

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 $\mu$ s PULS 0.75 n.m.)	9410 MHz
(at 0.25 $\mu$ s PULS 3.0 n.m.)	9408 MHz
(at 0.5 $\mu$ s PULS 6.0 n.m.)	9406 MHz
(at 1.0 $\mu$ s PULS 12.0 n.m.)	9406 MHz
Peak Output Power	
(at 0.08 $\mu$ s PULS 0.75 n.m.)	10.08 kW
(at 0.25 $\mu$ s PULS 3.0 n.m.)	9.31 kW
(at 0.5 $\mu$ s PULS 6.0 n.m.)	9.29 kW
(at 1.0 $\mu$ s PULS 12.0 n.m.)	9.18 kW
Pulse Length	
(at 0.08 $\mu$ s PULS 0.75 n.m.)	0.087 $\mu$ s
(at 0.25 $\mu$ s PULS 3.0 n.m.)	0.26 $\mu$ s
(at 0.5 $\mu$ s PULS 6.0 n.m.)	0.50 $\mu$ s
(at 1.0 $\mu$ s PULS 12.0 n.m.)	1.00 $\mu$ 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

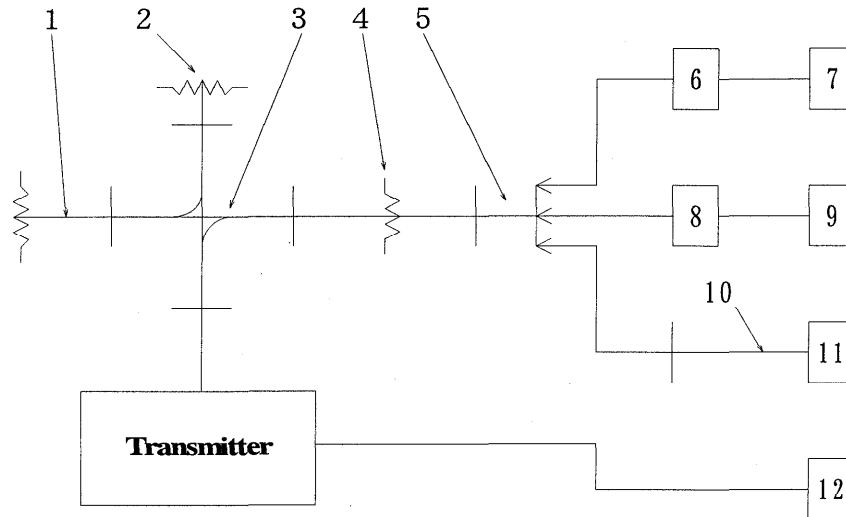
### 1.3 Display

Input Voltage and Current	DC.24V 2.43A (58W)
Repetition Frequency	
(0.08 $\mu$ s)	2250 Hz
(0.25 $\mu$ s)	1700 Hz
(0.5 $\mu$ s)	1200 Hz
(1.0 $\mu$ 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 $\mu$ s PULS 0.75 n.m.)	10.08 kW
(at 0.25 $\mu$ s PULS 1.5 n.m. long)	9.31 kW
(at 0.5 $\mu$ s PULS 3 n.m. long)	9.29 kW
(at 1.0 $\mu$ s PULS 12n.m.)	9.18 kW

#### 1.2 Average Power

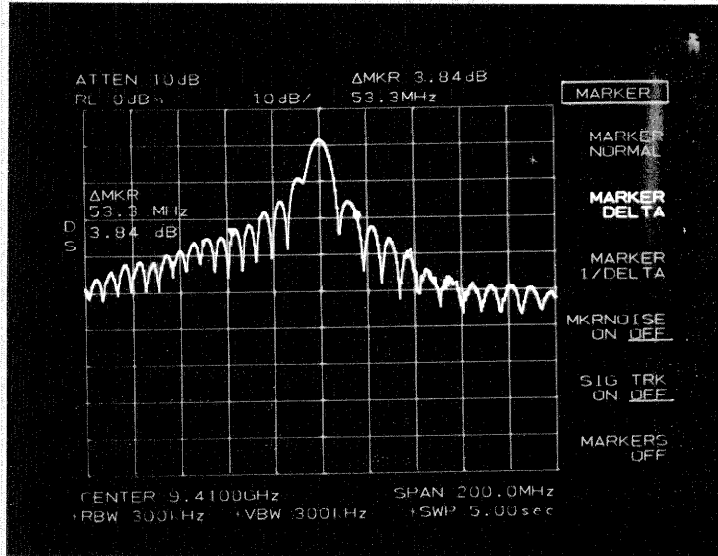
(at 0.08 $\mu$ s PULS 0.75 n.m.)	1.965 W
(at 0.25 $\mu$ s PULS 1.5 n.m. long)	4.16 W
(at 0.5 $\mu$ s PULS 3 n.m. long)	5.64 W
(at 1.0 $\mu$ s PULS 12n.m.)	6.00 W

#### 1.3 Load Impedance

VSWR 1.05 at 9.36 – 9.46 GHz

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

Scale  
 10dB/Div

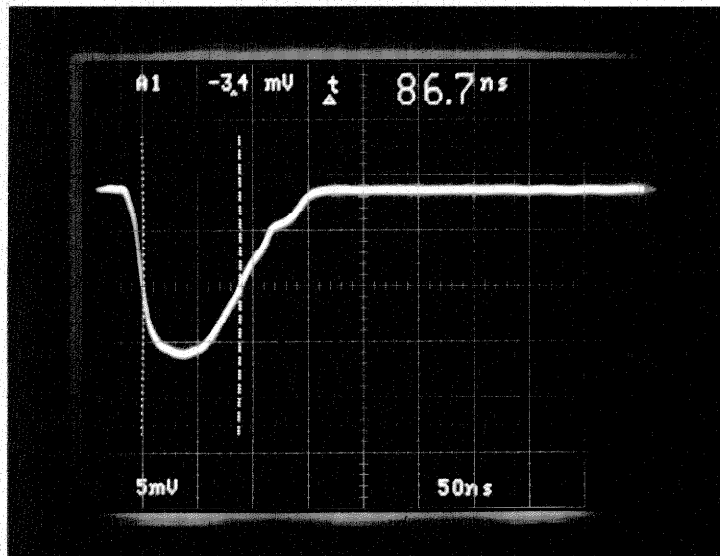


RF Spectrum  
 0.08  $\mu$ S Pulse  
 OBW=53.3 MHz

Scale 20MHz/Div  
 Center Frequency 9410MHz

(Sec. 2.987)

