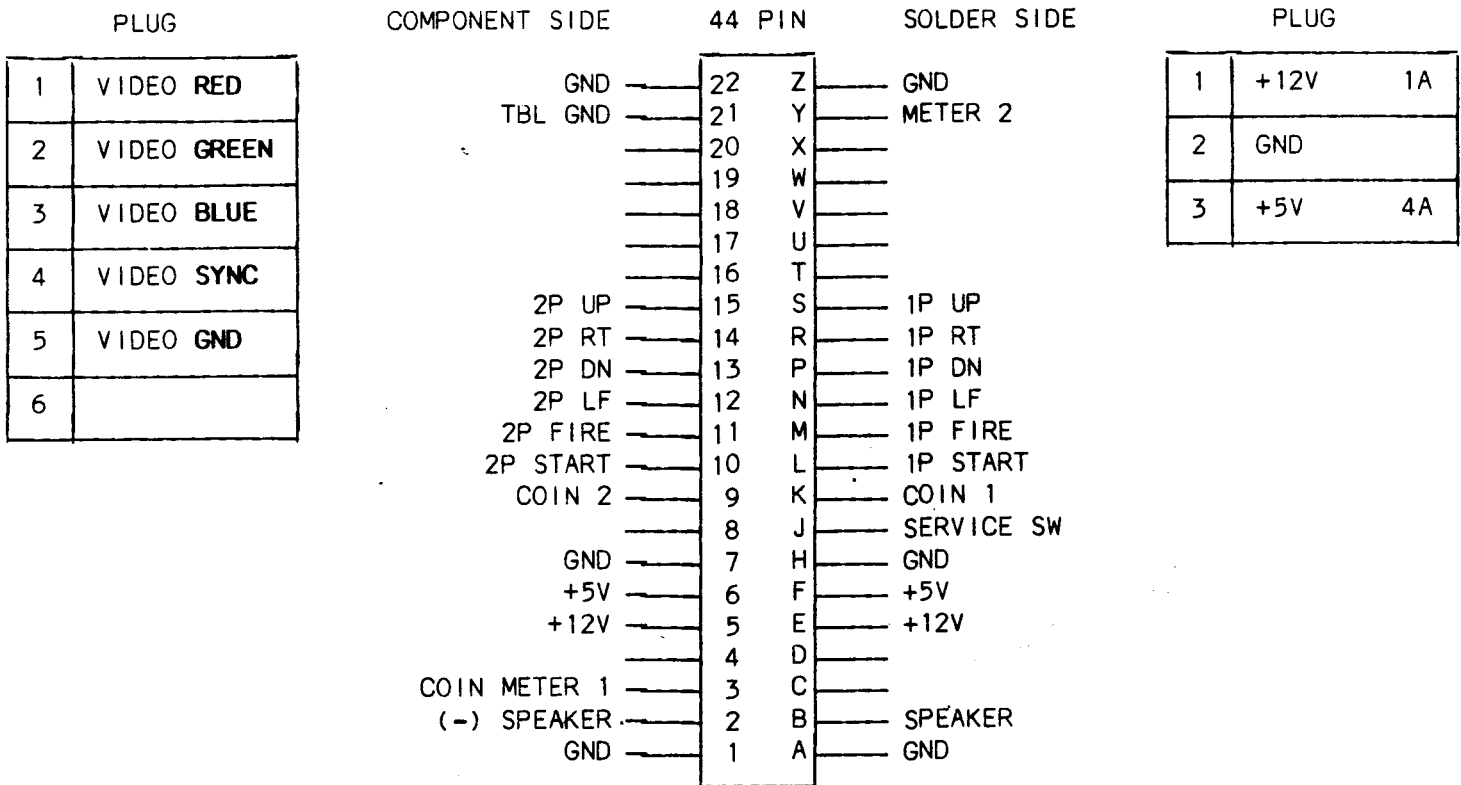


G A L A G A I I I G E N E R I C C O N V E R S I O N K I T

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

OPTION SWITCH SETTINGS - DIP SWITCH "A"

