

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
GAPLUS

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**.

----- WARNING ----- Game MUST be properly grounded.

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

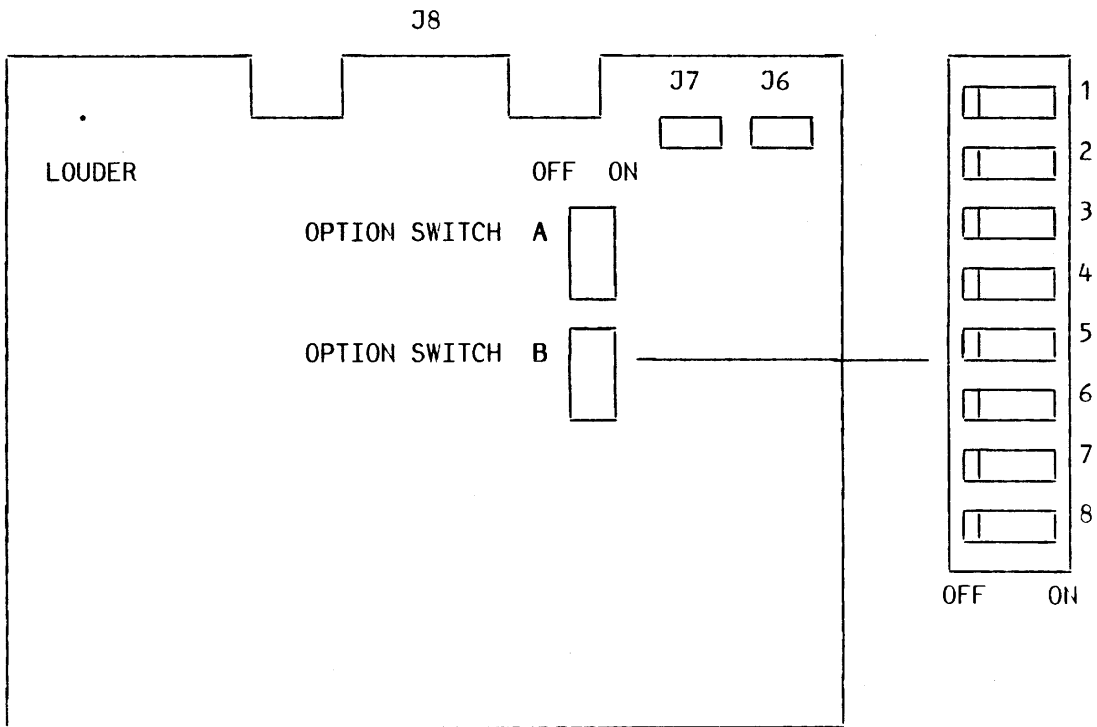
- Option Switches:

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".

<u>G A P L U S</u>												
<u>OPTION SWITCH SETTINGS - DIP SWITCH "A"</u>												
//////////////////////////////////////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. M051-00A87-B007		

G A P L U S

OPTION SWITCH SETTINGS - DIP SWITCH "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							
"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		OFF	OFF	ON					
* 0 STANDARD LEVEL OF PLAY		OFF	OFF	OFF					
PROGRESSIVELY MORE DIFFICULT LEVELS OF PLAY	2	OFF	ON	OFF					
	3	OFF	ON	ON					
	4	ON	OFF	OFF					
	5	ON	OFF	ON					
	6	ON	ON	OFF					
	7	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.

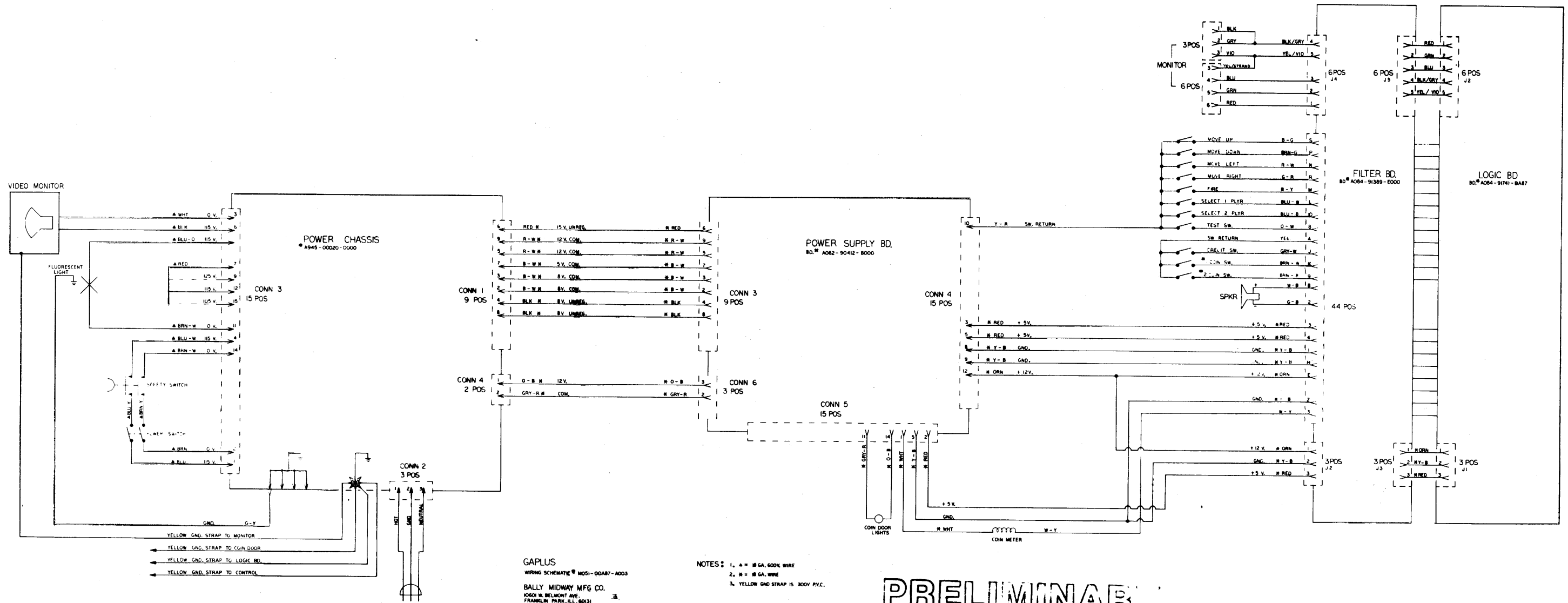
BALLY/MIDWAY'S GAPLUS
U.R. #0A87
PROGRAMED PART NUMBERS

