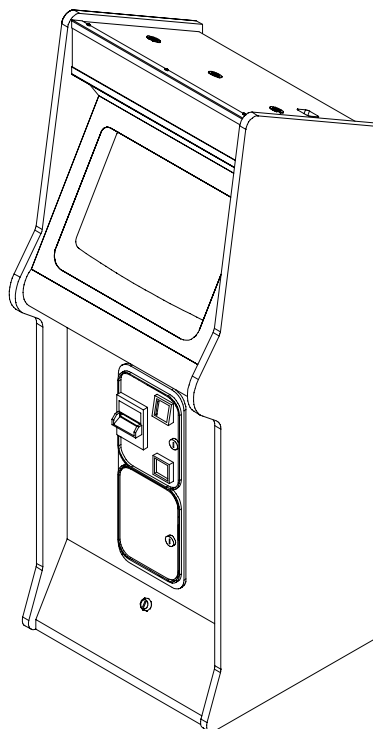# TOUCH MASTER 8000 ®

**FOR USE ON
THIS CABINET**

TOUCHSCREEN VIDEO GAME CONVERSION

Manual Includes
• Installation • Operations • Adjustments • Parts Information • Wiring • Troubleshooting •

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.
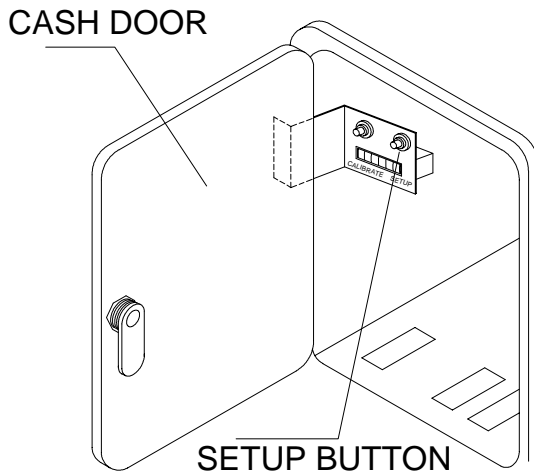
How to adjust the volume of your Touchmaster®:

CASH DOOR

Illustration A. Setup Button Location

SETUP BUTTON

SYSTEM SETUP
VER : X.XX XXXXX XX/XX/XX

GAME-COIN SETUP | DISPLAY AUDITS | HIGH SCORES

OPERATOR MESSAGE | LOCATION SETUP | DIAGNOSTIC

ENGLISH | ESPANOL

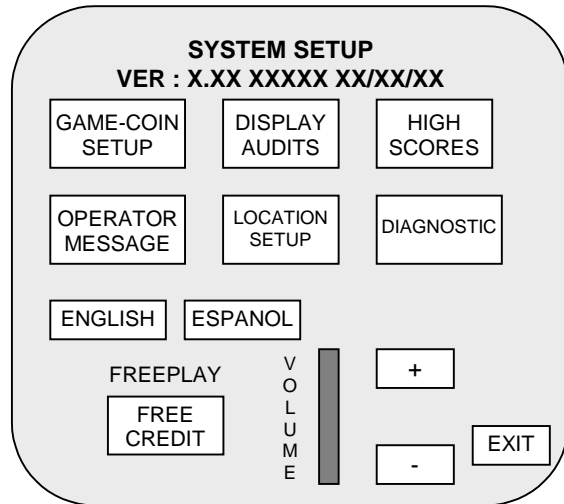FREEPLAY | VOLUME | +

FREE CREDIT | | - EXIT

Illustration B. SYSTEM SETUP screen

1. Unlock and open cash door and hit SETUP button. (See Illust. A.)
2. Touch + or – to adjust volume level. When done, touch EXIT. (See Illust. B.)
3. Close and lock cash door. (See Illust. A.)

How to customize your Touchmaster® name:

1. Unlock and open cash door and hit SETUP button. (See Illust. A.)
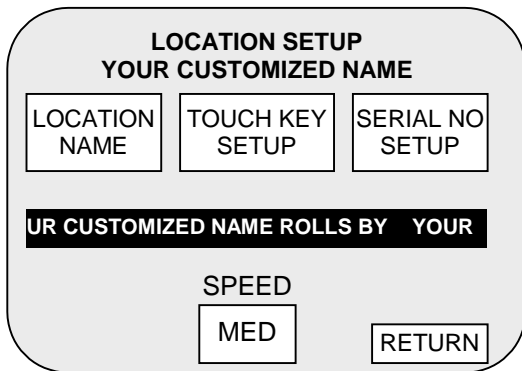**2.** Touch LOCATION SETUP on screen. (See Illust. B.)

LOCATION SETUP
YOUR CUSTOMIZED NAME

LOCATION NAME | TOUCH KEY SETUP | SERIAL NO SETUP

UR CUSTOMIZED NAME ROLLS BY   YOUR

SPEED
MED | RETURN

Illustration C. LOCATION SETUP screen

ENTER LOCATION NAME
_____

CLEAR | RETURN | SPACE | DELETE | SHIFT

0 1 2 3 4 5 6 7 8 9 ← →
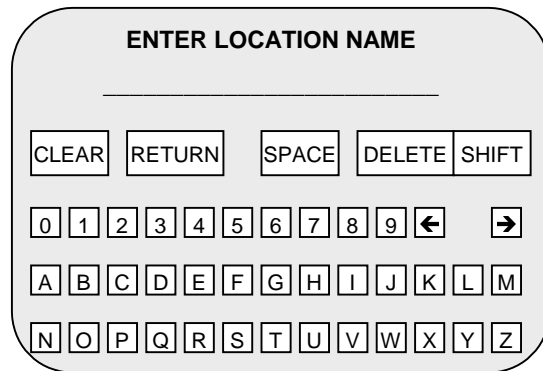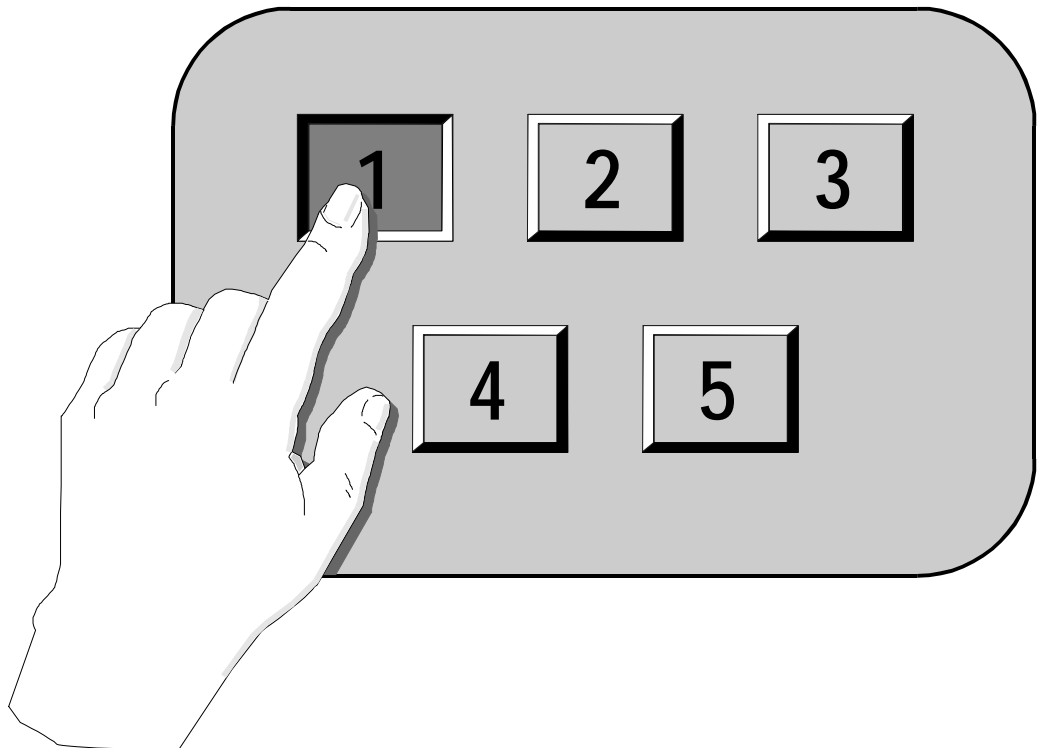
A B C D E F G H I J K L M

N O P Q R S T U V W X Y Z

Illustration D. ENTER LOCATION NAME screen

3. Touch LOCATION NAME. (See Illust. C.)
4. Touch characters of name. (See Illust. D.) Touch RETURN when done.
5. Touch RETURN button in LOCATION SETUP screen. (See Illust. C.)
6. Touch EXIT in SYSTEM SETUP screen. (See Illust. B.)
7. Close and lock cash door. (See Illust. A.)

TOUCHMASTER®
CONVERSION

C H A P T E R

SETUP

	NOTICE: Information in this manual is subject to change without notice. Midway Amusement Games, LLC reserves the right to improve equipment function, design, or components as progress in engineering or manufacturing methods may warrant. Field installed upgrade kits may also change the operating sequence or functions.

SAFETY INSTRUCTIONS

The following instructions apply to operators and service personnel. Read these instructions before preparing your Video Game Machine for play. Other safety instructions appear throughout this manual.

DEFINITIONS OF SAFETY TERMS

DANGER indicates an imminent hazard. Failing to avoid this hazard WILL cause death or serious injury.

WARNING indicates a potential hazard. Failing to avoid this hazard COULD cause death or serious injury.

CAUTION indicates a potential hazard. Failing to avoid this hazard MAY cause minor or moderate injury. CAUTION also alerts you about unsafe practices.

NOTICE indicates information of special importance. Observing notices may prevent you from damaging equipment.

⚠	**WARNING: DO NOT SUBSTITUTE PARTS.** Use of inferior parts or modifications could cause serious injury or equipment damage! Use only Midway authorized parts. For safety and reliability, do not substitute parts or modify Midway products. Substitute parts or modifications may void EMC directive or FCC type acceptance.
⚡	**WARNING: DISCONNECT POWER.** Always turn power off and unplug line cord before attempting service or adjustments. Installing or repairing board assemblies while the power is on can cause injury, damage components, and void the warranty. Be sure that you securely install ground wires.
✋	**WARNING: GROUND MACHINE.** Avoid electrical shock! Do not plug in the line cord until you have inspected and properly grounded the Video Game Machine. Only use a grounded, three-wire outlet. Do not use a "cheater" plug, or cut off the ground pin on the line cord.
✋	**WARNING: GROUND SELF.** Wear a grounding strap during installation. Ground yourself frequently by touching the metal chain lug on the rear of the cabinet to discharge static electricity from your body.
⚠	**CAUTION: INSPECT SALVAGED PARTS.** Kit completion requires salvaging parts from an existing Video Game Machine. Salvaged parts must operate perfectly for the converted Machine to perform properly and safely. Before attempting conversion, repair circuit board malfunctions and cabinet damage.
⚠	**CAUTION: PROPERLY ATTACH ALL CONNECTORS.** Make sure connectors on CPU Board Assembly are properly connected. If the connectors do not slip on easily, do not force them. A reversed connector may damage your Machine and void warranty. All wiring harness connectors are keyed to fit specific header pins on the Board Assembly.

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 convolutions, *discontinue use immediately* and consult your physician.

PRODUCT SPECIFICATIONS

Video Game Machine Characteristics

Player Variables	*Operator Variables*	*Diagnostics*
Choice of many games	Coinage, Difficulty,	Automatic Power-Up Self-Test
1 or 2 players per game	Graphics, Statistics	Manual multi-level menu system
High score recognition, Difficulty	Audits, Time, Volume	Touchscreen calibration

INSPECTION

Unpack the materials from the carton and inspect for obvious signs of damage. Use the checklist to be sure the kit is complete. You must supply the remainder of the materials required for this conversion.
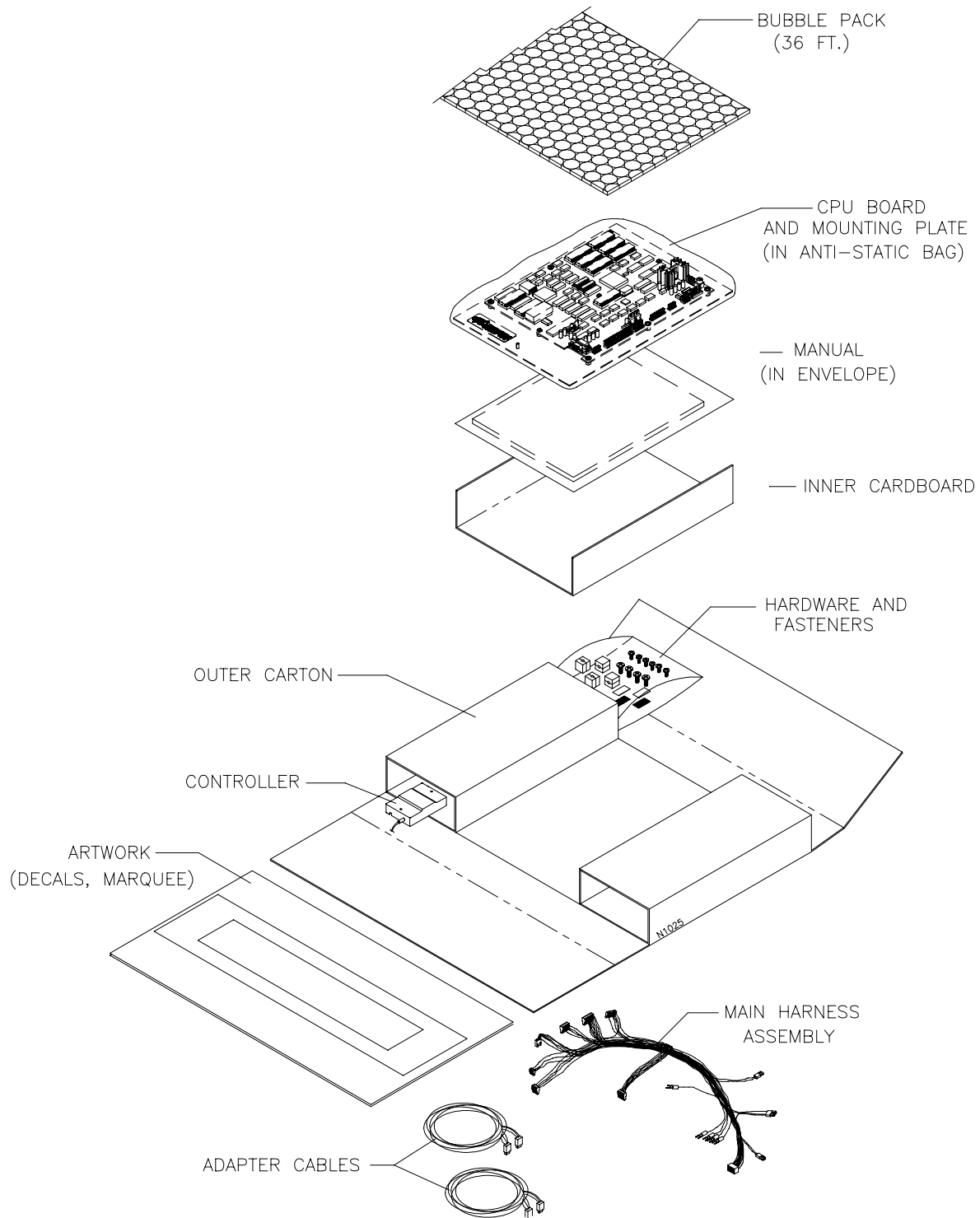
Part Number	Item	Quantity
[ ] 16-80021-101	Touchmaster Conversion Kit Manual (this publication)	1
[ ] 04-12824	Touchmaster® CPU Board Assembly (processor and electronics)	1
[ ] 04-12898	CPU metal plate	1
[ ] 20-10478	Touchscreen control module (converts processing signal)	1
[ ] H-23505	Adapter Cable (mates 15-pin to 12-pin connector)	1
[ ] H-23379	Adapter Cable (mates 15-pin to 9-pin connector)	1
[ ] H-23608	Main Harness (connects CPU Board to speaker, video, etc.)	1
[ ] 31-3628	Paper Marquee	1
[ ] 31-3499	Side Panel Decals	2
[ ] 4008-01003-05	Screw 8-32 x 5/16 P-PH-S.	6
[ ] 4108-01219-08	Screw #8 x ½ Pinhead-AB Special	4
[ ] RM-42-01	Hook Fastener	2
[ ] RM-43-01	Loop Fastener	2
[ ] 5556-13956-00	Ferrite Bead	4
[ ] 4406-01128-00	6/32" KEPS nut (Affixes ground cable to bracket)	1
[ ] 16-10089.1	Label-Epilepsy Warning (Affix beneath monitor bevel)	1
[ ] 16-10650	Game Registration Card	1
[ ] 03-8338-1	Spacer, PCB MTG ¼"	3

	NOTICE: The conversion kit CPU Board Assembly is not interchangable with the standard Touchmaster CPU Board Assembly. The assemblies look very similar, but have different part numbers. The incorrect assembly will cause sync and Touchscreen calibration errors.
	NOTICE: Neither Midway Amusement Games LLC nor its affiliates sponsors, authorizes, condones, or is in any way associated with tournaments using any Touchmaster® games.

TOOLS REQUIRED FOR CONVERSION

Philips head screwdriver, flat head screwdriver, safety utility knife, nut driver or small socket wrench, squeegee or sponge.

TOUCHMASTER® CONVERSION KIT PACKAGING AND CONTENTS

BUBBLE PACK
(36 FT.)

CPU BOARD
AND MOUNTING PLATE
(IN ANTI-STATIC BAG)

MANUAL
(IN ENVELOPE)

INNER CARDBOARD

HARDWARE AND
FASTENERS

OUTER CARTON

CONTROLLER

ARTWORK
(DECALS, MARQUEE)

N1025

MAIN HARNESS
ASSEMBLY

ADAPTER CABLES

INSTALLATION PROCEDURE

VERIFY ORIGINAL EQUIPMENT OPERATION

1. **INSPECT PARTS:** Unpack the conversion kit and verify that nothing was damaged in shipping.

2. **CHECK CABINET:** Inspect cabinet for damage. Repair before proceeding.