//////////////////////////////////////VARIOUS GAME PLAY OPTIONS//////////////////////////////////////

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

BALLY/MIDWAY'S GALAGA 3

U.R. #0B86

PROGRAMED PART NUMBERS

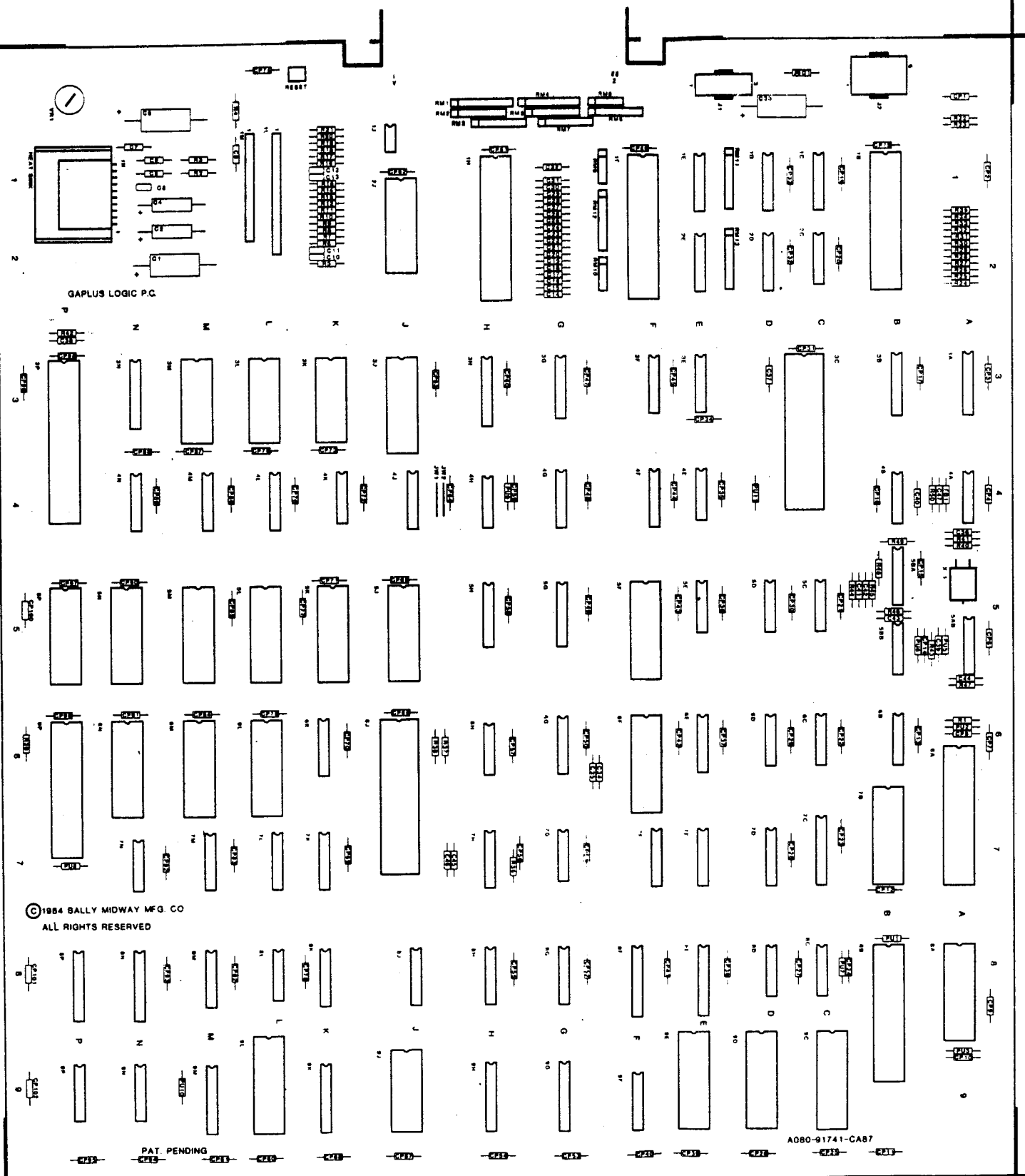
UNPROGRAMED LOGIC BD. A082-91741-BA87
PROGRAMED GALAGA 3 LOGIC BD. A084-91741-BA86

