EXHIBIT U – Technical Report

FCC ID EJM-HRMP131

Measurement/Technical Report

Intel Corporation

Intel® Web Tablet, Model 10

FCC ID: EJM-HRMP131

March 6, 2001

This report concerns (check one):	Original Grant__*X*	*Class II Change*____
Equipment Type: Unlicensed Spread Spectrum Transmitter		Rule Part: 47 CFR 15.247

Deferred grant requested per 47 CFR 0.457 (d)(1)(ii)? Yes_____ no__X__

If yes, defer until: _____N/A_____ date

Intel Corp. agrees to notify the Commission by: _____N/A_____ date

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

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1.0 General Information

1.1 Product Description

Manufactured By ..... Intel Corporation

Address..... 5200 NE Elam Young Parkway, Hillsboro, OR 97124

Test Requested By:..... Tom Du

Model..... Intel® Web Tablet, Model 10

FCC ID EJM-HRMP131

Serial Number(s) TA5300100019

Date of Test ..... February 12 – 14, 2001

Job Number INTE4292

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1.1 Product Description con't

The Equipment Under Test (EUT) is the Intel® Web Tablet, Model 10, a spread spectrum transmitter that uses frequency hopping modulation. This wireless tablet is intended to be sold for home use only via retail and internet sales channels. The transmitter provides a data link to a host computer so users of the wireless tablet can access the internet.

Frequency Range (center frequency of the lowest channel to the center frequency of the highest channel):
2.403 GHz - 2.477 GHz

Peak Output Power (conducted at the antenna terminals, not EIRP)
102 mW

How the transmitter is used:
The Intel® Web Tablet contains a transceiver that communicates with a personal computer which uses a similar transceiver device connected to the USB port of the PC. The PC is connected to the Internet. Please note that the wireless USB device for the PC is currently marketed in the United States and Canada as "Anypoint" and has been previously certified by the FCC and Industry Canada. It can be purchased in computer/electronic stores throughout the U.S. and Canada.

A cradle will be marketed separately as an optional accessory to the Intel® Web Tablet. It provides a means to position the Intel® Web Tablet vertically while making a passive, pass-through connection to the AC adapter and a keyboard. The EUT was tested both with and without the cradle to determine the worse case configuration.

Available Ports
DC Input
Audio Output (Headphones)
Contacts for Cradle (DC input and keyboard connection)

Available Antennas
The Intel® Web Tablet can be configured with only one antenna that is permanently installed at the factory. There is no provision for the user to change the antenna.

Other FCC Equipment Authorizations
There are no provisions for a wired connection to a PC, so the digital portion of the Intel® Web Tablet has been "Verified" compliant with FCC Part 15 Subpart B requirements as a Class B digital device.

1.2 Related Submittals/Grants

None

1.3 Tested System Details

EUT and Peripherals

Item	FCC ID	Description and Serial No.
EUT	EJM-HRMP131	Intel® Web Tablet, Model 10, S/N TA5300100019.
AC Adapter	N/A	Delta Electronics, Model ADP-24HB Rev A, S/N NOC0024000860
Headphones	N/A	Unknown manufacturer, Model LT-100, S/N none

Cables

Cable Type	Shield	Length (meters)	Ferrite	Connection Point 1	Connection Point 2
Power	No	1.8	No	AC Adapter	DC Input on EUT
Headphones	No	1.0	No	Headphones	Audio Output on EUT

1.4 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.4 (1992) and DA 00-705. Radiated testing was performed at an antenna to EUT distance of 3 meters, from 30 MHz to 8 GHz, and at 1 meter from 8 GHz to 25 GHz.

1.5 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data is located at

Northwest EMC, Inc.
22975 NW Evergreen Pkwy., Ste 400
Hillsboro, OR 97124
(503) 844-4066
Fax: 844-3826

The semi-anechoic chamber, and conducted measurement facility is located in Hillsboro, OR, at the address shown above. This site has been fully described in a report filed with the FCC (Federal Communications Commission), and accepted by the FCC in a letter maintained in our files.

Northwest EMC, Inc. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. NVLAP Lab Code: 200059-0.

3.0 System Test Configuration

3.1 Justification

3.1.1 Operating Modes

All operating modes of the EUT were investigated. During spurious radiated emissions testing, the carrier was put into a no-hop mode while modulated with a PRBS signal at the maximum data rate. In this configuration, the EUT was tested with its single antenna at low, mid, and high transmit frequencies.

