8000 Beta Rev 5

		0 degrees			AZ (H-plane)			EL (E-plane), phi = 0deg			EL (E-plane), phi = 90deg		
Copolar	**UNITS**	**2400MHz**	**2440MHz**	**2485MHz**	**2400MHz**	**2440MHz**	**2485MHz**	**2400MHz**	**2440MHz**	**2485MHz**	**2400MHz**	**2440MHz**	**2485MHz**
Avg Gain	**dBi**	-4.75	-5.07	-5.03	-3.68	-3.64	-3.72	-6.99	-4.97	-5.13	-2.77	-2.73	-2.16
Peak Gain	**dBi**	-1.41	-1.23	-0.94	-1.29	-2.60	-1.44	-4.38	-1.67	-1.92	1.46	0.76	0.88
Total Angle >= -6dBi	**deg**	192.00	200.00	184.00	312.00	328.00	316.00	128.00	248.00	220.00	250.00	258.00	282.00
Total Angle >= -2dBi	**deg**	66.00	28.00	30.00	46.00	0.00	56.00	0.00	28.00	12.00	146.00	148.00	164.00
X-polar	**UNITS**	**2400MHz**	**2440MHz**	**2485MHz**	**2400MHz**	**2440MHz**	**2485MHz**	**2400MHz**	**2440MHz**	**2485MHz**	**2400MHz**	**2440MHz**	**2485MHz**
Avg Gain	**dBi**	-7.21	-6.14	-6.95	-8.55	-8.34	-9.39	-6.74	-6.49	-6.95	-15.18	-19.92	-15.23
Peak Gain	**dBi**	-3.59	-3.03	-2.90	-3.06	-4.00	-4.60	-1.96	-0.84	-1.78	-11.81	-15.67	-10.39
Total Angle >= -6dBi	**deg**	104.00	180.00	148.00	62.00	126.00	52.00	106.00	122.00	124.00	0.00	0.00	0.00
Total Angle >= -2dBi	**deg**	0.00	0.00	0.00	0.00	0.00	0.00	14.00	60.00	14.00	0.00	0.00	0.00
Total Field	**UNITS**	**2400MHz**	**2440MHz**	**2485MHz**	**2400MHz**	**2440MHz**	**2485MHz**	**2400MHz**	**2440MHz**	**2485MHz**	**2400MHz**	**2440MHz**	**2485MHz**
Avg Gain	**dBi**	-3.74	-3.53	-3.74	-3.17	-3.19	-3.36	-4.83	-3.35	-3.69	-2.72	-2.73	-2.13
Peak Gain	**dBi**	-1.39	-1.17	-0.91	-1.23	-2.11	-1.44	-1.83	-0.77	-1.69	1.46	0.76	0.88
Total Angle >= -6dBi	**deg**	322.00	352.00	350.00	340.00	360.00	332.00	216.00	312.00	302.00	250.00	258.00	288.00
Total Angle >= -2dBi	**deg**	70.00	32.00	30.00	64.00	0.00	56.00	32.00	118.00	40.00	146.00	148.00	164.00

RF Exposure Antenna Summary

Network Systems Organization

FCC ID: **H9PLA4121** WLAN PC Card, 11 Mbps, T2

Original Equip.

Output Power: 150 mW

Duty Cycle Factor: 0.0 dB

Mobile Antennas

Ant No	Model	Symbol P/N	Type	Gain (dBi)	Cabel Loss (dB)	Pout (dBm)	MPE (cm)	TR Status	Device Type
01.	Parapolic Grid	ML-2499-PGA1-0	Dish	24.0	14.49	7.27	10.3	Tested	Mobile
02.	Pipe Bomb 11"x4'	50-11901-048P	Dipole Array	5.2	1.00	20.76	5.6	Tested	Mobile
02.1	Pipe Bomb 11"x15'	50-11901-180P	Dipole Array	5.2	3.75	18.01	4.1	See # 2	Mobile
03.	Patch	ML-2499-PTA1-0	Patch	6.5	1.50	20.26	6.1	Tested	Mobile
04.	Panel	ML-2499-PNA1-0	Panel	11.0	3.48	18.28	8.2	Tested	Mobile
08.	Pipe Bomb 25"x20'	50-11902-240S	Dipole Array	7.0	5.00	16.76	4.3	Tested	Mobile
08.1	Pipe Bomb 25"x30'	50-11902-360S	Dipole Array	7.0	7.49	14.27	3.3	See # 8	Mobile
09.	Ceiling Panel	ML-2499-SD24-0	Plane	3.3	1.50	20.26	4.3	Tested	Mobile
10.	Trilogy AP	21-20667-01	Dipole	2.0	0.20	21.56	4.3	Tested	Mobile
15.	Amtrak Omni	50-21900-027	Dipole	3.0	0.00	21.76	4.9	See # 10	Mobile
16.	Rubber DuckTNC-RP	50-21900-029	Dipole	1.0	0.00	21.76	3.9	See # 10	Mobile
16.1	Rubber Duck	50-21900-007	Dipole	1.0	0.00	21.76	3.9	See # 10	Mobile
17.	PC04	50-11903-0115	Dipole	2.0	0.28	21.48	4.2	See # 10	Mobile
17.1	PC14	50-11903-0355	Dipole	2.0	0.86	20.90	3.9	See # 10	Mobile
20.	Mag Dipole	ML-2499-MGA1-	Dipole	2.0	3.00	18.76	3.1	See # 10	Vehicle Mount
21.	Trilogy PCI, 72"	25-20728-01	Dipole	2.0	3.53	18.23	2.9	See # 10	Mobile
32.	Corner Patch	ML-2499-DLA1-0	Patch	7.5	1.50	20.26	6.9	See # 3	Mobile
33.	Plane	50-21900-008	Plane	0.0	1.00	20.76	3.1	See # 9	Mobile

Antenna Gain listed without cable
TR Status refers to weither the antena was tested. If not refer to the directed antenna test data

