PIGSKIN
621 AD

Ancient Archrivals on a Rampage!

Bally/MIDWAY

OPERATIONS MANUAL

including:

Game Operation & Adjustment
Game Testing & Problem Diagnosis
Parts Information
Reference Diagrams & Schematics

PIGSKIN
SIX-TWENTY-ONE A.D.
(Ancient Arch Rivals on a Rampage!)

The rigors of day to day existence in the early part of the Seventh Century A.D. were far more severe than those most of us face today. It is no surprise then, that the era produced "Role Models" of a slightly different sort.

Men like: Attilla DeSoiled; whose infamous "Mongrel Horde" spent much of their free time sweeping across Central Asia into the dustbins of Eastern Europe.

Men like: Thor Akenbak; the renegade Viking whose piercing battle cry "... Loot and pillage, loot and pillage, Let's go find us an English Village..."

In the Dark Ages, the world's wildest warriors had a word for "mind blowing, bone crunching, heart-stopping" excitement.....PIGSKIN!

PIGSKIN 621 A.D. is a thoroughly researched, unflaggingly faithful re-creation of those exciting, fictitious days of yore when "Good, Clean Fun" was simply known as "Fun".

Each player directly controls one of a half-dozen hulking barbarians in a bone-crushing "battle for the ball" across a medieval countryside.

The object of the game: to inflict as much pain and suffering as possible on the opposition and carry the PIGSKIN back to your "stronghold" (your ship or castle) more times than your opponent can and thereby win the battle!

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PIGSKIN RULES

Each player directly controls an armoured "team captain" ; and indirectly controls up to 5 teammates. Each player has the following to control the character selected:

- 1 49 Way Joystick
- 2 Punch Button(s) (whichever is more comfortable)
- 1 Pass Button
- 1 Team Attitude Adjustment Button

Punch buttons allow a player to throw punches (all teammembers throw punches when pressed). It can also be used along with the pass button while on defense (press both buttons to attempt a flying tackle).

The Pass button allows the player to pass or kick the ball to a teammate (passplays are shown on the screen and the player has the choice of which one to select.

Team Attitude Adjustment Buttons are used to select a style of play (get the ball, man to man, bad attitude, etc.).

Players may pick up "concealed weapons" by simply running over them. Weapons are used automatically durring "grapples" involving the Pigskin. Characters that are severely injured by weapons are revived after the next goal is scored.

A "grapple" is a savage battle for the pigskin, which is usually won by the team with the most players involved in it.

The terrain will affect a character's movement (Mud, rocks, swampy areas, etc.). Players that remember how a field is "mapped out" may learn to use the terrain to their advantage.

Players score points for carrying the Pigskin (1 point for every 5 seconds in the player's possession), and for scoring a goal (6 points).

IMPORTANT NOTICE

To Receive A Free Player's Handbook Including:

- Rules
- Strategies
- Game Tips
- Designer's Notes
- Pigskin Product Information

Send a Self Addressed Stamped Envelope to:

PIGSKIN
P.O. BOX 1000
PLANO, IL 60545
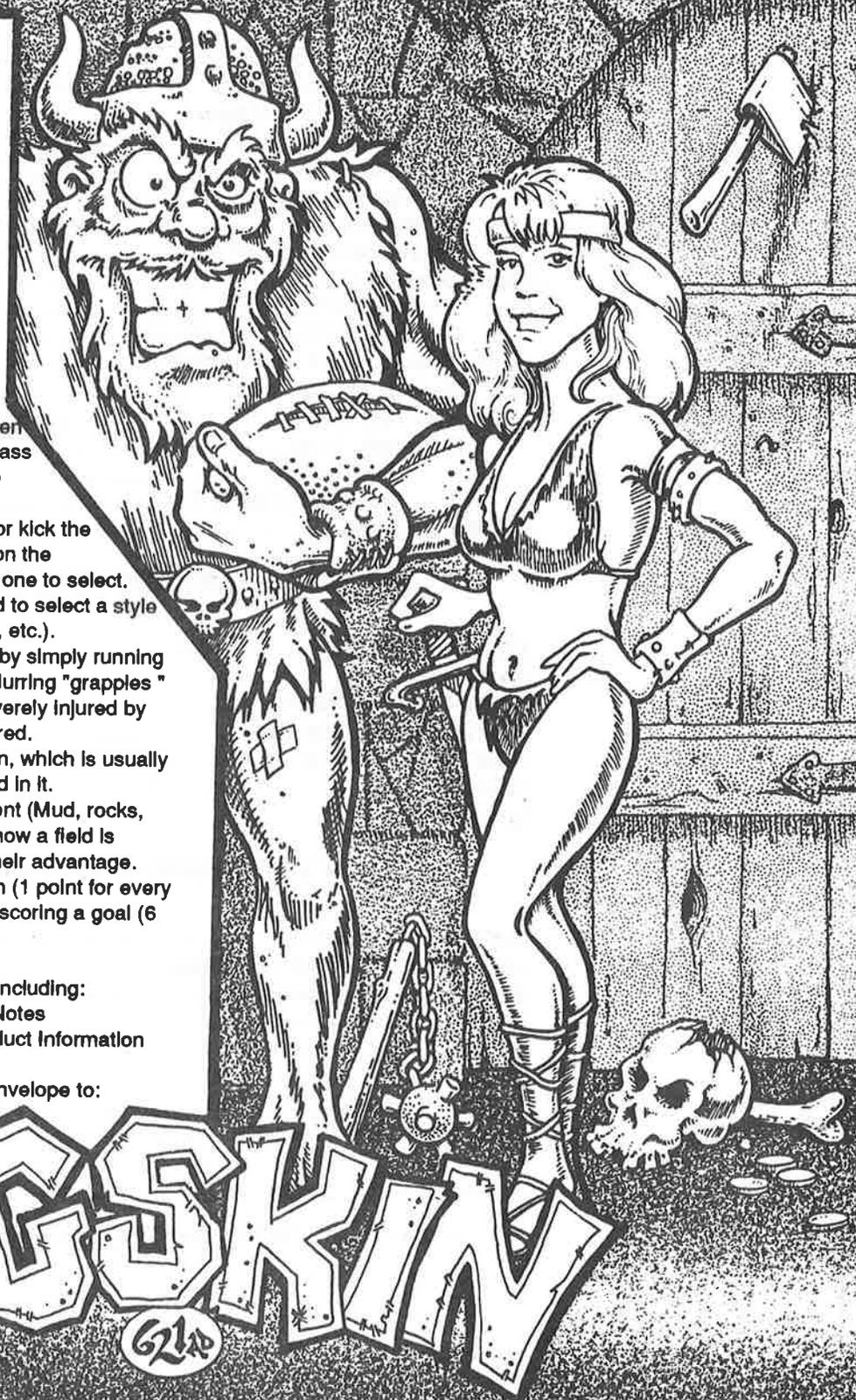
PIGSKIN

Game Operation & Troubleshooting Information

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Safety Notices

The following safety hints apply to all game operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you read this page, and also all of Section 1, before preparing your game for play.

WARNINGS

AC POWER CONNECTION. Before connecting the game to the AC power source, verify that the "line voltage selection chart" jumper wires are installed correctly for the line voltage in your area. For details, refer to Section 3.

PROPERLY GROUND THE GAME. To avoid electrical shocks, do not plug in the game until it has been inspected and properly grounded. Bally/Midway games should only be plugged into a grounded 3-wire outlet. Shocks will also result, if the control panel is not properly grounded! After servicing any parts on the panel, assure that the grounded wires are secure. Only then should you lock up the game.

DISCONNECT POWER DURING REPAIRS. To avoid electrical shock, disconnect the game from the AC power source before removing or repairing any part of the game. When removing or repairing the monitor, extra precautions must be taken to avoid electrical shock because high voltages may exist within the monitor circuitry and cathode ray tube (CRT) even after power has been disconnected. Do not touch internal parts of the display with your hands or metal objects! Always discharge the CRT: attach one end of a large, well-insulated, 20-kV jumper to ground. Momentarily touch the free end of the grounded jumper to the anode by sliding it under the anode cap. Wait two minutes and discharge the anode again.

USE THE PROPER FUSE. To avoid electrical shock, use the replacement fuse which is specified in the parts list for this game. The replacement fuse must match the original fuse replaced in fuse type, voltage rating, and current rating.

HANDLE FLUORESCENT TUBE AND CRT WITH CARE. If you drop a fluorescent tube or CRT and it breaks, it will implode! Shattered glass can fly eight feet or more from the implosion.

(CAUTION)

PROPERLY ATTACH ALL CONNECTORS. Make sure that the connectors on each printed circuit board (PCB) are properly connected. If they do not slip on easily, do not force them. A reversed connector may damage your game and void the warranty. All connectors are keyed to fit specific pins on each board.

Setup Procedure

Installation and Inspection

1. Remove the game from its shipping carton, and inspect the exterior of the cabinet for any signs of damage. Remove the shipping cleats from the bottom of the cabinet.

2. Remove keys from the taped coin return slot (or attached to joystick). Unlock and open the coin and cash box doors. (Leg levellers and spare parts are stored in the cash box.)

3. Locate the four threaded holes on the bottom of the cabinet (one in each corner),and install one leg leveller (with its hex nut) in each hole.

4. Stand the cabinet upright and make certain that it is in a stable position. Level the cabinet.

5. Unscrew (or unlock) and remove the rear doors/panels of the cabinet. Inspect the interior for any signs of damage. Check all major assemblies to assure that they are mounted securely.

6. Refer to the game's cabinet wiring diagram (Section 3), and check to see that all cable connectors are correctly secured and firmly seated. DO NOT FORCE CONNECTORS. Watch for damaged connectors and avoid making reversed connections.

7. Line Voltage Selection. Your game is designed to work properly on the line voltage where you are located. Determine the value of your line voltage with a meter. 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 local line voltage value. If necessary, reconnect the power input wires to the transformer in accordance with the Tranformer Chart in Secton 3.

If the line voltage in your area falls outside the upper or lower limits of the range of voltage inputs covered by the main powe supply transformer, DO NOT PLUG YOUR GAME IN until you have contacted your distributor or the Bally/Midway Service Department and obtained a solution to the problem. Otherwise, you could damage your game.

8. Lay the line cord (connected to the Power Chassis) in the slot along the bottom edge of the lower rear cabinet door/panel. Install the rear cabinet doors/panelsand screw (lock) them securely. Close and lock the front coin and cash box doors.

9. Connect the line cord to a grounded (3-terminal) AC wall outlet.

10. Switch ON the game, usingthe ON/OFF switch located on the upper left rear of the cabinet, to verify proper operation.

GAME LOCATION REQUIREMENTS

Power
Domestic 115V @ 60 Hz
Foreign 230V @ 50 Hz

Temp.
32° F to 100° F
(0° C to 38° C)

Humidity
Not to exceed 95% relative.

CABINET ASSEMBLY DIAGRAM

Monitor Board

Audio Board

Transformer

PIGSKIN CPU Board

Vent Holes

Lamp Board

1 & 2 Player Credit Buttons

Joystick

Player Control Buttons:
- Team Attitude Adjustment
- Punch (2)
- Pass

6" Speaker

4" Piezo Speaker

19" Monitor

Coin Door
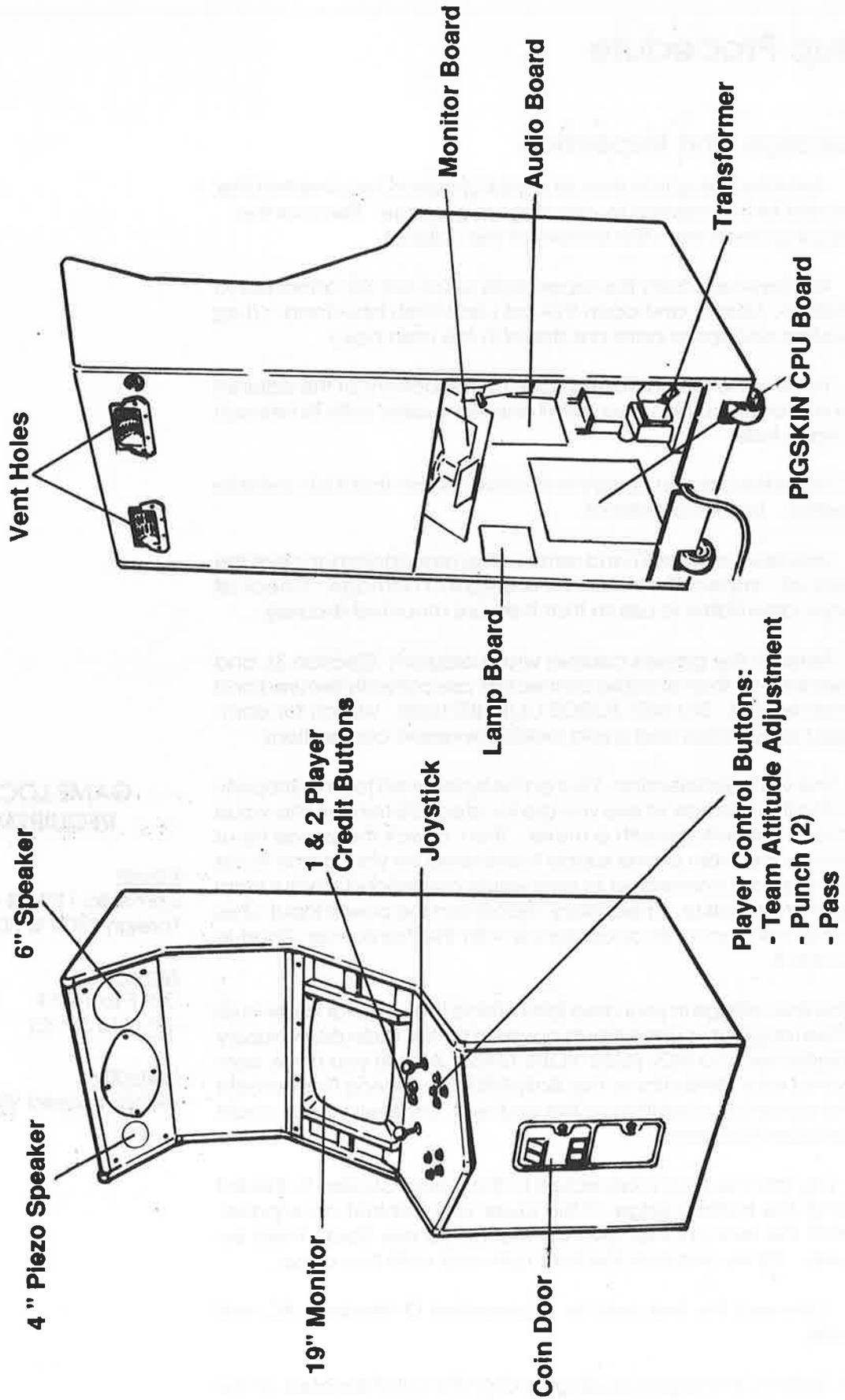
Servicing

■ Servicing the Control Panel

Switch OFF power to the game. The control panel is held in place by four latches (located on the left and right sides of the cabinet) which provide constant pressure on the strikes. The latches can be reached through the coin door opening. To release the latches, lift the latch handle and unhook the wire fasteners. Carefully use the joysticks to lift the control panel. Rest the panel on its support bracket, while working on it. To reinstall the control panel, check for proper cable connections, including the ground strap, and use the joysticks to lower it into position, avoiding pinched wires. Reclamp the latches.

NOTE

To remove the control panel for bench servicing, release the latches and lift the control panel, until it rests on its support bracket. Disconnect the cables and the ground strap. Lift the control panel out of the game cabinet.

■ Removal of Viewing Glass

Switch off power to the game, and open the control panel. Unscrew the four nuts at the bottom of the glass and remove the protective black plastic strip. Carefully lift the glass from its bottom groove and lift it clear of the cabinet.

■ Removal of Monitor Bezel

Switch off power to the game, and remove the viewing glass. Remove the bezel securing screws to free the monitor bezel.

■ Monitor Replacement

We recommend that you read the WARNINGS section thoroughly before beginning this procedure.

Switch off power to the game. Open the upper rear door/panel. Remove the viewing glass and the monitor bezel. Completely disconnect the monitor from all of its cabling, including its chassis ground strap. Remove the four bolts securing the monitor's mounting flanges to its mounting panel. Pull the monitor carefully from the cabinet front.

(CAUTION)

The monitor DOES NOT contain an isolation transformer in its chassis (it is mounted instead in the Power Chassis Assembly located on the floor of the cabinet). When servicing the monitor on a test bench, YOU MUST ISOLATE THE MONITOR FROM THE LINE VOLTAGE WITH AN ISOLATION TRANSFORMER.

