

Report No	ED0386-1
Client	Escort, Inc 5440 West Chester Road West Chester, OH 45069
Phone	513-870-8542
Fax	513-870-8509
FRN	0007508732
Models	SR1
FCC ID	QKLSR1
Equipment Type Equipment Code	Radar Detector CRD
Results	As detailed within this report
Prepared by	 Mairaj Hussain – Test Engineer
Authorized by	 Michael Buchholz – EMC Manager
Issue Date	6-9-03
Conditions of issue	This Test Report is issued subject to the conditions stated in ‘terms and conditions’ section of this report.

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Summary

This report is an application for Certification of a radar detectors operating pursuant to 47 CFR 15.109 as amended by ET Docket No. 01-278; FCC 02-211, published in the Federal Register Vol. 67, No. 145 on Monday July 29, 2002. This report is designed to demonstrate the compliance of the SR1 with the requirements outlined in Part 15 (using the methods outlined in Part 2) of 47 CFR.

Statement of Conformity

47 CFR 15.109(h) states that “*Radar detectors shall comply with the emissions limits...of [section 15.109(a)] over the frequency range of 11.7 – 12.2GHz.*” The applicable limit being 500µV/m measured at a distance of 3m.

Test Methodology

Radiated emission testing was performed according to the procedures in ANSI C63.4 (2001). The testing was performed at a distance of 1 meter. The device's performance was investigated in the range 11.7-12.2GHz. The EUT was powered by HP DC supply MN: 6012A. Since the device is a hand-held unit, the emissions were maximized around the three orthogonal axes and the maximum reading was recorded. The integrated antenna cannot be maximized separately.

EUT Configuration

EUT Configuration					
Work Order: D0386					
Company: Escort Inc					
Company Address: 5440 West Chester Road West Chester, OH 45069					
Contact: John Kuhn					
Person Present: None					
MN		SN	FCC ID		
EUT: SR1		2DA0490024	QKLSR1		
System's Components:					
Rear Laser					
Receiver Pasport SR1 Display					
Remote Mute					
Interface					
EUT Description: Radar detector.					
Support Equipment:		MN	SN	FCC ID	
HP DC power supply		6012A	2213A-00961		
EUT Cables:	Qty	Shielded?	Length	Ferrites	
SR1 to receiver	1	No	> 1m	None	
Rear laser	1	No	> 1 m	None	
Display (RJ45)	1	No	> 1 m	None	
Remote mute	1	No	> 1m	None	
DC power	1	No	> 1 m	None	
Software / Operating Mode Description:					
Normal operation: scanning for radar.					

Radiated Emissions Measurements**LIMIT**

Average: 500µV/m = 54dBµV/m @ 3m [15.109(a)]

Note: If peak measurements meet the Average limit, then Average measurements are not required.

The reading was adjusted in order to account for the actual measuring distance of 1 m.

$$\text{Distance factor} = 20 \cdot \log\left(\frac{3}{1}\right)$$

$$\text{Distance factor} = 9.5\text{dB}$$

MEASUREMENTS*Note: All readings are noise floor.*

RBW: 1MHz; VBW: 3MHz

Radiated Emissions Table											Curtis-Straus LLC		
Date: 19-May-03			Company: Escort Incorporated						Table 1				
Engineer: Mairaj Hussain			EUT Desc: SR1						Work Order: D0386				
Frequency Range: 11.7 - 12.2 GHz								Measurement Distance: 1 m					
Notes: NF -- Noise floor													
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Distance Factor (dB)	Adjusted Reading (dBμV/m)	---			CFR 47 FCC Part 15.209 Class B		
								Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
NF	11835.0	32.4	20.0	40.9	2.8	9.5	46.6				54.0	-7.4	Pass
NF	12069.0	32.7	20.2	41.3	2.8	9.5	47.1				54.0	-6.9	Pass
Table Result: Pass by 6.9 dB Worst Freq: 12069.0 MHz													
Test Site: F		Pre-Amp: Org-Blk		Cable: 6 ft Microflex #8		Analyzer: Orange		Antenna: Black horn					

Test Equipment Used

REV. 5/11/03

SPECTRUM ANALYZERS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	9kHz-1.8GHz	8591E	HP	3441A03559	00024	05-JUN-2003
WHITE	9kHz-22GHz	8593E	HP	3547U01252	00022	25-FEB-2004
BLUE	9kHz-1.8GHz	8591E	HP	3223A00227	00070	04-SEP-2003
YELLOW	9kHz-2.9GHz	8594E	HP	3523A01958	00100	03-JUL-2003
GREEN	9kHz-26.5GHz	8593E	HP	3829A03618	00143	02-OCT-2003
BLACK	9kHz-12.8GHz	8596E	HP	3710A00944	00337	08-JUL-2003
YELLOW-BLACK	20Hz-40.0MHz	3585A	HP	2504A05219	00030	25-DEC-2003
ORANGE	9kHz-26.5GHz	E4407B	HP	US39440975	00394	07-JUN-2003

LISN	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	956348	00753	01-APR-2004
BLUE	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	956349	00752	01-APR-2004
YELLOW-BLACK	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	984735	00248	01-APR-2004
ORANGE	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	903707	00754	24-OCT-2003
GOLD	10kHz-30MHz	8012-50-R-24-BNC	SOLAR	984734	00247	01-APR-2004
WHITE-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972019	00678	01-APR-2004
BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972017	00675	01-APR-2004
RED-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972016	00677	01-APR-2004
BLUE-BLACK	10kHz-30MHz	8610-50-TS-100-N	SOLAR	972018	00676	01-APR-2004

