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# PRELIMINARY OWNER/OPERATOR'S MANUAL

## GAPLUS

# PRELIMINARY

*Bally*

MIDWAY MFG. CO.

10601 W Belmont Avenue  
Franklin Park, Illinois 60131  
U.S.A.



Phone: (312) 451-9200    Cable Address: MIDCO    Telex No.: 72-1596

PRELIMINARY INSTRUCTIONS  
FOR  
CAPLUS

INSTALLATION

1. Unlock and open the coin box door.
2. Remove four (4) "CABINET LEVELING LEGS" from inside the coin box.
3. Tip the cabinet to the side and remove the shipping cleats from its bottom.
  - ° Locate the threaded holes - one in each corner - and install the "CABINET LEVELING LEGS" in them.
  - ° Level the cabinet.
  - ° When finished, the cabinet should be stable in the upright position.
4. Close and lock the rear access door and plug the game into a **standard** A.C. wall outlet **ONLY**.

----- <b>WARNING</b> ----- Game <b>MUST</b> be properly grounded.
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LINE VOLTAGE SAFETY INTERLOCK SWITCHES

Line voltage SAFETY INTERLOCK SWITCHES have been provided for your protection. The locations of these SAFETY INTERLOCK SWITCHES are:

1. UPRIGHT MODEL:                      Inside the rear of the cabinet at the side of the rear access door.

When the cabinet access door(s) are secured in place, the SAFETY INTERLOCK SWITCH plunger(s) are in a fully depressed condition. The game circuit can function normally.

When any cabinet access door(s) are opened, the SAFETY INTERLOCK SWITCH plunger(s) are in a partially extended condition. This isolates the game circuit from the line voltage.

To restore power to the game circuit with the access door(s) open, gently pull the SAFETY INTERLOCK SWITCH plunger(s) out to the fully extended condition. **THIS IS TO BE USED FOR SERVICING THE GAME ONLY!**

SELF-TEST

A slide switch is provided to make the game run a "Self-Test" on itself. The SELF-TEST SWITCH is located on a mounting bracket just inside the coin door opening.

When in the Self-Test mode, the monitor screen will display the results of certain test functions it has run on itself.

## TO SERVICE THE CONTROL PANEL

### 1. UPRIGHT MODEL:

- ° The control panel is held in place by three latches, one on the left side, one on the right side, and one in the center of the front of the cabinet.

They are spring loaded to provide constant positive pressure on their latch plates.

They can be reached through the coin door AFTER turning power to the game off.

To release the latches, lift up and toward the center of the control panel.

Once they are released, unhook them from their latch plates.

- ° To remove the control panel:

Cradling the control panel between yourself and the cabinet, disconnect it from its cabling and any miscellaneous hardware.

The control panel is now free and can be removed.

- ° To reinstall the control panel, reverse this procedure.

## REMOVAL OF THE MAIN-DISPLAY-GLASS AND/OR THE T.V. BEZEL ASSEMBLY

### 1. UPRIGHT MODEL:

NOTE: In order to do this, the control panel **MUST** be removed first. See the "UPRIGHT MODEL" procedure.

- ° **Turn the power to the game off** and remove the control panel. This frees the main-display-glass so it can be lifted up.
- ° By putting your finger in the hole in the middle of the main-display-glass support, you can lift it up and out.
- ° Loosen the screws which secure the T.V. bezel-glass-clamps in place.

Move the clamps to the side and the bezel glass may be removed.

Remove the bezel securing screws and the bezel with four bezel-glass-clamps may be removed.

- ° To reinstall the T.V. bezel assembly and the main-display-glass, reverse this procedure.

## VOLUME CONTROL POT

The volume control pot is located on the games Logic P.C. Board in the back of the game cabinet. For adjustment, it may be reached through the games rear access door.

To make the sounds louder, turn the pot clockwise as you face it.

To make the sounds less loud, turn the pot counterclockwise as you face it.

### CAUTION

- ° Be sure to check the PC Board for any foreign particles i.e. dust, etc.. Foreign particles on the PC Board are one of the main causes of the PC Board malfunctions.
- ° When in doubt as to the cause of any particular problem, **ALWAYS** take the PC Board to your distributor for repair. DO NOT attempt to repair the PC Board yourself by using a volt-ohm meter or other testing equipment.
- ° When transporting the PC Board, be sure to pack the board carefully with air caps, sponge or other packing materials.

### PC BOARD

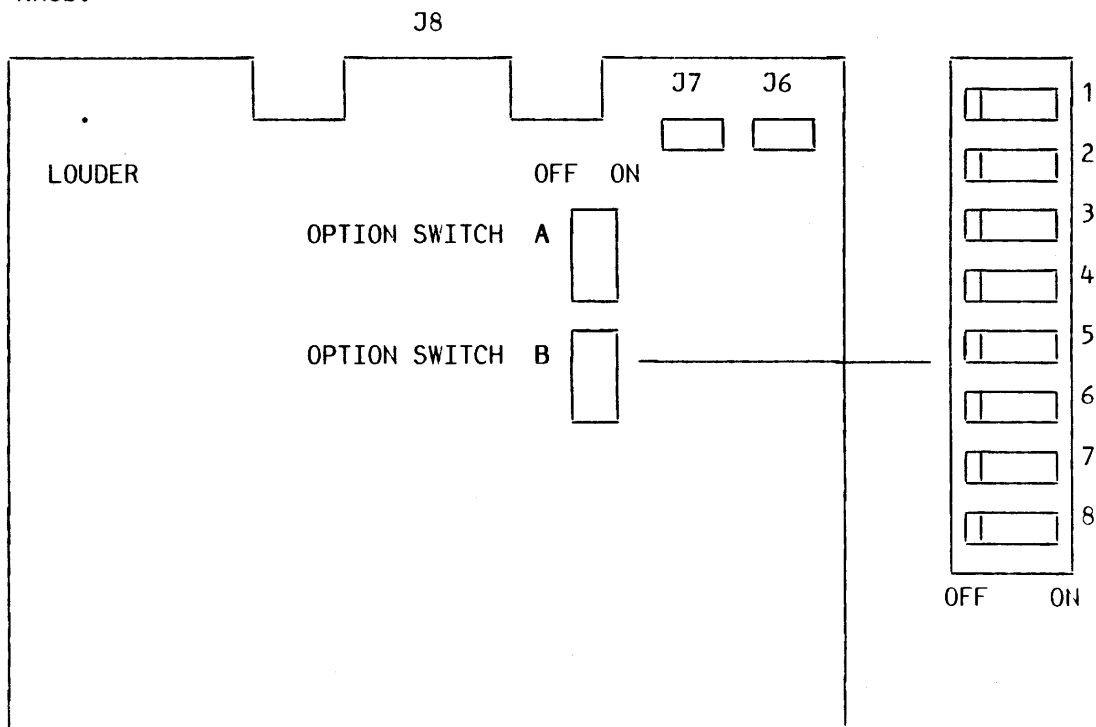
- ° Option Switches:

The game fee, bonus points, etc. are operator-adjustable. See the Option Switch Settings Table.

