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ENGINEERING AND TEST DIVISION

CHURCH STREET, BOHEMIA, LONG ISLAND, NEW YORK 11716 (516) 589-6300

TEST REPORT NO.: DTB01R98-0737

DAYTON T. BROWN, INC. JOB NO.: 400208-00-000

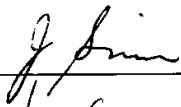
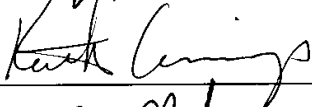
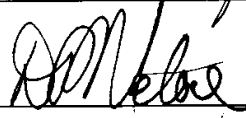
CUSTOMER: MICROWAVE POWER DEVICES
49 WIRELESS BLVD
HAUPPAUGE, NY 11788

SUBJECT: RESULTS OF A TYPE ACCEPTANCE MEASUREMENT PROGRAM
PERFORMED ON A MODEL FFPA8689-60 FEED-FORWARD
LINEAR POWER AMPLIFIER, SERIAL NO. 7879

PURCHASE ORDER NO.: 51872

ATTENTION: MR. P. MADIGAN

THIS REPORT CONTAINS: 4 PAGES AND 11 ENCLOSURES

TEST ENGINEER	 J. SMIRK
DEPARTMENT SUPERVISOR	 K. CUMMINGS
OPERATIONS MANAGER	 D. MELORE
DATE	4 NOVEMBER 1998

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 test report details the results of a type acceptance measurement program performed on a Model FFPA8689-60 Feed-Forward Linear Power Amplifier, Serial No. 7879. Measurements performed included (A) three-signal intermodulation distortion measurements; (B) harmonic and spurious emissions both conducted through the antenna port and radiated from the case and cabling; (C) comparison of amplifier output and amplifier input for distortion; and (D) IEEE C95.1-1991 for safety levels with respect to human exposure to radio frequency fields measurements. The results of each measurement indicated that the test item met the requirements of each specification.

Test data pertinent to this program will remain on file at Dayton T. Brown, Inc. for 90 days.

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

This test report shall not be reproduced, except in full, without the written approval of Dayton T. Brown, Inc.



2.0 REFERENCES

- (a) Customer Purchase Order No.: 51872
- (b) Dayton T. Brown, Inc. Job No.: 400208-00-000
- (c) Specifications:
 - FCC Rules and Regulations, Part 2
 - FCC Rules and Regulations, Part 22
 - IEEE C95.1-1991 IEEE Standards for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields
 - Verbal Instructions on Three-Signal Intermodulation Distortion Measurement Supplied to Dayton T. Brown, Inc. by FCC Engineer Mr. Frank Coprich



3.0 ADMINISTRATIVE INFORMATION

Customer: Microwave Power Devices
49 Wireless Blvd
Hauppauge, NY 11788

Test Item: Feed-Forward Linear Power Amplifier

Model No.: FFPA8689-60

Serial No.: 7879

FCC ID: MCDFFPA8689-60

Test Start Date: 25 August 1997

Test Completion Date: 7 October 1998

Disposition of Test Item: Returned to Microwave Power Devices on 7 October 1998.

Customer Representatives Present During Portions of Test:

<u>Name</u>	<u>Affiliation</u>
Mr. P. Madigan	Microwave Power Devices
Mr. P. Polite	Microwave Power Devices



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.



<u>TEST</u>	<u>ITEM</u>	<u>MANUFACTURER</u>	<u>DTB NO.</u>	<u>EQUIPMENT CHARACTERISTIC</u>	<u>MODEL</u>	<u>SERIAL NO.</u>	<u>CALIBRATION DUE DATE</u>
Acceptance Measurements	Spectrum Analyzer	Hewlett-Packard	Rental	9 kHz - 26.5 GHz	8563E	3425A-02523	8/8/99 A/N 295239A
Acceptance Measurements	Signal Generator	Rhode & Schwartz	Customer Equip	300 kHz - 3.3 GHz	SM1Q03	DE21299	-
Acceptance Measurements	Double Ridge Waveguide Antenna	Electro-Mechanics Co.	27-41	200 - 2000 MHz	3106	2036	8/6/00
Acceptance Measurements	Double Ridge Waveguide Antenna	Electro-Mechanics Co.	27-55	1.0 - 18 GHz	3115	2072	10/18/98
Acceptance Measurements	Attenuator	Weinschel	56-8	DC - 18 GHz 50Ω, 25 Watts, 20 dB	46-20-34	BD0648	4/18/99
Acceptance Measurements	Attenuator	Weinschel Engineering	56-26	DC - 18 GHz 50Ω, 25 Watts, 20 dB	46-20-34	AV0525	9/27/98
Acceptance Measurements	Coaxial Dual Directional Coupler	Amplifier Research Corp.	56-31	0.01 - 220 MHz 50Ω, 2500 Watts, 50 dB	DC2000	14259	8/15/99
Acceptance Measurements	Coupler Coaxial Directional	Narda Microwave	65-8	225 - 460 MHz Coupling, 30 dB	3000-30	41072	7/18/99
Acceptance Measurements	Attenuator	Pasternak	65-115	DC - 2.0 GHz, 50Ω, 100 Watt, 6 dB	PE-7021-6	-	1/31/99
Acceptance Measurements	Coaxial Directional Coupler	Narda Microwave	65-130	460 - 950 MHz 50Ω, 30 dB	3001-30	20163	10/18/98
Acceptance Measurements	Coaxial Directional Coupler	Narda Microwave	65-136	4.0 - 10.0 GHz 50Ω, 30 dB	3004-30	40282	3/28/99

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.



<u>TEST</u>	<u>ITEM</u>	<u>MANUFACTURER</u>	<u>DTB NO.</u>	<u>EQUIPMENT CHARACTERISTIC</u>	<u>MODEL</u>	<u>SERIAL NO.</u>	<u>CALIBRATION DUE DATE</u>
Acceptance Measurements	Coaxial Resistor	Bird Electronic Corporation	65-179	DC - 1.00 GHz 50Ω, 500 Watts	8201	8813	2/29/00
Acceptance Measurements	Coupler Coaxial Directional	Narda Microwave	65-197	2 - 4 GHz 50Ω, 10 dB	3003-10	21025	4/25/99
Acceptance Measurements	Plotter A & B Size	Hewlett-Packard	65-205-1	HPIB & Serial Interface	7550A	2848A- 22163	-
Acceptance Measurements	Coupler Coaxial Directional	Narda Microwave	65-209	920 - 2200 MHz 50Ω, 30 dB	3042B-30	10996	12/27/98
Acceptance Measurements	Spectrum Analyzer	Hewlett-Packard	65-247	10 kHz - 26.5 GHz	8563A	3220A 01924	11/8/98
Acceptance Measurements	Wooden 1 Meter Rule	Lufkin	68-841	Centimeter and Inches	7112	-	5/2/99



Enclosure 2

Information as Required in Paragraph 2.983 of FCC Part 2



- 2.983 (a) NAME OF APPLICANT
MPD Technologies, Inc.
49 Wireless Blvd
Hauppauge, NY 11788-3935
- 2.983 (b) IDENTIFICATION OF EQUIPMENT
Feed-Forward Linear Power Amplifier, Model FFPA8689-60, Serial No. 7879
Part No. DB054500, FCC ID: MCDFFPA8689-60
- 2.983 (c) QUANTITY PRODUCTION
Quantity production is planned.
- 2.983 (d) TECHNICAL DESCRIPTION OF EQUIPMENT
The FFPA8689-60 is a single-channel linear power amplifier designed for cellular base station application. It is entirely solid-state and powered by an external 27 VDC power supply. A complete technical description is provided in the Installation, Operation, and Instruction Manual (Enclosure 2) and Detailed Circuit Diagrams (Enclosure 3).
- 2.983 (d1) TYPES OF EMISSION
The emissions designators are TBD.
- 2.983 (d2) FREQUENCY RANGE
869 - 894 MHz
- 2.983 (d3) RANGE OF OPERATING POWER
The amplifier has a fixed gain of 60 ± 0.25 dB. The output power is dependent on the applied input power. Under normal operating conditions, the maximum average output power of 60 watts is not exceeded. The amplifier dynamic range is 20 dB.
- 2.983 (d4) MAXIMUM POWER RATING
The maximum RF output power rating is 60 watts average.
- 2.983 (d5) DC VOLTAGE & CURRENT OF FINAL TRANSISTOR STAGE
Four devices in parallel, each draws 5 amps at 27 volts.
- 2.983 (d6) FUNCTION OF ACTIVE DEVICES
Refer to Enclosures 3 and 4.
- 2.983 (d7) COMPLETE CIRCUIT DIAGRAMS
Refer to Enclosure 4.
- 2.983 (d8) INSTRUCTION BOOKS
Refer to Enclosure 3.



- 2.983 (d9) **TUNE-UP PROCEDURE**
The unit is aligned to specification after manufacture at the factory. There are no user adjustments or tune-up procedures.
- 2.983 (d10) **DESCRIPTION OF FREQUENCY DETERMINING/STABILIZING CIRCUITS AND DEVICES**
The power amplifier does not affect the frequency characteristics of the signals that it amplifies.
- 2.983 (d11) **DESCRIPTION OF CIRCUITS SUPPRESSING SPURIOUS & LIMITING POWER**
The unit is a solid-state linear power amplifier; no special or unusual circuitry is utilized to suppress spurious or limit power.
- 2.983 (d12) **DESCRIPTION OF DIGITAL MODULATION METHODS USED**
The power amplifier does not modulate the external signals applied to it.
- 2.983 (e) **TEST AND MEASUREMENT DATA**
All required test data is provided in Enclosures 6, 7, 8, and 9.
- 2.983 (f) **PHOTOGRAPH/DRAWING OF EQUIPMENT IDENTIFICATION PLATE/LABEL**
Refer to Enclosure 5.
- 2.983 (g) **PHOTOGRAPHS/DRAWINGS OF EQUIPMENT**
Refer to Enclosure 5.
- 2.983 (h) **ENCODER DEVICES**
Not applicable.
- 2.983 (i) **EQUIPMENT FOR USE IN AMATEUR RADIO/RF POWER AMPLIFIER KIT**
Not applicable. The equipment is not available as a kit. The equipment is not intended for amateur radio service.
- 2.983 (j) **AM BROADCAST STEREOPHONIC EXCITER-GENERATOR**
Not applicable.



