

TEST DATA OF JMA-5110

Type JMA-5110 Ser. No. LX59972

Scanner Unit NKE-2102

Display Unit NCD-4310

Ship's Main DC24 – 32 V

Date June.26.2003

Section Chief Akio Yoshida

Inspector M. Itoh

1.Mechanical Tests

Appearance and Structure

Scanner Unit	Good
Display Unit	Good

2.Electrical Tests

2.1 Working of each operation unit

Scanner Unit	Good
Keyboard Unit	Good
STBY Key	Good
TX/PRF Key	Good
EBL1/EBL2 key	Good
VRM1/VRM2 key	Good
ALARM ACK key	Good
MOB key	Good
CLEAR key	Good
DIMM key	Good
FUNC key	Good
OFF CENT key	Good
RR/HL key	Good
TM/RM key	Good
AZI MODE key	Good
TGT DATA key	Good
TRAILS key	Good
CSR POS key	Good
+RANGE key	Good
ACQ/ENT key	Good
MENU key	Good
AUTO-TUNE Control	Good
AUTO-RAIN Control	Good
AUTO-SEA Control	Good
GAIN/PL Control	Good

1.1 Scanner Unit

VSWR	frequency (MHz)	VSWR
	9380	1.2
	9410	1.2
	9440	1.2
Scanner Rotation Speed		27 rpm

2.3 Transmitter

Magnetron Ser. No.	H1459C
Operating Frequency	
(at 0.08 μ s PULS 0.75 n.m.)	9410 MHz
(at 0.25 μ s PULS 3.0 n.m.)	9408 MHz
(at 0.5 μ s PULS 6.0 n.m.)	9406 MHz
(at 1.0 μ s PULS 12.0 n.m.)	9406 MHz
Peak Output Power	
(at 0.08 μ s PULS 0.75 n.m.)	10.08 kW
(at 0.25 μ s PULS 3.0 n.m.)	9.31 kW
(at 0.5 μ s PULS 6.0 n.m.)	9.29 kW
(at 1.0 μ s PULS 12.0 n.m.)	9.18 kW
Pulse Length	
(at 0.08 μ s PULS 0.75 n.m.)	0.087 μ s
(at 0.25 μ s PULS 3.0 n.m.)	0.26 μ s
(at 0.5 μ s PULS 6.0 n.m.)	0.50 μ s
(at 1.0 μ s PULS 12.0 n.m.)	1.00 μ s

1.2 Receiver

MIC Front-end Ser. No.	A0790A
Diode limiter Ser. No.	A3705A
IF Center Frequency	60 MHz
IF Bandwidth	20/6/3 MHz

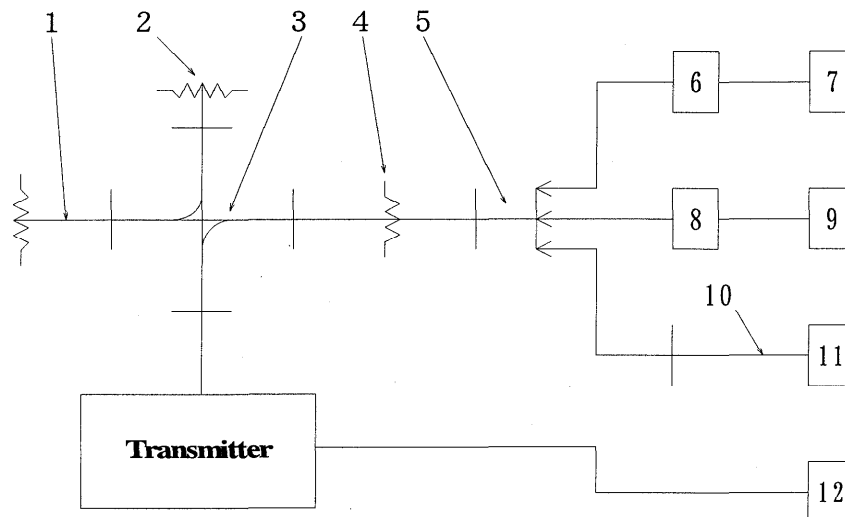
1.3 Display

Input Voltage and Current	DC.24V 2.43A (58W)
Repetition Frequency	
(0.08 μ s)	2250 Hz
(0.25 μ s)	1700 Hz
(0.5 μ s)	1200 Hz
(1.0 μ s)	650 Hz

2. Overall Test

Working Time of Timer	1.5 m
Input Variation (21.6Vdc – 42Vdc)	Good
Overall Sensitivity	Good
Minimum Range	Good
Bearing Accuracy	Good
Mechanical Noise	Good

(Sec. 2.985) 1.0 RF Power Output
 (Sec. 2.989) 2.0 Occupied Bandwidth



1:Dummy Load	—	Shimada
2:high power Dummy Load	WTM-0910	MANUF NIHON KOSHUHA
3:Directional Coupler	50351	Shimada
Coupling 30dB		
Directivity 30dB		
4:Attenuator	X382A	HP
5:Adaptor	X281A	HP
6:Power Sensor	8481A	HP
7:Power Meter	435A	HP
8:Crystal Detector	423B	HP
9:Oscilloscope	2445B	Tektronix
10:Coaxial Cable	MI-04	SONY/Tektronix
11:Spectrum Analyzer	8592A	HP
12:Frequency Counter	5300A	HP

Measurement Point : Transmitter Output

FCC Submittal Material Data

(Sec. 2.985)

1.0 RF Power Output

1.1 Peak Power

(at 0.08 μ s PULS 0.75 n.m.)	10.08 kW
(at 0.25 μ s PULS 1.5 n.m. long)	9.31 kW
(at 0.5 μ s PULS 3 n.m. long)	9.29 kW
(at 1.0 μ s PULS 12n.m.)	9.18 kW

1.2 Average Power

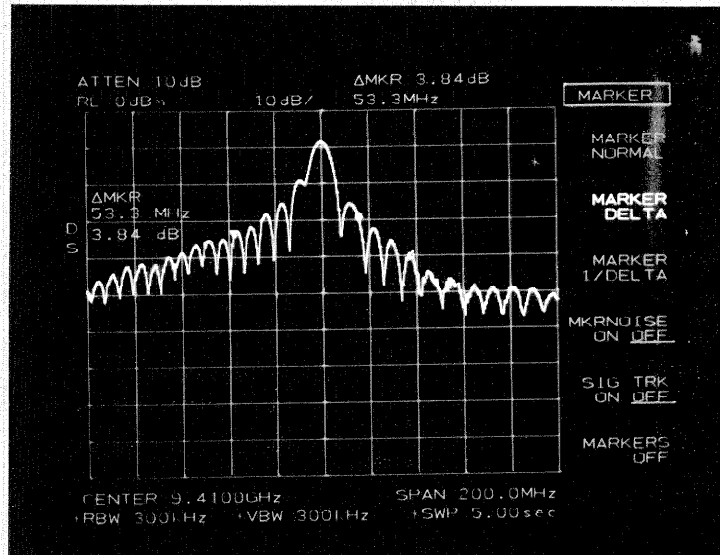
(at 0.08 μ s PULS 0.75 n.m.)	1.965 W
(at 0.25 μ s PULS 1.5 n.m. long)	4.16 W
(at 0.5 μ s PULS 3 n.m. long)	5.64 W
(at 1.0 μ s PULS 12n.m.)	6.00 W

