TEST REPORT #061000

STANDARD: FCC PART 15

SUBPART B--UNINTENTIONAL RADIATORS
SECTION 15.109 RADIATION EMISSION LIMITS

EQUIPMENT TESTED:

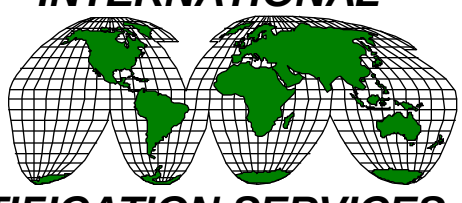
AMERICAN TEL-A-SYSTEMS, INC.
dba AMTELCO

MODEL: H.110 MC3
MULTI-CHASSIS INTERCONNECT AND CONFERENCE
PC PERIPHERAL PLUG-IN

TEST DATE: 06 OCTOBER 2000

INTERNATIONAL

1100 Falcon Avenue
Glencoe, MN 55336



Tele: 320-864-4444
Fax: 320-864-6611

CERTIFICATION SERVICES, INC.

Prepared for:

American Tel-A-Systems, Inc.
dba AMTELCO
4800 Curtin Drive
McFarland, WI 53558

Test agent:

International Certification Services, Inc.
1100 Falcon Avenue
Glencoe, MN 55336
Tele: 320-864-4444
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Test location:

International Certification Services, Inc.
1100 Falcon Avenue
Glencoe, MN 55336
Tele: 320-864-4444
Fax: 320-864-6611

Prepared by:

International Certification Services, Inc.
1100 Falcon Avenue
Glencoe, MN 55336

International Certification Services represents to the client that testing is done in accordance with standard procedures applicable and that reported test results are accurate within generally accepted commercial ranges of accuracy.

· **This report only applies to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. International Certification Services shall have no liability for any deductions, inferences or generalizations drawn by the client or others from this report.**

1.0 TEST SUMMARY

TEST REPORT: #061000	
COMPANY:	American Tel-A-Systems, Inc.
AGENT:	International Certification Services, Inc.
PHONE:	320-864-4444
TEST DATE:	06 October, 2000
EQUIPMENT UNDER TEST:	Multi-Chassis Interconnect and Conference PC Peripheral plug in board
GENERAL TEST SUMMARY:	The testing was performed at International Certification Services, Inc. at 1100 Falcon Ave, Glencoe, MN 55336
VERIFICATION / CERTIFICATION STATUS:	The American Tel-A-Systems, Inc. Model: H.110 MC3 Multi-Chassis Interconnect and Conference board was found to be in compliance with the FCC Part 15 Subpart B, Section 15.109 requirements.
MODIFICATIONS NECESSARY:	None

TESTED BY

Steve Wendlandt

WRITTEN BY

Duane R. Bagdons

2.0 Applicable Standards

47 CFR Ch.1 (10-1-98 Edition)

FCC Part 15 Radio Frequency Devices

Subpart B Unintentional Radiators

Section 15.109 Radiated Emission Limits

2.1 Referenced Standards

ANSI C63.4-1992 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 Khz to 40 Ghz.

2.2 Equipment Units Tested

The Infinity Series H.110 MC3 Multi-chassis Interconnect & Conference Board is designed to provide a high capacity interconnect path between multiple computers using the H.110 bus to connect computer telephony boards within a *Compac*tPCI chassis. This path is provided by fiber-optic links conforming to the MC3 standard and operating at the OC3 bit rate of 155 Mbps. Provisions are included for supporting dual counter rotating rings for redundancy or higher capacity.

In addition to the multi-chassis function, the board is equipped with enhanced conferencing facilities for up to 42 conferences with a total of 128 participants. Enhanced features include individual DTMF detection for each conference participant, a “clamping” function to prevent conferees from hearing DTMF tones generated by other conferees, and energy detection capabilities for conference inputs. A bi-directional analog port is also provided for such functions as music on hold and monitoring.

The H.110 bus was devised by the Enterprise Computer Telephony Forum (ECTF) to provide a single telecom bus for the entire industry. It is intended for add-in boards using the *Compac*tPCI form factor. A variety of boards are available from a number of different vendors. The *Compac*tPCI and H.110 specifications also provide for hot swap capabilities for use in high availability applications. The MC3 bus is a chassis interconnect standard promulgated by the GO-MVIP standards body.

