TMC Design CORPORATION

2008 Product Catalog

Corporate Headquarters
4325 Del Rey Blvd.
Las Cruces, NM 88012
575.382.4600

GSA Contract Holder

TMC Design Headquarters, Las Cruces, NM

Here at TMC Design Corporation, we are committed to providing the finest antennas and systems to meet your requirements. We specialize in high power, airborne and ground based military Electronic Warfare (EW) antennas and systems as well as a wide variety of commercial and industrial antennas.

If you do not find an antenna or EW system for your application in this 2008 catalog, call or email us for a fast friendly quote on a custom design. Our antenna design engineers are ready to design, fabricate and test custom antenna requests in our specialized facilities with low NRE cost and reasonable delivery time.

TMC Design Corporation

Troy E. Scoughton
Chief Executive Officer

4325 Del Rey Blvd
Las Cruces, NM
88012-8347

tel: (575) 382-4600
fax: (575) 523-8588
tscoughton@tmcdesign.com

Bringing you tomorrow's systems...Today

Contents

Antenna Design Facilities

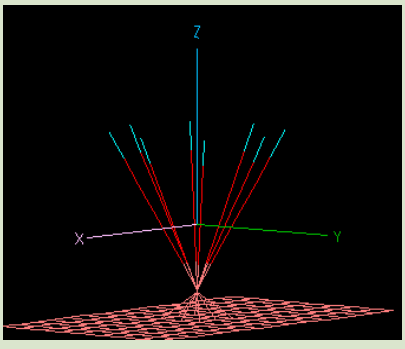
Our antenna design and fabrication facilities are housed entirely within the TMC Design fabrication and manufacturing facility located in Las Cruces, New Mexico (at our Corporate Headquarters). Our facilities include high bay doors to allow access for large trailer or truck mounted antenna systems.

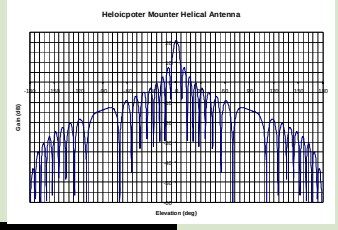
Modern and fully calibrated automated test equipment and facilities insure superior antenna performance.

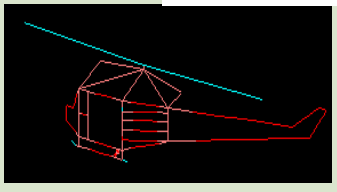
Our fully equipped, on-site fabrication and manufacturing facilities allow us to maintain the highest standards and quality control. Because we possess the in-house design fabrication, test and manufacturing capability we can provide a quick and cost effective response to your custom or off-the -shelf antenna needs.

Electromagnetic Analysis and Mission Planning

TMC Design can provide electromagnetic analysis for your test or operational deployment using proven simulations software and techniques. Our mission planning can be as simple as path loss analysis or as complete as requesting frequency authorization for your test and providing flight plans for your airborne contingents. Contact us for your next test or operational requirement and allow us to bring our experience in electromagnetic analysis and mission planning to your test or operational needs.

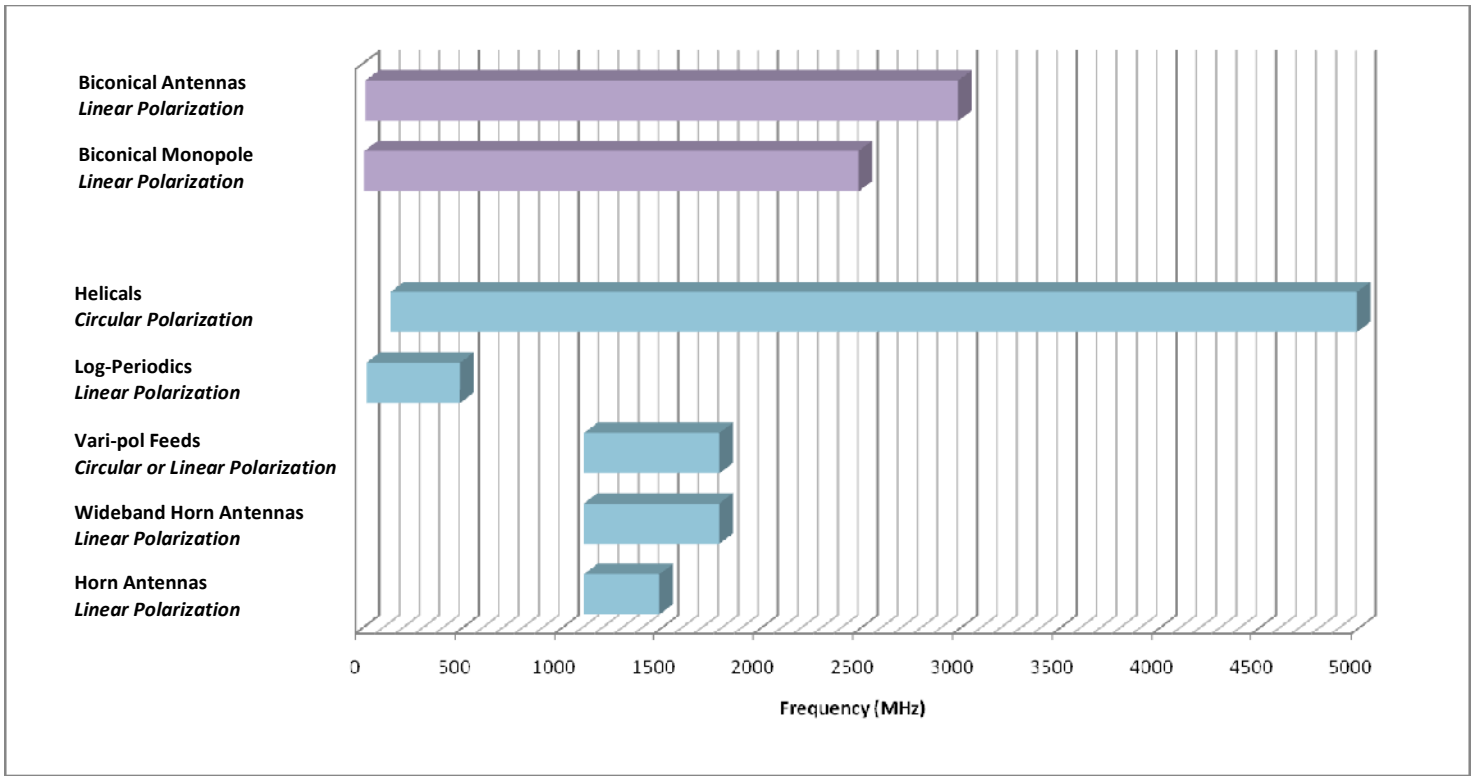






Antenna Selection Guide

Select the frequency band to determine available antenna types. Polarization for each antenna type is listed with the antenna heading.

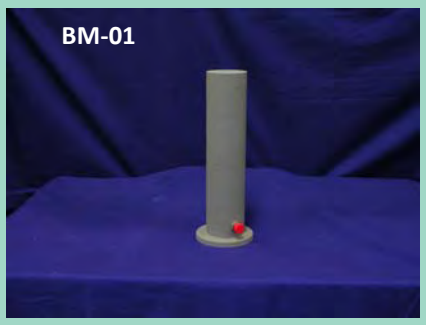


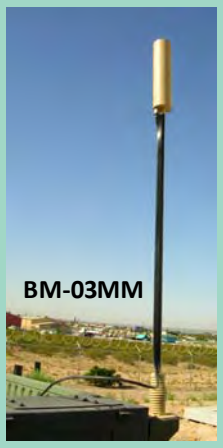
If we do not list the antenna you need please submit the custom antenna request on the following page for a fast, friendly quotation on a custom antenna.

Omni-Directional Antennas

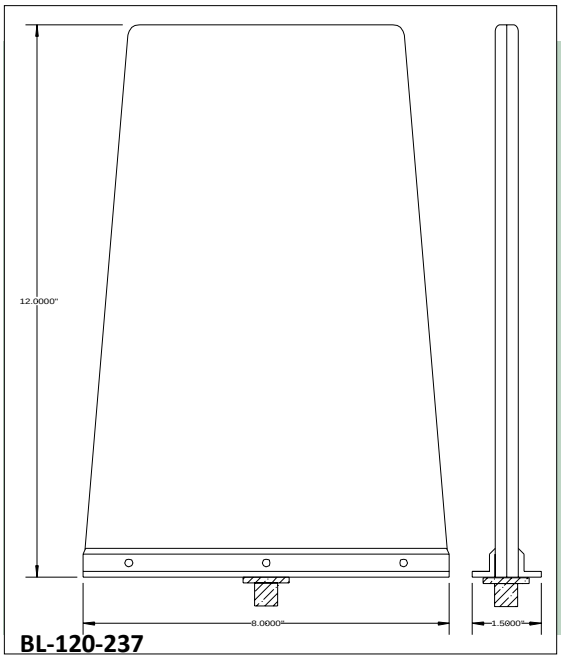
Omni-directional Antennas are generally used for communications systems or other systems that require equal coverage in all directions. Many of these antenna are made for mobile applications and can be provided with a magnetic base. For more information and pricing see our web page at www.tmcdesign.com or call our main office in beautiful southern New Mexico at 575.382.4600

Model Number	Frequency	Gain	HPBW
BM-01	25-1000 MHz	3 dB (@F_o)	360x85
BM-03A	500-2000 MHz	3 dB (@F_o)	360x85
BM-03-30	20-1000 MHz	3 dB (@F_o)	360x85
BM-03-MM	0.5-2 GHz	4 dB (@F_o)	360x85
BM-04	30-500 MHz	4 dB (@F_o)	360x85
BM-04-HP	25-1000 MHz	4 db (@F_o)	360x85
BC-06r	1-2 GHz	10 dB (@F_o)	120x45
BC-06r-hp	1-2 GHz	10 dB (@F_o)	120x45
BC-0150	1.2-1.6 GHz	4 dB (@F_o)	360 x 85
BC-0300	1.2-1.6 GHz	4 dB (@F_o)	360 x 85
BC-0300hp	1.2-1.6 GHz	4 dB (@F_o)	360x85
BC-0375-B	550-900 MHz	3 dB (@F_o)	360 x 85
BC-7350	25-1200 MHz	4 dB (@F_o)	360 x 85
TC2700	70-1000 MHz	4 dB (@F_o)	360x85
BL-120-237	225-400 MHz	2 dB	360x60





Omni-Directional Antennas



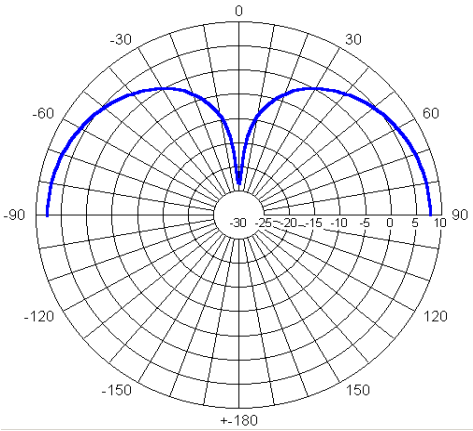
BL-120-237

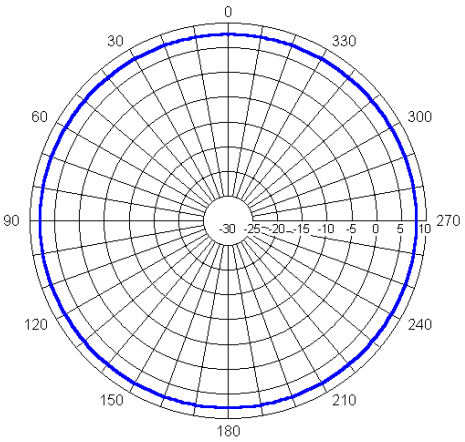
BL-120-237

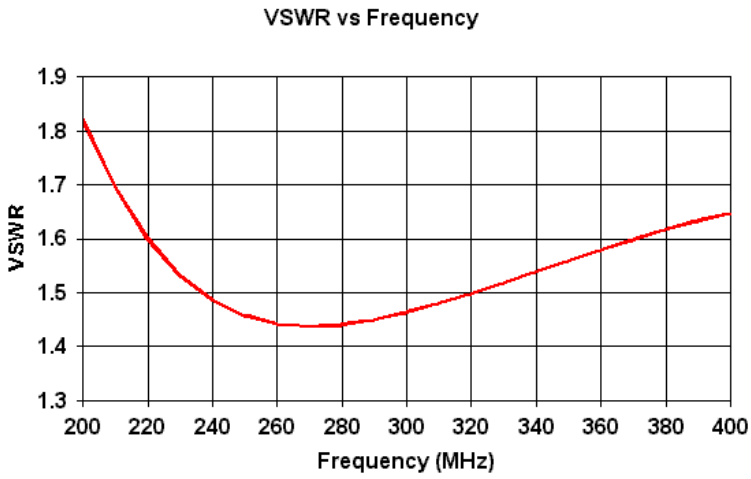
The BL-120-237 is a high power, wide band severe duty antenna for both military and commercial applications. The antenna is constructed entirely of G-10 epoxy glass and aircraft certified 6061-T6 aluminum and with a 100% sealed copper radiator. They are available with SMA, BNC, TNC or Type-N connectors. Several options are available including monitor port and separate from prim radiator monitoring antenna. These antennas will provide years of trouble free service, even when used in the most severe environments.

