



Philips Consumer Electronics Company

MEASUREMENT TECHNICAL REPORT FOR

TEN-TECH, INC. 1185 Dolly Parton Pkwy. Sevierville, TN 37862 Attention: Mr. Gary Barbour

> MODEL SC150Y FCC ID: DJ7-150-2

March 26, 1999

This report concerns:

FCC Certification of a Class B Computer Peripheral

(ref. FCC Part 15, Subpart B) (ref. ANSI C63.4-1992)

This report was prepared by:

PHILIPS CONSUMER ELECTRONICS COMPANY

ONE PHILIPS DRIVE

P.O. BOX 14810.

KNOXVILLE, TN. 37914-1810

PCEC REPORT #90551-2 FCC ID: DJ7-150-2



Engineering Statement

All measurement data on the attached reports was taken pursuant to FCC Rules and Regulations (Part 15, Sub-part A., 15.31 (a) (6) - Digital Device Test Procedures) on the Philips Consumer Electronics Company site at Knoxville, Tennessee, which is recognized by the FCC. Although this data is taken under stringent laboratory conditions and to the best of our knowledge, represents accurate data, it must be recognized that emissions from this type equipment may be greatly affected by the final installation of the equipment. Therefore, Philips Consumer Electronics Company, while supporting the accuracy of the data in this report, takes no responsibility for use of equipment based on these tests. The manufacturer of this equipment must take full responsibility for any field problems which may arise, and agrees that Philips Consumer Electronics Company, in performing its functions in accordance with its objectives and purposes, does not assume or undertake to discharge any responsibility of the manufacturer to any other party or parties.

The measurement report was compiled and approved by:

Richard K. Moyers

Lead Business coordinator, EMI/EMC

Fred A. Fisher

Manager Regulatory FCC/DOC

SYSTEM TEST CONFIGURATION

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TEN-TEC proposes to market a computer interface only, to be installed in an already FCC approved product, Uniden SportCat scanning receiver model SC150Y, FCC ID AMWUB268A. With this submission, TEN-TEC is providing technical information, schematics and operating instructions only for the item we plan to manufacture, the computer interface. TEN-TEC does not have access to the technical information, schematics and operating instructions for the Uniden receivers which are already on file with the FCC as part of Uniden's original submission and subsequent grant.

In-order to determine compliance, the SC150Y was tested in (2) modes of operation:

Mode 1:

Stand alone (Scanner only)

Mode 2:

Computer Peripheral

Testing as a computer peripheral, was performed using the following:

TYPE	MFG.	MODEL	S/N	FCC ID
Computer:	HP	D4594B	US73708928	DTPC-01
Monitor:	Philips	CM1215 D101	LCA50820106	A3KMO55
Keyboard:	HP	SK-2502	M970645423	GYUR41SK
Mouse:	HP	M-S34	LCA50820106	DZL210472
Printer:	HP	C4582A	CN7AA1K030	B94C2164X
Modem:	Note no m	odem was utilized, as ti	hat the EUT was a Seri	al device

Testing as a stand alone device was performed utilizing the scanner's normal mode of operation. Measurements were performed using the lo, mid, and hi frequencies for all bands of operation; and included the fundamental frequencies and all harmonics.

Ten-Tec Modifications to Uniden SportCat SC150 Series Scanners

The modification made by Ten-Tec to the Uniden SportCat Series of scanners is intended to add a Personal Computer Interface without modifying or compromising the existing RF performance. This modification requires that an additional circuit board be placed into the scanner housing with solder connections made only for power and ground. A special, flexible conductive material on the add-in board makes additional connections to the existing keypad circuit board. No component or assembly of the existing scanner is modified in any way.

