Honeywell

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November 29, 2001
5150-0111-1896

Federal Communications Commission
Equipment Approval Services
P.O. Box 358315
Pittsburgh, PA 15251-5313

Subject: HP-700 FCC Type Acceptance Report Data (Non-Confidential)

Dear Sir or Madam:

The enclosed information is being furnished to support FCC Type Certification of the HP-700 High Power Amplifier, P/N 7516251. This information which comprises primarily the applicable test data has been extracted from the FCC Type Acceptance Report, Honeywell document EB7516254. This letter and accompanying information is being submitted as exhibit type Test Report.

Please note that in spite of the Proprietary Notice contained on the front page of the referenced report, only those pages that are non-confidential and relevant to this FCC application are contained herein.

Regards,

Charles L. Dosdall

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5353 W. Bell Road
Glendale, AZ 8530

6. TEST PROCEDURES AND DATA

TEST PROCEDURES AND DATA: TEST NO: 1

1.0 DESCRIPTION OF TEST: Output Power

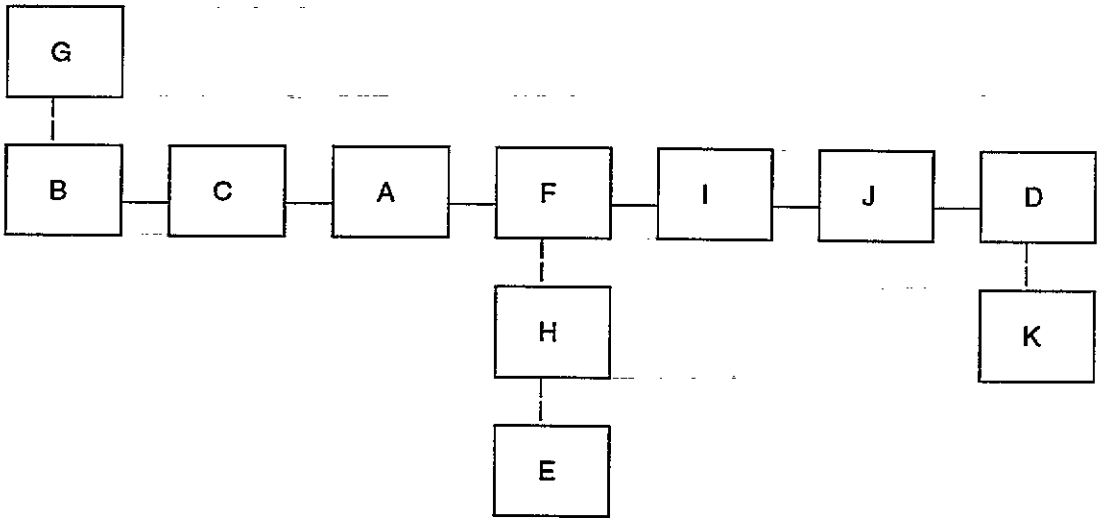
2.0 SPECIFICATIONS: 47 CFR 87.131
47 CFR 2.985a
47 CFR 2.985c

3.0 EQUIPMENT REQUIRED:

	TYPE	MANUFACTURER	MODEL	SER. NO.
A	High Power Amplifier	Honeywell	HP700	97110006
B	Satellite Data Unit	Honeywell	SD600	95040674
C	20 dB Attenuator	Narda	757-20	-
D	Spectrum Analyzer	Hewlett Packard	8566B	AV55142
E	Power Meter	Hewlett Packard	438B	AV53490
F	Directional Coupler	Narda	3242B-20	-
G	Terminal (PC)	Dell w/ Procom	-	-
H	20 dB Attenuator	Narda	766-20	-
I	30 dB Attenuator	Weinschel Eng.	4830-33	-
J	Diplexer/LNA	Com Atlantic	P/N 103624	S/N 1690116
K	Plotter	Hewlett Packard	7475A	AV58285

TEST PROCEDURES AND DATA: TEST NO: 1

4.0 BLOCK DIAGRAM OF TEST SETUP:



TEST PROCEDURES AND DATA: TEST NO: 1

5.0 PROCEDURE:

1. Connect the equipment as shown in the block diagram in Section 4.0 of test number 1.
2. Using the terminal set the SDU back-off attenuator to 0 dB. (This is the nominal back-off setting.)
3. Using the terminal set the SDU to transmit a CW carrier on channel 1 at 1643.6075 MHz. (This frequency selection puts the SDU on the middle of the SAW filter band).
4. Using the terminal set the HPA back-off attenuator to produce 3.5 dBm $\pm$ 0.5 dB level on power meter. (This level corresponds to 25 W $\pm$ 5 W at the HPA RF connector.) Record this reading.
5. Using the Qume terminal set the channel frequency to 1626.7225 MHz and record the power reading.
6. Using the Qume terminal set the channel frequency to 1656.9865 MHz and record the power reading.
7. Repeat steps 3 through 6 for channel number two and three.

NOTE: The total L-band loss between HPA TX port and the power meter is 40.5 dB. This includes the insertion loss of the attenuator and the cable loss of the SATCOM Qual Rack.

NOTE: The primary input power voltage tolerance is 115V $\pm$ 10 percent and the frequency tolerance is 400 Hz $\pm$ 2 percent.

6.0 DATA

FREQUENCY [MHz]	OUTPUT POWER [dBm]		
	CHANNEL 1	CHANNEL 2	CHANNEL 3
1626.7225	43.70	43.60	43.20
1643.6075	44.00	44.00	44.00
1659.9865	42.30	43.40	43.00

