USA

Viridian™ Gen 7
RoHS Compliant

Electronic Gaming Machines

Service Manual

AM-0087-04

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Restrictions of Hazardous Substances (RoHS)

This EGM complies with Directive 2002/95/EC on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment. All components for repair or upgrade of this EGM must be ROHS compliant. When ordering new components for this EGM, it is the responsibility of the venue to specify that the components are for a RoHS compliant EGM.

Warnings, Cautions and Notes

Warnings, Cautions and Notes appear throughout this manual. They are designated as shown below:

Warning

Caution

Note

Important Safety Information

This document contains important information about the use of the equipment and hazards involved in owning and operating the equipment to which it relates. The equipment can be very hazardous if used other than in accordance with this document.

Inform Yourself and Your Staff

You must read this document before using the equipment or opening any part of the equipment. Ensure your staff do too.

The equipment itself is marked with important warning labels detailing dangers.

- Check for warning labels whenever opening any part of the equipment.
- Read and comply with all warning labels you see when operating or opening the equipment.
- Under no circumstances remove or alter any warning label.

Be Careful

If you do not follow the directions in this manual and on warning labels you increase the risk of the following things occurring:

- Serious personal injury, including electrocution and amputation. Unless you are a trained technician, tampering with the EGM can kill you.
- Serious damage to the equipment.
- Serious damage to other equipment.
- Serious damage to the premises housing the equipment.
- Rendering the warranty void.

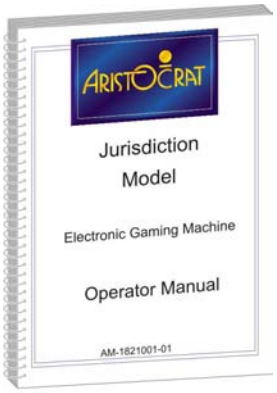
This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate action.

All functions of the machine are controlled by complex electronics. Unqualified personnel must not interfere with any mechanisms or controls as this may permanently damage the machine and lead to expensive repairs or component replace ment, and will render the warranty void.

Procedures outlined in the Installation Chapter of the Service Manual and throughout this manual ensure compliance with the standards AS60950, EN60950 and UL22. These Standards define the stability requirements for equipment in normal operation and service mode.

The Electronic Gaming Machine (EGM) described in this manual is certified and classified for indoor use only.

Aristocrat Manuals



G00002

Operator Manual

The operator manual provides procedures for the operation of the EGM. Machine installation, service, and repair must be carried out by licensed technicians. The manual is aimed at club staff, particularly floor personnel, who do not need to understand the detailed and technically complex aspects of machine processes. Primarily intended for operators of Aristocrat EGMs the Operator Manual:

- Gives a general overview of the hardware and soft ware.
- Provides procedures for daily operations and simple maintenance.

G00003

Service Manual

The service manual provides procedures for the servicing and maintenance of the Aristocrat EGM, It covers areas of machine operation that must be carried out by licensed technicians. The manual is aimed at technicians who need to understand detailed and technically complex aspects of the EGM to service and maintain it.
Primarily intended for service technicians the Service Manual:

- Gives a general overview of the hardware and software.
- Provides instructions for installation and fault finding.
- Describes in detail each of the major components of the EGM.

G00004

Parts Catalogue

Primarily intended for operators and service technicians. The Parts Catalogue enables operators and service technicians to order EGM Parts and:

- Shows illustrations of each of the components of the EGM.
- Links each illustration with part numbers.

Record of Amendments

Rev.	Date	Description	By
01	Jun 2007	Original issue for submission.	TV
02	Aug 2007	Updates to removal and replacement procedures	TV
03	Sep 2007	Updates to Specifications	TV
04	Mar 2008	Updates from USA gap analysis	TV

Brief History of Aristocrat Technologies Australia Pty Ltd

Aristocrat Technologies Australia Pty Ltd, established in 1953, is one of the oldest and most successful gaming machine manufacturers. Aristocrat has supplied machines to every country and region in the world where gaming machines are legal, including Austria, France, Germany, Holland, Malaysia, New Zealand, the Philippines, Africa, Singapore, Russia, South America, and the USA.

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Chapter 1

General Description

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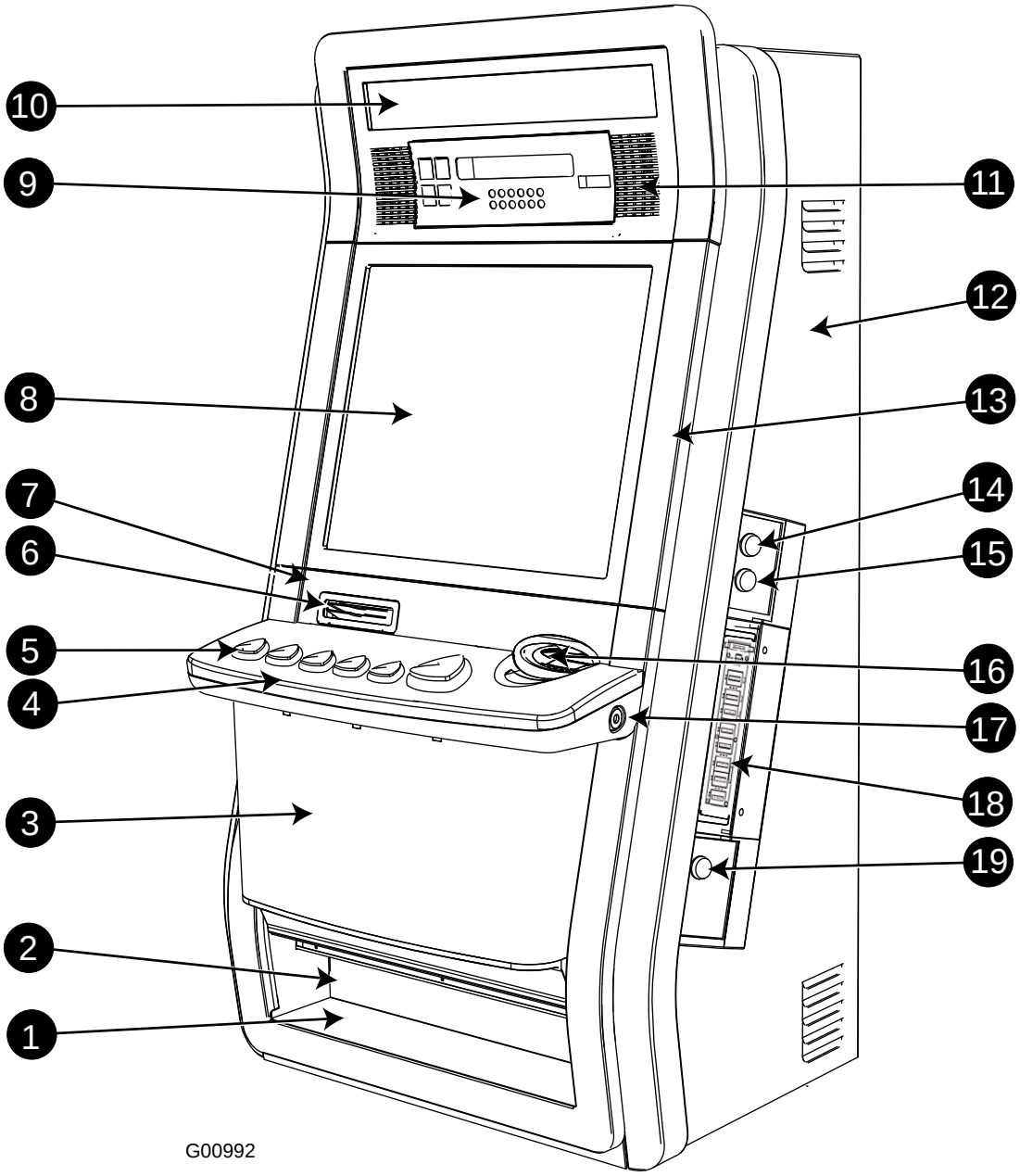
1.1 Physical Description

Aristocrat™ Electronic Games (EGMs) are assembled from various subassemblies and major components (modules). The following table identifies and describes the various EGM modules:

Table 1-1 EGM Modules

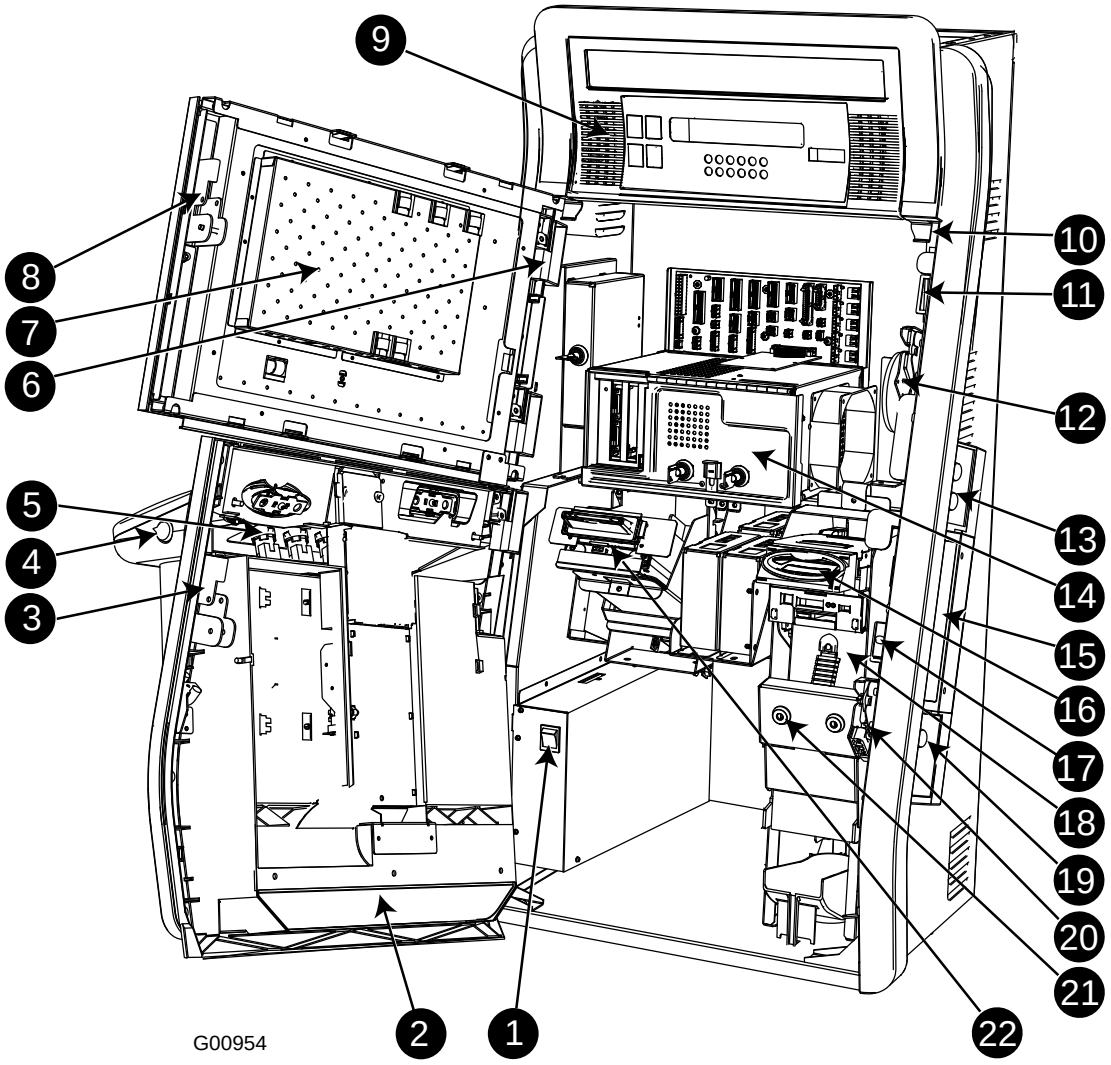
EGM Module	Description
Cabinet, Doors and Top Box	The physical outer enclosure which provides for the location and mounting of other modules.
Main LCD Screen	The main LCD screen is the main medium for displaying game operation and status to the player.
Carrier Board	The main Printed Circuit Board (PCB) provides primary control of the EGM and is interfaced (via the backplane board) to all the major components of the EGM. The board receives signals from, and sends control signals to, EGM components. The carrier board houses the central processor and other logic components for game generation, video drivers, security items, power control, memory storage, and communications.
Backplane Board	The backplane board houses an array of connectors which are used to electrically connect (via direct mechanical coupling or through looms and ribbon cables) the various electrical components of the EGM to the carrier board.
Logic Cage	The logic cage consists of a secure, steel cabinet that houses the carrier board. The section of the backplane board that interfaces with the carrier board is also located within the logic cage.
Power Supply Unit	The power supply unit converts the AC power input voltage into low voltage DC power for the various EGM modules and circuits. DC power is directed via the backplane board to the EGM components.
Bill Acceptor	The function of the bill acceptor is to accept valid currency and indicate to the carrier board the monetary value of credits for game play. A bill cash box is used to store the bills.
Player Marketing Module (PMM) (if fitted)	The player marketing module allows a player, using an identification card, to 'log on' to a network system when playing an EGM. The network system maintains a record of player transactions, and allows messages to be sent to individual players.
Mechanical Meter Board (if fitted)	Electromechanical meters are used to record accounting data in a physical format.
Voucher Printer (if fitted)	A voucher printer can provide players with a voucher for redeemable credits.
Communications Interface (if fitted)	The function of the communications interface is to enable the EGM to be linked to a network and/or subsidiary equipment.
Belly Door Assembly	The belly door provides access to the belly door artwork, lighting and illumination panel, as well as to the bill cash box.
Top Box (if fitted)	The top box provides an additional display on top of the EGM that can be used to house supplementary artwork or an additional LCD display.
Light Tower (if fitted)	Multi-level light towers may be used to provide an additional level of customer service and security.
Touch Screen (if fitted)	A touch screen enables games to be played by touching designated areas of the screen.
Top Box LCD Screen (if fitted)	The LCD screen, located in the top box, provides an additional area for game and jackpot display.

Figure 1-1 Typical EGM with Player Marketing Module



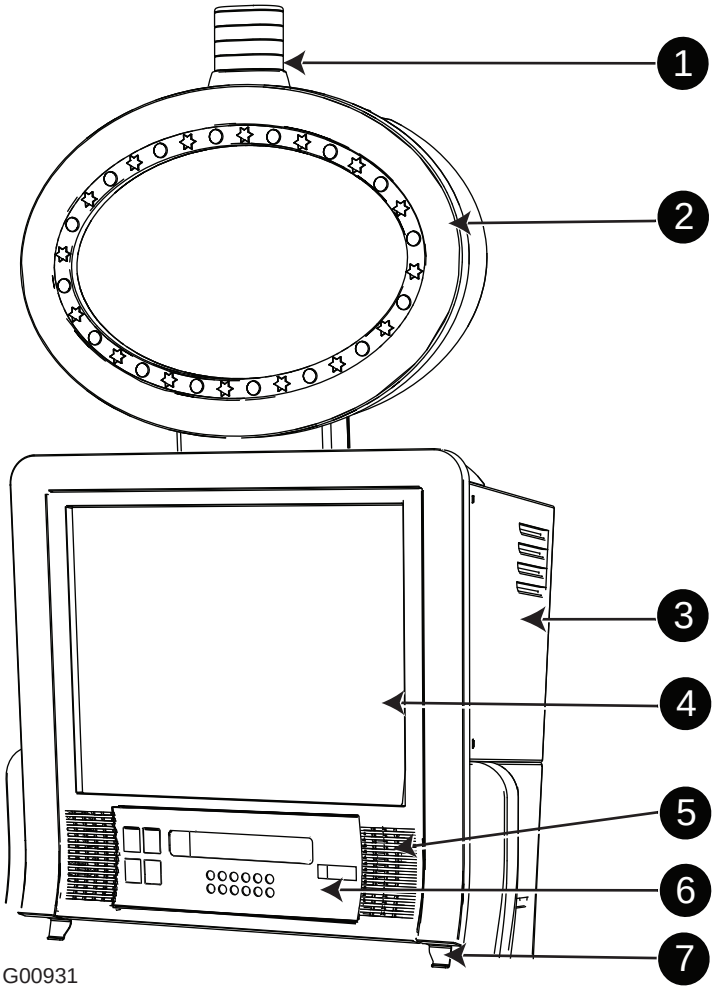
Legend					
1	Chip Tray	8	Main LCD Screen	15	Jackpot Reset Key Switch
2	Voucher Out	9	PMM (if fitted)	16	Bill Entry
3	Belly Door / Artwork	10	Artwork (Chop/Round Top only)	17	Belly Door Lock
4	Mid Trim	11	Speaker (2 off)	18	Electromechanical Meters
5	Buttons	12	Cabinet	19	Lower Main Door Lock
6	Voucher Printer	13	Upper Main Door		
7	Pay Panel	14	Audit Key Switch		

Figure 1-2 Internal View of Typical EGM



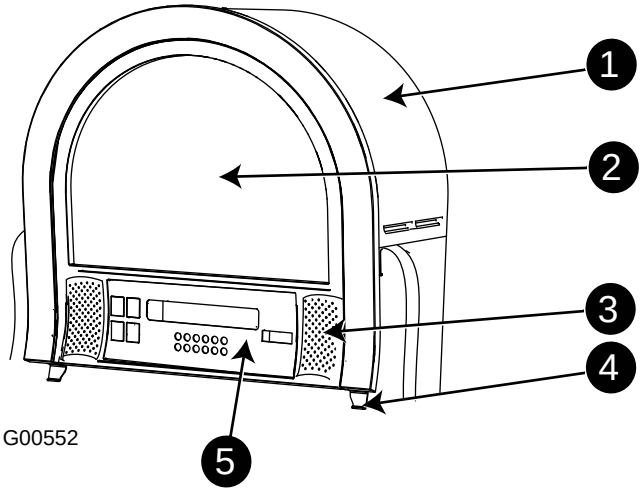
Legend					
1	Power On/Off Switch	9	Speaker (2 off)	17	Lower Main Door Security Switch
2	Chip Tray	10	Top Box Door Tabs	18	Bill Cash Box
3	Lower Main Door Latch and Optics Light Pipe Coin Chuting (if fitted)	11	Upper Main Door Catch	19	Lower Main Door Lock
4	Belly Door Key	12	Woofer	20	Lower Main Door Catch
5	Playbutton Switches	13	Audit/Jackpot Reset Key Switches	21	Bill Cage Lock
6	Door Hinge (4 off)	14	Logic Cage	22	Voucher Printer
7	Main LCD Screen	15	Electromechanical Meters		
8	Upper Main Door Latch Coin Validator (if fitted)	16	Bill Acceptor		

Figure 1-3 EGM Casino Top Box



Legend					
1	Light Tower	4	Top Box Door / LCD Screen	7	Top Box Tabs
2	Topper	5	Speaker		
3	Casino Top Box	6	PMM		

Figure 1-4 Game Round Top Box

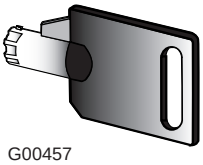
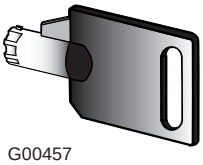
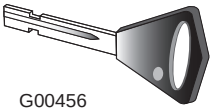
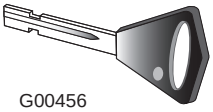
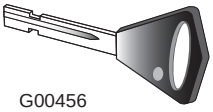
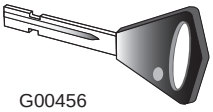
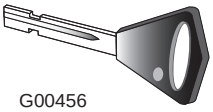


Legend					
1	Round Top Box	3	Speaker	5	PMM
2	Artwork	4	Top Box Door Tabs		

EGM Keys

The EGM requires keys for the following locks/switches to establish effective security and correct operation. A key may only be removed from its lock/key switch when returned to the locked position. Key and lock types may vary between markets.

Table 1-2 EGM Key Types

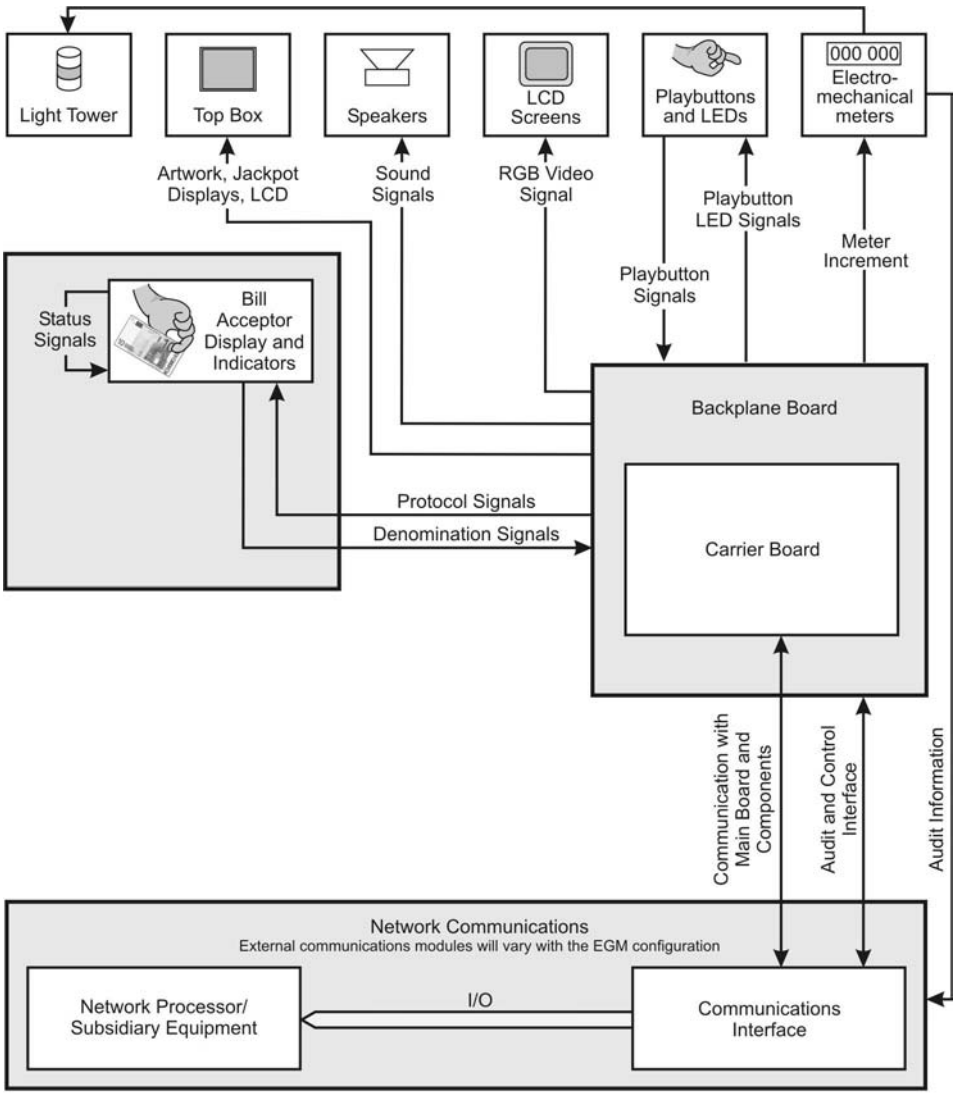
Name	Function	Type
Audit / Operator / Meter Key Switch	Enables entry to the Operator Mode Menu (see Machine Modes). Insert the Audit Key and turn it clockwise. Enables viewing of the electromechanical meters. Insert the key and turn it counter-clockwise.	 G00457
Jackpot Reset/ Cancel Credit Key Switch (if fitted)	Allows the operator to reset the EGM after a machine fault has been corrected (see Machine Modes). Insert the Cancel Credit key, turn it clockwise, then back again.	 G00457
Lower Main Door Lock	Allows the operator to open the lower main door. Insert the door key and turn it clockwise.	 G00456
Belly Door Lock	Provides security for the belly door (along with the belly door switch). To open the door, insert the key and turn it clockwise.	 G00456
Logic Cage Lock (if fitted)	Allows operator access to the PCB logic cage. Insert the logic cage key and turn it clockwise.	 G00456
Bill Acceptor Cage Door Lock(s) (if fitted)	Allows operator access to remove the bill cash box. When two locks are fitted, one key turns clockwise and one key turns counter-clockwise to open.	 G00456
Bill Acceptor Cash box Lock(s)	Allows the operator to remove bills from the cash box. Insert the key and turn it clockwise, open the door and remove the bills.	 G00456

1.2 Functional Description

All processing by the EGM is carried out on the carrier board. The carrier board contains the central processor and the software required for game generation and video graphics. All data and control signals to and from the carrier board are distributed by the backplane board.

The backplane board also distributes regulated low voltage power from the power supply unit.

Figure 1-5 Typical EGM Functional Diagram



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1.3 Specifications

Table 1-3 Physical Characteristics

Dimensions (Typical)	
Height of cabinet plus top box (Casino and Round top)	1362 mm (53.62”)
Height of chop top cabinet	1097 mm (43.18”)
Width at back of cabinet / Width including Trims	500mm (19.68”) / 576 mm (22.67”)
Depth (at base)	400 mm (15.74”)
Recommended minimum clearance between EGMs	210mm (8.27”)
Weight (typical)	
With casino top box and bill acceptor (Approx.)	105kg (232lb)

The power supply is capable of accepting a wide range of AC power voltage.

Table 1-4 Power Requirements

Mains Input Voltage		
Minimum		100V AC
Maximum		240V AC
Frequency		50Hz/60Hz
Mains Input Current	**115V AC**	**240V AC**
EGM Typical	2A	1A
EGM Typical plus Convenience Load Maximum	4A	3A
Power Consumption at Nominal Voltage	**115V AC**	**240V AC**
EGM Typical	240W	240W
EGM Maximum	360W	360W
Typical Heat Load	820 BTU/hr	820 BTU/hr
Power Factor Typical	95%	95%

Table 1-5 Environment

	Operating	Storage
Minimum Temperature	10°C (50°F)	-40°C (-40°F)
Maximum Temperature	40°C (104°F)	70°C (158°F)
Relative Humidity	0 - 85% non-condensing	0 - 95% non-condensing

Chapter 2

Installation

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2.1 Pre-Installation Requirements

The following items are required to install an Electronic Game (EGM):

- Jurisdictional approval (to be sighted).
- A floor plan.
- A suitable base on which to mount the EGM.
- An appropriate clearance between the sides of adjacent EGMs so that the doors may be opened (see EGM Clearance diagram).
- Access to power outlets and connection cables of peripheral devices to the EGM.
- EGM keys (when locks are fitted).

All mains wiring must be installed by a qualified electrician and comply with the relevant national/jurisdictional standards for mains wiring.

The Electronic Game must be transported and handled with care. Ensure the EGM is not dropped, severely bumped or inappropriately moved.

The Electronic Game is a heavy item. Follow the applicable national standard and code of practice for manual handling.

The game is not to be installed in an area where a water jet could be used.

Figure 2-1 Front and Side View - Chop Top - Dimensions

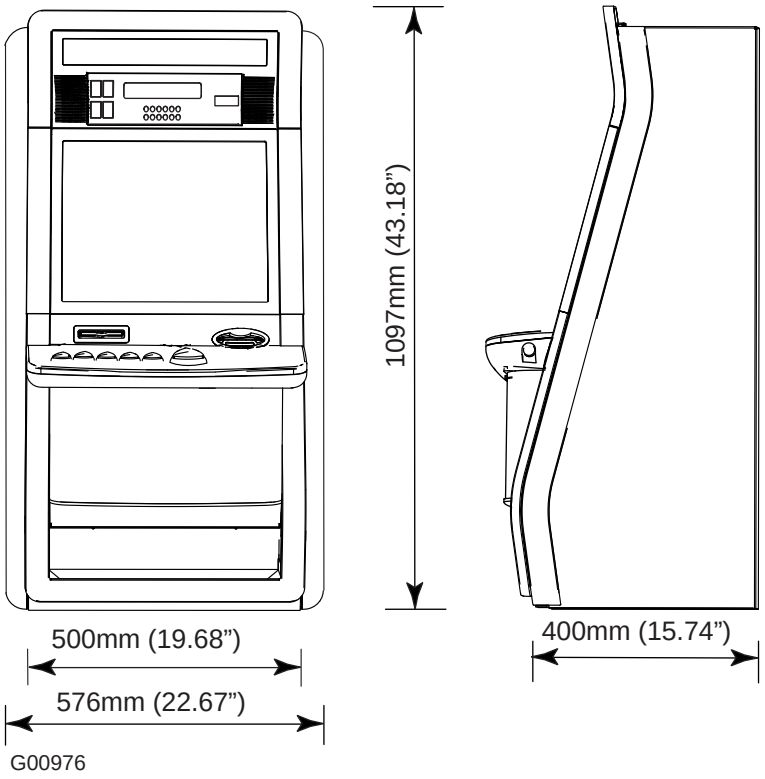

Figure 2-2 Front and Side View - Casino Top Box - Dimensions

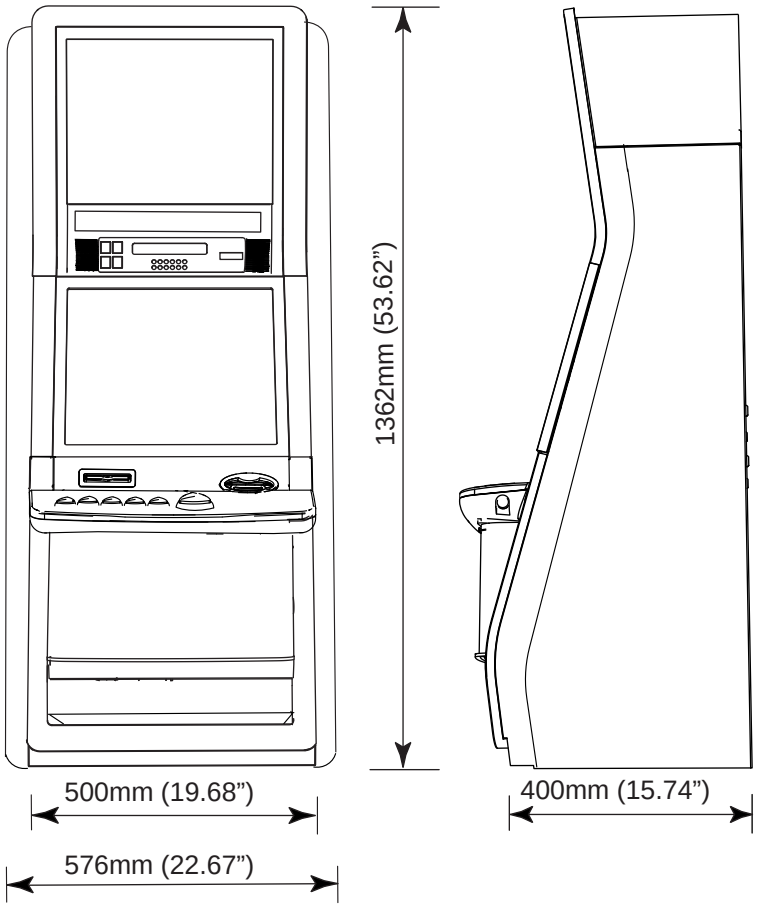

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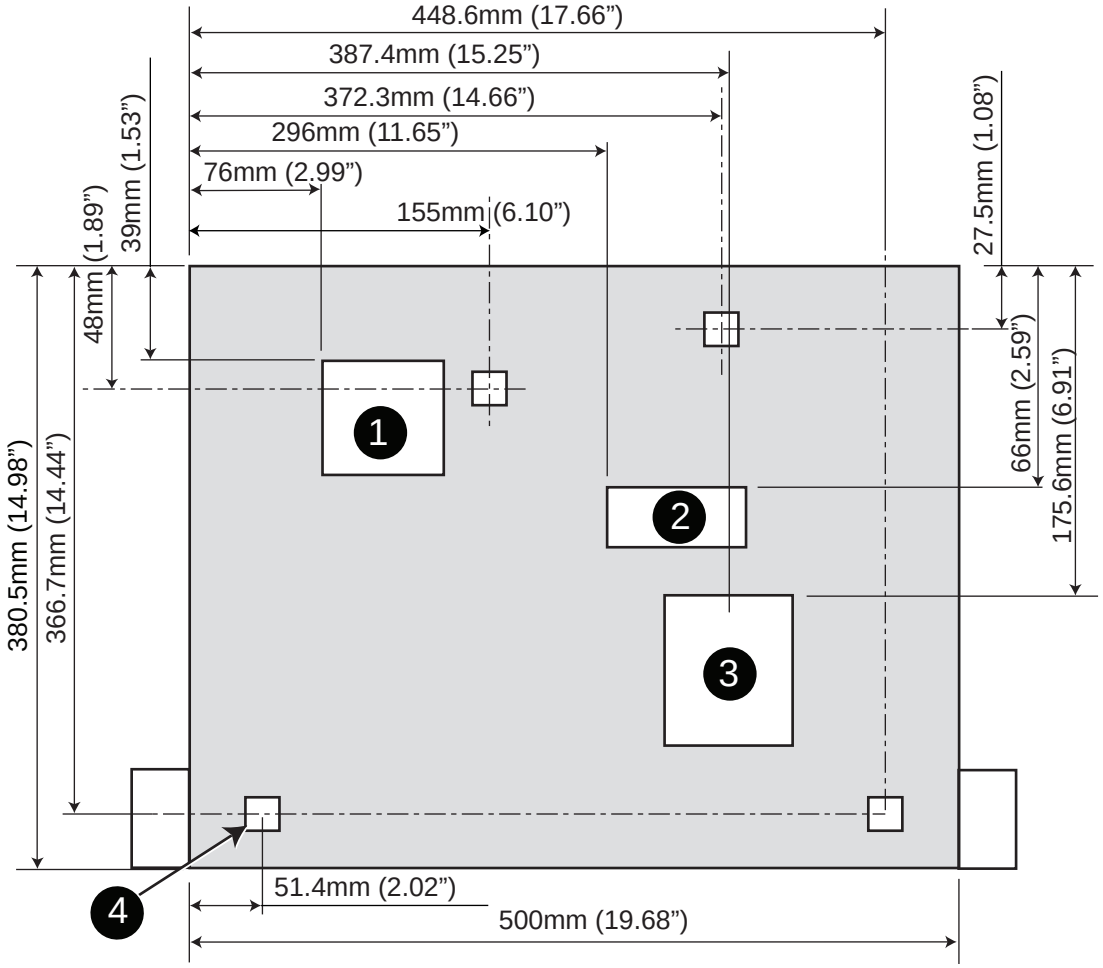
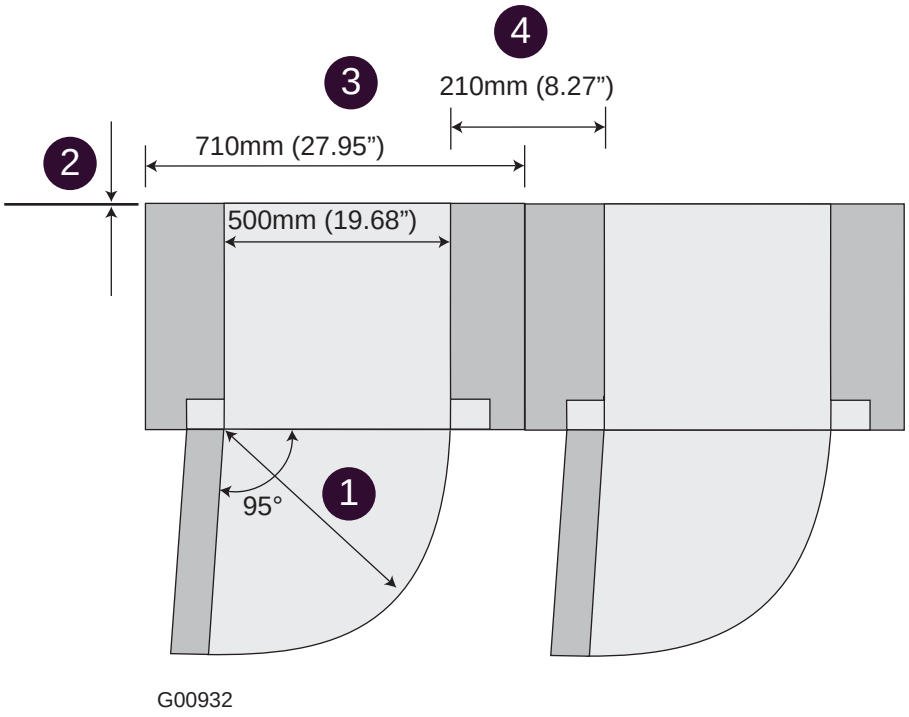
Figure 2-3 EGM Footprint



Legend			
1	55mm x 55mm (2.16” x 2.16”) aperture with 5mm (0.19”) radius corners	3	65mm x 73mm (2.55” x 2.87”) aperture with 5mm (0.19”) radius corners
2	105mm x 35mm (4.13” x 1.37”) aperture with 5mm (0.19”) radius corners	4	Mounting holes (4 off) Drill to 10mm (0.39”) diameter

Figure 2-4 EGM Clearances



Legend			
1	Arc of Door Swing	3	Minimum Base Width
2	Minimum Spacing Between EGM and Walls = Flush	4	Minimum Spacing Between EGMs

2.2 Installation Procedure

An appropriately licensed technician must carry out installation and commissioning of the EGM.

The following procedures are for mounting, connecting and commissioning the EGM into service.

Care should be exercised during shipment and transit to prevent EGMs from toppling. Do not apply any undue forces and secure all loads prior to transport.
Ensure all EGMs and/or base assemblies being moved are secured to form a single assembly. Do not transport EGMs, or components thereof, unless they are duly connected together.
Base assemblies or furniture must be constructed appropriately to support the static load of the EGM as well as loads applied from forces imposed, in keeping with relevant standards.

Installation and commissioning of EGMs, including configuring machine options, and the sealing / unsealing of logic cages, must comply with the regulations of the jurisdictional authority.

2.2.1 Mounting

The EGM, and the cabinet base that supports the EGM, MUST be installed as follows to ensure the assembled unit meets all safety requirements with regard to possible tip over. EGMs or EGM/cabinet base assemblies must not be toppled by events such as leaning on an open door or attempted vandalism.

Mount the EGM to the cabinet base as follows:

1. Position the EGM on the cabinet base, aligning it with the cashbox and cable holes (refer to figure 2-3 EGM Footprint).

There are four mounting hole positions in the base (see figure 2-3 EGM Footprint). The EGM MUST be fixed in all four positions (two at the front and two at the back) to ensure the EGM meets tip-over (stability) requirements.

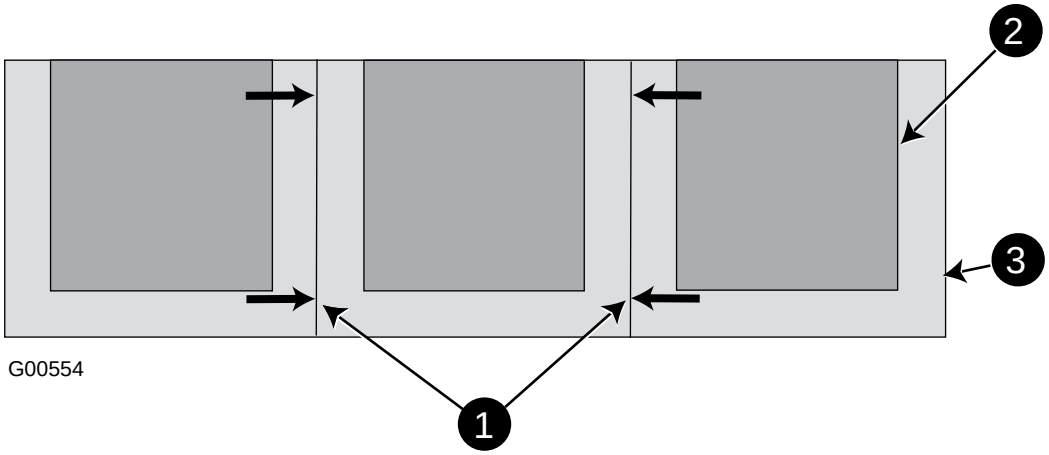
2. Drill holes in the cabinet base to match the EGM mounting holes for bolts and nuts, or use the special-purpose fasteners provided to secure the EGM to the base.
3. Insert the fasteners, fit the nuts and tighten to ensure that the EGM is mounted securely.

EGM Base Installation

Adjacent bases supporting EGMs and installed in a row (two or more side-by-side) MUST be fixed to each other such that the row assembly becomes an integrated structural unit.

Groups of only two adjacent bases MUST be fixed side-to-side and back-to-back, or to a wall or floor as illustrated in Figure 2-6 EGM Fixing Back-to-back and Figure 2-7 EGM Fixing Isolated.

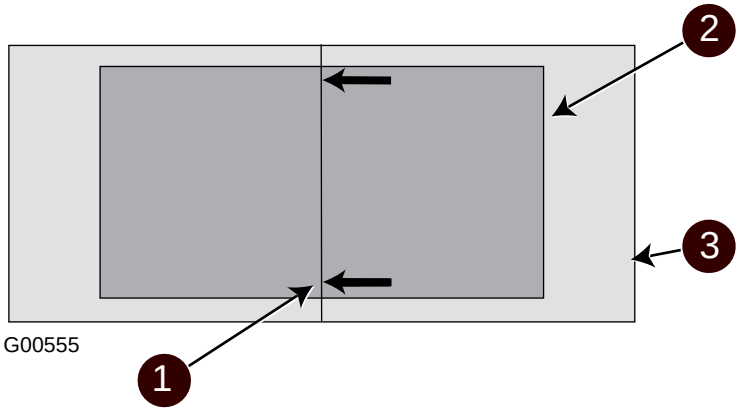
Figure 2-5 EGM Fixing In-line



Legend					
1	Fix Adjacent Bases to Each Other	2	EGM	3	Cabinet Base

Bases supporting EGMs that are arranged back-to-back, and not in a row, MUST be fixed to each other at the rear so that the assembly becomes an integrated structural unit.

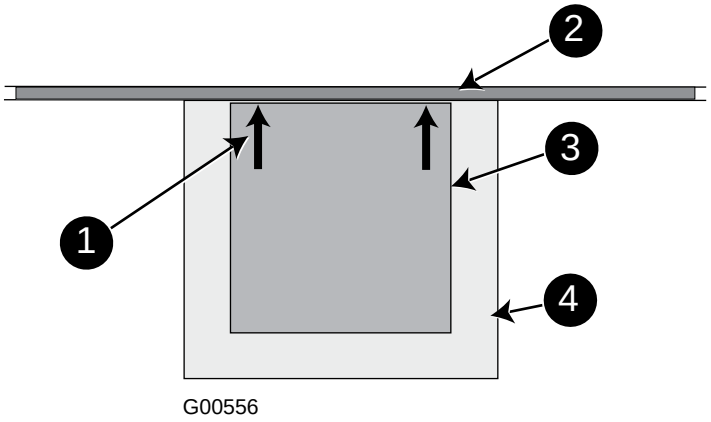
Figure 2-6 EGM Fixing Back-to-Back



Legend					
1	Fix Bases Back to Back	2	EGM	3	Cabinet Base

A base that supports an isolated EGM MUST either be fixed to a structural wall or fastened securely to the floor.