OPEN AREA TEST SITE (OATS)	FCC CODE	IC CODE	VCCI CODE	CALIBRATION DUE
SITE F	93448	IC 2762-F	R-468	04-FEB-2004
SITE T	93448	IC 2762-T	R-905	04-FEB-2004
SITE A	93448	IC 2762-A	R-903	04-FEB-2004
SITE M	93448	IC 2762-M	R-904	04-FEB-2004
BUBBLE (HP FACILITY)	N/A	N/A	R-1467	16-MAY-2005

LINE CONDUCTED TEST SITES	FCC CODE	IC CODE	VCCI CODE	CALIBRATION DUE
EMI 1	93448	N/A	C-480	01-MAY-2006
EMI 2	93448	N/A	C-480	01-MAY-2006
EMI 3	93448	N/A	C-480	01-MAY-2006
BUBBLE (HP FACILITY)	N/A	N/A	C-1556	16-MAY-2005

ANTENNAS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
GREEN BILOG	30MHz-2GHz	CBL6112B	CHASE	2742	00620	17-MAR-2005
GREEN-BLACK BILOG	30MHz-2GHz	CBL6112B	CHASE	2412	00127	17-MAR-2005
GREEN-WHITE BILOG	30MHz-2GHz	CBL6112B	CHASE	2574	00319	17-MAR-2005
RED BILOG	30MHz-1GHz	3143	EMCO	1270	00042	17-MAR-2005
BLUE BILOG	30MHz-1GHz	3143	EMCO	1271	00803	17-MAR-2005
GRAY BILOG	26MHz-2GHz	3141	EMCO	9703-1038	00066	18-JUL-2003
YELLOW-BLACK BILOG	20-2000MHz	CBL6140A	CHASE	1112	00126	18-JUL-2003
YELLOW HORN	1-18GHz	3115	EMCO	9608-4898	00037	08-JUN-2003
BLACK HORN	1-18GHz	3115	EMCO	9703-5148	00056	12-JUN-2003
ORANGE HORN	1-18GHz	3115	EMCO	0004-6123	00390	27-MAY-2003
WHITE HORN	18-26.5GHz	3160-09	EMCO	9610-1068	00758	26-JUN-2003
SMALL LOOP	9kHz-30MHz	PLA-130/A	ARA	1024	00755	27-JAN-2004
LARGE LOOP	20Hz-5MHz	6511	EMCO	9704-1154	00067	05-NOV-2003
ACTIVE MONOPOLE	30Hz-30MHz	3301B	EMCO	3824	00068	08-APR-2004
INDUCTION COIL	50-60Hz	1000-4-8	C-S	N/A	00778	16-SEP-2004
ADJUSTABLE DIPOLE	30-1000MHz	3121C	EMCO	1370	00757	26-JUN-2003
ADJUSTABLE DIPOLE	30-1000MHz	3121C	EMCO	1371	00756	26-JUN-2003
RE101 LOOP SENSOR	30Hz-100kHz	RE101-13.3CM	C-S	N/A	00818	07-JAN-2005
RS101 RADIATING LOOP	30Hz-100kHz	RS101-12CM	C-S	N/A	00819	07-JAN-2005
RS101 LOOP SENSOR	30Hz-100kHz	RS101-4CM	C-S	N/A	00820	07-JAN-2005

MIXERS/DIPLEXERS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
MIXER / HORN	26.5-40 GHz	11970A/28-442-6	HP/ATM	2332A00900/A046903-01	00369	09-JUL-2003
MIXER / HORN	40-60 GHz	M19HW/A	OML	U30110-1	00821	03-JAN-2005
MIXER / HORN	60-90 GHz	M12HW/A	OML	E30110-1	00822	03-JAN-2005

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MIXER / HORN	90-140 GHz	MO8HW/A	OML	F21206-1	00811	05-DEC-2004
MIXER / HORN	140-220 GHz	MO5HW/A	OML	G21206-1	00812	05-DEC-2004
DIPLEXER		DPL.26	OML	N/A	00813	05-DEC-2004

PREAMPS / ATTENUATORS / FILTERS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	0.10-2000MHz	ZFL-1000-LN	C-S	N/A	00798	17-MAR-2004
BLUE	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00759	07-AUG-2003
BLUE-BLACK	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00800	08-APR-2004
GREEN	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00802	17-MAR-2004
GOLD	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00044	24-MAY-2003
BLACK	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00799	17-MAR-2004
ORANGE	0.01-2000MHz	ZFL-1000-LN	C-S	N/A	00765	17-MAR-2004
WHITE	1-20GHz	SMC-12A	C-S	426643	00760	27-AUG-2003
YELLOW-BLACK	1-20GHz	SMC-12A	C-S	535055	00801	27-AUG-2003
ORANGE-BLACK	1-20GHz	SMC-12A	C-S	637367	00761	04-MAR-2004
YELLOW	18-26.5GHz	AFS4-18002650-60-8P-4	C-S	467559	00758	27-AUG-2003
HIGH PASS FILTER	1-18 GHz	SPA-F-55204	K&L	36	00817	31-DEC-2003
LOW PASS FILTER	1-9 GHz	11SL10-4100/X4400-O/O	K&L	4	00816	31-DEC-2003
20dB ATTENUATOR	0.03-20 GHz	PE 7019-20	PASTERNAK	01	00791	13-JUN-2003

ABSORBING CLAMPS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
FISCHER CLAMP	30-1000MHz	F-201-23MM	FISCHER	10	00081	04-JAN-2004

