NAME OF TEST: Transmitter Occupied Bandwidth
GEMINI Modem at 14400 bps 4FSK
In Support of Emission Designator **11K8F1D**

RULE PART NUMBER: 2.201, 2.202, 2.1049 (h), 2.1041, 90.209 (b)(5), 90.210 (j)

MINIMUM STANDARD: Mask J
Sidebands and Spurious [Rule 90.210 (j)]
Authorized Bandwidth = 13.6 kHz [Rule 90.209(b) (5)]

Fo to 2.5 kHz	Attenuation = 0 dB
>2.5 kHz to 6.25 kHz	Attenuation= 53*log(f_d KHz /2.5) dB
>6.25 kHz to 9.5kHz	Attenuation = 103 log (f_d/3.9)dB
>9.5kHz	lesser of 50 + 10*log(P) or 157 log (f_d/5.3)
or 70dB	

Corner Points:

f_0 to 2.5 kHz	Attenuation = 0 dB
>2.5 kHz to 3.8 kHz	Attenuation= 0 dB to 10 dB
>3.8 kHz to 6.25 KHz	Attenuation = 10 dB to 21 dB
>6.25 kHz to 7.6 KHz	Attenuation = 21 dB to 30 dB
>7.6 kHz to 9.5 KHz	Attenuation = 30 dB to 40 dB
>9.5 kHz to 11.2 KHz	Attenuation = 40 dB to51 dB
>11.2 kHz to 13.8kHz	Attenuation = 51 dB to65 dB
>13.8kHz	Attenuation = minimum 65 dB (30W)

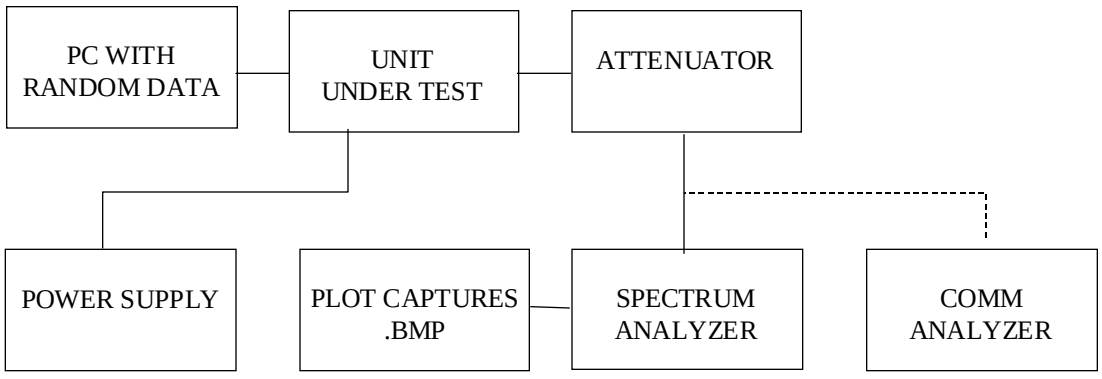
UNIT UNDER TEST Prototype#3
TEST RESULTS: Meets minimum standard (see data on the following pages)
TEST CONDITIONS: Standard Test Conditions, 25 C
TEST EQUIPMENT: Attenuator, BIRD Model / 100-A-MFN-30 / 30 dB / 50 Watt
DC Power Supply , Astron Model VS-20M
IFR COM-120B
Spectrum Analyzer, Model HP8563E
HP Benchlink -software for plot captures.

PERFORMED BY:

Sébastien Lafrance

DATE:07/19/2002

TEST SET-UP:



NAME OF TEST: Transmitter Occupied Bandwidth (Continued)
GEMINI Modem at 14400 bps
In Support of Emission Designator **11K8F1D**

TX Data Test Pattern:

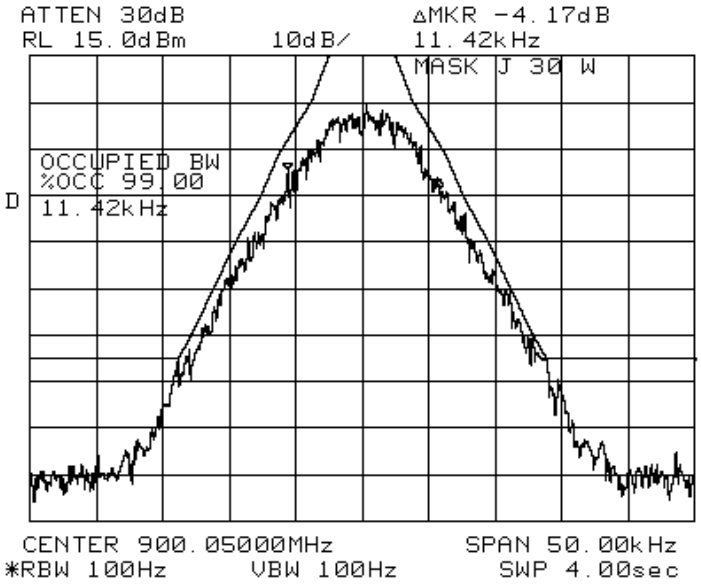
The transmit "test data" pattern command produces a 2047 bit pseudo-random pattern. This pattern is generated by the internal software using the polynomial $X^{11}+X^{9}+1$ form and a 12-bit shift register. Initial value of the register is 111111111110 (FFE hex). The 2047 bit sequence is repeated thereafter as long is necessary to complete the test duration (55 sec). This pattern is applied to the DSP processor data input for encoding and pulse shaping as described above.

