TEST REPORT

ACCREDITED

Certification # 1367-01

Laboratory ID
PRODUCT SAFETY ENGINEERING, INC.
12955 Bellamy Brothers Boulevard
Dade City, Florida 33525 USA
PH (352) 588-2209 FX (352) 588-2544

Submitter ID
The Genie Company
22790 Lake Park Blvd.

Alliance, OH 44601-3498

Report Issue Date: 13 OCT 03
Sample S/N: None
Sample Receipt Date: October 01, 2003
Sample Test Date: see data sheets

Test Report Number: 03F289B
Model Designation: ACSD1G
Product Description: Garage Door Transmitter
Marketing Approval _____

Description of non-standard test method or test practice: ***None***

Estimated Measurement Uncertainty: ***Not Applicable***

Special limitations of use: ***None***

Traceability: ***reference standards of measurement have been calibrated by a competent body using standards traceable to the NIST.***

According to testing performed at Product Safety Engineering, Inc., the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in regulations indicated on page (3) of the test report. The test results contained herein relate only to the model(s) identified above. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Project Engineer, I hereby declare that the equipment tested as specified above conforms to the requirements indicated on page (3) of the test report.

Signature David Foerstner Name David Foerstner

Title Engineering Group Leader Date 10 OCT 03

Reviewed by:
Approved Signatory John Eldred Date 13 OCT 03

DIRECTORY - EMISSIONS

Product Safety Engineering, Inc 12955 Bellamy Brothers Blvd. Dade City, FL 33525
Tel (352) 588-2209 Fax (352) 588-2544

EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

□ - EN 50081-1 : 1992

□ - EN 50081-2 : 1995

□ - EN 55011 : 1998 / A1:1999 — □ - Group 1 — □ - Group 2

□ - Class A — □ - Class B

□ - EN 55013 : 1990 / A12:1994 / A13:1996 / A14:1999

□ - EN 55014 : 1993 /A1:1997

□ - Household appliances and similar

□ - Portable tools

□ - Semiconductor devices

□ - EN 55022 : 1998 — □ - Class A — □ - Class B

□ -AS/NZS 3548:1995 — □ - Class A — □ - Class B

□ - ICES-003 — □ - Class A — □ - Class B

□ - CNS 13438 — □ - Class A — □ - Class B

□ - VCCI : 1999 — □ - Class A — □ - Class B

■ - FCC Part 15 — □ - Class A — ■ - Class B

■ - Certification
□ - Verification
□ - Declaration of Conformity

□ - FCC Part 18

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Environmental conditions during testing:

	LAB	OATS
Temperature: *	_____	: _____
Relative Humidity: **	_____	: _____

* The ambient temperature during the testing was within the range of (50° - 104° F) unless indicted above.
** The humidity levels during the testing was within the range of (10% - 90%) relative humidity unless indicated above.

Power supply system : 3 (2x1.5V) Volts DC Hz Battery

Sign Explanations:

□ - not applicable
■ - applicable

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Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)* measurements were performed at the following test location:

■ - **Test not applicable**

□ - Darby Test Site (Open Area Test Site)
□ - Darby Laboratory

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number
□ -	8028-50	Solar	50 Ω LISN	829012, 829022
□ -	3825/2	Solar	50 Ω LISN	924840
□ -	EMC-30	Electro-Metrics	EMI Receiver	191
□ -	8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
□ -	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ -	85662A	Hewlett Packard	Analyzer Display	2403A07352
□ -	8028-50	Solar	50 Ω LISN	903725, 903726
□ -	FCC-TLISN-T4	Fisher Custom Com.	Telecom ISN	20072

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *RADIATED EMISSIONS (MAGNETIC FIELD)* measurements were performed at the following test location:

□ - Darby Test Site (Open Area Test Site)
□ -
□ -

at a test distance of :

□ - 3 meters
□ - 30 meters

■ - **Test not applicable**

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number
□ -	96005	Eaton	Log Periodic Antenna	1099
□ -	BIA-25	Electro-Metrics	Biconical Antenna	4283
□ -	8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
□ -	85662A	Hewlett-Packard	Analyzer Display	2403A07352
□ -	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ -	ALR-30M	Electro-Metrics	Loop Antenna	824
□ -	8447D	Hewlett Packard	Preamplifier	2944A06832
□ -	EMC-30	Electro-Metrics	EMI Receiver	191
□ -	ALA-130/A	Antenna Research	Loop Antenna	106

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Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location :

□ - Test not applicable

■ - Darby Site (Open Area Test Site)
□ - Darby Lab
□ -

at a test distance of :

