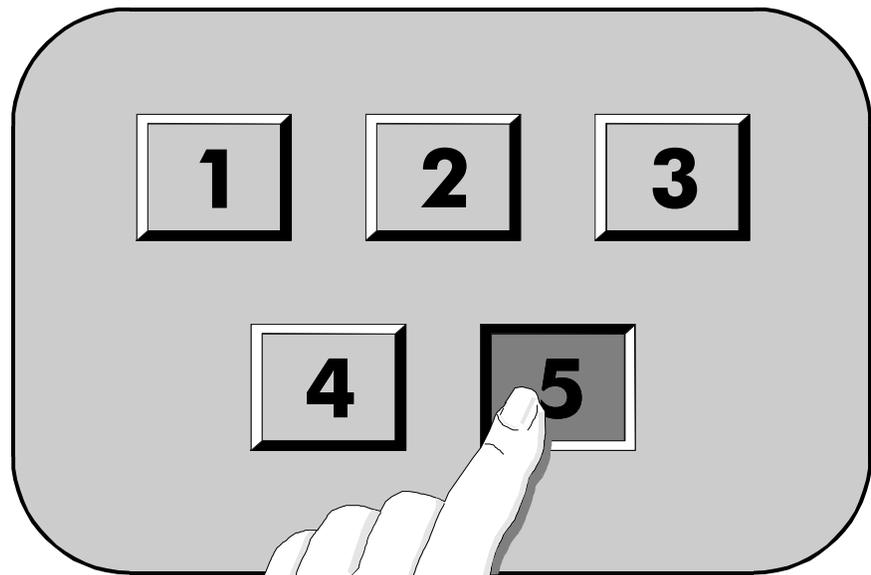


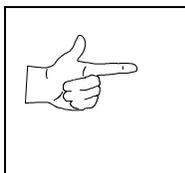
TOUCHMASTER®

CONVERSION

CHAPTER



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
<ul style="list-style-type: none"> 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.
<ul style="list-style-type: none"> Machine appears non-functional Fan operates 	Poor AC connection	<ol style="list-style-type: none"> Check air flow out of cabinet near fan. Air flow suggests DC power is available from power supply. Turn off AC power. Remove line cord cable clamp. Test line cord, power plug and IEC connector for breaks or damage. Verify continuity of each wire in cord. Fully seat IEC connector in cabinet receptacle. Replace cable clamp and all of its screws. Ensure wiring harness connectors are fully seated in corresponding AC Power connectors. Verify AC wire connections at power supply terminals.
	Tripped circuit	<ol style="list-style-type: none"> Examine circuit breaker. If the circuit has been broken, reset button protrudes from the circuit breaker. Press button in until it latches to restore power.
	Faulty AC line filter	<ol style="list-style-type: none"> Examine AC line filter. If faulty, replace with identical filter of proper voltage and current rating. Connect line cord and verify operation. Fully seat AC plug in the outlet. Verify that AC line voltage is present. Turn AC power on. Check DC wiring harness and connectors if breaker opens circuit again.
	Poor DC connections	<ol style="list-style-type: none"> Open bottom door while AC power is on. Inspect the CPU Board Assembly under low light level conditions. 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.) Turn AC power off. Unplug AC line cord. Inspect CPU Board Assembly. Ensure DC Power connector is attached and fully seated onto mating board connector. Check other harness connectors in same way.

