



**CFR TITLE 47 PART 15.247
CLASS II PERMISSIVE CHANGE TO APPLICATION
FCC ID# IMKRL81PC**

EMI TEST REPORT

ON

**PROXIM, INC.
RANGELAN802 WIRELESS PCMCIA ADAPTER**

**MAXRAD MPA-2450 2 DBI OMNIDIRECTIONAL ANTENNA
LARSEN FB 42400 5 DBI OMNIDIRECTIONAL ANTENNA
CUSHCRAFT S2403BP12NF 3DBD PATCH ANTENNA
CUSHCRAFT S2307AMP10SMF 7.5DBI OMNIDIRECTIONAL ANTENNA
NCC N2400SM9B 2 DBI OMNIDIRECTIONAL ANTENNA
LARSEN KDMU2400 RSM HW 3 DBI OMNIDIRECTIONAL ANTENNA**

PREPARED FOR

**PROXIM, INC.
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MOUNTAIN VIEW, CA 94043
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PREPARED BY

**ELECTRONIC COMPLIANCE LABORATORIES INC.
1249 BIRCHWOOD DR.
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TEL: (408) 747-1490
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TEST REPORT NUMBER: P804014

DATE OF TEST: APRIL 27, 1998

**IF THIS DOCUMENT IS REPRODUCED IT MUST BE
REPRODUCED IN ITS ENTIRETY**



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1.0 Verification of Compliance

Purpose of Test: To validate compliance of six additional antennas used with the RangelAN802 PCMCIA Card

- ✓ MAXRAD MPA-2450 2 dBi Omnidirectional Antenna
- ✓ Larsen FB 42400 5 dBi Omnidirectional Antenna
- ✓ Cushcraft S2403BP12NF 3dBd Patch Antenna
- ✓ Cushcraft S2307AMP10SMF 7.5dBi Omnidirectional Antenna
- ✓ NCC N2400SM9B 2 dBi Omnidirectional Antenna
- ✓ Larsen KDMU2400 RSM HW 3 dBi Omnidirectional Antenna

Description: Wireless PCMCIA card adapter.

Model Number: 84XX

Serial Number: 0020A6324BC5

Applicant: Proxim, Inc.

Type of Test: CFR 47 Part 15.247; Class II Permissive Change
Addendum to Application for FCC ID# IMKRL1PC

Date of Test: April 27, 1998

Tested By: Chris Byleckie

The above equipment was tested by Electronic Compliance Laboratories, Inc. and found to be in compliance with the requirements set forth in the FCC Rules and Regulations, Part 15, Subpart B. The equipment, Test in the configuration described in this report, shows that the maximum emission levels emanating from this equipment are within the compliance requirements.

Date: _____

Chris Byleckie
Technical Director

2.0 Test Facility

Name: Electronic Compliance Laboratories

Location: 1249 Birchwood Drive
Sunnyvale, CA 94089

Site Filing: A site description is on file at the Federal Communications Commission
P.O. Box 429
Columbia, MD 21045

Types of Sites: Open Field Radiated and Indoor (Screen Room).
Line Conducted: All sites are constructed and calibrated to meet ANSI C63.4-1994 requirements.
Test facility is recognized by the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations.

NVLAP Code: 20089 effective through: March 31, 1998

3.0 Test Equipment

The following list contains equipment used at EC Laboratories, Inc. for compliance testing. The equipment conforms to the American National Standard Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1000 MHz.

Description	Manufacturer	S/N	Model No.
EMI Receiver	HP	3325A00137	8456A
Pre-amp	HP	3008A00527	8449B
Spectrum Analyzer	HP	3137A01183	8563A
Plotter	HP	2644V00365	7470A
Filter BP 1.2 - 4 GHz	FSY	001	HM 1160-1155
Filter BP 4 - 10 GHz	FSY	001	HM 2950-1565
Filter 10 - 18 GHz	FSY	001	HP 8601-7SS

HP = Hewlett Packard
EM = Electro Metrics

The antenna used at the time the data was taken is indicated on each data page. The antenna height and polarization are also noted on the data pages.

The calibration of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

4.0 Data Reporting Format

The measurement results are expressed in accordance with FCC Part-15, Subpart C; Class B limits, where applicable, are presented in tabular or graphical form.

5.0 Detector Functions

On any frequency or frequencies below or equal to 1000 MHz, the limits shown below are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths.

On any frequency or frequencies above 1000 MHz, the radiated limits shown below are based on the use of measuring equipment employing an average detector function.

EC Laboratories uses the Peak detection mode for normal testing and initial screening of the EUT. The Peak detection mode will produce a measurement value that is always greater than, or equal to, the quasi-peak or average detection mode. Whenever the measurement value is 6 dB below the applicable limit or greater, the appropriate detector function will be employed and recorded.

6.0 Frequency Range of Investigation

The spectrum was investigated up to the frequency specified in the following table according to the highest clock frequency generated in the device.

<u>Highest Frequency Used (Clock)</u>	<u>Upper Limit of Range Measured</u>
Below 1.705 MHz	30 MHz
1.705 to 108 MHz	1000 MHz
108 to 500 MHz	2000 MHz
500 to 1000 MHz	5000 MHz
Above 1000 MHz	5th Harmonic or 40 GHz (Whichever is Lower)

7.0 Summary of Measurements

Summary of Measurements for a Spread Spectrum System, 2400 - 2483.5 MHz

CFR Title 47, Parts 15.247

Manufacturer: Proxim, Inc.
295 North Bernardo Ave
Mountain View, CA 94043
Contact: Carmelo Amarena
FCC ID: IMKRL81PC
Test Report Number: P804014

Pass/Fail: Passed

15.247 Operation within the 2400 - 2483.5 MHz Band:

The EUT was placed on a wooden table, approx. 1 meter tall, with the search antenna located 1 meter away. With the spectrum analyzer in Max. Hold the table was rotated and the antenna raised and lowered to maximize emission levels.

15.247 (b) Maximum Peak Output Power

Power = 23.0 dBm (peak reading) + 1.0dB cable loss = +24.0 dBm / 251 mW EIRP
Limit: +30 dBm / 1 W maximum power

MAXRAD MPA-2450 2 dBi Omnidirectional Antenna

EIRP = +24.0 (peak power) + 2.0 (peak gain, dBi) = + 26.0 dBm / 398mW EIRP
Limit: +36 dBm / 4 W maximum EIRP

Larsen FB 42400 5 dBi Omnidirectional Antenna

EIRP = +24.0 (peak power) + 5.0 (peak gain, dBi) = + 29.0 dBm / 794mW EIRP
Limit: +36 dBm / 4 W maximum EIRP

Cushcraft S2403BP12NF 3dBd Patch Antenna

EIRP = +24.0 (peak power) + 3.0 (peak gain, dBi) = + 27.0 dBm / 500 mW EIRP
Limit: +36 dBm / 4 W maximum EIRP

Cushcraft S2307AMP10SMF 7.5dBi Omnidirectional Antenna

EIRP = +24.0 (peak power) + 7.5 (peak gain, dBi) = + 31.5 dBm / 1.41W EIRP
Limit: +36 dBm / 4 W maximum EIRP

NCC N2400SM9B 2 dBi Omnidirectional Antenna

EIRP = +24.0 (peak power) + 2.0 (peak gain, dBi) = + 26.0 dBm / 398mW EIRP
Limit: +36 dBm / 4 W maximum EIRP

Larsen KDMU2400 RSM HW 3 dBi Omnidirectional Antenna

EIRP = +24.0 (peak power) + 3.0 (peak gain, dBi) = + 27.0 dBm / 500mW EIRP
Limit: +36 dBm / 4 W maximum EIRP

APPENDIX A
Restricted Band Emissions Data

FCC RADIATED DATA SHEET

EUT: RangeLAN802 PCMCIA
S/N:
RULE PART: 15.247
DATE: 4/27/98
CUSTOMER NAME: Proxim
WORK ORDER: 8041602
FILE: 8041602c
ANTENNA: Horn
OTHER CAL FACTOR: ATTN dB: 0
MODULATION TYPE: DUTY dB: 0
TESTED BY: Chris
HP IL dB: 0
COMMENTS: ✓ Larsen KDMU2400RSM Antennas.
DIST dB: 10

FREQ.	EADING	Pk, QP,	A.F.	able los	AMP	O.C.F.	TOTAL	LIMIT	DELTA
MHz	dB(uV)	or Av	dB	dB	dB	dB	dB(uV/m)	dB(uV/m)	dB
Fund = 2402									
4804	52.8	Pk	32.8	7.0	35.0	10.0	47.6	74.0	-26.4
4804	41.7	Avg	32.8	7.0	35.0	10.0	36.5	54.0	-17.5
12010	48.2	Pk	39.3	13.6	35.0	10.0	56.1	74.0	-18.0
12010	37.5	Avg	39.3	13.6	35.0	10.0	45.4	54.0	-8.7
Fund = 2440									
4880	51.3	Pk	32.8	7.0	35.0	10.0	46.1	74.0	-27.9
4880	42.0	Avg	32.8	7.0	35.0	10.0	36.8	54.0	-17.2
7320	56.5	Pk	36.0	10.6	35.0	10.0	58.1	74.0	-15.9
7320	37.3	Avg	36.0	10.6	35.0	10.0	38.9	54.0	-15.1
12200	49.5	Pk	39.3	13.6	35.0	10.0	57.4	74.0	-16.7
12200	37.8	Avg	39.3	13.6	35.0	10.0	45.7	54.0	-8.4
Fund = 2480									
4960	54.8	Pk	32.8	7.0	35.0	10.0	49.6	74.0	-24.4
4960	42.0	Avg	32.8	7.0	35.0	10.0	36.8	54.0	-17.2
7440	57.6	Pk	36.0	10.6	35.0	10.0	59.2	74.0	-14.8
7440	37.5	Avg	36.0	10.6	35.0	10.0	39.1	54.0	-14.9
12400	48.1	Pk	39.3	13.6	35.0	10.0	56.0	74.0	-18.1
12400	37.5	Avg	39.3	13.6	35.0	10.0	45.4	54.0	-8.7

FCC RADIATED DATA SHEET

EUT: RangeLAN802 PCMCIA
 S/N:
 RULE PART: 15.247
 DATE: 4/27/98
 CUSTOMER NAME: Proxim
 WORK ORDER: 8041602
 FILE: 804160k
 ANTENNA: Horn
 OTHER CAL FACTOR: ATTN dB: 0
 MODULATION TYPE: DUTY dB: 0
 TESTED BY: Chris
 HP IL dB: 0
 COMMENTS: ✓1 NCC N2400SM9B Antenna
 DIST dB: 10

FREQ.	EADING	Pk, QP,	A.F.	able los	AMP	O.C.F.	TOTAL	LIMIT	DELTA
MHz	dB(uV)	or Av	dB	dB	dB	dB	dB(uV/m)	dB(uV/m)	dB
Fund = 2402									
4804	54.0	Pk	32.8	7.0	35.0	10.0	48.8	74.0	-25.2
4804	42.0	Avg	32.8	7.0	35.0	10.0	36.8	54.0	-17.2
12010	48.8	Pk	39.3	13.6	35.0	10.0	56.7	74.0	-17.3
12010	37.8	Avg	39.3	13.6	35.0	10.0	45.7	54.0	-8.3
Fund = 2440									
4880	53.8	Pk	32.8	7.0	35.0	10.0	48.6	74.0	-25.4
4880	41.8	Avg	32.8	7.0	35.0	10.0	36.6	54.0	-17.4
7320	58.5	Pk	36.0	10.6	35.0	10.0	60.1	74.0	-13.9
7320	37.5	Avg	36.0	10.6	35.0	10.0	39.1	54.0	-14.9
12200	49.8	Pk	39.3	13.6	35.0	10.0	57.7	74.0	-16.3
12200	37.8	Avg	39.3	13.6	35.0	10.0	45.7	54.0	-8.3
Fund = 2480									
4960	53.5	Pk	32.8	7.0	35.0	10.0	48.3	74.0	-25.7
4960	41.8	Avg	32.8	7.0	35.0	10.0	36.6	54.0	-17.4
7440	60.2	Pk	36.0	10.6	35.0	10.0	61.8	74.0	-12.3
7440	37.7	Avg	36.0	10.6	35.0	10.0	39.3	54.0	-14.8
12400	48.5	Pk	39.3	13.6	35.0	10.0	56.4	74.0	-17.7
12400	37.7	Avg	39.3	13.6	35.0	10.0	45.5	54.0	-8.5