(CAUTION)

While removing the four bolts, firmly support the monitor from the front of the crt so that it will not slip.

■ Removal of the Header Attract Glass

Switch off the power to the game. The glass is held in place by
retaining brackets at the top and bottom of the glass. The top
retaining bracket is secured to the cabinet by five torx® tamper-
resistant screws. Remove these screws using the proper torx®
tool.

The fluorescent light tube starter may also be replaced at this
time. Grasp the starter (located on the back of the mounting
bracket of fluorescent light assembly), give it a quarter turn, and
remove it from its socket. Carefully place a new tube starter into
the socket, and turn to reinstall.

■ Removal of the Fluorescent Light Assembly

After switching off the power to the game, remove the header
glass. Disconnect the fluorescent light assembly from its power
cable. Remove the screws which secure the assembly to the
cabinet and lift out the assembly.

■ Removal of the Speakers

Switch off the power to the game. Take out the tamper-resistant
screws which secure the speaker grille to the cabinet, and
remove the speaker grille. Remove the rear cabinet door.
Disconnect both speakers from their cabling. Each of the two
speakers is secured to the cabinet with two carriage bolts and
two hex nuts. Remove the speakers by removing the nuts and
sliding the bolts out of the cabinet. Note that, in the process, the
ground wires to both speakers are also removed.

■ Volume Control and Diagnostics Switches

Looking inside the coin door, you will find the game's control
switches. Located towards the near left corner is the Power
Interlock Switch. The Volume Control Potentiometer is the
white knob located on left side of the bracket which is mounted
at the rear of the coin box. Turning the knob clockwise will in-
crease volume. The upper right switch on the bracket is the
Test/Diagnostics Switch which enables you to enter the game's
test mode. Finally, the lower right switch located on the bracket
is the Service Credit Switch, which enables you to add credits
to a game for service testing without affecting the game's book-
keeping total.

■ Option Switch Settings

The option switch controls all game options. It is located on the
68000 Video Board which is mounted inside the lower portion
of the cabinet. Refer to the Video Board Reference Drawing for
option switch settings.

Game Rules and Features

Starting Up

Switch on the power to the game. A "rug" pattern appears on the CRT screen. When the "rug" pattern ends, the screen shows CHECKING SCRATCH RAMS, and then CHECKING ROMS. The next screen shows PIGSKIN REVISION LEVEL, CMOS TEST OK and the Coin Setting. The game then moves to the attract mode. After the proper coinage has been inserted, the game exits the attract mode and enters playmode.

Player Controls

▨ Each Credit Button allows (1 or 2) players respectively, to begin play or continue play.

▨ Each Joystick enables players (1 or 2) respectively, to move their team captain.

▨ Four Buttons (per player) control Team Attitude Adjustment, Punch, and Pass. See Diagram below for locations.

PIGSKIN
Player Control Panel

One Player Credit Button   Two Player Credit Button

Move

Punch   Team Attitude Adjustment   Punch

Punch

Pass
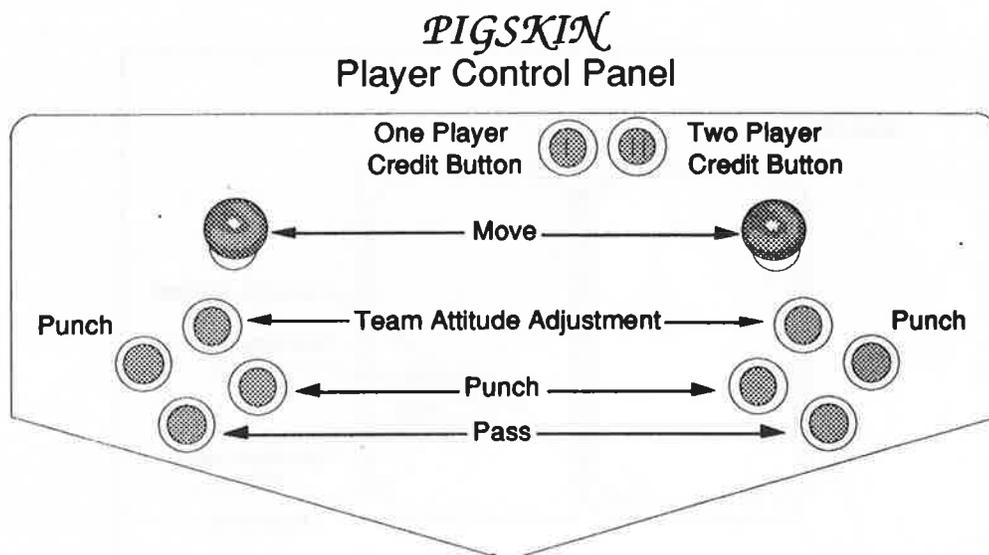
Game Operation

PIGSKIN is a one or two player video game with a color monitor. From the player's perspective, the game has two modes of operation: Ready-to-Play and Play. For the owner/operator, the game has an additional mode of operation called Game Diagnostics and Adjustments.

Control Switches

■ The **COIN DOOR SLAM TILT SWITCH** detects any forceful vibrations against the Coin Door. This eliminates pounding for free games.

■ The **VOLUME CONTROL** allows increasing or decreasing the volume level of the game music and speech. For greater profits, set your game's volume level at its maximum.

■ The **TEST/DIAGNOSTICS SWITCH** allows you to enter into the game's Diagnostic mode. Move the Test Switch to the left, then back to the right to enter the Diagnostics Mode. To exit this mode, select EXIT TO GAME OVER from the Diagnostics main menu.

■ The **SERVICE CREDIT SWITCH** is a special feature switch that allots credit without affecting the game's bookkeeping total.

■ The **POWER INTERLOCK SWITCH** is a safety switch that ensures power to the game is turned off during servicing. This switch is located inside the lower rear door/panel.

Slam Tilt Switch

Volume Control

Test/Diagnostics Switch

Service Credit Switch

Cash Box

Control Switch Locations
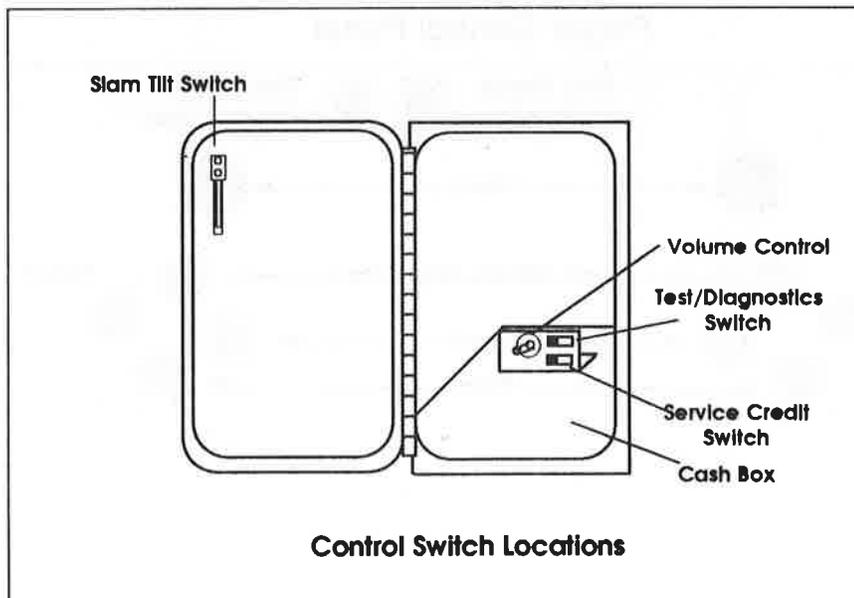
Game Adjustments & Diagnostics

Starting Up

All PIGSKIN game adjustments and diagnostics are menu-driven features. Each menu lists several choices that you may act upon as desired. PIGSKIN contains many menu levels (i.e., one menu selection will send the game to another menu).

Switch on the power to the game. Locate the Test Switch and push it towards the left to activate the PIGSKIN Diagnostics mode. The first menu you see is the main test menu. Game adjustments, bookkeeping, and diagnostics are all available from this menu.

Once in the main test menu, use the PLAYER JOYSTICK to select an option and the one or two player CREDIT BUTTON to enter into it. Notice that the selected option is always the one that has the cursor in front of it.

The main test menu lists six diagnostic options to enter.

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          PIGSKIN 621

      1. SELF TEST

      2. SWITCHES

      3. GRID

      4. DIP SWITCH

      5. RESET HISCORE

      6. LIGHT TEST


      USE PLAYER JOYSTICK TO
      MOVE CURSOR & SELECT
      CHOICE.

