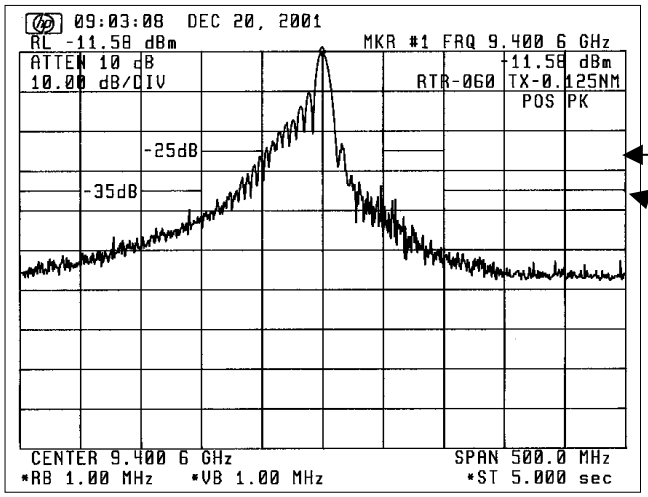
Attachment A

[TEST DATA for Clause 3.4. SPURIOUS EMISSIONS AT ANTENNA TERMINALS]

1. Spurious emissions for 0.125 nm Range:



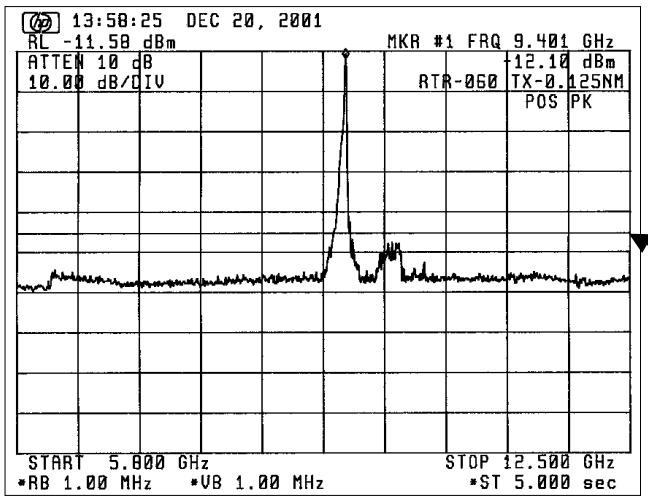
Ref. level: -11.58 dBm

Emission limitations:

(a) 25 dB for 50 to 100 % of the authorized BW (100 MHz)

(b) 35 dB for 100 to 250 % of the authorized BW (100 MHz)

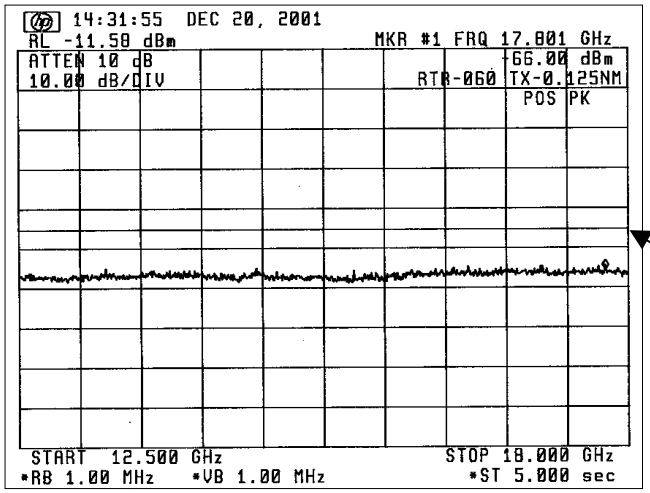
Fig. 1.1



Emission limitations:

(c) 43 + 10 log Pm = 44.99 dB for more than 250 % of the authorized BW (100 MHz)

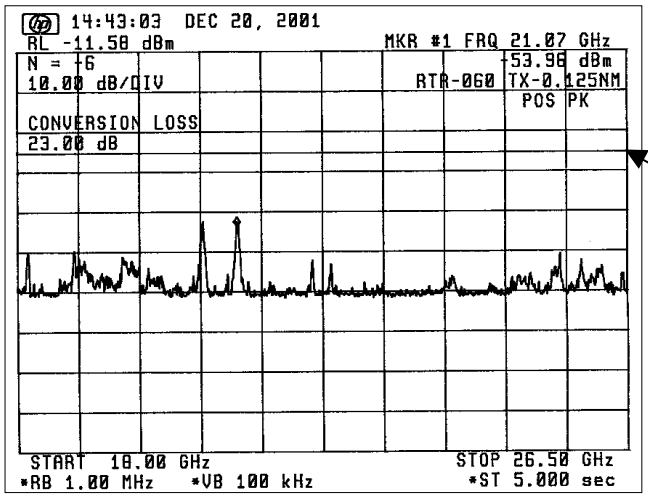
Fig. 1.2



Emission limitations:

(c) 43 + 10 log Pm = 44.99 dB for more than 250 % of the authorized BW (100 MHz)

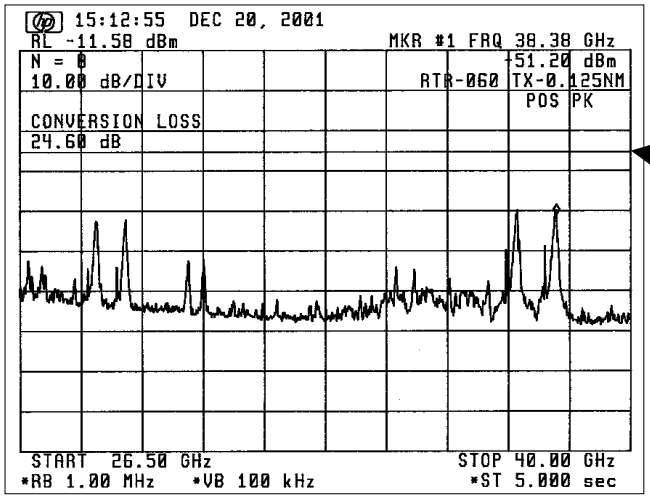
Fig. 1.3



Emission limitations:

(c) 43 + 10 log Pm = 44.99 dB
for more than 250 % of
the authorized BW (100 MHz)

Fig. 1.4

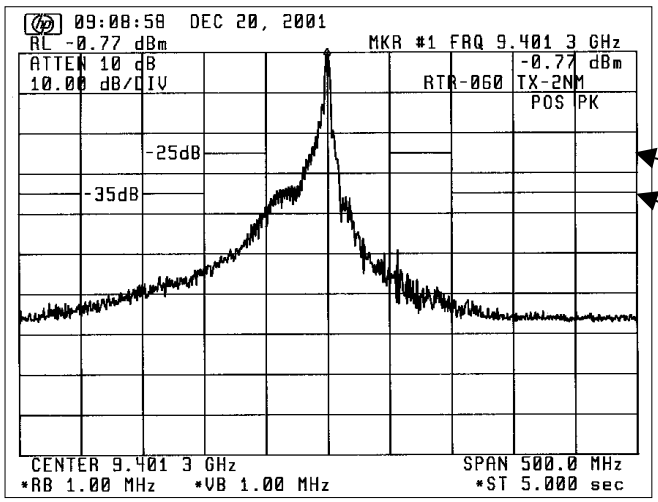


Emission limitations:

(c) 43 + 10 log Pm = 44.99 dB
for more than 250 % of
the authorized BW (100 MHz)

Fig. 1.5

2. Spurious emissions for 2 nm Range:



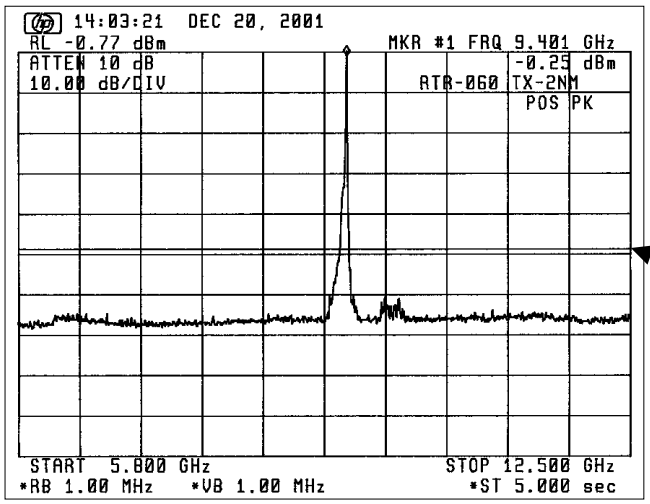
Ref. level: -0.77 dBm

Emission limitations:

(a) 25 dB for 50 to 100 % of the authorized BW (100 MHz)

(b) 35 dB for 100 to 250 % of the authorized BW (100 MHz)

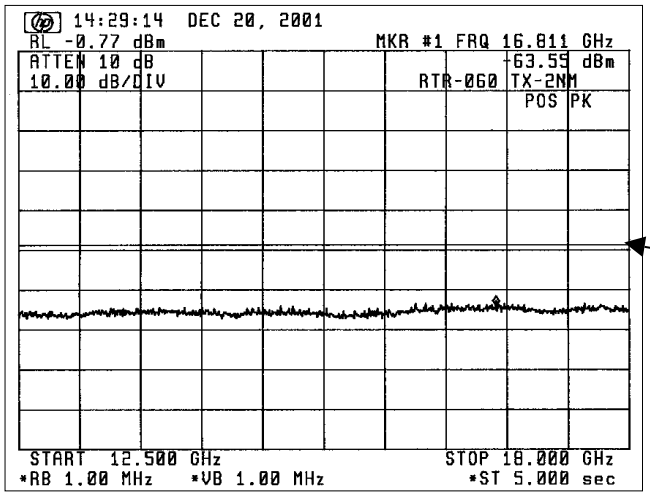
Fig. 2.1



Emission limitations:

(c) 43 + 10 log Pm = 48.44 dB for more than 250 % of the authorized BW (100 MHz)

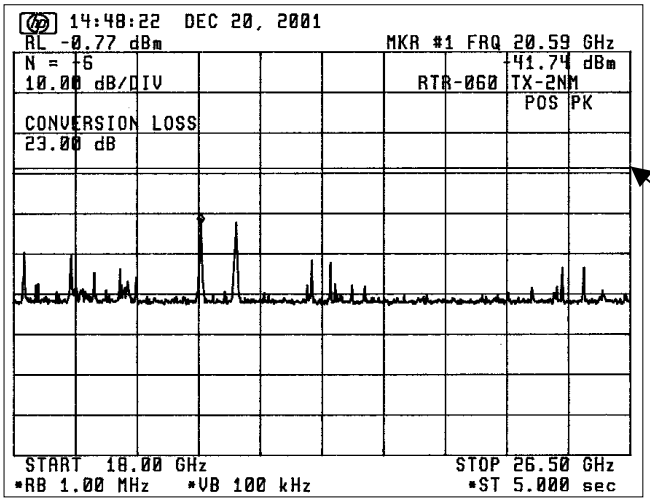
Fig. 2.2



Emission limitations:

(c) 43 + 10 log Pm = 48.44 dB for more than 250 % of the authorized BW (100 MHz)

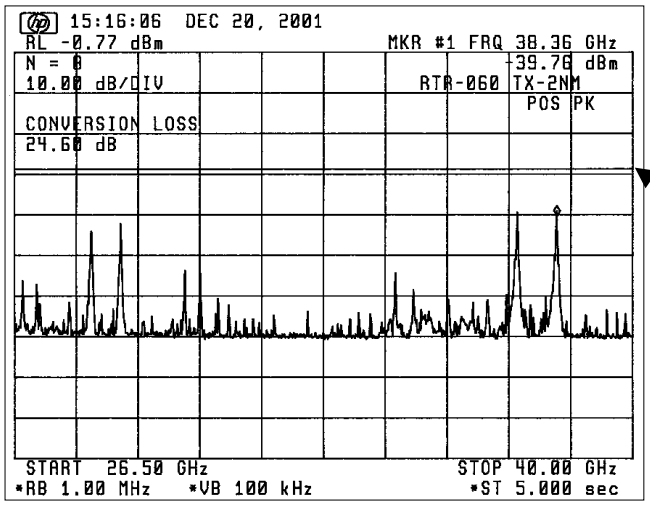
Fig. 2.3



Emission limitations:

(c) 43 + 10 log Pm = 48.44 dB
for more than 250 % of
the authorized BW (100 MHz)

Fig. 2.4

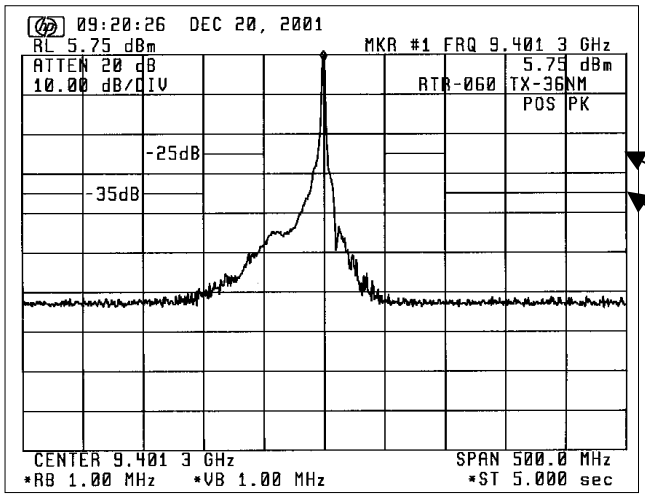


Emission limitations:

(c) 43 + 10 log Pm = 48.44 dB
for more than 250 % of
the authorized BW (100 MHz)

Fig. 2.5

3. Spurious emissions for 36 nm Range:



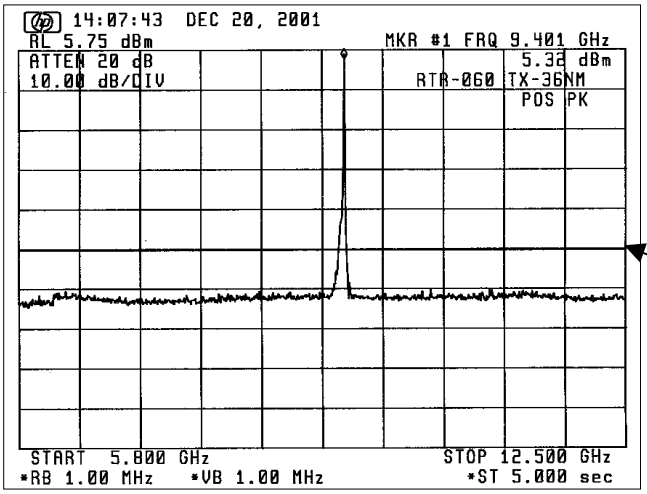
Ref. level: 5.75 dBm

Emission limitations:

(a) 25 dB for 50 to 100 % of the authorized BW (100 MHz)

(b) 35 dB for 100 to 250 % of the authorized BW (100 MHz)