FCC RADIATED DATA SHEET

EUT:	RangeLAN802 PCMCIA	DATE:	4/27/98
S/N:		CUSTOMER NAME:	Proxim
RULE PART:	15.247	WORK ORDER:	8041602
		FILE:	8041602j
ANTENNA	Horn	OTHER CAL FACTOR	ATTN dB: 0
MODULATION TYPE:			DUTY dB: 0
TESTED BY:	Chris		HP IL dB: 0
COMMENTS:	✓ S2307AMP10SMF Antenna		DIST dB: 10

FREQ	EADING	Pk, QP,	A.F.	able los	AMP	O.C.F.	TOTAL	LIMIT	DELTA
MHz	dB(μV)	or Av	dB	dB	dB	dB	dB(μV/m)	dB(μV/m)	dB
Fund = 2402									
4804	53.0	Pk	32.8	7.0	35.0	10.0	47.8	74.0	-26.2
4804	41.7	Avg	32.8	7.0	35.0	10.0	36.5	54.0	-17.5
12010	48.7	Pk	39.3	13.6	35.0	10.0	56.5	74.0	-17.5
12010	37.8	Avg	39.3	13.6	35.0	10.0	45.7	54.0	-8.3
Fund = 2440									
4880	53.3	Pk	32.8	7.0	35.0	10.0	48.1	74.0	-25.9
4880	42.0	Avg	32.8	7.0	35.0	10.0	36.8	54.0	-17.2
7320	58.0	Pk	36.0	10.6	35.0	10.0	59.6	74.0	-14.4
7320	37.7	Avg	36.0	10.6	35.0	10.0	39.3	54.0	-14.8
12200	50.0	Pk	39.3	13.6	35.0	10.0	57.9	74.0	-16.2
12200	37.8	Avg	39.3	13.6	35.0	10.0	45.7	54.0	-8.3
Fund = 2480									
4960	52.5	Pk	32.8	7.0	35.0	10.0	47.3	74.0	-26.7
4960	41.7	Avg	32.8	7.0	35.0	10.0	36.5	54.0	-17.5
7440	58.5	Pk	36.0	10.6	35.0	10.0	60.1	74.0	-13.9
7440	41.8	Avg	36.0	10.6	35.0	10.0	43.4	54.0	-10.6
12400	49.5	Pk	39.3	13.6	35.0	10.0	57.4	74.0	-16.7
12400	37.8	Avg	39.3	13.6	35.0	10.0	45.7	54.0	-8.3

FCC RADIATED DATA SHEET

EUT: RangelAN802 PCMCIA
 S/N: 15.247
 RULE PART: 8041602g
 DATE: 4/27/98
 CUSTOMER NAME: Proxim
 WORK ORDER: 8041602
 FILE: 8041602g

ANTENNA: Horn
 MODULATION TYPE: DUTY DB: 0
 TESTED BY: Chrs
 COMMENTS: ✓ Cushcraft S2403BP12NF Antenna
 DIST DB: 10

FREQ	MHz	EADING	Pk, QP, or Av	A.F.	able los	AMP	O.C.F.	TOTAL	LIMIT	DELTA
		dB(uv)		dB	dB	dB	dB	dB(uv/m)	dB(uv/m)	dB

Fund = 2402										
4804	52.3	Pk	32.8	7.0	35.0	10.0	47.1	74.0	-26.9	
4804	42.0	Avg	32.8	7.0	35.0	10.0	36.8	54.0	-17.2	
12010	49.7	Pk	39.3	13.6	35.0	10.0	57.5	74.0	-16.5	
12010	37.7	Avg	39.3	13.6	35.0	10.0	45.5	54.0	-8.5	

Fund = 2440										
4880	53.3	Pk	32.8	7.0	35.0	10.0	48.1	74.0	-25.9	
4880	42.0	Avg	32.8	7.0	35.0	10.0	36.8	54.0	-17.2	
7320	59.0	Pk	36.0	10.6	35.0	10.0	60.6	74.0	-13.4	
7320	37.3	Avg	36.0	10.6	35.0	10.0	38.9	54.0	-15.1	
12200	49.2	Pk	39.3	13.6	35.0	10.0	57.0	74.0	-17.0	
12200	37.7	Avg	39.3	13.6	35.0	10.0	45.5	54.0	-8.5	

Fund = 2480										
4960	53.2	Pk	32.8	7.0	35.0	10.0	48.0	74.0	-26.0	
4960	42.0	Avg	32.8	7.0	35.0	10.0	36.8	54.0	-17.2	
7440	59.5	Pk	36.0	10.6	35.0	10.0	61.1	74.0	-12.9	
7440	37.7	Avg	36.0	10.6	35.0	10.0	39.3	54.0	-14.8	
12400	49.7	Pk	39.3	13.6	35.0	10.0	57.5	74.0	-16.5	
12400	37.7	Avg	39.3	13.6	35.0	10.0	45.5	54.0	-8.5	

FCC RADIATED DATA SHEET

EUT: RangeLAN802 PCMCIA

S/N:

RULE PART: 15.247

DATE: 4/27/98

CUSTOMER NAME: Proxim

WORK ORDER: 8041602

FILE: 8041602h

ANTENNA: Horn

OTHER CAL FACTOR ATTN dB: 0

MODULATION TYPE:

DUTY dB: 0

TESTED BY: Chris

HP IL dB: 0

COMMENTS: ✓ Larsen FB2400 Antenna

DIST dB: 10

FREQ.	EADING	Pk, QP,	A.F.	able los	AMP	O.C.F.	TOTAL,	LIMIT	DELTA
MHz	dB(uV)	or Av	dB	dB	dB	dB	dB(uV/m)	dB(uV/m)	dB
Fund = 2402									
4804	53.3	Pk	32.8	7.0	35.0	10.0	48.1	74.0	-25.9
4804	41.7	Avg	32.8	7.0	35.0	10.0	36.5	54.0	-17.5
12010	49.3	Pk	39.3	13.6	35.0	10.0	57.2	74.0	-16.8
12010	38.0	Avg	39.3	13.6	35.0	10.0	45.9	54.0	-8.2
Fund = 2440									
4880	51.8	Pk	32.8	7.0	35.0	10.0	46.6	74.0	-27.4
4880	41.7	Avg	32.8	7.0	35.0	10.0	36.5	54.0	-17.5
7320	57.3	Pk	36.0	10.6	35.0	10.0	58.9	74.0	-15.1
7320	37.5	Avg	36.0	10.6	35.0	10.0	39.1	54.0	-14.9
12200	47.8	Pk	39.3	13.6	35.0	10.0	55.7	74.0	-18.3
12200	37.7	Avg	39.3	13.6	35.0	10.0	45.5	54.0	-8.5
Fund = 2480									
4960	53.7	Pk	32.8	7.0	35.0	10.0	48.5	74.0	-25.5
4960	41.7	Avg	32.8	7.0	35.0	10.0	36.5	54.0	-17.5
7440	58.3	Pk	36.0	10.6	35.0	10.0	59.9	74.0	-14.1
7440	37.5	Avg	36.0	10.6	35.0	10.0	39.1	54.0	-14.9
12400	49.2	Pk	39.3	13.6	35.0	10.0	57.0	74.0	-17.0
12400	37.7	Avg	39.3	13.6	35.0	10.0	45.5	54.0	-8.5

FCC RADIATED DATA SHEET									
EUT:		RangeLAN802 PCMCIA				DATE:		4/27/98	
S/N:						CUSTOMER NAME:		Proxim	
RULE PART:		15.247				WORK ORDER:		8041602	
						FILE:		8041602d	
ANTENNA		Horn		OTHER CAL FACTOR		ATTN dB:		0	
MODULATION TYPE:						DUTY dB:		0	
TESTED BY:		Chris				HP IL dB:		0	
COMMENTS:		✓ MAXRAD MPA2450 Reverse Antenna.				DIST dB:		10	

FREQ.	READING	Pk, QP,	A.F.	able los	AMP	O.C.F.	TOTAL	LIMIT	DELTA
MHz	dB(uV)	or Av	dB	dB	dB	dB	dB(uV/m)	dB(uV/m)	dB
Fund = 2402									
4804	52.5	Pk	32.8	7.0	35.0	10.0	47.3	74.0	-26.7
4804	41.5	Avg	32.8	7.0	35.0	10.0	36.3	54.0	-17.7
12010	48.8	Pk	39.3	13.6	35.0	10.0	56.7	74.0	-17.4
12010	37.8	Avg	39.3	13.6	35.0	10.0	45.7	54.0	-8.4
Fund = 2440									
4880	53.8	Pk	32.8	7.0	35.0	10.0	48.6	74.0	-25.4
4880	41.8	Avg	32.8	7.0	35.0	10.0	36.6	54.0	-17.4
7320	58.2	Pk	36.0	10.6	35.0	10.0	59.8	74.0	-14.3
7320	37.5	Avg	36.0	10.6	35.0	10.0	39.1	54.0	-14.9
12200	49.3	Pk	39.3	13.6	35.0	10.0	57.2	74.0	-16.9
12200	38.0	Avg	39.3	13.6	35.0	10.0	45.9	54.0	-8.2
Fund = 2480									
4960	52.8	Pk	32.8	7.0	35.0	10.0	47.6	74.0	-26.4
4960	41.7	Avg	32.8	7.0	35.0	10.0	36.5	54.0	-17.5
7440	58.3	Pk	36.0	10.6	35.0	10.0	59.9	74.0	-14.1
7440	37.5	Avg	36.0	10.6	35.0	10.0	39.1	54.0	-14.9
12400	48.5	Pk	39.3	13.6	35.0	10.0	56.4	74.0	-17.7
12400	37.8	Avg	39.3	13.6	35.0	10.0	45.7	54.0	-8.4

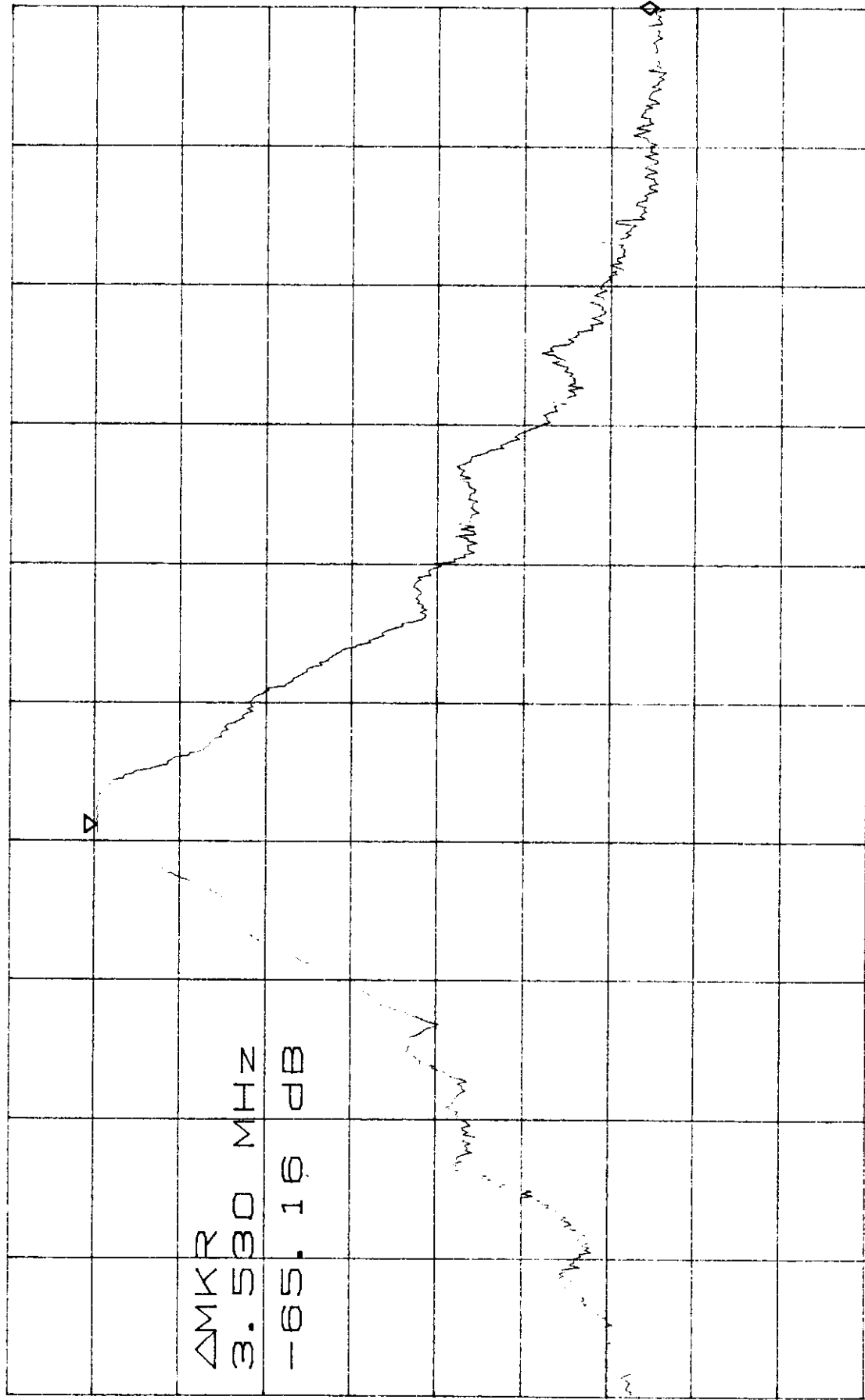
ATTEN 40dB

ΔMKR -65.16dB

RL 137.0dBμV

10dB/

3.530MHz



START 2.477500GHz

STOP 2.483500GHz

*RBW 100kHz

VBW 100kHz

SWP 50ms

APPENDIX B

Support Equipment

Equipment Type:	Laptop Computer
Model Number:	T19005
Serial Number:	11453067
FCC ID Number:	FKGP66
Manufacturer:	Toshiba

APPENDIX C

Set-up Photographs

APPENDIX D

Antenna and Conector Drawings

APPENDIX D

Antenna and Conector Drawings

MAXRAD Portable Antennas MPA Series

MAXRAD now offers a series of portable antennas for the emerging DCS, PCS and Wireless Data markets. Using proven design technologies, the MAXRAD MPA series is the answer for even the most discriminating portable antenna user. This series is available with several different connector options.