To perform the Self-Test, use the test switch located on the bracket just inside your games coin door.

- ° Volume:

Adjust the game volume as desired. **DO NOT** place any unnecessary pressure on the volume control knob.



## SELF-TEST

The Self-Test mode is a special mode for checking game switches and computer functions. It is the easiest and best way to check for proper operation of the entire game.

You may begin a Self-Test at any time after the power to the game is on by sliding the Self-Test switch to the "ON" position. Now that the game is in the Self-Test mode, it will act as follows:

- ° The Self Test will take about five (5) seconds to perform. The following check list will appear on the screen.

RAM OK	_____	A.
ROM OK	_____	B.
I/O OK	_____	C.
1ST 1 COIN 1 CREDIT	_____(COIN 1)_____	D.*
2ND 1 COIN 1 CREDIT	_____(COIN 2)_____	D.*
MYSHIP 3	_____	E.*
RANK 0	_____	F.
UPRIGHT	_____	G.
SOUND 00	_____	H.
1ST BONUS	50000 PTS _____	I.*
2ND BONUS	150000 PTS _____	I.*
EVERY BONUS	150000 PTS _____	I.*

- A. RAM Test: If "OK" appears, RAM is normal.
  - B. ROM Test: If "OK" appears, ROM is normal.
  - C. I/O Test: If "OK" appears, I/O is normal.
  - D. Game Fee Indicator: If 1 coin/1 game appears, the game fee is normal.
  - E. Number of Fighters: If "3" appears, the number of Fighters is normal.
  - F. Rank: If "0" appears, rank is normal.
  - G. Table Specification: If "TABLE" appears for the Cocktail Table model and for the Upright Model, "UPRIGHT" appears, model specification is normal.
  - H. Sound Test: A sound should appear when the control lever, firing button and the start button is pushed.
  - I. Bonus Points: This game has been set for the first 50,000 points, then 150,000 points and for every 150,000 points thereafter.
- \* By using the OPTION SWITCH; "D", "E", and "I" are operator-adjustable.

When finished with the Self-Test mode, slide the Self-Test switch back to the "OFF" position and normal game functions will now return to the monitor screen.

#### CROSS HATCH PATTERN

Turn "ON" the Self-Test switch, push the Service button, and a cross hatch pattern will appear. Push the button one more time and the Self-Test mode will appear. Use this pattern when making adjustments to the monitor.

#### ADJUSTING GAME FEE, BONUS POINTS, ETC.

This is accomplished by using the various switches located on the games Logic P.C. Board. See the OPTION SWITCH SETTINGS tables and switch location information in this instruction sheet.

Turn the power switch "OFF" and then proceed to set the Option Switches.

After setting the option switches, again perform the Self-Test.

**The settings of these switches are only read by the game on "POWER-UP".**

G A P L U S												
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					SW#1	SW#2	SW#3	SW#4	SW#5	SW#6	SW#7	SW#8
*	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					SW#1	SW#2	SW#3	SW#4	SW#5	SW#6	SW#7	SW#8
*	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					SW#1	SW#2	SW#3	SW#4	SW#5	SW#6	SW#7	SW#8
*	SOUND IN ATTRACT MODE								OFF	OFF		
	NO SOUND IN ATTRACT MODE								ON	OFF		
COIN #2 - NUMBER OF COINS PER CREDIT					SW#1	SW#2	SW#3	SW#4	SW#5	SW#6	SW#7	SW#8
*	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. M051-00A87-B007			



G A P L U S									
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   "B"									
///VARIOUS GAME PLAY OPTIONS///									
SELF-TEST MODE					SW#1	SW#2	SW#3	SW#4	SW#5 SW#6 SW#7 SW#8
*        NORMAL TEST					OFF ON				
"RANK" = DIFFICULTY LEVEL OF PLAY					SW#1	SW#2	SW#3	SW#4	SW#5 SW#6 SW#7 SW#8
EASIEST LEVEL OF PLAY 1 * 0 STANDARD LEVEL OF PLAY PROGRESSIVELY        2 3 4 5 6 7					OFF	OFF	ON		
					OFF	OFF	OFF		
					OFF	ON	OFF		
					OFF	ON	ON		
					ON	OFF	OFF		
					ON	OFF	ON		
					ON	ON	OFF		
					ON	ON	ON		
**        ROUND ADVANCE					SW#1	SW#2	SW#3	SW#4	SW#5 SW#6 SW#7 SW#8
*        NORMAL ADVANCE					OFF ON				
BONUS SHIPS AWARDED AT:					SW#1	SW#2	SW#3	SW#4	SW#5 SW#6 SW#7 SW#8
1st @ 100,000; 2nd @ 300,000 & every 600,000									OFF OFF OFF
1st @ 150,000; 2nd @ 400,000									OFF OFF ON
1st @ 150,000; 2nd @ 400,000 & every 900,000									OFF ON OFF
1st @ 100,000; 2nd @ 300,000 & every 300,000									OFF ON ON
1st @ 50,000; 2nd @ 200,000 & every 300,000									ON OFF OFF
1st @ 50,000; 2nd @ 150,000 & every 600,000									ON OFF ON
1st @ 50,000; 2nd @ 150,000 & every 300,000									ON ON OFF
* 1st @ 30,000; 2nd @ 150,000 & every 600,000									ON ON ON
** BY TURNING "ON" THE OPTION SWITCH WHILE "PARSEC" IS BEING INDICATED ON THE SCREEN, YOU CAN ADVANCE THROUGH THE "ROUNDS". PUSH THE ONE PLAYER CONTROL LEVER FORWARD (PLAYER NUMBER ONE UP SWITCH IS "ON") TO INDICATE THE NUMBER. THE INDICATED ROUND NUMBER WILL APPEAR ON THE MONITOR SCREEN WHEN THE OPTION SWITCH IS TURNED "OFF".									
* INDICATES FACTORY RECOMMENDED SETTINGS							PART NO. M051-00A87-B007		

THIS TAG TO BE TYPESET AND REPRODUCED IN BLACK INK ON HEAVY WHITE 8" x 11" CARD STOCK

TOLERANCE =  $\pm 1/2"$

## GAME PLAY

With the eight-way joystick, maneuver your fighter and fire your missiles using the firing button to shoot down "GAPLUS".

"GAPLUS" comes in different varieties. Depending upon the variety and the flight pattern, the number of points received will vary. Also, when "GAPLUS" is in formation, the number of points received will vary. The following indicates the number of points each "GAPLUS" is worth at different times.

	When in Formation	When Attacking
(a) Queen Gaplus	100	400
(b) Ad Gaplus	100	400
(c) Cap Gaplus	100	300
(d) Lute Gaplus	100	200
(e) Zako Gaplus	100	100

Destroy all "GAPLUSES" and the round will clear. The "QUEEN GAPLUS" possesses the BLASTER HEAD. When the QUEEN GAPLUS is shot down, the Blaster Head will connect onto the player's fighter enabling it to power up!!!

