

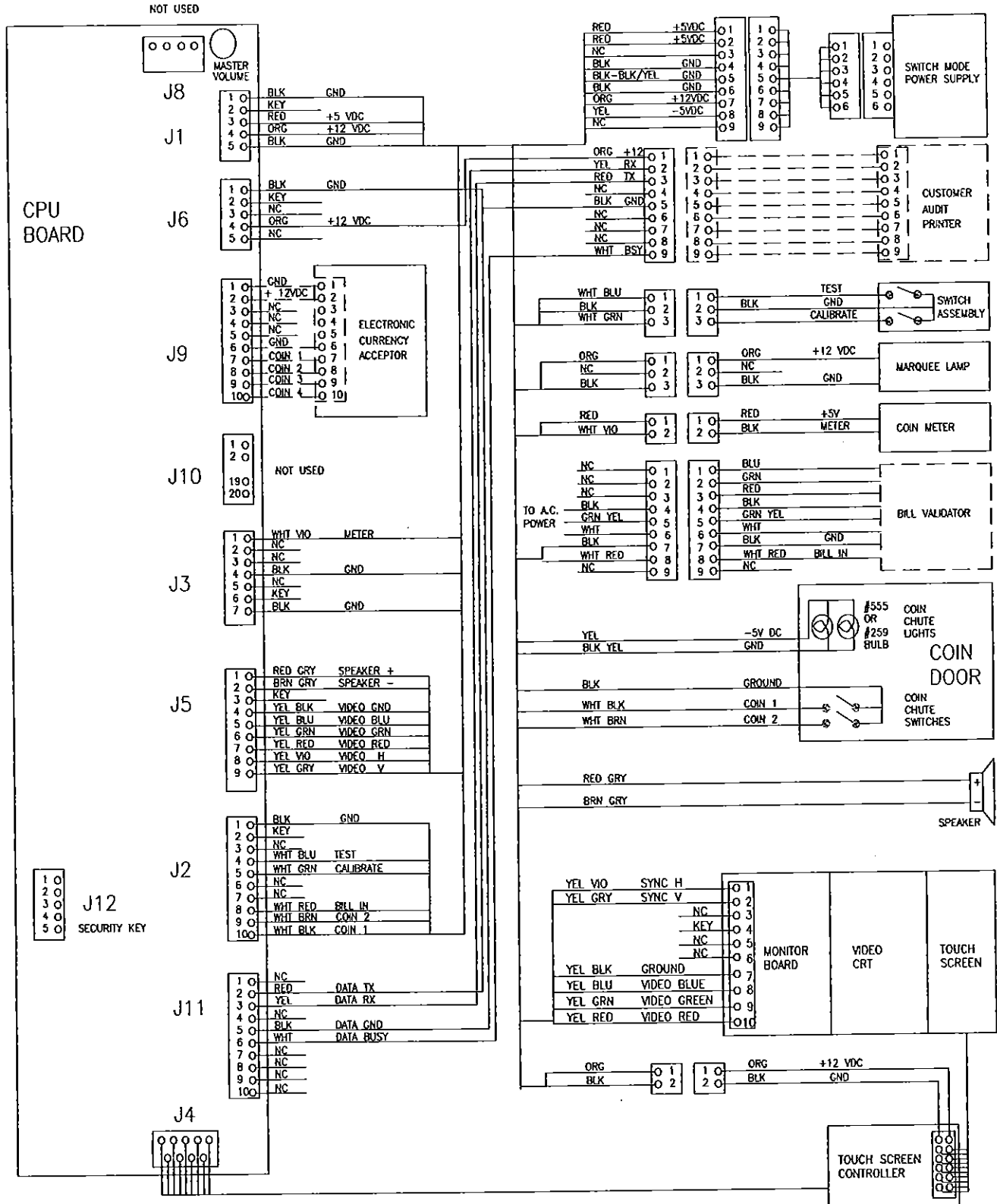
TOUCH MASTER

MANUAL AMENDMENT

The following corrections and additions have been made to the TouchMaster Classic Upright Style Cabinet Operations Manual (Part Number 16-60074.1-101) dated June 1998:

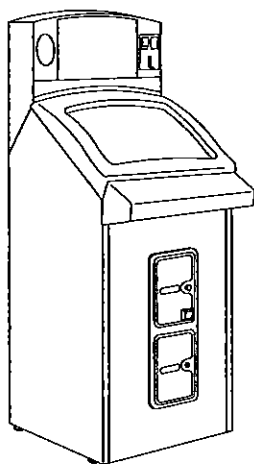
DESCRIPTION	LOCATION	CHANGE
Cabinet Wiring Diagram	WIRING Page 3-3	Coin meter connector wire colors have changed.

CABINET WIRING



NOTE: PRINTER PORT NOT FACTORY INSTALLED IN ALL MODELS. A PORT KIT IS AVAILABLE.

TOUCH MASTER™



CLASSIC UPRIGHT STYLE CABINET



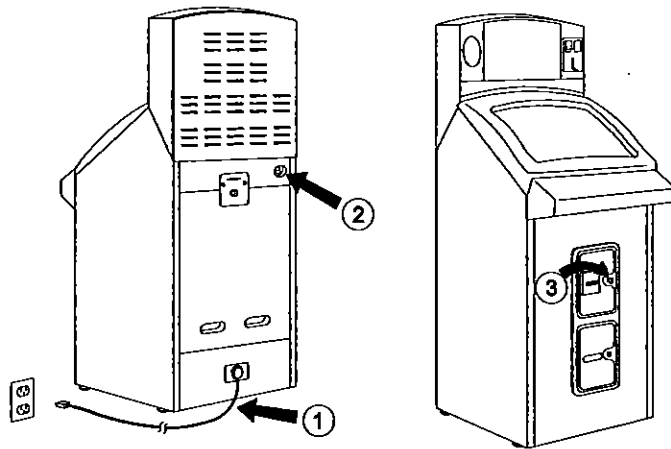
Operations Manual Includes

- Operations • Adjustments • Parts Information • Wiring • Calibration • Problem Diagnosis

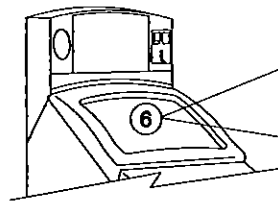
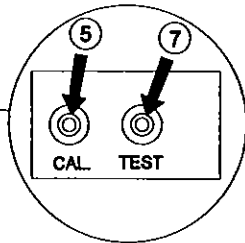
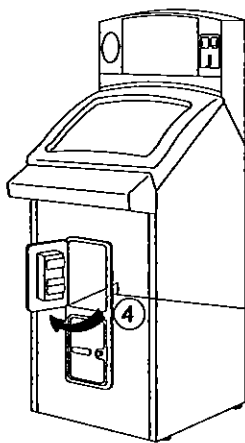
The manufacturer intends that this game is to be operated for amusement purposes only and not in contravention of any federal, state or local law or regulation of the United States or any foreign country governing gaming devices. All operators of this game are responsible for its operation in accordance 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.

**MIDWAY GAMES INC.
3401 North California Avenue
Chicago, Illinois 60618-5899**

CLASSIC TOUCHMASTER QUICK REFERENCE

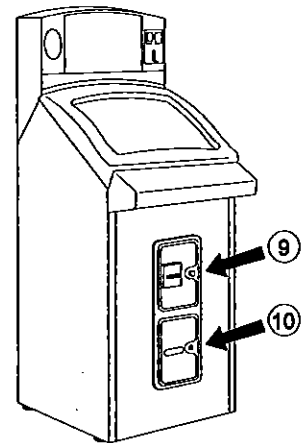
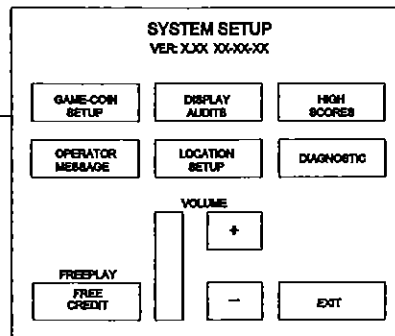
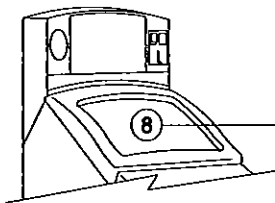


1. Install and secure power cord.
2. Plug in unit and turn on power.
3. Insert key in coin door; turn key clockwise and hold.
4. Swing door open. Buttons are inside.
5. Press and release Calibrate button.
6. Touch white dots, then touch red boxes.
7. Press and release Test button.
8. Use menus to audit or adjust.
9. Close door and remove key.
10. Open cash door to remove currency.



CALIBRATE TOUCH SCREEN
TOUCH WHITE DOT IN
LOWER LEFT CORNER

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CALIBRATION TEST PRESS EACH RED BOX			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CYCLE POWER AND RECALIBRATE IN CASE OF TROUBLE			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



DECLARATION OF CONFORMITY

MIDWAY GAMES INC.

3401 N. CALIFORNIA AVE.
CHICAGO, IL 60618
U.S.A.

WE, HEREBY DECLARE UNDER SOLE RESPONSIBILITY THAT

THE MODEL: *TOUCHMASTER CLASSIC 1.5* 60274,60374,60474,60774,60974,61074,61174,61374
61474,61874,62074,62174,66274,66374,66474,66574

TO WHICH THIS DECLARATION RELATES IS IN CONFORMITY WITH THE
FOLLOWING EUROPEAN PRODUCT SAFETY DIRECTIVES:

ELECTROMAGNETIC COMPATABILITY DIRECTIVE
(89/336/EEC AND AMENDMENTS 91/C162/08, 92/31/EEC,93/68/EEC

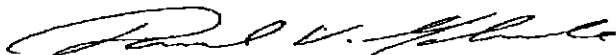
**ELECTRICAL EQUIPMENT DESIGNED FOR USE WITHIN
CERTAIN VOLTAGE LIMITS DIRECTIVE**
(73/336/EEC AND AMENDMENTS 88/C168/02, 92/C210/01,
93/68/EEC,94/C199/03, 95/C214/02)

AS IS VERIFIED BY COMPLIANCE WITH THE FOLLOWING STANDARDS:

EN55014: 1993	EN61000-4-2: 1995
IEC 801-3: 1984 (EN61000-4-3)	EN61000-4-4: 1995
EN61000-4-5: 1995	EN335-1: 1995
IEC 335-2-82 (DRAFT)	

Date issued:

MARCH 16, 1998



DAN GALARDE

CORPORATE V.P. OF QUALITY

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TOUCH MASTERTM CLASSIC

**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.

Safety Notices

These safety instructions apply to all game operators and service personnel. There also are specific warnings and cautions throughout this manual. Read this page before preparing your game for play.



AC POWER CONNECTION. Verify that the slide switch on the power supply is set for 110VAC or 220VAC according to local line voltage. Verify that the AC voltage is correct for local line voltage.

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

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

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

DISCONNECT POWER DURING REPAIRS. To avoid electrical shock, turn off the power switch and disconnect game 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 originals in type, voltage rating, and current rating. Replacement circuit breakers also must have identical ratings.

HANDLE CRT AND TOUCH SCREEN WITH CARE. Both the Touch Screen and CRT are both made of glass. Shattered glass from a CRT implosion can fly eight feet or more from the point of impact.

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 the game and void its warranty. All wiring harness connectors are keyed.

ALLOW HOT SURFACES TO COOL. The halogen lamps in some cabinets operate at high temperatures. Remove fingerprints or dirt from bulb with methylated spirits and a lint-free cloth before testing replacement.

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 23.5" (59.7 cm)	220 Lbs	Dedicated Video Game
Depth 31" (78.7 cm)	(100 kg.)	Classic Cabinet Style
Height 60" (152.4 cm)		

Equipment Characteristics

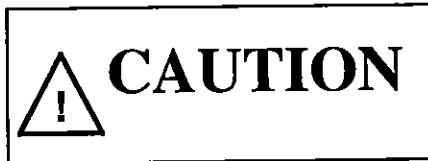
<u>Video Display Monitor</u>	<u>Audio System</u>	<u>Currency Acceptors</u>
Standard Resolution RGB 19" (48.3 cm) CRT with Touch Screen	Digital Monaural 3.5" (8.9 cm) Full Range Speaker	Electronic Currency Acceptor (std.) DBV or Coin Mech door (optional) 1 Coin Counter

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.



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 clean. *Do not apply the cleaner directly on the glass!* Liquids could drip down into Touch Screen circuits and cause erratic game operation.