Scale  
 5mV/Div



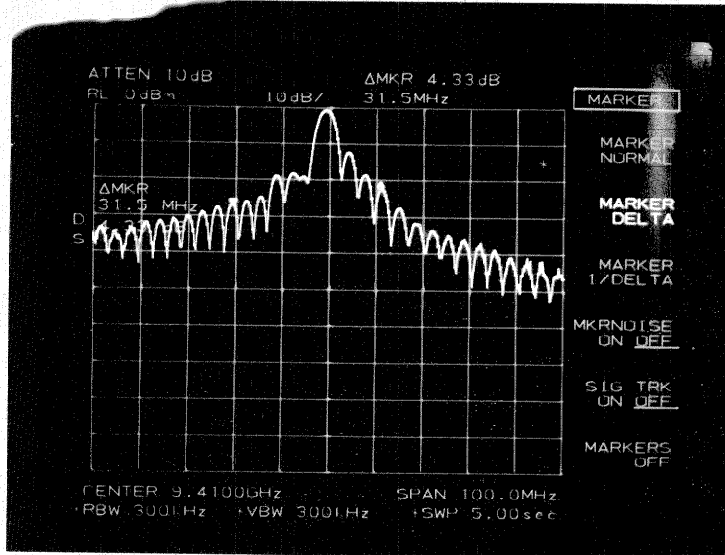
← - 3 dB  
 Detected RF  
 Pulse  
 0.08  $\mu$ S Pulse

Scale 0.05  $\mu$ S/Div

(Sec. 2.989)

2.2 0.25  $\mu$ S Pulse PRF 1707Hz  
0.25  $\mu$ S Pulse Length 0.2618  $\mu$ S

Scale  
10dB/Div

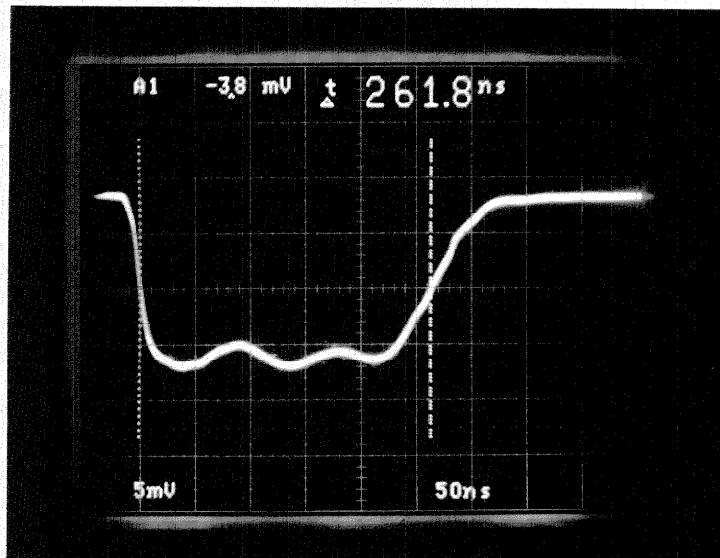


RF Spectrum  
0.25  $\mu$ S Pulse  
OBW=31.5MHz

Scale 10MHz/Div  
Center Frequency 9408MHz

(Sec. 2.987)

Scale  
5mV/Div



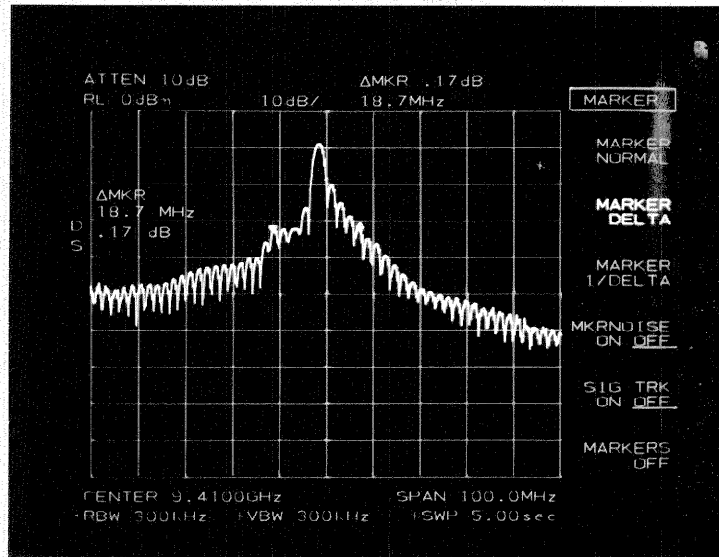
$\leftarrow$  -3 dB  
Detected RF  
Pulse  
0.25  $\mu$ S Pulse

Scale 0.05  $\mu$ S/Div

(Sec. 2.989)

2.3 0.5  $\mu$ S Pulse PRF 1204Hz  
0.5  $\mu$ S Pulse Length 0.5040  $\mu$ S

Scale  
10dB/Div

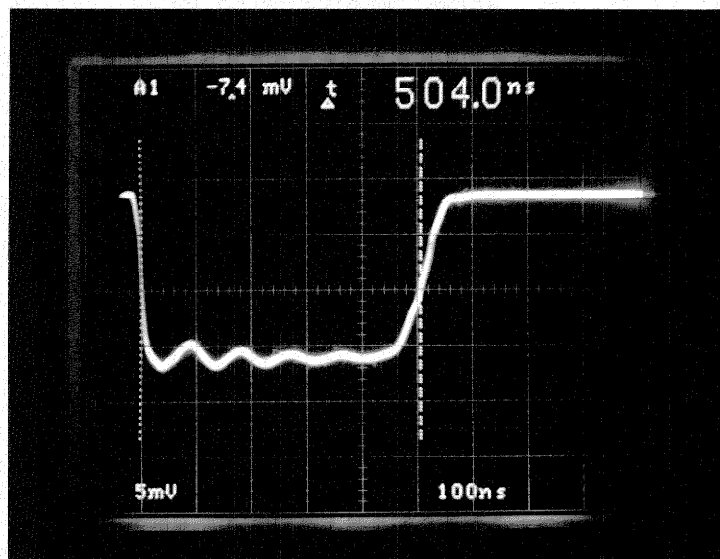


RF Spectrum  
0.5  $\mu$ S Pulse  
OBW=18.7MHz

Scale 10MHz/Div  
Center Frequency 9406MHz

(Sec. 2.987)

