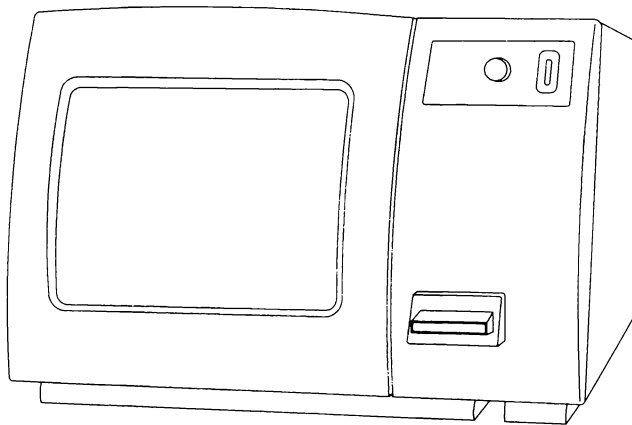


# TOUCH MASTER



## COUNTERTOP STYLE CABINET



### Operations Manual Includes

- Operations & Adjustments • Testing & Problem Diagnosis • Parts Information • Wiring

The manufacturer intends that this game is to be operated for amusement purposes only and not in contravention of any federal, state or local law or regulation of the United States or any foreign country governing gaming devices. All operators of this game are responsible for its operation in accordance with such laws and regulations. The manufacturer's factory settings for this game may require adjustment in order to comply with laws applicable in an operator's specific jurisdiction. It is the operator's responsibility to determine whether adjustments are necessary and, if they are, to make the appropriate adjustments prior to operating the amusement game.

Tournaments, contests and sweepstakes are heavily regulated, and laws vary from state to state. Most states require the posting of rules. Consult legal counsel prior to engaging in any prize promotion or tournament. Failure to comply with state regulations may result in criminal and civil liability. Neither Midway Games Inc., nor its affiliates, agents or employees are responsible for the actions of any party using the TouchMaster game as part of a prize promotion, or tournament. Any attempt by any individual to state or imply that Midway Games Inc., or affiliates, or their employees, approve of, authorize, sponsor, or co-sponsor any specific prize promotion or tournament will be prosecuted to the full extent of the law.

MIDWAY GAMES INC.  
3401 North California Avenue  
Chicago, Illinois 60618

# TOUCH MASTER<sup>TM</sup> COUNTERTOP

## SECTION ONE



### Operation

**NOTICE**

Information in this manual is subject to change without notice. MIDWAY reserves the right to make improvements in equipment function, design, or components as progress in engineering or manufacturing methods may warrant. Field installed upgrade kits may also change the operating sequence or functions.

## **SAFETY NOTICES**

The following safety instructions apply to all game operators and service personnel. Specific warnings and cautions will be found throughout this manual. Read this page before preparing your game for play.

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**TRANSPORTING GAME.** This game contains glass and fragile electronics. Protect touch screen and CRT and avoid rough handling. Transport this game securely. Do not move this game with the power on.

**POTENTIAL SHOCK HAZARD.** This video game system does not utilize an isolation transformer. No isolation exists between the cabinet AC system and the external AC line.

**PROPERLY GROUND THE GAME.** To avoid electrical shock, 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 different line cord, install a "cheater" plug, or cut off the ground connection on the line cord.

**DISCONNECT POWER DURING REPAIRS.** To avoid electrical shock, turn off the power switch and disconnect the cord from the AC power source before removing or repairing any part of the game. After servicing any parts of the unit, be sure that all of the ground wires are secure before restoring power.

**USE PROPER FUSE.** To avoid electrical shock, all replacement fuses must match the original fuse in fuse type, voltage rating, and current rating. Replacement circuit breaker must also have identical ratings.

**HANDLE CRT AND TOUCH SCREEN WITH CARE.** The touch screen and CRT are both made of glass. If you drop a CRT and it breaks, it will implode! Shattered glass can fly eight feet or more from implosion.

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

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Any tournaments using the TouchMaster™ game are not sponsored by, associated with, or authorized by Midway Games Inc. or its affiliates.

## **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 commonly 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. seizure 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 any of 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

## 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 21" (53.3 cm)	83 Lbs (37.7 kg.)	Countertop Video Game
Depth 17" (43.2 cm)		
Height 15.5" (39.4 cm)		

### Equipment Characteristics

<u>Video Display Monitor</u>	<u>Audio System</u>	<u>Currency Acceptors</u>
Standard Resolution RGB 13" (34 cm) CRT with Touch Screen	Digital Monaural 4" (10 cm) Full Range Speaker	Standard 1 Coin Mechanism Door DBV ready or 2 Coin Door options 1 Coin Counter

### Game Characteristics

<u>Player Variables</u>	<u>Operator Variables</u>	<u>Diagnostics</u>
Choice of Several Different Games 1 or 2 players per game High Score Recognition	Coinage, Difficulty, Graphics, Statistics Audits, Time, Volume	Automatic Power-Up Self-Test Manual Multi-Level Menu System Touch Screen Calibration

---

## MAINTENANCE

This game uses the same surface for video display and player controls. Because players use their fingers, the entire unit will quickly become covered with fingerprints. We recommend that you clean the game frequently to ensure maximum customer interest.

**⚠ CAUTION** USE ONLY ISOPROPYL ALCOHOL OR WARM WATER AS CLEANING SOLUTIONS. DO NOT USE PRODUCTS WITH AMMONIA, BLEACH, LEMON, VINEGAR, TSP (TRI-SODIUM PHOSPHATE), OR ANY ABRASIVE INGREDIENTS.

#### ◆ Glass surfaces

It is not necessary to switch off power to the game to clean the glass. Apply a mild glass cleaner to a clean cloth or sponge, then use this to wipe screen. **Do not apply the cleaner directly on the glass!** Liquids could drip down into Touch Screen circuits and cause erratic game operation.

#### ◆ Cabinet

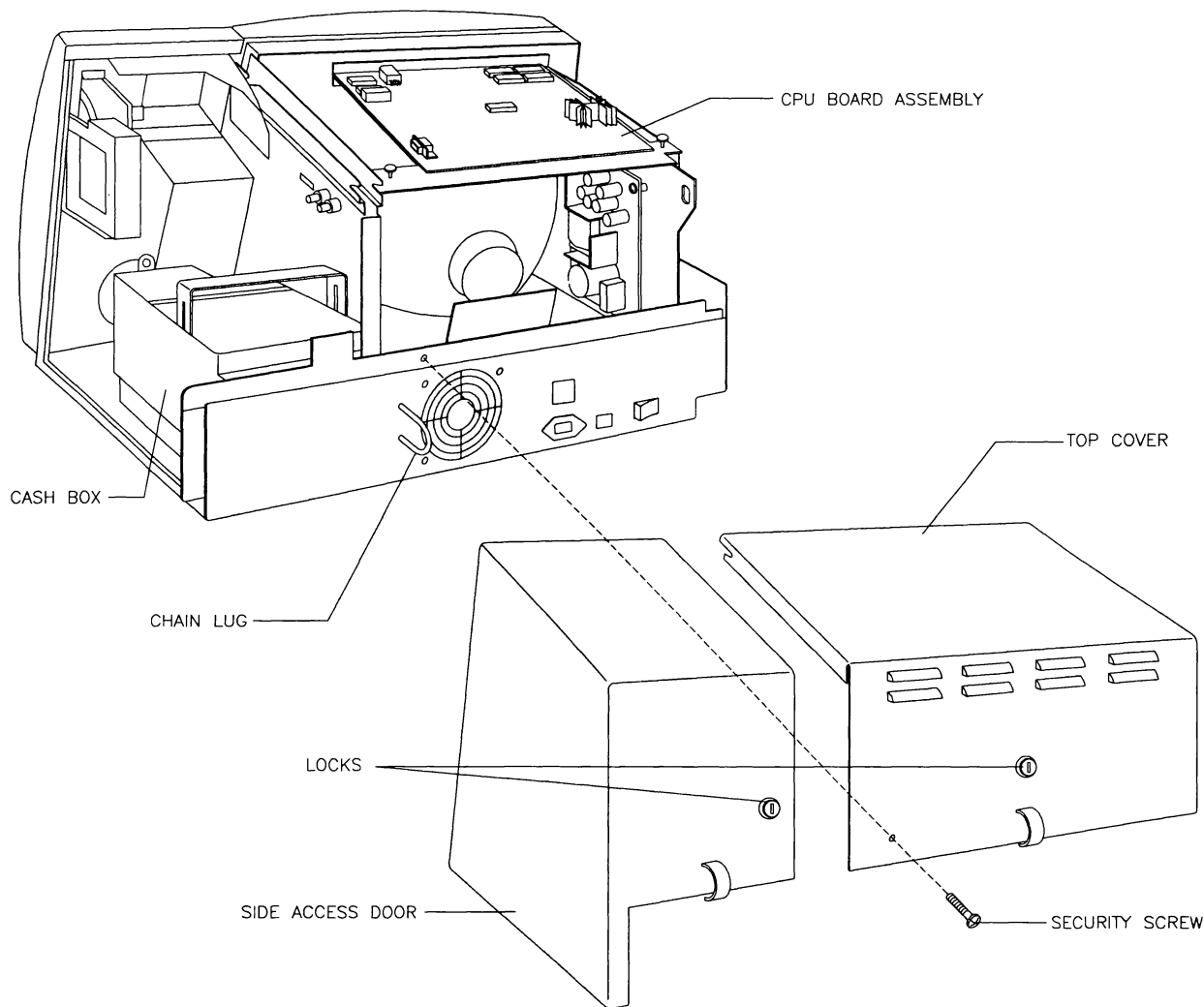
Use only non-abrasive cleaners to avoid damaging game graphics. Apply the cleaner to a clean cloth or sponge, then use this to wipe screen clean. **Do not apply the cleaner directly on the cabinet!** Liquids could enter the cabinet, damaging electronic circuits and voiding the warranty.

#### ◆ Calibration

Each time the game is cleaned, screen calibration should be checked for accuracy. Use the Calibration Test steps to determine if recalibration is required (refer to Calibration in this section).

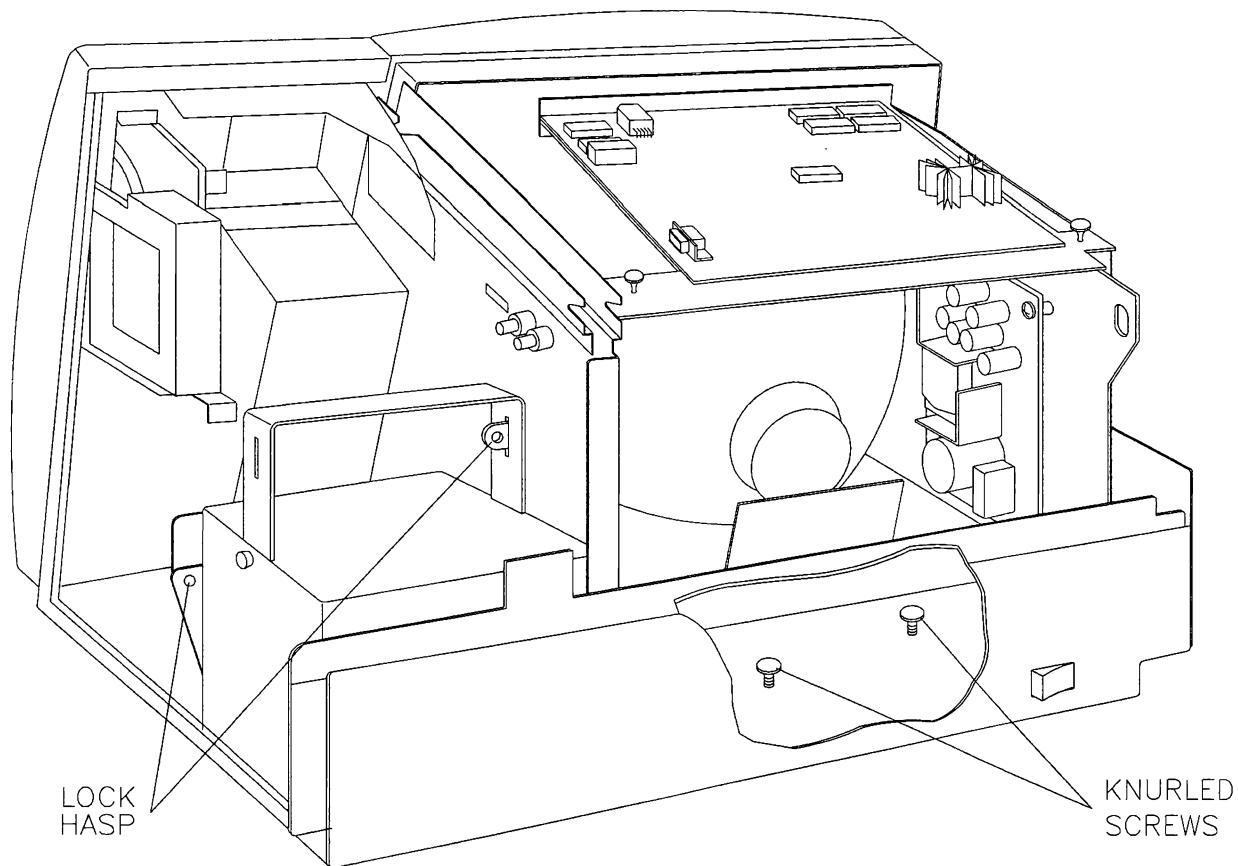
## INSTALLATION AND INSPECTION

1. Remove all items from the shipping container (the line cord is stored in the bottom of the box). Inspect the exterior of the cabinet and the front glass of the CRT for any signs of damage.
2. Remove the keys from the steel chain lug on the back of the game cabinet. Remove the security screw (directly above the chain lug) to permit top cover removal. Save this screw for reinstallation.
3. Insert a key into the top cover lock (right side of cabinet). Turn the key fully clockwise and hold (the lock will re-latch if not held). Grasp the hook at the lower edge of the door and pull slightly down and back approximately 3 inches (7.5 cm.). Lift the cover up and away from the unit. Set in a safe place.
4. Insert the key into the side access door lock (left side of cabinet). Turn the key fully clockwise and hold (the lock will re-latch if not held). Grasp the hook at the lower edge of the door and pull slightly down and back as before. Tilt the top of the door to the left and remove. Set in a safe place.
5. 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.



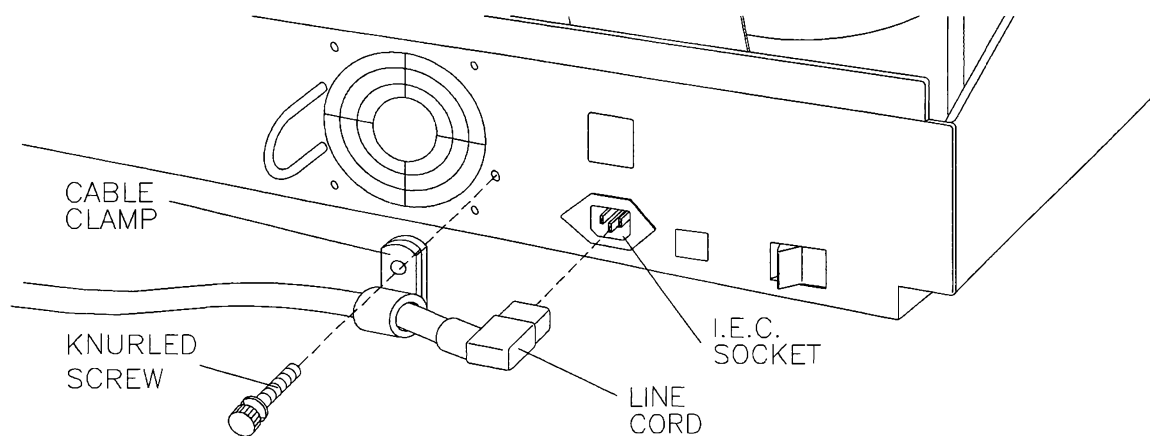
### COVER AND DOOR REMOVAL

6. Extra padlocks may be installed to lock the vault door opening and the cash box. (These locks are not provided with game.) Install one padlock through the hasp in each location shown below.
7. Locate the two knurled plastic screws at the bottom of the case under the monitor as illustrated. These screws adjust the amount of mechanical friction applied to the rotating base of the cabinet. Hand tighten each screw just enough to prevent game swivel when the screen is touched.



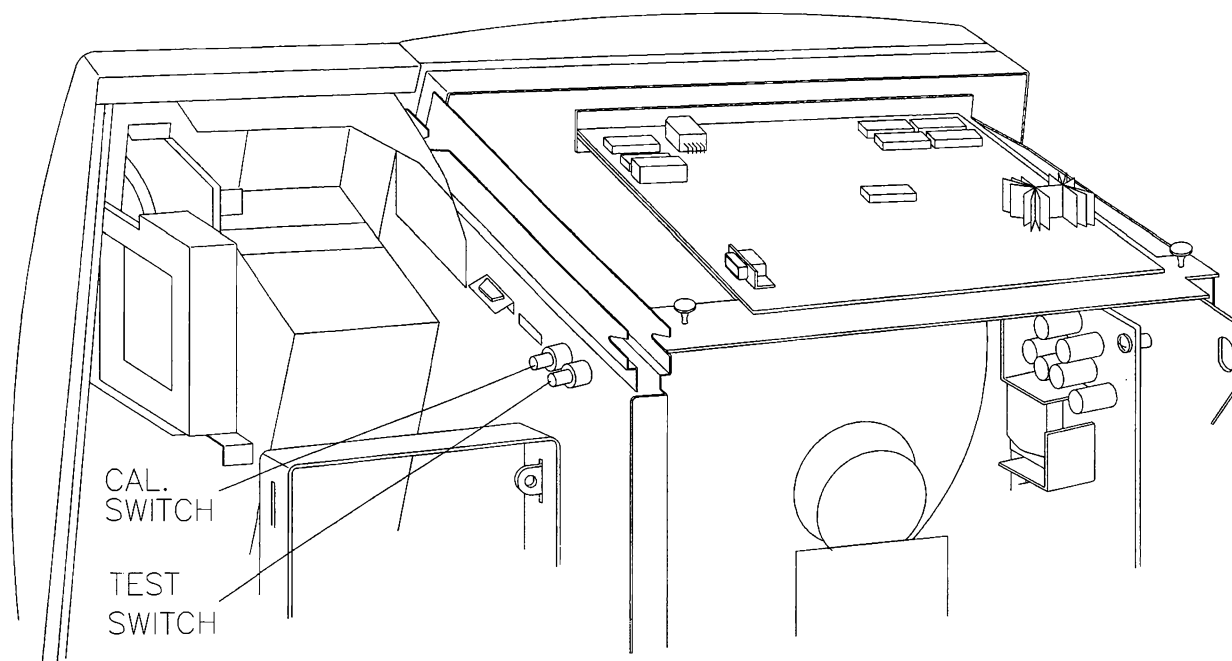
#### HASP LOCATIONS AND SWIVEL ADJUSTMENTS

8. Match the holes on the I.E.C. plug with the prongs in the receptacle and push firmly to seat the line cord. Hold the cord flat against the cabinet and secure it to the back of the unit using the cable clamp and knurled screw provided in the spare parts kit.



#### LINE CORD INSTALLATION

9. Plug the line cord into a grounded (3-terminal) AC wall outlet. Switch ON the game, using the power switch located on the back of the game. The game will power up and begin self-diagnostics. If no errors are found, the game will automatically enter its "attract" mode of operation.
10. Press and release the CAL. switch pushbutton to optimize the monitor screen touch sensors (see the illustration below). Follow the screen instruction to calibrate and verify the touch screen system. Refer to Calibration Instructions later in this same section for more detail.
11. Press and release the TEST switch pushbutton to enter the menu system. Choose the menu screens needed to set the game variables and verify machine operation (described later in this same section).



#### **CONTROL SWITCH LOCATIONS**

12. Reinstall the side access door. Align the hooks at bottom of the door with the hooks along the bottom edge of the chassis. Engage the hooks and swing the door toward the cabinet. Align the right edge of the top with the edge of bulkhead (bulkhead edge fits inside door edge). Insert the key into the side access door lock (left side of cabinet). Turn the key fully clockwise and hold (the lock will re-latch if not held). Push the door forward and up until it seats fully against the front and top of the cabinet. Release the key and make sure the door is locked securely. Remove the key.
13. Reinstall the top cover assembly. Align the bulkhead edge with the left edge of the top cover assembly (bulk head edge fits inside cover edge). Align the right edge along the game inside the groove at the bottom edge of the top cover assembly. Insert a key into the top cover lock (right side of cabinet). Turn the key fully clockwise and hold (the lock will re-latch if not held). Push the door forward and up until it seats fully against the front and top of the cabinet. Release the key and make sure the door is locked securely. Remove the key.
14. Allow the system to operate for several hours before attempting any volume changes, monitor adjustments, etc. Install the security screw and tighten.
15. Once the game has been installed in its intended location, chain or wire cable may be attached the rear panel chain lug and a convenient anchor point. Leave enough slack to allow turntable rotation.

## **GAME FEATURES**

TouchMaster™ has many different games. Each game can accommodate one or two players. Update the software frequently to give players the latest games, and interesting new additions to the existing ones.

Operators can adjust the characteristics of each game to suit the proficiency of the players. Graphics may be changed to alter the game appearance, the speed of the games may be increased or decreased, etc. This flexibility increases the entertainment value of these games for those who play them often.

Some versions include different games. International games permit play in several widely spoken languages. Contact your authorized distributor to discover which games are available for your location.

Games are classified according to the type of player challenge. Here are some representative examples of games found in most TouchMaster models.

### **DEXTERITY - Games that test the player's eye-hand coordination**

#### **Hot Hoops™**

Touch the player to make him shoot at a moving basket. Surprise objects block shots at random.

### **PRESTIDIGITATION - Video versions of popular sleight-of hand tricks**

#### **Shell Shock™**

Pick the correct item that covers the pea. The shuffle speeds up as your skills improve.

### **TRADITIONAL - Electronic versions of old favorites**

#### **Solitaire™**

Use all the cards in the deck to build up the four suit stacks from ace to king.

