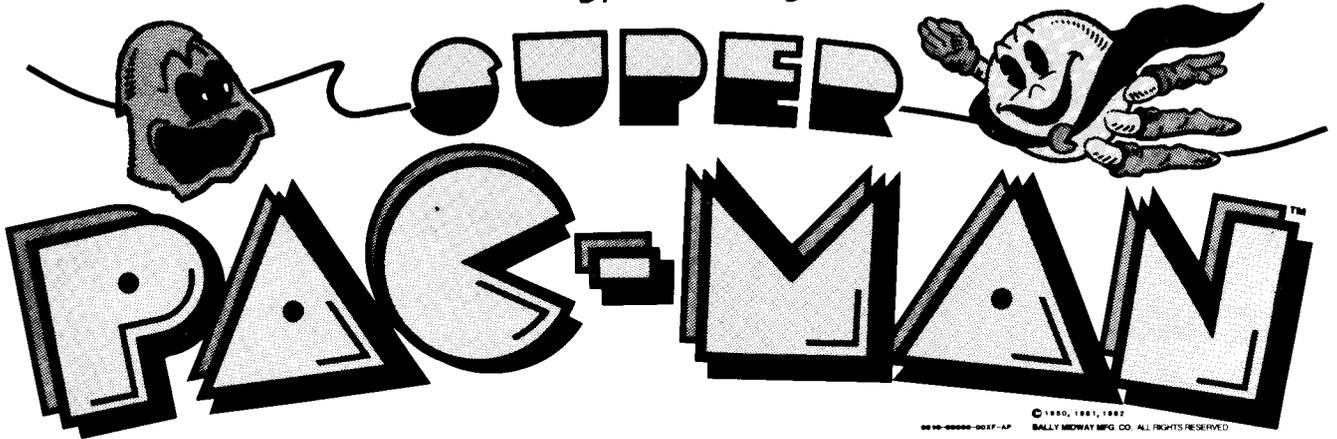
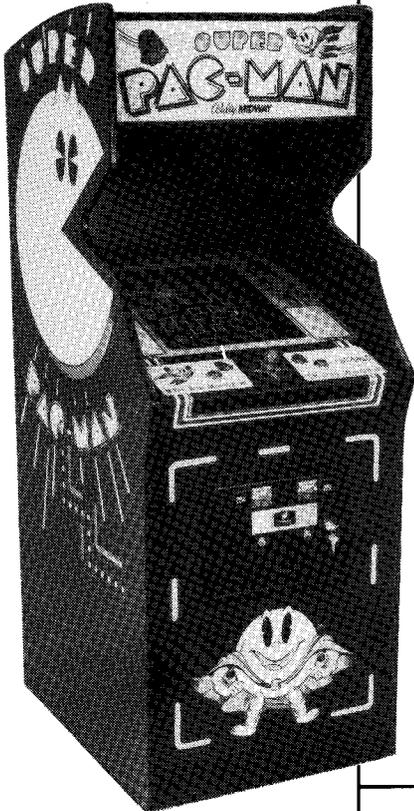


Bally/Midway's

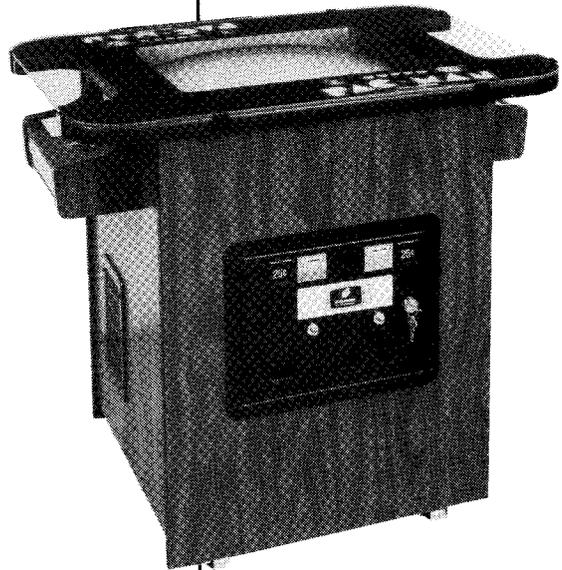


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Parts and
Operating Manual



NO. 316 UPRIGHT



NO. 317 COCKTAIL

Bally

MIDWAY MFG. CO.