3. **VERIFY OPERATION:** Plug line cord into grounded outlet and switch on AC power. You should hear a single beep during startup. A working machine starts without system errors and enter Attract Mode.

4. Turn AC power off and unplug line cord from outlet.

5. **CLEAN:** Vacuum vent opening at bottom rear of machine to remove loose dust.

6. Insert key into coin lock and turn clockwise to unlock.

7. Locate the coin meter, CALIBRATE button, and SETUP button inside the coin door on the left.
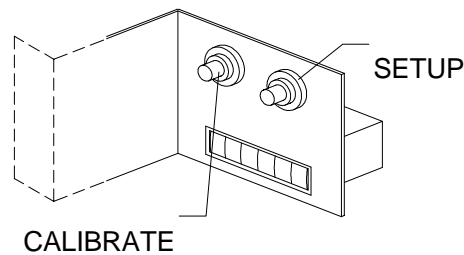
CONTROL BUTTON LOCATION

8. **METER:** Record the coin meter count.

9. Plug in line cord and turn AC power on. Leave it on for an hour (to detect problems related to heat).

10. **CURRENCY:** Insert coins and play games to verify operation. Record number of coins used.

11. Confirm that coin meter has advanced for each coin inserted.

12. **ORIGINAL MANUFACTURER'S CALIBRATION:** Press CALIBRATE button to perform original manufacturer's adjustment. If Touchscreen does not calibrate correctly, repair or replace it.
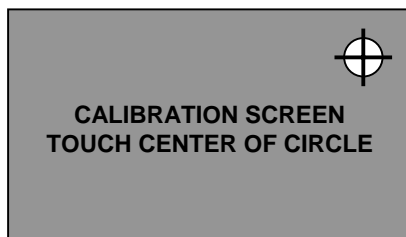
FIRST CALIBRATION SCREEN   **SECOND CALIBRATION SCREEN**
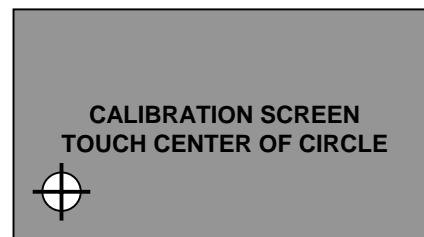
13. The first calibration dot appears in the upper right-hand corner of the screen. Touch center of circle with one finger. An audible tone verifies finger position.

14. The second calibration dot appears in lower left-hand corner of the screen. Touch its center with one finger. The software enters Test Screen mode accompanied by an audible tone.

15. Touchscreen and note that crosshair centers beneath your fingertip. Touch all four corners and entire bottom edge of Touchscreen. Touch EXIT on screen when done.

16. **TRACKING TEST:** Press SETUP button. Touch TEST SCREEN .
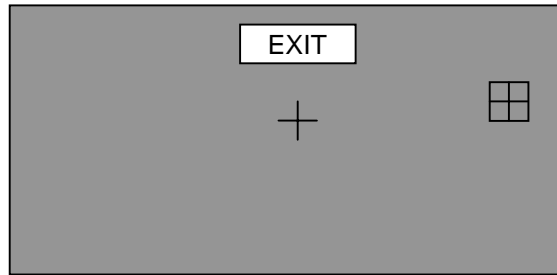
TRACKING TEST SCREEN

17. A cross appears in test screen center. Touch center of the cross and observe that crosshair centers on cross. The crosshair follows your finger as you move it across the screen.

18. Touch EXIT on the screen.

   If crosshair fails to center on your finger, note distance and direction of discrepancy. Return to calibration screen and place your finger on screen slightly away from, but in same general direction and distance, from dot to where the crosshair was off center.

   Example: If crosshair appears slightly below where you touched the screen, place your finger just below calibration dot. If crosshair appears slightly above and to the right of where you touched the screen, place your finger just above and to right of calibration dot.

   Repeat previous step for second calibration dot. When crosshair centers on your finger, calibration is successful. You may need several attempts to accurately calibrate the screen to compensate for your Touchscreen's individuality and its mounting on CRT. Use CALIBRATE mode as needed to calibrate Touchscreen as accurately as possible.

	NOTICE: If the existing Touchscreen cannot be calibrated correctly, troubleshoot and repair or replace any defective components before proceeding. The kit electronics will not fix these symptoms.

REMOVE ORIGINAL EQUIPMENT ELECTRONICS
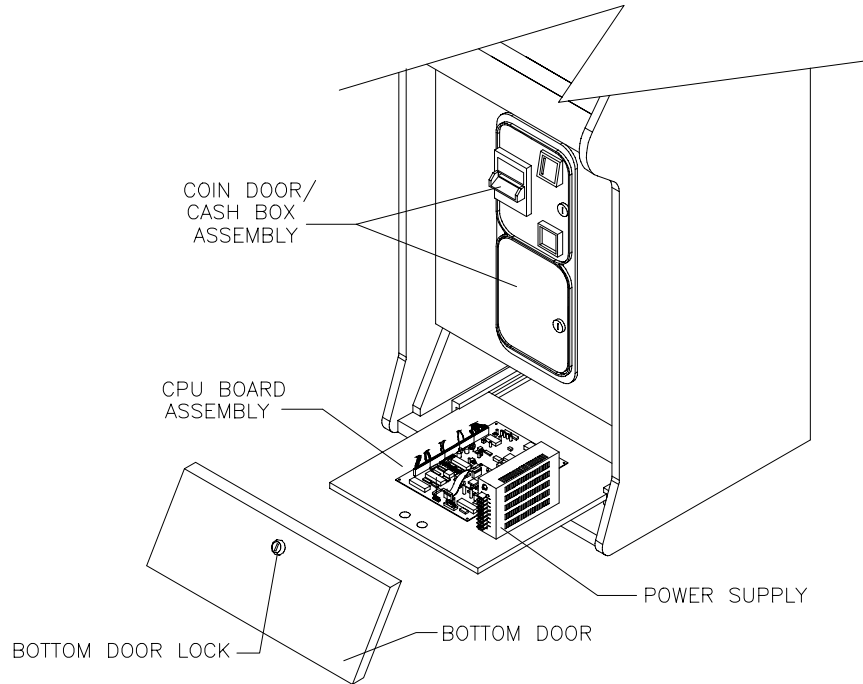
BOTTOM DOOR REMOVED

1. Unplug line cord. Insert key into Bottom Door Lock and turn clockwise to unlock. Remove Door.

2. **GROUND WIRE:** Remove ground wire, if present.

3. **TOUCHSCREEN:** If Touchscreen Connector Cable (a rectangular connector shown below) is connected to the CPU Board Assembly at J5, disconnect it from the CPU Board Assembly.
   If a separate Touchscreen Controller Connector Cable is also present, disconnect it (a D-subminiature connector) from CPU Board Assembly. You may have either or both connectors.
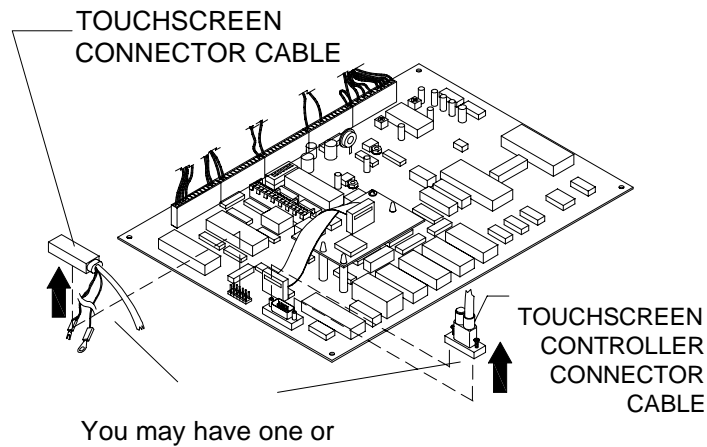
You may have one or

REMOVAL OF CONNECTOR(S)
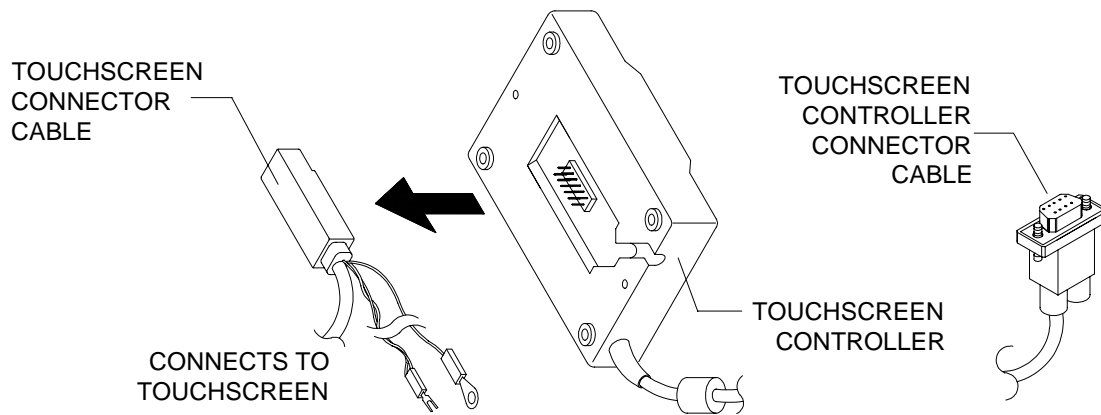
TOUCHSCREEN COMPONENTS

4. **CONTROLLER:** If present, remove Touchscreen Controller from cabinet. Detach Touchscreen Connector Cable from Controller. Leave cable inside cabinet and retain mounting hardware.
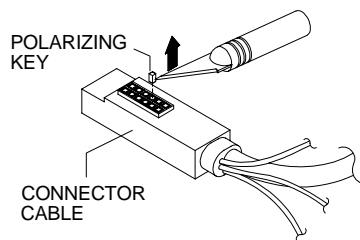
REMOVAL OF POLARIZING KEY (IF PRESENT)
FROM TOUCHSCREEN CABLE CONNECTOR

5. **KEY REMOVAL:** Inspect Touchscreen Connector Cable sockets for polarizing key. Remove any keys with a sharp tool.

6. **CONTROL:** Disconnect 15-pin (or 9-pin, depending on model) coin and control connector.

7. **SPEAKER:** Disconnect 2-pin speaker connector.

8. **COIN LOCKOUT:** Disconnect coin lockout connector, if present.

9. **VIDEO:** Locate video connector attachment to monitor board. Record orientation of red wire, either toward front or toward rear of cabinet. Detach connector.
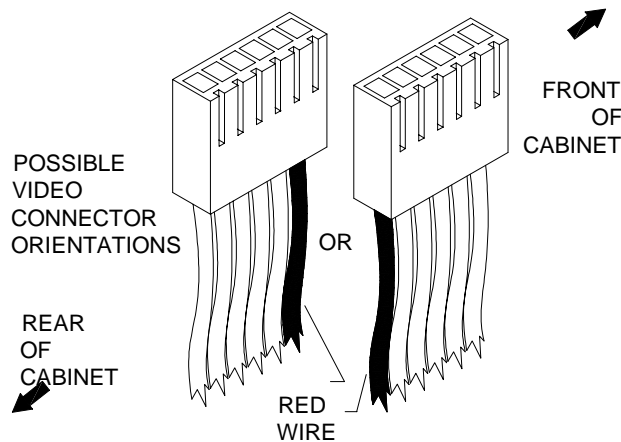
ORIENTATION OF VIDEO CONNECTOR

10. **POWER:** Loosen, but do not remove, top six screws on power supply terminal strip by turning one full turn with a screwdriver. Do not loosen bottom two (AC) screws.

11. Remove DC wires from +5, GND, -5, and +12 terminals. Leave AC wires connected. If you must disconnect a green and yellow striped AC connector to reach another connector, replace it.
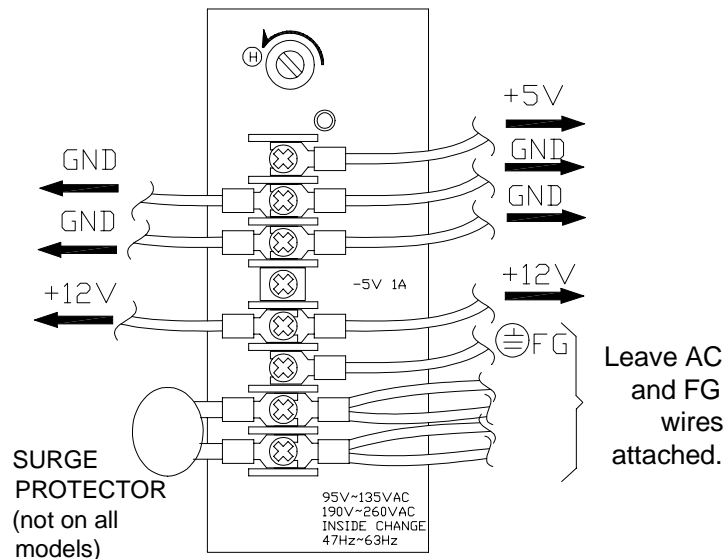
REMOVAL OF DC WIRES FROM TYPICAL POWER SUPPLY

12. Verify connections on your power supply. Illustration above is only a typical view.

13. **CPU BOARD ASSEMBLY:** Slide wooden electronics shelf out of front of cabinet. Pull gently, to avoid damaging remaining connections to power supply. Remove CPU Board Assembly with original wiring attached. Avoid snagging hanging cables or wires. Store CPU Board Assembly in an anti-static bag.

⚠	**WARNING: DO NOT SUBSTITUTE PARTS.** Use of inferior parts or modifications could cause serious injury or equipment damage! Use only Midway authorized parts. For safety and reliability, do not substitute parts or modify Midway products. Substitute parts or modifications may void EMC directive or FCC type acceptance.

INSTALL GAME ELECTRONICS

1. **ORIENT ELECTRONICS:** Place Touchmaster® CPU Board Assembly and metal tray on wooden electronics shelf in roughly same position as previous electronics so heat sink is at rear of cabinet.

2. Using screws in parts kit, attach metal tray onto wooden electronics shelf. Do not overtighten screws.

3. **ADJUST VOLUME:** Set master volume control to middle position. The potentiometer is near heat sink. Use a screwdriver to point arrow toward front of cabinet.
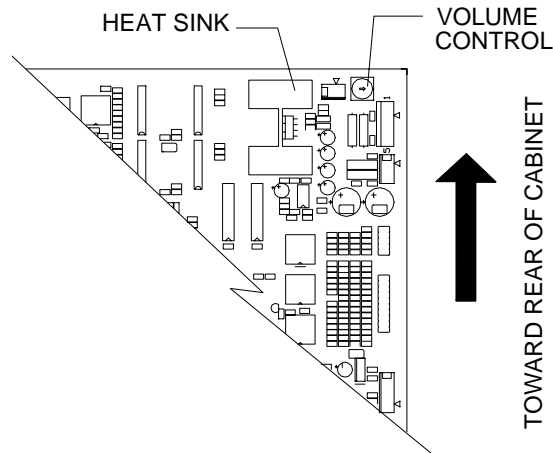
COMPONENTS ON CPU BOARD ASSEMBLY

4. **INSTALL WIRING HARNESS:** Attach keyed connectors to CPU Board Assembly.

> **CAUTION: UNKEYED CONNECTOR** The black connector is unkeyed and can be accidentally reversed on CPU Board Assembly. When attaching connector, make sure tabs face inward toward center of board.
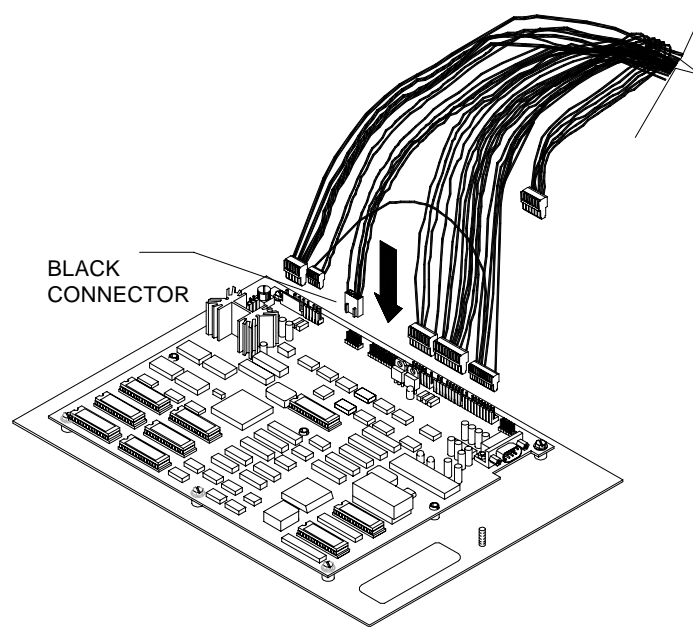
HARNESS INSTALLATION

5. **TOUCHSCREEN:** Connect Touchscreen Connector Cable to bottom of new Touchscreen Controller.

6. **MOUNTING:** Orient new Controller in same position as previous Controller (if applicable) and mount in cabinet
   If there was no Touchscreen Controller before, install hook and loop fastener material from parts kit. LED should face front of cabinet.

7. **GROUND WIRE:** If there was an existing ground wire, attach it to threaded stud on metal plate. Use nut in parts kit for this.

8. **INSERT ELECTRONICS:** Slide wooden electronics shelf back into cabinet until clear of opening.

9. Guide main harness through rear of cabinet and to level of coin mechanisms.

10. **SPEAKER:** Attach the 2-pin speaker connector.

11. **COIN:** Attach the 15-pin coin mechanism cable connector. If your coin mechanism has a 9-pin connector, use the 9-to-15 pin connector to mate it with the 15-pin connector. Reconnect the coin lockout connector, if applicable.

12. **POWER:** Install the harness to the power supply terminal strip at the following screws:
    +5V (red wire)
    GND (black wire)
    GND (black wire and green wire with yellow stripe)
    +12V (orange wire)
    FG (green wire with yellow stripe) should already be connected.
    The –5V terminal is not used. The AC wires remain connected from the original equipment.

