

May 14, 2003

WYSE Technology FCC 3M Class B Test Record

for

Window Based Terminal

Model Number: J400

Tests performed by WYSE Technology

3471 N. First Street, San Jose, CA

Test completed: May 14, 2003

Test Engineer: Jimmy Nguyen

May 14, 2003

1.0 INTRODUCTION

1.1 Scope

This record is intended to document conformance with the EMC Directive (89/336/EEC) and details the results of testing performed on May 14, 2003 on the model J400.

1.2 Purpose

Testing was performed to evaluate the emissions performance of the J400 with respect to FCC 3m Class B.

1.3 Summary

The Windows Terminal J400 was found to be compliant to FCC 3m Class B Emission Requirements.

1.4 Testing Requirements

Testing was performed using procedures and criteria contained in FCC 3m.

2.0 TEST ENVIRONMENT

2.1 Test Sample Description

J400 is designed to communicate with a host system via Twisted Pair LAN interface on NT Windows Server.

Test Software

The software used during the test was a continuous loop batch file on Windows NT station. The program creates an entire page of "H"s and writes the entire page to the screen, and it also prints to the serial and parallel devices as used in the test setup. The cables were moved around to find the maximum emission from the EUT.

2.2 Test Facilities

2.2.1 Emissions Test Site

Radiated emissions testing was performed in a 3m Semi-Anechoic Chamber. The description of the **3m Chamber** is filed at the WYSE Regulatory Engineering Department. The Chamber is located at 3471 N. First Street, San Jose, California, USA. Conducted emission testing was performed inside a shielded enclosure (**Screen Room**) in the WYSE RFI laboratory. The description of the screen room is filed at WYSE Regulatory Engineering Department. The Screen Room is located at 3471 N. First Street, San Jose, California, USA.

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2.3 Test Equipment

The following are the list of equipment used during the radiation and conducted testing.

Radiated:

HP Receiver model 85460A (RES BW: 30 KHz-100KHz, VBW: 10KHz – 30KHz)

Conducted:

HP 85650A Quasi-Peak Adapter

HP 85680B Spectrum Analyzer (RES BW: 30KHz –100KHz, VBW: 10KHz – 30KHz)

SETUP:

In accordance with WYSE Technology test procedure.

PROCEDURE:

Biconilog antenna was used for frequency range 30MHz - 2 GHz. The frequency range was checked for signals strength. The antenna was then raised and lowered for final maximization. The frequency range was checked with antennas in the horizontal and vertical polarization.

3.0 TEST RESULTS

3.1 Test Description

CISPR Publication 22:1997, limits and methods of measurements of radio interface of information technology equipment, was the guiding document for the test. The product's radiated emissions from 30 MHz to 2000 MHz and its power mains conducted emissions from 150 KHz to 30 MHz were measured.

3.2 Test Configuration

The EUT was configured with a typical mix of available peripherals which fully configured all types of communications ports of the EUT and exercised it in a typical manner.

3.3 Test Procedure

For radiated emissions testing, the equipment is installed on a 0.8 meter high non-conductive turntable 3 meters from the receiving antenna mast. The EUT is fully exercised during the test to maximize emissions. The receiving antenna is scanned over the height range of 1 to 4 meters in both polarities and the turntable is rotated with emissions level observed at each frequency. During the process the equipment configuration is also modified by moving the interconnecting cables to find the typical configuration that maximizes emissions at each frequency.

The frequency range from 30 MHz to 2000 MHz is explored. Measurement data is compared to Class **B** limit.

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For conducted emissions testing the equipment is moved to a 0.8 meter high platform and the EUT and Configurations equipment are powered from a different LISNs. Both sides of the AC line are measured and the results compared to the Class **B** limit.

3.4 Test Results

A comparison of the measured data with the Class **B** limit of **FCC (3M)** shows that Windows Terminal **J400** was **3.18 dB** below the limits at the worst case frequency of **240.028733 MHz** in a Horizontal Polarization.