Figure 2-7 EGM Fixing Isolated



Legend			
1	Fix Bases to a Structural Wall or to the Floor	3	EGM
2	Structural Wall	4	Cabinet Base

2.2.2 Pre-start Connections, Checks and Power Up

Perform the following EGM connections and checks:

1. Check that the carrier board is firmly seated in the logic cage.

For accessing PCBAs, refer to the relevant chapter in the Service Manual.

2. It is not necessary to select the voltage as the power supply assembly automatically accepts a wide range of AC voltage.
3. Connect the EGM power cable to the power outlet. The power cable may enter the cabinet either via an aperture in the base of the cabinet near the power supply or via an aperture in the rear wall of the cabinet. The aperture in the rear wall of the cabinet is fitted with a cover plate. This cover plate has a latch to allow a clamp to be fitted to the power cable. The purpose of this clamp is to prevent the power cable from being accidentally disconnected, and it should be used if there is a reasonable risk that this may happen.

Visually check that the insulation of the power cabling has not been damaged during the installation. Check that earthing leads or screws that might have been moved during the installation are correctly attached.

4. Switch on the EGM and close the lower main door. The main LCD screen and the lighting system will power up. The EGM will perform self-testing procedures for a few moments and any faults detected will be highlighted by a message on the main LCD screen. To fix faults detected, refer to Current Lockup Menu items in the Machine Modes chapter.
5. If the main LCD screen is fitted with a touch screen, carry out a Touch Screen Calibration procedure as described in the LCD Screens chapter in this manual.

The EGM is ready for configuring.

2.2.3 Configuring the EGM

A variety of identifications, options and essential settings need to be entered to configure the EGM:

1. Commence operations by following the Reset and Restart Procedure described in the Machine Modes chapter. The procedure will enable appropriate values and identifications to be set from the Machine Options and the other Operator Setup / Selections menus presented in the Operator Mode menu system. In this procedure, the following menu displays are used - Sound System Setup, Set Default Encryption Keys, Hardware Selection and Attract Mode.
2. The Site Controller (if connected) must carry out any required System setup procedures. These may include:
    a. Procedure to configure additional EGM items including Serial Number (to match the EGM Serial Number), Poll Address, Name for the Base Game Variation Number, Jurisdiction Code, Credit Denomination, and Currency Denomination.
    b. Procedure to configure the EGM game items including Game Variation Number, Name for the Game Variation Number, Game Progressive Group ID, Name of the progressive levels in the game, and Game Configuration Poll message data.

The EGM has been configured.

2.2.4 Commissioning the EGM

With the EGM checked and powered up, carry out the following processes (for additional information refer to the Machine Modes chapter):

1. Check that the EGM program type and variation match the customer order. Use the Operator Mode menu and the options described in the chapter, Machine Modes.
2. Observe the EGM self-tests for any faults (for details refer Self Test Mode in the chapter Machine Modes). Carry out a range of tests as appropriate using the Operator Mode options.
   EGMs operating on a network system may now be connected and installed onto the network. For installation procedures refer to the manual for the specific communications network used.
3. Request the operator to read and record the hard and/or soft audit meters (if fitted and as required by applicable jurisdictional requirements).
4. Where the venue permits, monitor game play operations for any faults:
    - For configurations that use a bill acceptor, insert a valid bill and confirm that it reads and credits it correctly. If the bill is not accepted on the second attempt then repeat the test on another bill – should the second bill fail to be accepted and credited the bill acceptor should be replaced.
5. For EGMs fitted with a serial voucher printer, carry out the test and maintenance operations as detailed in the chapter, Care and General Maintenance in the Operator Manual.

6. Log installation data as specified by the appropriate jurisdictional requirements.

The EGM may now commence operations.

Notes

Chapter 3

Machine Modes

List of Figures

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3.1 Modes of Operation

The electronic game is operated in two modes:

- The Play Mode permits game play while the lower main door is closed and locked, the audit key switch is in the neutral position and there are no fault or lockup conditions.
- The Operator Mode allows the operator to configure the game, view audit information, carry out game tests, and reset game faults. To access this mode the meter/audit key is set to the audit position.

3.2 Play Mode

In Play Mode the game:

- Permits game play.
- EGM display is ready for player operation.
- Operates security and audit features.
- Monitors and records game play.
- Runs self-checking/testing and
- Displays guidance for players, operators and technicians.

Depending on how the game is configured, credits may be registered by:

- Inserting bills.
- Using a cashless system.

In a cashless system, credits are transferred to and from the game by either a computer link or smart card. The game has security features to ensure that only valid currency is accepted.

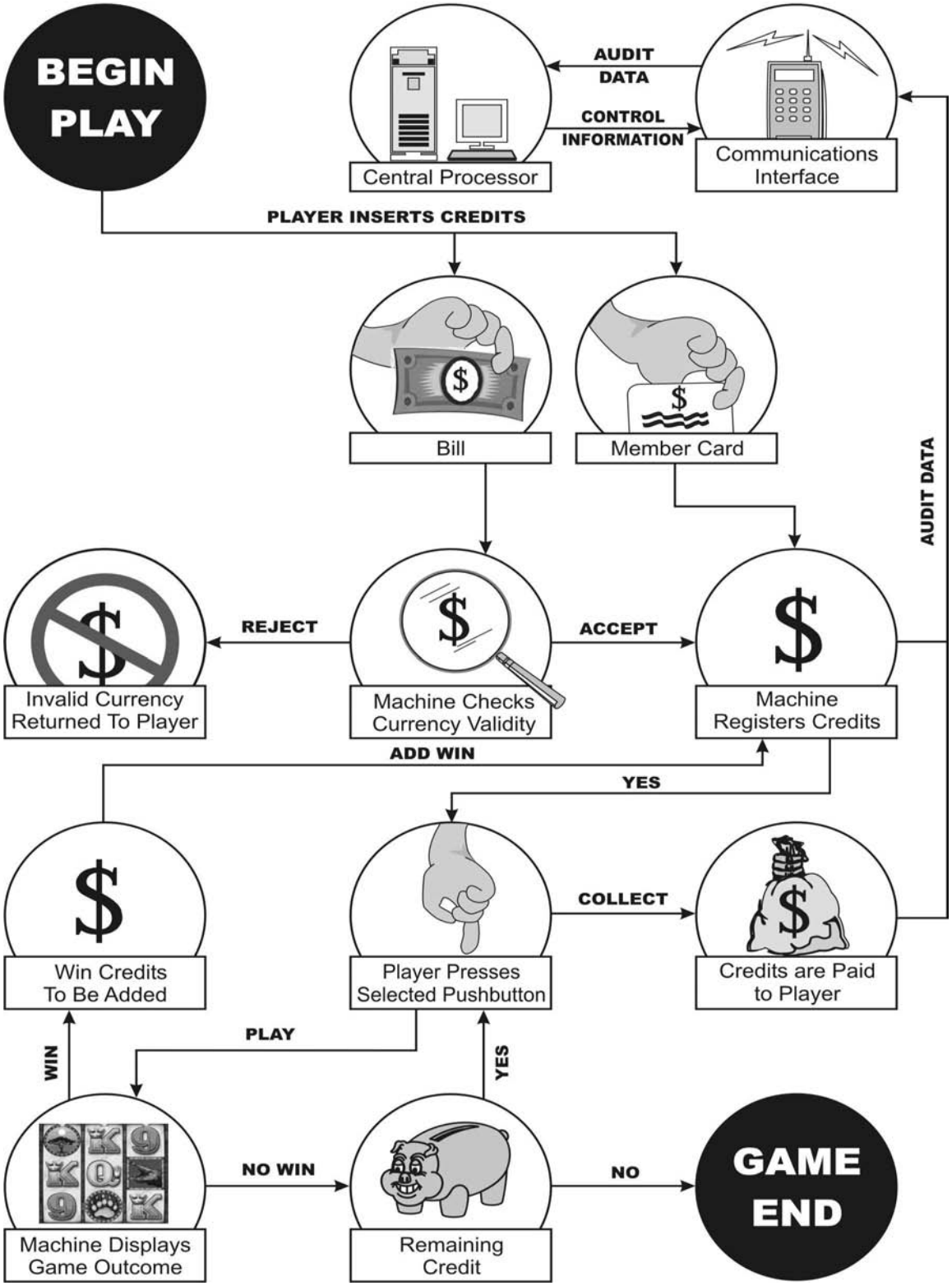
The player determines how many credits to wager by pressing one of the BET buttons. The BET meter on the display screen shows the credits wagered.

The player starts a game by pressing one of the active buttons, the game runs the game sequence and displays the outcome on the screen.

The EGM is equipped with electronic audit meters that continuously monitor and record credit movement and game activity. This information is used for audit calculations and security purposes. Electromechanical meters may also be fitted.

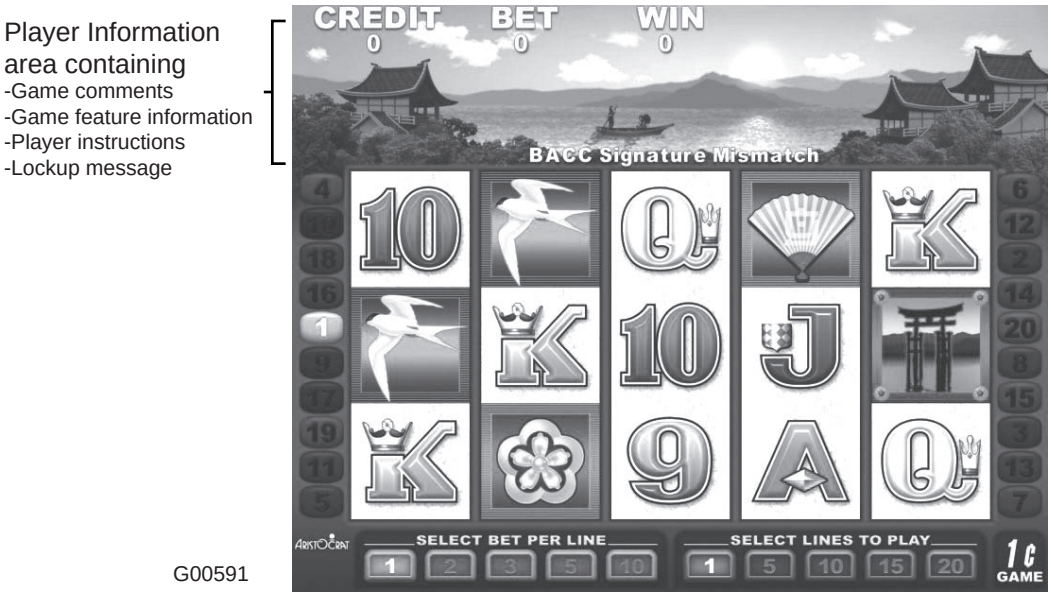
If the game encounters an abnormal condition, it alerts the operator by automatically entering Machine Lockup. In lockup, game play is disabled to prevent any further player interaction and guidance information is displayed in the game message area.

Figure 3-1 Basic Game Operation in Play Mode



The figure below shows the format of a game display. The symbols on the screen will vary depending on game.

Figure 3-2 Format of Game Display



The CREDIT, BET, and WIN game meters show the number of credits applicable at the current stage of the game. Comments appear in four message lines to guide players and operators as the game progresses. The denomination icon can appear in either the top right or bottom right corners of the screen. Machine conditions, including security alerts, are also displayed in a message area. Examples of messages are:

- Game comments — THAT'S A WINNER
GOOD LUCK
WELL DONE
- Feature information — FOUR FREE SPINS REMAINING
- Player instructions — GAME OVER PLAY NOW
1 CREDIT PER LINE
- Lockup Message — DOOR OPEN BELLY PANEL
DOOR OPEN MAIN

Lockup messages are listed in Fault Mode - Current Lockup Menu.

In Play Mode the game operates with full security features. For example, the game monitors operations and alerts operators should malfunction or tampering occur. Electronic meters and electromechanical meters (if fitted) record details of game play and game operations in Play Mode.

Options

Besides being able to alter game controls to suit house preferences, the game provides menu controls for setting important game and player preferences, which may include:

- Game percentage.
- Base credit value (a game credit) and acceptable bill denominations.
- Links to house and stand-alone progressives in various levels (if fitted).
- Game gamble option.
- Volume settings for sounds and tunes.

See Operator Setup/Selection Mode.

Jurisdictional requirements must be followed when configuring games.

3.2.1 Player Operation

When the game is switched on and the lower main door is closed and locked, the game automatically initiates a self-test. If no faults are detected, game play may begin.

Play

When a player inserts a bill, the game either accepts or rejects the currency. If the game accepts the currency, it increments the CREDIT meter on the game main LCD screen by the number of credits. The mid trim buttons become active and flash. The player may now either insert more currency or press one of the buttons to play the game. The player selects the number of credits to bet and this number is shown on the BET meter on the main LCD screen. A beep sound is heard when any of the BET buttons is pressed.

The reels spin and when they stop the line combinations are evaluated. If the result is a winning combination, a win tune is played. The main LCD screen shows the number of credits won in the win meter.

Some games incorporate a win-gamble feature that provides players with the chance to multiply their win amount. This feature is initiated by pressing the GAMBLE playbutton. The GAMBLE feature may be selected a maximum of 5 times in succession. If players do not wish to gamble their win, they may press the TAKE WIN playbutton which adds the win to the credit meter.

When a player presses the COLLECT playbutton and the value of the game credits is greater than the configured limit, the Cancel Credit procedure is used to hand pay the amount:

- The message **Cancel Credit Call Attendant** is displayed (the value of credits to be paid out is displayed).
- The attendant hand pays the value of the credits and then resets the game using the Jackpot Key.
- The message **Credits paid out $99.99** is displayed on the screen.
- The CANCEL CREDIT electronic meters and electromechanical meters record the number of credits paid out.
- The game CREDIT on the screen and the CREDIT electronic meters and electromechanical meters (if fitted) are reset to zero.

In the case where a printer is fitted when a player presses the COLLECT playbutton and the value of the game credits is greater than the configured limit, the printer prints a voucher and the game CREDIT on the screen and the CREDIT electronic meter are reset to zero.

Pressing the RESERVE playbutton (if fitted) displays the message **MACHINE RESERVED** on the screen. This allows players to reserve a game for a short period. Pressing the SERVICE playbutton (if fitted) lights a tier in the light tower to catch the attention of floor attendants.

3.2.2 Main LCD Screen

The main LCD screen provides high-resolution graphics which can display attractive game illustrations and animations, as well as player messages, operator menus and information displays.

The simulated spinning reels take up most of the screen area. The area at the top of the screen displays CREDIT, BET, and WIN information. Between these two areas is the top message display area. The main LCD screen may be fitted with a touchscreen that enables games to be played by touching designated areas of the screen.

3.2.3 Sounds and Tunes

Sounds and tunes are used, in combination with the graphics and animation, to increase game appeal.

Different sounds are played to signify various game conditions, such as alarm, reel spin/stop, win, lose, double-up win and jackpot bell. Each game has its own specific sounds and tunes. The volume of the sound system can be adjusted in the Sound System Setup Menu.

A generic Attract Mode tune, lasting approximately 5 seconds, accompanies the occurrence of the attract mode screen. It repeats at subsequent one minute intervals until attract mode is exited.

3.2.4 Buttons

Playbutton layouts vary in different jurisdictions and for different games. Each playbutton has a LED behind it that may either be lit, unlit, flashing, or flashing at double speed, depending on the game situation and the machine mode.

More information about the playbutton configuration can be found in Operator Modes – Test Diagnostic Modes.

3.2.5 Game Self-Monitoring

Self-test

When the game is switched on, it automatically initiates a self-test that continues in the background as long as the game is in play mode. During the self-test, the game checks the electronic meter data held in computer memory and carries out audit calculations using essential meter counts. The self-audit calculation formula varies depending on game configuration.

The memory holds up to three copies of the electronic meter data, METER SET 1, METER SET 2 and METER SET 3. If the data in one meter set does not match that in the other two sets, the data of the two identical sets overwrites the single set.

Security

When the game is in play mode, it continuously operates with the following security features:

Bill Acceptor

The bill acceptor consists of an optical scanning unit and a bill cashbox contained in a high-security housing. The scanning unit achieves a high percentage of acceptances, and a second-level scanning option can be initiated for high-denomination bills. During operation, the acceptor registers acceptances and rejections. Bills accepted increment the CASH IN electronic meter and electromechanical meter (where fitted). Detailed information is recorded in the bill acceptor meters, which may be accessed from Operator Mode / Accounting Information Menu. These meters record the value and quantity of each bill accepted. A record is also kept of the last five bills accepted.

The game monitors the bill acceptor operation, and unusual conditions and faults are registered by increments in the Diagnostic Meters, and by display messages and game lockups. The lockups and video messages are BILL ACCEPTOR ERROR and BILL ACCEPTOR OUT OF SERVICE. Should the bill cashbox door be open, the alarm sounds and the message BILL Cashbox REMOVED is displayed. A lockup occurs should the bill acceptor cashbox become full. The lockup description and video message is BILL ACCEPTOR FULL.

The game Options menu enables the bill acceptor to be configured ON or OFF and to recognize specific bill denominations.

Door Security

A total of eight mechanical and eight optical security switches may be used to monitor door access. All of the mechanical security switches are battery-backed to enable door access to be detected even when the game is not powered.

If a door fitted with a security switch is opened while the game is powered:

- A DOOR OPEN message is displayed on the screen, specifying which door is open (a DOOR MISMATCH message refers to a game fault where the mechanical and the optical door security switches are not operating correctly).
- The alarm sound is heard.
- The game locks up, suspending game play.
- The appropriate DOOR ACCESSES Diagnostic Meter is incremented.

The condition is reset by closing the appropriate door or by correcting faulty or poorly aligned mechanical / optical door switches. The security signals are typically distributed as follows:

Table 3-1 Door Security Functions

Security	Mechanical	Optical
0	Logic cage (if fitted)	Main door
1	Top box (if fitted)	----
2	Mechanical meters (if fitted)	----
3	Drop box door (if fitted)	----
4	Main door	----
5	Bill cashbox cage door	----
6	Belly door	----
7		

The actual distribution and use of security switches will depend on the individual game configuration.

In some jurisdictions, the drop box door security switch function is not required. To meet this jurisdictional standard, a loop-back plug is installed to simulate that the drop box door is always closed.

Door Security During Power Off

All doors are monitored when power is OFF. When power is turned ON, a series of messages on the main LCD screen show which doors have been opened and closed. Typical messages are DOOR OPEN – MAIN, DOOR OPEN - BELLY PANEL, SECURITY CAGE CLOSED - MAIN BOARD. The events are included in game logs and time stamped to power-on time. See Diagnostic Information.

3.2.6 Light Tower

A multi-level light tower may be fitted on top of the game to provide an additional level of customer service, security and house control. The tower has two tiers of different colors. The colors and functionality of the light tower are determined by individual market requirements. The typical functions of a two-tier light tower are described below.

Two-Tier Light Tower

Typical light tower functions are as follows:

Table 3-2 Two-Tier Light Tower

CONDITION	DOOR CLOSED		DOOR OPEN	
	Top Light	Bottom Light	Top Light	Bottom Light
Idle	OFF	OFF	OFF	FAST FLASH
Service	ON	OFF	ON	FAST FLASH
Fault	SLOW FLASH	OFF	SLOW FLASH	FAST FLASH
Hand Pays	SLOW FLASH	SLOW FLASH	SLOW FLASH	FAST FLASH

The light tower indicates one of four possible game states:

The **IDLE** state: the default state when no other state exists.

The **SERVICE** state: the 'Service' button has been being pressed by the player to request service (change, drinks, etc.) (if available).

The **FAULT (TILT)** state: the game will be considered to be in this state when one of the following conditions exist:

- A lockup fault condition (excluding Lower Main Door Open and the Handpays State), such as Logic Door Accesses or Bill Acceptor Error.
- A non-lockup fault condition, such as Bill Cashbox Full or Printer Paper Low.

The **HANDPAYS** state exists when one of the following conditions exist:

- A Jackpot lockup.
- A Cancelled Credit lockup, or
- A Progressive Link Jackpot lockup.

After the lower main door has been closed, the bottom tier light will remain lit (unless it is otherwise flashing) until the start of the next game.

Specifying Light Tower Tiers

A DIP switch is provided at the base of the light tower board to control the four sets of lights on the light tower.

For two tier light towers the top two sets and the bottom two sets of lights are combined.

Table 3-3 Light Tower Tiers - Various Switch Setting

Switch Number						No. of Tiers
1	2	3	4	5	6	
ON	OFF	OFF	OFF	OFF	OFF	2
OFF	ON	OFF	OFF	OFF	OFF	2
ON	ON	OFF	OFF	OFF	OFF	2
OFF	OFF	ON	OFF	OFF	OFF	2
ON	OFF	ON	OFF	OFF	OFF	2
OFF	ON	ON	OFF	OFF	OFF	2
ON	ON	ON	OFF	OFF	OFF	2
OFF	OFF	OFF	ON	OFF	OFF	2

3.2.7 Electromechanical Meters (Hard Meters)

The game may be fitted with electromechanical meters and electronic meters. These meters form part of the comprehensive security system by recording the results of game operations.

A game fitted with Electromechanical Meters will not function if they are not connected.

The electromechanical meters (hard meters), are located on the right-hand-side of the cabinet. The meters provide a permanent and cumulative record of essential counts.

On delivery of a game, these meters are not set to zero because of factory tests. Record the initial meter values before using the game.

The meters cannot be reset and are cumulative for the life of the meter. They accumulate and usually display currency. In cases where a stroke meter is used it provides a numerical count. Currency accumulations are accurate but the meters only display amounts in whole units.

To read the electromechanical meters, turn the audit / operator / meter key switch counter-clockwise to illuminate the area, and view the meters through the viewing window.

Meter Security

Mechanical meters are monitored for abnormal conditions, cage accesses, and meter disconnection. Detection of conditions is actioned as follows:

- Game play is suspended and the alarm sound is heard.
- An appropriate lockup and operator message is actioned, being selected from: METERS FAULTY, METERS CAGE OPEN, METERS DISCONNECTED.
- The appropriate electronic meter increments, being selected from: METERS FAULTY, METERS CAGE OPEN, and METERS DISCONNECTED.

The condition is reset when the game condition is cleared, the lockup is removed, and the door is closed. See Fault Mode - Current Lockup.

3.2.8 Electronic Meters (Soft Meters)

The electronic meters (soft meters) record a variety of details relating to game operation, game play and player interaction, as well as a variety of statistical counts, security events and past games. Players have the assurance there is a record kept of recent win and pay events.

When the game is switched on, it automatically initiates a self-test that continues in the background as long as the game is in play mode. During the self-test, the game checks the electronic meter data held in memory.

Some jurisdictions require electronic metering data to be stored in triplicate in three separate battery-backed RAM chips. In the case of a meter malfunction, where meters sets do not match, the game displays an error message and the game locks up. This message can also indicate that the game software has been changed or a serious game malfunction has occurred.

3.2.9 Start, Reset and Restart Procedure

When installing or replacing a Mk7 high resolution software, the smartcard and the flashcard need to be installed or replaced in the game.

When replacing the existing software with emulated Mk6 games, only the flash card needs to be replaced.

To insert the flash card, push it into the flash card socket on the carrier board.

To insert the smartcard:

1. Lift the cover of the smartcard housing.
2. Insert the SIM style smartcard into the underside of the cover.
3. Close the cover.

Reboot sequence

After the smartcard and flash card have been installed and the mains power is turned ON, the game initiates a series of procedures which result in software being loaded and a game screen being displayed. The sequence of startup steps is shown below:

1. NO SIGNAL INPUT message appears on the screen(s).
   (This may remain for several minutes.)
2. System then checks the smartcard.
3. System then checks for Development SPT.
4. System then load Linux operating system.
5. The screen(s) then go white while the graphics software is loaded.
   (This may remain for several minutes.)
6. The buttons will light up and flash as they are tested.
7. The screen(s) will then go black.
8. A couple of messages will flash up - too fast to read.
9. Testing and loading finishes and the game appears on the screen(s).

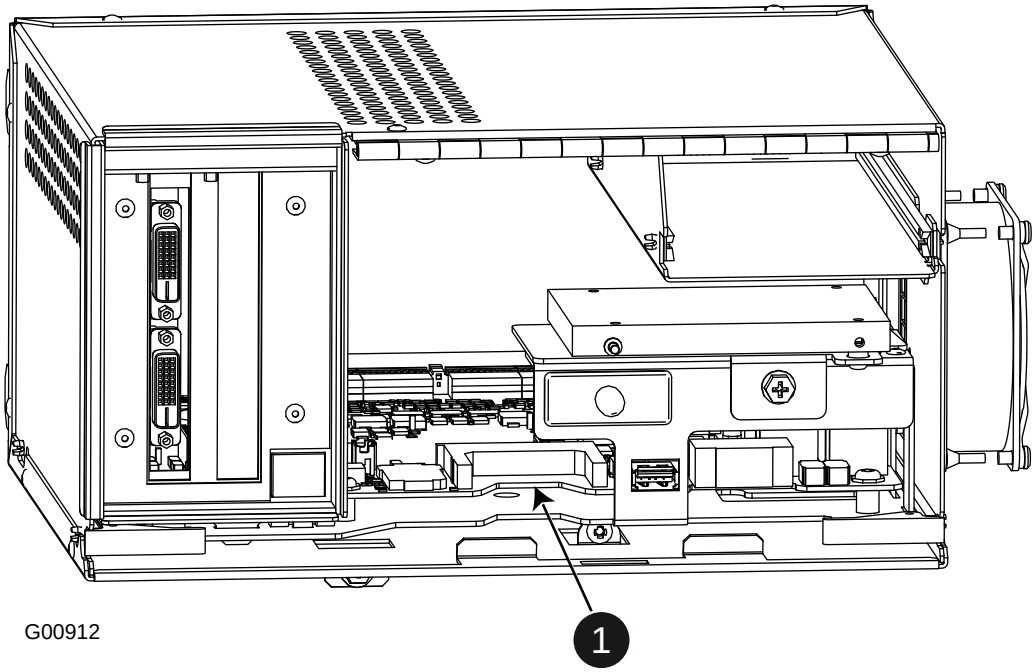
Reset and Restart Procedures

Note that after clearing SRAM in the following procedure, the Accounting and Diagnostic electronic meters are set to zero.

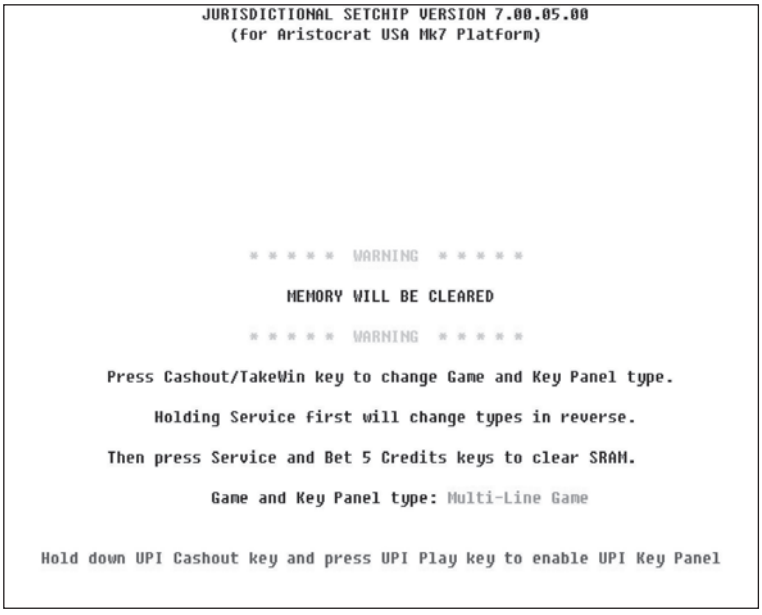
Configuring with the SetChip Program

To configure a new machine in a venue, it is necessary to install and run the Jurisdictional SetChip flash card, run the SetChip Program, and amend the configuration settings as necessary, before installing the System and Game flash card.

Figure 3-3 Location of Flash Card in Logic Cage



1. Take the SETCHIP flash card, insert it into the flash card slot in the logic cage (as shown above) and restart the Game. The following message is displayed.

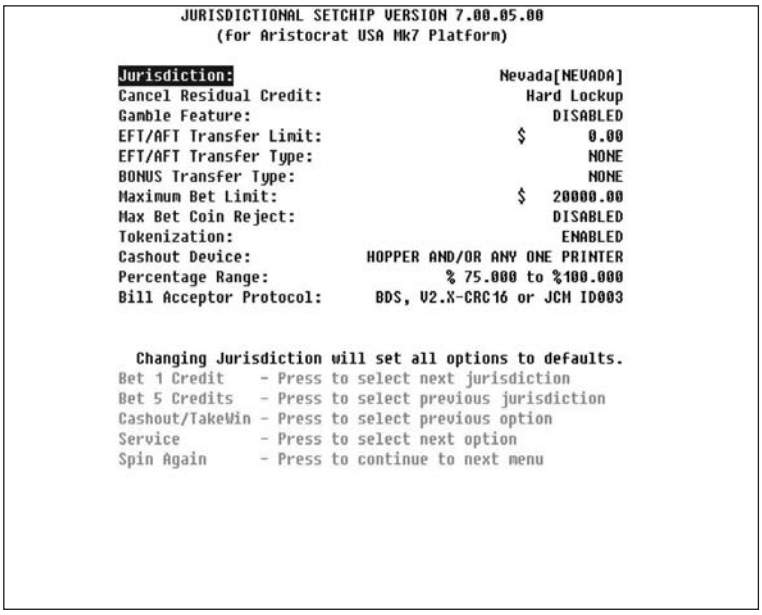


2. Set the Game and Panel Type by pressing the [Cashout / Take Win] key to toggle game and key panel type – the setting will display on the screen GAME and KEY PANEL TYPE: Reel Power Game (25).

3. Press the [Service] and [Bet 5 Credits] buttons (playbutton names vary with Game Type chosen) simultaneously to clear SRAM.
   The Jurisdictional Set Chip Version Menu will be displayed.

4. Press [Spin Again] (SPIN playbutton) to proceed to the Jurisdictional Options Menu.

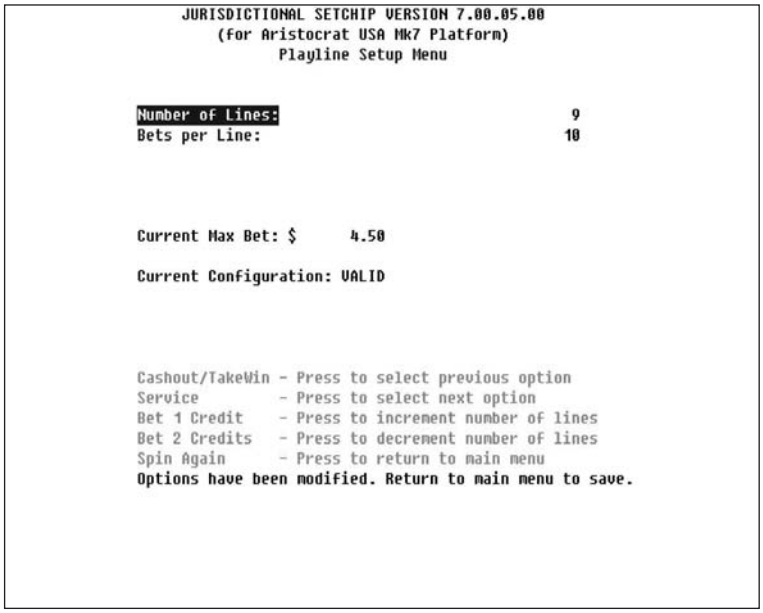
5. After setting the Jurisdiction and making required changes to the configuration items go to the SetChip Main Menu by pressing [Spin Again].



6. Step down to the Money Setup Menu and select the option. The following Money Setup Menu display will be shown.

7. After setting the Money Setup options, press [Spin Again] to return to the main menu. Step down to the Payout Setup Menu and select the option. The following Payout Device and Type Menu screen will be displayed.

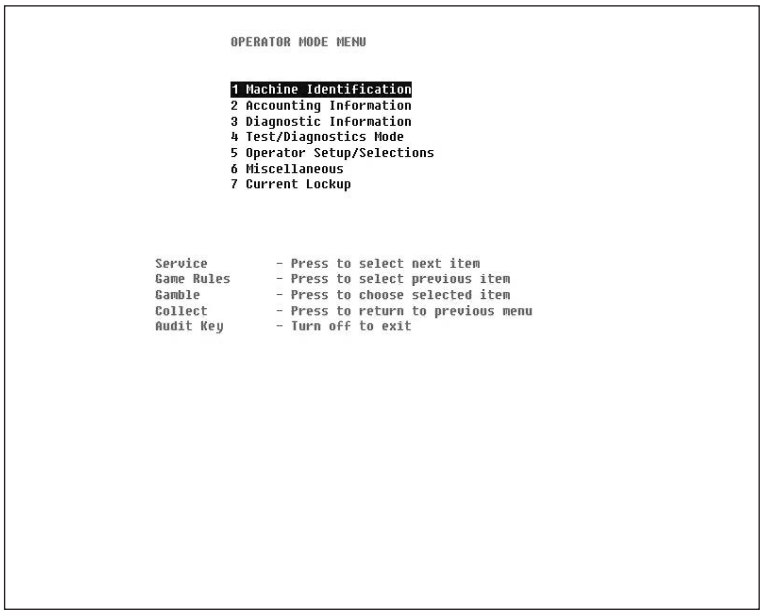
8. After setting the Payout Setup options, press [Spin Again] to return to the main menu. Step down to the Playline Setup Menu and select the option – the Playline Setup Menu will display.



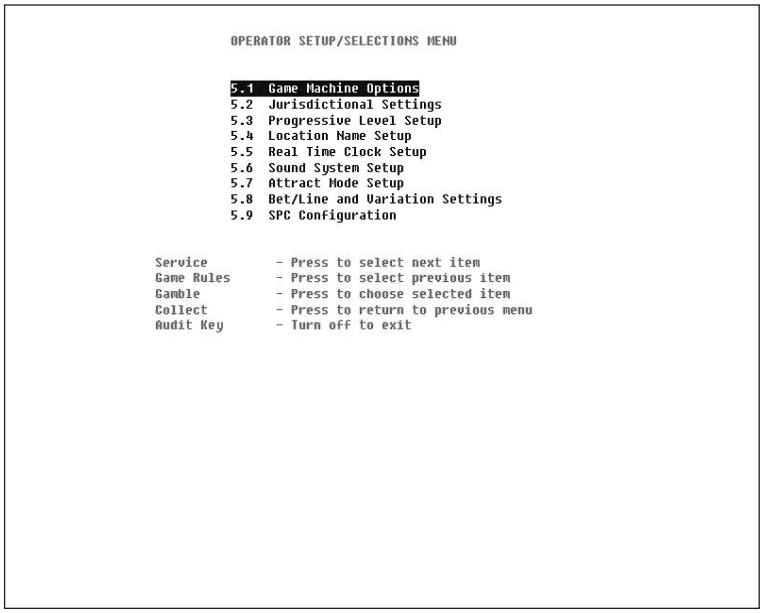
9. After setting the Playline Setup options, press [Spin Again] to return to the main menu. Step down to the Miscellaneous Options Menu and select the option. The following screen will be displayed.

10. After setting the Miscellaneous Options Menu, [Spin Again] to return to the main menu. Select Save all Options from the main menu. The system will request the logic door be opened to permit the saving of the new configuration.
11. Open the logic cage door and save the new configuration options.
12. Turn the power OFF and remove the Jurisdictional SetChip flash card from the logic cage.
13. Install the System and Game flash card.
14. Turn the power ON. The game screen will be displayed and the message MEMORY ERROR – GAME EPROM CHANGED will be seen below the game images.

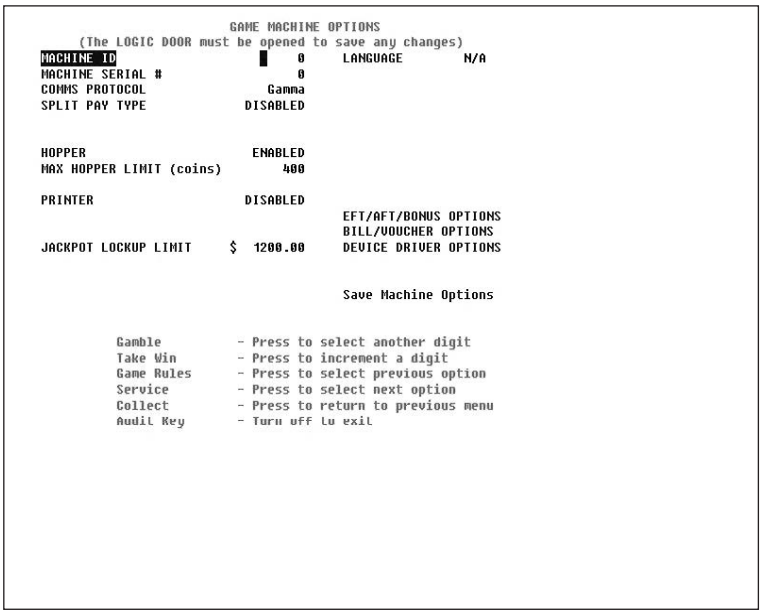
15. Turn the Audit / Operator key clockwise and the Operator Mode Menu will be displayed.



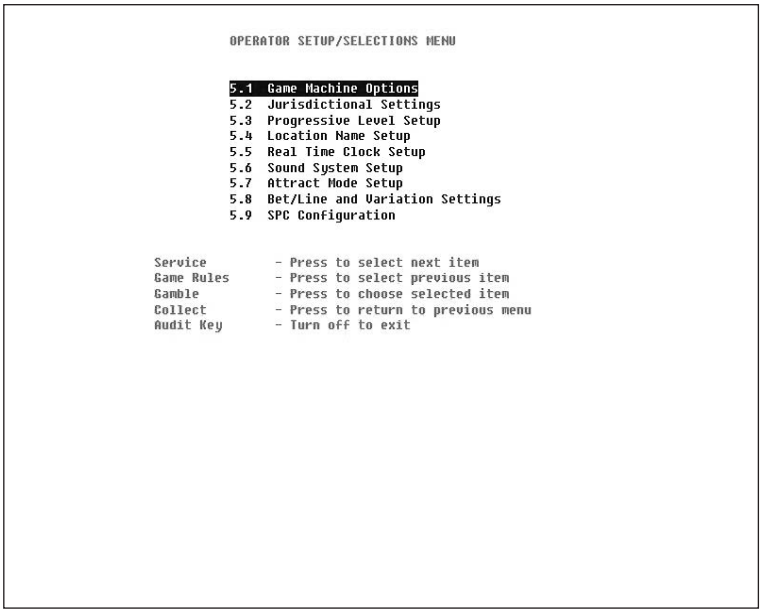
16. Open the main door, step down to the Operator Setup / Selections option, and press Play 4 Reels to go to the menu. The following display will be seen. The Operator Setup / Selections Menu enables a range of configuration items to be set prior to permitting game play to commence.



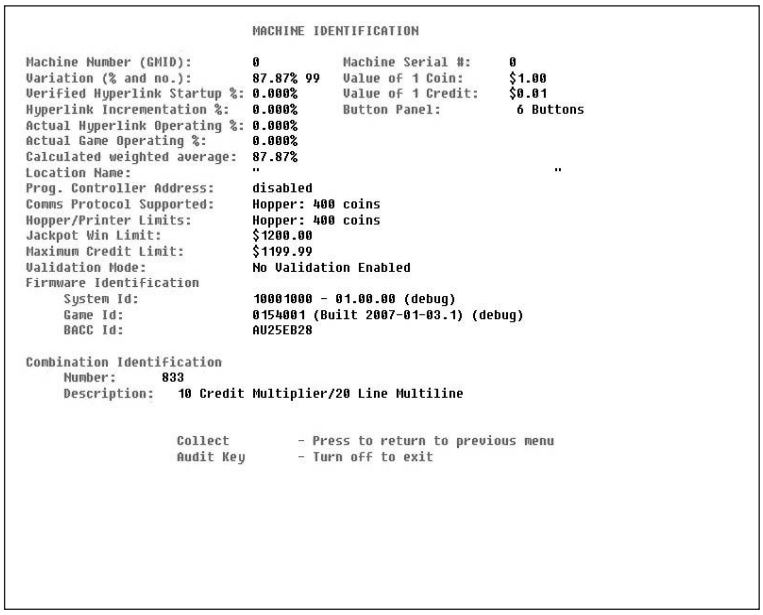
17. Select the Game Machine Options from the menu and press Play 4 Reels to go to the menu.



18. Change the necessary options in the Game Machine Options including the EFT/Bonus, Bill/Voucher, Device Driver Options.
    Open the Logic Door and select Save Machine Options to set the configuration as selected.
    Change other items in the Operator Setup / Selections Menu as required.
19. Return to the Operator Setup / Selections by pressing Bet 3 Credits and then return to the Operator Mode Menu by pressing Bet 3 Credits.



20. Select Machine Identification from the menu and press Play 4 Reels to display the options.



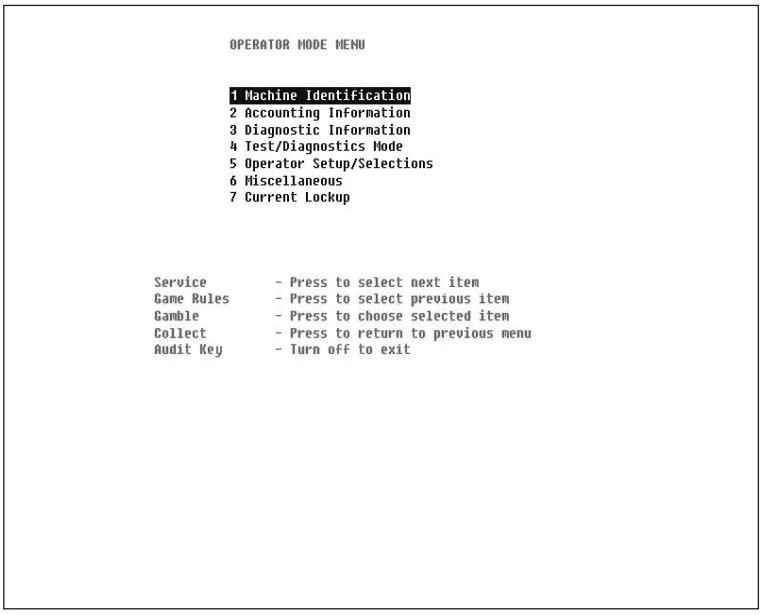
21. Review the configuration settings in the Machine Identification display. Note that Firmware Identification – BACC Id is not displayed at this time.
22. Follow the on-screen guidance to reset the static RAM by pressing both the nominated buttons simultaneously (Cash Out / Take Win and Service). Wait 3 seconds as requested by the display.
    A message WAITING FOR BACC TO VERIFY will be displayed and after a short delay the BACC CRC security check will be completed.
    The BACC Id Firmware Number will now be seen in Machine Identification display.
23. Shut the logic door and the main door. The Operator Mode Menu will be on display. Turn the Operator Key OFF and game screen will be displayed. The message MEMORY RESET is displayed beneath game images.

The machine is ready for gameplay.

3.3 Operator Mode

Operator Mode addresses the jurisdictional and accounting / management information requirements, allows the game configuration to be changed, and facilitates game testing and fault finding. Entry to Operator Mode is achieved by turning the audit (operator) key ON. The various options can be selected by following the on-screen guidance and pressing the appropriate playbutton.

