



Section 11

Logic Module

The logic module is composed of the processor board, the door and cabinet input/output (I/O) boards, and the motherboard.

It is not necessary to remove the mounting brackets in order to remove or service the individual boards. To remove or install these boards, refer to the procedures later in this section.

Those components not described in this section are covered under the component name in separate sections in this manual, or in a model-specific electronic diagrams and parts manual that includes schematics and board part lists.

The following topics are covered in this section:

- **Section 11.1, Logic Module Routine Maintenance** – provides information about routine inspection of electrical connections.
- **Section 11.2, Processor Board** – provides procedures for removal and replacement of the processor tray and related circuit board.
- **Section 11.3, Input/Output Boards** – covers removal and replacement of the I/O trays and related circuit boards.
- **Section 11.4, Motherboard** – covers removal and replacement of the motherboard.
- **Section 11.5, Logic Module Functional Verification** – covers items to check if power problems are suspected, and identifies references for in-depth troubleshooting and verification procedures.



11.1 Logic Module Routine Maintenance

Routinely inspect all board components in the logic module, especially if problems are suspected. Look for any obvious problems: damaged or bent components or connections, chips not seated properly, etc.

Make adjustments to the board settings or replace components while the trays are removed from the machine. Consult the *Game Software: Vision Slot Products* manual for a description of IC chip replacement procedures.





11.2 Processor Board

The processor board is mounted to the processor tray and plugs into the motherboard at the back of the machine. It contains the game software IC (integrated circuit) EPROMs, the battery-backed game statistic memory, and all circuitry necessary to control game and video functions. Refer to the *Game Software: Vision Slot Products* manual for information regarding operator switch functions.

Vision series machines are equipped with a lockable processor tray. The lock assembly can be monitored to determine whether or not the processor tray is locked in place. When the processor tray is not locked in place, a status message appears on the video screen. Refer to the *Machine Specifications* manual for processor tray lock specifications.

Note: Various components or areas inside the machine may have adhesive warning decals permanently affixed, either indicating potential for a shock hazard or identifying an electrical grounding point.

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o i	c g t i o n
	Potential Shock Hazard In This Area
	Electrical Grounding Point

Removal

To remove the processor tray from the machine, see Figure 11-1 and proceed as follows.

Caution: The processor board and components are static-sensitive. Prior to touching any component on the processor board, verify that any static buildup in your body is discharged. These devices should be handled by qualified personnel only.

1. Open the machine door, turn the machine **power off**.
2. Remove the coin tray and hopper, as necessary, to provide access to the interior of the machine.



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3. Disconnect the machine main power cord from the line filter on the power distribution module. Remove the shipping screw from the processor tray, if present.

