ELITE ELECTRONIC ENGINEERING COMPANY
1516 CENTRE CIRCLE
DOWNERS GROVE, ILLINOIS 60515-1082

ELITE PROJECT: 24949 DATES TESTED: Aug 22-28 and Sept 25, 1996

TEST PERSONNEL: Daniel E. Crowder; R.J. Klouda

TEST SPECIFICATION: FCC "Code of Federal Regulations" Title 47
Part 74 and Part 2, Para. 2.993

ENGINEERING TEST REPORT NO. 19167

MEASUREMENT OF RADIATED INTERFERENCE FROM

A MODEL REPLY DL KEYPAD TRANSMITTER

FOR: Fleetwood Electronics
Holland, Michigan

PURCHASE ORDER NO.: P8540

Report By:
Daniel E. Crowder

Witnessed By:
Harry Derks
Acil Couch
Fleetwood Electronics

Approved By:
Raymond J. Klouda
Registered Professional
Engineer of Illinois - 44894

ENGINEERING TEST REPORT NO. 19167

ADMINISTRATIVE DATA AND SUMMARY OF TESTS

DESCRIPTION OF TEST ITEM: Transmitter

MODEL NO: Reply DL Keypad **SERIAL NO:** None Assigned

MANUFACTURER: Fleetwood Electronics

APPLICABLE SPECIFICATIONS: FCC "Code of Federal Regulations" Title 47, Part 74 and Part 2, Para. 2.993

QUANTITY OF ITEMS TESTED: One (2)

TEST PERFORMED BY: ELITE ELECTRONIC ENGINEERING COMPANY
Radio Interference Consultants
Downers Grove, Illinois 60515

DATES TESTED: Aug 22-28 and Sept 25, 1996

PERSONNEL (OPERATORS, OBSERVERS, AND CO-ORDINATORS):
CUSTOMER: Acil Couch and Harry Derks
ELITE ELECTRONIC: Daniel E. Crowder

ELITE JOB NO.: 24949

ABSTRACT: The Model Reply DL Keypad Transmitter, in the transmit mode, does meet the RF Power, the modulation characteristics, the occupied bandwidth, the spurious emissions at antenna terminals, the field strength of spurious radiation, and frequency stability of the FCC "Code of Federal Regulations", Title 47, Part 74. See test results and data pages for more details.

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MEASUREMENT OF RADIATED INTERFERENCE FROM

A MODEL REPLY DL KEYPAD TRANSMITTER

1.0 INTRODUCTION:

1.1 DESCRIPTION OF TEST ITEM: This report presents the results of a series of radio interference measurements which were performed on two Model Reply DL Keypad Transmitters, (hereinafter referred to as the test item). No serial numbers were assigned to the test items. Two test item's were tested. One was set for a high end frequency (803.3MHz) and the other was set for a low end frequency (800.3MHz). The test item's were powered by a 9.0 volt DC battery. The tests were performed for Fleetwood Electronics of Holland, Michigan.

1.2 PURPOSE: The test series was performed to determine if the test item meets the type acceptance test requirements of the FCC "Code of Federal Regulations" Title 47, Part 74.

1.3 APPLICABLE DOCUMENTS: The following documents of the exact issue designated form part of this document to the extent specified herein:

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 2 and 74, dated 1 October 1995

1.4 SUBCONTRACTOR IDENTIFICATION: This series of tests was performed by the Elite Electronic Engineering Company, radio interference consultants of Downers Grove, Illinois.

2.0 TEST ITEM SETUP AND OPERATION:

The test item operates in the frequency range of 800MHz to 804MHz, with approximately 0.5 milliwatts of power into an integral antenna.

For all tests the test item was placed on a 1 meter high non-conductive stand.

For all tests, the test item was energized.

For all tests, the test item was set to transmit continuously. Transmission was verified by observation of a display which was lit whenever the transmit button was enabled.

Since the test item is battery powered, it was ungrounded during the tests.

3.0 TEST EQUIPMENT:

A list of the test equipment used can be found on Table I. All equipment was calibrated per the instruction manuals supplied by the manufacturer.

4.0 REQUIREMENTS, PROCEDURES AND RESULTS:

4.1 RF POWER OUTPUT:

4.1.1 REQUIREMENTS: In accordance to Paragraph 74.861(((e)1)i); Except where otherwise specifically provided, the maximum power that will be authorized is as follows: The maximum output power for a transmitter that operates in the 614MHz to 806MHz frequency range shall not exceed 250 milliwatts.

4.1.2 PROCEDURES: Since the test item is equipped with an integral antenna, the effective radiated power (ERP) was measured instead of the output power. The measurement equipment was connected to the receiving antenna 3 meters away from the test item. The test item was set to transmit. The level was maximized and recorded.

The ERP into a dipole antenna was calculated from the field intensity levels measured at 3 meters using the equation shown below:

$Pg = E^2 4\pi d^2/120\pi = E^2 d^2/30$

where P = power in watts
g = arithmetic gain of transmitting antenna over isotropic radiator.
E = maximum field strength in volts/meter
d = measurement distance in meter

Using a dipole gain of 1.67 or 2.2 dB and a test distance of 3 meters, this equation reduces to:

P(dBm) = E(dBuV/m) - 97.2dB

4.1.3 RESULTS OF TESTS: Data page 101 shows the results of the measured ERP. As can be seen from this data page, the maximum ERP was 0.58 mW is below the 250 milliwatt limit.

