REV	REVISIONS DESCRIPTION	DATE	APPROVED
1A	ENG REL PER ERC E0204Q	4/11/84	JJ

DESIGN ASSURANCE

1450XLD(TONG)

DESIGN VALIDATION TEST PLAN (A)

ENGINEERING RELEASED

	1450XLD
NEXT ASSY	USED ON

DRAWN BY DATE

ENGINEER

ENGINEER 4-6-84
D. D. Ongman

APPROVED April 6, 1984

APPROVED

ATARI®

Atari

San Jose, CA

A Warner Communications Company

TITLE

1450XLD(TONG) TEST PLAN

SIZE	DRAWING NO.	REV
A	C024673-166	1A
SCALE	SHEET 1 OF 13	

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1.0 PURPOSE

The "A" test plan, design validation tests, task is to define the prototype tests to be conducted and provide capability for verifying conformance to the 1450XLD product specification.

2.0 SCOPE

This test plan shall apply to all lab and production prototype 1450XLD computers being submitted for test.

3.0 REFERENCES

1. CO61908 - ATARI 1450XLD Product Specification.
2. CO61616 - ATARI Environmental Engineering Manual.
3. CO21703 - ESD Product Level.
4. CO62297 - 1450XLD Power Supply.

4.0 ENVIRONMENTAL TESTS

All tests will comply with the Environmental Engineering Manual CO61616 and FCC part 68 environmental requirements.

1. Storage Mode (non-operating).

   Temperature and humidity per FCC part 68.302 Environmental requirements.

2. Operating Mode.

   Temperature and humidity per ATARI Environmental Engineering Manual CO61616.

3. Humidity.

   In addition to the humidity tests in 1 and 2, perform the standard 96 hours operating test per ATARI Environmental Engineering Manual CO61616.

4. Unpackaged mechanical shock and vibration per ATARI Environmental Engineering Manual CO61616.

5. Packaged mechanical shock and vibration per FCC part 68.302 environmental requirements.

6. EMI

The 1450XLD will meet with any compliances that are required. These will include the following: UL 114 and 94HB, CSA C22.2 No. 154, FCC Docket 20780, Part 15, Subpart J, Class B and Part 68.

7. ESD

The 1450XLD will be subjected to the following electrostatic discharge test: External surfaces are subjected to at least 50 discharges up to 25KV from a 100pf capacitor through a 1,500 ohm resistance. No physical damage to the 1450XLD is allowed. (ESD sensitivity specification/product level, CO21703.)

8. Acoustic Noise.

Per ATARI Environmental Engineering Manual CO61616.

5.0 FUNCTIONAL TESTING AND DESIGN VALIDATION

1. Test and verify the following:

a) Power supply will be verified to comply with the functional specifications and the following:

AC input range and DC power supply output for compliance.

- o Input voltage range of 100 - 129VAC @ 60Hz
- o +5VDC (Vcc) ± 5% @ 4.0 Amps (max.)
- o -5VDC (Vbb) ± 5% @ 300MA (max.)
- o +12VDC (Vdd) ± 5% @ 1.5 Amp
  Under normal operation and 2.2 Amp peak for 500 msec. max. @ 6 pulses per hour.

b) Peripheral Compatibility

Complete hardware regression (downward compatible) testing will be done with all existing and new peripheral products to determine conformance to functional specifications. (See hardware regression matrix.)

c) Thermal Mapping

Monitor, for conformance to specifications, critical IC's, including linear devices, passive components, etc.

d) Serial I/O

Verify all pinouts as to conformance to functional specification requirements.

e) Parallel Port

- o Exercise unit with a modified SALT cartridge to verify conformance.
- o Verify all pinouts as to conformance to functional specification requirement.
- o AC characteristics - The worst case timing requirements for the parallel bus interface (PBI) are shown in figure 1, 2 and Table 1.