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	

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 6A	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	74LS363
C33	470 UF AX ELEC	IC 6H	74LS32
C34,C35	680 PF AX CER	IC 6I	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	74LS245
CP6-CP102		IC 7F	74LS257
		IC 7G	74LS158
		IC 7H	74LS04
		IC 7I	74LS368
R1	330 OHM 1/4W 5%	IC 7K,7L,7M	74LS157
R2,R3	4.7 OHM 1/4W 5%	IC 7N	74LS74
R4	22K OHM 1/4W 5%	IC 8A	34XX CUSTOM IC
R5	10K OHM 1/4W 5%	IC 8B	68A09E CPU
R6	150K OHM 1/4W 5%	IC 8C	ROM
R7	4.7K OHM 1/4W 5%	IC 8D	74S74
R8	10K OHM 1/4W 5%	IC 8E	74LS00
R9	22K OHM 1/4W 5%	IC 8F	74LS245
R10	4.7K OHM 1/4W 5%	IC 8G	ROM
R11	4.7K OHM 1/4W 5%	IC 8H	74LS375
R12	10K OHM 1/4W 5%	IC 8J	NOT USED
R13	22K OHM 1/4W 5%	IC 8K	NOT USED
R14	4.7K OHM 1/4W 5%	IC 8L	74LS86
R15	150K OHM 1/4W 5%	IC 8M	74LS139
R16	470K 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%		
R31	2.2K OHM 1/4W 5%	IC 1BS	40 PIN IC SOCKET
R32	220 OHM 1/4W 5%	IC 1CS,1DS	16 PIN IC SOCKET
R33	470 OHM 1/4W 5%	IC 1FS,1HS	42 PIN IC SOCKET
R34	1K OHM 1/4W 5%	IC 2DS	16 PIN IC SOCKET
R35	2.2K OHM 1/4W 5%	IC 2JS	28 PIN IC SOCKET
R36	330 OHM 1/4W 5%	IC 3AS,3BS	18 PIN IC SOCKET
R37,R38	470 OHM 1/4W 5%	IC 3CS	64 PIN IC SOCKET
R39	330 OHM 1/4W 5%	IC 3ES	16 PIN IC SOCKET
R40,R41	180 OHM 1/4W 5%	IC 3JS	28 PIN IC SOCKET
R42	240 OHM 1/4W 5%	IC 3KS,3LS,3MS,3PS(x2)	24 PIN IC SOCKET
R43-R46	JUMPER WIRE		
R47-R49	1K OHM 1/4W 5%	IC 4FS	16 PIN IC SOCKET
R50	NOT USED	IC 4ES	28 PIN IC SOCKET
		IC 4GS,4HS	18 PIN IC SOCKET
		IC 4JS,4KS	28 PIN IC SOCKET
PU1-PU3	1K OHM 1/4W 5%	IC 5AS	40 PIN IC SOCKET
PU5-PU11		IC 5BS	28 PIN IC SOCKET
		IC 5CS	64 PIN IC SOCKET
		IC 5DS,5MS,5PS	28 PIN IC SOCKET
		IC 5ES	40 PIN IC SOCKET
		IC 5FS	28 PIN IC SOCKET
		IC 5GS	28 PIN IC SOCKET
		IC 5HS	40 PIN IC SOCKET
		IC 5IS	16 PIN IC SOCKET
		IC 5JS,5PS	28 PIN IC SOCKET
		IC 5LS	24 PIN IC SOCKET
		IC 5MS	28 PIN IC SOCKET
IC 1B	26XX CUSTOM IC		
IC 1C,1D	ROM		
IC 1F	58XX CUSTOM IC		
IC 1H	56XX CUSTOM IC		
IC 1J	OP AMP TL 082		
IC 1K	98XX CUSTOM IC		
IC 1L	99XX CUSTOM IC		
IC 1M	4460 AUDIO AMP		
IC 1N	74LS30		
IC 2C	ROM		
IC 2D	62XX CUSTOM IC		
IC 2J	MB8148L-55 RAM		
IC 3A,3B	29XX CUSTOM IC		
IC 3C	ROM		
IC 3E,3F	2114 RAM		
IC 3G	74LS245		
IC 3H	16XX CUSTOM IC		
IC 3K,3L,3M	MS8725 RAM		
IC 3N	74LS245		
IC 3P	21XX CUSTOM IC		
IC 4A	74LS04		
IC 4B	NOT USED		
IC 4E	74LS20		
IC 4F	ROM		
IC 4G	74LS157		
IC 4H	74LS74		
IC 4J	74LS157		
IC 4K	74LS00		
IC 4L	74LS174		
IC 4M	74LS175		
IC 4N	74LS378		
IC 5AB	74S163		
IC 5BA	74S139		
IC 5BB	74LS86		
IC 5C	74LS04		
IC 5D	74LS08		
IC 5E	74S10		
IC 5F	15XX CUSTOM IC		
IC 5G,5H	MB8148L-55 RAM		