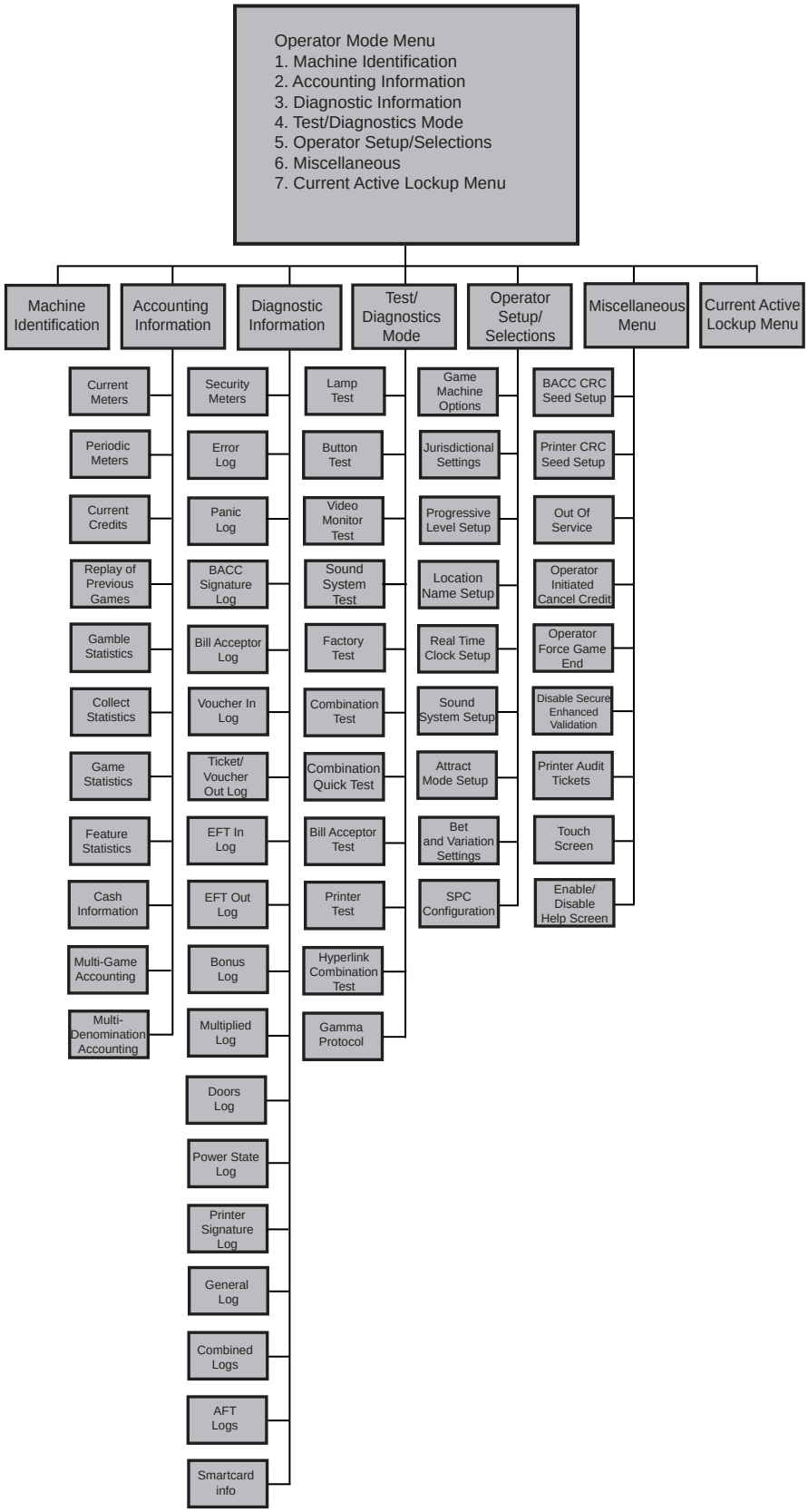
The screen displays and options covered in this chapter are typical; however, slight variations may occur between markets.



"Operator Key - Turn off to exit" message will not be displayed if a Lockup is present.

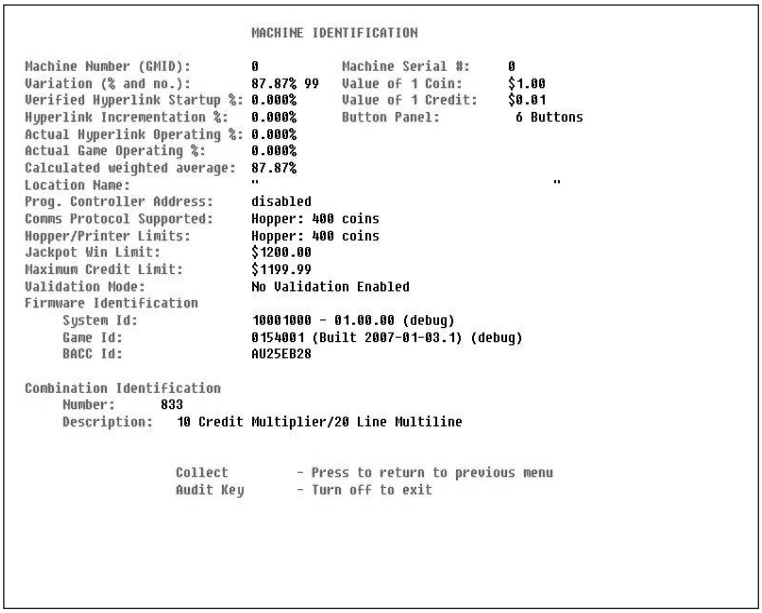
Instructions are given on each screen to guide the operator through the various menus and options available. Any active lockups are indicated by a flashing message at the bottom of the screen.

Figure 3-4 Operator Mode Menu Displays - Typical Structure



3.3.1 Machine Identification

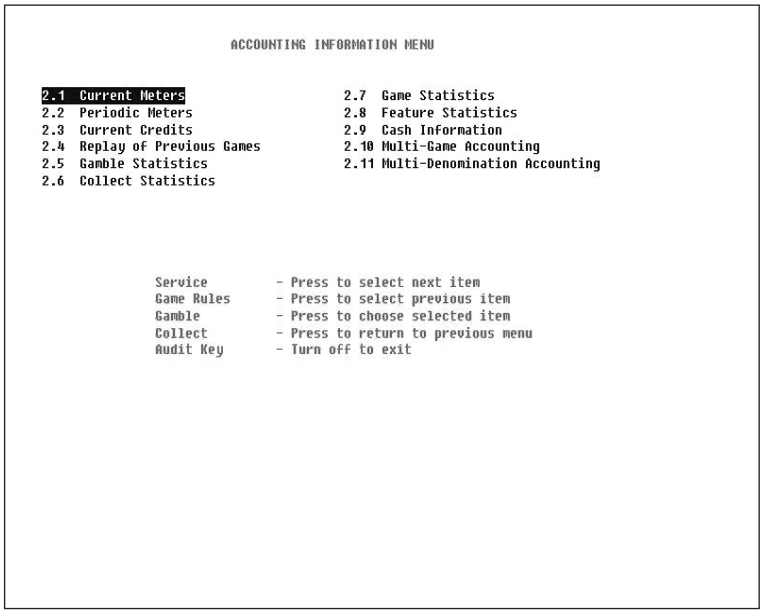
The Machine Identification screen provides essential game information, such as game ID, credit value, percentage return, and jackpot limit.



3.3.2 Accounting Information

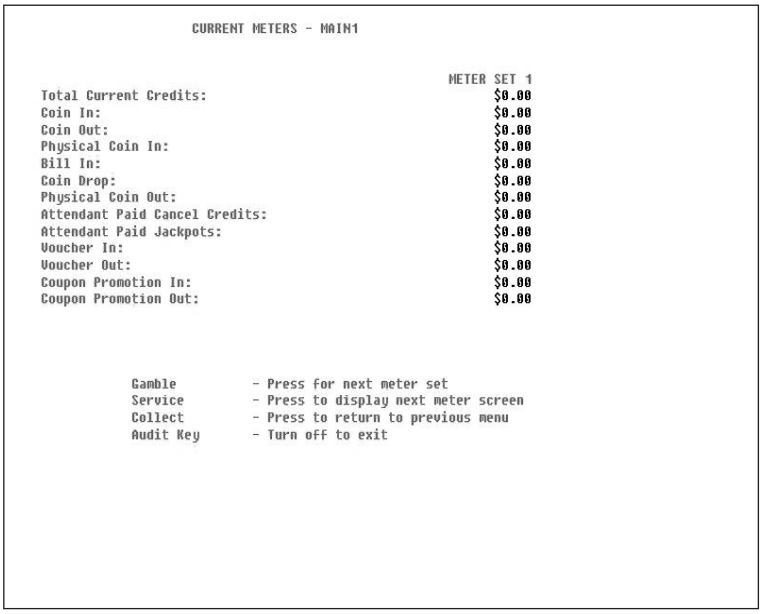
The Accounting Information displays provide information for government authorities, as well as additional financial and statistical details. This includes periodic performance details, game replay, and game and gamble statistics. Most of the information can not be altered although some details may be changed through Operator Setup / Selections ⇒ Game Machine Options.

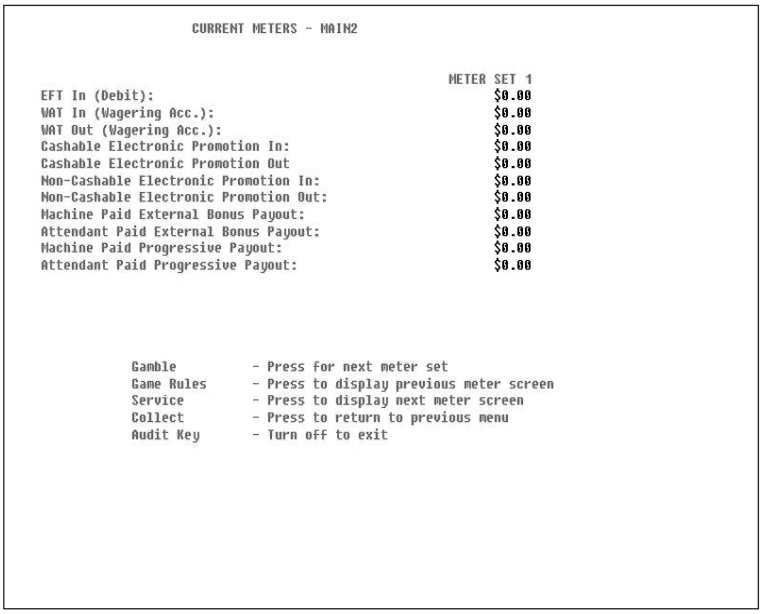
The various screen displays may be accessed by following the on-screen guidance and pressing the appropriate buttons.

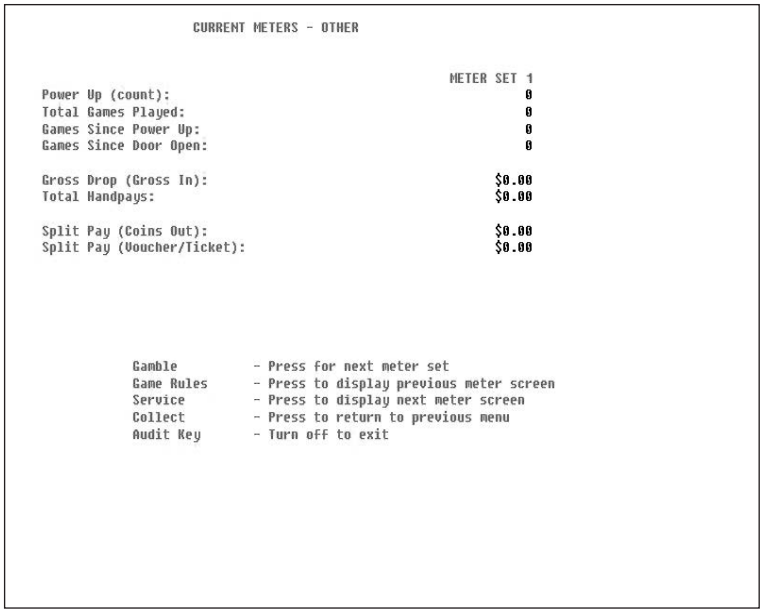


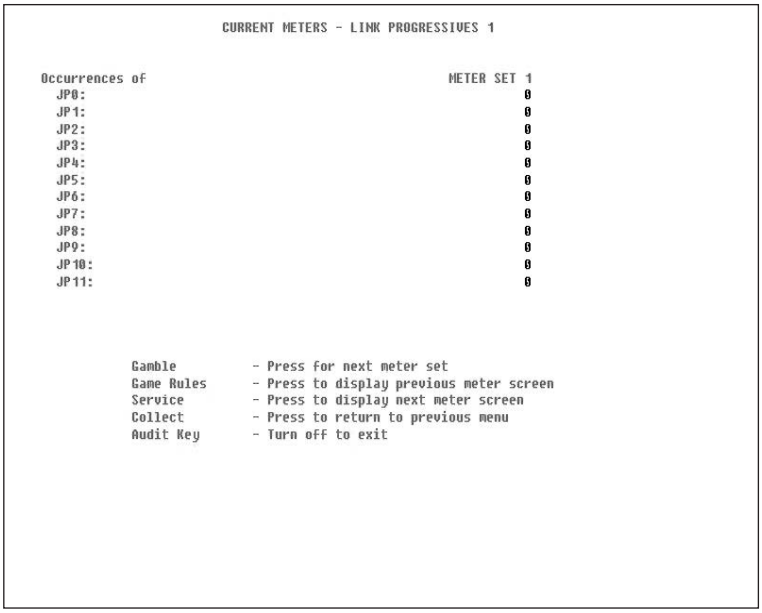
Current Meters

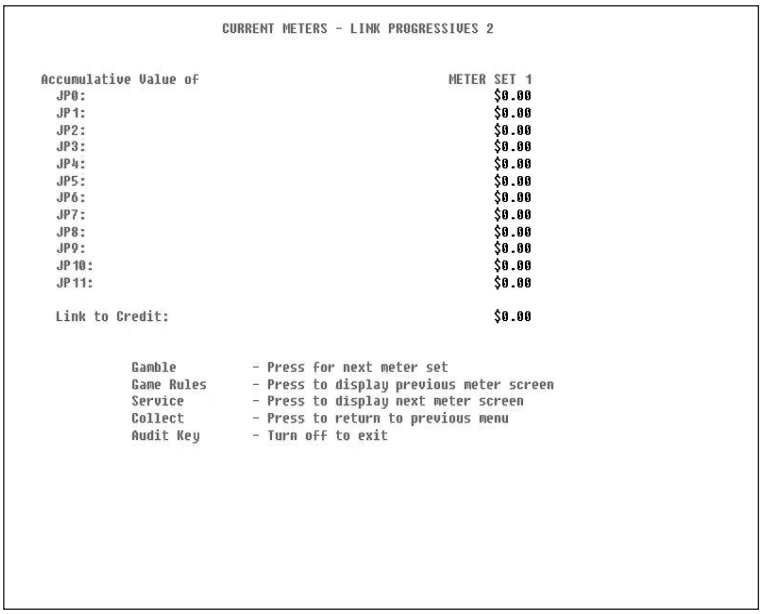
The Current Meters provide the financial counts of game activity. Items include turnover, total wins, and amounts inserted in the bill acceptor device. In depth statistical information is also provided by the game and gamble displays.

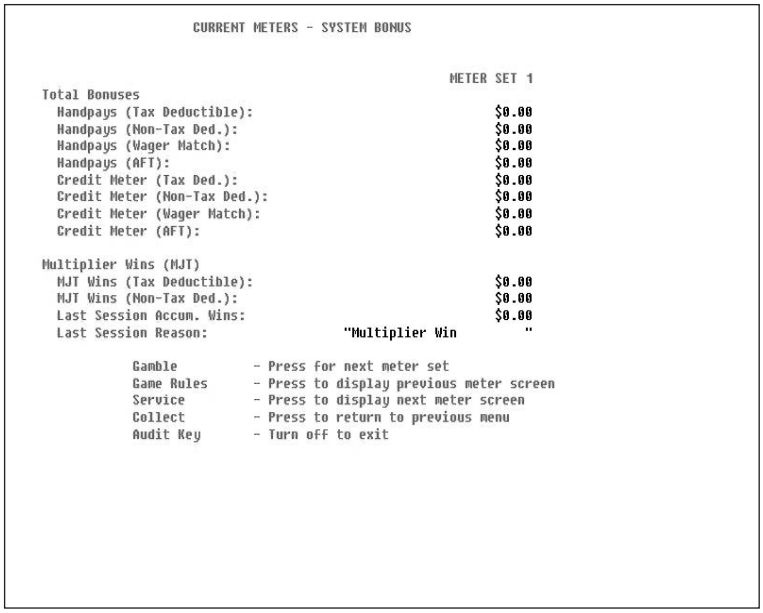


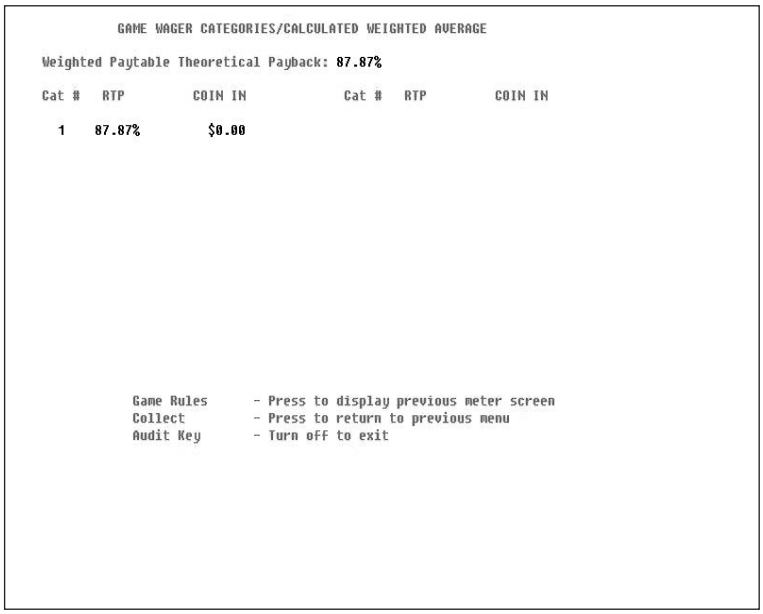



CURRENT METERS - OTHER
METER SET 1
Power Up (count): 0
Total Games Played: 0
Games Since Power Up: 0
Games Since Door Open: 0
Gross Drop (Gross In): $0.00
Total Handpays: $0.00
Split Pay (Coins Out): $0.00
Split Pay (Voucher/Ticket): $0.00
Gamble - Press for next meter set
Game Rules - Press to display previous meter screen
Service - Press to display next meter screen
Collect - Press to return to previous menu
Audit Key - Turn off to exit


CURRENT METERS - LINK PROGRESSIVES 1
Occurrences of
METER SET 1
JP0:
0
JP1:
0
JP2:
0
JP3:
0
JP4:
0
JP5:
0
JP6:
0
JP7:
0
JP8:
0
JP9:
0
JP10:
0
JP11:
0
Gamble - Press for next meter set
Game Rules - Press to display previous meter screen
Service - Press to display next meter screen
Collect - Press to return to previous menu
Audit Key - Turn off to exit

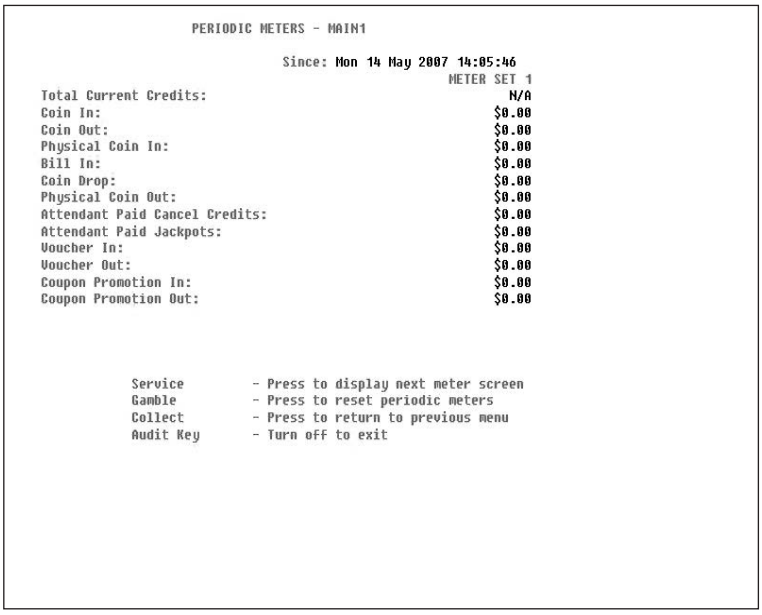

CURRENT METERS - LINK PROGRESSIVES 2
Accumulative Value of
METER SET 1
JP0:
$0.00
JP1:
$0.00
JP2:
$0.00
JP3:
$0.00
JP4:
$0.00
JP5:
$0.00
JP6:
$0.00
JP7:
$0.00
JP8:
$0.00
JP9:
$0.00
JP10:
$0.00
JP11:
$0.00
Link to Credit:
$0.00
Gamble - Press for next meter set
Game Rules - Press to display previous meter screen
Service - Press to display next meter screen
Collect - Press to return to previous menu
Audit Key - Turn off to exit

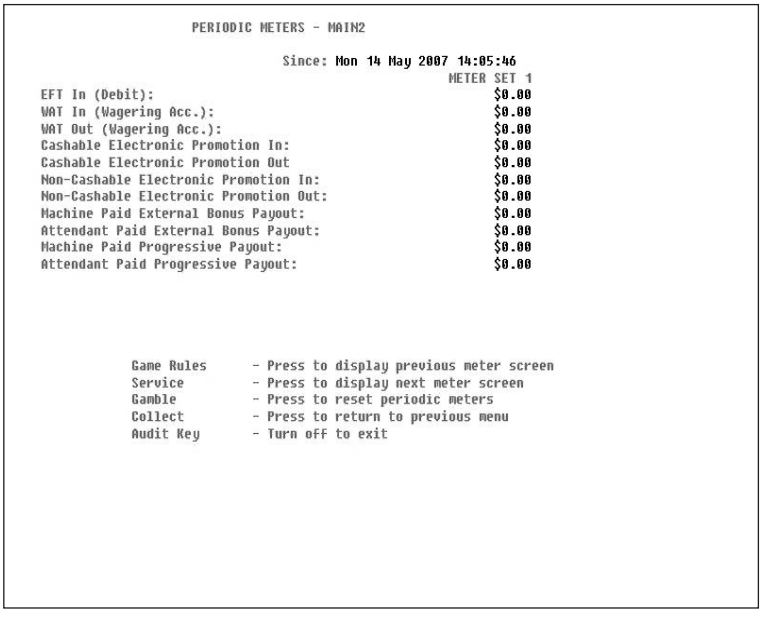

CURRENT METERS - SYSTEM BONUS
METER SET 1
Total Bonuses
Handpays (Tax Deductible): $0.00
Handpays (Non-Tax Ded.): $0.00
Handpays (Wager Match): $0.00
Handpays (AFT): $0.00
Credit Meter (Tax Ded.): $0.00
Credit Meter (Non-Tax Ded.): $0.00
Credit Meter (Wager Match): $0.00
Credit Meter (AFT): $0.00
Multiplier Wins (MJT)
MJT Wins (Tax Deductible): $0.00
MJT Wins (Non-Tax Ded.): $0.00
Last Session Accum. Wins: $0.00
Last Session Reason: "Multiplier Win "
Gamble - Press for next meter set
Game Rules - Press to display previous meter screen
Service - Press to display next meter screen
Collect - Press to return to previous menu
Audit Key - Turn off to exit


GAME WAGER CATEGORIES/CALCULATED WEIGHTED AVERAGE
Weighted Paytable Theoretical Payback: 87.87%
Cat # RTP COIN IN Cat # RTP COIN IN
1 87.87% $0.00
Game Rules - Press to display previous meter screen
Collect - Press to return to previous menu
Audit Key - Turn off to exit

Periodic Meters

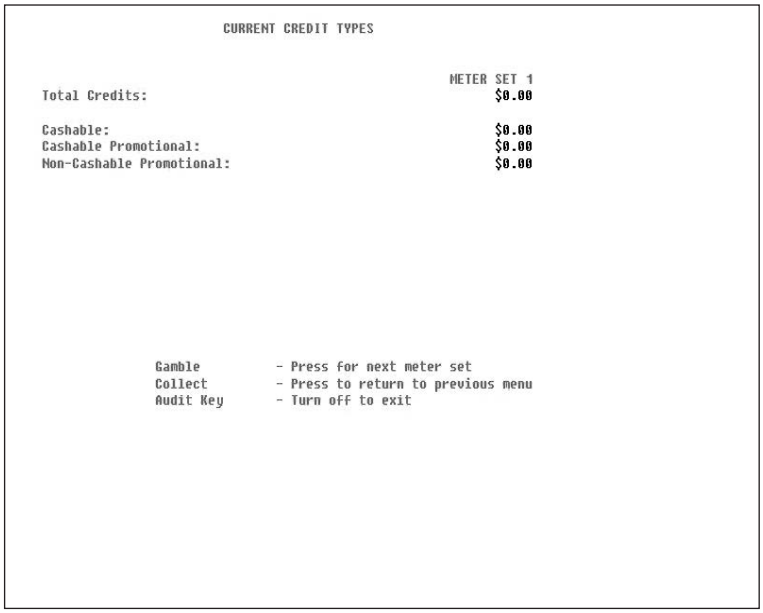
The Periodic Meters screens contain the same information items as the Jurisdictional Meters, but the values held usually relate only to a specified period determined by the venue management. The periodic meters can be reset via the Miscellaneous Options from the Operator Mode Menu.





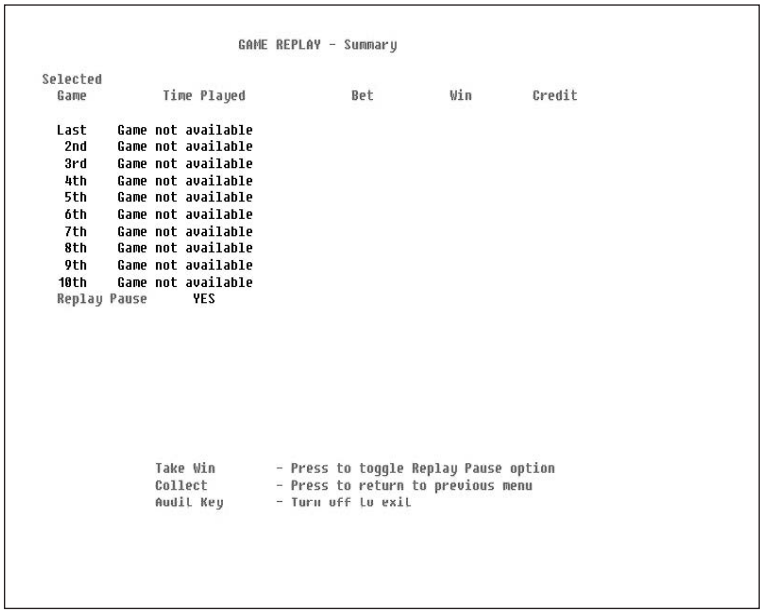
Current Credit Meters

The Current Credit Meters can be reset via the Miscellaneous option from the Operator Mode Menu.



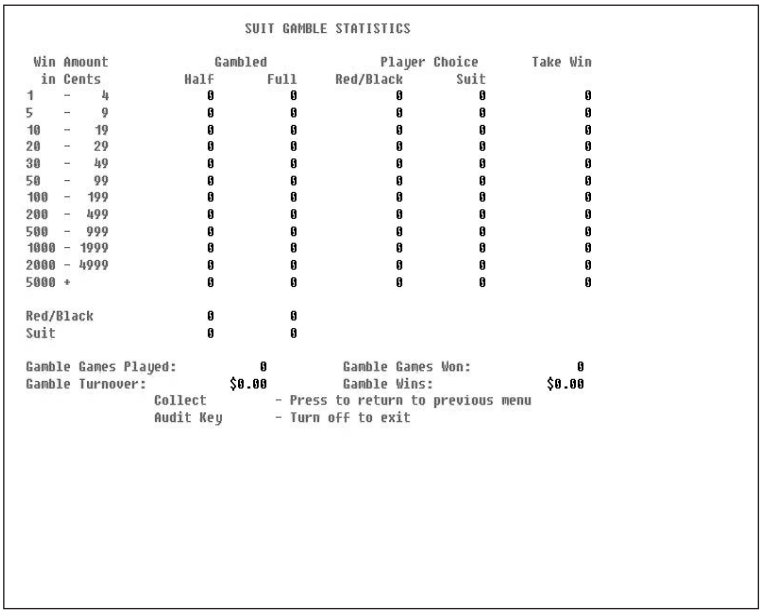
Replay Previous Games

The Replay Previous Games screen allows the operator to replay the most recent games played on the game. The most recent game is game number 1, and approximately twenty of the most recent games are normally available to be replayed. Because these game histories are stored dynamically in memory, the number of games available to be recalled will vary depending on the available memory. Options provide additional levels of detail should they be required.



Gamble Statistics

The Gamble Statistics screen displays the gamble statistic of the game. For each winning amount within a winning range, the selected gambled or Take win is recorded.



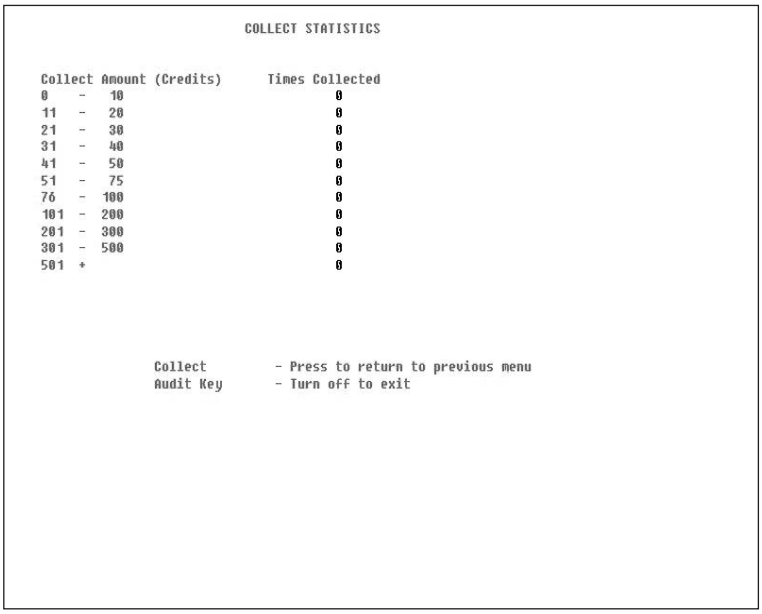
SUIT GAMBLE STATISTICS

Win Amount in Cents	Gambled Half	Gambled Full	Player Choice Red/Black	Player Choice Suit	Take Win
1 - 4	0	0	0	0	0
5 - 9	0	0	0	0	0
10 - 19	0	0	0	0	0
20 - 29	0	0	0	0	0
30 - 49	0	0	0	0	0
50 - 99	0	0	0	0	0
100 - 199	0	0	0	0	0
200 - 499	0	0	0	0	0
500 - 999	0	0	0	0	0
1000 - 1999	0	0	0	0	0
2000 - 4999	0	0	0	0	0
5000 +	0	0	0	0	0
Red/Black	0	0			
Suit	0	0			

Gamble Games Played: 0 Gamble Games Won: 0
Gamble Turnover: $0.00 Gamble Wins: $0.00
Collect - Press to return to previous menu
Audit Key - Turn off to exit

Collect Statistics

This screen provides information on how many times collect was selected for different win amounts.



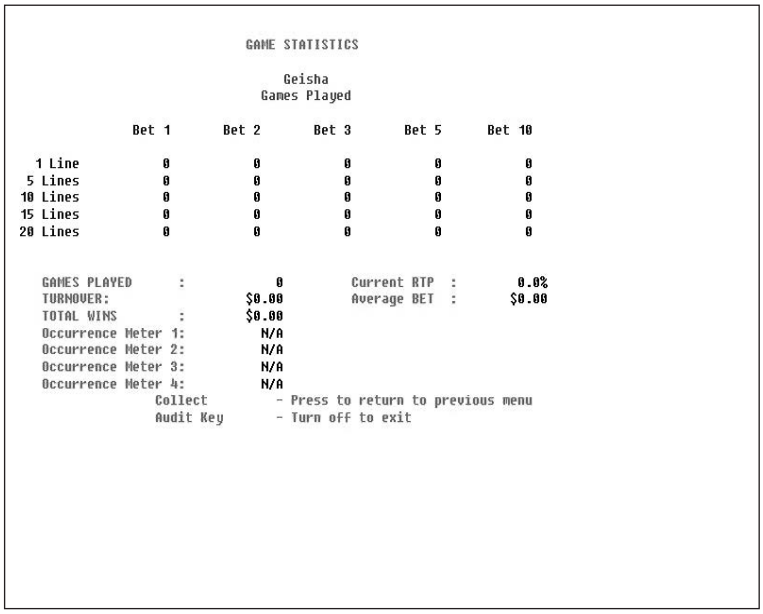
COLLECT STATISTICS

Collect Amount (Credits)	Times Collected
0 - 10	0
11 - 20	0
21 - 30	0
31 - 40	0
41 - 50	0
51 - 75	0
76 - 100	0
101 - 200	0
201 - 300	0
301 - 500	0
501 +	0

Collect - Press to return to previous menu
Audit Key - Turn off to exit

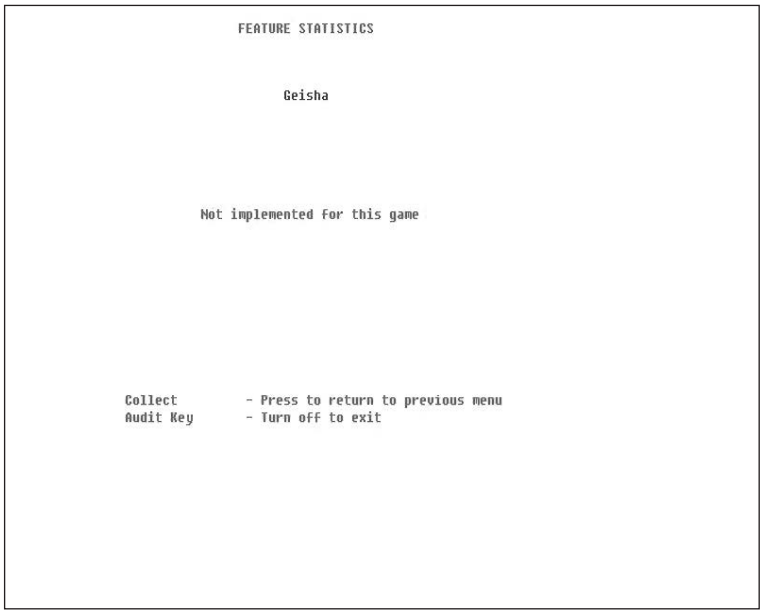
Game Statistics

Details of game play are recorded and displayed through the Game Statistics option. The types of bets and lines chosen are analyzed, and the number of games played and the money won is displayed for each sub-division.



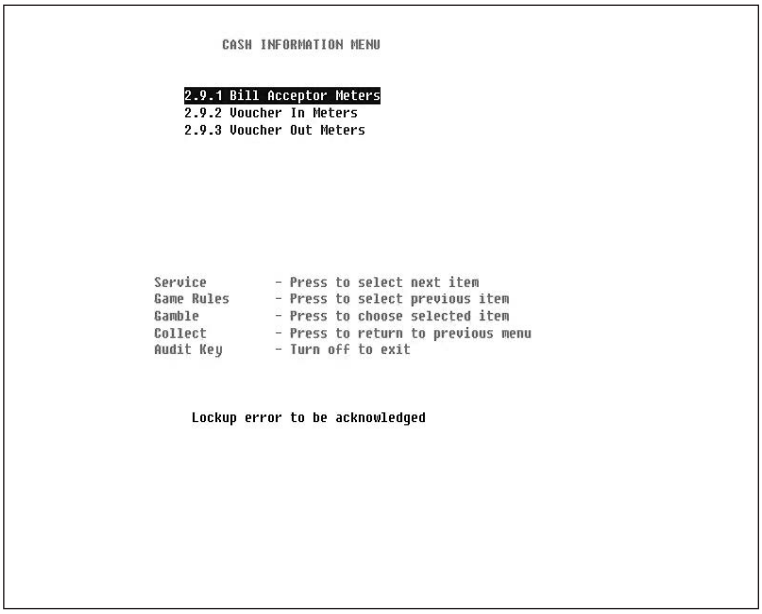
Feature Statistics

Varies with each game installed - provides specific analysis of game play and features for the installed games.



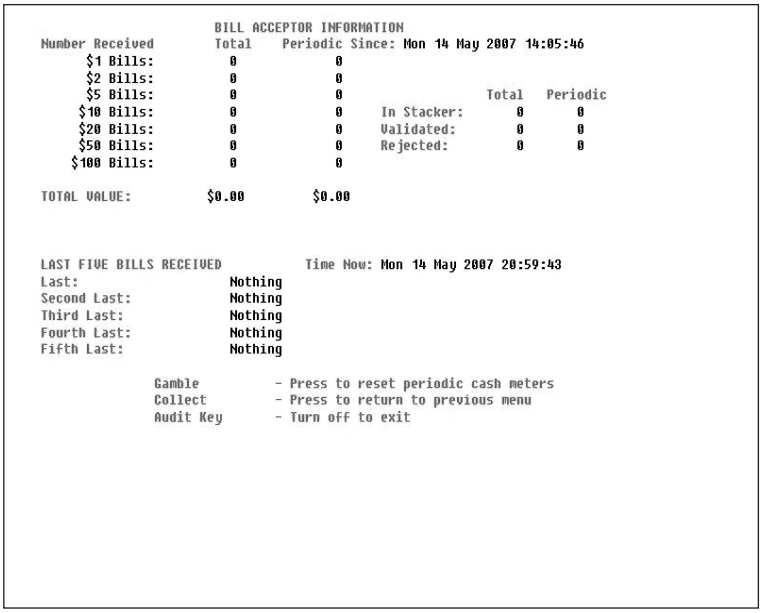
Cash Information

Cash Information displays provide details of bill acceptor activities including information on the last five bills accepted. Voucher in and voucher out details are recorded and displayed.



Bill Acceptor Meters

The Bill Acceptor Meters provide the financial counts of game activity. Items include total and periodic value, amounts inserted and rejected, last five received bills in the bill acceptor.



Voucher in Meters

The Voucher in Meters record vouchers input to the game. Items include voucher in type, value, non-cashable, cashable and the information on the last five vouchers received.

```
 VOUCHERS IN                  Total and Since Mon 14 May 2007 14:05:46

Voucher In Type              Total #    Total Amt   Periodic       Amount
Cashable Vouchers:               0       $0.00          0       $0.00
Non-Cashable Promotional:        0       $0.00          0       $0.00
Cashable Promotional:            0       $0.00          0       $0.00
Unknown Type:                    0       $0.00          0       $0.00
                Total:           0       $0.00

Vouchers In Stacker:             0                      0
Vouchers Validated:              0                      0
Vouchers Confiscated:            0                      0
Change Credits Obtained:         0                      0

LAST FIVE VOUCHERS RECEIVED     Time Now: Mon 14 May 2007 21:00:05
Last Voucher In:      Nothing
Second Voucher In:    Nothing
Third Voucher In:     Nothing
Fourth Voucher In:    Nothing
Fifth Voucher In:     Nothing

                Gamble          - Press to reset periodic voucher meters
                Collect         - Press to return to previous menu
                Audit Key       - Turn off to exit
```

Voucher Out Meters

The Voucher out Meters record vouchers output by the game. Items include voucher out type, value, non-cashable and cashable, winning amount within a winning range and the information on the last five vouchers printed.

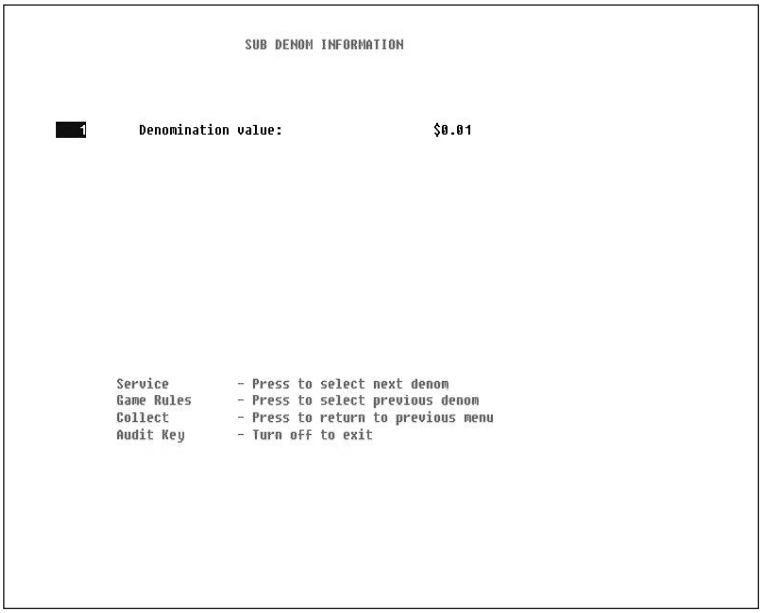
```
 VOUCHERS OUT                 Total and Since Mon 14 May 2007 14:05:46


Voucher Out Type             Total #    Total Amt   Periodic       Amount
Cashable Vouchers:               0       $0.00          0       $0.00
Non-Cashable Promotional:        0       $0.00          0       $0.00
Cashable Promotional:            0       $0.00          0       $0.00
                Total:           0       $0.00

Cashout Vouchers:                0       $0.00          0       $0.00
Cash Win Vouchers:               0       $0.00          0       $0.00
Jackpot Vouchers:                0       $0.00          0       $0.00
                Total:           0       $0.00

LAST FIVE VOUCHERS PRINTED      Time Now: Mon 14 May 2007 21:00:26
Last Voucher Out:     Nothing
Second Voucher Out:   Nothing
Third Voucher Out:    Nothing
Fourth Voucher Out:   Nothing
Fifth Voucher Out:    Nothing

                Gamble          - Press to reset periodic voucher meters
                Collect         - Press to return to previous menu
                Audit Key       - Turn off to exit
```

Multi Game Accounting

Multi Game Accounting provides various game play information installed in the game.

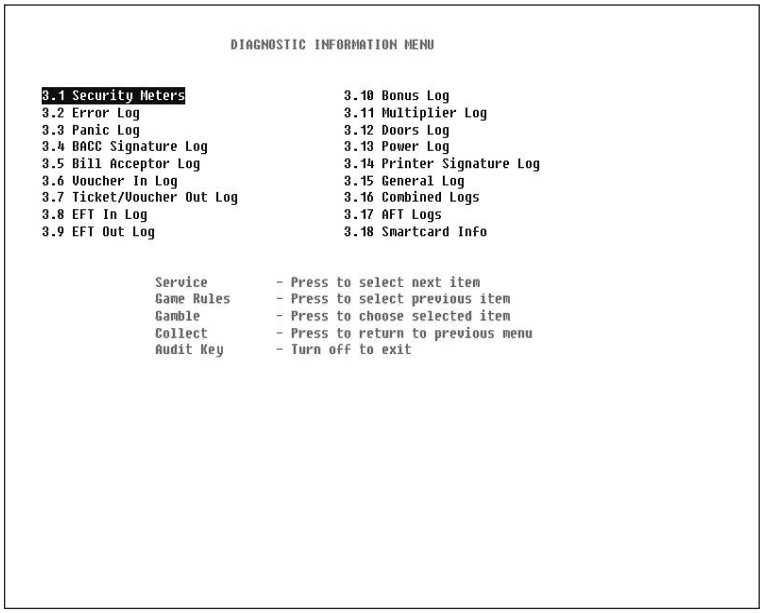
Multi Denomination Accounting

Multi Denomination Accounting provides denomination values used in the game.