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	



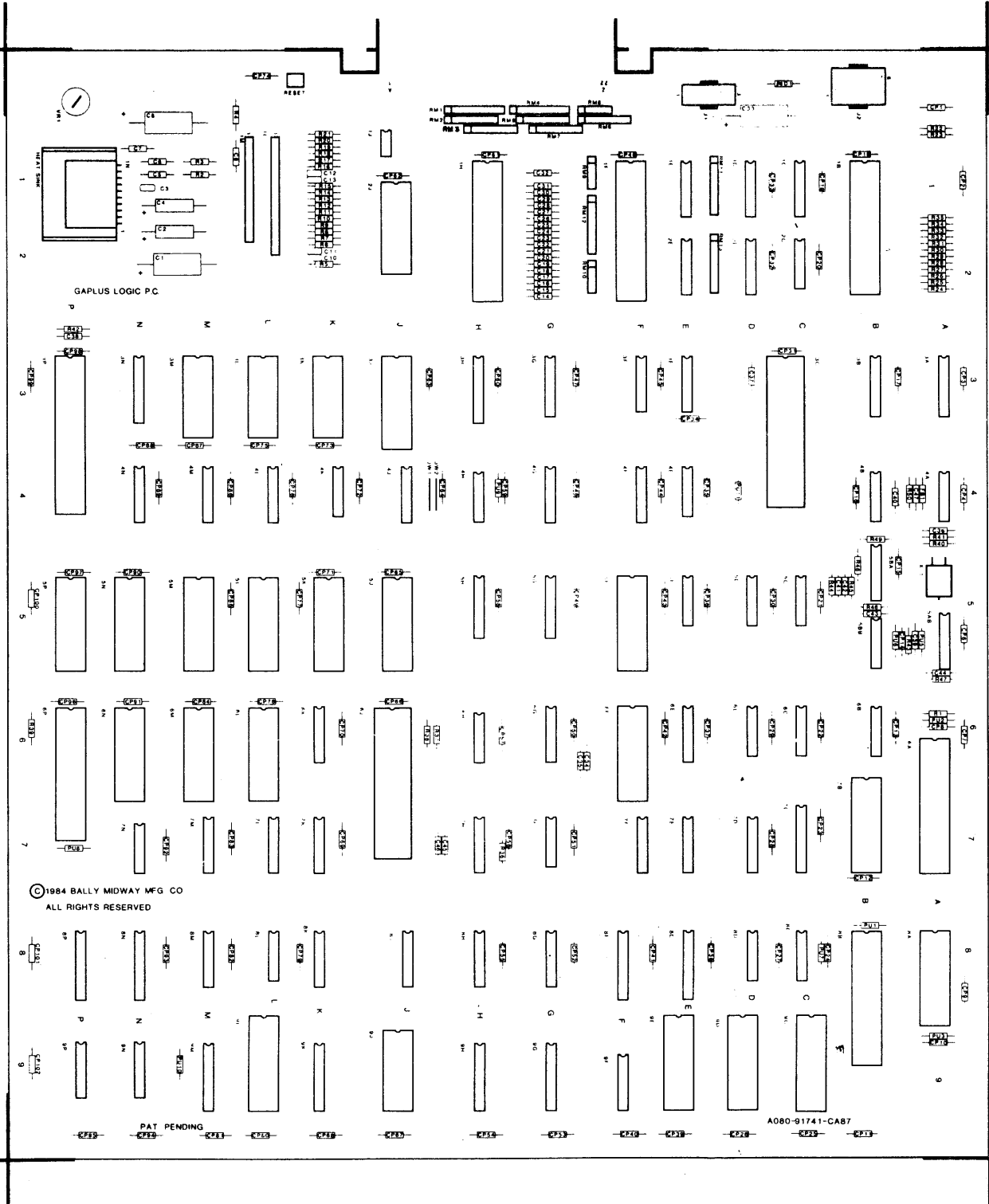
GAPLUS
 WIRING SCHEMATIC # M051-00A87-0003
 BALLY MIDWAY MFG CO.
 10601 N. BELMONT AVE.
 FRANKLIN PARK, ILL. 60131

NOTES: 1. #14 - 18 GA. 600K WIRE
 2. #16 - 18 GA. WIRE
 3. YELLOW GND STRAP IS 300V PVC.

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-C17	.01 UF POLY	IC 6F	33XX CUSTOM IC
C14-C32	.01 UF 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 6L,6M,6N	ROM
C38-C46	100 PF AX CER	IC 6P	68A09E CPU
C47	68 PF AX CER	IC 7B	ROM
		IC 7C	74LS245
CP1-CP4	.1 UF AX CER	IC 7D,7E	74LS257
CP6-CP102		IC 7F	74LS158
		IC 7G	74LS04
R1	330 OHM 1/4W 5%	IC 7H	74LS368
R2,R5	4.7 OHM 1/4W 5%	IC 7I,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	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	1K OHM 1/4W 5%	IC 9N	74LS208
R29	470 OHM 1/4W 5%	IC 9P	74LS153
R30	220 OHM 1/4W 5%		
R31	2.2K OHM 1/4W 5%	IC3 1BS	40 PIN IC SOCKET
R32	1K OHM 1/4W 5%	IC3 1CS,1DS	16 PIN IC SOCKET
R33	470 OHM 1/4W 5%	IC3 1FS,1HS	42 PIN IC SOCKET
R34	220 OHM 1/4W 5%	IC3 2DS	16 PIN IC SOCKET
R35	2.2K OHM 1/4W 5%	IC3 2JS	28 PIN IC SOCKET
R36	330 OHM 1/4W 5%	IC3 3AS,3BS	18 PIN IC SOCKET
R37,R38	470 OHM 1/4W 5%	IC3 3CS	64 PIN IC SOCKET
R39	330 OHM 1/4W 5%	IC3 3ES	16 PIN IC SOCKET
R40,R41	180 OHM 1/4W 5%	IC3 3JS	28 PIN IC SOCKET
R42	240 OHM 1/4W 5%	IC3 3KS,3LS	24 PIN IC SOCKET
R43-R46	JUMPER WIRE	3MS,3PS(X2)	
R47-R49	1K OHM 1/4W 5%	IC3 4FS	16 PIN IC SOCKET
R50	NOT USED	IC3 5FS	28 PIN IC SOCKET
		IC3 5GS,5HS	18 PIN IC SOCKET
PUI-PU3	1K OHM 1/4W 5%	IC3 5JS,5KS	28 PIN IC SOCKET
PUS-PU11		5LS,5MS,5NS	
		IC3 6AS	40 PIN IC SOCKET
		IC3 6FS	28 PIN IC SOCKET
		IC3 6JS	64 PIN IC SOCKET
		IC3 6LS,6MS	28 PIN IC SOCKET
		6NS	
		IC3 6PS	40 PIN IC SOCKET
		IC3 7BS	28 PIN IC SOCKET
		IC3 8AS	28 PIN IC SOCKET
		IC3 8BS	40 PIN IC SOCKET
		IC3 8GS	16 PIN IC SOCKET
		IC3 8NS	20 PIN IC SOCKET
		IC3 9CS,9DS	28 PIN IC SOCKET
		9ES	
		IC3 9JS	24 PIN IC SOCKET
		IC3 9LS	28 PIN IC SOCKET
IC 2C	74LS30		
IC 2D	ROM	X1	24.576 MHZ XTAL
IC 2J	92XX CUSTOM IC		
IC 3A,3B	MS8748L-55 RAM	1E	8 POS DIP SW
IC 3C	29XX CUSTOM IC	2E	8 POS DIP SW
IC 3E,3F	ROM		
IC 3G	2114 RAM	JW1,JW2	JUMPER WIRE
IC 3H	74LS245	J1	3 PIN AMP CONN
IC 3J	16XX CUSTOM IC	J2	6 PIN AMP CONN
IC 3K,3L,3M	MS8725P RAM		
IC 3N	74LS245		
IC 3P	21XX CUSTOM IC	VR1	2K OHM POT
IC 4A	74S04		
IC 4B	NOT USED	D1	ZENER DIODE 6.2V
IC 4E	74LS20		
IC 4F	ROM	FB1	JUMPER WIRE
IC 4G	74LS157		
IC 4H	74LS74		
IC 4J	74LS157		
IC 4K	74LS00		
IC 4L	74LS174		
IC 4M	74LS175		
IC 4N	74LS378		
IC 5A	74S163		
IC 5B	74S139		
IC 5C	74LS86		
IC 5D	74LS04		
IC 5E	74LS08		
IC 5F	74S10		
IC 5G,5H	MS8748L-55 RAM		