3.5 Product Specification

Model: J400 (Logic Board P/N 770394-02)

Clock Circuit:

U16 = ICS C9725-198

Filters:

33 MHZ CLK Line:

R215-217 = 33 ohms

14 MHZ CLK Line:

C164, 173 = 22 pF

48 MHZ CLK Line:

R240 = 22 ohms

U15 = VIA C3 CPU, 1 GHz EBGA

C61, 72, 59, 65 = 47 pF

R117, 106 124, 122 = 27 ohms

C56, 68 = 27 pF

R120, 126, 113, 119 = 15 Kohms

L12, L17 = BLM1IP 300S

Main Power Filters:

U17 = ISL6524

PL1 = 2uH Choke

C188, C169, 168 = 10 uF Aluminum cap

Video Circuit:

U12 = IC,8601,NORTH BRIDGE

Filters:

L19, 20, 24, 25, 35, 32, 31 = BLM11P600S

C119 = 1 uF

C114 = 1000 pF

B38 = 0.1 uF

CT23 = 10 uF 16V

L40, 41 = BLM11A121S

C187, 192 = 1000 pF

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Termination:

R149, 140, 141, 70, 138, 146, 151 = 22.5 ohms
R242, 233 = 47 ohms

Audio Circuit:

U13 = VIA VT1621A AC97 CODEC and Audio

Filters:

L2, 8, 7, 3, 10, 1 = BLM11P600S
B2, 9, 6, 7, 25, 30, C11, 32, 33 = 0.1 uF
B16, B17 = 0.01 uF
C26, 28, 24, 23, 25 = 0.22 uF
C8, 9 = 27 pF
C7, 6, 22 = 22 pF

Network:

U11 = VIA VT6103 LAN

Filters:

C77, 83, 79, 75, 86 = 0.1 uF
C266, 267 = 47 pF
C73, 74 = 22 pF
R171, 175 = 330 ohms
R156, 159 = 49.9 ohms
CN3B = Conn, RJ45, 8P

Radiated Emission Test

3m Chamber

WYSE Technology Inc.

3471 North 1st Street

San Jose Ca 95134

Test Description:

EUT: J400

Serial No. 9U01C500005

Part No. 902073-05

File No. 051403#1

Test Type:

EN55022

EN55022

FCC-A { } FCC-B { x } CISPR-A { } CISPR-B { }

PASS: X FAIL: Debug:

Frequency MHz	Peak dV/m	DelLim-Pk dB	QP dBuV/m	DelLim-QP dB	Angle deg	Hgt cm	Pol
240.028733	42.82	-3.18	41.79	-4.21	102	92	Horz
480.165359	42.25	-3.75	40.73	-5.27	102	199	Vert

Configuration:

- 1) Fully configured
- 2) Video 1024X768 @ 85Hz

Modifications:

1. NONE

Test Procedure Definition:

EMI Receiver	Model: 85460A (Cal. Date: May 2002)
	SN: 3807A11445 (Cal. Due Date: May 2003)
Emco Biog Ant. (Type2)	Model: 3142 (Cal Date: Aug. 19 2002)
	SN: 1048 (Cal Due Date: Aug. 19 2003)
Configuration	WYSE 3M Chamber
Frequency Rang	30 - 2000 MHz
Operation to perform	Maximize & Measure
Initial Setting	Table angle: 0 degree to 360 degree
	Tower Height: 1meter - 4meter (Steps 1M)
	Antenna Polarity: Vertical and Horizontal

Comment:

- 1) H Pattern on monitor screen.
- 2) Installed Bead On 10/100 Base T

EUT:

Description	Part No.	Serial No.	FCC ID:
J400 Power adapter	902073-05 LSE9802A1255	9U01C500005 A20308031275	TBA