Scale  
05mV/Div



← -3 dB

Detected RF  
Pulse

0.5  $\mu$ S Pulse

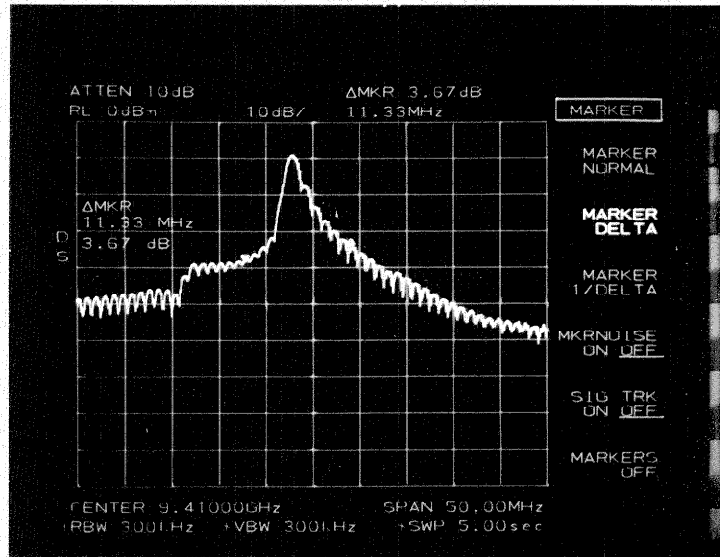
Scale 0.1  $\mu$ S/Div



(Sec. 2.989)

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

Scale  
10dB/Div

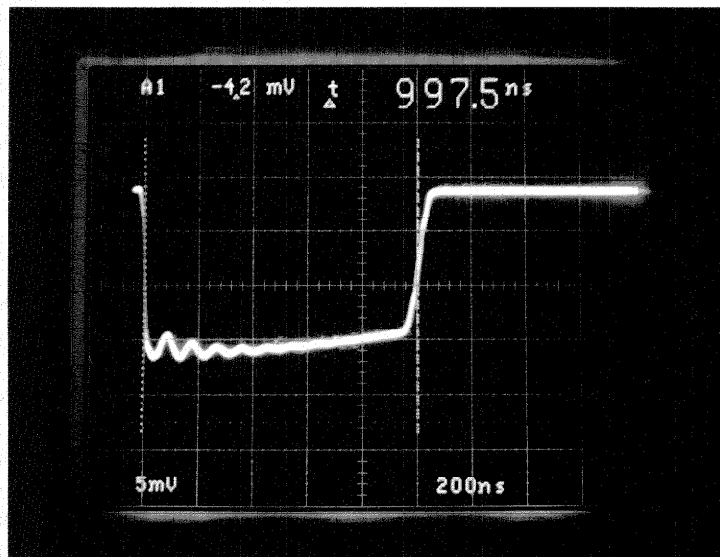


RF Spectrum  
1.0  $\mu$ S Pulse  
OBW=11.33MHz

Scale 5MHz/Div  
Center Frequency 9406MHz

(Sec. 2.987)

Scale  
5mV/Div



← -3 dB

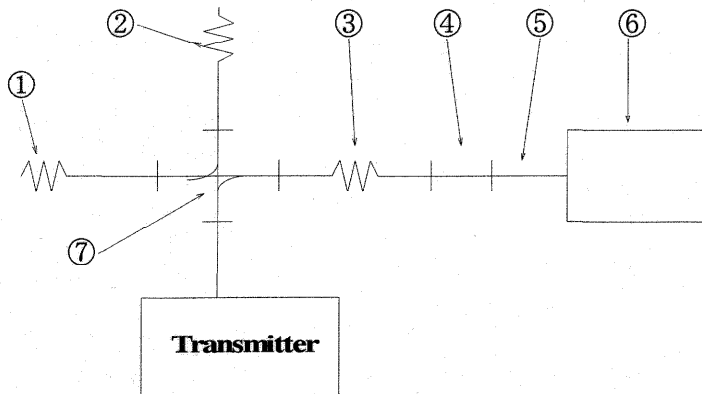
Detected RF  
Pulse

1.0  $\mu$ S Pulse

Scale 0.2  $\mu$ S/Div

(Sec.2.991) 3.0 Spurious signal at antenna port

condition 1 : 0 to 20 GHz



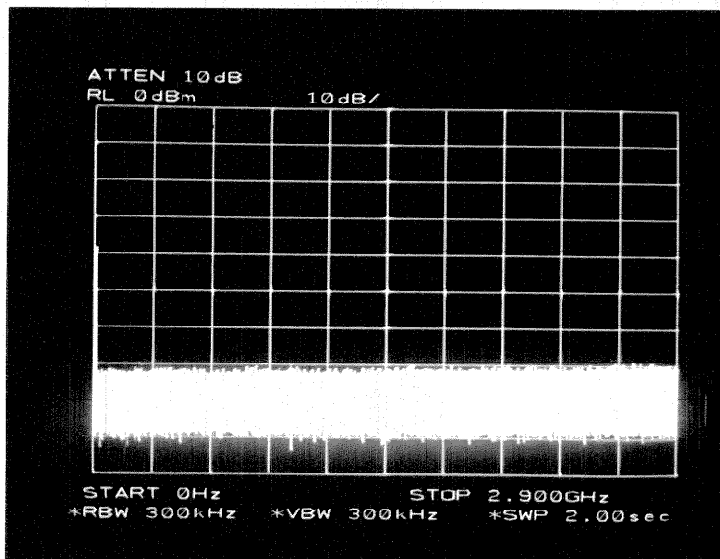
1. Dummy Load	4D104	Shimada
2. High power Dummy Load	WTM-0910	MANUF MHON KOSHUHA
3. Attenuator	X382A	HP
4. Adaptor	X281A	HP
5. Coaxial Cable	*****	HP
6. Spectrum Analyzer	8563A	HP
7. Direction Coupler	50351	Shimada
	Coupling	30dB
	Directivity	30dB

Attenuation 3 :40 dB

Measurement Point :Transmitter Output

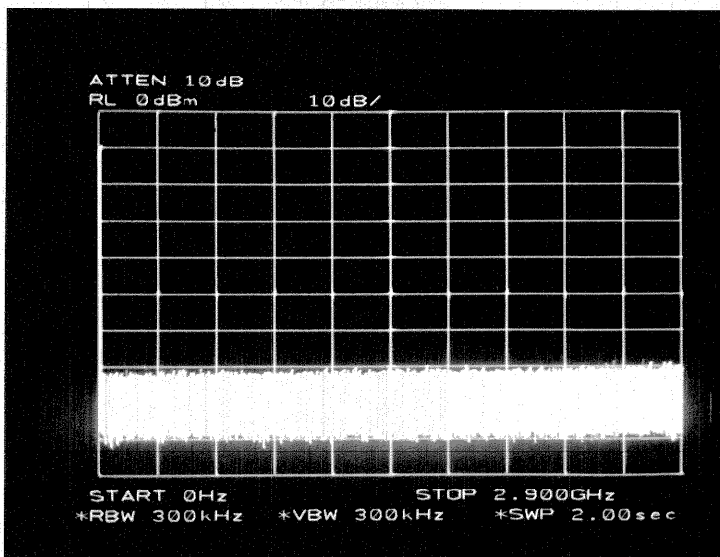
(Sec. 2.991)