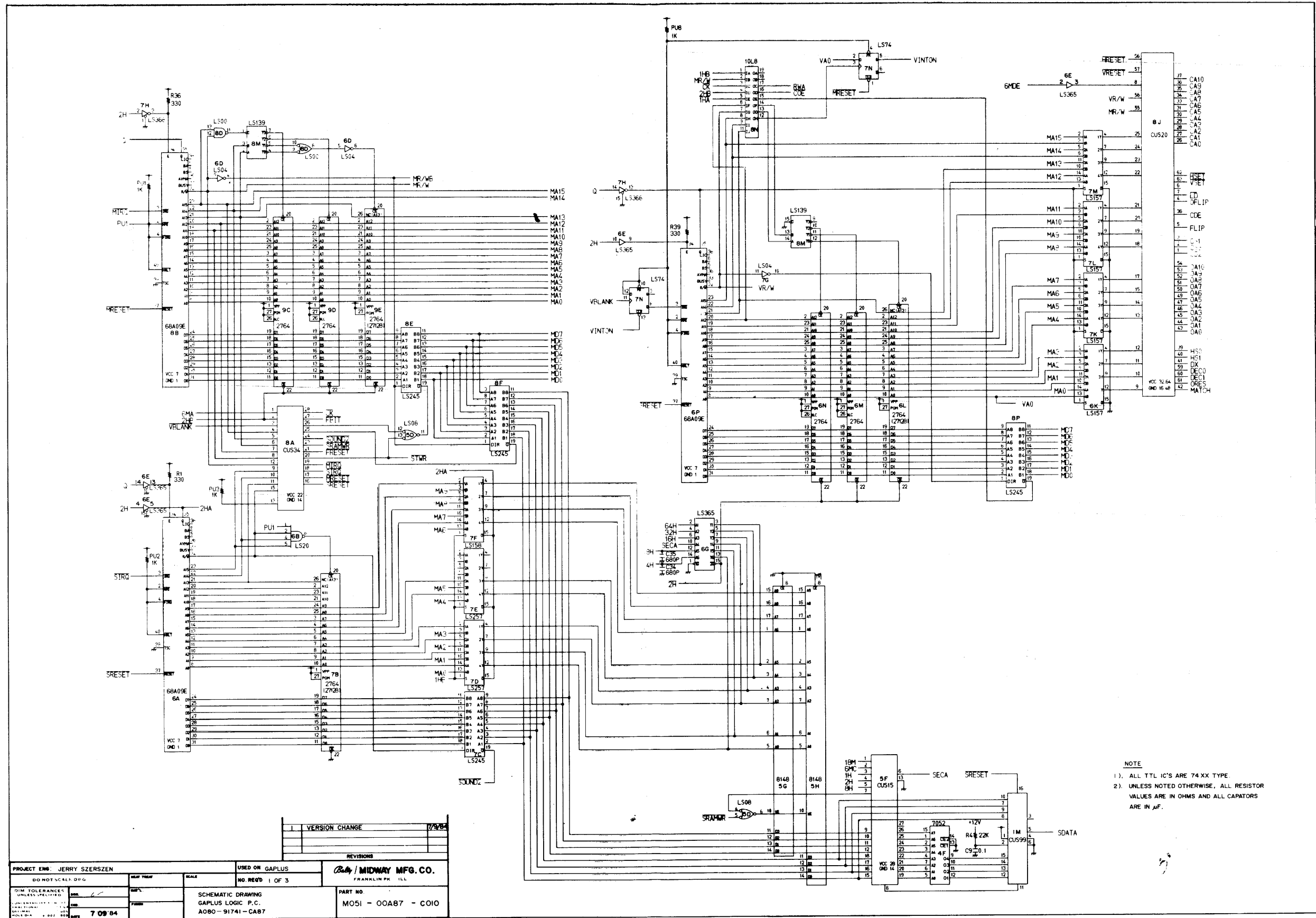


CROSS REFERENCE LIST

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-KAPX
68 PF AX CER	1	C47	0360-00800-0010	15XX CUSTOM IC	1	5F	0066-020CX-KAPX
100 PF AX CER	10	C36,C38-C46	0A64-00800-0006	16XX CUSTOM IC	1	3J	0066-021CX-KAPX
680 PF AX CER	2	C34,C35	0358-00800-0002	20XX CUSTOM IC	1	6J	0066-035CX-KAPX
.01 UF AX CER	19	C14-C32	0353-00800-0001	21XX CUSTOM IC	1	3P	0066-036CX-KAPX
.01 UF POLY	5	C5,C10-C13	0550-00800-1000	26XX CUSTOM IC	1	1B	0066-037CX-KAPX
.033 UF POLY	2	C5,C6	0353-00800-0002	29XX CUSTOM IC	1	3C	0066-038CX-KAPX
.1 UF AX CER	103	C7,C9,CP1-CP4	0508-00800-0900	33XX CUSTOM IC	1	6F	0066-039CX-KAPX
		CP6-CP102		34XX CUSTOM IC	1	8A	0066-040CX-KAPX
2.2 UF AX ELEC	1	C2	0353-00800-0005	56XX CUSTOM IC	1	1H	0066-022CX-KAPX
10 UF AX ELEC	1	C1	0508-00800-1100	58XX CUSTOM IC	1	1F	0066-028CX-KAPX
47 UF AX ELEC	1	C4	0353-00800-0003	62XX CUSTOM IC	1	2J	0066-041CX-KAPX
470 UF AX ELEC	2	C8,C33	0550-00800-1300	98XX CUSTOM IC	1	1L	0066-042CX-KAPX
				99XX CUSTOM IC	1	1M	0066-029CX-KAPX
4.7 OHM 1/4W 5%	2	R2,R3	100E-00005-0007				
100 OHM 1/4 5%	1	R23	100E-00005-0033				
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	MS8725P 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	0508-00803-0300
470 OHM 1/4W 5%	5	R5,R29,R33,R37,R38	100E-00005-0051	ROM	15		SEE NOTE
1K OHM 1/4W 5%	17	R22,R26,R28,R32,R47-R49,PU1-PU3,R20,R21,R27,R31,R35	100E-00005-0061	68A09E CPU	3		
		PUS-PU11		24.576 MHZ XTAL	1	X1	109E-00001-0020
2.2K OHM 1/4W 5%	5	R20,R21,R27,R31,R35	100F-00005-0069				
4.7K OHM 1/4W 5%	2	R7,R11	100E-00005-0079				
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-00005-0104				
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-00001-0013
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,3JS	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	18 PIN IC SOCKET	4	3AS,3BS,5GS,5HS	100E-00001-0004
2K OHM POT	1	VR1	105E-00001-0038	20 PIN IC SOCKET	1	8NS	100E-00001-0005
ZENER DIODE 6.2V	1	D1	103E-00001-0011	24 PIN IC SOCKET	6	3KS,3LS,3MS,9JS,3PS	100E-00001-0007
				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
74LS00	2	4K,8D	0300-00803-0027				
74LS04	3	5C,6D,7G	0300-00803-0029				
74LS08	1	4A	0304-00803-0011				
74LS10	1	5B,6C	0300-00803-0030				
74LS20	2	4E,6B	0A87-00803-0001	8 POS DIP SW	2	1E,2E	0300-00804-0700
74LS30	1	2C	0304-00803-0016				
74LS32	1	6H,7N	0300-00803-0032	3 PIN AMP CONN	1	J1	0017-00021-0443
74LS74	2	4B,7N	0300-00803-0032	6 PIN AMP CONN	1	J2	0017-00021-0424
74LS74	1	8C	0986-00803-1500				
74LS86	2	5BB,8L	0300-00803-0054	JUMPER WIRE	7	JW1,JW2,R43-R46,FB1	0151-00087-0000
74LS139	1	8M	0508-00803-0084				
74S139	1	5BA	0300-00803-5100	HEATSINK AUD AMP	1		0353-00900-0000
74S153	1	9P	0986-00803-1000				
74S157	6	4E,4J,6K,7K,7L,7M	0300-00803-0050	PN1G SCRW 4-40X7	2		0017-00101-0511
74S158	1	7F	0300-00803-0049	PAN HD			
74S163	1	5AB	0A87-00803-0007				
74S174	1	4L	0300-00803-0047	#4 FLT WASHER	4		0017-00104-0092
74S175	1	4M	0304-00803-0025	4-40 HEX NUTS	2		0017-00103-0093
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	9C,9K,9M	0935-00804-1500	BLANK PCB	1		A080-91741-CAB7
74LS298	1	9N	0316-00803-0019				
74LS365	2	6E,6G	0316-00803-0020				
74LS368	1	7M	0316-00803-0004				
74LS375	1	8H	0A29-00803-0007				
74LS378	1	4N	0316-00803-0018				
4460 AUDIO AMP	1	1N	0066-3738X-VBAX				

