

SUB./DATE: Minutes of Reliability Meeting of February 28, 1979 March 6, 1979

TO: Mattel

GTE

* A. Secor	* B. Asplund	* L. Holt
* C. Perry	* D. Aukerman	* J. Hunt
H. Cohen	* J. Ballotti	* J. Knopp
D. Bogart	S. Brouse	* V. Larka
<u>G. I.</u>	* L. Buries	* A. Serang
* K. Greenberg	* D. Christian	* S. Sisak
	E. Cillo	* R. Smith
	* F. Fedorko	H. Sprankle
	M. Fisher	A. van der Lek
	M. Frey	G. Weinfurther
* Attendees	G. Gopal	

I. Product Performance and Reliability Specifications

1. A 1% process average per chip results in a 92% yield for an 8 chip set which is not acceptable.
2. A .65% AQL not attainable by G.I. during startup.
3. A. Secor proposed the following:

	<u>Lot Sample QA</u>
a. Individual parts tested to parts spec on Century or equivalent (100% at G.I.)	1% AQL
b. Parts tested on IMI Tester using 7 known parts, 1 unknown at G.I.	1% AQL
c. Parts testing by GTE 1% AQL at incoming on IMI Tester	1% AQL
d. Random Chip Set Test to ___% AQL to be determined	
e. Kit selection of parts 1st 1000/5000 by G.I. Data available to all parties	100% Test
f. Ongoing kitting by G.I. to be in P.O. until 97% Kit yield is achieved	
g. G.I./Mattel find critical parts that affect Kit compatability.	

4. Product Reliability Program Presented by D. Christian

1. 5 units each (Logic Board Assembly and Power Supply Board Assembly) pre-test to determine maximum temperature and voltage units will withstand. Requires: IMI Cartridge (3/31) 4-5 days 4/6/79
2. Select maximum temperature plus 2 lower temperatures for testing 3 groups of 15 each and run to failure. 3 mo. total

Note: All failures to be repaired at least one time and returned to test.

3. Failure analysis on all component failures
 - a. G.I. perform failure analysis on G.I. Chips
 - b. GTE Sylvania will analyze all other failures.
4. Generate and issue Analysis Report July 1, 1979
 - a. Identify design problems. 2 weeks April 20, 1979
 - b. Identify component manufacturing process problems. April 20, 1979
 - c. Identify assembly manufacturing process problems. April 20, 1979
 - d. Estimate long term reliability July 1, 1979
 - e. Determine assembly manufacturing controls necessary for product reliability.
 1. Burn-in at system level May 20, 1979
 2. Component stress test May 20, 1979
 3. Inspection May 20, 1979
 4. Test units to come from the first 100 units of the 250 units to be produced in April.

II. Production Status and Plans

1. GTE will complete the remaining 16 units from the February pilot run and hold for Mattel.
2. New logic board artwork will be available by March 7, 1979.

3. Chip availability to GTE for 1st production run of 250 units will be as follows:
 - 100 sets March 30, 1979
 - 150 sets April 13, 1979
4. New target for F.C.C. submission is March 31, 1979.
5. Availability of G.I. Chip Tester now estimated at March 31, 1979.
6. No more system changes for first 250 units after March 7, 1979 Ref R except if required by:
 - a. Failure of F.C.C. samples
 - b. Operating failures
7. No fan motors and associated parts on first 250 units (including F.C.C. units) unless otherwise directed.
8. Allocation of first 250 units as follows:

5	- G.I.(w/O Chips) for F.C.C.	March 16, 1979
50	- Reliability analysis	April 13, 1979
5	- Program verification (Zehntel)	April 13, 1979
6	- Test fixtures and production standards	April 13, 1979
8	- IMI Tester	April 13, 1979
15	- G.I. with chips	April 13, 1979
	Balance - Mattel	April 20, 1979
9. The following program was developed for collection of Data during the first two months of production:
 - I. MID
 1. Meet and review inspection data weekly with CMO
 2. Chip - IMI
 - II. Program Test Data
 1. Lot traveler w/individual logic board unit recording all failure data from logic board tester.
 - a. Chip failures verified in IMI tester and retained with PCB Assembly for G.I. review.

Logic boards retained and data recorded by Serial No.

10. A. Secor requested information on testing plans and procedures.

III. Common Parts List

1. In CMO Computer
2. Issued weekly* (First issue March 9, 1979).
3. Maintenance report (weekly) (Revisions from previous week).
4. Specifications on Rev. Level on parts.