4.2 MODULATION CHARACTERISTICS:

4.2.1 REQUIREMENTS: In accordance to Paragraph 74.861, the maximum deviation shall not exceed 75 kHz.

4.2.2 PROCEDURES:

4.2.2.1 PROCEDURES FOR FREQUENCY RESPONSE OF AUDIO CIRCUIT: An audio signal generator was connected to the microphone input through a 1 uf blocking capacitor. A audio spectrum analyzer was connected across the output stage of the audio circuit where it connects to the VCO. With the input voltage set to 1 mV (mid-level) the frequency was varied from 100 Hz to 10 kHz. The output voltage at selected frequency was measured and recorded.

4.2.2.2 PROCEDURES FOR MODULATION LIMITING : The measurement receiver was connected to a probe antenna that was placed near the test item. The receiver was tuned to the test item's frequency and then set to measure the FM deviation. The microphone element was removed and an audio signal generator was connected in its

place.

The audio signal generator frequency was set to 300 Hz. While varying the input level, the resulting FM deviation was measured and recorded. This step was repeated at modulating frequencies of 1000Hz, 3000Hz and 5000Hz).

4.2.3 RESULTS: The modulation characteristics are shown on data page 102.

The audio response was fairly linear up to 3.5 kHz after which the response leveled off.

The maximum deviation measured 73 kHz. This deviation was achieved with an input voltage of 1.7 mV at 3000 Hz.

4.3 OCCUPIED BANDWIDTH MEASUREMENTS:

4.3.1 REQUIREMENTS: In accordance with paragraph 74.209(c); The mean power of any emission shall be attenuated below the mean output power in accordance with the following schedule:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth of 200 kHz: at least 25 decibels;

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth of 200 kHz: at least 35 decibels;

(3) On any frequency removed from the assigned frequency by more than 250 percent: at least 43 plus 10 log (mean output power in watts) decibels or 80 decibels, whichever is the lesser attenuation.

4.3.2 PROCEDURES: The measurement equipment was connected to a probe antenna that was placed near the test item. The unit was

set to transmit continuously. The transmitter was modulated by a 3000Hz signal at an audio level of 5.4 millivolts. This level was 16dB higher than the audio level found to produce 50% modulation. The emissions near the fundamental frequency were plotted. The test was repeated with the input level that produced the maximum deviation (1.7 mV at 3000 Hz).

4.3.3 RESULTS: The plot of the emissions near the fundamental frequency of 800MHz are presented on data page 103 and 104. As can be seen from this data page, the transmitter met the occupied bandwidth requirements.

4.4 FIELD STRENGTH OF SPURIOUS EMISSIONS:

4.4.1 PRELIMINARY RADIATED MEASUREMENTS:

4.4.1.1 REQUIREMENTS: Because emission levels in the open field may be masked by interference from sources other than the test item, preliminary radiated measurements are first performed in the low ambient environment of a shielded enclosure. Radiated emissions from the test item were therefore first measured and automatically plotted using a peak detector. The frequencies with significant emission levels were then manually remeasured in the open field.

4.4.1.2 PROCEDURES: All preliminary tests were performed in a 17ft. x 20ft. x 8ft. high shielded enclosure. The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

The preliminary measurements were performed with the test item transmitting at 800.2 MHz and repeated with the test item transmitting at 803.2MHz. The broadband measuring antenna was positioned at a 1 meter distance from the test item. The entire frequency range from 30MHz to 10GHz was investigated using a peak detector function.

4.4.1.3 RESULTS: The preliminary plots are presented on data pages 107 through 111. This data is only presented for a reference, and is not used as official data. All significant radiated emissions with the test item transmitting at 800.2MHz and 803.2MHz were subsequently measured at Elite Electronic Engineering Company's open field test site in accordance with the FCC "Code of Federal Regulations", Title 47, Part 2, para. 2.993.

4.4.2 FINAL RADIATED EMISSIONS:

4.4.2.1 REQUIREMENTS: The test methods of FCC "Code of Federal Regulations", Title 47, Part 2, para. 2.993 regarding field strength of spurious radiation were used in performing these tests with the test item in the transmit mode. According to FCC Part 74, the spurious emissions shall be 43 + 10log dB below the mean output power which translates to an equivalent power level of -13 dBm into a dipole antenna.

4.4.2.2 PROCEDURES: Final open field measurements were manually performed at Elite's open field test site located in Downers Grove, Illinois. The open field test site is located in a clear area and is constructed in accordance with Appendix B, FCC/OST 55 (1982). The test site is equipped with a 1/4-inch wire mesh ground plane.

The final open field emission test procedure is as follows:

a) The test item was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna.

b) The antenna output was terminated in a 50 ohm load.

c) A tuned dipole, or double ridged waveguide antenna was placed on an adjustable height antenna mast 3 meters from the test item for emission measurements.

d) Detected emissions were maximized at each frequency by rotating the test item and adjusting the receive antenna height and polarization. The maximum meter reading was recorded.

The equivalent power into a dipole antenna was calculated from the field intensity levels measured at 3 meters using the equation shown below:

$$Pg = E^2 4\pi d^2 / 120\pi = E^2 d^2 / 30$$

where P = power in watts
g = arithmetic gain of transmitting antenna over isotropic radiator.
E = maximum field strength in volts/meter
d = measurement distance in meter

Using a dipole gain of 1.67 or 2.2 dB and a test distance of 3 meters, this equation reduces to:

$$P(dBm) = E(dBuV/m) - 97.2dB$$

4.4.2.3 RESULTS OF OPEN FIELD RADIATED TEST: The final open field radiated levels are presented on data pages 107 and 108. As can be seen from this data, the emissions up through the 10th harmonic met the specification requirements.