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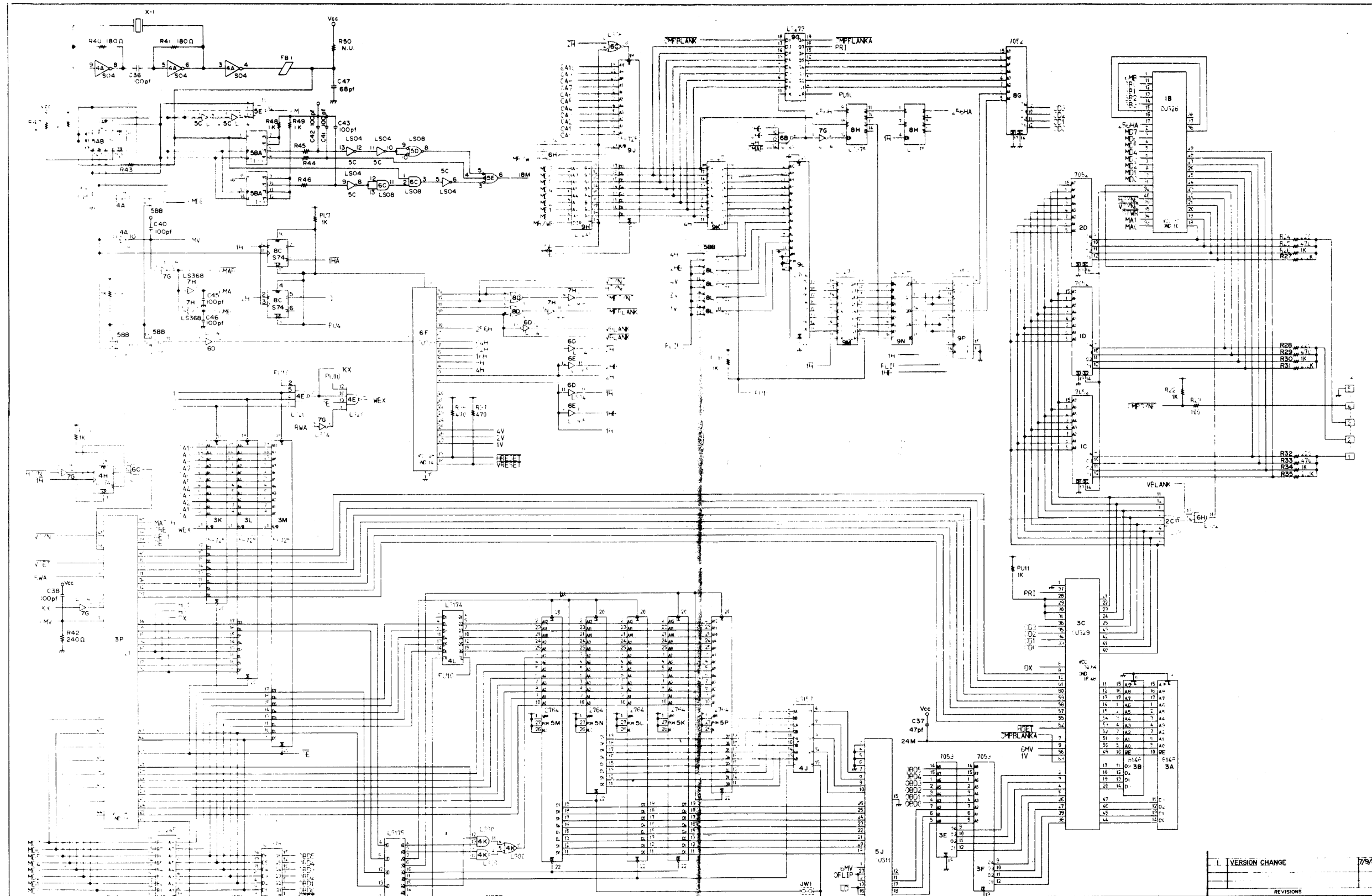
DIM TOLERANCES UNLESS OTHERWISE SPEC CONCENTRICITY ± .002 FRACTIONAL ± .005 DECIMAL ± .005 HOLE DIA ± .002 ANGLE ± .01° DO NOT SCALE DWG	GAPLUS 7/10/84	Bally MIDWAY MFG CO FRANKLIN PARK, IL 60131	REVISIONS M051-00A87-C009
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NOTE
 1). ALL TTL IC'S ARE 74 XX TYPE.
 2). UNLESS NOTED OTHERWISE, ALL RESISTOR VALUES ARE IN OHMS AND ALL CAPACITORS ARE IN μ F.