Enclosure 5

Equipment and Equipment Identification Label Photographs



Figure 5, Model FFPA 8689-60

98-0737 Enc 5 Pg 1



Figure 6, Back View FFPA 8689-60

98-0737 Enc 5 Pg 2

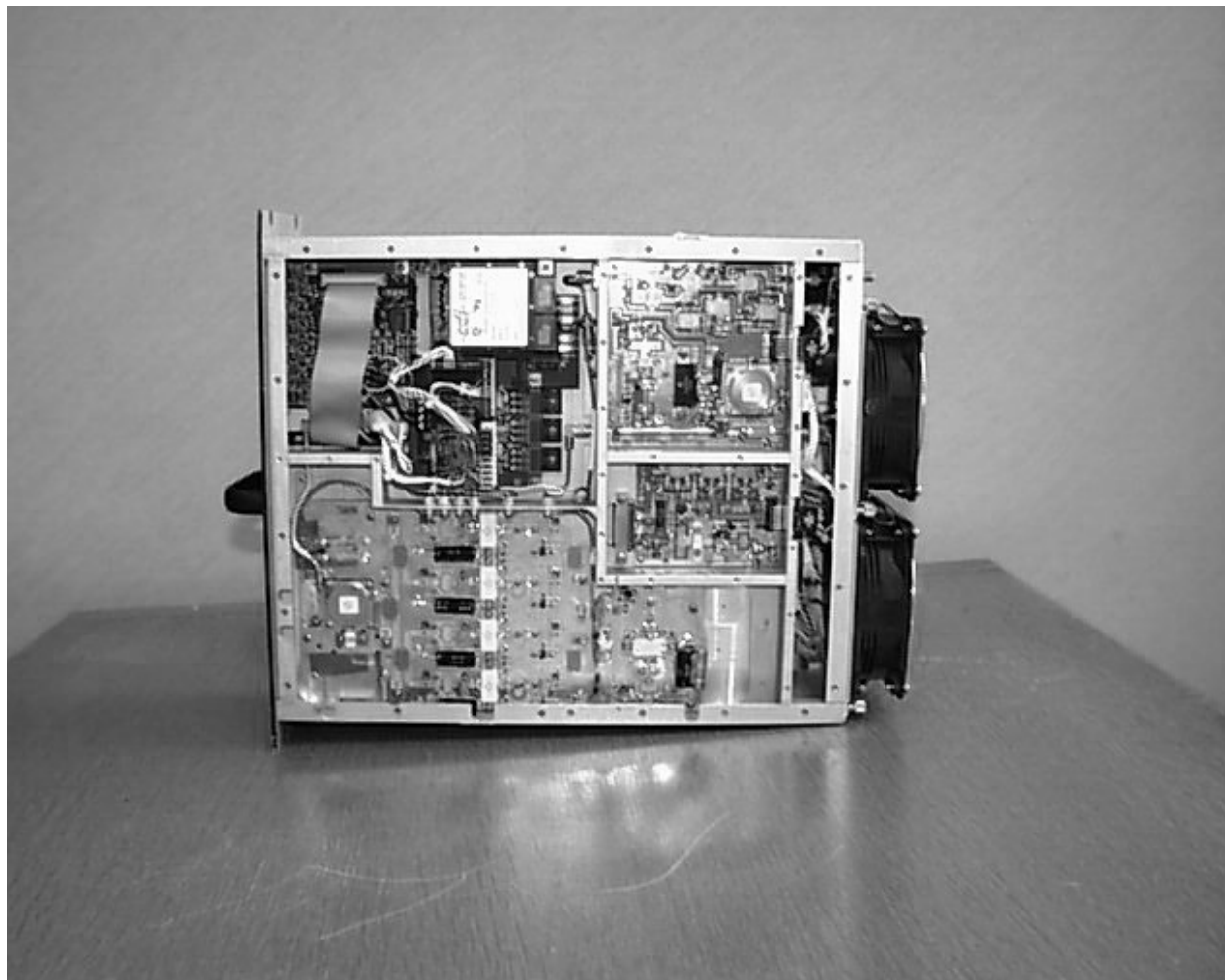


Figure 7, Side View1 of FFPA 8689-60

98-0737 Enc 5 Pg 3

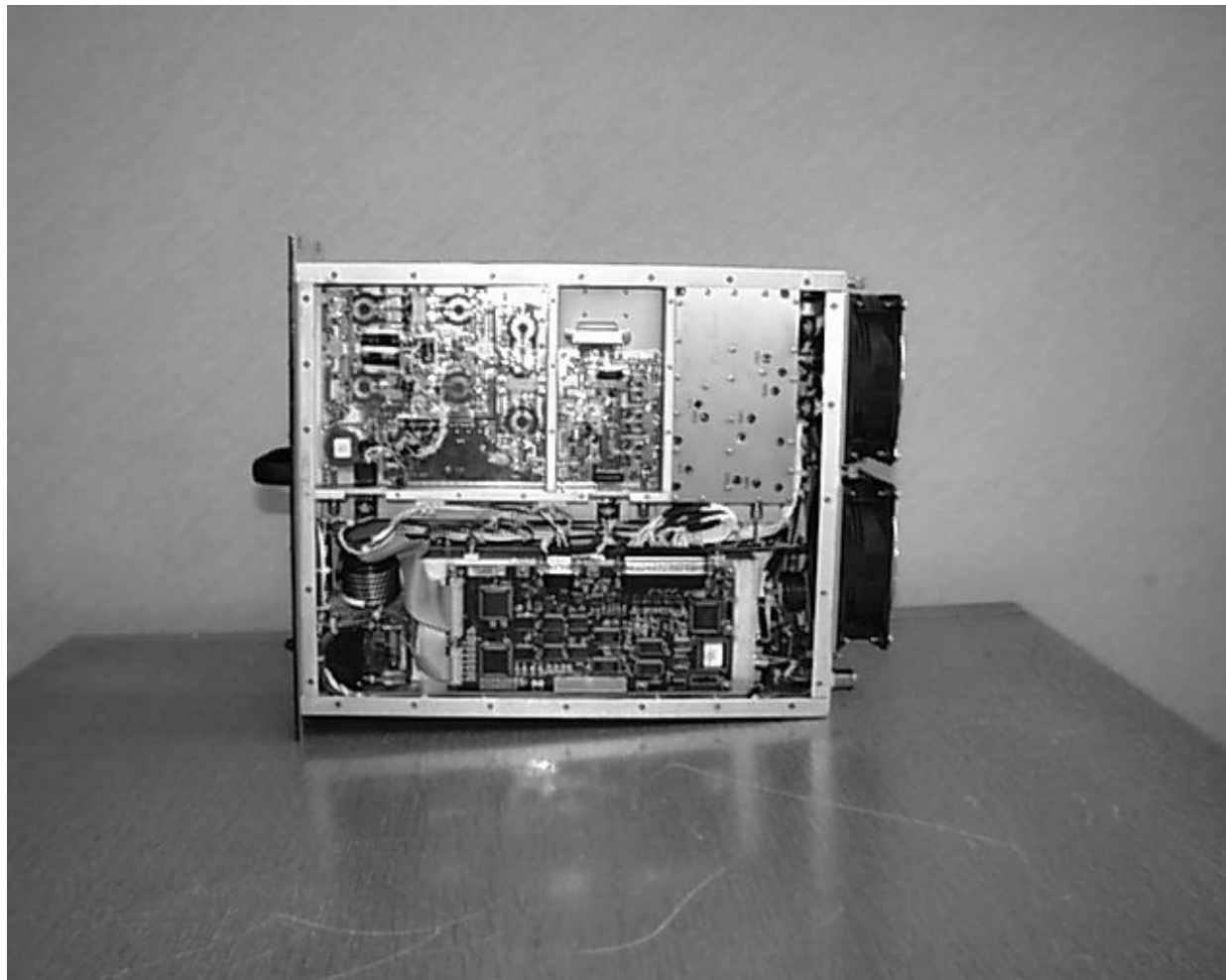


Figure 8, Side View2 FFPA 8689-60

98-0737 Enc 5 Pg 4

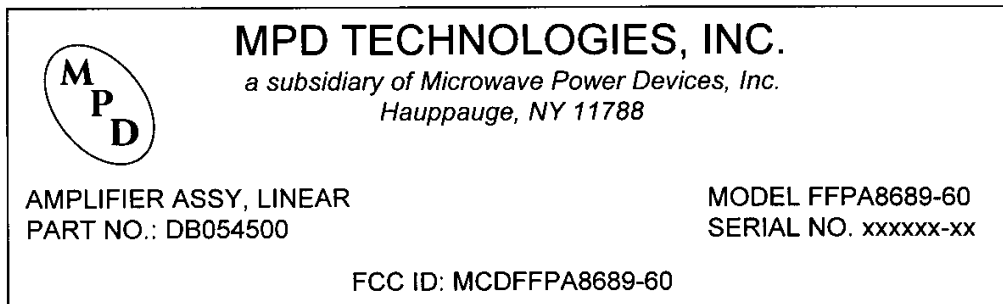


Figure 9, Proposed Marking Label
Model FFPA 8689-60



Enclosure 6

Results of Three-Signal Intermodulation Distortion Measurement



THREE-SIGNAL INTERMODULATION DISTORTION MEASUREMENT

Test Procedure

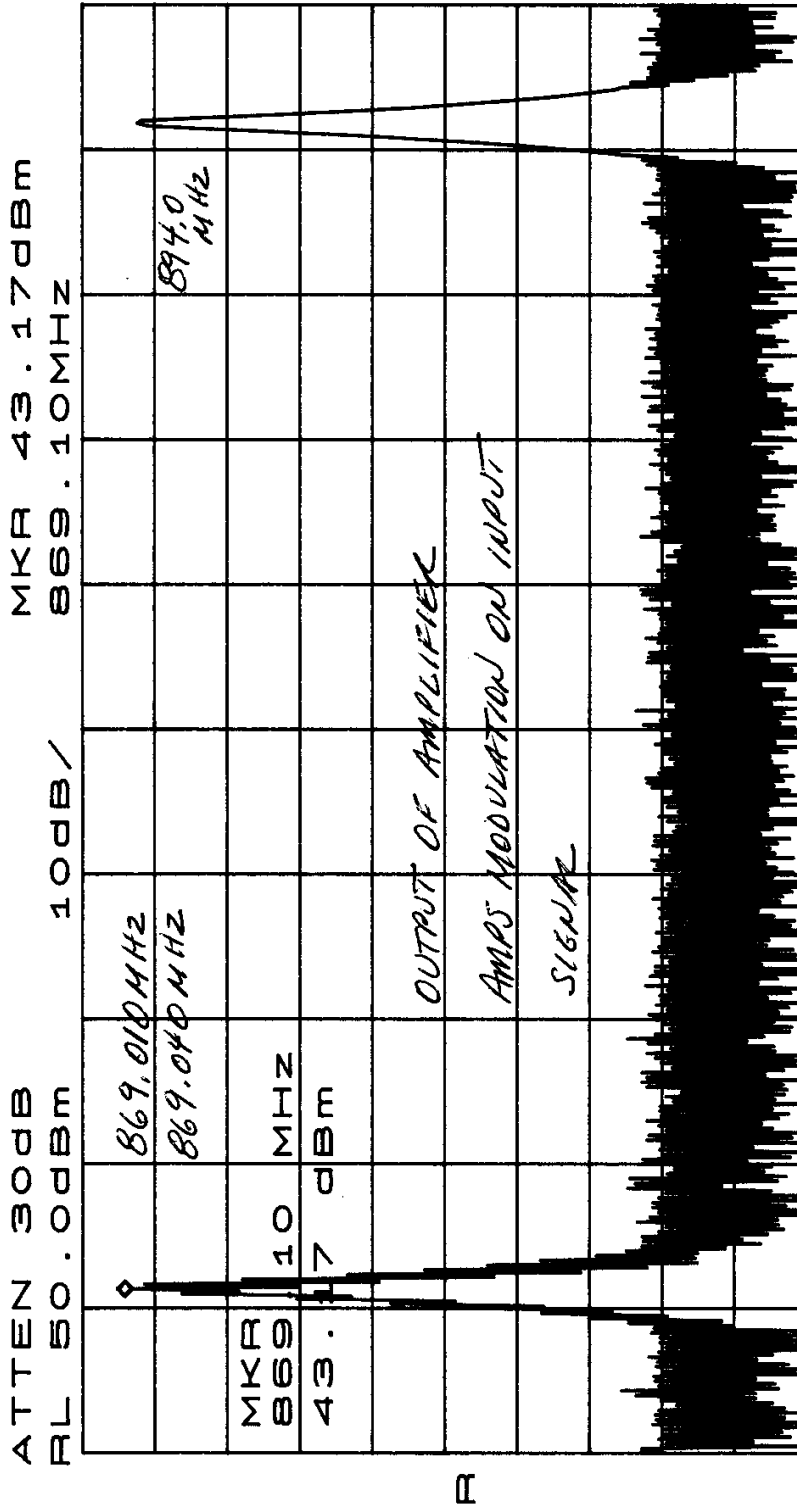
Three signals at 869.010 MHz, 869.040 MHz and 894.000 MHz, respectively, with AMPS modulation were applied to the input of the amplifier at a level which produced individual amplifier outputs of 38.5 dBm at 869.010 MHz, 37.0 dBm at 869.040 MHz, and 42.5 dBm at 894.000 MHz. Frequencies 869.010 MHz and 869.040 MHz are at the low end of the amplifiers bandpass and frequency 894.000 MHz is at the high end of the amplifiers bandpass. The output of the amplifier was analyzed from 30 MHz to 1 GHz using a spectrum analyzer to measure any out-of-band intermodulation products that exceed -23 dBm or a delta of 60 dB minimum between the individual in band outputs and any out-of-band products.

Test Results

No out of band intermodulation distortion products that exceeded -23 dBm or the delta of 60 dB minimum were found between 30 MHz and 1 GHz.. See the enclosed spectrum analyzer plots for more specific test results.

JOB NUMBER 400208-00-000

GRAPH NUMBER 1



START 865.58MHz STOP 896.69MHz
*RBW 100kHz *VBW 100kHz SWP 50.0ms

REMARKS THREE SIGNAL INTERMODULATION DISTORTION MEASUREMENT.

THREE SIGNALS WITHIN BANDWIDTHS OF AMPLIFIER

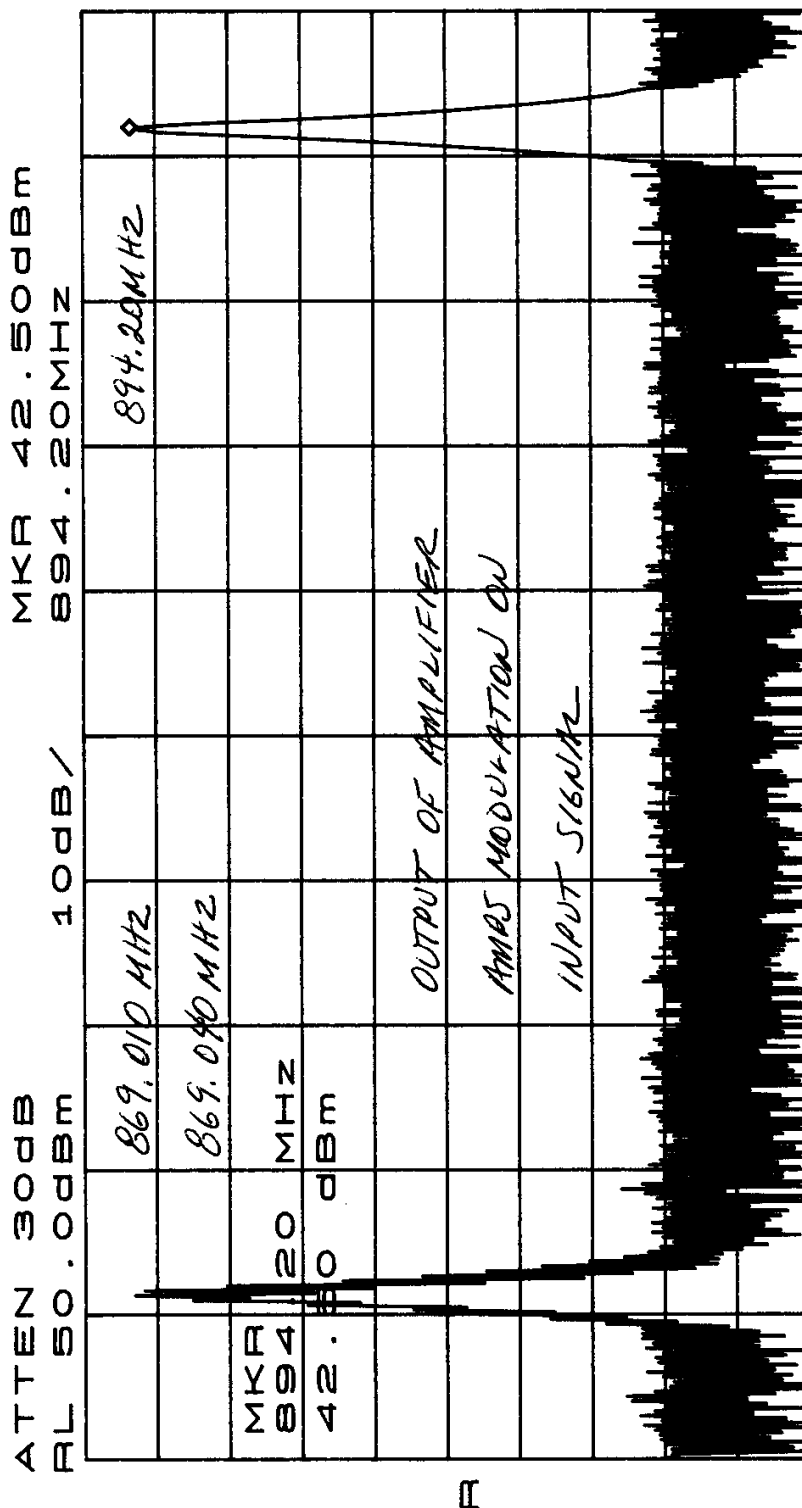
TEST TECHNICIAN [Signature]

TEST ENGINEER [Signature]



GRAPH NUMBER 2

JOB NUMBER 400208-00-000



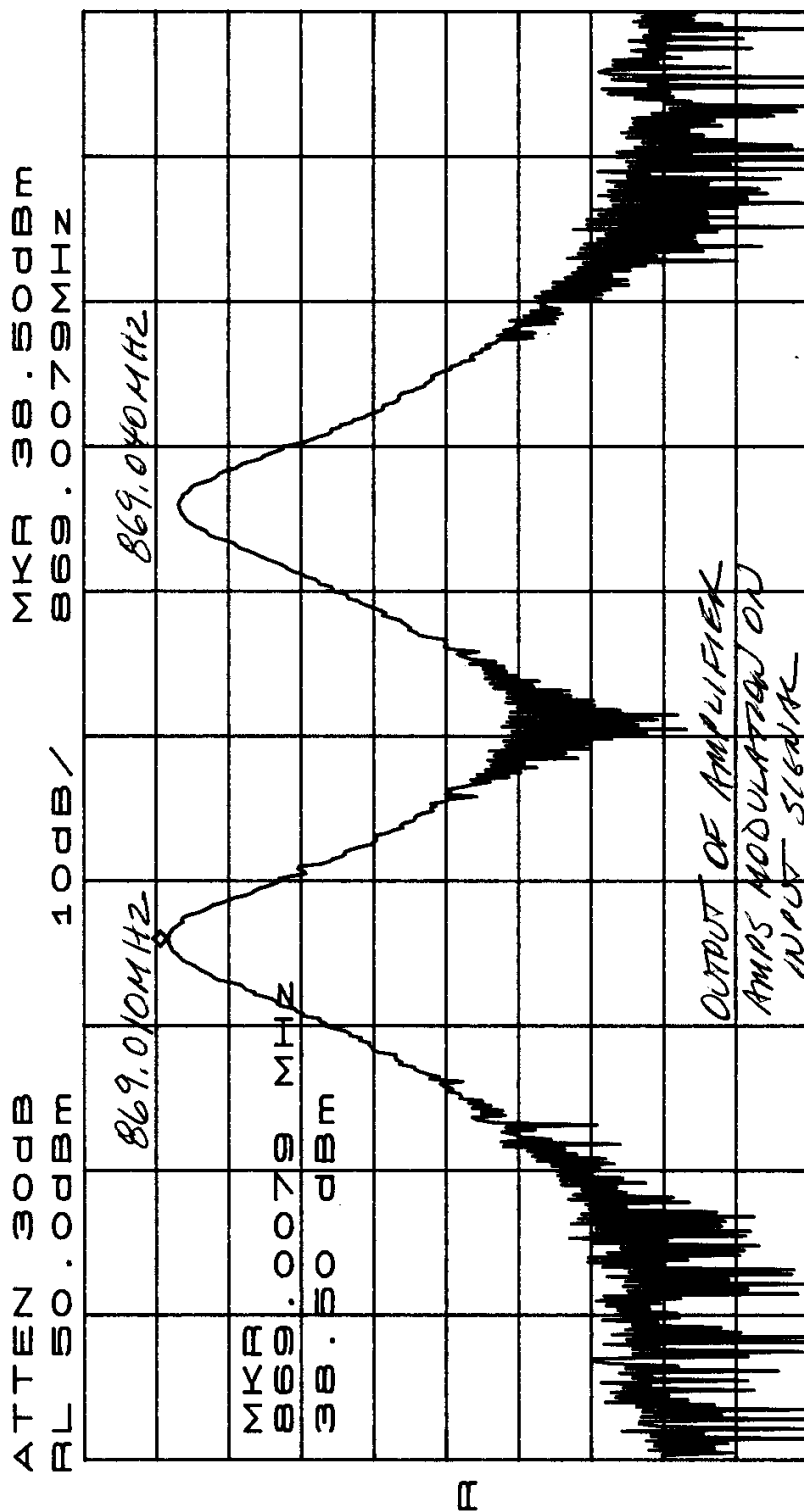
START 865.58MHz STOP 896.69MHz
*RBW 100kHz *VBW 100kHz SWP 50.0ms

REMARKS THREE SIGNAL INTERMODULATION DISTORTION MEASUREMENT
THREE SIGNALS WITHIN BANDPASS OF AMPLIFIER

TEST TECHNICIAN [Signature] TEST ENGINEER [Signature]



JOB NUMBER 400208-00-000 GRAPH NUMBER 3



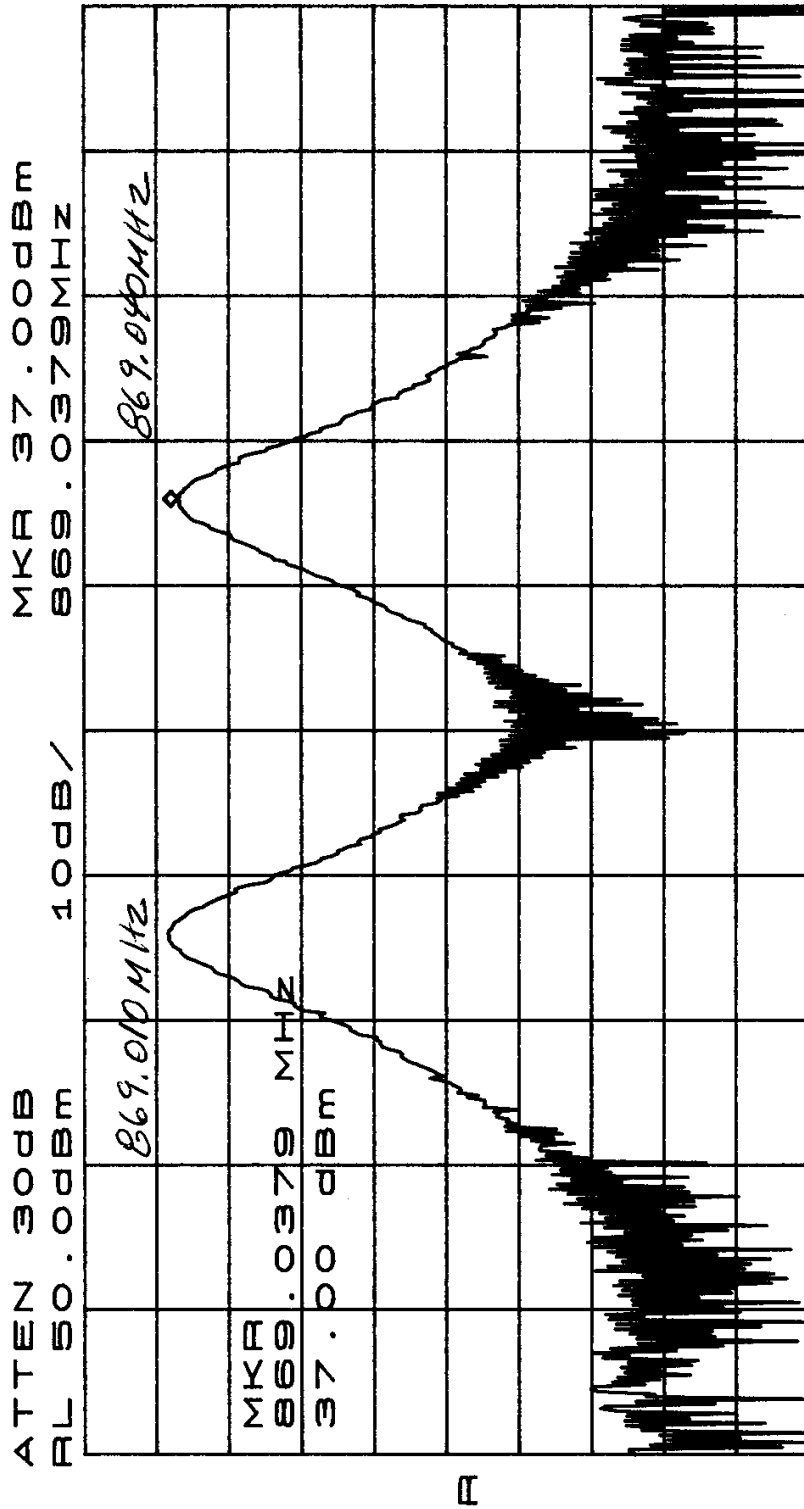
CENTER 869.0219MHz SPAN 100.0KHz
*RBW 3.0KHz *VBW 100KHz SWP 67.0ms

