MEASUREMENT/TECHNICAL REPORT

SK-NET FDDI-LP 64 DAS

FCC ID: K3S5844

April 09, 1998

Equipment Under Test

Type:	SK-NET FDDI-LP 64 DAS
Serial No:	L6DEOS847OO1O
Equipment Category:	FDDI PCI Network Card

Relevant Standard: 47 CFR Part 15

This report concerns: ☒ Original grant ☐ Class II change

Request issue of grant:
☒ Immediately upon completion of review.
☐ Defer grant per 47 CFR 0.457(d)(ii) until ..... Company Name agrees to notify the Commission by .....of the intended date of announcement of the product so that the grant can be issued on that date.

Measurement Procedure used:

☒ ANSI C63.4-1992 ☐ FCC/OET MP-4 (1987) ☐ Other

If other describe .....

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Dr. Werner G. Rašek
- President -

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1 GENERAL INFORMATION

1.1 Product Description

Equipment Under Test (EUT)

The following describes the function of the EUT and the general operation:

Product name: SK-NET FDDI-LP 64 DAS

The SK-NET FDDI-LP 64 DAS is a Fiber optic/PCI network card uses FDDI class A fiber optic cable connection to integrate PC, PowerPC systems, SUN and RS/6000 workstations with PCI Bus architecture direct into the dual FDDI ring or allow dual homing.

The general operation is to send and receive data, between the host PCI-System and the connected FDDI network.

1.2 Related Submittal(s)/Grant(s)

None.

1.3 Tested System Details

DEVICE	FCC ID
HP Vectra VL4 5/100 Product Number D3672B S/N FR62661336S SK-NET FDDI-LP 64 DAS*1	HCLVECTRAVL5 K3S5844
Monitor Siemens Nixdorf Informationssysteme(SNI) Product Number MCM 1551 (N) S/N 735911	A3LCSU597
HP Keyboard Product Number C3754A #ABD S/N E03633LXGR	CIGE03614
HP Mouse Product Number C3751B S/N LZBG1213594	DZL210582
HP Deskjet 600 Product Number C2184A S/N ES64U140VT	B94C2184X
Modem Hayes ACCURA 288 FAX Model Number 5901US S/N A57759013811	BFJ5901US
Bypass AMP FDDI DUAL SWITCH MODULE Product Number 501016-1 S/N 0490041	-

Simulator: Network Client:

DEVICE	FCC ID
HP Vectra XM2 4/66 Product Number D3221B S/N 3516F54650 Network Adapter: SK-NET FDDI-LP DAS	B94VECTRASM2 K3S5544
Monitor Dell Product Number D1528-LS S/N 90628H0362C5	H4ICM15006
HP Keyboard Product Number C3758A S/N C3758A-6020	CIGE03633
HP Mouse Product Number C3751A S/N LCA50900627	DLZ210472

*1 EUT submitted for grant.

1.4 Interface Cables

Function / Type	Shielded or Non Shielded	Length
AC Power	unshielded	2,0 m
DC Power	unshielded	1,5 m
Video	shielded	1,1 m
Keyboard	shielded	1,5 m
Mouse	shielded	2,0 m
I/O Data (parallel)	shielded	3,0 m
I/O Data (serial)	shielded	3,0 m
Fiber Optic	-	10,0 m
Optical Bypass	unshielded	0,5 m

1.5 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C 63.4 - 1992.

Conducted emissions were measured to demonstrate compliance with the alternative standards contained in CISPR 22:1985 (with Draft CISPR/G 2, 5, 9, 11, 12, 13 and 14) as described in CFR 47 § 15.107 (e).

Radiated emissions were measured to demonstrate compliance with the alternative standards contained in CISPR 22: 1985 (with Draft CISPR/G 2, 5, 9, 11, 12, 13 and 14) as described in CFR 47 § 15.109 (g). Radiated testing was performed at an antenna to EUT distance of 10 meters.

1.6 Test Facility

The open area test site and conducted measurement facility used to collect the conducted and radiated emission data are located in Moggast, D-91320 Ebermannstadt, Germany. This site has been fully described in a report submitted to the FCC, and accepted in the letter dated Jan. 15, 1997 (31040/SIT - 1300 F2).