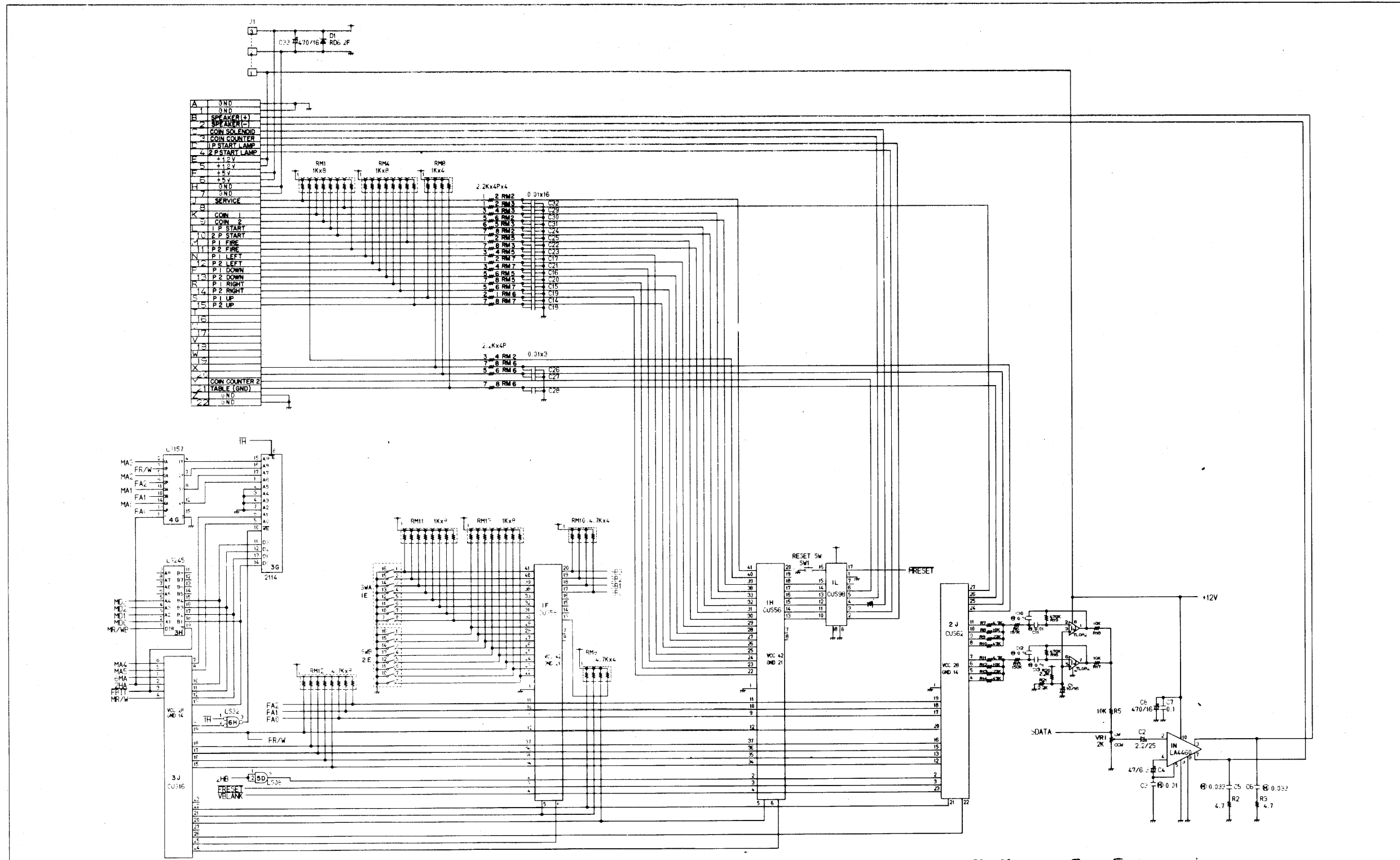
VERSION CHANGE		REVISIONS	
1			7/9/84

PROJECT ENG: JERRY SZERSZEN	DATE: 7/9/84	USED ON: GAPLUS	NO. REV'D: 1 OF 3
DIM TOLERANCES UNLESS SPECIFIED:		PART NO: MO51 - 00A87 - CO10	
SCHEMATIC DRAWING		FRANKLIN, PA. U.S.A.	
GAPLUS LOGIC P.C.		MIDWAY MFG. CO.	
A080-91741-CAB7			



- NOTE
- 1) WHEN ROM LOCATION 5P IS USED, JW1 IS OMITTED JW2 MUST BE JUMPED.
 - 2) ALL TTL IC'S ARE 74XX TYPE.
 - 3) UNLESS NOTED OTHERWISE, ALL RESISTOR VALUES ARE IN OHMS AND ALL CAPATORS ARE IN μ F.

PROJECT ENG JERRY SZERSZEN		USED ON GAPLUS		REVISIONS	
DO NOT SCALE DRAWING	DATE 7/08/84	NO REQ'D	2 OF 3	Bally / MIDWAY MFG. CO.	
SCHEMATIC DRAWING			PART NO		
GAPLUS LOGIC P.C.			M051 - 00A87 - CO10		
AO80 - 91741 - CAB7					



- NOTE
- 1) ALL TTL IC'S ARE 74XX TYPE.
 - 2) UNLESS NOTED OTHERWISE, ALL RESISTOR VALUES ARE IN OHMS AND ALL CAPATORS ARE IN μ F.
 - 3) M DENOTES POLYESTER FILM CAP.

PRELIMINARY

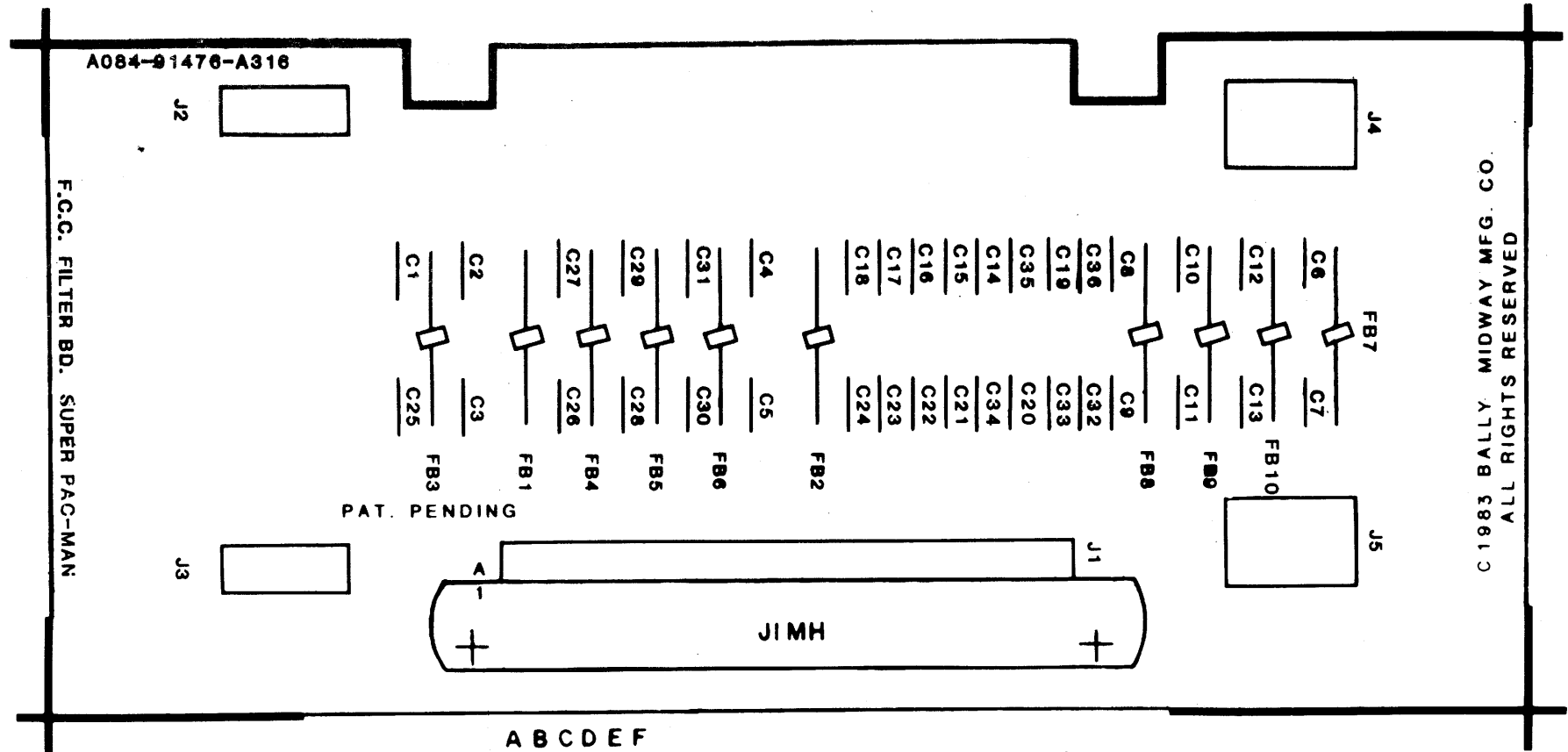
VERSION	CHANGE	DATE
1		7/9/84

PROJECT ENG: JERRY SZERSZEN	SCALE	USED ON GAPLUS	REVISIONS
DO NOT CALL BY V		NO REQ'D 3 OF 3	<i>Billy</i> / MIDWAY MFG. CO. FRANKLIN PK. ILL.
DIM TOLERANCES UNLESS SPECIFIED		SCHMATIC DRAWING	PART NO
DATE: 7/09/84		GAPLUS LOGIC P.C.	M051 - 00A87 - C010
		A080-91741-CAB7	