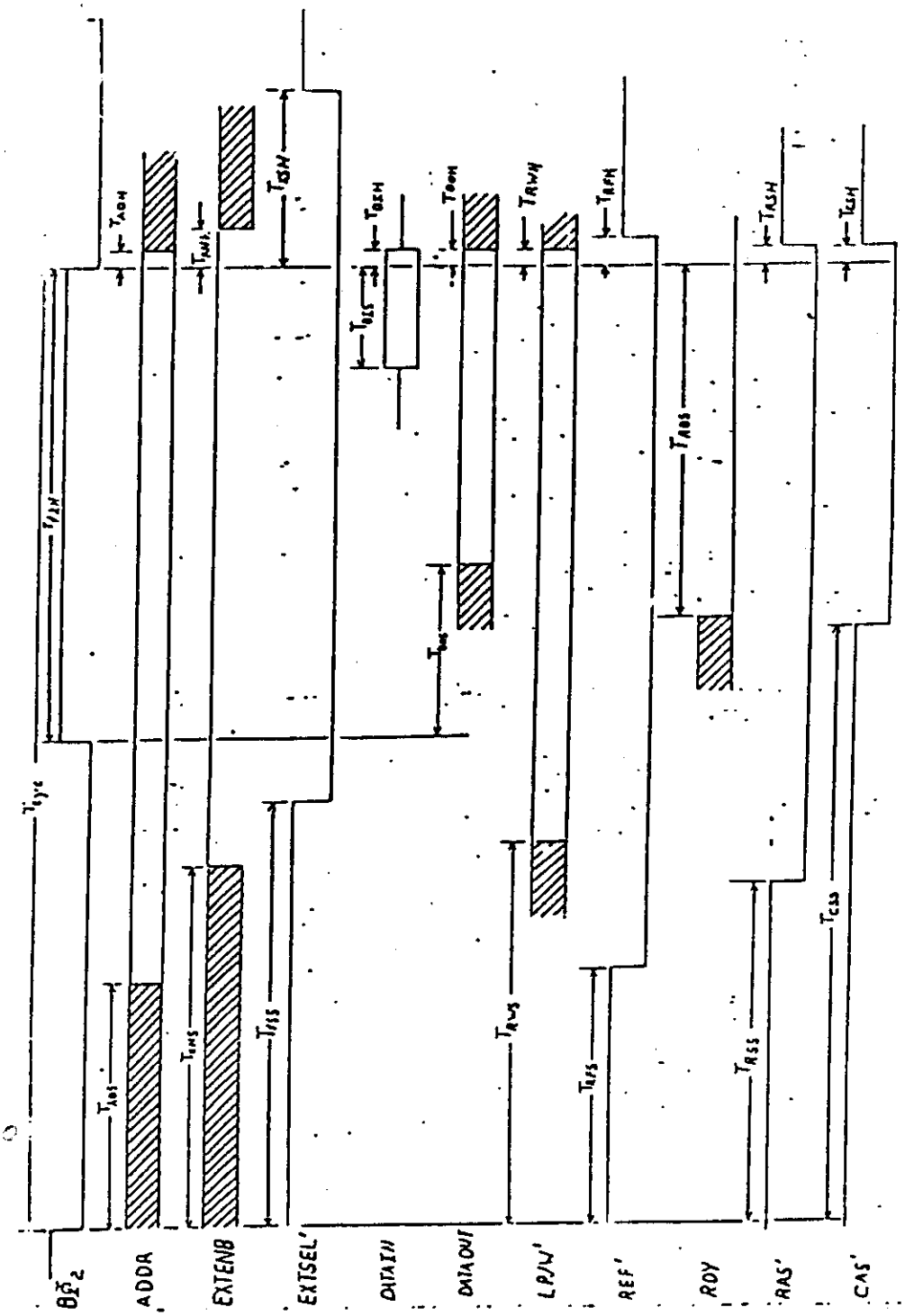

FIGURE 1 Worst Case Timing Requirements For the Parallel Bus Interface (PBI)

