

Exhibit 2

Report of Measurements

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

ELITE PROJECT: 26466

DATES TESTED: March 3, 1998

TEST PERSONNEL: Daniel E. Crowder

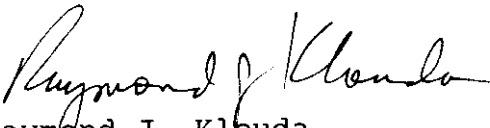
TEST SPECIFICATION: FCC "Code of Federal Regulations" Title 47
Part 2 and 90

ENGINEERING TEST REPORT NO. 20518
MEASUREMENT OF RF INTERFERENCE FROM
A TYPE III JBUS TRANSPONDER
MODEL 16230729D, S/N 20800AFD

FOR: Delphi Delco Electronics Systems
Kokomo, IN

PURCHASE ORDER NO: EKM 16513

Report By: 
Daniel E. Crowder

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

ENGINEERING TEST REPORT NO. 20518
ADMINISTRATIVE DATA AND SUMMARY OF TESTS

DESCRIPTION OF TEST ITEM: Type III JBUS Transponder

MODEL NO: 16230729D

SERIAL NO: 30805E3D

MANUFACTURER: Delphi Delco Electronics Systems

APPLICABLE SPECIFICATIONS: FCC "Code of Federal Regulations"
Title 47, Parts 2 and 90

QUANTITY OF ITEMS TESTED: One (1)

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

DATES TESTED: March 3, 1998

PERSONNEL (OPERATORS, OBSERVERS, AND CO-ORDINATORS):
CUSTOMER: John Funk of Delphi Delco Electronics Systems
ELITE ELECTRONIC: Daniel E. Crowder

ELITE JOB NO.: 26466

ABSTRACT:

FCC Part 90 - The transponder meets the RF Power, the occupied bandwidth and the field strength of spurious emissions requirements. The frequency stability requirements do not apply to this device.

See test results and data pages for more details.

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ENGINEERING TEST REPORT NO. 20518
MEASUREMENT OF RF INTERFERENCE FROM
A TYPE III JBUS TRANSPONDER
MODEL 16230729D, S/N 30805E3D

1.0 INTRODUCTION:

1.1 DESCRIPTION OF TEST ITEM: This report present the results of the radio interference measurements performed on the Type III JBUS Transponder, Model 16230729D, serial number 30805E3D, (hereinafter referred to as the test item). The tests were performed for Delphi Delco Electronics Systems, Kokomo, IN.

1.2 PURPOSE: The test series was performed to determine if the test item meets the technical requirements of the FCC "Code of Federal Regulations" Title 47, Part 90, Subpart I for Location and Monitoring Services (LMS) transmitters.

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

- "Code of Federal Regulations - Telecommunications", Title 47, Part 2 and 90

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

2.0 TEST ITEM SETUP AND OPERATION:

The test item is a small LMS transponder used to transmit data from a vehicle. The transmitter operates at 915 MHz and has an internal antenna.

The transponder required an excitation signal to transmit its

signal. The excitation signal was supplied from its companion equipment or reader and coupled into the test item by placing the reader's antenna in close proximity to the transponder. The excitation signal was set to the minimum level required to turn on the transponder. When the excitation signal is on, the transponder transmits continuously.

The transponder was powered from an internal 3 Vdc battery. The test item was ungrounded for the tests.

The modulation was set to send four "packets" of information to the reader. This modulation scheme represents the maximum modulation that the device was capable of performing.

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 with Paragraph 90.205(j); LMS systems operating in the 902-927.25 MHz band will be authorized a maximum of 30 Watts effective radiated power (ERP).

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

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

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

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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:

$$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$$

A measurement bandwidth of 3 MHz was selected for the power measurements. The 3 MHz bandwidth was required in order to exceed the 6dB bandwidths of test item. The readings were made with peak detection.

4.1.3 RESULTS OF TESTS: Data page 101 shows the radiated field intensity results and the calculated effective radiated power. The maximum effective radiated power was determined to be 9.3 dBm or 8.5 milliwatts. This power level is well below the 30 watts allowed.

4.2 OCCUPIED BANDWIDTH MEASUREMENTS:

4.2.1 REQUIREMENTS: In accordance with Paragraph 90.209(b)(5), the maximum authorized bandwidth shall be 12 MHz for non-multilateration LMS operations in the band 909.75-921.75 MHz.

In accordance with paragraph 90.210(k)(3), the peak power of any emission shall be attenuated below the mean output power in accordance with the following schedule:

- (1) On any frequency within the authorized bandwidth: Zero dB
- (2) On any frequency outside the authorized bandwidth: $55 + 10\log(P)\text{dB}$ where (P) is the highest emission (watts) of the transmitter inside the authorized bandwidth.

4.2.2 PROCEDURES: The measurement equipment was connected to the measurement antenna. The measurement antenna was positioned near the test item. The test item was set to transmit continuously. The test item signal was modulated at the maximum level available. The

emissions near the fundamental frequency were plotted. The measurement bandwidth was 100 kHz.

4.2.3 RESULTS: The plot of the emissions near the fundamental frequency of 915MHz is presented on data page 102. The limits, shown on the plot, are based on the maximum level measured in the open field with a 100 kHz bandwidth. As can be seen from the data, the occupied bandwidth of the test item is within the maximum authorized bandwidth.

4.3 FIELD STRENGTH OF SPURIOUS EMISSIONS:

4.3.1 PRELIMINARY RADIATED MEASUREMENTS:

4.3.1.1 REQUIREMENTS: Preliminary radiated measurements were performed in the low ambient environment of a shielded enclosure. The radiated emissions from the test item were measured using peak detection. This data was then automatically plotted. The frequencies with significant emission levels were then maximized for worst case levels.

4.3.1.2 PROCEDURES: All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4 1992 for site attenuation.

The preliminary measurements were performed with the test item transmitting at 915 MHz. The broadband measuring antenna was positioned at a 3 meter distance from the test item. The entire frequency range from 30MHz to 10GHz was investigated. The readings

were taken with a peak detector function.

4.3.1.3 RESULTS: The preliminary plots are presented on data pages 103 and 104. Factors for the antenna and cable loss corrections were added to the data before it was plotted.

This data is only presented for a reference, and is not used as official data. All significant radiated emissions were re-measured at which time the levels were maximized for worst case.