10750 W. Grand Avenue
Franklin Park, Illinois 60131
U.S.A.



Phone: (312) 451-1360

Cable Address: MIDCO

Telex No.: 72-1596

II. Location and Setup

INSPECTION

1. Remove the game from its shipping crate.
2. Inspect the entire outside of it for any signs of damage.
 - Any scratches?, dents?, cracks?
 - Any broken controls?
 - Any broken glass or plastic?
 - Just look it over closely and make a note of any signs of damage.
3. Remove the shipping cleats from the bottom of the cabinet.
4. Install the four levelers, one at each corner of the cabinet.
 - Level the cabinet.
5. Open the cabinet and inspect the inside of the game for any signs of damage. See Figure 2-1.
 - Also check to make sure all plug-in connectors on the wire harness are firmly seated.
 - Replug any connectors found unplugged. **DO NOT FORCE PLUGS ONTO CONNECTORS. DO NOT FORCE PLUGS TOGETHER.** If it won't go on easily, assuming the keys are lined up, it either does not belong there or is damaged.
 - Make sure all printed circuit boards (P.C.B.'s) are firmly seated in their connectors. These connectors are also keyed. The P.C.B.'s will only go into them one way without being damaged.
 - Note the location of the game's serial number. See Figure 2-1.
 - Check all major subassemblies to be sure they are mounted securely. These are called out in Figure 2-1.
 - Power supply.
 - Control panel(s).
 - T.V. monitor.
 - Other P.C.B.'s and/or P.C.B. rack, etc.
 - Power Chassis.
6. Make a note of any problems that can't be easily corrected.
7. Call your distributor and/or service man about your problem list.

NOTE: ALL connectors or plugs are keyed so they will only go together when all pins are properly lined up.

