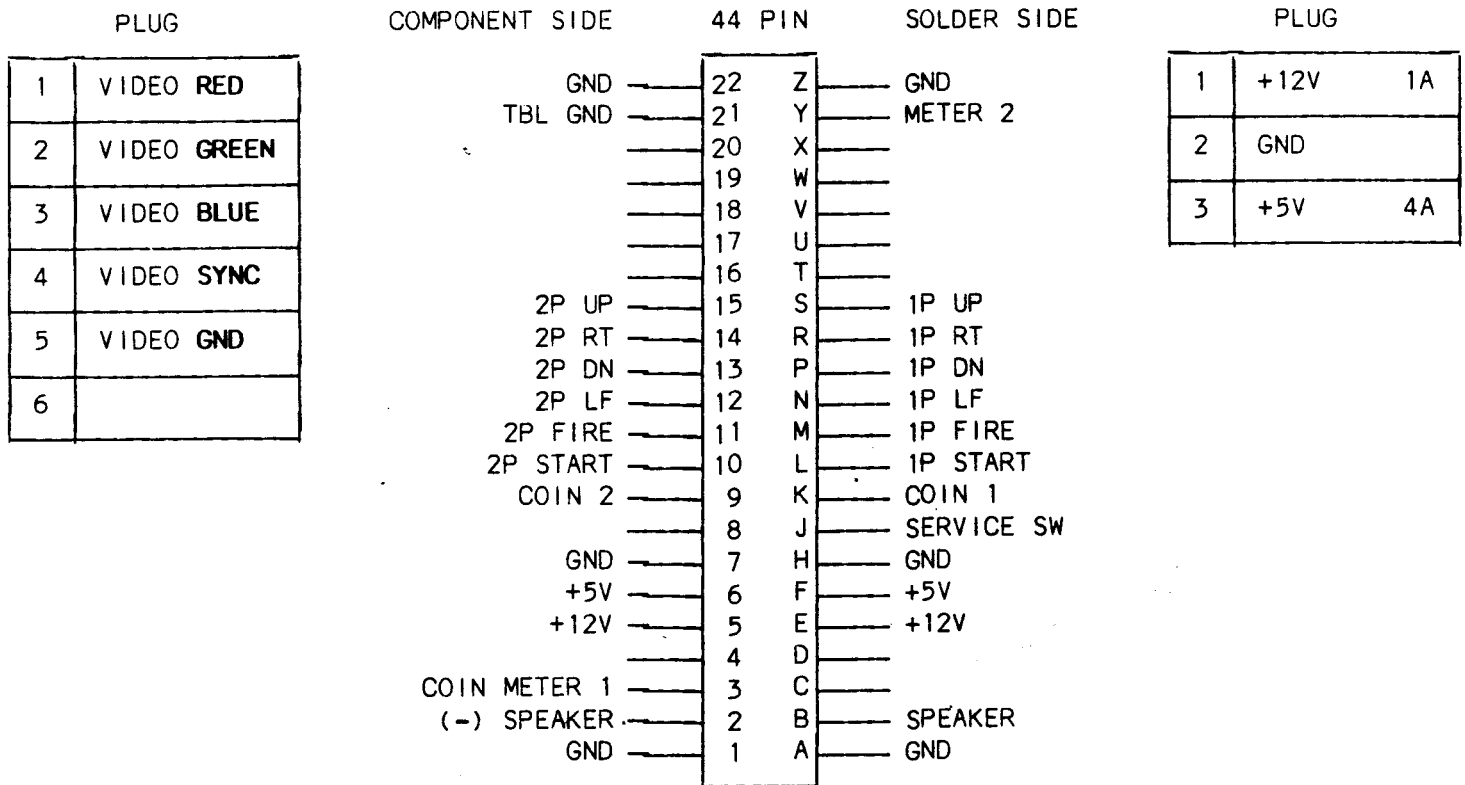


G A L A G A I I I G E N E R I C C O N V E R S I O N K I T

M 0 5 1 - 0 0 B 8 6 - A 0 0 4

Pin-out information follows:



Power supply
information
shown at right:

POWER SUPPLY VOLTAGES AND CURRENT SPECS.	
VOLTAGE	CURRENT
DC 5 VOLTS	4 AMPS
DC 12 VOLTS	1 AMP

GAME USES A 8 WAY JOYSTICK AND A FIRE BUTTON.

MODIFY YOUR CONTROL PANEL AS NEEDED TO ACCEPT THE ABOVE CONTROLS; APPLY THE GENERIC CONTROL PANEL OVERLAY TO THE TOP SURFACE OF YOUR CONTROL PANEL AND CUT OUT THE NECESSARY HOLES; INSTALL THE CONTROLS TO YOUR NEWLY MODIFIED CONTROL PANEL.

