SECURITY SUMMARY & SPECIAL HANDLING REQUIREMENTS

The title of this application is :   THE MARS ATMOSPHERE & VOLATILE EVOLUTION (MAVEN)

The overall classification of this application is :   **UNCLASSIFIED**

Refer to your Security Manual for further guidance.

The Application Level Special Handling is : A
Approved for public release; distribution is unlimited (DoD Directive 5230.24)

DOWNGRADING INSTRUCTIONS

Special Handling Instruction : A

CLASSIFICATION   **UNCLASSIFIED**

FULL RECORD PRINT FOR The Mars Atmosphere & Volatile EvolutioN (MAVEN)

Selected Frequencies
(U) 7188.5 MHz   (U) 8445.8 MHz

System Name (Nomenclature)	:	(U) The Mars Atmosphere & Volatile EvolutioN (MAVEN)
Stage	:	(U) 2 - Experimental
Agency	:	(U) NASA - National Aeronautics and Space Administration
NTIA Certified	:	(U) No
Overall Security	:	Unclassified
Date/Time Last Mod.	:	6/2/2010 2:19:28 PM (GMT)
System Description	:	(U) The Mars Atmosphere and Volatile EvolutioN (MAVEN) project is part of NASAs Mars

Scout Program. MAVEN is a satellite that will orbit the planet in a highly elliptical trajectory while studying Mars' upper atmosphere and how it interacts with the Sun. MAVEN will carry instruments to measure characteristics of Mars' atmospheric gases, upper atmosphere, solar wind, and ionosphere. The 100 Watt X-band only telecommunications system will transmit engineering and science data to Earth and receive commands to control the spacecraft and run science operations.

One of MAVENs primary goals is to determine the role that loss of volatiles from the Mars atmosphere to space has played through time. This information will lead to the understanding of the histories of Marss atmosphere and climate, liquid water and planetary habitability.

Target Date(s)
System Activation	:	(U) 11/18/2013
System Termination	:	(U) 3/31/2019

NSEP Use	:	(U) No
ITU Waiver	:	(U) No

Control Numbers
SPS- 17466/1

Source Documents
- (U) SPS - 17466/1 The Mars Atmosphere & Volatile EvolutioN (MAVEN) Certification Application 6/1/2010

Estimated Initial Cost of the System   :   (U) $485000000

Information Transfer Requirement

(U) a. X-band uplink Requirements: The X-band uplink signal will consist of command data with maximum bit-rates of 2 kbps. The uplink signal is a phase modulated (PCM/PSK/PM) 16kHz sinewave subcarrier modulated onto a carrier signal transmitted at a frequency of 7188.499990 MHz.
b. X-band downlink Requirements: The science and telemetry signal will consist of telemetry data bit rates between 10bps and 550 kbps. The low bit rate telemetry will use BPSK modulation. The high bit-rates (> 2.0 kbps) shall be QPSK modulated directly onto an RF carrier at 8445.767679 MHz.

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System Essentiality
>(U) The communication links are essential for commanding the spacecraft and for collecting spacecraft telemetry and scientific data.

Replacement Information
>(U) Not Applicable

Stations

Station Name	**:**	(U) Goldstone, CA
City, State/Country	**:**	(U) Goldstone, (U) CA
Location Type	**:**	(U) Single Point
Lat/Lon	**:**	(U) 351418N1164636W

Transmitters
>(U) DSN 34m - MAVEN Tx

Receivers
>(U) DSN 34m - MAVEN Rx

Antennas
>(U) DSN 34m - MAVEN Ant

Station Name	**:**	(U) Madrid, Spain
City, State/Country	**:**	(U) Madrid DSN, (U) Spain
Location Type	**:**	(U) Single Point
Lat/Lon	**:**	(U) 402548N0041500W

Transmitters
>(U) DSN 34m - MAVEN Tx

Receivers
>(U) DSN 34m - MAVEN Rx

Antennas
>(U) DSN 34m - MAVEN Ant

Station Name	**:**	(U) Canberra, Australia
City, State/Country	**:**	(U) Canberra DSN, (U) Australia
Location Type	**:**	(U) Single Point
Lat/Lon	**:**	(U) 352400S1485736E

Transmitters
>(U) DSN 34m - MAVEN Tx

Receivers
>(U) DSN 34m - MAVEN Rx

Antennas
>(U) DSN 34m - MAVEN Ant

FULL RECORD PRINT FOR The Mars Atmosphere & Volatile EvolutioN (MAVEN)

Station Name   **:**   (U) MAVEN
City, State/Country   **:**   (U) MAVEN, (U) Space
Location Type   **:**   (U) Non-geostationary Satellite
    Apogee   **:**   (U) 6200 km
    Perigee   **:**   (U) 150 km
    Equatorial Inclination   **:**   (U) 75.0 degrees
    Period Of Orbit   **:**   (U) 16173 s
    <u>**Transmitters**</u>
       (U) MAVEN - Tx

    <u>**Receivers**</u>
       (U) MAVEN - Rx

    <u>**Antennas**</u>
       (U) MAVEN - Ant

<u>**Links - Selected Modes**</u>

   <u>**Link**</u>
    <u>**Transmitting Station**</u>   <u>**Receiving Station**</u>
    (U) Goldstone, CA   (U) MAVEN

      <u>**Radio Service**</u>   **:**   Space Research
       Station Class   **:**   TH
       <u>**Equipment Combination**</u>
         Transmitter   **:**   (U) DSN 34m - MAVEN Tx
         Tx Antenna   **:**   (U) DSN 34m - MAVEN Ant
         Receiver   **:**   (U) MAVEN - Rx
         Rx Antenna   **:**   (U) MAVEN - Ant
         <u>**Selected Modes**</u>

Frequency	Em. Des	Power	Notes
(U) 7188.5 MHz	(U) 36K0G2D	Mean (U) 19953 W	PRI
(U) 7188.5 MHz	(U) 2M40G2D	Mean (U) 19953 W	PRI

   <u>**Link**</u>
    <u>**Transmitting Station**</u>   <u>**Receiving Station**</u>
    (U) MAVEN   (U) Goldstone, CA

      <u>**Radio Service**</u>   **:**   Space Research
       Station Class   **:**   EH
       <u>**Equipment Combination**</u>
         Transmitter   **:**   (U) MAVEN - Tx
         Tx Antenna   **:**   (U) MAVEN - Ant
         Receiver   **:**   (U) DSN 34m - MAVEN Rx
         Rx Antenna   **:**   (U) DSN 34m - MAVEN Ant
          Sp. Power Density   **:**   (U) -40.4 dBw/Hz
         <u>**Selected Modes**</u>

Frequency	Em. Des	Power	Notes
(U) 8445.8 MHz	(U) 1M10G1D	Mean (U) 100 W	PRI

FULL RECORD PRINT FOR The Mars Atmosphere & Volatile EvolutioN (MAVEN)

