DAYTON T. BROWN INC.
Founded 1950

ENGINEERING AND TEST DIVISION
CHURCH STREET, BOHEMIA, LONG ISLAND, NEW YORK 11716 (631) 589-6300

TEST REPORT NO.: DTB01R01-0547

DAYTON T. BROWN, INC. JOB NO.: 402394-01-000

CUSTOMER: CRESTRON ELECTRONICS, INC.
15 VOLVO DRIVE
ROCKLEIGH, NJ 07647

SUBJECT: FCC CODE OF FEDERAL REGULATIONS, 47 CFR, PART 15, SUB-PART B AND SUB-PART C TESTING PERFORMED ON ONE SMARTOUCH RF TOUCHPANEL, MODEL NO. STX-1550C, SERIAL NO. C562407; AND ONE POWER PACK WITH AC ADAPTER, MODEL NO. 481215003CT

PURCHASE ORDER NO.: 42840

ATTENTION: MR. SAM YOGASUNTHARM

THIS REPORT CONTAINS: SIX PAGES AND FIVE ENCLOSURES

TEST ENGINEER	J. SMIRK
DEPARTMENT SUPERVISOR	T. ZIMOULIS
OPERATIONS MANAGER	T. ZIMOULIS
QUALITY DEPARTMENT	
DATE	4 SEPTEMBER 2001

THE DATA CONTAINED IN THIS REPORT WAS OBTAINED BY TESTING IN COMPLIANCE WITH THE APPLICABLE TEST SPECIFICATION AS NOTED

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1.0 ABSTRACT

This report details the results of the FCC Code of Federal Regulations, 47 CFR, Part 15, Sub-Part B and Sub-Part C testing performed on one Smartouch RF Touchpanel, Model No. STX-1550C, Serial No. C562407, manufactured by Crestron Electronics, Inc. operated with one Power Pack with AC Adapter, Model No. 481215003CT, manufactured by Leader Electronics, Inc.

The Smartouch RF Touchpanel and the Power Pack with AC Adapter were found to be in compliance with the radiated portions of the FCC Code of Federal Regulations, 47 CFR, Part 15, Sub-Part B for Class B equipment.

The Smartouch RF Touchpanel and the Power Pack with AC Adapter were found to be in compliance with the radiated portions of the FCC Code of Federal Regulations, 47 CFR, Part 15, Sub-Part C.

The Smartouch RF Touchpanel and the Power Pack with AC Adapter were found to be in compliance with the conducted portions of the FCC Code of Federal Regulations, 47 CFR, Part 15, Sub-Part B, specification limits Class B.

The Smartouch RF Touchpanel and the Power Pack with AC Adapter were found to be in compliance with the conducted portions of the FCC Code of Federal Regulations, 47 CFR, Part 15, Sub-Part C.

Detailed test results can be observed in Enclosures 2, 3, and 4 of this report.

The test results recorded in this report relate only to those items tested.

2.0 REFERENCES

(a) Customer Purchase Order No.: 42840

(b) Dayton T. Brown, Inc. Job No.: 402394-01-000

(c) Test Specifications: Code of Federal Regulations, 47 CFR, Part 15, Sub-Part C
Code of Federal Regulations, 47 CFR, Part 15, Sub-Part B, Class B

(d) Test Procedure: American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz, ANSI C63.4-1992, dated 17 July 1992

3.0 ADMINISTRATIVE INFORMATION

Customer:	Crestron Electronics, Inc. 15 Volvo Drive Rockleigh, NJ 07647
Test Items:	Smartouch RF Touchpanel, Model No. STX-1550C, Serial No. C562407, manufactured by Crestron Electronics, Inc.; and Power Pack with AC Adapter, Model No. 481215003CT, manufactured by Leader Electronics, Inc.
Quantity Received:	One of Each
Test Start Date:	16 August 2001
Test Completion Date:	17 August 2001
Disposition of Test Items:	The test samples were returned to Crestron Electronics, Inc. on 17 August 2001.

4.0 TEST PROGRAM OUTLINE

Description of Test Method	Results
Radiated Emission, Intentional Radiator, 30 MHz to 10 GHz	Met the specification requirements.
Occupied Bandwidth	Met the specification requirements.
Conducted Emission, 450 kHz to 30 MHz	Met the specification requirements.

5.0 GENERAL TEST INFORMATION

Setup

For the radiated emission test, in the frequency range of 30 to 1000 MHz, the test sample was set up in a climate controlled open field site that measures 44 feet long by 24 feet wide by 24 feet high.

For the radiated emission test, in the frequency range of 1 to 10 GHz, the test sample was set up in an anechoic chamber that measures 20 feet wide by 20 feet long by 12 feet high.

For the conducted emission test, the test sample was set up within a shielded enclosure which is 20 feet wide by 20 feet long by 12 feet high.

All lines carrying power into the shielded enclosure passed through RF suppression filters suitably bonded to the enclosure and capable of 100-dB attenuation over a spectrum of 14 kHz to 10,000 MHz.

Unit Operation:

Operational Mode Tested - Transmit Mode - The Smartouch RF Touchpanel was transmitting at 417.998 MHz.

Enclosure 1

Test Equipment List

Test equipment utilized for the program reported herein was within its assigned interval of calibration.
Details are on file at Dayton T. Brown, Inc. and will be made available upon request.

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TEST	ITEM	MANUFACTURER	DTB NO.	EQUIPMENT CHARACTERISTIC	MODEL	SERIAL NO.	CALIBRATION DUE DATE
CE	20-Foot RG-214 BNC Cable	Pasternack	7-9	DC - 1.0 GHz ±1.0 dB	RG214/U	9	7/2/2002
RE	Cable	Dayton T. Brown, Inc.	7-17	DC – 1 GHz ±6 dB	30 Ft	-	1/27/2002
RE	SMA Cable	Insulated Wire, Inc.	7-26	1 – 22 GHz	2505	26	2/24/2002
RE	Cable	Insulated Wire, Inc.	7-30	900 MHz – 6.5 GHz	-	30	3/3/2002
RE	BiLog Antenna	Chase-York	27-1	30 - 2000 MHz	CBL 6112	2055	2/10/2002
RE/OCB	Double Ridge Waveguide Antenna	Electro-Mechanics Co.	27-41	200 - 2000 MHz	3106	2036	2/24/2002
RE	Double Ridge Waveguide Antenna	Electro-Mechanics Co.	27-55	1.0 - 18 GHz	3115	2072	12/8/2002
RE	Interference Analyzer	Electro-Metrics	65-203	9 kHz - 1.0 GHz	EMC-30 Mk IV	44137	11/25/2001
CE	Interference Analyzer	Electro-Metrics	65-206	9 kHz - 1.0 GHz	EMC-30 Mk IV	44162	10/7/2001
RE	Preamplifier	Hewlett-Packard	71-11	1 - 26.5 GHz 30 dB Gain	8449B	3008A-00284	9/29/2002
CE	Line Impedance Stabilization Network	Solar Electronics	73-92	10 kHz - 30 MHz 50 µh, 24 Amps Dual LISN	9252-50-R-24-BNC	951302	10/14/2001
CE	Screen Room	Ace Engineering and Machine Company	-	20 ft x 20 ft 10 ft High	-	Screen Room 1	-

Test equipment utilized for the program reported herein was within its assigned interval of calibration.
Details are on file at Dayton T. Brown, Inc. and will be made available upon request.