4.3.2 FINAL RADIATED EMISSIONS:

4.3.2.1 REQUIREMENTS: The radiated emissions outside the authorized bandwidth shall be attenuated by $55 + 10\log(P)$ where P is in watts. This requirement equates to an effective radiated power of -25dBm in a tuned dipole antenna.

4.3.2.2 PROCEDURES: Final radiated measurements were performed at Elite's 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4 1992 for site attenuation.

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 internal antenna was connected for the test.
- c) A bilog, 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

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height and polarization. The maximum meter reading was recorded.

- e) Measurement BW was set to 100 kHz for all out of band measurements.

4.3.2.3 RESULTS OF OPEN FIELD RADIATED TEST: The final open field radiated levels are presented on data page 101. The radiated emissions were measured through the 10th harmonic. The peak power levels for the harmonics were at least 7.2 dB below the specification limit. The highest level measured was for the 2nd harmonic at 1829 MHz which was -32.2 dBm.

4.4 FREQUENCY STABILITY:

4.4.1 REQUIREMENTS: In accordance with Paragraph 90.213, fixed non-multilateration transmitters with an authorized bandwidth that is more than 40kHz from the band edge, intermittently operated hand-held readers and mobile transponders are not subject to frequency stability restrictions. Therefore, no frequency stability tests were performed.

5.0 CONCLUSION:

The results demonstrate that the Type III JBUS Transponder, Model 16230729D, complies with the requirements for FCC Part 90.

Summary of Results:

FCC Part 90:

<u>Description</u>	<u>Test Results</u>	<u>Requirements</u>	<u>Comply?</u>
RF Power Output (ERP)	8.5 mW	Max. 30 W	Yes
Occupied Bandwidth	7.7 MHz	Max. 12 MHz	Yes
Spurious Emissions (Radiated)	-32.2 dBm	Max. -25 dBm	Yes

6.0 CERTIFICATION:

Elite Electronic Engineering Company certifies that the

ENGINEERING TEST REPORT NO. 20518

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.

TABLE I: TEST EQUIPMENT LIST

ELITE ELECTRONIC ENGINEERING

Page: 1

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	---	01/24/98	12	01/24/99
Equipment Type: AMPLIFIERS								
APK0	PREAMPLIFIER	HEWLETT PACKARD	8449B	3008A00662	1-26.5GHZ	01/27/98	12	01/27/99
Equipment Type: ANTENNAS								
NTA1	BILOG ANTENNA	CHASE EMC LTD.	BILOG CBL611	2054	.03-2GHZ	04/21/97	12	04/21/98
NWH0	DOUBLE RIDGED WAVEGUIDE	TENSOR	4105	2081	1-12.4GHZ	10/17/97	12	10/17/98
Equipment Type: CONTROLLERS								
CDD2	COMPUTER	HEWLETT PACKARD	D4171A#ABA	SUS61654645	N/A		N/A	
CMA0	MULTI-DEVICE CONTROLLER	EMCO	2090	9701-1213	---	10/21/97	12	10/21/98
Equipment Type: PRINTERS AND PLOTTERS								
HRE1	LASER JET 5P	HEWLETT PACKARD	C3150A	USHB061052	---			N/A
Equipment Type: RECEIVERS								
RAC1	SPECTRUM ANALYZER	HEWLETT PACKARD	85660B	3407A08369	100HZ-22GHZ	01/24/98	12	01/24/99
RACB	RF PRESELECTOR	HEWLETT PACKARD	85685A	3506A01491	20HZ-2GHZ	01/24/98	12	01/24/99
RAF3	QUASISPEAK ADAPTER	HEWLETT PACKARD	85650A	3303A01775	0.01-1000MHZ	01/26/98	12	01/26/99

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.

ELITE ELECTRONIC ENGINEERING CO

MKR 914.85 MHz
-41.80 dBm

ETR 20518

hp REF -20.0 dBm ATTN 0 dB

10 dB/
OFFSET
-10.0
dB

MANUFACTURER : DELPHI DELCO ELECTRONICS SYSTEMS
MODEL No. : 16230729D
SERIAL No. : 30805E3D
TEST PERFORMED : FCC-90 OCCUPIED BANDWIDTH
MODE : Tx AT 915MHz
NOTES : NOTEBOOK 10653 PAGE 80

D. CROWDER
3 Mar 1998
11:44:29

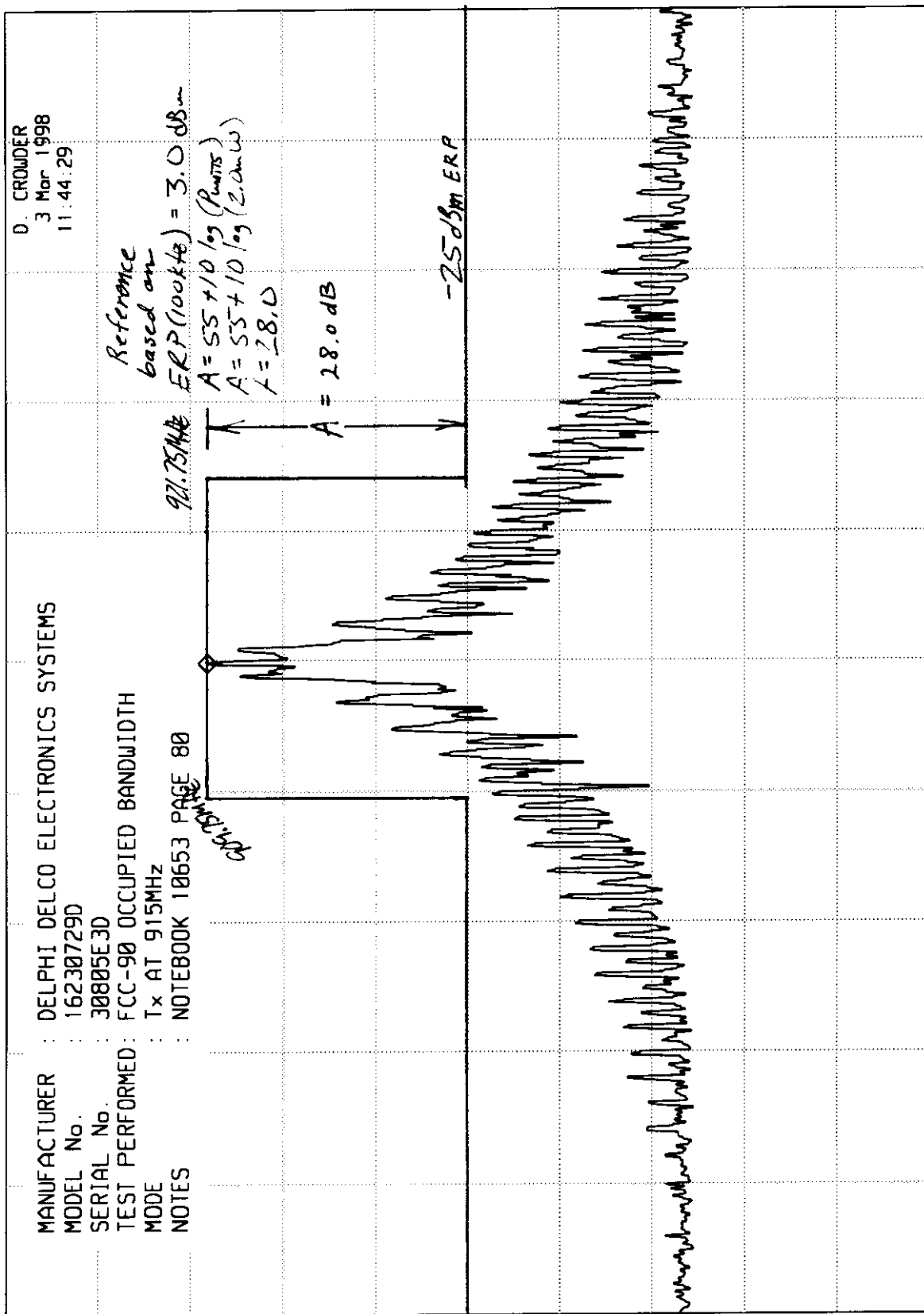
Reference
based on
ERP (look to) = 3.0 dBm
A = 55 + 10 log (P_{avg})
A = 55 + 10 log (2.0mW)
A = 28.0

