

**MIDWAY**

**MARCH 1997**

**16-40065-101**

# **RAMPAGE**

**WORLD TOUR**

TM

## **DEDICATED VIDEO GAME**

### **Operations Manual Includes**

- Kit Installation & Operation
- Testing & Problem Diagnosis
  - Parts Information
  - Wiring Diagrams

**Midway Manufacturing Company  
3401 North California Avenue  
Chicago, Illinois 60618**



# RAMPAGE WORLD TOUR

TM

SECTION  
ONE

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## OPERATION

**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.

## **SAFETY NOTICES**

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

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### **CAUTION**

**HANDLING ELECTRONIC DEVICES:** This kit uses complex electronic components that are SENSITIVE to static electricity. The following precautions must be observed and followed prior to handling any of the electronics that make up this game.

- 1) Ensure that the A.C. power to the game is turned off prior to servicing the electronics.
- 2) Discharge any static electricity build up in your body by touching the safety ground stud of the power supply chassis. This must be done BEFORE touching or handling the electronic assemblies.
- 3) Store the electronic assemblies in an anti-static area. Anti-static bags must be used to store the CPU board assembly. Use the same bag to save the old CPU assembly after the new unit is installed.
- 4) DO NOT remove or connect any electronic assemblies when the cabinet power is on. Doing so will damage the electronic assemblies and void the warranty.

**DISCONNECT POWER DURING INSTALLATION OR REPAIRS.** Always turn your game OFF and unplug it before attempting to service or install your kit. Installing or repairing PC boards with power ON can damage components and void the warranty. Be sure that all ground wires are installed securely.

**PROPERLY GROUND THE GAME.** To avoid electrical shocks, do not plug in the game until it has been inspected and properly grounded. This game should only be plugged into a grounded 3-wire outlet. Do not use a "cheater" plug or cut off the ground pin on the line cord.

**USE PROPER FUSE.** To avoid electrical shock, all replacement fuses must match the original fuse in fuse type, voltage rating, and current rating.

**SALVAGED PARTS.** Parts salvaged from old games are required to complete your kit. These salvaged parts must operate perfectly; otherwise, the converted game cannot perform properly or safely. Always repair circuit board malfunctions and cabinet damage before conversion is attempted.

**POWER SUPPLY.** Be sure the power supply from your old game is capable of +5Vdc at 5A, -5Vdc at 1A, and +12Vdc at 2A. All power supply voltages are  $\pm 5\%$  under load. These operating voltages are necessary for the kit. Your power supply must be FCC approved.

**WIRING.** This kit uses as much of the existing wiring as possible. To avoid errors in operation, verify that the wiring is an exact match with the diagrams after the conversion is completed.

**FAN.** The fan must be connected to a fused power source. Keep wires clear of moving fan blades.

**MONITOR.** This kit is not intended for use with X-Y monitors. Suitable monitors have horizontally mounted CRTs and raster electronics with inputs for RGB video and COMPOSITE NEGATIVE SYNC.

**COIN MECHANISMS.** Be sure to clean and test your game coin mechanisms with known currency. Servicing of these mechanisms is crucial to your game's earning potential and operation.

**COIN METERS.** Coin meters are not provided with this kit. Wiring information is provided as a convenience to the operator. Existing meters may be used provided their operation is verified.

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

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## PRODUCT SPECIFICATIONS

### Operating Requirements

<u>Location</u>	<u>Electrical Power</u>	<u>Temperature</u>	<u>Humidity</u>
Domestic	120VAC @ 60Hz 3.0 Amps	32°F to 100°F	Not to exceed 95% relative
Foreign	230VAC @ 50Hz 2.0 Amps	(0°C to 38°C)	
Japan	100VAC @ 50Hz 3.0 Amps		

### Cabinet Statistics

<u>Shipping Dimensions</u>	<u>Shipping Weight</u>	<u>Design Type</u>
Width 27" (68.5 cm)	Approx. 385 Lbs (175 kg.)	Dedicated Video Game
Depth 41" (104.2 cm)		
Height 73" (185.4 cm)		

### Equipment Characteristics

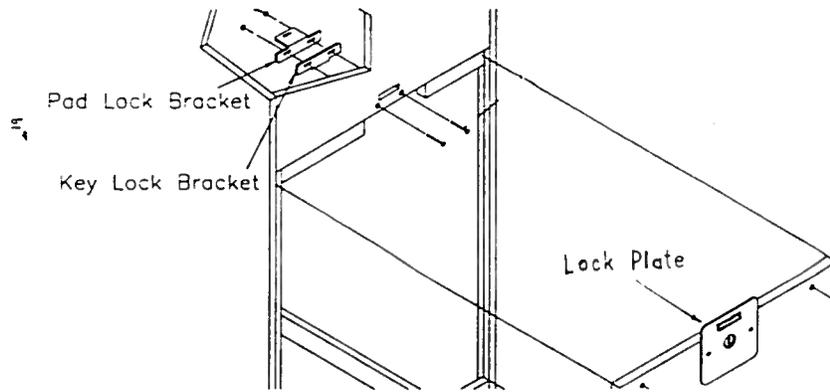
<u>Video Display Monitor</u>	<u>Audio System</u>	<u>Currency Acceptors</u>
Standard Resolution RGB 25" (63.5 cm) CRT	Digital Monaural 5" (12.7 cm) Coaxial Full Range Speakers	Standard Coin Door 2 Coin Mechanisms 1 Coin Counter

### Game Characteristics

<u>Player Variables</u>	<u>Operator Variables</u>	<u>Diagnostics</u>
1 to 3 players per game High Score Recognition	Coinage, Play Mode, Difficulty, Volume, Audits, Statistics	Automatic Power-Up Self-Test Manual Multi-Level Menu System

## INSTALLATION & INSPECTION

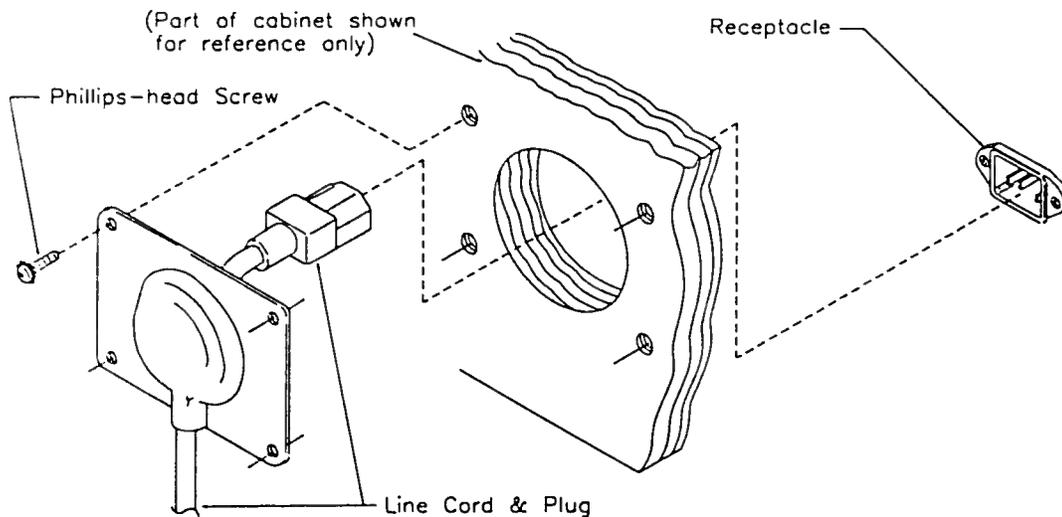
1. Remove all items from the shipping containers and set them aside. Inspect the exterior of the cabinet and the control panel for any damage. Pay special attention to cabinet edges, seams, and corners.
2. The coin door keys are attached to one of the joysticks. Unlock and open the coin door. The cash box door and rear door keys are located on a key hook attached to the inside of the coin door. Unlock and open the cash box door. Remove the spare parts stored in the cash box.
3. Remove and save the screws at the top and sides of the rear door. Unlock the rear door, then lift it off of the cabinet and set it aside. Inspect the cabinet interior for any signs of damage. Check all major assemblies to assure that they are mounted securely.
4. Refer to the Cabinet Wiring Diagram (Section 3), and check to see that all cable connectors are correctly secured. *Do not force connectors; they are keyed to fit in only one location.* Bent pins and reversed connections may damage your game and void the warranty.
5. Four leg levelers and nuts are located in the spare parts bag. Install one nut onto each leveler. Install a leveler with its nut into the threaded hole in each corner of the cabinet. Do not tighten at this time.
6. An extra padlock may be installed to secure the rear door. A hasp is located in the spare parts bag. Remove the two lock bracket nuts from inside the cabinet, above the rear door opening. Slide the hasp onto the bolts so that it protrudes from the hole in back of the cabinet, then reinstall the nuts.
7. Modify the lock plate at the top of the rear door. Remove the bolts and nuts from the lock plate, then rotate the plate so that the slot will be above the door. Reinstall the bolts and nuts and tighten firmly.



**WARNING**

The cabinet is top heavy.

8. The power cord is with the spare parts. Remove and save four screws from the line cord cover plate at the rear of the cabinet. Match the holes on the IEC plug with the prongs in the receptacle and push firmly to seat the line cord. Hold the cord flat against the cabinet and reinstall the cover plate (the indentation should point down so that the cord exits toward the bottom of the cabinet).



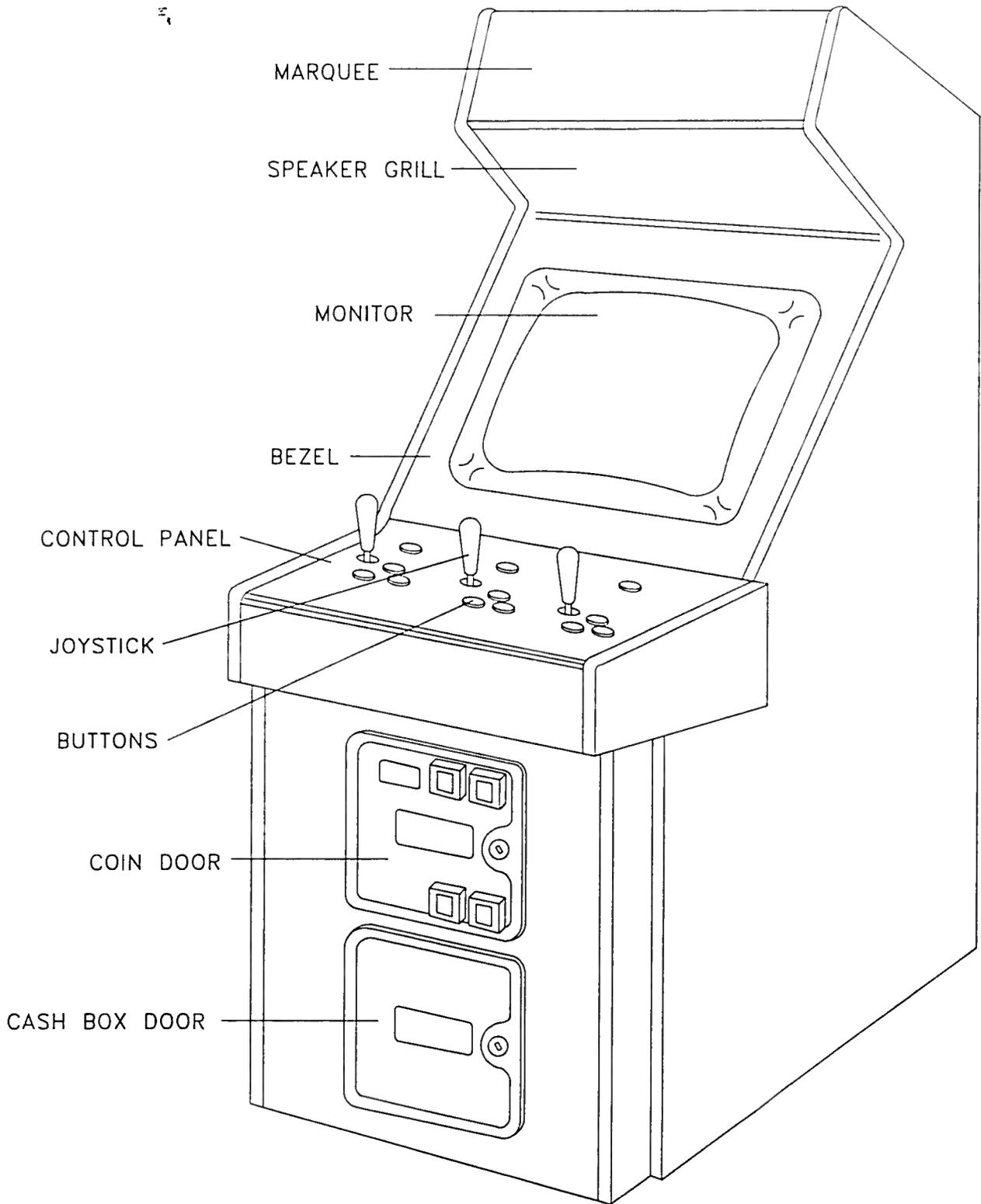
9. Reinstall the rear door onto the cabinet and close it. Lock the rear door and remove the key. If required, install the extra padlock through the hasp at this time. Install the screws at the top and sides of the rear door and tighten snugly. Close and lock the cash box and coin doors.

