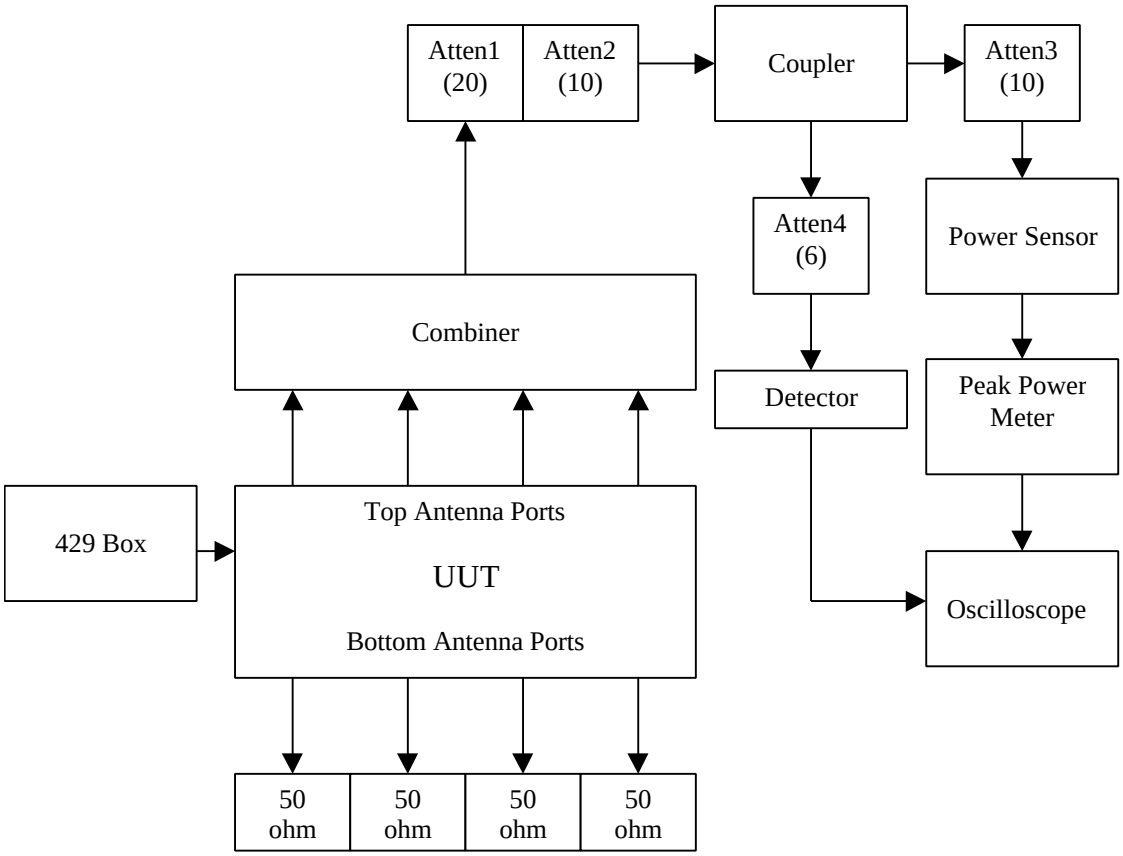
Exhibit I – Required Measurements

Sec. 2.1046 Measurement required: RF power output

When measured at the RF output terminals of the TTR-921/TTR-4000 the output power shall be:

Minimum RF power :	+51.25 dBm (149.6 W)
Nominal RF power :	+53.25 dBm (211.3 W)
Maximum RF power :	+55.25 dBm (298.5 W)

Test Setup



Test Equipment

429 Box – Atlantic Instruments Datatrac 400.
Combiner - Four way power combiner configured with 0, -45, -45, and –135 degree inputs.
Attenuator 1 - 50 Ohm power attenuator, 20 dB nominal.
Attenuator 2 - 50 Ohm power attenuator, 10 dB nominal
Attenuator 3 - 50 Ohm power attenuator, 10 dB nominal.
Attenuator 4 - 50 Ohm power attenuator, 6 dB nominal.
Coupler – Narda 3002-10

Power Sensor – Gigatronics 80350A Peak Power Sensor
Peak Power Meter – Gigatronics 8542C Universal Power Meter
Oscilloscope – Techtronics TDS 754C
Detector – HP423B
50 Ohm – 50 Ohm power termination

Test Procedure

The power meter was calibrated to indicate the power output directly with the particular attenuators and coupler used.

Proper programming of the 429 box accesses the following test modes:

(1) Mode C Test Mode 1 – A standard Mode C only all-call interrogation at a rate of 50 per second, nominal.

(2) Mode S Test Mode 1 – A Mode S interrogation format with a short P6 pulse but containing a data block whose bit values are all one. The interrogation rate is 50 per second, nominal.

The top antenna ports are connected to the combiner as follows: Ch1 0, Ch2 -45, Ch3 -135, Ch4 – 45. This is the Top/Forward configuration. Power was measured for both test modes. The combiner was then moved to the bottom antenna ports and connected as above, resulting in the Bottom/Forward configuration. The 50 Ohm loads were moved to the top antenna ports. Power was again measured for both test modes.

Data

MCN: E005
Date: 4/23/99
Tested By: K.S.

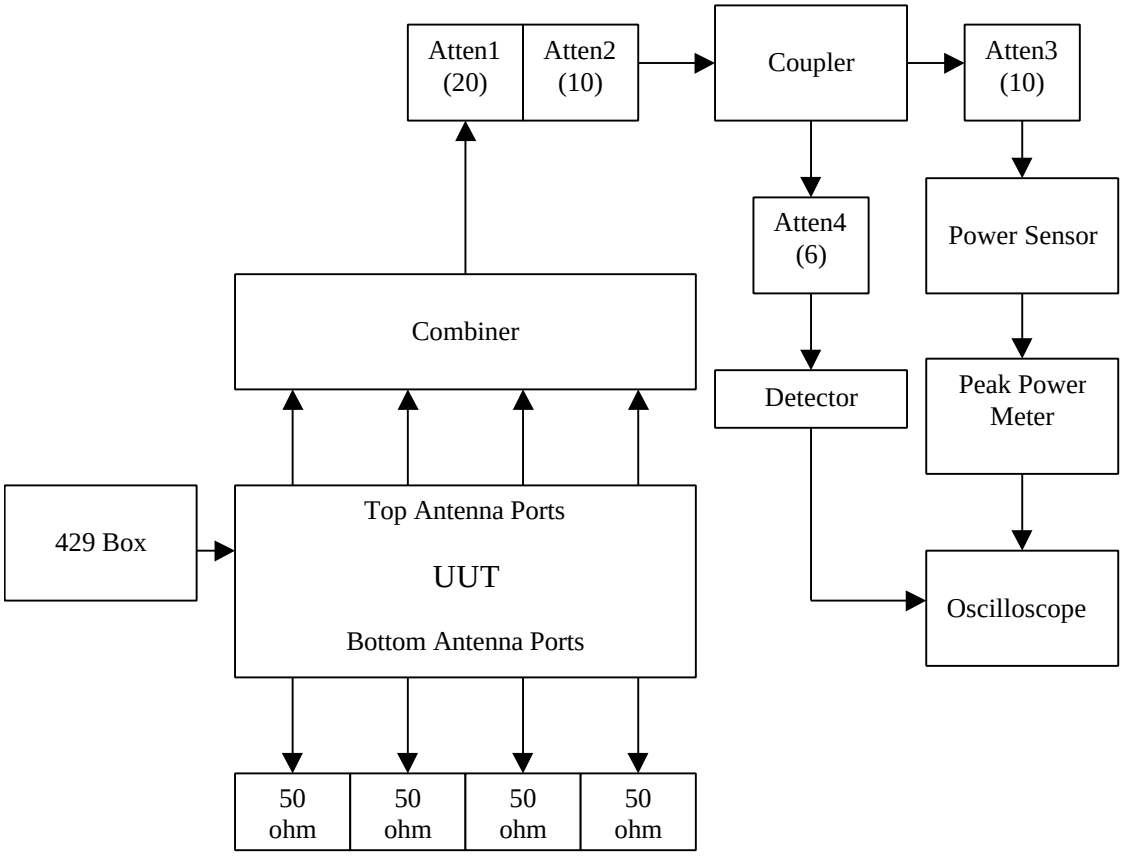
Test Mode	Pulse	Power Output Top Ant. dBm (Watts)	Power Output Bottom Ant. dBm (Watts)
1	P_1	53.95 (248.3)	54.05 (254.1)
	P_2	53.80 (239.9)	53.89 (243.2)
	P_3	53.90 (245.5)	54.02 (252.3)
2	P_1	53.96 (248.9)	54.05 (254.1)
	P_2	53.97 (249.5)	54.05 (254.1)
	P_3	53.91 (246.0)	53.99 (250.6)

Sec. 2.1047 Measurement required: Modulation characteristics

The TTR-921/TTR-4000 output consists of pulse groups whose attributes are defined by RTCA DO-185A. Transmissions fall into two categories - TCAS to Mode C transmissions and TCAS to Mode S transmissions.

See Exhibit B, Item (13) for a description and requirements for the modulation characteristics.

Test Setup (Amplitude characteristics)



Test Equipment (Amplitude characteristics)

429 Box – Atlantic Instruments Datatrac 400.
Combiner - Four way power combiner configured with 0, -45, -45, and –135 degree inputs.
Attenuator 1 - 50 Ohm power attenuator, 20 dB nominal.
Attenuator 2 - 50 Ohm power attenuator, 10 dB nominal
Attenuator 3 - 50 Ohm power attenuator, 10 dB nominal.
Attenuator 4 - 50 Ohm power attenuator, 6 dB nominal.
Coupler – Narda 3002-10
Power Sensor – Gigatronics 80350A Peak Power Sensor
Peak Power Meter – Gigatronics 8542C Universal Power Meter
Oscilloscope – Techtronics TDS 754C

Detector – HP423B
50 Ohm – 50 Ohm power termination

Test Procedure (Amplitude characteristics)

The power was calibrated to indicate the power output directly with the particular attenuators and coupler used.

Proper programming of the 429 box accesses the following test modes:

(1) Mode C Test Mode 1 – A standard Mode C only all-call interrogation at a rate of 50 per second, nominal.

(2) Mode S Test Mode 1 – A Mode S interrogation format with a short P6 pulse but containing a data block whose bit values are all one. The interrogation rate is 50 per second, nominal.

(3) Mode S Test Mode 2 – A Mode S interrogation format with a long P6 pulse but containing a data block whose bit values are all one. The interrogation rate is 50 per second, nominal.

The top antenna ports are connected to the combiner as follows: Ch1 0, Ch2 -45, Ch3 -135, Ch4 – 45. This is the Top/Forward configuration. Photos and data were taken to show the pulse shapes in each of the three test modes. The combiner was then moved to the bottom antenna ports and connected as above, resulting in the Bottom/Forward configuration. The 50 Ohm loads were moved to the top antenna ports. Photos and
data were again taken to show the pulse shapes in each of the three test modes.

Data (Amplitude characteristics) MCN: E005

Date: 4/23/99

Tested By: K.S.

Figures show the detected envelopes for the three test modes from the top antenna and bottom antenna.
Data were as follows:

Mode C

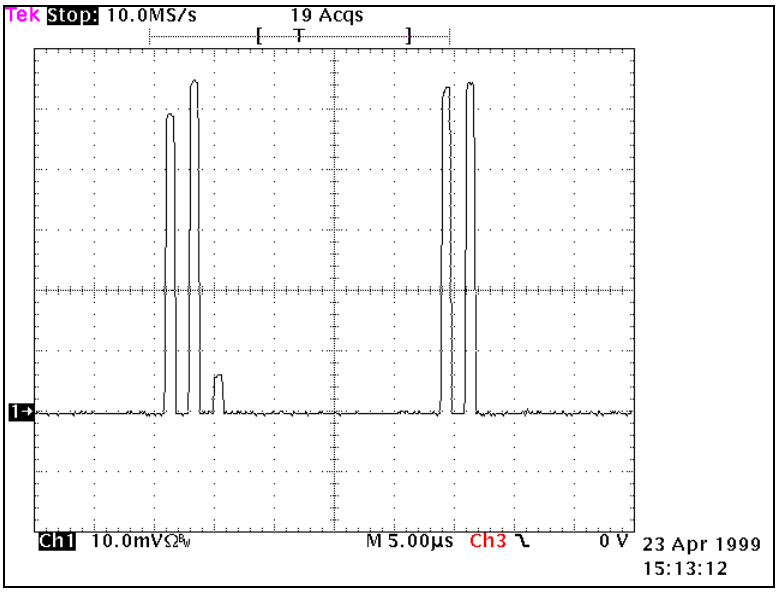
Top Antenna	S_1	P_1	P_3	P_4	
Pulse amplitude	53.27	53.94	53.74	53.89	dBm
Pulse width	0.806	0.802	0.792	0.788	usec
Rise time	0.055	0.057	0.059	0.057	usec
Fall time	0.078	0.077	0.077	0.078	usec
S_1 to P_1	ref	2.00			usec
P_1 to P_3		ref	21.01		usec
P_3 to P_4			ref	2.00	usec

Bottom Antenna	S_1	P_1	P_3	P_4	
Pulse amplitude	53.50	54.16	53.99	54.12	dBm
Pulse width	0.806	0.802	0.793	0.788	usec
Rise time	0.056	0.057	0.060	0.057	usec
Fall time	0.078	0.079	0.078	0.078	usec
S_1 to P_1	ref	2.00			usec
P_1 to P_3		ref	21.01		usec
P_3 to P_4			ref	2.00	usec

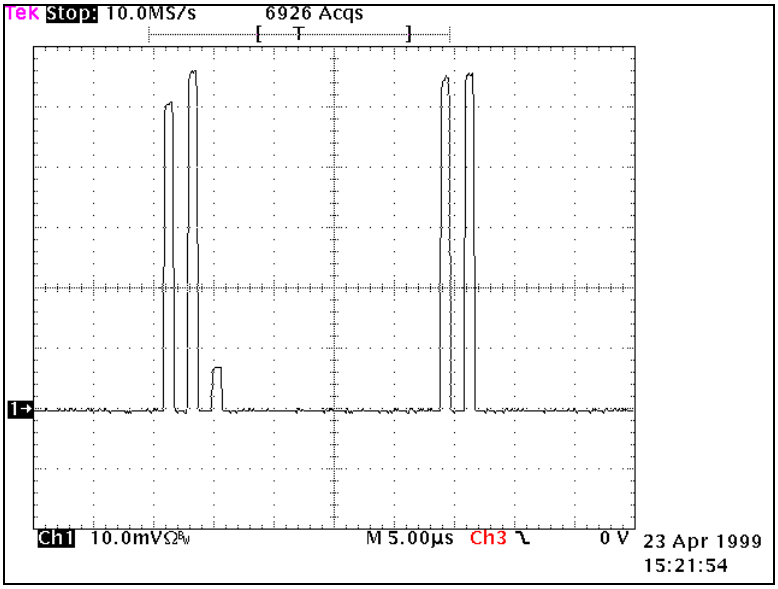
Mode S

Top Antenna	P_1	P_2	P_6	
Amplitude var. and droop	Ref	+0.01	-0.05	dB (P_6 at 1usec)
Rise time	0.059	0.058	0.056	usec
Fall Time	0.079	0.080	0.081	usec
Pulse width	0.806	0.801		
Short P_6			16.17	usec
Long P_6			30.17	usec
P_1 to P_2 spacing	ref	2.00		usec
Sync phase reversal		ref	2.76	usec
Phase reversal duration			0.053	usec
P_6 leading edge from sync			1.260	usec
Chip guard interval			0.660	Usec