Electrical Specifications

Gain:

Unity

VSWR at Resonant Point:

<1.5:1

Nominal Impedance:

50 Ohms

Antenna Type:

Coaxial dipole

Available Connectors:

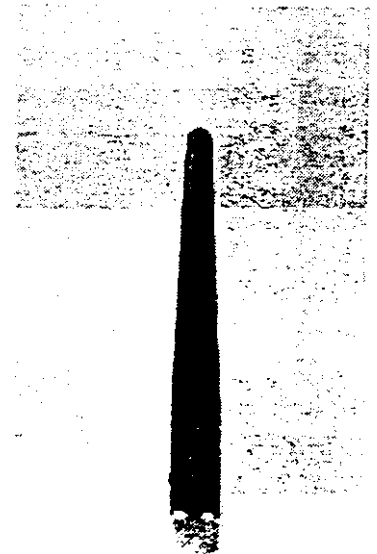
BNC, TNC, male SMA, female SMA

MPA Series

Model #	Connector Options	Frequency Range	Factory Tuned Frequency	Gain	List Price
MPA-1750*	*PL* = Mini-UHF *BN* = BNC	1.71-1.88 GHz	1.8 GHz	Unity	\$30.25
MPA-1850*	*C* = TNC *FSMA* = female SMA	1.85-1.99 GHz	1.9 GHz	Unity	\$30.25
MPA-2450*	*MSMA* = male SMA	2.4-2.5 GHz	2.45 GHz	Unity	\$30.25

*Please specify connector option when ordering

For SMA connectors - add \$5.25

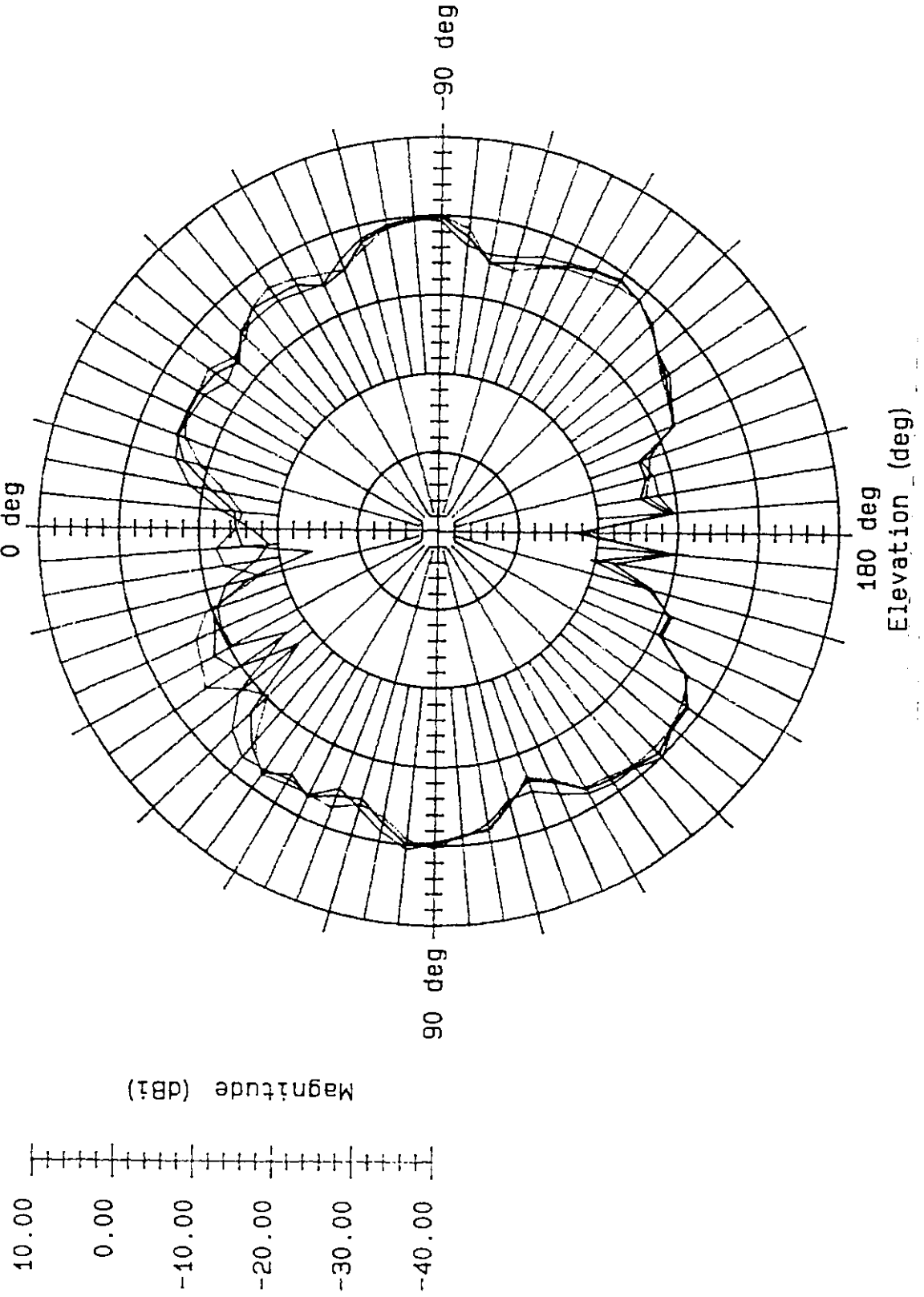


MPA-2450

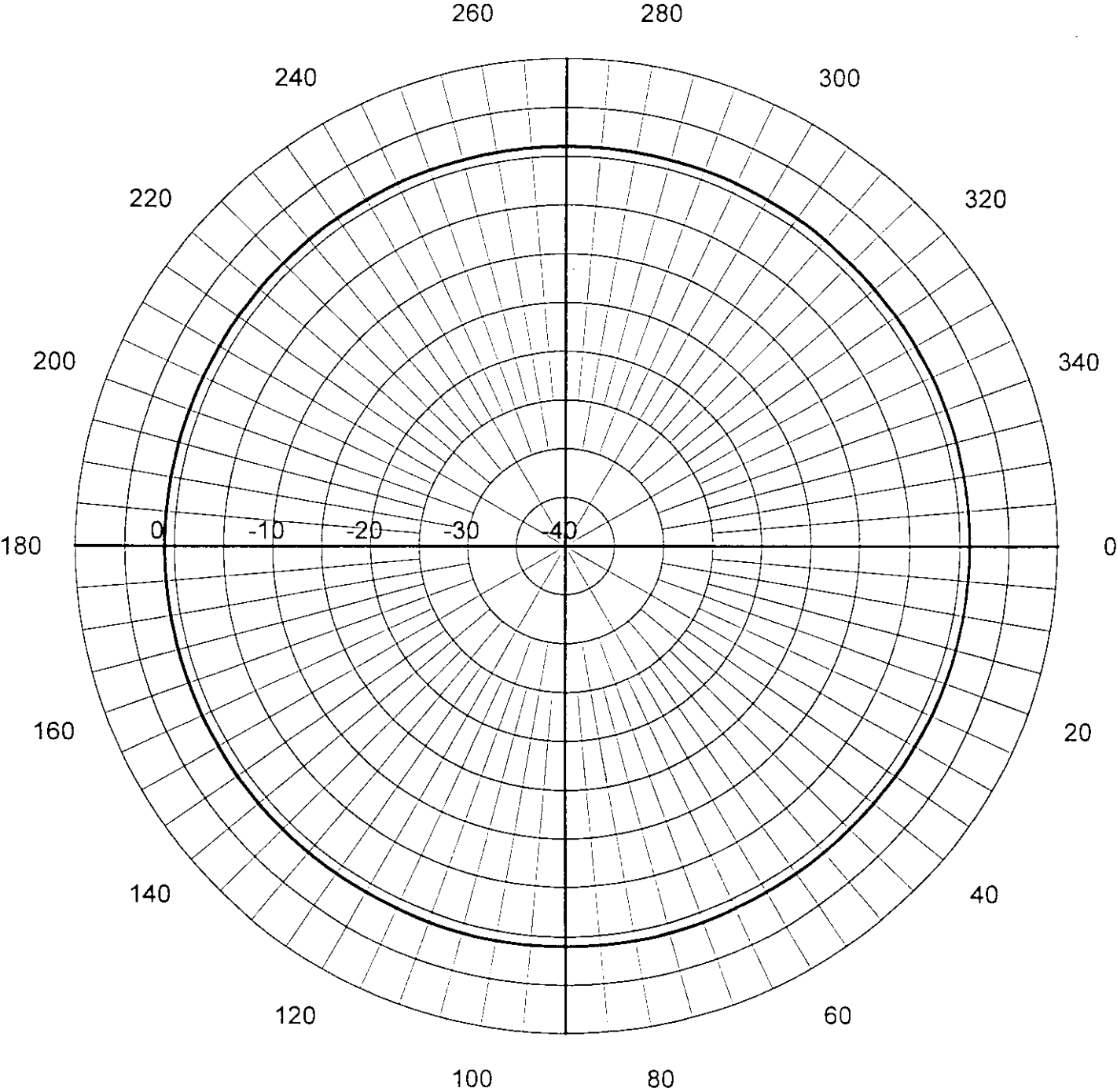
MAXRAD_TEST_5_1.DAT
 MAXRAD_CAL_V
 4-NOV-97
 15: 08: 16

--- Antenna Measurement ---
 0.000 deg 0.000 deg
 0.000 deg 0.000 deg
 2.45 GHz 2.50 GHz