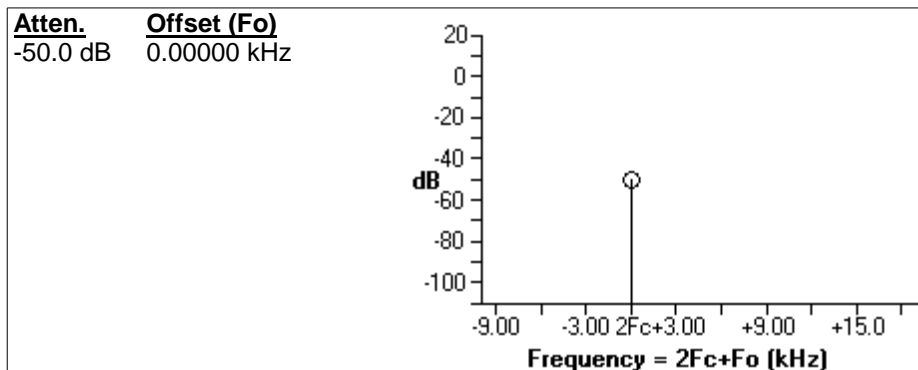|			
(U) 8445.8 MHz	(U) 2M40G1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 602HG1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 6K02G1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 12K0G1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 27K1G1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 60K2G1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 300KG1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 600KG1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 750KG1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 857KG1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 1M00G1D	Mean (U) 100 W	PRI
(U) 8445.8 MHz	(U) 800KG1D	Mean (U) 100 W	PRI

FULL RECORD PRINT FOR The Mars Atmosphere & Volatile EvolutioN (MAVEN)
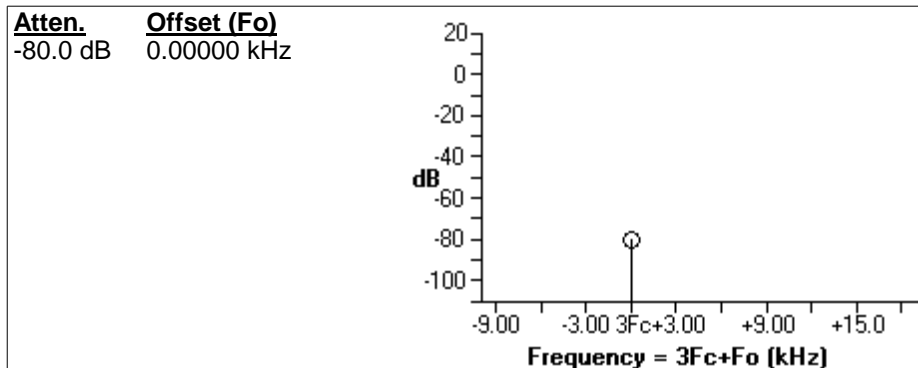
TRANSMITTER MAVEN - Tx

Nomenclature	:	(U) MAVEN - Tx
Manufacturer	:	(U) LOCKHEED MARTIN ASTRO SPACE
NTIA Approval Status	:	(U) Unapproved
Date/Time Last Mod.	:	6/1/2010 2:11:08 PM (GMT)
Coordination ID	:	(U) J/F 12
Freq. Stability	:	(U) 2.5 ppm
Output Device	:	(U) Traveling Wave Tube
Tuning Method	:	(U) Voltage Controlled Oscillator
Radar/Comm	:	(U) Communications
Supp. of Harmonics	:	(U) No

Figure 1 - 2nd Harmonic Curve (U)

Atten.   Offset (Fo)
-50.0 dB   0.00000 kHz

Frequency = 2Fc+Fo [kHz]

(UNCLASSIFIED)

Figure 2 - 3rd Harmonic Curve (U)

Atten.   Offset (Fo)
-80.0 dB   0.00000 kHz

Frequency = 3Fc+Fo [kHz]

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Figure 3 - Spurious Emission Curve (U)

Peak Freq. Disp. 0:00000 kHz
Atten.   **Offset (Fo)**
-50.0 dB   0.00000 kHz
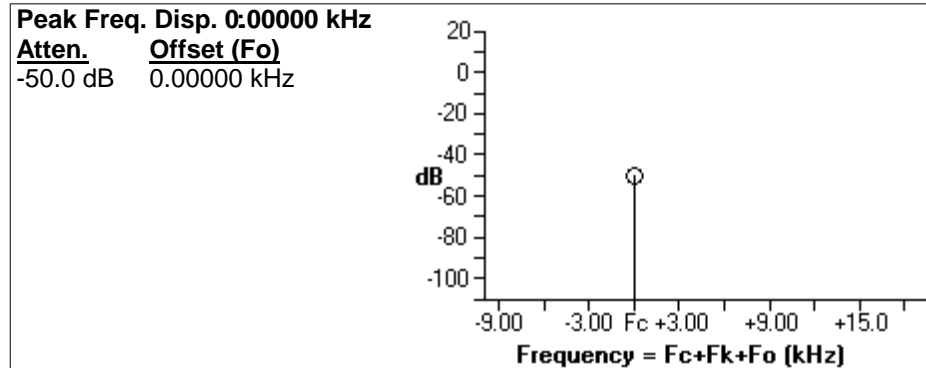
(UNCLASSIFIED)

Frequencies
    Fixed Frequency   **:**   (U) 8445.8 MHz
    Em. Designator   **:**   (U) 1M10G1D
        Neccessary BW   **:**   (U) 1100.0 kHz
            Modulation - 1M10G1D
                Radar/Communications   **:**   (U) Communications
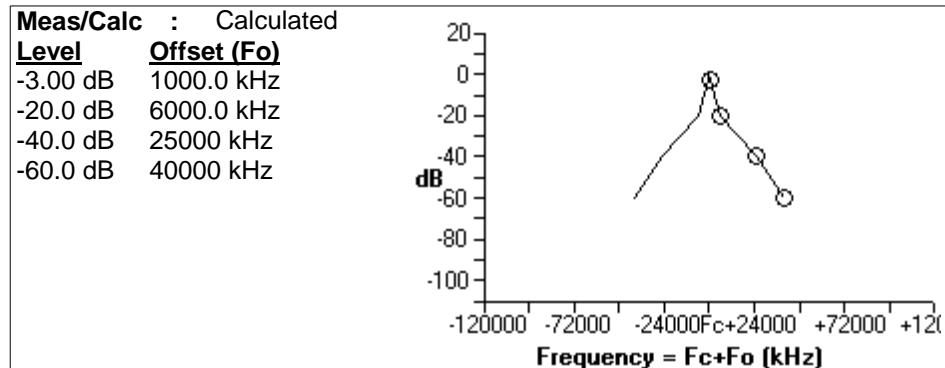   **Modulation Type**   **:**   (U) Digital Modulation
                Spread Spectrum   **:**   No
                Dig. Modulation Type   **:**   (U) QPSK - Quadrature Phase Shift Keying
                Digital Bit Rate   **:**   (U) 550000 bps
        Figure 4 - Fundamental Curve (U)