### **MATHEMATICS - Test your ability to add different combinations of numbers**

#### **Triple Elevens™**

Assemble three groups of numbers whose total is eleven. How fast can you calculate sums?

### **LANGUAGE - Display word recognition skills**

#### **Wordz™**

Guess the phrase by picking letters to complete each word. Spelling counts, just like in school.

### **MEMORY - Demonstrate your powers of mental recall**

#### **Spotlight™**

Try to remember the patterns as they keep changing. Difficulty increases as your skill improves.



# 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 hardware and game EPROMs. If any of the individual tests fails, then an error message will be displayed for each test. The message will be displayed for 3 seconds or until any button is pressed. If a fatal error (for example, a touch screen controller fault) is detected, then the message will remain on the screen until the fault is resolved. Other errors (key problems, low battery, etc.) may be reported, but the program will load and permit game play.

- \* Press the CAL. switch pushbutton at any time to adjust or verify the touch screen operation.
- \* Press the TEST switch pushbutton at any time to activate the menu system (audits, adjustments, etc.).
- \* If no pushbuttons are pressed, the system will quickly complete all tests then load and run the game.

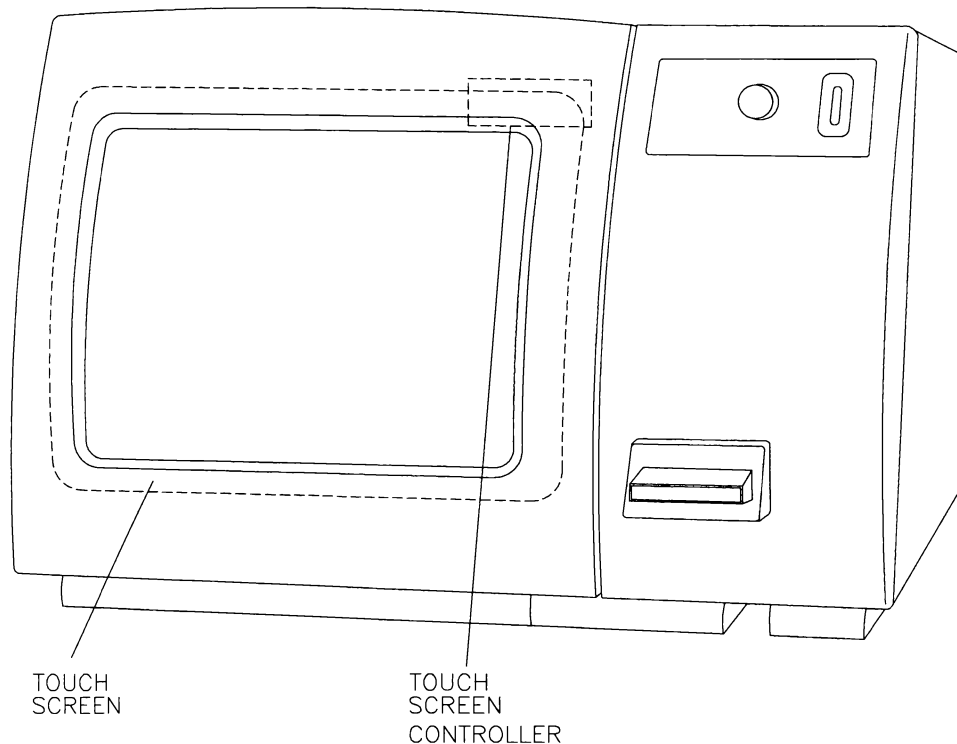
Once all power-up tests have been completed, the game goes into its "attract mode". Game choices are alternated with scenes and sounds from a typical game in an endless pattern until game play starts.

Insert currency to start the game. Players select a game and choose game variables. Play begins immediately. The game will progress until time is exhausted or the player exits from the selected game. If no more play is required, the game automatically returns to the "attract mode".

The operator may insert his own message to inform players of new games, upcoming events, etc. This message will then appear as one of the features displayed in the "attract mode".

## PLAYER CONTROLS

This game uses an on-screen touch sensor on the CRT face to control all the player moves and choices. Players touch the screen for one second in any active area to enter information. Touching inactive areas of the screen will produce no response. The touch sensor responds to only one active input at a time.



**LOCATION OF TOUCH SCREEN COMPONENTS**

# OPERATOR CONTROLS

## CABINET SWITCHES

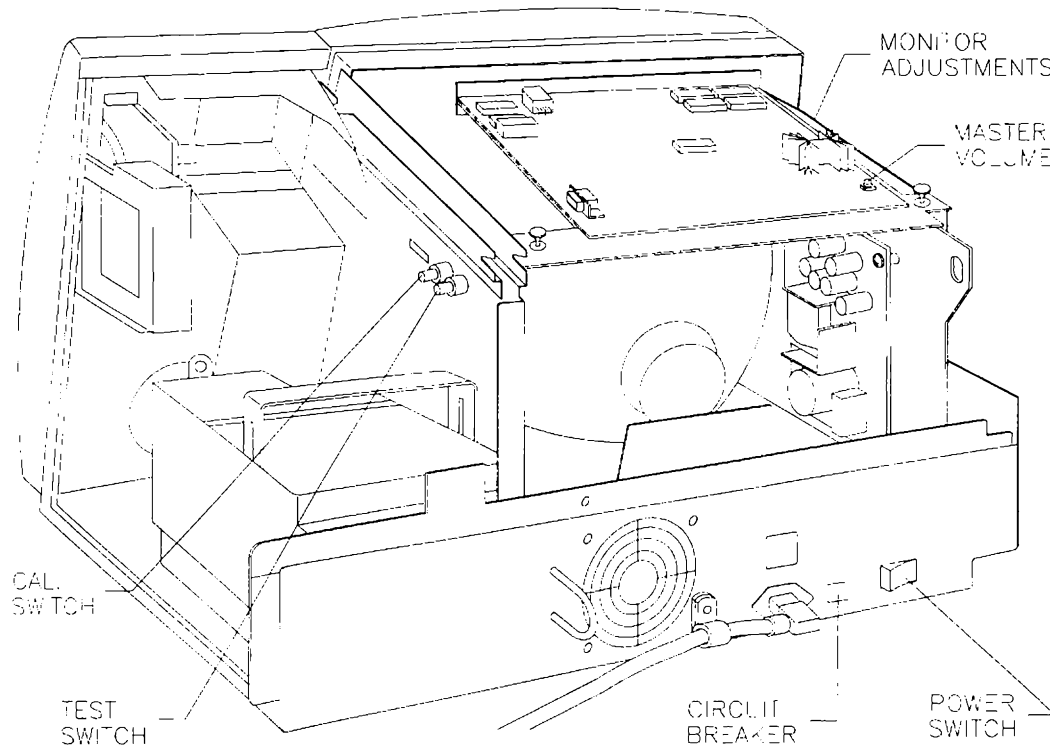
The external switches are located on the rear of the game near the line cord.

- ◆ **Power Switch**  
The **Power Switch** turns off the game during service. It does not reset the game variables.
- ◆ **Circuit Breaker**  
The **Circuit Breaker** protects the game from fault conditions. It does not reset the game variables.

## CONTROL SWITCHES

The internal switches are located behind the coin door. They are attached to the cabinet bulkhead.

- ◆ **Test Switch**  
The **Test** push-button switch enters the menu system. Use this switch to set game characteristics. A menu Exit command allows you to leave the menu system and return to normal game operation.
- ◆ **Calibrate Switch**  
The **Calibrate** push-button switch enters the Touch Screen adjustment and verification routine. After the routine steps have been completed, normal game operation returns automatically.
- ◆ **Master Volume Control**  
The **Master Volume Control** (on the CPU Board) sets the maximum sound level for the game. The game volume is adjusted from the diagnostic and sound test screens in the menu system.
- ◆ **Monitor Remote Adjustments** (inside cabinet on the side near the front outside corner of the CRT)  
The **Monitor Remote Adjustment Board** sets the video display for optimum viewing.



**CABINET AND CONTROL SWITCH LOCATIONS**

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

The area at the top center of each screen displays the current menu title.

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

The bottom of the screen is reserved for control functions (increase, decrease, next, return, etc.).

## ORGANIZATION

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

Main Menu screen items fall into three categories: audits, options and tests.

Audits provide the operator with information about earnings and the performance of each game.

Option items permit the operator to change the game and customize or return to factory defaults.

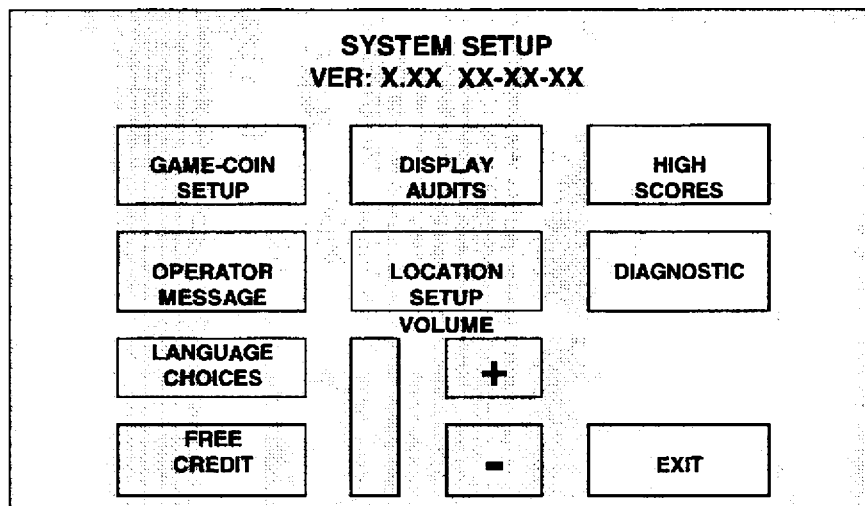
Tests are useful to verify proper operation of the equipment.

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.

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.

Touch the screen to highlight an item on any menu. Only one highlighted item can be selected at a time. Choose the indicated box to modify the highlighted item. To restore the game to normal play, touch the RETURN box on each sub or detail menu and then select the EXIT box at the Main Menu.

Press and release the TEST pushbutton to enter the menu system. The Main Menu will appear on the screen, similar to the one below. Some TouchMaster versions may include different boxes than those illustrated in the example. After completing any task, you must return to this screen to restore game play



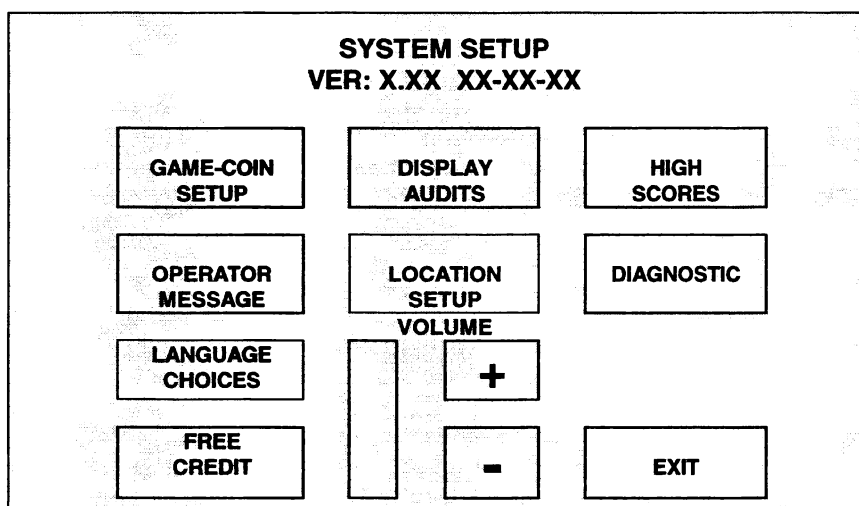
TYPICAL SYSTEM SETUP SCREEN

## TOUCH KEY LOCATION ADJUSTMENT SYSTEM

The Touch Key™ location adjustment feature enables individuals to change certain game characteristics without using a key to remove the cabinet side access door. A Personal Identification Number (PIN) is entered into the Touch Key access screen to permit local changes. This allows attendants or other designated employees to vary loudness, insert new messages, reset scores, etc., without having keys for the cabinet. The PIN can be altered as often as needed to prevent unauthorized changes to games.

**TOUCH KEY PROGRAMMING** Use these steps to activate the TOUCH KEY system for future operation:

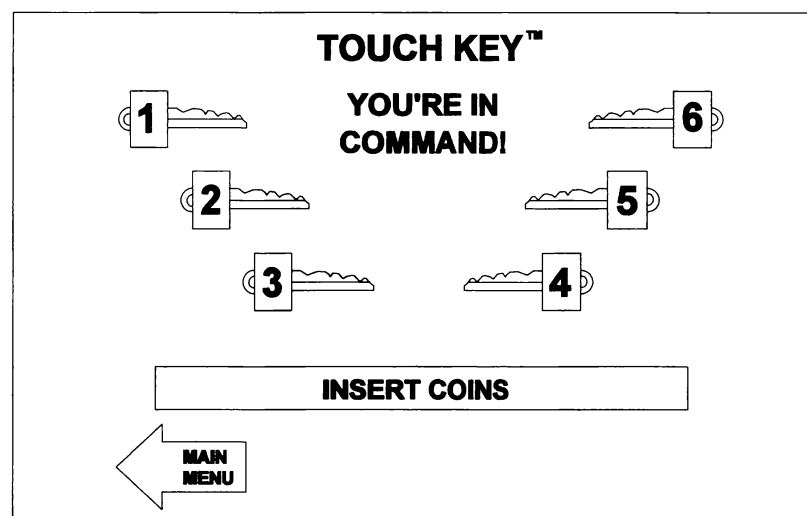
1. Press and release the TEST switch pushbutton to enter the menu system. Touch the LOCATION SETUP box to begin the process. Select LOCATION NAME to identify the game environment.
2. Enter letters one at a time to spell out the establishment, city, country or other location identification. Use arrow boxes, DELETE, or SPACE to edit the information. Press RETURN to save this name and return to the LOCATION SETUP menu screen. *NOTE: Omit this step if a name is not required.*
3. The MACHINE NUMBER screen is used to assign a game ID number. Touch the MACHINE NUMBER box from the LOCATION SETUP menu screen to enter the game number. Enter a unique number to distinguish this particular machine from others, especially if they have the same Location Name. Press RETURN to save this number and go back to the LOCATION SETUP menu screen. *NOTE: Omit this step if only one game is in use at each separate location. Machine Numbers can be entered later.*
4. The TOUCH KEY screen is used to select features for attendant access. Select TOUCH KEY SETUP from the LOCATION SETUP menu screen to enter the access code number and turn on features. Press the TOUCH KEY ENABLE box to begin, then touch any combination of keys to set the PIN code (enter more keys as required to edit). The feature boxes to permit or block changes for Touch Key access. Press RETURN to save this information and go back to the LOCATION SETUP menu screen. Press RETURN again to go back to main menu, then EXIT to the game. *NOTE: You may DISABLE or ENABLE this access at any time without losing the PIN code or feature selections on this screen.*
5. Test the TOUCH KEY system before releasing a game for use. From the main Attraction screen menu, touch the MIDWAY symbol at the bottom of the screen. *The TOUCH KEY access screen appears only if the system is enabled.* Touch the keys in the proper sequence to enter the chosen PIN code, then turn off or on features as desired. EXIT to the game and verify these changes.



TYPICAL SYSTEM SETUP SCREEN

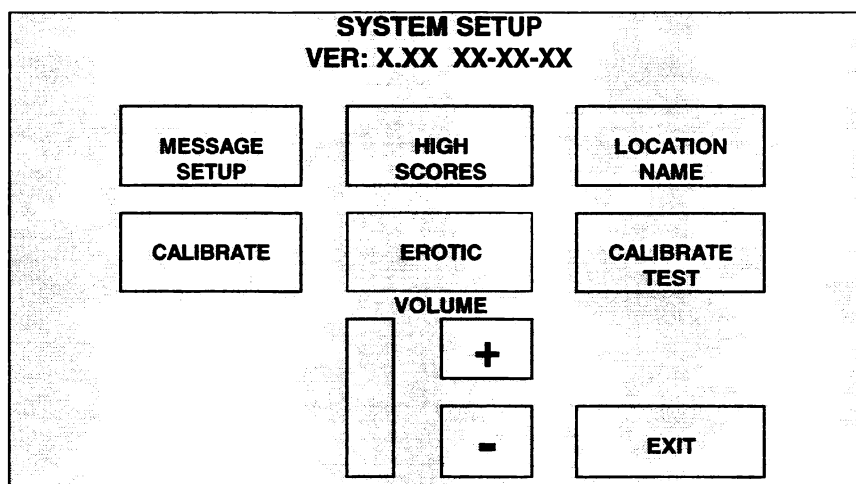
**TOUCH KEY USE** Location adjustments can be turned over to designated employees using this procedure:

1. Explain the conditions and policies governing when changes are to be made (i.e., lower volume levels after a certain time of day, periods of free or reduced cost play, messages advertising tournaments, etc.). Describe any situations when certain game scores might need to be cleared or reset.
2. Give the chosen individuals the PIN code and instruct them to memorize it. Tell them how often the code will be changed, and who to contact if their code is no longer functional. Show that the code will not function if the key system is disabled, but the game will continue to operate and play normally.
3. Demonstrate the location adjustments. Press the MIDWAY symbol on the Attraction screen menu. Touch the necessary keys to enter the PIN code. Explain effects of each feature and show examples of how each is used. Return to the game and show individuals the actual changes that have occurred.



**TYPICAL TOUCH KEY ENTRY SCREEN**

4. Demonstrate the touch screen operation. Describe incorrect tracking and what happens if the screen is out of calibration. Show how to calibrate the touch screen, and how to test the calibration tracking.
5. Have employees enter codes and make changes to verify that they understand the Touch Key system. ***You are responsible for enforcing all local, state, and federal regulations concerning this game.***



**TYPICAL TOUCH KEY SYSTEM SETUP SCREEN**

## LOCATION SETUP

The operator can use this menu screen to identify games for auditing purposes, to setup keyless entry, and to assign a machine serial number. A SPEED button controls how fast the message information scrolls across the bottom of the screen. Press this button to change the rate of message movement.

## LOCATION NAME

Press the LOCATION NAME button to open the Location Name entry screen. Several buttons on this screen control text entry:

- CLEAR** Deletes all characters from the screen simultaneously. Used to erase old information.
- NEXT MENU** Advances to the next information screen. Saves the location and ID number in memory.
- SHIFT** Changes the letter entry boxes to standard symbols. Use for math, punctuation, etc.
- SPACE** Enters a space between characters. Used to separate words and sentences.
- ARROWS** These boxes control the left and right position of the cursor on the screen.

<b>ENTER LOCATION NAME:</b>												
<hr style="width: 50%; margin: 0 auto;"/>												
CLEAR			RETURN			SPACE		DELETE		SHIFT		
0	1	2	3	4	5	6	7	8	9	←	→	
A	B	C	D	E	F	G	H	I	J	K	L	M
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

**TYPICAL GAME LOCATION SCREEN**

This is a convenience feature. The location and machine identification have no effect on game play. There is one line available for the name of your location. This line can be up to 24 characters in length. The TouchMaster™ will automatically recall this information if the game audit tables are printed out.

**Example:** In areas where there are several TouchMasters in use, some locations will have two or more machines with the same software. Without identifying machines, it can be difficult for owners or operators to determine why some machines have more players or higher earnings. Entering a unique identity for each machine solves this problem. **NOTE:** This information is optional and does not have to be used.

Suppose the name of an establishment with two TouchMasters is NEW YORK BAR & GRILL. To enter the identity of each unit, proceed as follows: Press the TEST pushbutton to display the Menu System. Choose LOCATION SETUP to get to the GAME LOCATION screen (a typical screen is illustrated above). A flashing line indicates the active screen area where the first character of the information will start.

Touch CLEAR to empty the location memory. Touch the letters N E W in sequence to enter the first word. Touch SPACE, then the letters Y O R K to complete the location. Touch SPACE, then the letters B A R. Touch SHIFT to display symbols, then touch &. Touch SHIFT again to return to letters. Touch G R I L L to complete the name. Touch ← or → as needed to correct any errors. Touch RETURN when the entire location name is complete to save the text and go back to the previous menu.

### **TOUCHKEY SETUP**

The Touch Key™ location adjustment feature enables individuals to change certain game characteristics without using a key to remove the cabinet side access door. A Personal Identification Number (PIN) is entered into the Touch Key access screen to permit local changes. This allows attendants or other designated employees to vary loudness, insert new messages, reset scores, etc., without having keys for the cabinet. The PIN can be altered as often as needed to prevent unauthorized changes to games.

The Touch Key™ location adjustment procedure has been described in detail elsewhere in the manual. Refer to TOUCH KEY LOCATION ADJUSTMENT SYSTEM in this section for setup and user instructions.

### **SERIAL NO. SETUP**

The Serial No. Setup menu screen is very similar to the Location Name Entry menu screen shown on the previous page. Since this is a number entry/display screen, only numerical characters are allowed.

Touch the numbers in sequence to enter a four digit control number (for instance, 0 0 0 1). If there is already a number shown and you wish to change it, touch CLEAR to empty the machine number memory. Touch RETURN to save the data. Touch EXIT to leave the menu system and prepare for game play.

Repeat this process for each game, entering a unique machine number. Each machine now has a separate identity at one location. Keep a master list of machines for future reference.

**NOTE: Applicable law may dictate changes in the TouchMaster™ game compliment, and may also regulate the appearance, bonus awards, language, or other variables on a game-by-game basis. The example here shows how operators might use these utilities to customize the TouchMaster.**

### GAME-COIN SETUP

GAME-COIN SETUP allows operators to change variables, such as game difficulty and appearance, and to set the cost required for one play. Game variables may also be reset to their factory default settings.

Touch the GAME-COIN SETUP box to view the GAME ADJUSTMENTS menu. Choose the variable to be changed by touching it on the monitor screen. An item can be changed only once it is highlighted.