Az = 0.000 deg
 Pol = 0.000 deg
 Freq= 2.40 GHz



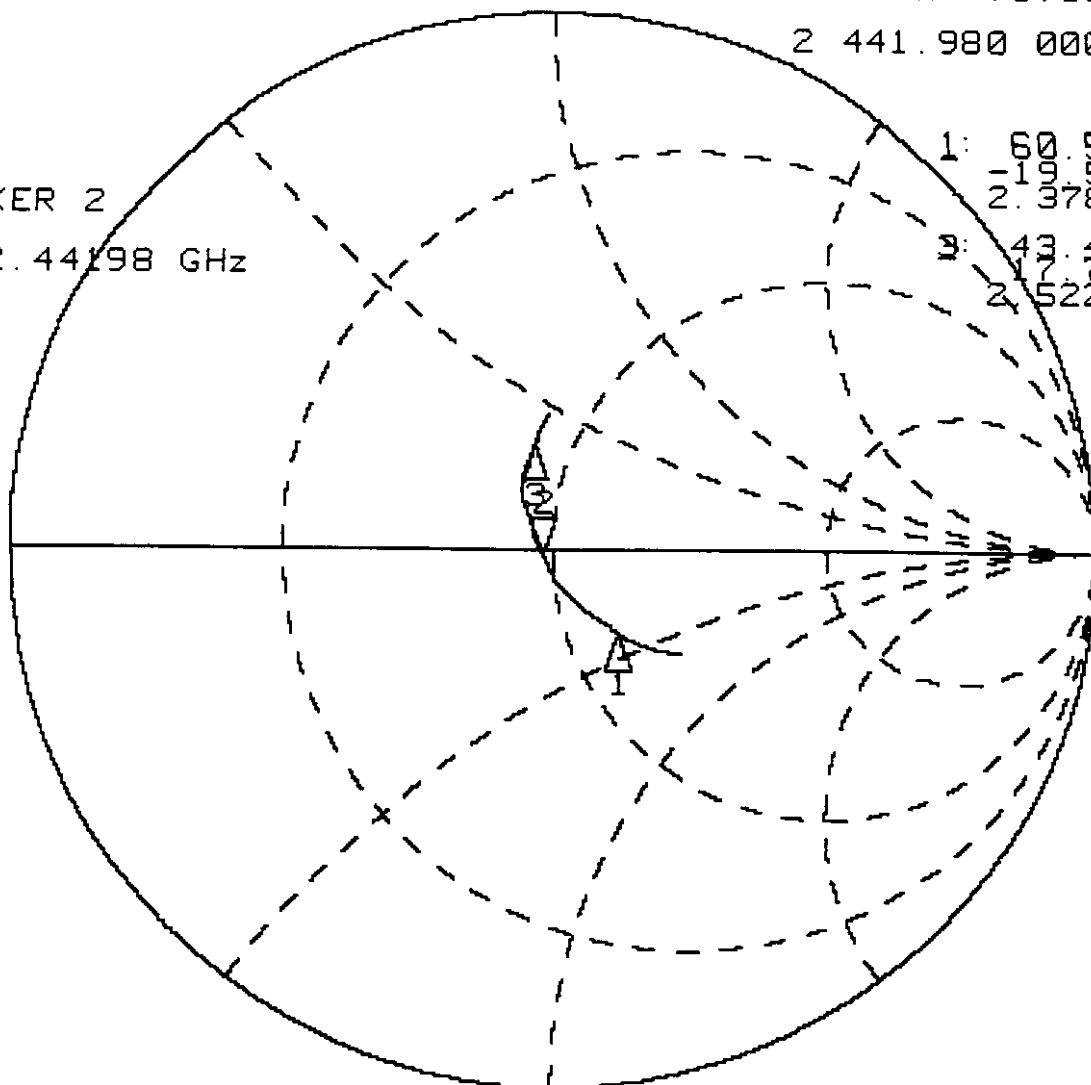
Maxrad MPA-2450 (Azimuth Cut)



CH1 S₁₁ 1 UFS 2: 48.248 Ω -886.72 m Ω 73.501 pF
 hp 2 441.980 000 MHz

Cor MARKER 2
 2.44198 GHz

1: 60.525 Ω
 -19.559 Ω
 2.378 GHz
 3: 43.457 Ω
 -17.795 Ω
 2.522 GHz



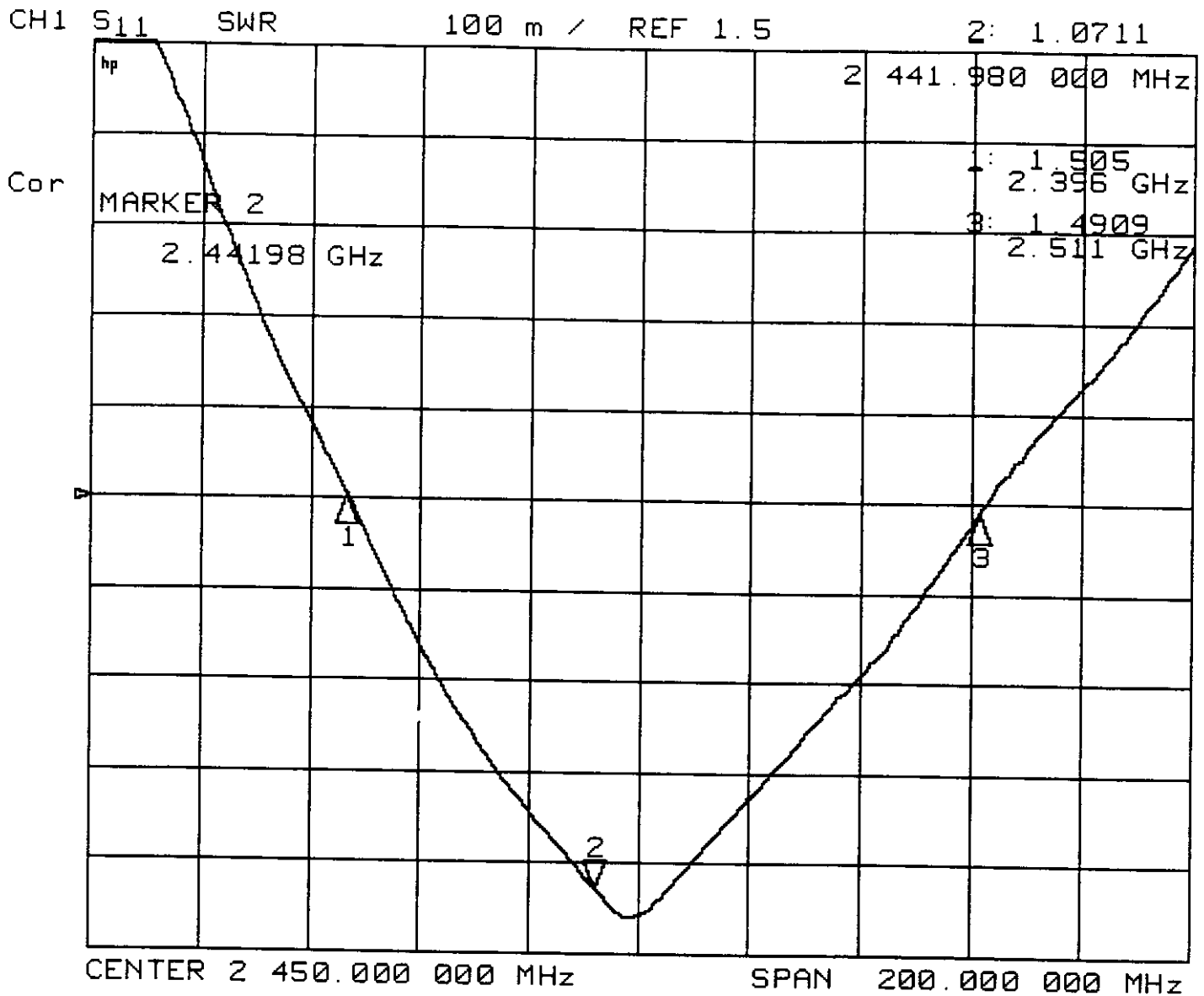
CENTER 2 450.000 000 MHz

SPAN 200.000 000 MHz

P/N: N24005M3B
REV. SMA, 2.4 GHz
AIR-TUNED
2/24/98

NCC, INC.
 18385 Parkman-Nelson Road
 P.O. Box 736
 Parkman, OH 44080

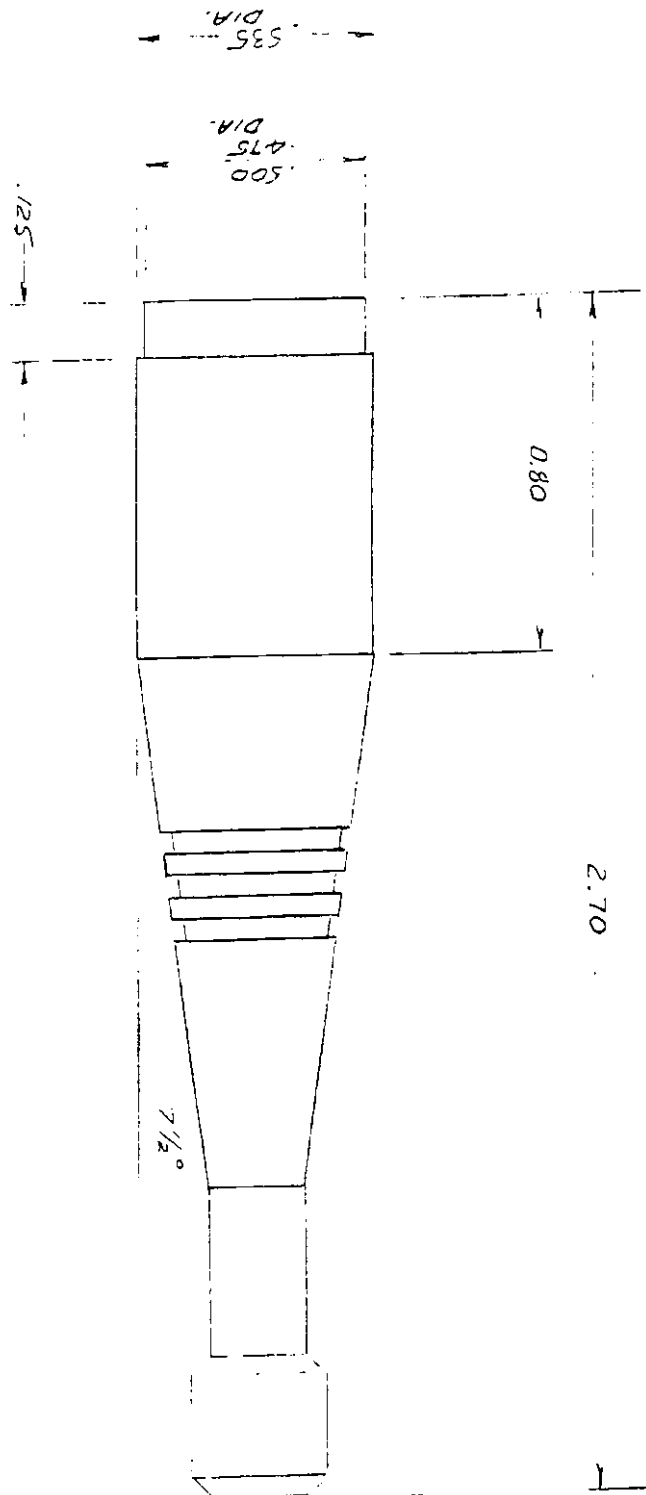
FIG. 2 OF 2



P/N: N24003M18B
REV. SMA, 2.4GHz
AIR-TUNED
2/24/98

NCO, INC.
18385 Parkman-Nelson Road
P.O. Box 736
Parkman, OH 44080

PS. 1002



SPECIFICATIONS

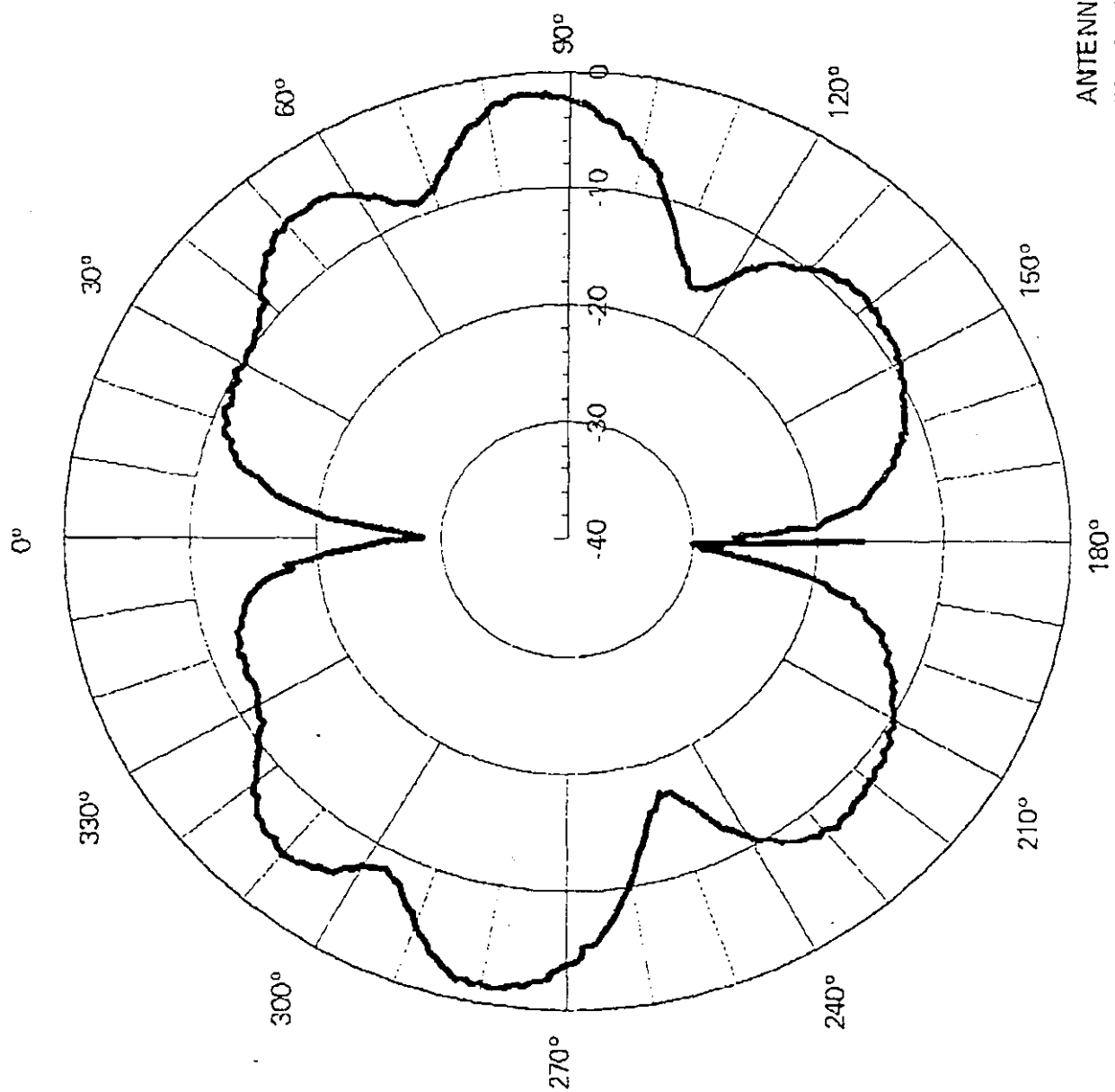
Frequency - 2.4 GHz - 2.5 GHz
 Bandwidth - 75 MHz <1.5:1
 VSWR - <1.5:1
 Impedance - Nominally 50 Ohms
 Polarity - Vertical
 Gain - 2 dBi