*Distribution

H. Cohen	K. Greenberg	CMO List
C. Perry	B. Asplund	
D. Bogart	J. Robertson	

IV. Material Status

John Ballotti presented the status of the remaining material shortages for the 1st 250 units as follows:

<u>Part No.</u>	<u>Item</u>	<u>Delivery Date</u>	<u>Problems</u>
Consigned	Chip Sets	100 - 3/31 150 - 4/13	
0099-1140	Modulator	3/5	
03-260966	Circuit Assembly	3/5	
	Plastics	3/7	Pieces from upper housing mold are warped
2609-9399	44 Pin Connector	3/2	
92-260968	Choke 10 μ Hz	Obsoleted	
92-260972	Choke 6.8 μ Hz	3/5	New item
Packaging	Material	Unknown	Specifications

Hot stamping of upper Housing being coordinated by Mattel. The Production Plan is to lease a machine from Metaframe and supply it to East Coast Molding so that the hot stamping can be done at the same location that the plastics are molded.

V. GTE presented Mattel with the documentation package per paragraph II of the Agreement. (Cover letter attached).

VI. Chokes

A. Secor requested that GTE hold procurement of RFC-SS-6.8 choke to a minimum until its use is verified on 3/30/79.

VII. Definition of R.F.Q. for GTE for 5,000 cartridges:

5,000 Cartridges

Quote by March 2, 1979

1. Include in shipment of first 5,000 Games

2. Material

a. Consigned

- 1 Top Shield
- 1 Bottom Shield
- 1 Housing
- 1 Access Panner
- 1 Football Label
- 2 Roms
- 2 Mylar Program Guides
- 1 Instruction Book
- 1 Box

b. Procure/Build

- 2 Screws
- 1 PCB
- 1 Cap Axial @ .500

Note: Mattel will provide two cartridges for standards.

VIII. Update on Design Changes

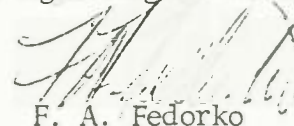
I. Logic Board

- 1. Elim 4 diodes IN 914
- 2. Elim $47\ \Omega$ 1/4 Watt 10% res
- 3. Add $100\ \Omega$ 1/4 Watt 10% res

II. Power Supply Board

- 1. Delete (2) .1 uf cap
- 2. Add 2 6.8 uf electrolytics

IX. Ab Serang addressed the group regarding the importance of keeping the information flow through contractual channels current and in parallel with the developments in engineering and operations.



F. A. Fedorko



S. R. Sisak

(HAND DELIVERED)

SYLVANIA

Electronic Products
and Services

Mr. A. Secor
Mattel Electronics Division
Mattel Incorporated
5150 Rosecrans Avenue
Hawthorne, CA 90250

February 28, 1979

Subject: GTE SYLVANIA/MATTEL PURCHASE AGREEMENT
DATED NOVEMBER 30, 1978

Dear Al:

As provided for in Paragraph 11 of the Agreement, please find enclosed the Mattel approved documentation package consisting of the components list and purchase specifications (including sources for procurement), including:

<u>DRAWING TITLE</u>	<u>DRAWING NO.</u>	<u>NO. OF SHEETS</u>
Heatsink	21-260907	2
Eyelet	31-260940	2
Flex Jumper 2"	54-260969	2
Capacitor Ceramic	64-260954	2
Capacitor Ceramic	64-260955	2
Capacitor Ceramic	64-260971	2
Capacitor, Electrolytic	67-260947	2
Capacitor, Electrolytic	67-260948	2
Capacitor, Electrolytic	67-260949	2
Capacitor, Electrolytic	67-260950	2
Capacitor, Tantalum	67-260951	2
Trimmer Capacitor	69-260952	2
7805C Voltage Regulator	73-260900	2
7812C Voltage Regulator	73-260901	2
7407 HEX Buffer	74-260912	2
74LS27 Triple 3 Input NOR	74-260913	2
74LS125 Quad Buffer	74-260914	2
256x8 RAM 3539 UCP	74-260911	3
74LS00 Quad 2 Input NAND	74-260941	2