Portable Antennas

Ant No	Model	Symbol P/N	Type	Gain (dBi)	Cabel Loss (dB)	Pout (dBm)	EIRP (mW)	TR Status	Device Type
05.	IEC	24- 20776- 02	Patch	0.0	0.00	21.76	150.0	Tested	Laptop
06.	4140	50-11900-001	Whip	-2.0	0.00	21.76	94.6	Tested	Hand Held
07.	HS Dipole	50-21900-030	Dipole	2.0	0.55	21.21	209.5	Tested	Hand Held
12.	Toko	50-21900-022	Puck	0.0	0.00	21.76	150.0	Tested	Hand Held
13.	6846D	10-41003-01	Slot	0.0	0.37	21.39	137.8	Tested	Hand Held
14.	End Cap "C"	10-20511-01	F-Element	0.0	0.00	21.76	150.0	Tested	Laptop
18.	4342	50-21900-033	Dipole	1.2	0.15	21.61	191.0	See # 10	Hand Held
19.	DASH 3000	50-21900-036	Dipole	2.2	0.62	21.14	216.0	See # 10	Hand Held
22.	Novas	50-21900-034	F-Element	0.0	0.43	21.33	135.9	See # 14	Hand Held
23.	1742	703549-2	F-Element	0.0	0.11	21.65	146.1	See # 14	Hand Held
24.	2742	703624-2	F-Element	0.0	0.13	21.63	145.6	See # 14	Hand Held
25.	7242	10-35477-01	F-Element	0.0	0.13	21.63	145.6	See # 14	Hand Held
26.	Criticare BFA	50-21900-021	F-Element	0.0	0.20	21.56	143.3	See # 14	Hand Held
27.	7546D	10-40948-01	F-Element	0.0	0.22	21.54	142.7	See # 14	Hand Held
28.	7546	10-38649-02	F-Element	0.0	0.31	21.45	139.7	See # 14	Hand Held
29.	6846	10-32290-02	F-Element	0.0	0.34	21.42	138.7	See # 14	Hand Held
30.	2042	10-17577-03	F-Element	0.0	0.06	21.70	147.9	See # 14	Hand Held
31.	6146	10-35305-02	F-Element	0.0	0.12	21.64	145.9	See # 14	Hand Held
35.	XP	50-21900-024	Slot	0.0	0.58	21.19	131.4	See # 13	Hand Held

Body Worn Antennas

Ant No	Model	Symbol P/N	Type	Gain (dBi)	Cabel Loss (dB)	Pout (dBm)	EIRP (mW)	TR Status	Device Type
11.	Vocollect MMCX	50-21900-025	Dipole	2.0	0.25	21.51	224.5	Tested + SAR	Body worn
34.	Oniel MMCX	50-21900-031	Slot	0.0	0.37	21.39	137.8	See # 13	Body worn

Antenna Gain listed without cable
TR Status refers to weither the antena was tested. If not refer to the directed antenna test data

Parabolic Grid Antenna

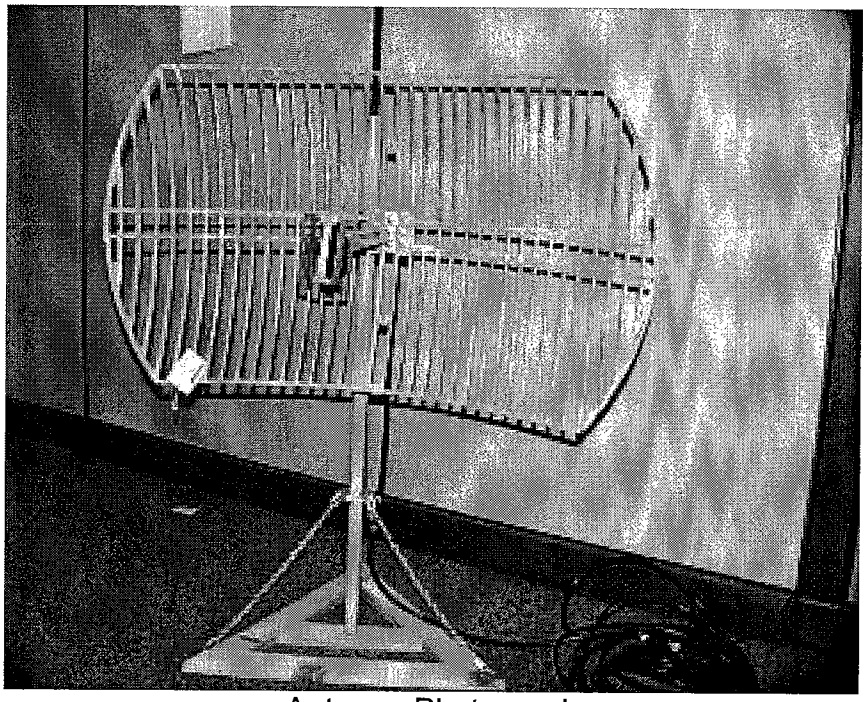
The **Parabolic Grid** antenna assembly is 9.5 dBi high gain directional dish with a 7° beam width in azimuth plane. It is used for point to point connections across a large corporate campus.

Location	Outdoor Mast
Pattern	7° Beam
Type	Dish
Max Gain	9.5 dBi
Physical	See attached dwg
Cable	See attached dwg
Symbol P/N	ML-2499-PGA1-00
MPE Distance	See summary table

It is mounted on a outdoor mast. The **Parabolic Grid** is always installed with a minimum amount of cable as shown in the attached block diagram. It is always farther than 20 cm from a person's body. It is used with mobile devices.

The following RF exposure information is included in a prominent place in the device's user manual to inform the user of safety issues as required by OET Bulletin 65, Supplement C when ever the device configuration could reduce the MPE distance to be less than 20 cm.

"Important Note: To comply with FCC RF exposure requirements, no one may remain within 20 cm of the antenna for extended periods of time."



