IGT S2000/Vision Repair Worksheets

Slot Machine		
Model		
Model Number		
Serial Number		
Date of Manufacture		
Denomination		
Number of Reels		
Vacuum Fluorescent Display	Y	N

Component	Issue	Maintenance Performed
Machine Door		
Belly Door		
Belly Panel		
Locking Bar Assembly		
Optic Open-Door Sensor		
Player Panel Switches		
Coin-In Handling		

Component	Issue	Maintenance Performed
Sample Coin		
Coin Comparitor		
Coin Comparitor Adjustments		
Coin Comparitor Cleaning		
JCM WBA Series Bill Acceptor		
Bill Acceptor DIP Switch Settings		

Component	Issue	Maintenance Performed
Sensor and Transport Assembly		
Cash Box/Stacker Assembly		
Bill Acceptor		
Pinwheel Hopper		
Pinwheel Bowl		
(or)		
Holeywheel Hopper		
Holeywheel Bowl		
Ticket Printer		

Component	Issue	Maintenance Performed
Power Supply and Distribution		
Power Distribution Module		
Logic Module		
Processor Board (Video Controller)		
Input/Output Boards		
Motherboard		

Component	Issue	Maintenance Performed
Stepper Reels		
Reel Strips		
Reels		
Reel Position Sensor		
Stepper Motor		

Component	Issue	Maintenance Performed
Speaker		
Fluorescent Lighting		
Belly Door Lighting		
Reel Lighting		
Top Box Lighting		
Machine Glass		

Component	Issue	Maintenance Performed
Displays		
Incandescent Displays		
LED Displays		
Vacuum Fluorescent Display		
Liquid Crystal Display		
Machine Glass		

Component	Issue	Maintenance Performed
Meters		
Slot Handle		
Slot Handle Release (Lockout) Solenoid		
Fan (clean monthly!)		
Service Light (Candle)		
Bell		

Component	Issue	Maintenance Performed
Resistors		
Capacitors		
Inductors		
Transformers		
Ballasts		
Motors		

Component	Issue	Maintenance Performed
Hardware		
Cabinet Interior		
Cabinet Exterior		
AC Line Cord and Plug		
Location of Machine (away from heat, moisture, exterior doors, etc.)		
Other		

1.1 Vision Slot Upright Machine Components

For a summary of functional assemblies, refer to Table 1-1. See Figure 1-1 to identify the machine components.

Table 1-1
Summary of Functional Assemblies

Assembly	Function
Bell	The bell rings when a jackpot is won.
Belly Door	This door is located on the lower front portion of the main door; it provides access to the bill acceptor cash box without opening the machine door.
Bill Acceptor	The bill acceptor validates and accepts a variety of dollar denominations.
Bill Acceptor Cash Box	A container that is part of the bill acceptor assembly, and is the location where bills are stacked and stored.
Cabinet	The exterior "shell" that surrounds the metal machine enclosure.
Coin Cash Box	This box is located in the machine under the bill acceptor, and is equipped with an optic door sensor and an optional keyed lock.
Coin Drop Container	A container inside the machine stand where coins can be routed for collection.
Coin-In	This assembly receives, verifies, counts and routes valid coins to the hopper or drop box. Invalid coins are routed to the coin tray.
Displays	Machine displays include a light-emitting diode display (LED) that typically provides game play information; a liquid crystal display (LCD) that displays diagnostic, troubleshooting, bonus modes and site-specific player information; and a vacuum fluorescent display (VFD) that provides player and service information.
Drop Box	The drop box is the area inside the stand containing the coin-drop container. The drop box door fastens with a keyed lock and is equipped with an optional door-open sensor.
Drop Door Sensor Switch	This sensor monitors the number of times the drop door is opened.
Hopper	The hopper allows coins to be channelled to the coin tray when a player earns maximum coins or cashes out.
Input/Output	This assembly provides the input and output interface for machine operation.
Machine Door	The machine door contains the coin chute, coin tray, coin-in assembly, player panel switches, display glass, lower fluorescent panel, speaker, optic door sensor and door lock assembly.
Mechanical Meters	Mechanical meters store and display cumulative game-play information.
Motherboard	The motherboard acts as an interface between the processor and I/O boards and machine components.
Operator Switch	The operator switch enables data transfer between CMOS RAM and EEPROM, clear system errors and enter the operator menu, which allows the viewing of meters, full diagnostics and all setups.
Optic Door Sensor	This assembly senses when the machine door is open and causes a screen display message.

Table 1-1 (cont.)
Summary of Functional Assemblies

Assembly	Function
Player Panel Switches	These switches communicate player decisions to the processor board. Some player panel switches also have functions in diagnostic and accounting options.
Power Distribution Module	The power distribution module provides power to some machine components, and contains a fuse, connector panel and service outlets.
Power On/Off Switch	This is the machine power switch.
Power Supply	This assembly is one of two covered assemblies that provide power to machine components; the other assembly is the power distribution module.
Processor Board	The processor board controls internal video and game functions; interfaces with the communication and I/O system to coordinate machine operation.
Reset Key Switch	The reset key switch allows a technician to reset a top award win and various malfunctions, provides access to the attendant menu to view accounting and perform limited diagnostics.
Service Lamp Switch	This switch activates when the machine door is opened and illuminates the service lamp.
Service Light (Candle)	This optional component indicates various modes, game conditions and change requests.
Speakers	The speakers produce game sounds and attract-mode music.
Stand	The wood or metal base to which the standard upright machine is attached.
Stepper Reels	Motorized slot reels are individually driven by computerized software programmed to average a specific payback percentage.
Ticket Printer	Produces both an original and an audit copy of game events such as tilts, door access, cash out, etc.
Top Box	The enclosed area at the top of the machine that typically contains a liquid crystal display (LCD), speakers, fluorescent light, display glass, fan, candle, and other various other optional assemblies.