- **Rugged Construction**
- **Linear Polarization**

BL-120-237 Specifications	
Frequency	215 to 260 MHz
Nominal Gain	2.0 dB
HPBW (azimuth)	360 degrees
HPBW (elevation)	60 degrees
Polarization	Vertical Linear
VSWR	2.0:1 max.
Power	500 Watts
Weight	4.2 lbs.
Ground Plane Requirements	15” diameter with blade centered
Connectors	SMA, BNC, TNC or Type N







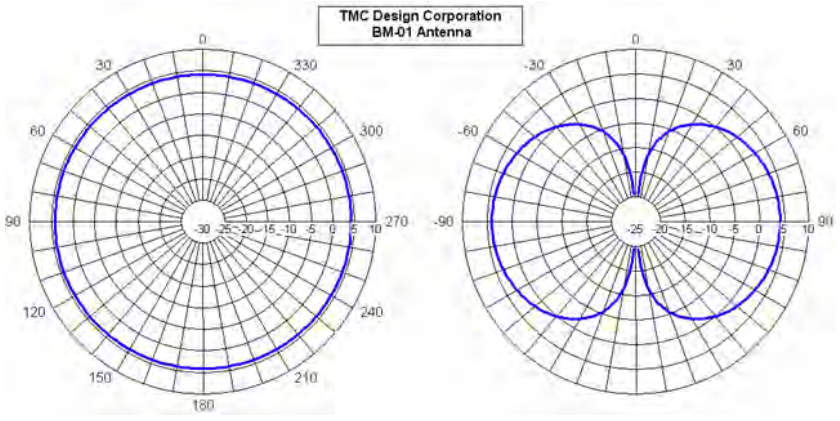
Biconical Monopole Antennas

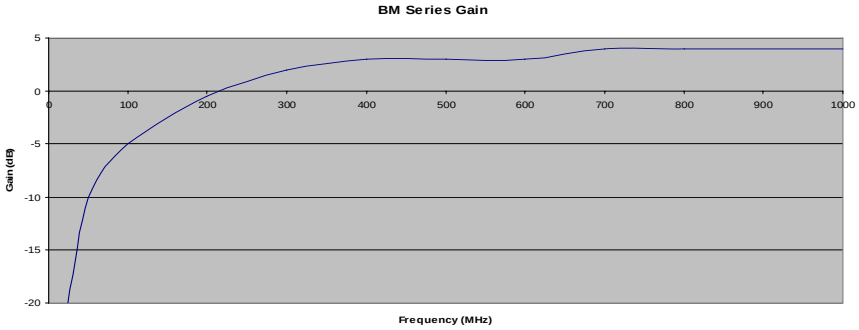
BM-01

The BM-01 antennas are very wide band, electrically small biconical monopole antenna designed for low frequency testing and wideband communications systems or electronic warfare without requiring large antennas or tuning systems. The antenna is housed and sealed in a rugged radome to insure long life and electrical repeatability.

- **Electrically Small**
- **Passive Transmit**
- **Wideband Communications**
- **Wideband Test**
- **Wideband Electronic Warfare**

BM-01 Electrical Specifications		BM-01 Mechanical Specifications	
Frequency	25-1000 MHz	**Dimensions**	12.7" x 3.0" (diameter)
Gain (*See gain plot*)	> 0 dB (225 to 1000 MHz) > -20 dB (25 to 224 MHz)	**Weight**	2.0 lbs.
Power Handling	10, 40 or 100 Watts CW	**Temperature**	-40° to +50° C
Polarization	Linear (vertical)	**Environmental**	Full mil-810 testing; including temperature, shock and vibration.
VSWR	3.0:1 Maximum		
Beamwidth	360x85 degrees (F_o)		





Biconical Monopole Antennas

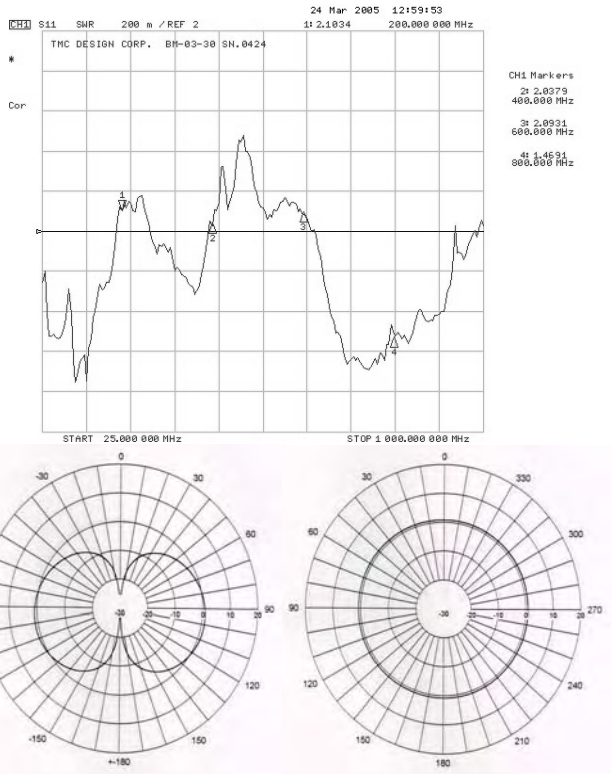
BM-03-30
Wide Band Electronic Warfare Antenna

The BM-03-30 is a very wide band, biconical monopole transmit/receive antenna contained within a rugged, sealed radome. This antenna has withstood the rigors of combat as part of our mobile military jammer systems with few failures. This version was designed specifically to emulate the snorkel deep water forting kit on a HMMWV.

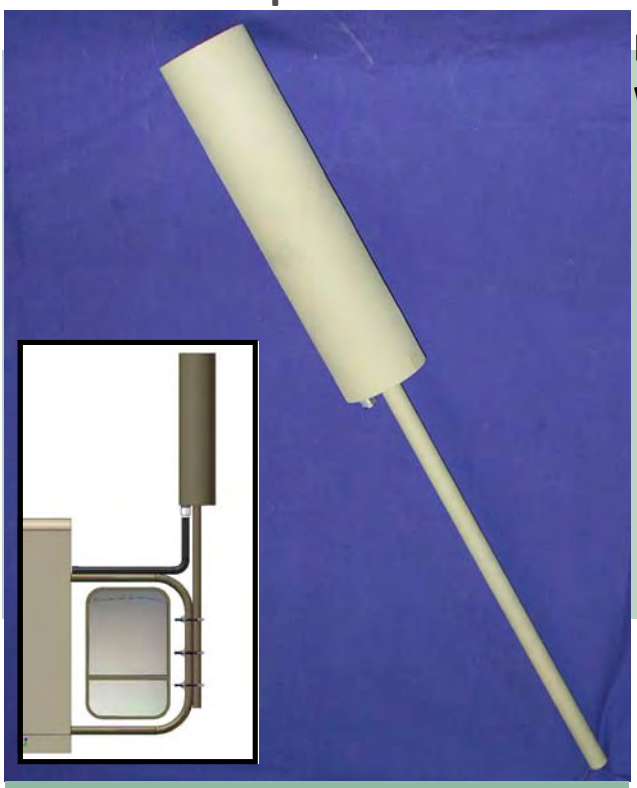
- **Multi-Octave Bandwidth**
- **Linear Polarization**
- **Rugged Construction**

BM-03-30 Specifications

Frequency	20-1000 MHz
Gain	2 dB (center frequency)
Power	10, 40 or 100 Watts
Polarization	Linear (typically vertical)
VSWR	2.5:1 maximum (20-1000 MHz)
Beamwidth	360x85 degrees (center frequency)
Dimensions	30.00” x 3.25” (diameter)
Weight	3.68 lbs. (with mounting hardware)



Biconical Monopole Antennas

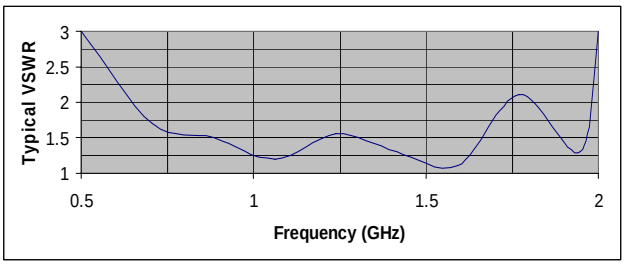


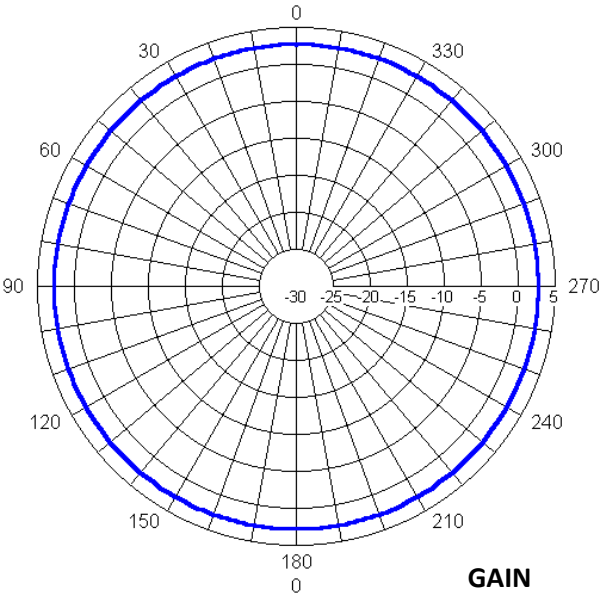
BM-03A Wideband Electronic Warfare Antenna

The BM-03A is a wide band, small biconical transmit and receive antenna contained within a rugged, sealed fiberglass radome. These antennas come with a variety of mounting options (magnetic or bolted as pictured, left) to fit your application. Contact us for complete system design and fabrication.