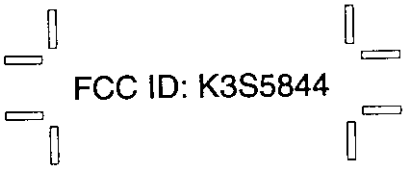
2 PRODUCT LABELING

2.1 FCC ID Label

Label Definition

Art.-Nr.	**50-75-103-131**
Rev.:	1.0
Description:	Certification Label , FCC ID for SK-NET FDDI-LP^{64} DAS
Revision:	1.0
Status:	VALID
Filename:	label-certif.fcc_id.K3S5844.doc
Date:	3/20/98
Owner:	mehrenfried
Partname:	LABEL-CERTIF
Package:	
Property:	FCC_ID_K3S5844
Size [mm]:	38.1 x 6.35 (1.5" x 0.25")
Material:	white vinyl, Brady B-607
Color of Printing:	black
Adhesive:	permanent, not removable
Content (Text):	FCC ID: K3S5844
Content (Marks):	
File:	none
Specifics:	none

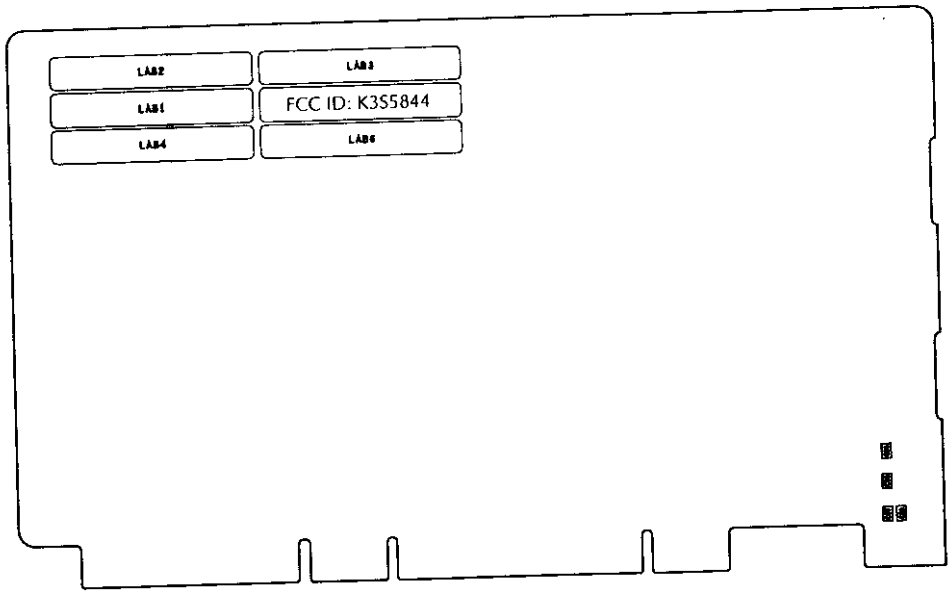
Drawing:



2.2 Location of Label on EUT

The drawing below, shows the placement of the FCC ID Label on the solder-side of PCB.

