

**MIDWAY**

**SEPTEMBER 1995**  
**16-40038-101**

# **OPEN ICE™**

## **DEDICATED GAME OPERATION MANUAL**

**Operation & Adjustments • Testing & Problem Diagnosis  
Parts Information • Wiring Diagrams**



ALL NHL and teams logos and other marks depicted are property of the NHL and may not be reproduced without the prior written consent of NHL Enterprises  
© 1995 NHL



NHLPA is a Trade-mark of the National Hockey League Players' Association and is used under license by Midway Manufacturing Company. Official Licensed Product of the National Hockey League Players' Association."

# **OPEN ICE™**

## **INSTRUCTIONS**

### **RED BUTTON**

**Shoot On Offense  
Block On Defense**

### **WHITE BUTTON**

**Turbo**

### **BLUE BUTTON**

**Pass On Offense  
Steal On Defense**

**WHITE and RED BUTTON = SLAPSHOT**

**WHITE and BLUE BUTTON = CHECK**

**Turbo Bars And Hot Meters Are Displayed At The Top Of The  
Screen.**

**When Playing With A Computer Controlled Teammate:  
Your Buttons Control When He Shoots Or Passes Back To  
You.**

TABLE OF CONTENTS

Section One - Operation and Troubleshooting

1-2 Safety Notices

1-3 Set-up Procedure

1-3 Inspection and Installation

1-3 Location Requirements

1-4 Cabinet Assembly Diagram

1-8 Servicing

1-8 Game Features

1-8 Dismantling

1-9 Player Controls

1-8 Control Panel Diagram

1-9 Game Operation

1-9 Control Switches

1-9

1-10

1-10

1-10

1-11

1-11

1-11

1-12 DIP Switch Table and Test

1-13 CPU and Sound Test

1-14 Monitor Params and Gun-in Test

1-15 Coin Bookkeeping

1-15 Game Audio

1-19 Pricing Options

1-20 Standard Pricing Table

1-21 Custom Pricing Table

1-22 Game Adjustments

1-24 Utilities

1-25 Hardware Info

1-26 Volume Adjust

1-27 Troubleshooting

# OPEN ICE™

Section Two - Parts Information

2-2 Cabinet - View 1

2-3 Cabinet - View 2

2-4 Cabinet Rear View

2-5 Cabinet Cut-Away View

2-6 Rear Door Parts & Coin Door Parts

2-6 Control Panel & Housing Parts

2-7 CPU Board

2-10 Power Supply

Information current at time of release.

Fill out and mail in game Registration card. Be sure to include the game serial number. For your records, write the game serial number in the manual.

MIDWAY Manufacturing Company reserves the rights to make modifications and improvements to its products. The specifications and parts identified in this manual are subject to change without notice.

## TABLE OF CONTENTS

### **Section One - Operation and Troubleshooting**

<b>Safety Notices</b> .....	1-2
<b>Set-up Procedure</b> .....	1-3
Inspection and Installation.....	1-3
Location Requirements.....	1-3
Cabinet Assembly Diagrams.....	1-4
<b>Servicing</b> .....	1-6
<b>Game Features</b> .....	1-8
Starting-up.....	1-8
Player Controls.....	1-8
Control Panel Diagram.....	1-8
<b>Game Operation</b> .....	1-9
Control Switches.....	1-9
Control Switch Location Diagram.....	1-9
<b>Menu System Operation</b> .....	1-10
Operation.....	1-10
Main Menu.....	1-10
Diagnostic Test.....	1-11
Switch Test.....	1-11
DIP Switch Table and Test.....	1-12
CPU and Sound Test.....	1-13
Monitor Patterns and Burn-in Test.....	1-14
Coin Bookkeeping.....	1-15
Game Audits.....	1-16
Pricing Options.....	1-19
Standard Pricing Table.....	1-20
Custom Pricing Table.....	1-21
Game Adjustments.....	1-22
Utilities.....	1-24
Hardware Info.....	1-25
Volume Adjust.....	1-26
<b>Troubleshooting</b> .....	1-27

### **Section Two - Parts Information**

Cabinet - View 1.....	2-2
Cabinet - View 2.....	2-3
Cabinet Rear View.....	2-4
Cabinet Cut-Away View.....	2-5
Rear Door Parts & Coin Door Parts.....	2-6
Control Panel & Housing Parts.....	2-7
CPU Board.....	2-8
Power Supply.....	2-10

### **Section Three - Cabinet Wiring**

JAMMA Chart.....	3-2
Interboard Wiring.....	3-3
Power Wiring and Transformer Diagram.....	3-4
Cabinet Wiring Diagram.....	3-5

## SAFETY NOTICES

The following safety instructions 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 before preparing your game for play.

# OPEN ICE™

**ISOLATION TRANSFORMER.** This video game system does not utilize an isolation transformer. The power transformer is an Auto Transformer, and as such, no isolation exists between the cabinet AC system and the external AC line.

**AC POWER CONNECTION.** Before connecting the game to the AC power source, verify the 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 properly grounded. MIDWAY games should only be plugged into a grounded 3-wire outlet.

**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.

To avoid electrical shock, replacement fuses must match the original fuses.

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

## SECTION ONE

## ATTENTION

**PROPERLY ATTACH ALL CONNECTORS.** Be 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.

## EPILEPSY WARNING

A very small portion of the population may experience epileptic seizures or have moments of 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.



## **SAFETY NOTICES**

The following safety instructions 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 before preparing your game for play.

---



### **CAUTION**

**ISOLATION TRANSFORMER.** This video game system does not utilize an isolation transformer. The power transformer is an "Auto Transformer" and as such, no isolation exists between the cabinet AC system and the external AC line.

**AC POWER CONNECTION.** Before connecting the game to the AC power source, verify the 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. MIDWAY games should only be plugged into a grounded 3-wire outlet.

**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.

**USE THE PROPER FUSES.** To avoid electrical shock, replacement fuses must match the original fuses 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.

---

### **ATTENTION**

**PROPERLY ATTACH ALL CONNECTORS.** *Be 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.*

### **EPILEPSY 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.

---

---

## SETUP PROCEDURE

### INSTALLATION & INSPECTION

<b>Game Location Requirements</b>	<u>Power</u> 100VAC @ 50Hz 3.0 Amps 120VAC @ 60Hz 3.0 Amps 230VAC @ 50Hz 2.0 Amps	<u>Temperature</u> 32°F to 100°F (0°C to 38°C)	<u>Humidity</u> Not to exceed 95% relative
<b>Cabinet Statistics</b>	<u>Shipping Dimensions</u> Width 27" - Depth 41" - Height 73"	<u>Shipping Weight</u> Approximately 420 Lbs	

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.
2. The keys for the coin door and rear door are attached to the key hook wire on the inside left of the cabinet. Unlock and open the coin and cash box doors. Remove spare parts stored in the cash box.
3. Remove the screws holding the rear door then unlock and remove the door. 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.* Watch for damaged connectors and avoid making reversed connections.
5. If a padlock is desired, turn the rear door hasp so that it protrudes from the hole in the back of the cabinet. Remove the two nuts inside the cabinet, at the top and middle of the rear door opening. Then slide the hasp off of the bolts. Turn the hasp, slide it back on the bolts and replace the nuts.
6. Next, locate the four leg levelers among the spare parts in the cash box. There are four threaded holes on the bottom of the cabinet; one in each corner. Place one leg leveler (with its hex nut) in each of the threaded holes. Lower each leg leveler until the cabinet is stable and level.

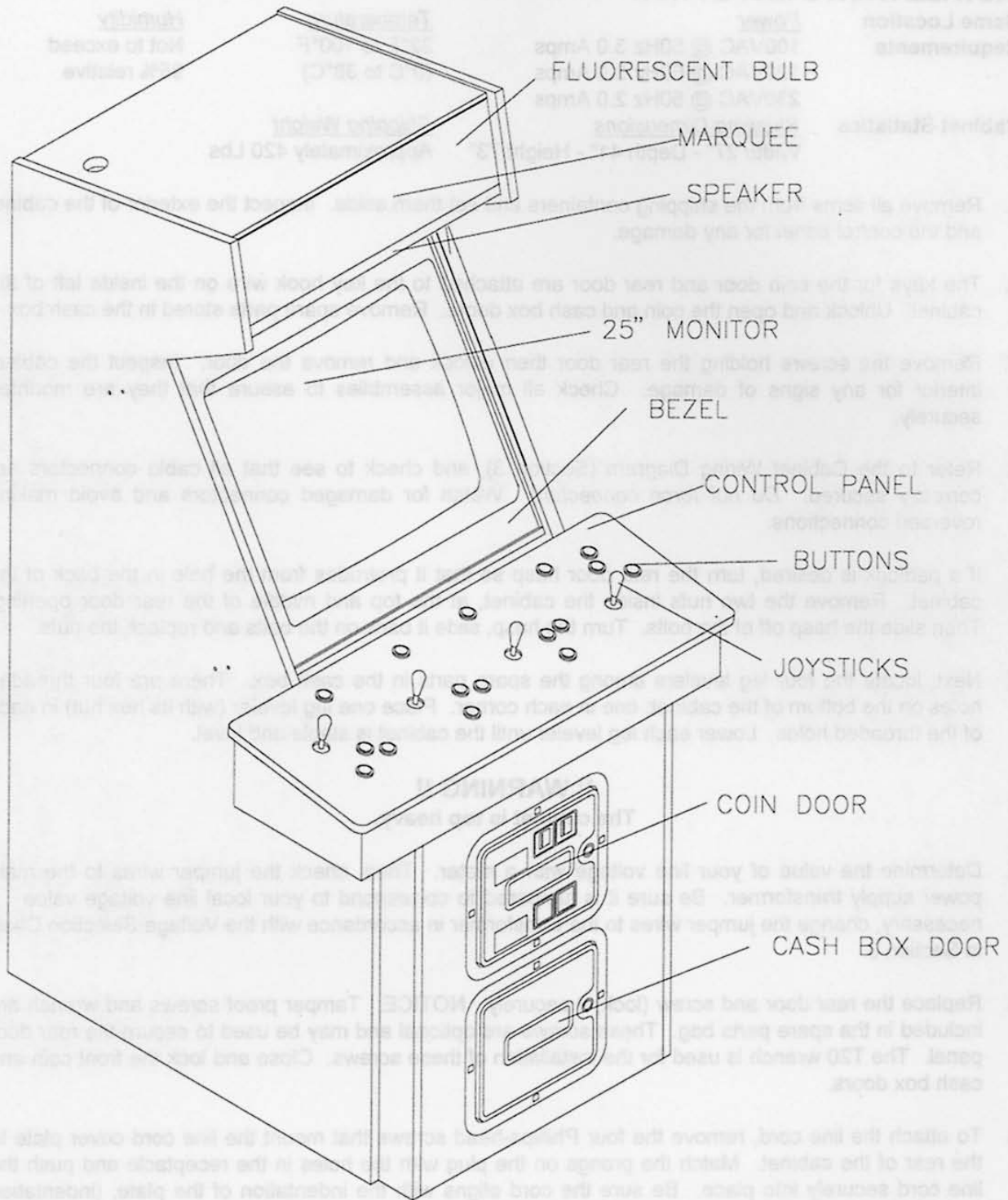
### **!! WARNING !!**

**The cabinet is top heavy.**

7. Determine the value of your line voltage with a meter. Then, check the jumper wires to the main power supply transformer. Be sure it is jumpered to correspond to your local line voltage value. If necessary, change the jumper wires to the transformer in accordance with the Voltage Selection Chart in Section 3.
8. Replace the rear door and screw (lock) it securely. NOTICE: Tamper proof screws and wrench are included in the spare parts bag. These screws are optional and may be used to secure the rear door panel. The T20 wrench is used for the installation of these screws. Close and lock the front coin and cash box doors.
9. To attach the line cord, remove the four Phillips-head screws that mount the line cord cover plate to the rear of the cabinet. Match the prongs on the plug with the holes in the receptacle and push the line cord securely into place. Be sure the cord aligns with the indentation of the plate, (indentation should point toward the bottom of the cabinet). Remount the line cord cover plate.
10. 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.

# CABINET ASSEMBLY

## Front View





# CABINET ASSEMBLY

## Rear View

SERVICING

◆ **Servicing the Control Panel**  
 Switch off power to the game and open the rear door. The control panel is held in place by two latches (located inside the cabinet) which require constant pressure on the strikes. To release the latches, reach through the rear door opening toward the right and left sides of the cabinet. Do not reach into the cabinet or you could damage the monitor control board. Lift the latch handle and without the rear door. Grip the joystick and carefully lift the control panel back on its hinges.

To return the control panel to its normal position, carefully lean it forward until it rests on the cabinet. To close the cabinet, the control panel must be pushed down into the cabinet. Always re-close the latches.

◆ **Removal of the Viewing Glass**  
 Switch off power to the game and open the rear door. Remove the five hex-head screws and the black metal strip at the bottom of the viewing glass. Carefully slide the glass from the side grooves and lift it clear of the cabinet.

◆ **Removal of the Monitor Bezel**  
 Switch off power to the game. Open the control panel and remove the viewing glass. Lift the bezel of the monitor.

