TMC Design
CORPORATION

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

2009 Product Catalog

Tactical Multi-band Antenna Trailer System loading onto a C-17 transport

TMC Design Corporation is an engineering services and manufacturing company providing state-of-the-art, cost-effective solutions to complex world issues for governmental and commercial customers. We are committed to providing our customers the latest in technology through the synergistic integration of antenna design, RF electronics, state-of-the-art fabrication and intelligent software solutions to meet your specific requirements. If you do not find an engineering solution for your application in this 2009 catalog, call or email us for a fast friendly quote to meet your specific needs. Our engineers are ready to design, fabricate and test custom antennas and systems with low NRE costs and reasonable delivery times.

2009 Product Catalog

TMC Design Corporation

Table of Contents

OMNI-DIRECTIONAL ANTENNAS

TMC Titan V2 Omni-Directional Antenna

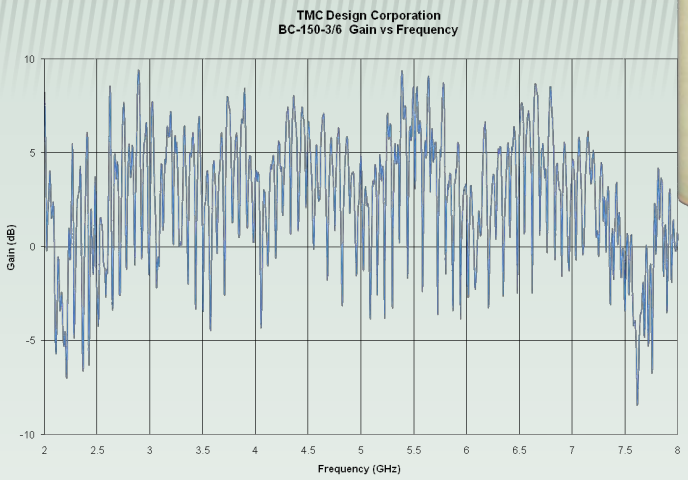
Model Number	Frequency	Gain	HPBW
BC-0150-3/6	500-6000 MHz	2.6 dB (Avg)	360x85
BC-0300	500-3000 MHz	3.5 dB (Avg)	360x85
BM-02	25-1000 MHz	-2 dB (Avg)	360x85
BM-03A	500-2000 MHz	3 dB (@F_o)	360x85
BM-03-MM	0.5-2 GHz	4 dB (@F_o)	360x85
BM-04	30-500 MHz	4 dB (@F_o)	360x85
BM-04-HP	25-1000 MHz	4 db (@F_o)	360x85
BC-06r	1-2 GHz	10 dB (@F_o)	120x45
BC-06r-hp	1-2 GHz	10 dB (@F_o)	120x45
BC-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
TMC Titan V2	20-6000 MHz	0 dB	360x65
TMC Titan V3	20-2000 MHz	0 dB	360x65

Omni-directional antennas are generally used for communications systems or other systems that require equal coverage in all directions. Many of these antennas 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 office headquarters in beautiful southern New Mexico at 575.382.4600.

BC-150-3/6 Very Wide Band Omni Directional Antenna

The BC-150-3/6 antenna is very wide band, electrically/physically small biconical monopole antenna designed for low frequency testing and wideband communications systems without requiring large antennas or tuning systems. The antenna is housed and sealed in a rugged radome to insure long life and electrical repeatability.

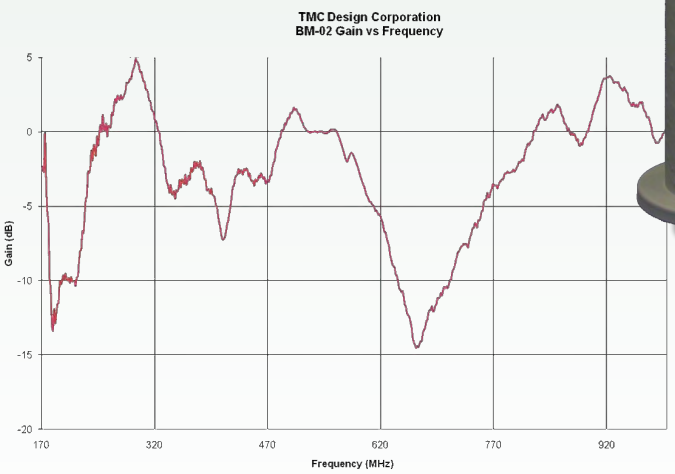
Parameter	Specification
Frequency	500 to 6000 MHz
Gain	-2.6 dB Average across frequency band
Polarization	Linear Vertical
HPBW	360 x 85°
Maximum Power	100 W, CW
Maximum VSWR	3:1
Connector	Type N (female)
Height	8"
Diameter	1.5”
Weight	2 lbs



BM-02 Wide Band Omni Directional Antenna

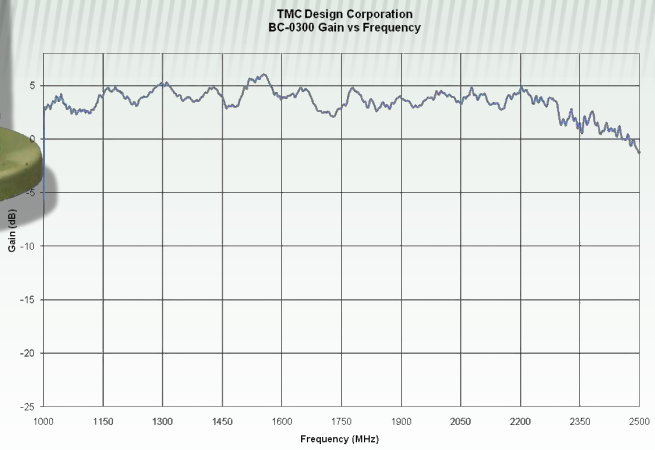
The BM-02 antenna is a wide band, electrically small biconical monopole antenna designed for low frequency testing and wideband communications systems without the need for large antennas or tuning systems. The antenna is housed and sealed in a rugged radome to ensure long life and electrical repeatability.

Parameter	Specification
Frequency	25 to 1000 MHz
Gain	-2 dB Average across frequency band
Polarization	Linear/Vertical
HPBW	360 x 85°
Maximum Power	100 W, CW
Maximum VSWR	3:1
Connector	Type N (female)
Height	12.7"
Diameter	3”
Weight	4 lbs



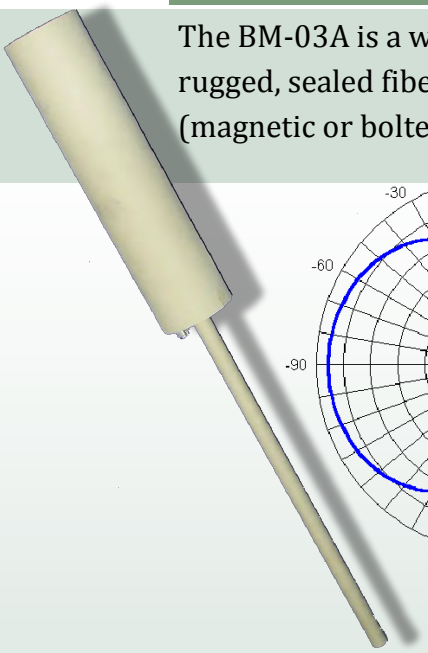
BC-0300 Wide-Band Omni Directional Antenna

The BC-0300 antenna is a wide band, electrically small biconical monopole antenna designed for low frequency testing and wideband communications systems without requiring large antennas or tuning systems. The antenna is housed and sealed in a rugged radome to ensure long life and electrical repeatability.

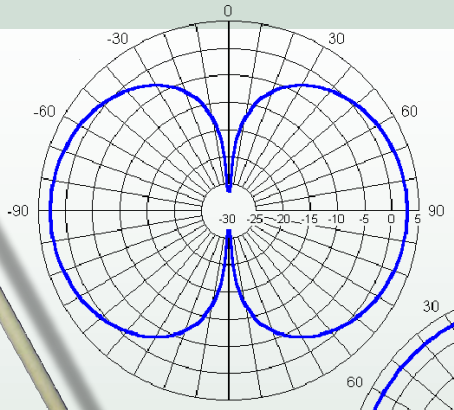


Parameter	Specification
Frequency	500—3000 MHz
Gain	3.5 dB Average across frequency band
Polarization	Linear(Vertical)
HPBW	360 x 85°
Maximum Power	100 W, CW
Maximum VSWR	3:1
Connector	Type N (female)
Height	12.7"
Diameter	3”
Weight	4 lbs

BM-03A Wide-Band Electronic Warfare Antenna

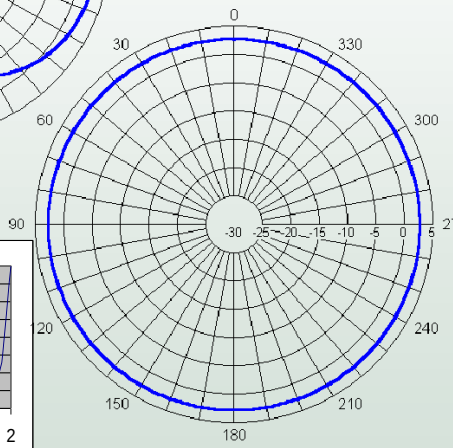


The BM-03A is a wide band, small biconical transmit and receive antenna contained within a rugged, sealed fiberglass radome. These antennas come with a variety of mounting options (magnetic or bolted as pictured, left) to fit your application.



GAIN

EL



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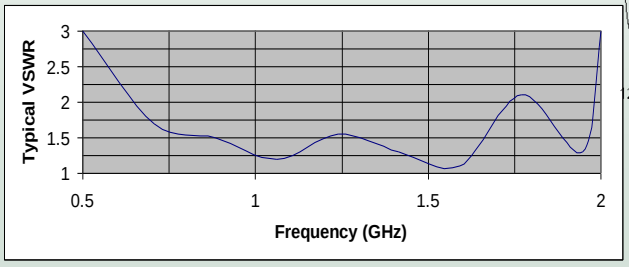


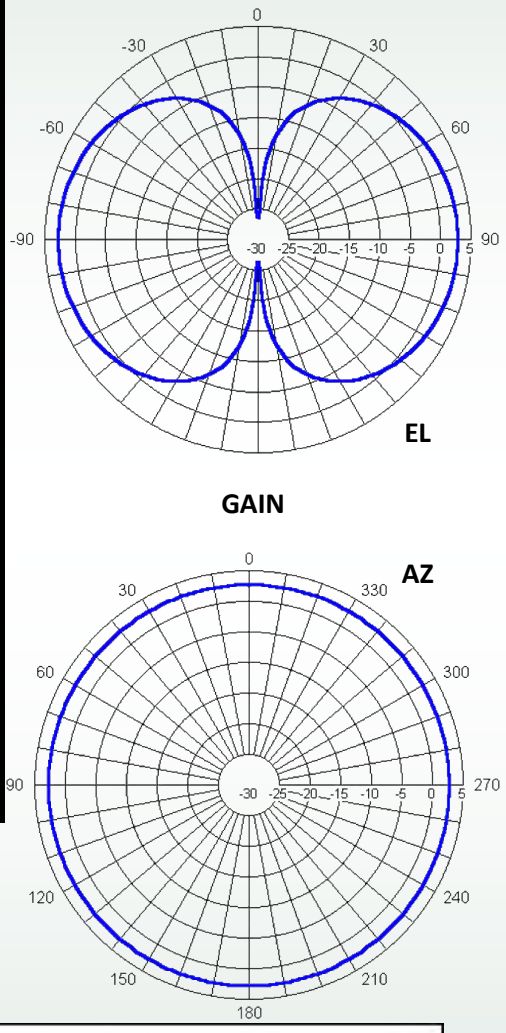
Parameter	Specification
Frequency	500-2000 MHz
Gain	4 dB (F_o)
Max. Power	100 Watts (CW)
Polarization	Linear (vertical)
VSWR	3.0:1 maximum
Beamwidth	360x85 degrees (F_o)
Dimensions	13 $^{19}/_{16}$” 3 $^{1}/_{4}$”
Weight	3.0 lbs.
Temperature	-40° to +50° C
Environment	Passes full 810 environmental shock,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

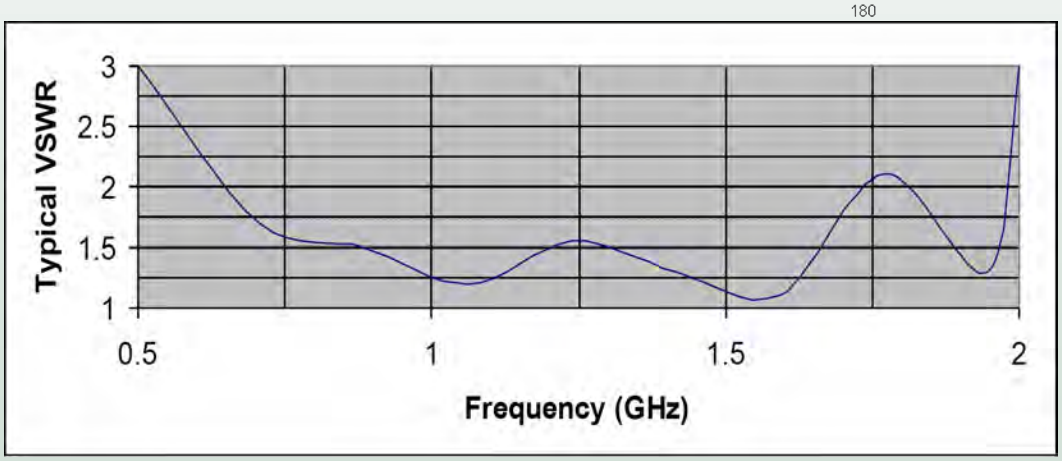
Omni-Directional Antennas

BM-03MM Wide-Band Electronic Warfare Antenna

The BM-03MM is a wide-band, small bi-conical transmit and 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.

Parameter	Specification
Frequency	500 to 2000 MHz
Gain	4 dB (F_o)
Max. Power	100 Watts CW
Polarization	Linear (vertical)
VSWR	3.0:1.0 (maximum)
Beamwidth	360x85 degrees (F_o)
Dimensions (Unit)	5 $^1/_2$"l x 5 $^1/_2$"w x 64 $^5/_6$"h
Dimensions (Antenna)	3 $^1/_4$"l x 3 $^1/_4$"w x 13 $^1/_2$"h
Weight	12 lbs.
Temperature	-40° to +50° C
Connector	Type N
Environments	Passes full 810 military environmental shock, temperature & vibration testing



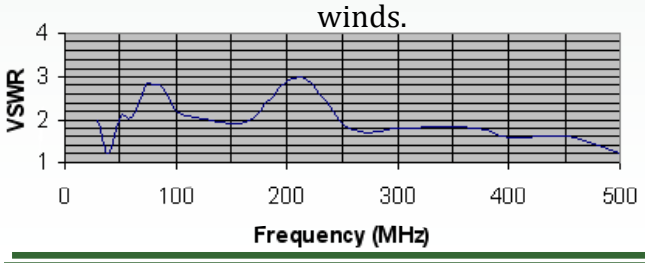


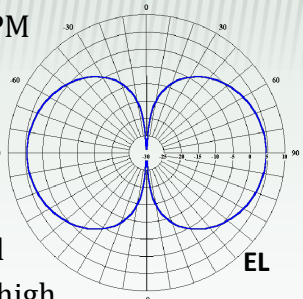
BM-03MM antenna shown mounted on an HMMWV

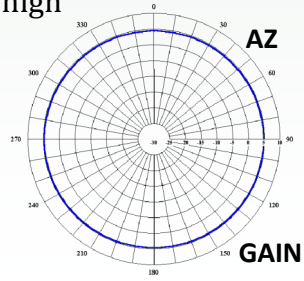
BM-04 Wide-Band Communications Antenna

BM-04 Antenna

The BM-04 is a wide band, electrically small biconical antenna designed to allow coverage of the VHF/FM communications band (30-88 MHz) without need for 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 within minutes. Guy kit included for outdoor operation in high winds.







