

FCC SUBPART C
TEST REPORT

for

ELITE ENTRY TRANSMITTER
Model: DT418
FCC ID: NIFDT1000

Prepared for

ELITE ENTRY PHONE INC.
25741 COMMERCENTRE DRIVE
LAKE FOREST, CALIFORNIA 92630

Prepared by: *Victor Magana*
VICTOR MAGANA

Approved by: *Victor Ratinoff*
VICTOR RATINOFF

COMPATIBLE ELECTRONICS INC.
19121 EL TORO ROAD
SILVERADO, CALIFORNIA 92676
(949) 589-0700

DATE: NOVEMBER 16, 1998

REPORT BODY	APPENDICES				TOTAL
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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedure described in the test specification given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested: Elite Entry Transmitter
 Model: DT418
 S/N: 16248

Product Description: The EUT is 418 MHz radio transmitter for access control to be use with a Phone Entry System in a gated community or similar application.

Modifications: The EUT was not modified during the testing.

Manufacturer: Elite Entry Phone Inc.
 25741 Commercentre Drive
 Lake Forest, California 92630

Test Dates: October 1, 1998

Test Specifications: EMI requirements
 FCC Title 47, Part 15 Subpart C
 Test Procedure: ANSI C63.4: 1992.

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Radiated RF Emissions, 418 MHz – 5000 MHz.	Complies with the Limits of Section 15.205, 15.209, and 15.231 of FCC Title 47, Part 15, Subpart C.
2	Conducted RF Emissions, 450kHz-30 MHz	This test is not applicable, the EUT is a battery powered device.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) and test performed on the Elite Entry Transmitter Model: DT418. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 1992. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined by FCC title 47, Part 15, Subpart C, Section 15.205, 15.209, and 15.231.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 19121 El Toro Road, Silverado, California.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Elite Entry Phone Inc.:

Daniel Perez Engineer

Compatible Electronics Inc.:

Victor Magana	Test Technician
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24 Date Test Sample was Received

The test sample was received from Elite Entry Phone Inc. on October 1, 1998.

2.5 Disposition of the Test Sample

The test sample was returned to Elite Entry Phone Inc. on October 10, 1998

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
N.C.R.	No Calibration Required

3.

APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
FCC Title 47, Part 15, Subpart C.	FCC Rules - Radio frequency devices (including digital devices).
ANSI C63.4 1992	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 KHz to 40 GHz.

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

The Elite Entry Phone Inc. Elite Entry Transmitter, model: DT418 (EUT) was placed in the center of the test table. It was transmitting constantly throughout the test and was tested in all three orthogonal axis. The EUT was a stand-alone device with no cables attached to it. The Antenna of the EUT is a PCB trace.

All initial investigation were performed with the EMI receiver in manual mode scanning the frequency range continuously.

4.1.1 **Cable Construction and Termination**

There were no cables on the device.

5. **LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 **EUT and Accessory List**

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER	FCC IDENTIFIER
ELITE ENTRY TRANSMITTER (EUT)	ELITE ENTRY PHONE INC.	DT418	109810007	NIFDT1000

5.2

EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DUE DATE	CAL. CYCLE
Spectrum Analyzer	Hewlett Packard	8566B	2747A04875	August 11, 1999	1 Year
Preamplifier	Com Power	PA-102	01200	February 9, 1999	1 Year
Preamplifier	Com Power	PA-122	01321	February 13, 1999	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01195	August 11, 1999	1 Year
RF Attenuator	Com Power	A-410	02473	February 9, 1999	1 Year
Biconical Antenna	Com Power	AB-100	14022	February 9, 1999	1 Year
Log Periodic Antenna	Com Power	AL-100	16022	February 10, 1999	1 Year
Horn Antenna	Com Power	AH-118	1319	February 13, 1999	1 Year
Antenna Mast	Com Power	AM-100	N/A	N.C.R.	N/A
Turntable	Com Power	TT-100	N/A	N.C.R.	N/A
Computer	Hewlett Packard	98561X	2522A08303	N.C.R.	N/A
Printer	Hewlett Packard	2225A	2620S30245	N.C.R.	N/A
Plotter	Hewlett Packard	7550A	2407A01455	N.C.R.	N/A
Keyboard	Hewlett Packard	46021A	3020S50284	N.C.R.	N/A

6. **TEST SITE DESCRIPTION**

6.1 **Test Facility Description**

Please refer to section 7.1.1 and 7.1.2 of this report for EMI test location.

6.2 **EUT Mounting, Bonding and Grounding**

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests.

7.1 RF Emissions

7.1.1 Radiated Emissions Test

The HP 8566B spectrum analyzer was used as a measuring meter along with the HP 85650A quasi-peak adapter. The Com Power Preamplifier PA-102 and PA-122 were used to increase the sensitivity of the instrument. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps. The HP 85650A quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets. The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
300 MHz to 1000 MHz	120 kHz	Log Periodic Antenna
1 MHz to 5000 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 1992. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength).

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain final test data. The six highest emissions are listed in Table 1.

7.1.2 **RF Emissions Test Results**Table 1.0 **RADIATED EMISSION RESULTS**
ELITE ENTRY TRANSMITTER Model: DT418

Frequency MHz	Meter* Reading dBuV/m	Effective Gain ** dB	Antenna Factor ** dB/m	Distance Factor dB	Corrected Reading dBuV/m	Spec. Limit dBuV/m	Delta dB
418.12	@90.6	33.3	16.4	0.0	73.7	80.2	-6.5
836.13	@57.5	31.2	21.1	0.0	47.7	60.2	-12.8
1254.00	@57.6	32.5	23.0	0.0	48.1	60.2	-12.1
1672.00	@45.5	32.1	29.5	0.0	42.0	54.0	-11.1
2090.00	@58.2	31.6	30.3	0.0	53.9	60.2	-6.3
2508.00	@51.9	32.0	27.5	0.0	47.4	60.2	-12.8

Notes:

- * The complete emissions data is given in Appendix A of this report.
- ** The effective factor includes the cable loss. The correction factors for the antenna and effective gain are attached in [Appendix C](#) of this report.
- @ Average Peak Reading

7.1.3

Sample Calculations

The use of the Com Power Preamplifier Model: PA-102 and PA-122 were used to increase the sensitivity of the spectrum analyzer. A correction factor for the antenna, preamplifier, cable loss and a distance factor (if any), must be applied to the meter reading before a true field strength reading can be obtained. For greater efficiency and convenience, instead of using these correction factors for each meter reading, the specification limit was modified to reflect these correction factors at each frequency, so that the meter readings can be compared directly to the modified specification limit, referred to henceforth as the corrected meter reading limit (CML).