- RESET** Returns variables to factory default values. *This cancels all on screen custom settings.*
- +** Raises the value of the variable until the maximum value is reached.
- Lowers the value of the variable until the minimum value is reached.
- NEXT** Saves the current on screen values and advances to additional Game Setup screens.

GAME ADJUSTMENTS			
GAME	CREDITS	TIME	GRAPHIC
HOT HOOPS	1	MED	-
SHELL SHOCK	1	MED	-
SOLITAIRE	1	MED	-
RIPLEY TRIVIA	1	MED	-
WORDZ	1	MED	-
TRIPLE ELEVENS	1	MED	TILE

RESET	-	+	NEXT
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**TYPICAL GAME ADJUSTMENTS SCREEN**

Example: Make adjustments to the TRIPLE ELEVENS™ game in the following manner. Press the TEST pushbutton to display the Menu System. Choose GAME - COIN SETUP to get to the Setup Sub Menu, then choose GAME SETUP box to go to the first of the GAME ADJUSTMENTS screens (a typical GAME ADJUSTMENT screen is illustrated; your TouchMaster may have a different compliment of games).

Touch the CREDITS column box next to the TRIPLE ELEVENS game name to highlight this variable. Touch the + or - box to vary the number, or choose "OFF" to disable this game. At least one game must remain active. To set game speed, touch the TRIPLE ELEVENS TIME column box. Touch the + or - box to vary the length. To change game appearance, touch the TRIPLE ELEVENS GRAPHIC column box. Use the + and - boxes as before. Touch NEXT to save the changes and go to other screens. Make other changes as needed. Select RETURN to go to the main menu, then touch EXIT to begin game play.

Use this same sequence of steps to examine or change the play characteristics of the other games in the TouchMaster. Keep in mind that some adjustments will not apply for certain games. For instance, the GRAPHIC box for HOT HOOPS™ may be highlighted, but the + or - boxes will have no effect because no choices are available for the on screen appearance of the basketball players or the basketballs.

There are two options to restore the previous game settings. RESET reloads the factory-programmed names and scores in memory. CLEAR removes all names and sets all scores to zero. Choose RESET only when you intend to simultaneously restore factory default values to every game's high score table.



## COINAGE SETUP

Game Coinage allows the operator to set individual revenue characteristics. Choose the variable to be changed by touching it on the monitor screen. Adjustments can be made only if an item is highlighted.

### RESET

Returns variables to factory default values. This cancels all on screen custom settings.

### RETURN

Saves the current on screen values and returns to the previous Sub Menu.

COINAGE SETUP			
	COINS	CREDITS	METER PULSES
MECH COIN 1	1	1	1
MECH COIN 2	0	0	0
D.B.V. INPUT	1	1	4
ELEC COIN 1	0	0	0
ELEC COIN 2	0	0	0
ELEC COIN 3	0	0	0
ELEC COIN 4	0	0	0

**TYPICAL GAME COINAGE SCREEN**

Each line item on the screen represents one input signal from the coin door. The screen above is correct for a TouchMaster™ with one mechanical coin mechanism and one dollar bill validator installed.

Example: Suppose a different coin mechanism must be installed to accept another type of coin than was previously used. Turn off the game power and open the Coin Door. Remove the existing mechanism and replace it with the alternate unit. After the other mechanism has been mounted and connected to the game electronics, the game must be matched to the new currency values. Turn on the game. Verify the Touch Screen operation and the coin mechanism switch functions. Check that all games are present.

Make adjustments to the game Currency Acceptors in the following manner. Press the TEST pushbutton to display the Menu System. Choose GAME - COIN SETUP to get to the Setup Sub Menu, then choose the GAME COINAGE box to go to the first of the COINAGE SETUP screens (a typical game COINAGE screen is illustrated; your TouchMaster may have a different compliment of Currency Acceptors).

Select MECH COIN 1 by touching the screen box. Touch the COINS box to vary the number. Touch the CREDITS box to vary the amount of credit for each coin. Touch METER PULSES to match the meter indication to the new values for coins and credits. Choose RETURN to save the new values and go back to the Sub Menu. Select the RETURN box to go to the main menu, then touch EXIT to restart the game.

Use this same sequence of steps to examine or change the currency characteristics of the other acceptors in the TouchMaster. Keep in mind that some adjustments will not apply for certain games. For instance, you might touch the CREDITS box for ELEC COIN 4. The quantity changes, but it will have no effect if there is no such device installed in the game. We recommend setting unused values to zero.

You may decide to restore some original values after trying the modified currency acceptance quantities. Repeat the steps given in the example to change any item back to its factory setting. Do not choose RESET unless you intend to simultaneously cancel every change to every number on this screen.

## DISPLAY AUDITS

Display Audits allows the operator to assess how well the games are played. In addition to the earnings, game aspects are tracked to determine player skill levels. Statistics may be set to zero after viewing.

**CLEAR ALL** This sets all audit quantities to zero. Record the information before using this command.  
**NEXT** Advances to additional Game Audit screens. The screens repeat after the last is viewed.  
**RETURN** Reverts to the main menu screen. The screen values remain without change.

GAME AUDITS	
AUDIT	TOTAL
1 PLAYER	0
2 PLAYER	0 X2
TOTAL BUYINS	0
<hr/>	
TOTAL GAMES PLAYED	0
FREE GAMES WON	0
FREE GAMES HI SCORE	0
FREE GAMES BUYINS	0
AVG GAME TIME	0:00 MIN

CLEAR ALL      GAME DETAILS      NEXT      RETURN

**TYPICAL GAME AUDIT SCREEN**

Data in the Display Audits portion of the Menu System is presented in the following categories:

- ◆ Game Play: 1-Player games, 2-player games, Free game awards; Buyins; Average game times.
- ◆ Earnings: Coin and Credit statistics for each Currency Acceptor installed in the game.
- ◆ Game Comparison: Popularity and average length of game play for individual games.
- ◆ Game Specifics: Detailed account of characteristics applying only to one game.

Example: Analyze the performance of SOLITAIRE compared to other TouchMaster™ games as follows: Press the TEST pushbutton to enter the Menu System. Choose DISPLAY AUDITS to get the first audits screen (a typical screen is illustrated; your TouchMaster may have a different compliment of statistics).

Touch GAME DETAILS to see individual game audit screen. Touch NEXT repeatedly until the Solitaire detail screen displays. Note and record all of the items presented on this screen. Select RETURN to go to the main menu and then EXIT to game play.

Note each of the totals that apply to all games. Record these numbers for later reference. Also note and record the items that apply only to SOLITAIRE, such as the number of Buyins for this game only.

Use this same sequence of steps to analyze the performance of any other game in the TouchMaster. Use CLEAR ALL to empty the screen counters only after you have examined and recorded the audit data. Do not choose CLEAR ALL unless you intend to simultaneously cancel all audit values and set them to zero.

## HIGH SCORES

High Scores allows the operator to view the top game scores and the player identifications. There is one scores screen for each of the games in the TouchMaster™. Statistics may be set to zero after viewing.

**RESET ALL** Returns variables to factory default values. This erases all high scores and identifiers.  
**CLEAR** Returns variables to blanks. This erases scores and identifiers on this game screen.  
**NEXT** Saves the current on screen values and advances to additional High Score screens.  
**RETURN** Saves the current on screen values and reverts to the main menu screen.

HIGH SCORE CLEAR/RESET		
HOT HOOPS		
	NAME	SCORE
1 -	DR. J	120
2 -	BOB S.	117
3 -		66
4 -		49
5 -	BILLY	11
6 -		0
7 -		0
8 -		0
9 -		0
10 -		0

**CLEAR**      **RESET**      **RETURN**

**TYPICAL GAME HIGH SCORES SCREEN**

Data in the High Scores portion of the Menu System is presented in numerical sequence, with the highest point total listed as the first line. Only the top five high scores are listed. Each time a previous high score is bettered, the lowest score on the list is dropped to make room for the new value.

When a player succeeds in getting one of the highest scores, he or she is offered the opportunity of creating an identifier at the end of the game. The player may elect to skip this opportunity and remain anonymous. In this case, the high score will be posted in the correct order without any identifier.

Example: Display the Highest Scores for the HOT HOOPS™ game. Proceed as follows: Press the TEST pushbutton to display the Menu System. Choose HIGH SCORES to get to the list of games. Touch the HOT HOOPS button to see its HIGH SCORES screens (a typical screen is illustrated; your TouchMaster may have a different set of scores). Record these scores before making any changes to this game.

In the illustrated example, the player identified as DR. J has the highest score. Note that players number 3 and 4 chose not to list their identifiers. Player number 5, BILLY, will remain on the list only until another player scores more than 11 points.

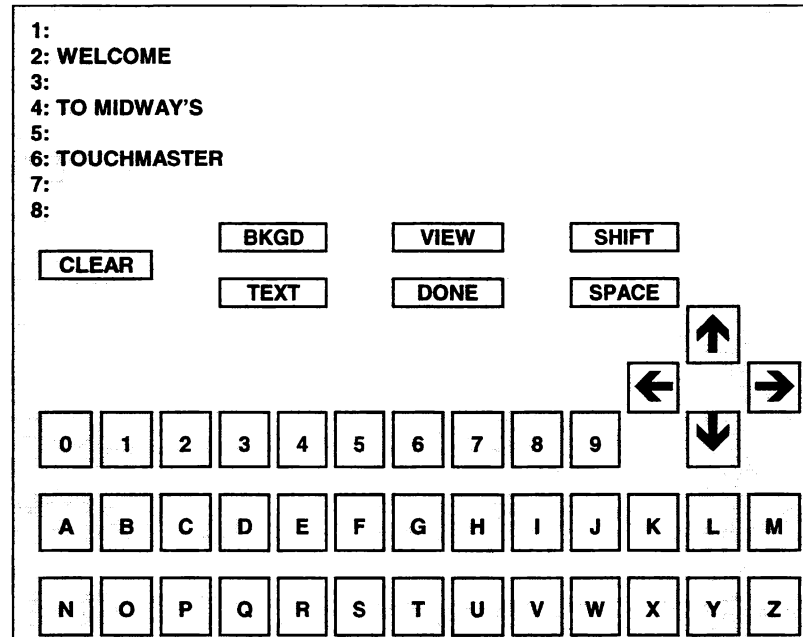
This is the only screen needed to view the HOT HOOPS™ scores. To compare these scores with those from the other games, you must view the High Scores screen for each game separately. Note and record all of the items presented on these screens. Touch RETURN to select other high scores. Touch RETURN again to go to the main menu.

You may decide to delete some existing high scores after they have been posted for a long period of time. Select CLEAR to erase all of the high scores for the specific game on the screen. Do not choose RESET unless you intend to simultaneously cancel every high score for ALL games in the TouchMaster.

## OPERATOR MESSAGE

The game can have an on screen message to draw attention, announce contests, welcome players, etc.

<b>CLEAR</b>	Deletes all characters from the screen simultaneously. Used to erase old messages.
<b>BKGD</b>	Changes the color of the background area behind the message. Provides contrast.
<b>TEXT</b>	Changes the color of the message. Each message line can be another color if you like.
<b>VIEW</b>	Displays how your finished message will appear before it is saved in game memory.
<b>DONE</b>	Saves the message and background, then reverts to the main menu screen.
<b>SHIFT</b>	Changes the letter entry boxes to standard symbols. Use for math, punctuation, etc.
<b>SPACE</b>	Enters a space between characters. Used to separate words and sentences.
<b>ARROWS</b>	These boxes control the up, down, left and right position of the cursor on the screen.



**TYPICAL GAME MESSAGE SCREEN**

There are eight lines available for your message. Each line can be up to 32 characters in length. Each line can be a different color. You may also vary the color of the background area behind the message. The TouchMaster™ will automatically center each line of the message when it is displayed.

**Example:** Change the message to announce that a HOT HOOPS™ contest is coming soon. Proceed as follows: Press the TEST pushbutton to display the Menu System. Choose OPERATOR MESSAGE to get to the MESSAGE ENTRY screen (a typical screen is illustrated; your TouchMaster may have a different message). A flashing square indicates the active screen area where the new message will start.

The new message will have three lines, just as the original did. Touch CLEAR to erase the old message. Touch ↓ once to leave a blank line at the top of the screen. Touch the letters H O T in sequence to enter the first word of the message. Touch SPACE, then the letters H O O P S to complete the line. Touch TEXT repeatedly to choose the color of the line. Touch ↓ to leave a blank line under the text.

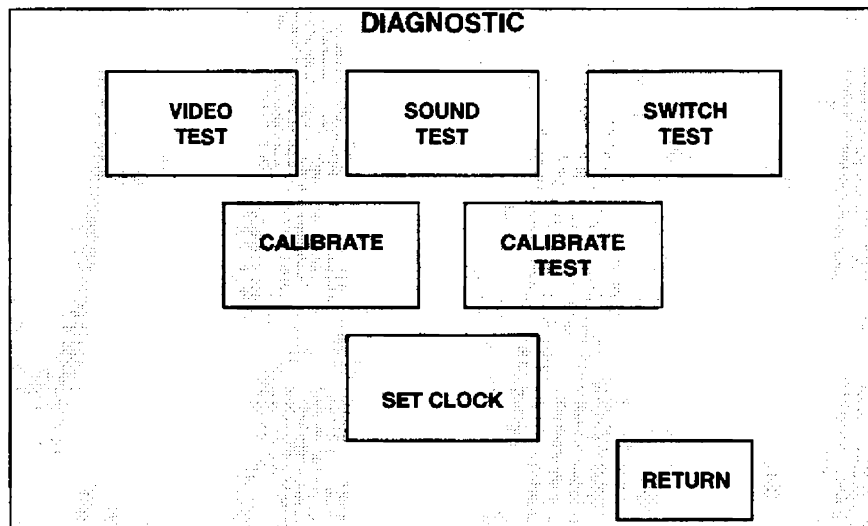
Touch the letters C O N T E S T, use TEXT to pick a color, and touch ↓ to leave a blank line. Touch C O M I N G, insert a SPACE, and touch S O N. Touch SHIFT to locate and enter the ! symbol. Touch TEXT repeatedly to choose the color of the line. Touch ↓ to leave a blank line under the text.

Touch BKGD repeatedly to choose the background color. Touch VIEW to see the completed message. Touch DONE to save the message, then EXIT. The message will be displayed during the "attract mode".

## DIAGNOSTIC

The Diagnostic routines are used to check display performance, verify sounds and music, test switches, and to calibrate and verify the Touch Screen. To select an item, touch the desired box with your fingertip.

- VIDEO TEST** Choose this test group to examine the CRT linearity, uniformity, or color characteristics.  
**SOUND TEST** Check the audio components with game sounds and music. Have you heard them all?  
**SWITCH TEST** Permits manual testing of currency acceptors, cabinet TEST and CALIBRATE switches.  
**CALIBRATE** Sets the Touch Screen Controller coordinates to correspond to fixed screen locations.  
**CALIB. TEST** Verifies Touch Screen sensitivity and linearity for the entire active touch screen area.  
**SET CLOCK** Allows the operator to set the time and date to current values after repairs or service.\*\*  
**RETURN** Reverts to the main menu screen. Use the main menu screen to exit to the game.



**DIAGNOSTICS SUB MENU SCREEN**

These routines provide the operator with a means of keeping the TouchMaster™ in top operating condition. Perform these tests on a regular basis. Players may lose interest if they have to compensate for screen misadjustments, in addition to remembering the rules of the game. All of these tests quickly completed, and may be done in any order.

When adjustments are made to the TouchMaster calibration settings, these values are stored in memory. The game is very stable and will retain its accuracy if it is not moved from the spot where it was last calibrated. However, the internal electronics can not compensate for changes in nearby magnetic and electrical fields that may occur when the game is relocated to another position. Verify the calibration each time the TouchMaster is moved, in addition to the regular maintenance checks, for best game performance.

.\*\*Some games do not have a SET CLOCK box. The clock provides accurate time and date information which is required to set the length of tournaments and communicate network data. Once set, the clock will run until the battery dies or some major fault occurs. Periodically examine the time and date on the system setup screen for correct values, and use the SET CLOCK utility to make changes when needed.

NOTE: The Calibrate routine may be run without going through the Menu System by pressing the CAL. SWITCH push button in the cabinet. However, doing so omits the Touch Screen Controller tracking test. This push button was included to encourage a quick check of the touch screen functions each time the cash box is emptied. Use the complete Calibrate and Calibrate Test procedures after relocation or service to ensure that the TouchMaster is fully optimized before restoring it to regular game play.

## VIDEO TEST

Video test provides patterns for verifying the monitor performance or making adjustments.

### ALIGNMENT GRID

Used to check or adjust monitor convergence, linearity, and dynamic focus.

### GRADIENT TEST

Permits CRT screen image to be optimized for brightness and contrast.

### COLOR BARS

This pattern allows the red, green, blue, and white balance to be analyzed.

### RED SCREEN

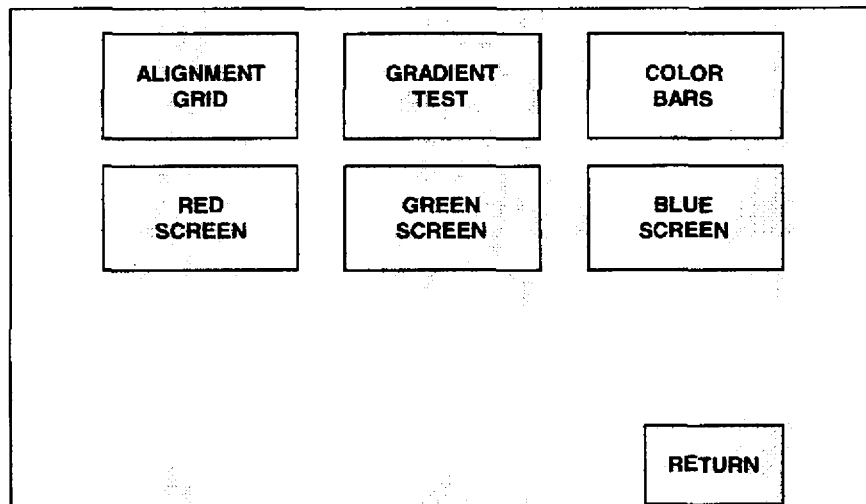
Solid red screen for purity tests. There should be no other color showing.

### GREEN SCREEN

Solid green screen for purity tests. There should be no other color showing.

### BLUE SCREEN

Solid blue screen for purity tests. There should be no other color showing.



**VIDEO TEST MENU SCREEN**

It is extremely important that the information on the video display for the TouchMaster™ is accurate, since the CRT screen is also the control panel for this game. Use these test patterns often to ensure precise game images. Users tend to be more critical when they are close to the monitor, and the Touch Screen Controller requires intimate screen contact. This is especially true of small screen versions, since some of the sensor areas are the same size as the contact area of the player's fingers.

Use the video screens as follows: Press the TEST button to display the Menu System. Choose DIAGNOSTICS to get to the Sub Menu, then select VIDEO TEST. Examine the video screens in any order. Touch the selected video screen anywhere to end the test, then RETURN and EXIT to quit.

The ALIGNMENT GRID fills the screen with a series of lines and dots. The lines and dots should be all one color, with no fringes or parallel images. The lines must be straight and the dots very nearly round. Two color bars should be visible at the center of each screen edge. These bars verify scan size.

The GRADIENT TEST covers 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 the others. This test indicates a need for adjustment if some of the bars appear to be missing or blend together at the edges.

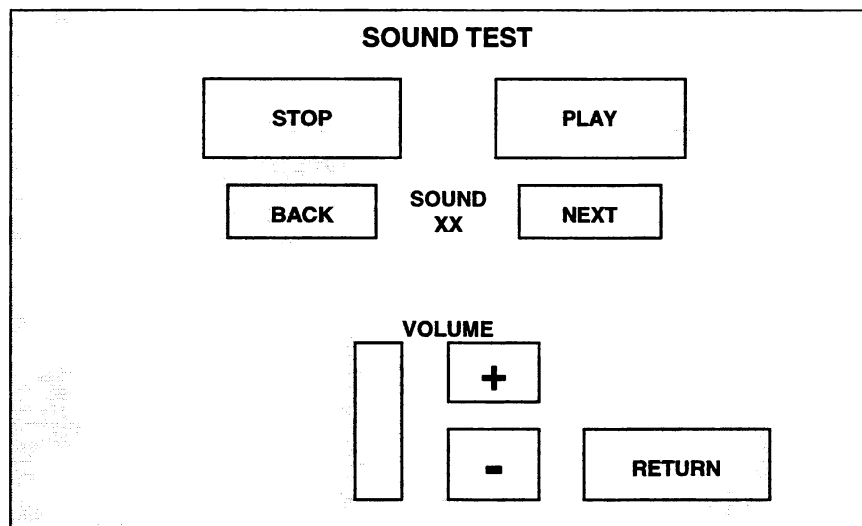
The COLOR BARS screen displays each of the standard colors and shades produced by the game's video circuits. The vertical bars must be uniform from top to bottom. The horizontal bars should show small changes in intensity or shade from side to side. A sudden transition in any bar indicates a fault.

RED, GREEN, and BLUE SCREENS fill the screen entirely with 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. These tests verify that the black level, degaussing, and blanking circuits are correct.

## SOUND TEST

Sound test allows the operator to ensure that audio components are connected and operating properly.

<b>STOP</b>	Ends the sound selected. Used to halt the repetitive sound tracks in the game.
<b>PLAY</b>	Starts the sound selected. Can be used to start another sound while one is active.
<b>BACK</b>	Selects the previous sound choice. Each single touch decrements the counter by one.
<b>NEXT</b>	Selects the next sound choice. Each single touch increments the counter by one.
<b>+</b>	Raises the volume of the sound in steps until the maximum value is reached.
<b>-</b>	Lowens the volume of the sound in steps until the minimum value is reached.
<b>RETURN</b>	Reverts to the Sub Menu screen. Touch RETURN again to go to the Main Menu.



**SOUND TEST MENU SCREEN**

Each of the game sounds is stored in a discrete memory location. All of these sounds are available to test the audio reproduction capabilities of the sound circuits. Vary the volume as you sample these sounds to determine if loose wire connections, faulty memory, digital-to-analog conversion problems, a defective speaker, etc. could be responsible for distorted or missing sound effects. Select a repetitive sound track and a high volume level if you suspect errors caused by heat or time-related problems.