13. Attach Touchscreen Controller power wires at GND screw (green) and the +12V screw (orange)
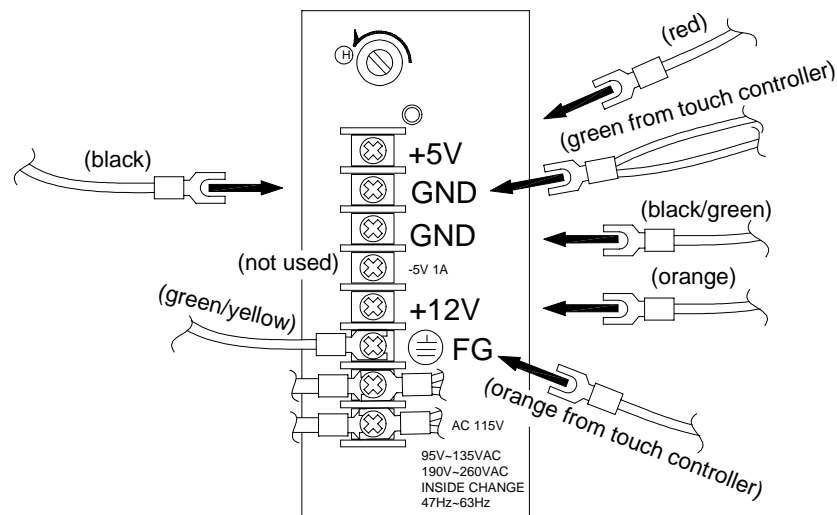
TYPICAL POWER SUPPLY CONNECTIONS

14. **ATTACH:** Secure, but do not overtighten, top six screws on power supply terminal strip.

15. **CONTROLLER:** Attach Touchscreen Controller Connector Cable to socket on CPU Board Assembly. Do not overtighten connector screws.

HEAT SINK — MASTER VOLUME CONTROL

TOUCHSCREEN CONTROLLER CONNECTOR CABLE
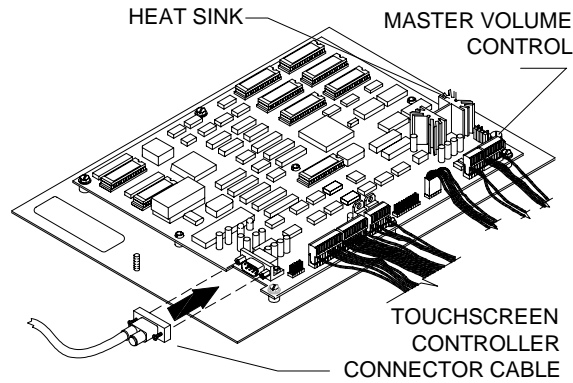
CPU BOARD ASSEMBLY

16. **VIDEO:** Attach video connector to monitor board. Orient yellow and red-striped wire in connector where existing red wire was previously oriented, as noted in electronics removal section of manual.

17. **GROUND WIRE:** Reconnect any additional ground wires removed during disassembly.

VERIFY NEW EQUIPMENT OPERATION

1. **START UP:** Plug in line cord and turn on AC power. Observe CPU Board Assembly LED. They should illuminate. After Touchmaster® logo and game version appear on screen, close cabinet door.

2. **ADJUST MONITOR:** Correct size and position of on-screen video if needed using monitor controls.

3. **CALIBRATE:** Perform a Touchscreen calibration. This sets new values into the game memory.

RETURN

CONTROLLER VERSION

The screen registers it here.
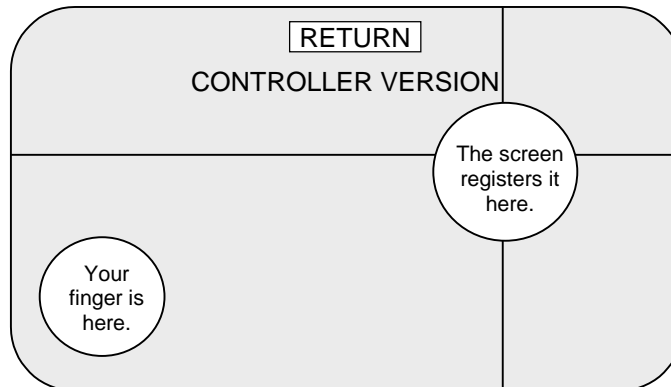
Your finger is here.

INCORRECT TOUCHSCREEN ORIENTATION

4. In the calibration test, a vertical and horizontal line should cross beneath your finger. If Touchscreen is inverted (that is, touching screen in lower left corner causes reaction in upper right corner) you can correct it by following the procedure on page 14 of this chapter.

DECALS AND MARQUEE

1. Remove existing decals or artwork. Clean off all glue residue. Turn off AC power and unplug line cord.

2. Locate side panel cabinet artwork. One at a time, peel each oval decal off the backing paper.

3. Line up artwork with the top of each panel. Use care to avoid wrinkles. Moving outward from the center of the artwork, smooth down and squeeze out any air bubbles.
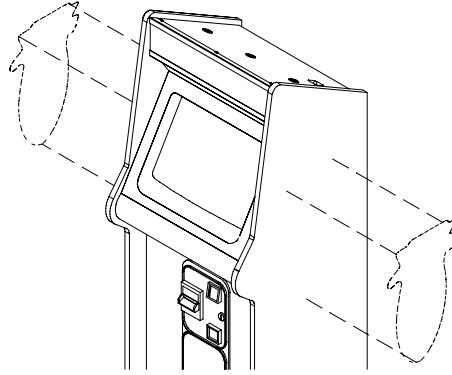
LOCATION OF DECALS

4. **LABEL:** Locate the epilepsy warning label. Peel off backing and apply to the base of the cabinet just underneath the monitor bezel.

5. **CURRENCY:** Insert coins and play games to verify operation. Record number of coins used.

6. Remove the cash door and confirm that coin meter has advanced for each coin inserted.

7. **OPTIMIZE:** Read operating instructions and adjust game characteristics.

8. **MARQUEE**: Remove screws holding marquee glass retainer. Remove glass retainer. Remove original paper marquee. Trim new marquee equally on each side, if necessary, to fit. Insert new marquee between two glass panes. Replace retainer and screws.
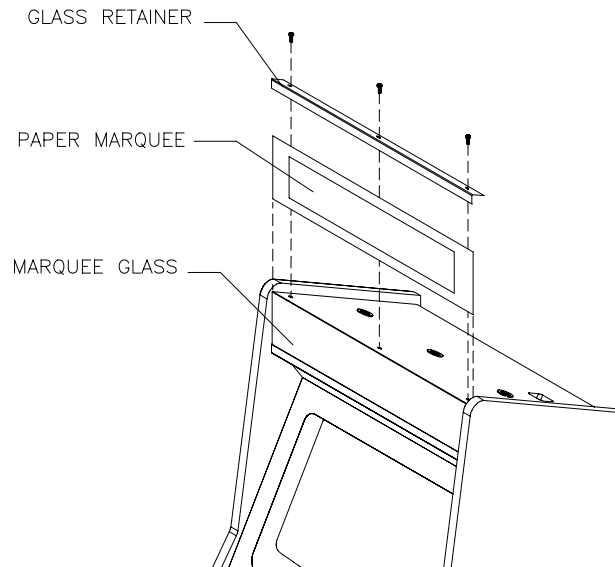
MARQUEE LOCATION

INVERTING TOUCHSCREEN SIGNALS

1. Turn off AC power and unplug line cord.

2. Unlock and remove Bottom Door and pull wooden electronics shelf out slightly.

3. Locate P2 connector on CPU Board Assembly and remove connector from socket.	P2 CONNECTOR HEAT SINK FRONT OF CABINET **CONNECTOR P2 ON CPU BOARD ASSEMBLY**
4. Using your fingers, pry off plastic connector cap. Set cap aside in a safe place.	FIRST WIRE **REMOVAL OF CONNECTOR CAP**
5. Remove first wire (it will be blue with a white stripe). Replace cap and close it tightly.	BLUE AND WHITE WIRE **REMOVAL OF BLUE AND WHITE WIRE**
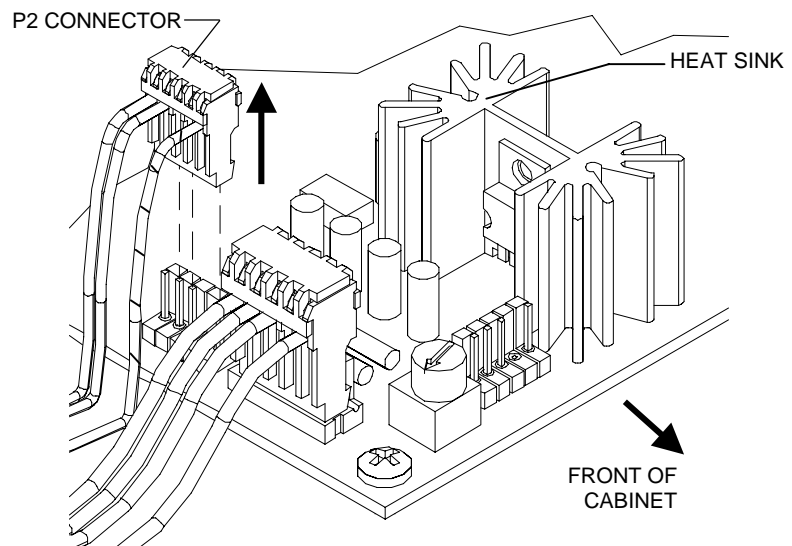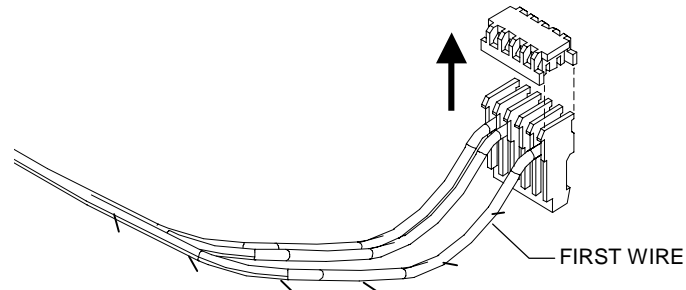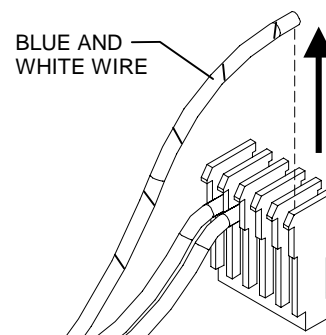
6. Insulate blue, white-striped wire and secure it to harness.

7. Reattach connector P2 to CPU Board Assembly.

8. Replace wooden electronics shelf. Replace and lock Bottom Door.

9. Plug in line cord. Turn on AC power.

10. Recalibrate Touchscreen.

TOUCHMASTER®
CONVERSION

CHAPTER

OPERATION

👉	**NOTICE:** Information in this manual is subject to change without notice. Midway Amusement Games, LLC reserves the right to make improvements in equipment function, design, or components as progress in engineering or manufacturing methods may warrant. Field installed upgrade kits may also change the operating sequence or functions.
👉	**NOTICE:** You are responsible for enforcing all local, state, and federal regulations concerning this game.

GAME FEATURES

Touchmaster® offers many different games, each of which accommodates one or two players. Update software frequently to offer players new games and interesting updates to existing games.

You can adjust game characteristics to suit player proficiency. Modify graphics to alter game appearance. Increase or decrease game speed and length, etc. This flexibility increases game entertainment value for frequent players and lets you maximize revenues.

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

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

DEXTERITY - Games that test the player's eye-hand coordination
Hot Hoops™

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

PRESTIDIGITATION - Video versions of popular sleight-of hand tricks
Shell Shock™

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

TRADITIONAL - Electronic versions of old favorites
Solitaire™

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

MATHEMATICS - Test your ability to add different combinations of numbers
Triple Elevens™

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

LANGUAGE - Display word recognition skills
Wordz™

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

TOUCHMASTER® OPERATION

STARTING UP

Each time AC power is turned on or power is restored, code executes from the boot ROM. These self-diagnostic tests automatically verify and report hardware and EPROM conditions. If any individual test fails an error message for that test displays for three seconds or until an on-screen button is touched. If a fatal error (i.e., a touchscreen controller fault) is detected, the message remains on the screen until the fault is resolved. In the event of other errors (key problems, low battery, etc.) a message is reported, but the program loads and permits game play.

Press the CALIBRATE button at any time to adjust or verify the touchscreen operation.

Press the SETUP button at any time to activate the menu system (audits, adjustments, etc.).

If you do not press either button, the system completes all tests, then enters Attract Mode.

Game choice menus alternate with scenes and sounds from typical games until game play starts.

Insert currency, select a game, and choose variables (i.e., number of players). Play begins at once and progresses until time runs out or you exit the game. If no more play is required, Attract Mode begins.

You may insert your own message to inform players of new games, upcoming events, etc. This message then appears as a screen in Attract Mode.

To shut the game off, turn the power switch to the **off** position at any time.

PLAYER CONTROLS

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

OPERATOR CONTROLS

CABINET SWITCHES

External switches are located on top and at the botom of the cabinet near the line cord.

- **Power Switch**
  The **Power Switch** at the top of the Machine turns the AC power on or off. It does not reset game variables.

- **Circuit Breaker**
  The **Circuit Breaker** protects the electronics from fault conditions. It does not reset game variables.

CONTROL SWITCHES

The internal switches are located behind the cash door, attached to a mounting bracket.

- **SETUP Pushbutton**
  The **SETUP** pushbutton takes you into the Menu System to set game characteristics. An on-screen EXIT button lets you return to Attract Mode.

- **CALIBRATE Pushbutton**
  The **CALIBRATE** pushbutton takes you to a Touchscreen adjustment screen and verification routine. After verification, normal game operation returns automatically.

- **Master Volume Control**
  The **Master Volume Control** (on the CPU Board Assembly) sets the maximum sound level. Adjust the game volume at the initial System Setup screen after pressing the SETUP button.

- **Monitor Remote Adjustments** (inside cabinet in the rear)
  The **Monitor Remote Adjustment Board** sets the video display for optimum viewing.

MENU SYSTEM

SYSTEM OVERVIEW

Adjustments and diagnostics appear in a series of on-screen menus. The SYSTEM SETUP menu lets you enter information, make changes, or verify equipment operation. Subsequent screens 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 is different, but the general location of objects is consistent.
> 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

You must activate the menu system manually and deactivate it manually to return to Attract Mode.

SYSTEM SETUP menu choices fall into three categories: audits, options and tests.
> Audits provide you with information about earnings and the performance of each game.
> Option items permit you to change the game and customize or return to factory defaults.
> Tests are used to verify proper operation of the equipment.

Submenu screen items offer you choices within a category. Some items have no submenu while others may have several. You can return to the previous menu or go on to the next menu.

Detail menu screen items contain specific information. You interact with the system to get results or to make changes. There is always a way to go back to the previous menus from a detail menu.

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

Press and release the SETUP button inside the cabinet to enter the menu system. A Main Menu, similar to the one below, appears. After completing any task, you must return to this screen to restore game play

SYSTEM SETUP
VER : X.XX XXXXX XX/XX/XX

GAME-COIN SETUP	DISPLAY AUDITS	HIGH SCORES
OPERATOR MESSAGE	LOCATION SETUP	DIAGNOSTIC

ENGLISH   ESPANOL

VOLUME   +

FREE CREDIT   0   -   EXIT
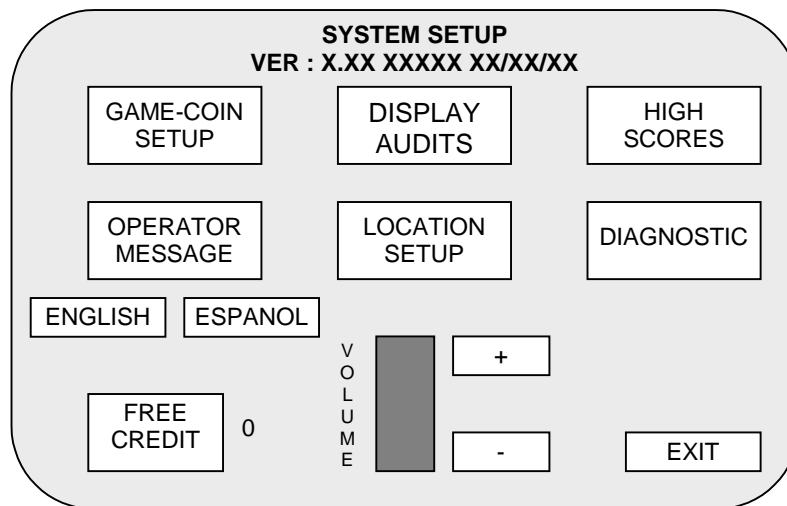
TYPICAL SYSTEM SETUP SCREEN

GAME/COINAGE SETUP

👉	**NOTICE:** 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®

This menu allows you to change variables, such as game difficulty and appearance, and adjust the cost of one play. You can also reset game variables to their factory default settings.

```
                    GAME/COINAGE SETUP

        ┌──────────────┐        ┌──────────────┐
        │ GAME SETUP   │        │  COINAGE     │
        │              │        │  SETUP       │
        └──────────────┘        └──────────────┘

                     ┌──────────────┐
                     │  RESTORE     │
                     │  FACTORY     │
                     │  SETTINGS    │
                     └──────────────┘
    MAXIMUM   9
    CREDITS

        ┌──────────────┐        FREEPLAY
        │      +       │     ┌──────────────┐
        └──────────────┘     │     NO       │   ┌──────────────┐
        ┌──────────────┐     └──────────────┘   │   RETURN     │
        │      -       │                        └──────────────┘
        └──────────────┘
```
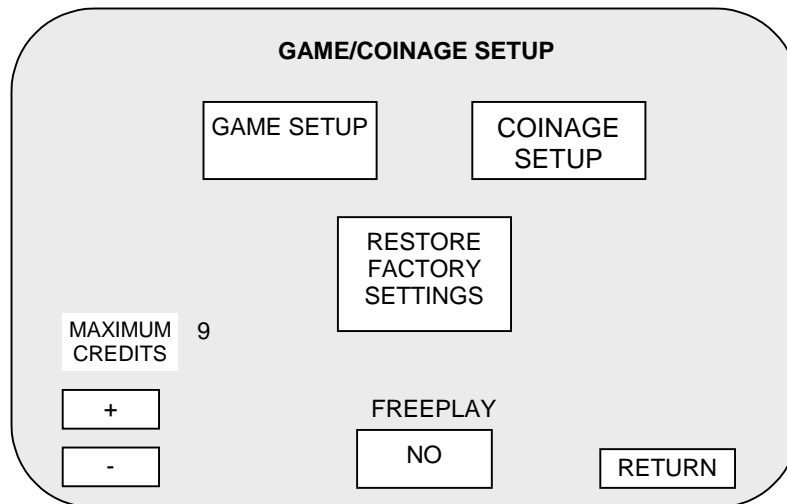
TYPICAL GAME/COINAGE SETUP SCREEN

MAXIMUM CREDITS

Touch the + button to increase the number of maximum credits. Touch the − button to reduce the number of maximum credits.