The equation can be derived in the following manner:

$$\text{Corrected Meter Reading} = \text{meter reading} + F - G - D$$

where:
F = antenna factor
G = effective gain (amplifier gain - cable loss)
D = distance factor

Therefore, the equation for determining the corrected meter reading limit is:

$$\text{CML} = \text{spec. limit} - F + G + D$$

A table of corrected meter reading limits was used to permit immediate comparison of the meter reading and determine if the emission level exceeded the specification limit at that frequency. The correction factors for the antenna and the effective gain are attached in Appendix C of this report. The data sheets are attached in Appendix A.

The distance factor D is 0 when the test is performed at a distance of 3 meters.

8. **CONCLUSIONS**

The Elite Entry Transmitter Model: DT418 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections **15.205, 15.209, and 15.231** as in FCC Title 47, Part 15, Subpart C.

APPENDIX A***RADIATED EMISSIONS DATA SHEETS***

19121 EL TORO ROAD, SILVERADO, CALIFORNIA 92676 PHONE: (949) 589-0700 FAX: (949) 589-7700



COMPATIBLE ELECTRONICS

FCC ID: NIFDT1000 Report Number: C81001H1 Page A2

RADIATED EMISSIONS

COMPANY NAME: ELITE ENTRY PHONE INC DATE: 10/1/98

EUT: ELITE ENTRY TRANSMITTER EUT S/N: 102810007

EUT MODEL: DT418 LOCATION: BREA SILVERADO AGOURA

SPECIFICATION: FCC CLASS: C TEST DISTANCE: 3 LAB: 4

ANTENNA: LOOP BICONICAL LOG HORN POLARIZATION: VERT HORIZ

QUALIFICATION ENGINEERING MFG. AUDIT ENGINEER: *VICTOR MAGATA*

NOTES: DUTY CYCLE 40% AVG PK = PK R_{Dyn} = 7.9

X74L 418 MHZ

NOTES:
CUT ON END
VERTICAL ↑

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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**COMPATIBLE
ELECTRONICS**

FCC ID: NIFDT1000 Report Number: C81001H1 Page A3

RADIATED EMISSIONS

COMPANY NAME: ELITE ENTRY PHONE INC DATE: 10/1/98

EUT: ELITE ENTRY TRANSMITTER EUT S/N: 1098/10007

EUT MODEL: DT 418 LOCATION: BREA SILVERADO AGOURA

SPECIFICATION: FCR Sub Part C CLASS: C TEST DISTANCE: 3 LAB: H

ANTENNA: LOOP BICONICAL LOG HORN POLARIZATION: VERT HORIZ

POLARIZATION: VERT HORIZ

QUALIFICATION ENGINEERING MFG. AUDIT ENGINEER: VICTOR MATAJA

NOTES: CUT ON VERTICAL END

17

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
19121 EL TORO ROAD, SILVERADO, CALIFORNIA 92676 PHONE: (949) 589-0700 FAX: (949) 589-7700



RADIATED EMISSIONS

COMPANY NAME: ELITE ENTRY PHONE INC DATE: 10/1/98

EUT: ELITE ENTRY TRANSMITTER EUT S/N: 1098/10007

EUT MODEL: DT 418 LOCATION: BREA SILVERADO AGOURA

SPECIFICATION: FCC SUSPANT C CLASS: C TEST DISTANCE: 3 LAB: 4

ANTENNA: LOOP BICONICAL LOG HORN POLARIZATION: VERT HORIZ

QUALIFICATION ENGINEERING MFG. AUDIT ENGINEER: Victor A

NOTES: 2019 CYCLE 40%
FLAT ON TABLE

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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COMPATIBLE ELECTRONICS

FCC ID: NIFDT1000 Report Number: C81001H1 Page A5

RADIATED EMISSIONS

COMPANY NAME: ELITE ENTRY PHONES INC DATE: 10/1/98

EUT: ELITE ENTRY TRANSMITTER EUT S/N: 109810007

EUT MODEL: OT 418 LOCATION: BREA SILVERADO AGOURA

SPECIFICATION: FCC SUBPART: C CLASS: C TEST DISTANCE: 3 LAB: 4

ANTENNA: LOOP BICONICAL LOG HORN POLARIZATION: VERT HORIZ

QUALIFICATION ENGINEERING MFG. AUDIT ENGINEER: VICTOR MAGATA

NOTES: EUT FLAT ON TABLE

NOTES: EVI FLAT ON TABLE

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
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COMPATIBLE ELECTRONICS