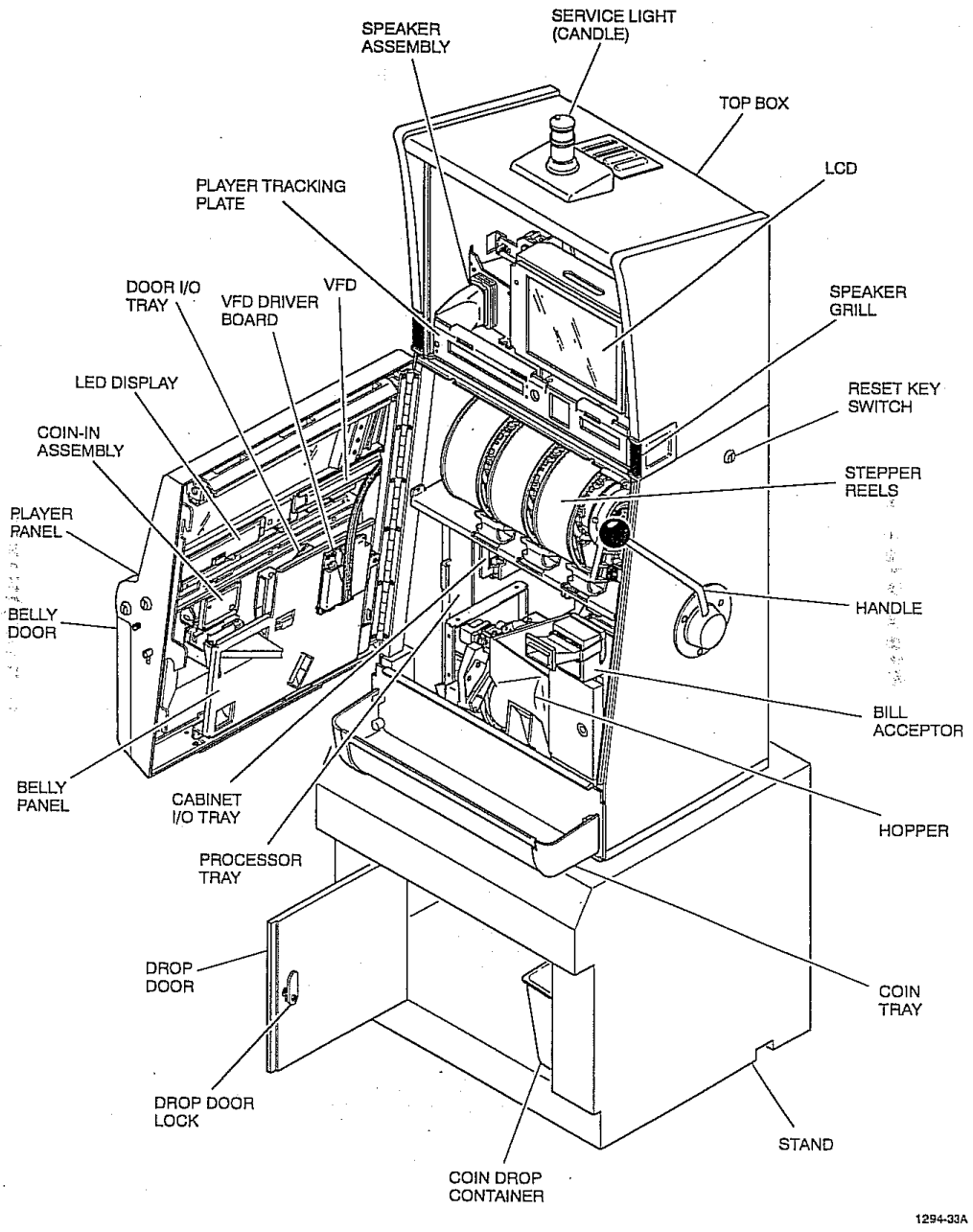


Figure 1-1. Component Identification – Vision Slot Upright.

1.2 Component Maintenance Schedule

Table 1-2 provides a concise machine maintenance schedule. Perform adjustment procedures only as needed. If a component is functioning properly, do not adjust it.

Table 1-2 Preventive Maintenance Chart

Assembly	Maintenance Item	Sevice Interval (Months)*		
		1	3	6
Machine Door	Player Panel Switches	C		
	All Glass	C		
	Door-Open Optics		C	
Cabinet	Door-Open Optics		C	
Reel Mechanism	Reel Optics		C	
	Reel Strip	C		
Slot Handle	Microswitch			A
Coin-In	Encoder Optics		C	
	Coin Acceptor	C		A
	Entry Assembly		C	
Hopper	Bowl			C
	Motor Armature & Brake			C
	Metal Coin Wiper			A
	Optic Coin Sensor			C
	Coin Level Probe			C
	Knife		C	
Bill Acceptor	Bill Path	C		
	Timing Belts		C	
	Pinch Rollers		C	
	Magnetic Sensors	C		
	Optical Lenses	C		
Logic Module/ Processor	Inspect harnesses for worn wires and loose connections		C	

* C = Clean & Inspect A = Check Adjustment

Machine Types

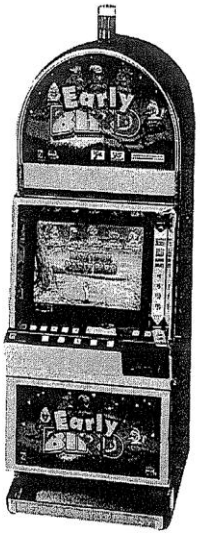
Vision (80960)
IGT's latest reel game combines the most popular IGT S-Plus game themes with bonus features and state-of-the-art hardware enhancements. The Vision machine's liquid crystal display (LCD) panel and high quality sound set the Vision machine apart from all others.