BM-04 Electrical Specifications	
Frequency	30 to 500 MHz
Gain	4 dB (@ f_0)
Max. Power	1000 watts CW
Polarization	Linear (typically vertical)
VSWR	2.8:1 max (30-100 MHz) 3.0:1 max (25-1000 MHz)
Beamwidth	360x85 degrees (@ f_0)
Dimensions	72.5" x 38.2"
Weight	28.6 lbs
Temperature	-20° to +150° F
Winds	Up to 45 mph with guy kit option

BC-06r Wide-Band Communications Antenna

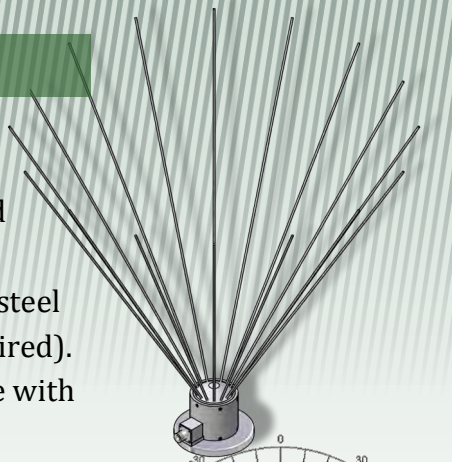
The BC-06r is a wide-band antenna is ideal for applications requiring a wide azimuth beamwidth but not omni-directional coverage. This small, mobile transmit and receive antenna is contained within a rugged, sealed fiberglass radome and can be provided with a magnetic mount for mobile applications (*available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

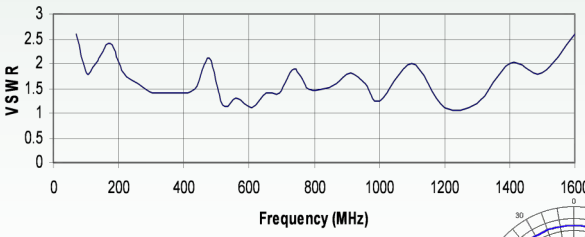
BC-06r Antenna

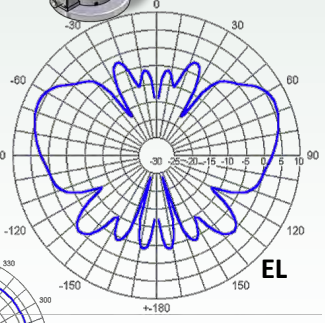
TC2700 Wide-Band Mobile Communications Antenna

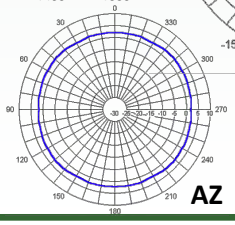
TC2700 Specifications	
Frequency	70 to 1600 MHz
Gain	4 dB
Max Power	100 Watts (CW)
Polarization	Linear (vertical)
VSWR	2.5:1 maximum (ground plane required)
Beamwidth	360° x 40° (@ f_0)
Dimensions	25” x 27”
Weight	3.9 lbs.
Temperature	-20° to +150° F
Winds	Up to 55 mph on smooth steel roof
Environmental	Commercial/industrial (mil spec version available)

The TC2700 is a 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.



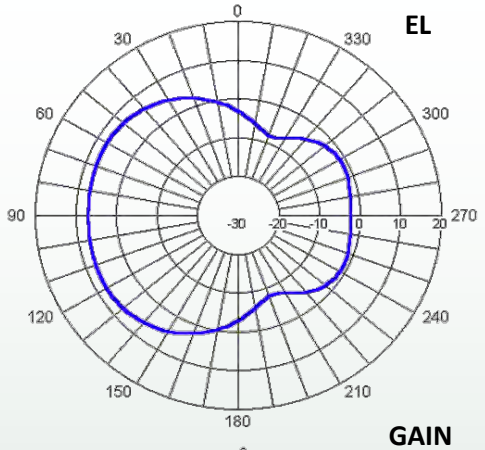






GAIN

Model	BC-06r-D-L	BC-06r-HP
Frequency	1.1 to 1.7 GHz	1.1 to 1.7 GHz
Gain	10 dB	10 dB
Max 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
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



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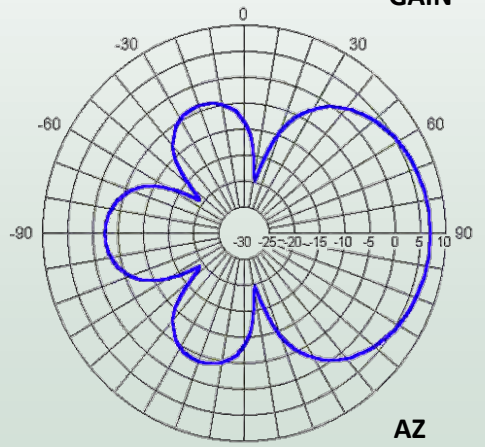
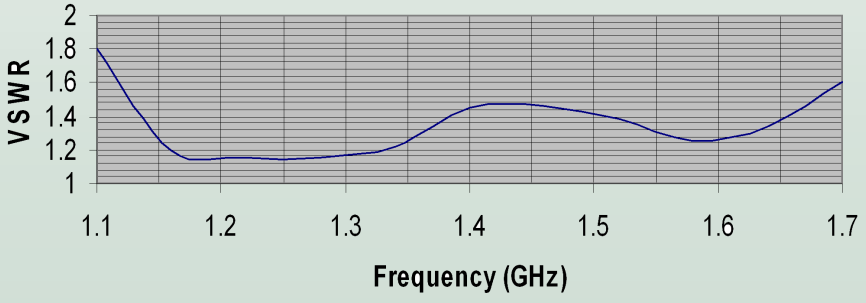




TMC Titan Wideband Electronic Warfare Antenna

TMC Design offers two new electronic warfare antennas for 2009; the **Titan V2** and **Titan V3**.

The TMC Titan V.2 antenna is a tri-band high-power omni-directional antenna with a wide bandwidth of 20 to 6000 MHz, divided among **three** bands.

The TMC Titan V.3 antenna is a dual-band high power omni-directional antenna with a wide bandwidth of 20 to 2000 MHz, divided among **two** bands.

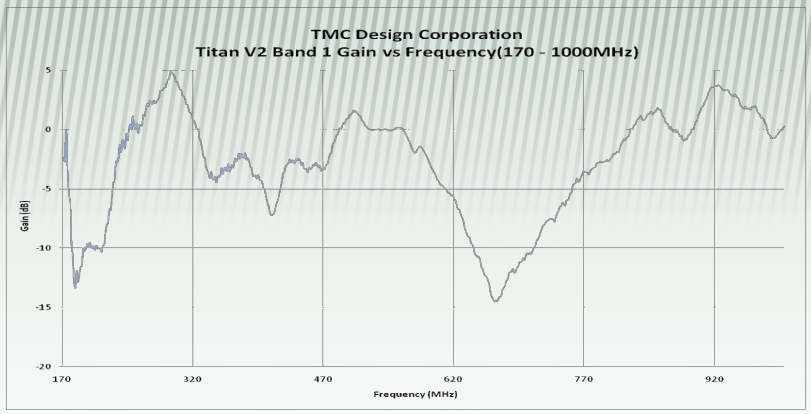
Both antennas are manufactured with sturdy radomes for ruggedized, outdoor use and are conveniently attached to a SINCGARS Antenna Vehicle Mount for easy deployment.

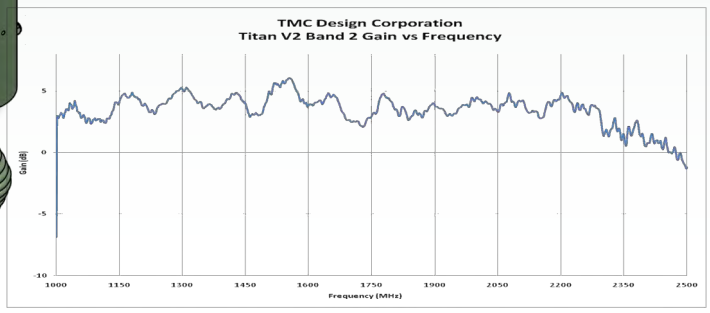
TMC Titan V2 undergoing chamber testing

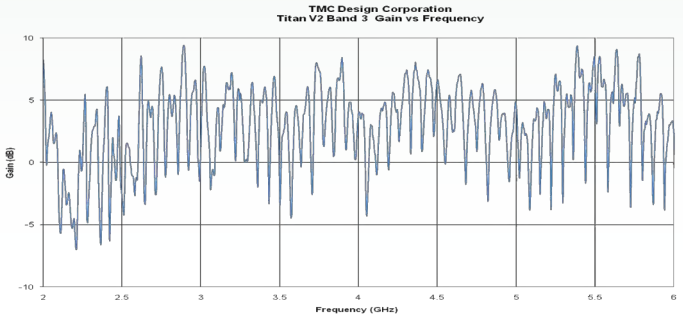
New TMC Titan antenna shown mounted on an HMMWV

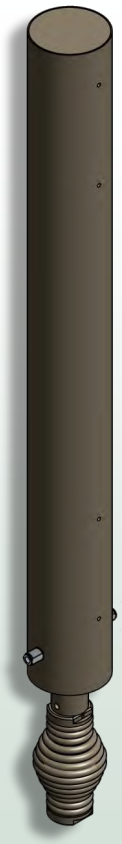
TMC Titan V2 Antenna

Parameter	Specification
Frequency	20—6000 MHz
Gain	0 dB avg.
Polarization	Linear, Vertical
HPBW	360° x 65°
Maximum Power	100 W, CW
Maximum VSWR	3.5:1
Connector	Type N (female)
Height	36.75"
Width	4"
Length	11"
Weight	5.25 lbs.

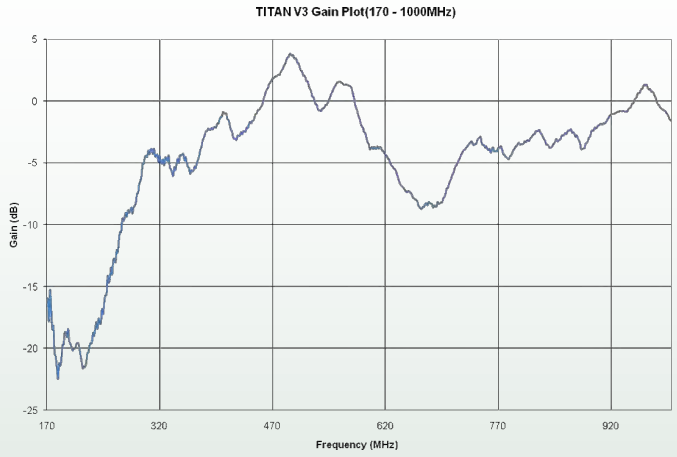


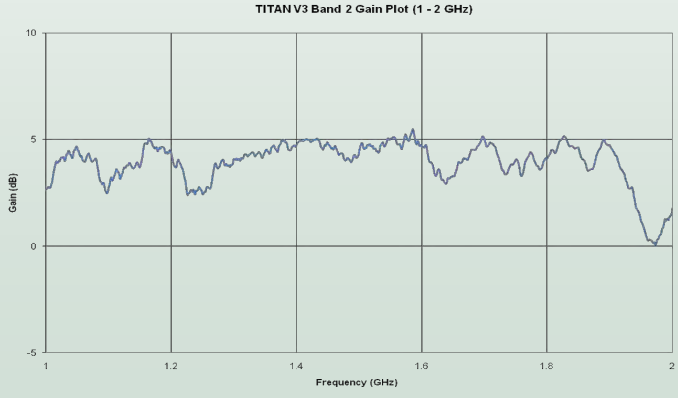






TMC Titan V3 Antenna





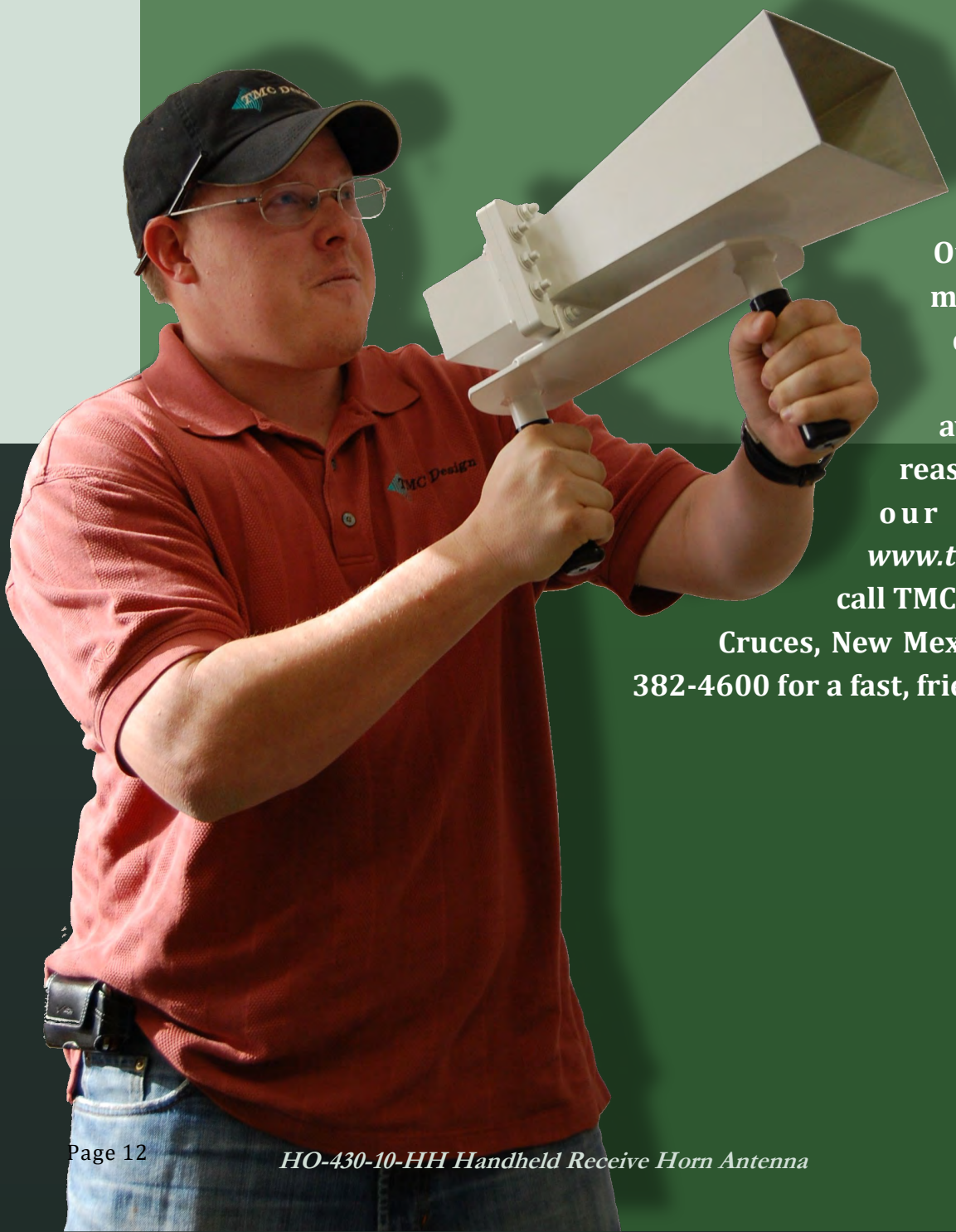
Parameter	Specification
Frequency	20—2000 MHz
Gain	0 dB avg
Polarization	Linear, Vertical
HPBW	360° x 65°
Maximum Power	100 W, CW
Maximum VSWR	3.5:1
Connector	Type N (female)
Height	36.75"
Width	4"
Length	11"
Weight	5.25 lbs.

DIRECTIONAL ANTENNAS

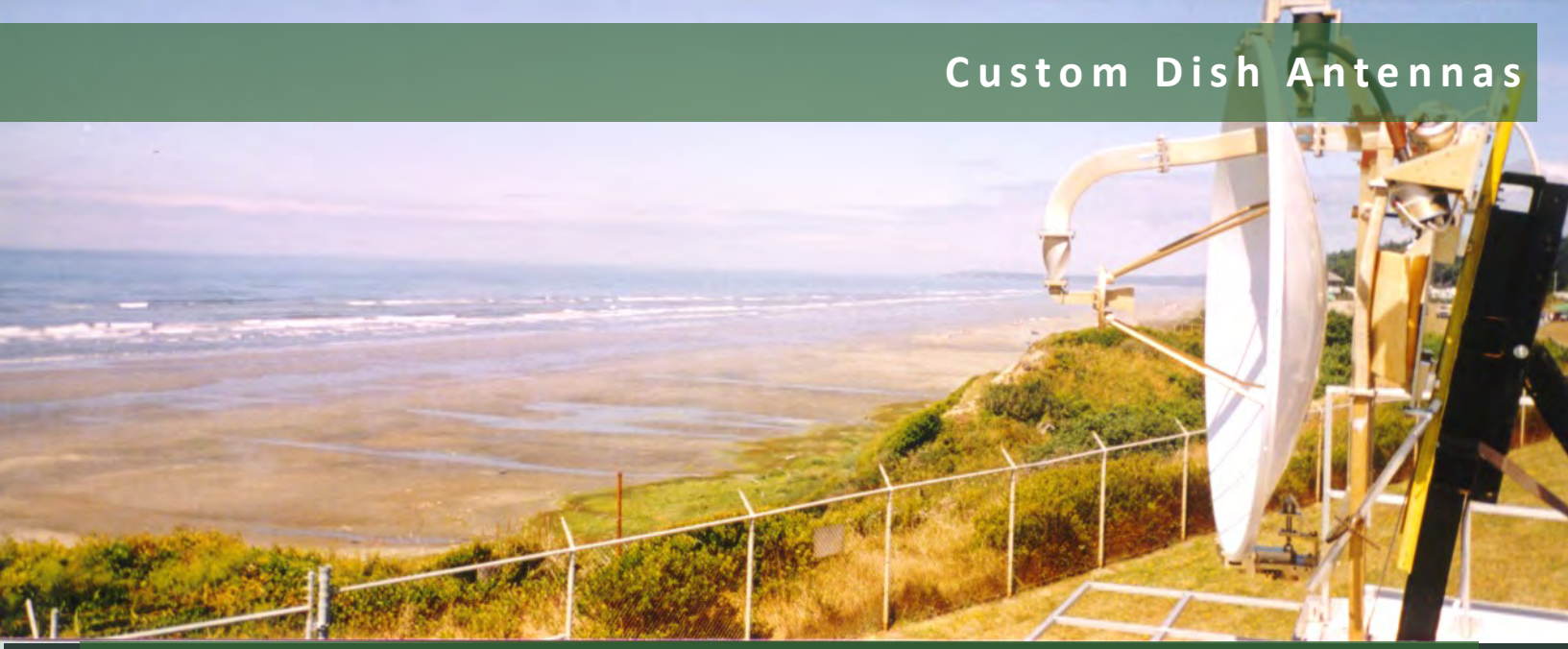
Directional Antennas are generally used for systems that require narrow beamwidth and highly directed energy. These narrow beam antennas can provide a large amount of energy over a small coverage area.