FCC ID: NIFDT1000 Report Number: C81001H1 Page A6

RADIATED EMISSIONS

COMPANY NAME: ELITE ENTRY PHONE INC DATE: 10/11/98

EUT: E21TC ENTRY TRANSMITTER EUT S/N: 109A10007

EUT MODEL: DT 418 LOCATION: BREA SILVERADO AGOURA

SPECIFICATION: FCC SUBPART C CLASS: C TEST DISTANCE: 3 LAB: 4

ANTENNA: LOOP BICONICAL LOG HORN POLARIZATION: VERT HORIZ

POLARIZATION: VERT HORIZ

QUALIFICATION ENGINEERING MFG. AUDIT ENGINEER: VICTOR MAGANIA

NOTES: EUT ON LEFT SIDE

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

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COMPATIBLE ELECTRONICS

FCC ID: NIFDT1000 Report Number: C81001H1 Page A7

RADIATED EMISSIONS

COMPANY NAME: ELITE ENTRY PHONE INC DATE: 10/11/98

EUT: ELITE ENTRY TRANSMITTER **EUT S/N:** 108810007

EUT MODEL: 07 418 **LOCATION:** BREA SILVERADO AGOURA

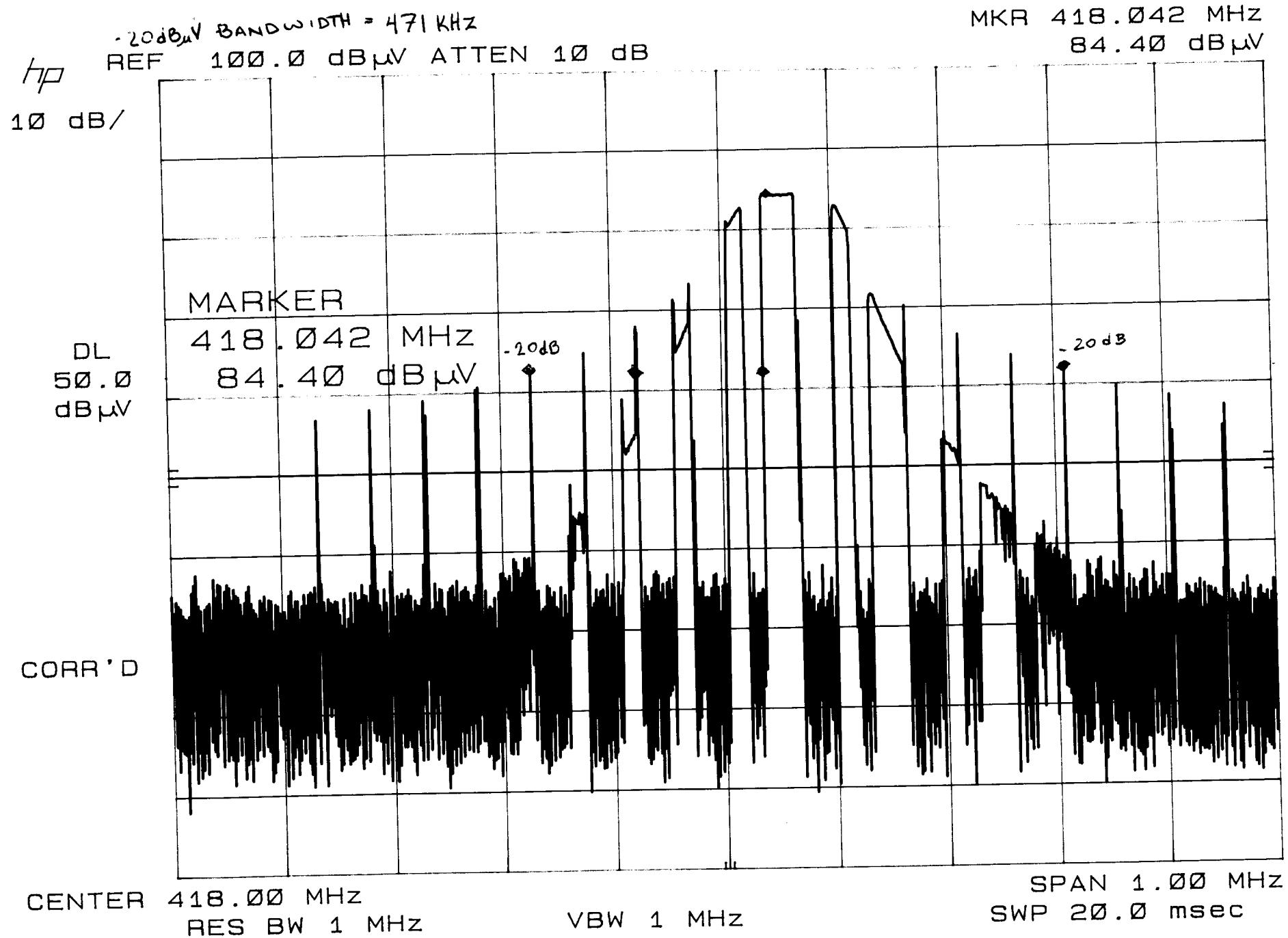
SPECIFICATION: FCC **SUBPART** C **CLASS:** C **TEST DISTANCE:** 3 **LAB:** H

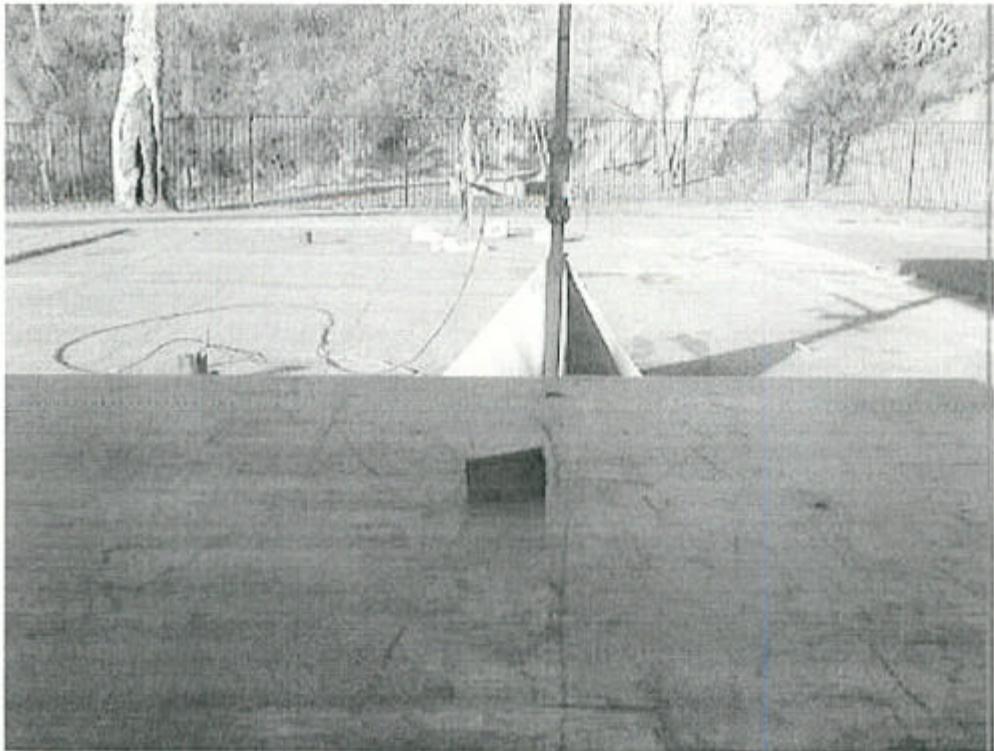
ANTENNA: LOOP BICONICAL LOG HORN **POLARIZATION:** VERT HORIZ

QUALIFICATION ENGINEERING MFG. AUDIT ENGINEER: Victor Magaña

NOTES: EOT ON LEFT SIDE

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
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**FRONT VIEW**

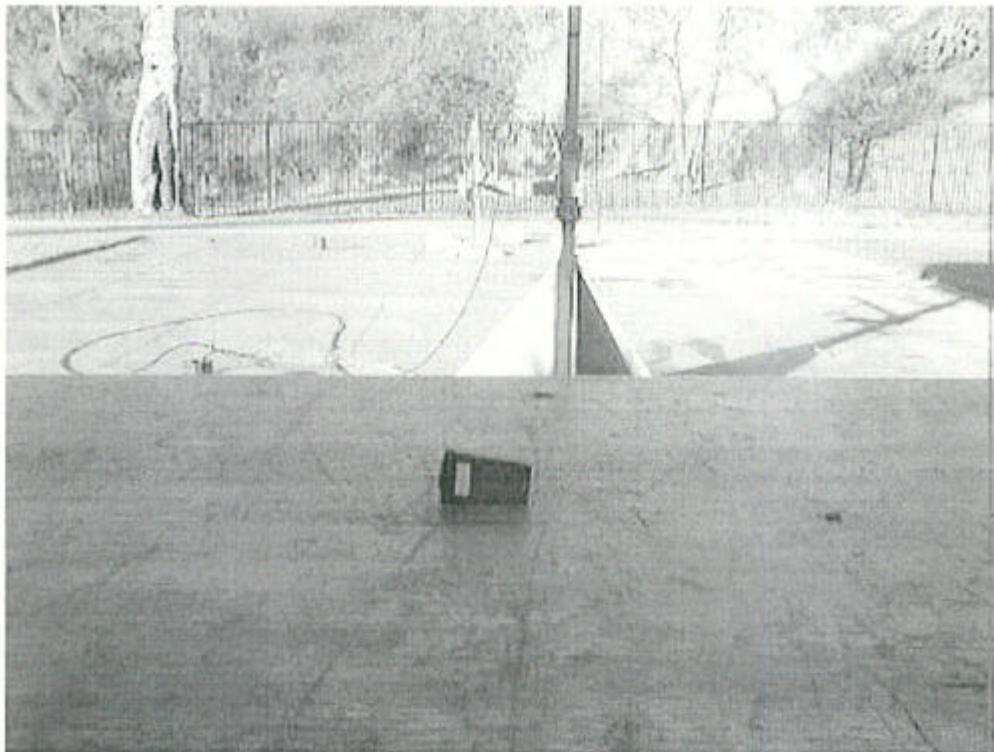
ELITE ENTRY PHONE INC.
ELITE ENTRY TRANSMITTER