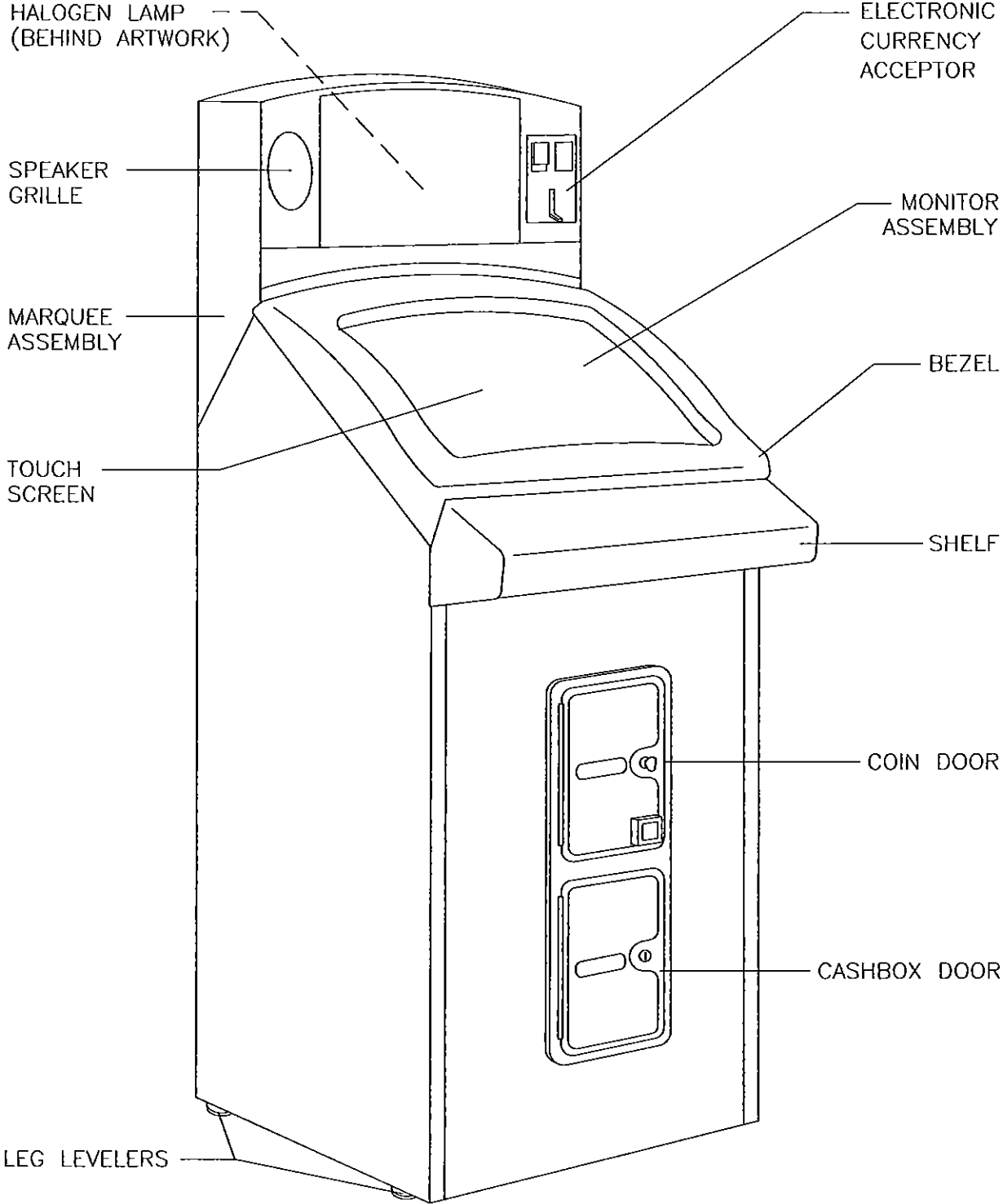
◆ Cabinet

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

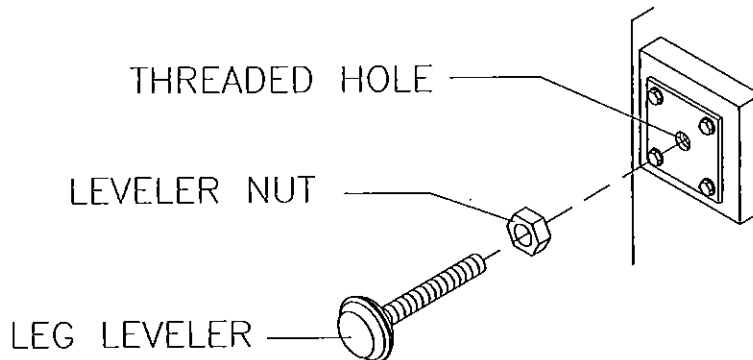
When cleaning the TouchMaster, use the Calibration Test to check the touch screen for accuracy (refer to Calibration in this section).

CABINET ASSEMBLY
(Front View)

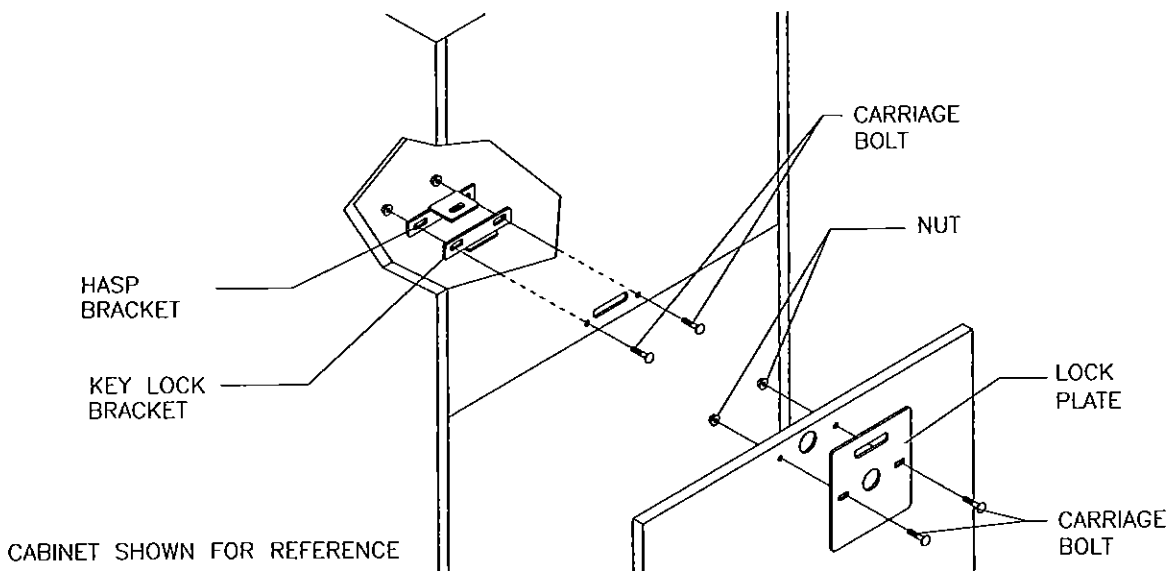


INSTALLATION & INSPECTION

1. Remove all items from shipping container and set them aside (the line cord and the spare parts are shipped in the cash box). Inspect the exterior of the cabinet and the CRT for any signs of damage.
2. The coin door keys are attached to the marquee currency acceptor. Remove the keys. Unlock and open the coin and cash box doors. Leg levelers and other loose cabinet parts are in the cash box.
3. Four leg levelers and nuts are located in the spare parts bag. Install one nut onto each leveler. Install one leveler and nut into the threaded hole in each cabinet corner. Do not tighten at this time.

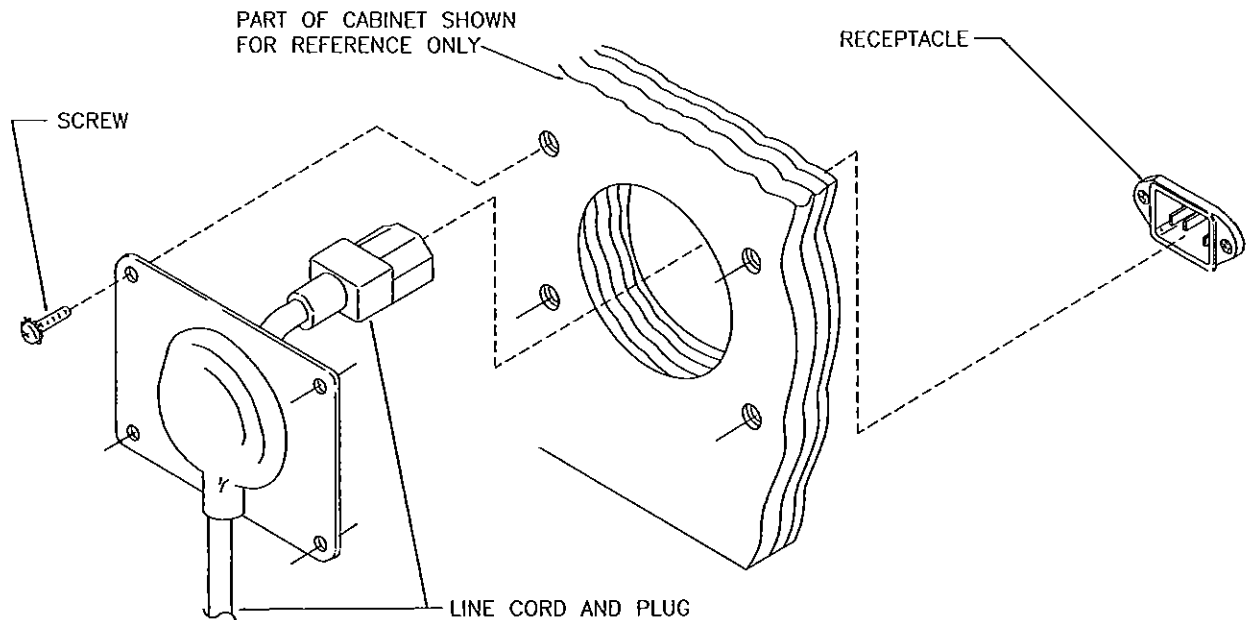


4. Remove and save the screws from the cabinet rear door. Lift the door off. Inspect the interior for any signs of damage. Check all major assemblies to assure that they are mounted securely.
5. Refer to the Cabinet Wiring Diagram (section 3), and check to see that all cable connectors are correctly secured. *Do not force connectors; they are keyed to fit in only one direction.* Bent pins and reversed connections may damage your game and void the warranty.



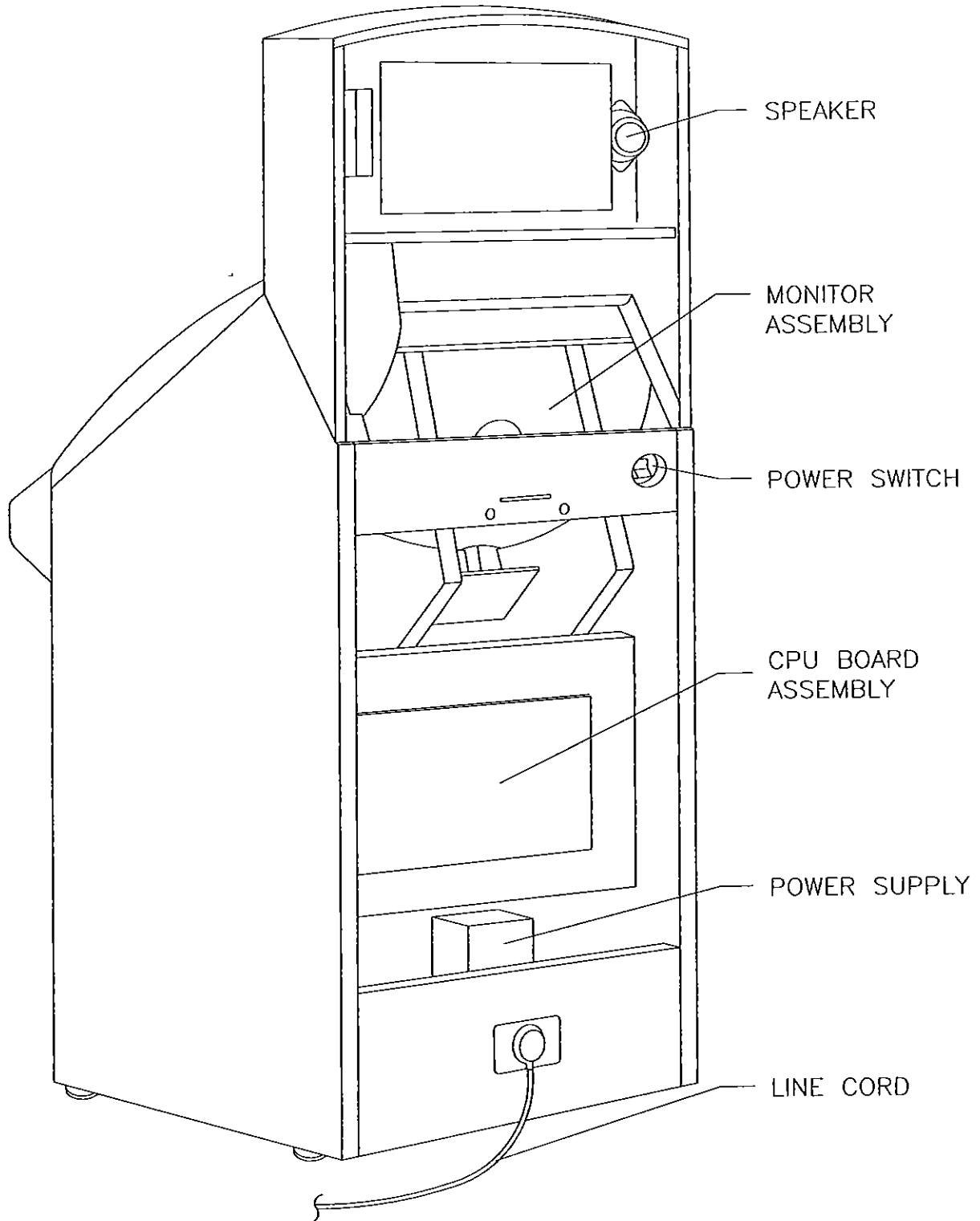
6. An extra padlock may be installed to secure the rear door. A hasp is located in the spare parts bag. Remove the two lock bracket nuts from inside the cabinet, above the rear door opening. Slide the hasp onto the bolts so that it protrudes from the hole in back of the cabinet, then reinstall the nuts.

7. Locate the lock plate at the top of the rear door. Remove the bolts and nuts from the lock plate, then rotate the plate so that the slot will be above the door. Reinstall the bolts and nuts and tighten firmly.
8. The power cord is with the spare parts. Remove and save four screws from the line cord cover plate at the rear of the cabinet. Match the holes on the IEC plug with the prongs in the receptacle and push firmly to seat the line cord. Hold the cord flat against the cabinet and reinstall the cover plate (the indentation should point down so that the cord exits toward the bottom of the cabinet).



9. Close and lock the cash box and coin doors. Store the keys in a safe place (hang the extra keys on the key hook inside the cabinet if desired).
10. Reinstall the rear door onto the cabinet and close it. Install the screws at the top and sides of the rear door and tighten snugly.
11. Lift the game and move it to its intended location. Do not slide the game; there are no wheels on the cabinet. Lower each leg leveler until the cabinet is stable and level. Adjust the levelers as required to distribute weight equally on each corner. Tighten the nuts firmly.
12. Plug the game into a grounded AC wall outlet. Connect line cord ground wires. Turn ON the game, using the switch located on the upper left rear of the cabinet. The game will power up and begin self-diagnostics. If there are no errors, the game will automatically enter its "attract" mode of operation.
13. Unlock and open the coin door. Press and release the CAL switch pushbutton to optimize the monitor screen touch sensors. Follow the screen instruction to calibrate and verify the touch screen system.
14. Press and release the TEST switch pushbutton to set the game variables and verify game operation.
15. Recalibrate the touchscreen each time the cabinet is moved to a different location.

CABINET ASSEMBLY (Rear View)



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.

The characteristics of each game can be adjusted to suit the proficiency of the players. For example, operators can change game graphics to alter game appearance, or the speed of the games to suit player abilities. This flexibility increases the entertainment value of these games for those who play them often.

Some TouchMaster versions include different games. International games permit players to participate one of several widely spoken languages. Some versions permit customers to select their own language. Contact your authorized distributor to discover which games are available for your location.

TouchMaster games are classified according to type of player challenge. Here are some representative examples of games in each group (your TouchMaster may have a different complement of games):

DEXTERITY - Games that test a player's hand-eye 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 the condition of the hardware and game EPROMs. If any of the individual tests fails, then an error message displays for that test. The message appears 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 complete all tests then load and run the game.