TEST PERFORMED BY: S. L. DeWell DATE: 6-12-98

TEST PROCEDURES AND DATA: TEST NO: 1

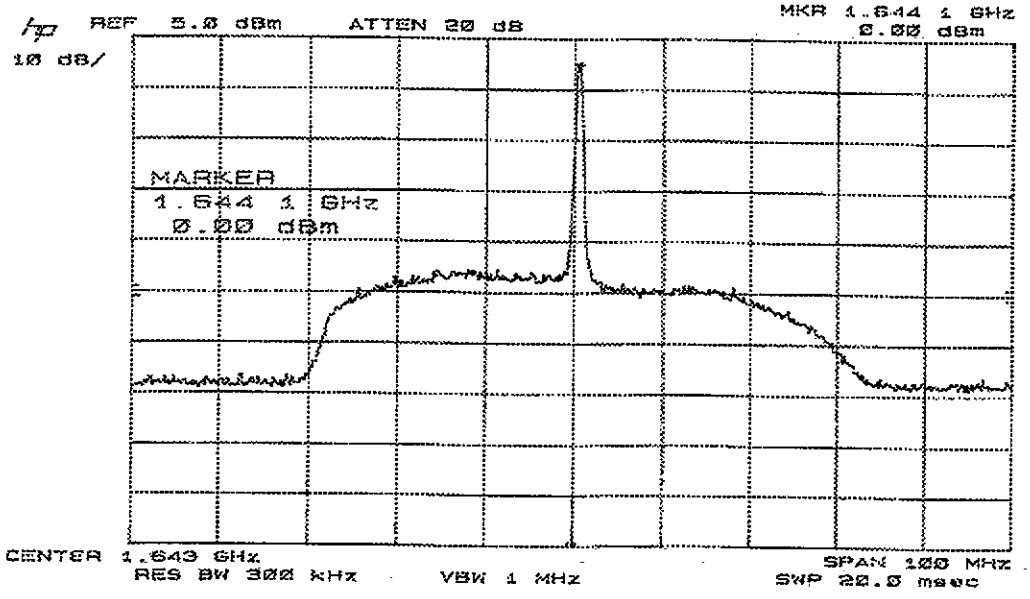


Figure 6-1. Channel 1 Power Output Mid Band

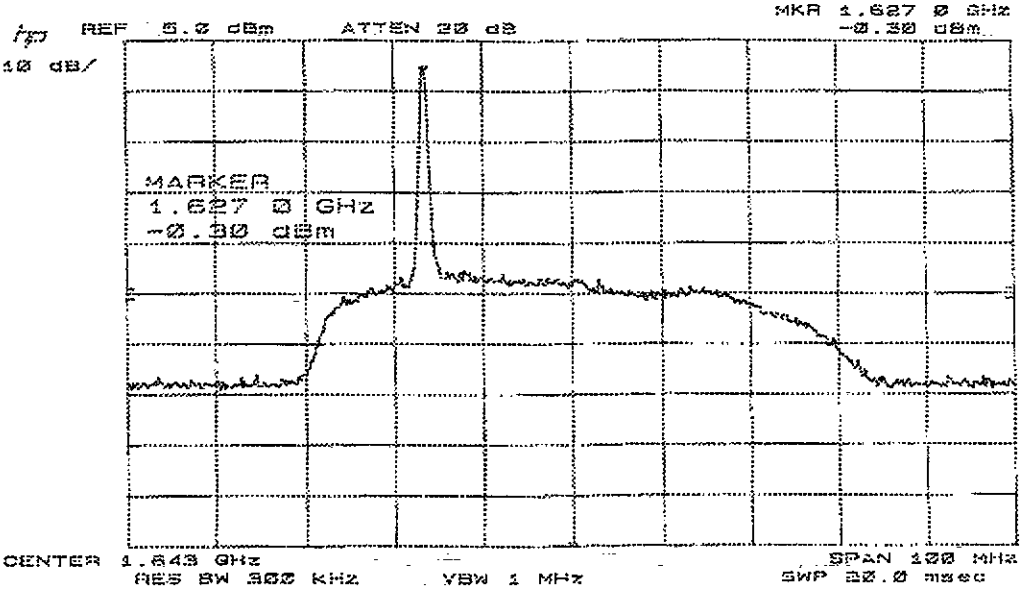


Figure 6-2. Channel 1 Power Output Low Band

TEST PROCEDURES AND DATA: TEST NO: 1

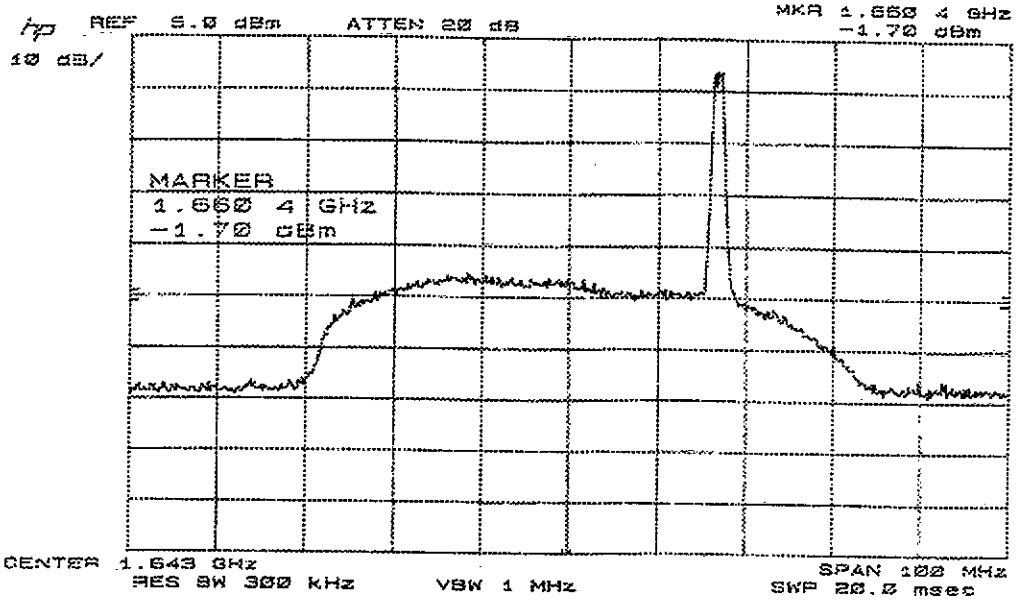


Figure 6-3. Channel 1 Power Output High Band

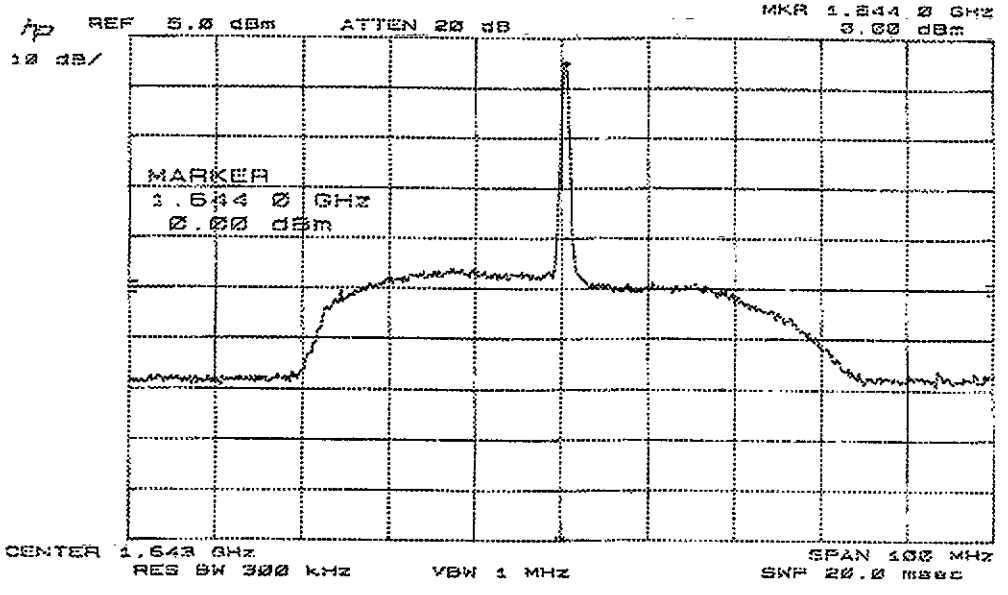


Figure 6-4. Channel 2 Power Output Mid Band

TEST PROCEDURES AND DATA: TEST NO: 1

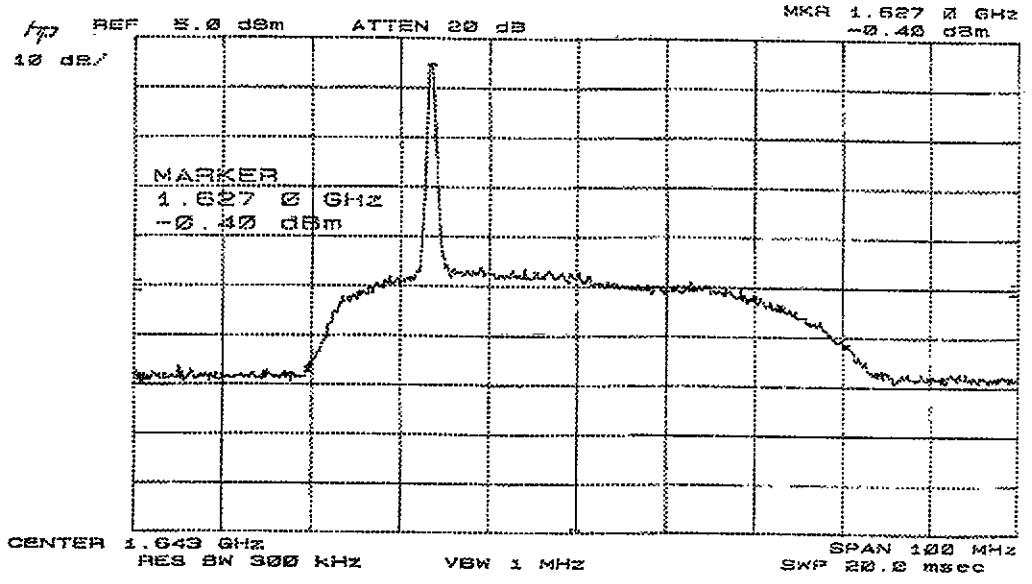


Figure 6-5. Channel 2 Power Output Low Band

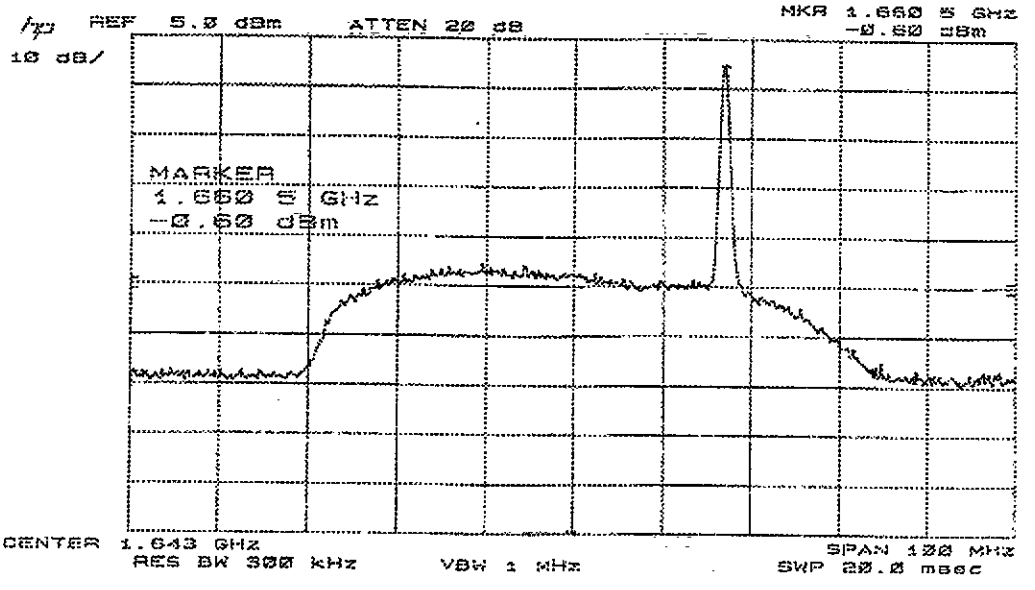


Figure 6-6. Channel 2 Power Output High Band

TEST PROCEDURES AND DATA: TEST NO: 1

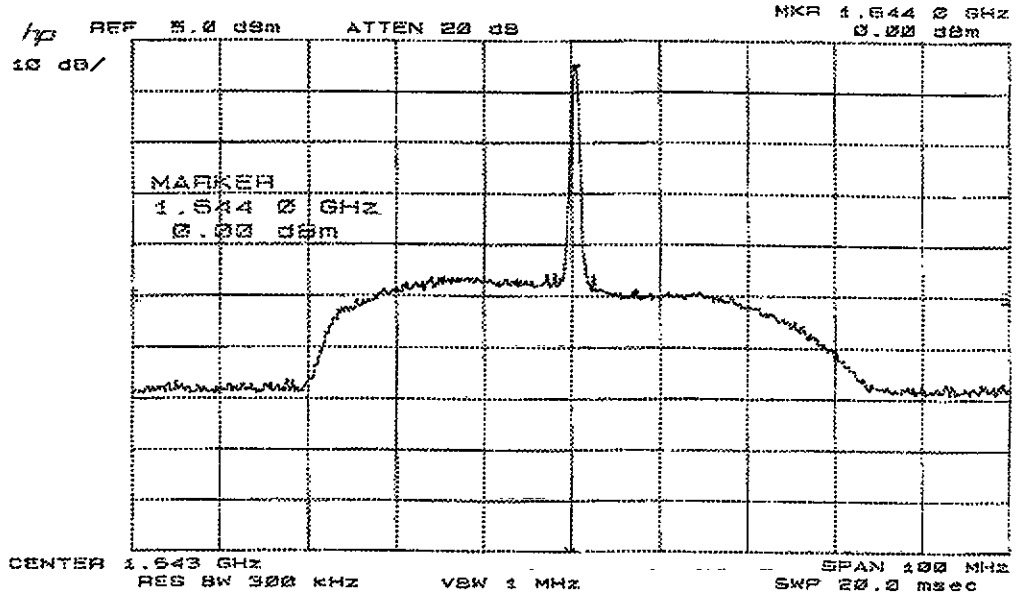


Figure 6-7. Channel 3 Power Output Mid Band

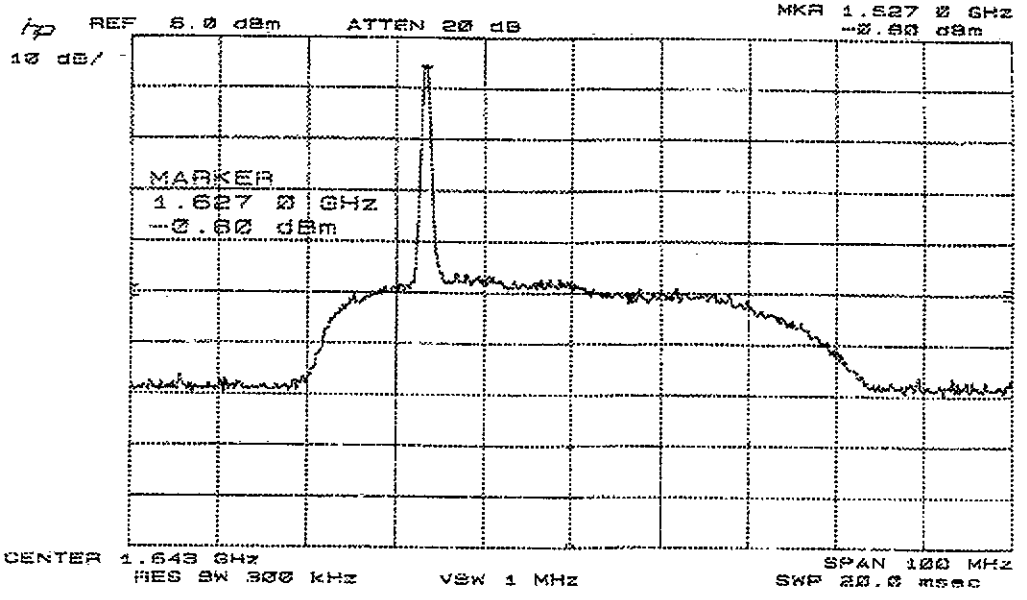


Figure 6-8. Channel 3 Power Output Low Band

TEST PROCEDURES AND DATA: TEST NO: 1

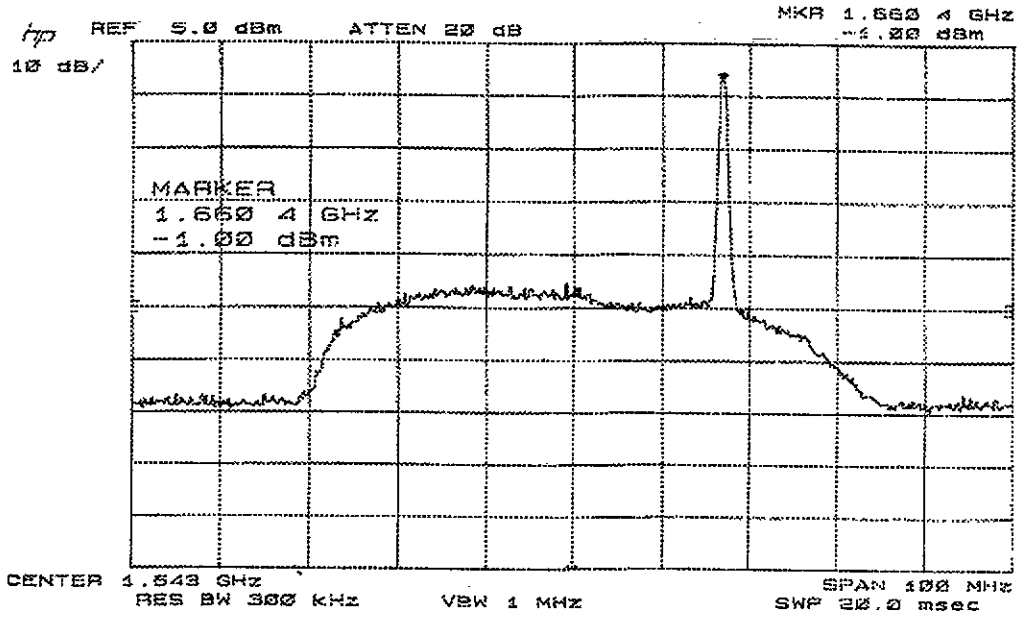


Figure 6-9. Channel 3 Power Output High Band

TEST PROCEDURES AND DATA: TEST NO: 2

1.0 DESCRIPTION OF TEST: Frequency Stability (Temperature)

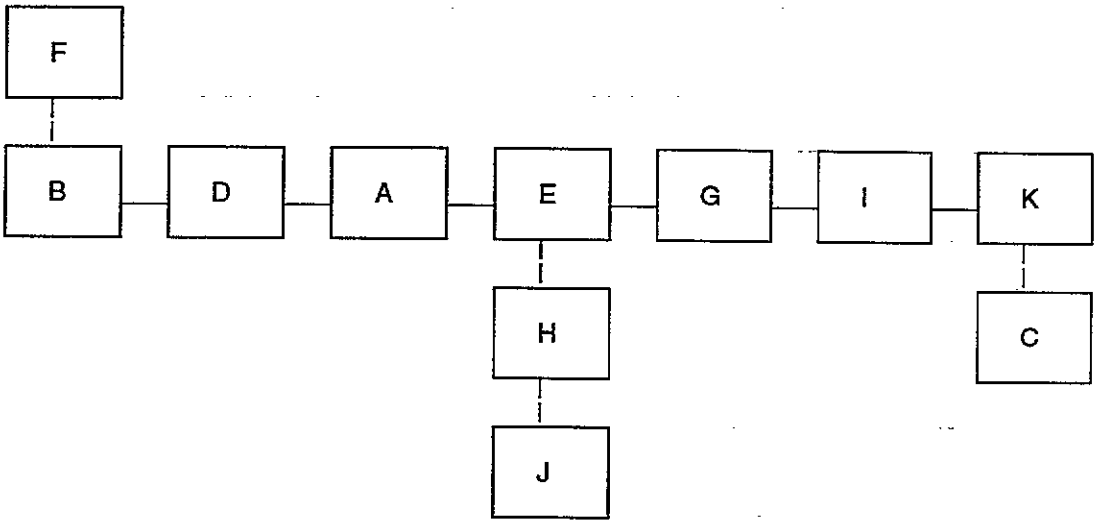
2.0 SPECIFICATIONS: 47 CFR 87.133
47 CFR 2.995a

3.0 EQUIPMENT REQUIRED:

	TYPE	MANUFACTURER	MODEL	SER. NO.
A	High Power Amplifier	Honeywell	HP700	97110006
B	Satellite Data Unit	Honeywell	SD600	95040674
C	Microwave Counter	Hewlett Packard	5361A	AV55635
D	20 dB Attenuator	Narda	757-20	-
E	Directional Coupler	Narda	3242B-20	-
F	Terminal (PC)	Dell w/Procom	-	-
G	20 dB Attenuator	Narda	756-20	-
H	20 dB Attenuator	Narda	756-20	-
I	20 dB Attenuator	Narda	766-20	-
J	Power Meter	Hewlett Packard	435B	AV53490
K	Diplexer/LNA	Com Atlantic	P/N 103624	S/N 1690116

TEST PROCEDURES AND DATA: TEST NO: 2

4.0 BLOCK DIAGRAM OF TEST SETUP:



TEST PROCEDURES AND DATA: TEST NO: 2

5.0 PROCEDURE:

1. Connect the equipment with the exception of the frequency counter as shown in the block diagram in Section 4.0 of test number 2.
2. Using the terminal set the SDU back-off attenuator to 0 dB. (This is the nominal back-off setting.)
3. Using the terminal set the SDU to transmit a CW carrier on channel 1 at 1643.5 MHz.
4. Using the terminal set the HPA back-off attenuator for -3.5 dBm amplitude on the power meter. (This corresponds to 5W output power at the HPA RF port).
5. Connect the frequency counter as shown in section 4.0 of test number 2.
6. Feeding a LORAN-C generated 10 MHz signal to the external reference input of the Microwave Frequency Counter (Equipment "E") measure the output frequency.
7. Repeat steps 3 and 4 with 1626.5 and 1660.5 MHz frequencies selected.
8. Repeat steps 3, 4 and 5 at -55 °C and at +70 °C.

TEST PROCEDURES AND DATA: TEST NO: 2

6.0 DATA

TEMP [°C]	MEASURED FREQUENCY WITH 1626.5 MHz SELECTED	MEASURED FREQUENCY WITH 1643.5 MHz SELECTED	MEASURED FREQUENCY WITH 1660.5 MHz SELECTED
-55	1626499976 Hz	1643499974 Hz	1660499973 Hz
-45	1626499977 Hz	1643499976 Hz	1660499975 Hz
-35	1626499978 Hz	1643499977 Hz	1660499976 Hz
-25	1626499980 Hz	1643499979 Hz	1660499977 Hz
-15	1626499981 Hz	1643499975 Hz	1660499978 Hz
-5	1626499977 Hz	1643499970 Hz	1660499973 Hz
5	1626499975 Hz	1643499976 Hz	1660499971 Hz
+15	1626499973 Hz	1643499973 Hz	1660499968 Hz
+25	1626499925 Hz	1643499923 Hz	1660499921 Hz
+35	1626499968 Hz	1643499967 Hz	1660499963 Hz
+45	1626499959 Hz	1643499960 Hz	1660499956 Hz
+55	1626499955 Hz	1643499953 Hz	1660499950 Hz
+65	1626499948 Hz	1643499945 Hz	1660499945 Hz
+70	1626499923 Hz	1643499921Hz	1660499919 Hz

Maximum deviation: 81 Hz

Acceptance limit: 320 Hz

TEST PERFORMED BY: Steve DeWell DATE: 6-12-98

TEST PROCEDURES AND DATA: TEST NO: 3

1.0 DESCRIPTION OF TEST: Frequency Stability (input power)

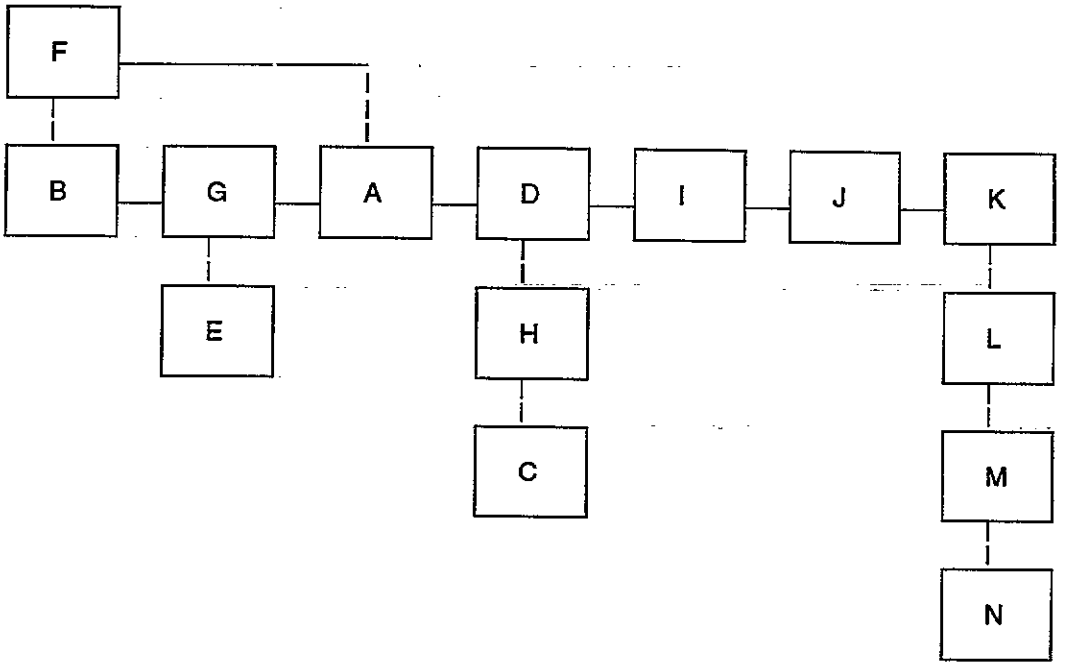
2.0 SPECIFICATIONS: 47 CFR 87.133
47 CFR 2.995a