CENTER YOUR GAMES OLD HEADER ON THE NEW OVER-SIZE HEADER PROVIDED IN YOUR KIT; DRAW A LINE AROUND IT AND CUT OUT YOUR NEW HEADER; TRIM IT FOR PROPER FIT IN YOUR GAME.

INSTALL THE NEW GAME PLAY INSTRUCTION CARD WHERE IT WILL BE PLAINLY VISIBLE AND WILL NOT BLOCK THE PLAYER'S VIEW OF THE GAME.

APPLY GENERIC SIDE DECALS TO GAME; TRIM TO FIT AS DESIRED. WE SUGGEST THEY BE TRIMED BACK ONE INCH FROM FRONT EDGE OF CABINET TO DISCOURAGE THEIR BEING PEELED BACK BY PATRONS.

G A L A G A I I I

O P T I O N S W I T C H S E T T I N G S - D I P S W I T C H "A"

//VARIOUS GAME PLAY OPTIONS//

NUMBER OF FIGHTERS GAME BEGINS WITH				<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>
*	3	FIGHTERS		OFF	OFF				NOT		
	2	FIGHTERS		OFF	ON				USED		
	4	FIGHTERS		ON	OFF				OFF		
	5	FIGHTERS		ON	ON				OFF		
COIN #1 - NUMBER OF COINS PER CREDIT				<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>
*	1	COIN	1 CREDIT			OFF	OFF		OFF		
	1	COIN	2 CREDITS			OFF	ON		OFF		
	2	COINS	1 CREDIT			ON	OFF		OFF		
	3	COINS	1 CREDIT			ON	ON		OFF		
SOUND				<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>
*	SOUND IN ATTRACT MODE							OFF	OFF		
	NO SOUND IN ATTRACT MODE							ON	OFF		
COIN #2 - NUMBER OF COINS PER CREDIT				<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>
*	1	COIN	1 CREDIT						OFF	OFF	OFF
	1	COIN	2 CREDITS						OFF	OFF	ON
	2	COINS	1 CREDIT						OFF	ON	OFF
	3	COINS	1 CREDIT						OFF	ON	ON
* INDICATES FACTORY RECOMMENDED SETTINGS										PART NO. M051-00C41-C007	

OPTION SWITCH SETTINGS - DIP SWITCH "B"