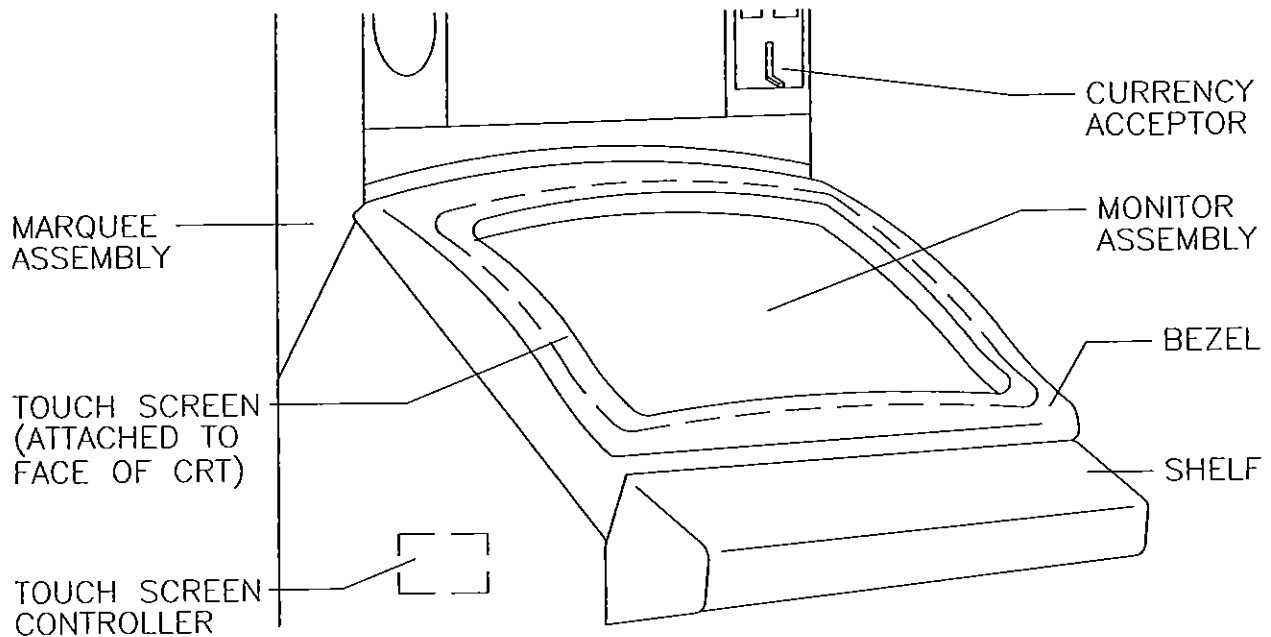
Once all power-up tests are complete, the game goes into its "attract mode". Game choices alternate with scenes and sounds from a typical game in an endless pattern until game play starts.

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 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 will respond to only one active area at a time.



LOCATION OF PLAYER CONTROLS

OPERATOR CONTROLS

CABINET SWITCHES (located above the rear door behind the marquee)

◆ Power Switch

The **Power Switch** turns off the game during service. It does not reset the game variables. The only external control on this game is located on the back of the cabinet above the rear door.

CONTROL SWITCHES (inside the coin door unless otherwise noted)

◆ Test Button

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 Button

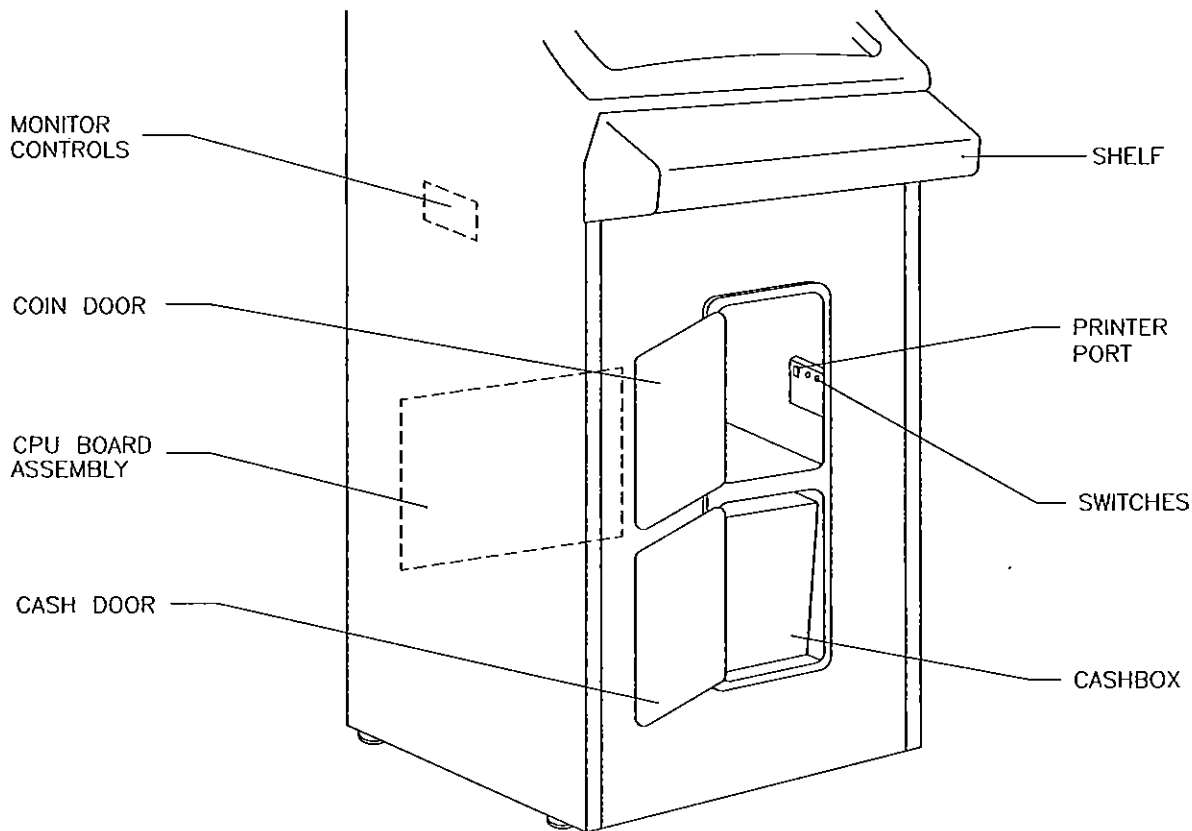
The **Calibrate** push-button switch enters the Touch Screen adjustment and verification routine. After the routine steps have been completed, normal game operation returns automatically.

◆ 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 the cabinet on the wall between the CPU Board and the CRT)

The **Monitor Remote Adjustment Board** sets the video display for optimum viewing.



OPERATOR CONTROL LOCATIONS

NOTE: PRINTER PORT NOT FACTORY INSTALLED IN ALL MODELS. A PORT KIT IS AVAILABLE.

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.

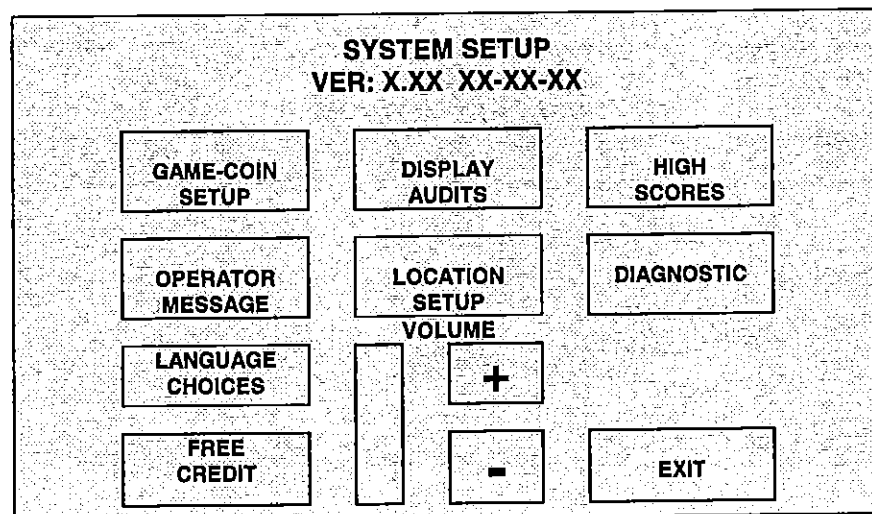
Tests are useful to verify proper operation of the equipment.

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



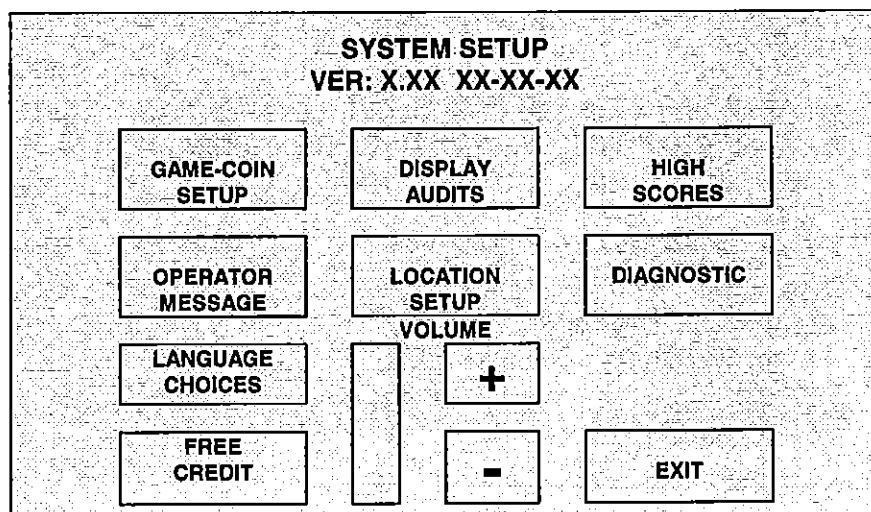
TYPICAL SYSTEM SETUP SCREEN

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:

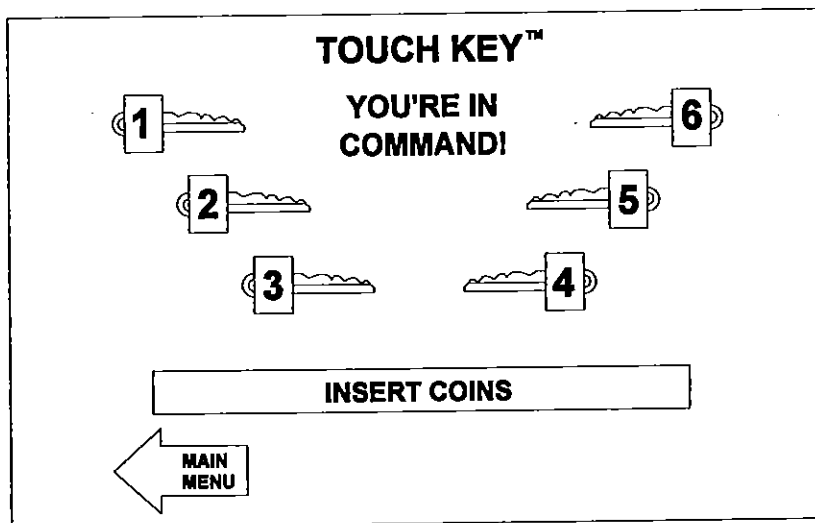
1. Press and release the TEST switch pushbutton to enter the menu system. Touch the LOCATION SETUP box to begin the process. Select LOCATION NAME to identify the game environment.
2. Enter letters one at a time to spell out the establishment, city, country or other location identification. Use arrow 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

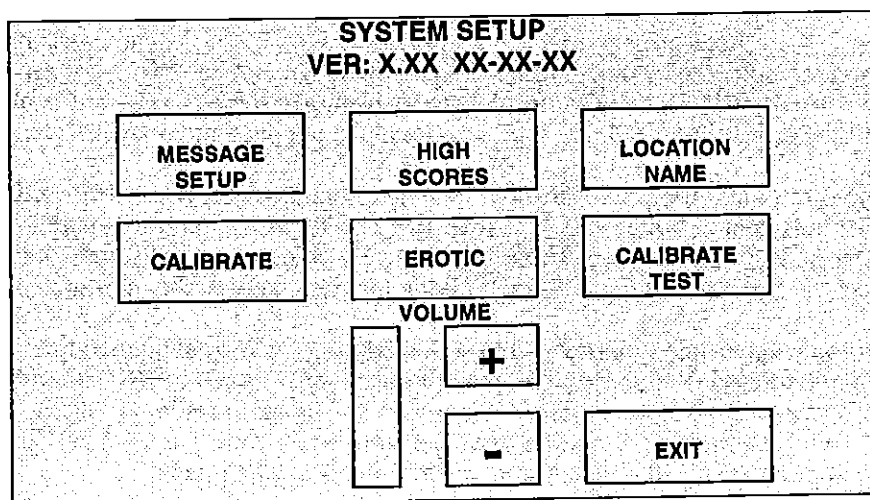
TOUCH KEY USE Location adjustments can be turned over to designated employees using this procedure:

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

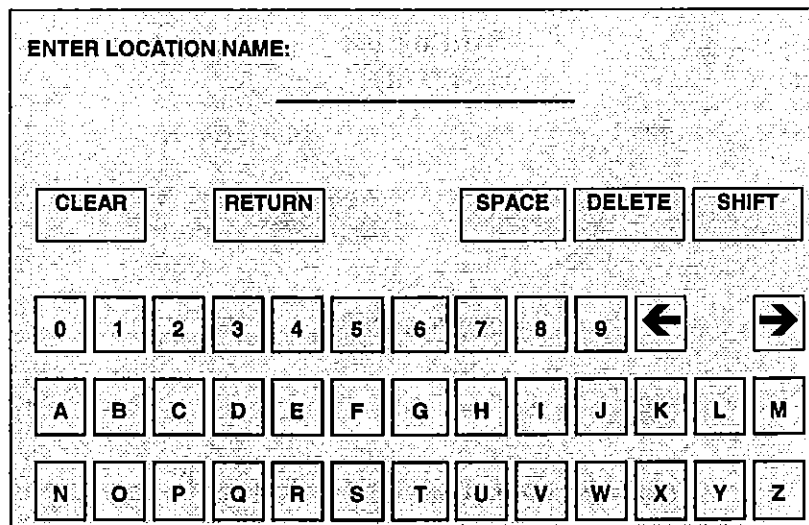
LOCATION SETUP

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.



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

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

RESET **RETURN**

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.