The new circuit board which Ten-Tec has designed for the SportCat scanner is intended to be placed between the existing rubberized keypad and keypad circuit board. A microprocessor on the add-in board has been designed to duplicate the action of pressing a key on the keypad. Output pins on the microprocessor are interfaced to row and column signals on the existing keypad. A host PC connected to the add-in board via a special cable can fully duplicate the keypad interface. This allows the host PC to program the scanner as if it had been programmed from the keypad. The ability of the host PC to control the scanner is limited to those features that are presently available on the keypad. It is impossible to affect performance or receiver limitations through keypad activity.

An additional feature of the add-in board is the ability of the microprocessor to detect the host PC connection at power-up. If a host PC is connected to the scanner when power is turned on, the onboard microprocessor will remain active until power is turned off. This allows the host PC to program the scanner memories via the interface cable. If, on the other hand, the microprocessor did not detect a host PC at power-up the microprocessor would turn off its onboard oscillator and enter an extremely low power mode. This process will help reduce any burden the add-in board would place on the scanner's power supply.

The Ten-Tec add-in board is inserted into the scanner by the following process.....

- 1) Fully disassemble the scanner, including removal of the keypad PCB and rubber keypad.
- 2) Place the Ten-Tec board on top of the existing keypad circuit board.
- 3) Using a soldering iron, connect ground and power from the existing keypad board to the Ten-Tec board.
- 4) Drill a hole and mount the 3.5-mm phone jack into the case.
- 5) Connect 2 wires from the Ten-Tec board to the mounted jack using a soldering iron.
- 6) Reassembly is the reverse of disassembly.

TEST PROCEDURE (ANSI C63.4 - 1992)

PCEC REPORT #90551-2 FCC ID: DJ7-150-2

ACRONYMS

(E.M.I.) Electromagnetic Interference (E.U.T.) Equipment Under Test (L.I.S.N.) Line Impedance Stabilizing Network

PROCEDURE-CONDUCTED LINE EMISSIONS

The EUT was placed in an un-lined screen room, 80 cm above the (2) 50/250 microhenry LISN's. The AC power leads were connected to two (2) 50/250 microhenry L.I.S.N.s. The system was energized and placed into its normal operating mode. The 50 ohm output of the L.I.S.N., was connected to the HP8566B RF Spectrum Analyzer. The spectrum was observed from 450 KHz to 30 MHz to identify the frequency of the emission that had the highest amplitude relative to the limit. For each mode of operation and for each current carring conductor, cable and/or wire manipulation was performed while observing the spectrum analyzer. For this series of tests the emission that had the highest amplitude relative to the limit was recorded.

Based on the preliminary tests, the EUT, and the cable and/or wire configuration and mode of operation which produced the highest emission relative to the limit was selected for the final AC powerline conducted emissions test. The final test on all current carrying conductors of the power cords that comprise the EUT was performed without variation of the configuration determined during the preliminary tests.

The X-Y plots of EMI generated by the E.U.T. were taken. The 6 highest readings from 450 KHz - 30 MHz for each side of the line are recorded. Unless otherwise specified, all Conducted Emissions are recorded as "PEAK" spectrum analyzer readings.

Equipment Used During Testing:

HP 8566B s/n: 6612 Spectrum Analyzer
HP 85650A s/n: 1001 Quasi-Peak Adapter
HP 85685A s/n: 0627 RF Pre-selector
Fisher 50/250uH s/n: 10 & 11 LISN

TEST PROCEDURES CONT'D

PROCEDURE-SPURIOUS RADIATION

The EUT was placed on a rotatable metal turntable mounted level with the metal ground plane of the 3 meter test site. The receiving antenna was connected to the 50 Ω input of the HP8566B spectrum analyzer. The EUT was powered by a 110 VAC supply, and was configured into it's normal operational mode.

The 30 to 40 MHZ band was observed on the spectrum analyzer while the EUT power and control leads were adjusted to maximize emissions. The peak frequencies for this band were recorded. This search for emissions continued from 40 MHZ up to the upper frequency required per FCC 15.33 (b) (1).