■ - 3 meters
□ - 10 meters
□ - 30 meters

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number
■ -	96005	Eaton	Log Periodic Antenna	1099
■ -	BIA-25	Electro-Metrics	Biconical Antenna	4283
■ -	8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
■ -	85662A	Hewlett-Packard	Analyzer Display	2403A07352
■ -	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
■ -	8447D	Hewlett-Packard	Preamplifier (26dB)	2944A06832
□ -	EMC-30	Electro-Metrics	EMI Receiver	191
□ -	8568B	Hewlett Packard	Spectrum Analyzer	2407A03213
□ -	85650A	Hewlett Packard	Quasi-Peak Adapter	2043A00358
□ -	85662A	Hewlett Packard	Analyzer Display	2340A05806
□ -	LPA30	Electro-Metrics	Log Periodic	2280
□ -	BIA 30	Electro-Metrics	Biconical Antenna	3852

Emissions Test Conditions): INTERFERENCE POWER

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

■ - Test not applicable

□ - Darby Lab
□ -

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number
□ -	MDS-21	Rhode&Schwarz	Absorbing Clamp	8608447020
□ -	8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
□ -	85662A	Hewlett-Packard	Analyzer Display	2403A07352
□ -	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ -	8447D	Hewlett-Packard	Amplifier (26 dB)	2944A06832
□ -	EMC-30	Electro-Metrics	EMI Receiver	191

The *EQUIVALENT RADIATED EMISSIONS* measurements in the frequency range 1 GHz - 4 GHz were performed in a horizontal and vertical polarization at the following test location :

■ - Darby Test Site (Open Area Test Site)
□ -
□ -
□ -

at a test distance of:

□ - 1 meters
■ - 3 meters
□ - 10 meters

□ - Test not applicable

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number
■ -	8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
■ -	85662A	Hewlett-Packard	Analyzer Display	2403A07352
■ -	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
■ -	8449B	Hewlett-Packard	Preamplifier	3008A00320
■ -	3115	Electro-Mechanics	Double Ridge Guide Horn	3810

The *ANTENNA TERMINAL DISTURBANCE VOLTAGE* in the frequency range 30 MHz - 1,000 MHz were performed.

□ - Darby Test Site (Open Area Test Site)
□ - Laboratory
□ -
□ -

■ - Test not applicable

	Model Number	Manufacturer	Description	Serial Number
□ -	2F9-3C4-3C5	Wavecom	UHF PAL TV Modulator	185879
□ -	2F1-3C4-3C5	Wavecom	VHF PAL TV Modulator	157728
□ -	A-8000	IFR	Spectrum Analyzer	1306
□ -	8648B	Hewlett-Packard	Signal Generator	3623A01433
□ -	8648B	Hewlett-Packard	Signal Generator	3623A01477
□ -	LMV-182A	Leader	RMS Milli-Voltmeter	8010091
□ -	3202	Krhon-Hite	Active filter	5899
□-	FMT115	Leaming	FM Modulator	NONE
□ -	371	UDT	Optical power meter	06657
□ -	TSG95	Tektronix	PAL video / Audio generator	B028883
□-				

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Equipment Under Test (EUT) Test Operation Mode - Emission tests :

The device under test was operated under the following conditions during emissions testing:

□ - Standby

□ - Test program (H - Pattern)

□ - Test program (color bar)

□ - Test program (customer specific)

■ - Practice operation

□ - Normal Operating Mode

□ -

Configuration of the device under test:

■ - See System Under Test Information in Appendix B

Rationale for EUT setup / configuration:

ANSI C63.4

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Emission Test Results:

Conducted emissions 10/150/450 kHz - 30 MHz

The requirements are ☐ - **MET** ☐ - **NOT MET**

Minimum limit margin dB at MHz
Remarks:

Radiated emissions (magnetic field) 10 kHz - 30 MHz

The requirements are ☐ - **MET** ☐ - **NOT MET**

Minimum limit margin dB at MHz
Remarks:

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are ■ - **MET** ☐ - **NOT MET**

Minimum limit margin **10.9** dB at **390.0** MHz
Remarks:

Interference Power at the mains and interface cables 30 MHz - 300 MHz

The requirements are ☐ - **MET** ☐ - **NOT MET**

Minimum limit margin dB at MHz
Remarks:

Radiated emissions 1 GHz - 4 GHz

The requirements are ■ - **MET** ☐ - **NOT MET**

Minimum limit margin **16.6** dB at **1.170** GHz
Remarks:

Antenna Terminal Disturbance Voltage 30 MHz - 1,000 MHz

The requirements are ☐ - **MET** ☐ - **NOT MET**

Minimum limit margin dB at MHz
Remarks:

GENERAL REMARKS:

SUMMARY:

The requirements according to the technical regulations are

■ - met

□ - **not** met.

The device under test does

■ - fulfill the general approval requirements mentioned on page 3.