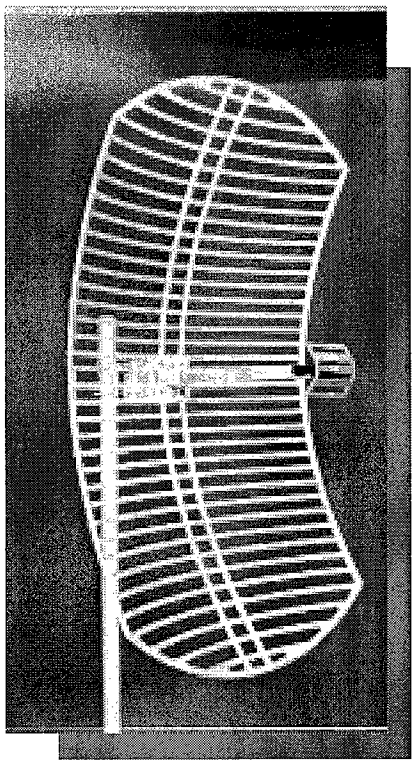
Antenna Photograph

Wireless Antennas

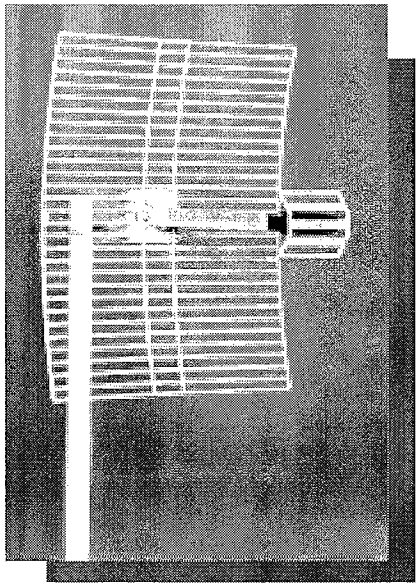
For World-Wide Applications

WLAN/ISM
2.4 - 2.5 GHz*

MODEL 26T-2400*



MODEL 18T-2400*



*U.S. Patent 5,191,350

FEATURES

- Die-cast 18/26 manufacturing processes
- Magnesium Alloy is superior to anodized aluminum and weighs 33% less
- Low wind loading
- Manufactured with nonferrous materials; magnesium alloy, stainless steel and aluminum
- Compact packaging
- No mechanical adaptors required to mount the feed
- Five Year Limited Warranty

BENEFITS

- Consistent high performance from every antenna
- Lightest weight and most durable grid antennas
- Operational in most all weather environments
- No rust!
- Saves on shipping costs
- One feed fits both antennas
- Guaranteed reliability

*Contact factory for other frequency options.

CONIFER II®
WIRELESS TELECOMMUNICATION TECHNOLOGY

URS
ISO 9001

1400 N Roosevelt, Burlington, IA 52601
Phone 800-843-5419 (U.S.), 319-752-3607 (Int'l)
Fax 319-753-5508, email <conifer@conifercorp.com>

PERFORMANCE SPECIFICATIONS*

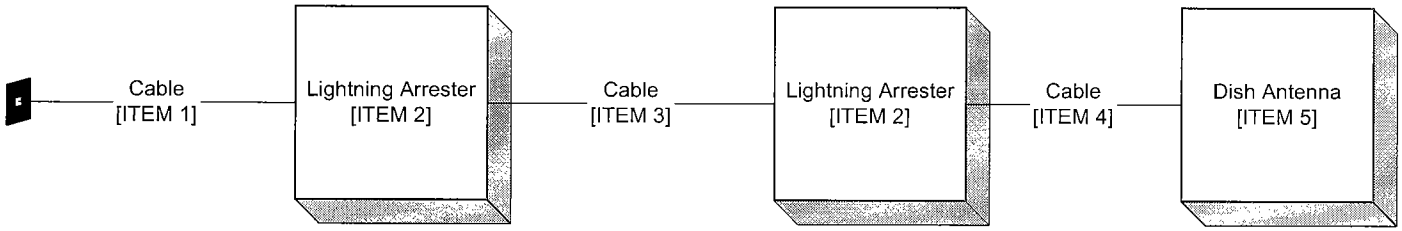
	MODEL 18T-2400	MODEL 26T-2400
Input Frequency	2400 - 2500 MHz	2400 - 2500 MHz
Gain	18 dBi	24 dBi
-3 dB Beam Width	14^0	7.5^0
Front to Back Ratio	>23 dB	>31 dB
Polarity	Dual	Dual
Cross Polarity Rejection	>23 dB	>26 dB
VSWR (Maximum)	1.4:1 @ 2400-2500 MHz	1.4:1 @ 2400-2500 MHz
Impedance @ Output	50 OHMS	50 OHMS
Connector "N" Type**	Male	Male
Coaxial Pigtail - RG8**	24 inches	24 inches
Input Power	50 Watts	50 Watts
Windloading @ 100 MPH @ 140 MPH	 39.4 lbs. 77.9 lbs.	 97.0 lbs. 199.5 lbs.
Elevation Adjustment	60^0 in 10^0 Increments	60^0 in 10^0 Increments
Size	16 x 20 x 15 inches (40.64 x 50.80 x 38.10 cm)	23.5 x 39.25 x 15 inches (60.95 x 91.44 x 38.10 cm)
Weight	2.7 lbs. (1.22 Kg)	5.4 lbs. (2.43 Kg)
Reflector Material	Cast Magnesium Alloy	Cast Magnesium Alloy
Mounting Hardware	Stainless Steel	Stainless Steel
Mounting	1" - 2" O.D. Mast (2.54 - 5.08 cm)	1" - 2" O.D. Mast (2.54 - 5.08 cm)

*Specifications subject to change without notice.
**Contact factory for other options.