REMARKS THREE SIGNAL INTERMODULATION DISTORTION MEASUREMENT
TWO SIGNALS AT LOW FREQUENCY END OF AMPLIFIER
BANDPASS

TEST TECHNICIAN [Signature] TEST ENGINEER [Signature]

JOB NUMBER 400208-00-000

GRAPH NUMBER 4



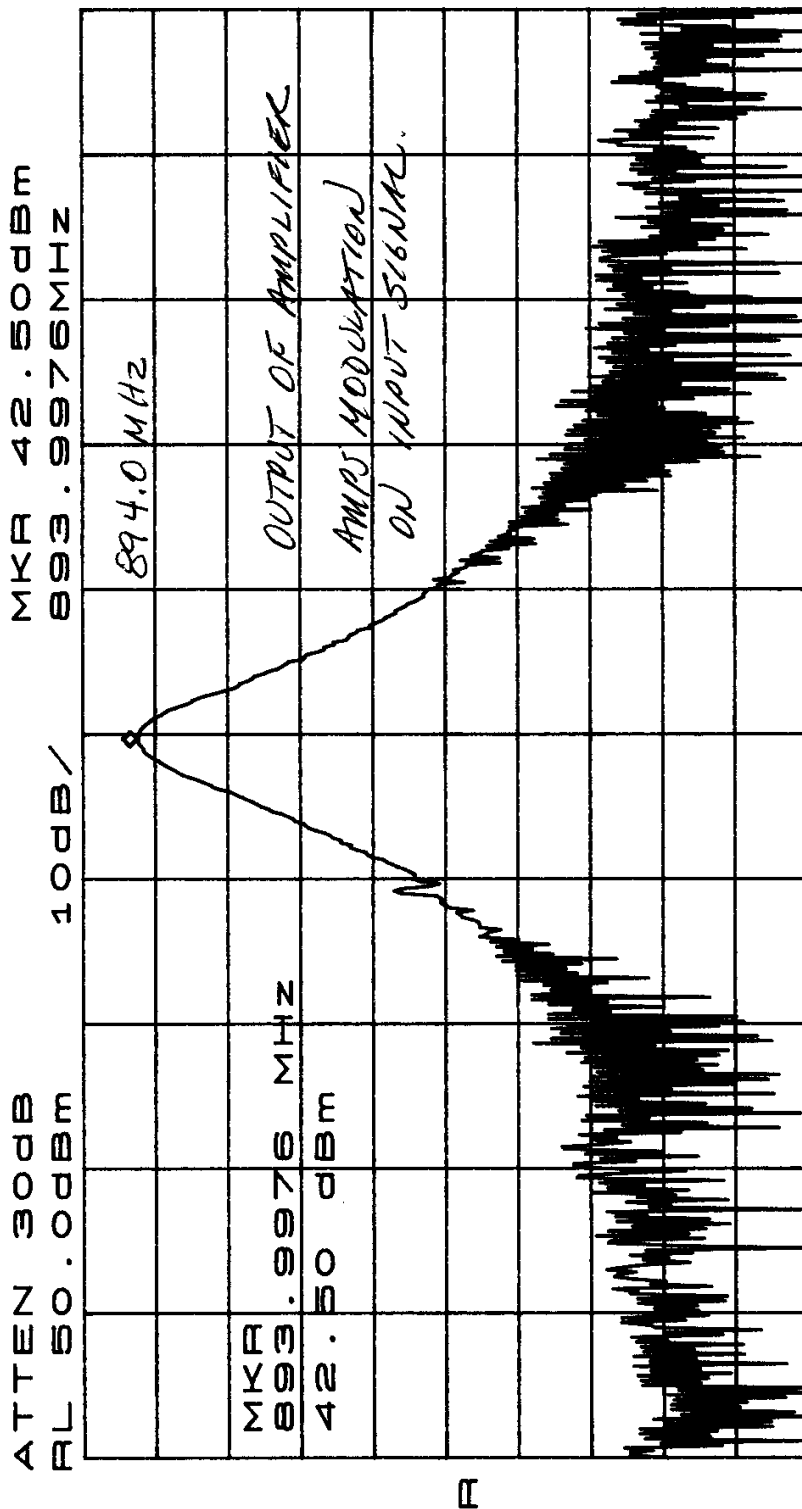
CENTER 869.0219MHz SPAN 100.0KHz
*RBW 3.0KHz *VBW 100KHz SWP 67.0ms

REMARKS THREE SIGNALS INTERMODULATION DISTORTION MEASUREMENT

TEST TECHNICIAN [Signature] TEST ENGINEER [Signature]
SAME AS GRAPH 3

JOB NUMBER 400208-00-000

GRAPH NUMBER 5



CENTER 893.9980MHz SPAN 100.0KHz
*RBW 3.0KHz *VBW 100KHz SWP 67.0ms

REMARKS THREE SIGNAL INTERMODULATION DISTORTION MEASUREMENT
ONE SIGNAL AT HIGH FREQUENCY END OF AMPLIFIER

TEST TECHNICIAN J. Butler TEST ENGINEER J. Butler



-23.33 dBm
~~3.33 dBm~~

ATTENTION BOARD OF
PUBLIC WORKS

N I S V F . F V
O O I I

100B/

[illegible]

U S O . D M S * N I Y O . N I Y O .
S T O S T O S T O S T O S T O S T O
I N . O . O . O . O . O . O . O .

REMARKS
THREE SPEAK INTERMODULATION DISTORTION MEASUREMENTS
30MHZ TO 125MHZ OUT OF BAND PRODUCTS

TEST TECHNICIAN J. Buckley



GRAPH NUMBER 7



ATLANTA
TENN.
NOV. 7
0000
0000
0000

1000 /
1000
1000
1000
1000

MYR
1000
1000
1000
1000

- 23.33 dBm
~~- 3.33 dBm~~

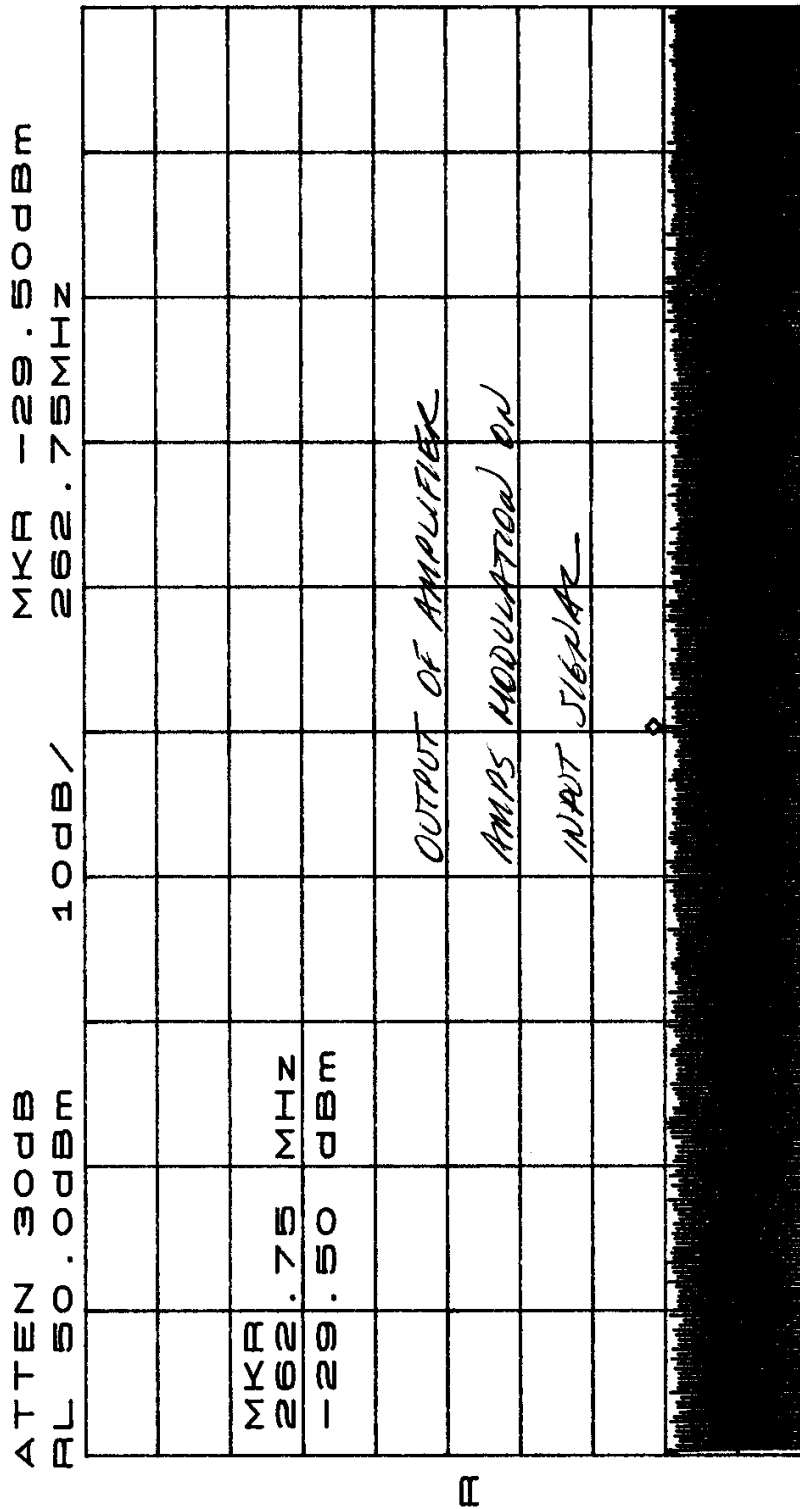
JF

[illegible][illegible]

REMARKS	THREE SIGMA INTERMODULATION DISTORTION MEASUREMENT
TEST TECHNICIAN	125 MHz TO 225 MHz OUT OF BAND PRODUCTS <i>[Signature]</i>
TEST ENGINEER	<i>[Signature]</i>

JOB NUMBER 460208-00-000

GRAPH NUMBER 8



START 225.00MHz STOP 300.00MHz
*RBW 3.0kHz *VBW 100kHz *SWP 50.0sec

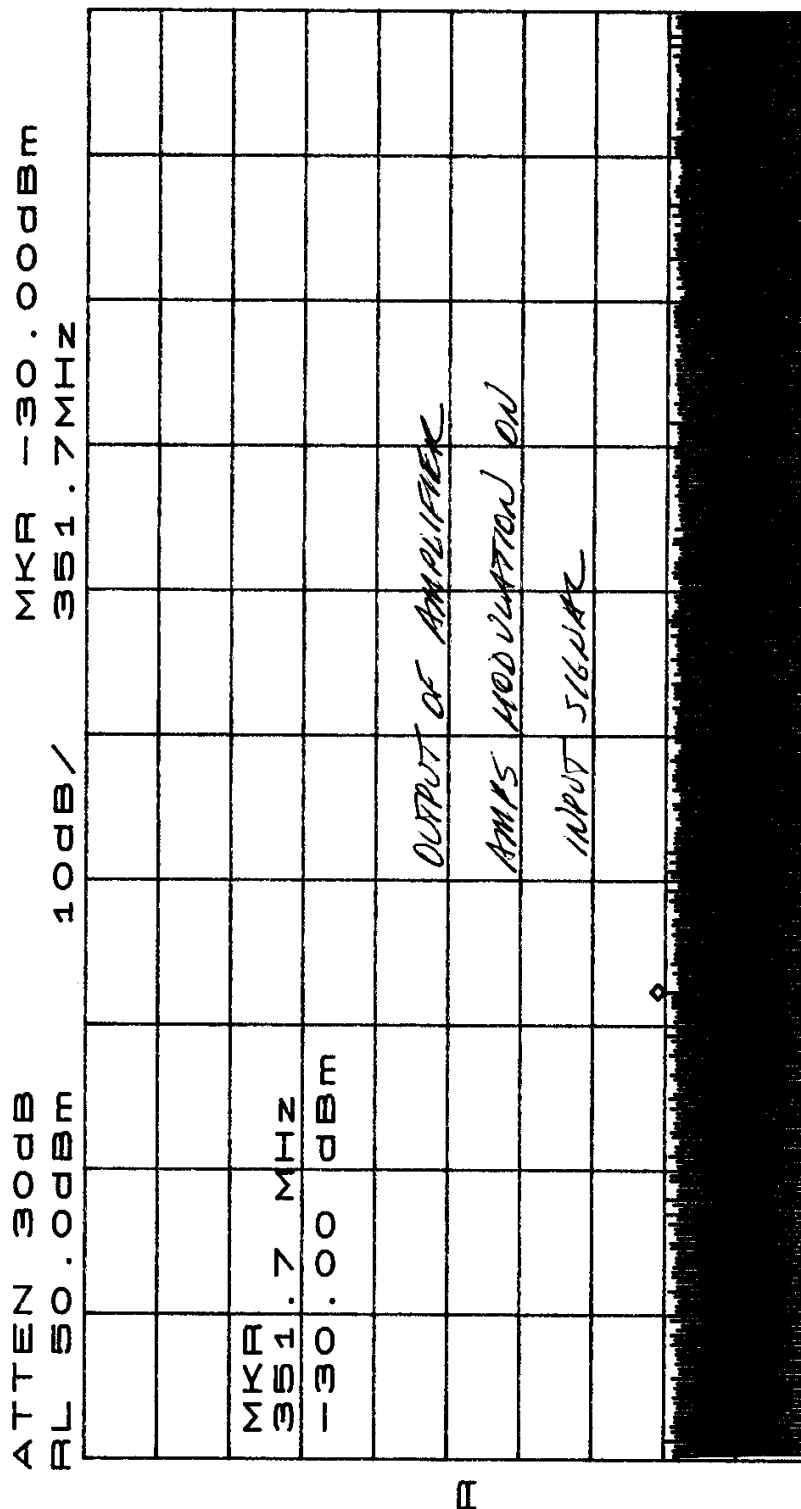
REMARKS THREE SIGNAL INTERMODULATION DISTORTION MEASUREMENTS
225 MHz TO 300 MHz OUT OF BAND PRODUCTS

TEST TECHNICIAN [Signature] TEST ENGINEER [Signature]