EFT	MN	MFR	SN	ASSET	CALIBRATION DUE
EFT DIRECT COUPLING CAP	N/A	C-S	01	00794	10-DEC-2003

ESD GENERATORS	MN	MFR	SN	ASSET	CALIBRATION DUE
GREEN	NSG435	SCHAFFNER	000839	00763	04-NOV-2003
RED	NSG435	SCHAFFNER	001625	00762	15-NOV-2003
YELLOW	930D	ETS	201	00673	29-MAY-2003

BEST EMC-2	MN	MFR	SN	ASSET	CALIBRATION DUE
BLUE	711-1100	SCHAFFNER	199824-002SC	00117	04-SEP-2003
RED	711-1100	SCHAFFNER	200122-074SC	00623	04-SEP-2003

CHAMBERS AND STRIPLINE	MN	MFR	SN	ASSET	CALIBRATION DUE
RFI 1 CHAMBER	3 METER COMPACT	PANASHIELD	N/A	00797	11-JUN-2003
RFI 2 CHAMBER	04' x 07' SHIELDING SYSTEM	LINDGREN	13329	00795	09-JUN-2003
RFI 3 STRIPLINE	N/A	C-S	N/A	00796	09-JUL-2003
ENVIRONMENTAL (SAFETY)	SGTH-31S	B-M-A INC.	2245	00321	07-JUN-2003

AMPLIFIERS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	0.5-1000MHz	10W1000B	AR	18708	00032	11-JUN-2003
BLUE	0.01-250MHz	75A250	AR	19165	00039	14-JAN-2004
GREEN	0.5-1000MHz	10W1000B	AR	23423	00123	11-JUN-2003
BLACK	0.01-250MHz	75A250	AR	23411	00122	14-JAN-2004
ORANGE	0.01-250MHz	75A250	AR	26827	00367	14-JAN-2004
HP489A	1.0-2.0GHz	HP489A	HP	1144AU1780	00083	28-AUG-2003
HP491C	2.0-4.0GHz	HP491C	HP	449-00638	00764	28-AUG-2003
HP493A	4.0-8.0GHz	HP493A	HP	171402242	00085	28-AUG-2003
HP495A	7.0-12.0GHz	HP495A	HP	904-00237	00086	28-AUG-2003

FIELD PROBES	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	0.01-1000MHz	HI-4422	HOLADAY	90369	00031	14-APR-2004
GREEN	0.01-1000MHz	HI-4422	HOLADAY	97363	00136	02-APR-2004

SIGNAL GENERATORS	RANGE	MN	MFR	SN	ASSET	CALIBRATION DUE
RED	0.09-2000MHz	HP8648B	HP	3847U02192	00366	11-DEC-2003
BLUE	0.1-1000MHz	HP8648A	HP	3426A00548	00034	11-JUL-2003
GREEN	0.09-2000MHz	HP8648B	HP	3623A02072	00125	04-SEP-2003
ORANGE	0.1-1000MHz	HP8648B	HP	3537A01210	00025	05-JUN-2003
BLACK	15MHz	HP33120A	HP	US36004674	00766	23-OCT-2003

YELLOW	15MHz	HP33120A	HP	US36014119	00249	07-JUN-2003
BLUE-WHITE	0.1Hz-13MHz	HP3312A	HP	1432A07632	00775	27-FEB-2004
SWEeper	0.01-20.0GHz	HP83752A	HP	3610A01133	00087	04-APR-2004
BULK INJECTION CLAMPS						
RED	0.01-100MHz	95236-1	TEGAM	12248	00035	14-JAN-2004
GREEN	0.01-100MHz	95236-1	EMCO	50215	00118	14-JAN-2004
MEASUREMENT PROBES						
BLUE MONITORING PROBE	0.01-150MHz	91550-2	TEGAM	12350	00807	17-MAY-2003
YELLOW MONITORING PROBE	0.01-150MHz	91550-2	ETS	50972	00493	21-NOV-2003
GREEN CURRENT TRANSFORMER	40Hz-20MHz	150	PEARSON	10226	00793	03-APR-2004
CISPR LINE PROBE	150kHz-30MHz	N/A	C-S	01	00805	20-DEC-2004
CISPR TELCO VOLTAGE PROBE	150kHz-30MHz	CS A/C-10	C-S	CS01	00296	12-SEP-2003
CDN NETWORKS						
BLACK	0.15-100MHz	20A M-2	C-S	04	00783	14-JAN-2004
BLUE	0.15-100MHz	15A M-3	C-S	05	00806	14-JAN-2004
RED	0.15-100MHz	15A M-3	C-S	06	00780	14-JAN-2004
WHITE	0.15-100MHz	15A M-3	C-S	07	00782	14-JAN-2004
YELLOW-BLACK	0.15-100MHz	15A M-3	C-S	08	00784	14-JAN-2004
BLUE-BLACK	0.15-100MHz	15A M-3	C-S	09	00781	14-JAN-2004
GREEN	0.15-100MHz	30A M-3	C-S	10	00779	14-JAN-2004
YELLOW	0.15-100MHz	30A M-5	C-S	11	00804	14-JAN-2004
BLUE-WHITE	0.15-100MHz	15A M-5	C-S	12	00788	14-JAN-2004
YELLOW (RES)	0.15-100MHz	100Ω RESISTOR NWK	C-S	01	00810	10-SEP-2003
GREEN (RES)	0.15-100MHz	100Ω RESISTOR NWK	C-S	02	00785	10-SEP-2003
HARMONIC ANALYZER						
HFTS	HP6842A	HP		3531A-00169	00738	29-OCT-2003
FREQUENCY COUNTER						
5340A	HP5340A	HP		1440A02320	00787	12-JUN-2003
SURGE GENERATORS						
TRANSIENT WAVEFORM MONITOR	TWM-5	CDI		003982	00323	13-JUN-2003
UNIVERSAL SURGE GENERATOR	M5	CDI		003966	00324	10-OCT-2003
THREE PHASE COUPLING NWK	3CN	CDI		003455	00325	10-OCT-2003
HIGH VOLTAGE CAP NWK 5KVDC, 18μF	CS-HVCC	C-S		01	00772	15-OCT-2003
NEBS SURGE GENERATOR	N/A	C-S		N/A	00088	12-SEP-2003
12 PAIR SURGE RESISTOR MODULE	N/A	C-S		N/A	00768	12-SEP-2003
POWER SUPPLIES						
10001I/2 AC POWER SYSTEM	(2) 500i	CALIFORNIA INSTRUMENTS		HK53687/HK53688	00376	31-DEC-2003
RMS VOLTMETERS/CURRENT CLAMP						
RED RMS VOLTMETER	3400A	HP		40102044	00770	04-OCT-2003
WHITE RMS VOLTMETER	3400A	HP		1218A14427	00809	09-DEC-2003
GREEN RMS VOLTMETER (TELECOM)	3400A	HP		806-09594	00344	10-DEC-2003
TRUE-RMS VOLTMETER	79III	FLUKE		71700298	00769	03-OCT-2003
TRUE-RMS CLAMP METER (SAFETY)	36	FLUKE		68805882	00700	31-MAR-2004
POWER/NOISE METERS						
POWER METER	435B	HP		2445A11012	00773	07-APR-2004
POWER SENSOR	8481A	HP		2702A61351	00774	07-APR-2004
TRANSMISSION LINE TESTER (DbrnC)	185T	AMREL		998658	00823	14-JAN-2004
OVERVOLTAGE CHAMBERS						
72kW POWER FAULT SIMULATOR	OV1	C-S		N/A	00792	14-MAR-2004
POWER FAULT SIMULATOR	OV2	C-S		N/A		14-MAR-2004
DIPOLE TAPE MEASURES						
26FT TAPE #1	2338CME	LUFKIN		C3166-1	00776	26-MAR-2005
26FT TAPE #2	2338CME	LUFKIN		C3166-2	00772	26-MAR-2005

