COST ESTIMATE SUMMARY MTL-392-H

TOY NAME	INTRO SEASON	TOY YEAR	TOY NUMBER
PHONE MODEM		81	

TOY DESCRIPTION

GENERAL DATA	DATE	8/20/80	8/20/80	8/20/80	
	STATUS	FEAS	FEAS	FEAS	
	SOURCE	US-VENDOR	US-VENDOR	US-VENDOR	
	'A' PRICE	100.00	140.51	93.86	
	QUOTA	5M	5M	30M	
	SALES @ QUOTA	500.0	702.6	2815.8	
VARIABLE COSTS	SALES VAR. %/$	12.0 / 12,000	12.0 / 16,861	12.0 / 11,263	/
	ROYALTY %/$	— / —	— / —	— / —	/
	RETURNS %/$	5.0 / 5,550	5.0 / 7,798	5.0 / 5,209	/
	MFG. VAR. COSTS	46.817	46.817	46.817	
	FRT. & SHIPPING	.055	.055	.055	
	TOTAL VAR. COST	64.422	71.532	63.344	
PRODUCT CONTRIBUTION	PROD CONTR. %	35.6	49.1	32.5	
	PROD CONTR. $	35,578	68,978	30,516	
	CONTR. @ QUOTA	177.9	344.9	915.5	
MARKETING CONTRIBUTION	MFG. FIXED COSTS	— / —	— / —	— / —	/
	MKTG CONTR. %	35.6	49.1	32.5	
	CONTR. @ QUOTA	177.9	344.9	915.5	
DIRECT FIXED COSTS	R&D PROJECT COST	50.0	50.0	50.0	
	R&D NON-REPORTING	—	—	—	
	FREE ASSIST	—	—	—	
	TOOLING	105.2	105.2	105.2	
	NEW PROD. DEVP. COST	—	—	—	
	ADVERTISING	—	—	—	
	TOTAL FIXED	155.2	155.2	155.2	
NET CONTRIBUTION	NET CONTR. $	W/ADV / W.O. ADV 22.7	W/ADV / W.O. ADV 189.7	W/ADV / W.O. ADV 760,3	W/ADV / W.O. ADV
	NET CONTR. %	W/ADV / W.O. ADV 4,5	W/ADV / W.O. ADV 27.0 (T)	W/ADV / W.O. ADV 27.0 (T)	W/ADV / W.O. ADV

COST SHT. DISTRIBUTION			
MATH CHECK BY/DATE			
PREPARED BY/DATE	[illegible] 8/20/80	[illegible] 8/20/80	[illegible] 8/20/80
APPROVED BY/DATE			

MANUFACTURING SUMMARY MTL-434-L

TOY NAME	TOY NUMBER	PREPARED BY:	DATE
PHONE MODEM		TIM R NESBIT	8/20/

DOMESTIC COMPONENTS	MFG. SOURCE	MAT'L. $ EA.	LABOR $ EA.	TOTAL $ EA.	G & A/ PROFIT
INJECT MOLD	HFH	1.168			
ELECTRONICS		21.464			
5% CONT ON 9.400		.470			
10% CONT ON 25.348		2.535			
LABOR		—	11.368		
PACKAGE		.457			
SUBTOTAL		26.094			
VENDORS SCRAP @3%		.783			
VENDORS MAT'L HANDLING 10% (26.877)		2.688			
SUBTOTAL		29.565			
VENDORS G&A @9%		2.661			
SUBTOTAL		32.226			
VENDORS PROFIT @ 10%		3.223			
TOTAL		35.449			
PACKAGE					
LANDED COST ORIENT COMPONENTS					
SUB-TOTAL (PRIME COST)		A 35.449	11.368	46.817	C
SCRAP & NON STANDARD COST ____ %					

VAR. OVERHEAD	BASE	STD. HRS.	AMOUNT	FACTOR	$ EACH
	DOM PRIMARY HOURS				
	DOM ASSY. HOURS				
	DOM CUBE				
	NO. OF PARTS				