A vacuum fluorescent display (VFD) panel has also been added for easier communication with both customers and slot technicians. Game play is similar to the S-Plus: the player pulls the handle, the reels spin and stop. Vision's added feature is the opportunity for a bonus game, which is carried out in the top box.

The LCD displays bonus game action and information, keeping the player in suspense until the bonus amount is awarded. Bonuses contribute to more excitement and higher monetary rewards for the player, resulting in continued game play and return visits.

iGame-Plus/Game King 17" (80960)
IGT's latest and most interactive game yet is the iGame-Plus series, providing a virtual return to spinning reel themes on a video screen. Enhanced video graphics, interactive play choices and bonus chances keep players excited and interested. The iGame-Plus incorporates past concepts with new technology and new ideas for fun and exotic game themes.

You can easily spot an iGame-Plus among a group of machines because of the extra row of player panel switches. More switches make it easier for players to place their wager and activate additional paylines, allowing them more flexibility in how to play. Two speakers provide enhanced, high quality stereo sound, while a higher resolution monitor pumps out eye-catching animated graphics.



Platform Overview Module

Notes

80960 COMPONENT IDENTIFICATION

The 80960 product line consists of Game King, iGame, iGame-Plus, and Vision Series machines. Game King, iGame and iGame-Plus products are video-based machines. The Vision machine is a spinning reel game. Similar to 8032 machines, the basis components are:

- Service Light (Candle)
- Cabinet
- Coin Tray
- Coin-In Mechanism
- Processor Board
- Power Distribution Module
- Top Box
- Main Door
- Player Panel Switches
- Hopper
- Power Supply
- Mechanical Meters

Key differences between the 8032 and 80960 models are:

- Greater ESD sensitivity
- Processor board types
- Processor speed
- I/O assemblies
- Power supply type
- DC vs. AC

Key visual differences between video and spinning reel machines within the 80960 product line are:

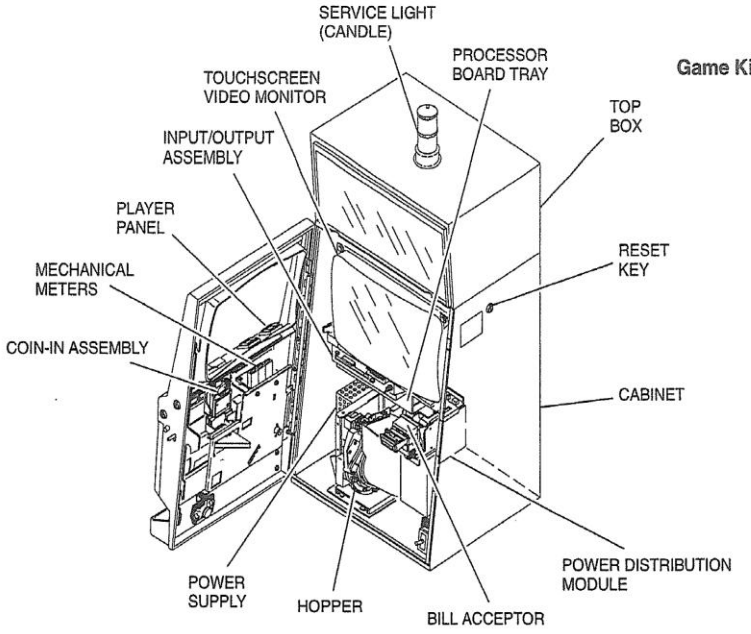
Game King (video)
- High resolution monitor
- Touchscreen

Vision (reels)
- LCD
- VFD
- Reels
- Handle

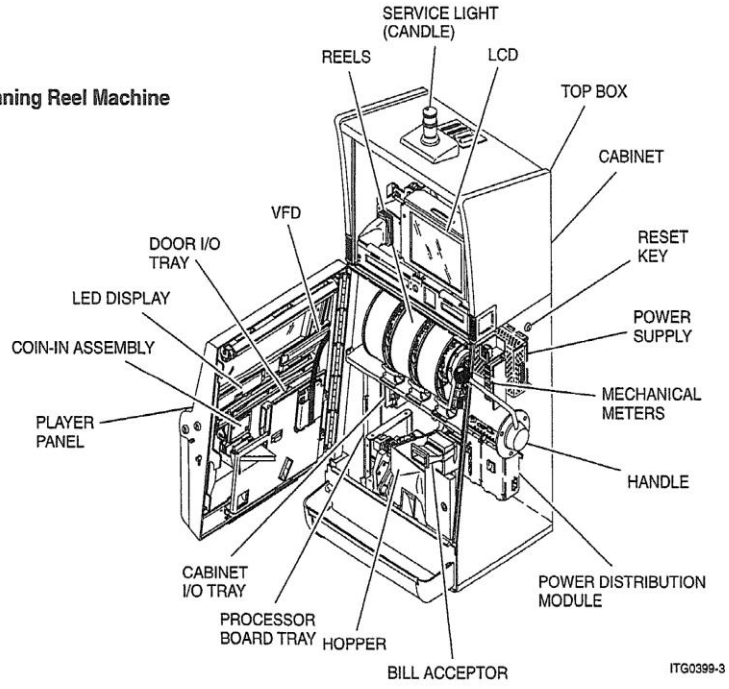
iGame-Plus/Game King 17" (video)
- Higher resolution 17" monitor
- Extra row of player panel switches
- Two speakers
- Third I/O board
- Electronic DC ballast assemblies
- Universal switching power supply
- Door switch monitoring (gaming machines)