Mr. A. Secor
Mattel Electronics Division
February 28, 1979
Page Two

<u>DRAWING TITLE</u>	<u>DRAWING NO.</u>	<u>NO. OF SHEETS</u>
Crystal	76-260915	2
1N4001 Rectifier Diode	80-260956	2
1N746A Zener Diode	80-260957	2
1N5241B Zener Diode	80-260958	2
1N914 Diode	80-260959	2
Potentiometer, Carbon Comp.	86-260908	3
I.C. Socket, 40 PIN DIP	89-260919	2
I.C. Socket, 18 PIN DIP	89-260920	2
I.C. Socket, 28 PIN DIP	89-260922	2
Connector - SIP Header 5 PIN	89-260970	2
RFC Coil	92-260937	2
RFC Coil	92-260938	2
2N3906 PNP Silicon Transistor	96-260960	2
2N3904 NPN Silicon Transistor	96-260961	2
Wire #22 AWG, 7/30 Stranded	98-260927	2
Wire, 26 AWG, 7/34 Stranded - Red	98-260946	2
Wire, 26 AWG, 7/34 Stranded - Black	98-260963	2

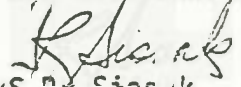
The missing component specifications and the scheduled dates for submission to Mattel are as follows:

1. 6.8 μ H Choke - 3/6/79
2. Resistors - 3/2/79
3. Channel Select Switch - 3/9/79
4. 5 PIN Rt. Angle Header - 3/9/79
5. FCC/Serial No. Label - 3/15/79

Your urgent review and written approval of this documentation package is requested.

Very truly yours,

GE SYLVANIA INCORPORATED


S. R. Szisak
General Marketing Manager

bcc: F. Fedorko
J. Roberts
R. Smith
R. Asplund
V. Larka
G. Gopal
S. Brouse
M. Fisher

March 6, 1979

Recording of telephone conversation with Fritz Fedorko of GTE.

The purpose of the telephone conversation was to review the meeting notes from our February 28th meeting and also to cover new and open items. The first set of items addresses the meeting notes.

1. Regarding Controllers--GI requested that Controllers be sent to support the logic boards which had been provided them by GTE. GTE has provided Mattel purchasing with a quote for the 50 boards under construction. That quote specified the number of hand-sets to be provided. GTE will proceed to build the 26 hand-sets requested by GI. However, if the purchase order does not cover these, it will be amended to add them. The action here is for Cliff Perry to review the latest purchase order for 50 units that Howard Cohen has supplied GTE. GTE is targeting for delivery of these hand-sets on March 13th.
2. Plastics for GI--GTE will look into sending 15 sets of plastics to GI as soon as possible. They believe they have plastics in-house and should be able to do that yet this week. The added quantities of plastics from Mattel are due in March 6th at GTE, with the exception of the upper housing. We owe GTE a date on shipment of the upper housing. The action here is for Cliff Perry to follow up with H & H on the status of those plastics.
3. As a correction to the notes in Part II of our February 28th meeting, Fritz Fedorko notes that the reliability testing will consist of destructive testing or limit testing on 5 units and then follow up testing of 3 groups of 15 each. (The remaining notes relate to new items which are still open and need to be resolved with GTE.)
4. Procurement of blower parts--The DC blower is still specified on the drawings. It is agreed that this DC blower is an unacceptable method of heat reduction and as a result, it will not be used on either the submission to FCC or on the permanent production units. Heat sinking techniques to the shield are currently being incorporated to take care of the temperature rise problem. As a result, the DC blower and all of the associated piece parts and tooling should be deleted from the bill of material. Cliff Perry should advise Sylvania of this decision. We will, however, maintain a capability of mounting and using blowers on an interim basis for the first 250 test units only. This is strictly a fall-back position, and it is not expected to be exercised.
5. There are still a significant number of unanswered questions in Sylvania's mind about packaging. They do not have the art work for either the individual carton of the master component, nor for the carton which holds six master units. It is requested that Visual Design provide us with dates of availability for the art work on these two items.
6. There is a question concerning the polyvynal sleeve which fits over the master component inside of the carton. The question is whether it

should be tubular or welded. Cliff Perry should work this out with the Sylvania buyer.