Use the sound screens as follows: Press the TEST button to display the Menu System. Choose DIAGNOSTICS to get to the Sub Menu, then select SOUND TEST. Use BACK or NEXT to choose a sound, then touch PLAY to activate it. STOP is required to terminate the endless sound tracks.

The sounds may be examined in any order. Touch the + or - box to change the volume as necessary. Touch RETURN to end these tests and go back to DIAGNOSTICS, then RETURN and EXIT to quit.

There are three types of sounds used in the TouchMaster™ games. Short bursts of sound indicate single events such as a touch selection or an incorrect answer to a question. A dog barking, a cowbell, and the "boing" are examples of these sounds. Medium-length phrases are used to announce the start or end of a game, bonus rounds, or a new high score. These phrases can last from one to five seconds. The final group of sounds are repetitive sounds like a jazz-drum riff or the ticking of a clock. These sounds are used to distract the player and attract others to the game.

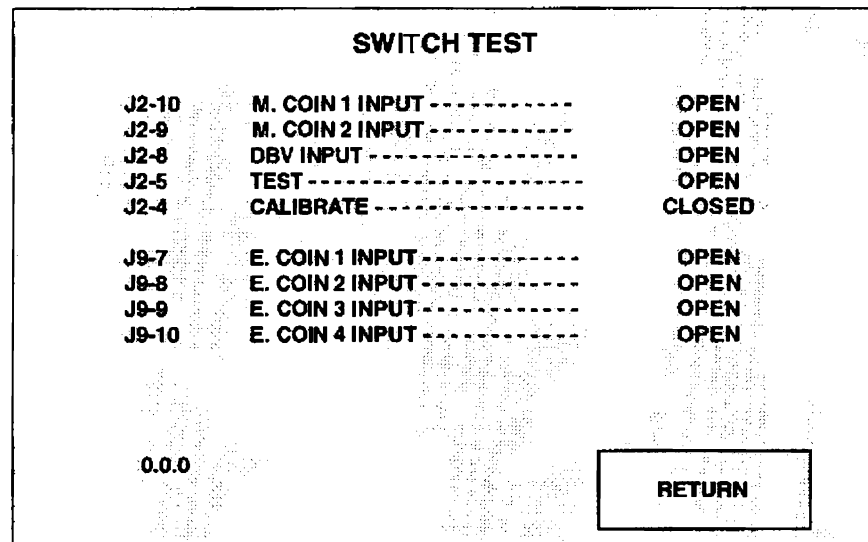
**NOTE: The volume adjustment in the sound tests is the same as the one used for the game play. Be sure to set the volume back to a reasonable level when you have concluded the tests.**

There is a master volume control on the CPU Board Assembly. Change this potentiometer only if there is not enough range in the on screen volume adjustment. Refer to audio Troubleshooting (Section Four).

## SWITCH TEST

Switch test allows the operator to manually check each switch used in the game. Because the Touch Screen uses a digital controller to sense player signals, it has a separate test (refer to Calibrate steps).

**OPEN** Indicates a circuit with no continuity. This is a Normally Open switch condition.  
**CLOSED** Indicates a circuit with continuity. This is a Normally Closed switch condition.  
**RETURN** Reverts to the Sub Menu screen. Touch RETURN again to go to the Main Menu.



**TYPICAL SWITCH TEST MENU SCREEN**

The TouchMaster™ game electronics expect all switches to be Normally Open except when activated.

Each line item on the screen represents one input signal from the currency acceptors or the push button switches. The screen above is correct for a TouchMaster with the Calibration button depressed and held. The game will detect and display the status of each switch independently, permitting switches to be checked for interaction or incorrect programming (electronic currency acceptors).

In addition to the on screen OPEN or CLOSED indication, the TouchMaster audio circuits generate CLUNKing noises each time a switch is closed. This is used to locate shorted or intermittent connections when you are working from the back or sides of the cabinet and cannot see the monitor screen.

**Example:** Suppose a different coin mechanism must be installed to accept another type of coin than was previously used. Turn off the game power and open the Coin Door. Remove the existing mechanism and replace it with the alternate unit. After the other mechanism has been mounted and connected to the game electronics, the game must be matched to the new currency values. Power up the game and verify the Touch Screen operation (minor calibration may be required after any type of product service).

Check switch operation for the game Currency Acceptors in the following manner: Press the TEST button to display the Menu System. Choose DIAGNOSTICS to get to the Sub Menu, then choose SWITCH TEST to go to the switch menu screen (a typical game SWITCH screen is illustrated; your TouchMaster may have a different compliment of Acceptors).

Press and hold the CAL. push button. The TouchMaster will emit CLUNKing sounds and indicate this switch is CLOSED on the screen. Release the button to stop the sound and revert to an OPEN state. Repeat these steps for other switches in the game. When finished, choose RETURN and EXIT to quit.

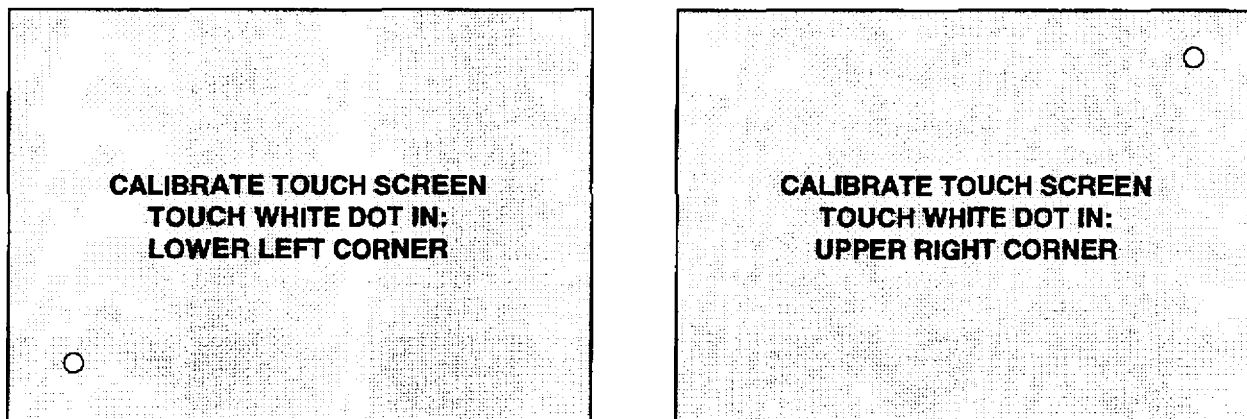
**NOTE:** Continuous CLUNKing noises can indicate wiring defects, jammed switch, bad IC, etc.



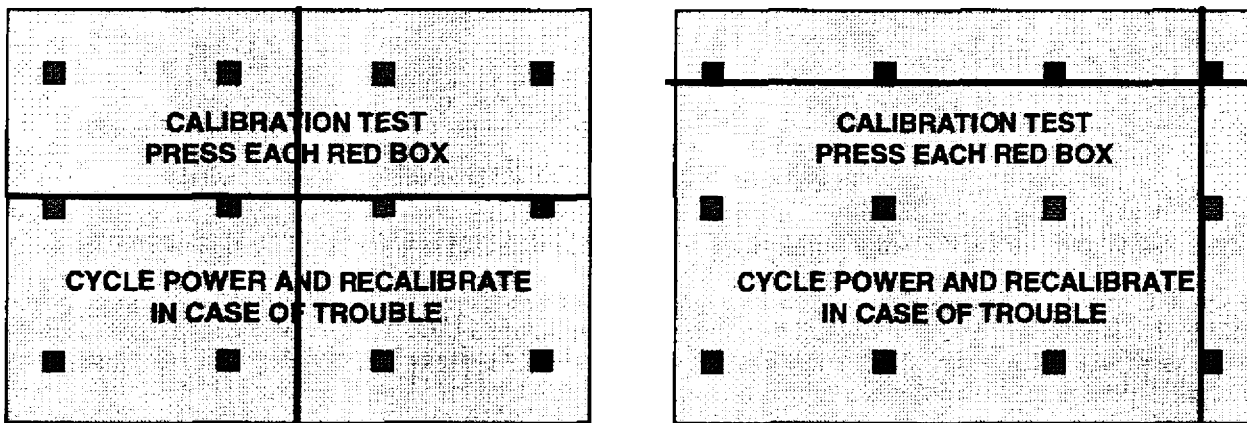
## CALIBRATE

This series of steps allows the operator to calibrate the Touch Screen Controller and correct its accuracy.

- Dot for controller calibration. This sets the ability to correctly recognize a player's touch.
- Box for controller verification. This verifies the Touch Screen accuracy in critical areas.



TYPICAL CALIBRATION SCREENS



TYPICAL VERIFICATION SCREENS

The Touch Screen Controller in the TouchMaster™ senses your finger position based on its capacitance. The Touch Screen uses a very weak uniform electrical field. Touching the screen it disturbs the field. The controller tracks this and translates it into a location. The game electronics use this information as a command. This entire process occurs in a fraction of a second, allowing the game to respond rapidly.

When the TouchMaster is moved from one location to another, the amount of capacitance changes. This causes the controller to shift its tracking coordinates and may generate errors in some screen areas. The Calibration routine allows the controller to adjust its tracking to match the touch point.

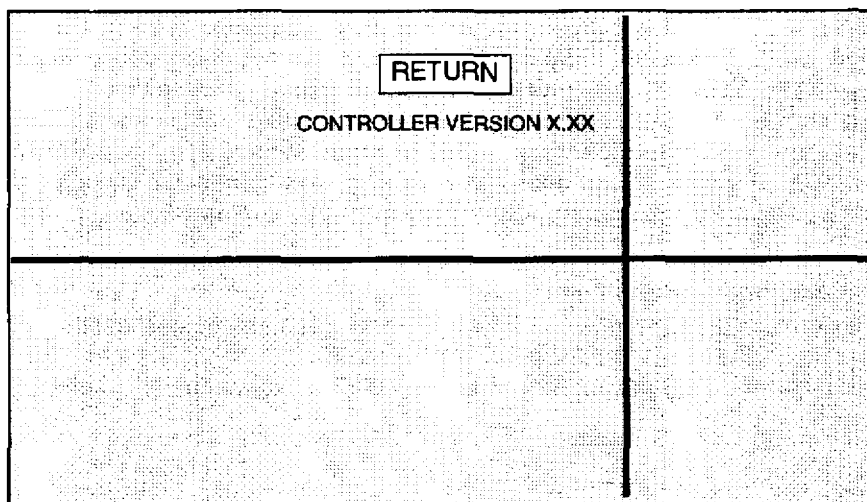
Calibration screens require the user to touch one specific location as indicated by a single dot. Touch the dot and hold this position until coarse tracking adjustments are completed (about two seconds). The TouchMaster will automatically advance to the next screen and emit a short burst of sound. Repeat this procedure for each screen with a single dot. The Calibration Test screen (see next page) tracks finger position over the entire screen, allowing the entire playing surface to be checked for accurate calibration.

Verification screens require the user to touch several locations as indicated by several boxes. Touch each box and hold this position until fine tracking adjustments are completed (about one second). The TouchMaster will display one vertical and one horizontal line on the screen. The lines should intersect over the box when the finger is removed. Repeat this procedure for each box on the screen.

## CALIBRATION TEST

This test verifies touch tracking for the entire active screen area and detects any calibration errors.

- +** Intersecting lines indicate screen location coordinates from the Touch Screen Controller.
- RETURN** Reverts to the Sub Menu screen. Touch RETURN again to go to the Main Menu.



**TYPICAL CALIBRATION TEST SCREEN**

The accuracy of the Touch Screen Controller may be checked without going through a new calibration procedure. This test will quickly detect any non-linear or unresponsive areas of the Touch Screen.

The Controller Version number indicates the model of controller used in this unit. Because of space limitations, the Touch Screen Controller is mounted where these numbers may be difficult to view easily. If customer assistance is required, the service person may request this number during problem solving.

When the Touch Screen Controller is calibrated for the first time, the tracking data is stored in a section of the TouchMaster™ memory. Each time the screen is touched this information is recalled. This data must be changed if the game has been serviced or relocated. The test does not change the data stored in memory. The only way to replace the existing data with new information is to go through each of the calibration steps. Use Calibration Test on a regular basis to determine if a new calibration is necessary.

Perform the touch test in the following manner: Press the TEST button to display the Menu System. Choose DIAGNOSTICS to get to the test menu, then choose CALIBRATE TEST to go to the test screen (a typical test screen is illustrated). The vertical and horizontal lines should be centered on the screen.

Touch any location on the screen. The intersecting lines move to the point of contact. Touch another location. The lines will move to the new location. For each additional touch point, the lines must cross under the fingertip. Check several locations, especially those along the outer perimeter of the screen. If either or both lines are visible beside the finger after the lines stop moving, recalibrate the touch screen.

Touch RETURN to end the test and go back to the DIAGNOSTICS screen. Choose CALIBRATE and complete each step if any errors were detected by this test. When the CALIBRATE TEST results are satisfactory, select RETURN to go to the main menu and EXIT to restart the game.

**NOTE: ALWAYS RE-CALIBRATE AND TEST THE UNIT AFTER MOVING THE TOUCHMASTER™.**

## SERVICING

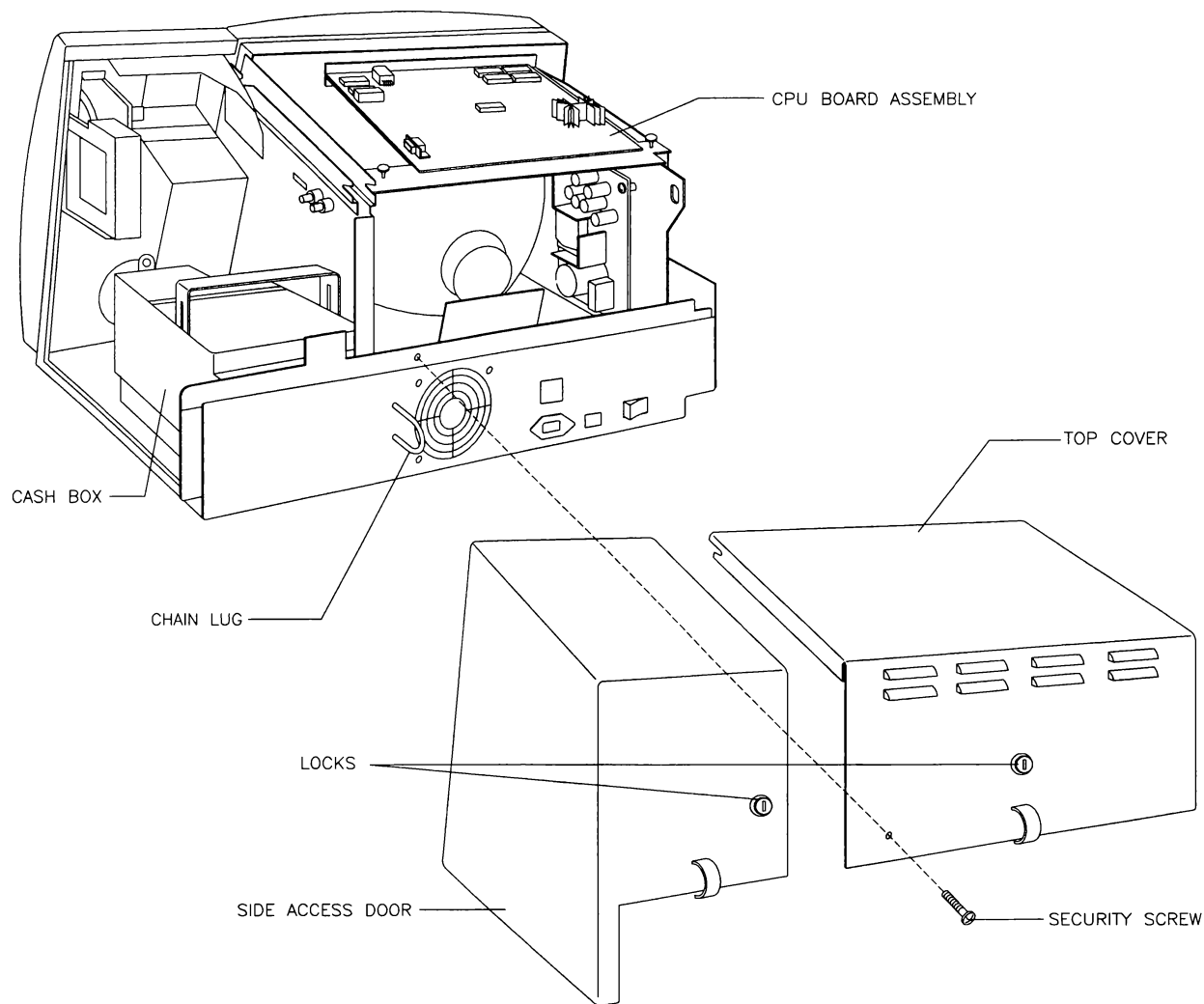
We recommend that you read the SAFETY NOTICES section thoroughly before beginning service.

***This game 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.***

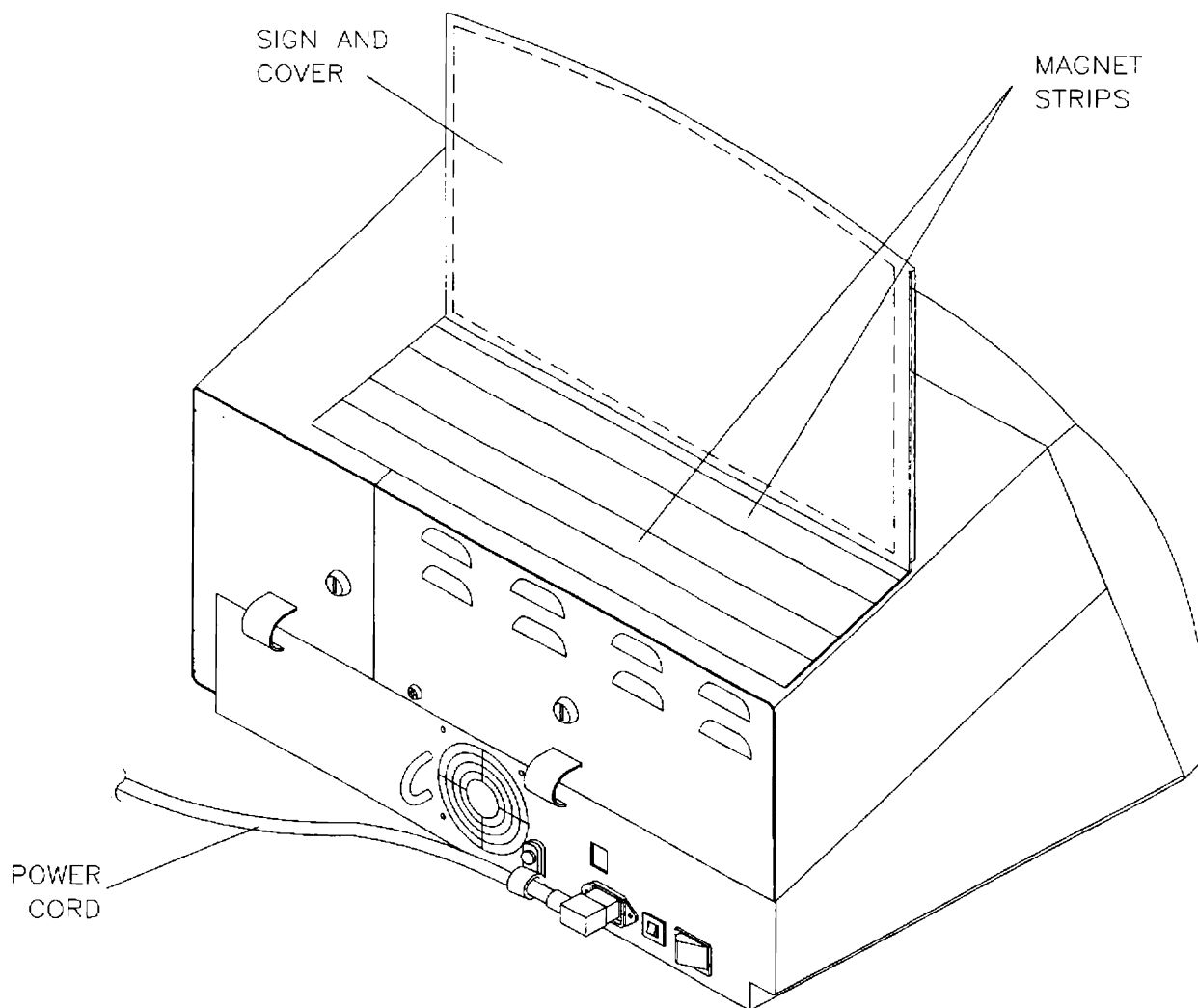
- 1. Ensure that the A.C. power to the game is turned OFF prior to servicing the electronics.***
- 2. Discharge any static electricity build up in your body by touching the game cabinet. This must be done BEFORE touching or handling the electronic assemblies.***
- 3. Store the electronic assemblies in an anti-static area. Anti-static bags are to be used to store game electronic assemblies. Reuse the bag to store removed boards during service.***
- 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.***

### ◆ Cabinet (Side Access Door and Top Cover)

Switch off power to the game. Remove security screw. Insert key in side access door lock. Turn key clockwise and hold. Pull access door back approximately 3 inches (7.6 cm), then lift up and off of cabinet. Repeat steps for top cover. Remember to hold the key during reinstallation. Reinstall screw.



**OPENING THE CABINET**



### SIGNAGE KIT MOUNTING

#### ◆ Signage Kit (Optional – not included with some models)

Grasp the top edge of the sign holder and pull it forward and down to free the magnet strips from the top cover, then lift the sign up and off of the cabinet. The sign will slide out at the bottom of the holder.