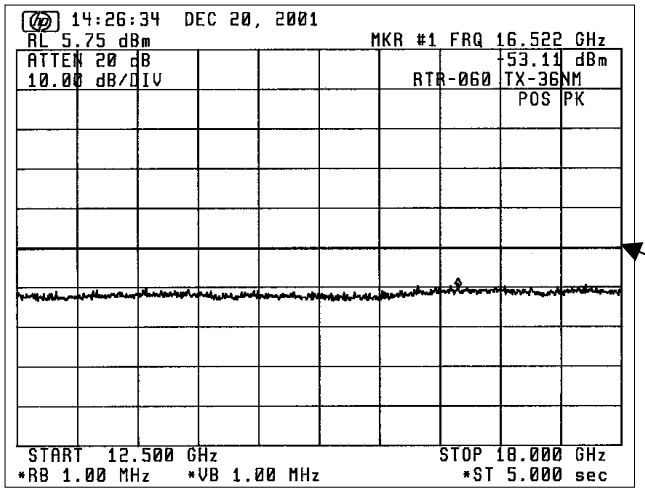
Fig. 3.1



Emission limitations:

(c) 43 + 10 log Pm = 49.94 dB for more than 250 % of the authorized BW (100 MHz)

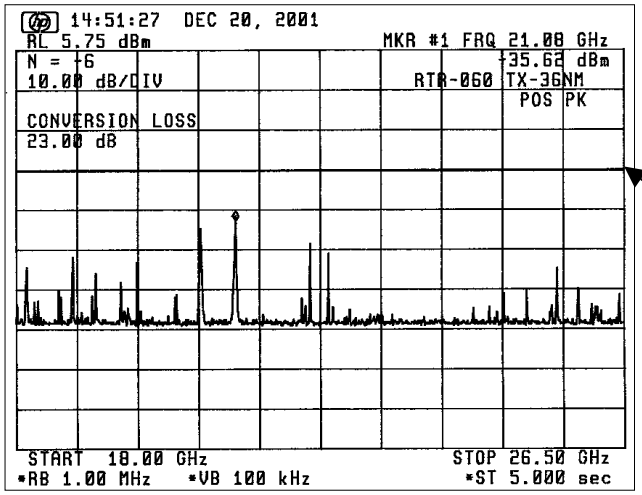
Fig. 3.2



Emission limitations:

(c) 43 + 10 log Pm = 49.94 dB for more than 250 % of the authorized BW (100 MHz)

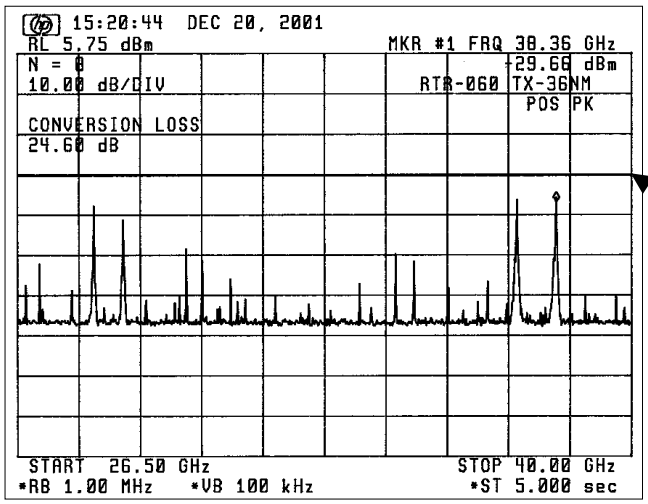
Fig. 3.3



Emission limitations:

(c) 43 + 10 log Pm = 49.94 dB
for more than 250 % of
the authorized BW (100 MHz)

Fig. 3.4

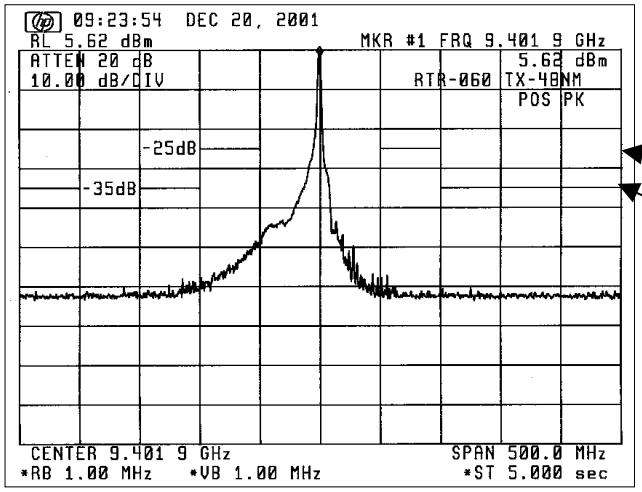


Emission limitations:

(c) 43 + 10 log Pm = 49.94 dB
for more than 250 % of
the authorized BW (100 MHz)

Fig. 3.5

4. Spurious emissions for 48 nm Range:



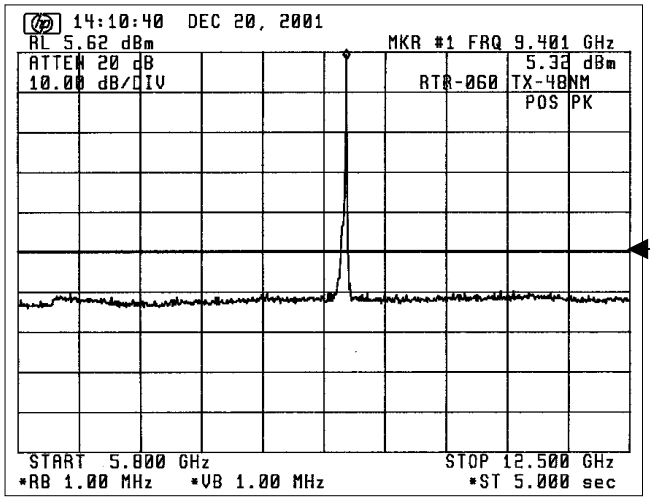
Ref. level: 5.62 dBm

Emission limitations:

(a) 25 dB for 50 to 100 % of the authorized BW (100 MHz)

(b) 35 dB for 100 to 250 % of the authorized BW (100 MHz)

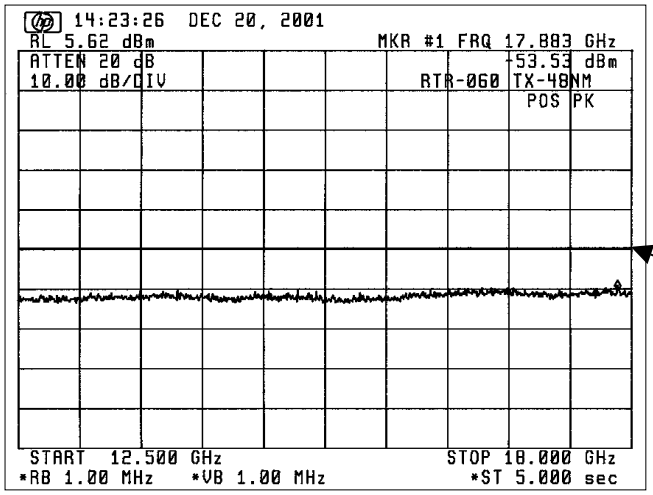
Fig. 4.1



Emission limitations:

(c) 43 + 10 log Pm = 49.41 dB for more than 250 % of the authorized BW (100 MHz)

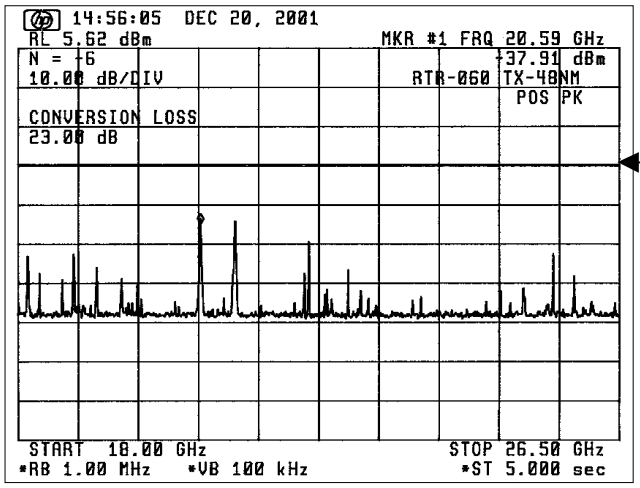
Fig. 4.2



Emission limitations:

(c) 43 + 10 log Pm = 49.41 dB for more than 250 % of the authorized BW (100 MHz)

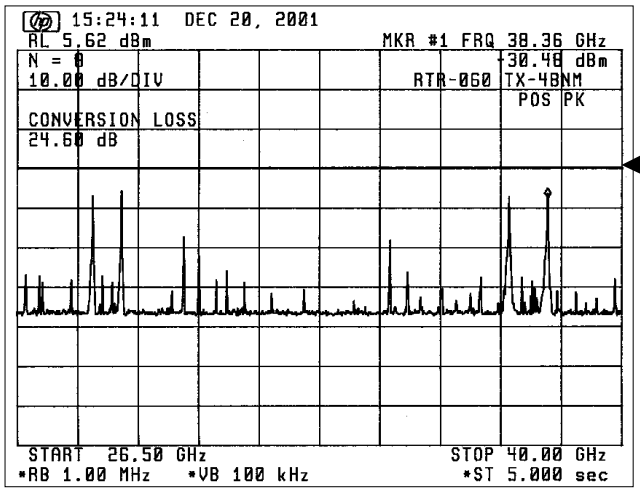
Fig. 4.3



Emission limitations:

(c) 43 + 10 log Pm = 49.41 dB
for more than 250 % of
the authorized BW (100 MHz)

Fig. 4.4

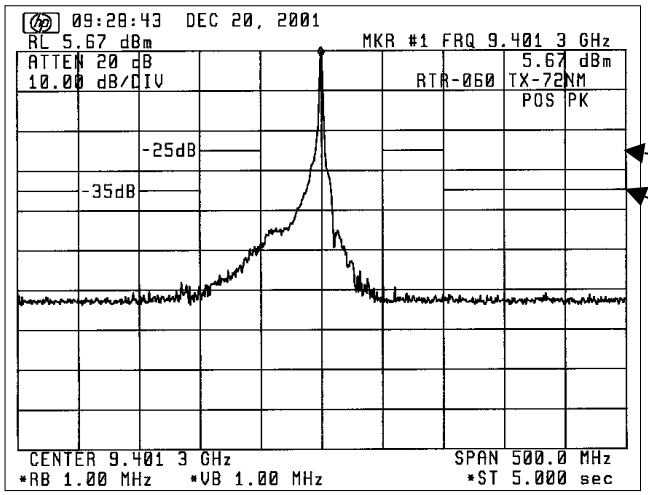


Emission limitations:

(c) 43 + 10 log Pm = 49.41 dB
for more than 250 % of
the authorized BW (100 MHz)

Fig. 4.5

5. Spurious emissions for 72 nm Range:



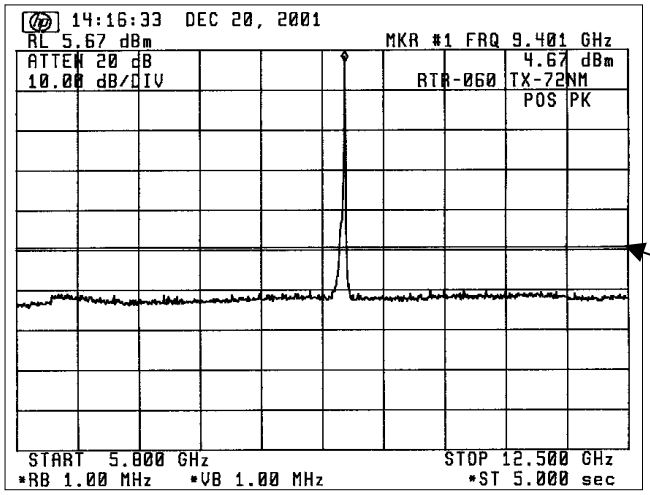
Ref. level: 5.62 dBm

Emission limitations:

(a) 25 dB for 50 to 100 % of the authorized BW (100 MHz)

(b) 35 dB for 100 to 250 % of the authorized BW (100 MHz)

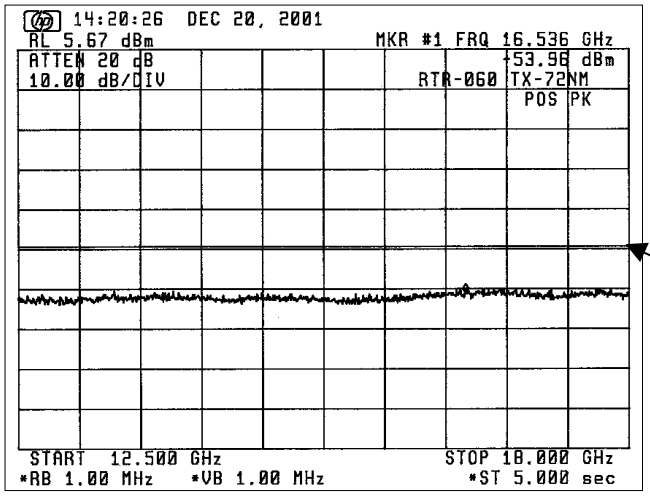
Fig. 5.1



Emission limitations:

(c) 43 + 10 log Pm = 49.05 dB for more than 250 % of the authorized BW (100 MHz)

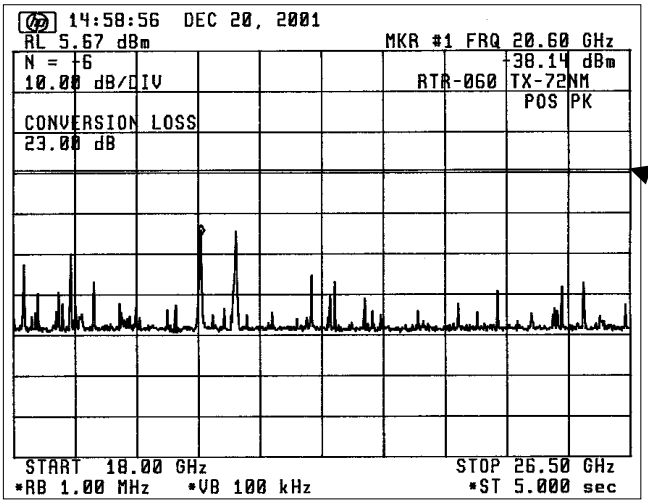
Fig. 5.2



Emission limitations:

(c) 43 + 10 log Pm = 49.05 dB for more than 250 % of the authorized BW (100 MHz)

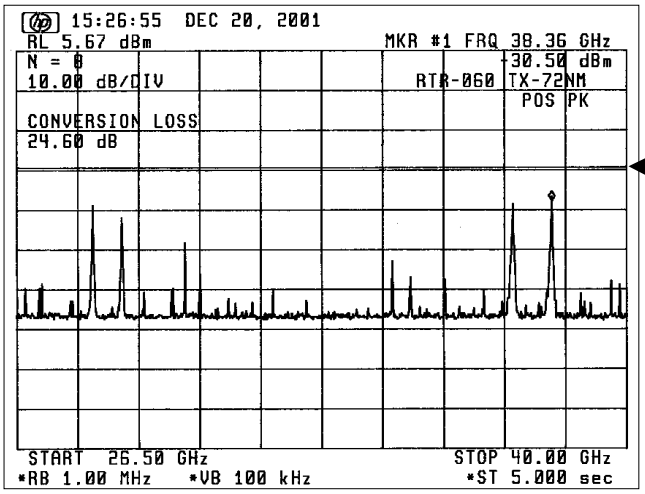
Fig. 5.3



Emission limitations:

(c) 43 + 10 log Pm = 49.05 dB
for more than 250 % of
the authorized BW (100 MHz)

Fig. 5.4



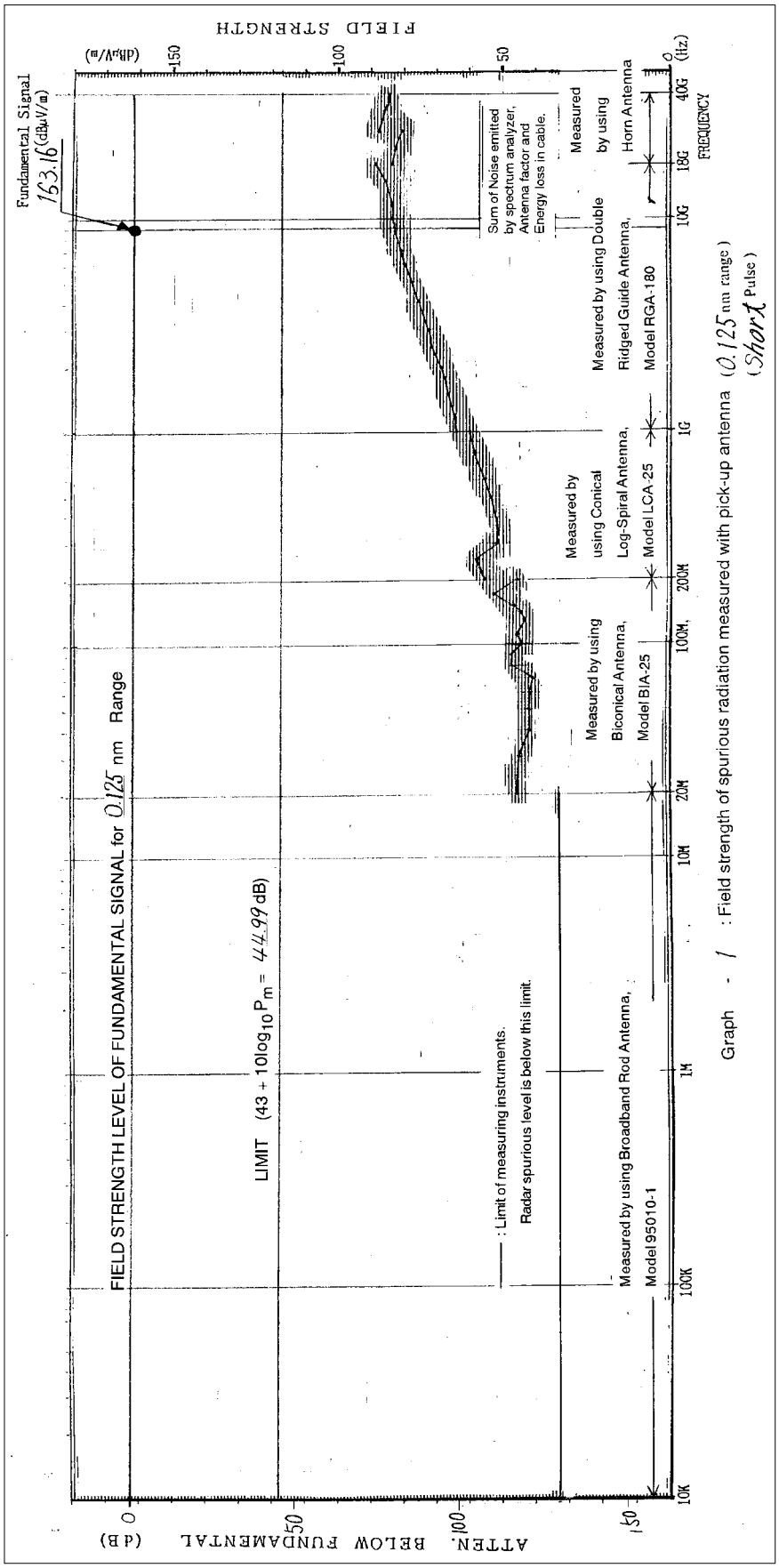
Emission limitations:

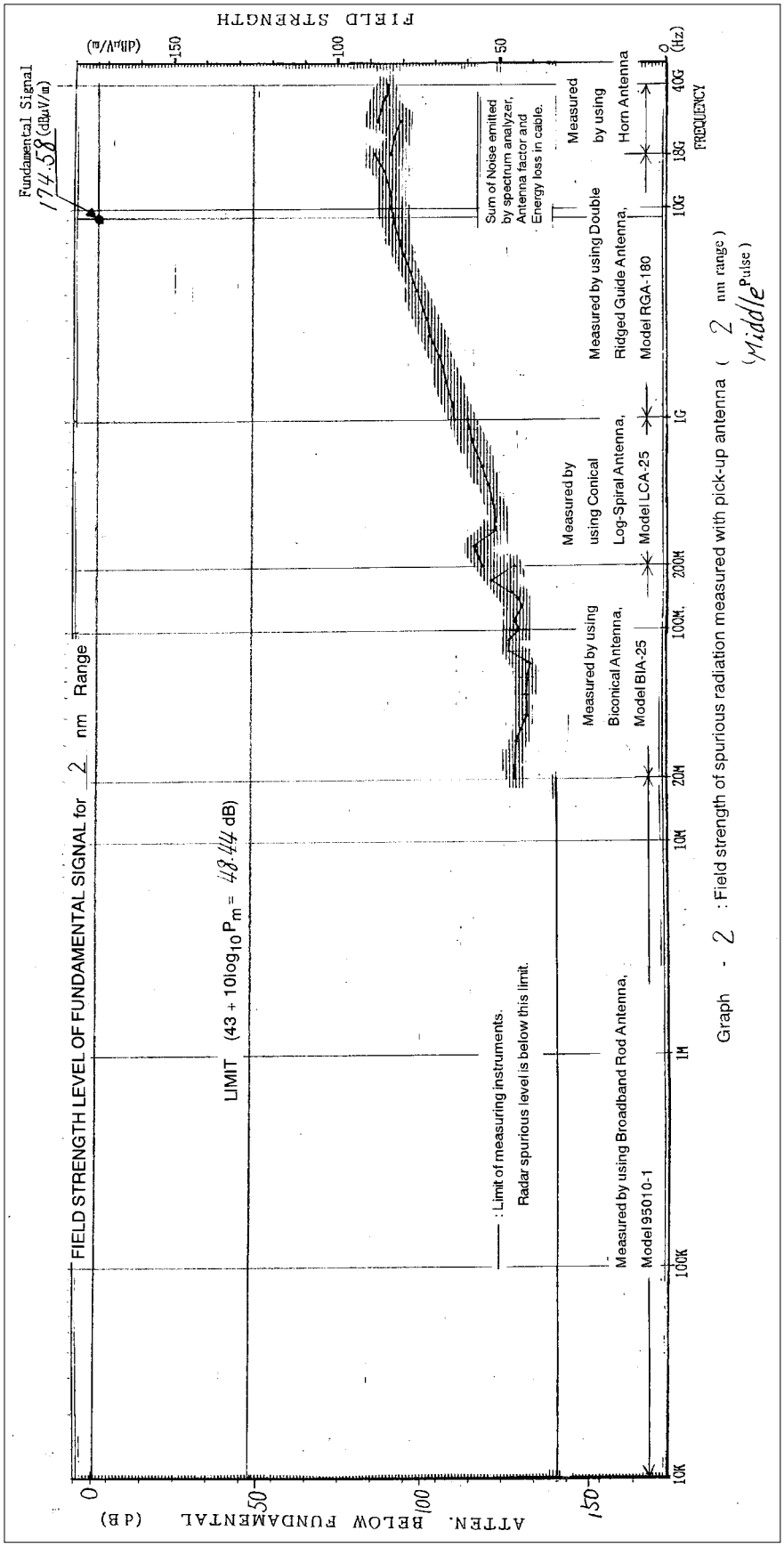
(c) 43 + 10 log Pm = 49.05 dB
for more than 250 % of
the authorized BW (100 MHz)

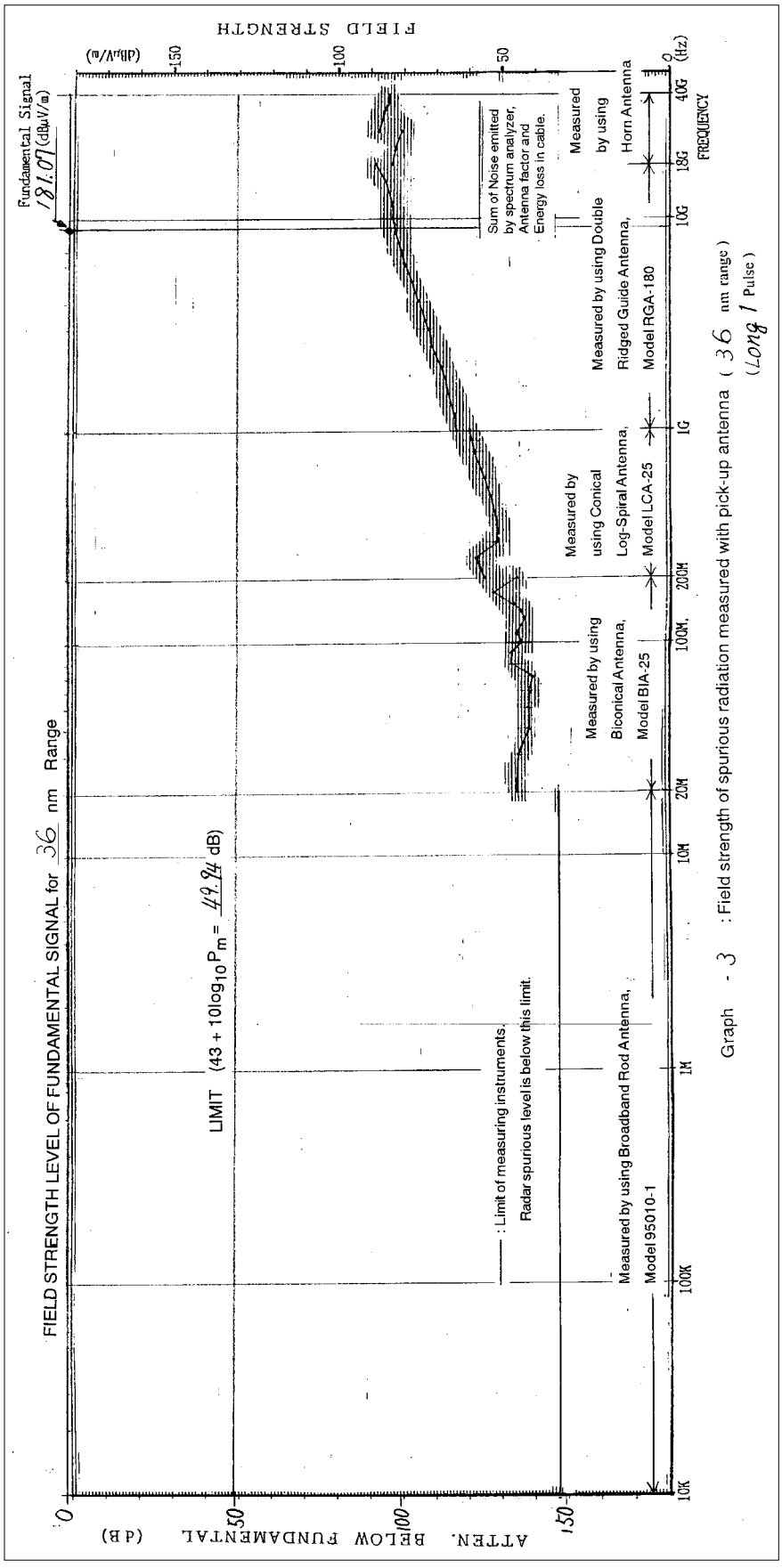
Fig. 5.5

Attachment B

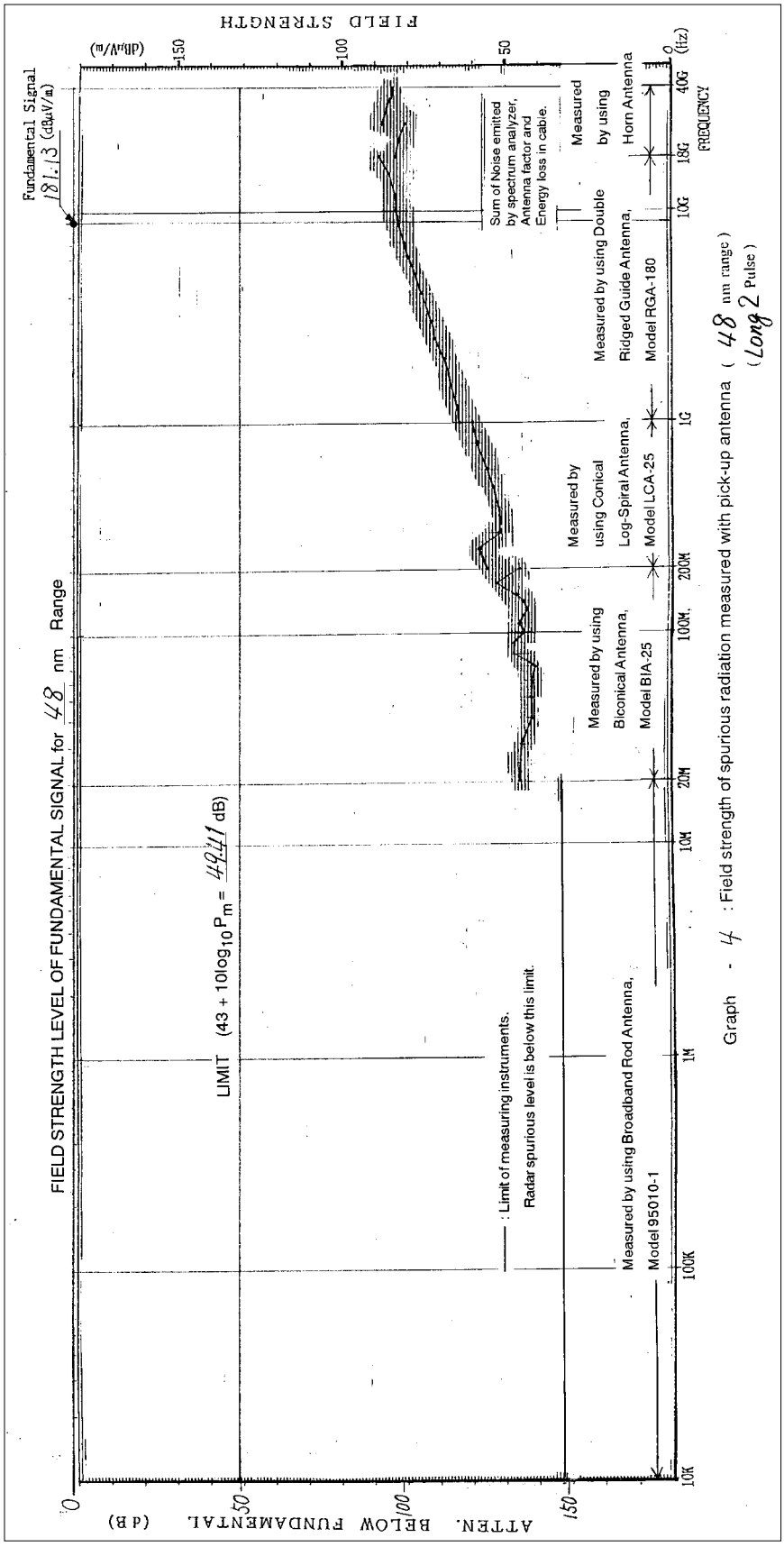
TEST DATA for Clause 3.5 FIELD STRENGTH OF SPURIOUS RADIATION