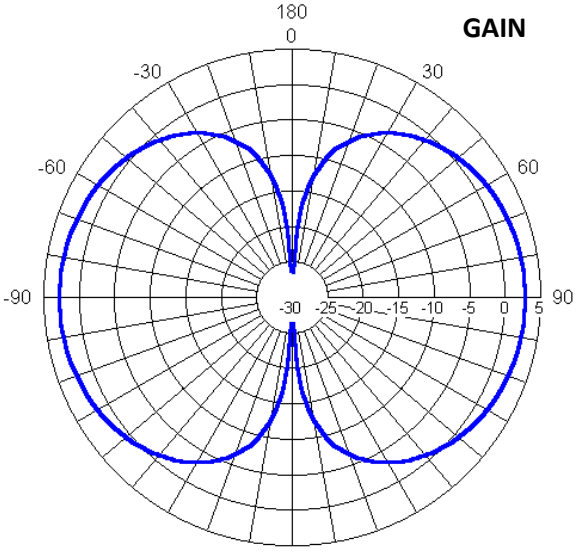
- **Wide Bandwidth**
- **Linear Polarization**

BM-03A Functional Specifications	
Frequency	500-2000 MHz
Gain	4 dB (F_o)
Power	100 Watts (CW)
Polarization	Linear (vertical)
VSWR	3.0:1 maximum
Beamwidth	360x85 degrees (F_o)
BM-03A Mechanical Specifications	
Dimensions	13 $^{19}/_{16}$" 3 $^{1}/_{4}$"
Weight	3.0 lbs.
Temperature	-40° to +50° C
Environment	Full 810 environmental shock, temperature and vibration testing performed.
Connector	Type-N





GAIN



Biconical Monopole Antennas

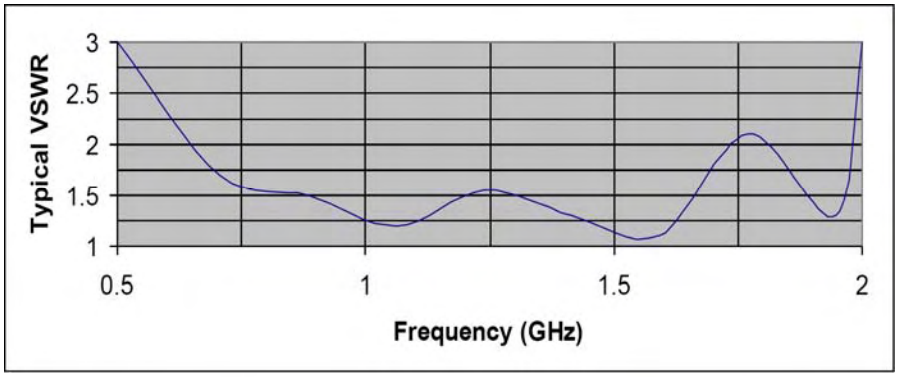

BM-03MM

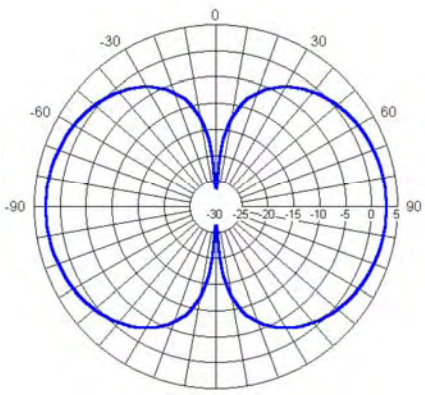
BM-03MM Wideband EW Antenna

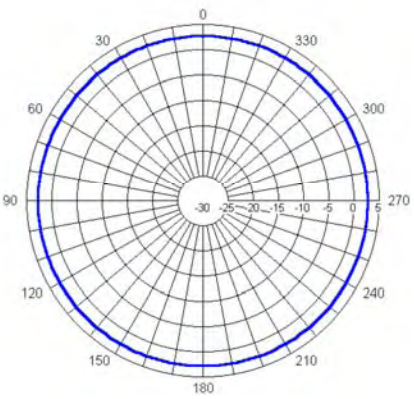
The BM-03MM is a wide-band, small bi-conical transmit & receive antenna contained within a rugged, sealed fiberglass dome. The antenna is manufactured to be mounted to an HMMWV and connected to a vehicle-based jammer. Different mounting options are available. Call for more information on complete systems design and fabrication.


BM-03MM Bolt-Mount

BM-03MM Functional Specifications		BM-03MM Mechanical Specifications	
Frequency	500 to 2000 MHz	**Dimensions (Unit)**	5 1/2"l x 5 1/2"w x 64 5/6"h
Gain	4 dB (F_o)	**Dimensions (Antenna)**	3 1/4"l x 3 1/4"w x 13 1/2"h
Power	100 Watts	**Weight**	12 lbs.
Polarization	Linear (vertical)	**Temperature**	-40° to +50° C
VSWR	3.0:1.0 (maximum)	**Connector**	Type N
Beamwidth	360x85 degrees (F_o)	**Environments**	Full 810 military environmental shock, temp & vibration testing performed








BM-03MM mounted on the back of an HMMWV

Biconical Monopole Antennas

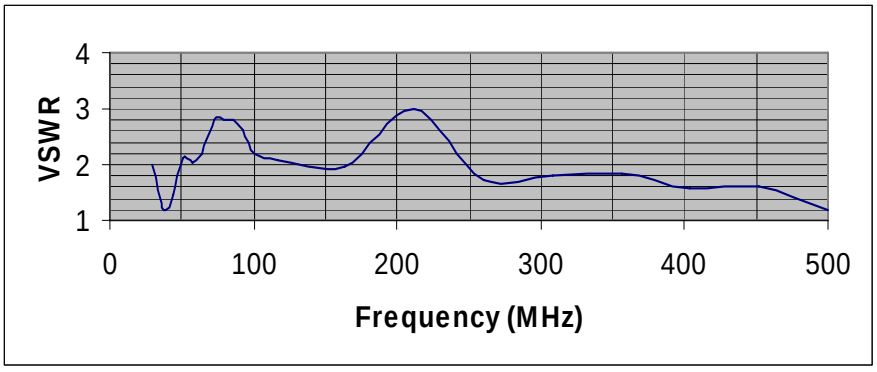

BM-04 Communications Antenna

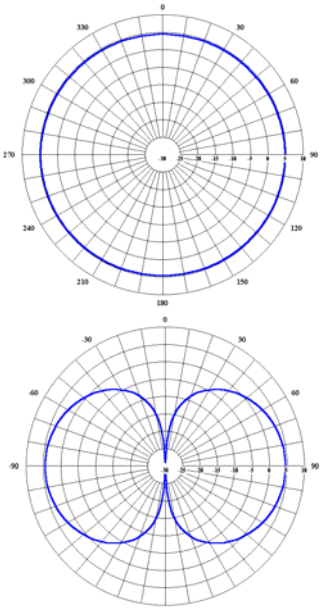
BM-04

The BM-04 is a very wide band, electrically small biconical antenna designed to allow coverage of the VHF/FM communications band (30-88 MHz) without need of tuning systems. The very wide bandwidth will also transmit fast rise pulses with high fidelity for HPM operations. This rugged antenna is portable easily shipped/stored and can be set up and operational in a matter of minutes. Guy kit included for outdoor operation in high winds.

BM-04 Electrical Specifications	
Frequency	20-1000 MHz
Gain	2 dB (center frequency)
Power	10, 40 or 100 Watts
Polarization	Linear (typically vertical)
VSWR	2.5:1 maximum (20-1000 MHz)
Beamwidth	360x85 degrees (center frequency)
Dimensions	30.00" x 3.25" (diameter)
Weight	3.68 lbs. (with mounting hardware)

BM-04 Mechanical Specifications	
Dimensions	72.5" x 38.2"
Weight	28.6 lbs
Temperature	-20° to +150° F
Winds	Up to 45 mph (with guy kit option)
Environment	Commercial industrial (mil spec version available)





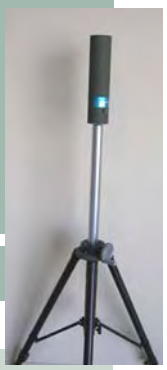
Wideband Communications Antennas

BC-0150

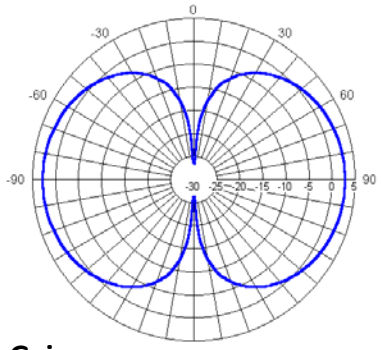
BC-0150

The BC-0150 is a wide band, small biconical transmit and receive antenna contained within a rugged, sealed radome. The result is a commercially priced antenna with the toughness and performance of a military antenna. The antenna is available in a high power version and in a wide variety of mounting options including vehicular magnetic mount and backpack mount (shown left).

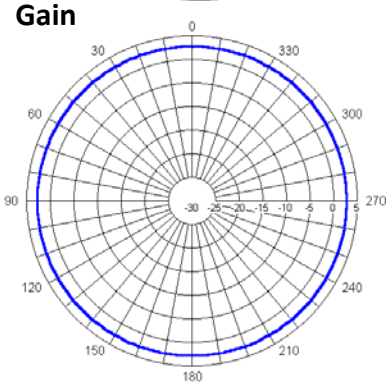
- **3 Octave Bandwidth**
- **Linear Polarization**
- **Rugged Construction**



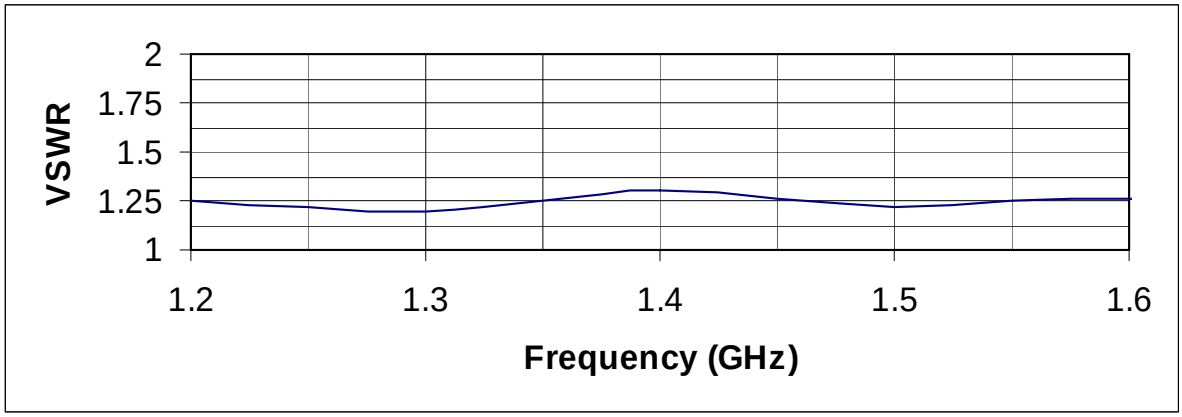
BC-0150



Gain



BC-0150 Functional Specifications	
Frequency	1.2-1.6 GHz
Gain	4 dB
Power	50 Watts (CW)
Polarization	Linear Vertical
VSWR	1.8:1 Maximum
Bandwidth	360x85 degrees
BC-0150 Mechanical Specifications	
Dimensions	7.50" x 1.75" (19.05 cm x 4.44 cm)
Weight	1.8 lbs. (816 kg)
Temperature	-20° to +150° F (-28.8° to +65.5° C)
Environment	Commercial industrial (mil spec available)
Connector	SMA, BNC, TNC or Type-N available

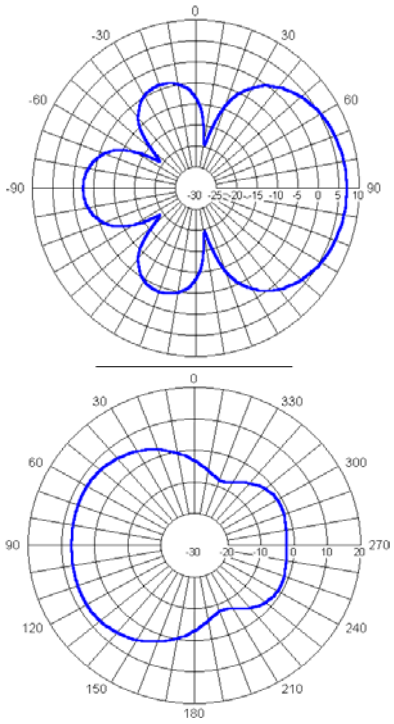


Wideband Communications Antennas

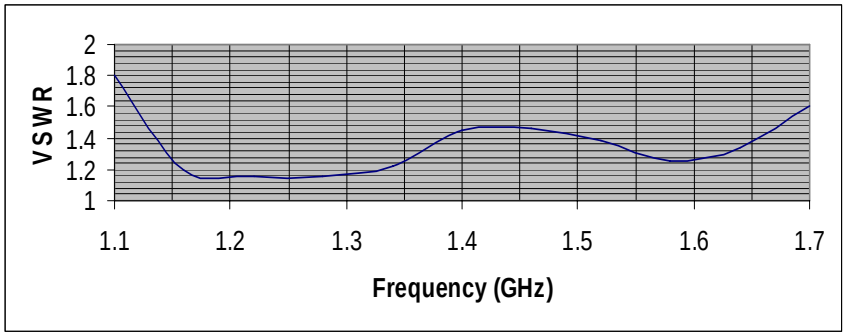
BC-06r-Series Antennas

The BC-06r is a wide-band antennas ideal for applications requiring a wide azimuth beamwidth but not omni-directional coverage. This small, mobile transmit and receive antenna is contained within a rugged, sealed fiberglass radome and can be provided with a magnetic mount for mobile applications (*available with optional tripod*). High-power operation models are also available (*BC-06r -HP, See specification table below*).