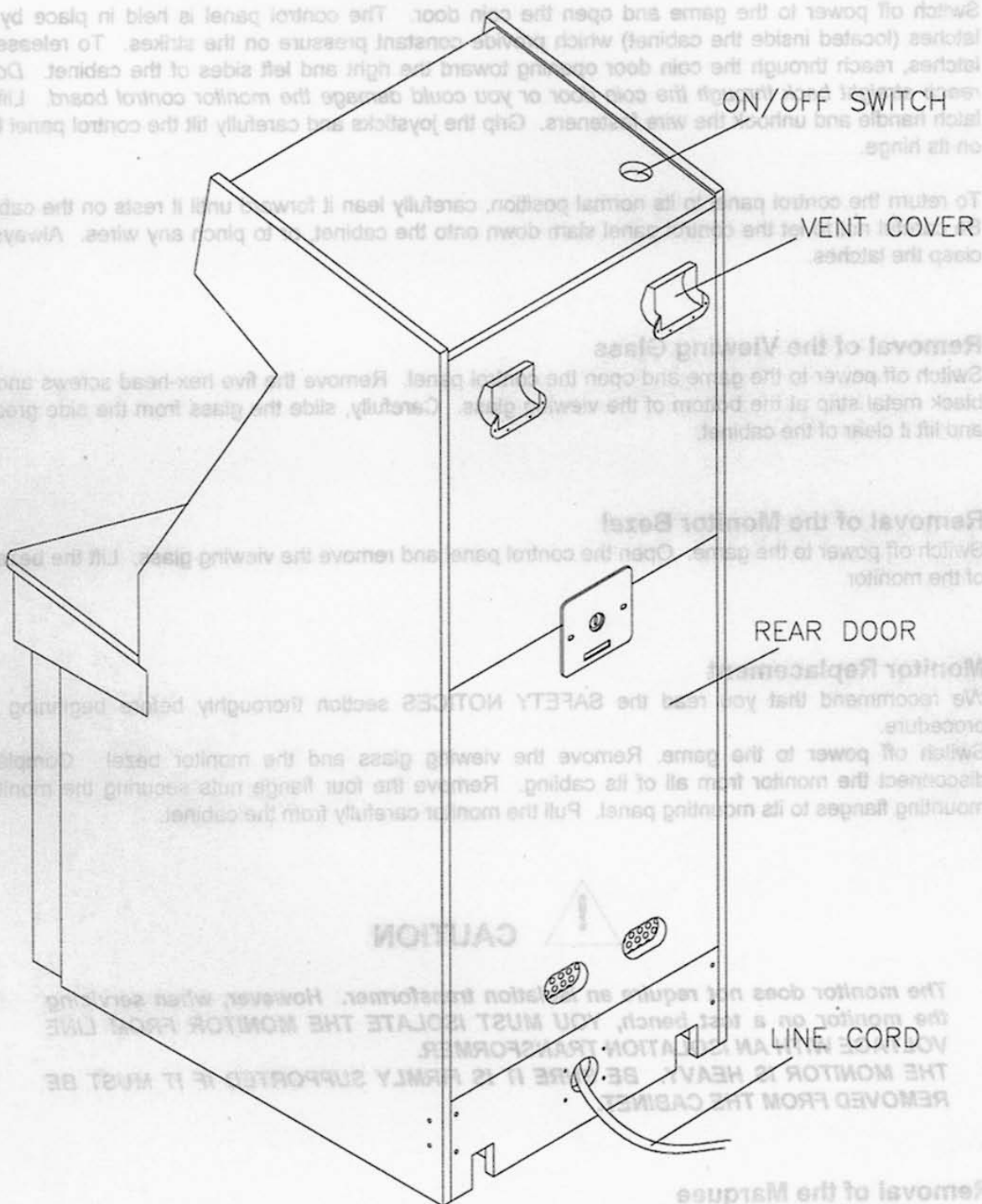
◆ **Monitor Replacement**  
 We recommend that you read the SAFETY NOTICES section thoroughly before beginning this procedure.

Switch off power to the game. Remove the viewing glass and the monitor bezel. Completely disconnect the monitor from all of its cabling. Remove the four hinge nuts securing the monitor's mounting flanges to its mounting panel. Pull the monitor carefully from the cabinet.

**CAUTION**

The monitor does not require an isolation transformer. However, when servicing the monitor on a test bench, YOU MUST ISOLATE THE MONITOR FROM LINE VOLTAGE WITH AN ISOLATION TRANSFORMER. THE MONITOR IS HEAVY. BE SURE IT IS FIRMLY SUPPORTED IF IT MUST BE REMOVED FROM THE CABINET.

◆ **Removal of the Marquee**  
 Switch off power to the game. Remove the hex-head screws from the black marquee retaining strip located on top of the header. Remove the strip and carefully lift the marquee and the marquee glass from the top of the header. Store the marquee carefully to prevent damage.



---

---

## SERVICING

### ◆ Servicing the Control Panel

Switch off power to the game and open the coin door. The control panel is held in place by two latches (located inside the cabinet) which provide constant pressure on the strikes. To release the latches, reach through the coin door opening toward the right and left sides of the cabinet. *Do not reach straight back through the coin door or you could damage the monitor control board.* Lift the 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, carefully lean it forward until it rests on the cabinet. Be careful not to let the control panel slam down onto the cabinet, or to pinch any wires. Always re-clasp the latches.

### ◆ Removal of the Viewing Glass

Switch off power to the game and open the control panel. Remove the five hex-head screws and the black metal strip at the bottom of the viewing glass. Carefully, slide the glass from the side grooves and lift it clear of the cabinet.

### ◆ Removal of the Monitor Bezel

Switch off power to the game. Open the control panel and remove the viewing glass. Lift the bezel off of the monitor.

### ◆ Monitor Replacement

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

Switch off power to the game. Remove the viewing glass and the monitor bezel. Completely disconnect the monitor from all of its cabling. Remove the four flange nuts securing the monitor's mounting flanges to its mounting panel. Pull the monitor carefully from the cabinet.



## CAUTION

*The monitor does not require an isolation transformer. However, when servicing the monitor on a test bench, YOU MUST ISOLATE THE MONITOR FROM LINE VOLTAGE WITH AN ISOLATION TRANSFORMER. THE MONITOR IS HEAVY. BE SURE IT IS FIRMLY SUPPORTED IF IT MUST BE REMOVED FROM THE CABINET.*

### ◆ Removal of the Marquee

Switch off power to the game. Remove the hex-head screws from the black marquee retaining strip located on top of the header. Remove the strip and carefully lift the marquee and the marquee glass from the top of the header. Store the marquee carefully to prevent damage.

### ◆ Removal of the Fluorescent Light Assembly

Switch off power to the game. Remove the marquee glass and the marquee. The fluorescent bulb is now accessible for replacement. Remove the plastic lamp locks. Grasp the bulb, give it a quarter turn, and remove it from its socket. Carefully, place a new bulb into the socket, and turn to reinstall.

To remove the entire light fixture, disconnect the fluorescent light assembly from its power cable. Remove the screws that hold the assembly to the cabinet then lift out the assembly.

### !! WARNING !!

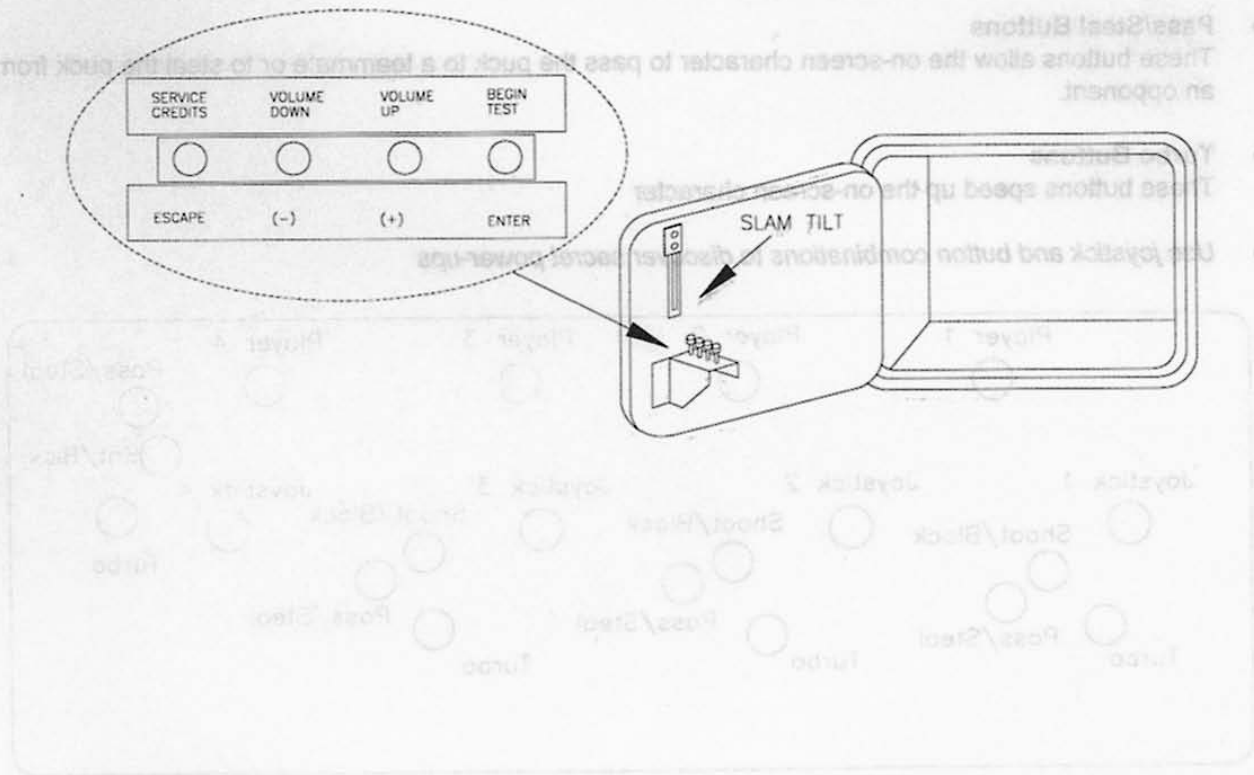
**If you drop a fluorescent tube and it breaks, it will implode! Use care in handling.**

### ◆ Removal of the Speakers

Switch off power to the game. Remove the marquee and the marquee glass. 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.

### ◆ Volume Control, Begin Test Switch, and Service Credit Switch

Open the coin door. The game's volume control and diagnostic push-button switches are located on a small bracket on the coin door. The volume is controlled by the two center buttons. Press the Volume Up or the Volume Down button until the desired sound level is reached. The Begin Test switch, on the right, activates the game's menu system. The Service Credit switch, on the left, allows credits to be allotted for service testing without affecting the game's bookkeeping total.



## GAME FEATURES

### STARTING UP

Switch on power to the game. A "rug" pattern appears on the screen. When the "rug" pattern ends, the screen shows *Checking Scratch RAMS*, then *Checking ROMS*. (Refer to page 2-9 for proper chip location.) The next screen shows the revision level, the CMOS test results, and the coin setting. The game goes into the Attract Mode.

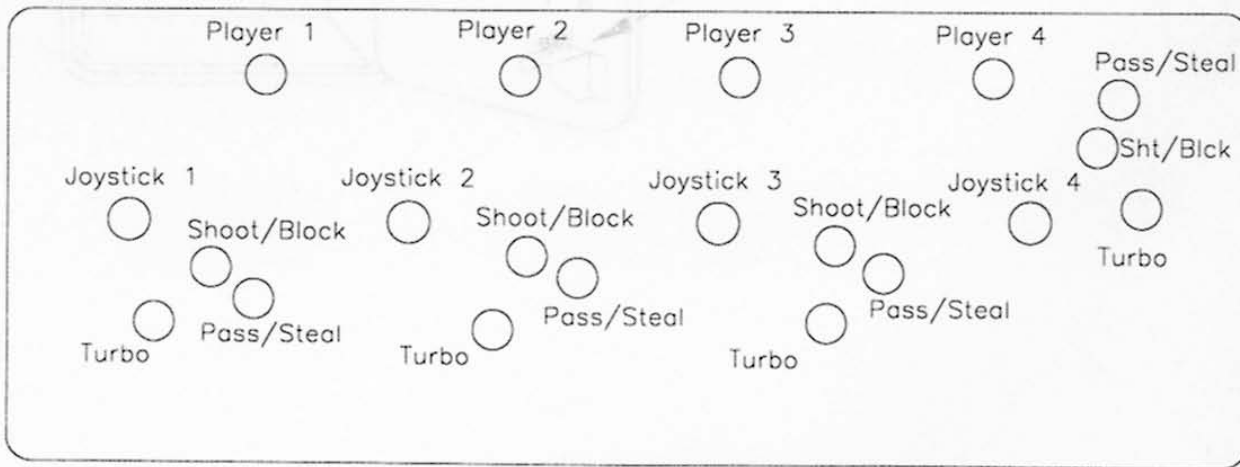
Insert the desired amount of coins, bills or tokens. Select which player receives the credit by pressing the appropriate Start button. Use the joysticks to select an on-screen character, and any control panel button to confirm your choice. Game play starts automatically once the on-screen characters are chosen.

### NOTE

*When an error is detected during the Start-up tests, game start-up does not progress, and an error message appears on the screen.*

### PLAYER CONTROLS

- **Start Button**  
Each player has a Start button. The Start buttons allow one to four players to begin or continue play.
- **Joysticks**  
Each player has a joystick which he/she uses to control an on-screen character. The player can make the on-screen character move up, down, left, or right.
- **Shoot/Block Buttons**  
These buttons allow the on-screen character to shoot the puck into an opponent's goal or to block an opponent from shooting a puck into the player's goal.
- **Pass/Steal Buttons**  
These buttons allow the on-screen character to pass the puck to a teammate or to steal the puck from an opponent.
- **Turbo Buttons**  
These buttons speed up the on-screen character
- *Use joystick and button combinations to discover secret power-ups*



CONTROL PANEL



## GAME OPERATION

The OPEN ICE™ game Control switches are located on a bracket, inside the coin door.

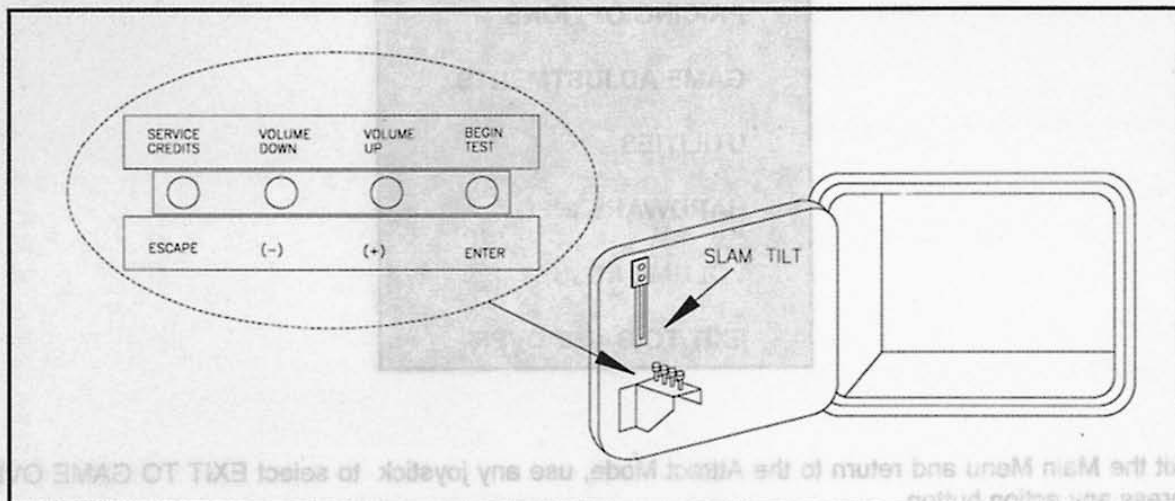
### CONTROL SWITCHES

- ◆ **Slam Tilt Switch**  
The **Slam Tilt** switch prevents pounding for free games.
- ◆ **Volume Down/Volume Up Buttons**  
The **Volume Down** and **Volume Up** push-button switches increase or decrease the volume level of the music and speech. The volume level can be adjusted during the Attract Mode or during menu system operation. For greater profits, set your game's volume level at a nice loud setting.
- ◆ **Begin Test Button**  
The **Begin Test** push-button switch enters the game's menu system. Press the Begin Test switch to access any of the menu system functions.
- ◆ **Service Credit Button**  
The **Service Credit** push-button switch is a special feature switch that allots credit without affecting the game's bookkeeping total.