Meas/Calc   **:**   Calculated
Level   **Offset (Fo)**
-3.00 dB   1000.0 kHz
-20.0 dB   6000.0 kHz
-40.0 dB   25000 kHz
-60.0 dB   40000 kHz

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    Em. Designator   **:**   (U) 800KG1D
        Neccessary BW   **:**   (U) 800.00 kHz
            Modulation - 800KG1D
                Radar/Communications   **:**   (U) Communications
                Modulation Type   **:**   (U) Digital Modulation
                Spread Spectrum   **:**   No
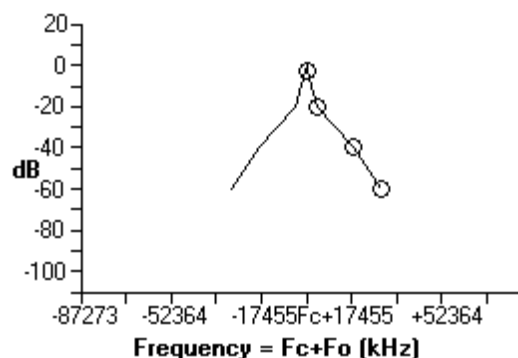   **Dig. Modulation Type**   **:**   (U) QPSK - Quadrature Phase Shift Keying
                Digital Bit Rate   **:**   (U) 400000 bps

FULL RECORD PRINT FOR Transmitter

Figure 5 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	727.27 kHz
-20.0 dB	4363.4 kHz
-40.0 dB	18182 kHz
-60.0 dB	29091 kHz

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Em. Designator : (U) 1M00G1D
Neccessary BW : (U) 1000.0 kHz
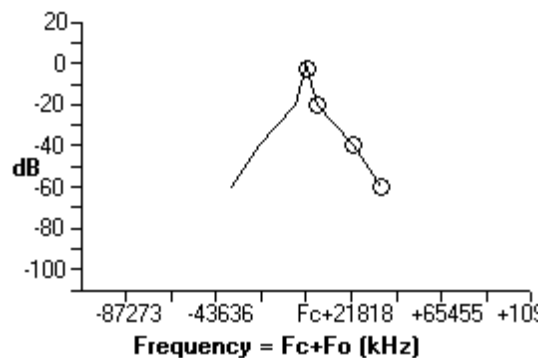   **Modulation - 1M00G1D**
        Radar/Communications : (U) Communications
        Modulation Type : (U) Digital Modulation
        Spread Spectrum : No
        Dig. Modulation Type : (U) QPSK - Quadrature Phase Shift Keying
        Digital Bit Rate : (U) 333 bps

Figure 6 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	909.09 kHz
-20.0 dB	5454.5 kHz
-40.0 dB	22727 kHz
-60.0 dB	36364 kHz

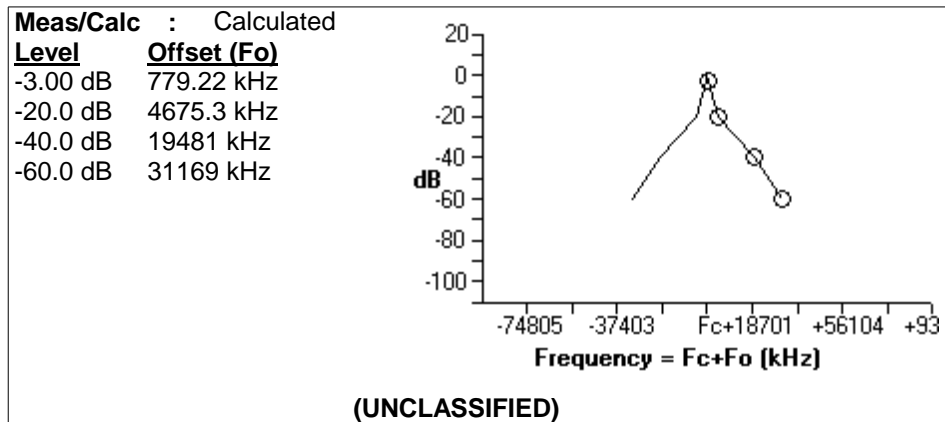**(UNCLASSIFIED)**

Em. Designator : (U) 857KG1D
Neccessary BW : (U) 857.00 kHz
    Modulation - 857KG1D
        Radar/Communications : (U) Communications
        Modulation Type : (U) Digital Modulation
        Spread Spectrum : No
        Dig. Modulation Type : (U) QPSK - Quadrature Phase Shift Keying
        Digital Bit Rate : (U) 285714 bps

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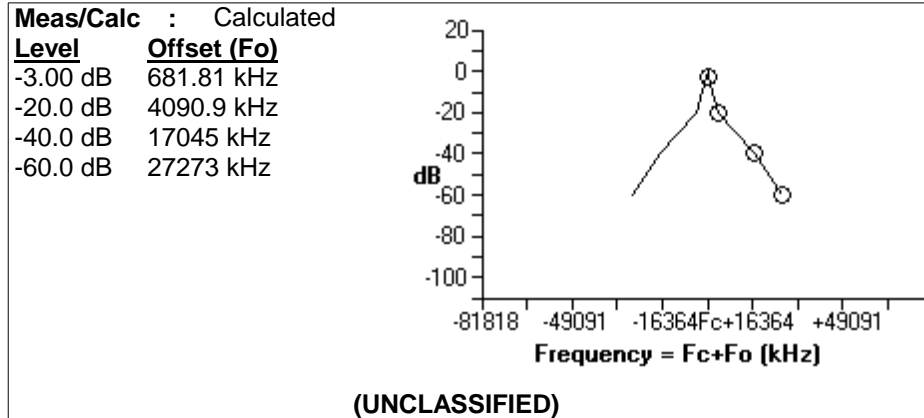
Figure 7 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	779.22 kHz
-20.0 dB	4675.3 kHz
-40.0 dB	19481 kHz
-60.0 dB	31169 kHz

(UNCLASSIFIED)

Em. Designator	**:**	(U) 750KG1D
Neccessary BW	**:**	(U) 750.00 kHz

Modulation - 750KG1D

Radar/Communications	**:**	(U) Communications
Modulation Type	**:**	(U) Digital Modulation
Spread Spectrum	**:**	No
Dig. Modulation Type	**:**	(U) QPSK - Quadrature Phase Shift Keying
Digital Bit Rate	**:**	(U) 250000 bps

Figure 8 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	681.81 kHz
-20.0 dB	4090.9 kHz
-40.0 dB	17045 kHz
-60.0 dB	27273 kHz

(UNCLASSIFIED)

