


REV	REVISIONS DESCRIPTION	DATE	APPROVED
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ENVIRONMENTAL TEST REPORT NO. C024673-161

ENVIRONMENTAL EVALUATION OF VIDEO GAME M/N 2100 (PAL B)

DATE: MARCH 8, 1984

ENGINEERING RELEASED

		DRAWN BY	DATE	 ATARI <small>© A Warner Communications Company</small>	Atari, Inc. 30 E. Plumeria Drive San Jose, CA 95134		
NEXT ASSY	USED ON	CHECKED			TITLE 2100 PAL B/G, Environmental Evaluation		
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				<i>D.D. Dymon 3-8-84</i>	A	C024673-161	
				APPROVED <i>[Signature]</i> Mar 8, 84	SCALE	SHEET 1 OF 11	
				APPROVED			
				<i>[Signature]</i> 3/8/84			

ABSTRACT

ENVIRONMENTAL TEST REPORT NO. CO24673-161

AUTHOR: G. ONGMAN

DATE: MARCH 8, 1984

TITLE: ENVIRONMENTAL EVALUATION OF VIDEO GAME M/N 2100 (PAL B)

This report covers the environmental testing that was performed on the 2100 (PAL B) video game preproduction units to evaluate its ability to withstand the conditions that may occur during shipment or in its normal service life.

The 2100 (PAL B) video game was subjected to the following tests: 1. thermal mapping 2. high temperature 3. low temperature 4. temperature shock 5. temperature & humidity 6. vibration 7. electrostatic discharge and 8. software regression. The 2100 (PAL I) was previously subjected to an environmental evaluation; reference report no. CO24673-129, which included a shock (impact) test. Due to the similarity between the 2100 (PAL I) and the 2100 (PAL B) this test wasn't repeated.

No physical or functional discrepancies were noted due to any of the tests that were performed. The 2100 (PAL B) appears to be physically and electrically rugged and to have wide safety margins in its design and construction.

NOTE

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

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1.0 INTRODUCTION

All of the tests covered by this report were conducted by Atari environmental engineering at the Atari San Jose plant. It is the intent of this report to provide only a synopsis of the test results. Supplemental details may be found in the test data included at the end of this report and in the Atari "Environmental Engineering Manual" C031316 (rev. 1A).

2.0 TEST PROCEDURES

2.1 THERMAL MAPPING

A thermal mapping test is performed to identify any component that could cause or be affected by adverse thermal conditions.

The first portion of the test is a thermal survey of all the components to establish which components, if any, require closer scrutiny. For this portion of the test all obstacles, such as the case and rf shield, are removed to permit direct access to every component. The specimen is then placed in an operating mode and each individual component is probed with a temperature indicating device to determine if it is operating well within the manufacturers specifications. The low temperatures measured on the 2100 (PAL B) indicate that no thermal problem exists. Based on this information no further investigation was deemed necessary.

2.2 HIGH TEMPERATURE

The high temperature test is designed to be a dual purpose test. The first portion of the test, 60 degrees Celsius, the specimen is nonoperating and is a measure of the unit's ability to survive storage under hot and dry conditions. The second portion of the test, 45 degrees Celsius, the specimen is operating and is an indication of the unit's ability to function in a warm environment.

2.3 LOW TEMPERATURE

The low temperature test is also designed to be a dual purpose test. The first portion of the test, -30 degrees Celsius, the specimen is nonoperating and is a demonstration of the unit's ability to withstand the rigors of storage at cold temperatures. The second portion of the test, 10 degrees Celsius, the specimen is operating and reveals the unit's ability to function in a cool environment.

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2.4 TEMPERATURE SHOCK

A temperature shock test is a nonoperating test performed to determine a unit's ability to survive storage under quickly changing thermal conditions. A secondary benefit from this test is the screening of poor workmanship. The rapid temperature excursions cause unequal expansion and contraction of dissimilar materials revealing problems such as cold solder joints.

2.5 TEMPERATURE AND HUMIDITY

The temperature and humidity test is an operating test performed to determine if a unit has the ability to function satisfactorily under the adverse climatic conditions found in various parts of the world. A secondary benefit from this test is the evaluation of the materials used to construct the unit. For example insulations that absorb moisture or metals that corrode become apparent very quickly.