These buttons can be used instead of the control panel buttons when operating the Menu System. The Up and Down buttons move the cursor, and the Enter and Escape buttons open and close the menus.

#### **NOTE**

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



**CONTROL SWITCH LOCATIONS**

---

## MENU SYSTEM OPERATION

### OPERATION

All game audits, adjustments and diagnostics are options of the Main Menu. Each option, in turn, has its own menu that lists several choices which you may act upon as desired.

Press the Begin Test switch on the coin door to open the Main Menu (shown below). Game adjustments, bookkeeping and diagnostics are all accessible from this menu.

Use any joystick to move the cursor up and down the menu screen. Notice that the options are highlighted in sequence. Press any action button (Shoot, Pass, or Turbo), on the control panel to open a highlighted option.

#### NOTE

*Only highlighted options can be opened.*

**OPEN ICE™ - MAIN MENU**  
**Midway Manufacturing**

**SELECT WITH ANY JOYSTICK**  
**ACTIVATE WITH ANY ACTION BUTTON**

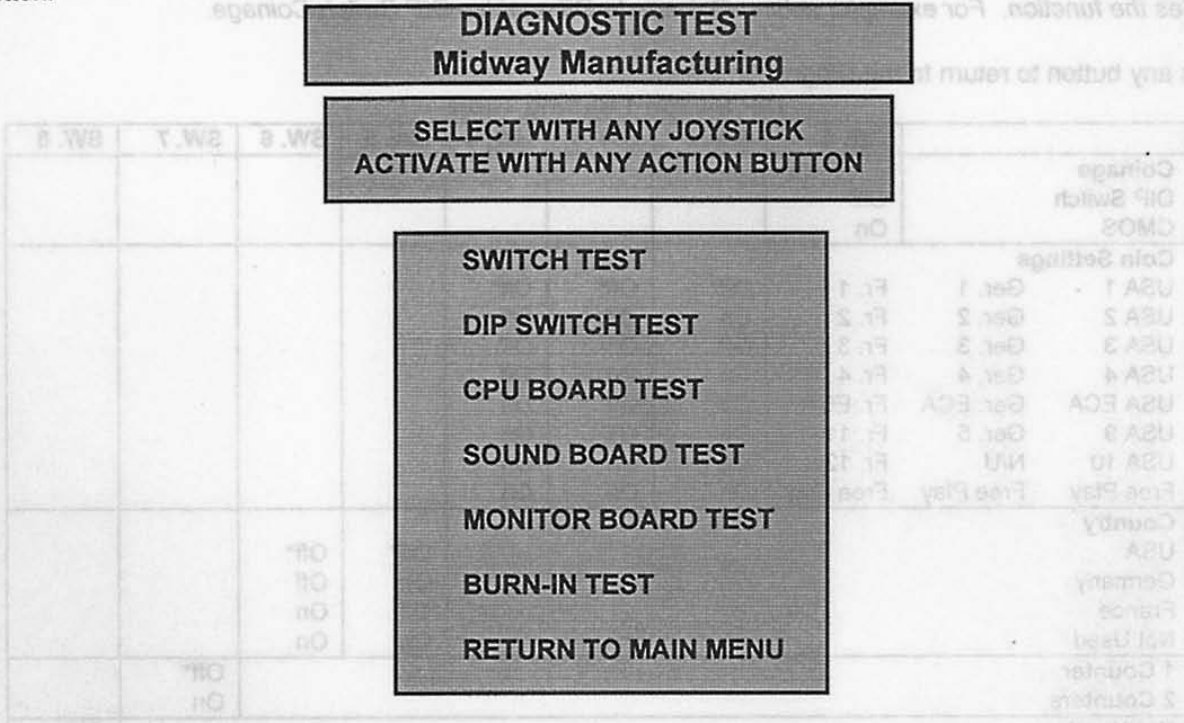
**DIAGNOSTIC TESTS**  
**COIN BOOKKEEPING**  
**GAME AUDITS**  
**PRICING OPTIONS**  
**GAME ADJUSTMENTS**  
**UTILITIES**  
**HARDWARE INFO**  
**VOLUME ADJUST**  
**EXIT TO GAME OVER**

To exit the Main Menu and return to the Attract Mode, use any joystick to select EXIT TO GAME OVER and press any action button.

## DIAGNOSTIC TESTS

Use any joystick to select the Diagnostic Menu and any action button to open it. Then, use any joystick to move the cursor up and down the menu and any action button to open a highlighted option.

To exit the Diagnostic Menu, use any joystick to select RETURN TO MAIN MENU and press any action button.



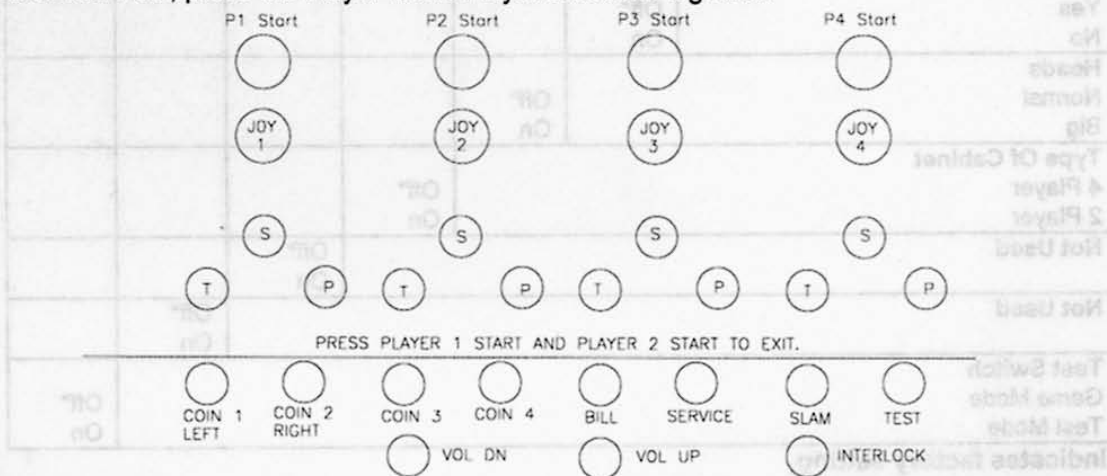
### Switch Test

The Switch Test allows the operator to test the switches on the control panel and in the coin door.

Use any joystick to highlight the Switch Test and any action button to begin the test.

During the Switch Test the top of the screen shows the control panel switches while the bottom of the screen shows the coin door switches. Press a control panel or coin door switch and the switch location on the screen lights. Release the switch and the screen returns to normal.

To exit the Switch Test, press the Player 1 and Player 2 buttons together.



## DIP Switch Test

The DIP Switch Test allows the operator to check or change the position of the DIP Switches on the CPU.

Use any joystick to select the DIP Switch Test. Press any action button to access the DIP Switch Setting Tables. The screen displays the current settings. To change a setting, slide the switch to the desired position. Check the screen to verify the new setting. *In some cases, setting a function to OFF actually enables the function. For example, setting Coinage to Off enables DIP Switch Coinage.*

Press any button to return to the Diagnostic Menu.

**DIP Switch 1 Setting Table**

	SW. 1	SW. 2	SW. 3	SW. 4	SW. 5	SW. 6	SW. 7	SW. 8
<b>Coinage</b>								
DIP Switch	Off*							
CMOS	On							
<b>Coin Settings</b>								
USA 1	Ger. 1	Fr. 1	Off*	Off*	Off*			
USA 2	Ger. 2	Fr. 2	On	Off	Off			
USA 3	Ger. 3	Fr. 3	Off	On	Off			
USA 4	Ger. 4	Fr. 4	On	On	Off			
USA ECA	Ger. ECA	Fr. ECA	Off	Off	On			
USA 9	Ger. 5	Fr. 11	On	Off	On			
USA 10	N/U	Fr. 12	Off	On	On			
Free Play	Free Play	Free Play	On	On	On			
<b>Country</b>								
USA					Off*	Off*		
Germany					On	Off		
France					Off	On		
Not Used					On	On		
<b>1 Counter</b>							Off*	
<b>2 Counters</b>							On	
<b>Not Used</b>								Off*
								On

**DIP Switch 2 Setting Table**

	SW. 1	SW. 2	SW. 3	SW. 4	SW. 5	SW. 6	SW. 7	SW. 8
<b>Bill Validator</b>								
None	Off*							
Present	On							
<b>Attract Sounds</b>								
Yes		Off*						
No		On						
<b>Power-up Tests</b>								
Yes			Off*					
No			On					
<b>Heads</b>								
Normal				Off*				
Big				On				
<b>Type Of Cabinet</b>								
4 Player					Off*			
2 Player					On			
<b>Not Used</b>						Off*		
						On		
<b>Not Used</b>							Off*	
							On	
<b>Test Switch</b>								Off*
Game Mode								On
Test Mode								On

\*Indicates factory setting.



## CPU Test

The CPU Board Test, much like the Start-up Test, allows the operator to check the RAMS and the ROMS.

Select the CPU Board Test with any joystick. Press any action button to start the test.

When this test is activated, a "rug" pattern appears on the screen. The screen then changes to show the layout of the RAMS and ROMS. A chip location that is shown as black with a white outline is used. A chip location that is shown as gray with a white outline is not used. During the test, chips are good if they turn green and faulty if they turn red. Turn to page 2-9 for the exact chip location.

The test pauses if a faulty RAM or ROM is detected. Press any button to continue the test.

## Sound Test

This test allows the operator to listen to some of the sounds this game is capable of producing.

Use any joystick to select the test, then press any action button to open the menu. The screen displays two test options. Use any joystick to select an option and any action button to begin the test.

**SOUND BOARD TEST**  
**Midway Manufacturing**

**SELECT WITH ANY JOYSTICK**  
**ACTIVATE WITH ANY ACTION BUTTON**

**GENERAL TEST**  
**PLAY SOUNDS**  
**BACK TO DIAGNOSTIC MENU**  
**RETURN TO MAIN MENU**

**GENERAL TEST** analyzes the sound circuitry. The screen shows a list of error codes. A successful test causes a single "tone" to sound. Detection of a fault causes a series of tones or no tone at all to sound. Press any action button to return to the Sound Test Menu.

**GENERAL TEST**  
**Midway Manufacturing**

**0 TONES - CHECK HARDWARE**  
**1 TONE - SOUND BOARD O.K.**  
**2 TONES - RAM ERROR U2**  
**3 TONES - ROM ERROR U3**

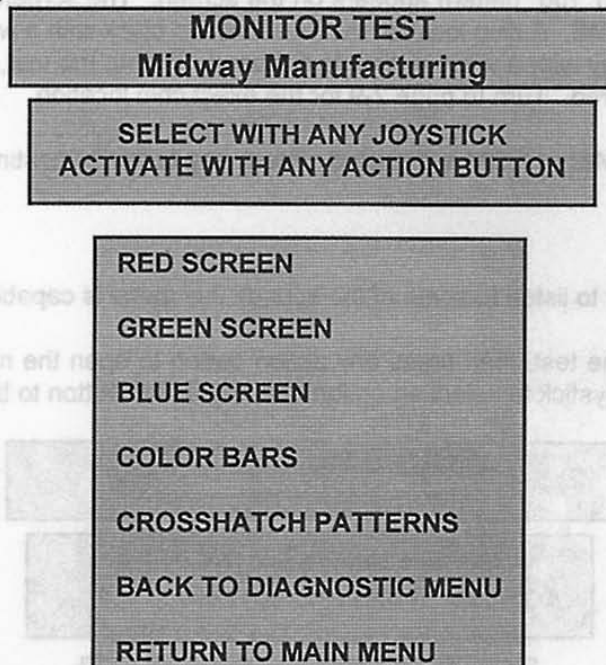
**PLAY SOUNDS** tests synthesized and digitized sounds from the CPU/Sound board. Advance to the next sound with any action button. Use any joystick to end the test.

Select **RETURN TO MAIN MENU** or **BACK TO DIAGNOSTIC MENU** and press any action button.

## Monitor Patterns

The Monitor Patterns Test provides a menu for testing the monitor.

Select the test with any joystick. Press any action button to open the test menu. Once the menu is open, use any joystick to select an option, and any button to begin it. Press any action button again to return to the Monitor Patterns Menu.



The **RED**, **GREEN** and **BLUE SCREEN** tests fill the screen with either red, green or blue. Press any action button to return to the Monitor Patterns Menu.

The **COLOR BARS** test fills the screen with 15 shades of colors to help with red, green and blue level adjustments. Each color should appear sharp and clear. Press any action button to return to the Monitor Patterns Menu.

The **CROSSHATCH PATTERNS** test fills the screen with a grid and a series of dots. The grid and the dots should be clear. The dots should be round. Press any action button to return to the Monitor Patterns Menu.

If any of the tests show a need for adjustment, use the proper knobs on the Monitor Controls board. The Monitor Controls board is located just inside the control panel opening, mounted to the inner left side of the cabinet.

To exit this test, use any joystick to select **RETURN TO MAIN MENU** or **BACK TO DIAGNOSTIC MENU**, then press any action button.

## Burn-in Test

The Burn-in Test continually repeats the CPU Board Test. Use this test to find intermittent CPU Board problems. *The Audit Table specifies the number of Burn-in cycles that have been successfully completed.* Use any joystick to select the test, then press any action button to activate it. When the Burn-in Test detects an error the test stops and an error message is displayed on the screen.

To exit this test, switch the game off, then on again.

## COIN BOOKKEEPING

The Coin Bookkeeping Table records the coin box totals and the game play counters.

Use any joystick to select the Coin Bookkeeping Menu, then press any action button to open it.

COIN BOOKKEEPING Midway Manufacturing	
LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
FOURTH SLOT COINS	0
BILL VALIDATOR COINS	0
SERVICE CREDITS	0
PAID CREDITS	0
MORE DETAILED DATA RETURN TO MAIN MENU	

LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
FOURTH SLOT COINS	0
BILL VALIDATOR COINS	0
TOTAL	0
CLEAR COIN COUNTERS RETURN TO MAIN MENU	

To exit Coin Bookkeeping, use any joystick to select RETURN TO MAIN MENU and press any action button.

## GAME AUDITS

Use any joystick to select the Game Audits Menu, then press any action button to open it. Page through the available audits by selecting NEXT AUDIT PAGE or LAST AUDIT PAGE. Select RETURN TO MAIN MENU and press any action button to exit Game Audits.

