1. GENERAL INFORMATION

1-1. Product Description

The Teco Image Systems Co., Ltd. Model DC3500(referred to as the EUT in this report) is a digital camera features as both the portable camera as well as the tethered PC camera. As a portable camera, it can snap color pictures directly from the field. When it is connected to PC's serial port, then the user's can not only download portable pictures, but also preview, snap and edit images under the Windows software.

Following described the summarized feature of EUT:

1.	Image Sensor	1/3'' (approx. 350K pixels)
2.	Image Resolution	Fine 640 (H) X 480 (V) / Normal 320 (H) X 240 (V)
3.	Storage	Flash Memory Card (1 MB)/(2 MB)
4.	Shutter	CCD electronic shutter
5.	PC 1/F	RS-232C
6.	Power	one 3 V lithium battery

A more detailed and/or technical description of EUT is attached in **User's Manual**.

1-2. Related Submittal(s) / Grant (s)

1-2-1. Models Covered

The test report submitted for FCC ID NSCDC35ØØ filing for model DC35ØØ covers the accessory of AC/DC adaptor, model SCP48-31000

1-2-2. Models Difference

N/A

1-3. Tested System Details

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

Model No.	FCC ID	Equipment	Cable
DC35ØØ SCP48-31000	NSCDC35ØØ	Digital Camera AC/DC Adaptor	Shielded Data Cable Unshielded Power Cord
4500DC-E	GWGMULTI82	Monitor	Shielded Data Cable(2) Un-Shielded Power Cord
93V	ANO6282	PC	Shielded Power Cord
HP2225C+	DSI6XU2225	Printer, Parallel I/F	Shielded Parallel Data Cable Un-Shielded Power Cord
AT-1200CK	E2O5OV1200CK	Modem, Serial I/F	Shielded Serial Data Cable Un-Shielded Power Cord
6311	FVI6311-K	Keyboard	Shielded Data Cable
SERIES 2-7S	DZL6QBS2	Mouse	Shielded Data Cable

Notes:

(1) EUT submitted for grant.
(2) Monitor's attached video cable without ferrite core.

1-4. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992). Radiated testing was performed at an antenna to EUT distance 10 meters.

1-5. Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of No. 5, All 2, Lane 220, Kang Lo St., Nei Hwu, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated July 09, 1996 Submitted to your office, and accepted in a letter dated March 28, 1998 (31040/SIT-1300F2).

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 Digital Camera was connected to support equipment-personal computer and used to receive the video signal of outside. Peripherals of PC such as monitor, printer, modem, keyboard and mouse were contained in this testing system in order to comply with ANSI C63.4 /CISPR22(1996) Rules requirement. The PC operated in pixel resolution 640x480/31.5 KHz ,true color, mode. This operating condition was tested and used to collect the data included.

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 disk, was inserted into driver A and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read object image from CCD sensor (EUT) to PC RS-232 port.
2. Send picture from PC to the video port device (Monitor).
3. Repeated from 1 to 2 continuously.

The keyboard, mouse, modem as well as the printer are strictly connected only, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.

3-3. Special Accessories

A special detachable type data Cable, non-shielded, without ferrite core attached, incorporated with a 9 pin D-Sub connector, provides EUT connection to PC RS-232C serial COM port required for compliance testing of FCC Rules. This interface cable is normally supplied by the applicant.

3-4. Equipment Modifications

N/A

Applicant Signature : Yangman Jang Date : Mar. 22 '99

Type/Printed Name : Yangman Jang Position : Project Manager

3.5 Configuration of Tested System

The configuration of tested system is described as the block diagram shown in next page Figure 3.1 and details information of I/O cable an power cord connection are tabulated as Table A and B. The monitor is powered from a floor mounted receptacle (referred to as the wall outlet in the previous described)was tested.

TABLE A - Test Equipment

Item	Equipment	Mfr.	Model/Type No.	I/O Port	FCC ID	Remark
E-1	Digital Camera	TECO	DC35ØØ	COM1 Port	NSCDC35ØØ	EUT
E-2	Monitor	Optiquest	4500DC-E	VGA Port	GWGMULTI82	
E-3	PC	IBM	93V		ANO6282	
E-4	Printer, Parallel I/F	HP	HP2225C+	Printer Port, PC	DSI6XU2225	
E-5	Modem, Serial I/F	Datatronics	AT-1200CK	COM2 Port, PC	E2O5OV1200CK	
E-6	Keyboard	ACER	6311	PS/2 Port, PC	FVI6311-K	
E-7	Mouse	Logitech	SERIES 2-7S	PS/2 port, PC	DZL6QBS2	

Remark:

(1) Unless otherwise denoted as EUT in 「Remark」 column , device(s) used in tested system is a support equipment.

(2) Unless otherwise marked as ※ in 「Remark」 column, Neutron consigns the supporting equipment(s) to the tested system.