91.75 MHz

91.75 MHz

A = 28.0 dB

102



STOP 940.0 MHz
SWP 37.5 msec

UBW 1 MHz

START 890.0 MHz
RES BW 100 kHz (i)

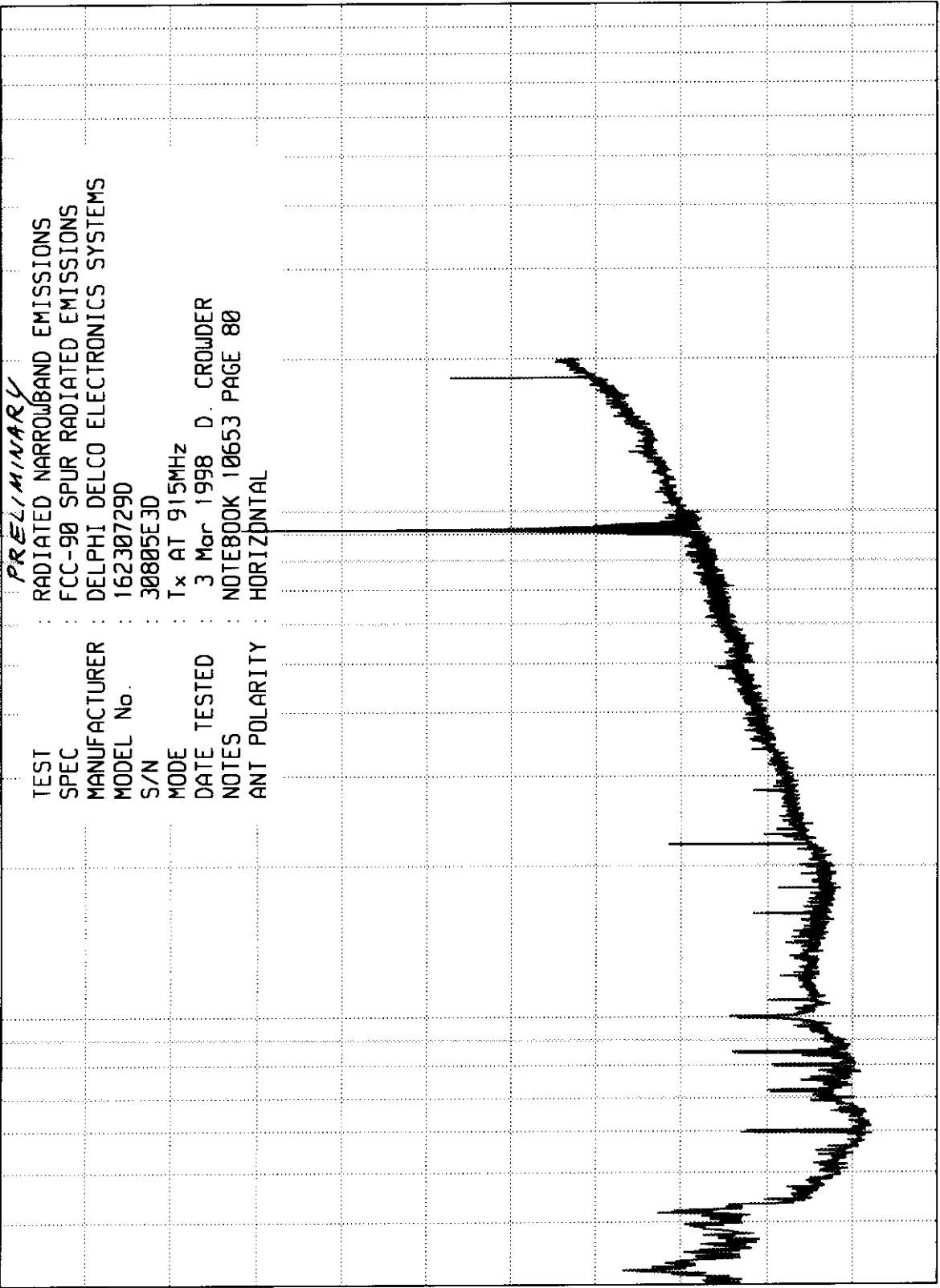
ETR 20518

ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515

UNTU_EM RUN RUN 1

WJKA00 02/24/98



STOP = 10000

FREQUENCY - MHz

START = 30

103

ETR 20518

ELITE ELECTRONIC ENGINEERING Co.