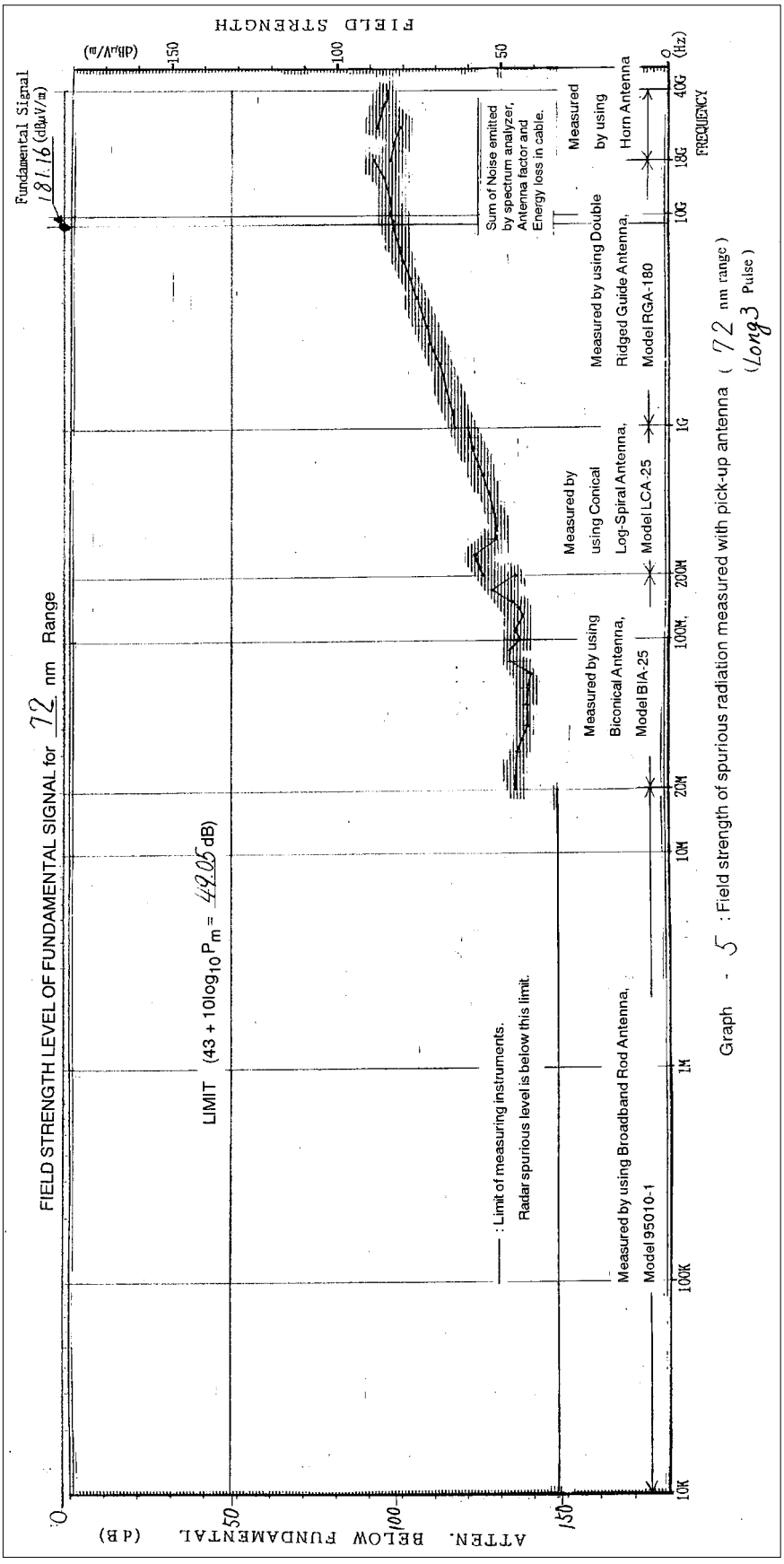



FIELD STRENGTH
(dBμV/m)
150
100
50
0
(Hz)
Fundamental Signal
174.58 (dBμV/m)
Sum of Noise emitted by spectrum analyzer, Antenna factor and Energy loss in cable.
Measured by using Double Ridged Guide Antenna, Model RGA-180
Measured by using Horn Antenna
Measured by using Conical Log-Spiral Antenna, Model LCA-25
Measured by using Biconical Antenna, Model BIA-25
Measured by using Broadband Rod Antenna, Model 95010-1
FREQUENCY
10G
18G
40G
1G
200M
100M
20M
10M
1M
100K
10K
FIELD STRENGTH LEVEL OF FUNDAMENTAL SIGNAL for 2 nm Range
LIMIT (43 + 10log10 Pm = 48.44 dB)
: Limit of measuring instruments.
Radar spurious level is below this limit.
ATTEN. BELOW FUNDAMENTAL (dB)
0
50
100
150
Graph - 2 : Field strength of spurious radiation measured with pick-up antenna (2 nm range) (Middle Pulse)



Graph - 3 : Field strength of spurious radiation measured with pick-up antenna (36 nm range)
(Long / Pulse)


FIELD STRENGTH
(dBμV/m)
150
100
50
0
(Hz)
Fundamental Signal
181.13 (dBμV/m)
FREQUENCY
100K
1M
10M
20M
100M
200M
1G
10G
18G
40G
Sum of Noise emitted by spectrum analyzer, Antenna factor and Energy loss in cable.
Measured by using Horn Antenna
Measured by using Double Ridged Guide Antenna, Model RGA-180
Measured by using Conical Log-Spiral Antenna, Model LCA-25
Measured by using Biconical Antenna, Model BIA-25
Measured by using Broadband Rod Antenna, Model 95010-1
: Limit of measuring instruments.
Radar spurious level is below this limit.
LIMIT (43 + 10log10Pm = 49.71 dB)
FIELD STRENGTH LEVEL OF FUNDAMENTAL SIGNAL for 48 nm Range
ATTEN. BELOW FUNDAMENTAL (dB)
0
50
100
150
Graph - 4 : Field strength of spurious radiation measured with pick-up antenna (48 nm range)
(Long Pulse)
2

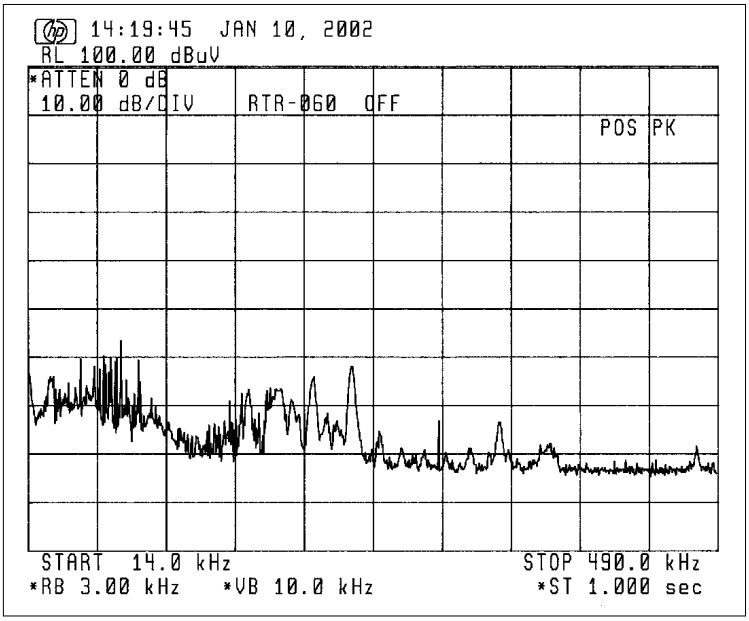

FIELD STRENGTH
(dBμV/m)
150
100
50
0
(Hz)
FREQUENCY
10K
100K
1M
10M
20M
100M
200M
1G
10G
18G
40G
ATTEN. BELOW FUNDAMENTAL (dB)
0
50
100
150
Fundamental Signal
181.16 (dBμV/m)
FIELD STRENGTH LEVEL OF FUNDAMENTAL SIGNAL for 72 nm Range
LIMIT (43 + 10log10 Pm = 49.05 dB)
: Limit of measuring instruments.
Radar spurious level is below this limit.
Measured by using Broadband Rod Antenna, Model 95010-1
Measured by using Biconical Antenna, Model BIA-25
Measured by using Conical Log-Spiral Antenna, Model LCA-25
Measured by using Double Ridged Guide Antenna, Model RGA-180
Measured by using Horn Antenna
Sum of Noise emitted by spectrum analyzer, Antenna factor and Energy loss in cable.
Graph - 5 : Field strength of spurious radiation measured with pick-up antenna (72 nm range)
(Long Pulse)

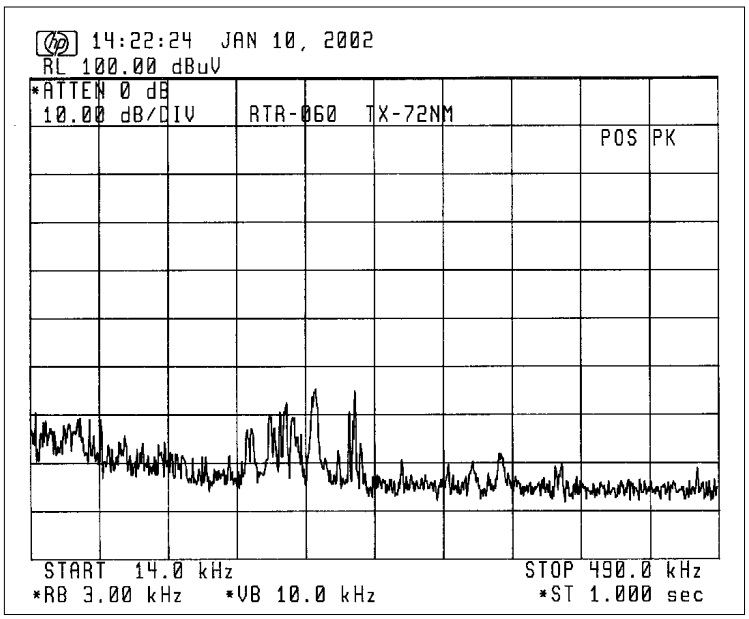
Attachment C

[TEST DATA for Clause 3.7 SUPPRESSION OF INTERFERENCE ABOARD SHIPS]

1. Harmful Interference to Receiver

(Band : 14 kHz - 490 kHz)





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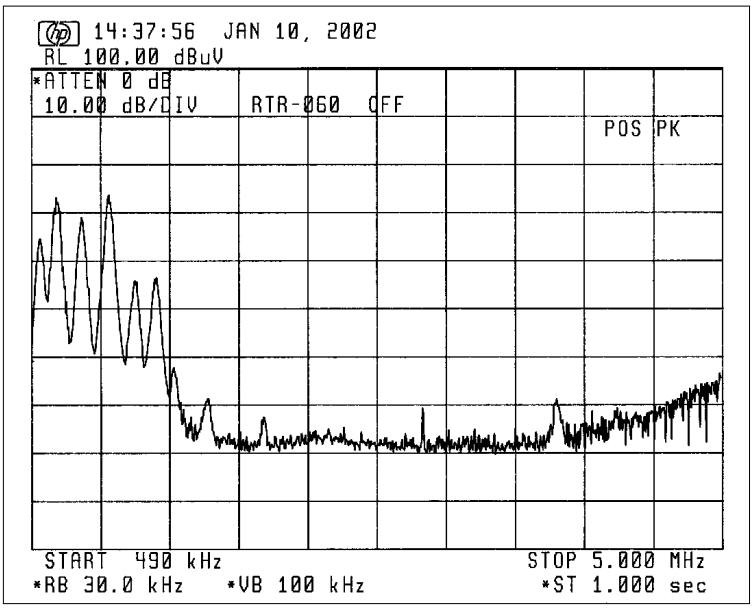
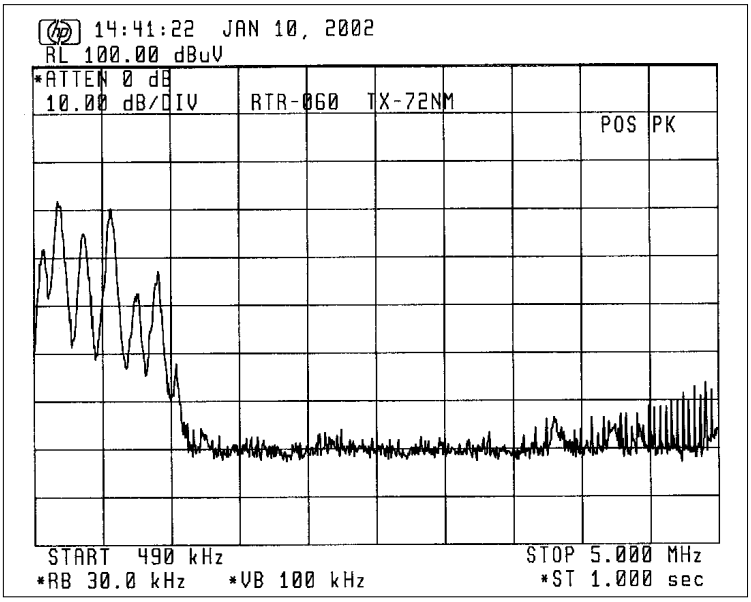
(Band : 490 kHz - 5 MHz)