Model: DT418

FCC SUBPART C - RADIATED EMISSIONS - 10-1-98

**PHOTOGRAPHS SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

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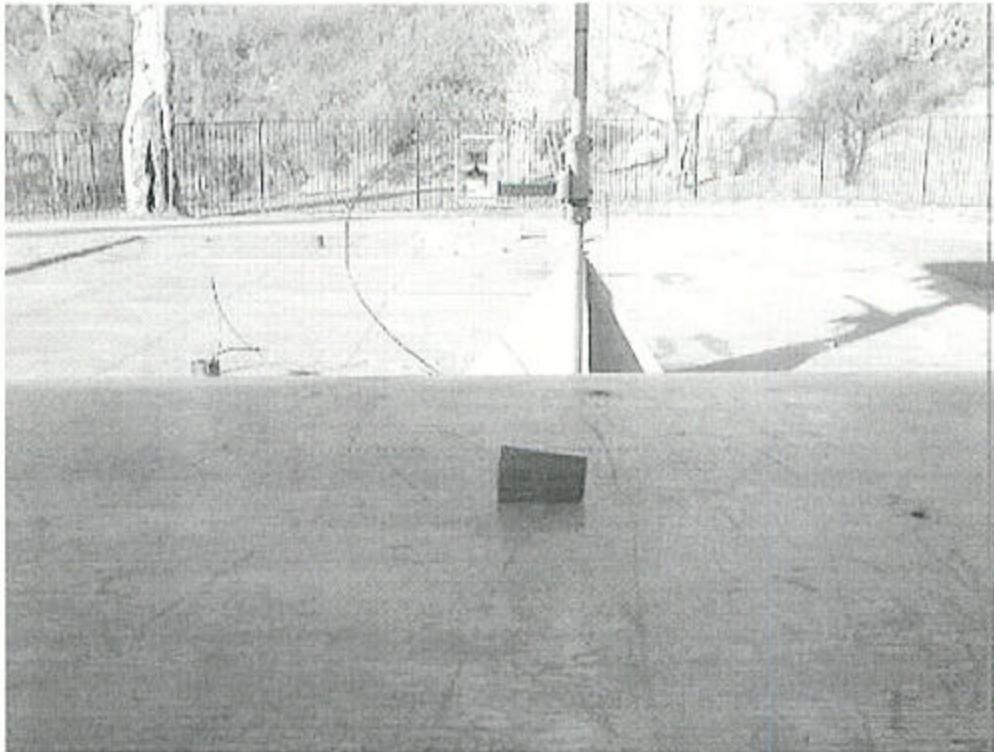
**REAR VIEW**

ELITE ENTRY PHONE INC.
ELITE ENTRY TRANSMITTER
Model: DT418

FCC SUBPART C - RADIATED EMISSIONS - 10-1-98

**PHOTOGRAPHS SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

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**HORN ANTENNA****FRONT VIEW**

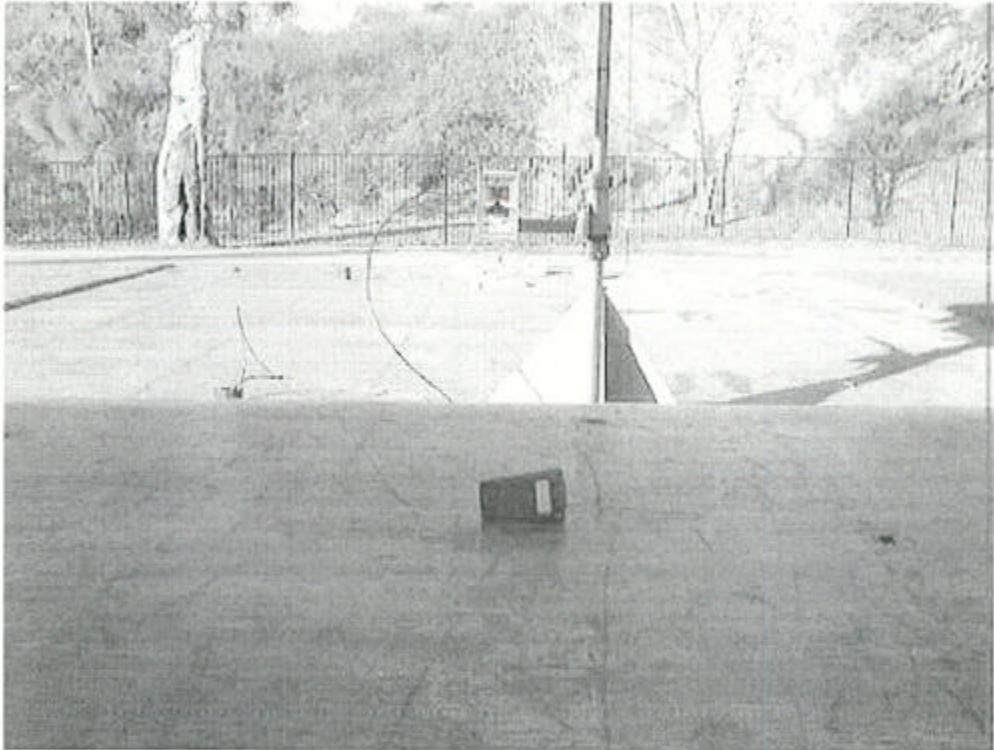
ELITE ENTRY PHONE INC.