//VARIOUS GAME PLAY OPTIONS//

3

BALLY/MIDWAY'S GALAGA 3

U.R. #0B86

PROGRAMED PART NUMBERS

UNPROGRAMED LOGIC BD. A082-91741-BA87
PROGRAMED GALAGA 3 LOGIC BD. A084-91741-BA86

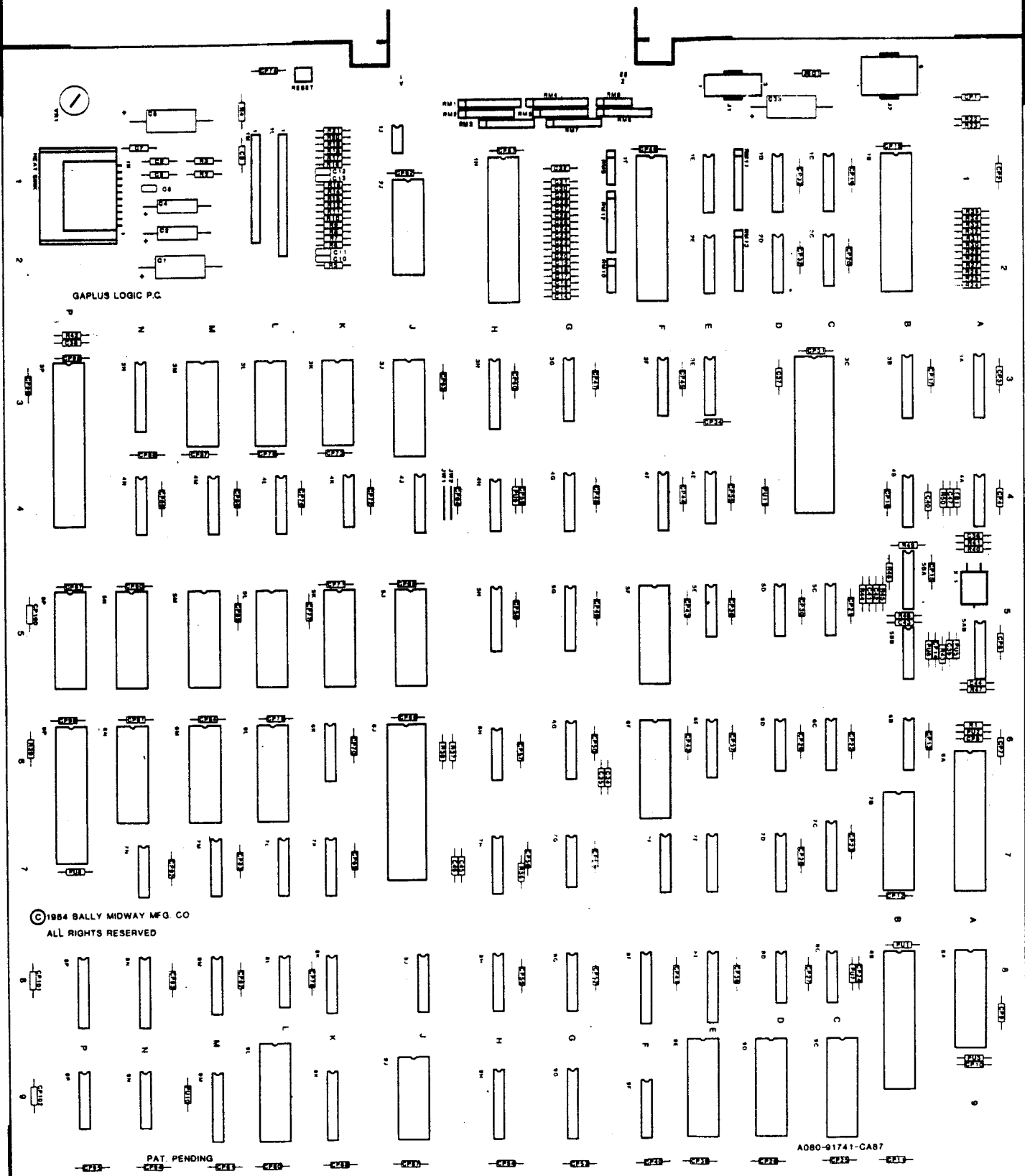
POS.	MIDWAY PART NUMBER
8N	0A87-00803-0003
3E	0C41-00803-0002
3F	0C41-00803-0003
1D	0A87-00803-0006
2D	0A87-00803-0007
1C	0A87-00803-0008
4F	0A87-00803-0009
8G	0A87-00803-0010
7B0	0A87-00803-0011
9C1	0A87-00803-0012
9D2	0A87-00803-0013
9E3	0A87-00803-0014
9L4	0C41-00803-0001
6N5	0A87-00803-0016
6M6	0A87-00803-0017
6L	0A87-00803-0018
5N	0A87-00803-0019
5L	0A87-00803-0020
5M	0A87-00803-0021
5K	0A87-00803-0022