Em. Designator	**:**	(U) 600KG1D
Neccessary BW	**:**	(U) 600.00 kHz

Modulation - 600KG1D

Radar/Communications	**:**	(U) Communications
Modulation Type	**:**	(U) Digital Modulation
Spread Spectrum	**:**	No
Dig. Modulation Type	**:**	(U) QPSK - Quadrature Phase Shift Keying
Digital Bit Rate	**:**	(U) 100000 bps

FULL RECORD PRINT FOR The Mars Atmosphere & Volatile EvolutioN (MAVEN)
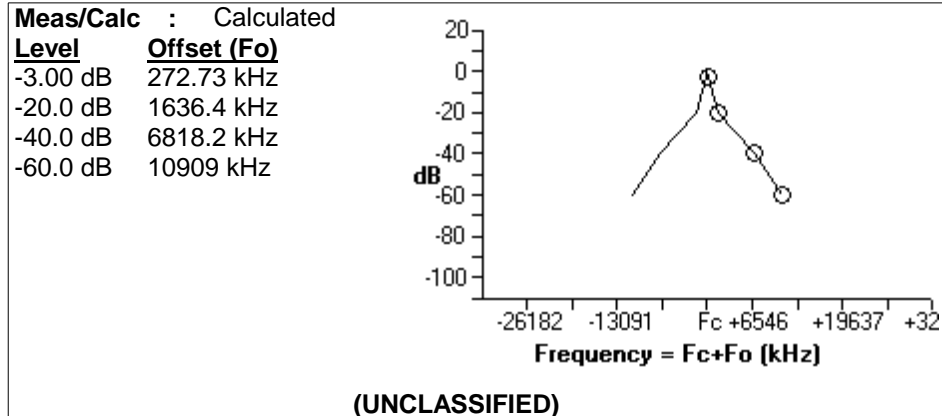
Figure 9 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	545.45 kHz
-20.0 dB	3272.7 kHz
-40.0 dB	13636 kHz
-60.0 dB	21818 kHz

(UNCLASSIFIED)
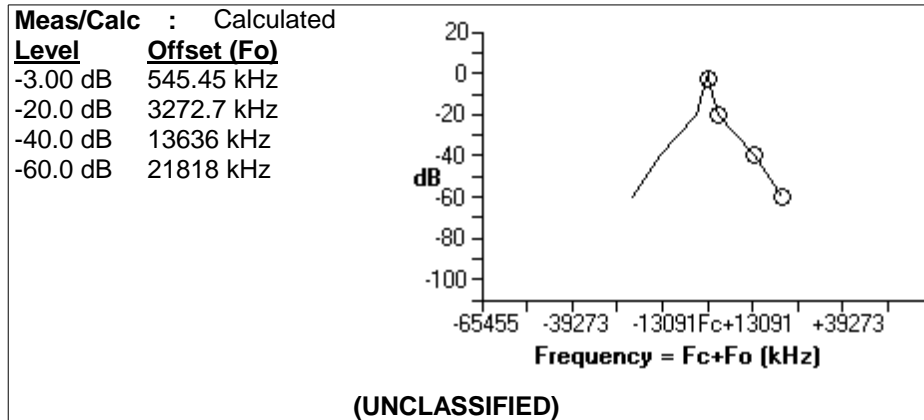
Em. Designator	**:**	(U) 300KG1D
Neccessary BW	**:**	(U) 300.00 kHz

Modulation - 300KG1D

Radar/Communications	**:**	(U) Communications
Modulation Type	**:**	(U) Digital Modulation
Spread Spectrum	**:**	No
Dig. Modulation Type	**:**	(U) QPSK - Quadrature Phase Shift Keying
Digital Bit Rate	**:**	(U) 50000 bps

Figure 10 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	272.73 kHz
-20.0 dB	1636.4 kHz
-40.0 dB	6818.2 kHz
-60.0 dB	10909 kHz

(UNCLASSIFIED)

Em. Designator	**:**	(U) 60K2G1D
Neccessary BW	**:**	(U) 60.200 kHz

Modulation - 60K2G1D

Radar/Communications	**:**	(U) Communications
Modulation Type	**:**	(U) Digital Modulation
Spread Spectrum	**:**	No
Dig. Modulation Type	**:**	(U) QPSK - Quadrature Phase Shift Keying
Digital Bit Rate	**:**	(U) 10036 bps

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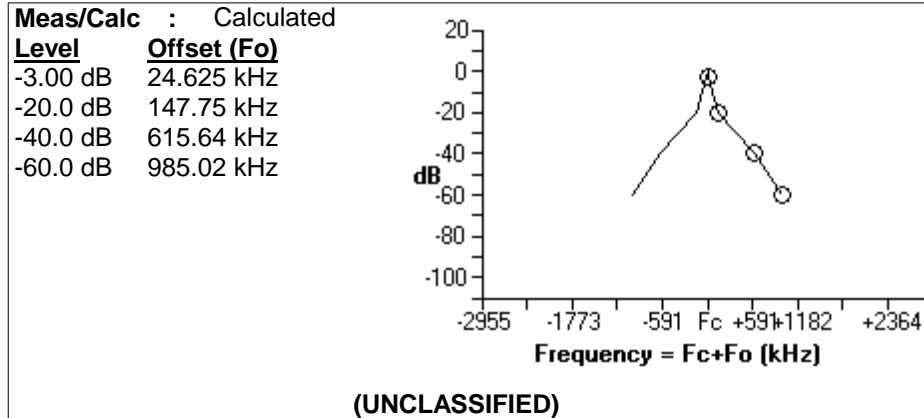
Figure 11 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	54.745 kHz
-20.0 dB	328.47 kHz
-40.0 dB	1368.6 kHz
-60.0 dB	2189.8 kHz

(UNCLASSIFIED)
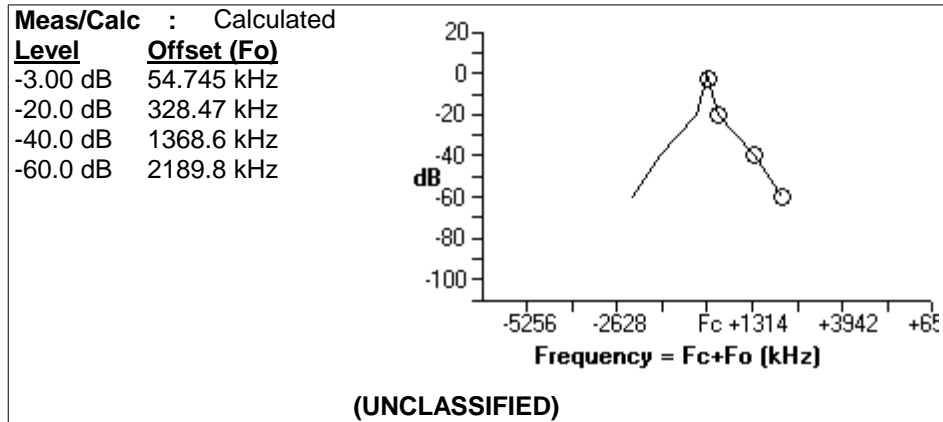
Em. Designator	**:**	(U) 27K1G1D
Neccessary BW	**:**	(U) 27.100 kHz