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TEST	ITEM	MANUFACTURER	DTB NO.	EQUIPMENT CHARACTERISTIC	MODEL	SERIAL NO.	CALIBRATION DUE DATE
RE	Anechoic Facility	Rayproof	-	20 ft x 20 ft 12 ft High	-	Solid Room 1	-
RE	FCC Facility	Dayton T. Brown, Inc.	-	44 ft x 24 ft 24 ft High	-	FCC Site	-
RE/OCB	Spectrum Analyzer	Hewlett-Packard	376636A	9 kHz - 26.5 GHz	8563E	3635A- 05798	1/12/2002

Enclosure 2

Radiated Emission,
Intentional Radiator, 30 MHz to 10 GHz

DAYTON T. BROWN INC.
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RADIATED EMISSION, INTENTIONAL RADIATOR, 30 MHz to 10 GHz

Test Procedure

A radiated emission test, in the frequency range of 30 to 1000 MHz, was performed with the test item while it was mounted on a wooden table that was standing on a conductive turntable.

For the frequency range of 30 to 1000 MHz, measurements were made utilizing a manually tuned interference measurement receiver which was located in the instrumentation room below the ground plane.

The receiver was connected to the measurement antenna which was located 3 meters from the turntable for the frequency range of 30 to 1000 MHz.

A linear polarized antenna was utilized for the measurements. The antenna height was varied between 1 and 4 meters, and the test sample was rotated 360° to ensure maximum pickup from the test sample.

A radiated emission test, in the frequency range of 1 to 10 GHz, was performed on the test item while it was mounted on a wooden table in an anechoic chamber.

For the frequency range of 1 to 10 GHz, measurements were made utilizing a spectrum analyzer.

The receiver was connected to the measurement antenna, which was located 1 meter from the table for the frequency range of 1 to 10 GHz, with a length of 50Ω coaxial cable.

The test item utilizes pulse modulation with a 50-percent duty cycle.

Measurements were made utilizing the following bandwidth and detector function:

Frequency Range	CISPR Bandwidth	Detector Function
30 to 1000 MHz	120 kHz	Quasi-Peak
1 to 10 GHz	100 kHz	Peak

The antenna per meter factors of the antenna utilized are depicted in the figure contained in this enclosure.

The test setup employed is depicted in the photograph contained in this enclosure.

RADIATED EMISSION,
INTENTIONAL RADIATOR, 30 MHz to 10 GHz
(Continued)

Test Results

No emission levels above the FCC Code of Federal Regulations, 47 CFR, Part 15, Sub-Part B, specification limits for Class B equipment were observed between 30 and 1000 MHz excluding the transmit frequency of 418 MHz.

No emission levels above the FCC Code of Federal Regulations, 47 CFR, Part 15, Sub-Part C, specification limits for intentional radiating equipment transmitting at 418 MHz were observed. Emission levels at 418 MHz were below the maximum specification limit of 80.2 dBuV/m (10,232 microvolts per meter) and spurious emissions between 30 MHz and 10 GHz were below the maximum limit of 51.5 dBuV/m (375 microvolts per meter).

Detailed test results for the radiated emission test for Intentional Radiators can be observed on pages 3 through 7 of this enclosure.

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Test Item: Smartouch STX-1550C
Customer: Crestron Electronics, Inc.
Test Condition: Transmitting
Specification: FCC Part 15 Sub-Part B, Class B; Sub-Part C
Detector Function: Quasi-Peak **Units:** dBuV/m

Date: 17-Aug-01
Serial No.: C562407
Job No.: 402934-01-000
Distance: 3 Meters
Antenna Polarization: Vertical
Bandwidth: 120 kHz (CISPR)

Radiated Field Strength Measurements

Met Requirement Yes [X] **No** [ ]

Freq. (MHz)	Meter Indicated (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain # (dB)	Total Indicated (dBuV/m)	Spec. Limit (dBuV/m)		Level Above Spec. Limit	Notes
30	1	18.1	0.32		19.4	40			Ambient
418	18	17.0	1.40		36.4	80.2			TX Frequency
1000	15	21.3	2.30	25.0	13.6	54			Ambient

RFSM1

Remarks: * Indicates above Specification Limit; A - Indicates Ambient; Total Indicated = Meter Indicated + Antenna Factor + Cable Loss - Pre-Amp Gain
Antenna Factor is for BiLog Antenna, DTB No. 27-1; Calibration Due: 26-Feb-02

Reviewed By: _____ Test Performed By: _____

DAYTON T. BROWN, INC.
Founded 1950

Test Item: Smartouch STX-1550C
Customer: Crestron Electronics, Inc.
Test Condition: Transmitting
Specification: FCC Part 15 Sub-Part B, Class B; Sub-Part C
Detector Function: Quasi-Peak **Units:** dBuV/m

Date: 17-Aug-01
Serial No.: C562407
Job No.: 402934-01-000
Distance: 3 Meters
Antenna Polarization: Horizontal
Bandwidth: 120 kHz (CISPR)

Radiated Field Strength Measurements

Met Requirement Yes [X] **No** [ ]

Freq. (MHz)	Meter Indicated (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain # (dB)	Total Indicated (dBuV/m)	Spec. Limit (dBuV/m)		Level Above Spec. Limit	Notes
30	1	19.7	0.32		21.0	40			Ambient
418	40	17.4	1.40		58.8	80.2			TX Frequency
1000	15	22.2	2.30	25.0	14.5	54			Ambient

RFSM1

Remarks: * Indicates above Specification Limit; A - Indicates Ambient; Total Indicated = Meter Indicated + Antenna Factor + Cable Loss - Pre-Amp Gain
Antenna Factor is for BiLog Antenna, DTB No. 27-1; Calibration Due: 26-Feb-02