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

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



HO-430-10-HH Handheld Receive Horn Antenna



At TMC Design our dish antennas are custom designed and fabricated to 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.

BF-550-72 Dish Antenna

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.

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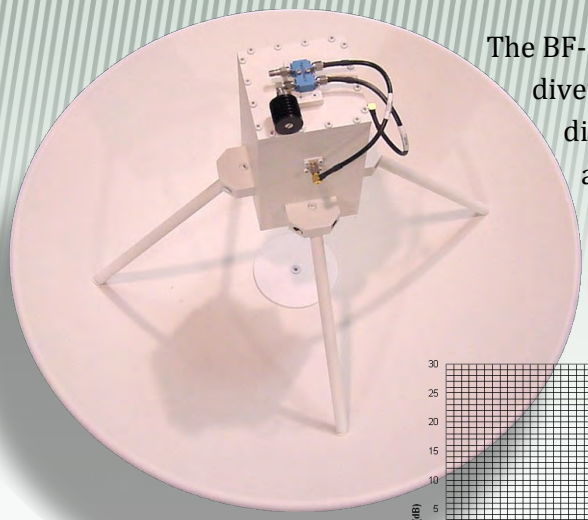
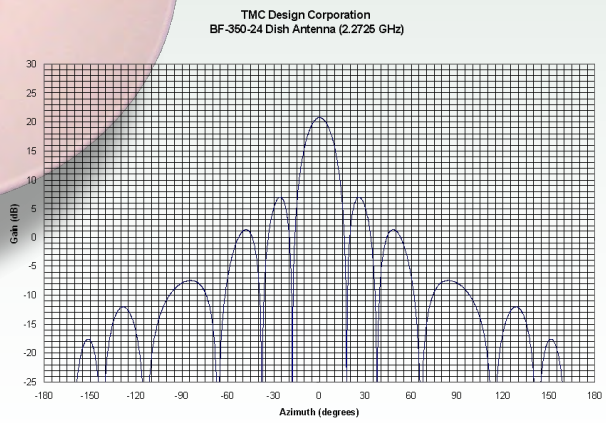
2009 Product Catalog

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.

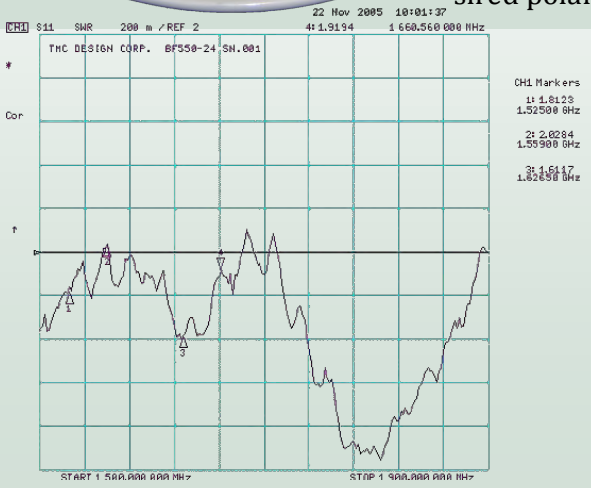
BF-350-24 Functional Specifications	
Frequency	2000 to 3000 MHz
Gain	18 dB
Max. Power	20 Watts CW
Polarization	Circular or Linear
VSWR	2.0:1 maximum
HPBW	15.4 Degrees
Dimensions	24" dia. x 16.5" h
Weight	5.25 lbs.



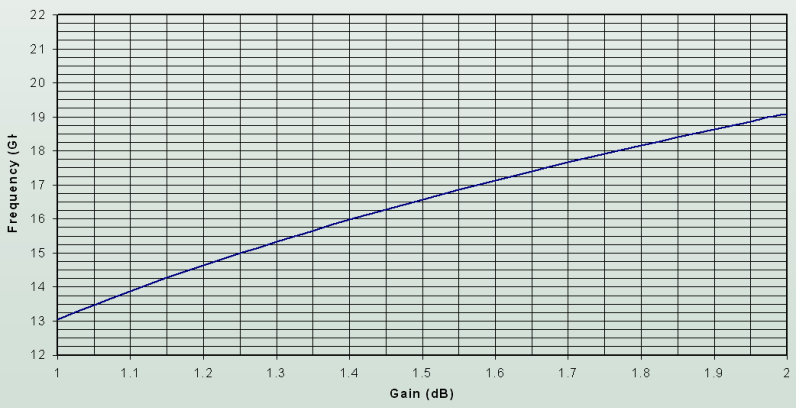
BF-550-24 Dish Antenna

The BF-550-24 antenna is an electrically superior, polarization-diverse dish feed with a 24" diameter prime-focus parabolic antenna that has been designed for operation in the 1400 to 2000 MHz range in any desired polarization.

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



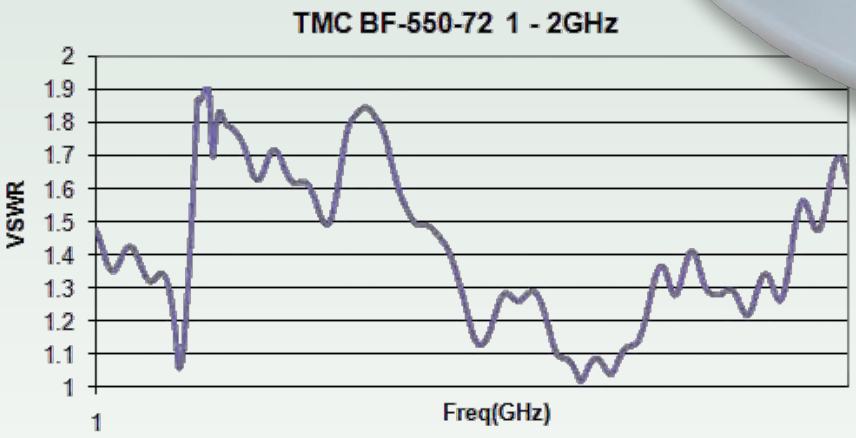
24" Dish with BF-550 (1.5 GHz)



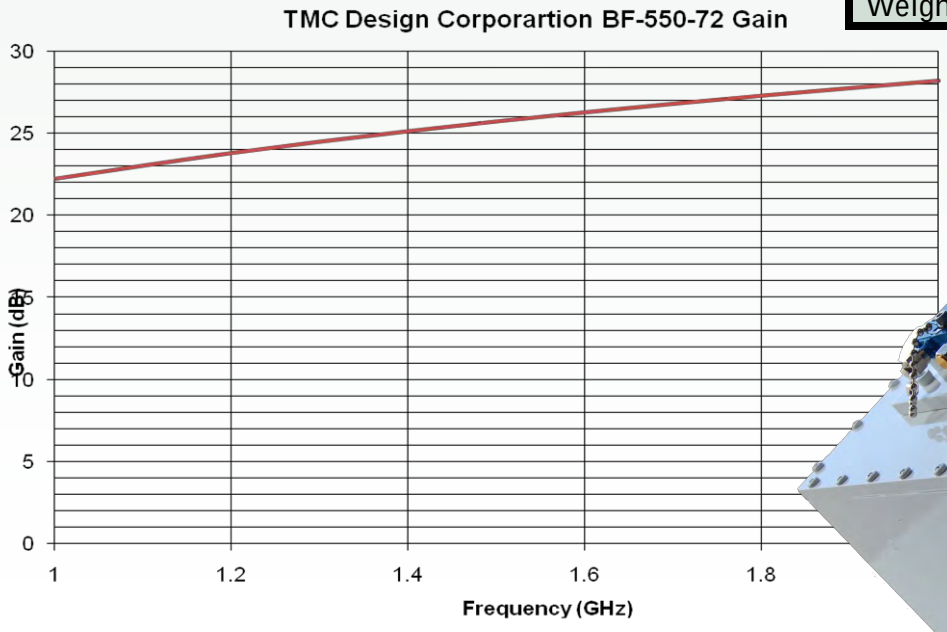
BF-550-72 Dish Antenna with Vari-Pol Feed

TMC Design's newest dish antenna, the BF-550-72, is an ideal directive L-band solution. This antenna's design includes a variable-polarized feed allowing it to operate in both linear or circular polarization.

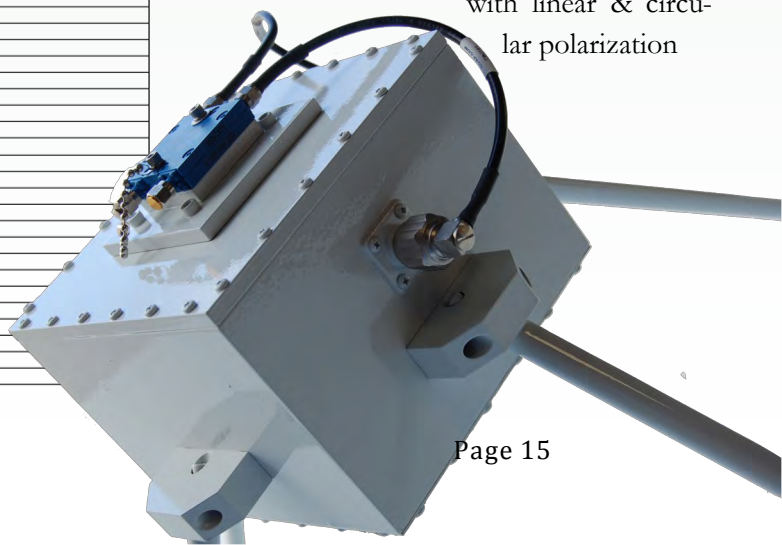
The dish feed has an approximate 72" diameter and comes in a variety of mounting options.



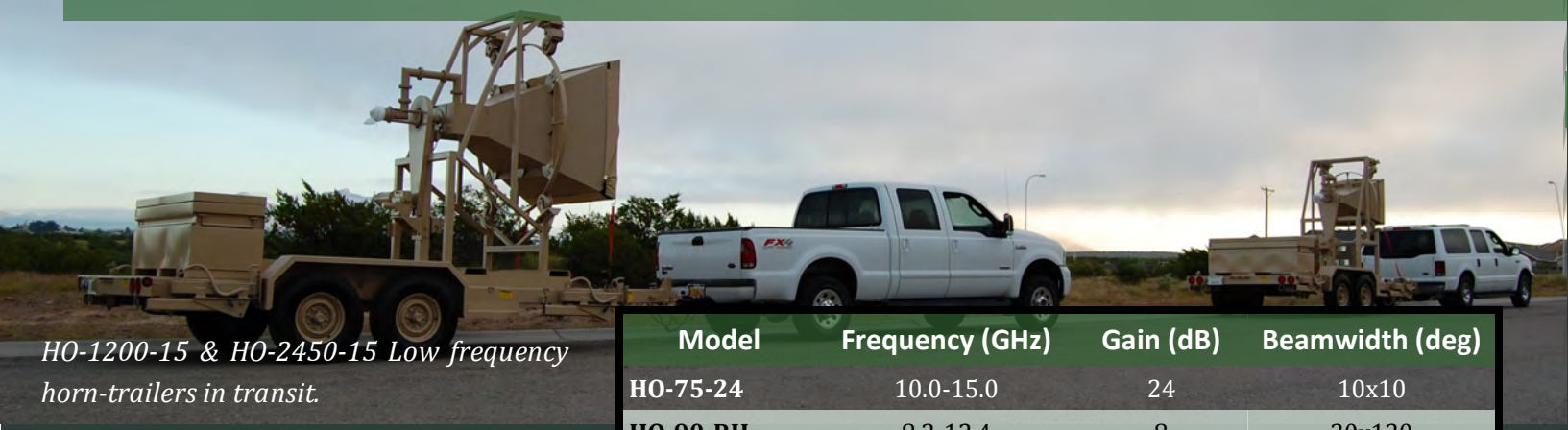
Parameter	Specification
Frequency	1—2 GHz
Gain	24 dBi @ 1.5 GHz
Polarization	Linear or Circular
HPBW	8.28°
Maximum Power	50 Watts
Maximum VSWR	2:1
Connector	SMA (Female)
Height	27"
Width	68"
Weight	20 lbs



The BF-550-72 box feed operates with linear & circular polarization



Optimum Gain Horn Antennas



HO-1200-15 & HO-2450-15 Low frequency horn-trailers in transit.

TMC Design Corporation offers optimum gain horn antennas covering the frequency spectrum from 150 MHz to 18.00 GHz in wave guide bandwidths.

These antennas offer high gain capability in a very durable design. Many models are available with optional tripod mounts. Lower frequency horns also have highly portable designs with removable side panels.

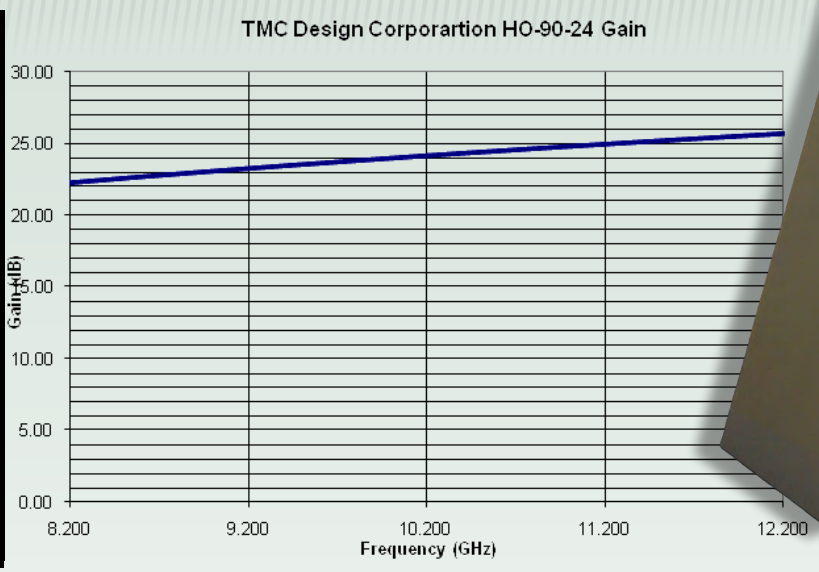
TMC Design's newest antenna trailer, the HO-4925-13 Horn Antenna, operates in the 150 to 229 MHz range

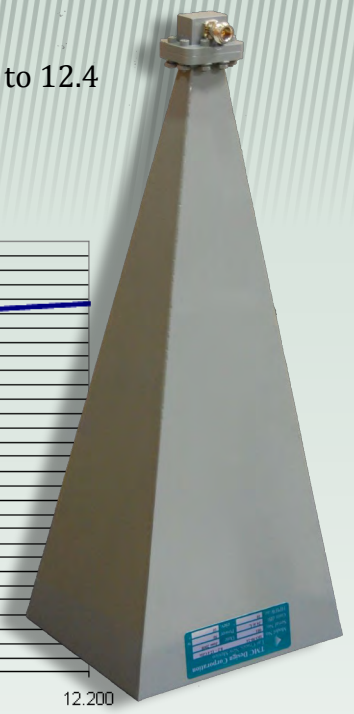
Model	Frequency (GHz)	Gain (dB)	Beamwidth (deg)
HO-75-24	10.0-15.0	24	10x10
HO-90-RH	8.2-12.4	8	30x120
HO-90-S	8.2-12.4	10	30x90
HO-90-18	8.2-12.4	18	20x20
HO-90-20	8.20-12.40	20	15x15
HO-90-24	8.20-12.40	24	10x10
HO-112-RH	7.05-10.00	8	30x120
HO-112-S	7.05-10.00	10	30x90
HO-112-18	7.05-10.00	18	20x20
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-430-10-HH	1.70-2.60	10	44x72
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
HO-1200-15	.615-.940	15	30x30
HO-2450-15	.301-.460	15	30x30
HO-4925-13	.150-.229	13	44x44

HO-90-24 Horn Antenna

The HO-90-24 antenna is a small, high-power directional antenna that covers the 8.2 to 12.4 Ghz range.