7. In caps for packaging the master component have been sampled by Sylvania supplier. These samples have been forwarded to Cliff Perry for review and approval. There is, however, another question which comes up relating to the proper packaging of the associated hardware along with the master component. If it is desired to contain any cabling switches or other auxiliary piece parts, then these should be incorporated at this time into the packaging of the master component. The current samples that have been sent to Mattel do not address the packaging of these auxiliary components. The action here is to have Cliff Perry summarize, in drawing or sketch form, what components are to be included in the packaging of the master component.
8. There is a series of questions that relate to the packaging of the master component as directed toward the design of the carton. Sylvania has suggested an alternate type of carton which may provide easier assembly and better utility with the consumer. It is requested that Cliff Perry and the cognizant individuals from Visual Design discuss these options with Sylvania and make appropriate decisions to resolve them. A schedule for problem resolution is important at this time.
9. Shielding--Due to the lengthy time for construction of hard tools for the shields, it is important that we start our efforts with Sylvania now. It is understood that revised shield drawings for the logic board are now available and should be forwarded to Sylvania immediately. I have requested that Sylvania contact their tooling suppliers and put them under contract immediately for these tools. The drawings that we provide them this week will be the basis for letting that tooling contract. However, they will retain the right to change these drawings as late as March 31st, pending the testing that Glen Dash performs for the FCC. It is requested that Larry Atkinson work with Cliff Perry and the GTE buyers to establish a timely start up for production of these shields. Interim to that time, we must identify the production capability required from soft tools. A decision to make these tools here on the west coast or at Sylvania needs to be made in the near term.
10. Status of the in-lays submitted by Sylvania--Sylvania has not received approval on the milar in-lays that were submitted to Howard Cohen and in turn given to Visual Design. Request that Cliff Perry meet with Shel Platt and transmit the necessary approvals to Sylvania.
11. Regarding the component changes necessary as a result of Glen Dash's testing of last week--I have instructed Sylvania to work directly with Ken Greenberg to finalize this latest set of changes on both the circuit board and components. These changes will then be transmitted from Sylvania to Mattel, such that we can approve them and make the necessary drawing changes.

AS:mc

cc: D. Bogart
D. Chandler ✓
H. Cohen
C. Perry
F. Fedorko (GTE)
K. Greenberg (GTE)

March 7, 1979

To: Howard Cohen

From: Al Secor

Subject: Attached TWX

The units noted in the referenced TWX are to be used for testing and internal consumption and are not part of the 250 units slated as preproduction or start up. As a result, we should issue a purchase order for them. The price seems reasonable to me. However, we do need to include the requirement for hand controllers to support the 30 units going to GI (need 26 sets of controllers.)

I am requesting that Cliff Perry construct a requisition calling these requirements out and forward it for appropriate signature for you to respond to.

Please contact me if you have additional questions.

A. Secor

AS:mc

cc: D. Bogart
D. Chandler ✓
F. Mernane
C. Perry

ATTENDING VTR

ALABAMA STATE

197 11 0

400 0014 1567 3305
210 12 425 376772
7103257168 INTELLECTUAL
INTELLECTUAL ELECTRONICS
A DIVISION OF INTELLECT
2150 ROSSDALE AVE.
MONTGOMERY, ALABAMA 36103

*Alan -
For your
info & action.
Howard*

RECEIVED
MAR - 6 1979
A. SECOR

ITEM: 104 107100 L. 00124. IN SECTION OF PURCHASING
RESPECTS QUANTITIES TO SUPPLY FIFTY (50) ASSEMBLIES
IN DIFFERENT STAGES OF COMPLETION

OUR RELATIONS DISCUSSIONS WE QUOTE A PRICE OF \$11,993.00 TO
SUPPLY FIFTY (50) PROTOTYPE ASSEMBLIES IN DIFFERENT STAGES OF
COMPLETION AS FOLLOWS:

QTY	STAGE OF COMPLETION	UNIT PRICE
2	RAW COMPONENTS AND P.C. BOARD**	\$1
10	LOGIC BOARD ASSY'S 1/3 SOCKET AND POWER SUPPLY BOARD ASSYS. 01	
10	LOGIC BOARD ASSY'S 1/0 SOCKET AND POWER SUPPLY BOARD ASSYS. 01	
10	COMPLETE INTEGRATED ASSYS. INTEL	
0	COMPLETE INTEGRATED ASSYS. 010**	

* P.C. BOARDS ARE NOT INCLUDED IN THIS PRICE SINCE THEY ARE
COVERED BY P.O.# 36013

** Price Five (5) assemblies to be used for stress testing to
determine life and will not be shipped.

Total unit quantity for the above P.O. is 30 units plus 20
units for stress testing.