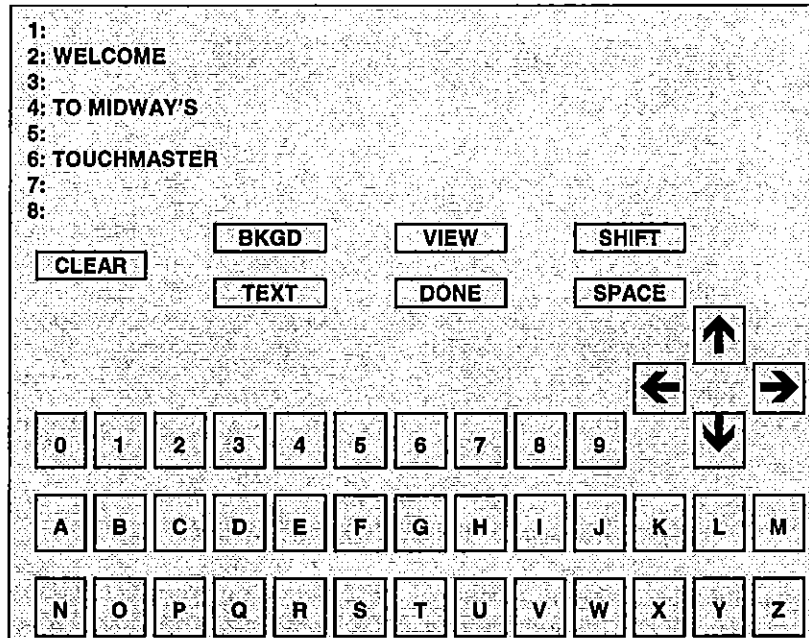
This is the only screen needed to view the HOT HOOPS™ scores. To compare these scores with those from the other games, you must view the High Scores screen for each game separately. Note and record all of the items presented on these screens. Touch RETURN to select other high scores. Touch RETURN again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

CLEAR	Deletes all characters from the screen simultaneously. Used to erase old messages.
BKGD	Changes the color of the background area behind the message. Provides contrast.
TEXT	Changes the color of the message. Each message line can be another color if you like.
VIEW	Displays how your finished message will appear before it is saved in game memory.
DONE	Saves the message and background, then reverts to the main menu screen.
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 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.

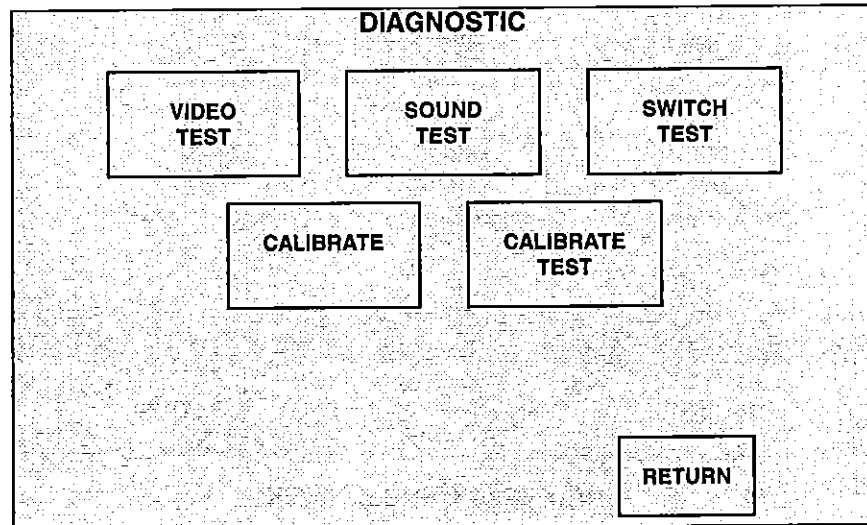
Touch the letters C O N T E S T, use TEXT to pick a color, and touch ↓ to leave a blank line. Touch C O M I N G, insert a SPACE, and touch S O O N. Touch SHIFT to locate and enter the ! symbol. Touch TEXT repeatedly to choose the color of the line. Touch ↓ to leave a blank line under the text.

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

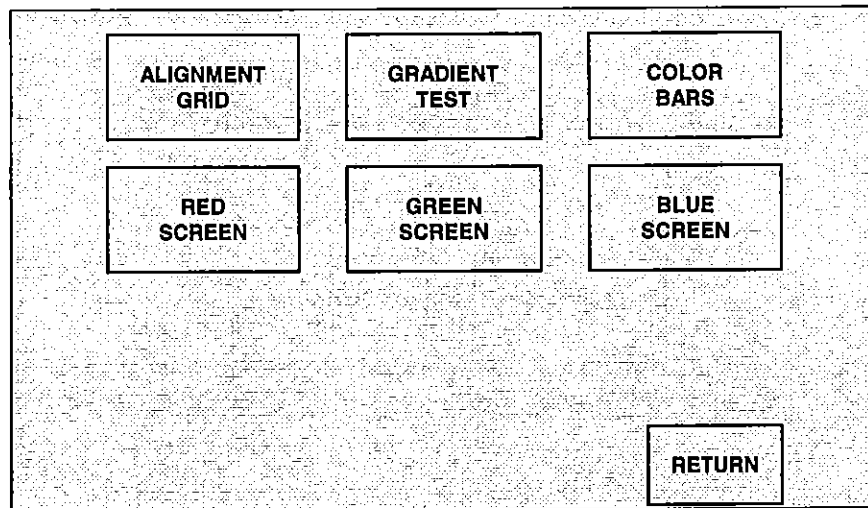
Solid red screen for purity tests. There should be no other color showing.

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.

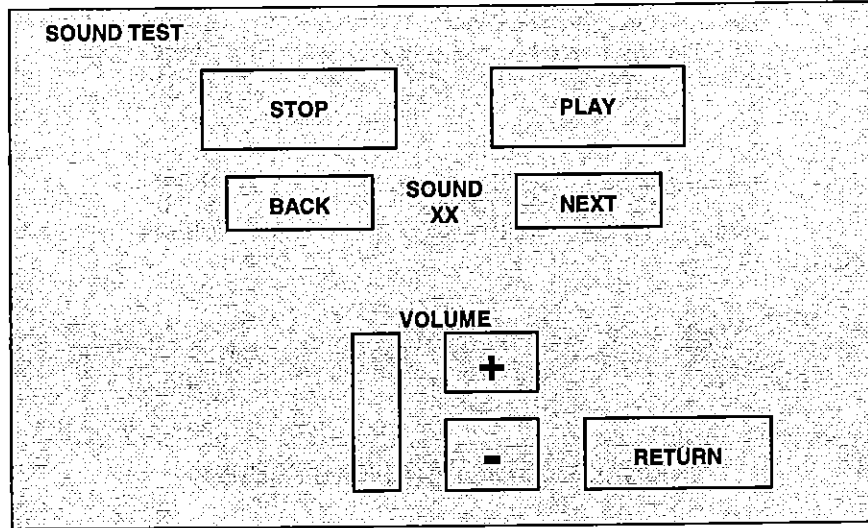
The COLOR BARS screen displays each of the standard colors and shades produced by the game's video circuits. The vertical bars must be uniform from top to bottom. The horizontal bars should show small changes in intensity or shade from side to side. A sudden transition in any bar indicates a fault.

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.

- STOP** Ends the sound selected. Used to halt the repetitive sound tracks in the game.
- PLAY** Starts the sound selected. Can be used to start another sound while one is active.
- BACK** Selects the previous sound choice. Each single touch decrements the counter by one.
- NEXT** Selects the next sound choice. Each single touch increments the counter by one.
- +** Raises the volume of the sound in steps until the maximum value is reached.
- Lowers the volume of the sound in steps until the minimum value is reached.
- RETURN** 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.

SWITCH TEST		
J2-10	M. COIN 1 INPUT -----	OPEN
J2-9	M. COIN 2 INPUT -----	OPEN
J2-8	DBV INPUT -----	OPEN
J2-5	TEST -----	OPEN
J2-4	CALIBRATE -----	CLOSED
J9-7	E. COIN 1 INPUT -----	OPEN
J9-8	E. COIN 2 INPUT -----	OPEN
J9-9	E. COIN 3 INPUT -----	OPEN
J9-10	E. COIN 4 INPUT -----	OPEN
0.0.0		RETURN

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).

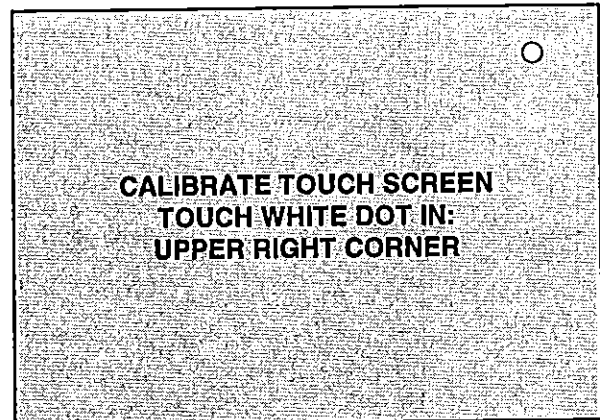
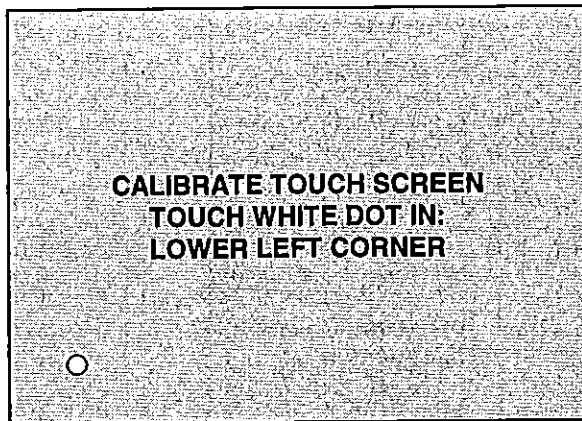
Press and hold the CAL. push button. The TouchMaster will emit CLUNKing sounds and indicate this switch is CLOSED on the screen. Release the button to stop the sound and revert to an OPEN state. Repeat these steps for other switches in the game. When finished, choose RETURN and EXIT to quit.

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

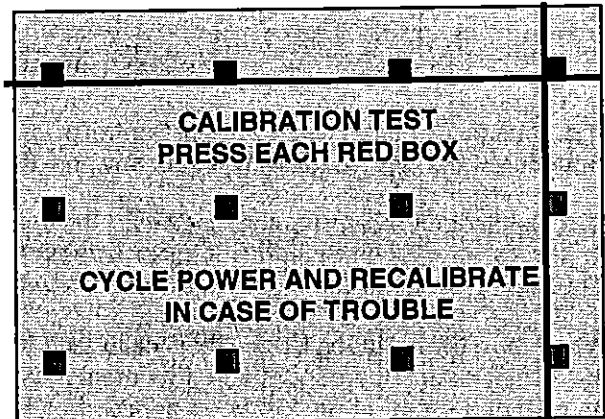
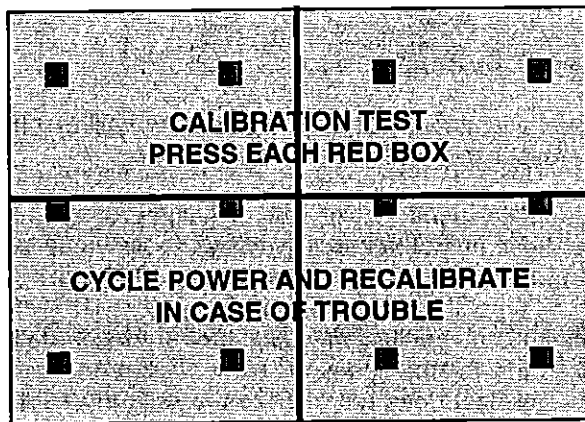
CALIBRATE

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.

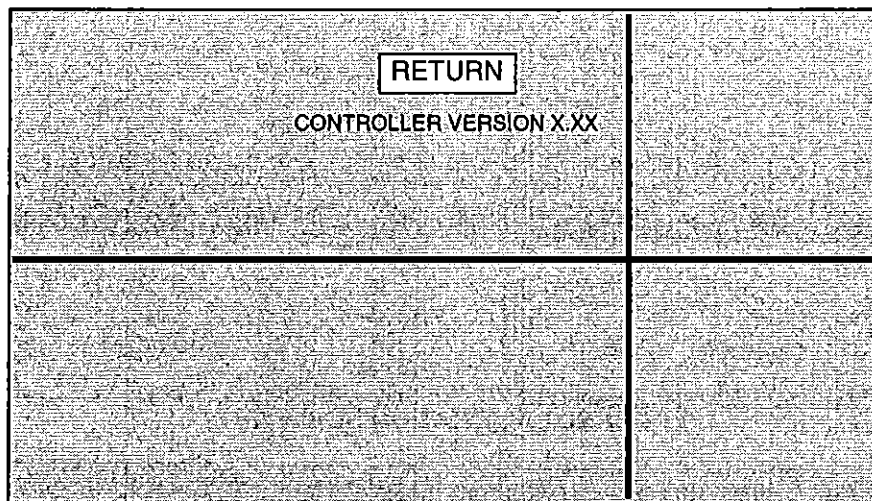
Calibration screens require the user to touch one specific location as indicated by a single dot. Touch the dot and hold this position until coarse tracking adjustments are completed (about two seconds). The TouchMaster will automatically advance to the next screen and emit a short burst of sound. Repeat 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

Read the SAFETY NOTICES section thoroughly before beginning service.

This game uses complex electronic components that are SENSITIVE to static electricity. Follow and observe these precautions prior to handling the game electronics:

1. **Ensure that the A.C. power to the game is turned OFF prior to servicing the electronics.**
2. **Discharge any static electricity build up in your body by touching the safety ground stud of the power supply chassis while the line cord is connected to a properly grounded outlet. Do this 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 the game CPU assembly. 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.**

◆ Shelf

Switch off power to the game. Remove the cover plate under the shelf to expose the mounting bolts. Support the shelf when removing the mounting bolts. Tighten the bolts very firmly during reassembly.

◆ Monitor Bezel

Switch off power to the game. Unlock and remove the rear door. Reach up alongside the monitor and locate the latches (two on each side). Lift the latch handle to release each latch, then swing it away from the cabinet. From the front of the cabinet, grasp the bezel and pull it out away from the monitor.

◆ Touch Screen Controller

Switch off power to the game. Unlock and remove the rear door. Disconnect the Touch Screen Controller cable from the CPU Board Assembly. Carefully cut the cable ties that secure the controller cable, then free it from all other wiring. Remove the two mounting screws from the controller. Pull the controller from the cabinet and turn it to expose the Touch Screen cable. Disconnect this cable and let it hang loose in the cabinet. Lift the controller and its cable out of the cabinet.

◆ Touch Screen

Switch off power to the game. Remove the monitor bezel as described above. Remove the Touch Screen Controller and disconnect the Touch Screen cable. Disconnect power and ground wiring. Carefully note the orientation of the touch screen cable and the adhesive strips before separating the screen from the monitor. See Instruction Sheet (part number 16-10567) for replacement procedure.

◆ Speaker

Switch off power to the game. Remove the marquee back cover to expose the speaker. Disconnect the wires. Remove the speaker mounting nuts. Pull the speaker straight out of the cabinet.

◆ Electronic Currency Acceptor

Switch off power to the game. Unlock and open the Currency Acceptor door. Swing door forward and down just enough to expose the wiring. Use a slight rocking motion to disconnect the cables. Lift the entire assembly up and out of the cabinet. Remove mounting screws to separate device from door.

The currency acceptor may be cleaned or cleared of jams without further disassembly. To release the acceptor from its mini-plate bracket, gently bend each of the side and bottom mounting prongs away from the unit while pulling it with a slight rocking motion. The prongs snap into place upon assembly.