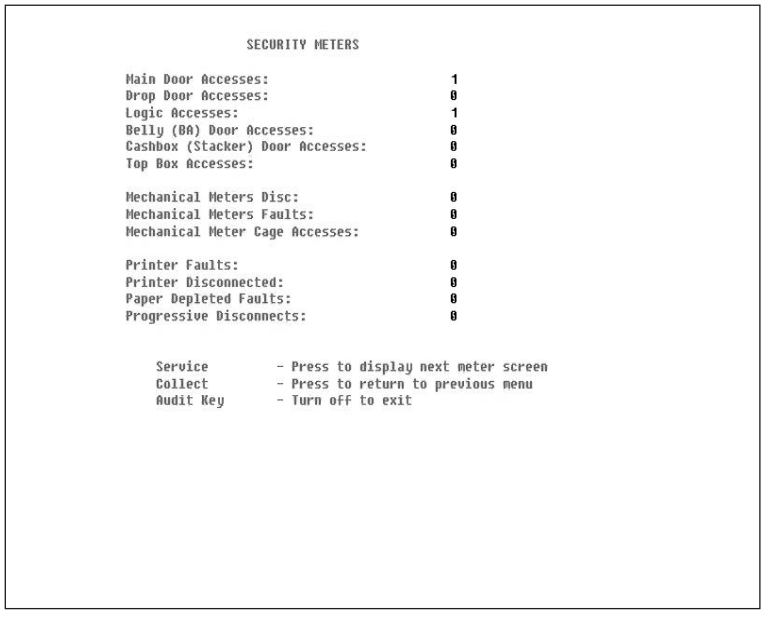
3.3.3 Diagnostic Information Menu

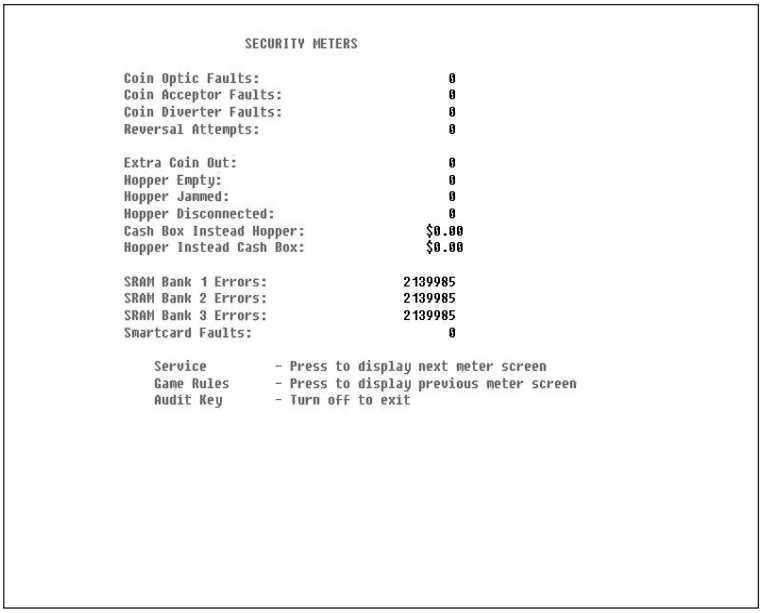
The Diagnostic Information Menu provides access to the security meter counts, the various logs and extra information provided for signature security checks.

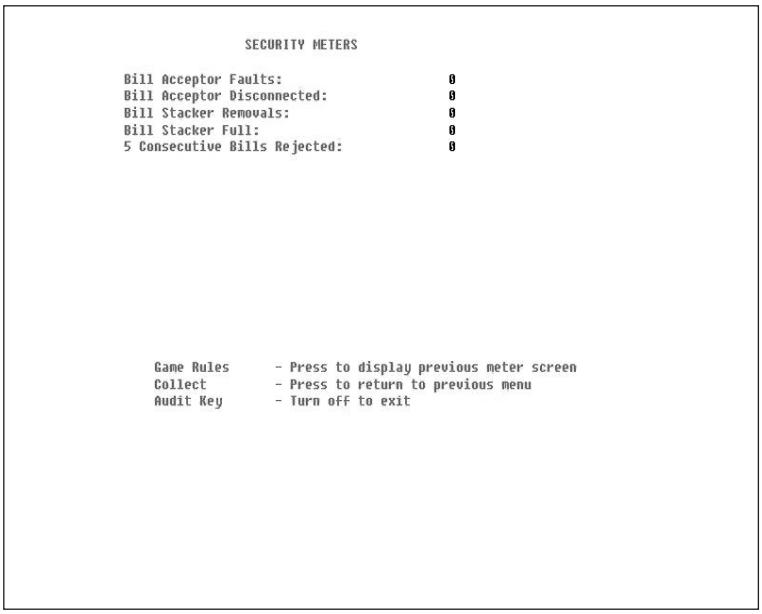


Security Meters

The Security Meters provide information about all the door accesses, meter faults and disconnection counts of game activity.




SECURITY METERS
Coin Optic Faults: 0
Coin Acceptor Faults: 0
Coin Diverter Faults: 0
Reversal Attempts: 0
Extra Coin Out: 0
Hopper Empty: 0
Hopper Jammed: 0
Hopper Disconnected: 0
Cash Box Instead Hopper: $0.00
Hopper Instead Cash Box: $0.00
SRAM Bank 1 Errors: 2139985
SRAM Bank 2 Errors: 2139985
SRAM Bank 3 Errors: 2139985
Smartcard Faults: 0
Service - Press to display next meter screen
Game Rules - Press to display previous meter screen
Audit Key - Turn off to exit


SECURITY METERS
Bill Acceptor Faults: 0
Bill Acceptor Disconnected: 0
Bill Stacker Removals: 0
Bill Stacker Full: 0
5 Consecutive Bills Rejected: 0
Game Rules - Press to display previous meter screen
Collect - Press to return to previous menu
Audit Key - Turn off to exit

Constraints and Limitations of Log Displays

Information is recorded in the various logs whenever an event occurs. The events are listed in time order until the log is filled. Later events continue to be recorded, and the record of the earliest events is deleted. In effect, each log lists the latest series of events.

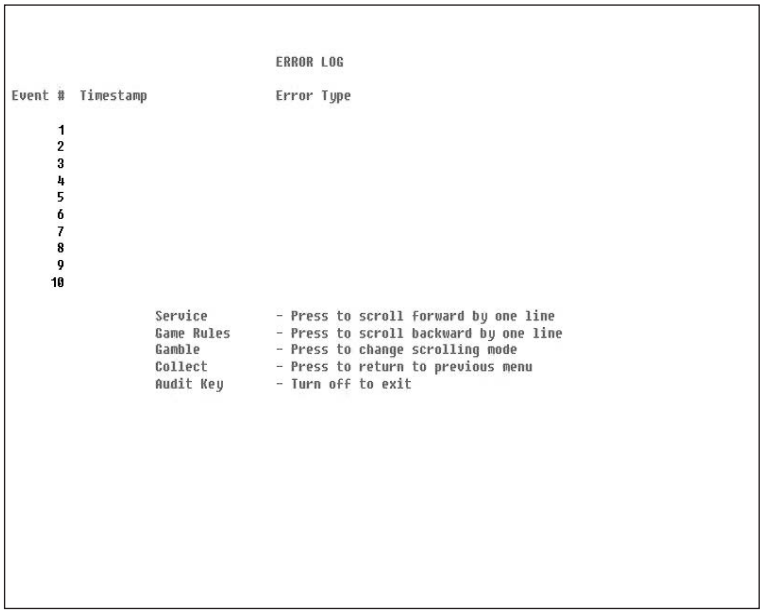
The size of each log are given below.

Log Name	Size (No. of Events)
Error Log	100
Panic Log	10
Note Log	100
Doors Log	100
Power Log	50
General Log	1000

The Master Log displays the available events in all the above logs. The maximum size is 1360 entries.

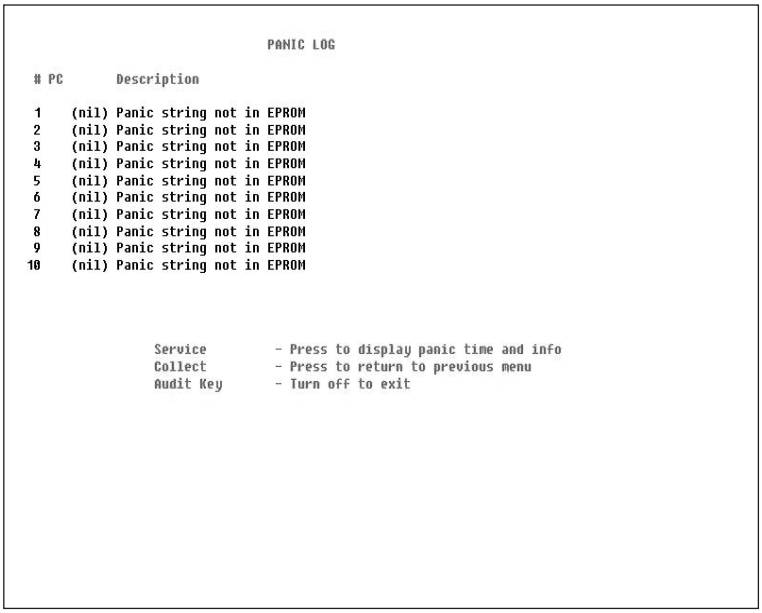
Error Log

This screen display shows the date, time and type of the most recent error messages. The log holds information on the last one hundred errors.



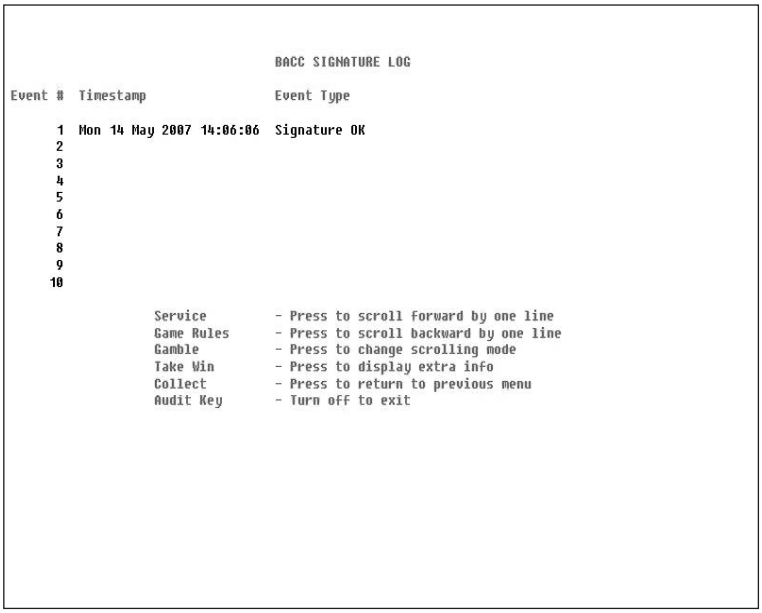
Panic Log

Information is recorded in this log whenever a critical error occurs from which the game cannot recover.



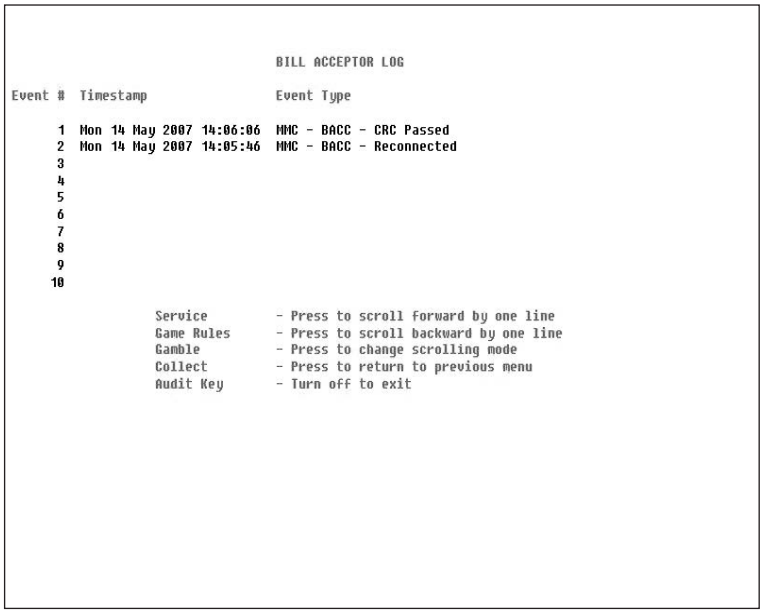
BACC (Bill Acceptor) Signature Log

The BACC Signature log provides security check information.



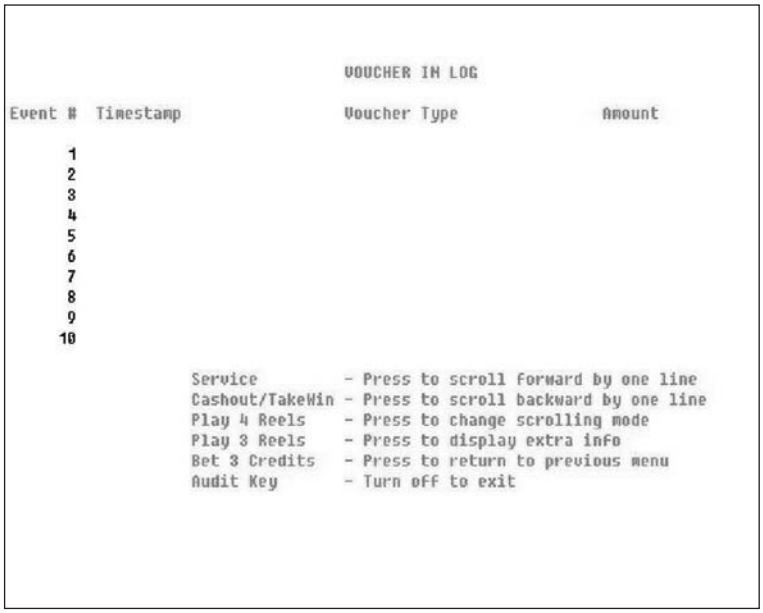
Bill Acceptor Log

This log provides a record of events generated by the bill acceptor's driver – items include cashbox removed and bill acceptor disconnected.



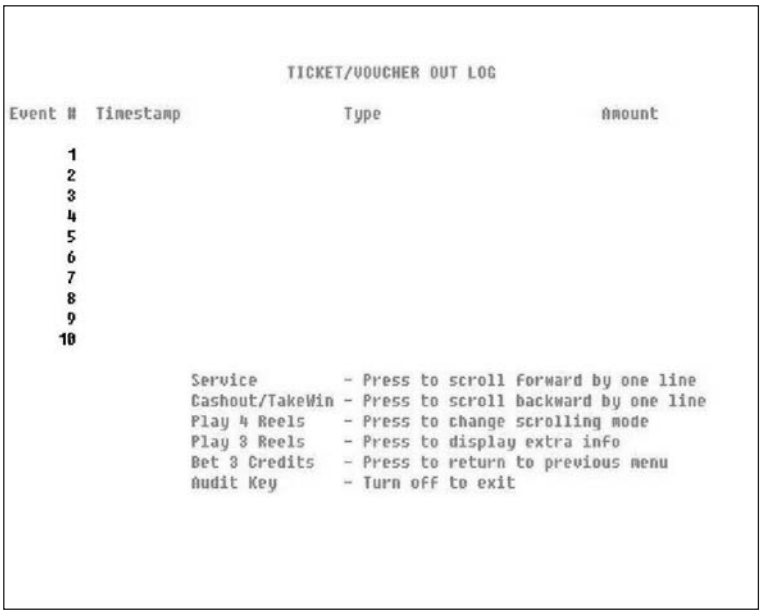
Voucher In Log

Voucher in events are itemized in the Voucher In Log.



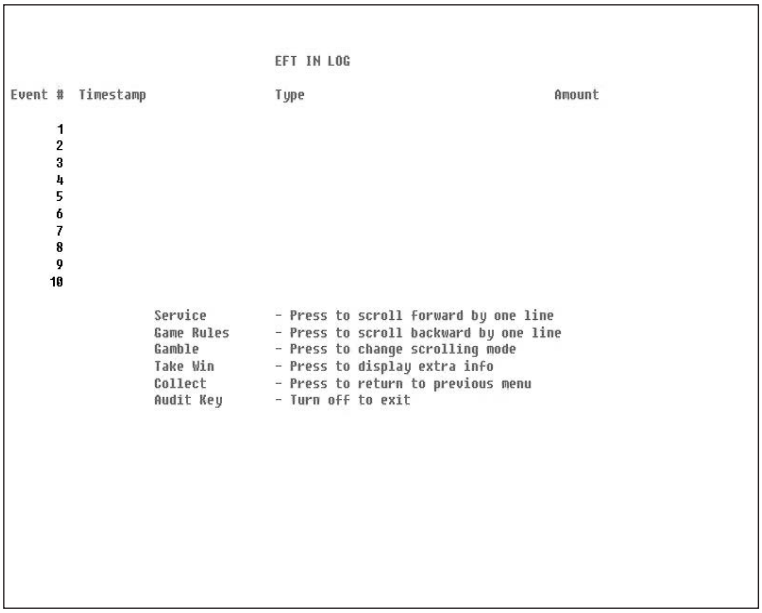
Voucher/Voucher Out Log

Voucher and voucher out events are itemized in the Voucher / Voucher Out Log.



EFT In Log

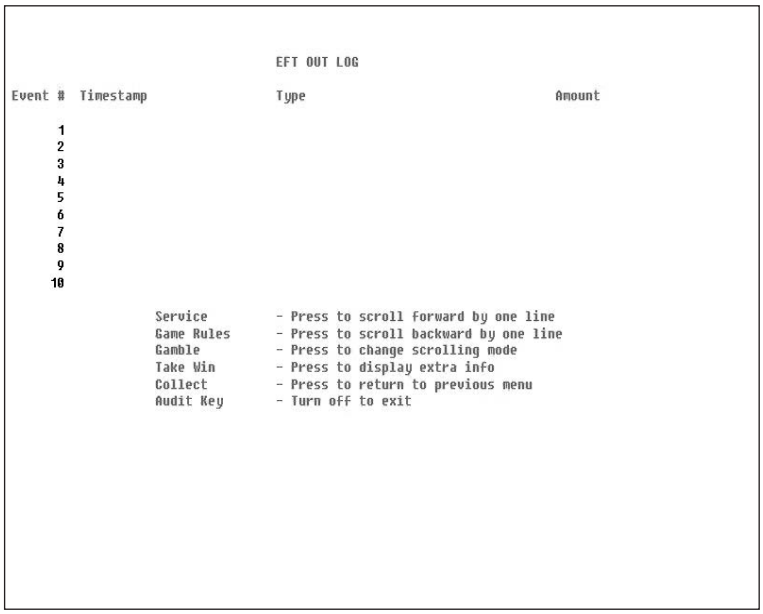
EFT (electronic funds transfer) in events are itemized in the EFT In Log.



The EFT In Log Extra Information display provides security check information.

EFT Out Log

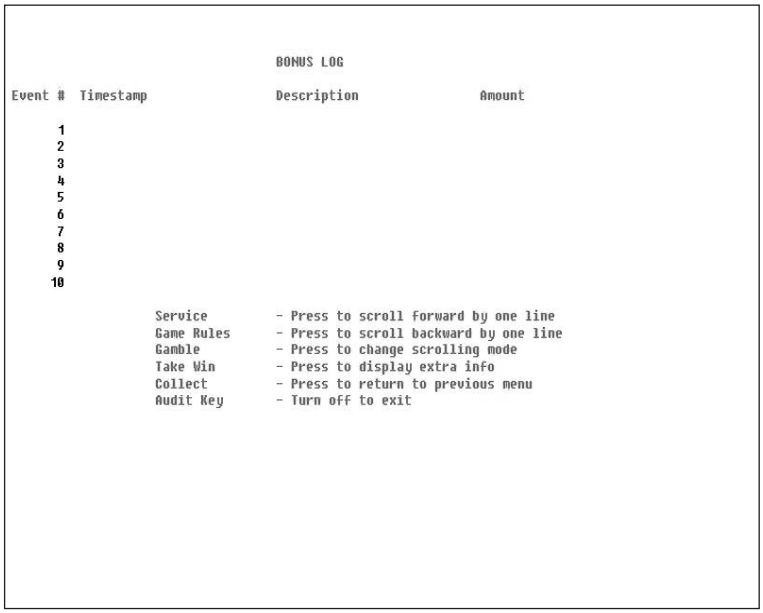
EFT out events are itemized in the EFT Out Log.



The EFT Out Log extra information display provides security check information.

Bonus Log

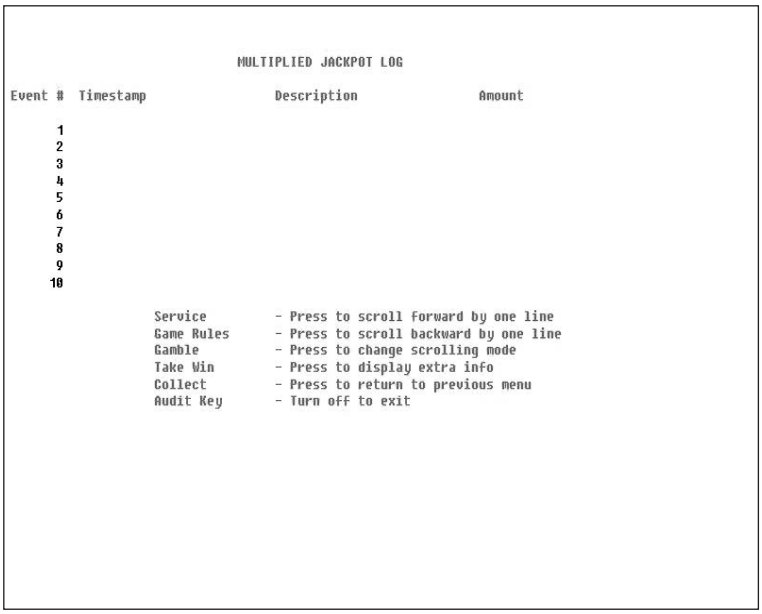
Bonus events are itemized in the Bonus Log.



The Bonus Log extra information display provides security check information.

Multiplied Jackpot Log

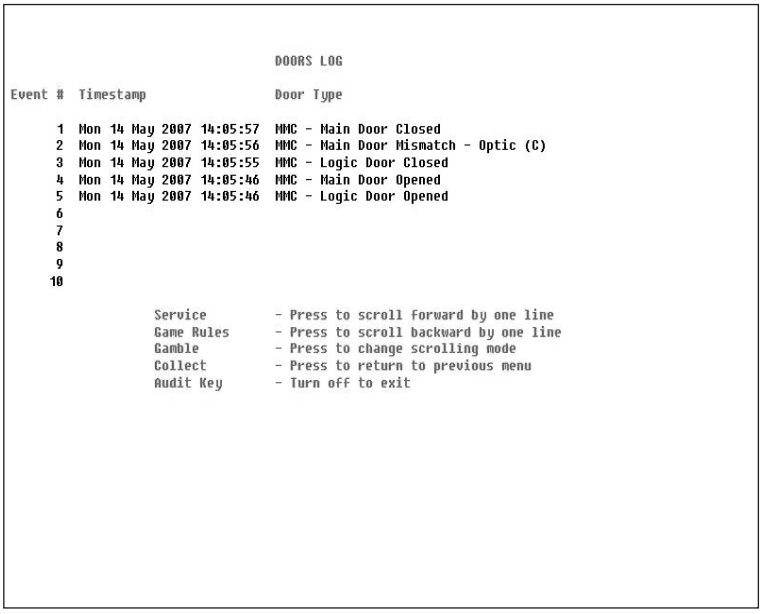
Multiplied jackpot events are itemized in the Multiplied Jackpot Log.



The Multiplied Jackpot extra information display provides security check information.

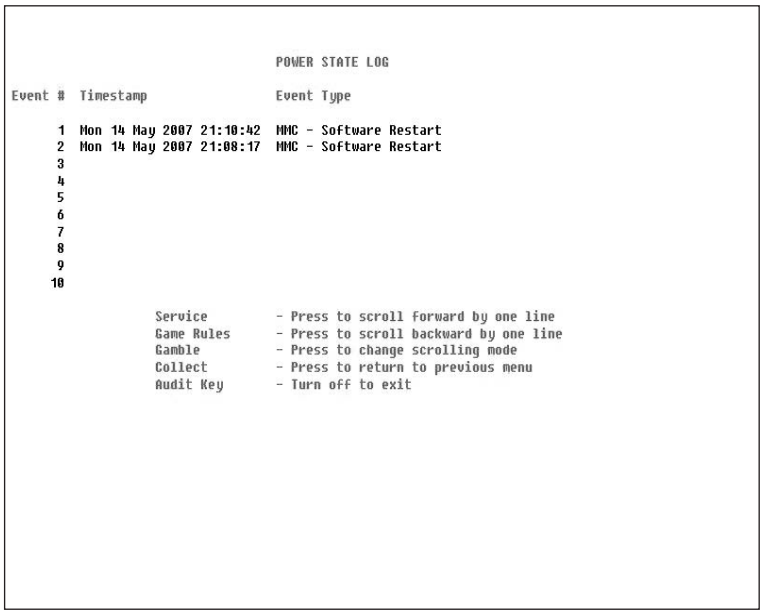
Doors Log

The Doors Log provides a record of the doors' security driver with reporting on events for every door in the game, including the bill acceptor door. The opening and closing of any door is reported and logged.



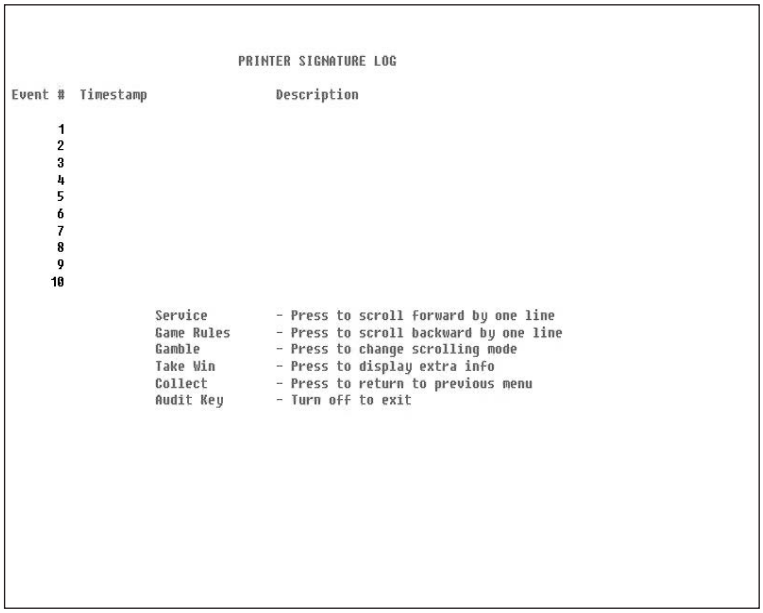
Power State Log

Power on / off events are logged in the Power State Log.



Printer Signature Log

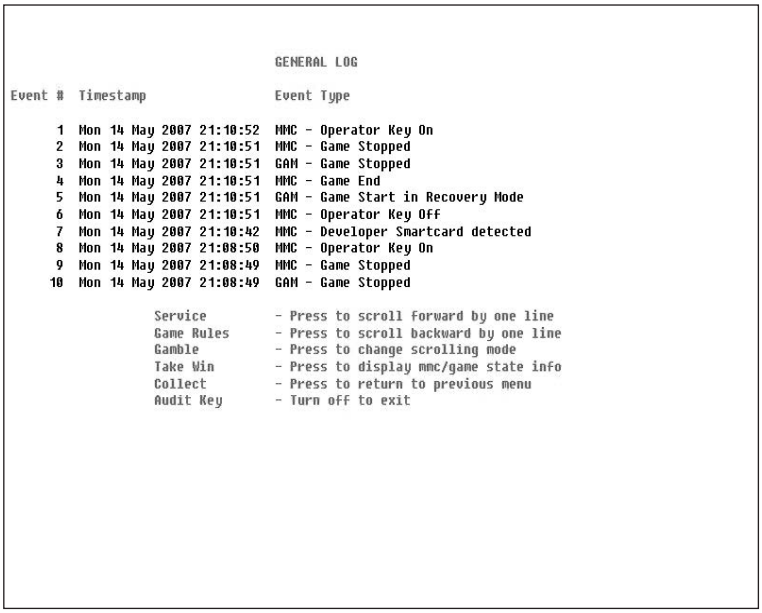
Printer signature events are logged in the Printer Signature Log.



The Printer Signature extra information display provides security check information.

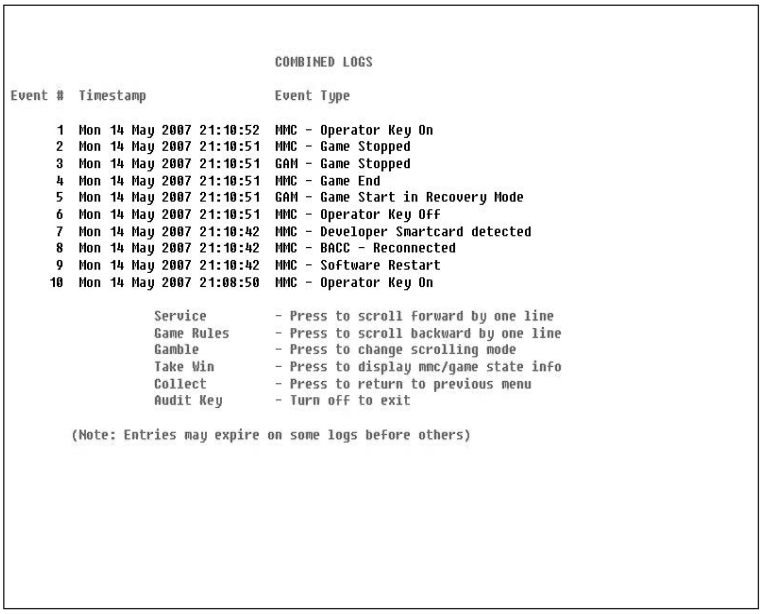
General Log

The General Log provides a record of general events which include all events excluding those in the previously shown logs.



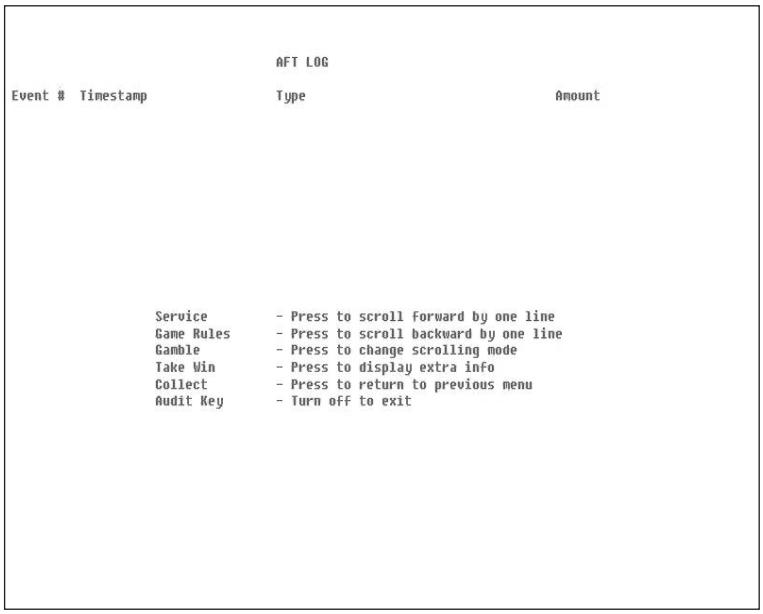
Combined Logs

The Combined Log itemizes events from all logs. Items are listed in order of occurrence.



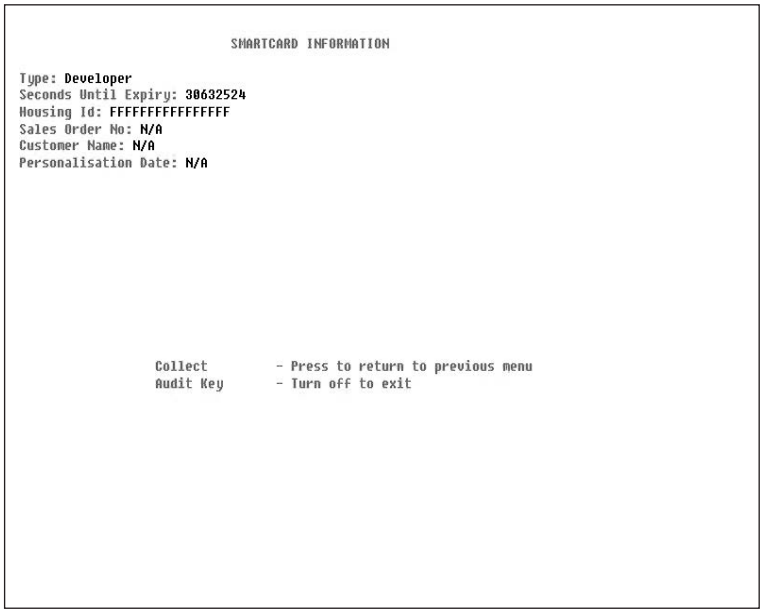
AFT Logs

Service, game rules, gamble events are logged in the AFT Log.



Smartcard Information

This screen provides smartcard information.

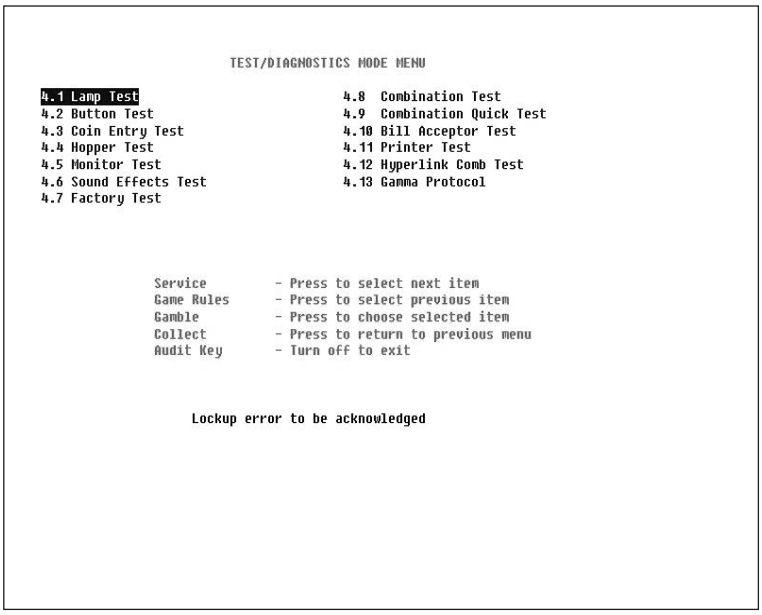


3.3.4 Test/Diagnostics Mode

Test/Diagnostics Mode addresses the repair and maintenance tasks for the game. The items on the Test/Diagnostics Mode Menu are designed to test various game components and features . The Test/Diagnostics screen is displayed below.

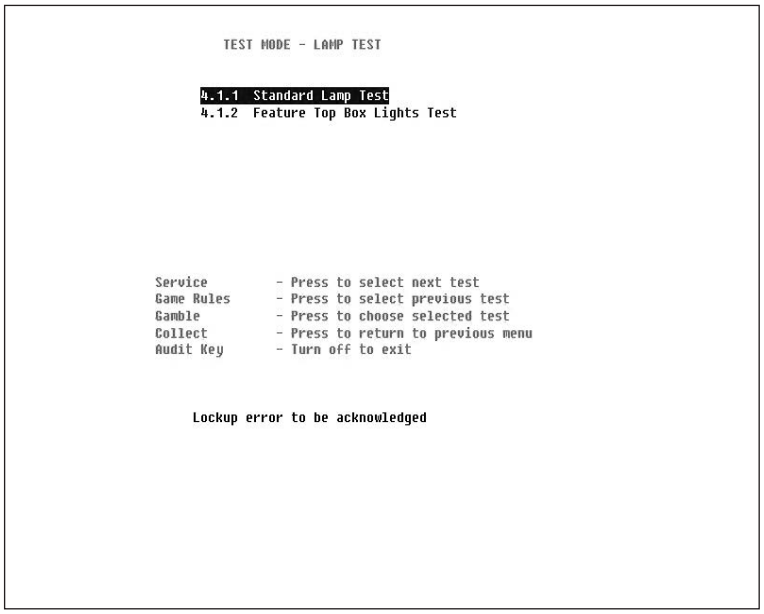
Test/Diagnostics Mode can only be entered when the following conditions are met, otherwise a warning screen will be displayed:

- Credit is zero.
- Lower main door is open.
- No other lockups active, and
- No game is currently in progress.



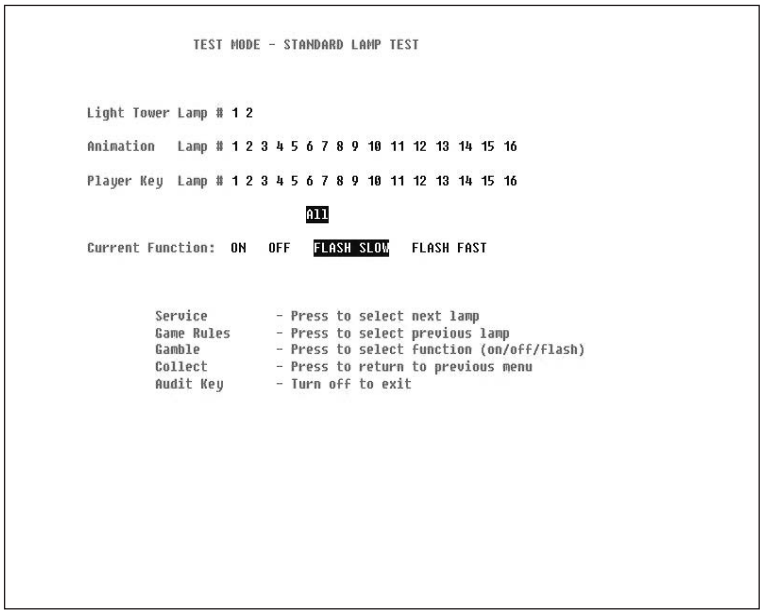
Lamp Test

This screen allows the operator to test the playbutton lamps, animation lamps and light tower lamps. The state of individual lamps can be set to either on, off, flashing slow, or flashing fast. The operator can then observe the lamps to verify correct operation.



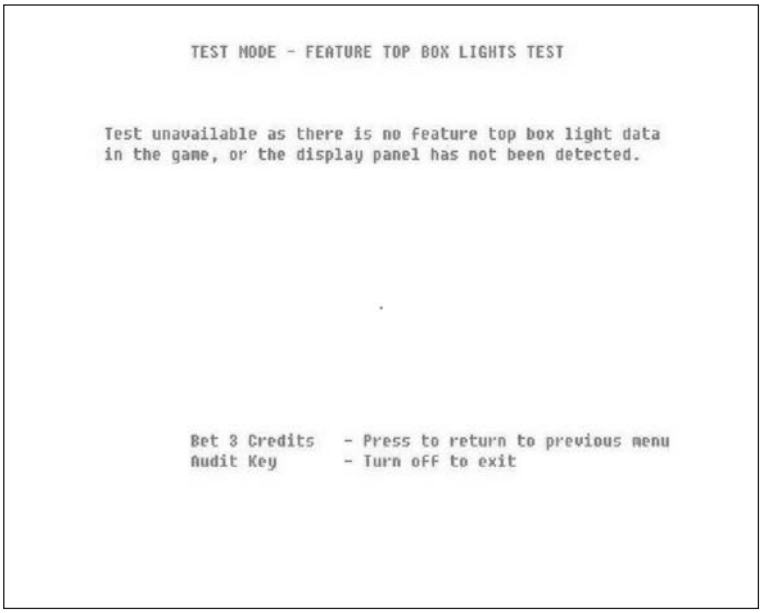
Standard Lamp Test

This screen allows standard lamp test.



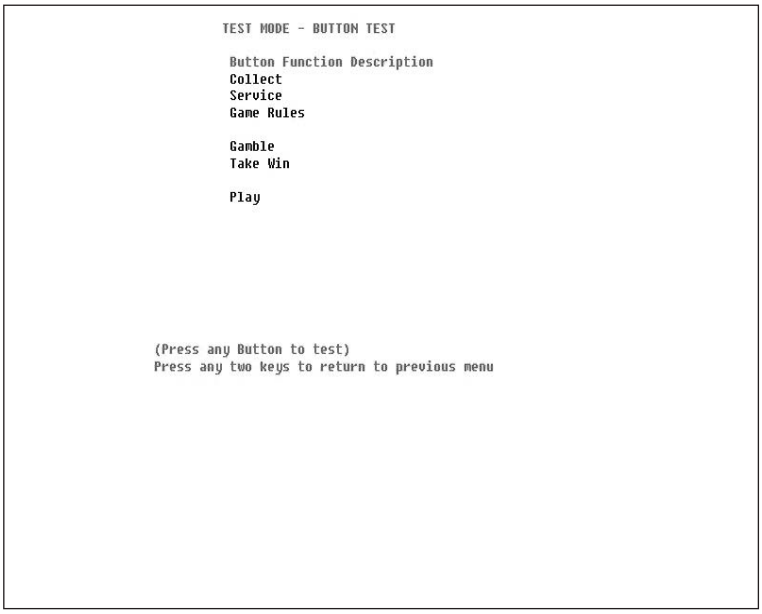
Feature Top Box Lights Test

The Feature Top Box Lights Test allows the operator to test the operation of top box lights.



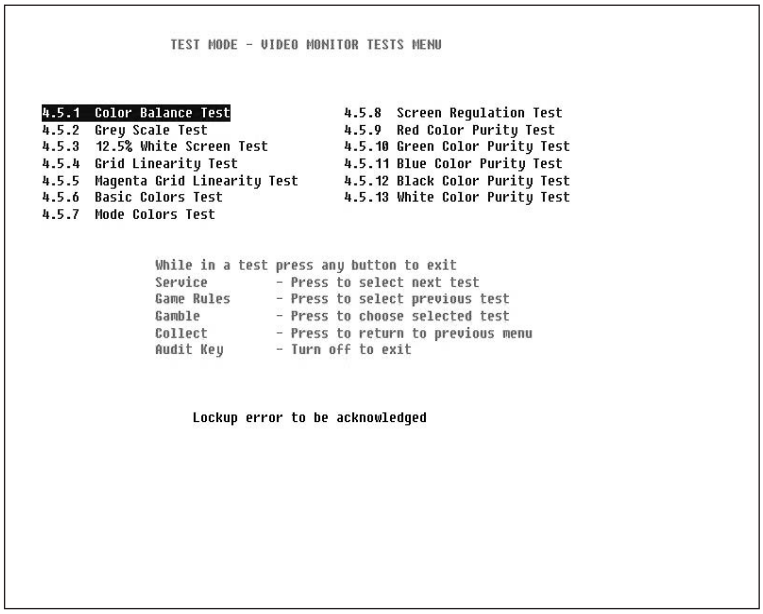
Button Test

The Button Test allows the operator to test the function and operation of each playbutton.