MANUFACTURED IN BURLINGTON, IOWA

TITLE

Antenna Model: Parabolic Grid



Gain: -6 dB -.75 dB -6 dB -.75 dB -1 dB 24 dBi

Total Gain: 9.5 dBi

Item #	Part #	Description	Quantity
1		Cable, RG-58 (Belden 8219) , BNC-RP-Plug to N-Male	20 ft.
2		Lightning Suppressor, Conifer II (2.4-2.5 GHz) N-Female to N-Female	2
3		Cable,RG-8 (Belden 8237) N-Male to N-Male	30 ft.
4		Cable, RG-8 (Belden 8237), N-Male to pigtail	3 ft.
5	**26T-2400**	ANT:Dish, 2440 - 2500 MHz, 24 dBi. LPV,N-MALE	1
6			
7			

Symbol Technologies, Inc., Network Systems Organization			
ANT KIT:S24, DISH, 9.5 DBI, LP, CBL 50FT, BNCRP			
	MAY 2, 2000	ML-2499-PGA1-00	REV 1
NOT TO SCALE		SHEET 1 OF 1	

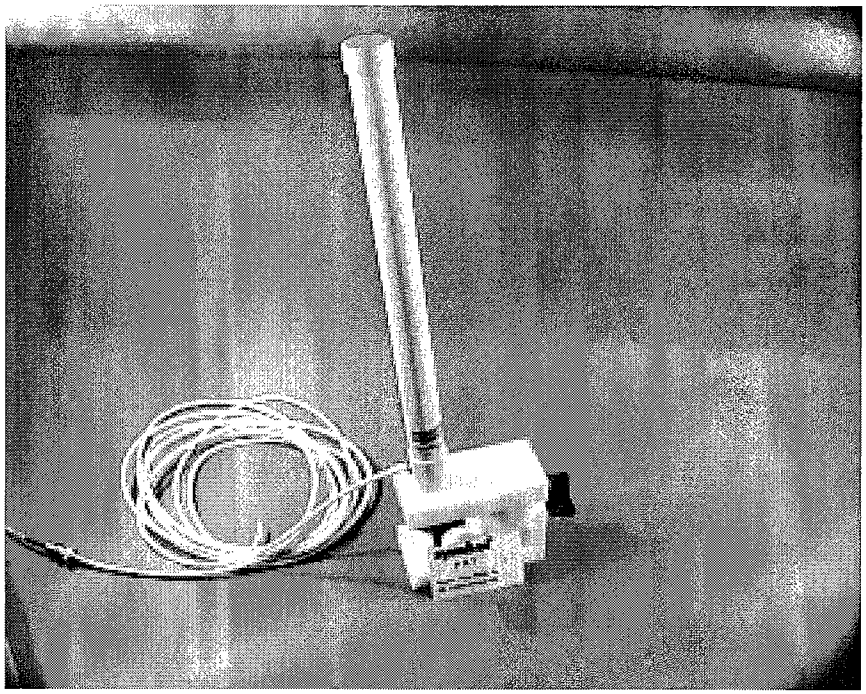
Pipe Bomb 11”Antenna

The **Pipe Bomb 11”**antenna is 4.2 dBi omni-directional in azimuth plane The **Pipe Bomb 11”** uses a reverse polarity BNC connector. It is mounted on the ceiling or on a wall near the ceiling. In its use it would be farther than 20 cm from a persons body. It is used with mobile devices. It is available with either a 4’ or 15’ cable.

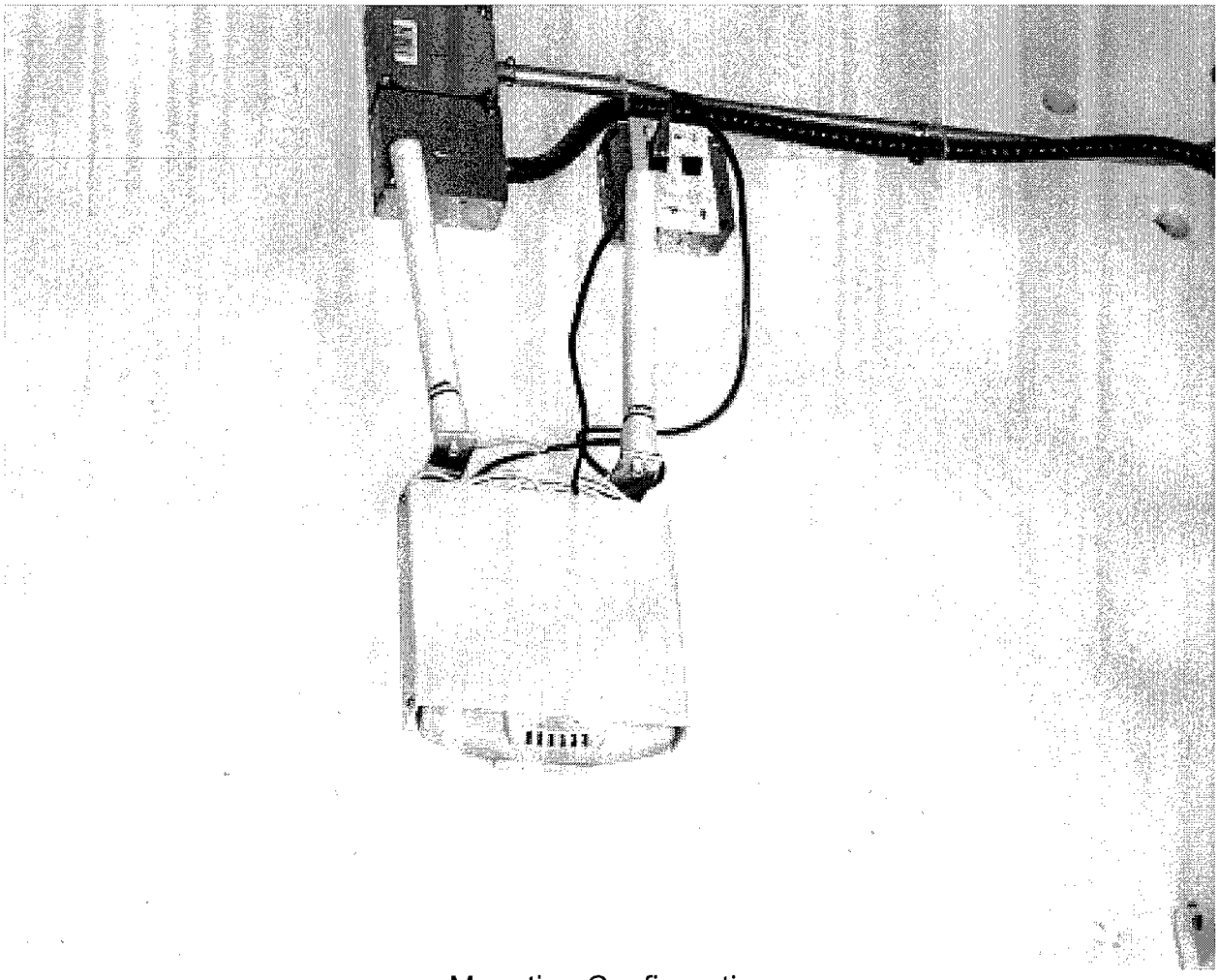
Location	Near ceiling
Pattern	Omni
Type	Dipole Array
Max Gain	4.2 dBi
Physical	See attached dwg
Cable	4, 15 ft (Plenum-rated)
Symbol P/N	ML-2499-HPA1-00 ML-2499-HPA2-00
MPE Distance	See summary table

The following RF exposure information is included in a prominent place in the device’s user manual to inform the user of safety issues as required by OET Bulletin 65, Supplement C when ever the device configuration could reduce the MPE distance to be less than 20 cm.