DESIGNATION NO. DESCRIPTION

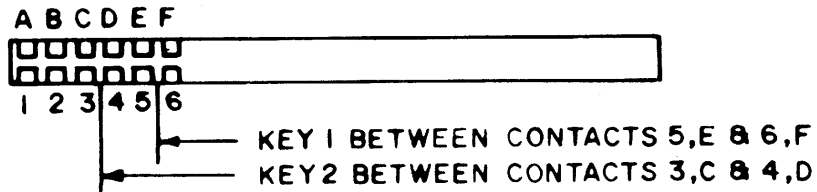
C1 - C5	390pf 50V. AX. CER.
C6, C7	470pf " " "
C8 - C13	100pf " " "
C14-C24	.01µf " " "
C25	390pf " " "
C26-C29	.01µf " " "
C30, C31	390pf " " "
C32-C36	.01µf " " "
FBI - FBIO	FERRITE BEAD
J1	P.C. EDGE CONN.
J2, J3	3 PIN HEADER
J4, J5	6 PIN HEADER
JIMH	(2) P.C. EDGE CONN. KEY
"	(2) 6-32 X 10 SLOT PAN SCREW
"	(2) WSH. 6 145-.250-.032
"	(1) BRKT. - CONN. FIN.
-	(1) INSULATED GND. STRAP
-	(1) 8-32 X 5 SLOT PAN SCREW
-	(1) 8-32 NUT HEX

A080-91476-A316 F.C.C. FILTER BD. SUPER PAC-MAN



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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
6-32 X 10 SLOT PAN SCREW	2	"	0017-00101-0574

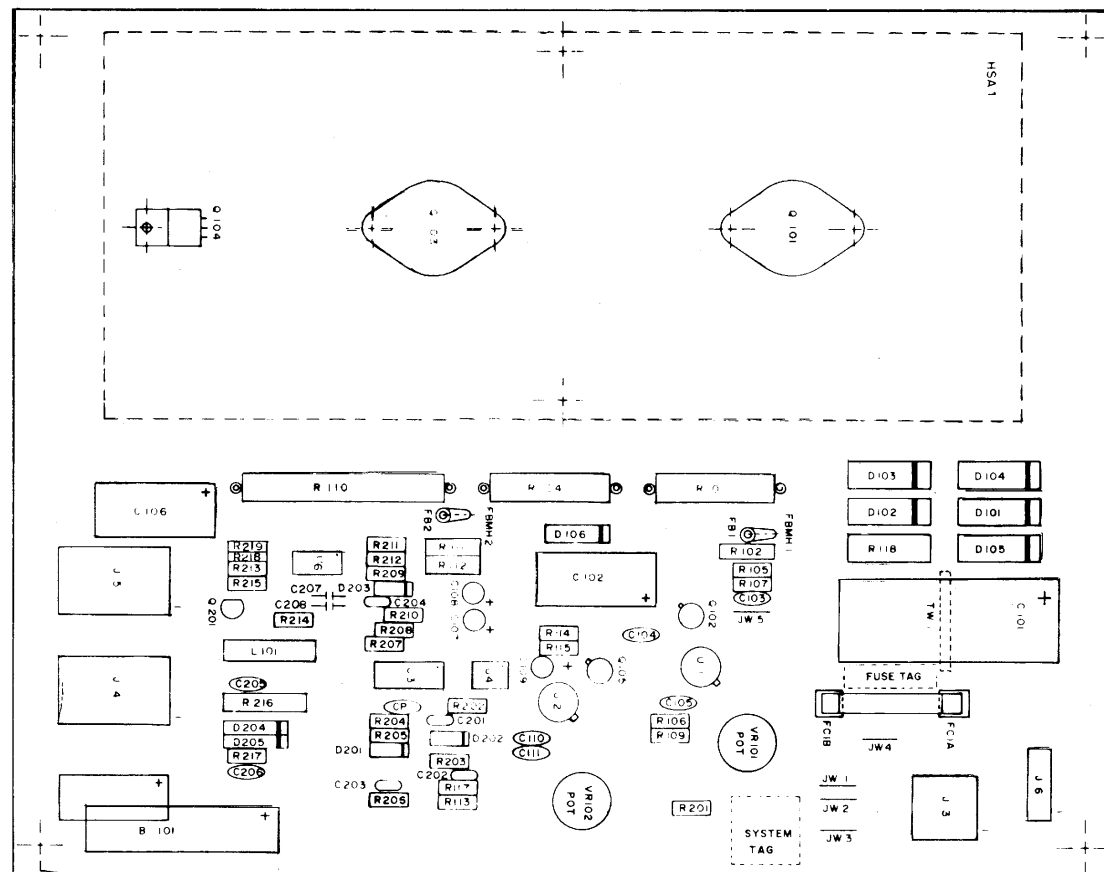


DESCRIPTION	Q'TY	DESIGNATION NO.	PART NO.
WSH. 6 145-.250-.032	2	JIMH	0017-00104-0002
BRKT. - CONN. FIN.	1	"	0866 00118-00XF
INSULATED GND. STRAP	1	-	3000-17143-0700
8-32 X 5 SLOT PAN SCREW	1	-	0017-00101-0595
8-32 NUT HEX	1	-	0017-00103-0008
F.C.C. FILTER BD. SUPER PAC-MAN	1	A080-91476-A316	A080-91476-A316