Connector - R SMA
 Length - Nominally 3 inches
 Material - Flexible Vinyl

MODEL N2400SM98 "2.4 GHz CURRENT FED HORN ANTENNA, WITH REVERSE SMA CONNECTOR"			
SCALE	3:1	APPROVED BY	DRAWN BY
DATE	03-20-98		476
		NCC, INC. PARKMAN, OHIO	
		DRAWING NUMBER N2400SM9	

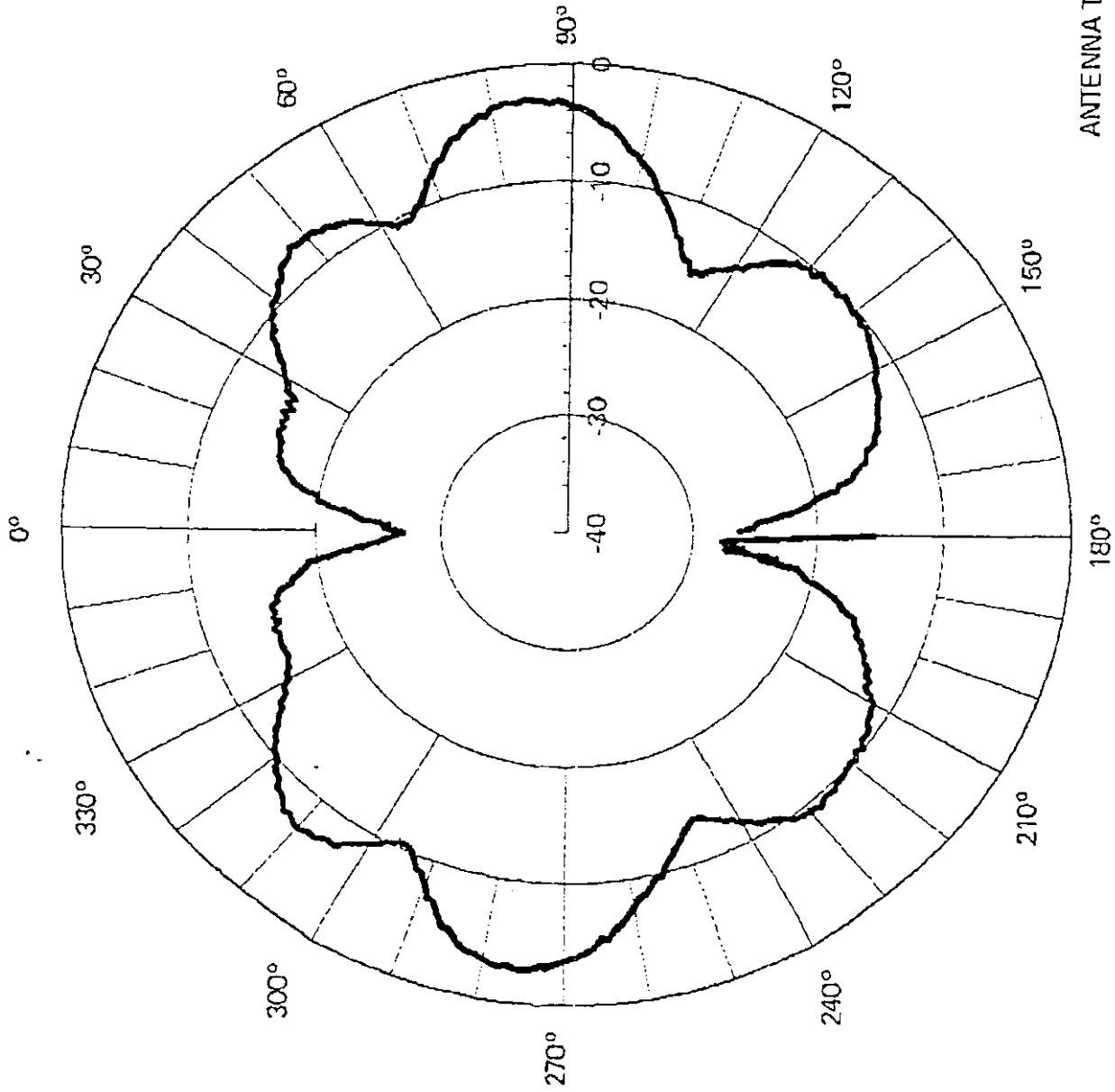
Post-It® Fax Note		7671	Date	# of pages
To	DENYSE		From	PALL T.
Co./Dept.			Co.	
Phone #			Phone #	
Fax #	615.830.9426		Fax #	

FB3 2400
 LATER CHANGED TO
 FB4 2400



LARSEN ELECTRONICS
 ANTENNA TYPE; Colinear G/P MODEL No. FB3-2400
 FREQ; 2.485 GHZ POLORIZATION; HORIZONTAL
 FILE No. FB324002 DATE; 3-19-96 ENG; JBV
 NOTES; E-PLANE GAIN; RELATIVE

5 dBS



LARSEN ELECTRONICS

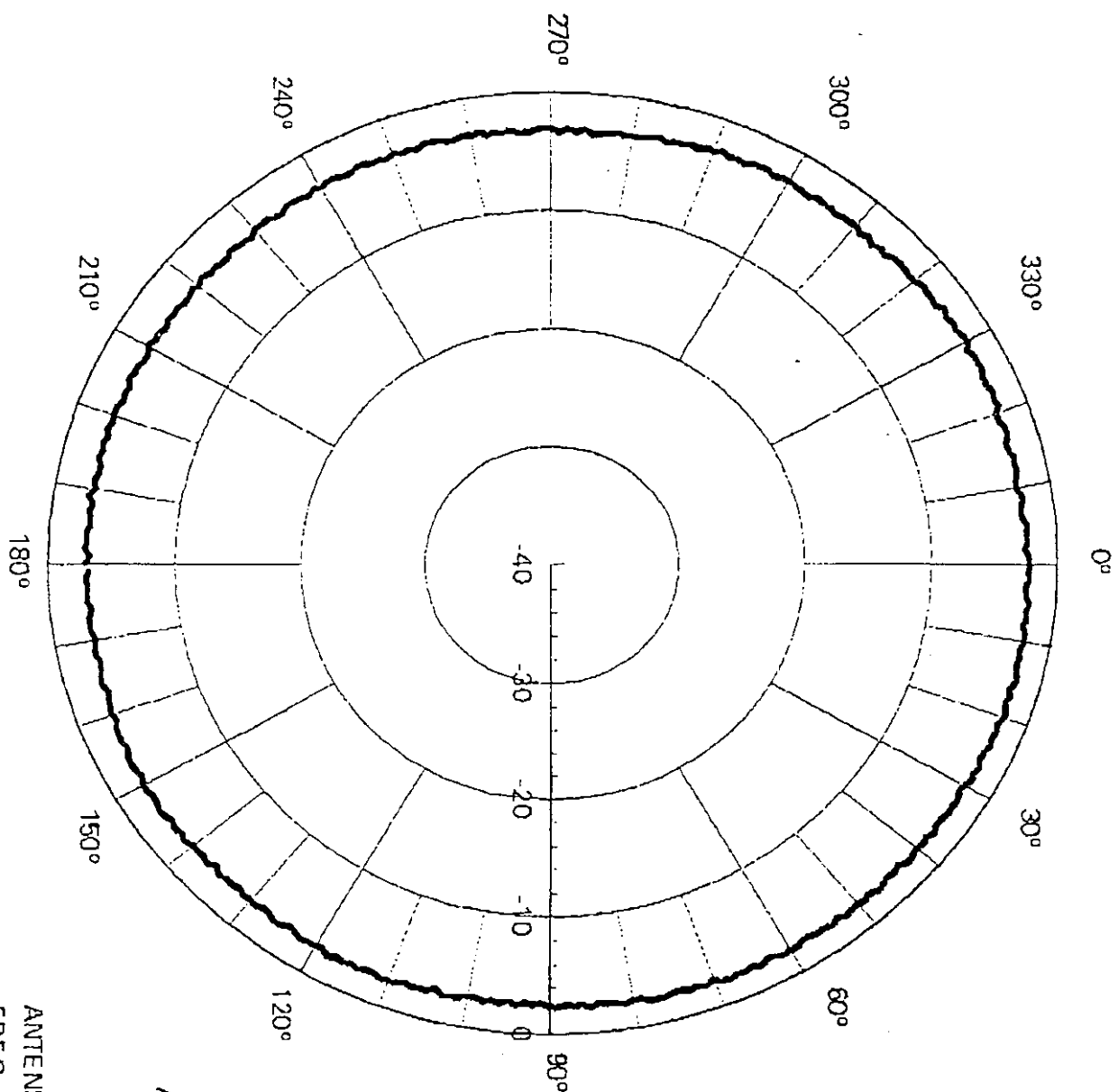
ANTENNA TYPE; Collinear G/P MODEL No. FB3-2400