CROSS REFERENCE LIST

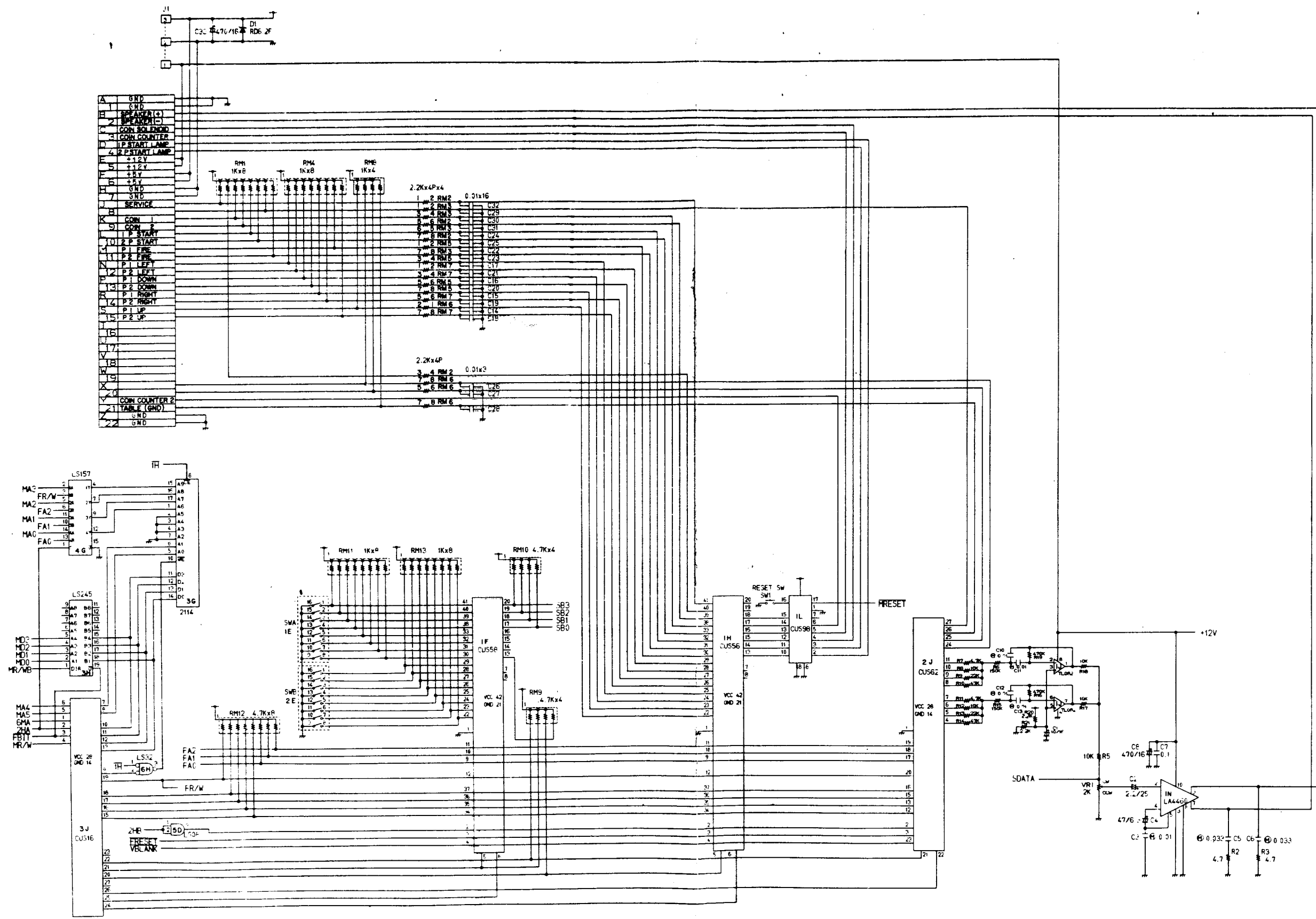
DESCRIPTION	QTY	DESIGNATION NO.	PART NUMBER	DESCRIPTION	QTY	DESIGNATION NO.	PART NUMBER
47 PF AX CER	1	C37	0980-00800-2800	11XX CUSTOM IC	1	5J	0066-018CX-KA
68 PF AX CER	1	C47	0360-00800-0010	15XX CUSTOM IC	1	5F	0066-020CX-KA
100 PF AX CER	10	C36,C38-C46	0A64-00800-0006	16XX CUSTOM IC	1	5J	0066-021CX-KA
580 PF AX CER	2	C34,C35	0358-00800-0002	20XX CUSTOM IC	1	6J	0066-035CX-KA
.01 UF AX CER	19	C14-C32	0353-00800-0001	21XX CUSTOM IC	1	3P	0066-036CX-KA
.01 UF POLY	5	C3,C10-C13	0550-00800-1000	26XX CUSTOM IC	1	1B	0066-037CX-KA
.033 UF POLY	2	C5,C6	0353-00800-0002	29XX CUSTOM IC	1	3C	0066-038CX-KA
.1 UF AX CER	103	C7,C9,CP1-CP4	0508-00800-0900	33XX CUSTOM IC	1	6F	0066-039CX-KA
		CP6-CP102		34XX CUSTOM IC	1	8A	0066-040CX-KA
2.2 UF AX ELEC	1	C1	0353-00800-0005	36XX CUSTOM IC	1	1H	0066-022CX-KA
10 UF AX ELEC	1	C2	0508-00800-1100	58XX CUSTOM IC	1	1F	0066-028CX-KA
47 UF AX ELEC	1	C4	0353-00800-0003	62XX CUSTOM IC	1	2J	0066-041CX-KA
470 UF AX ELEC	2	C8,C33	0550-00800-1300	98XX CUSTOM IC	1	1L	0066-042CX-KA
				99XX CUSTOM IC	1	1M	0066-029CX-KA
4.7 OHM 1/4W 5%	2	R2,R3	100E-00005-0007				
100 OHM 1/4W 5%	1	R23	100E-00005-0033	OP AMP TL 082	1	1J	0333-00803-001
180 OHM 1/4W 5%	2	R40,R41	100E-00005-0039	MB8148L-55 RAM	4	3A,3B,5G,5H	
220 OHM 1/4W 5%	3	R24,R28,R32	100E-00005-0041	MS8725 RAM	3	3K,3L,3M	
240 OHM 1/4W 5%	1	R42	100E-00005-0043	MS8725P RAM	1	9J	
330 OHM 1/4W 5%	3	R1,R36,R39	100E-00005-0047	2114 RAM	1	3G	0508-00803-03
470 OHM 1/4W 5%	5	R25,R29,R33,R37,R38	100E-00005-0051	ROM	20	1C,1D,2D,3E,3F,4F,5K,5L,5M,5N,6L,6M,6N,7B,8B,8N,9C,9D,9E,9L,6A,6P,8B	SEE NOTE
1K OHM 1/4W 5%	17	R22,R26,R30,R34,R27,R49,PU1-PU3,PU5-PU11	100E-00005-0061				
