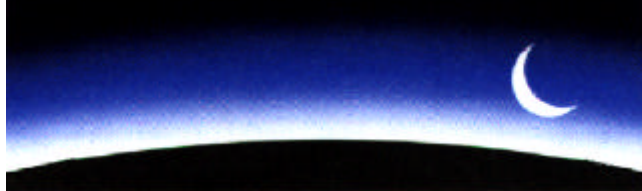
Housed within a disguise radome the antenna closely resembles a standard ceiling/flush mounted light fitting. Normal colour is white. It blends well with other fittings found in modern buildings.

The antenna is ground independent and therefore does not require a metal ground plane/ceiling etc., for correct operation. It is DC grounded for protection from static and other like forms of interference. It may be supplied tuned to any frequency in the range with a bandwidth better than 1 MHz (VHF) or 15 MHz (UHF) at the specified frequency.

Mounting is simplified by the extended base flange with positions marked for screw holes placed equally around its perimeter. Cable entry is via a connector in the base of the housing, allowing the cable to enter directly through the ceiling behind the base.

Specifications

Frequency Range	VHF 148-174 MHz	UHF 400-500 MHz
Bandwidth	Greater than 1 MHz at 1.5:1 SWR, 2.5 MHz at 2.0:1 SWR	15 MHz at 1.5:1 SWR, 30 MHz at 2.0:1 SWR
Gain	Unity	Unity
Power	50w CW	50w CW
Polarisation	Vertical	Vertical
Radiation Pattern	Omnidirectional	Omnidirectional
Impedance	50Ω (nominal)	50Ω (nominal)
Connection	BNC socket protruding from flat base (cable entry through mounting surface /ceiling (other connectors to order)	
Radome	White ABS plastic 360mm (diameter) x 115mm (height) (14.2 x 4.5 in)	
Mountings	Via screws through base flange 395mm (15.5 ins) diameter	
Weight (Antenna)	1.1kg (2.42 lbs)	
Packed Weight	2 kg (4.4 lbs) approx	



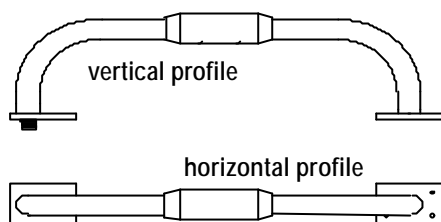
MOONRAKER

Type LPD S/L



Low Profile Disguise Heavy Duty VHF or UHF Semi Loop Antenna System

The Moonraker type LPD S/L is designed to provide efficient VHF or UHF communications where visual impact or covert requirements restrict the use of standard antennas and where conventional systems are prone to damage due to hostile environments and harsh use.



The antenna fits snugly on the top or side of vehicles, where it blends in well, resembling a typical vehicle hand rail and may even be used as a hand hold. The profile extends only 122mm (4.8 in) from the vehicle. It is especially suitable for heavy vehicles from military transports to underground mine machinery and trains.

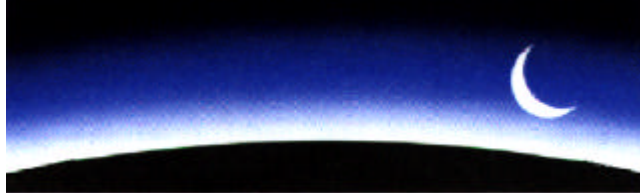
The antenna elements are housed within the semi loop and protected by a central external nylon shroud. This extremely rugged housing is designed to withstand shock impact from external objects, such as accidental scraping on mine tunnel ceilings and walls and attempts to render it inoperative by vandals and thieves. Construction is of brass finished with a high durability epoxy based coating, highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation.

The vehicle roof or bodywork provides the antenna ground plane. The antenna is mounted flush to the vehicle roof via a brass plate at either end. Cable entry is via a UHF, N type or other suitable connector at one end. The connection may be made externally at the side of the vehicle by overhanging the mounting plate sufficiently, or through the vehicle roof.

The antenna may be supplied tuned to any frequency in the range. Antenna length and bandwidth vary according to frequency. At standard frequencies 148-175 MHz and 400-512 MHz antenna length is 460mm (18 in).

Specifications

Frequency Ranges	Standard: VHF 148-174 MHz and UHF 400-512 MHz; also available 118-137 MHz and 70-75MHz
Bandwidths	148-175 MHz 20MHz at $\square 5:1$ VSWR, 3MHz at $\square 1.5:1$ VSWR; 118-137 MHz 3 MHz at $\square 2:1$ VSWR; 70-85 MHz 1 MHz at $\square 2:1$ VSWR 400-512 MHz 20 MHz at $\square 2:1$ VSWR;
Antenna Height	122mm (4.8 in)
Antenna Length (footprint)	148-174 and 400-512 MHz: 460mm (18 in); 118-137 MHz 600mm (24 in); 70-85 MHz 900mm (36 in)
Gain	Unity
Power	100w CW; higher power to order
Polarisation	Predominantly vertical
Radiation Pattern	Omnidirectional
Impedance	50 Ω (nominal)
Connection	UHF, N type or other suitable connector (please specify)
Mountings	Via screws through mounting plates to the metal roof
Weight (Antenna)	1.6 kg (3.52 lbs)
Packed Weight	2 kg (4.4 lbs) approx



MOONRAKER

Type BCA200-1300



Wideband Omnidirectional UHF Tactical System



The BCA200-1300 is designed to provide wideband omnidirectional tactical communications for bands in the 150-1300 MHz frequency range. It provides excellent ground to ground as well as ground/sea to air communication. With the BCA200-1300 system only one antenna is now required where multiple antennas were required previously to cover the VHF marine band and UHF and Link 16 tactical bands. The system has particular application for military and para military services.

The principle of operation is that of an omnidirectional biconical wideband system comprising two conical conductors with a common axis and vertex. Band separation filters are used at the transceiver, so that there is a single feed coaxial cable to the antenna.

The antenna has been designed to yield a low VSWR over the entire range. Radiation characteristics designed to minimise the effects of the movement of a vessel at sea

Polarisation is slant linear so that both horizontally and vertically polarised signals can be received.

The antenna features two flat plane conical radiators constructed from non ferrous metal with a composite fibre collar and is fully marinised for use at sea. The surface is coated with a high durability epoxy based coating for full protection from the environment and ultra violet radiation. Standard colour is military APO grey with other colours to order.

A high quality band stop filter to reduce effects from nearby radars is available as an option.

Specifications

Frequency Range	150-1300 MHz, including 150-157 MHz marine band and 225-400 MHz and 960-1215 LINK 16 tactical bands
Azimuth Coverage	360°
Polarisation	Slant polarised giving horizontal and vertical patterns
Gain	-1.7 to 4.1 dBi over frequency range
VSWR	<2:1 over frequency range, typically 1.5:1
Impedance (output)	50Ω (nominal)
Power Capability	500W CW
Connection	N type coaxial connector (female) in base at centre
Overall Dimensions	589mm (23.2 in) (h) x 400mm (15.75 in) (dia)
Mounting Base Required	300mm (11.8 in) dia
Mounting	8 off M6 x 1 x 25mm stainless steel studs equally spaced on a 250mm circle NB coaxial connection is in centre of base
Wind Survival	185 km/h (116mph)
Weight (Antenna only)	6.8 kg (14.96 lbs); packed: 16 kg (35.2 lbs)