**NOTE**

Tamper resistant screws and matching wrench are provided with this game for additional security. Four tamper resistant screws and one wrench are located in the spare parts bag. If desired, replace the original screws with the tamper resistant screws. Tighten the screws firmly with the wrench.

10. Move the game to its intended location. Lower each leg leveler until the cabinet is stable and level. Adjust the levelers as required to distribute weight equally on each corner. Tighten the nuts firmly.
11. Plug the game into a grounded (3-terminal) AC wall outlet. Switch ON the game, using the ON/OFF switch located on the upper left rear of the cabinet. The game will power up and begin self-diagnostics. If no errors are found, the game will automatically enter its "attract" mode of operation.

# CABINET VIEW 1



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## SERVICING

We recommend that you read the SAFETY NOTICES section thoroughly before beginning service.

### ◆ Opening the Control Panel

Switch off power to the game. Open the coin door. Reach through the coin door opening up inside the control housing toward the right and left sides of the cabinet. The control panel is held in place by two latches inside the cabinet which provide constant pressure on the strikes. Lift each latch handle and unhook the wire fasteners. Grip the joysticks and carefully tilt the control panel back on its hinge.

To return the control panel to its normal position, slowly lean it forward until it rests on the cabinet. Do not let the control panel slam down onto the housing. Inspect for binding or pinched wires before re-clasping the latches. Grip the joysticks and verify complete latch on both sides of the panel.

### ◆ Removal of the Viewing Glass

Switch off power to the game. Open the control panel as described above. Loosen three mounting screws and slide the black metal strip from the bottom of the glass. Carefully slide the glass from the side grooves, then lift clear of the cabinet and set in a safe place. Clean the glass before reinstalling.

### ◆ Removal of the Monitor Bezel

Switch off power to the game. Open the control panel and remove the viewing glass as described in the paragraphs above. Lift the bezel up off of the monitor and set aside. Clean the labels and orient them so they can be read correctly (not upside down) when the bezel is reinstalled.

### ◆ Removal of the Marquee

Switch off power to the game. Remove the hex-head screws from the black marquee retaining strip located at the top of the header. Remove the strip and carefully lift the marquee and the marquee glass from the top of the header and set in a safe place. Clean the glass before reinstalling.

### ◆ Removal of the Speakers

Switch off power to the game. Remove the marquee and the marquee glass as described above. The grill and the speakers come out from the front of the cabinet. Be sure to disconnect the cabling and remove the nuts on the mounting screws before attempting to remove the speakers from the enclosure. Carefully reinstall the seals upon completing any task in the speaker enclosure.

### ◆ Removal of the Fluorescent Light Assembly

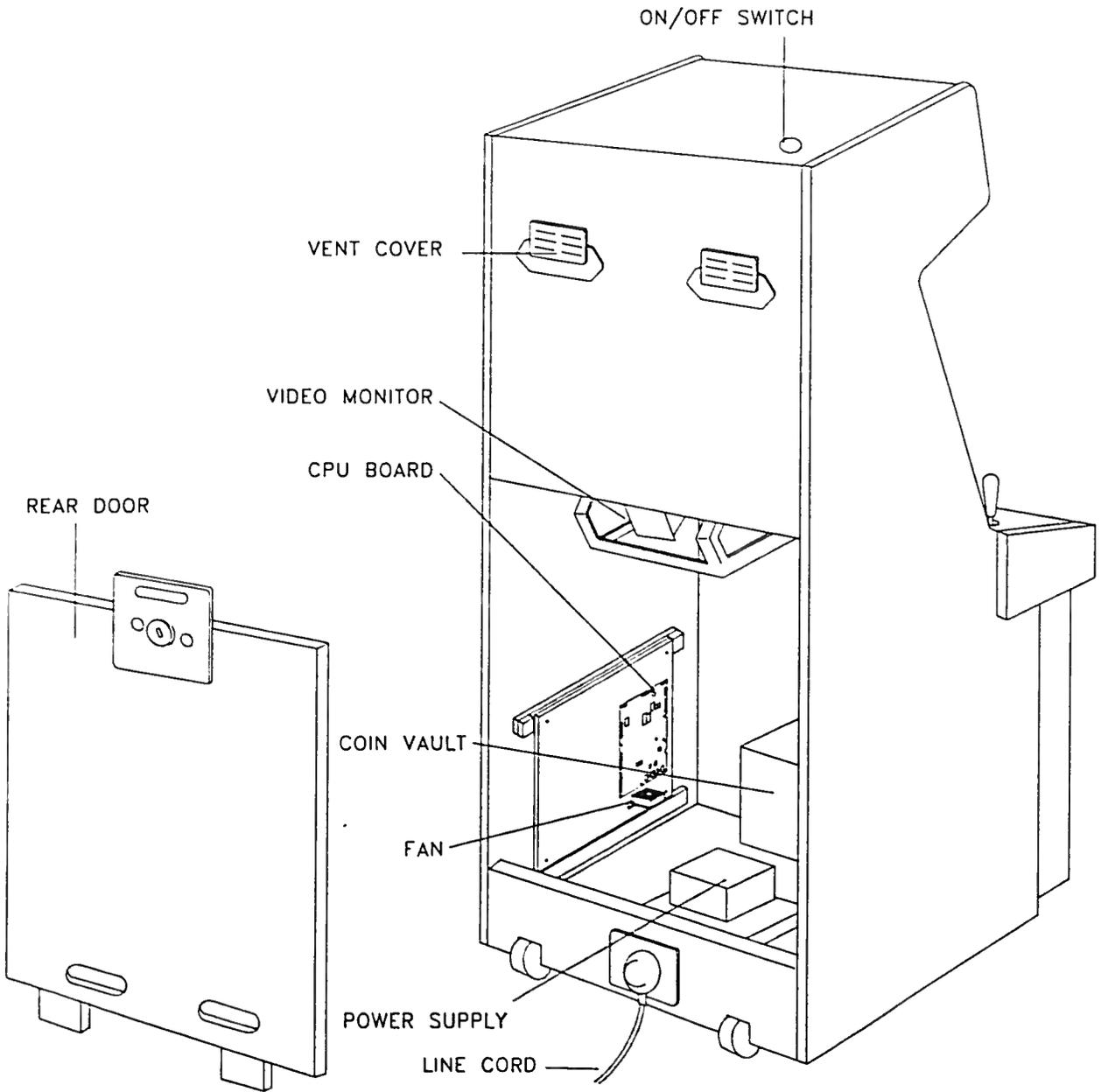
Switch off power to the game. Remove both marquee glass and marquee. Remove both plastic lamp locks. Grasp the bulb at each end and give it a quarter turn. Gently pull the bulb straight out to remove it from its sockets. The starter also requires a quarter turn for removal. Do not force the bulb or starter during reinstallation. Clean the bulb to remove fingerprints and dust, then reinstall marquee.

To remove the entire light fixture, remove the lamp locks and the bulb as described above. Disconnect the fluorescent light assembly connector from its power cable. Remove the screws that hold the assembly to the cabinet, then lift out the assembly.

## !! WARNING !!

If you drop a fluorescent tube or a CRT and it breaks, it will implode! Use care in handling.

# CABINET VIEW 2



### ◆ Monitor Replacement

Switch off power to the game. Open the control panel, remove the viewing glass and the monitor bezel. Open the cabinet door and disconnect all monitor cables. Remove the four flange nuts securing the monitor's mounting brackets to its mounting panel. Pull the monitor carefully from the cabinet and set in a safe place. Clean the face of the CRT before reinstalling the bezel and the glass.



### CAUTION

***THE VIDEO MONITOR IS HEAVY, WITH MOST OF THE WEIGHT TOWARD THE FRONT OF THE ASSEMBLY. BE SURE IT IS FIRMLY SUPPORTED AS IT IS REMOVED FROM THE CABINET.***

***The monitor does not require isolation from the A.C. line voltage in normal operation. However, when operating outside the cabinet or servicing the monitor on a test bench, YOU MUST ISOLATE THE MONITOR FROM LINE VOLTAGE WITH AN ISOLATION TRANSFORMER.***

### ◆ Hard Disk Drive Replacement

***REMEMBER: HARD DISK DRIVES ARE FRAGILE***

Use an anti-static bag and approved shipping container (P/N 08-7981.1) to return the hard disk drive assembly to your distributor.

Switch off power to the game. Remove screws, then unlock and remove the rear door. Unplug the ribbon cable from the CPU board. Remove the four hex head screws from the spacers and set them aside. Remove the spacers from the enclosure and set them aside. Remove the hard disk drive and its enclosure as one assembly (see Hard Drive Handling Guidelines in the front of this manual).

To reinstall the hard drive assembly, install one spacer in each corner hole of the enclosure. Orient the assembly over the mounting holes with the ribbon cable facing the CPU Board. Line up the holes in the spacers with the screw holes in the wood and use the hex head screws to fasten the assembly. Carefully plug the ribbon cable into the CPU board. Do not force the connector into its header pins.

### ◆ Power Supply Replacement

Switch off power to the game. Remove screws, then unlock and remove the rear door. Unplug the IEC A.C. connector from the rear of the supply and the D.C. connector from the front. Remove two front and two rear screws from the supply, then lift off of the power chassis. Note the voltage setting.

To reinstall the power supply, set the voltage switch to the correct value. Set the supply on the power chassis and align the mounting holes. Install the four screws and the two power connectors.

### ◆ Memory Replacement

The ROM (Read Only Memory) circuits contain the computer operating instructions. *Memory devices are especially sensitive to static charges. Use grounding precautions when handling these parts.*

Switch off power to the game. Carefully note the position, then remove using a chip extraction tool.

To reinstall memory circuits, orient a chip over its socket and press firmly to seat pins. *Do not force.*

### ◆ Battery Replacement

Switch off power to the game. Carefully note the position, then gently lift the contact arm to release tension. *Do not bend the arm.* Slight finger pressure may be needed to pry the cell from its holder.

To reinstall the battery, orient cell near its holder and slide it in under the contact arm. *Do not force.*

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## GAME OPERATION

### STARTING UP

Each time the game is first turned on or power is restored, it begins executing code out of the boot ROM. These self-diagnostic tests automatically verify and report condition of the CPU and the game hardware. If any of the individual tests fails, then an error message will be displayed for each test.

During initial tests, patterns which resemble woven fabric rugs appear on the CRT screen. When the "rug" patterns end, the screen displays a CPU Board map. Critical integrated circuits are tested one at a time. Bad devices are indicated in red, good in green. The game will not start when faults are found by this test.

Once all Power-up tests have been passed, the game goes into its "attract mode". Scenes and sounds from a typical game are alternated with previous high scores in an endless pattern until game play starts.

Insert currency to start the game. Players select locations and other game variables. Play begins after a countdown period is completed. The game will progress until time is exhausted. If no more play is required, the game automatically returns to the "attract mode".

### GAME RULES

*Play instructions are found on the information panel under the video monitor.*

#### INDIVIDUAL PLAY

Insert currency to start the game. The mission is explained and the opening situation is revealed. Press the nearest START button to choose a creature. The joystick and action buttons control creature activity.

#### MULTIPLE PLAYERS

Insert currency to start the game. The mission is explained. Press START buttons to choose creatures. An indicator bar at the top of the screen shows the condition of each creature during competition.

## PLAYER CONTROLS

#### ◆ START Button

This button allow players to begin or continue play. Choose a creature with this button.  
This same button has no dedicated function during service.

#### ◆ JUMP Button

The JUMP button lifts the creature up. The joystick affects which direction the creature will jump.  
This same button is used to select items from the menus during service.

#### ◆ PUNCH Button

The PUNCH button activates the arms. The joystick affects which direction the creature will punch.  
This same button is used to select items from the menus during service.

#### ◆ KICK Button

The KICK button activates the legs. The joystick affects which direction the creature will kick.  
This same button is used to select items from the menus during service.

#### ◆ JOYSTICKS

Each player has a joystick to control the movements of an on-screen character.  
The joystick is also used to select items from the menus during service.

## OPERATOR CONTROLS

### CABINET SWITCHES

- ◆ **Power Switch**  
The **Power Switch** turns off the game during service. It does not reset the game variables.
- ◆ **Slam Tilt Switch**  
The **Slam Tilt** switch prevents game abuses such as pounding to obtain free games.

### CONTROL SWITCHES

- ◆ **Volume Down and Volume Up Buttons**  
The **Volume Down** and **Volume Up** push-button switches increase or decrease game sound levels. Press either button briefly to make minor changes. Press and hold a button to make major changes. Volume may also be changed with the joysticks and buttons when the menu system is active.