NECESSARY BANDWIDTH (Bn) measurement

See Part A0 for emission designator determination.

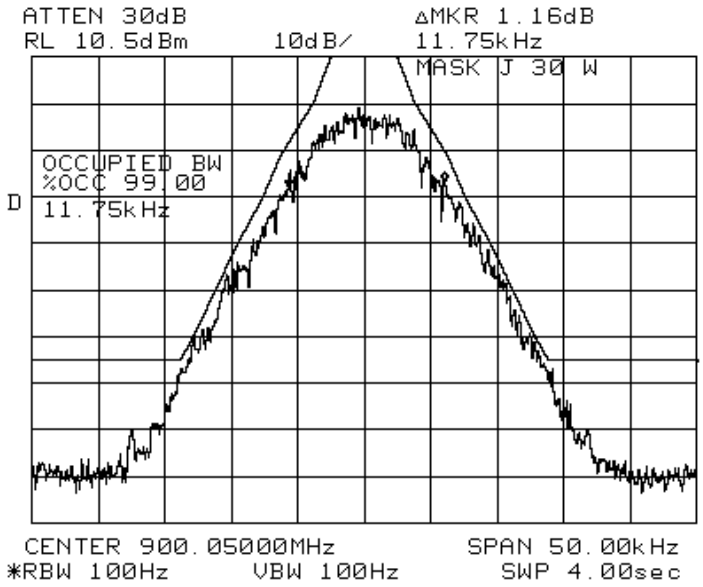
The corresponding emission designator prefix for necessary bandwidth = **11K8**
The corresponding deviation for 14400 Bps is 3.22KHz
TEST DATA: Refer to the following graphs:

MASK: J , 11K8F1D, 27W
SPECTRUM FOR EMISSION **11K8F1D**
OUTPUT POWER: 27 Watts
14400 bps 4 FSK
PEAK DEVIATION = 3220 Hz
SPAN = 50 kHz



MASK: J, 11K8F1D, 10W

SPECTRUM FOR EMISSION **11K8F1D**
OUTPUT POWER: 10 Watts
14400 bps 4 FSK
PEAK DEVIATION = 3220 Hz
SPAN = 50 kHz



NAME OF TEST: Transmitter Occupied Bandwidth
GEMINI Modem at 16000 bps 4FSK
In Support of Emission Designator **10K7F1D**

RULE PART NUMBER: 2.201, 2.202, 2.1049 (h), 2.1041, 90.209 (b)(5), 90.210 (j)

MINIMUM STANDARD: Mask J
Sidebands and Spurious [Rule 90.210 (j)]
Authorized Bandwidth = 13.6 kHz [Rule 90.209(b) (5)]

Fo to 2.5 kHz	Attenuation = 0 dB
>2.5 kHz to 6.25 kHz	Attenuation= 53*log(f_d KHz /2.5) dB
>6.25 kHz to 9.5kHz	Attenuation = 103 log (f_d/3.9)dB
>9.5kHz	lesser of 50 + 10*log(P) or 157 log (f_d/5.3)
or 70dB	

Corner Points:

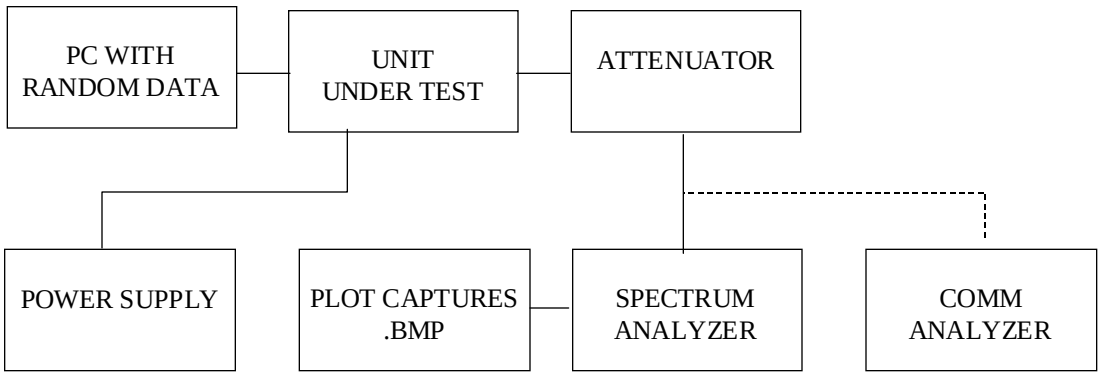
f_0 to 2.5 kHz	Attenuation = 0 dB
>2.5 kHz to 3.8 kHz	Attenuation= 0 dB to 10 dB
>3.8 kHz to 6.25 KHz	Attenuation = 10 dB to 21 dB
>6.25 kHz to 7.6 KHz	Attenuation = 21 dB to 30 dB
>7.6 kHz to 9.5 KHz	Attenuation = 30 dB to 40 dB
>9.5 kHz to 11.2 KHz	Attenuation = 40 dB to51 dB
>11.2 kHz to 13.8kHz	Attenuation = 51 dB to65 dB
>13.8kHz	Attenuation = minimum 65 dB (30W)

UNIT UNDER TEST Prototype#3
TEST RESULTS: Meets minimum standard (see data on the following pages)
TEST CONDITIONS: Standard Test Conditions, 25 C
TEST EQUIPMENT: Attenuator, BIRD Model / 100-A-MFN-30 / 30 dB / 50 Watt
DC Power Supply , Astron Model VS-20M
IFR COM-120B
Spectrum Analyzer, Model HP8563E
HP Benchlink -software for plot captures.

PERFORMED BY:

Sébastien Lafrance DATE:07/19/2002

TEST SET-UP:



NAME OF TEST: Transmitter Occupied Bandwidth (Continued)
GEMINI Modem at 16000 bps
In Support of Emission Designator **10K7F1D**

TX Data Test Pattern:

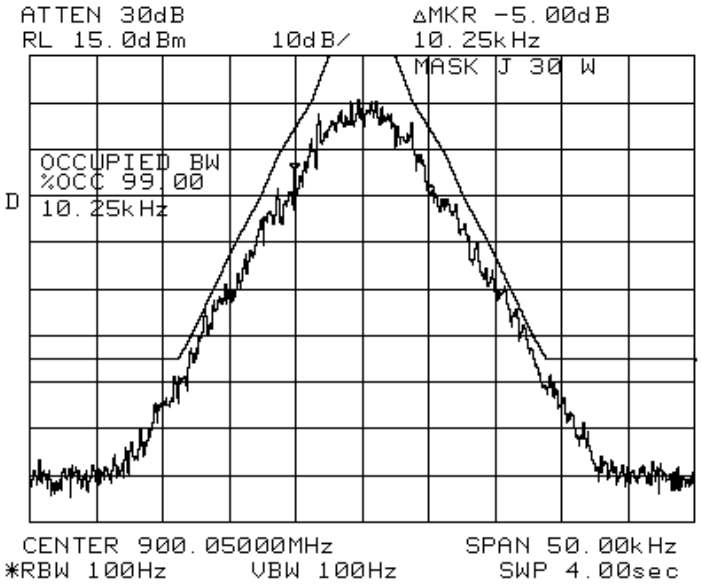
The transmit "test data" pattern command produces a 2047 bit pseudo-random pattern. This pattern is generated by the internal software using the polynomial $X^{11}+X^{9}+1$ form and a 12-bit shift register. Initial value of the register is 111111111110 (FFE hex). The 2047 bit sequence is repeated thereafter as long is necessary to complete the test duration (55 sec). This pattern is applied to the DSP processor data input for encoding and pulse shaping as described above.

NECESSARY BANDWIDTH (Bn) measurement

See Part A0 for emission designator determination.