METEOROLOGICAL METERS	MN	MFR	SN	ASSET	CALIBRATION DUE
TEMPERATURE /HUMIDITY GAUGE	TH300	DICKSON	9044101	00733	09-DEC-2003
TEMPERATURE /HUMIDITY GAUGE	THG-912	HUGER	4000562	00789	08-NOV-2003
ATMOSPHERIC PRESSURE GAUGE	BA928	OREGON SCIENTIFIC	C3166-1	00831	03-MAR-2004

TRACEABLE CLOCKS	MN	MFR	SN	ASSET	CALIBRATION DUE
5003	5003	CONTROL COMPANY	99026940	00808	09-DEC-2003

Unless otherwise noted the calibration interval is one year. All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Terms And Conditions

Paragraph 1. SERVICES. LABORATORY will:

- 1.1 Use the degree of care and skill ordinarily exercised by and consistent with the standards of the profession.
- 1.2 Perform all technical services in substantial accordance with the generally accepted laboratory principles and practices.
- 1.3 Retain all pertinent records relating to the services performed for a period of three (3) years following submission of the report describing such services, during which period the records will be made available to CLIENT upon reasonable request.

Paragraph 2. CLIENT'S RESPONSIBILITIES. CLIENT or his authorized representative will:

- 2.1 Provide LABORATORY with all plans, schematics, specifications, addenda, change orders, drawings and other information for the proper performance of technical services.
- 2.2 Designate a person to act as CLIENT's representative with respect to LABORATORY's services to be performed on behalf of the CLIENT; such person or firm to have complete authority to transmit instructions, receive information and data, interpret and define CLIENT's policies and decisions with respect to the LABORATORY's work on behalf of the CLIENT and to order, at CLIENT's expense, such technical services as may be required.
- 2.3 Designate a person who is authorized to receive copies of LABORATORY's reports.
- 2.4 Undertake the following:
 - (a) Secure and deliver to LABORATORY, without cost to LABORATORY, preliminary representative samples of the equipment proposed to require technical services, together with any relevant data.
 - (b) Furnish such labor and equipment needed by LABORATORY to handle samples at the LABORATORY and to facilitate the specified technical services.

Paragraph 3. GENERAL CONDITIONS:

- 3.1 LABORATORY, by the performance of services covered hereunder, does not in any way assume any of those duties or responsibilities customarily vested in the CLIENT, its employees, or any other party, agency or authority.
- 3.2 LABORATORY shall not be responsible for acts of omissions of any other party or parties involved in the design, manufacture or maintenance of the equipment or the failure of any employee, contractor or subcontractor to undertake any aspect of equipment's design, manufacture or maintenance.
- 3.3 LABORATORY is not authorized to revoke, alter, release, enlarge or release any requirement of the equipment's design, manufacture or maintenance unless specifically authorized by CLIENT or his authorized representative.
- 3.4 THE ONLY WARRANTY MADE BY LABORATORY IN CONNECTION WITH ITS SERVICE PERFORMED HEREUNDER IS THAT IT WILL USE THAT DEGREE OF CARE AND SKILL AS SET FORTH IN PARAGRAPH 1 ABOVE. NO OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE OR INTENDED FOR SERVICES PROVIDED HEREUNDER.
- 3.5 Where the LABORATORY indicates that additional testing is advisable to obtain more valid or useful data, and where such testing has not been authorized, CLIENT agrees to view such test reports as inconclusive and preliminary.
- 3.6 The LABORATORY will supply technical service and prepare a report based solely on the sample submitted to the LABORATORY by the CLIENT. The CLIENT understands that application of the data to other devices is highly speculative and should be applied with extreme caution.
- 3.7 The LABORATORY agrees to exercise ordinary care in receiving, preserving and shipping (F.O.B. Littleton, MA) any sample to be tested, but assumes no responsibility for damages, either direct or consequential, which arise from loss, damage or destruction of the samples due to the act of examination, modification or testing, or technical services or circumstances beyond LABORATORY's control.
- 3.8 The LABORATORY will hold samples for thirty (30) days after tests are completed, or until the CLIENT's outstanding debts to the LABORATORY are satisfied, whichever is later.
- 3.9 The CLIENT recognizes that generally accepted error variances apply and agrees to consider such error variances in its use of test data.
- 3.10 It is agreed between LABORATORY and CLIENT that no distribution of any tests, reports or analysis other than that described below shall be made to any third party without the prior written consent of both parties unless such distribution is mandated by operation of law. It is agreed that tests, reports, or analysis results may be disclosed to third party auditors of the laboratory at the laboratory facility in the course of accreditation maintenance audits. No reference to reports or technical services of the LABORATORY shall be made in any advertising or promotional literature without the express written permission of the LABORATORY.
- 3.11 The CLIENT acknowledges that all employees of LABORATORY operate under employment contracts with the LABORATORY and CLIENT agrees not to solicit employment of such employees or to solicit information related to other clients from said employees.
- 3.12 In recognition of the relative risks and benefits of the project to both CLIENT and LABORATORY, the risks have been allocated such that the CLIENT agrees, to the fullest extent permitted by law, to limit the liability of the LABORATORY to the CLIENT for any and all claims, losses, costs, damages of any nature whatsoever or claims expenses from any cause or causes, including attorneys' fees and costs and expert witness fees and costs, so that the total aggregate liability of the LABORATORY to the CLIENT shall not exceed \$100,000, or the LABORATORY'S total fee for services rendered on this project, whichever is greater. It is intended that this limitation apply to any and all liability or cause of action however alleged or arising, unless otherwise prohibited by law.

Paragraph 4. INSURANCE:

- 4.1 LABORATORY shall secure and maintain throughout the full period of the services provided to the CLIENT adequate insurance to protect it from claims under applicable Workmen's Compensation Acts and also shall maintain one million dollars of general liability coverage to cover claims for bodily injury, death or property damage as may arise from the performance of its services.
- 4.2 The CLIENT hereby warrants that it has sufficient insurance to protect its employees adequately under applicable Workmen's Compensation Acts and for bodily injury, death, or property damage.
- 4.3 No insurance of whatever kind or type, which may be carried by either party is to be considered as in any way limiting any other party's responsibility for damages resulting from their operations or for furnishing work and materials.

Paragraph 5. PAYMENT:

- 5.1 CLIENT shall pay to LABORATORY such fees for services as previously agreed, orally or in writing, within 30 days of presentment of a bill for such services performed. In the event CLIENT ordered, orally or in writing, services but such services were not assigned a rate for billing, such services shall be billed at the LABORATORY's reasonable and customary rate.
- 5.2 CLIENT shall be responsible for all shipping, customs and other expenses related to services provided by LABORATORY to the CLIENT, and shall fully insure any test sample or other equipment provided to LABORATORY by the CLIENT.
- 5.3 Amounts overdue from CLIENT to LABORATORY shall be charged interest at a rate of 1½ % per month.

Paragraph 6. ISO/IEC GUIDE 17025 ADDITIONS:

- 6.1 CLIENT agrees that this test report will not be reproduced except in full, without written approval from the LABORATORY.
- 6.2 CLIENT agrees that this test report shall not be used to claim product endorsement by A2LA or ANSI or any agency of the U.S. Government.
- 6.3 CLIENT agrees that test results presented herein relate only to the sample tested by the LABORATORY.

A2LA Accreditation**SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999**

CURTIS-STRAUS
527 Great Road
Littleton, MA 01460
Jon Curtis Phone: 978-486-8880

ELECTRICAL

Valid until: July 31, 2003

Certificate Number: 1627-01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following Electromagnetic Compatibility (EMC), Telecommunications, and Product Safety tests:

Electromagnetic Compatibility (EMC)

Radiated emissions testing (electric and magnetic fields); Conducted emissions testing (voltage and current); Electrostatic Discharge testing; Electrical Fast Transient testing; Radiated Immunity testing; Conducted Immunity testing; Lightning Immunity testing; Voltage Dips, Interrupts and Voltage Variations testing; Magnetic Immunity testing; RF Power measurements; Frequency Stability measurements; Longitudinal Induction measurements; Harmonic emissions testing; Light flicker testing; Low frequency disturbance voltage testing; Disturbance Power measurements

EMC Standards <i>Emissions</i>	Title		
CISPR 22 1997 with amendments 1 and 2	Limits and methods of measurement of radio disturbance characteristics of information technology equipment.	CNS 13439 AS/NZS 1053: 1999	Broadcast receiver and associated equipment Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers and associated equipment.
CNS13438 1994	Limits and methods of measurement of radio interference characteristics of information technology equipment.	CISPR 14 1993	Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and electric apparatus.
EN55022:1994 and 1998	Limits and methods of measurement of radio disturbance characteristics of information technology equipment.	EN 55014 1993, 1997	Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus.
SABS CISPR 22:1997	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	AS/NZS 1044: 1995	Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus.
Canada ICES-003 1997 AS/NZS 3548 1995	Digital apparatus Australian/New Zealand Standard Limits and methods of measurement of radio disturbance characteristics of information technology equipment		
CISPR 11 1990, 1997	Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.	<i>Immunity</i> CNS13783-1 SABS CISPR 14-1 1993	Household Electrical Appliances Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 1: Emission – Product family standard
EN 55011 1991, 1998	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.	SABS CISPR 14-2 1997	Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity - Product family standard
SABS CISPR 11:1997	Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics Limits and methods of measurement		

