REV REVISIONS DESCRIPTION DATE APPROVED

1 SAJGRELTER CROSS CONTROL TO THE PROPERTY OF THE PRO

ENVIRONMENTAL TEST REPORT NO. CO24673-149

ENVIRONMENTAL EVALUATION OF VIDEO GAME A/N 5100

AUTHOR: G. D. ONGMAN

DATE: FEBRUARY 8, 1984

		DRAWN BY	DATE		-	Atari, Ir 0 E. Plumar 3an Jose, CA	ia Driv	
NEXT ASSY	CHECKED		AT	ARI*	Warner Communic			
NOTICE TO ALL PERSONS CONFIDENTIAL: Reproduction written permission of Atart Indrawing is only conditionally possession thereof confers or truse, the subject matter of the discontinuous confidence.	ENGINEER APPROVED		TITLE		 AL EVALUAT M/N 5100	'ION (OF	
drawing or any part thereof, ex for Atari Incorporated and for	nor any right to reproduce this scept for manufacture by vendon manufacture under the corpora to reproduce this drawing is	A Rug	graki	SIZE	DRAWING	024673-14	.9	REV
granted or the subject matter ment with or written permission	thereof unless by written agree	Kah	2/16/84	SCALE		SHEET 1	١ ٥	F 15

ABSTRACT

ENVIRONMENTAL TEST REPORT NO. C024673-149

AUTHOR: G. ONGMAN

DATE: FEBRUARY 8, 1984

TITLE: ENVIRONMENTAL EVALUATION OF VIDEO GAME M/N 5100

This report covers the environmental testing that was performed on the video game M/N 5100 preproduction units. These tests were performed to evaluate the unit's ability to withstand the conditions that may occur during shipment or in its normal service life.

The 5100 game was subjected to the following tests: 1. Thermal Mapping, 2. High Temperature, 3. Low Temperature, 4. Temperature Shock, 5. Temperature and Humidity, 6. Vibration, 7. Package Qualification, 8. Electrostatic Discharge and 9. Life.

There were two discrepant conditions noted during this test program. The first discrepancy was a unit failed the temperature and humidity test on the first attempt. The failure was attributed to poor workmanship in the construction of the specimens used for the test. The specimen was repaired and the test was repeated. The second discrepancy was it was noted that the specimen, which requires 9 VDC, uses the same power connector as several other Atari products, which require 9 VAC. When the 9 VAC power supply is connected to the 5100, the voltage regulators fail.

NOTE

This report contains Atari private data, and is for use only within the Atari technical community.

ENVIRONMENTAL TEST REPORT NO. C024673-149

ENVIRONMENTAL EVALUATION OF VIDEO GAME M/N 5100

DATE: FEBRUARY 8, 1984

1.0 INTRODUCTION

The environmental tests covered in this report were designed to simulate, under controlled laboratory conditions, the entire lifetime of the product. To accelerate this simulated life into a reasonable time period, the actual test conditions are probably more severe than most units will see in normal use.

The package qualification tests were performed at Package Analysis Laboratory, an independent test laboratory. The remaining tests were conducted by Atari environmental engineers at the Atari San Jose plant. It is the intent of this report to supply only a brief description of the tests. Supplemental details may be found in the test data included at the end of this report and in the "Environmental Engineering Manual" C061616 (rev. 1A).

2.0 TEST PROCEDURES

2.1 THERMAL MAPPING

A thermal mapping test is performed to determine if any component part of the specimen could cause or be affected by adverse thermal conditions.

The first portion of a thermal mapping test is a thermal survey of all components to identify any potential problems. For this portion of the test, a specimen is removed from its case for complete access to all components, and operated. Each component of the operating specimen was individually monitored with a temperature indicating device to determine if it was operating well within the manufacturer's specifications. All of the components operated at termperatures well below 45° C., so no further testing was deemed necessary.

2.2 HIGH TEMPERATURE

The high temperature test is a two part test. For the first portion of the test (60° C.) the specimen is nonoperating and is intended to simulate the storage conditions a unit may encounter during its normal service life. For the second portion of the test (45° C.) the specimen is operating and is intended to simulate the worst case conditions a unit is likely to be subjected to in normal service.