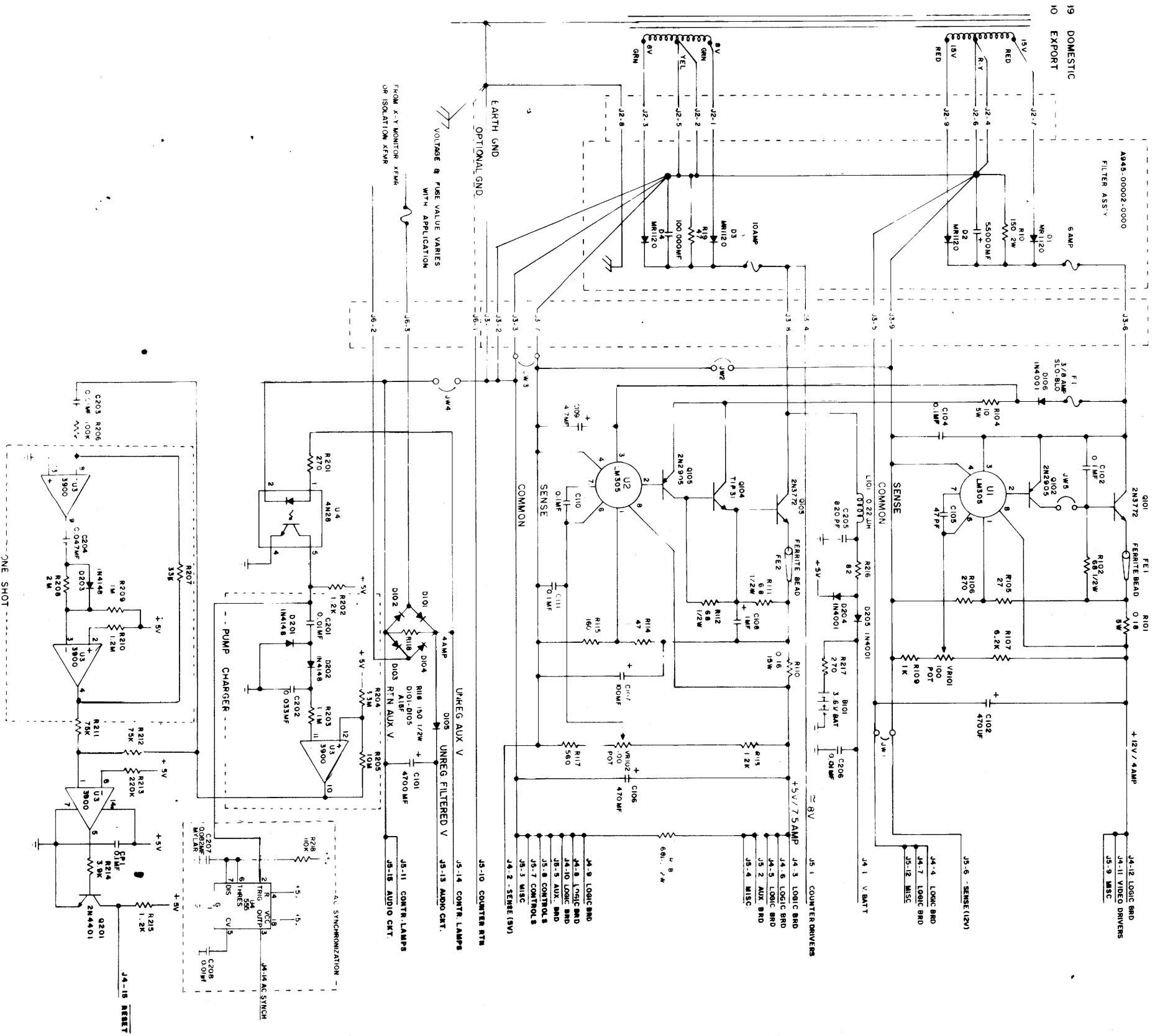
REVISIONS	

PROJECT ENG: L. DEKKER		SCALE: FULL		Bally / MIDWAY MFG. CO. FRANKLIN, PA.
HEAT TREAT		MATERIAL		
DIM. TOLERANCE UNLESS SPECIFIED		DATE: 02/08/83		PART NO: M051-00316-A026
ASSEMBLY DRAWING F.C.C. FILTER BD SUPER PAC-MAN A084-91476-A316		FINISH		