### ° PHALANX ATTACK:

The tractor beam will swallow up the enemy and reform them to the good side as your fighter's ally. Result...multi-missile attacking capability.

### ° HYPER ATTACK:

Moving at lightening speed, the player's fighter will fire off missiles in the multiples of two.

### ° CYCLONE ATTACK:

The cyclone beam will draw in the enemy and smash them apart!!! Points received will double each time, 200, 400,... 6,400!

When throwing off his beam, the player's fighter can only move right and left. Also, when the Blaster Head is mounted onto the fighter's plane, he will become invincible.

When the Blaster Head is connected onto the Queen Gaplus and it is hit once, the Queen will change colors. You must hit it one more time to destroy the Queen.

### Challenging Stage:

- ° The Challenging Stages are in Rounds 3, 8, 13, 18, .... During this stage, the enemy will continually fly about the screen. At the top of the screen, Gaplus will form a letter or a bar across the screen. When all the Gapluses leave the screen, the following bonus points are given.
- ° The number of Gapluses to form a letter x 100
- ° The number of Gapluses to form a bar x 200

Also, if the letters are completed, the following

- ° "B O N U S" --- Bonus points of 10,000
- ° "G A P L U S" --- Bonus points of 0 - 5,000  
(Push the firing button to stop the rotating number located under your total score and then your grand total will appear.)
- ° "D O U B L E" --- Bonus points will double.
- ° "T R I P L E" --- Bonus points will triple.

### Star Flash:

- ° A flash will appear on the screen and at the same time a star will appear attacking the player's fighter. When the star approaches the fighter, it will split up into four parts. The fighter must fire his missiles at all four parts.

### "Bean Curd" (Tofu) Attack:

- ° When Gaplus peels off from the formation and is hit, his ghost (looking like a Bean Curd) will fall from the sky. The fighter must shoot it down.

If the player's fighter is touched by: Gaplus, missiles, star flash or the bean curd; it is a miss. The Blaster Head will disintegrate when a miss is made.

During the Phalanx Attack when Gaplus has become the fighter's ally, if Gaplus is touched by a missile or bean curd it is not a miss.

As bonus points are added up, a bonus ship will be awarded. The Queen Gaplus will bring down parts of the fighter's plane (three in all). When all three are put together, one bonus ship is added on.

The Best players to date can enter their initials on the screen by using the joystick to select a letter and then pushing the FIRE button.

**BALLY/MIDWAY'S GAPLUS**  
**U.R. #0A87**  
**PROGRAMED PART NUMBERS**

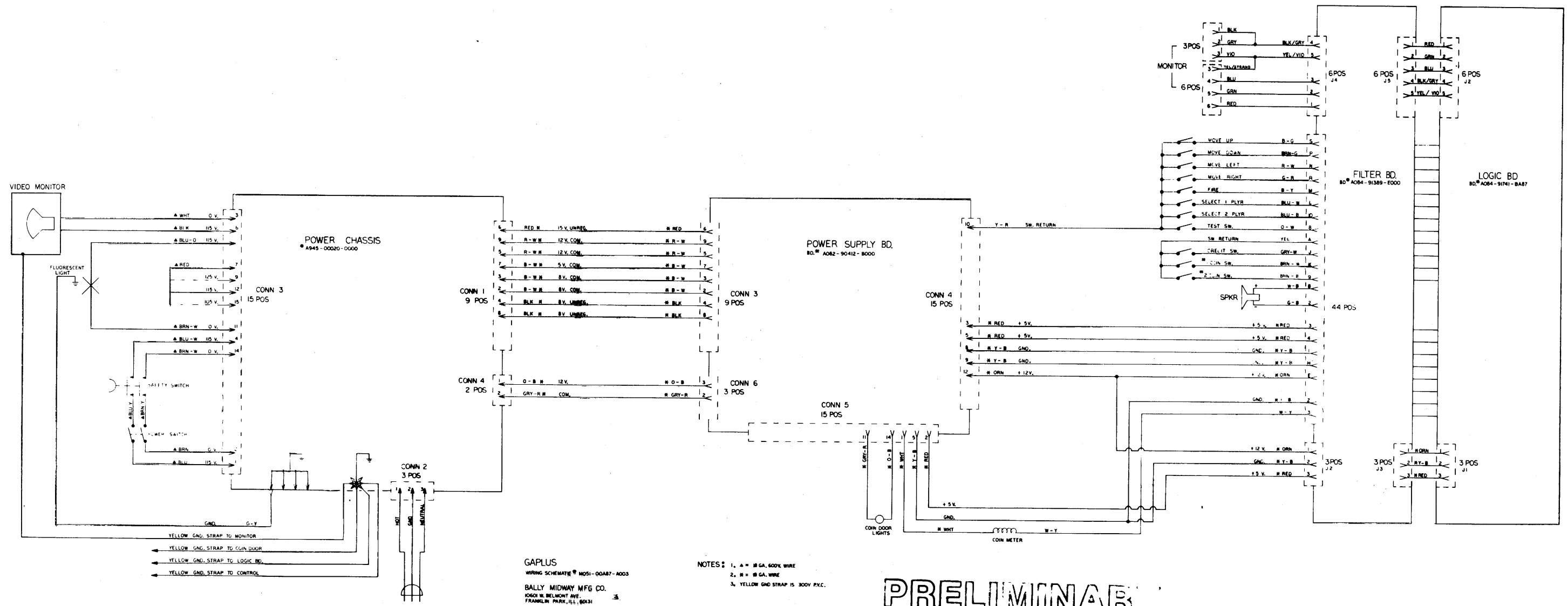
**UNPROGRAMED LOGIC BD. A082-91741-BA87**  
**PROGRAMED GAPLUS LOGIC BD. A084-91741-BA87**

POS.	MIDWAY PART NUMBER
8N	0A87-00803-0003
3E	0A87-00803-0004
3F	0A87-00803-0005
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	0A87-00803-0015
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