**NOTE:** *The paint may be scratched by sliding. Separate the magnet strips before lifting up on the sign to avoid damage to the surface of the top cover. Clean magnets before reinstallation.*

#### ◆ Power Supply

Switch off power to the game. Remove the top cover. Pull out on the snap latch plunger handles until they unlock. Lift the rear edge of the CPU Board Bracket up just enough to reach the Power Supply mounting screws. Unplug the A.C. connector and the D.C. connector from the wiring harnesses. Remove two screws at the top of the bracket, then lift the assembly up and out of the cabinet. Remove the remaining screws to separate supply from bracket. Retain the bracket and the screws.

**NOTE:** *Early (full metal chassis) and late production (open frame) power supply assemblies are electrically and mechanically interchangeable. Either version will operate the electronics.*

**Remember to set the line voltage switch on early production power supplies after replacement (late production supplies automatically sense line voltage and do not require any adjustment).**

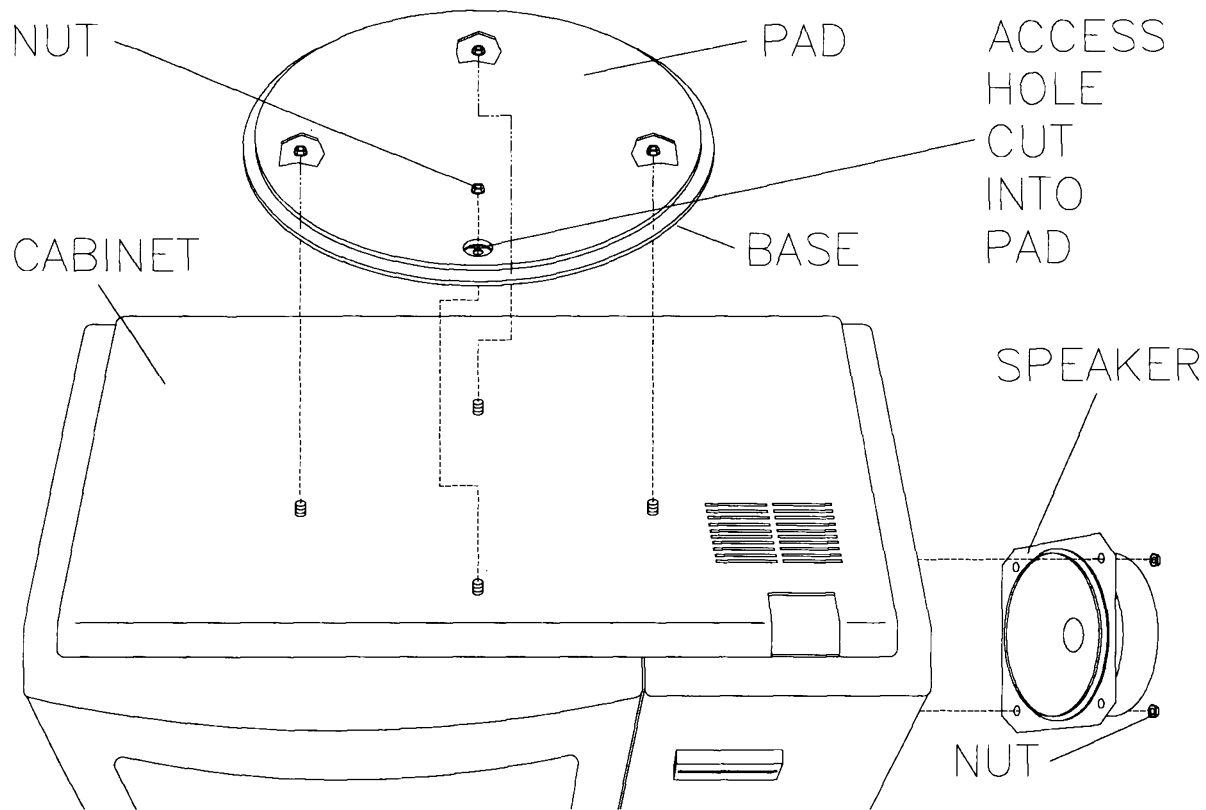
◆ **Speaker**

Switch off power to the game. Remove top cover and side access door. Tilt coin door forward but do not remove. Disconnect speaker wire connectors at speaker terminals. Remove speaker mounting nuts. Lift the speaker up and out of the cabinet. Do not damage the paper cone during installation.

**NOTE:** *Be certain that any replacement speaker used in this unit is magnetically shielded.*

◆ **Rotating Base**

Switch off power to the game. Invert the cabinet so the base faces up. Use finger pressure to find the .75" (1.9 cm) access hole near the edge of the base. Cut away the pad material to expose the hole. Rotate the base to locate and remove each of the mounting nuts, then lift the base off of the cabinet.



**ROTATING BASE AND SPEAKER MOUNTING**

◆ **Coin Meter**

Switch off power to the game. Remove the top cover and side access door. Record meter reading. Disconnect from wiring harness. Remove meter mounting screws. Lift meter up and out of cabinet.

◆ **Control Switches**

Switch off power to the game. Remove the top cover and side access door. Remove switch mounting (ring) nuts and push switches into cabinet. Disconnect wiring and lift switches up and out.

◆ **Coin Door Assembly**

Switch off power to the game. Remove security screw and side access door. Remove padlock (if used) and cash box. Loosen but do not remove the large slotted screw near the coin meter. Pull coin door forward until it rests on the cabinet. Disconnect harnesses and slide door out of cabinet.

#### ◆ **Monitor Bezel**

Switch off power to the game. Remove the security screw. Unlock and remove the top cover. Remove two front cabinet screws under the bottom left and right corners of the bezel. Hold the bezel in place while removing the top two hex head screws, then lift the bezel up and off of the cabinet.

***Important! Clean and inspect the foam gasket inside the bezel before it is reinstalled. Replace the gasket if there are gaps or breaks where it fits against the touch screen. There must be a tight seal in this area to prevent liquids, dirt, or debris from entering the cabinet at this point.***



#### **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 CRT and the Monitor Chassis Boards operate at high temperatures and VERY HIGH VOLTAGES! The high voltage can be stored for several days in the CRT glass and some board components. Allow parts to cool, then carefully discharge these items before replacement.***

***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.***

#### ◆ **Monitor**

Switch off power to the game. Remove the side access door, cash box, and top cover. Remove the Monitor Bezel. Remove the philips head screws from the bulkhead. Loosen but do not remove the large slotted screw in the upper coin door support plate (a spring will cause this captive screw to pop out when it is loose enough). Disconnect the CPU Board, Touch Screen Controller, and power supply, then remove each of them. Disconnect and remove the coin meter and switches. Remove the Video Board but do not disconnect it. Remove the monitor mounting bracket nuts. Disconnect the remaining cables. Lift the monitor carefully up and out from the cabinet and set it in a safe place.

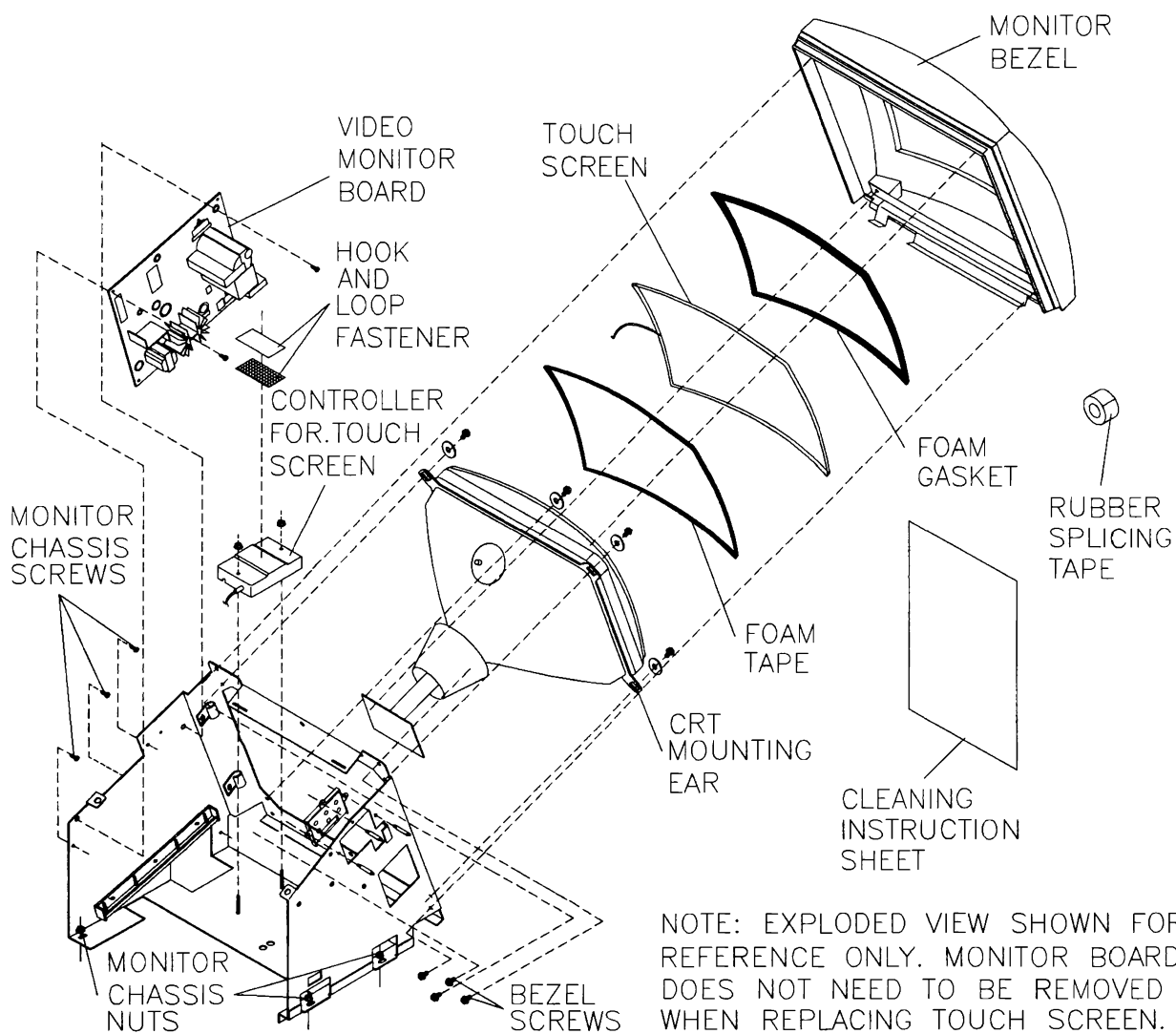
If the CRT is to be removed from the monitor chassis assembly, use a pen or felt tip marker to outline the position of the mounting ears on the chassis. These outlines should be used to ensure proper CRT alignment during reassembly. This step avoids leaks between the bezel gasket and the monitor.

#### ◆ **Monitor Chassis Boards**

Switch off power to the game. Remove the top cover. Pull out on the snap latch plunger handles until they unlock. Lift the rear edge of the CPU Board up just enough to reach the Monitor Board mounting screws. Disconnect the Monitor Chassis Boards from the wiring harness. Remove the Remote Adjustment Board from its mounting posts, but leave the posts attached to the metal Chassis frame. Remove the adhesive that secures the Neck Board to the base of the CRT, then gently pull this board off of the tube pins. Remove the Video Board mounting screws and lift this board out of its plastic support. Carefully discharge the CRT high voltage directly to the metal frame (expect a loud “pop” and a flash), then disconnect the high voltage connector. Lift boards and cables out of the cabinet.

#### ◆ **Touch Screen Controller**

Switch off power to the game. Remove the top cover. Pull out on snap latch plunger handles until they unlock. Lift the rear edge of the CPU Board up just enough to disconnect the Touch Screen Controller cable. Carefully cut the cable ties that secure the controller cable. Free the cable from all other wiring. Disconnect the Controller from the wiring harness. Remove the cable tie from the touch screen controller. Pull the controller from its mounting and turn it to expose the Touch Screen cable. Disconnect this cable and let it hang loose in the cabinet. Lift controller and cables out of the cabinet.



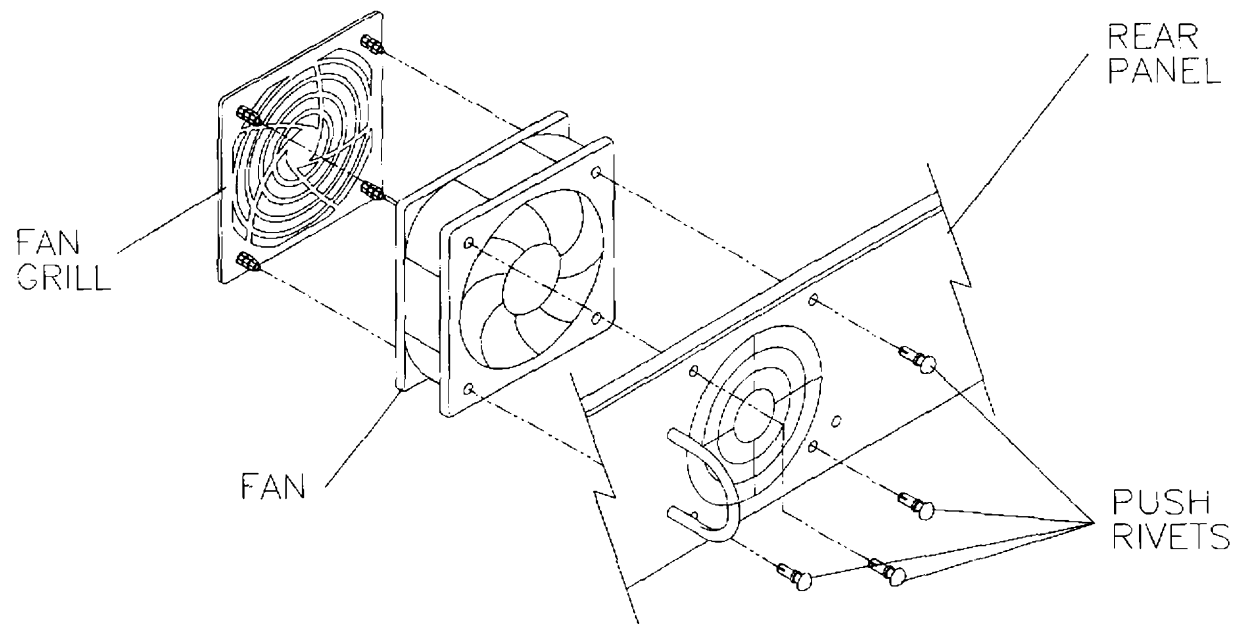
### MONITOR AND TOUCH SCREEN COMPONENTS

#### ◆ Touch Screen

Switch off power to the game. Remove the top cover and the monitor bezel. Pull out the old bezel gasket and all adhesive, then install the new gasket in its place. Remove the Touch Screen Controller from the monitor bracket and turn it over. Disconnect the Touch Screen cable, power harness, and ground wire. Remove the rubber sealing tape surrounding the Touch Screen. Carefully note the orientation of the Touch Screen cable and the foam adhesive strips before separating the screen from the monitor. Cut the foam tape with a safety knife, using care not to cut or damage the wires. The Touch Screen Controller need not be removed if the Touch Screen is the only item to be replaced.

To install the new Touch Screen, remove tape residue from the surface of the CRT and the new Touch Screen. Clean both surfaces, then remove the backing from the foam adhesive strips and mount the Touch Screen on the monitor. Route the new cables inside the chassis and reconnect the ground wire, power harness, and controller cable. Install new rubber sealing tape around edge of CRT and Touch Screen. Remount Touch Screen Controller and bezel. Calibrate and test your work.

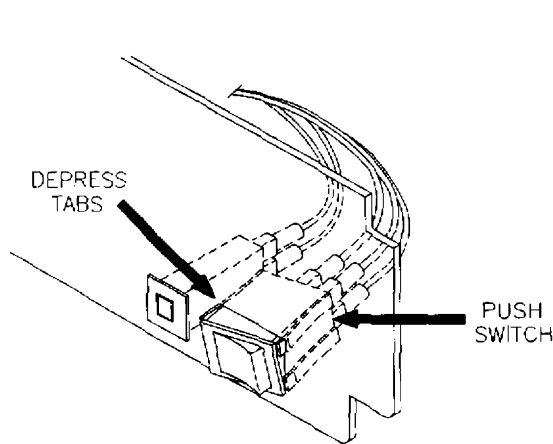
**NOTE:** Detailed pictorial instructions are included with the Touch Screen Replacement Kit.



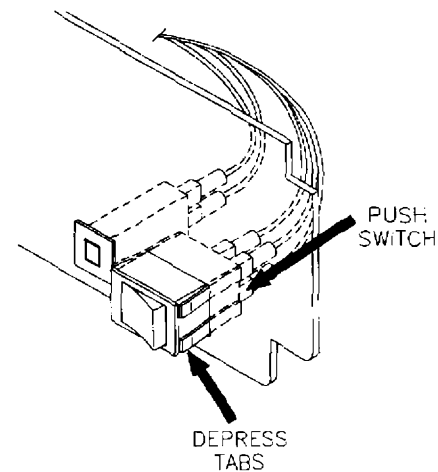
### FAN MOUNTING

#### ◆ Fan Assembly

Switch off power to the game. Remove the top cover. Press out push rivet pins from inside the cabinet using a straightened paper clip or similar tool. Pull out each rivet from the outside of the cabinet. Disconnect wiring and lift fan up and out of cabinet. Gently separate the grill and the fan with a flat blade screwdriver. Always replace the grill before reinstalling the fan.



### UNLOCKING SWITCH TABS



### REMOVING SWITCH FROM CABINET

#### ◆ Power Switch or Circuit Breaker

Switch off power to the game. Unplug the line cord from the source of power. Remove the top cover. Use a large flat blade screwdriver to depress the upper and lower locking tabs against one side of the device. Hold both tabs flat against case sides and push rear of device forward so that one side protrudes from the cabinet. Depress the locking tabs on the opposite side of the case and push the device forward as before. Alternate sides until the device can be pushed out of the cabinet opening.

**Note orientation.** One at a time, grasp the crimped end of each of the harness connectors and use a rocking motion to remove it from the device terminal. *Do not pull on the wires! This can break wire strands and loosen the bond between wire and connector, causing intermittent electrical continuity.*



#### ◆ CPU Board Assembly

Switch off power to the game. Remove the top cover. Pull out on snap latch plunger handles until they unlock. Lift the rear edge of the CPU Board Bracket up enough to disconnect the Touch Screen Controller and cable. Extract harness cables from the board connectors. Lift the Board Bracket up off of the monitor and set in a safe place. Remove the board mounting screws. Anti-static bags and protective containers from new parts must be used to store the board if not reinstalled immediately.

#### ◆ Battery Memory Module

Switch off power to the game. Remove the top cover. Carefully note module orientation, as some versions do not have a notch or keying mark. Remove the module using a chip extraction tool.

To reinstall the module, align the module over its socket and press firmly to seat pins. Do not force.

**NOTE: The battery is permanently attached to a memory circuit and cannot be replaced separately. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to instructions printed on the module or its packaging.**

#### ◆ Memory and Security Key

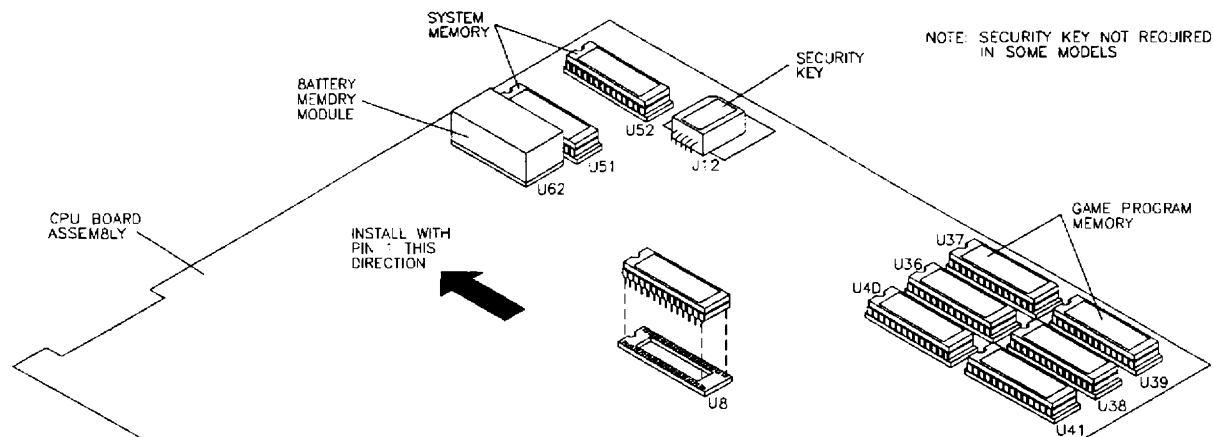
The ROM (Read Only Memory) circuits contain the computer operating instructions. *Memory devices are especially sensitive to static charges. Use grounding precautions when handling these parts.*

Switch off power to the game. Unlock and remove the top cover. Carefully note position, then pull using a chip extraction tool (not needed for security key). Use a rocking motion to avoid bending pins.

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



**CAUTION** Discharge any static electricity build up in your body by touching the metal chain lug. This must be done **BEFORE** touching or handling any of the electronic assemblies.



#### ORIENTATION OF FIELD REPLACEABLE ELECTRONIC COMPONENTS

Note the arrow indicating the position of pin 1. Components will be damaged if installed backwards!