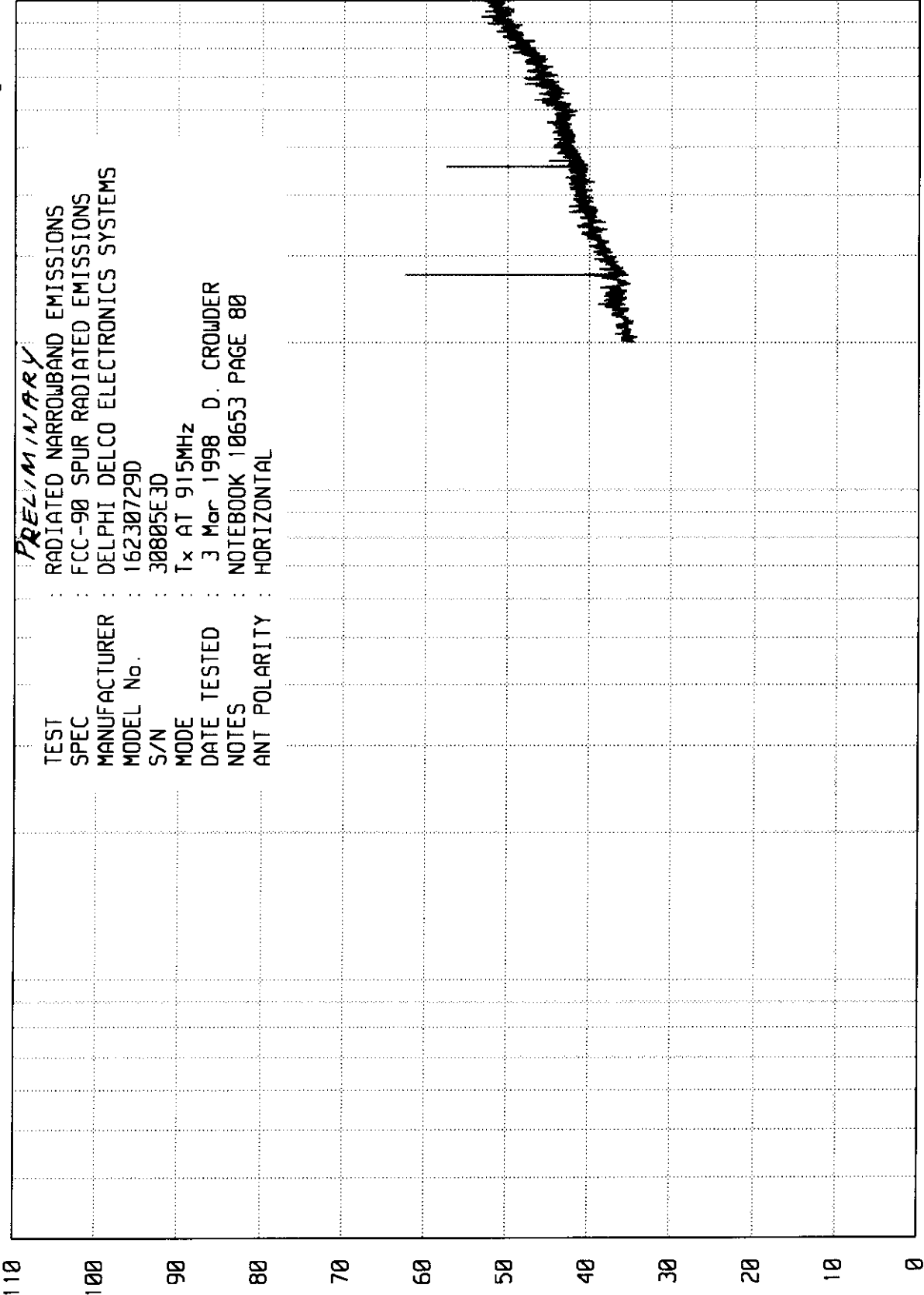
Downers Grove, Ill. 60515

UNTU_EM RUN RUN 1

UKA0 02/24/98

PRELIMINARY

TEST : RADIATED NARROWBAND EMISSIONS
 SPEC : FCC-90 SPUR RADIATED EMISSIONS
 MANUFACTURER : DELPHI DELCO ELECTRONICS SYSTEMS
 MODEL No. : 16230729D
 S/N : 30805E3D
 MODE : Tx AT 915MHz
 DATE TESTED : 3 Mar 1998 D. CROWDER
 NOTES : NOTEBOOK 10653 PAGE 80
 ANT POLARITY : HORIZONTAL



RADIATED NARROWBAND EMISSIONS - dBu/m

104

START = 30

FREQUENCY - MHz

STOP = 10000

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

ELITE PROJECT: 26466

DATES TESTED: March 3, 1998


TEST PERSONNEL: Daniel E. Crowder

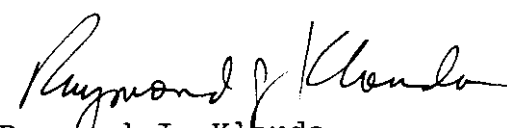
TEST SPECIFICATION: FCC "Code of Federal Regulations" Title 47
Part 2 and 90

ENGINEERING TEST REPORT NO. 20518
MEASUREMENT OF RF INTERFERENCE FROM
A TYPE III JBUS TRANSPONDER
MODEL 16230729D, S/N 20800AFD

FOR: Delphi Delco Electronics Systems
Kokomo, IN

PURCHASE ORDER NO: EKM 16513

Report By: 
Daniel E. Crowder

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

ENGINEERING TEST REPORT NO. 20518

ADMINISTRATIVE DATA AND SUMMARY OF TESTS

DESCRIPTION OF TEST ITEM: Type III JBUS Transponder

MODEL NO: 16230729D

SERIAL NO: 30805E3D

MANUFACTURER: Delphi Delco Electronics Systems

APPLICABLE SPECIFICATIONS: FCC "Code of Federal Regulations"
Title 47, Parts 2 and 90

QUANTITY OF ITEMS TESTED: One (1)

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

DATES TESTED: March 3, 1998

PERSONNEL (OPERATORS, OBSERVERS, AND CO-ORDINATORS):

CUSTOMER: John Funk of Delphi Delco Electronics Systems

ELITE ELECTRONIC: Daniel E. Crowder

ELITE JOB NO.: 26466

ABSTRACT:

FCC Part 90 - The transponder meets the RF Power, the occupied bandwidth and the field strength of spurious emissions requirements. The frequency stability requirements do not apply to this device.

See test results and data pages for more details.