LINE TOOLING ____ M + ____ M — UNITS

PRIMARY LINE TOOLING ____ HRS X ____

MFG. COMPLEXITY ____ PTS X $ ____ M/PT ÷ ____ M—UNITS

VALUE ADDED/SOURCE OVERHEAD- ____ % X B

MANUFACTURING PROFIT 3.1% OF (A+B+C+D) ____

TOTAL MFG. COST (= MFG. VARIABLE + MFG. FIXED) 46.817 — 46.817

FREIGHT & SHIPPING ____ CU. FT. X ____ = ____ CTN/TOYS X ____ = .055

TOTAL HARD COST 46.872

ECONOMICS ____ %

TOOLING SUMMARY	COMMENTS	ITEM NO.	$ M
		10	65.2
	TEST		34.0
	GAGES & FIXTURES	90	

TOTAL HARD TOOLING		99.2
PRINT (ITEM 60)		6.0
CAPITAL	PRODUCT WT.	TOTAL TOOLING 105.2

COMPONENT COST WORKSHEET–LABOR MTL–911-D

PAGE ____ OF ____

TOY NAME: PHONE MODEM | R&D NO: -

PREPARED BY: TIM R NESBIT | DATE: 8/20/80 | TOY NO: -

COMPONENT DESCR →		ASS'Y				PACK OUT							
DEPT. OR C C	EFF.	STD. HRS.	ACT. HRS.	RATE	$/M	STD. HRS.	ACT. HRS.	RATE	$/M	STD. HRS.	ACT. HRS.	RATE	$/M
	85	4188	442.7	22.00	10840								
	85					15.0	24.0	22.00	528				
TOTAL LABOR					10840				528				

LABOR DETAIL

OPERATION DESCRIPTION	STD HRS/M
PCB SUB ASS'Y	
INSERT 140 COMP @ 2.0 HR/M EA	280.0
WAVE SOLDER	5.0
INSPECT 10%	28.8
TEST 10%	28.5
REWORK 10%	27.1
TEST	374.4
GENERAL ASS'Y	
TOTAL	44.4