“Important Note: To comply with FCC RF exposure requirements, no one may remain within 20 cm of the antenna for extended periods of time.”



Antenna Photograph



Mounting Configuration

REVISIONS			
REV	DESCRIPTION	DATE	APPVL
A	DOCUMENT RELEASED PER EDR# 16847	1/2/95	TS
B	CHANGE DIM. PER MFGR. & UPDATE FAMILY DWG PER EC#E6375	4/14/00	D. Foth

General Notes:

THE FOLLOWING STI SPECIFICATIONS APPLY:

50-04100-013: **Specification: Supplier Packaging and Labeling Requirements**

APPROVAL	NAME	DATE	COMPONENT SPECIFICATION
DRAWN	S. VanNoy	12/15/95	
CHECKED	T. SMURA	2/1/95	TITLE:
ENG.	T. HOFBAUER	1/18/96	**ANT:OMNI ASSY, 2.4-2.5GHz , 3dBd W/CBL, W/REV BNC, OPTIONAL PLENUM**
OPERATIONS	S. SPITERI	1/15/96	
			DOC. NO. 50-11901-XXX REV B
			SHEET 1 of 5

OMNIDIRECTIONAL ANTENNA ASSEMBLY

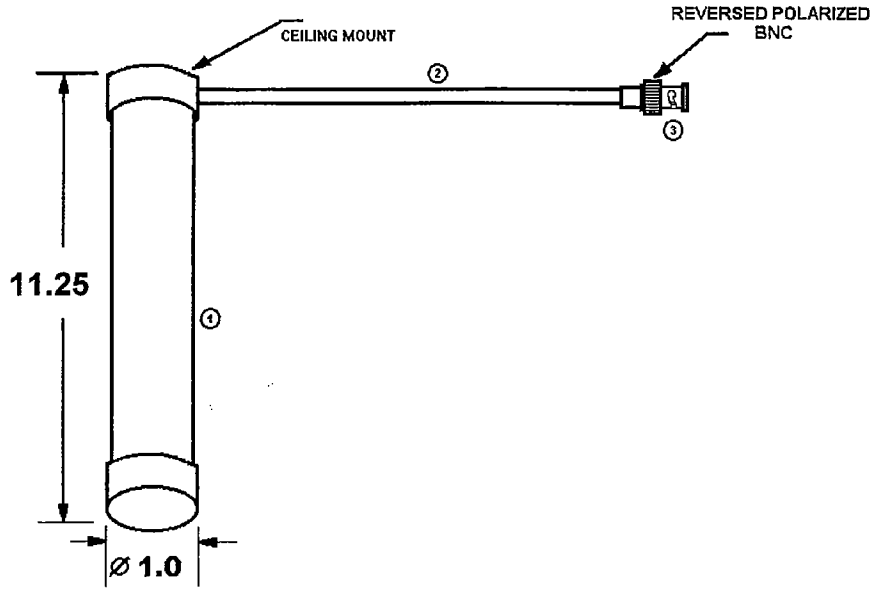
Features:

- Weatherproof designs with UltraLink pigtail
- DC grounded
- Plated copper laminated radiator

Enclosure Material:	Ultraviolet-stabilized Polycarbonate
Mount Style:	Ceiling
Performance:	Omnidirectional
Frequency:	2.4 - 2.5 GHz
Gain:	3 dBd
Bandwidth (1.5:1):	100 MHz
-3dB bmwidth:	38 E-Plane^0
Weight:	.31 lb.
W/sur Area:	0.08 ft^2
W/survival:	125 mph
Power:	50W
Operating Temperature:	-30°C - 70°C

Note:
Common Specifications: VSWR - 1.2: nominal; Connector Type -N-female; Element material - printed circuit