ENGINEERING TEST REPORT NO. 20518

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3.0	TEST EQUIPMENT	2
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5.0	CONCLUSION	6
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ENGINEERING TEST REPORT NO. 20518
MEASUREMENT OF RF INTERFERENCE FROM
A TYPE III JBUS TRANSPONDER
MODEL 16230729D, S/N 30805E3D

1.0 INTRODUCTION:

1.1 DESCRIPTION OF TEST ITEM: This report present the results of the radio interference measurements performed on the Type III JBUS Transponder, Model 16230729D, serial number 30805E3D, (hereinafter referred to as the test item). The tests were performed for Delphi Delco Electronics Systems, Kokomo, IN.

1.2 PURPOSE: The test series was performed to determine if the test item meets the technical requirements of the FCC "Code of Federal Regulations" Title 47, Part 90, Subpart I for Location and Monitoring Services (LMS) transmitters.

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

- "Code of Federal Regulations - Telecommunications", Title 47, Part 2 and 90

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

2.0 TEST ITEM SETUP AND OPERATION:

The test item is a small LMS transponder used to transmit data from a vehicle. The transmitter operates at 915 MHz and has an internal antenna.

The transponder required an excitation signal to transmit its

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signal. The excitation signal was supplied from its companion equipment or reader and coupled into the test item by placing the reader's antenna in close proximity to the transponder. The excitation signal was set to the minimum level required to turn on the transponder. When the excitation signal is on, the transponder transmits continuously.

The transponder was powered from an internal 3 Vdc battery. The test item was ungrounded for the tests.

The modulation was set to send four "packets" of information to the reader. This modulation scheme represents the maximum modulation that the device was capable of performing.

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 with Paragraph 90.205(j); LMS systems operating in the 902-927.25 MHz band will be authorized a maximum of 30 Watts effective radiated power (ERP).

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

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

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

ENGINEERING TEST REPORT NO. 20518

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:

$$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$$

A measurement bandwidth of 3 MHz was selected for the power measurements. The 3 MHz bandwidth was required in order to exceed the 6dB bandwidths of test item. The readings were made with peak detection.

4.1.3 RESULTS OF TESTS: Data page 101 shows the radiated field intensity results and the calculated effective radiated power. The maximum effective radiated power was determined to be 9.3 dBm or 8.5 milliwatts. This power level is well below the 30 watts allowed.

4.2 OCCUPIED BANDWIDTH MEASUREMENTS:

4.2.1 REQUIREMENTS: In accordance with Paragraph 90.209(b)(5), the maximum authorized bandwidth shall be 12 MHz for non-multilateration LMS operations in the band 909.75-921.75 MHz.

In accordance with paragraph 90.210(k)(3), the peak power of any emission shall be attenuated below the mean output power in accordance with the following schedule:

- (1) On any frequency within the authorized bandwidth: Zero dB
- (2) On any frequency outside the authorized bandwidth: $55 + 10\log(P)\text{dB}$ where (P) is the highest emission (watts) of the transmitter inside the authorized bandwidth.

4.2.2 PROCEDURES: The measurement equipment was connected to the measurement antenna. The measurement antenna was positioned near the test item. The test item was set to transmit continuously. The test item signal was modulated at the maximum level available. The

emissions near the fundamental frequency were plotted. The measurement bandwidth was 100 kHz.

4.2.3 RESULTS: The plot of the emissions near the fundamental frequency of 915MHz is presented on data page 102. The limits, shown on the plot, are based on the maximum level measured in the open field with a 100 kHz bandwidth. As can be seen from the data, the occupied bandwidth of the test item is within the maximum authorized bandwidth.

4.3 FIELD STRENGTH OF SPURIOUS EMISSIONS:

4.3.1 PRELIMINARY RADIATED MEASUREMENTS:

4.3.1.1 REQUIREMENTS: Preliminary radiated measurements were performed in the low ambient environment of a shielded enclosure. The radiated emissions from the test item were measured using peak detection. This data was then automatically plotted. The frequencies with significant emission levels were then maximized for worst case levels.

4.3.1.2 PROCEDURES: All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4 1992 for site attenuation.

The preliminary measurements were performed with the test item transmitting at 915 MHz. The broadband measuring antenna was positioned at a 3 meter distance from the test item. The entire frequency range from 30MHz to 10GHz was investigated. The readings

were taken with a peak detector function.

4.3.1.3 RESULTS: The preliminary plots are presented on data pages 103 and 104. Factors for the antenna and cable loss corrections were added to the data before it was plotted.

This data is only presented for a reference, and is not used as official data. All significant radiated emissions were re-measured at which time the levels were maximized for worst case.

4.3.2 FINAL RADIATED EMISSIONS:

4.3.2.1 REQUIREMENTS: The radiated emissions outside the authorized bandwidth shall be attenuated by $55 + 10\log(P)$ where P is in watts. This requirement equates to an effective radiated power of -25dBm in a tuned dipole antenna.

4.3.2.2 PROCEDURES: Final radiated measurements were performed at Elite's 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4 1992 for site attenuation.

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 internal antenna was connected for the test.
- c) A bilog, 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

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height and polarization. The maximum meter reading was recorded.

- e) Measurement BW was set to 100 kHz for all out of band measurements.

4.3.2.3 RESULTS OF OPEN FIELD RADIATED TEST: The final open field radiated levels are presented on data page 101. The radiated emissions were measured through the 10th harmonic. The peak power levels for the harmonics were at least 7.2 dB below the specification limit. The highest level measured was for the 2nd harmonic at 1829 MHz which was -32.2 dBm.

4.4 FREQUENCY STABILITY:

4.4.1 REQUIREMENTS: In accordance with Paragraph 90.213, fixed non-multilateration transmitters with an authorized bandwidth that is more than 40kHz from the band edge, intermittently operated hand-held readers and mobile transponders are not subject to frequency stability restrictions. Therefore, no frequency stability tests were performed.

5.0 CONCLUSION:

The results demonstrate that the Type III JBUS Transponder, Model 16230729D, complies with the requirements for FCC Part 90.

Summary of Results:

FCC Part 90:

<u>Description</u>	<u>Test Results</u>	<u>Requirements</u>	<u>Comply?</u>
RF Power Output (ERP)	8.5 mW	Max. 30 W	Yes
Occupied Bandwidth	7.7 MHz	Max. 12 MHz	Yes
Spurious Emissions (Radiated)	-32.2 dBm	Max. -25 dBm	Yes

6.0 CERTIFICATION:

Elite Electronic Engineering Company certifies that the

ENGINEERING TEST REPORT NO. 20518

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.