*Game audits cannot be set. They can only be cleared.*

### GAME AUDITS Midway Manufacturing

GAMES STARTED	0
PERIOD 1 PLAYED	0
PERIOD 2 PLAYED	0
PERIOD 3 PLAYED	0
OVERTIME PLAYED	0
PLAYER STARTS	0
PERIODS BOUGHT	0
TOTAL PLAYTIME	0
TOTAL GAME UPTIME	0
TIME 1 PLAYER ONLY	0
TIME 2 PLAYERS SIMULTANEOUS	0
TIME 3 PLAYERS SIMULTANEOUS	0
TIME 4 PLAYERS SIMULTANEOUS	0

NEXT AUDIT PAGE  
RETURN TO MAIN MENU

### GAME AUDITS Midway Manufacturing

INITIALS ENTERED	0
ALL TEAMS BEATEN	0
LEFT TEAM WINS	0
RIGHT TEAM WINS	0
TIE GAMES	0
CPU TEAM WINS	0
CPU TEAM LOSSES	0
CPU TEAM TIES	0

NEXT AUDIT PAGE  
PREVIOUS AUDIT PAGE  
RETURN TO MAIN MENU



**GAME AUDITS**  
**Midway Manufacturing**

GOALS SCORED	0
ASSISTS	0
LEFT TEAM GOALS	0
RIGHT TEAM GOALS	0
CPU TEAM GOALS	0
CPU PLAYER GOALS	0
HUMAN PLAYER GOALS	0
GOALIE ON FIRE	0
GOALIE SAVES	0
ON FIRES	0
ON FIRE GOALS	0

NEXT AUDIT PAGE  
PREVIOUS AUDIT PAGE  
RETURN TO MAIN MENU

**GAME AUDITS**  
**Midway Manufacturing**

BOSTON BRUINS SELECTED	0
BUFFALO SABRES SELECTED	0
HARTFORD WHALERS SELECTED	0
MONTREAL CANADIENS SELECTED	0
OTTAWA SENATORS SELECTED	0
PITTSBURGH PENGUINS SELECTED	0
COLORADO AVALANCHE SELECTED	0
FLORIDA PANTHERS SELECTED	0
NEW JERSEY DEVILS SELECTED	0
NEW YORK ISLANDERS SELECTED	0

NEXT AUDIT PAGE  
PREVIOUS AUDIT PAGE  
RETURN TO MAIN MENU

**GAME AUDITS**  
**Midway Manufacturing**

NEW YORK RANGERS SELECTED	0
PHILADELPHIA FLYERS SELECTED	0
TAMPA BAY LIGHTNING SELECTED	0
WASHINGTON CAPITALS SELECTED	0
CHICAGO BLACKHAWKS SELECTED	0
DALLAS STARS SELECTED	0
DETROIT RED WINGS SELECTED	0
ST. LOUIS BLUES SELECTED	0
TORONTO MAPLE LEAFS SELECTED	0
WINNIPEG JETS SELECTED	0

NEXT AUDIT PAGE  
PREVIOUS AUDIT PAGE  
RETURN TO MAIN MENU

**GAME AUDITS**  
**Midway Manufacturing**

MIGHTY DUCKS OF ANAHEIM SELECTED	0
CALGARY FLAMES SELECTED	0
EDMONTON OILERS SELECTED	0
LOS ANGELES KINGS SELECTED	0
SAN JOSE SHARKS SELECTED	0
VANCOUVER CANUCKS SELECTED	0
RANDOM TEAM SELECTED	0
SPECIAL CHARACTERS SELECTED	0

NEXT AUDIT PAGE  
PREVIOUS AUDIT PAGE  
RETURN TO MAIN MENU

**GAME AUDITS**  
**Midway Manufacturing**

COIN DOOR SLAMS	0
BURN-IN LOOPS SUCCESSFULLY COMPLETED	0
START FAILURES	0

PREVIOUS AUDIT PAGE  
RETURN TO MAIN MENU

## PRICING OPTIONS

The Pricing Options menu allows the operator to set the cost of a game.

Use any joystick to select the Pricing Options Menu. Press any action button to open the menu. To exit the Pricing Option menu, use any joystick to select RETURN TO MAIN MENU, and press any action button.

**PRICING OPTIONS**  
Midway Manufacturing

SELECT WITH ANY JOYSTICK  
ACTIVATE WITH ANY ACTION BUTTON

RETURN TO MAIN MENU  
STANDARD PRICING  
CUSTOM MULTIPLIERS  
CUSTOM PRICING  
FREE PLAY  
RETURN TO MAIN MENU

### Standard Pricing

Standard pricing allow the operator to choose any of the "standard" selections from the Standard Pricing Table. See page 1-20.

Modify the setting value with either joystick. Press any button to lock in the new value and return to the Adjustments Menu.

### Custom Multipliers

Customize the internal coin chute multipliers for each chute.

### Custom Pricing

Custom pricing allows the operator to install pricing other than that of the Standard Pricing Table. Custom pricing also allows the operator to select the maximum amount of credits per game, the amount of credits required to start a game, and the amount of credits required to continue a game. To use Custom Pricing, the Coinage DIP Switch must be set to ON (CMOS). (See page 1-12).

Modify the setting value with either joystick. Press any button to lock in a new value and return to the Adjustment Menu.

### Free Play

This option selects free play. The setting choices for this adjustment are:

- No
- Yes
- Factory Setting: No

**STANDARD PRICING TABLE**

Name	Setting - Coin/Credit	Coin 1	Coin 3	Coin 2	Coin 4	Bills
USA 1	1/25¢ (2 to Start, 2 to Continue)	25¢		25¢		\$1.00
USA 2	1/25¢ (2 to Start, 1 to Continue)	25¢		25¢		\$1.00
USA 3	1/25¢ (1 to Start, 1 to Continue)	25¢		25¢		\$1.00
USA 4	1/50¢, 3/\$1.00 (1 to Start, 1 to Continue)	25¢		25¢		\$1.00
USA 5	1/50¢, 4/\$1.00 (2 to Start, 1 to Continue)	25¢		25¢		\$1.00
USA 6	1/50¢ (1 to Start, 1 to Continue)	25¢		25¢		\$1.00
USA 7	1/50¢, 3/\$1.00 (1 to Start, 1 to Continue)	25¢		25¢		\$1.00
USA 8	1/50¢, 4/\$1.00 (2 to Start, 2 to Continue)	25¢		25¢		\$1.00
USA 9	1/25¢ (3 to Start, 2 to Continue)	25¢		25¢		\$1.00
USA 10	1/25¢ (3 to Start, 3 to Continue)	25¢		25¢		\$1.00
USA ECA	1/25¢, 4/\$1.00 (2 to Start, 2 to Continue)	\$1.00	10¢	25¢	5¢	\$1.00
German 1	1/1DM, 6/5DM	1DM		5DM		
German 2	1/1DM, 7/5DM	1DM		5DM		
German 3	1/1DM, 8/5DM	1DM		5DM		
German 4	1/1DM, 5/5DM	1DM		5DM		
German 5	1/1DM, 6/5DM	1DM		5DM		
German ECA	1/1DM, 2/2DM, 6/5DM	5DM	1DM	2DM		
France 1	2/5F, 5/10F	5F		10F		
France 2	2/5F, 4/10F	5F		10F		
France 3	1/5F, 3/10F	5F		10F		
France 4	1/5F, 2/10F	5F		10F		
France 5	2/5F, 5/10F, 11/2 x 10F	5F		10F		
France 6	2/5F, 4/10F, 9/2 x 10F	5F		10F		
France 7	1/5F, 3/10F, 7/2 x 10F	5F		10F		
France 8	1/5F, 2/10F, 5/2 x 10F	5F		10F		
France 9	1/3 x 1F, 2/5F	1F		5F		
France 10	1/2 x 1F, 3/5F	1F		5F		
France 11	1/3 x 1F, 2/5F, 5/2 x 5F	1F		5F		
France 12	1/2 x 1F, 3/5F, 7/2 x 5F	1F		5F		
France ECA	1/3 x 1F, 2/5F, 5/2 x 5F	1F	10F	5F		
Canada	1/2 x 25¢, 3/\$1.00	25¢		\$1.00		\$1.00
Swiss 1	1/1F, 6/5F	1F		5F		
Swiss 2	1/1F, 7/5F	1F		5F		
Swiss 3	1/1F, 8/5F	1F		5F		
Italy	1/500 lire	500 lire		500 lire		
UK 1 ECA	1/50P, 3/£1	£1	20P	50P	10P	
UK 2 ECA	1/50P, 2/£1	£1	20P	50P	10P	
UK 3 ECA	1/30P, 2/50P, 5/£1	£1	20P	50P	10P	
UK 4	1/50P, 3/£1	£1		50P		
UK 5	1/50P, 2/£1	£1		50P		
Spain 1	1/100 peseta, 6/500 peseta	100 peseta		500 peseta		
Spain 2	1/100 peseta, 5/500 peseta	100 peseta		500 peseta		
Australia 1	1/3 x 20¢, 2/\$1.00	20¢		\$1.00		
Australia 2	1/5 x 20¢, 1/\$1.00	20¢		\$1.00		
Japan 1	1/100 yen	100 yen		100 yen		
Japan 2	2/100 yen	100 yen		100 yen		
Austria 1	1/5 schilling, 2/10 schilling	5 schilling		10 schilling		
Austria 2	1/2 x 5 schilling, 3/2 x 10 schilling	5 schilling		10 schilling		
Belgium 1	1/20F	20F		20F		
Belgium 2	3/20F	20F		20F		
Belgium 3	2/20F	20F		20F		
Belgium ECA	1/20F	50F	5F	20F		
Sweden	1/3 x 1 krona, 2/5 krona	1 krona		5 krona		
New Zealand 1	1/3 x 20¢	20¢		20¢		
New Zealand 2	1/2 x 20¢	20¢		20¢		
Netherlands	1/1 HFA, 3/2.5 HFA	1 guilder		2.5 guilder		
Finland	1/1 markka	1 markka		1 markka		
Norway	1/2 x 1 krone, 3/5 x 1 krone	1 krone		1 krone		
Denmark	1/2 x 1 krone, 3/5 krone, 7/2 x 5 krone	1 krone		5 krone		
Antilles	1/25¢, 4/1 guilder	25¢		1 guilder		
Hungary	1/2 x 10 forint, 3/2 x 20 forint	10 forint		20 forint		



## CUSTOM PRICING

**SELECT WITH ANY JOYSTICK  
ACTIVATE WITH ANY ACTION BUTTON**

**RETURN TO ADJ. MENU**

**(1) LEFT CHUTE UNITS**

**(1) RIGHT CHUTE UNITS**

**(1) THIRD CHUTE UNITS**

**(1) FOURTH CHUTE UNITS**

**(2) DBV UNITS**

**(3) UNITS/CREDITS**

**(4) UNITS/BONUS**

**(5) MINIMUM UNITS REQUIRED**

**(6) CREDITS TO START**

**(7) CREDITS TO CONTINUE**

**(8) COINS PER DOLLAR**

**(9) MAXIMUM CREDIT**

**RETURN TO ADJ. MENU**

- 1) Coins inserted accumulate units. This adjustment specifies the number of units given for each coin in the fourth chute (see "Units/Credit").
- 2) Coins inserted accumulate units. This adjustment specifies the number of units given for each bill validated (see "Units/Credits").
- 3) This is the number of coin units required to buy one credit.
- 4) There is one bonus credit awarded after this many coin units have accumulated.
- 5) This is the minimum number of units required before any credits are awarded.
- 6) Each player needs this many credits to begin a game.
- 7) Each player needs this many credits to continue a game.
- 8) The detailed bookkeeping screen shows total collection based on this many coins per dollar. (Set to zero to disable the display of money totals.)
- 9) This is the limit for the credit counter. Additional coins inserted will be lost (factory setting: 50).

## GAME ADJUSTMENTS

The Game Adjustments allow the operator to customize the game.

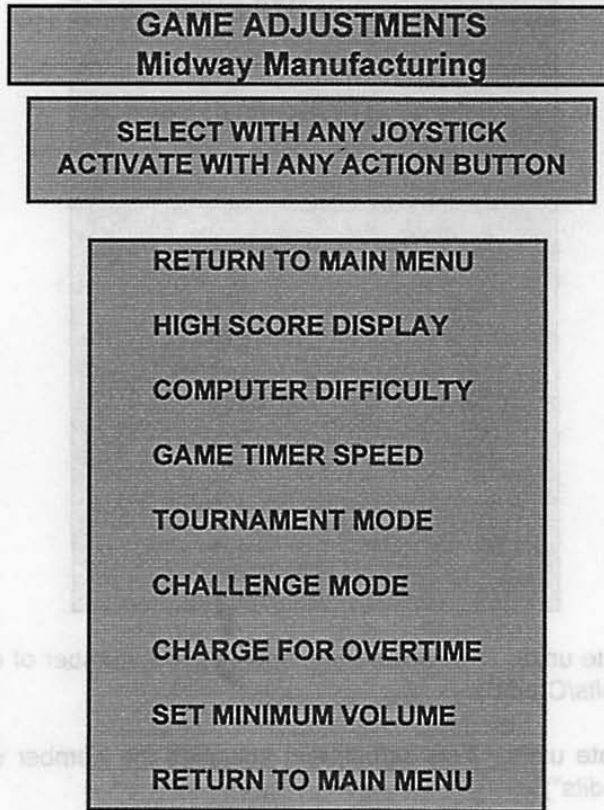
Use any joystick to select the Game Adjustments Menu. Press any action button to open the menu.

The Game Adjustments Menu offers several options. Each option has several choices. Use any joystick to select an option, then press any action button to open the option. The next menu screen provides a setting value. Use any joystick to change the setting value and press any action button to lock it in.

To exit the Adjustments Menu, use any joystick to select RETURN TO MAIN MENU, and press any action button.

### NOTE

*Adjustment values set by DIP SWITCH, override adjustment values set by the menu system.*



## Game Adjustments

### High Score Display

This option determines whether the high scores are displayed. The setting choices for this adjustment are:

- Yes
- No
- Factory Setting:        Yes

## Game Adjustments Continued...

### Computer Difficulty

This option controls the difficulty of the computer controlled players. The setting choices for this adjustment are:

- Easiest = 1
- Hardest = 10
- Factory Setting: 5

### Game Timer Speed

This controls how fast the game timer counts down. The setting choices for this adjustment are:

- Extra Fast
- Fast
- Normal
- Slow
- Extra Slow
- Factory Setting: Normal

### Tournament Mode

If On, this disables power-up tests, secret characters, and computer assistance. The setting choices for this adjustment are:

- On
- Off
- Factory Setting: Off

### Challenge Mode

If On, the winning team of a four player game plays the next game for free. Only the challenging team pays. The setting choices for this adjustment are:

- On
- Off
- Factory Setting: On

### Charge For Overtime

After a 3<sup>rd</sup> period tie: If Yes, players pay for a 4<sup>th</sup> period. If No, there is a free Sudden Death. The setting choices for this adjustment are:

- Yes
- No
- Factory Setting: No

### Set Minimum Volume

This is the minimum level allowed when setting the volume of the sound board. The choices for this adjustment are:

- Off = 0
- Lowest = 1
- Loudest = 255
- Factory Setting : 31

## UTILITIES

The Utilities Menu allows the operator to clear the game's bookkeeping memory.