4.5 FREQUENCY STABILITY:

4.5.1 REQUIREMENTS: In accordance with Paragraph 74.861, a

licensee in the services governed by this part shall maintain the carrier frequency of each authorized transmitter within the designated percentage of the assigned frequency. A 614MHz to 806MHz transmitter shall have a frequency stability of 0.005 percent.

4.5.2 PROCEDURES: Two separate procedures were performed for each of the two tests which are as follows:

(a) Frequency Stability vs. Temperature

(1) The test item was placed in a Thermotron temperature chamber. The test item was powered up.

(2) The measurement equipment was connected to the test item's antenna port.

(3) The ambient room temperature was recorded and a reference frequency was recorded.

(4) The temperature was varied from -30 to +50 degrees centigrade in 10 degree increments. The test item was allowed to soak from 30 to 45 minutes at each temperature. After this time period the unit was set to transmit and the frequency recorded.

(b) Frequency Stability vs. Voltage:

(1) The measurement equipment was connected to the test item's antenna port.

(2) The nominal voltage to the test item is 9.0 VDC. The test item was set to transmit and a reference frequency was recorded.

(3) The input voltage was adjusted to 85 percent of the nominal voltage or 7.65 VDC and the test item set to transmit. This frequency was recorded.

(4) The input voltage was adjusted to 115 percent of the nominal voltage or 10.35 VDC and the test item set to transmit. This frequency was recorded.

4.5.3 RESULTS OF TESTS: The results of the frequency stability tests can be found on data pages 109 and 110. As can be seen from the data, the frequency is within the 0.005 percent tolerance.

5.0 CONCLUSION:

It was found that the Fleetwood Electronics Model Reply DL Keypad Transmitter, did comply with the requirements of the FCC "Code of Federal Regulations" Title 47, Part 74 as measured per Part 2, para. 2.993.

6.0 CERTIFICATION:

Elite Electronic Engineering Company certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the test specification.

The data presented in this test report pertains to the test item at the test date.

ENGINEERING TEST REPORT NO. 19167

TABLE I: TEST EQUIPMENT LIST

ELITE ELECTRONIC ENGINEERING

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Cal Inv	Due Date
Equipment Type: ACCESSORIES, MISCELLANEOUS								
XZG0	ATTENUATOR/SWITCH DRIVER	HEWLETT PACKARD	11713A	3439A00325	---	01/31/96	12	01/31/97
Equipment Type: AMPLIFIERS								
APK0	PREAMPLIFIER	HEWLETT PACKARD	8449B	3008A00662	1-26.5GHZ	01/31/96	12	01/31/97
Equipment Type: ANTENNAS								
NBF1	BICONICAL ANTENNA	ELECTRO-METRICS	BIA-25	8-09	20-220MHZ	07/11/96	12	07/11/97
NSB4	LOG SPIRAL ANTENNA	ELECTRO-METRICS	LCA-25	8-36	200-1000MHZ	07/10/96	12	07/10/97
NTA1	BILOG ANTENNA	CHASE EMC LTD.	BILOG CBL611	2057	.03-2GHZ	04/24/96	12	04/24/97
NWG0	DOUBLE RIDGED WAVEGUIDE	AEL	H1479	104	1-12.4GHZ	07/15/96	12	07/15/97
Equipment Type: CONTROLLERS								
CCB0	CALCULATOR	HEWLETT PACKARD	9825B	1622A06230	---		N/A	
CDA1	COMPUTER	HEWLETT PACKARD	9836	2143A02590	---		N/A	
CDA2	COMPUTER	HEWLETT PACKARD	9836	2143A00777	---		N/A	
CTB0	TEMP. RECORDER/CONTR.	BRISTOL	TE-2T500FFS4	66A25927	-100 TO +250 F	07/12/96	6	01/12/97
Equipment Type: METERS								
MFC0	MICROWAVE FREQ. COUNTER	HEWLETT PACKARD	5343A	2133A00591	10HZ-26GHZ	05/17/96	12	05/17/97
MMM5	MULTIMETER	FLUKE CORP.	76	64371304	I;VDC;VAC;R	05/29/96	12	05/29/97
Equipment Type: PRINTERS AND PLOTTERS								
HLI0	X-Y PLOTTER W/ HPIB	HEWLETT PACKARD	7440A	2929L08284	---		N/A	
HRB1	PRINTER	HEWLETT PACKARD	2631B	2235A27896	---		N/A	
Equipment Type: RECEIVERS								
RAB0	SPECTRUM ANALYZER	HEWLETT PACKARD	8568A	1818A00258	100HZ-1.5GHZ	01/29/96	12	01/29/97
RAC0	SPECTRUM ANALYZER	HEWLETT PACKARD	8566B	2449A01117	100HZ-22GHZ	02/02/96	12	02/02/97
RAC1	SPECTRUM ANALYZER	HEWLETT PACKARD	8566B	3407A08369	100HZ-22GHZ	01/31/96	12	01/31/97
RACA	RF PRESELECTOR	HEWLETT PACKARD	85685A	2926A00980	20HZ-2GHZ	01/30/96	12	01/30/97
RACB	RF PRESELECTOR	HEWLETT PACKARD	85685A	3506A01491	20HZ-2GHZ	01/31/96	12	01/31/97
RAF1	QUASIPEAK ADAPTER	HEWLETT PACKARD	85650A	2043A00271	0.01-1000MHZ	01/30/96	12	01/30/97
RAF2	QUASIPEAK ADAPTER - FL	HEWLETT PACKARD	85650A	2043A00245	0.01-1000MHZ		12	
RYA0	MODULATION METER	RADIOMETER	AFM3	238195	7-1000MHZ	05/03/96	24	05/03/98
RYC0	DYNAMIC SIGNAL ANALYZER	HEWLETT PACKARD	3561A	2338A00389	0-100KHZ	01/29/96	12	01/29/97
Equipment Type: SIGNAL GENERATORS								
GDA0	SIGNAL GENERATOR - FL	HEWLETT PACKARD	614A	640-03876	1-2GHZ	03/12/93		
GWF0	WAVEFORM GENERATOR	HEWLETT PACKARD	33120A	US34013437	100UHZ-15MHZ	09/19/95	12	09/19/96