**PRELIMINARY**

6/29/84	RELEASE FOR PRODUCTION	

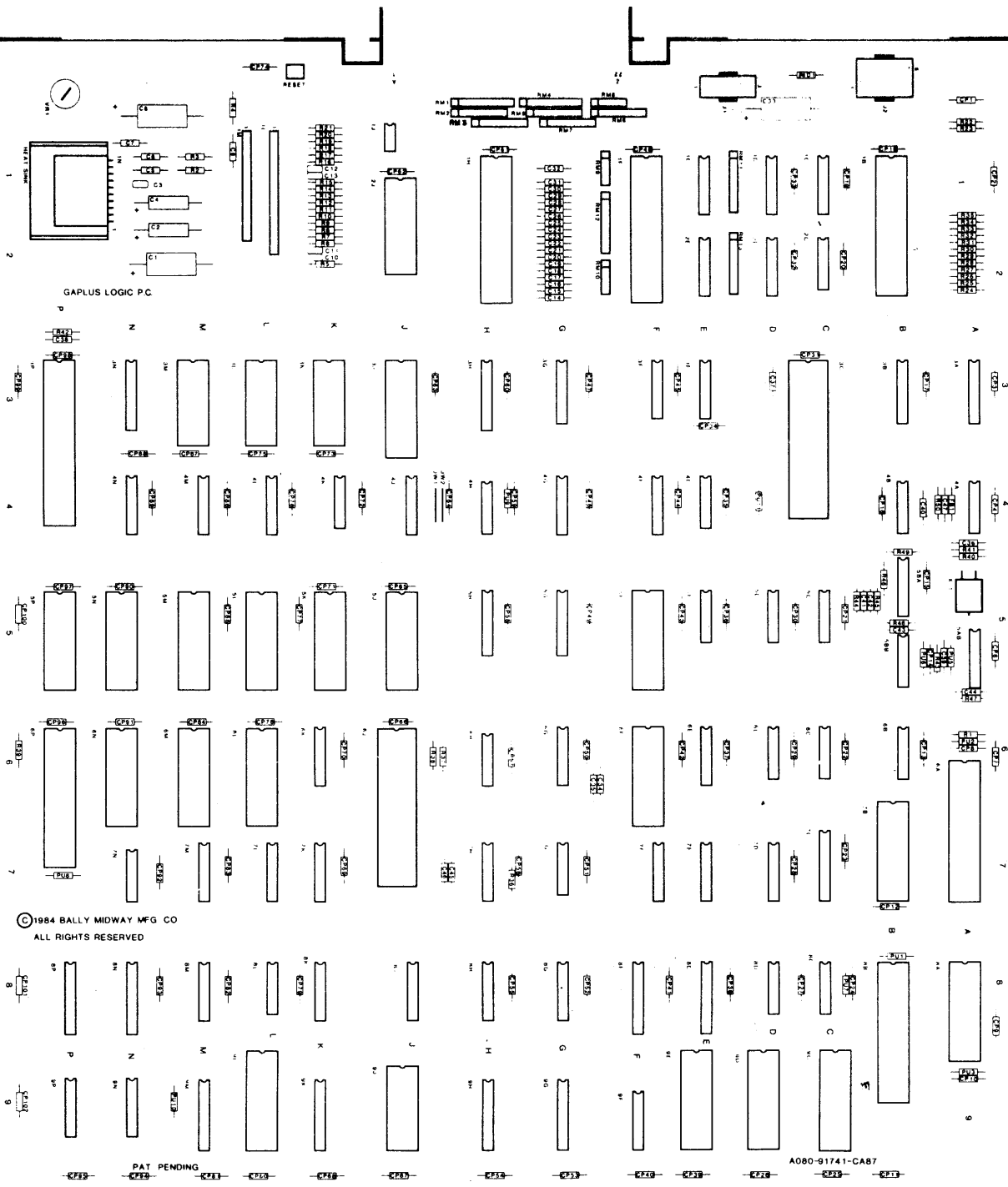
**M051-00A87-A008**



# PRELIMINARY

# DESIGNATION LIST

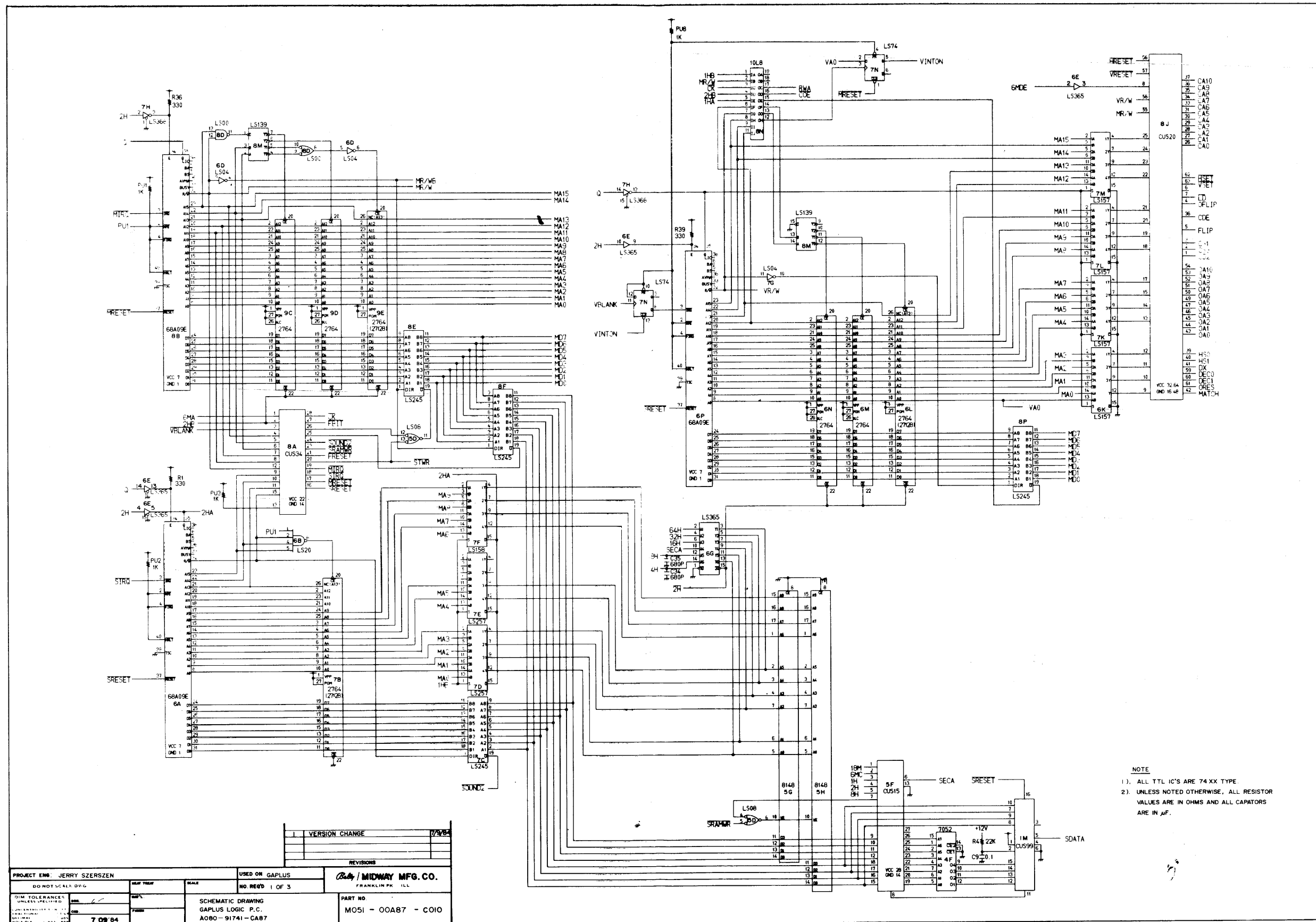
DESIGNATION NO.	DESCRIPTION	DESIGNATION NO.	DESCRIPTION
C1	10 UF AX CER	IC 5J	11XX CUSTOM IC
C2	2.2 UF AX CER	IC 5K,5L,5M,5N	ROM
C3	.01 UF AX CER	IC 5P	NOT USED
C4	47 UF AX ELEC	IC 6A	68A09E CPU
C5,C6	.033 UF POLY	IC 6B	74LS20
C7	.1 UF AX CER	IC 6C	74LS08
C8	470 UF AX ELEC	IC 6D	74LS04
C9	.1 UF AX CER	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	480 PF AX CER	IC 6J	20XX CUSTOM IC
C36	100 PF AX CER	IC 6K	74LS157
C37	47 PF AX CER	IC 6L,6M,6N	ROM
C38-C46	100 PF AX CER	IC 6P	68A09E CPU
C47	68 PF AX CER	IC 7B	ROM
CP1-CP4	.1 UF AX CER	IC 7D,7E	74LS245
CP6-CP102		IC 7F	74LS158
		IC 7G	74LS04
R1	330 OHM 1/4W 5%	IC 7H	74LS368
R2,R3	4.7K OHM 1/4W 5%	IC 7J,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	42K OHM 1/4W 5%	IC 8E,8F	74LS245
R10	47K 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	47K 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	M58725P 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	1K OHM 1/4W 5%	IC 9N	74LS298
R29	470 OHM 1/4W 5%	IC 9P	74LS153
R30	220 OHM 1/4W 5%		
R31	2.2K OHM 1/4W 5%	IC5 1BS	40 PIN IC SOCKET
R32	1K OHM 1/4W 5%	IC5 1CS,1DS	16 PIN IC SOCKET
R33	470 OHM 1/4W 5%	IC5 1FS,1HS	42 PIN IC SOCKET
R34	220 OHM 1/4W 5%	IC5 2DS	16 PIN IC SOCKET
R35	2.2K OHM 1/4W 5%	IC5 2JS	28 PIN IC SOCKET
R36	330 OHM 1/4W 5%	IC5 3AS,3BS	18 PIN IC SOCKET
R37,R38	470 OHM 1/4W 5%	IC5 3CS	64 PIN IC SOCKET
R39	330 OHM 1/4W 5%	IC5 3ES	16 PIN IC SOCKET
