GOVERNMENT OF THE DISTRICT OF COLUMBIA
OFFICE OF THE CHIEF TECHNOLOGY OFFICER

May 29, 2002

Carol Mitten, Chair
D.C. Zoning Commission
441 4th Street, N.W.
Suite 210 South
Washington, D.C. 20001

Reference: Zoning Commission Case Number 01-36C; the Unified Communications Center (UCC)
Subject: Supplemental Zoning Submission – Antenna Plan

Dear Chairperson Mitten;

In review of OCTO's supplemental submission, the Office of Planning has requested additional information regarding the proposed antenna placement relative to the UCC PUD application in order to prepare a meaningful review. We would like to submit this information for the record, and respectfully request that this information be accepted by the zoning commission.

The additional information includes a drawing package and an antenna information booklet. The drawing package contains nine (9) drawings with additional detail regarding antenna location and antenna placement. The antenna information booklet contains specifications and cut sheets of all antennas.

Should you have any questions please don't hesitate to call me at (202) 912-8040.

Sincerely,

William H. Al-Alao

FOR / John Lecker
UCC Project Manager

Attachments – Supplemental Zoning Submission-Antenna Information and ½ size Antenna Information Drawings

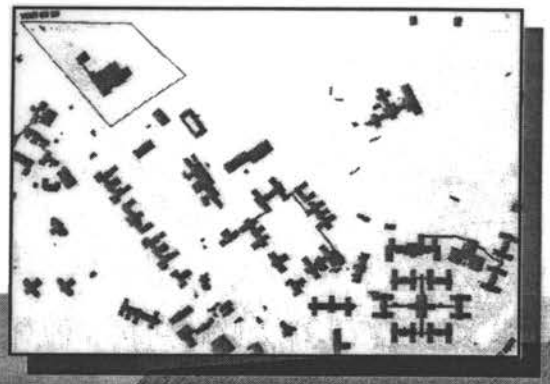
Cc: Anthony Hood, Vice-Chair, James Hannaham, Commissioner, Peter May, Commissioner, John Parsons, Commissioner

ZONING COMMISSION
District of Columbia
Case 01-36C
Exhibit 44

ZONING COMMISSION
District of Columbia
CASE NO.01-36C
EXHIBIT NO.44

SUPPLEMENTAL ZONING SUBMISSION
ANTENNA INFORMATION

UNIFIED COMMUNICATIONS CENTER
DISTRICT OF COLUMBIA



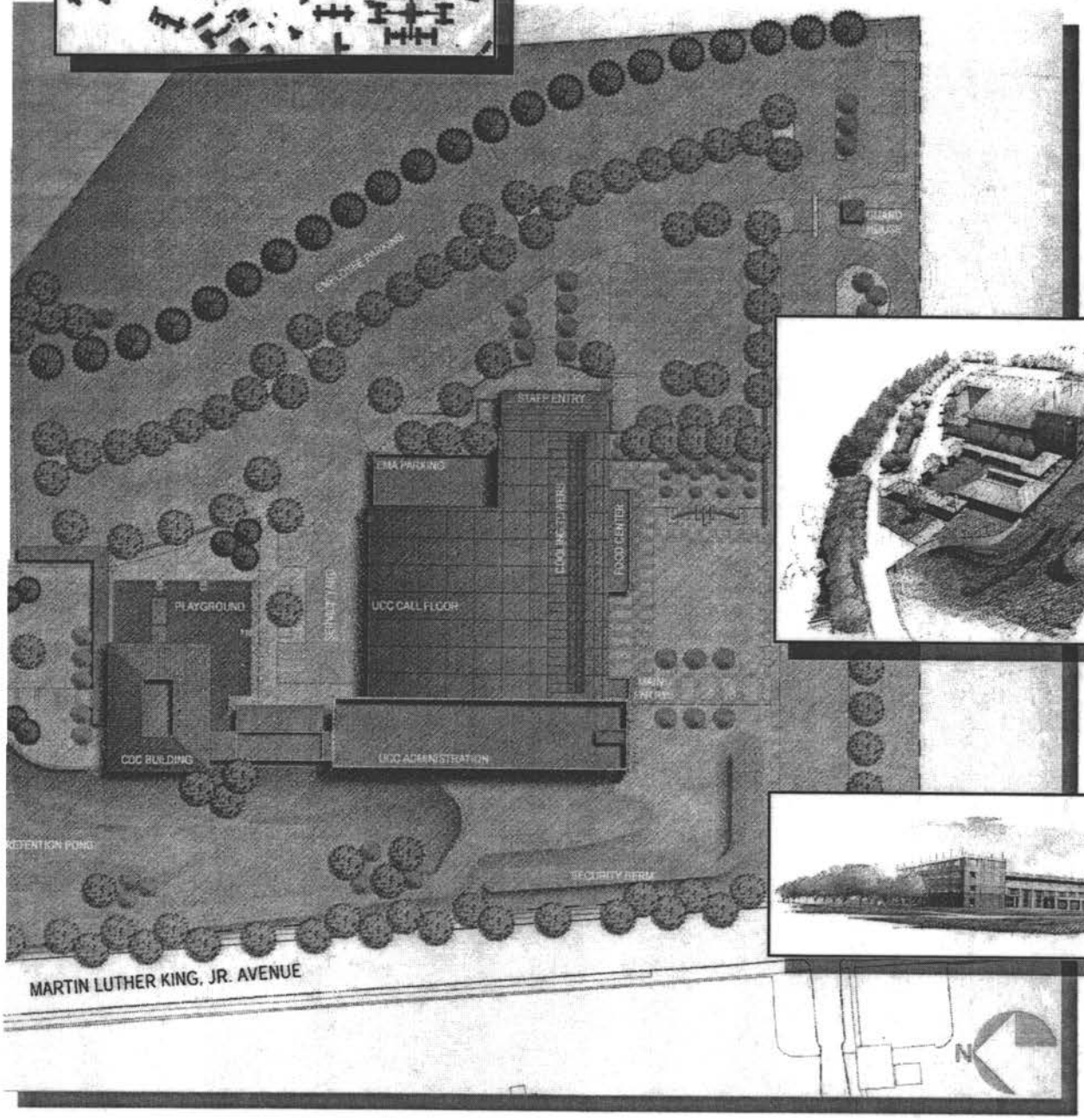
PREPARED FOR:

ZONING COMMISSION
CASE NO. 01-36C

SUBMITTED BY:

OFFICE OF THE CHIEF TECHNOLOGY OFFICER

RECEIVED
D.C. OFFICE O
2002 MAY 29



UCC RENDERING- AERIAL VIEW

UCC RENDERING- ENTRY VIEW

28 MAY 2002

ANTENNA SCHEDULE

Ant #	Use	Ant. Type	Manufacturer	Model #	Color	Material	Height Above Parapet (ft.)	Height Above Ground (AGL) (ft.)	Mount Type	Dimensions	Connectors	Status
1	Washington Gas	Ground Plane	Decibel	DB201(50 MHz)	White	Fiber Glass	N/A (Parking Lot)	30'-0"	Pole	11' H x 12' 7" W	Type N Male	Live
2	MDW Singar	Whip	R.A. Miller	OE-254/GRC	Olive Drab	Aluminum	N/A (Parking Lot)	30'-0"	Pole	16' 2" H	Type N Female	Live
3	Red Cross	Ground Plane	Decibel	DB201(50 MHz)	White	Fiber Glass	N/A (Parking Lot)	30'-0"	Pole	11' H x 12' 7" W	Type N Male	Live
4	MDW UHF 380-400	Whip	Decibel	DB636NS-TT	Horizon Blue	Fiber Glass	N/A (Parking Lot)	30'-0"	Pole	12' 4" H	Type N Female	Live
5	HMARS	Whip	Decibel	DB630	Horizon Blue	Fiber Glass	11'-0"	barrel roof - refer to 02-A302	Pole	~ 4' H	Type N Female	Live
6	JPS VHF	Ground Plane	Decibel	DB201(150 MHz)	White	Fiber Glass	11'-0" (flat roof) 11'-0" (barrel roof) 4'-0" (CDC roof)	flat roof - refer to 01-A301 barrel roof - refer to 02-A302 CDC roof - refer to 1A-A301	Pole	4' H x 4' 1" W	Type N Male	Live
7	JPS UHF	Whip	Decibel	DB630	Horizon Blue	Fiber Glass	11'-0" (flat roof) 4'-0" (CDC roof)	flat roof - refer to 01-A301 CDC roof - refer to 1A-A301	Pole	~ 4' H	Type N Female	Live
8	FEMS	Whip	Decibel	DB580	Horizon Blue	Fiber Glass	11'-0"	refer to 01-A301	Pole	5' 2" H	Type N Female	Live
9	CB	Army Stick	Shakespeare	AS-1102	White	Fiber Glass	11'-0"	refer to 03-A303	Pole	8' 6" H	N/A	Live
10	EMA	Whip	Decibel	DB580	Horizon Blue	Fiber Glass	11'-0"	refer to 03-A303	Pole	5' 2" H	Type N Female	Live
11	MPD Tx	Whip	Decibel	DB633	Horizon Blue	Fiber Glass	11'-0"	refer to 01-A301	Pole	~ 5' H	Type N Female	Live
12	JPS 800MHz	Whip	Decibel	DB580	Horizon Blue	Fiber Glass	11'-0"	refer to 01-A301	Pole	5' 2" H	Type N Female	Live
13	SATCOM Dish	Dish	ViaSat	8136	White	Aluminum	13'-4"	refer to 01-A301	Platform	12' diameter	N/A	Live
14	RPU Tx	Whip	Decibel	DB616	Horizon Blue	Fiber Glass	11'-0"	refer to 01-A301	Pole	21' 5" H	Type UHF-Female	Live
15	RACES UHF Video Receive Only	Yagi	PC Electronics	DSFO ATV-25	Aluminum	Aluminum	11'-0"	refer to 01-A301	Center mounted	17' W boom with rotor	N/A	Live
16	HF	Whip	SGC	SG-303	Black	Aluminum	30'-0"	refer to 01-A301	Wall	8' 4" H	DC Couplers required	Live
17	TV	Yagi	PC Electronics	DSFO ATV-25	Aluminum	Aluminum	3'-0"	refer to 01-A301	Center mounted	17" W boom with rotor	N/A	Live
18	RPU Rx	Whip	Decibel	DB616	Horizon Blue	Fiber Glass	11'-0"	refer to 01-A301	Pole	21' 5" H	Type UHF-Female	Live
19	MPD Rx	Whip	Decibel	DB633	Horizon Blue	Fiber Glass	11'-0"	refer to 01-A301	Pole	~ 5' H	Type N Female	Live
20	Rx Only	Diskcone	Kreco Antennas	D-300B	Aluminum	Aluminum	N/A (Entrance Columns)	refer to 04-A950	Pipe	3' diameter	N/A	Live
21	Fiber Glass Poles	N/A	N/A	N/A	White	Fiber Glass	11'-0" (flat roof) 11'-0" (barrel roof)	flat roof - refer to 01-A301 barrel roof - refer to 02-A302	Pole	3" diameter, 11'H	N/A	Dummy
22	U.S. Park Service	Dish	Turtle Mountain Communication	TMC TAC-VRX/VTX	White	Fiber Glass	N/A (Below Parapet)	N/A (Below Parapet)	Tripod	6"H	Type N	Live
23	Sat Phone	Dish	Mitsubishi	ST-251	White	Fiber Glass	N/A (Below Parapet)	N/A (Below Parapet)	Tripod	15" Dia	Coax	Live
24	Sat Phone	Whip	Qualcomm	GSP 2900	White	Lexan	11'-0"	refer to 03-A303	Pole	1"dia x 19.8"H	RJ11	Live
25	DirecTV	Dish	TERK Technologies	TRK-S2	Grey	Fiber Glass	N/A (Below Parapet)	N/A (Below Parapet)	Pole	18" Dia	Coax	Live
26	Weather	Dish	DTN Weather	DVB-SR1	Grey	Fiber Glass	N/A (Below Parapet)	N/A (Below Parapet)	Pole	18" Dia	Coax	Live

TRW Proprietary and Confidential

OVERVIEW

- Type: Ground Plane Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB201 (50 MHz)
- Color: White
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

DECIBEL PRODUCTS

30 - 124 MHz and 220 - 512 MHz

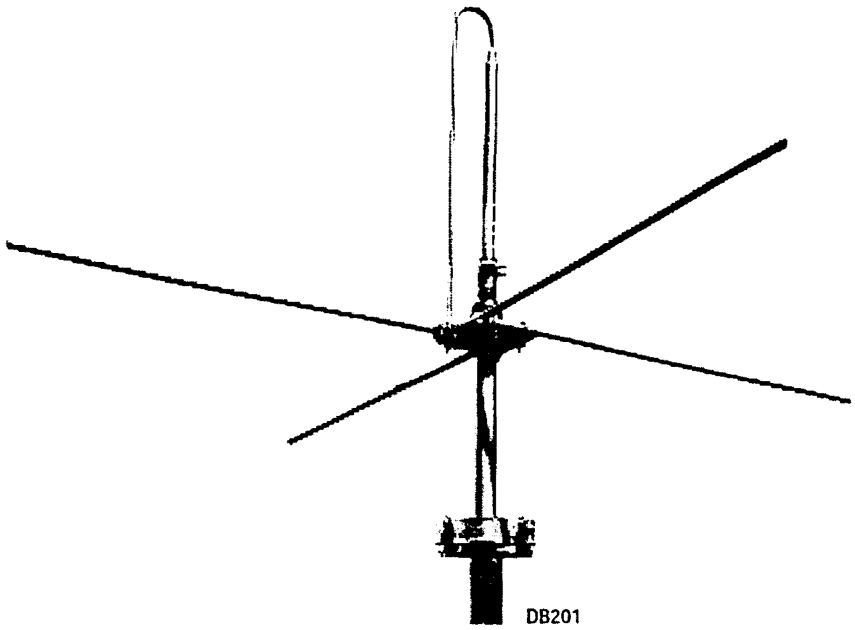
Ground Plane Omni Antenna

DB201, Unity gain

Very Popular – Heavy duty, light weight antenna is one of our most widely used.

- Unique Design – Features a new approach to the feeding of the insulated portion of the radiator.
- Moisture Resistant – 50-ohm feed-through connector is encapsulated in a moisture and corrosion proof molded epoxy insulator.
- Cut and Tested – The radiating element and ground radials are cut to frequency and tested at the factory for minimum VSWR. Uncut models for 30-50, 144-174 and 406-512 MHz are optional. Cutting chart is included.
- Lightning Resistant – Constructed of metal with all elements operating at DC ground.
- Protected Lead – A male-to-female connection is weather protected but can be replaced if necessary.
- New – 30-50 MHz models have galvanized steel support pipe.
- Easy Mounting – Galvanized steel DB365-OS Mount is furnished for mounting atop a tower, pole or building.

Ordering Information – Use model number for correct frequency or specify uncut model and frequency range, also termination if non-standard. Order jumper cable separately, if desired. Order 12007 for Radial U-Bolt Kit to support field adjustments.



DB201

Electrical Data	
Frequency Ranges – MHz	A = 30-33, B = 33-37, C = 37-42, D = 42-50, E = 60-88, F = 100-144, G=144-150, H=150-174, J=225-406, JJ=220-222, K = 406-512
	Uncut models: L = 30-50, M = 144-174, N = 406-512, P = 450-470
Bandwidth	2% of frequency
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole) – dBd	Unity
Maximum power input – watts	500
Vertical beamwidth (half power points)	78°
Lightning protection	Direct ground
Standard Termination: Captive Type N-male to end of flexible lead.	

Mechanical Data	35 MHz	50 MHz	150 MHz	450 MHz
Radiator (aluminum) – in. (mm)	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod
Ground rods (aluminum) – in. (mm)	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod	.5 (12.7) OD solid rod
Support pipe – in. (mm)	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 12 (304.8) length	1.31 (33.34) OD, 12 (304.8) length
Maximum exposed area (flat plate equivalent) – ft² (m²)	1.1 (.102)	0.8 (.074)	.4 (.037)	.3 (.028)
Wind rating*:				
Survival without ice – mph (km/hr)	93 (150)	122 (196)	125 (201)	125 (201)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	51 (82)	65 (105)	125 (201)	125 (201)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	44 (195.7)	32 (142.3)	16 (71.2)	12 (53.4)
Overall length – in. (mm)	101 (2.57)	78 (1.98)	30 (.76)	19 (.48)
Height (above base plate) – in. (m)	77 (1.96)	54 (1.37)	18 (.45)	6.5 (.17)
Maximum width (horizontal) – in. (m)	216 (5.49)	151 (3.84)	49 (1.24)	15 (.381)
Net weight (w/clamps) – lbs. (kg)	25 (11.34)	23 (10.43)	10 (4.54)	6 (.152)
Shipping weight (w/clamps) – lbs. (kg)	35 (15.88)	31 (14.06)	14 (6.35)	9 (.229)
Mounting clamps (Galvanized steel)	DB365-OS	DB365-OS	DB365-OS	DB365-OS

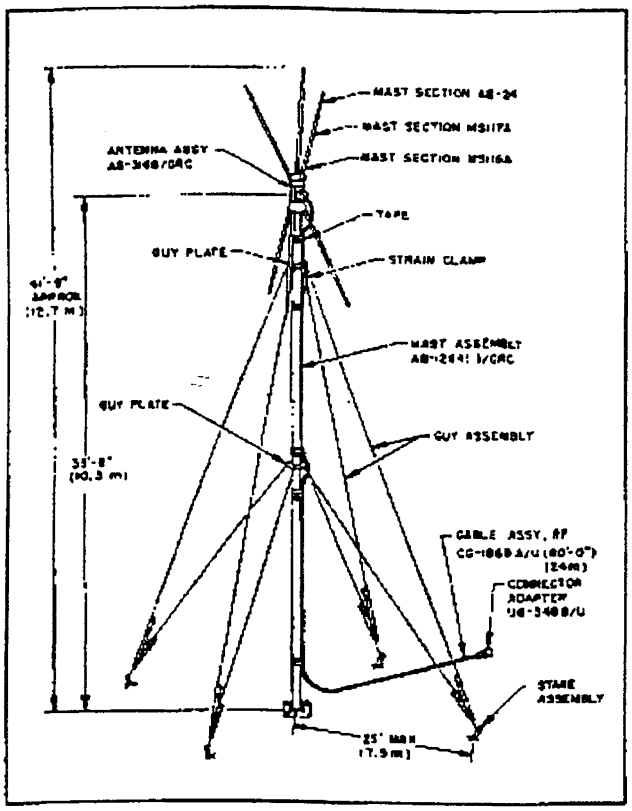
*Calculation of wind survivability does not include damage due to flying debris.

OVERVIEW

- Type: Whip Antenna
- Manufacturer: R. A. Miller
- Model #: OE-254/GRC
- Color: Olive Drab
- Material: Aluminum

(See next page for manufacturer cut-sheets and specifications.)

The Antenna Professionals



Antenna OE-254/GRC

Description

The OE-254/GRC Antenna Group is designed for broadband omni-directional ground-based communications. It is intended for use with Radio Sets AN/VRC-12, AN/VRC-43 through AN/VRC-49, AN/VRC-53, AN/VRC-64, AN/GRC-125, and AN/GRC-160 but will also function with the AN/PRC-25 and AN/PRC-77 Radio Sets. The Antenna Group OE-254/GRC is produced to Military Specification MIL-A-49204 and can withstand 145 km/hr (90 mph) winds without an ice coating and 96.5 km/hr (60 mph) with 12.7 mm (0.5 in) of radial ice coating the entire antenna and remain erect and operational. The Antenna Group OE-254/GRC is stowed in a transit bag and spare antenna elements, guy assemblies, guy plates, and stake assembly are included. Artwork detailing assembly and erection procedures and stowing instructions are sewed integral with the bag. The Antenna Group OE-254/GRC is designed for use in all climates and terrains.