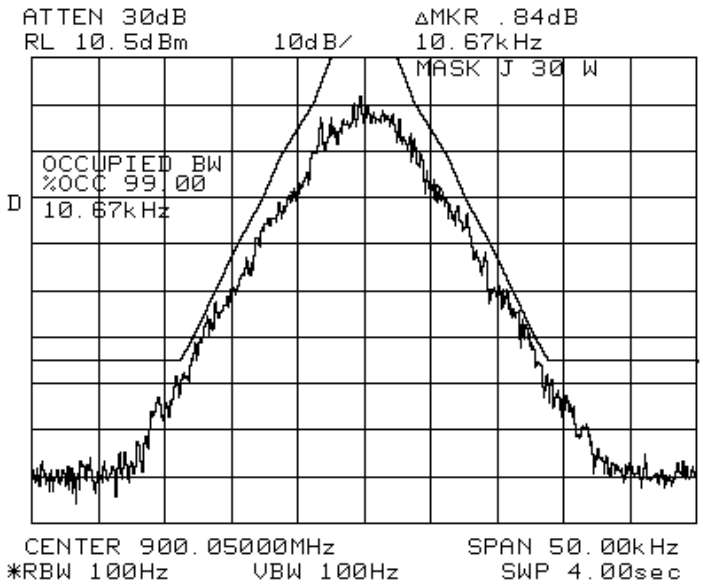
The corresponding emission designator prefix for necessary bandwidth = **10K7**
The corresponding deviation for 16000 Bps is 2.8 KHz
TEST DATA: Refer to the following graphs:

MASK: J , 10K7F1D, 27W
SPECTRUM FOR EMISSION **10K7F1D**
OUTPUT POWER: 27 Watts
16000 bps 4 FSK
PEAK DEVIATION = 2800 Hz
SPAN = 50 kHz



MASK: J, 10K7F1D, 10W

SPECTRUM FOR EMISSION **10K7F1D**
OUTPUT POWER: 10 Watts
16000 bps 4 FSK
PEAK DEVIATION = 2800 Hz
SPAN = 50 KHz



NAME OF TEST: Transmitter Occupied Bandwidth
GEMINI Modem at 19200 bps 4FSK
In Support of Emission Designator **9K92F1D**

RULE PART NUMBER: 2.201, 2.202, 2.1049 (h), 2.1041, 90.209 (b)(5), 90.210 (j)

MINIMUM STANDARD: Mask J
Sidebands and Spurious [Rule 90.210 (j)]
Authorized Bandwidth = 13.6 kHz [Rule 90.209(b) (5)]

Fo to 2.5 kHz	Attenuation = 0 dB
>2.5 kHz to 6.25 kHz	Attenuation= 53*log(f_d KHz /2.5) dB
>6.25 kHz to 9.5kHz	Attenuation = 103 log (f_d/3.9)dB
>9.5kHz	lesser of 50 + 10*log(P) or 157 log (f_d/5.3)
or 70dB	

Corner Points:

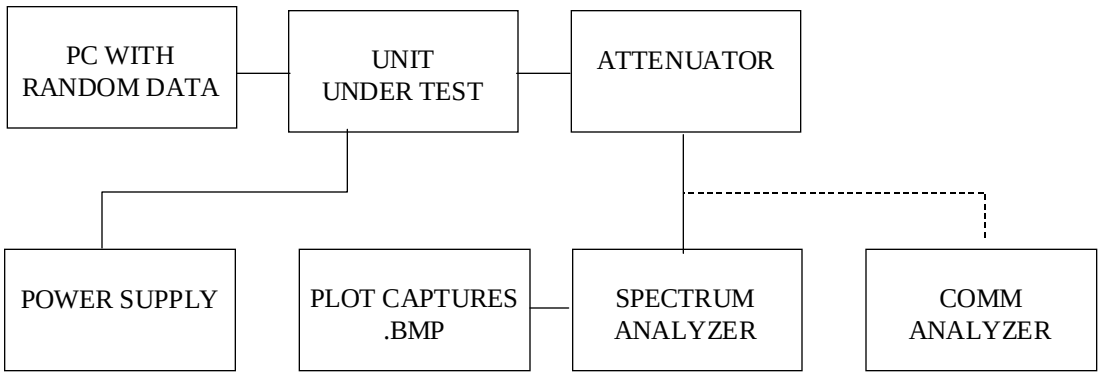
f_0 to 2.5 kHz	Attenuation = 0 dB
>2.5 kHz to 3.8 kHz	Attenuation= 0 dB to 10 dB
>3.8 kHz to 6.25 KHz	Attenuation = 10 dB to 21 dB
>6.25 kHz to 7.6 KHz	Attenuation = 21 dB to 30 dB
>7.6 kHz to 9.5 KHz	Attenuation = 30 dB to 40 dB
>9.5 kHz to 11.2 KHz	Attenuation = 40 dB to51 dB
>11.2 kHz to 13.8kHz	Attenuation = 51 dB to65 dB
>13.8kHz	Attenuation = minimum 65 dB (30W)

UNIT UNDER TEST Prototype#3
TEST RESULTS: Meets minimum standard (see data on the following pages)
TEST CONDITIONS: Standard Test Conditions, 25 C
TEST EQUIPMENT: Attenuator, BIRD Model / 100-A-MFN-30 / 30 dB / 50 Watt
DC Power Supply , Astron Model VS-20M
IFR COM-120B
Spectrum Analyzer, Model HP8563E
HP Benchlink -software for plot captures.