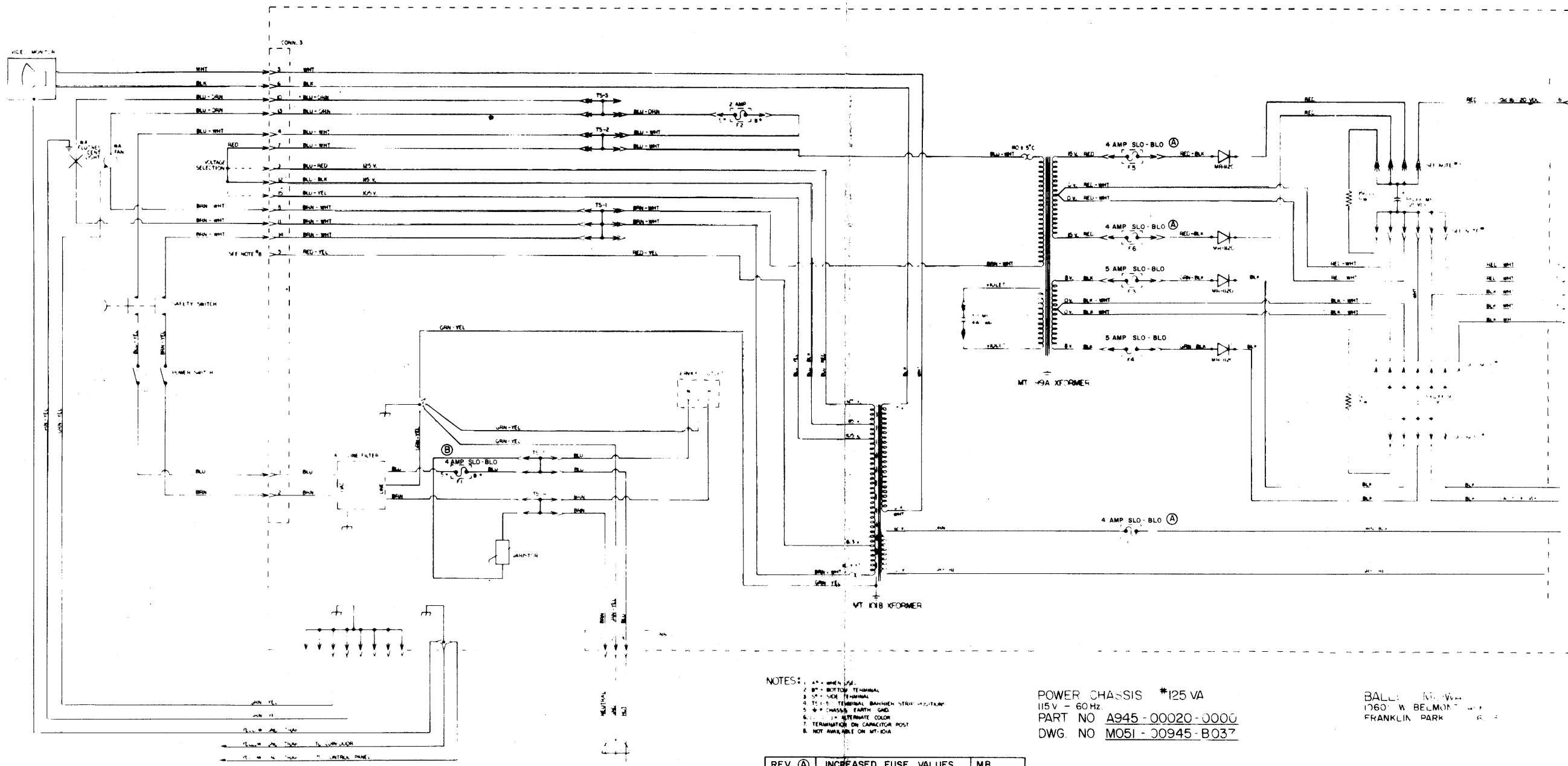
DESIGNATION #	DESCRIPTION	DESIGNATION #	DESCRIPTION	DESIGNATION #	DESCRIPTION	DESCRIPTION	Q'ty	DESIGNATION #	PART #	DESCRIPTION	Q'ty	DESIGNATION #	PART #
C101	4700uf AX. ELECT	R117	560ohm 1/4W 5%	U1	LM305 REG.	47pf AX. CER.	1	C105	0945-00811-0100	LM305 REG	2	U1,2	0945-00811-0100
C102	470uf AX. ELECT	R118	150ohm 2W	U2	LM305 REG	820pf AX. CER.	1	C205	0945-00816-0400	555	1	U6	0929-00810-4500
C103	.1uf AX. CER.	R201	270ohm 1/4W 5%	U3	LM3900	.01uf AX. CER.	2	C206,208	0945-00816-0100	LM3900	1	U3	0945-00813-0200
C104	47pf AX. CER.	R202	1.2K 1/4W 5%	U4	4N28	.01uf MYLAR	2	C201,203	0945-00816-0200	4N28	1	U4	0945-00813-0300
C105	470uf AX. ELECT.	R203	1.1M 1/4W 5%	U6	555	.033uf MYLAR	1	C202	0945-00816-0500				
C106	100uf RD. TANT.	R204	3.3M 1/4W 5%			.047uf MYLAR	1	C204	0945-00816-0300				
C107	.1uf RD. TANT.	R205	10M 1/4W 5%	L101	22uH INDUCTOR	0.082uf AX. CER.	1	C207	0945-00816-1900	A15F RECTIFIER	5	D101 '05	0945-00804-0200
C108	4.7uf RD. TANT.	R206	100K 1/4W 5%			.1uf AX. CER.	5	C103,104,110,111, CP1	0945-00811-0200				
C109	.1uf AX. CER.	R207	33K 1/4W 5%					C108	0945-00811-0300	1N4001	3	D106,204,205	0945-00804-0300
C110	.1uf AX. CER.	R208	2M 1/4W 5%					C109	0945-00811-0400	1N4148	3	D201-203	0945-00804-0500
C111	.01uf MYLAR	R209	1M 1/4W 5%	B101	BATTERY 3.6VDC 60DEG-C	100uf RAD. TANT.	1	C107	0945-00811-0500				
C201	.033uf MYLAR	R210	1.2M 1/4W 5%			470uf AX. ELECT.	2	C102,106	0945-00816-0600	2N2905	2	Q102,105	0945-00808-0300
C202	.01uf MYLAR	R211	75K 1/4W 5%	F1	3 BA S BLO FUSE	470uf AX. ELECT.	1	C101	0945-00811-0700	2N4401	1	Q201	0945-00804-0400
C203	.047uf MYLAR	R212	75K 1/4W 5%										
C204	820pf AX. CER.	R213	220K 1/4W 5%	FC1A,1B	FUSE CLIP			R110	0945-00815-0100	BATTERY 3.6VDC 60DEG C	1	B101	0017-00003-0377
C205	.01uf AX. CER.	R214	3.9K 1/4W 5%					R101	0945-00815-0200	FUSE 3/8A S BLO	1	F1	0945-00808-0400
C206	0.082uf MYLAR	R215	1.2K 1/4W 5%	FE1,2	FERRITE BEAD			R111	0062-047D3-1XXX	FUSE CLIP	2	FC1A,1B	0017-00003-0214
C207		R216	82ohm 1W 10%					R104	0945-00812-0100	TIE WRAP	1	TW1	0945-00814-0300
		R217	270ohm 1/4W 5%	TW1	TIE WRAP			R105	0062-068B3-1XXX	FERRITE BEAD	2	FB1,2	0017-00009-0221
		R218	110K 1/4W 5%					R114	0062-086B3-1XXX	FERRITE MOUNTING HDW	2	FBMH1,2	0017-00033-0135
		R219	68ohm 1/2W 5%					R102,112,219	0062-098D3-1XXX				
		VR101,102	100ohm POT					R216	0062-104F5-1XXX				
CP1	.1uf AX. CER.			J3	9PIN P.C. MOUNT CONN.(MALE)			R118	0945-00812-0200	22uH INDUCTOR	1	L101	0945-00814-0200
		D101	A15F	J4	15PIN P.C. MOUNT CONN.(FEMALE)			R115	0062-124B3-1XXX	FUSE TAG	1		
		D102	A15F	J5	15PIN P.C. MOUNT CONN.(MALE)			R106,201,217	0062-138B3-1XXX	SYSTEM TAG	1		
		D103	A15F	J6	3PIN P.C. MOUNT CONN.(MALE)			R117	0062-162B3-1XXX	SYSTEM TAG	1		
		D104	A15F					R109	0062-179B3-1XXX	P.C.B.	1		
		D105	A15F	LB1	FUSE TAG			R113,202,215	0062-183B3-1XXX				
R101	18 ohm 5W W/RES. SPACER	D106	1N4001	LB2	SYSTEM TAG			R214	0062-207B3-1XXX				
R102	68ohm 1/2W 5%	D201	1N4148	HSA1	HEAT SINK ASS'Y 1			R107	0062-217B3-1XXX				
R104	10ohm 5W W/RES. SPACER	D202	1N4148	MHSA1	MOUNTING HARD WARE(HEAT SINK)			R207	0062-251B3-1XXX				
R105	27ohm 1/4W 5%	D203	1N4148					R211,212	0062-269B3-1XXX	HEAT SINK ASS'Y (SEE HS ASS'Y DRAWING "X" NOTE")	1	HSA1	A945-00008-0000
R106	270ohm 1/4W 5%	D204	1N4001					R206	0062-275B3-1XXX	4-40 X 10 SLT RND	2	MH HSA1A,2A.	0017-00101-00727
R107	6.2K 1/4W 5%	D205	1N4001					R218	0062-277B3-1XXX	4-40 HEX NUT	2	MH HSA1E,2E.	0017-00103-0002
								R213	0062-291B3-1XXX	WSH 4-120-.250-018	4	MH HSA1B,1D	0017-00104-0071
								R209	0062-323B3-1XXX				
								R203	0062-325B3-1XXX				
								R210	0062-327B3-1XXX				
								R208	0062-337B3-1XXX				
								R204	0062-347B3-1XXX				
								R205	0062-371B3-1XXX				
R109	1K 1/4W 5%	Q102	2N2905	JW1-5	JUMPER WIRE					3PIN P.C. MOUNT CONN. (MALE)	1	J6	0017-00021-0441
R110	16ohm 15W W/RES. SPACER	Q105	2N2905	FBMH1,2	FERRITE BEAD MOUNTING HARDWARE	100ohm POT	2	VR101,102	0945-00814-0030	9PIN P.C. MOUNT CONN (MALE)	1	J3	0017-00021-0425
R111	6.8ohm 1/2W 5%	Q201	2N4401							15PIN P.C. MOUNT CONN (FEMALE)	1	J4	0017-00021-0441
R112	68ohm 1/2W 5%									15PIN P.C. MOUNT CONN (MALE)	1	J5	0017-00021-0441
R113	1.2K 1/4W 5%												
R114	47ohm 1/4W 5%									22 AWG T & R BARE 2.5"	5	JW1-5	0151-00087-0000
R115	160ohm 1/4W 5%												



PROJ. ENG.: L. DEKKER		SIGNED BY: SATAN'S HOLLOW		MIDWAY MFG. CO.	
DO NOT SCALE DWG	DATE: 5/17/82	FULL	NO REVD	FRANKLIN PK ILL	
ASSEMBLY DRAWING I25VA PWRSPY			PART NO: M051-00945-D006		
A082-90412-D000					



PROJECT ENG. L. DEKNER	SATANS HOLLOW	MIDWAY MFG. CO.
DATE: 5-3-92	PER: [Signature]	POWER SUPPLY 125VA
		W/CKT SUPPORT
		A082-90412-D000
		M051-00945-D007



- NOTES:
1. * - WHEN 1/2"
 2. BT - BOTTOM TERMINAL
 3. ST - SIDE TERMINAL
 4. TS - TERMINAL BANDED STRIP TERMINAL
 5. CH - CHASSIS EARTH GND
 6. () - ALTERNATE COLOR
 7. TERMINATION ON CAPACITOR POST
 8. NOT AVAILABLE ON MT-125A

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

BALL: M. W. W.
 1760 W BELMONT
 FRANKLIN PARK, N. J.

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