Canada ICES-001 1998 <i>L. B. Riley</i> CNS13803 AS/NZS 2064: 1997 CSA C108.8 – M1983 CISPR 13 1996, 1998 EN 55013 1990 EN 55013 Amend 12 1994 SABS CISPR 13: 1996 (A2LA Cert. No. 1627-01) Revised 02/21/02	Industrial, scientific and medical radio frequency generators Industrial, Scientific and Medical Instrument Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment. Electromagnetic Emission from Data Processing Equipment and Electronic Office Machines Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers and associated equipment. Sound and television broadcast receivers and associated equipment: Electromagnetic compatibility. Part 1: Specification for limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment. Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment. Amendment 12 Limits and methods of measurement of radio interference characteristics of sound and television broadcast receivers and associated equipment. Page 2 of 9	CISPR 14-2 1996 CISPR 20 with amendment 3 EN 55020 1995 CISPR 24 SABS CISPR 24 1997 AS/NZS 3200.1.2: 1995 <i>European Union Basic EMC Standards</i> EN 61000-4-2 1995, 1999 EN 61000-4-3 1997, 1998 AS/NZS 61000.4.3 1999 (A2LA Cert. No. 1627-01) Revised 02/21/02	Immunity requirements for household appliances, tools and similar apparatus. Limits and methods of measurement of immunity characteristics of sound and television broadcast receivers and associated equipment. Electromagnetic immunity of broadcast receivers and associated equipment. Information technology equipment – Immunity characteristics – Limits and methods of measurement Information technology equipment – Immunity characteristics – Limits and methods of measurement Approval and test specification – Medical electrical Equipment – General requirements for safety Collateral Standard: Electromagnetic compatibility – Requirements and tests. Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 2: Electrostatic discharge immunity test – Basic EMC Publication Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 3: Radiated, radio-frequency, electromagnetic field immunity test Page 3 of 9
EN 61000-4-4 1995 <i>L. B. Riley</i> EN 61000-4-5 1995 AS/NZS 61000.4.5 1999 EN 61000-4-6 1996 AS/NZS 61000.4.6 1999 EN 61000-4-8 1994 EN 61000-4-11 1994 ENV 61000-2-2 1993 <i>EU Product Family Standards</i> EN 50081-1 1992 EN 50081-2 1993 EN 50082-1 1992, 1998 EN 50082-2 1995 EN 61000-6-1 1997 EN 61000-6-2 1998 EN 50091-2 1996 EN 55024 1998 EN 55103-1 1997 EN 55103-2 1997 (A2LA Cert. No. 1627-01) Revised 02/21/02	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 4: Electrical fast transient/burst immunity test – Basic EMC publication (EMC) Part 4: Testing and measurement techniques. Section 5: Surge immunity test. Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 6: Immunity to conducted disturbances, induced by radio-frequency fields Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 8: Power frequency magnetic field immunity test. (EMC) Part 4: Testing and measurement techniques. Section 11: Voltage dips, short interruptions and voltage variations immunity tests. Electromagnetic compatibility (EMC). Part 2: Environment, Section 2: Compatibility levels for low-frequency conducted disturbances and signaling in public low-voltage power supply systems (IEC 1000-2-2:1990) Electromagnetic capability – Generic emission standard. Part 1: Residential, commercial and light industry. (I.S.) Electromagnetic compatibility – Generic emission standard. Part 2: Industrial environment Electromagnetic compatibility – Generic emission standard. Part 1: Residential, commercial and light industry Electromagnetic compatibility – Generic immunity Standard. Part 2: Industrial environment Electromagnetic Compatibility (EMC)- Part 6: Generic standards- Section 1: Immunity for residential, commercial and light-industrial environments Electromagnetic Compatibility (EMC)- Part 6: Generic standards- Section 2: Immunity for industrial environments Specification for Uninterruptible Power Systems (UPS). Part 2: EMC requirements Information technology equipment – Immunity Characteristics – Limits and methods of measurement. Electromagnetic Compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1: Emission Electromagnetic Compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control professional use. Part 2: Immunity Page 4 of 9	EN 61326 1998 EN 61547 1996 EN 50130-4 1996 EN 55104 1995 EN 50083-2 1995 EN 60601-1-2 1993 IEC 1800-3 1995 EN 60555 Part 2 1987 EN 60555 Part 3 1987 EN 61000-3-2 1995 AS/NZS 61000.3.2 1998 EN 61000-3-3 1995 AS/NZS 61000.3.3 1999 ETS 300 386-1 1994 ETS EN 300 386-2 1997, 1998 ETS 300 132-1 1996 ETS 300 132-2 1996 ETR 283 1997 (A2LA Cert. No. 1627-01) Revised 02/21/02	Electrical equipment for measurement, control and laboratory use – EMC requirements Equipment for general lighting purposes – EMC immunity requirements Alarm Systems. Part 4: Electromagnetic compatibility. Product family standard: Immunity requirements for components of fire, intruder and social alarm systems. Electromagnetic compatibility immunity – requirements for household appliances, tools and similar apparatus. Product family standard. Cabled distribution systems for television and sound signals. Part 2: Electromagnetic compatibility for equipment. Medical electrical equipment Part 1: general requirements for safety Section 2: Collateral standard: Electromagnetic compatibility – requirements and tests Adjustable speed electrical power drive systems. Part 3: EMC product standard including specific test methods. Disturbances in supply systems caused by household appliances and similar electrical equipment. Part 2: Harmonics Disturbances in supply systems caused by household appliances and similar electrical equipment. Part 3: Voltage fluctuations. Electromagnetic compatibility (EMC). Part 3: Limits Section 2: Limits for harmonic current emissions Electromagnetic compatibility (EMC). Part 3: Limits Section 2: Limitation of voltage fluctuations and flicker in low-voltage supply systems. Equipment Engineering (EE); Public telecommunication network equipment electromagnetic compatibility (EMC) requirements Part 1: Product family overview, compliance criteria and test levels Electromagnetic compatibility and radio spectrum matters (ERM); Telecommunication network equipment; Electromagnetic compatibility (EMC) requirements; Part 2: Product family standard. Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 1: Operated by alternating current (ac) derived from direct current (dc) sources Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 2: Operated by direct current (dc) Equipment Engineering (EE): Transient voltages at Interface A on telecommunications direct current (DC) power distributions. Page 5 of 9