1.3 Load Impedance

VSWR 1.05 at 9.36 – 9.46 GHz

(Sec. 2.989) 2.0 Occupied Bandwidth
 2.1 0.08 μ S Pulse PRF 2249Hz
 0.08 μ S Pulse Length 0.0867 μ S

Scale
 10dB/Div

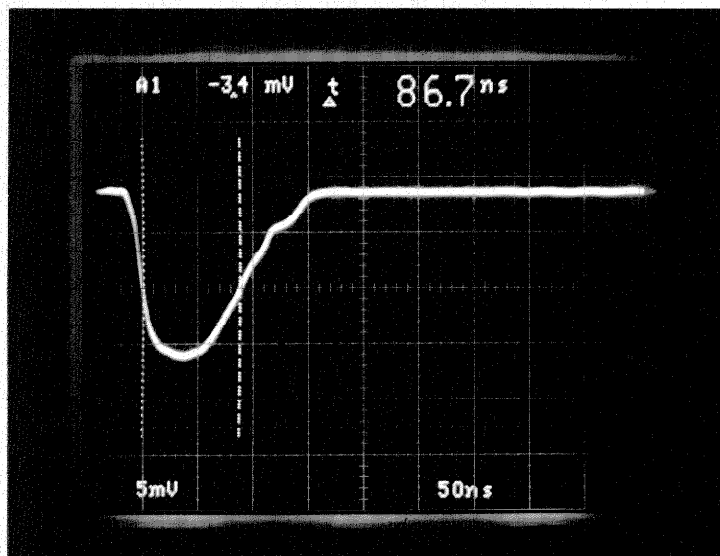


RF Spectrum
 0.08 μ S Pulse
 OBW=53.3 MHz

Scale 20MHz/Div
 Center Frequency 9410MHz

(Sec. 2.987)

Scale
 5mV/Div



← - 3 dB

Detected RF
 Pulse

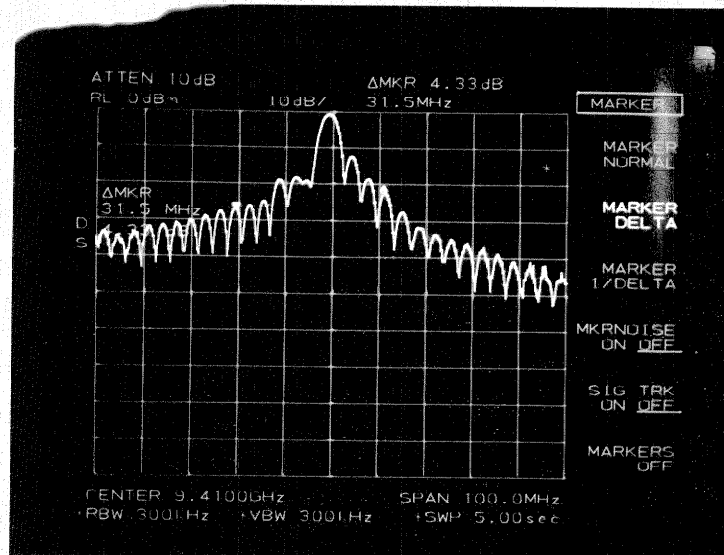
0.08 μ S Pulse

Scale 0.05 μ S/Div

(Sec. 2.989)

2.2 0.25 μ S Pulse PRF 1707Hz
0.25 μ S Pulse Length 0.2618 μ S

Scale
10dB/Div

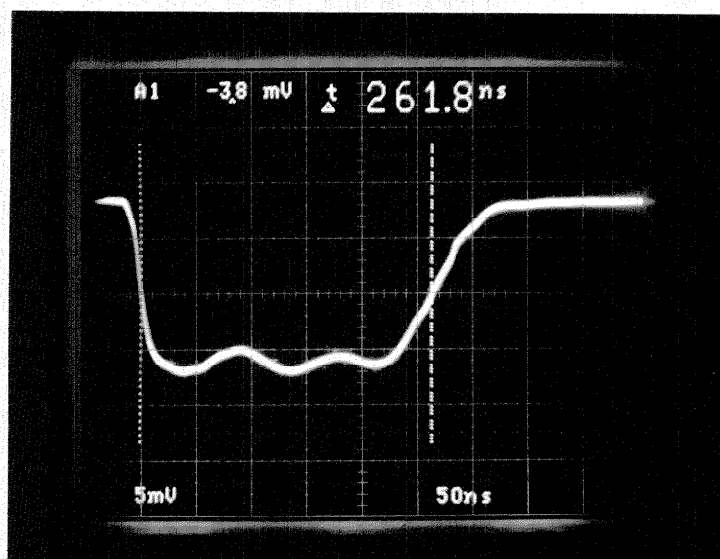


RF Spectrum
0.25 μ S Pulse
OBW=31.5MHz

Scale 10MHz/Div
Center Frequency 9408MHz

(Sec. 2.987)

Scale
5mV/Div



← - 3 dB

Detected RF
Pulse

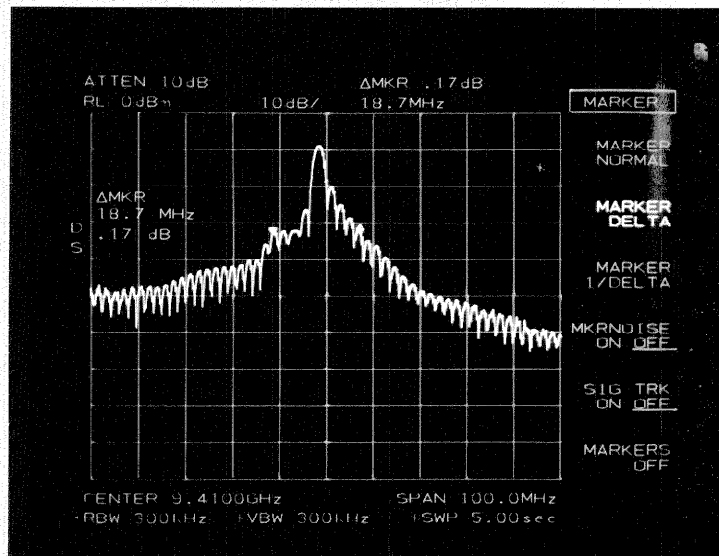
0.25 μ S Pulse

Scale 0.05 μ S/Div

(Sec. 2.989)

