MEASUREMENT/TECHNICAL REPORT

OLIVETTI PRINTER

FCC ID: DYK98XP32

December 15th, 1998

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

Equipment type: PRINTER (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: P.Antonio VELO Giuseppe MECCHIA

TÜV QSL srl
Via Montalenghe 8
10010 Scarmagno (TO)
Italy
Phone : 0125 – 529711 Phone : 0125 - 529823
Fax : 0125 - 711477

Table of Contents Page

1 GENERAL INFORMATION 3
1.1 Product Description 3
1.2 Related Submittal(s)/Grant(s) 3
1.3 Tested System Details 4
1.4 Test Methodology 5
1.5 Test Facility 5

2 PRODUCT LABELING 6
Figure 2.1 FCC ID Label 6
Figure 2.2 Location of the Label on EUT 7

3 SYSTEM TEST CONFIGURATION 8
3.1 Justification 8
3.2 EUT Exercise Software 8
3.3 Special Accessories 9
3.4 Equipment Modifications 9
3.5 Configuration of the Tested System 10
Figure 3.1 Configuration of the Tested System 10

4 BLOCK DIAGRAM(S) OF THE EUT 11
4.1 Block Diagram Description 11
Figure 4.1 Block Diagram of the EUT 12

5 CONDUCTED AND RADIATED MEASUREMENT PHOTOS 13

6 CONDUCTED EMISSION DATA 14

7 RADIATED EMISSION DATA 15
7.2 Field Strength Calculation 16

8 PHOTOS OF TESTED EUT 17-26

User Manual (Draft Edition) 27-Attached

1 GENERAL INFORMATION

1.1 Product Description

The EUT is a desk-top bubble ink-jet printer intended to be connected to Personal Computers in a system configuration; it is equipped with a printing head that can be fitted alternatively with color or black ink-cartidges being capable of driving one or the other according to the instructions received from the Computer.

It is supplied by a Switched Mode Power Supply Unit and includes a Controller (Printed Wiring Board with standard electronic components) and a printing unit driven by dc stepping motors.

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
Artjet 10 (1) s/n EMC-98-0396	**DYK98XP32**	**Printer, parallel I/F**	**Shielded parallel cable Unshielded power cord**
ECHOS PRO 150S s/n EMI-98-0328	GXLGP900T	Personal Computer	Unshielded power cord Shielded signal cables
ILAN model F1670 s/n 050961	None	AC adapter	Unshielded power cords
HP 7440A s/n 2539A94878	BSD8537440	Plotter, serial I/F	Shielded serial cable Unshielded power cord

(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 QSL test site No. 2

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).

Test equipment list:

Test receiver	Rohde & Schwarz ESH3	s/n 881364/012
LISN	Schwarzbeck NNLA8120	s/n 8120399
Test receiver	Rohde & Schwarz ESVP	s/n 879783/029
Biconical antenna	EMCO 3110	s/n 1735
Log-periodic antenna	EMCO 3146	s/n 3678

3 SYSTEM TEST CONFIGURATION

3.1 Justification

The printer was configured for testing in a typical fashion (as a customer would normally use it).

It was connected to the parallel port of a personal computer and operated in standard mode.

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, (EMI_DIA) 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, plotter and printer prints an "H" pattern. The complete cycle takes about 2 seconds and is repeated continously. 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.

3.3 Special Accessories

Line Filter on the Power Supply Unit:

Capacitors:

C6 (X2 class)	0.1μF-250 V.....	Matsushita ECQ-MV or
	.....	Arcotronics R47K or R47L or
	.....	Roederstein F1772 or
	.....	Philips 2222
C17; C26; (Y class)	680pF - 250 V.....	Murata KY series or
	.....	Draloric WKO
C18; C25; (Y class)	1000pF – 250 V.....	Murata KY series or
	.....	Draloric WYO

Inductors:

L2	Filter coil 2 x 50 mH	Moelettra 209428-G or
	.....	Elettronica Rossoni ER817
L3	Filter coil 2 x 100 μH	Radiohm 42V15 or
	.....	Moelettra 100176E

Metal shieldings:

Metal shield on the controller board (see picture attached as Figure 8.8);