3.1.2 Test Configuration

The EUT can be configured to operate powered from either batteries or the AC mains. Also, it can operate with or without a cradle (optional accessory). The cradle provides a means to position the Intel® Web Tablet vertically while making a passive, pass-through connection to the AC adapter and a keyboard. Without the cradle, only the AC adapter and headphones may be connected to the EUT. The EUT was scanned in both configurations to determine worse case emissions.

3.2 EUT Exercise Software

The software used to exercise the EUT is engineering developmental software designed to provide manual control over the transceiver functions.

System Software: VxWorks Release 5.7 based software with following features added to meeting needs for EMI tests:

- White letter “H” and black background is displayed on screen.
- “Print button” on front panel is programmed to enable frequency-hopping mode to transmit data packet stream.
- “Family button” #1, 2, 4 on front panel are programmed to disable frequency hopping mode, and set transmitter to transmit packet stream at highest available channel (2.477Ghz), lowest available channel (2.403Ghz) and 2.437Ghz) respectively.
- Audio circuit is always enabled to play a randomly selected audio source file and output to either built-in speakers or an external headphone

Radio Module Firmware: Product code and Revision: 9400.0177, V2.5-89/2.5-B11, 628B REV01.

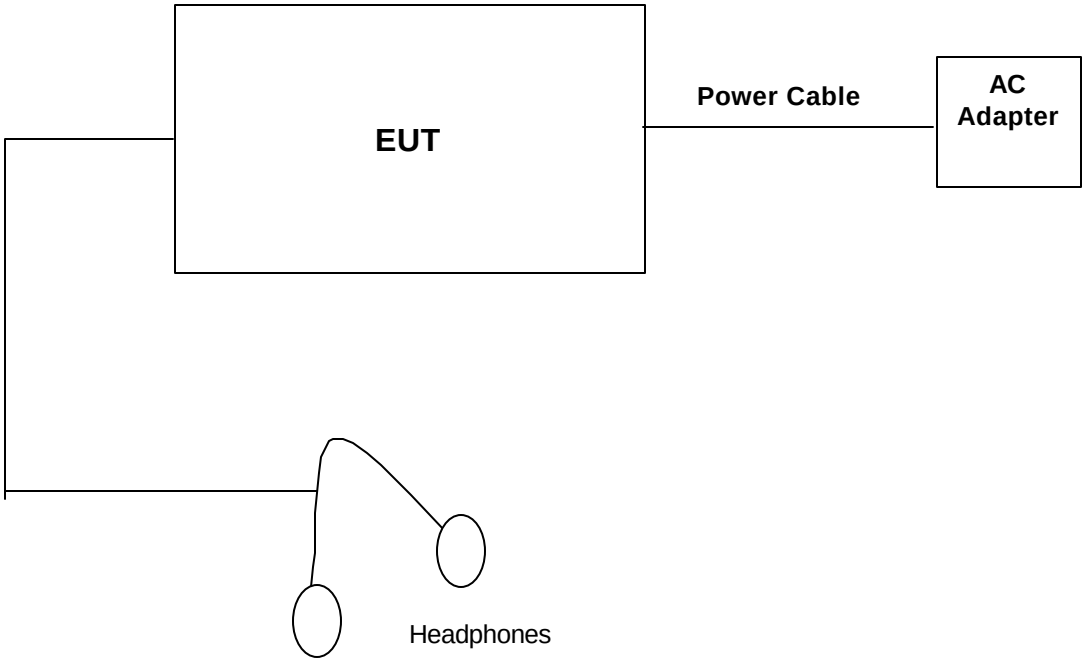
3.3 Special Accessories

None

3.4 Equipment Modifications

None.

Figure 3.1: Configuration of Tested System



4.0 Antenna Requirement

Per 47 CFR 15.203, the EUT use a single antenna that is designed to ensure that no other antennas other than the one supplied by Intel will be used with the device.

The Intel® Web Tablet can be configured with only one antenna that is permanently installed at the factory. There is no provision for the user to change the antenna.

4.1 Antenna Information

Per 47 CFR 15.204 (c), a description of the antenna tested with the EUT is provided. The type, manufacturer, model number, and gain with reference to an isotropic radiator is given.

Please reference exhibit "C", file name "Antenna Description.pdf" for that information.

Photographs of the antenna are in exhibit "D", file name "External Photos.pdf"

4.2 Frequency Hopping System

Per 47 CFR 15.247(a), a description of how the EUT meets the definition (found in 47 CFR 2.1) of a frequency hopping spread spectrum system is provided.