Reviewed By: _____ Test Performed By: _____

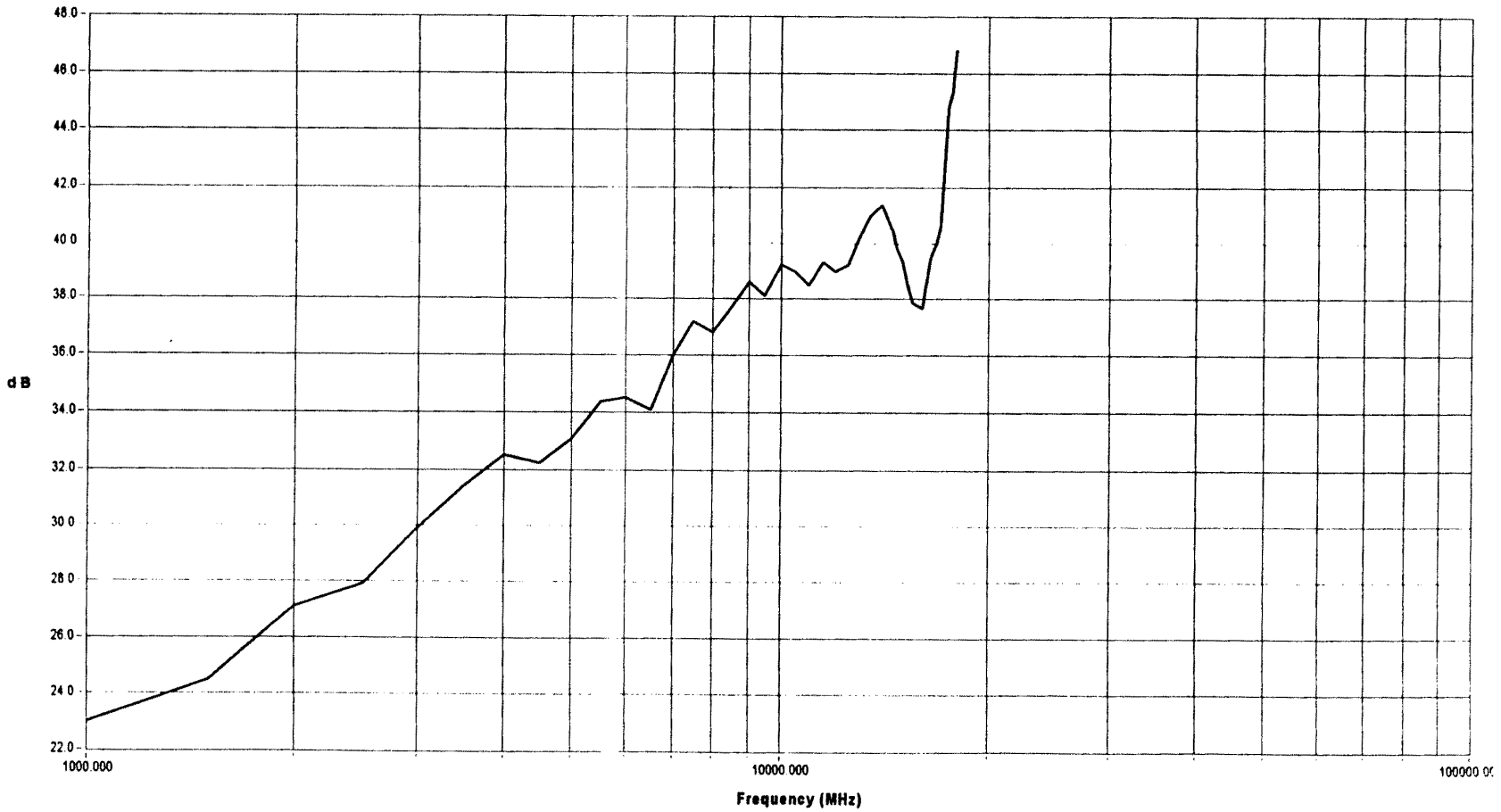
CORRECTION FACTOR

Factor File Name: 27-55.rea

Factor Description: Double Ridged Guide Antenna

DTB Number: 27-55

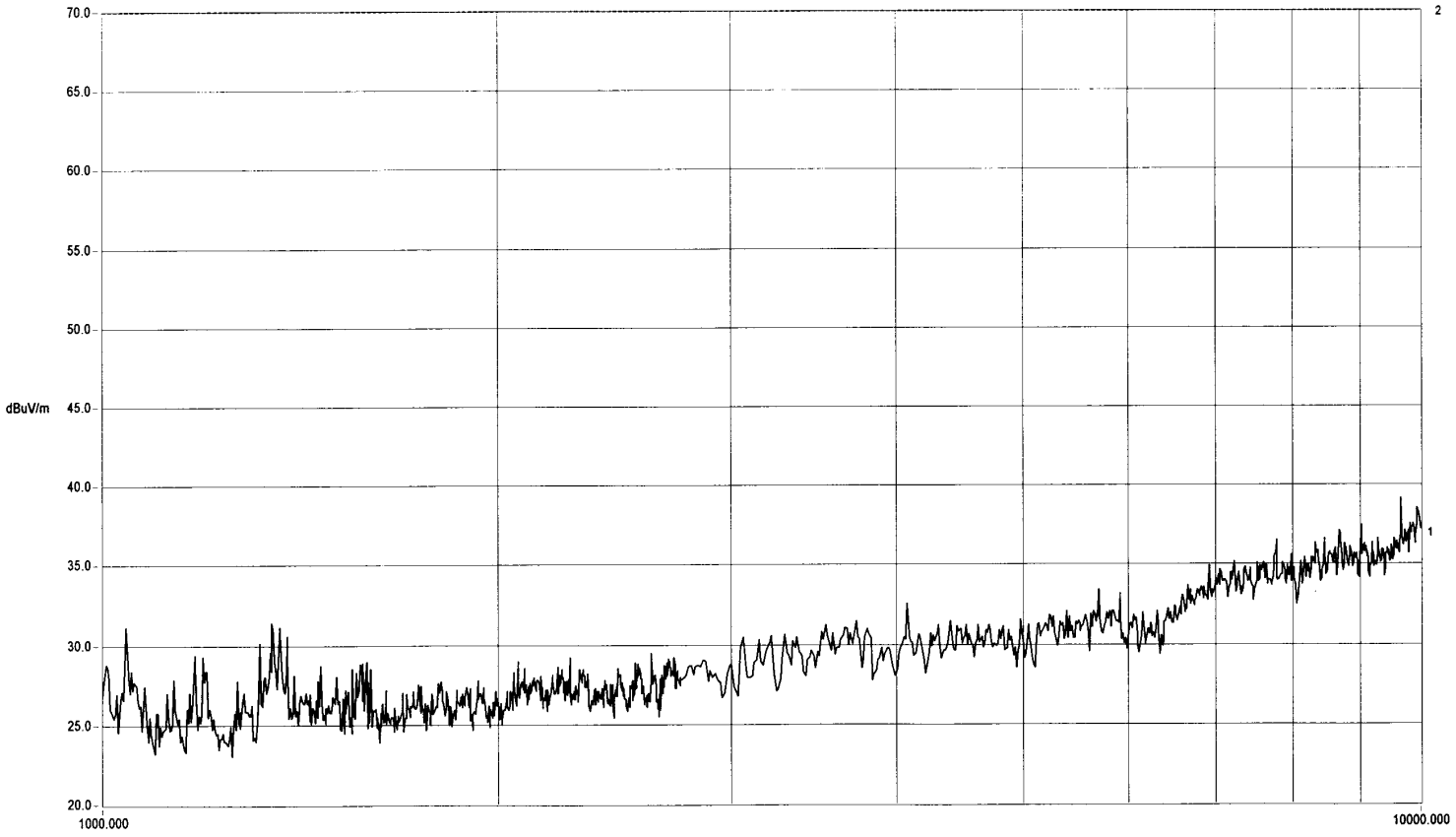
Cal Due Date: 12/08/02



Test Title:	**Radiated Emmisions**				
Test Procedure:	**FCC Part 15**	**Date:**	**8/16/01**	**Time:**	**4:53 PM**
Customer:	**Crestron Electronics, Inc**	**Tested By:**	**S. Retta**		
Test Item:	**Smartouch**	**Project Eng.:**	**J. Smirk**		
Model Num.:	**STX-1550C**	**Job Num.:**	**402394-01-000**		
Part Num.:	**N/A**	**Test Num.:**	**402394-01-104**		
Serial Num.:	**C862407**	**Sensor Loc.:**	**1 Meter from test item**		
Mode of Op.:	**Transmiting**	**Sensor Pol.:**	**Vertical**		
Comment:	**Power pack AC adaptor " Leader Electronics " Model No: 481215003CT**				