2.3 0.5 μ S Pulse PRF 1204Hz
0.5 μ S Pulse Length 0.5040 μ S

Scale
10dB/Div

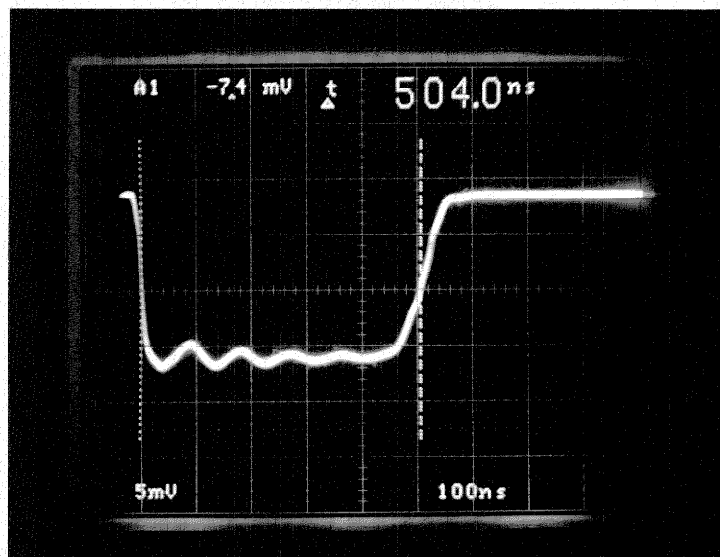


RF Spectrum
0.5 μ S Pulse
OBW=18.7MHz

Scale 10MHz/Div
Center Frequency 9406MHz

(Sec. 2.987)

Scale
05mV/Div



← - 3 dB

Detected RF
Pulse

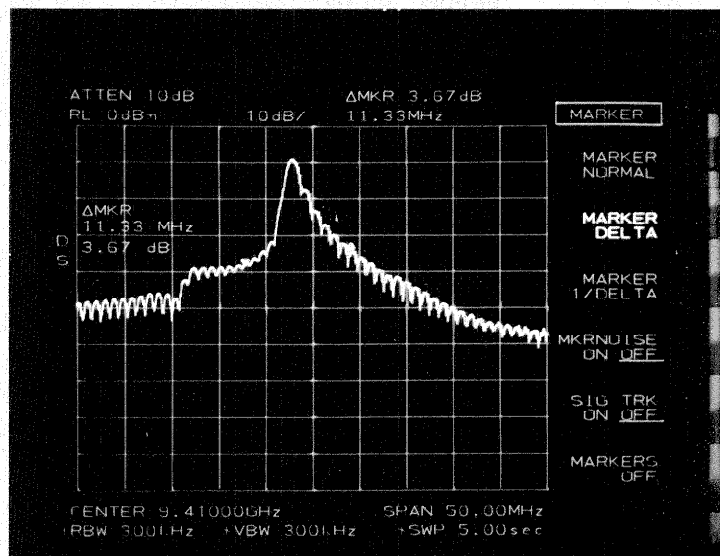
0.5 μ S Pulse

Scale 0.1 μ S/Div

(Sec. 2.989)

2.4 $1.0\ \mu\text{S}$ Pulse PRF 655.3Hz
 $1.0\ \mu\text{S}$ Pulse Length $0.997.5\ \mu\text{S}$

Scale
 $10\text{dB}/\text{Div}$



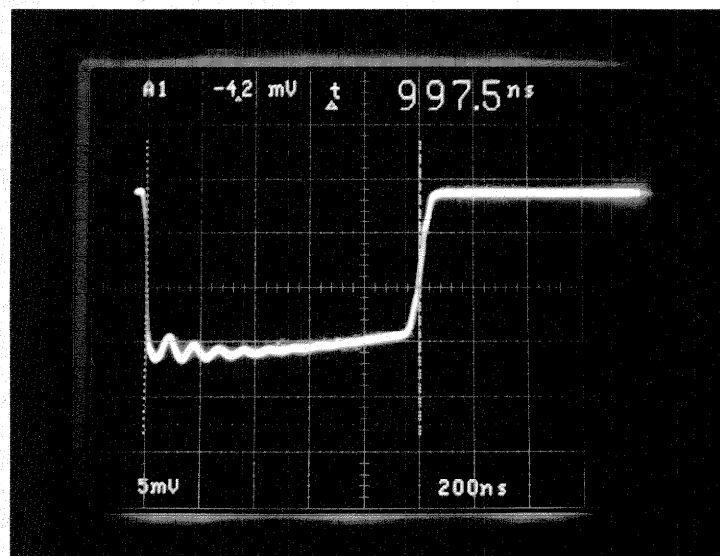
RF Spectrum
 $1.0\ \mu\text{S}$ Pulse

OBW=11.33MHz

Scale 5MHz/Div
Center Frequency 9406MHz

(Sec. 2.987)

Scale
 $5\text{mV}/\text{Div}$



← -3 dB

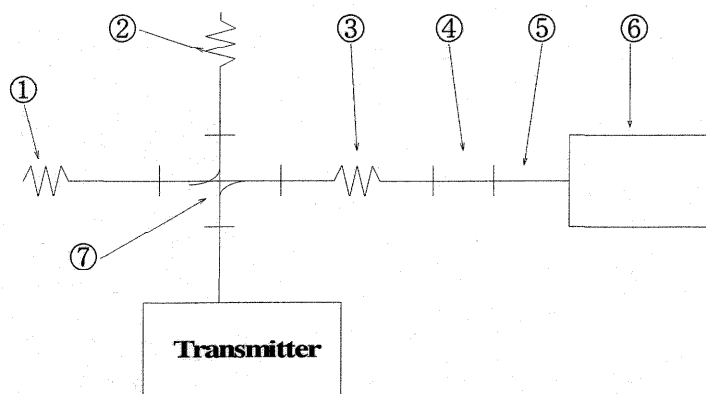
Detected RF
Pulse

$1.0\ \mu\text{S}$ Pulse

Scale $0.2\ \mu\text{S}/\text{Div}$

(Sec.2.991) 3.0 Spurious signal at antenna port

condition 1 : 0 to 20 GHz



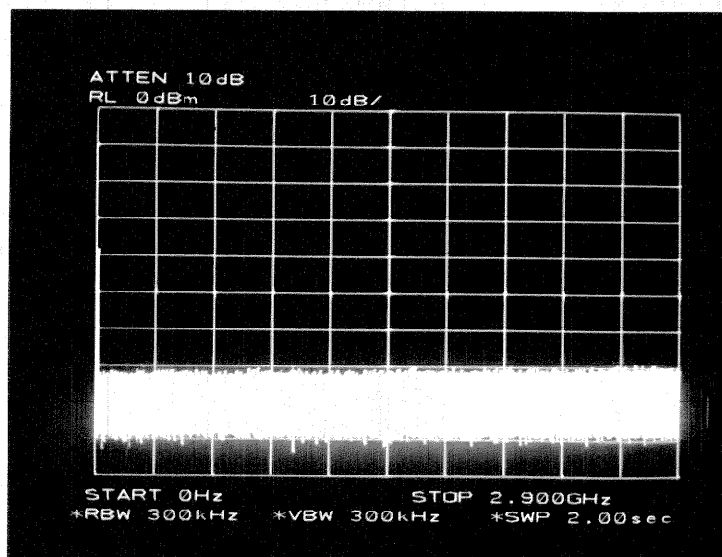
1. Dummy Load	4D104	Shimada
2. High power Dummy Load	WTM-0910	MANUF MHON KOSHUHA
3. Attenuator	X382A	HP
4. Adaptor	X281A	HP
5. Coaxial Cable	*****	HP
6. Spectrum Analyzer	8563A	HP
7. Direction Coupler	50351	Shimada
Coupling	30dB	
Directivity	30dB	