# TOUCH MASTER<sup>TM</sup> COUNTERTOP

SECTION  
TWO



## Parts Information

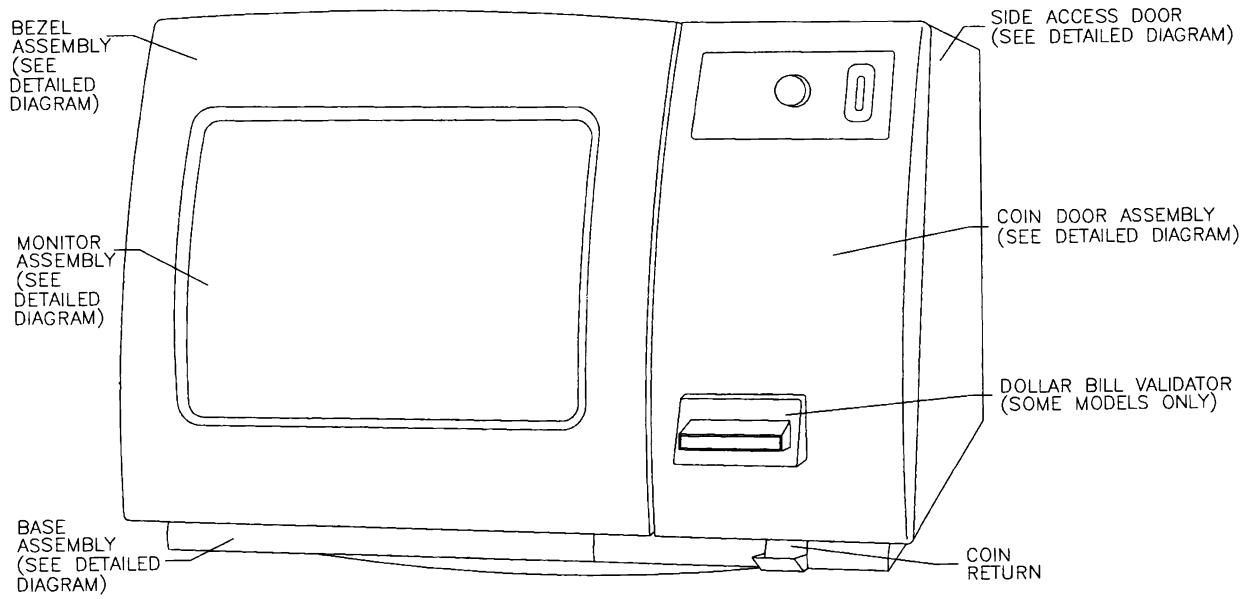
### Warning

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

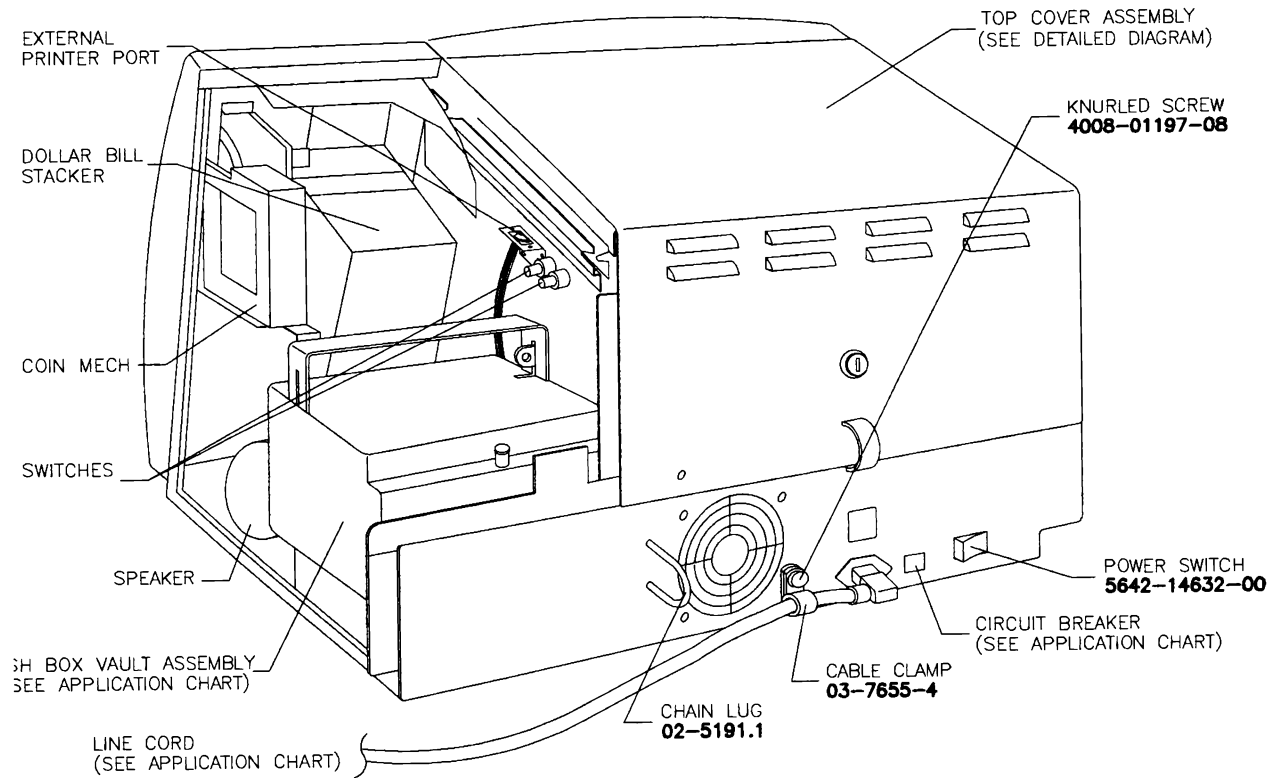
\* For safety and reliability, substitute parts and modifications are not recommended.

\* Substitute parts or modifications may void FCC type acceptance.

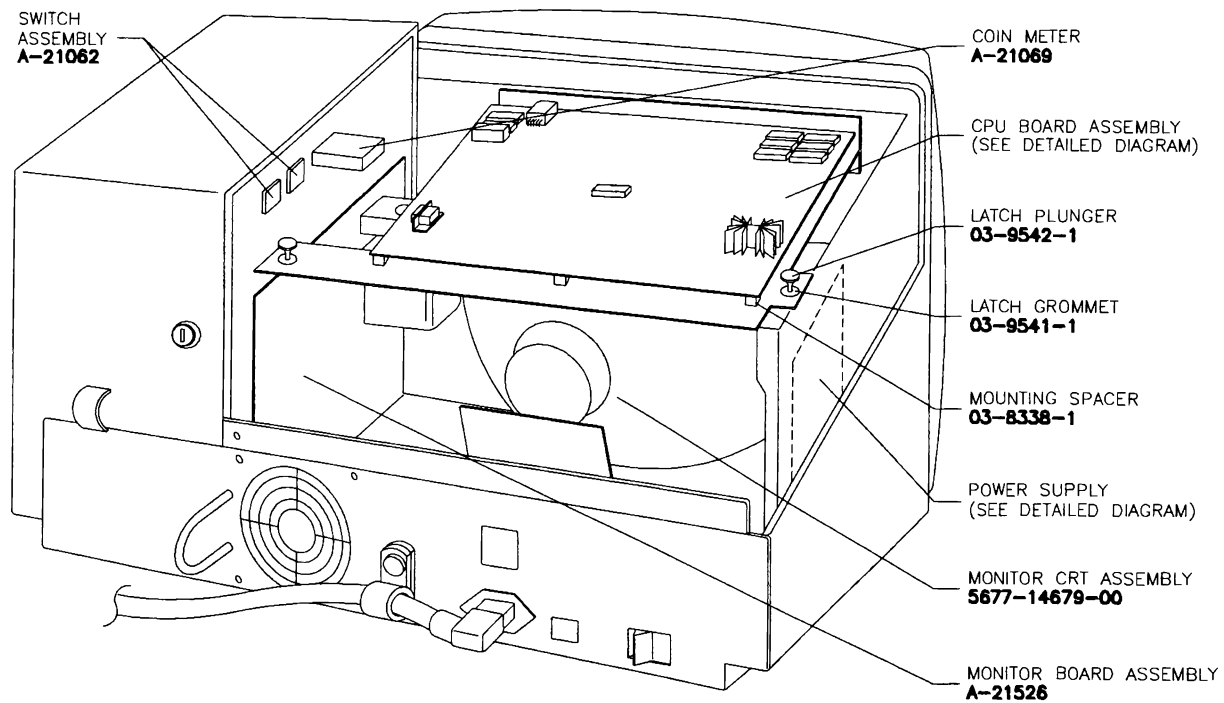
## CABINET ASSEMBLY (Front View)



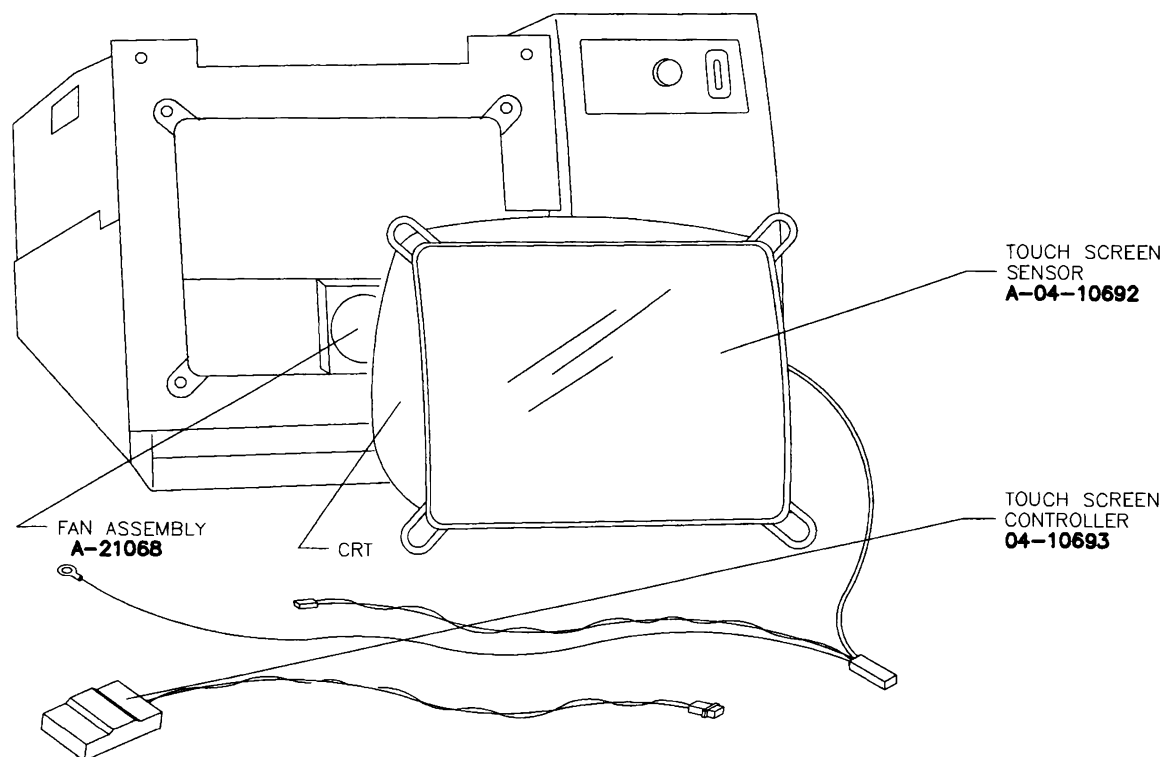
## CABINET ASSEMBLY (Left Rear View)



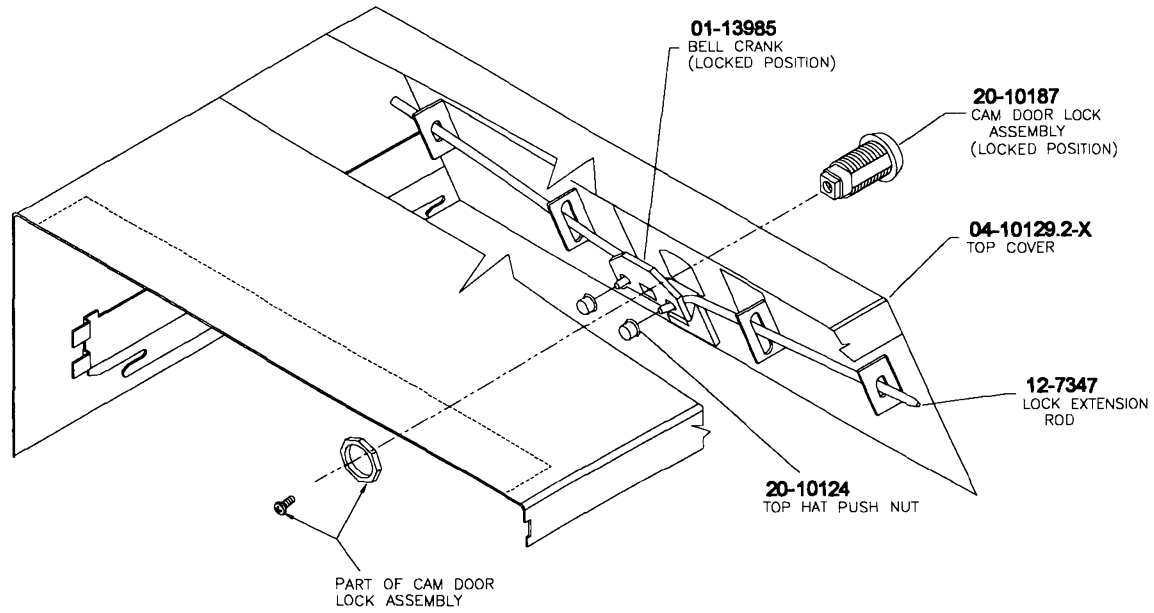
## CABINET ASSEMBLY (Right Rear View)



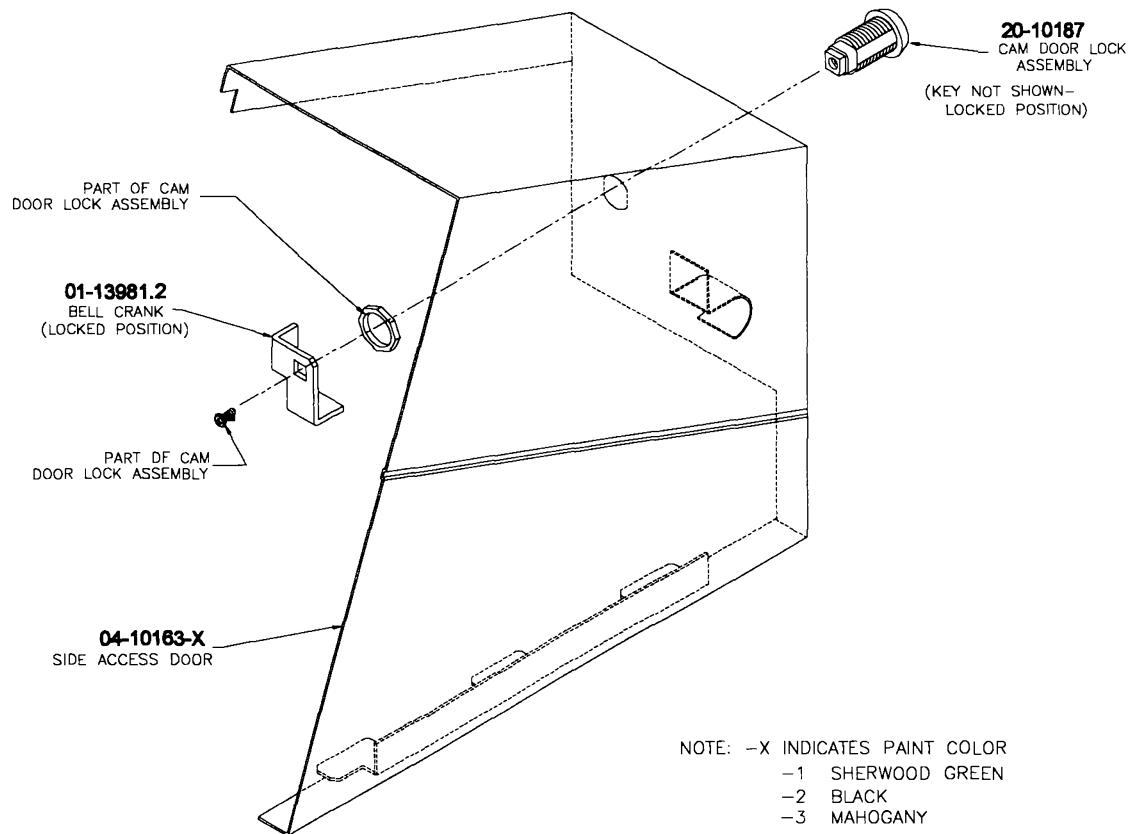
## TOUCH SCREEN COMPONENTS (Front View)



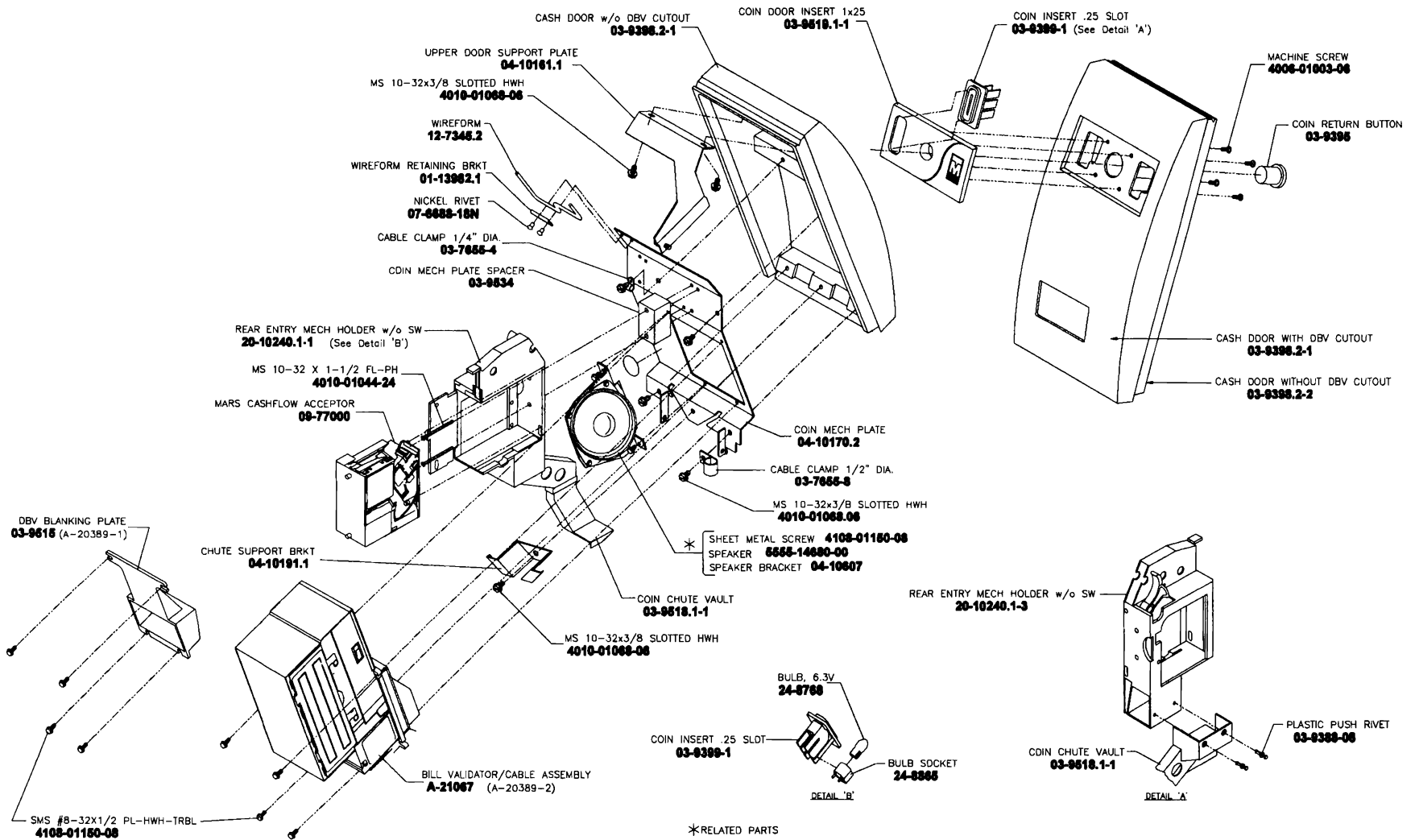
## A-20393-X TOP COVER ASSEMBLY



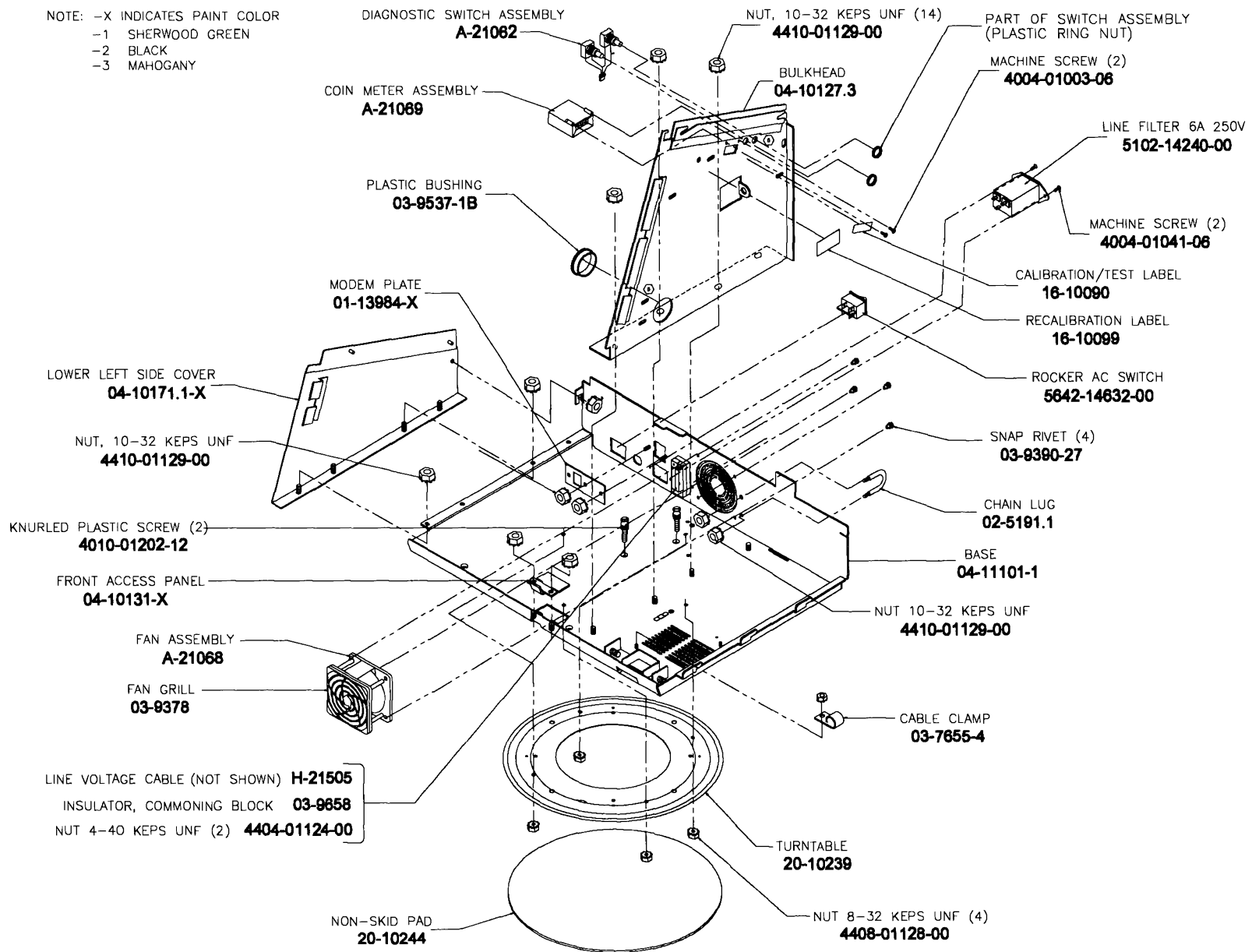
## A-20392-X SIDE ACCESS DOOR ASSEMBLY



**A-20389-1 CASH DOOR ASSEMBLY, DOLLAR BILL VALIDATOR READY**  
**A-20389-2 CASH DOOR ASSEMBLY, DOLLAR BILL VALIDATOR INSTALLED**