Specifications

Application	Ground-Based Communications
Frequency	30 to 88 MHz
Impedance	50 Ohms Nominal
VSWR	3.0 to 1 Maximum
Polarization	
Pattern	Omni-Directional
Connector	Type "N" Female
Height	12.7m (41.75 ft) Approx.
Weight	103.4 Kg (47 lb) Max.
RF Power Capacity	350 Watts Continuous
Gain (When referenced to a specified dipole fabricated to MIL-A-49204 requirements)	-3 dB over 30-88 MHz

R. A. Miller Industries
14500 168th Ave., P.O. Box 858, Grand Haven, MI 49417 (616) 842-9450 Fax (616) 842-2771
E-mail: info@rami.com

OVERVIEW

- Type: Ground Plane Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB201 (50 MHz)
- Color: White
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

DECIBEL PRODUCTS

30 - 124 MHz and 220 - 512 MHz

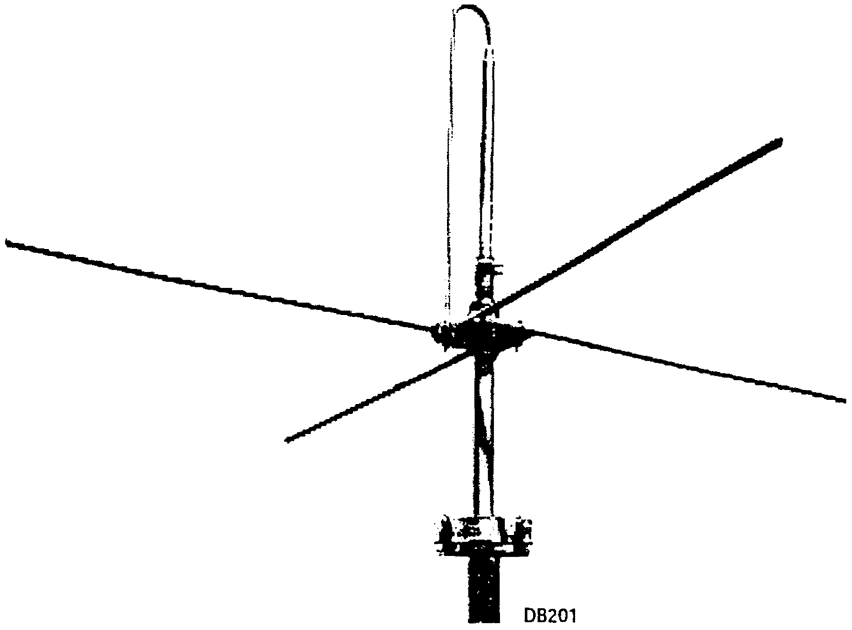
Ground Plane Omni Antenna

DB201, Unity gain

Very Popular – Heavy duty, light weight antenna is one of our most widely used.

- Unique Design – Features a new approach to the feeding of the insulated portion of the radiator.
- Moisture Resistant – 50-ohm feed-through connector is encapsulated in a moisture and corrosion proof molded epoxy insulator.
- Cut and Tested – The radiating element and ground radials are cut to frequency and tested at the factory for minimum VSWR. Uncut models for 30-50, 144-174 and 406-512 MHz are optional. Cutting chart is included.
- Lightning Resistant – Constructed of metal with all elements operating at DC ground.
- Protected Lead – A male-to-female connection is weather protected but can be replaced if necessary.
- New – 30-50 MHz models have galvanized steel support pipe.
- Easy Mounting – Galvanized steel DB365-OS Mount is furnished for mounting atop a tower, pole or building.

Ordering Information – Use model number for correct frequency or specify uncut model and frequency range, also termination if non-standard. Order jumper cable separately, if desired. Order 12007 for Radial U-Bolt Kit to support field adjustments.



DB201

Electrical Data	
Frequency Ranges – MHz	A = 30-33, B = 33-37, C = 37-42, D = 42-50, E = 60-88, F = 100-144, G = 144-150, H = 150-174, J = 225-406, JJ = 220-222, K = 406-512
	Uncut models: L = 30-50, M = 144-174, N = 406-512, P = 450-470
Bandwidth	2% of frequency
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole) – dBd	Unity
Maximum power input – watts	500
Vertical beamwidth (half power points)	78°
Lightning protection	Direct ground
Standard Termination: Captive Type N-male to end of flexible lead.	

Mechanical Data				
	35 MHz	50 MHz	150 MHz	450 MHz
Radiator (aluminum) – in. (mm)	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod
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Lateral thrust at 100 mph (161 km/hr) – lbf (N)	44 (195.7)	32 (142.3)	16 (71.2)	12 (53.4)
Overall length – in. (mm)	101 (2.57)	78 (1.98)	30 (.76)	19 (.48)
Height (above base plate) – in. (m)	77 (1.96)	54 (1.37)	18 (.45)	6.5 (.17)
Maximum width (horizontal) – in. (m)	216 (5.49)	151 (3.84)	49 (1.24)	15 (.381)
Net weight (w/clamps) – lbs. (kg)	25 (11.34)	23 (10.43)	10 (4.54)	6 (.152)
Shipping weight (w/clamps) – lbs. (kg)	35 (15.88)	31 (14.06)	14 (6.35)	9 (.229)
Mounting clamps (Galvanized steel)	DB365-OS	DB365-OS	DB365-OS	DB365-OS

*Calculation of wind survivability does not include damage due to flying debris.

OVERVIEW

- Type: Whip Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB636NS-TT
- Color: Horizon Blue
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

DECIBEL PRODUCTS
An Allen Telecom Company

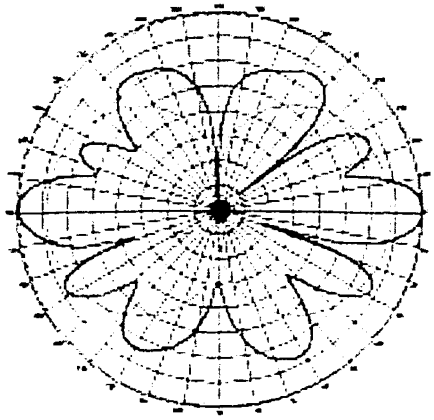
DB636NS-TT

6 dBd
Omni Antenna

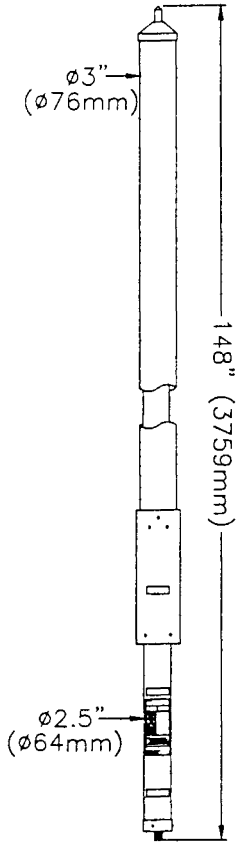
380-400 MHz

- 380-400 MHz
- 6 dBd (8.1 dBi) Gain
- Vertical Polarization
- 360° Azimuth BW
- 16° Elevation BW
- Type N-Female
- Tetra

360°



Elevation
(Vertical)



Electrical

VSWR:	< 1.5:1
Isolation:	30 dB
Max. Input Power:	500 Watts
Impedance:	50 Ohms
Lightning Protection:	DC Ground

Mechanical

Weight:	31.5 lbs (14.29 kg)
Max. Exposed Area:	2.05 ft² (0.19 m²)
Wind Thrust:	82 lbf (365N) 37 kp (at 100 mph)
Max. Wind Speed:	125 mph (201 km/h) w/ ice
	100 mph (161 km/h) w/o ice
Radiator:	Brass
Radome:	Fiberglass
Mounting Hardware:	Galvanized Steel
Color:	Light Blue
Dimension:	148" x 3" x 3" (376 x 8 x 8 cm)

Mounting Options

Standard: DB5091-3, included

8635 Stemmons Freeway • Dallas, Texas U.S.A. 75247-3701
Dallas/Ft.Worth Area Tel: 214.631.0310 • Fax: 214.631.4706
Toll Free Tel: 1.800.676.5342 • Fax: 1.800.229.4706
www.decibelproducts.com
dbtech@decibelproducts.com

ISO9001 Compliant

099039-007 10/01-A

OVERVIEW

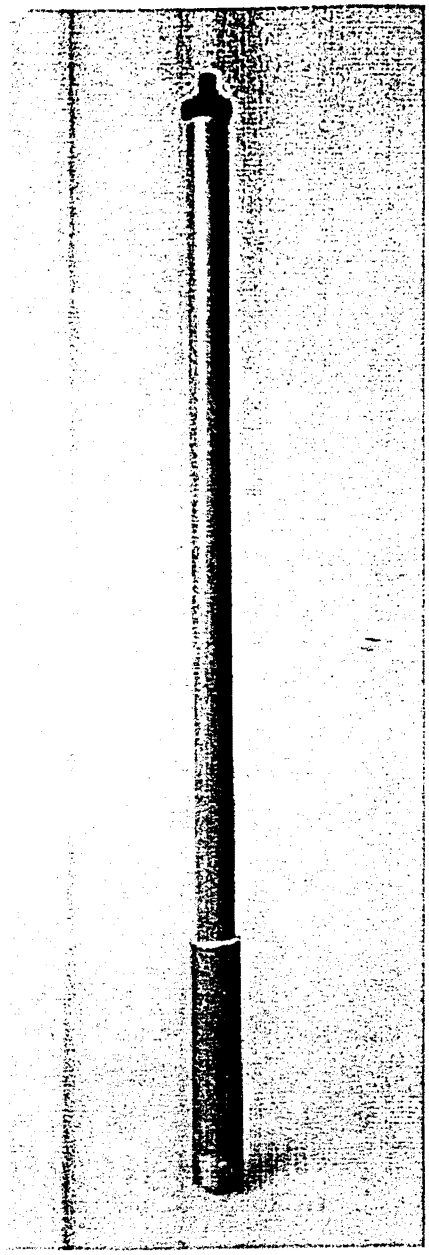
- Type: Whip Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB630
- Color: Horizon Blue
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

DECIBEL PRODUCTS

406 - 512 MHz Omni Antenna

DB630, DB633, Unity and 3 dBd gain



DB630/633

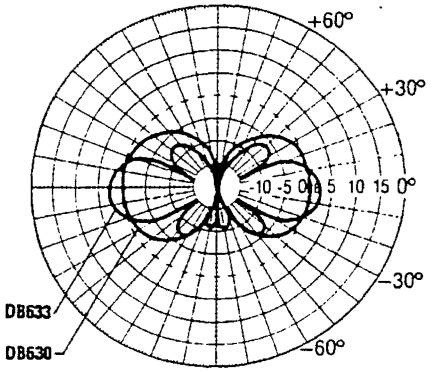
These are UHF omnidirectional antennas enclosed in 2" (50.8 mm) OD Horizon Blue™ radomes made of Minimum-Tip-Deflection* (MTD*) fiberglass, Decibel's radome material that resists extremely high winds with very little tip deflection.

- Full UHF Coverage – Four models with bandwidths up to 32 MHz fulfill spectrum needs for UHF conventional, paging and radiotelephone communications.
- Sturdy Construction – In addition to the Minimum-Tip-Deflection fiberglass radome, each antenna has a 9" (228.6 mm) weather-resistant, gold iridited mast made of strong 6061-T6 aluminum alloy.
- Engineered to Last – All metals used in radiator, feed and matching systems are copper or brass, which minimizes galvanic reaction and reduces intermodulation.
- Lightning Resistant – A large diameter conduction extends from top to bottom to provide ground to the tower.
- Moisture Resistant – The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- Ready to Install – DB365-OS Clamps and Vapor-Wrap® are provided.

Ordering Information – Clamps are included.
Order jumper cable separately, if desired.

Frequency Ranges Available – MHz	
DB630/633-A	406-436
DB630/633-B	425-455
DB630/633-C	450-482
DB630/633-D	480-512

DB630/633 Typical Vertical Radiation Pattern



Electrical Data		
	DB630	DB633
Frequency Range – MHz	See table	See table
Bandwidth – MHz	See table	See table
Gain – dBd	Unity	3
Beamwidth "E" Plane (half power)	80°	35°
Beamwidth "H" Plane (half power)	Omni	Omni
Maximum power input – watts	500	500
VSWR	1:5 to 1 or better	1:5 to 1 or better
Lightning protection	Direct ground	Direct ground
Termination	Type N-Female (fixed)	Type N-Female (fixed)

Mechanical Data		
	DB630	DB633
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	13.6 (60.5)	19.6 (87.2)
Radome OD – in. (mm)	2 (50.8)	2 (50.8)
Radome ID – in. (mm)	1.75 (44.45)	1.75 (44.45)
Radome length – ft. (m)	2.42 (.74)	4.1 (1.24)
Mast OD – in. (mm)	2.5 (63.5)	2.5 (63.5)
Mast length – in. (mm)	9 (22.86)	9 (228.6)
Maximum exposed area (flat plate equivalent)– ft² (m²)	.34 (.03)	.55 (.06)
Wind rating: – mph (km/hr)*	100 (161)	100 (161)
Tip deflection at 100 mph (161 km/hr)	0.1°	0.4°
Bending moment 1" (25.4 mm) below top of mast at 100 mph (161 km/hr) – ft./lbs. (N/m)	12.2 (16.5)	32.3 (43.8)
Radome	Fiberglass	Fiberglass
Radiators	Brass	Brass
Support pipe	6061-T6 Aluminum	6061-T6 Aluminum
Net weight – lbs. (kg)	6 (2.27)	8 (3.63)
Shipping weight – lbs. (kg)	16 (7.26)	19 (8.62)
Clamps (galvanized steel)	DB365-OS	DB365-OS

*Calculation of wind survivability does not include damage due to flying debris.

OVERVIEW

- Type: Ground Plane Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB201 (150 MHz)
- Color: White
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

DECIBEL PRODUCTS

30 - 124 MHz and 220 - 512 MHz

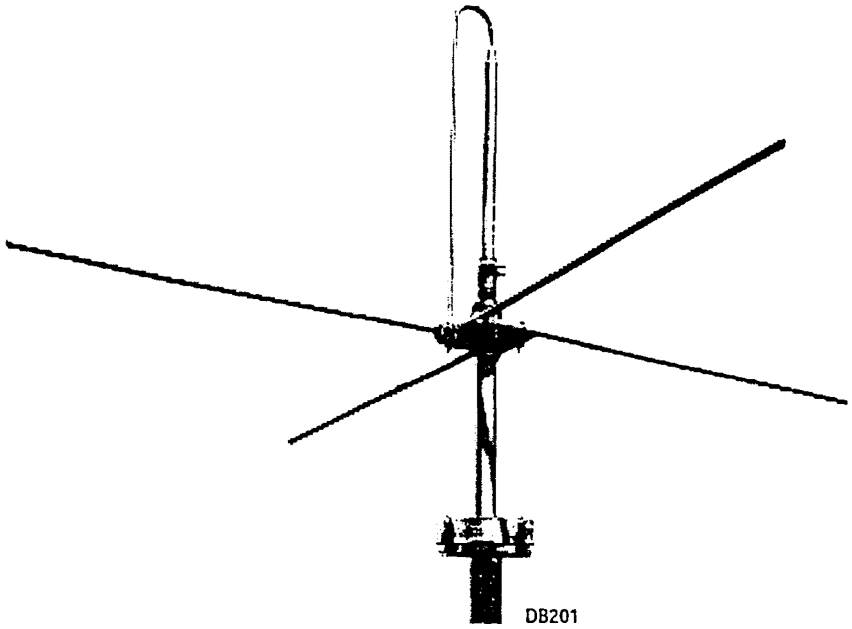
Ground Plane Omni Antenna

DB201, Unity gain

Very Popular – Heavy duty, light weight antenna is one of our most widely used.

- Unique Design – Features a new approach to the feeding of the insulated portion of the radiator.
- Moisture Resistant – 50-ohm feed-through connector is encapsulated in a moisture and corrosion proof molded epoxy insulator.
- Cut and Tested – The radiating element and ground radials are cut to frequency and tested at the factory for minimum VSWR. Uncut models for 30-50, 144-174 and 406-512 MHz are optional. Cutting chart is included.
- Lightning Resistant – Constructed of metal with all elements operating at DC ground.
- Protected Lead – A male-to-female connection is weather protected but can be replaced if necessary.
- New – 30-50 MHz models have galvanized steel support pipe.
- Easy Mounting – Galvanized steel DB365-OS Mount is furnished for mounting atop a tower, pole or building.

Ordering Information – Use model number for correct frequency or specify uncut model and frequency range, also termination if non-standard. Order jumper cable separately, if desired. Order 12007 for Radial U-Bolt Kit to support field adjustments.



DB201

Electrical Data	
Frequency Ranges – MHz	A = 30-33, B = 33-37, C = 37-42, D = 42-50, E = 60-88, F = 100-144, G = 144-150, H = 150-174, J = 225-406, JJ = 220-222, K = 406-512
	Uncut models: L = 30-50, M = 144-174, N = 406-512, P = 450-470
Bandwidth	2% of frequency
VSWR	1.5 to 1 or less
Nominal impedance – ohms	50
Gain (over half-wave dipole) – dBd	Unity
Maximum power input – watts	500
Vertical beamwidth (half power points)	78°
Lightning protection	Direct ground
Standard Termination: Captive Type N-male to end of flexible lead.	

Mechanical Data				
	35 MHz	50 MHz	150 MHz	450 MHz
Radiator (aluminum) – in. (mm)	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod	.875 (22.23) OD with .125 (3.18) wall & .375 (9.35) OD solid rod
Ground rods (aluminum) – in. (mm)	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod tapered to .250 (6.35) OD	.5 (12.7) OD solid rod	.5 (12.7) OD solid rod
Support pipe – in. (mm)	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 24 (609.6) length	1.31 (33.34) OD, 12 (304.8) length	1.31 (33.34) OD, 12 (304.8) length
Maximum exposed area (flat plate equivalent) – ft² (m²)	1.1 (.102)	0.8 (.074)	.4 (.037)	.3 (.028)
Wind rating*:				
Survival without ice – mph (km/hr)	93 (150)	122 (196)	125 (201)	125 (201)
Survival with .5" (12.7 mm) radial ice – mph (km/hr)	51 (82)	65 (105)	125 (201)	125 (201)
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	44 (195.7)	32 (142.3)	16 (71.2)	12 (53.4)
Overall length – in. (mm)	101 (2.57)	78 (1.98)	30 (.76)	19 (.48)
Height (above base plate) – in. (m)	77 (1.96)	54 (1.37)	18 (.45)	6.5 (.17)
Maximum width (horizontal) – in. (m)	216 (5.49)	151 (3.84)	49 (1.24)	15 (.381)
Net weight (w/clamps) – lbs. (kg)	25 (11.34)	23 (10.43)	10 (4.54)	6 (.152)
Shipping weight (w/clamps) – lbs. (kg)	35 (15.88)	31 (14.06)	14 (6.35)	9 (.229)
Mounting clamps (Galvanized steel)	DB365-OS	DB365-OS	DB365-OS	DB365-OS

*Calculation of wind survivability does not include damage due to flying debris.