Very respectfully,
[Signature]
[Title]

GTE Sylvania Incorporated
PO Box 360
Muncy PA 17756
717 546 3191

DAVE

SYLVANIA

**Electronic Products
and Services**

Mr. Denny Bogart
Mattel Electronics Division
Mattel Incorporated
5150 Rosecrans Avenue
Hawthorne, Calif. 90250

GTE

March 9, 1979

Dear Denny,

Attached please find two sheets listing drawings and/or information required for the Intellivision System.

Sheet 1 lists critical items for which we urgently need your action. Sheet 2 lists requirements which we classify non-critical but should be given immediate priority following the items listed on Sheet 1.

Your immediate attention to all of these items will be sincerely appreciated.

Very truly yours,

GTE SYLVANIA INCORPORATED


JOHN R. ROBERTSON
Sales Engineer

Attachments

JRR/nlr

DOCUMENTATION STATUS
CRITICAL ITEMS

DRAWING REV - COMMENTS -

0099-1160	A	NEED SEPIA PRINT (HAVE BLUE PRINT)
2609-0230	A	NEED REVISED PRINT SHOWING ENLARGED HOLES & DIMENSION CHANGES
2609-2059	C	NEED SEPIA PRINT (HAVE BLUEPRINT)
2609-2069	F	NEED SEPIA PRINT (HAVE BLUEPRINT)
2609-2139	A	NEED SEPIA PRINT (HAVE BLUE PRINT)
2609-2149	D	NEED SEPIA PRINT (HAVE BLUEPRINT)
2609-4159		NEED SEPIA PRINT
2609-9549	B	NEED SEPIA PRINT (HAVE BLUEPRINT)
2609-9579	-	NEED PINOUT DESIGNATION AT LOGIC BOARD
2609-9599	A	NEED SEPIA PRINT (HAVE BLUEPRINT)
2609-9629	A	NEED REVISED PRINT - CONNECTOR PRESENTLY SHOWN IN MIRROR IMAGE
2609-9649	-	GTE SYLVANIA HAS ALREADY ASSIGNED A PART NUMBER FOR THE 0.1 μ F CAPACITOR

DOCUMENTATION STATUS
NON-CRITICAL ITEMS

DRAWING	REV	COMMENTS
0405-0290	A	WHERE USED?
0405-0790	E	WHERE USED?
0405-9950	A	WHERE USED?
2609-0310	-	INSUFFICIENT INFORMATION FOR PURCHASING,
2609-0320	-	
2609-0330	-	
2609-0810	A	
2609-0930	-	
2609-0970	-	
2609-4159	-	
2609-2069	F	PLASTIC MAT'L SPEC AND/OR COLOR INCORRECT
2609-2079	A	
2609-2089	A	
2609-2129	B	
2609-2139	A	
2609-2149	D	
2609-6119		DOES MATTEL PLAN TO PREPARE DRAWINGS FOR THESE ASSEMBLIES?
2609-9059		
2609-9069		
2609-9089		
2609-9109		
2609-9119		
2609-9219		
2609-9519		
2609-9539		
2609-9991		
2609-9992		
2609-9993		
2610-9039		
2610-9389		
2610-9991		

Circuit Module Operations
GTE Sylvania Incorporated
PO Box 360
Muncy PA 17756
717 546 3191

SYLVANIA

**Electronic Products
and Services**

Mr. Howard L. Cohen,
Director of Purchasing
Mattel Electronics Division
Mattel Incorporated
5150 Rosecrans Avenue
Hawthorne, California 90250

GTE

March 12, 1979

Subject: INTELLIVISION PARTS LIST DATED 3/9/79

Reference: A. Secor Meeting Notes Dated March 2, 1979
Part II Paragraph 7

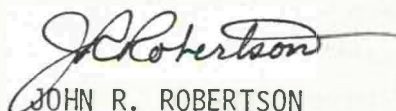
Dear Howard,

In accord with the referenced meeting notes relative to the joint meeting held at GTE Sylvania, Muncy, Pa., on February 28, 1979, attached please find the subject computerized listing.

Should you have any questions, please do not hesitate to contact me.

Very truly yours,

GTE SYLVANIA INCORPORATED



JOHN R. ROBERTSON
Sales Engineer

Attachment

JRR/nlr

cc/Attachments C Perry - Mattel
D. Bogart - Mattel
K. Greenberg - GI