80960 Component Identification

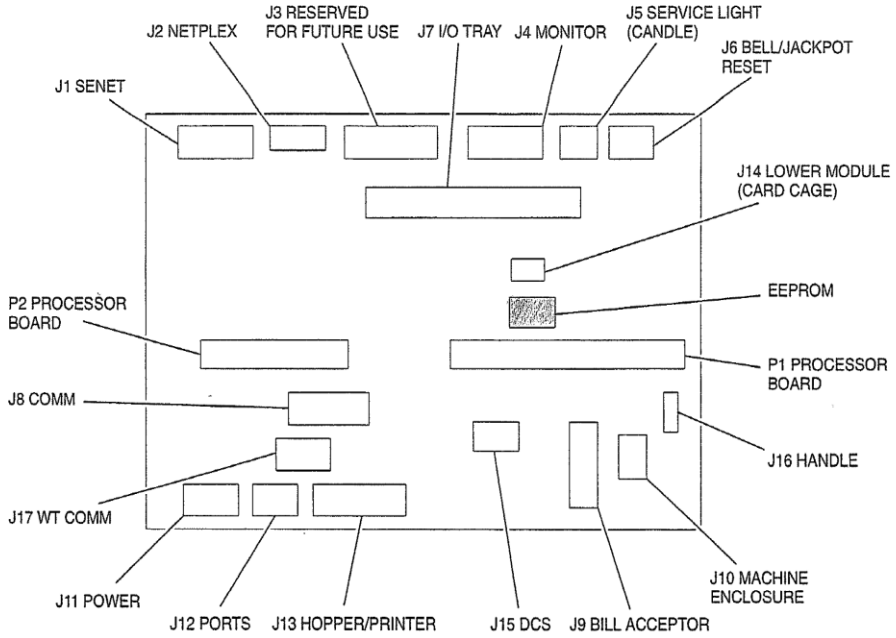
Game King Video Machine



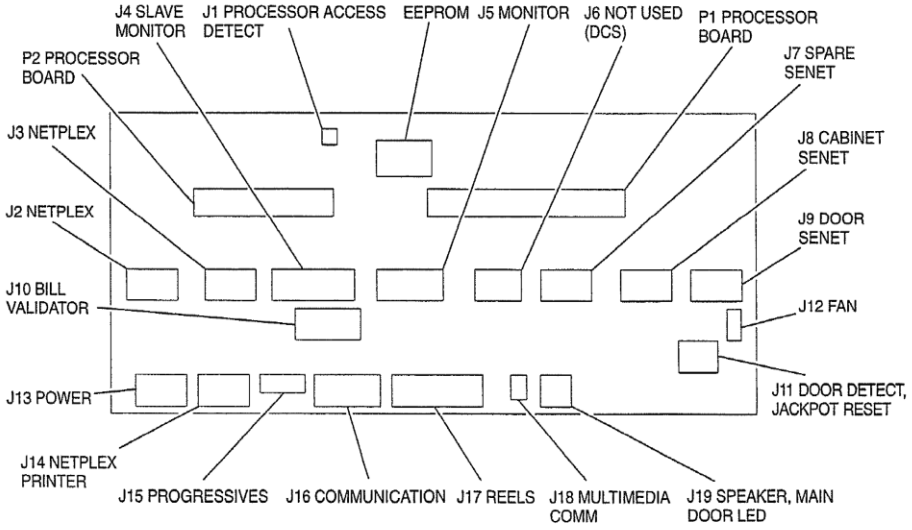
Vision Series Spinning Reel Machine



GAME KING 19" MOTHERBOARD – 759 044 06

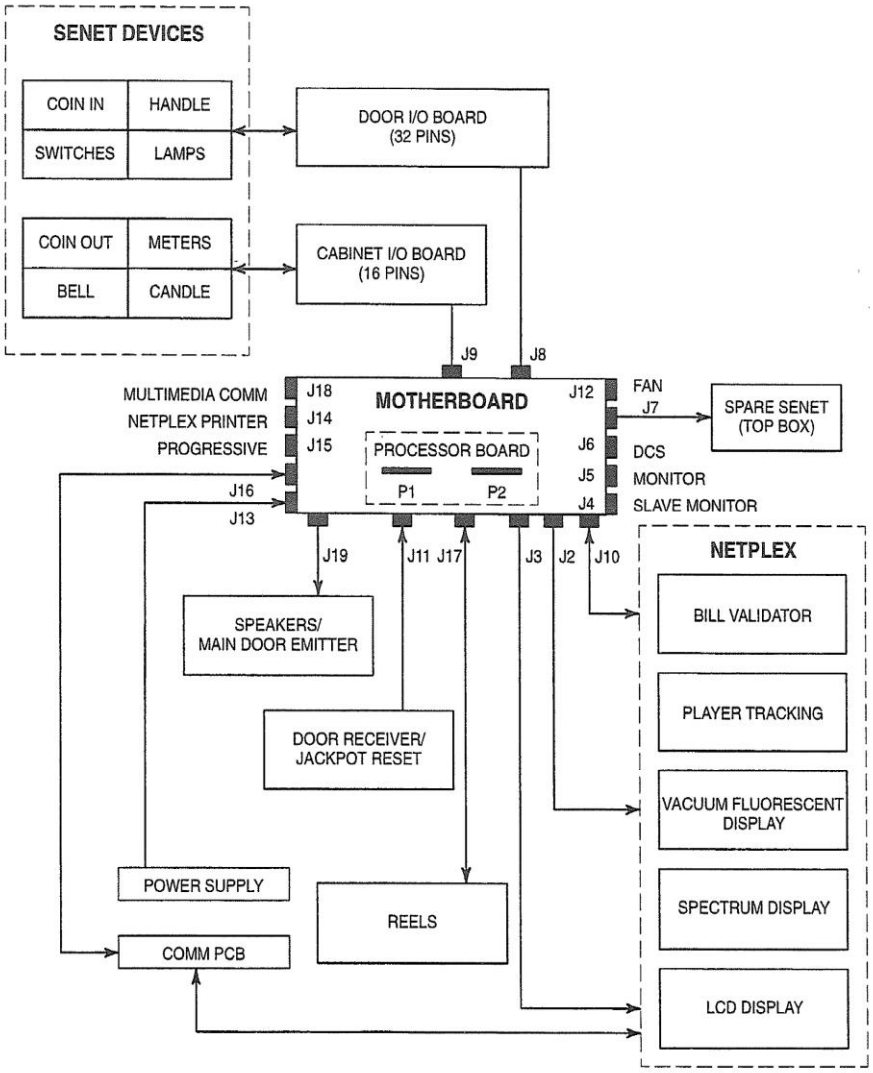


VISION AND iGAME-PLUS MOTHERBOARD – 759 053 0X



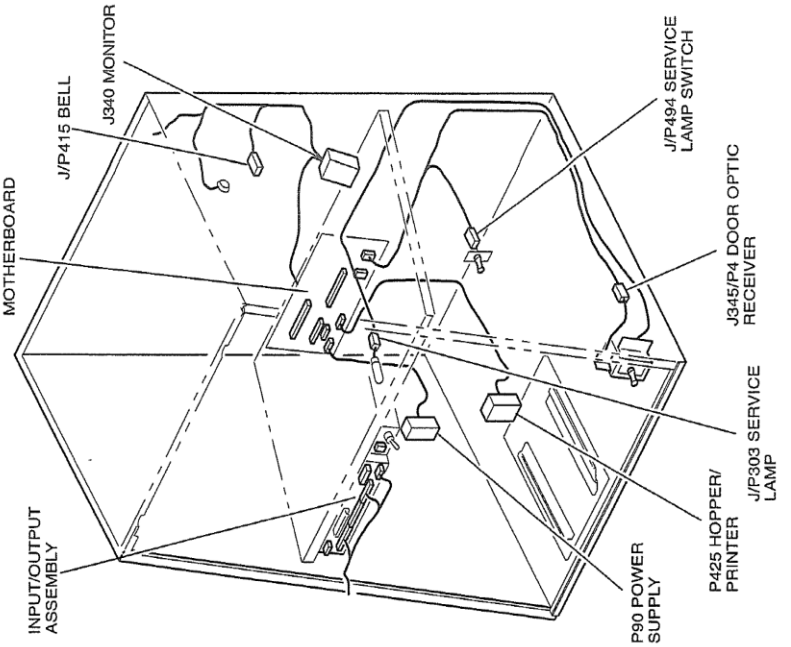
Logic Boards Module

80960 VISION MOTHER BOARD CONNECTOR DIAGRAM

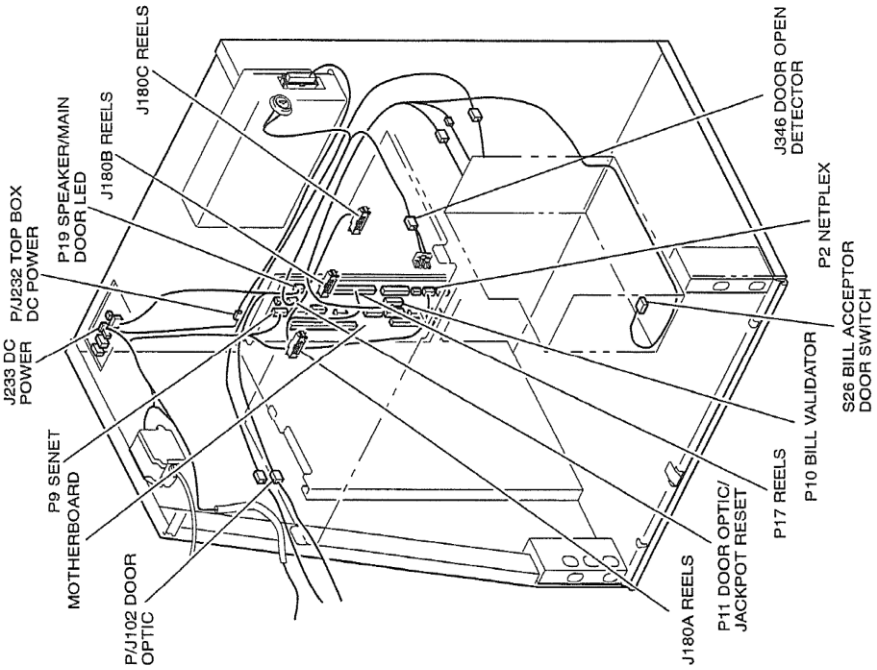


80960 Motherboard and Wiring

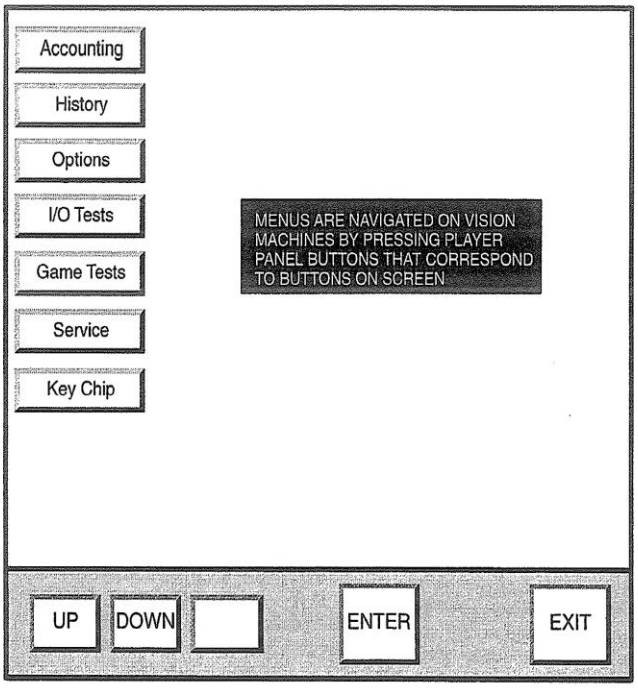
GAME KING 19" UPRIGHT MACHINE



VISION UPRIGHT MACHINE



VISION PROGRAM OPTIONS



1299-5A

Vision Attendant/Operator Access Matrix

Option	Attendant Menu Access through reset key switch.	Operator Menu Access through operator switch on processor tray.
Accounting	X	X
History	X	X
Options		X
I/O Tests	X*	X
Game Tests		X
Service		X
Key Chip		X**

* Partial access only.
** A view only menu, unless a key chip procedure is followed for setup of options contained within this menu.

4.4 Vision Slot Service Messages

When an error first occurs, the vacuum fluorescent display (VFD) shows the message Call Attendant with the machine door closed. When the door is opened, this message alternates with one of the following error messages:

- System Error
- RAM Error
- Processor Fault
- EEPROM Error