FREEPLAY

Set FREEPLAY to YES to allow unlimited free games. Set FREEPLAY to NO to return to coin-activated games.

Touch RETURN to return to the SYSTEM SETUP menu.

GAME ADJUSTMENTS

These submenus let you change variables for each of the Touchmaster® games. At the GAME/COINAGE SETUP menu, touch the GAME SETUP button to view the GAME ADJUSTMENTS menu.

RESET   Returns variables to factory default values. This resets *all* your custom game settings.

+   Raises the value of the selected variable until the maximum value is reached.

-     Lowers the value of the selected variable until the minimum value is reached.

NEXT   Saves the current on-screen values and advances to additional Game Setup screens.

GAME ADJUSTMENTS

GAME	CREDIT	TIME	GRAPHIC
HOT HOOPS	1	MED	--
SHELL SHOCK	1	MED	--
TARGET 21	1	MED	CARD
ROYAL QUEST	1	MED	CARD
SOLITAIRE	1	MED	CARD
MOVIE TRIVIA	1	MED	--
WORDZ	1	MED	--
PAIRS	1	MED	CARD
TRIPLE ELEVENS	1	MED	CARD
PYRAMID 13	1	MED	CARD

RESET   -   +   NEXT

TYPICAL GAME ADJUSTMENTS SCREEN

When you touch the NEXT button, you are taken through several screens with individual game adjustments. The final submenu in this permits you to make some more general adjustments, such as whether to award free games, enable erotic games, etc.

GAME ADJUSTMENTS

ROYAL QUEST – WILD CARDS	YES
ROYAL QUEST – DECK	EASY
ROYAL QUEST – HI-LO BONUS	YES
WORD GAMES - MAX. CHANCES	6
ENABLE EROTIC GAMES	YES
AWARD FREE GAMES	YES
HIGHEST SCORE FREE GAME	YES
SHOW TRIVIA ANSWER	YES

AUTO RESET HIGH SCORES

RESET   AFTER   200   PLAYS   RETURN

TYPICAL FINAL GAME ADJUSTMENTS SCREEN

COINAGE SETUP

This submenu lets you set individual revenue characteristics.

CANCEL	Reverts to the previous menu without saving your changes.
NEXT	Advances to the next submenu.
CUSTOM	Takes you to a submenu where you can modify coin values
ACCEPT	Saves your changes to coin values

```
                    PRESET COINAGE VALUES

        TOKEN                        JAPAN
        AUSTRALIA                    NEW
        ZEALAND
        BELGIUM                      SPAIN
        BRAZIL                       SWEDEN
        CANADA
                                     SWITZER
        LAND
        FINLAND                      UK
        FRANCE                       USA
        GERMANY                      CUSTOM
        INDIA
      ┌──────────────┐         ┌──────────────┐
      │   CANCEL     │         │    NEXT      │
      └──────────────┘         └──────────────┘
```

TYPICAL GAME COINAGE SCREEN

To access your currency from the PRESET COINAGE VALUES screen, touch your country to highlight it, then touch NEXT.

```
                    PRESET COINAGE USA

        USA1            $.25 = 1CR,  $1.00 = 4CR
        USA2            $.25 = 1CR,  $1.00 = 5CR
        USA3            $.50 = 1CR,  $1.00 = 2CR
        USA4            $.50 = 1CR,  $1.00 = 3CR
        USA5            $.25=1CR,  $1=4CR, $5=24CR




      ┌──────────┐  ┌──────────┐      ┌──────────┐
      │  CANCEL  │  │  CUSTOM  │      │   NEXT   │
      └──────────┘  └──────────┘      └──────────┘
```

TYPICAL PRESET COINAGE SCREEN

RESTORE FACTORY SETTINGS

This changes all customized settings (i.e. game, coin) to their condition when the Touchmaster® was built. Accidentally doing this can cost you a lot of time resetting variables, so a warning screen lets you cancel.

```
                    RESET FACTORY SETTINGS

                           WARNING
                  THE FOLLOWING WILL OCCUR
                   RESET GAME ADJUSTMENTS
                      CLEAR ALL AUDITS
                   CLEAR ALL HIGH SCORES
                   RESET OPERATOR MESSAGE

                         CONTINUE?

           [ YES ]                    [ NO ]
```

TYPICAL RESTORE FACTORY SETTINGS SCREEN

Touch YES, to restore all factory settings. Touching NO returns to the GAME/COINAGE SETUP menu.

DISPLAY AUDITS

This submenu allows you to assess game popularity. The screen displays earnings and other aspects of the game that reveal player skill levels. Statistics may be reset to zero after viewing.

CLEAR ALL	Sets every audit quantity to zero. Record the information before using this command.
GAME DETAILS	Goes to a submenu to view, clear, and reset high scores for individual games. You can also reset high scores through the HIGH SCORES submenu.
NEXT	Advances to more GAME AUDIT screens. The screens repeat after the last is viewed.
RETURN	Reverts to the main menu screen. The screen values remain without change.

TYPICAL GAME AUDIT SCREEN

```
                      GAME AUDITS

AUDIT                                      TOTAL
1 PLAYER                                      39
2 PLAYER                                       0
TOTAL BUYINS                                   0
TOTAL GAMES PLAYED                            39
_____
FREE GAMES WON                                 0
FREE GAMES HI SCORE                            9
FREE GAME BUYINS                               2
AVG. GAME TIME                         1:35 MIN.

   [ CLEAR ]   [ GAME   ]    [ NEXT ]   [ RETURN ]
   [  ALL  ]   [ DETAILS ]
```

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.

HIGH SCORES
The HIGH SCORES submenu lets you view the top game scores and the player identifications. Players who earn a high score may create an identifier of up to eight characters. The player can also skip this opportunity and remain anonymous. In this case, the high score will be posted without any identifier.

NEXT	Saves the current on-screen values and advances to additional HIGH SCORE screens.
RESET ALL	Returns variables to factory default values. This erases *all* high scores and identifiers.
RETURN	Saves the current on-screen values and reverts to the main menu screen.

HIGH SCORE CLEAR/RESET

HOT HOOPS	SHELL SHOCK	TARGET 21
ROYAL QUEST	SOLITAIRE	MOVIE TRIVIA
WORDZ	PAIRS	TRIPLE ELEVENS
PYRAMID 13	3 PEAK	5 STAR
TIMES SQUARE	STRIP SEARCH	UPLIFT
NEXT	RESET ALL	RETURN
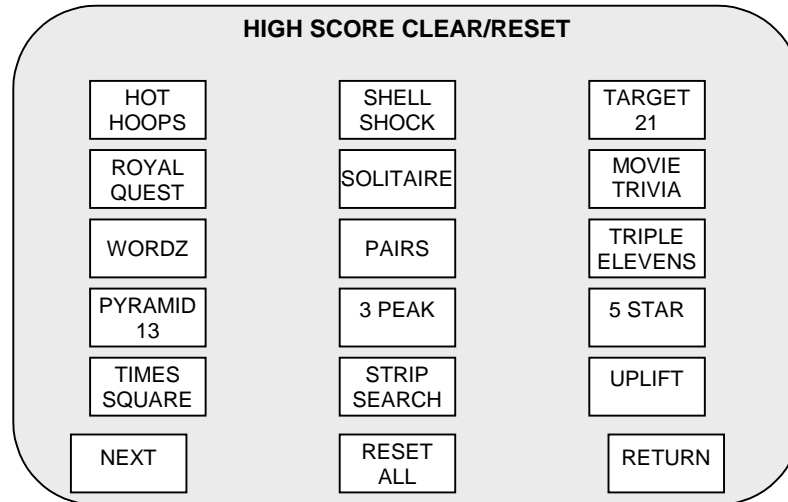
TYPICAL HIGH SCORE CLEAR/RESET SCREEN

Scores are ranked in numerical order, with the highest of the top ten scores listed first. When a high score is bettered, the lowest score on the list is dropped to make room for the new one. Each game has a high score screen, which you access by touching the button with the game's name.

HIGH SCORES
SPECIFIC GAME

Name	SCORE
1 – PR1	100000
2 – PR2	76000
3 – PR3	24000
4 -	0
5 -	0
6 -	0
7 -	0
8 -	0
9 -	0
10-	0
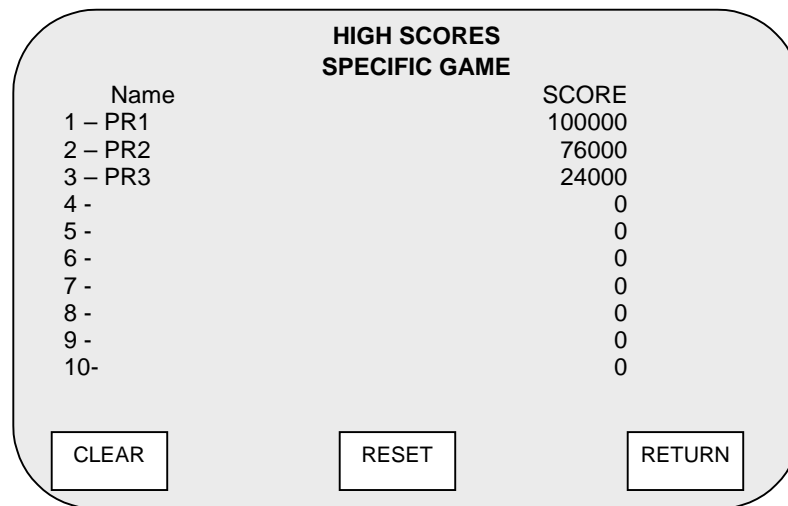
CLEAR	RESET	RETURN

TYPICAL GAME HIGH SCORE SCREEN

In the screen above, CLEAR erases all the scores, RESET restores the factory values of the top ten scores, and RETURN brings you back to the HIGH SCORE CLEAR/RESET menu.

OPERATOR MESSAGE

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

CLEAR   Deletes all characters from the screen simultaneously. Use it 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.

```
 1:
 2:
 3:
 4:
 5:
 6:
 7:
 8:
          [ BKGD ]    [ VIEW ]    [ SHIFT ]    [↑]
 [ CLEAR ][ TEXT ]    [ DONE ]    [ SPACE ] [←]  [→]
                                                [↓]
 [0][1][2][3][4][5][6][7][8][9]
 [A][B][C][D][E][F][G][H][I][J][K][L][M]
 [N][O][P][Q][R][S][T][U][V][W][X][Y][Z]
```
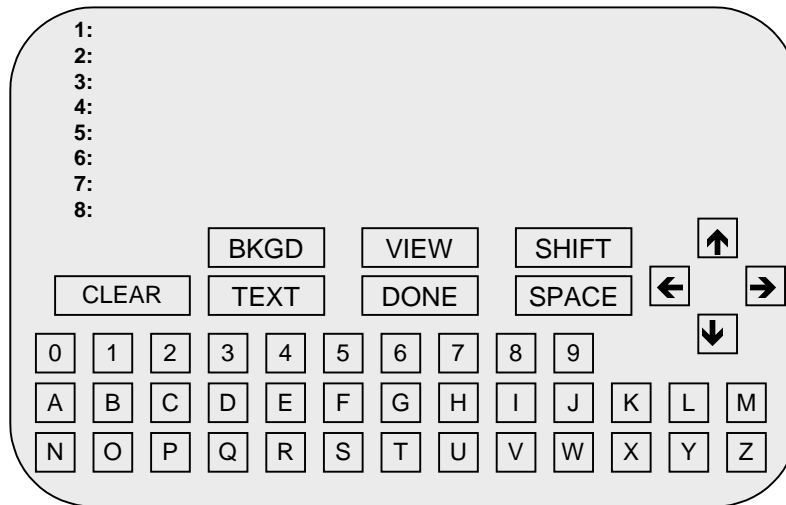
TYPICAL GAME MESSAGE SCREEN

You can write a message of up to eight lines with 32 characters each. All the characters in each line can be a different color than the other lines. You may also vary the color of the background area behind the message. The Touchmaster® automatically centers each line of the message when it is displayed.

1. To create a new message, first reach the OPERATOR MESSAGE menu from the SYSTEM SETUP menu.

2. Touch CLEAR to erase any existing message.

3. Select a background by touching BKGD Until the texture you like is visible at the top of the screen. At any time, you can touch VIEW to preview how your final message will look in Attract Mode.

4. Select the color of the first line by touching TEXT until the line shows your preferred color.

5. Touch the sequence of letters and numbers to spell out the first line of your message.

6. Touch SHIFT to access punctuation and other symbols.

7. Touch ↓ to begin entering the next line. Repeat for each line.

8. Use ↑, ←, and → to place the cursor where you need to correct errors.

9. Use SPACE to insert empty space between characters.

10. When satisfied with your message, touch DONE to save it and return to the previous screen.

LOCATION SETUP

This submenu contains three more submenus that permit you to customize your Touchmaster®: LOCATION NAME, TOUCH KEY SETUP, and SERIAL NO. SETUP. You can also adjust the speed by which your customized location name scrolls in Attract Mode.
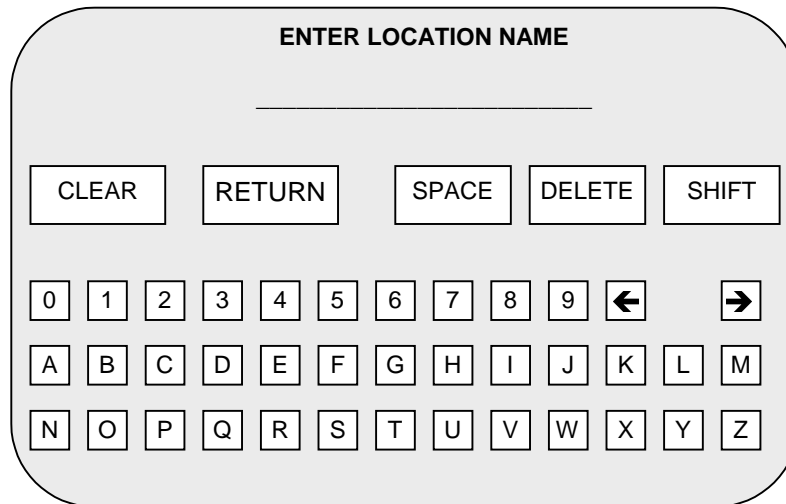
LOCATION NAME

To modify the location name displayed during Attract Mode, enter the SYSTEM SETUP screen either by pressing SETUP in the coin vault or using your touch key PIN to access the LOCAL ADJUSTMENTS screen (explained on next page). You can enter up to 24 characters.

If you used SETUP, touch LOCATION SETUP on screen.

Press LOCATION NAME. Several buttons on this screen control text entry:

CLEAR	Deletes all characters in the location name at once. Use this to erase old information.
RETURN	Returns you to the Location Setup screen and saves your location and ID number.
SPACE	Enters a space between characters. Use this to separate words and sentences.
DELETE	Deletes the character above the flashing cursor and moves the remaining text to the left.
SHIFT	Changes the letter entry boxes to standard symbols. Use for math, punctuation, etc.
ARROWS	Move the flashing cursor left and right.

```
┌─────────────────────────────────────────────────────┐
│               ENTER LOCATION NAME                     │
│                                                       │
│           _____                    │
│                                                       │
│   ┌───────┐  ┌────────┐    ┌───────┐ ┌────────┐ ┌───────┐
│   │ CLEAR │  │ RETURN │    │ SPACE │ │ DELETE │ │ SHIFT │
│   └───────┘  └────────┘    └───────┘ └────────┘ └───────┘
│                                                       │
│   0  1  2  3  4  5  6  7  8  9  ←        →            │
│   A  B  C  D  E  F  G  H  I  J  K  L  M               │
│   N  O  P  Q  R  S  T  U  V  W  X  Y  Z               │
└─────────────────────────────────────────────────────┘
```

TYPICAL GAME LOCATION SCREEN

The location and machine identification are convenience features and have no effect on game play. The Touchmaster® automatically recalls this information if the game audit tables are printed out.

1. To enter your location name, access the ENTER LOCATION NAME screen.

2. Touch CLEAR to erase the existing location name.

3. Touch the character keys on screen to enter the numbers and letters that spell your location name.

4. Use SHIFT to access punctuation and other symbols.

5. Use SPACE to insert an empty space between characters.

6. ← and → let you maneuver the flashing insertion cursor left and right in your location name.

7. DELETE erases the character above the flashing insertion cursor.

8. When finished, touch RETURN to save the name and go back to the previous screen.

TOUCH KEY LOCATION ADJUSTMENT SYSTEM

The Touch Key™ setup feature lets you make some "local adjustments" to games without removing the cash door to access SETUP. A Personal Identification Number (PIN) gives access, allowing you or other designated employees to vary loudness, insert new messages, reset scores, etc., without having keys for the cabinet. The PIN can be altered regularly to prevent unauthorized changes to games.