□ - **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date **October 02, 2003**

Testing End Date: **October 02, 2003**

- PRODUCT SAFETY ENGINEERING INC -

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Test-setup photo(s):
Conducted emission 450/150 kHz - 30 MHz

N/A

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Test-setup photo(s):
Radiated emission 30 MHz - 4000 MHz

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APPENDIX

A

Test Equipment Calibration Information

&

Test Data Sheets

TEST EQUIPMENT CALIBRATION INFORMATION

Manufacturer	Model	Description	Serial Number	Cal Due
Hewlett Packard	8566B	Spectrum Analyzer	2421A00526	08/14/04
Hewlett Packard	85662A	Display	2403A07352	08/14/04
Hewlett Packard	85650A	Quasi-Peak Adapter	2043A00209	08/14/04
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	2944A06832	11/13/03
Hewlett Packard	8568B	Spectrum Analyzer	2407A03213	08/14/04
Hewlett Packard	85662A	Display	2340A05806	08/14/04
Hewlett Packard	85650A	Quasi-Peak Adapter	2043A00358	08/14/04
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	2944A06901	08/02/03
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	1937A03247	07/17/04
Hewlett Packard	8449B	Preamp 1 - 26.5 GHz	3008A00320	11/08/03
Hewlett Packard	8648B	Signal Generator	3443U00312	04/24/04
Hewlett Packard	8672A	Signal Generator	2211A02426	11/14/03
Eaton	96005	Log Periodic Antenna	1099	01/24/04
Electro-Metrics	LPA 30	Log Periodic Antenna	2280	12/06/03
Electro-Metrics	BIA 30	Biconical Antenna	3852	12/05/03
Electro-Metrics	BIA 25	Biconical Antenna	4283	01/22/04
Electro-Mechanics	3115	Double Ridge Guide Ant.	3810	11/07/03
Electro-Metrics	ALR30M	Magnetic Loop Antenna	824	12/12/03
Solar	8012	LISN	924840	12/29/03
Solar	8028	LISN	829012/809022	12/19/03
Solar	8028	LISN	903725/903726	11/18/03
Schwartzbeck	MDS-21	Absorbing Clamp	02581	09/13/03
Leader	LFG1310	Function Generator	8060233	04/24/04
IFR Systems	A-8000	Spectrum Analyzer	1306	11/13/03
Electro-Metrics	EMC-30	EMI Receiver	191	04/24/04
Antenna Research	ALA-130/A	Loop Antenna	106	03/14/04
Radio Shack	63-867	Temp/Hygrometer	N/A	04/18/04
Radio Shack	63-867A	Temp/Hygrometer	N/A	04/28/04

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PRODUCT SAFETY ENGINEERING Data File: KEYPAD FCC-B 10-2-2003

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS ABS	dLIM dB	MODE	POL	SITE HGT cm	SITE AZM deg	CORR FACTOR dB	COMMENTS
1	60.07	40.0	14.9	-25.1	PK	V	100	1		
2	61.74	40.0	19.4	-20.6	PK	V	100	90		
3	68.89	40.0	16.1	-23.9	PK	V	100	180		
4	118.85	43.5	20.7	-22.8	PK	H	200	225		
5	390.021	46.0	81.3	35.3	PK	V	200	45		
6	512.34	46.0	23.0	-23.0	PK	H	200	90		
7	681.14	46.0	24.3	-21.7	PK	H	200	270		
8	728.39	46.0	24.9	-21.1	PK	V	100	135		
9	779.986	46.0	56.2	10.2	PK	V	200	45		

A3

Genie WKEP Transmitter

Measured @ 3 Meters

Frequency (GHz)	Spec Limit (dBμV/M)	Measurement (dBμV/M)	Δ Limit	Polarity	Height (cm)
1.170	72.2	55.6	-16.6	Vertical	100
1.560	72.2	46.6	-25.6	Vertical	100
1.950	72.2	37.5	-34.7	Vertical	100
2.340	72.2	36.3	-35.9	Vertical	100
2.730	72.2	32.0	-40.2	Vertical	100
3.120	72.2	32.1	-40.1	Vertical	100
3.510	72.2	32.2	-40.0	Vertical	100
3.900	72.2	32.0	-40.2	Vertical	100