11/16/84	RELEASE FOR PRODUCTION	

M051-00B86-A008

DESIGNATION LIST

DESIGNATION NO.	DESCRIPTION	DESIGNATION NO.	DESCRIPTION
C1	10 UF AX CER	IC 5J	11XX CUSTOM IC
C2	2.2 UF AX CER	IC 5K, 5L, 5M, 5N	ROM
C3	.01 UF AX CER	IC 5P	NOT USED
C4	47 UF AX ELEC	IC 6A	68A09E CPU
C5, C6	.033 UF POLY	IC 6B	74LS20
C7	.1 UF AX CER	IC 6C	74LS08
C8	470 UF AX ELEC	IC 6D	74LS04
C9	.1 UF AX CER	IC 6E	74LS365
C10-C13	.01 UF POLY	IC 6F	33XX CUSTOM IC
C14-C32	.01UF AX CER	IC 6G	74LS365
C33	470 UF AX ELEC	IC 6H	74LS32
C34, C35	680 PF AX CER	IC 6J	20XX CUSTOM IC
C36	100 PF AX CER	IC 6K	74LS157
C37	47 PF AX CER	IC 6P	ROM
C38-C46	100 PF AX CER	IC 7B	68A09E CPU
C47	68 PF AX CER	IC 7C	ROM
CP1-CP4	.1 UF AX CER	IC 7D, 7E	74LS257
CP6-CP102		IC 7F	74LS158
		IC 7G	74LS04
		IC 7H	74LS368
R2, R3	4.7 OHM 1/4W 5%	IC 7K, 7L, 7M	74LS157
R4	22K OHM 1/4W 5%	IC 7N	74LS74
R5	10K OHM 1/4W 5%	IC 8A	34XX CUSTOM IC
R6	150K OHM 1/4W 5%	IC 8B	68A09E CPU
R7	4.7K OHM 1/4W 5%	IC 8C	74S74
R8	10K OHM 1/4W 5%	IC 8D	74LS00
R9	22K OHM 1/4W 5%	IC 8E, 8F	74LS245
R10	4.7K OHM 1/4W 5%	IC 8G	ROM
R11	10K OHM 1/4W 5%	IC 8H	74LS375
R12	22K OHM 1/4W 5%	IC 8J	NOT USED
R13	47K OHM 1/4W 5%	IC 8K	NOT USED
R14	150K OHM 1/4W 5%	IC 8L	74LS86
R15	470K OHM 1/4W 5%	IC 8M	74LS139
R16	10K OHM 1/4W 5%	IC 8N	ROM
R17, R18	10K OHM 1/4W 5%	IC 8P	74LS245
R19	470K OHM 1/4W 5%	IC 9C, 9D, 9E	ROM
R20, R21	2.2K OHM 1/4W 5%	IC 9F	NOT USED
R22	1K OHM 1/4W 5%	IC 9G	74LS273
R23	100 OHM 1/4W 5%	IC 9H	74LS245
R24	220 OHM 1/4W 5%	IC 9J	MS8725P RAM
R25	470 OHM 1/4W 5%	IC 9K	74LS273
R26	1K OHM 1/4W 5%	IC 9L	ROM
R27	2.2K OHM 1/4W 5%	IC 9M	74LS273
R28	250 OHM 1/4W 5%	IC 9N	74LS298
R29	470 OHM 1/4W 5%	IC 9P	74LS153
R30	1K OHM 1/4W 5%	IC 1BS	40 PIN IC SOCKET
R31	2.2K OHM 1/4W 5%	IC 1CS, 1DS	16 PIN IC SOCKET
R32	220 OHM 1/4W 5%	IC 1FS, 1HS	42 PIN IC SOCKET
R33	470 OHM 1/4W 5%	IC 2DS	16 PIN IC SOCKET
R34	1K OHM 1/4W 5%	IC 2JS	28 PIN IC SOCKET
R35	2.2K OHM 1/4W 5%	IC 3AS, 3BS	18 PIN IC SOCKET
R36	330 OHM 1/4W 5%	IC 3CS	64 PIN IC SOCKET
R37, R38	470 OHM 1/4W 5%	IC 3ES	16 PIN IC SOCKET
R39	330 OHM 1/4W 5%	IC 3JS	28 PIN IC SOCKET
R40, R41	180 OHM 1/4W 5%	IC 3KS, 3LS	24 PIN IC SOCKET
R42	240 OHM 1/4W 5%	IC 3MS, 3PS (X2)	16 PIN IC SOCKET
R43-R46	JUMPER WIRE	IC 3FS	28 PIN IC SOCKET
R47-R49	1K OHM 1/4W 5%	IC 3GS	28 PIN IC SOCKET
R50	NOT USED	IC 3HS	18 PIN IC SOCKET
PJ1-PJ3	1K OHM 1/4W 5%	IC 3JS, 3KS	28 PIN IC SOCKET
PJ5-PJ11		IC 3LS, 3MS, 3NS	40 PIN IC SOCKET
		IC 3PS	28 PIN IC SOCKET
		IC 3JS	64 PIN IC SOCKET
		IC 3LS, 3MS, 3NS	28 PIN IC SOCKET
RM1, 4, 11, 13	1K OHM 5 PIN SIP	IC 3PS	40 PIN IC SOCKET
RM2, 3, 5, 6, 7	2.2K OHM 8 PIN SIP	IC 3TS	28 PIN IC SOCKET
RM9, RM10	4.7K OHM 6 PIN SIP	IC 3AS	28 PIN IC SOCKET
RM12	4.7K OHM 9 PIN SIP	IC 3BS	40 PIN IC SOCKET
IC 1B	26XX CUSTOM IC	IC 3CS	28 PIN IC SOCKET
IC 1C, 1D	ROM	IC 3DS	40 PIN IC SOCKET
IC 1F	58XX CUSTOM IC	IC 3ES	20 PIN IC SOCKET
IC 1H	56XX CUSTOM IC	IC 3JS	28 PIN IC SOCKET
IC 1J	OP AMP TL 082	IC 3KS	28 PIN IC SOCKET
IC 1L	98XX CUSTOM IC	IC 3MS	28 PIN IC SOCKET
IC 1M	99XX CUSTOM IC	IC 3PS	28 PIN IC SOCKET
IC 1N	4460 AUDIO AMP	IC 3TS	28 PIN IC SOCKET
IC 2C	74LS30	IC 3AS	28 PIN IC SOCKET
IC 2D	ROM	IC 3BS	28 PIN IC SOCKET
IC 2J	62XX CUSTOM IC	IC 3CS	28 PIN IC SOCKET
IC 3A, 3B	MB8148L-55 RAM	IC 3DS	28 PIN IC SOCKET
IC 3C	29XX CUSTOM IC	IC 3ES	28 PIN IC SOCKET
IC 3E, 3F	ROM	IC 3JS	28 PIN IC SOCKET
IC 3G	2114 RAM	IC 3KS	28 PIN IC SOCKET
IC 3H	74LS245	IC 3MS	28 PIN IC SOCKET
IC 3J	16XX CUSTOM IC	IC 3PS	28 PIN IC SOCKET
IC 3K, 3L, 3M	MS8725P RAM	IC 3TS	28 PIN IC SOCKET
IC 3N	74LS245	IC 3AS	28 PIN IC SOCKET
IC 3P	21XX CUSTOM IC	IC 3BS	28 PIN IC SOCKET
IC 4A	74LS04	IC 3CS	28 PIN IC SOCKET
IC 4B	NOT USED	IC 3DS	28 PIN IC SOCKET
IC 4C	74LS20	IC 3ES	28 PIN IC SOCKET
IC 4D	ROM	IC 3JS	28 PIN IC SOCKET
IC 4E	74LS157	IC 3KS	28 PIN IC SOCKET
IC 4F	74LS74	IC 3MS	28 PIN IC SOCKET
IC 4G	74LS157	IC 3PS	28 PIN IC SOCKET
IC 4H	74LS00	IC 3TS	28 PIN IC SOCKET
IC 4J	74LS174	IC 3AS	28 PIN IC SOCKET
IC 4K	74LS175	IC 3BS	28 PIN IC SOCKET
IC 4L	74LS378	IC 3CS	28 PIN IC SOCKET
IC 4M	74LS163	IC 3DS	28 PIN IC SOCKET
IC 4N	74LS139	IC 3ES	28 PIN IC SOCKET
IC 5A	74LS86	IC 3JS	28 PIN IC SOCKET
IC 5B	74LS04	IC 3KS	28 PIN IC SOCKET
IC 5C	74LS08	IC 3MS	28 PIN IC SOCKET
IC 5D	74LS10	IC 3PS	28 PIN IC SOCKET
IC 5E	15XX CUSTOM IC	IC 3TS	28 PIN IC SOCKET
IC 5F	MB8148L-55 RAM		