2.6 VIBRATION

A vibration test is performed to determine if a specimen will still function after being subjected to the severe handling encountered during transportation and harsh consumer abuse. This test is also useful in the detection of mechanical design weaknesses and poor workmanship.

2.7 ELECTROSTATIC DISCHARGE

An electrostatic discharge test is performed to prove that a unit will still function after it is inadvertently exposed to a similar discharge by an operator.

2.8 SOFTWARE REGRESSION

Software regression is a subjective test. There is no exact method to evaluate all aspects of a unit's response to various games. Instead we must rely on the observations of a reliable person with experience in game play.

3.0 CONCLUSIONS

The video game M/N 2100 (PAL B) appears to be rugged mechanically and electrically. Game play and graphics aren't quite as good as the M/N 2800 but are adequate for the average consumers needs.

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Date Started	3-6-84	Specimen Description	Video Game w/0 2100 (Part B)
Date Completed	3-6-84	Type of Test	Low Temperature
Engineer (Signature)	H. D. Mungman	Manufacturer	ATARI
Technician (Signature)	H. D. Mungman	Test Specification	EEM C061616 (REV. 1A) Para. 3.2.3.4.2

Specimen Number	Time	Temp. (OC)	Remarks
2	0745	Amb	START TEMPERATURE DECREASE
	0800	-29	START STABILIZATION
	0805	-29	
	0810	-29	
	0815	-30	START CONDITIONING
	0908	-30	
	1044	-30	
	1200	-30	START TEMPERATURE INCREASE
	1245	8	START STABILIZATION
	1250	9	
	1255	10	
	1300	10	START CONDITIONING
2	1400	10	Specimen operates normally to end of the Test

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Date Started 3-1-84	Specimen Description Video Game m/u 2100 (PAL B)
Date Completed 3-1-84	Type of Test Temperature Shock
Engineer (Signature) A.D. Dugan	Manufacturer ATARI
Technician (Signature) A.D. Dugan	Test Specification EEM C061616 (REV. 1A) PARA. 3.2.3.4.3

Specimen Number	Time	Temp (°C)	Cycle NO	Remarks
1	0730	-30	1	START The Test
	0830	-30	1	
	0830	60	1	
	0930	60	1	
	0930	-30	2	
	1030	-30	1	
	1030	60	1	
	1130	60	2	
	1130	-30	3	
	1230	-30	1	
	1230	60	1	
1	1330	60	3	specimen OPERATES normally - end of The Test

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Date Started 3-1-84	Specimen Description Video Game M/N 2100 (PAL R)
Date Completed 3-5-84	Type of Test Temperature and Humidity
Engineer (Signature) A. J. Buchanan	Manufacturer Atari
Technician (Signature) A. J. Buchanan	Test Specification EEM C061616 (REV. 1A) Para. 3.2.4

Date	Time	Temp (°C)	Humidity (%RH)	Remarks
3-1-84	1030	Amb	Amb	Specimen # 2 in the chamber and operating - START Temp increase
	1100	45	33	START humidity increase
	1145	45	90	START CONDITIONING
3-1-84	1800	45	90	
3-2-84	0000	45	90	
	0600	45	90	
	1200	45	90	
3-2-84	1800	45	90	
3-3-84	0000	45	90	
	0600	45	90	
	1200	45	90	
3-3-84	1800	45	90	
3-4-84	0000	45	90	
	0600	45	90	
	1200	45	90	
3-4-84	1800	45	90	
3-5-84	0000	45	90	
	0600	45	90	
	1200	45	90	end of Test - specimen operates normal - START Temp and humidity decrease
3-5-84	1300	Amb	Amb	

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Sheet End II

DATE STARTED 2-29-84	SPECIMEN DESCRIPTION Video Game M/N 2100 (PAL 3)
DATE COMPLETED 2-29-84	TYPE OF TEST VIBRATION
ENGINEER (SIGNATURE) J. D. Dugan	MANUFACTURER ATARI
TECHNICIAN (SIGNATURE) J. D. Dugan	TEST SPECIFICATION EEM C061616 (REV 1A) Para. 3.3.2.5.1 (PARTS B+C)