Bottom Antenna	P_1	P_2	P_6	
Amplitude var. and droop	Ref	+0.01	-0.06	dB (P_6 at 1 usec)
Rise time	0.058	0.058	0.056	usec
Fall time	0.079	0.080	0.081	usec
Pulse width	0.806	0.801		
Short P_6			16.17	usec
Long P_6			30.17	usec
P_1 to P_2 spacing	ref	2.00		usec
Sync phase reversal		ref	2.76	usec
Phase reversal duration			0.053	usec
P_6 leading edge from sync			1.259	usec
Chip guard interval			0.662	usec

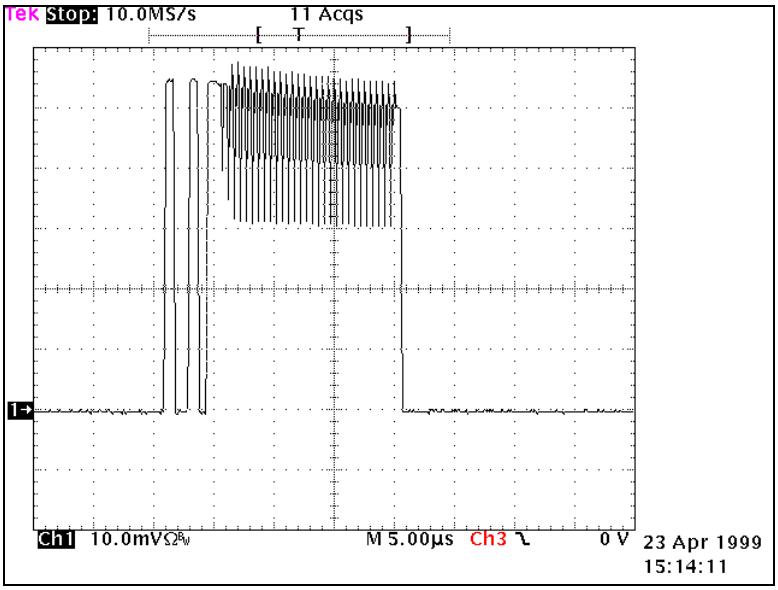


Mode C Test Mode 1 - Top Antenna

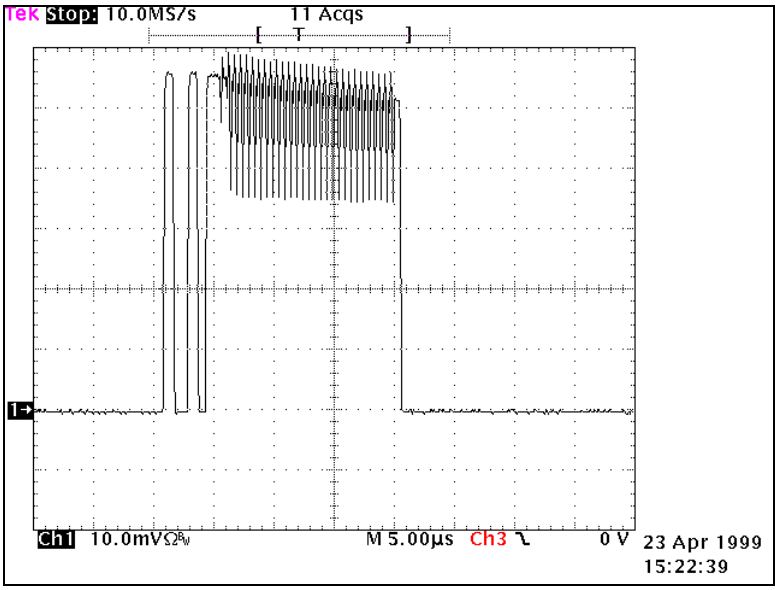


Mode C Test Mode 1 - Bottom Antenna

PULSE ENVELOPES

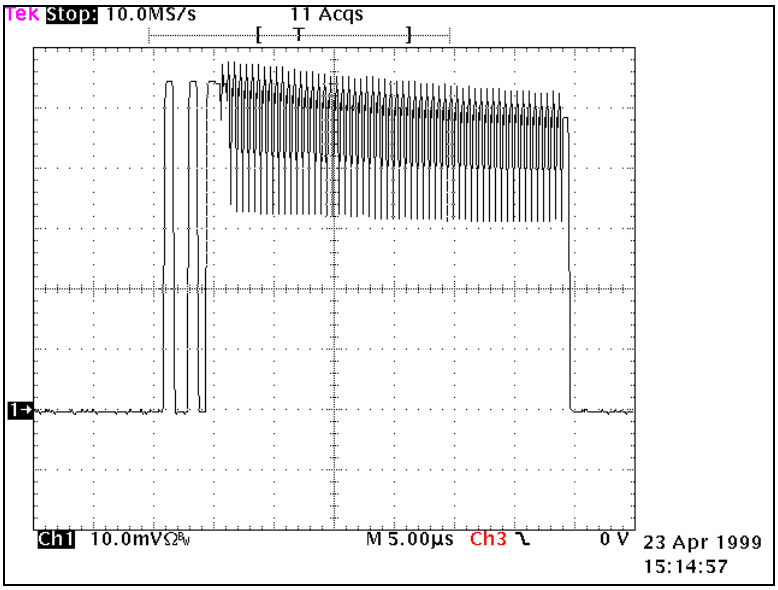


Mode S Test Mode 1 - Top Antenna

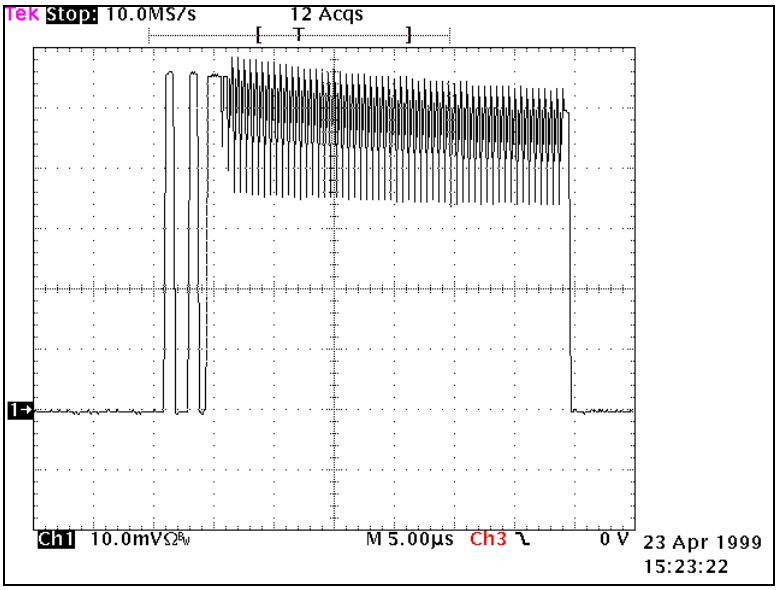


Mode S Test Mode 1 - Bottom Antenna

PULSE ENVELOPES, cont.



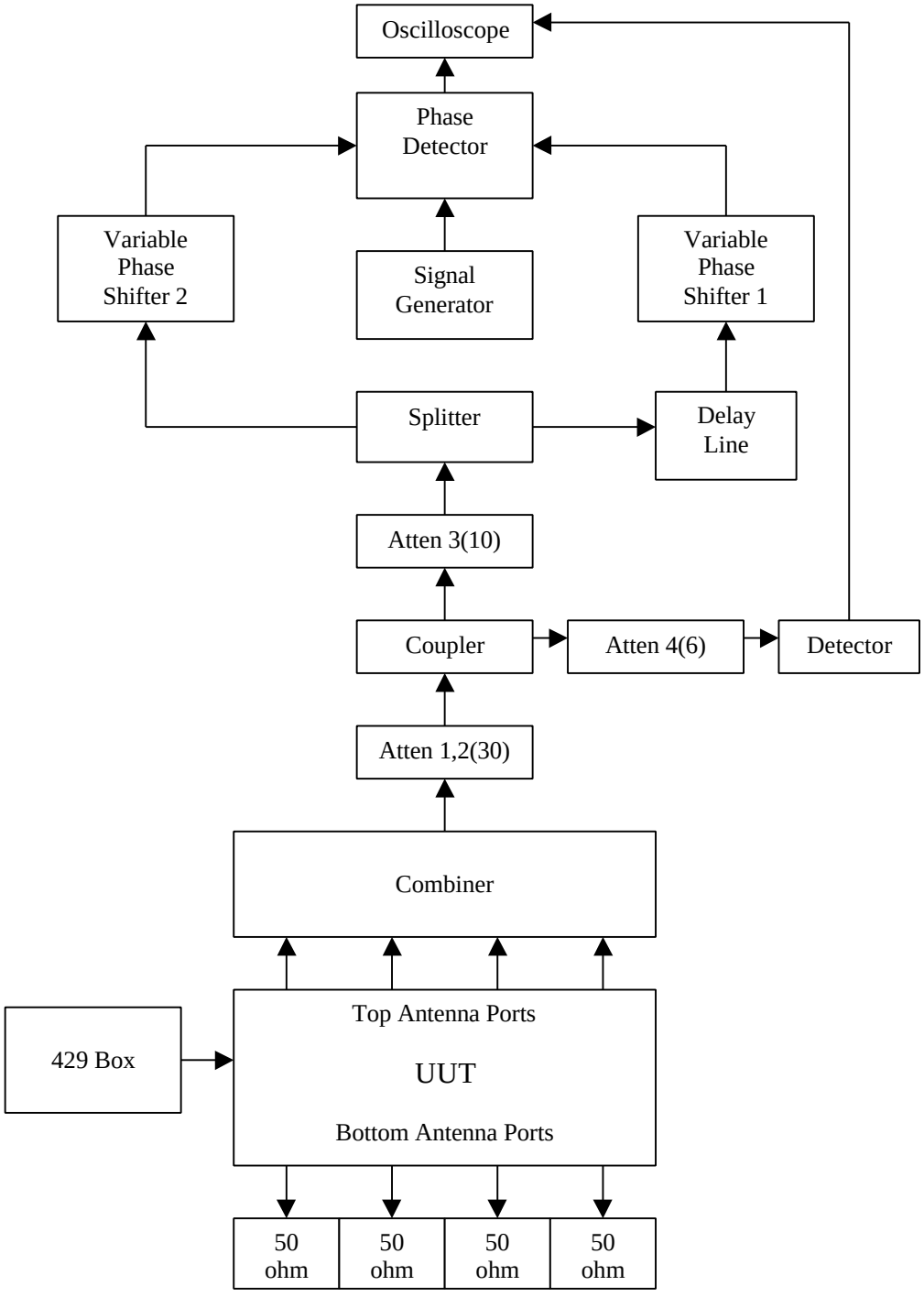
Mode S Test Mode 2 - Top Antenna



Mode S Test Mode 2 - Bottom Antenna

PULSE ENVELOPES, cont.

Test Setup (Phase characteristics)



Test Equipment (Phase characteristics)

429 Box – Atlantic Instruments Datatrac 400.
Combiner - Four way power combiner configured with 0, -45, -45, and –135 degree inputs.
Attenuator 1 - 50 Ohm power attenuator, 20 dB nominal.
Attenuator 2 - 50 Ohm power attenuator, 10 dB nominal
Attenuator 3 - 50 Ohm power attenuator, 10 dB nominal.

Attenuator 4 - 50 Ohm power attenuator, 6 dB nominal.
Coupler – Narda 3002-10
Splitter – Mini-Circuits ZFSC-2-5
Delay – Coax delay line cut to 150 nsec.
Variable phase shifter 1 – Narda Model 3752
Variable phase shifter 2 – ARRA N3428A
Signal Generator – HP ESG-2000A
Phase Detector – Rockwell Collins
Oscilloscope – Techtronics TDS 754C
Detector – HP423B
50 Ohm – 50 Ohm power termination

Test Procedure (Phase characteristics)

The top antenna ports are connected to the combiner as follows: Ch1 0, Ch2 -45, Ch3 -135, Ch4 – 45. This is the Top/Forward configuration.

The signal generator is set to 1090 MHz at +14 dBm out.
Variable phase shifter 2 is calibrated to determine 175 degrees and 185 degrees phase shift at 1030 MHz.

Program the 429 box to access Mode S Test Mode 3 (no phase modulation).
Set variable phase shifter 2 for 0 degrees reference.
Adjust variable phase shifter 1 for 0.0 VDC on the oscilloscope during the transmit pulse.
Set variable phase shifter 2 for 175 degrees phase relative to reference. Note phase detector output and set first horizontal cursor to represent the 175 degrees detector output point.
Set variable phase shifter 2 for 185 degrees phase relative to reference. Note phase detector output and set second horizontal cursor to represent the 185 degrees detector output point.
Set variable phase shifter 2 back to 0 degrees phase reference point.

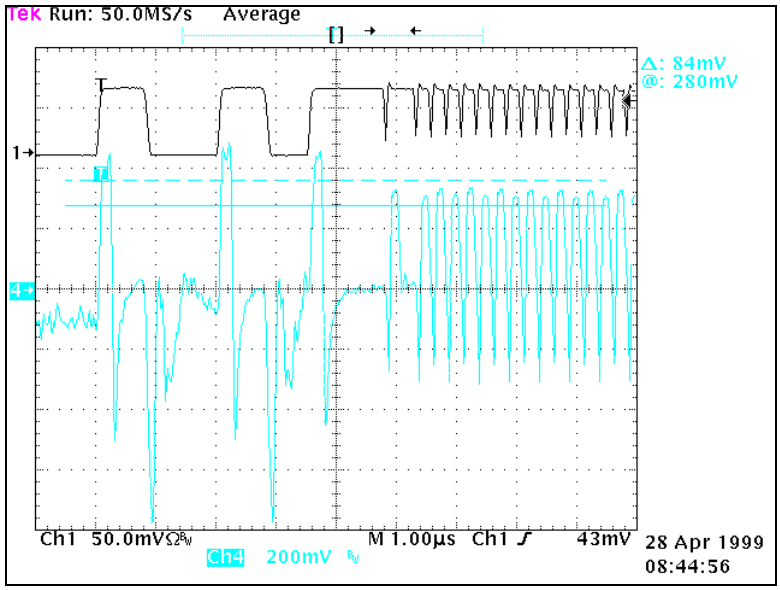
Program the 429 box to access Mode S Test Mode 1.
Verify that the amplitude of the sync phase reversal and each data chip at a point midway between the 150 nsec. amplitude transients is between the 180 + 5 degree amplitudes represented by the oscilloscope cursors.