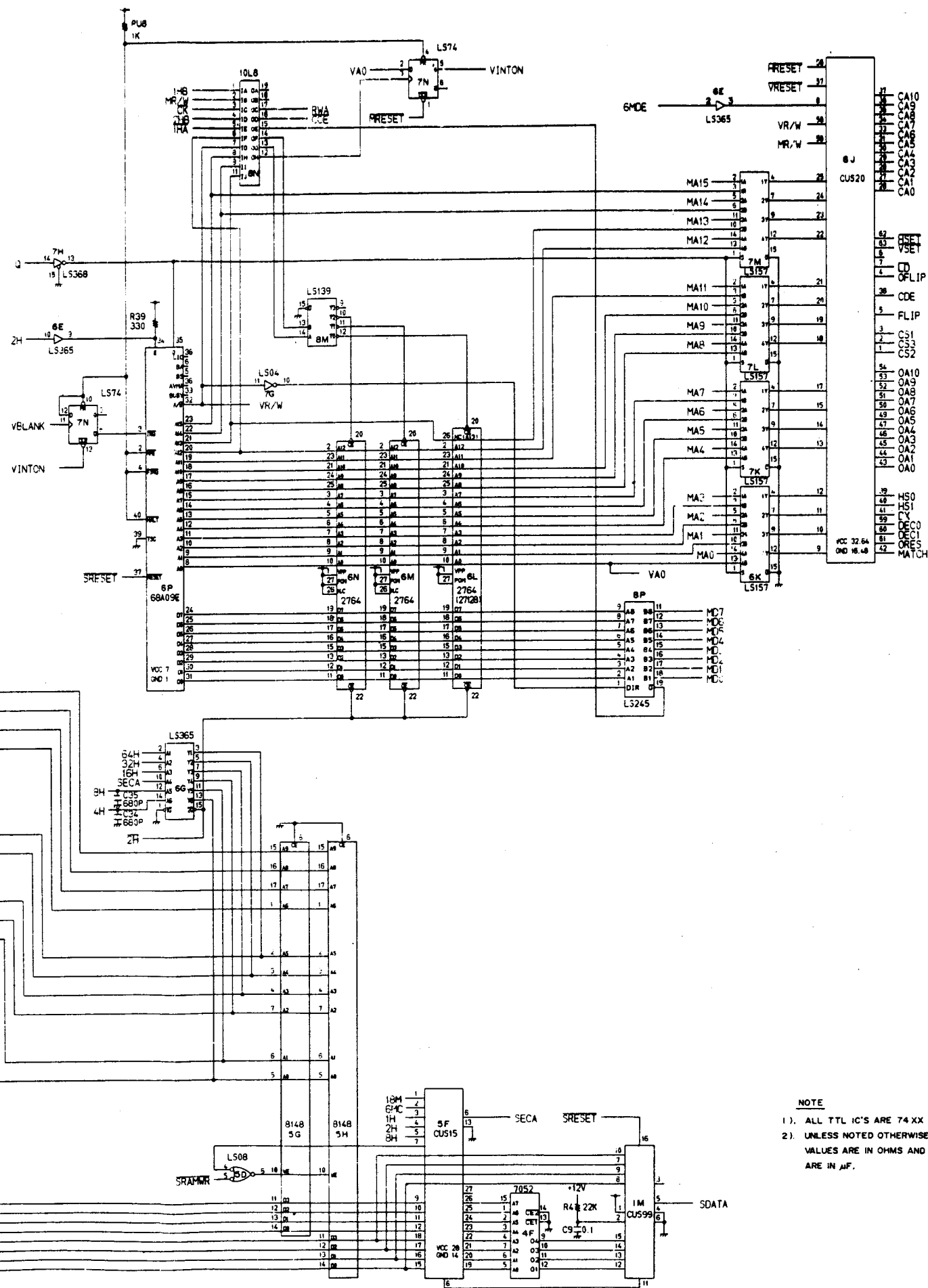


CROSS REFERENCE LIST

DESCRIPTION	QTY	DESIGNATION NO.	PART NUMBER	DESCRIPTION	QTY	DESIGNATION NO.	PART NUMBER
47 PF AX CER	1	C37	0986-00800-2800	11XX CUSTOM IC	1	5J	0066-018CX-XA
68 PF AX CER	1	C47	0360-00800-0010	15XX CUSTOM IC	1	5F	0066-020CX-XA
100 PF AX CER	10	C36, C38-C46	0A64-00800-0006	16XX CUSTOM IC	1	3J	0066-021CX-XA
680 PF AX CER	2	C34, C35	0356-00800-0002	20XX CUSTOM IC	1	6J	0066-035CX-XA
.01 UF AX CER	19	C14-C32	0353-00800-0001	21XX CUSTOM IC	1	3P	0066-036CX-XA
.01 UF POLY	5	C3, C10-C13	0550-00800-1000	26XX CUSTOM IC	1	1B	0066-037CX-XA
.033 UF POLY	2	C5, C6	0553-00800-0002	29XX CUSTOM IC	1	3C	0066-038CX-XA
.1 UF AX CER	103	C7, C9, CP1-CP4	0508-00800-0900	33XX CUSTOM IC	1	6F	0066-039CX-XA
		CP6-CP102		34XX CUSTOM IC	1	8A	0066-040CX-XA
2.2 UF AX ELEC	1	C1	0353-00800-0005	36XX CUSTOM IC	1	1H	0066-022CX-XA
10 UF AX ELEC	1	C2	0508-00800-1100	58XX CUSTOM IC	1	1F	0066-028CX-XA
47 UF AX ELEC	1	C4	0353-00800-0003	62XX CUSTOM IC	1	2J	0066-041CX-XA
470 UF AX ELEC	2	C8, C33	0550-00800-1300	98XX CUSTOM IC	1	1L	0066-042CX-XA
				99XX CUSTOM IC	1	1M	0066-029CX-XA
4.7 OHM 1/4W 5%	2	R2, R3	100E-00005-0007	OP AMP TL 082	1	1J	0333-00803-001
100 OHM 1/4W 5%	1	R23	100E-00005-0033	MB8148L-55 RAM	4	3A, 3B, 3E, 3H	
180 OHM 1/4W 5%	2	R40, R41	100E-00005-0039	MS8725 RAM	3	3K, 3L, 3M	
220 OHM 1/4W 5%	3	R24, R28, R32	100E-00005-0041	MS8725P RAM	1	9J	
240 OHM 1/4W 5%	1	R42	100E-00005-0043	2114 RAM	1	3G	0508-00803-03
330 OHM 1/4W 5%	3	R1, R36, R39	100E-00005-0047	ROM	20		
470 OHM 1/4W 5%	5	R25, R29, R33, R37, R38	100E-00005-0051				
1K OHM 1/4W 5%	17	R22, R26, R30, R34, R47-R49, PU1-PU3, PU5-PU11	100E-00005-0061				
		R20, R21, R27, R31, R35	100E-00005-0069	68A09E CPU	3		
2.2K OHM 1/4W 5%	5			24.576 MHZ XTAL	1	X1	109E-00001-001
4.7K OHM 1/4W 5%	5	R7, R11	100E-00005-0079				
10K OHM 1/4W 5%	2	R5, R8, R12, R17, R18	100E-00005-0088				
22K OHM 1/4W 5%	3	R4, R9, R13	100E-00005-0096				
47K OHM 1/4W 5%	2	R10, R14	100E-00005-0104				
150K OHM 1/4W 5%	2	R6, R15	100E-00005-0120				
470K OHM 1/4W 5%	2	R16, R19	100E-00005-0132				