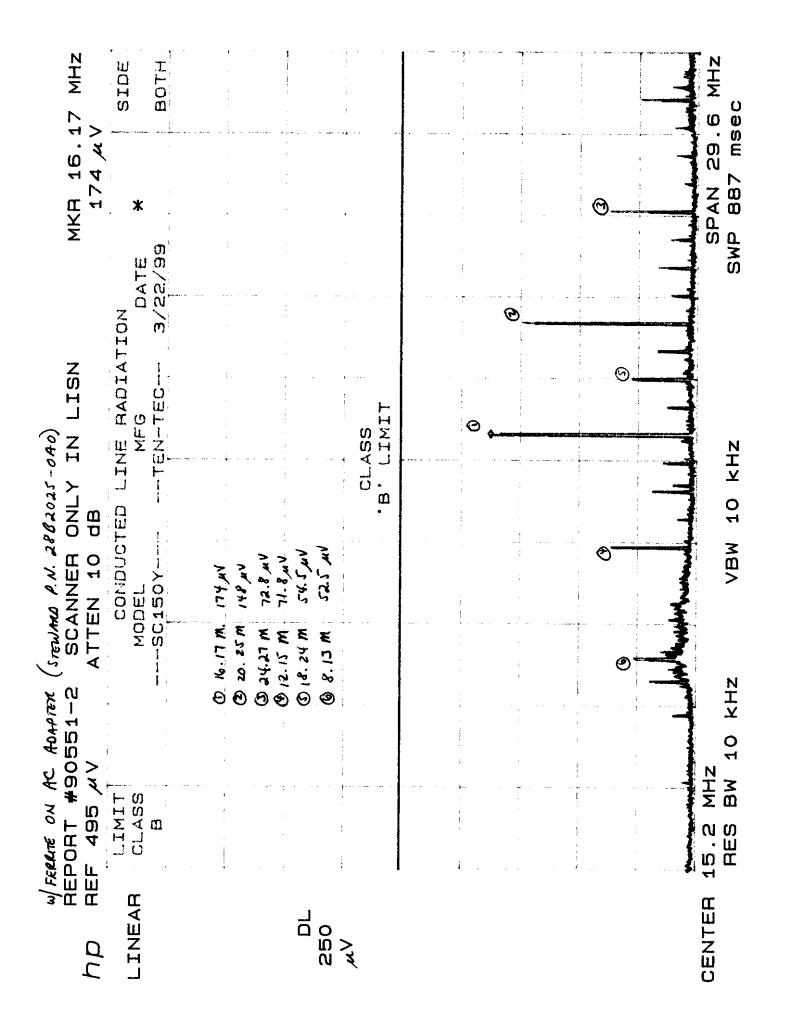
The receiving antennas were varied in height from 1 to 4 meters and the remote turntable was rotated 360° to find the maximum emissions. This test was performed for all modes of operation.