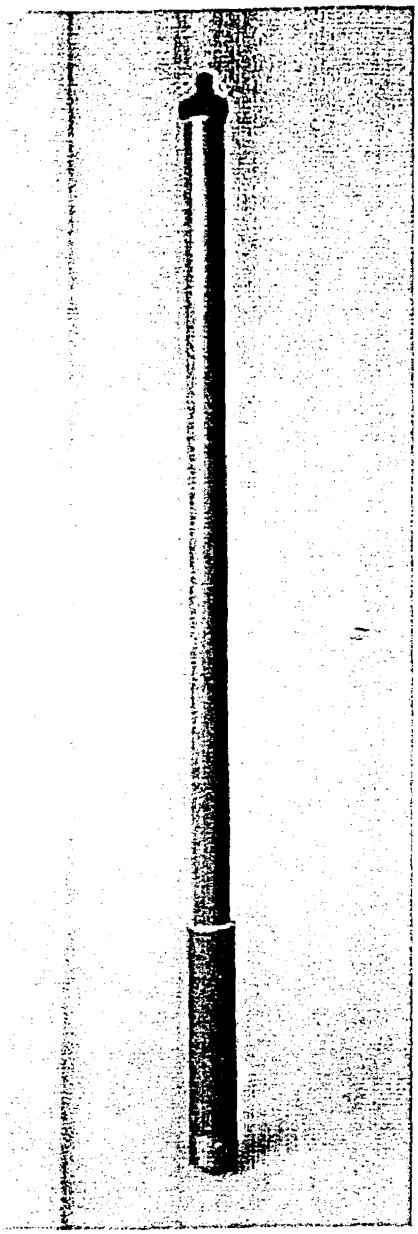
OVERVIEW

- Type: Whip Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB630
- Color: Horizon Blue
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

Omni Antenna

DB630, DB633, Unity and 3 dBd gain



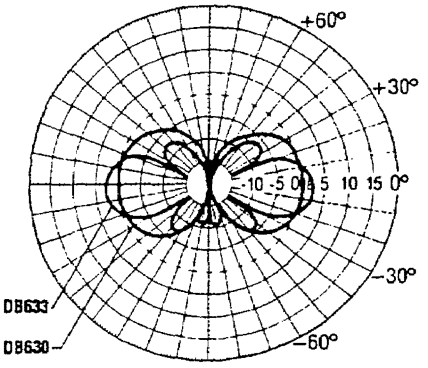
DB630/633

These are UHF omnidirectional antennas enclosed in 2" (50.8 mm) OD Horizon Blue™ radomes made of Minimum-Tip-Deflection* (MTD*) fiberglass, Decibel's radome material that resists extremely high winds with very little tip deflection.

- Full UHF Coverage – Four models with bandwidths up to 32 MHz fulfill spectrum needs for UHF conventional, paging and radiotelephone communications.
- Sturdy Construction – In addition to the Minimum-Tip-Deflection fiberglass radome, each antenna has a 9" (228.6 mm) weather-resistant, gold iridited mast made of strong 6061-T6 aluminum alloy.
- Engineered to Last – All metals used in radiator, feed and matching systems are copper or brass, which minimizes galvanic reaction and reduces intermodulation.
- Lightning Resistant – A large diameter conduction extends from top to bottom to provide ground to the tower.
- Moisture Resistant – The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- Ready to Install – DB365-OS Clamps and Vapor-Wrap* are provided.

Ordering information – Clamps are included.
Order jumper cable separately, if desired.

DB630/633 Typical Vertical Radiation Pattern



Frequency Ranges Available – MHz	
DB630/633-A	406-436
DB630/633-B	425-455
DB630/633-C	450-482
DB630/633-D	480-512

Electrical Data	DB630	DB633
Frequency Range – MHz	See table	See table
Bandwidth – MHz	See table	See table
Gain – dBd	Unity	3
Beamwidth "E" Plane (half power)	80°	35°
Beamwidth "H" Plane (half power)	Omni	Omni
Maximum power input – watts	500	500
VSWR	1.5 to 1 or better	1.5 to 1 or better
Lightning protection	Direct ground	Direct ground
Termination	Type N-Female (fixed)	Type N-Female (fixed)

Mechanical Data	DB630	DB633
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	13.6 (60.5)	19.6 (87.2)
Radome OD – in. (mm)	2 (50.8)	2 (50.8)
Radome ID – in. (mm)	1.75 (44.45)	1.75 (44.45)
Radome length – ft. (m)	2.42 (.74)	4.1 (1.24)
Mast OD – in. (mm)	2.5 (63.5)	2.5 (63.5)
Mast length – in. (mm)	9 (22.86)	9 (228.6)
Maximum exposed area (flat plate equivalent)– ft² (m²)	.34 (.03)	.55 (.06)
Wind rating: – mph (km/hr)*	100 (161)	100 (161)
Tip deflection at 100 mph (161 km/hr)	0.1°	0.4°
Bending moment 1" (25.4 mm) below top of mast at 100 mph (161 km/hr) – ft./lbs. (N/m)	12.2 (16.5)	32.3 (43.8)
Radome	Fiberglass	Fiberglass
Radiators	Brass	Brass
Support pipe	6061-T6 Aluminum	6061-T6 Aluminum
Net weight – lbs. (kg)	6 (2.27)	8 (3.63)
Shipping weight – lbs. (kg)	16 (7.26)	19 (8.62)
Clamps (galvanized steel)	DB365-OS	DB365-OS

*Calculation of wind survivability does not include damage due to flying debris.

OVERVIEW

- Type: Whip Mirage Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB580
- Color: Horizon Blue
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

Mirage™ Omni Antenna

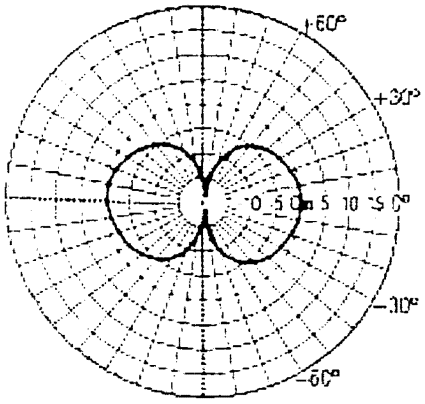
DB580, DB583, unity, 3 dBd gain

The economical DB580 with unity or 0 dBd gain and DB583 with 3 dBd gain are omnidirectional antennas for 800/900 MHz applications. Radiators are enclosed in a 1.5" (38.1 mm) OD Horizon Blue™ radome made of Mirage extruded fiberglass.

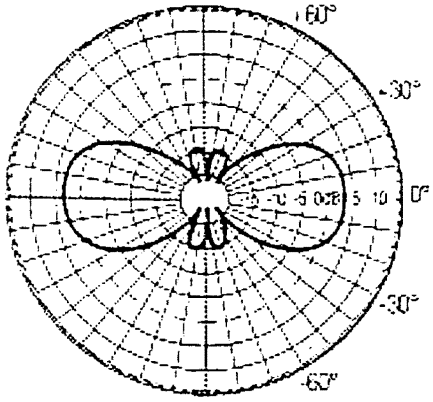
- Broad Response – Three models of each are designed for 800/900 MHz conventional, trunked, paging and cellular communications.
- Dual Purpose Mount – New integral mount made of cast aluminum alloy mounts to the side or top of a pipe.
- Reliable – Each antenna is tested for 500 watts power rating compliance and the absence of intermodulation generators.
- Moisture Resistant – The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- Lightning Resistant – A DC ground is provided.
- Ready to Install – Since the transmission line of any length can be connected directly to the antenna (and dropped through the mounting pipe), no jumper cable is furnished.

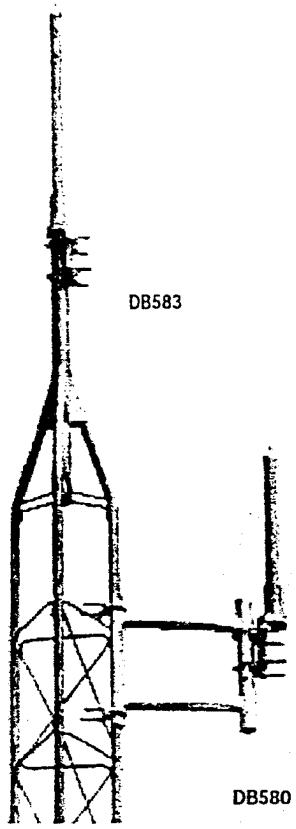
Ordering Information – Order DB580 for unity gain and DB583 for 3 dBd gain. Use model number for correct frequency. Order jumper cable separately, if needed.

DB580 Typical Vertical Radiation Pattern



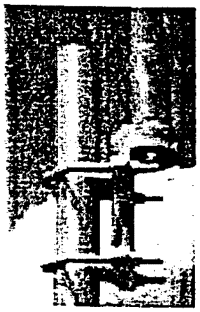
DB583 Typical Vertical Radiation Pattern





DB580 and DB583

Frequency Ranges Available – MHz	
DB580-XT or DB583-XT	806-869
DB580-XC or DB583-XC	824-896
DB580-Y or DB583-Y	890-960



Side Mounted



Top Mounted

Electrical Data	
Frequency Range – MHz	See table
Bandwidth	See table above
Gain – dBd	DB580 = Unity DB583 = 3
Beamwidth "E" Plane (half power)	DB580 = 83° DB583 = 30°
Beamwidth "H" Plane (half power)	Omni
Maximum power input – watts	250
Input Impedance – ohms	50
VSWR	1.5 to 1
Lightning protection	Direct ground
Termination	Type N-Female (fixed)

Mechanical Data	DB580	DB583
Radome (diameter = 1.5" [38.1 mm])	Mirage Fiberglass	
Radiators	Brass	
Mounting hardware	Stainless steel	
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	11.95 (53.1)	13.12 (58.4)
Overall length – ft. (m)	2.48 (.76)	2.67 (.81)
Radome length – ft. (m)	1.77 (.54)	2.11 (.64)
Mounting pipe length – in. (mm)	11 (279.4)	11 (279.4)
Maximum exposed area (flat plate equivalent) – ft² (m²)	.27 (.03)	.33 (.03)
Net weight – lbs. (kg)	3.8 (.17)	6.25 (2.84)
Shipping weight (w/clamps) – lbs. (kg)	6 (27.2)	8 (3.63)
Mount, dual purpose	Cast aluminum alloy	

OVERVIEW

- Type: Army Stick Antenna
- Manufacturer: Shakespeare
- Model #: AS-1102
- Color: White

(See next page for manufacturer cut-sheets and specifications.)

Army Sticks™

Models AS-1048, AS-1060, AS-1072, AS-1096, AS-1102

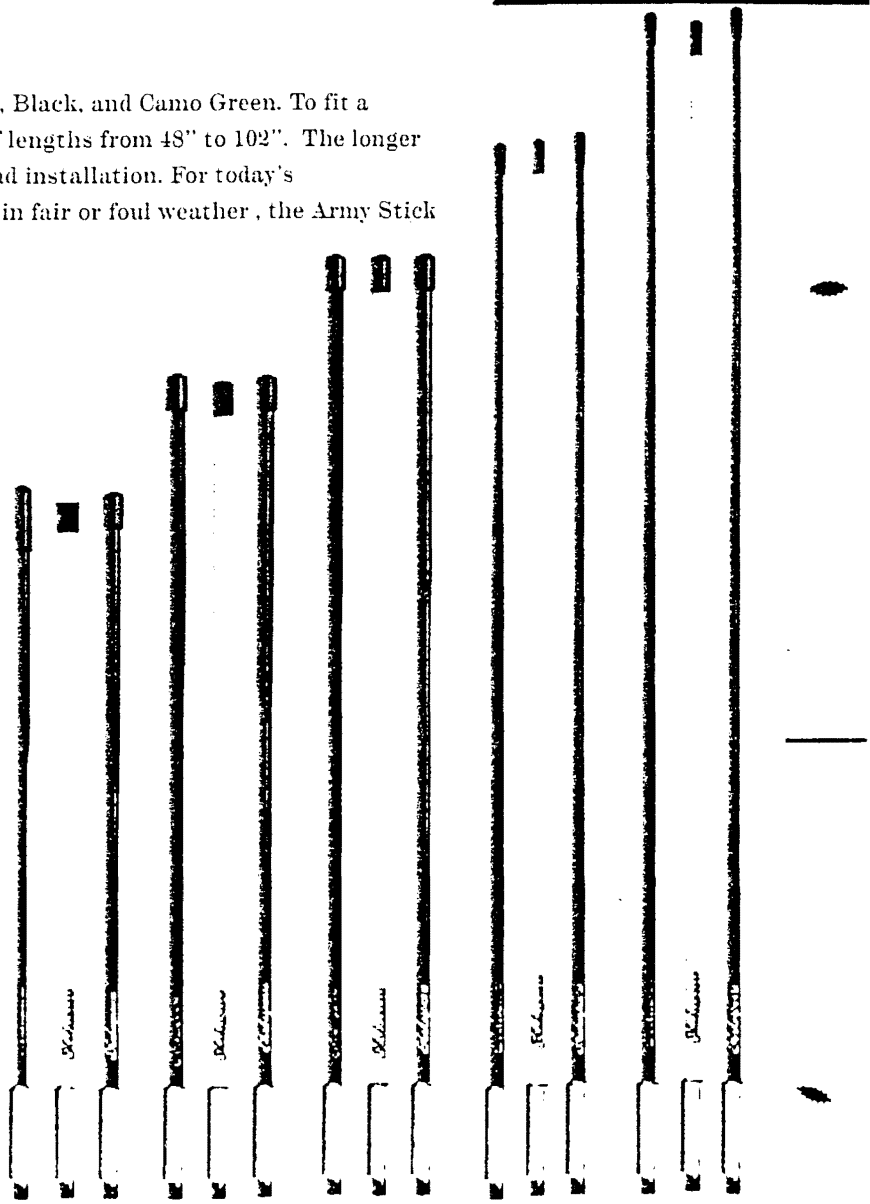


Shakespeare's Army Sticks are broadband, high-power, end-fed 3/8-wave antennas. They're built for high RF power levels, maximum performance in the 26 to 30 MHz band, and extreme resistance to shock and vibration. Like the ABS-1600, they have at their heart the same antenna technology that Shakespeare incorporates in its military antennas for use on armored vehicles, missile launchers, and other tactical vehicles.

The Army Sticks are made in the same tradition, on the same production lines, and to the same critical military specifications as the company's military antennas - hence their name. These new Army Stick antennas are built to withstand high speed impacts, meeting or exceeding the rigors of MIL-STD 810 testing for shock, vibration, and power handling. Their low wind deflection give them excellent anti-jitter, low fade groundwave and skywave communications on heavy rigs, making the Army Stick an excellent choice for the most demanding CB radio operators.

One size does not have to fit all

The Army Sticks come in three colors: White, Black, and Camo Green. To fit a variety of applications, they also come in a range of lengths from 48" to 102". The longer antennas are made in sections for easy assembly and installation. For today's communications, for demanding mobile operations in fair or foul weather , the Army Stick is the ideal choice.



Specifications: Army Sticks

Color: White, Black, or Camo Green
Power: 1000 W. PeP ICAS
Bandwidth: >1.5 MHz (28-30 MHz)
Performance: 3/8-wave
Wind Deflection: .1"/in. length @70MPH
Length (nominal): AS-1048 - 48"
AS-1060 - 60"
AS-1072 - 72"
AS-1096 - 96"
AS-1102 - 102"
Sections: 1 - UPS shippable
Mounting: Standard 3/8"-24 thread ferrule

OVERVIEW

- Type: Whip Mirage Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB580
- Color: Horizon Blue
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

Mirage™ Omni Antenna

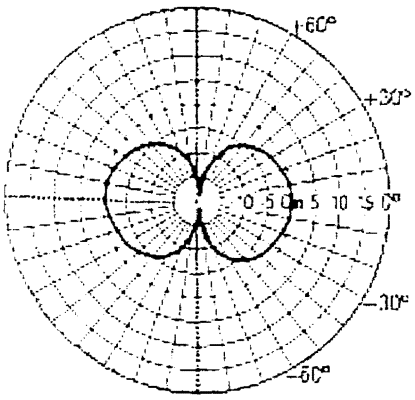
DB580, DB583, unity, 3 dBd gain

The economical DB580 with unity or 0 dBd gain and DB583 with 3 dBd gain are omnidirectional antennas for 800/900 MHz applications. Radiators are enclosed in a 1.5" (38.1 mm) OD Horizon Blue™ radome made of Mirage extruded fiberglass.

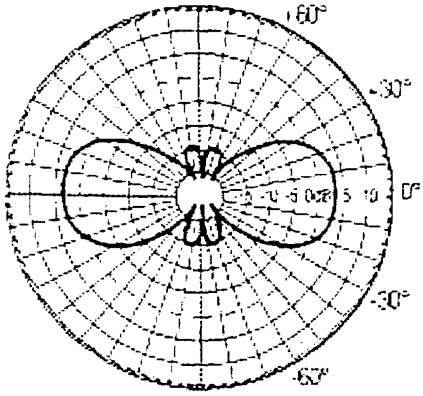
- Broad Response – Three models of each are designed for 800/900 MHz conventional, trunked, paging and cellular communications.
- Dual Purpose Mount – New integral mount made of cast aluminum alloy mounts to the side or top of a pipe.
- Reliable – Each antenna is tested for 500 watts power rating compliance and the absence of intermodulation generators.
- Moisture Resistant – The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- Lightning Resistant – A DC ground is provided.
- Ready to Install – Since the transmission line of any length can be connected directly to the antenna (and dropped through the mounting pipe), no jumper cable is furnished.

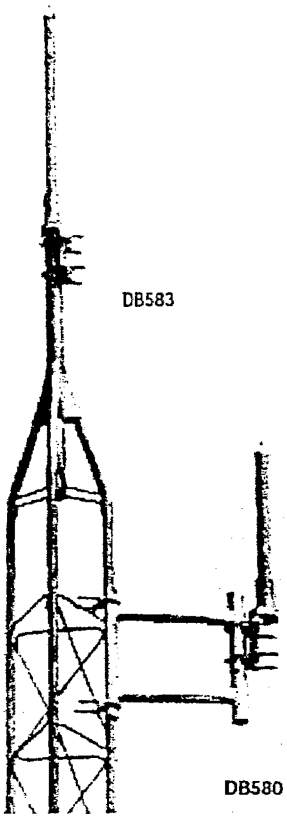
Ordering Information – Order DB580 for unity gain and DB583 for 3 dBd gain. Use model number for correct frequency. Order jumper cable separately, if needed.

DB580 Typical Vertical Radiation Pattern



DB583 Typical Vertical Radiation Pattern





DB580 and DB583

Frequency Ranges Available – MHz	
DB580-XT or DB583-XT	806-869
DB580-XC or DB583-XC	824-896
DB580-Y or DB583-Y	890-960



Side Mounted



Top Mounted

Electrical Data	
Frequency Range – MHz	See table
Bandwidth	See table above
Gain – dBd	DB580 = Unity DB583 = 3
Beamwidth "E" Plane (half power)	DB580 = 83° DB583 = 30°
Beamwidth "H" Plane (half power)	Omni
Maximum power input – watts	250
Input Impedance – ohms	50
VSWR	1.5 to 1
Lightning protection	Direct ground
Termination	Type N-Female (fixed)

Mechanical Data	DB580	DB583
Radome (diameter = 1.5" [38.1 mm])		Mirage Fiberglass
Radiators		Brass
Mounting hardware		Stainless steel
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	11.95 (53.1)	13.12 (58.4)
Overall length – ft. (m)	2.48 (.76)	2.67 (.81)
Radome length – ft. (m)	1.77 (.54)	2.11 (.64)
Mounting pipe length – in. (mm)	11 (279.4)	11 (279.4)
Maximum exposed area (flat plate equivalent) – ft² (m²)	.27 (.03)	.33 (.03)
Net weight – lbs. (kg)	3.8 (1.7)	6.25 (2.84)
Shipping weight (w/clamps) – lbs. (kg)	6 (27.2)	8 (3.63)
Mount, dual purpose		Cast aluminum alloy

OVERVIEW

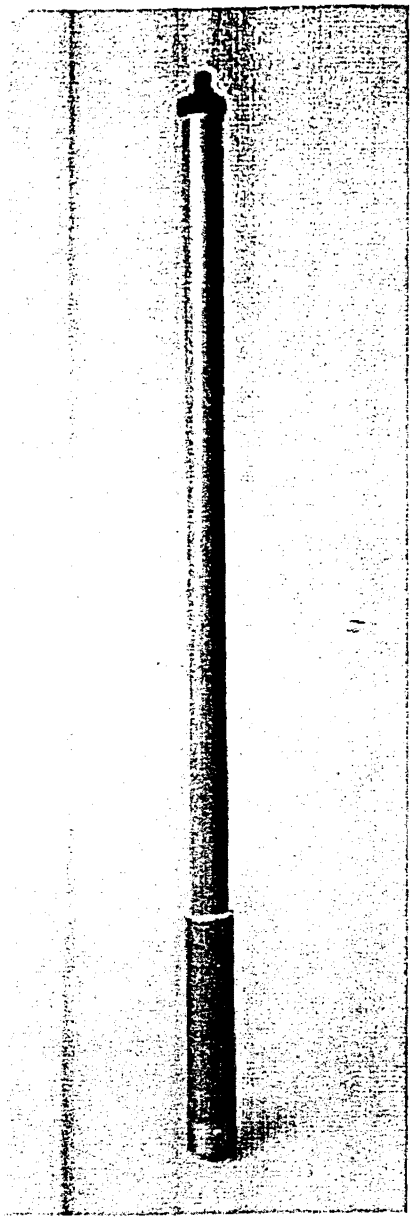
- Type: Whip Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB633
- Color: Horizon Blue
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

DECIBEL PRODUCTS

406 - 512 MHz Omni Antenna

DB630, DB633, Unity and 3 dBd gain



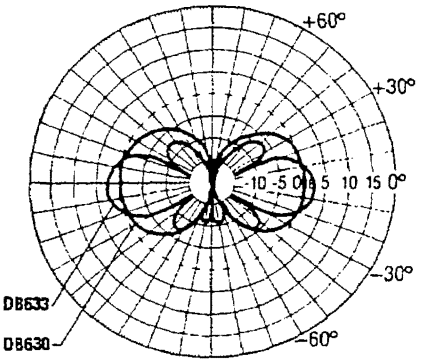
DB630/633

These are UHF omnidirectional antennas enclosed in 2" (50.8 mm) OD Horizon Blue™ radomes made of Minimum-Tip-Deflection* (MTD*) fiberglass, Decibel's radome material that resists extremely high winds with very little tip deflection.