Parameter	Specification
Frequency	8.2 – 12.4 GHz
Gain	24 dBi
Polarization	Linear
HPBW	10° x 10°
Maximum Power	50 watts, CW
Maximum VSWR	1.5:1
Connector	Type SMA
Height	20.5"
Width	8.5"
Length	6"
Weight	2 lbs.

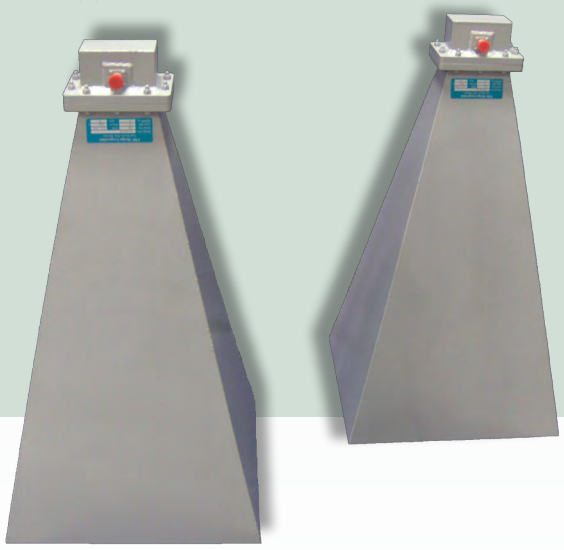




HO-430-18 Horn Antenna

The HO-430-18 is a medium-sized, high-power horn antenna designed to operate from 1.7 to 2.6 GHz.

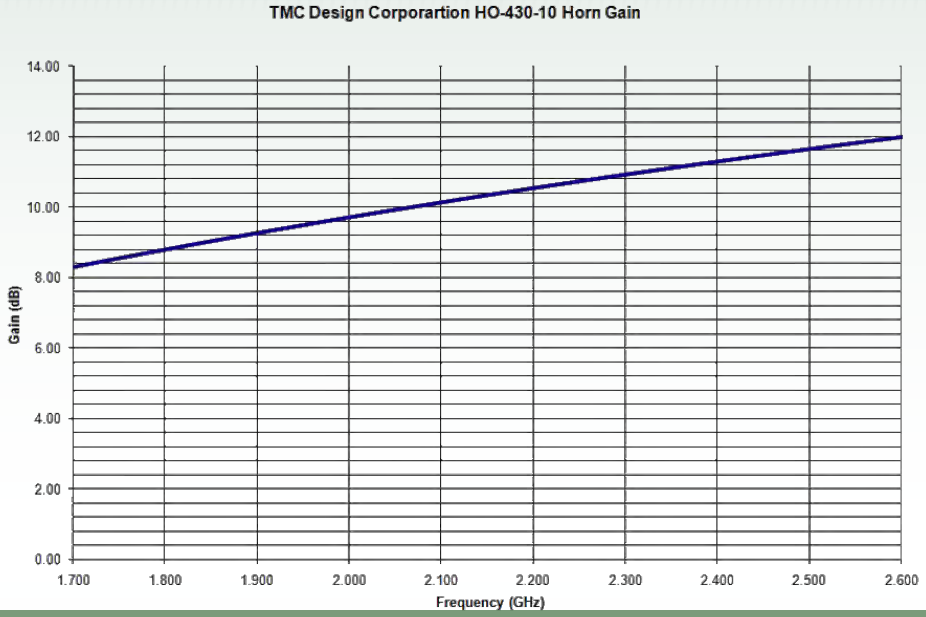
Parameter	Specification
Frequency	1.7 – 2.6 GHz
Gain	18dBi typical
Polarization	Linear
HPBW	20°
Maximum Power	1000 watts, CW
Maximum VSWR	2:1
Connector	Type N
Height	16"
Width	18"
Length	30"
Weight	16 lbs.



HO-430-10-HH S-Band Direction Finding Antenna

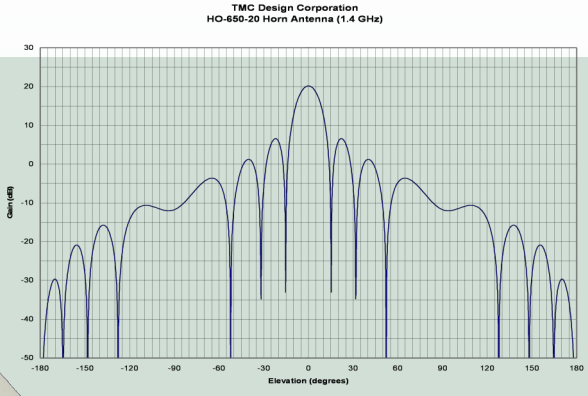
The TMC HO-430-10-HH antenna is the latest addition to our hand held direction-findin g (DF) antennas. This S-Band DF antenna is ideal for testing or real-life DF scenarios. The antenna is mounted on two ergonomic grips for easy handling and quick results.

Parameter	Specification
Frequency	1.7—2.6 GHz
Gain	10 dBi @ Fo
Polarization	Linear (Vertical)
HPBW	44° x 72°
Maximum Power	Receive Only
Maximum VSWR	2:1
Connector	Type N(Female)
Height	14”
Width	4.1”
Weight	2 lbs

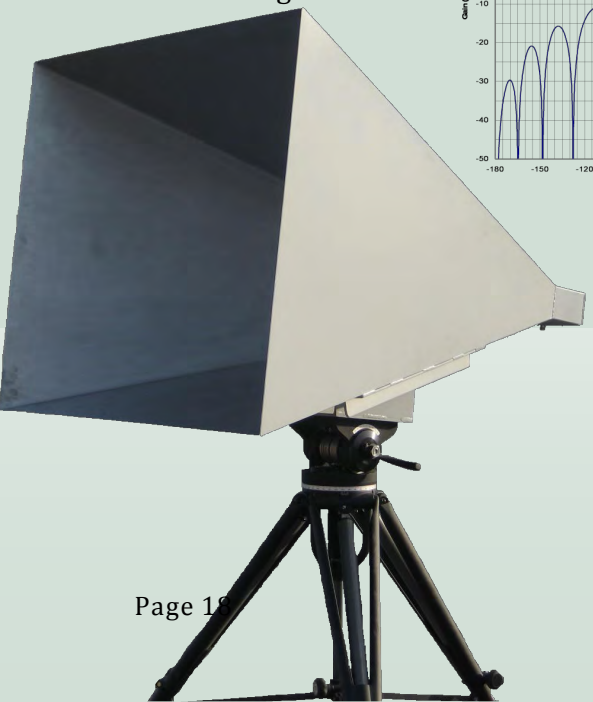


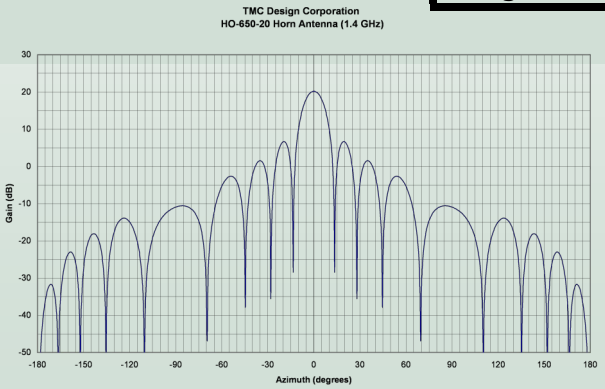
HO-650-20 Horn Antenna

The HO-650-20 is a large horn antenna designed to operate in the 1.12 to 1.70 GHz range.



Parameter	Specification
Frequency	1.12 – 1.7 GHz
Gain	20dBi* typical
Polarization	Linear
HPBW	15°
Max. Power	500 watts, CW
Max. VSWR	2:1
Connector	Type N
Dimensions	36"h x 38.5”w x 58.5”l
Weight	47 lbs.





Low-Frequency Horn Antenna Trailers

TMC Design's latest horn antennas operate at lower frequencies, covering the 150 to 940 MHz range. These antennas are mounted on ruggedized, military-grade trailers for easy positioning and maneuverability.

The trailers are capable of travel over roads and highways at speeds up to 55 MPH and come with four (4) stow-able stabilizer jacks. In addition, all trailer models come with weather-proof storage cases with 24.5 ft³ carrying capacity.

Horn trailers also come with a rotary system which allows users to operate the antenna in either linear or horizontal polarization.

HO-1200-15

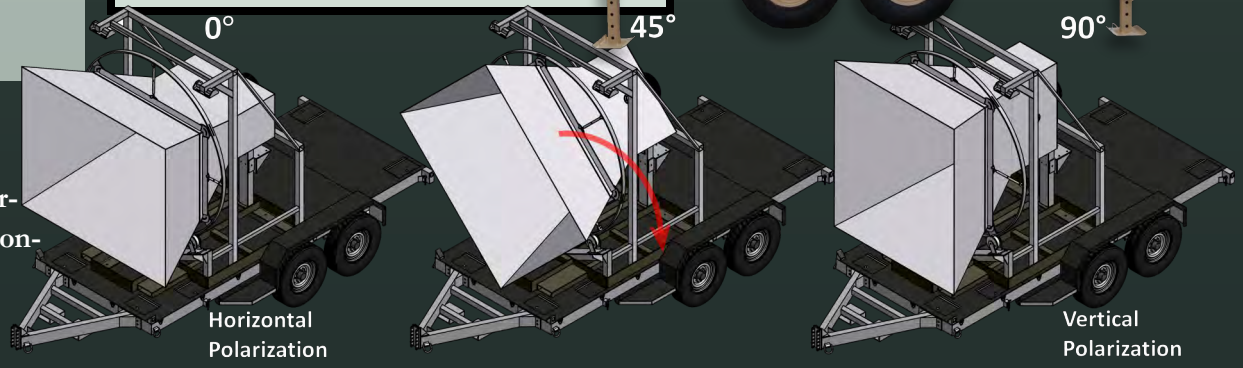
Parameter	Specification
Frequency	615 to 940 MHz (Optimal)
Gain	15 dBi @ 770 MHz
Polarization	Linear (Horizontal/Vertical)
HPBW	30°az x 30°el
Max Power	15 kW, CW
Max VSWR	1.6:1
Connector	3 1/8 " EIA Flange
Dimensions	44"h x 44"w x 37"l

HO-2450-15

Parameter	Specification
Frequency	301 to 460 MHz (Optimal)
Gain	15 dBi @ 380 MHz
Polarization	Linear (Horizontal/Vertical)
HPBW	≈ 30°az x 30°el
Max Power	15 kW, CW
Max VSWR	1.6:1
Connector	3 1/8 " EIA Flange
Dimensions	63"h x 69"w x 57.5"l

HO-4925-13

Parameter	Specification
Frequency	150 to 229 MHz (Optimal)
Gain	13 dBi @ 190 MHz
Polarization	Linear (Horizontal/Vertical)
HPBW	≈43.6°az x 43.7°el
Max Power	15 kW, CW
Max VSWR	1.6:1
Connector	3 1/8 " EIA Flange
Dimensions	83"h x 96"w x 80"l



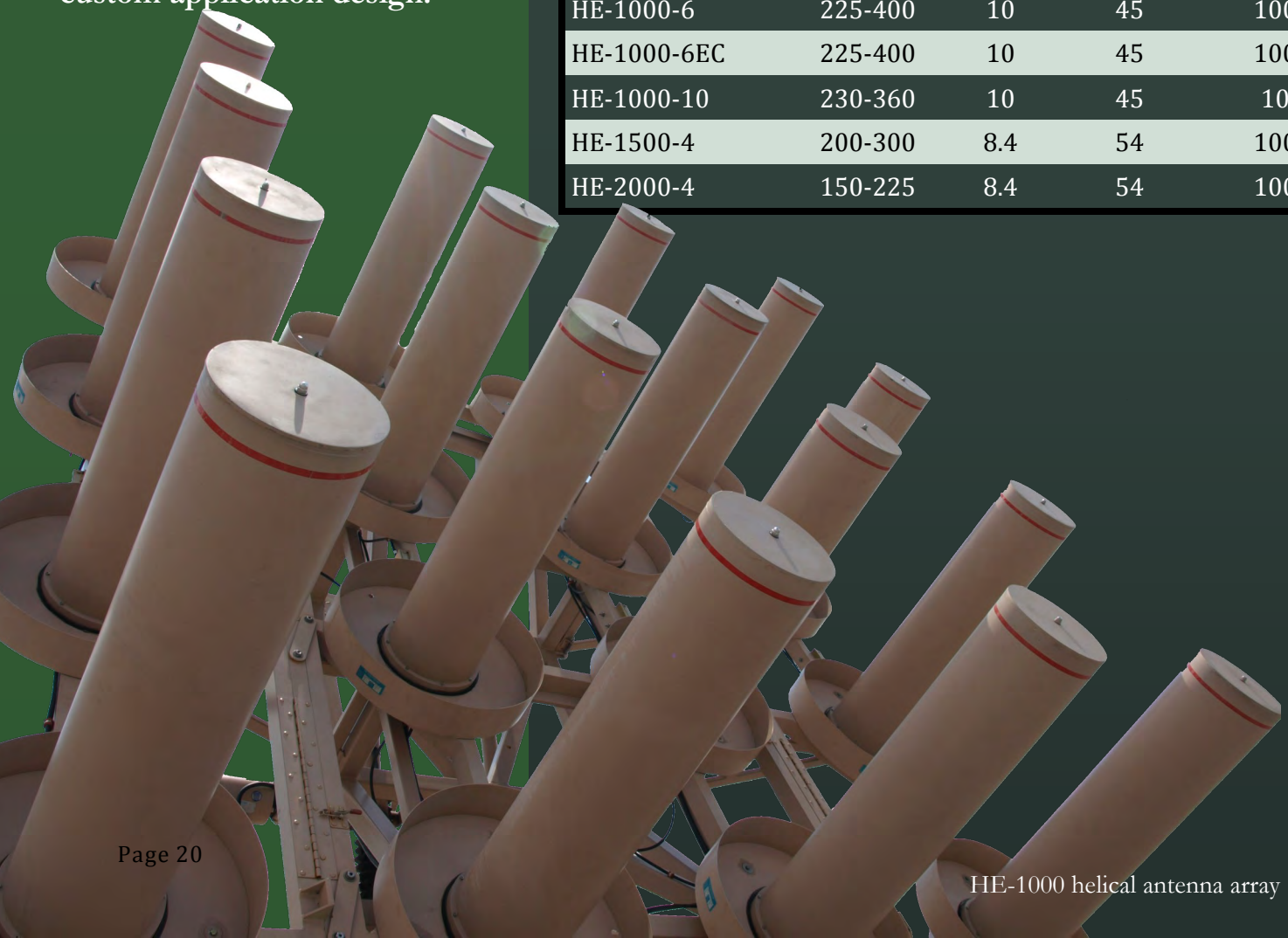
Low frequency horn trailer rotary systems allow antennas to operate in vertical or horizontal polarization

Helical Antennas

HE-0238-13 GPS Antenna

Available helical antennas provide continuous coverage from 100 MHz to 6000 MHz (6 GHz) in both left or right hand circular polarization. All helical models can be manufactured in either military or commercial grades. Contact us for more information on delivery and custom application design.

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-0238-165-HH	1200-1600	15	27	-
HE-0300-8	1000-1500	11.4	38	200
HE-0500-10	480-880	10	45	100
HE-1000-6	225-400	10	45	1000
HE-1000-6EC	225-400	10	45	1000
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-1000 helical antenna array

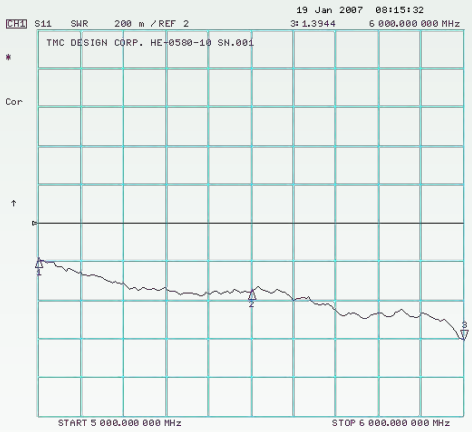
HE-0238-165-HH Handheld Direction Finding (DF) Antenna

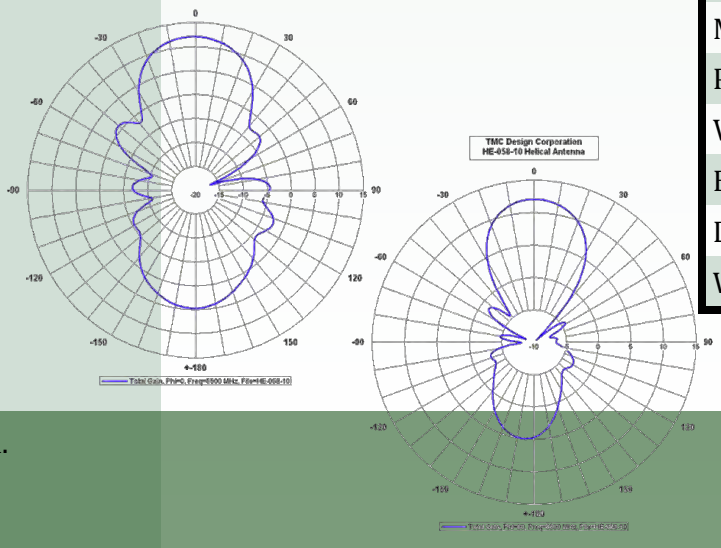
The HE-0238-165-HH is a handheld directional finding antenna. Used by multiple government entities, this antenna is constructed entirely out of aircraft certified 6061-T6 aluminum and G-10 fiberglass within a 100% sealed radome and will provide many years of quality and reliable service in the field. Previous models have achieved a 2:1 VSWR across the band. Antennas come packaged with shoulder straps and a mounted magnetic compass.