Use any joystick to select the Utilities Menu, then press any action button. Use any joystick to select a utility. Press any action button to activate the selection.

<b>UTILITIES</b> <b>Midway Manufacturing</b>
<b>SELECT WITH ANY JOYSTICK</b> <b>ACTIVATE WITH ANY ACTION BUTTON</b>
<b>CLEAR CREDITS</b>
<b>CLEAR COIN COUNTERS</b>
<b>CLEAR GAME AUDITS</b>
<b>RESET HIGH SCORE</b>
<b>DEFAULT ADJUSTMENTS</b>
<b>FULL FACTORY RESTORE</b>
<b>RETURN TO MAIN MENU</b>

Once the selection is made, a dialogue box appears, and the operator can choose to reset the utility.

*For example:*

<b>CLEAR COIN COUNTERS?</b> <b>ARE YOU SURE?</b>
<b>YES</b>
<b>NO</b>

Use any joystick to choose a setting value. Press any action button to lock in the new setting value.

To exit the Utilities Menu, use any joystick to select RETURN TO MAIN MENU, then press any action button.



## HARDWARE INFO

The Hardware Information screen gives the date the game was manufactured and the game's serial number.

### HARDWARE INFO Midway Manufacturing

MIDWAY MANUFACTURING

OI UNIT

SERIAL NUMBER: XXXXXXXX

DATE OF MANUFACTURE: XX/XX/XXXX

PRESS ANY BUTTON TO QUIT

Press any action button to exit this screen and return to the Main Menu.

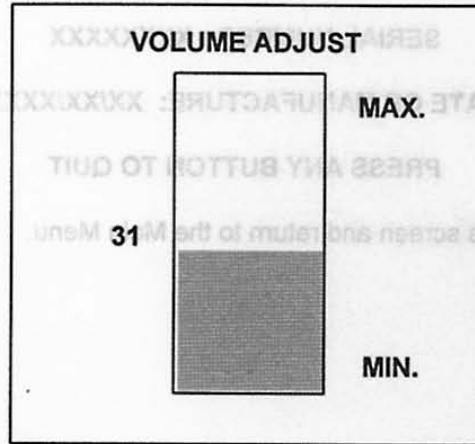
MIN.

## VOLUME ADJUST

The Volume Adjust feature allows the operator to determine the sound and music level of the game.

The volume level can be adjusted from either the Attract Mode or the Menu System. Press the Volume Up button to raise the volume level and the Volume Down button to lower the volume level. Any joystick can also be used to raise or lower the volume level. The current volume level is shown with a red bar.

Press any action button to return to the Main Menu.



USE JOYSTICK OR VOLUME BUTTONS TO ADJUST VOLUME.

## TROUBLESHOOTING

NOTES

### PROBLEM

1) No picture or distorted picture.

### POSSIBLE SOLUTION

1) Check for faulty video board or monitor.  
Check for disconnected video signal cable.

2) Turn game On and nothing happens.

2) Check line fuse. Check for +5Vdc at pins C, D, 3 and 4 of the JAMMA connector.

3) No sound.

3) Check the speaker and the speaker connection to pin L and 10 on the JAMMA connector. Check volume control setting. Check for +12Vdc at pins F and 6 on the JAMMA connector. Check for -5Vdc at pins E and 5 on the JAMMA connector.

4) No general illumination.

4) Check the 1A, S.B. fuse in the AC power pack assembly.

5) Press Start button and nothing happens.

5) Check for open wires between the button and the CPU board. Check for contamination on CPU board pins or the Start button switch blade contacts. Check for proper ground.

6) No credit given for number of coins inserted.

6) Check DIP switch coin settings. Check for contamination on the coin switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on the JAMMA connector or Coin Switch 2 and pin T of the JAMMA connector.

7) Too many credits for number of coins inserted.

7) Check the game pricing settings. Check for a short between pins T & 16 on the JAMMA connector.

8) Game stays in test mode.

8) Check that the switch #8 of DIP switch bank #2 is set to off.

NOTES

TROUBLESHOOTING

TROUBLE	CAUSE
1) No picture or distorted picture	<p>1) Check for faulty video board or monitor</p> <p>2) Check for disconnected video board cable</p>
2) Turn game On and nothing happens	<p>1) Check for fuse</p> <p>2) Check for 5Vdc at pins 2 and 4 of the JAMMA connector</p>
3) No sound	<p>1) Check the speaker and the speaker connection to pin J and 10 on the JAMMA connector</p> <p>2) Check volume control</p> <p>3) Check for +12Vdc at pins F and 6 on the JAMMA connector</p> <p>4) Check for -5Vdc at pins E and 5 on the JAMMA connector</p>
4) No games/competition	<p>1) Check for 1A 0.2A fuse in the power assembly</p>
5) Press Start button and nothing happens	<p>1) Check for open wire between the button and the CPU board</p> <p>2) Check for contamination on the CPU board</p> <p>3) Check for contamination on the Start button</p> <p>4) Check for proper ground plate contact</p>
6) No credit given for number of coins inserted	<p>1) Check DIP switch coin settings</p> <p>2) Check for contamination on the coin switch contacts</p> <p>3) Check for coin when button is pushed</p> <p>4) Check for coin when button is pushed and pin 16 on the JAMMA connector or coin switch 2 and pin 7 of the JAMMA connector</p>
7) Too many credits for number of coins inserted	<p>1) Check the game programming</p> <p>2) Check for short between pins 7 &amp; 16 on the JAMMA connector</p>
8) Game plays in test mode	<p>1) Check that the position of DIP switch #2 is set to off</p>