BC-06r



Model	BC-06r-D-L	BC-06r-HP
Functional Specifications		
Frequency	1.1 to 1.7 GHz	1.1 to 1.7 GHz
Gain	10 dB	10 dB
Power	100 Watts (CW)	200 Watts (CW)
Polarization	Linear (vertical)	Linear (vertical)
VSWR	1.8:1 maximum	2.1:1 maximum
Beamwidth	120x45 degrees	120x45 degrees
Mechanical Specifications		
Dimensions	6”x6”x12”	6”x6”x12”
Weight	5.5 lbs.	5.5 lbs.
Temperature	-20° to +150° F	-20° to +150° F
Winds	Up to 65 mph	Up to 65 mph
Environment	Commercial/industrial (mil spec version available)	Commercial/industrial (mil spec version available)
Connector	Type N	Type N



BC-06r attached with magnetic mount

Wideband Communications Antennas

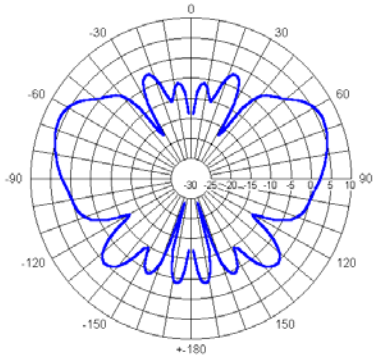
TC2700

The TC2700 is a very wide band, mobile communications antenna designed for both transmit (100 watts CW) and receive applications. The powerful magnetic base firmly attaches to any steel surface (sufficient ground plane required). The unit is housed in a sealed radome with replaceable elements.

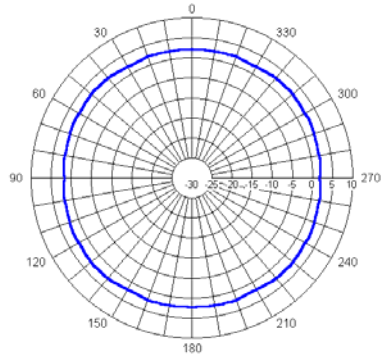
- **Useful for Mobile Applications**
- **Linear Polarization**
- **Rugged Construction**

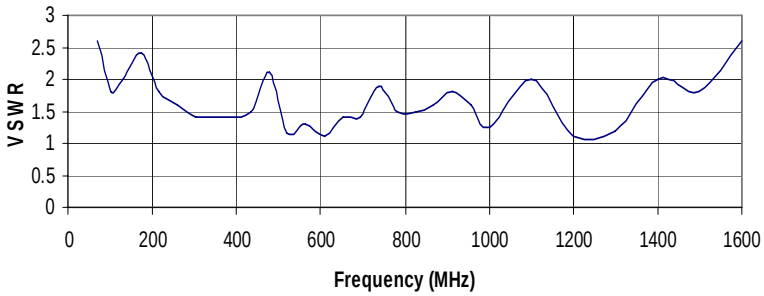
TC2700 Functional Specifications	
Frequency	70-1600 MHz
Gain	4 dB
Power	100 Watts (CW)
Polarization	Linear (vertical)
VSWR	2.5:1 maximum (ground plane required)
Beamwidth	360x40 degrees (center frequency)
Mechanical Specifications	
Dimensions	25” x 27”
Weight	3.9 lbs.
Temperature	-20° to +150° F
Winds	Up to 55 mph (on smooth steel roof)
Environmental	Commercial/industrial (mil spec version available)

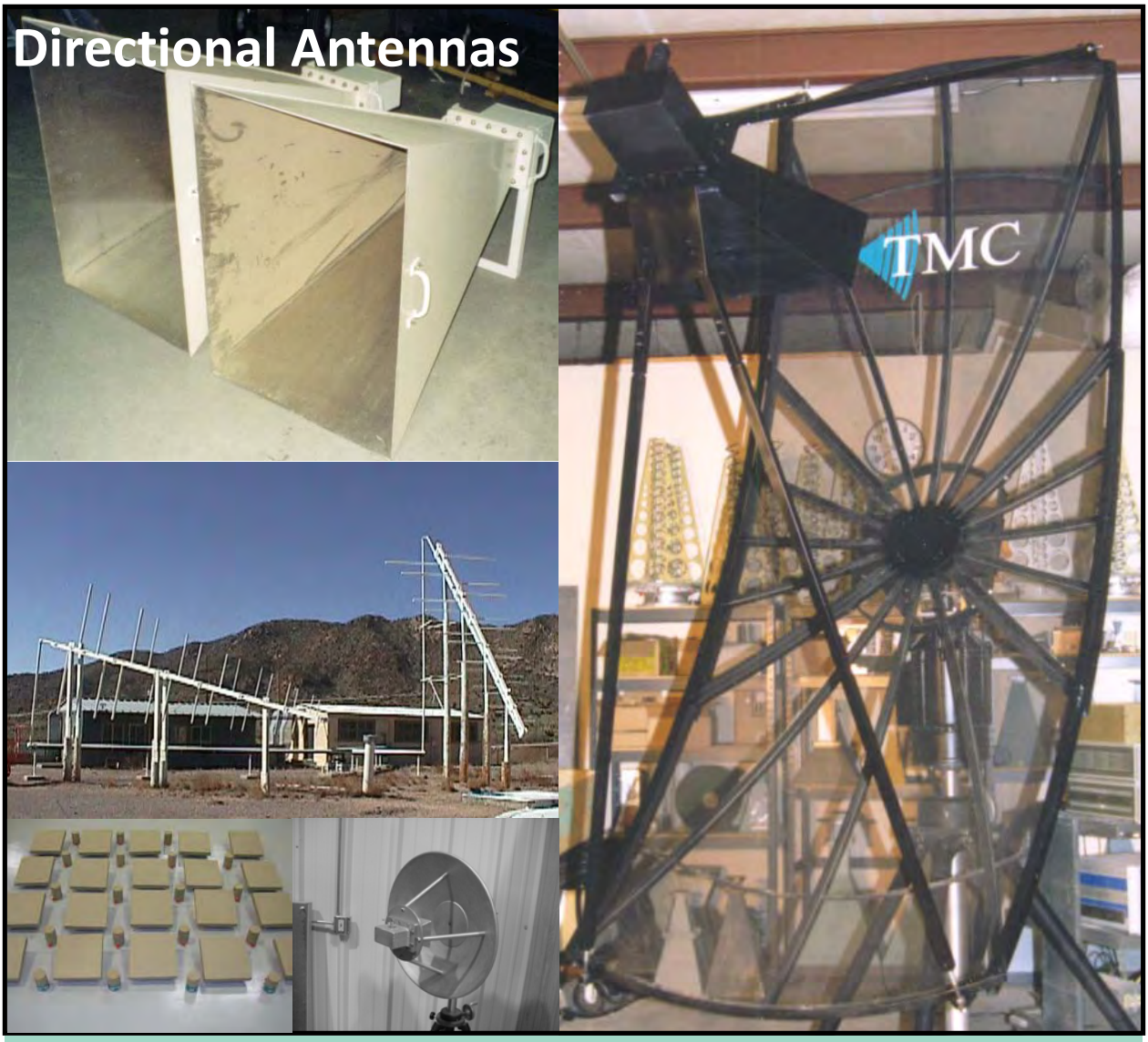
Elevation Pattern



Azimuth Pattern







Directional Antennas are generally used for systems that require narrow beamwidth and highly directed energy. These narrow beam antennas can provide a large amount of energy over a small coverage area.

When used for point to point communications systems (such as satellite links) these very-directive antennas will greatly reduce the required power. When in EW systems, highly directive antennas increase the field strength at the target at a fraction of the cost of higher output amplifiers. When combined with higher power amplifiers the results are the most effective results obtainable.

Our quality trailer-mounted, highly-directional dish antennas are available at a reasonable cost. Visit our web page (www.tmcdesign.com) or call or TMC Design's Las Cruces, New Mexico offices at (575) 382-4600 for a fast, friendly quotation.

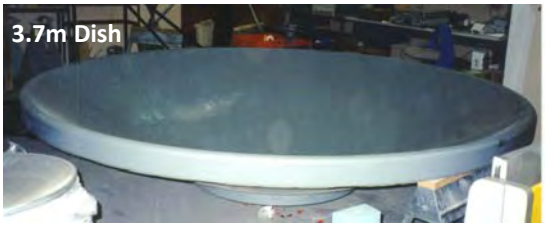
Directional Antennas

Custom Dish Antennas

At TMC Design our dish antennas are custom designed and fabricatedto meet customer specifications. TMC Design manufactures several types of dish feeds (*see Box Feeds page in Accessories section*) that are available for custom dish orders. Owing to our many years of experience in this area and available dish feeds TMC Design can often complete a dish antenna within a fraction of the time and cost of our competition.

In addition to our dish fabrication, design and alignment capabilities, TMC Design can also provide test and validation services or can suggest alternate test facilities, for our customers that prefer independent test and validation of performance.

Our dish antennas are currently in use by several U.S. Government agencies for communications systems, EW systems (both airborne and ground based) and for a wide variety of test applications. Contact us with your dish antenna application at (575) 382-4600.

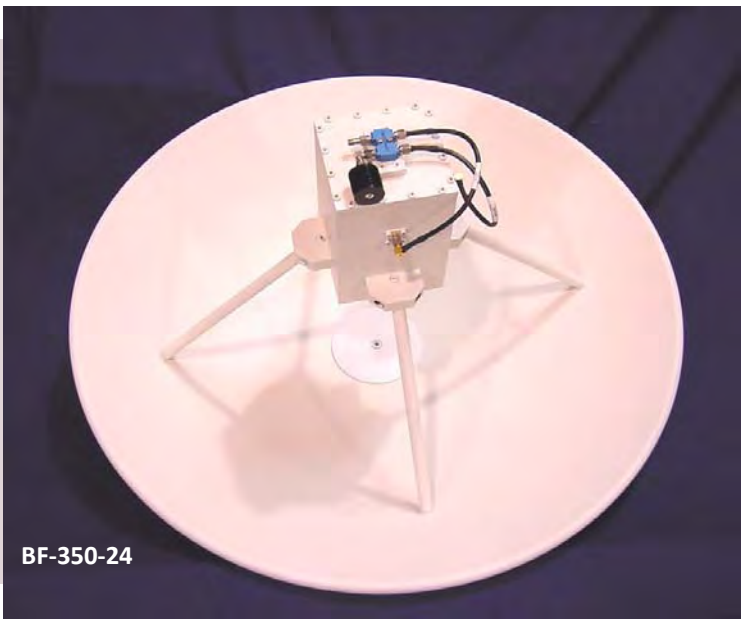


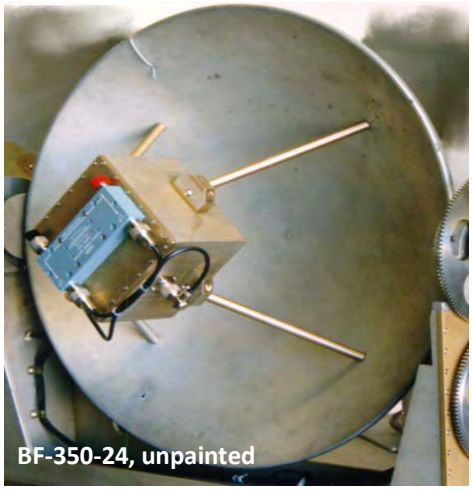
Custom Dish Antennas

BF-350-24 Dish Antenna

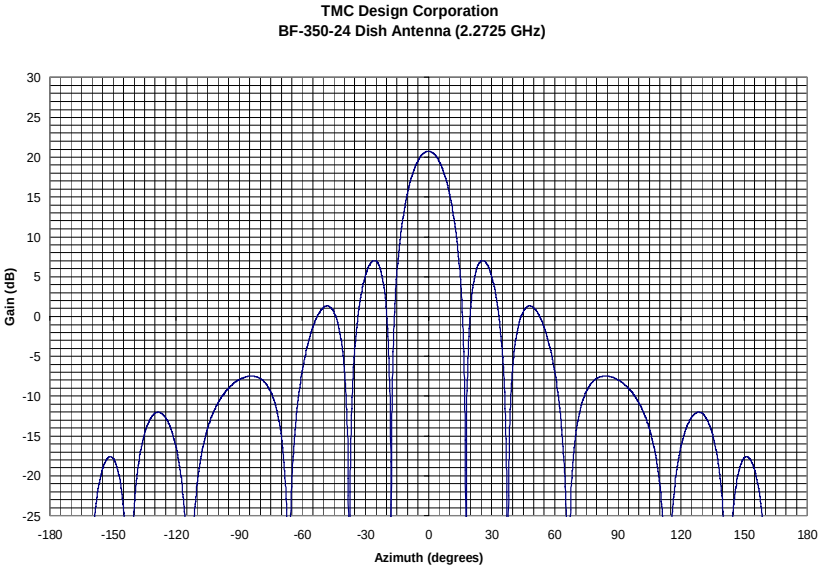
The BF-350-24 antenna is a polarization diverse dish feed with a 24" diameter prime-focus parabolic antenna designed to be both electrically superior and allow for any desired polarization.