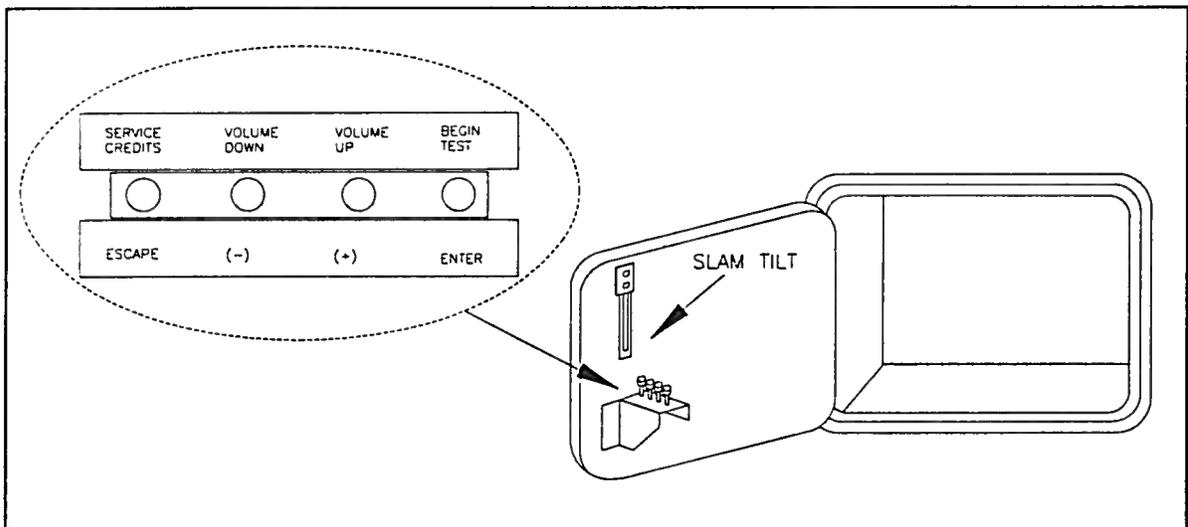
#### NOTE

The Attract Mode volume is controlled independently of the Game Mode volume. For greater profits, adjust your volume levels to a loud setting to draw attention to this game.

- ◆ **Begin Test Button**  
The **Begin Test** push-button switch enters the menu system. Press the **Begin Test** button briefly to run the automatic tests. Press and hold the **Test** button to get to any of the menu selections.
- ◆ **Service Credit Button**  
The **Service Credit** push-button switch allots credits without changing the game's bookkeeping total.

#### NOTE

*The coin door must be open to reach the control switches.*



**CONTROL SWITCH LOCATIONS**

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# MENU SYSTEM

## SYSTEM OVERVIEW

Game variables and diagnostics are presented in a series of on-screen menus. The Main Menu screen allows the operator to view information, make changes, or verify equipment operation. Each Sub Menu screen displays one specific group of choices. The Detail Menu presents data or runs the required test. You must be at the Detail Menu level to detect errors, make changes, or activate tests. Both the operator controls and the player controls are used to move through the menus and start or stop particular routines.

Each time the game is switched from normal play mode to the menu system and back, the self-diagnostic routine is activated. These basic tests run automatically; their purpose is to detect those faults which would prevent the game or the menu system from operating properly. Messages appear on the screen as each item is run, along with any errors detected. A successful self-test usually takes less than one minute to complete. Write down any messages before proceeding to the menus or game play.

## SCREEN LAYOUT

Each menu screen is different, but the material presented stays in the same physical location each time.

The color bar at the top center of each screen displays the current menu title and software version.

The center of the screen is used for data (menu items, video signals, statistics, reports, etc.)

The bottom of the screen is reserved for messages (control functions, revision levels, etc.)

## ORGANIZATION

The menu system must be activated manually. It must also be deactivated manually to play the game.

Main Menu screen items are divided into categories: tests, bookkeeping, audits, adjustments, etc.

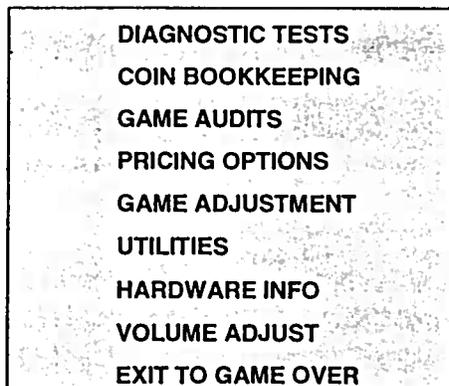
Tests are useful to verify proper operation of the equipment assemblies one at a time.

Other items permit the operator to audit the game and customize or return to factory defaults.

Sub Menu screen items offer the operator choices within a category. Some items have no Sub Menu while others may have more than one. You can get back to the previous menu or go on to the next menu. At the top level, Sub Menus will appear as a box to the right of the Main Menu choices.

Detail Menu screen items contain specific information. The operator must interact with the system to get results or to make changes. There is always a way to go back to the previous menus from this screen.

Control functions are listed on screen. Use the joysticks to highlight an item on any menu. Only one highlighted item can be selected at a time. Press the indicated button to select a highlighted item. To return the game to normal, use the joysticks to select EXIT TO GAME OVER, then press an action button.

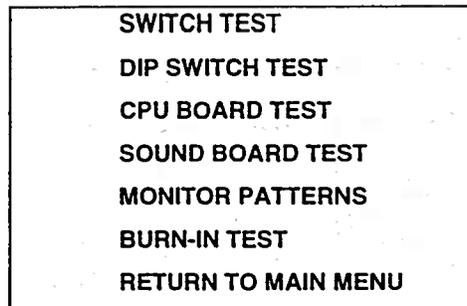


MAIN TEST MENU

## DIAGNOSTIC TESTS

These tests allow the operator to verify the condition of the electrical and electronic hardware in the game.

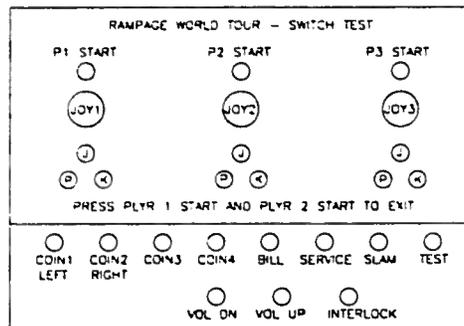
To select these tests, use a joystick to pick DIAGNOSTIC TESTS and a control panel button to activate it. The screen displays the sub menu. Use the same steps to activate any one of the items listed.



### DIAGNOSTIC TESTS SUB MENU

#### SWITCH TEST

To enter the test, use a joystick to select the Switch Test and any control panel button to begin testing. Activate each switch and the indicator on the screen changes state. Release the switch and the indicator returns to its previous normally open or closed condition. Switches may be tested in any combination.



#### SWITCH TEST SCREEN

**Player Controls** are shown on the screen in the same positions as on the cabinet control panel. Each switch change should be exactly duplicated by a single indication on the menu screen.

The Player Controls Tests are used to verify crossed wires, intermittent conditions, and stuck switches.

**Operator Controls** are shown on the screen just as they are found on the coin door bracket. Each switch change should be exactly duplicated by a single indication on the menu screen.

The Operator Controls Tests are used to verify crossed wires, intermittent conditions, and stuck switches.

The Coin and Cabinet Switches are shown on the screen without regard for their actual game location. Each switch change should be exactly duplicated by a single indication on the menu screen.

These Switch Tests are used to verify crossed wires, intermittent conditions, and stuck switches.

## DIP SWITCH TEST

The DIP Switch Test allows the operator to check the position of the two 8-position DIP switches on the CPU Board. The operator can also change the setting of any DIP Switch and see the results immediately.

To enter the test, use a joystick to select the DIP Switch Test and any control panel button to activate it. The screen displays an illustration of each switch block and the current settings.

DIP Switch settings may be changed with the power on. Move the switch to the desired setting, then check the screen to verify that the switch now shows the new setting.

Press any control panel button to exit the DIP Switch Test.

DIP Switch 1			SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Coinage Control	DIPSwitch CMOS		Off* On							
USA1	Ger1	Fr1		Off*	Off*	Off*				
USA2	Ger2	Fr2		Off	Off	On				
USA3	Ger3	Fr3		Off	On	Off				
USA4	Ger4	Fr4		Off	On	On				
USAECA	GerECA	FrECA		On	Off	Off				
N/U	N/U	N/U		On	Off	On				
N/U	N/U	N/U		On	On	Off				
Free Play	Free Play	Free Play		On	On	On				
USA							Off*	Off*		
French							On	Off		
German							Off	On		
Unused							On	On		
1 Coin Counter									Off*	
2 Coin Counters									On	
Unused										Off*
Unused										On

DIP Switch 2			SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
0 Bill Validator (None)			Off*							
1 Bill Validator			On							
Attract Sounds Off				Off*						
Attract Sounds On				On						
Power Up Test Off					Off*					
Power Up Test On					On					
Creature Heads	Normal					Off*				
	Big					On				
Control Panel	3 Player						Off*			
	4 Player						On			
Unused								Off*		
Unused								On		
Unused									Off*	
Unused									On	
Test Mode	Manual									Off*
	Fixed									On

## **CPU BOARD TEST**

The CPU Board Test verifies the critical active circuits. Its appearance is similar to the power up test.

Highlight the CPU Board Test by using any joystick to select the option; then press any control panel button to activate. When this test is activated, a "rug" pattern appears on the screen. The screen then changes to show the layout of the components being tested. During the test, integrated circuits are indicated as good if they turn green; and faulty if they turn red. Sockets that have no circuits installed will not change color. Inspect the CPU Board to determine which sockets will be tested.

## **Image Circuits**

The graphics used in this game are installed in sockets U102 through U133. These circuits are tested one at a time. Faults in this area will affect the video images that appear as the game is played.

## **Sound Circuits**

The sounds used in this game are installed in sockets U2 through U9. These circuits are tested one at a time. Faults in this area will affect the music, voices, or noises that occur as the game is played.

## **Instruction Circuits**

The Instruction Circuits contain the routines for the processor. They are located in sockets U35, U45, U47, U54, U57, U63, and U64. These circuits affect the way the CPU Board operates.

## **SOUND BOARD TEST**

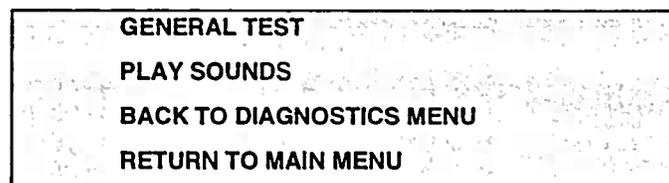
The Sound Test permits listening to some of the sounds that the game is capable of producing. These tests verify that the audio components are connected and operating properly.

To enter the test, use any joystick to select the option; then press any control panel button to activate.

### **NOTE**

*The level must be turned up for the speakers to be heard. Check the volume setting before testing.*

Each of the game sounds is stored in a discrete memory location. All of these sounds are available to test to audio reproduction capabilities of the sound circuits. Vary the volume as you sample these sounds.

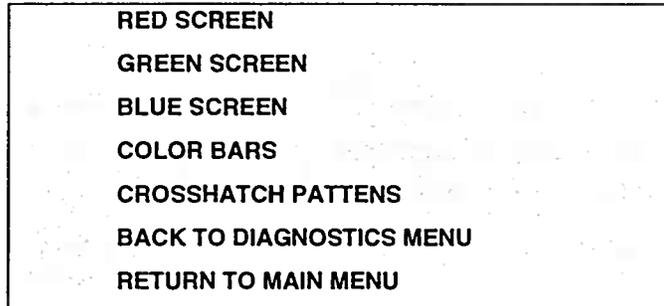


### **SOUND TEST SUB MENU**

## MONITOR PATTERNS

The Monitor Patterns routine provides test screens to verify monitor performance or make adjustments.

Highlight the test by using any joystick to select the option; then press any control panel button to activate.



### MONITOR PATTERN SUB MENU

**Color Screen** tests fill the screen with 100% of the chosen color at normal intensity. Each screen should be absolutely uniform from top to bottom and side to side. No retrace lines or noise should be visible.

The Color Screen tests are useful in verifying monitor intensity, black level, blanking and degaussing.

**Color Bars** fills the screen with shades of colors to verify red, green, blue and white level dynamic adjustments. Each color bar should appear sharp, clear, and distinct from bars on either side.

The Color Bars screen is useful in adjusting the monitor brightness and contrast.

**Crosshatch Patterns** fill the screen with a grid and a series of dots. The grid and the dots should be all one color, with no fringes or parallel images. The lines should be straight and the dots round.

The Crosshatch Patterns are useful in verifying the monitor convergence, linearity, and dynamic focus.

If any of the tests shows a need for adjustment, use the proper knobs on the Monitor Controls board.

## BURN-IN TEST

The Burn-in Test continually repeats the CPU Board Test. Use any joystick to select the option; then press any control panel button to activate. When the Burn-in Test detects an error, the test stops and displays an error message on the screen. Use this test to find intermittent CPU problems.

To exit this test, switch the game OFF then ON again.

### COIN BOOKKEEPING

The Coin Bookkeeping menu permits the operator to assess the currency collection. The first report lists each category by quantity; the detailed data screen presents calculated revenue amounts.

Highlight Coin Bookkeeping by using any joystick to select the option; then press any control panel button to activate. Choose More Detailed Data to see the amounts collected or to clear all counters to zero.

LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
BILL VALIDATOR	0
SERVICE CREDITS	0
PAID CREDITS	0
<b>MORE DETAILED DATA</b>	
<b>RETURN TO MAIN MENU</b>	

COIN BOOKKEEPING SUB MENU

LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
BILL VALIDATOR	0
TOTAL	0
<b>CLEAR COIN COUNTERS</b>	
<b>RETURN TO MAIN MENU</b>	

BOOKKEEPING DETAILED DATA MENU

We recommend that all bookkeeping information be examined and recorded before any changes are made. Once the counters have been cleared, the previous data cannot be retrieved from the system.