The combiner was then moved to the bottom antenna ports and connected as above, resulting in the Bottom/Forward configuration. The 50 Ohm loads were moved to the top antenna ports.
Repeat above procedure and verify that the amplitude of the sync phase reversal and each data chip at a point midway between the 150 nsec. amplitude transients is between the 180 + 5 degree amplitudes represented by the oscilloscope cursors.

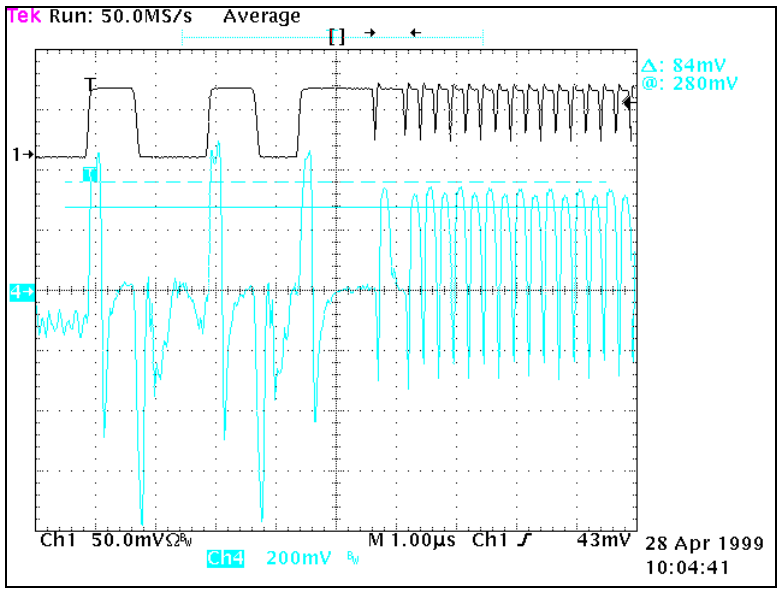
Data (Phase characteristics)

MCN:	E005
Date:	4/28/99
Tested By:	K.S.

The TTR-921/TTR-4000 has less than 5 degrees of phase reversal tolerance as specified in DO-185A on both the top and bottom antenna ports.



Mode S Phase Reversal - Top Antenna

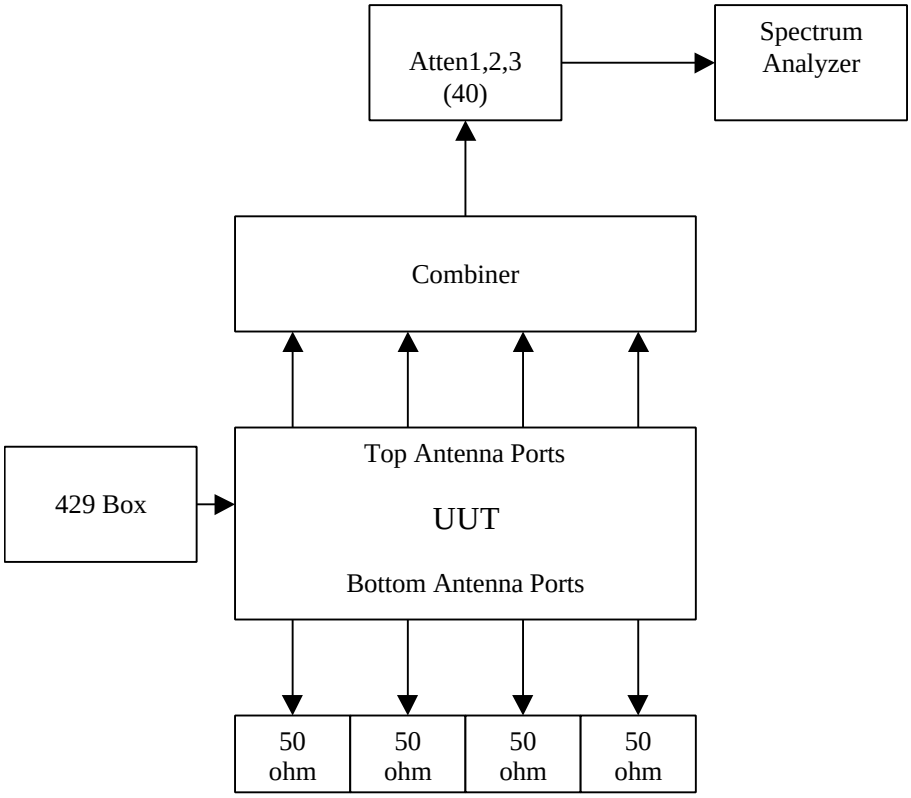


Mode S Phase Reversal - Bottom Antenna

Sec. 2.1049 Measurement required: Occupied bandwidth

See Exhibit B, Item (4) for the a description and requirements for the type of emission and occupied bandwidth.

Test Setup



Test Equipment

429 Box – Atlantic Instruments Datatrac 400.
Combiner - Four way power combiner configured with 0, -45, -45, and –135 degree inputs.
Attenuator 1 - 50 Ohm power attenuator, 20 dB nominal.
Attenuator 2 - 50 Ohm power attenuator, 10 dB nominal
Attenuator 3 - 50 Ohm power attenuator, 10 dB nominal.
Spectrum Analyzer – HP8562A
50 Ohm – 50 Ohm power termination

Test Procedure

Proper programming of the 429 box accesses the following test modes:

(1) Mode C Test Mode 1 – A standard Mode C only all-call interrogation at a rate of 50 per second, nominal.

(2) Mode S Test Mode 1 – A Mode S interrogation format with a short P_6 pulse but containing a data block whose bit values are all one. The interrogation rate is 50 per second, nominal.

(3) Mode S Test Mode 2 – A Mode S interrogation format with a long P_6 pulse but containing a data block whose bit values are all one. The interrogation rate is 50 per second, nominal.

The top antenna ports are connected to the combiner as follows: Ch1 0, Ch2 -45, Ch3 -135, Ch4 –45. This is the Top/Forward configuration.

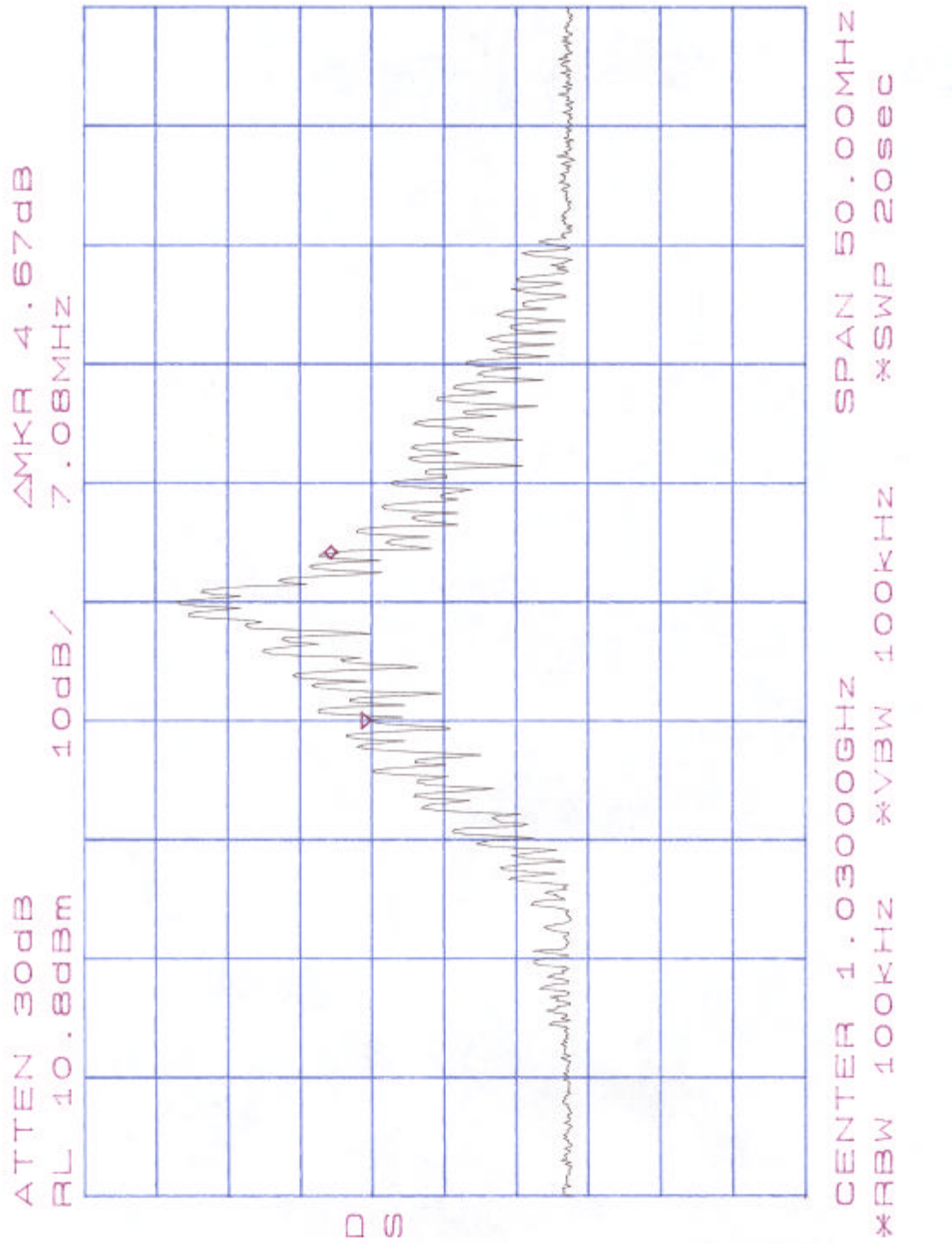
Because of the low repetition rate, the spectrum analyzer was set for at least three sweeps with very slow sweep rate and peak storage ("Max Hold"). A plot of power output vs. frequency was made and the frequency whereupon between which 99 percent of the transmitter power occurs was determined using a built-in feature of the spectrum analyzer.

Data

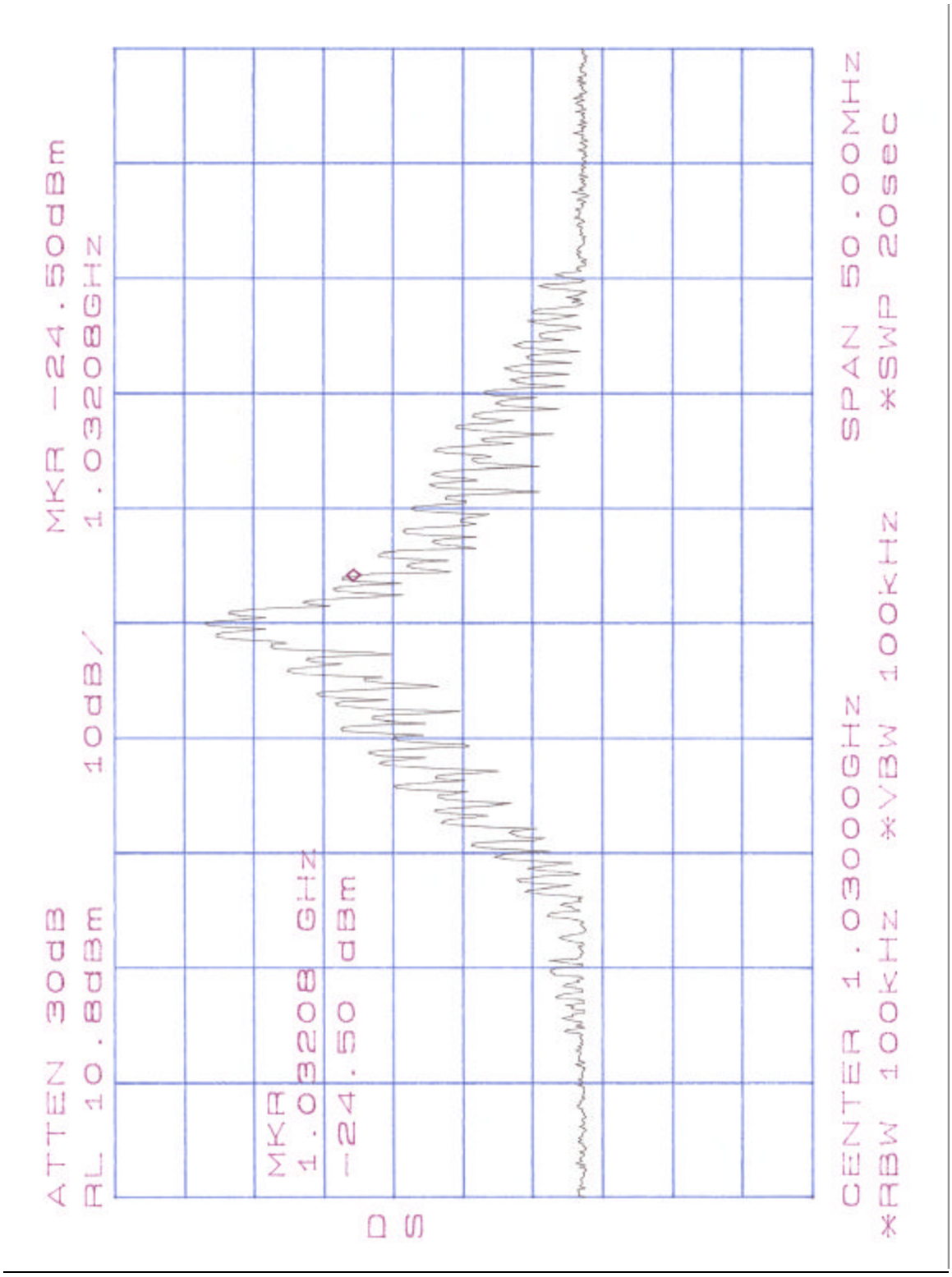
MCN: E005
Date: 4/28/99
Tested By: K.S.

The 99 percent occupied bandwidth, as well as the upper and lower frequency of the 99 percent occupied bandwidth are tabulated below for each test mode.