	GND	1	2	$\overline{\text{EXT SEL}}$	
	A0	3	4	A1	
	A2	5	6	A3	
	A4	7	8	A5	
	A6	9	10	GND	
	A7	11	12	A8	
	A9	13	14	A10	
	A11	15	16	A12	
	A13	17	18	A14	
	GND	19	20	A15	
	D0	21	22	D1	
	D2	23	24	D3	
CONSOLE TOP	D4	25	26	D5	CONSOLE BOTTOM
	D6	27	28	D7	
	GND	29	30	GND	
	B02	31	32	GND	
	Reserved	33	34	$\overline{\text{RST}}$	
	$\overline{\text{IRQ}}$	35	36	RDY	
	Reserved	37	38	EXTENB	
	Reserved	39	40	$\overline{\text{REF}}$	
	CAS	41	42	GND	
	$\overline{\text{MPD}}$	43	44	$\overline{\text{RAS}}$	
	GND	45	46	LR/$\overline{\text{W}}$	
	Reserved	47	48	Reserved	
	AUDIO	49	50	GND	

FIGURE 2 PBI CONNECTOR
(Looking out from the CPU Connector)

SYMBOL	MIN	MAX	UNITS	DESCRIPTION
T_{CYC}			nS	CLK period
T_{02H}	219	297	nS	Phase 2 duty cycle
T_{ADS}		145	nS	Address setup
T_{ADH}	10		nS	Address Hold
T_{XNS}		215	nS	EXTENB setup
T_{XNH}	15		nS	EXTENB hold
T_{XSS}		253	nS	EXTSEL' setup
T_{XSH}	100		nS	EXTSEL' hold
T_{DIS}	62		nS	Data in setup
T_{DIH}	10		nS	Data in hold
T_{DOS}		112	nS	Data out setup
T_{DOH}	10		nS	Data out hold
T_{RWS}		228	nS	R/W' setup
T_{RWH}	10		nS	R/W' hold
T_{RFS}		150	nS	Refresh setup
T_{RFH}	15		nS	Refresh hold
T_{RDS}	200		nS	Ready setup
T_{RSS}	187	305	nS	RAS' setup
T_{RSH}	10		nS	RAS' hold
T_{CSS}	295	385	nS	CAS' setup on read cycle
T_{CSS}	409	522	nS	CAS' setup on write cycle
T_{CSH}	10		nS	CAS' hold read or write

TABLE 1 TIMING PARAMETERS

5.0 FUNCTIONAL TESTING AND DESIGN VALIDATION (cont.)

1. (cont.)

f) Controller Ports

Controller ports will be verified to comply with all ATARI controller products per functional specification requirements.

g) RF Output

The RF modulator output will be verified to comply with the functional specifications.

h) Modem

The full duplex, 300 bps modem transmitter, receiver and timing will be verified to comply with the functional specifications.

i) Speech Synthesizer

The speech synthesizer using 64 phonemes for sound generation, Table 2, will be verified to comply with the functional specifications.

j) Disk Drive Peripheral Interface

The double density disk drive peripheral device will be verified to comply with the functional specifications.

k) Keyboard and overall 1450XLD computer system will be verified to comply with the functional specification.

l) Software Testing and Validation

Complete software regression (downward compatible) testing will be done with the existing and new interfaces, operating system, peripherals and computer cartridges to determine conformance to the software external reference specifications portion of the functional specification. (See software regression matrix to be supplied by Jack Quinn.)

6.0 SAFETY

The 1450XLD product must comply and be verified to all Atari Engineering product specifications and Corporate Product Safety requirements. In the event of a conflict with any other document, vendor/manufacturer is responsible to notify Atari Engineering and Corporate Product Safety of the conflict for written disposition from Atari, Inc.

7.0 MECHANICAL CHARACTERIZATION AND LIFE TESTS

1. Mechanical Characterization: Each unit will be fully reviewed for conformance to Engineering product and quality specifications.