## GAME AUDITS

The Game Audits Menus permit the operator to review the game play statistics. Additional menus give detailed reports for each player position on game starts, ends, cabinet abuse, fault conditions, etc.

GAMES STARTED	0
TOTAL GAME PLAY TIME	0
TOTAL GAME UP TIME	0
TOTAL TIME PLAYER 1	0
TOTAL TIME PLAYER 2	0
TOTAL TIME PLAYER 3	0
TIME PER QUARTER PLAYER 1	0
TIME PER QUARTER PLAYER 2	0
TIME PER QUARTER PLAYER 3	0
TIME PER PLAY PLAYER 1	0
TIME PER PLAY PLAYER 2	0
TIME PER PLAY PLAYER 3	0
NEXT AUDIT PAGE	
RETURN TO MAIN MENU	

### AUDIT MENU PAGE 1

Use the joystick and action buttons to move between Audit menus or to return to the main menu.

PLAYER 1 PLAYS	0
PLAYER 2 PLAYS	0
PLAYER 3 PLAYS	0
PLAYER 1 QUARTERS	0
PLAYER 2 QUARTERS	0
PLAYER 3 QUARTERS	0
PLAYER 1 QUARTERS PER PLAY	0
PLAYER 2 QUARTERS PER PLAY	0
PLAYER 3 QUARTERS PER PLAY	0
AVERAGE RACK END DAY	0
NEXT AUDIT PAGE	
PREVIOUS AUDIT PAGE	
RETURN TO MAIN MENU	

### AUDIT MENU PAGE 2

GAME AUDITS (continued)

GAME END IN RACKS	1-10	0			
GAME END IN RACKS	11-20	0			
GAME END IN RACKS	21-30	0			
GAME END IN RACKS	31-40	0			
GAME END IN RACKS	41-50	0			
GAME END IN RACKS	51-60	0			
GAME END IN RACKS	61-70	0			
GAME END IN RACKS	71-80	0			
GAME END IN RACKS	81-90	0			
GAME END IN RACKS	90-100	0			
GAME END IN RACKS	101-110	0			
GAME END IN RACKS	111-120	0			
GAME END IN RACKS	121-130	0			
<table border="1"><tr><td>NEXT AUDIT PAGE</td></tr><tr><td>PREVIOUS AUDIT PAGE</td></tr><tr><td>RETURN TO MAIN MENU</td></tr></table>			NEXT AUDIT PAGE	PREVIOUS AUDIT PAGE	RETURN TO MAIN MENU
NEXT AUDIT PAGE					
PREVIOUS AUDIT PAGE					
RETURN TO MAIN MENU					

AUDIT MENU PAGE 3

Use the joystick and action buttons to move between Audit menus or to return to the main menu.

INITIALS ENTERED	0		
COIN DOOR SLAMS	0		
BURN-IN LOOPS SUCCESSFULLY COMPLETED	0		
START FAILURES	0		
<table border="1"><tr><td>PREVIOUS AUDIT PAGE</td></tr><tr><td>RETURN TO MAIN MENU</td></tr></table>		PREVIOUS AUDIT PAGE	RETURN TO MAIN MENU
PREVIOUS AUDIT PAGE			
RETURN TO MAIN MENU			

AUDIT MENU PAGE 4

## PRICING OPTIONS

The Pricing Options menus allow the operator to view current settings or change the cost of games. Custom pricing allows the operator to select the specific number of coins or credits required for each game. Factory default values are restored if the CPU Board is exchanged or the back up battery fails.

Use the joysticks to select a particular game option. Joysticks are also used to view the range of choices and change values. Options may be reset to factory defaults or changed after each viewing.

We recommend that all pricing options be examined and recorded before any changes are made.

<b>STANDARD PRICING</b>
<b>CUSTOM MULTIPLIERS</b>
<b>CUSTOM PRICING</b>
<b>FREE PLAY</b>
<b>CREDITS FOR FULL GAME</b>
<b>RETURN TO MAIN MENU</b>

### PRICING OPTIONS SUB MENU

Standard Pricing is adjusted by changing Dip Switch positions. The display shows the current settings.

DIPSWITCH				
2 TO START / 2 TO CONTINUE				
1 CREDIT / 1 COIN				
<b>S1</b>	<b>S2</b>	<b>S3</b>	<b>S4</b>	<b>BILL</b>
.25	.25			\$1.00

### STANDARD PRICING SUB MENU

Custom Multipliers reports values used to calculate earnings. Current values are displayed on screen.

<b>USING MULTIPLIERS:</b>	<b>YES</b>
<b>CHUTE 1 MULTIPLIER:</b>	<b>1</b>
<b>CHUTE 2 MULTIPLIER:</b>	<b>1</b>
<b>CHUTE 3 MULTIPLIER:</b>	<b>1</b>
<b>CHUTE 4 MULTIPLIER:</b>	<b>1</b>
<b>VALIDATOR MULTIPLIER:</b>	<b>1</b>

### CUSTOM MULTIPLIERS SUB MENU

## PRICING OPTIONS (continued)

Custom Pricing shows credit requirements and maximum limits. The present settings are displayed.

PRICING:	DIPSWITCH
FREE PLAY:	NO
MAXIMUM CREDITS:	50
CREDITS TO START:	1
CREDITS TO CONTINUE:	1

### CUSTOM PRICING SUB MENU

Free Play affects several game variables at one time. The display is small when Free Play is turned off.

CURRENT SETTING	
DIPSWITCH:	NO

### FREE PLAY SUB MENU

## GAME ADJUSTMENTS

The Game Adjustment menu items allow the operator to customize the game sound level to match the environment. The minimum level can be set between zero and half power (range 0 through 128).

Highlight setting choice with any joystick, then press any button to lock setting.

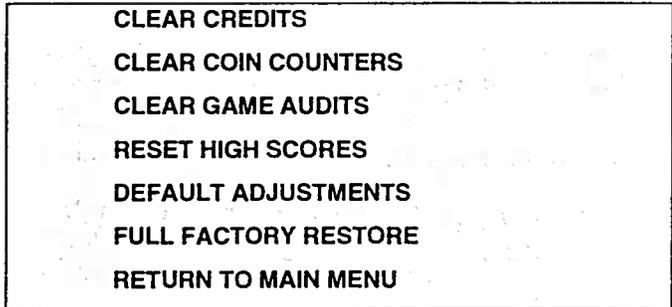
THIS IS THE MINIMUM LEVEL ALLOWED WHEN SETTING THE VOLUME OF THE SOUND BOARD	
FACTORY SETTING	31
CURRENT SETTING	14

### GAME ADJUSTMENT SUB MENU

## UTILITIES

The Utilities Menu allows the operator to clear individual memory counters or to reset them all at one time.

Use the joysticks to select a particular game option. Joysticks are also used to view the range of choices and change values. Options may be reset to factory defaults or changed after each viewing.



### UTILITY SUB MENU

**Clear Credits** removes any posted credits from the game. It does not affect any other game items.

**Clear Coin Counters** removes any paid credits total and sets all coin slot counts to zero.

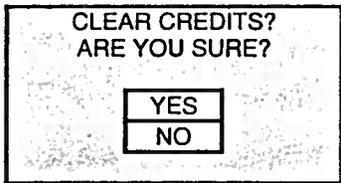
**Clear Game Audits** changes all game play statistics back to zero.

**Reset High Scores** returns the high score table to the factory default values.

**Default Adjustments** returns all game adjustments to the factory default values.

**Full Factory Restore** changes all categories to the factory default values simultaneously.

After an item has been selected, you are given the opportunity to escape from this change. For example:

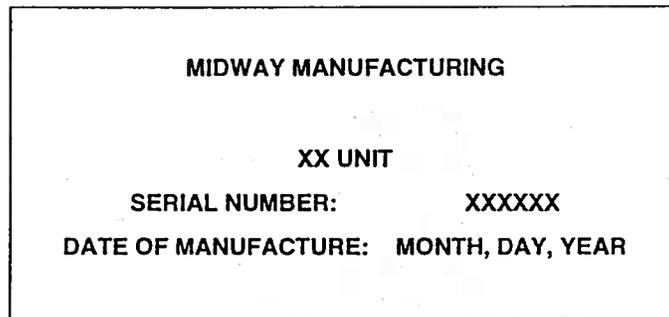


### LAST CHANCE SUB MENU

We recommend that all utility values be examined and recorded before any changes are made.

### HARDWARE INFO

Displays the unit type, serial number, and date and location of manufacture. This information will be requested each time the operator requests parts, service, upgrades, etc.



Press any control panel button to exit to the main menu.

### VOLUME ADJUST

Music plays continuously with this screen. Use any joystick or the volume buttons to change the sound level of the game. Press any control panel button to save the volume level and return to the Main Menu.



Press any control panel button to exit to the main menu.

**TYPICAL STANDARD PRICING TABLE**

NAME	Settings Credit/Coin	COIN 1	COIN 2	COIN 3	COIN4	Bill
USA1	1/25c (2 to Start; 2 to Continue)	.25c	.25c			\$1.00
USA2	1/25c (2 to Start; 1 to Continue)	.25c	.25c			\$1.00
USA3	1/25c (1 to Start; 1 to Continue)	.25c	.25c			\$1.00
USA4	1/50c, 3/\$1.00 (1 to Start; 1 to Continue)	.25c	.25c			\$1.00
USA5	1/50c, 4/\$1.00 (2 to Start; 1 to Continue)	.25c	.25c			\$1.00
USA6	1/50c (1 to Start; 1 to Continue)	.25c	.25c			\$1.00
USA7	1/50c, 3/\$1.00 (1 to Start; 1 to Continue)	.25c	.25c			\$1.00
USA8	1/50c, 4/\$1.00 (2 to Start; 2 to Continue)	.25c	.25c			\$1.00
USA9	1/25c, 4/\$1.00 (2 to Start; 2 to Continue)	.25c	.25c			\$1.00
USA10	1/25c, 4/\$1.00 (3 to Start; 2 to Continue)	.25c	.25c			\$1.00
USA ECA	1/25c, 4/\$1.00 (3 to Start; 3 to Continue)	\$1.00	.25c	.10c	.05c	\$1.00
GERMAN1	1/1DM, 6/5DM	1DM	5DM			
GERMAN2	1/1DM, 7/5DM	1DM	5DM			
GERMAN3	1/1DM, 8/5DM	1DM	5DM			
GERMAN4	1/1DM, 5/5DM	1DM	5DM			
GERMAN5	1/1DM, 6/5DM	1DM	5DM			
GERMAN ECA	1/1DM, 2/2DM, 6/5DM	5DM	2DM	1DM		
FRANCE1	2/5F, 5/10F	5F	10F			
FRANCE2	2/5F, 4/10F	5F	10F			
FRANCE3	1/5F, 3/10F	5F	10F			
FRANCE4	1/5F, 2/10F	5F	10F			
FRANCE5	2/5F, 5/10F, 1 1/2 X 10F	5F	10F			
FRANCE6	2/5F, 4/10F, 9/2 X 10F	5F	10F			
FRANCE7	1/5F, 3/10F, 7/2 X 10F	5F	10F			
FRANCE8	1/5F, 2/10F, 5/2 X 10F	5F	10F			
FRANCE9	1/3 X 1F, 2/5F	1F	5F			
FRANCE10	1/2 X 1F, 3/5F	1F	5F			
FRANCE11	1/3 X 1F, 2/5F, 5/2 X 5F	1F	5F			
FRANCE12	1/2 X 1F, 3/5F, 7/2 X 5F	1F	5F			
FRANCE ECA	1/3 X 1F, 2/5F, 5/2 X 5F		5F	10F	20F	
CANADA	1/2X25c, 3/\$1.00	.25c	\$1.00			\$1.00
SWISS1	1/1F, 6/5F	1F	5F			
SWISS2	1/1F, 7/5F	1F	5F			
SWISS3	1/1F, 8/5F	1F	5F			
ITALY	1/500LIRE	500 LIRE	500 LIRE			
UK1	1/20P, 3/50P	20P	50P			
UK2	2/20P, 5/50P	20P	50P			
UK ECA1	1/20P, 3/50P, 7/£1.00	£1.00	50P	20P	10P	
UK ECA2	1/20P, 3/50P, 7/£1.00	£1.00	50P	20P	10P	
UK ECA3	1/30P, 2/50P, 4/£1.00	£1.00	50P	20P	10P	
UK ECA4	1/30P, 2/50P, 5/£1.00	£1.00	50P	20P	10P	
UK ECA5	1/50P, 2/£1.00	£1.00	50P	20P	10P	
UK ECA6	1/50P, 3/£1.00	£1.00	50P	20P	10P	
UK ECA7	3/£1.00	£1.00	50P	20P	10P	
UK ELEC W/CCU	1/30P, 2/50P, 4/£1.00	£1.00	CCU			
SPAIN1	1/100PESETA, 6/500PESETA	100PESETA	500PESETA			
SPAIN2	1/100PESETA, 5/500PESETA	100PESETA	500PESETA			
AUSTRALIA1	1/3X20c, 2/\$1.00	.20c	\$1.00			
AUSTRALIA2	1/5X20c, 1/\$1.00	.20c	\$1.00			
JAPAN1	1/100YEN	100 YEN	100 YEN			
JAPAN2	2/100YEN	100 YEN	100 YEN			
AUSTRIA1	1/5SCHIL, 2/10SCHIL	5 schilling	10 schilling			
AUSTRIA2	1/2X5SCHIL, 3/2X10SCHIL	5 schilling	10 schilling			
BELGIUM1	1/20F	20F	20F			
BELGIUM2	3/20F	20F	20F			
BELGIUM3	2/20F	20F	20F			
BELGIUM ECA	1/20F	50F	20F	5F		
SWEDEN	1/3X1KRONA, 2/5KRONA	1 KRONA	5 KRONA			
NEW ZEALAND1	1/3X20c	20c	20c			
NEW ZEALAND2	1/2X20c	20c	20c			
NETHERLANDS	1/1HFI, 3/2.5HFI	1HFI	2.5HFI			
FINLAND	1/1MARKKA	1MARKKA	1MARKKA			
NORWAY	1/2X1KRONE, 3/5X1KRONE	1KRONE	1KRONE			
DENMARK	1/2X1KRONE, 3/5KRONE, 7/2X5KRONE	1 KRONE	5 KRONE			
ANTILLIES	1/25c, 4/1GUILDER	.25c	1GUILDER			
HUNGARY	1/2X10FORINT, 3/2X20FORINT	10FORINT	20FORINT			