1K OHM 5 PIN SIP	1	RM8	102E-00004-0010	42 PIN IC SOCKET	2	1FS, 1HS	100E-00001-001
1K OHM 9 PIN SIP	4	RM1, 4, 11, 13	102E-00004-0011	40 PIN IC SOCKET	2	1BS, 6AS, 6PS, 8BS	100E-00001-001
2.2K OHM 8 PIN SIP	5	RM2, 3, 5, 6, 7	102E-00004-0042	64 PIN IC SOCKET	2	3CS, 6JS	100E-00001-001
4.7K OHM 6 PIN SIP	2	RM9, RM10	102E-00004-0027	16 PIN IC SOCKET	7	1CS, 1DS, 2DS, 3ES, 3FS, 4FS, 8BS	100E-00001-001
4.7K OHM 9 PIN SIP	1	RM12	102E-00004-0024				
2K OHM POT	1	VR1	105E-00001-0038	18 PIN IC SOCKET	4	3AS, 3BS, 3ES, 3MS	100E-00001-001
ZENER DIODE 6.2V	1	D1	103E-00001-0011	20 PIN IC SOCKET	1	8NS	100E-00001-001
				24 PIN IC SOCKET	6	3KS, 3LS, 3MS, 9JS, 3PS	100E-00001-001
74LS00	2	4K, 8D	0300-00803-0027	28 PIN IC SOCKET	18	2JS, 3JS, 3FS, 3JS, 3KS, 3LS, 3MS, 3NS, 6FS, 6LS, 6MS, 6NS, 7BS, 8AS, 9CS, 9DS, 9ES, 9LS	100E-00001-001
74LS04	3	5C, 6D, 7G	0300-00803-0029				
74LS08	1	4A	0304-00803-0011				
74LS10	2	5D, 6C	0300-00803-0030				
74LS20	1	5E	0A87-00803-0001				
74LS30	2	4E, 6B	0300-00803-0052	8 POS DIP SW	2	1E, 2E	0300-00804-071
74LS32	1	2C	0304-00803-0016				
74LS74	1	6H	0300-00803-0031	3 PIN AMP CONN	1	J1	0017-00021-041
74S74	2	4H, 7N	0300-00803-0032	6 PIN AMP CONN	1	J2	0017-00021-041
74S86	1	8C	0986-00803-1500				
74LS139	1	5BB, 8L	0300-00803-0054	JUMPER WIRE	7	JV1, R43-R46, FB1	0151-00087-001
74S139	1	8M	0508-00803-0054				
74S139	1	5BA	0300-00803-5100				
74LS153	1	9P	0986-00803-1000	HEATSINK AUD AMP	1	HEATSINK	0353-00900-001
74LS157	6	4G, 4J, 6K, 7K, 7L, 7H	0300-00803-0050	MNTG SCRW 4-40X7	2		0017-00101-05
74LS158	1	7F	0300-00803-0049	PAN HD			
74S163	1	5AB	0A87-00803-0002				
74LS174	1	4L	0300-00803-0047	#4 FLT WASHER	4		0017-00104-001
74LS175	1	4M	0304-00803-0025	4-40 HEX NUTS	2		0017-00103-001
74LS245	7	3H, 3N, 7C, 8E, 8F, 8P, 9H	0300-00803-0046				
74LS257	2	7D, 7E	0316-00803-0002	THERMAL CMPD	.001		0017-00009-021
74LS273	3	9G, 9K, 9M	0935-00804-1500				
74LS298	1	9N	0316-00803-0019	BLANK PCB	1		A080-91741-CAL
74LS365	2	6E, 6G	0316-00803-0020				
74LS368	1	7H	0316-00803-0004				
74LS375	1	8H	0A29-00803-0007				
74LS378	1	4N	0316-00803-0018				
4460 AUDIO AMP	1	1N	0066-0378X-KBAX				