- Standard machine tilts (refer to Table 4-6)

Refer to the specific procedures in Section 5, Troubleshooting Procedures to resolve error situations.

Vision Slot System Errors

System errors usually occur when:

- Memory is corrupt
- EEPROMs are bad
- Other hardware fails
- Game firmware fails

Open the machine door and turn the reset key to view the error message. To clear the message, turn the reset key again and follow the instructions that appear on the VFD. If errors recur, copy the messages that appear and contact IGT service.

Vision Slot RAM Errors

RAM errors usually occur when an EEPROM is changed or memory becomes corrupt. Open the machine door and turn the reset key to view the error message. To clear the message, turn the reset key again and follow the instructions that appear on the VFD. If errors recur, copy the messages that appear and contact IGT service.

Vision Slot EEPROM Errors

Turn the reset key to clear these messages. Follow the instructions in Table 4-5 to resolve the error.

Table 4-5
Vision Slot EEPROM Errors

Message	Situation	Resolution
DATA ID MISMATCH ERROR	Data stored on the EEPROM is corrupt. The machine may lose some of the data stored on the EEPROM.	Turn the reset key.
EEPROM CRC FAILURE	All of the data on the EEPROM is lost. The machine will store the values from RAM into the EEPROM. If RAM is clear, the machine will store default values.	Follow the instructions shown on the VFD.
EEPROM DEVICE ERROR	The EEPROM is bad.	Remove and replace the EEPROM.
PROC BOARD ID MISMATCH	The processor board ID stored in the EEPROM does not match the processor board.	Replace the processor board with the correct one or clear the error. The date from the EPROM is then loaded into the new processor board.

Vision Slot Processor Faults

These errors occur when a power fluctuation, brown out or electro-static discharge causes the game firmware to malfunction, or if the microprocessor itself fails. It is usually necessary to turn machine **power off**, then back **on** to clear these messages. If the message recurs, replace the processor board.

Vision Slot NETPLEX Faults

Communication problems in the NETPLEX system may cause an erroneous bill acceptor error to occur. This is usually caused by a communication problem that blocks all NETPLEX communication. It is necessary to turn machine **power off**, then back **on** to clear this message. If the message recurs, turn machine **power off**, disconnect the bill acceptor, then turn power back **on**. Once the machine responds, access the Event Log to determine the problem component.

Vision Slot Standard Machine Tilts

These messages indicate specific machine problems. Use Table 4-6 to resolve these issues.