# RAMPAGE WORLD TOUR

TM

SECTION  
TWO

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PARTS

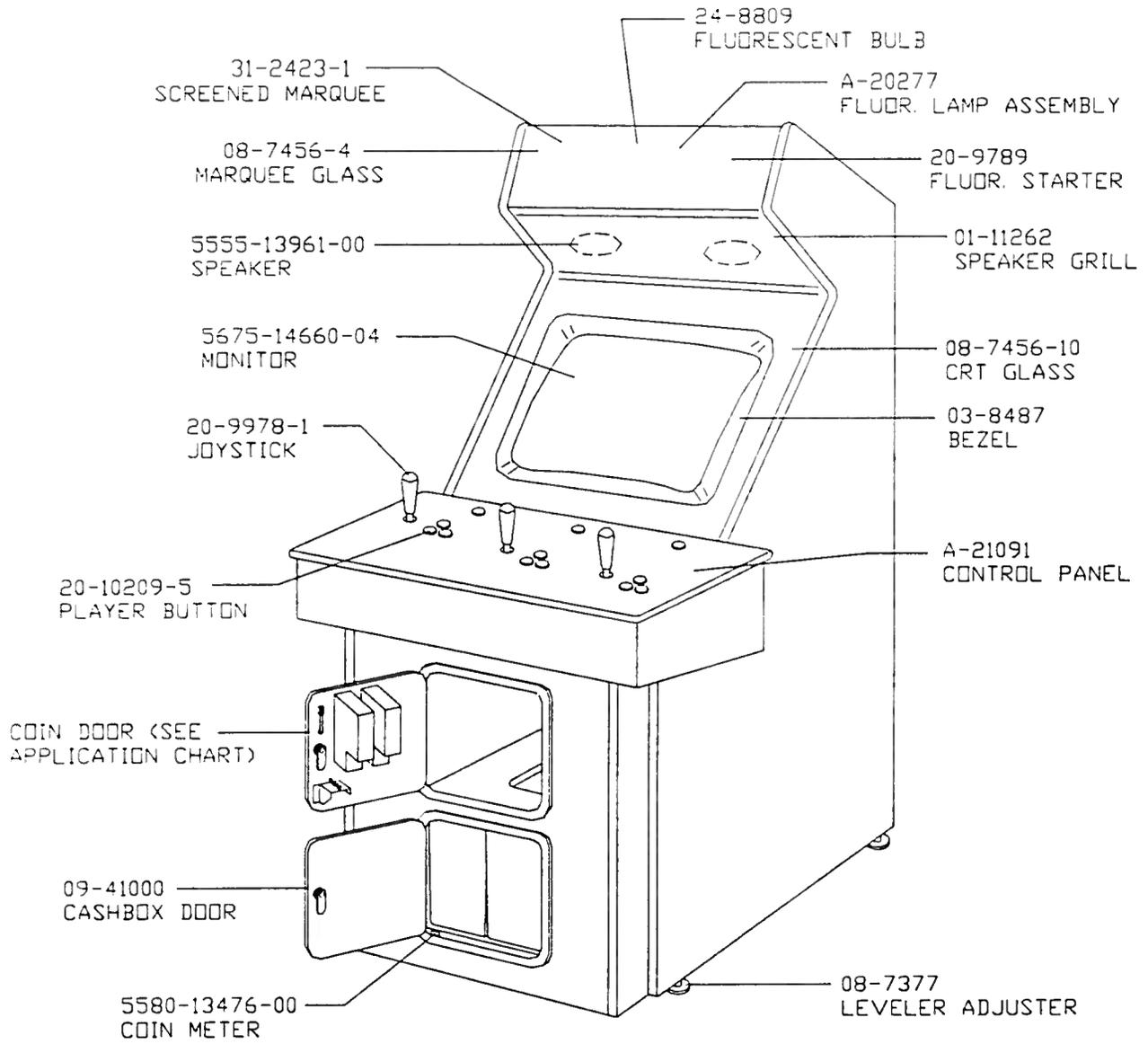
**Warning**

USE OF NON-MIDWAY PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY MIDWAY AUTHORIZED PARTS.

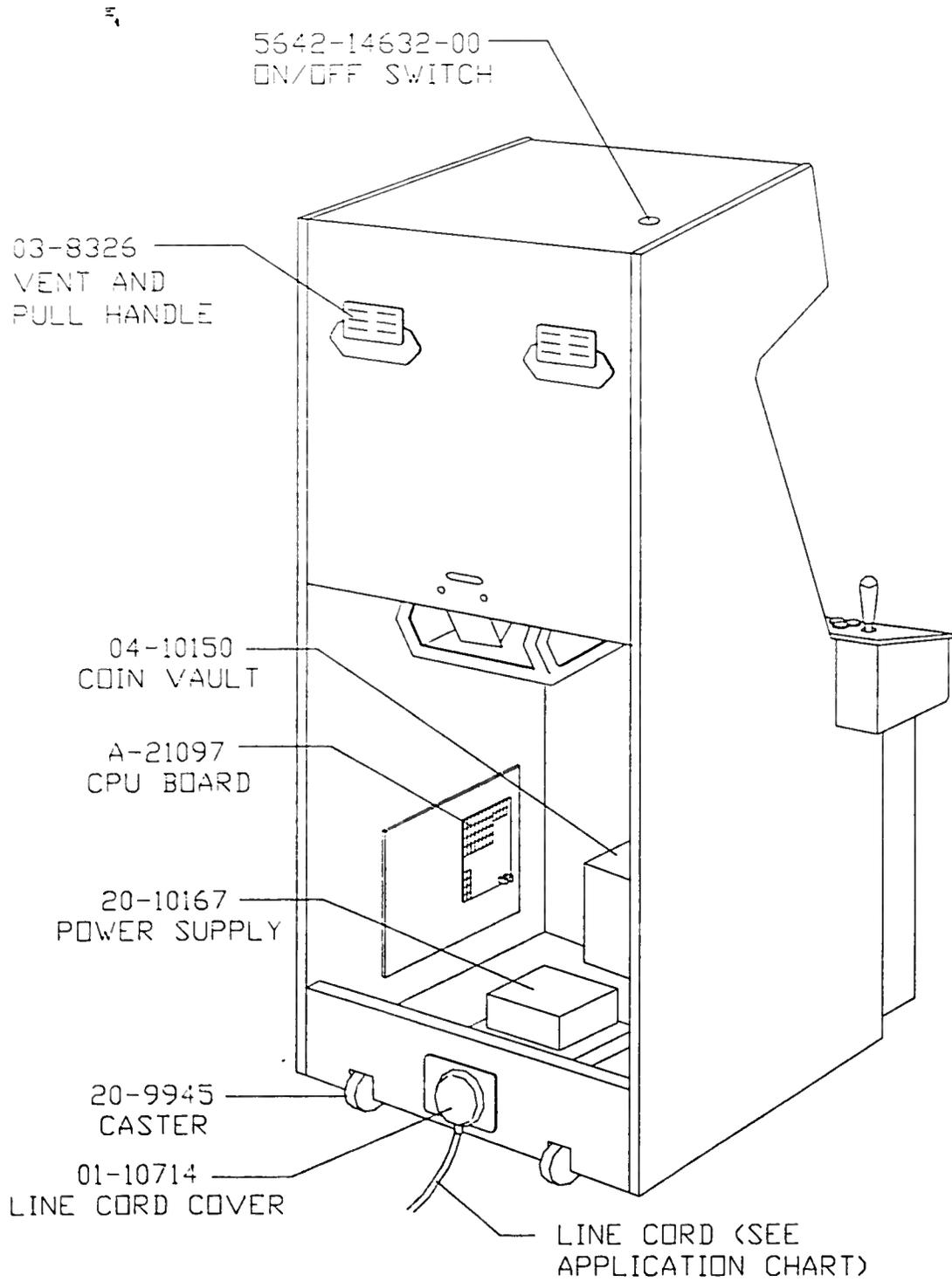
- For safety and reliability, substitute parts and modifications are not recommended.
- Substitute parts or modifications may void FCC type acceptance.