R40,R41	180 OHM 1/4W 5%	IC5 3JS	28 PIN IC SOCKET
R42	240 OHM 1/4W 5%	IC5 3KS,3LS	24 PIN IC SOCKET
R43-R46	JUMPER WIRE	IC5 3MS,3PS(X2)	
R47-R49	1K OHM 1/4W 5%	IC5 4FS	16 PIN IC SOCKET
R50	NOT USED	IC5 5FS	28 PIN IC SOCKET
PUI-PUS	1K OHM 1/4W 5%	IC5 5GS,5HS	18 PIN IC SOCKET
PUS-PUI1		IC5 5JS,5KS	28 PIN IC SOCKET
		IC5 5LS,5MS,5NS	
RM8	1K OHM 5 PIN SIP	IC5 6AS	40 PIN IC SOCKET
RM1,4,11,13	1K OHM 3 PIN SIP	IC5 6FS	28 PIN IC SOCKET
RM2,3,5,6,7	2.2K OHM 8 PIN SIP	IC5 6JS	64 PIN IC SOCKET
RM9,RM10	4.7K OHM 6 PIN SIP	IC5 6LS,6MS	28 PIN IC SOCKET
RM12	4.7K OHM 9 PIN SIP	IC5 6NS	
		IC5 6PS	40 PIN IC SOCKET
IC 1B	26XX CUSTOM IC	IC5 7BS	28 PIN IC SOCKET
IC 1C,1D	ROM	IC5 8BS	40 PIN IC SOCKET
IC 1F	58XX CUSTOM IC	IC5 8GS	16 PIN IC SOCKET
IC 1H	56XX CUSTOM IC	IC5 8NS	20 PIN IC SOCKET
IC 1J	OP AMP TL 082	IC5 9CS,9DS	28 PIN IC SOCKET
IC 1L	98XX CUSTOM IC	IC5 9ES	
IC 1M	99XX CUSTOM IC	IC5 9JS	24 PIN IC SOCKET
IC 1N	4400 AUDIO AMP	IC5 9LS	28 PIN IC SOCKET
IC 2C	74LS30		
IC 2D	ROM	X1	24.576 MHZ XTAL
IC 2J	62XX CUSTOM IC	1E	8 POS DIP SW
IC 3A,3B	M58148L-55 RAM	2E	8 POS DIP SW
IC 3C	29XX CUSTOM IC		
IC 3E,3F	ROM	JW1,JW2	JUMPER WIRE
IC 3G	2114 RAM	J1	3 PIN AMP CONN
IC 3H	74LS245	J2	6 PIN AMP CONN
IC 3J	16XX CUSTOM IC		
IC 3K,3L,3M	M58725P RAM		
IC 3N	74LS245		
IC 3P	21XX CUSTOM IC	VR1	2K OHM POT
IC 4A	74LS04	D1	ZENER DIODE 6.2V
IC 4B	NOT USED	FB1	JUMPER WIRE
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 5A8	74S163		
IC 5B	74S139		
IC 5B8	74LS86		
IC 5C	74LS04		
IC 5D	74LS08		
IC 5E	74LS10		
IC 5F	15XX CUSTOM IC		
IC 5G,5H	M58148L-55 RAM		