Video Monitor Test

This screen display allows a range of tests to be conducted on the main LCD screen. The operator inspects the display to display whether the tests have been passed or failed. The available tests are described below.

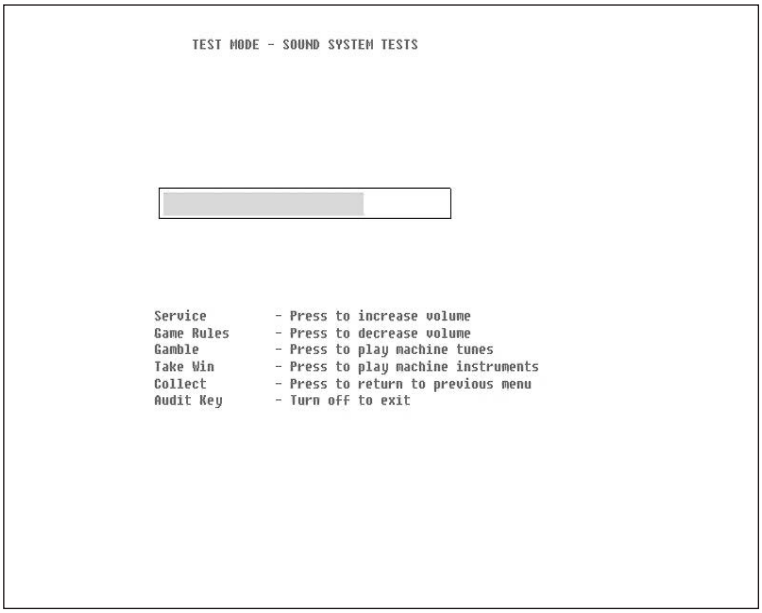


Details of Tests

TEST	DESCRIPTION
Color Balance Test	Tests the shading of primary colors to confirm the adjustment of colors
Gray Scale Test	Tests the color guns are equal in intensity
12.5% White Screen Test	Displays a slightly lighter color than black
Grid Linearity Test	Displays a series of horizontal and vertical lines on the same screen
Magenta Grid Linearity Test	Displays a series of horizontal and vertical lines on the same screen using magenta color
Basic Colors Test	Displays four colored rectangles - red, green, blue, white
Mode Colors Test	Displays the full range of colors available
Screen Regulation Test	Displays a flashing white box
Red Color Purity Test	Activates all red pixels
Green Color Purity Test	Activates all green pixels
Blue Color Purity Test	Activates all blue pixels
Black Color Purity Test	Activates all black pixels
White Color Purity Test	Activates all white pixels

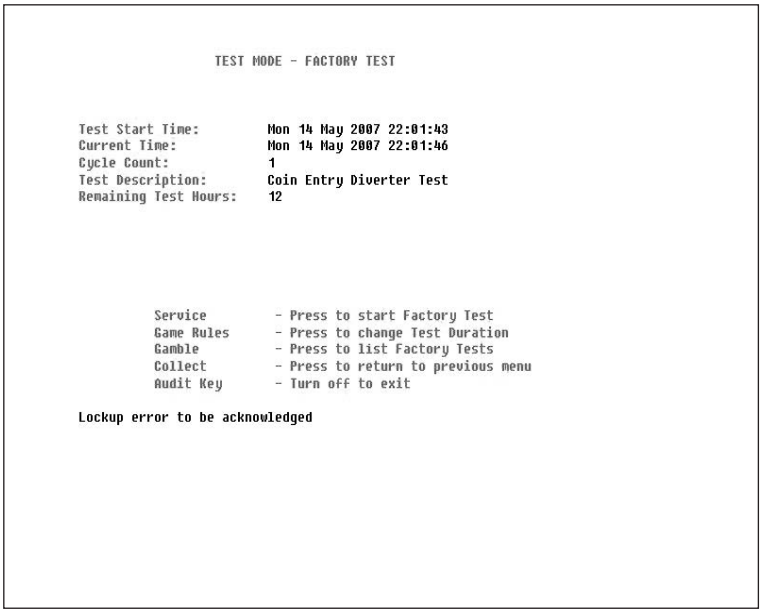
Sound System Tests

This screen allows the operator to change the volume setting of the game and to listen to all the sound effects used by the game.



Factory Test

The Factory Test option automatically conducts several tests simultaneously. Tests conducted include door switch, main LCD screen tests, and sound system tests. Failed tests are displayed on the screen. The Factory Test continues until stopped by the operator or until an error occurs, in which case the type of failure is displayed on the screen.

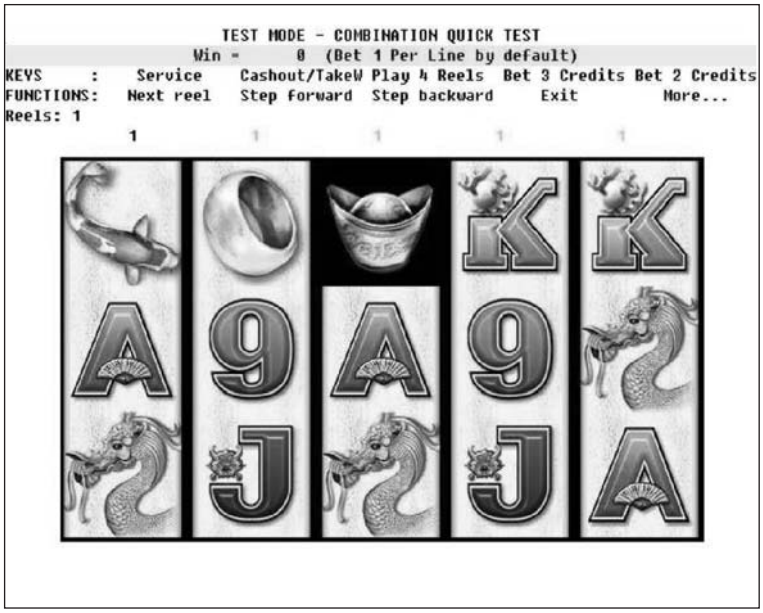


Combination Test

The Combination Test allows the operator to select a combination of cards to be dealt. This test is used to check the graphics and sound output associated with any winning combination.

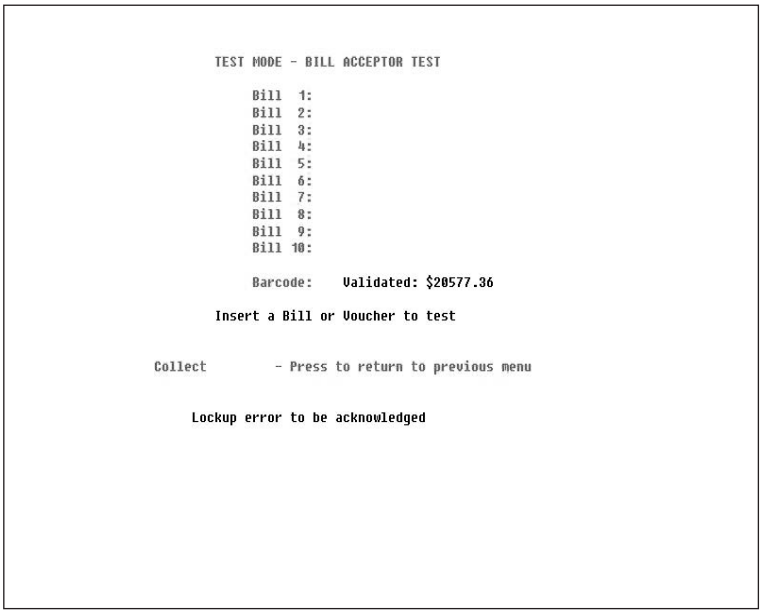
Combination Quick Test

This test allows the operator to check the WIN amount for any combination of reel positions, without actually spinning the reels. When COLLECT is pressed, additional keys and functions are displayed.



Bill Acceptor Test

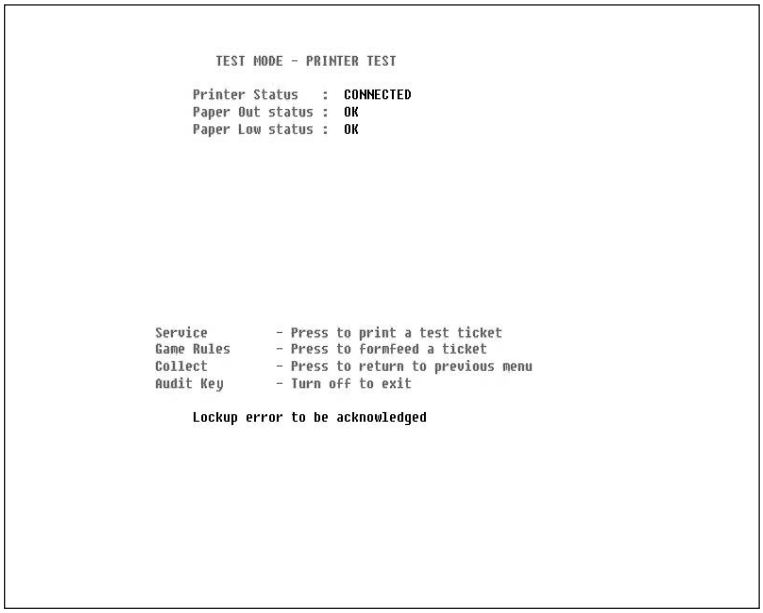
The procedure enables an operator to feed notes into the bill acceptor for acceptance testing. Accepted notes display “Validated” in the appropriate denominational line.



Printer Test

The Printer Test information shows the connection status of the printer (connected, not connected) as well as highlighting paper-roll problems provided the printer is selected (as fitted and installed) in the device driver options which is part of the game options Display.

If a printer is not fitted or enabled then the message “Printer not enabled or available” will be displayed.



Hyperlink™ Combination Test

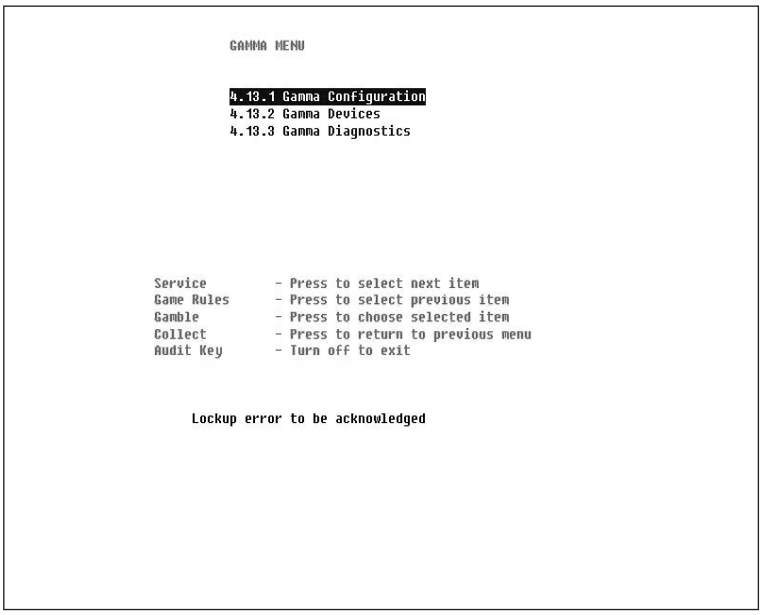
This screen shows Hyperlink™ information and is only available when the Hyperlink™ is connected and on-line.

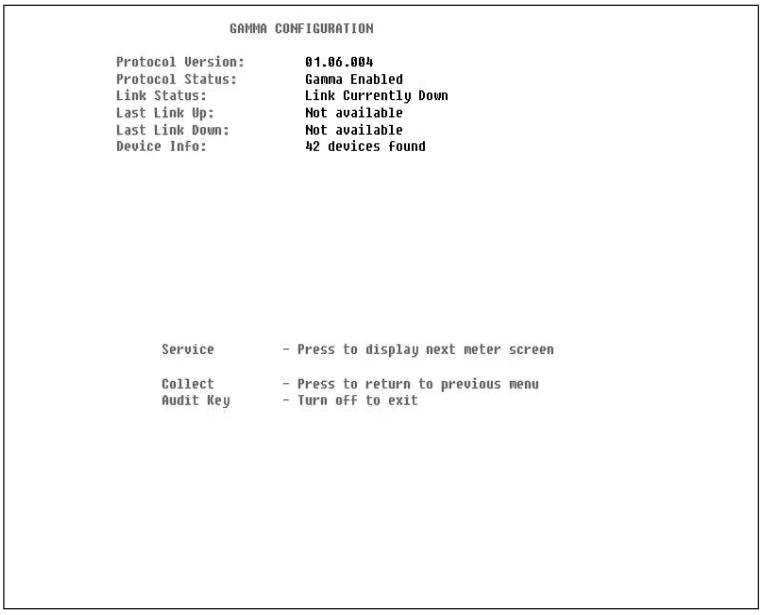
This screen is only available when game is connected to Hyperlink™.

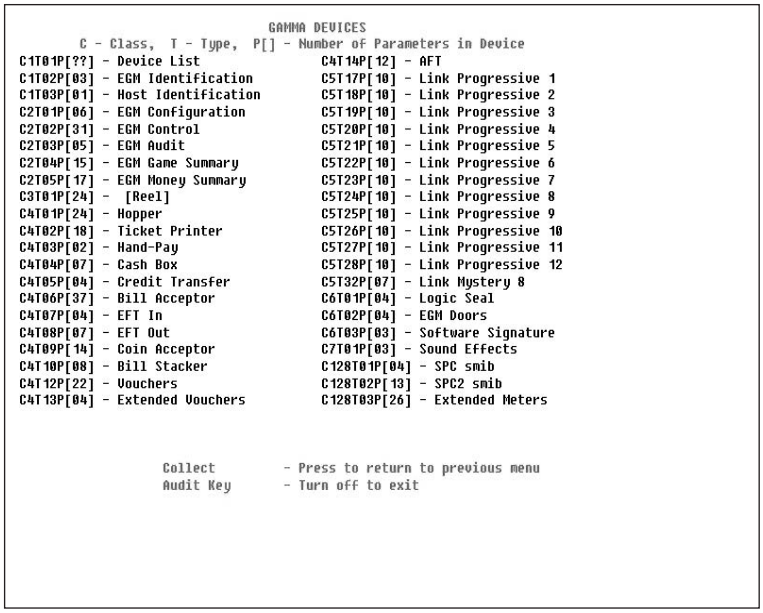
Gamma Protocol

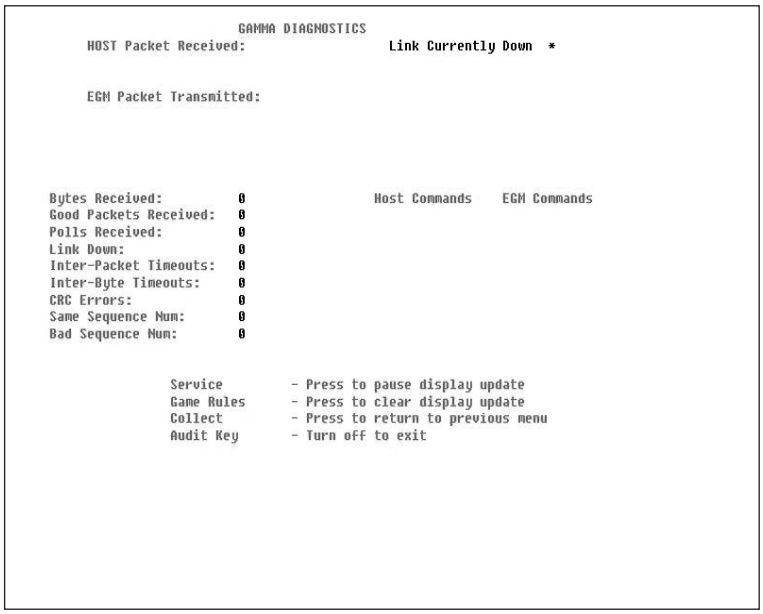
The GAMMA Protocol menu item provides procedures relating to the point to point GAMMA (gaming manufacturers association) a Link Communications Protocol (ACP) used between a serial electronic game (EGM) and its Game Communications Interface (MCI).

The displays provide details on GAMMA ACP Configuration, Devices and Diagnostics – devices refer to components in the games and communications elements.



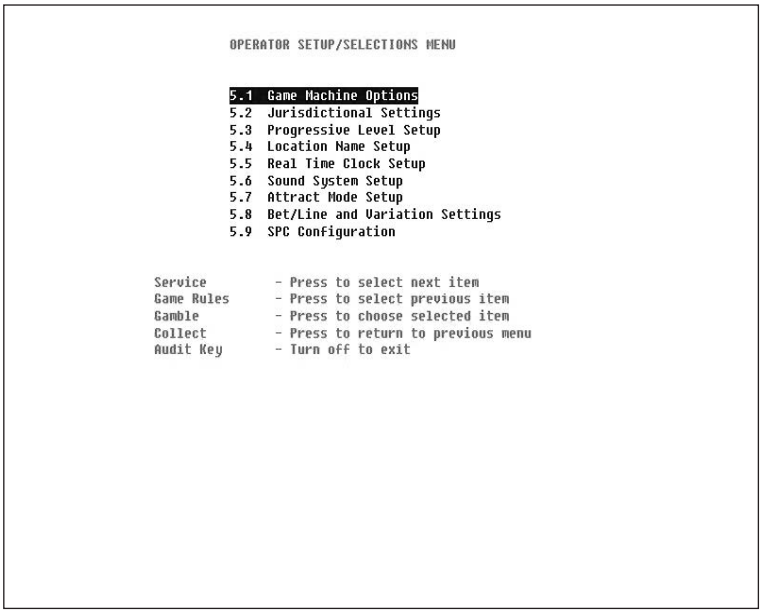



GAMMA DEVICES
C - Class, T - Type, P[] - Number of Parameters in Device
C1T01P[??] - Device List
C1T02P[03] - EGM Identification
C1T03P[01] - Host Identification
C2T01P[06] - EGM Configuration
C2T02P[31] - EGM Control
C2T03P[05] - EGM Audit
C2T04P[15] - EGM Game Summary
C2T05P[17] - EGM Money Summary
C3T01P[24] - [Reel]
C4T01P[24] - Hopper
C4T02P[18] - Ticket Printer
C4T03P[02] - Hand-Pay
C4T04P[07] - Cash Box
C4T05P[04] - Credit Transfer
C4T06P[37] - Bill Acceptor
C4T07P[04] - EFT In
C4T08P[07] - EFT Out
C4T09P[14] - Coin Acceptor
C4T10P[08] - Bill Stacker
C4T12P[22] - Vouchers
C4T13P[04] - Extended Vouchers
C4T14P[12] - AFT
C5T17P[10] - Link Progressive 1
C5T18P[10] - Link Progressive 2
C5T19P[10] - Link Progressive 3
C5T20P[10] - Link Progressive 4
C5T21P[10] - Link Progressive 5
C5T22P[10] - Link Progressive 6
C5T23P[10] - Link Progressive 7
C5T24P[10] - Link Progressive 8
C5T25P[10] - Link Progressive 9
C5T26P[10] - Link Progressive 10
C5T27P[10] - Link Progressive 11
C5T28P[10] - Link Progressive 12
C5T32P[07] - Link Mystery 8
C6T01P[04] - Logic Seal
C6T02P[04] - EGM Doors
C6T03P[03] - Software Signature
C7T01P[03] - Sound Effects
C128T01P[04] - SPC smib
C128T02P[13] - SPC2 smib
C128T03P[26] - Extended Meters
Collect - Press to return to previous menu
Audit Key - Turn off to exit


GAMMA DIAGNOSTICS
HOST Packet Received:
Link Currently Down *
EGM Packet Transmitted:
Bytes Received: 0
Good Packets Received: 0
Polls Received: 0
Link Down: 0
Inter-Packet Timeouts: 0
Inter-Byte Timeouts: 0
CRC Errors: 0
Same Sequence Num: 0
Bad Sequence Num: 0
Host Commands
EGM Commands
Service - Press to pause display update
Game Rules - Press to clear display update
Collect - Press to return to previous menu
Audit Key - Turn off to exit

3.3.5 Operator Setup/Selections

The Operator Setup/Selections menu gives the operator access to configurable options of the game.

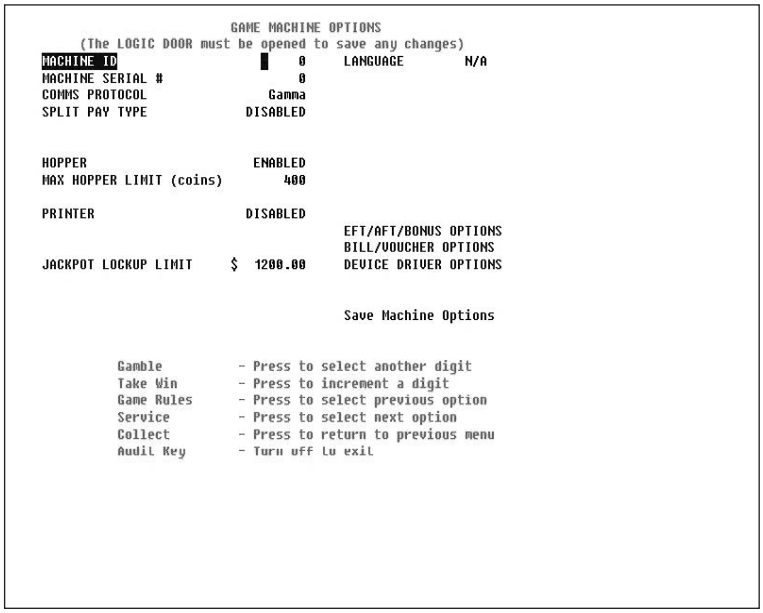


Game Machine Options

The Machine Options setup screen allows the operator to control and change some aspects of game operation. Options are selected and changed by following the on-screen guidance and pressing the appropriate buttons. The machine options are stored in the first EEPROM on the carrier board.

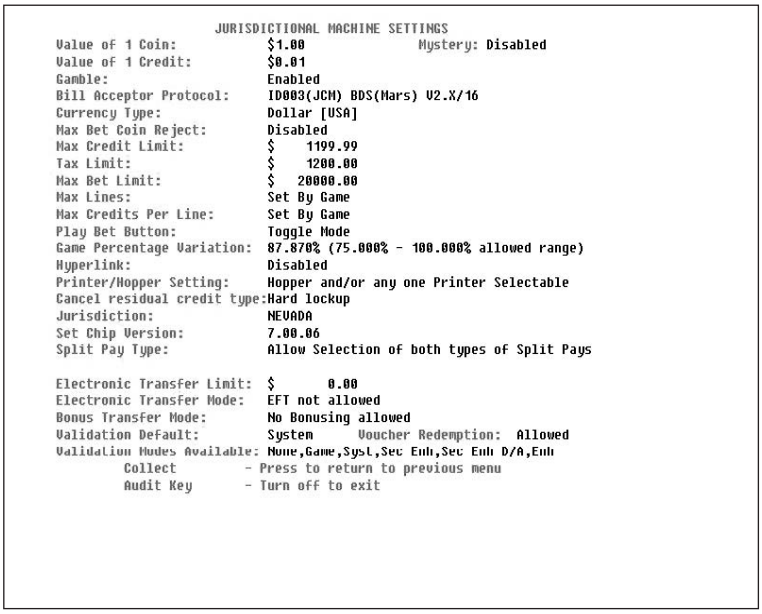
Approval from the jurisdictional authority is required before the items in the Machine Options screen can be changed.

The logic door must be open to save changes to machine options.



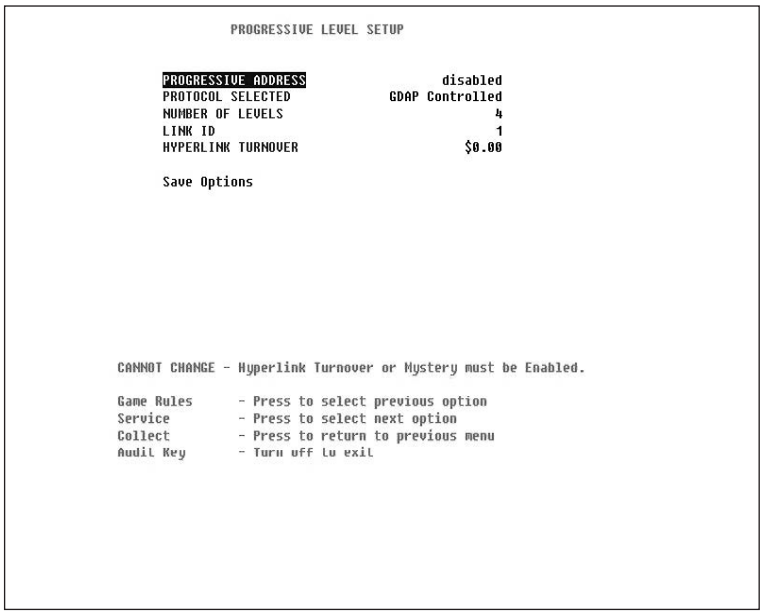
Jurisdictional Settings

The Jurisdictional Settings display provides a detailed list of the configurations and settings as required by the jurisdictional authority which have been selected in the SetChip procedure and initiated from the Audit Mode menus.



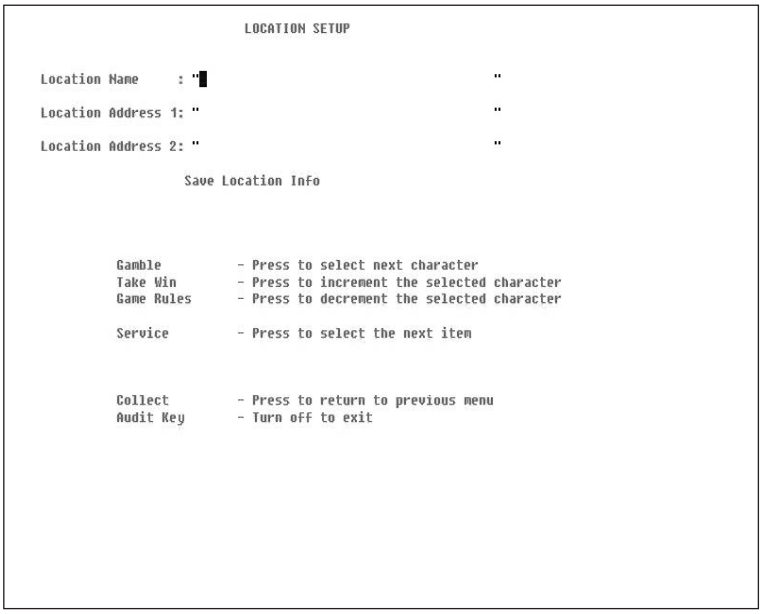
Progressive Level Setup

This display allows the operator to set each winning hand to correspond to a link progressive jackpot. The operator selects the desired winning hand to be modified. Then the level may be changed by pressing the appropriate button to increase or decrease the level. A non-existent level (blank) implies that there is no link progressive level associated with that hand, and hence the normal credit win value will be won. Otherwise, a number between 0 and 5 will appear and this indicates the level of the link that will be won.



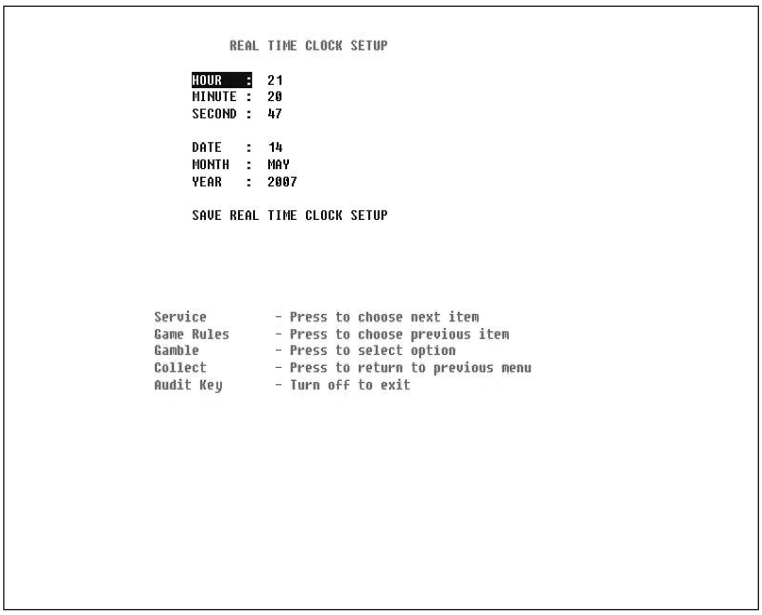
Location Name Setup

This screen allows the operator to enter the name of the venue. This name is displayed in the Game Identification Screen and is printed on cash vouchers and metering vouchers.



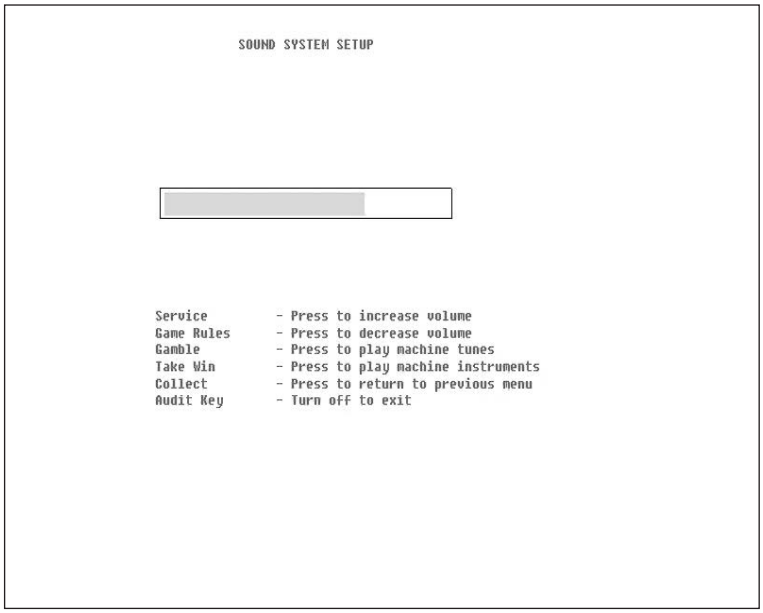
Real Time Clock Setup

This screen allows the real time clock to be set.



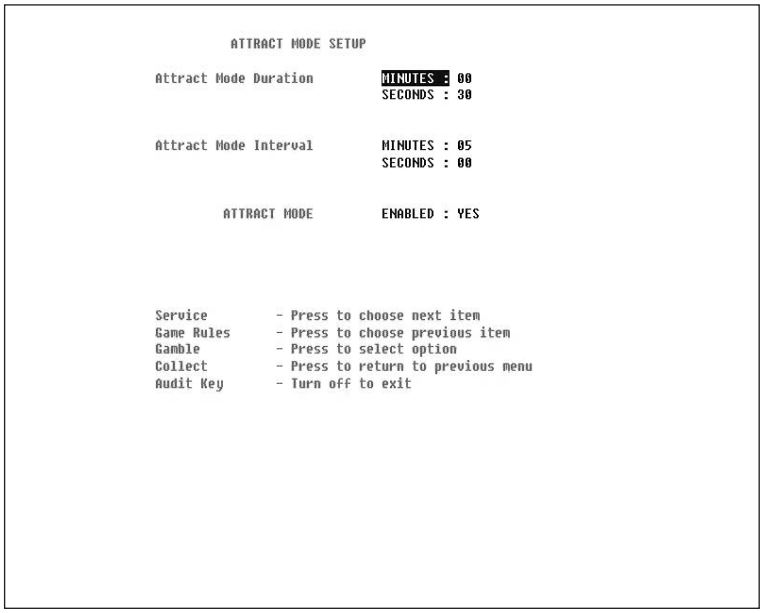
Sound System Setup

This screen allows the operator to change the volume setting of the game and to hear all the sound effects used by the game.



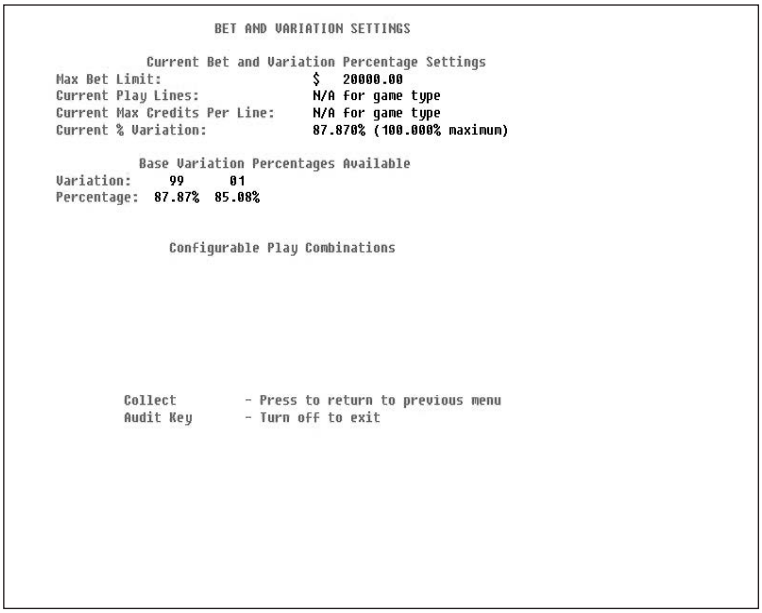
Attract Mode Setup

The contents of the Attract Mode screen display is shown on the game screen during game play.



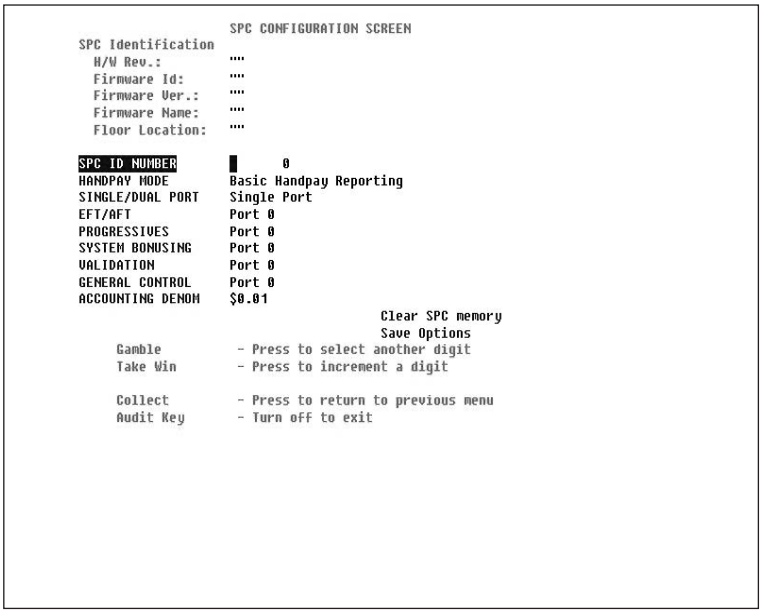
Bet and Variation Settings

The contents of the Attract Mode screen display is shown on the game screen during game play.



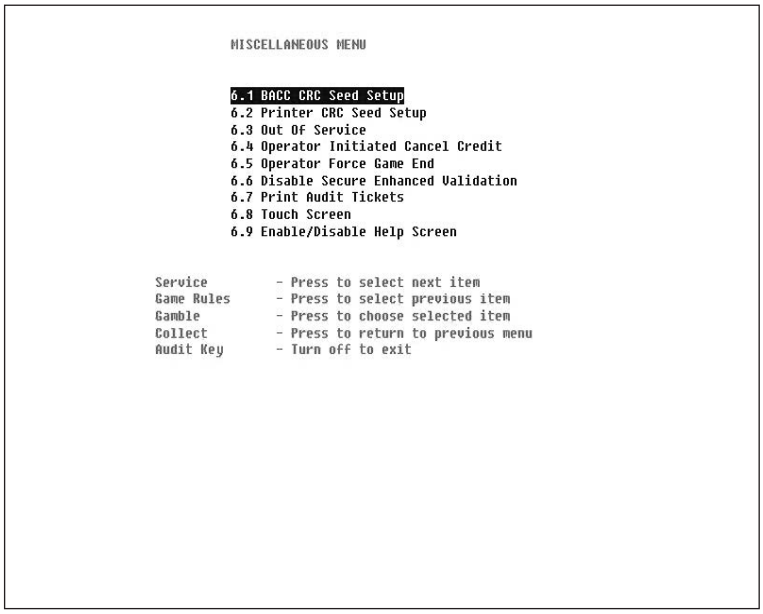
SPC Configuration Setup

The contents of the SPC Configuration screen display is shown on the game screen during game play.



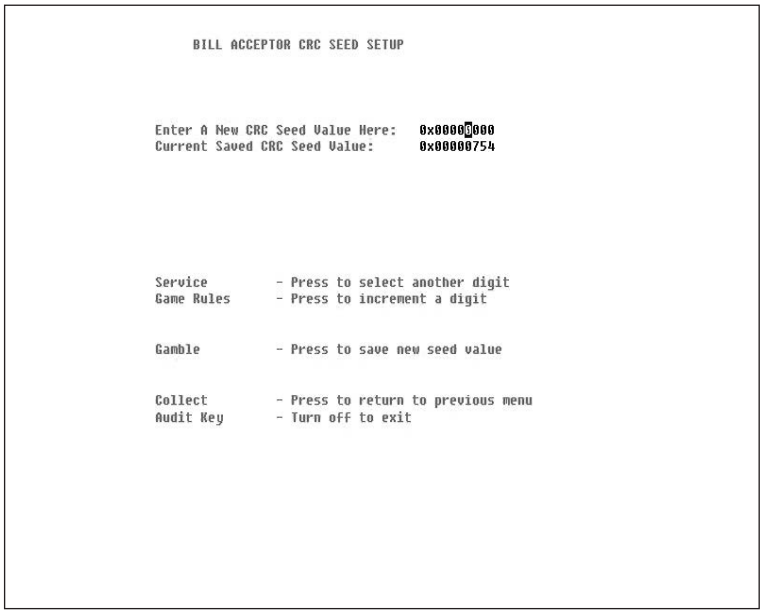
3.3.6 Miscellaneous Menu

The Miscellaneous Menu provides a range of operational features relating to the bill acceptor, periodic meters, demonstrations, accounting print outs, initiating cancel credit, and removing the game from service.



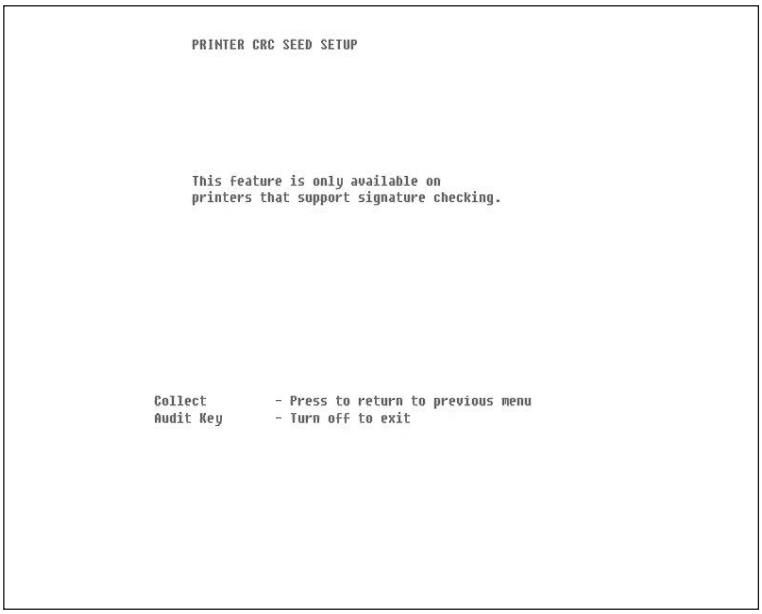
Bill Acceptor CRC Seed Setup

This screen allows the operator to reset the bill acceptor CRC Seed Setup meter. This meter should be reset each time the bill cashbox is emptied.



Printer CRC Seed Setup

This screen allows the operator to reset the Printer CRC Seed Setup meter.

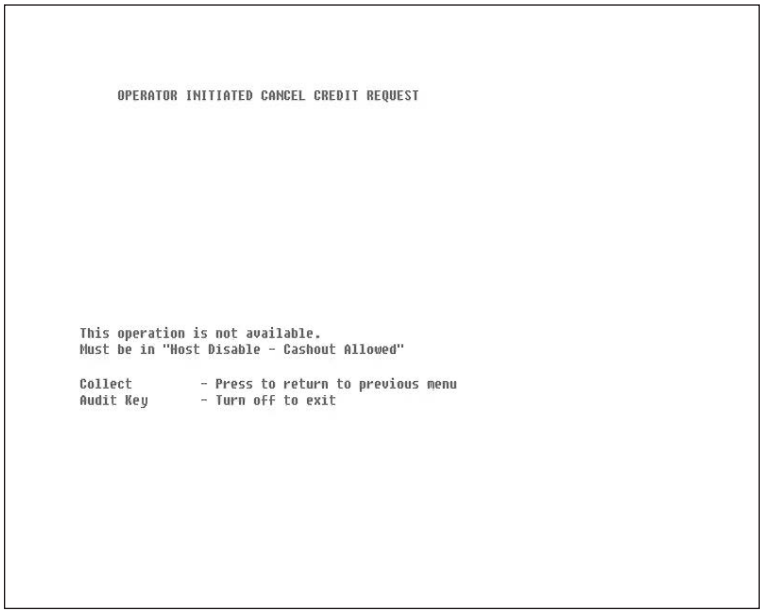


Out of Service

This operational option enables a floor attendant to place an game into, or remove a game from, the Out of Service mode as required.

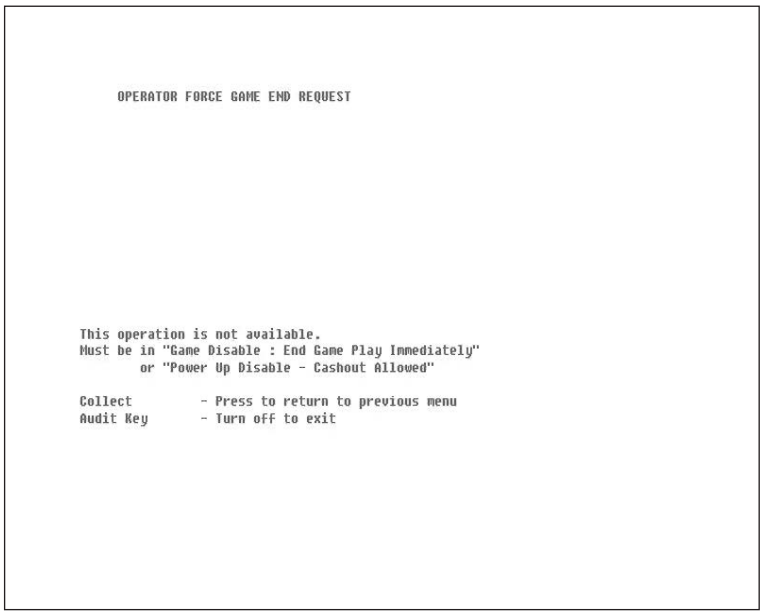
Operator Initiated Cancel Credit Request

A Cancel Credit Request (if fitted) procedure, which can be initiated by a floor operator, is processed though the operations provided by this display.