The board is equipped with a processor that can be used to control the lower level functions of the board. The host PC controls the board using messages passed through dual-ported RAM. The board shares a common message passing and control scheme with other Infinity Series boards.

2.3 Equipment and Cable Configuration

See photos of the EUT pc board and schematic and test configuration setup in Attachment A

2.4 List of Test Equipment

Test Equipment	Model	S/N	Calibration Date
Spectrum Analyzer	Hewlett-Packard 8566B	2421A00458	09/24/00
Preamp	MiniCircuits ZKL-2R7	N/A	09/24/00
Biconical Antenna	AH Systems Model SAS-200/540	328	09/24/00
Log Periodic Antenna (200-1000 MHz)	EMCO 3146	9111-3280	09/24/00

2.5 Units of Measurement.

All measurements were taken in dBuV/m with the antenna located at 3 meters distance from the EUT. Frequency measurements are recorded in Mhz

2.6 Location of Test Site

The open area test site (OATS) measurement facility used to collect the data was International Certification Services, Inc. at 1100 Falcon Ave in Glencoe, MN 55336. This site has been certified to be in spec of the normalized site attenuation per ANSI C63.4-1992**.** See letter of compliance from FCC dated July 23, 1998. (FCC 31040/SIT 1300F2)

2.7 Measurement Procedures

The American Tel-A-Systems, Inc. Model: H.110 MC3 Multi-Chassis Interconnect and Conference board was installed in a Motorola CPX2000 Series Main Frame. The Motorola CPV5300 SBC Card was removed from the main frame to eliminate emissions from that card. American Tel-A-Systems, Inc. verified that the H.110 MC3 board was functioning normally with this card removed.

The receiving antenna was placed at a distance of 3 meters from the EUT. The EUT was set on an insulating table in the OATS site and rotated through 360 degrees to determine the worst case EUT orientation. The antenna was then positioned vertical and horizontal to determine which antenna polarity orientation was worst case. Then certification data was recorded at all the frequencies from the fundamental to the 10^{th} harmonic at an antenna height variation of from 1-4 meters.

2.8 Reporting Measurement Data

See data sheets and plots in Attachment B.

2.9 Radiated Emissions Data

The frequency and amplitude of the tuned frequency of the EUT along with the frequencies and amplitudes of the harmonics are reported in the data sheets in Attachment B. This information is plotted against the limit of section 15.109 of FCC

Part 15 subpart B. The polarization of the antenna for each measurement is also recorded.

The Final Level, expressed in dBuV/m, is arrived at by taking the reading from the spectrum analyzer (Level dBuV) and adding the antenna correction factor and cable loss factor (Factor dB) and subtracting the preamp gain. This result then has the FCC limit subtracted from it to provide the margin which gives the tabular data as shown in the data sheets in Attachment B.

Example:

Frequency	**Level**	+	**Factor**	=	**Corr Data**	-	**FCC Limit**	=	**Margin**
(MHz)	**(dBuV)**	+	**(dB)**	=	(dBuV/m)	-	**(dBuV/m)**	=	**(dB)**
100.0	20.6	+	11.0	=	31.6	-	43.5	=	-11.9

2.10 Operating Frequency Data for Unintentional Radiators

All operating frequencies and harmonic frequencies and ambient temperature at which all data was taken at is recorded in the data sheets in Attachment B.