3.0 EQUIPMENT REQUIRED:

	TYPE	MANUFACTURER	MODEL	SER. NO.
A	High Power Amplifier	Honeywell	HP700	97110006
B	Satellite Data Unit	Honeywell	SD600	93040109
C	Power Meter	Hewlett Packard	435B	AV53490
D	Directional Coupler	Narda	3242B-20	-
E	Terminal (PC)	Dell w/Procom	-	-
F	Power Supply	Invertron	1501	-
G	20 dB Attenuator	Narda	757-20	-
H	20 dB Attenuator	Narda	766-20	-
I	20 dB Attenuator	Narda	765-20	-
J	20 dB Attenuator	Narda	765-20	-
K	Diplexer/LNA	COM Atlantic	P/N 103624	S/N 1690116
L	3 dB Attenuator	Narda	768-3	-
M	3 dB Attenuator	Narda	768-3	-
N	Microwave Counter	Hewlett Packard	5361A	AV55635

TEST PROCEDURES AND DATA: TEST NO: 3

4.0 BLOCK DIAGRAM OF TEST SETUP:



TEST PROCEDURES AND DATA: TEST NO: 3

5.0 PROCEDURE:
Frequency versus input power voltage and frequency:

1. Connect the equipment with the exception of the frequency counter as shown in the block diagram in Section 4.0 of test number 3.
2. Using the terminal set the SDU back-off attenuator to 0 dB. (This is the nominal back-off setting.)
3. Using the terminal set the SDU to transmit a CW carrier on channel 1 at 1643.5 MHz.
4. Using the terminal set the HPA back-off attenuator to produce -3.5 dBm amplitude on the power meter. (This corresponds to 5 W output power at the HPA RF port).
5. Connect back the frequency counter as shown in section 4.0 of test number 3.
6. Feeding a LORAN-C generated 10 MHz signal to the external reference input of the Microwave Frequency Counter (equipment "E") measure the output frequency with the input voltages and frequencies shown below.
7. Repeat the procedure for channel two and three. Frequencies selected.

6.0 DATA

POWER SUPPLY VOLT. [V_{RMS}]	POWER SUPPLY FREQ. [Hz]	FREQUENCY [Hz]		
		CHANNEL 1	CHANNEL 2	CHANNEL 3
103.5	392	1643 499 947	1643 499 947	1643 499 947
103.5	408	1643 499 949	1643 499 949	1643 499 949
126.5	392	1643 499 949	1643 499 949	1643 499 949
126.5	408	1643 499 950	1643 499 950	1643 499 950

TEST PERFORMED BY: [signature] DATE: 6-12-98

TEST PROCEDURES AND DATA: TEST NO: 4

1.0 DESCRIPTION OF TEST: Occupied Bandwidth

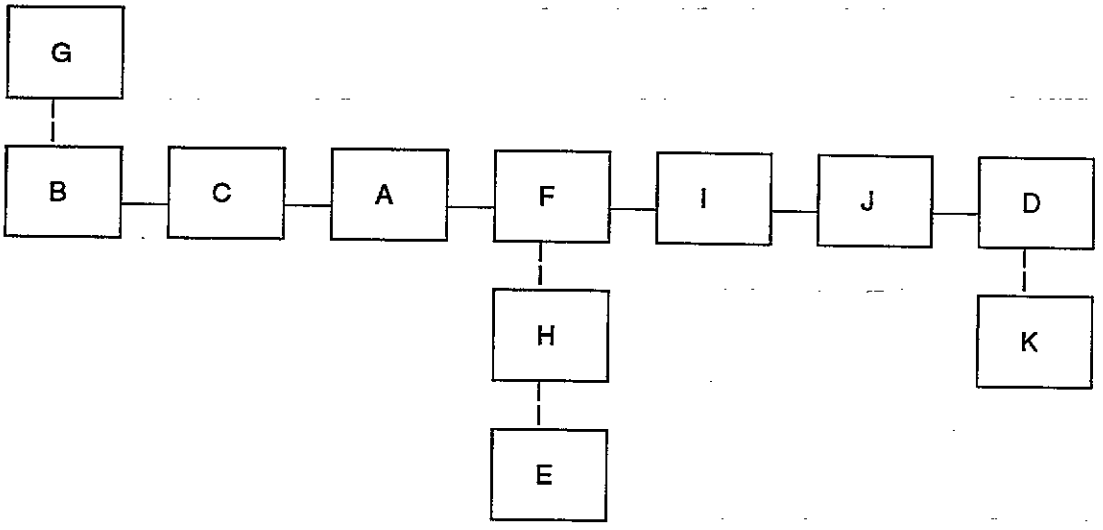
2.0 SPECIFICATIONS: 47 CFR 87.1337
47 CFR 2.989

3.0 EQUIPMENT REQUIRED:

	TYPE	MANUFACTURER	MODEL	SER. NO.
A	High Power Amplifier	Honeywell	HP700	97110006
B	Satellite Data Unit	Honeywell	SD600	95040674
C	20 dB Attenuator	Narda	757-20	-
D	Spectrum Analyzer	Hewlett Packard	8566B	AV55142
E	Power Meter	Hewlett Packard	438B	AV53490
F	Directional Coupler	Narda	3242B-20	-
G	Terminal (PC)	Dell w/ Procom	-	-
H	20 dB Attenuator	Narda	766-20	-
I	30 dB Attenuator	Weinschel Eng.	4830-33	-
J	Diplexer/LNA	Com Atlantic	P/N 103624	S/N 1690116
K	Plotter	Hewlett Packard	7475A	AV58285

TEST PROCEDURES AND DATA: TEST NO: 4

4.0 BLOCK DIAGRAM OF TEST SETUP:



TEST PROCEDURES AND DATA: TEST NO: 4

5.0 PROCEDURE:

1. Set the spectrum analyzerto 100 kHz span, 1643.5 MHz center frequency, 10 dB/division, 1 kHz resolution BW and 30 kHz video bandwidth.
2. Connect the equipment a shown in block diagram in Section 4 of test number 4.
3. Using the terminal set the SDU back-off attenuator to 0 dB. (This is the nominal back-off setting.)
4. Using the terminal set the SDU to transmit a CW carrier on channel 1 at 1643.5 MHz.
5. Using the terminal set the HPA back-off attenuator to produce 3.5 dBm on the power meter. This level equals 25.1 W at the HPA RF antenna port.
6. Using the terminal, set the SDU to transmit a 1643.5 MHz on C-Channel (21 kps). This will yield the widest bandwidth in the transmit spectrum due to the highest bit rate.

   Capture the spectrum analyzers display and with numerical integration calculate the energy distribution.

   The results of the integration is shown on the page following the spectrum of the signal. The frequency column indicated the frequency distance from the spectrum center. P/L [dBm] column lists the amplitude in the lower band (i.e. below the center), while P/U [dBm] is for the upper band. The "% Power in band" column shows the power distribution in percent for the total power in the frequency band.

   First spectrum: Channel 1, C-Channel, 21 kbps, 25.1

   Second spectrum: Channel 1, P-Channel, 600 bps, 25.1

   Third spectrum: Channel 1, P-Channel, 12 kbps, 25.1

   Fourth spectrum: Channel 1, P-Channel, 10.5 kbps, 25.1

   Frequency for all conditions: 1643.5

6.0 DATA

The data is presented on the following pages of this test:

Limit: 25 kHz

TEST PROCEDURES AND DATA: TEST NO: 4

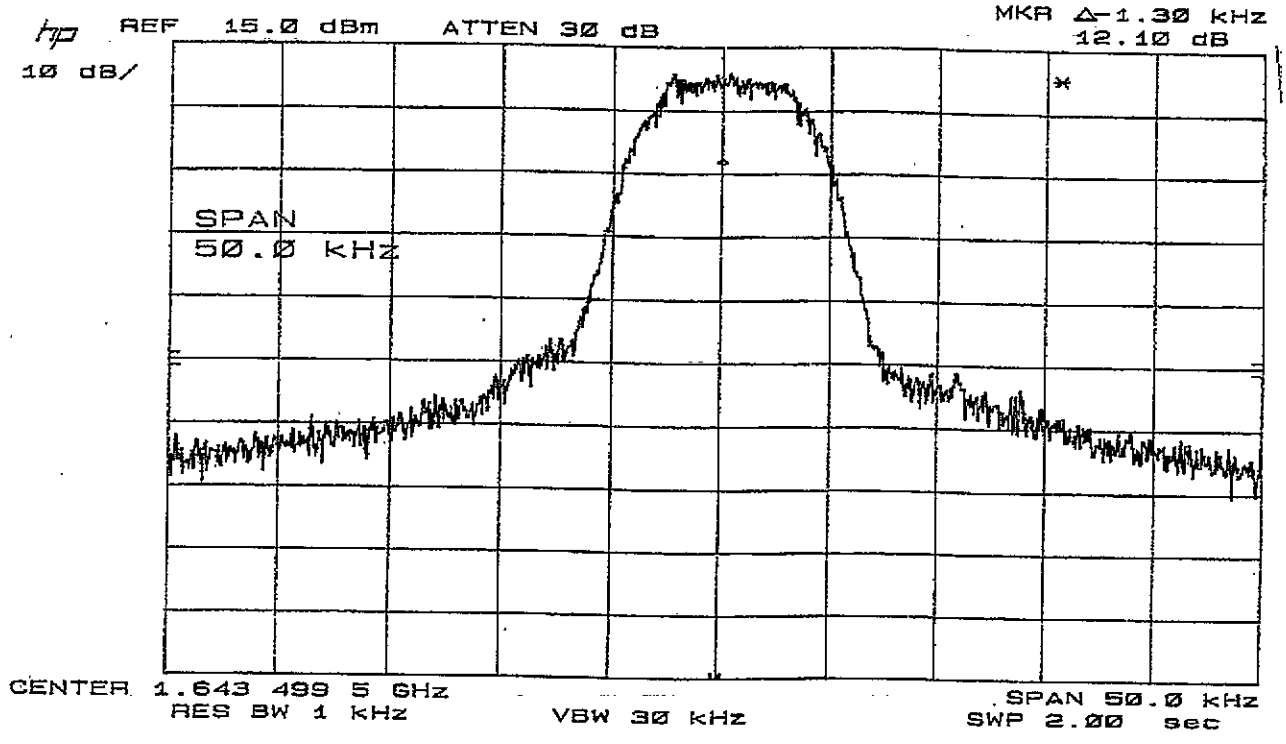


Figure 6-10. Channel 1, C-Channel, 21 kbps, 25.1 W

TEST PROCEDURES AND DATA: TEST NO: 4

Channel 1, C Channel, 21 kbps, 25.1 Watts

FREQUENCY FROM CENTER AND POWER LEVELS				FREQUENCY FROM CENTER AND POWER LEVELS			
kHz	P/U (dBm)	P/L (dBm)	% P	kHz	P/U (dBm)	P/L (dBm)	% P
±0	6.8	6.8	-	±36	-53.5	-54.4	100
±1	6.6	6.8	2.1	±37	-53.3	-52.8	100
±2	7.4	7.6	22.2	±38	-54.5	-54.4	100
±3	5.2	6.2	46.2	±39	-53.7	-56.1	100
±4	3.7	5.4	62.2	±40	-54.4	-52.5	100
±5	3.9	2.0	74.7	±41	-53.5	-54.5	100
±6	1.7	4.0	83.3	±42	-55.0	-55.5	100
±7	1.0	0.0	91.8	±43	-54.8	-54.3	100
±8	-2.1	-4.7	96.7	±44	-53.4	-55.8	100
±9	-7.4	-4.4	98.7	±45	-54.7	-54.9	100
±10	-17.4	-15.7	99.9	±46	-55.8	-54.5	100
±11	-33.4	-26.0	100	±47	-52.8	-55.9	100
±12	-41.4	-27.7	100	±48	-54.1	-54.7	100
±13	-42.9	-40.8	100	±49	-54.2	-53.7	100
±14	-42.9	-39.8	100				
±15	-43.7	-40.6	100				
±16	-43.4	-40.0	100				
±17	-43.4	-40.4	100				
±18	-45.3	-42.5	100				
±19	-46.1	-44.3	100				
±20	-46.2	-46.1	100				
±21	-45.1	-44.4	100				
±22	-45.9	-45.9	100				
±23	-47.4	-46.3	100				
±24	-48.1	-48.6	100				
±25	-50.2	-48.6	100				
±26	-49.4	-50.1	100				
±27	-50.8	-51.4	100				
±28	-51.2	-49.0	100				
±29	-51.6	-50.8	100				
±30	-54.6	-52.2	100				
±31	-49.8	-53.2	100				
±32	-52.7	-52.4	100				
±33	-53.8	-51.5	100				
±34	-53.8	-52.1	100				
±35	-55.5	-53.2	100				

TEST PERFORMED BY: _____ DATE: 6-12-95

TEST PROCEDURES AND DATA: TEST NO: 4

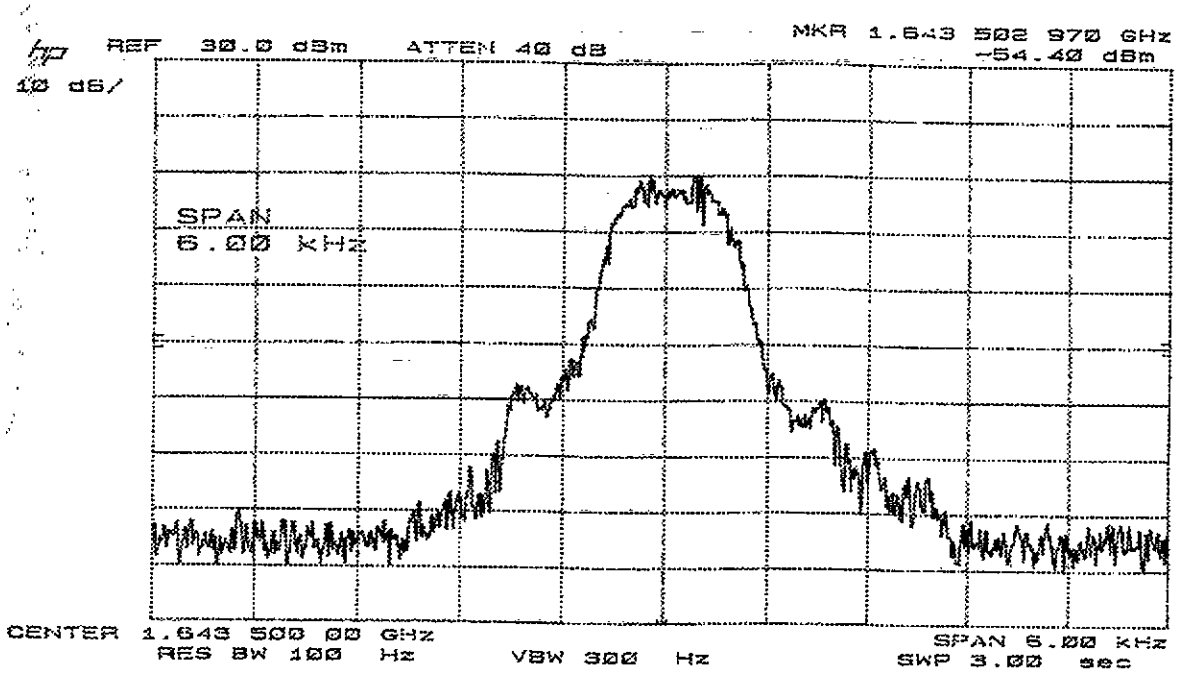


Figure 6-11. Channel 1, P-Channel, 600 bps, 25.1 W

TEST PROCEDURES AND DATA: TEST NO: 4

Channel 1, P Channel, 600bps, 25.1 Watts

FREQUENCY FROM CENTER (Hz)	P/U(dBm)	P/L(dBm)	% POWER IN BAND
±0	6.5	6.5	-
±120	6.4	5.1	4.8
±240	8.3	4.5	41.7
±360	3.0	-5.0	88.1
±480	-9.4	-18.7	99.3
±600	-24.6	-26.5	99.9
±720	-31.0	-31.8	100
±840	-34.6	-27.6	100
±960	-31.3	-46.7	100
±1080	-37.6	-47.1	100
±1200	-42.2	-47.6	100
±1320	-49.1	-50.8	100
±1440	-46.5	-48.4	100
±1560	-43.9	-56.4	100
±1680	-52.4	-53.1	100
±1800	-52.8	-55.3	100
±1920	-52.8	-56.6	100
±1040	-57.5	-55.9	100
±2160	-53.4	-53.4	100
±2250	-51.4	-54.0	100
±2400	-56.0	-54.7	100
±2520	-53.8	-51.4	100
±2640	-52.1	-56.2	100
±2760	-56.0	-56.5	100
±2880	-53.2	-54.7	100
±3000	-53.4	-53.0	100