Scale  
↑ 10dB/Div  
→ 290MHz/Div



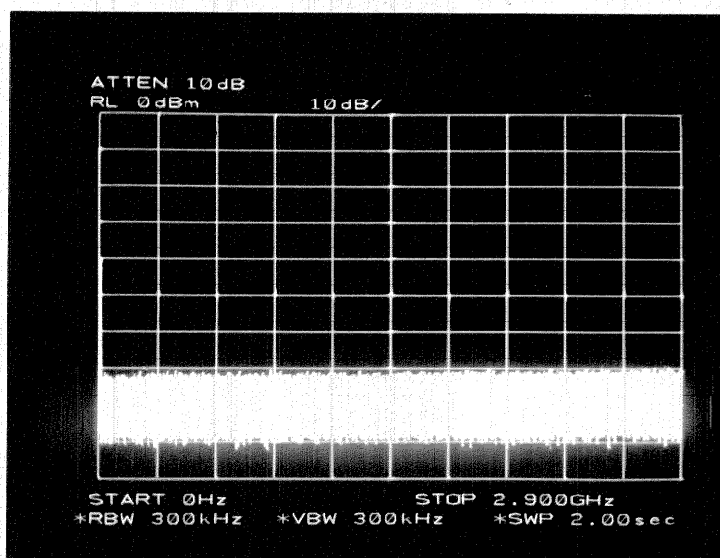
Spurious  
Signal  
  
OFF  
  
0 to 2.9 GHz

Scale  
↑ 10dB/Div  
→ 290MHz/Div



Spurious  
Signal  
  
Stand-By  
  
0 to 2.9 GHz

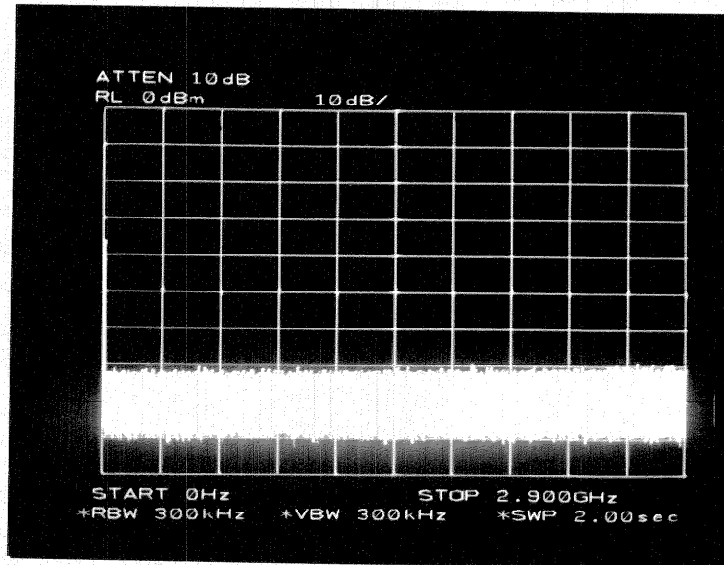
Scale  
↑ 10dB/Div  
→ 290MHz/Div



Spurious  
Signal  
  
0.08  $\mu$ S Pulse  
  
0 to 2.9 GHz

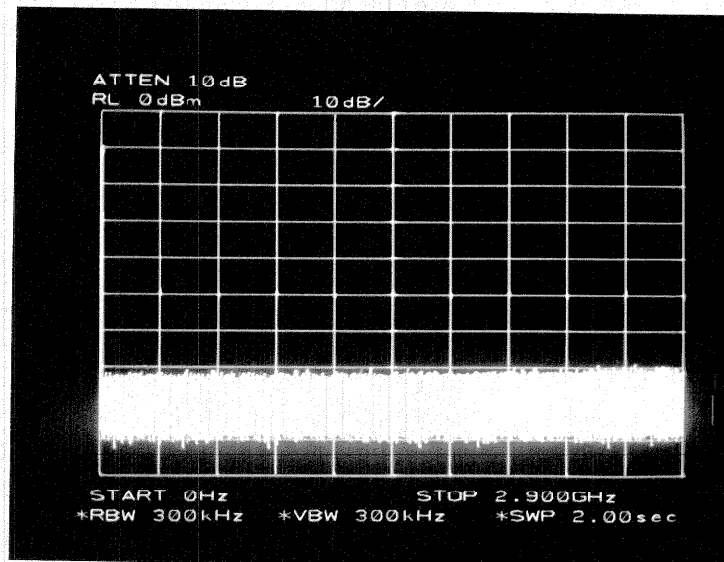
(Sec. 2.991)

Scale  
↑ 10dB/Div  
→ 290MHz/Div



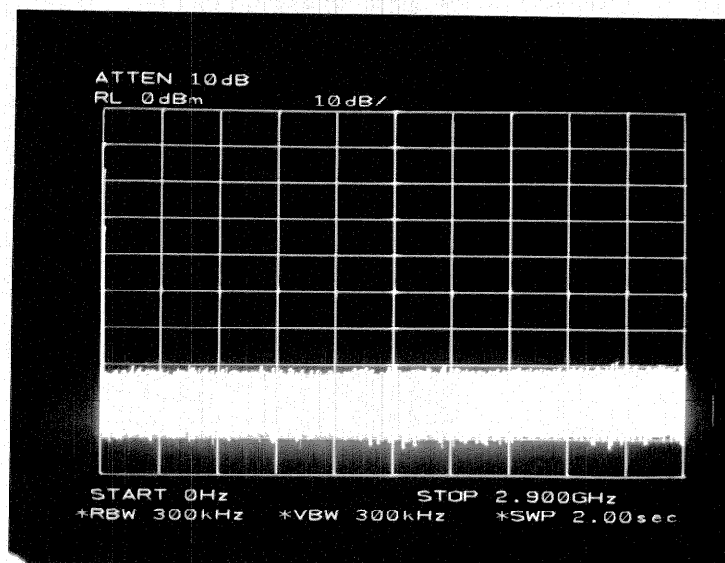
Spurious  
Signal  
0.25  $\mu$ S Pulse  
0 to 2.9 GHz