Attenuation 3 :40 dB

Measurement Point :Transmitter Output

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 290MHz/Div

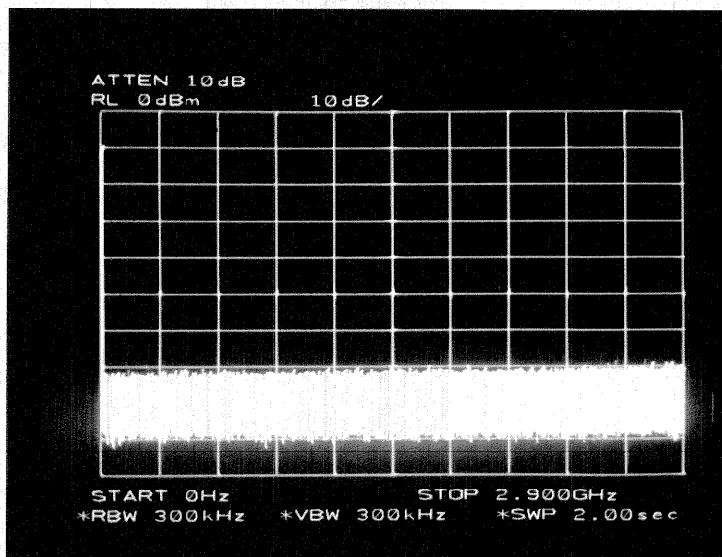


Spurious
Signal

OFF

0 to 2.9 GHz

Scale
↑ 10dB/Div
→ 290MHz/Div

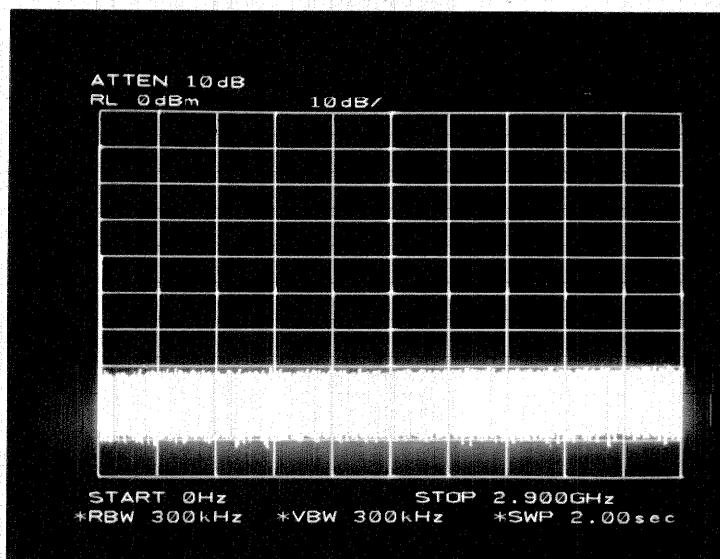


Spurious
Signal

Stand-By

0 to 2.9 GHz

Scale
↑ 10dB/Div
→ 290MHz/Div



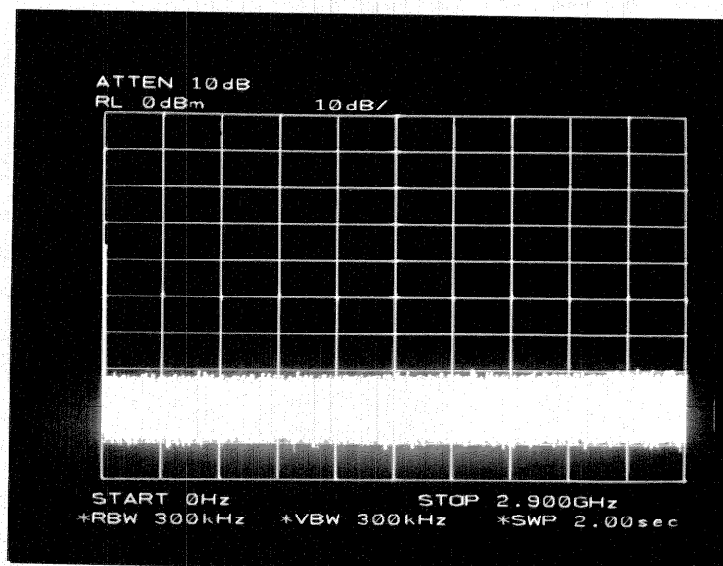
Spurious
Signal

0.08 μ S Pulse

0 to 2.9 GHz

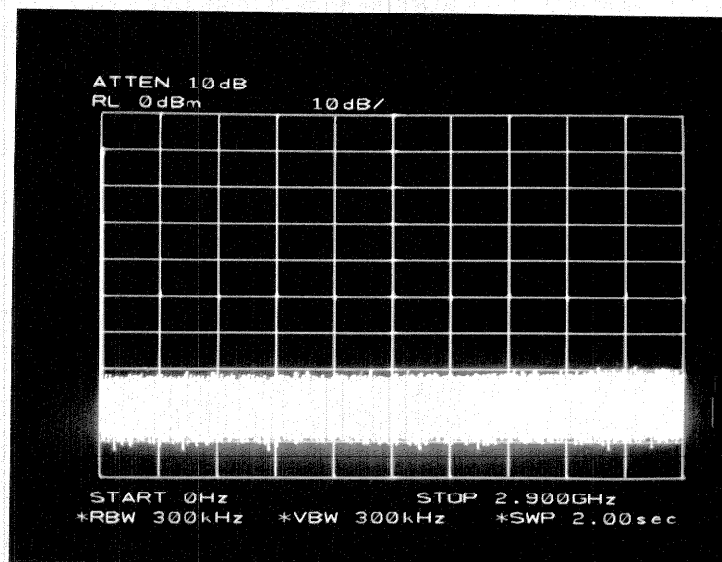
(Sec. 2.991)