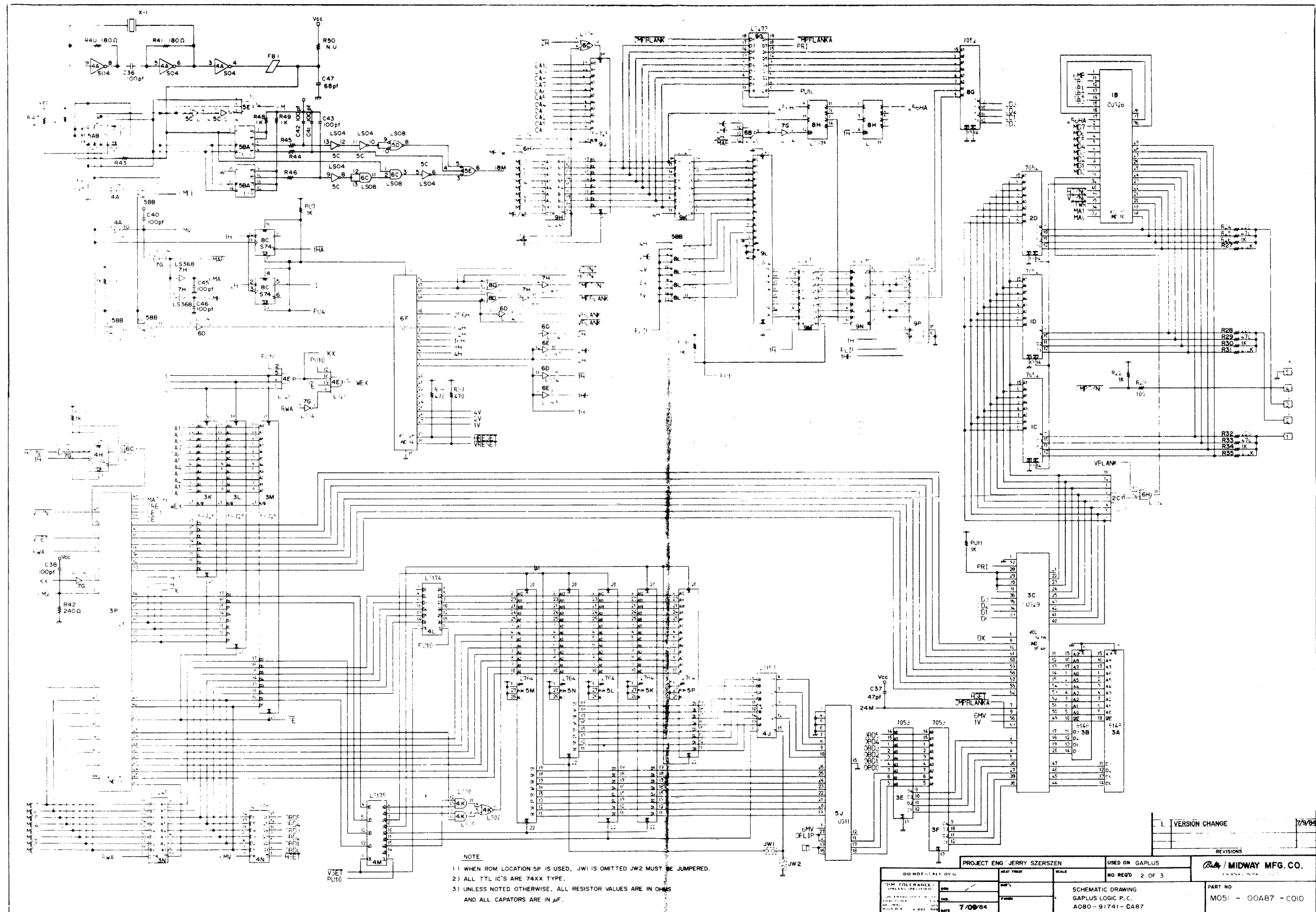


# CROSS REFERENCE LIST

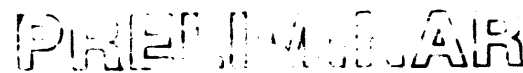
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68 PF AX CER	1	C47	0360-00800-0010	15XX CUSTOM IC	1	5F	0066-020CX-XAPX
100 PF AX CER	10	C36,C38-C46	0A64-00800-0006	16XX CUSTOM IC	1	5J	0066-021CX-XAPX
680 PF AX CER	2	C34,C35	0358-00800-0002	20XX CUSTOM IC	1	6J	0066-035CX-XAPX
.01 UF AX CER	19	C14-C32	0353-00800-0001	21XX CUSTOM IC	1	3P	0066-036CX-XAPX
.01 UF POLY	5	C5,C10-C13	0550-00800-1000	26XX CUSTOM IC	1	1B	0066-037CX-XAPX
.033 UF POLY	2	C5,C6	0353-00800-0002	29XX CUSTOM IC	1	3C	0066-038CX-XAPX
.1 UF AX CER	103	C7,C9,CP1-CP4	0508-00800-0900	33XX CUSTOM IC	1	6F	0066-039CX-XAPX
		CP6-CP102		34XX CUSTOM IC	1	8A	0066-040CX-XAPX
2.2 UF AX ELEC	1	C2	0353-00800-0005	56XX CUSTOM IC	1	1H	0066-022CX-XAPX
10 UF AX ELEC	1	C1	0508-00800-1100	58XX CUSTOM IC	1	1F	0066-028CX-XAPX
47 UF AX ELEC	1	C4	0353-00800-0003	62XX CUSTOM IC	1	2J	0066-041CX-XAPX
470 UF AX ELEC	2	C8,C33	0550-00800-1300	98XX CUSTOM IC	1	1L	0066-042CX-XAPX
				99XX CUSTOM IC	1	1M	0066-029CX-XAPX
4.7 OHM 1/4W 5%	2	R2,R3	100E-00005-0007				
100 OHM 1/4 5%	1	R23	100E-00005-0035				
180 OHM 1/4W 5%	2	R40,R41	100E-00005-0039	OP AMP TL 082	1	1J	0333-00803-0029
220 OHM 1/4W 5%	3	R24,R30,R34	100E-00005-0041	M58148L-55 RAM	4	3A,3B,5G,5H	
240 OHM 1/4W 5%	1	R42	100E-00005-0043	M58725P RAM	3	3K,3L,3M	
330 OHM 1/4W 5%	3	R1,R36,R39	100E-00005-0047		1	9J	
470 OHM 1/4W 5%	5	R25,R29,R33,R37,R38	100E-00005-0051	2114 RAM	1	3G	0508-00803-0300
1K OHM 1/4W 5%	17	R22,R26,R28,R32,R47-R49,PUI-PUS,PUS-PUI1	100E-00005-0061	ROM	15	1C,1D,2D,3E,3F,4F,5K,5L,5M,5N,6L,6M,6N,7B,8G,8N,9C,9D,9E,9I,6A,6P,8B	SEE NOTE
2.2K OHM 1/4W 5%	5	R20,R21,R27,R31,R35	100F-00005-0069	68A09E CPU	3		
4.7K OHM 1/4W 5%	2	R7,R11	100E-00005-0079	24.576 MHZ XTAL	1	X1	109E-00001-0020
10K OHM 1/4W 5%	5	R5,R8,R12,R17	100E-00005-0088				
22K OHM 1/4W 5%	3	R4,R9,R13	100E-00005-0096				
47K OHM 1/4W 5%	2	R10,R14	100E-00005-0106				
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-00001-0013
1K OHM 9 PIN SIP	4	RM1,4,11,13	102E-00004-0011	40 PIN IC SOCKET	4	1BS,6AS,6PS,8BS	100E-00001-0011
2.2K OHM 8 PIN SIP	5	RM2,3,5,6,7	102E-00004-0042	64 PIN IC SOCKET	2	3CS,4JS	100E-00001-0019
4.7K OHM 6 PIN SIP	2	RM9,RM10	102E-00004-0027	16 PIN IC SOCKET	7	1CS,1DS,2DS,3ES,3FS,4FS,8GS	100E-00001-0003
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-00001-0004
ZENER DIODE 6.2V	1	D1	103E-00001-0011	20 PIN IC SOCKET	1	8NS	100E-00001-0005
				24 PIN IC SOCKET	6	3KS,3LS,3MS,9JS,3PS	100E-00001-0007
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-00001-0010
74LS04	3	5C,6D,7G	0300-00803-0029				
74S04	1	4A	0304-00803-0011				
74LS08	2	5D,6C	0300-00803-0030				
74LS10	1	5E	0A87-00803-0001	8 POS DIP SW	2	1E,2E	0300-00804-0700
74LS20	2	4E,6B	0300-00803-0052				
74LS30	1	2C	0304-00803-0016	3 PIN AMP CONN	1	J1	0017-00021-0443
74LS32	1	6H	0300-00803-0031	6 PIN AMP CONN	1	J2	0017-00021-0424
74LS74	2	4H,7N	0300-00803-0032				
74LS74	1	8C	0986-00803-1500	JUMPER WIRE	7	JW1,JW2,R43-R46,FB1	0151-00087-0000
74LS86	2	5BB,8L	0300-00803-0054				
74LS139	1	8M	0508-00803-0084				
74S139	1	5BA	0300-00803-5100	HEATSINK AUD AMP	1		0353-00900-0000
74LS153	1	9P	0986-00803-1000				
74LS157	6	4E,4J,6K,7K,7L,7M	0300-00803-0050	MNTG SCRW 4-40x7 PAN HD	2		0017-00101-0511
74LS158	1	7F	0300-00803-0049				
74S163	1	5AB	0A87-00803-0002	#4 FLT WASHER	4		0017-00104-0092
74LS174	1	4L	0300-00803-0047	4-40 HEX NUTS	2		0017-00103-0093
74LS175	1	4M	0304-00803-0025				
74LS245	7	3H,3N,7C,8E,8F,8P,9H	0300-00803-0046	THERMAL CMPD	.001		0017-00009-0204
74LS257	2	7D,7E	0316-00803-0002				
74LS273	3	9G,9K,9M	0935-00804-1500	BLANK PCB	1		A080-91741-CA87
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-YBAX				