TOUCH KEY PROGRAMMING These steps explain how to activate the TOUCH KEY™ system.
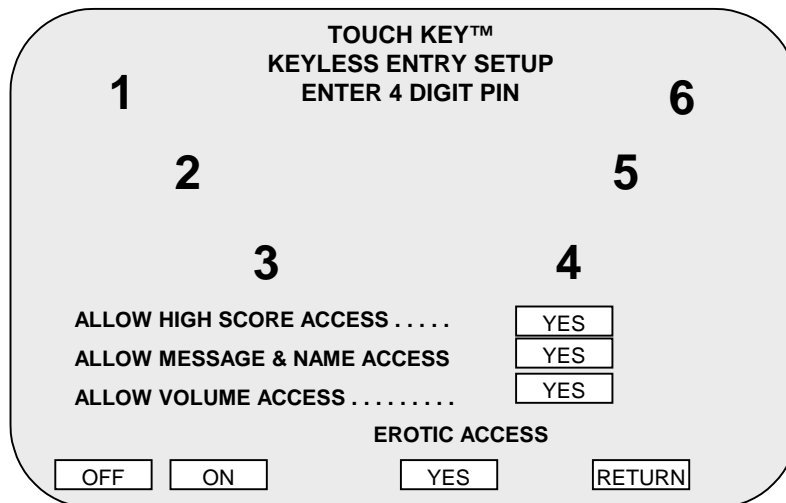
Press SETUP inside the cabinet to enter the menu system. Touch LOCATION SETUP on the screen. Touch TOUCH KEY SETUP to access the TOUCH KEY menu..

```
                    LOCATION SETUP
                  YOUR CUSTOMIZED NAME

    ┌──────────┐    ┌──────────┐    ┌──────────┐
    │ LOCATION │    │TOUCH KEY │    │SERIAL NO.│
    │   NAME   │    │  SETUP   │    │  SETUP   │
    └──────────┘    └──────────┘    └──────────┘



   UR CUSTOMIZED NAME ROLLS BY   YOUR CUSTOMIZE
                      SPEED
                  ┌──────────┐
                  │   MED    │    ┌──────────┐
                  └──────────┘    │  RETURN  │
                                  └──────────┘
```
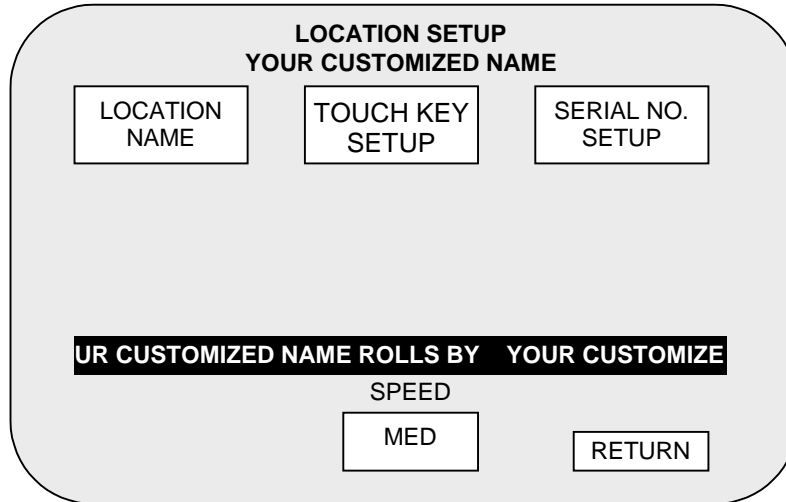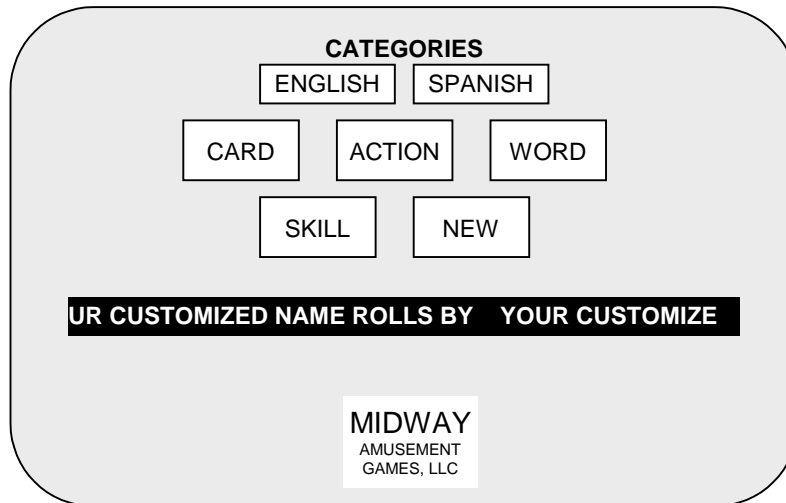
In the TOUCH KEY menu, select a four-digit PIN by sequentially pressing any four keys. You can choose any of the six keys more than once. Determine what adjustments to allow access to (high score, message and name, volume, erotic access). Touch ON to activate your PIN. When finished, touch RETURN. At the LOCATION SETUP menu, touch RETURN again to return to SYSTEM SETUP.

```
                         TOUCH KEY™
                    KEYLESS ENTRY SETUP
    1               ENTER 4 DIGIT PIN              6

          2                              5


               3                4

    ALLOW HIGH SCORE ACCESS . . . . .   ┌─────┐
                                        │ YES │
    ALLOW MESSAGE & NAME ACCESS         ├─────┤
                                        │ YES │
    ALLOW VOLUME ACCESS . . . . . . . . ├─────┤
                                        │ YES │
                                        └─────┘
                        EROTIC ACCESS
    ┌─────┐ ┌─────┐         ┌─────┐     ┌────────┐
    │ OFF │ │ ON  │         │ YES │     │ RETURN │
    └─────┘ └─────┘         └─────┘     └────────┘
```

TOUCH KEY USE:

You can turn over local adjustments to designated employees using this procedure:

1. While in Attract Mode, touch the Midway Amusement Games, LLC logo at the bottom of the screen.

CATEGORIES

| ENGLISH | SPANISH |

| CARD | ACTION | WORD |

| SKILL | NEW |

UR CUSTOMIZED NAME ROLLS BY   YOUR CUSTOMIZE

MIDWAY
AMUSEMENT
GAMES, LLC

2. Touch the four numbered keys to enter the PIN. Each key highlights as you touch it. The correct PIN reveals the LOCAL ADJUSTMENTS menu. The wrong PIN begins a series of high score screens.

**TOUCH KEY™
YOU'RE IN
COMMAND!**

1   6

2   5

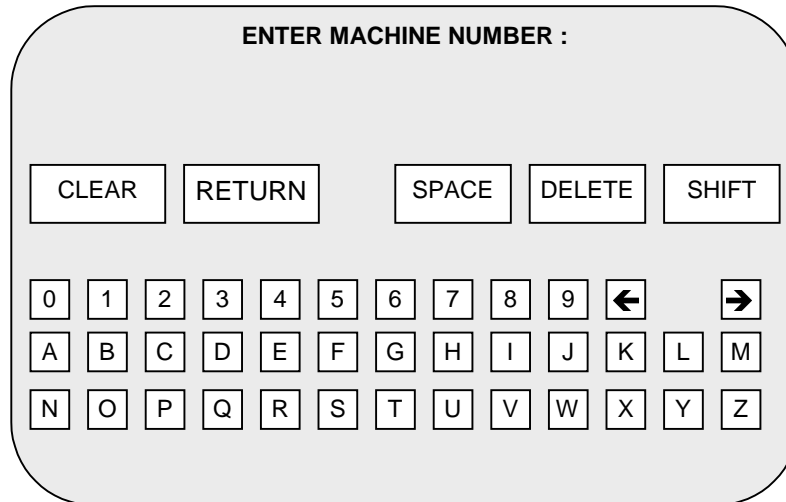3   4

INSERT COINS

MAIN
MENU
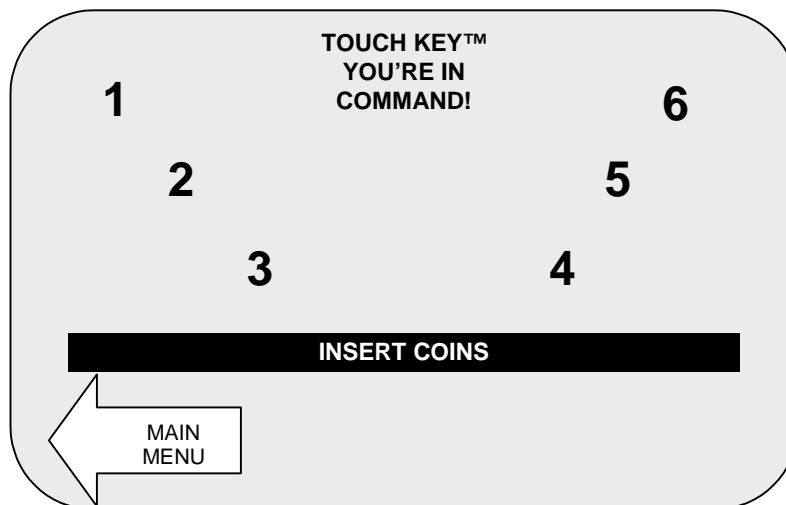
3. In the LOCAL ADJUSTMENTS menu, you can change the custom message, clear or reset high scores, change your custom location name, adjust the volume, change the language of the game's text, turn the erotic games on or off, or perform a touchscreen calibration.

4. When done with local adjustments, touch EXIT to return to Attract Mode.

5. Explain policies for to make changes (i.e., lower volume or erotic game access after a certain time of day). Describe when game scores might be reset. Demonstrate adjustments and explain features.

6. Have chosen individuals memorize the PIN. Explain how often it will change and whom to contact if it fails to work. Show that the code functions only if the key system is enabled, but the game continues to operate and play normally. Have them enter codes to verify their understanding of the system.

7. Demonstrate Touch Key operation. Describe incorrect tracking and what happens if the screen is out of calibration. Show how to calibrate the touchscreen, and how to test the calibration tracking.

8. If you forget the PIN, you can reset it as long as you have access to SETUP.

SERIAL NO. SETUP

You can enter a four-digit alpha-numeric serial number. If you have multiple VGMs that can print reports, serial numbers can identify each unit. SERIAL NO. SETUP cannot be accessed through Touch Key. The only time you will see your serial number is when you return to this screen or create a printout.

CLEAR	Deletes all characters in the location name at once. Use this to erase old information.
RETURN	Returns you to the Location Setup screen and saves your location and ID number.
SPACE	Enters a space between characters. Use this to separate words and sentences.
DELETE	Deletes the character above the flashing cursor and moves the remaining text to the left.
SHIFT	Changes the letter entry boxes to standard symbols. Use for math, punctuation, etc.

```
┌─────────────────────────────────────────────────────┐
│                ENTER MACHINE NUMBER :                 │
│                                                       │
│  ┌───────┐ ┌────────┐   ┌───────┐ ┌────────┐ ┌───────┐│
│  │ CLEAR │ │ RETURN │   │ SPACE │ │ DELETE │ │ SHIFT ││
│  └───────┘ └────────┘   └───────┘ └────────┘ └───────┘│
│                                                       │
│  0  1  2  3  4  5  6  7  8  9  ←     →                │
│  A  B  C  D  E  F  G  H  I  J  K  L  M                │
│  N  O  P  Q  R  S  T  U  V  W  X  Y  Z                │
└─────────────────────────────────────────────────────┘
```

**TYPICAL SERIAL NO. SETUP SCREEN**

Enter a unique machine number for each unit at a location. Keep a master list of machines for future reference.

1. To enter your serial number, access the SERIAL NO. SETUP SCREEN through the LOCATION SETUP submenu.

2. Touch CLEAR to erase the existing serial number.

3. Touch the four characters or numerals to spell out your serial number.

4. Use DELETE to correct mistakes.

5. Use SHIFT to access punctuation and other symbols.

6. Use SPACE to insert empty space between characters.

7. Touch RETURN to save your number and return to the LOCATION SETUP screen.

DIAGNOSTIC

Use the Diagnostic routines to check display performance, to verify sounds and music, to test switches, and to calibrate and verify the Touchscreen.

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	Manually test of currency acceptors, cabinet SETUP and CALIBRATE switches.
CALIBRATE	Set the Touchscreen Controller coordinates to correspond to fixed screen locations.
CALIB. TEST	Verify Touchscreen sensitivity and linearity for the entire active Touchscreen area.
RETURN	Revert to the main menu screen. You can then return to Attract Mode.

DIAGNOSTIC

VIDEO TEST	SOUND TEST	SWITCH TEST

CALIBRATE	CALIBRATE TEST

RETURN
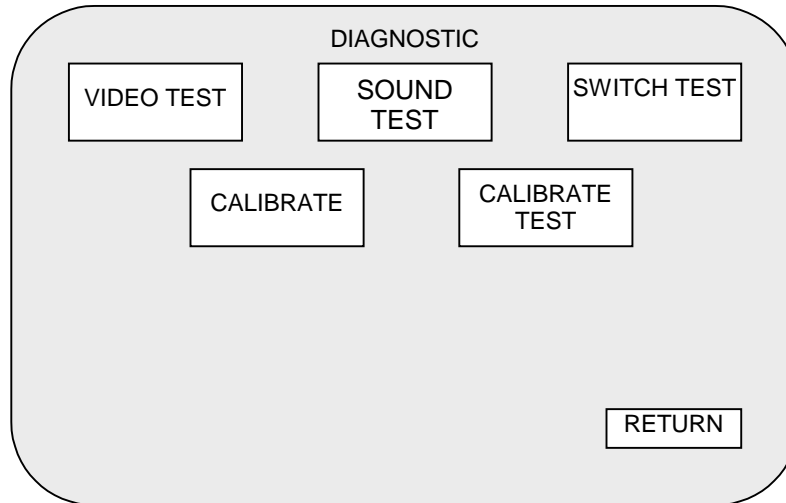
TYPICAL DIAGNOSTICS SUBMENU SCREEN

These routines provide you 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 maladjustments, in addition to remembering the rules of the game. All of these tests are brief, and may be done in any order.

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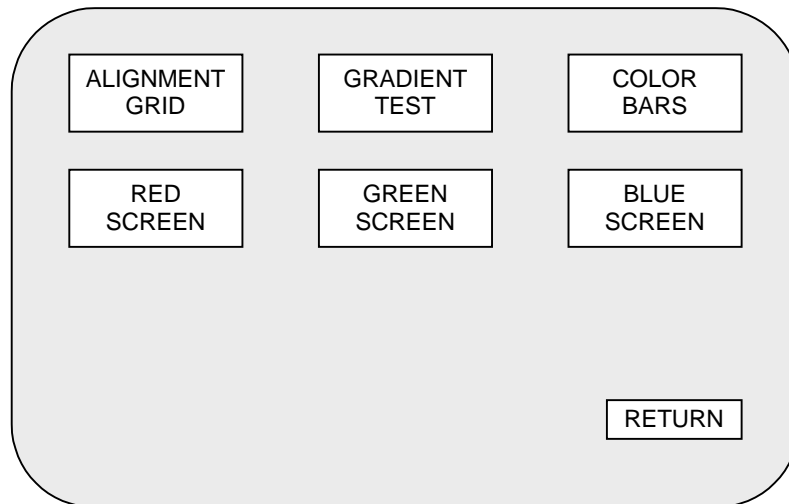
Verify the calibration each time the Touchmaster® is moved, in addition to the regular maintenance checks, for best game performance.

You can run the Calibrate routine without going through the Menu System by pressing the CALIBRATE button in the coin vault. However, this omits the Touchscreen Controller tracking test. The CALIBRATE button was included to encourage a quick check of the touchscreen functions each time the cash door is emptied.

VIDEO TEST
Video tests provide patterns which verify monitor performance or making adjustments. You can modify some monitor characteristics using the monitor controls remote board.

ALIGNMENT GRID	Lets you check or adjust monitor convergence, linearity, and dynamic focus.
GRADIENT TEST	Permits you to optimize CRT screen image for brightness and contrast.
COLOR BARS	Lets you analyze red, green, blue, and white balance.
RED SCREEN	Solid red screen for purity tests. Red should be the only color showing.
GREEN SCREEN	Solid green screen for purity tests. Green should be the only color showing.
BLUE SCREEN	Solid blue screen for purity tests. Blue should be the only color showing.

```
┌─────────────────────────────────────────────────┐
│                                                   │
│   ┌──────────┐   ┌──────────┐   ┌──────────┐     │
│   │ALIGNMENT │   │ GRADIENT │   │  COLOR   │     │
│   │   GRID   │   │   TEST   │   │   BARS   │     │
│   └──────────┘   └──────────┘   └──────────┘     │
│                                                   │
│   ┌──────────┐   ┌──────────┐   ┌──────────┐     │
│   │   RED    │   │  GREEN   │   │   BLUE   │     │
│   │  SCREEN  │   │  SCREEN  │   │  SCREEN  │     │
│   └──────────┘   └──────────┘   └──────────┘     │
│                                                   │
│                                   ┌──────────┐    │
│                                   │  RETURN  │    │
│                                   └──────────┘    │
│                                                   │
└─────────────────────────────────────────────────┘
```

TYPICAL VIDEO TEST MENU SCREEN

It is vital 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. Game players tend to be more critical when they are close to the monitor, and the Touchscreen 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.

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 you to ensure that audio components are connected and operating properly.

STOP	Ends selected sound. You can halt repetitive sound tracks with this button.
PLAY	Starts selected sound. You can start another sound while one is still playing.
BACK	Selects previous sound choice. Each single touch decrements counter by one.
NEXT	Selects next sound choice. Each single touch increments the counter by one.
+	Raises volume of the sound in steps until the maximum value is reached.
-	Lowers volume of the sound in steps until the minimum value is reached.
RETURN	Reverts to previous screen. Touching RETURN again takes you to SYSTEM SETUP menu. Touching EXIT at this point takes you back to Attract Mode.

SOUND TEST

STOP   PLAY

BACK   SOUND   NEXT
          1

VOLUME   +

          -        RETURN
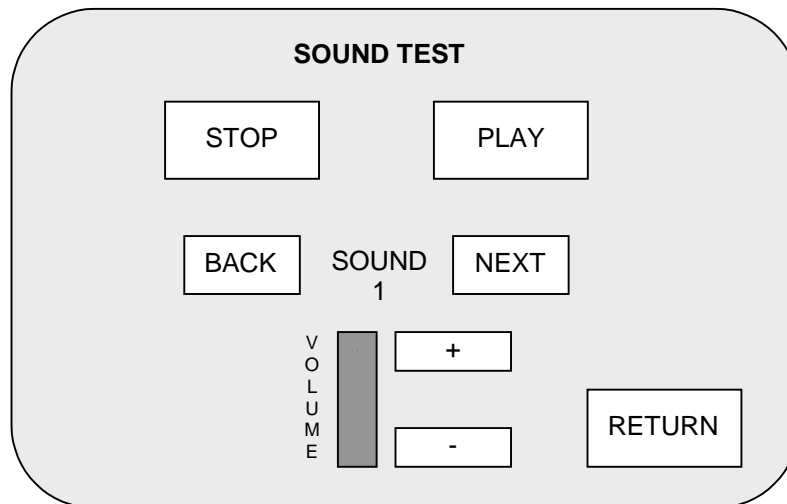
TYPICAL SOUND TEST MENU SCREEN

Each sound is stored in a discrete memory location. All 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 causing 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.