LABOR DETAIL

OPERATION DESCRIPTION	STD HRS/M
PACK OUT	
TOTAL	15.0

RAW GOODS (INVENTORY) LISTING

PHONE MODEM

08/20/80
PAGE 1

REC	P/N	REV	DESCRIPTION	QTY	U/M	COST	STD. HRS	TOTAL	CODE
1	1		IC 74LS00	0	EA	$.200 .0000		$.000	0
2	2		IC 74LS85	0	EA	$.360 .0000		$.000	0
3	3		IC 74LS138	0	EA	$.390 .0000		$.000	0
4	4		IC CD4059AE DIV BY N COUNT	1	EA	$2.000 .0000		$2.000	0
5	5		OPEN	1	EA	$.000 .0000		$.000	10
6	6		IC MC6821	0	EA	$2.000 .0000		$.000	0
7	7		IC MC6850P ACIA	0	EA	$2.000 .0000		$.000	0
8	8		ROM 2316, 2K X 8	0	EA	$2.500 .0000		$.000	1
9	9		IC PROM 74S288, 32 X 8	0	EA	$1.050 .0000		$.000	0
10	10		IC XR2206CP TONE GENERATOR	1	EA	$2.250 .0000		$2.250	0
11	11		IC XR2211CP DEMODULATOR	1	EA	$2.600 .0000		$2.600	0
12	12		IC MC4741CP QUAD OP AMP	1	EA	$.500 .0000		$.500	0
13	13		RESISTORS, 1/4W 5%	30	EA	$.008 .0000		$.240	8
14	14		RESISTORS, 1/4W 1%	15	EA	$.012 .0000		$.180	8
15	15		CAP .01MFD 25VDC +-5%	6	EA	$.100 .0000		$.600	9
16	16		CAP .1MFD 25VDC CER DISC	10	EA	$.030 .0000		$.300	9
17	17		CAP 10MFD 25VDC ELECTRO	5	EA	$.050 .0000		$.250	9
18	18		TRIM POTS 5K LINEAR +-20%	5	EA	$.350 .0000		$1.750	8
19	19		CABLE HARNESS, MODEM-KEYBD	1	EA	$1.000 .0000		$1.000	10
20	20		AUDIO CONN + CABLE	0	EA	$.500 .0000		$.000	10
21	21		TELEPHONE CORD + CONN	0	EA	$.250 .0000		$.000	10
22	22		PCB 3X7 NO GOLD	1	EA	$2.520 .0000		$2.520	11
23	23		EDGE CONN	1	EA	$.860 .0000		$.860	10
24	24		ROCKER SWITCH 4PDT LAMP	1	EA	$.350 .0000		$.350	7
25	25		RELAY DPDT 1 AMP	1	EA	$1.000 .0000		$1.000	7
26	26		AUDIO TRANSFORMER 3 WINDING	1	EA	$1.600 .0000		$1.600	6
27	27		QUAD SWITCH CD4066BC	0	EA	$.800 .0000		$.000	7
28	28		QUAD OP AMP 741 TYPE	1	EA	$.650 .0000		$.650	3
29	29		DUAL OP AMP 741 TYPE	1	EA	$.600 .0000		$.600	3
30	30		ZENER DIODE	1	EA	$.500 .0000		$.500	8
31	31		SIG DIODE, 1N914 OR 1N4148	5	EA	$.050 .0000		$.250	5
32	32		RESISTORS 1/4W 5%	40	EA	$.008 .0000		$.320	10
33	33		RESISTORS 1/2W 5%	4	EA	$.015 .0000		$.060	8
34	34		CAP CER DISC 50V	5	EA	$.030 .0000		$.150	9
35	35		CAP ELECT 2.2MFD 100V	2	EA	$.035 .0000		$.070	9
36	36		CAP .01MFD 1400V	1	EA	$.060 .0000		$.060	9
37	37		TRANSISTOR NPN 2N2222	1	EA	$.050 .0000		$.050	4
38	38		INSTRUCTION BOOK	1	EA	$.090 .0000		$.090	10
39	39		INLAY ALUMINUM LABEL	1	EA	$.100 .0000		$.100	10
40	40		KRATON FEET	4	EA	$.008 .0000		$.032	10
41	41		SCREWS	8	EA	$.004 .0000		$.032	12
42	42		MISC PARTS	1	EA	$.500 .0000		$.500	10
43	43		UPPER HSG ABS	1	EA	$.584 .0000		$.584	13
44	44		LOWER HSG ABS	1	EA	$.584 .0000		$.584	13
45	45		MASTER CTN	1	EA	$.077 .0000		$.077	15
46	46		INDIV CTN	1	EA	$.180 .0000		$.180	15
47	47		LABEL 11.5 X 15.5	1	EA	$.100 .0000		$.100	15
48	48		BUBBLE PACK	1	EA	$.050 .0000		$.050	15
49	49		CONTINGENCY--PACKAGE	1	EA	$.050 .0000		$.050	15
50	50		5% CONT ON CHIPS	1	EA	$.729 .0000		$.729	19
51	51		10% CONT ON MAT'L	1	EA	$2.899 .0000		$2.899	19
52	52		LABOR	1	EA	$11.940 .0000		$11.940	18
53	53		VENDOR SCRAP AT 3%	1	EA	$1.465 .0000		$1.465	10
54	54		VENDOR MAT'L HANDL	1	EA	$5.028 .0000		$5.028	10
55	55		VENDOR G & A	1	EA	$4.978 .0000		$4.978	10
56			VENDOR PROFIT AT 10%	1	EA	$6.029 .0000		$6.029	10
57			FRT & SHIPPING	1	EA	$.055 .0000		$.055	23