# CABINET FRONT VIEW

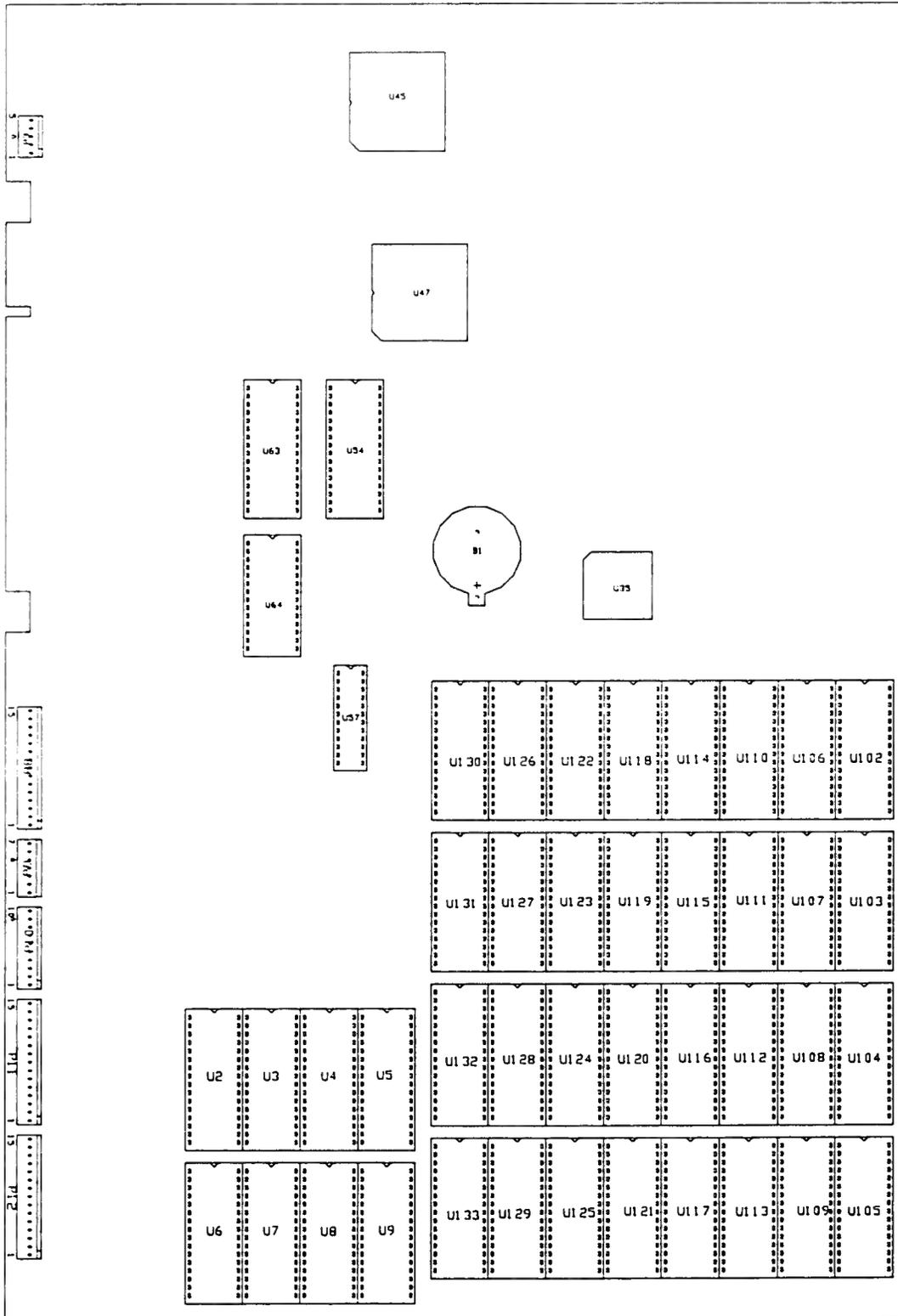
Complete Cabinet Assembly 40065-C



# CABINET REAR VIEW



# CPU BOARD ASSEMBLY A-21907



# CPU BOARD ASSEMBLY

## Field Replaceable Parts

DESIGNATION	PART NUMBER	FUNCTION	DESCRIPTION
B1	5880-11056-00	Memory Backup	3Volt Lithium Battery
U2	A-5343-40065-2	Sounds	EPROM Assembly
U3	A-5343-40065-3	Sounds	EPROM Assembly
U4	A-5343-40065-4	Sounds	EPROM Assembly
U5	A-5343-40065-5	Sounds	EPROM Assembly
U6	---	None	Not used at this time
U7	---	None	Not used at this time
U8	---	None	Not used at this time
U9	---	None	Not used at this time
U35	A-20257	Game Instructions	FPGA Assembly
U45	A-20258	Game Instructions	FPGA Assembly
U47	A-20259	Game Instructions	FPGA Assembly
U54	A-5343-40065-22	Game Instructions	EPROM Assembly
U57	A-20255	Sound Instructions	PLD Assembly
U63	A-5343-40065-23	Game Instructions	EPROM Assembly
U64	---	None	Not used at this time
U102	---	None	Not used at this time
U103	---	None	Not used at this time
U104	---	None	Not used at this time
U105	---	None	Not used at this time
U106	---	None	Not used at this time
U107	---	None	Not used at this time
U108	---	None	Not used at this time
U109	---	None	Not used at this time
U110	A-5343-40065-27	Images	EPROM Assembly
U111	A-5343-40065-26	Images	EPROM Assembly
U112	A-5343-40065-25	Images	EPROM Assembly
U113	A-5343-40065-24	Images	EPROM Assembly
U114	---	None	Not used at this time
U115	---	None	Not used at this time
U116	---	None	Not used at this time
U117	---	None	Not used at this time
U118	A-5343-40065-31	Images	EPROM Assembly
U119	A-5343-40065-30	Images	EPROM Assembly
U120	A-5343-40065-29	Images	EPROM Assembly
U121	A-5343-40065-28	Images	EPROM Assembly
U122	A-5343-40065-10	Images	EPROM Assembly
U123	A-5343-40065-11	Images	EPROM Assembly
U124	A-5343-40065-12	Images	EPROM Assembly
U125	A-5343-40065-13	Images	EPROM Assembly
U126	A-5343-40065-14	Images	EPROM Assembly
U127	A-5343-40065-15	Images	EPROM Assembly
U128	A-5343-40065-16	Images	EPROM Assembly
U129	A-5343-40065-17	Images	EPROM Assembly
U130	A-5343-40065-18	Images	EPROM Assembly
U131	A-5343-40065-19	Images	EPROM Assembly
U132	A-5343-40065-20	Images	EPROM Assembly
U133	A-5343-40065-21	Images	EPROM Assembly

## ***Other Parts Necessary***

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### Power and Protection

A.C. Distribution Assembly	A-20278
A.C. Power Chassis	04-10103.1
A.C. Line Filter, 6A, 250V	5102-14240-00
D.C. Switcher Power Supply	20-10167
Fuse Holder Panel	5733-12869-00
Fuse, 3A, 250V, SB	5731-10356-00

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### Cables

Dixie-Mars Adapter Cable	H-17019
USA DBV Acceptor Cable	H-20398
Main Harness (JAMMA) Cable	H-20282.1
AC Distribution Cable	H-20279
Line Voltage Cable Assembly	A-20331
Speaker Assembly Cable	H-19599
Fluorescent Lamp Cable	H-20330
Control Panel Cable	H-21665
IDC A.C. Cable	H-20353

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### Documents

Product Registration Card	16-9478.2
DBV Installation Instructions	16-9637
Game Manual	16-40065-101
Product Safety Manual	16-10341

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### Tools

T-20 Torx key	20-9620
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**LINE CORD APPLICATION CHART**

Part Number Country	Part Number							
	5850-13271-00	5850-13272-00	5850-13273-00	5850-13275-00	5850-13276-00	5850-13277-00	5850-13278-00	
USA	■							
England			■					
Italy				■				
Japan							■	
New Zealand						■		
Germany		■						
Spain		■						
Denmark		■						
Finland		■						
Holland		■						
Norway		■						
Switzerland					■			
Hungary		■						
Canada	■							
Austria		■						
France		■						
Australia						■		
Belgium		■						

**COIN DOOR APPLICATION CHART**

Part Number Country	Part Number 09-50000-																
	02	03	04	06	07	09	11	13	14	15	17	18	20	22	23	24	33
USA																	■
England																	
Italy									■								
Japan										■							
New Zealand											■						
Germany	■																
Spain													■				
Denmark						■											
Finland							■										
Holland								■									
Norway												■					
Switzerland														■			
Hungary															■		
Canada																■	
Austria		■															
France			■														
Australia				■													
Belgium					■												

## NOTES

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# RAMPAGE WORLD TOUR <sup>TM</sup>

SECTION  
THREE

## WIRING

**Warning**

Failure to reconnect all ground wires or replace metal shields and covers with each mounting screw installed and securely tightened may result in radio frequency interference.

## JAMMA Chart

FUNCTION	WIRE COLOR	PIN	PIN	WIRE COLOR	FUNCTION
Ground	Black	A	1	Black	Ground
Ground	Black	B	2	Black	Ground
+5VDC	Red	C	3	Red	+5VDC
+5VDC	Red	D	4	Red	+5VDC
-5VDC	Yellow	E	5	Yellow	-5VDC
+12VDC	Orange	F	6	Orange	+12VDC
Key	N/C	H	7	N/C	Key
Coin Counter 2	Brown-Red	J	8	Brown	Coin Counter 1
Not Used	N/C	K	9	N/C	Not Used
Speaker -, Left	Brown-Gray	L	10	Red-Gray	Speaker +, Left
Not Used	N/C	M	11	N/C	Not Used
Video Green	Green	N	12	Red	Video Red
Video Sync	White	P	13	Brown	Video Blue
Service Credits	White-Gray	R	14	Shield	Video Ground
Slam Tilt	Black-Green	S	15	Black-Blue	Test
Coin 2	Black-Red	T	16	Black-Brown	Coin 1
2 Start	Violet-White	U	17	White	1 Start
2 Up	Violet-Black	V	18	White-Black	1 Up
2 Down	Violet-Brown	W	19	White-Brown	1 Down
2 Left	Violet-Red	X	20	White-Red	1 Left
2 Right	Violet-Orange	Y	21	White-Orange	1 Right
2 Jump	Violet-Yellow	Z	22	White-Yellow	1 Jump
2 Punch	Violet-Green	a	23	White-Green	1 Punch
2 Kick	Violet-Blue	b	24	White-Blue	1 Kick
Not Used	Violet	c	25	White-Violet	Not Used
Not Used	N/C	d	26	N/C	Not Used
Not Used	N/C	e	27	N/C	Not Used
Ground	Black	f	28	Black	Ground
<b>SOLDER SIDE</b>			<b>COMPONENT SIDE</b>		

### Control Panel wires that are not part of the Main JAMMA Harness.

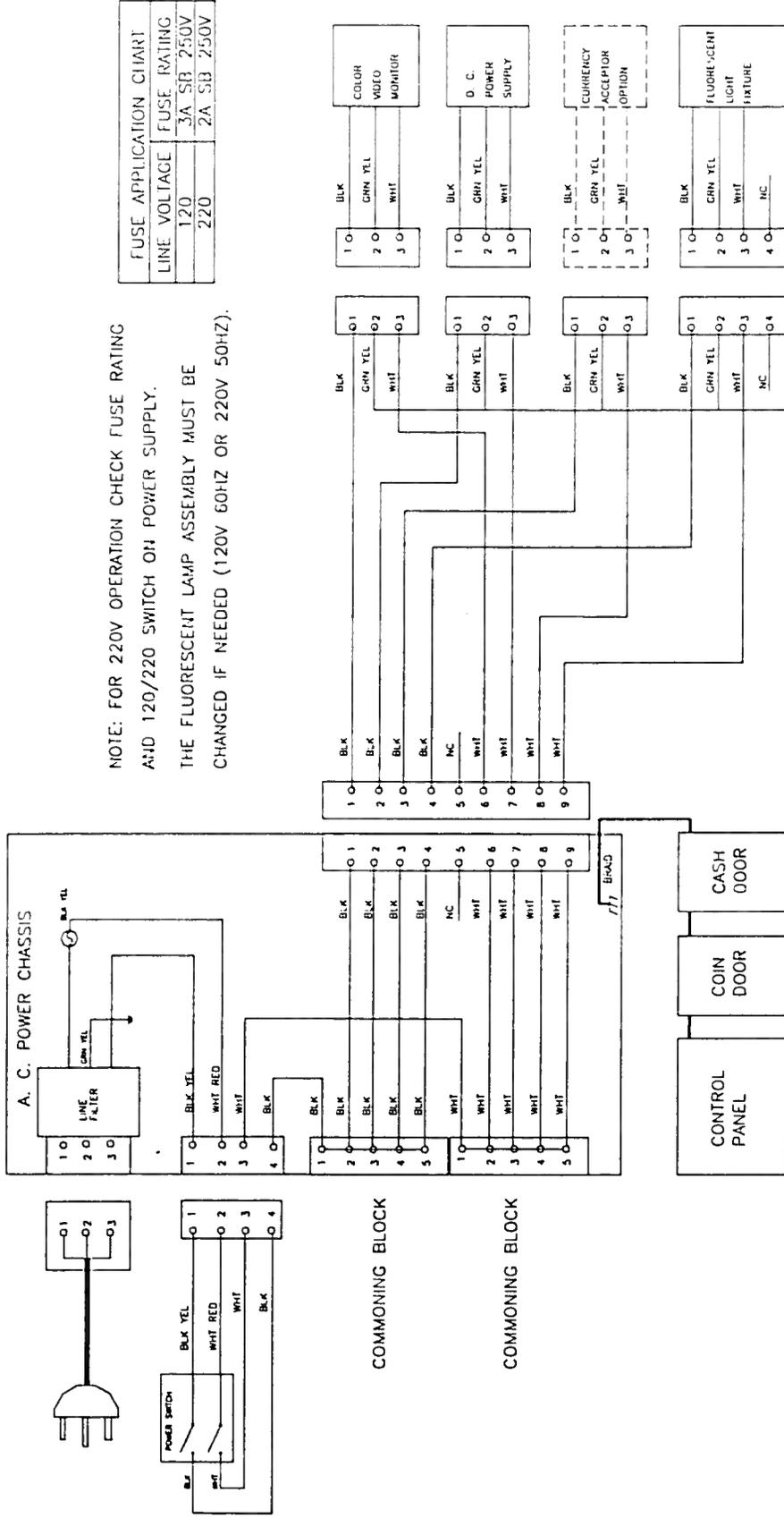
Not Used	Grey-White	6	6	Blue-White	3 Start
Not Used	Grey-Black	7	7	Blue-Black	3 Up
Not Used	Grey-Brown	8	8	Blue-Brown	3 Down
Not Used	Grey-Red	9	9	Blue-Red	3 Left
Not Used	Grey-Orange	10	10	Blue-Orange	3 Right
Not Used	Grey-Yellow	11	11	Blue-Yellow	3 Jump
Not Used	Grey-Green	12	12	Blue-Green	3 Punch
Not Used	Grey-Blue	13	13	Blue	3 Kick
Not Used	Grey-Violet	14	14	Blue-Violet	Not Used

### D.C. Power Source Voltage Limits

FUNCTION	RANGE LIMITS	ID	ID	RANGE LIMITS	FUNCTION
Digital Circuits	+4.90V to +5.10V	+5V	-5V	-4.75V to -5.25V	Audio
Audio	+11.5V to +12.5V	+12V	NOTE: +5V is adjustable at the Power Supply		