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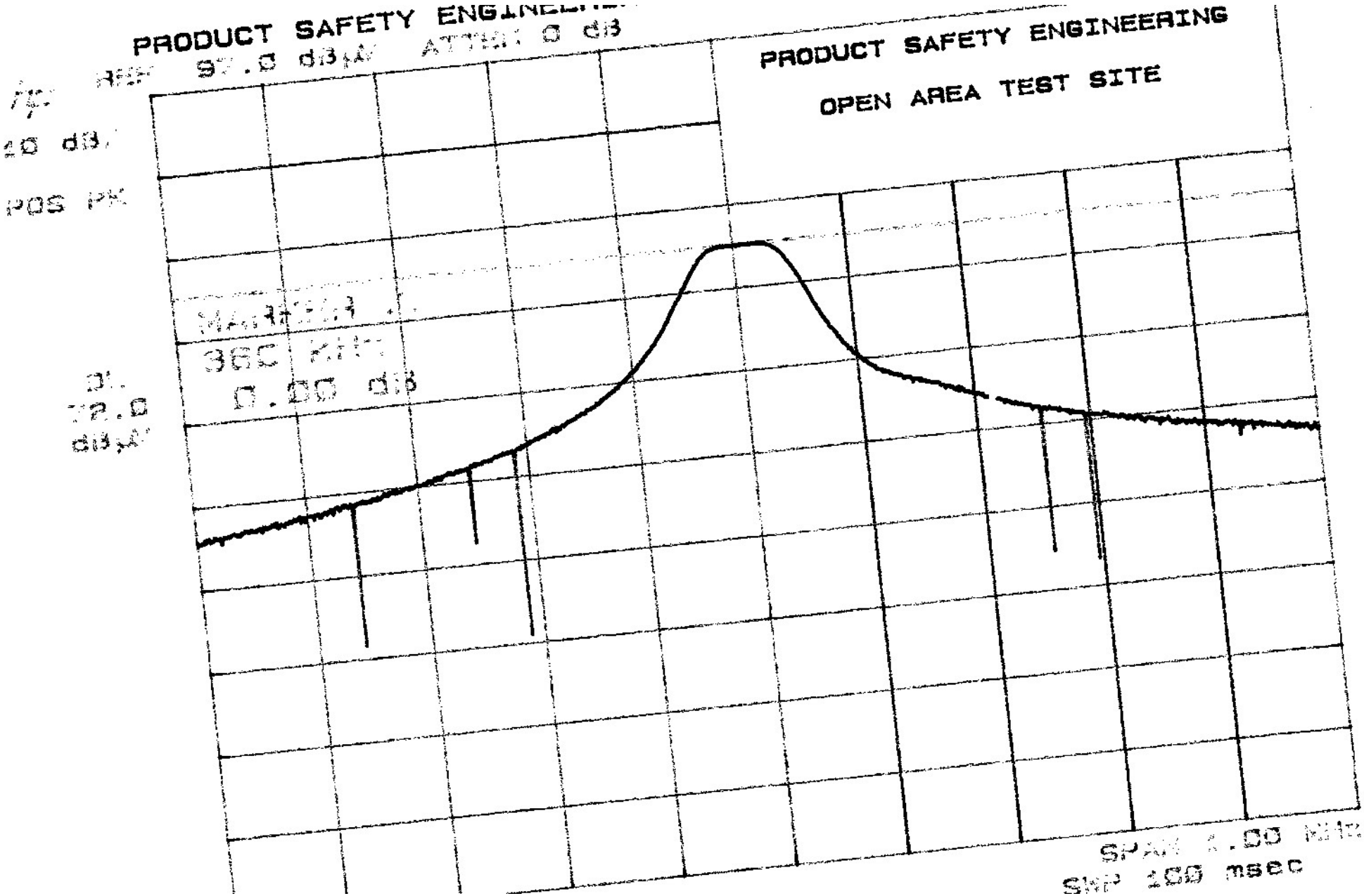

PRODUCT SAFETY ENGINEERING
PRODUCT SAFETY ENGINEERING
OPEN AREA TEST SITE
POS PK
SWP 100 msec

FIELD STRENGTH LIMIT CALCULATION

Per FCC Part 15.231

For Transmitter operating at 390 MHz, Peak Limit for Fundamental Frequency:

Limit uV/M = 3750 + ((Fundamental MHz - 260) 41.6667)

Limit uV/M = 3750 + ((390 - 260) 41.6667) =(3750 + (130 X 41.6667)) =
(3750 + 5,416.6) =9166.6 uV/M

Fundamental Limit in dBuV/M = 20 log (9166.6) = 79.2 dBuV/M

For Transmitter operating at 390 MHz, Limit for Spurious Emissions is 20 dB down
Therefore Spurious Limit is 79.2 - 20 = 59.2 dBuV/M

CALCULATION FOR DUTY CYCLE ADJUSTMENT

Sample of 100 ms pulse train (see plot#1)
52.0 ms "completely off time"
43.0 ms "mixed on/off time"
5.0 ms mostly on time which we will count as completely on

Examining the 43.0 ms of "mixed on/off time", we see that each 5.0 ms frame of mixed has six " short on pulses" of 200 uS and two " long on pulses" of 420 uS (per plots #2 & #3)