2. Mechanical Life: Utilizing special exerciser fixtures, all moving parts will be operated on a continuous basis while outputs are monitored. Purpose of this test is to determine life expectancy of mechanical parts. Failing parts will be replaced and test continued. Number of actuations (or time) will be logged on each failure along with amount of time required to repair or replace the failed part.

8.0 DOCUMENTATION

Detailed logs and charts will be maintained during every test listing, test number, unit number, test condition, time measurement and recommendations.

Failure data will also include the following:

- Number of DC Parametric failures
- Number of functional failures
- Number of catastrophic failures

HEX PHONEME CODE	PHONEME SYMBOL	DURATION (ms)	EXAMPLE WORD
00	EH3	59	jacket
01	EH2	71	enlist
02	EH1	121	heavy
03	PA0	47	no sound
04	DT	47	butter
05	A2	71	made
06	A1	103	made
07	ZH	90	azure
08	AH2	71	honest
09	I3	55	inhibit
0A	I2	80	inhibit
0B	I1	121	inhibit
0C	M	103	met
0D	N	80	sun
0E	B	71	bag
0F	V	71	van
10	CH*	71	chip
11	SH	121	shop
12	Z	71	zoo
13	AW1	146	lawful
14	NG	121	thing
15	AH1	146	father
16	OO1	103	looking
17	OO	185	book
18	L	103	land
19	K	80	trick
1A	J*	47	judge
1B	H	71	hello
1C	G	71	get
1D	F	103	fast
1E	U	55	paid
1F	S	90	pass

HEX PHONEME CODE	PHONEME SYMBOL	DURATION (ms)	EXAMPLE WORD
20	A	185	day
21	AY	65	day
22	Y1	80	yard
23	UH3	47	miss
24	AH	250	mop
25	P	103	past
26	O	185	cold
27	I	185	pin
28	U	185	nov
29	Y	103	any
2A	T	71	tap
2B	R	90	red
2C	E	185	eel
2D	W	80	win
2E	AE	185	dad
2F	AE1	103	aft
30	AW2	90	sal
31	UH2	71	abo
32	UH1	103	unc
33	UH	185	cup
34	O2	80	for
35	O1	121	abo
36	IU	59	you
37	U1	90	you
38	THV	80	th
39	TH	71	th
3A	ER	146	bi
3B	EH	185	ge
3C	E1	121	be
3D	AW	250	ca
3E	PA1	185	no
3F	STOP	47	no

*/T/must precede /CH/ to produce CH sound
*/D/must precede /J/ to produce J sound

TABLE 2 SPEECH SYNTHESIZER PHONEMES

ATARI
Atari, Inc.
30 E. Plumeria Drive
San Jose, CA 95134
A Warner Communications Company

ATARI®
Atari, Inc.
30 E. Plumeria Drive
San Jose, CA 95134
A Warner Communications Company

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9.0 REGRESSION ANALYSIS, HARDWARE

ATARI®
UNIVERSAL PLANNING FORM

		810	1060	410	1010	820	822	1020	1025	1027	1029	1030	850	825	830	835	Joystick	Numeric Keypad	Paddle	Touch Tablet	Light Pen	CX85 Keypad	5¼"	5¼"2	5¼"3
1																									
2 System 1 - 1450XLD		X			X			X			X		X	X	X	X					X			X	
3																									
4																									
5 System 2 - 1450XLD				X		X				X		X					X		X			X			X
6 1025 Printer																									
7 1050 Drive ($10)																									
8																									
9																									
10 System 3 - 1450XLD			X				X		X									X		X			X		
11 850																									
12 825 Printer																									
13 810 Disk ($10)																									
14 410 Cassette																									
15 830 Modem																									
16																									
17																									
18																									
19																									
20																									
21 Software:																									
22																									
23 Visicalc (budget)																									
24																									
25 Pole Position Cart.																									
26																									
27 3rd Party Diskette																									
28																									
29 Compuserve																									
30																									
31 Basic Loop																									
32																									
33																									
34																									
35																									
36																									
37																									
38																									
39																									
40																									