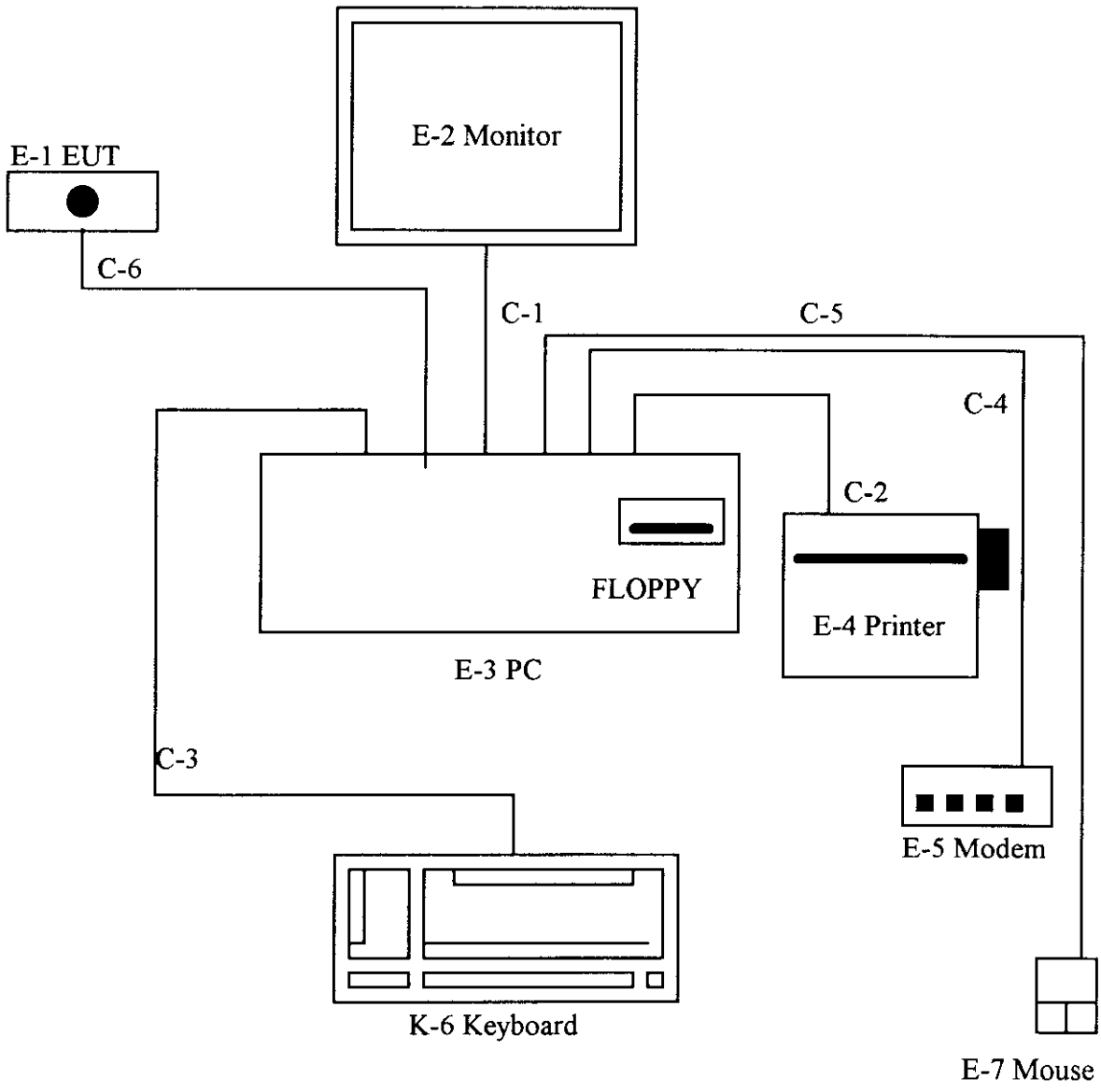
Table B. - Informations Cable Information

Item	I/O Cable	Device Connected	Shielded	Ferrite	Detachalbe/Permanently	Note
C-1	Video Cable	Monitor-PC	Yes	No	Permanently attached	
C-2	Centronics Cable	PC-Printer	Yes	No	Detachable type	
C-3	Keyboard Cable	EUT-Keyboard	Yes	No	Detachable type	
C-4	RS-232 Cable	PC-Modem	Yes	No	Detachable type	
C-5	Mouse Cable	PC-Mouse	Yes	No	Permanently attached	
C-6	I/O Cable	EUT-PC	Yes	No	Detachable type	※

Note:

(1) Unless otherwise marked as ※ in 『Remark』 colum, Neutron consigns the supporting equipment(s) to the tested system.