ELITE ENTRY TRANSMITTER

Model: DT418

FCC SUBPART C - RADIATED EMISSIONS - 10-1-98

**PHOTOGRAPHS SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

**HORN ANTENNA****REAR VIEW****ELITE ENTRY PHONE INC.****ELITE ENTRY TRANSMITTER**

Model: DT418

FCC SUBPART C - RADIATED EMISSIONS - 10-1-98

**PHOTOGRAPHS SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

APPENDIX B***TEST SETUP DIAGRAMS***

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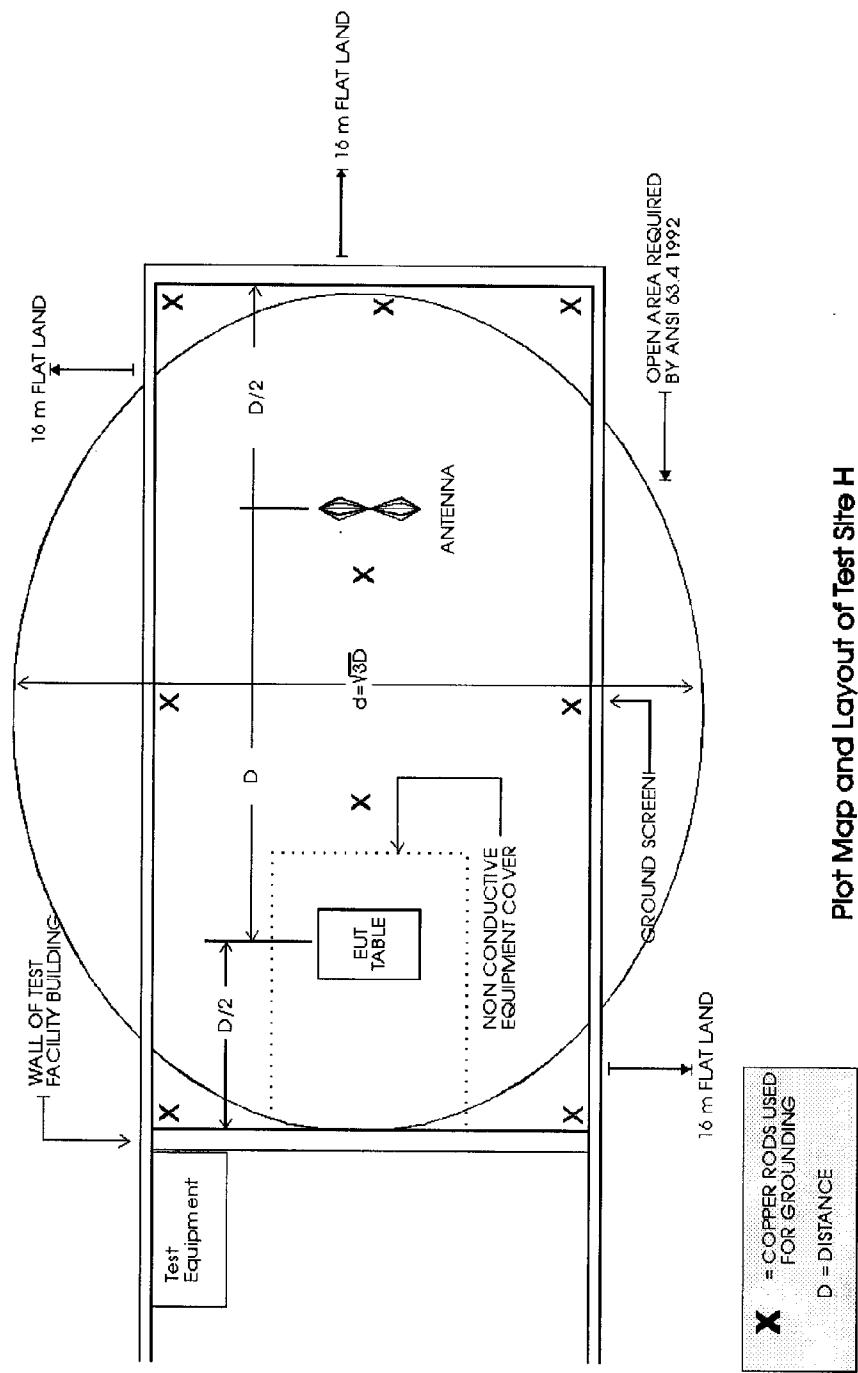
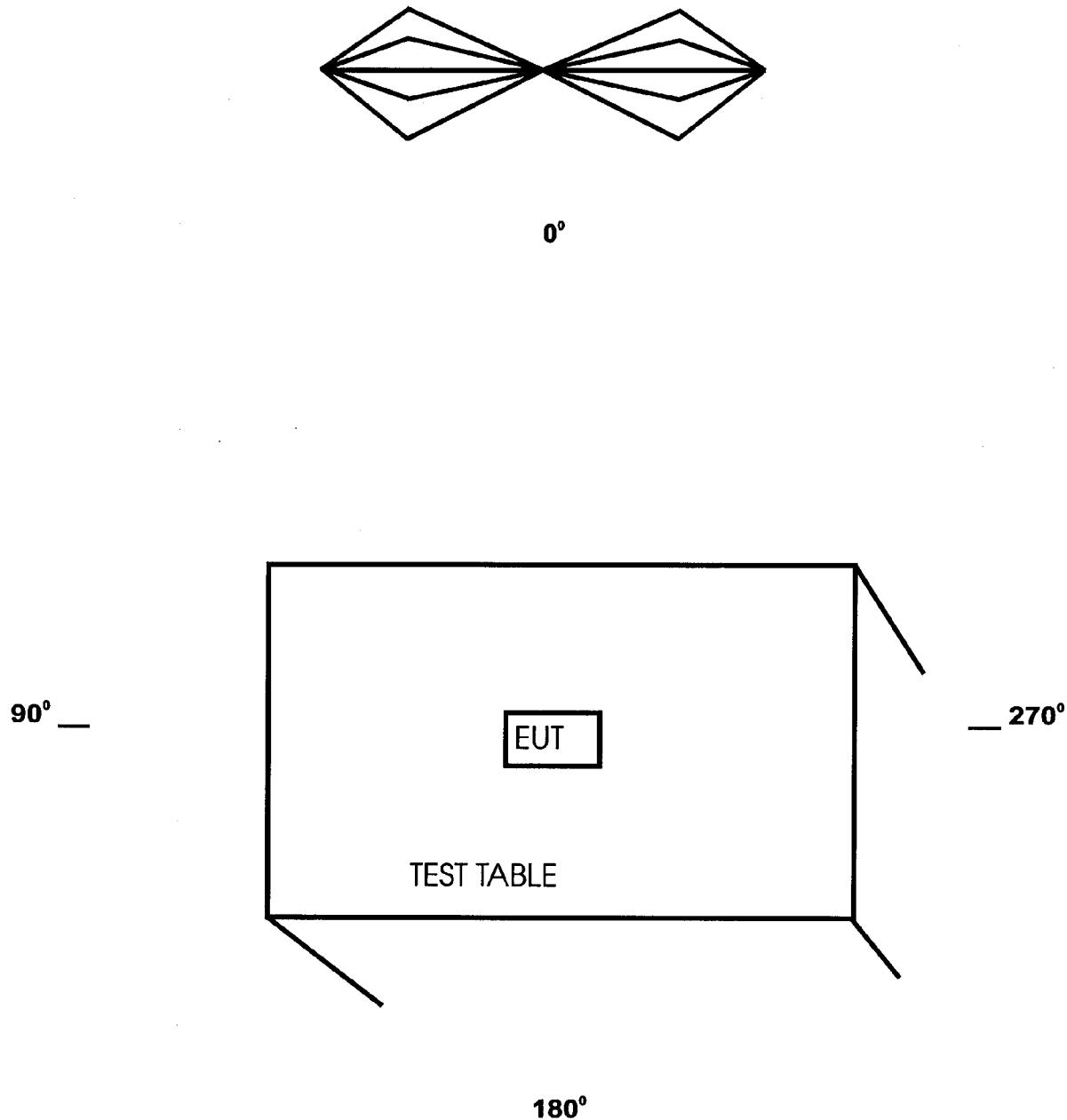