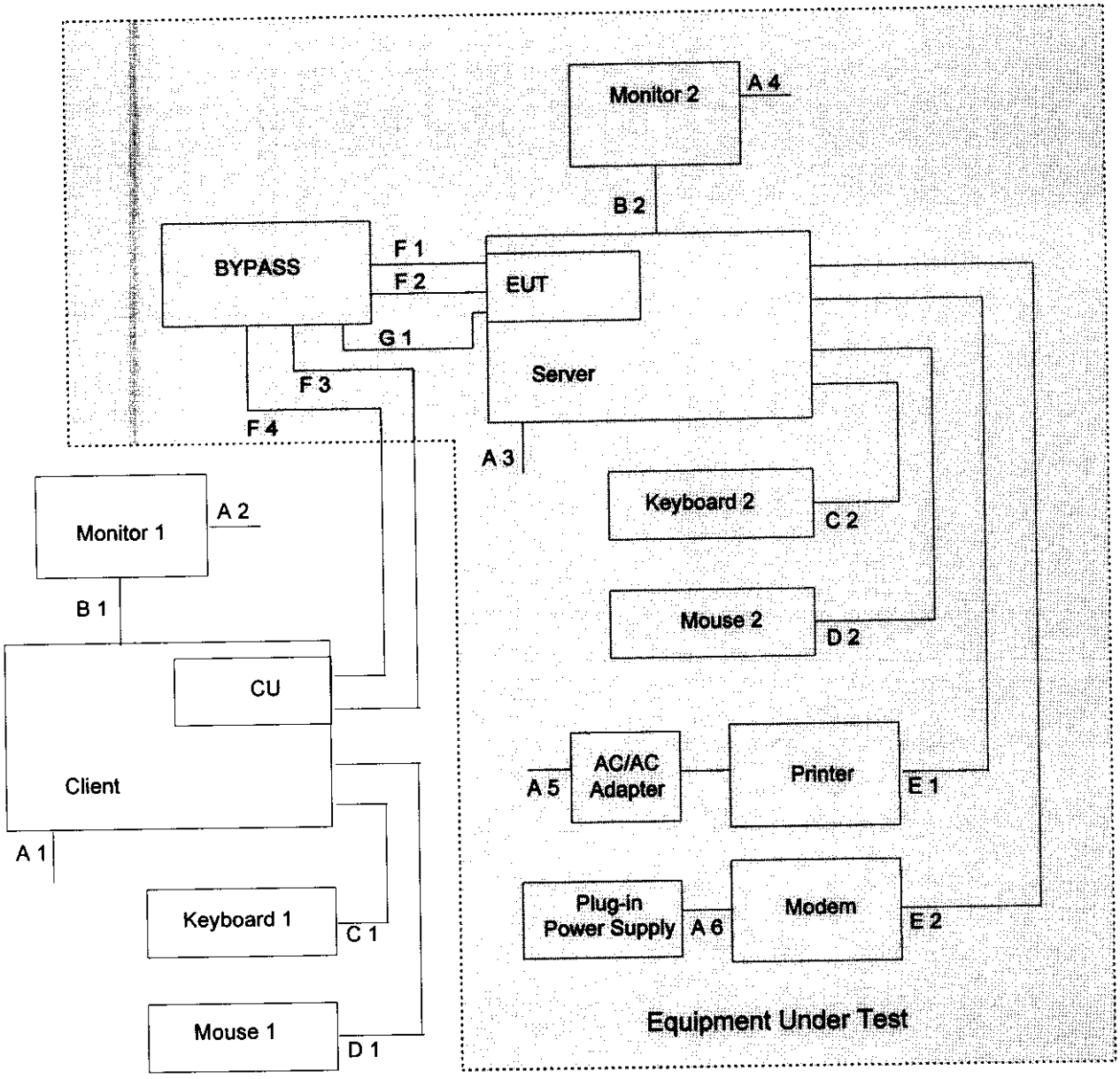
Title: MONALISA		Rev.: 1.0 Date: 09/24/97
60-10-060-000		Components Bottom
SysKonnect	a business unit of Schneider & Koch & Co. Datensysteme GmbH Siemensstr. 28 D-70736 Ettlingen / Germany	all rights reserved
Product: SK-NET FDDI xP64		Engineer: Feldmeth



3 CONFIGURATION OF TESTED SYSTEM

3.1 Test Setup

This Block Diagram displays the Test Setup. Client, monitor 1, keyboard 1 and mouse 1 are remotely located devices according to ANSI C 63.4-1992. paragraph 6.1.2.1 and do not contribute to the measured level.



AC Power = 115 V / 60 Hz

Cable	Function / Type	Length
A1 - A5	AC Power	2.0 m
A6	DC Power	1.5 m
B1 - B2	Video	1.1 m
C1 - C2	Keyboard	1.5 m
D1 - D2	Mouse	2.0 m
E1	I/O Data (parallel)	3.0 m
E2	I/O Data (serial)	3.0 m
F1 - F 4	Fiber Optic	10.0 m
G1	Optical Bypass	0.5 m

3.2 Justification

The system was configured for testing in a typical fashion. The only inserted I/O card is the SK-NET FDDI-Network Adapter. The second serial port was tested (Serial B) in addition to the first port (Serial A) during preliminary emissions tests. The simultaneous testing of this identical port did not increase emissions significantly. Therefore, the final qualification testing was completed with only one port connected (Serial A).

3.3 Equipment Modifications

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

3.4 Operation Mode of the EUT

The EUT is running Novell Netware 3.12.
The server's monitor tool displays Link Errors and Ring Op Changes.

The CU is connected to the server and starts a performance test and transfers frames of different sizes between the server and the client.