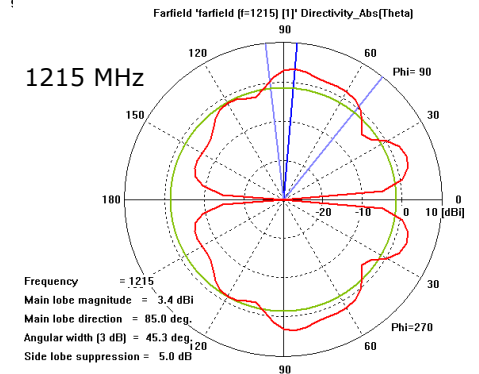
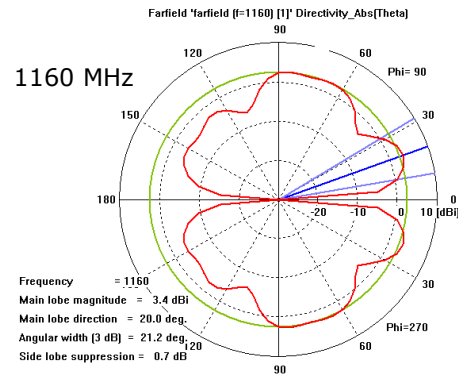
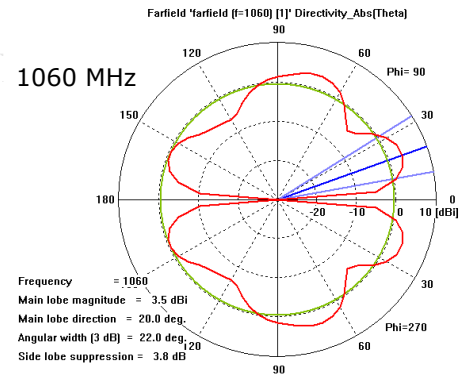
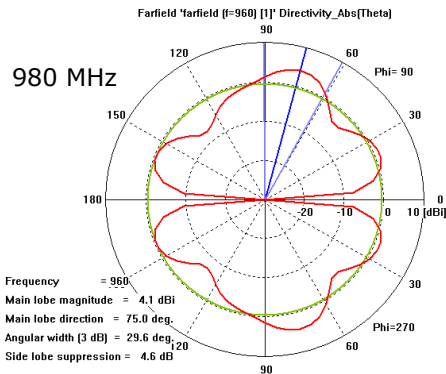
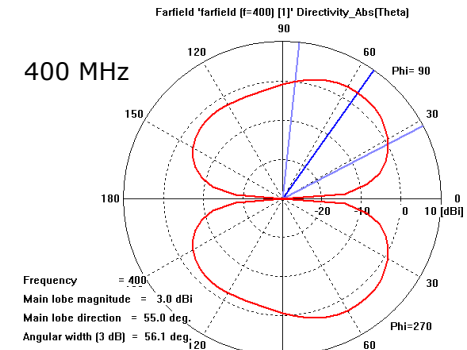
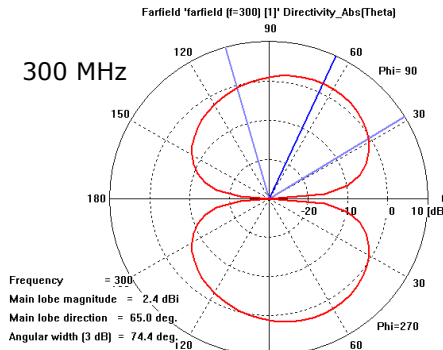
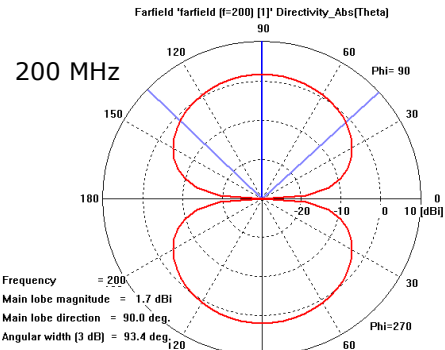
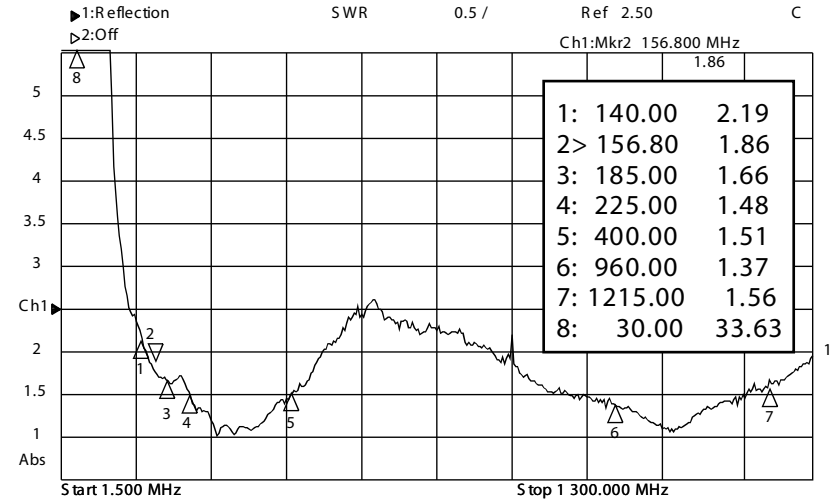
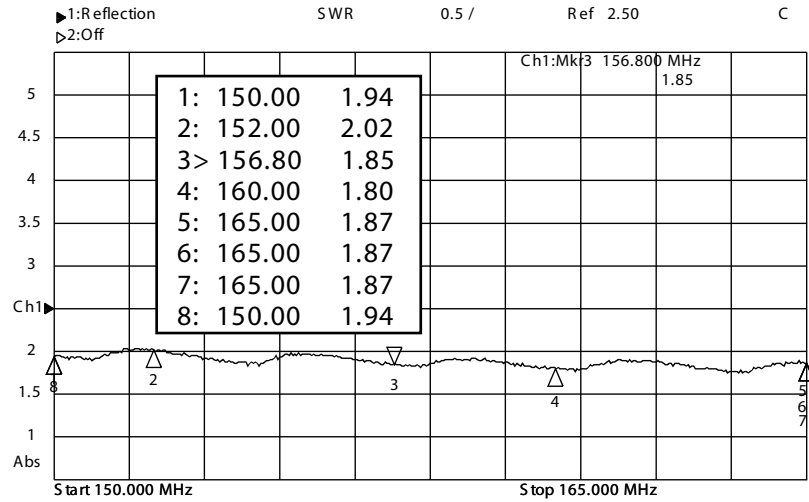
Specifications subject to change 06/07

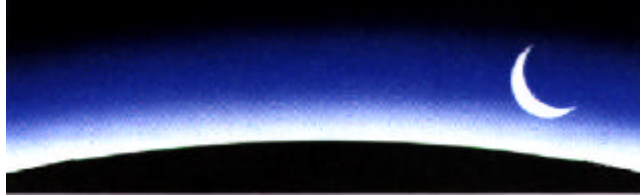
Moonraker Australia Pty. Ltd. A.B.N. 57 009 531 211

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TECHNICAL DATA



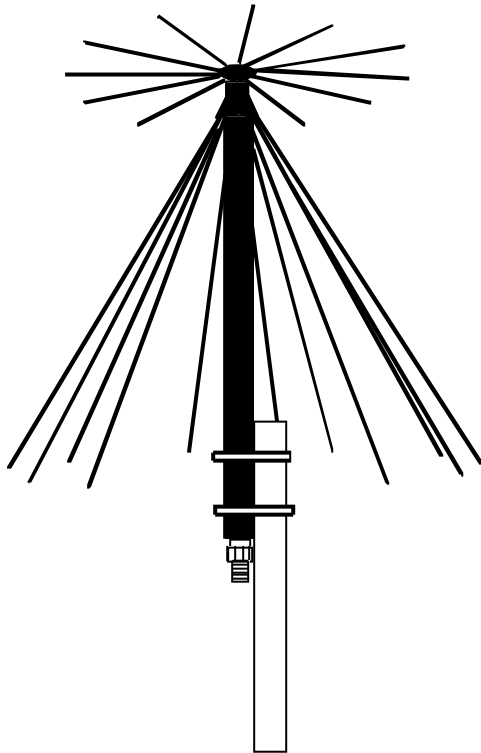


MOONRAKER

Type BDA400



Broadband Omnidirectional UHF Airband Tactical System



The BDA400 is designed to provide wideband omnidirectional communications over the 225-400 MHz military aviation tactical band, providing excellent ground to ground as well as ground/sea to air communications. It has particular application for military and para military services.

The principle of operation is that of an omnidirectional ground independent wideband system comprising a disccone antenna with multiple elements. It has been designed to yield a low VSWR within this range with optimised radiation characteristics suited to ground to ground and ground to air operation.

Elevation patterns are consistent in character over the range, being similar to a $\frac{1}{4}$ wave vertical monopole.

The antenna features stainless steel sloping and top hat radials. It is coated with a high durability epoxy based coating for full protection from the environment and ultra violet radiation and is fully marinised for use at sea.

Standard colour is drab olive (other colours to order).

Specifications

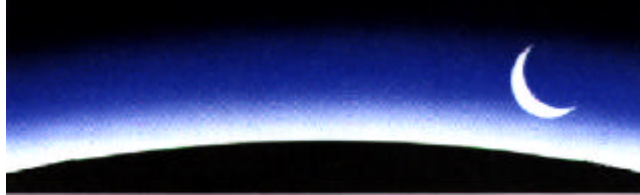
Frequency Range	225-400 MHz
Polarisation	Vertical linear
Gain	+2dBi minimum over frequency range
VSWR	<2:1 over frequency range
Impedance (output)	50 Ω (nominal)
Power Capability	100w CW, 400w PEP
Connection	N type coaxial connector (female) in base
Overall Dimensions	410mm (16 in) (h) x 400mm (15.7 in) (dia)
Mounting Pole Length	340mm (13.4 in), longer to order; mounting clamps not included
Wind Survival	160 km/h (100mph)
Weight	910g (2 lbs); packed: 1.2kg (2.6 lbs)

Specifications subject to change 2/02

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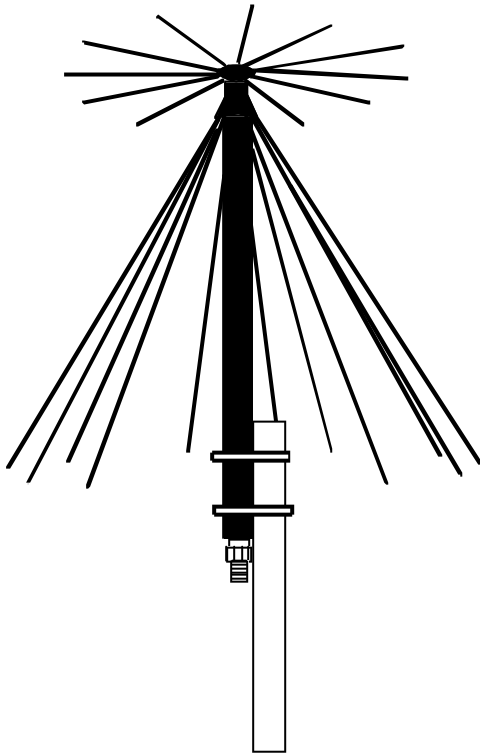


MOONRAKER

Type BDA500



Broadband Omnidirectional UHF Airband Tactical System



The BDA500 is designed to provide wideband omnidirectional communications over the 450-550 MHz military aviation tactical band, providing excellent ground to ground as well as ground/sea to air communications. It has particular application for military and para military services.

The principle of operation is that of an omnidirectional ground independent wideband system comprising a disccone antenna with multiple elements. It has been designed to yield a low VSWR within this range with optimised radiation characteristics suited to ground to ground and ground to air operation.

Elevation patterns are consistent in character over the range, being similar to a $\frac{1}{4}$ wave vertical monopole.

