

MEASUREMENT / TECHNICAL REPORT

OP COMPUTERS

FCC ID: NJH98NST5XX

FEBRUARY 4th, 1998

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

Equipment type: PERSONAL COMPUTER (ex.: computer, printer, modem, etc.)

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

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: P.Antonio VELO Corrado GARBASSO

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1 GENERAL INFORMATION

1.1 Product Description

The EUT is an enhanced, high performance Mini Tower Personal Computer (Olivetti model SILVER / II) available in a commercial version designated NETSTRADA 5200.

It is provided with a fully equipped motherboard (Intel Redwood - BA2398) featuring one or two Intel Pentium® II, 300 or 333 MHz processors with MMX™ Technology (the second one is optional). To be noticed that, when two processors are provided both of them shall have the same operating frequency (300 or 333 MHz).

Three mass storage shelves are provided plus the following **Power Supply Unit**:

- **Model 3783 - 45 - 2 by MAGNETEK - 450 W**

The EUT is finally provided with the following interface ports: 1 VGA port, 1 parallel port, 1 serial port, 1 mouse port, 1 keyboard port, 1 LAN port and 2 ports of the SCSI board AMI series 428.

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
NETSTRADA 5200 s/n EMI-97-0113 (1)	NJH98NST5XX	Personal Computer	Unshielded power cord
DSM 50-175 s/n 602000008	BGBTM8705K	Monitor	Shielded video cable (2) Unshielded power cord
RS 6000 s/n G0035713	GDDG83-6000	Keyboard	Shielded keyboard cable
M-S34-6MD s/n LZA61402207	DZL211029	Mouse	Shielded mouse cable
SONY MDR-V100 s/n none	none	Headphones	Shielded audio cable
DM 119 s/n 3031602	DYKDM119	Printer, parallel I/F	Shielded parallel cable Unshielded power cord
PEM s/n EMI-97-0112	NJH98PEMBSL	Peripheral expansion module SCSI I/F	Shielded SCSI cables Unshielded power cord
HP 7440A s/n 2539A94848	BSD8537440	Plotter, serial I/F	Shielded serial cable Unshielded power cord
remotely connected through LAN cable :			
MPR 10T/S s/n 91TY28014813	none	LAN HUB	Unshielded LAN cables Unshielded power cord
Modulo 200 DT s/n none	DYK96AUG	Personal Computer	Unshielded power cord

(1) EUT submitted for grant

(2) Ferrite core removed from shielded video cable

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

Olivetti test site No. 1

The open area test site and conducted measurement facility used to collect the radiated data are located at Via Montalenghe 8, Scarmagno and Via Jervis 11, Ivrea, Italy. This site has been fully described in a report dated March 25, 1997 submitted to your office, and accepted in a letter dated June 13, 1997 (31040/SIT-1300F2).

1.6 Test equipment used:

Test receiver	Rohde & Schwarz ESH3	s/n 881364/012
LISN	Schwarzbeck NNL8120	s/n 8120399
Test receiver	Rohde & Schwarz ESVP	s/n 892372/023
Spectrum analyzer	HP 8562A	s/n 3043A05627
Biconical antenna	EMCO 3104	s/n 2951
Log-periodic antenna	EMCO 3146	s/n 1492
Double ridged guide horn ant.	EMCO 3115	s/n 3572

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, contained on a 3-1/2 inch disc, was inserted into drive A and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is: an H is printed on the monitor, speaker beep, mass storage devices exercised (on both PC and PEM), plotter and printer print an H. The complete cycle takes about 2 seconds and is repeated continuously. As the keyboard and mouse are strictly input devices, no data is transmitted to them during test. They are, however, continuously scanned for data input activity. The PC was also operating in multimedia mode: sound from CD to headset. Finally the EUT was sending data frames to a remote Personal Computer through LAN.