- **L-Band Frequency**
- **Circular or Linear Polarization**


BF-350-24


BF-350-24, unpainted

BF-350-24 Functional Specifications	
Frequency	2000 to 3000 MHz
Gain	20 dB
Power Handling	20Watts CW
Polarization	Circular or Linear
VSWR	2.0:1 maximum
HPBW	15.4 Degrees
BF-350-24 Mechanical Specifications	
Dimensions	24" dia. x 16.5" h
Weight	5.25 lbs.




BF-350-24

Custom Dish Antennas

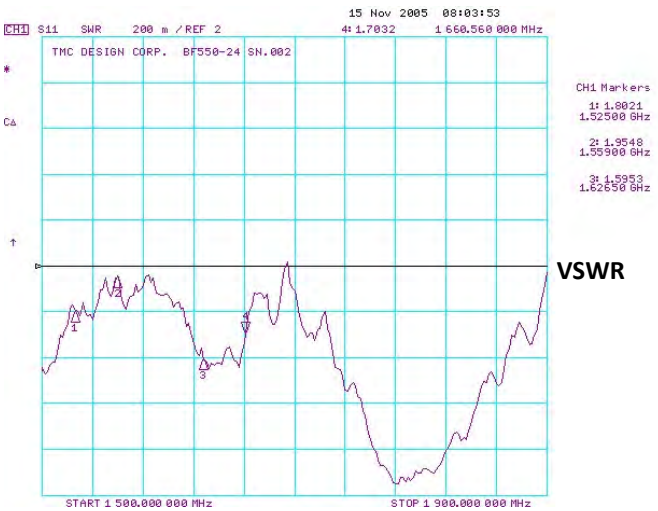

BF-550-24

BF-550-24 Dish Antenna

The BF-550-24 antenna is a polarization diverse dish feed with 24” diameter prime focus parabolic antenna designed to be both electrically superior and allow for any desired polarization.

- **L-Band Frequency**
- **Circular or Linear Polarization**

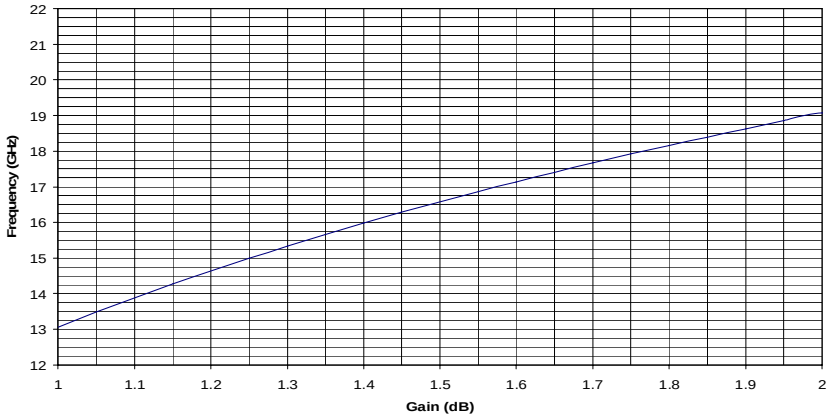
BF-550-24 Functional Specifications	
Frequency	1400 to 2000 MHz
Gain	16.6 dBiC (F_o)
Power Handling	20 Watts CW
Polarization	Circular
VSWR	2.0:1 maximum
HPBW	20 degrees (1.575 GHz)
BF-550-24 Mechanical Specifications	
Dimensions	24” dia. x 16.5” h
Weight	5.25 lbs



VSWR


BF-550-24, unpainted

24" Dish with BF-550 (1.5 GHz)

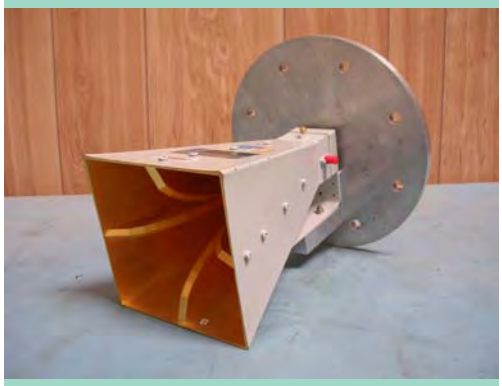


Directional Antennas

Optimum Gain Horn Antennas

TMC Design Corporation offers optimum gain horn antennas covering the frequency spectrum from 1.12 to 18.00 GHz in wave guide bandwidths. These antennas offer high gain in a very durable horn antenna. Many are available with optional tripod mounts and lower frequency horns as highly portable designs with removable side panels.


HO-650



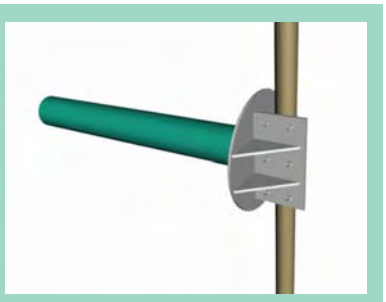

HO-430-18

Model	Frequency GHz	Gain dB	Beamwidth Degrees
HO-75-24	10.0-15.0	24	10x10
HO-90-RH	8.2-12.4	8	30x120
HO-90-S	8.2-12.4	10	30x90
HO-90-18	8.2-12.4	18	20x20
HO-90-20	8.20-12.40	20	15x15
HO-90-24	8.20-12.40	24	10x10
HO-112-RH	7.05-10.00	8	30x120
HO-112-S	7.05-10.00	10	30x90
HO-112-18	7.05-10.00	18	20x20
HO-112-20	7.05-10.00	20	15x15
HO-112-24	7.05-10.00	24	10x10
HO-137-RH	5.85-8.20	8	30x120
HO-137-S	5.85-8.20	10	30x90
HO-137-18	5.85-8.20	18	20x20
HO-137-20	5.85-8.20	20	15x15
HO-137-24	5.85-8.20	24	10x10
HO-187-S	3.95-5.85	10	30x90
HO-187-18	3.95-5.85	18	20x20
HO-187-20	3.95-5.85	20	15x15
HO-187-24	3.95-5.85	24	10x10
HO-284-S	2.60-3.95	10	30x90
HO-284-18	2.60-3.95	18	20x20
HO-284-20	2.60-3.95	20	15x15
HO-284-24	2.60-3.95	24	10x10
HO-430-S	1.70-2.60	10	30x90
HO-430-18	1.70-2.60	18	20x20
HO-430-20	1.70-2.60	20	15x15
HO-650-S	1.12-1.70	10	30x90
HO-650-18	1.12-1.70	18	20x20
H0-650-20	1.12-1.70	20	15x15

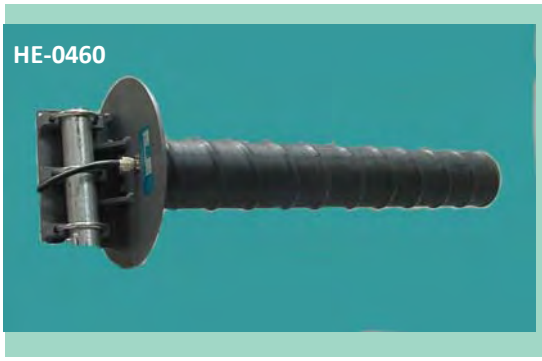
Directional Antennas

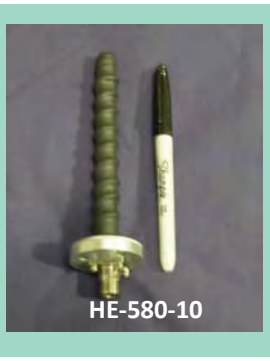
Helical Antennas

TMC Design Corporation offers helical antennas providing continuous coverage from 100 MHz to 6000 MHz (6 GHz) in both left or right hand circular polarization. All helical models can be manufactures in both commercial or military grades. Call us for more information on delivery and custom applications.



Model	Frequency MHz	Gain dB	Beamwidth Degrees	Max Power Watts
HE-0580-10	5000-6000	~11.75	35	200
HE-0075-10	4000-5000			
HE-0150-8	1530-2730			
HE-0200-10	1500-2250	12.4	35	200
HE-0200-18	1500-2250	15	26	200
HE-0238-6	1200-1600	10.2	45	200
HE-0238-8	1200-1600	11.4	38	200
HE-0238-10	1200-1600	12.4	35	200
HE-0238-13	1200-1600	13	30	200
HE-0238-18	1200-1600			
HE-0238-165-HH	1200-1600			
HE-0300-8	1000-1500	11.4	38	200
HE-0500-10	480-880	10	45	100
HE-1000-6	225-400			
HE-1000-6EC	225-400			
HE-1000-10	230-360	10	45	100
HE-1500-4	200-300	8.4	54	1000
HE-2000-4	150-225	8.4	54	1000


HE-0460


HE-580-10


HE-0230-165-HH

Helical Antennas

HE-0238-165-HH Handheld Direction Finding (DF) Antenna

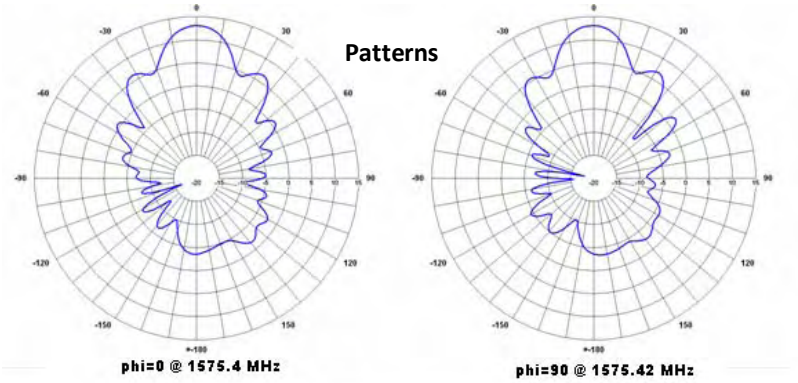
The HE-0238-165-HH is a handheld directional antenna designed to provide many years of quality and reliable service in the field. This antenna is constructed entirely out of aircraft certified 6061-T6 aluminum and G-10 fiberglass with a copper radiator in a 100% sealed radome. Previous models have achieved a 2:1 VSWR across the band.

TMC Design Corporation offers other custom direction finding (DF) antennas to aid in locating transmitted signals. TMC Design antennas are currently in use by U.S. Government agencies for EW systems. Contact us to find a DF application that best suits your requirements.

HE-0238-165-HH

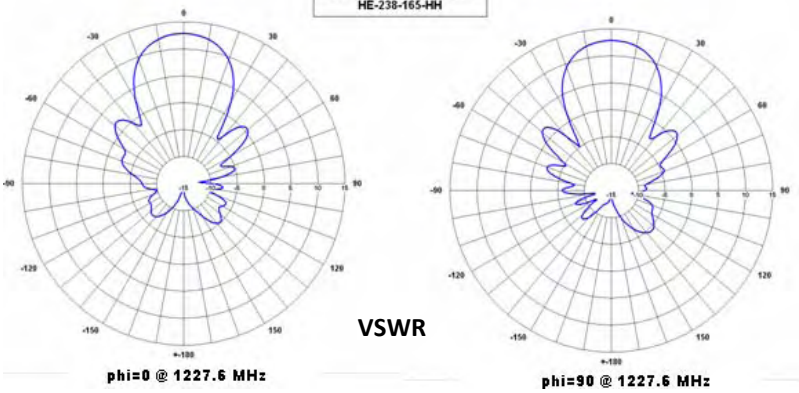
HE-0238-165-HH Electrical Specifications	
Frequency	1.2 to 1.6 GHz
Gain	15 dBi (@F_o)
Power Handling	RECEIVE ONLY
Polarization	RHCP
VSWR	2:1 Maximum
Beamwidth	27 degrees (@F_o)
Mechanical Specifications	
Dimensions	7” x 35”
Weight	5.25 lbs.