The description includes the number of hopping frequencies, the time of occupancy (dwell time) per hopping channel, and an explanation of how the hopping sequence is generated (an example is provided of the hopping channel sequence). Also, a description of how the EUT's hopping channels are used equally on average is provided.

In an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitters; a description is provided of how the EUT does not have the ability to coordinate with other frequency hopping systems.

Please reference exhibit "G", file name"Operational Description" for that information

4.3 Frequency Hopping Receiver

Per 47 CFR 15.247 (a)(1), a description is provided of how the EUT's associated receiver complies with the requirement that the input bandwidth matches the hopping channel bandwidth of the transmitter, and shifts frequencies in synchronization with the transmitted signals.

Please reference exhibit "G", file name"Operational Description", for synchronization information, and exhibit "E", file name "Frequency Block Diagrams" for input bandwidth information

4.4 De Facto EIRP Limit

Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36dBm. The peak output power of the EUT is approximately +20.1 dBm, and the maximum gain of the antenna used with the EUT is 1 dBi. Therefore, the EUT's maximum EIRP is +21.1 dBm.

4.5 RF Exposure Compliance Requirements

Per 47 CFR 15.247 (b)(4), the EUT meets the requirement that it be operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines (ref . 47 CFR 1.1307, 1.1310, 2.1091, and 2.1093. Also OET Bulletin 65, Supplement C).

The EUT will only be used as a mobile transmitter per 47 CFR 2.1091. The EUT supports the connection of only one antenna at a time. Eligibility to grant TCB certification of this device was confirmed by emails from Ray LaForge (8/28/00) and Tom Phillips (8/29/00) of the FCC's OET laboratory.

The MPE estimates are as follows:

Table 1 in 47 CFR 1.1310 defines the maximum permissible exposure (MPE) for the general population as 1mW/cm^2. The distance from the EUT's transmitting antenna where the exposure level reaches the maximum permitted level is calculated using the general equation:

$$S = (PG)/4\pi R^2$$

Where: S = power density (1mW/cm^2 maximum permitted level)
P = power input to the antenna (102 mW)
G = linear power gain relative to an isotropic radiator (1 dBi = numeric gain of 1.25)
R = distance to the center of the radiation of the antenna

Solving for R, the 1mW/cm^2 limit is reached 3.19 cm or closer to the transmitting antenna. Therefore, no warning labels, no RF exposure warnings in the manual, or other protection measures will be used with the EUT.

4.6 AC Powerline Conducted Emissions

Requirement: Per 47 CFR 15.207, the radio frequency voltage that is conducted back onto the AC power line from the EUT, on any frequency within the 450 kHz to 30 MHz band, shall not exceed 250 microvolts.

Configuration: The AC powerline conducted emissions were measured with the EUT operating in a frequency hopping mode typical of normal operation. The EUT was transmitting at its maximum data rate. The spectrum was scanned from 450 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.4-1992.

Result: Per 47 CFR 15.207, the radio frequency voltage that is conducted back onto the AC power line from the EUT, on any frequency within the 450 kHz to 30 MHz band, does not exceed 250 microvolts.

The AC Powerline conducted emissions data may be referenced in Exhibit "I", file name "AC Powerline Conducted.pdf".

4.7 Spurious Radiated Emissions

Requirement: The field strength of any spurious emissions or modulation products that fall in a restricted band, as defined in 47 CFR 15.205, is measured. The peak level must comply with the limits specified in 47 CFR 15.35(b). The average level (taken with a 10Hz VBW) must comply with the limits specified in 15.209.

Configuration: The antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. The EUT was transmitting at its maximum data rate in a no hop mode. For each configuration, the spectrum was scanned from 30 MHz to 25 GHz. In addition, measurements were made in the restricted band of 2.4835 to 2.5 GHz to verify compliance.

While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:1992). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

Since the dwell time per channel of the hopping signal was less than 100 ms, the readings obtained with the 10 Hz VBW were further reduced by a "duty cycle correction factor" of 19.2 dB, derived from 20log(dwell time/100ms), where the EUT's maximum dwell time in any 100mS period was measured to be 11mS.

Band-edge compliance for peak emissions in the restricted band of 2.4835 GHz to 2.5 GHz was confirmed by using the "marker-delta" method described in FCC Public Notice DA 00-705:

1. In-band field strength of the fundamental was measured in both polarities
2. Amplitude delta between the fundamental and highest band-edge emission was measured in both polarities.
3. For each polarity, the amplitude delta from step #2 was subtracted from the field strength level of step #1. The resultant field strengths were used to determine compliance of peak emissions with band-edge requirements.