2.3 LOW TEMPERATURE

The low temperature test is also a two part test. For the first portion of the test (- 30 ° C.) the specimen is non-operating and is intended to simulate the storage conditions a unit may encounter in normal service. For the second portion of the test (10 degrees C), the specimen is operating and is intended to simulate the worst case conditions that a unit is likely to be subjected to in normal service life.

2.4 TEMPERATURE SHOCK

The temperature shock test is a nonoperating test which is performed to simulate the rapid transfer from one temperature extreme to another that often occurs during transportation.

2.5 TEMPERATURE AND HUMIDITY

The temperature and humidity test is an operating test performed to simulate the adverse climatic conditions that exist worldwide. The first time this test was performed on this product, the specimen stopped functioning. The test was terminated and the failure was analyzed. The test specimen itself operated normally but the power supply, which was not in the test chamber, had been shorted. A visual examination of the test specimen revealed that the flux had not been removed from the printed circuit board after the soldering process. It was believed that the flux had reacted with the high humidity to short out the power supply. The flux was cleaned from the specimen and the test was restarted. This time the specimen operated normally for the entire duration of the test.

2.6 VIBRATION

A vibration test is performed to simulate the abuse a product may receive during transportation or throughout a normal service life. The frequency range and levels used to perform this test cover the vibratory conditions common to transportation by land, sea, and air.

2.7 PACKAGE OUALIFICATION

The package qualification tests are performed to verify that the packing method used to ship the product will adequately protect that product. There are two package qualification tests, the transportation vibration and the package drop.

The test procedures used to perform these tests were in accordance with the specifications used by the National Safe Transit Association. For these tests the product is packed in its normal shipping configurations. In this case it meant that three units were combined into a single package.

The transportation vibration test is performed by placing the package on the table of a vibration machine, in one of its normal shipping positions, and slowly increasing the vibration frequency until the package decouples from the table by at least 0.060". The package is vibrated in this manner for about 30 minutes. The package is then rotated to another of its normal shipping positions and the above procedure is repeated.

The drop test is performed by placing the package on the table of the drop machine in one of the required orientations. The package is then allowed to freefall from a height of 30" and impact on a steel base. The above procedure is repeated with the package reoriented until it has been dropped in all ten of the required orientations.

2.8 ELECTROSTATIC DISCHARGE

An electrostatic discharge test is performed to simulate the conditions that would occur if an operator walked accross a carpeted floor and touched an operating product.

2.9 LIFE

The life test is performed to simulate the normal usage a consumer might expect from our product. Three specimens were placed in a temperature chamber and connected to a timer that cycled the power on and off. The ambient temperature within the chamber was increased to 39° C. The specimens were programmed to operate for 30 minutes followed by 15 minutes off. This power on/off cycling at elevated temperature was continued for one week. Due to the acceleration factors introduced by the elevated temperature and the power cycling this equates to about 3.5 years of normal consumer use.

3.0 CONCLUSIONS

The video game M/N 5100 proved to be mechanically and electrically rugged and to have wide margins in its design and construction. The fact the the 5100 will accept Atari power adapters that supply AC voltage could lead to 5100 damage. Adequate warning labels are to be positioned at power inlet of the 5100.

Date Staries	Specimen Descaration							
_								
1-31-84 Date Completed	Type of Test							
1-31-84 Engineer (signature)	Thermal Mapping							
223,0034 (0.5)								
Technician (31 guoture)	Test Specification							
•	i i							
J. L. Dugman, Specimen	EFM COLIGIC (Rev 14) Para. 321							
Speciment								
Unber	Remarks							
5 The specimen	was removed from its care and placed in as operating							
nede. Each	compount was individually nontered for Therenal							
1	No composer had an operating Temperature over							
1	No FURTHER TESTING was deemed Necessary.							
	· ·							
	Co24673-149 Sheet 6 of 15							
	CO24073-147 Sheet 0 O1 13							

.