2.2K OHM 1/4W 5%	5	R20,R21,R27,R31,R35	100E-00005-0069	68A09E CPU	3		
4.7K OHM 1/4W 5%	2	R7,R11	100E-00005-0079	24.576 MHZ XTAL	1	X1	109E-00001-001
10K OHM 1/4W 5%	5	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	4	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,5GS,5HS	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,9S	100E-00001-001
74LS00	2	4K,8D	0300-00803-0027	28 PIN IC SOCKET	18	2JS,3JS,5FS,5JS,5KS,5LS,5MS,5NS,6FS,6LS,6MS,6NS,7BS,8AS,9CS,9DS,9ES,9LS	100E-00001-001
74LS04	3	5C,6D,7G	0300-00803-0029				
74S04	1	4A	0304-00803-0011				
74LS08	2	5D,6C	0300-00803-0030				
74S10	1	5E	0A87-00803-0001				
74LS20	2	4E,6B	0300-00803-0052	8 POS DIP SW	2	1E,2E	0300-00804-071
74LS30	1	2C	0304-00803-0016				
74LS32	1	6H	0300-00803-0031	3 PIN AMP CONN	1	J1	0017-00021-041
74LS74	2	4H,7N	0300-00803-0032	6 PIN AMP CONN	1	J2	0017-00021-041
74S74	1	8C	0986-00803-1500				
74LS86	2	5BB,8L	0300-00803-0054	JUMPER WIRE	7	JW1, JW2, R43-R46,FB1	0151-00087-001
74LS139	1	8M	0308-00803-0034				
74S139	1	5BA	0300-00803-5100				
74LS153	1	6P	0986-00803-1000	HEATSINK AUD AMP	1	HEATSINK	0353-00900-001
74LS157	6	4G,4J,6K,7K,7L,7M	0300-00803-0050	MNTG SCRW 4-40X7	2		0017-00101-051
74LS158	1	7F	0300-00803-0049	PAN HD			
74S163	1	5AB	0A87-00803-0002	#4 FLT WASHER	4		0017-00104-001
74LS174	1	4L	0300-00803-0047	4-40 HEX NUTS	2		0017-00103-001
74LS175	1	4M	0304-00803-0025				
74LS245	7	3H,3N,7C,8E,8F,8P,9H	0300-00803-0046	THERMAL CMPD	.001		0017-00009-021
74LS257	2	7D,7E	0316-00803-0002	BLANK PCB	1		A080-91741-CAB7
74LS273	3	9G,9K,9M	0935-00804-1500				
74LS298	1	9N	0316-00803-0019				
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	0066-3738X-KBAX				