Patterns

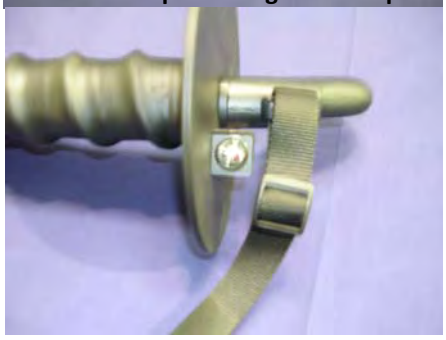


TMC Design Corporation
HE-238-165-HH

VSWR



HE-0238-165-HH shown with removable shoulder strap and magnetic compass



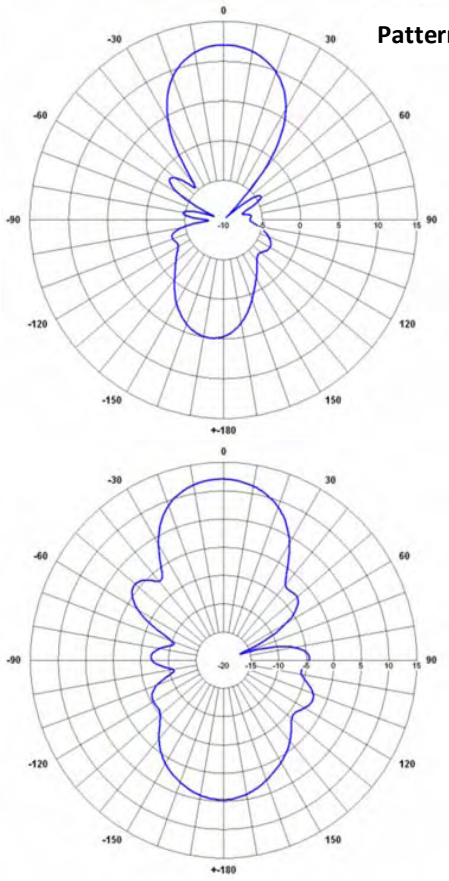
Helical Antennas

HE-0580-10

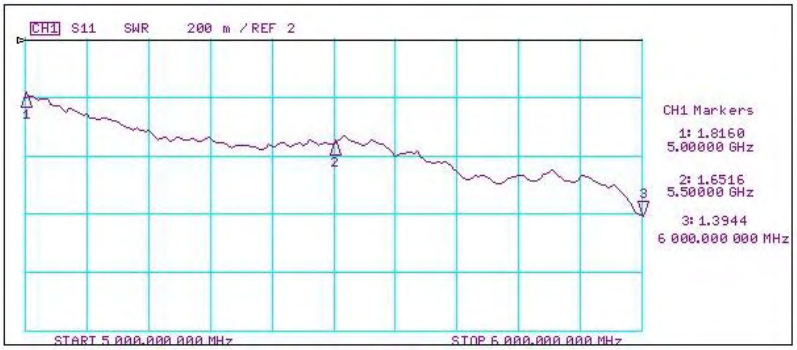
The HE-0580-10 is a high-power, right-hand circular-polarized (RHCP) severe duty small antenna that can suit both commercial and military applications. The antenna is constructed entirely of aircraft certified 6061-T6 aluminum and G-10 fiberglass with a copper radiator which is all enclosed in a sealed radome. This will ensure the antenna provides many years of quality service. In addition, these antennas are manually matched to achieve a low 2:1 VSWR across the 5.0 to 6.0 GHz band.

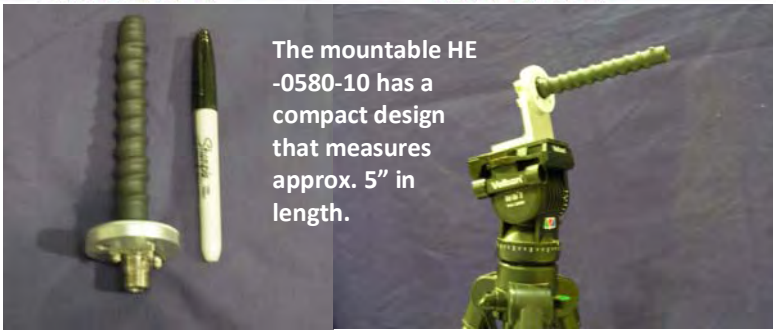
HE-0580-10 Electrical Specifications	
Frequency	5.0 to 6.0 GHz
Gain	~11.75 dBiC (F_o)
Power Handling	200 Watts CW
Polarization	RHCP
VSWR	1.8:1 maximum
Beamwidth	35° x 35° F_o
HE-0580-10 Mechanical Specifications	
Dimensions	5.0” length x 4.0” diameter
Weight	8 oz.

Patterns



VSWR



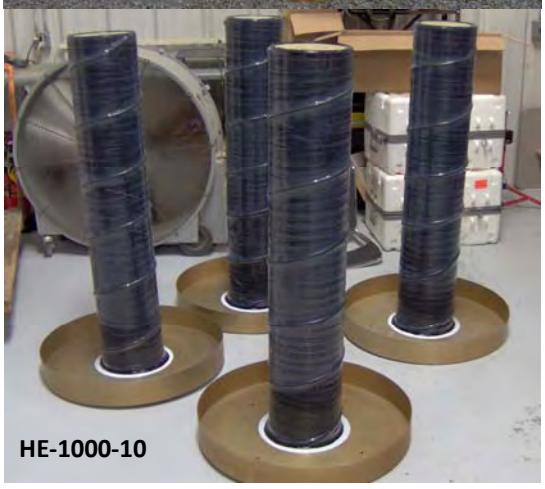


The mountable HE-0580-10 has a compact design that measures approx. 5” in length.

Helical Antennas


HE-1000-06EC/RHCP


HE-1000-06EC/LHCP in a 16-element array

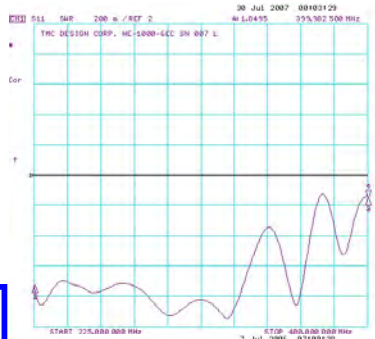

HE-1000-10

HE-1000 Series Antennas

The HE-1000 series antennas are high-power, wide band, severe-duty antennas that can serve both military and commercial applications. The antennas are constructed entirely of aircraft certified 6061-T6 aluminum with copper radiators all enclosed 100% sealed radomes. They are available as a single helix or as a pair, dual mounted on an antenna tower. These antennas will provide years of trouble-free service in the most severe environments and are currently in use by several U.S. Military installations in remote locations.

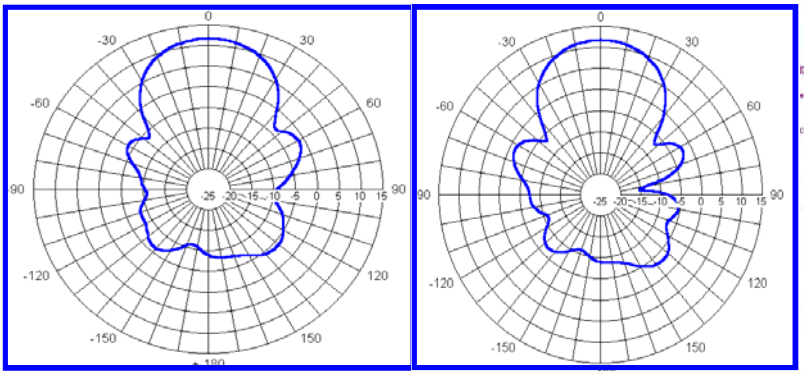
HE-1000 Series Functional Specifications		
Model	**HE-1000-6EC**	**HE-1000-10**
Frequency	225-400 MHz	230-360 MHz
Gain	10 dB	
HPBW	45 deg.	
Polarization	LHCP or RHCP	RHCP
VSWR	1.9:1 maximum	1.5:1 maximum
Power	1000 Watts	
HE-1000 Series Mechanical Specifications		
Weight	43 lbs.	45 lbs.
Dimensions	50.00" x 28.00"	52.68" x 30.00"
Connectors	Type N, HN or LC	

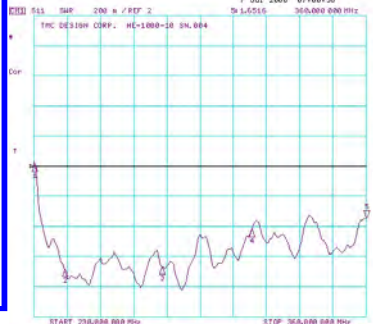
VSWR HE-1000-6EC LHCP



Elevation **Azimuth**

Typical gain plots taken from HE-1000-10



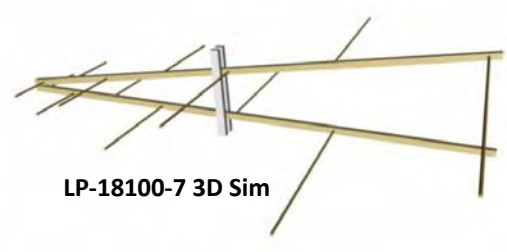


VSWR HE-1000-10

Directional Antennas

Log Periodic Antennas

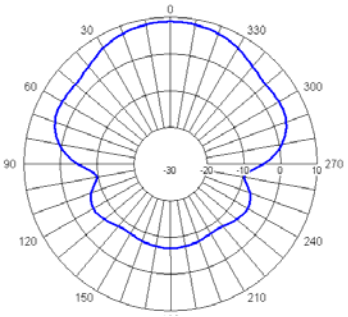
TMC Design Corporation has many years experience in the design and fabrication of high power log periodic antennas. We offer log periodic antennas covering the frequency spectrum from 20 MHz to 2 GHz available in commercial or military grades. Call for pricing and delivery.

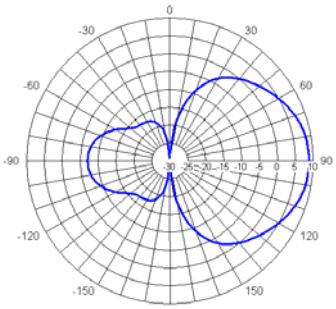


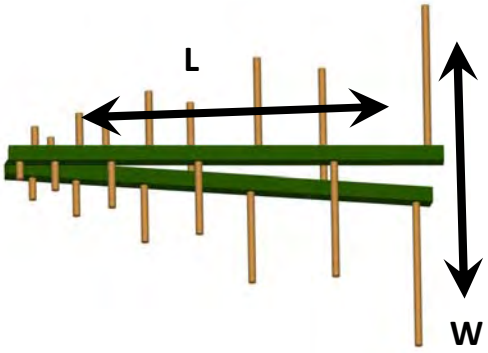
LP-18100-7 3D Sim

LP-18100-7

Model	Frequency MHz	Gain dB	Beamwidth Degrees	Max Power Watts	Dimensions Inches (l x w)	Application
LP-02400	350-425	8.7	62x90	1000	21" x 24"	Airborne
LP-03000	160-200	7.5	60x90	1000	21" x 30"	Airborne
LP-03500	135-160	7.5	60x90	1000	21" x 35"	Airborne
LP-18000	400-500	10.3	95x75	1000	32" x 15"	Airborne



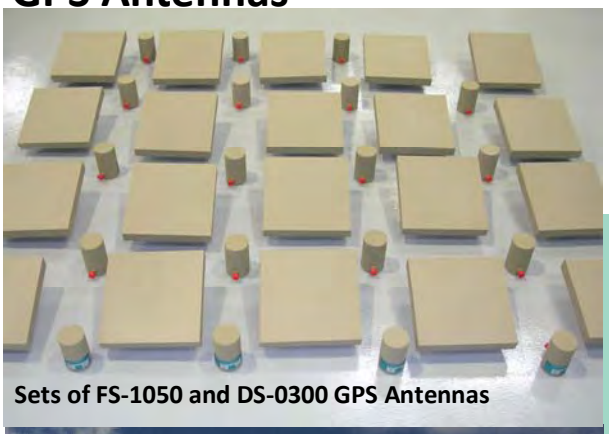




LP-03000

LP-19200

GPS Antennas



Sets of FS-1050 and DS-0300 GPS Antennas

Dual mounted HE-238-13 antennas on a deploy-tower

DS-0300

FS-1050

TMC Design Corporation offers GPS antennas that provide continuous coverage from 1.2 GHz to 1.6 GHz. These antennas are available in directional and omni-directional varieties with linear and RHCP polarizations. Call for pricing, delivery or custom application inquiries (575-382-4600).