1. RE Data

File Name: 402394-01-104.red



BW Table

Frequency	BW
1000.000 MHz	1.0000E5 Hz
10000.000 MHz	

Factor Files

27-55.rea (1000.00 MHz)

Correction Files

7-26 (1-18,5g).rec (1000.00 MHz)
7-30 (1-26g).rec (1000.00 MHz) (2nd
zero.rec (1000.00 MHz) (3rd cable)
zero.ret (1000.00 MHz) (attenuator)
71-11.rep (1000.00 MHz) (pre-amp)

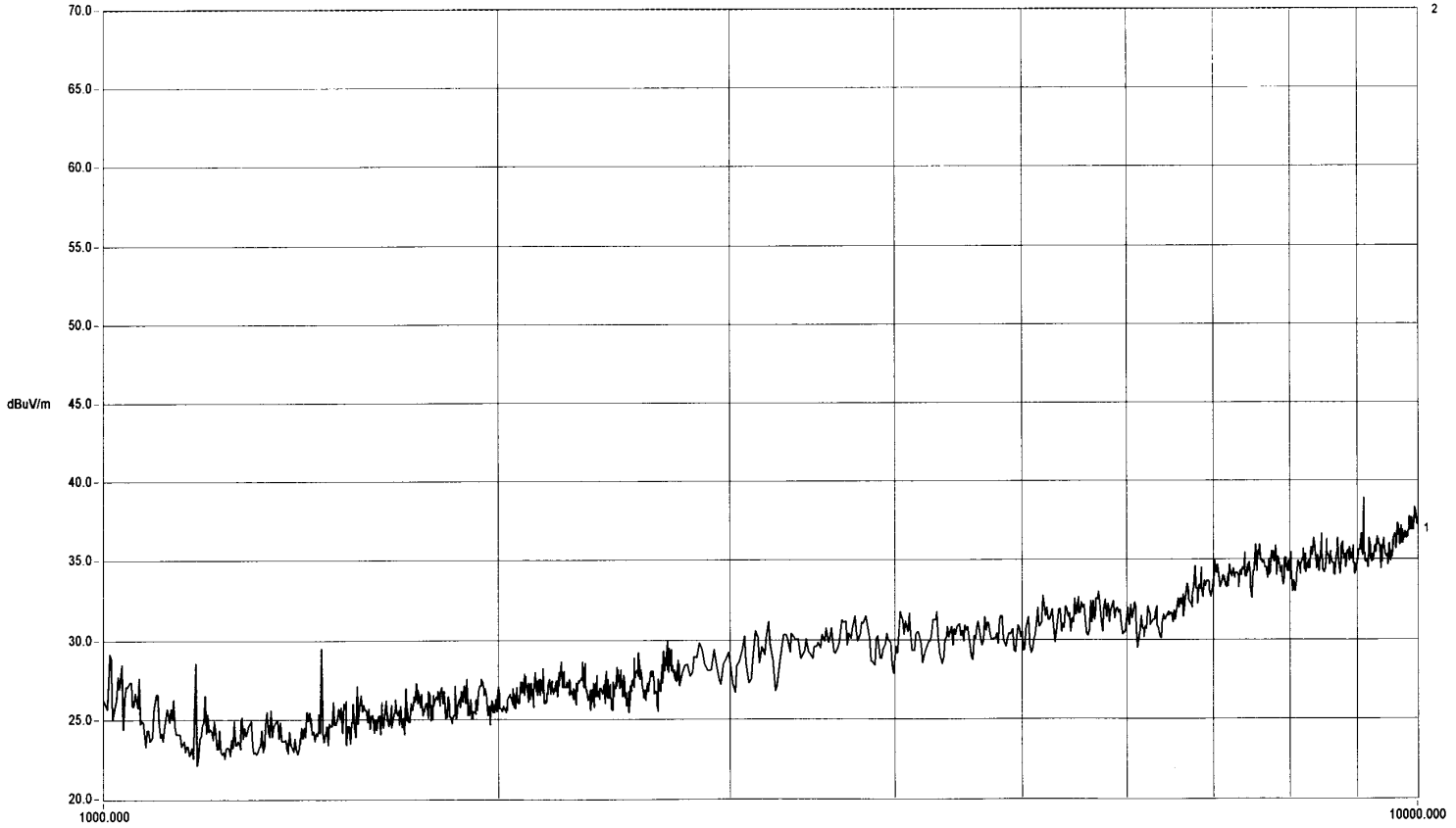
Engineer: _____

Technician: _____

Test Title:	Radiated Emmisions				
Test Procedure:	FCC Part 15	**Date:**	8/16/01	**Time:**	5:00 PM
Customer:	Crestron Electronics, Inc	**Tested By:**	S. Retta		
Test Item:	Smartouch	**Project Eng.:**	J. Smirk		
Model Num.:	STX-1550C	**Job Num.:**	402394-01-000		
Part Num.:	N/A	**Test Num.:**	402394-01-105		
Serial Num.:	C862407	**Sensor Loc.:**	1 Meter from test item		
Mode of Op.:	Transmiting	**Sensor Pol.:**	Horizontal		
Comment:	Power pack AC adaptor " Leader Electronics " Model No: 481215003CT				

1. RE Data

File Name: 402394-01-105.red



BW Table

Frequency	BW
1000.000 MHz	1.0000E5 Hz
10000.000 MHz	

Factor Files

27-55.rea (1000.00 MHz)

Correction Files

7-26 (1-18,5g).rec (1000.00 MHz)
7-30 (1-26g).rec (1000.00 MHz) (2nd
zero.rec (1000.00 MHz) (3rd cable)
zero.ret (1000.00 MHz) (attenuator)
71-11.rep (1000.00 MHz) (pre-amp)

Engineer: _____

Technician: _____

TESTED FOR CRESTRON ELECTRONICS, INC.
ITEM: SMARTOUCH RF TOUCHPANEL
RADIATED EMISSION TEST SETUP
JOB NO. 402394-01-000
DTB01R01-0547
FILE NO. 01-2902
ENCLOSURE 2
M/N STX-1550C
S/N C562407
17 AUGUST 2001
PHOTO 1

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Enclosure 3

Occupied Bandwidth

OCCUPIED BANDWIDTH

Test Procedure

The occupied bandwidth of the test item was measured using a spectrum analyzer with a bandwidth setting of 100 kHz. The spectrum analyzer was operated in the "Max Hold" mode.

The test item has an operating frequency of 417.998 MHz. The maximum allowed bandwidth for devices operating above 70 MHz and below 900 MHz is 0.25 percent of the center frequency.