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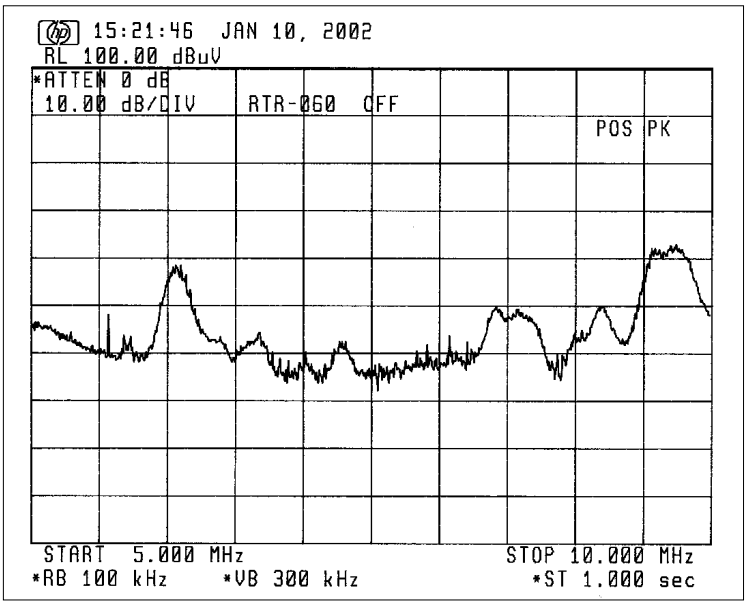
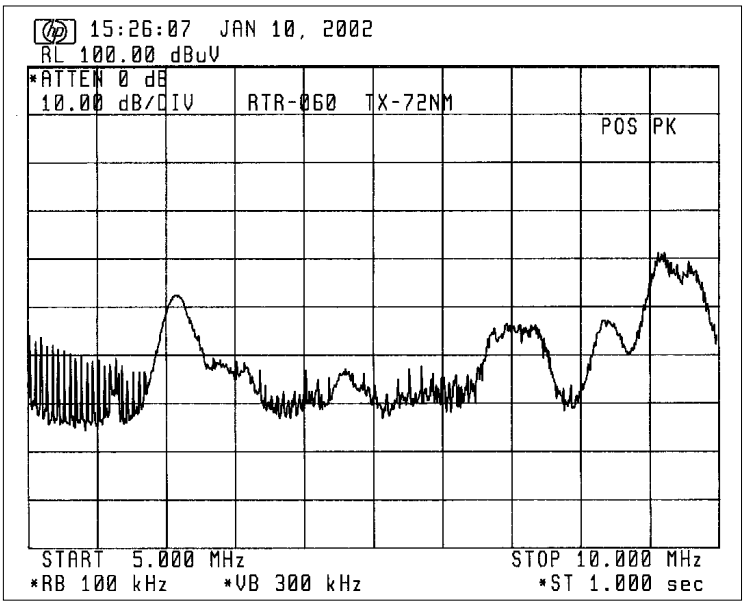
(Band : 5 MHz - 10 MHz)





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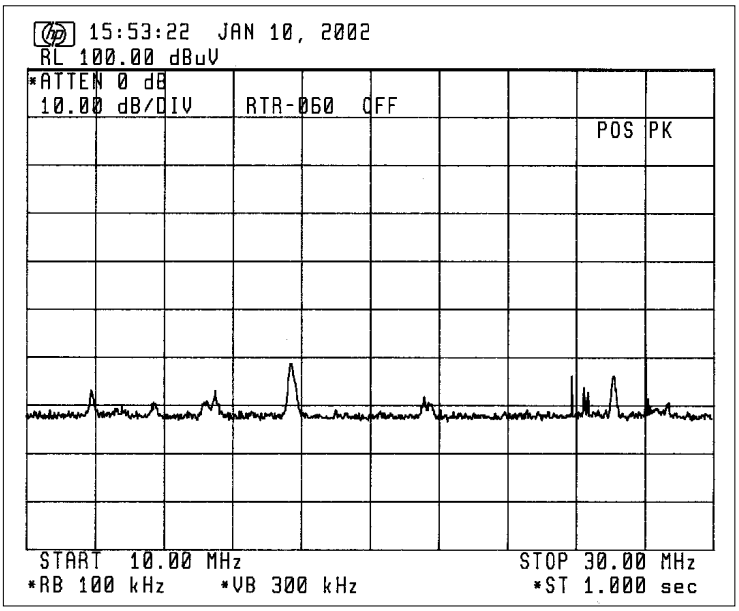
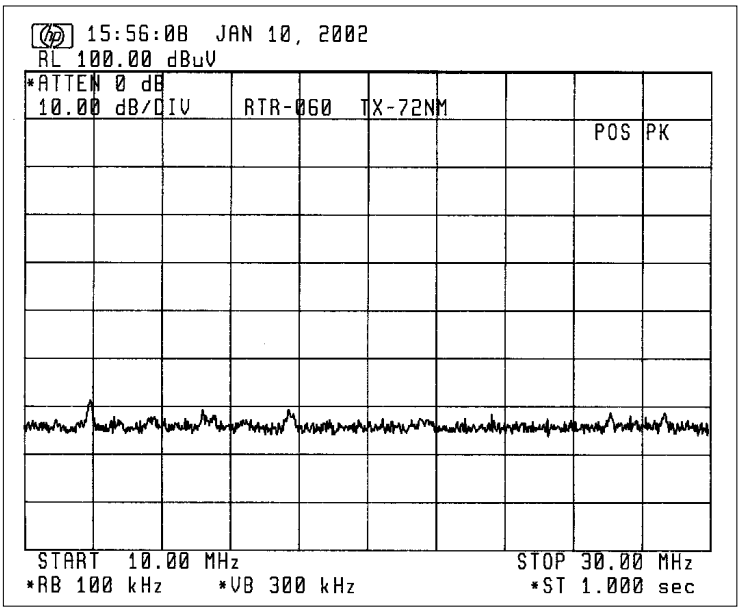
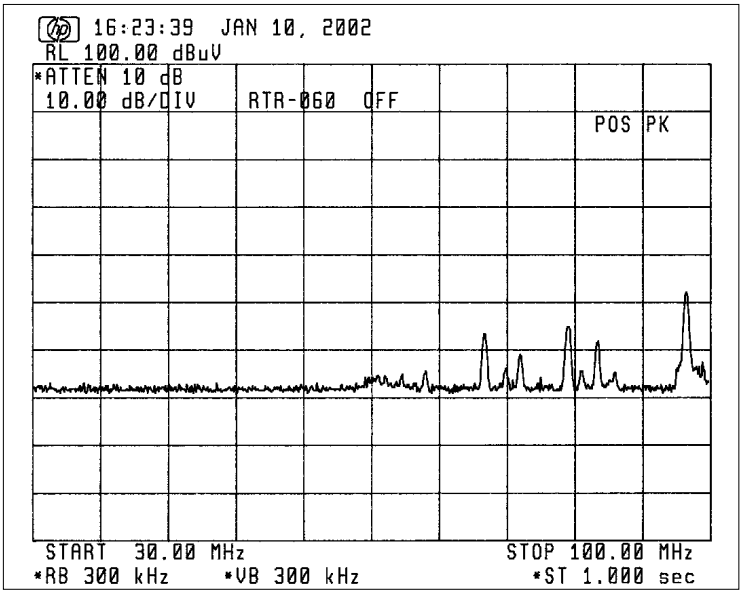
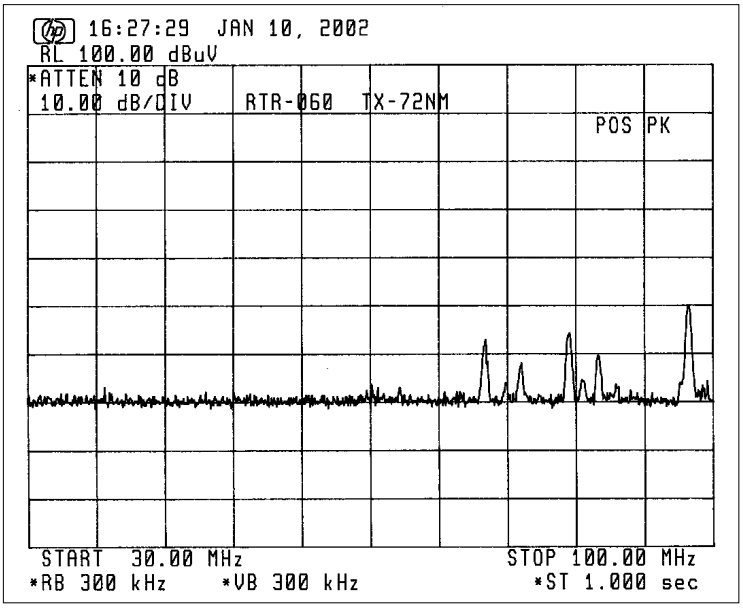
(Band : 10 MHz - 30 MHz)





(Band : 30 MHz - 100 MHz)





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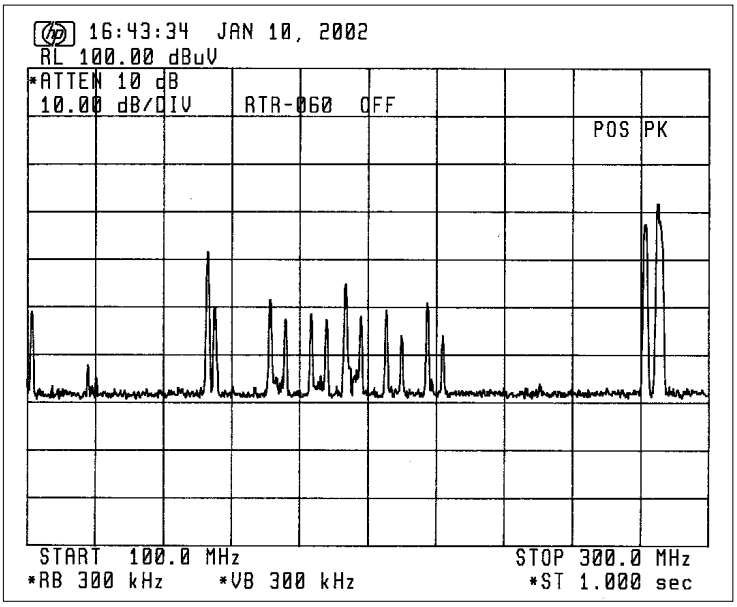
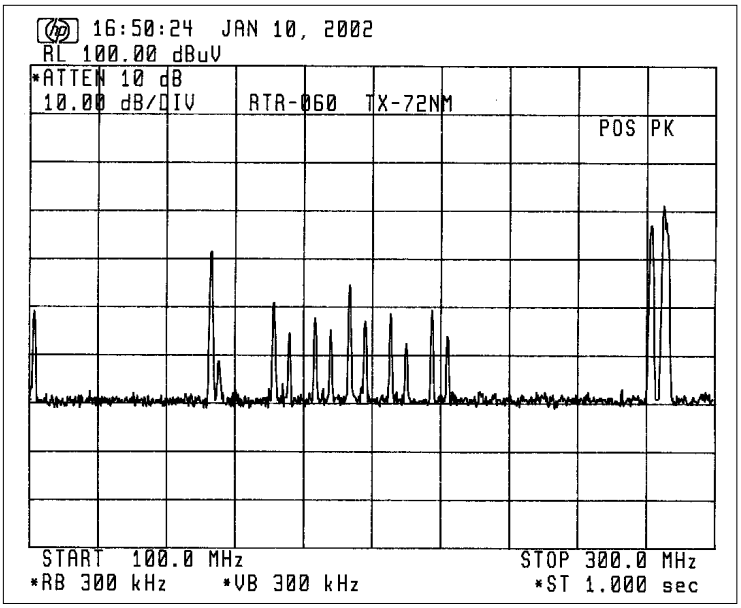
(Band : 100 MHz - 300 MHz)





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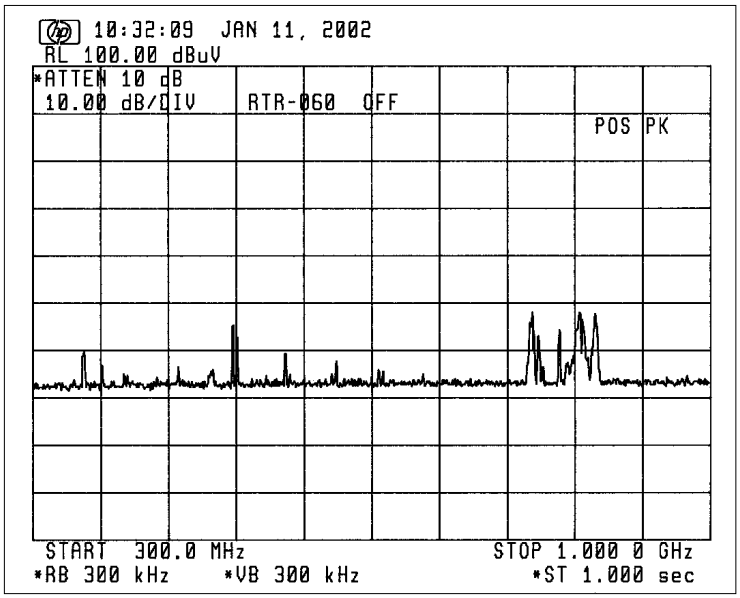
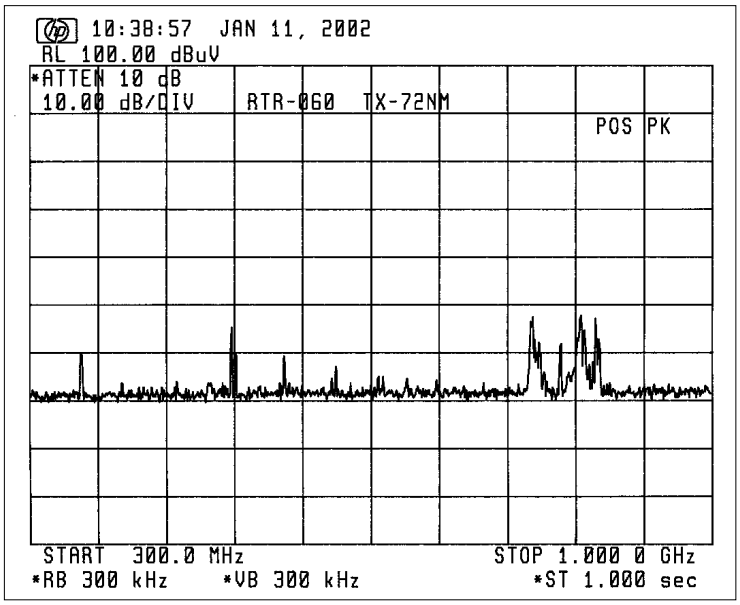
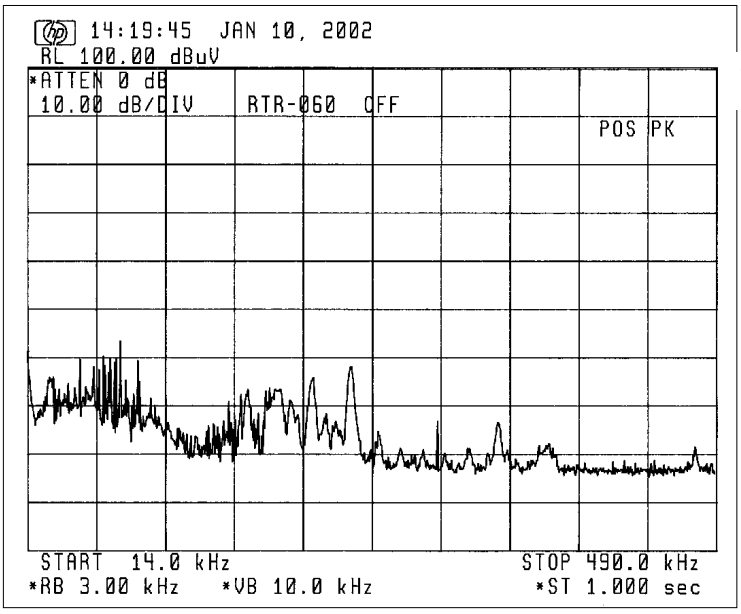
(Band : 300 MHz - 1 GHz)