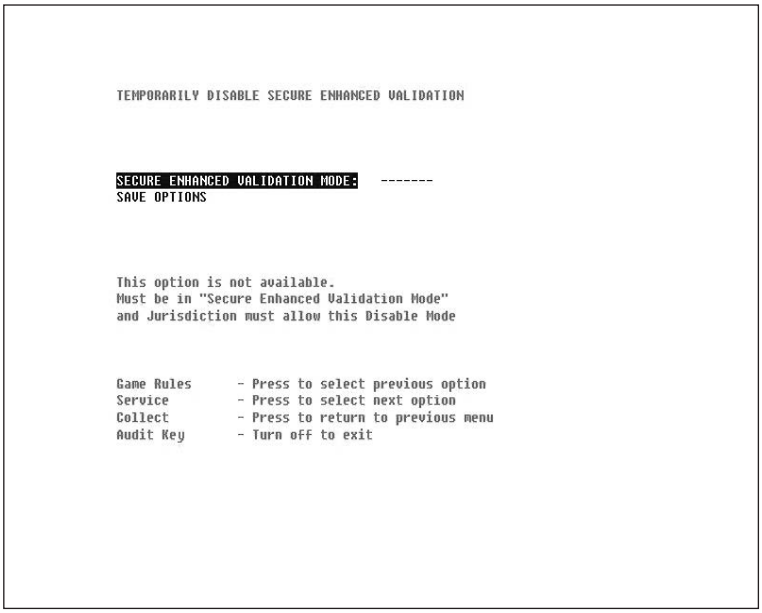
Operator Force Game End

Operator Force Game End Request procedure enables the operator to end the game immediately and allow cashout.



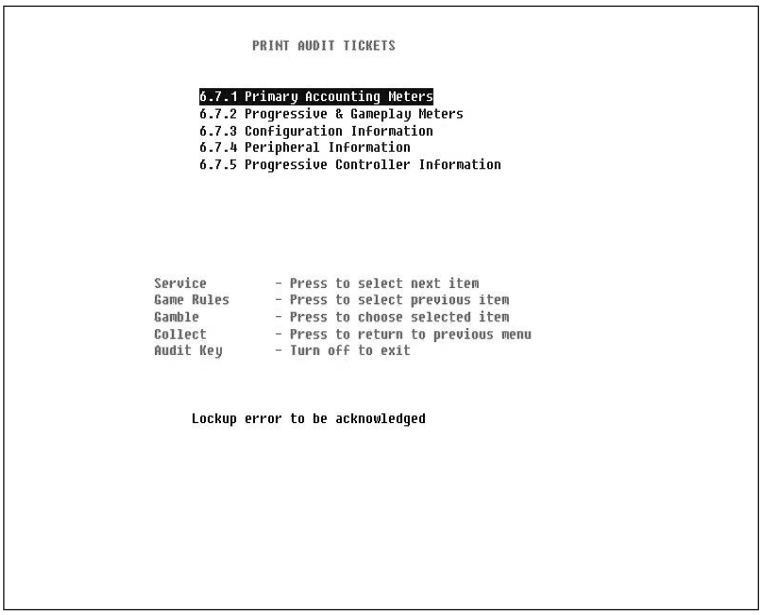
Disable Secure Enhanced Validation

This security procedure enables a CRC check to be carried out by an authorized attendant at a suitable time.



Print Audit Vouchers Menu

Selection of the Print Accounting Information menu item results in a printed voucher with a variety of details. An example of a printer output is shown below.



Chapter 4

Cabinet

List of Figures

List of Tables

4.1 General Description

The Game cabinet, cabinet doors, top box and player marketing module provide the major components of the EGM.

The cabinet provides security to the inside of the EGM and, with the doors, a rigid structure for mounting the various EGM components. Both the lower main door and upper main door are secured to the cabinet with two high-strength hinges and a belly door is provided for access to the bill acceptor drop box.

The player marketing module provides for the attachment of player interface components and the storage of communications devices. The optional top box provides a large, static artwork display or an LCD display.

The major components of the EGM are located either within the cabinet, on the cabinet doors, or in the top box. The following components are detailed in this chapter:

In the cabinet:

- Key switches.
- Cabinet door security.
- Cashbox chute.
- Player marketing module.
- Logic cage.
- Bill acceptor.

On the lower main door:

- Mid trim and buttons.
- Door latch assembly and security.
- Belly door and belly door artwork.
- Light chamber.
- Chip tray.

On the upper main door:

- Door latch assembly and security.
- Main LCD screen.

In the top box:

- Lighting and reflector (if fitted).
- Top box artwork (if fitted).
- Light tower (if fitted).
- Topper (if fitted).
- LCD screen (if fitted).

Refer to General Description chapter for pictures of the EGM.

4.2 Cabinet and Doors

The cabinet is comprised of a one-piece shell. The parts are welded together with strengthening gussets and rails for rigidity.

The lower main door is comprised of a single casting which contains integrated attachment points and partial components and is mounted on two high-strength hinges attached to the cabinet. The upper main door, which contains the main LCD screen, is similarly mounted. The belly door is mounted on a piano hinge on the lower main door and opens forward from the cabinet.

Various brackets and plates are welded to, or integrated with, the assemblies to provide mountings for other EGM components.

4.2.1 Removal and Replacement of Upper Main Door

To remove the main upper door:

1. Open lower main door then upper main door.
2. Switch off main power.
3. Disconnect video and power cables from the LCD mounted on the upper main door.
4. Disconnect the 3M Touch System cable from the backplane board & disconnect the power.
5. If touch screen is fitted, disconnect touch screen cable from the backplane board.
6. Remove the top box door.
7. Remove the earth braid that bridges the door and the cabinet at a hinge position.
8. Remove the gas shock at the ball connection on the door by using a small flat blade screwdriver to prise off the spring clip that retains the ball in the gas shock socket.
9. Lift off the upper main door.

Replacement is a reversal of the removal procedure.

4.2.2 Removal and Replacement of Lower Main Door

To remove the lower main door:

1. Follow procedure above and remove the upper main door.
2. Disconnect the lower main door looms from the logic cage backplane PCB and remove cable ties securing these looms to the cabinet.
3. Remove lower main door gas shock as per method used on the upper main door.
4. Remove lower main door earth braid.
5. Lift off lower main door.

Replacement is a reversal of the removal procedure.

The door is a heavy item; follow the national standard and code of practice for manual handling.

4.2.3 Belly Door

A belly door is provided to enable access to the belly panel artwork, belly panel CCFL system, the bill acceptor and the bill drop box.

The door features a piano hinge and two stays that fix the belly door to the lower main door. The door security includes a cherry pushbuttton switch mounted in the lower main door.

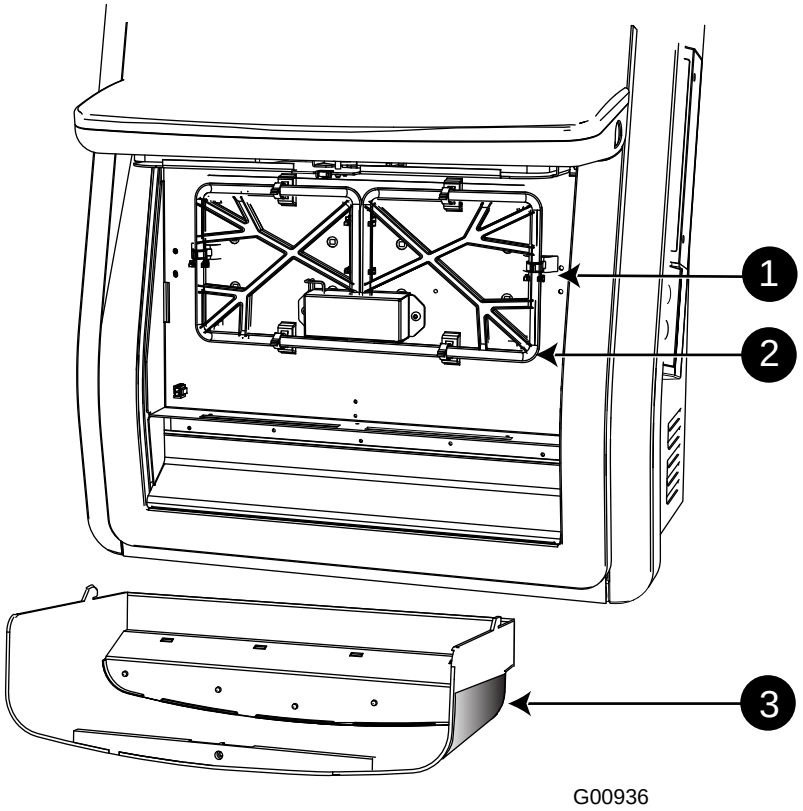
Access to the artwork and CCFL is gained by removing the belly door housing:

1. Open the belly door.
2. Unlock the quarter turn captive fastener on the top of the molded belly door housing.
3. Slide the housing forward to disconnect the hooks from the steel plate sides of the housing.
4. Drop the housing down and remove it from the EGM.

Replacement is a reversal of the removal procedure.

Belly Door Lighting and Artwork

Figure 4-1 Belly Door and Lighting System



Legend			
1	Belly Door	3	Artwork Housing
2	CCFL Lighting Module		

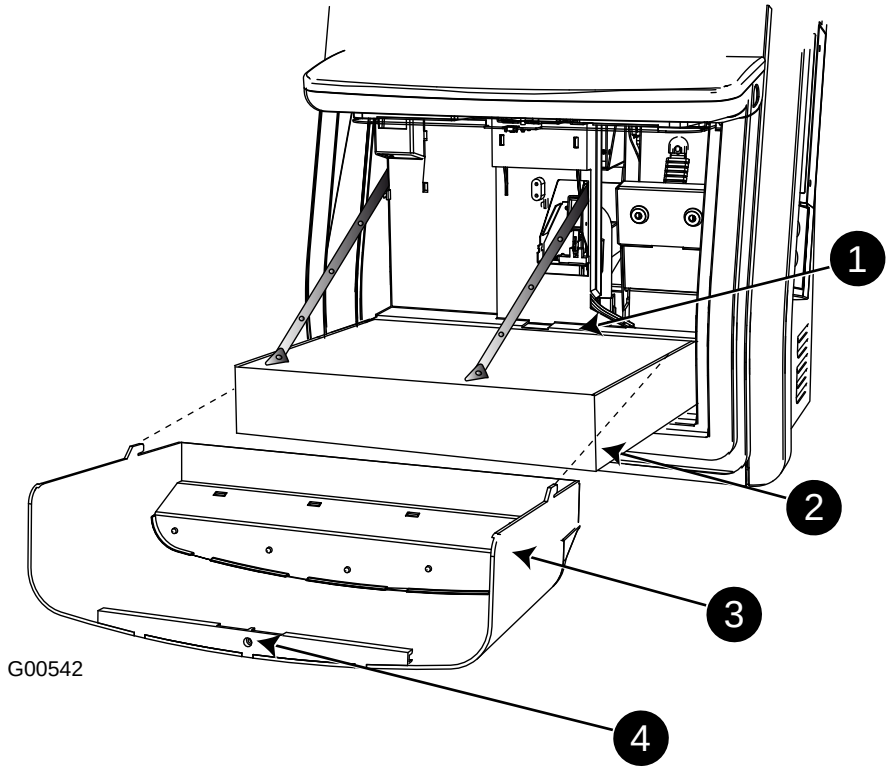
The belly door CCFL is located in the belly door behind the art work.

To replace the belly door CCFL:

1. Open the lower main door and switch OFF the EGM.
2. Open the belly door.
3. Unlock the quarter turn captive fastener on the top of the molded belly door housing.
4. Slide the housing forward to disconnect the hooks from the steel plate sides of the housing.
5. Drop the housing down and remove it from the EGM.
6. Disconnect the CCFL loom from the connector mounted on the lower main door.
7. Remove the two screws that fix the CCFL inverter cover to the belly door.
8. Close the belly door to gain access to the CCFL.
9. The CCFL is fixed to the belly door with six clips. Open each clip and remove the CCFL module.

Replacement is a reversal of the removal procedure.

Figure 4-2 Belly Door and Artwork



Legend			
1	Piano Hinge	3	Artwork Housing
2	Belly Door	4	Quarter Turn fastener

To replace the belly door artwork:

1. Open the belly door.
2. Unlock the quarter turn captive fastener on the top of the molded belly door housing.
3. Slide the housing forward to disconnect the hooks from the steel plate sides of the housing.
4. Drop the housing down and remove it from the EGM.
5. Slide the artwork out of the housing.

Replacement is a reversal of the removal procedure.

4.2.4 Door Latches

Door latches are provided for both the cabinet doors and the belly door. The latch assemblies utilize a cam-locking system for each of the doors.

Opening the door is simply accomplished by turning the key clockwise. Closing the door is achieved by pushing the door closed, with or without the key removed. The key is removed by turning the key counterclockwise. A secondary lock system is provided as an option for the lower main door.

On closing any door, the cabinet cams rotate and interlock to secure the door to the cabinet on pressure from the door pin.

The latches are shielded on both sides by metal plates for additional security.

Removal and Replacement Procedures

To remove the main door latches:

1. Open the lower main door and upper main door.
2. Switch OFF the EGM.
3. Disconnect the loom to the optic connector on the cabinet latch assembly - lower main door only.
4. Disconnect the loom to respective switch (each doors).
5. Remove the two nuts that secure the latch assembly to the cabinet.
6. Lift the latch assembly off the mounting studs.

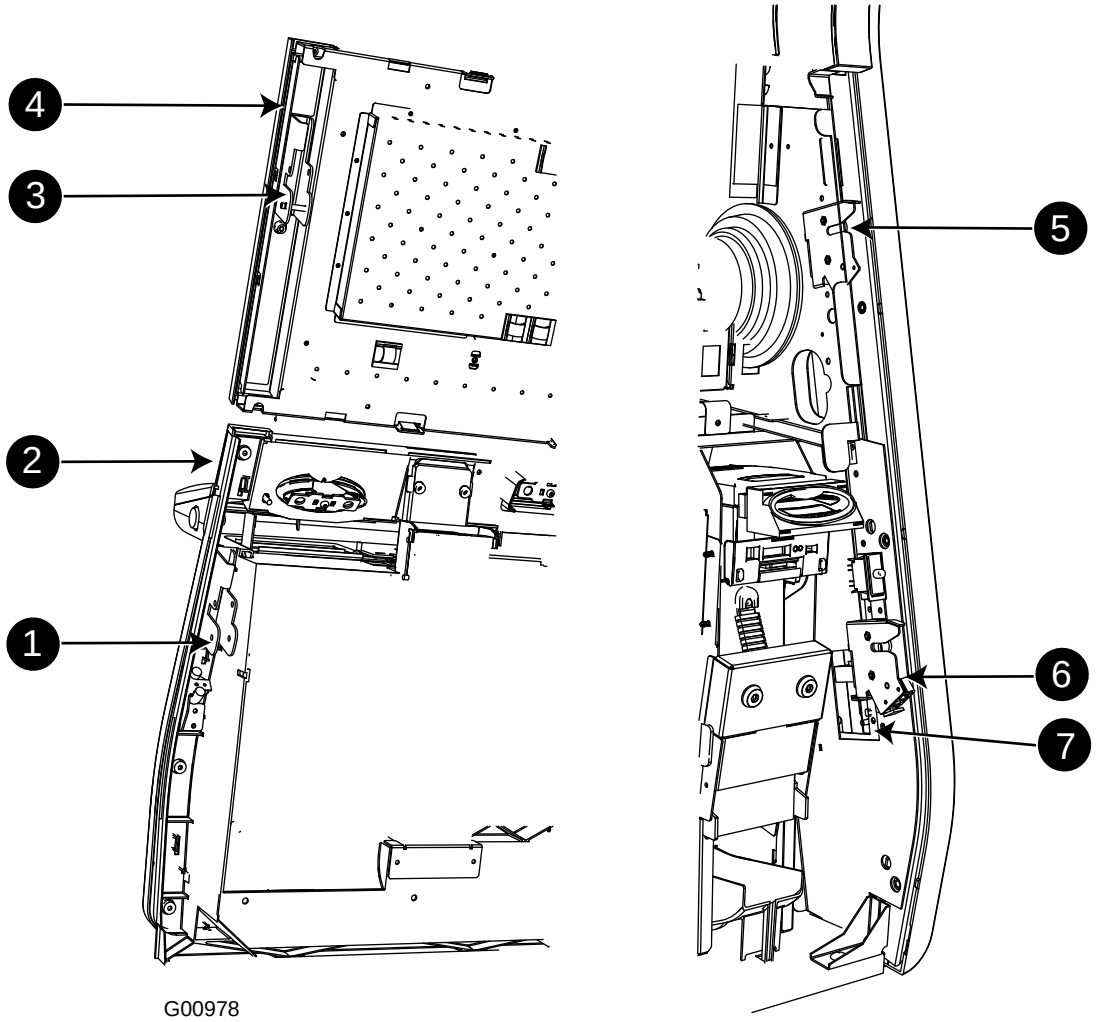
Replacement is a reversal of the removal procedure.

To remove the belly door latch:

1. Open the lower main door and switch OFF the EGM.
2. Open the belly door.
3. Remove the playbutton panel by accessing two fasteners on the back of the door and disconnecting playbutton switch assemblies from the playbutton housings.
4. Remove the latch assembly by removing the two nuts that secure the assembly to the mid trim.
5. Remove the screw that secures the latch assembly & two metal plates.
6. Slide and lift the two metal plate up and remove it from the assembly.
7. Remove the latch assembly from underneath.

Replacement is a reversal of the removal procedure.

Figure 4-3 Main and Belly door Latching



Legend					
1	Lower main door Latch Bracket Assembly and light Pipe	4	Upper main door	7	Lock Panel
2	Lower main door	5	Upper main door Cabinet Latch Assembly		
3	Upper main door Latch Bracket Assembly	6	Lower main door Cabinet Latch Assembly		

Removing the keyed lock from the cabinet:

1. Open the lower main door, and switch OFF the EGM.
2. Access the two fasteners that secure the lock panel assembly to the cabinet and remove the panel assembly.
3. Remove the cam nut, cam washer and cam from the end of the lock.
4. Remove the rotation limiting washer from the lock. Note the position of the stops on the rotation limiting washer - it will make replacement easier.
5. Remove the lock nut and lock washer from the lock barrel.
6. Withdraw the lock barrel from the lock panel.

Replacement is a reversal of the removal procedure. The procedure for lock removal is the same for all keyed locks.

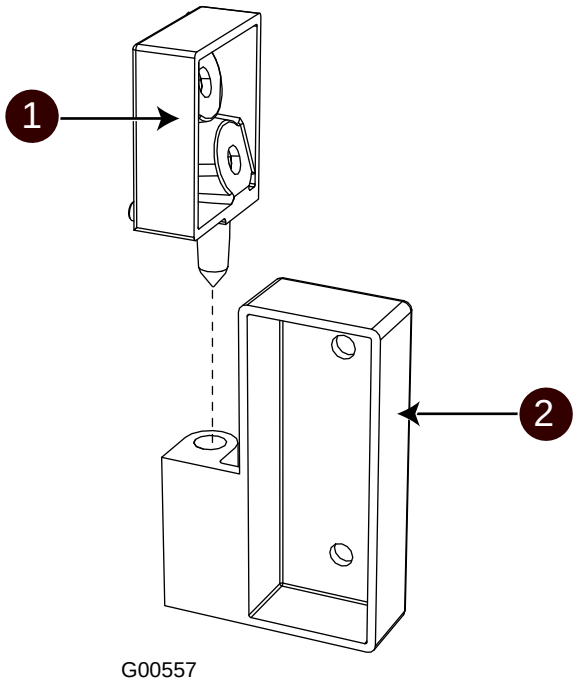
4.2.5 Hinges

Door hinges consist of two parts: the female hinge and the male hinge.

The male hinges are fixed to the doors with two fasteners and the female hinges are fixed to the cabinet with two fasteners.

Each hinge has a pin, with a nylon washer, that locates the part correctly in the corresponding door or cabinet. These pins must locate correctly before tightening the fasteners.

Figure 4-4 Hinge Module



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Legend			
1	Male Hinge	2	Female Hinge

4.2.6 Cabinet Security

The cabinet doors incorporates security monitoring in the form of a mechanical switches and an optical sensor.

If the security devices do not provide the correct signals to the carrier board, an alarm will sound, gameplay will be disabled, and the appropriate machine lockup message will be displayed on the main LCD screen.

A mechanical switch and a photo-optic sensor are both monitored for lower main door security detection. A mechanical switch is monitored for the upper main door. A mechanical switch is monitored for the belly door. When the lower main door or the belly door is opened:

- A message DOOR OPEN - MAIN or DOOR OPEN – BELLY is displayed on the screen.
- The alarm sound is heard.
- Gameplay is suspended.
- The event is recorded in the Doors Log in the Diagnostic Meters.
- The diagnostic meters for door accesses are incremented.

The message DOOR MISMATCH MAIN indicates a condition where the mechanical and the optical door security switches report contradictory door status indicators. The condition is cleared by ensuring that all door latches are fully engaged or by correcting a faulty switch or sensor.

The photo-optic sensor consists of an emitter and detector. Both the emitter and the detector are mounted on the cabinet and the light path is through the acrylic light-pipe attached to the cabinet door when the lower main door is closed properly.

The optical sensor may be removed as follows:

1. Open the lower main door, and switch OFF the EGM.
2. Unplug the looms to the switch and the optics.
3. Bill acceptor assembly may be required to remove to gain access to the latch assembly (refer to the bill acceptor chapter).
4. Remove the latch assembly from the cabinet.
5. Remove the optical housing and PCB assembly.

Replacement of the optical switch is a reverse of the removal procedure.

Removal of the mechanical door switch:

1. Open the lower main door, and switch OFF the EGM.
2. Unplug the switch loom.
3. Using a flat-blade screwdriver, prise the mechanical switch from the cabinet latch bracket.

The switch is replaced by firmly pushing it back into position.

4.2.7 Key Switches

The jackpot reset (if fitted) and Audit/Meter-Lights Key switches are used to access and reset the EGM's software. The key switch functions are covered in detail in the chapter Machine Modes.

The key switches are fixed to a common plate mounted to the inside wall of the cabinet. The switches are connected by a trunk loom that connects to the backplane board which transfers the switch signals to the carrier board for processing.

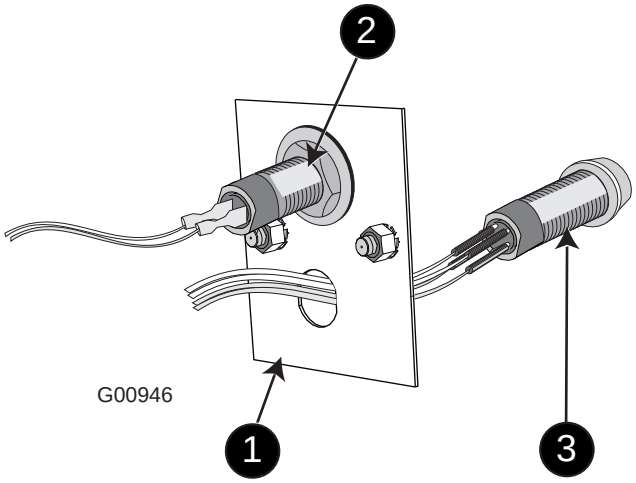
Removal and Replacement Procedures

Removal of the key switches is as follows:

1. Open the lower main door, and switch OFF the EGM.
2. Open upper main door.
3. Unplug the key-switch loom from the panel mounted connection.
4. Remove the two nuts fastening the assembly to the cabinet wall.
5. Remove the key-switch assembly from the cabinet.
6. The individual key switches may be removed from the assembly:
    a. Unplug or de-solder the loom from the key switch.
    b. Remove the lock nut and washer from the switch body.
    c. Pull the switch from the mounting plate.

Replacement is a reversal of the removal procedure.

Figure 4-5 Key Switches: Removal and Replacement



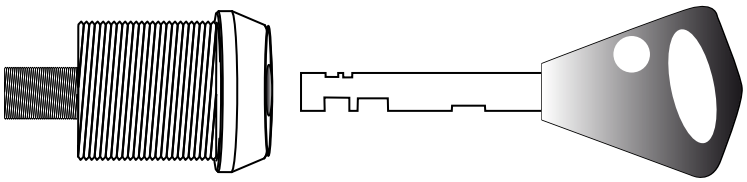
Legend					
1	Mounting Plate	2	Jackpot Key Switch	3	Audit Key Switch

Abloy Locks

The EGMs may be fitted with high-security Abloy locks. The locks feature the Quick Change Core facility whereby the keyed core of the lock is fitted separately from the lock barrel. Locks may be rekeyed in a matter of seconds without having to dismantle the lock assembly.

If a lock assembly must be removed, simply unscrew the large nut on the lock barrel and pull out the lock assembly.

Figure 4-6 Abloy Keyway and Quick Change Core



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4.2.8 Logic Cage

The logic cage is a steel enclosure with a hinged front door and is attached to the game display shelf. The cage houses the EGM logic PCBAs and the upper part of the backplane board. The door of the cage has a sliding latch that allows a security seal to be fitted. The door may be fitted with a battery-backed microswitch used for signaling the EGM software that the logic cage door has been opened. In addition, one or two security key locks may optionally be fitted to the logic cage door.

The logic cage slots into the back of game display shelf with two tabs and is fastened by two screws to the shelf. Within the logic cage are brackets and plastic guides for locating the PCBAs. The backplane board is mounted at the back of the logic cage. When a PCBA is fitted into the logic cage, it travels along the guides and is aligned with the corresponding multi-way connector on the backplane.

Removal and Replacement Procedures

To remove the logic cage and backplane board:

1. Open the lower main door and the upper main door and switch OFF the EGM.
2. Remove the security seal, if fitted.
3. Open the logic cage door – the door flips up.
4. Disconnect the VGA cable from the logic cage.
5. Carefully lever the carrier board assembly (carrier board and COM Express module) out using the extractors. Standard Electrostatic Discharge (ESD) prevention procedures should be followed when removing PCBAs.
6. Disconnect all of the looms from the backplane board. Make sure the connectors are labeled to facilitate replacement.
7. Remove the one fastener inside the logic cage attaching the logic cage to the cabinet shelf at the front.
8. Remove the one fastener under the logic cage attaching the cage to the cabinet shelf at the front.
9. Gently pull the logic cage from the EGM. The tabs at the back of the cage will disengage from the cabinet shelf.
10. Remove the logic cage and backplane board from the EGM.

Replacement is a reversal of the removal procedure.

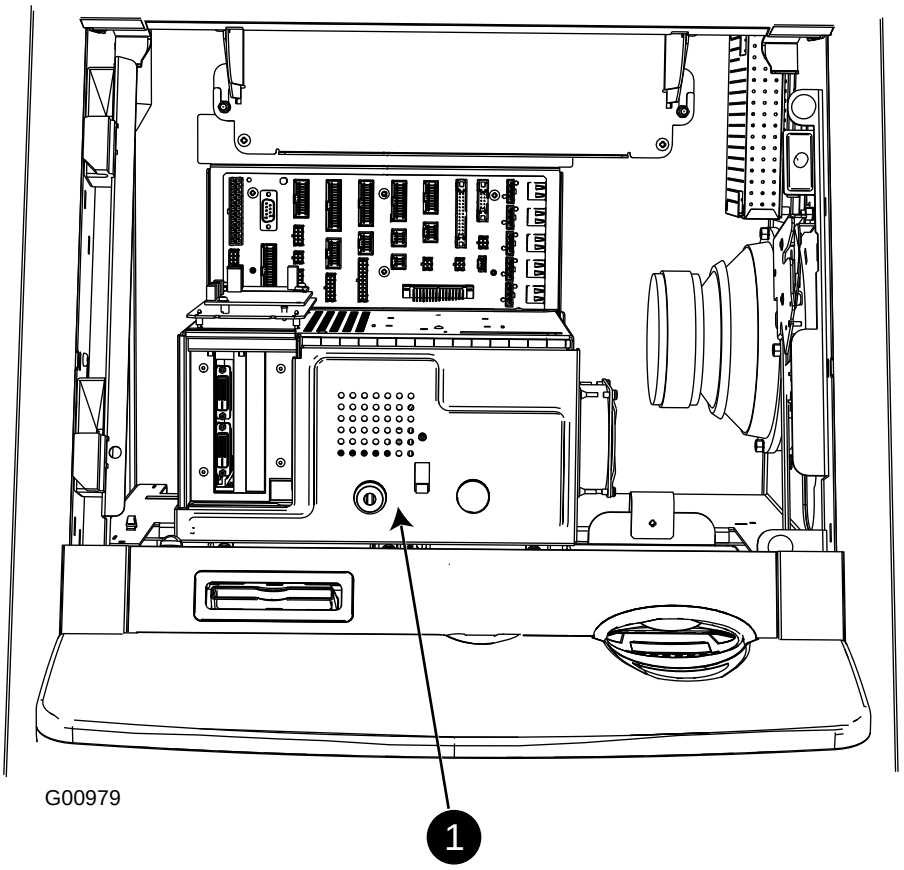
Disassembly and Assembly Procedures

To disassemble the logic cage:

1. Remove the logic cage as previously described.
2. The backplane board mounting bracket assembly is removed by removing the four screws securing the assembly to the logic cage.
3. The fan unit (if fitted) is removed by removing the screws securing it.
4. The PCB guides are removed by pulling them from their location holes.

Assembly is a reversal of the disassembly procedure.

Figure 4-7 Logic Cage



Legend	
1	Logic Cage

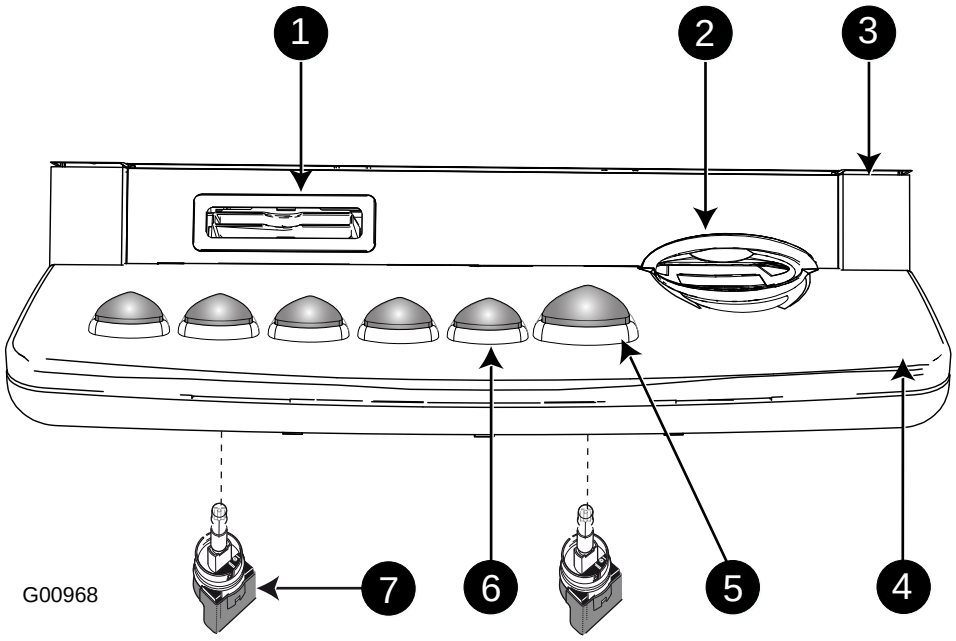
4.2.9 Mid Trim

The mid trim panel, diecast from chromed zinc, provides an area for the buttons to be mounted.

Trilobal (three cornered) playbutton assemblies are attached to the top of the mid trim and LED assemblies are attached beneath the mid trim.

The bill acceptor (bill-entry) device fits into the bill-entry aperture and a denomination display identifies acceptable currency.

Figure 4-8 Mid Trim and Buttons - Exploded View



Legend					
1	Voucher Printer	4	Mid Trim	7	5mm (0.19”) LED Assembly
2	Bill Entry	5	Bash Button		
3	Pay Panel	6	Playbutton		

4.2.10 Pay Panel

The pay panel fits to the top of the lower main door and comes without coin entry.

Without Coin Entry

This pay panel consists of a molded panel that has an allowance for bezels for the bill acceptor and the voucher printer.

To remove a pay panel without coin entry:

1. Open the lower main door and turn off main power.
2. Remove the screw that fixes the bill bezel to the rear of the lower main door.
3. Remove the screw that fixes the printer bezel to the lower main door.
4. Remove the two screws on the back of the door that secure the playbutton panel. Slide the mid trim panel forward so that it clears the pay panel.
5. Lift the module and tilt forwards so that it can be lifted off the top of the door.

Replacement is a reversal of the removal procedure.

Optional Blanking Plates for the Pay Panel

The two pay panel bezels, voucher printer and bill entry, can be converted to non-operational status by the addition of blanking plates. This allows for easy game conversion, if required. Each of the bezels can be fitted with a dedicated blanking panel that is secured through the bezel with a screw together with a retaining plate at the rear of the lower main door.

4.2.11 Buttons

The buttons function as the interface between the player and the EGM. Various games have different configurations of buttons. The buttons are mounted onto the mid trim panel.

Removal and Replacement Procedures

To replace a playbutton LED:

1. Open the lower main door, and switch OFF the EGM.
2. Unscrew the two screws inside the door which hold the top portion of the mid trim and the associated buttons.
3. Grasp the switch assembly, turn counterclockwise, and draw downwards and away from the EGM.
4. Grasp the micro switch and switch holder between the thumb and forefinger and pull out the faulty LED wedge. Observe the orientation of the polarisation indicator.
5. Gently push the replacement LED wedge into the switch holder, ensuring that its orientation is the same as the faulty LED removed.
6. Replace the switch assembly by aligning pips on the assembly with positions in the playbutton body, and press upwards.
7. Screw the top portion of the mid trim back onto the cabinet.
8. Switch ON the EGM, and close and lock the lower main door.

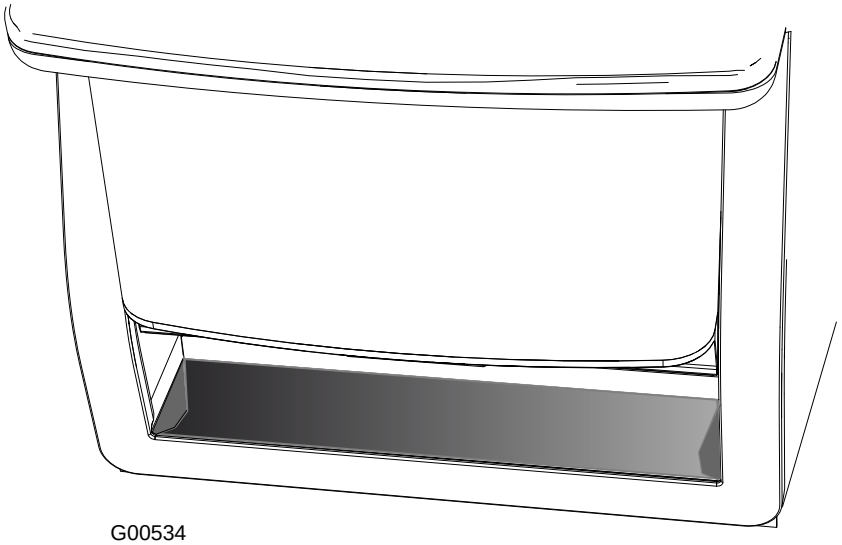
If a playbutton does not light up when it should, check the connections and the LED wedge.

To change a button label:

1. Place a small screwdriver against the vertical facing edge of the button and prise off the button cap. Do not use the button surround for leverage as this may cause damage to the surround.
2. The button label is now exposed and may be removed.
3. Place the new label between the button cap and the legend plate.
4. Clip the button cap into place.

4.2.12 Chip Tray

Figure 4-9 Chip Tray



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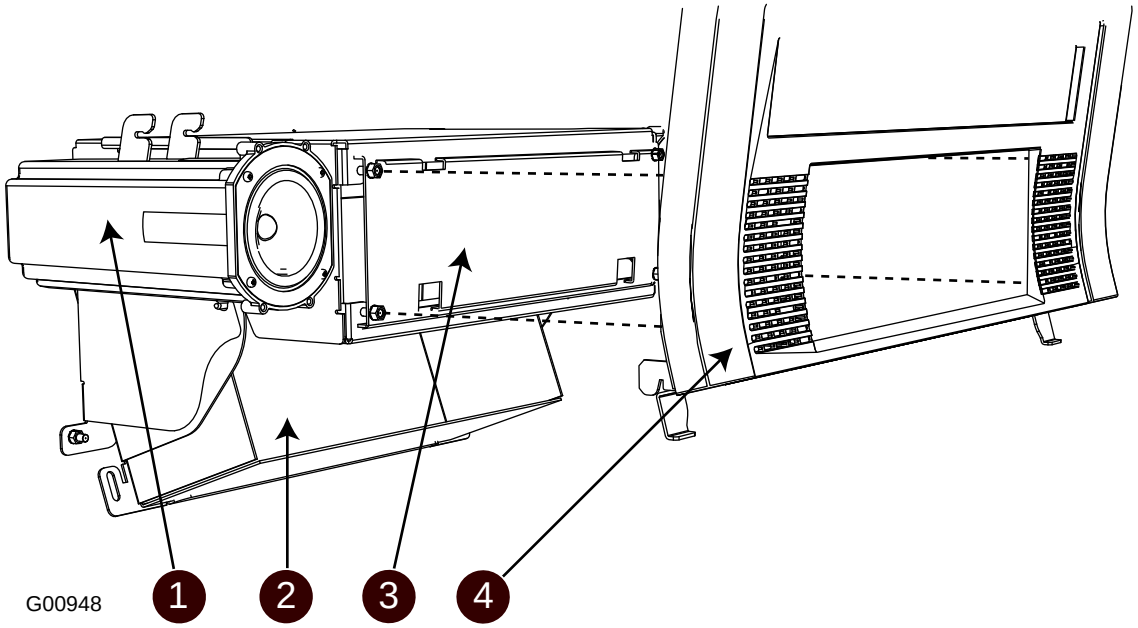
Chip Tray Blanking Panel

A chip tray blanking panel can be fitted for coinless EGMs or used in the conversion of coin capable EGMs to coinless.

4.3 Player Marketing Module (PMM)

Figure 4-10 Player Marketing Module



Legend			
1	Speaker (1 each side)	3	PMM Fascia
2	Hinged PMM housing	4	Top Box Door

EGM models are fitted with a slide out unit located above the main LCD screen between the two speakers. The front of the assembly is either blanked off or may be configured with a player marketing module (PMM). The PMM boards are mounted in a housing at the back of the PMM which can be hinged forward for easier access to the components.

The PMM can only be accessed by removing the top box door (which requires the opening of the upper main door and the lower main door).

4.3.1 General Description

The Player Marketing Module provides a range of services for players through a magnetic stripe card reader, a character display unit, and three buttons. Functions are integrated into the venue Casino management system.

The PMM fitted may be from one of several different manufacturers, including Bally, GRIPS, IGT, Sentinel and Aristocrat™. The following descriptions are based on the Aristocrat™ PMM**.** The internal components may vary slightly between manufacturers, however, the functionality of the devices remains the same.

Player communication is accomplished through the use of a magnetic stripe card. The player inserts the card into a card reader, and the PMM reads the information stored on the card. The host processor then 'knows' who is playing the EGM, and messages can be sent to the player via the PMM liquid crystal display (LCD).

The player communication function thus allows scope for the marketing strategies of the venue.

The PMM is housed in the slide-out tray above the lower main door and connects to the venue Casino management system via looms.

4.3.2 Technical Description (PMM)

Magnetic Stripe Card Reader

The Magnetic Stripe Card Reader is a manual feed Omron type 3S4YR-SBR. The card reader is a 66% reader; ie: it reads approximately 66% of the magnetic stripe. The reader works with magnetic cards conforming to AS 3522.2 and ISO 2894 and 3554. The magnetic stripe cards used can contain up to 10 characters of information on track two.

The reader has a minimum life of 300,000 card insertions.

Table 4-1 Magnetic Stripe Card Reader Characteristics

Parameter	Value
Operating Voltage	5V DC ± 10%
Current Consumption	25mA max.
Connector	IL-10P-S3FP2-1 or equivalent
Effective Stripe Length	46.6mm (1.83”) max.

Liquid Crystal Display

The Liquid Crystal Display is a Data Vision DV-16252 S2FTLY. The display consists of 2 lines of 16 characters. The characters appear in silver-gray LCD mode over a yellow-green LED backlight.

Table 4-2 Liquid Crystal Display Characteristics

Parameter	Value
Operating Voltage	5 V DC
Current Consumption	2 mA
Connector	14 way header, Molex M6471-14-1 or equivalent

Service Buttons

The Service Buttons used in the Player Marketing Module are Omron type B3W-4150S. The buttons are a two piece arrangement incorporating the switch itself (soldered onto the Service Button PCB) and a plastic push on cap.

4.3.3 Removal and Replacement Procedures

Removal procedure for the Player Marketing Module

To remove the player marketing module is as follows:

1. Disconnect power to the venue Casino management system communications interface.
2. Open lower main door, and switch OFF EGM power.
3. Open upper main door.
4. Lift off the top box door.
5. Disconnect the looms from the Player Marketing Module to the communications interface.
6. The fascia of the Player Marketing Module may now be removed by removing the four holding screws.
7. The other components of the PMM may be accessed by releasing the screw holding the hinged PMM housing in place and pivoting the housing forward. Sliding the PMM assembly forward will make this easier.

Replacement is a reversal of the removal procedure.

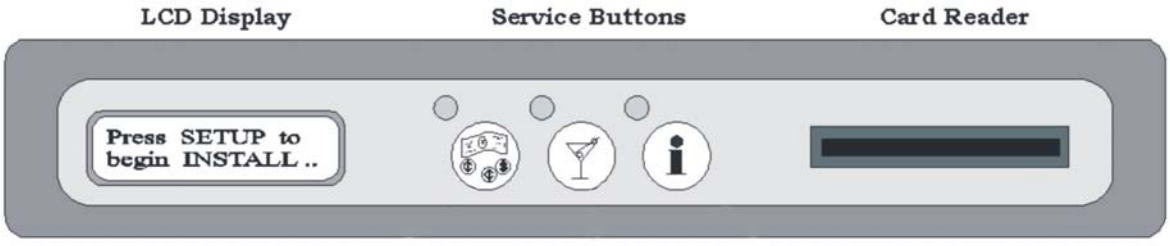
4.3.4 Machine Communications Setup

A setup procedure must be carried out to link the EGM to the host computer network. Details of this setup procedure are detailed in the venue Casino management system support publications.

The setup involves logging the venue Casino management system communications interface to the host processor along with the identification number of the EGM (usually located on the upper left of the play window) via the PMM.

The Service Buttons perform dual functions, providing cursor movement and acceptance of options through the LCD menu when installing the communications interface onto the network.

Figure 4-11 Variation to Face of PMM (Initial Display Message)



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Once the venue Casino management system communications interface is powered on, the Player Marketing Module will display a series of messages and installation processes are carried out.

Upon completion of the setup procedure, the EGM becomes functional and the range of player services and programs are available to EGM players. Also, links

are established between the host computer and components in the EGM which enable security control and machine monitoring.

