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 two printing heads respectively fitted with color and 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 low voltage d.c. stepping motors for paper feeding and the printing heads movements.

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
JP 883 (1) s/n EMC-98-0366	**DYKJP883**	**Printer, parallel I/F**	**Shielded parallel cable Unshielded power cord**
PC PRO SX16 s/n EMI-96-0942	EP8BU386SX16	Personal Computer	Unshielded power cord
DSM 25-314/P MDU1441 s/n 0003518	A3K9Q2M003	Monitor	Shielded video cable Unshielded power cord
ANK27-101 s/n 106	DYKANK	Keyboard	Shielded keyboard cable
M-SE9-6MD s/n MAI149301395	DZLMSE9	Mouse	Shielded mouse cable
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

Olivetti 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).

1.6 Test equipment used:

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 EUT 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:

C2	0.1μF-250V	Arcotronics or Roederstein or Siemens or Philips
C3, C4, C5, C6	2200 pF - 250V	Roederstein

Inductors:

LF1	Filter coil 2x41 mH - 0.8A	Moelettra 209428G-XX

Metal shieldings:
Sheet steel plate underneath the Power Supply Unit (see picture attached as Figure 8.4;
Spring type contact connecting the above mentioned plate to the metal frame of the EUT (see picture attached as Figure 8.9);
Sheet steel plate secured by screws over the Controller P.W.A (see picture attached as Figure 8.10).

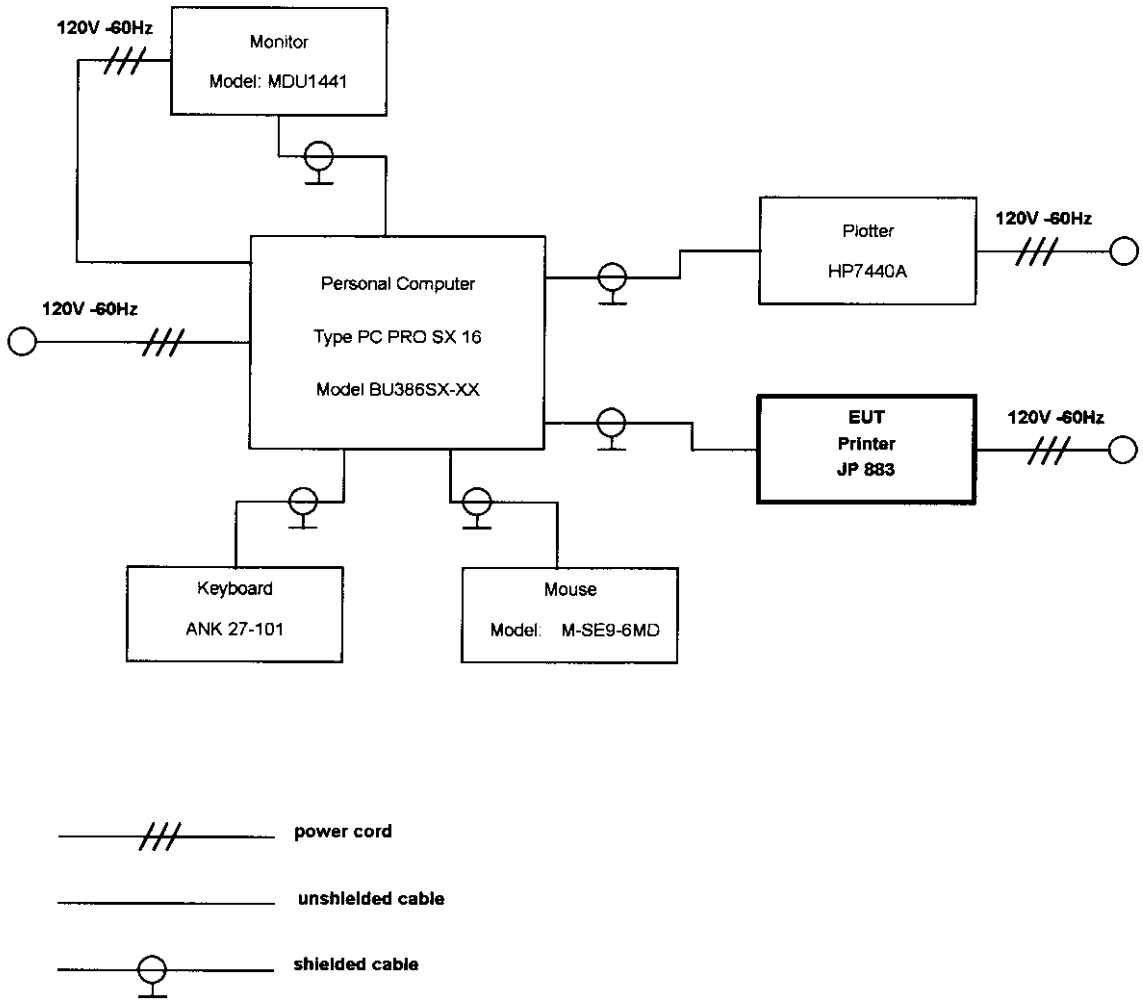
As shown in Figure 3.1 all interface cables used for compliance testing are shielded as normally supplied by Olivetti Company. These cable model and part numbers are marketed with the Olivetti Company peripherals to the end user, and appear on the related product price list supplied to our customers.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



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	0.45	35	48
	2.4	36	
	2.7	36	
	3.2	35	
	3.9	35	
	21.6	36	
line	0.45	34	48
	2.4	35	
	2.7	35	
	3.2	34	
	3.9	34	
	21.6	35	

* All readings are quasi-peak

Test Personnel:

Tester Signature  Date March 12, 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 6.5 dB

Frequency (MHz)	Polarity (V/H)	Receiver* Reading (dBμV)	Correction Factor (dB/m)	Corrected Reading (dBμV/m)	3 Meter Limit (dBμV/m)
74.4	V	19.9	11.8	31.7	40
127.9	H	18.3	14.4	32.7	43.5
159.9	H	17.5	15.7	33.2	43.5
591.7	H	9.3	25.8	35.1	46
687.7	V	11.3	28.2	39.5	46
719.6	V	10.4	28.4	38.8	46

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

Test Personnel:

Tester Signature  Date March 9, 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 11.3 dBμV is obtained. The Antenna and Cable Factor of 28.2 is added, giving a field strength of 39.5 dBμV/m. The 39.5 dBμV/m value was mathematically converted to its corresponding level in μV/m.

FS = 11.3 + 28.2 = 39.5 dBμV/m

Level in μV/m = Common Antilogarithm [(39.5 dBμV/m)/20]= 94.1 μV/m

8 PHOTOS OF THE 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 Power Supply Unit - Overall view with enclosure in place
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 - Foil side
Fig. 8.9 Metal spring contact connecting PSU bottom plate and machine frame
Fig. 8.10 Sheet steel shield over the Controller Board