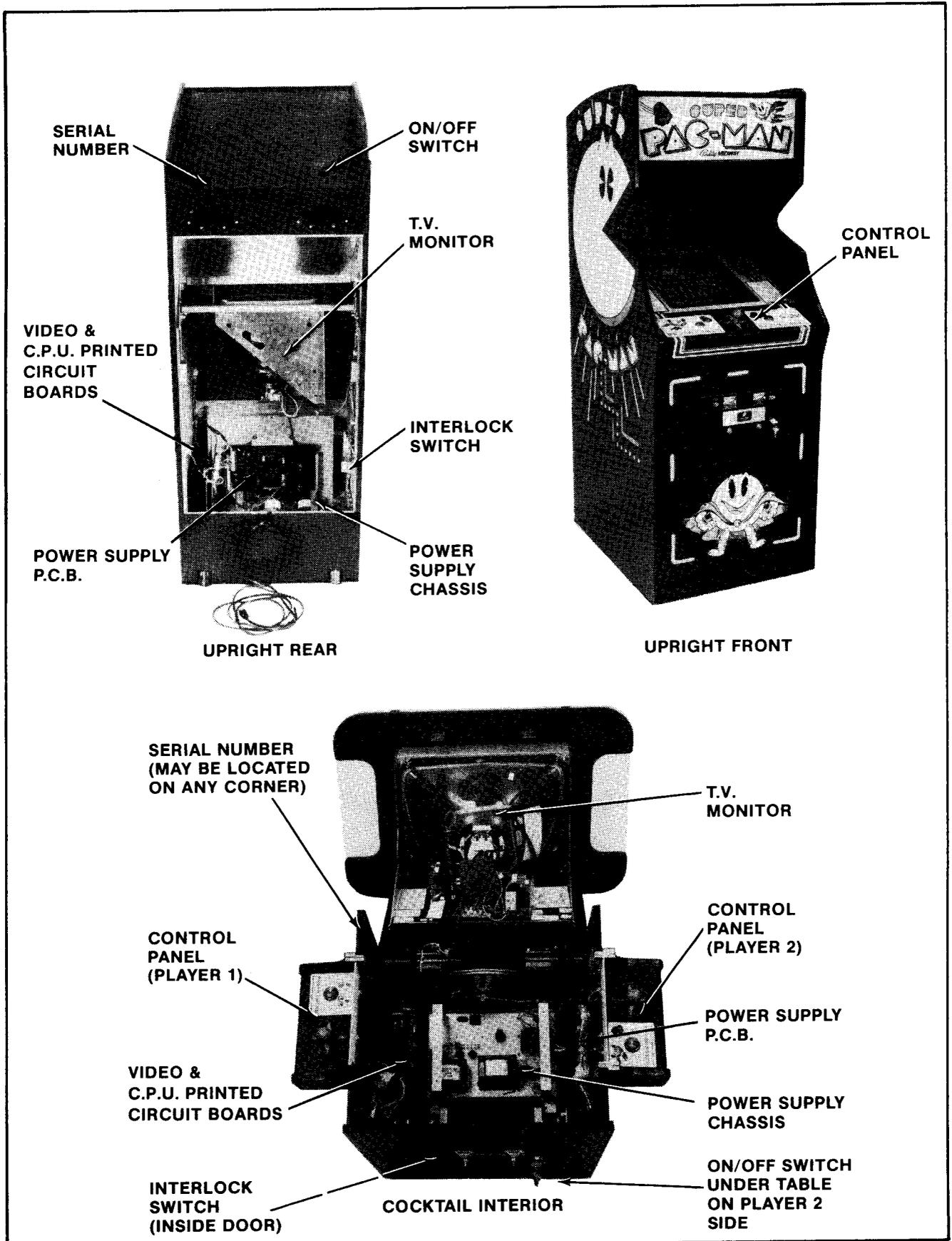


Figure 2-1 Location of Serial No., Interlock Switch, On/Off Switch, & Major Sub-Assemblies

INSTALLATION

1. Location requirements:

- Power:**
 - Domestic 110 V @ 60 Hz
 - Foreign 200 V to 240 V @ 50 Hz
- Temperature:** 32° to 100°F (0° to 38° C)
- Humidity:** Not over 95% relative
- Space required:**
 - Upright 25" x 33" (63 x 84cm)
 - Cocktail 32" x 22" (81 x 55cm)
- Game height:**
 - Upright 68" (170cm)
 - Cocktail 29" (73cm)

2. Voltage Selection:

Your game is designed to work properly on the line voltage where you are located. Check your line voltage with a meter to determine what its value is. Then check the power input wires to the main power supply transformer on your game to be sure they are connected to taps which correspond to your line voltage value.

If the power input wires to the main power supply transformer are not connected to taps which correspond to your local line voltage, move them to the proper taps.

If the line voltage in your area falls outside the upper or lower limits of the range of inputs covered by the main power supply transformer, **DO NOT PLUG YOUR GAME IN** until you have talked with your distributor and/or service man and obtained a solution to this problem. Otherwise you could damage your game.

3. Interlock and power ON/OFF switches: See Figure 2-1.

- To help prevent the possibility of getting an electric shock while working inside the game cabinet, interlock switches have been installed at each cabinet access door (this **DOES NOT** include the coin door in the Upright models).
- When any access door is opened, the interlock switch installed there turns off all power to the game.
- Check each interlock switch for proper operation. After checking the line voltage in your area and determining that the input wires to the main power supply transformer of your game are connected properly — or — after obtaining a solution to your over or under voltage problem from your distributor and/or your service man, plug the game into your A.C. wall outlet.

The game ON/OFF switches for both models are located as shown in Figure 2-1. Turn the game on and allow it to warm up a few minutes.

Slowly open each access door to the game (this **does not** include the coin door on the Upright models).

As the door is opened approximately 1" (2.54cm) the power to the game should go off (the T.V. monitor, all the lights, and all sounds will stop).

If this does not happen, check the interlock switch by this door to see if it has broken loose from its mounting or if it is stuck in the "ON" position.

If the switch is found to be bad, turn the game off, unplug it, and replace the interlock switch.

When done, plug the game back into the wall outlet, close the access door, and turn the game back on.

After the game has warmed up, repeat the above interlock switch test.

When the interlock switch is working properly and turns the power to the game off, power may be restored to the game with the access door(s) open. Take hold of the interlock switch plunger and **gently** pull it out to its fully extended position. **THIS IS TO BE USED ONLY FOR SERVICING THE GAME.** See Figure 2-2.

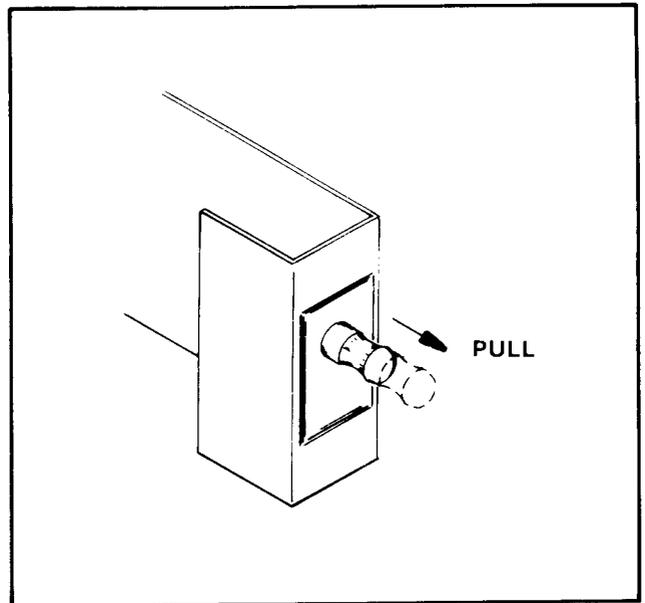


Figure 2-2 Interlock Switch Operation

SELF-TEST

Your new game will Self-Test itself to see if it has any bad parts. The information it receives while testing itself will be shown on the T.V. monitor. Some information can also be heard through the game's speaker system. See the GAME OPERATION section for a more detailed description of this function.