EU radio standards (ETS) EN 300 385 v1.2.1 1998 (ETS) EN 300 220-1 v1.2.1 1997 (ETS) EN 300 220-2 v1.2.1 1997 (ETS) EN 300 330 v1.2.1 1998 ETS 300 328 1996 ETS EN 300 440 v1.2.1 1999 Canada Radio Standards Canadian GL-36 1995 Canadian RSS-119 1996 Canadian RSS-134 1996 Canadian RSS-210 Issue 3, Feb 5, 2000 RFS29 1998 FCC Standards 47 CFR FCC low power transmitters operating on frequencies below 1 GHz, emergency alert systems, unintentional radiators and ISM devices. 47 CFR FCC low power transmitters operating on frequencies above 1 GHz, with the exception of spread spectrum devices. (A2LA Cert. No. 1627-01) Revised 02/21/02	Electromagnetic compatibility and Radio spectrum matters (ERM); ElectroMagnetic Compatibility (EMC) standard for fixed radio links and ancillary equipment Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices; Technical characteristics and test methods for radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW; Part 1: Parameters intended for regulatory purposes Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices; Technical characteristics and test methods for radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW; Part 2: Supplementary parameters not intended for regulatory purposes Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices (SRD); Technical characteristics and test methods for radio equipment in the range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz Radio Equipment and Systems (RES); Wideband transmission systems; Technical characteristics and test conditions for data transmission equipment operating in the 2.4 GHz ISM band and using spread spectrum modulation techniques Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices; Technical characteristics and test methods for radio equipment to be used in the 1 GHz to 40 GHz frequency range Industry Canada – technical requirements for low power Devices in the 2400 – 2483.5 MHz band. Industry Canada – Land mobile and fixed radio transmitters and receivers, 27.41 to 960.0 MHz Industry Canada – 900 MHz narrowband personal communications services Industry Canada – Low power license-exempt radio communication devices Specification for Restricted Radiation Radio Apparatus (New Zealand) Scope A1 Scope A2	47 CFR FCC Unlicensed Personal Communications System (PCS) devices 47 CFR FCC Unlicensed National Information Infrastructure devices and low power transmitters using spread spectrum techniques. 47 CFR FCC Personal mobile Radio Services in the following FCC Rule Parts 22, 24, 25, 27. 47 CFR FCC General Mobile Radio Services in the following FCC Rule Parts 22, 74, 90, 95, 97. 47 CFR FCC Maritime and Aviation RadioServices in 47 CFR Parts 80 and 87 47 CFR FCC Microwave Radio Services in 47 CFR Parts 21, 74 and 101. FCC/OST MP-5 1986 GR-1089-CORE 1997, 1999 ANSI EMC Standards ANSI C63.4 1992, 1999 ANSI C63.5 1988 IEEE EMC Standards IEEE C62.41 1980 Swedish EMC Standards BAKOM 3336.3 1995 South African EMC standards other than CISPR equivalents SABS 1718-1: 1996 Japanese VCCI Standards VCCI V-3/99.05 1999 VCCI V-4/99.05 1999 Scope A3 Scope A4 Scope B1 Scope B2 Scope B3 Scope B4 FCC (Federal Communications Commission) methods of measurement of radio noise emissions from industrial, scientific and medical equipment. Bellcore electromagnetic compatibility and electrical safety – Generic criteria for network telecommunications equipment. American National Standard for methods of measurement of radio-noise emissions for low-voltage electrical and electronic equipment in the range of 9 kHz to 40GHz. American National Standard for electromagnetic compatibility – radiated emissions measurements in electromagnetic interference (EMI) control – calibration of antennas. IEEE recommended practice on surge voltages in low-voltage AC power circuits Electromagnetic compatibility and electrical safety (EMC & S) for wired terminal equipment. Harmonization documentation information over the OFCOM requirements. South African Bureau of Standards: Specification for Gaming equipment. Part 1: Casino equipment. Technical Requirements Instruction for Test Conditions for Requirement under test	
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Telecommunications

Telecommunications Registration; General test methods; Lightning surge; Drop testing; Balance testing; Signal power (metallic and longitudinal); Frequency measurements; Pulse templates; Leakage testing; Impedance testing; Hearing Aid Compatibility testing; Protocol analysis and Jitter testing.