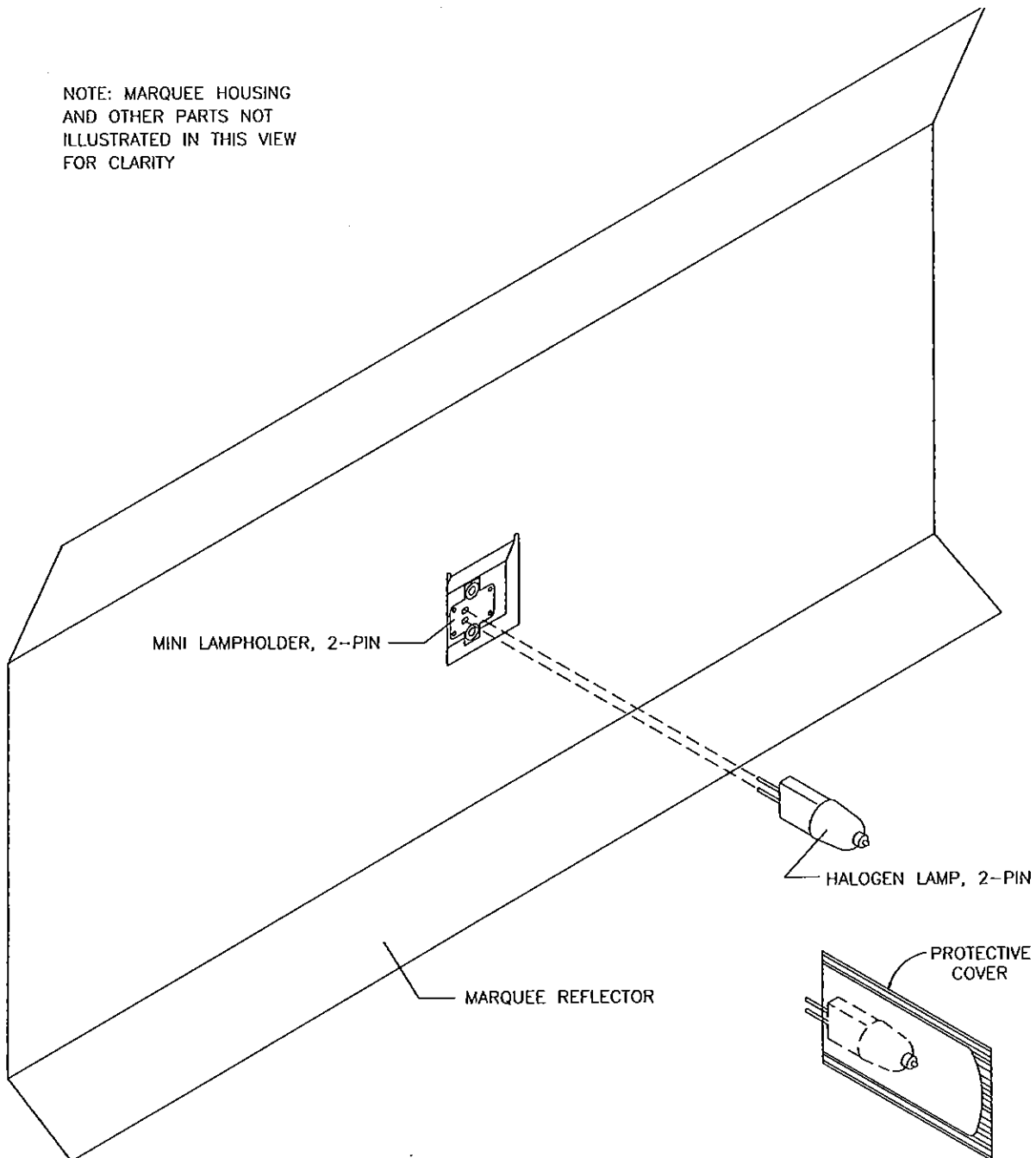
NOTE: Acceptors are factory programmed. Contact authorized distributors for replacements.

◆ **Halogen Marquee Lamp**

Switch off power to the game and allow two minutes for the lamp to cool. Unlock the coin acceptor door and swing it forward. Unplug the ribbon cable connector from the electronic coin acceptor, then remove the acceptor assembly and set it aside. Remove two tamper-resistant screws at the front of each side of the marquee, and one at the front top. Tilt the marquee front cover forward at the top, then lift it, the plastic cover, and the artwork up and out of the marquee. Set all three items aside.

Do not touch the halogen bulb with your fingers! Grasp the lamp with a bulb puller or a clean, lint free cloth and pull it straight out of the holder. Cut off the end of the protective cover nearest the pins of the replacement lamp and squeeze the package slightly to make the lamp pins protrude. Hold the lamp with the protective cover and align the pins with the lamp holder holes. Press firmly to seat the contacts fully, then slide the cover off and discard it. Reassemble the marquee and coin acceptor.

NOTE: MARQUEE HOUSING
AND OTHER PARTS NOT
ILLUSTRATED IN THIS VIEW
FOR CLARITY



◆ **Control Switches**

Switch off power to the game. Open the coin door. Remove switch mounting nuts and push switches through the bracket into the cabinet. Disconnect wiring and lift the switches up and out of cabinet.

Ensure that the switches are not installed in reversed locations during reassembly (wires are labeled).

◆ **Coin Meter**

Switch off power to the game. Open the cash door. Locate coin meter at bottom right corner. Remove meter mounting screws from front. Disconnect wiring and lift meter out of cabinet from rear.

◆ **Power Switch**

Switch off power to the game. Unplug the line cord from the source of power. Remove the rear door. 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.*

◆ **Power Supply**

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

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



CAUTION

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

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

◆ **Monitor**

Switch off power to the game. Remove the monitor bezel as described on a previous page. Unlock and remove the rear door. Remove the screws from the Touch Screen Controller and pull it just far enough to clear the cabinet. Turn the controller over to expose the Touch Screen cable and disconnect it. Replace the controller and install the screws finger tight. Disconnect all of the monitor cables. Remove the four flange nuts securing the monitor's mounting brackets to its mounting panel. Pull the monitor carefully from the front of the cabinet and set it in a safe place. Clean the face of the CRT and the touch screen before reinstalling the bezel and the control panel.

If a different monitor is to be installed, remove the top and bottom brackets and their mounting hardware from the original monitor and transfer them to the other unit prior to installation. These brackets provide the additional stiffness required to withstand strong forces on the touch screen.

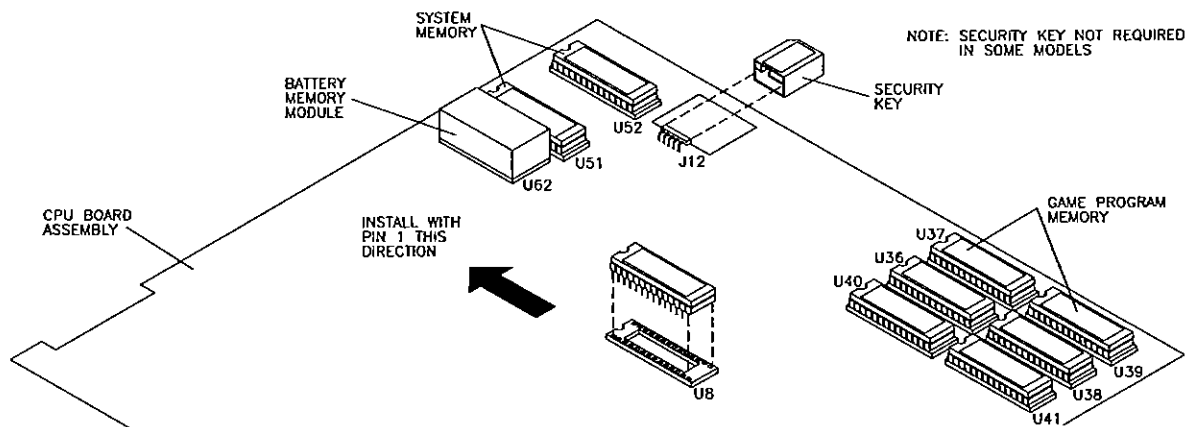
◆ CPU Board Assembly

Switch off power to the game. Remove the cabinet rear door. Remove the metal cover (if present) to expose the CPU Board Assembly. Carefully note the orientation of the Touch Screen Controller cable and the other cables of the wiring harness. Extract the harness cables from the board connectors. Remove the CPU Board Assembly mounting screws. Disconnect the Touch Screen Controller cable from the CPU. Lift the board out of the cabinet and set in a safe place. Anti-static bags and protective containers from new parts may be used to store the board if it is not reinstalled.

NOTE: Ensure that all sides of the metal cover (if present) are in direct electrical and mechanical contact with the bottom when the top is replaced. This is necessary to meet FCC requirements.



Discharge any static electricity build up in your body by touching the ground stud on the power supply chassis. Do this done BEFORE touching or handling the electronic assemblies.



ORIENTATION OF FIELD REPLACEABLE ELECTRONIC COMPONENTS

◆ Battery Memory Module

NOTE: The battery is permanently attached to a memory circuit and cannot be replaced separately. Switch off power to the game. Remove the cabinet rear door. Remove the RF Cage top to expose the CPU Board Assembly. Carefully note module position, then remove using a chip extraction tool.

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

◆ 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. Remove the cabinet rear door. Remove the RF Cage top to expose the CPU Board Assembly. Carefully note ROM positions, then remove using a chip extraction tool.

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

Be certain that to align notches on parts as indicated. Reversed orientation can destroy circuits! Do not install any circuit on the CPU Board Assembly or Power Supply with the power turned on. Doing so while the power is turned on may damage the game and void your warranty.