TEST PERFORMED BY: [signature] DATE: 6-12-98

TEST PROCEDURES AND DATA: TEST NO: 4

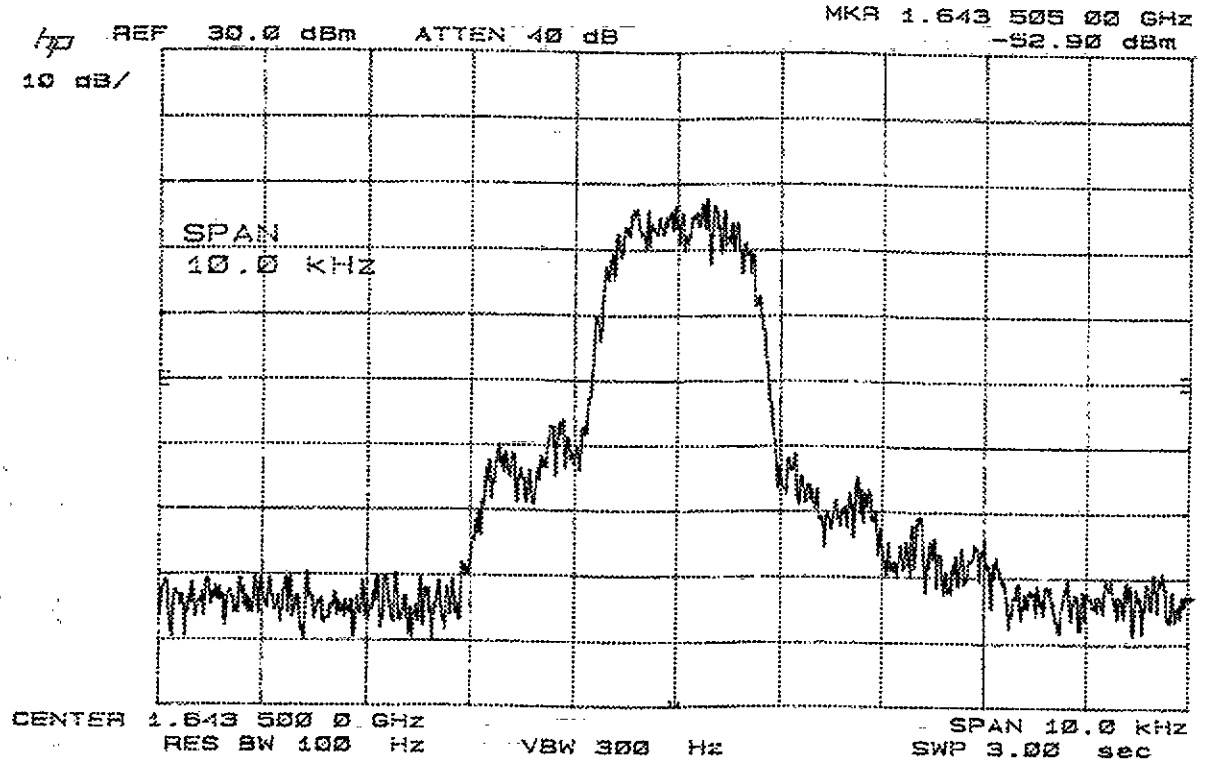


Figure 6-12. Channel 1, P-Channel, 12 kbps, 25.1 W

TEST PROCEDURES AND DATA: TEST NO: 4

Channel 1, P Channel, 12kpbs, 25.1 Watts

FREQUENCY FROM CENTER (kHz)	P/U (dBm)	P/L(dBm)	% POWER IN BAND
±0	3.1	3.1	-
±0.2	5.5	2.4	6.6
±0.4	3.3	5.8	41.2
±0.6	3.3	-1.8	80.1
±0.8	-7.1	-13.8	98.4
±1.0	-33.0	-32.9	100
±1.2	-38.1	-27.3	100
±1.4	-40.9	-38.1	100
±1.6	-42.4	-33.7	100
±1.8	-37.8	-32.7	100
±2.0	-42.7	-47.7	100
±2.2	-45.2	-53.0	100
±2.4	-40.9	-52.2	100
±2.6	-49.7	-57.5	100
±2.8	-46.0	-50.8	100
±3.0	-46.5	-56.5	100
±3.2	-51.4	-56.6	100
±3.4	-55.1	-57.5	100
±3.6	-52.7	-59.6	100
±3.8	-52.2	-55.6	100
±4.0	-33.1	-50.4	100
±4.2	-50.5	-50.7	100
±4.4	-50.8	-52.1	100
±4.6	-57.0	-54.1	100
±4.8	-56.1	-53.4	100
±5.0	-52.9	-54.7	100

TEST PERFORMED BY: Steve Powell DATE: 6-12-98

TEST PROCEDURES AND DATA: TEST NO: 4

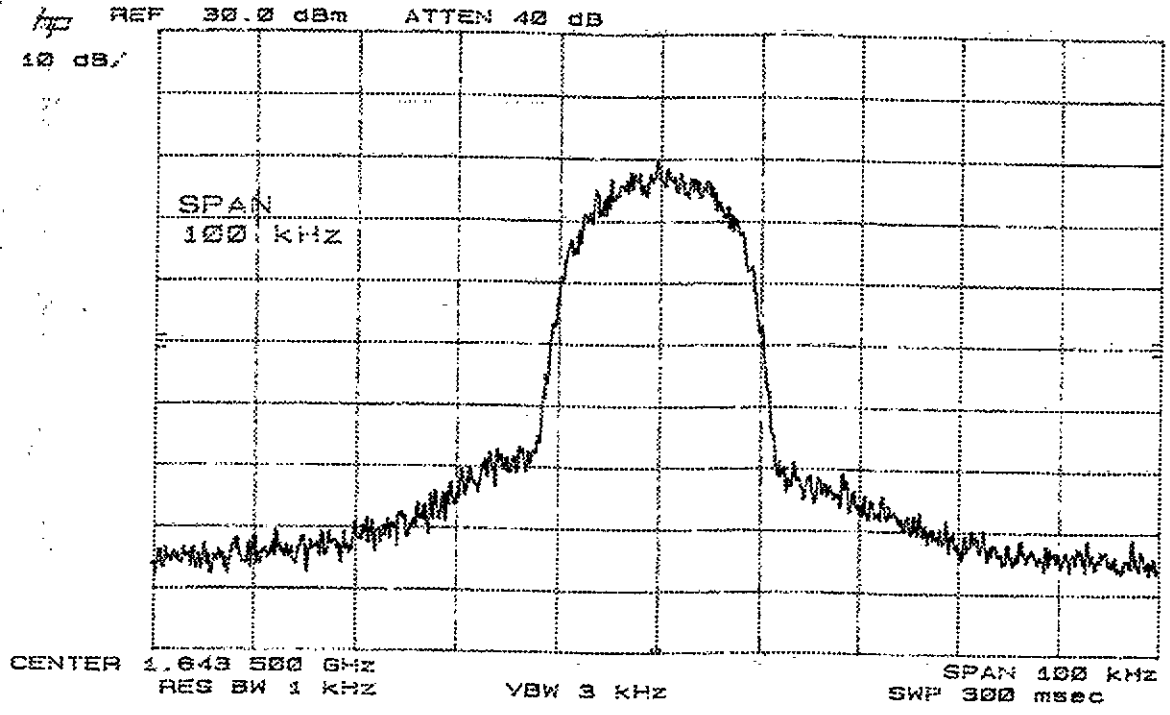


Figure 6-13. Channel 1, R-Channel, 10.5 kbps, 25.1 W

TEST PROCEDURES AND DATA: TEST NO: 4

P Channel 10.5 kbps, 25.1 Watts

FREQUENCY FROM CENTER (Hz)	P/U (dBm)	P/L (dBm)	% POWER IN BAND
±0	0.0	0.0	-
± 1000	-1.2	-1.1	20.0
±2000	-1.7	-1.5	50.6
±3000	-4.4	-3.4	78.2
±4000	-10.1	-8.6	94.6
±5000	-17.3	-17.9	99.3
±6000	-32.4	-32.2	100
±7000	-43.8	-41.2	100
±8000	-44.2	-44.4	100
±9000	-48.9	-46.9	100
±10000	-49.4	-49.4	100
±11000	-49.7	-50.2	100
±12000	-52.0	-53.3	100
±13000	.54.2	-55.9	100
±14000	-56.4	-54.7	100
±15000	-54.6	-54.6	100
±16000	-57.3	-59.4	100
±17000	-55.8	-57.7	100
±18000	-58.3	-59.7	100
±19000	-58.8	-55.9	100
±20000	-59.3	-60.0	100
±21000	-60.7	-58.6	100
±22000	-61.3	-60.6	100
±23000	-59.9	-60.0	100
±24000	-61.1	-60.5	100
±25000	-58.6	-61.5	100

TEST PERFORMED BY: S. R. Dell DATE: 6-12-98

TEST PROCEDURES AND DATA: TEST NO: 5

1.0 DESCRIPTION OF TEST: Conducted Spurious emission (100 kHz and 18 GHz)

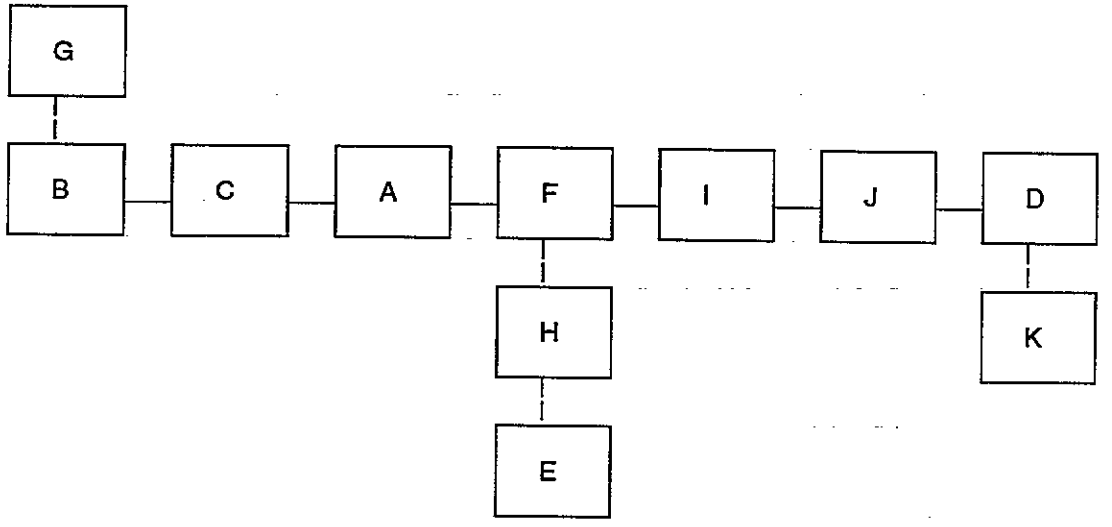
2.0 SPECIFICATIONS: 47 CFR 87.139
47 CFR 2.991
47 CFR 2.993

3.0 EQUIPMENT REQUIRED:

	TYPE	MANUFACTURER	MODEL	SER. NO.
A	High Power Amplifier	Honeywell	HP700	97110006
B	Satellite Data Unit	Honeywell	SD600	95040674
C	20 dB Attenuator	Narda	757-20	-
D	Spectrum Analyzer	Hewlett Packard	8566B	AV55142
E	Power Meter	Hewlett Packard	438B	AV53490
F	Directional Coupler	Narda	3242B-20	-
G	Terminal (PC)	Dell w/ Procom	-	-
H	20 dB Attenuator	Narda	766-20	-
I	30 dB Attenuator	Weinschel Eng.	4830-33	-
J	Diplexer/LNA	Com Atlantic	P/N 103624	S/N 1690116
K	Plotter	Hewlett Packard	7475A	AV58285

TEST PROCEDURES AND DATA: TEST NO: 5

4.0 BLOCK DIAGRAM OF TEST SETUP:



TEST PROCEDURES AND DATA: TEST NO: 5

5.0 PROCEDURE:

1. Connect the equipment a shown in block diagram in Section 4.0 of test number 5.
2. Using the terminal set the SDU back-off attenuator to 0 dB. (This is the nominal back-off setting.)
3. Using the terminal set the SDU to transmit a CW carrier on channel 1 at 1643.5 MHz.
4. Using the terminal set the HPA back-off attenuator to produce -6.5 dBm on the spectrum analyzer. This level equals to 25.1 W at the HPA RF antenna port.
5. Capture the spectrum analyzers display and set the display line for the acceptance level.