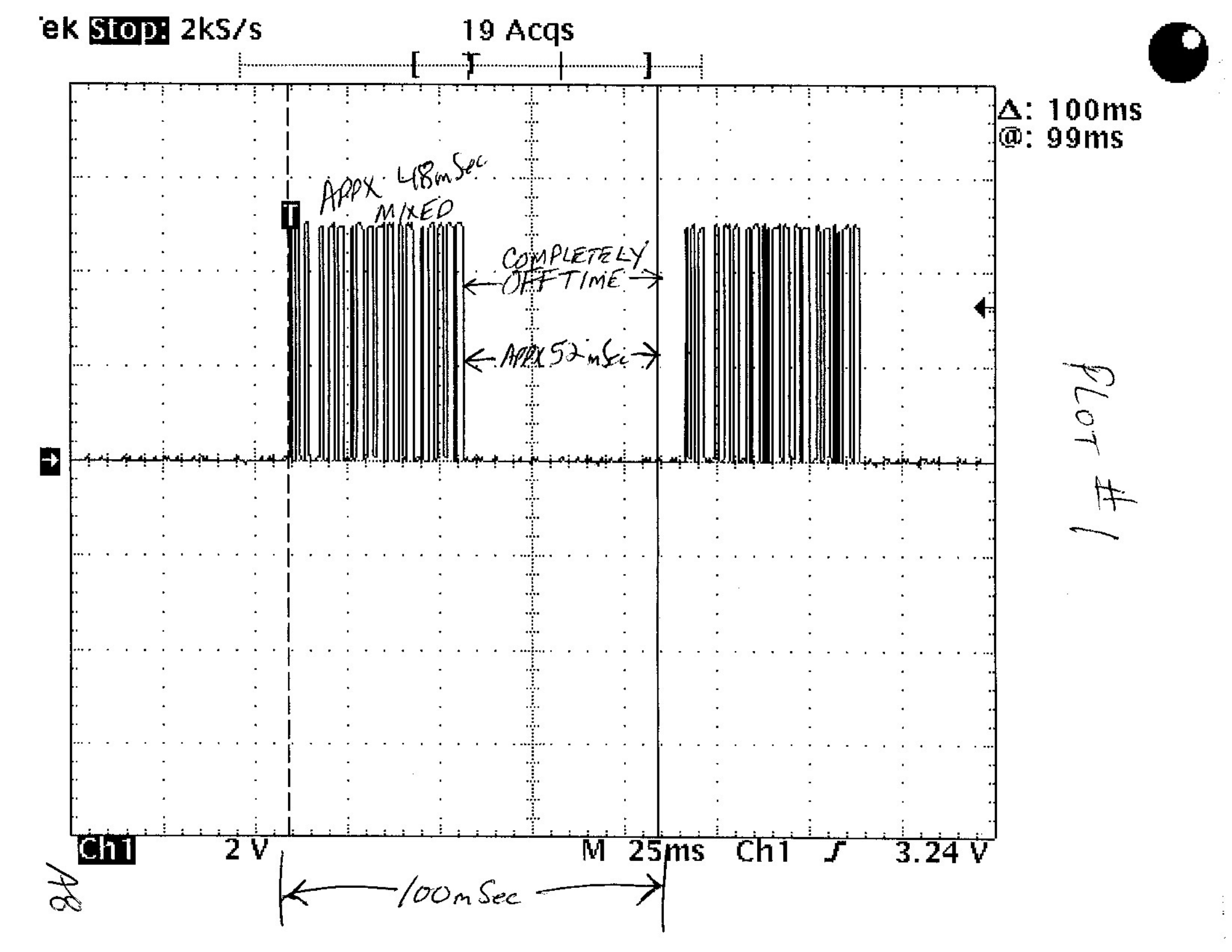
Calculating the "on time" for mixed: 6 X 200 us = 1.2 ms and 2 X 420 us = 0.8 4ms
Combining 1.2 ms + 0.84 ms = 2 ms "on time" per each 5 ms frame, so there is 4 ms "on time" per each 10 ms frame.

Therefore in 43 ms of mixed there is **4.3 X 4.0 = 17.2 ms of "on time"** and
43 -17.2 = 25.8 ms of "off time".