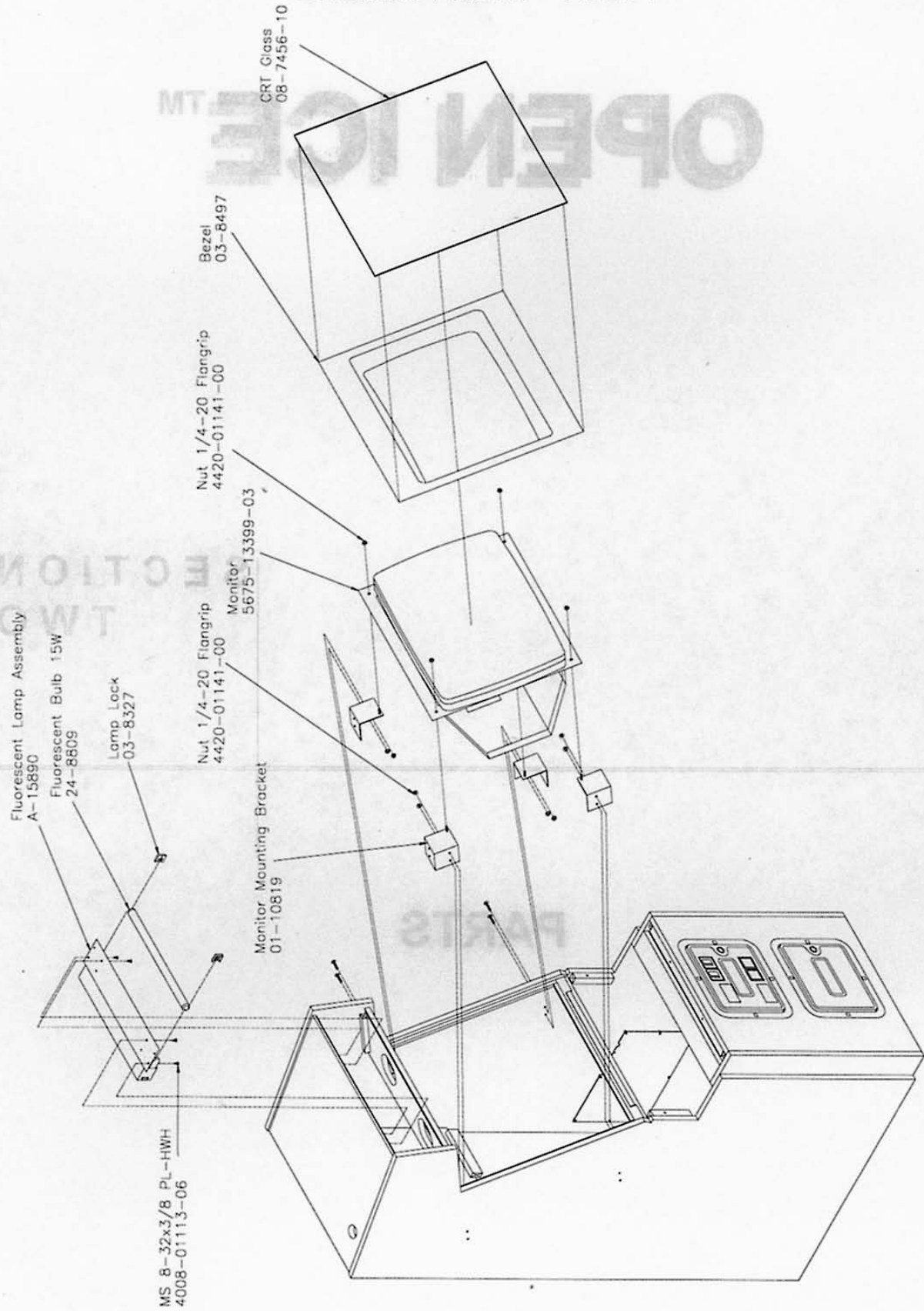


# OPEN ICE™

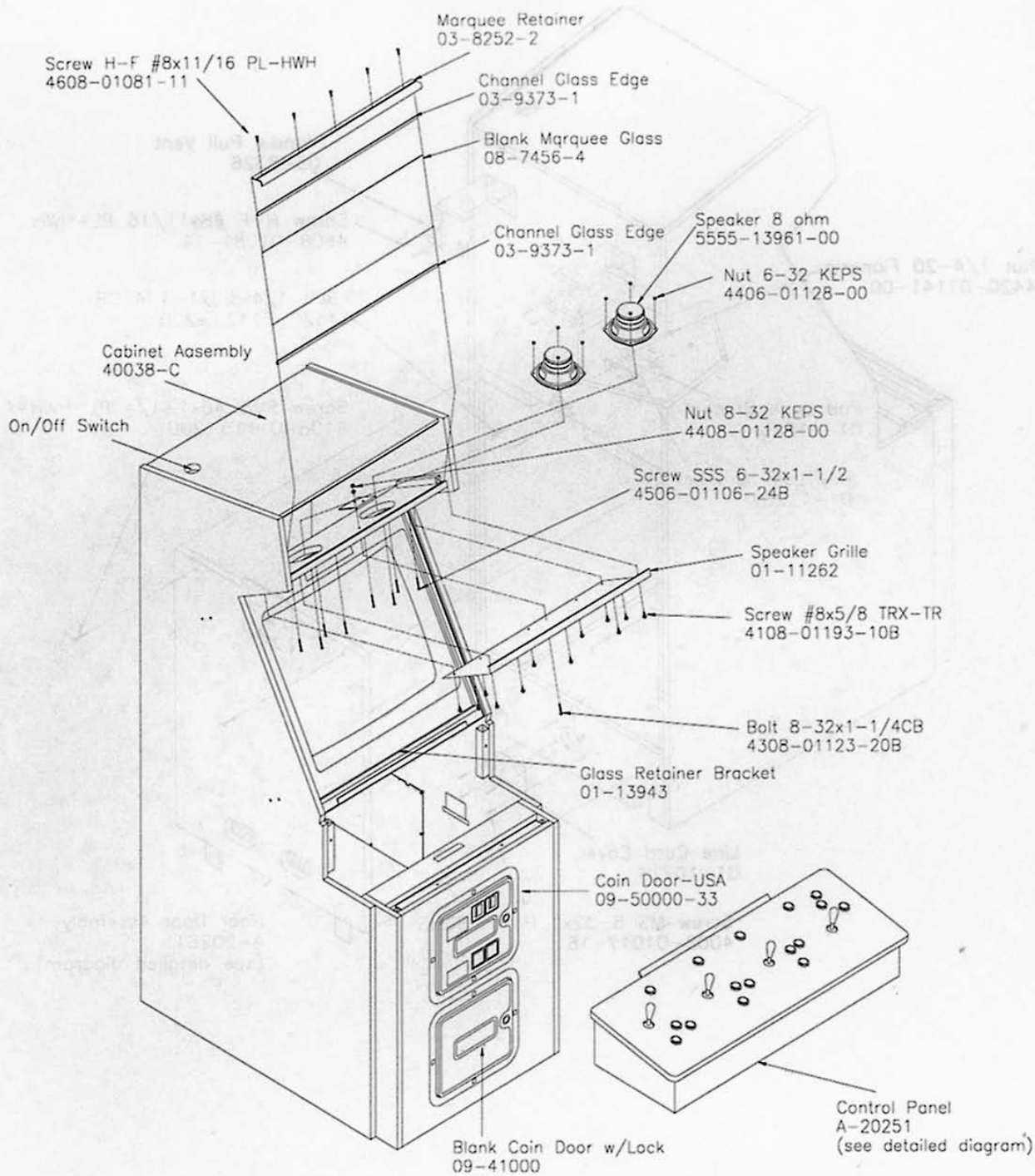
SECTION  
TWO

PARTS

# CABINET FRONT - VIEW 1

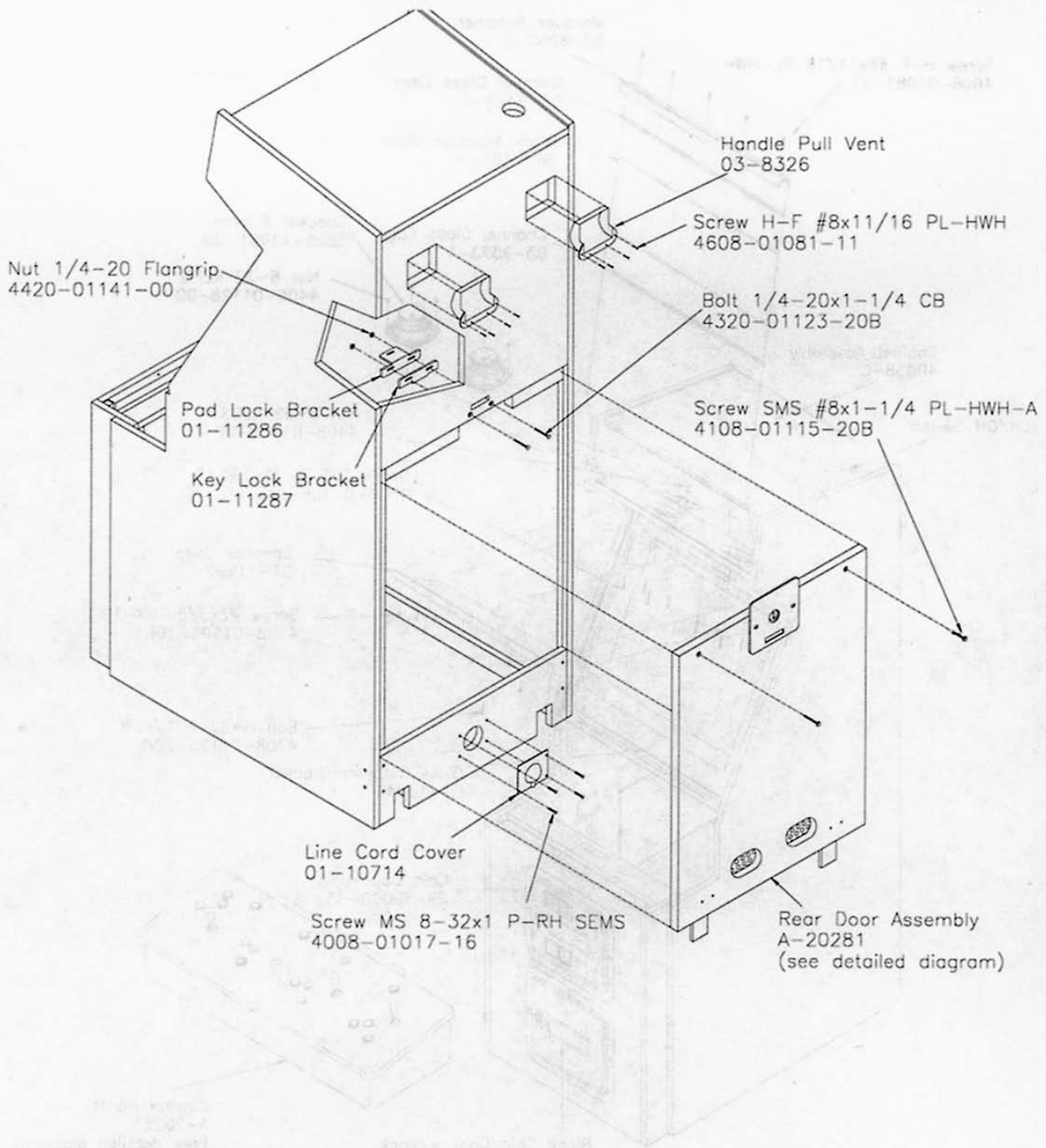


## CABINET FRONT - VIEW 2



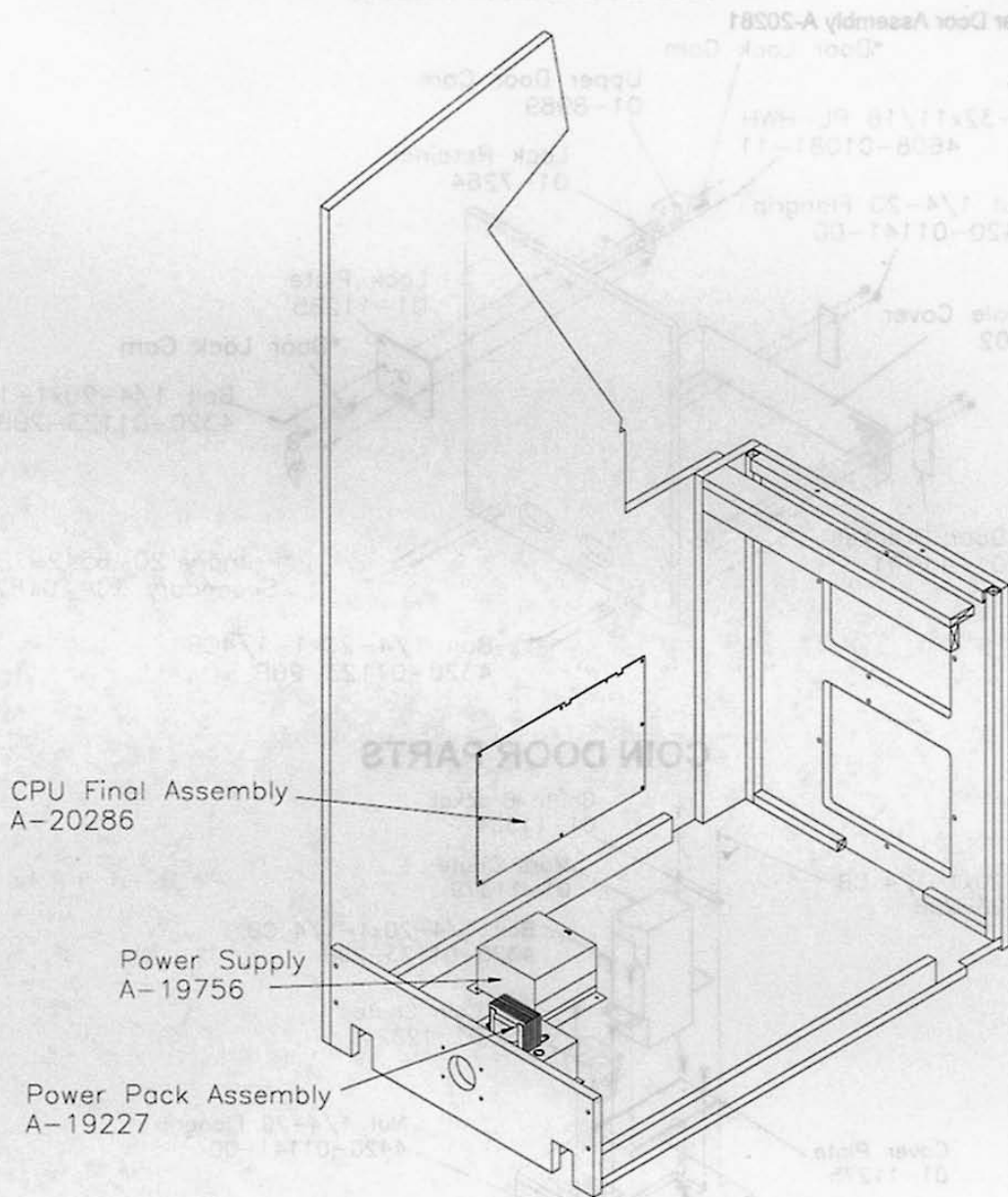
Not Shown:  
 Leg Leveler Plate 01-9155  
 Leg Adjuster 08-7377  
 DVB Installation Inst. 16-9637  
 Manual 16-40038-101  
 Caster Wheel 20-9627  
 Screened Marquee 31-2350

# CABINET REAR VIEW





# CABINET CUT-AWAY VIEW



CPU Final Assembly  
A-20286

Power Supply  
A-19756

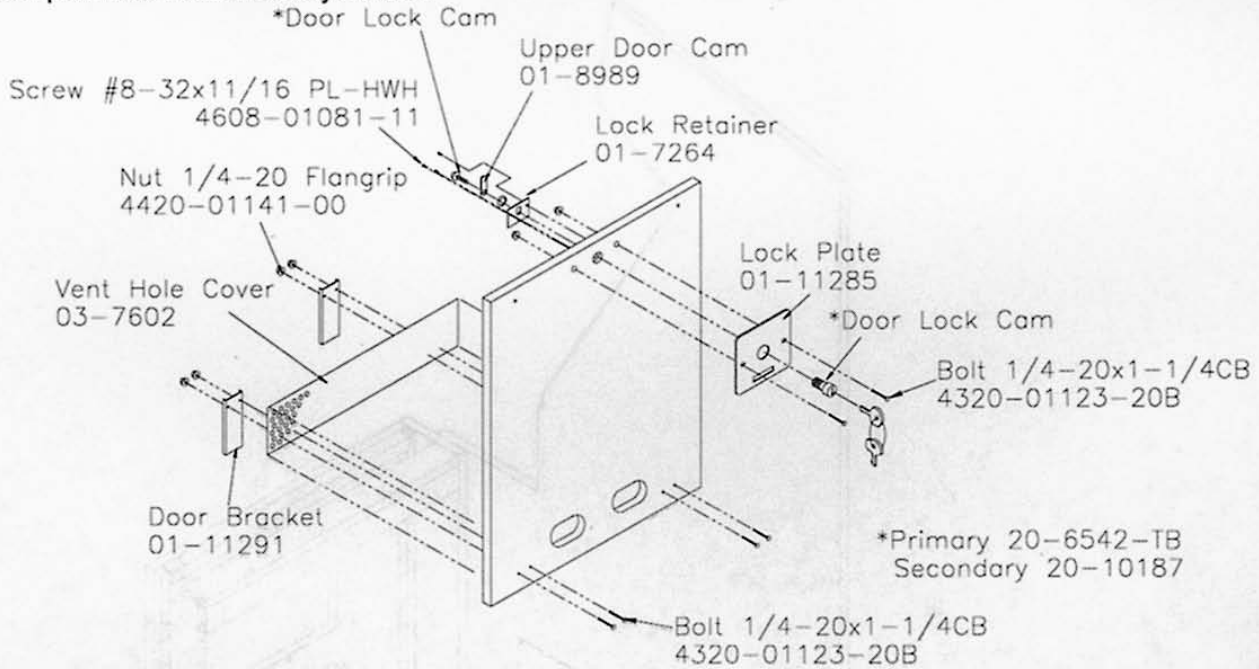
Power Pack Assembly  
A-19227

Not Shown:

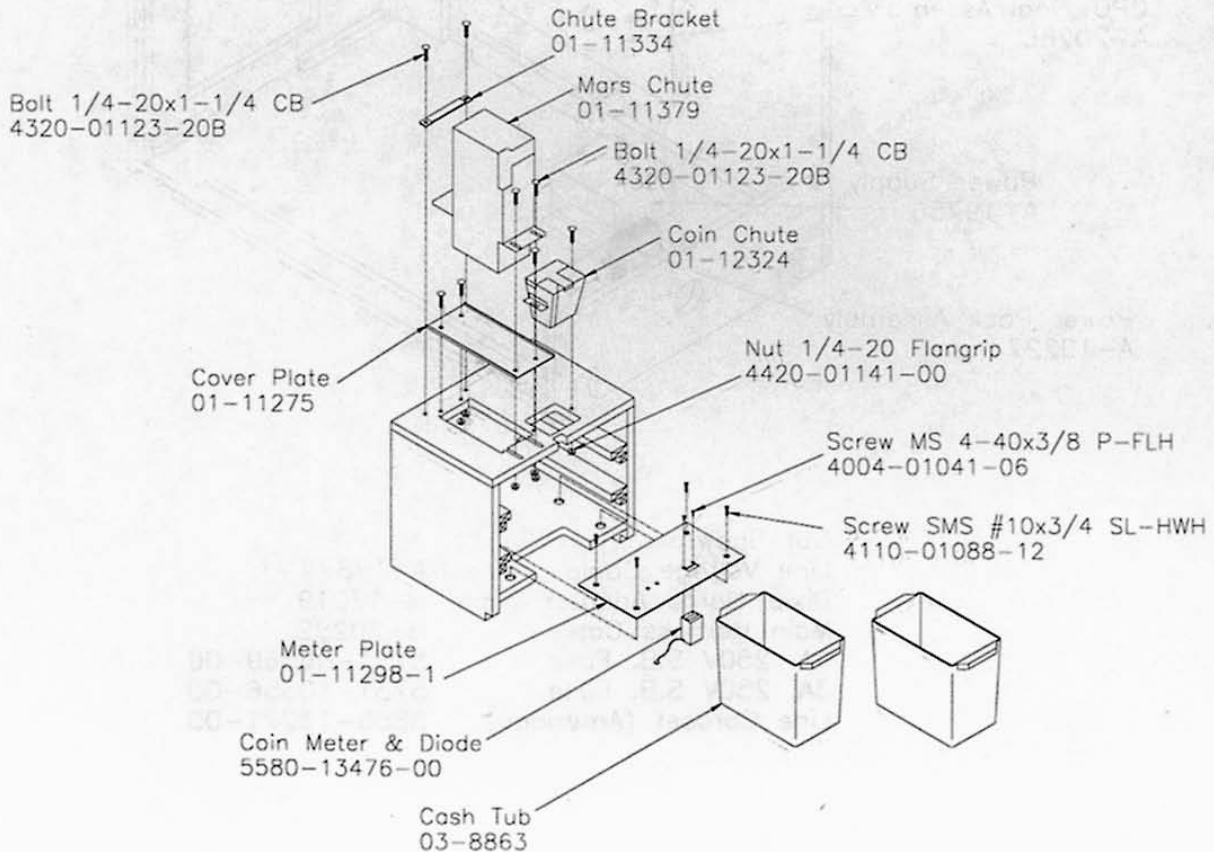
- |                           |               |
|---------------------------|---------------|
| Line Voltage Cable        | A-17877-7     |
| Dixie-Narco Adapter Cable | H-17019       |
| Main Harness Cable        | H-20282       |
| 1A. 250V S.B. Fuse        | 5731-06569-00 |
| 3A. 250V S.B. Fuse        | 5731-10356-00 |
| Line Cordset (American)   | 5850-13271-00 |