When there is a bad result according to the Self-Test, call your distributor and/or service man to have the trouble fixed unless it is something you can do yourself (such as replace a bad RAM or ROM chip).

GAME VOLUME ADJUSTMENT CONTROL

See Figure 2-3.

The game volume control pot is located on the game CPU board assembly. There is only one pot. For adjustment, it may be reached through the rear access door on the Upright models. On the Cocktail Table models, you will have to open the table top to reach it.

To make the sounds louder, turn the pot in a clockwise direction (↻).

To make the sounds **less** loud, turn the pot in a counterclockwise direction (↺).

OPTION SWITCH SETTINGS

To change the option switch settings, you **DO NOT** have to take the Main Game CPU Board out of the

game. They can be easily reached through the rear access door on the Upright models. On the Cocktail Table model, you do have to open the table top to reach them.

When changing any options, **ALWAYS** put the game into the Self-Test mode, make your changes, check the results on the monitor screen, take the game out of the Self-Test mode, and play the game to be sure the switches have worked properly and that no switches were accidentally moved that were not meant to be. (These switches are small and this can happen.)

The option switch settings and what they will make the game do are shown in Figure 2-4. See Figure 2-3 for option switch locations.

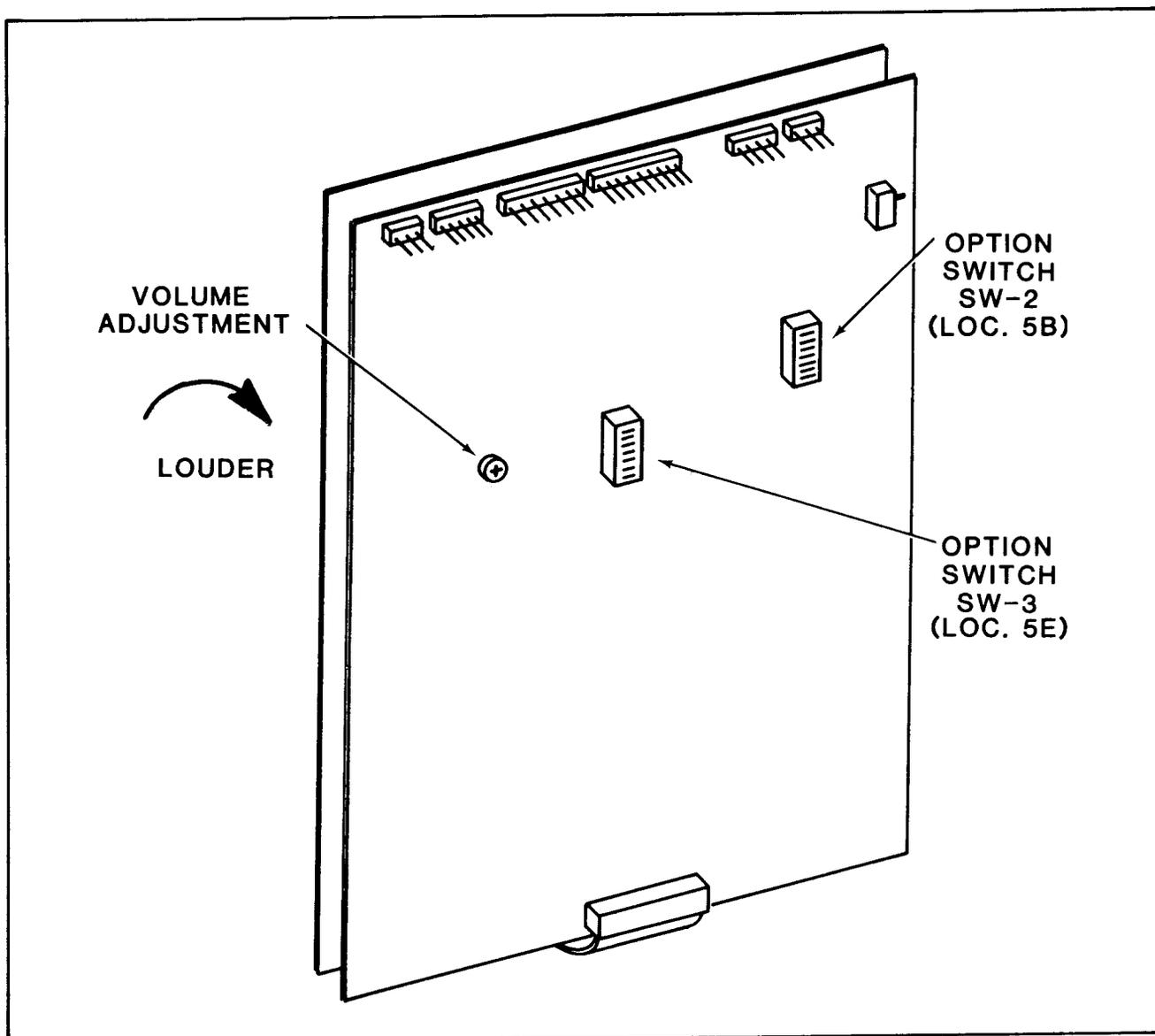


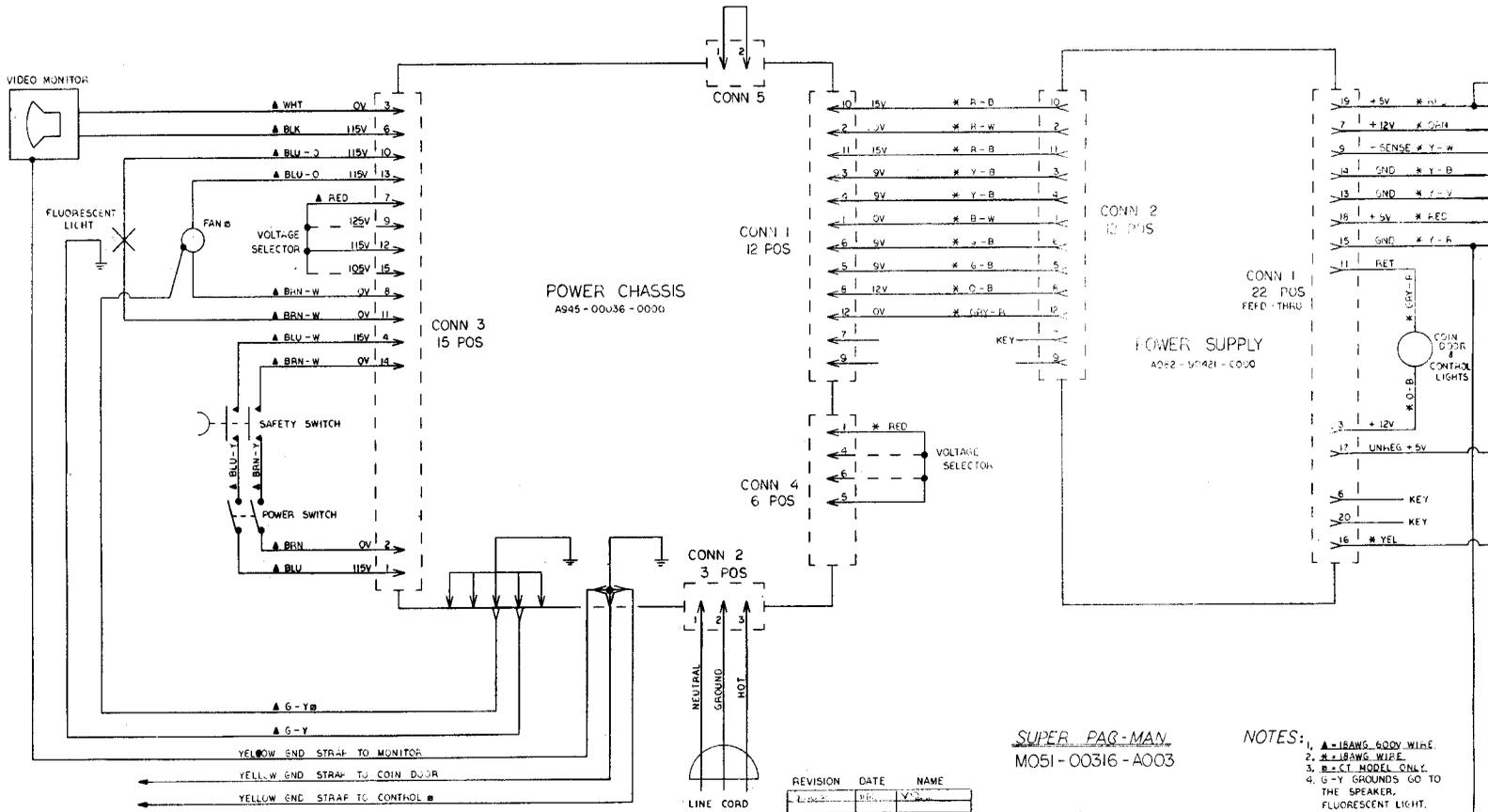
Figure 2-3 Game Volume Adjustment Control & Option Switch Location