OUTLINE DRAWING



DRAWING NOT TO SCALE

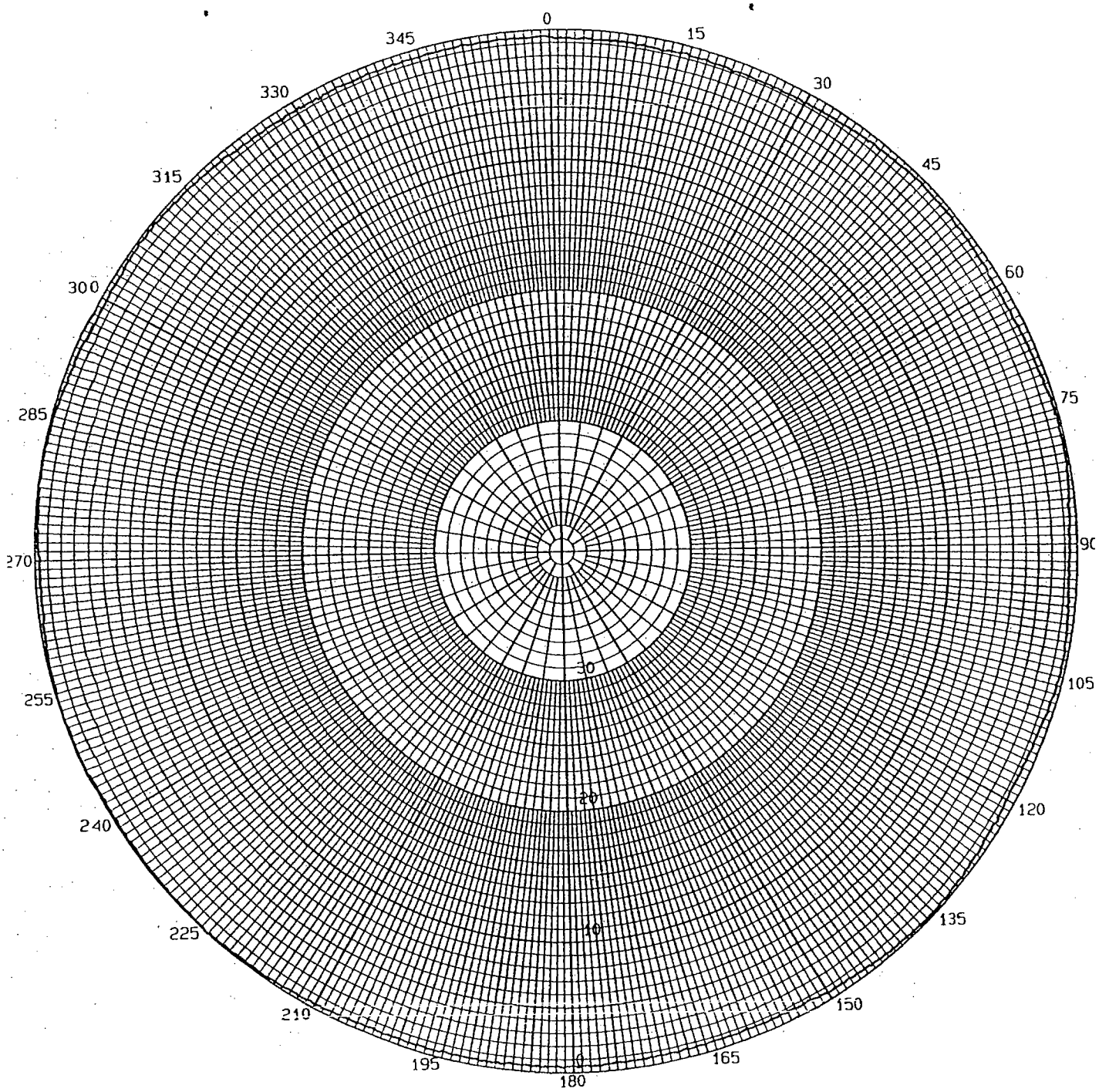
TABULATION:	50-11901-XXX	XXX = Cable Length in Inches
OPTIONS:	Plenum Rating[1]	Add "P" to Part Number (Rating applies to Cable not Antenna)
	Color	Add single character for color e.g. Y = Yellow, without color is white.
	Private Label	Add "S" for private label.
EXAMPLE:	50-11901-048P	048 = 48 Inches or 4 FT., P = with Plenum Rating

Note:
1. Modified Steiner Tunnel Flame Test (UL-910). Plenum is a closed area, such as between drop ceiling and true ceiling. With rating coax can be run in plenum without conduit.

ITEM	PART#	QTY	DESCRIPTION
1	S2403BH	1	CUSHCRAFT/Signals Omnidirectional Antenna
2	N/A	1	Coaxial Cable (RG58)
3	50-12100-093	1	Reversed Polarized Female BNC Connector

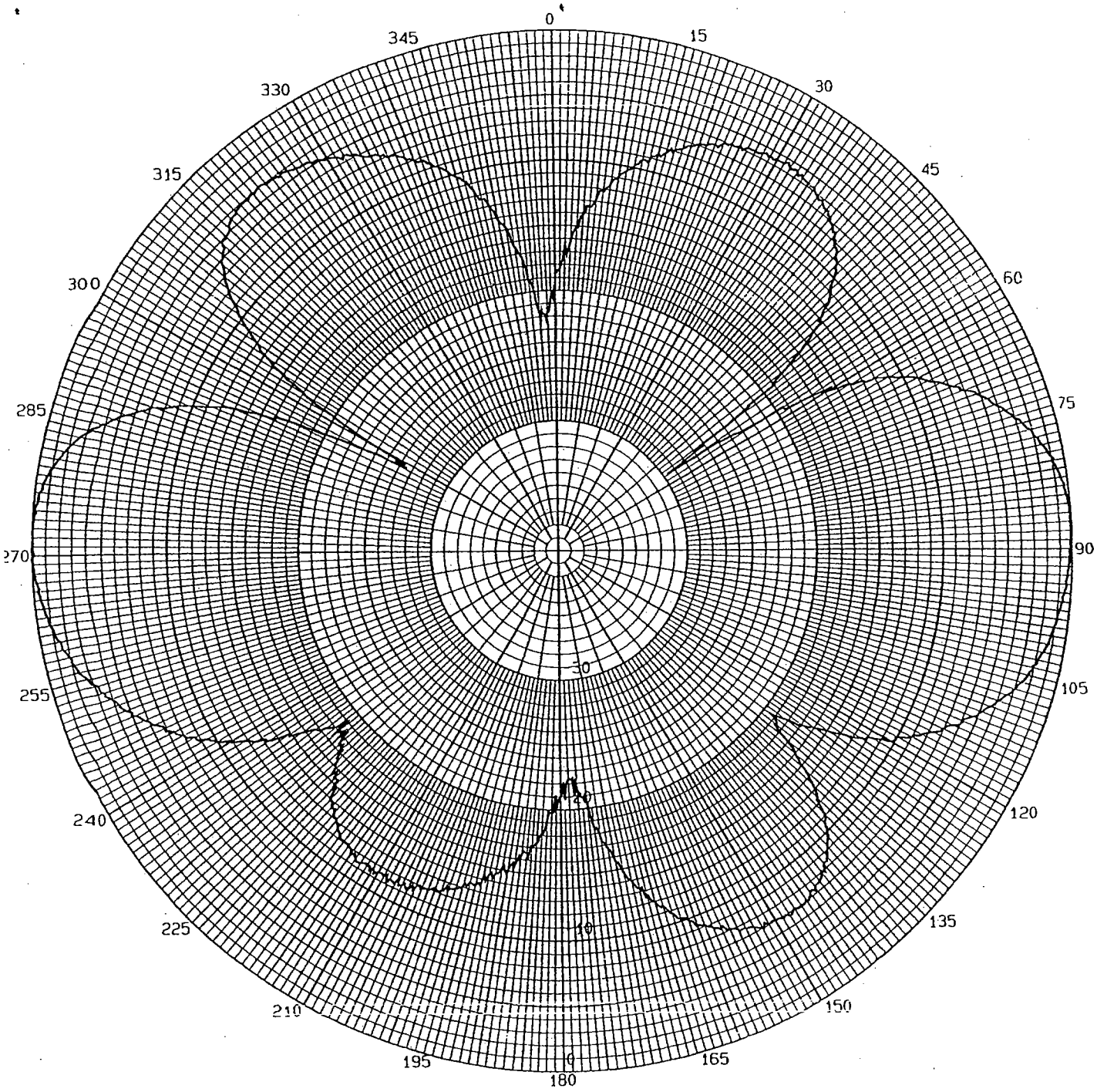
Dimensions are in inches unless otherwise noted