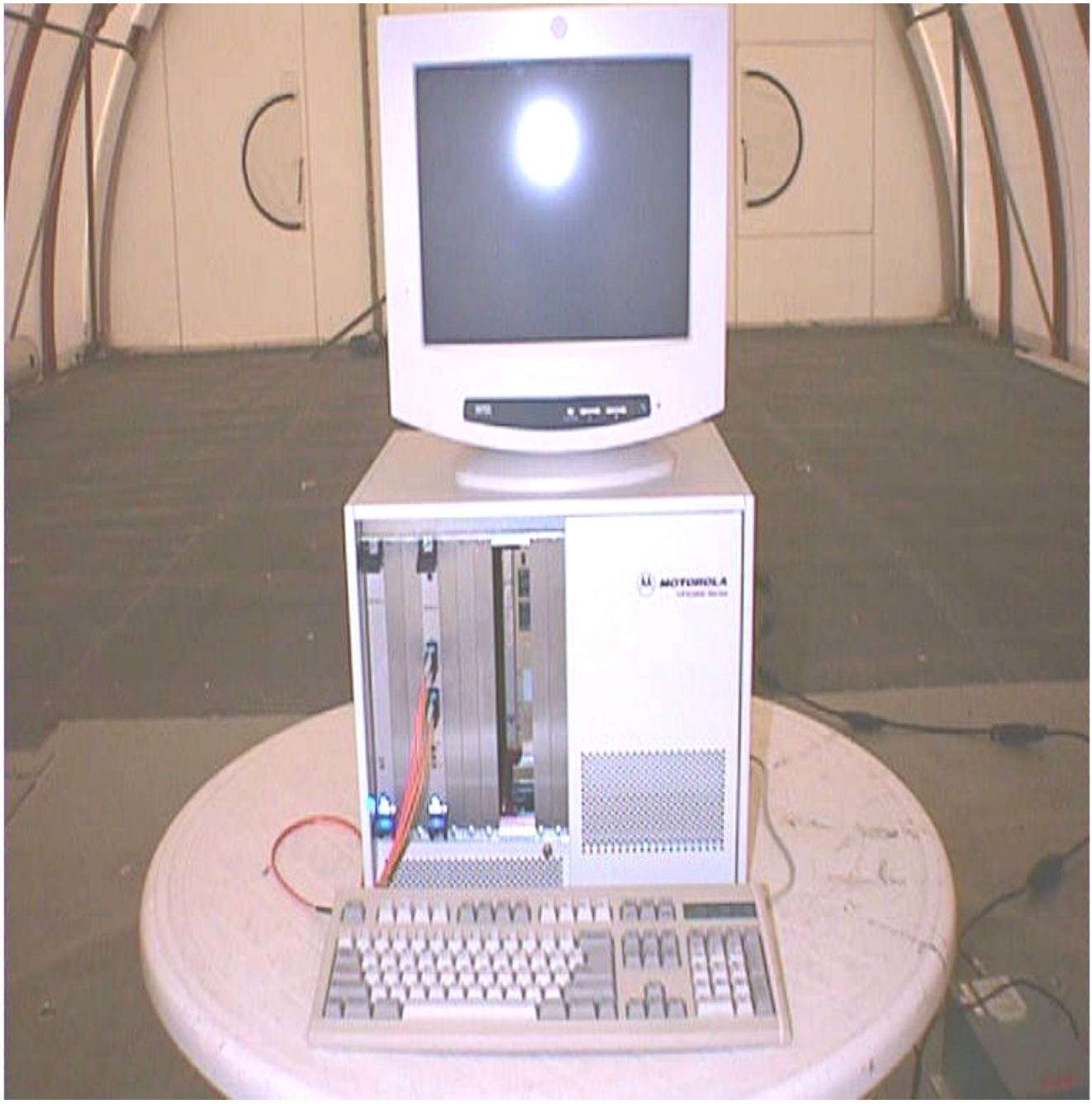
2.11 Summary of Results

The EUT passed the requirements of FCC Part 15 Subpart B, Section 15.109 with a minimum passing margin of –5.3382 dBuV/m at 798.0904 Mhz. for radiated emissions and –14.63 dBuV at 0.5161 Mhz for conducted emissions. No modifications were necessary to accomplish this compliance.