PERFORMED BY:

Sébastien Lafrance DATE:07/19/2002

TEST SET-UP:



NAME OF TEST: Transmitter Occupied Bandwidth (Continued)
GEMINI Modem at 19200 bps
In Support of Emission Designator **9K92F1D**

TX Data Test Pattern:

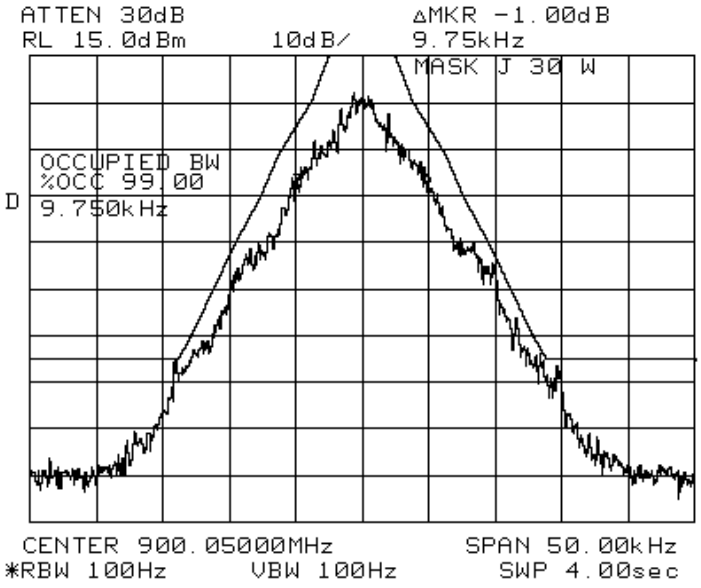
The transmit "test data" pattern command produces a 2047 bit pseudo-random pattern. This pattern is generated by the internal software using the polynomial $X^{11}+X^{9}+1$ form and a 12-bit shift register. Initial value of the register is 111111111110 (FFE hex). The 2047 bit sequence is repeated thereafter as long is necessary to complete the test duration (55 sec). This pattern is applied to the DSP processor data input for encoding and pulse shaping as described above.

NECESSARY BANDWIDTH (Bn) measurement

See Part A0 for emission designator determination.

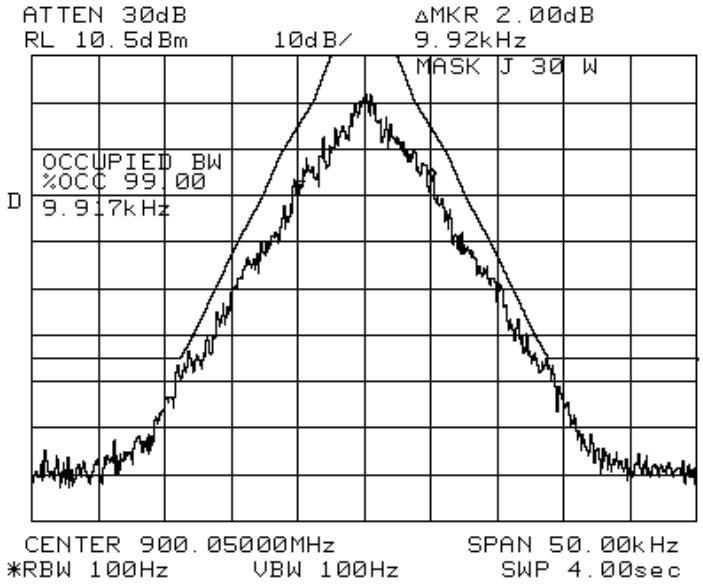
The corresponding emission designator prefix for necessary bandwidth = **9K92**
The corresponding deviation for 19200 Bps is 2.25 KHz
TEST DATA: Refer to the following graphs:

MASK: J , 9K92F1D, 27W
SPECTRUM FOR EMISSION **9K92F1D**
OUTPUT POWER: 27 Watts
19200 bps 4 FSK
PEAK DEVIATION = 2250 Hz
SPAN = 50 kHz



MASK: J, 9K92F1D, 10W

SPECTRUM FOR EMISSION **9K92F1D**
OUTPUT POWER: 10 Watts
19200 bps 4 FSK
PEAK DEVIATION = 2250 Hz
SPAN = 50 KHz



NAME OF TEST: Transmitter Occupied Bandwidth
GEMINI Modem at 9600 bps DGMSK
In Support of Emission Designator **10K2F1D**