      PRESS 1 OR 2 PLAYER CREDIT
      BUTTON TO START TEST.
```
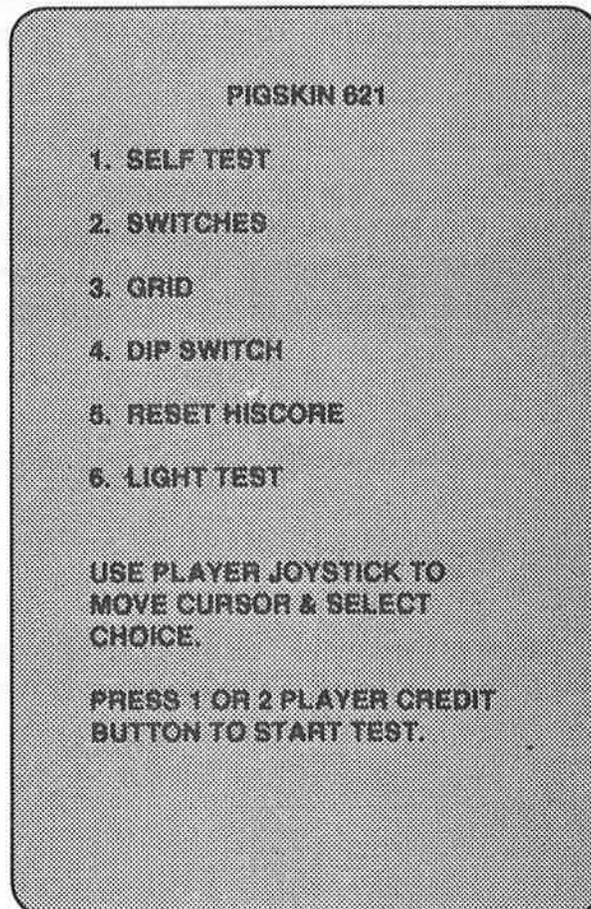
Main Test Menu

PIGSKIN DIAGNOSTICS & ADJUSTMENTS

SELF TEST

This test is designed to locate and identify any computer malfunctions. When selected, the game enters this mode immediately and begins scanning its memory. The phrases "PASSED TEST" or "FAILED TEST" will appear on the screen depending on whether the test was successful or not.

SWITCHES

The Switch and Sound Self-Test mode allow the operator to determine if all game swithes, sound features, and the opto-board controlled joysticks are operating properly. The operator can activate switches one at a time and check the monitor screen to see if they are acknowledged.

GRID

The Convergence Grid Display Test displays a crosshatch pattern to aid in adjusting the color monitor. This pattern is useful in adjusting the color balance, convergence, vertical linearity, and vertical/horizontal sizing. To exit this test, press the Tilt switch.

DIP SWITCH

Game options are adjustable by changing the bit switch settings on the DIP Switch Table (shown on the next page). The DIP Switch unit combines seven bit switches, which are set to the ON or OFF position. When you enter this test mode, the screen shows a full display of current DIP Switch settings.

RESET HISCORE

The operator may reset the high scores by pressing both the 1 and 2 Player Credit Buttons simultaneously.

LIGHT TEST

The Light Test allows the operator to determine if all the "Player Awareness" Lights are working correctly. Simply press the Player 1 Credit Button to run through the lights.

PIGSKIN DIP SWITCH TABLE

BITS	1	OFF	→	MEDIUM
	2	OFF		PRESET TIME
	1	ON	→	SHORT
	2	OFF		TIME
	1	OFF	→	LONG
	2	ON		TIME
	1	OFF	→	SHORTEST
	2	ON		TIME
BITS	3	OFF	→	1 COIN 1CREDIT
	4	OFF		
	3	ON	→	2 COIN GAME
	4	OFF		
	3	OFF	→	SET YOUR OWN COIN *
	4	ON		OPTIONS
	3	ON	→	FREE PLAY
	4	ON		
BIT	6	OFF	→	BLANK
BIT	6	ON	→	TEST SWITCH ON
BIT	7	OFF	→	BLANK
BIT	7	ON	→	INDEPENDENT COIN **
				CHUTES

* After selecting this option through DIP SWITCH (3 & 4) return to the main menu and select (Coin Settings). Select the desired number of coins with the player 1(increments of 1) & player 2 credit buttons (decrements of 1). Follow the same procedure for selecting the desired number of credits per coin.
NOTE: This menu item will only be displayed when the appropriate Dip Switches have been correctly set as shown in the table above.

** After selecting this option through DIP SWITCH (7) return to the main menu and select (Independent Coin Chutes). Select a coin chute by pressing the one or two player credit button. Set the Coin and Credit options in the same manner as explained above.
NOTE: This menu item will only be displayed when the appropriate Dip Switch has been correctly set as shown in the table above.

Troubleshooting

Problem	Possible Solution
NO PICTURE OR DISTORTED PICTURE.	Check for faulty video board or monitor. Check for disconnected video signal cable.
TURN GAME ON & NOTHING HAPPENS	Check line fuse. Check for +5V dc at pins C, D, 3, and 4 of the JAMMA Connector.(Check for LED on CPU Board.)
NO SOUND	Check the speaker and speaker connection to pins L and 10 on JAMMA Connector. Check volume control setting. Check for +12V dc at pins F and 6 on the JAMMA Connector. Check interboard wiring from CPU Board to Sound Board.
NO GENERAL ILLUMINATION	Check the 1A., S-B fuse on the Lamp Driver Board.
MOVE JOYSTICK, BUT PLAYER DOES NOT MOVE OR FIRE	Check for open wires between Joystick and CPU Board. Check for contamination on joystick switch contacts and CPU Board pins. Check for proper ground.
PRESS START BUTTON AND NOTHING HAPPENS	Check for open wires between button and CPU Board. Check for contamination on CPU Board pins or button switch blade contacts. Check for proper ground.
NO CREDIT GIVEN WHEN COINS ARE INSERTED	Check DIP switch coin setting. Check for contamination on coin switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on JAMMA Connector or Coin Switch 2 and pin T of JAMMA Connector.
TOO MANY CREDITS FOR NUMBER OF COINS INSERTED	Check Game Pricing setting. Check for a short between pins T & 16 on JAMMA Connector.
GAME STAYS IN THE TEST MODE.	Check that the Test Switch in the coin door and the Test Switch (Position 8) on DIP Switch 2 are set to Off.

PIGSKIN

Game Parts Information

SECTION TWO

Description	Part Number

Battery

Lithium Battery, 3V	5880-11056-00

Cables

Coin Door Cable	H-13842	Sound Board Jumper Cable	H-12758
Power Pak Jumper Cable	H-13265	Speaker Cable	H-13213
Video Switch Power Cable	H-10217-4	Control Panel Cable	H-13790
Video Signal Cable	H-12746-2	Main Harness Cable	H-13791
Line Voltage Cable	H-13789	Sound/Speaker Cable	H-13827
Line Filter Jumper Cable	H-13344	Lamp Board Cable Assembly	H-13828
Transformer Jumper Cable	H-13378	Volume Control Cable	H-8865-5

Electrolytic Capacitors

$10\mu F$ at 20V $\pm 20\%$	5040-09343-00
$1\mu F$ at 63V ± 50-10%	5040-09365-00
$470\mu F$ at 16V ± 50-10%	5040-09776-00
$100\mu F$ at 35V	5040-10974-00
$1000\mu F$ at 16V $\pm 20\%$	5040-12006-00
$10\mu F$ at 10V $\pm 10\%$	5041-09243-00
$0.01\mu F$ at 50V ± 80-20%	5043-08980-00
$0.1\mu F$ at 50V $\pm 20\%$	5043-08996-00
470pF at 50V $\pm 20\%$	5043-09065-00
100pF at 50V $\pm 20\%$	5043-09492-00
47pF at 50V $\pm$ 20%	5043-09844-00
1000pF at 50V $\pm 20\%$	5043-09845-00