TABLE I: TEST EQUIPMENT LIST

ELITE ELECTRONIC ENGINEERING

Page: 1

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	---	01/24/98	12	01/24/99
Equipment Type: AMPLIFIERS								
APK0	PREAMPLIFIER	HEWLETT PACKARD	8449B	3008A00662	1-26.5GHZ	01/27/98	12	01/27/99
Equipment Type: ANTENNAS								
NTA1	BILOG ANTENNA	CHASE EMC LTD.	BILOG CBL611	2054	.03-2GHZ	04/21/97	12	04/21/98
NWHO	DOUBLE RIDGED WAVEGUIDE	TENSOR	4105	2081	1-12.4GHZ	10/17/97	12	10/17/98
Equipment Type: CONTROLLERS								
CDD2	COMPUTER	HEWLETT PACKARD	D4171A#ABA	SUS61654645	N/A		N/A	
CMA0	MULTI-DEVICE CONTROLLER	EMCO	2090	9701-1213	---	10/21/97	12	10/21/98
Equipment Type: PRINTERS AND PLOTTERS								
HRE1	LASER JET 5P	HEWLETT PACKARD	C3150A	USHB061052	---			N/A
Equipment Type: RECEIVERS								
RAC1	SPECTRUM ANALYZER	HEWLETT PACKARD	85660B	3407A08369	100HZ-22GHZ	01/24/98	12	01/24/99
RACB	RF PRESELECTOR	HEWLETT PACKARD	85685A	3506A01491	20HZ-2GHZ	01/24/98	12	01/24/99
RAF3	QUASIPEAK ADAPTER	HEWLETT PACKARD	85650A	3303A01775	0.01-1000MHZ	01/26/98	12	01/26/99

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. 20518

DATA SHEET

MANUFACTURER : Delphi Delco Electronics Systems
 TEST ITEM : Transponder
 MODEL : Type III JBUS (16230729D)
 SERIAL NUMBER : 30805E3D
 TEST PERFORMED : FCC Part 90 OATS Radiated Emissions
 DATE TESTED : March 3, 1998
 NOTES : Transmitting at 915 MHz

Freq. MHz	Ant. Pol.	RBW/ Det	Mtr. Rdg. dBuV	Ant. Fac. dB	Cable Loss dB	Pre- Amp Gain dB	F.I. Corr. Fac. dB	ERP	Total dBm	Limit dBm
915.0	H	3M/PK	81.8	20.7	4.0	---	-97.2	ERP	9.3	44.8
915.0	V	3M/PK	71.5	20.7	4.0	---	-97.2	ERP	-1.0	44.8
915.0	H	100k/PK	75.5	20.7	4.0	---	-97.2	ERP	3.0	44.8
915.0	V	100k/PK	65.3	20.7	4.0	---	-97.2	ERP	-7.2	44.8
1829.0	H	100k/PK	69.7	27.6	3.9	-36.2	-97.2		-32.2	-25
1829.0	V	100k/PK	68.9	27.6	3.9	-36.2	-97.2		-33.0	-25
2745.0	H	100k/PK	52.7	29.5	4.6	-36.0	-97.2		-46.4	-25
2745.0	V	100k/PK	51.2	29.5	4.6	-36.0	-97.2		-47.9	-25
3659.6	H	100k/PK	41.0	31.6	5.4	-35.8	-97.2		-55.0	-25
3659.6	V	100k/PK	43.9	31.6	5.4	-35.8	-97.2		-52.1	-25
4574.2	H	100k/PK	35.7	33.1	6.1	-35.3	-97.2		-57.6	-25
4574.2	V	100k/PK	36.4	33.1	6.1	-35.3	-97.2		-56.9	-25
5489.0	H	100k/PK	30.8*	34.6	7.0	-35.1	-97.2		-59.9	-25
5489.0	V	100k/PK	34.2	34.6	7.0	-35.1	-97.2		-56.5	-25
6404.0	H	100k/PK	32.3	35.7	7.4	-35.2	-97.2		-57.0	-25
6404.0	V	100k/PK	30.5*	35.7	7.4	-35.2	-97.2		-58.8	-25
7319.0	H	100k/PK	31.9*	36.6	8.0	-35.6	-97.2		-56.3	-25
7319.0	V	100k/PK	32.5*	36.6	8.0	-35.6	-97.2		-55.7	-25
8234.0	H	100k/PK	32.3*	37.2	8.8	-35.7	-97.2		-54.6	-25
8234.0	V	100k/PK	32.1*	37.2	8.8	-35.7	-97.2		-54.8	-25
9149.0	H	100k/PK	33.7*	38.0	9.7	-35.9	-97.2		-51.7	-25
9149.0	V	100k/PK	33.4*	38.0	9.7	-35.9	-97.2		-51.9	-25

H = Horizontal V = Vertical

* = Ambient

F.I. = Field Intensity

ERP = Effective Radiated Power (Calculated from Field Intensity)