Scale
↑ 10dB/Div
→ 290MHz/Div



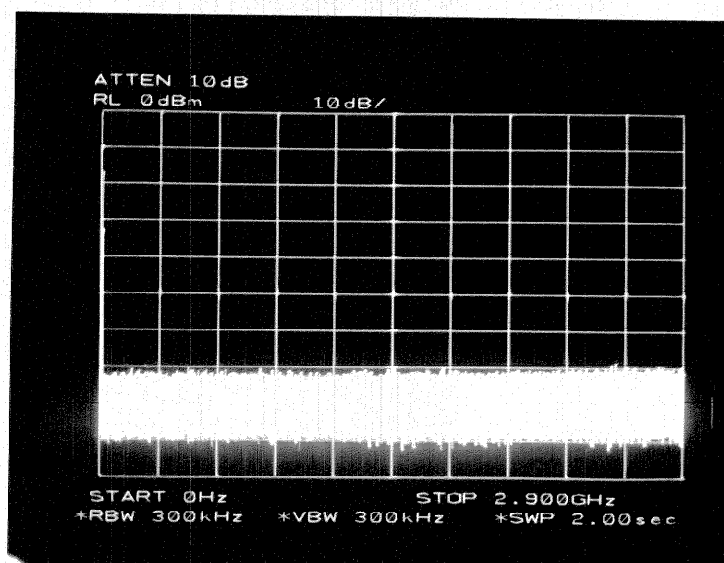
Spurious
Signal
0.25 μ S Pulse
0 to 2.9 GHz