Model	Frequency MHz	Gain dB	Beamwidth degrees	Max Power Watts
FS-1050	1.2—1.6 GHz	7	65	25
DS-0300	1.2—1.6 GHz	2.39	360x90	50
HE-238-8	1.2—1.6 GHz	10.5	40	500
HE-238-10	1.2—1.6 GHz	11.5	35	500
HE-238-13	1.2—1.6 GHz	13	30	500

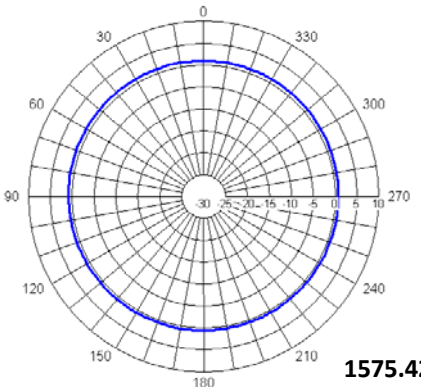
GPS Antennas

DS-0300 Disk Spiral Antenna

The DS-0300 is a wide band, small biconical spiral transmit/receive antenna contained within a rugged, sealed epoxy-glass radome. The result is an exact threat representative antenna in a robust package with standard N Type connectors. The antenna is available in a high-powered version and in a wide variety of mounting options including a vehicular magnetic mount or with a deployable tower mount.

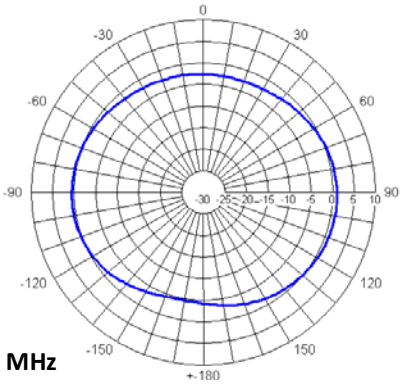
- **Threat Representative**
- **Linear Polarization**
- **Rugged Construction**

DS-0300 shown mounted on top of a deployable tower



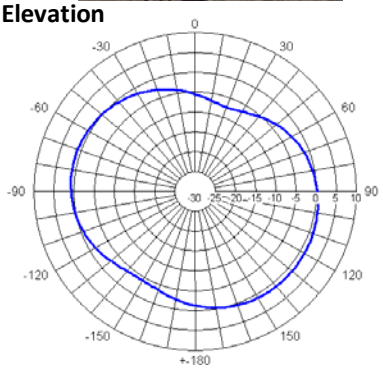
1575.42 MHz

Azimuth



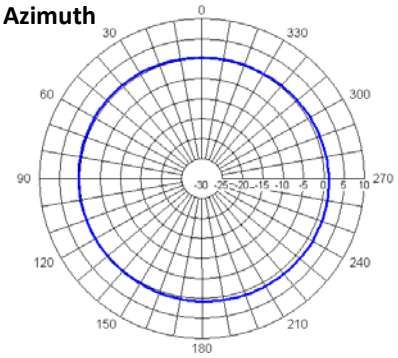
Elevation

Elevation



1227.60 MHz

Azimuth



DS-0300 Functional Specifications	
Frequency	1.2 to 1.6 GHz
Gain	2.39 dBiL
Power	50 Watts (CW), high power version available
Polarization	Linear (typically vertical)
VSWR	1.5:1 typical 2.0:1 maximum
Beamwidth	360x90 degrees (center frequency)

DS-0300 Mechanical Specifications	
Dimensions	4.0” x 3.0” x 3.0” (10.16cm x 7.62cm x 7.63cm)
Weight	2.2 lbs. (.998 kg)
Temperature	-20° to +150° F (-28.8° to 65.5° C)
Environment	Harsh
Connector	Type N (other types available)


FS-1050

FS-1050 RHCP Antenna

The FS-1050 is a wide band, flat spiral transmit and receive antenna contained within a rugged, sealed epoxy-glass radome. The result is an exact threat representative antenna in a robust package with standard type-N connectors. The antenna is available in a high power version and with a deployable tower mount. The unit is also available with internal modulator and amplifier to operate as a stand-alone jammer system.


FS-1050,mounted

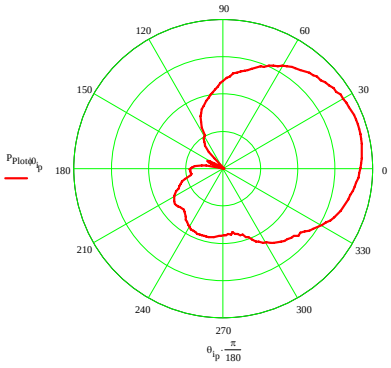
- **Threat Representative**
- **Linear Polarization**
- **Rugged Construction**


FS-1050 shown mounted (middle) on a quick-deploy tower.

FS-1050 Functional Specifications	
Frequency	1.2 to 1.6 GHz
Gain	7 dBiC
Power	25 Watts (CW), high-power version available
Polarization	RHCP
VSWR	1.5:1 typical 2.0:1 maximum
Beamwidth	65x65 degrees (center frequency)

FS-1050 Mechanical Specifications	
Dimensions	11.0” x 11.0” x 3.0” (27.9 cm x 27.9 cm x 7.6 cm)
Weight	5.25 lbs (2.38 kg)
Temperature	-20° to +150° F
Environment	Harsh
Connector	Type N (other types available)

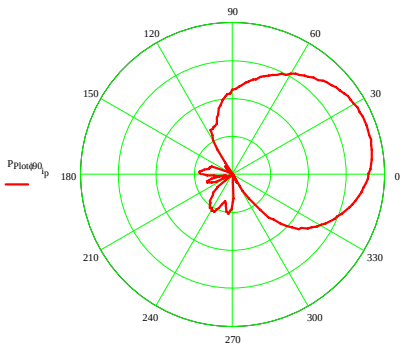
ϕ = 0 PATTERN



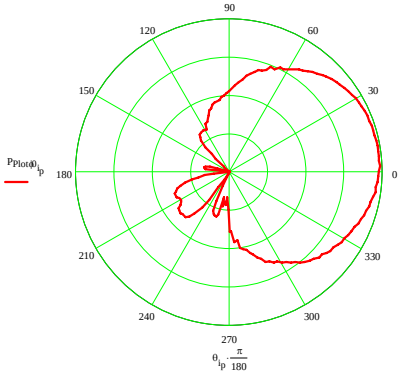
Frequency = 1227.6 MHz 10dB per radial division

Full Scale Gain FSG = 10 dB_{ic}

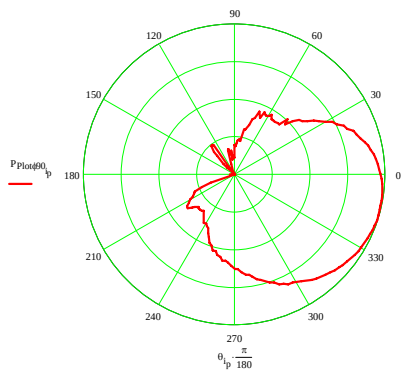
ϕ = 90 PATTERN



ϕ = 0 PATTERN



ϕ = 90 PATTERN

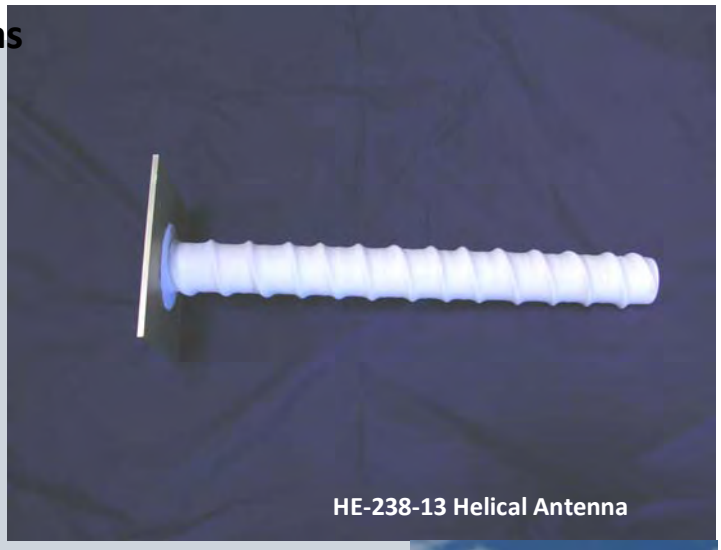


Frequency = 1575.4 MHz 10dB per radial division

Full Scale Gain FSG = 10 dB_{ic}

GPS Antennas

HE-238 Series Helical Antennas

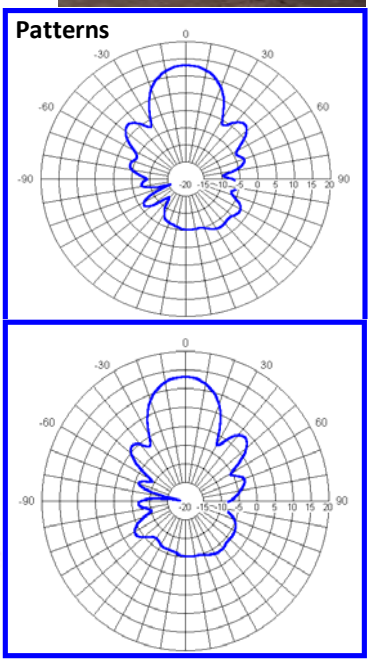

HE-238-13 Helical Antenna

The HE-238 is a high power, wide band, severe duty antenna for both military and commercial applications. The antenna is constructed entirely of aircraft certified 6061-T6 aluminum and G-10 fiberglass with copper radiator in a 100% sealed radome. They are available as a single helix or as a dual mounted pair of tower mounted antennas (shown above). Several options are available for the tower mounted antennas including motorized azimuth rotators and adjustable elevation mounts. These antennas will provide years of trouble free service in extreme environments and are currently in use by several U.S. Military installations in remote locations.


Dual mounted HE-238-13 antennas on a deployable tower

Model	HE-238-8	HE-238-10	HE-238-13
Electrical Specifications			
Frequency		1.2 to 1.8 GHz	
Gain (see plots)	10.5 dB	11.5 dB	13 dB
Power Handling		500 Watts	
Polarization		RHCP	
VSWR		2:1 maximum	
Beamwidth	40°	35°	30°
Mechanical Specifications			
Weight		21 lbs. (dual mount)	
Azimuth Movement		360° (with rotator)	
Elevation Movement		-15° to +15°, manual	

VSWR


Patterns

Electronic Warfare (EW) Systems

WBJ

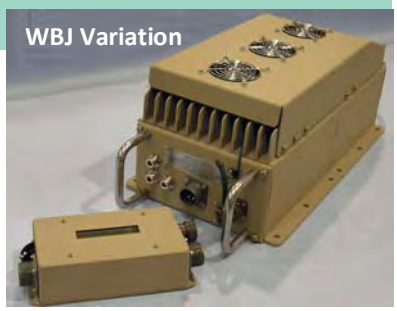

Dual Channel 20 Watt Amplifier


MGJ

TMC Design Corporation is a supplier of high-quality Electronic Warfare systems for the U.S. Air Force, U.S. Army and U.S. Navy. Our GPS jamming systems are used by all JPO approved exercises where certified systems are required. Our facilities are ready to meet you EW needs; whether you need a single high-quality , mil-spec EW system or a thousand a month, TMC Design is ready to provide all you EW needs.


WBJ Variation

System/Model	Description/Comments
WBJ	Wireless Bomb Jammer
TAVIA	RF Threat Emulator Unit
TAVIA System	RF Threat Emulator System
MGJ	Micro-GPS Jammer
XRF 338	.8 to 2 GHz 100 Watt Amplifier
5063-ART	.8 to 2 GHz 200 Watt Amplifier
TMC-AM-20W	Dual Channel 20-Watt Amplifier Module


WBJ Variation


WBRJ

EW Systems

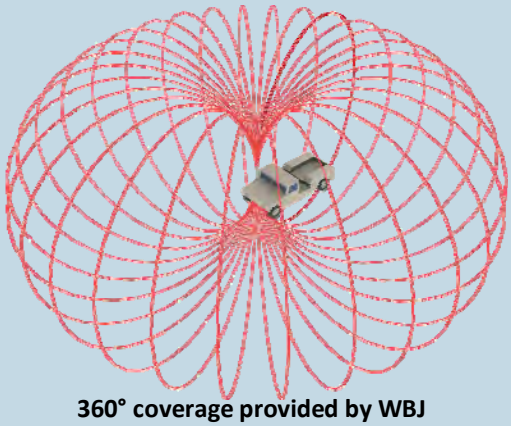
Wireless Bomb Jammer

Subsequent to the successful invasion of Iraq in 2003, the greatest threat to the US armed forces has been the Remote Controlled Improvised Explosive Devices (RCIED). Due to the cheap, efficient, and relatively safe methods of deploying these RCIED devices, wireless bombs have become a staple in the insurgent's arsenal.