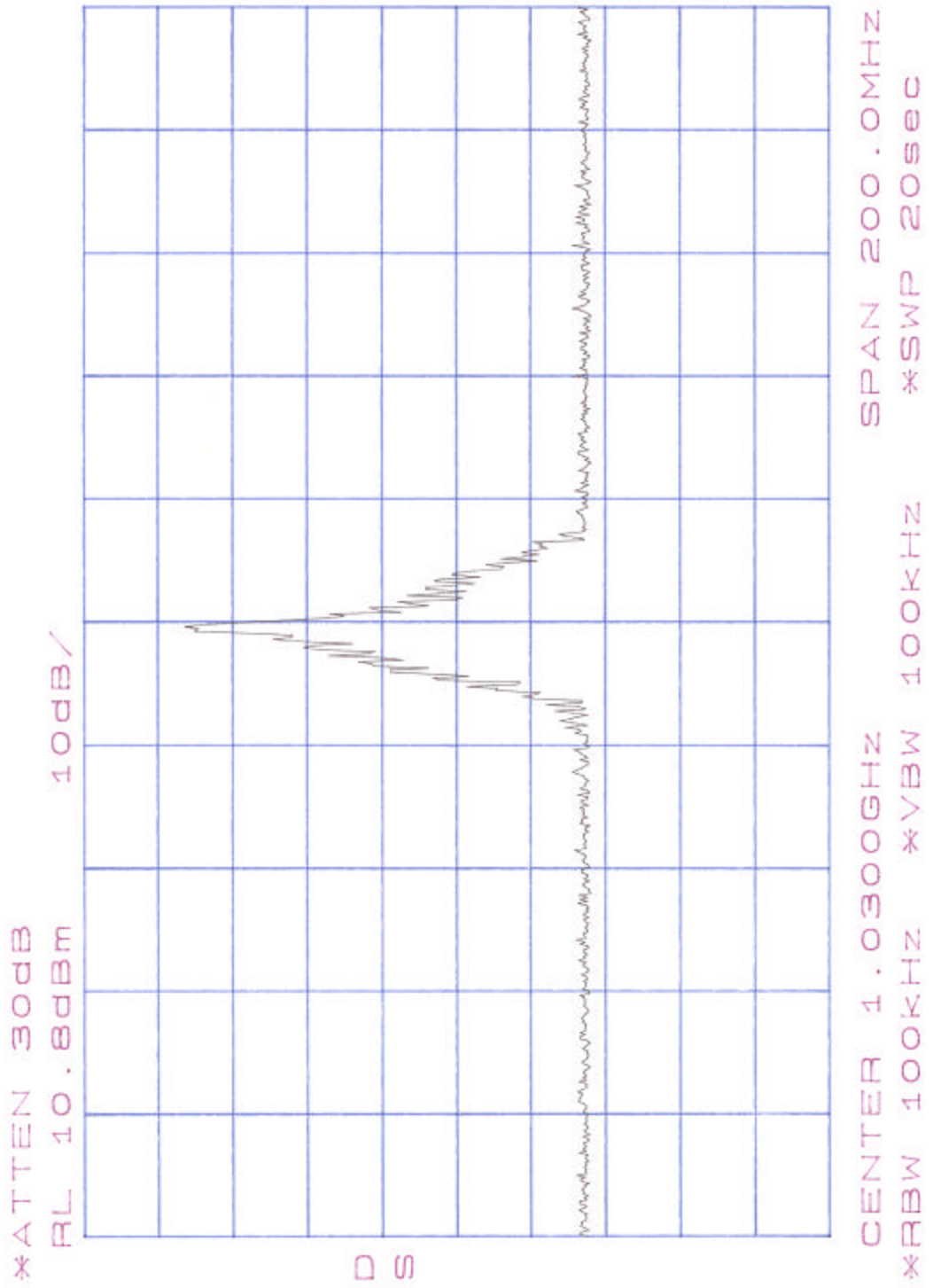
Test Mode	99 Percent Bandwidth (MHz)	Frequency Bounds (MHz)	
		Upper	Lower
(1)	7.08	1032.08	1025.00
(2)	16.25	1036.08	1019.83
(3)	16.25	1036.08	1019.83



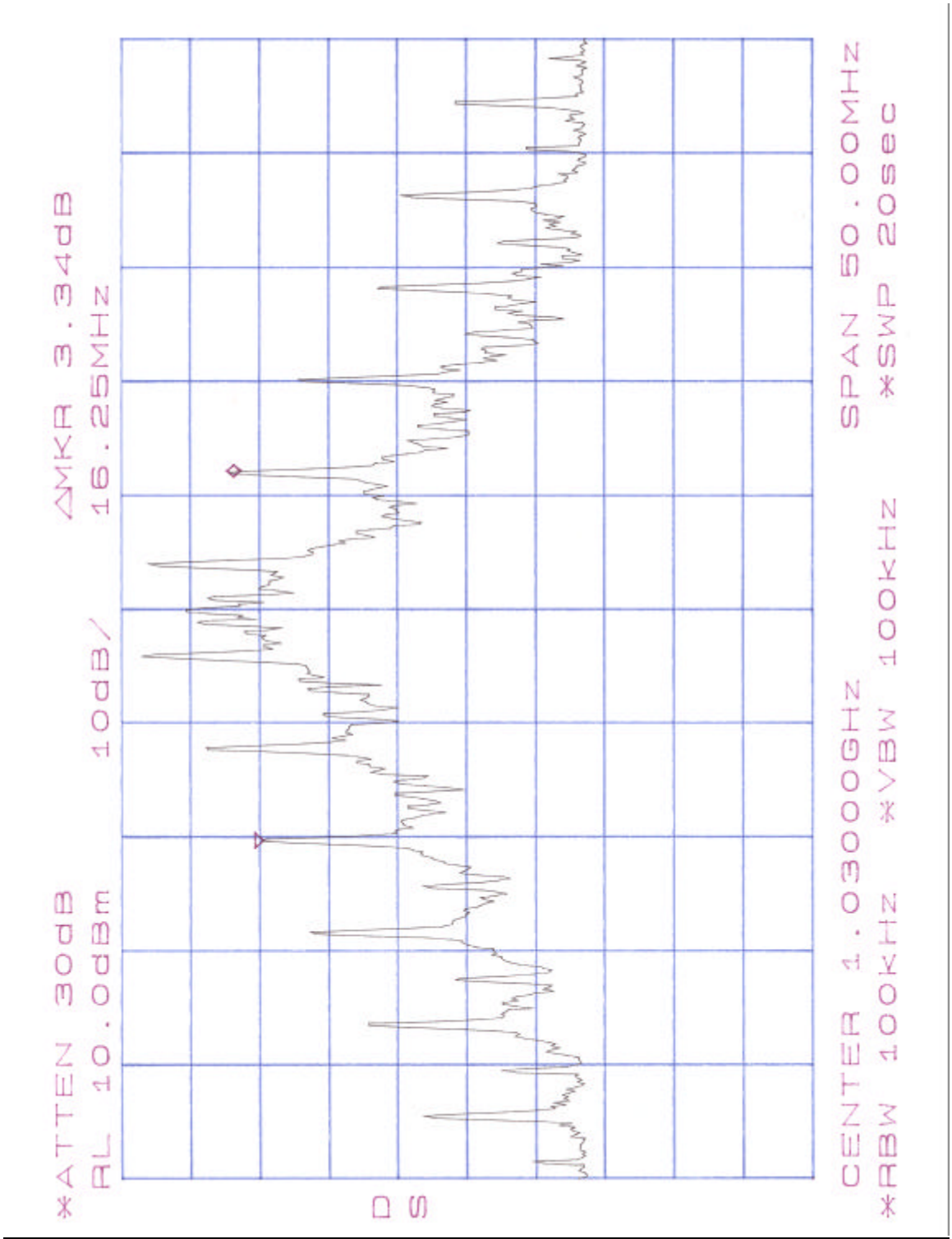
Occupied Bandwidth Mode C Test Mode 1



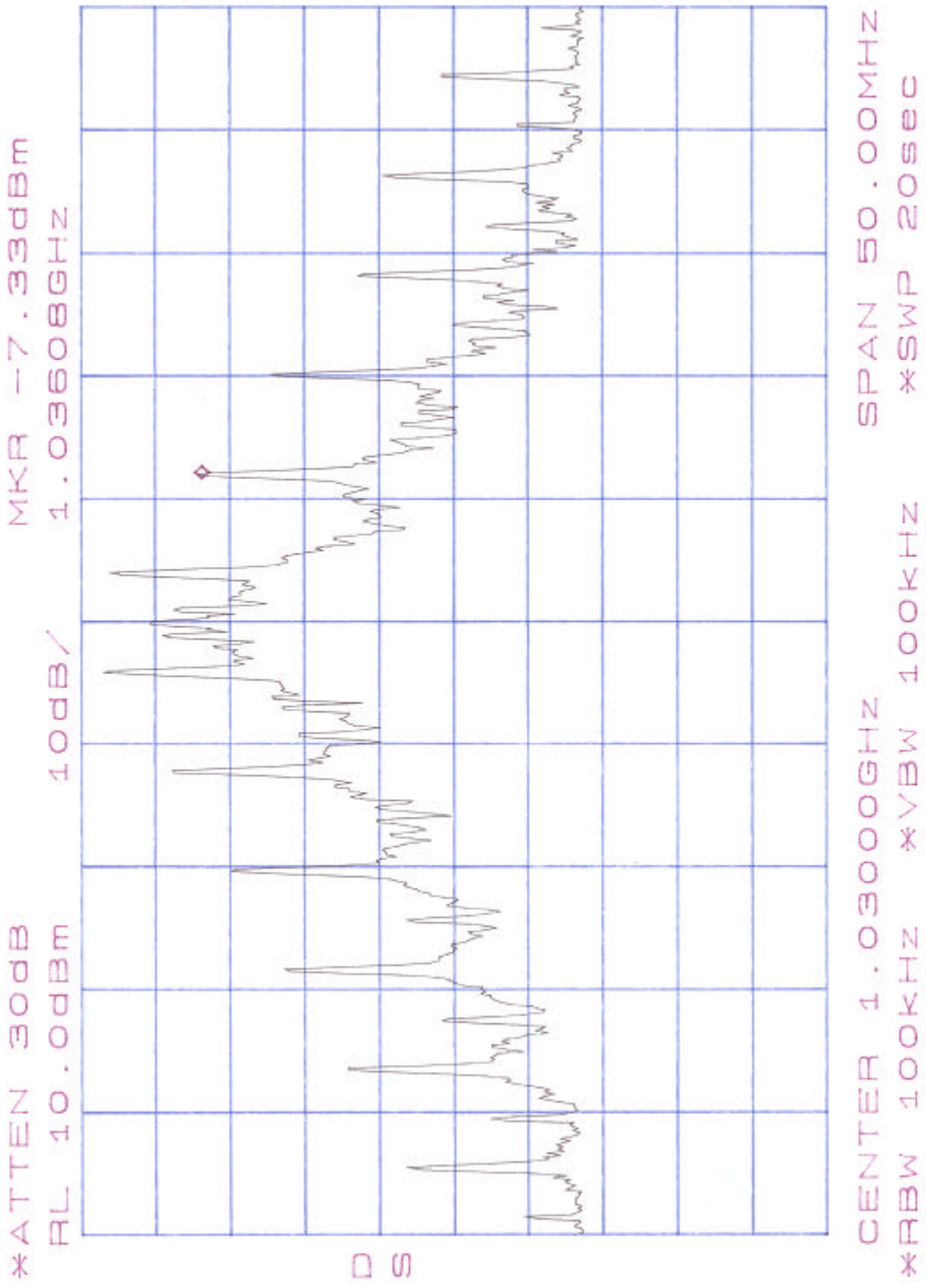
Occupied Bandwidth Mode C Test Mode 1, cont.



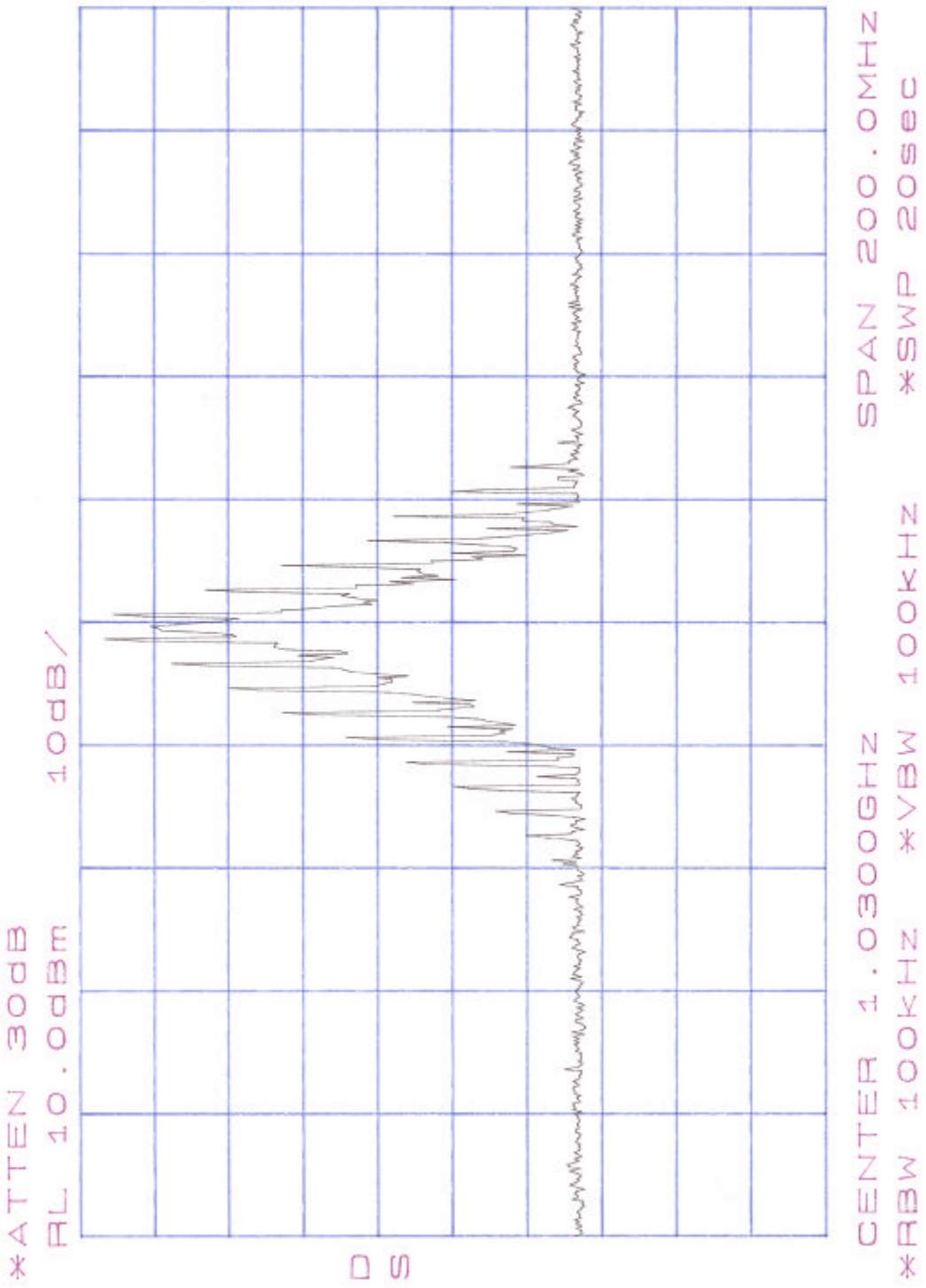
Occupied Bandwidth Mode C Test Mode 1, cont.



