

REV	REVISIONS DESCRIPTION	DATE	APPROVED
1A	ENG REL EPC LPA45D	5/3/84	YUN


ENVIRONMENTAL/RELIABILITY ENGINEERING

TEST REPORT

7800(3600) SYSTEM MTBF PREDICTIONS

MEMO 2/15/84

**ENGINEERING RELEASED**

		DRAWN BY	DATE	 <b>ATARI</b> <small>© A Warner Communications Company</small>	<b>Atari, Inc.</b> 30 E. Plumaria Drive San Jose, CA 95134		
NEXT ASSY	USED ON	CHECKED					
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		APPROVED	<i>S.F. Summers</i>	APPROVED	<i>5/2/84</i>		
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				DRAWING NO.	C024673-154		
				SCALE		REV	1A
				SHEET	1	OF	4

## ATARI INTEROFFICE MEMO

**RECEIVED**

FEB 25 1984

TO: D. SHAH  
FROM: GIL SEYMOUR *GS*  
SUBJECT: 7800 (3600) SYSTEM MTBF PREDICTIONS  
MEMO 2/15/84  
(C024673-154)

DATE: 2/17/84

DEVELOPMENT & ENGINEERING  
By: E. R. KUCZYNSKI

Appreciate your effort in identifying the 7800 system failure rate. However, I might suggest the following future considerations, such that various departments do not misuse or misinterpret your point estimate failure rate number:

1. Please communicate with design assurance to inquire if any predictions are in existence. (Reliability guidelines for the 3600, presently known as the 7800, have been in existence since 10/14/83. The 3600 guidelines indicates a system prediction in document number (C024673-102).
2. The predicted failure rate summarized is the console only, not the 7800 system. The baseline 7800 system would include the ~~power adaptor, game cartridge, switch box, controllers and the console.~~
3. The failure rate prediction identified in your 2/15/84 memo needs further clarification.
  - (a) Identify the original return rate goal for the 7800 (3600) system.
  - (b) Your assumptions need clarification:
    - Game play per day in hours
    - Warranty period
    - Power on/off cycling impact per day
    - Reliability model for the system
    - Basis of quality factors, (i.e. screening level assumed)
  - (c) LSI's & IC failure rates must be determined on the basis of number of device gates. One cannot use a "standard" LSI failure rate when device complexity varies 3:1 and new unproven LSI devices are used.
  - (d) Parts failure rates used need review. (i.e. source, assumptions and stress considerations)
  - (e) Missing a cost/benefit analysis which is one of the prime purposes of doing a prediction. (Ref. 5100 Console) C024673-132

- Identifying the principal high failure rate components by % contribution. Further, considering component burn-in screening and its impact on the failure rate.
  - Return rates under different screening conditions and associated warranty costs.
  - Impact of in house burn-in/repair cost for various burn-in levels.
4. A failure rate prediction without an integrated product test plan, reliability guidelines, field feedback and knowledge of design decisions will provide nothing to the reliability of the product.

cc: K. Ashton  
J. Gray  
G. Kuczynski  
R. Lewis

GS/jg

# Inter Office Memo



Home Computer Division

To: Distribution  
From: D. Shah, PRA *D. Shah*  
Subject: Atari '7800' System - MTBF Prediction Date: February 15, 1984 *Rev 152*

Attached is preliminary estimate of Atari '7800' system predicted failure rate and MTBF.

The calculations are based on Atari '7800' system - Rev 6, and Mil- HDBK-217D - Part Count Method.

The calculations assume that:

- 1) All infant mortality failures have been eliminated prior to shipment of the product (By system or component burn-in)
- 2) System operates in ground-benign environment with ambient temperature to 30°C.
- ~~3) The part applications are within their specifications~~
- 4)  $\pi_0$ -Quality factors used are considered adequate for commercial quality parts.
- 5) Failure rate data of custom LSI's are same as standard LSI's.

The predicted failure rate of system is:  $142.31 \times 10^{-6}$  failures/hrs  
The predicted MTBF of '7800' system is:  $\frac{1}{142.31 \times 10^{-6}}$  or  
7026.9 hours.

This MTBF implies about 1.5% failures out of the first 100 hours of life.

Any comments or suggestions will be appreciated.

DS:paw

cc: K. Ashton  
P. Comfort  
A. DeSchweinitz  
J. Gray  
R. Green  
E. Kuczynski  
R. Lewis  
L. McCracken  
B. Nakamoto  
G. Rubio  
\* G. Seymour *30*