Cycling

SPECIMEN NUMBER	AXIS	TIME START	TIME STOP	REMARKS
1	Z	0715	0730	No Resonance Noted - No discrepancies noted
1	Y	0737	0752	No Resonance Noted - No discrepancies noted
1	X	0755	0810	No Resonance Noted - No discrepancies noted

Dwell

SPECIMEN NUMBER	AXIS	TIME START	TIME STOP	FREQ (HZ)	REMARKS
1	X	0823	0835	30	No discrepancies noted
1	Y	0839	0849	30	No discrepancies noted
1	Z	0854	0904	30	No discrepancies noted

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DATE STARTED	SPECIMEN DESCRIPTION
3-7-84	Video Game M/N 2100 (PAL B)
DATE COMPLETED	TYPE OF TEST
3-7-84	ELECTROSTATIC DISCHARGE
ENGINEER (SIGNATURE)	MANUFACTURER
H. D. Dreyman	ATARI
TECHNICIAN (SIGNATURE)	TEST SPECIFICATION
H. D. Dreyman	EEM C061616 (REV. 1A) PARA 3.4.1 (MODIFIED)

Voltage
(KVDC)

REMARKS

15	ARCS NEAR POWER LIGHT, POWER PLUG, AND RF PLUG - NO DISCREPANCIES NOTED
20	ARCS NEAR POWER LIGHT, POWER PLUG, RF PLUG, RIGHT SIDE VENT, BACK TOP VENT (RIGHT SIDE), AND BOTH RIGHT SWITCHES - NO DISCREPANCIES NOTED
25	ARCS NEAR POWER LIGHT, POWER PLUG, RF PLUG, RIGHT SIDE VENT, BACK TOP VENT (RIGHT SIDE), AND ALL SWITCHES EXCEPT THE POWER SWITCH - NO DISCREPANCIES NOTED
	ARC ON THE RIGHT SCAN - UNIT CYCLES THROUGH GAME SELECTIONS BY ITSELF. POWER WAS REMOVED FROM THE SPECIMEN AND REAPPLIED AND THE UNIT RETURNED TO NORMAL OPERATION
	NOTE: SPECIMEN #2 WAS USED FOR THIS TEST. THE TEST PROBE USED CONTAINED A 1500 OHM RESISTOR AND A 100 PF CAPACITOR.
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2100 PAL B

SOFTWARE EVALUATION TEST

TECH: TERRY MUSTO

The following software was tested on the 2100 unit and evaluated for any bugs or flaws.

	GR.	SO.	CO.		GR.	SO.	CO.
DEFENDER - ● *	○	○	○	MOON PATROL ● Δ	○	○	○
SORCERER'S APPRENTICE ■ *	○	○	○	GALAXIAN ● Δ	●	○	○
OBELIX ● Δ	●	●	○	MARIO BROS. ● Δ	●	○	○
MS. PACMAN ● Δ	○	○	○	LASER BLAST ○ *	○	○	○
JUNGLE HUNT ● Δ	●	○	○	PAC-MAN ○ *	○	○	○
SOCCER ● Δ	●	○	○	DIG DUG ● Δ	○	○	○
PHOENIX ● Δ	○	○	○	MISSILE COMMAND ○ *	○	○	○
VANGUARD ● Δ	○	○	○				
VOLLEYBALL ● *	●	○	○	* NO PROBLEMS			
DONKEY KONG □ Δ	○	○	○	Δ COLOR/B/W SWITCH DOESN'T FUNCTION			
SPACE INVADERS ● *	○	○	○	○ ACTIVISION CARTRIDGE			
STAMPEDE ○ *	○	○	○	● ATARI CARTRIDGE			
ATLANTIS + Δ	○	○	○	+ IMAGIC CARTRIDGE			
KEYSTONE KAPERS ○ Δ	●	●	○	□ CBS CARTRIDGE			
JOUST ● Δ	○	○	○	■ WALT DISNEY CARTRIDGE			
PIGS IN SPACE ● Δ	○	○	○				
SNOOPY ● Δ	○	○	○	GRAPHICS - ○ ○ ●			
ASTERIX ● Δ	○	○	○	SOUND - ○ ○ ●			
				COLOR - ○ ○ ●			

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