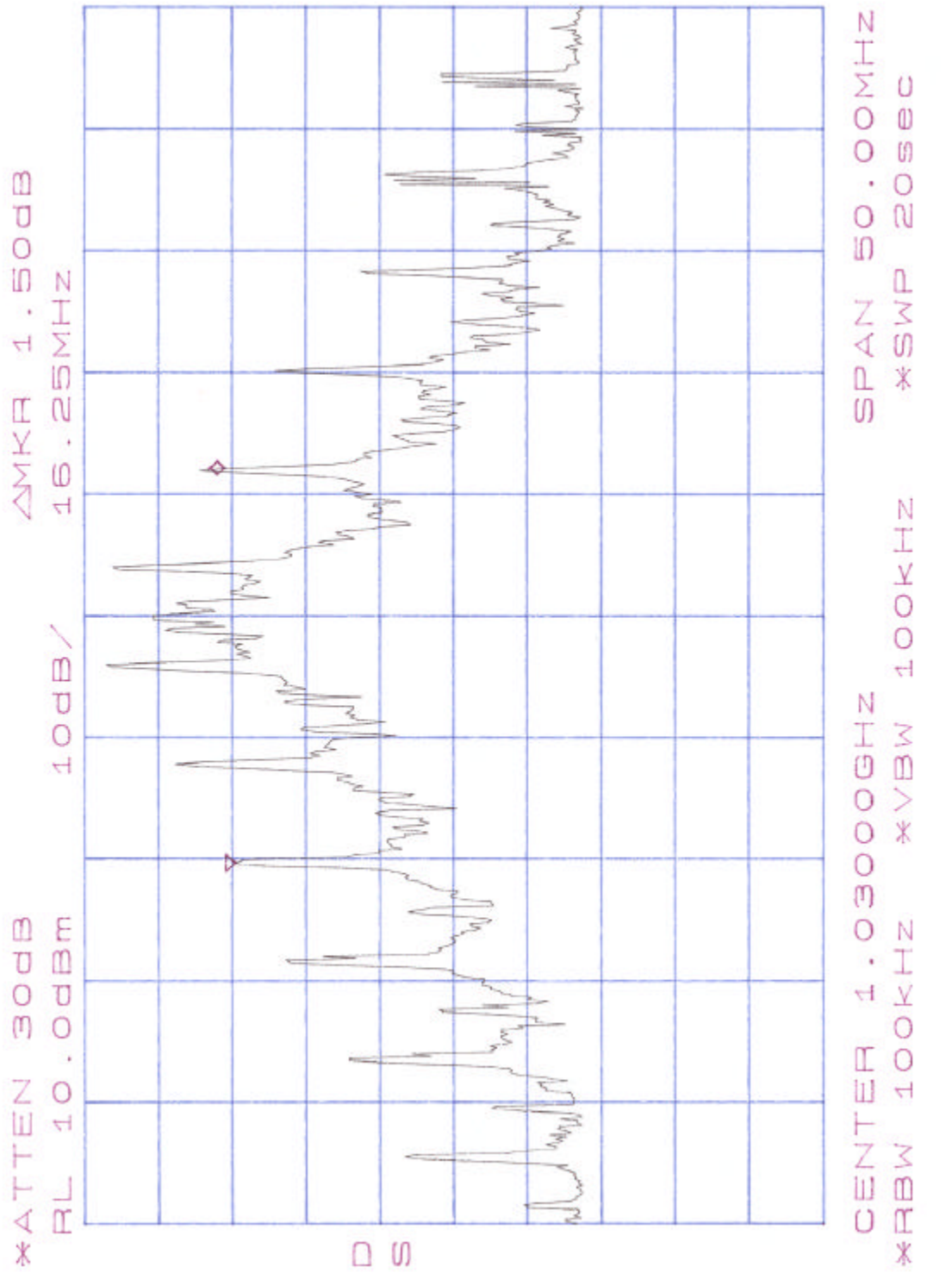
Occupied Bandwidth Mode S Test Mode 1



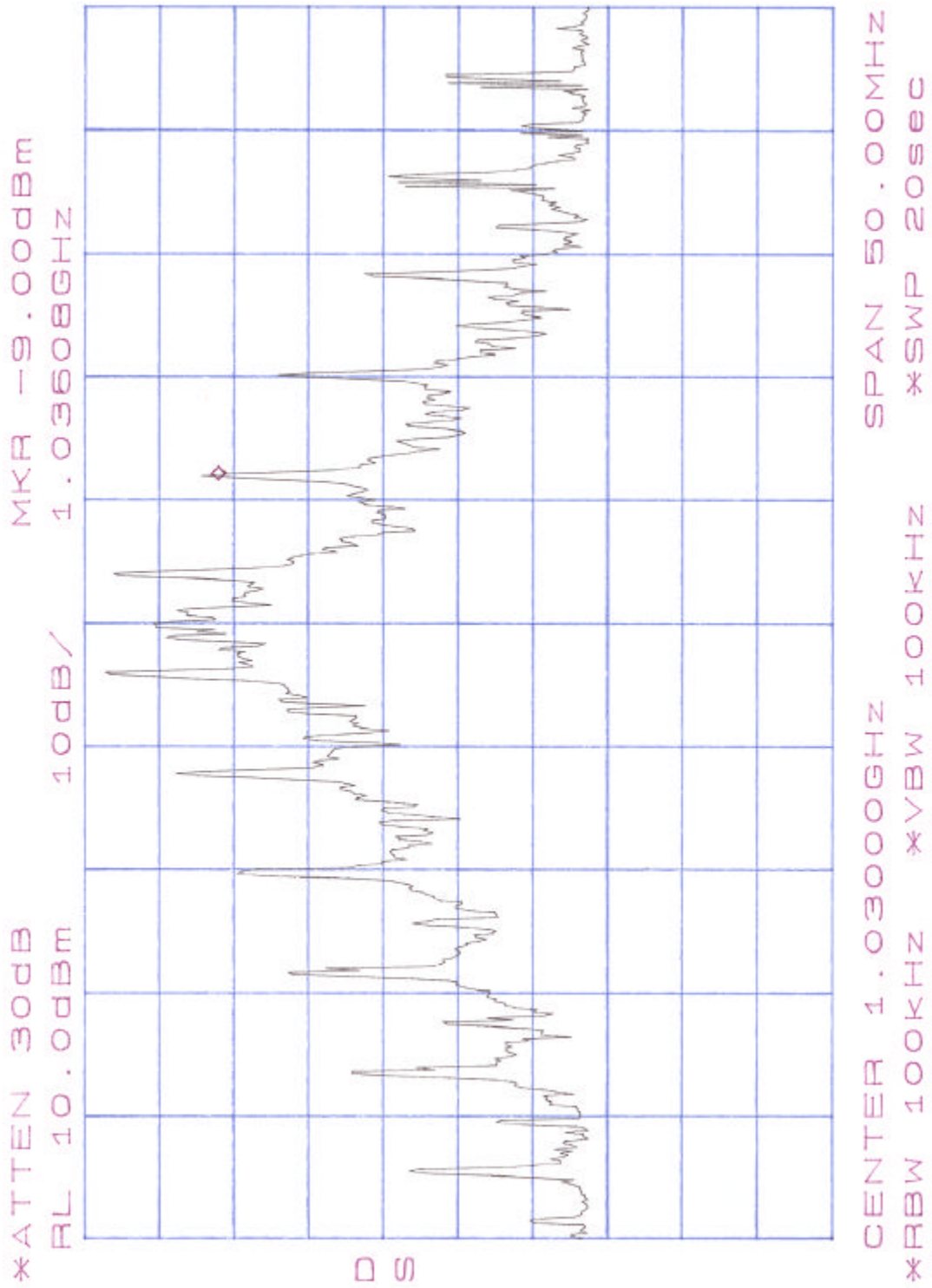
Occupied Bandwidth Mode S Test Mode 1, cont.



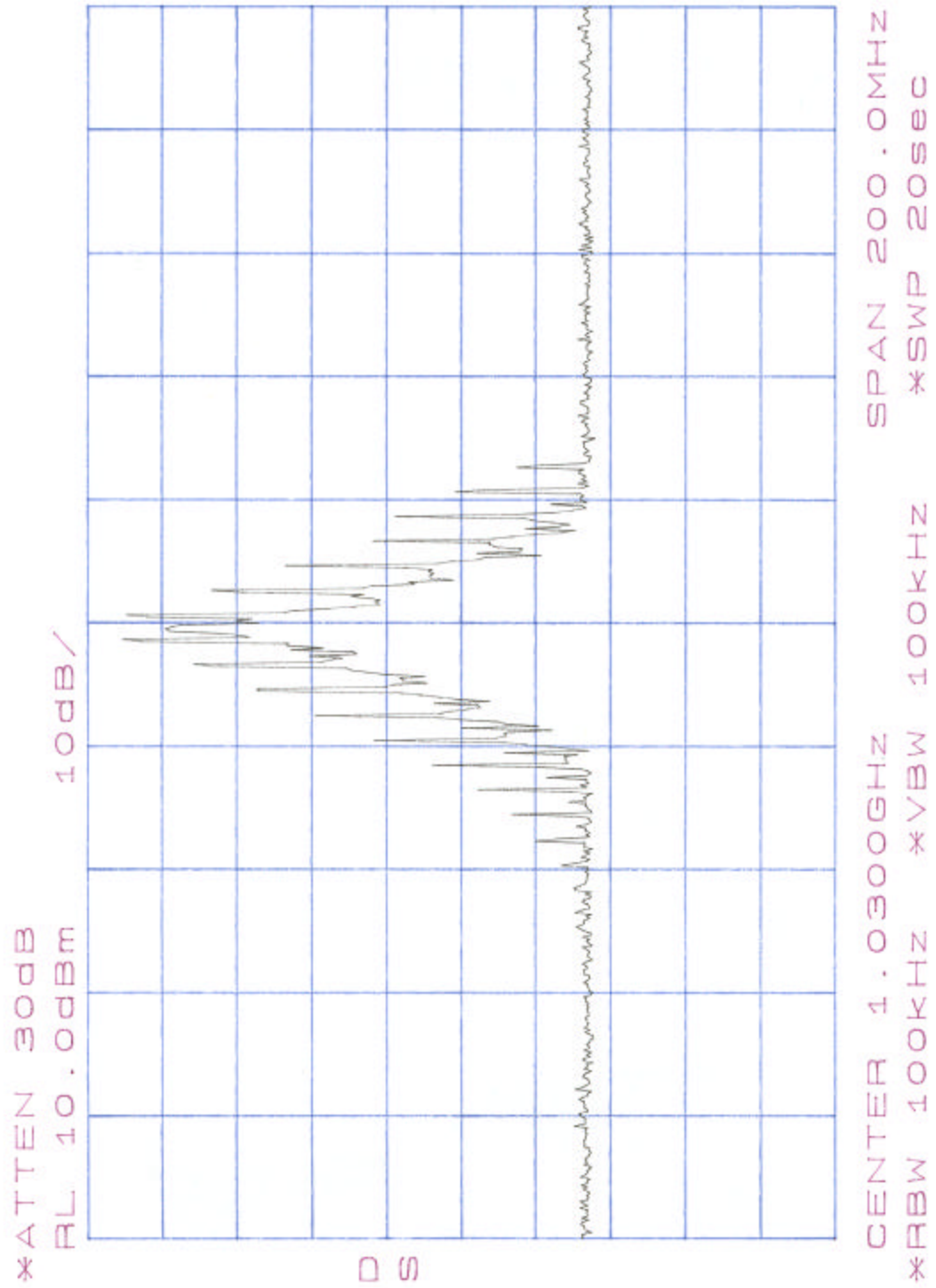
Occupied Bandwidth Mode S Test Mode 1, cont.



Occupied Bandwidth Mode S Test Mode 2



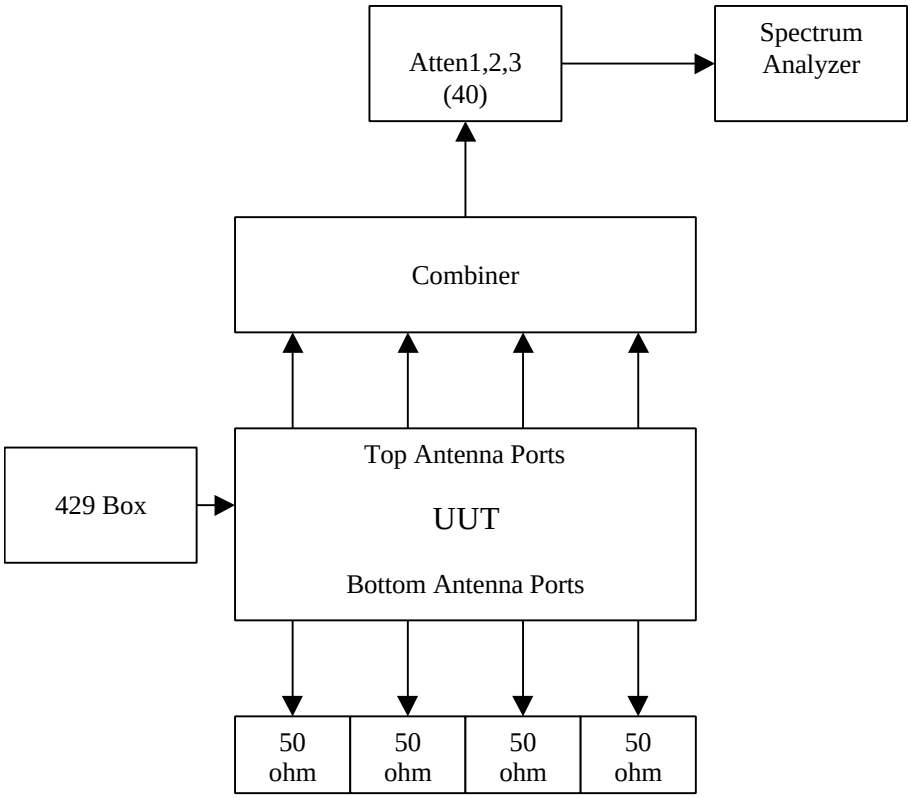
Occupied Bandwidth Mode S Test Mode 2, cont.



Occupied Bandwidth Mode S Test Mode 2, cont.