Scale
↑ 10dB/Div
→ 290MHz/Div



Spurious
Signal
0.5 μ S Pulse
0 to 2.9 GHz

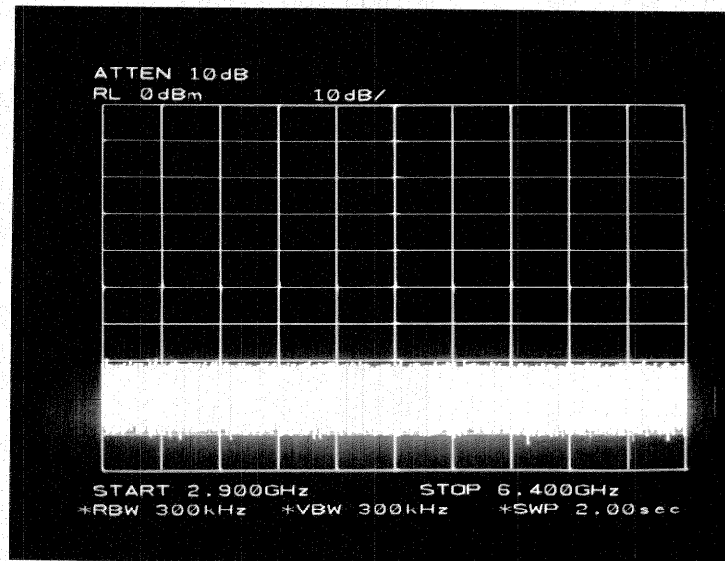
Scale
↑ 10dB/Div
→ 290MHz/Div



Spurious
Signal
1.0 μ S Pulse
0 to 2.9 GHz

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 350MHz/Div

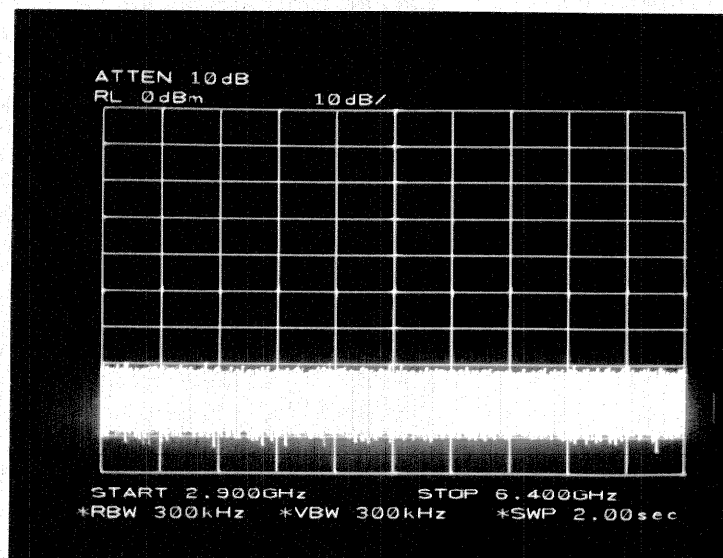


Spurious
Signal

OFF

2.9 to 6.4 GHz

Scale
↑ 10dB/Div
→ 350MHz/Div

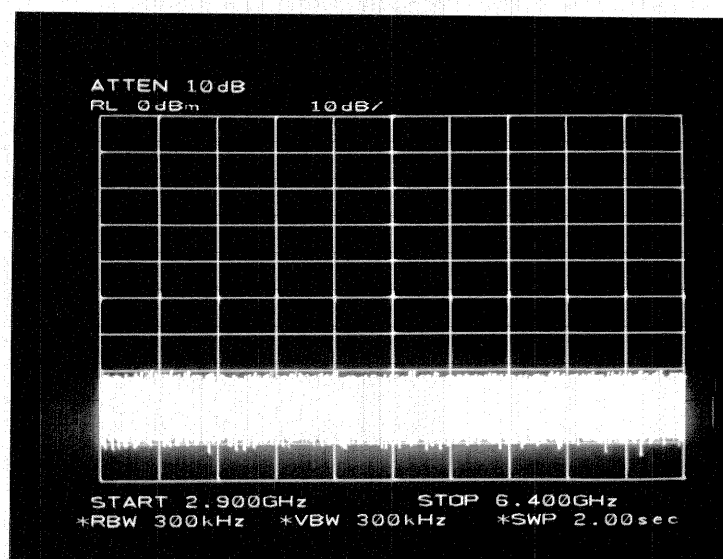


Spurious
Signal

Stand-By

2.9 to 6.4 GHz

Scale
↑ 10dB/Div
→ 350MHz/Div



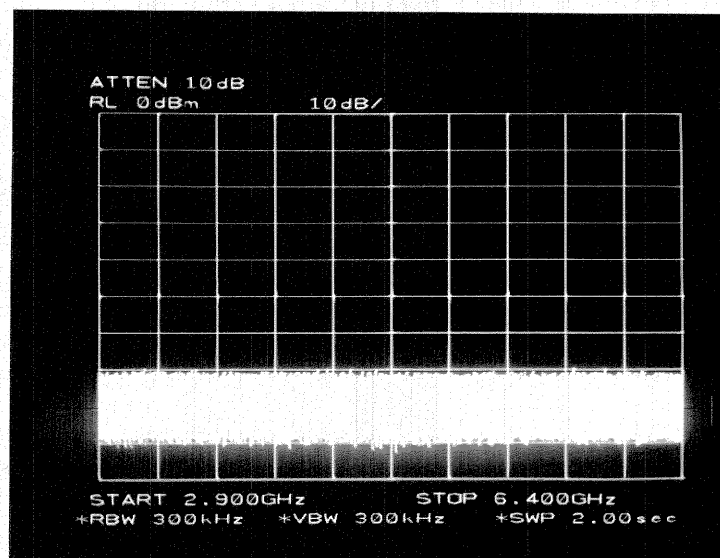
Spurious
Signal

0.08 μS Pulse

2.9 to 6.4 GHz

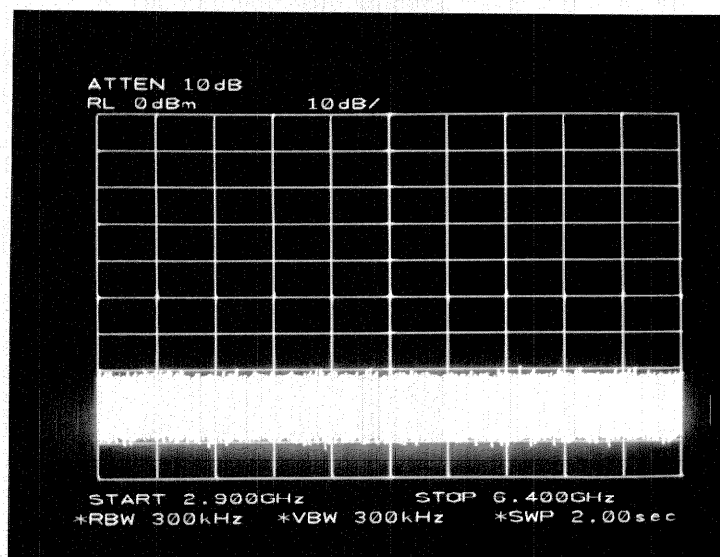
(Sec. 2.991)

Scale
↑ 10dB/Div
→ 350MHz/Div



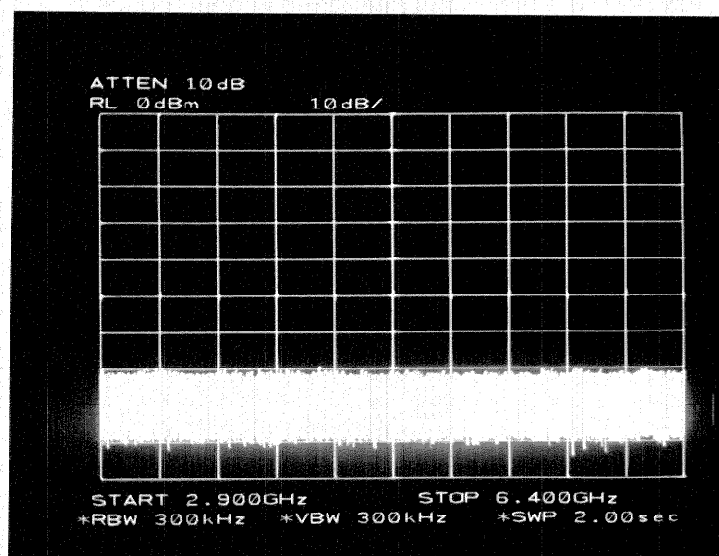
Spurious
Signal
0.25 μ S Pulse
2.9 to 6.4 GHz