1200pF at 50V $\pm 5\%$	5046-09346-00
180pF at 100V $\pm 5\%$	5046-09350-00
$0.0047\mu F$ at 50V $\pm 10\%$	5048-10992-00
100pF at 50V $\pm$ 5%	5048-11029-00
390pF at 50V $\pm$ 10%	5048-11064-00
820pF 10% AXIL	5048-12506-00
.47 at 50V AX	5048-12577-00

Fluorescent Lamp Parts

Fluorescent Light Fixture -60H	20-9590
Fluorescent Light Bulb, #555, 6.3V. .25A.	24-8768
Fluorescent Light Bulb, 15W, 18"	24-8809

	Description	Part Number

Transformers

Transformer	5610-12291-00

Line Filter

5 Amp Line Filter	5102-08895-00

Pots & Switches

Description	Part Number
DPAT, 227V, 15 Amps	5640-10932-00
SPST, Switch	5640-12540-00
Pushbutton SPS	5641-12539-00
Pushbutton PC Mount	5641-12551-00
Interlock Cheater Switch	5643-09556-00
10 Position DIP Switch	5645-12512-00
Universal Switch, Molded	03-7614
Bracket Interlock Switch	01-9399
Bracket-Test Switch	01-9383

Single Inline Packages

Description	Part Number
4.7K, 9R 10P, 5%	5019-09362-00
4.7K & 470pF x 8	5060-10396-00
1K & 9R 10%	5019-09669-00
100K & 9R, 10P, 5%	5019-12509-00

Speakers

Description	Part Number
6", 8Ω Speaker, 20W	5555-12015-00
4" Piezo Speaker, 50W	5555-12068-00

Control Panel

Description	Part Number	Description	Part Number
Control Shelf Assembly	D-13551	Universal Switch Molding	03-7614
Control Shelf Plate	01-9618	Wood Control Shelf	11-939
Red Button Assembly	C-9214-4	5/8 Palnut	20-9222
White Button Assembly	C-9214-5	Screened Overlay	31-1549-4004
Yellow Button Assembly	C-9214-6	49W Joystick Assembly	C-9477-1
Latch Bracket	01-6994		
Latch Bracket	01-9605		

	Description	Part Number
Analog ICs	2002 Audio Amplifier	5370-09156-00
	1458 Op Amp	5370-09321-00
Oscillators	8 MHz Oscillator	5521-10931-00
	16 MHz Oscillator Clock	5521-12501-00
	20 MHz Oscillator Clock	5521-10743-00
RAM ICs	5516-2 CMOS RAM 2K x 8	5340-10139-00
	93419 SRAM	5340-12496-00
	2018 SRAM	5340-12497-00
	6116 SRAM	5340-12500-00
	Low Power 8K x 8 SRAM	5340-12558-00
Random Logic	74LS139 2/4 Decoder	5281-09246-00
	74LS138 Demultiplexer	5281-09745-00
	74LS74 Dual D Flip-Flop	5281-09487-00
	74LS04 Hex Inverter	5281-09215-00
	74LS10 Triple NAND	5281-09235-00
	74LS175	5281-10043-00
Transistors	2N4123 NPN	5160-12510-00
	2N3904 NPN	5160-10269-00
Diodes & Varistors	130V, 10 Joules Varistor	5017-09044-00
VLSI Chips	68B09E Microprocessor	5400-10320-00
	68B21 PIA	5430-10322-00
	YM2151 Yamaha Synthesizer	5370-11086-00
Miscelaneous Electronic Parts	1408 D/A Converter	5371-09152-00
	YM3012 D/A Converter	5371-11087-00
	3.58 MHz Crystal	5520-09020-00
	55536 CVSD	5370-09691-00
Monitor	Monitor 19"	5675-12560-00
Manuals	Monitor Manual	16-3000-103
	Instruction Manual	16-4004-101

Description	Part Number

Metal & Wooden Parts

Description	Part Number
Cabinet	11-936
Coin Door-USA	09-20000-V-1
Back Door	11-948-1
PCB Board Shelf	11-936-2
Speaker Panel	11-936-3
Wood Control Shelf	11-939
Wire Key Hook	12-6230

Rubber, Glass & Plastic Parts

Description	Part Number
Screened Marquee	31-1542-4004-U
Decal, Player One/Two, Offense	31-1548-4004-1
Decal, Player One/Two, Defense	31-1548-4004-2
Screened Overlay	31-1549-4004
Screened Football	31-1556-4004
Screened Backdrop	31-1563-4004

Major Assemblies

Description	Part Number
Cabinet Assembly	A-13768-4004
Back Door Assembly	B-12590-1
Caster Wheel Assembly	B-13086
Test Switch Assembly	A-13115
Speaker Grille Assembly	B-13600
Switcher Power Supply Assembly	C-13253
Line Voltage Cable Assembly	C-12773-7
Mounting Plate Toggle Assembly	A-9958
PC Board Shelf Assembly	C-13532
Speaker Shelf Assembly	C-13533
Power Pak Chassi Assembly	D-12356
Line Cord Assembly - USA	A-13340
Control Shelf Assembly	D-13551
49 Way Joystick Assembly	C-9477-1
PCB Lamp Assembly	C-13797
PCB Lamp Driver Assembly	C-13765
Opto-Board (49JS) Assembly	C-9471

PC BOARDS

Description	Part Number
PIGSKIN CPU Board	C-13246-4004
Sound Board Assembly	D-11581-4004
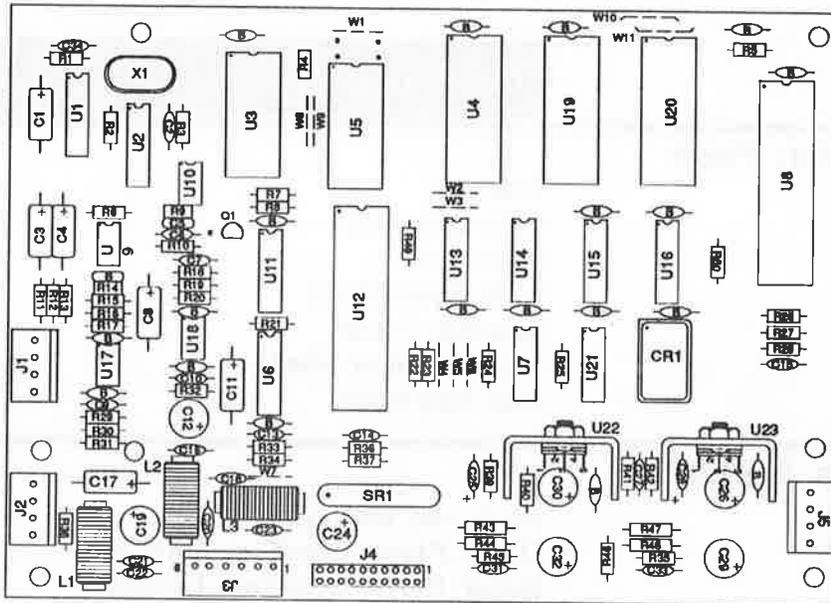
Audio Board Assembly
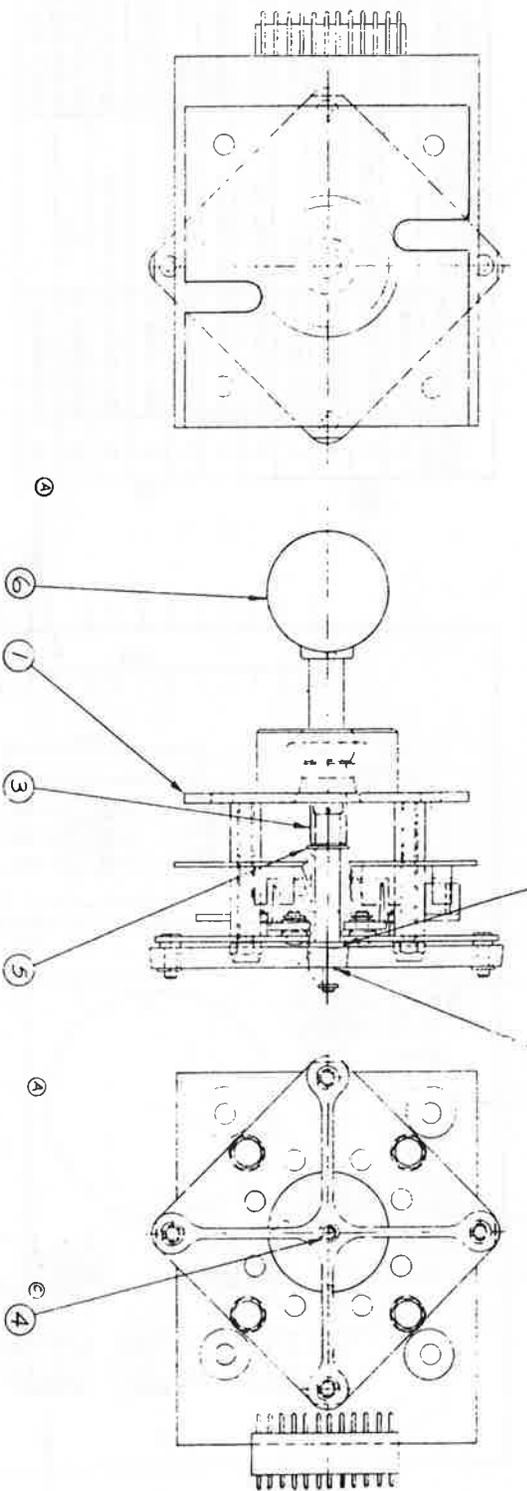## p/n D-11581-4004

Part Number	Ckt Designator	Description	Part Number	Ckt Designator	Description
5700-10176-00	U4, U19, U20	Socket, IC, 28 PIN	5010-10985-00	R14, R15	Resistor, 20K, 1/4w, 5%
5766-12130-00		Bare P. C. Board	5010-09034-00	R22-R24, R17, R34	Resistor, 10K, 1/4w, 5%
5371-11087-00	U1	IC, D/A Conv, YM3012	5010-09324-00	R6, R19, R20, R21	Resistor, 27K, 1/4w, 5%
a) 5700-09006-00		Socket, IC, 16-pin (U1)	5010-09086-00	R1G	Resistor, 6.8K, 1/4w, 5%
5370-11086-00	U3	IC, Sound Processor, YM2151	5010-09534-00		Resistor, 0Ω, C.F., 1/4W
a) 5700-09004-00		Socket, IC, 24-pin (U3)	5010-09162-00	R39	Resistor, 100K, 1/4w, 5%
5400-10320-00	U8	IC, µProcessor, MC68B09E	5010-09331-00	R16	Resistor, 13K, 1/4W, 5%
a) 5700-08985-00		Socket, IC, 40-pin (U8)	5010-08772-00	R18	Resistor, 15KΩ, 1/4W, 5%
5343-4004-1	U4	IC, Audio ROM 1	5010-08824-00	R32	Resistor, 43KΩ, 1/4W, 5%
5343-4004-2	U19	IC, Audio ROM 2	5010-08846-00	R31	Resistor, 220KΩ, 1/4W, 5%
5343-4004-3	U20	IC, Audio ROM 3	5010-08991-00	R12	Resistor, 4.7KΩ, 1/4W, 5%
a) 5700-10176-00		Socket, IC, 28-pin (U4, U19)	5010-09219-00	R38	Resistor, 8.2K, 1/4W, 5%
5371-09152-00	U11	IC, D/A Convtr, MC1408	5010-10258-00	R40	Resistor, 1M, 1/4w, 5%
5430-10322-00	U12	IC, PIA, MC68B21	5010-09179-00	R10	Resistor, 3.3M, 1/4w, 5%
5340-10139-00	U5	IC, RAM/S 5516-2 2Kx8	5010-09333-00	R29	Resistor, 180KΩ, 1/4W, 5%
5281-09487-00	U16	IC, Dual D Flipflop, 74LS74	5010-09342-00	R30	Resistor, 36KΩ, 1/4W, 5%
5281-10043-00	U13	IC, 74LS175	5010-09534-00	W9	Resistor, 0Ω, 1/4w, 5%