Table 4-6
Vision Slot Standard Machine Tilts

Message	Situation	Resolution
BILL VALIDATOR COMM FAILURE	Communication has failed between the bill acceptor and the machine.	Check wiring, connectors and motherboard. Cycle power.
BILL VALIDATOR CRC MISMATCH	Bill acceptor program was changed.	Open and then close the machine door.
BILL VALIDATOR DOWNLOAD CS ERROR	During a program download procedure of the bill acceptor validator component, a checksum error was reported.	Re-attempt the download operation.
BILL VALIDATOR EPROM CS ERROR	The bill acceptor reported a bad checksum for its internal EPROM.	Remove and repair the bill acceptor.
BILL VALIDATOR ERROR	The validator in the bill acceptor reported a nonspecific error.	Remove and repair the bill acceptor.
BILL VALIDATOR HARDWARE ERROR	The bill acceptor reported a non-specific error.	Remove and repair the bill acceptor.
BILL VALIDATOR JAM	A bill is jammed in the validator bill path of the bill acceptor.	Clear the jam.
BILL VALIDATOR NO DOWNLOAD	During a program download to the validator in the bill acceptor, the process failed.	Re-attempt the download operation.
BILL VALIDATOR NONVOLATILE DATA ERROR	The bill acceptor reported invalid data in its internal nonvolatile memory.	Remove and repair the bill acceptor.
BILL VALIDATOR NONVOLATILE DEVICE ERROR	The bill acceptor reported its internal non-volatile memory failed.	Remove and repair the bill acceptor.
BILL VALIDATOR RAM DATA ERROR	The bill acceptor reported invalid data in its internal RAM.	Remove and repair the bill acceptor.
BILL VALIDATOR RAM DEVICE ERROR	The bill acceptor reported its internal RAM failed.	Remove and repair the bill acceptor.
BILL VALIDATOR STACKER ERROR	The bill stacker did not reach home position after a stacking operation.	Remove and repair the bill stacker.
BILL VALIDATOR STACKER FULL	The bill stacker is full.	Remove the bills.
BILL VALIDATOR STACKER JAM	The bill stacker jammed during a stacking operation.	Remove the bills and clear the jam.
BILL VALIDATOR STACKER OPEN	A problem occurred during a stacking operation.	Remove and repair the bill stacker.
BILL VALIDATOR TAMPER DETECT	The bill acceptor detected an incorrect sensor input.	Verify that no security violations have occurred. Remove and repair the bill acceptor.
COIN-IN JAM	A coin is stuck in the acceptor assembly.	Remove the jammed coin.

Table 4-6 (cont.)
Vision Slot Standard Machine Tilts

Message	Situation	Resolution
COIN-IN SEQUENCE	The coin-in optics were blocked out of sequence.	Check for dirt or damage. Open, then close, the machine door to clear.
COIN-OUT JAM	A coin is stuck in the hopper assembly.	Remove the jammed coin.
DISPLAY COMMUNICATIONS FAILURE	Communication has failed between the VFD and the machine.	Check wiring, connectors and motherboard. Cycle power.
DIVERTER ERROR	The diverter position did not change in response to the firmware.	1. Clear the jam. 2. Remove and replace the diverter assembly.
EXTRA COIN PAID	A coin was dispensed from the hopper when none should have been.	Check for possible tampering or hopper malfunction. Open, then close, the machine door to clear the screen display.
HOPPER EMPTY	The hopper has no more coins to complete a payout.	Fill the hopper. If the hopper is not empty, then check for possible tampering or hopper malfunction. Open, then close, the machine door to clear the display and restart the hopper.
HOPPER JAM DETECTED	The hopper motion detect optic has not transitioned during a payout.	Remove and repair the hopper.
HOPPER MALFUNCTION EXTRA COIN PAID	A coin was dispensed from the hopper when none should have been.	Check for possible tampering or hopper malfunction. Open, then close, the machine door to clear the screen display.
KEY CHIP ACCESS FAILURE	An error occurred during the key chip procedure.	Verify that there are no credits on the machine and perform the key chip procedure again.
MACHINE IS OUT OF SERVICE	Machine is under repair.	Open the door and turn the reset key to clear the message.
MAIN BATTERY LOW	The battery supplying power to the CMOS RAM devices is low.	Remove and replace the battery.
REEL 1 TILT	The number 1 stepper reel has malfunctioned.	Repair or replace number 1 reel.
REEL 2 TILT	The number 2 stepper reel has malfunctioned.	Repair or replace number 2 reel.
REEL 3 TILT	The number 3 stepper reel has malfunctioned.	Repair or replace number 3 reel.
REEL 4 TILT	The number 4 stepper reel has malfunctioned.	Repair or replace number 4 reel.

Table 4-6 (cont.) Vision Slot Standard Machine Tilts		
Message	**Situation**	**Resolution**
REEL 5 TILT	The number 5 stepper reel has malfunctioned.	Repair or replace number 5 reel.
REELS DISCONNECTED	The stepper reels are disconnected from the motherboard.	Check connector J17 on the motherboard. Check that the reels are seated correctly.
VIDEO DISPLAY COMM FAILURE	Communication has failed between the machine and the LCD.	Check wiring and connections and the comm board in the power distribution assembly.
VIDEO DISPLAY ERROR	A nonspecific error has occurred with the LCD.	Repair or replace the LCD.

Vision Slot Security Messages

These messages (Table 4-7) inform the operator of door openings and closures and are tracked in the machine soft meters.

Table 4-7 Vision Slot Security Messages		
Message*	**Situation**	**Resolution**
CLOSURE B	The bill acceptor door was just closed.	Playing the next game clears this message.
CLOSURE C	The coin drop door was just closed.	Playing the next game clears this message.
CLOSURE L**	Logic (processor) board has been installed.	Playing the next game clears this message.
CLOSURE M	The machine door was just closed.	Playing the next game clears this message.
DOOR OPEN B	The bill acceptor cash box door is open.	Close the bill acceptor cash box door.
DOOR OPEN C	The coin drop door is open.	Close the coin drop door.
DOOR OPEN L**	The logic board has been removed.	Replace the logic board.
DOOR OPEN M	The machine door is open.	Close the machine door.

*These messages can occur in combination (e.g., "DOOR OPEN MB" and "CLOSURE MC").
** Optional

Phase 1

The S2000/Vision will tilt if anything gets disconnected or loose, or if the machine is moved. Almost all of the issues with the S2000/Vision machine can be solved with the following steps.