FIGURE 2 - RADIATED EMISSIONS TEST SETUP

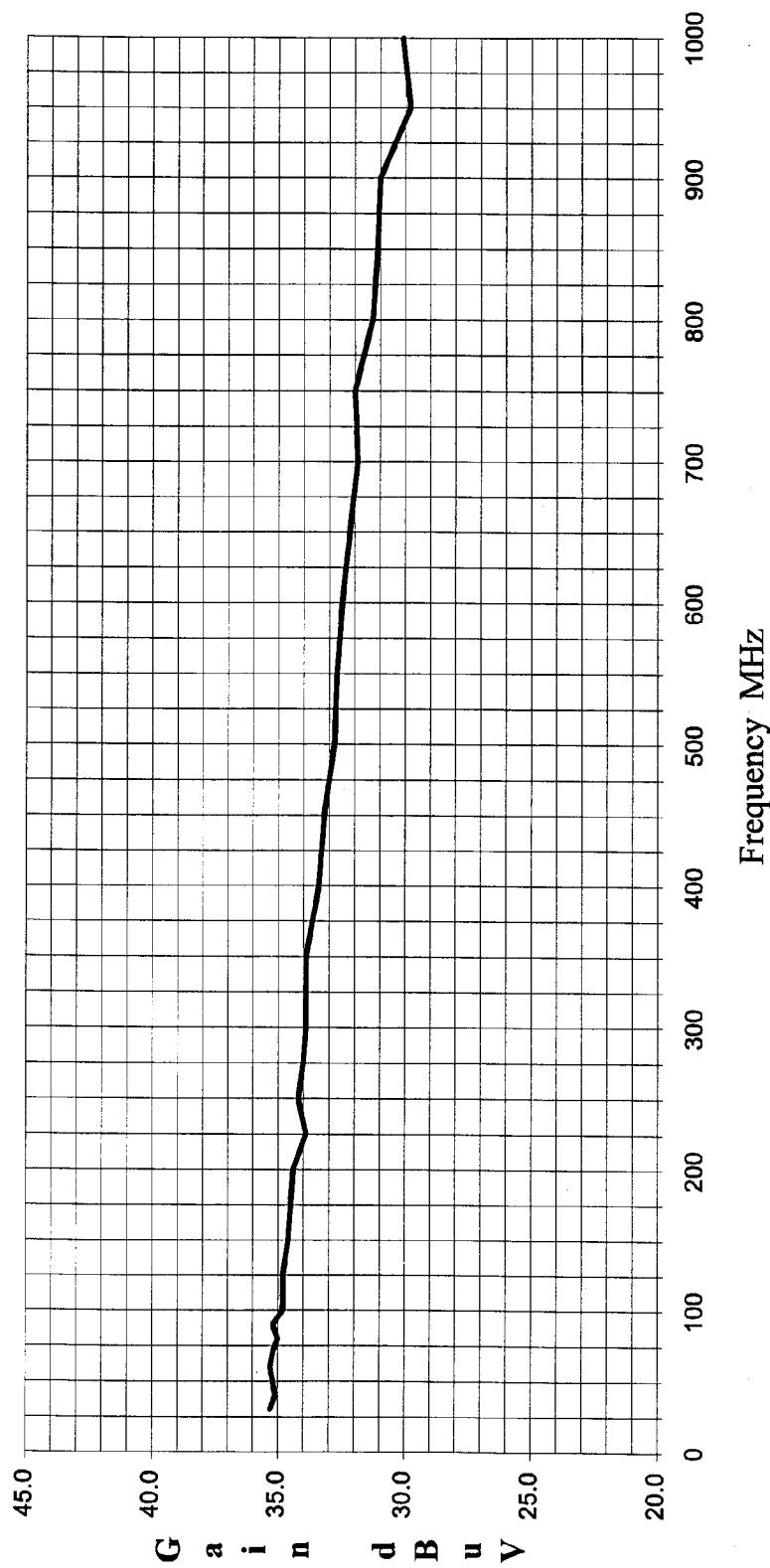


**EQUIPMENT SETUP DURING RADIATED
EMISSIONS TEST**

FIGURE 3 – EUT AND CABLING TEST SETUP

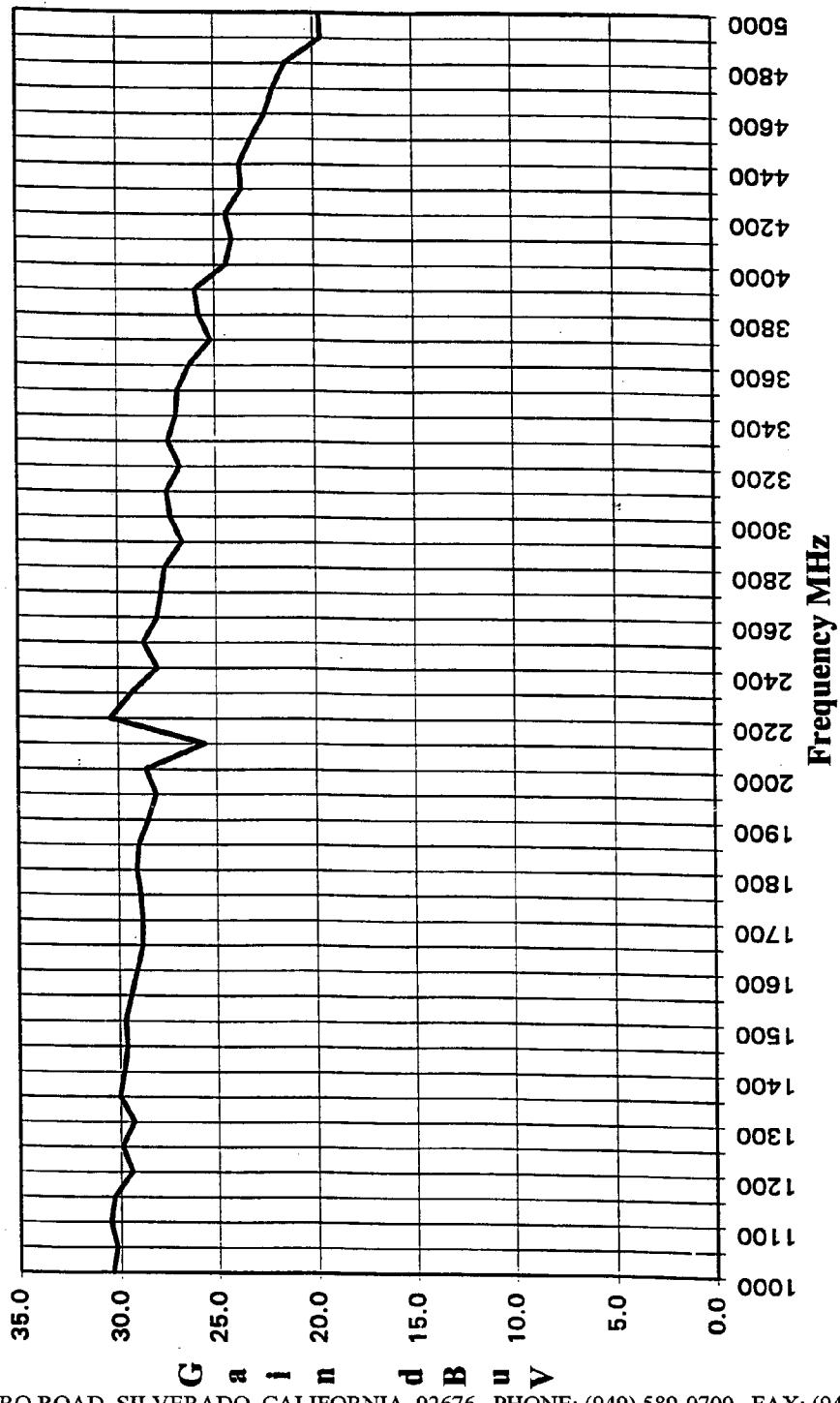
APPENDIX C***ANTENNA FACTORS AND
EFFECTIVE GAIN FACTORS***

Preamplifier Effective Gain at 3m. Model: CPPA-102 S/N: 01200