3.3 Special Accessories

As shown in the Figure 3.1, all interface cables used for compliance testing are shielded as normally supplied by the vendors. These cable model and part numbers are marketed with the peripherals to the end user, and appear on the related product price list supplied to the customers. 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 Systems

Figure 3.1 - Configuration of the Tested System

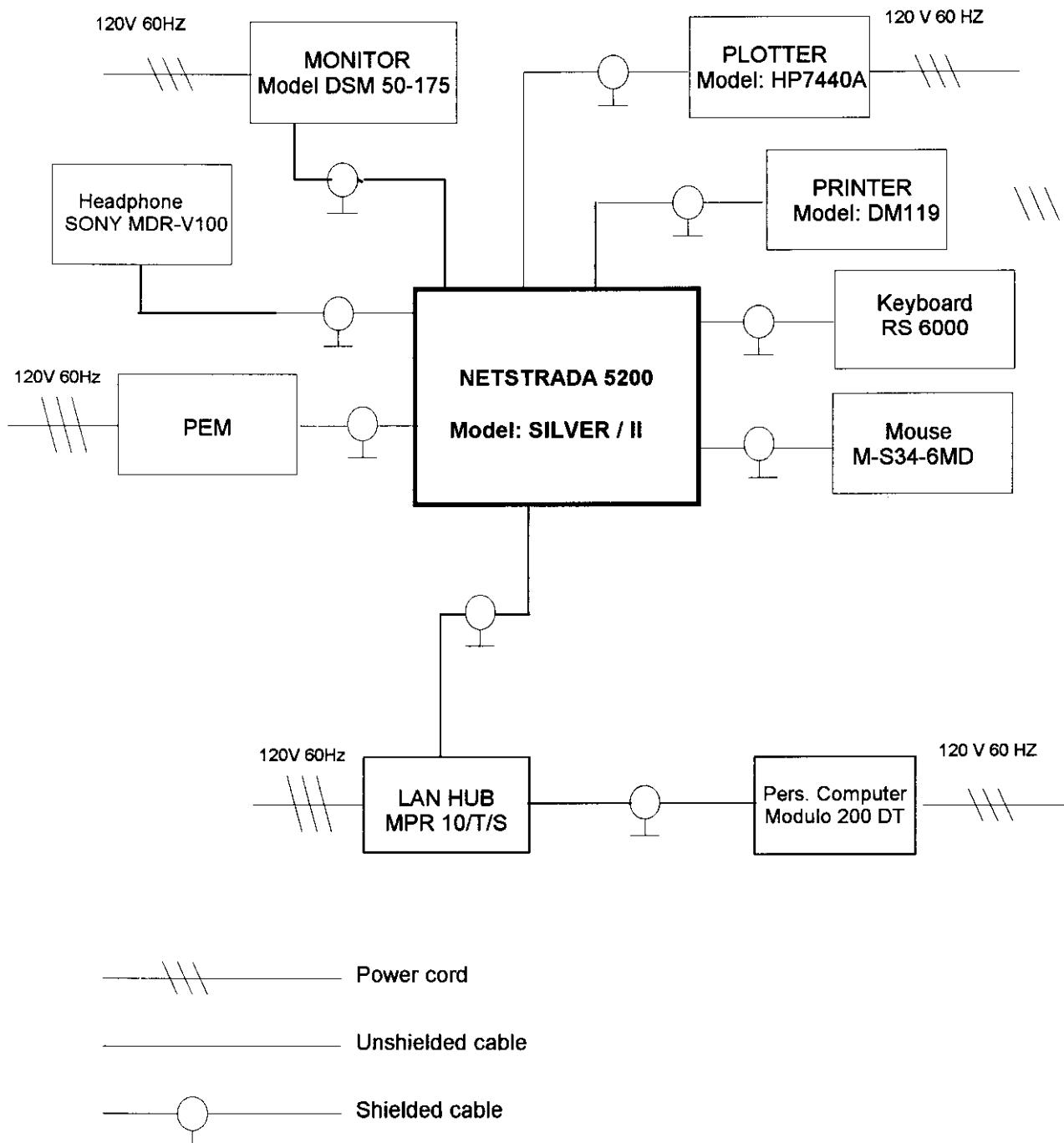


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	User Manual	Attached

Power Supply Unit(s) - (max. two provided)				
- Model 3783-45-2 by MAGNETEK (450 W) Switching frequency: 80 - 100 KHz.				

