Test Report No. RD2002/047
Date February 28th, 2002

MEASUREMENT/TECHNICAL REPORT

FCC Part 15 Sections 15-107 and 15.109

IPM-NET

February 28th, 2002

This report concerns (check one): Original grant __X__ Class II change____

Equipment type: Reader, Browser, Player Unit (ex.: computer, printer, modem, etc.)

Deferred grant request per 47 CFR 0.457(d)(1)(ii)? yes _____ no __X__

If yes, defer until: _____
date

Company Name agrees to notify the Commission by _____
date
of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by: Giuseppe MECCHIA

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1 GENERAL INFORMATION

1.1 Product Description

Myfriend is a portable device designed for work, study and leisure time.
Thanks to its wide high definition display, *Myfriend* is ideal for reading Microsoft Reader LIT eBooks.
Based on Microsoft Windows CE 3.0 operating system, *Myfriend* has a built-in modem, allowing users to either navigate the Internet with the use of the Microsoft Internet Explorer browser, or send and receive emails.
The built-in microphone located on the front allows you to record vocal messages, while the speaker makes it possible to listen to audio MP3 files.

EUT is formed by a main board, an inverter board TAMURA HBL-0243 and a Toshiba TFT-LCD module LTM 07C388 all contained in the same case, plus an external TAMURA PAA1628N7 power supply.

1.2 Related Submittal(s)/Grant(s)

None

1.3 Tested System Details

The FCC IDs for all equipment, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

Model & Serial No.	FCC ID	Description	Cable Descriptions
Myfriend (1) s/n EMC-2001-301	**P622002001**	**Reader, browser, player unit**	**Unshielded power cord Shielded signal cables**
TAMURA PAA1628N7 S/n 0132	None	Power supply	Unshielded power cords
SanDisk FPC-PC.U S/n none	Declaration of Conformity	Compact flash memory card 32MB PCMCIA I/F	No cables
SanDisk S/n none	None	Memory card 16MB Smart Media I/F	No cables
Smart card S/n none	None	Smart card	No cables
CD-1000 S/n none	None	Stereo headphones	Shielded signal cable
Acer TravelMate 312 T S/n 9142B0134	Declaration of Conformity	Personal Computer USB I/F IrDA I/F	Unshielded power cord Shielded signal cable
HP 7440A s/n 2539A94878	BSD8537440	Plotter, serial I/F	Shielded serial cable Unshielded power cord

20m unshielded telephone cable connected to a remote telephone plug.

(1) EUT submitted for grant.

1.4 Test Methodology

Both conducted and radiated testing were performed according to the ANSI C63.4-1992 test procedures . Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

TÜV ITALIA test site No. 3 – semi-anechoic chamber

The semi-anechoic chamber test site and conducted measurement facility used to collect the radiated data are located at Via Montalenghe 12, Scarmagno, Italy. This site has been fully described in a report dated May 12, 2000 submitted to your office, and accepted in a letter dated May 30, 2000 (registration Number: 90860)

1.6 Test equipment list:

Description	Model	serial No.	Cal due date
Test receiver	Rohde & Sch.ESH3	s/n 881364/012	10/02
Spectrum analyzer	HP 8568B+QP adapter	s/n 2601A02134	04/02
Spectrum analyzer	HP 8562A	s/n 3043A05627	10/02
LISN	Schwarzb.NNLA 8120	s/n 8120471A	02/03
Biconical antenna	Tensor 4104	s/n 2222	03/02
Log-periodic antenna	Electro-metrix LPA-25	s/n 1117	03/02
Double r.g.horn ant.	EMCO 3115	s/n 3572	11/02

2 PRODUCT LABELING

Figure 2.1 FCC ID Label

See exhibit.

Figure 2.2 Location of the Label on EUT

See exhibit.

3 SYSTEM TEST CONFIGURATION

3.1 Justification

The EUT was configured for testing in a typical fashion (as a customer would normally use it).
In order to simulate a real application, the EUT has been provided with all its internal cards: Compact flash PCMCIA, Smart media and Smart card; also all the external peripherals: USB, IrDA and Serial have been connected and operated according to normal use. (see Figure 3.1).

Conducted emission testing was performed on the power mains cord of the power supply Tamura PAA1628N7.

3.2 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, loaded on the hard disk (Audio player, Internet explorer, Microsoft reader and other windows CE applications) exercises each system component. More in particular: “H”s printed on the monitor, speaker beep, mass storage devices and cards exercised, plotter plots triangle, music on the headphones, exchange of data to and from PC through USB and IrDA ports, netsurfing through browser, ecc. As the touch screen is strictly input device, no data is transmitted to it during test. It is, however, continuously scanned for data input activity.