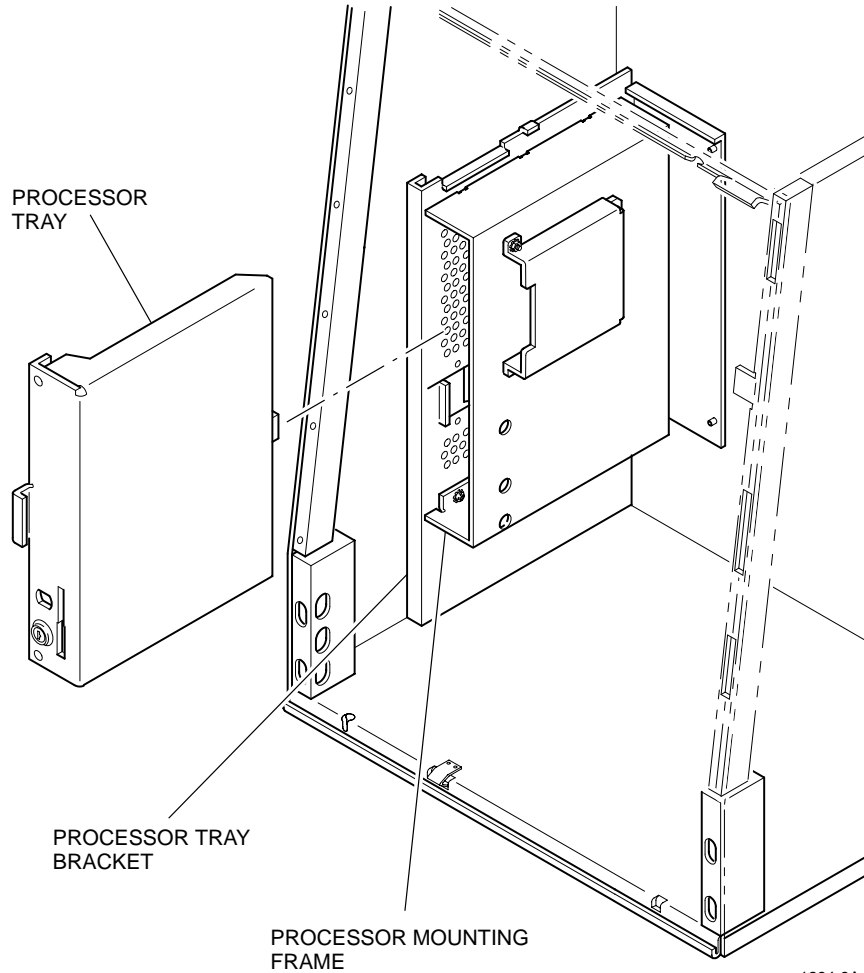


Figure 11-1. Processor Tray Removal.

4. Unlock the security lock on the processor tray, if present, by turning it 90° right or left.
5. Grasp the handle on the front of the processor tray and slide the tray out of the processor frame.
6. **To remove the processor board from the tray:** Remove the mounting screws that fasten the processor board to the metal standoffs on the tray. Lift the board up and away from the tray.

Installation

To install the processor tray in the machine, see Figure 11-1 and proceed as follows.

1. **To install the processor board onto the tray:** The holes in the back of the processor board should line up with the metal standoffs on the tray. Attach the board to the tray using the mounting screws.
2. Slide the processor tray into the processor frame, making sure that connectors to the motherboard seat firmly.
3. Lock the processor tray in place with the security lock, if present.
4. Reconnect the machine main power cord by plugging it into the line filter on the power distribution module.
5. Replace the coin tray or hopper, if they were removed.
6. Turn the machine **power on**; refer to the *Game Software: Vision Slot Products* manual to verify correct game play. Close and verify latching of the machine door.



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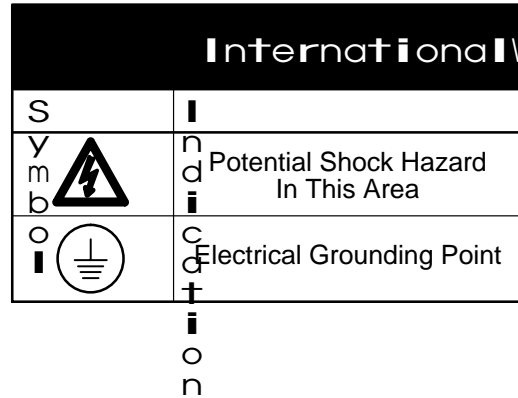
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11.3 Input/Output Boards

The I/O assembly consists of two removable tray assemblies located in different parts of the machine. The tray mounted to the processor frame holds the cabinet I/O board; the tray located on the inside of the belly panel on the door holds the door I/O board. The trays can be removed and serviced individually.

Note: Various components or areas inside the machine may have adhesive warning decals permanently affixed, either indicating potential for a shock hazard or identifying an electrical grounding point.



11.3.1 Cabinet I/O Assembly

Removal

To remove the cabinet I/O tray from the logic module, see Figure 11-2 and proceed as follows.

Caution: The I/O boards and their components are static-sensitive. Prior to touching any component on the I/O boards, verify that any static buildup in your body is discharged. These devices should be handled by qualified personnel only.

1. Open the machine door, turn the machine **power off**.
2. Remove the coin tray and hopper, as necessary, to provide access to the interior of the machine.
3. Disconnect the machine main power cord from the line filter on the power distribution module.
4. Grasp the handle on the front of the I/O assembly tray and slide the tray out of the I/O mounting bracket.