Identification	Frequency	Location		
U3	10.000 MHz	IF 2079 SAF-TE Board		
Y3G2	25.000 MHz	Intel Redwood Motherboard		
Y7H1	12.000 MHz	Intel Redwood Motherboard		
Y5H1	14.318 MHz	Intel Redwood Motherboard		
Y3G1	32.768 KHz	Intel Redwood Motherboard		

Complete list of oscillators / crystals provided within the EUT is as follows:

A 32.768 KHz clock is finally generated for the Intel PIIX4 in order to maintain the system time and date.

A third one is related to the FPC (Front Panel Controller) that has its own 12 MHz crystal, since requiring specific time reference (it does not run from the main 5 V VCC power plane of the motherboard).

A second one is the I/O clock generator (synthesizer), which generates a 40 MHz clock for the embedded SCSI controller, a 24 MHz clock for the super I/O, a 16 MHz clock for the BMC, and 14.318 MHz clock for ISA devices.

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- 66.6 MHz at 2.5 V logic levels: SDRAM DIMMs
- 66.6 MHz at 3.3 V logic levels: both Slot 1 connectors and the PAC

A first source is the CPU clock generator (synthesizer), which generates the 33.3 MHz PCI reference clock, the 66.6 MHz host clocks, and the 14.318 MHz APIC clocks. Host clocks are further differentiated in terms of logic levels:

The following clock sources are provided in the Intel Redwood Motherboard (BA2398).

The following clock sources are provided in the Intel Redwood Motherboard

Operating Frequencies.