Scale  
↑ 10dB/Div  
→ 290MHz/Div



Spurious  
Signal  
0.5  $\mu$ S Pulse  
0 to 2.9 GHz

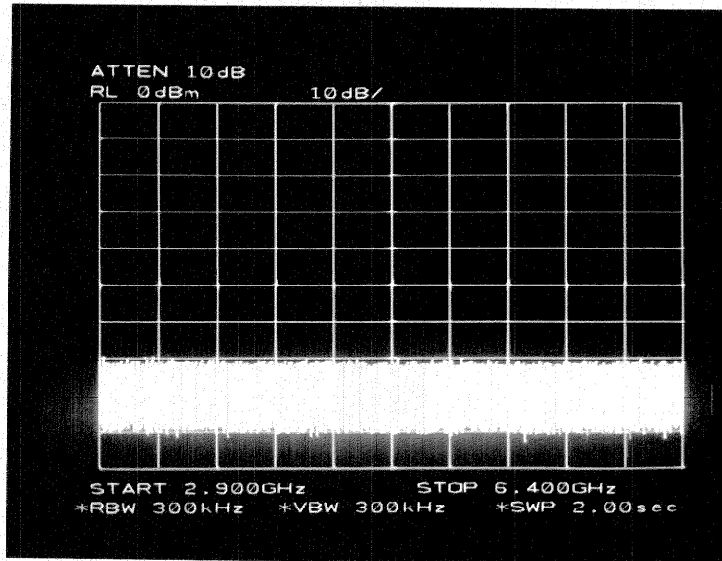
Scale  
↑ 10dB/Div  
→ 290MHz/Div



Spurious  
Signal  
1.0  $\mu$ S Pulse  
0 to 2.9 GHz

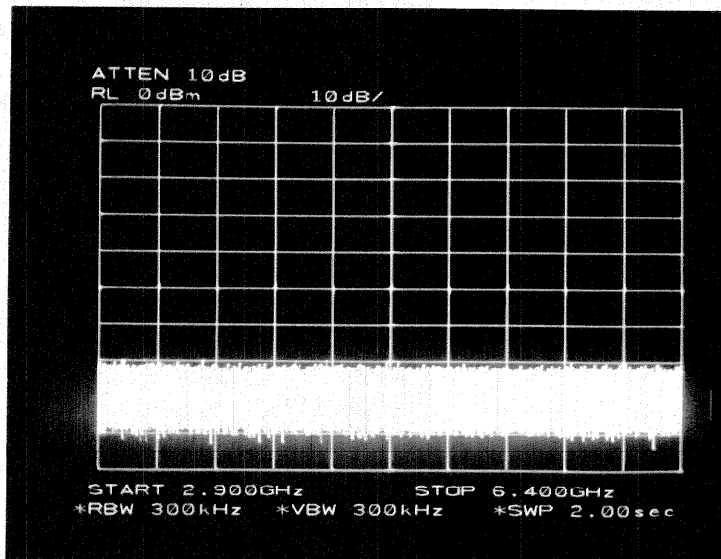
(Sec. 2.991)

Scale  
↑ 10dB/Div  
→ 350MHz/Div



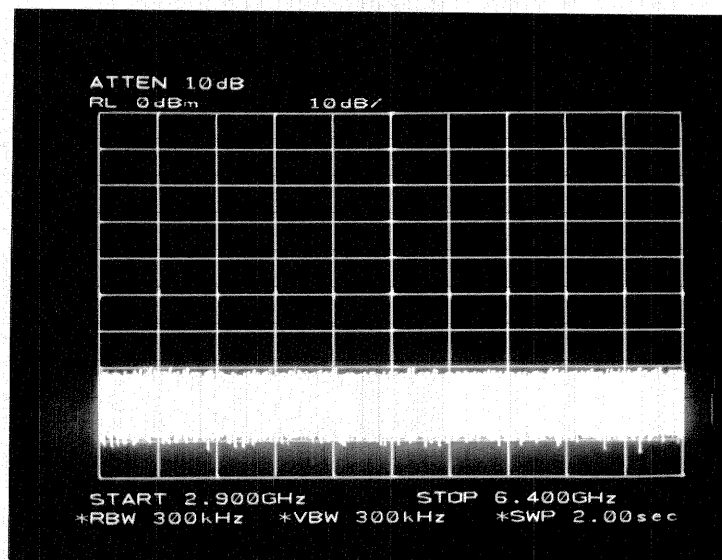
Spurious  
Signal  
OFF  
2.9 to 6.4 GHz

Scale  
↑ 10dB/Div  
→ 350MHz/Div



Spurious  
Signal  
Stand-By  
2.9 to 6.4 GHz

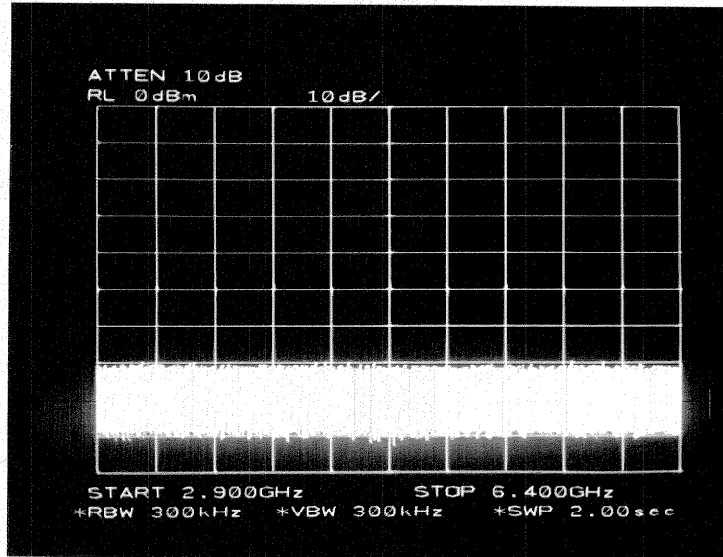
Scale  
↑ 10dB/Div  
→ 350MHz/Div



Spurious  
Signal  
0.08  $\mu$ S Pulse  
2.9 to 6.4 GHz

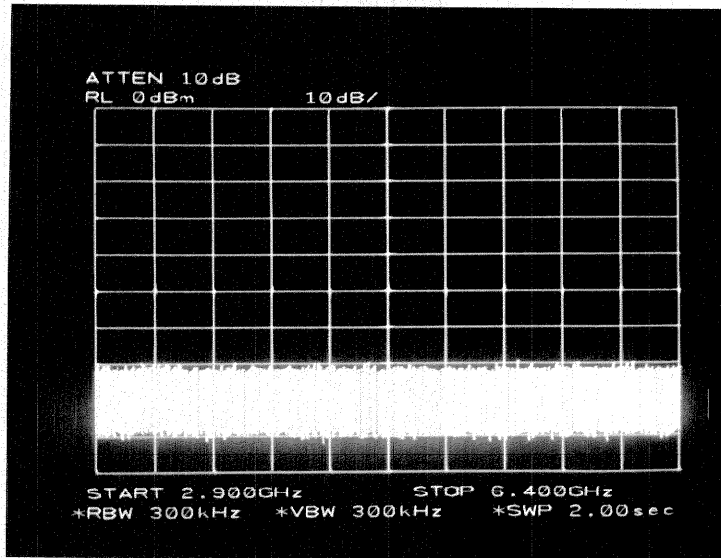
(Sec. 2.991)