6.0 DATA

The data is presented on the following pages of this test:

TEST PROCEDURES AND DATA: TEST NO: 5

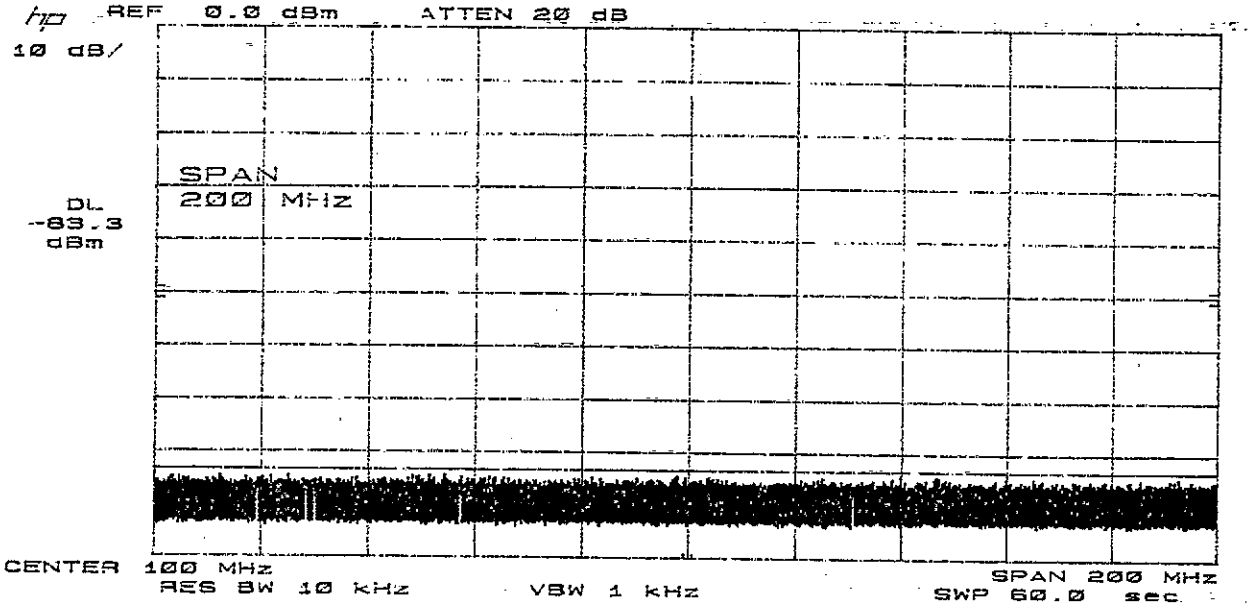


Figure 6-14. 0 to 200 MHz

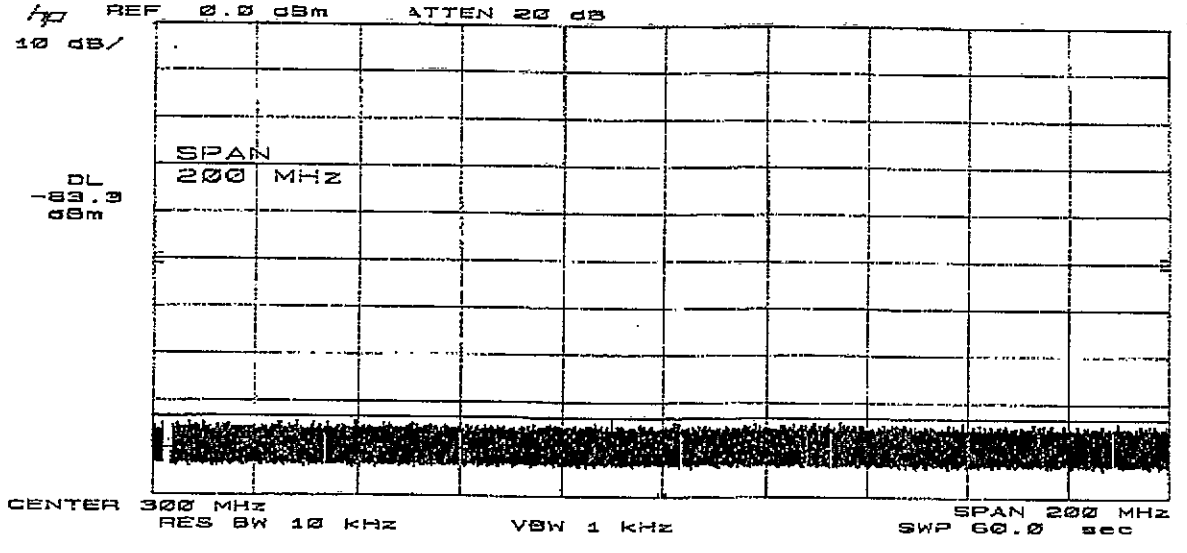


Figure 6-15. 200 MHz to 400 MHz

TEST PROCEDURES AND DATA: TEST NO: 5

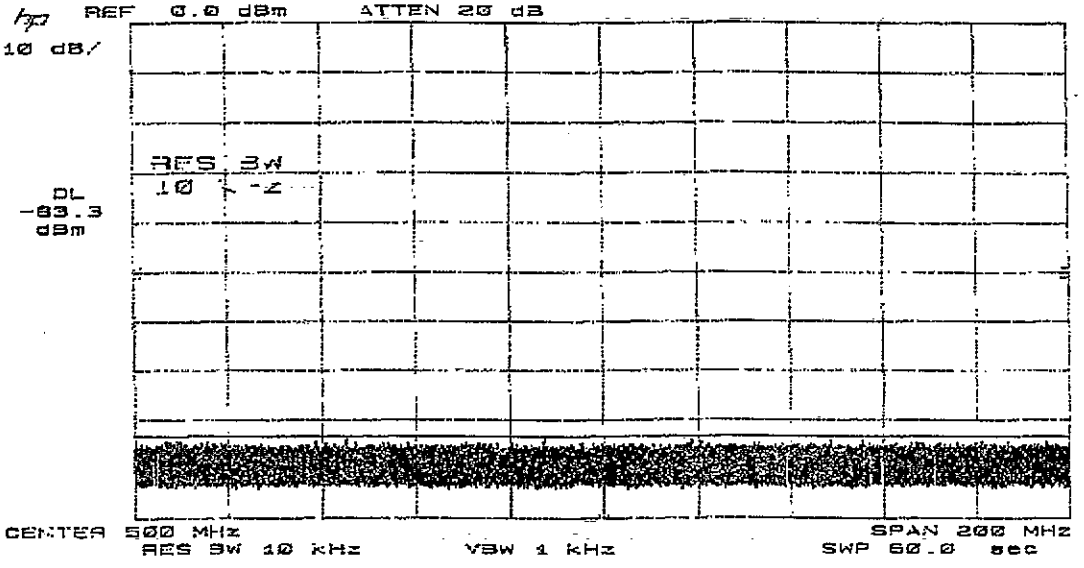


Figure 6-16. 400 MHz to 600 MHz

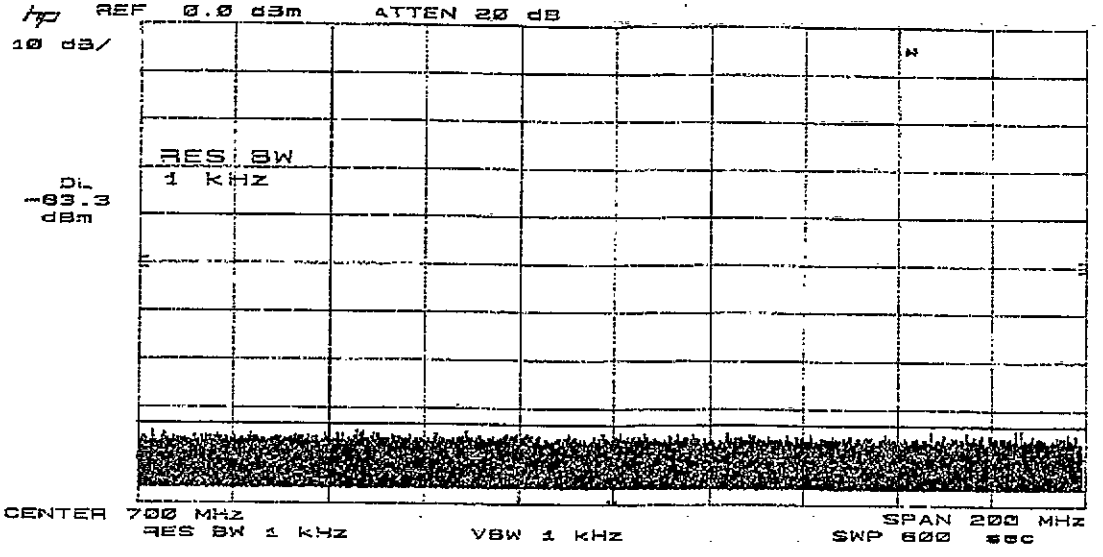


Figure 6-17. 600 MHz to 800 MHz

TEST PROCEDURES AND DATA: TEST NO: 5

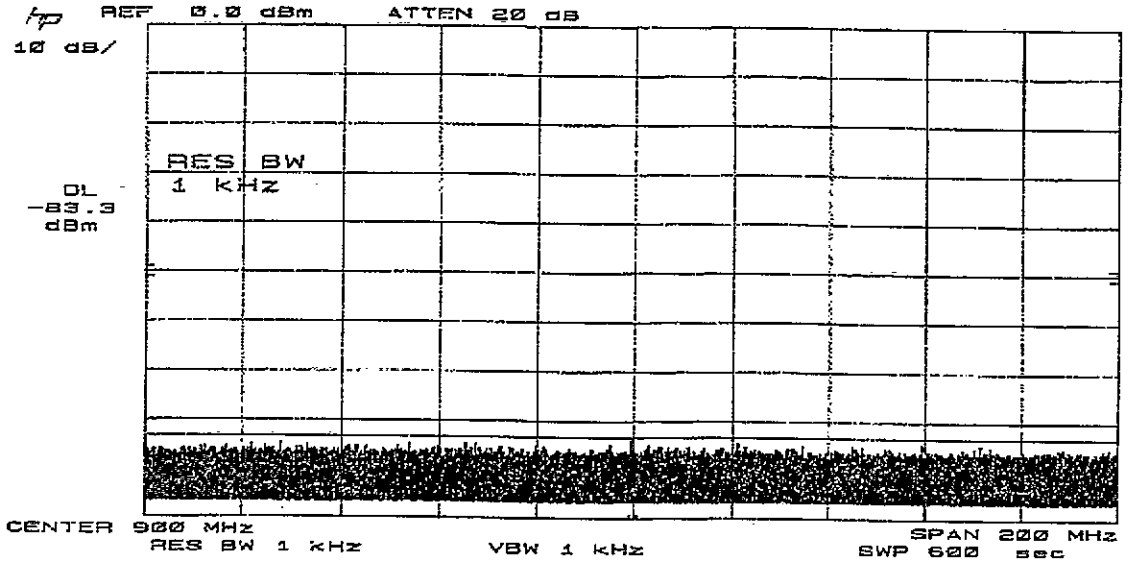


Figure 6-18. 800 MHz to 1000 MHz

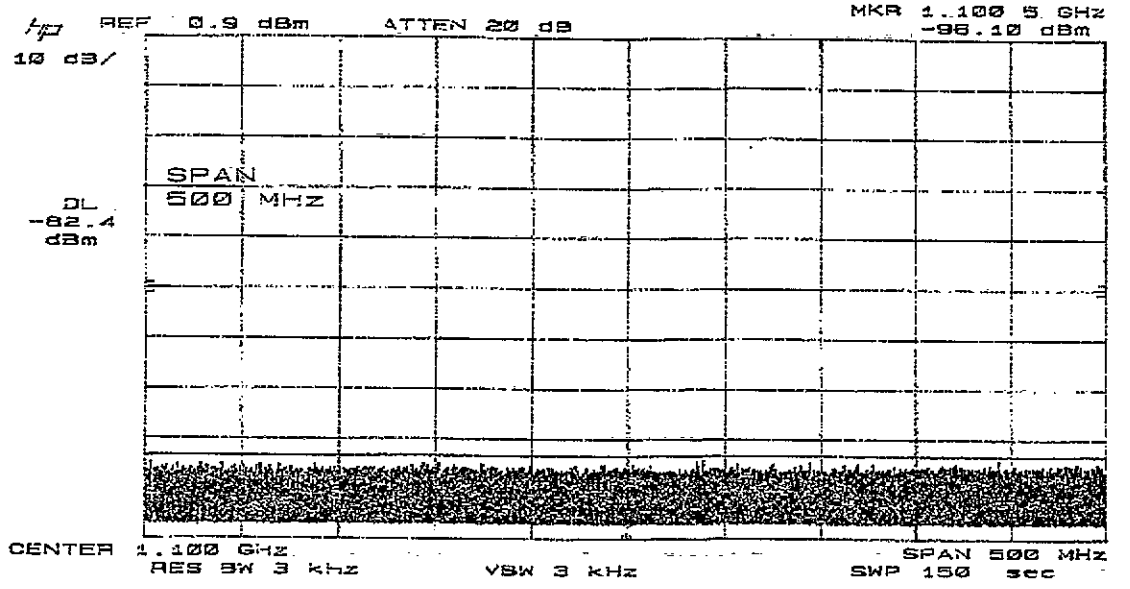


Figure 6-19. 850 MHz to 1350 MHz

TEST PROCEDURES AND DATA: TEST NO: 5

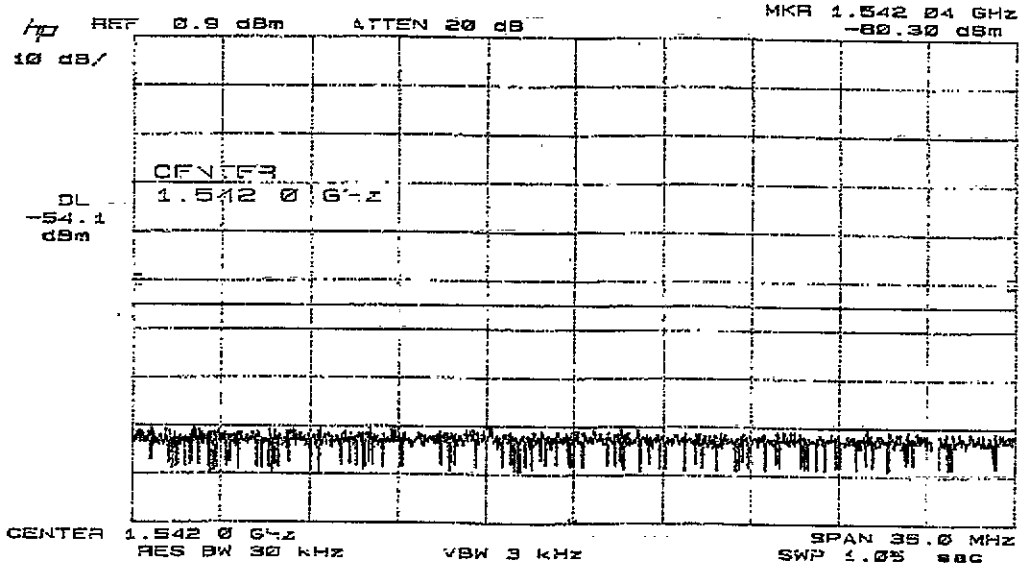


Figure 6-20. 1524.5 MHz to 1559.5 MHz

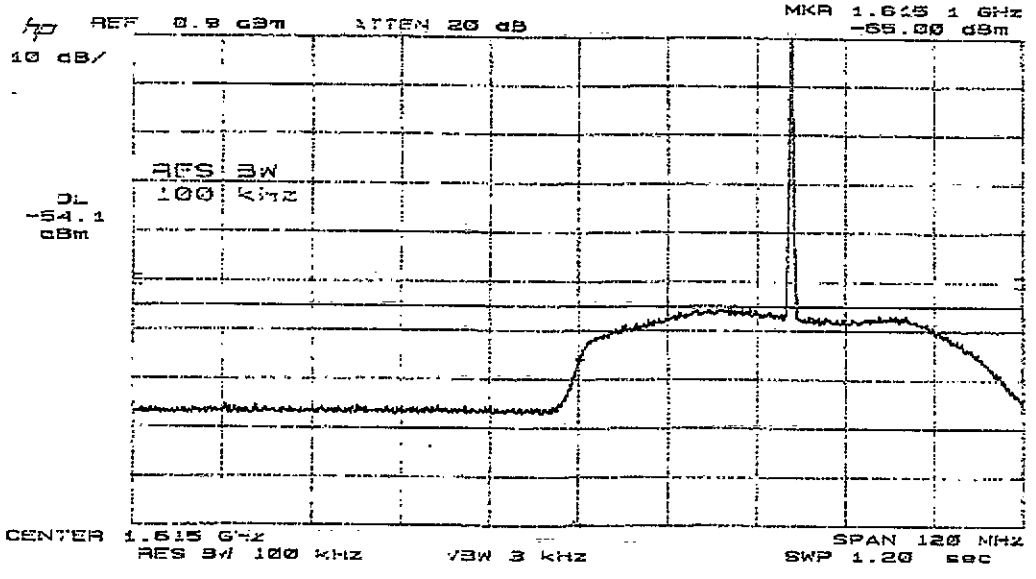


Figure 6-21. 1555 MHz to 1675 MHz

TEST PROCEDURES AND DATA: TEST NO: 5

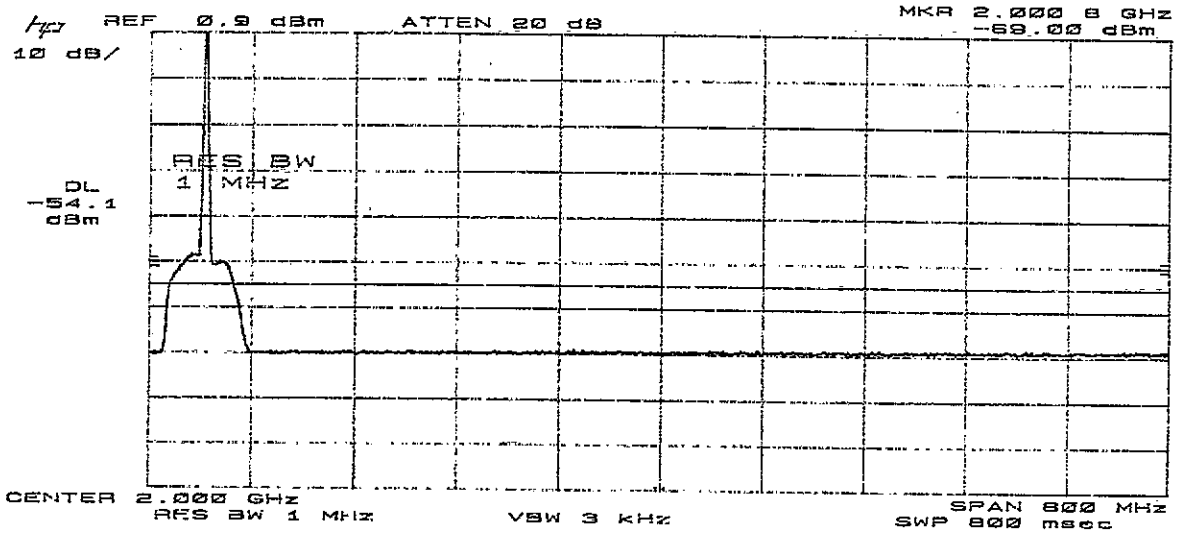


Figure 6-22. 1600 MHz to 2400 MHz

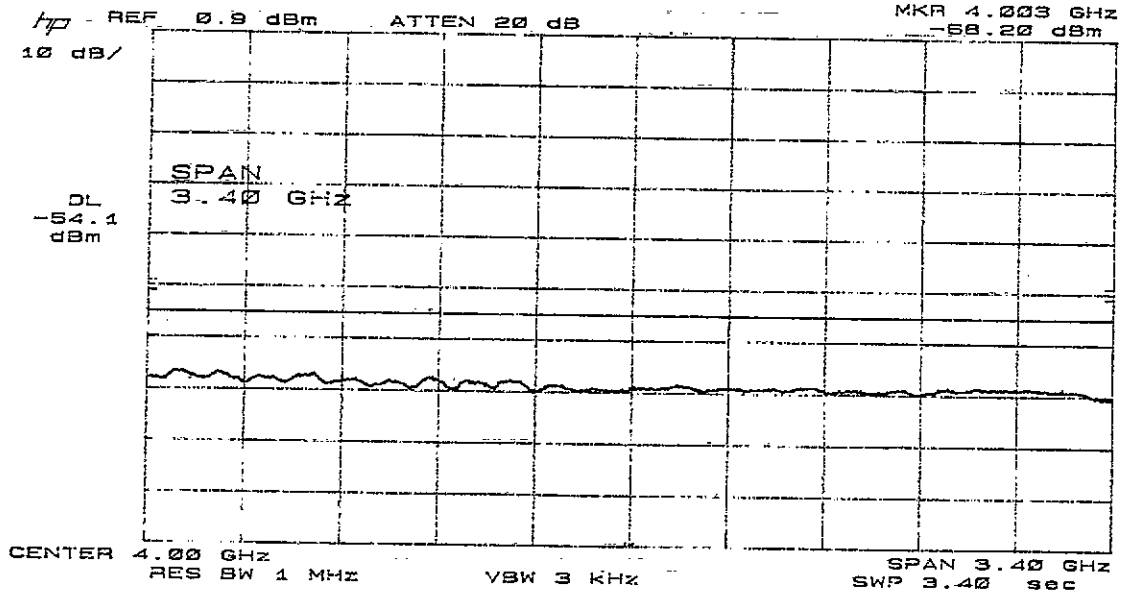


Figure 6-23. 2300 MHz to 5700 MHz

TEST PROCEDURES AND DATA: TEST NO: 5

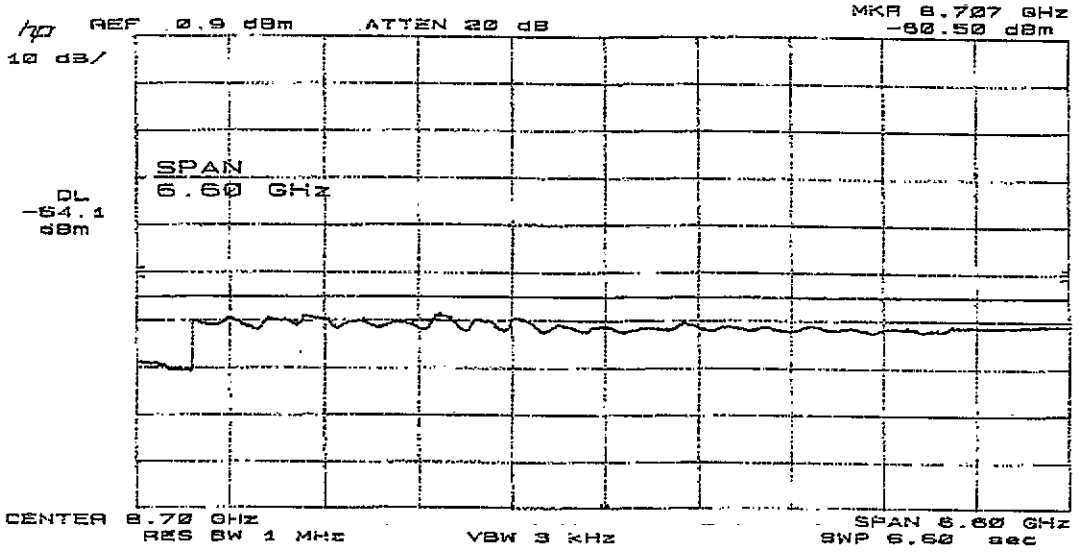


Figure 6-24. 5400 MHz to 12000 MHz

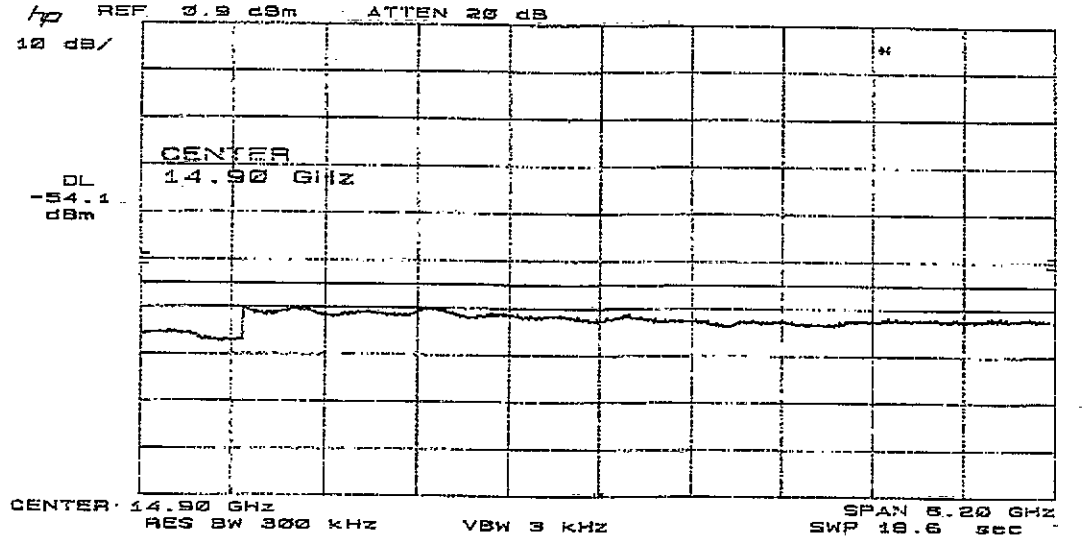


Figure 6-25. 11800 MHz to 18000 MHz

TEST PERFORMED BY: _____ DATE: 6-12-98

TEST PROCEDURES AND DATA: TEST NO: 6

1.0 DESCRIPTION OF TEST: Spurious emission (Radiated)

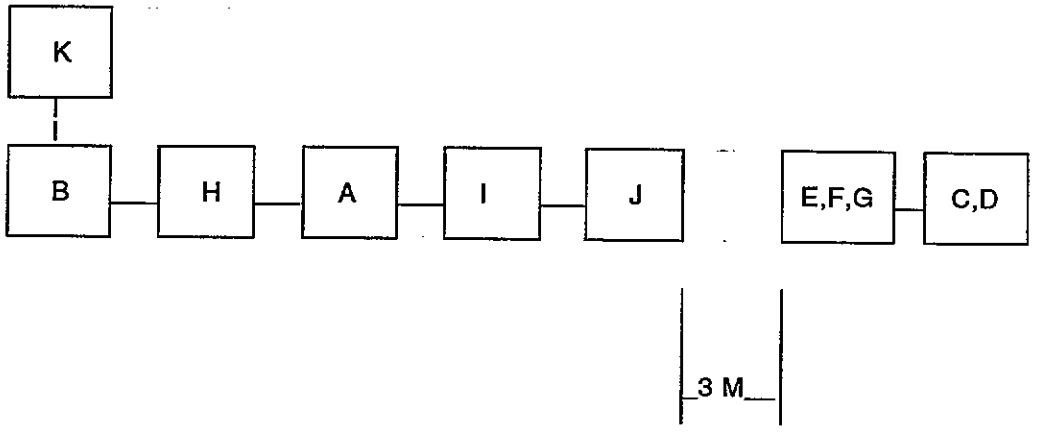
2.0 SPECIFICATIONS: 47 CFR 87.139

3.0 EQUIPMENT REQUIRED:

	TYPE	MANUFACTURER	MODEL	SER. NO.