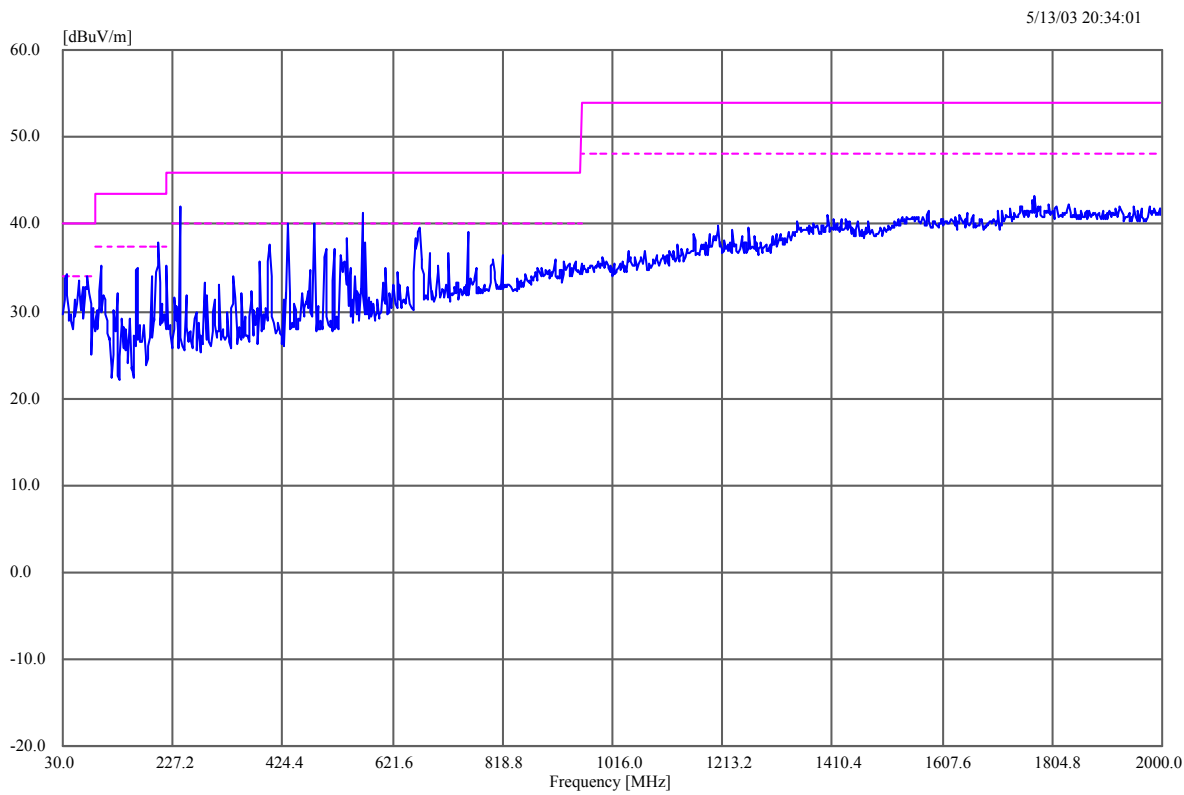
Supporting Devices:

Description	Model No.	Serial No.	FCC ID:
Server HP Brio Computer	81XX	US74852369	
HP Key Board	SK-2501K	M970814311	GYUR38SK
HP Mouse	M-S34	LZA72737431	DZL211029

Peripherals:

Description	Model No.	Serial No.	FCC ID:
Sony 21" Monitor	CPD-G500	CN9AC1811W	
HP Parallel Printer	812C	MX97GW196	
US ROBOTICS-Serial port	144000 MODEM	0002680214407879	CJE0265
Wyse Keyboard (PS2)	KU-3923	1F11100211	E8HKB5923
Wyse mouse (PS2)	M-S69	HCA24301537	JNZ211443
Compaq Mouse (USB Wheel)	M-u48a	F29690AMSN205L0	JNZ211360
Compaq Mouse (USB Wheel)	M-u48a	F29690AMSNA0EK8	JNZ211360
Compaq Mouse (USB Wheel)	M-u48a	F29690AMSN503ES	JNZ211360
Compaq Mouse (USB)	M-u34	F48920A5BNF01BK	JNZ211374
Headset and Microphone	None	None	

Composite Trace



Final Data [122/849]