3.3 Special Accessories

Metal shieldings:

Metal shield above the electronic board (see drawing attached as SHIELD.pdf).

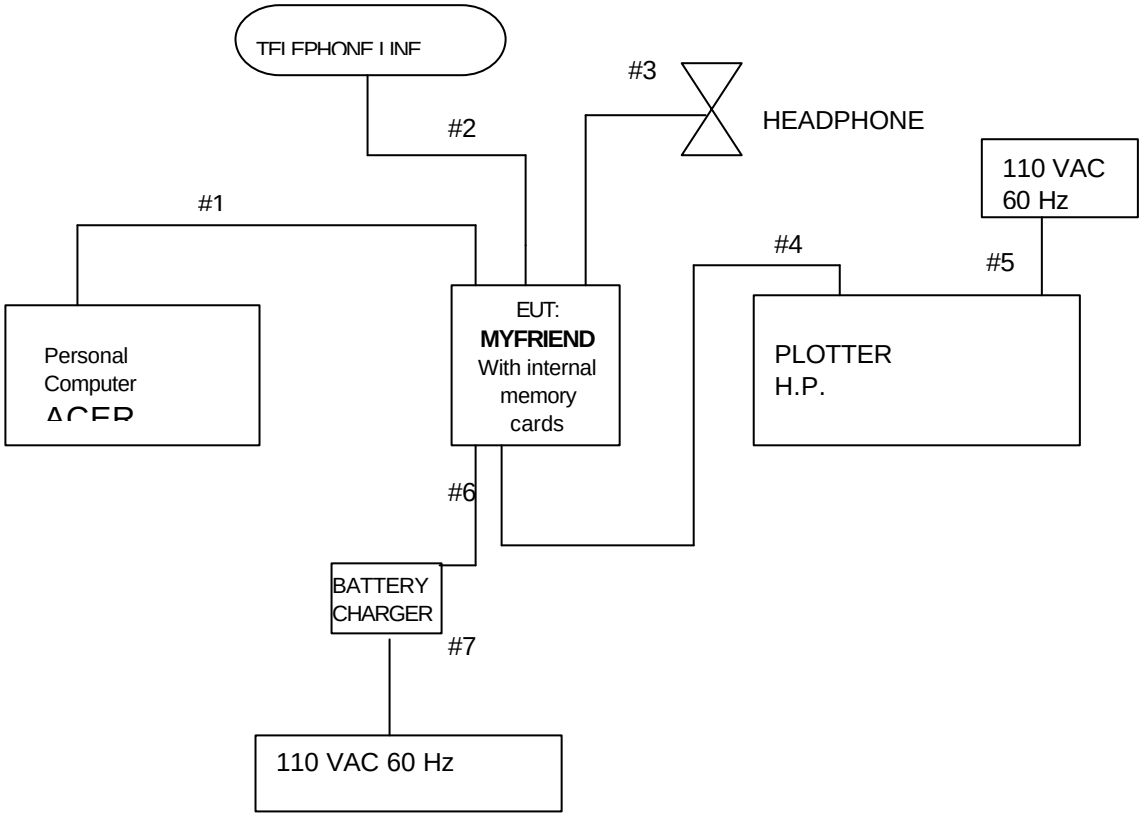
As shown in Figure 3.1 interface cables used for compliance testing are shielded as readily available on the market ; serial cable only, considering that is a specific cable, is provided by IPM-NET and packaged in the same box with EUT. All cable connectors feature integral metal hoods for shielding.

3.4 Equipment Modifications

To achieve compliance to Class B levels, no changes were made during compliance testing.

3.5 Configuration of the Tested System

Figure 3.1 Configuration of the Tested System



LEGEND

#1 :	USB CABLE
#2 :	TELEPHONE LINE
#3 :	HEADPHONE CABLE
#4 :	SERIAL CABLE
#5 :	POWER UNSCREENED CABLE
#6 :	POWER UNSCREENED CABLE
#7 :	POWER UNSCREENED CABLE

4 BLOCK DIAGRAM(S) OF THE EUT

4.1 Block Diagram Description

Cristal and Oscillators :

The **main board** of EUT is provided with:

CRYSTAL 8.064 MHz SX7	Main Microprocessor Clock
CRYSTAL 32.768 kHz 20PPM	Processor Clock
CRYSTAL 6.000 MHz SX3	Irda Interface Clock
CRYSTAL 14.7456 MHz CRY-1158 SX7	Sim Controller Clock
QUARTZ 3.6864 MHz 20PF 50PPM SX3	RS232 Interface Clock
CRYSTAL 12.288 MHz SX7	LCD Controller Clock
QUARTZ 28.224 MHz 50PPM 16PF SX7	Modem V90 Clock

CPU Processor Toshiba MIPS RISC R3000 129 MHz internal frequency

Tamura HBL-0243 inverter board:

oscillator 90 to 120 kHz

Toshiba TFT-LCD module:

NCLK (clock):	48 MHz
FL Driving frequency:	50 kHz

Tamura PAA1628N7 power supply:

oscillator 50 to 70 kHz

RF Suppression devices:

The **main board** of EUT is provided with:

- On dc power imput :
  No. 17 ferrite bead MURATA BLM 11HA 471 SG-PT

- On USB interface port :
  No. 3 ferrite bead MURATA BLM 11HA 471 SG-PT

- On RS232 interface port :
  No. 2 ferrite bead MURATA BLM 11HA 471 SG-PT

- On Headphone port :
  No. 4 ferrite bead MURATA BLM 11HA 471 SG-PT

- On Line Interface port :
  No. 2 capacitor NOVACAP LS1812B102J302NT
  Filter Common Mode TOKIN SBT-0180W
  No. 2 ferrite bead MURATA BLM 11HA 471 SG-PT

- On Oscillator :
  No. 2 EMI Suppressor CYPRESS W180 51G

Tamura PAA1628N7 power supply:

Mains filter:

Common Mode Inductor	Murata Electronics 4.3mH PLY10A4321ROR
X-Capacitor	Arcotronics 0.22 µF R46KI3220

On DC output:

Inductor	TAMURA 5.4 µH TO-9674
Y-Capacitor	Murata Electronics 3300 pF DE1410E332M-KX or Matsushita Electr. Ind. ECKDNA332ME or TDK Corporation CD14-E2GA332MYNS
Output cable core ferrite	URITE Corporation P/N F5B RH12*20*7.3 No.2 turns

Fig. 4.1 - Block Diagram of the EUT

See exhibit.

5 CONDUCTED AND RADIATED MEASUREMENT PHOTOS

See exhibit.

6 CONDUCTED EMISSION DATA

6.1 Tests of the worst case configuration.

The conducted tests are performed with a receiver in quasi-peak mode.

	Frequency (MHz)	Measured* (dBµV)	Limit (dBµV)
neutral	0.49	45	48
	0.54	42	
	1.6	37	
	4	39	
	5.4	44	
	10	38	
line	0.49	44	48
	0.54	41	
	1.6	36	
	4	38	
	5.4	43	
	10	39	

* All readings are quasi-peak

Test Personnel:

Tester Signature  Date January 10, 2002

Typed/Printed Name Giuseppe MECCHIA .

7 RADIATED EMISSION DATA frequency range 30 MHz – 2 GHz

7.1 Tests of the worst case configuration

The following data list the significant emission frequencies, measured levels, correction factors (including cable and antenna corrections), the corrected reading, plus the limit. Field strenght calculation is given in paragraph 7.2.

Judgement: Passed by 1.3 dB

Frequency (MHz)	Polarity (V/H)	Receiver* Reading (dBµV)	Correction Factor (dB/m)	Corrected Reading (dBµV/m)	3 Meter Limit (dBµV/m)
65.7	V	20.3	11.1	31.4	40
97	H	26.1	13.4	39.5	43.5
124.9	V	27.8	14.4	42.2	43.5
157.5	V	18.9	17.1	36	43.5
188.8	H	19.4	19.6	39	43.5
864	H	6.5	30.3	36.8	46
1858	V	11.2	27.4	38.6	54

* below 1 GHz readings are quasi-peak, with an IF bandwidth of 120 kHz,
* above 1 GHz readings are peak, with an IF bandwidth of 1 MHz,

Test Personnel:

Tester Signature _ G. Mecchia Date January 10, 2002

Typed/Printed Name Giuseppe MECCHIA .

7.2 Field Strength Calculation

7.2.1 The field strength is calculated by adding the Antenna and Cable Factor to the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF

where

FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 19.4 dBμV is obtained. The Antenna and Cable Factor of 19.6 is added, giving a field strength of 39 dBμV/m. The 39 dBμV/m value was mathematically converted to its corresponding level in μV/m.

FS = 19.4 + 19.6 = 39 dBμV/m

Level in μV/m = Common Antilogarithm [(39 dBμV/m)/20]= 89.1 μV/m