A	High Power Amplifier	Honeywell	HP600	-
B	Satellite Data Unit	Honeywell	SD600	-
C	Pre Amplifier	Hewlett Packard	8449A	-
D	Spectrum Analyzer	Hewlett Packard	8563E	-
E	Biconical Antenna (30-300MHz)	EMCO	3109	-
F	Log Periodic Antenna (200-1000MHz)	APREL	2001	-
G	Horn antenna (1-18GHz)	EMCO	3115	-
H	20 dB Attenuator	Narda	757-20	-
I	30 dB Attenuator, 150W	Narda	769-30	-
J	50 Ohm RF Termination 5W	Narda	377BNM	-
K	Terminal	Dell w/Procom	-	-

TEST PROCEDURES AND DATA: TEST NO: 6

4.0 BLOCK DIAGRAM OF TEST SETUP:



TEST PROCEDURES AND DATA: TEST NO: 6

5.0 PROCEDURE:

1. Place the LRUs in an appropriate open field are on a turntable 1 meter above the ground and temporarily connect the equipment as shown in the block diagram of the previous test (Spurious Emissions -Conducted). See figures 6-26 and 6-27.
2. Using the terminal set the SDU back-off attenuator to 0 dB.
3. Using the terminal, set the SDU to transmit a CW carrier on Channel 1 at 1643.5 MHz.
4. Using the terminal set the HPA back-off attenuator until the carrier level is about -6.5 dBm on the spectrum analyzer. This level equals to 25.1 W total power at the HPA RF antenna port.
5. Without turning the LRUs off, reconfigure the test setup as shown for the spurious emission radiated test.
6. Using the antenna in vertical and in horizontal polarization between 1 meter and 4 meter elevation above the ground plane and while rotating the platform 360°, measure and record the maximum value of the radiated energy between 1643.5 MHz and up to 16435 MHz.