ATTACHMENT A

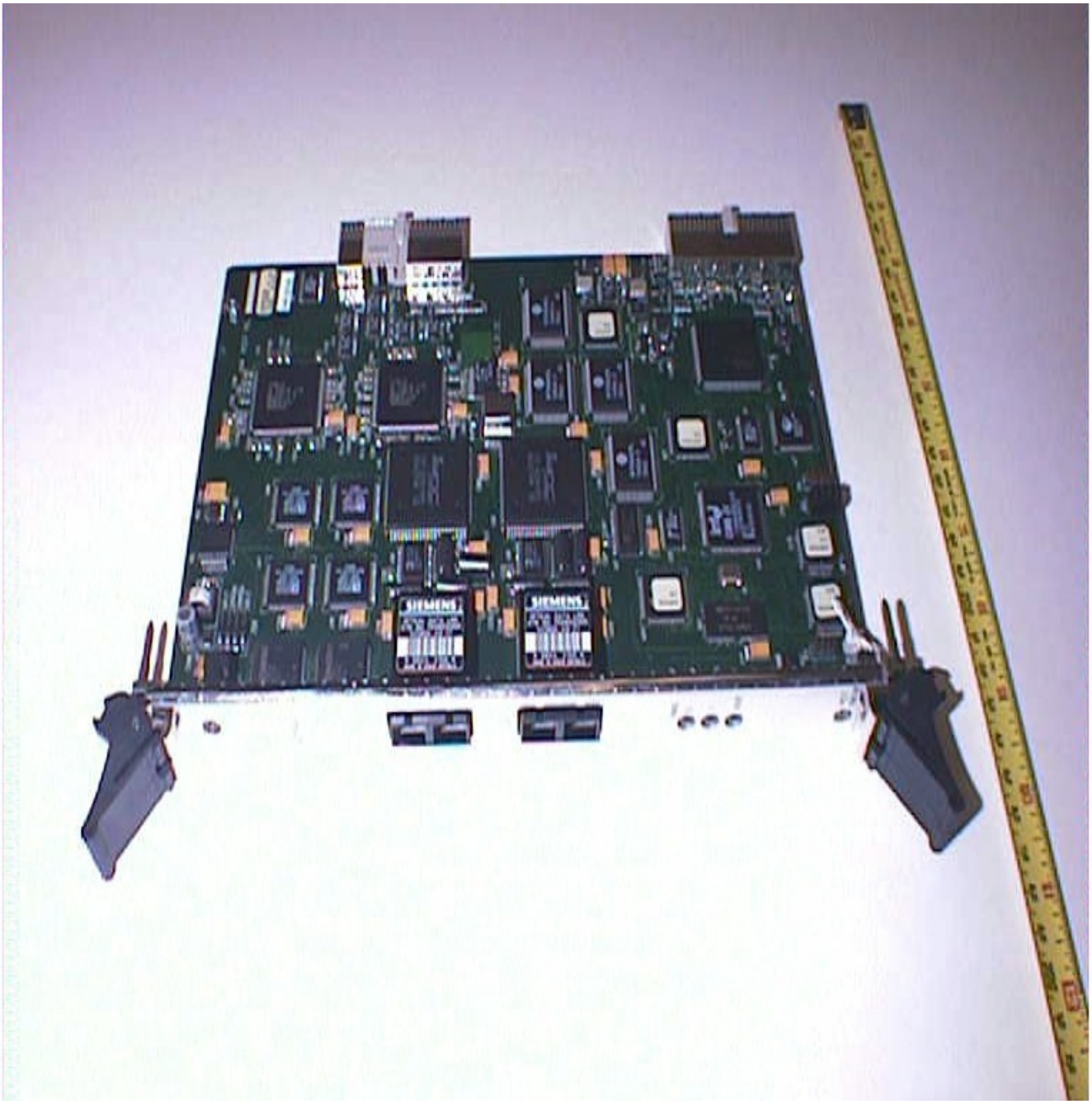
RADIATED MEASUREMENT SCHEMATIC, PHOTOS AND TEST CONFIGURATION

American Tel-A-Systems, Inc.
Model: H110 MC3 Multi-Chassis
Interconnect and Conference System
Radiated Emissions Test Configuration



American Tel-A-Systems, Inc.
Model: H110 MC3 Multi-Chassis Interconnect and Conference System
Conducted Emissions Test Configuration

American Tel-A-Systems, Inc.
Model: H110 MC3 Multi-Chassis Interconnect and Conference System
H110. MC3 PC Board



ATTACHMENT B

DETAILED TEST DATA SHEETS

Each radiated emissions plot indicates the receiving antenna measurement distance in meters and the emission amplitudes with respect to their applicable limits. The associated tabulation for each radiated plot lists the emission frequency, the final emission level, and the margin from the limit.

American Tel-A-Systems, Inc.
Model: H110.MC3 Multi-Chassis Interconnect and Conference Board
Temperature: 66 Deg F.
Humidity: 55 % R.H.

Test Technician: Steve Wendlandt

Certification testing was performed at the OATS site with an antenna distance of 3 meters and the EUT at 0-360 Degrees to the antenna. Data was optimized at antenna heights of from 1-4 meters.

The limit for section 15.109 is 100 uV/m from 30-88 Mhz, 150 uV/m from 88-216, 200 uV/m from 216-960 Mhz and 500 uV/m above 960 Mhz. All data is taken with the required Quasi-Peak Detector. This converted to dBuV is the limit shown in the next table.