Parameter	Specification
Frequency	1.2 to 1.6 GHz
Gain	15 dBi (@F_o)
Polarization	RHCP
VSWR	2:1 Maximum
Beamwidth	27 degrees (@F_o)
Dimensions	7” x 35”
Weight	5.25 lbs.

HE-0580-10 Small Helical Antenna

The HE-0580-10 is a high-power, right-hand circular-polarized (RHCP) heavy 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.





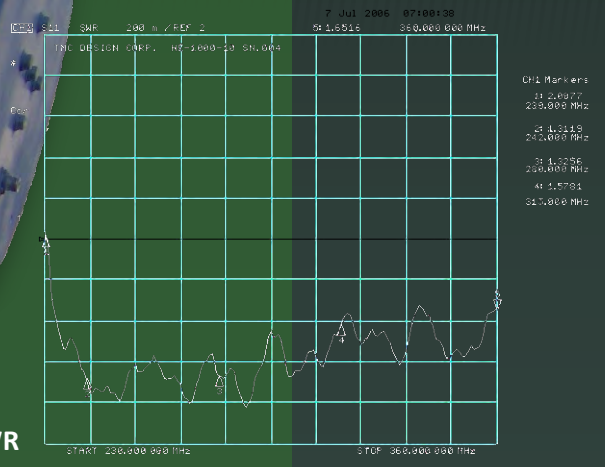
Parameter	Specification
Frequency	5.0 to 6.0 GHz
Gain	~11.75 dBiC (F_o)
Maximum Power	200 Watts CW
Polarization	RHCP
VSWR	1.8:1 maximum
Beamwidth	35° x 35° F_o
Dimensions	5.0” length x 4.0” dia.
Weight	8 oz.

TMC Design CORPORATION

2009 Product Catalog

HE-1000 Series Helical Antennas

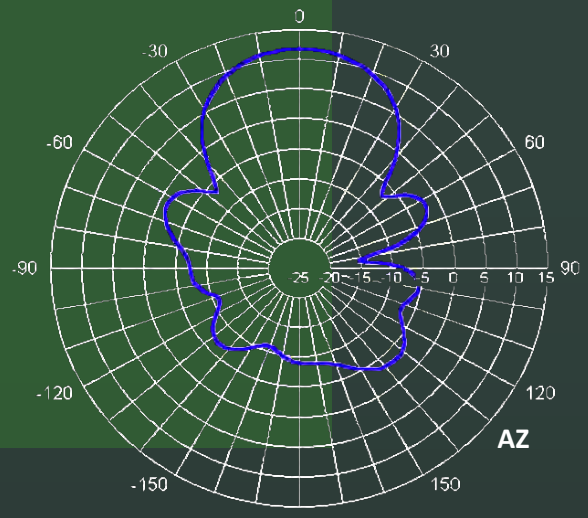
HE-1000-10 Helical Antenna



VSWR

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 in 100% sealed radomes.

Antennas 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.



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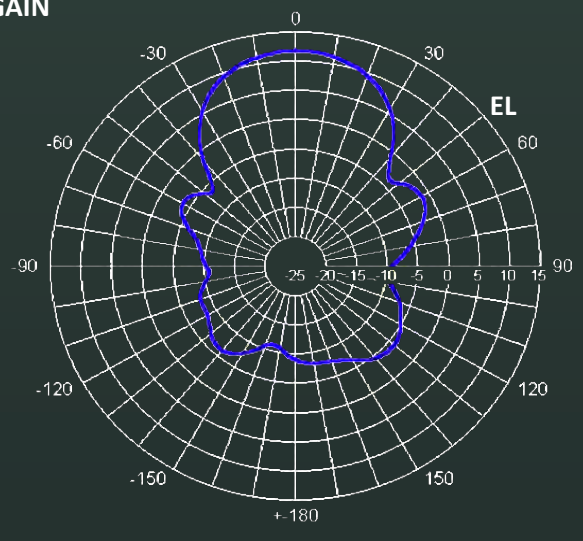


HE-1000 Series Functional Specifications		
Model	**HE-1000-6EC**	**HE-1000-10**
Frequency	225-400 MHz	230-360 MHz
Gain	10 dB	
HPBW	45 deg.	
Polarization	LHCP or RHCP	RHCP
VSWR	1.9:1 maximum	1.5:1 maximum
Max. Power	1000 Watts	
Weight	43 lbs.	45 lbs.
Dimensions	50.00” x 28.00”	52.68” x 30.00”
Connectors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

Log Periodic Antennas

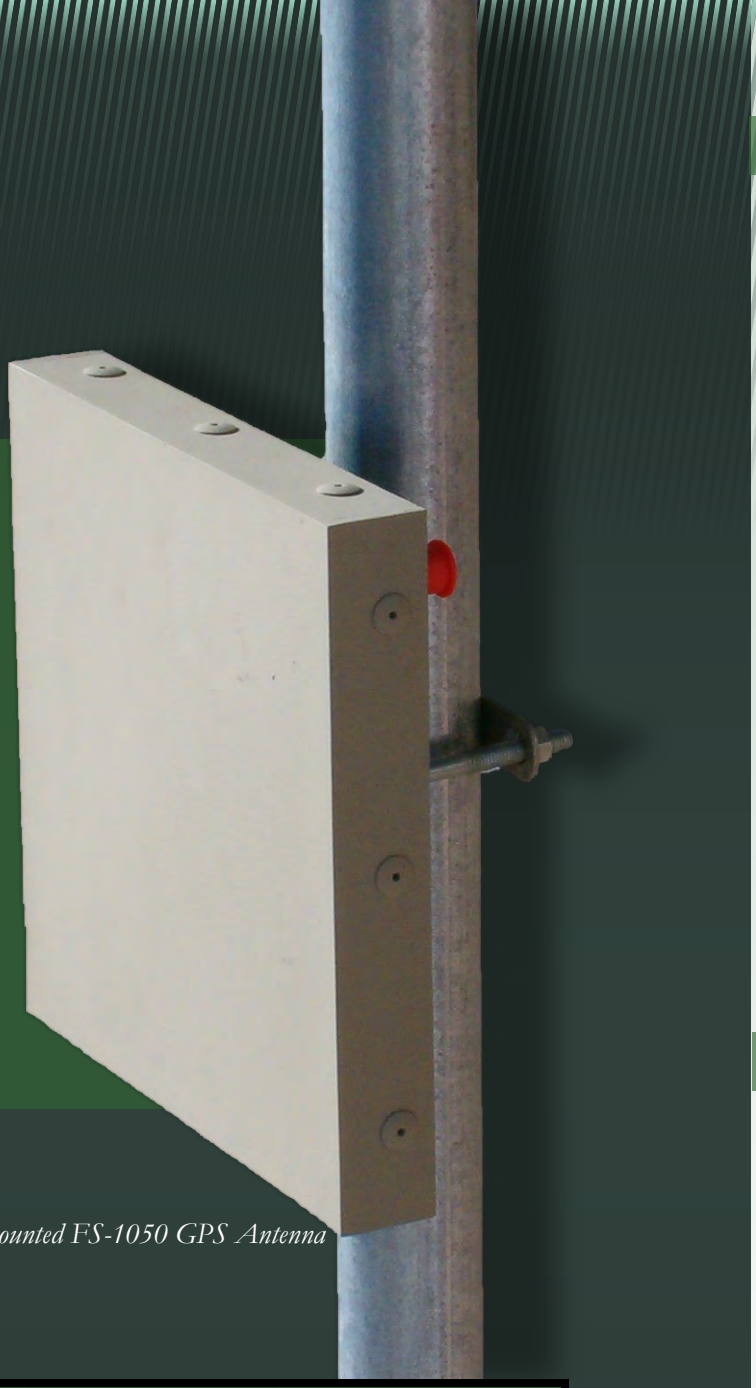
LP-0300 Antennas

TMC Design Corporation has many years of 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.

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

GPS ANTENNAS

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.



Mounted FS-1050 GPS Antenna

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
HC-238-13	1.2—1.6 GHz	15.5	30	500
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

DS-0300 Disk Spiral Antenna

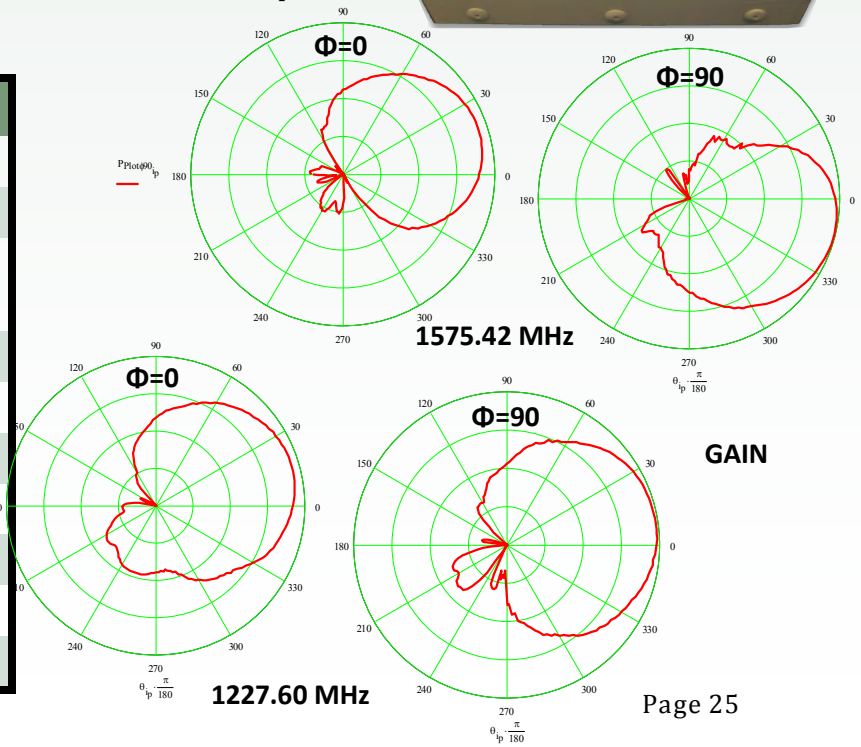
The DS-0300 is a wide band, small biconical spiral transmit/receive antenna contained within a rugged, sealed epoxy-glass radome. The result is an exact threat representative antenna in a robust package with standard N Type connectors. The antenna is available in a high-powered version and a wide variety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

DS-0300 Functional Specifications	
Frequency	1.2 to 1.6 GHz
Gain	2.39 dBiL
Max Power	50 Watts (CW), high power version available
Polarization	Linear (typically vertical)
VSWR	1.5:1 typical, 2.0:1 maximum
Beamwidth	360x90 degrees (@ f_0)
Dimensions	4.0” x 3.0” x 3.0”
Weight	2.2 lbs.
Temperature	-20° to +150° F
Connector	Type N (other types available)

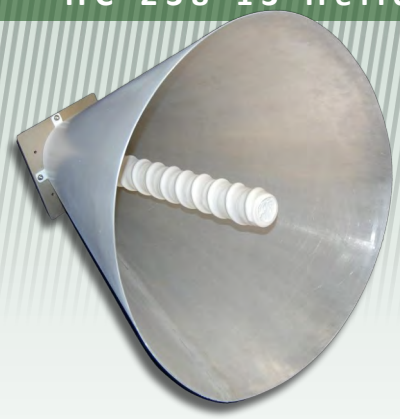
FS-1050 RHCP GPS Antenna

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 an internal modulator and amplifier to operate as a stand- alone jammer system.

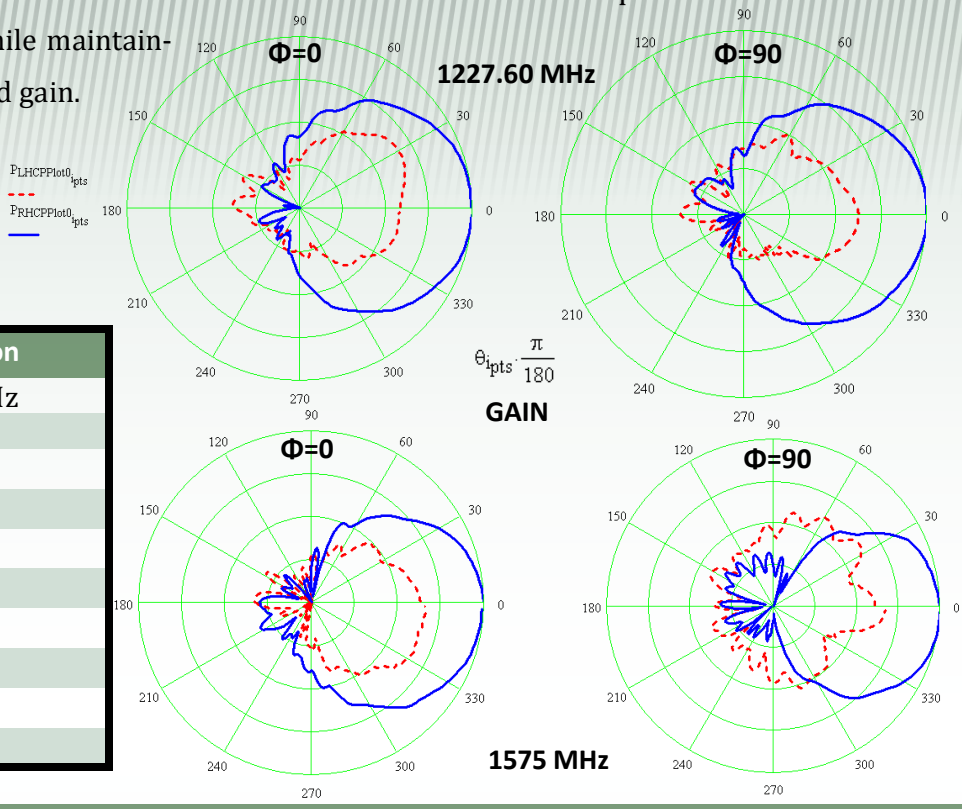
FS-1050 Functional Specifications	
Frequency	1.2 to 1.6 GHz
Gain	7 dBiC
Max Power	25 Watts (CW), high-power version available
Polarization	RHCP
VSWR	1.5:1 typical, 2.0:1 maximum
Beamwidth	65x65 degrees (@ f_0)
Dimensions	11.0” x 11.0” x 3.0”
Weight	5.25 lbs
Temperature	-20° to +150° F
Connector	Type N (other types available)



HC-238-13-Helicone Antenna

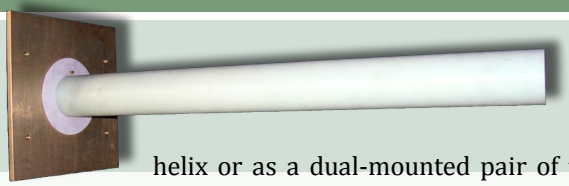


The TMC HC-238-13 antenna is a high-power L-Band helicone antenna that uses a helix-conical horn combination. This combination provides low sidelobe levels while maintaining a solid gain.

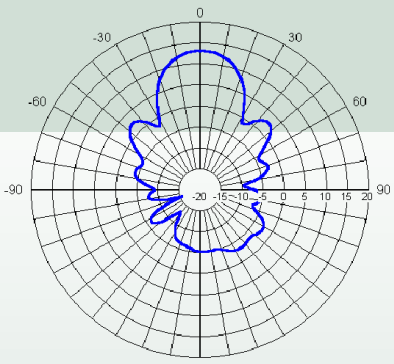


Parameter	Specification
Frequency	1200—1600 MHz
Gain	15.5 @ Fo
Polarization	RHCP
HPBW	30°
Maximum Power	500 W, CW
Maximum VSWR	2:1
Connector	Type N(female)
Height	23.5"
Diameter	24.5”"
Weight	17 lbs

HE-238 Series Helical Antennas



The HE-238 is a high power, wide band, severe duty antenna for both military and commercial applications. They are available as a single helix or as a dual-mounted pair of tower-mounted antennas. 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.