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

There are three types of Touchmaster® sounds. Short bursts of sound indicate single events such as 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 announce start or end of game, bonus rounds, or new high score. Phrases can last from one to five seconds. The final group consists of repetitive sounds like a jazz-drum riff or a ticking clock. These sounds distract players and attract others.

👉	**NOTICE:** Volume adjustment in sound tests is same as one used for game play. Be sure to set volume back to a reasonable level when you conclude tests.
👉	**NOTICE:** 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.

SWITCH TEST

Switch tests allow you to manually check each switch. Touchscreen uses a digital controller to sense player input and it has a separate test (refer to Calibrate steps).
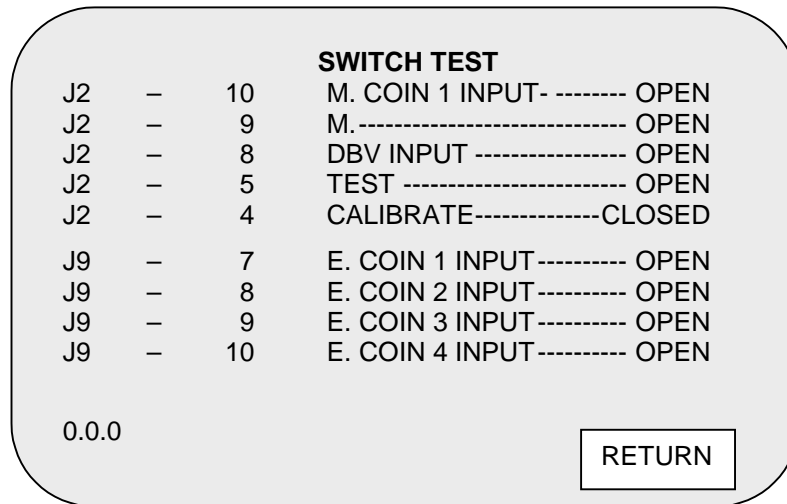
OPEN   Indicates a circuit with no continuity. This is a Normally Open switch condition.
CLOSED   Indicates a circuit with continuity. This is a Normally Closed switch condition.
RETURN Reverts to the Submenu screen. Touch RETURN again to go to the Main Menu.

SWITCH TEST

J2	–	10	M. COIN 1 INPUT- -------- OPEN
J2	–	9	M.----------------------------- 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

Touchmaster® electronics expect all switches to be Normally Open except when activated.

Each line item on screen represents an input signal from currency acceptors or pushbutton switches. The screen above is correct for a Touchmaster® with CALIBRATE pushbutton depressed and held. The Video Game Machine detects and displays status of each switch independently, allowing you to check switches for interaction or incorrect programming (as with electronic currency acceptors).

Touchmaster® audio circuits also generate a *clunk* noise as switches close to help you locate shorted or intermittent connections when you are not in position to view monitor screen.

To install a coin mechanism that accepts a type of coin different than previously used, turn off AC power and open Cash Door. Remove existing mechanism and install alternate unit. After mounting and connecting new mechanism, match Touchmaster® software to new currency values. Turn AC power on and verify Touchscreen operation. Recalibrate Touchscreen.

Check switch operation for Currency Acceptors as follows: press SETUP pushbutton to display Menu System. Choose DIAGNOSTICS, then choose SWITCH TEST to go to switch menu screen. A typical game SWITCH screen is illustrated; your Touchmaster® may have a different compliment of acceptors.
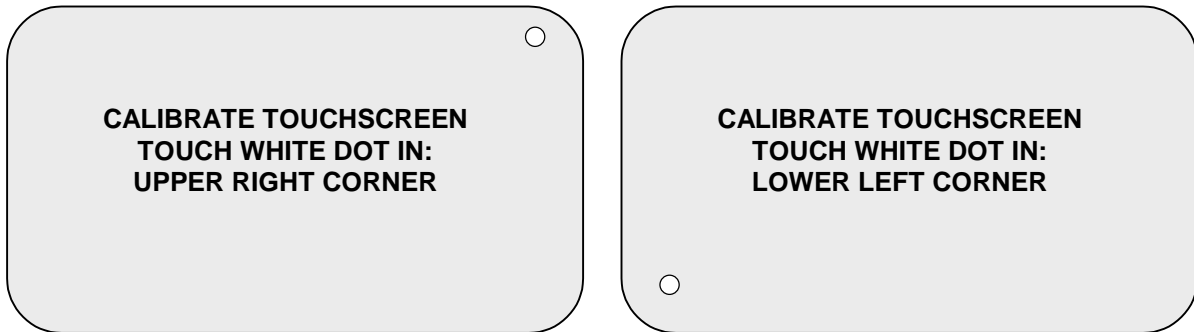
Press and hold CALIBRATE pushbutton. The Touchmaster® emits CLUNKing sounds and indicate switch is CLOSED on screen. Release button to stop the sound and revert to OPEN state. Repeat steps for other switches in VGM. When finished, choose RETURN and EXIT to quit.

NOTICE: Continuous *clunk* noises can indicate wiring defects, jammed switch, bad IC, etc.
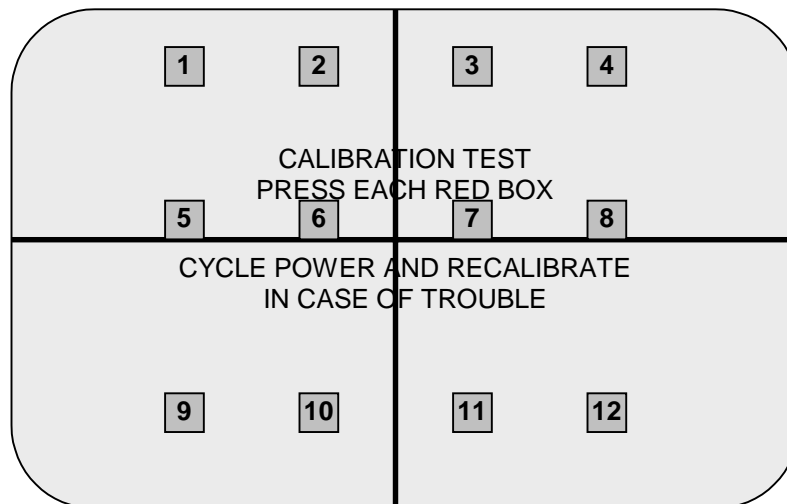
CALIBRATE
This procedure lets you correct the accuracy of the Touchscreen controller.

○   Dot for controller calibration. This sets the ability to correctly recognize a player's touch.

CALIBRATE TOUCHSCREEN
TOUCH WHITE DOT IN:
UPPER RIGHT CORNER

CALIBRATE TOUCHSCREEN
TOUCH WHITE DOT IN:
LOWER LEFT CORNER

TYPICAL CALIBRATION SCREENS

☐   Box for controller verification. This verifies the Touchscreen accuracy in critical areas.

CALIBRATION TEST
PRESS EACH RED BOX

CYCLE POWER AND RECALIBRATE
IN CASE OF TROUBLE

TYPICAL CALIBRATION TEST SCREEN

The Touchscreen Controller in the Touchmaster® senses the position of your finger based on its capacitance. The Touchscreen uses a very weak uniform electrical field. Touching the screen disturbs the field. The controller tracks the disturbance and translates it into a location. The game electronics interpret the location information into commands. The 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 you 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® automatically advances 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 you 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® displays one vertical and one horizontal line on the screen. The lines should intersect over the box when you remove your finger. Repeat this procedure for each box on the screen.

CALIBRATE TEST

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

✚   Intersecting lines indicate screen location coordinates from the Touchscreen Controller.

RETURN   Returns you to the previous screen.
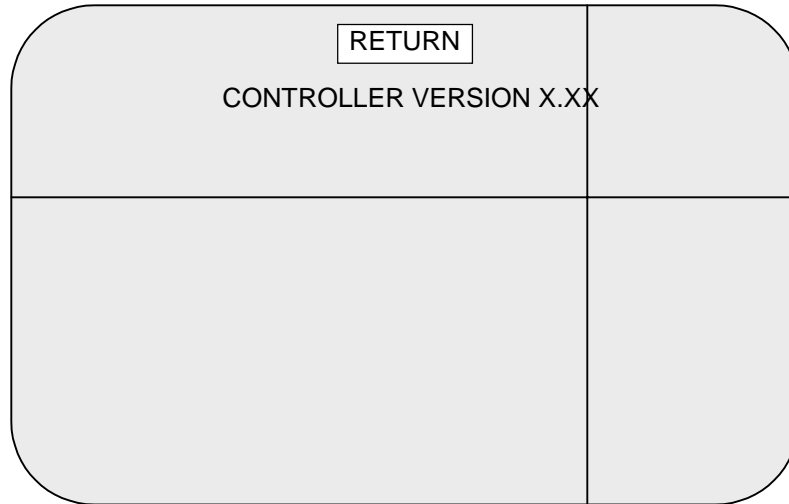
TYPICAL CALIBRATION TEST SCREEN

Check the accuracy of the Touchscreen Controller can be checked without going through a new calibration procedure. This test quickly detects any non-linear or unresponsive areas of the Touchscreen.

The Controller Version number indicates the model of controller used in this unit. Because of space limitations, the Touchscreen 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.

The first time the Touchscreen Controller is calibrated, 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 Calibrate Test on a regular basis to determine if a new calibration is necessary.

1. Touch CALIBRATE TEST to view the test screen. The lines should intersect at the screen's center.

2. Touch any location on the screen. The lines intersect at the point of contact.

3. For each additional touch point, the lines must intersect under your fingertip. Drag your finger across the screen, as well as lift it from the screen and place it down again.

4. Check several locations, especially along the outer perimeter of the screen. If *either* or both lines are visible beside your finger after the lines stop moving, recalibrate the touchscreen.

5. Touch RETURN to end the test and go back to the DIAGNOSTICS screen. If you encountered errors in the test, choose CALIBRATE and complete each step.

6. When the CALIBRATE TEST results are satisfactory, select RETURN to go to the main menu and EXIT to return to Attract Mode.

☞	**NOTICE:** Always recalibrate and test Touchmaster® after moving it.

# TOUCHMASTER®
CONVERSION
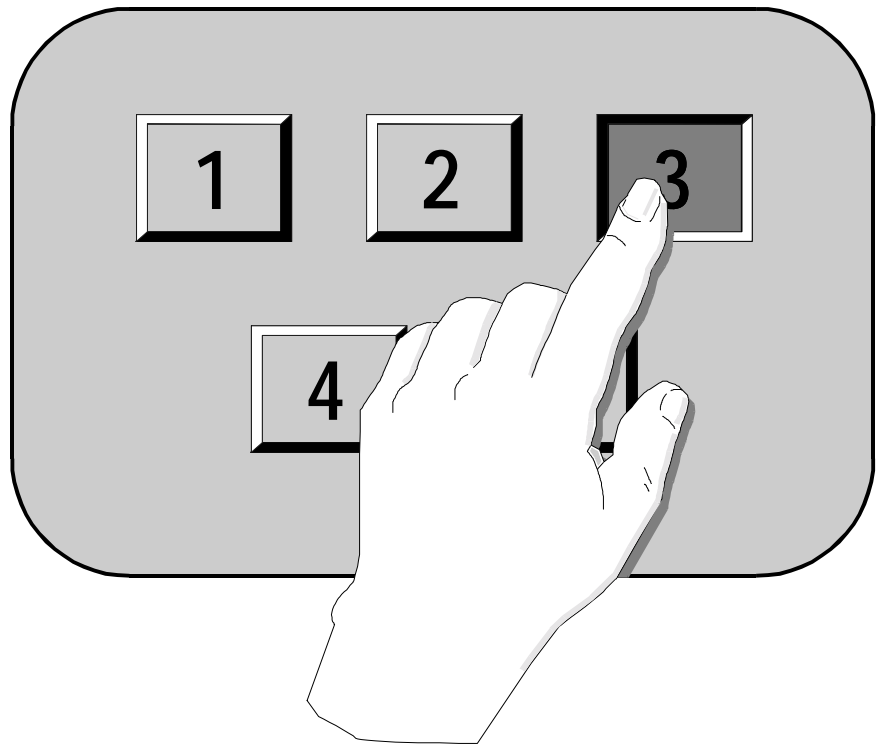
Parts and Service

⚠	**WARNING: DO NOT SUBSTITUTE PARTS.** Use of non-Midway Amusement Games, LLC Parts or circuit modifications may cause serious injury or equipment damage! Use only Midway-authorized parts. For safety and reliability, do not substitute parts or modify Midway products. Substitute parts or modifications may void EMC directive or FCC type acceptance.

A-23811-33 CPU BOARD ASSEMBLY
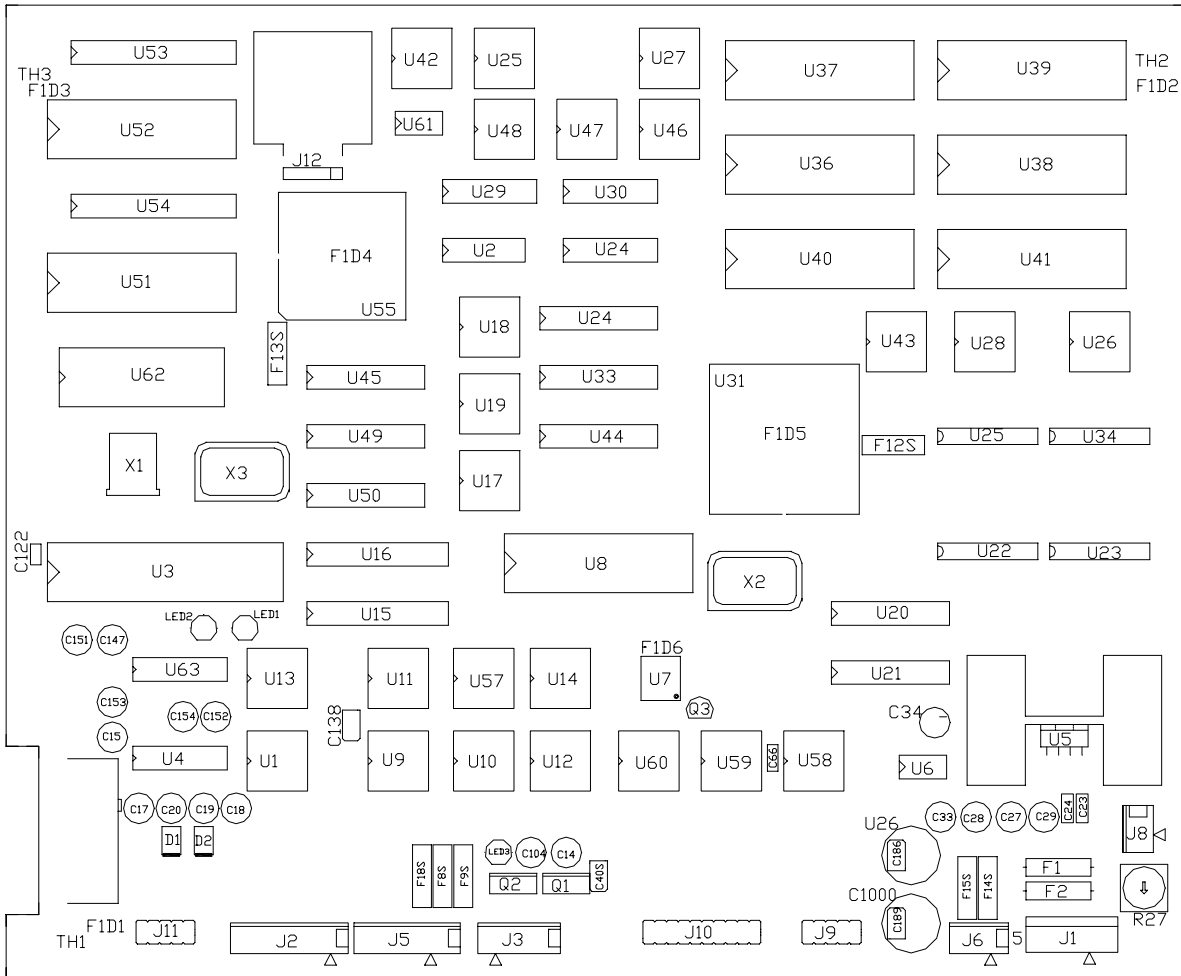
Field Replaceable Parts

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)	Graphic ROM	EPROM Assembly
U37	--- (see Note 1 & 2)	Graphic ROM	EPROM Assembly
U38	--- (see Note 1 & 2)	Graphic ROM	EPROM Assembly
U39	--- (see Note 1 & 2)	Graphic ROM	EPROM Assembly
U40	--- (see Note 1 & 2)	Graphic ROM	EPROM Assembly
U41	--- (see Note 1 & 2)	Graphic ROM	EPROM Assembly
U51	--- (see Note 1 & 2)	Game ROM	EPROM Assembly
U52	--- (see Note 1 & 2)	Game ROM	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.*

MAINTENANCE

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

☞	**NOTICE: AVOID ABRASIVE CHEMICALS.** Do not use products with ammonia, bleach, lemon, vinegar, trisodium phosphate (tsp), or any abrasive ingredients. These products can damage the surface of the Touchscreen and degrade performance.

♦ **Glass surfaces**
You may clean glass while power is on. Apply a mixture of isopropyl alcohol and warm water to a clean cloth or sponge, then use this to wipe screen. *Do not apply the cleaner directly on the glass!* Liquids could drip down into the Touchscreen circuits and cause erratic operation.

♦ **Calibration**
Calibrate the screen each time you clean the screen. Use the Calibration Test steps to determine if recalibration is required.

SERVICING

We recommend you read the Safety Notices section thoroughly before beginning service.

Touchmaster® uses complex electronic components that are very sensitive to static electricity. Observe the following precautions prior to handling any of the electronics.

1. Ensure that AC power is off prior to servicing the electronics.
2. Discharge any static electricity build up in your body by touching the metal cabinet base. Do this before touching or handling electronic assemblies.
3. Store the electronic assemblies in an anti-static area. Use anti-static bags to store electronic assemblies. Reuse the bag to store removed boards during service.
4. Do not remove or connect any electronic assemblies when AC 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.