SUPER PAC-MAN	
OPTION SWITCH SETTINGS	
DIP SWITCH SW-2 AT LOCATION 5B	
DIFFICULTY LEVEL SETTINGS — "R1" IS THE EASIEST AND "RB" IS THE MOST DIFFICULT	
RANK "R0"—STANDARD LEVEL OF DIFFICULTY	SW#1 SW#2 SW#3 SW#4 SW#5 SW#6 SW#7 SW#8 OFF OFF OFF OFF
RANK "R1"—EASIEST LEVEL OF DIFFICULTY	ON OFF OFF OFF
RANK "R2"	OFF ON OFF OFF
RANK "R3"	ON ON OFF OFF
RANK "R4"	OFF OFF ON OFF
RANK "R5"	ON OFF ON OFF
RANK "R6"—GRADUATED LEVELS OF DIFFICULTY	OFF ON ON OFF
RANK "R7"	ON ON ON OFF
*RANK "R8"—FACTORY SETTING	OFF OFF OFF ON
RANK "R9"	ON OFF OFF ON
RANK "RA"	OFF ON OFF ON
RANK "RB"—HARDEST LEVEL OF DIFFICULTY	ON ON OFF ON
RANK "RC"—EASIEST AUTO DIFFICULTY SETTING	OFF OFF ON ON
RANK "RD"	ON OFF ON ON
RANK "RE"	OFF ON ON ON
RANK "RF"—HARDEST AUTO DIFFICULTY SETTING	ON ON ON ON
SOUND	
*SOUND NO SOUND	SW#1 SW#2 SW#3 SW#4 SW#5 SW#6 SW#7 SW#8 OFF ON
SCREEN	
*NORMAL OPERATION FREEZE VIDEO	SW#1 SW#2 SW#3 SW#4 SW#5 SW#6 SW#7 SW#8 OFF ON
*INDICATES FACTORY RECOMMENDED SETTINGS	PART NUMBER MO51-00316-C012

Figure 2-4 Option Switch Settings

SUPER PAC-MAN							
OPTION SWITCH SETTINGS							
DIP SWITCH SW-3 AT LOCATION 5E							
COINS PER CREDIT — COIN SWITCH 1							
*1 COIN	1 CREDIT	SW#1	SW#2	SW#3	SW#4	SW#5	SW#6 SW#7 SW#8
1 COIN	2 CREDITS	OFF	OFF	OFF			
1 COIN	3 CREDITS	ON	OFF	OFF			
1 COIN	6 CREDITS	OFF	ON	OFF			
1 COIN	7 CREDITS	ON	ON	OFF			
2 COINS	1 CREDIT	OFF	OFF	ON			
2 COINS	3 CREDITS	ON	OFF	ON			
3 COINS	1 CREDIT	OFF	ON	ON			
3 COINS	1 CREDIT	ON	ON	ON			
BONUS SUPER PAC-MEN AWARDED AT THE FOLLOWING POINT VALUES:							
BEGAN WITH 1, 2 OR 3 SUPER PAC-MEN	BEGAN WITH 5 SUPER PAC-MEN	SW#1	SW#2	SW#3	SW#4	SW#5	SW#6 SW#7 SW#8
*1st S P-M 30000	1st S P-M 30000				OFF	OFF	OFF
2nd S P-M 100000	2nd S P-M 100000						
1st S P-M 30000	1st S P-M 30000				ON	OFF	OFF
2nd S P-M 80000	2nd S P-M 120000						
1st S P-M 30000	1st S P-M 40000				OFF	ON	OFF
2nd S P-M 120000	2nd S P-M 120000						
1st S P-M 30000	1st S P-M 30000				ON	ON	OFF
AND EVERY 80000	AND EVERY 100000						
1st S P-M 30000	1st S P-M 40000				OFF	OFF	ON
AND EVERY 100000	AND EVERY 120000						
1st S P-M 30000	ONLY				ON	OFF	ON
AND EVERY 120000	1st S P-MP 100000						
ONLY	ONLY				OFF	ON	ON
1 S P-M AT 30000	1 S P-M AT 40000						
NO BONUS SHIPS GIVEN WITH THIS SETTING					ON	ON	ON
DETERMINES NUMBER OF SUPER PAC-MEN PLAYER BEGINS GAME WITH:							
*3 SUPER PAC-MEN		SW#1	SW#2	SW#3	SW#4	SW#5	SW#6 SW#7 SW#8
1 SUPER PAC-MAN							OFF OFF
2 SUPER PAC-MEN							ON OFF
5 SUPER PAC-MEN							OFF ON
							ON ON
*INDICATES FACTORY RECOMMENDED SETTINGS				PART NUMBER MO51-00316-C012			