Freq (Mhz)	(dBuV)	Cable Corr Fac	Ant Corr Fac	Preamp Gain	Corr Data (dBuV)	FCC Class B Limits	FCC Margin
33.2318	28.9	12.8872	1.306244	22	21.09344	40	-8.90656
38.3396	30.3	11.6542	1.3895	22	21.3437	40	-8.6563
61.3984	29.5	9.8	1.7818	22	19.0818	40	-10.9182
115.254	33.7	10.5106	2.5141	22	24.7247	43.52	-8.7953
532.0908	24.6	18.2581	5.3124	22	26.1705	46.02	-9.8495
598.5544	24.5	18.8861	5.6313	22	27.0174	46.02	-9.0026
665.0686	24.5	20.6048	5.7001	22	28.8049	46.02	-7.2151
698.3898	24.5	21.5	5.7267	22	29.7267	46.02	-6.2933
798.0904	**24.5**	**21.3814**	**6.8004**	**22**	**30.6818**	**46.02**	**-5.3382**
997.604	24.5	23.9529	6.7957	22	33.2486	53.98	-10.7314

Worst Case Margin

Conducted tests were performed at 120 VAC, 60 Hz. The limit for section 15.109 is 250 uV or 48 dBuV from .45-30 Mhz. All data is taken with the required Quasi-Peak Detector. This converted to dBuV is the limit shown in the next table.

Freq (Mhz)	dBuV	COND	LISN Corr Fac	Cable Corr Fac	EM7600 Corr Fac	Corr Data (dBuV)	FCC Class B Limits	FCC Margin
0.45							48	
0.5							48	
0.51161	23.05	Line1	-0.48	0.1	10	32.67	48	-15.33
0.5161	**23.75**	**N**	**-0.48**	**0.1**	**10**	**33.37**	**48**	**-14.63**
0.54142	20.8	Line1	-0.48	0.1	10	30.42	48	-17.58
0.5431	20.5	N	-0.48	0.1	10	30.12	48	-17.88
0.57302	18.75	Line1	-0.48	0.1	10	28.37	48	-19.63
0.6322	20.9	Line1	-0.48	0.2	10	30.62	48	-17.38
0.6945	19.9	Line1	-0.48	0.1	10	29.52	48	-18.48
0.8312	13.9	N	-0.48	0.1	10	23.52	48	-24.48
0.835	17.05	Line1	-0.48	0.1	10	26.67	48	-21.33
30							48	

Worst Case Margin

ATTACHMENT C

PRODUCT DATA SHEET OR PRODUCT INFORMATION FORM AS SUPPLIED BY THE CUSTOMER

COMPANY NAME: American Tel-A-Systems, Inc.

CUSTOMER REPRESENTATIVE: International Certification Services, Inc.

EQUIPMENT DESCRIPTION: Multi-Chassis Interconnect and Conference Board.

MODEL NUMBER: H.110 MC3

SERIAL NUMBER: 0118

TYPE OF TEST:

	Development
X	Initial Design Verification
	Design Change (Please describe exact changes below)
	Production Sample (Audit Test)

OSCILLATOR FREQUENCIES: 16.384 Mhz, 50 Mhz

POWER INTERFACE:
Frequency: 60 Hz
Voltage: 120 VAC
Number of Phases: 1
Current N/A

POWER SUPPLY: (included in the HOST computer)
Description:
Manufacturer:
Model Number:
Switching Frequencies:

POWER CABLE:

☐ Hardwired ☒ Flexible

☐ Shielded ☒ Unshielded

☐ Current ☒ Removable

POWER LINE FILTER: (Included in the HOST computer)
Manufacturer: N/A
Model Number: N/A

CABINET SHIELDING PROVISION:
Painted metal enclosure.