<u>Telecom Standards</u>	Title	TBR 013 : 1996	Business TeleCommunications (BTC); 2 048 kbit/s digital structured leased lines (D2048S); Attachment requirements for terminal equipment interface
FCC 47 CFR Part 68 Telephone Terminal Equipment <i>Be. Noy</i>	Connection of terminal equipment to the telephone network. Analog and Digital Equipment. TCB Scope C1.	TBR 21 : 1998	Terminal Equipment (TE); Attachment requirements for pan-European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE (excluding TE supporting the voice telephony service) in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signaling
CS-03 Issue 8 1996 through amendment 3	Specification for terminal equipment, terminal systems, Network protection devices, connection arrangements and hearing aids compatibility. Bulletin Part 68 Rationale and Measurement Guidelines (Feb 1998)	TBR 24 : 1997	Business TeleCommunications (BTC); 34 Mbit/s digital unstructured and structured leased lines (D34U and D34S); Attachment requirements for terminal equipment interface
TIA/EIA TSB31-B 1998	Attachment requirements for terminal equipment to be connected to circuit switched data networks and leased circuits using a CCITT Recommendation X.21 interface, or at an interface physically, functionally and electrically compatible with CCITT Recommendation X.21 but operating at any data signalling rate up to, and including, 1 984 kbit/s	Australia TS 002 : 1997	
TBR 1 : 1995	Attachment requirements for Data Terminal Equipment (DTE) to connect to Packet Switched Public Data Networks (PSPDNs) for CCITT Recommendation X.25 interfaces at data signalling rates up to 1 920 kbit/s utilizing interfaces derived from CCITT Recommendations X.21 and X.21 bis	TS 016 : 1997	
TBR 2 : 1997	Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN basic access	TS 031 : 1997 TS 038 : 1997	
TBR 3 : 1995 + Amdt : 1997	Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN primary rate access	AS/ACIF S043.2:2001	
TBR 4 : 1995 + Amdt : 1997	Business TeleCommunications (BT); Open Network Provision (ONP) technical requirements; 2 048 kbit/s digital unstructured leased line (D2048U) Attachment requirements for terminal equipment		Analogue Interworking and Non interference Requirements for Customer Equipment Connected to the Public Switched Telephone Network General Requirements for Customer Equipment Connected to Hierarchical Digital Interfaces Requirements for ISDN Basic Access Interface Requirements for ISDN Primary Rate Access Interface Requirements for Customer Equipment for connection to a metallic loop interface of a Telecommunications Network – Part 2 Broadband
TBR 012 : 1993 + Amdt : 1996			
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Product Safety

General test methods; Input tests; Electric strength tests; Impulse tests; Permanency of marking tests; Accessibility tests; Energy Hazard measurements; Capacitor discharge tests; Humidity conditioning; Earthing tests; Limited power source measurements; Stability tests; Steel ball tests; Lithium Battery Reverse Current measurements; Leakage current tests; Transformer abnormal tests; Telecom leakage tests; Overvoltage/power cross tests.

Product Safety Standards	Title		
<i>Specific Product Safety Standards</i> IEC 950 1991 Includes Amendments 1, 2, 3 and 4 UL 1950 1996	Safety of information technology equipment including electrical business equipment. Safety of information technology equipment, including electrical business equipment.	UL 3111-1 1996 UL 3121-1 1995 IEC 60601-1 1995 EN 60601-1 UL 2601-1 1997 IEC 60065 1998, 2000 ANSI/UL 6500: 1998 CAN/CSA 60065-00 AS/NZS 3250 1995 AS/NZS 60065 2000	Electrical measuring and test equipment. Part 1: General requirements. Medical electrical equipment. Part 1: General requirements for safety. Medical electrical equipment Medical electrical equipment. Part 1: General Requirements for safety. Audio, video and similar electronic apparatus – Safety requirements Audio/video and musical instrument apparatus for Household, commercial and similar general use Australian/New Zealand Standard – Approval and test Specification – Mains operated electronic and related Equipment for household and similar general use Audio, video and similar electronic equipment. Consumer and commercial products Safety requirements for main operated electronic and related apparatus for household and similar general use.
CSA C22.2 No.950-95	Safety of Information Technology Equipment (UL 1950)		
UL 60950 2000 IEC 60950 2000 EN 60950 1997, 1998 IEC 60950-1 2001 AS/NZS 3260 1993	Safety of information technology equipment Safety of information technology equipment Safety of information technology equipment, including Electrical business equipment. Approval and test specification – Safety of information technology equipment including electrical business Equipment.	Canadian C22.2 No. 1-94 (1-98) 1994, 1998 EN 60065 1994 IEC 60825 1990 EN 60825-1 1994 IEC 60825-1 2001 IEC 60825-2 2000-5 IEC 60825-4 1997-11 IEC 60335-1 1995 (Including AM2 – 1997 & AM 12 – 1997) EN 60335-1 2001 UL 60335-1 1998 CAN/CSA E335-1 1994	Radiation safety of laser products, equipment Classification, requirements and user's guide Safety of laser products Part 1: equipment Classification, requirements and user's guide. Safety of laser products – Part 2: Safety of optical communication systems Safety of laser products – Part 4: Laser guards Safety of household and similar electrical appliances Part 1: General requirements
AS/NZS 3260 Supp 1 1996	Approval and test specification – Safety of information technology equipment including electrical business equipment – Alphabetical reference index to IEC 950 (Supplement to AS/NZS 3260:1993)		
ACA TS 001 1997	Australian Communications Authority – Safety requirements for customer equipment.		
UL 1459 1995 IEC 1010-1 1990 IEC 61010-1 1993	Telephone Equipment Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General requirements.		
EN 61010-1 1993 IEC 61010-1 2000	Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General requirements.		
UL 3101-1 1993 CAN/CSA 1010-1 1999 (Including AM 2)	Electrical equipment for laboratory use Part 1: General requirements.		

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