FREQ; 2.40 GHZ POLORIZATION; HORIZONTAL

FILE No. FB324001 DATE; 3-19-96 ENG; JBV

NOTES; E-PLANE GAIN; RELATIVE

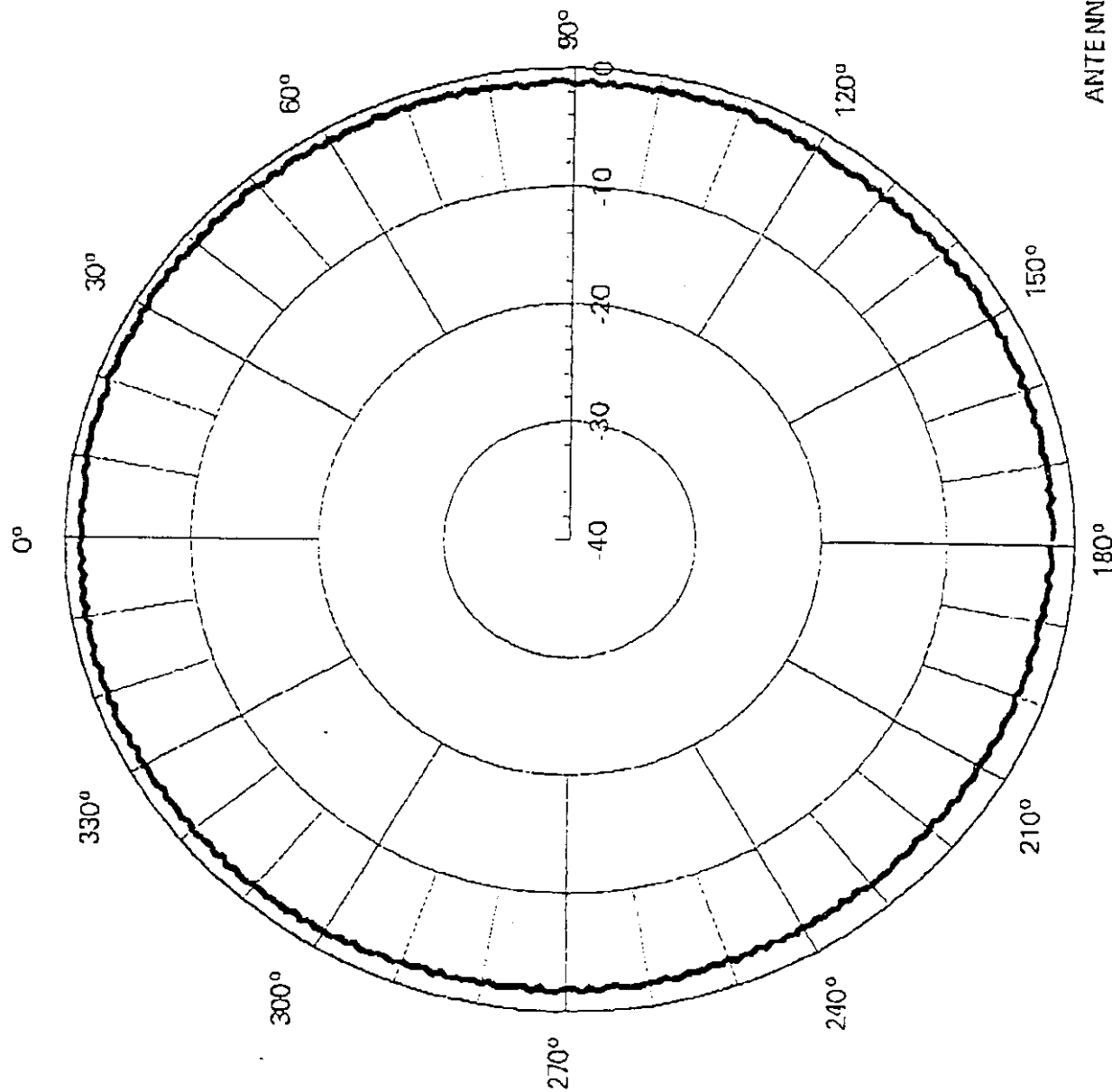
Handwritten notes and signatures, including a large signature at the top and several lines of text below it.



AVG. REL. GAIN; -27DB

LARSEN ELECTRONICS

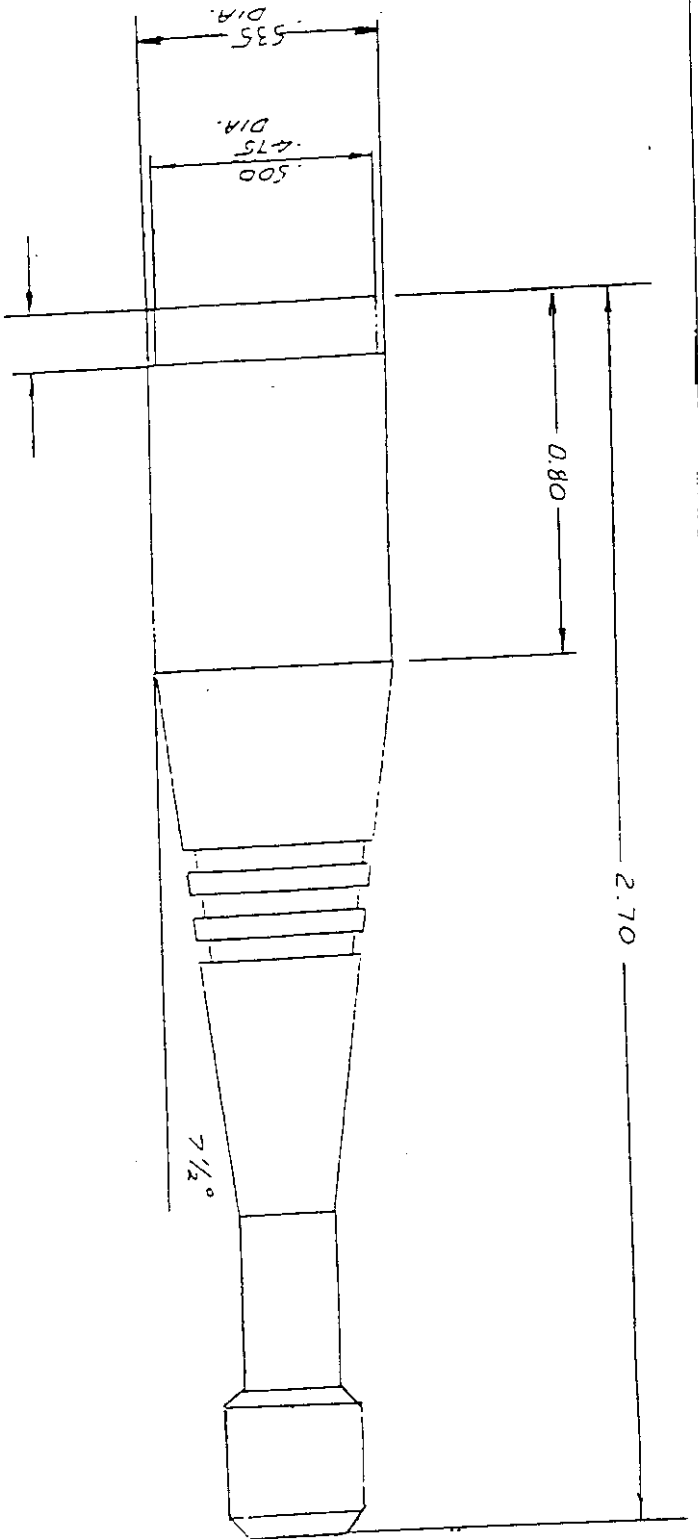
ANTENNA TYPE; Collinear G/P MODEL No. FB3-2400
 FREQ; 2.40GHZ POLORIZATION; VERTICAL
 FILE No. FB324003 DATE; 3-19-96 ENG; JBV
 NOTES; H-PLANE GAIN; RELATIVE



AVG. REL. GAIN; -1.5DB

LARSEN ELECTRONICS

ANTENNA TYPE; Collinear G/P MODEL No. FB3-2400
FREQ; 2.485 GHZ POLARIZATION; VERTICAL
FILE No. FB324004 DATE; 3-19-96 ENG; JBV
NOTES; H-PLANE GAIN; RELATIVE

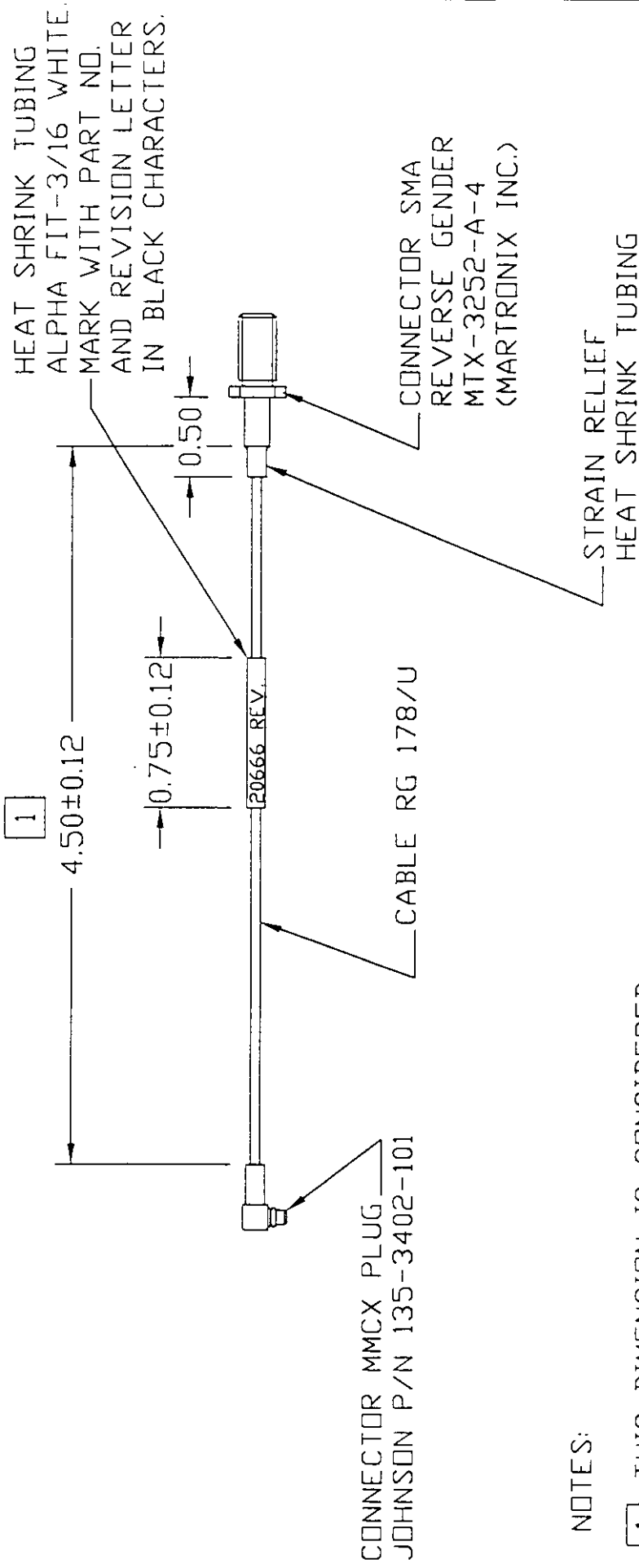


0.087
± 0.010

SPECIFICATIONS

Frequency - 2.4 GHz - 2.5 GHz
 Bandwidth - 75 MHz <1.5:1
 VSWR - <1.5:1
 Impedance - Nominally 50 Ohms
 Polarity - Vertical
 Gain - 2 dBi
 Connector - B SMA
 Length - Nominally 3 inches
 Material - Flexible Vinyl

MODEL N2400SM9B "2.4 GHz CURVED FEED HORN ANTENNA WITH REVERSE SMA CONNECTOR"			
SCALE	3:1	APPROVED BY	DRAWN BY
DATE	03-20-98		4776
		REVISD	
		NCC, INC.	
		PARKMAN, OHIO	
		DRAWING DATA IN	
		N2400SM9	

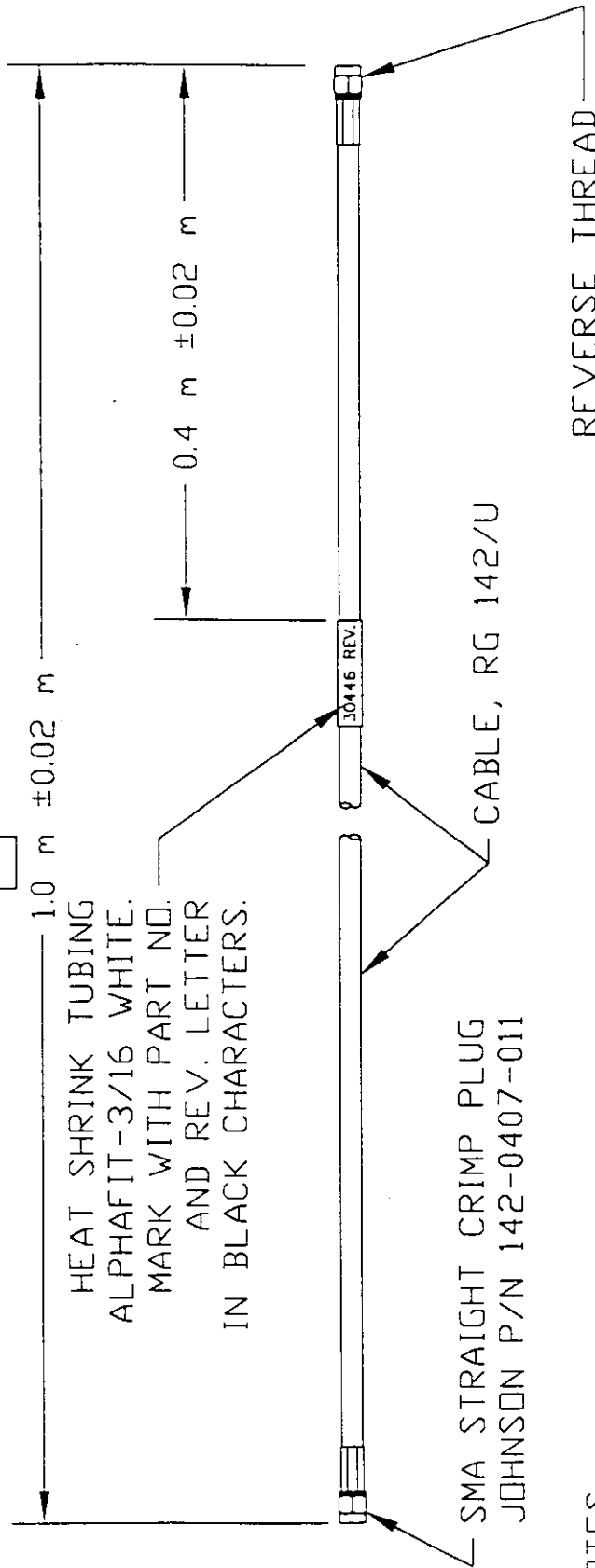


NOTES:

- 1 THIS DIMENSION IS CONSIDERED INSPECTABLE.
2. CONNECTORS ARE TO BE INSTALLED PER THE CONNECTOR MANUFACTURER'S INSTRUCTIONS.
3. CABLE LENGTH IS NOT TO SCALE.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES		SIGNATURES		DATE	TEKLOGIX TEKLOGIX INC. MISSISSAUGA ONTARIO			
TOLERANCES:		DRAWN		M. SITCHON	98/03/30	ASSY., CABLE, 7035 ANTENNA 1, 2.4 GHZ, MMCX, REVERSE GENDER		
XX ± 0.12		CHND.		APPD.				
XXX ±		PROD. ENG.						
ANGLES ±		PROL. ENG.						
MATERIAL:		MECH. ENG.						
FINISH:		ELEC. ENG.						
ECO:		DO NOT SCALE				CODE IDENT. NO.	DRAWING NO.	REV.
REL. DATE		DRAWING				38481	20666	A
						SCALE	SHEET	OF
						1/1	2	2

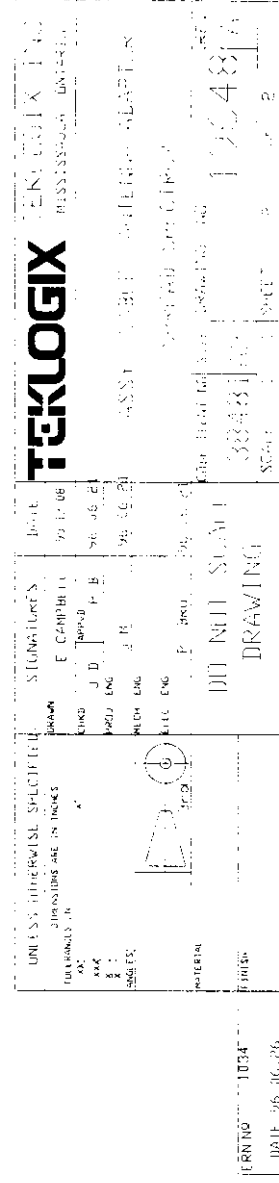
1

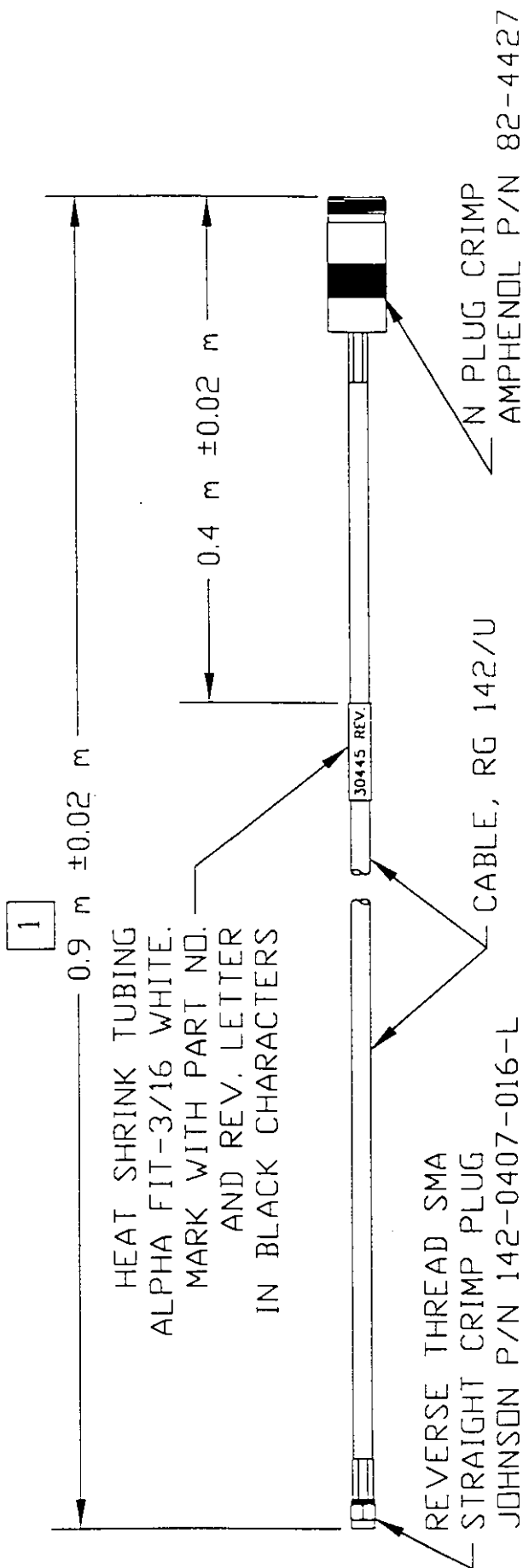


NOTES:

1. THIS DIMENSION IS CONSIDERED INSPECTABLE.
2. CONNECTORS ARE TO BE INSTALLED PER THE CONNECTOR MANUFACTURER'S INSTRUCTIONS.
3. CABLE LENGTH IS NOT TO SCALE.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES		SIGNATURES		DATE	
TOLERANCES:		DRAWN M. SITCHON		98/03/30	
XX ±		CHKD.		APPRO.	
XXX ±		PROD. ENG.			
ANGLES ±		PROJ. ENG.			
MATERIAL:		MECH. ENG.			
FINISH:		ELEC. ENG.			
ECO:		DO NOT SCALE			
REL. DATE		DRAWING			
		TEKLOGIX		TEKLOGIX INC.	
				MISSISSAUGA ONTARIO	
		ASSY, CABLE, PATCH ANTENNA ADAPTOR 2.4GHZ			
		CODE IDENT. NO.	SIZE	DRAWING NO.	REV.
		38481	A	30446	A
		SCALE	N.T.S.	SHEET	2 OF 2





NOTES:

1. THIS DIMENSION IS COSIDERED INSPECTABLE.
2. CONNECTORS ARE TO BE INSTALLED PER THE CONNECTOR MANUFACTURER'S INSTRUCTIONS.
3. CABLE LENGTH IS NOT TO SCALE.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES		SIGNATURES		DATE	
TOLERANCES:		DRAWN		M. SITCHON	
X ±		CHKD.		APPD.	
XX ±		PROD. ENG.			
XXX ±		PROJ. ENG.			
ANGLES ±		MECH. ENG.			
MATERIAL:		ELEC. ENG.			
FINISH:		DO NOT SCALE		DRAWING	
ECO:		CODE IDENT. NO.		SIZE	
REL. DATE		38481		A	
		SCALE		N.T.S.	
		SHEET		2	
		OF		2	
		REV.		A	

TEKLOGIX

TEKLOGIX, INC.

MISSISSAUGA ONTARIO

ASSY, CABLE,

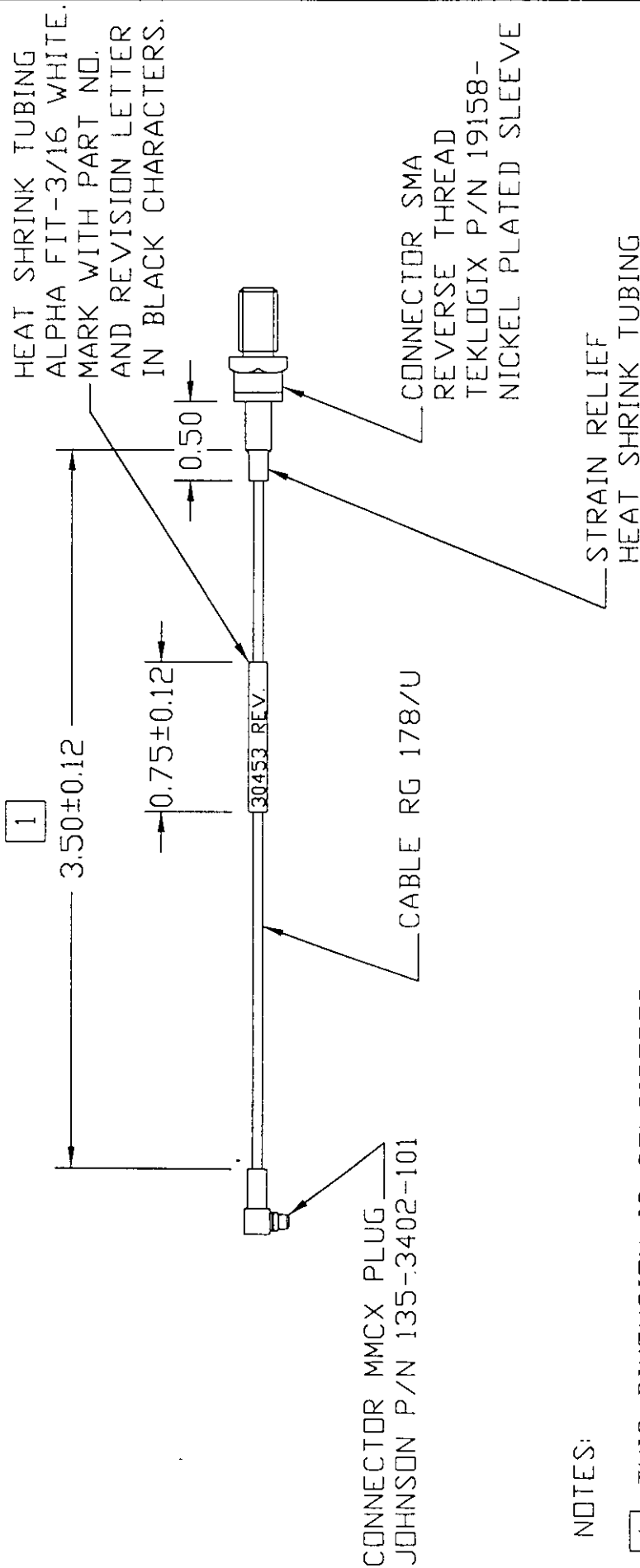
ANTENNA ADAPTOR

REVERSE SMA, N-PLUG

30445

38481

A



NOTES:

- 1 THIS DIMENSION IS CONSIDERED INSPECTABLE.
- 2 CONNECTORS ARE TO BE INSTALLED PER THE CONNECTOR MANUFACTURE'S INSTRUCTIONS.
3. CABLE LENGTH IS NOT TO SCALE.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES		SIGNATURES		DATE
TOLERANCES:		DRAWN J. PEARSON		98-03-04
XX ± 0.12		CHKD.	APPRO.	
XXX ±		PROD. ENG.		
ANGLES ±		PROJ. ENG.		
MATERIAL:		MECH. ENG.		
FINISH:		ELEC. ENG.		
ECO:		DO NOT SCALE DRAWING		
REL. DATE				

TEKLOGIX		TEKLOGIX INC. MISSISSAUGA ONTARIO	
ASSY., CABLE, 9150, ANTENNA 1, 2.4 GHZ, REVERSE THREAD			
CODE IDENT. NO.	SIZE	DRAWING NO.	REV.
30453	A	30453	P1
SCALE 1/1	SHEET 2	OF 2	

LOCTITE

705 North Mountain Road
 Nashington, Connecticut 06111
 Telephone (203) 278-1280
 Telex 378207
 Telex 208200658

May 1991

Technical Data Sheet Product 410

PRODUCT DESCRIPTION

LOCTITE® PRISM™ 410 is a single component, black, cyanoacrylate instant adhesive toughened with elastomers for impact, peel and improved resistance to humid or damp environments.