Figure 2-4 Option Switch Settings (cont.)



SUPER PAG-MAN
M051-00316-A003

- NOTES:
1. ▲ = 18AWG 60V WIRE
 2. ■ = 18AWG WIRE
 3. B = CT MODEL ONLY
 4. G-Y GROUNDS GO TO THE SPEAKER, FLUORESCENT LIGHT, THE FAN ON THE CT
 5. □ = PINED AT LOGIC CUI AT MONITOR JACK

REVISION	DATE	NAME

Bally / MIDWAY
10601 W BELMONT
FRANKLIN PARK, ILL 60131

Subject: Re: TEAH: SUPER PAC COCKTAIL

Date: Thu, 13 Nov 1997 04:37:42 -0800

From: Kev <mowerman?@erols.com>

Organization: Erol's Internet Services

To: The Retrodaddy <retrod@usa.net>

Newsgroups: rec.games.video.arcade.marketplace

The Retrodaddy wrote:

>

> *I have a Super Pac Man upright that is running in cocktail mode.*
> *There does not appear to be a dip switch that handles this, and I have*
> *been told that a pin either needs to be grounded or powered up with*
> *+5v.*

Connector 2, the 20 position one, pin 15 is grounded to make the game cocktail.

--

Kev <http://www.erols.com/mowerman> <- Coin Op Video Game site

Here are the pinouts to Super Pac-Man. The first part of this file contains original information pulled from the manual. At the end of this file, Scott Lemon was kind enough to test the pinouts and he gives the minimum set of pins needed to get the game to actually work.

--Dave Holcomb
holcomb@halcyon.com

Super Pac-Man pinouts
Midway, December 1982

There are three boards to the Super Pac-Man boardset:

CPU Board	A084-91436-D316
Video Board	A084-91435-C316
Credit Bypass Bd	A082-91348-0000

The CPU board is labeled with:

[@ location 2M]
c1982 BALLY MIDWAY MFG. CO
ALL RIGHTS RESERVED
[@ location 3K]
A084-91436-F316
[@ location 4J]
SUPER PAC-MAN CPU BD.

And the video board is labeled with:

[upside down, @ location 5L]
VIDEO P.C. BD
SUPER PAC-MAN
A084-91435-D316
c1982 BALLY MIDWAY MFG CO.
ALL RIGHTS RESERVED
PATENT PENDING

I do not know if the credit bypass board has any distinguishing features or not. The diagrams do not show the board.

The CPU board has a 9-pos connector at label J1, a 20-pos connector at label J2, and a 10-pos connector at location J3.

The video board has an 11-pos connector at label J1.

The credit bypass board has a 7-pos connector.

Legend:

CP = Control Panel
PS = Power Supply
Cred = Credit Bypass Board
CPU = CPU Board

The game is powered using these supply outputs:

+5V DC @ 4A
+5V DC (UNREG) @ 2A [coin meter only]

-5V DC (-SENSE) @ 0.45A
+12V DC @ 2A

Here are the pinouts for the CPU, Video, and Credit Bypass boards:

J1 CPU Board (9-pos)

Pin | Definition

1		Not Used
2		Gnd (to speaker)
3		Speaker
4		Key
5		Not Used
6		P2 Down
7		P2 Left
8		P2 Up
9		P2 Right

J2 CPU Board (20-pos)

Pin | Definition

1		P1 Down
2		P1 Left
3		P1 Up
4		P1 Right
5		Not Used
6		Service
7		Coin Meter (and to Cred/4)*
8		Not Used
9		Key
10		P2 Start
11		P1 Start
12		P2 Fast
13		P1 Fast
14		Tilt (and to Play/Test switch)**
15		Gnd (to CPU/J3-3)
16		(from Cred/7)
17		Not Used
18		Not Used
19		Not Used
20		Not Used

* Note: It looks to me like pin 7 is inverted before it reaches the Coin Meter or Credit Bypass board pin 4. The symbol used is "--|". The "--" is a triangle. On the other side of the coin meter, the diagram shows the trace going to UNREG +5V on the power supply.