- ○ Turn OFF machine.
- ○ Use a 4500 joule surge suppressor.
- ○ Plug suppressor into wall outlet.
- ○ Check all cables. Verify they are connected.
- ○ Check all harnesses. Verify they are whole with no cuts/breaks.
- ○ Check all wiring. Verify no breaks.
- ○ Check all plugs. Verify tight.
- ○ Remove any loose coins. DO NOT place them back into the hopper!
- ○ Remove any loose hardware or any stray conductive metal pieces.
- ○ Remove any loose papers, packing or stray foreign matter.
- ○ Plug **only** this machine into the suppressor.
- ○ Turn ON suppressor. Turn ON machine.
- ○ Reboot completely. This may take several minutes. Be patient!
- ○ Watch display for messages indicating the rebooting process.
- ○ Open door.
- ○ Turn reset key 1/4 turn CW. Turn this key only **ONCE**!
- ○ Close door tightly. Do not force it!
- ○ Slide the latch down. Latch completely.
- ○ Finish off the game currently playing.
- ○ If machine still does not reset, repeat above steps from the top.
- ○ If it does not reset after several attempts, go to the next page to perform **Phase 2.**

Phase 2

If the machine continues to show errors, start with the device that you are getting the error from. Work back from each wire or harness to the motherboard.

○ With the machine ON, try clearing the error by lifting and lowering the main door latch a few times. If this does not work, perform the steps below.

○ Turn the machine OFF. Be sure it is unplugged from its surge suppressor.

○ Gently pull out MPU (Main Processing Unit) with both hands. Check the copper tabs on this board. (Use contact cleaner to clean the copper if it is dirty. Wipe gently with a soft cloth.) Replace MPU. Slide it into the socket. Be sure it is fully seated and firmly placed in its holder.

○ Make sure the two or three I/O cards are fully seated. Verify all harnesses connected to the handle end of them are fully connected.

○ There is one Cabinet I/O and one or two Door I/O boards in an upright machine. Verify they are connected securely to their respective socket holders.

○ Check the connections to each display in the machine, VFD, and seven segment display. Be sure they are secure.

○ Check the three connections to the Bill Acceptor in an upright machine. They are behind the bill acceptor, near a light that gets very hot; be careful.

○ Check each connection to the motherboard. Disconnect it and reconnect it. Do one at a time. Do not lose track of where a connection goes.

○ Pull the reels out. Behind them in an upright machine will be the 13/25V power supply (approximately 300 watts). There is a screw on the left side. Loosen it, disconnect and reconnect (push on it firmly to reattach to the power supply.) Tighten the screw. Do not over tighten.

○ Check all connections once more carefully!

○ Plug the machine into its surge suppressor. Turn ON the machine.

○ Repeat steps above.

○ If the machine still does not reset after several tries, perform the following steps for **Phase 3.**

Phase 3

If machine continues to show errors, or will not reset, or has a continuous tilt condition, the motherboard may need replacing. Perform the following steps.

- ○ Be sure the machine is OFF and unplugged from its surge suppressor.
- ○ Check devices and cables connected to Cabinet I/O.
- ○ Confirm physical meters and cables are connected.
- ○ Hopper: verify it is plugged in securely. Pull out, and gently slide it back into its plug. DO NOT FORCE! Do not overload the hopper! Fill it with several handfuls of coins if there are very few coins in the hopper.
- ○ Confirm handle switch and solenoid are free and clear from obstructions.
- ○ Confirm bell circuit cables are connected.
- ○ Check the connections for the Back Lit Controller (cabinet I/O does not control it.)
- ○ Check devices and cables connected to Door I/O,
- ○ Test by pressing all player button switches and lamps on the player deck.
- ○ Verify Coin Comparitor connections are connected.
- ○ Confirm Coin-in optics are clean and connected.
- ○ Confirm Coin solenoid connections are connected. These control coins going to hopper or into drop bucket in stand (overflow).
- ○ Verify connections for seven segment 5-5-2 or 6-6-3 and multiple denomination touch pad secure. (Door I/O does not control either one.)
- ○ Plug the machine into its surge suppressor. Turn ON the machine.
- ○ Return to the steps for **Phase 1** and repeat them to reset the machine. Work slowly and patiently through each step.

When errors or tilts occur, clear them by closing the door. Raise and lower the latch multiple times to clear the errors. They get stacked and only one error will clear on each door closure. If the previous steps in **Phases 1, 2** and **3** are not successful, the motherboard may need replacing. Please call us for assistance.

IF your S2000 is working correctly and you are not trying to do a game change or upgrade, leave it alone!

Phase 4

DO NOT perform the following steps. These steps must be performed by a competent slot machine technician.

○ **SLOT TECHNICIAN ONLY**: be sure the machine is OFF and unplugged from its surge suppressor.

○ Remove the motherboard.

○ Check the board for breaks, damaged or missing components or broken copper connections. Replace it gently into its socket. Plug any Molex connectors into the board.

○ Remove other circuit boards. Check them for any breaks, damaged or missing components.

○ Check each of them once more, carefully! Replace them gently into their respective sockets. Plug any remaining Molex connectors into the boards.

○ If there are any boards with the above flaws, the technician will record them here. DO NOT use this slot machine! Turn OFF the surge suppressor. Keep the slot machine OFF and unplugged from the suppressor.

Board Name	Issue

If there is no damage to the boards, plug the machine into its surge suppressor. Turn it and the slot machine ON. Repeat the steps in **Phases 1, 2 and 3**. If the slot machine still does not reset or function after this attempt, the processor and motherboards must be replaced. Turn OFF the machine. Unplug the machine and surge suppressor. Call us for assistance.