The antenna features stainless steel sloping and top hat radials. It is coated with a high durability epoxy based coating for full protection from the environment and ultra violet radiation and is fully marinised for use at sea.

Standard colour is drab olive (other colours to order).

Specifications

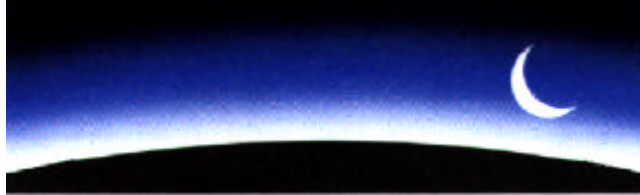
Frequency Range	450-550 MHz
Polarisation	Vertical linear
Gain	+2dBi minimum over frequency range
VSWR	<2:1 over frequency range
Impedance (output)	50 Ω (nominal)
Power Capability	100w CW, 400w PEP
Connection	N type coaxial connector (female) in base
Overall Dimensions	410mm (16 in) (h) x 390mm (15.4 in) (dia)
Mounting Pole Length	340mm (13.4 in), longer to order; mounting clamps not included
Wind Survival	160 km/h (100mph)
Weight	910g (2 lbs); packed: 1.2kg (2.6 lbs)

Specifications subject to change 6/04

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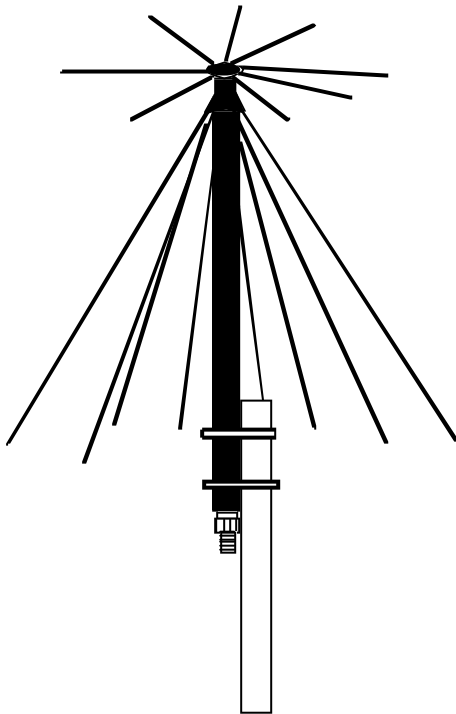


MOONRAKER

Type BDA1340



Broadband Omnidirectional 2 Band VHF/UHF Airband Tactical System



The BDA1340 is designed to provide dual band omnidirectional communications over the 113-174 and 225-400 MHz aviation tactical bands, providing excellent ground to ground as well as ground/sea to air communications. It has particular application for military and para military services.

The principle of operation is that of an omnidirectional ground independent wideband system comprising a disccone antenna with multiple elements. It has been designed to yield a low VSWR within this range with optimised radiation characteristics suited to ground to ground and ground to air operation.

Elevation patterns are consistent in character over the range, being similar to a $\frac{1}{4}$ wave vertical monopole.

The antenna features stainless steel sloping and top hat radials. It is coated with a high durability epoxy based coating for full protection from the environment and ultra violet radiation and is fully marinised for use at sea.

Standard colour is drab olive (other colours to order).

Specifications

Frequency Range

VHF 113-174 MHz and UHF 225-400 MHz

Polarisation

Vertical linear

Gain

up to +2.5dBi over frequency range

VSWR

<2.5:1 over frequency range

Impedance (output)

50 Ω (nominal)

Power Capability

100w CW, 400w PEP

Connection

N type coaxial connector (female) in base

Overall Dimensions

750 (29.5 in) H x 840mm (33 in) Dia.

Mounting Pole Length

740mm (29.1 in), longer to order; mounting clamps not included

Wind Survival

160 km/h (100mph)

Weight

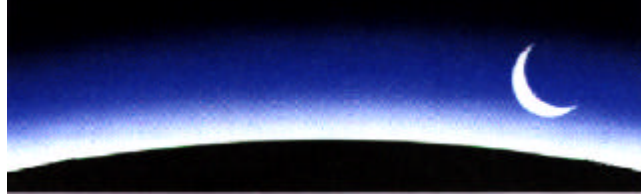
2.1g (4.6 lbs); packed: 3.0kg (6.6 lbs)

Specifications subject to change 7/03

Moonraker Australia Pty. Ltd. A.B.N. 57 009 531 211

Tasmania Technopark, Dowsing Point 7010, Tasmania Australia

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MOONRAKER

Type BDR2/400



Broadband Omnidirectional UHF Ground to Air System



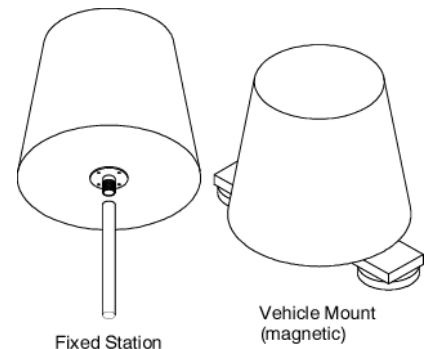
The BDR2/400 is designed to provide wideband omnidirectional communications over the 225-400 MHz military aviation tactical band, providing excellent ground to ground as well as ground/sea to air communications. It is designed to be used for mobile as well as for fixed station use.

The principle of operation is that of an omnidirectional ground independent wideband system comprising a solid conical type antenna housed within a radome. It has been designed to yield a low VSWR within this range with optimised radiation characteristics suited to ground to ground and ground to air operation.

Elevation patterns are consistent in character over the range, being similar to a $\frac{1}{4}$ wave vertical monopole.

The antenna is completely enclosed by a rugged radome, utilising a stainless steel threaded flange mount centrally located on the base. It is completely sealed against the ingress of water and insects. Mounting for fixed stations is via the short stainless steel mounting pole provided. For vehicle mounting a special magnetic mount base plate is an option.

Standard colour is drab olive (other colours to order).



Specifications

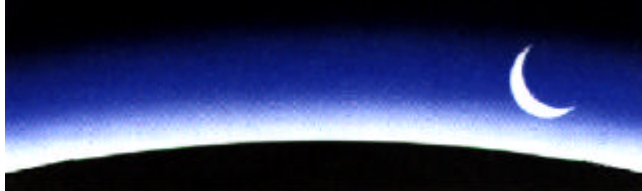
Frequency Range	225-400 MHz
Polarisation	Vertical linear
Gain	+2dBi minimum over frequency range
VSWR	<1.9:1 over frequency range
Impedance (output)	50Ω (nominal)
Power Capability	100w CW
Connection	short coaxial cable tail with N type connector
Overall Dimensions (approx)	335mm (13.2 in) (h) x 375mm (14.8 in) (dia)
Mounting Pole Length	300mm (11.8 in) long, 25.4mm (1 in) dia; mounting clamps not included
Vehicle Magnetic Mount	500 x 80mm bar with magnetic couplings each end
Wind Survival	160 km/h (100mph)
Weight (approx)	7kg (15.4 lbs) (vehicle mount version)
Packed Weight	8kg (17.6 lbs) (vehicle mount version)

Specifications subject to change 09/04

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MOONRAKER

Type BLP50-1500



**Directional Broadband transceiving antenna system
50MHz to 1500MHz**



The BLP50-1500 is designed to provide wideband directional transmission of radio signals from VHF through to the UHF bands. Output is provided via one 50W coaxial output in the frequency range: 50-1500 MHz. This system has particular application for military and para military services.

The principle of operation is that of a directional wideband system comprising a 25 element log periodic array antenna which can be erected at various angles for different polarisations..

The log periodic array has foldable long elements, the longest of which is 1.5 metres with a boom length of 2 metres. The longer elements are attached via a fast deployment self locking device at points along the boom.

Standard colour is drab olive and black (other colours to order).

Specifications

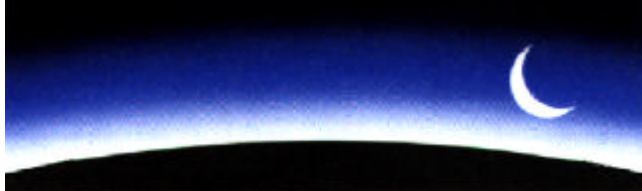
Frequency Range	50 to 1500 MHz
Impedance (output)	50 Ω (nominal)
Gain	10dBi (nominal)
RF Power	250W CW 1kW PEP
VSWR	2:1
Connection	N type coaxial connector
Polarisation	Variable according to installation
Pattern	Directional
Boom Length	2m (6.6ft)
Wind Survival	160 km/h (100mph)

Specifications subject to change 10/06

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MOONRAKER

Type BLP50-200



**Directional Broadband transceiving antenna system
50MHz to 200MHz**



The BLP50-200 is a compact tactical antenna, designed to provide wideband directional transmission of radio signals in the VHF band. This system has particular application for military and para military services.

The principle of operation is that of a directional wideband system comprising a 10 element log periodic array antenna which can be erected at various angles for different polarisations.

The log periodic array has foldable long elements, the longest of which is 1.5 metres with a boom length of 1.6 metres. The elements are attached via a fast deployment self locking device at points along the boom. Overall antenna only length when folded is 1.9 metres.

Standard colour is drab olive, sand bank and black (other colours to order).