The maximum allowed bandwidth is calculated as follows:

417.998 MHz X 0.0025 = 1.0449 MHz

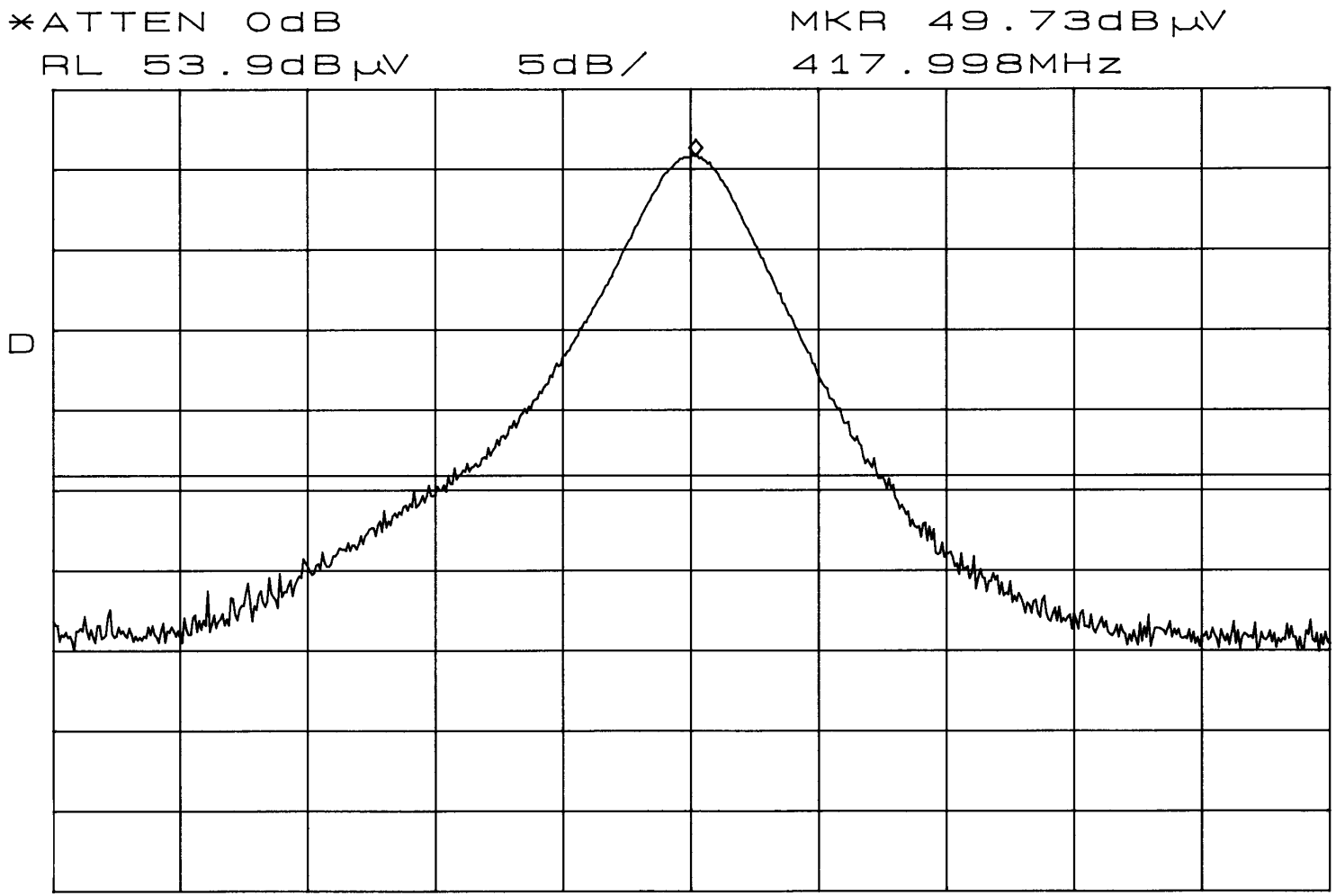
The occupied bandwidth was determined at the points 20 dB down from the carrier.

The test item employed is depicted in the photograph contained in this enclosure.

Test Results

The test item met the occupied bandwidth test. The measured occupied bandwidth from the test item was 500 kHz at the 20-dB down point.

Detailed test results for the occupied bandwidth test can be observed on page 2 of this enclosure.


*ATTEN 0dB
MKR 49.73dBµV
RL 53.9dBµV
5dB/
417.998MHz
D
CENTER 417.993MHz
SPAN 1.500MHz
*RBW 100kHz
*VBW 100kHz
*SWP 50.0ms

TESTED FOR CRESTRON ELECTRONICS, INC.
ITEM: SMARTOUCH RF TOUCHPANEL
OCCUPIED BANDWIDTH TEST SETUP
JOB NO. 402394-01-000
DTB01R01-0547
FILE NO. 01-2885
ENCLOSURE 3
M/N STX-1550C
S/N C562407
17 AUGUST 2001
PHOTO 1

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Enclosure 4

Conducted Emission, 450 kHz to 30 MHz

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CONDUCTED EMISSION, 450 kHz to 30 MHz

Test Procedure

A conducted emission test, in the frequency range of 450 kHz to 30 MHz, was performed on the test sample while mounted on a nonconductive table. The table measured 1 meter by 1.5 meters with its top surface 80 cm above the ground plane.

Power was supplied to the test sample via LISNs which were bonded to the ground plane below and to the side of the nonconductive table. The unused 50Ω connector on the LISN was terminated in 50Ω.

Measurements were made utilizing the following bandwidth and detector function:

Frequency Range	CISPR Bandwidth	Detector Function
450 kHz to 30 MHz	9 kHz	Quasi-Peak

Test Results

No emission levels above the FCC Code of Federal Regulations, 47 CFR, Part 15, Sub-Part B, specification limits for Class B equipment were observed between 450 kHz and 30 MHz.

No emission levels above the FCC Code of Federal Regulations, 47 CFR, Part 15, Sub-Part C, specification limits for intentional radiating equipment were observed between 450 kHz and 30 MHz.

Detailed test results for the conducted emission test can be observed on pages 2 and 3 of this enclosure.

Test Title: fcc r & r, part 15, class b

Test Procedure:	FCC part 15
Customer:	Crestron Electronics, Inc.
Test Item:	Smartouch
Model Num.:	STX-1550C
Part Num.:	N/A
Serial Num.:	C562407
Mode of Op.:	Transmiting
Comment:	Power pack with AC adaptor "Leader Electronics" Model No:481215003CT