Typical Radiation Pattern
Freq: 2.45 GHz
Polarizaton: H-Plane



Magnitude dB Vs. Azimuth

Typical Radiation Pattern
Freq: 2.45 GHz
Polarizaton: E-Plane



Magnitude dB Vs. Azimuth

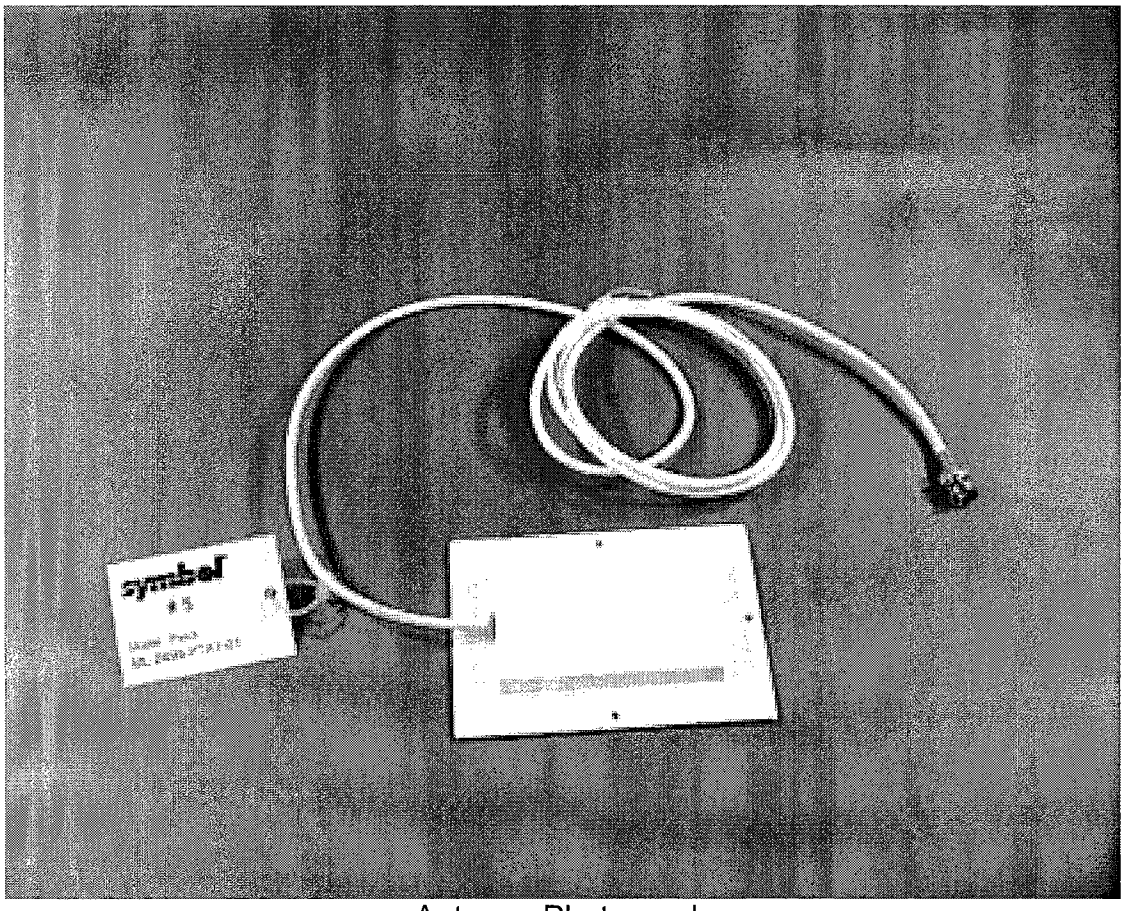
Patch Antenna

The **Patch** antenna is 5 dBi 70° directional in azimuth plane The **Patch** uses a reverse polarity BNC connector. It is mounted on a wall near the ceiling. In its use it would be farther than 20 cm from a persons body. It is used with mobile devices.

Location	Vertical Surface
Pattern	Directional 70°beam
Type	Patch
Max Gain	5 dBi
Physical	See attached dwg
Cable	6 ft (Plenum-rated)
Symbol P/N	ML-2499-PTA1-00
MPE Distance	See summary table