4.1 Block Diagram Description

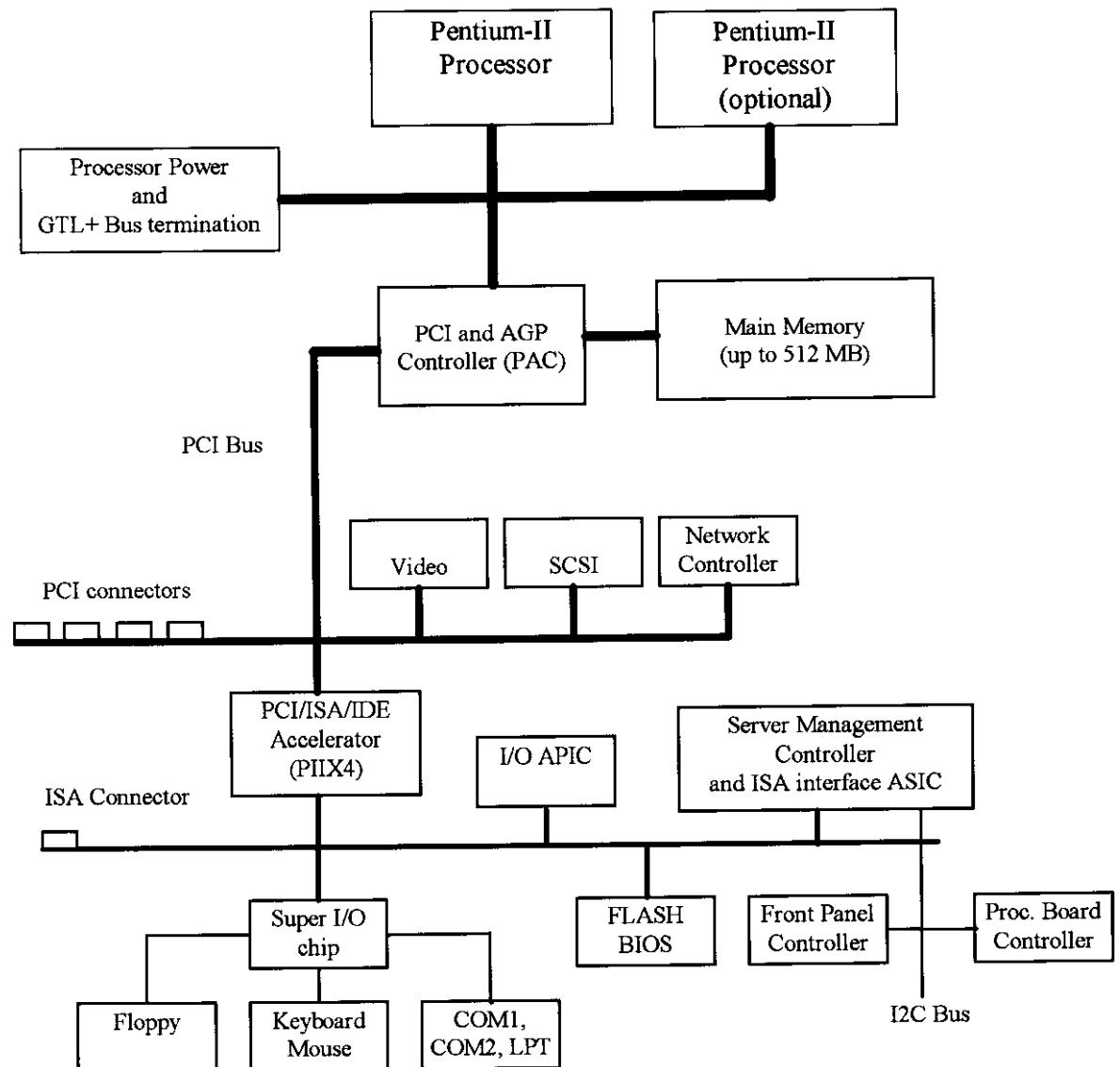
4 BLOCK DIAGRAM(S) OF THE EUT

Date: February 4th, 1998

Test Report No. RD98/018

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Figure 4.1 - Block Diagram of the EUT



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* (dB μ V)	Limit (dB μ V)
neutral	0.45	44	48
	0.5	38	
	0.58	35	
	17.5	46	
	19.9	45	
	21.9	44	
line	0.45	43	48
	0.5	38	
	0.58	36	
	17.5	45	
	19.9	44	
	21.9	43	

* All readings are quasi-peak

Test Personnel:

Tester Signature *G. Mecchia* Date December 16, 1997
Typed/Printed Name Giuseppe MECCHIA.

Type/Printed Name Giuseppe MECHIATester Signature G. Mechia Date December 11, 1997

Test Personnel:

Note: no emission detected in the frequency range 1 to 2 GHz.

* In the frequency range 30 MHz - 1 GHz all readings are quasi-peak, with an IF bandwidth of 120 KHz.

Frequency (MHz)	Receiver*	Correction	Corrected Reading (V/m)	Factor	Reading (dB/m)	Corrected Reading (dB/mV/m)	3 Meter Limit (dB/mV/m)
199.9	H	23.7	18.3	42	43.5	46	
220	H	29.8	14.1	43.9	46		
333.2	H	26	17.5	43.5	46		
352	H	24.3	17.8	42.1	46		
599.8	H	17.2	22.7	39.9	46		
749.8	H	15.9	25.1	41	46		

Judgement: Passed by 1.5 dB

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

7.1 Tests of the worst case configuration

7 RADIADED EMISSION DATA (Frequency range 30 MHz- 2GHz)

7.2 Field Strength Calculation

7.2.1 The field strength is calculated by adding the Antenna and the 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 23.7 dB μ V is obtained. The Antenna and Cable Factors of 18.3 dB/m are added, giving a field strength of 42 dB μ V/m. The 42 dB μ V/m value was mathematically converted to its corresponding level in μ V/m.

$$FS = 23.7 + 18.3 = 42 \text{ dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(42 \text{ dB}\mu\text{V/m})/20] = 126 \mu\text{V/m}$$

3 SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). The EUT provided with two Intel Pentium® II processors with MMX™ Technology operating at 300 MHz and then at 333 MHz was subjected to preliminary scan investigation with the monitor set in the highest available resolution modes of 1024 x 768 / 75 Hz, non interlaced and 1280 x 1024 / 87 Hz, interlaced (the highest available non-interlaced and interlaced resolution modes). The monitor was investigated as powered from the wall outlet .

Data attached to this report refer to the measurements conducted with the EUT fitted with two Intel Pentium® II processors operating at 300 MHz and the monitor set in the highest resolution graphic mode of 1024 x 768 / 75 Hz, non interlaced; this was found to be the worst case configuration.

In order to activate the PCI bus, the following board has been plugged:

- **SCSI controller AMI Series 428** (FCC ID.: IUESER428).