Specifications

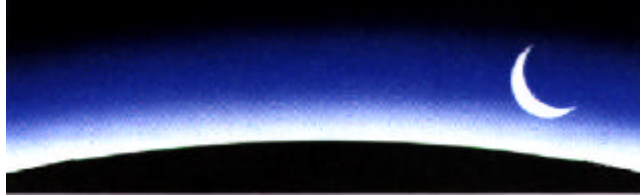
Frequency Range	50 to 200 MHz
Impedance (output)	50Ω (nominal)
Gain	5dBi (nominal)
RF Power	250W CW 1kW PEP
VSWR	2:1
Wind Survival	160 km/h (100mph)
Connection	N type coaxial connector
Polarisation	Variable according to installation
Pattern	Directional
Boom Length	1.6m (5ft 3 in)
Mounting	From end of antenna boom via short (300mm) gibbet and right angle spigot 24mm diameter x 100mm long
Weights	Antenna only 5.3 kg (11.66 lbs); antenna with gibbet and mounting spigot 7kg (15.4 lbs); packed 9 kg (19.8 lbs)

Specifications subject to change 4/09

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MOONRAKER

Type BLP30-200



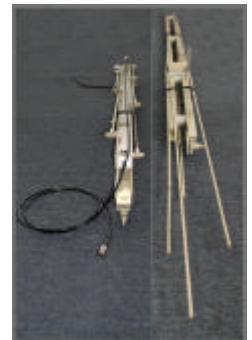
Directional Broadband transceiving antenna system 30MHz to 200MHz



The BLP30-200 is designed to provide wideband directional transmission of radio signals from 30 to 200 MHz. This system has particular application for military and para military services.

The principle of operation is that of a directional wideband system comprising a 11 element log periodic array antenna which can be erected at various angles for different polarisations.

The log periodic array has foldable long elements, the longest of which is 2.55 metres (8.4ft) with a boom length of 3.7metres (12.1ft). The longer elements are attached via a fast deployment self locking device at points along the boom. This permits the elements to fold along the boom itself. If required, we offer an option of a 2 piece boom breaking at the 2.6m (8.5ft) point. The shortest element is 274mm (0.9ft) long. For strength and durability high grade tubular stainless steel elements are utilised. Standard colour is drab olive and black (other colours to order).



Specifications

Frequency Range	30 to 200 MHz
Gain	5dBi (nominal)
Polarisation	Vertical/Horizontal/Slope
Pattern	Directional
Impedance (output)	50 Ω (nominal)
VSWR	2:1 (typical)
Beamwidth (degrees)	219 (30 MHz) – 160 (250MHz)
Front to Back Ratio (dB)	4.9 (30 MHz), 16.0 (125 MHz), 12.3 (200 MHz)
RF Power	250W CW 1kW PEP
Length of Boom	3.7m (12.1ft); two piece boom
Width Element	2.55m (8.4ft), half element length at 30 MHz (NB elements are foldable)
Temperature	operation: -45 to +60 degrees C; storage -60 to +70 degrees C
Wind Survival	160 km/h (100mph)
Material	Boom: aluminium alloy; elements: stainless steel (tubular)
Connection	N type coaxial connector (male)
Storage Bag (option)	3800 x 100 x 100mm (12.5 x .3 x .3 ft) approx heavy duty canvass carry bag is offered as an option
Mounting	Gibbet type mounting with spigot or socket (to order) to suit mast attachment (please supply requirements)
Colour	Drab olive green (other colours to order)
Weights	Back of antenna: 7.5kg (16.5 lbs); front of antenna: 4kg (8.8 lbs); complete antenna 11.5kg (25.3 lbs); gibbet: 3.5kg (7.7 lbs)
Packed Weight	24kg (52.8 lbs)

Specifications subject to change 08/08

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RECEIVING ANTENNA SYSTEMS



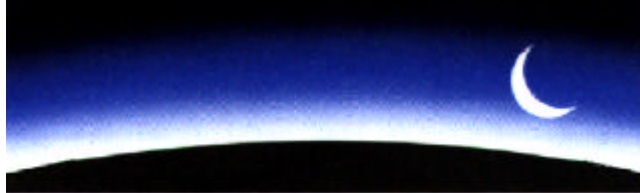
Left QH Series Circularly Polarised Satellite Receiving Antenna

Centre Broadband Receiving System 150 kHz to 1500 MHz

top: type BRX1500MC Mobile Receiving Antenna

bottom: type BRX1500 Receiving Base Station

Right Non-directional FM/TV Antenna type TV AM/FM Dome MkII
and TV/FM Distribution System



M O O N R A K E R

Type HF RXA

**Active broadband receiving antenna for LF/MF/HF communications
with single feed or cascading multicoupler**

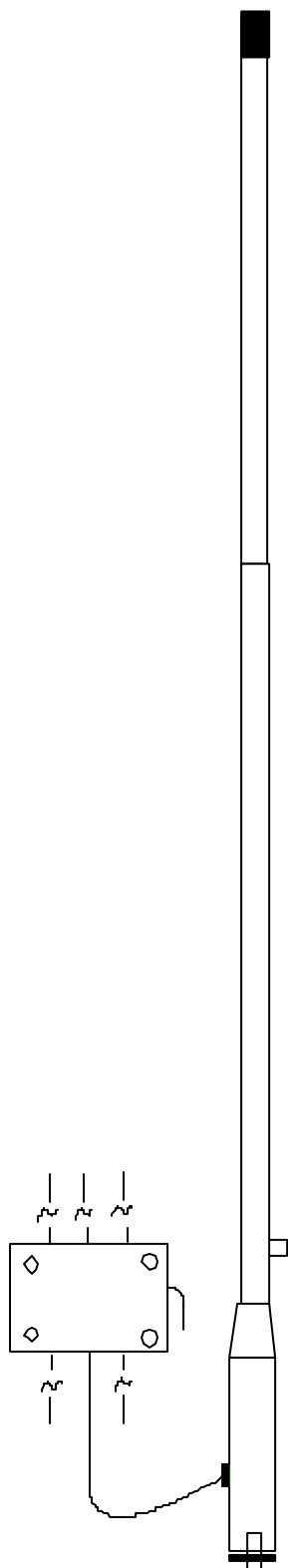
The Moonraker HF RXA antenna system is a compact receiving whip antenna and integral broadband amplifier with either a multicoupler power supply distribution unit or a single channel power supply unit, where only one feed is required. The system is suitable for use in buildings such as hotels, motels, schools and broadcast stations for off air monitors. Being fully marinised, it is also eminently suitable for shipboard and offshore oil rig installations for distribution to receivers, fax machines, crew quarters and the like.

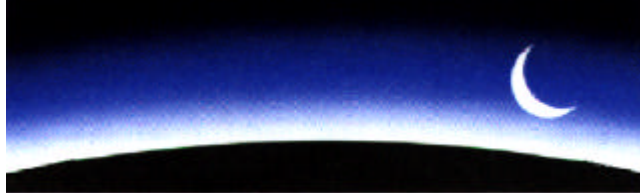
The multicoupler power supply has five separate isolated outputs. For installations requiring a greater number additional units may be cascaded in multiples of four outlets (ie 5, 9, 13, 17...). In its single channel configuration it is also suitable for amateur DX enthusiasts or anywhere that enhanced reception is required.

A stud on the side of the antenna permits connection of another wire antenna to utilise the HF RXA amplification system improving reception in weak signal areas. With horizontally erected wire antennas, this also gives the added advantage of providing horizontally polarised reception if required. The stud is provided as a connection point only and is not intended to be used as a strain relief.

Specifications

Antenna	2m (6.6ft) whip (painted white) with integral amplifier
Pattern	Omnidirectional
Polarisation	Vertical
Wind Loading	0.75 kg at 100 km/h (1.7 lbs at 60 mph)
Mountings	Base mounted, 44mm (1.25 in) with 3/8 in mounting stud
Connection	6m (19.7ft) coaxial cable (supplied). System will operate with up to 45m (147ft) cable length but with some cable losses, particularly at the higher frequencies
Amplifier	Low noise unit, totally enclosed in base of antenna
Frequency Range	0.070-30 MHz
Gain	5 dB at 12v (nominal)
Power Supply	12-28v, 30mA (max) fed from multicoupler
Protection	DC grounded for static protection. Amplifier input transient protected
Multicoupler	Enclosed in small 150 x 50 x 80 mm (6 x 2 x 3.2 in) box with grommated holes for cable entry/exit. Mounting by way of screws through back. Isolation 50 dB at 0.3-2.0 MHz, 70 dB between any output to input
Insertion Loss	0.5 dB (max)
Impedance	50Ω system; 75Ω optional, please specify
Power Supply	12-28v 60mA (max) per unit. Requires fused (100mA) feed. For 240/110v AC use plug pack. Reverse polarity protected
Single Channel Coupler	Enclosed in PVC box 28 x 54 x 83 mm (1.2 x 2.2 x 2.7 in)
Impedance	50-75Ω system; 75Ω optional, please specify
Power Supply	12v, reverse polarity protected
Packed Weight	3 kg (6.6 lbs)



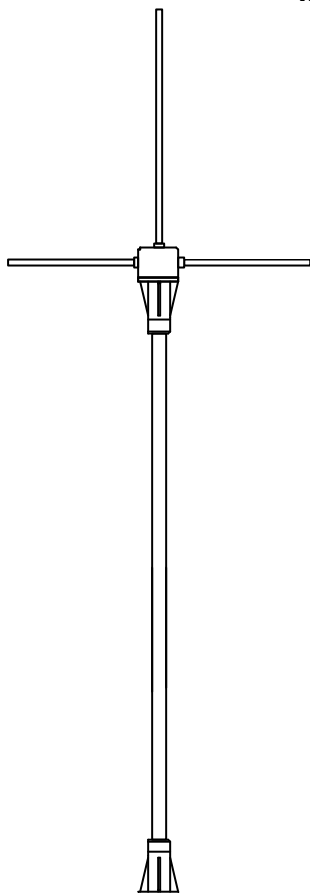


MOONRAKER

Type HF RXDPA



Military Active Broadband Receive Antenna

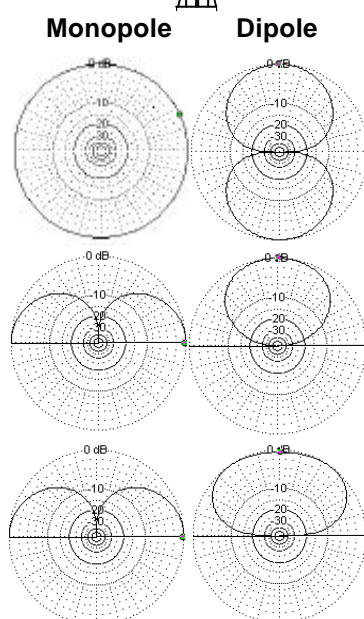


Designed to provide compact efficient HF broadband reception from 0.01 to 30 MHz over short, medium and long range distances simultaneously, being capable of receiving high (NVIS) through to low angle signals.