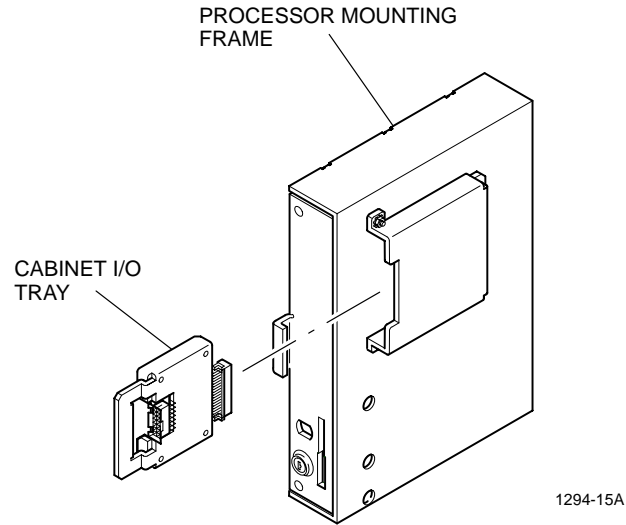


Figure 11-2. Cabinet I/O Tray Removal.

5. **To remove the circuit board from an I/O assembly tray:** Remove the mounting screws that fasten the board to the metal standoffs on the tray. Lift the board up and away from the tray.
6. **To remove the cabinet I/O mounting bracket from the processor frame:** Remove the two nuts at the front edge of the bracket attaching it to the processor frame. Lift the front edge of the bracket off of the threaded mounting studs, then pull the bracket straight out from the machine. (See Figure 11-3.)

Installation

1. **To install the cabinet I/O mounting bracket onto the processor frame:** Insert the feet at the back of the I/O mounting bracket into the mounting clips that stand out on the processor frame. Then lower the mounting tabs at the front edge of the I/O bracket onto threaded studs on the frame. Secure with two nuts.
2. **To install a circuit board onto an I/O assembly tray:** Rest the board on the mounting standoffs, and attach the board to the tray with mounting screws.
3. Slide the I/O assembly tray into the I/O mounting bracket, ensuring that it seats firmly into the motherboard connector.
4. Reconnect the machine main power cord by plugging it into the line filter on the power distribution module.



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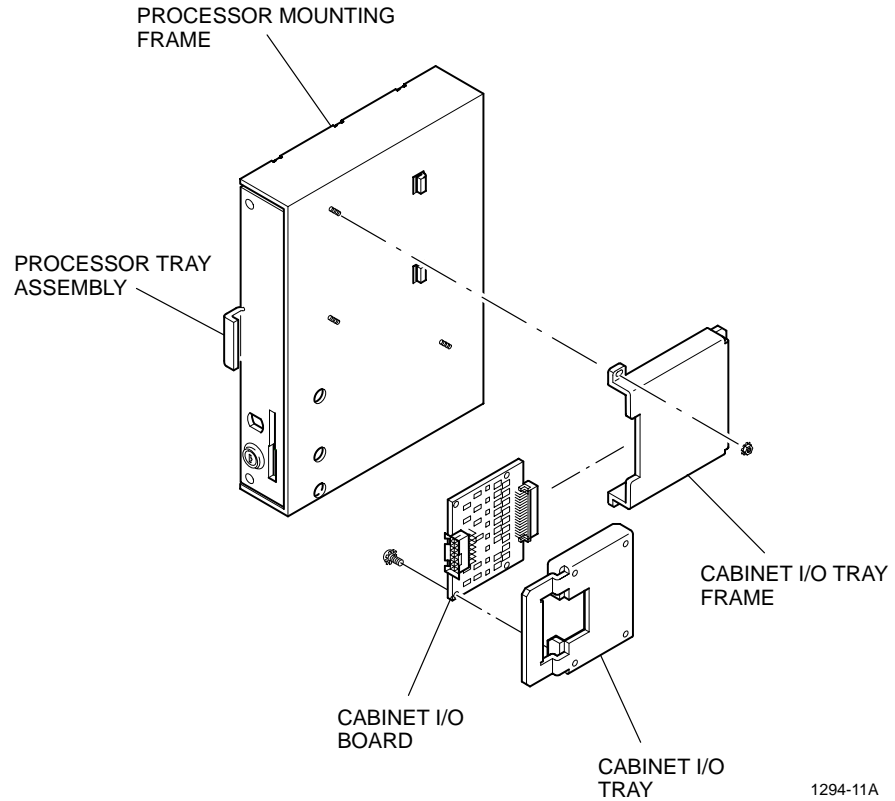


Figure 11-3. Cabinet I/O Tray Components.