- Full UHF Coverage – Four models with bandwidths up to 32 MHz fulfill spectrum needs for UHF conventional, paging and radiotelephone communications.
- Sturdy Construction – In addition to the Minimum-Tip-Deflection fiberglass radome, each antenna has a 9" (228.6 mm) weather-resistant, gold iridited mast made of strong 6061-T6 aluminum alloy.
- Engineered to Last – All metals used in radiator, feed and matching systems are copper or brass, which minimizes galvanic reaction and reduces intermodulation.
- Lightning Resistant – A large diameter conduction extends from top to bottom to provide ground to the tower.
- Moisture Resistant – The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- Ready to Install – DB365-OS Clamps and Vapor-Wrap* are provided.

Ordering Information – Clamps are included.
Order jumper cable separately, if desired.

DB630/633 Typical Vertical Radiation Pattern



Frequency Ranges Available – MHz	
DB630/633-A	406-436
DB630/633-B	425-455
DB630/633-C	450-482
DB630/633-D	480-512

Electrical Data	DB630	DB633
Frequency Range – MHz	See table	See table
Bandwidth – MHz	See table	See table
Gain – dBd	Unity	3
Beamwidth "E" Plane (half power)	80°	35°
Beamwidth "H" Plane (half power)	Omni	Omni
Maximum power input – watts	500	500
VSWR	1.5 to 1 or better	1.5 to 1 or better
Lightning protection	Direct ground	Direct ground
Termination	Type N-Female (fixed)	Type N-Female (fixed)

Mechanical Data	DB630	DB633
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	13.6 (60.5)	19.6 (87.2)
Radome OD – in. (mm)	2 (50.8)	2 (50.8)
Radome ID – in. (mm)	1.75 (44.45)	1.75 (44.45)
Radome length – ft. (m)	2.42 (.74)	4.1 (1.24)
Mast OD – in. (mm)	2.5 (63.5)	2.5 (63.5)
Mast length – in. (mm)	9 (22.86)	9 (228.6)
Maximum exposed area (flat plate equivalent)– ft² (m²)	.34 (.03)	.55 (.06)
Wind rating: – mph (km/hr)*	100 (161)	100 (161)
Tip deflection at 100 mph (161 km/hr)	0.1°	0.4°
Bending moment 1" (25.4 mm) below top of mast at 100 mph (161 km/hr) – ft./lbs. (N/m)	12.2 (16.5)	32.3 (43.8)
Radome	Fiberglass	Fiberglass
Radiators	Brass	Brass
Support pipe	6061-T6 Aluminum	6061-T6 Aluminum
Net weight – lbs. (kg)	6 (2.27)	8 (3.63)
Shipping weight – lbs. (kg)	16 (7.26)	19 (8.62)
Clamps (galvanized steel)	DB365-OS	DB365-OS

*Calculation of wind survivability does not include damage due to flying debris.

OVERVIEW

- Type: Whip Mirage Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB580
- Color: Horizon Blue
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

DECIBEL PRODUCTS

806 - 960 MHz

Mirage™ Omni Antenna

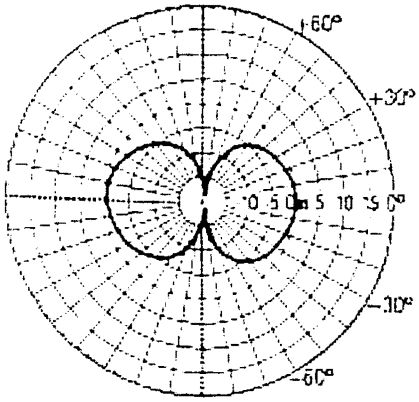
DB580, DB583, unity, 3 dBd gain

The economical DB580 with unity or 0 dBd gain and DB583 with 3 dBd gain are omnidirectional antennas for 800/900 MHz applications. Radiators are enclosed in a 1.5" (38.1 mm) OD Horizon Blue™ radome made of Mirage extruded fiberglass.

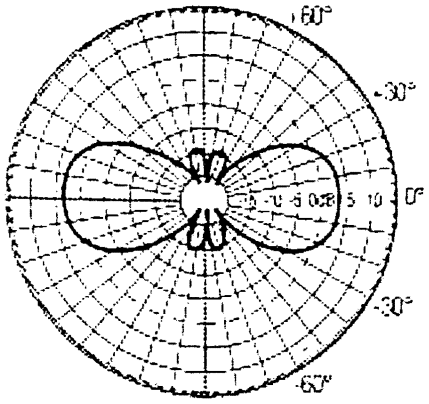
- Broad Response – Three models of each are designed for 800/900 MHz conventional, trunked, paging and cellular communications.
- Dual Purpose Mount – New integral mount made of cast aluminum alloy mounts to the side or top of a pipe.
- Reliable – Each antenna is tested for 500 watts power rating compliance and the absence of intermodulation generators.
- Moisture Resistant – The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- Lightning Resistant – A DC ground is provided.
- Ready to Install – Since the transmission line of any length can be connected directly to the antenna (and dropped through the mounting pipe), no jumper cable is furnished.

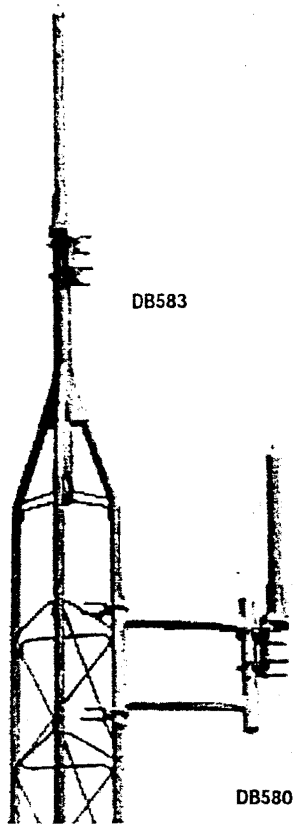
Ordering Information – Order DB580 for unity gain and DB583 for 3 dBd gain. Use model number for correct frequency. Order jumper cable separately, if needed.

DB580 Typical Vertical Radiation Pattern



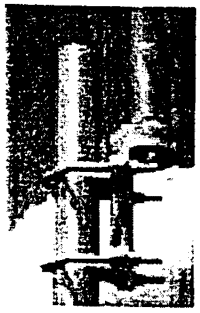
DB583 Typical Vertical Radiation Pattern





DB580 and DB583

Frequency Ranges Available – MHz	
DB580-XT or DB583-XT	806-869
DB580-XC or DB583-XC	824-896
DB580-Y or DB583-Y	890-960



Side Mounted



Top Mounted

Electrical Data	
Frequency Range – MHz	See table
Bandwidth	See table above
Gain – dBd	DB580 = Unity DB583 = 3
Beamwidth "E" Plane (half power)	DB580 = 83° DB583 = 30°
Beamwidth "H" Plane (half power)	Omni
Maximum power input – watts	250
Input Impedance – ohms	50
VSWR	1.5 to 1
Lightning protection	Direct ground
Termination	Type N-Female (fixed)

Mechanical Data	DB580	DB583
Radome (diameter = 1.5" [38.1 mm])	Mirage Fiberglass	
Radiators	Brass	
Mounting hardware	Stainless steel	
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	11.95 (53.1)	13.12 (58.4)
Overall length – ft. (m)	2.48 (.76)	2.67 (.81)
Radome length – ft. (m)	1.77 (.54)	2.11 (.64)
Mounting pipe length – in. (mm)	11 (279.4)	11 (279.4)
Maximum exposed area (flat plate equivalent) – ft² (m²)	.27 (.03)	.33 (.03)
Net weight – lbs. (kg)	3.8 (1.7)	6.25 (2.84)
Shipping weight (w/clamps) – lbs. (kg)	6 (27.2)	8 (3.63)
Mount, dual purpose	Cast aluminum alloy	

OVERVIEW

- Type: 3.6 Meter Earth Station Antenna Dish
- Manufacturer: ViaSat
- Model #: 8136
- Color: White
- Material: Aluminum

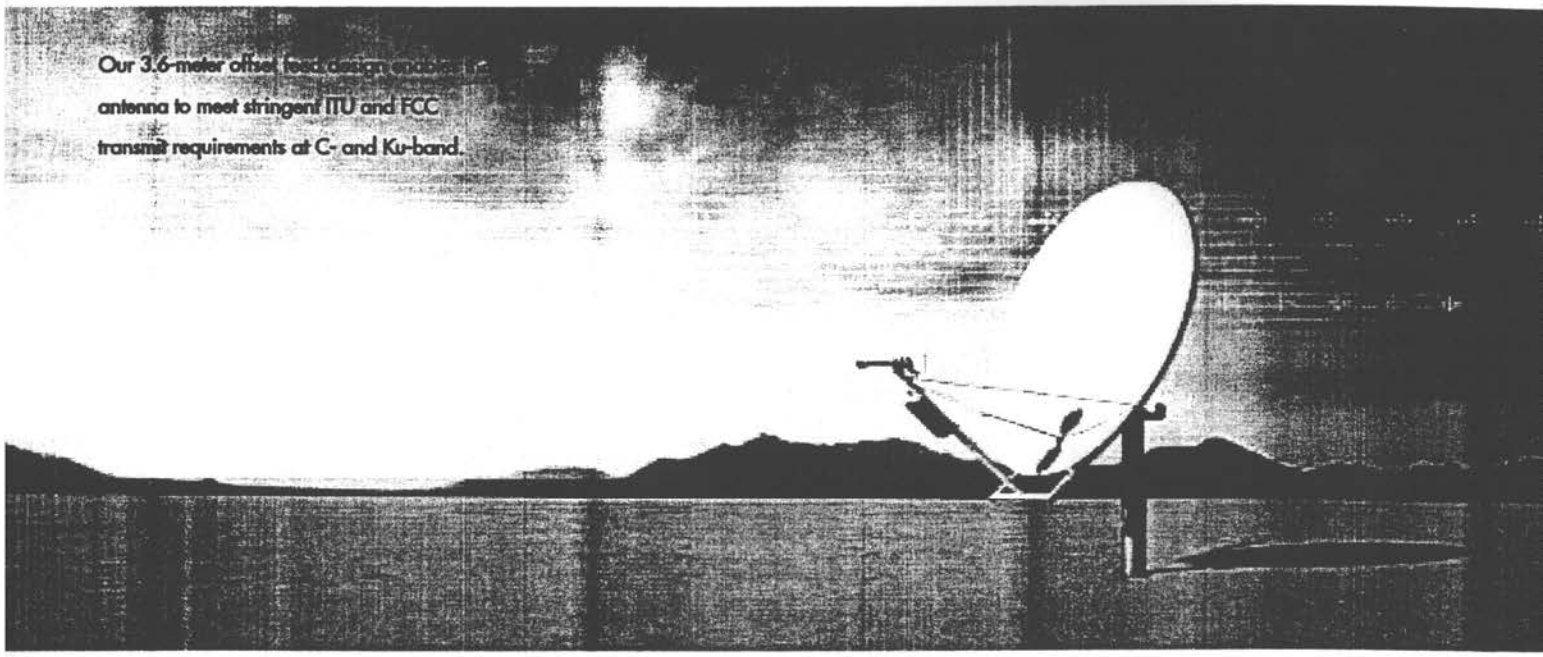
(See next 2 pages for manufacturer cut-sheets and specifications.)

ViaSat

Earth Station Antenna

3.6 Meter

HIGH-PERFORMANCE VIDEO, VOICE, AND DATA : C-BAND : EXTENDED C-BAND : Ku-BAND



- Compliant with FCC, INTELSAT, EUTELSAT, ITU and more
- CE compliant
- High-efficiency, cost-effective offset feed optics
- Use with C-band, Extended C-band, or Ku-band systems (custom frequency bands available)
- Add our 8860/8861A/8862 Antenna Controller with patented AdaptTrack for accurate tracking
- Minimal satellite repointing time with high-speed motorized option
- Three-piece stretch-formed aluminum reflector minimizes your shipping, installation, and maintenance costs
- No panel alignment required

CE

Model 8136 3.6 Meter Earth Station Antenna

Model 8136 is a 3.6-meter earth station antenna that is ideally suited for high-performance video, voice, and data communications, or thin-route telephony. The offset feed design maximizes efficiency and antenna pattern performance at both C- and Ku-band frequencies. A hot dipped galvanized mount is an elevation-over-azimuth pedestal, providing a full 360° of azimuth coverage and 90° of continuous elevation movement. The three-piece all-aluminum reflector makes shipment and installation easy.

Options

- Embedded pipe mounts
- De-icing for reflector and feed
- Lightning protection

SPECIFICATIONS

ELECTRICAL

	C-band	Ku-band
Operating Frequency (GHz):		
Transmit	5.850 – 6.425	14.0 – 14.5
Receive	3.625 – 4.2	10.95 –12.75
Gain (Midband, Ref. Feed Horn):		
Transmit	45.9 dBi[3]	52.3 dBi[4]
Receive	41.8 dBi[1]	50.8 dBi[2]
Feed Insertion Loss (dB):		
DP – 2-Port RX/RX Linear:		
Receive	0.10 dB	0.12 dB
RT – 2-Port RX/TX Linear:		
Transmit	0.10 dB	0.30 dB
Receive	0.15 dB	0.45 dB
VSWR:		
TX	1.3:1	1.3:1
RX	1.3:1	1.3:1
Beamwidth (-3 dB):		
Transmit	0.90°	0.44°
Receive	1.35°	0.48°
First Sidelobe Level:		
	18.0 dB	18.0 dB

Radiation Pattern:

C- and Ku-band: Meets standards set by FCC, INTELSAT, EUTELSAT, ITU and others.

Antenna Noise Temp (Typical, Ref. Feed Horn):

Elevation	C-band	Ku-band
10°	24 K	31 K
20°	16 K	23 K
30°	15 K	21 K
40°	14 K	20 K

Power Handling Per TX Port:		
	5 kW (CW)	2 kW (CW)
Cross Pol Isolation (on axis, min.) (Linear):		
Transmit	35 dB	35 dB
Receive	35 dB	35 dB
Feed Port Isolation (4-Port Linear):		
TX/RX	85 dB	85 dB

MECHANICAL

Antenna Diameter: 3.6 meters (11.8 ft)

Antenna Type: offset feed

Reflector Construction: 3 panels, precision stretch-formed aluminum

Mount Type: pipe, elevation-over-azimuth

Antenna Travel:

Elevation: 0° to 90° continuous[5]

Azimuth: Manual 360° ±4° Vernier

Motorized 360° in 125° sectors

Polarization Adjustment:

Manual: ±90°

Motorized: ±90°

Antenna Travel Rate (Motorized):

Various — consult factory

Feed Interface:

Transmit C-band:	CPR-137G
Transmit Ku-band:	WR-75
Receive C-band:	CPR-229G
Receive Ku-band:	WR-75

Weight C-band:

Net: 454 kg (1,000 lbs)

Ship: 589 kg (1,300 lbs)

Shipping Volume: 15.6 cubic meters (550 cubic feet)



ENVIRONMENTAL

Wind Loading:

Operational: 72 kph (45 mph)

Survival: 201 kph (125 mph)

Temperature Range:

Operational: -40° C to +65° C (-40° F to +150° F)

Atmospheric Conditions:

Salt, pollutants and corrosive contaminants as found in coastal and industrial areas

NOTES:

[1] Referenced at 3.95 GHz
[2] Referenced at 11.95 GHz
[3] Referenced at 6.175 GHz
[4] Referenced at 14.25 GHz
[5] Minimum elevation angle is 5° with the hot air de-icing option installed

ViaSat®

atlanta beijing london new delhi san diego santiago sydney

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telephone +1 678.924.2999 ≈ facsimile +1 770.935.3294

www.viasat.com

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OVERVIEW

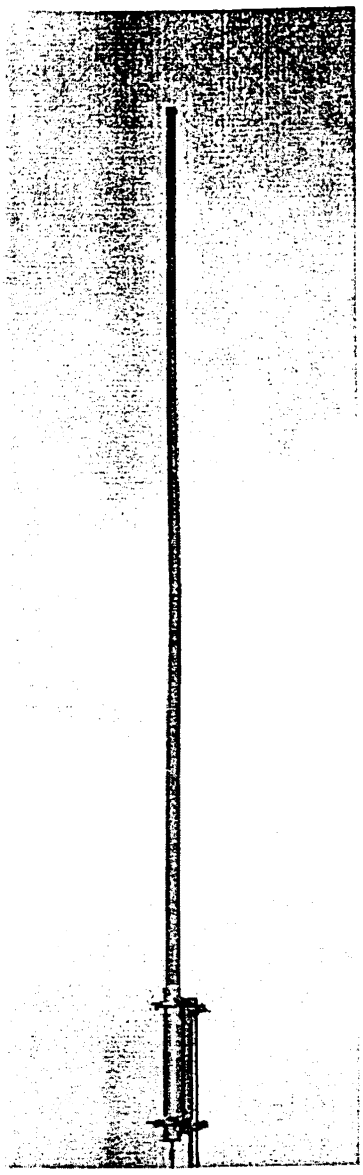
- Type: Whip Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB616
- Color: Horizon Blue
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

DECIBEL PRODUCTS

140 - 174 MHz Omni Antenna

DB616, 5.3 dBd gain



DB616

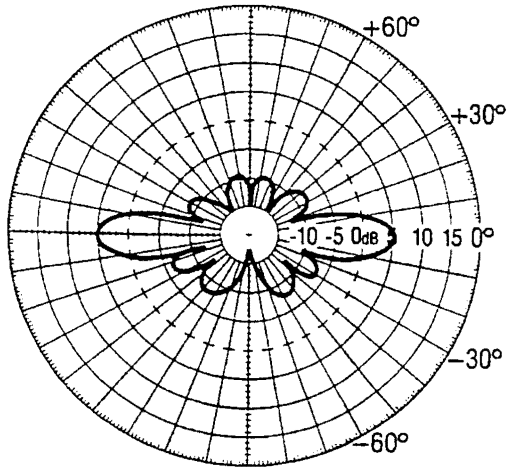
Designed for land and shore stations in severe environments, the DB616 omni-directional antenna has its radiators enclosed in a Horizon Blue™ radome made of strong, one-quarter inch thick Aeroglas® fiberglass, a Decibel Products exclusive for antennas. Aeroglas is also used for helicopter rotor blades, Olympic vaulters' poles and racing sailboat masts.

- Sturdy Construction – In addition to an Aeroglas radome, the antenna has a weather-resistant, gold iridited support pipe made of 6061-T6 aluminum alloys.
- Engineered to Last – All metals used in radiator, feed and matching systems are copper or brass, which minimizes galvanic reaction and reduces intermodulation.
- Lightning Resistant – A DC ground is provided.
- Moisture Resistant – The bottom cap has a moisture-sealed bulkhead UHF connector and drain plugs at the top and bottom provide drainage in upright or inverted positions.
- Ready to Install – A DB5087-3 No-Torsion Mount and Vapor-Wrap® are provided for easy installation.