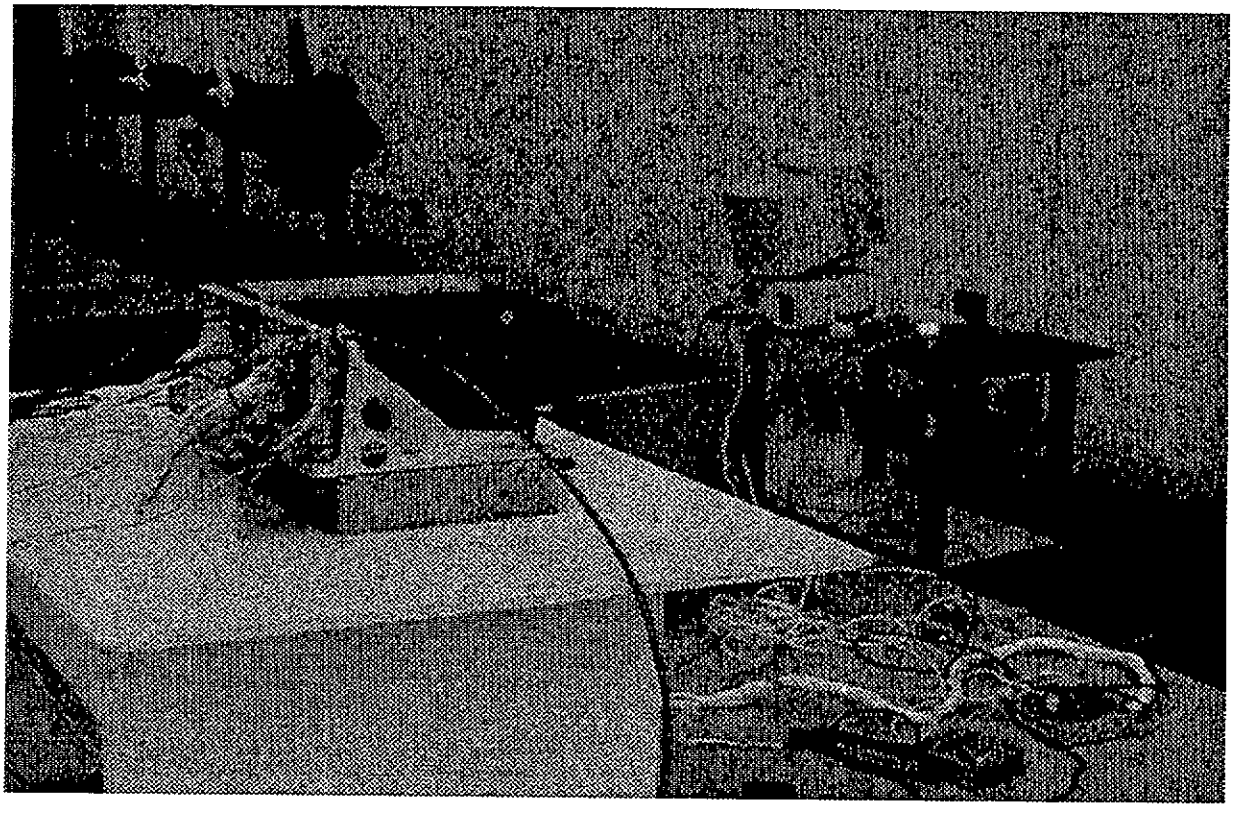


Figure 6-26. Test Setup and Equipment

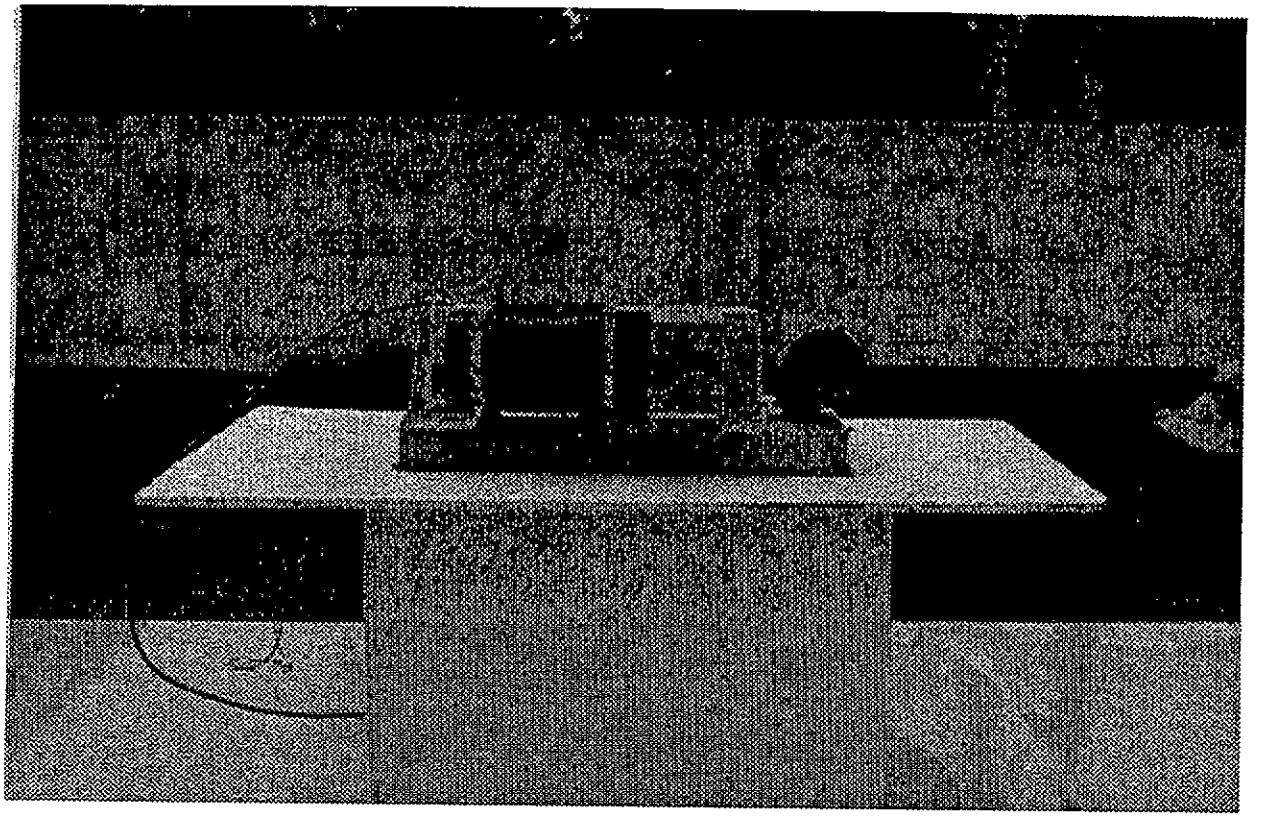


Figure 6-27. UUT on Turntable

TEST PROCEDURES AND DATA: TEST NO: 6

6.0 DATA: Radiated Energy

TUNED MHz	EMISSION LEVEL MHz	C.F. dBuV/m	CALC. @m	CALC. dB	dB Uv/M	@m	uV/m
0.000	30.010000	11.0	3	16.4	27.4	3	24
0.000	32.880000	22.6	3	15.9	38.5	3	84
0.000	36.760000	28.8	3	15.3	44.1	3	161
0.000	44.630000	39.1	3	13.8	52.9	3	442
0.000	48.510000	42.0	3	13.1	55.0	3	564
0.000	52.880000	41.7	3	12.3	54.0	3	503
0.000	64.260000	37.5	3	10.8	48.2	3	258
0.000	68.130000	30.1	3	10.4	40.5	3	106
0.000	74.010000	21.3	3	10.0	31.2	3	36
0.000	83.880000	30.3	3	10.1	40.3	3	104
0.000	87.010000	22.6	3	10.4	33.0	3	45
0.000	106.630000	32.5	3	13.3	45.8	3	196
0.000	115.010000	33.4	3	14.3	47.7	3	242
0.000	118.260000	34.2	3	14.6	48.8	3	275
0.000	122.130000	31.1	3	14.8	45.9	3	198
0.000	127.760000	24.3	3	15.0	39.4	3	93
0.000	131.630000	22.8	3	15.2	38.0	3	79
0.000	142.260000	19.8	3	15.9	35.7	3	61
0.000	149.510000	7.6	3	16.0	23.6	3	15
0.000	178.380000	13.2	3	15.7	28.9	3	28
0.000	183.630000	36.5	3	16.1	52.6	3	426
0.000	188.130000	16.4	3	16.5	33.0	3	44
0.000	194.760000	34.1	3	17.2	51.3	3	365
0.000	203.260000	8.0	3	18.0	26.0	3	20
0.000	211.880000	8.6	3	18.8	27.4	3	24
0.000	216.130000	15.7	3	19.2	34.9	3	56
0.000	226.510000	6.8	3	20.0	26.8	3	22
0.000	229.880000	7.8	3	20.2	28.0	3	25
0.000	241.760000	7.4	3	20.7	28.1	3	25
0.000	248.130000	6.1	3	21.1	27.2	3	23
0.000	256.010000	6.7	3	21.3	28.0	3	25
0.000	264.260000	8.4	3	21.5	29.9	3	31
0.000	280.130000	12.1	3	22.2	34.3	3	52
0.000	288.130000	8.7	3	22.1	30.8	3	35
0.000	297.260000	9.0	3	28.8	37.8	3	78
0.000	320.130000	21.7	3	20.6	42.4	3	132
0.000	328.250000	14.1	3	20.8	34.9	3	55
0.000	336.130000	18.1	3	20.9	39.1	3	90

TEST PROCEDURES AND DATA: TEST NO: 6

6.0 DATA: Radiated Energy (Continued)

TUNED MHz	EMISSION LEVEL MHz	C.F. dBuV/m	CALC. @m	CALC. dB	dB Uv/M	@m	uV/m
0.000	338.000000	9.5	3	21.0	30.4	3	33
0.000	344.130000	14.2	3	21.1	35.3	3	58
0.000	352.000000	11.2	3	21.2	32.4	3	42
0.000	360.130000	13.1	3	21.4	34.5	3	53
0.000	376.130000	8.6	3	21.7	30.3	3	33
0.000	392.130000	8.7	3	22.0	30.6	3	34
0.000	416.130000	5.9	3	22.7	28.6	3	27
0.000	425.130000	8.2	3	23.0	31.2	3	36
0.000	433.630000	9.5	3	23.2	32.7	3	43
0.000	448.130000	9.3	3	23.7	33.0	3	44
0.000	456.130000	6.1	3	23.9	30.0	3	32
0.000	468.130000	6.7	3	24.3	31.0	3	35
0.000	494.000000	5.8	3	25.1	30.8	3	35
0.000	505.750000	6.7	3	25.3	32.0	3	40
0.000	525.130000	3.3	3	25.6	28.8	3	28
0.000	542.130000	5.5	3	25.8	31.2	3	36
0.000	561.130000	8.0	3	26.0	34.0	3	50
0.000	627.250000	5.7	3	27.2	32.9	3	44
0.000	680.250000	1.6	3	28.5	30.0	3	32
0.000	704.130000	2.7	3	29.0	31.6	3	38
0.000	775.000000	-.3	3	29.9	29.6	3	30
0.000	825.000000	.1	3	30.6	30.7	3	34
0.000	874.750000	2.1	3	31.4	33.5	3	47
0.000	924.750000	.9	3	32.3	33.2	3	46
0.000	979.000000	-1.9	3	33.3	31.5	3	37
0.000	999.880000	.2	3	33.7	33.9	3	49

TEST PROCEDURES AND DATA: TEST NO: 6

6.0 DATA: Radiated Energy (Continued)

TUNED MHz	EMISSION MHz	LEVEL dBuV/m	@m	C.F. dB	CALC dBuv/m	@m	EIRP dBm
1643.500	3286.967333	69.3	3	9.3	78.6	3	-16.6
1643.500	3286.967333	69.2	3	9.3	78.5	3	-16.8
1643.500	4930.467666	44.2	3	13.1	57.3	3	-37.9
1643.500	4930.467666	49.2	3	13.1	62.3	3	-32.9
1643.500	6573.967999	43.3	3	16.7	60.0	3	-35.2
1643.500	6574.101332	35.0	3	16.7	51.7	3	-43.5
1643.500	8217.601665	29.7	3	20.6	50.2	3	-45.0
1643.500	8217.601665	38.5	3	20.6	59.1	3	-36.2
1643.500	9861.101998	42.0	3	22.7	64.7	3	-30.6
1643.500	9861.101998	31.0	3	22.7	53.7	3	-41.6
1643.500	11504.602331	30.2	3	24.0	54.2	3	-41.0
1643.500	11504.602331	41.0	3	24.0	65.0	3	-30.2
1643.500	13148.102664	39.7	3	25.1	64.8	3	-30.4
1643.500	13148.102664	30.2	3	25.1	55.3	3	-39.9
1643.500	14791.602997	30.2	3	25.7	55.9	3	-39.4
1643.500	14791.602997	40.3	3	25.7	66.0	3	-29.2
1643.500	16435.103330	41.8	3	25.9	67.8	3	-27.5
1643.500	16435.103330	30.2	3	25.9	56.1	3	-39.1

TEST PERFORMED BY: S. L. Dell DATE: 6-12-98

TEST PROCEDURES AND DATA: TEST NO: 7

1.0 DESCRIPTION OF TEST: Intermodulation

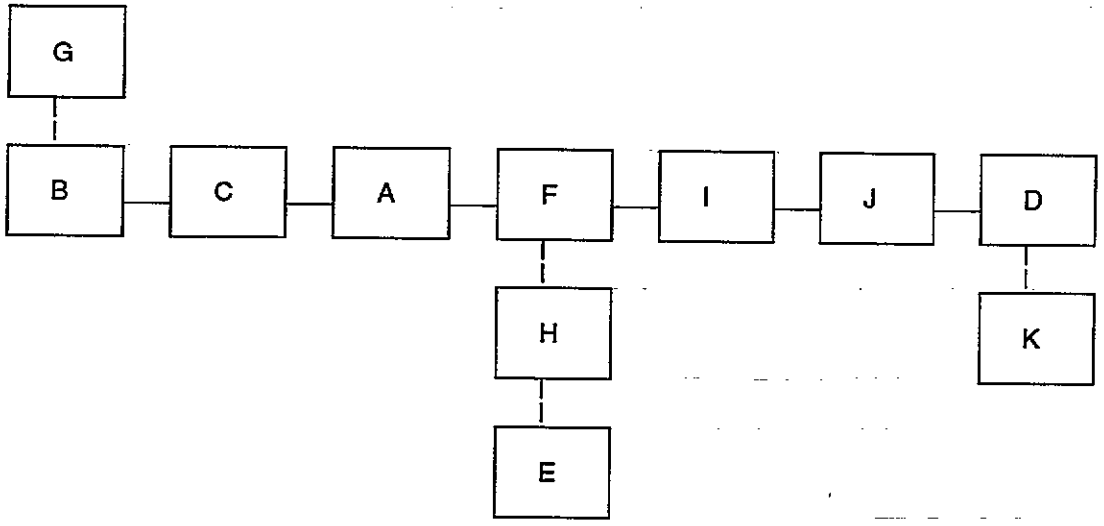
2.0 SPECIFICATIONS: 47 CFR 87.139

3.0 EQUIPMENT REQUIRED:

	TYPE	MANUFACTURER	MODEL	SER. NO.
A	High Power Amplifier	Honeywell	HP700	97110006
B	Satellite Data Unit	Honeywell	SD600	95040674
C	20 dB Attenuator	Narda	757-20	-
D	Spectrum Analyzer	Hewlett Packard	8566B	AV55142
E	Power Meter	Hewlett Packard	438B	AV53490
F	Directional Coupler	Narda	3242B-20	-
G	Terminal (PC)	Dell w/ Procom	-	-
H	20 dB Attenuator	Narda	766-20	-
I	30 dB Attenuator	Weinschel Eng.	4830-33	-
J	Diplexer/LNA	Com Atlantic	P/N 103624	S/N 1690116
K	Plotter	Hewlett Packard	7475A	AV58285

TEST PROCEDURES AND DATA: TEST NO: 7

4.0 BLOCK DIAGRAM OF TEST SETUP:



TEST PROCEDURES AND DATA: TEST NO: 7

5.0 PROCEDURE:

1. Connect the equipment as shown in the block diagram in Section 4.0 of test number 3.
2. Using the terminal set the SDU back-off attenuator to 3 dB for channel 1 and for channel 2.
3. Using the terminal set the SDU to transmit a CW carrier on channel 1 at 1626.5 MHz.
4. Using the terminal set the HPA back-off attenuator to until the carrier level is about -9.5 dBm on the spectrum analyzer. This level equals to 20 W at the HPA RF antenna port.
5. Using the terminal, set channel 2 to transmit

6.0 DATA: The data is presented on the following pages of this test:

The display line indicates the acceptance level. Marker is placed on the strongest intermodulation product.

TEST PROCEDURES AND DATA: TEST NO: 7

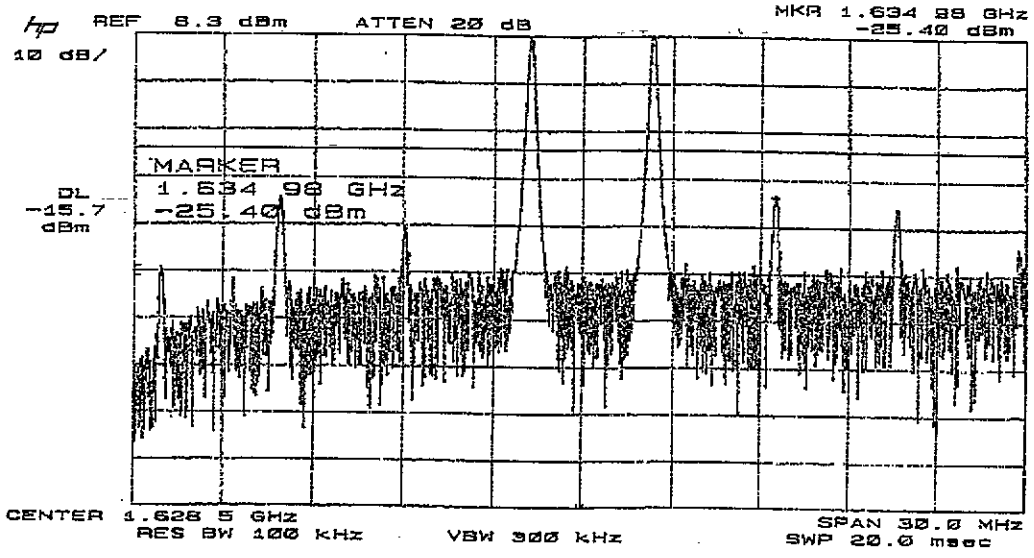


Figure 6-28.