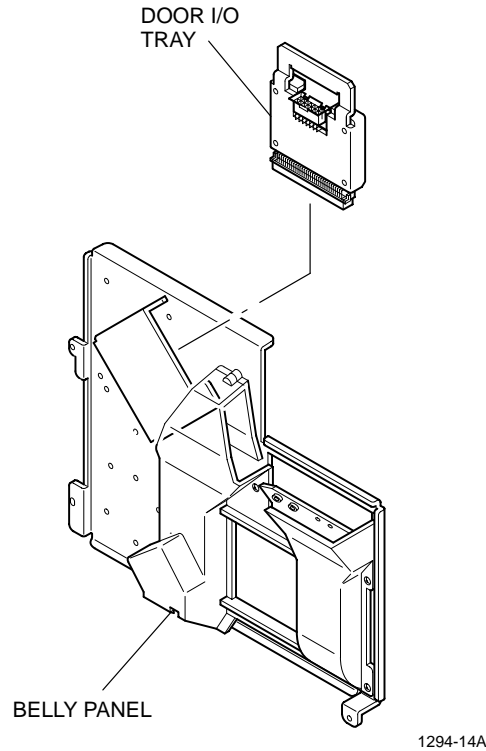
5. Replace the coin tray or hopper, if they were removed.
6. Turn the machine **power on** and verify correct machine operation. Close and verify latching of the machine door.

11.3.2 Door I/O Assembly

Removal

To remove the door I/O tray from the belly panel area in the door, see Figure 11-4 and proceed as follows.

Caution: *The I/O boards and their components are static-sensitive. Prior to touching any component on the I/O boards, verify that any static buildup in your body is discharged. These devices should be handled by qualified personnel only.*



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Figure 11-4. Door I/O Tray Removal.

1. Open the machine door, turn the machine **power off**.
2. Remove the coin tray and hopper, as necessary, to provide access to the interior of the machine.
3. Disconnect the machine main power cord from the line filter on the power distribution module.
4. Disconnect the harness from the top of the I/O assembly tray.
5. Grasp the handle on the top of the I/O assembly tray and slide the tray out of the I/O mounting bracket.
6. **To remove the circuit board from an I/O assembly tray:**
Remove the mounting screws that fasten the board to the metal standoffs on the tray. Lift the board up and away from the tray.
7. **To remove the door I/O mounting bracket from the belly panel:**
Refer to Figure 11-5 while performing the following steps.
 - a. Open the belly door from the front of the machine.



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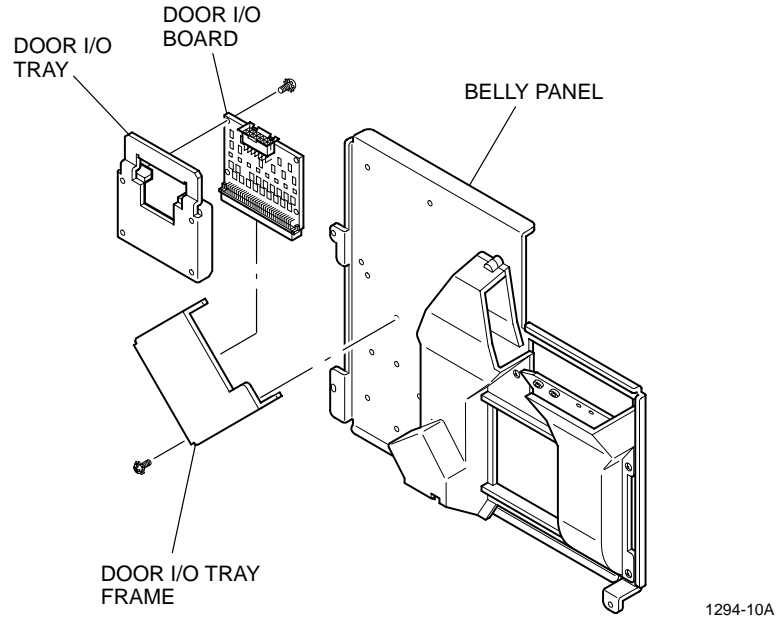


Figure 11-5. Door I/O Tray Components.