The HF RXDPA antenna system comprises two separate antennas mounted on a single support mast with separate feeds. Output from the antennas is fed directly to two broadband amplifiers. When erected onboard ship or at ground level, the array is suitable for simultaneous reception of both high angle (NVIS) mode and low angle long distance communications. Erected on buildings, it is possible to reduce local interference by careful positioning to null out unwanted signals. By using multiple antennas mounted at different angles with a suitable switching network into a receiver, it is possible to determine direction of signals. Over voltage protection (lightning/EMP) is provided.

The antenna is constructed of heavy gauge marine grade aluminium alloy. The radiator and base are finished with a high durability epoxy based coating in non-obtrusive APO navy grey, highly resistant to chemical attack, abrasion and the effects of ozone and ultra-violet radiation. For ease of transportation the antenna breaks down into three easy to assemble sections. The support mast is available in 2 or 3 metre lengths or as required for ease of shipboard siting.

SPECIFICATIONS



Radiation Patterns
From top: azimuth,
Elevation 0°, Elevation 90°

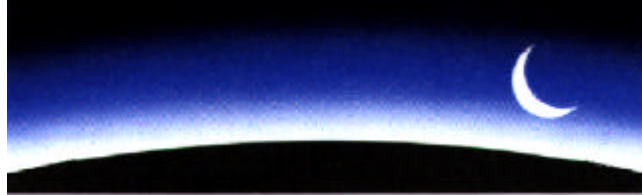
Antenna Elements	Vertical 1 x 1010mm (3.3ft); Horizontal 2 x 620mm (2.1ft)	
Antenna Height (overall)	3.65m (12ft) or 2.65m (8.7ft), depending on choice of support mast (Optional)	
Radiators	Active Monopole	Active Dipole
Frequency Range	0.010 to 30 MHz	0.10 to 30 MHz
Gain	6 dB (50 Ω load) gain (nom)	6dB (50 Ω load) differential voltage gain (nom)
Polarisation	Vertical	Horizontal
Radiation Pattern	Omnidirectional	Bi-directional
Output Impedance	50 Ω Nominal	
Output Intercept Point	2 nd Order = 66 dBm; 3 rd Order = 36 dBm	
Connectors	N Type Sockets	
Supply Voltage	11-14v DC @ 140 mA via each coaxial cable	
Power Supply Unit (Option)	Output Voltage 12v DC; Input Voltage Optional as required 12-24v DC	
Support Mast	2 or 3 metres (6.6 or 9.8 ft). optional	
Weights - Antenna	4.4kg (10 lbs); packed 5.6kg (12 lbs)	
- Mast (3m)	9.2kg (20.24lbs); packed 19kg (41.8lbs)	
Operating Temperature	-40° to +70°C, relative humidity 100%	
Wind Survival	200 km/h (125 mph)	

Specifications subject to change 10/09

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MOONRAKER



Type HF MRA RXMP

HF Broadband Tactical Receiving Antenna System

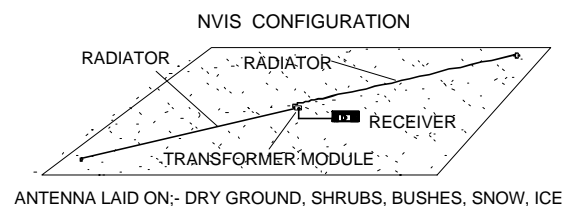
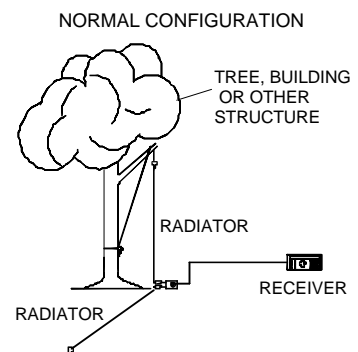


The Moonraker HF MRA RXMP is designed to provide reception from 2-30 MHz in the field. The system features a matching transformer with coaxial connector and uses two fast deployment reels, one for the antenna and the other for the counterpoise

The antenna cables are constructed from Kevlar strengthened tinned copper braided wire with PVC coating in drab olive colour.

The antenna is designed to be used as either a vertical or horizontally polarised system. Depending on the configuration and height above ground the antenna can be used operationally to receive high angle radiation NVIS (Near vertical Incidence Skywave), long distance skywave or short range ground wave field communications.

Designed for fast one man field deployment, the system is packed in a small lightweight *camouflage* pattern, as per Army (Aust) 6557, satchel with shoulder strap. It comes complete with waterproof instructions support cord, throwing weight support stake and coaxial cable with connectors fitted.



Specifications

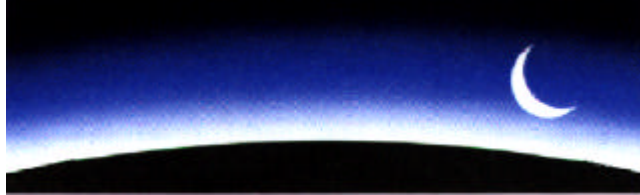
Frequency Range	HF 2-30 MHz
Element Lengths	2 x 15m (50ft) wire radials
Element Material	Kevlar fibre strengthened tinned copper PVC coated flexible wire
Element Colour	Drab olive green
Connectors	Coaxial BNC (options for receiver end)
Connection	10m 50Ω coaxial cable with fitted connectors
Polarisation	Either vertical or horizontal
Impedance	50Ω nominal
Pack Size (Satchel)	85x250x220mm (3.3x9.8x8.7 in) approx.
Packed Weight	1.25kg (2.75 lbs)

Specifications subject to change 11/03

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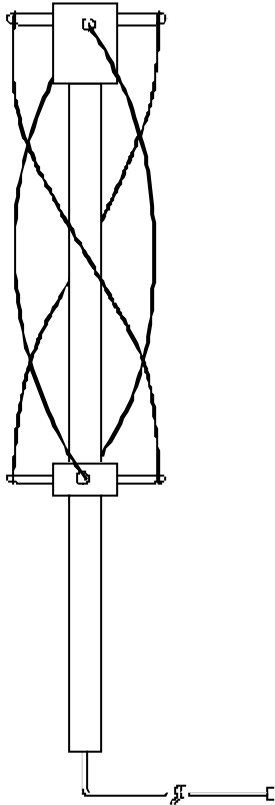


MOONRAKER

QH Series



VHF/UHF compact quadrifilar helix satellite receiving antenna for land and marine communications



QH series antennas are specifically designed to maximise reception of circular polarised transmissions from satellites, including military and weather satellites.

With QH series antennas, the gain is uniform over a greater capture area enabling signal reception when the satellite is low over the horizon as well as overhead. In this way the communications window can be extended while, at the same time, maintaining quality reception.

The antenna, a 1/2 wave quadrifilar helix, is fully marinised. It is comprised of marine grade stainless steel elements with polypropylene insulators and a stainless steel mounting pole, and has internal phasing and matching network.

SPECIFICATIONS

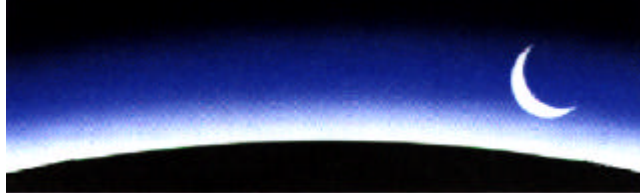
Frequency Range	VHF/UHF Bands (tuned to specified frequency)
Pattern	Elevation: Hemispherical Azimuth: Omni-directional
Polarisation	Circular
VSWR	<1.5:1
Phase Balance	+/- 2 deg. max
Amplitude Balance	+/- 0.5 dB max
Antenna Gain	0 dBi C
Impedance	50 Ohms (nominal)
Connection	1m (3.28ft) coaxial cable with BNC Jack - other connectors to order
Antenna Dimensions	Varies with frequency: at 137 and 243 MHz: length 830mm (2.7ft) diameter 150mm (6 in)
Mounting	Supplied with stainless steel mounting pole, suitable for clamping or strapping to mast or superstructure

Specifications subject to change 1/06

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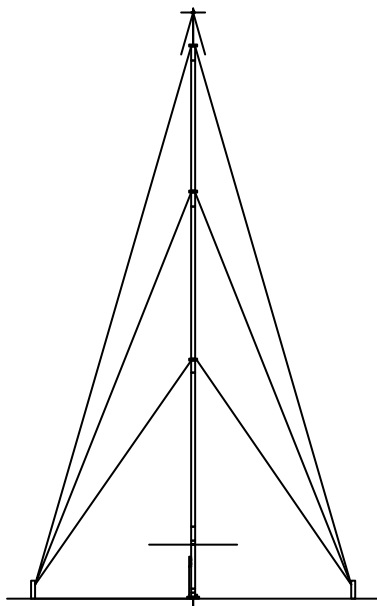
MOONRAKER

Type BRX 1500



Broadband 150 KHz to 1500 MHz receiving antenna system

The BRX1500 is designed to provide wideband reception of radio signals from LF through to the UHF bands. Output is provided via three 50W coaxial outputs in two frequency ranges: the LF, MF and HF bands, and the VHF band through to the UHF band. This system has particular application for military and para military services.