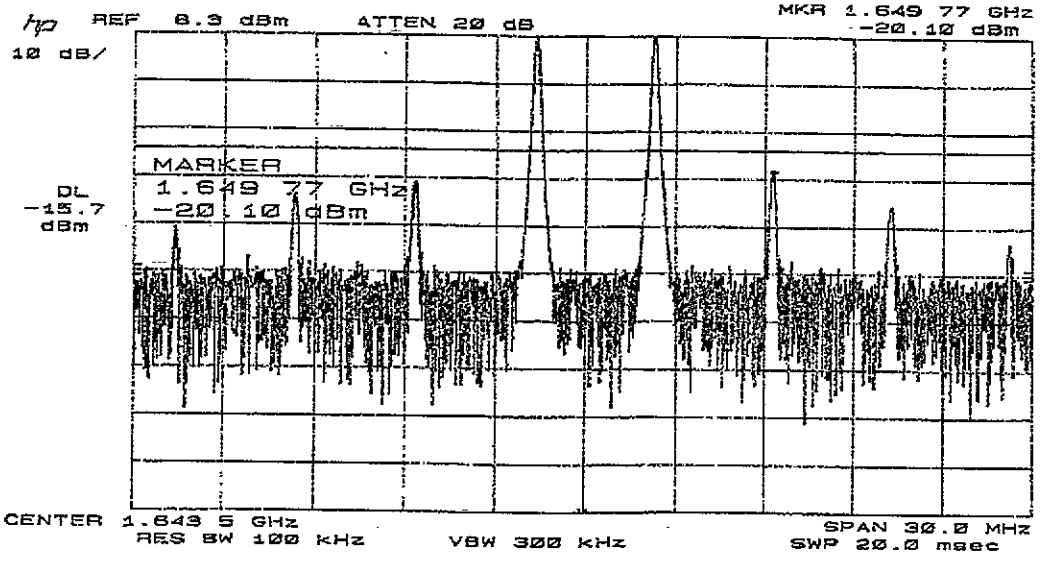


Figure 6-29.

TEST PROCEDURES AND DATA: TEST NO: 7

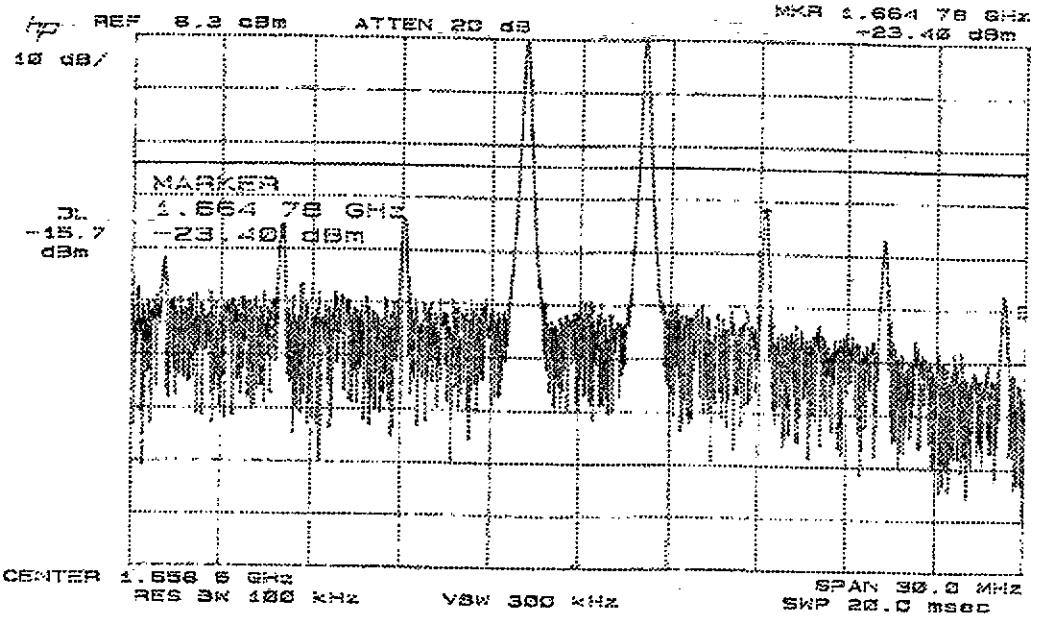


Figure 6-30.

TEST PERFORMED BY: _____ DATE: 6-12-98

TEST PROCEDURES AND DATA: TEST NO: 8

1.0 DESCRIPTION OF TEST: Transmitter Emission Limits (Tx Mask)

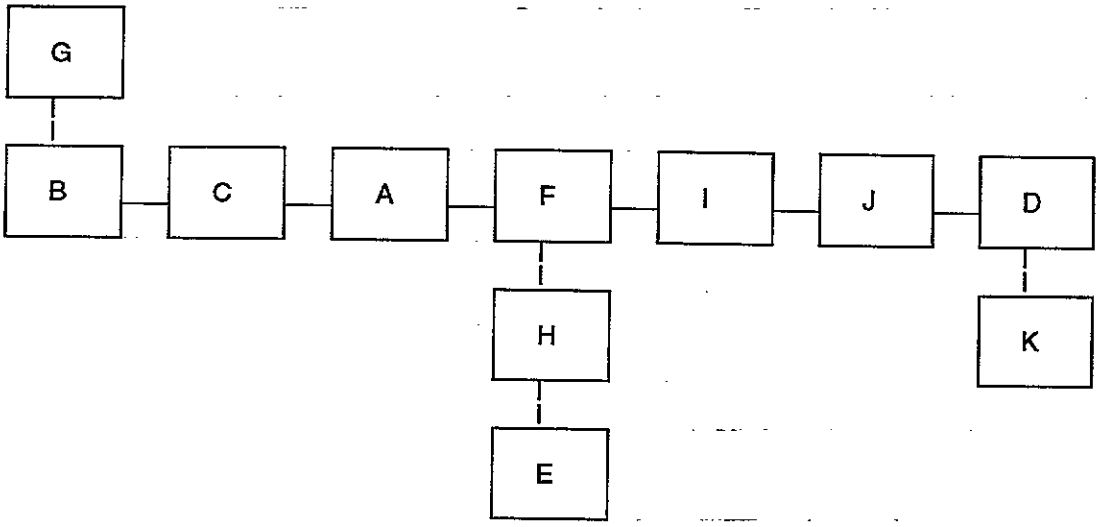
2.0 SPECIFICATIONS: 47 CFR 87.139

3.0 EQUIPMENT REQUIRED:

	TYPE	MANUFACTURER	MODEL	SER. NO.
A	High Power Amplifier	Honeywell	HP700	97110006
B	Satellite Data Unit	Honeywell	SD600	95040674
C	20 dB Attenuator	Narda	757-20	-
D	Spectrum Analyzer	Hewlett Packard	8566B	AV55142
E	Power Meter	Hewlett Packard	438B	AV53490
F	Directional Coupler	Narda	3242B-20	-
G	Terminal (PC)	Dell w/ Procom	-	-
H	20 dB Attenuator	Narda	766-20	-
I	30 dB Attenuator	Weinschel Eng.	4830-33	-
J	Diplexer/LNA	Com Atlantic	P/N 103624	S/N 1690116
K	Plotter	Hewlett Packard	7475A	AV58285

TEST PROCEDURES AND DATA: TEST NO: 8

4.0 BLOCK DIAGRAM OF TEST SETUP:



TEST PROCEDURES AND DATA: TEST NO: 8

5.0 PROCEDURE:

1. Set the spectrum analyzer to 100 kHz span, 1643.5 MHz center frequency, 10 dB/division, 1 kHz resolution BW and 30 kHz video bandwidth.
2. Connect the equipment a shown in block diagram in Section 4.
3. Using the terminal set the SDU back-off attenuator to 0 dB. (This is the nominal back-off setting for the SDU.)
4. Using the terminal set the SDU to transmit a CW carrier on channel 1 at 1643.5 MHz.
5. Using the terminal set the HPA back-off attenuator to produce -6.5 dBm on the spectrum analyzer. This level equals 25.1 W at the HPA RF antenna port.
6. Using the terminal, set the SDU to transmit a 1643.5 MHz on C-Channel (21 kps). This will yield the widest bandwidth in the transmit spectrum due to the highest bit rate.
7. Capture the spectrum analyzers display

   First spectrum: Channel 1, C-Channel, 21 kbps, 25.1

   Second spectrum: Channel 1, P-Channel, 600 bps, 25.1

   Third spectrum: Channel 1, P-Channel, 1.2 kbps, 25.1

   Fourth spectrum: Channel 1, P-Channel, 10.5 kbps, 25.1

   Frequency for all conditions: 1643.5

   Limit:

Frequency Offset	Attenuation [dB]
$\pm$ 0.075	0
$\pm$ 1.4	20
$\pm$ 2.8	40
$\pm$ 4 SR or $\pm$ 35kHz	F_m

   F_m = 55 or [37+10log(py)] whichever is greater

   SR = Symbol Rate

6.0 DATA: The data with the applicable transmit mask is presented on the following pages:

TEST PROCEDURES AND DATA: TEST NO: 8

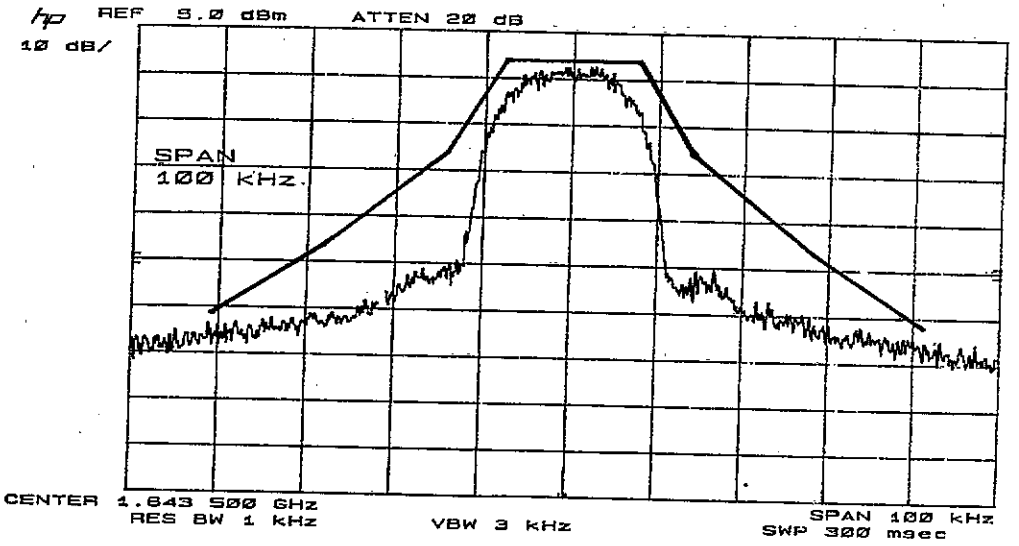


Figure 6-31. Channel 1, C-Channel, 21 kbps

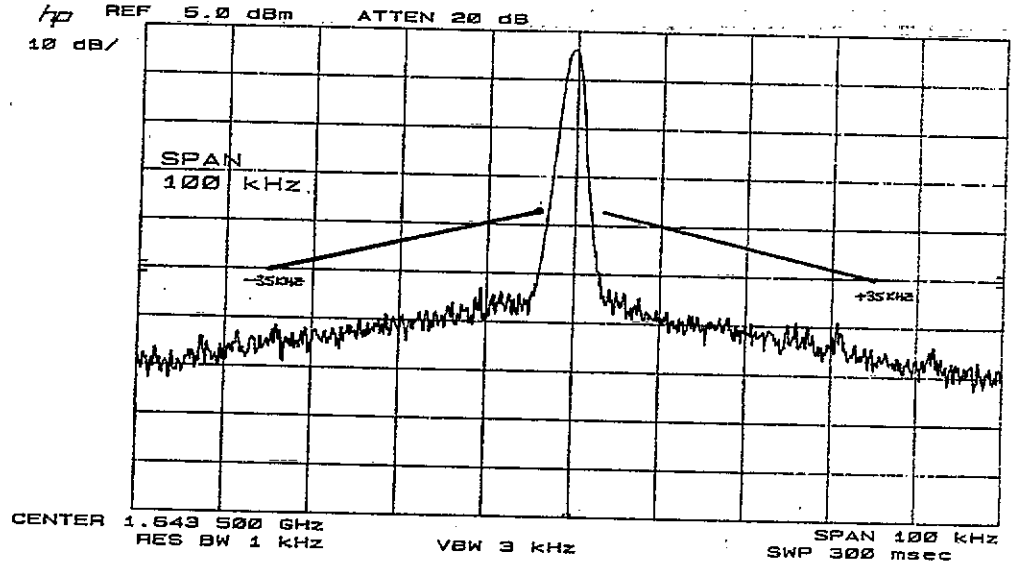


Figure 6-32. Channel 1, P-Channel, 600 bps

TEST PROCEDURES AND DATA: TEST NO: 8

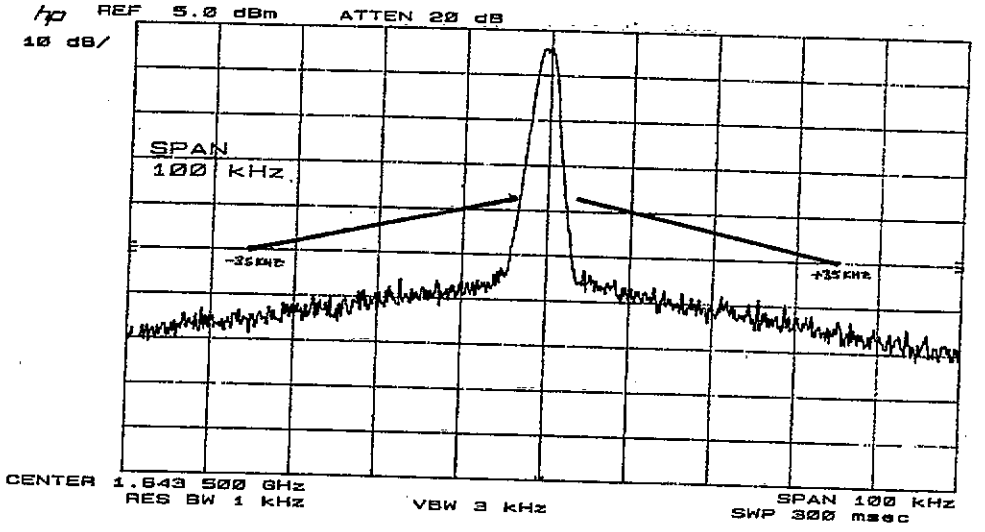


Figure 6-33. Channel 1, P-Channel, 1.2 kbps

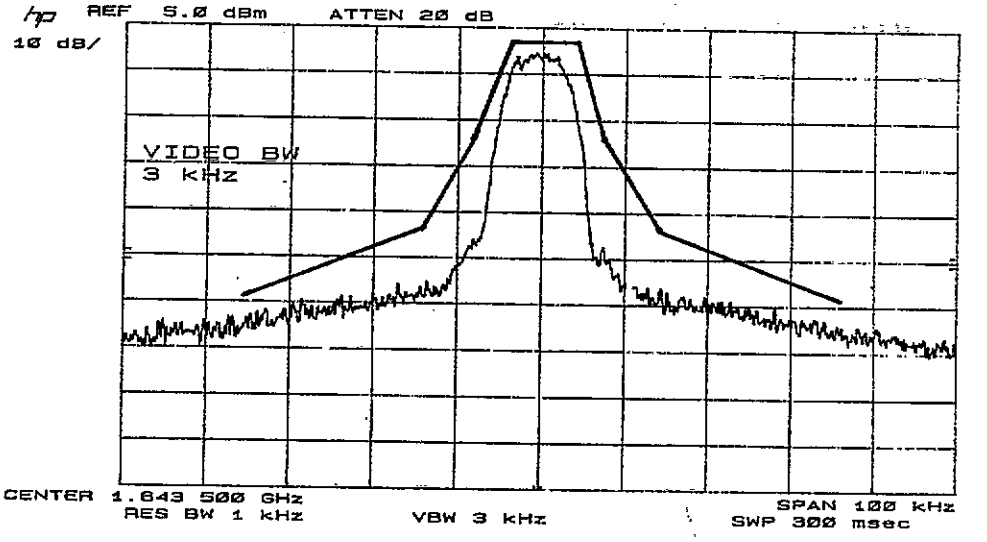


Figure 6-34. Channel 1, P-Channel, 10.5 kbps

TEST PERFORMED BY: _____ DATE: 6-12-98