Cal. Interval: Listed in Months I/O: Initial Only N/A: Not Applicable

Note 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

ENGINEERING TEST REPORT NO. 19167

DATA SHEET

MANUFACTURER : Fleetwood Electronics
TEST ITEM : Transmitter
MODEL : Reply DL Keypad
SERIAL NUMBER : None Assigned
TEST PERFORMED : FCC Part 74 RF Output Power *
DATE TESTED : August 23, 1996

FREQ MHz	ANT POL	METER READING dBuV	CABLE LOSS dB	ANTENNA FACTOR dB	CONV. FACTOR dB	ERP dBm	ERP mW	LIMIT mW
800.2	Hor	70.1	4.0	19.8	-97.2	-3.3	0.47	250
800.2	Vert	68.2	4.0	19.8	-97.2	-5.2	0.30	250
803.2	Hor	71.0	4.0	19.8	-97.2	-2.4	0.58	250
803.2	Vert	69.8	4.0	19.8	-97.2	-3.6	0.44	250

* Output power could not be measured directly since the unit has an integral antenna. Instead, the Effective Radiated Power (ERP) into a dipole was measured in the open field and compared to the limit.

Checked By: RJK

ENGINEERING TEST REPORT NO. 19167

DATA SHEET

MANUFACTURER : Fleetwood Electronics
TEST ITEM : Transmitter
MODEL : Reply DL Keypad
SERIAL NUMBER : None Assigned
TEST PERFORMED : FCC Part 74 RF Modulation Characteristics
DATE TESTED : September 25, 1996

AUDIO RESPONSE - FREQUENCY VS. OUTPUT:

Input Level = 1 mV

Freq (Hz)	Output (mV)	Freq (Hz)	Output (mV)	Freq (Hz)	Output (mV)
100	85	900	250	4000	480
200	120	1000	270	4500	490
300	140	1200	300	5000	500
400	160	1500	340	6000	510
500	180	2000	390	7000	515
600	200	2500	420	8000	520
700	220	3000	450	9000	520
800	240	3500	470	10000	520

Input through 1 uF capacitor to microphone input.
Output measured across compression stage into the VCO.

MODULATION LIMITING - INPUT VS. FM DEVIATION :

Input (mV) FM Deviation (kHz)

Mod. Freq (Hz):	300	1000	3000	5000
0.3	--	7.6	14.0	13.0
0.4	--	--	18.5	17.0
0.5	4.1	12.0	23.0	21.0
0.6	--	--	28.0	26.0
0.7	5.7	17.0	--	--
0.8	--	--	35.0	33.0
1.0	8.6	24.5	45.0	42.0
1.2	--	--	52.0	49.0
1.5	12.0	36.0	70.0	60.0
1.7	--	--	73.0*	60.0
2.0	16.0	48.0	68.0	56.0
2.5	20.0	60.0	57.0	49.0
3.0	24.0	54.0	53.0	46.0

* Max. Deviation = 73.0 kHz at 3000Hz with an input of 1.7 mV

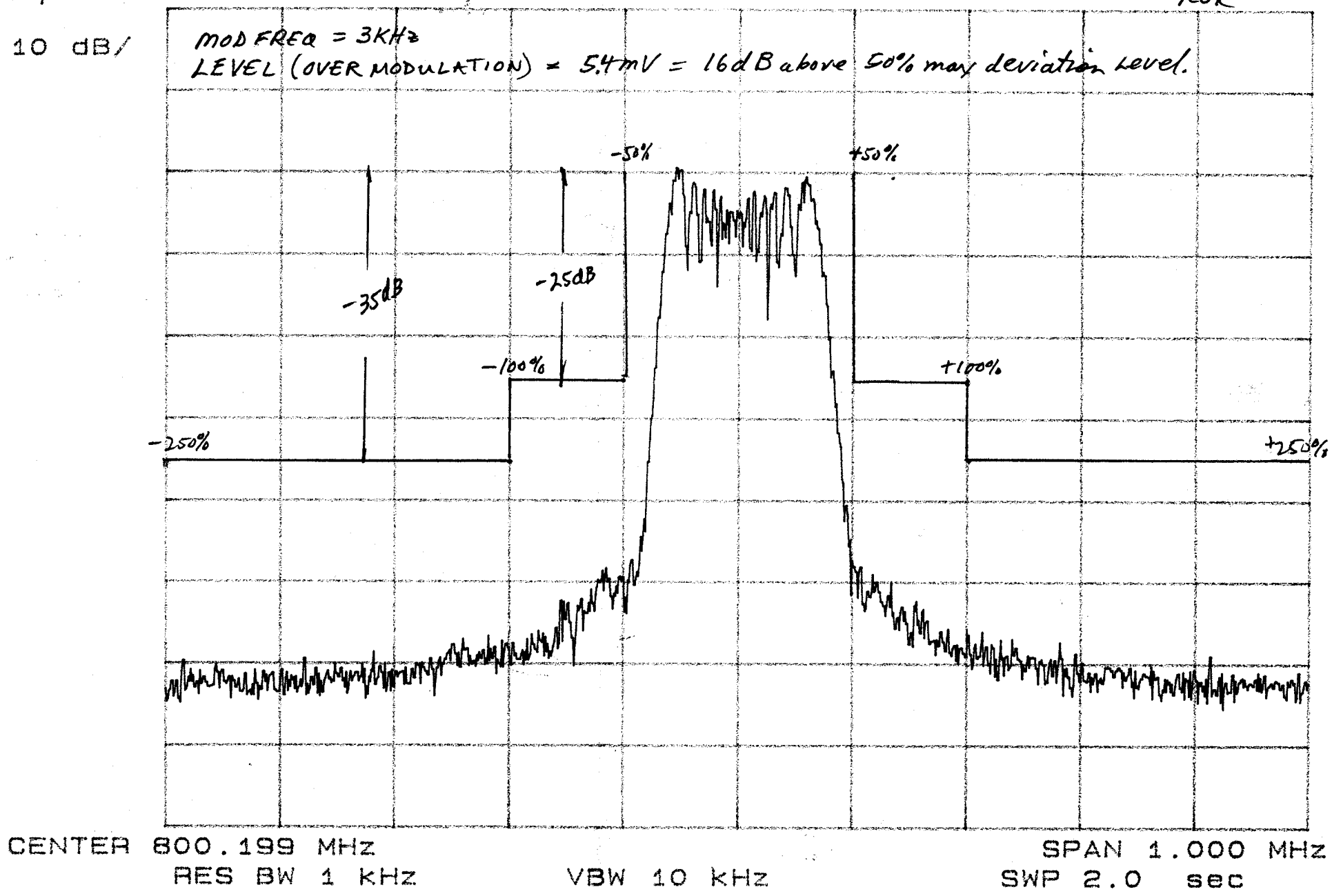
Overmodulation Level for BW Measurement:
(+16dB above 50% of max) = 3kHz at 5.1 mV