TYPICAL APPLICATIONS

- For most rubber, plastic or metal substrates
- For slower fixture/cure speeds
- Where thermal cycling resistance is required
- For parts subjected to shock and vibration

TYPICAL PROPERTIES OF UNCURED MATERIAL

Chemical type:	Ethyl cyanoacrylate
Appearance:	Black liquid
Specific gravity, 77°F (25°C):	1.05
Viscosity @ 77°F, cP (25°C, mPa.s)	
2.5 rpm:	3500
ASTM 1084, Method B	
Flash point (COC):	>176°F (>80°C)
Vapor pressure, mbar:	<1

USE AND APPLICATION

SURFACE PREPARATION

To ensure a good bond, the surface must be clean and free from rust inhibitors, mold release agents, grease, oil and other contaminants. Bond strength on painted parts may be determined by how well the paint adheres to the substrate.

ADHESIVE APPLICATION

Optimum results with cyanoacrylate adhesives are obtained with the minimum quantity of adhesive needed to fill the joint. In general, one free-falling drop spreads over one square inch. Apply firm pressure to mated surfaces until adhesive sets.

BOND DURABILITY

Bond durability is affected by surface conditions, bond areas, service temperature, environment and stress. Each application must be evaluated individually. Moisture and temperature resistance are dependent on the surfaces bonded.

POLYOLEFIN BONDING

Loctite PRISM Primers are single component materials which dry rapidly at room temperature and make polyolefin and other low energy surfaces suitable for bonding with Loctite cyanoacrylate adhesives. Primer may be applied by spraying, brushing or dipping. Excess primer should be avoided. When polyolefin substrates are bonded to other substrates, only the polyolefin should be primed.

CLEAN-UP / DEBONDING

Equipment may be cleaned by flushing with Loctite Equipment Flushing Solvent #12121. Excess adhesive can be dissolved with Loctite X-NMS™ 768 Clean-Up Solvent, nitromethane or acetone.

DISPENSING EQUIPMENT

Semi-automated and fully automatic dispensing equipment designed specifically for use with these adhesives is available from Loctite Corporation. Consult your Loctite Catalog or contact your Loctite Representative for details.

FIXTURING TIME

This is defined as the number of seconds after assembly when the PRISM 410 joint develops a shear strength of 14.5 lb./in.² or 0.1 N/mm² measured at 72°F (22°C), 50% relative humidity according to ASTM D1002 and DIN 53283. The cure speed is affected by the nature of the substrate, ambient humidity and temperature. In general, the thinner the bond line, the faster the fixture.

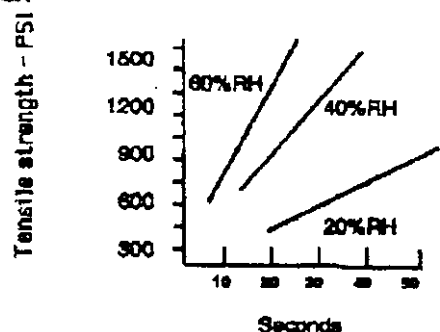
Performance of Loctite PRISM 410 on metallic and non-metallic substrates:

Substrate	Typical Fixturing Time (seconds)
Steel (degreased):	90
Aluminum (degreased):	20
Zinc dichromate:	100
Neoprene rubber:	20
Nitrile rubber:	20
ABS:	35
PVC:	75
Polycarbonate:	60
Phenolic materials:	40

All surfaces were cleaned by isopropyl alcohol wipe. Times and strengths can vary considerably for different grades of plastics, rubber and plated metals.

Note: Strong bonds are initially formed on glass, ceramic and stone, but often decrease in strength.

The effect of relative humidity on cure speed is shown in the graph, for PRISM 410 cyanoacrylate adhesive to Buna N rubber.



CURING INFORMATION

When fixture/cure speed is inadequate, due to low relative humidity or large gaps, Loctite Accelerator 711 or Loctite Tak Pak® 710 Accelerator may be used. This can, however, lead to a reduction in eventual strength of the bond; careful testing is recommended before use in production. Although full functional strength is developed in a relatively short time, curing continues for at least 24 hours before full chemical and solvent resistance is developed.

Weakly alkaline materials, such as the surface moisture present on most parts, initiate the hardening process. The type of material being bonded can significantly affect fixture/cure speed. Additionally, fixture/cure speed decreases when ambient humidity decreases (optimum is 40 - 60 % RH); the bond-line gap is increased; or a change is made to a higher viscosity cyanoacrylate adhesive. Fixture/cure speed can be increased by using an accelerator.

BLOOMING / CHLOROSIS:

Vapor generated by uncured liquid adhesive can deposit on nearby surfaces leaving a white residue. This condition can be reduced by one or more of the following methods:

- Reduce quantity of adhesive used
- Increase air flow over the parts
- Use accelerator to speed fixture/cure of exposed wet adhesive
- Deposit can be removed with Loctite X-NMS™ 768 Clean-Up Solvent

STRESS CRACKING:

Uncured liquid adhesives can cause cracking of some plastics when they are in a stressed condition. Examples are polycarbonate, acrylic and polysulfone. The possibility of stress cracking can be reduced by the following:

- Close joints quickly to avoid prolonged exposure to liquid adhesive
- Use accelerator to speed fixture/cure of adhesive
- Use reinforced grades of plastic which are more resistant to chemical attack

TYPICAL PROPERTIES OF CURED MATERIAL

Coefficient of thermal expansion,
ASTM D698, 1/"K: 100 X 10⁻⁶

Coefficient of thermal conductivity,
ASTM C177, W/m²K: 0.1
BTU-in
hr-ft²-°F 2.1

Normal operating temperature range: -65 to +223°F
(-54 to +106 °C)

Maximum gap: 0.008 in. (0.2mm)

ELECTRICAL PROPERTIES:

Dielectric constant, ASTM D150
100 Hz: 2.3
1 kHz: 2.3
10 kHz: 2.3

Dissipation factor, ASTM D150
100 Hz: <0.02
1 kHz: <0.02
10 kHz: <0.02

Volume resistivity, ASTM D257
Ω cm x 10¹⁶: 1

Surface resistivity Ω x 10¹⁶: 4

Dielectric strength, ASTM D149, KV/mm: 25
V/mil: 636

TYPICAL PERFORMANCE OF CURED MATERIAL FOR PRISM 410

Shear strength, ASTM D1002 (DIN 53283)
Cure procedure: 1 week at 72°F (22°C)

	PSI	N/mm ²
Grit blasted steel:	3200	22
Etched aluminum:	2200	15
Zinc dichromate:	2500	17
ABS:	850*	6*
PVC:	850*	6*
Polycarbonate:	700*	5*
Phenolic:	1450	10
Neoprene rubber:	1450*	10*
Nitrile rubber:	1450*	10*
G-10	1750	12

Peel strength, ASTM D1876 (DIN 53282)

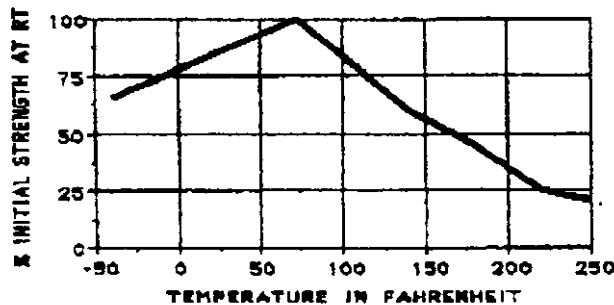
	PIW	N/mm
Degreased steel:	17	3

* Adhesive exceeds strength of bonded material

ENVIRONMENTAL RESISTANCE

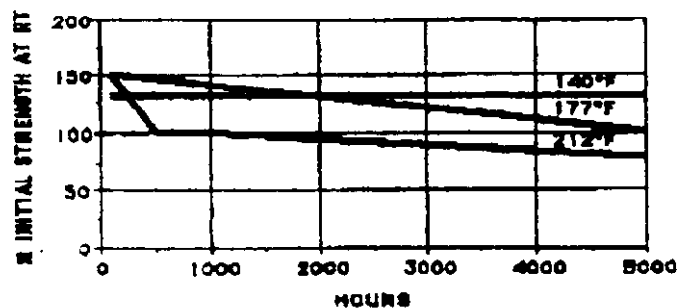
HOT STRENGTH:

Shear strength test procedure: ASTM D1002 (DIN 53283)
Substrate: Grit blasted mild steel
Cure procedure: 1 week at 72°F (22°C)



HEAT AGING:

Shear strength test procedure: ASTM D1002 (DIN 53283)
Substrate: Grit blasted mild steel
Cure procedure: 1 week at 72°F (22°C)



CHEMICAL / SOLVENT RESISTANCE

Solvent	Temperature		% Initial strength at		
	°F	°C	100	500	1,000
HOURS					
Motor oil (10W30):	104	40	85	85	85
Gasoline:	72	22	90	70	70
Isopropanol:	72	22	75	75	75
Ethanol:	72	22	85	85	80
Freon® TA:	72	22	90	90	85
1,1,1-Trichloroethane:	72	22	80	70	50

Strength test procedure: ASTM D1002 (DIN 53283)
Substrate: Grit blasted mild steel
Cure procedure: 1 week at 72°F (22°C)

SAFETY DATA

Handling Precautions:

Loctite Instant Adhesives are non-toxic. The vapors can cause eye irritation in poorly ventilated areas or low humidity environments.

Accidental skin bonding is best handled by passive, non-surgical first aid. Hot soapy water aids separation of skin tissue. Use peeling, not pulling action to separate bonded tissue.

A comprehensive safety leaflet is available upon request. In case of emergency, call Loctite Corporation at (203) 278-1280.

When large quantities of Instant Adhesive are accidentally spilled, the area should be flooded with water which will cause the liquid to cure. The cured material can then be scraped from the surface.

(NOTE: The liquid adhesive should not be wiped up with rags or tissue. The fabric will cause polymerization and large quantities of adhesive will generate heat on cure causing smoke and strong, irritating vapors. Always flood with excess water to clean up spill conditions.)

EYE IRRITANT. BONDS SKIN IN SECONDS. Contains cyanoacrylate ester. Apply only to surfaces to be bonded. In case of skin contact, flush with water. In case of eye or mouth contact, hold eyelid or mouth open and flush with water; call a physician immediately. If fingers become bonded, immerse in warm soapy water and gently roll or peel skin surfaces apart. Get immediate medical attention for any eye or internal contact. Use with adequate ventilation. **KEEP OUT OF REACH OF CHILDREN.**

**USE IN ACCORDANCE WITH
MATERIAL SAFETY DATA SHEET**

STORAGE CONDITIONS

For maximum shelf life, cyanoacrylate adhesives must be stored under refrigeration at a temperature of 40°F (+/- 5°F). Allow material to return to room temperature before opening. TO PREVENT CONTAMINATION OF UNUSED MATERIAL, DO NOT RETURN ANY PRODUCT TO ITS ORIGINAL CONTAINER.

FOR SPECIFIC SHELF LIFE/RECERTIFICATION POLICY INFORMATION, CONTACT THE LOCTITE CORPORATION, QUALITY DEPARTMENT, NEWINGTON, CT 06111; TELEPHONE: (203) 278-1280 X4401.

PRODUCT SPECIFICATIONS

THE TECHNICAL DATA CONTAINED HEREIN ARE INTENDED FOR REFERENCE ONLY. PLEASE CONTACT THE LOCTITE CORPORATION, QUALITY DEPARTMENT, NEWINGTON, CT 06111 (PHONE: (203) 278-1280, X4401) FOR ASSISTANCE AND RECOMMENDATIONS ON SPECIFICATIONS FOR THIS PRODUCT.

FOR THE NAME OF YOUR NEAREST LOCTITE DISTRIBUTOR CALL: (800) 562-0580
FOR THE NAME OF YOUR NEAREST LOCTITE MARKETING REPRESENTATIVE CALL: (800) 323-5106
FOR TECHNICAL PRODUCT ASSISTANCE CALL: (800) LOC-TITE

LOCTITE TECHNICAL SERVICE CENTERS

Loctite Corporation
705 North Mountain Road
Newington, CT 06111
(203) 278-1280
Telex 275207
Telefax 2032808558

Loctite Corporation
One Northfield Plaza
5800 Crooks Road, Suite 106
Troy, MI 48068
(313) 628-8000
Telefax 3136289009

Loctite Canada Inc.
270 Britannia Road East
Mississauga, Ontario L4Z 1B6
(416) 800-6511
Telex 3686851251
Telefax 4168906522

Loctite Company de Mexico, S.A. de C.V.
Bosques de Cerveces No. 130-11 PISO
Bosques de las Lomas, 11700 Mexico, D.F.
(011) 625-896-4511
Telex 3831781125 LOCTME
Telefax 011525251382

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Printed in U.S.A.

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TDS 410

2/91

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