- b. Unscrew and disconnect the ground wire leading from the ballast to the lower right corner of the door I/O mounting bracket.
- c. On the inside of the door, grasp the top edge of the door I/O mounting bracket, located in the space between the belly panel and the belly door.
- d. Pull gently from the top edge of the bracket to disengage the hooks that fasten into slots in the belly panel.
- e. Guide the bracket out gently at an angle.

Installation

1. **To install the door I/O mounting bracket onto the belly panel:**
 - a. Orient the bracket so that the long edge is angled toward the bottom of the machine, as shown in Figure 11-5.
 - b. Guide the bracket at the appropriate angle into the area between the belly panel and belly door.
 - c. Secure the two hooks on the upper edge of the bracket into their respective slots on the belly panel.

- d. Open the belly door from the front of the machine.
 - e. Connect the ground wire from the ballast to the stud at the lower right corner of the I/O mounting bracket.
2. **To install a circuit board onto an I/O assembly tray:** Rest the board on the mounting standoffs, and attach the board to the tray with mounting screws.
 3. Slide the I/O assembly tray into the I/O mounting bracket, ensuring that it seats firmly into the internal connector, then reconnect the top harness connector to the tray.
 4. Reconnect the machine main power cord by plugging it into the line filter on the power distribution module.
 5. Replace the coin tray or hopper, if they were removed.
 6. Turn the machine **power on** and verify correct machine operation. Close and verify latching of the machine and belly doors.

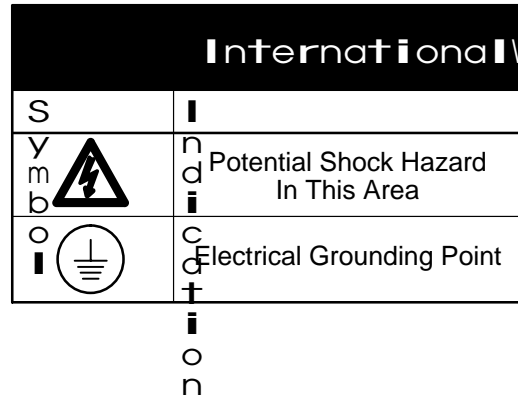




11.4 Motherboard

To remove or install the motherboard for the logic module, see Figure 11-6 and proceed as follows. Refer to the appropriate electronic diagram and parts manual for related wiring diagrams and schematics.

Note: Various components or areas inside the machine may have adhesive warning decals permanently affixed, either indicating potential for a shock hazard or identifying an electrical grounding point.



Removal

1. Open the machine door and turn the machine **power off**.
2. Remove components such as the hopper and coin tray to provide access.
3. Disconnect the machine main power cord from the line filter on the power distribution module.
4. Remove the processor tray.
5. Remove the processor mounting frame.
 - a. Unfasten the nut at the lower right edge of the processor frame that secures it to a mounting post on the floor of the machine.
 - b. Grasp the frame, pull it forward and then up to disengage hook-shaped tabs that fit into slots on the floor of the machine.
 - c. Remove the processor mounting frame from the machine.
6. Disconnect all harnesses from the motherboard.