# POWER WIRING DIAGRAM

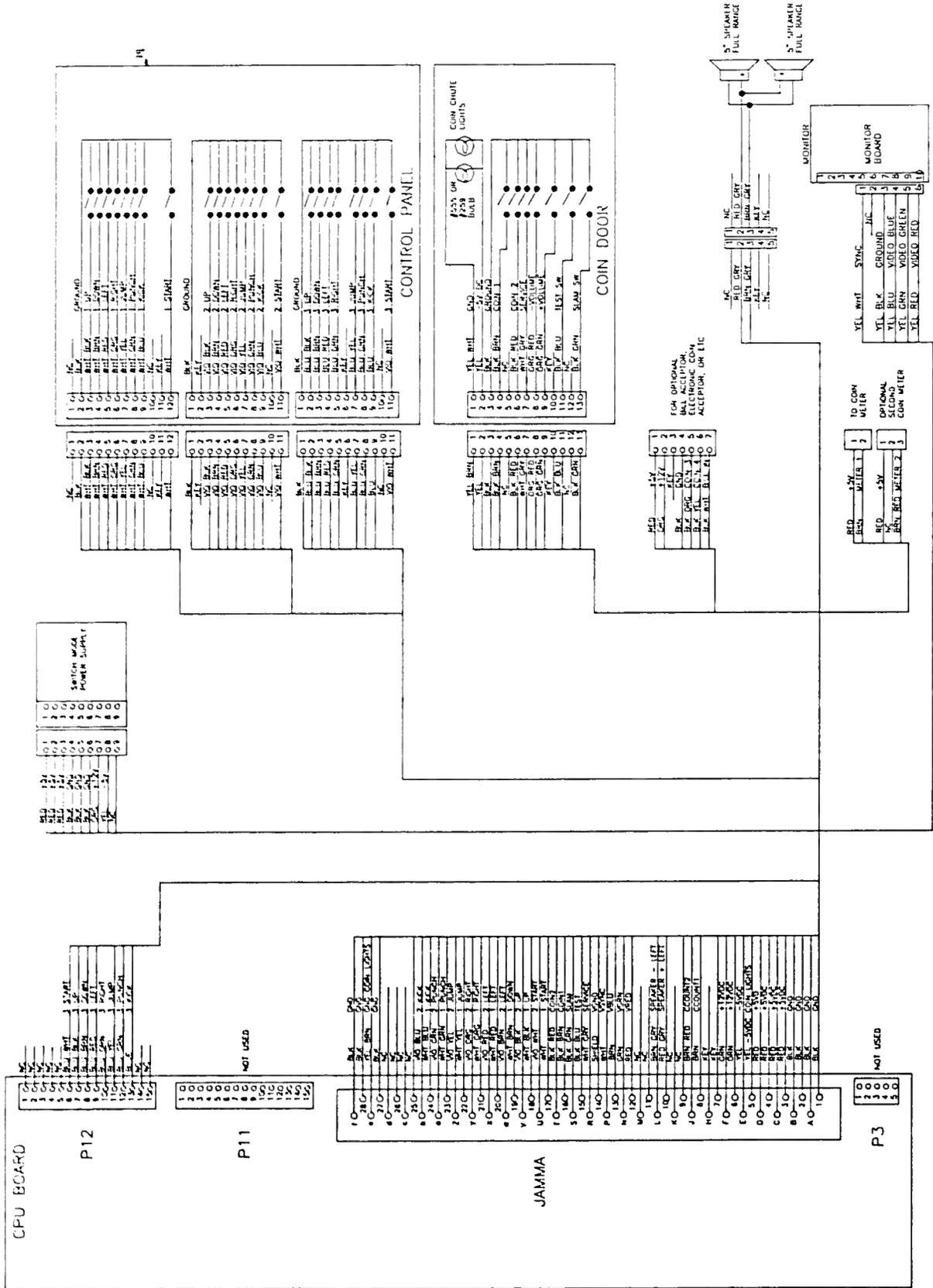
IN



NOTE: FOR 220V OPERATION CHECK FUSE RATING AND 120V/220 SWITCH ON POWER SUPPLY. THE FLUORESCENT LAMP ASSEMBLY MUST BE CHANGED IF NEEDED (120V 60HZ OR 220V 50HZ).

FUSE APPLICATION CHART	FUSE RATING
LINE VOLTAGE	3A SB 250V
220	2A SB 250V

# CABINET WIRING DIAGRAM



# RAMPAGE WORLD TOUR

TM

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## SECTION FOUR

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# TROUBLESHOOTING

This game uses complex electronic components that are very SENSITIVE to static electricity. The following precautions must be observed and followed prior to handling any of the game electronics.

1. Ensure that the A.C. power to the game is turned OFF prior to servicing the electronics.
2. Discharge any static electricity build up in your body by touching the safety ground stud of the power supply chassis while the line cord is connected to a properly grounded outlet. This is to be done BEFORE touching or handling the electronic assemblies.
3. Store the electronic assemblies in an anti-static area. Anti-static bags are to be used to store or transport the game CPU Board Assembly.
4. DO NOT remove or connect any electronic assemblies when the cabinet power is ON. Doing so will damage the electronic assemblies and void the warranty.
5. Always replace ground wires, shields, safety covers, etc. when maintenance or service is completed. Ensure that all ground and mounting screws are installed and tightened firmly.

## GAME DOES NOT START

### 1. Game appears completely non-functional; no audio, no illumination, no video display.

- A: Check that the Power Switch has been turned ON (top left rear corner of the game cabinet).
- B: Turn OFF the game power. Unplug the A.C. line cord. Unlock and remove the cabinet rear door. The Power Supply Line Voltage Switch must be set to agree with the local A.C. line voltage.
- C: Remove the Line Cord Cover Plate. Test the line cord, power plug and I.E.C. connector for breaks or damage. Verify the continuity of each wire in the cord. Fully seat the I.E.C. connector into the mating receptacle of the cabinet. Replace the cover plate and all four screws.
- D: Ensure that cabinet wiring harness connectors are fully seated in the corresponding A.C. Power Chassis Assembly connectors (refer to Power Wiring Diagram, Section Three).
- E: Examine the A.C. Line Fuse on the A.C. Power Chassis. If the fuse is faulty, replace it with an identical fuse from the spare parts bag. Replace the spare fuse when repairs are complete.
- F: Fully seat the A.C. plug in the outlet. Verify that A.C. line voltage is present. Turn the game power ON. Check the D.C. wiring harness and connectors if the breaker opens the circuit again.

### 2: Video game appears non-functional, but currency acceptor price indicator is illuminated.

- A: Unlock and open the coin door. Inspect the CPU Board Assembly under low light level conditions. A glow will be seen from the Light Emitting Diodes if there is voltage in the processor circuits. This does not mean that voltages or signals are as they should be, but it does indicate that the CPU Board is receiving some D.C. power from the Power Supply.
- B: Turn OFF the game power. Unlock, open and remove the rear door. Inspect the CPU Board Assembly. Ensure that the JAMMA Wire Harness connector is attached and fully seated onto the mating board connector. Check the other wiring harness connectors in the same way.

**CAUTION: DO NOT REMOVE OR INSTALL ANY CONNECTOR WHEN POWER IS TURNED ON. DOING SO WILL DAMAGE THE GAME CPU BOARD ASSEMBLY AND VOID THE WARRANTY.**

- C: Verify that the game CPU DIP Switches are set as intended. Refer to the Switch Configuration Chart (Section One) for variables and default settings.
- D: Turn ON the game power. Using the 20 Volt D.C. setting on a digital voltmeter, measure D.C. voltages present at the Power connector pins. Adjust the +5V source if it is necessary. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information and voltage limits.
- E: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- F: Verify that the game runs and completes the power-up self-test sequence without any errors. Note errors and/or failures found during these tests.
- G: Enter the game Menu System by pressing and holding the BEGIN TEST switch inside the coin door. From the SELECT TEST menu, choose the MONITOR TESTS (refer to Section One for additional details). Use this set of tests to check the operation of each screen used in the game.

## **GAME CAN NOT BE PLAYED**

### **1. Game will not accept currency or tokens and cannot be started. Audio and video are present.**

- A: Unlock and open the cash door. Empty the cash box. Inspect the revenue for any counterfeit currency. Check the vault and remove any items that block the path from the mechanism.
- B: Unlock and open the coin door. Check each Acceptor by hand to ensure proper mounting. Remove the mechanism and clear the currency path. Reinstall the mechanism and latch it.
- C: Verify that the mechanism is level when the doors are closed. Repair or replace the coin door if it is bent or damaged. Adjust the cabinet leg levelers if necessary to keep mechanisms vertical.

### **2. Game accepts currency or tokens, but does not start. Audio and video are present.**

- A: Unlock and open the coin door. Check each Acceptor by hand to ensure proper mounting. Verify that each of the release latches is in the closed and locked position. Test known good and bad coins to see if the mechanism accepts and rejects the currency correctly.
- B: Ensure that no loose parts or wires are caught in the hinges, latches, or switch contacts.
- C: Inspect to see if the external Acceptor indicators (Pricing, Flashing Arrows, etc.) are illuminated. Check connectors and cables for wiring continuity from CPU Board connectors to the Acceptors.
- D: Enter the game Menu System by pressing and holding the BEGIN TEST switch inside the coin door. From the SELECT TEST menu, choose the CONTROLS TEST (refer to Section One for additional details). Use these tests to confirm the operation of each switch used in the game.
- E: Check for continuity in each of the suspect switch connections (Common to Normally Open or Common to Normally Closed). Replace faulty switches (bent levers, broken actuators, etc.).
- F: Verify that each Acceptor is operating properly by placing it in a known good unit.

### **3. Player controls are intermittent or completely non-functional. Game starts normally.**

- A: Unlock and open the coin door. Enter the game Menu System by pressing and holding the BEGIN TEST switch inside the coin door. From the SELECT TEST menu, choose the CONTROLS TEST (refer to Section One for additional details). Use these tests to confirm the operation of each switch used in the game.
- B: Reach through the coin door and unlatch the control panel. Grip the joysticks and carefully tilt the panel back on its hinge. Ensure that no loose parts or wires are caught in the hinges, latches, or switch contacts. Verify that the harness connectors are attached and fully seated.
- C: Check that the cabinet wiring is correct for this game. Ensure that the controls are properly connected to the control input wires from P11, P12, and the JAMMA connector. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information.
- D: Verify continuity in each of the switch connections (Common to Normally Open or Common to Normally Closed). Ensure that the control is operating properly by placing in a known good unit.

## AUDIO PROBLEMS

### 1: Audio is non-functional, but video is present and game appears to operate normally.

- A: Unlock and open the coin door. Enter the game Menu System by pressing and holding the BEGIN TEST switch inside the coin door. From the SELECT TEST menu, choose ADJUST VOLUME (refer to Section One for additional details). Verify that the attract and game volume levels have not been set at Zero. Change the levels if necessary to make the game audible.
- B: Follow the on-screen instructions to return to the first menu. From the SELECT TEST menu, choose SOUND TESTS. Use these tests to confirm the operation of each speaker in the cabinet.
- C: Turn OFF the game power. Open the marquee and remove the glass. Inspect the speakers and harness. Ensure that no loose parts or wires are caught in speaker cones, terminals, mounting screws, or stuck to the magnets.
- D: Verify correct cabinet wiring for this game. Ensure that the speakers are properly connected to the audio output wires from the JAMMA connector. Verify speaker continuity. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information.
- E: Turn ON the game power. Using the 20 Volt D.C. setting on a digital voltmeter, measure D.C. voltages present at the Power connector pins. Verify the +5V, -5V and +12V sources. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information and voltage limits.
- F: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- G: Verify proper operation of game CPU Board Assembly by placing it in a known good game.

### 2: The audio is distorted, muffled or missing frequencies. A constant low hum may be present.

- A: Unlock and open the coin door. Enter the game Menu System by pressing and holding the BEGIN TEST switch inside the coin door. From the SELECT TEST menu, choose SOUND TESTS. These tests will verify some of the functions of the audio circuits in this game.
- B: Turn OFF the game power. Open the marquee and check the speakers. This game uses coaxial speakers, not discrete woofer and tweeter units. Ensure that each speaker is FULL RANGE (100 to 10,000 Hz response) and rated for at least 25 WATTS.
- C: Check that the speaker wiring is not reversed at one of the speakers. Weak low frequencies and a thin or hollow sound quality is a symptom of incorrectly phased speakers. This condition will not be detected by the SOUND TESTS, but it will be audible during normal game operation.
- D: Check that the cabinet wiring is correct for this game. Verify that the cabinet wiring provides separate wires (not a common return) for each speaker. Ensure that all cabinet ground wires are connected. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information.
- E: Using the 2 Volt A.C. setting on a digital voltmeter, measure voltages at the speaker terminals. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- F: Verify that the speaker is operating properly by placing in a known good unit.

## VIDEO PROBLEMS

### 1. Monitor appears non-functional, but audio is present and controls operate as expected.

- A: Unlock and open the rear door. Verify that A.C. Power is connected to the Video Monitor. Inspect the neck of the CRT under low light level conditions. A glow will be seen near the CRT base if there is voltage in the filament circuits. This does not mean that other voltages or signals are as they should be, but it does indicate that some of the monitor circuits are receiving power.
- B: Turn OFF the game power. Verify that the Video Signal and the Remote Adjustment Board connectors are fully seated on the Video Monitor Board Assembly. Check the other monitor connectors in the same way.
- C: Examine the A.C. line fuse on the Video Monitor Board Assembly. If the fuse is faulty, replace it with an identical fuse of the proper voltage and current rating.
- D: Ensure that no loose parts or wires are caught on the chassis or the mounting brackets.
- E: Check that the brightness (intensity) and contrast have not been set to their minimum levels.
- F: Verify that the Video Monitor is operating correctly by placing it in a known good unit.

### 2: The power-up self-test will run, but the game does not appear. No audio is present.

- A: Note and record any error messages that occur during self-test. Open the coin door. Press and hold the BEGIN TEST switch to enter the menu system. From the SELECT TESTS menu, choose DISK TESTS. These tests will verify some of the Hard Disk Drive functions in this game.
- B: Turn OFF the game power. Unlock and remove the rear door. Inspect the CPU Board Assembly. Ensure that the Hard Disk DRIVE Assembly ribbon cable connector is fully seated into the mating shrouded connector on the CPU Board. Verify that all hard drive mounting screws are installed.