RULE PART NUMBER: 2.201, 2.202, 2.1049 (h), 2.1041, 90.209 (b)(5), 90.210 (j)

MINIMUM STANDARD: Mask J
Sidebands and Spurious [Rule 90.210 (j)]
Authorized Bandwidth = 13.6 kHz [Rule 90.209(b) (5)]

Fo to 2.5 kHz	Attenuation = 0 dB
>2.5 kHz to 6.25 kHz	Attenuation= 53*log(f_d KHz /2.5) dB
>6.25 kHz to 9.5kHz	Attenuation = 103 log (f_d/3.9)dB
>9.5kHz	lesser of 50 + 10*log(P) or 157 log (f_d/5.3)
or 70dB	

Corner Points:

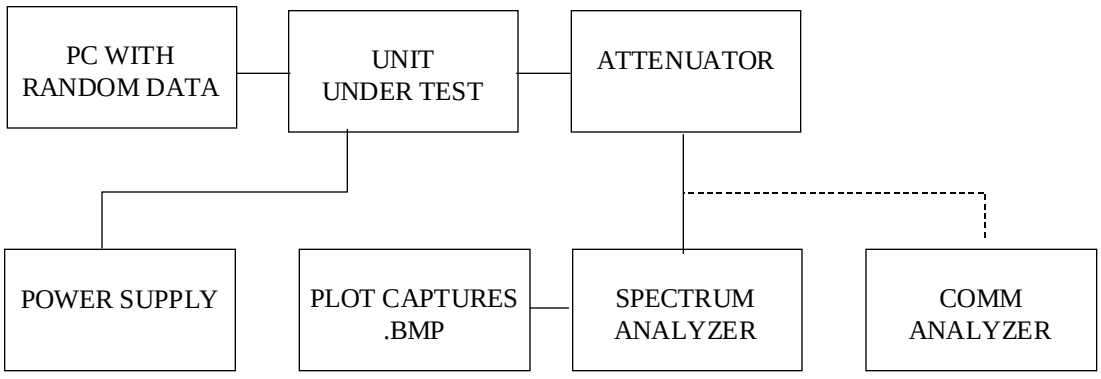
f_0 to 2.5 kHz	Attenuation = 0 dB
>2.5 kHz to 3.8 kHz	Attenuation= 0 dB to 10 dB
>3.8 kHz to 6.25 KHz	Attenuation = 10 dB to 21 dB
>6.25 kHz to 7.6 KHz	Attenuation = 21 dB to 30 dB
>7.6 kHz to 9.5 KHz	Attenuation = 30 dB to 40 dB
>9.5 kHz to 11.2 KHz	Attenuation = 40 dB to51 dB
>11.2 kHz to 13.8kHz	Attenuation = 51 dB to65 dB
>13.8kHz	Attenuation = minimum 65 dB (30W)

UNIT UNDER TEST Prototype#3
TEST RESULTS: Meets minimum standard (see data on the following pages)
TEST CONDITIONS: Standard Test Conditions, 25 C
TEST EQUIPMENT: Attenuator, BIRD Model / 100-A-MFN-30 / 30 dB / 50 Watt
DC Power Supply , Astron Model VS-20M
IFR COM-120B
Spectrum Analyzer, Model HP8563E
HP Benchlink -software for plot captures.

PERFORMED BY:

Sébastien Lafrance DATE:07/19/2002

TEST SET-UP:



NAME OF TEST: Transmitter Occupied Bandwidth (Continued)
GEMINI Modem at 9600 bps DGMSK
In Support of Emission Designator **10K2F1D**

TX Data Test Pattern:

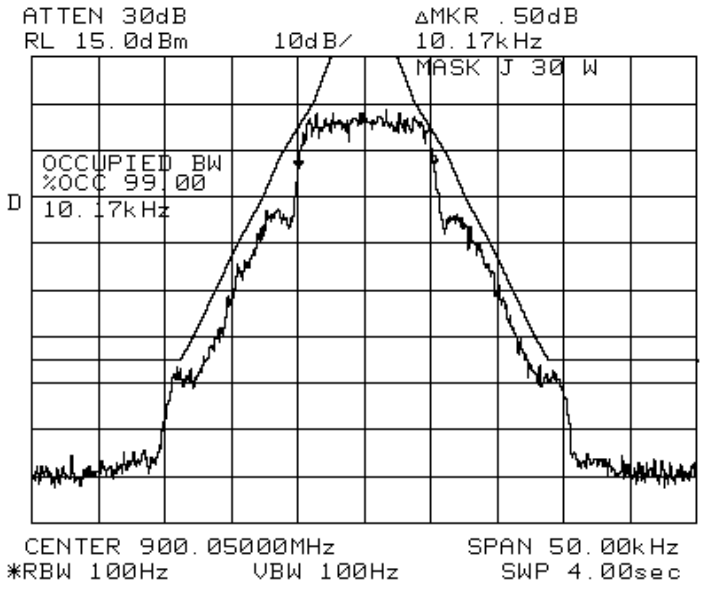
The transmit "test data" pattern command produces a 2047 bit pseudo-random pattern. This pattern is generated by the internal software using the polynomial $X^{11}+X^{9}+1$ form and a 12-bit shift register. Initial value of the register is 111111111110 (FFE hex). The 2047 bit sequence is repeated thereafter as long is necessary to complete the test duration (55 sec). This pattern is applied to the DSP processor data input for encoding and pulse shaping as described above.