56,212
34,748
21,464
FIXED →

TOTAL $56.212

Competitive Product
Modems

6/17/80
Scott Klymas

General Information	Atari Model 830	Radio Shack Interface II	Novations D-CAT	Universal Data Systems UDS 103 LP	Apple - D.C. Hays Micromodem II
1. Type:	Acoustic	Acoustic	Direct	Direct	Direct
2. Controls:	a) Full/Half/Test (Duplex)	a) Full/Half/Test (Duplex)	a) Data/Talk	a) Data/Talk	None
	b) Originate/Answer	b) Originate/Answer	b) Monitor In/Out	--	--
	c) On/Off	c) On/Off			
3. Indicators:	a) Power	a) Power	a) Power	a) Data On	None
	b) Ready	b) Ready	b) Ready	--	--
4. Size:	10.2" x 4.7" x 2.3"	10.2" x 4.7" x 2.3"	10" x 4.7" x 1.2"	--	5.5" x 3.25" x 1.375"
5. Weight:	1.5 lbs	1.5 lbs	--	--	--
6. List Price:	to be announced	$199.00	$199.00	$195.00	$199.95
Interface Module:	--	$ 99.00	--	--	$190.00
Expansion Module:	to be announced	$299.00	--	--	--

Competitive Product
Modems

6/17/80
Scott Klynas

Electrical Information	Atari Model 830	Radio Shack Interface II	Novations D-CAT	Universal Data Systems UDS 103 LP	Apple - D.C. Hays Micromodem II
1. Type:	Acoustic	Acoustic	Direct	Direct	Direct
2. Data Rate:	up to 300 Baud	up to 300 Baud	110 - 300 Baud	0 - 300 Baud	110 or 300 Baud
3. Compatibility:	Bell 103/113 series	Bell 103/113 series	Bell 100 series	Bell 103 series	Bell 103
4. Connector:	RS232C	RS232C	RS232C	RS232 and TTY	Special interface to Apple
5. Receive Sensitivity:	-45 dbm	-45 dbm	-45 dbm	-46 dbm	-50 dbm
6. Duplex:	Half/Full	Half/Full	Half/Full	Full	?
7. Originate/ Receive:	Both	Both	Both	Originate only	Both
8. Auto Answer:	No	No	No	No	Yes
9. Auto Call:	No	No	No	No	Yes
10. Power Supply:	24VAC/150mA Uses external transformer	24VAC/150mA Uses external transformer	117VAC/15W Uses external transformer	Uses phone line	Uses power supply from Apple

7/29/80
Scott Klynas

Modems

A modem is a device that allows a computer to communicate over the telephone lines. This gives the home computer access to thousands of prewritten programs and general information by telephoning a time-share service.

Types of Time-Share Services to be Available

A) General Data Processing:

Share the capabilities of a much larger computer.
Share special mathematical, business, or engineering programs.
Share entertainment programs (i.e. games).

B) Electronic Newspaper:

Use the home computer to display the latest news reports.

C) Banking Services:

From your home computer, you can make transactions with your checking and savings account.

D) Electronic Mail:

Send or receive messages or pictures.

E) Department Store Services:

Use the home computer to see sales merchandise and place purchase orders.

F) Entertainment:

Games, etc.

G) Public Library:

As time goes on, printed material will become available to the public.

H) Stock Market Reports:

Available as they happen.

I) Weather Report

J) Farm Report

7/29/80
Scott Klynas

Modem - Special Features

A) Auto Dial:

Use the home computer to store telephone numbers and dial the telephone. If the number is busy, the computer can be told to redial.

B) Auto Answer:

Use the Intellivision as an automatic telephone answering service. Messages could be stored on tape.

C) Security PROM:

This device would contain a built-in password for making transactions with a bank.