Scale
↑ 10dB/Div
→ 350MHz/Div



Spurious
Signal
0.5 μ S Pulse
2.9 to 6.4 GHz

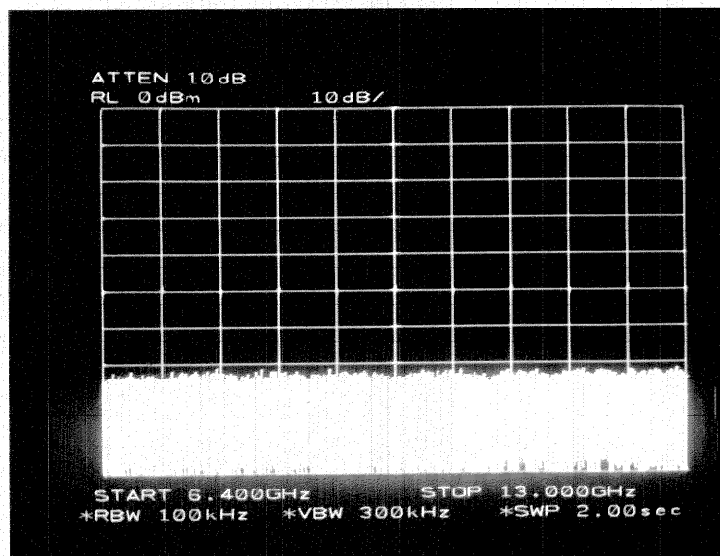
Scale
↑ 10dB/Div
→ 350MHz/Div



Spurious
Signal
1.0 μ S Pulse
2.9 to 6.4 GHz

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 660MHz/Div

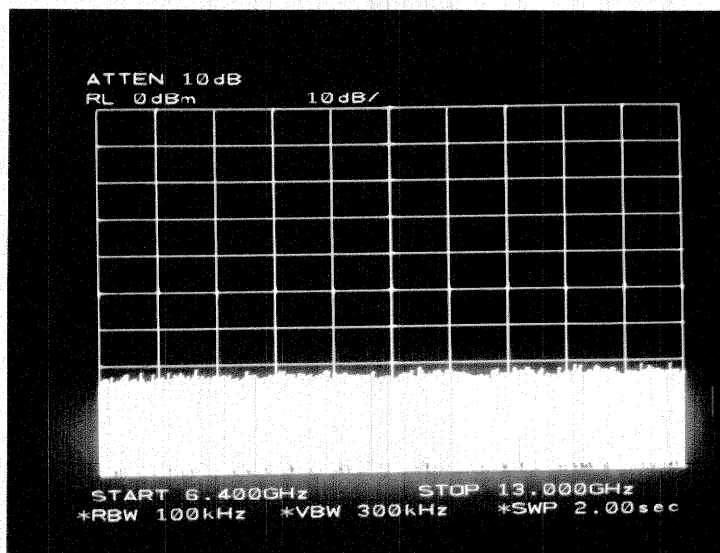


Spurious
Signal

OFF

6.4 to 13.0 GHz

Scale
↑ 10dB/Div
→ 660MHz/Div

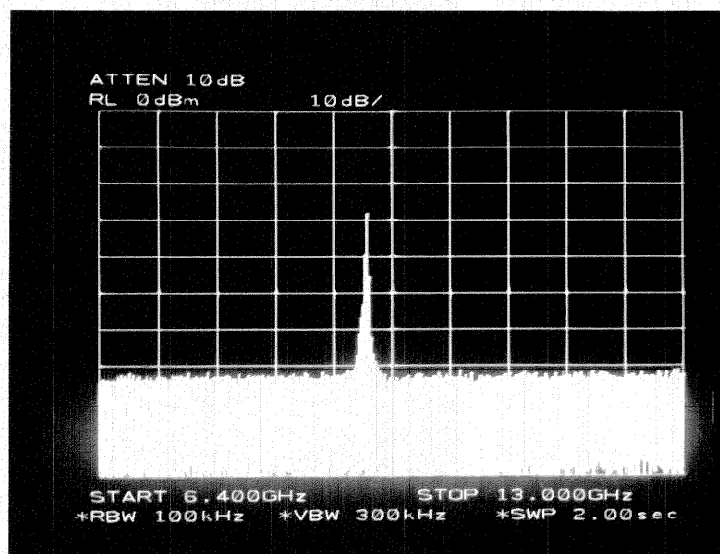


Spurious
Signal

Stand-By

6.4 to 13.0 GHz

Scale
↑ 10dB/Div
→ 660MHz/Div



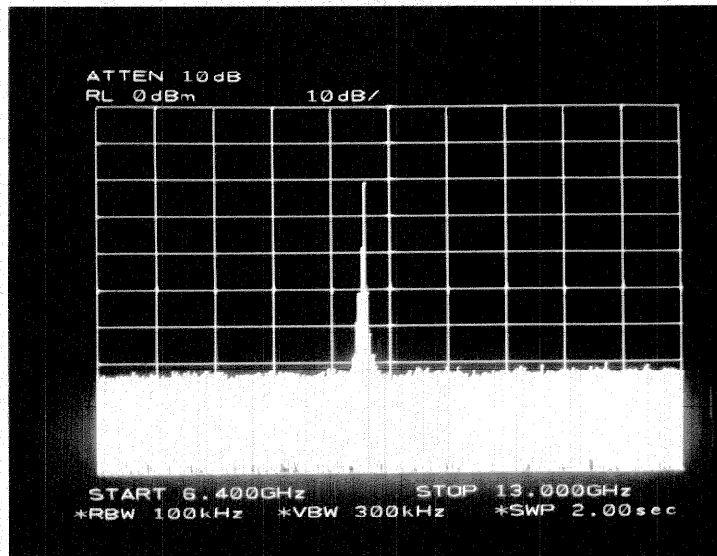
Spurious
Signal

0.08 μ S Pulse

6.4 to 13.0 GHz

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 660MHz/Div

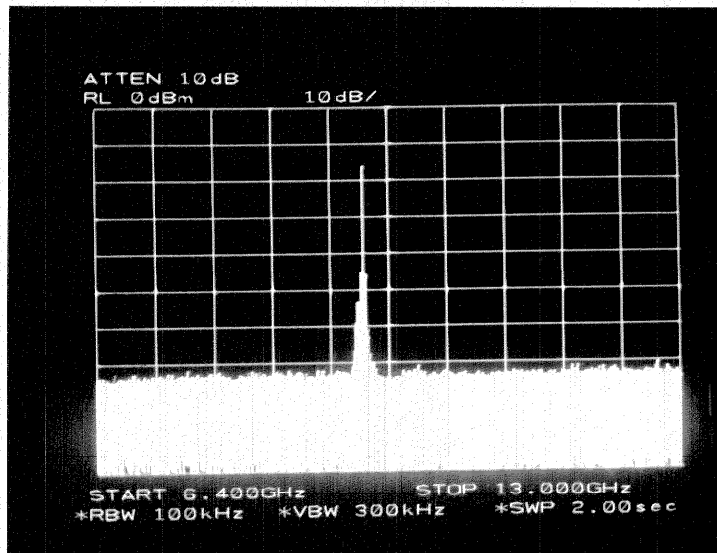


Spurious
Signal

0.25 μ S Pulse

6.4 to 13.0 GHz

Scale
↑ 10dB/Div
→ 660MHz/Div

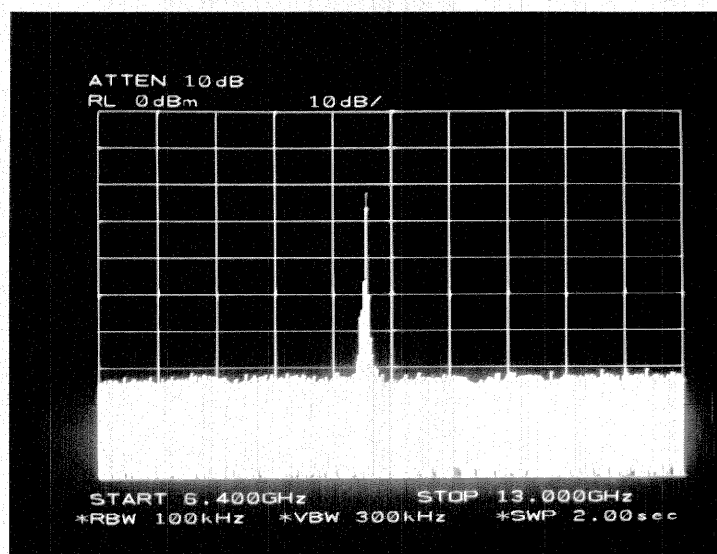


Spurious
Signal

0.5 μ S Pulse

6.4 to 13.0 GHz