## REAR DOOR PARTS

### Complete Rear Door Assembly A-20281

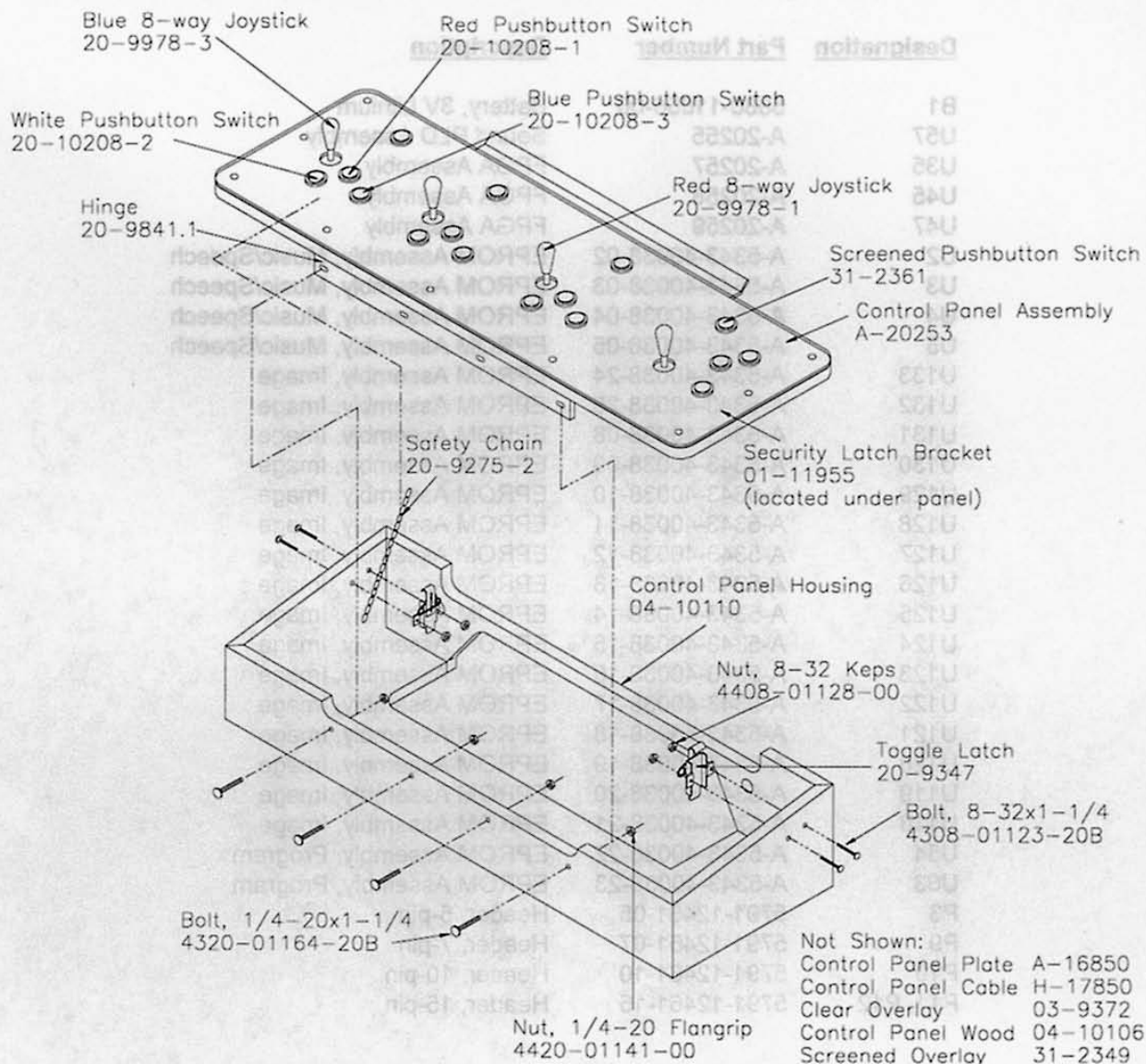


## COIN DOOR PARTS



# CONTROL PANEL & HOUSING PARTS

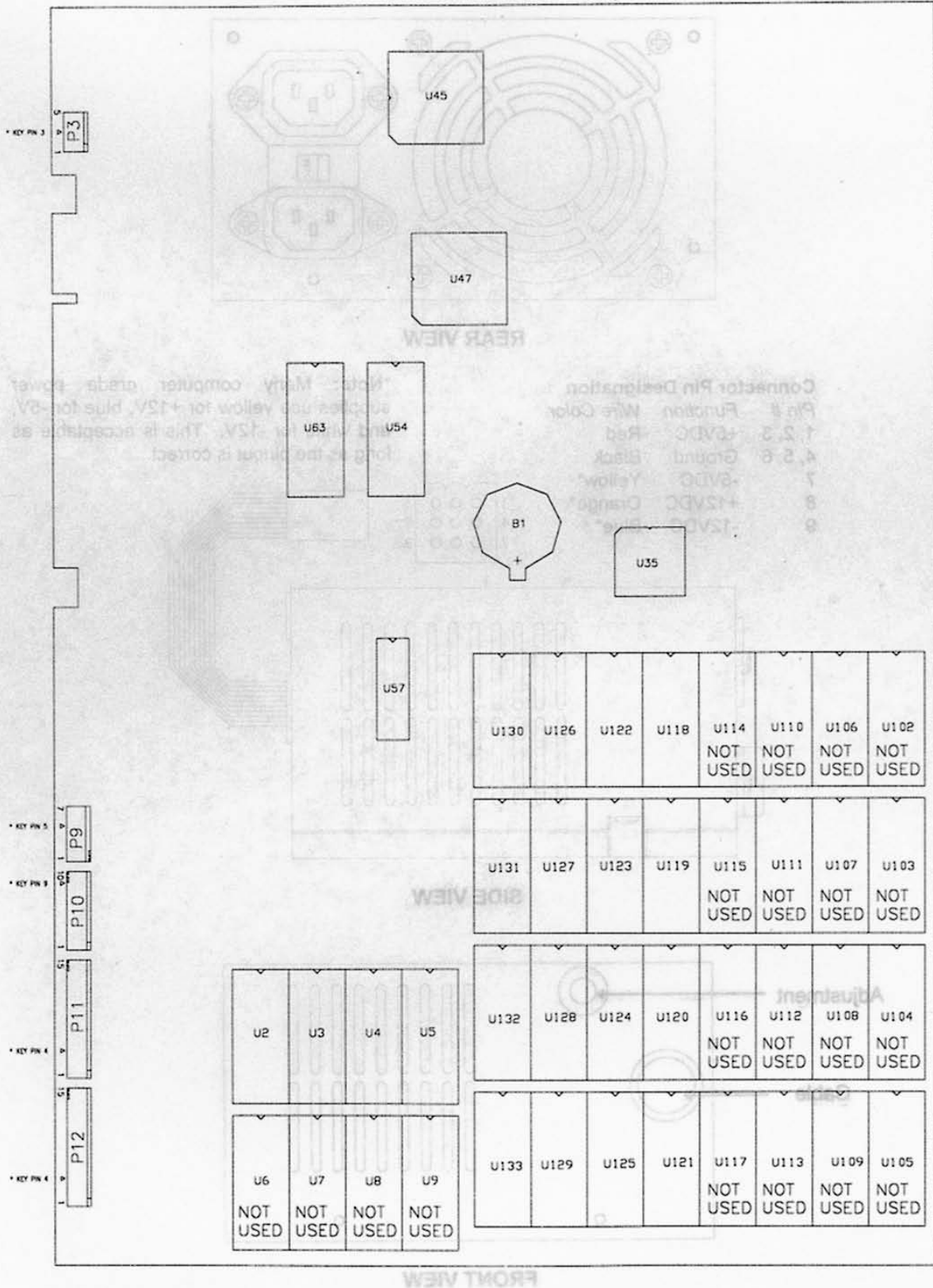
Complete Control Panel & Housing Assembly A-20251



**OPEN ICE™ CPU FINAL ASSEMBLY**  
**A-20286**

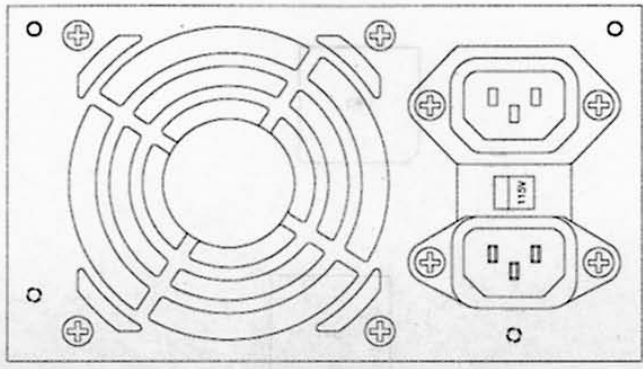
<u>Designation</u>	<u>Part Number</u>	<u>Description</u>
B1	5880-11056-00	Battery, 3V Lithium
U57	A-20255	Sound PLD Assembly
U35	A-20257	FPGA Assembly
U45	A-20258	FPGA Assembly
U47	A-20259	FPGA Assembly
U2	A-5343-40038-02	EPROM Assembly, Music/Speech
U3	A-5343-40038-03	EPROM Assembly, Music/Speech
U4	A-5343-40038-04	EPROM Assembly, Music/Speech
U5	A-5343-40038-05	EPROM Assembly, Music/Speech
U133	A-5343-40038-24	EPROM Assembly, Image
U132	A-5343-40038-25	EPROM Assembly, Image
U131	A-5343-40038-08	EPROM Assembly, Image
U130	A-5343-40038-09	EPROM Assembly, Image
U129	A-5343-40038-10	EPROM Assembly, Image
U128	A-5343-40038-11	EPROM Assembly, Image
U127	A-5343-40038-12	EPROM Assembly, Image
U126	A-5343-40038-13	EPROM Assembly, Image
U125	A-5343-40038-14	EPROM Assembly, Image
U124	A-5343-40038-15	EPROM Assembly, Image
U123	A-5343-40038-16	EPROM Assembly, Image
U122	A-5343-40038-17	EPROM Assembly, Image
U121	A-5343-40038-18	EPROM Assembly, Image
U120	A-5343-40038-19	EPROM Assembly, Image
U119	A-5343-40038-20	EPROM Assembly, Image
U118	A-5343-40038-21	EPROM Assembly, Image
U54	A-5343-40038-22	EPROM Assembly, Program
U63	A-5343-40038-23	EPROM Assembly, Program
P3	5791-12461-05	Header, 5-pin
P9	5791-12461-07	Header, 7-pin
P10	5791-12461-10	Header, 10-pin
P11, P12	5791-12461-15	Header, 15-pin

# OPEN ICE™ CPU FINAL ASSEMBLY A-20286





POWER SUPPLY  
20-10167

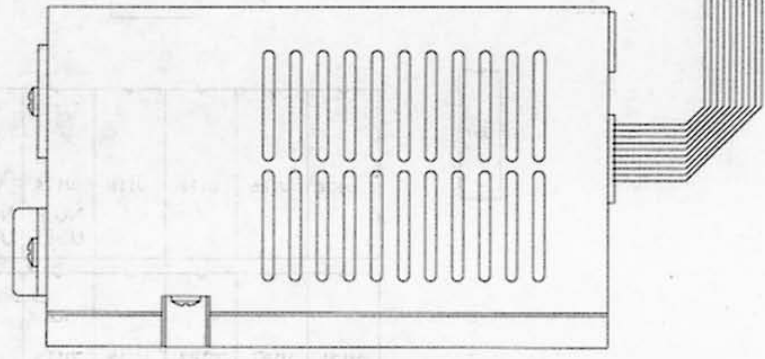
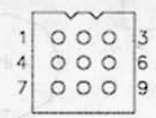


**REAR VIEW**

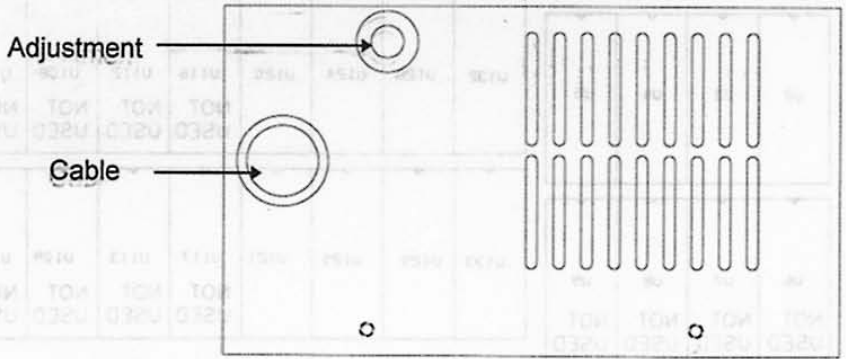
**Connector Pin Designation**

Pin #	Function	Wire Color
1, 2, 3	+5VDC	Red
4, 5, 6	Ground	Black
7	-5VDC	Yellow*
8	+12VDC	Orange*
9	-12VDC	Blue*

\*Note: Many computer grade power supplies use yellow for +12V, blue for -5V, and white for -12V. This is acceptable as long as the pinout is correct.



**SIDE VIEW**



**FRONT VIEW**

# OPEN ICE™

COMPONENT SIDE		SOLDER SIDE	
FUNCTION	WIRE COLOR	PIN	PIN
Ground	Black	1	1
Ground	Black	27	27
Ground	Black	28	28
Not Used	White-Violet	28	28
2 Turbo	White-Blue	24	24
2 Parallel	White-Green	23	23
2 Serial/Block	White-Yellow	22	22
2 Turbo	White-Orange	21	21
1 Left	White-Red	20	20
1 Down	White-Brown	19	19
1 Up	White-Black	18	18
2 Start	Violet-White	17	17
Coin 2	Black-Red	16	16
Start Tilt	Black-Green	15	15
Service Credits	White-Gray	14	14
Video Sync	White	13	13
Video Green	Green	12	12
N/C	N/C	11	11
Speaker -	Brown-Gray	10	10
N/C	N/C	9	9
Coin Counter 2	Brown-Red	8	8
Coin Counter 1	Brown	7	7
Key	Key	6	6
+12VDC	Orange	5	5
-5VDC	Yellow	4	4
+5VDC	Red	3	3
+5VDC	Red	2	2
Ground	Ground	1	1