Combining completely off time of 52 ms with mixed off time of 25.8ms we get:
52 + 25.8 ms = 77.8 ms "total off time" which means total on time at most is
100ms (total train) - 77.8 = 22.2 ms of "on time" maximum

To determine the correction factor for comparing to the Average limit
20 log (on time/ total time) = 20 log (22.2/100) = 20 log (0.222) = (-13.0) dB

The Peak Limit for fundamental as determined previously is 79.2 dBuV/M
Thus Average Limit is 79.2 dBuV/M + 13.0 dB = 92.2 dBuV/M (Fundamental)
And Average Limit for the Spurious Emissions is 92.2 - 20 dB = 72.2dBuV/M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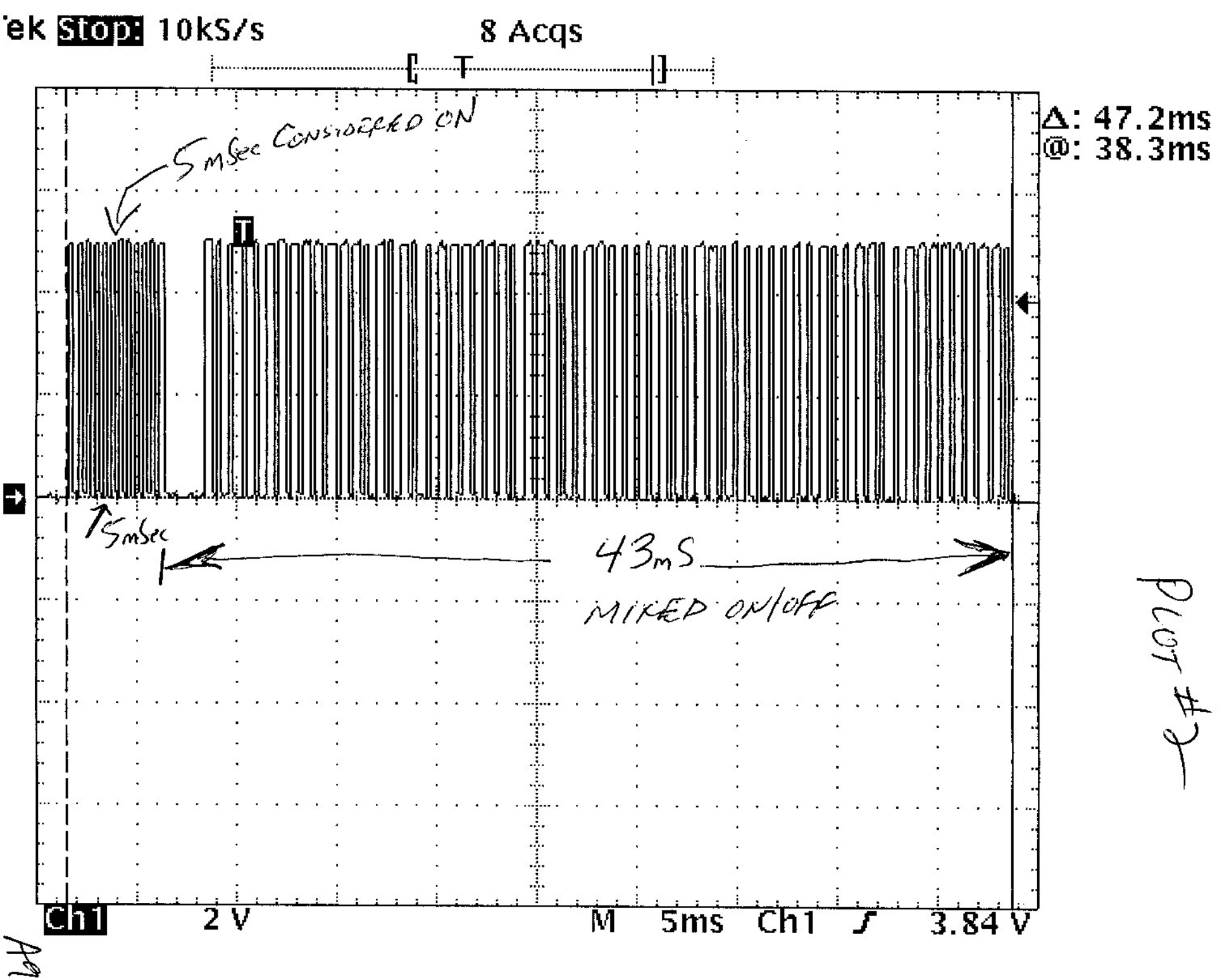
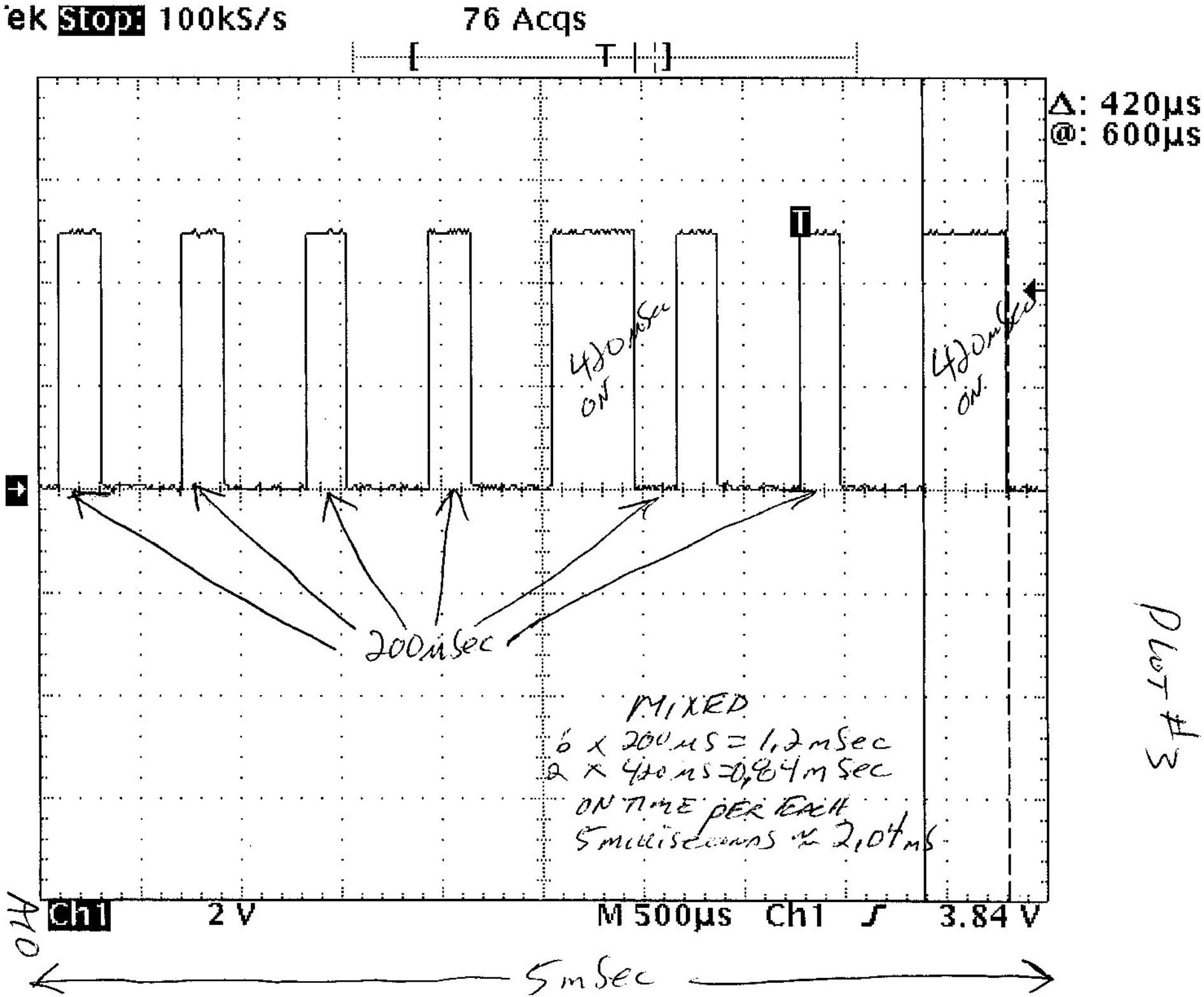
19 Acqs
Δ: 100ms
@: 99ms
APPX 48mSec
MIXED
COMPLETELY
OFF TIME
APPX 52mSec
Ch1 2 V
M 25ms Ch1 ƒ 3.24 V
100mSec
PLOT #1
24