Scale
↑ 10dB/Div
→ 660MHz/Div



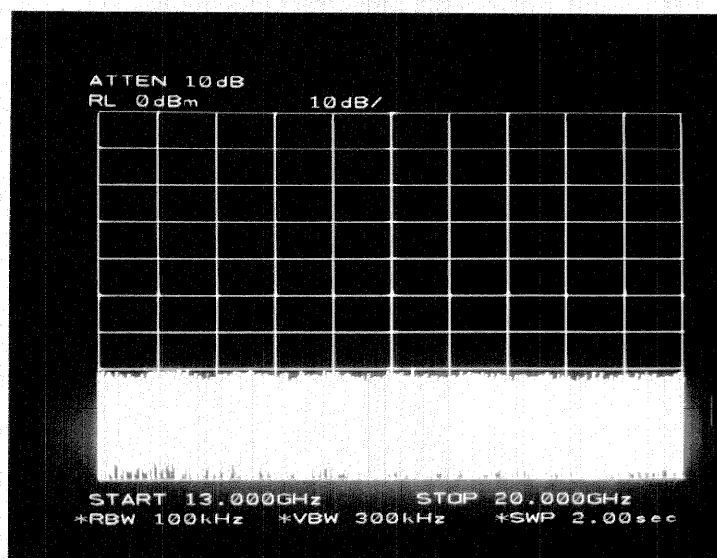
Spurious
Signal

1.0 μ S Pulse

6.4 to 13.0 GHz

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 700MHz/Div

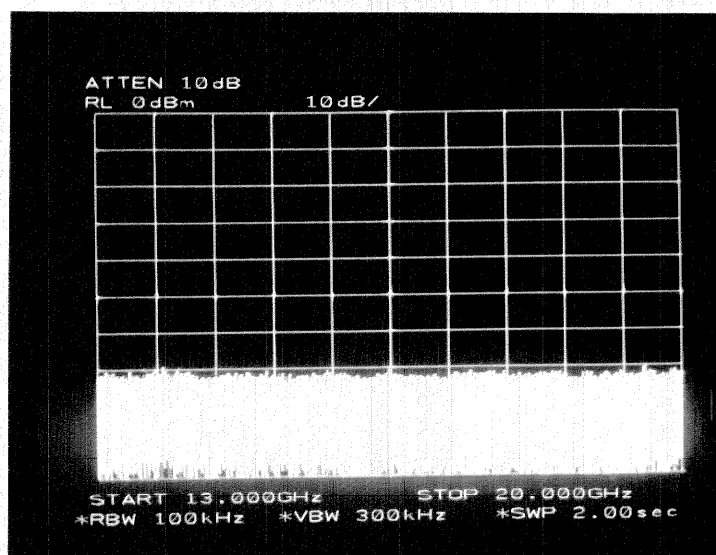


Spurious
Signal

OFF

13.0 to 20 GHz

Scale
↑ 10dB/Div
→ 700MHz/Div

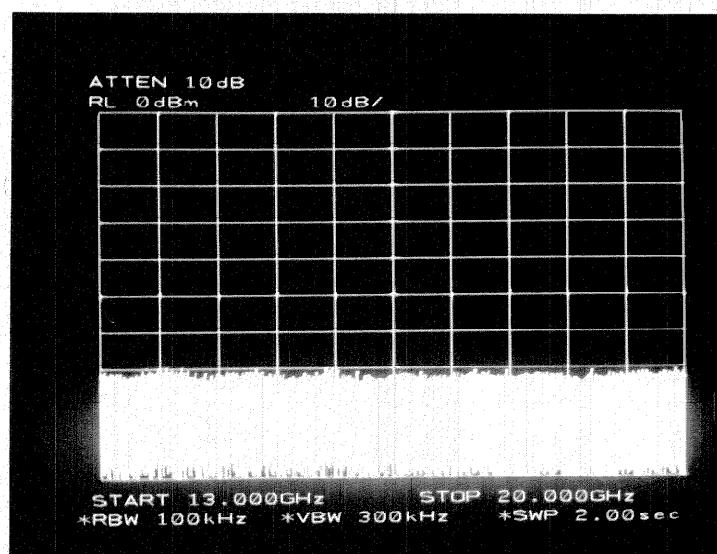


Spurious
Signal

Stand-By

13.0 to 20 GHz

Scale
↑ 10dB/Div
→ 700MHz/Div



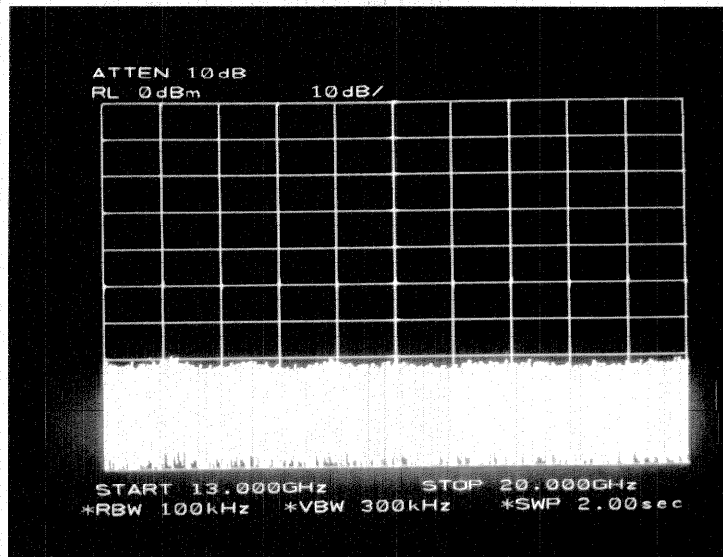
Spurious
Signal

0.08 μ S Pulse

13.0 to 20 GHz

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 700MHz/Div

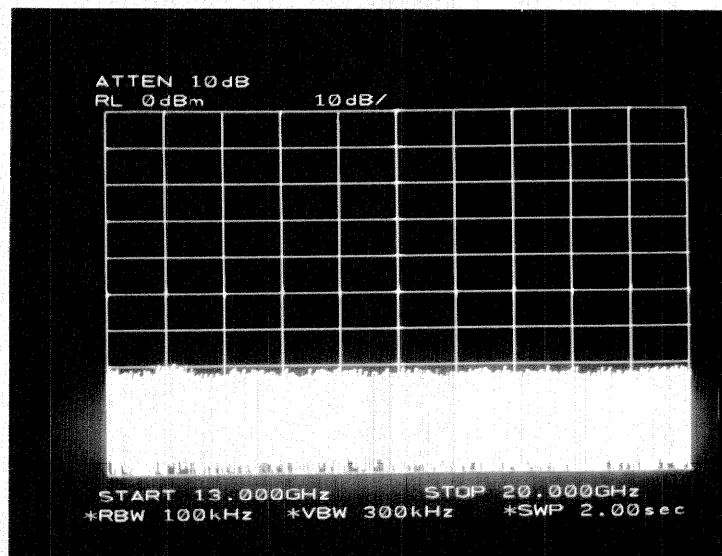


Spurious
Signal

0.25 μ S Pulse

13.0 to 20 GHz

Scale
↑ 10dB/Div
→ 700MHz/Div

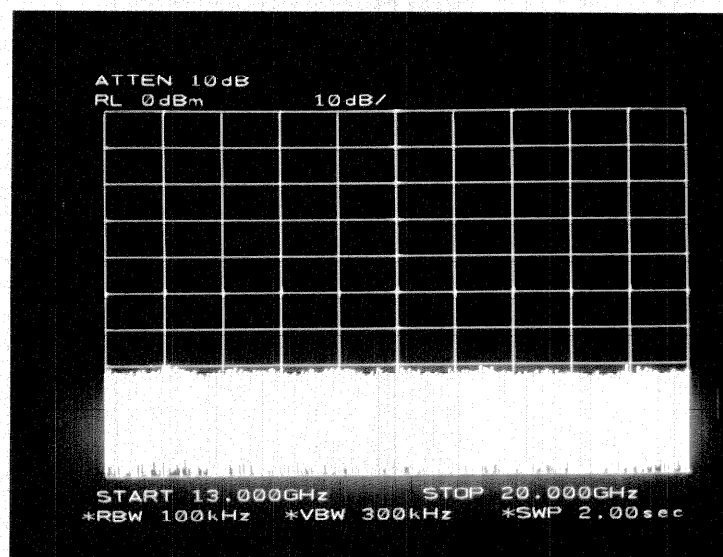


Spurious
Signal

0.5 μ S Pulse

13.0 to 20 GHz

Scale
↑ 10dB/Div
→ 700MHz/Div



Spurious
Signal

1.0 μ S Pulse

13.0 to 20 GHz