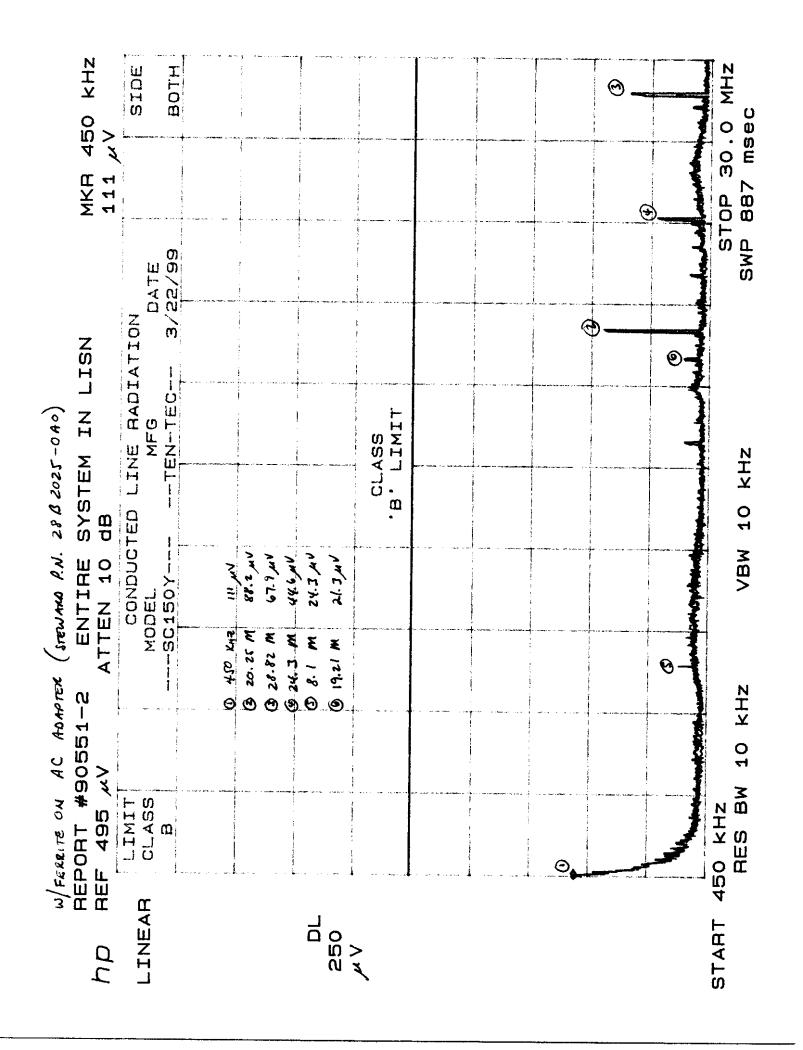
For all measured frequencies above 999MHZ the Conical Log Spiral antenna and/or the Double Ridged Guide Antenna was placed 3-meters away from the system on a 4-meter fiberglass mast. The receiving antenna was connected to an HP8566B spectrum analyzer via 100 ft. of 500hm Heliax (wave guide) cable.

All significant emissions are reported on the attached data report. To verify that the E.M.I. emissions measured were generated by the E.U.T., the system power was interrupted at peak reading while observing the Spectrum Analyzer. Unless otherwise specified, all Radiated Emissions are recorded as "PEAK" spectrum analyzer readings. The Radiated Field Strength was calculated as follows: Maximum Emission Received (dB) + Antenna Factor (dB) + Cable Loss (dB) = Field Strength dBuv/Meter.

Equipment Used During Testing:

HP 8566B	s/n: 6612	Spectrum Analyzer
HP 85650A	s/n: 1001	Quasi-Peak Adapter
HP 85685A	s/n: 0627	RF Pre-selector
EMCO 3110	s/n: 1679	Bicon Antenna
EMCO 3146	s/n: 1549	Log-Periodic Antenna
Eaton NM17/27A	s/n: 3355	Field Intensity Meter
Eaton NM 37/57A	s/n: 3356	Field Intensity Meter
Eaton CCA7	s/n: 3080	Quasi-Peak Adapter
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PHILIPS CONSUMER ELECTRONICS COMPANY EMI LAB

P.O. BOX 14810

KNOXVILLE, TENNESSEE 37914-1810 TEL:(423)-521-4720 FAX:(423)-521-4786

OPEN FIELD RADIATION MEASUREMENT FCC CLASS "B" LIMITS

REPORT #:

90551-2

MANUFACTURE:

Ten-Tec

MODEL#

SC150Y

DATE:

3/16/99

SUPPORT EQUIPMENT

DELTA REFERS TO THE dB DIFFERENCE BETWEEN THE HORIZONTAL OR VERTICAL READING AND THE dB LIMIT AT THAT FREQUENCY.

THE FOLLOWING ARE PEAK READINGS WITH CABLE AND ANTENNA FACTORS INCLUDED EXCEPT AS NOTED BY " \mathbf{QP} ".