Scale  
↑ 10dB/Div  
→ 350MHz/Div



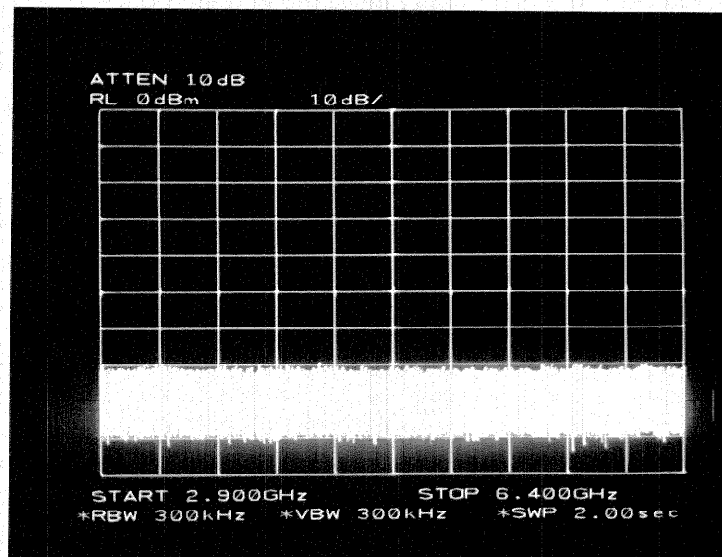
Spurious  
Signal  
0.25  $\mu$ S Pulse  
2.9 to 6.4 GHz

Scale  
↑ 10dB/Div  
→ 350MHz/Div



Spurious  
Signal  
0.5  $\mu$ S Pulse  
2.9 to 6.4 GHz

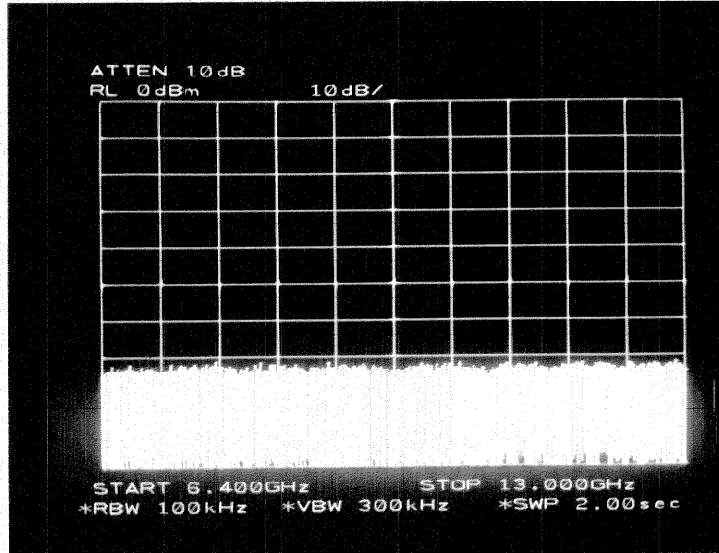
Scale  
↑ 10dB/Div  
→ 350MHz/Div



Spurious  
Signal  
1.0  $\mu$ S Pulse  
2.9 to 6.4 GHz

(Sec. 2.991)