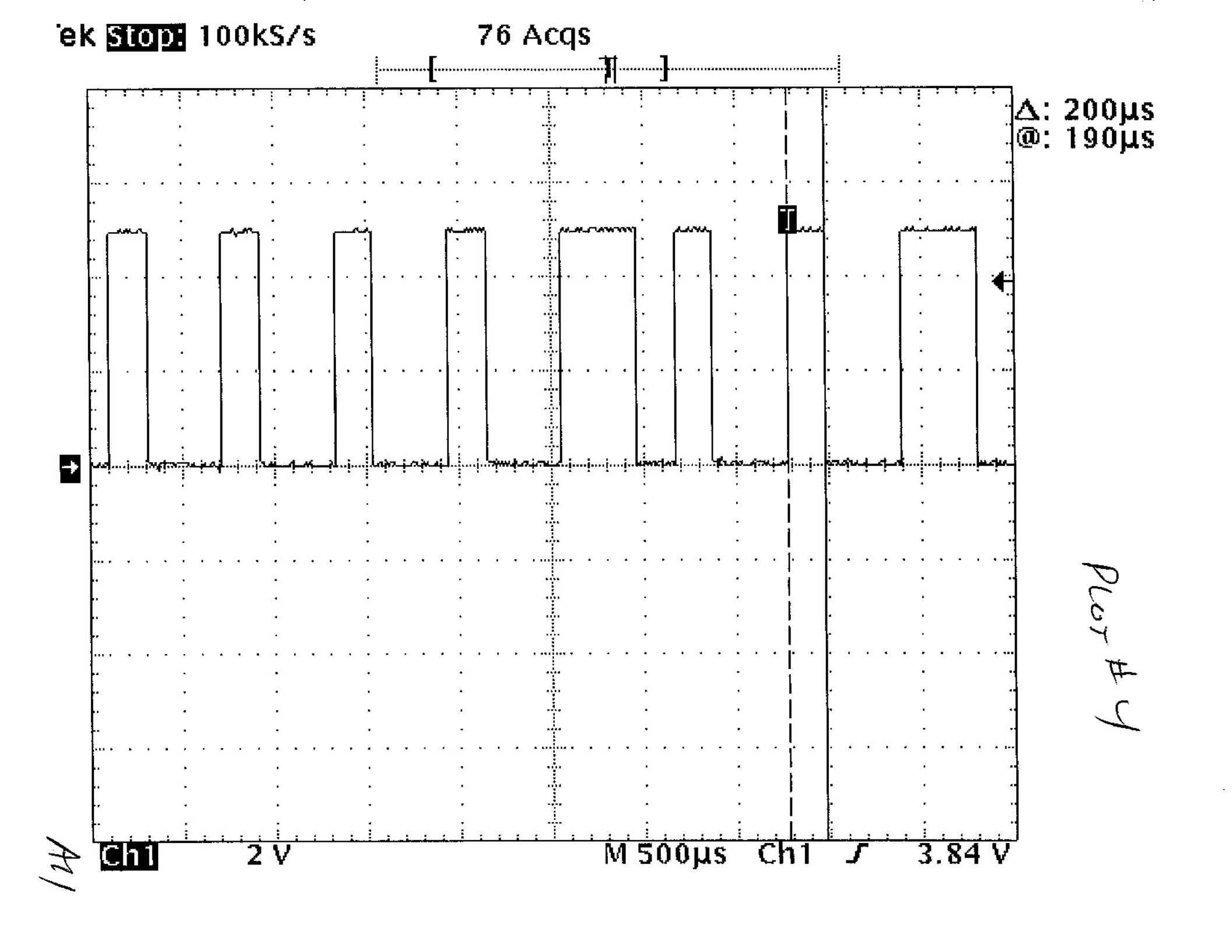

ek Stop: 10kS/s
8 Acqs
T
Δ: 47.2ms
@: 38.3ms
5mSec CONSIDERED ON
T
5mSec
43mS
MIXED ON/OFF
Ch1 2 V
M 5ms Ch1 ∫ 3.84 V

Plot #2

Ag


ek Stop: 100kS/s
76 Acqs
Δ: 420µs
@: 600µs
420mSec ON
420mSec ON
200mSec
MIXED
6 x 200mS = 1,2mSec
2 x 420mS = 0,84mSec
ON TIME PER EACH
5 milliseconds = 2,04mS
Ch1 2 V
M 500µs Ch1 3.84 V
5mSec

Plot #3



Plot #4

14

APPENDIX

B

System Under Test Description

Product Safety Engineering, Inc 12955 Bellamy Brothers Blvd. Dade City, FL 33525
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SYSTEM COMPONENTS

****

DEVICE TYPE: EUT, GENIE WKEP GARAGE DOOR TRANSMITTER

****

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INTERFACE CABLES

****

DEVICE TYPE: EUT NONE
SHIELD:
LENGTH:
CONNECTOR TYPE:
PORT:

****

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AC LINE CORDS

****

DEVICE TYPE: EUT NONE
SHIELD:
LENGTH:
CONNECTOR TYPE:

****

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APPENDIX

C

Measurement Protocol

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The test methodology followed during the collection of the data included within this technical report was ANSI C63.4:1992.

The EUT was powered with 3 Volts DC during the collection of data included within.

The data is compared to the FCC Part 15 Class B limits.

The "EMI" instrumentation is capable of calculating the final emission level based on the following formula:

Level at the receiver (dBµV) + Antenna Correction Factor (dB/M) + Cable Loss (dB) - Preamp Gain (dB) = Actual Level in dBµV/M.

The sample calculation below is based on the actual test data collected:

Observed Level		**88.1**	dBµV	
ACF	+	**16.7**	dB/M	
Cable Loss	+	**2.6**	dB	
Preamp Gain	-	**26.0**	dB	
Actual Level		**81.3**	dBµV/M	@ 390.0 MHz

Please have a company official review this report and sign.

_____

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