"QP" = QUASI PEAK READING AT THAT FREQUENCY

SPECTRUM ANALYZER SETTINGS:

RBW: 100KHz VBW: 100KHz

TEST DISTANCE BETWEEN DEVICE UNDER TEST AND RECEIVING ANTENNA W/3-METER

NOTE!! "FAILURE" INDICATES THAT THE DEVICE EXCEEDS THE FCC CLASS "B" LIMIT AT THAT FREQUENCY

FREQ.	HORZ.	VERT.	H DELTA	V DELTA	LIMIT	FREQ.	
(MHz)	dBuV/m	dBuV/m	(dBuV)	(dBuV)	CLASS "B"		
29.69	33.64188	39.24188	-6.35812	-0.75812	40		
29.69	29.14188	34.94188	-10.8581	-5.05812	40		(QP)
35.36	32.28335	40.68335	-7.71 66 5	0.683347	40	FAILURE	(, ,
35.36	37.23335	37.48335	-2.76665	-2.51665	40		(QP)
42.23	24.08283	32.08283	-15.9172	-7.91717	40		(,
44.33	22.51569	30.91569	-17.4843	-9.08431	40		
57.31	41.27192	36.87192	1.271915	-3.12808	40	FAILURE	
57.31	37.37192		-2.62808	-7.12808	40		(QP)
141.17	27.32386		-16.1761	-13.6761	43.5		(')
143.24	26.73503	27.03503	-16.765	-16.465	43.5		
166.11	34.36608	30.46608	-9.13392	-13.0339	43.5		
188.81	34.6	19.8	-8.9	-23.7	43.5		
223.68		20.19748		-25.8025	46		
232.51	27.72523	25.42523	-18.2748	-20.5748	46		
240.02	27.74711	29.94711	-18.2529	-16.0529	46		
265.76	26.43882	27.63882	-19.5612	-18.3612	46		
282.33	28.22416	25.72416	-17.7758	-20.2758	46		
288.03	33.94892	30.44892	-12.0511	-15.5511	46		
298.97	27.42171	27.42171	-18.5783	-18.5783	46		
332.18	31.96138	31.46138	-14.0386	-14.5386	46		
336.13	30.40173	29.00173	-15.5983	-16.9983	46		
349.54	21.43401	31.53401	-24.566	-14.466	46		
365.38	30.96793	29.66793	-15.0321	-16.3321	46		

384.04	37.38998	33.88998	-8.61002	-12.11	46
386.58	29.79878	24.29878	-16.2012	-21.7012	46
391.58	38.80953	30.80953	-7.19047	-15.1905	46
431.87	35.77317	33.47317	-10.2268	-12.5268	46
441.05	37.53439	30.53439	-8.46561	-15. 4656	46
446.91	41.99974	32.59974	-4.00026	-13.4003	46
493.38	43.56014	43.96014	-2.43986	-2.03986	46
498.3	38.67063	38.17063	-7.32937	-7.82937	46
531.53	38.15412	41.65412	-7.84588	-4.34588	46
545.5	28.52526	27.62526	-17.4747	-18.3747	46
564.75	27.96715	30.76715	-18.0328	-15.2328	46
631.07	28.44196	30.74196	-17.558	-15.258	46
652.43	28.74081	27.84081	-17.2592	-18.1592	46
727.76	40.06631	41.16631	-5.93369	-4.83369	46
730.77	32.69584	32.19584	-13.3042	-13.8042	46
789.35	37.9441	36.6441	-8.0559	-9.3559	46
996.68	43.26862	44.46862	-2.73138	-1 53138	46