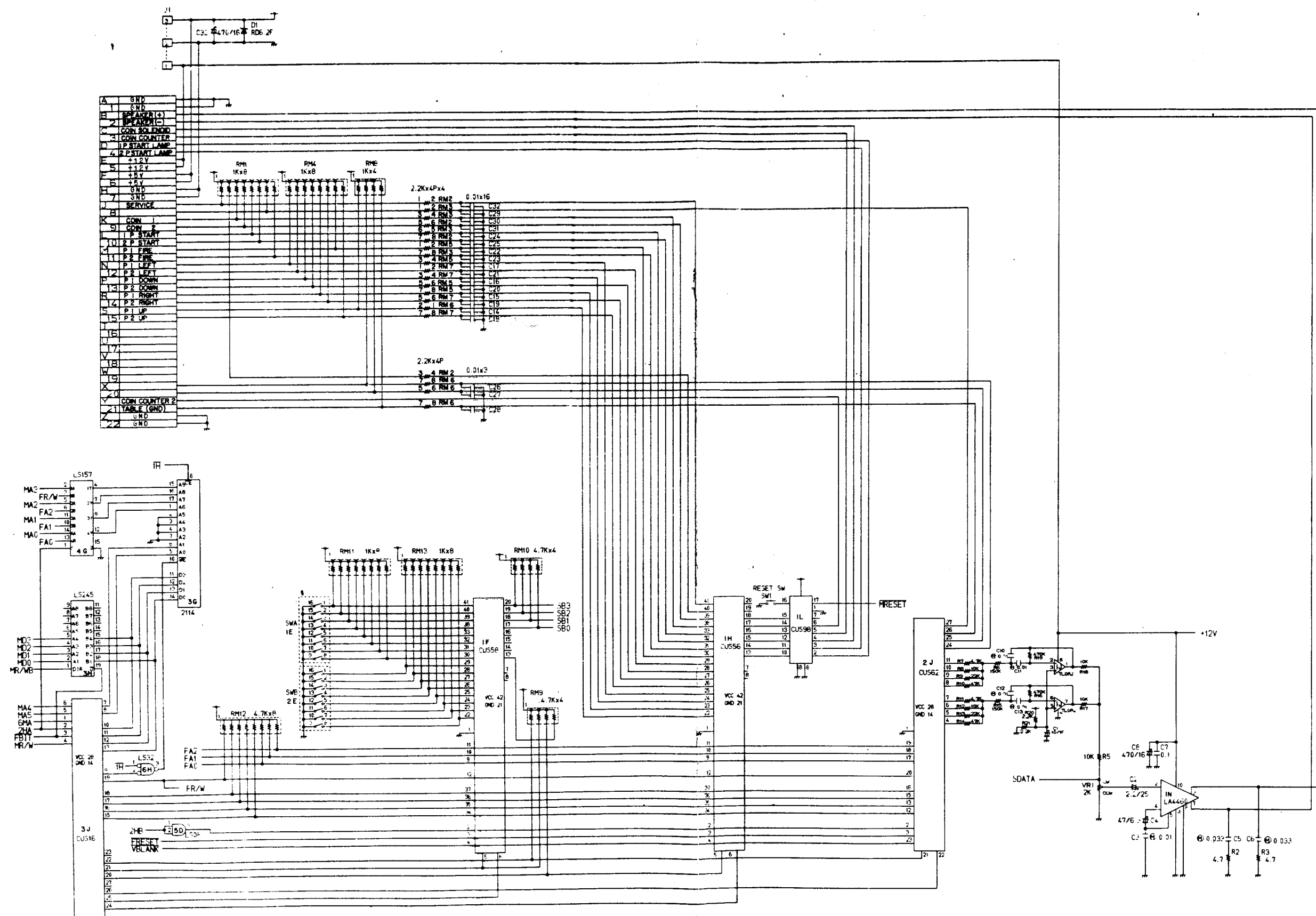
NOTE: EPROM CHART IN BACK OF CATALOG.