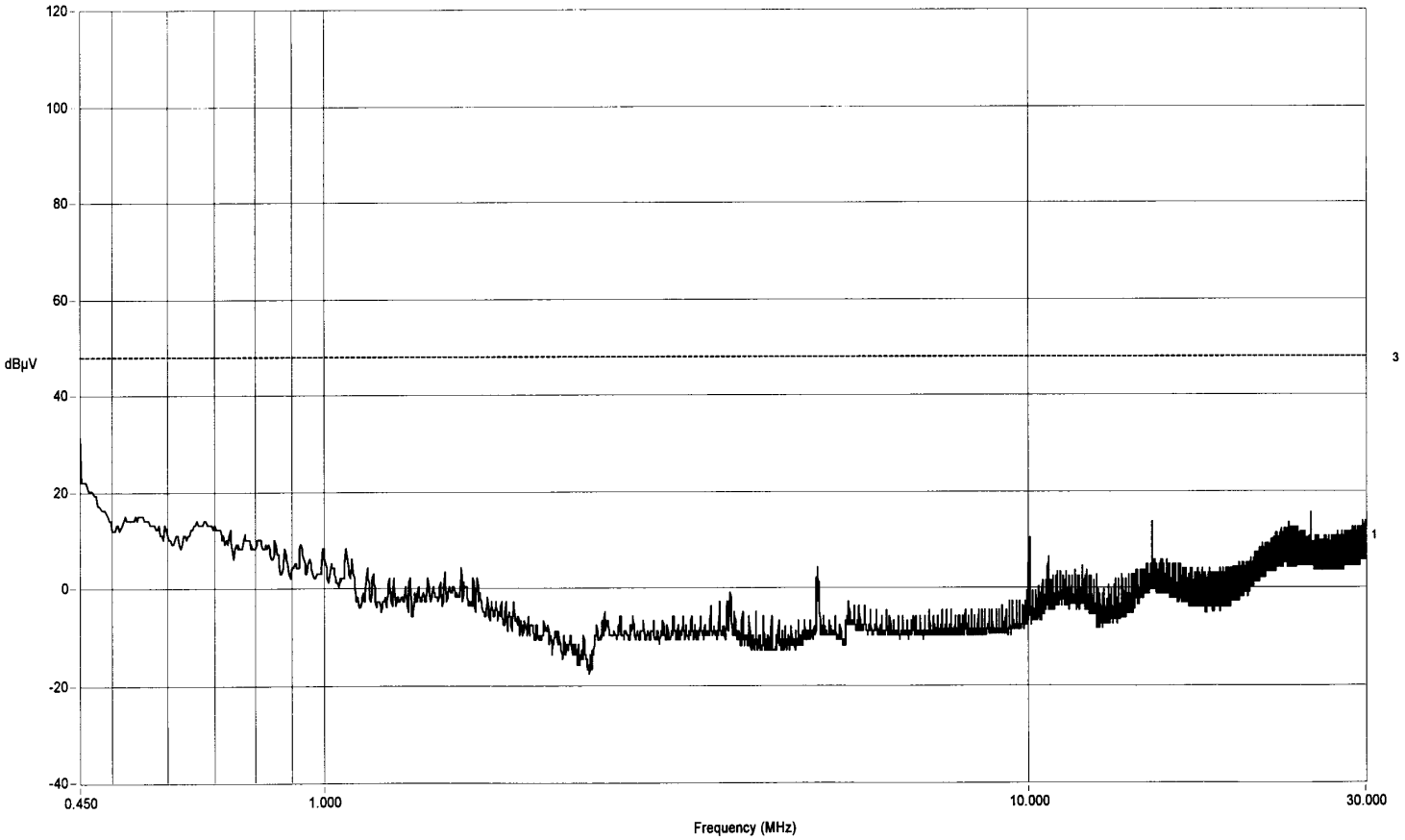
Date:	8/16/01
Tested By:	S. Retta
Project Eng.:	J. Smirk
Job Num:	402394-01-000
Test Num:	402394-01-004
Detector:	Quasi-Peak
Dwell:	160 milliseconds
Sensor Loc.:	115 VAC Phase
Sensor Pol:	N/A
File Name:	402394-01-004.d30

Time 1:28 PM

DAYTON T. BROWN

1. Data

3. fcc r & r, part 15, class b.l30 (Spec Limit)



BW Table

Frequency	BW
0.450 MHz	9 KHz
30.000 MHz	

Factor Files

lisn 73-92 max new.r30

Correction Files

7-09 (10k-1g).c30

Engineer: _____

Technician: _____

Test Title: fcc r & r, part 15, class b

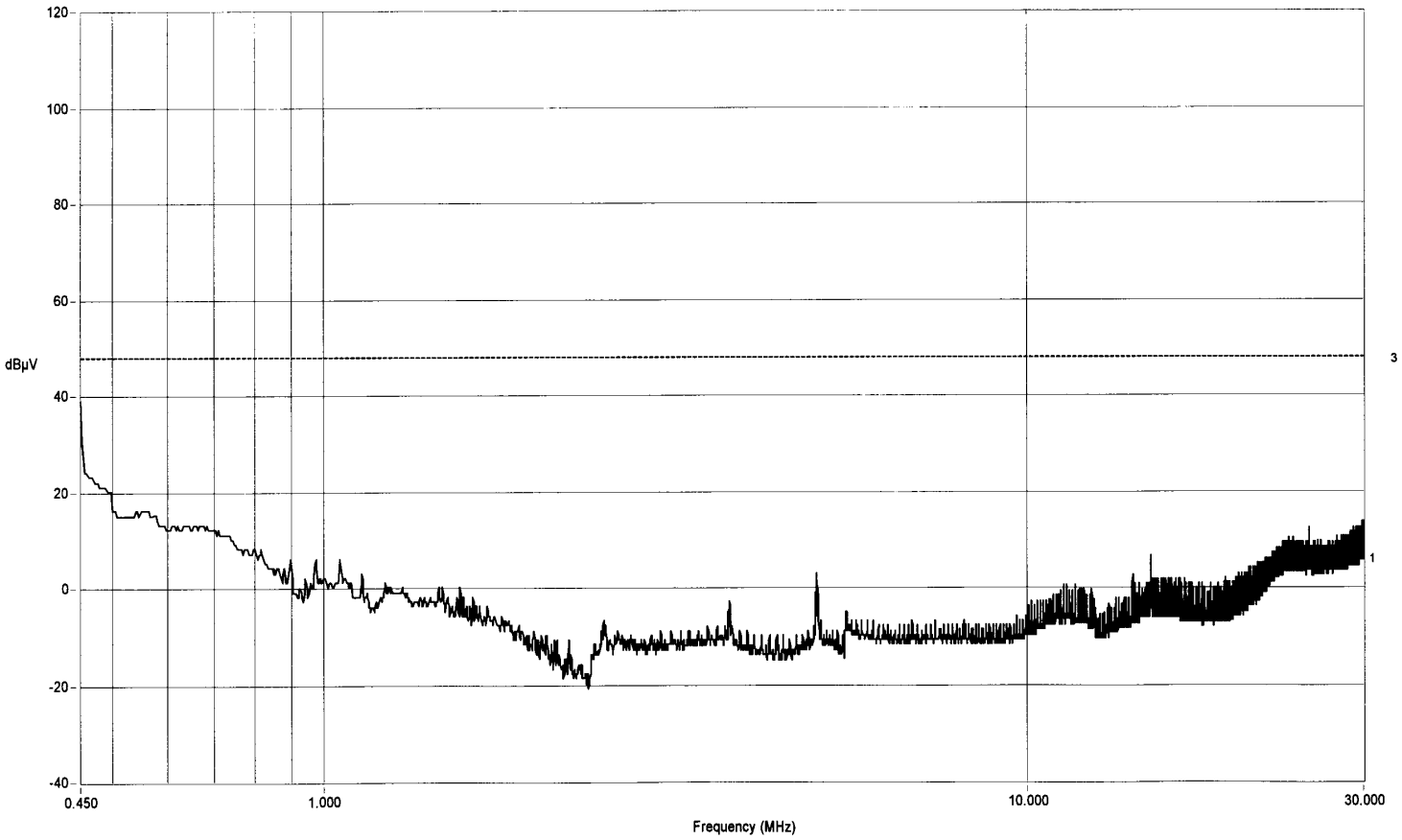
Test Procedure:	FCC Part 15
Customer:	Crestron Electronics, Inc.
Test Item:	Smartouch
Model Num.:	STX-1550C
Part Num.:	N/A
Serial Num.:	C562407
Mode of Op.:	Transmiting
Comment:	Power pack with AC adaptor " Leader Electronics" Model No: 481215003CT

Date:	8/16/01	Time	2:23 PM
Tested By:	S. Retta		
Project Eng.:	J. Smirk		
Job Num:	402394-01-000		
Test Num:	402394-01-006		
Detector:	Quasi-Peak		
Dwell:	160 milliseconds		
Sensor Loc.:	115 VAC Return		
Sensor Pol:	N/A		
File Name:	402394-01-006.d30		