Checked By: DEL

ELITE ELECTRONIC ENGINEERING CO

MKR 914.85 MHz
-41.80 dBm

ETR 20518

hp REF -20.0 dBm ATTN 0 dB

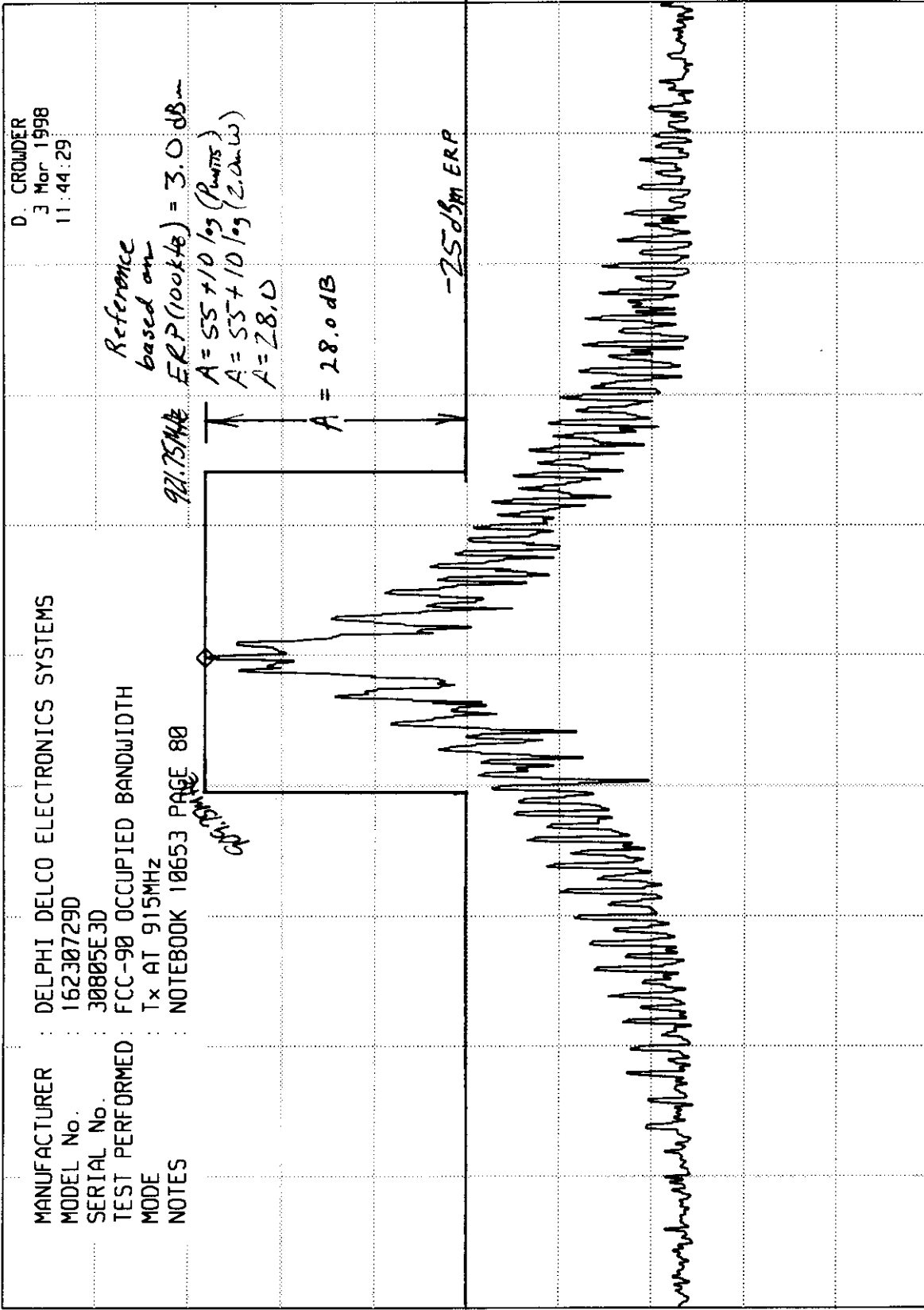
MANUFACTURER : DELPHI DELCO ELECTRONICS SYSTEMS
 MODEL No. : 16230729D
 SERIAL No. : 30805E3D
 TEST PERFORMED : FCC-90 OCCUPIED BANDWIDTH
 MODE : Tx AT 915MHz
 NOTES : NOTEBOOK 10653 PAGE 80

D. CROWDER
3 Mar 1998
11:44:29

Reference based on
 ERP (100kHz) = 3.0 dBm
 $A = 55 + 10 \log(P_{\text{avg}})$
 $A = 55 + 10 \log(2.0 \text{ mW})$
 $A = 28.0$