Ordering Information – Use model number for correct frequency. Order DB616-AB for VHF marine frequency range. Clamps are included. Side mount outrigger S5004S-616 10' (3048 mm) optional. Order jumper cable separately.

Frequency Ranges Available	
DB616-AB	150-164 MHz
DB616-BC	160-174 MHz
DB616-D	142-150 MHz

DB616 Typical Vertical Radiation Pattern



Electrical Data	
Frequency Range – MHz	See table
Bandwidth – MHz	See table
Gain – dBd	5
Beamwidth "E" Plane (half power)	18°
Beamwidth "H" Plane (half power)	Omni
Maximum power input – watts	500
VSWR	1.5:1 or less
Lightning protection	Direct ground
Termination	Type UHF-Female (fixed)

Mechanical Data	
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	88 (391.4)
Rated wind velocity – mph (kph)*	160 (257)
Rated wind velocity w/.5" (12.7mm) ice	100 (161)
Radome length – ft. (m)	
DB616-AB	20.4 (6.2)
DB616-BC	19.2 (5.9)
DB616-D	21.1 (6.4)
Mounting pipe length – in. (mm)	26 (660.4)
Maximum exposed area (flat plate equivalent) – ft.² (m²)	2.5 (.23)
Net weight – lbs. (kg)	51 (23.13)
Shipping weight (w/mount) – lbs. (kg)**	92 (41.73)
Radome	Aeroglas® Fiberglass
Radiators	Brass
Support pipe	6061-T6 Aluminum
Mount	DB5087-3 No-Torsion

*Calculation of wind survivability does not include damage due to flying debris.

**Mount shipped separately.

OVERVIEW

- Type: Yagi Antenna
- Manufacturer: PC Electronics
- Model #: DSFO ATV-25
- Color: Aluminum
- Material: Aluminum

(See next page for manufacturer cut-sheets and specifications.)

P. C. Electronics 2522 Paxson Lane Arcadia CA 91007-8537 USA ©2002

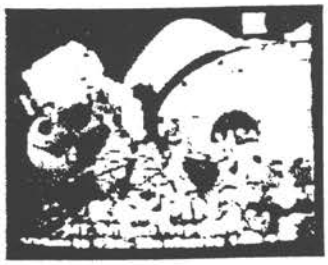
Tel: (626) 447-4565 m-th 8am-5:30pm pst (UTC - 8) Tom (W6ORG) & Mary Ann (WB6YSS) O'Hara

24 hr FAX order line (626) 447-0489 Email: tom@hamtv.com
Web site: www.hamtv.com

VISA MasterCard

420-450 MHz ATV DOWNCONVERTERS

GET STARTED WITH ONE OF THESE TO *SEE* THE ACTION!

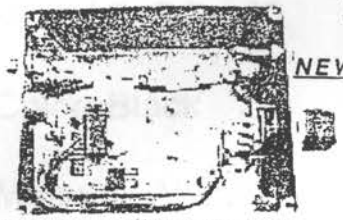


Space Shuttle video off the air from an ATV Repeater - Astronauts working in the cargo bay. You may be able to see it in your area with one of these downconverters.



TVC-4G
Plug-in and Play

TUNEABLE DOWNCONVERTER, TVC-4G with AC supply.....**$99**
This ready to go box downconverts the whole 420-450 MHz ham band down to TV channel 3 or 4 so your TV receiver can see and hear AM ATV just like broadcast TV. Contains the sensitive GaAsfet TVC-2G board (see pg 2) in a rugged black die cast 4.7x3.7x2.1 inch aluminum box ready to go with 120 Vdc 60 Hz to 12Vdc 100 ma. wall plug power supply. 50 Ohm N connector antenna input and 75 Ohm F output to TV. If you want composit video to directly drive a monitor, add the Rch3 channel 3 receiver or VRC-45 module below.



NEW

TVCS board shown mounted in TVC-4G with supplied rotary switch

DOWNCONVERTER SYNTHESIZER Board, TVCS-2, 9 or 12.....$79
Channelize & crystal lock your TC70 or TVC-2G, 4G, 9G or 12G tuneable downconverter with this piggyback add on board. Switch select the 5 most used frequencies in the band - no more being off frequency from someone nudging the dial or temperature drift. Easy installation.
TVCS-2 freq: 421.25, 426.25, 427.25, 434.0, 439.25 to ch3, 4 or 45MHz IF
TVCS-9 freq: 910.25, 911.25, 913.25, 919.25, 923.25 to ch3, 4 or 45 MHz IF
TVCS-12 freq: 1241.25, 1253.25, 1265.25, 1277.25, 1289.25 to ch7,8, 45 IF
Other frequencies on special order.



TVCX-4

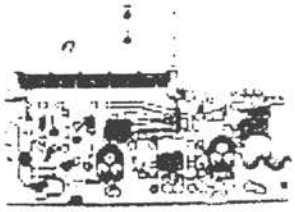
TVCX-4 PACKAGED DOWNCONVERTER with TVC-2G & TVCS-2....**$159**
Replaces the single crystal controlled version with the synthesized one.



KP2 Preamp & DC Coupler

MIRAGE KP2/440 ANTENNA MOUNTED PREAMP.....$174
If your coax loss is greater than 3 dB then this preamp can make a difference. Automatic T/R switching 1/4 to 150 Watts. .6 dB NF 15 to 25 dB gain. N conn. Req. 12 to 14 Vdc - new in shack dc coupler included.





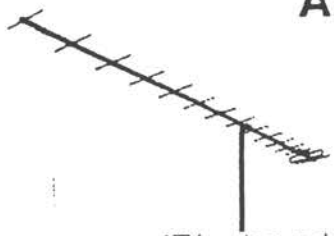
VRC45 45 MHz IF
AM ATV Receiver



VRC-45b 45.75 MHz IF/RECEIVER module.....**$99**
2 composite video outputs, squelched line & speaker audio outputs. Used with TVC2G or TVC-4G with the local oscillator reset for high side injection and 45.75 MHz output. Package in a CAB-247 box with a TVC-2G for complete receiver. 4x3.75". 13.8V @ .25A.

Rch3 AM ATV RECEIVER, CHANNEL 3 TO VIDEO AND AUDIO OUT...$59
Takes the ch 3 input from your 70cm or 33cm downconverter and outputs composite video and line audio to your monitor, camcorder or VCR. 13.8 Vdc, AC PS incl. 5x3.3x1.5". F ch 3 input, RCA jack A/V outputs. Includes app note for adding squelched audio and S-meter.

ANTENNAS FOR 420-450 MHZ ATV



OAL 5L-70cm 8 dBd gain beam, 31" boom, vertical or horizontal polarization rear mount. This antenna was specifically designed by the Olde Antenna Lab for ATV point to point, fixed at a repeater or is small enough to be portable for R/C or at public service events to minimize multipath ghosts and get some gain at the same time. Wide 60 degree beam width. Type N female connector. Price includes priority mail shipping in the contiguous USA.....**$70**

DIR. SYST. DSFO ATV-25 16 dBd gain, 17 ft boom, center mounted.....**$159**
Highest gain ATV by K1FO. The antenna, coax and tower height are the most important part of your ATV system and deserves your most care and attention. ATV antennas must have broad bandwidth in addition to high gain and low VSWR. Few other antennas work well at both 439 and 421 MHz. This DSFO antenna fits the requirement, especially for DXers and has a long history of rugged operation with ATVers. The gain has been proven out at VHF/UHF conference antenna measuring contests, and is not marketing hype. The DSFO ATV-25 can take up to the maximum legal power limit. Balun or matching network with female type N connector is included. We suggest using Belden 9913 (2.6 dB/100') or better 50 Ohm low loss coax or hard line. Belden 8214 (4.2 dB/100') is more flexible and is fine for runs less than 50 feet. Antenna heigth to get above trees is more important than coax length. Check with local ATVers to find out polarity - up to -20 dB if wrong. Always verify any new antenna system with a RF power meter for less than 10% reflected power before normal transmitting over 20 seconds. Weather-proof all outside connectors.

Prices include UPS surface shipping in cont. USA

DIAMOND **F718L** 420-430 MHz 9.3 dBd vertical omni, 15' long, N connector.....**$238**
X510NJ dual band vertical omni, 428-442 MHz/143.5-146.5 MHz, 9.5/6.1 dBd, 17.2'.....**$209**
X510NA dual band vertical omni, 438-450 MHz/144-148 MHz, 9.5/6.1 dBd, 17.2'.....**$199**

Great for repeaters, EOC or home - no beam to rotate.

OVERVIEW

- Type: Whip Antenna
- Manufacturer: SGC
- Model #: SG-303
- Color: Black
- Material: Aluminum

(See next 2 pages for manufacturer cut-sheets and specifications.)

SG-303 Antenna with SGC Couplers

The SG-303, a high performance mobile antenna, is designed and built to operate in rough terrain and extreme climactic conditions. It has a lifetime warranty.

The SG-303 antenna is a light-weight and low-cost mobile antenna for operation between 1.8 and 30 MHz. Nine feet in length overall, it consists of two sections of helically wound whip, mounted on a sturdy professional weatherproof rubber spring. Mounts on an adjustable ratchet mechanism:

- the base adjusts for the best attachment to the vehicle.
- the antenna ratchet permits orienting the whip from vertical to horizontal.

The SG-303 stands up to the wind loading at highway speeds, as well as to rain, ice, and the occasional tree branch.

The SGC line of antenna couplers—the famous SGC "Smartuners"—packed into a sturdy case, mount on the vehicle as close as possible to the antenna lead-through. Each one gives almost any HF-SSB a major boost in range and clarity. The Smartuner "intelligently" tunes any length antenna. No preliminary tuning or adjustment is required, and the Smartuner operates with any HF transceiver in the 1.6—30 MHz range and with output power from 3 to 500 watts.

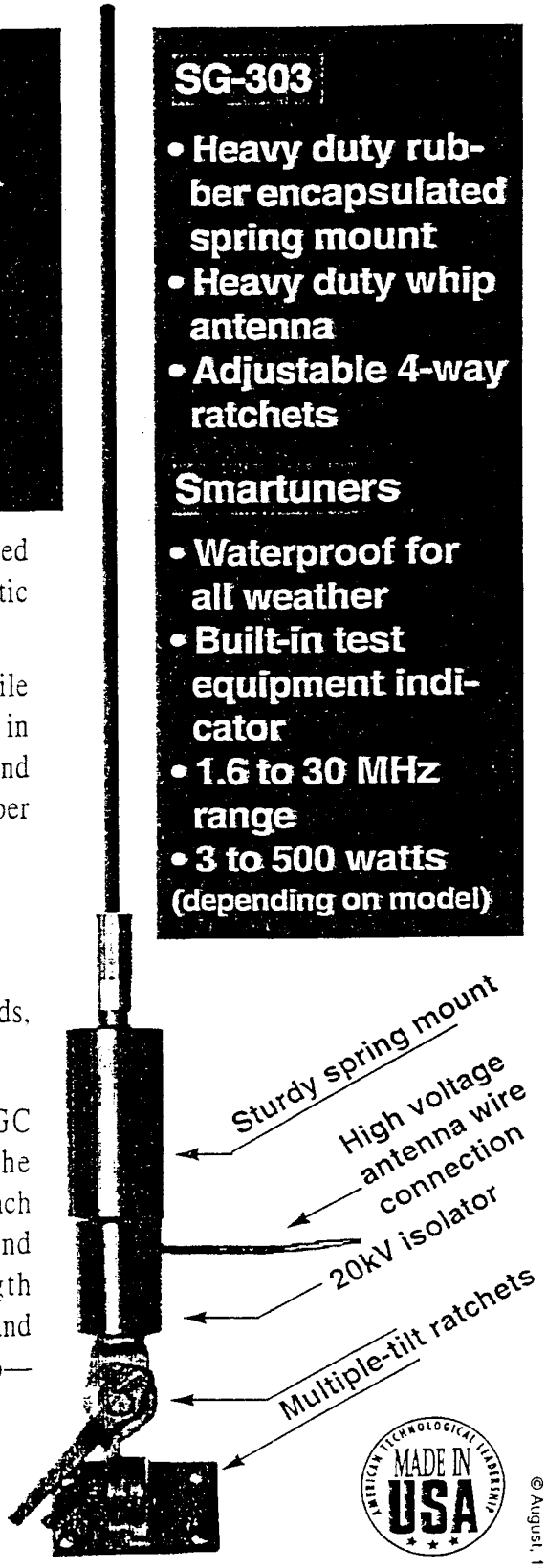
Be sure to see SGC's revolutionary mobile QMS system for mounting antenna and coupler outside the vehicle.

SG-303

- Heavy duty rubber encapsulated spring mount
- Heavy duty whip antenna
- Adjustable 4-way ratchets

Smartuners

- Waterproof for all weather
- Built-in test equipment indicator
- 1.6 to 30 MHz range
- 3 to 500 watts (depending on model)



MADE IN USA

SGC®

The SGC Building 13737 S.E. 26th Street, Bellevue, WA 98005 USA
Box 3526, Bellevue, WA 98009 USA 425-746-6310 or 1-800-259-7331
Fax: 425-746-6384 E-mail: SGCMKTG@aol.com Web site: http://www.sgcworld.com

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SG-303 Specifications

HF Frequency Ranges: 1.8 to 30MHz

Maximum Output Power: 3 to 500 watts (PEP) voice or CW

Dual Frequency Resonance: at 12 and 22 MHz

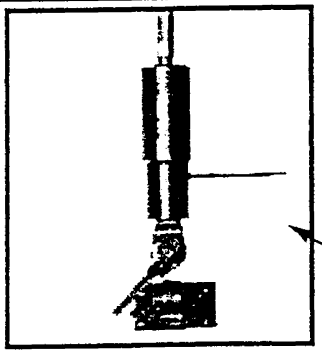
Antenna structure: Two sections, 50 inches each

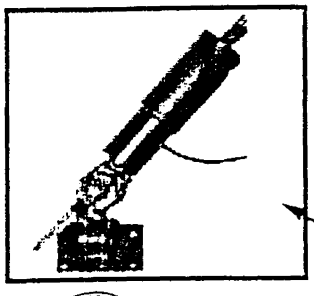
Mount: high voltage insulated 4-way stainless steel ratchet mount

Base: heavy duty rubber encapsulated spring mount

Feed-through: high voltage wall feed-through bushing (hole = .890 in.)

Cable: 3 ft. high voltage wire, one end terminated by a round lug





Combine an SG-303 with an SGC coupler for HF-SSB mobile operation with high radiation performance

Antenna installation. The heavy duty ratchet mount attaches to a flat surface. Mount high voltage cable away from the metal antenna support. Mount the antenna at the highest point of the vehicle. The high voltage waterproof cable feeds through the vehicle body as close to the base of the antenna as possible.

Coupler Installation. The coupler mounts inside the vehicle and close to the base of the antenna. Braided straps make a good ground.

Antenna ratchet mount. The four-way ratchet mount allows the antenna to be adjusted for operation when the vehicle is in motion.

Excellent communication under even adverse weather conditions can be achieved when the vehicle is moving.

Reclining the antenna. When the vehicle is travelling, this will avoid unnecessary exposure to objects like bridges or trees.

Smartuner Specifications

SG-230 - 200 watts

HF Frequency Range: 1.6 to 30MHz
Power Input Range: 3 to 200 watts(PEP)
VSWR: Typical—less than 2:1
DC Input: +13.6 VDC (24 VDC optional)

SG-230PRO - 200 watts

HF Frequency Range: 1.6 to 30MHz
Power Input Range: 3 to 200 watts(PEP)
VSWR: Typical—less than 1.4:1
DC Input: +13.6VDC (24 VDC optional)
Features: Receive pre-amplifier; manual control through computer

SG-235 - 500 watts

HF Frequency Range 1.8 to 30MHz
Power Input Range: 3 to 500 watts(PEP)
VSWR: Typical—less than 2:1
DC Input: +13.6VDC

General Specifications

Input Impedance Range:	45 to 55 Ω
DC Operating Range:	+10.5 to 15 VDC (24 VDC optional)
Input Current:	Average—.9 amps
Random Set Times:	Typical—less than 2 seconds
Recurrent Set Times:	Typical— less than 10 milliseconds
Non-volatile Memory Addresses:	500
Installation:	Any position
Operating Temperature:	-35° to +70°C
Environmental:	Waterproof at immersion of half meter, half hour
Size Overall:	16 D x 12 W x 3H inches 40.6D x 30.5W x 7.6H centimeters
Weight:	8 pounds (3.5 kilos)
Case Construction:	Plastic ABS weatherproof case
Cable:	SGC special cable, 9 feet coaxial and two power wire input wires, RMT tune and Smartlock wire

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MADE IN USA

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E-mail: SGCMKTG@aol.com Web site: http://www.sgcworld.com

OVERVIEW

- Type: Yagi Antenna
- Manufacturer: PC Electronics
- Model #: DSFO ATV-25
- Color: Aluminum
- Material: Aluminum

(See next page for manufacturer cut-sheets and specifications.)

P. C. Electronics 2522 Paxson Lane Arcadia CA 91007-8537 USA ©2002

Tel: **(626) 447-4565** m-th 8am-5:30pm pst (UTC - 8) Tom (W6ORG) & Mary Ann (WB6YSS) O'Hara

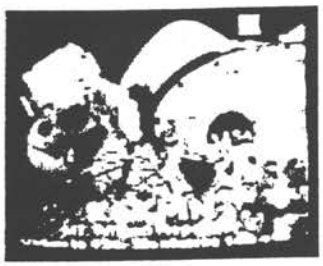
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VISA MasterCard

PC ELECTRONICS

420-450 MHz ATV DOWNCONVERTERS

GET STARTED WITH ONE OF THESE TO *SEE* THE ACTION!

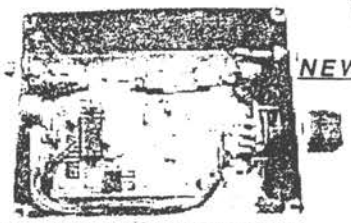


Space Shuttle video off the air from an ATV Repeater - Astronauts working in the cargo bay. You may be able to see it in your area with one of these downconverters.



TVC-4G
Plug-in and Play

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TVCS board shown mounted in TVC-4G with supplied rotary switch

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Channelize & crystal lock your TC70 or TVC-2G, 4G, 9G or 12G tuneable downconverter with this piggyback add on board. Switch select the 5 most used frequencies in the band - no more being off frequency from someone nudging the dial or temperature drift. Easy installation.
TVCS-2 freq: 421.25, 426.25, 427.25, 434.0, 439.25 to ch3, 4 or 45MHz IF
TVCS-9 freq: 910.25, 911.25, 913.25, 919.25, 923.25 to ch3, 4 or 45 MHz IF
TVCS-12 freq: 1241.25, 1253.25, 1265.25, 1277.25, 1289.25 to ch7,8, 45 IF
Other frequencies on special order.



TVCX-4

TVCX-4 PACKAGED DOWNCONVERTER with TVC-2G & TVCS-2....**$159**
Replaces the single crystal controlled version with the synthesized one.

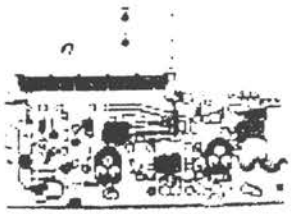


KP2 Preamp & DC Coupler

MIRAGE KP2/440 ANTENNA MOUNTED PREAMP.....$174
If your coax loss is greater than 3 dB then this preamp can make a difference. Automatic T/R switching 1/4 to 150 Watts. .6 dB NF 15 to 25 dB gain. N conn. Req. 12 to 14 Vdc - new in shack dc coupler included.



VRC-45b 45.75 MHz IF/RECEIVER module.....**$99**
2 composite video outputs, squelched line & speaker audio outputs. Used with TVC2G or TVC-4G with the local oscillator reset for high side injection and 45.75 MHz output. Package in a CAB-247 box with a TVC-2G for complete receiver. 4x3.75". 13.8V @ .25A.