    Modulation - 27K1G1D

Radar/Communications	**:**	(U) Communications
Modulation Type	**:**	(U) Digital Modulation
Spread Spectrum	**:**	No
Dig. Modulation Type	**:**	(U) QPSK - Quadrature Phase Shift Keying
Digital Bit Rate	**:**	(U) 4515 bps

Figure 12 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	24.625 kHz
-20.0 dB	147.75 kHz
-40.0 dB	615.64 kHz
-60.0 dB	985.02 kHz

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Em. Designator	**:**	(U) 12K0G1D
Neccessary BW	**:**	(U) 12.000 kHz

    Modulation - 12K0G1D

Radar/Communications	**:**	(U) Communications
Modulation Type	**:**	(U) Digital Modulation
Spread Spectrum	**:**	No
Dig. Modulation Type	**:**	(U) QPSK - Quadrature Phase Shift Keying
Digital Bit Rate	**:**	(U) 2006 bps

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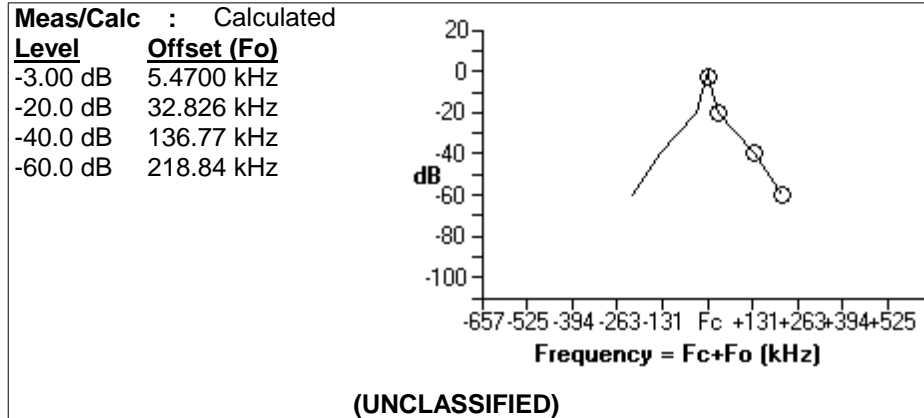
Figure 13 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	10.842 kHz
-20.0 dB	65.652 kHz
-40.0 dB	273.55 kHz
-60.0 dB	437.68 kHz

Frequency = Fc+Fo (kHz)

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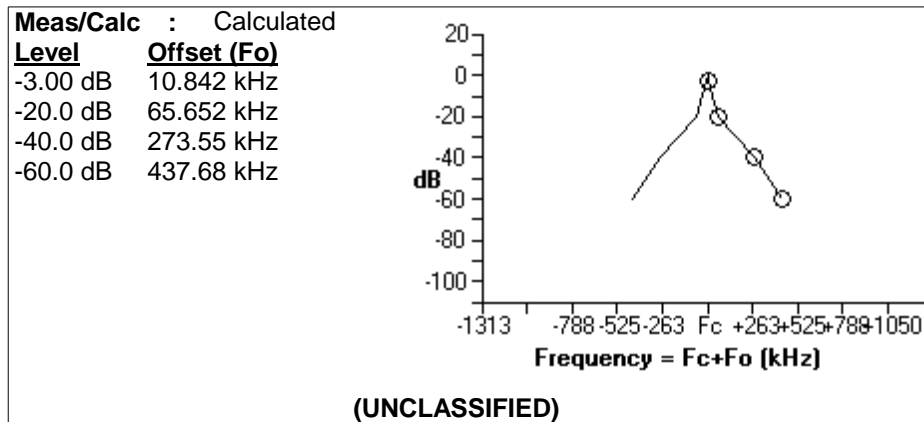
Em. Designator	**:** (U) 6K02G1D
Neccessary BW	**:** (U) 6.0200 kHz

Modulation - 6K02G1D

Radar/Communications	**:** (U) Communications
Modulation Type	**:** (U) Digital Modulation
Spread Spectrum	**:** No
Dig. Modulation Type	**:** (U) QPSK - Quadrature Phase Shift Keying
Digital Bit Rate	**:** (U) 1003 bps

Figure 14 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	5.4700 kHz
-20.0 dB	32.826 kHz
-40.0 dB	136.77 kHz
-60.0 dB	218.84 kHz

Frequency = Fc+Fo (kHz)

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Em. Designator	**:** (U) 602HG1D
Neccessary BW	**:** (U) 0.60200 kHz

Modulation - 602HG1D

Radar/Communications	**:** (U) Communications
Modulation Type	**:** (U) Digital Modulation
Spread Spectrum	**:** No
Dig. Modulation Type	**:** (U) QPSK - Quadrature Phase Shift Keying
Digital Bit Rate	**:** (U) 100 bps

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Figure 15 - Fundamental Curve (U)

Meas/Calc : Calculated	
Level	**Offset (Fo)**
-3.00 dB	0.54720 kHz
-20.0 dB	3.2830 kHz
-40.0 dB	13.679 kHz
-60.0 dB	21.887 kHz

Frequency = Fc+Fo (kHz)
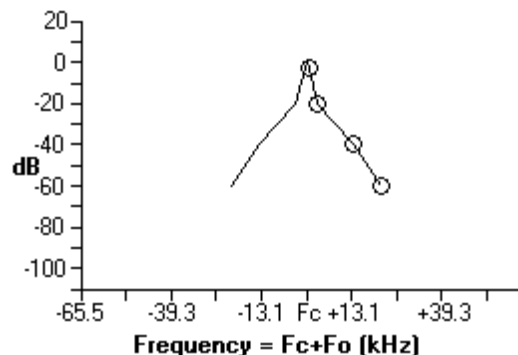
(UNCLASSIFIED)

Em. Designator	**:**	(U) 2M40G1D
Neccessary BW	**:**	(U) 2400.0 kHz

Modulation - 2M40G1D

Radar/Communications	**:**	(U) Communications
Modulation Type	**:**	(U) Digital Modulation
Spread Spectrum	**:**	No
Dig. Modulation Type	**:**	(U) BPSK - Binary Phase Shift Keying

Figure 16 - Fundamental Curve (U)

Level	**Offset (Fo)**
-3.00 dB	2181.8 kHz
-20.0 dB	13091 kHz
-40.0 dB	54545 kHz
-60.0 dB	87273 kHz