The software is started as following:

- EUT (Server, HP Vectra VL4 5/100)
  server
  load monitor -ns (without screen blanker)
  select menu item "LAN/WAN Informations"

- CU (Client, HP Vectra XM2 4/66)
  lsl
  uppsfp
  uppsmlid
  ipxodi
  netx.exe
  f: (change to the server drive)
  login test
  pmax.bat

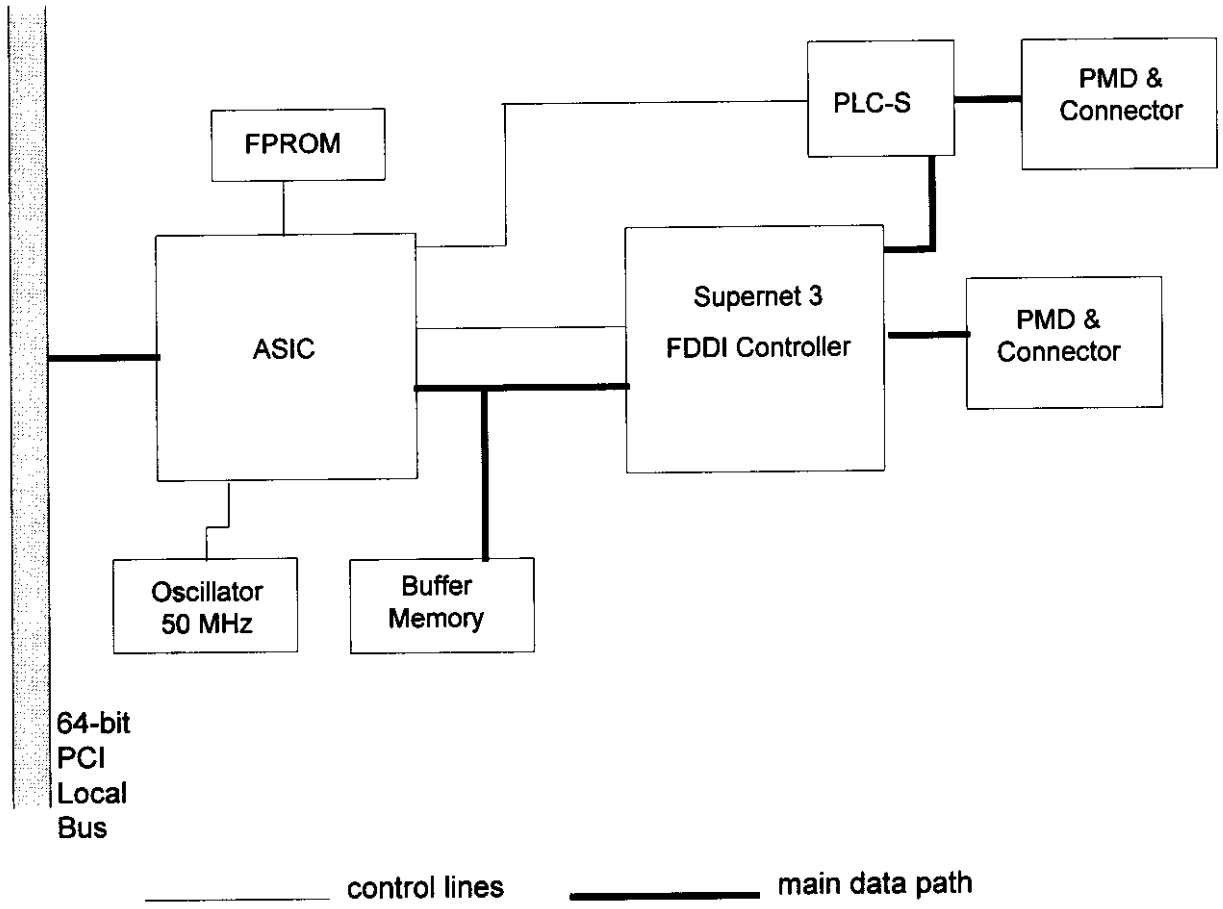
The batch-file "pmax.bat" starts the performance test "perform3.exe" with the following command line:

- perform3 tmax 120 100 65535 140

4 BLOCK DIAGRAM OF EQUIPMENT

4.1 Block Diagram of SK-NET FDDI-LP 64 DAS

The Block Diagram displays the controller's main devices.