NECESSARY BANDWIDTH (Bn) measurement

See Page 10 for emission designator determination.

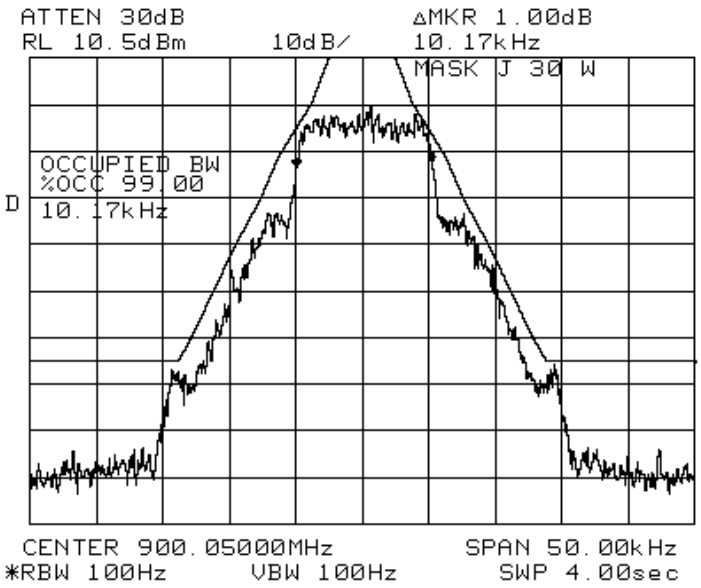
The corresponding emission designator prefix for necessary bandwidth = **10K2**
The corresponding deviation for 9600 Bps is 3.94 KHz
TEST DATA: Refer to the following graphs:

MASK: J , 10K2F1D, 27W
SPECTRUM FOR EMISSION **10K2F1D**
OUTPUT POWER: 27 Watts
9600 bps DGMSK
PEAK DEVIATION = 3940 Hz
SPAN = 50 kHz



MASK: J, 10K2F1D, 10W

SPECTRUM FOR EMISSION **10K2F1D**
OUTPUT POWER: 10 Watts
9600 bps DGMSK
PEAK DEVIATION = 3940 Hz
SPAN = 50 kHz



NAME OF TEST: Transmitter Occupied Bandwidth
GEMINI Modem at 8000Bps DGMSK
In Support of Emission Designator **8K75F1D**

RULE PART NUMBER: 2.201, 2.202, 2.1049 (h), 2.1041, 90.209 (b)(5), 90.210 (j)

MINIMUM STANDARD: Mask J
Sidebands and Spurious [Rule 90.210 (j)]
Authorized Bandwidth = 13.6 kHz [Rule 90.209(b) (5)]

Fo to 2.5 kHz	Attenuation = 0 dB
>2.5 kHz to 6.25 kHz	Attenuation= 53*log(f_d KHz /2.5) dB
>6.25 kHz to 9.5kHz	Attenuation = 103 log (f_d/3.9)dB
>9.5kHz or 70dB	lesser of 50 + 10*log(P) or 157 log (f_d/5.3)

Corner Points:

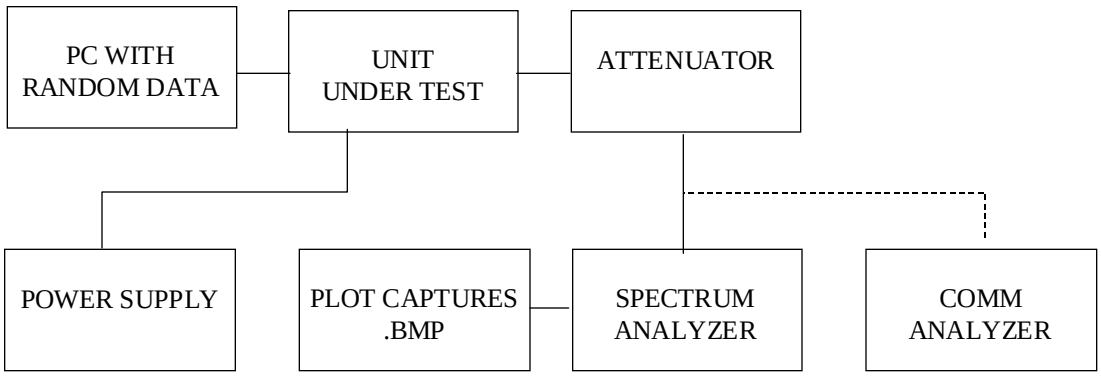
f_0 to 2.5 kHz	Attenuation = 0 dB
>2.5 kHz to 3.8 kHz	Attenuation= 0 dB to 10 dB
>3.8 kHz to 6.25 KHz	Attenuation = 10 dB to 21 dB
>6.25 kHz to 7.6 KHz	Attenuation = 21 dB to 30 dB
>7.6 kHz to 9.5 KHz	Attenuation = 30 dB to 40 dB
>9.5 kHz to 11.2 KHz	Attenuation = 40 dB to51 dB
>11.2 kHz to 13.8kHz	Attenuation = 51 dB to65 dB
>13.8kHz	Attenuation = minimum 65 dB (30W)

UNIT UNDER TEST Prototype#3
TEST RESULTS: Meets minimum standard (see data on the following pages)
TEST CONDITIONS: Standard Test Conditions, 25 C
TEST EQUIPMENT: Attenuator, BIRD Model / 100-A-MFN-30 / 30 dB / 50 Watt
DC Power Supply , Astron Model VS-20M
IFR COM-120B
Spectrum Analyzer, Model HP8563E
HP Benchlink -software for plot captures.

PERFORMED BY:

Sébastien Lafrance DATE:07/19/2002

TEST SET-UP:



NAME OF TEST: Transmitter Occupied Bandwidth (Continued)
GEMINI Modem at 8000 bps DGMSK
In Support of Emission Designator **8K75F1D**

TX Data Test Pattern:

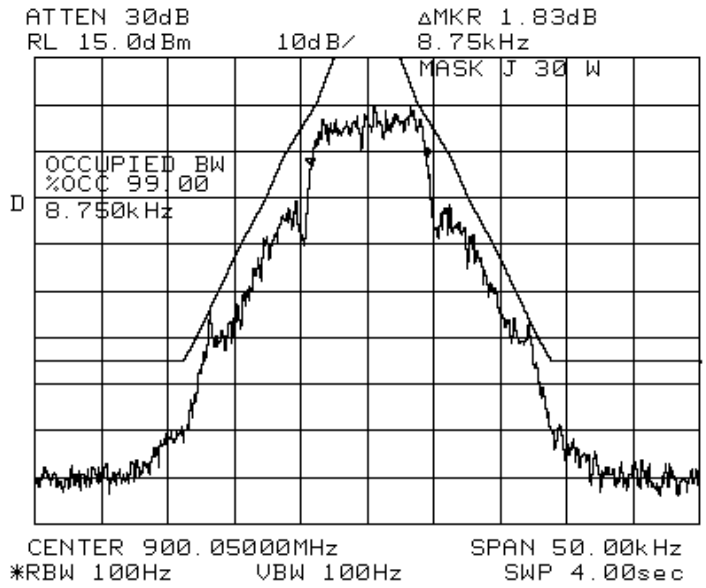
The transmit "test data" pattern command produces a 2047 bit pseudo-random pattern. This pattern is generated by the internal software using the polynomial $X^{11}+X^{9}+1$ form and a 12-bit shift register. Initial value of the register is 111111111110 (FFE hex). The 2047 bit sequence is repeated thereafter as long is necessary to complete the test duration (55 sec). This pattern is applied to the DSP processor data input for encoding and pulse shaping as described above.

NECESSARY BANDWIDTH (Bn) measurement

See Page 10 for emission designator determination.

The corresponding emission designator prefix for necessary bandwidth = **8K75**
The corresponding deviation for 8000 is 3.28 KHz
TEST DATA: Refer to the following graphs:

MASK: J , 8K75F1D, 27W
SPECTRUM FOR EMISSION **8K75F1D**
OUTPUT POWER: 27 Watts
8000 bps DGMSK
PEAK DEVIATION = 3280 Hz
SPAN = 50 kHz



MASK: J, 8K75F1D, 10W

SPECTRUM FOR EMISSION **8K75F1D**
OUTPUT POWER: 10 Watts
8000 bps DGMSK
PEAK DEVIATION = 3280 Hz
SPAN = 50 kHz