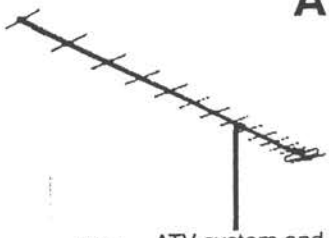


VRC45 45 MHz IF
AM ATV Receiver



Rch3 AM ATV RECEIVER, CHANNEL 3 TO VIDEO AND AUDIO OUT...$59
Takes the ch 3 input from your 70cm or 33cm downconverter and outputs composite video and line audio to your monitor, camcorder or VCR. 13.8 Vdc, AC PS incl. 5x3.3x1.5". F ch 3 input, RCA jack A/V outputs. Includes app note for adding squelched audio and S-meter.

ANTENNAS FOR 420-450 MHZ ATV



OAL 5L-70cm 8 dBd gain beam, 31" boom, vertical or horizontal polarization rear mount. This antenna was specifically designed by the Olde Antenna Lab for ATV point to point, fixed at a repeater or is small enough to be portable for R/C or at public service events to minimize multipath ghosts and get some gain at the same time. Wide 60 degree beam width. Type N female connector.
Price includes priority mail shipping in the contiguous USA.....**$70**

DIR. SYST. DSFO ATV-25 16 dBd gain, 17 ft boom, center mounted.....**$159**
Highest gain ATV by K1FO. The antenna, coax and tower height are the most important part of your ATV system and deserves your most care and attention. ATV antennas must have broad bandwidth in addition to high gain and low VSWR. Few other antennas work well at both 439 and 421 MHz. This DSFO antenna fits the requirement, especially for DXers and has a long history of rugged operation with ATVers. The gain has been proven out at VHF/UHF conference antenna measuring contests, and is not marketing hype. The DSFO ATV-25 can take up to the maximum legal power limit. Balun or matching network with female type N connector is included. We suggest using Belden 9913 (2.6 dB/100') or better 50 Ohm low loss coax or hard line. Belden 8214 (4.2 dB/100') is more flexible and is fine for runs less than 50 feet. Antenna heigth to get above trees is more important than coax length. Check with local ATVers to find out polarity - up to -20 dB if wrong. Always verify any new antenna system with a RF power meter for less than 10% reflected power before normal transmitting over 20 seconds. Weather-proof all outside connectors.

Prices include UPS surface shipping in cont. USA



DIAMOND **F718L** 420-430 MHz 9.3 dBd vertical omni, 15' long, N connector.....**$238**
X510NJ dual band vertical omni, 428-442 MHz/143.5-146.5 MHz, 9.5/6.1 dBd, 17.2'.....**$209**
X510NA dual band vertical omni, 438-450 MHz/144-148 MHz, 9.5/6.1 dBd, 17.2'.....**$199**

Great for repeaters, EOC or home - no beam to rotate.

OVERVIEW

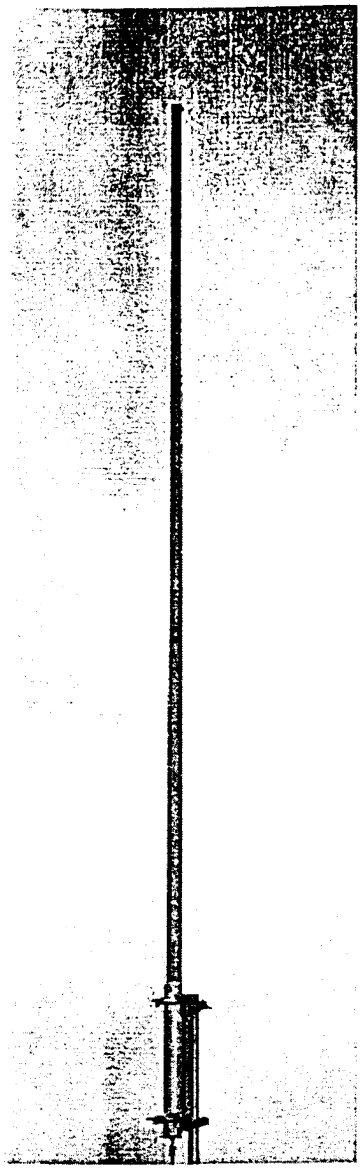
- Type: Whip Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB616
- Color: Horizon Blue
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

DECIBEL PRODUCTS

140 - 174 MHz Omni Antenna

DB616, 5.3 dBd gain



DB616

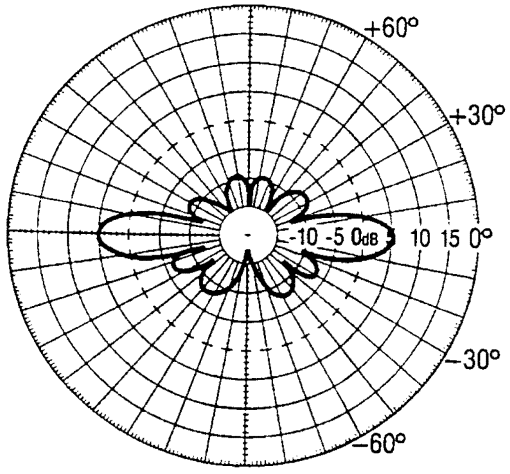
Designed for land and shore stations in severe environments, the DB616 omni-directional antenna has its radiators enclosed in a Horizon Blue™ radome made of strong, one-quarter inch thick Aeroglas® fiberglass, a Decibel Products exclusive for antennas. Aeroglas is also used for helicopter rotor blades, Olympic vaulters' poles and racing sailboat masts.

- Sturdy Construction – In addition to an Aeroglas radome, the antenna has a weather-resistant, gold iridited support pipe made of 6061-T6 aluminum alloys.
- Engineered to Last – All metals used in radiator, feed and matching systems are copper or brass, which minimizes galvanic reaction and reduces intermodulation.
- Lightning Resistant – A DC ground is provided.
- Moisture Resistant – The bottom cap has a moisture-sealed bulkhead UHF connector and drain plugs at the top and bottom provide drainage in upright or inverted positions.
- Ready to Install – A DB5087-3 No-Torsion Mount and Vapor-Wrap® are provided for easy installation.

Ordering Information – Use model number for correct frequency. Order DB616-AB for VHF marine frequency range. Clamps are included. Side mount outrigger S5004S-616 10' (3048 mm) optional. Order jumper cable separately.

Frequency Ranges Available	
DB616-AB	150-164 MHz
DB616-BC	160-174 MHz
DB616-D	142-150 MHz

DB616 Typical Vertical Radiation Pattern



Electrical Data	
Frequency Range – MHz	See table
Bandwidth – MHz	See table
Gain – dBd	5
Beamwidth "E" Plane (half power)	18°
Beamwidth "H" Plane (half power)	Omni
Maximum power input – watts	500
VSWR	1.5:1 or less
Lightning protection	Direct ground
Termination	Type UHF-Female (fixed)

Mechanical Data	
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	88 (391.4)
Rated wind velocity – mph (kph)*	160 (257)
Rated wind velocity w/.5" (12.7mm) ice	100 (161)
Radome length – ft. (m)	
DB616-AB	20.4 (6.2)
DB616-BC	19.2 (5.9)
DB616-D	21.1 (6.4)
Mounting pipe length – in. (mm)	26 (660.4)
Maximum exposed area (flat plate equivalent) – ft.² (m²)	2.5 (.23)
Net weight – lbs. (kg)	51 (23.13)
Shipping weight (w/mount) – lbs. (kg)**	92 (41.73)
Radome	Aeroglas® Fiberglass
Radiators	Brass
Support pipe	6061-T6 Aluminum
Mount	DB5087-3 No-Torsion

*Calculation of wind survivability does not include damage due to flying debris.

**Mount shipped separately.

OVERVIEW

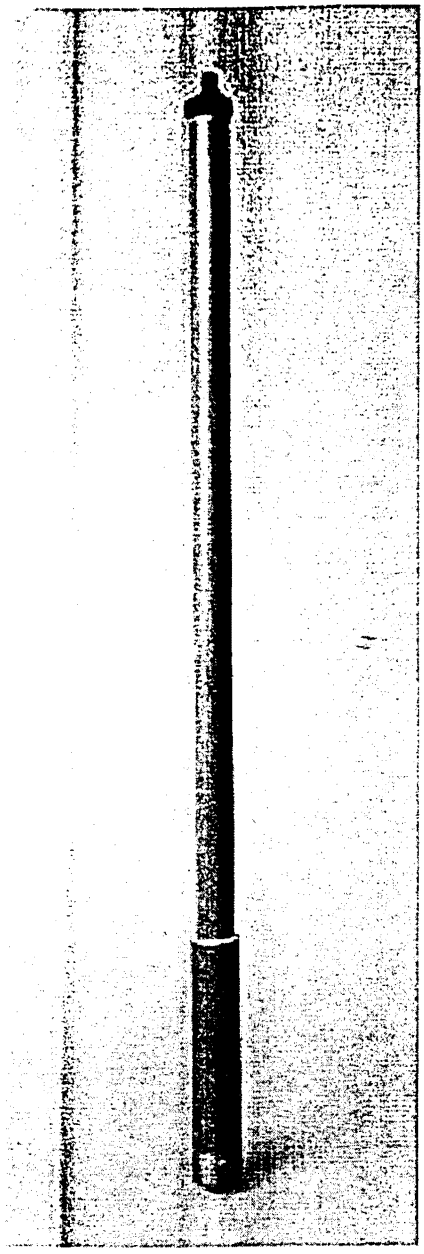
- Type: Whip Omni Antenna
- Manufacturer: Decibel Products
- Model #: DB633
- Color: Horizon Blue
- Material: Fiber Glass

(See next page for manufacturer cut-sheets and specifications.)

DECIBEL PRODUCTS

406 - 512 MHz Omni Antenna

DB630, DB633, Unity and 3 dBd gain



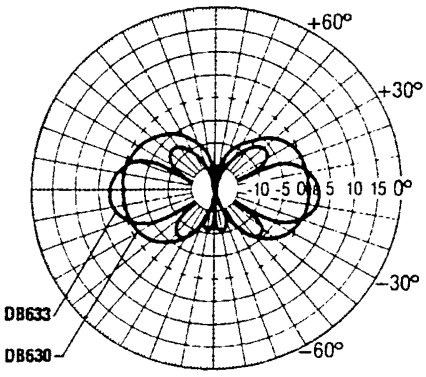
DB630/633

These are UHF omnidirectional antennas enclosed in 2" (50.8 mm) OD Horizon Blue™ radomes made of Minimum-Tip-Deflection* (MTD*) fiberglass, Decibel's radome material that resists extremely high winds with very little tip deflection.

- Full UHF Coverage – Four models with bandwidths up to 32 MHz fulfill spectrum needs for UHF conventional, paging and radiotelephone communications.
- Sturdy Construction – In addition to the Minimum-Tip-Deflection fiberglass radome, each antenna has a 9" (228.6 mm) weather-resistant, gold iridited mast made of strong 6061-T6 aluminum alloy.
- Engineered to Last – All metals used in radiator, feed and matching systems are copper or brass, which minimizes galvanic reaction and reduces intermodulation.
- Lightning Resistant – A large diameter conduction extends from top to bottom to provide ground to the tower.
- Moisture Resistant – The bottom cap has a moisture-sealed bulkhead N-Female connector, and a removable drain plug is located at each end of the antenna.
- Ready to Install – DB365-OS Clamps and Vapor-Wrap* are provided.

Ordering Information – Clamps are included.
Order jumper cable separately, if desired.

DB630/633 Typical Vertical Radiation Pattern



Frequency Ranges Available – MHz	
DB630/633-A	406-436
DB630/633-B	425-455
DB630/633-C	450-482
DB630/633-D	480-512

Electrical Data		
	DB630	DB633
Frequency Range – MHz	See table	See table
Bandwidth – MHz	See table	See table
Gain – dBd	Unity	3
Beamwidth "E" Plane (half power)	80°	35°
Beamwidth "H" Plane (half power)	Omni	Omni
Maximum power input – watts	500	500
VSWR	1:5 to 1 or better	1:5 to 1 or better
Lightning protection	Direct ground	Direct ground
Termination	Type N-Female (fixed)	Type N-Female (fixed)

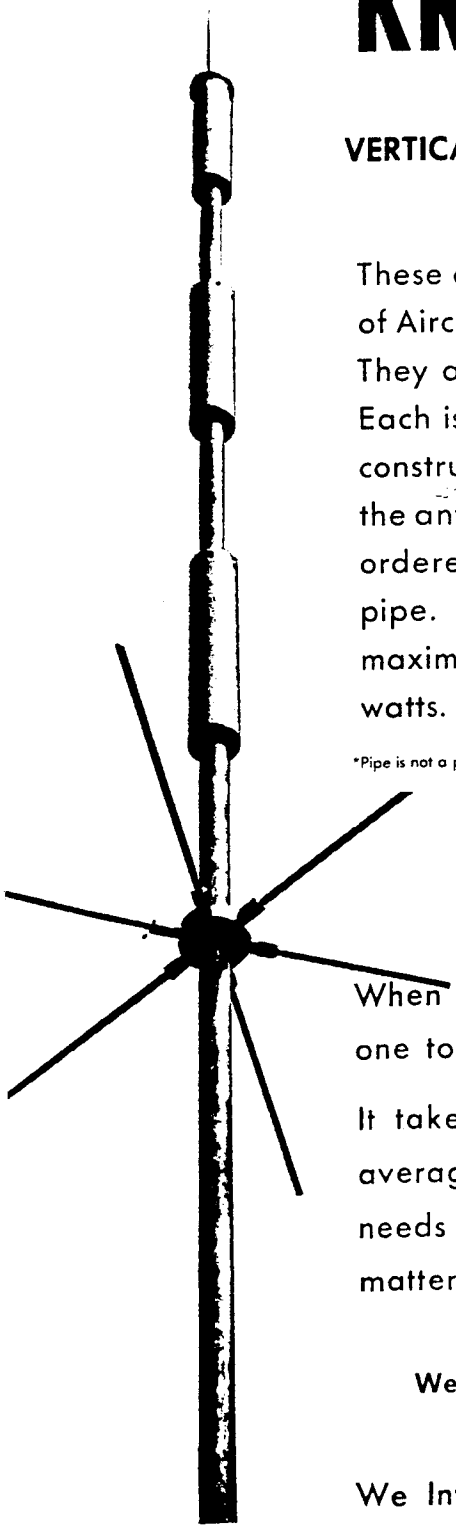
Mechanical Data		
	DB630	DB633
Lateral thrust at 100 mph (161 km/hr) – lbf (N)	13.6 (60.5)	19.6 (87.2)
Radome OD – in. (mm)	2 (50.8)	2 (50.8)
Radome ID – in. (mm)	1.75 (44.45)	1.75 (44.45)
Radome length – ft. (m)	2.42 (.74)	4.1 (1.24)
Mast OD – in. (mm)	2.5 (63.5)	2.5 (63.5)
Mast length – in. (mm)	9 (22.86)	9 (228.6)
Maximum exposed area (flat plate equivalent)– ft² (m²)	.34 (.03)	.55 (.06)
Wind rating: – mph (km/hr)*	100 (161)	100 (161)
Tip deflection at 100 mph (161 km/hr)	0.1°	0.4°
Bending moment 1" (25.4 mm) below top of mast at 100 mph (161 km/hr) – ft./lbs. (N/m)	12.2 (16.5)	32.3 (43.8)
Radome	Fiberglass	Fiberglass
Radiators	Brass	Brass
Support pipe	6061-T6 Aluminum	6061-T6 Aluminum
Net weight – lbs. (kg)	6 (2.27)	8 (3.63)
Shipping weight – lbs. (kg)	16 (7.26)	19 (8.62)
Clamps (galvanized steel)	DB365-OS	DB365-OS

*Calculation of wind survivability does not include damage due to flying debris.

OVERVIEW

- Type: Disk & Cone Antenna
- Manufacturer: Kreco Antennas
- Model #: D-300B
- Color: Aluminum
- Material: Aluminum

(See next 2 pages for manufacturer cut-sheets and specifications.)



KRECO ANTENNAS



VERTICALLY POLARIZED OMNIDIRECTIONAL ANTENNAS FOR BASE STATION USE

These are high quality antennas, machined in your choice of Aircraft Aluminum or Brass with all stainless steel screws. They all mount on the threaded end of standard pipe.* Each is equipped with a female UHF connector and is so constructed that a one-piece feedline is used directly from the antenna to the transmitter. Type N termination may be ordered but note that the Type N does not fit through ¾" pipe. All antennas are capable of withstanding the maximum power permissable with RG-8/U or well over 500 watts.

*Pipe is not a part of the antenna except the all grounded models which have support pipe as part of the antenna.

FAST SERVICE!

When you need an antenna "yesterday", we can ship one to you today!

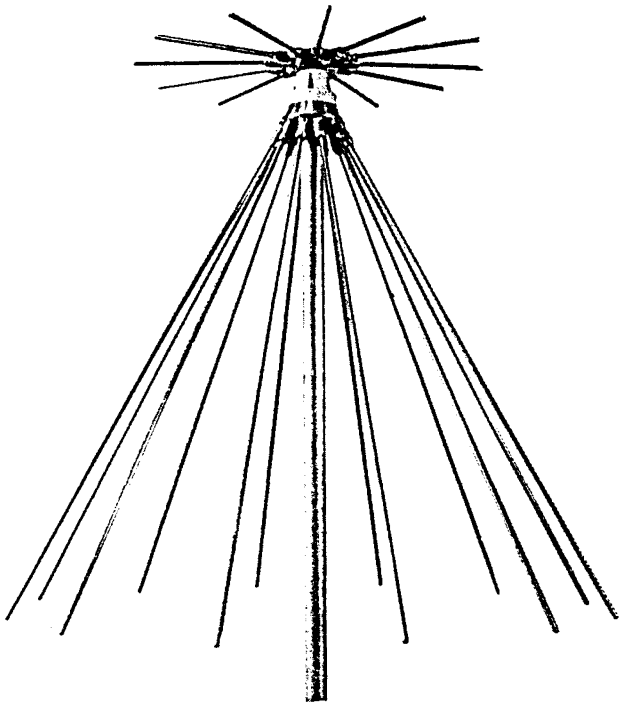
It takes us about 20 minutes to cut and package the average antenna. If you phone for your emergency needs we will have an antenna on its way to you in a matter of hours.

No Field Cutting!
We cut the antennas to the exact frequency you order
You need not tune them before installation

We Invite Your Inquiry For Your Special Requirements

Low VSWR Over 8 to 1 Range
Disk & Cone are Fabricated of 12 Radials

Model	Pipe Size	Wt	Frequency Range
D-30A	1¼″	38 lbs.	30 to 240 MHz
D-40A	1¼″	36 lbs.	40 to 320 MHz
D-50A	1¼″	34 lbs.	50 to 400 MHz
D-60A	1¼″	32 lbs.	60 to 480 MHz
D-100A	1″	12 lbs.	100 to 800 MHz
D-100B	1″	21 lbs.	100 to 800 MHz
D-150A	1″	4 lbs.	150 to 1200 MHz
D-150B	1″	7 lbs.	150 to 1200 MHz
D-300A	1″	4 lbs.	300 to 2400 MHz
D-300B	1″	6 lbs.	300 to 2400 MHz



D-150 (D-300 HAS SOLID DISK)

OVERVIEW

- Type: Fiber Glass Poles:
- Manufacturer: N/A- Architecturally designed
- Color: White
- Material: Fiber Glass

(Cut-sheets are not applicable.)

OVERVIEW

- Type: Dish TMC Tactical Video Receiver and Transmitter System
- Manufacturer: Turtle Mountain Communications
- Model #: TMC TAC-VRX/VTX
- Color: White
- Material: Fiber Glass

(See next 2 pages for manufacturer cut-sheets and specifications.)

The TMC TAC-VRX™ and TAC-VTX™ units make up a compact, lightweight, tactical video link that allows the user to transmit, receive, record, display and play back real-time full motion video imagery. The Receiver/Recorder system is fully self-contained in a rugged, weather resistant, deployable case and can be easily carried and operated by one person. The Transmit unit is normally configured for vehicle or aircraft mounting.



TYPICAL APPLICATIONS

A natural disaster Emergency Response Team conducts a real-time aerial survey of bridges, roads and structures immediately after an earthquake to assess damage and direct relief operations from a remote command center.