TOUCH MASTERTM CLASSIC

SECTION
TWO



Parts Information

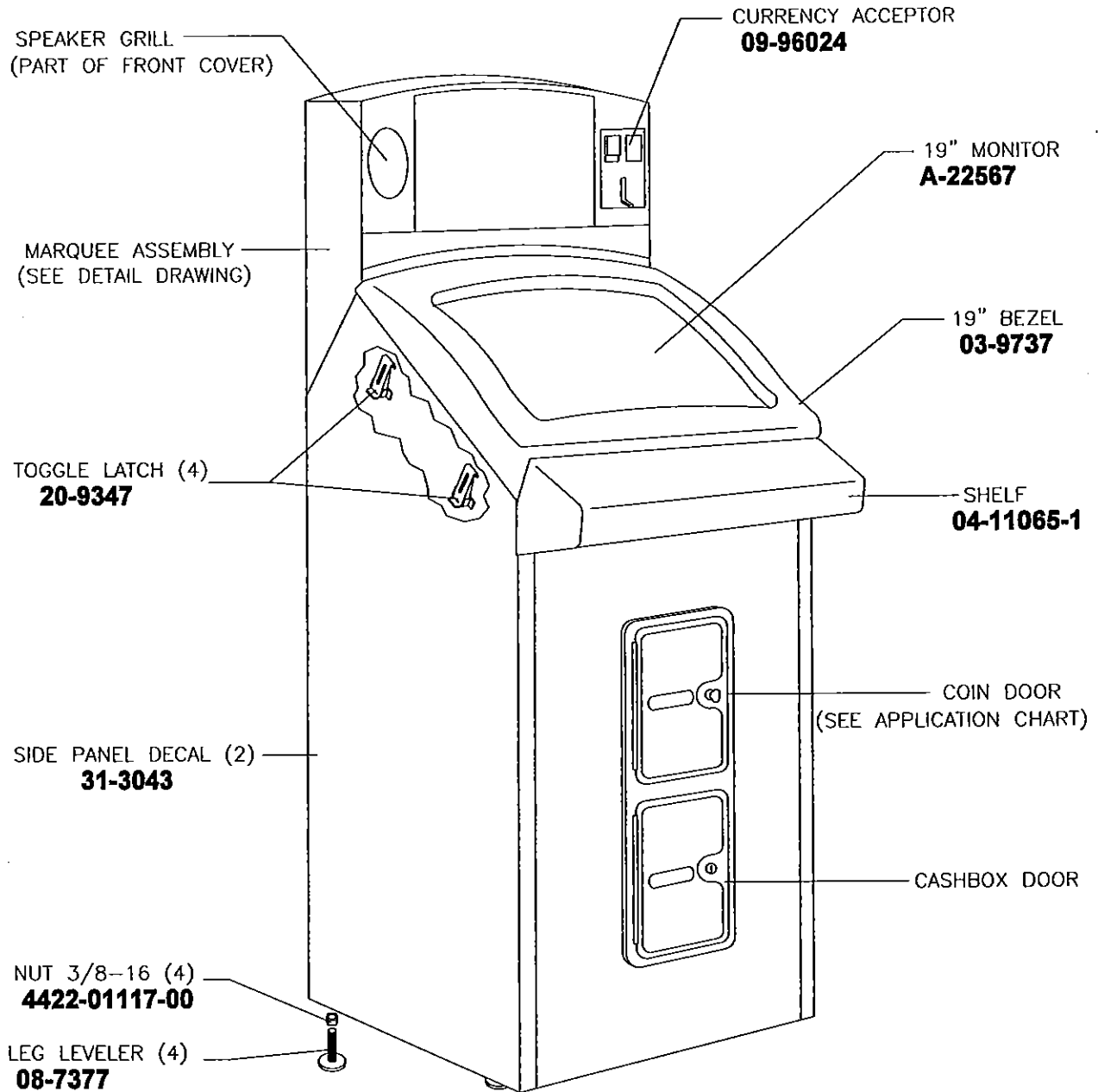
Warning

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

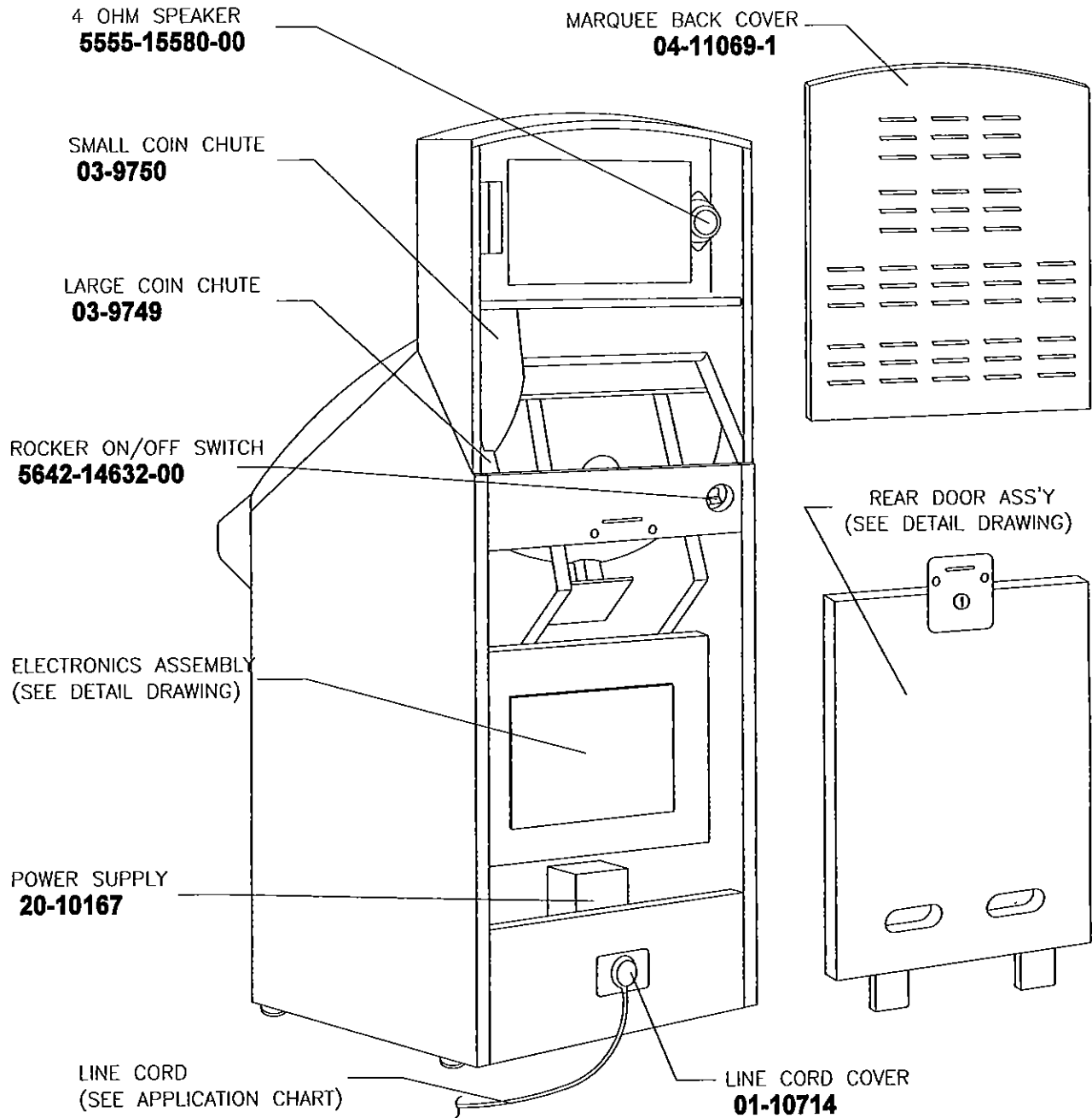
* For safety and reliability, substitute parts and modifications are not recommended.

* Substitute parts or modifications may void EMC directive or FCC type acceptance.

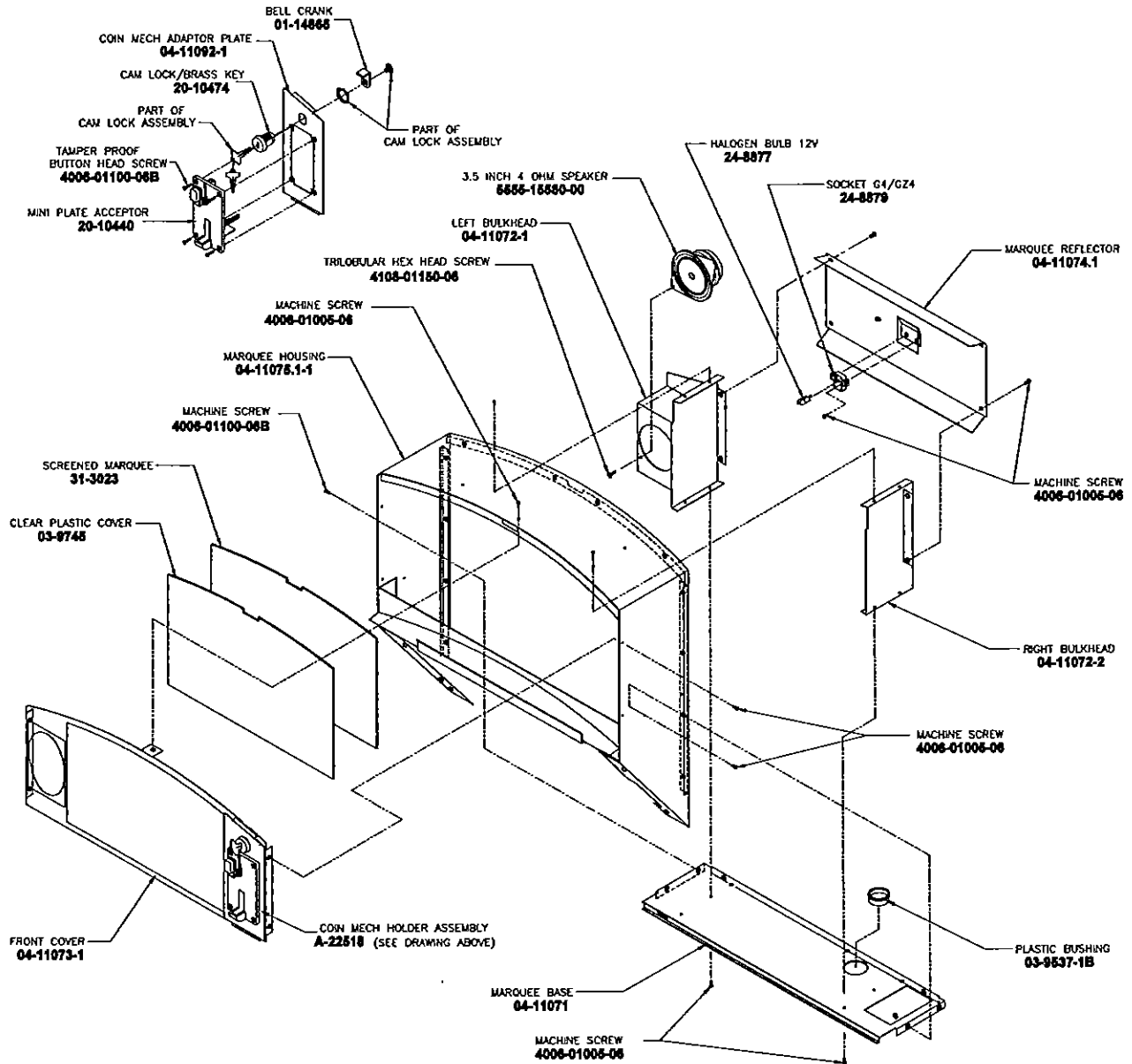
CABINET ASSEMBLY (Front View)



CABINET ASSEMBLY (Rear View)