5281-09235-00	U21	IC, Triple NAND, 74LS10	5040-09343-00	C1, C3, C4, C8, C17	Capacitor, 10µfd, 20v, ±20%
5370-09321-00	U9, U10, U17, U18	IC, Op Amp, MC1458	5040-10974-00	C12, C19, C24	Capacitor, 100µfd, 35v
5281-09215-00	U2	IC, Hex Inv, 74LS04	5040-09776-00	C26, C30	Capacitor, 470µfd, 16v; +50, -10%
5281-09246-00	U14	IC, 2-4 Dec, 74LS139	5040-12006-00	C29, C32	Capacitor, 1000µfd, 16v, 20%
5281-09745-00	U15	IC, Dual Mux, 74LS138	5041-09243-00	C25, C28	Capacitor, 10µfd, 10v,±10%
5370-09156-00	U22, U23	IC, Audio Amp, TDA2002	5043-08980-00	C5, B (20)*	Capacitor, 0.01µfd, 50v,+80, -20%
a) 5705-09199-00		Heatsink, #6030B	5043-08996-00	C31, C33	Capacitor, 0.1µfd, 50v, ±20%
b) 4006-01003-06		Mach. Screw, 6-32 x 3/8	5043-09065-00	C13 - C15	Capacitor, 470 pfd, 50v, ±20%
c) 4406-01117-00		Nut, 6-32 Hex.	5043-09492-00	C2, C34	Capacitor, 100 pfd, 50v, ±10%
d) 4703-00007-00		Lockwasher, #6 Ext.	5043-09844-00	C6	Capacitor, 47 pfd, 50v, ±20%
5160-10269-00	Q1	Transistor, 2N3904, NPN	5043-09845-00	C16, C18, C20 - C23, C27	Capacitor, 1000 pfd, 50v, ±20%
5060-10396-00	SP1	SIP 4.7K & 470pfd, 8R8C			
5010-09181-00	R44, R48	Resistor, 1.0Ω, 1/2w, 5%	5040-09365-00	C11	Capacitor, 1µfd, +50v, -10%
5010-09161-00	R35, R45	Resistor, 2.2Ω, 1/4w, 5%	5046-09346-00	C7	Capacitor, 1200P, 50v, +/-5%
5010-09361-00	R43, R46, R47	Resistor, 220Ω, 1/2w, 5%	5048-10992-00	C10	Capacitor, 4700P, 50v, +/-10%
5010-09358-00	R41, R42	Resistor, 1K, 1/4w, 5%	5046-09350-00	C9	Capacitor, 180P, 100v, +/-5%
5010-08998-00	R2, R3, R7-R9	Resistor, 2.2K, 1/4w, 5%	5520-09020-00	X1	Crystal, 3.58 MHz
5010-08983-00		Resistor, 3.3K, 1/4w, 5%	5521-10931-00	CR1	Oscillator, 8 MHz
5010-08991-00	R1, R4, R5, R11, R25 - R26, R33, R36, R37, R49, R50	Resistor, 4.7K, 1/4w, 5%	5551-09822-00	L1 - L3	Inductor, 4.7 µH, 3A
			5791-09437-00	J4	Connector, 20 pin, (Hdr), Rib. Cbl
			5791-10862-04	J1, J2, J5	Connector, 4 pin (Hdr)
			5791-10862-06	J3	Connector, 6 pin (Hdr)
			16-8850-297		P.C.B. I.D. Label

Notes: *20 capacitors (shown on diagram with "B" symbol) provide +5VDC filtering for ICs.
All capacitors are ceramic, 50v, axial, unless otherwise noted.
All resistors are 5%, 1/4w, Carbon Film, unless otherwise noted.

NOTES:
1. ASSEMBLY MUST OPERATE FREELY WITHOUT ANY EVIDENCE OF BINDING OR INTERFERENCE.
2. ELECTRICALLY TEST ASSEMBLY FOR PROPER OPERATION.
③3. LUBRICATE STEPPED SECTION OF ITEM 6 LIGHTLY WITH "LUBRIPLATE #105" BEFORE FINAL ASSEMBLY.

	DESCRIPTION (REF)	ASSEMBLY #	ITEM #6
④	J/STK ASSY - RED	C-9477-4	20-9344-4
D	J/STK ASSY - ORANGE	C-9477-15	20-9344-15
C	J/STK ASSY - BLUE	C-9477-1	20-9344-1

—SEE NOTE 3

ITEM	PART NUMBER	DESCRIPTION	QTY
6		CHART	
5	20-8712-3	JOYSTICK WIRING	1
4	20-8712-15	RETAINING RING	
3	02-4151	WASHER	
2	03-7807	ROLLER	
1	C-9476	SENSING MECHANISM ASSY	

WILLIAMS ELECTRONICS, INC.
CHICAGO

SCALE 1/1	NAME JOYSTICK ASSY 49 WAY D.3	SHT OF 1
		PART NO C 9477-

ANALOG DIGITAL 49W JOYSTICK ASSEMBLY
P/N: C-9471
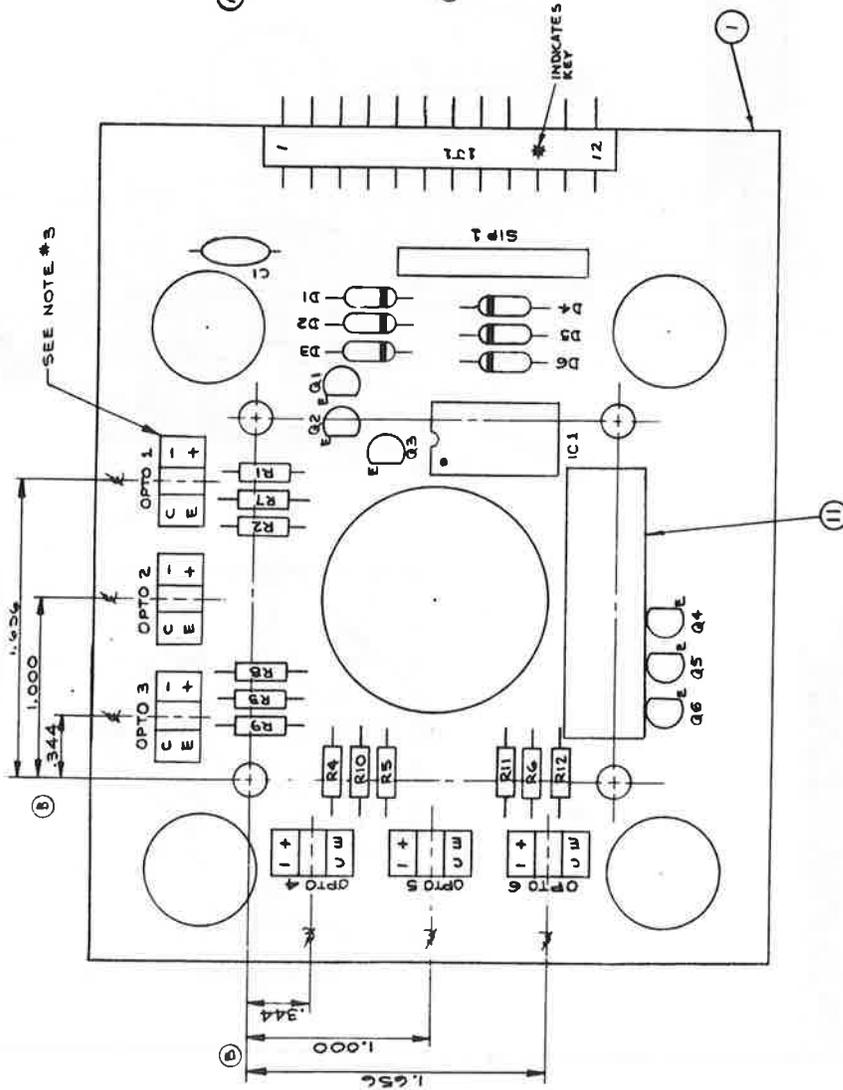
BILL OF MATERIAL

ITEM NO.	PART NUMBER	PART DESIGNATION	DESCRIPTION	QTY. REQD
1	5772-10068-00		BARE P.C. BOARD	1
2	5490-10189-00	OPTO 1 THRU OPTO 6	OPTO INTER MODULE	6
3	5310-09155-00	IC 1	I.C., 4011B CMOS QUAD 2-INP NAND GATE	1
4	5019-09362-00	SIP 1	10 PIN, 4.7K, SIP	1
5	5010-09769-00	R1 THRU R6	RESISTOR, 180Ω, 1/4 W	6
6	5160-08938-00	Q1 THRU Q6	TRANSISTOR, 2N4401 NPN	6
7	5070-08919-00	D1 THRU D6	DIODE, IN4148	6
8	5791-10869-12	J3 1	12H R/A SQ PIN .156	1
9	5010-09034-00	R7 THRU R12	RESISTOR, 10KΩ, 1/4 W.	6
10	5043-09341-00	C1	CAP. AXIAL CERAMIC, .01MFD 50V+ 80-20%	1
11	16-8850-59		LABEL - PCB ASSY ID	1

SEE NOTE #3

INDICATES KEY

2-8

PIGSKIN CPU BOARD
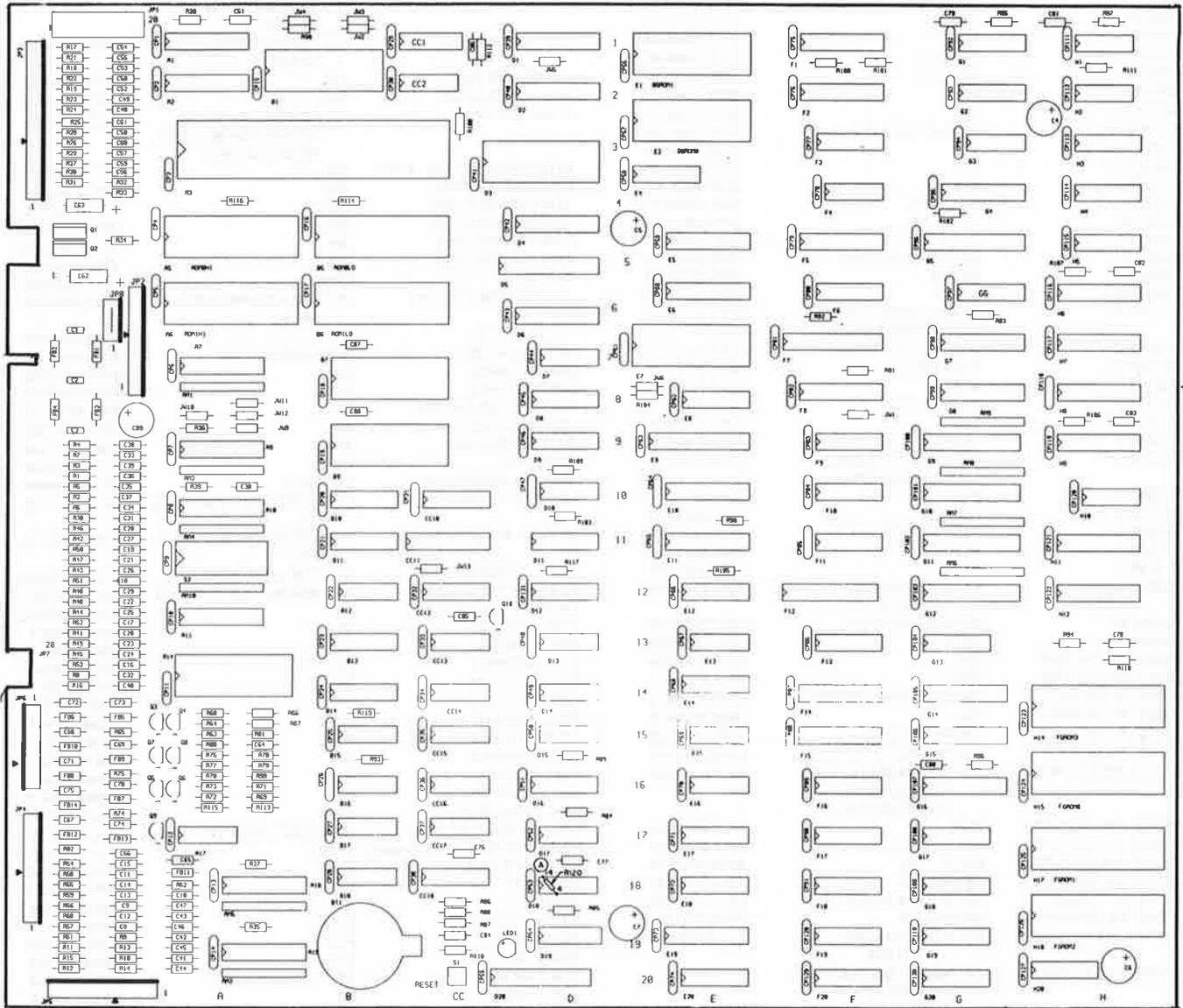
68K Mini Video Board
C-13246-4004

Description	Designation	Part Number
7406 IC	A17	5280-08974-00
74F00 IC	H1,E16	5283-10551-00
74F04 IC	B15,D15	5283-10552-00
74F08 IC	CC17	5283-12488-00
74F20 IC	D13	5283-12557-00
74F32 IC	CC13	5283-12489-00
74F74 IC	CC2,D18	5283-10468-00
74F86 IC	CC15,F4	5283-12486-00
74F157 IC	H3	5283-12487-00
74F174 IC	F13	5283-12484-00
74HC541 IC	A7,A9,A10,A18,A19	5311-12287-00
74LS00 IC	D14	5281-09499-00
74LS02 IC	E13	5281-09247-00
74LS14 IC	B12	5281-09851-00
74LS20 IC	H10,CC14	5281-10014-00
74LS27 IC	D7	5281-09852-00
74LS74 IC	H2,D10,B17,D17,B18	5281-09487-00
74LS86 IC	G3,E15	5281-09737-00
74LS153 IC	G1,F3	5281-10016-00
74LS157 IC	D8,B10,CC10,B11,B14, B13,D9,E4	5281-09738-00
74LS163 IC	D12,E12,D16	5281-10037-00
74LS169 IC	F8,F9,F11,G13	5281-09855-00
74LS173 IC	E14	5281-10040-00
74LS174 IC	G2,G6,E17,E20	5281-09733-00
74LS175 IC	E18	5281-10043-00
74LS244 IC	E5,A11	5281-09867-00
74LS194 IC	G17,F18,G18,F19,G19, F20,G20,H20	5281-09743-00
74LS245 IC	D4,E6	5281-09308-00
74LS258 IC	F16,F17	5281-09744-00
74LS273 IC	A1,F1,A2,F2,G4,G14	5281-09736-00
74LS283 IC	E8,F10	5281-09734-00
74LS298 IC	H4,H5	5281-12514-00
74LS374 IC	H6,G7,H7,G8,H8,H9, H11,H12	5281-09486-00
74LS377 IC	D1, D2,F5,G15,G16	5281-09741-00
MAX695 IC	CC12	5434-12550-00
16MHz CRYSTAL OSC	CC1	5521-12501-00
20MHz CRYSTAL OSC	D19	5521-10743-00
10 RES., 5% 1/4 WATT	R63,R64,R72,R73,R76,R77	5010-09039-00
22 RES., 5% 1/4 WATT	R92	5010-09434-00
47 RES., 5% 1/4 WATT	R86,R87,R88,R90	5010-10170-00
68 RES., 5% 1/4 WATT	R85,R89,R93	5010-12480-00
100 RES., 5% 1/4 WATT	R17,R18,R19,R20,R21,R22, R23,R24,R25,R26,R27, R28,R29,R30,R110	5010-09036-00
330 RES., 5% 1/4 WATT	R118	5010-09001-00
470 RES., 5% 1/4 WATT	R65,R74, R75	5010-09416-00