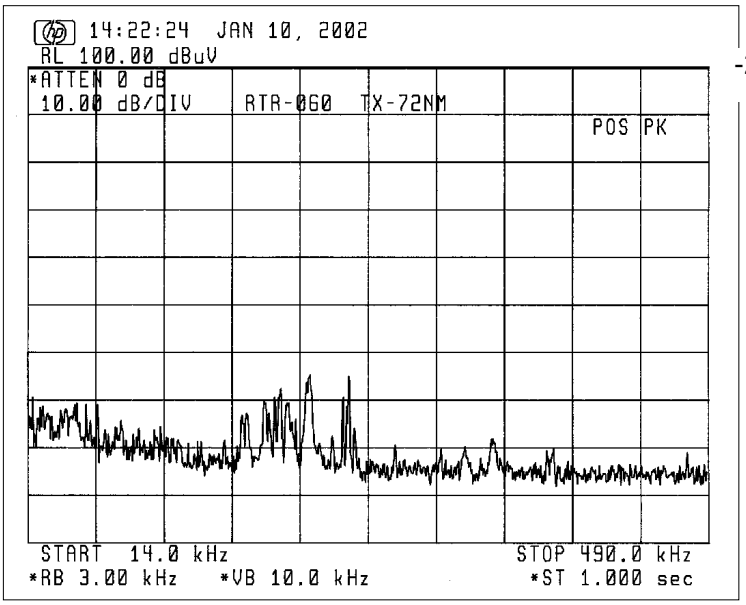


2. Electromagnetic Field

(Band : 14 kHz - 490 kHz, Limit at 1 nm = 0.1 µV/m = -20 dBµV/m)



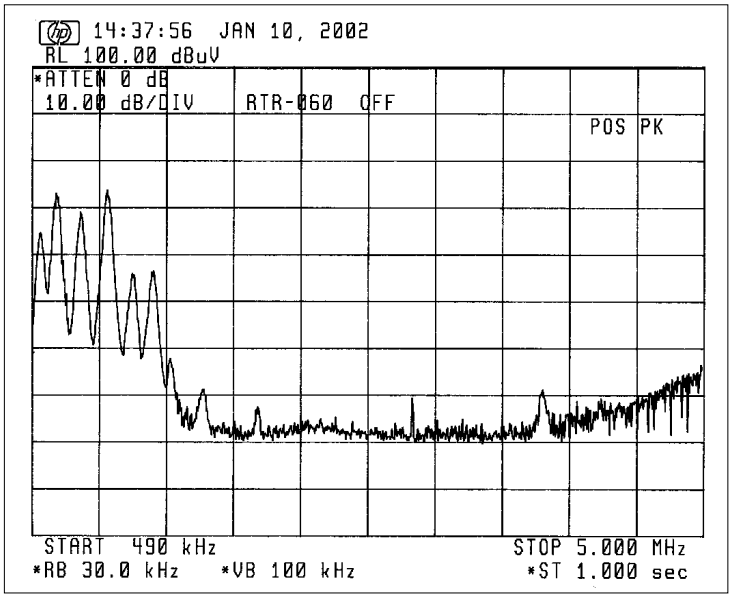
-26 dBµV/m

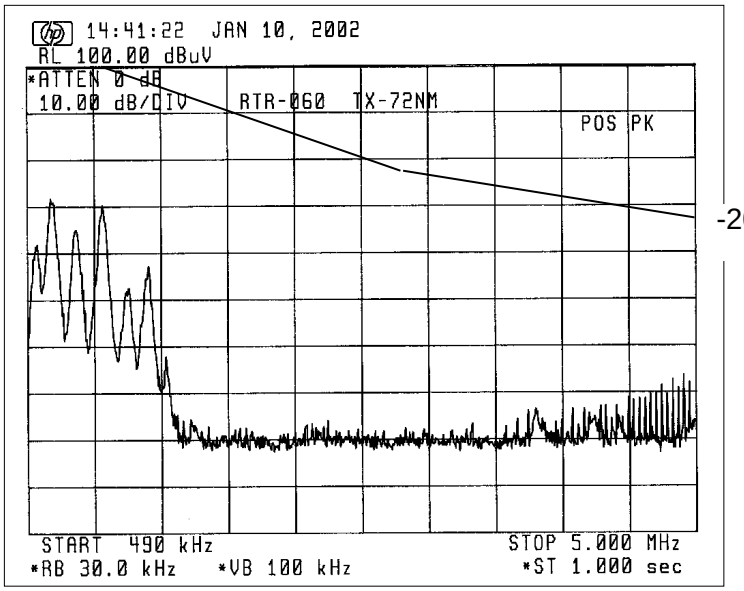


-26 dBµV/m

.

(Band : 490 kHz - 5 MHz, Limit at 1 nm = 0.1 µV/m = -20 dBµV/m)



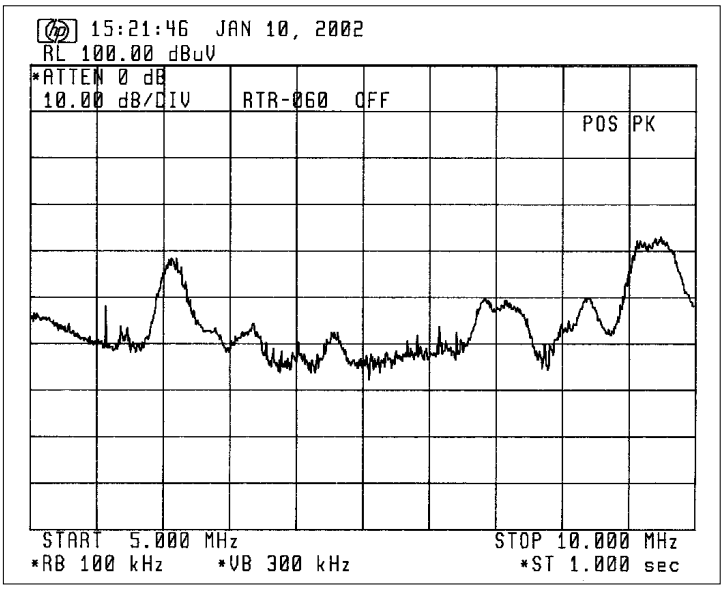


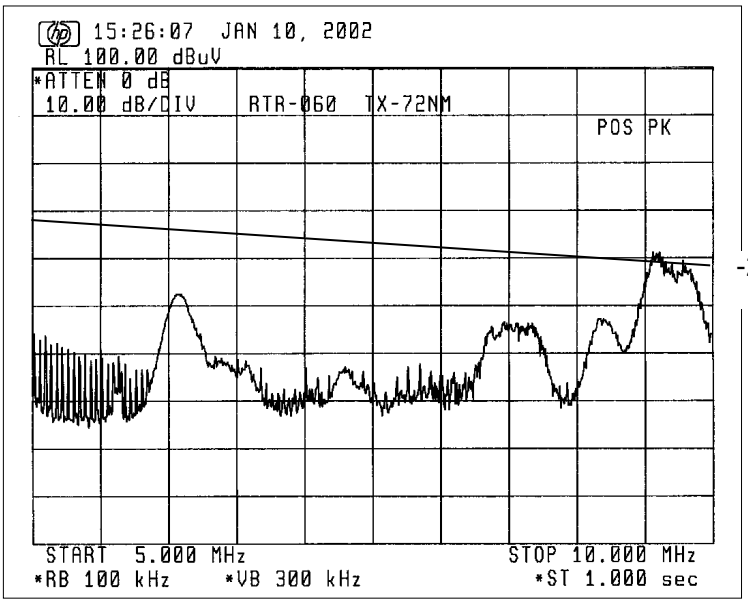
Ref. level (dBµV/m)
= 100 - 126 = -26 (at 0.5 MHz)
= 100 - 96 = 4 (at 3 MHz)
= 100 - 88 = 12 (at 5 MHz)

-20 dBµV/m limit line

.

(Band : 5 MHz - 10 MHz, Limit at 1 nm = 0.1 µV/m = -20 dBµV/m)





Ref. level (dBµV/m)
= 100 - 88 = 12 (at 5 MHz)
= 100 - 83 = 17 (at 7 MHz)
= 100 - 78 = 22 (at 10 MHz)

-20 dBµV/m limit line

All components above the limit are from external noise or signals, not from RADAR.

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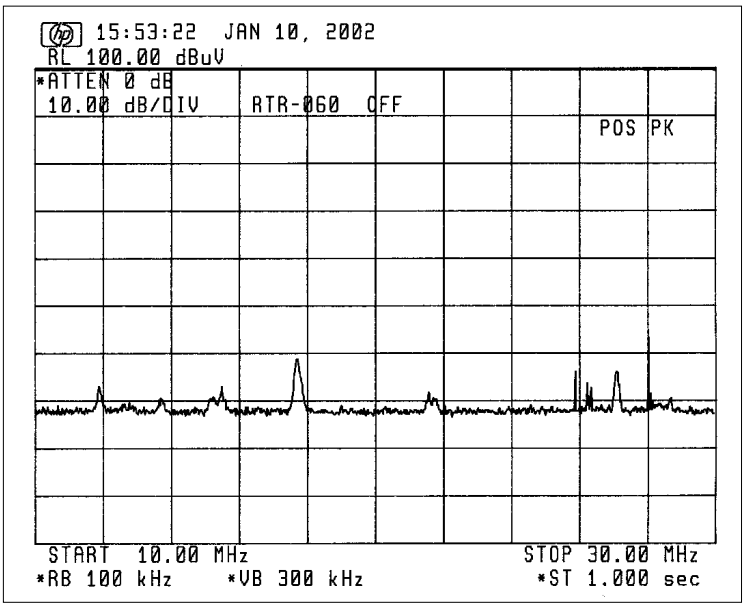
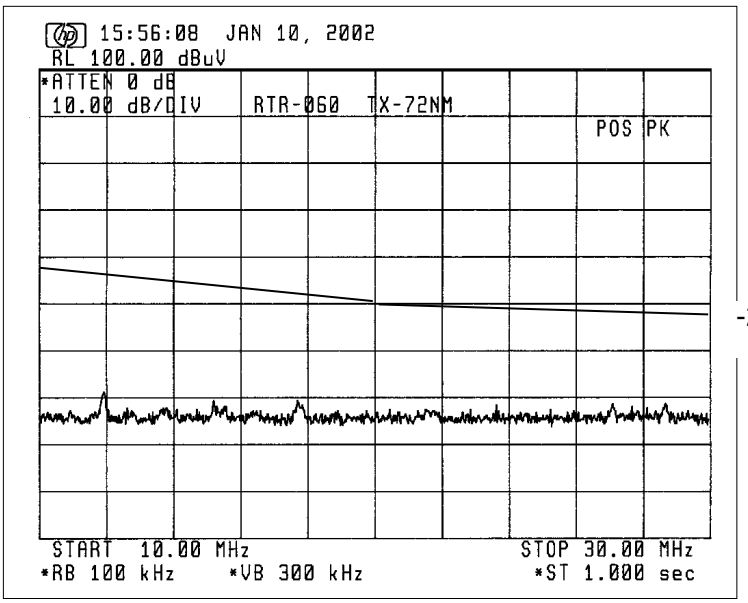
(Band : 10 MHz - 30 MHz, Limit at 1 nm = 0.1 µV/m = -20 dBµV/m)



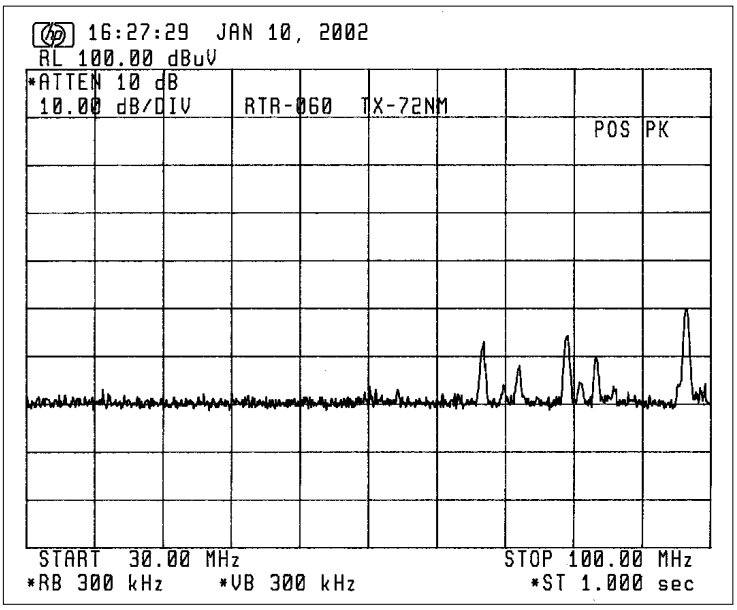


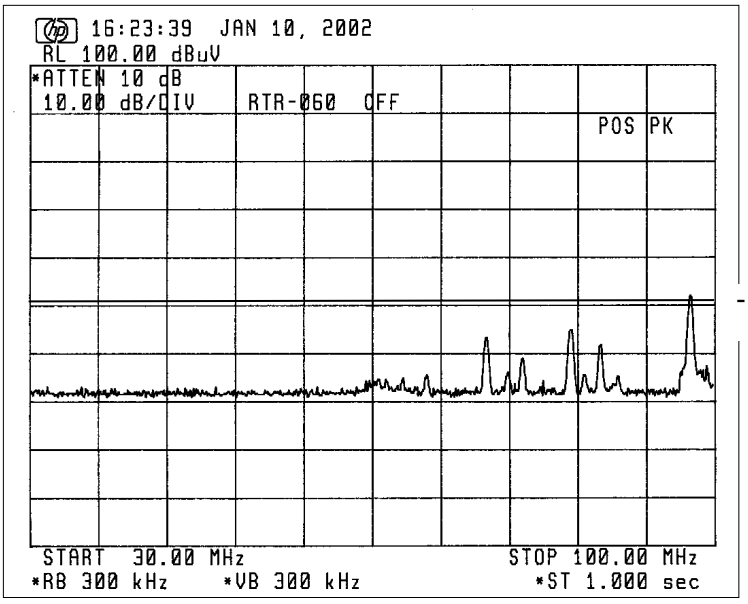
Ref. level (dBµV/m)
= 100 - 78 = 22 (at 10 MHz)
= 100 - 70 = 30 (at 20 MHz)
= 100 - 67 = 33 (at 30 MHz)

-20 dBµV/m limit line

.