JOB NUMBER 400208-00-000

GRAPH NUMBER 9

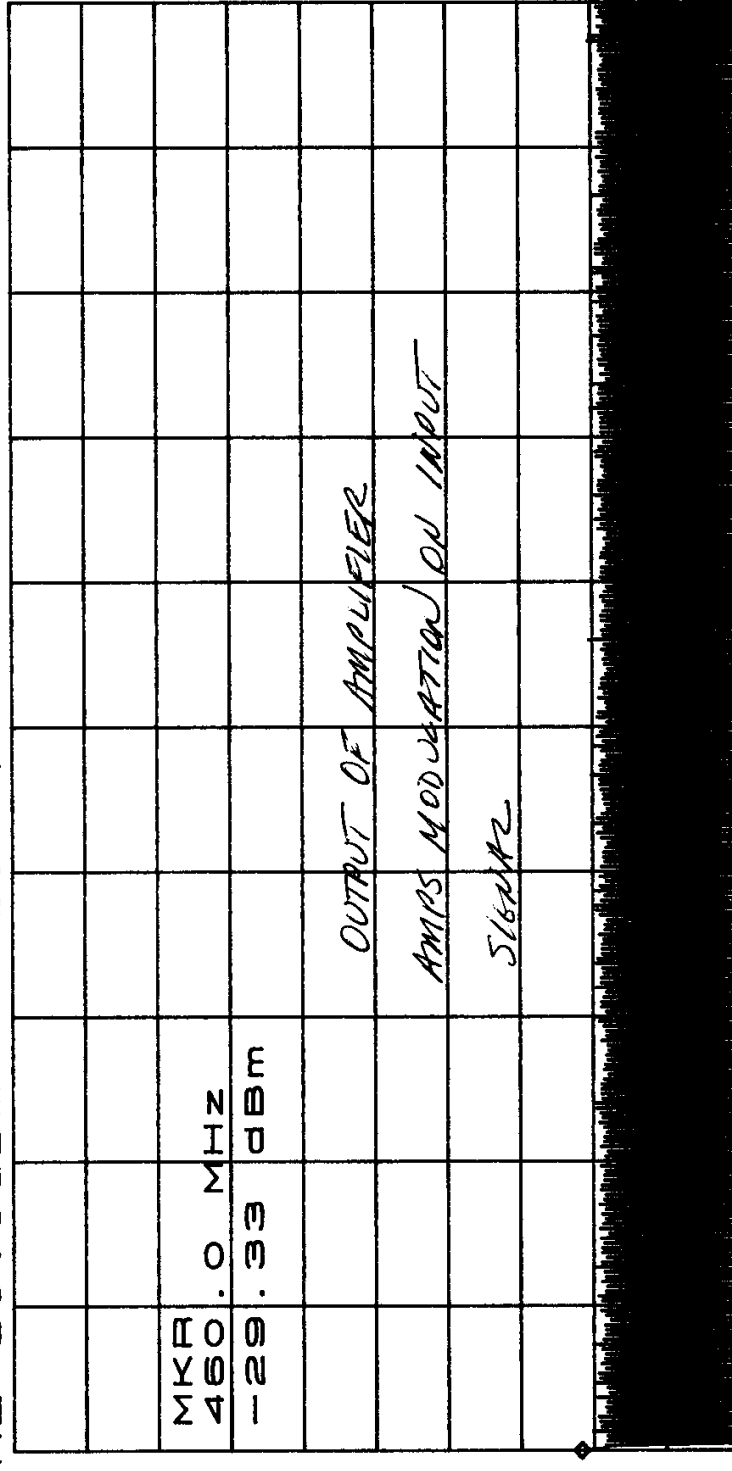


JOB NUMBER 400208-00-000

GRAPH NUMBER 10



ATTEN 30dB MKR -29.33dBm
RL 50.0dBm 460.0MHz
10dB/



660MHz

460MHz

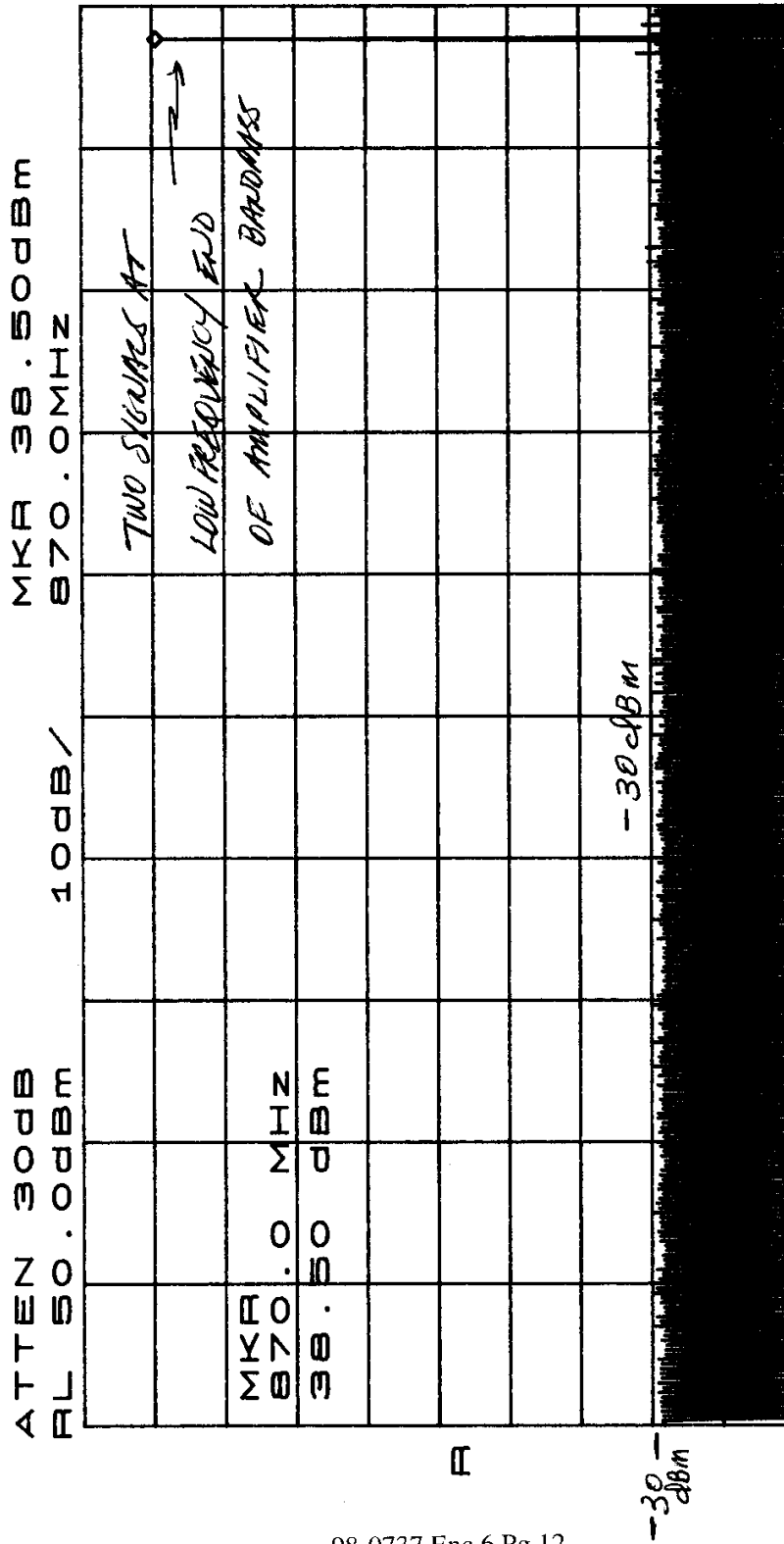
*RBW 3.0kHz *VBW 100kHz *SWP 60.0sec

REMARKS THREE SIGNAL INTERMODULATION DISTORTION MEASUREMENT
460MHz TO 660MHz OUT OF BAND PRODUCTS

TEST TECHNICIAN [Signature] TEST ENGINEER [Signature]

JOB NUMBER 400208-00-000

GRAPH NUMBER 11



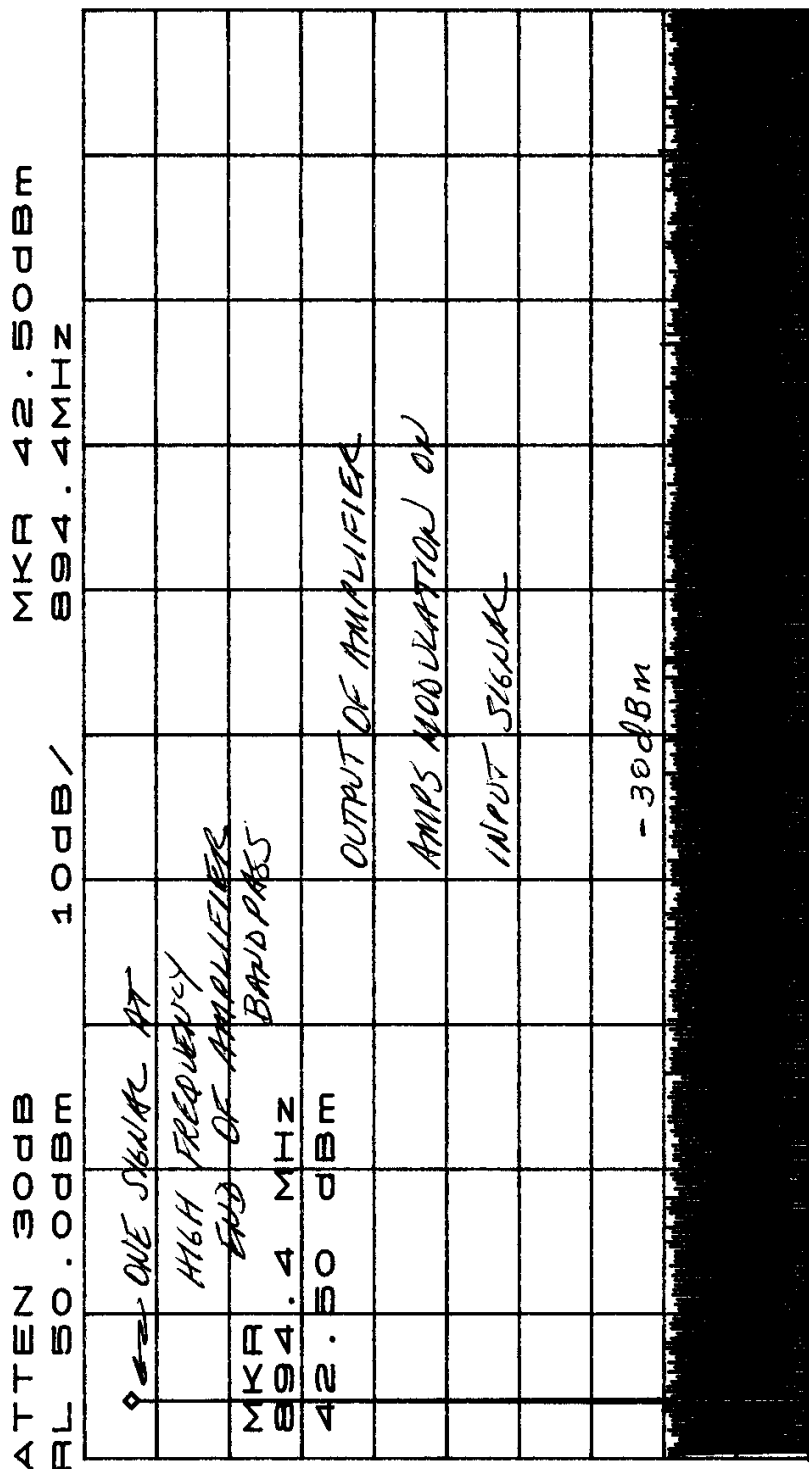
START 660.0MHz STOP 875.0MHz
*RBW 3.0kHz *VBW 100kHz *SWP 60.0sec

REMARKS THREE SIGNAL INTERMODULATION DISTORTION MEASUREMENT
660MHz TO 875MHz OUT OF BAND PRODUCTS

TEST TECHNICIAN [Signature] TEST ENGINEER [Signature]

JOB NUMBER 400208-00-000

GRAPH NUMBER 12



START 890.0MHZ STOP 1.0000GHZ
*RBW 3.0KHZ *VBW 100KHZ *SWP 35.098C

REMARKS THREE SIGNAL INTERMODULATION DISTORTION MEASUREMENT
890 MHz TO 1 GHz OUT OF BAND PRODUCTS

TEST TECHNICIAN [Signature] TEST ENGINEER [Signature]



Enclosure 7

Conducted and Radiated Spurious and
Harmonic Emission Measurements



CONDUCTED AND RADIATED SPURIOUS AND HARMONIC EMISSION MEASUREMENTS

Test Procedure

With the amplifier output set to 47.83 dBm at 881.35 MHz into a 50-ohm load, conducted spurious and harmonic emissions were measured at its output connector between 850 MHz and 10 GHz.

With the amplifier output set to 47.83 dBm at 881.75 MHz into a 50-ohm load, radiated spurious and harmonic emissions from its case and cabling were measured between 1 GHz and 10 GHz.

Test Results

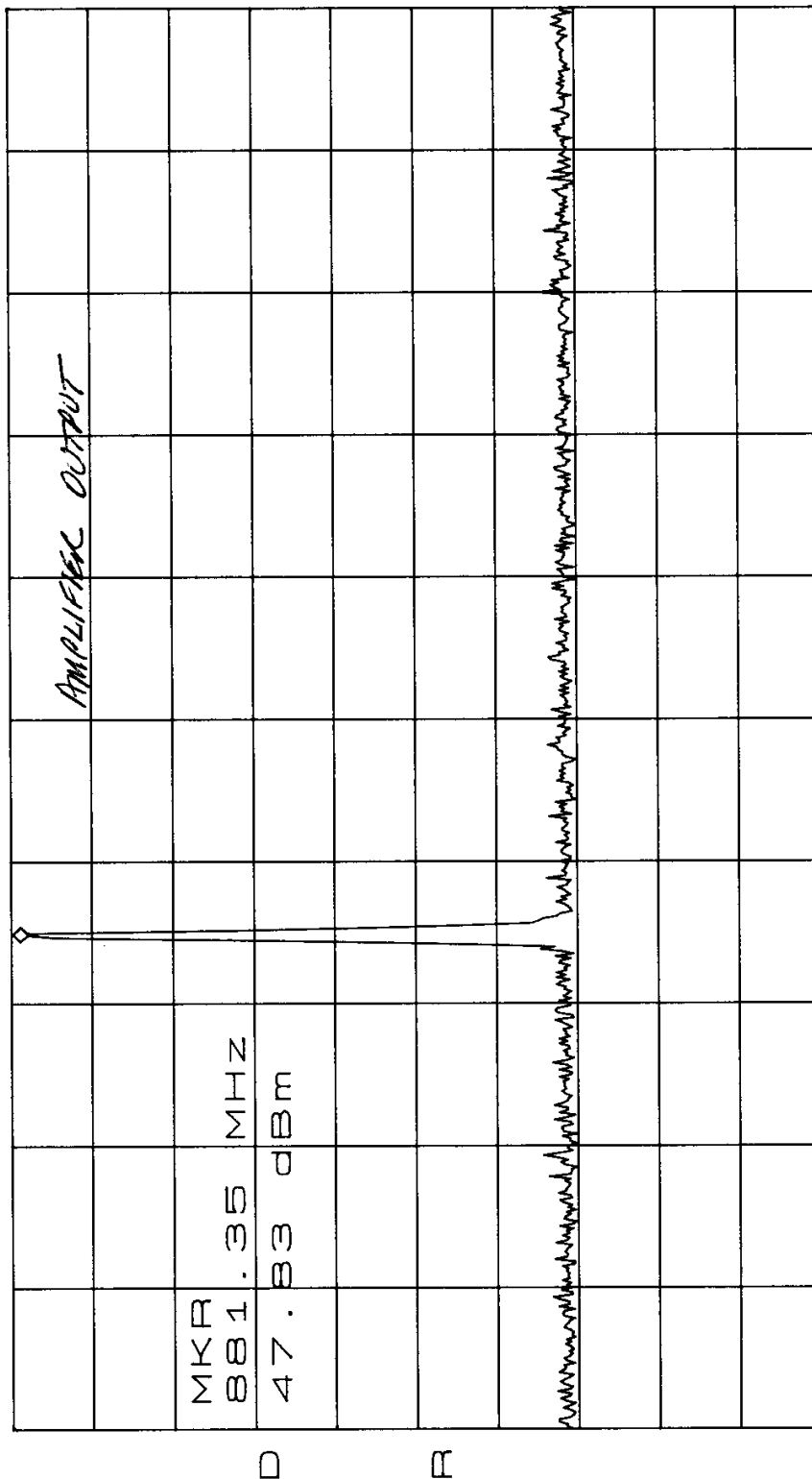
All measurements of conducted and radiated spurious and harmonic emissions were greater than 60.83 dB below the fundamental frequency output of the amplifier. See the data sheets for more detailed measurement information.

13

JOB NUMBER 400203-00-030

GRAPH NUMBER

*ATTEN 20dB MKR 47.83dBm
 RL 50.0dBm 881.35MHz
 10dB/



START 850.00MHz STOP 940.00MHz
 *RBW 100kHz VBW 100kHz SWP 50.0ms

REMARKS CW INPUT SIGNAL CONDUCTED SPURIOUS AND HARMONIC
EMISSION MEASUREMENT

TEST TECHNICIAN W. DingTEST ENGINEER J. J. J.

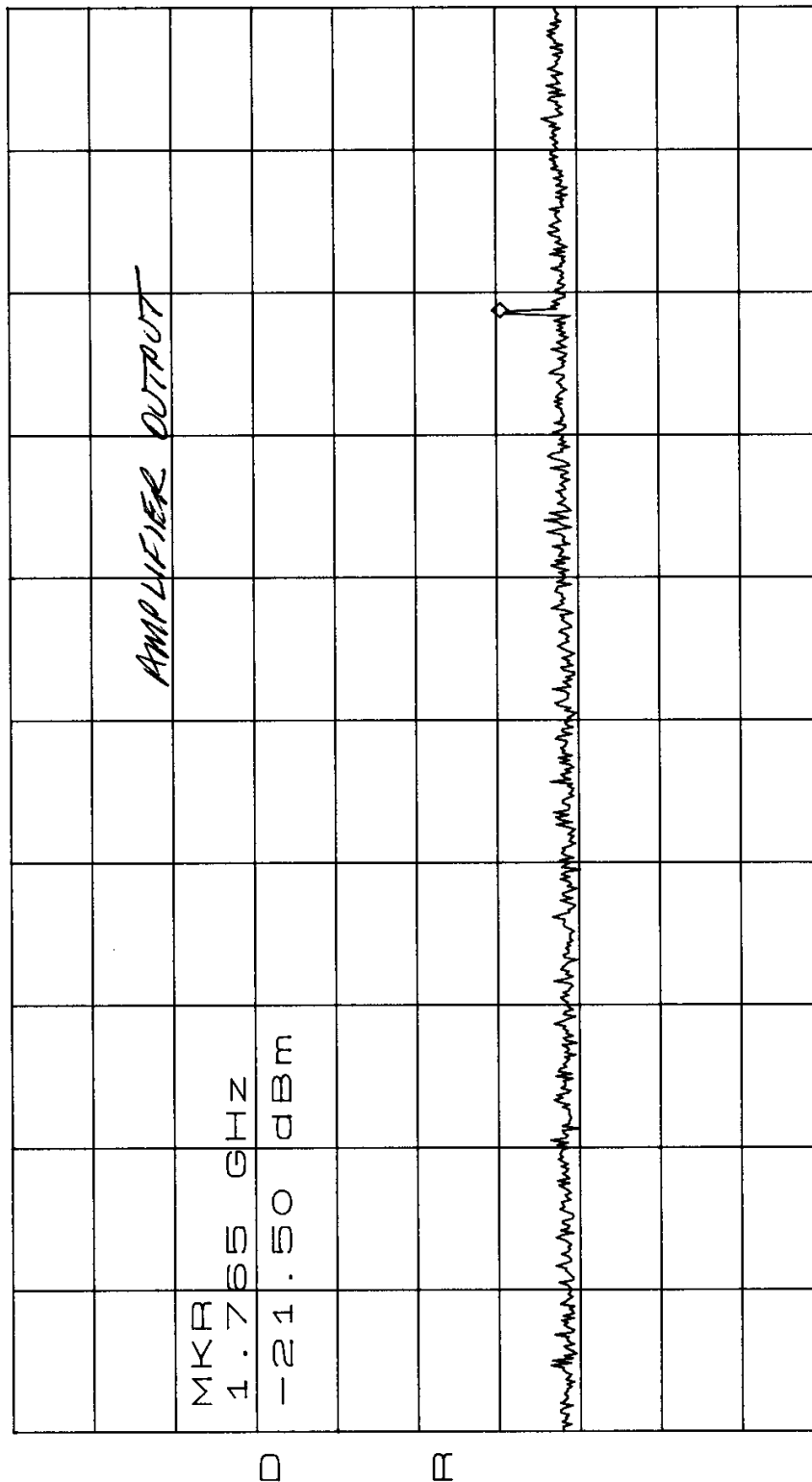
14



JOB NUMBER 400208-66-000

GRAPH NUMBER _____

*ATTEN 10dB MKR -21.50dBm
 RL 40.00dBm 10dB/ 1.765GHz



START 900MHZ STOP 2.000GHZ
 *RBW 100KHZ VBW 100KHZ SWP 280ms

REMARKS CW Input SIGNAL CONDUCTED SPURIOUS AND HARMONIC EMISSION MEASUREMENT

TEST TECHNICIAN [Signature] TEST ENGINEER [Signature]