Date Starte	:4	·, · · · · · · · · · · · · · · · · · ·	SPECIMEN DESCRIPTION
1-20	6-54	,	Type of Test
Date Comple	eTed		Type of Test
1.26	54		High Temperature
1.26 Engineer (5.	ig AlGTU !	(م ^چ	May & fac Tu Pe it
Technician (vi bricz		TEST SPECIFICATION
Technician (S	SiguaTu	رمع	Tear Specification
A Do Now-	v ar <i>ina</i> :	T. A. I	EEN Cobilete (Rev. 1+) Para 3.2.3 41
1	- 1	}	
Number T	1210	(°C)	X = 22 R H S
4 0	705	anh	START TO UPERATURE INCREASE
- 0	\$15		STORT STABILITATION
		60	
	<u> </u>		
1 1 1	1	I	STIRT 4 hers Couditive stg
		1.6	
	132		
; 1		!	START TEMPERATURE HECKEUSE
· •	300	:	57987 ST K. 1. 7.4710:
	365	t	
1		45	
1.	315	45	STORT I hour Conditioning
4 1	4,5	45	Specimen operate Connect - No discrepancies extend die To
		<u> </u>	This Test
:			
			
	<u> </u>		
		-	
		 	
			g024673-149 Sheet 7 of 15

-

DUTE STARTED	SPECIMEN DESCRIPTION
1.77-64	VI Game who see
Date Completed	Video Game 11/4 5101 Type of Test
1 22 CV	
Fuginese (SigNaTuRe)	Low Temperature MANOFACTURE
. S. An	
Techniciad (Signature)	Test Specification
_	
Operate Temp	EFA CCLIBIG (Rev 14) Papa. 3.2.3
·	
Comber Time (c)	Central Control Contro
4 0765 amb	START Temperative decrease
(330 3)	57627 Stable 247012
0835 -30	
084038	
0845 30	Start 4 Low Senditioning
0941 -38	
1043 36	
1345 37	START TEMPORETURE INCHES
i i	STAPT Scablization
1405 16	
1916 16	
	Sign. 1 hord Constraining
1455 10	
4 1515 16	Same, com to comelle - die discovere ving dested de To
	Thus Tree
,	
	- -
	<u> </u>
	0024672 140 Ghaal 0 of 15
	C024673-149 Sheet 8 of 15

Dare STAR	Tel			Specimen Description						
	1-30-84									
Date Comp	10-84 10-Tel			Video Game Mlu Sier						
1										
Englace (1 -31-84 1814 (519 NOTURE)			Temperature Sheek						
l										
Technician	1 h. King , was,			ATURI TEET SPECIFICATION						
Specimes	Ve freen	د مددم	CVA	EEM CO61616 (Rev. 14) Para. 3.2.3.4.3						
1	1		-/-							
Cember	Tine	(0)	Uc.	Remarks						
4	080c	-30_	1	START TEST						
	0900	-34	+							
	0900	60								
	1001	60	1							
	1000	-30	2							
;	1100	- 36								
	1160	1.5								
	17011	1.0	2							
	1200	-30	.3							
	1315	-30	<u> </u>							
'	1315	60	!							
4	1415	60	3	Specimen operates werenal - we discrepassive world						
				due to This Test						
	1	1								
	T									
			1							
	1		1							
	1		1							
	+-	1	1	C024673-149 Sheet 9 of 15						
	 	+	1							
	•	•								

.

Dare STO	RTed		Specin	NEW DESCRIPTION					
1-20-84 Date Completed			A Vid.	20 GO 112 11/N 5100					
Date Con	PleTed		Type	Pe of Test					
	Ø47		Ten	PERATURE AND HUMIDITY					
1-23 Engineze	(3.9.107	(ج4 ہ	Mauu	Fac Tu Pe i?					
15.1	Lea Assau		9700	·					
Technicia			1	Specification					
J 5.	Core now		EEA	n Cob1616 (Rev. 1A) Para. 3.2.4					
	Ĵ	Temp	humidity						
			(6/8 RH)	Remarks					
	0915		amb	Specimen to The Chamber and operating - START					
ì		21/2/17/		TEMPERATURE WEREASO (SPECIMEN #4)					
	09.50	45	50	STURT HUMINITY INCREASE					
	1015	45	90	STAIRT CONDITIONING					
1-20-86	1800	45	90						
1-21-84		45	90	·					
	0600	45	90						
Ī	1200	45	96						
1-21-89		45	90						
1-22-84	6000	45	90						
	0600	45	90						
	1200	45	90						
1-22-84	1800	45	90						
1-23-56	0000	4.5	90						
	0736	4.5	96	SPECIMEN SICT OPERATING					
	0.800	45	70	START TEMPERATURE & houndary decreases					
1-23-55	0830	anb	anh	and Specimen NOT OPERATING TEST TERMINATED					
	 								