(Band : 30 MHz - 100 MHz, Limit at 1 nm = 0.1 µV/m = -10.5 dBµV/m)





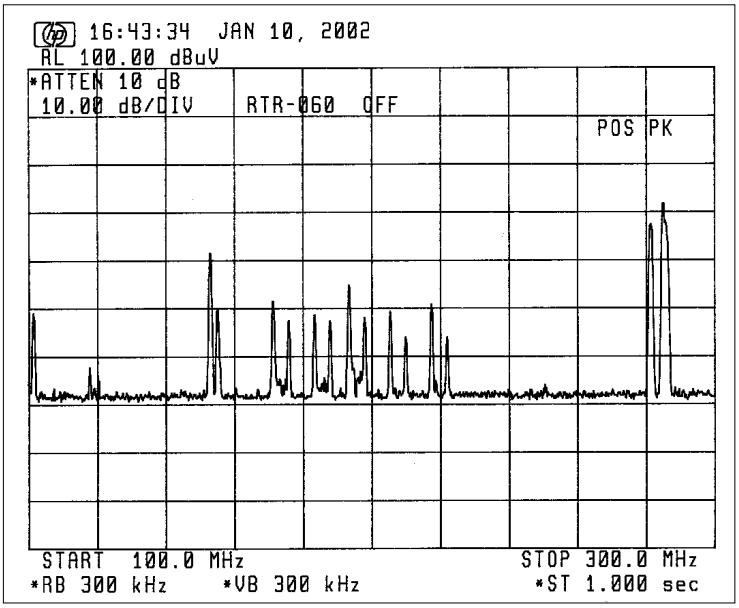
Ref. level (dBµV/m)
= 100 - 61 = 39

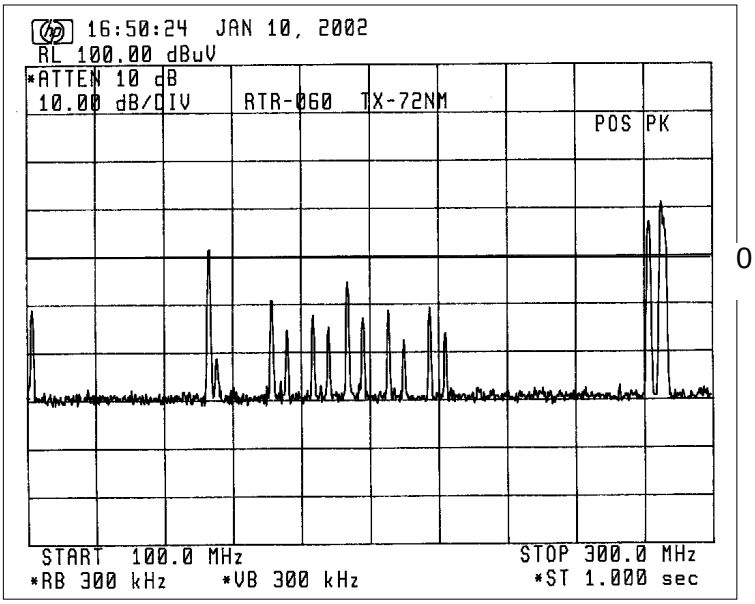
- 10.5 dBµV/m limit line

All components above the limit are from external noise or signals, not from RADAR.

.

(Band : 100 MHz - 300 MHz, Limit at 1 nm = 0.1 µV/m = -0 dBµV/m)





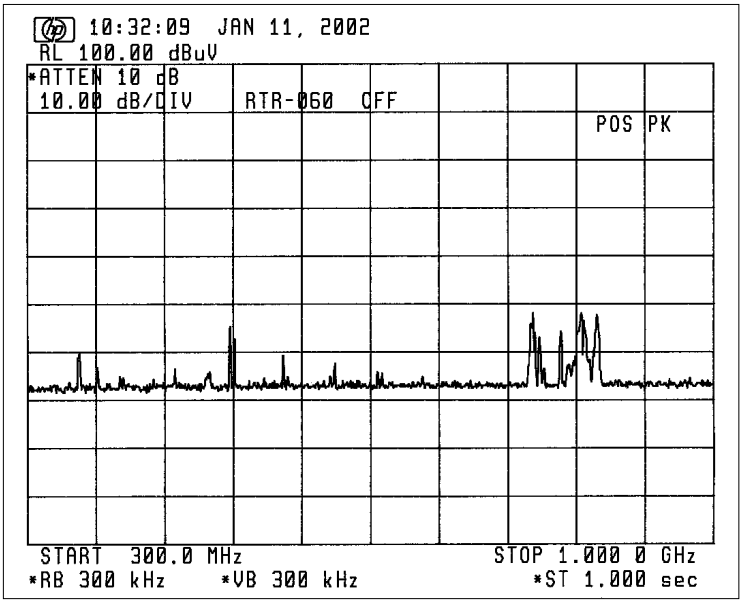
Ref. level (dBµV/m)
= 100 - 60 = 40

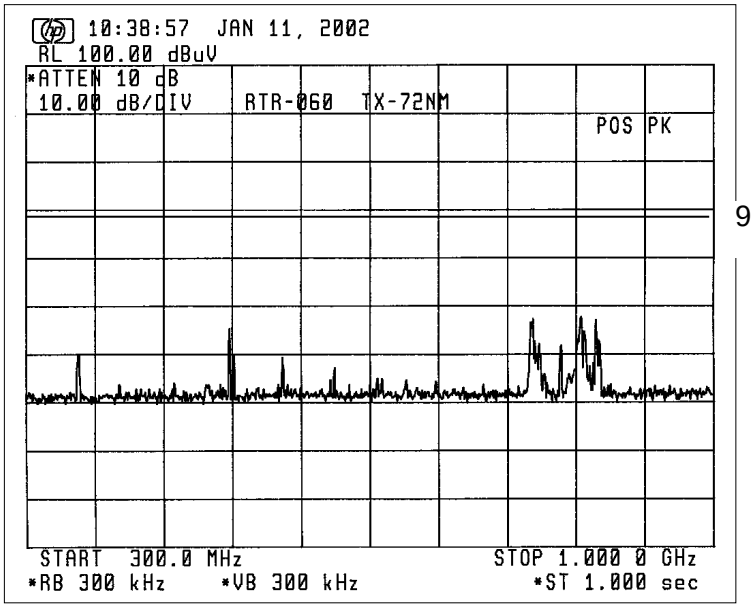
0 dBµV/m limit line

All components above the limit are from external noise or signals, not from RADAR.

.

(Band : 300 MHz - 1 GHz, Limit at 1 nm = 3 µV/m = -9.5 dBµV/m)



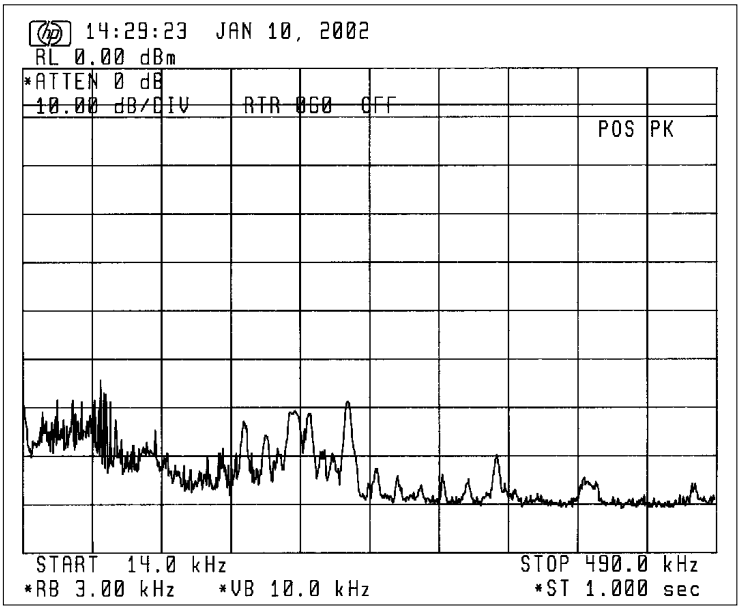


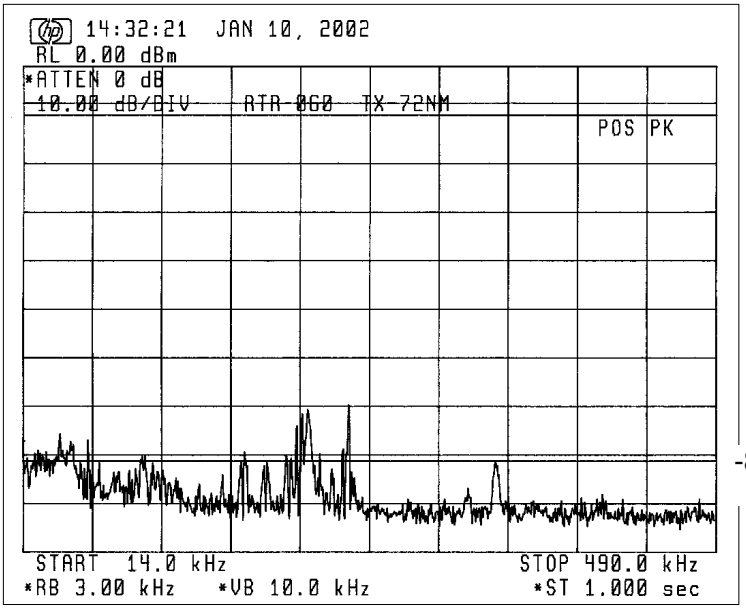
Ref. level (dBµV/m)
= 100 - 59.5 = 40.5

9.5 dBµV/m limit line

3. Power Input to an Artificial Antenna

(Band : 14 kHz - 490 kHz, Limit at 2 m = -81 dBm)





-81 dBm limit line

All components above the limit are from external noise or signals, not from RADAR.

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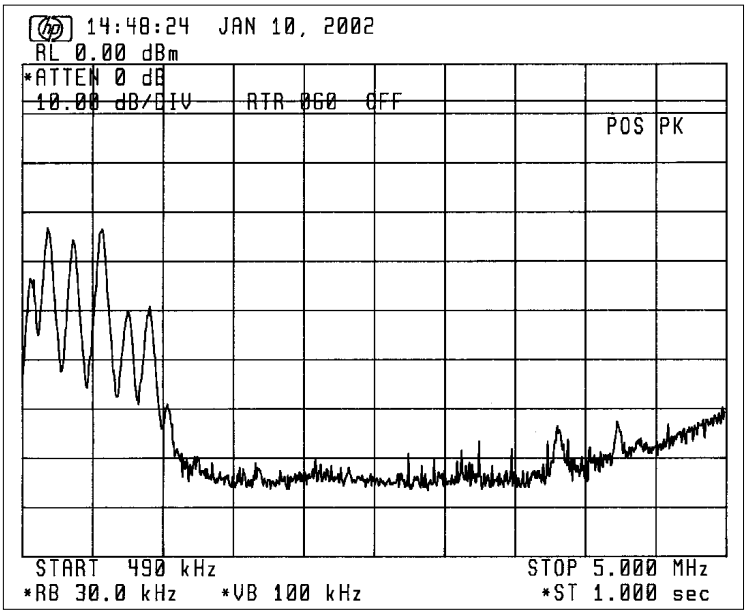
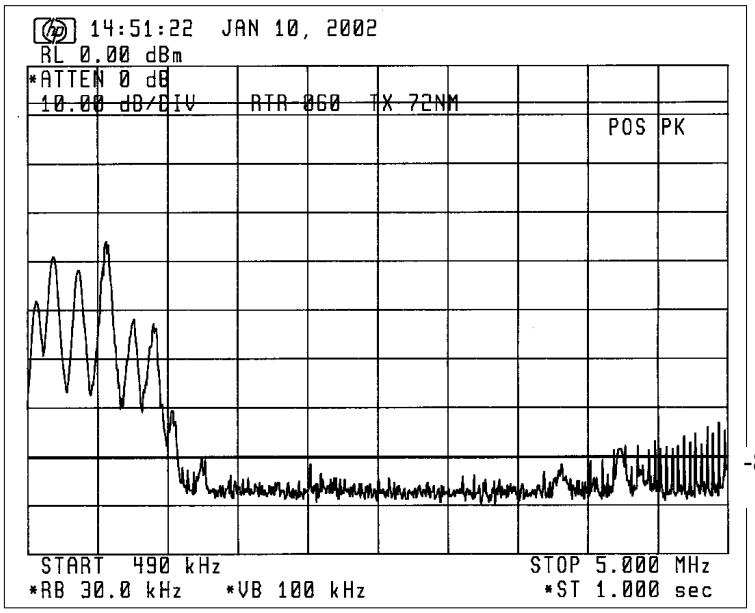
(Band : 490 kHz - 5 MHz, Limit at 2 m = -81 dBm)





-81 dBm limit line

All components above the limit are from external noise or signals, not from RADAR.

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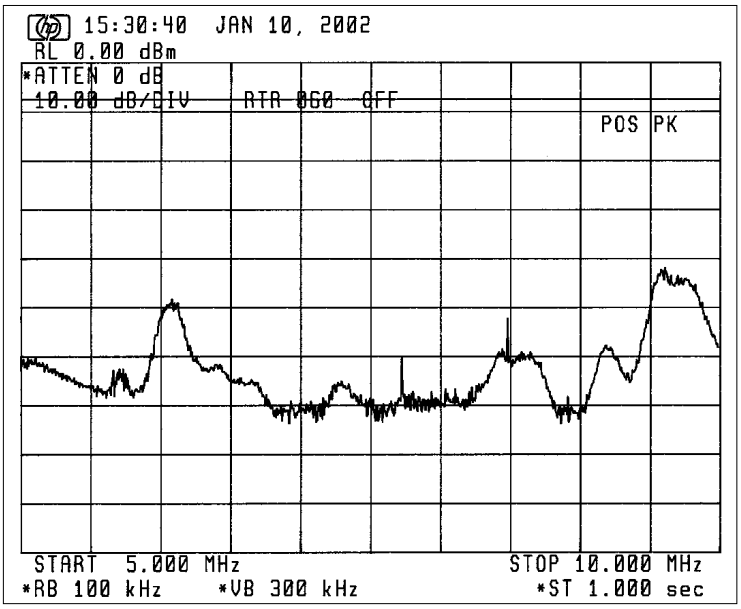
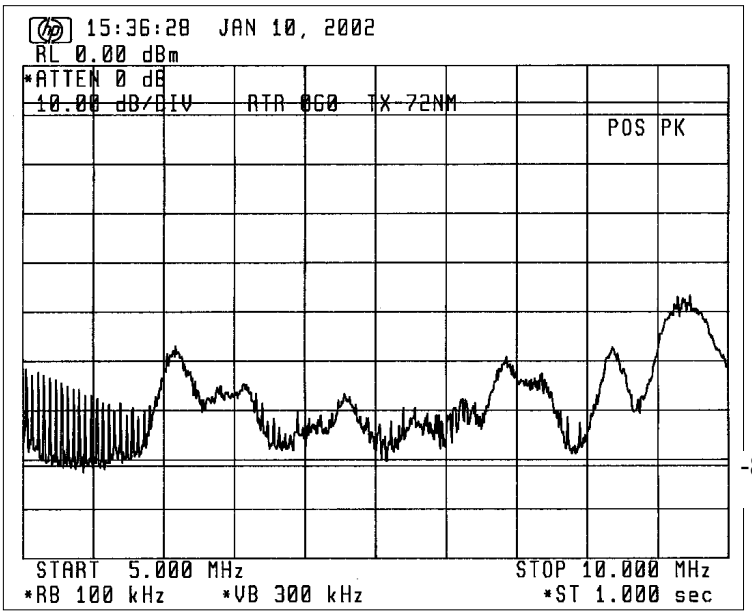
(Band : 5 MHz - 10 MHz, Limit at 2 m = -81 dBm)





-81 dBm limit line

All components above the limit are from external noise or signals, not from RADAR.