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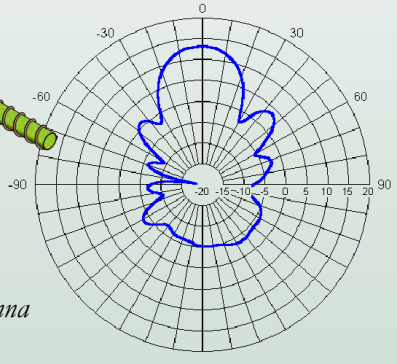
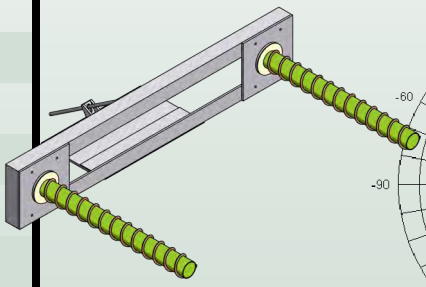


Model	HE-238-8	HE-238-10	HE-238-13
Frequency	1.2 to 1.8 GHz		
Gain (see plots)	10.5 dB	11.5 dB	13 dB
Maximum Power	500 Watts		
Polarization	RHCP		
VSWR	2:1 maximum		
Beamwidth	40°	35°	30°
Weight	21 lbs. (dual mount)		
Azimuth Movement	360° (with rotator)		
Elevation Movement	-15° to +15°, manual		



Dual mounted HE-238 antenna options are available

JAMMING SYSTEMS

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. Whether you need a single high-quality , mil-spec EW system or a thousand a month, Our facilities ready to meet your EW needs.

Wireless Bomb Jammer v3.0 multi-output jammer with USB programmable I/O Box

TMC Design Wireless Bomb Jamming Systems and EW antennas

Wireless Bomb Jammer (WBJ)

WBJ v1 with Controller Card

System Highlights

- Active jammer with continuous or hop operation modes
- 8 analog spots each adjustable in frequency, bandwidth & power level
- 40 digital spots with multiple digital modulations
- 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

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.

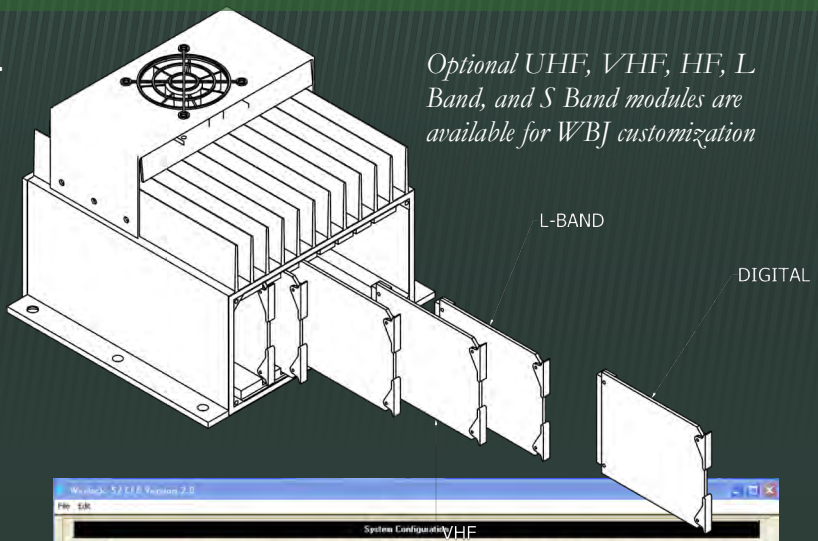
The Wireless Bomb Jammer (WBJ) counters these threats by blocking the controlling signal sent to the bomb from the remote detonator while still maintaining blue force communications.

The WBJ will provide 360° coverage around a vehicle. Setting up multiple systems strategically in convoys will effectively provide complete coverage.

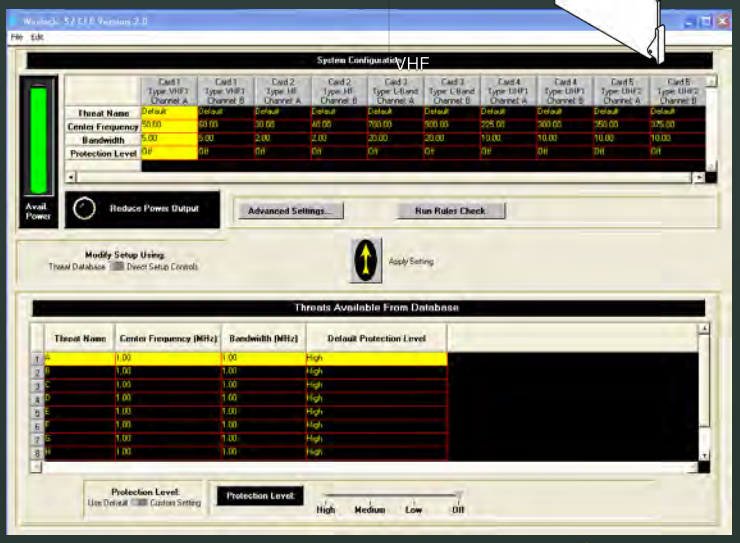
TMC Design offers a variety of Wireless Bomb Jammers which provide proven protection against current threats for single vehicle applications. Units outfitted in every vehicle will provide coverage for large convoys and smaller two (2) or three (3) vehicle parties.

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.

The intuitive WBJ setup software allows users to setup, calibrate and test units before deployment. All that is needed to use the software is a laptop computer and an RS-232 communications cable.



Optional UHF, VHF, HF, L Band, and S Band modules are available for WBJ customization



WBJ v1

TMC Design's original **WBJ** system is a field proven system that has been used by U.S. military forces.

Ordered systems can be factory–modified to operate with specifications that best fit customer requirements.

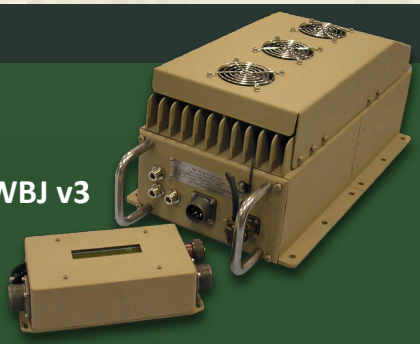
Units come with an I/O box power plug, power cable, communications cable, documentation, operating software and omni-directional EW antenna.

WBJ v2

The **V2 WBJ** unit was originally designed to quickly upgrade existing V1 unit capabilities. Using upgrade components, V1 units can be reassembled to operate with expanded power and coverage capability within minutes.

Added features include an expanded threat handling capability (GPS, sawtooth & H2K) and added power for extra coverage.

Upgrade kits or complete V2 units are available for purchase.



WBJ v3

WBJ-V3 jamming systems provide an increased simultaneous-threat handling capability over its V1 and V2 counterparts. Three RF output connections are available for wideband coverage at multiple frequency bands.

I/O boxes included with the V3 system are USB accessible and have an LCD readout panel. These boxes are also available for use with V1 and V2 systems.

Micro GPS Jammer (MGJ)

The MGJ is an 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 designed for use as a transportable system, resulting in a product that is lightweight, portable and robust.

Parameter	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

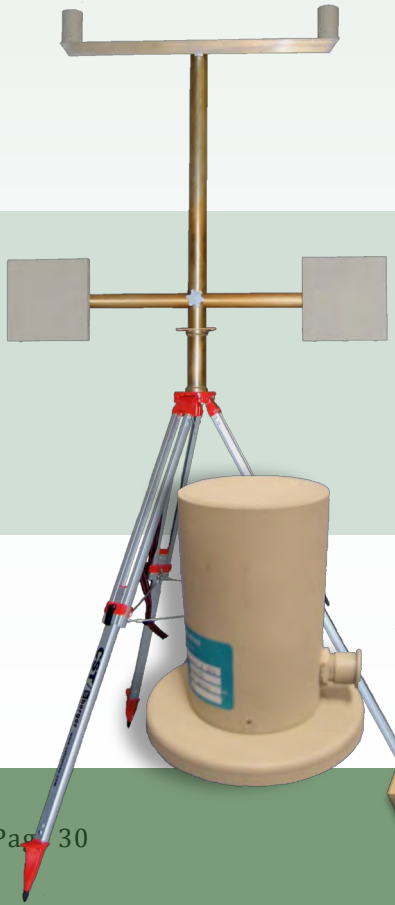
The MGJ has two RF outputs for simultaneous broadcast at 1575 and 1227 MHz.

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 system package includes four (4) antennas that operate within the GPS frequency range and a quick-deploy tower for rapid site setup and 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**

TAVIA-32 Emulator

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

TMC Design's goal during design and fabrication of this system was 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 and assembled using stainless steel hardware. Features include operation that exactly emulates the threat system without additional frequencies which can cause great difficulty obtaining frequency clearance. The unit can be provided as a modulator or with a variety of amplifier options.

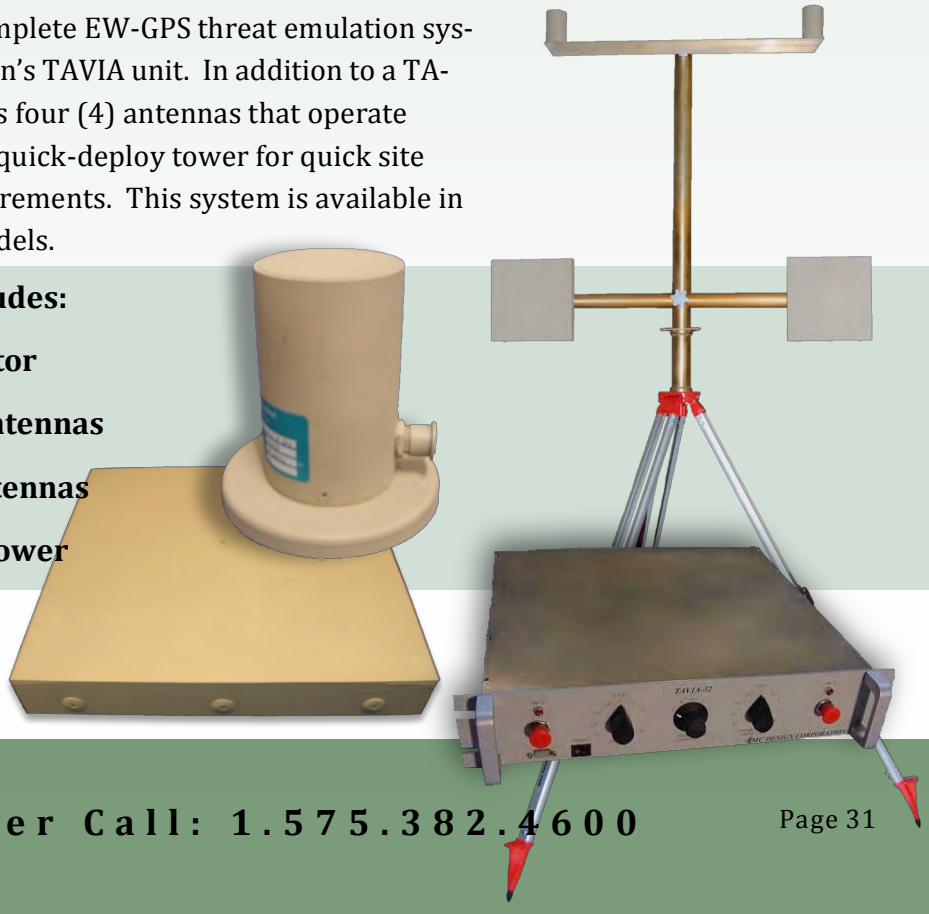
Parameter	Specifications
Stability	±10 KHz after 2-minute warm-up
No. of Channels	2 (L1 & L2)
RF Modes	Gold Code
Blink Modes	Selectable duration and period
Output Bandwidth	2.048 MHz
BPSK Modulation	All 32 Gold Codes
Output Power	+0 dBm
Dimensions	19" x 16" x 3.5"
Weight (typ.)	12.5 lbs
Operating Temperature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

TAVIA System

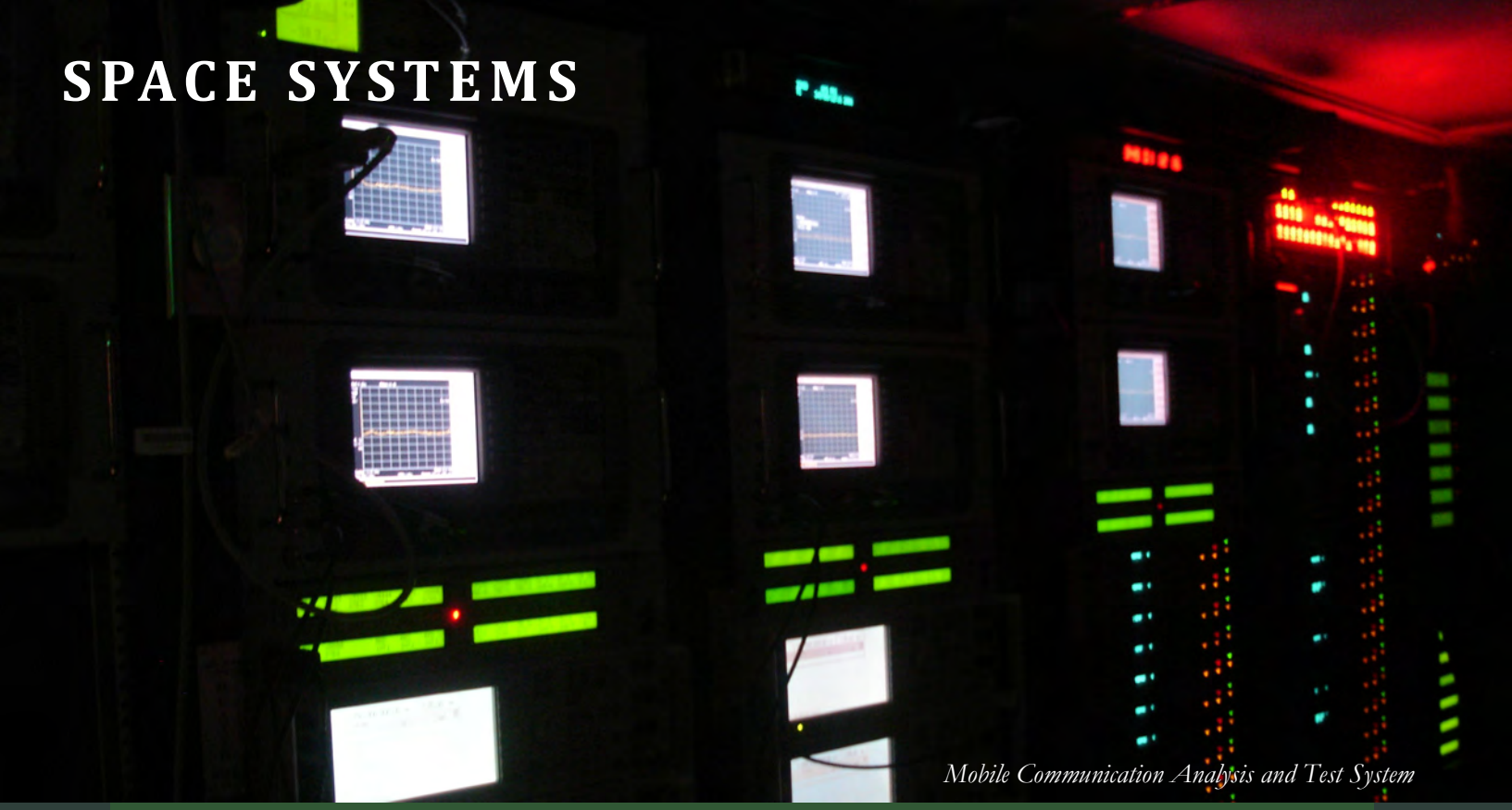
The TAVIA System is available as a complete EW-GPS threat emulation system that is centered around TMC Design's TAVIA unit. In addition to a TAVIA-32 emulator, this package includes four (4) antennas that operate within the GPS frequency range and a quick-deploy tower for quick site setup and teardown 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**



SPACE SYSTEMS

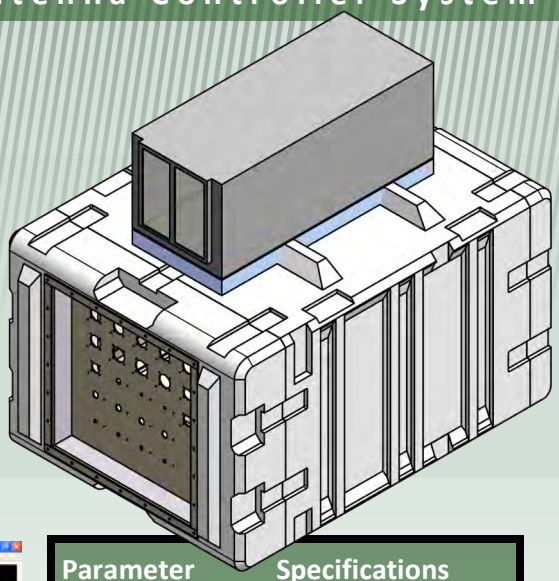


Mobile Communication Analysis and Test System

TMC Design specializes in Space Control systems design and production. We offer the latest industry solutions in Offensive Counterspace, Defensive Counterspace and Space Situational Awareness. Many of our space systems are in use at locations around the world. Our newest Space Operations Center, located in Colorado Springs, CO, provides training, quick reaction support and a hands-on approach for our existing systems.