Frequency = Fc+Fo (kHz)
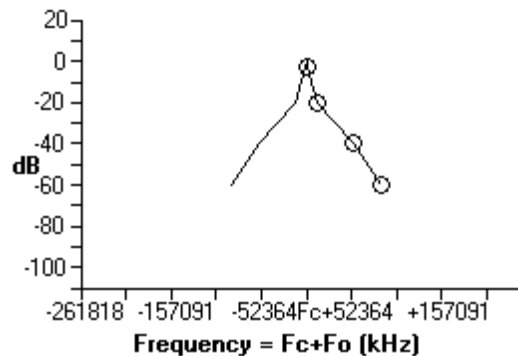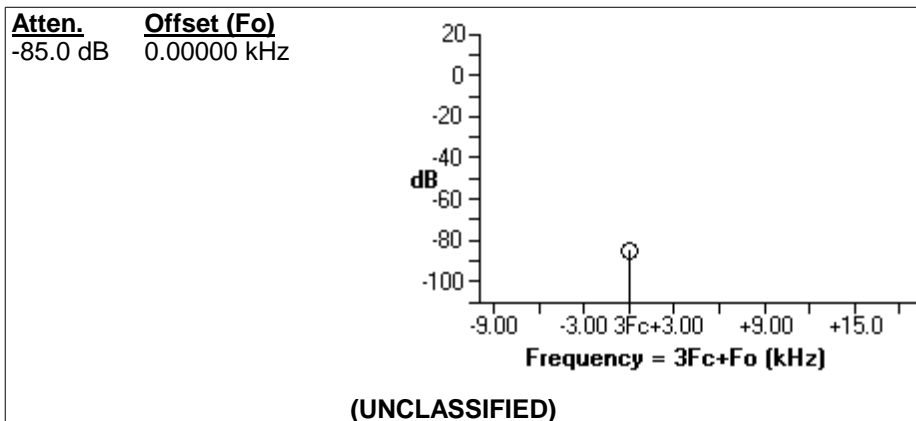
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Powers

Power Type : Mean
Upper Limit : (U) 100 W

FULL RECORD PRINT FOR The Mars Atmosphere & Volatile EvolutioN (MAVEN)

TRANSMITTER DSN 34m - MAVEN Tx

Nomenclature	**:**	(U) DSN 34m - MAVEN Tx
Manufacturer	**:**	(U) NASA JPL
Model Name	**:**	(U) DSS-34 S-band Tx
NTIA Approval Status	**:**	(U) Unapproved
Date/Time Last Mod.	**:**	6/1/2010 2:19:43 PM (GMT)
Coordination ID	**:**	(U) J/F 12
Freq. Stability	**:**	(U) 0.3 ppm
Output Device	**:**	(U) Klystron
Tuning Method	**:**	(U) Cavity
Radar/Comm	**:**	(U) Communications
Supp. of Harmonics	**:**	(U) No

Figure 17 - 2nd Harmonic Curve (U)

Atten.   Offset (Fo)
-85.0 dB   0.00000 kHz

Frequency = 2Fc+Fo [kHz]

(UNCLASSIFIED)
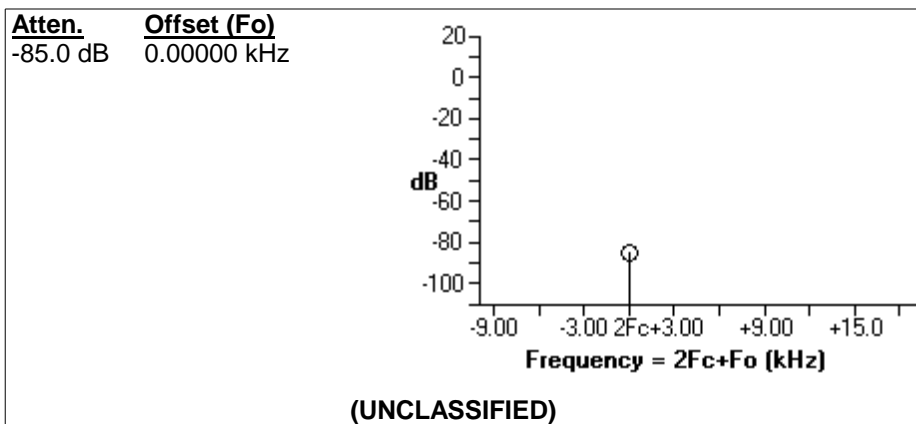
Figure 18 - 3rd Harmonic Curve (U)

Atten.   Offset (Fo)
-85.0 dB   0.00000 kHz

Frequency = 3Fc+Fo [kHz]

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FULL RECORD PRINT FOR The Mars Atmosphere & Volatile EvolutioN (MAVEN)

Figure 19 - Other Harmonic Curve (U)

Atten.   **Offset (Fo)**
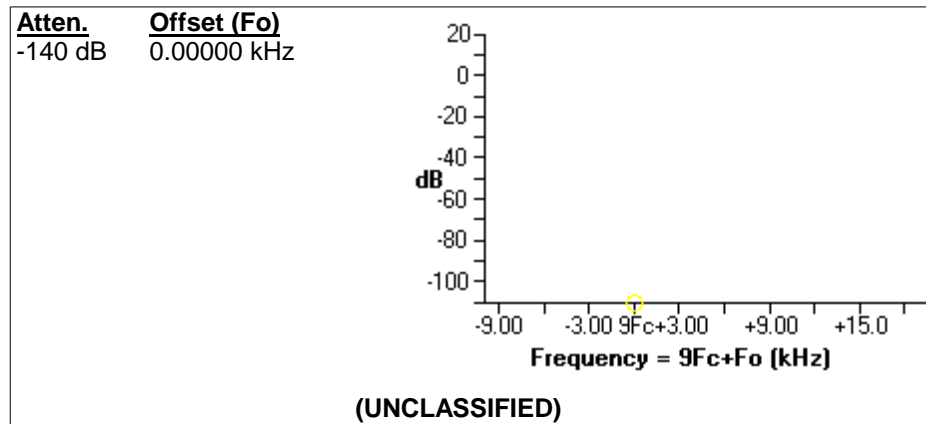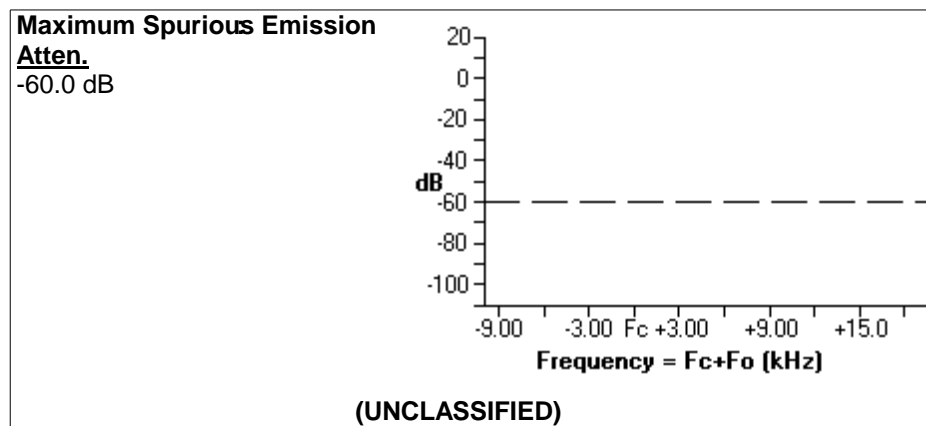-140 dB   0.00000 kHz