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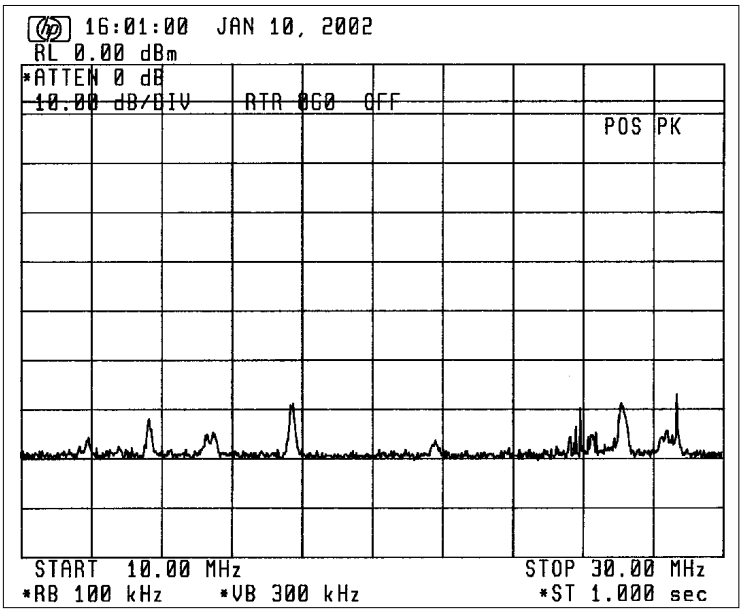
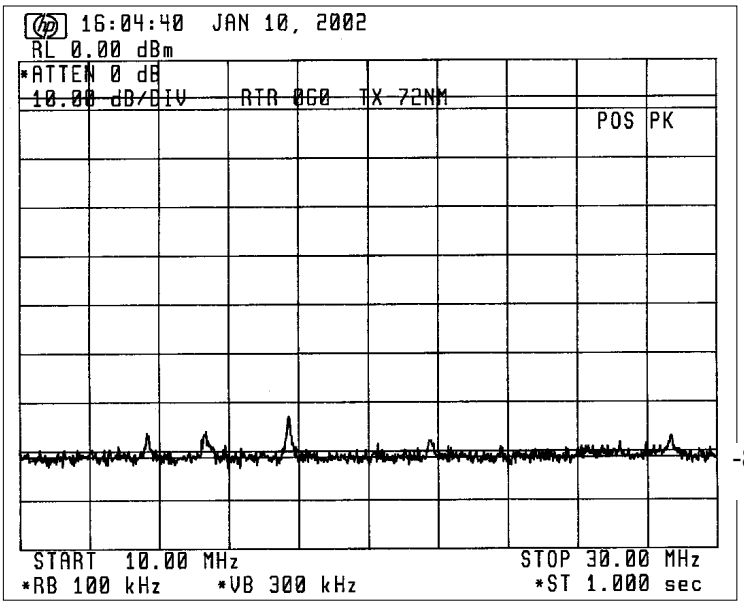
(Band : 10 MHz - 30 MHz, Limit at 2 m = -81 dBm)





-81 dBm limit line

All components above the limit are from external noise or signals, not from RADAR.

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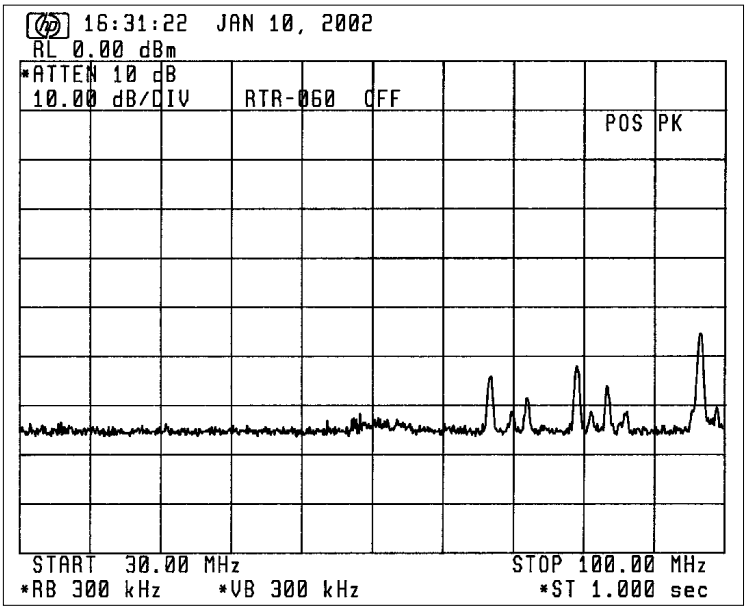
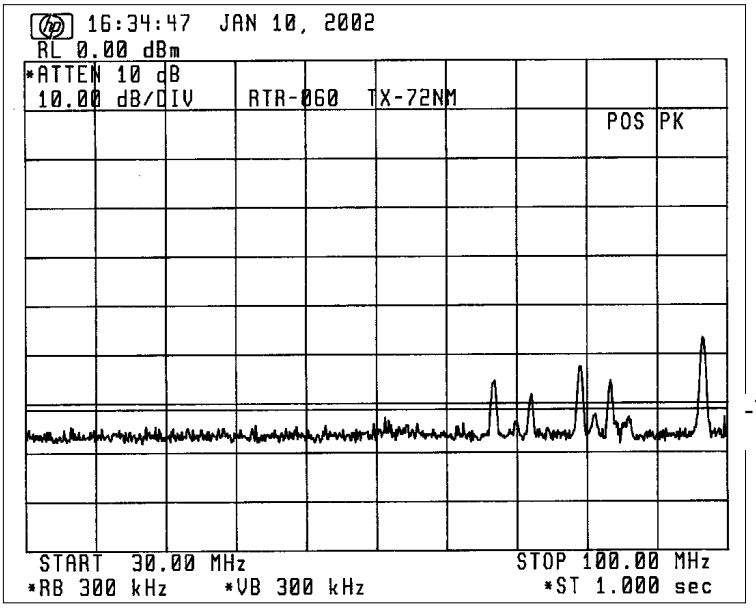
(Band : 30 MHz - 100 MHz, Limit at 2 m = -71 dBm)





-71 dBm limit line

All components above the limit are from external noise or signals, not from RADAR.

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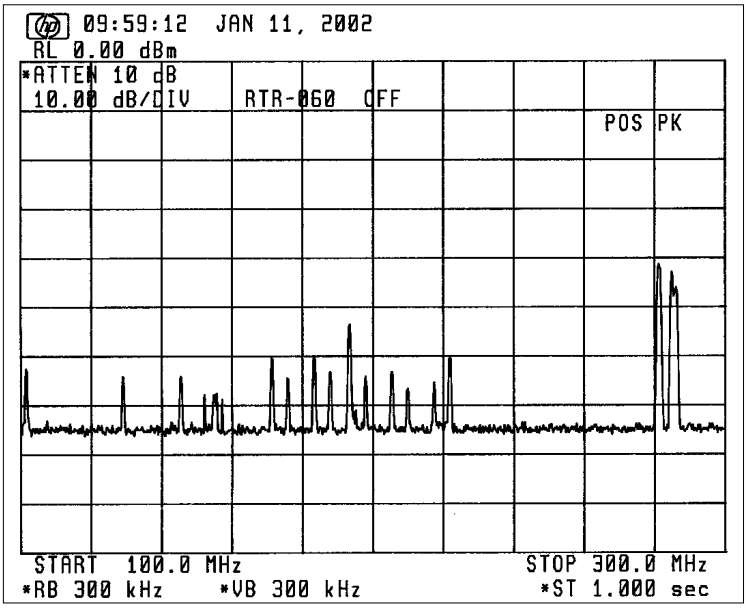
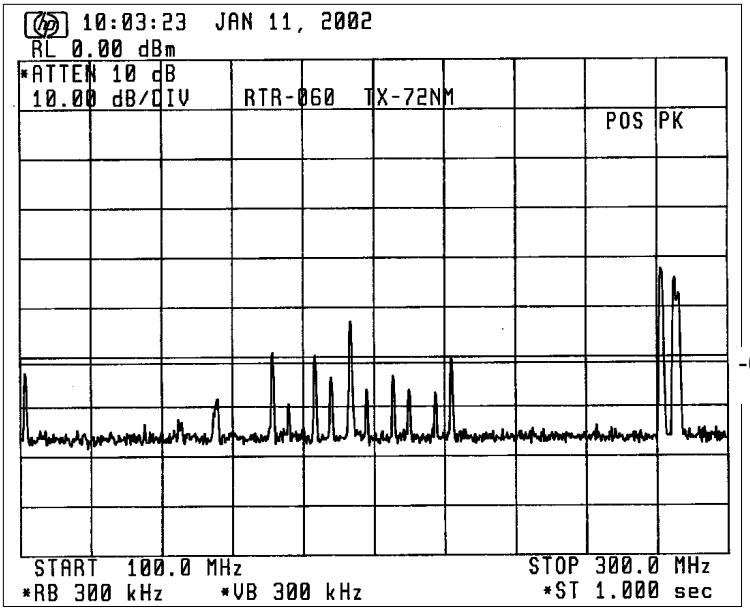
(Band : 100 MHz - 300 MHz, Limit at 2 m = -61 dBm)





-61 dBm limit line

All components above the limit are from external noise or signals, not from RADAR.

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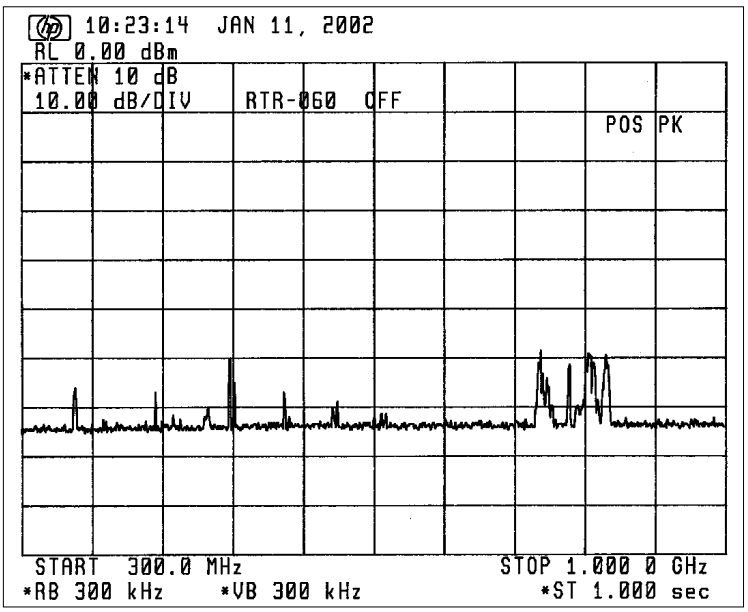
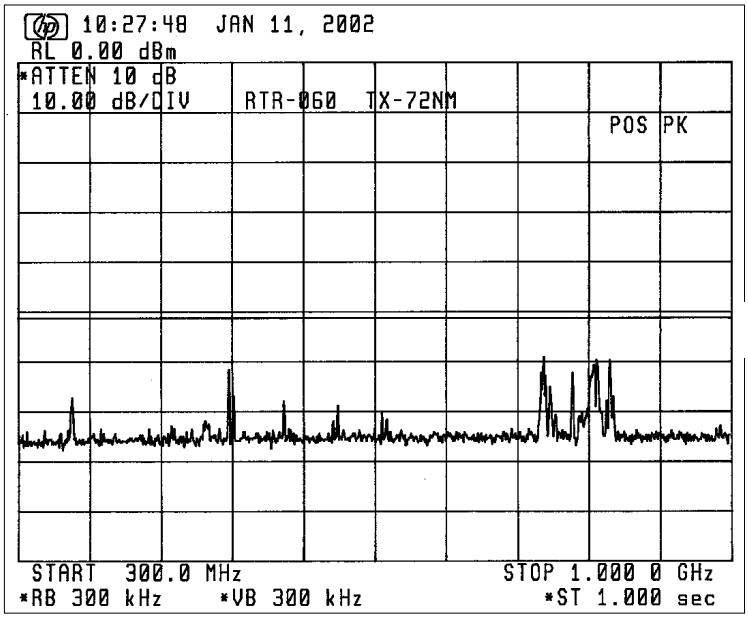
(Band : 300 MHz - 1 GHz, Limit at 2 m = -51 dBm)





-51 dBm limit line

Attachment D [List of Test/Measuring Equipment] (for X-band radar)

For Clause 3.1 RF Power Output

Model	Type	Serial no.	Mfr.
Spectrum Analyzer	71210C	2927A02847	HP
Oscilloscope	TDS680B	B030202	Tektronix
Directional Coupler	5D364S	R05762	Shimada
Voltage Divider	HV-P30	2780	Iwatsu
Current Transformer	2100	----	Pearson Electronics
Power Meter	436A	2410A19137	HP
Power Sensor	8481A	2349A39603	HP
Frequency Counter	TR5824A	41940036	Advantest
Frequency Meter	X532B	1441A00523	HP
Crystal Detector	423A	1822A09909	HP
Dummy Load	4D376	R05763	Shimada
Step Attenuator	8494B	US00430029	HP
Step Attenuator	8495B	3308A22026	HP

For Clause 3.2 Modulation Characteristics

Model	Type	Serial no.	Mfr.
Oscilloscope	TDS680B	B030202	Tektronix
Crystal Detector	423A	1822A09909	HP
Directional Coupler	5D364S	R05762	Shimada
Dummy Load	4D376	R05763	Shimada
Voltage Divider	HV-P30	2780	Iwatsu
Spectrum Analyzer	71210C	2927A02847	HP
Step Attenuator	8494B	US00430029	HP
Step Attenuator	8495B	3308A22026	HP

For Clause 3.4 Spurious Emissions at Antenna Terminal

Model	Type	Serial no.	Mfr.
Spectrum Analyzer	71210C	2927A02847	HP
External Mixer:	11970K	2332A00589	HP
External Mixer:	11970A	2332A01187	HP
Directional Coupler	5D364S	R05762	Shimada
Dummy Load	4D376	R05763	Shimada
Step Attenuator	8494B	US00430029	HP
Step Attenuator	8495B	3308A22026	HP

For Clause 3.5 Field Strength of Spurious Radiation

Model	Type	Serial no.	Mfr.
Broadband Rod Antenna	95010-1		Advanced Electronics
Biconical Antenna	BIA-25	2650	Electro Metrics
Conical Log-Spiral Antenna	LCA-25	2886	Electro Metrics
Double Ridged Guide Horn Antenna :RGA-180		2248	Electro Metrics
Horn Antenna:	----	----	Toshiba
Spectrum Analyzer:	71210C	2927A02847	HP
External Mixer:	11970K	2332A00589	HP
External Mixer:	11970A	2332A01187	HP
Coax. Attenuator (10 dB)	8491B	28845	HP

For Clause 3.6 Frequency Stability

Model	Type	Serial no.	Mfr.
Power Meter:	436A	2410A19137	HP
Power Sensor:	8481A	2349A39603	HP
Frequency Meter:	X532B	1441A00523	HP
Directional Coupler:	5D364S	R5762	Shimada
Dummy Load:	4D376	R05763	Shimada
Environmental Chamber:	PL-4KP	14004204	Tabai Espec

For Clause 3.7 Suppression of Interference Aboard Ships

Model	Type	Serial no.	Mfr.
Spectrum Analyzer:	71210C	2927A02847	HP
6 m Whip Antenna	14 k - 10 MHz	----	Furuno
4 m Whip Antenna	10 - 30 MHz	----	Furuno
VHF Whip Antenna	30 - 300 MHz	150M-W2UM	Anten
UHF Whip Antenna	300 - 1000 MHz	----	Anten
Network analyzer:	8753C	3214J01067	HP
Spectrum Analyzer	TR4172	30690116	Advantest
Spectrum Analyzer	8566B	2637A03642	HP
Coax. Attenuator (10 dB)	8491B	28845	HP