Scale  
↑ 10dB/Div  
→ 660MHz/Div

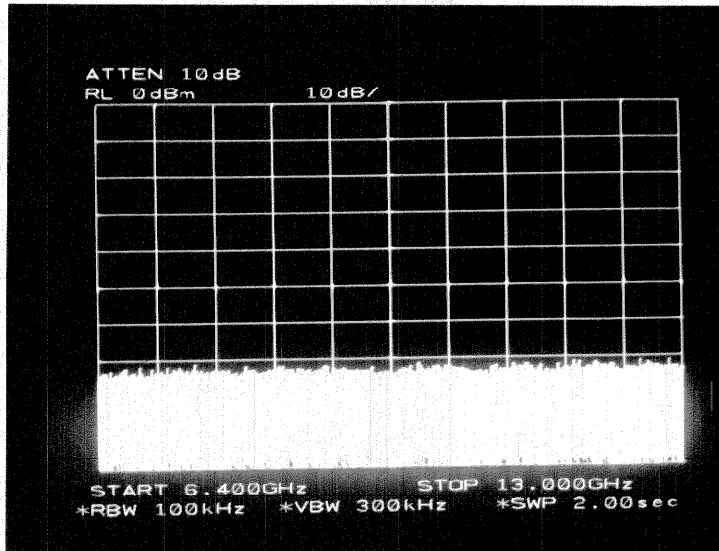


Spurious  
Signal

OFF

6.4 to 13.0 GHz

Scale  
↑ 10dB/Div  
→ 660MHz/Div

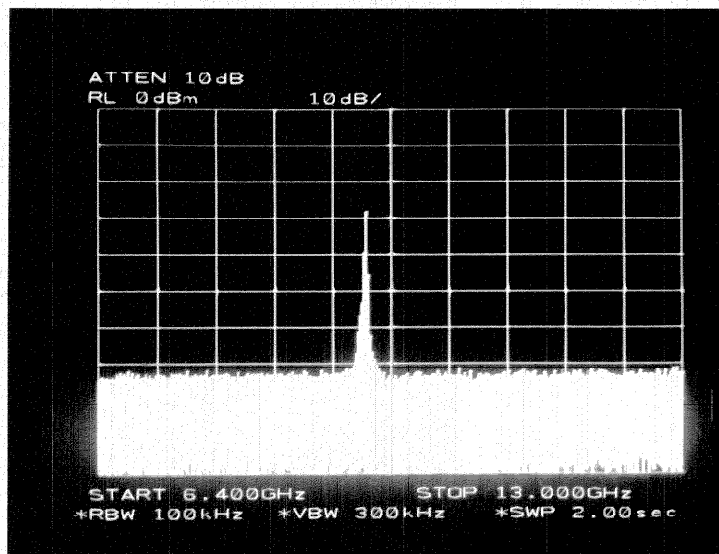


Spurious  
Signal

Stand-By

6.4 to 13.0 GHz

Scale  
↑ 10dB/Div  
→ 660MHz/Div



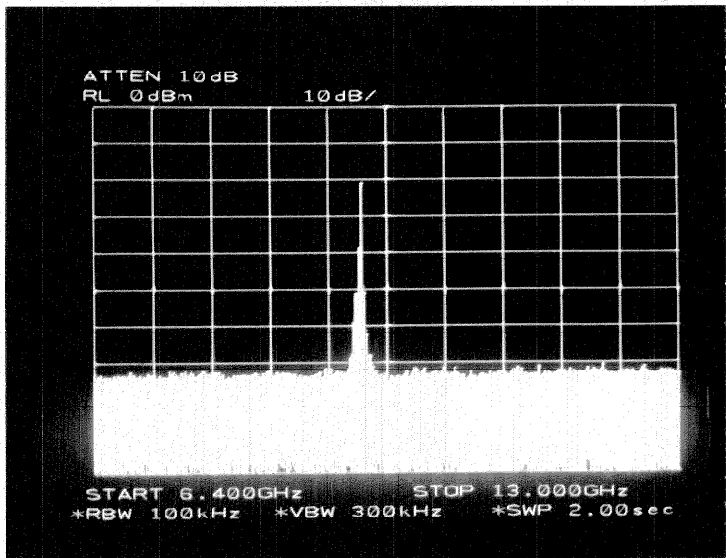
Spurious  
Signal

0.08  $\mu$ S Pulse

6.4 to 13.0 GHz

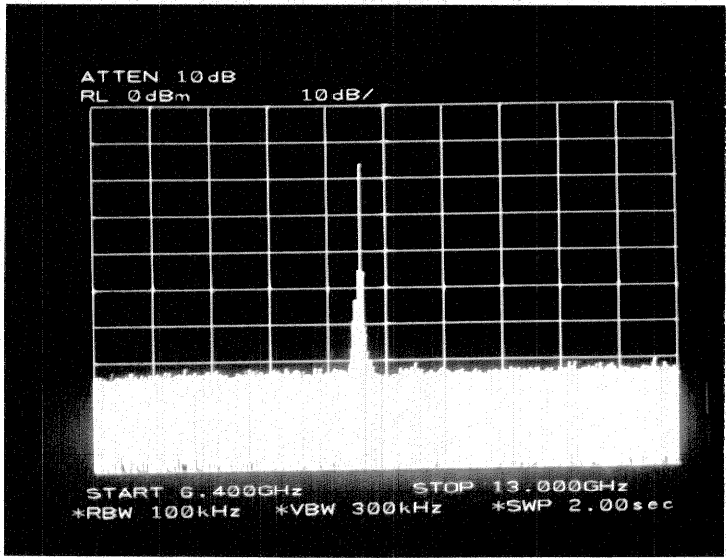
(Sec. 2.991)

Scale  
↑ 10dB/Div  
→ 660MHz/Div



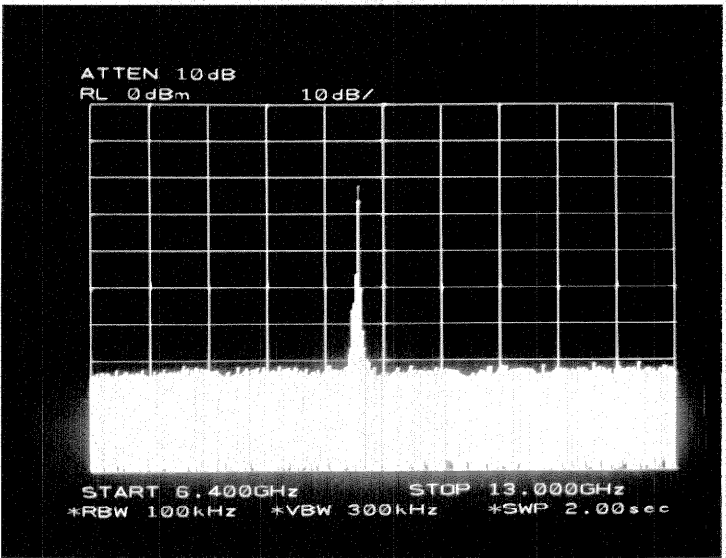
Spurious  
Signal  
0.25  $\mu$ S Pulse  
6.4 to 13.0 GHz

Scale  
↑ 10dB/Div  
→ 660MHz/Div



Spurious  
Signal  
0.5  $\mu$ S Pulse  
6.4 to 13.0 GHz

Scale  
↑ 10dB/Div  
→ 660MHz/Div

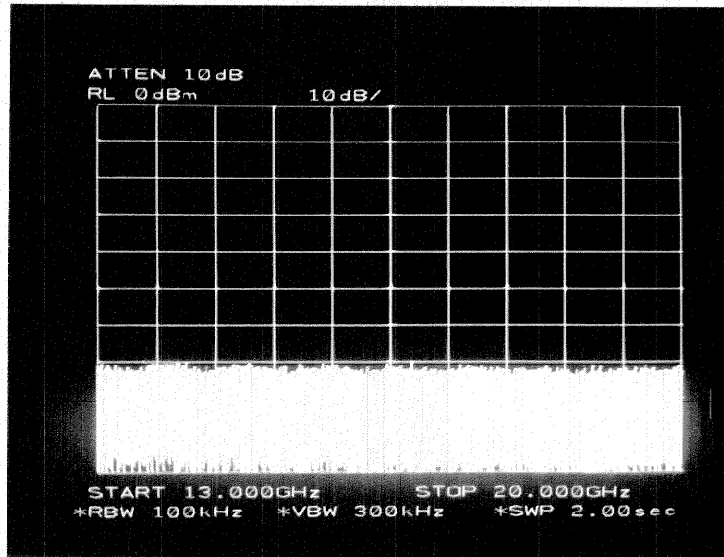


Spurious  
Signal  
1.0  $\mu$ S Pulse  
6.4 to 13.0 GHz



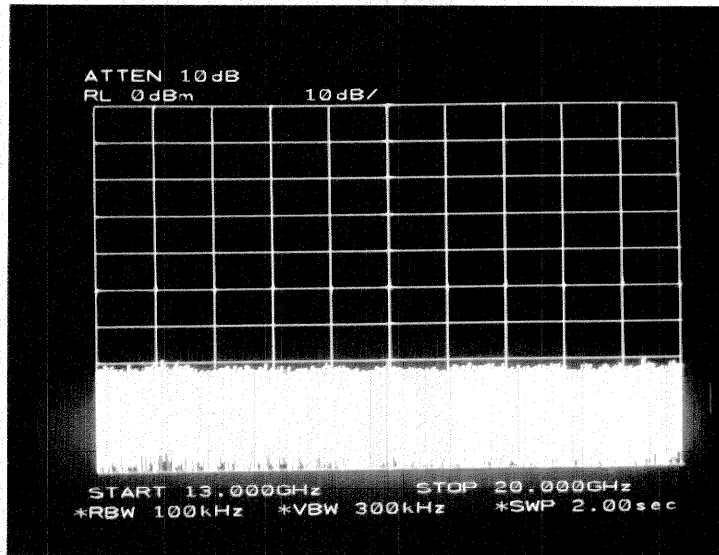
(Sec. 2.991)