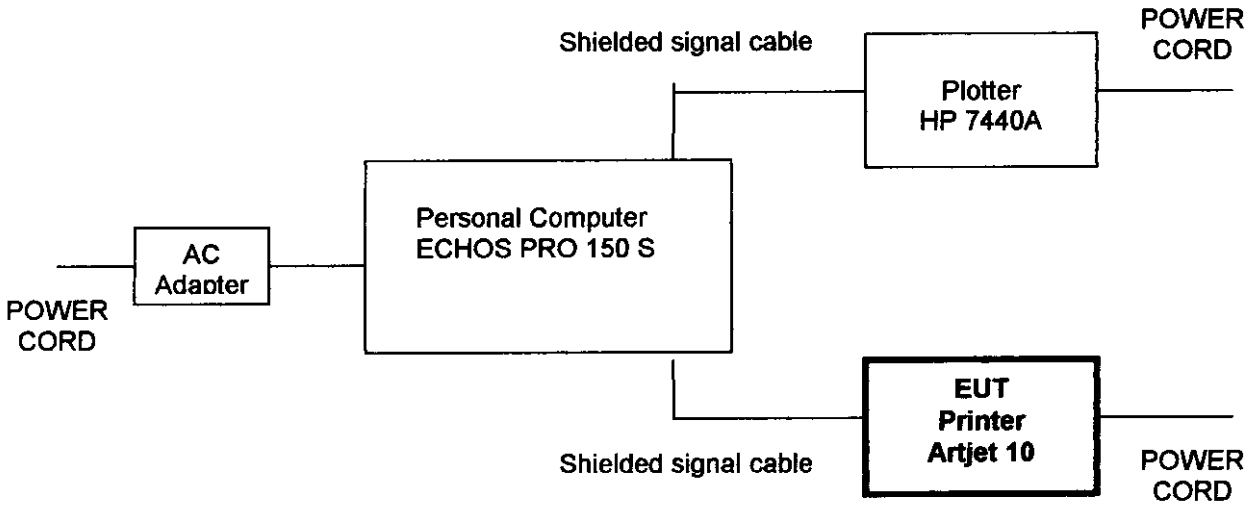
As shown in Figure 3.1 all interface cables used for compliance testing are shielded as normally supplied by Olivetti Company. These cable model and part numbers are marketed with the Olivetti Company peripherals to the end user, and appear on the related product price list supplied to our customers.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

Figure 3.1 Configuration of the Tested System



4 BLOCK DIAGRAM(S) OF THE EUT

4.1 Block Diagram Description

The Controller Board of the EUT is provided with the following frequency generators:

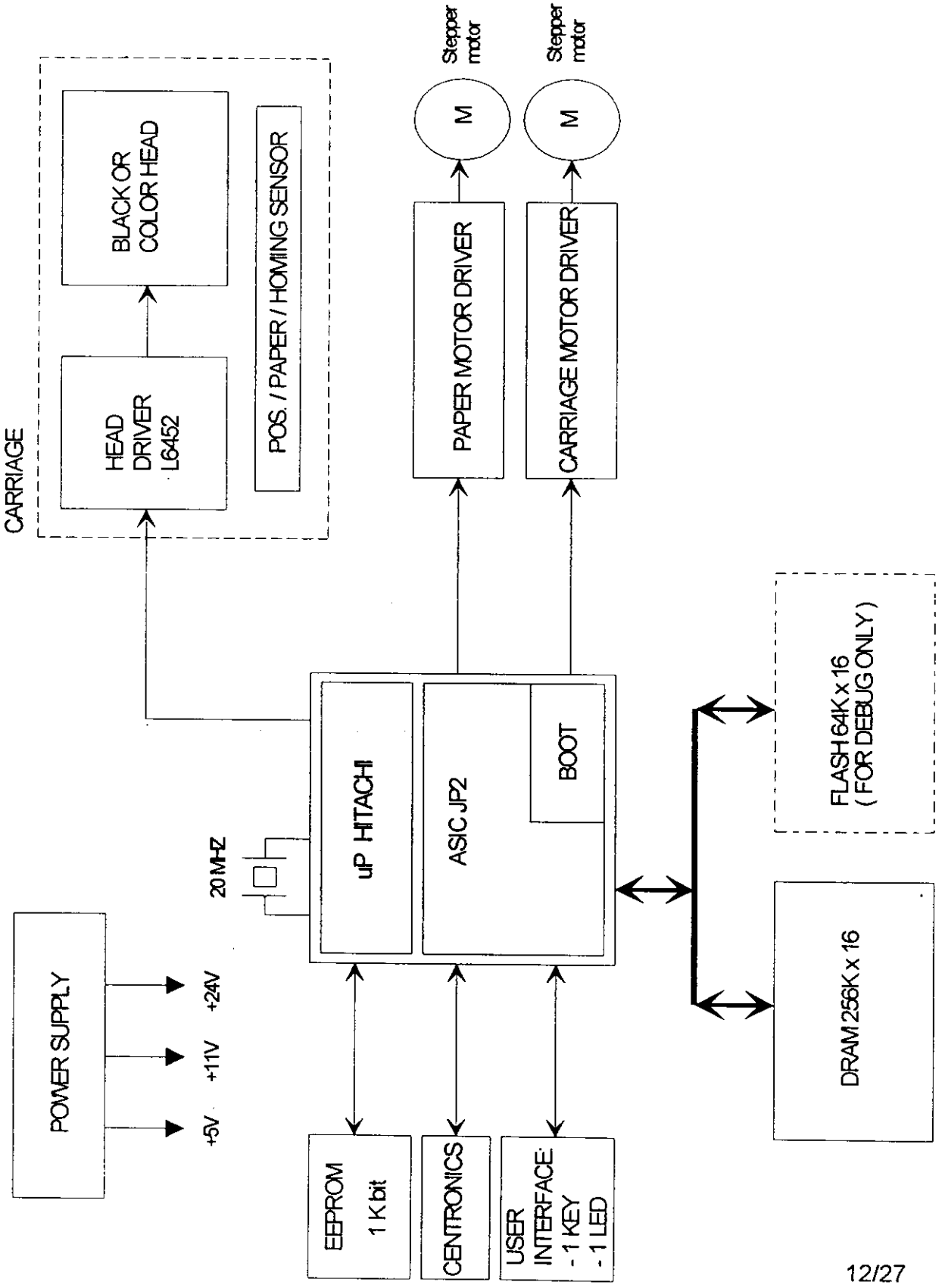
XT1 = 32.768 kHz Crystal
XT2 = 20.000 MHz Ceramic resonator

Carriage Motor Controller (PWM frequency): .....15 to 30 KHz

Paper Feed Motor Controller (PWM Frequency): .....25 to 30 KHz

Power Supply Unit switching frequency: .....50 to 70 KHz

Fig. 4.1 - Block Diagram of the EUT



6 CONDUCTED EMISSION DATA

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

	Frequency (MHz)	Measured* (dBμV)	Limit (dBμV)
neutral	0.9	38	48
	1.8	42	
	3.1	44	
	6	42	
	12.8	45	
	16.7	46	
line	0.9	38	48
	1.8	41	
	3.1	45	
	6	41	
	12.8	46	
	16.7	45	

* All readings are quasi-peak

Test Personnel:

Tester Signature  Date November 23, 1998

Typed/Printed Name Giuseppe MECCHIA

7 RADIATED EMISSION DATA

7.1 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)
38.7	V	21.3	12.7	34	40
195.1	H	15.5	17.6	33.1	43.5
204.7	H	18.9	14.3	33.2	43.5
300.8	H	26.9	17.8	44.7	46
421.1	V	22.2	17.8	40	46
666.1	V	17.8	21.2	39	46

* All readings are quasi-peak, with an IF bandwith of 120 kHz.

Test Personnel:

Tester Signature G. Mecchia Date November 20, 1998

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 21.3 dBμV is obtained. The Antenna and Cable Factor of 12.7 is added, giving a field strength of 34 dBμV/m. The 34 dBμV/m value was mathematically converted to its corresponding level in μV/m.

FS = 21.3 + 12.7 = 34 dBμV/m

Level in μV/m = Common Antilogarithm [(34 dBμV/m)/20]= 50.1 μV/m

8 PHOTOS OF TESTED EUT

Fig. 8.1 Overall front view
Fig. 8.2 Overall rear view
Fig. 8.3 Internal view with upper cover removed
Fig. 8.4 Internal view with upper cover removed (without paper feeder)
Fig. 8.5 Power Supply Unit P.W.A. - Components side
Fig. 8.6 Power Supply Unit P.W.A. - Foil side
Fig. 8.7 Controller Board - Components side
Fig. 8.8 Controller Board - Components side (with additional metal shield)
Fig. 8.9 Controller Board - Foil side