The main construction is from marine grade aluminium, nylon and stainless steel. It is supplied in sections as a semi-knockdown kit, which, when together, forms a 10m section with three sets of RF transparent guy ropes. Mounting is ideally over the ground via the swivel base mount, plate and earth spike and is easily achieved with two men and the use of the optional gin pole to "swing it up". No special tools are needed. The system is supplied with comprehensive assembly instructions.

The principle of operation is that of a wideband system comprising three separate antennas within a single structure. Each antenna is arranged as follows:

0.150 to 30 MHz: A monopole fed via a broadband matching transformer and operating against ground.

Note: A foreshortened radial system is utilised to control HF band radiation characteristics.

30 to 100 MHz: An elevated centre fed vertical dipole connected via a broadband matching transformer

100 to 1500 MHz: An elevated broadband discone, exhibiting broadband aperiodic qualities.

Connection is via the antenna interface unit which provides 50W coaxial outputs for each of the three frequency ranges. Also offered is an additional filtered HF outlet. This outlet permits improved HF performance by reducing breakthrough interference from strong MF/LF broadcast stations/beacons.

Standard colour is drab olive (other colours to order). An erection kit which includes a gin pole and four triangular guy stakes is available as an option.

Specifications

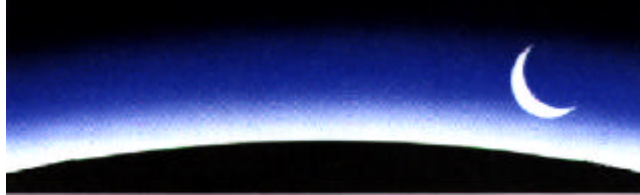
Frequency Range	0.15 to 1500 MHz
Bands	0.15-30 MHz, 30-1500 MHz
Impedance (output)	50Ω (nominal)
Connection	N type coaxial connectors (3) at base
Earth Connection	Ground spike (earth radials may be added)
Polarisation	Vertical
Pattern	Azimuth: omnidirectional; Elevation: 0.150-30 MHz and 100-1500 MHz similar to 1/4 wave monopole; 30-100 MHz similar to 1/2 wave monopole
Overall Length	10m (32.8ft)
Wind Survival	160 km/h (100 mph)
Guy System	3 sets (RF transparent)
Guy Radius	5m (20ft) recommended
Base Mount	Special ground plate, spike and swivel mount
Total Weight	40kg (88 lbs) antenna system and mount; 53kg (116.6 lbs) packed
Packing	The system is packed in 1 x 220mm diameter aluminium foil covered tube, 3300mm long and 1 box 360 x 360 x 190mm (the tube has two carry handles)

Specifications subject to change 9/01

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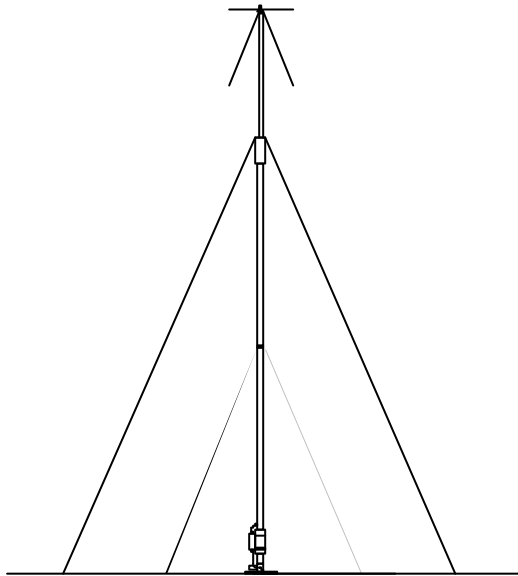
MOONRAKER

Type BRX 1500C



Compact Broadband 150 KHz to 1500 MHz receiving antenna system

The BRX1500 is designed to provide wideband reception of radio signals from LF through to the UHF bands where site area is restricted or roof top mounting is preferred. Output is provided via three 50 Ω coaxial outputs in three frequency ranges: the LF, MF and HF bands, the VHF band and the VHF/UHF band. This system has particular application for military and para military services.



The main construction is from marine grade aluminium, nylon and stainless steel. It is supplied in sections as a semi-knockdown kit, which, when together, forms a 6m section with one set of RF transparent guy ropes. Mounting is ideally over the ground via the base plate and earth spike and is easily achieved with two men. No special tools are needed. The system is supplied with comprehensive assembly instructions.

The principle of operation is that of a wideband system comprising three separate antennas within a single structure. Each antenna is arranged as follows:

- 0.150 to 30 MHz: A monopole fed via a broadband matching transformer and operating against ground.
- 30 to 100 MHz: An elevated centre fed vertical dipole connected via a broadband matching transformer
- 100 to 1500 MHz: An elevated broadband discone, exhibiting broadband aperiodic qualities.

Connection is via the antenna interface unit which provides 50 Ω coaxial outputs for each of the three frequency ranges. Also offered is an additional filtered HF outlet. This outlet permits improved HF performance by reducing breakthrough interference from strong MF/LF broadcast stations/beacons.

Standard colour is drab olive (other colours to order)

Specifications

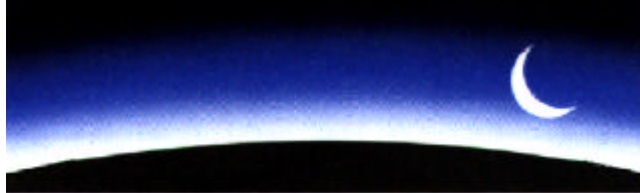
Frequency Range	0.15 to 1500 MHz
Bands	0.15-30 MHz, 30-1500 MHz
Impedance (output)	50 Ω (nominal)
Connection	N type coaxial connectors (3) at base
Earth Connection	Ground spike (earth radials may be added)
Polarisation	Vertical
Pattern	Azimuth: omnidirectional; Elevation: 0.150-30 MHz and 100-1500 MHz similar to 1/4 wave monopole; 30-100 MHz similar to 1/2 wave monopole
Overall Length	6m (20ft)
Wind Survival	160 km/h (100 mph)
Guy System	2 sets of 4 guys (RF transparent)
Guy Radius	3m (10ft) recommended
Base Mount	Special ground plate and spike
Total Weight	38kg (83.6 lbs) antenna system and mount packed; 8kg (17.6kg ground plane)
Packing	The system is packed in 1 x 214mm diameter aluminium foil covered tube, 3980mm long and 1 box 385 x 385 x 24mm (the tube has two carry handles)

Specifications subject to change 02/06

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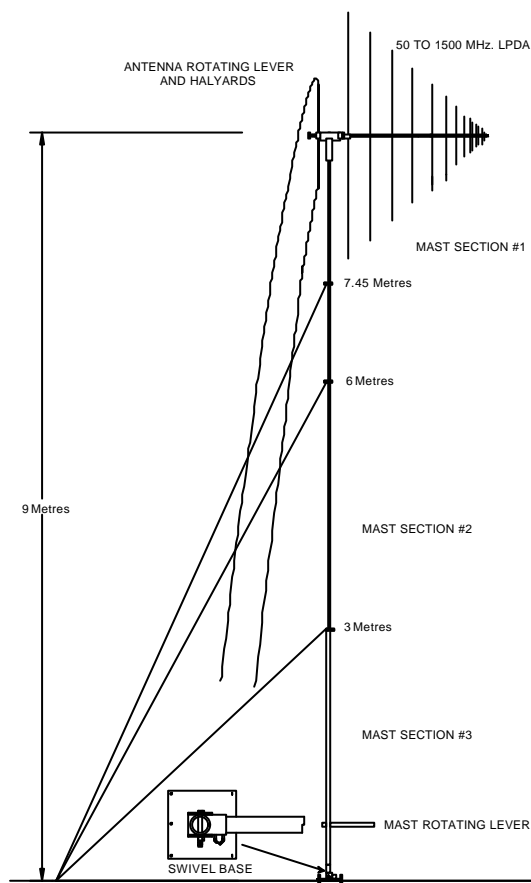
MOONRAKER

Type BRX1500D



Directional Broadband 50MHz to 1500MHz receiving antenna system

The BRX1500D is designed to provide wideband directional reception of radio signals from VHF through to the UHF bands. Output is provided via one 50W coaxial output in the frequency range: 50-1500 MHz. This system has particular application for military and para military services.



The main construction is from marine grade aluminium, nylon and stainless steel. It is supplied in sections as a semi-knockdown kit, which, when together, forms a 9m section complete with RF transparent guy ropes. Mounting is either over the ground or on a roof top via the swivel base mount, plate and spikes (for ground) and is easily achieved with two men and the use of the optional gin pole to "swing it up". No special tools are needed. The system is supplied with comprehensive assembly instructions.

The principle of operation is that of a directional wideband system comprising a 25 element log periodic array antenna which can be swivelled through 90 degrees allowing horizontal, vertical or slant polarisation to be selected prior to erection. The complete mast and antenna assembly can be rotated manually through 360° whilst erected.

The log periodic array has foldable elements, the longest of which is 1.5 metres with a boom length of 2 metres. The elements are attached via a fast deployment self locking device at points along the boom. The high frequency end elements are permanently attached to a sub-boom.