Refer to the original equipment manufacturer's manual for information relating to the removal and installation of approved parts for the following components.

Power Supply	Speaker	Coin Meter	Control Switches	Touchscreen
Monitor Bezel, chassis boards, and Gasket	Monitor	Cash Door Assembly	Power Switch or Circuit Breaker	

♦ **Touchscreen Controller**
Do not substitute original Touchscreen controller (if any) for the one in the kit. While they look similar, the new one has the latest software instruction set. Early devices may not calibrate correctly.

♦ **CPU Board Assembly**
Switch off AC power and unplug line cord. Unlock and open rear door. Slide electronics shelf forward a bit. Disconnect Touchscreen Controller Connector Cable. Extract harness cables from board connectors. Disconnect ground wires as needed. Pull assembly out of cabinet and set in a safe place. Remove board mounting screws. Anti-static bags and protective containers from new parts must be used to store board if not reinstalled immediately.

♦ **Battery Memory Module**
Switch off AC power, remove line cord, and remove rear door. Carefully note module orientation, as some versions do not have a notch or keying mark. Remove the module using a chip extraction tool.

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

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

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

Switch off AC power, remove line cord, and remove rear door. Carefully note position of each chip before using a chip extraction tool (not needed for security key). Use a rocking motion to avoid bending pins.

To reinstall a memory circuit, orient a device over its socket and press firmly to seat pins.

|	
⚠	**WARNING: DO NOT FORCE PARTS.** If a component does not fit easily into its socket, inspect the component and socket to ensure they are keyed properly and reorient the component. Do not force components to fit, as you will damage them or the socket.
⚠	**CAUTION: GROUND SELF BEFORE TOUCHING ELECTRONICS.** Discharge any static electricity build up in your body by touching the metal chain lug. This must be done before touching or handling any of the electronic assemblies.
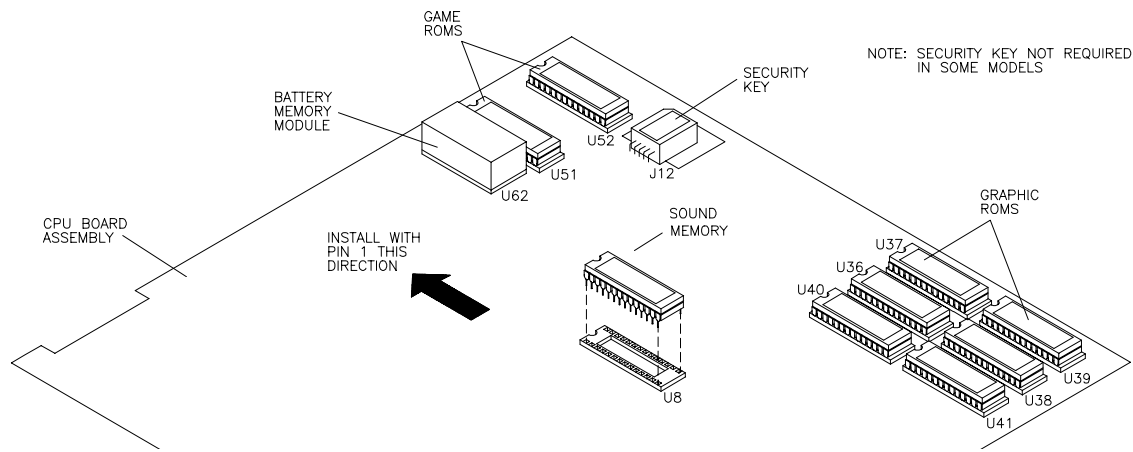
ORIENTATION OF FIELD REPLACEABLE ELECTRONIC COMPONENTS

TOUCHMASTER®
CONVERSION

CHAPTER
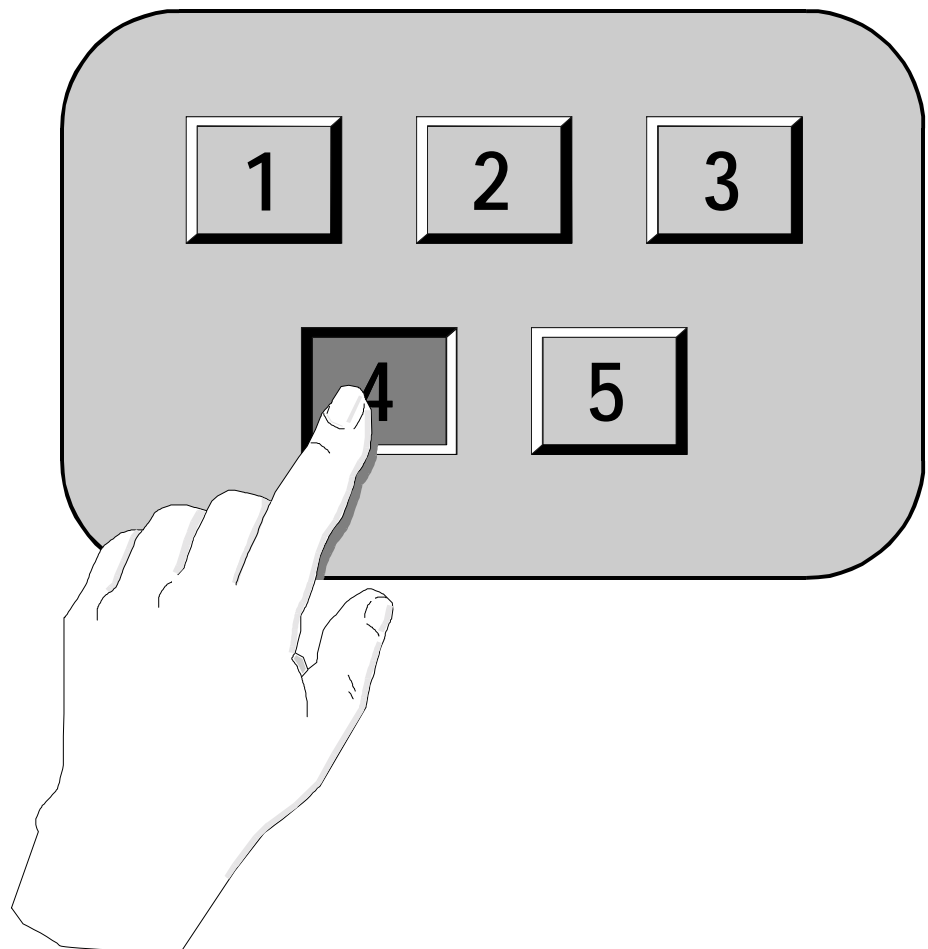
Wiring

⚠	**WARNING: GROUND TOUCHMASTER®.** 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	Screen Invert Ground	J6	1	Blue-White
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	Orange
Analog Ground	J1	5	Black	Analog Ground	J6	5	Black
Digital Ground	J2	1	Black	Not Used	J7	--	N/C
Key	J2	2	N/C	Amplifier Volume In	J8	1	N/C
Screen Invert	J2	3	Blue-White	Preamp Volume Out	J8	2	N/C
Calibrate	J2	4	White-Blue	Key	J8	3	N/C
Setup	J2	5	White-Green	Audio Volume Ground	J8	4	N/C
Not Used	J2	6	N/C	Digital Ground	J9	1	Black
Not Used	J2	7	N/C	+12VDC	J9	2	N/C
Bill Detect	J2	8	N/C	Not Used	J9	3	N/C
Mech Coin 2	J2	9	N/C	Not Used	J9	4	N/C
Mech Coin 1	J2	10	White-Black	Not Used	J9	5	N/C
Meter	J3	1	White-Violet	Digital Ground	J9	6	N/C
Not Used	J3	2	N/C	Elec Coin 1	J9	7	Black-Brown
Coin Lock Out	J3	3	Blue-Grey***	Elec Coin 2	J9	8	Black-Red
Digital Ground	J3	4	Black	Elec Coin 3	J9	9	Black-Orange
Not Used	J3	5	N/C	Elec Coin 4	J9	10	Black-Yellow
Key	J3	6	N/C	Not Used	J10	--	N/C
Digital Ground	J3	7	Black	Not Used	J11	--	N/C
Not Used	J4	1	Cable	Security	J12	1	N/C**
Touchscreen RXD	J4	2	Cable	Security	J12	2	N/C**
Touchscreen TXD	J4	3	Cable	Security	J12	3	N/C**
Not Used	J4	4	Cable	Security	J12	4	N/C**
Digital Ground	J4	5	Cable	Security	J12	5	N/C**
Not Used	J4	6	Cable				
Not Used	J4	7	Cable				
Not Used	J4	8	Cable				
Not Used	J4	9	Cable				
Speaker +	J5	1	Red-Grey				
Speaker -	J5	2	Brown-Grey				
Key	J5	3	N/C				
Video Ground	J5	4	Yellow-Black				
Video-Blue	J5	5	Yellow-Blue				
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. An optional printer port kit is available.
** Security key circuit is required to permit operation of some software versions.
*** Coin lock out function is required in some locations. This connector is included in the wiring harness.

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	N/C
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.
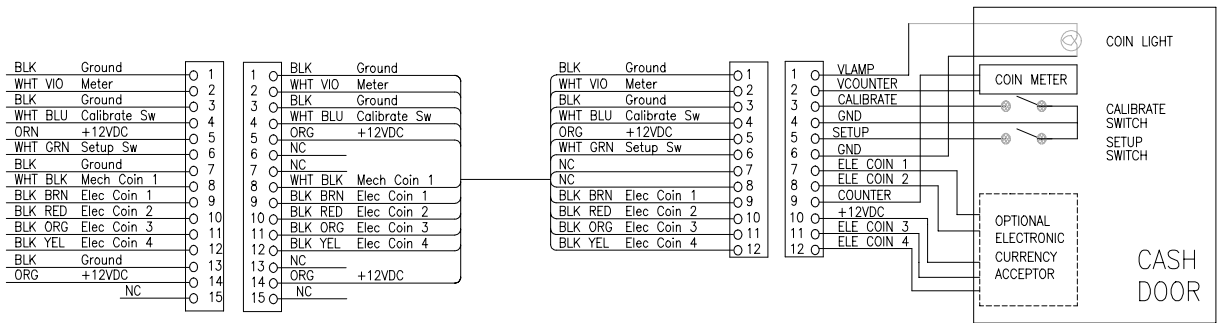
TYPICAL CABINET WIRING USING MAIN HARNESS H-23608
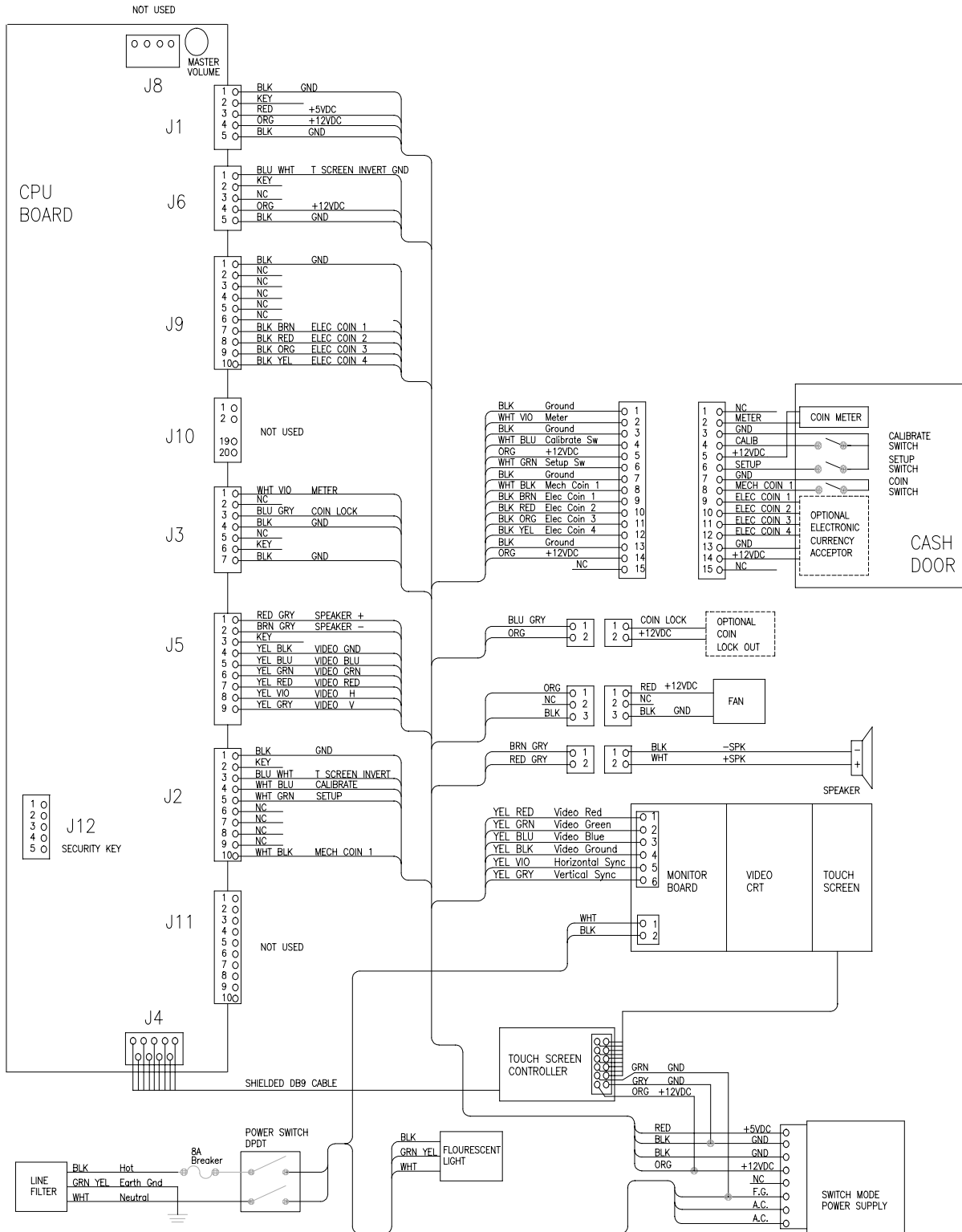
ADAPTERS FROM CASH DOOR TO MAIN HARNESS

9-12 PIN WIRING ADAPTER CABLE H-23379
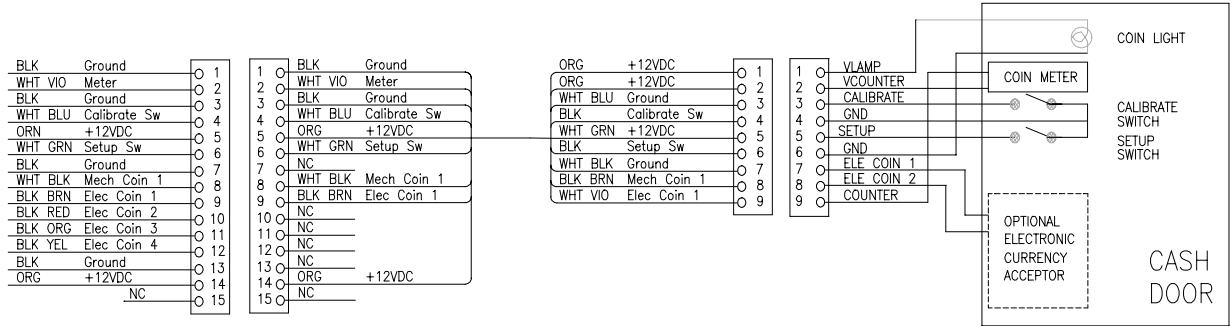


12-15 PIN WIRING ADAPTER CABLE H-23505

LED INDICATOR STATUS CHART

DESIGNATION	LOCATION	FUNCTION	COLOR	STATE	MEANING
LED 1	CPU BOARD ASSEMBLY	PROCESSOR ACTIVITY	RED	OFF	NO POWER (No DC power at the CPU)
				ON	LOCKED UP (Faulty CPU instructions)
				BLINKING	NORMAL OPERATION
LED 2	CPU BOARD ASSEMBLY	RESET INDICATOR	GREEN	OFF	NO POWER (CPU not operating)
				ON	NORMAL OPERATION
				BLINKING	ERROR (Continuous reset at the CPU)
LED 3	CPU BOARD ASSEMBLY	INTERFACE CONDITION	RED	OFF	NORMAL (No touch signal from Controller)
				ON	LOCKED UP (Continuous busy at the interface)
				BLINKING	TOUCH DETECTION
LED 4	TOUCHSCRN CONTROLLER	CONTROLLER CONDITION	GREEN	OFF	NO POWER (No DC power at the Controller)
				ON	NORMAL OPERATION
				BLINKING	ERROR (Internal Controller error. See note for details.)

NOTES FOR LED 4, Internal Controller error.

Number of flashes every 10 seconds	Reason
1	RAM fault
2	ROM fault
3	A/D fault
4	NOVRAM fault
5	Analog fault
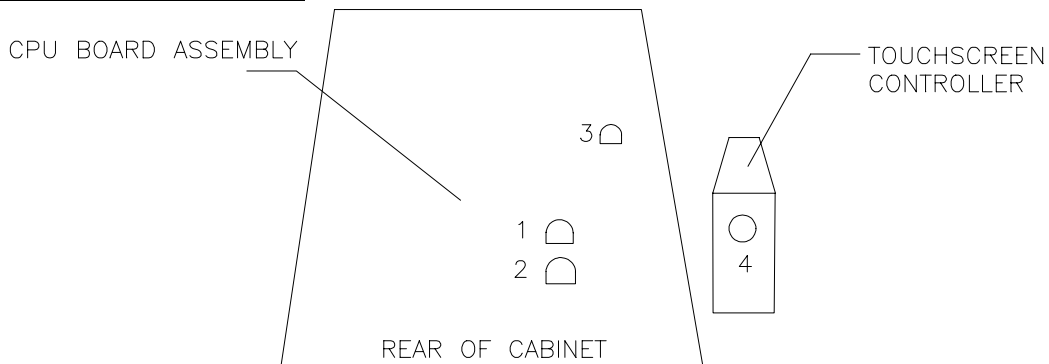
LOCATIONS OF LED 1, 2, 3, and 4 IN CABINET

NOTES...