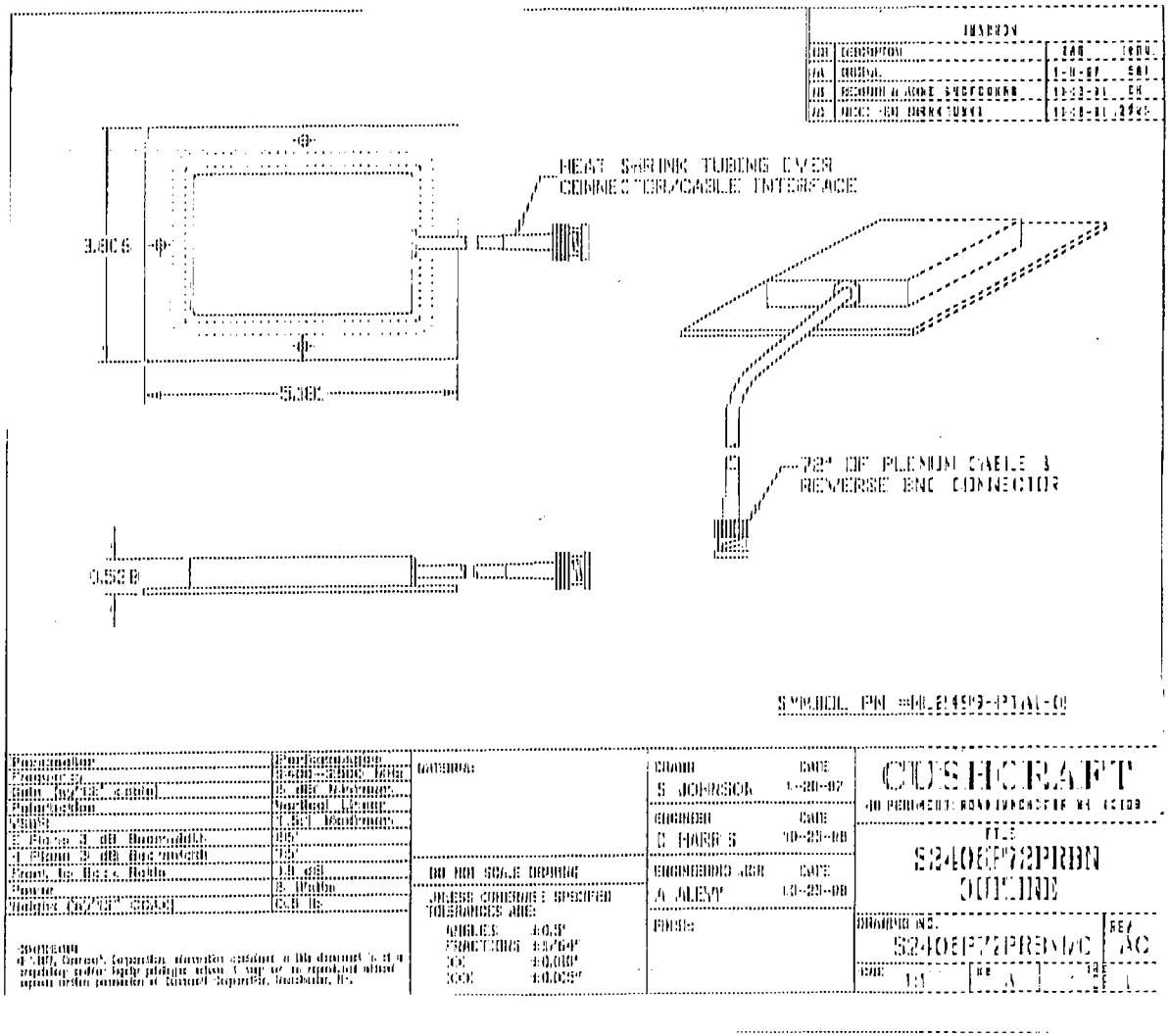
The following RF exposure information is included in a prominent place in the device's user manual to inform the user of safety issues as required by OET Bulletin 65, Supplement C when ever the device configuration could reduce the MPE distance to be less than 20 cm.

"Important Note: To comply with FCC RF exposure requirements, no one may remain within 20 cm of the antenna for extended periods of time."



Antenna Photograph

.A	RELEASE PER EDR # 20049	03/18/97
.B	ADD TUBING PER EC# D4429	01/27/99



2. SYMBOL PART NUMBER: **ML-2499-PTA1-01**

1. PART TO BE PACKAGED IN ACCORDANCE WITH STI SPECIFICATION 50-04100-013

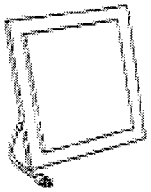
UNLESS OTHERWISE SPECIFIED:

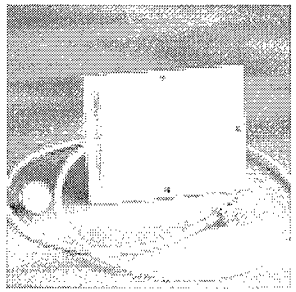
THIRD PARTY PRODUCT
CUSHCRAFT

SYMBOL TECHNOLOGIES
PART NO. ML-2499-PTA1-01
ANTENNA,VA: PATCH, 2.4, 6 DBI, 6 FT:
REV .B

Patches for both 902, 2400 and 5800
Linear and Circular Polarization

Patch antennas lend themselves well to many data collection applications. They are flat and unobtrusive in most environments. Their patterns are much like a short Yagi. Patches are available in either linear or circular polarity. The choice of polarity and the convenient shape of the patch makes it the right choice for many applications. Patches are most commonly wall mounted. Occasionally ceiling mounted patches are the right answer. We can also design patches so that they may be an integral part of the enclosure for data transceivers.



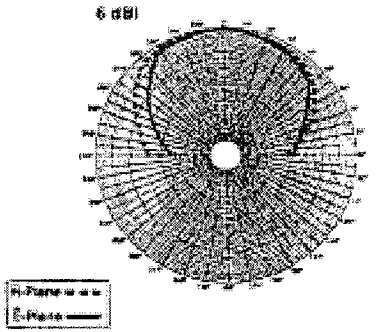


PATCHES

Model	S2406PL
Type	Patch
Polarity	Linear
Frequency, MHz	2400–2500
Gain	6 dB
Front to Back, dB	18
Bandwidth 1.5:1, MHz	100
-3 dB beamwidth:	
E-Plane, degrees	60
H-Plane, degrees	75
Connector Type	N-female
Enclosure Material	ABS plastic
Dimensions, in (cm)	5 x 5 x 7/16 (12.7 x 12.7 x 1.1)
Weight, oz (g)	9 (255)
Mount Style	Optional

S2406PL

6 dBi



SYMBOL TECHNOLOGIES
PART NO. ML-2499-PTA1-01
ANTENNA,VA: PATCH, 2.4, 6 DBI, 6 FT REV .B