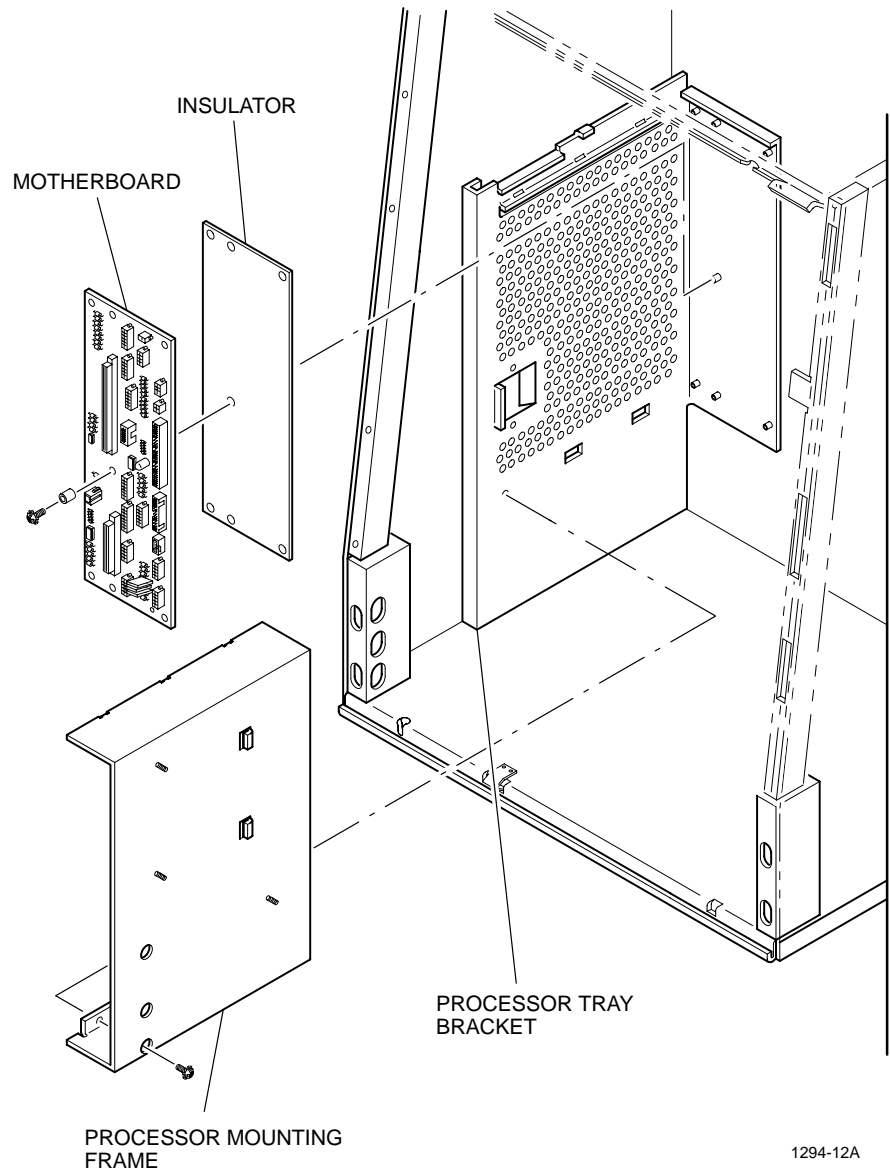


Figure 11-6. Processor Frame Removal.

Important: Each harness connector has a safety catch on one side. Press and hold the safety catch to release the harness connector from the board connector. Pull straight out on the connector to avoid bending any pins.

7. Remove the seven retaining screws and center spacer from the motherboard. Carefully lift the corners of the motherboard from the threaded standoffs and guide the board carefully away from the processor frame.



Installation

8. Remove the white insulator, located behind the motherboard, if necessary.

1. Install the white insulator by fitting it over the threaded standoffs on the machine back wall.
2. Orient the motherboard so that connector J13 is in the lower right corner (see Figure 11-7) and carefully rest the motherboard onto the threaded standoffs on the processor frame.