Necessary Bandwidth: 2M + 2D = 2(3.5k) + 2(73k) = 153k
Emission Designator: 153kF3E

RJK

OCCUPIED BANDWIDTH
FLEETWOOD M/N REPLY DL KEYPAD

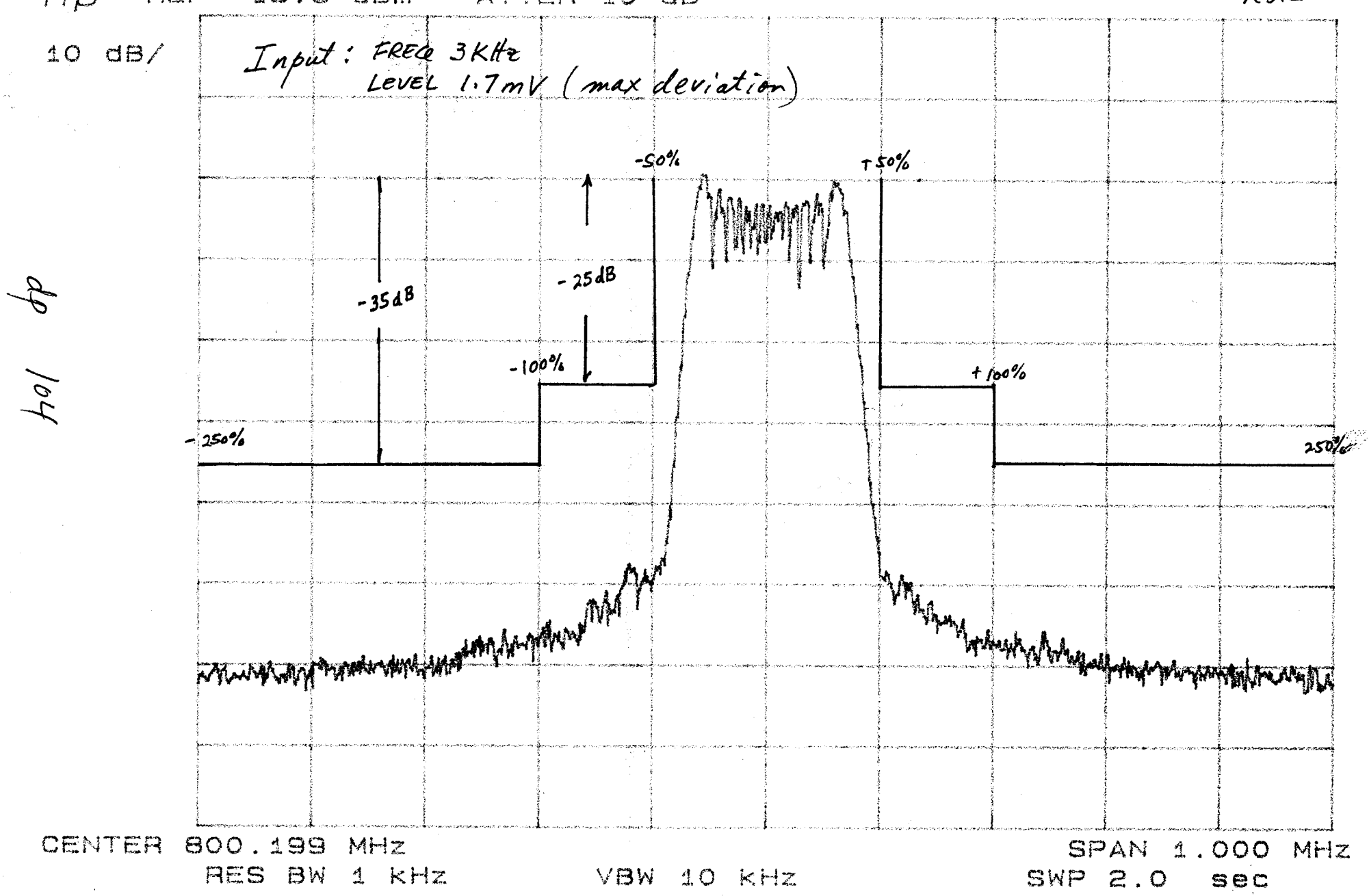
9-25-96
RJK



dp 103

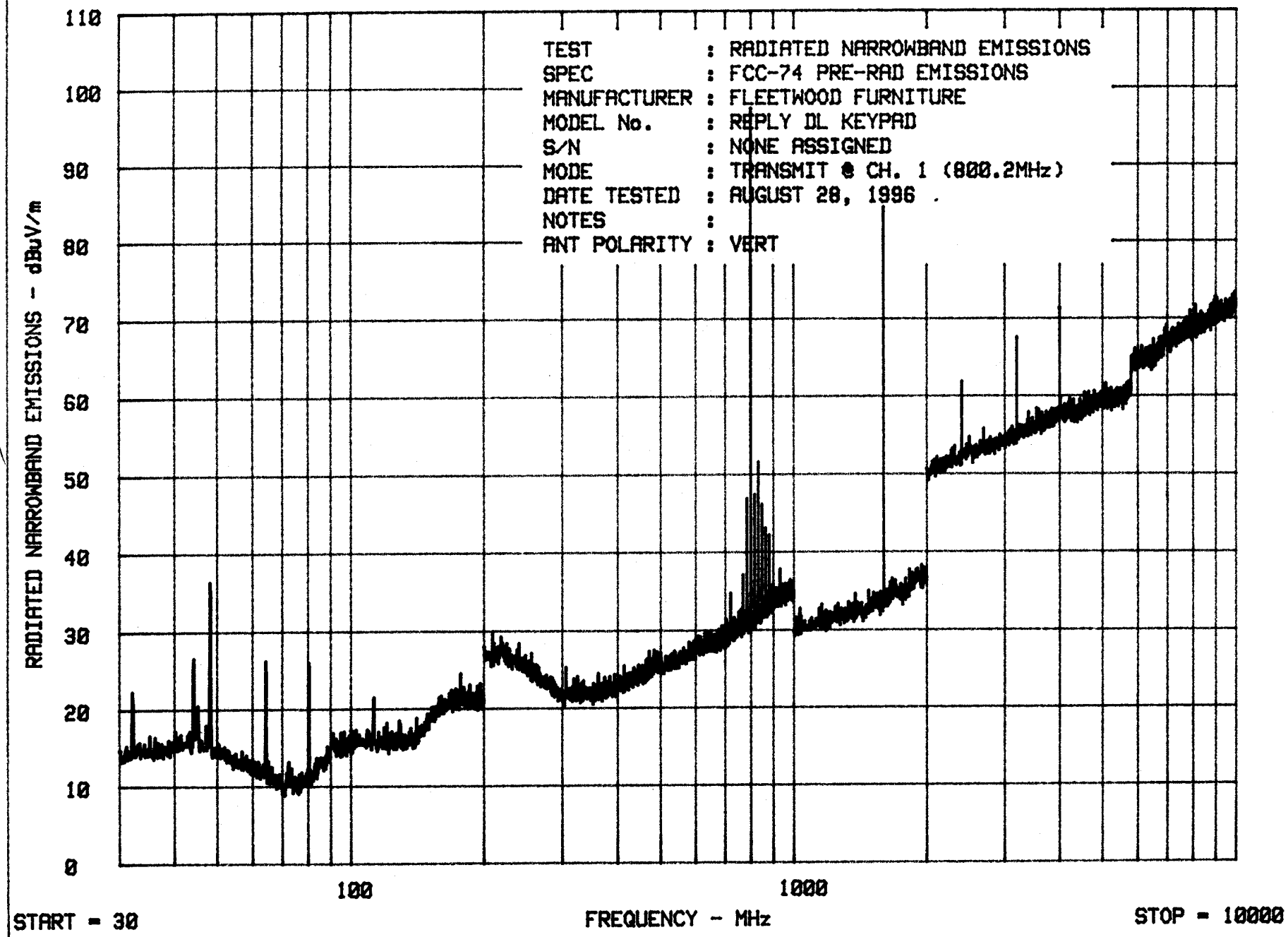
OCCUPIED BANDWIDTH -
FLEETWOOD M/N REPLY DL KEYPAD

9-25-96
RJK



ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515



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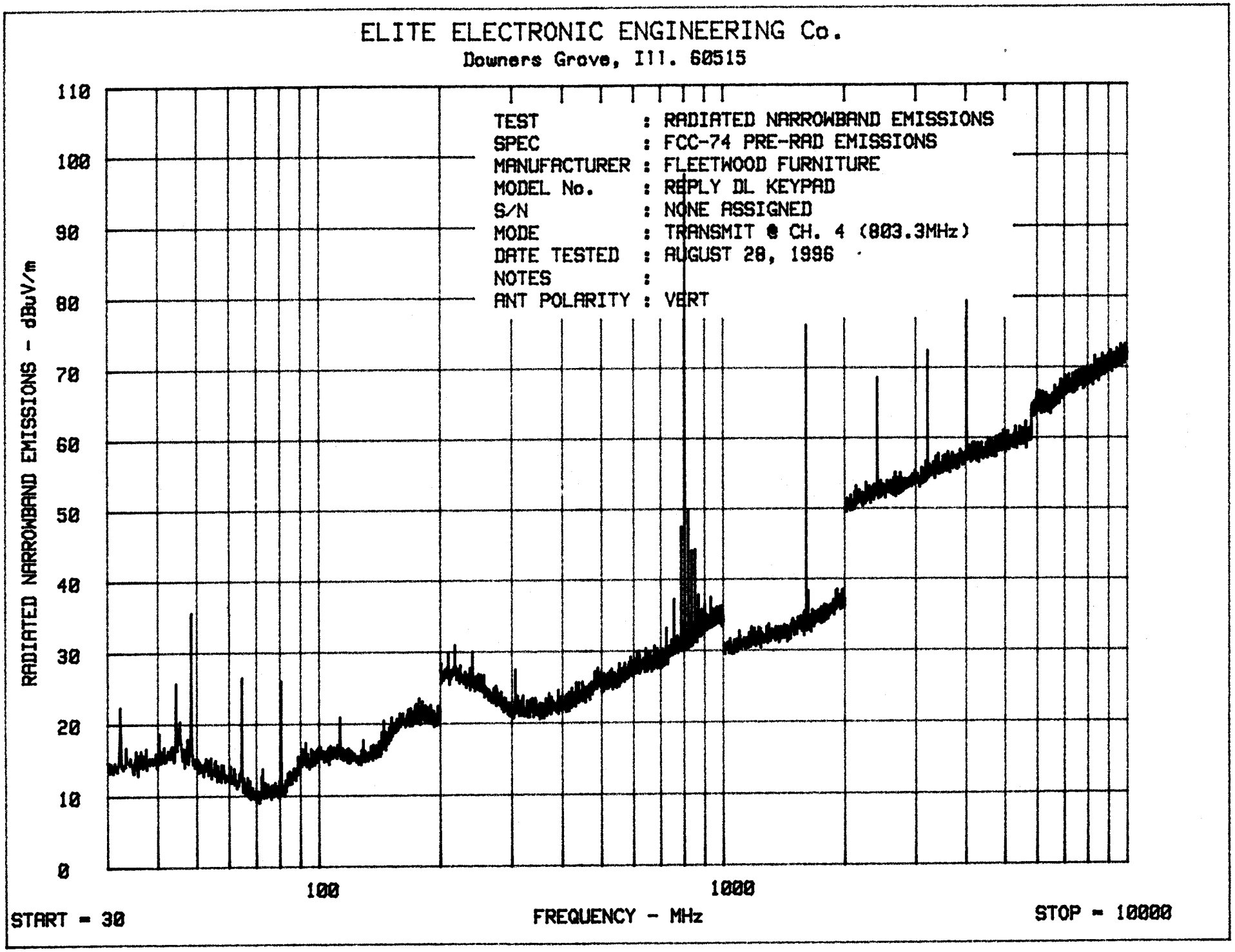
ELITE ELECTRONIC ENGINEERING Co.
Downers Grove, Ill. 60515
TEST : RADIATED NARROWBAND EMISSIONS
SPEC : FCC-74 PRE-RAD EMISSIONS
MANUFACTURER : FLEETWOOD FURNITURE
MODEL No. : REPLY DL KEYPAD
S/N : NONE ASSIGNED
MODE : TRANSMIT @ CH. 4 (903.3MHz)