Test Title: Radiated Emissions

Test Procedure: IEEE CS11-1991 Measurement

Customer: Microwave Power Devices

Test Item: Power Amplifier

Model Num.: FPPA 6659-60

Part Num.: DBO 54500-5

Serial Num.: 7879

Mode of Op.: Normal Operation (CW 661 MHz, 60 Watts output power)

Comment:

Date: 8/26/98

Tested By: Gary Butler

Project Eng.: J. Smith

Job Num.: 400208-00-000

Test Num.: 001

Sensor Loc.: 1 meter distance from back of unit

Sensor Pol.: Vertical

Time: 3:31 PM

1. RE Data

2. mptdata rel (spec limit)

File Name: 0208002 red

RADIATED SPURIOUS AND HARMONIC EMISSION MEASUREMENT

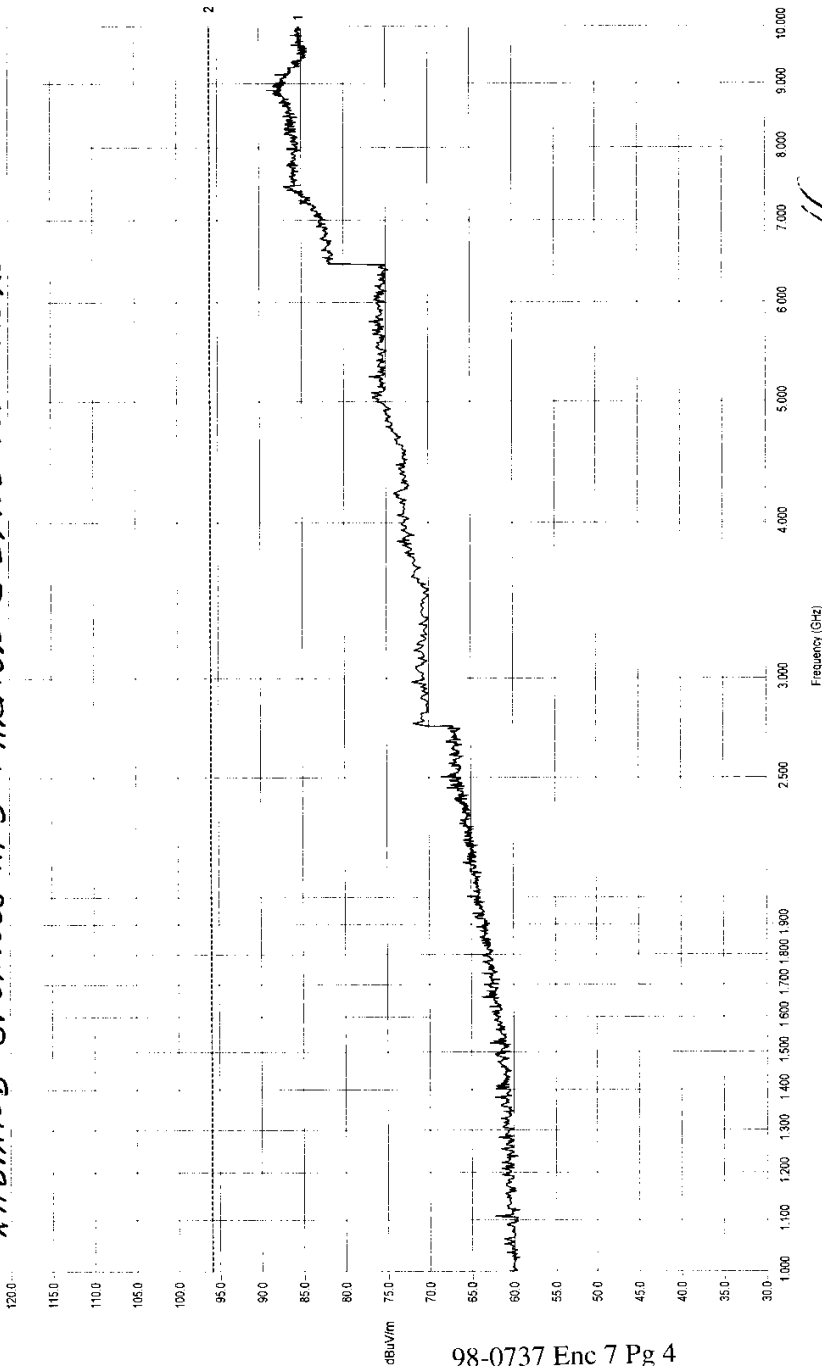
BW Table	
Frequency	BW
1.00 GHz	3.00E5 Hz
10.00 GHz	

Factor Files

27.55 na (1.00 GHz)

Correction Files

sm115c rec (1.00 GHz) (cable)
sm115b rec (1.00 GHz) (2nd cable)
z80 rec (1.00 GHz) (3rd cable)
z80 rel (1.00 GHz) (attenuator)
z80 rel (1.00 GHz) (pre-amp)



Engineer:

Technician:



Test Title: Radiated Emissions

Test Procedure: IEEE C63.1 1-1991 Measurement

Customer: Microwave Power Devices

Test Item: Power Amplifier

Model Num.: FFPA 666-60

Part Num.: DBO 54500-5

Serial Num.: 7879

Mode of Op.: Normal Operation (CW 881 MHz, 60 Watts output power)

Comment:

Date: 8/25/98

Tested By: Gary Butler

Project Eng.: J. Smith

Job Num.: 460208-00-000

Test Num.: 003

Sensor Loc.: 1 meter distance from back of unit

Sensor Pol.: Horizontal

Time: 4:00 PM

1. RE Data

2. upgrade rel (spec limit)

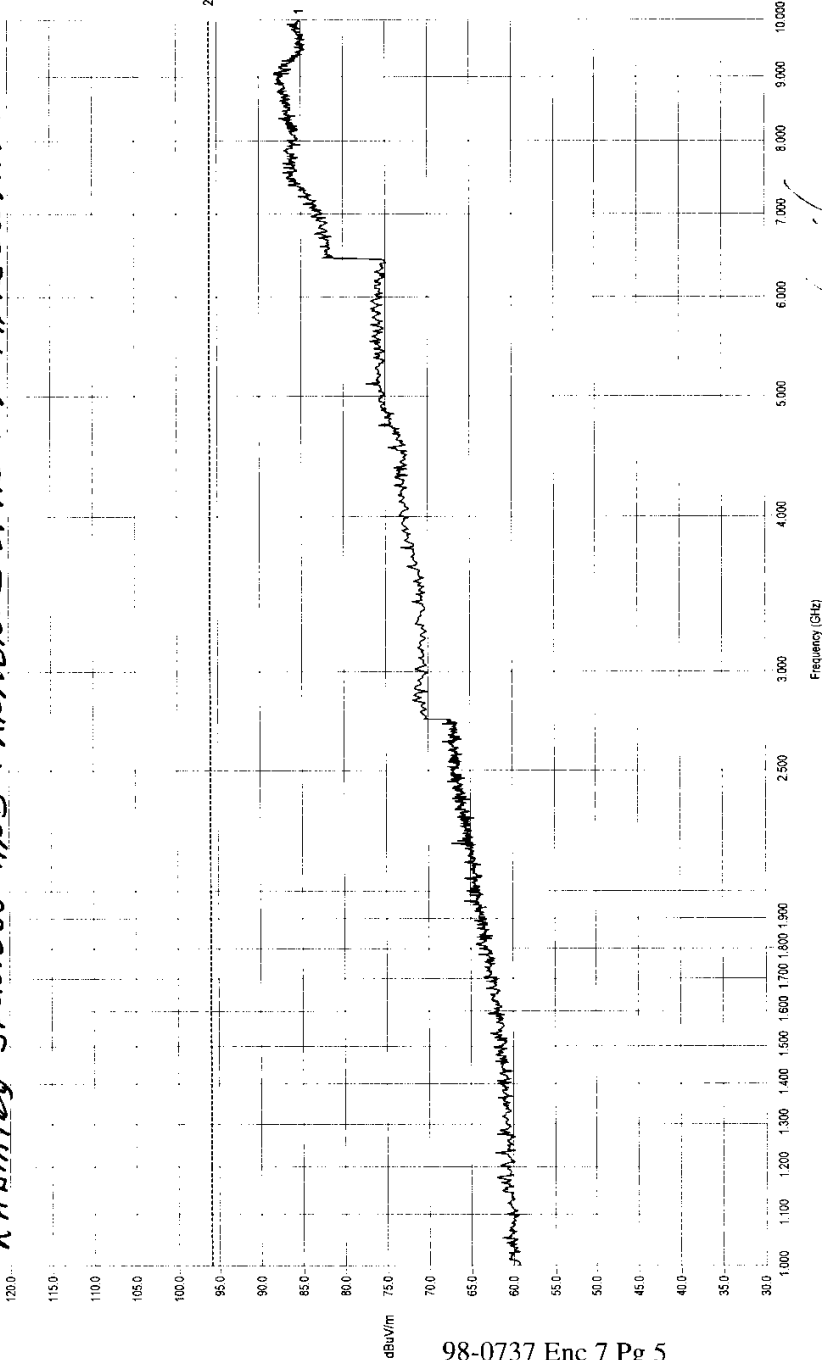
File Name: 0206003 red

RADIATED SPURIOUS AND HARMONIC EMISSION MEASUREMENT

BW Table	
Frequency	BW
1.00 GHz	3.00ES Hz
10.00 GHz	

Factor Files	
27.55 res	1.00 GHz

Correction Files	
sm111cc res	1.00 GHz (cable)
sm111b res	1.00 GHz (2nd cable)
zero res	1.00 GHz (3rd cable)
zero ref	1.00 GHz (attenuator)
zero eq	1.00 GHz (pre-amp)



Engineer: *[Signature]*

Technician: *[Signature]*



Enclosure 8

Comparison of Amplifier Output to Amplifier Input for Distortion



COMPARISON OF AMPLIFIER OUTPUT TO AMPLIFIER INPUT FOR DISTORTION

Test Procedure

A CW signal was applied to the input of the amplifier at 880.99 MHz with sufficient level to produce 46.83 dBm of amplifier output into a 50-ohm load. The input signal and the output signal were both analyzed with a spectrum analyzer to detect distortion products produced by the amplifier.

The CW input signal was then frequency modulated with a 1-kHz tone to a deviation level of 5 kHz. The input signal and the output signal were both analyzed with a spectrum analyzer to detect distortion products produced by the amplifier.

A CDMA signal was applied to the input of the amplifier at 880.99 MHz with sufficient level to produce 30 dBm of amplifier output into a 50-ohm load. The input signal and the output signal were both analyzed with a spectrum analyzer to detect distortion products produced by the amplifier.

A TDMA signal was applied to the input of the amplifier at 880.99 MHz with sufficient level to produce 30 dBm of amplifier output into a 50-ohm load. The input signal and the output signal were both analyzed with a spectrum analyzer to detect distortion products produced by the amplifier.

A 2FSK signal was applied to the input of the amplifier at 880.99 MHz with sufficient level to produce 30 dBm of amplifier output into a 50-ohm load. The input signal and the output signal were both analyzed with a spectrum analyzer to detect distortion products produced by the amplifier.

An AMPS signal was applied to the input of the amplifier at 894.0 MHz with sufficient level to produce 42.5 dBm of amplifier output into a 50-ohm load. The input signal and the output signal were both analyzed with a spectrum analyzer to detect distortion products produced by the amplifier.

Test Results

No significant amplifier distortion was detected using either the CW, Frequency Modulated, CDMA, TDMA, 2FSK, or AMPS input signal. See the following graphs for more detailed test results.

15



JOB NUMBER 400208-00-000

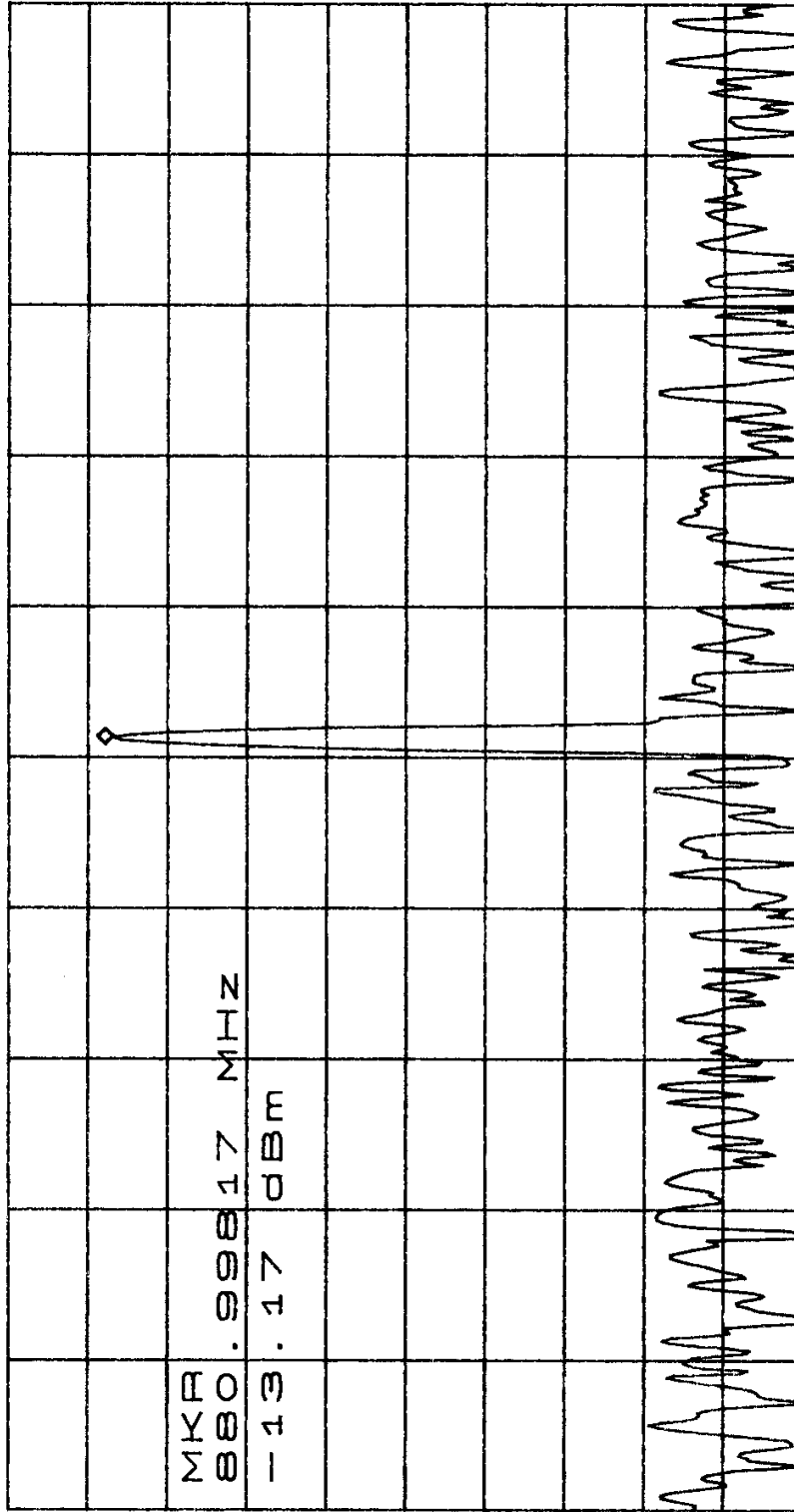
GRAPH NUMBER

*ATTEN 0dB

RL 0dBm

MKR -13.17dBm

880.99817MHz



II

CENTER 880.99790MHz

SPAN 20.00KHz

VBW 100Hz

*RBW 100Hz

SWP 1.60sec

REMARKS

CW (Input Signal to Amplifier)

TEST TECHNICIAN W Pms

TEST ENGINEER

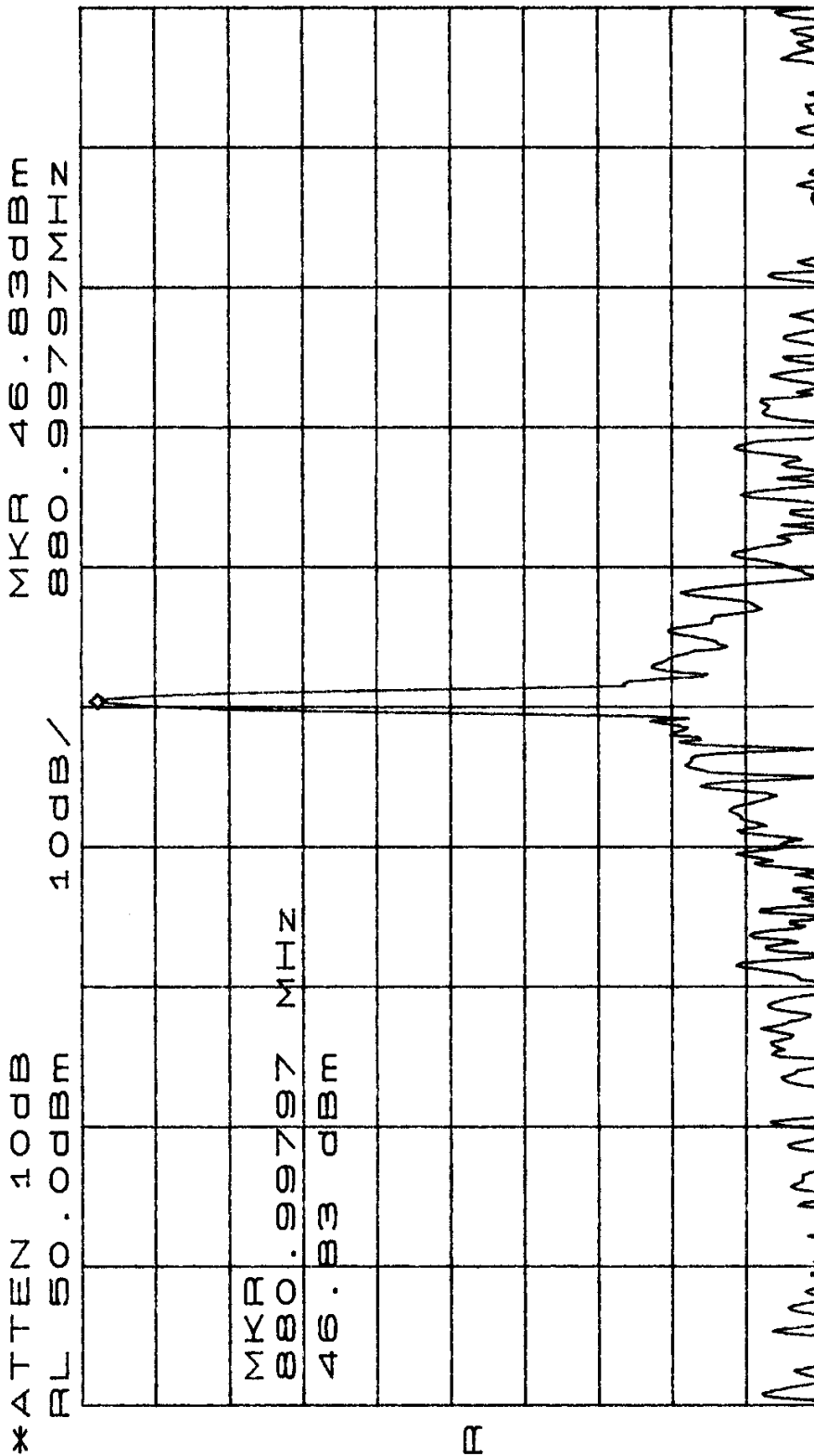
[Signature]