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RBW: 100 VBW: 100			<u> </u>						
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RBW: 1001 VBW: 1001 TEST DIST/ NOTE!! "FA FREQ. (MHz) 30	HORZ. dBuV/m AMBIENT	VERT. dBuV/m 23.64188	H DELTA (dBuV) NO DELTA	V DELTA (dBuV) -16.3581	LIMIT CLASS "B"	CLASS "B		THAT FREG	RUENCY
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RBW: 1001 VBW: 1001 TEST DIST/ NOTE!! "FA FREQ. (MHz) 30 58 87 116 145 174 30 58.7 88.05 117.4 146.75 176.1 30 59.4 89.1 118.8 148.5 178.2 39.85 79.7	HORZ. dBuV/m AMBIENT	VERT. dBuV/m 23.64188 AMBIENT	H DELTA (dBuV) NO DELTA	V DELTA (dBuV) -16.3581 NO DELTA	LIMIT CLASS "B" 40 40 43.5 43.5 43.5 40 40 43.5 43.5 43.5 40 40 43.5 43.5 40 40 40 43.5 43.5 40 40 40 43.5 43.5 40 40 40 40 43.5 43.5 40 40 40 40 40 40 40 40 40 40 40 40 40	CLASS "B		THAT FREG	RUENCY
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52	AMBIENT AMBIENT NO DELTANO DELTA	40				
104	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
156	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
208	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
260	AMBIENT AMBIENT NO DELTANO DELTA	46				
312	AMBIENT AMBIENT NO DELTANO DELTA	46				
54	AMBIENT AMBIENT NO DELTANO DELTA	40				
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324	AMBIENT AMBIENT NO DELTANO DELTA	46				
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324	AMBIENT AMBIENT NO DELTANO DELTA	46	-		<u> </u>	
432	AMBIENT AMBIENT NO DELTANO DELTA	46				
540	AMBIENT AMBIENT NO DELTANO DELTA	46				
648	AMBIENT AMBIENT NO DELTANO DELTA	46				
122.5	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
245	AMBIENT AMBIENT NO DELTANO DELTA	46				
367	AMBIENT AMBIENT NO DELTANO DELTA	46				
490	AMBIENT AMBIENT NO DELTANO DELTA	46				
612.5	AMBIENT AMBIENT NO DELTANO DELTA	46				-
735	AMBIENT AMBIENT NO DELTANO DELTA	46				
137	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
274	AMBIENT AMBIENT NO DELTANO DELTA	46				
411	AMBIENT AMBIENT NO DELTANO DELTA	46				
548	AMBIENT AMBIENT NO DELTANO DELTA	46				
685	AMBIENT AMBIENT NO DELTANO DELTA	46			***	
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140.5	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
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562	AMBIENT AMBIENT NO DELTANO DELTA	46				
702.5	AMBIENT AMBIENT NO DELTANO DELTA	46				
843	AMBIENT AMBIENT NO DELTANO DELTA	46				_
144	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
288	AMBIENT AMBIENT NO DELTANO DELTA	46				
432	AMBIENT AMBIENT NO DELTANO DELTA	46				
576	AMBIENT AMBIENT NO DELTANO DELTA	46				
720	AMBIENT AMBIENT NO DELTANO DELTA	46				
864	AMBIENT AMBIENT NO DELTANO DELTA	46				
146	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
292	AMBIENT AMBIENT NO DELTANO DELTA	46				