Emergency Response Teams and National Hurricane Response Centers receive real-time information at Command and Control Centers as well as mobile ground units.

Military C3 Analysis Teams are provided with real-time full motion information and imagery from airborne LLTV and FLIR cameras.

A drug interdiction strike team leader views a crack house on his Receiver just prior to issuing final orders to his team. The System displays real time video from an infrared sensor mounted on a support aircraft.

TMC TAC-V™
TMC Tactical Video Receiver and Transmitter System
GSA Contract #GS-35-F-4348D
Valid Through: 31 March 2002



Turtle Mountain Communications, Inc.
"The Total Systems Solution Company"
1741 Triangle Park Drive • Maryville, TN • 37801-3750
Phone 865.977.8518 • Fax 865.977.8253
E-mail: sales@turtle-mtn.com

PRODUCT SPECIFICATIONS

TRANSMITTER SPECIFICATIONS

RF Characteristics

Transmit: .....L-Band, 1710-1900 Mhz, in 1-Mhz steps
Frequency Stability: .....+/-.003
Output Power: .....3 to 40 Watts
Output Impedance: .....50 Ohms
VSWR: .....1.5 to 1
Open/Short Protection: .....(Internal isolator)

Power Requirements

Input Voltage: .....28 +/-4 VDC @ 9.5 Amps Max with Reverse Polarity Protection

Modulation Characteristics

Type: .....True FM
Modulation Sense: .....Positive voltage increase Frequency
Input Impedance: .....75 ohms +/-5% shunted by 30 pf. Maximum
Modulation Frequency: .....6Hz-5Mhz, per CCIR 405, 524 line pre emphasis curve,+/-1dB
Carrier Deviation: .....Up to +/-6 Mhz
Modulation Sensitivity: .....Adjustable, up to +/-6 MHz/V
Modulation Linearity: .....2% max. least squares method
Modulation Distortion: .....2% maximum
Incidental AM: .....5% maximum
Incidental FM: .....10 kHz p-p. maximum

Subcarrier Characteristics

Frequency: .Any 2 frequencies between 4.8 and 8.5 Mhz
Frequency Response: .....40Hz to 15 kHz +/-dB
Deviation Sensitivity: .....Adjustable, up to +/-75 KHz/V

Environmental Specifications

Temperature: .....Operating: -20 to +71 degrees C
Vibration: .....Sine: 20 g, 5-2000Hz, .4" DA maximum
Shock: .....100g, 11msec., 3 axes, 1/2 sine
Acceleration: .....100g, 3 axes
Altitude: .....Unlimited
Humidity: .....up to 95%

RECEIVER SPECIFICATIONS

RF Characteristics

Frequency Range: .....1710 to 1900 Mhz
Frequency Selection: .....10 Frequencies in 1 Mhz steps Minimum
Frequency Stability: .....+/- 003
Sensitivity: .....-85 dBm input for +12 dB Video SNR
Input Impedance: .....50 ohms
Dynamic Range: .....60 dB minimum
Image/spurious Rejections: .....60 dB minimum
IF Bandwidth: .....20 Mhz 1 dB, 23 MHz, 3 dB nominal
L.O. Radiation: .....-95 dBm maximum
Meter Output: .....Signal Strength, -85 to -20 dBm, 0 to +5 VDC
Amplitude Response: .....Adjustable 1.5v p-p for +/-4 Mhz
Frequency Response: .....6 Hz to 5 Mhz +/-1.5dB Per CCIR 405 525 line de-emphasis curve
Linearity: .....+/-2% of best straight line
Distortion: .....1% maximum

Power Requirements

Power: .....10 to 35 VDC, 1 amp Reverse polarity protected

Subcarrier Characteristics

Frequencies: .....any two between 5.8 and 7.5 Mhz (lower frequencies available)
Output: .....Up to 5Vp-p into 600 ohms
Frequency Response: .....40 Hz to 15 kHz +/-3dB (75 microsecond de-emphasis audio subcarrier only) (Higher frequency response available in FM subcarrier) (DC response available on FM at extra cost)
Linearity: .....2% Maximum, least squares method
Distortion: .....1% Maximum

Environmental Specifications

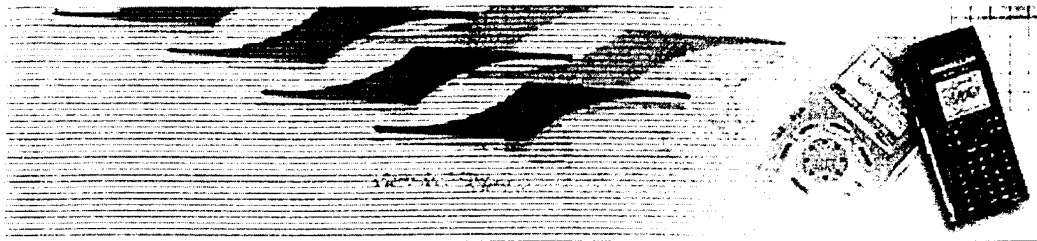
Temperature: .....-20 to +71 degrees C
Altitude: .....Unlimited
Vibration: .....20 grams, 20 Hz to 2000 Hz .4" DA max
Shock: .....100 g, 11ms, 1/2 sine, 3 axes
Humidity: .....Up to 95%, non-condensing

For More Information, Contact
Turtle Mountain Communications, Inc.
Phone: 865.977.8518 • Fax: 865.977.8253 • E-mail: sales@turtle-mtn.com

OVERVIEW

- Type: Dish OmniQuest Transportable Satellite Phone
- Manufacturer: Mitsubishi
- Model #: ST-251
- Color: White
- Material: Fiber Glass

(See next 2 pages for manufacturer cut-sheets and specifications.)



Preferred Communications

International Phone: 001-919-528-9330 Toll-Free Phone: 1-877-589-9800

Welcome to Preferred Communications Product Lineup

Mitsubishi ST-251 OmniQuest Transportable MT



OmniQuest® provides utilities, telecommunications companies and disaster response organizations with a powerful tool for dependable and seamless communication when disasters strike or when wireless and wireline systems may be down or overloaded. The OmniQuest® Transportable is quick and easy to setup and has all the features you expect in a satellite phone. With available accessories such as a fixed dish antenna and Net Radio capabilities, the applications for this unit are almost unlimited.

Features

- Secure Digital Communications
- 4800 bps Real Time Data
- Hands-Free Operation
- Call Timer and Accumulated Call
- Caller ID, Call Waiting and Conference Calling
- Satellite Signal Strength Indicators
- Easy Setup and Operation
- 3 Speed Dial Keys
- Security and Call Restrictions
- Firmware Echo Cancellation

Optional Wide Area Dispatch Features:

- Easy to Use Push-to-Talk Microphone
- Transmit to Hundreds of Other Users in 15 Different Talk Groups
- Point-to-Point Private Mode Communications

Specifications

- NT100A - OmniQuest Kit with Integrated Antenna and RFU
- TU201A - Removable Transceiver
- SZ511A - Rechargeable Battery
- SZ503A - AC Charger/Adapter
- SZ100A - Handset
- Carrying Case, Compass, and Quick Reference Card
- ST251N01 - Operating Instruction Manual

Optional Accessories



OQFAU50/100 Fixed Dish with 50 or 100 foot Cable

- The OQFAU50/100 Fixed Dish Antenna comes with a mounting bracket and hardware. Positioning the antenna outside allows for inside use of the OmniQuest.
- OQFAU50/100 does not include tripod

Pricing

$2,999.00

Special Price

Pricing subject to change without notice. Shipping and applicable sales tax are additional. Call for information on other Satellite Products.

BACK TO TOP

OVERVIEW

- Type: Whip Fixed Satellite Phone
- Manufacturer: Qualcomm
- Model #: GSP 2900
- Color: White
- Material: Lexan

(See next 5 pages for manufacturer cut-sheets and specifications.)

QUALCOMM®



G S P 2800/2900

FIXED SATELLITE PHONE

ONE SYSTEM. ONE ANTENNA, ONE PHONE.

www.qualcomm.com

The Globalstar system, making use of 48 Low-Earth Orbit satellites, is set to revolutionize the world of communications before the end of the millennium. From rural or remote areas where population densities cannot justify the deployment cost of conventional wireline or terrestrial-based wireless solutions, users will enjoy telephone service using QUALCOMM's Globalstar Fixed Satellite Phone.

The QUALCOMM Globalstar Fixed Satellite Phone meets an immediate need for voice communications, while offering flexibility, capacity and quality needed for future growth in demand. The telephone set is easy to use, versatile and dependable.

Globalstar

The QUALCOMM Globalstar Fixed Satellite Phone combines the ready availability of a two-wire telephone set with the superior performance of a state-of-the-art digital wireless technology, QUALCOMM's Code Division Multiple Access (CDMA), and the Globalstar system.

Components

The components comprising a completed installation for QUALCOMM's Globalstar Fixed Satellite Phone are:

- Radio Antenna Unit (RAU)
- Junction Box (minimizes damage from lightning strikes)
- Power Supply
- Two-wire Telephone Set
- Telco/Power Cable

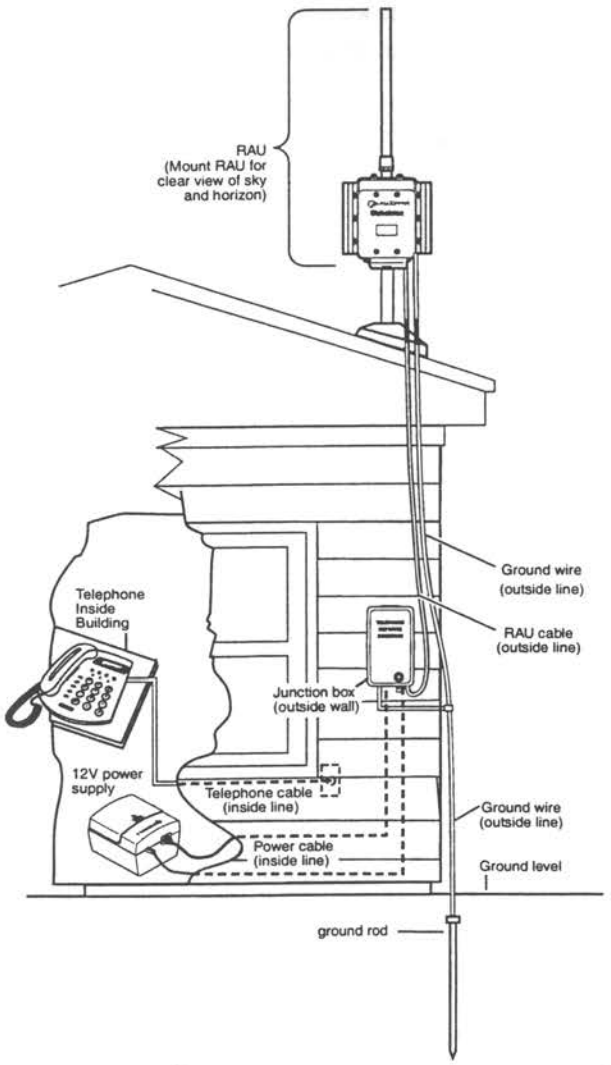
The roof mounted RAU provides over the air communications in typical environmental climates and can be used in extreme environments as well. The telephone set provides user access to a wide range of Globalstar satellite services.

Available Customer Product Configurations

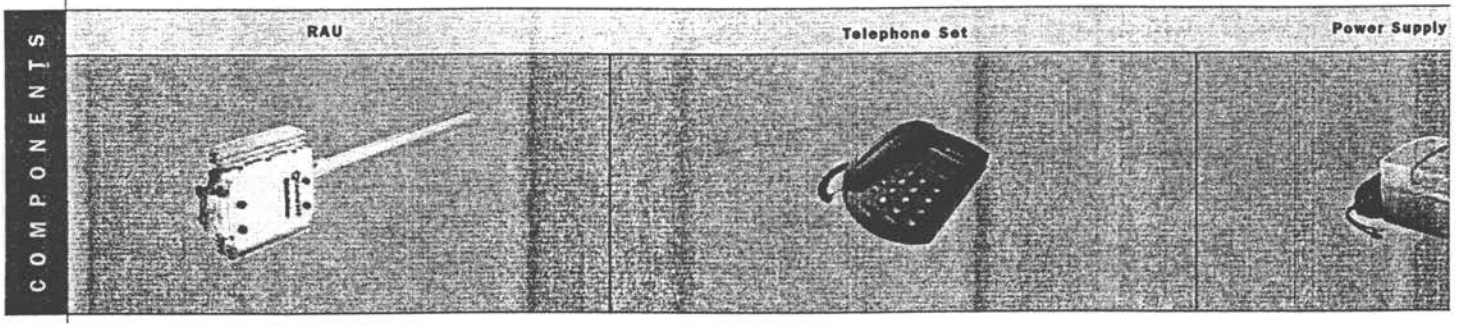
Standard Model (GSP-2800)

This configuration is designed for sale in countries with prohibitively high import tariffs; the installer can elect in-country purchase/fabrication of the additional components needed to complete the installation. The standard kit consists of the RAU and the junction box only.

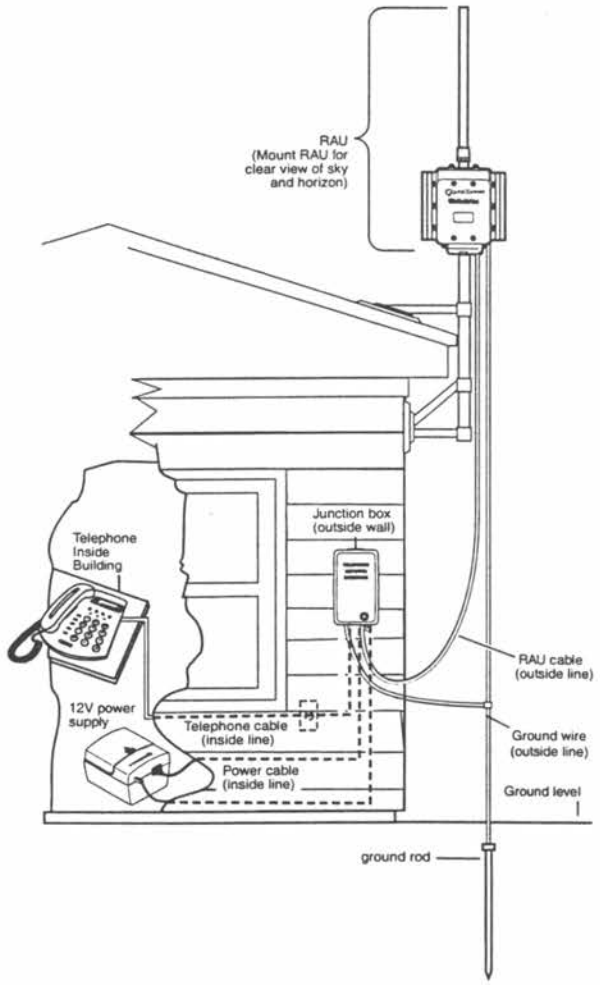
TOP MOUNT



COMPONENTS



SIDE MOUNT



Enhanced Model (GSP-2900)

As an enhanced turnkey solution, the configuration includes an RAU, 15m of connecting cable, junction box, stylish two-wire line telephone set and a 12VDC output/ universal AC input power supply complete with backup battery.

A detailed installation manual is available for both the Standard and the Enhanced models.

Features

In addition to offering clear voice quality of CDMA technology, the QUALCOMM Globalstar Fixed Satellite Phone features a two-wire RJ-11 connector, allowing the subscriber to place calls using inexpensive, commercially available telephone sets. The two-wire RJ-11 connector permits the use of cordless telephone models as well as those equipped with a speakerphone or built-in answering machine.

Installation

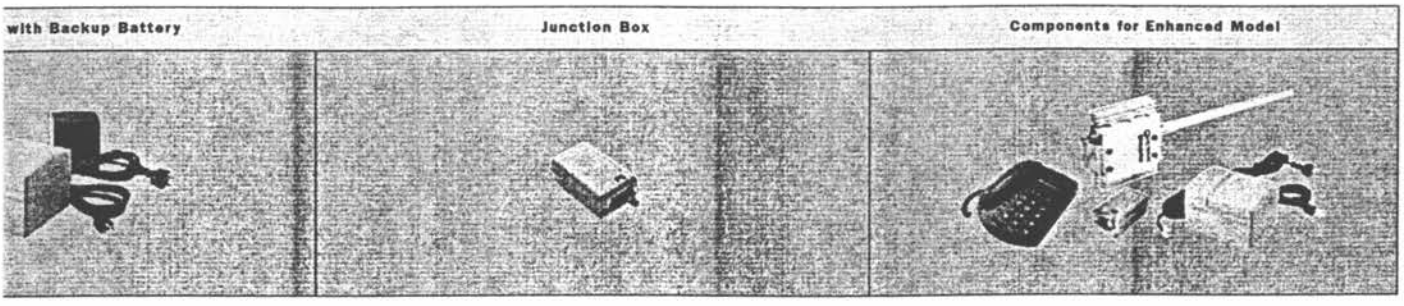
The RAU, junction box, and cabling are designed for outdoor use and if properly installed, will not be harmed by weather extremes.

Your service provider will arrange for or perform the installation and maintenance of the equipment required to place or receive calls over the Globalstar System.

All products include mounting hardware.

Radio Antenna Unit

- Acts as a radio receiver and transmitter connecting telephone set with Globalstar low-Earth orbit satellites



- RAU antenna must have clear view of sky and horizon
- Globalstar/RAU operating frequencies: TX: 1610.73 to 1625.49 MHz (reverse link) RX: 2484.39 to 2499.15 MHz (forward link)
- Optional solar panel supply is available from Sunwize™ (tel.: +(1) 831-479-0974). QUALCOMM has approved Sunwize's solar panel equipment for use with the QUALCOMM Globalstar Fixed Satellite Phone.

Junction Box

- Provides the user equipment with protection against nearby lightning strikes when properly grounded.

Power Supply

- QUALCOMM supplied
- Cost effective
- +12 VDC output, universal AC input.
- Back-up battery featuring approximately 3.5 hours talk time and 24-48 hours standby time

Safety

The design of QUALCOMM's Globalstar Fixed Satellite Phone complies with the updated (1992) ANSI standard for safe levels of human exposure to RF energy.

Making A Call

Making a call with your QUALCOMM Globalstar Fixed Satellite Phone is accomplished as easily as using a wireline connection. Like most telephone sets:

- Pick up the telephone handset and listen for dial tone. When you hear dial tone, dial the telephone number.
- After a short pause, the number will be sent over the Globalstar satellite system.
- To end a call, place the telephone hand set in its cradle.

QUALCOMM Globalstar Customers Worldwide

The choice is simple. With QUALCOMM's Globalstar Fixed Satellite Phone, subscribers can place or receive calls from both office and residential settings in rural or remote areas virtually worldwide.