Silverado Canyon (Lab H) Cal: 02/13/98 Effective Gain = Preamplifier Gain - Cable Loss

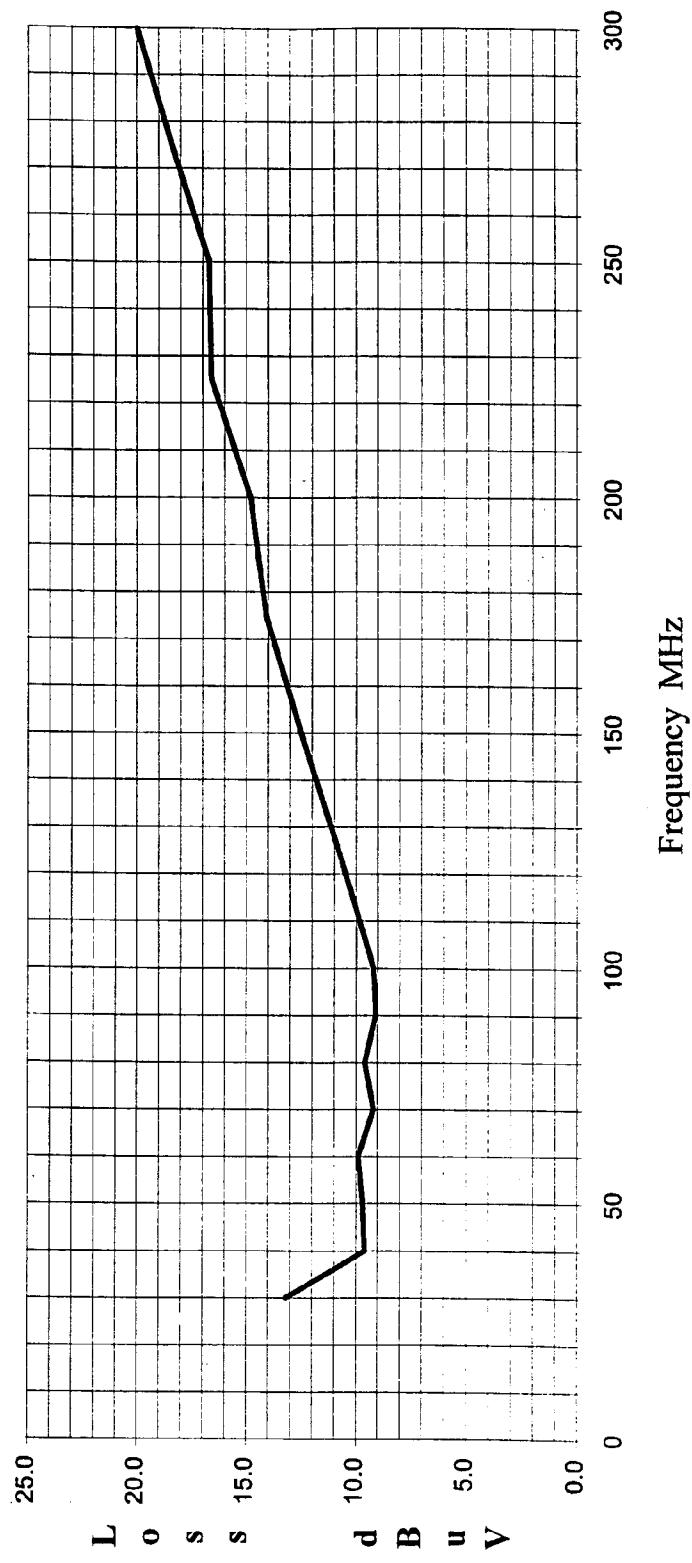
Preamplifier Effective gain at 3m. Model: PA-122 S/N: 1321



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Antenna Factors Biconical Antenna Model: AB-100 S/N 014022