510 RES., 5% 1/4 WATT	R68,R71,R80	5010-12483-00
560 RES., 5% 1/4 WATT	R62,R81,R82	5010-08992-00
1K RES., 5% 1/4 WATT	R67,R70,R79,R113,R115	5010-09358-00
2K RES., 5% 1/4 WATT	R66,R69,R78	5010-09999-00
2.7K RES., 5% 1/4 WATT	R31,R32,R33,R34,R35, R36,R37	5010-08997-00
4.7K RES., 5% 1/4 WATT	R83,R84,R91,R98,R99,R100, R101,R102,R103,R104, R105,R108,R109,R111, R112,R114,R116,R117, R119,R120	5010-08991-00
10K RES., 5% 1/4 WATT	R1,R2,R3,R4,R5,R6,R7,R8, R9,R10,R11,R12,R13,R14, R15,R16,R38,R39,R40,R41, R42,R43,R44,R45,R46,R47, R48,R49,R50,R51,R52,R53, R54,R55,R56,R57,R58,R59, R60,R61	5010-09034-00
1K SIP RES., 10 PIN	RM6,RM7,RM8,RM9	5019-09669-00
100K SIP RES., 10 PIN	RM1,RM2,RM3,RM4,RM5	5019-12509-00
4.7K SIP RES., 10 PIN	RM10	5019-09362-00
10uF RD. ELEC. CAP., 10V	C62,C63	5041-09243-00
470uF RD. ELEC. CAP., 16V	C4,C5,C6,C7,C89	5040-09776-00
47pF AX. CER. CAP.	C68,C69,C70,C71,C72,C73	5043-09844-00
100pF AX. CER. CAP.	C8,C9,C10,C11,C12,C13,C14, C15,C16,C17,C18,C19,C20, C21,C22,C23,C24,C25,C26, C27,C28,C29,C30,C31,C32, C33,C34,C35,C36,C37,C38, C39,C40,C41,C42,C43,C44, C45,C46,C47	5048-11029-00

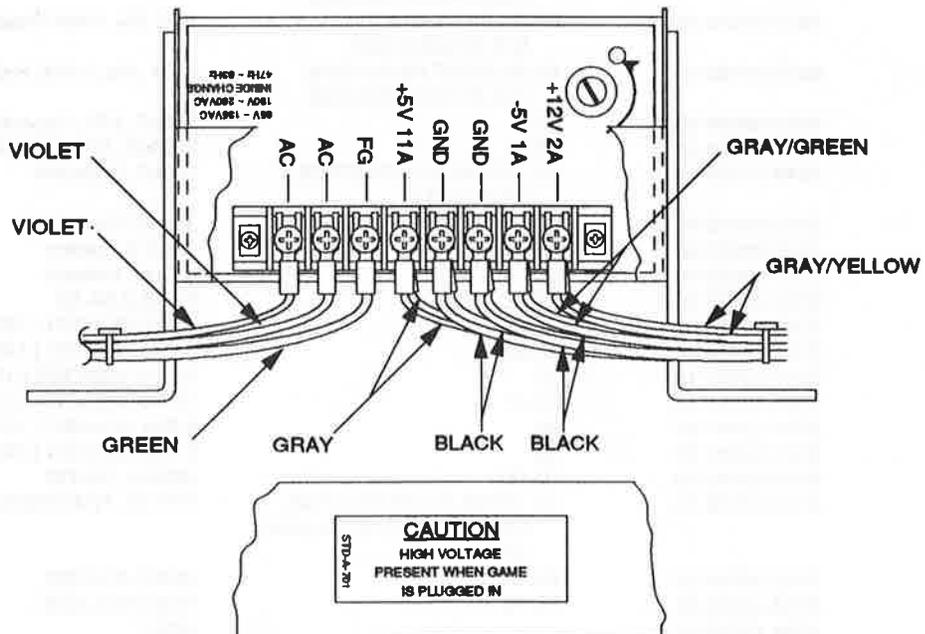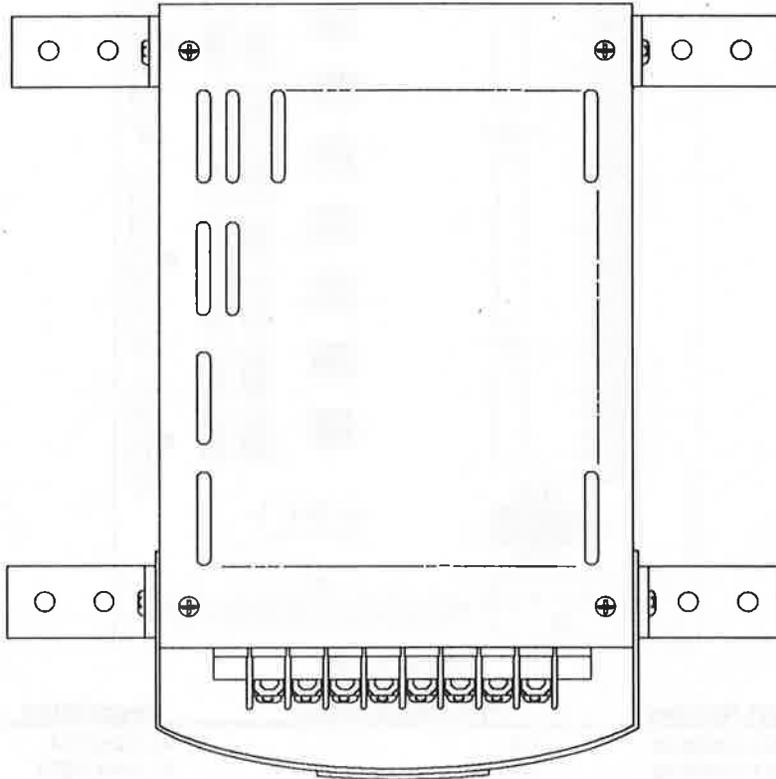| Description	Designation	Part Number
390pF AX. CER. CAP.	C64,C76	5048-11064-00
320pF AX. CER. CAP.	C48,C49,C50,C51,C52,C53, C54,C55,C56,C57,C58, C59,C60,C61,C65,C66, C74,C75	5048-12506-00
.01uF AX. CER. CAP.	CP(1-131),C1,C2,C3,C77,C86, C87,C88	5043-08980-00
1uF AX. CER. CAP.	C85	5043-08996-00
.47uF AX. CER. CAP.	C67	5048-12577-00
FERRITE BEAD	FB1,FB2,FB3,FB4,FB5,FB6, FB7,FB8,FB9,FB10,FB11, FB12,FB13,FB14	5556-12513-00
20 PIN HEADER (DUAL .100)	JP1	5791-09437-00
8 PIN HEADER (.156)	JP2	5791-10862-00
18 PIN HEADER (.100)	JP3	5791-12461-18
12 PIN HEADER (.100)	JP4,JP5	5791-12461-12
9 PIN HEADER (.100)	JP6	5791-12461-09
4 PIN HEADER (.100)	JP8	5791-12461-04
RED LED	LED1	5671-09019-00
JUMPER WIRE (0ΩRES.)	JW1,JW2,JW3,JW8,JW9,JW10, JW13	5010-09534-00
TIP110 TRANS.	Q1,Q2	5162-12508-00
MPSA70 TRANS.	Q3,Q4,Q5,Q6,Q7,Q8	5192-12507-00
2N4123 TRANS.	Q9	5160-12510-00
2N3906 TRANS.	Q10	5190-10270-00
PUSHBUTTON SWITCH	S1	5641-12551-00
10 POS. DIP SWITCH	S2	5645-12512-00
BATTERY HOLDER	BT1	5881-12315-00
BARE PCB	PCB	5770-12552-00
16 PIN IC SOCKET (.300)	CC18,D11	5700-09006-00
20 PIN IC SOCKET (.300)	CC11,D6,E10,E11,E19,F8,F14, F15	5700-09496-00
24 PIN IC SOCKET (.300)	D5,E9,F7,F12,G5,G9,G10,G11, G12	5700-12047-00
28 PIN IC SOCKET (.300)	A14,B1,B7,B9,D3,E1,E2,E7	5700-10176-005
32 PIN IC SOCKET (.300)	A5,A6,B5,B6,H14,H15,H17,H18	700-12088-00
64 PIN IC SOCKET (.300)	A3	5700-10453-00
27512 ROM 0HI	A5	A-5343-4004-7
27512 ROM 1HI	A6	A-5343-4004-6
27512 ROM 0LO	B5	A-5343-4004-5
27512 ROM 1LO	B6	A-5343-4004-4
27512 ROM BG1	E1	A-5343-4004-9
27512 ROM BG0	E2	A-5343-4004-8
27010 ROM FG3	H14	A-5343-4004-10
27010 ROM FG0	H15	A-5343-4004-11
27010 ROM FG1	H17	A-5343-4004-12
27010 ROM FG2	H18	A-5343-4004-13
2Kx8 RAM, 120nS	D3,E7	5340-12500-00
2018-45, 2Kx8 RAM, 45nS	G9,G10,G11,F12,G12	5340-12497-00
100nS 8Kx8 RAM, (ultra low pwr.)	B7,B9	5340-12558-00
93419, 64x9 RAM	A14	5340-12496-00
MC6840 IC	B1	5431-12499-00
68000 IC	A3	5400-12498-00
PACOUT IC, PLD	F15	A-5346-4004-1
PACNS IC, PLD	F14	A-5346-4004-2
ROMCTRL IC, PLD	E19	A-5346-4004-3
VERTTIME IC, PLD	F7	A-5346-4004-4
HORIZTIME IC, PLD	E9	A-5346-4004-5
MISCV IC, PLD	F8	A-5346-4004-6
MISCHV IC, PLD	E11	A-5346-4004-7
COLARB IC, PLD	G5	A-5346-4004-8
DECODE0 IC, PLD	D5	A-5346-4004-9
DECODE1 IC, PLD	D6	A-5346-4004-10
DECODE2 IC, PLD	CC11	A-5346-4004-11
HENABLE IC, PLD	E10	A-5346-4004-12
74LS368 IC	CC18	5281-09746-00
74LS157 IC	D11	5281-09738-00
3.6V BR2325 BATTERY	BT1	5880-11056-00
1/4 SPACER		03-8338-1
SUB-ASSEMBLY		C-13247-1
LABEL		16-8800-29B

POWER SUPPLY SWITCHER ASSEMBLY
p/n C-13253

Part Number	Description
20-9633	Power Supply, 85W
01-9254	Shield
16-8587-701	High Voltage Label

LAMP DRIVER ASSEMBLY
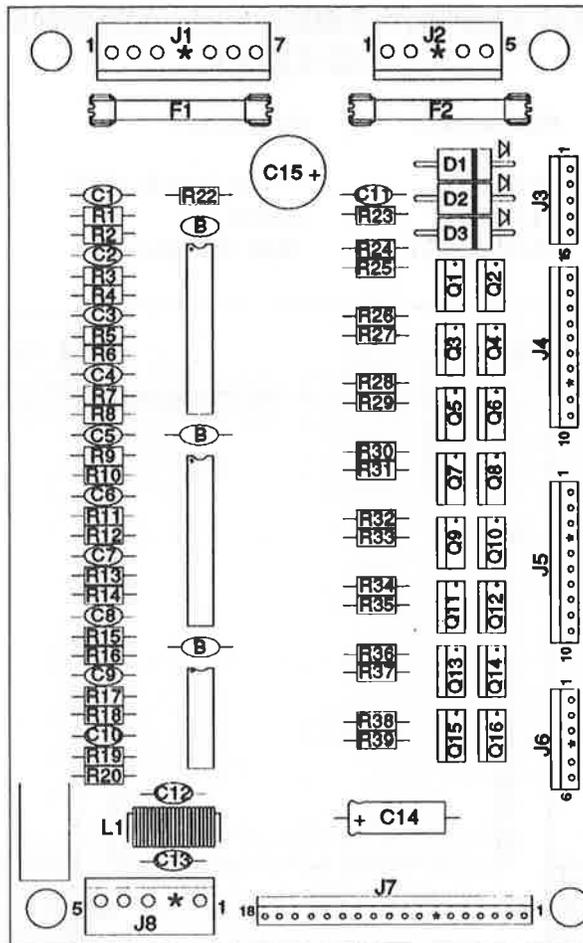
P/N: C-13765

Part Number	Part Designation	Description
5311-12669-00	U3	IC, 74HCT14
5311-12668-00	U1,U2	IC, 74HCT273
5010-09416-00	R24,R25,R26,R27,R28,R29, R30,R31,R32,R33,R34, R35,R36,R37,R38,R39	470, 5%, 1/4W, Resistor
5010-09034-00	R2,R4,R6,R8,R10,R12,R14, R16,R18,R20,R22	10K, 5%, 1/4W, Resistor
5010-09162-00	R1,R3,R5,R7,R9,R11,R13, R15,R17,R19,R21,R23	100K, 5%, 1/4W, Resistor
5040-08986-00	C14	100uF, 10V, Capacitor
5040-12670-00	C15	2200uF, 16V, Capacitor
5048-11029-00	C1,C2,C3,C4,C5,C6,C7,C8, C9,C10,C11	100pF, Capacitor
5043-09845-00	C12,C13	.001uF Capacitor
5043-08980-00	B1,B2,B3	.01uF Capacitor
5551-09822-00	L1	4.7 uH, Inductor
5731-09128-00	F1,F2	FUSE 2.5A SB
5791-10862-07	J1	7 PIN HEADER (.156)
5791-10862-05	J2,J8	5 PIN HEADER (.156)
5791-12461-18	J7	18 PIN HEADER (.100)
5791-12461-10	J4,J5	10 PIN HEADER (.100)
5791-12461-06	J6	6 PIN HEADER (.100)
5791-12461-05	J3	5 PIN HEADER (.100)
5070-09045-00	D1,D3	MR501, DIODE
5162-12508-00	Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8, Q9,Q10,Q11,Q12,Q13,Q14, Q15,Q16	TIP110, TRANSISTOR
5010-09534-00	D2	WIRE JUMPER
5733-12060-01	F1,F2	FUSE HOLDER
5763-12665-00		PCB
03-8338-1		SPACER, 1/4"
16-8850-308		LABEL, PCB ID

PIGSKIN

Diagrams & Schematics

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**AUDIO SCHEMATIC
P/N: 16-8999**
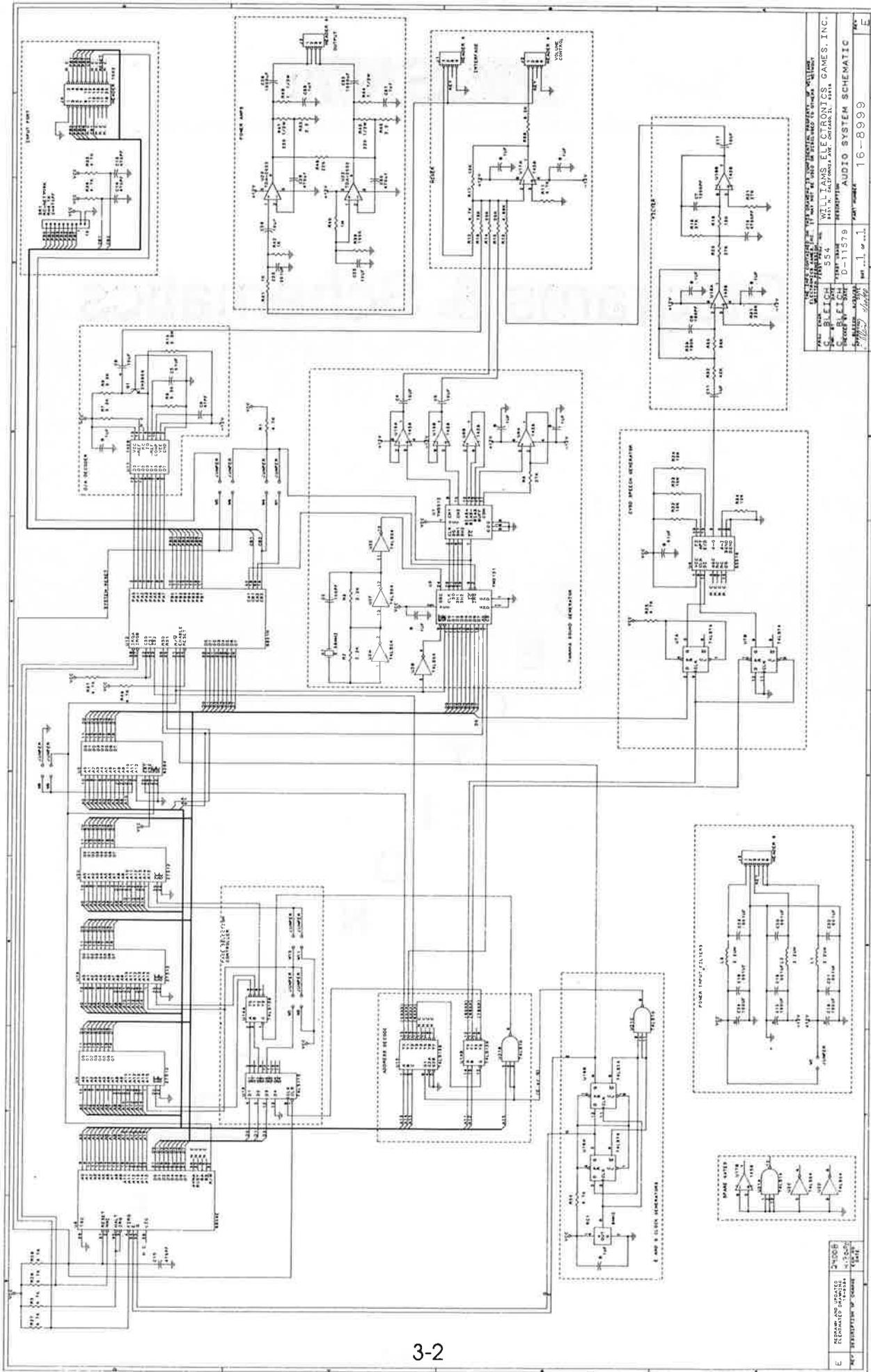
LAMP DRIVER PC BOARD
SCHEMATIC

ANALOG DIGITAL 49W JOYSTICK SCHEMATIC