DIM TOLERANCES UNLESS OTHERWISE SPEC CONCENTRICITY ± .002 FRACTIONAL DECIMAL HOLE DIA ANGLE DO NOT SCALE DWG	GAPLUS 7/10/84 ASS'Y DRAWING GAPLUS LOGIC P.C. A084-91741-CA87	BALLY MIDWAY MFG CO. FRANKLIN PARK, IL 60131 PART NO M051-00A87-C009	REVISIONS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
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- 1) ALL TTL IC'S ARE 74XX TYPE.
- 2) UNLESS NOTED OTHERWISE, ALL RESISTOR VALUES ARE IN OHMS AND ALL CAPATORS ARE IN  $\mu F$ .
- 3) (M) DENOTES POLYESTER FILM CAP.

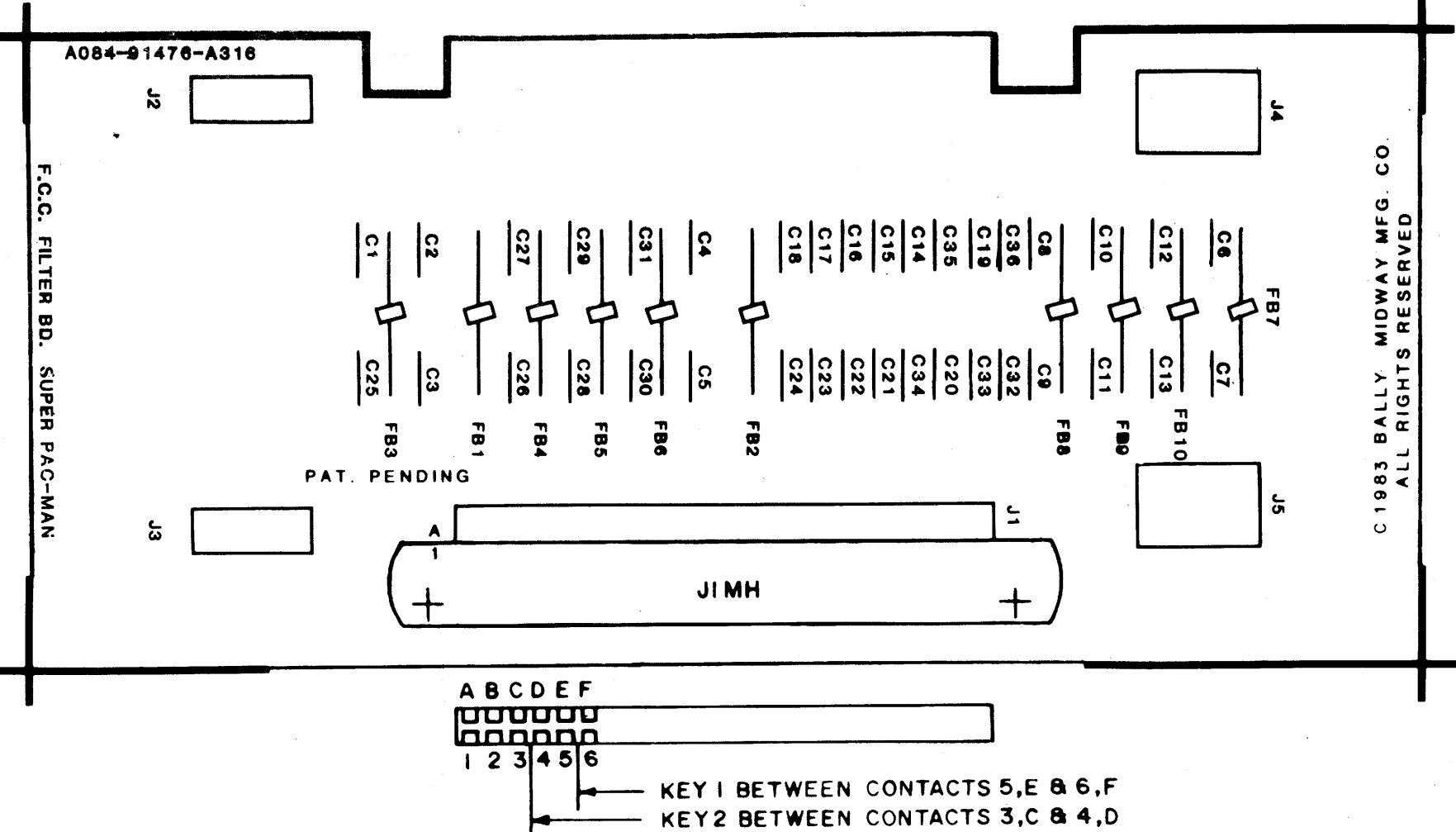
## REVISIONS

*Bally* / MIDWAY MFG. CO.