## SECTION THREE

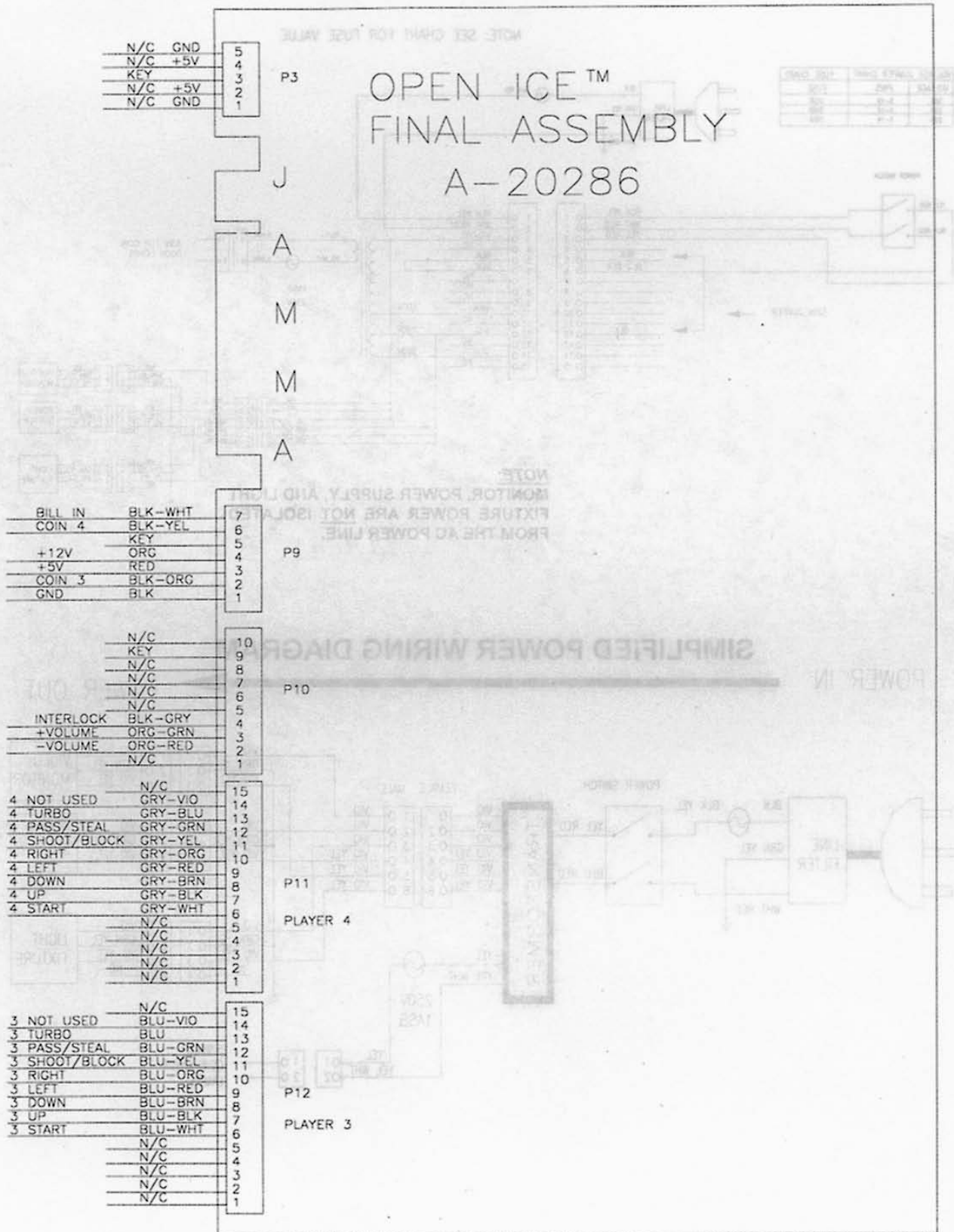
### WIRING DIAGRAMS

## JAMMA Chart

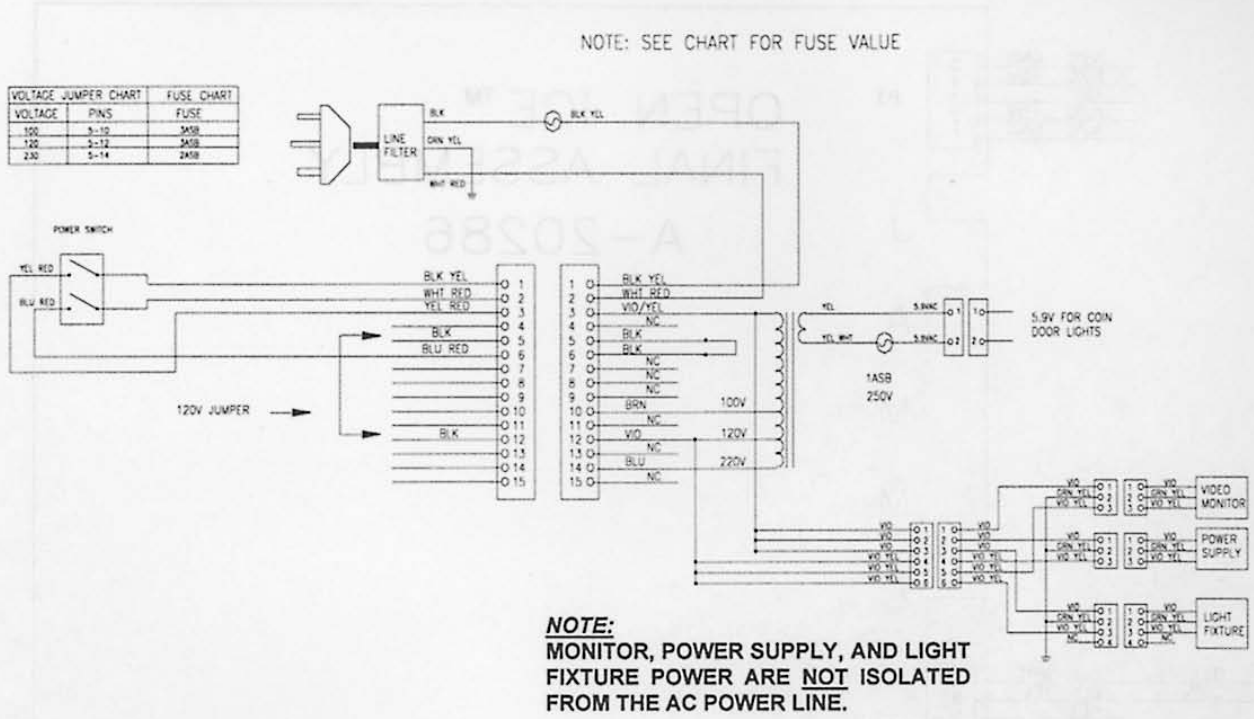
FUNCTION	WIRE COLOR	PIN	PIN	WIRE COLOR	FUNCTION
Ground	Black	A	1	Black	Ground
Ground	Black	B	2	Black	Ground
+5VDC	Red	C	3	Red	+5VDC
+5VDC	Red	D	4	Red	+5VDC
-5VDC	Yellow	E	5	Yellow	-5VDC
+12VDC	Orange	F	6	Orange	+12VDC
	Key	H	7	Key	
Coin Counter 2	Brown-Red	J	8	Brown	Coin Counter 1
	N/C	K	9	N/C	
Speaker-	Brown-Gray	L	10	Red-Gray	Speaker +
	N/C	M	11	N/C	
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 Shoot/Block	Violet-Yellow	Z	22	White-Yellow	1 Shoot/Block
2 Pass/Steal	Violet-Green	a	23	White-Green	1 Pass/Steal
2 Turbo	Violet-Blue	b	24	White-Blue	1 Turbo
Not Used	Violet	c	25	White-Violet	Not Used
	N/C	d	26	N/C	
	N/C	e	27	N/C	
Ground	Black	f	28	Black	Ground
<b>SOLDER SIDE</b>			<b>COMPONENT SIDE</b>		

WIRING DIAGRAMS

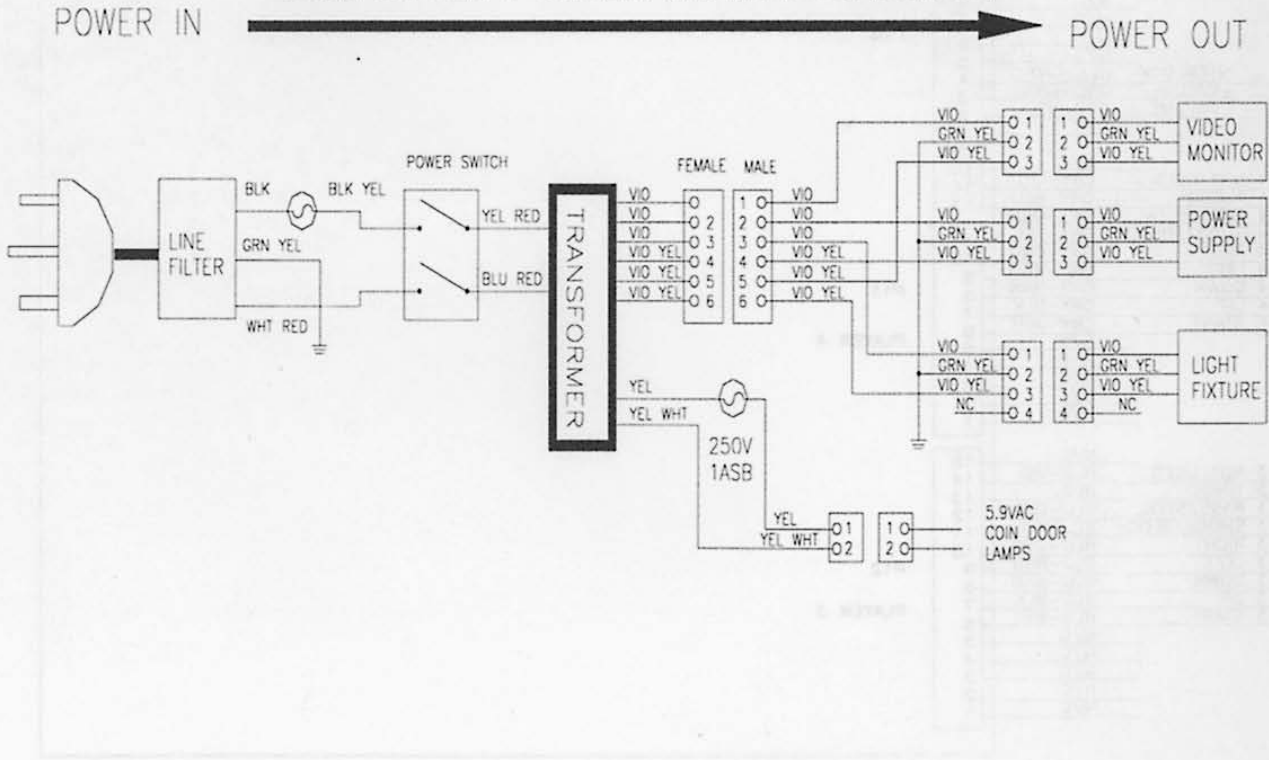
# INTERBOARD WIRING



# POWER WIRING AND TRANSFORMER DIAGRAM

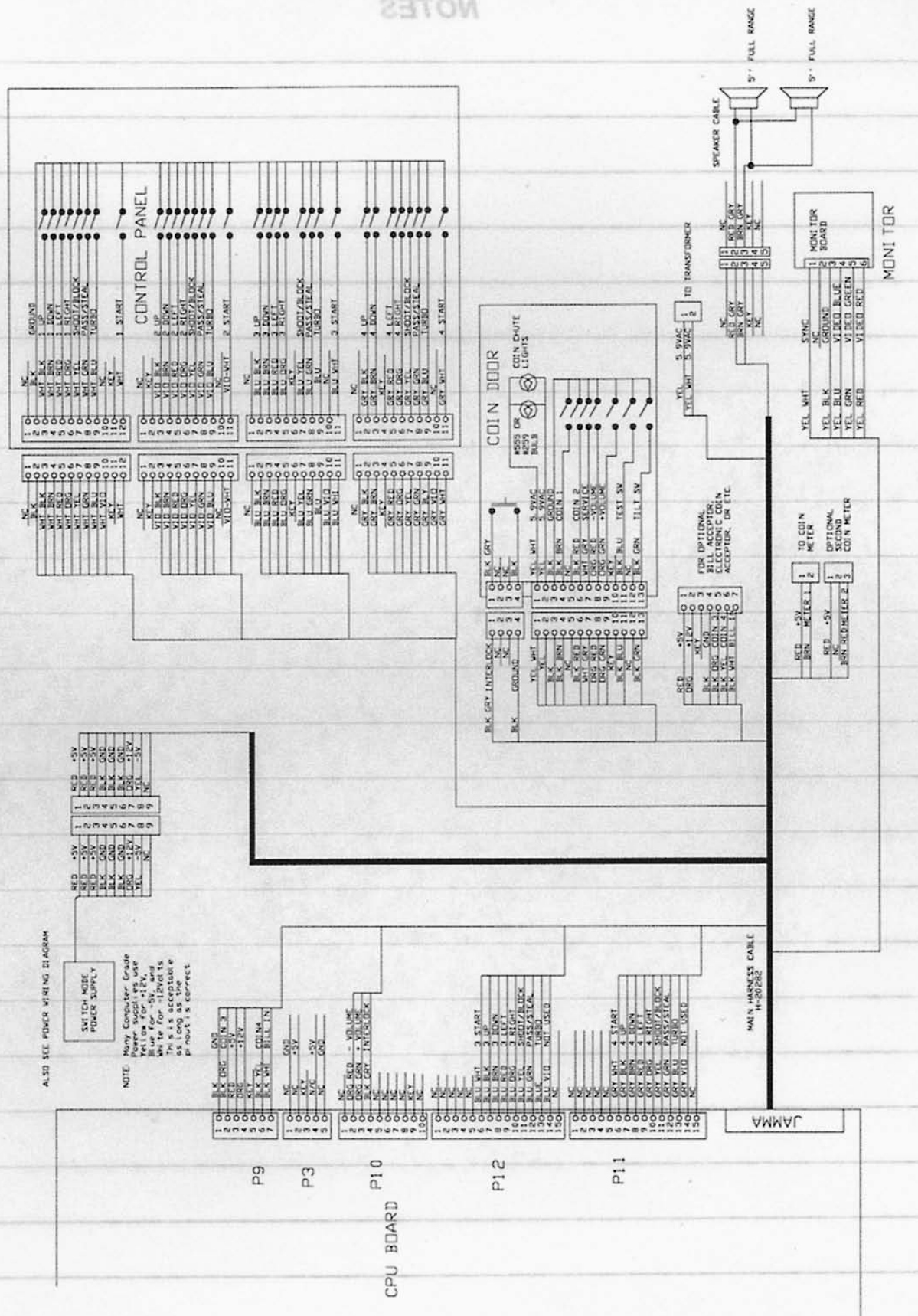


## SIMPLIFIED POWER WIRING DIAGRAM





# CABINET WIRING DIAGRAM



# NOTES

Blank lined area for notes, featuring horizontal ruling lines across the page.

## CONTROL PANEL WIRE COLOR LIST

<u>PLAYER ONE</u>		<u>PLAYER TWO</u>	
<u>FUNCTION</u>	<u>WIRE COLOR</u>	<u>FUNCTION</u>	<u>WIRE COLOR</u>
Start	White	Start	Violet-White
Up	White-Black	Up	Violet-Black
Down	White-Brown	Down	Violet-Brown
Left	White-Red	Left	Violet-Red
Right	White-Orange	Right	Violet-Orange
Shoot/Block	White-Yellow	Shoot/Block	Violet-Yellow
Pass/Steal	White-Green	Pass/Steal	Violet-Green
Turbo	White-Blue	Turbo	Violet-Blue

<u>PLAYER THREE</u>		<u>PLAYER FOUR</u>	
<u>FUNCTION</u>	<u>WIRE COLOR</u>	<u>FUNCTION</u>	<u>WIRE COLOR</u>
Start	Blue-White	Start	Gray-White
Up	Blue-Black	Up	Gray-Black
Down	Blue-Brown	Down	Gray-Brown
Left	Blue-Red	Left	Gray-Red
Right	Blue-Orange	Right	Gray-Orange
Shoot/Block	Blue-Yellow	Shoot/Block	Gray-Yellow
Pass/Steal	Blue-Green	Pass/Steal	Gray-Green
Turbo	Blue	Turbo	Gray-Blue

**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.

\* Use only MIDWAY Manufacturing authorized components and parts. Failure to do so will void warranty and may result in incorrect and/or unsafe operation.

\* 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**

**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.

**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.

**NOTICE**

When MIDWAY ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game does not contain an FCC sticker, call MIDWAY immediately.

**NOTICE**

No part of this publication may be reproduced by any mechanical, photographic, or electronic process, or in the form of a phonographic recording, nor may be transmitted, or otherwise copied for public or private use, without permission from the publisher.

**FOR SERVICE: CALL YOUR AUTHORIZED MIDWAY DISTRIBUTOR.**

**MIDWAY MANUFACTURING COMPANY  
3401 N. CALIFORNIA AVE.  
CHICAGO, IL 60618**

Entire contents of this manual copyright © 1995 Midway Manufacturing Company, INC. All Rights Reserved.  
OPEN ICE and MIDWAY are trademarks of Midway Manufacturing Company.