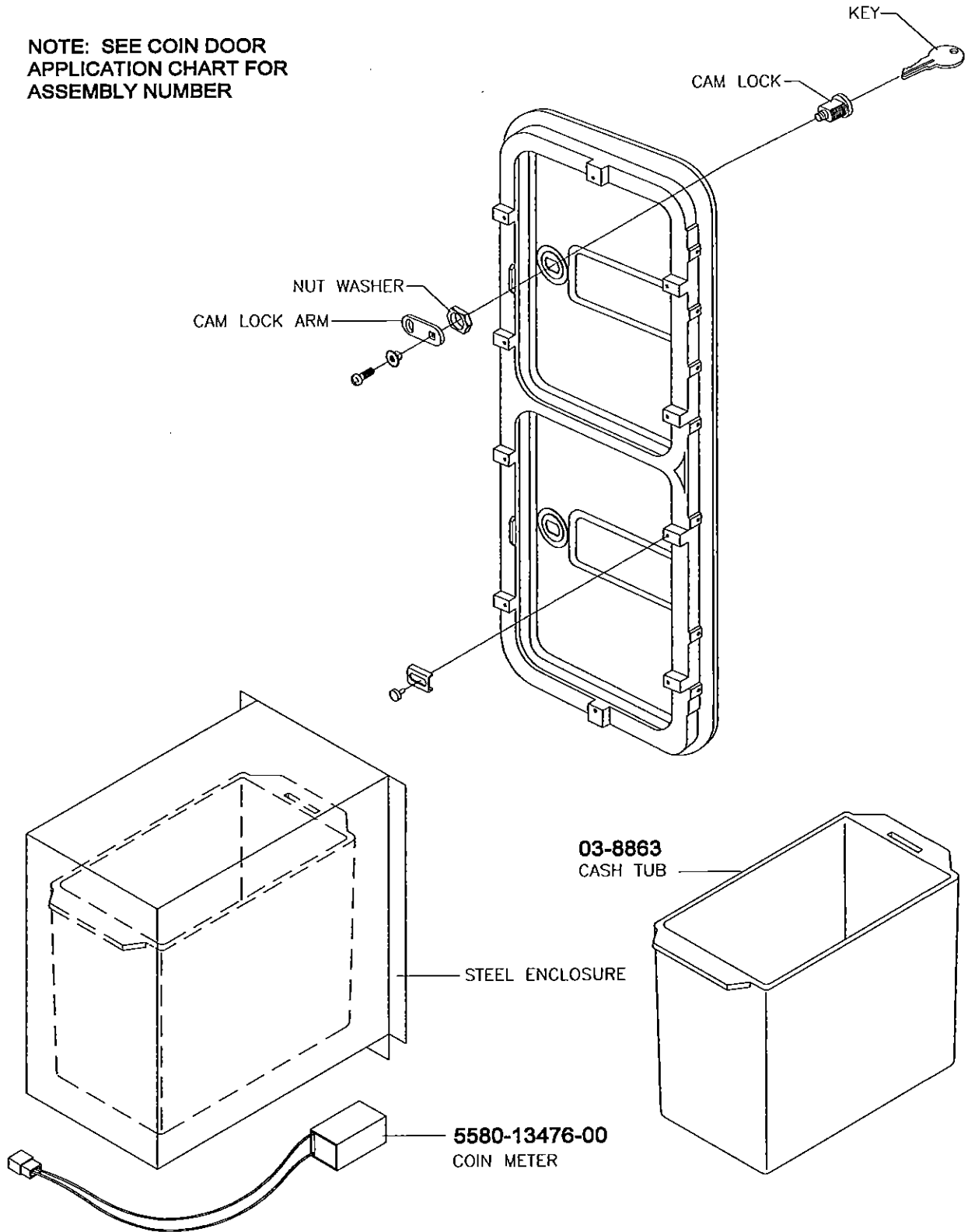


MARQUEE ASSEMBLY A-22306



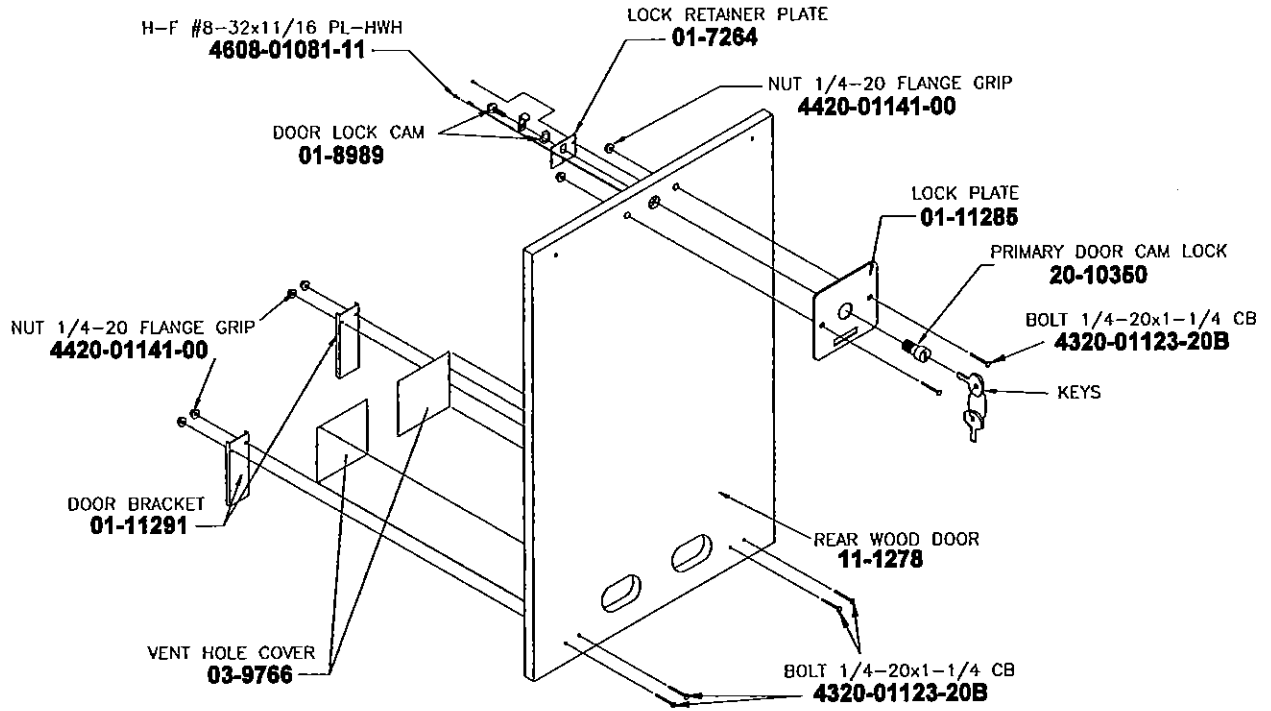
COIN DOOR ASSEMBLY

NOTE: SEE COIN DOOR
APPLICATION CHART FOR
ASSEMBLY NUMBER

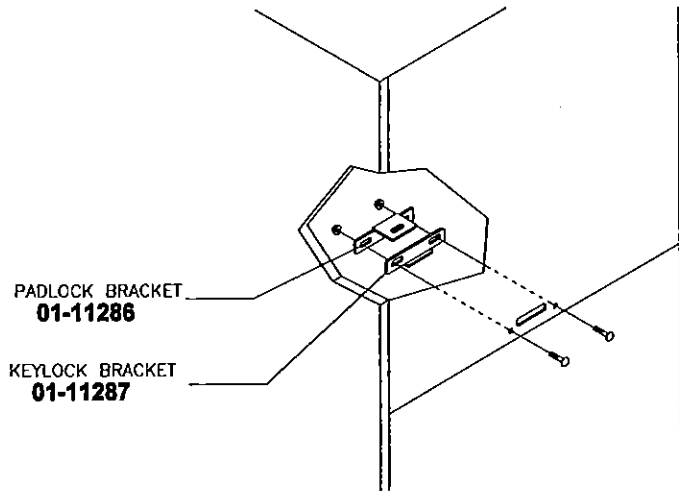


NOTE: MODELS WITH ELECTRONIC CURRENCY ACCEPTORS HAVE NO COIN MECHANISMS

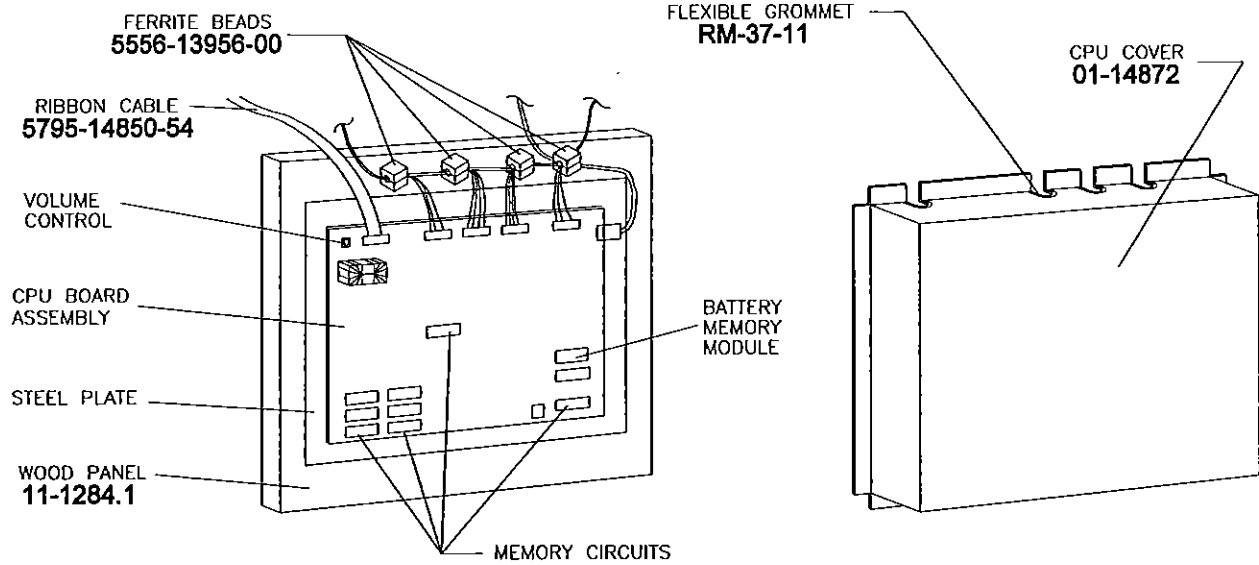
REAR DOOR ASSEMBLY A-22143



CABINET SHOWN FOR REFERENCE

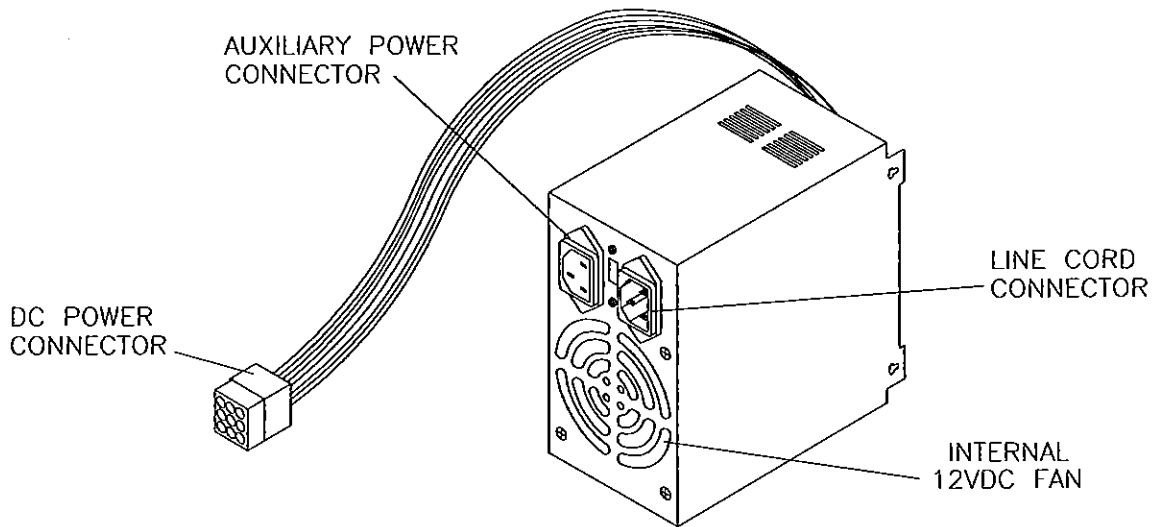


ELECTRONICS ASSEMBLY



NOTE: SOME MODELS DO NOT REQUIRE A CPU COVER OVER THE GAME ELECTRONICS

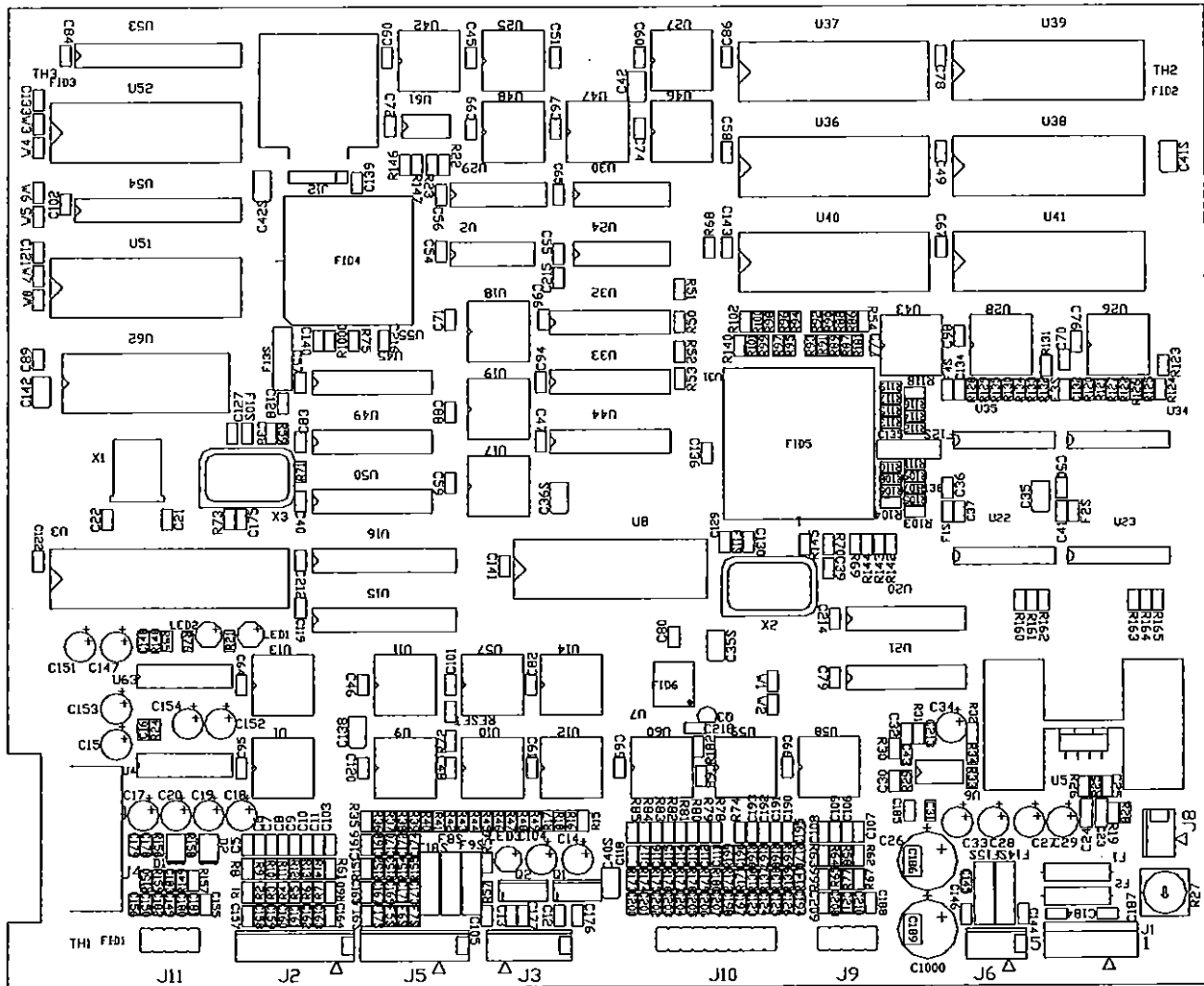
POWER SUPPLY ASSEMBLY 20-10167



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

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

A-22501 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

Part Number Country	5850- 13271- 00	5850- 13272- 00	5850- 13273- 00	5850- 13274- 00	5850- 13275- 00	5850- 13276- 00	5850- 13277- 00	5850- 13278- 00
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		■						

NOTES:

1. Some countries may use alternate line cord numbers for specific locations.
2. Do not use a different line cord, install a "cheater" plug, or cut off the ground connection.

COIN DOOR APPLICATION CHART

Part Number Country	09-96021	09-96022						
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: Coin Door Assembly has no coin mechanism. Electronic Currency Acceptor is in the marquee.

TOUCH MASTERTM CLASSIC

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	Preamp 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.

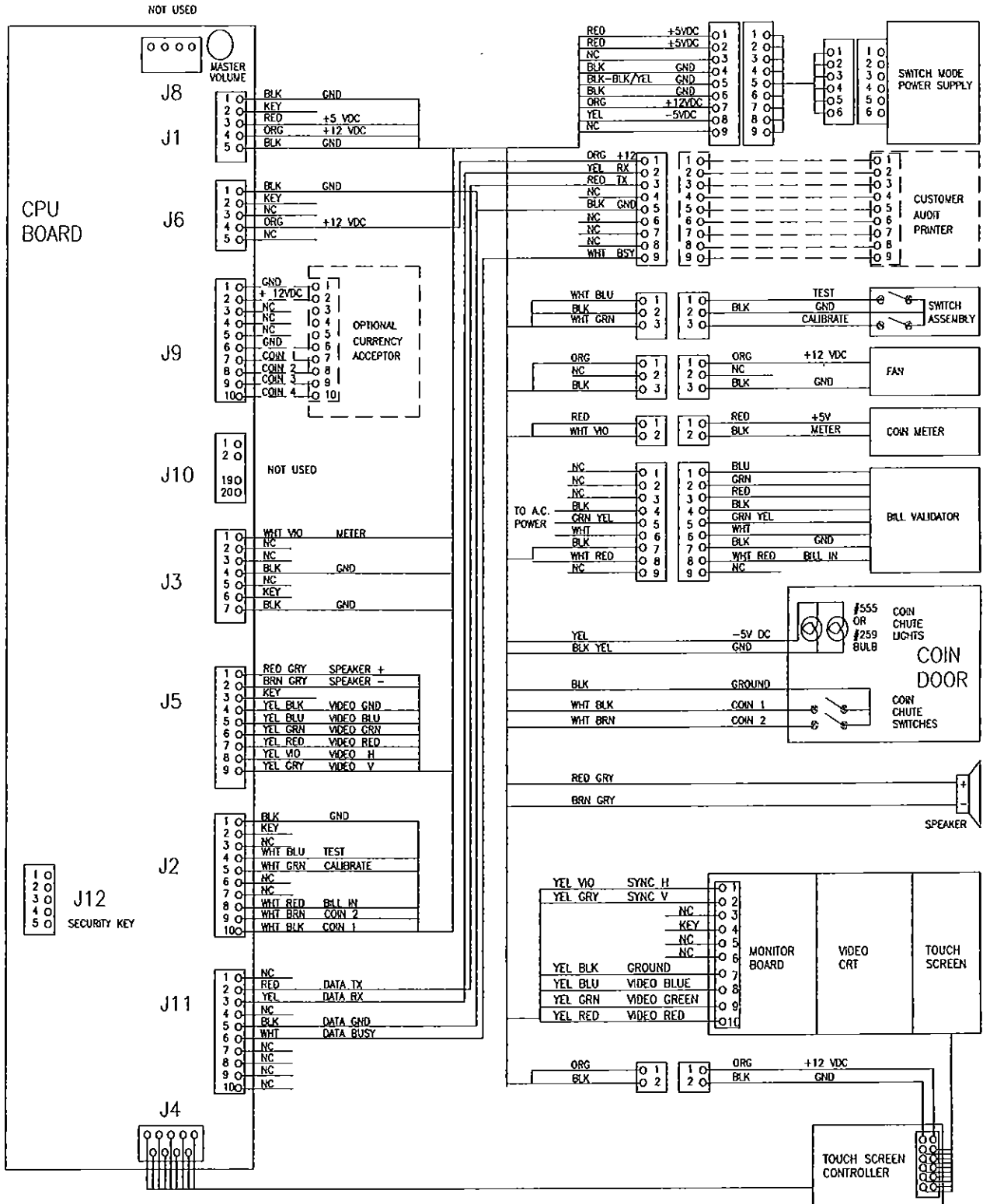
** Security key circuit is required to permit operation of some software versions.

D.C. Power Source Voltage Limits

FUNCTION	RANGE LIMITS	COLOR	FUNCTION	RANGE LIMITS	COLOR
Digital Circuits	+4.90V to +5.10V	Red	Not Used	-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.