DATE TESTED : AUGUST 28, 1996
NOTES :
ANT POLARITY : VERT
RADIATED NARROWBAND EMISSIONS - dBuV/m
110
100
90
80
70
60
50
40
30
20
10
0
100
1000
START = 30
FREQUENCY - MHz
STOP = 10000

70/ dp

ENGINEERING TEST REPORT NO. 19167

DATA SHEET

MANUFACTURER : Fleetwood Electronics
TEST ITEM : Transmitter
MODEL : Reply DL Keypad
SERIAL NUMBER : None Assigned
TEST PERFORMED : FCC Part 74 Case Radiated Emissions
TEST SPECIFICATION: (43 plus 10 log P below P) = -13dBm into a tuned dipole
FREQUENCY : Up through 10th Harmonic
DATE TESTED : August 23, 1996
NOTES : Transmitting at 800.2MHz

FREQUENCY MHz	ANTENNA POLARITY	METER READING dBuV	CABLE LOSS dB	ANTENNA FACTOR dB	CONV. FACTOR dB	TOTAL dBm	LIMIT dBm
1600.4	Hor	50.4	3.3	26.3	-97.2	-17.2	-13
1600.4	Vert	51.0	3.3	26.3	-97.2	-16.6	-13
2400.6	Hor	32.8	3.9	29.1	-97.2	-31.4	-13
2400.6	Vert	31.1	3.9	29.1	-97.2	-33.1	-13
3200.8	Hor	32.8	4.5	31.0	-97.2	-28.9	-13
3200.8	Vert	38.1	4.5	31.0	-97.2	-23.6	-13
4001.1	Hor	32.3	5.1	33.0	-97.2	-26.8	-13
4001.1	Vert	35.6	5.1	33.0	-97.2	-23.5	-13
4801.3	Hor	20.3*	5.8	33.6	-97.2	-37.5	-13
4801.3	Vert	20.6*	5.8	33.6	-97.2	-37.2	-13
5601.5	Hor	19.1*	6.2	35.7	-97.2	-36.2	-13
5601.5	Vert	19.7*	6.2	35.7	-97.2	-35.6	-13
6401.8	Hor	25.7*	6.6	36.0	-97.2	-28.9	-13
6401.8	Vert	25.2*	6.6	36.0	-97.2	-29.4	-13
7202.0	Hor	24.5*	7.1	36.8	-97.2	-28.8	-13
7202.0	Vert	24.9*	7.1	36.8	-97.2	-28.4	-13
8002.3	Hor	24.3*	7.6	37.4	-97.2	-27.9	-13
8002.3	Vert	24.8*	7.6	37.4	-97.2	-27.4	-13