Flgure 3.1 Configuration of Tested System



6. Conducted Emission Datas

6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Judgement: Passed by **-24.36** **dB** in mode of **Neutral** terminal **29.624** **MHz**

Freq.	Terminal	Measured(dBuV)		Limits(dBuV)		Safe Margins	
(MHz)	L/N	QP-Mode	AV-Mode	QP-Mode	AVG-Mod	(dBuV)	Note
6.11	Line	21.24	*	60.00	50.00	-38.76	(QP)
6.64	Line	20.51	*	60.00	50.00	-39.49	(QP)
12.26	Line	24.05	*	60.00	50.00	-35.95	(QP)
24.22	Line	26.88	*	60.00	50.00	-33.12	(QP)
29.62	Line	28.47	*	60.00	50.00	-31.53	(QP)
3.78	Neutral	16.87	*	56.00	46.00	-39.13	(QP)
10.03	Neutral	21.33	*	60.00	50.00	-38.67	(QP)
12.63	Neutral	23.03	*	60.00	50.00	-36.97	(QP)
24.11	Neutral	31.31	*	60.00	50.00	-28.69	(QP)
29.62	Neutral	35.64	*	60.00	50.00	-24.36	(QP)

Remark :

(1) Reading inwhich marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=100KHz,VBW =100KHz, Swp. Time = 0.3 sec./MHz ◦ Reading inwhich marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz ◦

(2) All readings are QP Mode value unless otherwise stated AVG in colum of 『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemd to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform ◦ In this case, a " * " marked in AVG Mode colum of Interference Voltage Measured ◦

(3) Measuring frequency range from 150KHz to 30MHz ◦

Review : Test Personnel. : Date: MAR. 22, 1998

7. Radiated Emission Datas

7.1 The following data lists the significant emission frequencise, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by **-6.14 dB** in polarity of **Horizon 150.50 MHz**

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	orr.Factor(CF (dB)	Measured(FS) (dBuV)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
31.70	V	12.50	11.13	23.63	30.00	-6.37	
52.60	H	12.50	11.32	23.82	30.00	-6.18	
128.40	H	10.20	13.11	23.31	30.00	-6.69	
150.50	H	10.80	13.06	23.86	30.00	-6.14	
153.80	V	10.30	13.46	23.76	30.00	-6.24	
177.60	V	6.00	17.84	23.84	30.00	-6.16	
203.20	V	10.50	12.30	22.80	30.00	-7.20	
203.20	H	10.90	12.30	23.20	30.00	-6.80	
219.20	H	10.70	11.79	22.49	30.00	-7.51	
226.40	V	10.10	11.72	21.82	30.00	-8.18	
257.60	V	15.60	14.16	29.76	37.00	-7.24	
376.80	H	9.60	17.52	27.12	37.00	-9.88	

Remark :

(1) Reading inwhich marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=1MHz, VBW =1MHz, Swp. Time = 0.3 sec./MHz ◦

(2) All readings are Peak unless otherwise stated QP in colum of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦

(3) Measuring frequency range from 30MHz to 1000MHz ◦

(4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦

Review : Test Personnel. : Date: MAR. 22, 1998

7-2. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading.The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor (1)

CL = Cable Attenuation Factor (1)

AG = Amplifier Gain (1) (2)

Remark :

(1) The Correction Factor = AF + CL - AG, as shown in the data tables' Correction Factor column.

(2) AG is not available for Neutron's Open Site Facility

Example of Calculation:

Assume a Receiver Reading of 23.7 dBuV is obtained with an Antenna Factor of 7.2 dB and a Cable Factor of 1.1 dB. Then:

1. The Correction Factor will be caculated by

Correction Factor = AF + CL - AG = 7.2 + 1.1 - 0 = 8.3 (dB)

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

FS = RA + Correction Factor = 23.7 + 8.3 = 32 (dBuV/m).

FS is the value shown in the data tables' Corrected Reading column and RA is the value shown in the data tables' Receiver Reading column.The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m as:

$$\mathbf{Log^{-1}\ [\ (32.0dBuV/m)/20\ ]\ =\ 39.8\ (uV/m)}$$

7-3. Correction Factor VS Frequency

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30.00	11.10	0.20
35.00	10.80	0.00
40.00	11.20	0.40
45.00	11.50	0.40
50.00	11.30	0.90
55.00	10.50	0.00
60.00	9.90	0.00
65.00	8.70	0.20
70.00	7.60	0.00
75.00	6.40	0.50
80.00	6.10	0.10
85.00	7.00	0.80
90.00	8.00	0.30
95.00	10.00	0.40
100.00	11.20	0.60
110.00	12.60	0.60
120.00	13.00	0.60
130.00	12.50	0.50
140.00	12.00	0.20
150.00	12.00	1.00
160.00	13.20	1.20
170.00	14.80	1.60
180.00	16.30	1.90
190.00	17.00	1.90
200.00	17.30	1.40
225.00	10.50	1.10
250.00	11.70	2.00
275.00	12.80	2.40
300.00	14.50	2.40
325.00	14.00	1.90
350.00	14.20	2.40
375.00	14.60	2.90
400.00	15.10	2.70
450.00	16.20	3.20
500.00	17.60	3.70
550.00	17.80	3.90
600.00	18.40	4.30
650.00	19.50	4.00
700.00	20.80	4.10
750.00	20.50	5.30
800.00	21.10	5.90
850.00	22.40	5.80
900.00	23.50	5.50
950.00	24.00	6.30
1000.00	24.80	5.20

8. Photos of Tested EUT:

The following photos are attached:

Photo # 1.	Front View
Photo # 2.	Rear View
Photo # 3.-12	Unit Partially Disassembled
Photo # 13.	Power Supply Front View
Photo # 14.	Power Supply Rear View
Photo # 15-18.	Power Supply Unit Partially Disassembled