Sec. 2.1051 Measurement required: Spurious emissions at antenna terminals

Test Setup (Transmit emissions – 9kHz to 11 GHz)



Test Equipment (Transmit emissions – 9kHz to 11 GHz)

429 Box – Atlantic Instruments Datatrac 400.
Combiner - Four way power combiner configured with 0, -45, -45, and –135 degree inputs.
Attenuator 1 - 50 Ohm power attenuator, 20 dB nominal.
Attenuator 2 - 50 Ohm power attenuator, 10 dB nominal
Attenuator 3 - 50 Ohm power attenuator, 10 dB nominal.
Spectrum Analyzer – HP8566B
50 Ohm – 50 Ohm power termination

Test Procedure (Transmit emissions – 9kHz to 11 GHz)

Proper programming of the 429 box accesses the following test mode:

> (3) Mode S Test Mode 2 – A Mode S interrogation format with a long P6 pulse but containing a data block whose bit values are all one. The interrogation rate is 50 per second, nominal.

The top antenna ports are connected to the combiner as follows: Ch1 0, Ch2 -45, Ch3 -135, Ch4 –45. This is the Top/Forward configuration.

The spectrum analyzer was set for : +13 dBm reference level, 200 MHz span, 60 sec. sweep, 3 kHz resolution bandwidth, 3 kHz video bandwidth, and 30 dB attenuation. Center frequency was run from 100 MHz to 10.9 GHz in 200 MHz steps.
The combiner was then moved to the bottom antenna ports and connected as above, resulting in the Bottom/Forward configuration. The 50 Ohm loads were moved to the top antenna ports. Center frequency was again run from 100 MHz to 10.9 GHz in 200 MHz steps.

Data (Transmit emissions – 9 kHz to 11 GHz)

MCN: E005
Date: 4/29/99
Tested By: K.S.

Top Antenna

	Frequency	Power	
Reference carrier power	1030 MHz	13	dBm
Spurious	None		dBm
			dBm
			dBm
			dBm
			dBm
			dBm
			dBm
			dBm

Spurious outputs outside of the transmit spectrum above the noise floor of the system were not observed. The measurement noise floor was better than –58 dB below the peak carrier power.

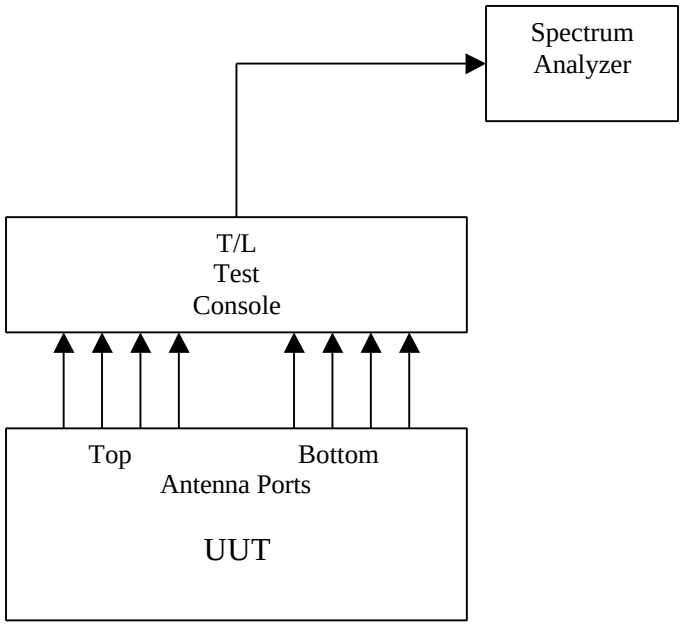
Bottom Antenna

	Frequency	Power	
Reference carrier power	1030 MHz	13	dBm
Spurious	None		dBm
			dBm
			dBm
			dBm
			dBm
			dBm
			dBm
			dBm

Spurious outputs outside of the transmit spectrum above the noise floor of the system were not observed. The measurement noise floor was better than –58 dB below the peak carrier power.

Test Setup (CW Leakage)

When the TCAS II interrogator is in the inactive state, the RF power at 1030 ± 3 MHz at the terminals of the antenna shall not exceed -70 dBm.



Test Equipment (CW Leakage)

Spectrum Analyzer – HP8561B
50 Ohm – 50 Ohm power termination

Test Procedure (CW Leakage)

Using the spectrum analyzer, power at each top antenna output port was measured at 1030 MHz. Total power of all four ports is summed and reported.
Using the spectrum analyzer, power at each bottom antenna output port was measured at 1030 MHz. Total power of all four ports is summed and reported.

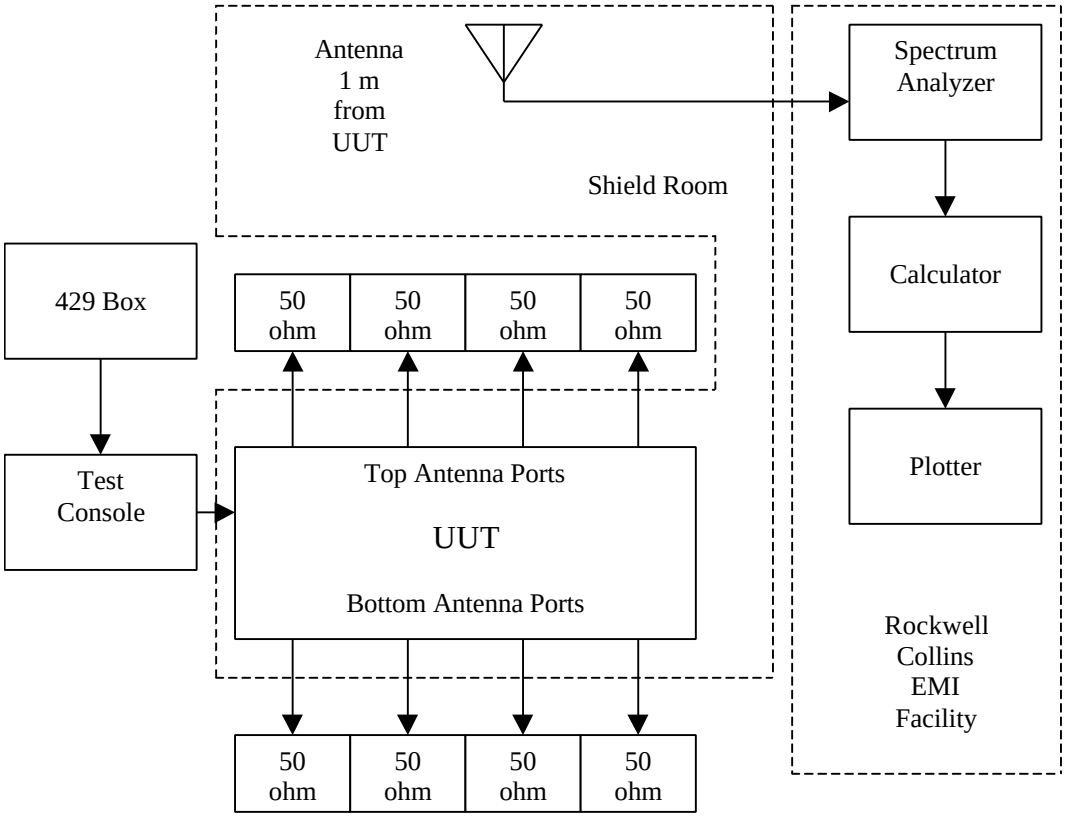
Data (CW Leakage)

MCN : E005
Date : 4/20/99
Tested By : K.S.

Antenna	1030 MHz Leakage
Top	-81.8 dBm
Bottom	-88.0 dBm

Sec. 2.1053 Measurement required: Field strength of spurious radiation

Test Setup



Note: 115 VAC power is fed to the UUT through two LISN's with 1m length between LISN and the UUT. Interface from test console to UUT inside shield room exposed for 3.3m. Setup is according to RTCA DO-160D.

Test Equipment

Test Console - Collins TCAS Control Display Panel, Collins TPR-920 Mode-S Transponder, JcAIR TCAS Reply RF Generator, JcAIR TCAS Reply RF Generator, JcAIR Mode-S RF Generator, JcAIR Video Processor, IBM Compatible PC, etc. interconnected to form a TCAS Test Console.
429 Box - JcAIR Model 429E ARINC 429 Bus Programmer.
50 Ohm – 50 Ohm power termination
Antenna – per DO-160D

Test Procedure

The TTR-921/TTR-4000 is operated in its normal Whisper/Shout mode where it transmits a whisper shout sequence once per second.
An automated test routine measures narrowband radiated power at frequencies up to 1.215 GHz. Another automated test routine measures narrowband radiated power at frequencies up to 18 GHz.

Data

MCN: E005
Date: 3/11/99 to 4/7/99
Tested By: Rockwell Collins

Due to the pulsed nature of the transmitter, harmonics of the transmit frequency were looked at individually using multiple sweeps with the following spectrum analyzer settings to guarantee the capture of accurate readings:

Frequency Span – 1 MHz Sweep Time – 50 sec. at max hold
Resolution Bandwidth – 1 MHz Video Bandwidth – 3 MHz

A reference field strength level was calculated for comparison with the narrowband data plotted in these figures. The following assumptions were made in making these calculations:

1) The intended transmitter signal at 1030 MHz is radiated through a dipole antenna at 1 meter distance from the point at which measurements are to be made (same distance as that used in the data of this exhibit). This distance is sufficiently great that the radial component of the E-field is negligible.

2) The peak power available at the dipole transmitting antenna is at specification minimum, thereby leading to the most conservative result. This is 149.6 W (or +21.25 dBW), less the 3 dB maximum permitted cable loss, giving 74.8 watts, or 18.25 dBW.

3) Mode C suppression pulse S_1 is at minimum –3 dB level with respect to P_1 and Mode C sidelobe suppression pulse P_2 is present at the same level as P_1.

4) An attenuation of 40 dB with respect to the average power of the transmission shall be used as per Section 87.139. The use of the 43+10log(Pave) calculation of Section 87.139 (a) (3) would lead to a less stringent requirement.

Calculation of average power

Average power is calculated for the TCAS unit broadcasting a standard Mode C minimum sequence once per second and transmitting one Mode S long pulse once per second. The standard Mode C minimum sequence consists of a series of Mode C transmissions at varying peak power levels. The peak power and duration/duty cycle of each S_1, P_1, P_2, P_3, and P_4 pulse of the Mode C transmissions were considered in the average power calculation. The Mode S transmission is at maximum power. The peak power and duration/duty cycle of the P_1, P_2, and P_6 pulses of the Mode S transmissions were considered in the average power calculation.

Calculated average power is: 0.00330 Watt

Calculation of emissions specification

For a half-wave dipole in free space in the direction of maximum radiation the field strength is:

E = [(49.2 * Pt)^0.5]/R where Pt = transmitted power in Watts
R = distance in meters

Substituting numerical values yields:

E = [(49.2 * 0.00330)^0.5]/1 = 0.4029 V/m

E = 0.4029 E6 uV/m or 112.1 dBuV/m

The limit then becomes 112.1 dBuV/m – 40 = 72.1 dBuV/m.

The following plots show the narrowband emissions data taken in this manner. DO-160 limits may be superimposed on the plots but do not represent the limits for this report.

Note : Plots for the TTR4000 were incorrectly listed as TTR-921 however UUT Serial # E3 is a size 4 MCU TTR4000.

All emissions through the tenth harmonic or 10.3 GHz were below the limit.

Field strength of spurious radiation plots:

UNIT UNDER TEST

TTR-921/W.CARD

TEST CONDITION or MODE

ON

PROCEDURE PARA.#

4.8.2

DATE

12 Mar 1999

TECHNICIAN

8819

SERIAL #

115400

ANTENNAS:

RVA 30 460-0118-548

EMCO 3104C 460-0115-516

EMCO 3101 S/N 2714

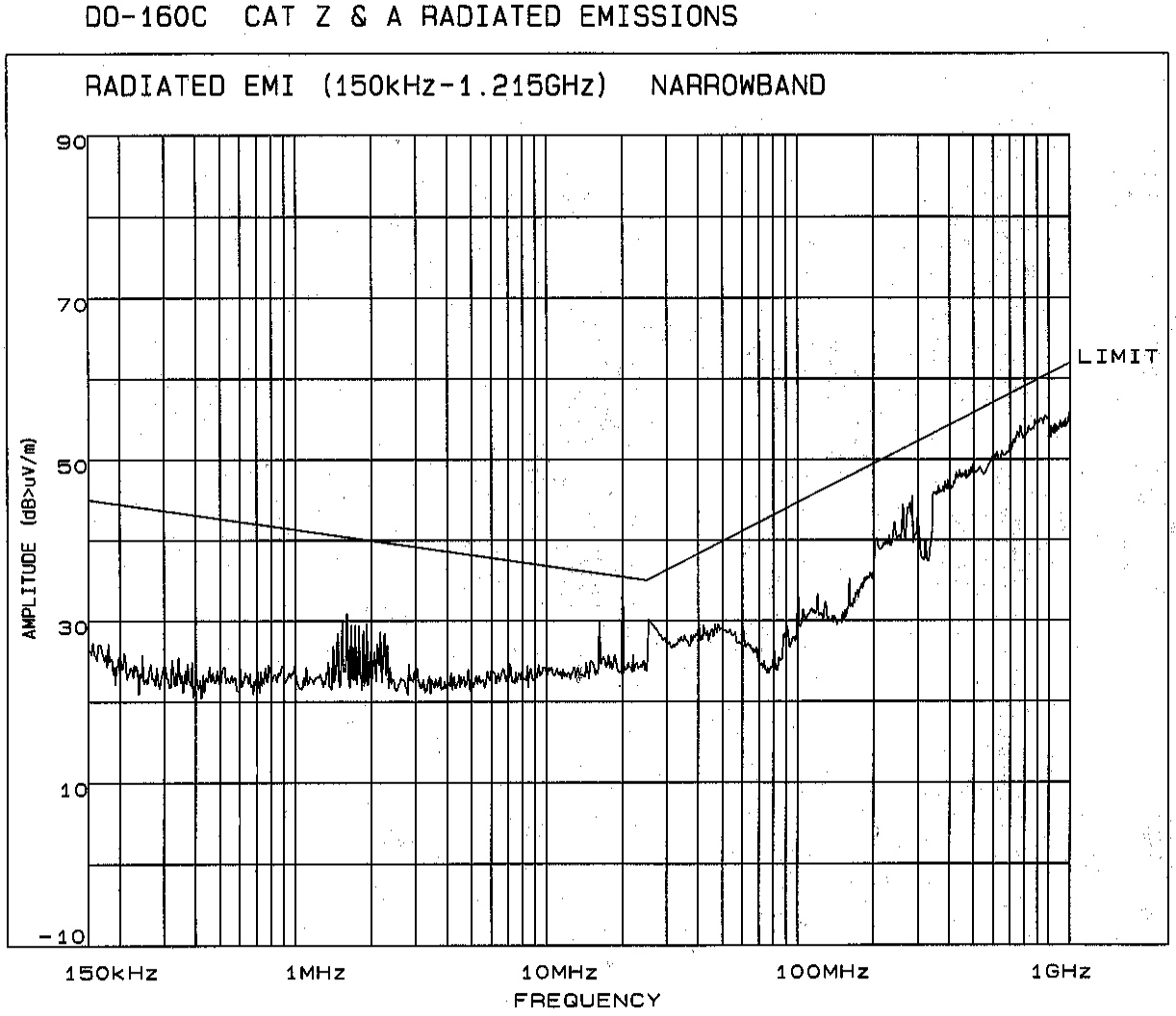
EMCO 3115 460-0078-854

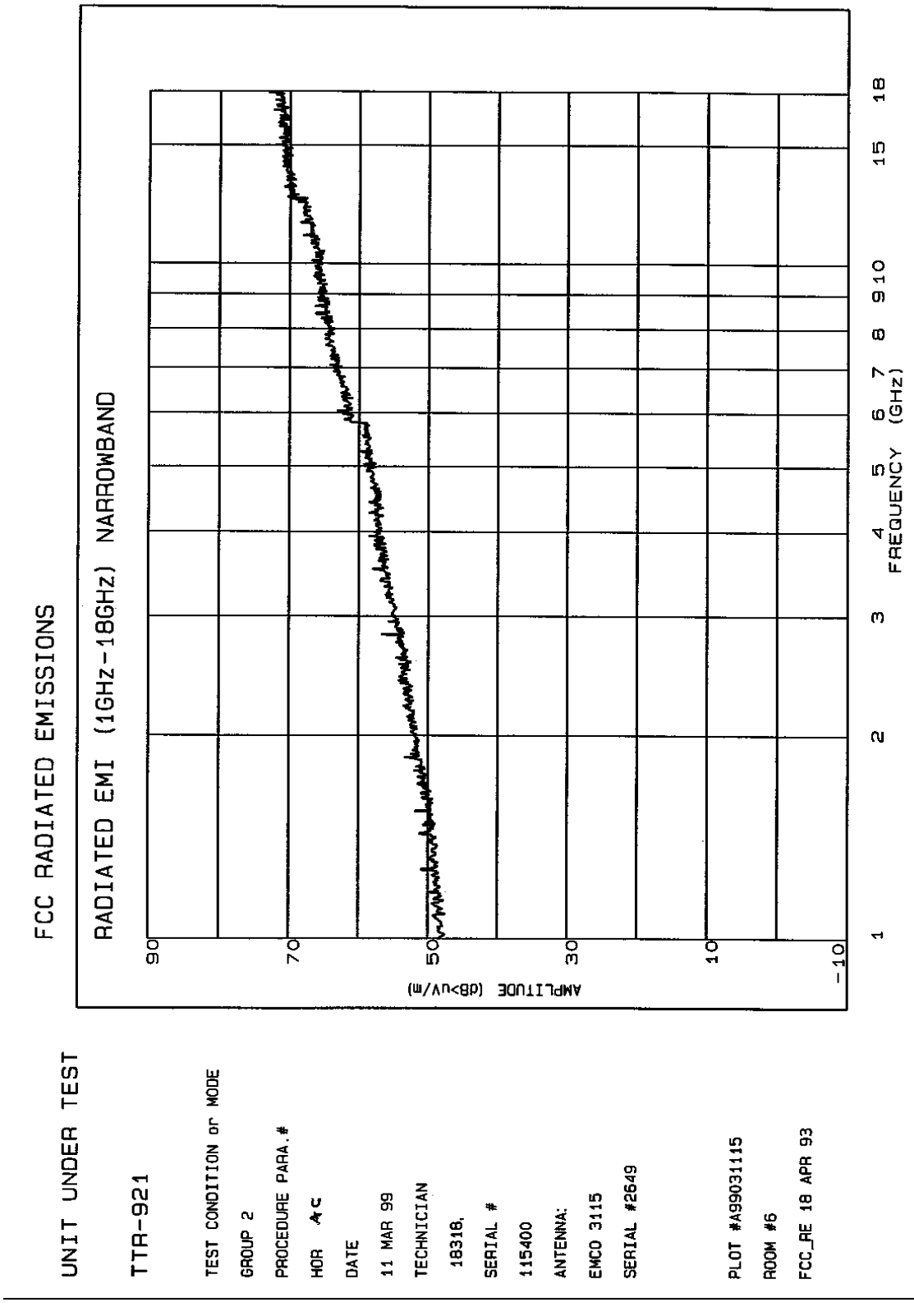
85668 85685A

PLOT #C99031221

ROOM #6

160_RAD 26 APR 95





Field Strength of Spurious Radiation - TTR921, cont.

Field Strength of Spurious Radiation - TTR921, cont.

UNIT UNDER TEST

TTR-921

TEST CONDITION or MODE

GROUP 2

PROCEDURE PARA.#

VERT Ac

DATE

11 MAR 99

TECHNICIAN

18318,

SERIAL #

115400

ANTENNA:

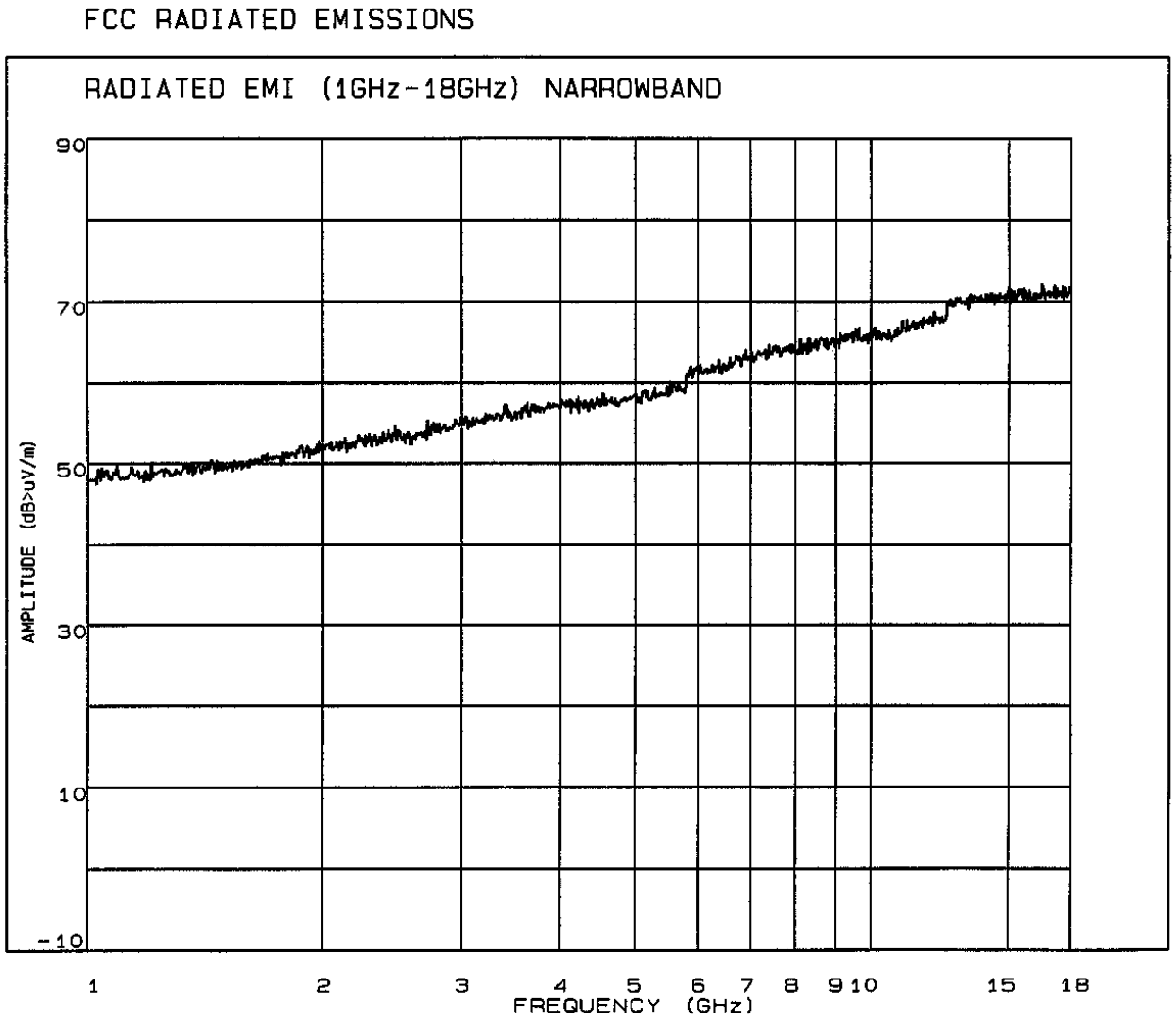
EMCO 3115

SERIAL #2649

PLOT #A99031116

ROOM #6

FCC_RE 18 APR 93



UNIT UNDER TEST

TTR-921 WO CRD

TEST CONDITION or MODE

FCC TEST
CONFIG.4
PROCEDURE PARA.#

4.8.2

DATE

7 Apr 1999

TECHNICIAN

10746

SERIAL #

E3

ANTENNAS:

RVA 30 460-0118-546

EMCO 3104C 460-0115-516

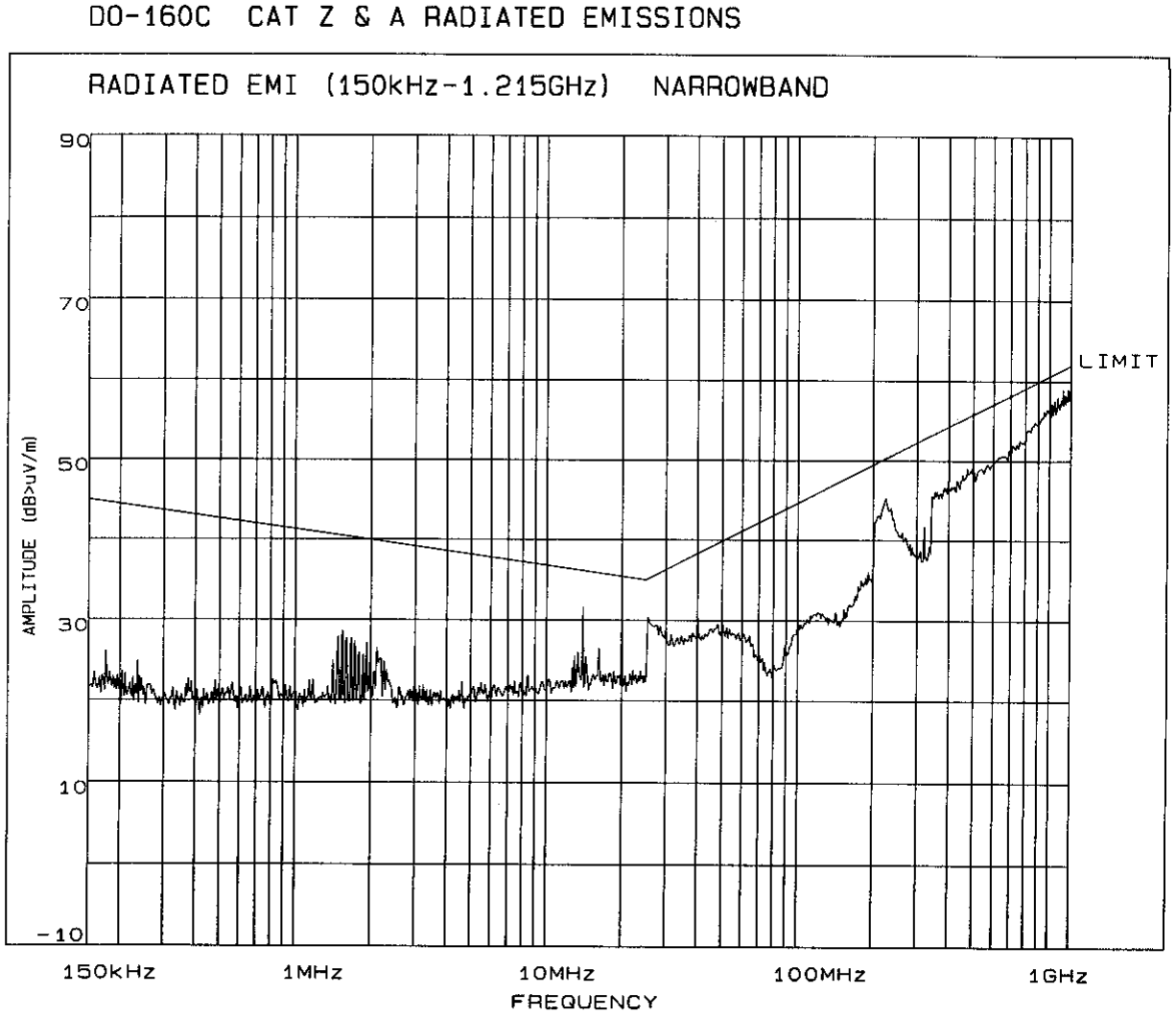
EMCO 3115 460-0078-853

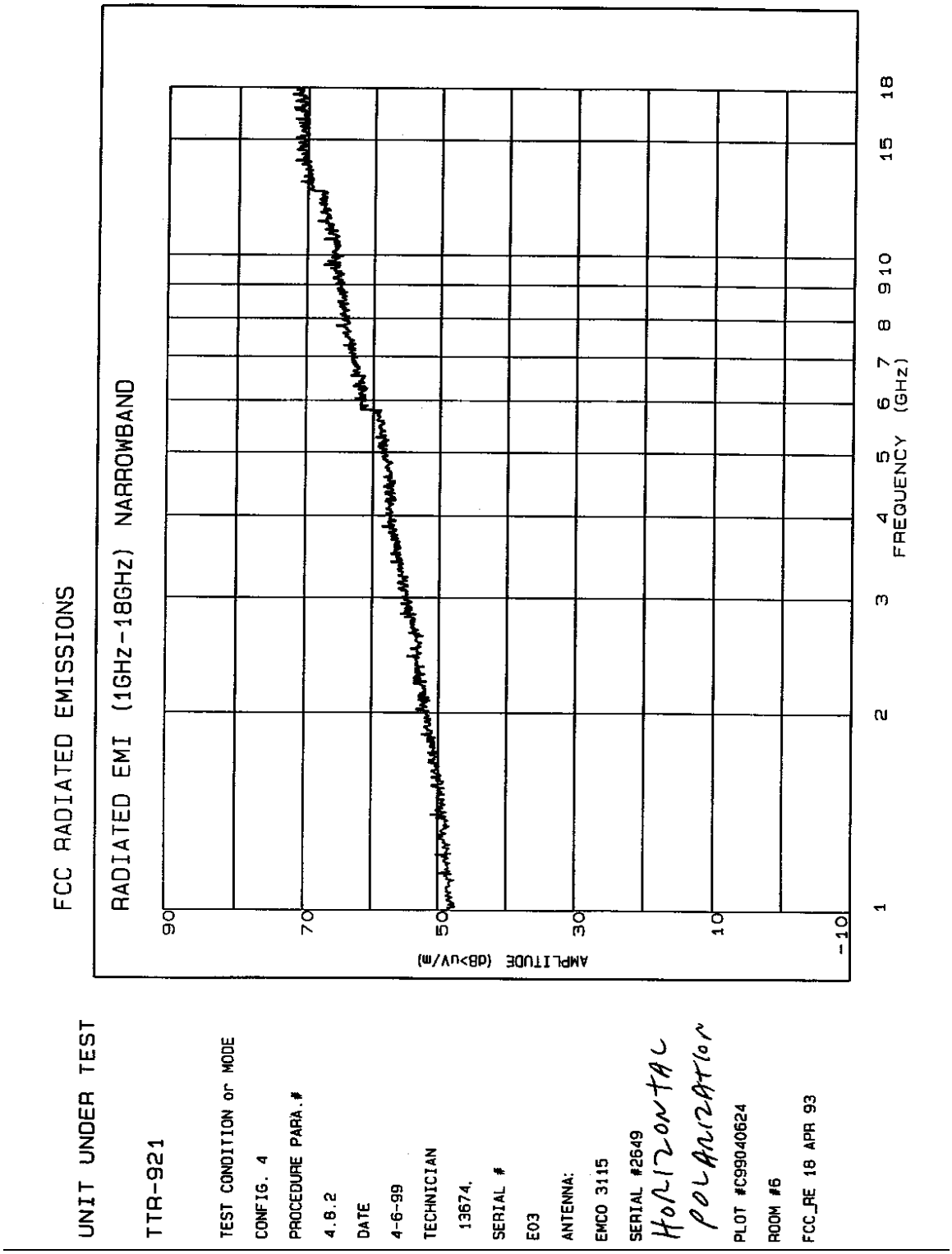
8566B 85685A

PLOT #C99040701

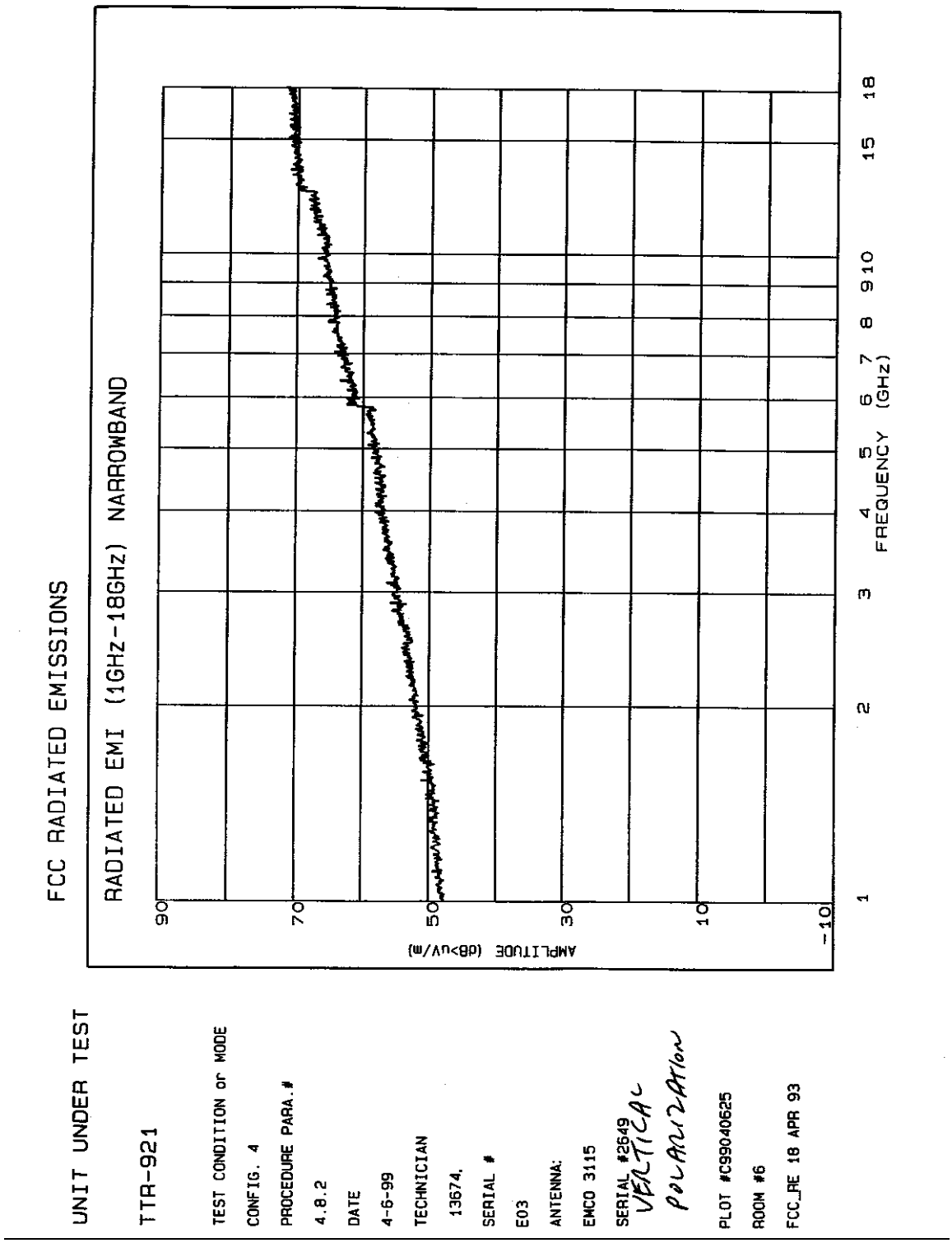
ROOM #6

160_RAD 26 APR 95





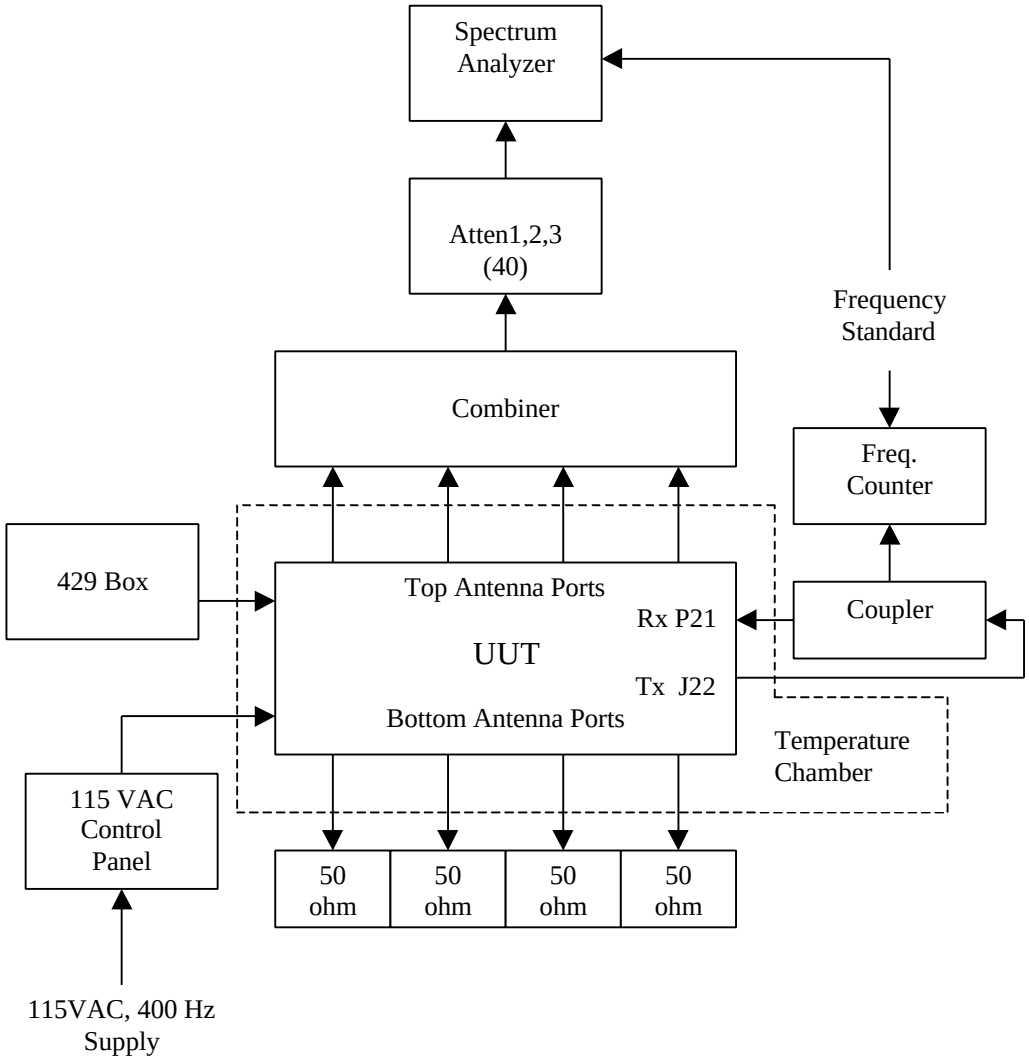
Field Strength of Spurious Radiation - TTR4000, cont.



Field Strength of Spurious Radiation - TTR4000, cont.

Sec. 2.1055 Measurement required: Frequency stability

Test Setup



Test Equipment

429 Box – Atlantic Instruments Datatrac 400.
Combiner - Four way power combiner configured with 0, -45, -45, and –135 degree inputs.
Coupler – Narda 3002-10
Attenuator 1 - 50 Ohm power attenuator, 20 dB nominal.
Attenuator 2 - 50 Ohm power attenuator, 10 dB nominal
Attenuator 3 - 50 Ohm power attenuator, 10 dB nominal.
Spectrum Analyzer – HP8562A

50 Ohm – 50 Ohm power termination
115 VAC Control Panel – Rockwell Collins 029-6166-109
Frequency Counter – Racal Dana 1992

Test Procedure

Proper programming of the 429 box accesses the following test mode:

Mode S Test Mode 3 – Mode S, P6 only with no modulation

A carrier frequency measurement is made by setting the spectrum analyzer to 1030 MHz center frequency, 50 kHz scan width, 1 kHz resolution bandwidth, and 30 sec. sweep. The pulsed frequency is determined as the midpoint between the –3dB down points of the spectrum peak.

Proper programming of the 429 box accesses the following test mode:

Bench Test Mode 10 – No interrogations but receive processing enabled.

The local oscillator signal present on the cable that runs from J22 of the transmitter assembly to P21 of the receiver assembly is a continuous signal with no modulation at 1030 MHz nominal. It directly determines the center frequency of transmission. The frequency of the 1030 MHz source is measured directly by the frequency counter.

Under factory ambient temperature conditions: The TTR-921/TTR-4000 was operated while the input line voltage was varied as measured on the AC meter of the 115 VAC Control Panel. Nominal power input is 115 VAC, 400 Hz. The carrier frequency was measured at the nominal 115 VAC and at 85 percent (97.75 VAC) and at 115 percent (132.25 VAC) of the nominal voltage.

Using the temperature chamber, the TTR-921/TTR-4000 was then stabilized at each temperature specified in Section 2.1055 (a) (2). For this data the input line voltage was maintained at 115 VAC. The carrier frequency was measured and recorded at each temperature.

Data

MCN: E005
Date: 4/30/99 to 5/1/99
Tested By: K.S.

Line Voltage (VAC)	Temp (deg. C)	Frequency Pulsed (Hz)	Frequency Source (Hz)
132.25	F.A.*	1,030,000,585	1,029,999,710
115	F.A.*	1,030,000,625	1,029,999,713
97.75	F.A.*	1,030,000,585	1,029,999,711
115	-20	1,030,000,165	1,029,999,633
115	-10	1,030,001,210	1,030,000,448
115	0	1,030,001,545	1,030,000,691
115	10	1,030,001,335	1,030,000,422
115	20	1,030,000,795	1,029,999,885
115	30	1,030,000,125	1,029,999,276
115	40	1,030,000,040	1,029,999,128
115	50	1,030,001,165	1,030,000,212

* Factory ambient, 26 C nominal.

Test Equipment List

429 Box	Atlantic Instruments Datatrac 400	460-0205-616
Combiner	Rockwell Collins	
Phase Detector	Rockwell Collins	827-3556-001
Variable Phase Shifter 1	Narda 3752	460-0083-090
Variable Phase Shifter 2	ARRA N3428A	460-0209-170
Attenuator1	Weinschel 49-20-43 (20dB)	460-0073-243
Attenuator2	Weinschel 33-10-34 (10dB)	460-0078-237
Attenuator3	Weinschel Model 1 (10dB)	460-0206-578
Attenuator4	Midesco MDC5079s-6 (6dB)	460-0207-105
Coupler	Narda 3002-10	460-0069-563
Power Sensor	Gigatronics 80350A Peak Power Sensor	460-0126-777
Peak Power Meter	Gigatronics 8542 Universal Power Meter	460-0120-699
Oscilloscope	Techtronics TDS 754C	460-0124-954
Spectrum Analyzer	HP8562A	460-0083-888
Spectrum Analyzer	HP8566B	460-0071-037
Spectrum Analyzer	HP8561B	460-0086-489
Detector	HP423B	460-0203-426
Frequency Counter	Racal Dana 1992	460-0075-365
115 VAC Control Panel	Rockwell Collins	029-6166-109
50 OHM	Various	

Test Modes	Test Mode	Label	TopFwd Data	BotFwd Data
Mode C Test Mode 1 – Mode C all call, -3 dB suppression	6	275(BD)	0C0219	OCOC19
Mode S Test Mode 1 – Mode S, short P6 with all bits set 1	3	275(BD)	0C020C	OCOCOC
Mode S Test Mode 2 – Mode S, long P6 with all bits set 1	4	275(BD)	0C0210	OCOC10
Mode S Test Mode 3 – Mode S, P6 only with no modulation	5	275(BD)	0C0214	OCOC14
Idle Mode – Receive only, no transmit	10	275(BD)	0C0229	None

Must turn UUT off, remove antenna port 1, remove 429 inputs. Turn UUT on, connect antenna port 1, input 429.

Calibration Data

Combiner	A1	(-32.8 deg.	-6.38 dB)	
	A2	(-77.5 deg	-6.58 dB)	
	A4	(-77.5 deg	-6.61 dB)	
	A3	(-166.4 deg	-6.48 dB)	
		Loss =	-6.52 (Combiner loss = 6.52-6.01=	0.51 dB

Test cable loss = 0.10 dB

Loss from attenuator input to power sensor input = 40.40 dB
(atten1, atten2, coupler, atten3)

Power Meter total offset used 41.1 dB

UUT E5 measured phase output

A1	-90 deg ref
A2	-38.6
A3	-307.9
A4	-37.7