16



JOB NUMBER 400208-20-000

GRAPH NUMBER _____



CENTER 880.99790MHz SPAN 20.00kHz
*RBW 100Hz VBW 100Hz SWP 1.60sec

REMARKS Amplifier Output, No modulation (CW)

TEST TECHNICIAN W. P. Moore TEST ENGINEER J. A. [Signature]

17

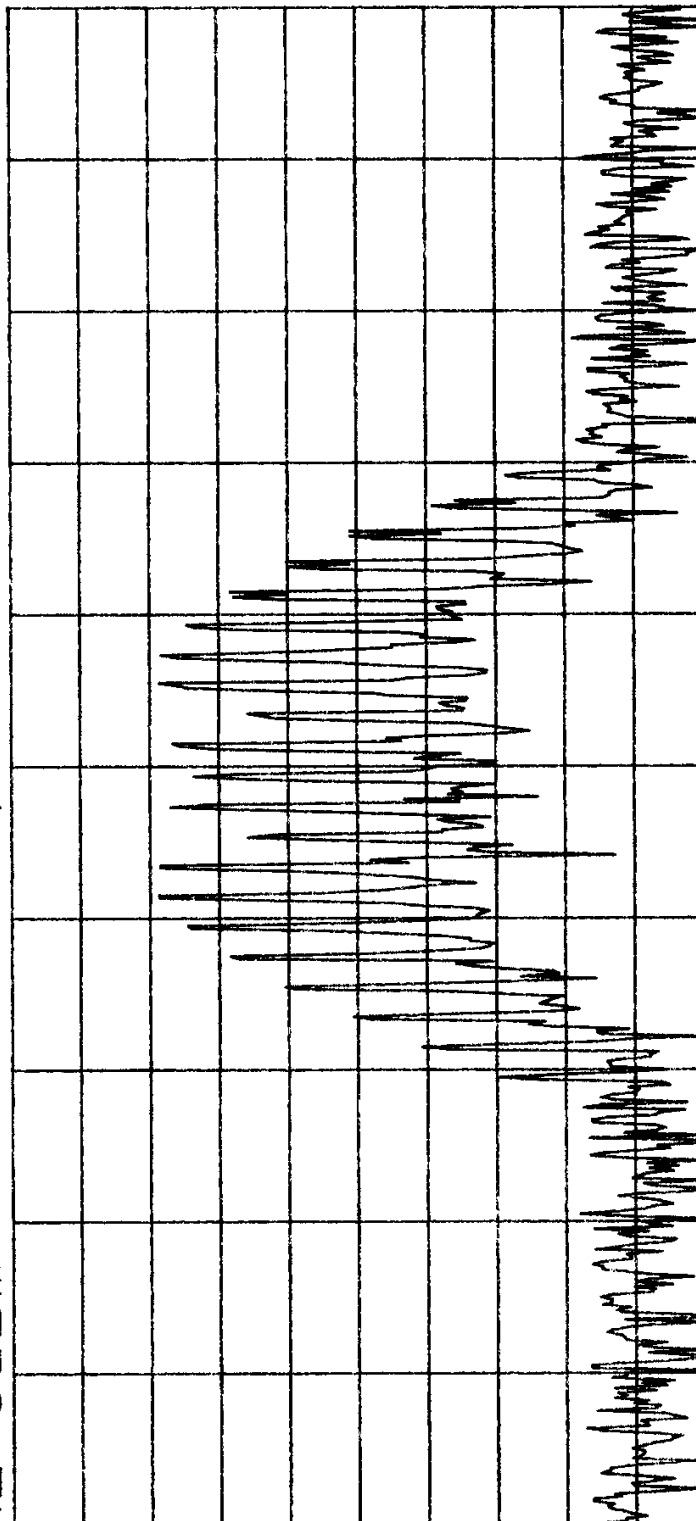


JOB NUMBER 402208-00-000

GRAPH NUMBER

*ATTEN 0dB
RL 0dB

100dB/



CENTER 881.00040MHZ SPAN 50.000000
RBW 100HZ VBW 100HZ SWP 4.000000

REMARKS FM (Input Signal to Amplifier)

TEST ENGINEER J. P. [Signature]

TEST TECHNICIAN W. P. [Signature]

18

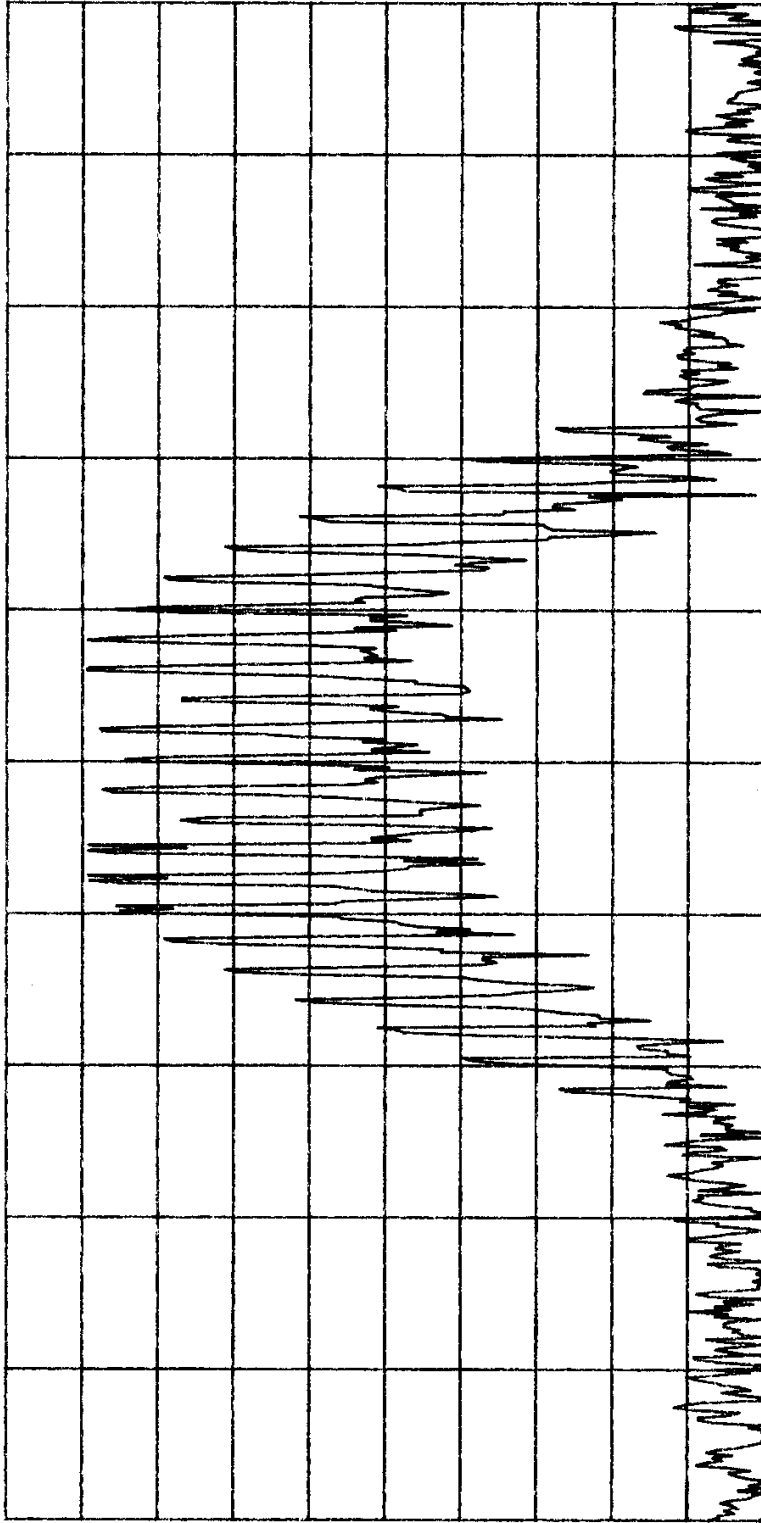


GRAPH NUMBER

JOB NUMBER 400208-0-00

*ATTEN 10dB
RL 50.0dBm

10dB/



1

CENTER 881.00000MHZ SPAN 50.000KHZ
*RBW 100HZ VBW 100HZ SWP 4.000SEC

REMARKS FM (Output of Amplifier)

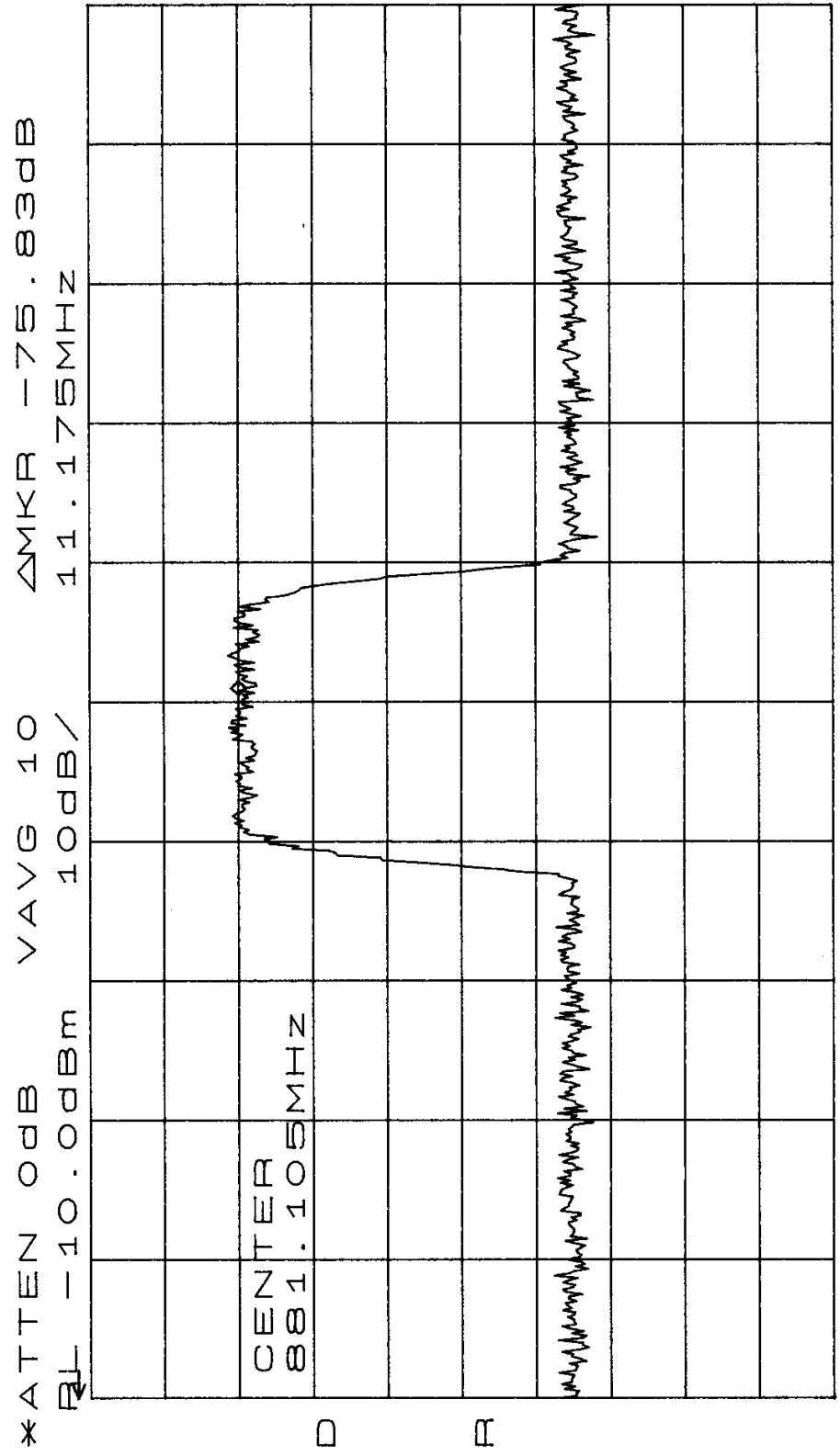
TEST TECHNICIAN 1/1/02 TEST ENGINEER JL

19



JOB NUMBER 40020P-20-000

GRAPH NUMBER _____



CENTER 881.105MHZ SPAN 7.000MHZ
 *RBW 30KHZ VBW 30KHZ SWP 50.0ms

REMARKS COMA (INPUT SIGNAL TO AMPLIFIER)

TEST TECHNICIAN TD Davis TEST ENGINEER OK

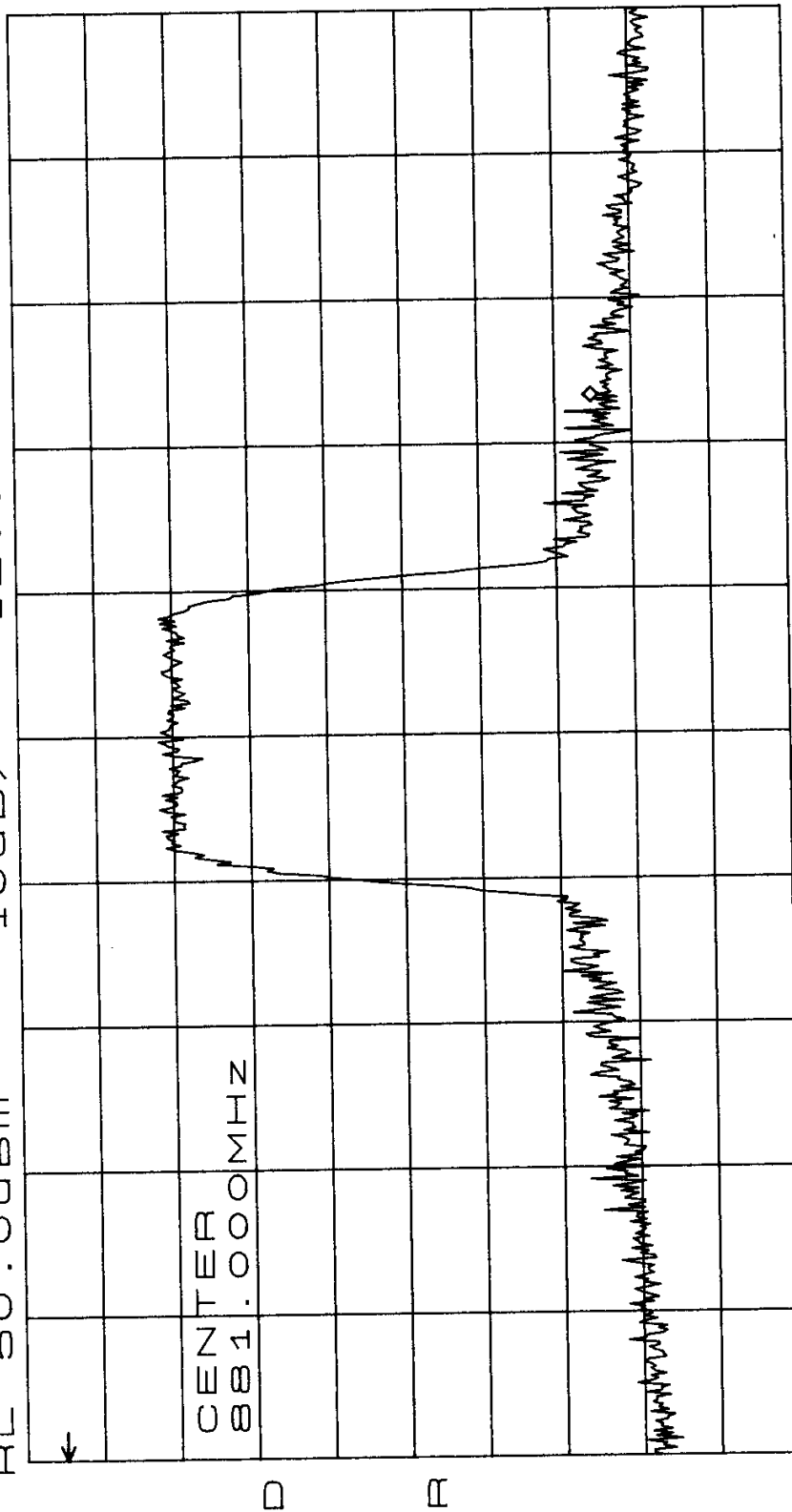
20



JOB NUMBER 400208-00-000

GRAPH NUMBER

*ATTEN 10dB VAVG 10 ΔMKR -70.50dB
 RL 50.0dBm 10dB/ 12.633MHz



CENTER 881.000MHZ SPAN 7.000MHZ
 *RBW 30KHZ VBW 30KHZ SWP 50.0ms

REMARKS COMA (Output of Amplifier)