Touchmaster® Cannot Be Played

Symptom	Problem	Suggested Solution
<ul style="list-style-type: none"> Machine does not accept currency or tokens. Machine does not start. Audio functional. Video functional. 	Cash door blockage	<ol style="list-style-type: none"> Unlock and remove cash door. Empty cash box. Inspect for counterfeit currency. Remove items from vault that block path from coin mechanism. Check each coin mechanism or currency acceptor by hand to ensure proper mounting. Clear the currency path. Reinstall and latch mechanism.
	Unlevel cash door	<ol style="list-style-type: none"> Verify mechanism is level in cabinet. Ensure connector is attached and fully seated. Repair or replace bent or damaged mechanism.
<ul style="list-style-type: none"> Machine accepts currency or tokens. Machine does not start. Audio functional. Video functional. 	Bad switch	<ol style="list-style-type: none"> Unlock and remove cash door. Check each mechanism to ensure proper mounting. Verify each release latch is closed and locked. Test both good and bad coins to see if mechanism accepts and rejects currency correctly. 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	<ol style="list-style-type: none"> Inspect internal cash door wiring connections. Check cables for wiring continuity from CPU Board Assembly to coin mechanism or currency acceptor. Examine acceptor for programmable features. Some devices require operator adjustment for each specific type of currency recognized. Refer to manufacturer's literature for assistance in setting acceptor features to the required values. Turn off AC power. Ensure no parts or wires are caught in hinges or switch contacts. Check for continuity in each suspect switch connection (Common to Normally Open or Common to Normally Closed). Replace faulty switches (i.e. bent levers). Verify each mechanism operates properly by placing in a known functional unit.
<ul style="list-style-type: none"> Machine accepts currency or tokens. Number of credits per coin or bill is incorrect. 	Faulty switch	<ol style="list-style-type: none"> Unlock and remove cash door. Press SETUP button. From SYSTEM SETUP, go to DIAGNOSTICS and choose SWITCH TEST. Use tests to confirm operation of each switch used. Set pulse width adjustment to long pulses if bills do not register when inserted into the acceptor. Verify that each acceptor operates properly by placing in a known functional unit.

Touchscreen Malfunctions

Symptom	Problem	Suggested Solution
<ul style="list-style-type: none"> 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. <i>Do not apply the cleaner directly on the unit.</i> 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.
<ul style="list-style-type: none"> 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	<ol style="list-style-type: none"> Turn off AC power. Unlock and open rear door. Remove the top cover and bezel (refer to Servicing instructions). 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.
<ul style="list-style-type: none"> Touchscreen reacts in opposite corner from where touched 	Improper signal	<ol style="list-style-type: none"> Turn off AC power and remove line cord. Open Bottom Door. Verify that pin 3 of connector P6 is electrically grounded. Temporarily disconnect the blue/white wire at pin 3 of connector P6. Tape or insulate end of blue/white wire and secure to wiring harness. Plug in line cord and turn on AC power. Recalibrate Touchscreen.
<ul style="list-style-type: none"> Player touch controls are intermittent or completely non-functional. Machine starts normally. 	Poor connection	<ol style="list-style-type: none"> Unlock and remove cash door. Enter Menu System by pressing SETUP button. 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	<ol style="list-style-type: none"> 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.
<ul style="list-style-type: none"> • “Touch Controller Not Found” error message 	Poor connection	<ol style="list-style-type: none"> 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
<ul style="list-style-type: none"> • Audio is non-functional. • Video is functional • Machine appears to operate normally. 	Volume set to zero in software.	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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.
<ul style="list-style-type: none"> • Audio is distorted or muffled. • A constant low hum may be present. • Sounds may be 		<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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
<ul style="list-style-type: none"> • Monitor appears non-functional. • Audio is functional. • Controls operate normally. 	Lack of electricity	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. <i>Do not operate monitor without Remote Adjustment Board.</i>
	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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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.
<ul style="list-style-type: none"> • Power-up self-test is functional. • Game does not appear. • Audio is not functional. 	Error message	<ol style="list-style-type: none"> 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.
<ul style="list-style-type: none"> • 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	<ol style="list-style-type: none"> 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
<ul style="list-style-type: none"> • Machine operates normally. • Video wavers or rolls, has dark bars, uneven colors, etc. 	Poor connection	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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
<ul style="list-style-type: none"> Machine operates normally. Cabinet gets very warm after several hours of use. 	Poor air flow	<ol style="list-style-type: none"> 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.
<ul style="list-style-type: none"> Touchscreen requires excessive recalibration to maintain accuracy. 	Touchscreen abuse	<ol style="list-style-type: none"> 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. <i>Do not apply cleaner directly on unit.</i> 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.
<ul style="list-style-type: none"> Error messages appear on screen. Machine is not functional. Audio is not functional. 	Defined by message	<ol style="list-style-type: none"> 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.
<ul style="list-style-type: none"> "Security Key Error" message 	Security failure	<ol style="list-style-type: none"> 1. Check if security key is missing or incorrectly installed on CPU Board Assembly. 2. Confirm that security key version matches software version.