Operating Unit: Prepared By: Date:

10.0 TEST RESPONSIBILITIES

	DESIGN ASSURANCE	ELECTRICAL ENGINEERING	DESIGN ENG. HARDWARE SOFTWARE	CORPORATE PRODUCT SAFETY
All Environmental Tests Less EMI	X			
EMI	X	X		
Functional Testing & Design Validation	X		X	
Safety	X	X	X	X
Mechanical Characterization Preliminary Life Tests	X			
Documentation	X	X	X	X

ITEM	DESCRIPTION	QTY	ATARI PART #	INDUSTRIAL #	SCHEM. REF.	PKG	VCC	GND
150	IC 6502 (SALLY)	1	C014806	6502 (MOD.)	U1	40	8	1
151	IC ANTIC	1	C012296		U2	40	21	1
152	IC GTIA	1	C014805		U3	40	27	3
153	IC POKEY	1	C012294		U26	40	17	1
154	IC PIA	1	C014794	6520	U27	40	20	1
155	IC FREDDIE	1	C061922		U8	40	40	20
156	IC GATE ARRAY (A)	1		BARBARA	U22	40	15	16
157	IC GATE ARRAY (B)	1		CARMIN	U21	40	6	7
158	IC DYNAMIC RAM	8	C060612	8264-15	U9-U16	16	16	8
159	IC OS ROM	1	C061598	27128	U23	28	28	14
160	IC BASIC ROM	1	C060302	2764	U24	28	28	14
161	IC HANDLER ROM	1	C061920	2764	U25	28	28	14
162	IC DISK CONT. ROM	1		2732	U48	24	24	12
163	IC VOICE PROCESSOR	1		SSI 263	U29	24	24	12
164	IC 6551 ACIA	1	C061690	6551	U30	28	15	1
165	IC MODEM	1		74HC942	U31	20	6	19
166	IC 80C49	1	C061921	80C49	U39	40	40	20
167	IC 2016 STATIC RAM	1		2016/6116	U49	24	24	12
168	IC WD2797	1	C025777-1	WD2797	U45	40	21	20
169	IC 74LS90	1		74LS90	U37	14	5	10
170	IC 74LS74	1		74LS74	U38	14	14	7
171	IC 74LS374	2		74LS374	U41,40	20	20	10
172	IC 74LS373	1		74LS373	U47	20	20	10
173	IC 7406	1		7406	U46	14	14	7
174	IC 7407	3		7407	U6,28,44	14	14	7
175	IC 74LS00	1		74LS00	U42	14	14	7
176	IC 74LS244	2	C014313	74LS244	U17,18	20	20	10
177	IC 74LS245	2	C061689	74LS245	U19,20	20	20	10
178	IC 74LS273	1	C061687	74LS273	U33	20	20	10
179	IC 74LS123	1	C061932	74LS123	U35	16	16	8
180	IC 4050	1	C061430	4050	U4	16	1	8
181	IC 4053	1	C061691	4053	U34	16	16	8
183	IC LM324	1	C014320	LM324	U32	14	4	3
	IC 74LS03	1			U5	14	14	7
	IC 74LS14	1			U7	14	14	7
	IC 74LS139	1			U43			

ITEM	DESCRIPTION	QTY	SCHEMATIC REFERENCE DESIGNATOR	
00	POWER SWITCH	1	C061913	SW1
01	13 PIN SIO CONN.	1	C012995	J1
02	9 PIN JOYST. CONN.	2	C019602	J5, J6
03	SA400 POWER CONN.	1	350211-1	J13
04	30 PIN CART. CONN.	1	C060410	J4
05	CHANNEL SWITCH	1	C019702-01	SW2
06	40 PIN IC SOCKET	10	C014386-09	XU1,2,3,8,21,22,26,27,39,45
07	28 PIN IC SOCKET	4	C014386-08	XU23,24,25,30
08	24 PIN IC SOCKET	3	C014386-07	XU29,48,49