FRANKLIN PK ILL

PART NO	
M051 - 00A87 - C010	

DESIGNATION NO.	DESCRIPTION
C1 - C5	390pf 50V. AX. CER.
C6, C7	470pf " " "
C8 - C13	100pf " " "
C14-C24	.01µf " " "
C25	390pf " " "
C26-C29	.01µf " " "
C30, C31	390pf " " "
C32-C36	.01µf " " "
FBI - FBIO	FERRITE BEAD
J1	P.C. EDGE CONN.
J2, J3	3 PIN HEADER
J4, J5	6 PIN HEADER
JIMH	(2) P.C. EDGE CONN. KEY
"	(2) 6-32X10 SLOT PAN SCREW
"	(2) WSH. 6 145-.250-.032
"	(1) BRKT. - CONN. FIN.
-	(1) INSULATED GND. STRAP
-	(1) 8-32X5 SLOT PAN SCREW
-	(1) 8-32 NUT HEX
A080-91476-A316	F.C.C. FILTER BD. SUPER PAC-MAN



DESCRIPTION	Q'TY	DESIGNATION NO.	PART NO.
100pf 50V. AX. CER.	6	C8 - C13	0789-00800-1800
390pf " " "	8	C1 - C5, C25, C30, C31	0316-00800-0002
470pf " " "	2	C6, C7	0550-00800-0200
.01µf " " "	20	C14-C24, C26-C29, C32-C36	0550-00800-0300
FERRITE BEAD	10	FBI - FBIO	0316-00804-0002
P.C. EDGE CONN	1	J1	0017-00021-0418
3 PIN HEADER	2	J2, J3	0017-00021-0443
6 PIN HEADER	2	J4, J5	0017-00021-0424
P.C. EDGE CONN. KEY	2	JIMH	0017-00021-0396
6-32X10 SLOT PAN SCREW	2	"	0017-00101-0574

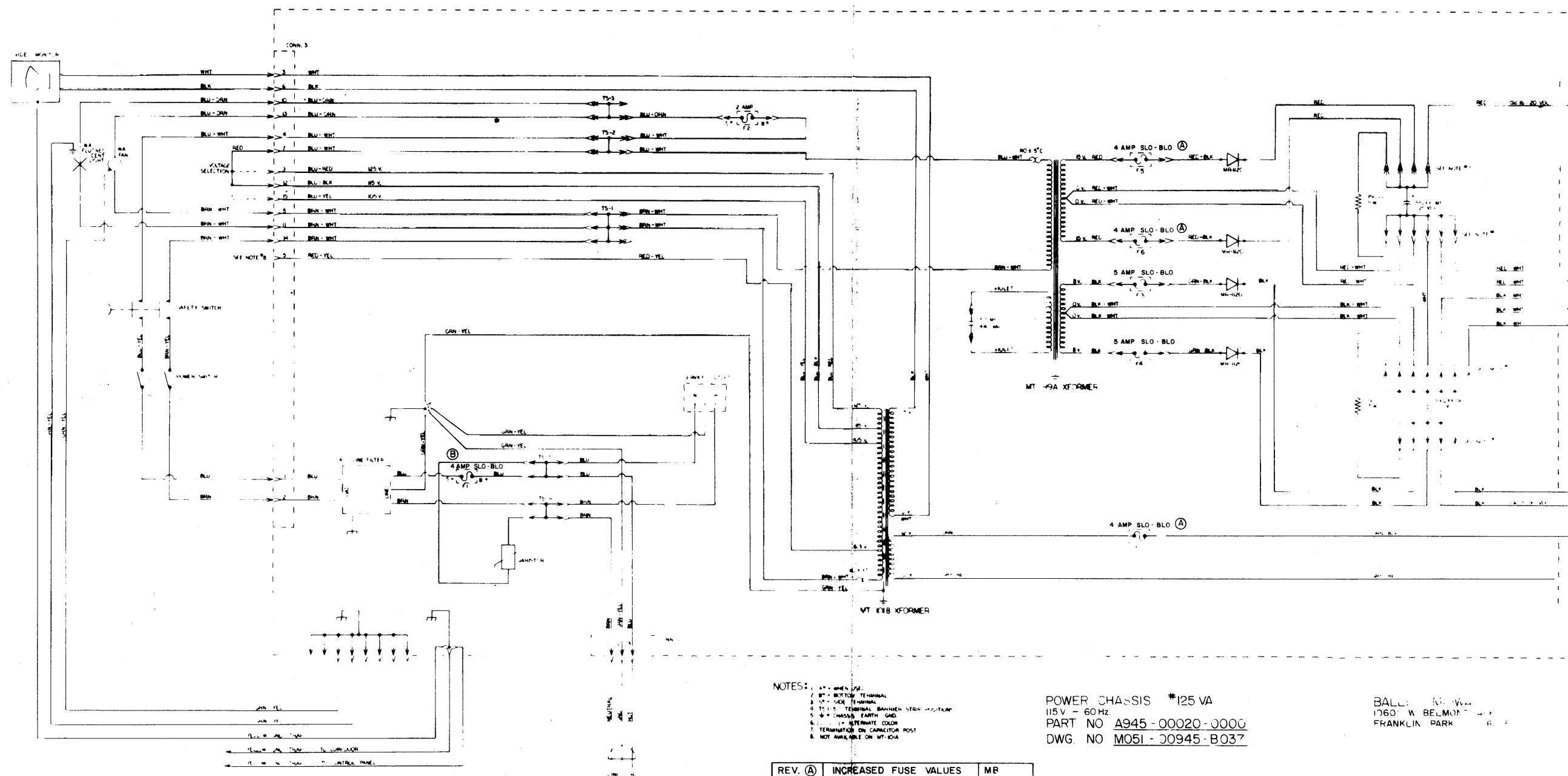
DESCRIPTION	Q'TY	DESIGNATION NO.	PART NO.
WSH. 6 145-.250-.032	2	JIMH	0017-00104-0002
BRKT. - CONN. FIN.	1	"	0866 00118-00XF
INSULATED GND. STRAP	1	-	3000-17143-0700
8-32 X5 SLOT PAN SCREW	1	-	0017-00101-0595
8-32 NUT HEX	1	-	0017-00103-0008
F.C.C. FILTER BD. SUPER PAC-MAN	1	A080-91476-A316	A080-91476-A316

REVISIONS

PROJECT ENG: L. DEKKER			SCALE: FULL		Bally / MIDWAY MFG. CO. FRANKLIN, PA.
DO NOT SCALE DIMS			N. R. 1 PER		
DIM. TOLERANCES UNLESS SPECIFIED		DRN. RLW	MATERIAL		PART NO M051 - 00316 - A026
CHECKED BY		CKD.	FINISH		
DATE		02/08/83	ASSEMBLY DRAWING F.C.C. FILTER BD. SUPER PAC-MAN A084 - 91476 - A316		

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- NOTES:
1. WHEN USED
  2. BT - BOTTOM TERMINAL
  3. ST - SIDE TERMINAL
  4. TC - TOP TERMINAL BAKKIN STRIP - 25 TAMP
  5. CH - CHASSIS EARTH GND
  6. AL - ALTERNATE COLOR
  7. TERMINATION ON CAPACITOR POST
  8. NOT AVAILABLE ON MT-104

REV. A	INCREASED FUSE VALUES WAS 3 AMP - NOW 4 AMP ADDED PART NO. (UL)	MR 3-15-83
REV. B	INCREASED FUSE VALUE WAS 3 AMP - NOW 4 AMP	MB 3-24-83

POWER CHASSIS \*125 VA  
115 V - 60 Hz  
PART NO A945-00020-0000  
DWG. NO M051-00945-B037

BALL: 100 VVA  
1760 W BELMONT  
FRANKLIN PARK R.