**CAUTION: DO NOT REMOVE OR INSTALL ANY CONNECTOR WHEN POWER IS TURNED ON. THIS WILL DAMAGE THE CPU BOARD OR HARD DISK DRIVE AND VOID THE WARRANTY.**

- C: Check that the Hard Disk Drive Assembly is the correct part for this game. Each Hard Disk Drive is labeled with the assembly number and the software version. Refer to Parts (Section Two).
- D: Verify that the ROM instruction set is correct for this game. There is more than one ROM in a game set. Each ROM circuit is labeled with the assembly number and the software version.
- E: Verify that the CPU Board Assembly is correct for this game. Each CPU Board is marked with the manufacturer name, assembly number and the hardware version.
- F: Turn ON the game power. Using the 20 Volt D.C. setting on a digital voltmeter, measure D.C. voltages present at the Power connector pins. Verify the +5V source if it is adjustable. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information and voltage limits.
- G: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading indicates that the supply voltages are unstable and may contain ripple or noise.
- H: Compare CPU Board Light Emitting Diode states with the CPU Indicator Chart (Section Three).

**3. Monitor will not lock onto the signal and provide a stable picture, colors are missing, etc.**

A: Check connectors and cables for wiring continuity from the CPU Board to the Video Monitor.

B: Ensure that the Video Monitor Assembly is correct for this game. Use of video monitors with different resolution will result in what appears to be horizontal tearing or complete loss of sync.

C: Verify that the Video Monitor is operating correctly by placing it in a known good unit.

**4: Game operates normally, but video picture wavers or rolls, has dark bars, uneven colors, etc.**

A: Check connectors and cables for wiring continuity from the CPU Board to the Video Monitor.

B: Ensure that all the cabinet ground wires are connected, especially at the Video Monitor Chassis.

C: Move the cabinet farther away from machines, appliances, other games, etc. Very strong electrical or magnetic fields are emitted from some equipment when it is operating normally.

D: Verify that the Video Monitor is operating correctly by placing it in a known good unit.

**MISCELLANEOUS**

**1: Marquee lamp is intermittant or non-functional. Game starts and plays normally.**

A: Open the marquee and remove the glass. Remove the plastic lamp locks and the fluorescent tube from the holders. Install a new lamp if cracks or darkened ends are found. Clean the tube.

B: Verify that the lamp and starter pins are making good connection with their socket contacts.

C: Measure the Fluorescent Lamp Assembly A.C. voltages (Power Wiring Diagram, Section Three). Check wiring and connector continuity from the A.C. Power Chassis to the Lamp Assembly.

D: Ensure that the Fluorescent Lamp Ballast is rated for the local A.C. line voltage and frequency.

E: Check for continuity of both fluorescent lamp filaments, the starter, and the ballast. One at a time, verify that the lamp, starter, and ballast operate by placing each in a known good unit.

**2. Game operates normally, but fan is noticeably noisy.**

A: Check bottom and rear of cabinet for blocked air flow. Move game away from sources of heat.

B: Turn OFF the game power. Apply high power vacuum cleaner to vent holes to remove dust.

C: Unlock and remove the rear door. Ensure that the fan is connected to wiring harness.

**3. Error Messages appear on the screen. The game does not start and there is no audio.**

A: Check any assembly (RAM, ROM, Battery, etc.) identified in the Error Message.

B: Call your authorized distributor for help with unresolved screen messages.

## NOTES

Handwritten notes on a page with horizontal dotted lines. The text is mostly illegible due to blurring and low contrast. Some faint characters are visible at the beginning of the first line, possibly including a small symbol or the letter 'i'.

## 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.
- \* Use only authorized components and parts. Failure to do so will void warranty and may result in incorrect and/or unsafe operation. Substitute parts or modifications may void FCC type acceptance.
- \* This game is protected by federal copyright, trademark and patent laws. Unauthorized modifications may be illegal under federal law. This also applies to MIDWAY logos, designs, publications and assemblies. Moreover, facsimiles of MIDWAY equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles are manufactured with MIDWAY components.

### 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.

### WARNING

A very small portion of the population has a condition which may cause them to experience epileptic seizures or have momentary loss of consciousness when viewing certain kinds of flashing lights or patterns that are present in our daily environment. These persons may experience seizures while watching some kinds of television pictures or playing certain video games. People who have not had any previous seizures may nonetheless have an undetected epileptic condition.

If you or anyone in your family has experienced symptoms linked to an epileptic condition (e.g. seizures or loss of awareness), immediately consult your physician before using any video games.

We recommend that parents observe their children while they play video games. If you or your child experience the following symptoms: dizziness, altered vision, eye or muscle twitching, involuntary movements, loss of awareness, disorientation, or convulsions, DISCONTINUE USE IMMEDIATELY and consult your physician.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generated, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### NOTICE - FCC COMPLIANCE STICKER

- I. THIS KIT WAS TESTED IN A MIDWAY UNIVERSAL VIDEO CABINET (MODEL 40135) AND FOUND TO COMPLY WITH FCC PART 15 CLASS A REQUIREMENTS. IF INSTALLED IN A MIDWAY UNIVERSAL VIDEO CABINET (MODEL 40135), THE FCC COMPLIANCE STICKER SUPPLIED IS TO BE PLACED ON THE REAR OF THE CABINET.
- II. INSTALLATION OF THIS KIT INTO ANY OTHER PRODUCT DOES NOT GUARANTEE COMPLIANCE WITH FCC REQUIREMENTS. YOU ARE SOLELY RESPONSIBLE, AND MIDWAY WILL HAVE NO RESPONSIBILITY FOR FCC COMPLIANCE FOR INSTALLATIONS IN OTHER PRODUCTS. THE FCC COMPLIANCE STICKER SUPPLIED SHOULD NOT BE INSTALLED ON THE CONVERTED PRODUCT UNTIL FCC COMPLIANCE IS VERIFIED.

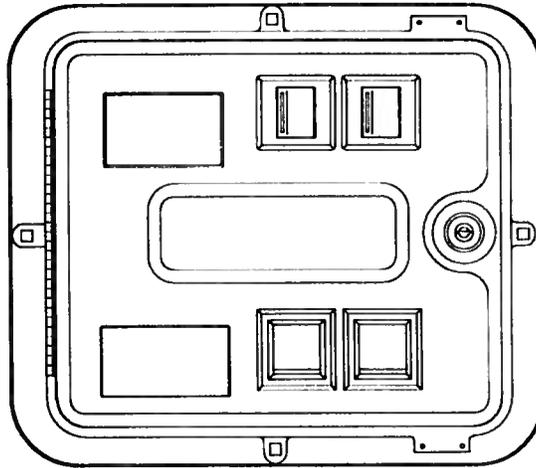
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MIDWAY MANUFACTURING COMPANY  
3401 N. CALIFORNIA AVE.  
CHICAGO, ILLINOIS 60618

# FIELD INSTALLATION INSTRUCTIONS



**09-50000 Universal Coin Door**

**SECTION 1**  
**SECTION 2**

Dollar Bill Validator  
Dixie-Narco DBV w/Up-Stacker

## INSTALLATION: MARS VFM2-L1

1. Before installing the MARS dollar bill validator, take off the cover by removing the two screws holding it.

2. Set the DIP switches as follows:

Switch #1 On	(Accepts \$1.00)
Switch #2 On	(Pulse Pattern 50ms ON/300ms Off)
Switch #3 Off	(Rejects \$5.00)
Switch #4 On	(Not Used)
Switch #5 Off	(Number of Pulses/Dollar-1)
Switch #6 Off	(Number of Pulses/Dollar-1)
Switch #7 Off	(Number of Pulses/Dollar-1)
Switch #8 Off	(Bill Orientation - Accepts in Both Directions)

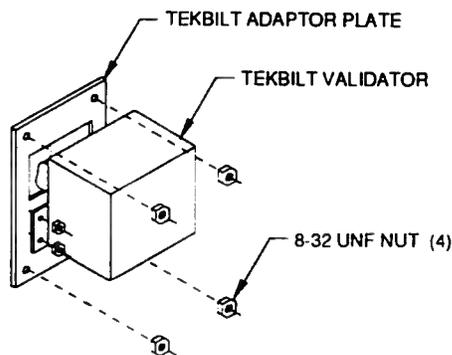
3. Replace the cover and secure it into place with the screws.
4. Locate the 18-pin connector/jumper (p/n 5797-13606-00), supplied in the game cashbox. Plug the connector into the bottom of the dollar bill validator through the opening in the cover.
5. Turn OFF power to the game and open the coin door.
6. **09-50000 Coin Door**
  - A. Remove four (4) nuts holding top plate to coin door. Save nuts.
  - B. Remove top plate.
  - C. Place finished dollar bill validator face down on coin door on the four (4) pem studs.
  - D. Place cable clamp on a lower pem stud. Orient cable clamp "down".
  - E. Replace and tighten the four (4) nuts removed previously.
7. Plug the male 9-pin connector from the dollar bill acceptor into the female 9-pin connector in the game. (Located next to the coin door).
8. Set DIP Switch 1, switch 6 to ON.
9. Close coin door. Turn power ON, insert several dollar bills. Be sure they are accepted and the proper credits are displayed.
10. Open the coin door and be sure that the validator aligns with the bill chute and that bills do not stay in the validator.

# INSTALLATION: TEKBILT NV110-GA1

1. Before installing the TEKBILT dollar bill validator set the DIP switches, located on the top of the validator, as follows:

<u>MODE</u>	<u>DIP SWITCH NUMBERS</u>			
	1	2	3	4
1 Credit per acceptance	Off	Off	Off	----
Slow Pulse 50msL/300msH	----	----	----	On

2. TEKBILT requires a separate adapter plate (this adapter is supplied with the unit). Mount the adapter plate to the dollar bill validator using 6-32 nuts (quantity:4).
3. Turn OFF power to the game and open the coin door.
4. **09-50000 Coin Door**
  - A. Remove four (4) nuts holding top plate to coin door. Save nuts.
  - B. Remove top plate.
  - C. Place finished dollar bill validator face down on coin door on the four (4) pem studs.
  - D. Place cable clamp on a lower pem stud. Orient cable clamp "down".
  - E. Replace and tighten the four (4) nuts removed previously.
5. Plug the male 9-pin connector from the dollar bill acceptor into the female 9-pin connector in the game. (Located next to the coin door).
6. Set DIP Switch 1, switch 6 to ON.
7. Close coin door. Insert several dollar bills. Be sure they are accepted and the proper credits are displayed. There should be one pulse-per-dollar on the center coin chute.  
**NOTE: If credits aren't registering correctly, swap the RED and WHITE wires on the validator side for correct crediting.**
8. Open the coin door and be sure that the validator aligns with the bill chute and that bills do not stay in the validator.



# INSTALLING DIXIE-NARCO UP-STACKER

09-50000

Your game has the capability to install a DBV with a vertical dollar bill stacker. The following information will instruct you as to which stacker can be used and how to install this item.

Installation must be done with the game On/Off Switch in the Off position. There should be no power in the game.

## I. Install only the following vendor and model numbers:

- A. Dixie-Narco USA-15 (12-pin connector)  
Model: 88X5003  
Software: 57X300-20
- B. Williams Part Number 09-47000  
Dixie-Narco (9-pin connector)  
Model: 88X5014 (DBA1US)  
Software: 57X300-20

## II. Dip Switch Settings:

Williams 09-47000  
Switch #1: Open  
Switch #2: Closed  
Switch #3: Open  
Switch #4: Open

Dixie-Narco USA-15  
Switch #1: Open  
Switch #2: Open  
Switch #3: Open  
Switch #4: Open

## III. Installation (To Coin Door):

- A. Remove four (4) nuts holding bottom plate to coin door. Save nuts.
- B. Remove bottom plate.
- C. Remove (2) nuts holding upper plate on. Save nuts.
- D. Remove one spacer, each from the two top pem studs.
- E. Attach these spacers to the bottom pem studs.
- F. Place item 3 face down on coin door on the four (4) pem studs.
- G. Place ground (green) wire, coming from the upstacker, on pem stud.
- H. Secure item 3 with the four (4) nuts (removed previously in step A) on pem studs.

## IV. Cable Connection:

- A. Dixie-Narco Stacker w/9-Pin Connector (Williams P/N 09-47000)
  - 1) Plug 9-pin connector from stacker into 9-pin female connector located inside cabinet.
- B. Dixie-Narco Stacker w/12-Pin Connector
  - 1) Take jumper cable H-17019 (9-pin to 12-pin) supplied with the game and mate the 9-pin connector with the 9-pin plug in the game, located by the coin door opening.
  - 2) Take the 12-pin from the jumper cable and mate with the 12-pin connector on the stacker cable.
  - 3) Dress the cable from the stacker away from the cash box area.

## **CONTROL PANEL/HOUSING ASSEMBLY INSTALLATION**

1. Be sure the game cabinet is unplugged and the coin door is open.
2. Remove all packaging from the control panel assembly.
3. Open the control panel by unhooking the two latches inside the housing. Pivot the control panel up onto it's hinges.
4. Place the control panel assembly on the cabinet so the bolt holes in the cabinet line up with the bolt holes in the assembly. Secure the assembly to the cabinet with four ¼-20 x 2" bolts and four large flat washers (located in spare parts bag).
5. Plug the control panel cable connectors into the appropriate cabinet cable connectors. Be sure to match up the wire colors when you plug the connectors into each other. (See the Cabinet Wiring Diagram in Section 3 of the game manual.)  
**DO NOT FORCE THE CABLE CONNECTORS.**
6. Attach ground strap from cabinet under wing nut.
7. Lower the control panel and reach through the coin door to close the latches on the left and right sides of the assembly.