The marker-delta method was not required for average emissions to demonstrate compliance. Average emissions were measured in the conventional manner.

Result: The peak level complies with the limits specified in 47 CFR 15.35 (b). The average level (taken with a 10Hz VBW) complies with the limits specified in 15.209.

The final radiated data may be referenced in Exhibit "Q",
file name "Radiated Spurious Emissions.pdf".

The dwell time data may be referenced in Exhibit " M"'
File name "Dwell Time.pdf"

4.8 Occupied Bandwidth

Requirement: Per 47 CFR 15.247(a)(1)(ii), the 20 dB bandwidth of a hopping channel must be less than 1 MHz. The measurement is made with the spectrum analyzer's resolution bandwidth set to ≥1% of the 20dB bandwidth, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The occupied bandwidth was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode

Result: Per 47 CFR 15.247(a)(1)(ii), the 20 dB bandwidth of a hopping channel is less than 1 MHz. The spectrum analyzer's resolution bandwidth was ≥1% of the 20dB bandwidth and the video bandwidth was greater than or equal to the resolution bandwidth.

The occupied bandwidth data may be referenced in Exhibit "O", file name "Occupied Bandwidth.pdf"

4.9 Peak Output Power

Requirement: Per 47 CFR 15.247(b)(1), the maximum peak output power must not exceed 1 Watt. The measurement is made using either a peak power meter, or a spectrum analyzer using the following settings:

- Resolution bandwidth set to greater than the 6 dB bandwidth of the modulated carrier, and
- The video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode.

Result: Per 47 CFR 15.247(b)(1), the maximum peak output power does not exceed 1 Watt. The data plots include the cable loss of 1.4 dB. The spectrum analyzer's resolution bandwidth was greater than the 6 dB bandwidth of the modulated carrier, and the video bandwidth was greater than or equal to the resolution bandwidth.

The Peak Output Power data may be referenced in Exhibit "P",
file name "Output Power.pdf"

5.0 Spurious RF Conducted Emissions

Requirement: Per 47 CFR 15.247(c), in any 100 kHz bandwidth outside the authorized band, the maximum level of radio frequency power must be at least 20dB down from the highest emission level within the authorized band. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The spurious RF conducted emissions were measured with the EUT set to low, medium, and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode. For each transmit frequency, the spectrum was scanned from 0 MHz to 25 GHz.

Result: Per 47 CFR 15.247(c), in any 100 kHz bandwidth outside the authorized band, the maximum level of radio frequency power is at least 20dB down from the highest emission level within the authorized band. The spectrum analyzer's resolution bandwidth was 100 kHz, and the video bandwidth was greater than or equal to the resolution bandwidth.

The Conducted Spurious Emissions data may be referenced in Exhibit "L", file name "Conducted Spurious Emissions.pdf""

5.1 Band Edge Compliance of RF Conducted Emissions

Requirement: Per 47 CFR 15.247(c), in any 100 kHz bandwidth outside the authorized band, the maximum level of radio frequency power must be at least 20dB down from the highest emission level within the authorized band. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode. The channels closest to the band edges were selected. The spectrum was scanned across each band edge from 5 MHz below the band edge to 5 MHz above the band edge.

Result: Per 47 CFR 15.247(c), in any 100 kHz bandwidth outside the authorized band, the maximum level of radio frequency power is at least 20dB down from the highest emission level within the authorized band. The spectrum analyzer's resolution bandwidth was 100 kHz and the video bandwidth was greater than or equal to the resolution bandwidth.

The data for spurious RF conducted emissions at the edges of the authorized band may be referenced in Exhibit "J", file name "Band-Edge Compliance.pdf"

5.2 Carrier Frequency Separation

Requirement: Per 47 CFR 15.247(a)(1), the hopping channel carrier frequencies must be separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel. The measurement is made with the spectrum analyzer's resolution bandwidth set to greater than or equal to 1% of the span, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The carrier frequency separation was measured between each of 5 hopping channels in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

Result: Per 47 CFR 15.247(a)(1), the hopping channel carrier frequencies are separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel. The spectrum analyzer's resolution bandwidth was greater than or equal to 1% of the span, and the video bandwidth was greater than or equal to the resolution bandwidth.