Component	Operational	Non-Operational
RAU		
Temperature	-30 to +60 °C (humidity 5% - 95%)	-40 to +85 °C
Dimensions (housing)	9.7 inches (25 cm) H x 8.5 inches (21.6 cm) W x 3.3 inches (8.4 cm) D	
Dimensions (antenna)	19.8 inches (49.5 cm) H x 1.0 inches (2.5 cm) D	
Weight	6.7 lbs. (3.04 kg)	
Material (housing)	Powder-coated aluminum	
Material (antenna)	White, untextured Lexan 153	
Power Consumption	25 watt maximum at 12 VDC nominal input voltage; 12 watt typical operation	
RF Power Output	2 watt maximum (+33 dBm)	
Junction Box		
Temperature	-30 to +60 °C	-40 to +85 °C
Dimensions	6 inches (15.2cm) H x 3.2 inches (8.2 cm) W x 2.1 inches (5.3 cm) D	
Weight	1 lb. (0.45 kg)	

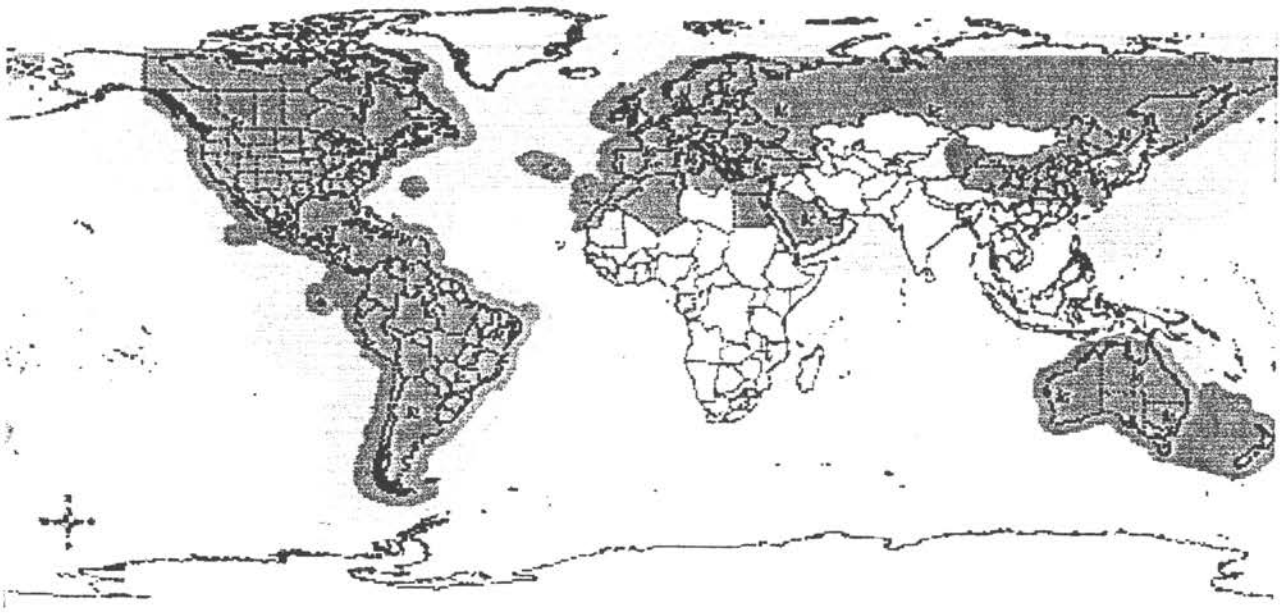
Agency/Regulatory.

CE: Standard Model is ETSI type approved. FCC: Standard and Enhanced Models, part 15B/25. UL/c-UL: Standard Model and QUALCOMM Power Supply. ETL/c-ETL (pending): Telephone Set. GMPCS-MOU: Standard and Enhanced Models are ITU registered. CB Scheme (pending): Standard Model and QUALCOMM power supply.

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www.qualcomm.com

GLOBALSTAR SERVICE COVERAGE



Globalstar Basic Coverage as of 1 October 2001

Extended Service Coverage

Gateway

Note: Roaming may not yet be available to all other countries, depending on where your phone is registered. Check with your local Globalstar service provider before travelling to other gateway areas to confirm roaming availability. In addition, Globalstar dealer networks have not yet been established in all countries, although this does not affect coverage areas indicated above.

Please visit www.globalstar.com for monthly updated coverage map.

1 October 2001

Globalstar™ Above and Beyond™

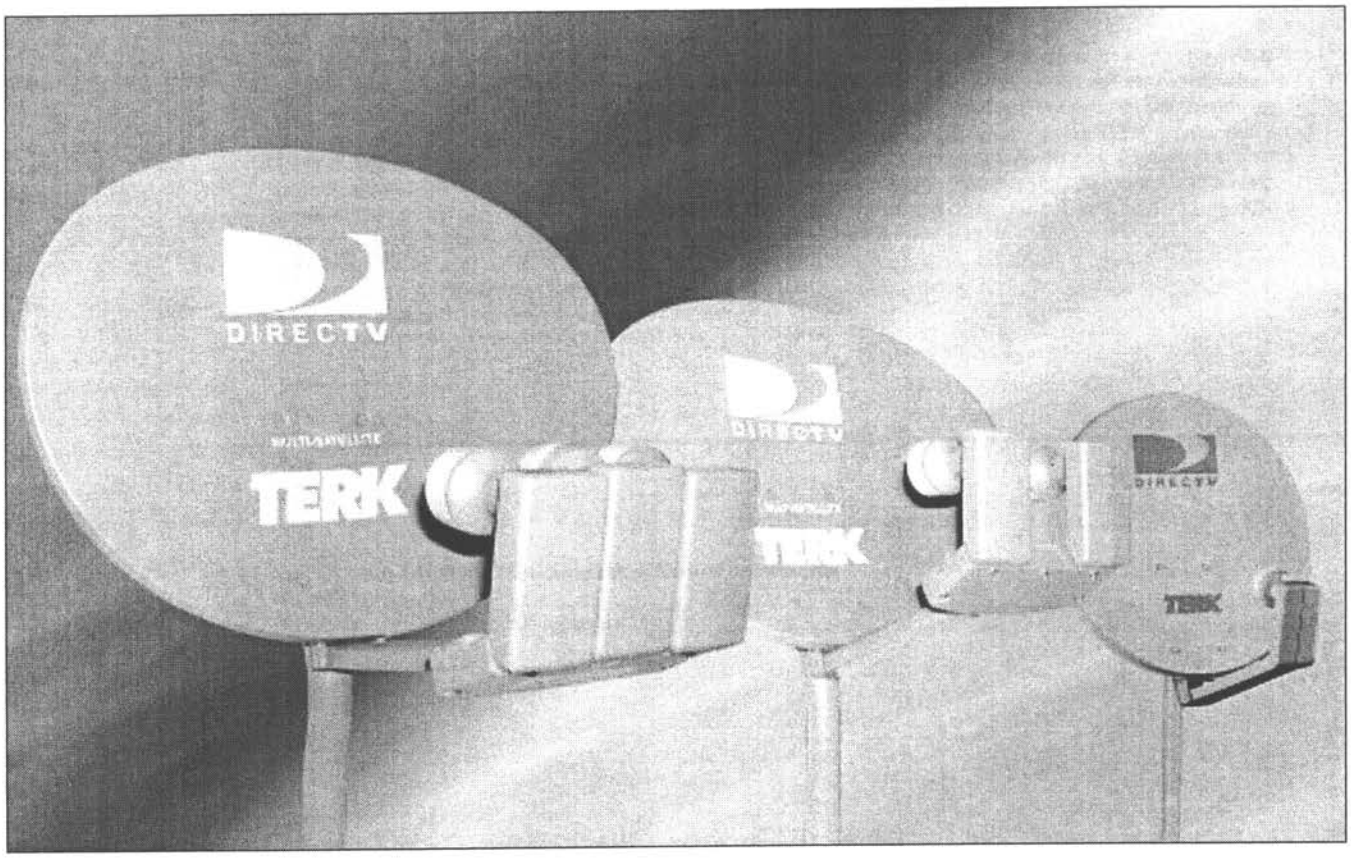


OVERVIEW

- Type: DirecTV Dish
- Manufacturer: TERK Technologies
- Model #: TRK-S2
- Color: Grey
- Material: Fiber Glass

(See next 2 pages for manufacturer cut-sheets and specifications.)

SATELLITE DISHES
MODELS: TRK-S2, TRK-S23, TRK-S24



DIRECTV approved satellite dish antennas
TERK's satellite dish antennas are compatible with all satellite receivers that are designed to receive DIRECTV programming. TERK offers you 3 models to meet your individual needs. The TRK-S2 is an 18" DIRECTV Satellite Dish Antenna with (1) dual LNB output. The TRK-S23 is an 18" x 23" DIRECTV Satellite Dish Antenna with (2) dual LNBs and an integrated 5x4 multiswitch, which enables you to connect your dish to multiple satellite receivers throughout your home. For maximum viewing enjoyment TERK offers the TRK-S24, a triple LNB satellite dish antenna that will receive HDTV broadcasts and local-to-local in some markets. Existing TRK-S23 dishes can also be upgraded to a triple-LNB dish using TERK's optional Sat C Kit (LNB-CBP).

Built to last
The TRK-S2, TRK-S23, and TRK-S24 are designed to provide many years of viewing pleasure. TERK satellite dish antennas are engineered to stand up to the most severe weather and atmospheric weather conditions without rusting. If wind is a concern there's no reason to worry. All TERK satellite dish antennas can withstand up to 75 mph winds.

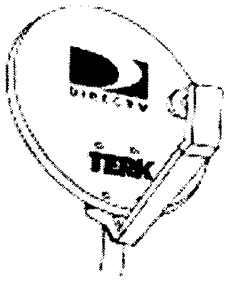
TERK

SATELLITE DISHES
MODELS: TRK-S2, TRK-S23, TRK-S24

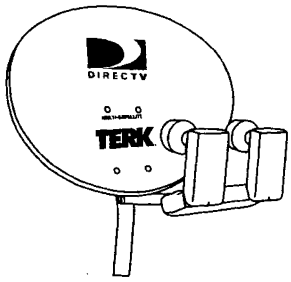
Watching more than one program on separate TVs will never be an issue
Now you can watch your favorite sport team in the family room while your children watch their favorite program in the living room. The TERK **TRK-S2**, 18" DIRECTV Satellite Dish Antenna with dual LNB output, allows you to connect up to 2 receivers in your home. You can increase the number of receivers in your home with the addition of a TERK Multiswitch (BMS-34). The **TRK-S23** and **TRK-S24** 18" x 23" DIRECTV Satellite Dish Antenna connects to up to 4 receivers. The integrated 5X4 Multiswitch on these antennas minimizes the need for extra wire, improving wire management and savint time.

Mounting flexibility
Mounting your satellite dish doesn't need to be a problem. Not only do the mounting brackets make it easy to install and adjust your dish but you can also customize your installation by mounting your TERK satellite dish on your roof, on a wall or even on your chimney (some additional installation materials may be required). You also have the ease in determining the azimuth and elevation to locate the satellite.

Features:

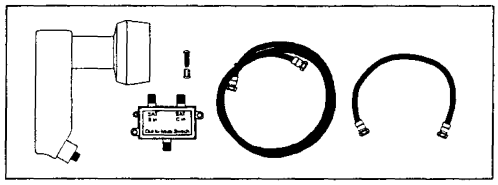


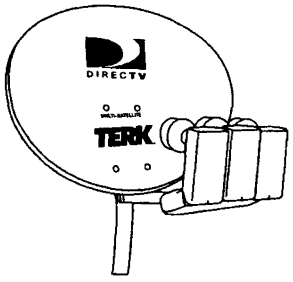
TRK-S2
18" DIRECTV Satellite Dish Antenna with dual output LNB
- DIRECTV approved
- Dual output LNB (up to two receivers)
- Easy installation



TRK-S23
18" x 23" DIRECTV Multi-Satellite Dish Antenna
- Two dual output LNBs for optimal signal strength (up to 4 receivers)
- Metal construction for maximum durability
- Digital-quality picture and sound
- Connect to multiple receivers throughout your home
- 5x4 integrated Multiswitch

- TRK-S23 can be upgraded to a TRK-S24 which receives additional DIRECTV programming, including HDTV and local-to-local in some markets from the 110 degree satellite using TERK's Sat C kit (LNB-CBP).





TRK-S24
18" x 23" DIRECTV Triple LNB Dish Antenna
- Multi-satellite dish antenna (TRK-S23) with a third LNB (up to 4 receivers)
- Additional LNB, Sat-C, allows antenna to receive additional programming from DIRECTV
- Sat-C LNB receives signal from 110 degree satellite, which will be broadcasting HDTV programming and local-to-local in some markets

At TERK Technologies we strive to offer the highest quality products to our consumers.
The specifications are subject to change without notice.

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a unit of Hughes Electronics Corp., and are used with permission.

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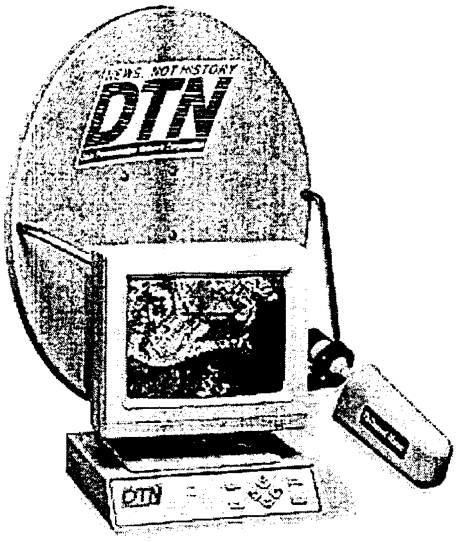
TERK TECHNOLOGIES CORPORATION 63 MALL DRIVE, COMMACK, NY 11725 TEL: 800.942.8375 www.terk.com

OVERVIEW

- Type: Dish
- Manufacturer: DTN Weather
- Model #: DVB-SR1
- Color: Grey
- Material: Fiber Glass

(See next 6 pages for manufacturer cut-sheets and specifications.)

DTN WEATHER SAFETY CENTER

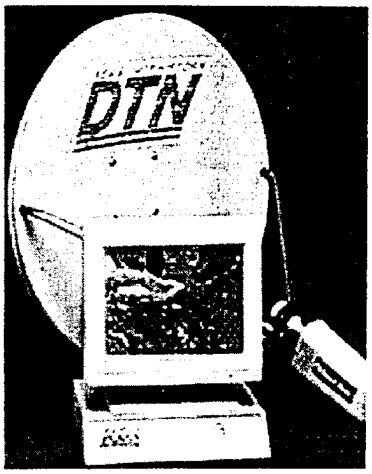


OVERVIEW

DTN Weather Safety Center is a satellite weather information service designed for anyone who is responsible for protecting lives and property from the hazards of severe weather. You can have instant access to comprehensive local, regional and national weather forecasts and information, along with NOAA Warnings & Alerts. . . at an affordable price, with no online, access or other phone charges.

It's not a computer. DTN Weather Safety Center is a "stand-alone" information system, with all the equipment (hardware and software) provided by DTN. The satellite delivery technology of DTN Weather Safety Center allows you unlimited usage of the most current weather data available 24 hours a day, seven days a week - for one low monthly fee.

DTN AVIATION CENTER

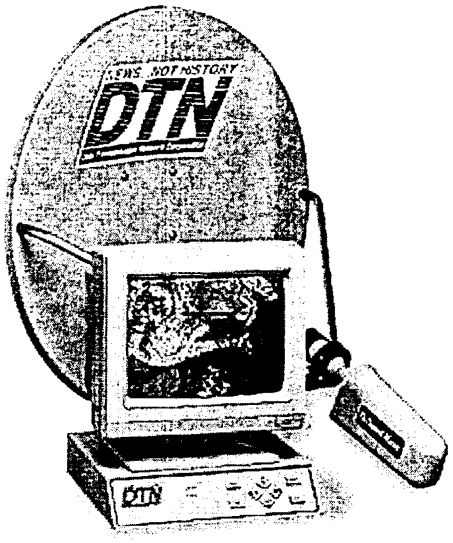


OVERVIEW

With DTN Aviation Center, aviation weather technology is simple and low cost. Designed especially for pilots, airports and FBOs, the Aviation Center has rapidly become the industry's premier service...at an affordable price, with no online, access or other phone charges.

It's not a computer. DTN Aviation Center is a "stand-alone" information system, with all the equipment (hardware and software) provided by DTN. The satellite delivery technology of DTN Aviation Center allows you unlimited usage of the most current weather data available 24 hours a day, seven days a week - for one low monthly fee.

DTN Broadcast Weather

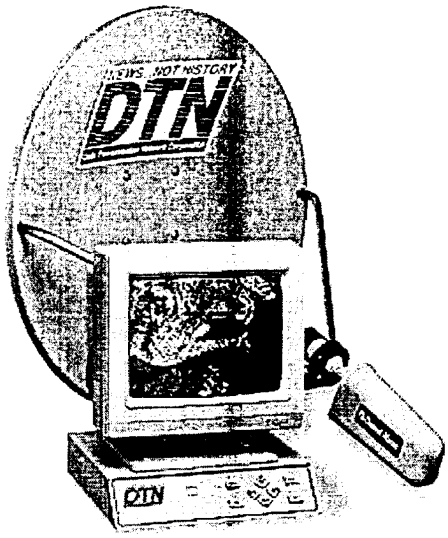


OVERVIEW

DTN Broadcast Weather is a satellite-delivered weather and news information service designed for the broadcast industry. The service provides instant access to comprehensive local, regional and national weather forecasts and information, along with NOAA Warnings & Alerts and Learfield World & National News Summary . . . at an affordable price, with no online, access or other phone charges.

It's not a computer. DTN Broadcast Weather is a "stand-alone" information system, with all the equipment (hardware and software) provided by DTN. The satellite delivery technology of DTN Broadcast Weather allows you unlimited usage of the most current weather data available 24 hours a day, seven days a week - for one low monthly fee.

DTN FORESTRY CENTER

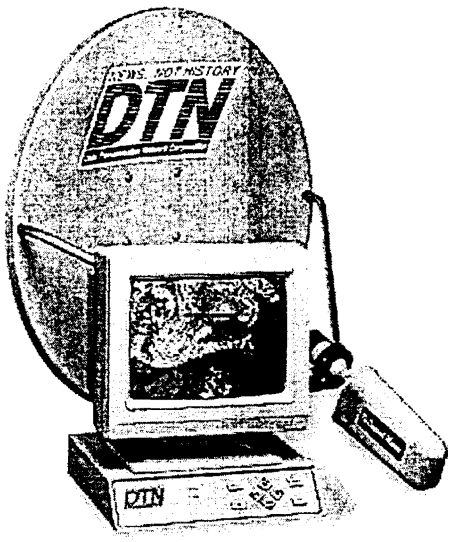


OVERVIEW

DTN Forestry Center is a satellite-delivered weather information system designed for the forestry industry. It provides valuable information to help keep you informed of potential fire hazards and dangerous weather conditions . . . at an affordable price, with no online, access or other phone charges.

It's not a computer. DTN Forestry Center is a "stand-alone" information system, with all the equipment (hardware and software) provided by DTN. The satellite delivery technology of DTN Forestry Center allows you unlimited usage of the most current weather data available 24 hours a day, seven days a week - for one low monthly fee.

DTN MARINE CENTER

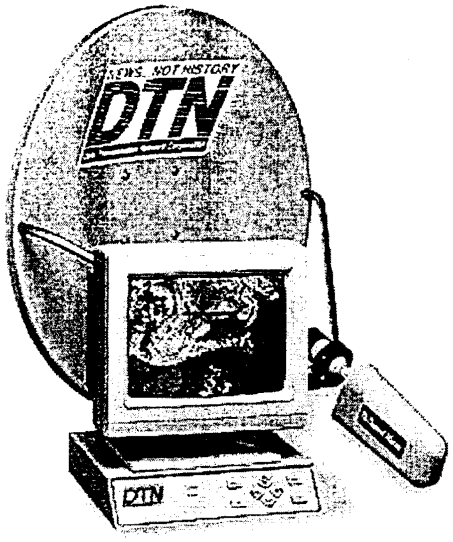


OVERVIEW

DTN Marine Center is a provider of satellite-delivered weather information for all areas of the marine industry. Whether you're involved in towing, shipping, salvage, service or recreation, DTN Marine Center will provide all the information necessary to make informed decisions that will help you operate your business in the most efficient, cost-effective way possible . . . at an affordable price, with no online, access or other phone charges.

It's not a computer. DTN Marine Center is a "stand alone" information system, with all the equipment (hardware and software) provided by DTN. The satellite delivery technology of DTN Marine Center allows you unlimited usage of the most current weather data available 24 hours a day, seven days a week - for one low monthly fee.

DTN TRANSPORTATION WEATHER



OVERVIEW

DTN Transportation Weather is a satellite weather information service designed especially for the transportation industry. Whether you're responsible for road maintenance or your business depends on road conditions, you can have instant access to comprehensive local, regional and national weather forecasts and information . . . at an affordable price, with no online, access or other phone charges.

It's not a computer. DTN Transportation Weather is a"stand-alone" information system, with all the equipment (hardware and software) provided by DTN. The satellite delivery technology of DTN Transportation Weather allows you unlimited usage of the most current weather data available 24 hours a day, seven days a week - for one low monthly fee.

CASE 01-36C

EXHIBIT 44

HAS OVERSIZED DOCUMENT

SEE FILE AT ZONING COMMISSION