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730	AMBIENT NO DELTANO DELTA	46				
876	AMBIENT AMBIENT NO DELTANO DELTA	46				
148	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
296	AMBIENT AMBIENT NO DELTANO DELTA	46				
444	AMBIENT AMBIENT NO DELTANO DELTA	46				
592	AMBIENT AMBIENT NO DELTANO DELTA	46				
740	AMBIENT AMBIENT NO DELTANO DELTA	46				
888	AMBIENT AMBIENT NO DELTANO DELTA	46				
161	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
322	AMBIENT AMBIENT NO DELTANO DELTA	46				
483	AMBIENT AMBIENT NO DELTANO DELTA	46				
644	AMBIENT AMBIENT NO DELTANO DELTA	46				
805	AMBIENT AMBIENT NO DELTANO DELTA	46				
966	AMBIENT AMBIENT NO DELTANO DELTA	46				
174	AMBIENT AMBIENT NO DELTANO DELTA	43.5				
348	AMBIENT AMBIENT NO DELTANO DELTA	46				
522	AMBIENT AMBIENT NO DELTANO DELTA	46				
696	AMBIENT AMBIENT NO DELTANO DELTA	46				
870	AMBIENT AMBIENT NO DELTANO DELTA	46				
1044	AMBIENT AMBIENT NO DELTANO DELTA	46				
406	AMBIENT AMBIENT NO DELTANO DELTA	46				
812	AMBIENT AMBIENT NO DELTANO DELTA	46				
1218	AMBIENT AMBIENT NO DELTANO DELTA	46				-
1624	AMBIENT AMBIENT NO DELTANO DELTA	46				
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2436	AMBIENT AMBIENT NO DELTANO DELTA	46				
413	AMBIENT AMBIENT NO DELTANO DELTA	46				
826	AMBIENT AMBIENT NO DELTANO DELTA	46				
1239	AMBIENT AMBIENT NO DELTANO DELTA	46				
1652	AMBIENT AMBIENT NO DELTANO DELTA	46				
2065	AMBIENT AMBIENT NO DELTANO DELTA	46				
2478	AMBIENT AMBIENT NO DELTANO DELTA	46				
420	AMBIENT AMBIENT NO DELTANO DELTA	46				
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2100	AMBIENT AMBIENT NO DELTANO DELTA	46				
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435	AMBIENT AMBIENT NO DELTANO DELTA	46				
870	AMBIENT AMBIENT NO DELTANO DELTA	46				
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450	AMBIENT AMBIENT NO DELTANO DELTA	46				
900	AMBIENT AMBIENT NO DELTANO DELTA	46				
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491		AMBIENT NO DELTANO DELTA	46				
982		AMBIENT NO DELTANO DELTA	46				
1473		AMBIENT NO DELTANO DELTA	46				
1964		AMBIENT NO DELTANO DELTA	46				
2455		AMBIENT NO DELTANO DELTA	46				
2946		AMBIENT NO DELTANO DELTA	46				
512		AMBIENT NO DELTANO DELTA	46				
1024		AMBIENT NO DELTANO DELTA	46				
1536		AMBIENT NO DELTANO DELTA	46				
2048		AMBIENT NO DELTANO DELTA	46				
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881	AMBIENT	AMBIENT NO DELTANO DELTA	46				
1762		AMBIENT NO DELTANO DELTA	46				
2643		AMBIENT NO DELTANO DELTA	46				
3524		AMBIENT NO DELTANO DELTA	46				
4405	AMBIENT	AMBIENT NO DELTANO DELTA	46				
5286	AMBIENT	AMBIENT NO DELTANO DELTA	46				
956	AMBIENT	AMBIENT NO DELTANO DELTA	46				
1912	AMBIENT	AMBIENT NO DELTANO DELTA	46				
2868	AMBIENT	AMBIENT NO DELTANO DELTA	46				
3824		AMBIENT NO DELTANO DELTA	46				
4780		AMBIENT NO DELTANO DELTA	46				
5736	AMBIENT	AMBIENT NO DELTANO DELTA	46				
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SUMMARY OF RESULTS (ANSI C63.4 - 1992)

PCEC REPORT #90551-2 FCC ID: DJ7-150-2

The measurement data (Report #90551-2) indicates the Ten-Tec Inc. Model SC150Y. Scanning Receiver MEETS the requirements as set forth by the FCC for Class B Computer Peripherals with the following modifications.

MODIFICATIONS:

.01uF Capacitor added between pins 3 & 6 of PIC16C54B (See Schematic) Steward Ferrite Model 28B2025-0A0 added to AC Adapter (1 turn @ scanner connector).

Mass production of final instrument systems utilizing the exact electrical/ mechanical components, lead dress, and RF ground paths as tested by PCEC will not likely cause harmful interference to any radio communication, radio navigation or safety services. Any deviation in design from the system tested by our facility will require further verification of FCC Compliance by PCEC.

PHILIPS CONSUMER ELECTRONICS COMPANY

Fred A. Fisher

Manager Regulatory FCC/DOC