1450XLD "TONG" PARTS LIST 6/1/84

CAP .01 1.4KV 1 27-142103 C88

ITEM	DESCRIPTION	QTY	ATARI PART #	SCHEMATIC REFERENCE DESIGNATOR
	CAP 180 PF	1		C10
50	CAP 47 UF 10V	1	24-100476	C2
51	CAP 22 UF 10V	3	C014393	C122,126,129
52	CAP 10 UF 10V	2	C014371	C61, 106
53	CAP 4.7 UF 35V,NP	3	C061647	C94,95,108
54	CAP 2.2 UF 16V	1	C024475-001	C87
55	CAP 1 UF 10V	1	C016569	C89
56	CAP .47 UF 25V	4	C014181-07	C91,96,97,104
57	CAP .22 UF 25V	2	C014181-05	C92,117
58	CAP .1 UF 25V	52	C014181-03	C1,3,4,5,8,16-20,23,24,27— 39,52,54 60,76,77,81-86,90,91,101-103,109-116, 119,120,123,124,127,130,133-140,144,145,143
59	CAP .047 UF 25V	4	C014180-09	C56-59
60	CAP .01 UF 100V	4	C014181-06	C71, ,98,105,107
61	CAP .0022 UF 1.4KV	1	27-142222	C93
62	CAP .001 UF 25V	38	C014181-01	C11,13-15,21,22,40-51,53,55,62-70,72-75 78-80,121,125,128,131,132,141,142
63	CAP 470 PF 50V	1	C014180-06	C100
64	CAP 200 PF 25V	1	C061336-06	C99
65	CAP 100 PF 25V	3	C014170-19	C6,7,12
66	CAP 39 PF	1	2A-011	C9
67	VAR.CAP. 6-70 PF	1	9396	C118
68	DIODE 1N4148	2	C060607	CR1,3,4,14
69	DIODE 1N5239B	1	C014608-05	CR2
70	DIODE 1N4002	4	C062082	CR5,8,9,10,11,13
71	DIODE 1N5242	1	C062061	CR12
72	DIODE 1N4733	2	C061845	CR6,7
73	DIODE 1N914	1	31-1N914	
74	TRANSISTOR 2N3904	6	34-2N3904	Q1,2,3,4,7,8
75	TRANSISTOR 2N3906	1	34-2N3906	Q9
76	TRANSISTOR MPSA55	1	C014809	Q5
77	TRANSISTOR MPSA13	1	C016000	Q6
78	FERRITE BEAD	9	C014384	L1,2,4,7,14,23,29,30,31
79	INDUCTOR 10 UH	20	C014381	L5,6,L9-13,15-22,24-28
80	INDUCTOR 100 UH	1	C017948-04	L3
81	OPTO-ISOLATOR 4N25	1	C061847	U36
82	XTAL MOD. 10.0MHZ	1	TD1100-A-10	Y3
83	XTAL MOD. 14.31818	1	C061905	Y1
84	XTAL 1.8432 MHZ	1	C061848	Y2
85	RF MODULATOR	1	CA061619	A1
86	PHONE TRANSFO.	1	C061844	T1
87	PHONE RELAY	1	C061909	RY1
88	PHONE JACK RJ-11	2	C061869	J9,J10
89	34 PIN PC MT CONN.	1	10-88-1343	J12
90	8 PIN DIN CONN.	1	C060409	J11
91	5 PIN DIN CONN.	1	C014388	J2
92	15 PIN R.A. HEADER	1	C060450-02	J8
93	5 PIN R.A. HEADER	1		J7
*94	CAP 18PF 25V	1		C25
*95	CAP 47PF 25V	1		C26

* ITEMS 94,95 OPTIONAL IF ITEM #83 IS NOT USED.