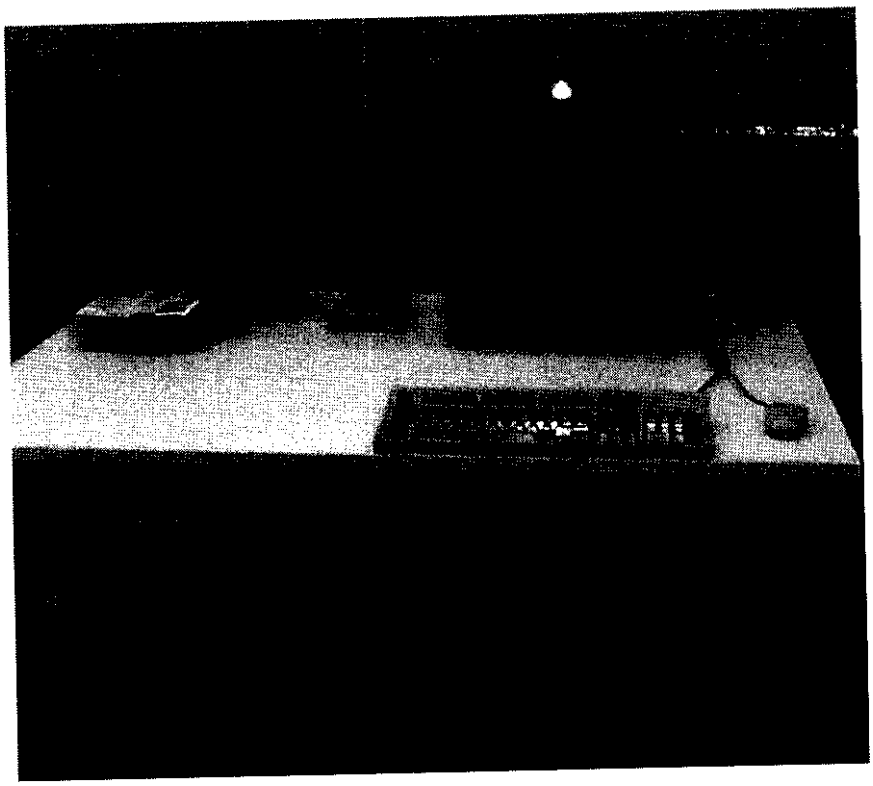


- Application Specific Integrated Circuit (ASIC)
- Reprogrammable Flash EPROM (FPROM)
- Supernet 3 FDDI Controller
- 128 Kbyte Buffer Memory
- 2 PLC-Transceiver Units

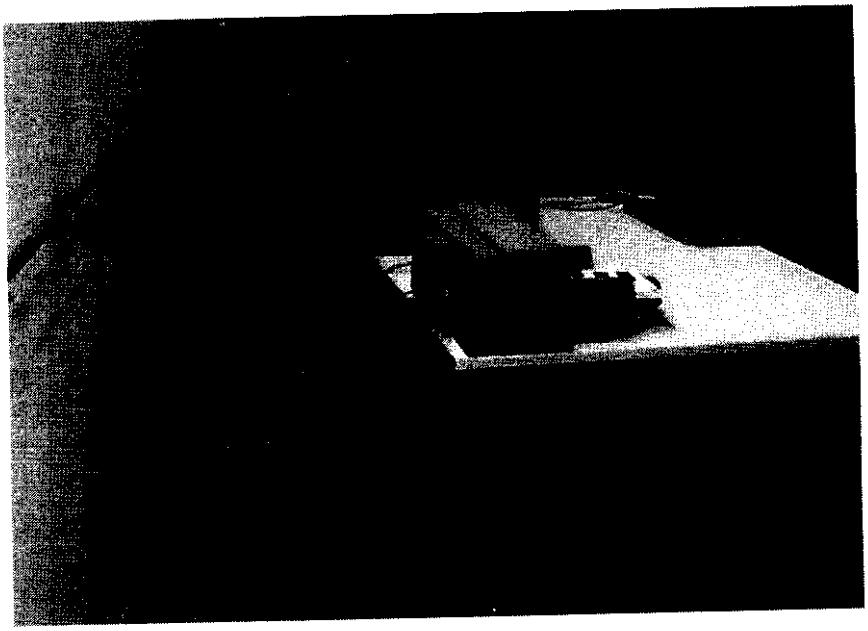
The PCI clock depends on the host PCI-System (in the tested system 33 MHz).
The Crystal Oscillator on the adapter card operates at 50 MHz.