TMC Design's latest 2.4 m Light Tactical SATCOM trailer design has been created as a lighter and more portable alternative to the TMAT Systems (pp. 34) to address cases where mobility is a requirement

Antenna Controller System



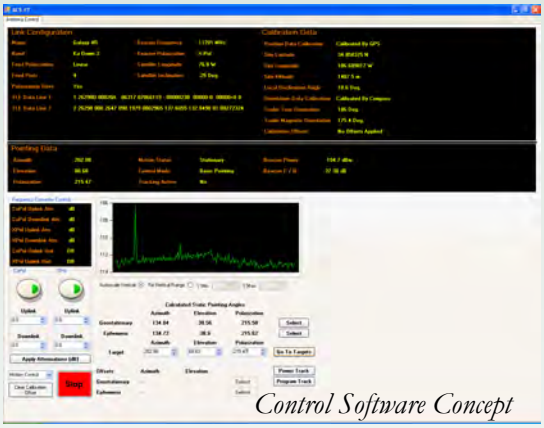
The **Antenna Controller System** contains an equipment suite of the latest satellite communications tools to perform remote tracking, signal testing and signal monitoring functions.

All equipment is contained within a rugged 32” x 27” x 38” container, fitted with a small air conditioner for use in extreme and isolated environments.

The system has been designed to simplify setup and configuration. All equipment connections (RF, data and power) are made along the back of the container. Internal can be controlled with a connected PC containing the custom control software.

System Features

Satellite Tracking



Control Software Concept

The Antenna Controller System offers two methods for space vehicle tracking. The system can move with the satellite by periodically measuring signal strength or it can move the antenna based on previously saved data (without taking measurements). The Antenna Controller System is also equipped to control motorized antennas for automatic and remote positioning.

Parameter	Specifications
Height (max)	32”
Width	27”
Length	38”
Power	110 VAC
Connectors	RJ45
	RS485
	MIL-C-5015 Cyl.
	BNC
	N-Type
	SMA

Signal Testing

The system contains a satellite bypass feature that performs L, C, X, Ku and Ka uplink/downlink frequency translation internally. Terminal output from the Antenna Controller System can then be fed to downlink monitoring equipment. This design can be utilized for loop-back testing or any other application that requires minimal amplitude and delay time.

Inside the Antenna Controller System

Signal Monitoring

Monitored events can be recorded through the custom software for post-process analysis and playback.

TMC Design CORPORATION

2009 Product Catalog

Tactical Multiband Antenna Trailer System (TMATS)

TMC Design's Tactical Multiband Antenna Trailer System (TMATS) is a mobile, ground-based Space Earth Terminal containing the latest in satellite tracking and communications technology. TMATS systems have been tested (undergoing DSCS Certification process) and fielded; units are currently in use by multiple government entities.

The system offers the best available answer to the rigors of military service. TMATS are extremely versatile and capable of operating in extreme environments while satisfying stringent functional requirements.

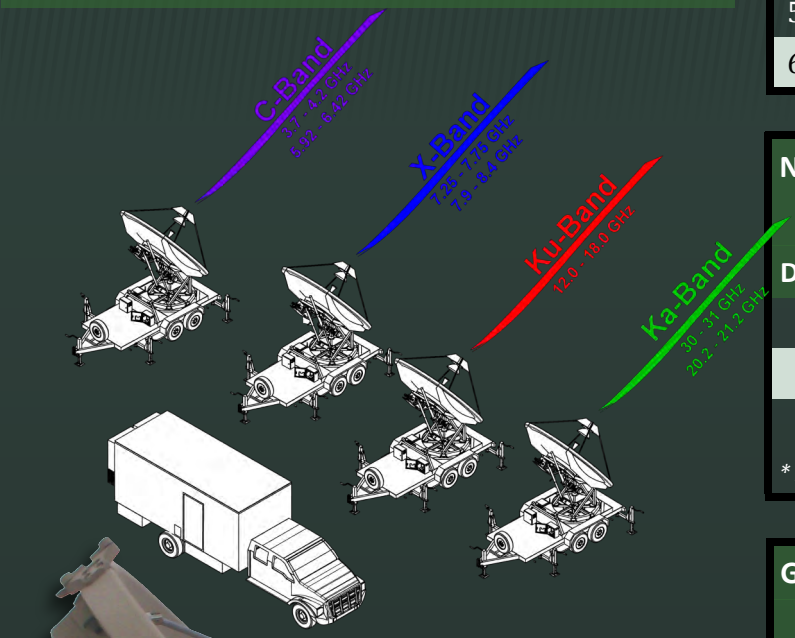
TMATS units are designed to be capable of travel by multiple means while meeting Federal safety requirements. This includes travel over highways, unimproved roads, air and rail transport.

TMATS can operate in a wide variety of environments and continue operations in adverse weather conditions. TMATS's external surfaces are powder coated and painted to prevent rust and scratches from outside elements such as rain, hail, snow and heavy winds

TMATS can be controlled remotely through software that allows operators to perform major or minor position adjustments of the pedestal-mounted aperture and track satellites through various schemes such as peak-power and programmed tracking.

Models are available with 3.7, 4.2 and 4.7 meter mounted apertures. 3.7 m apertures operate in C, X and K_u frequency bands, while the 4.2 and 4.7 m antennas will allow trailers to use SHF bands (K and K_a)

The versatile TMATS has been designed to operate as a self-contained system that can individually locate and track space vehicles or seamlessly work in conjunction with other TMATS systems or another TMC Design satellite-based system



Antenna Gain @ Feed Output Flange (dBi)							
C		X		K_u		K_a	
Freq	Gain	Freq	Gain	Freq	Gain	Freq	Gain
3.625	41.7	7.25	47.2	10.70	50.6	20.2	55.7
4.200	43.0	7.75	47.6	12.75	51.9	21.2	56.2
5.850	46.1	7.90	47.7	13.75	52.5	30.2	59.2
6.425	46.6	8.40	48.4	14.50	53.1	31.2	59.5

Noise Temperature*							
C		X		K_u		K_a	
Degree	Temp	Degree	Temp	Degree	Temp	Degree	Temp
10	49	10	78	10	67	10	69
30	41	30	63	30	53	30	56
50	38	50	61	50	50	50	53

** Noise Temperature is of the antenna at the noted elevations*

G/T Rates†			
C	X	K_u	K_a
22.17	24.57	30.78	32.85

† Calculated with standard RF transmit receive packages

Effective Isotropic Radiated Power (EIRP) (dbw)‡			
C	X	K_u	K_a
73.85	75.65	80.35	86.00

‡ Calculated with standard RF transmit package and a 750 W TWTA

Environmental	
Operating Temp	-40°F to +125°F
Sustained Winds	45 MPH (max)
Wind Gusts	65 MPH (max)
Max Altitude	Up to 10,000 ft.

Army 4.2 meter TMATS

TMC Design
CORPORATION

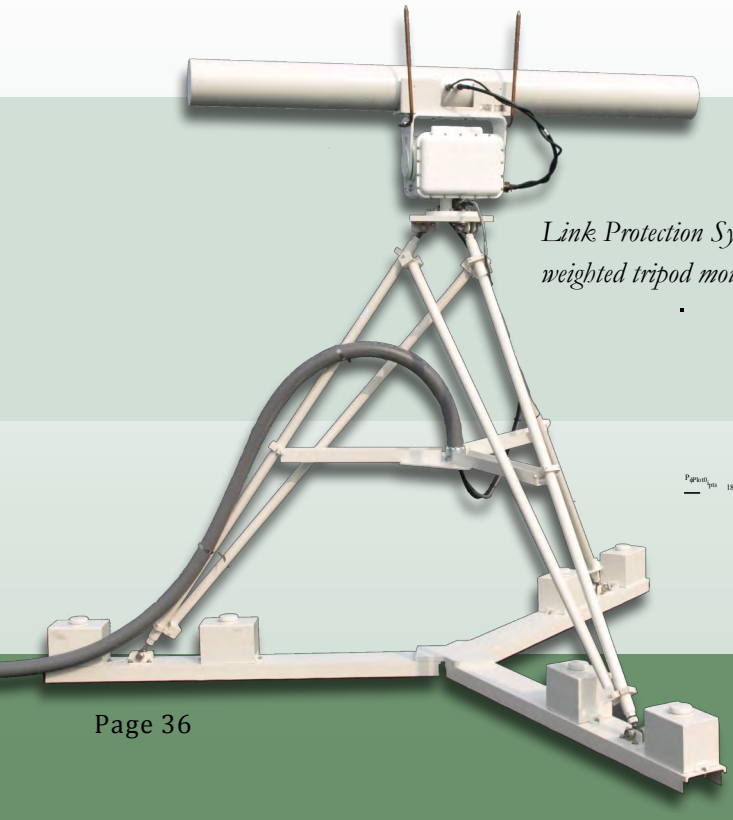
Environmental Electromagnetic Link Protection System

The S-band Space-Ground Link Subsystem (SGLS) detects Radio Frequency Interference (RFI) from the 2200-2300 MHz spectrum range. This system effectively detects RFI coming from either ground based or low altitude signal sources. Once detected, the system is capable of saving the reference time and duration of occurrence. It also locates the direction of the interfering source and records and measures the impact on a downlink signal.

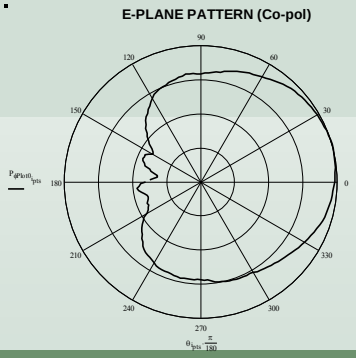
Multiple systems have been procured by the Air Force and are currently operating at eight of their facilities all over the world.

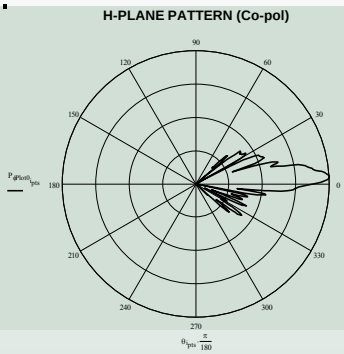
A typical system setup will contain:

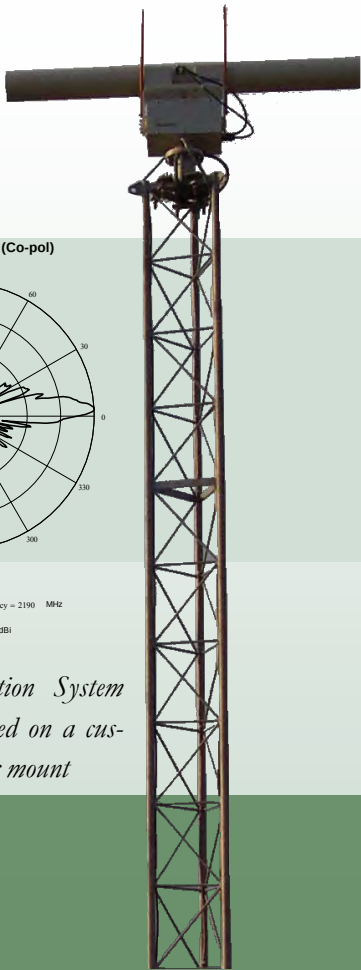
- a slotted wave guide antenna
- a 360 degree continuous rotating pedestal
- a rugged tripod mount (most mounts are designed to withstand up to 145 mph wind speeds)
- an equipment rack equipped with spectrum analyzing equipment and software



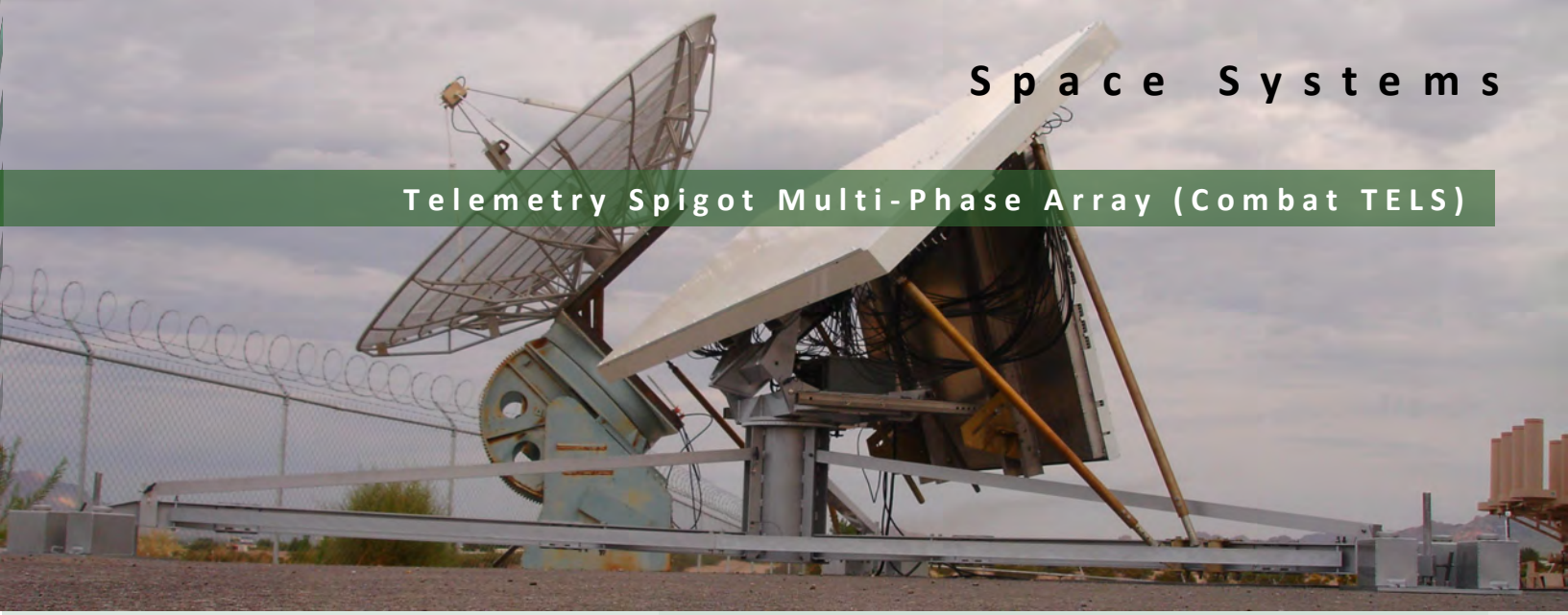
Link Protection System with a weighted tripod mount







Link Protection System shown mounted on a customized tower mount

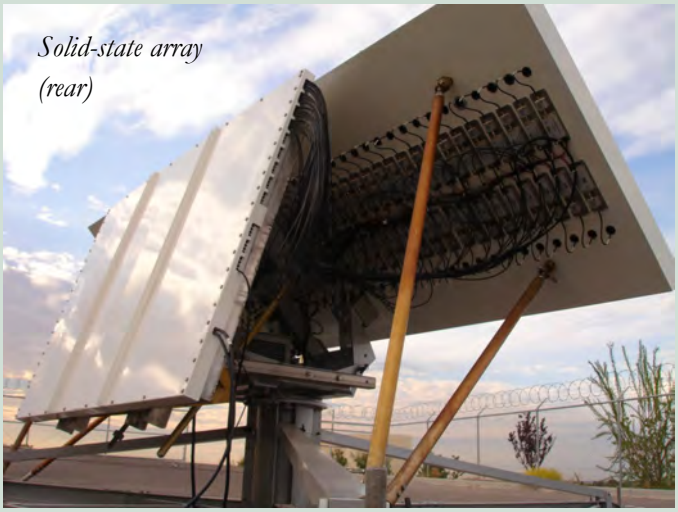


Telemetry Spigot Multi-Phase Array (Combat TELS)

The Telemetry Spigot Multi-Phase Solid-State Array is a unique receive-only array that allows operators simultaneous reception of up to three (3) geo-satellites within ± 45 degrees Azimuth and ± 2 degrees Elevation of each other. This is made possible by a beam-forming lens that works in conjunction with a multiple antenna array to scan the sky for desired SATCOM signals.

The complete system consists of the array assembly (including interconnect cables and documentation) and a 7U rack mounted telemetry receiver. The array assembly is mounted on an adjustable wide-leg tripod which can withstand heavy wind conditions. The tripod can be adjusted in azimuth and elevation (15°) directions after the system is set up.