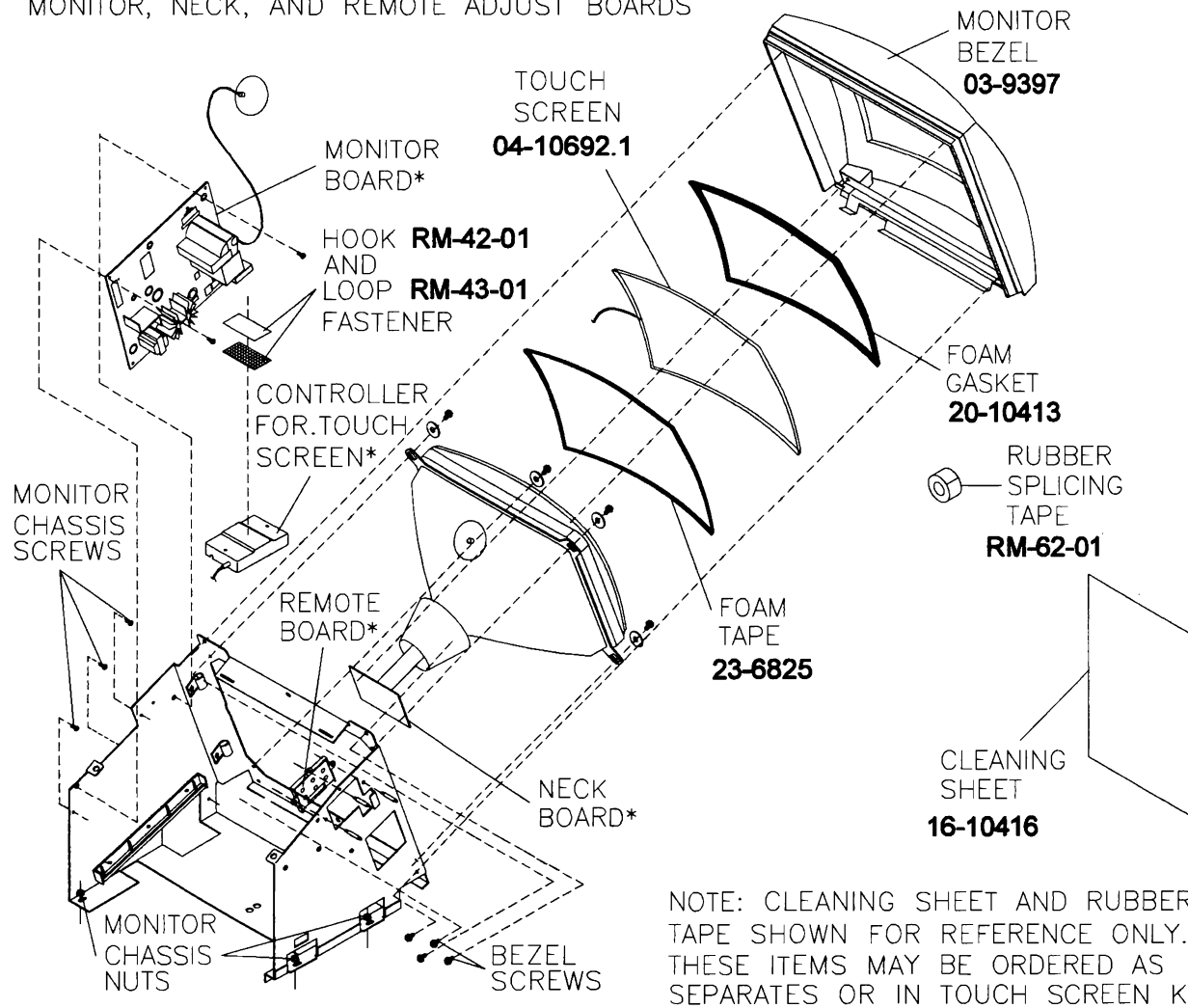


NOTE: -X INDICATES PAINT COLOR  
 -1 SHERWOOD GREEN  
 -2 BLACK  
 -3 MAHOGANY

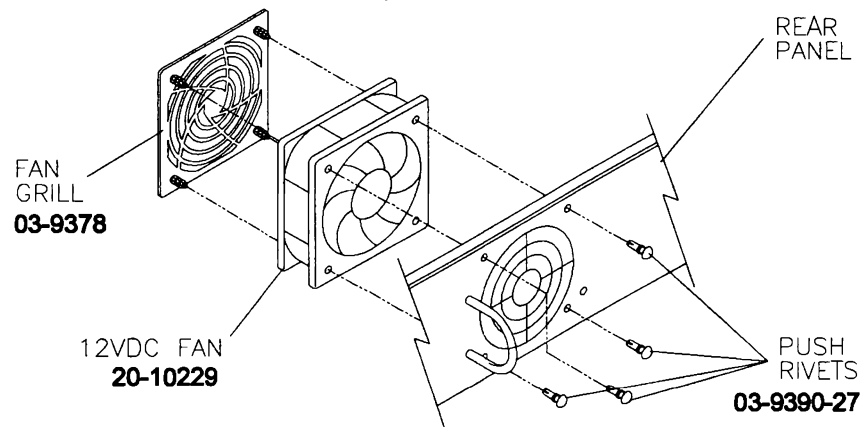


## A-21064 MONITOR ASSEMBLY, TOUCH SCREEN AND ASSOCIATED PARTS

\* A-21526 CHASSIS BOARD SET INCLUDES  
MONITOR, NECK, AND REMOTE ADJUST BOARDS

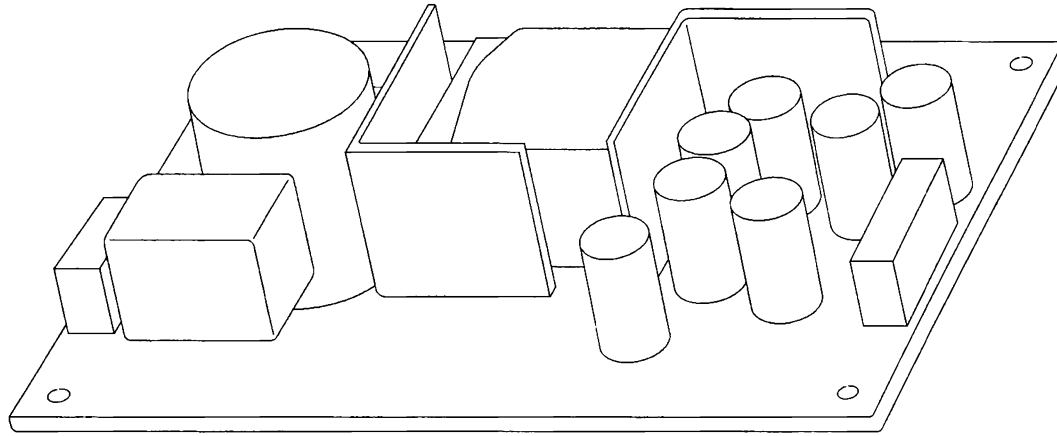


## A-21068 FAN ASSEMBLY AND ASSOCIATED PARTS

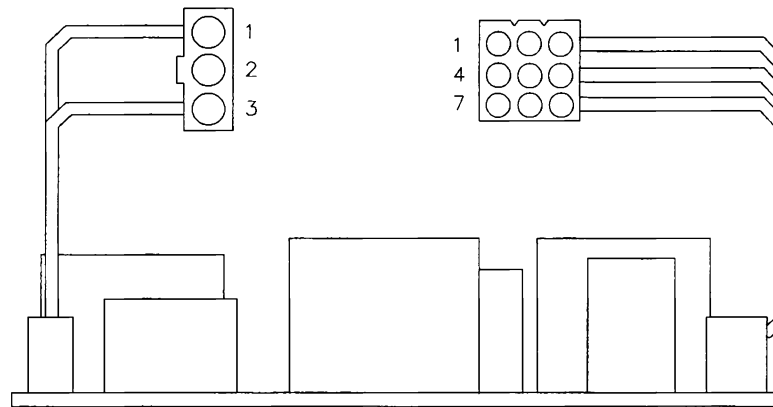




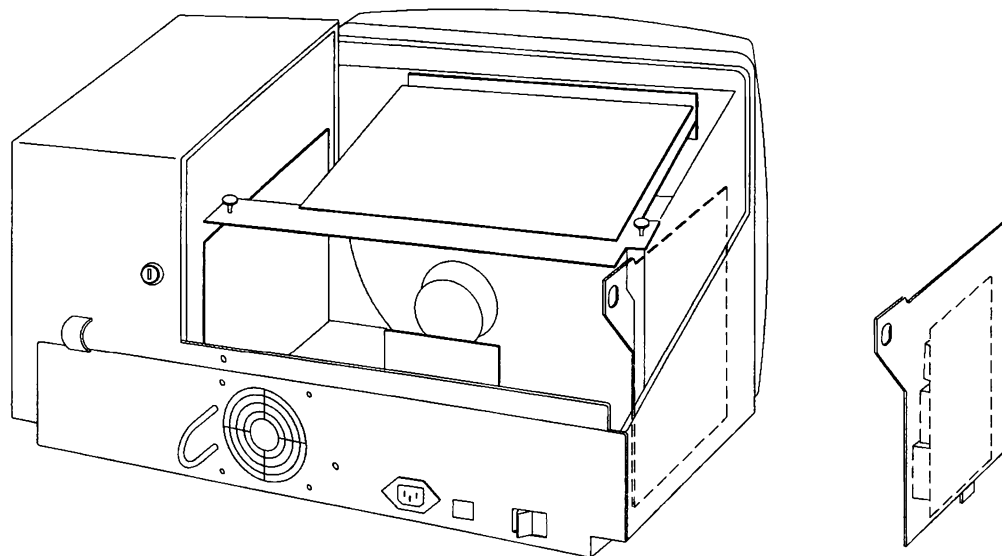
**POWER SUPPLY  
20-10259**



**SIDE VIEW**

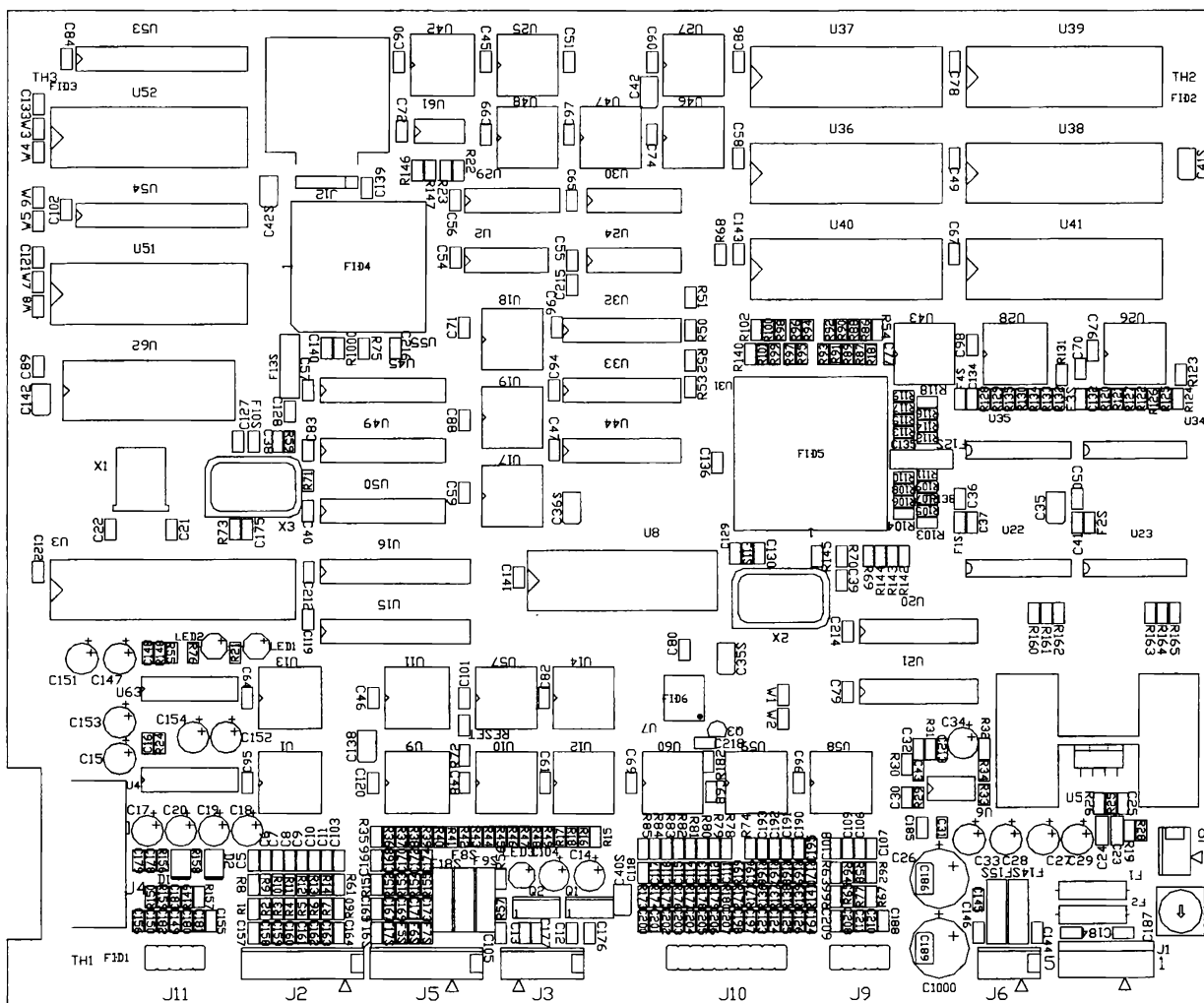


**FRONT VIEW**



**POWER SUPPLY ORIENTATION**

# A-21150 CPU BOARD ASSEMBLY



## Field Replaceable Parts

Designation	Part Number	Function	Description
J12	--- (see Note 1)	Security Key	Custom Assembly
U8	--- (see Note 1)	Sound Program	EPROM Assembly
U36	--- (see Note 1 & 2)	Game Program	EPROM Assembly
U37	--- (see Note 1 & 2)	Game Program	EPROM Assembly
U38	--- (see Note 1 & 2)	Game Program	EPROM Assembly
U39	--- (see Note 1 & 2)	Game Program	EPROM Assembly
U40	--- (see Note 1 & 2)	Game Program	EPROM Assembly
U41	--- (see Note 1 & 2)	Game Program	EPROM Assembly
U51	--- (see Note 1 & 2)	CPU Instructions	EPROM Assembly
U52	--- (see Note 1 & 2)	CPU Instructions	EPROM Assembly
U62	--- (see Note 1 & 3)	Memory Backup	Nonvolatile SRAM with Battery

**NOTES:** 1. Version specific. Contact your distributor for the latest part numbers of these components.  
 2. Some versions of software do not require that all sockets be filled.  
 3. The battery is permanently attached to the memory IC and cannot be replaced separately.

# LINE CORD APPLICATION CHART

<b>Part Number</b>	<b>5850-14699-00</b>	<b>5850-14699-01</b>	<b>5850-14699-02</b>	<b>5850-14699-03</b>	<b>5850-14699-04</b>	<b>5850-14699-05</b>	<b>5850-14699-06</b>	<b>5850-14699-07</b>
<b>Country</b>								
USA		■						
UK				■				
Italy	■							
Japan		■						
New Zealand						■		
Germany			■					
Spain			■					
Denmark			■					
Finland			■					
Holland			■					
Norway			■					
Sweden			■					
Switzerland					■			
Hungary			■					
Canada		■						
Austria			■					
France			■					
Australia						■		
Belgium			■					
Saudi Arabia			■					
Brazil		■						
India								■
Indonesia			■					

# COIN DOOR APPLICATION CHART

## ELECTRO-MECHANICAL COIN DOOR ASSEMBLIES

Part Number Country	A-20389-1	A-20389-2	A-20389-3	A-20389-4	A-20389-5	A-20389-6	A-20389-8	A-20389-9
USA	■	■	■					
UK				■				
Italy							■	
Japan						■		
New Zealand								■
Germany						■		
Spain						■		
Denmark						■		
Finland						■		
Holland						■		
Norway						■		
Sweden						■		
Switzerland						■		
Hungary						■		
Canada					■			
Austria						■		
France						■		
Australia								■
Belgium						■		
Saudi Arabia						■		
Brazil	■							
India							■	
Indonesia						■		

NOTE: Some countries may use alternate coin door numbers for specific locations.

NOTES...

# TOUCH MASTER<sup>TM</sup> COUNTERTOP

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.

## CPU Board Assembly Connector Chart

FUNCTION	NO.	PIN	COLOR	FUNCTION	NO.	PIN	COLOR
Digital Ground	J1	1	Black	Digital Ground	J6	1	N/C
Key	J1	2	N/C	Key	J6	2	N/C
+5VDC	J1	3	Red	+5VDC	J6	3	N/C
+12VDC	J1	4	Orange	+12VDC	J6	4	N/C
Analog Ground	J1	5	Black	Analog Ground	J6	5	N/C
Digital Ground	J2	1	Black	Not Used	J7	--	N/C
Key	J2	2	N/C	Amplifier Volume In	J8	1	N/C
Not Used	J2	3	N/C	Preamplifier Volume Out	J8	2	N/C
Test	J2	4	White-Blue	Key	J8	3	N/C
Calibrate	J2	5	White-Green	Analog Volume Gnd	J8	4	N/C
Not Used	J2	6	N/C	Analog Ground	J9	1	Cable-Stripe
Not Used	J2	7	N/C	+12VDC	J9	2	Cable
Bill Detect	J2	8	White-Red	Not Used	J9	3	Cable
Coin 2	J2	9	White-Brown	Not Used	J9	4	Cable
Coin 1	J2	10	White-Black	Not Used	J9	5	Cable
Digital Ground	J3	1	Black	Digital Ground	J9	6	Cable
Not Used	J3	2	N/C	Coin 1	J9	7	Cable
Not Used	J3	3	N/C	Coin 2	J9	8	Cable
Digital Ground	J3	4	Black	Coin 3	J9	9	Cable
Not Used	J3	5	N/C	Coin 4	J9	10	Cable
Not Used	J3	6	N/C	Not Used	J10	--	N/C
Meter	J3	7	White-Violet	Modem DCD	J11	1	N/C
Not Used	J4	1	Cable	Modem RXDB (Ptr*)	J11	2	Red
Touch Screen RXD	J4	2	Cable	Modem TXDB (Ptr*)	J11	3	Yellow
Touch Screen TXD	J4	3	Cable	Modem DTR	J11	4	N/C
Not Used	J4	4	Cable	Modem Gnd (Ptr*)	J11	5	Black
Digital Ground	J4	5	Cable	Modem DSR (Ptr*)	J11	6	White
Not Used	J4	6	Cable	Modem RTS	J11	7	N/C
Not Used	J4	7	Cable	Modem CTS	J11	8	N/C
Not Used	J4	8	Cable	Not Used	J11	9	N/C
Not Used	J4	9	Cable	Not Used	J11	10	N/C
Speaker +	J5	1	Red-Grey	Security	J12	1	N/C**
Speaker -	J5	2	Brown-Grey	Security	J12	2	N/C**
Key	J5	3	N/C	Security	J12	3	N/C**
Video Ground	J5	4	Yellow-Black	Security	J12	4	N/C**
Video-Blue	J5	5	Yellow-Blue	Security	J12	5	N/C**
Video-Green	J5	6	Yellow-Green				
Video-Red	J5	7	Yellow-Red				
Horizontal Sync	J5	8	Yellow-Violet				
Vertical Sync	J5	9	Yellow-Grey				

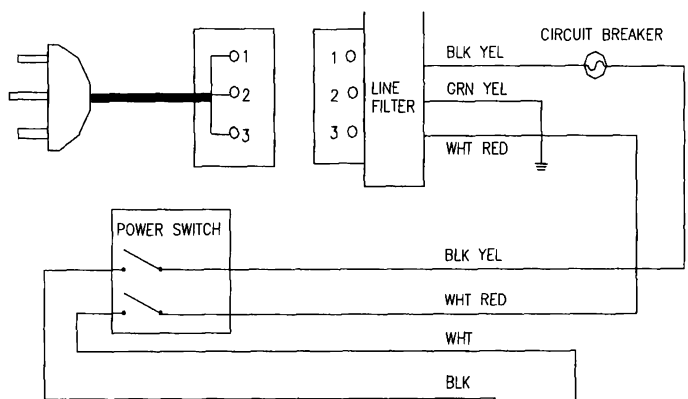
\* Modem connections are also used for the external printer port.