A = 28.0 dB

-25 dBm ERP



10 dB/
 OFFSET
 -10.0
 dB

START 890.0 MHz RES BW 100 kHz (i) STOP 940.0 MHz
 SWP 37.5 msec

ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515

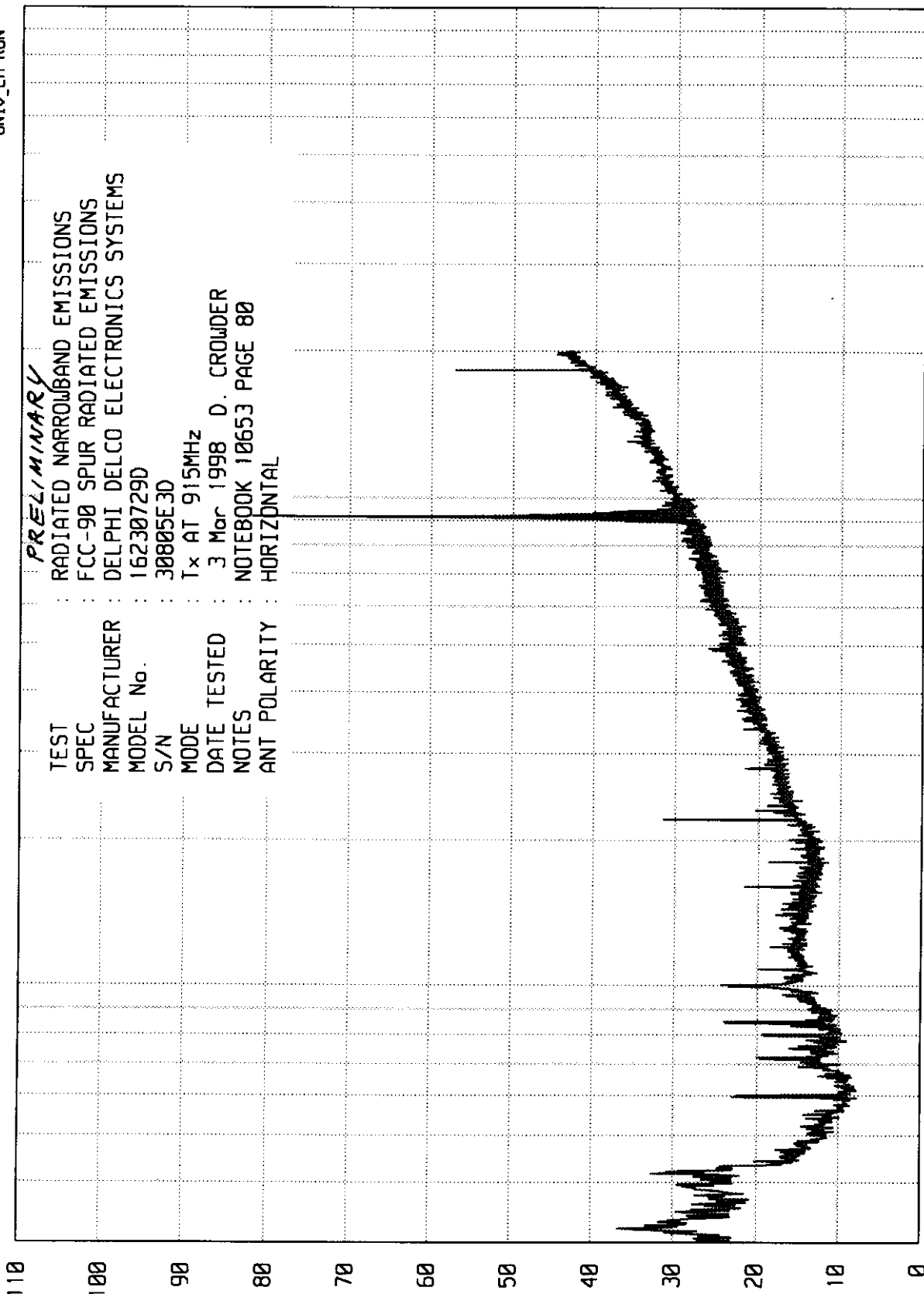
UNTV_EM_RUN RUN 1

JKAB 02/24/98

ETR 20518

PRELIMINARY

TEST : RADIATED NARROWBAND EMISSIONS
 SPEC : FCC-90 SPUR RADIATED EMISSIONS
 MANUFACTURER : DELPHI DELCO ELECTRONICS SYSTEMS
 MODEL No. : 16230729D
 S/N : 30805E30
 MODE : Tx AT 915MHz
 DATE TESTED : 3 Mar 1998 D. CROWDER
 NOTES : NOTEBOOK 10653 PAGE 80
 ANT POLARITY : HORIZONTAL



STOP = 10000

1000

FREQUENCY - MHz

100

START = 30

RADIATED NARROWBAND EMISSIONS - dBu/m

501

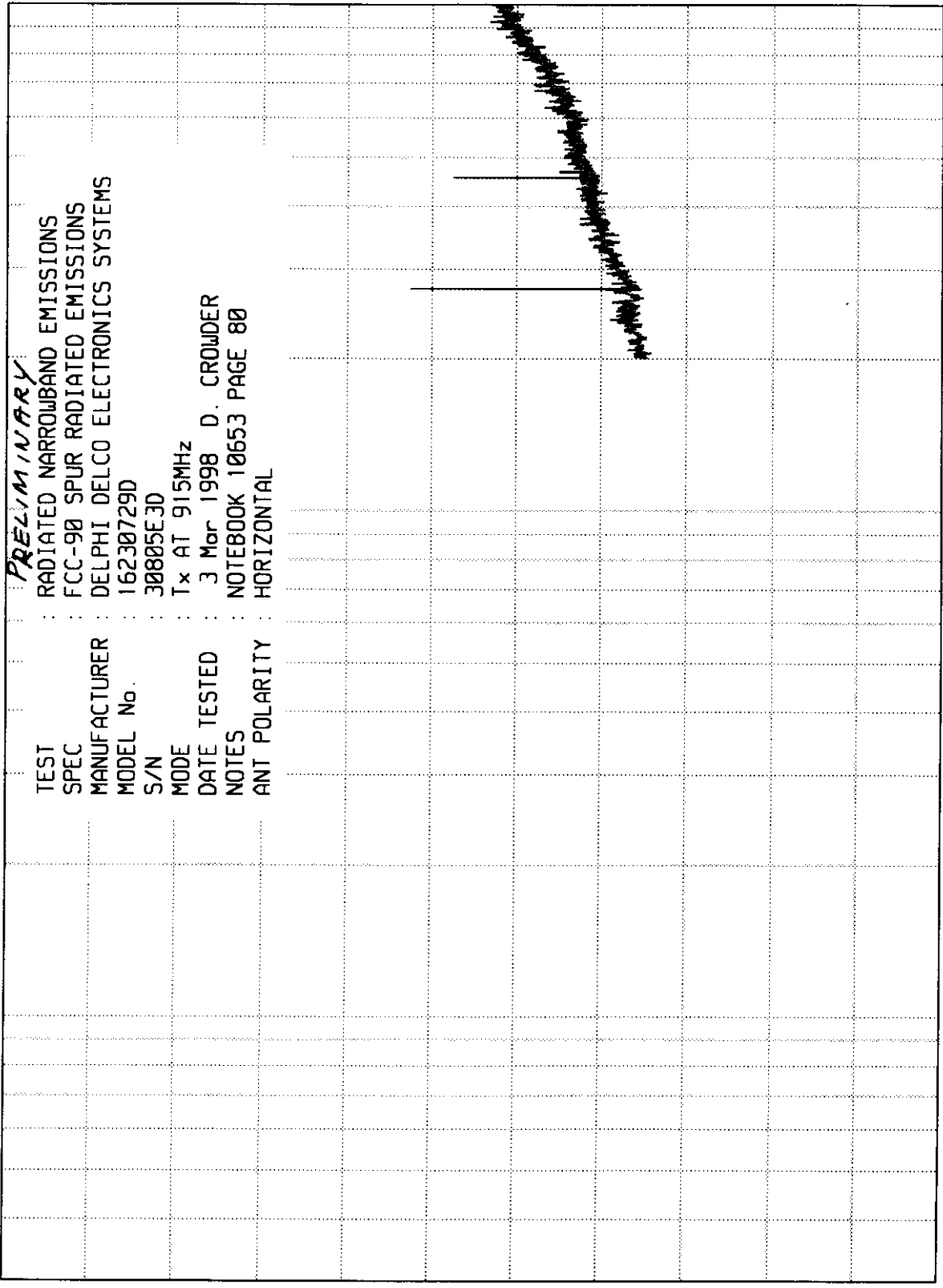
ELITE ELECTRONIC ENGINEERING Co.

Downers Grove, Ill. 60515

UNTV_EM RUN RUN 1

UKA0 02/24/98

ETR 20518



TEST : **PRELIMINARY**
 SPEC : RADIATED NARROWBAND EMISSIONS
 MANUFACTURER : DELPHI DELCO ELECTRONICS SYSTEMS
 MODEL No. : 16230729D
 S/N : 30805E3D
 MODE : Tx AT 915MHz
 DATE TESTED : 3 Mar 1998 D. CROWDER
 NOTES : NOTEBOOK 10653 PAGE 80
 ANT POLARITY : HORIZONTAL

RADIATED NARROWBAND EMISSIONS - dBu/m

104

STOP = 10000

1000

FREQUENCY - MHz

100

START = 30