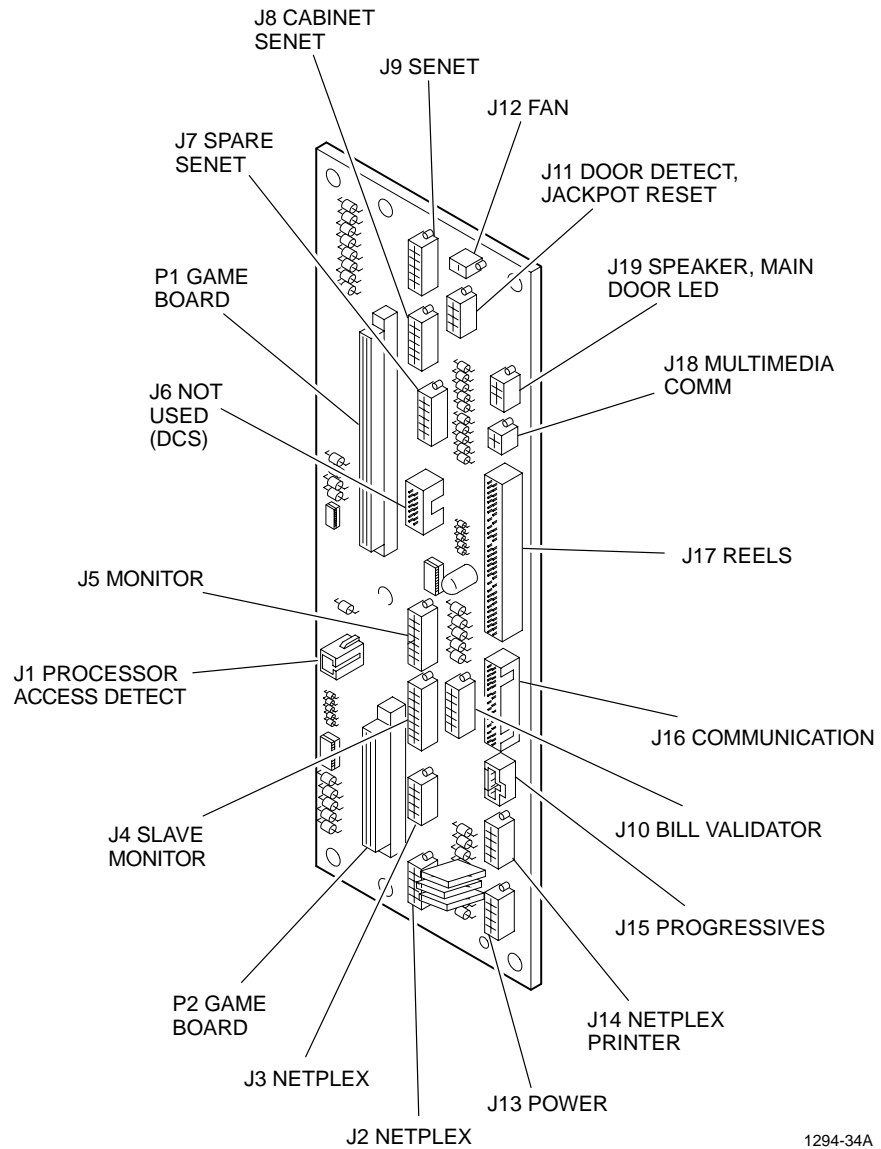


Figure 11-7. Motherboard Connectors.

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3. Install the retaining screws to mount the motherboard. The screw positioned at the center of the board should have a spacer.
4. Connect all harnesses to the motherboard. Refer to the appropriate electronic diagrams and parts manual for the machine wiring diagrams, if necessary.
5. Return the processor frame to the machine, sliding it into position such that the footings of the frame fit under guide tabs on the enclosure floor. Secure with a screw in the mounting tab at the lower right front corner of the frame.
6. Replace the processor tray.
7. Reconnect the machine main power cord by plugging it into the line filter on the power distribution module.
8. Replace any components that were removed for access.
9. Turn the machine **power on** and verify correct machine operation. Close and verify latching of the machine door.





11.5 Logic Module Functional Verification

After turning the machine **power on**, all machine components should be operating. If any components do not operate, make sure that the power supply connector is properly seated and that all connectors to the power distribution module and to the logic boards are connected correctly.

1. Confirm that the power cord, the connectors on the power distribution module, and the fuse are all firmly seated.
2. Check the integrity of all wires and fuses. Verify that no wires are pinched or bent.

Refer to the *Game Software: Vision Slot Products* manual for procedures to verify proper software operation.

Refer to the *Troubleshooting: Vision Slot Products* manual to resolve any problems.