5 CONDUCTED AND RADIATED MEASUREMENT PHOTOS

5.1 Conducted Measurement Photos



Conducted Front



Conducted Rear / Side

6 CONDUCTED EMISSION DATA

6.1 Test Procedure

The initial step in collecting conducted data is a peak scan of the measurement range with an EMI test receiver. The significant peaks are then measured with quasi-peak detector.

6.2 Measured Data

Judgement: Passed by 20.2 dB

	Frequency [MHz]	Measured* [dBµV]	Limit QP [dBµV]	Limit AV [dBµV]
neutral	0.205	35.9	63.4	53.4
	1.500	35.8	56	46
	1.705	35.2	56	46
	10.375	36.1	60	50
	12.010	35.7	60	50
	18.705	33.2	60	50
	21.160	34.7	60	50
line	0.205	33.7	63.4	53.4
	0.820	30.8	56	46
	2.390	29.8	56	46
	9.900	30.7	60	50
	12.010	34.2	60	50
	14.320	29.6	60	50
	15.975	30.5	60	50
	22.115	31.9	60	50
	24.580	27.1	60	50

* All readings are quasi-peak.

If the average limit is met when using a quasi-peak detector receiver, the test unit shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

Test Personnel:

Tester Signature  Date: March 30, 1998

Typed/Printed Name: Siegfried Guntermann

6.3 Test Instrumentation Used, Conducted Measurement

Type	Manufacturer/ Model No.	Serial No.	Last Calibration	Cal. Interval
Receiver	Rohde & Schwarz ESS	825132/015	March 27, 1998	12 months
LISN	Schwarzbeck NSLK 8127	253	January 15, 1998	12 months
LISN	Schwarzbeck NSLK 8126	8126228	January 15, 1998	12 months

7 RADIATED EMISSION DATA

7.1 Test Procedure

The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, plus the limit. Explanation of the Correction Factor is given in paragraph 7.3.

The frequency range investigated was 30 MHz to 1000 MHz.

7.2 Measured Data

Judgement: Passed by 4 dB

Frequency (MHz)	Receiver Reading NOTE 1 (dBµV)	Correction Factor (dB / m)	Corrected Reading (dBµV / m)	10 Meter Limit (dBµV / m)	Polarity (v/h)
166.2	15.5	10.5	26	30	h
350	3.1	17.9	21	37	h
398.8	4.4	19.4	23.8	37	h
400	2.6	19.4	22	37	h
565	8.1	22.9	31	37	h
600	1.6	23.4	25	37	h
700	1.8	25.2	27	37	h

Test Personnel:

Tester Signature: S. Guntermann Date: April 02, 1998

Typed/Printed Name: Siegfried Guntermann

NOTE 1 All readings are quasi-peak using a bandwidth of 120 kHz

7.3 Field Strength Calculation

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

FS = RA + AF + CF

where

FS = Field Strength (dBμV/m)

RA = Receiver Amplitude (dBμV)

AF = Antenna Factor (dB/m)

CF = Cable Attenuation Factor (dB)

Assume a receiver reading of 23.5 dBμV is obtained. The Antenna Factor of 7.4 dB/m and a Cable Factor of 1.1 dB is added, giving a field strength of 32 dBμV/m. The 32 dBμV/m value can be mathematically converted to its corresponding level in μV/m.

FS = 23.5 dBμV + 7.4 dB/m + 1.1 dB = 32 dBμV/m

Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20]=39.8 μV/m

7.4 Test Instrumentation Used, Radiated Measurement

Type	Manufacturer/ Model No.	Serial No.	Last Calibration	Cal. Interval
Receiver	Rohde & Schwarz ESS	825132/015	March 27, 1998	12 months
Antenna	EMCO 3143	9604-1269	Feb. 20, 1998	12 months

8 PHOTOS OF TESTED EUT

The following photos are attached:

Photo 8.1: HP Vectra VL4 5/100, Top Cover Removed

Photo 8.2: SK-NET FDDI-LP 64 DAS, Component Side

Photo 8.3: SK-NET FDDI-LP 64 DAS, Foil Side