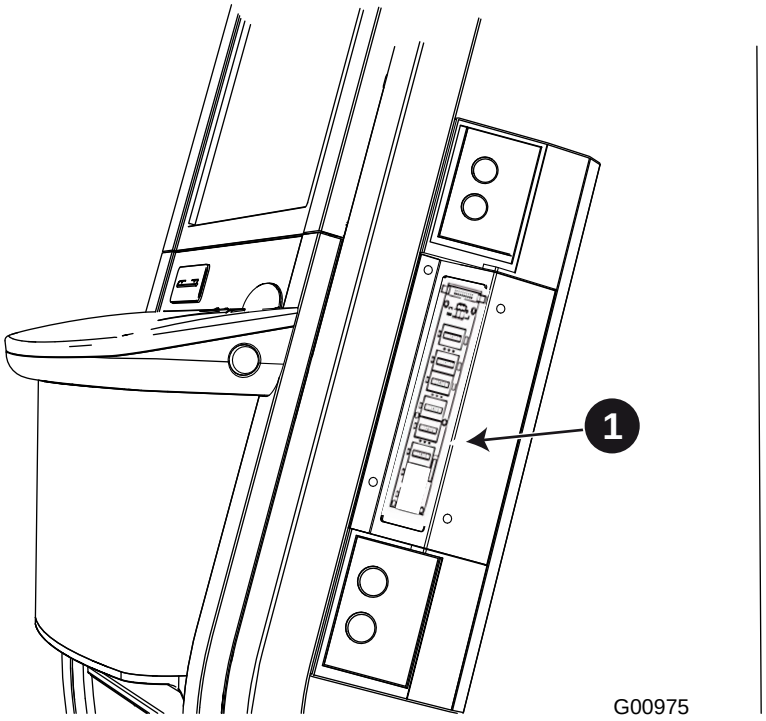
> The procedure for installing the venue Casino management system communications interface to the host processor remains the same regardless of the front decal in use. For example, if the front decal has only one button visible, the other two buttons will function in the manner previously described in this section for installation, even though they are not seen or utilized during normal EGM operation.

4.3.5 Electromechanical Meters (if fitted)

Mechanical meters are fitted to the EGM and can be viewed when the Audit / Operator / Meter Key Switch is turned anticlockwise. These meters form part of the comprehensive security system by recording the results of EGM cash flow operations.

> An EGM fitted with hard meters will not function unless the meters are connected.

Figure 4-12 Sealed Electromechanical Meters



Legend	
1	Electromechanical Meters

The hard meter board provides:

- A physical location for up to eight electromechanical meters.

- A physical location for a tamper switch.
- An interface to the meter lights key switch.

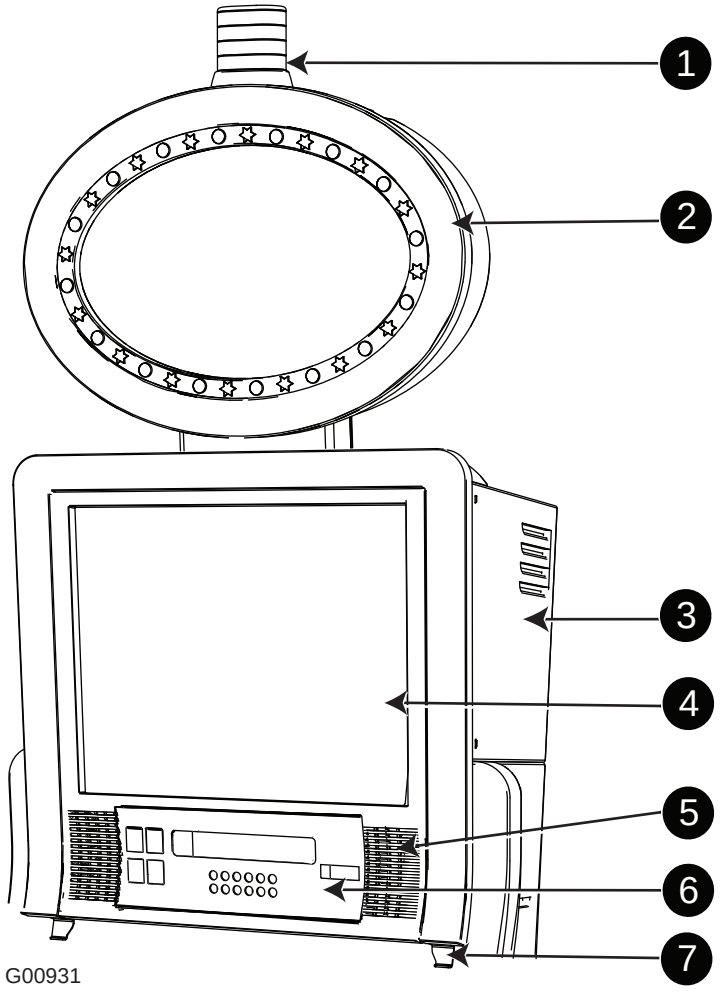
4.4 Top Box

The optional top box can be configured 3 ways:

- Casino top with static, backlit artwork display or LCD display.
- Round top with static, backlit artwork display.
- Chop top with static, backlit artwork display.

All top boxes can be fitted with a topper and/or a light tower and all top boxes are fitted with a door that retains an artwork panel.

Figure 4-13 Top Box and PMM Tray



Legend					
1	Light Tower	4	Top BoxDoor / LCD Screen	7	Top Box Locking Tab
2	Topper	5	Speaker (2 off)		
3	Top Box	6	PMM (if fitted)		

Removal and Replacement Procedures

The top box door is a lift off door. To remove all top box doors:

1. Open lower main door and switch OFF the EGM.
2. Open the upper main door.
3. Push the up top box door (vertically) to disengage hooks on the back of the door.
4. Lift off the top box door.

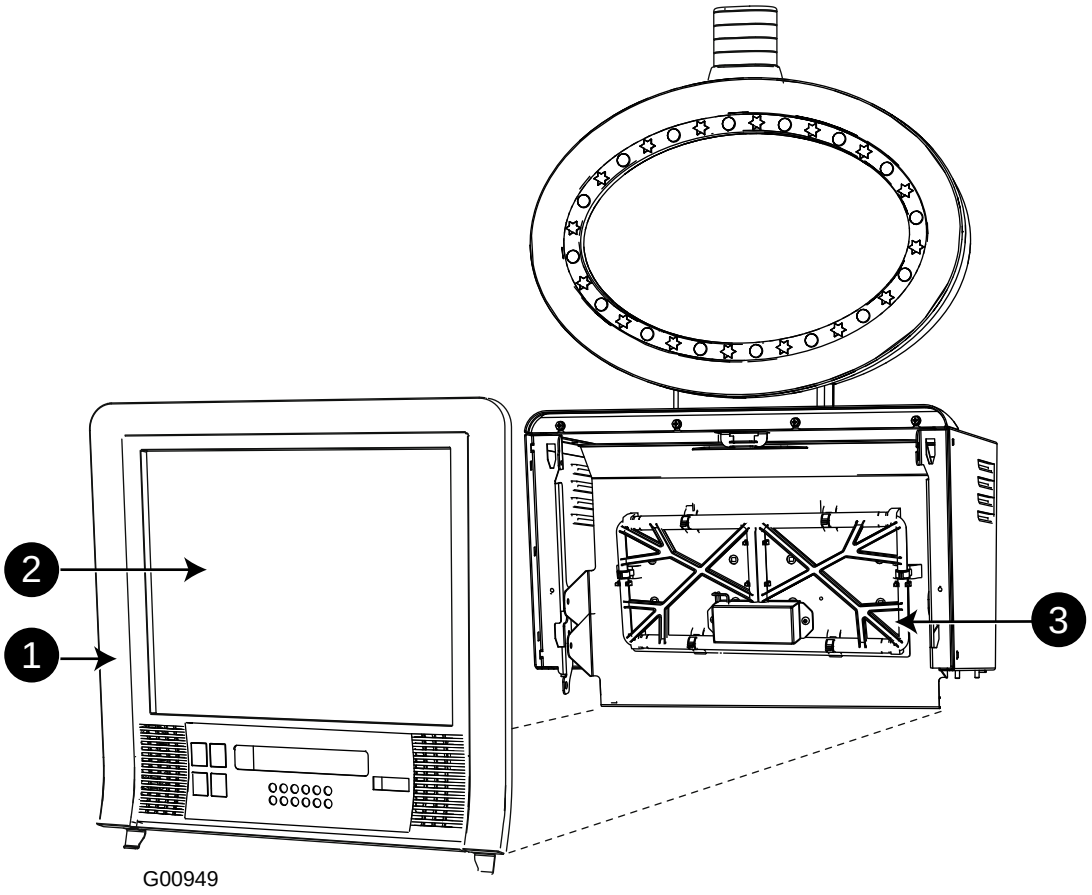
Replacement is a reversal of the removal procedure.

The upper main door must be open to remove the top box door.

4.4.1 Casino Top Box, Lighting, Artwork and Display (if fitted)

The following section covers casino top box and associated lighting, artwork and display (if fitted).

Figure 4-15 Top Box Lighting and Artwork



Legend			
1	Top Box Door	3	CCFL Lighting Module
2	Top Box Artwork		

Removal of the Casino Top Box LCD Display

The LCD display is mounted in the Casino top box and is hinged to the top box body via 2 pins. The top box is fitted with a spring operated plunger that, when released allows the LCD to be tilted for easy access to the top box. The LCD is retained in the open position by a stay. 2 transit screws (1 per side) are used to fix the LCD to the top box frame and are required for stability in transport. These screws can be removed after installation allowing the plunger to retain the LCD in an operational position.

To remove casino top box LCD screen:

1. Remove the top box as previously described.
2. Remove the two transit screws if fitted.
3. Tilt the LCD far enough to disconnect all cables.

4. Tilt the LCD far enough to access, on the left hand side, remove the screw that secures the stay to the LCD. Remove the screw.
5. Disengage the right hand side hinge pin from its supporting slot by tilting the LCD.
6. Slide the LCD to the right to allow the left hand side pin to disengage from its mounting hole and remove the LCD from the EGM.

Replacement is a reversal of the removal procedure.

Removal of Casino Top Box

To remove casino top box:

1. Remove top box door as previously described.
2. Remove LCD as described above.
3. Remove 4 screws (2 per side) that fix the top box side flange to the cabinet side flanges.
4. Remove the angle brackets (2) that clamp the flanges together by disengaging the hook at the cabinet rear.
5. Lift off the top box.

Replacement is a reversal of the removal procedure.

Removal of Casino Top Box Lighting

To remove casino top box CCFL:

1. Remove the top box as previously described.
2. Disconnect the CCFL loom from where it is mounted on the top box reflector.
3. Remove top box reflector.
4. Remove the two screws that fix the CCFL inverter cover to the reflector.
5. The CCFL is fixed with six clips. Open each clip and remove the CCFL module.

Replacement is a reversal of the removal procedure.

Removal of Casino Top Box Artwork

To remove casino top box artwork:

1. Remove the top box as previously described.
2. Remove the artwork out from the holding clips and spring the artwork from the metal retaining bracket.

Replacement is a reversal of the removal procedure.

4.4.2 Round Top Box, Lighting and Artwork (if fitted)

The following section covers removal and replacement procedures for round top box, CCFL and artwork (if fitted).

Removal of Round Top Box

To remove round top box:

1. Remove top box door as previously described.

2. Remove 4 screws (2 per side) that fix the top box side flange to the cabinet side flanges.
3. Remove the angle brackets (2) that clamp the flanges together by disengaging the hook at the cabinet rear.
4. Lift off the top box.

Replacement is a reversal of the removal procedure.

Removal of Round Top Box Lighting

To remove round top box CCFL:

1. Remove top box door as previously described.
2. Disconnect the CCFL loom from where it is mounted on the top box reflector.
3. Remove top box reflector.
4. Remove the two screws that fix the CCFL inverter cover to the reflector.
5. The CCFL is fixed with six clips. Open each clip and remove the CCFL module.

Replacement is a reversal of the removal procedure.

Removal of Round Top Box Artwork

To remove round top box artwork:

1. Remove the top box as previously described.
2. Remove the artwork out from the holding clips and spring the artwork from the metal retaining bracket.

Replacement is a reversal of the removal procedure.

4.4.3 Chop Top Box, Lighting and Artwork (if fitted)

The following section covers removal and replacement procedures for chop top box, CCFL and artwork (if fitted).

Removal of Chop Top Box

To remove chop top box:

1. Remove top box door as previously described.
2. Remove 2 screws (1 per side) that fix the cabinet top panel to the flanges on the cabinet to shelf.
3. Slide the top panel forward to disengage the hooks at the rear.
4. Lift off the top panel.

Replacement is a reversal of the removal procedure.

Removal of Chop Top Box Lighting

To remove chop top box CCFL:

1. Remove top box door as previously described.
2. Disconnect the CCFL loom from the panel mounted connector on the trunk loom.

3. Remove the 2 screws that secure the CCFL module to the cabinet top shelf.
4. Remove the CCFL module.

Replacement is a reversal of the removal procedure.

Removal of Chop Top Box Artwork

To remove chop top box artwork:

1. Disengage the 2 metal spring clips that secure the artwork panel and supporting bracket to the door (applying pressure to the front of the artwork panel will assist in this operation).
2. Remove the supporting bracket.
3. Remove the artwork panel.

Replacement is a reversal of the removal procedure.

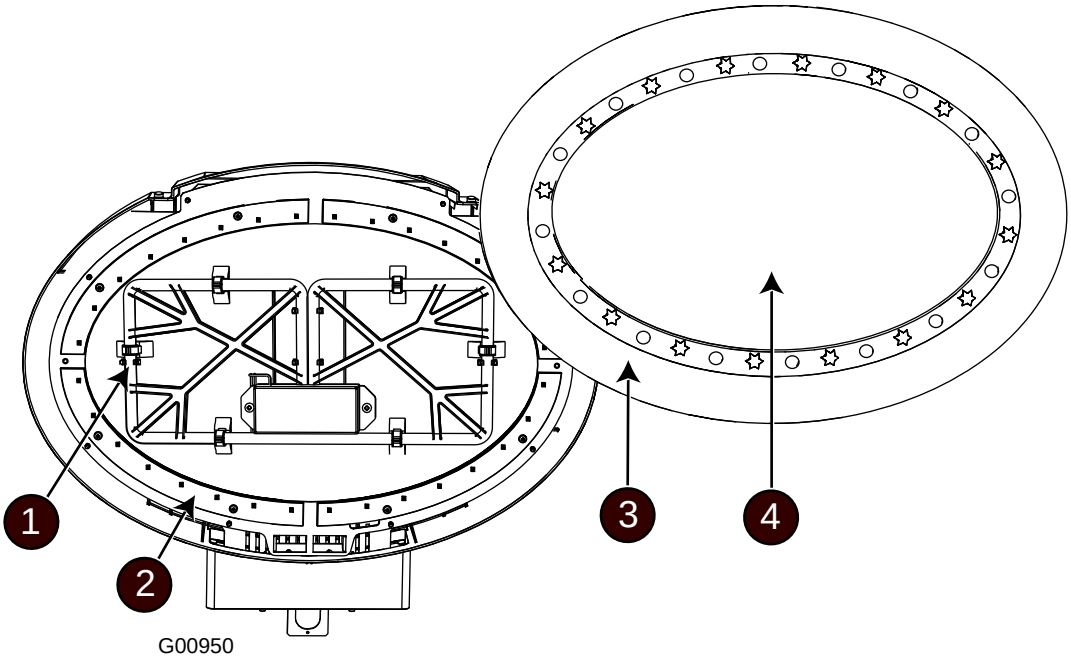
4.5 Topper (if fitted)

The following section covers topper components, topper wiring and general maintenance of topper board.

4.5.1 Topper Components

The diagram below shows the components making up the topper.

Figure 4-16 Oval Topper Components

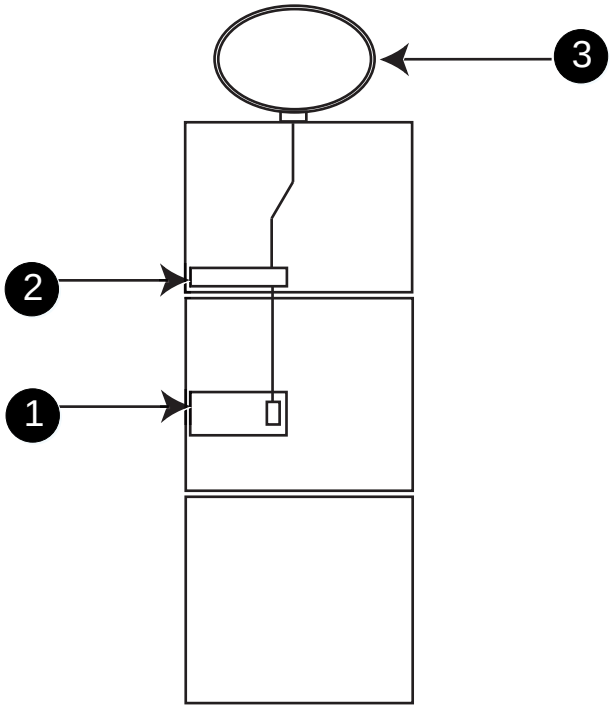


Legend			
1	CCFL Lighting Module	3	Topper Door
2	LED Board (4 off)	4	Artwork

4.5.2 Topper Wiring

The illustration below shows in principle how the topper unit is wired into an EGM.

Figure 4-17 Topper Wiring in EGM



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Legend					
1	Backplane Board	2	Patch Panel in bottom of Top Box	3	Oval Topper Assembly

4.5.3 General Maintenance of Topper Board

For general maintenance of the Topper Board:

- Remove any dust or dirt from external surfaces.
- Check that all connectors are in good condition and are secure.

4.5.4 Removal and Replacement

To remove the topper fluorescent light tube:

1. Open the cabinet door and switch OFF the EGM.
2. Remove the two screws, one each side, that secure the fascia and artwork to the topper assembly.
3. Disconnect the CCFL loom from where it is mounted on the topper reflector.
4. Remove the topper reflector.
5. Remove the two screws that fix the CCFL inverter cover to the reflector.
6. The CCFL is fixed with six clips. Open each clip and remove the CCFL module.

Replacement is a reversal of the removal procedure.

To remove the topper fuse:

1. Open the cabinet door and switch OFF the EGM.
2. Locate the topper loom. The fuse is part of the loom and is usually found hanging at the rear of the cabinet above the power supply unit.
3. Open the fuse holder and remove the fuse.

Make sure that the new fuse has the same current rating as the one being removed.

Replacement is a reversal of the removal procedure.

4.6 Light Tower (if fitted)

A light tower may be fitted to EGMs to provide an additional level of security and customer service. The light tower is screwed to the front center of the roof of the top box (or the front center of the roof of the cabinet where a top box is not used) so that it may be seen from a distance. Light towers are available with two, three, or four tiers. The tiers of the light tower illuminate in response to player requests (change, reserve, etc) through the buttons and/or machine conditions (door open, jackpot, etc). The color of the light tower tiers and the corresponding messages and functions may vary from EGM to EGM. Refer to the Machine Modes chapter for a description of the light tower messages.

One DIP switch is provided at the base of the light tower board and this is used to set the number of tiers (2, 3 or 4) to cater for different customer requirements.

On 4 tier light towers each set of lights has a colored plastic segment around it.

On 3 tier light towers the middle two sets of lights are combined, and for two tier light towers the top two sets and the bottom two sets of lights are combined.

The light tower may be disassembled in place or removed from the top box as a single unit.

4.6.1 Disassembly, Replacement, and Removal Procedures

Disassembly of Light Tower

To disassemble the light tower and replace components:

1. Open the lower main door and switch OFF the EGM.
2. Note the position, color and display of each tier.
3. Remove the screw fastening the light tower cap and remove the cap.
4. The individual segments can now be removed and replaced as required.
5. Replace the light tower cap and screw and fasten the assembly together.
6. Switch ON the EGM, close and lock the lower main door, and check that the light tower is functioning correctly.

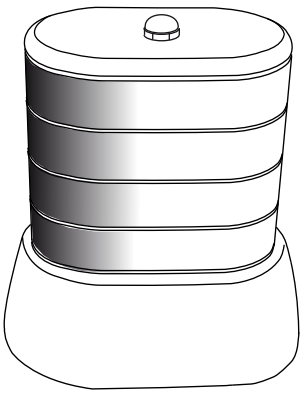
Removal of Light Tower Assembly

To remove the light tower assembly:

1. Open the lower main door and switch OFF the EGM.
2. Open the upper main door.
3. Lift off the top box door.
4. Unplug the loom from the hanging connector at the bottom of the light tower.
5. Remove the two nuts securing the light tower to the top box.
6. Remove the light tower from the roof of the top box.

Replacement is a reversal of the removal procedure.

Figure 4-17 Light Tower



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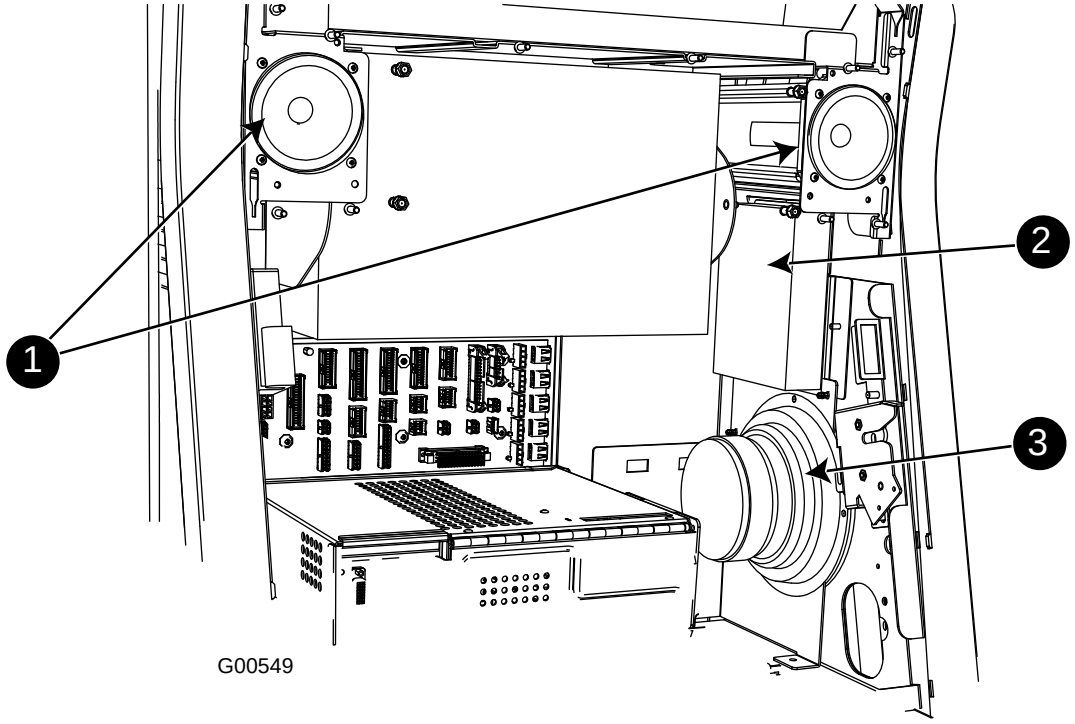
4.7 Audio System

The audio system fitted depends upon the jurisdiction.

4.7.1 Audio Setup

The audio system has two standard speakers and a large amplifier unit as well as a woofer speaker on the left hand inside wall of the EGM.

Figure 4-18 Standard Speakers, Woofer and Large Amplifier



Legend					
1	Standard Speakers (2 off)	2	Large Amplifier Unit	3	Woofer

4.7.2 Removal and Replacement

To remove standard speakers:

1. Open the lower main door and switch OFF the EGM.
2. Open the upper main door upper by pulling the lever.
3. Open top box door (as described elsewhere).
4. Remove SEI module assembly (as described elsewhere).
5. Remove screw at front that holds the speaker assembly in position.
6. Push speaker assembly towards the back of the cabinet until its fixing hook is released and it falls out of the fixing slots.
7. Remove loom from rear of speaker assembly.
8. Pull out from cabinet.

Replacement is the reversal of the removal procedure.

The woofer speaker is fixed to a circular speaker bracket with four bolts attached, which is welded to the side of the cabinet. This speaker bracket remains whether a woofer is attached or not.

To remove a woofer speaker from the cabinet:

1. Undo the four nuts holding the woofer speaker to the speaker bracket.
2. Disconnect the speaker loom.

Replacement is the reversal of the removal procedure.

To remove the amplifier:

To remove amplifier with plate attached.

1. Open main door using main door key and switch off mains power.
2. Open main door upper by pulling lever.
3. Remove screw on the front and on the back of the plate.
4. Remove cables.
5. Remove amplifier with plate attached.

To remove amplifier from the plate.

1. Remove four screws, one on each corner of the plate.
2. Remove amplifier from plate.

Replacement is the reversal of the removal procedure.

4.8 SEI

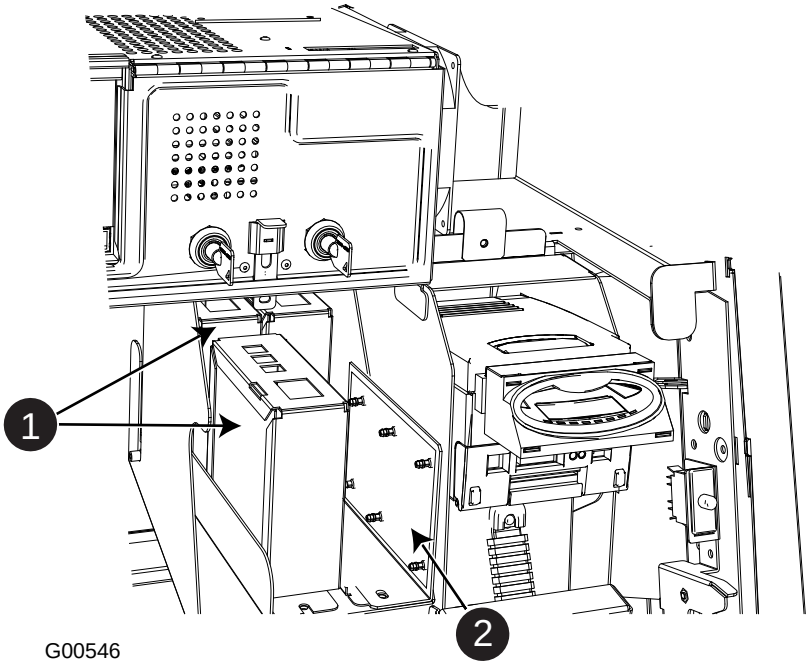
The Subsidiary Equipment (SEI) Module is used to provide communication between the EGM and external communications systems. Accommodation for multiple SEI boards has been provided in the EGM.

4.8.1 SEI Setup

The SEI setup provides accommodation for three SEI cards. The housing for the cards is located in the center of the cabinet, between the bill acceptor and the printer.

The fourth position in the SEI housing is used by the SEI power supply.

Figure 4-19 Three SEI Setup



Legend			
1	SEI/Comms Units (3 off)	2	SEI Power Supply Mounting Plate

4.8.2 SEI Board - 442013

The Hyperlink™ Subsidiary Equipment Interface (SEI) Board provides the communications interface between the EGM and the Jackpot Controller. The board converts the RS485 signals used to communicate with the JPC to RS232 signals to communicate with the EGM. It is also used to communicate with the Hyperlink™ Graphic Display.

Connectors

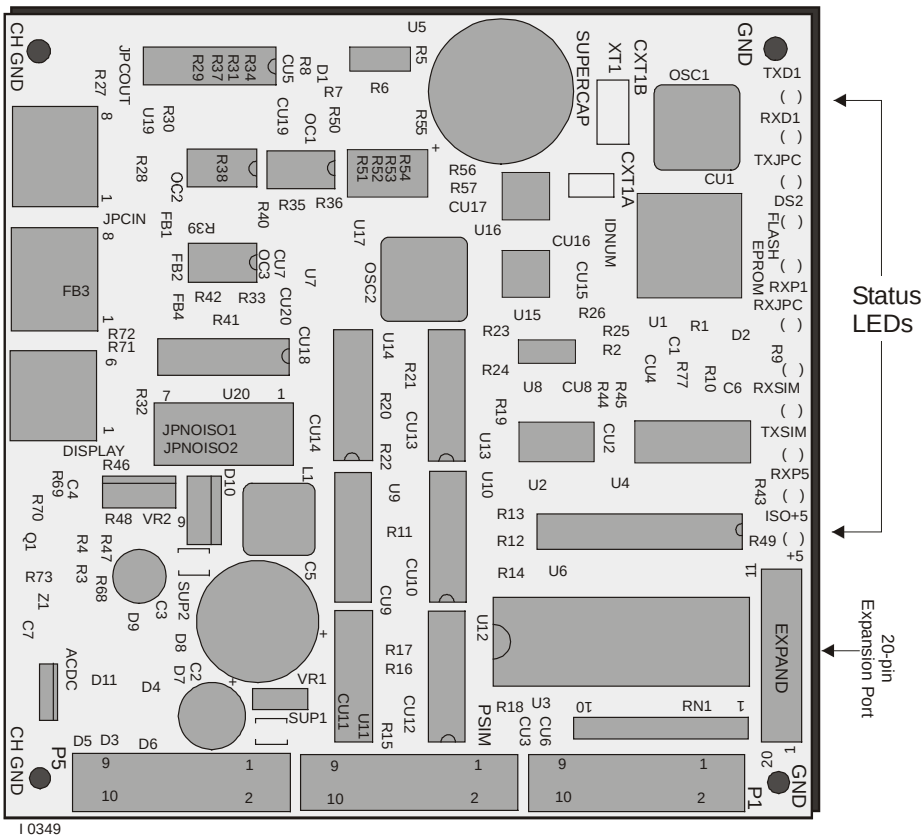
The 10-pin Amphenol 816 type header P1 provides bi-directional RS232 communications with the connector P15 (Serial 2) on the backplane board. The 10-pin Amphenol 816 type header PSIM provides bi-directional RS232 communications with the ASP Host. PSIM is provided for additional systems.

The 8-pin RJ45 type connector JPCIN provides RS485 communications with the JPC. The 8-pin RJ45 type connector JPCOUT allows the JPC signals to be serially connected to the next EGM. This port is connected to the JPCIN port on the SEI board in the next EGM. Where possible, it is preferable to use RJ45 3-way adaptors to achieve the serial connection between EGMs, in which case the JPCOUT port is not used.

The 6-pin RJ45 type connector DISPLAY provides RS485 communication with the Graphic Display. The SEI also receives 12V DC power from the EGM via the 3-pin Molex connector ACDC. The SEI is housed in a metal box and mounted in the SEI housing or on the SEI plate. The cover is held in place with a screw.

An assembly drawing of the Hyperlink™ SEI is shown below.

Figure 4-20 Hyperlink™ SEI Board – Component Layout



Status LEDs

There are a number of status LEDs located on one side of the SEI board. The LEDs illuminate to indicate that the SEI is either receiving or transmitting signals. The status indicators assist in machine diagnostics and fault finding. The table below explains the function of each of the status LEDs.

Table 4-3 Status LEDs on SEI

LED	Function
TXD1	Yellow LED. Illuminates when DISPLAY on the SEI is sending data to the graphic display located in the top box.
RXD1	Yellow LED. Illuminates when DISPLAY on the SEI is receiving data from the graphic display.
TXJPC	Green LED. Tx to JPC. Illuminates when JPCIN on the SEI is sending data to the JPC.
DS2	Red LED. Illuminates to indicate the CPU on the SEI is active. Should be flashing at all times when the board is powered.
RXP1	Red LED. Illuminates when P1 on the SEI is receiving data.
RXJPC	Green LED. Rx from JPC. Illuminates when JPCIN on the SEI is receiving data from the JPC.
RXSIM	Red LED. Illuminates when PSIM is receiving data.
TXSIM	Red LED. Illuminates when PSIM is sending data.
ISO+5	Yellow LED. Illuminates to indicate the isolated 5V line is active.
+5	Green LED. Illuminates to indicate the 5V line is active.

Removal and Replacement

When handling electrostatic devices (ESDs) such as PCBAs, take care to avoid physical contact with components. Handle PCBAs by their edges. Do not place ESD items on metal surfaces. When handling PCBAs, take care to avoid flexing the PCBA. Flexing may cause physical damage.

To remove the Hyperlink™ SEI Board from the EGM:

1. Open the lower main door and switch OFF the EGM.
2. Open the upper main door.
3. Hinge up the LCD if the SEI card is located on the SEI plate behind the LCD.
4. Locate the Hyperlink™ SEI Board mounted in the PMM housing against the back wall.
5. Disconnect the looms from the board.
6. Remove the board assembly with plates from the EGM.
7. The PCBA is fixed to the backplate with spacers, two nuts, and two stand-offs. Remove the PCBA from the metalwork, and place the PCBA in an antistatic bag.

Replacement is a reversal of the removal procedure.

A fault tag must be placed on any faulty PCBs.

4.8.3 SEI Power Supply

Functional Description

The SEI power supply unit (PSU), formerly called the LAB Communications PSU, provides power connections for up to six subsidiary equipment interfaces. Each connection is capable of supplying 12V (+/- 1V) DC @ 0.5A, isolated to 3kV. Each output connection from the PSU is protected by a 24-12V DC-DC converter with current limiting when output is shorted. Each output (J1-J6) is associated with a LED (D7-D12) that glows green when lit, indicating the presence of 12V.

The PSU is made up of the 24-12V Power Board, the Serial Interface Card Mounting Chassis (PSU Chassis) and an interconnecting power loom that connects from the EGM backplane board to the 24-12V power board input socket.

The 24-12V power board utilizes 6 snap-on standoffs for mounting.

Input Power Interface

The input power enters the Comms PSU module via a 4-way Microfit Connector. The PSU module will have the following single input power connection: 24V, and 0V.

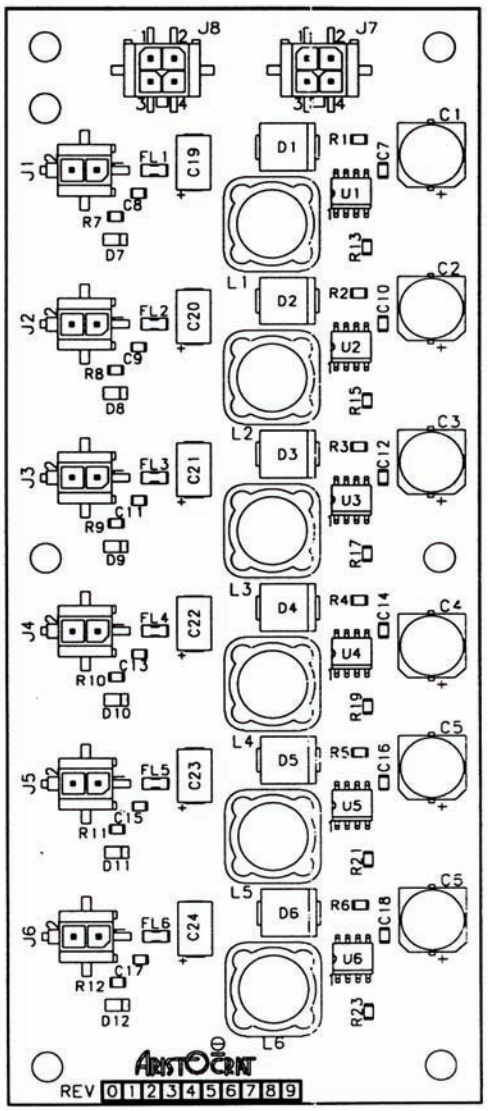
Output Power Interface for Connection to Subsidiary Equipment

Power leaves the 24-12V Power Board in the form of six, +12V DC, 0.5A rated outputs. The six output connectors are 2-way Microfit Connectors.

24-12V Power Board Component Layout

The diagram below shows the layout of the Power Board.

Figure 4-21 24-12V Power Board - Component Layout



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4.9 General Maintenance

The following should be carried out as part of regular EGM servicing:

- Check that all cabinet earth leads are in good condition and securely connected.
- Check the condition of the artwork panels. Replace if necessary.
- Check that the EGM security features (eg: cabinet door security switch) are functioning correctly and are not damaged.
- Check the CCFL system works correctly. Replace any faulty components if necessary.
- Check that all buttons function correctly. Replace if necessary.
- Check that there are no foreign objects in any of the security locks.
- Check that all doors & latches close and lock correctly. Adjust if necessary.

4.9.1 Care of Cabinet Surface

Clean the exterior of the cabinet with a damp cloth using an ordinary dishwashing type soap and water in a standard (mild) concentration. Remove any residue with clean water and a damp cloth. Be extremely careful not to allow water to seep into the EGM and electrical components.

Aggressive solvents, alkaline solutions or abrasive cleaners should not be used.

Notes

Chapter 5

Power Supply Part No. 432666

List of Figures

List of Tables

5.1 Overview

The Power Supply Unit (PSU) provides power to electronic and electrical devices in the Aristocrat™ Electronic Games (EGM). The unit also performs power line Electromagnetic Interference (EMI) filtering and protects the EGM from adverse input disturbances such as lightning and voltage fluctuation. The PSU provides all the necessary DC outputs for powering Gen7 electronics and associated gaming peripherals.

5.1.1 Basic Operation

The power supply unit receives AC mains input via a standard IEC socket. A wide range (100V AC to 240V AC) of mains voltage can be connected without the need for switch selection. Major aspects of the power supply specifications are summarized below.

Table 5-1 Specification summary

Specification	115V AC	230V AC
Voltage Range	100V AC - 240V AC	
Voltage Frequency	47Hz - 63Hz	
AC Input Current (Rated)	< 10A	< 5A
Efficiency	> 75% @ 230V AC, Full and Typical load	
PFC Type	Active PFC	
Power Factor	95%	
Inrush Current Limit	< 20A	< 20A

Table 5-2 DC Outputs

Output	Regulation Range	Ripple & Noise Spec	Output Load range	
			Imin	Imax
+12.3V	±2.5%	120mV	0.5A	10A
+24V combined	±2.5%	200mV	0.5A	11A
+5V SB	±5%	50mV	0.0A	2.0A

Protection Features

- Over Voltage.
- Over Current.
- Over Temperature.
- Under Voltage.
- Short Circuit.

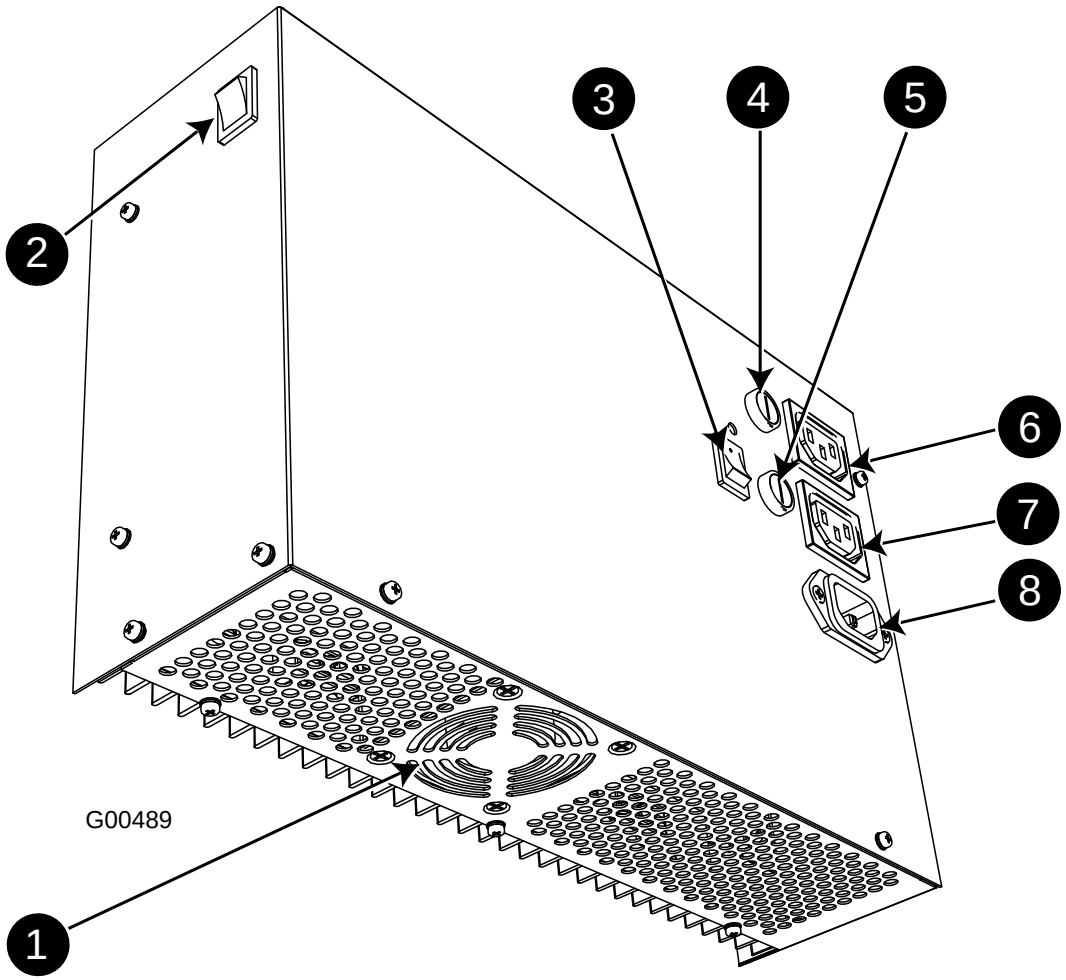
ATA Unique Features

- Two GPO mains outlets.
- Low leakage current.
- Mechanical size.