Standard colour is drab olive (other colours to order). An erection kit which includes a gin pole and four triangular guy stakes is available as an option.

Specifications

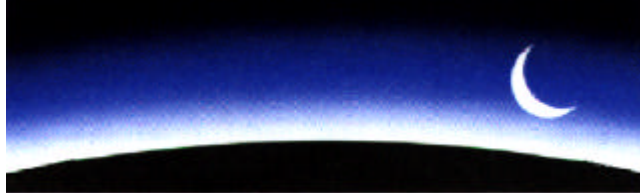
Frequency Range	50 to 1500 MHz
Impedance (output)	50Ω (nominal)
Gain	10dBi (nominal)
Connection	N type coaxial connector – 10m (32.8ft) of low loss flexible cable is supplied for connection to receiver
Polarisation	Vertical, horizontal or slant (adjustable)
Directionality	System may be rotated 360°
Overall Length	9m (29.5ft) mast; maximum 10.5m (34.5ft) in vertical configuration
Wind Survival	160 km/h (100mph)
Guy System	3 sets of 4 RF transparent guys complete with rope sliders and stakes
Guy Radius	5m (20ft) recommended
Base Mount	Special ground plate, spikes and swivel mount
Total Weight (approx)	44.5kg (98 lbs) antenna system and mount; 65kg (143 lbs) packed

Specifications subject to change 03/02

Moonraker Australia Pty. Ltd. A.B.N. 57 009 531 211

Tasmania Technopark, Dowsing Point 7010, Tasmania Australia

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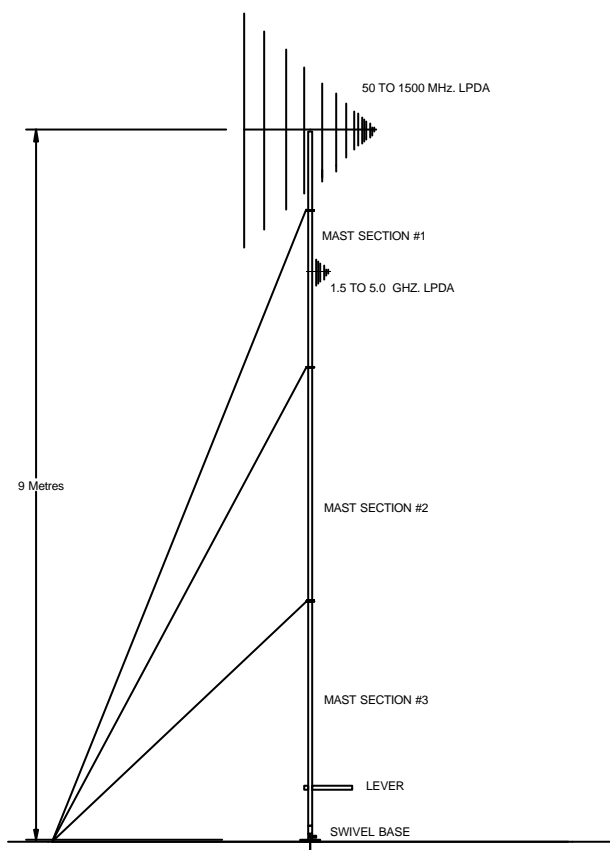
MOONRAKER

Type BRX5000



Directional Broadband 50MHz to 5000MHz receiving antenna system

The BRX5000 is designed to provide wideband directional reception of radio signals from VHF through to the SHF bands. Output is provided via two 50W coaxial outputs in two frequency ranges: 50-1500 MHz and 1500-5000 MHz. This system has particular application for military and para military services.



The main construction is from marine grade aluminium, nylon and stainless steel. It is supplied in sections as a semi-knockdown kit, which, when together, forms a 9.5m section complete with RF transparent guy ropes. Mounting is either over the ground or on a roof top via the swivel base mount, plate and spike and is easily achieved with two men and the use of the optional gin pole to "swing it up". No special tools are needed. The system is supplied with comprehensive assembly instructions.

The principle of operation is that of a directional wideband system comprising two separate log periodic array antennas which can be swivelled through 90 degrees allowing horizontal, vertical or slant polarisation to be selected prior to erection. The complete mast and antenna assembly can be rotated manually through 360° whilst erected.

- . 50-1500MHz: A log periodic array which has removable elements, the longest of which is 1.5 metres with a boom length of 2 metres.
- . 1500-5000MHz: A log periodic array of very compact dimensions with a boom length of 500mm and a longest element of 200mm. Connection is via the antenna interface unit which provides 50W coaxial outputs for each of the frequency ranges.

Standard colour is drab olive (other colours to order). An erection kit which includes a gin pole and four triangular guy stakes is available as an option.

Specifications

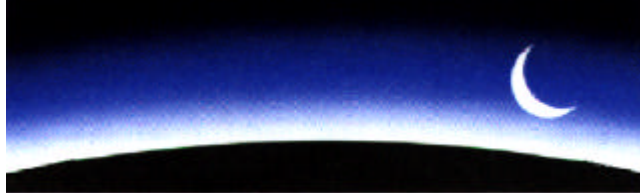
Frequency Range	50 to 5000 MHz
Bands	50-1500 MHz; 1500-5000MHz
Impedance (output)	50Ω (nominal)
Gain	10dBi (nominal)
Connection	N type coaxial connectors
Polarisation	Vertical, horizontal or slant (adjustable)
Directionality	System may be rotated 360°
Overall Length	9.8m (33ft)
Wind Survival	160 km/h (100mph)
Guy System	3 sets (RF transparent guys)
Guy Radius	5m (20ft) recommended
Base Mount	Special ground plate, spike and swivel mount
Total Weight (approx)	40kg (88 lbs) antenna system and mount; 53kg (116.6 lbs) packed

Specifications subject to change 9/01

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MOONRAKER

Type BRX 1500MC

Broadband 150 KHz to 1500 MHz mobile receiving antenna system

The BRX1500MC is a wideband receive antenna for radio signals from LF through to the UHF bands, designed for mobile surveillance purposes and has particular application for military and paramilitary services.

The antenna comprises an array of three separate elements. Output is provided in the three ranges via three separate 50 Ω coaxial outputs: the LF/MF/HF band, and the mid VHF band through to the upper VHF and UHF band. Active elements are utilised for the lowest frequency range. A suitable ground plane is required for operation up to 100 MHz. In mobile applications this may be provided by the vehicle body or the deck of the ship. Above 100 MHz the antenna functions as a centre fed elevated vertical dipole and is ground independent.

The elements, housed with a GRP shroud, sit on a base of marine grade aluminium. An anti-vibration stainless steel spring base is available to ensure correct movement of the antenna when fitted to vehicles. Mounting is achieved via an M12 bolt. The system is supplied with comprehensive assembly instructions.

The principle of operation is that of a wideband system comprising three separate antennas within a single structure. Each antenna is arranged as follows:

0.150 to 30 MHz	An active monopole fed via a broadband matching transformer and operating against ground
30 to 100 MHz	A dual element monopole
100 to 1500 MHz	A multi element vertical dipole.

Three 50 Ω (nominal) coaxial outputs are provided for the receiver. A 3 metre twin lead is supplied for the 12 volt DC input for the LF/MF/HF section.

Standard colour is black (other colours to order).

Specifications

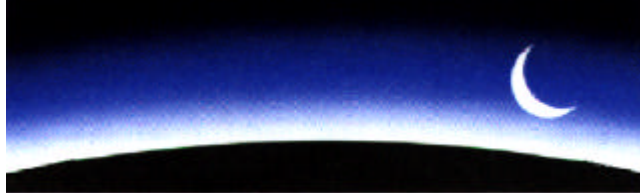
Frequency Range	0.150 to 1500 MHz in 3 ranges
Bands	0.15-30 MHz, 30-100 MHz; and 100-1500 MHz
Impedance (output)	50 Ω (nominal)
Connection	Via 3 separate fly leads with BNC type coaxial connector at base plus a twin 12V DC lead input
Polarisation	Vertical Linear
Pattern	Azimuth: omnidirectional; Elevation: 0.150-30 MHz and 30-100 MHz similar to 1/4 wave monopole; 100-1500 MHz similar to 1/2 wave monopole
Overall Length	2.3m (7.5ft)
Power Supply	12V DC required for LF/MF/HF section
Base	Marine grade aluminium base; stainless steel spring mount with M12 internal thread taking M12 bolt (option)
Packed Weight	5kg (11lbs)

Specifications subject to change 10/09

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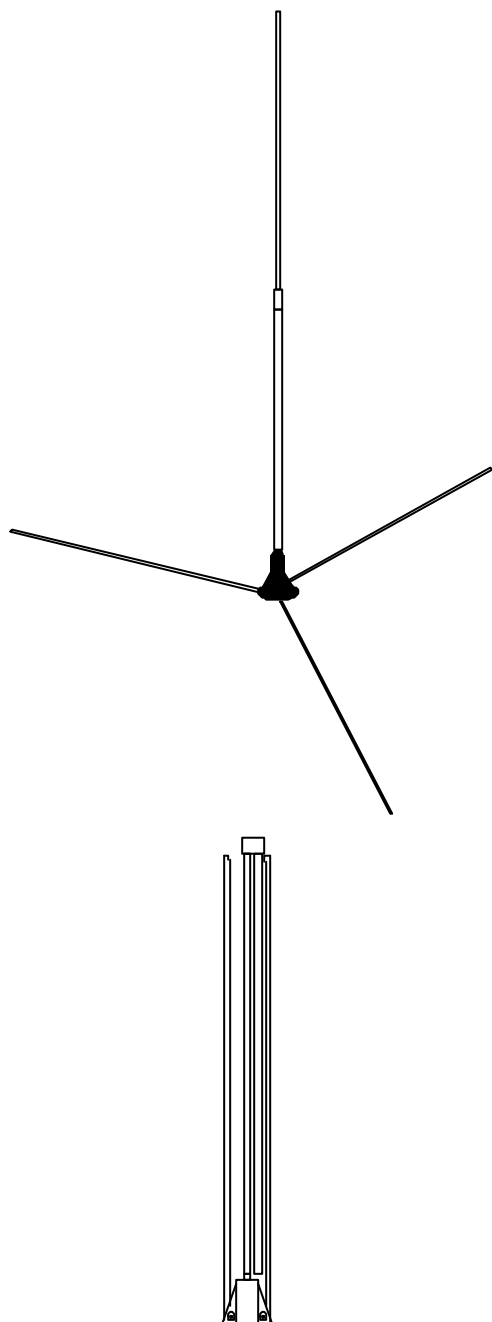


MOONRAKER



Type BRX 500MP

Broadband 30-500 MHz portable receiving antenna system



The BRX500MP is a wideband man portable receive antenna designed for tactical or covert surveillance purposes from VHF through to the UHF bands and has particular application for military and paramilitary services.