DAYTON T. BROWN

1. Data

3. fcc r & r, part 15, class b.l30 (Spec Limit)



BW Table

Frequency	BW
0.450 MHz	9 KHz
30.000 MHz	

Factor Files

lisn 73-92 max new.r30

Correction Files

7-09 (10k-1g).c30

Engineer: _____

Technician: _____

Enclosure 5

A2LA Scope of Accreditation

American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999

DAYTON T. BROWN, INC.
Church Street
Bohemia, NY 11716-5031
Charles Gortakowski – Phone: 631 244 6315 / 1 800 TEST456 – Fax: 631 589 4046
Email: test@daytontbrown.com / www.daytontbrown.com

MECHANICAL

Valid To: December 31, 2002 Certificate Number: 0767-03

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following mechanical tests:

Altitude - 14.1 meters (-282 feet to 122,000 meters); 400,000 feet or 1x10E^{-5} TORR
Chamber volumes up to 745 cubic ft
Burst Test - High Pressure Air to 5000psi
Coating/Plating Thickness
Combined Environments - Vibration and Temperature
Dimensional - CMM – X-1200mm (±0.001mm); Y-100mm (±0.001mm); Z-600mm (±0.001mm)
Durability
Durometer Hardness
Dye Penetrant
Explosive Environment - Chamber Volume 75 cubic ft, Altitudes up-to 50,000ft
Fungus Test Area Size 36" x 36"
Hardness
Humidity - Relative humidity range from desert (2%) to a tropical forest (100%).
Chamber volumes up-to 3500 cubic ft
Magnetic Particle Inspection
Material Cleanliness
Metallographic Analysis
Microhardness
Salt Fog/Spray Chamber up-to a Chamber volume of 2500 cubic ft
Sand & Dust Chamber volumes up-to 200 cubic ft; velocities up-to 5700ft/min
Seat Belt Assembly testing
Thermal Shock
Sun/Solar Radiation
Surface Temperature Profilometer
Temperature - Chambers from 64 cubic ft to 3500 cubic ft; Ambient temperatures from −300°F to +350°F
Tensile Testing
Water Immersion
Wind & Rain

5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8373 • Phone: 301-644 3248 • Fax: 301-662 2974

Using the following specifications directly related to the above listed testing technologies:

Test Technology	Test Method(s)
Low Pressure (Altitude)	MIL-STD-810: C (500.1), D (500.2), E (500.3), F (500.4)
High Temperature	MIL-STD-810: C (501.1), D (501.2), E (501.3), F (501.4); GR-63-CORE (5.1.1.2)
Low Temperature	MIL-STD-810: C (502.1), D (502.2), E (502.3), F (502.4); GR-63-CORE (5.1.1.1)
Temperature Shock	MIL-STD-810: C (503.1), D (503.2), E (503.3), F (503.4); GR-63-CORE (5.1.1.1, 5.1.1.2); MIL-STD-202 (107G)
Temperature/Altitude	MIL-STD-810 C (504.1); RTCA/DO-160C (4.0)
Temperature Variation	RTCA/DO-160C (5.9)
Solar Radiation (Sunshine)	MIL-STD-810: C (505.1), D (505.2), E (505.3), F (505.4)
Rain	MIL-STD-810: C (506.1), D (506.2), E (506.3), F (506.4)
Humidity	MIL-STD-810: C (507.1), D (507.2), E (507.3), F (507.4); GR-63-CORE (5.1.1.3); MIL-STD-202 (103B); RTCA/DO-160C (6.0)
Fungus	MIL-STD-810: C (508.1), D (508.2), E (508.4), F (508.5); RTCA/DO-160C (13.0)
Salt Fog	MIL-STD-810: C (509.1), D (509.2), E (509.3), F (509.4); MIL-STD-202 (101D)
Dust (Fine Sand)	MIL-STD-810: C (510.1), D (510.2), E (510.3), F (510.4); MIL-STD-202 (110A); RTCA/DO-160C (12.0)
Explosive Atmosphere	MIL-STD-810: C (511.1), D (511.2), E (511.3), F (511.4); MIL-STD-202 (109B); RTCA/DO-160C (9.0)
Leakage (Immersion)	MIL-STD-810: C (512.1), D (512.2), E (512.3), F (512.4)
Space Simulation (Unmanned Test)	MIL-STD-810 C (517.2)
Temperature/Humidity/Altitude	MIL-STD-810 C (518.1)
Temperature/Humidity/Vibration	MIL-STD-810: D (520.0), E (520.1), F (520.2)
Icing/Freezing Rain	MIL-STD-810: D (521.0), E (521.1), F (521.2)
Packaged Drop Test	GR-63-CORE (5.3.1)
Unpackaged Equipment Drop	GR-63-CORE (5.3.2)
Coating/Plating Thickness	ASTM E376
Tensile Testing	ASTM B557, E8
Material Cleanliness	ASTM E45
Magnetic Particle	ASTM E1444
Dye Penetrant	ASTM E1417
Microhardness	ASTM E3814-89
Hardness	ASTM D2240, E18
Dimensional – CMM	ASME Y14.5M, B46.1
Durability	Customer Supplied Procedure
Environmental Tests	ETS 300 019 Part: 1-1 Storage, 1-2 Transportation, 2-1 Storage
Durometer Hardness	ASTM D2240
Shock & Crash Safety	RTCA/DO-160C (7.0)
Waterproofness	RTCA/DO-160C (10.0)
Fluid Susceptibility	RTCA/DO-160C (11.0)
Salt Spray	RTCA/DO-160C (14.0)
Seat Belt Testing	FMVSS 209: S4.1 (Paragraphs (d) Hardware, (h) Webbing, (i) Strap, (j) Marking and (m) Workmanship), S4.2 (Requirements For Webbing, excluding paragraph (f) Resistance to Micro-Organisms), S4.3 (Requirements for Hardware, all paragraphs), S4.4 (Requirements for Assembly Performance, all paragraphs)

American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999

DAYTON T. BROWN, INC.
Church Street
Bohemia, NY 11716-5031
Charles Gortakowski – Phone: 631 244 6315 / 1 800 TEST456 – Fax: 631 589 4046
Email: test@daytontbrown.com / www.daytontbrown.com

ACOUSTICS & VIBRATION

Valid To: December 31, 2002 Certificate Number: 0767-01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following acoustics & vibration tests:

Vibration (Sine, Random, Sine on Random, Gunfire, Shipboard), Buzz, Squeak and Rattle, Combined Environments and Reliability (Temperature, Humidity and Vibration), Classical Shock (Half Sine, Sawtooth, Square Wave), Pyroshock, Airborne and Structureborne Noise Measurements.