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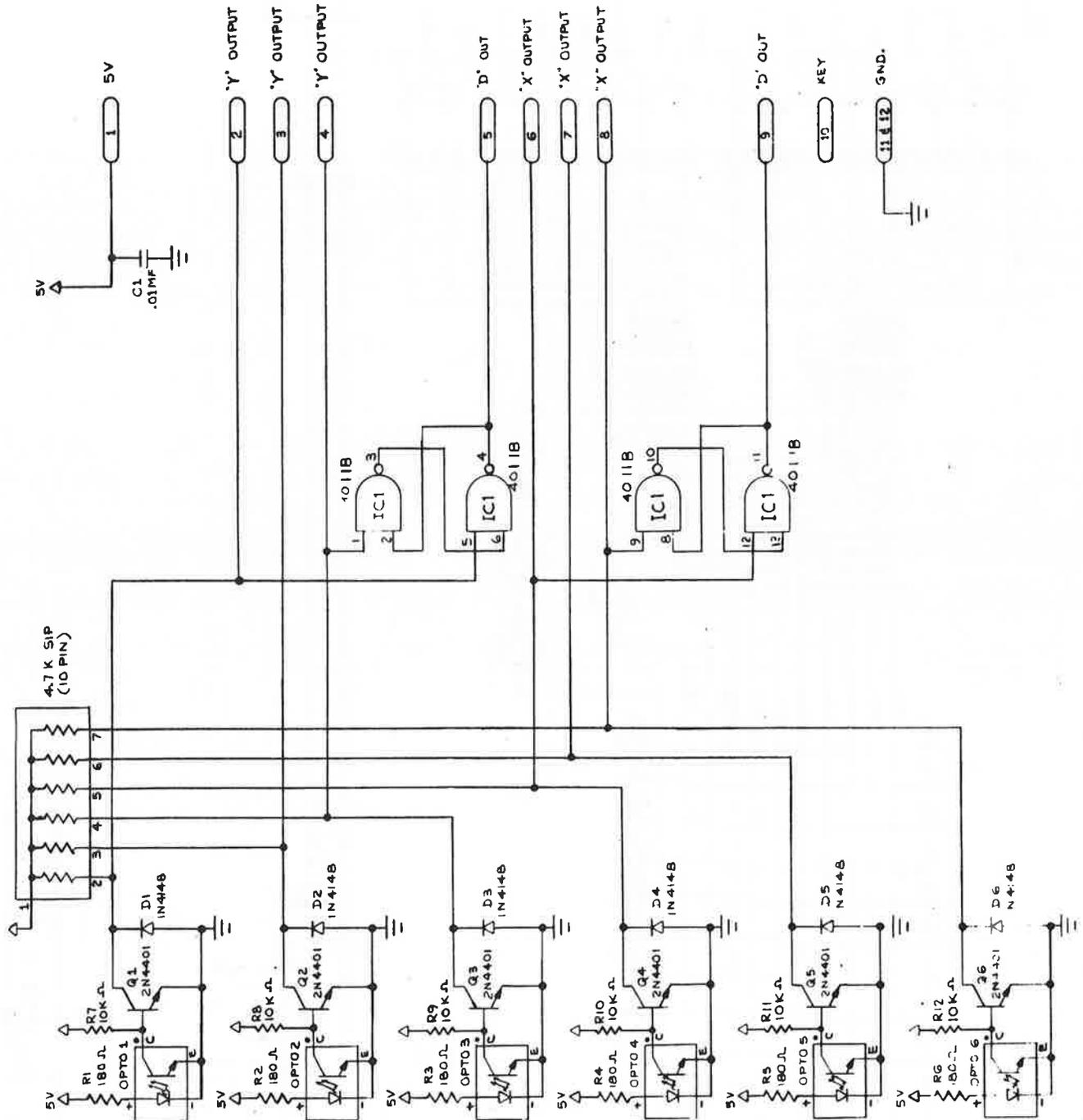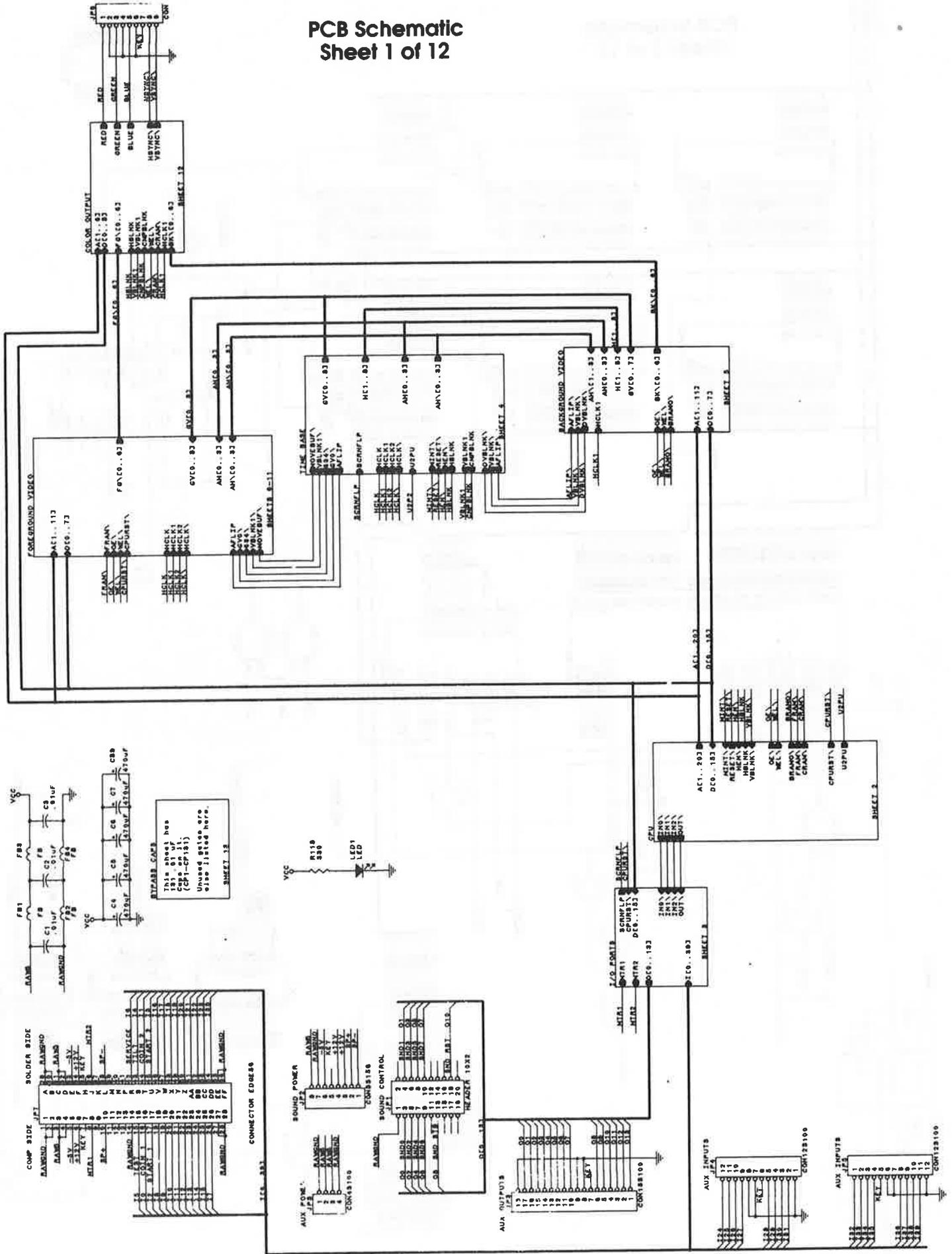
**PCB Schematic
Sheet 3 of 12**
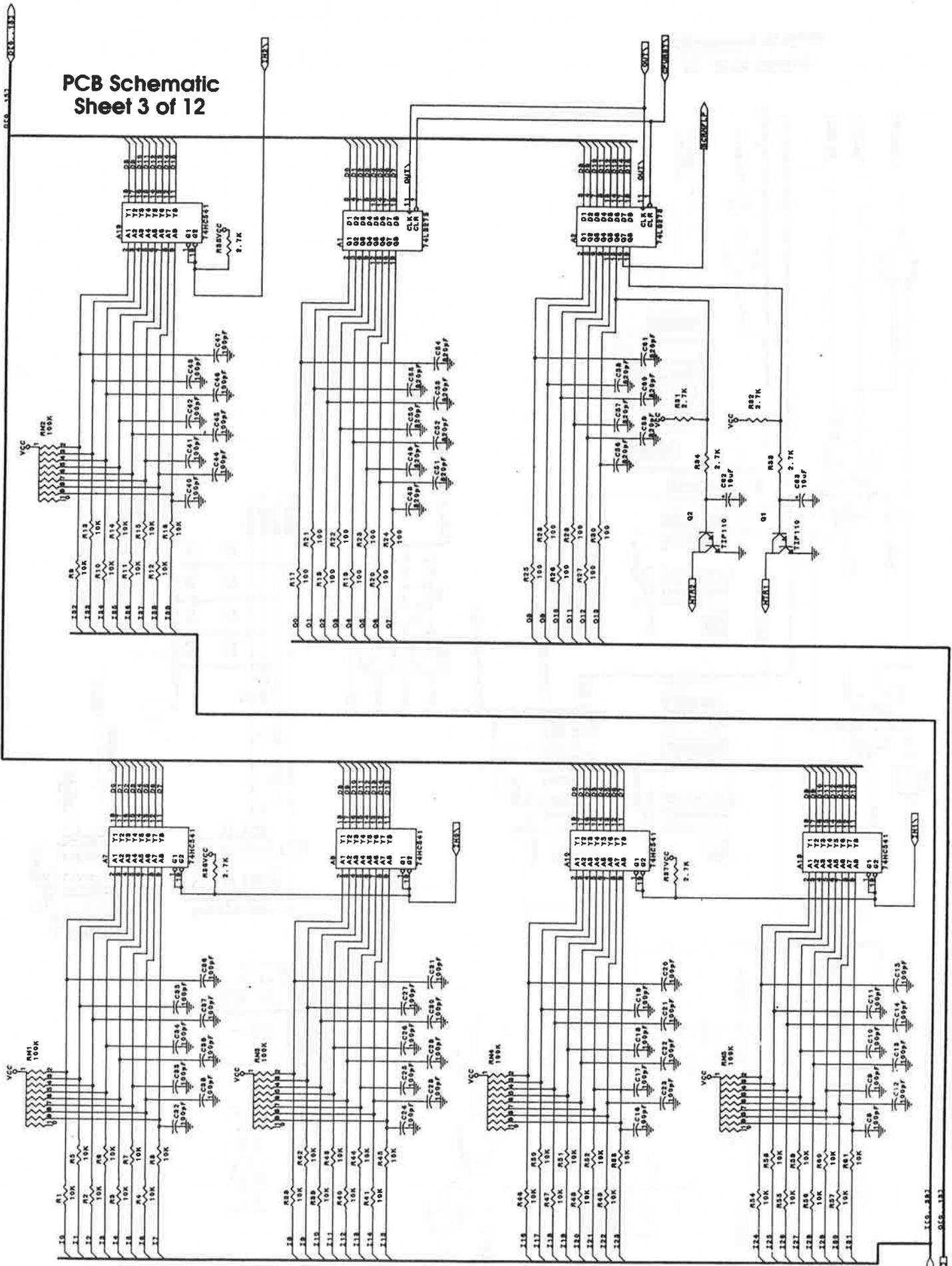
PCB Schematic Sheet 5 of 12
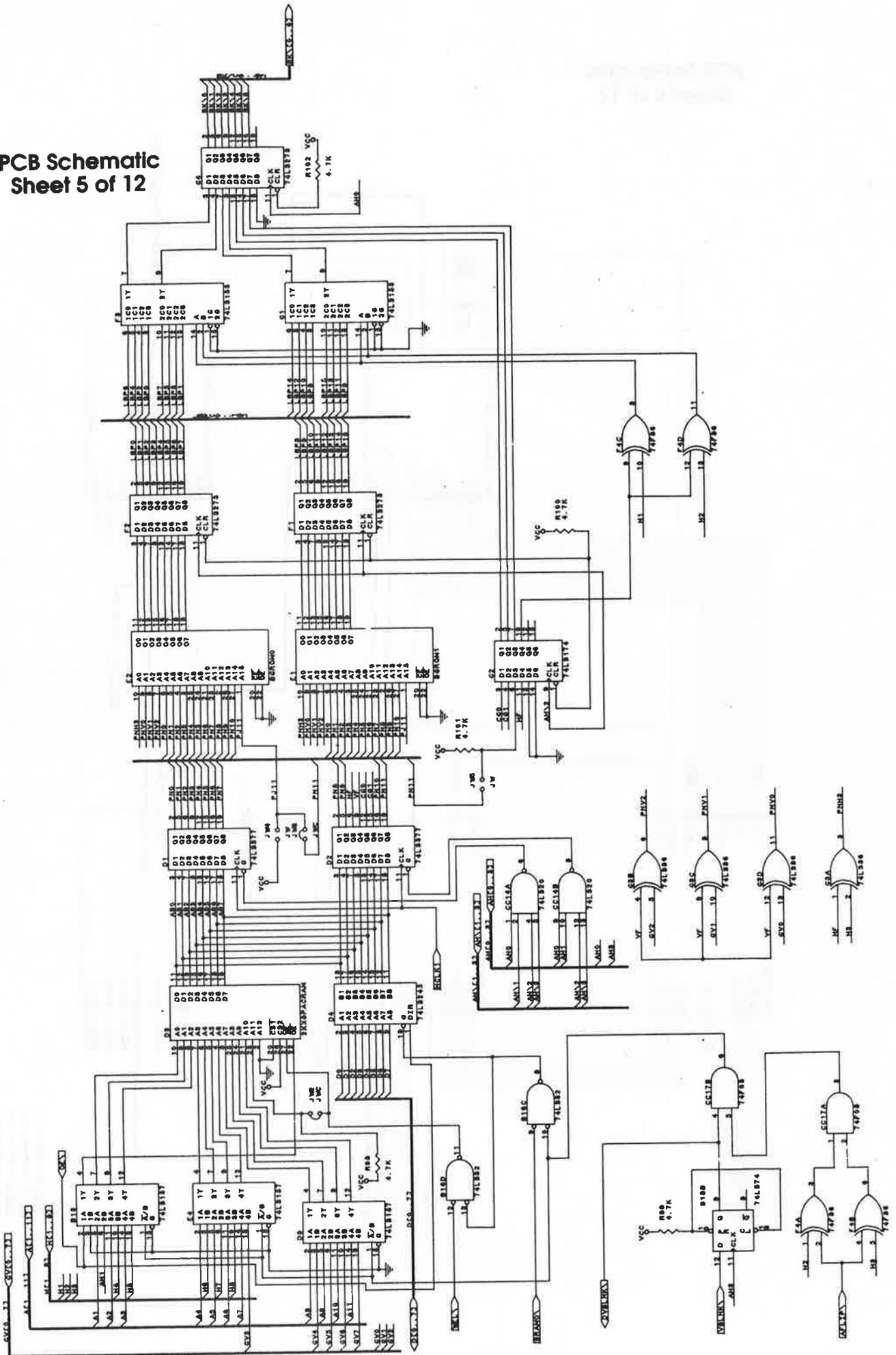
PCB Schematic
Sheet 9 of 12
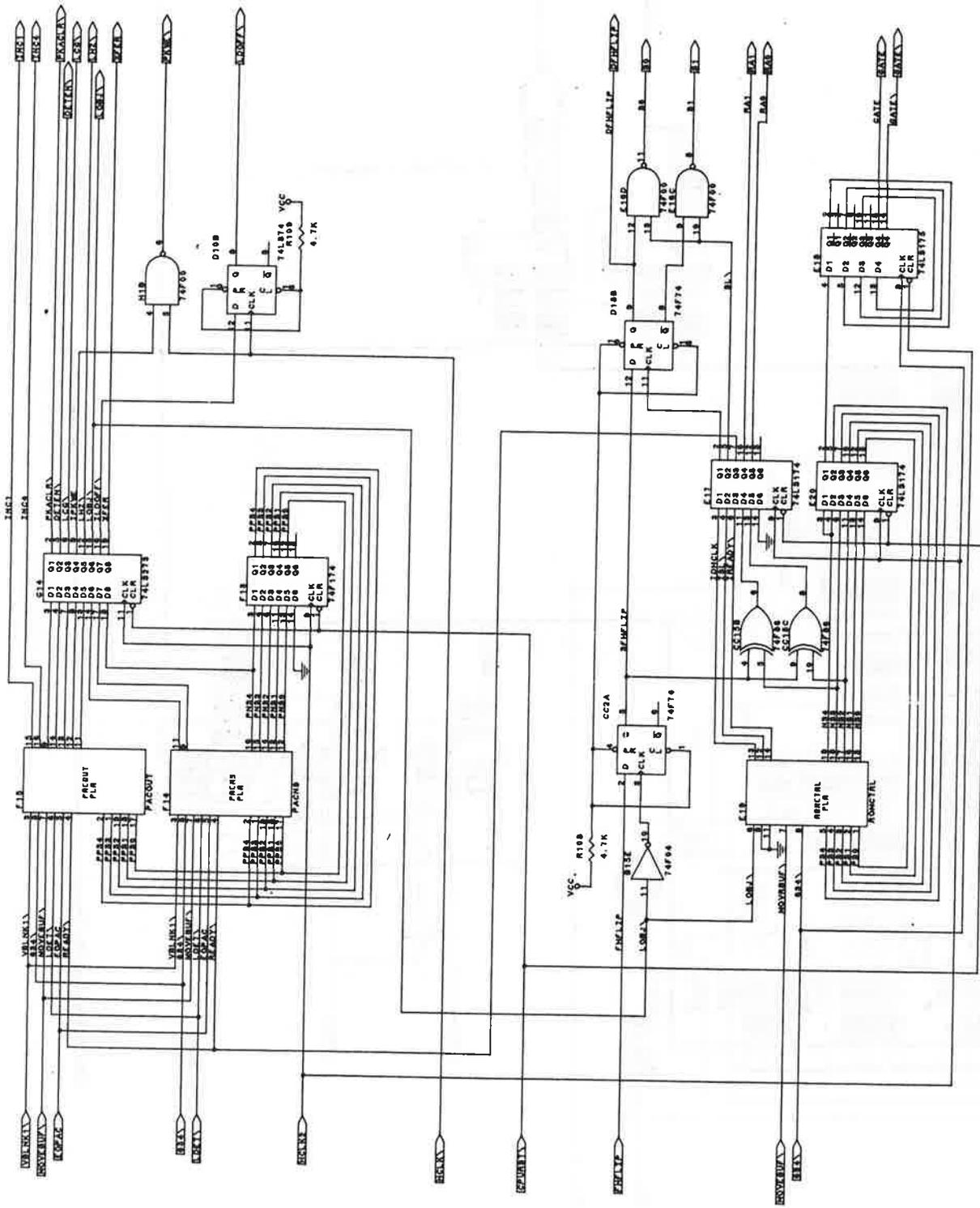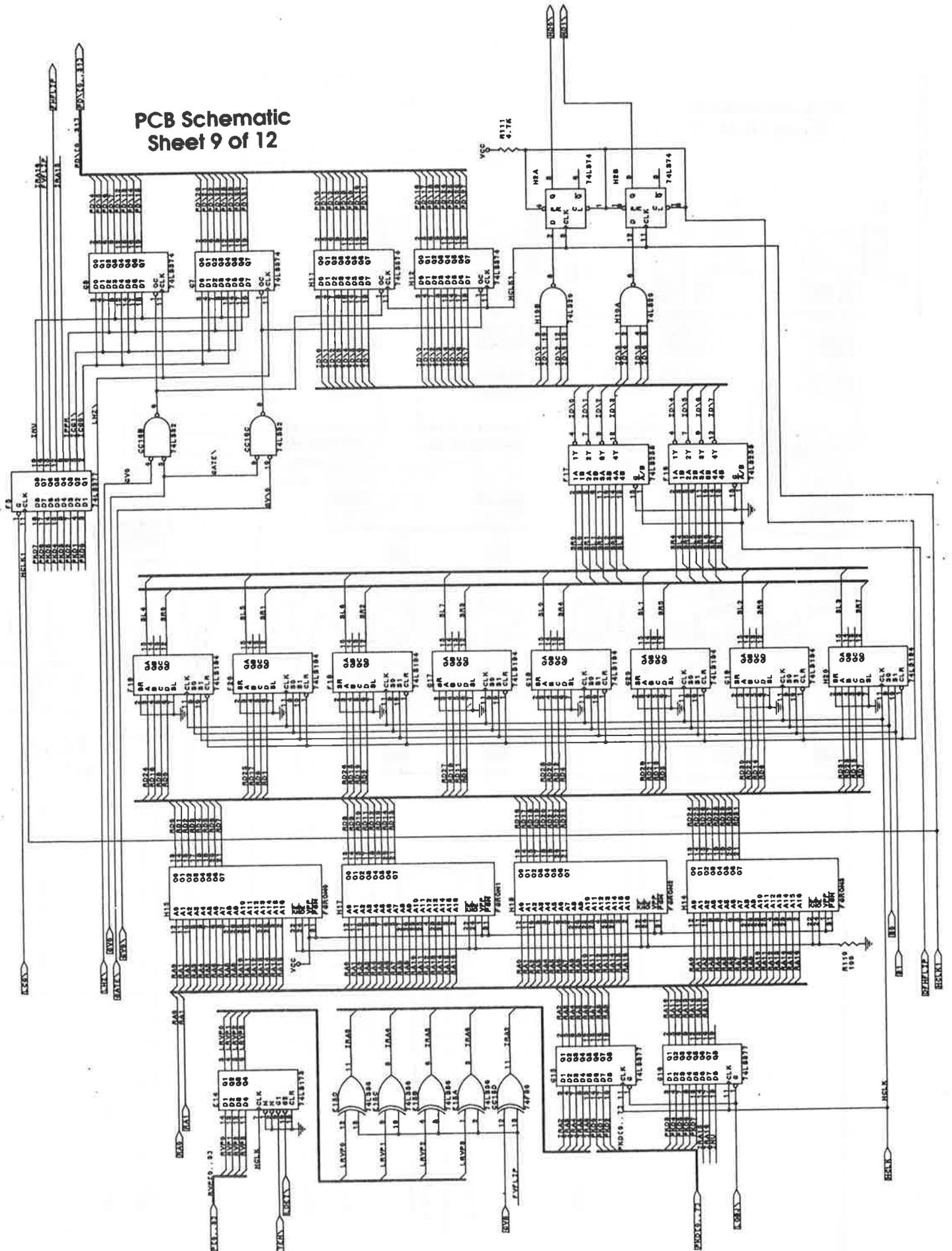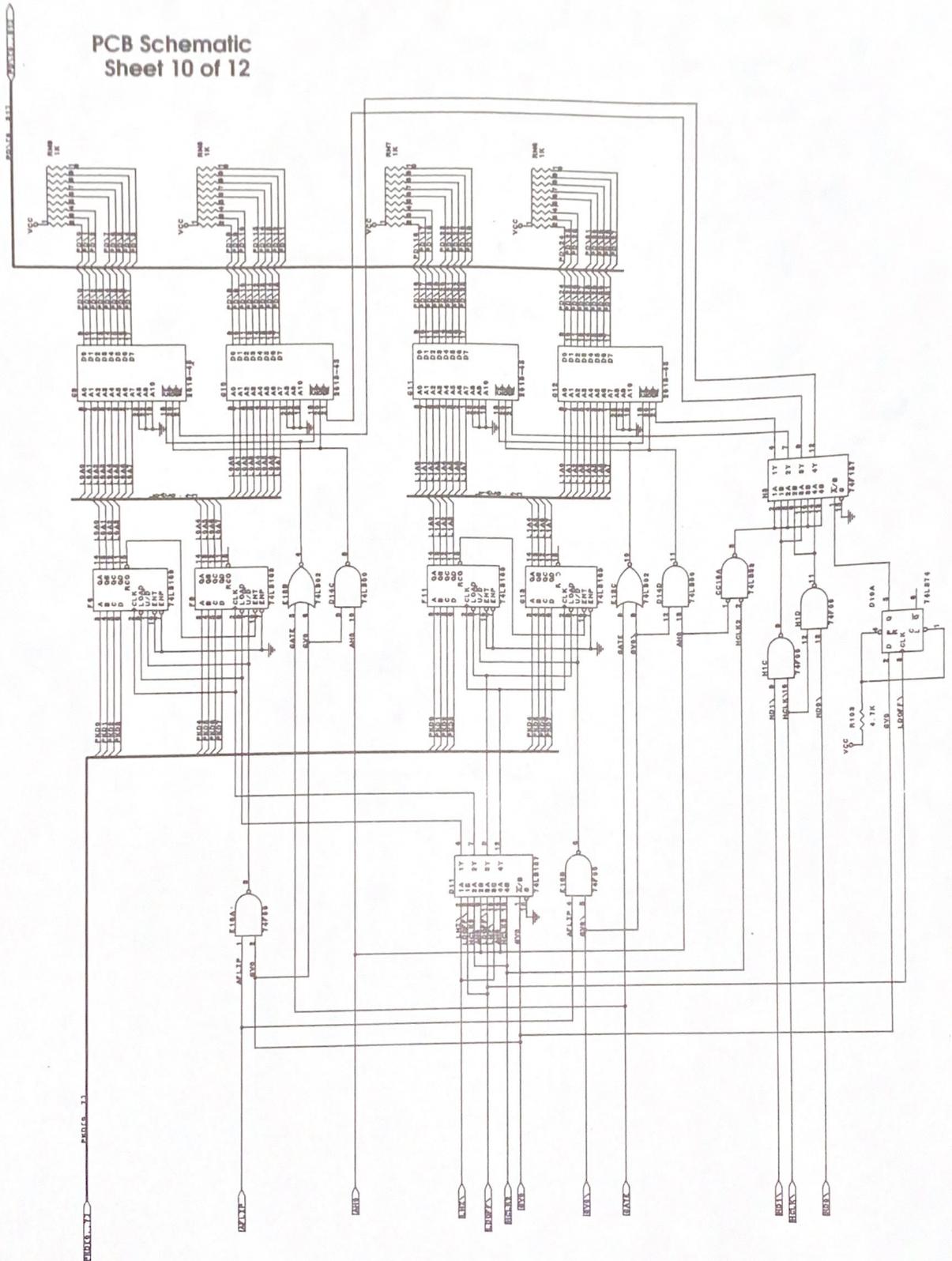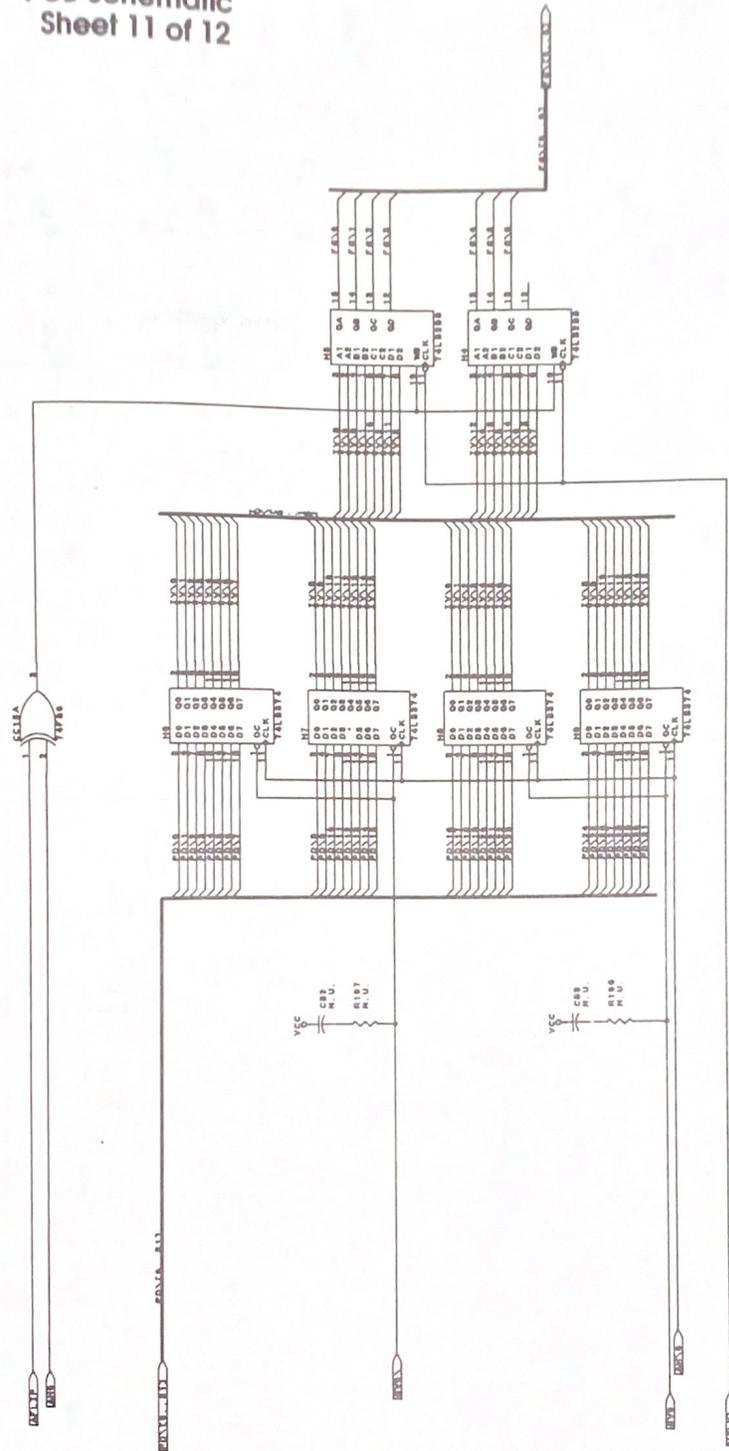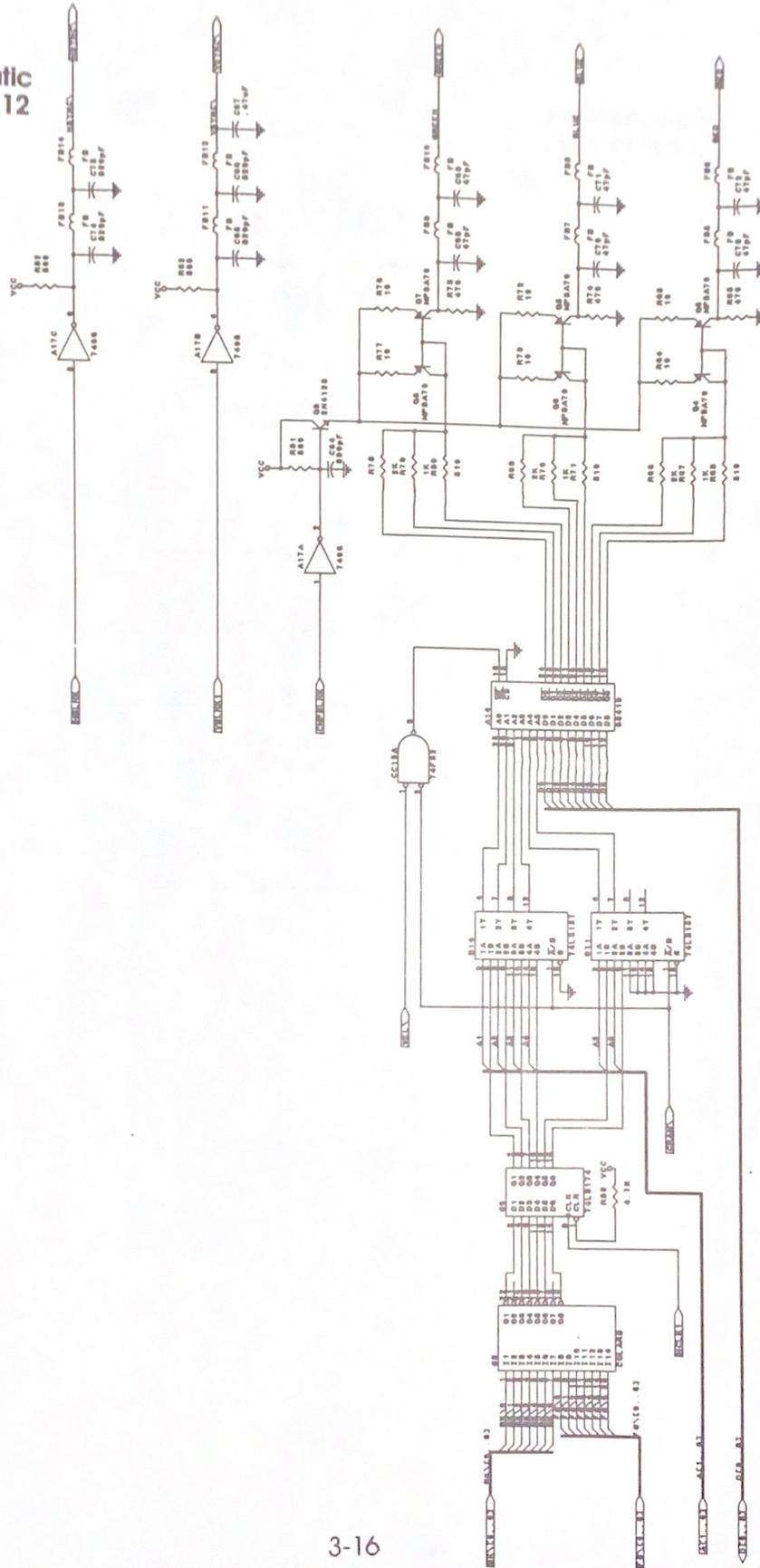
Function	Wire Color	Pin	Pin	Wire Color	Function
GROUND	BLK	1	A	BLK	GROUND
GROUND	GRN-BRN	2	B	BLK	GROUND
+5 VOLTS DC	GRY	3	C	GRY	+5 VOLTS DC
+5 VOLTS DC	GRY	4	D	GRY	+5 VOLTS DC
- 5 VOLTS DC	GRY-GRN	5	E	GRY-GRN	- 5 VOLTS DC
+12 VOLTS DC	GRY-YEL	6	F	GRY-YEL	+12 VOLTS DC
	KEY	7	H	KEY	
COUNTER 1	WHT-ORG	8	J	WHT-GRN	COUNTER 2
	NC	9	K	NC	
SPEAKER (+)	RED-VIO	10	L	GRN-VIO	SPEAKER (-)
	NC	11	M	NC	
VIDEO RED	RED	12	N	GRN	VIDEO GRN
VIDEO BLU	BRN	13	P	WHT	VIDEO SYNC
VIDEO GND	SHIELD	14	R	WHT-RED	SERVICE
TEST	GRN	15	S	WHT-VIO	TILT
COIN 1	WHT-BLU	16	T	YEL-WHT	COIN 2
START 1	YEL-GRN	17	U	YEL-BLU	START 2
NC	ORG-BLK	18	V	NC	
NC	ORG-BRN	19	W	NC	
NC	ORG-RED	20	X	NC	
NC	ORG	21	Y	NC	
1 PUNCH	ORG-YEL	22	Z	YEL-VIO	2 PUNCH
1 PASS	ORG-GRN	23	a	YEL-GRY	2 PASS
1 ATT. ADJ.	ORG-BLU	24	b	VIO-BLK	2 ATT. ADJ.
NC	ORG-VIO	25	c	VIO-BRN	NC
NC	ORG-GRY	26	d	VIO-RED	NC
	NC	27	e	NC	
GROUND	BLK	28	f	BLK	GROUND

Cable p/n: H-12758

CPU BOARD — **JAMMA EDGE CONNECTOR**

1	RED	VIDEO-RED
2	NC	
3	GRN	VIDEO-GRN
4	NC	
5	BRN	VIDEO-BLU
6	SHIELD	VIDEO-GND
7	KEY	
8	WHT	VERT. SYNC
9	BLK	HORIZ. SYNC

1	NC	
2	1 U/D DIR	RED-GRY
3	1 U/D 3	RED-BLU
4	1 U/D 2	RED-GRN
5	1 U/D 1	RED-YEL
6	KEY	
7	NC	
8	NC	
9	1 L/R DIR	RED-ORG
10	1 L/R 3	RED
11	1 L/R 2	RED-BRN
12	1 L/R 1	RED-BLK

1	2 L/R 1	BLU-BLK
2	2 L/R 2	BLU-BRN
3	2 L/R 3	BLU-RED
4	2 L/R DIR	BLU-ORG
5	KEY	
6	NC	
7	NC	
8	2 U/D 1	BLU-YEL
9	2 U/D 2	BLU-GRN
10	2 U/D 3	BLU
11	2 U/D DIR	BLU-VIO
12	NC	

1	NC	
2	Lamp Strobe 1	BLK-BRN
3	Lamp Strobe 0	BLK-RED
4	NC	
5	Lamp Reset	BLK-ORG
6	NC	
7	KEY	
8	NC	
9	NC	
10	Lamp Data 7	BLK-YEL
11	Lamp Data 6	BLK-GRN
12	Lamp Data 5	BLK-BLU
13	Lamp Data 4	BLK-VIO
14	Lamp Data 3	BLK-GRY
15	Lamp Data 2	BLK-WHT
16	Lamp Data 1	VIO-ORG
17	Lamp Data 0	VIO-YEL
18	NC	

TO LAMP BOARD

1	NC	
2	Lamp Strobe 1	BLK-BRN
3	Lamp Strobe 0	BLK-RED
4	NC	
5	Lamp Reset	BLK-ORG
6	NC	
7	KEY	
8	NC	
9	NC	
10	Lamp Data 7	BLK-YEL
11	Lamp Data 6	BLK-GRN
12	Lamp Data 5	BLK-BLU
13	Lamp Data 4	BLK-VIO
14	Lamp Data 3	BLK-GRY
15	Lamp Data 2	BLK-WHT
16	Lamp Data 1	VIO-ORG
17	Lamp Data 0	VIO-YEL
18	NC	

1	PLAYER 1 Lamp	GRN-GRY
2	PLAYER 2 Lamp	BRN-VIO
3	+6V LAMP	VIO
4	KEY	
5	5.9 VAC	WHT-YEL
6	5.9 VAC	YEL

To Switcher Power Supply

1	+5V	GRY
2	+5V	GRY
3	+5V	GRY
4	+5V	GRY
5	+12V	GRY-YEL
6	+12V	GRY-YEL
7	-5V	GRY-GRN
8	-5V	GRY-GRN
9	GND	BLK
10	GND	BLK
11	GND	BLK
12	GND	BLK

1	RED-VIO +	
2	GRN-VIO -	

6" SPEAKER

4" Piezo SPEAKER

MAIN HARNESS CABLE H-13791

1	NC	
2	NC	
3	SHIELD	VIDEO GND
4	BRN	VIDEO BLU
5	GRN	VIDEO GRN
6	RED	VIDEO RED

1	VERT. SYNC	WHT
2	HORIZ. SYNC	BLK
3	NC	

TO CONTROL PANEL

1	NU	ORG-BLK
2	GND	BLK
3	NU	ORG-BRN
4	NU	ORG-RED
5	NU	ORG
6	1 PUNCH	ORG-YEL
7	1 PASS	ORG-GRN
8	KEY	
9	1-AA	ORG-BLU
10	NU	ORG-VIO
11	NU	ORG-GRY
12	NC	

1	NU	YEL-BLK
2	NU	YEL-BRN
3	KEY	
4	NU	YEL-RED
5	NU	YEL-ORG
6	1 START	YEL-GRN
7	2 START	YEL-BLU
8	2 PUNCH	YEL-VIO
9	2 PASS	YEL-GRY
10	2-AA	VIO-BLK
11	NU	VIO-BRN
12	NU	VIO-RED

1	1 L/R 1	RED-BLK
2	1 L/R 2	RED-BRN
3	1 L/R 3	RED
4	1 L/R DIR	RED-ORG
5	KEY	
6	1 U/D 1	RED-YEL
7	1 U/D 2	RED-GRN
8	1 U/D 3	RED-BLU
9	1 U/D DIR	RED-GRY
10	NC	
11	START 1	BRN-VIO
12	START 2	GRN-GRY

1	2 L/R 1	BLU-BLK
2	2 L/R 2	BLU-BRN
3	2 L/R 3	BLU-RED
4	2 L/R DIR	BLU-ORG
5	2 U/D 1	BLU-YEL
6	2 U/D 2	BLU-GRN
7	KEY	
8	2 U/D 3	BLU
9	2 U/D DIR	BLU-VIO
10	LAMP +6V DC	VIO
11	+5V DC	GRY
12	NC	

Sound Power/Speaker Cable H-13827

1	VIO	+ SPK
2	BLU	- SPK
3	GRY-YEL	+12V
4	GRY-YEL	+12V
5	KEY	
6	GRY-GRN	-5V
7	BLK	GROUND
8	GRY	+5V

To Lamp Board J8

1	GRY	+5V
2	NC	
3	BLK	GND
4	NC	
5	NC	

20 Pin Ribbon Cable

Sound Board

J2

1	RED	
2	BLK	
3	KEY	
4	SHIELD	

1	VIO	+ SPK
2	NC	
3	NC	
4	BLU	- SPK

1	GRY	+5V
2	BLK	GRD
3	GRY-GRN	-5V
4	KEY	
5	GRY-YEL	+12V
6	GRY-YEL	+12V

J1

1	BLK	
2	NC	
3	NC	
4	BLK	

Cable p/n: H-13842

Coin Door

Service	WHT-RED	1
- Counter	WHT-ORG	2
COIN 1	WHT-BLU	3
TILT	WHT-VIO	4
KEY		5
TEST SWITCH	GRN	6
NU Counter 2	WHT-GRN	7
+5V	GRY	8
COIN 2	YEL-WHT	9
Ground	GRN-BRN	10
+5.9 VAC	YEL	11
+5.9 V.	WHT-YEL	12

WHT-RED	Service	1
WHT-ORG	- Counter 1	2
WHT-BLU	COIN 1	3
WHT-VIO	TILT	4
KEY		5
GRN	Test	6
NC		7
GRY	+5	8
YEL-WHT	Coin 2	9
GRN-BRN	Ground	10
YEL	5.9 VAC	11
WHT-YEL	5.9 VAC	12

Coin Meter

Coin Door Lights
#259 (or #655) bulb

Cable p/n: H-13790

FROM MAIN HARNESS

NU	ORG-BLK	1
GND	BLK	2
NU	ORG-BRN	3
NU	ORG-RED	4
NU	ORG	5
1 PUNCH	ORG-YEL	6
1 PASS	ORG-GRN	7
	KEY	8
1 ATT. ADJ	ORG-BLU	9
NU	ORG-VIO	10
NU	ORG-GRY	11
	NC	12

1	NC	
2	NC	BLK
3	NC	
4	NC	
5	NC	
6	1 PUNCH	ORG- YEL
7	1 PASS	ORG- GRN
8	KEY	
9	1 ATTITUDE ADJUSTMENT	ORG- BLU
10	NC	
11	NC	
12	NC	

NU	YEL- BLK	1
NU	YEL- BRN	2
	KEY	3
NU	YEL- RED	4
NU	YEL- ORG	5
1 START	YEL- GRN	6
2 START	YEL-BLU	7
2 PUNCH	YEL-VIO	8
2 PASS	YEL-GRY	9
2 ATT. ADJ	VIO-BLK	10
NU	VIO-BRN	11
	VIO-RED	12

1	NC	
2	NC	
3	NC	1 START YEL- GRN
4	NC	
5	NC	YEL- BLU
6		
7	2 START	
8	2 PUNCH	YEL- VIO
9	2 PASS	YEL- GRY
10	2 ATTITUDE ADJUSTMENT	VIO- BLK
11		
12		

1 L/R 1	RED- BLK	1
1 L/R 2	RED-BRN	2
1 L/R 3	RED	3
1 L/R DIR.	RED-ORG	4
	KEY	5
1 U/D 1	RED-YEL	6
1 U/D 2	RED-GRN	7
1 U/D 3	RED-BLU	8
1 U/D DIR.	RED-GRY	9
	NC	10
START 1 LAMP	BRN-VIO	11
START 2 LAMP	GRN-GRY	12