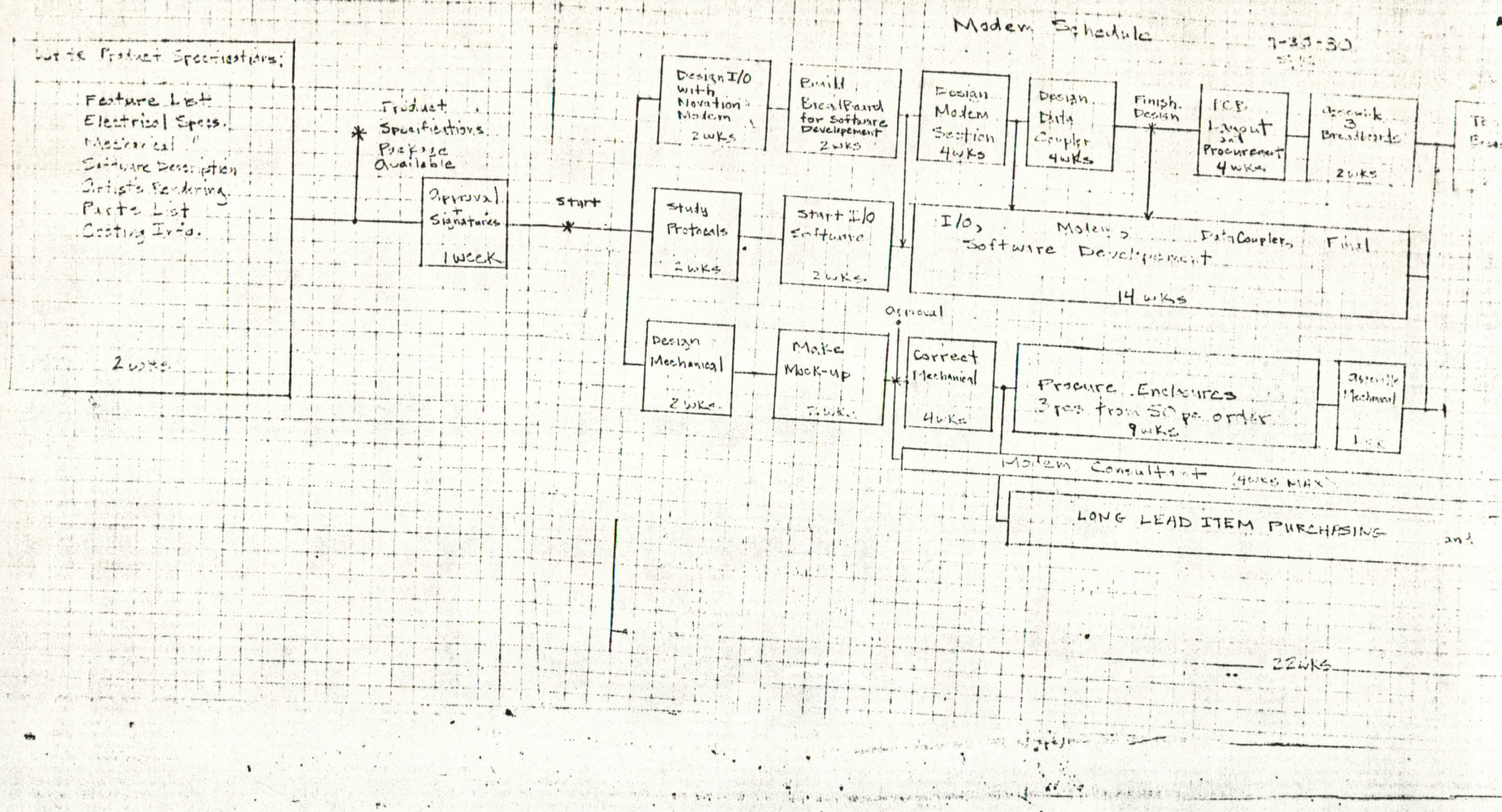
D) Direct Coupled to the Telephone:

This method is better than the standard "acoustic coupler" used in competitors products. Data can be transmitted with a lower error rate.