Silverado Canyon (Lab H) Cal: 02/09/98





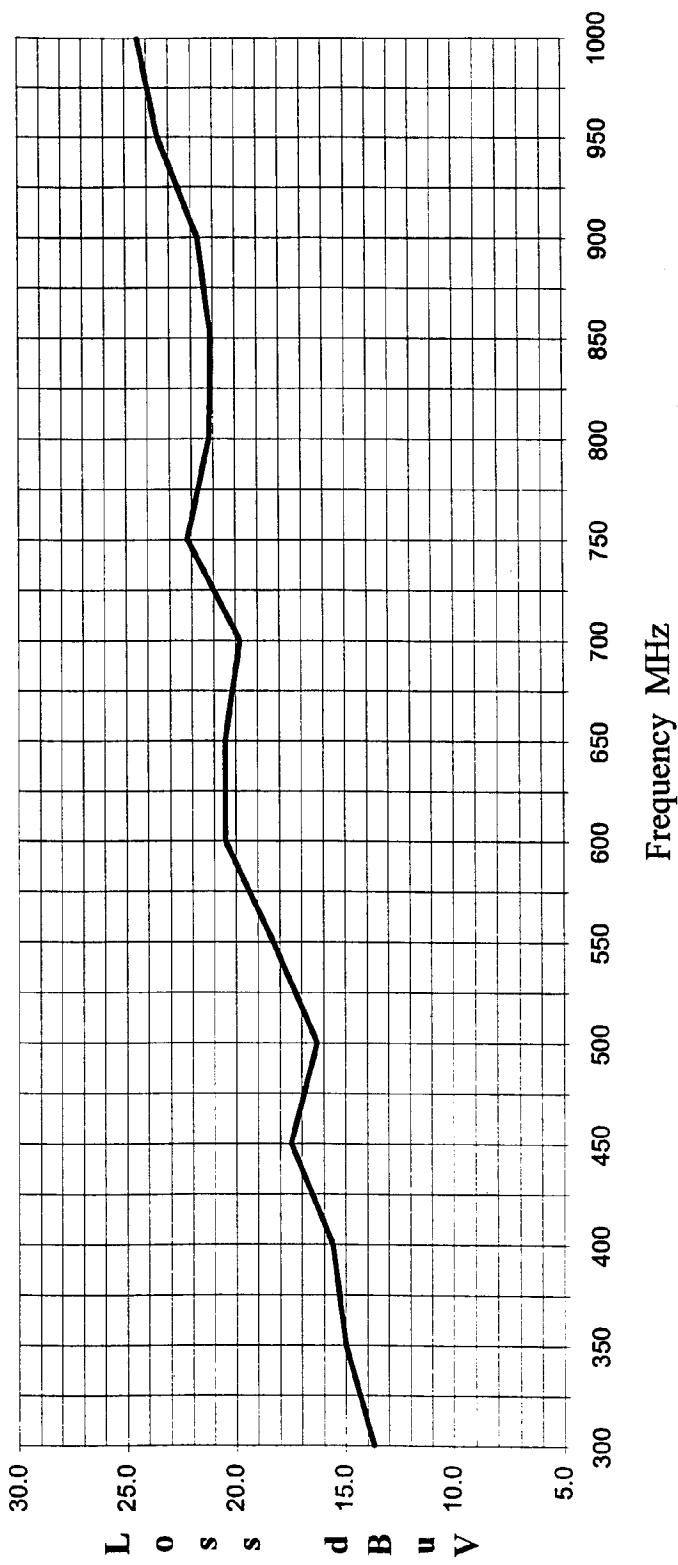
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Silverado Canyon (Lab H) Cal: 02/10/98

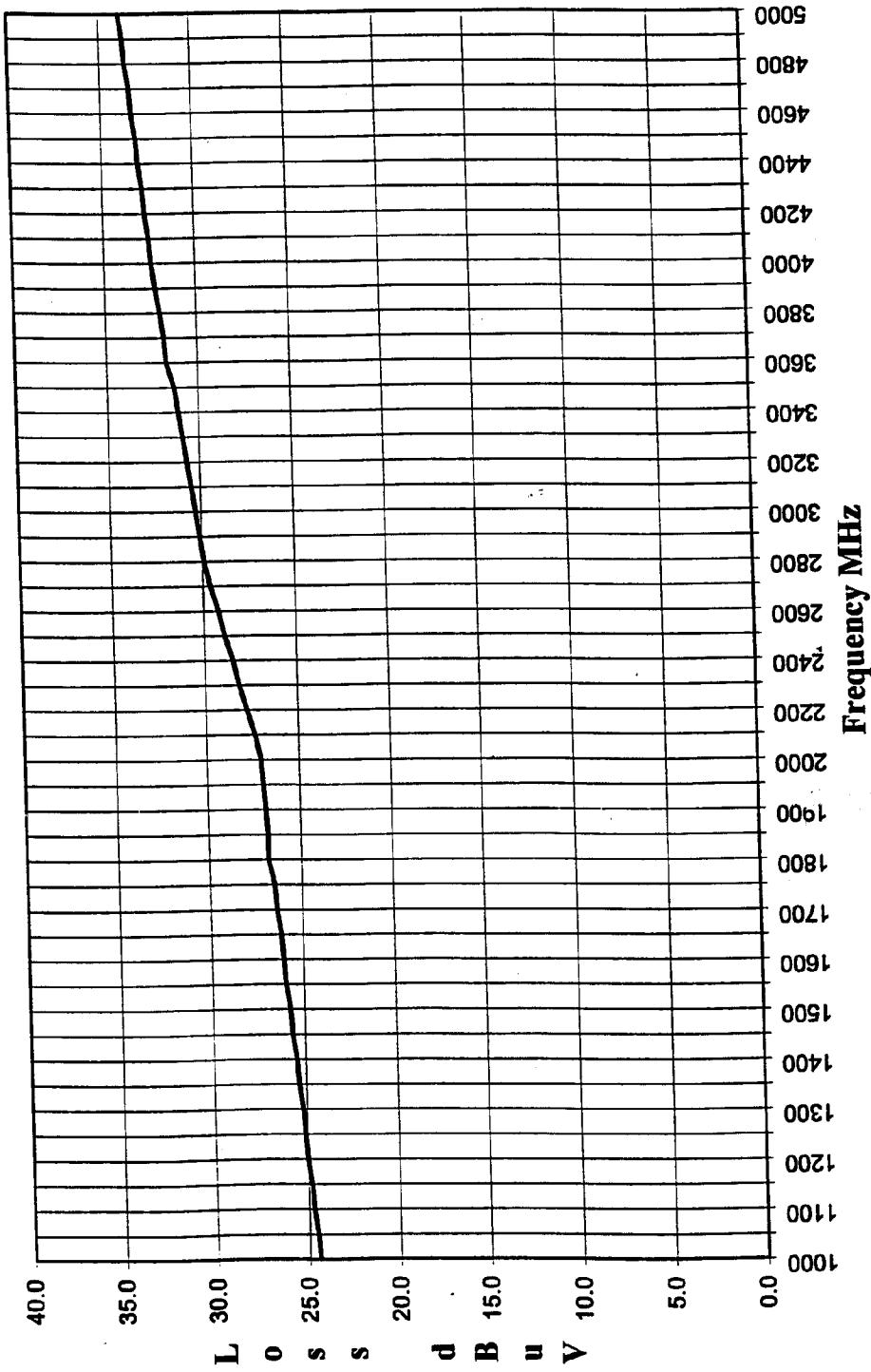
Antenna factors Log Periodic Antenna Model: AL-100 S/N: 16022



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Silverado Canyon (Lab H) Cal:02/13/98

Antenna Factors Horn Antenna Model: AH-118 S/N: 1319



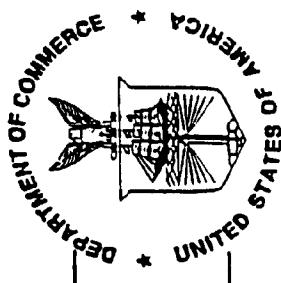
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APPENDIX D***NVLAP ACCREDITATION***

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ISO 9002:1987

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John G. Schaefer