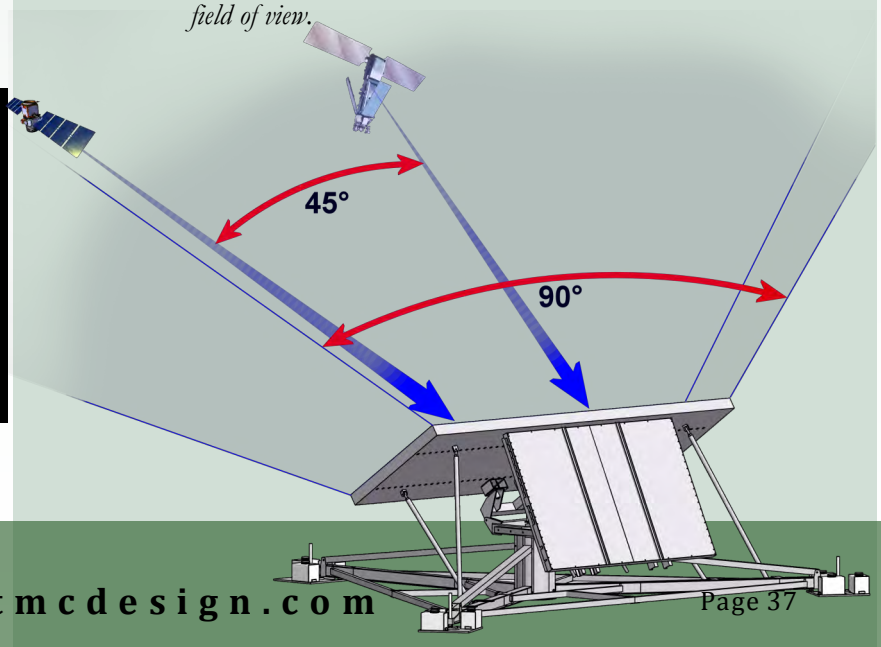
TMC Design can provide system site survey and installation services upon request.



Solid-state array (rear)

The Multi-Phase system is capable of picking up two SATCOM signals from satellites located within 45° of each other and within 90° azimuth x 15° elevation of the antenna's field of view.

Parameter	Specification
Operating Voltage	110 VAC
Operating Current	20 Amps
Frequency	60 Hz
Weight	Approx. 1050 lbs.
RF Interface	N-Type



Space Situational Awareness Systems

MCATSII SSA system, commissioned in 2006

Space Situational Awareness (SSA) Systems manufactured by TMC Design allow crew operators to perform SATCOM communications, testing and analysis using networked software/hardware. This allows users to control most system equipment from their workstation.

Equipment is linked together with TMC Design's custom ITTCS control software. The ITTCS software provides system operators with useful tools that allow users to make hardware connections and configurations, set up communication links and analyze communication data.

Our SSA systems are highly customizable. TMC Design can build stationary systems or highly mobile, forward deployable systems built to suit customer requirements.

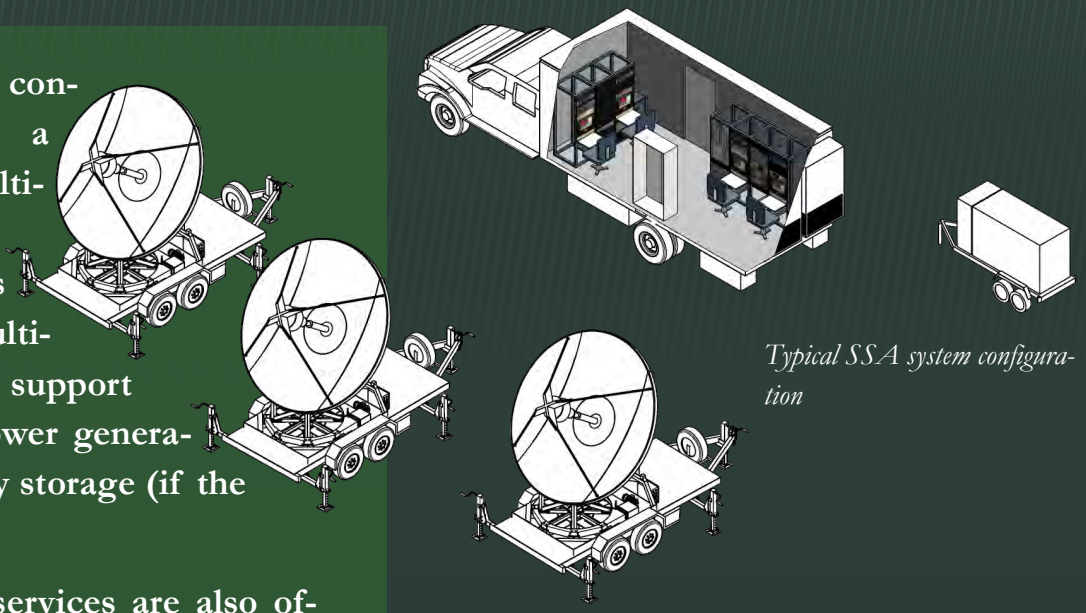
A forward deployable, mobile SSA concept utilizing a HMMWV shelter

SSA systems typically have a centralized control and command center. For mobile systems, much of the control equipment is housed inside mobile climate-controlled shelters

Typical SSA system configurations will have a Command Center, multiple SATCOM antennas (for simultaneous communication at multiple satellite bands) and support vehicles to serve as power generation stations and supply storage (if the system is mobile).

Sustainment facilities services are also offered for SSA systems.

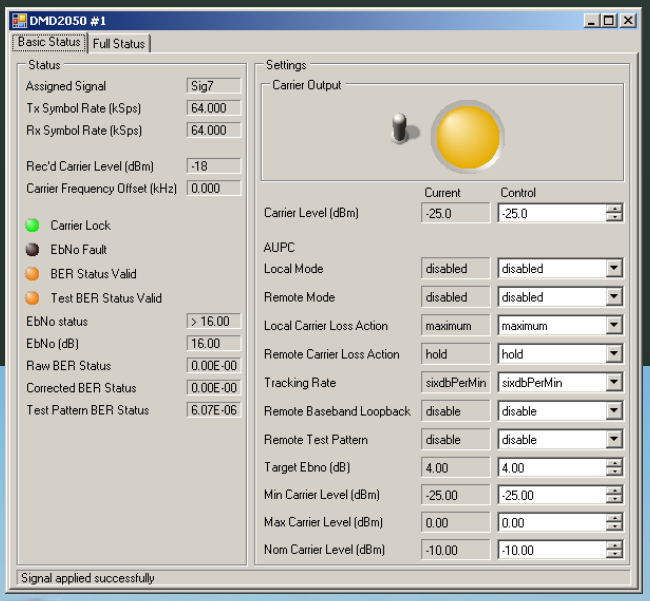
Contact us for more information on our SSA systems.



Typical SSA system configuration

ITTCS software gives operators the opportunity to monitor and make equipment hardware configurations on the fly. Using the ITTCS software suite, users will seldom have to leave their workstation to perform front panel configurations

SSA ITTCS software allows users to make hardware interconnections from the seat of their workstations



ACS SSA system, commissioned in 2007

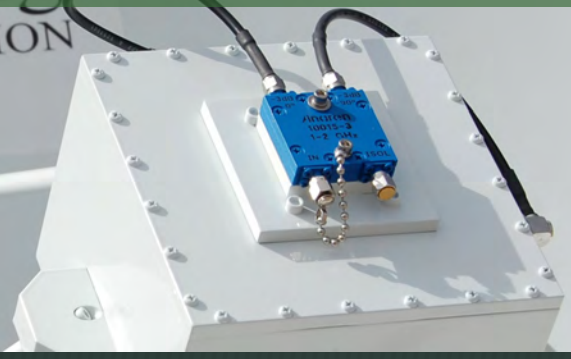
ANTENNA ACCESSORIES

Welding the HO-2450-15 Horn Trailer Pedestal

In addition to the extensive catalog and custom engineering products that TMC Design manufactures, we also provide supplemental equipment to complement our antennas and electronic systems.

Contact us for pricing on custom accessories not listed in the following pages.

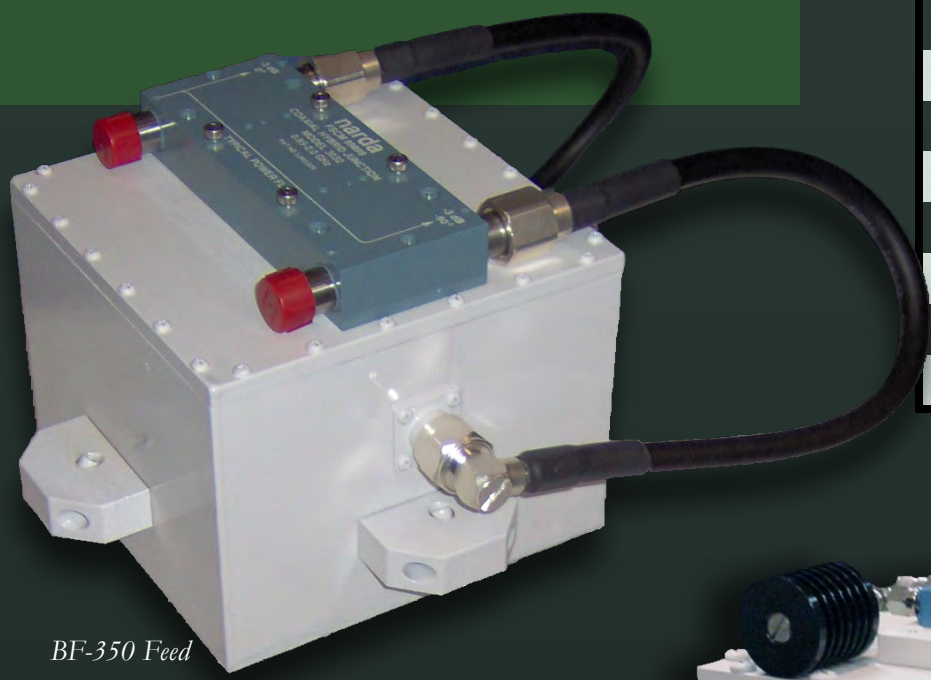
Antenna Box Feeds



A BF-550 box feed mounted on a dish antenna

TMC Design offers a variety of 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 feeds 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

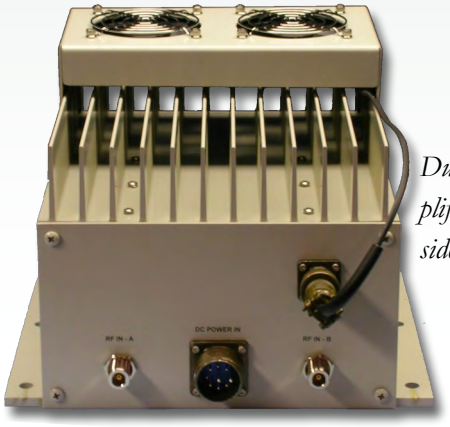


BF-350 Feed

BF-550 Feed

TMC-AM-20W Dual Channel Amplifier

Dual Channel Amplifier (Front), output side



Dual Channel Amplifier (Rear), input side

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 per channel) that operate independently of each other.

Parameter	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 High-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.

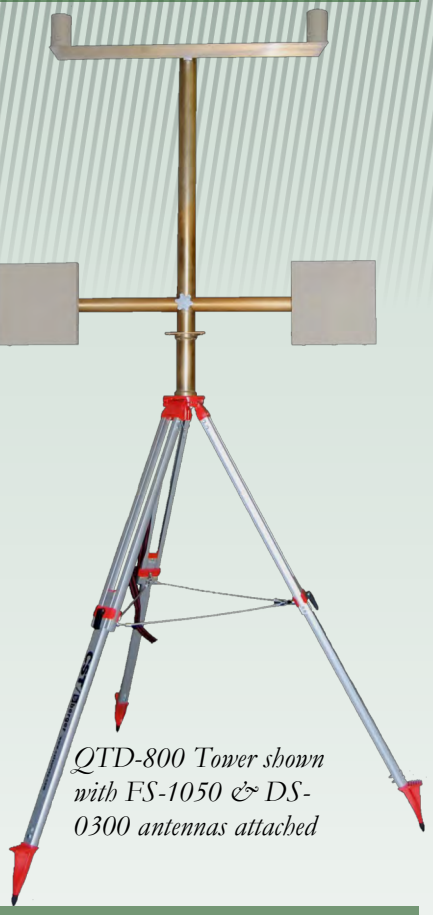
Parameter	Specifications
Frequency Range	1.0 to 2.0 GHz
Output Power	100 Watts (minimum)
Input Power	+0 dBm (maximum)
1 dB compression	@ 80 Watts
Harmonics	> 45 dBc @ 1 dB compression
Gain	+51 dB
AC Power	110 VAC @ 10 A, 60 Hz
Dynamic Range	50 dB
Dimensions	19" x 7" x 20" Rack Mount
Weight	47 lbs.
Input Connector	N-Type
Output Connector	N-Type
Front Panel Display	LCD
Options	RS-232 or IEEE-488 control

800 Series Quick Deploy Tower (QDT-800)

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. 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. 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.

Parameter	Specification
Height	80”
Width	36”
Guy Length	72”
Weight, tripod	8 lbs.
Weight, mast	16 lbs.



QTD-800 Tower shown with FS-1050 & DS-0300 antennas attached

900 Series Quick Deploy Tower (QDT-900)

The QDT-900 Quick Deploy Tower is a highly portable tower structure designed for the rapid deployment of mast mounted repeater or similar systems. Designed and fabricated by TMC Design in our Las Cruces facility, our goal 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.

QDT-900 Specifications	
Height (max)	84.25”
Width	15.75”
Guy Length	96”
Weight, base	39.4 lbs.
Weight, mast	19.1 lbs.
Weight, tool & guy kit	33.0 lbs.

2009 Product Catalog

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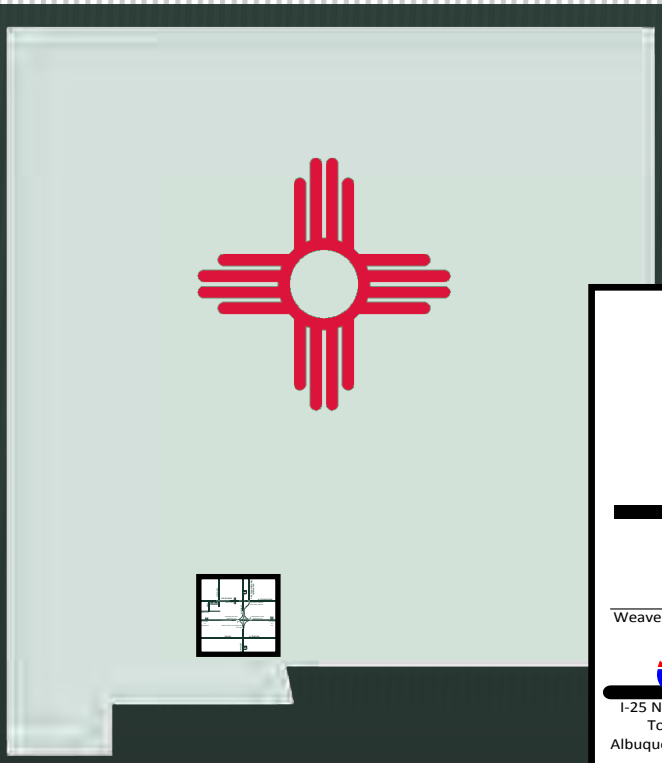

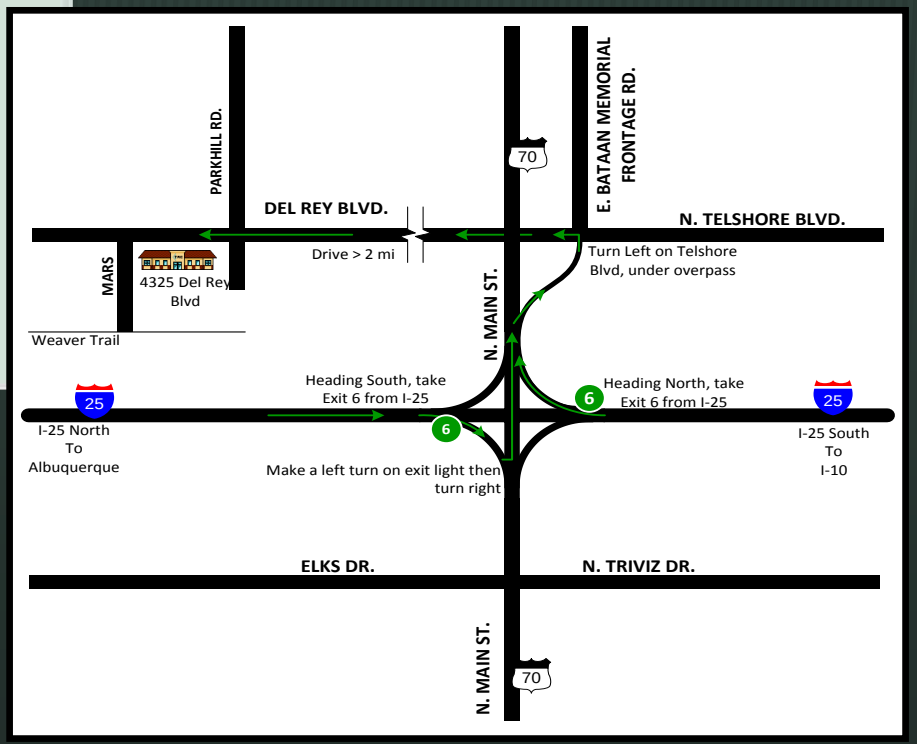

TMC Design Headquarters is located in Las Cruces, New Mexico, USA

To Order Call: 1.575.382.4600