\*\* Security key circuit is required to permit operation of some software versions.

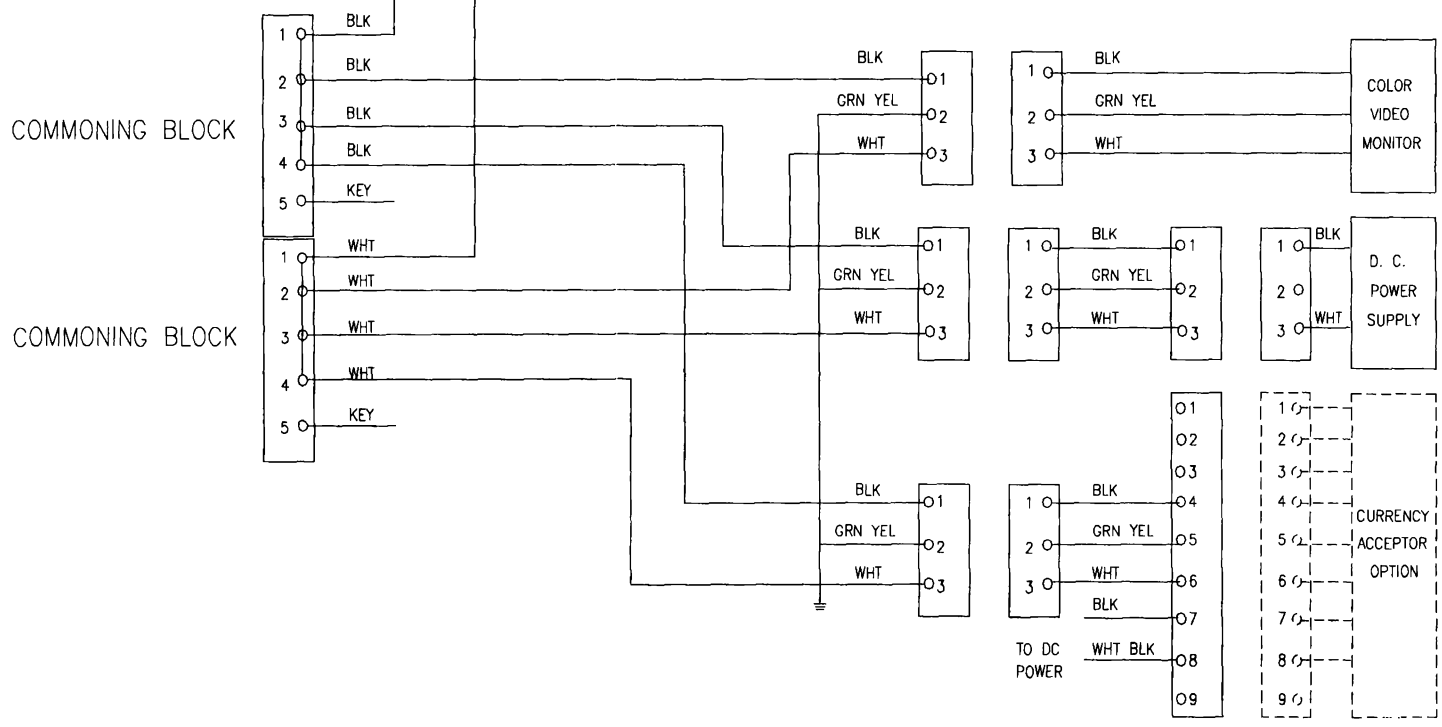
### D.C. Power Source Voltage Limits

FUNCTION	RANGE LIMITS	COLOR	FUNCTION	RANGE LIMITS	COLOR
Digital Circuits	+4.90V to +5.10V	Red	Coin Lights	-4.75V to -5.25V	Yellow
Audio Circuits	+11.5V to +12.5V	Orange	Ground Return	0V	Black

**NOTE: Full Metal Chassis Power Supply has +5V adjustment. Open Frame voltages are all fixed.**



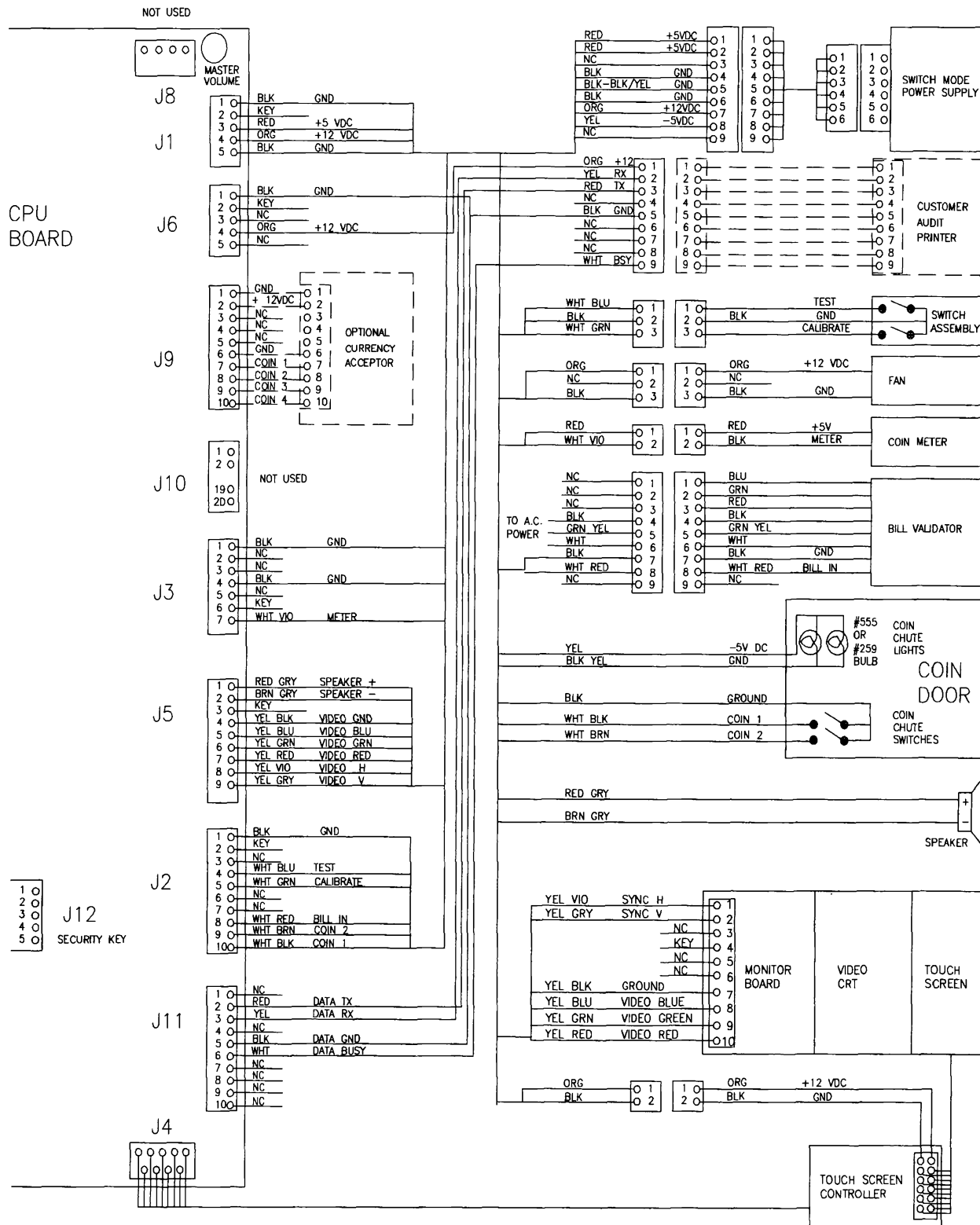
CIRCUIT BREAKER APPLICATION CHART	
LINE VOLTAGE	BREAKER RATING
120	3A 250V
230	2A 250V



**POWER WIRING**



# CABINET WIRING

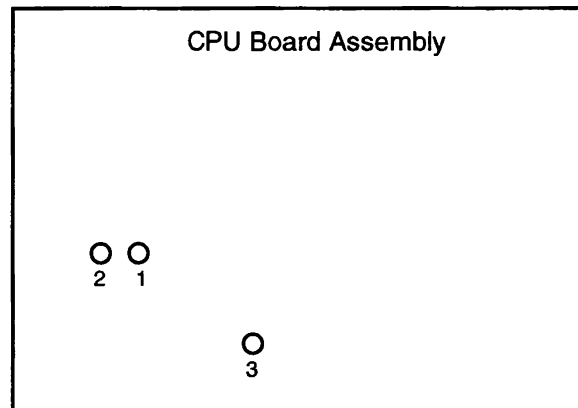


## LED INDICATOR STATUS CHART

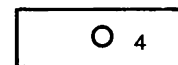
DESIGNATION	LOCATION	FUNCTION	COLOR	STATE	MEANING
LED 1	CPU BOARD ASSEMBLY	PROCESSOR ACTIVITY	RED	OFF	NO POWER (Note 1)
				ON	LOCKED UP (Note 2)
				BLINKING	NORMAL OPERATION
LED 2	CPU BOARD ASSEMBLY	RESET INDICATOR	GREEN	OFF	NO POWER (Note 3)
				ON	NORMAL OPERATION
				BLINKING	ERROR (Note 4)
LED 3	CPU BOARD ASSEMBLY	INTERFACE CONDITION	RED	OFF	NO POWER (Note 5)
				ON	LOCKED UP (Note 6)
				BLINKING	NORMAL OPERATION
LED 4	TOUCH SCREEN CONTROLLER	CONTROLLER CONDITION	GREEN	OFF	NO POWER (Note 7)
				ON	NORMAL OPERATION
				BLINKING	ERROR (Note 8)

### NOTES:

1. No DC power at the CPU.
2. Faulty CPU instructions.
3. CPU not operating.
4. Continuous reset at the CPU.
5. No DC power at the interface.
6. Continuous busy at the interface.
7. No DC power at the Controller.
8. Internal Controller error.



Touch Screen Controller



- 1 Flash every 10 seconds
- 2 Flashes every 10 seconds
- 3 Flashes every 10 seconds
- 4 Flashes every 10 seconds
- 5 Flashes every 10 seconds

- RAM fault
- ROM fault
- A/D fault
- NOVRAM fault
- Analog fault

**NOTES...**

# TOUCH MASTER<sup>TM</sup> COUNTERTOP

## SECTION FOUR



### Troubleshooting

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

1. *Ensure that the A.C. power to the game is turned OFF prior to servicing the game.*
2. *Discharge any static electricity build up in your body by touching any unpainted metal on the game, such as the chain lug. This is to be done BEFORE touching or handling the assemblies.*
3. *Handle the electronic assemblies by their edges and store them in an anti-static area when not in active use. Anti-static bags are to be used to store or transport the game CPU Board Assembly.*
4. *DO NOT install, remove, or connect any electronic assemblies when the cabinet A.C. 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 (back left rear corner of the game cabinet).
- B: Check the fan air flow (in toward the electronics). This does not mean that voltages or signals are as they should be, but it does indicate that there is D.C. power available from the Power Supply.
- C: Turn off power. Remove line cord cable clamp. Test 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 cabinet receptacle. Replace the cable clamp and its knurled screw.
- D: Ensure that cabinet wiring harness connectors are fully seated in the corresponding A.C. Power Wiring Harness connectors (refer to Power Wiring Diagram, Section Three).
- E: Examine the A.C. Circuit Breaker on the cabinet. If the circuit has been broken, the reset button will be protruding from the Circuit Breaker. Press the button in until it latches to restore power.
- F: Examine the A.C. line fuse on the Power Supply Board. If the fuse is faulty, replace it with an identical fuse of the proper voltage and current rating. Connect the line cord and verify operation.
- G: 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 remove the cabinet top cover. 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. Unplug the A.C. line cord. Inspect the CPU Board Assembly. Ensure that the D.C. Power 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: Examine the A.C. line fuse on the Video Monitor Board. If the fuse is faulty, replace it with an identical fuse of the proper voltage and current rating. Connect the line cord and verify operation.
- D: Turn ON the game power. Using the 20 Volt D.C. range on a digital voltmeter, measure D.C. voltages present at the Power connector pins. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information and voltage limits. Adjust the +5V source if it is variable.
- E: Using the 2 Volt A.C. range 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: Remove the side door. Enter the game Menu System by pressing the TEST switch button inside the coin vault. From the SYSTEM SETUP menu, choose the VIDEO TESTS (refer to Section One for additional details). Use these tests to check the operation of screens 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 remove the side access door. Empty the cash box. Inspect revenue for counterfeit currency. Check the vault and remove any items that block the path from the coin mechanism.
  - B: Unlock and remove the cash box. Check each mechanism 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 cabinet is in its normal position. Ensure that the connector is attached and fully seated. Repair or replace mechanism if it is bent or damaged.
  - D: Ensure that the cables and wiring are connected to the currency acceptor or coin mechanism.
  
- 2. Game accepts currency or tokens, but does not start. Audio and video are present.**
  - A: Unlock and remove the side access door. Check each mechanism 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: Enter the game Menu System by pressing the TEST switch inside the coin vault. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose SWITCH TEST (refer to Section One for additional details). Use these tests to confirm the operation of each switch used in the game.
  - C: Inspect to see if the external coin door indicators (Pricing, Flashing Arrows, etc.) are illuminated. Check connectors and cables for wiring continuity from CPU Board connector to the coin door.
  - D: Examine the acceptor for programmable features. Some devices require operator adjustment for each specific type of currency recognized. Refer to the manufacturer's literature for assistance in setting the acceptor features to the required values.
  - E: Turn OFF the game power. Ensure that no parts or wires are caught in hinges or switch contacts.
  - F: 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.).
  - G: Verify that each mechanism is operating properly by placing it in a known good unit.
  
- 3. Game accepts currency or tokens, but number of credits per coin or bill is incorrect.**
  - A: Unlock and remove the side access door. Enter the game Menu System by pressing the TEST switch inside the coin vault. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose SWITCH TEST (refer to Section One for additional details). Use these tests to confirm the operation of each switch used in the game.
  - B: Check that the cabinet wiring is correct for this game. Ensure that the coin meter and coin switches are properly connected to the control input wires at CPU Board Assembly connectors J2, J3, and J9. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information.
  - C: Refer to the manufacturer's literature to set the acceptor features to the required values.
  - D: Verify that each acceptor is operating properly by placing it in a known good unit.

## TOUCH SCREEN PROBLEMS

### 1. **Players complain that the touch screen is not accurate for two or more players.**

- A: Clean the entire cabinet frequently, especially the video screen glass and the touch screen area. It is not necessary to switch off power to the game to clean the unit. Apply an isopropyl alcohol or warm water to a clean cloth or sponge, then use this to wipe the surface. ***Do not apply the cleaner directly on the unit.*** Liquids could drip into circuits and cause erratic game operation.
- B: Warn players to use only one finger at a time. Simultaneous touches confuse the touch controller.
- C: Some players may find that touch screen response improves when they touch the surface of the metal cabinet with one hand as they operate the touch screen with the other hand.

### 2. **Touch screen chooses incorrect items or does not respond when certain areas are touched.**

- A: Unlock and remove the side access door. Enter the game Menu System by pressing the TEST switch inside the coin vault. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose the CALIBRATE TEST (refer to Operation for additional details). Use these tests to confirm that the touch screen is detecting and properly tracking finger position in all areas of the screen.
- B: From the DIAGNOSTIC menu, choose CALIBRATE to adjust the touch screen accuracy. Follow the on screen instructions to optimize the touch screen for sensitivity and linearity.
- C: Turn OFF the game. Unlock and remove the top cover. Remove the monitor bezel (refer to Servicing instructions). Clean the touch screen, especially areas normally hidden by the bezel.
- D: Ensure that the Touch Screen Controller is operating properly by placing it in a known good unit.

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

- A: Unlock and remove the side access door. Enter the game Menu System by pressing the TEST switch inside the coin vault. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose the SWITCH TEST (refer to Section One for additional details). Use these tests to confirm the operation of each switch used in the game.
- B: From the DIAGNOSTIC menu, choose CALIBRATE (refer to Operation for additional details). Follow the on screen instructions to optimize the Touch Screen for sensitivity and linearity.
- C: Unlock and remove the top cover. Observe the CPU Board and touch the screen. A glow will be seen from a red LED if the touch is sensed. Refer to LED Indicator Status Chart (Section Three).
- D: A glow will be seen from a green LED on the end of the Touch Screen Controller (underneath the CPU) if there is voltage in these circuits. Refer to LED Indicator Status Chart (Section Three).
- E: Turn OFF the game power. Unlock the snap latch plunger handles and lift up the rear edge of the CPU Board Assembly. Release the cable ties and lift the controller up just enough to expose the Touch Screen connector. Check that the cable is fully seated in the connector.
- F: Ensure that the Touch Screen Controller 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 remove the side access door and cabinet top cover. Enter the game Menu System by pressing the TEST switch inside the coin vault. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose SOUND TEST (refer to Operating section for details). Verify that volume has not been set at zero. Change the level to maximum to make the game audible.
- B: Select an endlessly repeating sound track. With screen audio level at maximum, turn the CPU Board master volume control full up. Now reduce the master volume until the sound is as loud as possible without distortion. Use the screen adjustments to set a comfortable playing level.
- C: While in the SOUND TEST menu, select PLAY and use the NEXT box to advance through all of the game sounds. Use these sounds to confirm the operation of the audio amplifier and speaker. Note if any of the game sounds are unintelligible voice messages, strange noises, missing, etc.
- D: Turn OFF the game power. Verify correct cabinet wiring for this game. Ensure that the speaker is properly connected to the audio output wires from the Audio 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. range 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. range 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 or muffled. A constant low hum may be present, or sounds are missing.

- A: Unlock and remove the side access door. Enter the game Menu System by pressing the TEST switch inside the coin vault. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose SOUND TESTS. These tests will verify some of the functions of the audio circuits in this game.
- B: Turn OFF the game. Unlock and remove cabinet cover. Locate the speaker. Ensure that it is FULL RANGE (100 to 10,000 Hz response) and rated for at least 15 WATTS continuous power.
- C: Inspect the speaker and its wires (next to the cash box). Ensure that no loose parts or wires are caught in speaker cone, terminals, mounting screws, or stuck to the magnets.
- D: Verify that the game sound ROM is correct for this game. There is only one sound ROM in this game set. The ROM circuit is labeled with the assembly number and the software version.
- E: Check that the cabinet wiring is correct for this game. Ensure that all cabinet ground wires are connected. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information.
- F: Using the 2 Volt A.C. range 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.
- G: 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 remove the cabinet cover. 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. ***Do not operate a monitor without a Remote Adjustment Board.***
- 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 or pinched by chassis or the mounting brackets. Reposition the thick red CRT high voltage wire away from other components under the CPU shelf.
- 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. Turn OFF the game power. Restore power after one minute. Note and record any new messages that appear on the screen.
- B: Unlock and remove the side access door. Enter the game Menu System by pressing the TEST switch inside the coin vault. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose VIDEO TEST. These tests will verify some of the functions of the video circuits in this game.

**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: Turn OFF the game power. 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.
- 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 ROM game image 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.
- F: Turn ON the game power. Using the 20 Volt D.C. range on a digital voltmeter, measure D.C. voltages present at the Power connector pins. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information and voltage limits. Adjust the +5V source if it is variable.
- G: Using the 2 Volt A.C. range 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. Monitors for TouchMaster games require separate horizontal, vertical, and video inputs. Units with different resolution or sync connections 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. Game operates normally, but cabinet gets very warm after several hours of use.**
- 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 all fans are connected and operating at full speed.
- 2. Touch screen requires excessive recalibration to maintain game accuracy.**
- A: Clean the entire cabinet frequently, especially the video screen glass and the touch screen area. It is not necessary to switch off power to the game to clean the unit. Apply an isopropyl alcohol or warm water to a clean cloth or sponge, then use this to wipe the surface. **Do not apply the cleaner directly on the unit.** Liquids could drip into circuits and cause erratic game operation.
  - B: Warn players to use only one finger at a time. Simultaneous touches confuse the touch controller.
  - C: Repeat the Calibrate and Calibrate Test sequence each time the game is relocated.
- 3. Error Messages appear on the screen. The game does not work and there is no audio.**
- A: Check any assembly (RAM, ROM, battery, touch screen, etc.) identified in the Error Message.
  - B: If errors seem to occur at random, try to determine what conditions are connected with the appearance of the message (i.e., time of day, when other equipment is turned off or on, when room temperature is elevated, only with certain players, periods of low or high humidity, etc.).
  - C: Call your authorized distributor for help with unresolved screen messages.

## NOTES

# WARNINGS & NOTICES

## Warning

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

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## Warning

This equipment generates, uses and can emit radio frequency energy and, if not installed properly and used according to the directions in this manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of part 15 of FCC rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference to radio communications, in which the user, at his or her own expense, will be required to take whatever measures may be needed to correct the interference. This equipment also complies with part 68 of FCC rules when connected to a standard telephone line. Connection to telephone coin service (central office implemented systems) is prohibited.

## Warning

Prevent shock hazard and assure proper game operation. This game should only be plugged into a grounded outlet. Do not use a different line cord, install a "cheater plug", or cut off the ground on the line cord.

## Notice

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

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## Notice

This game uses a touchscreen as the sensor for all player responses. Clean and calibrate the touchscreen frequently to ensure maximum accuracy. Use ONLY isopropyl alcohol or warm water as cleaning solutions.

**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 any unpainted metal on the game, such as the chain lug. This is to be done BEFORE touching or handling the electronic assemblies.
3. Handle the electronic assemblies by their edges and store them in an anti-static area when not in active use. Anti-static bags are to be used to store or transport the game CPU Board Assembly.
4. DO NOT install, remove, or connect any electronic assemblies when the cabinet A.C. 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.

**For Service: Call your Authorized MIDWAY GAMES INC. Distributor.**

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