Frequency = 9Fc+Fo (kHz)

(UNCLASSIFIED)

Figure 20 - Spurious Emission Curve (U)

Maximum Spurious Emission
Atten.
-60.0 dB

Frequency = Fc+Fo (kHz)

(UNCLASSIFIED)

Frequencies
    Fixed Frequency   **:**   (U) 7188.5 MHz
    Em. Designator   **:**   (U) 36K0G2D
      Neccessary BW   **:**   (U) 36.000 kHz
        Modulation - 36K0G2D
            Radar/Communications   **:** (U) Communications
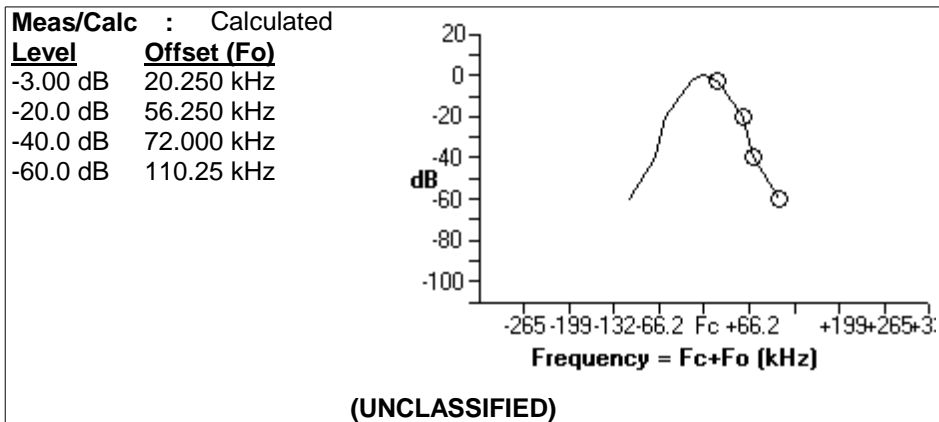   **Modulation Type**   **:** (U) Digital Modulation
            Spread Spectrum   **:** No
            Dig. Modulation Type   **:** (U) PSK - Phase Shift Keying
            Digital Bit Rate   **:** (U) 2000 bps

FULL RECORD PRINT FOR The Mars Atmosphere & Volatile EvolutioN (MAVEN)

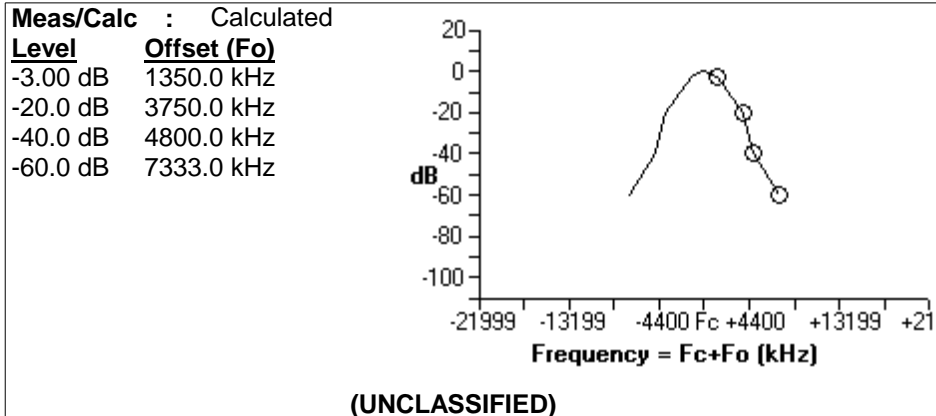### Figure 21 - Fundamental Curve (U)

Meas/Calc : Calculated

Level	Offset (Fo)
-3.00 dB	20.250 kHz
-20.0 dB	56.250 kHz
-40.0 dB	72.000 kHz
-60.0 dB	110.25 kHz

Frequency = Fc+Fo (kHz)

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Em. Designator	:	(U) 2M40G2D
Neccessary BW	:	(U) 2400.0 kHz

Modulation - 2M40G2D

Radar/Communications	:	(U) Communications
Modulation Type	:	(U) Digital Modulation
Spread Spectrum	:	No
Dig. Modulation Type	:	(U) PSK - Phase Shift Keying

Figure 22 - Fundamental Curve (U)

Meas/Calc : Calculated

Level	Offset (Fo)
-3.00 dB	1350.0 kHz
-20.0 dB	3750.0 kHz
-40.0 dB	4800.0 kHz
-60.0 dB	7333.0 kHz

Frequency = Fc+Fo (kHz)

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Powers
Power Type : Mean
Upper Limit : (U) 19953 W

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RECEIVER MAVEN - Rx

Nomenclature	**:**	(U) MAVEN - Rx
Manufacturer	**:**	(U) LOCKHEED MARTIN ASTRO SPACE
NTIA Approval Status	**:**	(U) Unapproved
Date/Time Last Mod.	**:**	5/26/2010 10:10:48 PM (GMT)
Coordination ID	**:**	(U) J/F 12
Cond. Undesired Em.	**:**	(U) 0.000dBm

Frequencies

Fixed Frequency : (U) 7188.5 MHz

Sensitivities

Em. Designator	**:**	(U) 36K0G2D
Necessary BW	**:**	(U) 36.000 kHz
Sensitivity	**:**	(U) -155 dBm
Noise Fig.	**:**	(U) 4.13 dB
Noise Temp.	**:**	(U) 461 K
Spur. Reject	**:**	(U) 60.0 dB

Sensitivities

Em. Designator	**:**	(U) 2M40G2D
Necessary BW	**:**	(U) 2400.0 kHz
Sensitivity	**:**	(U) -155 dBm
Noise Fig.	**:**	(U) 4.13 dB
Noise Temp.	**:**	(U) 461 K

Figure 23 - RF Selectivity Curve (U)

Meas/Calc	**:**	Calculated
Atten.	**Offset (Fo)**	
3.00 dB	36.000 kHz	
20.0 dB	100.00 kHz	
60.0 dB	196.00 kHz	
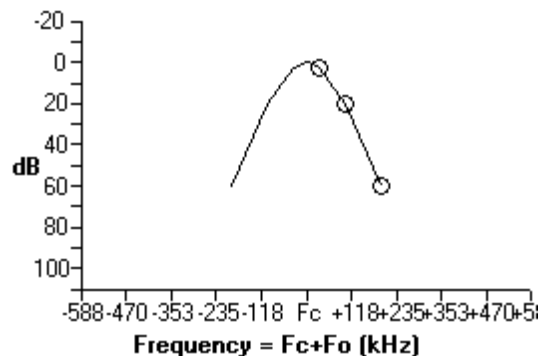
Frequency = Fc+Fo (kHz)