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TOUCHMASTER®
CONVERSION

C H A P T E R
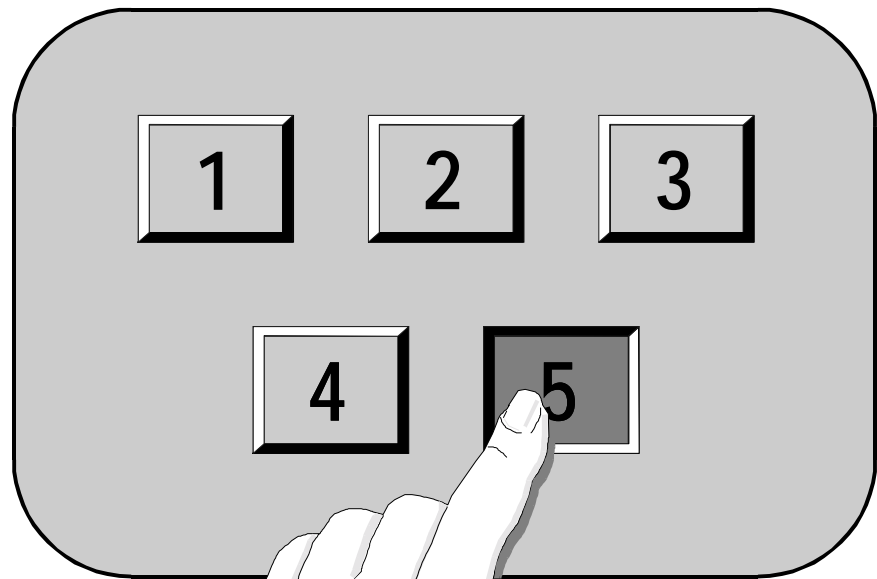
Troubleshooting
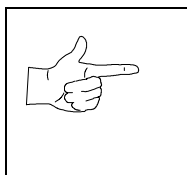
	NOTICE : The conversion kit interchangeable with the Board Assembly. The different part numbers. The Touchscreen calibration errors.	CPU Board Assembly is not standard Touchmaster® CPU assemblies look very similar but have incorrect assembly will cause sync and

Touchmaster® uses complex electronic components that are *sensitive* to static electricity. The following precautions must be observed and followed prior to handling electronics.

1. Turn off AC power and ensure the cord is unplugged prior to servicing.
2. Discharge any static electricity build up in your body by touching any unpainted metal on the cabinet, such as the chain lug. Do this *before* touching or handling the assemblies.
3. Handle electronic assemblies by their edges and store them in an anti-static area when not in active use. Use anti-static bags to store or transport the CPU Board Assembly.
4. *Do not* install, remove, or connect any electronic assemblies when AC 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 all ground and mounting screws are installed and tightened firmly.

Touchmaster® Does Not Start

Symptom	Problem	Suggested Solution
• Machine appears non-functional. • No audio • No fan • No video display.	Lack of electricity	Check that power switch is set to **on** and line cord is plugged in.
• Machine appears non-functional • Fan operates	Poor AC connection	1. Check air flow out of cabinet near fan. Air flow suggests DC power is available from power supply. 2. Turn off AC power. Remove line cord cable clamp. 3. Test line cord, power plug and IEC connector for breaks or damage. 4. Verify continuity of each wire in cord. 5. Fully seat IEC connector in cabinet receptacle. 6. Replace cable clamp and all of its screws. 7. Ensure wiring harness connectors are fully seated in corresponding AC Power connectors. 8. Verify AC wire connections at power supply terminals.
	Tripped circuit	1. Examine circuit breaker. 2. If the circuit has been broken, reset button protrudes from the circuit breaker. 3. Press button in until it latches to restore power.
	Faulty AC line filter	1. Examine AC line filter. If faulty, replace with identical filter of proper voltage and current rating. 2. Connect line cord and verify operation. 3. Fully seat AC plug in the outlet. Verify that AC line voltage is present. 4. Turn AC power on. Check DC wiring harness and connectors if breaker opens circuit again.
	Poor DC connections	1. Open bottom door while AC power is on. 2. Inspect the CPU Board Assembly under low light level conditions. 3. LEDs glow if voltage runs through processor circuits. (This does not mean that voltages or signals are as they should be, but it indicates CPU Board receives DC power from the Power Supply.) 4. Turn AC power off. 5. Unplug AC line cord. 6. Inspect CPU Board Assembly. 7. Ensure DC Power connector is attached and fully seated onto mating board connector. 8. Check other harness connectors in same way.

Touchmaster® Cannot Be Played

Symptom	Problem	Suggested Solution
• Machine does not accept currency or tokens. • Machine does not start. • Audio functional. • Video functional.	Cash door blockage	1. Unlock and remove cash door. Empty cash box. Inspect for counterfeit currency. Remove items from vault that block path from coin mechanism. 2. Check each coin mechanism or currency acceptor by hand to ensure proper mounting. Clear the currency path. Reinstall and latch mechanism.
	Unlevel cash door	1. Verify mechanism is level in cabinet. 2. Ensure connector is attached and fully seated. 3. Repair or replace bent or damaged mechanism.
• Machine accepts currency or tokens. • Machine does not start. • Audio functional. • Video functional.	Bad switch	1. Unlock and remove cash door. Check each mechanism to ensure proper mounting. 2. Verify each release latch is closed and locked. 3. Test both good and bad coins to see if mechanism accepts and rejects currency correctly. 4. Press SETUP button. From SYSTEM SETUP, go to DIAGNOSTICS and choose SWITCH TEST. Use these tests to confirm the operation of each switch.
	Poor connection	1. Inspect internal cash door wiring connections. 2. Check cables for wiring continuity from CPU Board Assembly to coin mechanism or currency acceptor. 3. Examine acceptor for programmable features. Some devices require operator adjustment for each specific type of currency recognized. 4. Refer to manufacturer's literature for assistance in setting acceptor features to the required values. 5. Turn off AC power. Ensure no parts or wires are caught in hinges or switch contacts. 6. Check for continuity in each suspect switch connection (Common to Normally Open or Common to Normally Closed). 7. Replace faulty switches (i.e. bent levers). 8. Verify each mechanism operates properly by placing in a known functional unit.
• Machine accepts currency or tokens. • Number of credits per coin or bill is incorrect.	Faulty switch	1. Unlock and remove cash door. Press SETUP button. From SYSTEM SETUP, go to DIAGNOSTICS and choose SWITCH TEST. 2. Use tests to confirm operation of each switch used. 3. Set pulse width adjustment to long pulses if bills do not register when inserted into the acceptor. 4. Verify that each acceptor operates properly by placing in a known functional unit.

Touchscreen Malfunctions

Symptom	Problem	Suggested Solution
• Touchscreen is inaccurate for two or more players.	Dirty screen	Clean cabinet frequently, especially the video screen glass and the Touchscreen area. It is not necessary to switch off AC power to clean the unit. Apply isopropyl alcohol and warm water to a clean cloth or sponge, then use this to wipe the surface. *Do not apply the cleaner directly on the unit.* Liquids can drip into circuits and cause erratic operation.
	Overzealous touching	Warn players to use only one finger at a time. Simultaneous touches confuse the touch controller.
	Poor player grounding	Some players may find response improves when they touch the metal cabinet surface with one hand while operating Touchscreen with other hand.
• Touchscreen chooses incorrect items or does not respond when certain areas are touched.	Poor calibration	Unlock and remove cash door. Press SETUP switch. From SYSTEM SETUP menu, go to DIAGNOSTICS and choose CALIBRATE TEST . Use tests to confirm that Touchscreen detects and properly tracks finger position in all areas of the screen.
		From DIAGNOSTIC menu, choose CALIBRATE to adjust Touchscreen accuracy. Follow instructions to optimize Touchscreen for sensitivity and linearity.
	Dirty screen	1. Turn off AC power. Unlock and open rear door. 2. Remove the top cover and bezel (refer to Servicing instructions). 3. Clean the Touchscreen, especially areas normally hidden by the bezel.
	Faulty controller	Ensure that Touchscreen Controller operates properly by placing in a known functional unit.
• Touchscreen reacts in opposite corner from where touched	Improper signal	1. Turn off AC power and remove line cord. 2. Open Bottom Door. 3. Verify that pin 3 of connector P6 is electrically grounded. 4. Temporarily disconnect the blue/white wire at pin 3 of connector P6. 5. Tape or insulate end of blue/white wire and secure to wiring harness. 6. Plug in line cord and turn on AC power. 7. Recalibrate Touchscreen.
• Player touch controls are intermittent or completely non-functional. • Machine starts normally.	Poor connection	1. Unlock and remove cash door. 2. Enter Menu System by pressing SETUP button. 3. From SYSTEM SETUP menu, go to DIAGNOSTICS and choose SWITCH TEST . Use tests to confirm the operation of each switch.
	Poor calibration	From the DIAGNOSTIC menu, choose CALIBRATE . Follow on-screen instructions to optimize Touchscreen

			for sensitivity and linearity.
	Poor power	1.	Unlock and remove the top cover.
		2.	Observe CPU Board Assembly as you touch the screen.
		3.	If the CPU senses your touch, you will see a glow from a red LED.
		4.	You will see a glow from a green LED on the end of Touchscreen Controller if there is voltage in Touchscreen circuits.
		5.	Refer to LED Indicator Status Chart.
		6.	Turn off AC power.
		7.	Inspect Controller and, if necessary, lift device up just enough to expose the Touchscreen connector.
		8.	Check that cable is fully seated in connector.
		9.	Ensure that Touchscreen Controller operates properly by placing in a known functional unit.
	Wrong board assembly	Verify that any replacement CPU Board Assembly is for use in conversion kit. CPU Board Assembly for standard production TouchMaster® units causes calibration errors in this kit.	
• "Touch Controller Not Found" error message	Poor connection	1.	Turn off AC power.
		2.	Unlock snap latch plunger handles and lift up rear edge of CPU Board Assembly.
		3.	Release cable ties and lift controller up just enough to expose Touchscreen connector.
		4.	Check that cable is fully seated in the connector.
		5.	Ensure that Touchscreen Controller operates properly by placing in a known good unit.

Audio Malfunctions

Symptom	Problem	Suggested Solution
• Audio is non-functional. • Video is functional • Machine appears to operate normally.	Volume set to zero in software.	1. Unlock and remove the cash door. 2. Open rear cover. 3. Enter Menu System by pressing the SETUP button. 4. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose SOUND TEST. 5. Verify that volume is not set to zero. 6. Change level to maximum to make sound audible.
	Volume set to zero on CPU Board Assembly	1. Select an endlessly repeating sound track. 2. With screen audio level at maximum, turn master volume control on the CPU Board Assembly full up. Do not come into contact with high voltage leads. 3. Reduce master volume until sound is as loud as possible without distortion. 4. Use screen adjustments to set a comfortable playing level.
		While in SOUND TEST menu, select PLAY and use NEXT to advance through all game sounds. Use sounds to confirm operation of the audio amplifier and speaker. Note if any game sounds are unintelligible, voice messages, strange noises, missing.
	Poor connection	1. Turn AC power off. Verify correct cabinet wiring. 2. Ensure that speaker is properly connected to audio output wires from Audio connector. 3. Verify speaker continuity. 4. Refer to Typical Cabinet Wiring Diagram for specific wiring information.
	Poor power continuity	1. Turn AC power on. Using 20 Volt DC range on a digital voltmeter, measure DC voltages present at the Power connector pins. 2. Verify +5V, -5V and +12V sources. 3. Refer to Typical Cabinet Wiring Diagram for specific wiring information and voltage limits. 4. Using 2 Volt AC range on a digital voltmeter, measure same DC voltages as above. 5. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise. 6. Verify proper operation of CPU Board Assembly by placing in a known functional unit.
• Audio is distorted or muffled. • A constant low hum may be present. • Sounds may be		1. Unlock and remove cash door. 2. Enter Menu System by pressing SETUP button. 3. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose SOUND TESTS.

missing.			These tests verify some audio circuit functions.
	Bad speaker	1.	Turn off AC power. Unlock and remove cabinet cover.
		2.	Locate speaker and ensure it is full range (100 to 10,000 Hz response) and rated for at least 15 watts continuous power.
	Poor connection	1.	Inspect speaker and its wires.
		2.	Ensure no loose parts or wires are caught in speaker cone, terminals, mounting screws, or stuck to magnet.
	Bad board assembly	1.	Verify that the sound ROM is correct. There is only one sound ROM in this set. The ROM is labeled with assembly number and software version.
		2.	Check that the cabinet wiring is correct.
		3.	Ensure all cabinet ground wires are connected.
		4.	Refer to Typical Cabinet Wiring Diagram for specific wiring information.
	Poor voltage	1.	Using 2 Volt AC range on a digital voltmeter, measure voltages at speaker terminals. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
		2.	Verify that speaker operates properly by placing in a known functional unit.

Video Problems

Symptom	Problem	Suggested Solution
• Monitor appears non-functional. • Audio is functional. • Controls operate normally.	Lack of electricity	1. Unlock and remove cabinet cover. 2. Verify AC Power is connected to Video Monitor. 3. Inspect neck of CRT under low light conditions. A glow near the CRT base while voltage is in filament circuits indicates some monitor circuits are receiving power.
	Poor connection	1. Turn off AC power. Verify that Video Signal and Remote Adjustment Board connectors are fully seated on the Video Monitor Board Assembly. 2. Ensure video connector pins are in the same orientation as the original connector. 3. Check other connectors in same way. *Do not operate monitor without Remote Adjustment Board.*
	Faulty fuse	Examine AC line fuse on Monitor Board Assembly. Replace faulty fuse with identical one of proper voltage and current rating.
	Loose parts	Ensure no loose parts or wires are caught or pinched by chassis or the mounting brackets.
	Incorrect adjustments	1. Check that brightness (intensity) and contrast are not been set to minimum levels. 2. Verify that Video Monitor operates correctly by placing in known functional unit.
	Poor voltage	1. Plug in line cord and turn AC power on. 2. Using 20 Volt DC range on a digital voltmeter, measure DC voltages at CPU power connector pins. 3. Refer to Typical Cabinet Wiring Diagram for specific wiring information and voltage limits. 4. Adjust +5V source if it is variable. 5. Using 2 Volt AC range on a digital voltmeter, measure DC voltages as above. Any reading here indicates that supply voltages are unstable and may contain ripple or noise.
• Power-up self-test is functional. • Game does not appear. • Audio is not functional.	Error message	1. Note and record error messages during self-test. 2. Turn off AC power. Restore after one minute. 3. Note and record new messages that appear. 4. Unlock and remove cash door. Enter Menu System by pressing the SETUP button. 5. From the SYSTEM SETUP menu, go to DIAGNOSTICS and choose VIDEO TEST. These tests verify some functions of the video circuits.
	Wrong board assembly	Turn off AC power. Verify CPU Board Assembly is correct. CPU Boards are marked with manufacturer name, assembly number and hardware version.

		Wrong ROM	Verify correct ROM instruction set. There is more than one ROM in a set. Each ROM circuit is labeled with assembly number and software version.
•	Monitor does not lock onto signal and provide stable picture. • Colors missing, etc.	Poor connection	Check connectors and cables for wiring continuity from CPU Board Assembly to Video Monitor.
		Wrong board assembly	1. Ensure correct CPU Board Assembly. Some monitors require different sync polarity than Midway production units. Units with incorrect polarity or unusual sync connections result in what appears to be horizontal tearing or complete loss of sync. 2. Verify that Video Monitor operates correctly by placing in known functional unit
•	Machine operates normally. • Video wavers or rolls, has dark bars, uneven colors, etc.	Poor connection	1. Check connectors and cables for wiring continuity from the CPU Board Assembly to Video Monitor. 2. Ensure all cabinet ground wires are connected, especially at Video Monitor Chassis.
		Interference	1. Move cabinet away from appliances, other cabinets, etc. Some equipment normally emits very strong electrical or magnetic fields. 2. Verify Video Monitor operates correctly by placing in a known functional unit.

Miscellaneous Malfunctions

Symptom	Problem	Suggested Solution
• Machine operates normally. • Cabinet gets very warm after several hours of use.	Poor air flow	1. Check bottom and rear of cabinet for blocked air flow. 2. Move cabinet away from heat sources. 3. Turn off AC power. 4. Apply a high-power vacuum cleaner to fan vent holes to remove dust.
	Poor cooling system	Unlock and open rear door. Ensure all fans are connected and operate at full speed.
• Touchscreen requires excessive recalibration to maintain accuracy.	Touchscreen abuse	1. Clean entire cabinet frequently, especially video screen glass and Touchscreen area. It is not necessary to switch off AC power for cleaning. Apply isopropyl alcohol and warm water to a clean cloth or sponge use it to wipe the surface. *Do not apply cleaner directly on unit.* Liquids could drip into circuits and cause erratic operation. 2. Warn players to use one finger at a time. Multiple, simultaneous touches confuse the controller.
	Infrequent calibration	Repeat Calibrate and Calibrate Test sequence each time cabinet is relocated.
• Error messages appear on screen. • Machine is not functional. • Audio is not functional.	Defined by message	1. Check assembly (RAM, ROM, battery, Touchscreen, etc.) identified in error message. 2. If errors seem to occur at random, determine what conditions occur with the appearance of the message (i.e., time of day, when other equipment is turned off or on, when room temperature is elevated, when certain people are playing, periods of low or high humidity, etc.). 3. Call your authorized distributor for help with unresolved screen messages.
• "Security Key Error" message	Security failure	1. Check if security key is missing or incorrectly installed on CPU Board Assembly. 2. Confirm that security key version matches software version.

WARNINGS & NOTICES

WARNING
- Use of non-Midway parts or circuit modifications may cause serious injury or equipment damage!
- Federal copyright, trademark and patent laws protect this game. Unauthorized modifications may be illegal under Federal law. The modification ban also applies to Midway Amusement Games, LLC and game logos, designs, publications and assemblies. Moreover, facsimiles of Midway equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles are manufactured with Midway components.

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

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

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

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

CAUTION
Installation of this kit does not guarantee compliance with FCC or EMC requirements. You are solely responsible, and Midway has no responsibility for FCC and EMC compliance of installed kits. Don't install any compliance label on the product until the testing agency acknowledges compliance.

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