TEST TECHNICIAN *W. J. King*TEST ENGINEER *J. J. King*

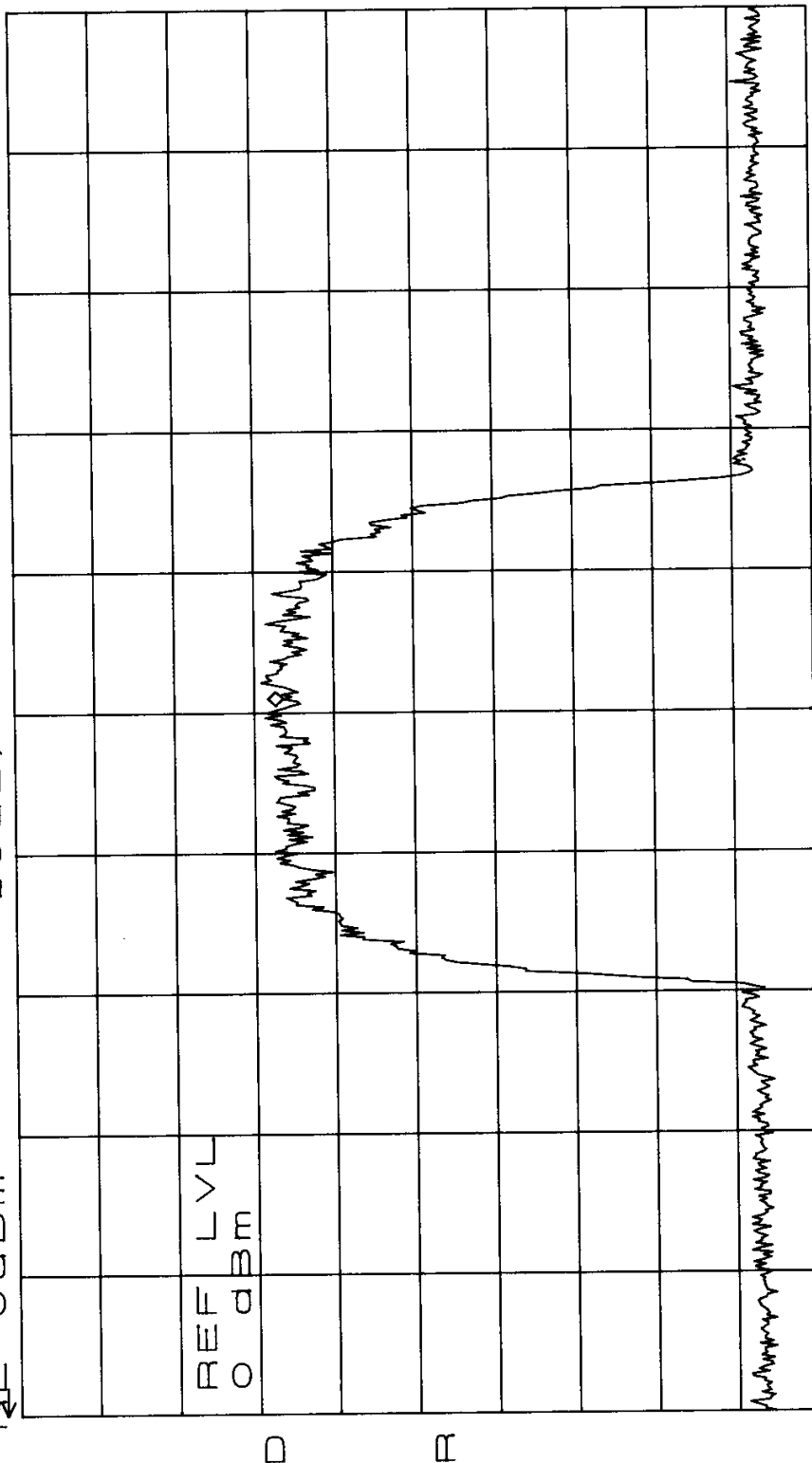


21

JOB NUMBER 400208-00-000

GRAPH NUMBER _____

*ATTEN 0dB VAVG 10 Δ MKR -78.50dB
RL 0dBm 10dB/ 11.0010MHZ



CENTER 881.0000MHZ SPAN 100.0KHZ
*RBW 300HZ VBW 300HZ SWP 2.80sec

REMARKS TDMA (Input 516kHz to Amplifier)

TEST TECHNICIAN TE

TEST ENGINEER John

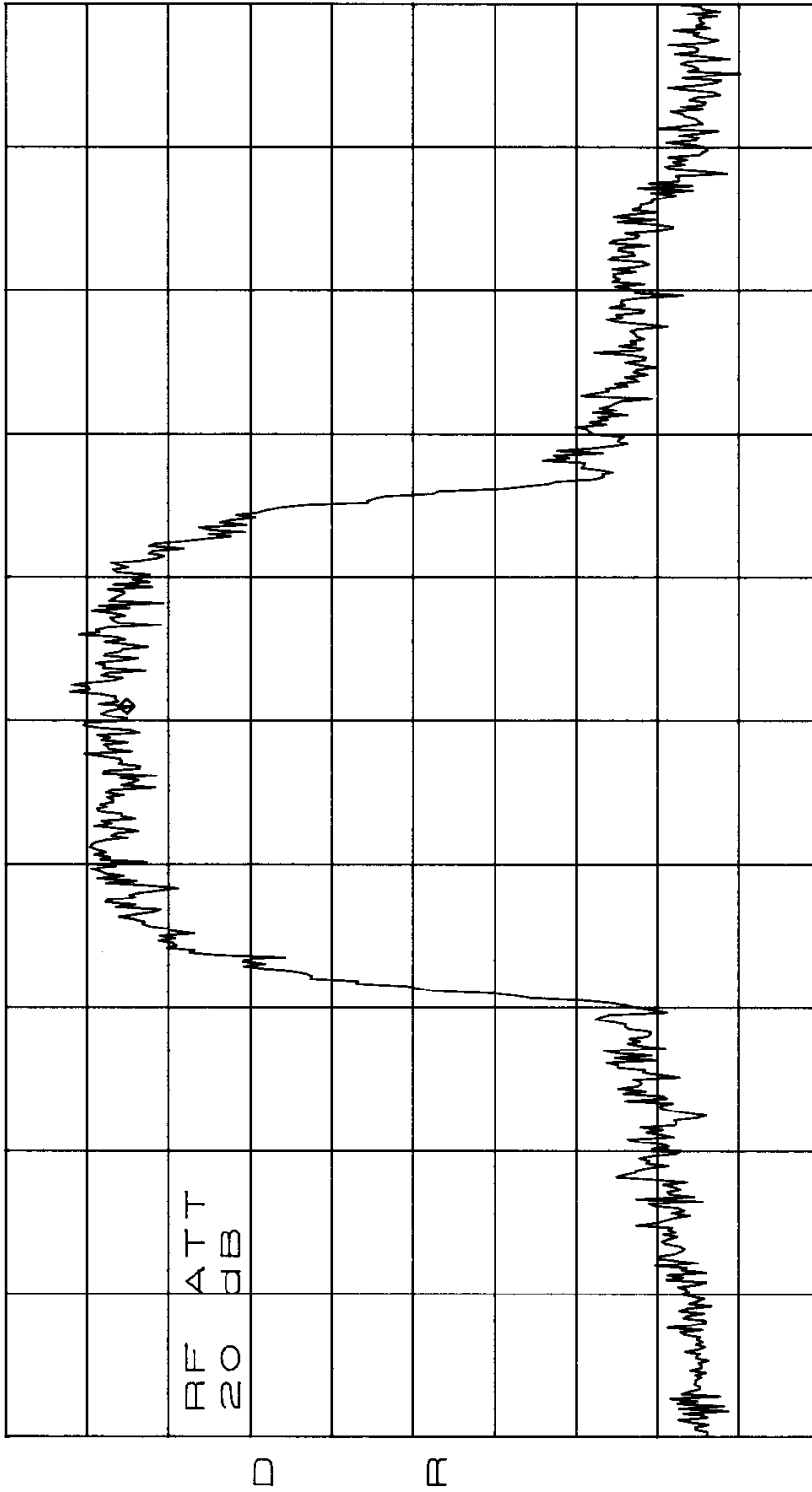
22



JOB NUMBER 40208-00-000

GRAPH NUMBER

*ATTEN 20dB VAVG 5 ΔMKR -20.56dB
RL 40.1dBm 10dB/ 11.0010MHZ



CENTER 881.0000MHZ SPAN 100.0KHZ
*RBW 300HZ VBW 300HZ SWP 2.80sec

REMARKS T01A (Output of Amplifier)

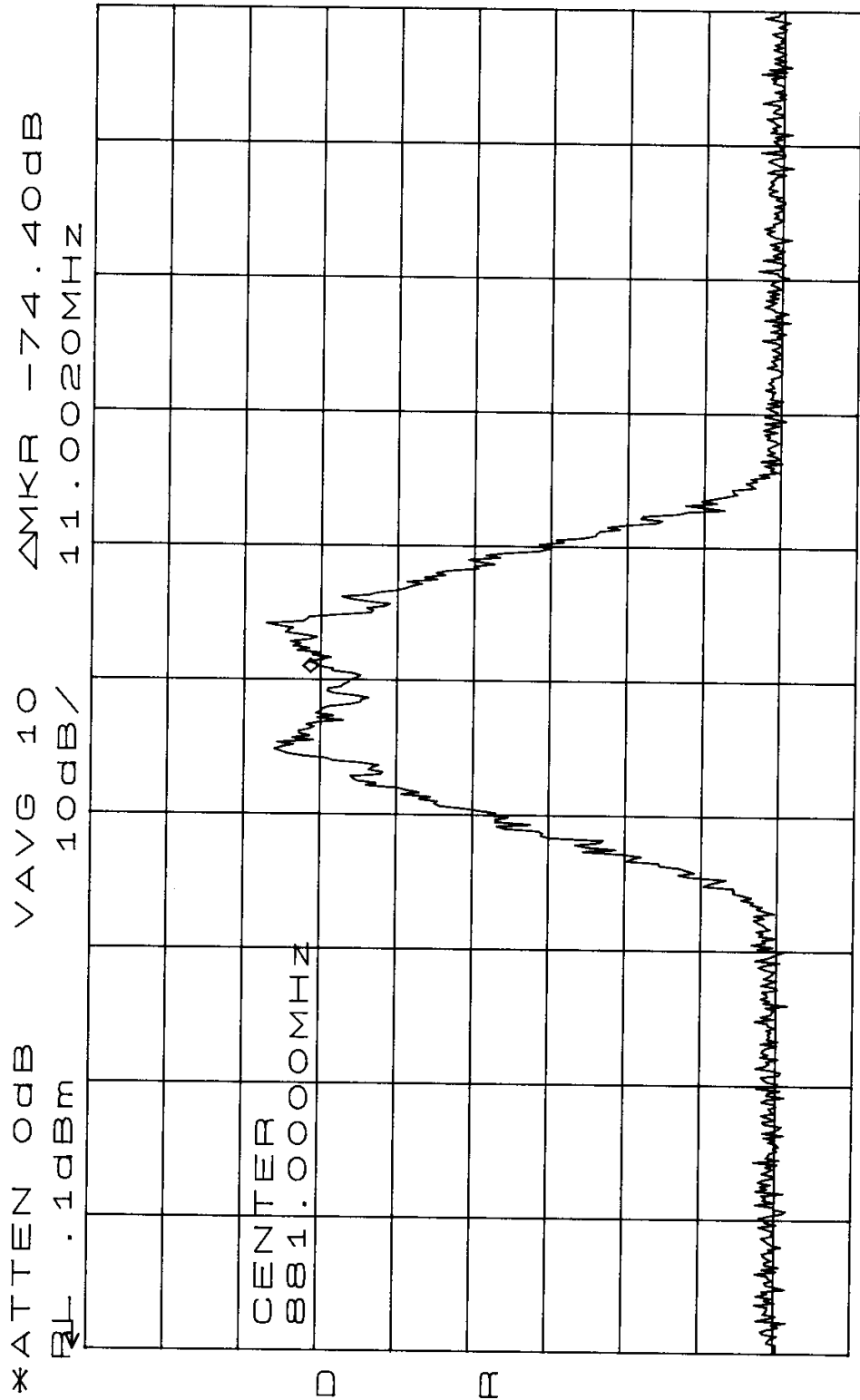
TEST TECHNICIAN W. D. [Signature] TEST ENGINEER [Signature]



23

GRAPH NUMBER

JOB NUMBER 400208-0-000



CENTER 881.00000MHZ SPAN 200.0KHZ
*RBW 1.0KHZ VBW 1.0KHZ SWP 500ms

REMARKS 2FSK (Input signal to amplifier)

TEST TECHNICIAN TDmy TEST ENGINEER gh

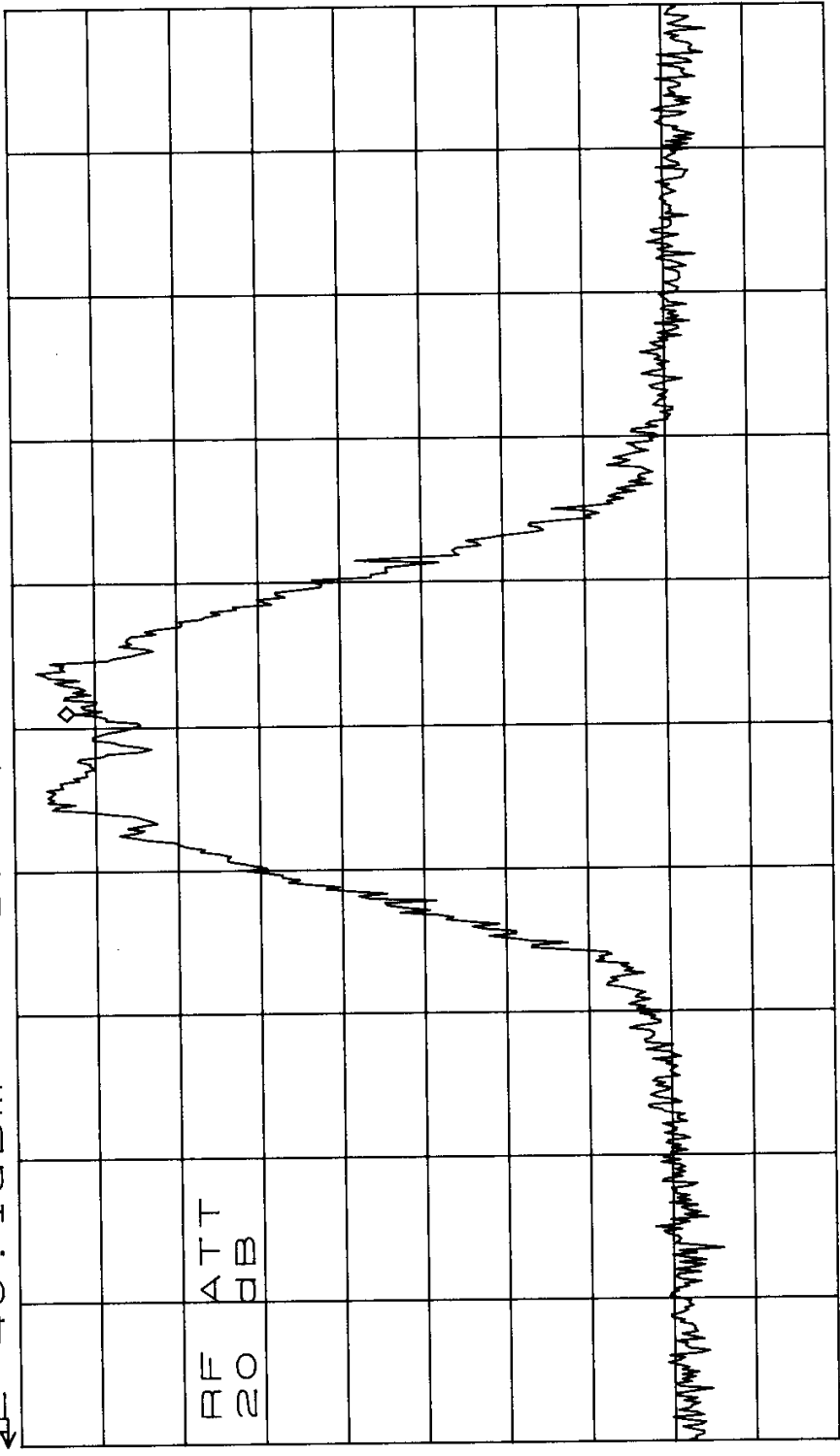


24

JOB NUMBER 400208-0-00

GRAPH NUMBER 24

*ATTEN 20dB VAVG 10 ΔMKR -12.23dB
RL 40.1dBm 10dB/ 11.0020MHZ



CENTER 881.0000MHZ SPAN 200.0KHZ
*RBW 1.0KHZ VBW 1.0KHZ SWP 500ms

REMARKS 2FSK (Output of Amplifier)

TEST TECHNICIAN W. J. J.