DIM TOLERANCES UNLESS OTHERWISE SPEC CONCENTRICITY .002 FRACTIONAL .004 DECIMAL .005 HOLE DIA .002 ANGLE .002		GAPLUS 11/19/84		Bally/MIDWAY MFG. CO. FRANKLIN PARK, IL 60131		REVISIONS	
ASS'Y DRAWING GALAGA3 LOGIC BD. A084-91741-AB86				PART NO MO 51-00886-A-0			



- 1). ALL TTL IC'S ARE 74XX TYPE.
- 2). UNLESS NOTED OTHERWISE, ALL RESISTOR VALUES ARE IN OHMS AND ALL CAPACITORS ARE IN μF .

PROJECT ENG: JERRY SZERSZEN	
DO NOT SCALE DWG	
DIM TOLERANCES UNLESS SPECIFIED	000
DATE: 11-20-84	000



NOTE
 1) ALL TTL IC'S ARE 74XX TYPE.
 2) UNLESS NOTED OTHERWISE, ALL RESISTOR VALUES ARE IN OHMS AND ALL CAPACITORS ARE IN μF .
 3) $\textcircled{M}$ DENOTES POLYESTER FILM CAP.

PROJECT ENG. JERRY SZERSZEN		USED ON		REVISIONS	
DO NOT SCALE DIMS		NO REV'D .3 OF 3		1	
DIM TOLERANCES UNLESS SPECIFIED:		SCHEMATIC DRAWING		PART NO	
FRACTIONAL .125 .250 .375 .500 .750 1.000 1.500 2.000 3.000 4.000 6.000 8.000 10.000 12.000 15.000 20.000 25.000 30.000 40.000 50.000 60.000 70.000 80.000 90.000 100.000		GALAGA 3 LOGIC P.C.		MO51 - 00886 - A006	
DATE 11/20/84		A084-91741-ABB6		Bally / MIDWAY MFG. CO.	
				FRANKLIN, PA. 15035	