			 						
	<u> </u>	<u> </u>	1	Note: A Post Test evalvation Revealed The					
	<u> </u>	1		Specimen was operative remail, but The					
	<u> </u>			private adapter (which was not in The					
	<u> </u>			chambers) was shorted out. A visual					
	<u> </u>		ļ	Example of the specimen should lange					
	<u> </u>			amounts of flux and The PCB The					
	1			PEB was cleaned and The Test was					
	<u> </u>			Restarted. C024673-149 Sheet 10 of 15					
				C024673-149 Sheet 10 01 13					
1			1						

Date Sia	RTej		Specim	EN DESCRIPTION
	_			
Date Com	7-84		Type	06 Test
	/ /c/Ca		İ	· · · · · · · · · · · · · · · · · · ·
្រុ <u>្</u> ក្រសួទសខ្លួន	1.54		Mayo	PERATURE AND HUMIDITY
•	_			
Technicia	<u> </u>	- 3-5	4TAR	Specification
Technicia	ا الله والد) (ا	נפאט		
1.3.1.	<u> </u>	1	EEA	n Cob1616 (Rev. 1A) PARA. 3.2.4
	J	TEMP	humidity	·
Date	Tine	(oc)	(HR 10)	Remarks
1-27-54				Specimen # 4 Pic The Chamber and operation - Spect
				TE APORATURE INSPERSO
	10.60	45	70	STORT Conditioning
	183c	45	90	
1-2 <u>7-89</u>			90	
1-28 84		45	76	
1	1230	4.5	20	
1-20-54		45	20	
u - 25 £9			76	
	0430		96	
	1631	4.5	90	
	16.30		90	
- 25 85			50	
1 - 3 - 5			98	
1 - 2 3 .		115	90	
	16.37			
<u> </u>	163c	45	76 70	
	22.30			
1.37.5		1	76	Specimen operator was of - Air discrepancies Noted dec
1-31-86	0930	18	90	1
				To This Test
	-		 	
	 	 		
		_		
				C024673-149 Sheet 11 of 15
			ĺ	1

' 4	<u>.</u>			
are staried				escriptia)
€1.f		\perp_{ν}	ارد له	GAME MIN 5160
Ted.		Type	04 70	Game MIN SICO
		\mid_{V}	ih Ra	TIA1)
g 44TVRE)	,	May	ofac Tu	₹ • ₹
bran		17	60	
19 JOTU RE		l.		
1 1.61 <u></u>		EE	M C	061616 (Rev 1A) Papa. 3,3.2.5,1 (Parts B4C)
				Cyclina
AXLS	START	STOP		Remarks
7		, ,	NO RE	chevalues aloted - Alo discrepanicies wited
				·
у	0811	0326	No Re	science Cored - No discrepancies Cored
				· -
Х	0904	5919	ALA RE	estimate veted - No discrepensions Nated
	<u> </u>		A)a	The Specimen was excled from 5 HZ - 166HZ-5H
	<u> </u>		<u> </u>	at 0.015" DA
<u> </u>		ļ!		
				Diwe II
	Time	Time	freq	
Axis	TIME START	STOP.	(HZ)	l
Axis 7	START 0748	STOP.	(HZ)	N'e discreparens vered
Axis	6748	5758	30	N'e discrepations Noved
Axis	6748	STOP.	30	l
# y	0748	5708 0758 8846	30 30	L'e discrepairers vered Un discrepaires vered
Axis	0748	5758	30 30	N'e discreparens Nered
# y	0748	5708 0758 8846	30 30	No discrepancies world
# y	0748	5708 0758 8846	30 30	No discrepancies Noved Vo discrepancies Noved Vo discrepancies Noved
# y	0748	5708 0758 8846	30 30	Note: No physical as favoring of discrepances were
# y	0748	5708 0758 8846	30 30	L'e discrepairers l'éred Un discrepairers Lored Vo discrepaires Noire
	AXIS	AXIS STAPT 7 0729	Spece SU Tred Type Superinge) AT That That AXIS START STOP AXIS START START STOP AXIS START STOP AXIS START START START STOP AXIS START START START ST	SPECIMEND D. SH. VIDEO TYPE OF TO VIDEO TYPE OF TO VIDEO THE START TEST STOP TO 129 0 144 NO RE X 0 704 0 919 No Re