The main vertical radiator comprises a multi-element array ensuring resonance, on different bands, at or near a quarter wavelength. The resulting radiation characteristics are omnidirectional and well suited to reception of both direct and skywave signals across the operational frequency range.

The BRX500MP is lightweight and compact collapsing from its extended length of 1200mm (3.9ft) to 600mm (2ft) to facilitate transportation.

The antenna is constructed in two sections with elements housed within a GRP shroud and four ground radials attached, forming a single unit for fast deployment in the field. No assembly is necessary and no tools are required. The radiator and radial elements are swung into their operational position being held in place by a simple automatic (releasable) locking system. Connection is via a BNC type coaxial connector in the base.

The system is packed in a lightweight carry bag in drab olive. Antenna finish is drab olive and black or drab olive and sand.

Specifications

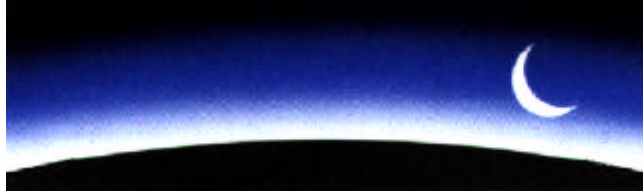
Frequency Range	30-500 MHz
Gain	+2 dBi
Pattern	Omnidirectional
Polarisation	Vertical Linear
Impedance (output)	50 Ω (nominal)
Connection	BNC type coaxial connector at base
Extended Length	1200mm (3.9 ft)
Folded Length	600mm (2ft)
Weight - Antenna	1100g (2.4 lbs) approx
- Carry Bag	300g (10oz)

Specifications subject to change 09/04

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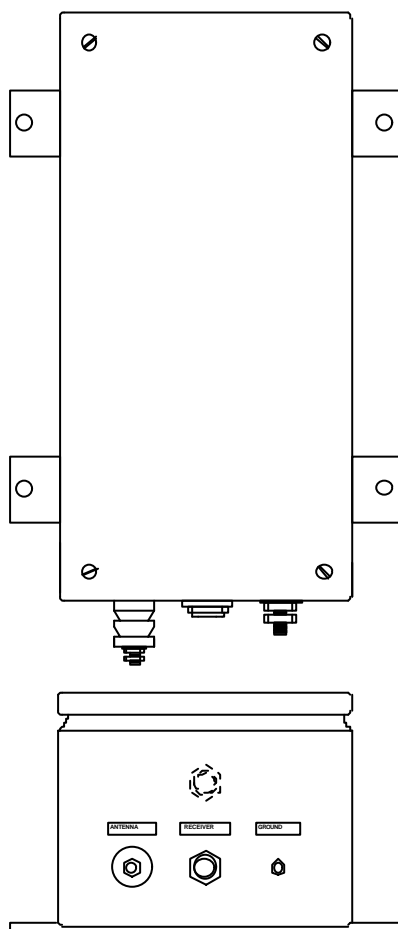
MOONRAKER

Type RXT1N & RXT2N Transformer



Matching transformer for MF/HF receiving antennas

The RXT1N (single feed) and RXT2N (dual feed) Transformers are a ruggedised, military version of our type MRA RX Transformer. It provides a wideband impedance match to a coaxial cable for either MF/HF whip or long wire antenna systems. The transformer is housed in a zinc coated welded steel box NATA tested to IP66 rating for water proofing.



The transformer converts the widely varying antenna impedance to a constant 50ohms, permitting long or variable lengths of coaxial cable to be used between the antenna and the receiver. Low loss cable is recommended for lengths exceeding 40 metres (130 feet). It is designed primarily for shipboard use, but is equally suitable for land based systems, to allow location of receiving antennas to be situated as far as practically possible from transmitting antennas or other high noise areas, such as power lines.

The antenna is DC grounded via the transformer to prevent static build-up and the connecting cable is DC isolated to prevent electrolysis. In addition a gas discharge device is also provided to allow for nearby lightning strikes.

Electrical connection to the antenna is by way of an insulated screw connector for a cable (not supplied) to the antenna feedpoint and an earth screw for ground connection. The connector for the coaxial cable(s) is inside the box with the cable entering via a cable gland(s). This negates the need to waterproof the connection(s). Mechanical mounting is provided by four 316 stainless steel lugs, permitting the unit to be easily fastened to the deck near the base of the antenna or nearby structures with screws or rivets.

The transformer components are housed in an IP66 rated zinc coated welded steel box powdercoated in a pebble grey colour. As a further guard against water ingress, the components are completely encapsulated. The lid is secured by 316 stainless steel screws and neoprene sponge seal.

Specifications

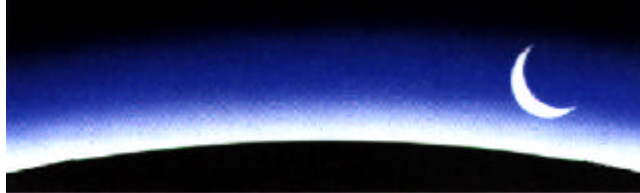
Dimensions	300 x 150 x 120 mm (11.8 x 5.9 x 4.7 in)
Frequency Range	0.28-30 MHz
Bandwidth	Full
Impedance	50Ω nominal
Antenna Types	7 metre(23ft) or longer whips or long wire antennas
Mountings	4 x stainless steel lugs to allow bolting down
Connection	N type (inside unit), allowing direct 50 ohm coaxial feed to receiver (RXT1N). RXT2N provides two coaxial feeds
Packed Weight	3.6 kg (7.92 lbs)

Specifications subject to change 8/99

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MOONRAKER TV AM/FM DOME

New Model

Land Mobile/Shipboard Non-directional TV and FM Radio Reception Antenna System

The Moonraker TV/FM Antenna is a compact active antenna system, designed to provide improved reception of TV and FM signals in both the VHF and UHF bands for both analogue and digital transmissions.



The system is truly omnidirectional and features separate VHF and multiple UHF arrays. These two arrays are suitably coupled via a built-in diplexer. Reception at UHF frequencies is also optimised through the ability to receive both horizontally and vertically polarised signals.

Completely sealed within a low profile ABS plastic radome, foam filled for complete protection from vibration and the marine environment, the antenna exhibits minimum pickup from other shipboard communications equipment and is protected from lightning static discharge. It may be roof mounted on buses, camper vans, and the like, providing a low profile, streamlined and rugged installation. It is supplied with 6 metres of low loss co-axial cable for connection to a remote control unit. There are two types of control unit available.

The AM/FM Antenna system has TV and AM/FM receiver outlets and input for a separate AM/BC receiving antenna for installations where a combined AM/FM receiver is used. The AM/BC signal is combined with the dome's FM signal and connected to the AM/FM receiver outlet via the control unit. A suitable AM antenna is the Moonraker type 15BC/Marine with matching transformer or the standard AM antenna on vehicles.

The TV/S Antenna is designed for installations where only a TV receiver outlet is required.

Specifications

Frequency Range	TV Bands: VHF 40-220 MHz; UHF 400-850 MHz; FM Band: 76-108 MHz
VHF Marine Band	Integral band stop filter reduces VHF marine transmitter interference
Polarisation	Horizontal at VHF; horizontal and vertical at UHF frequencies
Pickup Pattern	Omnidirectional
Amplifier	Gain: VHF 26dB UHF 34dB (replaceable unit)
Impedance	75 \square
Supply Voltage	TV AM/FM: 12 or 24v; TV/S: 12v only. Reverse polarity protected. Negative earth
Current Drain	60 milliamps (approx)
Cable Connections	75 \square co-axial via F type connector on antenna
Connecting Cable	6 metres x 6.5mm OD 75 \square high quality co-axial cable and F type connector (F type connection to dome)
Radome	White ABS plastic 380mm (diameter) x 185mm (height) (15 x 7.1 in)
Mountings	Supplied with threaded stainless steel mounting tube 25.4mm x 300mm (length) and flange base mount
Wind Loading	4.3 kg at 100 km/h (9.5 lbs at 60 mph) 6.8 kg at 130 km/h (15 lbs at 81.25 mph)
Control Unit	TV AM/FM: 110x60x30mm (4.3 x 2.4 x 1.2 in);
Size	TV/S: 54x33x22mm (2.1x1.3x0.9 in)
Protection	Reverse polarity protection with 3AG 250 mA fuse
Packed Weight	3.25kg ((7.2 lbs); cubic weight: 6.2kg (13.6 lbs)

Specifications subject to change 03/07

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