CABINET WIRING

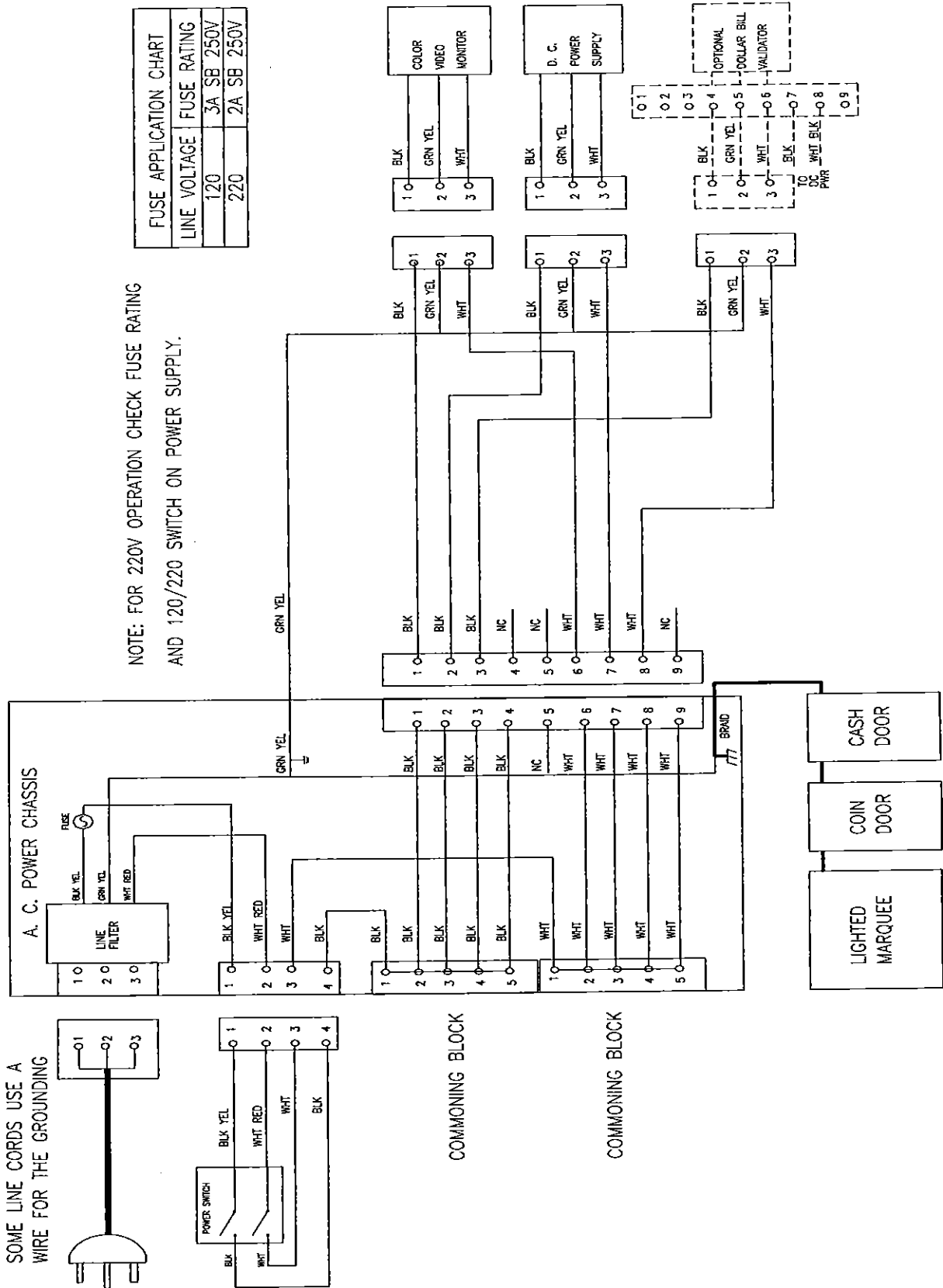


NOTE: PRINTER PORT NOT FACTORY INSTALLED IN ALL MODELS. A PORT KIT IS AVAILABLE.

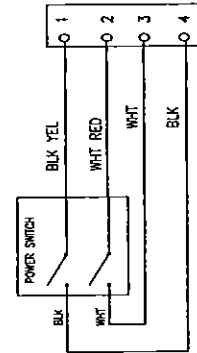
POWER WIRING

FUSE APPLICATION CHART	
LINE VOLTAGE	FUSE RATING
120	3A SB 250V
220	2A SB 250V

NOTE: FOR 220V OPERATION CHECK FUSE RATING AND 120/220 SWITCH ON POWER SUPPLY.



SOME LINE CORDS USE A WIRE FOR THE GROUNDING



COMMONING BLOCK

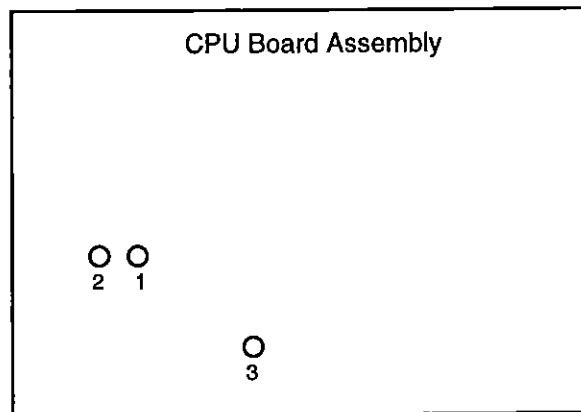
COMMONING BLOCK

LED INDICATOR STATUS CHART

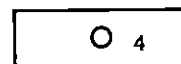
DESIGNATION	LOCATION	FUNCTION	COLOR	STATE	MEANING
LED 1	CPU BOARD ASSEMBLY	PROCESSOR ACTIVITY	RED	OFF	NO POWER (Note 1)
				ON	LOCKED UP (Note 2)
				BLINKING	NORMAL OPERATION
LED 2	CPU BOARD ASSEMBLY	RESET INDICATOR	GREEN	OFF	NO POWER (Note 3)
				ON	NORMAL OPERATION
				BLINKING	ERROR (Note 4)
LED 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

TOUCH MASTERTM CLASSIC

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 the safety ground stud of the power supply chassis while the line cord is connected to a properly grounded outlet. Do this BEFORE touching or handling the electronic assemblies.*
3. *Store the electronic assemblies in an anti-static area. Anti-static bags are to be used to store or transport the game CPU Board Assembly.*
4. *DO NOT remove or connect any electronic assemblies when the cabinet power is ON. Doing so will damage the electronic assemblies and void the warranty.*
5. *Always replace ground wires, shields, safety covers, etc. when maintenance or service is completed. Ensure that all ground and mounting screws are installed and tightened firmly.*

GAME DOES NOT START

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

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

2. Video game appears non-functional, but marquee artwork is illuminated.

- A: Unlock and remove the rear door. Open the CPU enclosure. Inspect the CPU Board Assembly under low light level conditions. A glow will be seen from the red and green LEDs 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. Open the CPU enclosure and 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 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. setting 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. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- F: Verify that the game runs and completes the power-up self-test sequence without any errors. Note errors and/or failures found during these tests.
- G: Enter the game Menu System by pressing the TEST switch behind the coin door. From the SYSTEM SETUP menu, go to DIAGNOSTICS and pick VIDEO TESTS (refer to Section One for additional details). Use this set of tests to check the operation of each screen used in the game.

GAME CAN NOT BE PLAYED

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

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

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

- A: Unlock and open the currency door. Check the 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: Ensure that no loose parts or wires are caught in the hinges, latches, or coin chutes. Route the ribbon cable so that it does not block the path of coins or tokens from the currency acceptor.
- C: Inspect to see if the external currency indicators (pricing, flashing arrows, etc.) are illuminated. Check connectors and cables for wiring continuity from CPU Board connector to coin switches.
- D: Enter the game Menu System by pressing the TEST switch behind the coin door. 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.
- E: From the SYSTEM SETUP menu, go to GAME-COIN SETUP and choose COINAGE. Ensure that the Coins, Credits, and Meter Pulses are set to correctly indicate the currency accepted.
- F: 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 open the coin 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 currency acceptor 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: 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.
- 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 a mild glass cleaner 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 down into touch screen 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 open the coin 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 tracking finger position in all areas of the screen.
- B: Press the CALIBRATE switch button 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 open the coin door. Reach in and unlatch the spring clips (two on each side of the monitor directly under the bezel. Lift and 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 open the coin door. Enter game Menu System by pressing the TEST switch behind the coin door. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose SWITCH TEST (see Section One for additional details). Use these tests to confirm switch operation.
- B: Press the CALIBRATE switch button to adjust the touch screen accuracy. Follow the on screen instructions to optimize the touch screen for sensitivity and linearity.
- C: Unlock and remove the rear door. Remove the CPU enclosure. Observe CPU Board and touch the screen in any location. A glow will be seen from a red LED on the CPU Board and the green LED on the controller 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 monitor) if there is voltage in these circuits. Remove the mounting screws and lift the controller to see the underside. Ensure that touch screen cable is fully seated in the controller connector.
- E: Turn OFF the game power. Remove the CPU Board mounting screws. Lift the CPU Board up just enough to expose the D-subminiature controller connector. Verify that the cable is fully seated and screws are tightened.
- 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 open coin door, rear door, and the CPU enclosure. Enter the game Menu System by pressing the TEST switch behind the coin door. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose SOUND TEST (refer to Section One for additional details). Verify that volume has not been set at zero. Change the level to maximum to make the game audible.
- B: 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.
- C: 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 sound level.
- 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. setting on a digital voltmeter, measure D.C. voltages present at the power connector pins. Verify the +5V, -5V and +12V sources. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information and voltage limits.
- F: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- G: Verify proper operation of game CPU Board by placing it in a known good game.

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

- A: Unlock and open the coin door. Enter game Menu System by pressing the TEST switch behind the coin door. 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 power. Remove the rear cover of the marquee. Ensure that the speaker 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. Ensure that no loose parts or wires are caught in speaker cones, terminals, mounting screws, or stuck to the magnets.
- D: Verify that the ROM game sound set 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. setting on a digital voltmeter, measure voltages at the speaker terminals. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- G: Verify that the speaker is operating properly by placing in a known good unit.
- H: Temporarily connect a different speaker to the game to test CPU Board audio amplifier operation.

VIDEO PROBLEMS

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

- A: Unlock and remove the rear door. Verify that A.C. power is connected to the video monitor. Inspect the neck of the CRT under low light level conditions. A glow will be seen near the CRT base if there is voltage in the filament circuits. This does not mean that other voltages or signals are as they should be, but it does indicate that some of the monitor circuits are receiving power.
- B: Turn OFF the game power. Verify that the video signal and the Remote Adjustment Board connectors are fully seated on the Video Monitor Board Assembly. Check the other monitor connectors in the same way. ***Do not operate a monitor without a Remote Adjustment Board.***
- 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.
- D: Ensure that no loose parts or wires are caught on the chassis or the mounting brackets.
- E: Check that the brightness (intensity) and contrast have not been set to their minimum levels.
- F: Verify that the video monitor is operating correctly by placing it in a known good unit.

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

- A: Note and record any error messages that occur during self-test. Turn OFF the game power. After one minute, restore power. Note and record new messages. Turn OFF the game power.
- B: Unlock and open the coin door. Enter game Menu System by pressing the TEST switch behind the coin door. 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. DOING SO WILL DAMAGE THE GAME CPU BOARD AND VOID THE WARRANTY.

- C: 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.
- D: 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.
- E: Verify that the CPU Board Assembly is correct for this game. Each CPU Board is marked with the manufacturer name, assembly number and the hardware version.
- F: Turn ON the game power. Using the 20 Volt D.C. setting on a digital voltmeter, measure D.C. voltages present at the power connector pins. 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. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading indicates that the supply voltages are unstable and may contain ripple or noise.
- H: Compare CPU Board Light Emitting Diode states with the CPU Indicator Chart (Section Three). Call your authorized distributor for help with unresolved TouchMaster circuit conditions.

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 is correct for this game. Monitors for TouchMaster games require separate horizontal, vertical, and video signals. Use of video monitors 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.

TOUCH SCREEN

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

- A: Clean the entire cabinet frequently, especially the CRT glass and the touch screen area.
- B: Caution players to use only one finger at a time. Simultaneous inputs cause controller confusion.

2. Touch screen chooses incorrect items or does not respond when some areas are touched.

- A: Perform a CALIBRATE TEST to verify any inaccuracies, then CALIBRATE the touch screen.
- B: Turn OFF the game. Remove control panel, glass and bezel. Clean the entire touch screen.

MISCELLANEOUS

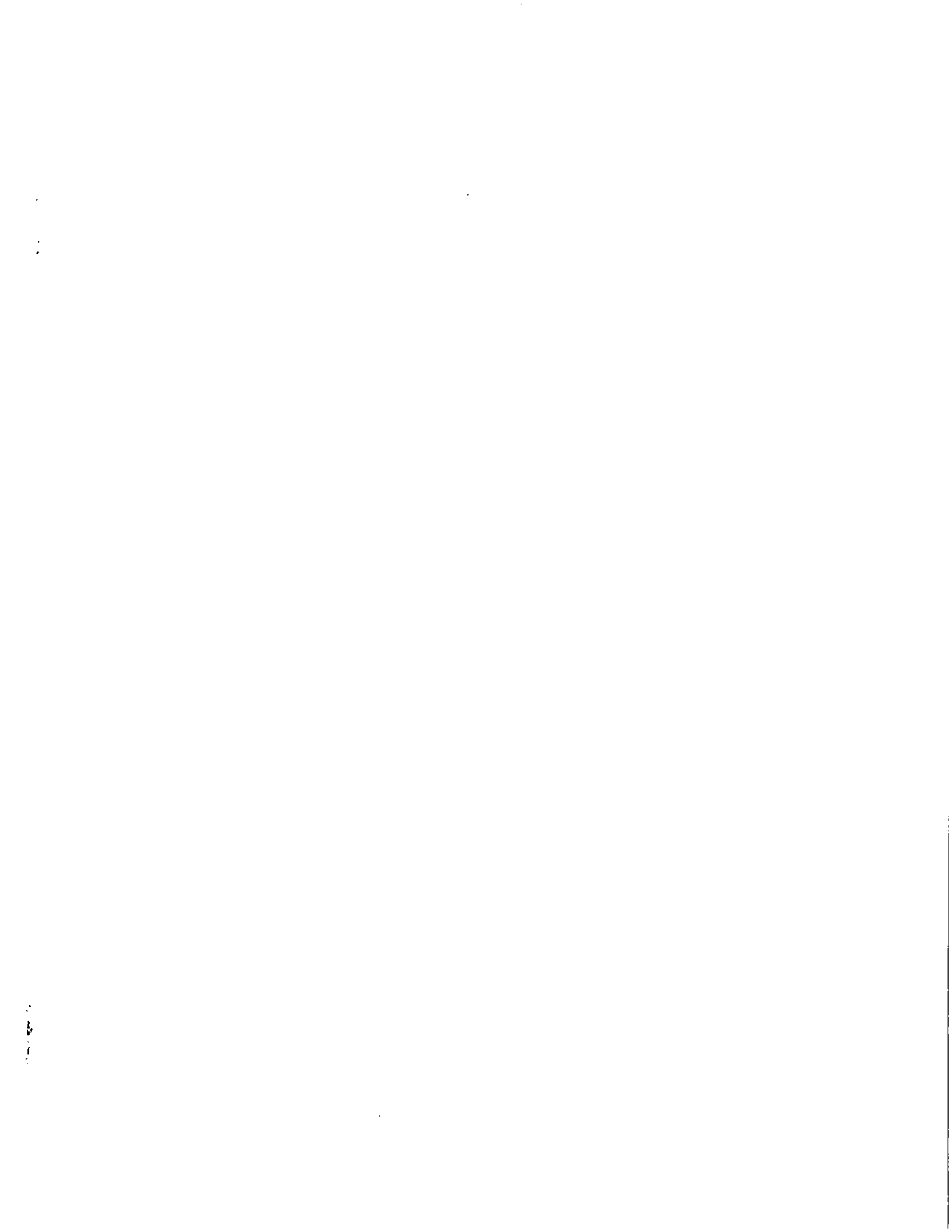
1. Game operates normally, but cabinet gets very warm after several hours of use.

- 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: Units with halogen lamps get very warm during normal use. Do not place items on the marquee.

2. 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: 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.

* Substitute parts or modifications may void EMC directive or FCC type acceptance.

* For safety and reliability, substitute parts and modifications are not recommended. Use only authorized parts. Failure to do so will void the warranty and may result in incorrect and/or unsafe operation.

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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.

Notice

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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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