Frequency MHz	Peak dBuV/m	DelLim-Pk dB	QP dBuV/m	DelLim-QP dB	Hgt cm	Angle deg	Pol
34.657669	31.18	-8.82	--.---	--.---	125	358	Vert
50.345812	29.76	-10.24	--.---	--.---	102	238	Vert
50.992098	30.92	-9.08	--.---	--.---	102	39	Vert
51.227112	30.07	-9.93	--.---	--.---	102	151	Vert
51.873399	28.91	-11.09	--.---	--.---	102	60	Vert
55.956757	33.00	-7.00	--.---	--.---	102	39	Vert
56.485538	32.76	-7.24	--.---	--.---	102	116	Vert
57.161201	32.11	-7.89	--.---	--.---	102	18	Vert
57.807488	30.90	-9.10	--.---	--.---	115	-2	Vert
58.277515	31.06	-8.94	--.---	--.---	102	32	Vert
58.659412	32.03	-7.97	--.---	--.---	102	322	Vert
59.423206	29.99	-10.01	--.---	--.---	102	18	Vert
61.204396	27.18	-12.82	--.---	--.---	152	358	Vert
62.841294	29.39	-10.61	--.---	--.---	123	358	Vert
63.061646	28.85	-11.15	--.---	--.---	376	358	Vert
64.163404	28.79	-11.21	--.---	--.---	201	358	Vert
64.761502	30.97	-9.03	--.---	--.---	279	358	Vert
66.618751	28.87	-11.13	--.---	--.---	99	358	Vert
69.766632	30.25	-9.75	--.---	--.---	201	358	Vert
70.773954	28.99	-11.01	--.---	--.---	181	358	Vert
70.962827	30.78	-9.22	--.---	--.---	162	358	Vert
71.151700	29.90	-10.10	--.---	--.---	210	358	Vert
71.528026	32.70	-7.30	--.---	--.---	102	131	Vert
72.678643	31.37	-8.63	--.---	--.---	102	169	Vert
73.717673	35.60	-4.40	31.33	-8.67	103	168	Vert
74.045001	33.02	-6.98	--.---	--.---	127	-2	Vert
74.524425	32.68	-7.32	--.---	--.---	117	-2	Vert
76.538005	32.17	-7.83	--.---	--.---	102	197	Vert
77.209198	31.16	-8.84	--.---	--.---	102	253	Vert
78.527613	26.14	-13.86	--.---	--.---	167	-2	Vert
82.087092	27.74	-12.26	--.---	--.---	139	1	Vert
82.689641	26.30	-13.70	--.---	--.---	128	1	Vert
84.828689	23.99	-16.01	--.---	--.---	253	358	Horz
85.491493	24.44	-15.56	--.---	--.---	148	1	Vert
86.063914	24.07	-15.93	--.---	--.---	255	1	Vert
86.425444	23.83	-16.17	--.---	--.---	102	56	Horz
86.907483	23.59	-16.41	--.---	--.---	139	1	Vert
87.570286	25.08	-14.92	--.---	--.---	207	1	Vert
88.504237	23.98	-19.52	--.---	--.---	398	318	Vert
88.956149	25.30	-18.20	--.---	--.---	139	1	Vert
90.944560	24.37	-19.13	--.---	--.---	292	358	Horz
91.456726	23.31	-20.19	--.---	--.---	102	84	Horz
94.372590	30.51	-12.99	--.---	--.---	102	144	Vert
96.034942	32.73	-10.77	--.---	--.---	286	-2	Horz
96.344872	29.47	-14.03	--.---	--.---	102	72	Vert
96.964732	34.16	-9.34	--.---	--.---	247	-2	Horz
98.232628	31.10	-12.40	--.---	--.---	102	207	Vert
100.035857	28.40	-15.10	--.---	--.---	102	158	Vert
101.839087	33.74	-9.76	--.---	--.---	102	194	Vert
102.374420	30.34	-13.16	--.---	--.---	102	179	Vert
102.571649	30.15	-13.35	--.---	--.---	102	207	Vert
103.247860	29.22	-14.28	--.---	--.---	102	312	Vert
104.615299	27.79	-15.71	--.---	--.---	105	-2	Vert
120.018270	22.40	-21.10	--.---	--.---	265	-1	Horz