Scale  
↑ 10dB/Div  
→ 700MHz/Div



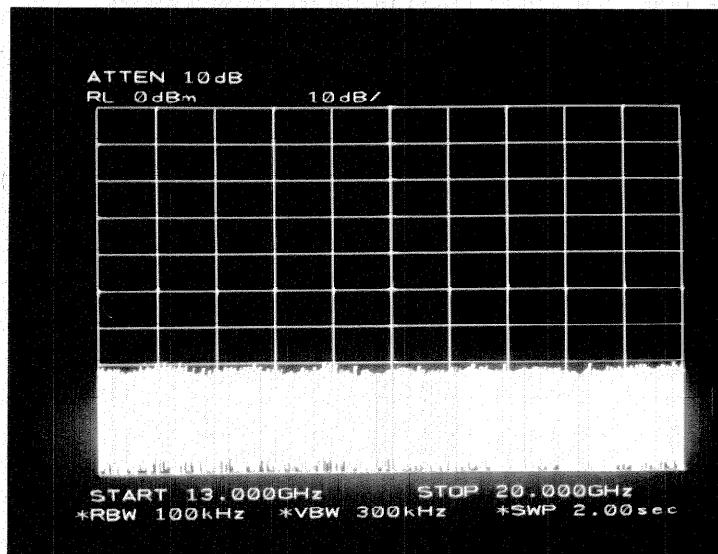
Spurious  
Signal  
OFF  
13.0 to 20 GHz

Scale  
↑ 10dB/Div  
→ 700MHz/Div



Spurious  
Signal  
Stand-By  
13.0 to 20 GHz

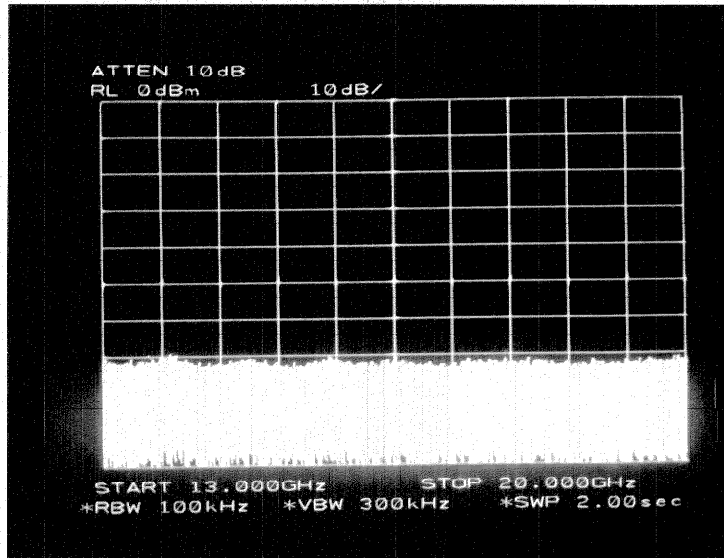
Scale  
↑ 10dB/Div  
→ 700MHz/Div



Spurious  
Signal  
0.08  $\mu$ S Pulse  
13.0 to 20 GHz

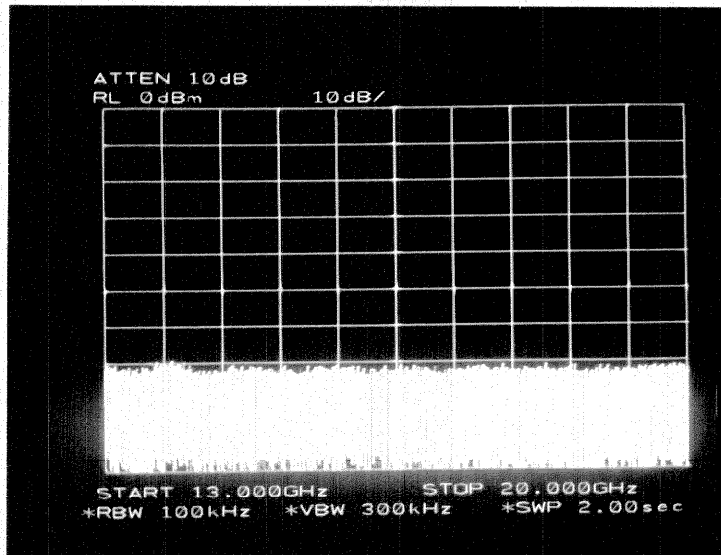
(Sec. 2.991)

Scale  
↑ 10dB/Div  
→ 700MHz/Div



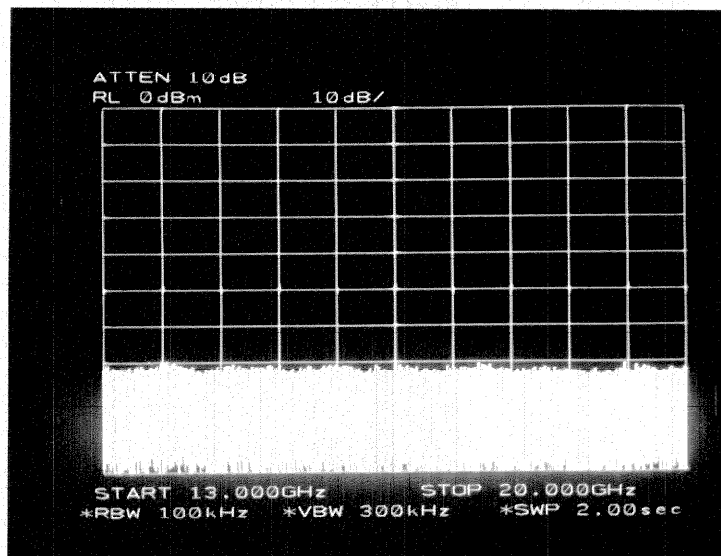
Spurious  
Signal  
  
0.25  $\mu$ S Pulse  
  
13.0 to 20 GHz

Scale  
↑ 10dB/Div  
→ 700MHz/Div



Spurious  
Signal  
  
0.5  $\mu$ S Pulse  
  
13.0 to 20 GHz

Scale  
↑ 10dB/Div  
→ 700MHz/Div



Spurious  
Signal  
  
1.0  $\mu$ S Pulse  
  
13.0 to 20 GHz