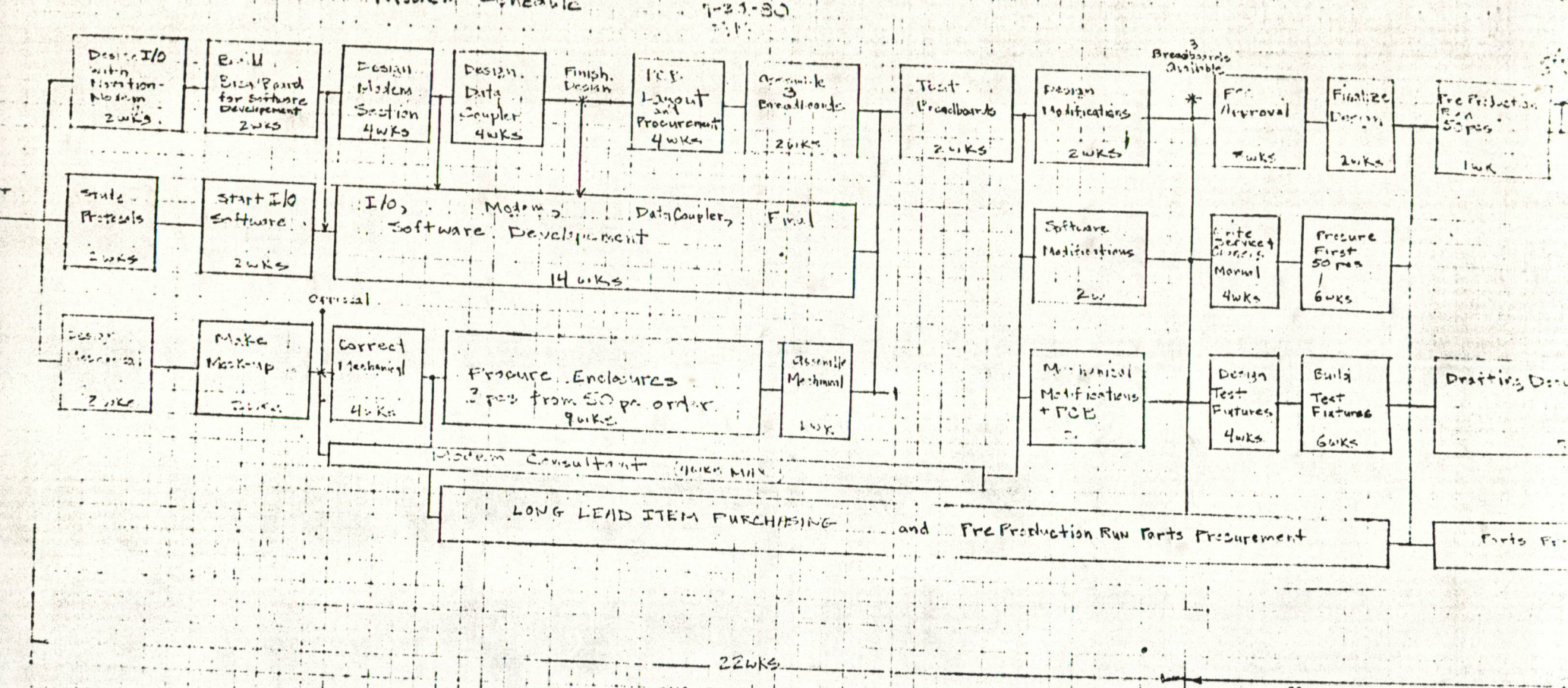
E) Directly Attached to the Keyboard Component:

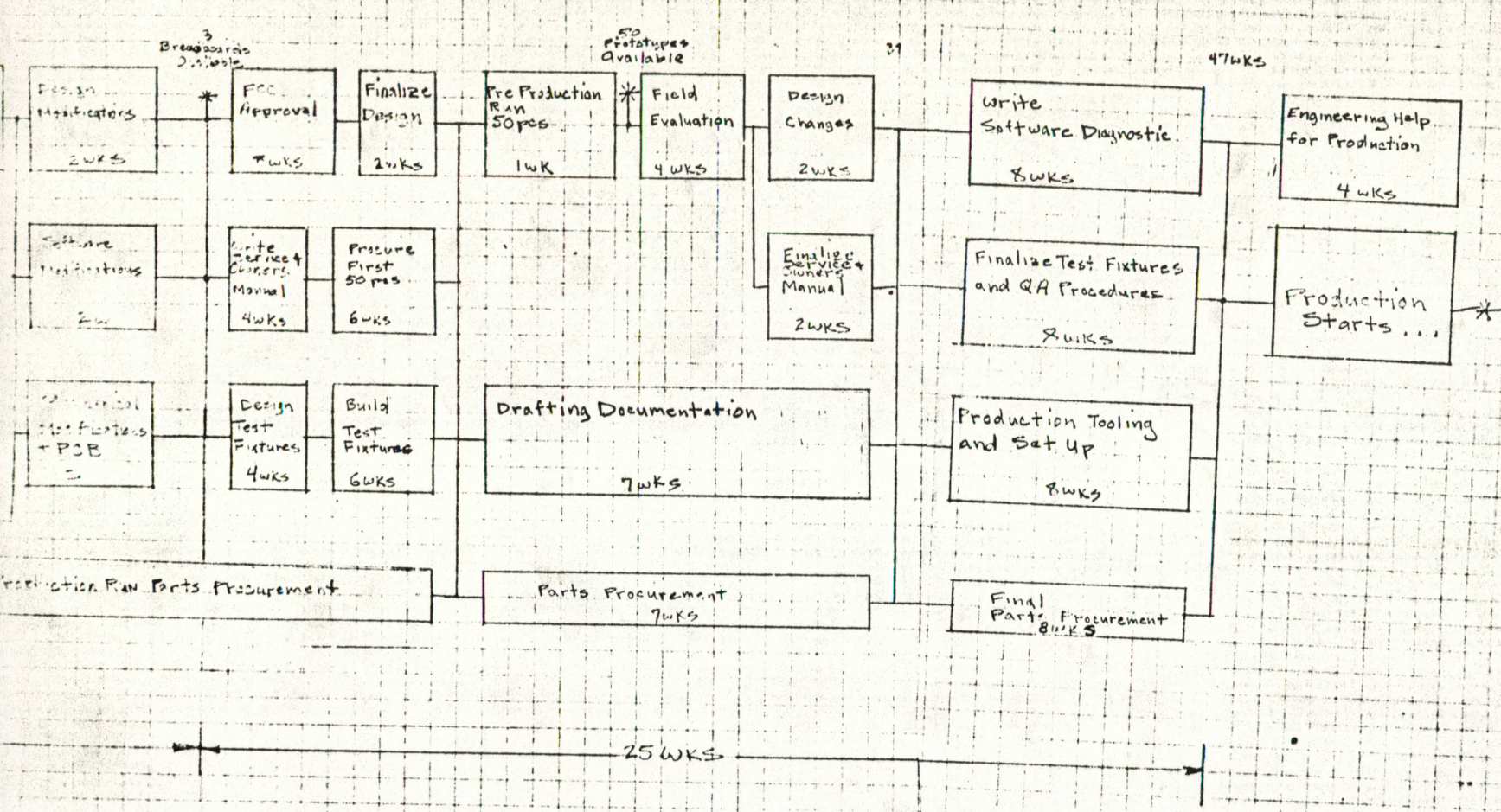
Most commercially available modems will not directly attach to the home computer. These types require the purchase of an interface module (up to $200.00).

The Intellivision modem will plug directly into the keyboard.


Modem Schedule
7-33-30
Write Product Specifications:
Feature List
Electrical Specs.
Mechanical "
Software Description
Artist's Rendering
Parts List
Costing Info.
2 wks
Product Specifications Package Available
Approval + Signatures
1 week
Start
Design I/O with Novation Modem
2 wks
Build Breadboard for Software Development
2 wks
Design Modem Section
4 wks
Design Data Coupler
4 wks
Finish Design
PCB 1 Input and Procurement
4 wks
Assemble 3 Breadboards
2 wks
Study Protocols
2 wks
Start I/O Software
2 wks
I/O, Modem, Data Coupler, Final Software Development
14 wks
Approval
Design Mechanical
2 wks
Make Mock-up
2 wks
Correct Mechanical
4 wks
Procure Enclosures 3 yes from SO pc. order
9 wks
Assemble Mechanical
1 wk
Modem Consultant (4 wks MAX)
LONG LEAD ITEM PURCHASING
22 wks