1	1 L/R 1	RED- BLK
2	1 L/R 2	RED-BRN
3	1 L/R 3	RED
4	1 L/R DIR.	
5	KEY	RED-ORG
6	1 U/D 1	RED-YEL
7	1 U/D 2	RED-GRN
8	1 U/D 3	RED-BLU
9	1 U/D DIR.	RED-GRY
10	NC	
11	LAMP 1	
12	LAMP 2	

+5V	GRY

49 WAY JOYSTICK PLAYER 1

1
2
3
4
5
6
7
8
9
KEY 10
NC 11
12

2 L/R 1	BLU-BLK	1
2 L/R 2	BLU-BRN	2
2 L/R 3	BLU-RED	3
2 L/R DIR.	BLU-ORG	4
2 U/D 1	BLU-YEL	5
2 U/D 2	BLU-GRN	6
	KEY	7
2 U/D 3	BLU	8
2 U/D DIR.	BLU-VIO	9
LAMP	VIO +6V	10
+5V	GRY	11
	NC	12

1		
2		2 L/R 1 BLU-BLK
3		2 L/R 2 BLU-BRN
4		2 L/R 3 BLU-RED
5		2 L/R DIR. BLU-ORG
6		2 U/D 1 BLU-YEL
7	KEY	2 U/D 2 BLU-GRN
8		2 U/D 3 BLU
9		2 U/D DIR. BLU-VIO
10	LAMP	VIO +6V
11	+5V DC	GRY
12	NC	

+5V	GRY

49 WAY JOYSTICK PLAYER 2

1
2
3
4
5
6
7
8
9
KEY 10
NC 11
12

BLK	GROUND

PIGSKIN
LAMP DRIVER BOARD

Lamp Boards
C-13797 (x4)

J1
- 1
- 2 5.9VAC YEL-WHT
- 3
- 4 KEY
- 5 AC COMM. YEL
- 6
- 7 5.9VAC WHT-YEL

J3
- 1 Lamp +6V VIO
- 2 Lamp +6V VIO
- 3 Lamp +6V VIO
- 4 Lamp +6V VIO
- 5 NC

Pigskin 4004-U
Lamp Board Cable
H-13828

J4
- 1 2 LP 3 BRN-GRY
- 2 2 LP 2 BRN-WHT
- 3 2 LP 1 GRN-BLK
- 4 2 LP 6 GRN-RED
- 5 2 LP 5 GRN-ORG
- 6 2 LP 4 GRN-YEL
- 7 NC
- 8 KEY
- 9 NC
- 10 NC

J5
- 1 1 LP 1 BRN-BLK
- 2 1 LP 2 BRN
- 3 NC
- 4 KEY
- 5 1 LP 3 BRN-RED
- 6 1 LP 4 BRN-ORG
- 7 1 LP 5 BRN-YEL
- 8 1 LP 6 BRN-GRN
- 9 NC
- 10 NC

J6
- 1 START 1 LAMP BRN-VIO
- 2 START 2 LAMP GRN-GRY
- 3 Lamp +6V
- 4 KEY
- 5 5.9VAC WHT-YEL
- 6 5.9VAC YEL

To Main Harness
H-13791 for control
panel lamps

Lamp Driver PC
C-13765

Lamp +6V VIO (Lamp board 1)
- 1 Lamp +6V VIO
- 2 KEY
- 3 LP 3 BRN-RED
- 4 LP 2 BRN
- 5 LP 1 BRN-BLK

Lamp 1 / 2 / 3

Lamp +6V VIO (Lamp board 2)
- 1 Lamp +6V VIO
- 2 KEY
- 3 LP 6 BRN-GRN
- 4 LP 5 BRN-YEL
- 5 LP 4 BRN-ORG

4 / 5 / 6

Player 1
Lamps
Left

Lamp +6V VIO (Lamp board 3)
- 1 Lamp +6V VIO
- 2 KEY
- 3 LP 3 BRN-GRY
- 4 LP 2 BRN-WHT
- 5 LP 1 GRN-BLK

Lamp 1 / 2 / 3

Lamp +6V VIO (Lamp board 4)
- 1 Lamp +6V VIO
- 2 KEY
- 3 LP 6 GRN-RED
- 4 LP 5 GRN-ORG
- 5 LP 4 GRN-YEL

4 / 5 / 6

Player 2
Lamps
Right

J7
- 1 NC
- 2 LP STROBE 1 BLK-BRN
- 3 LP STROBE 0 BLK-RED
- 4 NC
- 5 LP RESET BLK-ORG
- 6 NC
- 7 KEY
- 8 NC
- 9 NC
- 10 LP DATA 7 BLK-YEL
- 11 LP DATA 6 BLK-GRN
- 12 LP DATA 5 BLK-BLU
- 13 LP DATA 4 BLK-VIO
- 14 LP DATA 3 BLK-GRY
- 15 LP DATA 2 BLK-WHT
- 16 LP DATA 1 VIO-ORG
- 17 LP DATA 0 VIO-YEL
- 18 NC

To Main
Harness
H-13791

J8
- 1 +5V GRY
- 2 KEY
- 3 GND BLK
- 4 NC
- 5 NC

To Sound
Power/Speaker
Cable

3-20

PIGSKIN POWER WIRING DIAGRAM

Interlock safety Switch

On/Off Switch

YEL

Off WHT-RED

BLU

Off BLK-YEL

Pin 3 used for 60Hz
Pin 4 used for 50Hz

BLK
GRN
WHT
BLU

Fluorescent
Light
Fixture

3A SLO BLK

Line Filter

BLK-YEL

WHT-RED

WHT

GRN

6P1
5
2
1
4
3
6

6J1
5
2
1
4
3
6

VIO

VIO

Isolated VIO-YEL
Line Output VIO-YEL

GRN

Switcher
Power
Supply

+5V GRY
-5V GRY-GRN
+12V GRY-YEL
GND BLK

1
2
3

1
2
3

BLK
GRN-YEL
WHT

MONITOR

To Main Harness

BLK
JUMPER

9
8
7
6
5
4
3
2
1

9
8
7
6
5
4
3
2
1

Primary

NU
NU
NU
BLK
JUMPER
YEL

SEE TRANSFORMER CHART

Secondary

6P3
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

6J3
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

NU
NU
NU
BLK
NC
NU
JUMPER
NU
NU
NC
NC
NC
5.9VAC YEL-WHT
AC COMMON YEL
5.9VAC WHT-YEL

To J1 on
Lamp Driver Board

Schematic diagram shows Jumper for 115V Jumpers.
See chart for other voltage Jumper connections.

TRANSFORMER JUMPER CHART

103.5VAC	206VAC	218VAC	230VAC
YEL 7PS	YEL 7PS	YEL 7PS	YEL 7PS
BLU	BLU	BLU	BLU
Fuse 3A SLO	Fuse 2A SLO	Fuse 2A SLO	Fuse 2A SLO
Varistor 130V	275V	275V	275V

7PS pins: 1 2 6 9 3 5 4 8 7

130V Varistor	5017-09044-00
275V Varistor	5017-09063-00
2A SB Fuse	5017-08665-00
3A SB Fuse	5017-10056-00

5
2
1
6
3
4

VIO A
VIO-YEL A
VIO-YEL B
VIO B

BLK COMMON

BLK

6P2
1
2
6
9
3
5
4
8
7

BRN 103.5V
ORG 115V

WHT-BRN
WHT-BRN
WHT-ORG
WHT-ORG

103.5V

115V

6P3
ORG
24VAC 2.5A
ORG
GRY-YEL
GRY-WHT
GRY
BRN-YEL
BRN-GRN
BRN
NC
NC
YEL-WHT
5.9VAC
2.5A YEL
WHT-YEL
NC
NC

8
9
2
3
1
6
5
4
7
10
13
14
15
11
12

3-21
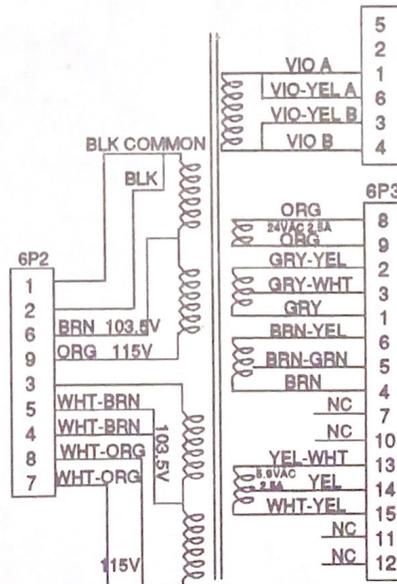
PIGSKIN INTERBOARD WIRING

LAMP DRIVER BOARD
(see page 3-20 for drawing)

SOUND BOARD

PIGSKIN CPU BOARD

JAMMA EDGE CONNECTOR
(See JAMMA Chart Page 3-15)

PIGSKIN Inserted Jumpers

AUDIO BOARD
P/N D-11581-4004

W2
W9
W11

PIGSKIN CPU BOARD
P/N C-13246-4004

W1
W2
W3
W6
W9
W10
W13

WARNINGS & NOTICES

Warning

USE OF NON-MIDWAY PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR
EQUIPMENT DAMAGE! USE ONLY MIDWAY AUTHORIZED PARTS.
* For safety and reliability, substitute parts and modifications are not recommended.
* Substitute parts or modifications may void FCC type acceptance.
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Warning

This equipment generates, uses and can emit radio frequency energy and, if not installed properly and used according to the directions in this manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of part 15 of FCC rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference to radio communications, in which the user, at his or her own expense, will be required to take whatever measures may be needed to correct the interference.

Warning

Prevent shock hazard and assure proper game operation. Only plug this game into a properly grounded outlet. Do not use a cheater plug to defeat the power cord's grounding pin. Do not cut off the ground pin.

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MIDWAY MANUFACTURING COMPANY
3401 N. CALIFORNIA AVE.
CHICAGO, ILLINOIS 60618