121.494075	31.99	-11.51	--.--	--.--	102	358	Vert
122.854883	28.29	-15.21	--.--	--.--	102	107	Vert
125.001510	31.64	-11.86	--.--	--.--	102	271	Vert
132.828447	26.39	-17.11	--.--	--.--	102	256	Horz
133.856293	27.72	-15.78	--.--	--.--	102	311	Horz
135.015353	29.34	-14.16	--.--	--.--	127	-1	Vert
135.408996	21.42	-22.08	--.--	--.--	102	142	Horz
138.864306	24.87	-18.63	--.--	--.--	102	354	Horz
144.006959	26.85	-16.65	--.--	--.--	126	-2	Horz
148.517655	30.54	-12.96	--.--	--.--	102	358	Vert
162.008164	38.73	-4.77	37.29	-6.21	102	105	Horz
162.895892	26.85	-16.65	--.--	--.--	104	-2	Vert
166.064264	26.48	-17.02	--.--	--.--	102	141	Horz
175.527743	31.61	-11.89	--.--	--.--	233	358	Vert
189.011342	32.78	-10.72	--.--	--.--	101	115	Horz
196.624206	33.13	-10.37	--.--	--.--	101	150	Horz
199.224485	36.34	-7.16	--.--	--.--	101	171	Horz
199.464668	35.39	-8.11	--.--	--.--	102	55	Vert
199.638420	35.61	-7.89	--.--	--.--	102	1	Vert
199.877328	34.93	-8.57	--.--	--.--	102	27	Vert
200.355143	34.12	-9.38	--.--	--.--	102	41	Vert
200.485457	33.31	-10.19	--.--	--.--	102	20	Vert
201.050148	32.95	-10.55	--.--	--.--	102	62	Vert
201.614840	34.16	-9.34	--.--	--.--	102	48	Vert
202.375001	30.64	-12.86	--.--	--.--	102	41	Vert
205.307053	25.83	-17.67	--.--	--.--	102	289	Vert
215.981211	36.98	-6.52	--.--	--.--	102	276	Horz
229.471121	29.56	-16.44	--.--	--.--	398	98	Horz
234.245525	27.00	-19.00	--.--	--.--	102	183	Vert
240.028733	42.82	-3.18	41.79	-4.21	102	92	Horz
250.019078	30.45	-15.55	--.--	--.--	102	318	Horz
256.533640	28.54	-17.46	--.--	--.--	102	187	Vert
266.352907	24.43	-21.57	--.--	--.--	102	193	Vert
267.908228	27.39	-18.61	--.--	--.--	102	247	Horz
283.474258	29.42	-16.58	--.--	--.--	102	88	Vert
288.021184	28.48	-17.52	--.--	--.--	114	-2	Horz
300.979416	30.59	-15.41	--.--	--.--	102	233	Horz
310.499687	31.97	-14.03	--.--	--.--	102	176	Horz
336.076692	32.08	-13.92	--.--	--.--	99	-2	Horz
337.488795	23.76	-22.24	--.--	--.--	102	277	Vert
350.999099	35.66	-10.34	--.--	--.--	102	177	Horz
384.071771	35.99	-10.01	--.--	--.--	102	354	Horz
399.214339	34.38	-11.62	--.--	--.--	102	199	Vert
399.984557	34.43	-11.57	--.--	--.--	102	284	Vert
400.888082	37.34	-8.66	--.--	--.--	104	-2	Horz
401.554617	35.94	-10.06	--.--	--.--	102	284	Vert
401.998974	32.46	-13.54	--.--	--.--	98	-2	Horz
432.054059	37.19	-8.81	--.--	--.--	102	224	Horz
472.531348	34.62	-11.38	--.--	--.--	102	299	Vert
480.165359	42.25	-3.75	40.73	-5.27	102	199	Vert
498.132711	33.87	-12.13	--.--	--.--	173	358	Vert
498.243999	33.28	-12.72	--.--	--.--	183	358	Vert
499.495986	36.99	-9.01	--.--	--.--	102	171	Horz
499.982870	32.27	-13.73	--.--	--.--	162	358	Vert
501.123570	34.22	-11.78	--.--	--.--	183	358	Vert
515.452483	36.66	-9.34	--.--	--.--	102	227	Vert
528.018043	32.82	-13.18	--.--	--.--	230	1	Horz
531.293257	31.03	-14.97	--.--	--.--	129	1	Horz
533.294777	29.34	-16.66	--.--	--.--	102	29	Horz
540.032732	41.69	-4.31	39.15	-6.85	102	195	Vert

544.094371	35.37	-10.63	--.--	--.--	102	173	Vert
566.988315	39.30	-6.70	--.--	--.--	141	1	Horz
572.711373	37.36	-8.64	--.--	--.--	151	1	Horz
661.526828	38.93	-7.07	--.--	--.--	102	137	Vert
668.318708	37.58	-8.42	--.--	--.--	102	157	Vert
668.921848	37.79	-8.21	--.--	--.--	102	165	Vert
669.236530	37.20	-8.80	--.--	--.--	102	199	Vert
756.016529	36.27	-9.73	--.--	--.--	102	177	Horz