** Note: Tilt shares it's ground with coin switch 1, coin switch 2, and Cred/3. Also, pin 14 goes to a Play/Test switch (I don't recognize the symbol for this switch), which gets its ground from CPU/J3-2. I assume this Play/Test switch is the kind where you pull it out to put the game into test mode.

J3 CPU Board (10-pos)

Pin | Definition

1		Gnd (to PS and from CP common ground)
---	--	---------------------------------------

2		Gnd (to PS and from Play/Test switch)
3		Gnd (to PS and from CPU/J2-15)
4		-SENSE (to PS)
5		+12V (to PS)
6		Key
7		+5V (to PS and from Cred/6)
8		Not Used
9		+5V (to PS and from CPU/J3-10)
10		+5V (to CPU/J3-9)

J1 Video Board (11-pos)

Pin		Definition
-----	--	------------

1		Shield*
2		Comp Sync (-)
3		Comp Sync (-)
4		Key
5		Gnd
6		B
7		Gnd
8		G
9		Gnd
10		R
11		Gnd

* Note: There is a note about the shield that says, "pined at logic; out at monitor jack". I have no idea what the shield is for.

Credit Bypass Board (7-pos)

Pin		Definition
-----	--	------------

1		Coin Sw#1
2		Coin Sw#2
3		Gnd (to PS/16)
4		(from CPU/J2-7, inverted, and to Coin Meter)
5		Key
6		+5V (to CPU/J3-7)
7		(to CPU/J2-16)*

* Note: the Credit Bypass board schematic shows pins 1, 2, and 4 as being on the same trace. I have a feeling that CPU/J2-16 can just be considered the Coin Switch pinout if you don't have a Credit Bypass board.

I don't really feel like labeling all the power supply (A082-90421-0000) pinouts. But I had already written this information down since I was referring to it in various places of the schematics, so here it is:

Power Supply (22-pos)

1	Audio Circuit, unreg filtered
2	-5V/0.45A
3	+12V [to coin door and control lights/2A, unreg aux., V.]
4	Reset
5	V.Batt
6	Key
7	+12V/2A
8	+12V/2A [connected to 7]
9	-SENSE

10 AC SYNC
11 Gnd [control lights return]
12 Audio Circuit [connected to 11]
13 Gnd
14 Gnd
15 Gnd
16 Gnd [from Cred/3]
17 Counter Drivers (~8V, unreg +5V) [from coin meter]
18 +5V/4A
19 +5V/4A [connected to 18]
20 Key
21 +5V/4A [connected to 18]
22 +5V/4A [connected to 18]

Feel free to correct any misinformation you find in this pinout. If you let me know (holcomb@halcyon.com), I will correct the copy of this pinout located on wiretap.spies.com.

--Dave Holcomb

--

Hi Dave,

I finally got all my Molex connectors I was waiting for, so I got to wire up my Super Pacman this weekend! And it works, with a few minor mods to your pinout. The only problem was getting around the coin bypass board, which wasn't difficult. Anyway, here is the amended info, you might want to merge it with the one you sent me.

Super PacMan Wiring Notes

Scott Lemon, 12/2/95 (slemon@jolt.mpx.com.au)

1. The credit bypass board is not required to get Super PacMan running. J2-8 appears to be the coin pin, although it is marked "Not Used" on your pinout. J2-15 has no effect as a coin pin.
2. I used Molex 0.156" crimp terminal housings to wire up a harness, these worked well. I wouldn't recommend soldering directly to the pins unless you were desperate.
3. Not all the pins need to be connected to work. Looking at the traces, many appear to be common. The following pinout works correctly:

CPU Board

J1-2 Speaker Ground
J1-3 Speaker

J2-1 Joystick Down (Player 1)
J2-2 Joystick Left (Player 1)
J2-3 Joystick Up (Player 1)
J2-4 Joystick Right (Player 1)
J2-8 Coin

J2-10 Player 2 Start
J2-11 Player 1 Start
J2-13 Player 1 Fast
J2-15 Ground - looped over to J3-3

J3-1 Ground
J3-2 Control Ground (this was spare so I used it)
J3-3 Ground - looped over to J2-15
J3-4 -5V
J3-5 +12V
J3-7 +5V

Video Board

J1-1 Coin Ground (this was spare so I used it)
J1-2 Composite Sync (-)
J1-6 Blue
J1-8 Green
J1-10 Red
J1-11 Video Ground

Scott
slemon@jolt.mpx.com.au