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FULL RECORD PRINT FOR The Mars Atmosphere & Volatile EvolutioN (MAVEN)

RECEIVER DSN 34m - MAVEN Rx

Nomenclature : (U) DSN 34m - MAVEN Rx
Manufacturer : (U) NASA JPL
Model Name : (U) DSS-34 S-band Rcv
NTIA Approval Status : (U) Unapproved
Date/Time Last Mod. : 5/25/2010 5:30:04 PM (GMT)
Coordination ID : (U) J/F 12
Freq. Stability : (U) 0.3 ppm
Tuning Method : (U) Synthesizer
Cond. Undesired Em. : (U) 0.000dBm
Frequencies
   Fixed Frequency : (U) 8445.8 MHz

     Sensitivities
     Em. Designator : (U) 1M10G1D
       Necessary BW : (U) 1100.0 kHz

     Sensitivities
     Em. Designator : (U) 1M00G1D
       Necessary BW : (U) 1000.0 kHz

     Sensitivities
     Em. Designator : (U) 800KG1D
       Necessary BW : (U) 800.00 kHz

     Sensitivities
     Em. Designator : (U) 857KG1D
       Necessary BW : (U) 857.00 kHz

     Sensitivities
     Em. Designator : (U) 750KG1D
       Necessary BW : (U) 750.00 kHz

     Sensitivities
     Em. Designator : (U) 600KG1D
       Necessary BW : (U) 600.00 kHz

     Sensitivities
     Em. Designator : (U) 300KG1D
       Necessary BW : (U) 300.00 kHz

     Sensitivities
     Em. Designator : (U) 60K2G1D
       Necessary BW : (U) 60.200 kHz

     Sensitivities
     Em. Designator : (U) 27K1G1D
       Necessary BW : (U) 27.100 kHz

     Sensitivities
     Em. Designator : (U) 12K0G1D
       Necessary BW : (U) 12.000 kHz

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<u>**Sensitivities**</u>
Em. Designator   :   (U) 6K02G1D
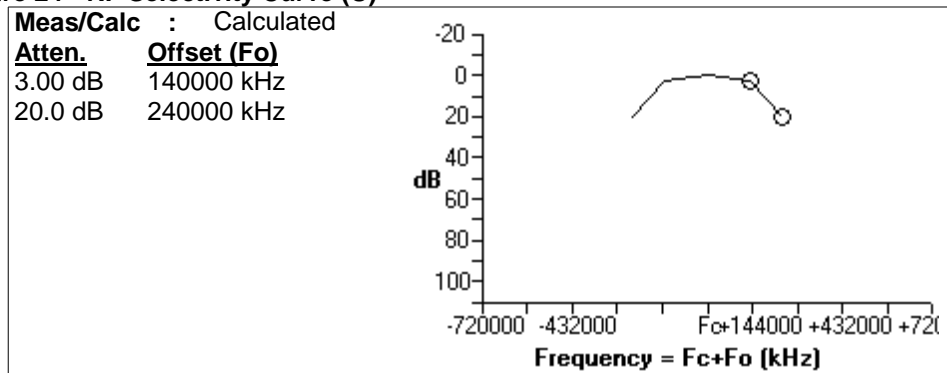   **Necessary BW   :**   (U) 6.0200 kHz

<u>**Sensitivities**</u>
Em. Designator   :   (U) 602HG1D
   Necessary BW   :   (U) 0.60200 kHz

<u>**Sensitivities**</u>
Em. Designator   :   (U) 2M40G1D
   Necessary BW   :   (U) 2400.0 kHz

Figure 24 - RF Selectivity Curve (U)

Meas/Calc   :   Calculated

<u>**Atten.**</u>	<u>**Offset (Fo)**</u>
3.00 dB	140000 kHz
20.0 dB	240000 kHz

Frequency = Fc+Fo (kHz)

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ANTENNA MAVEN - Ant

Nomenclature	**:**	(U) MAVEN - Ant
Antenna Code	**:**	Aperture
Manufacturer	**:**	(U) LOCKHEED MARTIN ASTRO SPACE
NTIA Approval Status	**:**	(U) Unapproved
Date/Time Last Mod.	**:**	5/25/2010 6:15:09 PM (GMT)
Coordination ID	**:**	(U) J/F 12
Lower Freq. Limit	**:**	(U) 7145.0 MHz
Upper Freq. Limit	**:**	(U) 8450.0 MHz
Main Beam Gain	**:**	(U) 41.6 dBi
Atten. Rel/Act	**:**	(U) Relative dB
Horz. Scan Type	**:**	(U) Fixed
Horz. Scan Type	**:**	(U) Fixed
Vert. Scan Type	**:**	(U) Fixed

FULL RECORD PRINT FOR The Mars Atmosphere & Volatile EvolutioN (MAVEN)	

ANTENNA DSN 34m - MAVEN Ant

Nomenclature	**:**	(U) DSN 34m - MAVEN Ant
Antenna Code	**:**	Aperture
Manufacturer	**:**	(U) NASA JPL
Model Name	**:**	(U) DSS-34 Waveguide Beam Antenna
NTIA Approval Status	**:**	(U) Unapproved
Date/Time Last Mod.	**:**	5/25/2010 5:20:52 PM (GMT)
Coordination ID	**:**	(U) J/F 12
Lower Freq. Limit	**:**	(U) 7145.0 MHz
Upper Freq. Limit	**:**	(U) 8450.0 MHz
Polarization	**:**	(U) Right and Left Hand Circular
Main Beam Gain	**:**	(U) 66.5 dBi
Atten. Rel/Act	**:**	(U) Relative dB
Horz. Beamwidth	**:**	(U) 0.240 degrees
Vert. Beamwidth	**:**	(U) 0.240 degrees
Horz. Scan Type	**:**	(U) Tracker
Horz. Scan Type	**:**	(U) Tracker
Vert. Scan Type	**:**	(U) Tracker
Dish Diameter	**:**	(U) 34.0 meters

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Frequency List

Tx Station	Rx Station	Frequency (MHz)	Em. Des.	Stn. Class
(U) Goldstone, CA	(U) MAVEN	(U) 7188.5	(U) 2M40G2D	TH
			(U) 36K0G2D	
(U) MAVEN	(U) Goldstone, CA	(U) 8445.8	(U) 12K0G1D	EH
			(U) 1M00G1D	
			(U) 1M10G1D	
			(U) 27K1G1D	
			(U) 2M40G1D	
			(U) 300KG1D	
			(U) 600KG1D	
			(U) 602HG1D	
			(U) 60K2G1D	
			(U) 6K02G1D	
			(U) 750KG1D	
			(U) 800KG1D	
			(U) 857KG1D	

Line Diagram: The Mars Atmosphere & Volatile EvolutioN (MAVEN)