500 LAURELWOOD ROAD, SUITE 5 SANTA CLARA, CALIFORNIA 95050 (408) 970-0606



Customer:	ATARI	ING		Date:	1-3/-	84	_
Producti	5100 G	AME 3	PACK	P. O.	No. V-5	9213 X R	EL. NO. I
Package C).o. <u>20 %</u>	×13/4×1	3 5/8 20	10 # S.W.		Temp. 67°	F.
Package D	Description	. 3 EA. 2	0 /2 × 12	3/4 × 4 1/2 "	O.P.F.		•
							-
			:				-
						······································	_
						<u></u>	-
							-
Vibration	1: 90°	ROTATION					~
	1	2	3	4	5	6	
Speed	220 CPM	195 CPM	`				
Time	33 MW.	37 MIN					
Drop Test							
Surface	Ref. No.	G's	Time	Drop He	eight: 3	<i>0"</i>	
SORNER	2-3-5))			
S. EDGE	2-3			6 -		~ ~ 2	
MED. ENGE	2-5			-		\prec	
L. EDGE	3-5				4	\rightarrow	
	4				4		
	2				\ /		
-	6			4		5	
	5						
	7					7	
<u> </u>	3				V	_	
Remarks:_	PASSE	D				·	
					C024673-14	Aneet 1	3 of 15
	• • •					//	
Witness: الم	1 D. Orginan		Sigr	ed: fhy	4 Low	<i>y</i> 7	

Date Starled 1-26 Date Comple	,	SPECIMEN DESCRIPTION					
1-26							
Data Canala	-84 -	Type of Test					
Dair Compile.	169						
1-26 Engineer (5:0	84	Electro Static Discharge					
Engineer (218	g AIGTURE)	May a tac , b tele					
Techniciau(Si	ومادا	ATAIR!					
Techniciau(Si	gwaTu Re)						
J. L. Brysi		FEM COBIELL (Rev IA) Para 341 (motitud)					
opecimed 1	Vernage						
Deschere C	Kesc)	Remarks					
45	15	No discrepancies nevel					
	20	ARCS WER All TOP VOUTS POWER SWITCH, Right CONTROLLER					
	-	COUNTER, RF CONNECTOR, AND POWER CONNECTOR - NO.					
		discreparcies deted					
		ARC To The Contrologo Coursed Juke on The School The					
		Specimes power was Torred off and have on To Reset					
		The program					
	.2.5	ages to The Role Seen have wille Sign RF Consection					
	7217	ARTS TO THE Right Seem have mille Soon AF Consectory					
		Private Courseror Top Neuts, and Power Switch we					
		discrepasone vora					
- ()-		ARC TO The lost Sound " Resut game					
7-3		ARC TO The CONTRIDER - RESULT SAME					
	· · · · · · · · · · · · · · · · · · ·						
		Note: The Jeystiens To be used with This product works					
	·	Cot available at The Time This Test was performed					
							
							
	·— ····						
		C024673-149 Sheet 14 of 15					

• .

•

	-54 Veted										
	1eTed			/							
		2-1-54 Date Completed			Type of Test						
2-8-	2-5-84 Engineer (signature)										
Fuerdeen (MANUFAC	TU # e ,?						
	-	_									
J. 1. Bu	D. Buzming Echalcian (Signoture)			Test Specification							
J. D. D.	ر وندرا و ما رسوا ا		T. 3	Verba	INSTRUCTIONS						
Speine			184170	Chekaliog							
Lonhor	10:00	ن بر	(OC)	(4)	Remarks						
1,2,93	Į.	i			Specimens stanted in perior cycling Terr at						
, ,					plevated Temperature The private sycle Courses						
					of 30 minutes power on followed by 15 minutes						
					Power off.						
	2-1-54	153c	39								
	2-2-54			.							
		11.30									
	2-2-54										
	2-3-54		i	L-"							
		1145									
	2-3 54										
	2-6-54		į.	2-							
1 1	2-6-84		i	<u></u>							
	2-7-81										
1											
-	2-7-84	[i								
	2.5.54	· ·	38								
1, 2, 9.3	7-8-84	1121	39	1							
				<u> </u>							
ļ											
		<u> </u>	 	ļ							
				-							
				ļ							
		<u> </u>									
					C024673-149 Sheet 15 of 15						