The data for carrier frequency separation may be referenced in Exhibit "K", file name "Channel Spacing.pdf"

5.3 Time of Occupancy (Dwell Time)

Requirement: Per 47 CFR 15.247(a)(1)(ii), the average time of occupancy on any frequency must not be greater than 0.4 seconds within a 30 second period. The measurement is made with the spectrum analyzer's span set to zero, the resolution bandwidth set to 1 MHz, and the video bandwidth set to 7 MHz. The measurement is made in two steps. First, the sweep speed is adjusted to capture the pulse width or dwell time of a single transmission. Then, the sweep speed is set to 30 seconds to count the number of transmissions during that period. The dwell time of a single transmission multiplied by the number of transmissions during a 30 second period equals the average time of occupancy during a 30 second period.

Configuration: The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

Result: Per 47 CFR 15.247(a)(1)(ii), the average time of occupancy on any frequency is not greater than 0.4 seconds within a 30 second period. The spectrum analyzer's span was set to zero, the resolution bandwidth was 1 MHz, and the video bandwidth was 7 MHz. The measurement was made in two steps. First, the sweep speed was adjusted to capture the pulse width or dwell time of a single transmission. Then, the sweep speed was set to 30 seconds to count the number of transmissions during that period

The dwell time for a single transmission is 11.1mS. The average number of transmissions during a thirty second period is 20. The dwell time, multiplied by the average number of transmissions during a thirty second period, equals the average time of occupancy during a 30 second period.

11.1 mS x 20 = 0.222 seconds

The data for time of occupancy may be referenced in Exhibit "M", file name "Dwell Time.pdf"

5.4 Number of Hopping Frequencies

Requirement: Per 47 CFR 15.247(a)(1)(ii), the number of hopping channels must be at least 75. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The number of hopping frequencies was measured across the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

Result: Per 47 CFR 15.247(a)(1)(ii), the number of hopping channels is at least 75. The spectrum analyzer's resolution bandwidth was 100 kHz, and the video bandwidth was greater than or equal to the resolution bandwidth.

The data for the number of hopping frequencies may be referenced in Exhibit "N", file name "Number of Hopping Frequencies.pdf"

5.5 Field Strength Calculations

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured level. The basic equation with a sample calculation is as follows:
FS = RA + AF + CF - AG

where : FS = Field Strength

RA = Measured Level

AF = Antenna Factor

CF = Cable Attenuation Factor

AG = Amplifier Gain

Assume a receiver reading of 52.5 dBuV is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The Amplifier Gain of 29 dB is subtracted, giving a field strength of 32 dBuV/meter.

FS = 52.5 + 7.4 + 1.1 - 29 = 32 dBuV/meter
Level in uV/m = Common Antilogarithm [(32 dBuV/m)/20] = 39.8 uV/m

5.6 Measurement Bandwidths

Resolution Bandwidth

Peak Data

150 kHz - 30 MHz ..... 10 kHz
30 MHz - 1000 MHz..... 100 kHz
1000 MHz - 25000 MHz ..... 1000 kHz

Quasi-peak Data

150 kHz - 30 MHz ..... 9 kHz
30 MHz - 1000 MHz..... 120 kHz

Average Data.

1000 MHz - 25000 MHz ..... 1000 kHz

Video Bandwidth

The video bandwidth was greater than or equal to the resolution bandwidth for all measurement data except average measurements:

Average Data.

1000 MHz - 25000 MHz ..... 10 Hz

6.0 Measurement Equipment

Instrument	Manufacturer	Model	Serial No	Cal Due
Spectrum Analyzer	Hewlett-Packard	8566B	2747A05213	3/19/2001
Pre-Amplifier	Amplifier Research	LN1000A	25660	12/4/2001
Antenna, Biconilog	EMCO	3141	9906-1146	12/14/2001
Antenna, Horn	EMCO	3115	9804-5441	7/17/2001
Pre-Amplifier 0.5-18 GHz	Miteq	AMF-4D-005180-24-10P	621707	7/7/2001
Spectrum Analyzer	Tektronix	2784	B010105	3/18/2001
Pre-Amplifier 18-26 GHz	Miteq	JSD4-18002600-26-8P	577858	4/10/2001
Antenna, Horn	EMCO	3160-09	9911-1189	01/15/2003
High Pass Filter	Microlab	FXR HD-40N	8402	4/10/2001
Power Meter	Hewlett-Packard	435B	2702A15817	7/10/01
Power Sensor	Hewlett-Packard	8481H	2349A07714	7/10/01