1-31-80


Design I/O with Narration-Modem 2 wks
Build Brd/Board for software Development 2 wks
Design Modem Section 4 wks
Design Data Coupler 4 wks
Finish Design
PCB Layout and Procurement 4 wks
Assemble 3 Breadboards 2 wks
Test Breadboards 2 wks
Design Modifications 2 wks
3 Breadboards Available
For Approval 4 wks
Finalize Design 2 wks
Pre Production Run 50 pcs 1 wk
State Protocols 2 wks
Start I/O Software 2 wks
I/O, Modems, Data Coupler, Final Software Development 14 wks
Software Modifications 2 w
Write Service Manual 4 wks
Procure First 50 pcs / 6 wks
Design Mechanical 2 wks
Make Mock-up 3 wks
Approval
Correct Mechanical 4 wks
Procure Enclosures & PCB from 50 pc. order 9 wks
Assemble Mechanical 1 wk
Mechanical Modifications + PCB
Design Test Fixtures 4 wks
Build Test Fixtures 6 wks
Drafting Dept
Modem Consultant (Quick Mix)
LONG LEAD ITEM PURCHASING and Pre Production Run Parts Procurement
Parts Pr
22 wks


3 Breadboards Delivered
50 Prototypes Available
39
47wks
Design Specifications 2wks
FCC Approval 7wks
Finalize Design 2wks
Pre Production Run 50pcs 1wk
Field Evaluation 4wks
Design Changes 2wks
Write Software Diagnostic 8wks
Engineering Help for Production 4wks
Software Specifications 2wks
Write Service & Owners Manual 4wks
Procure First 50 pcs 6wks
Finalize Service & Owners Manual 2wks
Finalize Test Fixtures and QA Procedures 8wks
Production Starts . . .
Design Test Fixtures 4wks
Build Test Fixtures 6wks
Drafting Documentation 7wks
Production Tooling and Set Up 8wks
Parts Procurement 7wks
Final Parts Procurement 8wks
25 WKS

Modems
Private Label Sources

6/16/80
Scott Klynas

1. NOVATION
   18664 Oxnard Street
   Tarzana, CA 91356
   (213) 996-5060

   Contact: Agi Nagy (Vice President, Administrations)

   Comments: This company makes modems for Atari, Radio Shack, and Apple. They also market modems under their own name. In 10K quantity their product would be roughly $75.00 to $100.00.

2. UNIVERSAL DATA SYSTEMS
   5000 Bradford Drive
   Huntsville, AL 35804
   (205) 837-8100
   (714) 972-4619

   Contact: A. Rich Woolard (District Sales Engineer)

   Comments: While they market modems under their own name, they claim 60% of their business is private label. In 10K quantity their product would be approximately $90.00 to $110.00.

3. PRENTICE CORPORATION
   266 Caspian Drive
   Sunnyvale, CA 94086
   (408) 734-9810

   Contact: Perry Lindburg (Vice President, Marketing)

   Comments: They have private label also.

Other Potential Private Label Sources (not contacted):

4. RACAL-MILGO, INC.
   8600 N.W. 41st Street
   Miami, FL 33166
   (305) 592-8600

5. GENERAL DATACOM INDUSTRIES
   One Kennedy Avenue
   Danburg, CT 06810
   (203) 797-0711

Modem
Integrated Circuits & Accessories

6/13/80
Scott Klynas

1. Question: Do you make IC Modems?

2. Question: Do you make Modem Filters?

Question One	Question Two	Company	Comments
No	No	National Semiconductors	
No	No	Fairchild	
No	No	Signetics	
No	No	Texas Instruments	
-	-	Intel	No Response
No	Yes	Reticon	They make CCD filters.
Yes	No	EXAR	They make modulator/demodulators
No	Yes	CTS	
Yes	Yes	Motorola	They are developing a CCD filter.
Yes	-	Rockwell	They only make 2400 baud modems.
No	Yes	Spraque	They make laser trimmed filters
Yes	Yes	Advanced Micro Devices	They are making a 1 chip modem that includes all digital filtering. Available in 1982.

8-20-80
S.K.

Modem Size Estimate

Data Coupler	24.6 sq"
Modem Section	22.1 sq"
Address Decoder	5 sq"
Interface (Counter, PIA, ACIA...)	10 sq"
ROMs	4 sq"
Chassis space	10 sq"
Total	75.7 sq"

7-24-80
S. Klyne

Modem System Layout