CA025664-001 REV X1A

1450XLD "TONG" PART LIST

REVISED 6/1/84 7/31/84

ITEM	DESCRIPTION	QTY	ATARI PART #	SCHEMATIC REFERENCE DESIGNATOR
1	10 OHMS RES. 1/4W	1	14-5100	R115
2	47 OHMS RES. 1/4W	2	14-5470	R32,108
3	56 OHMS RES. 1/4W	3	14-5560	R72,78,79
4	75 OHMS RES. 1/4W	4	14-5750	R39,40,42,43
5	82 OHMS 1/4W	1	14-5820	R117
6	100 OHMS 1/4W	113	14-5101	R3,33,38,88-95,133,147
7	150 OHMS 1/4W	4	14-5151	R139,143,144,145
8	220 OHMS 1/4W	5	14-5221	R45,46,47,55,56
9	240 OHMS 1/4W	1	14-5241	R37
10	470 OHMS 1/4W	3	14-5471	R71,76,77
11	620 OHMS 1/4W	1	14-5621	R111
12	680 OHMS 1/4W	1	14-5681	R19
13	750 OHMS 1/4W	1	14-5751	R25
14	1K OHMS 1/4W	85	14-5102	R9-13,16,26,28,36,87,124,131,142,149
15	1.2K OHMS 1/4W	1	14-5122	R44
16	1.6K OHMS 1/4W	1	14-5162	R30
17	1.8K OHMS 1/4W	5	14-5182	R81,82,83,84,146
18	2K OHMS 1/4W	4	14-5202	R31,100,128,129
19	2.2K OHMS 1/4W	3	14-5222	R18,29,103
20	2.7K OHMS 1/4W	2	14-5272	R73,99
21	3K OHMS 1/4W	4	14-5302	R41,80,86,113
22	3.3K OHMS 1/4W	2	14-5332	R14,27
23	3.9K OHMS 1/4W	3	14-5392	R101,122,126
24	4.7K OHMS 1/4W	17	14-5472	R1,4,24,35,50,59,68,69,85,119,120,132,134,135,138,150,151,152
25	5.1K OHMS 1/4W	1	14-5512	R110
26	5.6K OHMS 1/4W	1	14-5562	R112
27	6.2K OHMS 1/4W	3	14-5622	R17,107,148
28	6.8K OHMS 1/4W	2	14-5682	R116,130
29	9.1K OHMS 1/4W	1	14-5912	R23
30	10K OHMS 1/4W	19	14-5103	R5,7,8,34,54,109,114,121,136
	33K 1/4W	1		R102
31	18K OHMS 1/4W	1	14-5183	R22
32	20K OHMS 1/4W	1	14-5203	R123
33	22K OHMS 1/4W	1	14-5223	R2
34	36K OHMS 1/4W	1	14-5363	R21
35	43K OHMS 1/4W	1	14-5433	R96
36	56K OHMS 1/4W	7	14-5563	R70,74,75,77,97,104,105
37	75K OHMS 1/4W	1	14-5753	R15
38	120K OHMS 1/4W	1	14-5124	R106
39	160K OHMS 1/4W	1	14-5164	R127
40	470K OHMS 1/4W	2	14-5474	R118, 25
41	1MEG OHMS 1/4W	1	14-5105	R47
42	62 OHMS 1/4W	59	14-5620	R51-53,60-67,153-200
	39K 1/4W	1		R98
43	10K 10 PIN SIP	3	C014379-02	RN1,RN2,RN3
44	1K 8 PIN SIP	1	4308R-101-102	
45	500K 10 TURN POT	1	3299W-1-504	R20
46	50K 10 TURN POT	2	3299W-1-503	R140,R141
*47	390 OHMS 1/4W	1	14-5391	R48
*48	1MEG OHMS 1/4W	1	14-5105	
	33 OHM 1/4W	4		R6,57,58,137

* ITEM #47,48 OPTIONAL ;THESE ARE USED WHEN ITEM #83 IS NOT USED.