VIBRATION/SHOCK CAPABILITIES UP TO THE FOLLOWING:

Random

Force Rating	40,000 lb_f
Frequency Range	4 to 3000 Hertz
Maximum Level	200 grms
Displacement	2 inches Peak-to-Peak

Sinusoidal

Force Rating	40,000 lb_f
Frequency Range	4 to 3000 Hertz
Sine Velocity Continuous Duty	125 in/sec
Sine Velocity Intermittent Duty	135 in/sec
Maximum Level	200 g's
Displacement	2 inches Peak-to-Peak

Classical Shock

Force	80,000 lb_f
Waveforms	Sine, Sawtooth, Trapazoid
Maximum Level	600 to 3000 g's

Pyroshock

Level	5000 to 32,00 g's
Frequency Range	100 to 10,000 Hertz

Displacement 2 inches Peak-to-Peak

Airborne and Structureborne Noise Measurements

5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8373 • Phone: 301-644 3248 • Fax: 301-662 2974

Testing Criteria	*Specification (s)*
Airborne And Structure Borne Noise Measurement	MIL-STD-740 1-2
Acceleration (Centrifuge)	MIL-STD-810C 513.2, 810D 513.3, 810E 513.4 810F 513.5, RTCA/DO-160
Buzz, Squeak And Rattle	Automotive Requirements
Pyro Shock	MIL-STD-1540, MIL-STD-810F 517
Sound And Power	ANSI:S1.2, S1.35
Shock Test, High Impact on Shipboard Machinery, Equipment And Systems	MIL-S-901D I.WH and MWH
Reliability	MIL-STD-781, NAVMAT P-9492,
Automotive	FORD: DVT!.12.00.007-AC, ES-F5vb-54043B13-AA, GM: 9103P, 9104P, 9110P, 9125P, 9140P, 9144P, 9154P, 9163P, 9175P, CHRYSLER: PF-9007, PF-9531, PF-6897, PF-8243, PF-9164
Telephony	Bellcore GR-13, GR-63, GR-487, GR-2834 TR-NWT-000063

ANSI S12.35 - Precision Methods for the Determination of Sound Power Levels of Noise Sources in Anechoic and Semi-Anechoic Rooms
ANSI S1.2 - Method for the Physical Measurement of Sound
ANSI S1.35 - Sound Power Levels of Noise Sources in Anechoic and Semi-Anechoic Rooms.
MIL-STD-810 (Vibration: 810C 514.2, 810D 514.3, 810E 513.4, 810F 514.5; Acoustical Noise: 810C 515.2, 810D 515.3, 810E 515.4, 810F 515.5; Gunfire Vibration, Aircraft: 810C 519.2, 810D 519.3, 810E 519.4, 810F 519.5)
Bellcore GR-63-Core (Office Vibration 5.4.2; Transportation Vibration 5.4.3)
MIL-STD-202 201A Vibration, 202D, 203B Random Drop, 204D Vibration High frequency, 205E, 207A high-impact shock, 212A Acceleration, 213B Shock (specified pulse), 214A Random Vibration
RTCA/DO-160C (Sections 7.0 Operational Shocks and Crash Safety, 8.0 Vibration)
MIL-STD-167-1 Shipboard vibration
NAVMAT P-9492 Environmental Stress Screening for Navy Components

American Association for Laboratory Accreditation

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ELECTRICAL (AEMCLAP/EMC)

Valid To: December 31, 2002 Certificate Number: 0767-02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following electrical, electromagnetic compatibility (EMC), and telecommunications tests:

Capacitance	Impedance
AC Capacitance	Inductance
AC Loss Characteristics	Power Factor
Conductivity	Resistance (Dielectric Constant, Insulation Resistance)
Current (AC/DC)	Voltage (AC/DC)

EMI/RFI

Conducted Emissions	Surge Immunity
Conducted Transient Susceptibility	Input Power Variations
Conducted Immunity	Magnetic Field Emission
Radiated Emissions (3m & 10m Sites)	Magnetic Field Susceptibility
Radiated Emissions	Harmonics – Powerline & RF
Shielded Room, Mode Stirring	RF Power Handling
Radiated Susceptibility (Immunity)	Shielding Effectiveness
Radiated Transient Susceptibility	Electrical Fast Transient (EFT)
Electrostatic Discharge (ESD)	Transmissibility
Electromagnetic Pulse (EMP)	Electromagnetic Site Survey

Automotive EMC (AEMCLAP)

Electrostatic Discharge (ESD)	Absorption Chamber
Transverse Electromagnetic (TEM) Cell	Conducted Emissions
Audio Frequency Conducted Immunity	

On the following types of materials and products:
Aerospace Components & Systems; Automotive Components & Systems; Shipboard Components & Systems; Railroad & Industrial Vehicle Components & Systems; Information Technology & Telecommunication Equipment & Systems; Electrical & Electronic Components & Systems; Medical Electronic Equipment; Military Equipment & Hardware.

5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8373 • Phone: 301-644 3248 • Fax: 301-662 2974

Using the following sources of standards:

Test Technology	Test Method(s)
EMC Emissions and Immunity	EN 50091-2, EN 60601-1-2, IEC 601-1-2
EMC Emissions	Code of Federal Regulations (CFR) 47, FCC Method Part 15 using
Harmonic Current Emissions	IEC 1000-3-2,EN 60555-2
Voltage Fluctuation and Flicker	IEC1000-3-3, EN 60555-3
EMC Immunity	EN 50082-1, EN 50082-2
Electrostatic Discharge	EN 61000-4-2, IEC 1000-4-2, IEC 801-2
Radiated Field Immunity	IEC 1000-4-3, IEC801-3, ENV 50141, ENV 50140, ENV 50204
Electrical Fast Transient	EN 61000-4-4, IEC 1000-4-4, IEC 801-4
Surge Immunity	EN 61000-4-5, IEC 1000-4-5, IEC 801-5, ENV 50124 IEEE-587-1980, ANSI C62.41, ANSI C62.32
Conducted Immunity	EN 61000-4-6, IEC 1000-4-6, IEC 801-6
Harmonic Immunity	EN 61000-4-7, IEC 1000-4-7
Magnetic Field Immunity	EN 61000-4-8, IEC 1000-4-8
VoltageDips, Interruptions and Variations	EN61000-4- , IEC 1000-4-
Telecom	Code of Federal Regulations (CFR) 47, FCC Method Part 68
Commercial Aviation:	RTCA/DO-160, FAA Advisory Circular 20-136, Boeing D200Z001, Boeing WZZ7000
Military:	MIL-STD-461 (A, B, C & D), MIL-STD-462, MIL-STD-1399, MIL-STD-704, MIL-E-16400, MIL-STD-2036, MIL-STD-1275A (AT), MIL-STD-202
Automotive	GM: 9100P, 9105P, 9109P, 9110 P, 9112 P, 9113 P, 9114 P, 9115 P, 9116 P, 9117 P, 9119 P, 9120 P, 9103-P, 9104-P, 9125P, 9128P, 9140P, 9144P, 9154P, 9163P, 9175P Chrysler: PF-9164M, PF-9326
Safety	EN 50091-1

In recognition of the successful completion of the A2LA and the Automotive EMC Laboratory Accreditation Program (AEMCLAP) evaluation process, accreditation is granted to this laboratory to perform the following automotive electromagnetic compatibility tests:

Test Technology	Test Method(s)
Electrostatic Discharge (ESD)	ISO 10605; SAE J1113-13, ES-XW7T-1A278-AB
Absorption Chamber	SAE J1113-21; ISO 11452-2, ES-XW7T-1A278-AB
Transverse Electromagnetic (TEM) Cell	ISO 11452-3; SAE J1113-24
Conducted Emissions	DaimlerChrysler LP-388C-41
Audio Frequency Conducted Immunity	SAE J1113-2