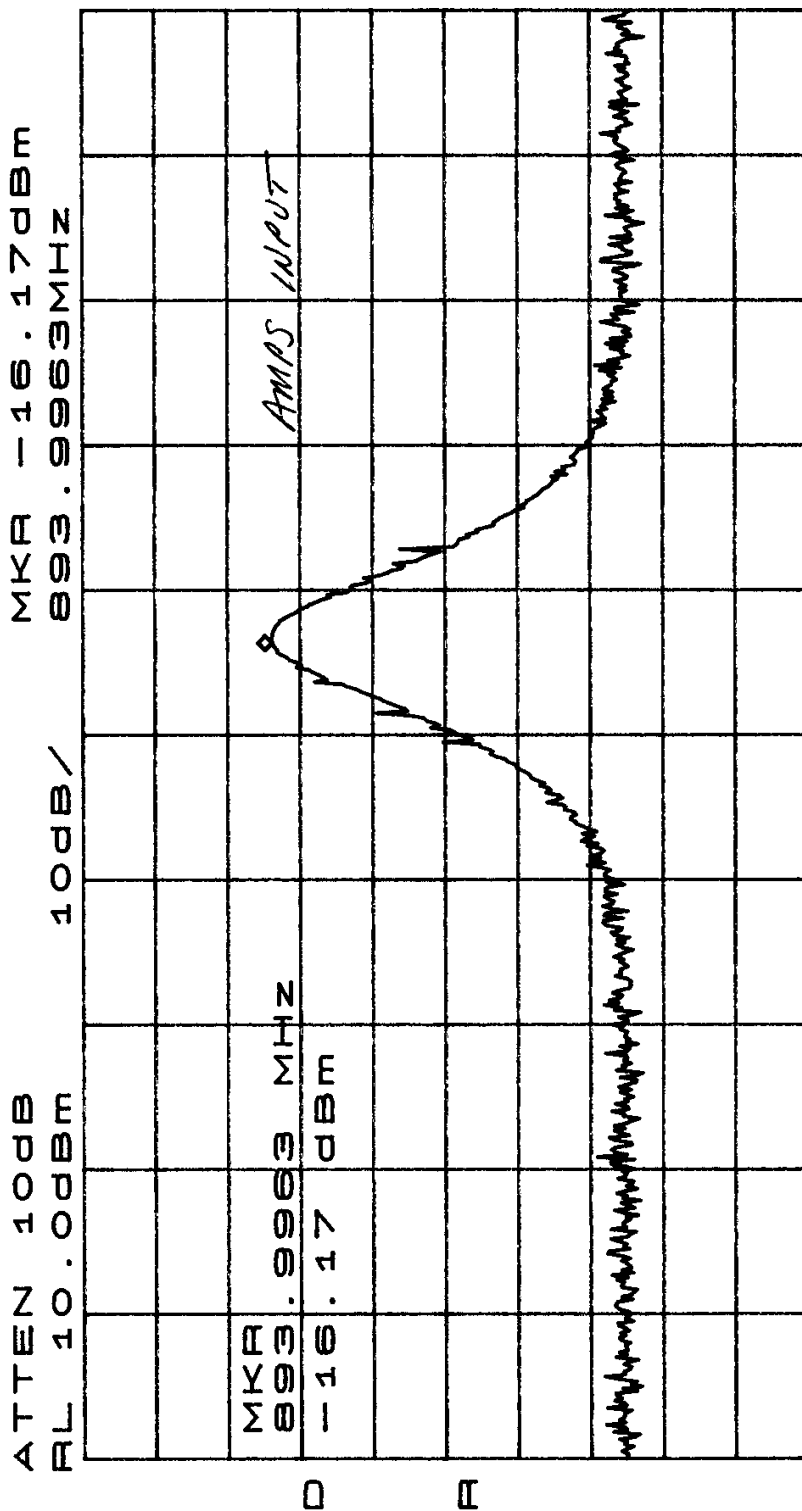
TEST ENGINEER W. J. J.



25

GRAPH NUMBER

JOB NUMBER 400208-00-000



CENTER 893.9900MHZ SPAN 100.0KHZ
*RBW 3.0KHZ *VBW 100KHZ *SWP 2.00500

REMARKS AMPS MODULATION INPUT SIGNAL TO AMPLIFIER

TEST TECHNICIAN *[Signature]*

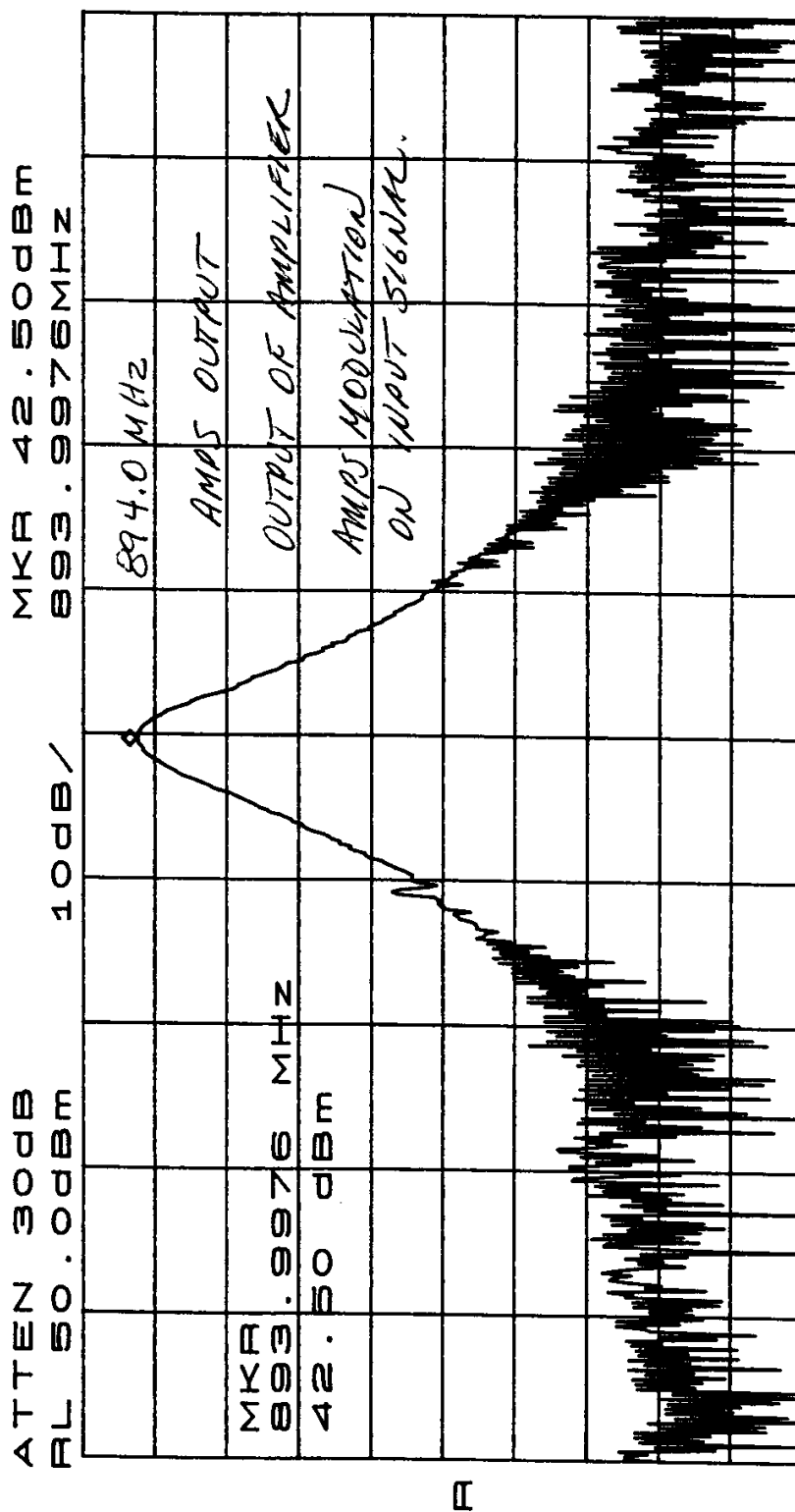
TEST ENGINEER *[Signature]*

26



GRAPH NUMBER

JOB NUMBER 400208-00-000



CENTER 893.9980MHz SPAN 100.0KHz
*RBW 3.0KHz *VBW 100KHz SWP 67.0ms

REMARKS THREE SIGNAL INTERMODULATION DISTORTION MEASUREMENT
ONE SIGNAL AT HIGH FREQUENCY END OF BANDPASS

TEST TECHNICIAN J. Butte TEST ENGINEER J. L.



Enclosure 9

Results of IEEE C95.1-1991 Measurement



IEEE C95.1 1-1991 MEASUREMENT

Test Procedure

With an 881 MHz signal applied to the amplifier, a radiated emission measurement was performed at a distance of 1 meter to determine if electromagnetic radiation from its enclosure and cabling exceed a safe maximum level of 63 V/m.

Test Results

Maximum electromagnetic radiation measured 0.025 V/m at a distance of 1 meter.

MPD

DBO 54500-5 (S/# 7879) 60 Watt Power Amp

26-Aug-98

Radiated Emissions at 881 MHz

Unit Location	Vertical Measured dBuV	Vertical Plus A/F	Horizontal Measured dBuV	Horizontal Plus A/F
Front	57.00	82.00	60.67	85.67
Rear	63.00	88.00	61.30	86.30
Top	54.50	79.50	57.10	82.10
Bottom	46.00	71.00	51.70	76.70
Left	56.33	81.33	56.33	81.33
Right	59.50	84.50	58.30	83.30

27-41 Used for 881 measurement (factor = 25 dB).





Enclosure 10

Physical Inspection Forms



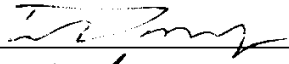
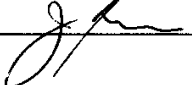
PHYSICAL INSPECTION FORM

JOB NUMBER 400208-00-000 DATE 08-25-98
CUSTOMER: MPD ENGINEER J. SMIRK
TEST FCC TYPE ACCEPTANCE SPECIFICATION FCC R&R
ITEM FFPA8689-60 AMPLIFIER SERIAL NO. 7879

A PRE TEST INSPECTION REVEALED :

- ☒ NO ANOMALIES
☐ NO ANOMALIES DUE TO TESTING
☐ THE FOLLOWING

Photograph Taken ?? _____ If Yes, Photo Number _____

Technician 
Engineer 

98-0737 Enc 10 Pg 1



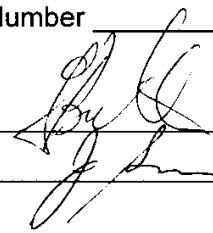
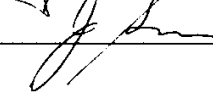
PHYSICAL INSPECTION FORM

JOB NUMBER 400208-00-000 DATE 10-07-98
CUSTOMER: MPD ENGINEER J. SMIRK
TEST FCC TYPE ACCEPTANCE SPECIFICATION FCC R&R
ITEM FFPA8689-60 AMPLIFIER SERIAL NO. 7879

A POST TEST INSPECTION REVEALED :

- ☒ NO ANOMALIES
☐ NO ANOMALIES DUE TO TESTING
☐ THE FOLLOWING

Photograph Taken ?? _____ If Yes, Photo Number _____

Technician 
Engineer 

98-0737 Enc 10 Pg 2



Enclosure 11

A2LA Scope of Accreditation



American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC GUIDE 25-1990

DAYTON T. BROWN, INC.
Church Street
Bohemia, NY 11716
Charles Gortakowski Phone: 516 589 6300

ACOUSTICS & VIBRATION

Valid To: December 31, 1998

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, Gunfire, Shipboard)

Buzz, Squeak and Rattle

Combined Environments and Reliability (Temperature, Humidity and Vibration)

Pyroshock

Sound Power and Measurements

Airborne and Structureborne Noise Measurement

On the following types of materials and products:

Aircraft Components & Systems; Automotive Components & Systems; Shipboard Components & Systems; Railroad & Industrial Vehicle Components & Systems; Information Technology & Telecommunication Equipment & Systems; Electronic Components & Systems; Medical Electronic Equipment; Military Equipment & Hardware.

Using the following standards:

Military: MIL-STD-810, MIL-STD-167-1, MIL-S-901, MIL-STD-202, MIL-STD-781, MIL-E-16400, MIL-STD-108, MIL-STD-2036, MIL-T-28800, MIL-STD-740-1, MIL-STD-740-2, NAVMAT P-9492
Commercial: RTCA/DO-160
ANSI: S1.2, S1.35
GN: 9103P, 9104P, 9110P, 9125P, 9128P, 9140P, 9144P, 9154P, 9163P, 9175P
FORD: DVT1.12.00.007-AC, ES-F5VB-54043B13-AA
Chrysler: PF-9007, PF-9531, PF-6897, PF-8243, PF-9164
Telephony: Bellcore GR-1089

Russell M. Robinson



American Association for Laboratory Accreditation

SUPPLEMENT TO THE SCOPE OF ACCREDITATION
TO ISO/IEC GUIDE 25-1990 AND EN 45001

DAYTON T. BROWN, INC.
Church Street
Bohemia, NY 11716
Charles Gortakowski Phone: 516 589 6300

ELECTRICAL (EMC)

Valid as of: November 18, 1997
Valid until: December 31, 1998

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 tests:

AS/NZS 3548

Code of Federal Regulations (CFR) 47, FCC Method Part 15 using ANSI C63.4

Code of Federal Regulations (CFR) 47, FCC Method Part 68

CISPR 22

EN: 50081-1, 50081-2, 50082-1, 50082-2, 50091-1, 50091-2, 55011, 55013, 55014, 55015, 55022, 60555-2, 60555-3, 60601-1-2, 61000-4-1, 61000-4-2, 61000-4-4, 61000-4-5, 61000-4-7, 61000-4-8, 61000-4-11

ENW: 50140, 50141, 50142, 50204

IEC: 601, 601-1-2, 801-1 (1000-4-1), 801-2 (1000-4-2), 801-3 (1000-4-3), 801-4 (1000-4-4), 801-5 (1000-4-5), 801-6 (1000-4-6), 1000-4-7, 1000-4-8, 1000-4-11, 1000-3-2, 1000-3-3

Commercial Aviation: RTCA/DO-160, FAA Advisory Circular 20-136, Boeing D200Z001, Boeing WZZ7J00

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

GN: 9100P, 9105P, 9109P, 9110P, 9112P, 9113P, 9114P, 9115P, 9116P, 9117P, 9119P, 9120P, 9103P, 9104P, 9125P, 9128P, 9140P, 9144P, 9154P, 9163P, 9175P

Chrysler PF9164

Telephony Bellcore GR-1089

ANSI/IEEE: IEEE-587-1980, IEEE-C62.41, IEEE-C62.32

TEMPEST: NST ISSAM Tempest/1-92, NACSEM 5100, NACSIM 5100A, NACSEM 5112, KAG-30A/TSEC

VCCI

Peter Almy



American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC GUIDE 25-1990 AND EN 45001

DAYTON T. BROWN, INC.
Church Street
Bohemia, NY 11716
Charles Gortakowski Phone: 516 589 6300

ELECTRICAL (EMC)

Valid To: December 31, 1998

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 tests:

Capacitance
AC Capacitance
AC Loss Characteristics
Permittivity
(Dielectric Loss Constant)
Conductivity
Current (AC/DC)
Electrostatic (ESD)
EMP

Impedance
Inductance
Lightning
Magnetism
Power Transmission
Resistivity
AC/DC
Insulation Resistance
Voltage (AC/DC)

EMI/RFI

Conducted Emissions
Conducted Transient Susceptibility
Conducted Susceptibility (Immunity)
Radiated Emissions (O.A.T.S. Method)
Radiated Emissions
Shielded Room Method
Radiated Susceptibility (Immunity)
Radiated Transient Susceptibility
Electrostatic Discharge (ESD)
Electromagnetic Pulse (EMP)
Electrical Fast Transient (EFT)

Lightning
Input Power Variations
Magnetic Field Emission
Magnetic Field Susceptibility
Harmonics
RF Power Handling
Shielding Effectiveness
Stimmed Mode
Transmissibility
Site Survey
TEMPEST

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.

Using the following sources of standards:

ANSI, AS/NZS, CFR, CISPR, EN, ENEC, FCC, IEC, Commercial Aviation, Military, GN, Chrysler, Telephony, ANSI/IEEE, TEMPEST, VCCI

A supplemental scope, identifying the full range of tests and types of tests, is available from A2LA or the laboratory.

Peter Almy



American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC GUIDE 25-1990

DAYTON T. BROWN, INC.
Church Street
Bohemia, NY 11716
Charles Gortakowski Phone: 516 589 6300

MECHANICAL

Valid To: December 31, 1998

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:

Compression
Fatigue
Shear
Stress
Metallography
Hardness
Fracture
Torsion

Tensile (Room, High & Low Temperatures)
NDT (Dye Penetrant & Magnetic Particle)

Environmental Simulation

Acceleration
Explosion
Temperature/Altitude
Salt Fog/Salt Spray
Temperature/Shock
Altitude
Dust
Wind & Rain
Humidity
Drop/Impact
Fungus
Sun/Solar Radiation
Combined Environments
Water Immersion
Sand

Durability (Horn Life Actuation/Horn Blow Mechanism)

High/Low Temperature/Humidity/Vibration

High Pressure Burst (Air & Hydraulic)

Shock (1/2 Sine, Sawtooth, Trapezoid)

On the following types of materials and products:

Aerospace Components & Systems; Automotive Components & Systems; Shipboard Components & Systems; Railroad & Industrial Components & Systems; Information Technology & Telecommunication Equipment & Systems; Electrical & Electronic Components & Systems; Medical Electronic Equipment; Military Equipment & Hardware; Packaging & Containers; Pipes, Hoses, Fittings, and Valves.

Using the following standards:

Military: MIL-STD-810, MIL-STD-167-1, MIL-S-901, MIL-STD-202, MIL-STD-781, MIL-E-16400, MIL-STD-108, MIL-STD-2036, MIL-T-28800, NAVMAT P-9492, MIL-STD-6866, MIL-T-7743, MIL-STD-410

Commercial: RTCA/DO-160

ASTM: B117, D1141, G23, E18, D2240, B567, F8, E1444

GN: 9110P, 9103P, 9104P, 9125P, 9128P, 9140P, 9144P, 9154P, 9163P, 9175P

FORD: DVT1.12.00.007-AC, ES-F5VB-54043B13-AA

Chrysler: PF-9007, PF-9531, PF-6897, PF-8243, PF-9164

Telephony: Bellcore GR-1089

Russell M. Robinson