H - Horizontal V - Vertical

* - Ambient

Checked By: RJC

ENGINEERING TEST REPORT NO. 19167

DATA SHEET

MANUFACTURER : Fleetwood Electronics
TEST ITEM : Transmitter
MODEL : Reply DL Keypad
SERIAL NUMBER : None Assigned
TEST PERFORMED : FCC Part 74 Case Radiated Emissions
TEST SPECIFICATION: (43 plus 10 log P below P) = -13dBm into a tuned dipole
FREQUENCY : Up through 10th Harmonic
DATE TESTED : August 23, 1996
NOTES : Transmitting at 803.2MHz

FREQUENCY MHz	ANTENNA POLARITY	METER READING dBuV	CABLE LOSS dB	ANTENNA FACTOR dB	CONV. FACTOR dB	TOTAL dBm	LIMIT dBm
1606.4	Hor	50.3	3.3	26.3	-97.2	-17.3	-13
1606.4	Vert	53.3	3.3	26.3	-97.2	-14.3	-13
2409.6	Hor	30.9	3.9	29.1	-97.2	-33.3	-13
2409.6	Vert	35.1	3.9	29.1	-97.2	-29.1	-13
3212.8	Hor	30.7	4.5	31.0	-97.2	-31.0	-13
3212.8	Vert	36.0	4.5	31.0	-97.2	-25.7	-13
4016.0	Hor	29.2	5.1	33.0	-97.2	-29.9	-13
4016.0	Vert	30.3	5.1	33.0	-97.2	-28.8	-13
4819.2	Hor	19.7*	5.8	33.6	-97.2	-38.1	-13
4819.2	Vert	20.4*	5.8	33.6	-97.2	-37.4	-13
5622.4	Hor	19.7*	6.2	35.7	-97.2	-35.6	-13
5622.4	Vert	19.9*	6.2	35.7	-97.2	-35.4	-13
6425.6	Hor	24.7*	6.6	36.0	-97.2	-29.9	-13
6425.6	Vert	26.2*	6.6	36.0	-97.2	-28.4	-13
7228.8	Hor	25.1*	7.1	36.8	-97.2	-28.2	-13
7228.8	Vert	24.0*	7.1	36.8	-97.2	-29.3	-13
8032.0	Hor	24.3*	7.6	37.4	-97.2	-27.9	-13
8032.0	Vert	24.4*	7.6	37.4	-97.2	-27.8	-13

H - Horizontal V - Vertical

* - Ambient

Checked By: RJK

ENGINEERING TEST REPORT NO. 19167

DATA SHEET

MANUFACTURER : Fleetwood Electronics
TEST ITEM : Transmitter
MODEL : Reply DL Keypad
SERIAL NUMBER : None Assigned
TEST PERFORMED : FCC Part 74 Frequency Stability
TEST SPECIFICATION: Tolerance of +/-0.005 percent change
DATE TESTED : August 27, 1996
NOTES : Transmitting at 800.2MHz

vs. Temperature:

Temperature Degrees Centigrade	Frequency MHz	Duration Minutes	% of Change	Limit % Change
-30	800.184240	45	0.0019	0.005
-20	800.190637	30	0.0011	0.005
-10	800.196090	30	0.0004	0.005
0	800.198489	30	0.0001	0.005
10	800.199323	30	0.0000	0.005
20	800.199312	30	0.0000	0.005
24	800.199533	--	Ref.	---
30	800.198773	30	0.0001	0.005
40	800.197921	30	0.0002	0.005
50	800.197906	30	0.0002	0.005

vs. Voltage:

Voltage VDC	% of Nominal Voltage	Frequency MHz	% of Change	Limit % Change
7.65	85	800.202403	0.0001	0.005
9.0	Nominal	800.202361	-----	Ref.
10.35	115	800.202330	0.0001	0.005

Checked By: RJK

ENGINEERING TEST REPORT NO. 19167

DATA SHEET

MANUFACTURER : Fleetwood Electronics
TEST ITEM : Transmitter
MODEL : Reply DL Keypad
SERIAL NUMBER : None Assigned
TEST PERFORMED : FCC Part 74 Frequency Stability
TEST SPECIFICATION: Tolerance of +/-0.005 percent change
DATE TESTED : August 27, 1996
NOTES : Transmitting at 803.2MHz

vs. Temperature:

Temperature Degrees Centigrade	Frequency MHz	Duration Minutes	% of Change	Limit % Change
-30	803.286488	45	0.0020	0.005
-20	803.292475	30	0.0013	0.005
-10	803.298524	30	0.0005	0.005
0	803.300865	30	0.0002	0.005
10	803.301665	30	0.0001	0.005
20	803.302453	30	0.0000	0.005
24	803.302560	--	Ref.	---
30	803.302541	30	0.0000	0.005
40	803.302773	30	0.0000	0.005
50	803.303940	30	0.0001	0.005

vs. Voltage:

Voltage VDC	% of Nominal Voltage	Frequency MHz	% of Change	Limit % Change
7.65	85	803.302346	>0.0001	0.005
9.0	Nominal	803.302392	-----	Ref.
10.35	115	803.302373	>0.0001	0.005

Checked By: RJK