The Wireless Bomb Jammer (WBJ) counters these threats by blocking the controlling signal sent to the bomb from the remote detonator. This is accomplished while still maintaining blue force communications.

TMC Design offers a variety of Wireless Bomb Jammers (WBJs) which provide proven protection against current threats for single vehicle applications. Units outfitted in every vehicle will provide coverage for large convoys and smaller two (2) or three (3) vehicle parties.

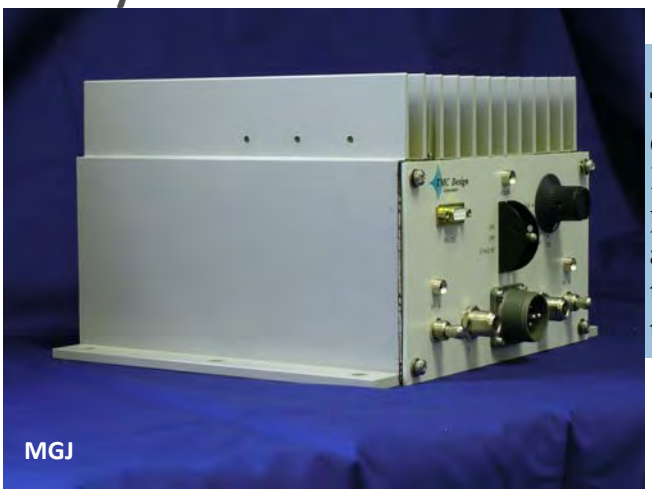
WBJ devices are inexpensive, easy to assemble and quick to deploy. WBJ protects against the latest threats and is field programmable to ensure protection against tomorrow's threats.



360° coverage provided by WBJ

WBJ & Modulator Controller Card

- **Active jammer**
- **8 analog spots each adjustable in:**
- **—Frequency**
- **—Bandwidth**
- **—Power Level**
- **40 digital spots with multiple digital modulations**
- **Customizable, optional modules for UHF, VHF, HF, L Band, and S Band**
- **Continuous or hop modes**
- **All standard low power and all high power (H2K) threats**
- **Modifiable amplifier adjusts output**
- **Rugged Design (Mil-Std-810F tested for mobile environments)**
- **Fully field programmable from a laptop (software provided)**
- **Easy installation /operation**
- **Field repairable**
- **360°, Full spectrum coverage**

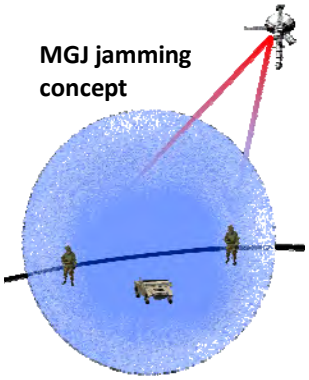


Micro-GPS Jammers (MGJ)

The MGJ is a EW Jammer created specifically for GPS systems. The unit uses active EW jamming and deception techniques to prevent adversaries from effectively operating GPS systems. It has been created as a transportable system, resulting in a design that is lightweight, portable and robust.

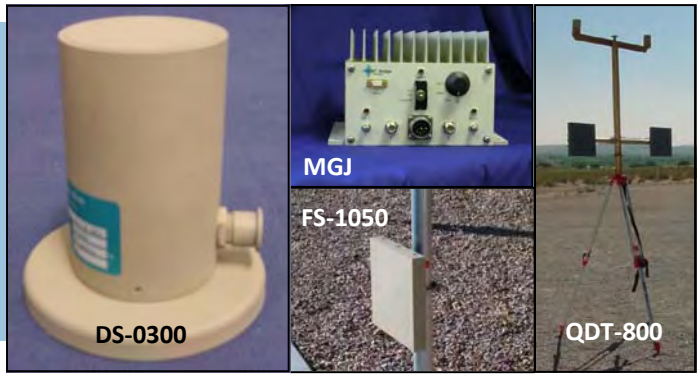
MGJ Specifications	
Carrier Frequency	1575 MHz and 1227 MHz
Working Voltage	9 to 36 Volts
Current Draw	3 A @12 Volts
Power Output	0 dBm
Modulations	CW, SAW, Noise & BPSK
Dimensions	9"h x 11"w x 13"l

- The MGJ has two RF outputs for simultaneous broadcast at the 1575 & 1227 MHz GPS Range.
- Unit is fully field programmable with a laptop via an RS-232 communication port
- An MGDS unit is capable of operating for up to 15 hours when connected to a 45 A/h rated car battery.
- System can be customized to handle an even wider variety of threats.



Mobile GPS Denial System (MGDS)

The MGDS is available as a complete EW-GPS combat system centered around TMC Design's MGJ unit. In addition to the GPS jammer, this package includes four (4) antennas that operate within the GPS frequency range and a quick-deploy tower for quick site setup & teardown for mobility requirements.



The MGDS package includes:

- **1 x Micro GPS Jammer**
- **2 x FS-1050 1.2 to 1.6 GHz Antennas**
- **2 x DS-300 1.2 to 1.6 GHz Antennas**
- **1 x QDT-800 Quick Deploy Tower**

EW Systems

TAVIA

The TAVIA-32 Emulator is a highly flexible RF source designed to allow reproduction of EW bi-phase frequency shift keyed pulse modulation Gold Codes techniques. The modulator can pulse on and off to exactly emulate the duty cycle and modulation of threat systems (as verified by NAIC).

TAVIA-32 Emulator

TAVIA Specifications	
Stability	±10 KHz after 2-minute warm-up
No. of Channels	2 (L1 & L2)
RF Modes	Gold Code
Blink Modes	Selectable duration and period
Output Bandwidth	2.048 MHz
BPSK Modulation	All 32 Gold Codes
Output Power	+0 dBm
Dimensions	19" x 16" x 3.5"
Weight (typ.)	12.5 lbs
Operating Temperature	0° to +65° C
Storage Temperature	-65° to +150° C

Designed and fabricated by TMC Design in our Las Cruces facility, our goal with this system is to produce an EW modulator that is a verified modulation source, highly reliable and rack mountable at 19" (therefore, highly transportable).

The system chassis is constructed from only aircraft quality aluminum, assembled using stainless steel hardware. Features include operation that exactly emulates the threat system without additional frequencies that can cause great difficulty obtaining frequency clearance. The unit can be provided as a modulator or with a variety of am-


QDT-800

TAVIA-32 Emulator

TAVIA System

The MGDS is available as a complete EW-GPS threat emulation system centered around TMC Design's TAVIA unit. In addition to the emulator, this package includes four (4) antennas that operate within the GPS frequency range and a quick-deploy tower for quick site setup & teardown for mobility requirements. This system is available in 0, +40 and +47 dBm output power models.

The TAVIA system package includes:

- **1 x Amplified TAVIA Modulator**
- **2 x FS-1050 1.2 to 1.6 GHz Antennas**
- **2 x DS-300 1.2 to 1.6 GHz Antennas**
- **1 x QDT-800 Quick Deploy Tower**

TMC-AM-20W Dual Channel Amplifier

The TMC-AM-20W Dual Channel Amplifier Module is suitable for RF signal amplification. This unit has been designed to amplify output signals of TMC Design's various jamming units such as the MGJ. This module contains two RF channels (two input and two output ports) that operate independently of each other.

TMC-AM-20W Specifications	
RF Operating Range	1.2 to 1.6 GHz (L-band)
RF Input Power Range	0 dBm to +6 dBm
Output Power	20 Watts
Working Voltage	24 ±4 VDC
Dimensions	13"l x 11"w x 9"h
Connectors	2 RF input N-Type, male 2 RF output N-Type, male

XRF-338 High-Power L-Band Amplifier

The XRF-338 Hi-Power L-Band Amplifier is a rack-mounted rugged solid state amplifier suitable for TWT replacement. Designed by OPHIR RF microwave to TMC Design Specifications, this amplifier is 100 % compatible with TMC Design's LBJ and LBS series Electronic Warfare devices. This amplifier, coupled with TMC Design's modulators and antennas, makes a complete test and operational L-Band jamming system to meet or exceed your transmitter specifications.

XRF-338 Functional Specifications	
Frequency Range	1.0 to 2.0 GHz
Output Power	100 Watts (minimum)
Input Power	+0 dBm (maximum)
1 dB compression	@ 80 Watts
Harmonics	> 45 dBc @ 1 dB compression
Gain	+51 dB
AC Power	110 VAC @ 10 A, 60 Hz
Dynamic Range	50 dB

XRF-338 Mechanical Specifications	
Dimensions	19" x 7" x 20" Rack Mount
Weight	47 lbs.
Input Connector	N-Type
Output Connector	N-Type
Front Panel Display	LCD
Options	RS-232 or IEEE-488 control

Antenna Accessories

Antenna Box Feeds

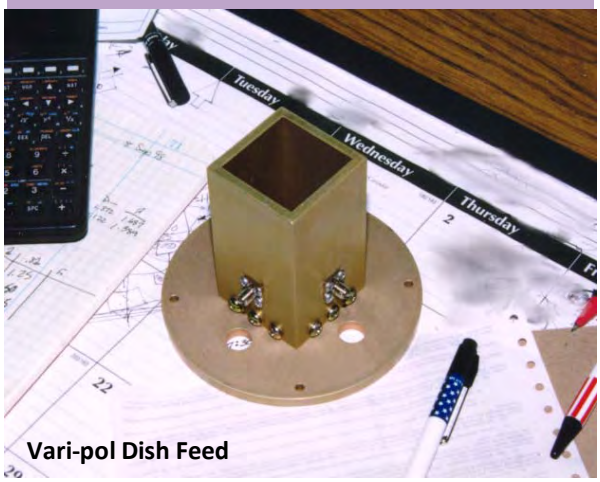
TMC Design offers a variety ground and flight based box feeds for dish antennas. All feeds are built to be electrically superior and allow for any desired polarization. Contact TMC Design for inquiries on box feed that will best suit your requirements.

Model	Operating Frequency (GHz)
BF-675	1.12 to 1.70
BF-550	1.4 to 2.0
BF-475	1.6 to 2.4
BF-375	2.1 to 3.0
BF-350	2.0 to 3.0
BF-275	2.9 to 4.0
BF-225	3.5 to 5.0
BF-175	4.5 to 6.5
BF-162	4.94 to 7.00
BF-150	5.2 to 7.5
BF-125	6.5 to 8.9
BF-100	7.6 to 11.5
BF-075	10.2 to 15.0
BF-062	12.4 to 18.0


BF-550


BF-350

BF-550



Vari-pol Dish Feed

Antenna Accessories

800 Series Quick Deploy Tower

The QDT-800 Quick Deploy Tower is a highly portable structure designed to allow for the rapid deployment of mast mounted repeater or jamming systems. Designed and fabricated by TMC Design in Las Cruces, New Mexico, our goal is to produce a system that is structurally superior, easily deployable and low cost. The tower allows mounting of four antennas and an repeater antenna on the same mast assembly. The system is constructed from only aircraft quality aluminum, welded by certified welders and assembled using only stainless steel hardware. The result is a ground structure built to aircraft standards.

QDT-800 Specifications		QDT-900 Specifications	
Height (max)	80”	**Height (max)**	84.25”
Width	36”	**Width**	15.75”
Guy Length	72”	**Guy Length**	96”
Weight ,tripod	8 lbs.	**Weight, base**	39.4 lbs.
Weight, mast	16 lbs.	**Weight, mast**	19.1 lbs.
		Weight, tool & guy kit	33.0 lbs.

900 Series Quick Deploy Tower

The QDT-900 Quick Deploy Tower is a highly portable tower structure designed to allow for the rapid deployment of mast mounted repeater or similar systems. Designed and fabricated by TMC Design in our Las Cruces facility our goal with this system was to produce a system that was both structurally superior and easily deployable. The system is constructed from only aircraft quality aluminum, welded by certified welders and assembled using only stainless steel hardware. The result is a ground structure built to aircraft standards.