SOFTWARE AND / OR OPERATING MODES:
American Tel-A-Systems, Inc. Firmware

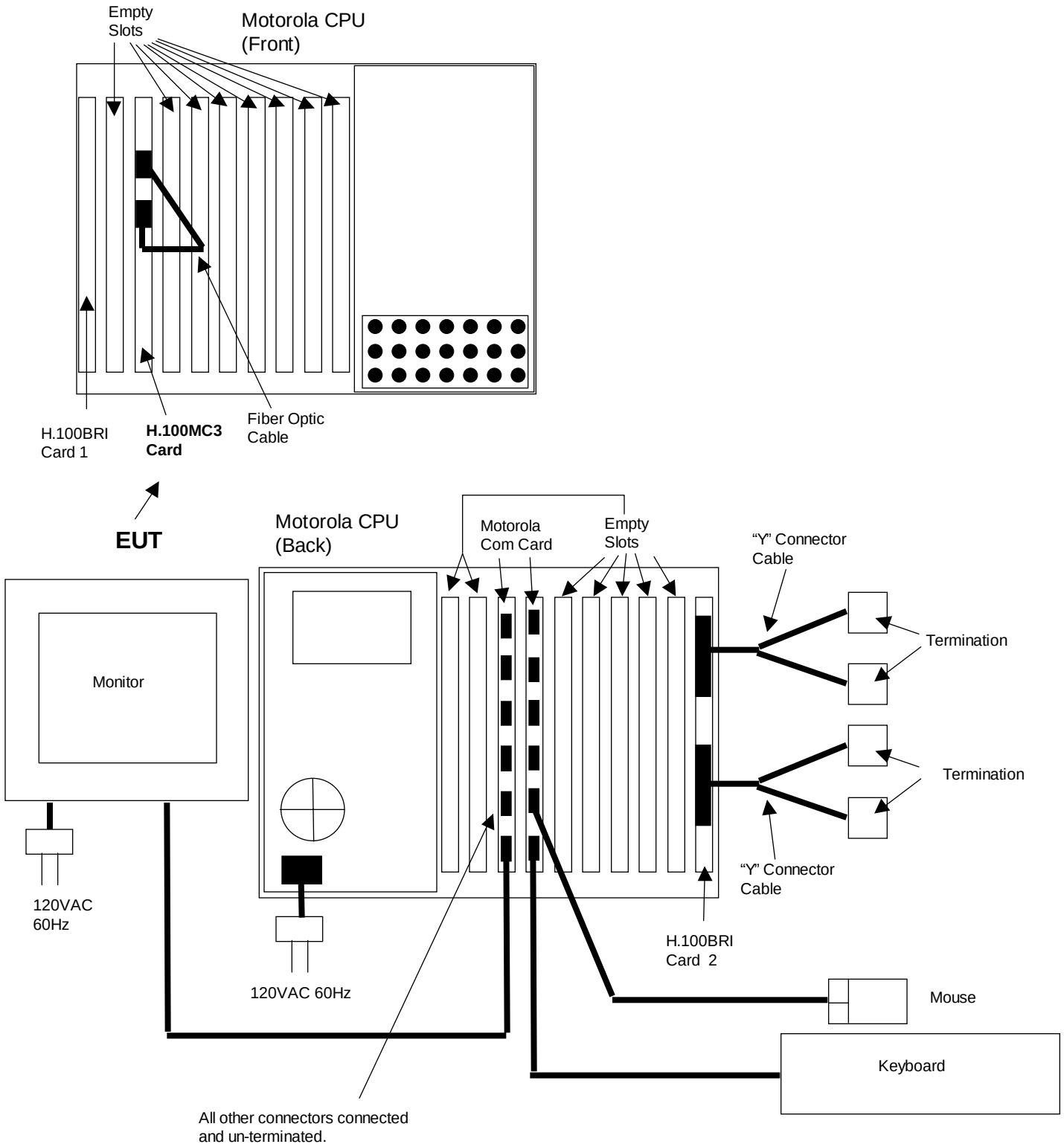
INTERFACING EQUIPMENT OR SIMULATORS

Description	Model Number	Serial Number	FCC ID (If Applicable)
WYSE PC Monitor	WY-15E	2DP15700858	LXMWY-157PES
BTC Keyboard	BTC-53 Series	N/A	E5X5R5BTC-5339R-0
Logitech Mouse	M-SAS51	None	JNZ211167
Motorola CPU	CPX2208	FH294	None

I/O CABLES:

Function	Length	Connector Type	Shield Termination Location
Fiber Optic	1 Meter	Siemens JZ-062SS002K	No Shield
Communication Interface “Y” Cable	1.5 Meters	XDS SCSI to RJ21	No Shield

American Tel-A-Systems, Inc.
Model: H.110 MC3 Multi-Chassis Interconnect and Conference Board
Test Configuration



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CERTIFICATION SERVICES, INC.