NOTE: EPROM CHART IN BACK OF CATALOG.

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A080-91741-CAB7

<p>QTY TOLERANCES UNLESS OTHERWISE SPECIFIED</p> <p>FRACTIONAL .001</p> <p>DECIMAL .005</p> <p>HOLE DIA .002</p> <p>ANGLE .125</p> <p>DO NOT SCALE DWG</p>	<p>GAPLUS</p> <p>11/19/84</p>	<p>Bally/MIDWAY MFG. CO.</p> <p>FRANKLIN PARK, IL 60151</p> <p>ASS'Y DRAWING</p> <p>GALAGA3 LOGIC BD.</p> <p>A084-91741-AB86</p>	<p>REVISIONS</p> <p>NO 51-00886-A-O</p>
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NOTE
 1) ALL TTL IC'S ARE 74XX TYPE.
 2) UNLESS NOTED OTHERWISE, ALL RESISTOR VALUES ARE IN OHMS AND ALL CAPATORS ARE IN μF .
 3) $\text{\textcircled{M}}$ DENOTES POLYESTER FILM CAP.

VERSION CHANGE	7/9/84

PROJECT ENG. JERRY SZERSZEN	USED ON	NO REV'S .3 OF 3	REVISIONS
DO NOT SCALE DWG.			
DWG TOLERANCES UNLESS SPECIFIED:		SCHEMATIC DRAWING	PART NO
DATE 11/20/84		A084-91741-ABB6	FRANKLIN, PA. U.S.A.