5.2 Power Supply Unit - 432666

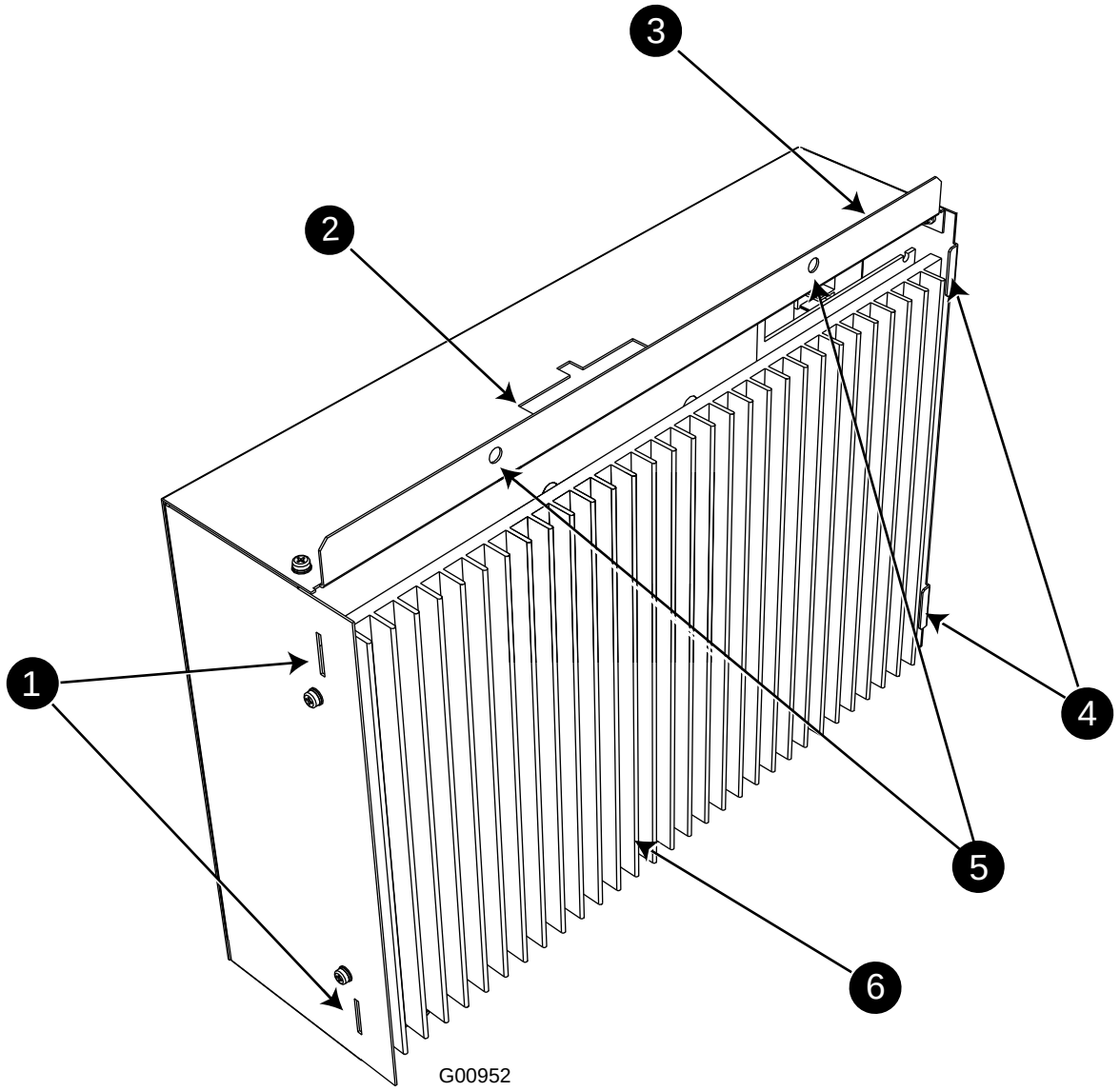
The power supply unit mounts into the base of the EGM, as detailed in the Cabinet chapter, with convection cooling airflow intake along the back. The mounted power supply is fully enclosed with venting holes complying with the safety standard “finger test”. The enclosure meets the safety standard “fire enclosure”. The overall maximum dimensions are 83mm (3.27”) wide by 200mm (7.87”) high by 300mm (11.81”) deep. Mounting consists of locating slots and tabs on the ends of the PSU and screw fixing points on the top tab of the PSU. The power supply and cabinet have been designed to optimize the natural airflow over the heat sink at the rear of the PSU.

Figure 5-1 Power Supply Unit - Front



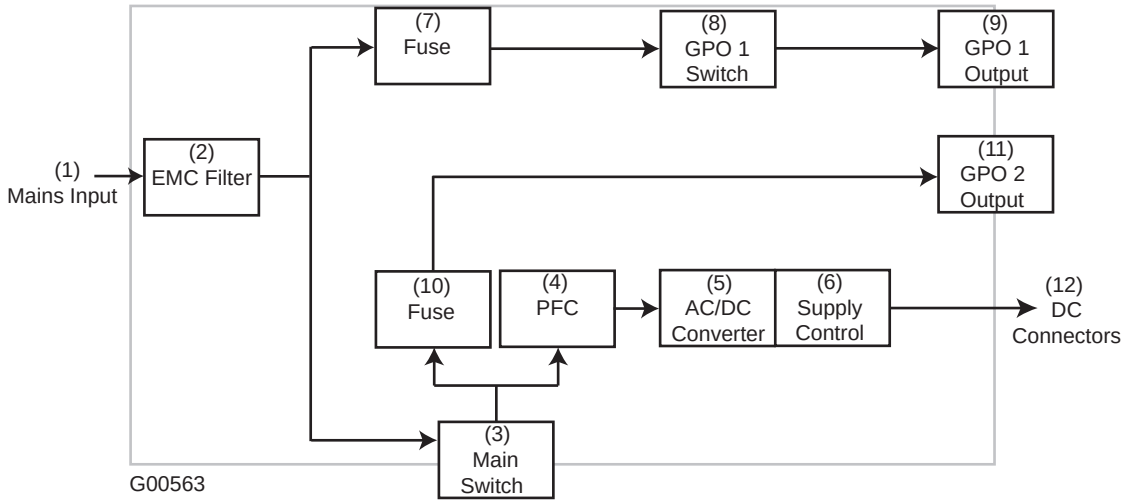
Legend					
1	Cooling Fan	4	Fuse	7	GPO (switched)
2	Main Power Switch	5	Fuse	8	Power Input
3	GPO Power Switch	6	GPO (unswitched)		

Figure 5-2 Power Supply Unit - Back



Legend					
1	Locating Slot	3	Fixing Screws (2 off)	5	Locating Tab
2	DC Outputs	4	Mounting Tab	6	Heatsink

Figure 5-3 Power Supply Unit - Block Diagram



5.2.1 Basic Operation

The mains power comes in via the mains input receptacle (1).

The EMC filter (2) maintains EMC susceptibility, low leakage current requirements and filters mains supply rail before its redistributed. Two mains general purpose outlets are available for internal EGM peripherals requiring mains input.

Unswitched GPO1 output (9) with associated switch (8) and fuse (7) provide mains independent on status of main EGM switch (3). Switched GPO2 (11) with fuse (10) can supply mains only when main switch (3) is in switched state.

Power Factor Correction (4) warrants harmonic limits compliancy and worldwide ranging mains input capability. Converters (5) generating low voltage outputs and its control circuitry (6) connects to output connectors (12).

5.2.2 Input Functional Specification

AC Input

The table below lists AC input voltage and frequency requirements for continuous operation. The power supply is capable of supplying full-rated output power over a wide input voltage range. The power supply can automatically recover from AC power loss. The power supply can start up under peak loading at 90V AC.

Table 5-3 AC Input Line Requirements

Parameter	Minimum	Maximum	Unit
Vin	90	264	VAC rms
Vin Frequency	47	63	Hz

An active power factor corrected input stage is used in order to meet the EMC requirements. The power supply automatically recovers from any brownout condition.

Inrush Current Limiting
The maximum inrush at turn on is limited to less than 20A peak when the power is turned on at either 115V AC or 230V AC (at any point on the AC cycle) and excluding transient currents due to EMI suppression capacitors. The inrush is applicable to both cold and hot starting conditions.

Input Under Voltage
The power supply contains protection circuitry such that the application of an input voltage below the minimum specified does not cause damage to the power supply.

Input Over Current Protection
The power supply incorporates primary fusing for input over-current protection to prevent damage to the power supply and meet safety requirements. Fuses are slow-blow type or equivalent to prevent nuisance trips and are located such that they are non-user accessible or serviceable.

Input Leakage Current
Maximum leakage current from the power supply (excluding equipment associated with Mains GPO outlets) is less than 400µA at 120V AC.

5.2.3 Output Functional Specifications

AC Outputs

GPO outputs are used to power various mains associated equipment within the EGM. Filtering of outputs is provided to protect against conducted EMI from the connected devices and also to provide immunity from mains disturbances for the connected devices.

GPO1 Output
Not controlled by the main switch. Power at this output is controlled by a single pole switch, located adjacent to the output.

The maximum rating of the output is 1A. Load regulation is better than 1% at maximum load.

GPO2 Output
Controlled by the main power switch. The maximum rating of the output is 1A. Load regulation is better than 1% at maximum load.

AC Outputs Fusing
The GPO outputs are over current protected by means of a fuse. To allow for the inrush current associated with the peripherals used, a “slow” fuse is used, rated at 3.0 A. The fuse holders are located adjacent to the outputs and are externally accessible.

DC Outputs

DC Voltage Regulation

The DC output voltages are within the regulation ranges shown in the table below. Voltages are measured at the output connectors under all line, load, and environmental conditions.

Table 5-4 DC Output Voltage Regulation

Output	Tolerance	Min.	Nom.	Max.
+12VDC	± 2.5%	12.00	12.30	12.60
+5VSB	± 5%	4.75	5.00	5.25
+24V1DC	± 2.5 %	23.4	24.0	24.6
+24V2DC	± 2.5 %	23.4	24.0	24.6

DC rail +24V1DC is used as a distributed rail for supplying EGM peripherals.

The +24V2DC output is used for light illumination. It is derived directly from the +24V1DC output. +24V2DC has a inhibit control input.

DC Output Currents

Output current capability of individual DC rails is defined in the table below. Peak rating describes short current demands of peripherals when in active state.

Table 5-5 DC Output Currents

Output	Min	Max	Peak
+12VDC	0.5	10A	15A
+5VSB	0	2A	3A
+24V1DC	0.5	6.5A	11.5A
+24V2DC	2 0	4.5A	7.1A

24V1DC is used for lighting. If 24V1DC is not being utilized then that extra power is available from 24V2DC.

Output Transient Response

The table below summarizes the expected output transient step sizes for each output.

Table 5-6 DC Output Transient Step Sizes

Output	Maximum Step Size (% of rated output amps)	Maximum Transient Load Slew Rates[3] (A/µs)
+12VDC	40%	1.0
+5VSB	0.5A	not specified
+24V1DC	40%	1.0
+24V2DC	50%	1.0

Efficiency

The power supply is at least 75% efficient under load conditions greater than 50% of nominal. In standby mode the efficiency of the power supply is greater than 50% when the 5VSB current is greater than 1A.

The power supply is designed for low standby power. When in stand by mode, the power supply is at least 50% efficient. Standby efficiency is measured with the DC outputs off (PS_ONn in active state).

Voltage Ripple & Noise

The output ripple/noise requirements listed in the table below are met throughout the load ranges specified in the DC Output Currents table and under all input voltage conditions.

Table 5-7 DC Output Ripple and Noise

Output	Max. Ripple & Noise (mVpp)
+12VDC	120
+5VSB	50
+24V1DC	200
+24V2DC	200

Capacitive Loads

The power supply powers up and operates with the following maximum capacitive loads simultaneously present on DC outputs.

Table 5-8 Output Capacitive Loads

Output	Capacitive Load (uF)
+12VDC	10,000
+5VSB	500
+24V1DC	10,000
+24V2DC	4,000

Closed-loop Stability

The power supply is unconditionally stable under all line/load/transient load conditions including capacitive loads. A minimum of 45 degrees phase margin and 10 dB gain margin is supplied at both the maximum and minimum loads.

Power Sequencing

The +24V1DC and +12VDC rails track each other on power-up and on power-down. +24V1DC output level is equal to or greater than the +12VDC output at all times.

Voltage Hold-up Time

The power supply is designed with good susceptibility to mains disturbance. It must maintain output despite a loss of input power at the low-end nominal range (115V AC / 47Hz or 230V AC / 47Hz) at maximum continuous output load as applicable for a minimum combined time of 45ms.

PWR_FAILn

The PWR_FAILn is an active-low signal that provides a warning to the EGM of mains failure. When input mains rectified voltage falls below a threshold indicating insufficient level of energy, the PWR_FAILn is activated.

Minimum duration of PWR_FAILn activity is longer than 5 ms to provide sufficient time for detection.

Table 5-9 PWR_FAILn Voltage Levels

Signal	Voltage
PWR_FAILn active	< 0.4V @ 5mA
PWR_FAILn inactive	> 6V

Table 5-10 Power Supply Timing

Parameter	Description	Value
T1	Power ON time	< 500ms
T2	Power rails rise time	2 – 20ms
T3	PWR_FAILn delay	5 – 500ms
T4	PWR_FAILn rise/ fall times	50 – 200us
T5	Hold up time to PWR_FAILn active	> 20ms
T6	Power fail warning	> 25ms

PS_ONn

PS_ONn is an active-low, TTL-compatible signal that allows a Gen7 electronic to remotely control the power supply for Wake on LAN. When PS_ONn is pulled to TTL low, the power supply turns on +12VDC, and +24V1DC. When PS_ONn is pulled to TTL high or open-circuited, the DC output rails do not deliver current and are held at zero potential with respect to ground.

PS_ONn has no effect on the +5VSB output, which is always enabled whenever the AC power is present.

Table 5-11 PS_ONn Signal Characteristics.

Signal	Voltage
PS_ONn active	< 0.8V @ -1.6mA
PS_ONn inactive	2 – 5.25V @ -200uA

24V2_OFFn

Current limiting device supplying 24V2DC provides switch capability. 24V2_OFFn is driven by an active-low, open collector signal from the Gen7 electronics to remotely control the 24V2DC rail. When 24V2_OFFn is pulled to low state, the power supply turns off +24V2DC and the rail is held at zero potential.

Table 5-12 24VF_OFFn Voltage Levels

Signal	Voltage and Current
24VF_OFFn active	< 0.4V @ 5mA
24VF_OFFn inactive	> 6V

+5 VSB

+5 VSB is a standby supply output that is active whenever the AC power is present and the main switch is on. This standby 5V provides a power source for circuits that must remain operational when other DC output rails are in a disabled state. Over-current protection is provided on the +5VSB output.

Power-on Time

The power-on time is defined as the time from when PS_ONn is pulled low to when the +12VDC and +24V1DC outputs are within the regulation ranges. The power-on time is defined as T1 in the Power Supply Timing table. +5VSB has a power-on time of two seconds maximum after application of valid AC voltages.

Rise Time

The output voltages will rise to the regulation ranges within T2 as defined in the Power Supply Timing table. There is a smooth and continuous ramp of each DC output voltage from 10% to 90% of its final setpoint within the regulation band.

Overshoot at Turn–on / Turn-off

The output voltage overshoot upon the application or removal of the input voltage, or the assertion/deassertion of PS_ONn is less than 10% the nominal voltage.

Reset after Shutdown

If the power supply latches into a shutdown state because of a fault condition on its outputs, the power supply returns to normal operation only after the fault has been removed and either the PSON signal is cycled or the main power supply switch has been turned OFF/ON with a minimum OFF time of 3 seconds.

+5VSB at AC Power-Down

After AC power is removed, the +5 VSB standby voltage output will remain at its steady state value for the minimum hold-up time specified in Voltage Holdup Time until the output begins to decrease in voltage.

Output Protection

Over Voltage Protection

The over-voltage sense circuitry and reference reside in devices that are separate and distinct from the regulator control circuitry and reference to prevent a single failure point.

Over voltage protection behaves such that:

- Over voltage on +24V or +12V will cause latched shutdown of +24V and +12V.
- Over voltage on +5VSB will shutdown all outputs (non latched) and the +5VSB will auto-recover.

Table 5-13 DC Output Over-voltage Limits

Output	Over Voltage Trip Limits	
	Min	Max
+12VDC	13.4	15.6
+5VSB	5.74	7.0
+24V1DC	25.5	29

Overload and Short circuit protection
All outputs are electronically overload and short circuit protected.

Over load and short circuit protection behaves such that:

- Overload or short circuit on either the +24V or +12V will cause a latched shutdown of the +12V and +24V rails.
- Overload or short circuit on the +5VSB will cause a non-latched shutdown of all rails and the 5VSB must recover once the fault condition has passed.
- Overload or short circuit between the +12V and the +24V rails will cause a latched shutdown of the +12V and +24V rails.
- A short circuit occurring between the +5VSB and either the +12V or the +24V will cause a nonlatched shutdown of all rails and the 5VSB must recover once the fault condition has passed.

The power supply is capable of withstanding a continuous short-circuit to the output without damage or overstress to the unit. Limits for overload are given in the table below. An overload or short circuit must be present for 50 to 100ms before the outputs are shutdown.

Table 5-14 Over Load Limits

Output	Over Current Limits
+12V1DC	16 – 18A
+5VSB	3.0 – 3.5A
+24V1DC	19 – 21A
+24V2DC	8 – 10A

No-Load Operation
No damage or hazardous condition should occur with all the DC output connectors disconnected from the load. The power supply may latch into the shutdown state.

Over-temperature Protection
The power supply includes an over-temperature protection sensor, which will trip and shutdown the power supply at a preset temperature point. Such an overheated condition is typically the result of internal current overloading or a cooling fan failure. Prior to thermally shutting down the PWR_FAILn signal will be issued.

5.2.4 Connectors

Main Power Input
The AC input receptacle is a male IEC 320 type.

Main Power Switch
The main power switch is connected and orientated such that when the switch is in the down position the switch illumination is off and the power converter generating the DC outputs are turned off.

The switch is an illuminated dual pole type disconnecting both active and neutral lines, and the same switch is used in both 120V and 240V supply locations and therefore illuminates sufficiently in both situations but is duller in low voltage environments.

The power supply will not be damaged by repeated switching on and off of the AC power.

GPO Outputs

The AC output receptacles is a female IEC 320 type.

Fuse Holders

Use fuse size 3AG, of the half twist bayonet type.

DC Outputs Connector

All signals are connected via a cable loom that has a 24 Pin Molex Mini-Fit Jr. connector on it.

Table 5-15 DC Outputs Connector Pin Assignment

Pin	Signal	Pin	Signal
1	GND	13	GND
2	GND	14	GND
3	+24V1	15	+24V1
4	+24V1	16	+24V1
5	+24V2	17	GND
6	+24V2	18	+5VSB
7	PS_ONn	19	--
8	24V2_OFFn	20	PWR_FAILn
9	12V	21	+12V
10	12V	22	+12V
11	GND	23	GND
12	GND	24	GND

5.2.5 Operating and Storage Environment

Table 5-16 Operating Environment

Condition	Range
Temperature	0°C (32°F) to +40°C (104°F)
Humidity	≤ 85% RH non-condensing
Altitude	3000m (9842.49')

Table 5-17 Storage Environment

Condition	Range
Temperature	-40°C (-40°F) to +70°C (158°F)
Humidity	≤ 95% RH non-condensing
Altitude	15000m (49212.45')

5.3 Maintenance

5.3.1 Fuse Removal and Replacement

The switched mode power supply fuse is an internal non-serviceable component. If this fuse is blown, the power supply unit must be shipped to the manufacturer for service (contact the nearest Aristocrat™ office).

AC mains voltage is present in the power supply unit even when the EGM is switched OFF. The main pwer input cable must be unplugged before attempting to replace a fuse.

To replace the externally accessible power outlet fuses:

1. Open door(s) as required and switch OFF the main power switch and the auxiliary power switch.
2. Unplug all power cables from the power supply unit.
3. Remove the fuse cap from the fuse holder by unscrewing it in an counterclockwise direction. The fuse should spring out of the holder.
4. Remove the blown fuse and insert the new fuse into the cap. Insert the fuse cap into the holder, screwing it in a clockwise direction. Do not over tighten.
5. Replace the power cables.
6. Switch ON the main power switch and the auxiliary power switch. Check that both the main LCD screen and the auxiliary mains have power. Close and lock the door(s).

5.3.2 Power Supply Unit Removal and Replacement

AC mains voltage is present in the power supply unit even when the EGM is switched OFF. The main pwer input cable must be unplugged before attempting to replace a fuse.

To remove the power supply from the EGM:

1. Open door(s) as require and switch OFF the main power switch and the auxiliary power switch.
2. Unplug all power cables from the power supply unit.
3. Unplug all other looms and connectors from the power supply unit.
4. Unscrew the 2 fasteners that secure the top of power supply unit to the cabinet wall.
5. Slide the power supply forward to disengage the tabs at the front and rear and lift power supply out of cabinet.

Replacement is a reversal of the removal procedure.

Run a complete EGM test after replacing the power supply unit or any power supply component.

Notes

Chapter 6

Coin Handling Assembly

This chapter is not required in this manual.

Chapter 7

Hoppers

This chapter is not required in this manual

Chapter 8

Bill acceptor

List of Figures

List of Tables

8.1 Overview

The bill acceptor and ancillary items provide advanced solutions for the entry, security, analysis, and accounting of bills and vouchers The bill acceptor communicates with the carrier board via generic serial channel 1, which is configured through connector P18 on the backplane board.

The full system provides a range of features, including:

- A bill acceptor for entry, sensing and acceptance of bills and vouchers. The unit is equipped with a microcontroller, an operating system, RAM and ROM.
- The bill or voucher is optically scanned for both transmissive and reflective properties at each of four different wave lengths. There is also a magnetic sensor.
- A cash box unit holds accepted bills and vouchers in a highly secure environment. It is linked to the bill acceptor.
- The bill acceptor cage assembly houses the bill acceptor and cash box. The assembly is located at the front of the cabinet. The cash box may be accessed by opening belly door without having to open the main door.
- The bill entry area is highlighted by the animated display of LEDs and a denomination decal shows the acceptable bill denominations.

The embedded bill acceptor consists of an optical scanning unit linked to a bill cash box for the entry and storage of a range of bill denominations and vouchers. The bill acceptor dual-cage assembly, which houses the bill acceptor and cash box, is located in the cabinet on the right hand side.

The bill entry channel is situated to the right of the play buttons. The bill cash box can be accessed for removal and emptying by opening the belly door, unlocking the cash box cage, and then withdrawing the cash box.

8.2 JCM Bill Acceptors (if fitted)

- JCM UBA – Universal Bill Acceptor

8.2.1 Physical Description

Figure 8-1 Bill Acceptor

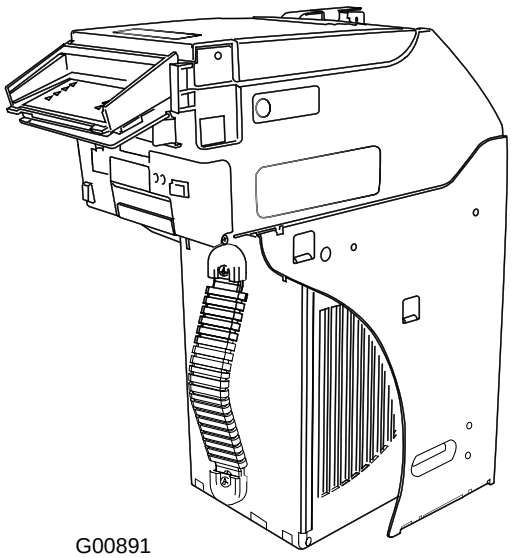


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Figure 8-2 Bill acceptor with Lid Open and with Note Cash box Withdrawn

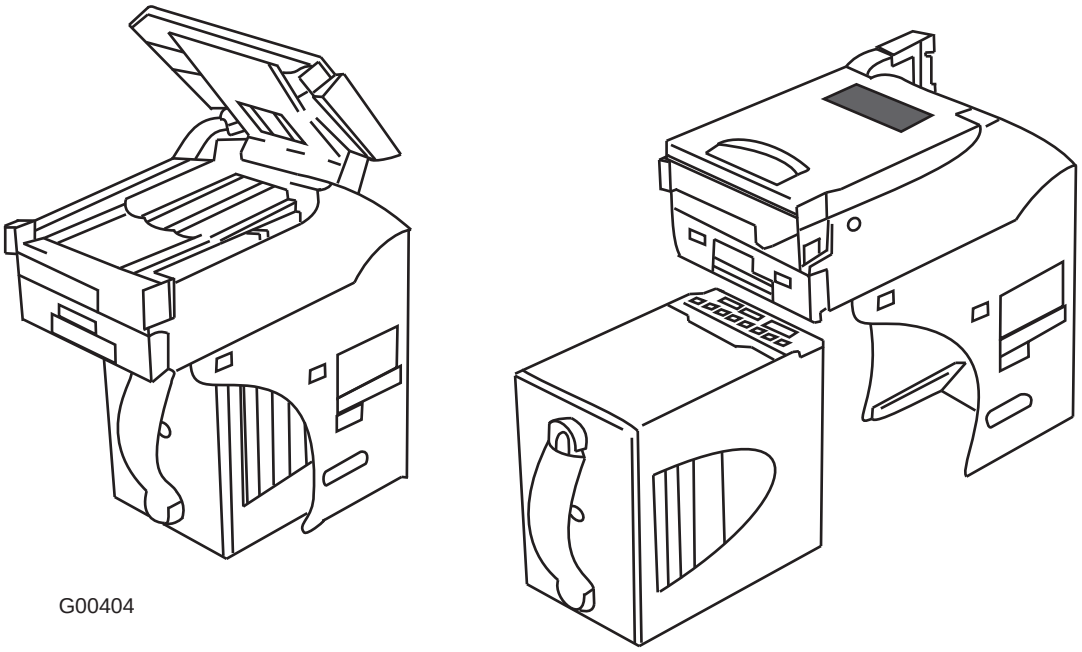
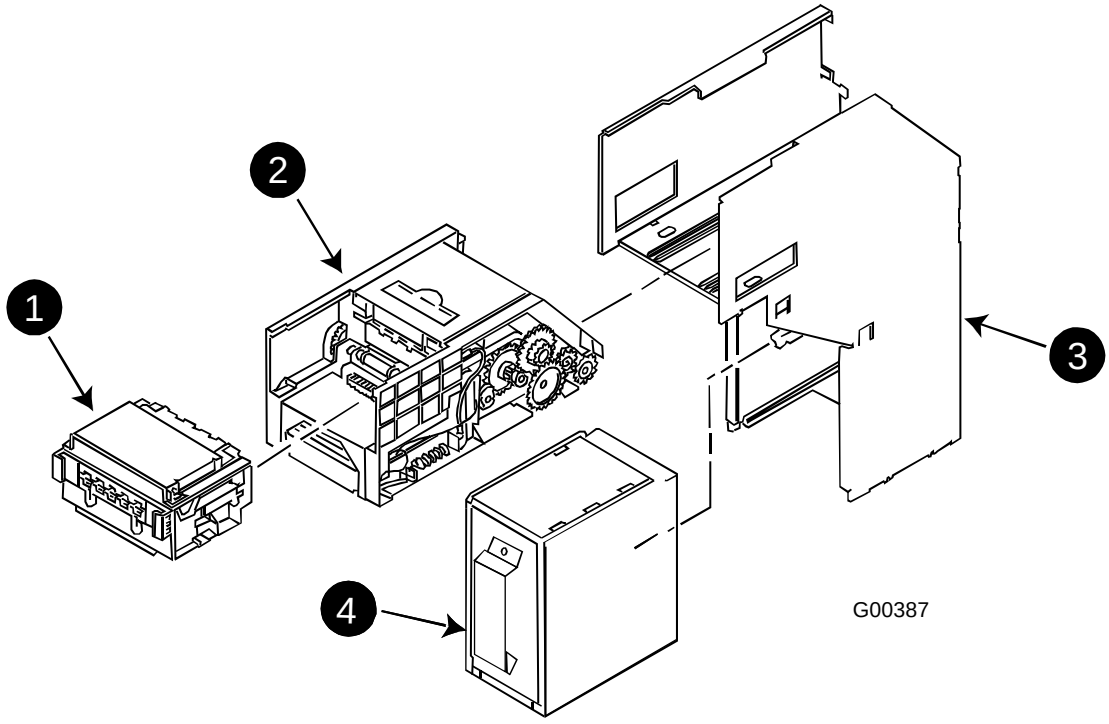


Figure 8-3 JCM Bill acceptor Assembly Components



Legend			
1	Acceptor	3	Frame
2	Transport	4	Note Cash box

Security

For security reasons, both the cash box access door and the bill cash box itself can be equipped with high-security locks.

The status of the belly door is monitored by the machine firmware. If this link is broken, the machine will lock up and display the error message:
Door Open – bill acceptor on the screen.

If the bill cash box is removed, the error message **Cash box Removed** is also displayed and the alarm sound is heard through the speakers.

Both of these exceptions are reported to the on-line system, if installed.

Mechanics and Transport

The bill acceptor assembly consists of the acceptor and transport. It slides into the UBA Frame, where it is securely latched in place. The bill cash box slides into position and latches into the UBA Frame just below the Transport.

Transport

The Transport assembly houses the main logic assembly, two drive motors, associated gears, belts and opto-interrupters.

The main logic assembly provides all of the control functions for the acceptor. It may be configured with either FLASH (UBA-12) or EPROM (UBA-13) program memory.

One drive motor provides motive power to the drive belts, which transport the bills or coupons through the acceptor and into the bill cash box. The other drive motor links, via a gear train, to the cash box mechanism in the bill cash box.

The two upper timing belts are individually tensioned to assure a reliable and straight feed. The lower timing belt assures transport of the bill or coupon to the entrance of the bill cash box.

Several levers and optic sensors assure proper direction of travel and progress into the bill cash box.

A connector and mounting provisions are provided for the acceptor, which mounts into the transport assembly.

Two opto-interrupters mounted at the rear of the Transport monitor the presence of the bill cash box and bill pusher activity.

Acceptor

Interchangeable guide rails in the acceptor allow proper sizing for currency from a variety of countries. Acceptable bill widths are 66, 70, 75 and 80 mm (2.60, 2.76, 2.95 and 3.15”). Acceptable lengths are determined in the software.

Two drive rollers in the front and two timing belts in the rear of the lower sensor unit of the acceptor assure transport of the inserted bill while several red, infrared, and magnetic sensors scan both faces.

Bill Cash box

The bill cash box includes drive belts and rollers to assure transport of the bill into the stacking position. The second motor in the Transport drives them through a gear train that meshes with another gear train in the bill cash box.

When the bill has moved into position, the pusher is activated via another gear train and the bill is stacked. The bill cash box has a capacity of approximately 500 bills or vouchers.

Two plastic levers mounted to the Frame contact the bill cash box and the pusher plate. These levers mesh with two opto-interrupters at the rear of the Transport, allowing the microprocessor to detect bill cash box presence and monitor bill-pusher activity.

Bill Entry

Operation commences when a bill of a suitable denomination is inserted into the bill acceptor. The bill may be inserted face up, either end first. The unit grips the inserted bill and moves it over the magnetic head and through the optical system.

Analog readings are taken every sixteenth of an inch for the entire length of the bill, converted to their digital equivalents, and stored in RAM as a profile of the bill. The stored data are then matched against the profiles stored in program memory.

The bill is evaluated and either accepted or rejected. If the bill is rejected, it is returned to the player immediately. If the bill is accepted, the EGM is notified of the value of the bill.

If the value of the bill is acceptable, a stack command is sent to the bill acceptor. Credits are issued only after the bill has exited the bill acceptor and reached the security cash box. If the value of the bill is not acceptable, a RETURN command is sent.

A bill should be given three read attempts before it is classified as unreadable.

TITO (Voucher In, Voucher Out)

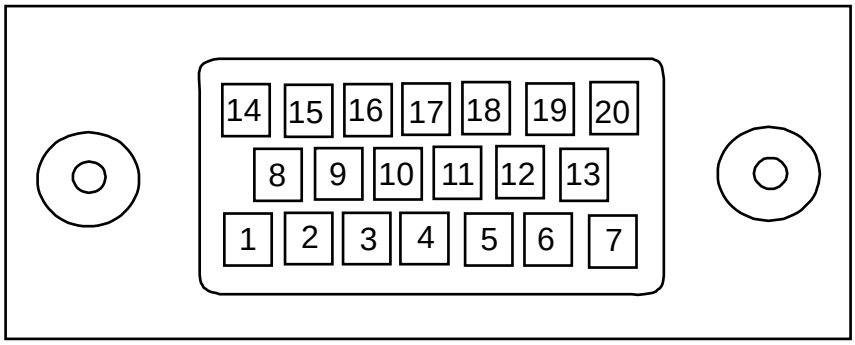
Voucher In, Voucher Out (TITO) is a cost effective and secure EGM payout solution. TITO is the cashless payout system that prints a player's total winnings, with a secure bar code, on a voucher. The voucher can then be used for crediting a machine. The JCM Universal bill acceptor is TITO capable and barcode coupon functionality is controlled by DIP switch settings.

Note that dip switch settings may vary depending on software changes related to individual jurisdictions.

Interface Connector

The interface connector, mounted at the back of the frame in the upper left corner, provides connections to the transport from the machine backplane. Not all of the 20 available pins will be used in any given installation. Actual pins connected will depend upon the protocol (VFM4, DBV, GAMMA, etc.) used.

Figure 8-4 Input/Output Connector



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8.2.2 Installation and Machine Conditions

Configuration Setup

Bill acceptor configuration options are established by the use of DIP switches on the bill transport unit and the Operator Mode Menu settings. To enable bill denominations, it is necessary to set the required bill values in both the bill acceptor DIP switches and the Operator Mode menu options.

The DIP switch locations vary between manufactures. See the relevant section of this manual for details.

The settings for accepted bill denominations are found in the Operator Mode Menu.

Machine Condition Indicators

Bezel LEDs will extinguish when the EGM disables the bill acceptor (door open, etc.). The LEDs should be ON when the bill acceptor is ready to accept and OFF when it is unable to function.

Conditions producing lockups are shown on the game screen. The alarm sounds for error conditions.

Operator Mode Menu Indicators

Several Operator Mode menu displays provide bill acceptor information that addresses bill entry history, machine status, accounting/audit/statistics data, and error and lockup information.

8.2.3 Removal and Replacement Procedures

The transport assembly slides into the frame assembly and latches securely in place. To remove, press the lower latch down and slide the transport forward. Electrical connection is through a single connector, which supplies both power and communications.

Removing UBA Note Cash box

To remove the bill acceptor cash box:

1. Open door(s) as required, and switch the EGM off, then open the belly door.
2. Pull the bill acceptor cage release lever, on the underside of the belly door and allow the bill acceptor cage to swing forward.
3. Unlock and open the cash box access door.
4. Withdraw the bill cash box from the EGM.
5. After the bill cash box is withdrawn, the currency access door in the bottom must be unlocked before the bills can be withdrawn. This is normally done only in a secure soft count facility. Each bill cash box may be numbered to assist accounting and control operations.
6. The bill cash box is replaced by pushing it into the frame until it locks into position.
7. Pivot down the frame until it clicks into place.
8. Switch on main power and close door(s) as required.

Removing UBA Transport

To remove the bill acceptor Transport:

1. Open door(s) as required, and switch off main power.
2. Press down and hold the lower latch bar located at the front of the Transport.
3. Slide the assembly toward you and out of the frame.

Bill Acceptor Jams

If a jam occurs, the unit is usually able to clear itself within a short period as an automatic process comes into effect. Should the jam persist, a fault message is initiated and a EGM lockup occurs.

The bill acceptor is controlled by complex electronics. Unqualified personnel must not interfere with the unit.

The scanning and transport channel of the bill acceptor passes currency in a direct process to the cash box. To clear a bill lodged within the scanning channel:

Ensure the power is turned off before any maintenance procedures are carried out on the bill acceptor or cash box.

1. Remove the transport as previously described.
2. Open the transport and inspect the bill path.
3. Remove any obstructions found.
4. Open the acceptor and inspect the bill path.
5. Remove any obstructions found.
6. Reinstall the transport assembly as previously described.

8.2.4 Calibration

Re-calibration of the acceptor sensors should be an annual event unless operating conditions dictate increased frequency. The automatic calibration procedure should be executed following any cleaning or repair operations. Special JCM black/white test paper is required.

In-machine Auto-calibration

Auto-calibration may be accomplished at the machine if the JCM Test Harnesses are available. Remove the transport from the machine, connect the harness to the plugs at the back of the frame and at the back of the transport and follow the auto-calibration procedure outlined below.

Workbench Auto-calibration

To perform the auto-calibration procedure at the workbench, JCM model PS15-006 is required to supply power to the UBA Transport.

Auto-calibration Procedure

1. With the UBA transport assembly in hand, set DIP switches 1, 2, 3, and 4 to the OFF (up) position and DIP switches to the ON (down) position.
2. Apply power.
3. Insert the test paper into the acceptor, black end first.
   a. The paper will move in and out several times and finally be ejected.
   b. The LED attached to the test harness will blink rapidly (approximately 10 flashes per second) if the calibration is successful.
   c. If the calibration is not successful, the LED will flash an error code as described in the following table.

Table 8-1 Blink Error Code

Number of Blinks	Error Detected
1	Entrance Lever
2	Solenoid Lever
3	Entrance Sensor
4	Transport Jam
5	Incorrect Gain Setting
6	Digital/Analog Conversion
7	Bar Code Sensor
8	Acceptor Head
9	Magnetic Setting
10	Write-in
11	Black Level

Refer to the JCM Service Manual for repair procedure information.

8.3 Maintenance

8.3.1 Troubleshooting

The following guide provides possible remedies to malfunctions that may be encountered. Also refer to Removal and Replacement earlier in this chapter.

Table 8-2 Bill Acceptor Issues and Remedies

Fault	Remedy
Bill jammed in unit	Open the acceptor and remove the bill.
Bill repeatedly skews and jams	Pressure rollers have incorrect tension. Belts are not adjusted properly. Make adjustments to the roller tension and transport belts.
Display electronics are non functional	The bill acceptor may not be receiving power. Ensure that all leads are correctly connected and power has been turned on.
Bill is not transported into the unit	The bill acceptor may not be receiving power. Reconnect the power. There may be a jam in the bill path. Remove the bill from the channel. The bill acceptor has been inhibited from further operation by the EGM software. Remove any current machine lockups (see chapter on Machine Modes).

8.3.2 Cleaning

Occasional wiping of the plastic bezel surface is all that is required to remove surface deposits and smudges. A soft, dry, lint-free cloth is recommended for cleaning.

With prolonged use, a build-up of dirt from the surface of the bills will accumulate on the pressure rollers, drive belt surfaces and bill acceptor optics. These areas should be cleaned to ensure reliable operation.

Caution must be exercised not to flood the bezel area, as liquids must not be allowed to seep down into the bill acceptor units.
Do not use any solvent, except as recommended by the bill acceptor manufacturer, as permanent damage to the validator optic lenses and other internal items may result.

To clean rollers, belt surfaces, and validation optics:

1. Remove the bill acceptor as described above.
2. Open the bill acceptor to gain access to the bill path.
   a. Using a soft lint-free cloth, wipe the surfaces of both the upper and lower guides to remove any surface dirt. Pay particular attention to the optics area and the magnetic head when removing deposits from the surfaces.
   b. On the upper guide assembly, clean the surface of the pressure rollers.
   c. On the lower guide assembly, timing belt surfaces may be cleaned by rotating one of the drive rollers while holding the cleaning cloth against it.

Do not clean small round sensors unless a film or dirt is visible on the lens.

Notes

Chapter 9

Voucher Printer

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9.1 Overview

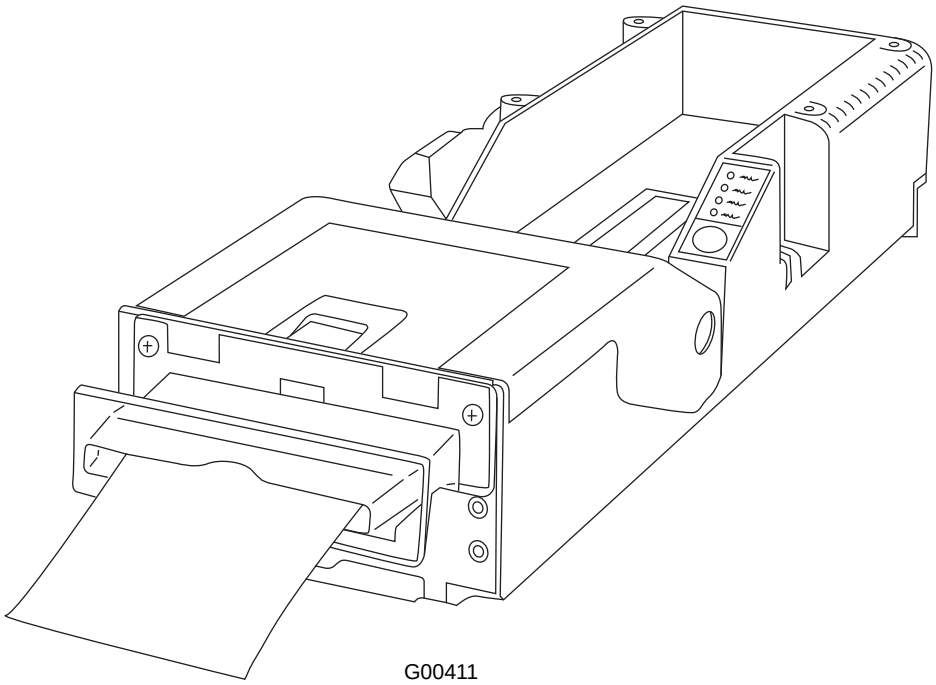
The Voucher Printer is a high-quality, high-speed output device providing portrait and landscape printing of text, graphics and lines.

Where printer capability and jurisdictions constraints permit, venues are able to print eye-catching graphics and messages in custom designed layouts. The printer can produce bar coded vouchers that can be recognized by the bill acceptor.

9.2 Futurelogic PSA-66-ST2 Printer (if fitted)

The FutureLogic PSA-66-ST2 is a second generation thermal printer. The printer makes the cashout voucher available ONLY after the voucher is fully printed internally and automatically burst (separated from the unprinted paper in the paper tray).

Figure 9-1 Futurelogic PSA-66-ST2 Printer



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The FutureLogic PSA-66-ST2 also offers:

- The Promotional Matrix Couponing System.
- Color printing capability.
- A USB communication port.
- A dedicated promotional printing port.
- A separate port for firmware upgrades.

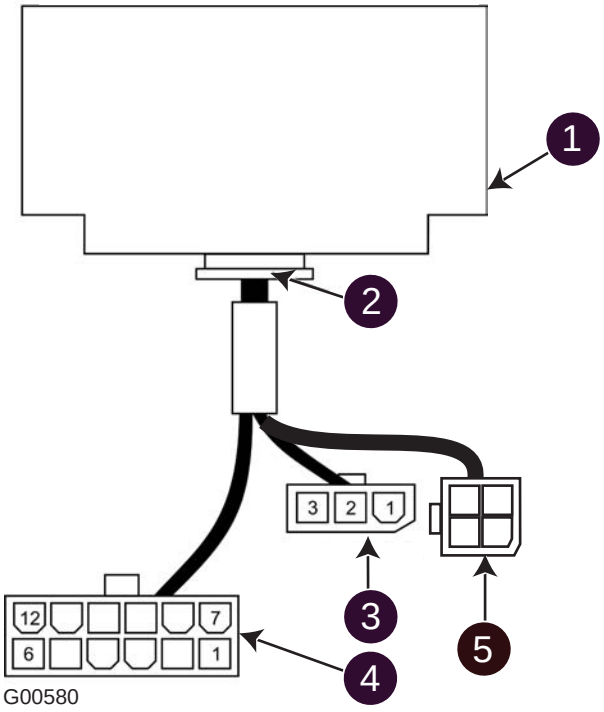
9.2.1 Specifications

The following table details the specifications of the Futurelogic PSA-66-ST2 printer.

Table 9-1 Futurelogic PSA-66-ST2 Printer Specifications

Parameter	Value
Dimensions (WxDxH)	110mm (4.33in) x 304.8mm (12.00in) x 64.3mm (2.53)
Weight	1.23kg (2.7lbs)
Power	24V DC @ 2.7A
Interface	Bi-directional RS232C, 9600 Bd
Operating Temperature	0°C (32°F) to 70°C (158°F)
Storage Temperature	-20°C (-4°C) to 85°C (185°C)
Operating Humidity	5 to 95% RH
Sensors	Paper low, Paper out, Printer drawer open, Voucher taken, Voucher jam, Voucher in chute, Black mark (includes a host controllable buzzer)
Voucher Storage	300 vouchers (with standard tray)
Memory	1MB Flash and 128K RAM
Resolution	Resolution 8 dots/mm (203 dpi)

Figure 9-2 Futurelogic Interface Cable Port Pin Locations

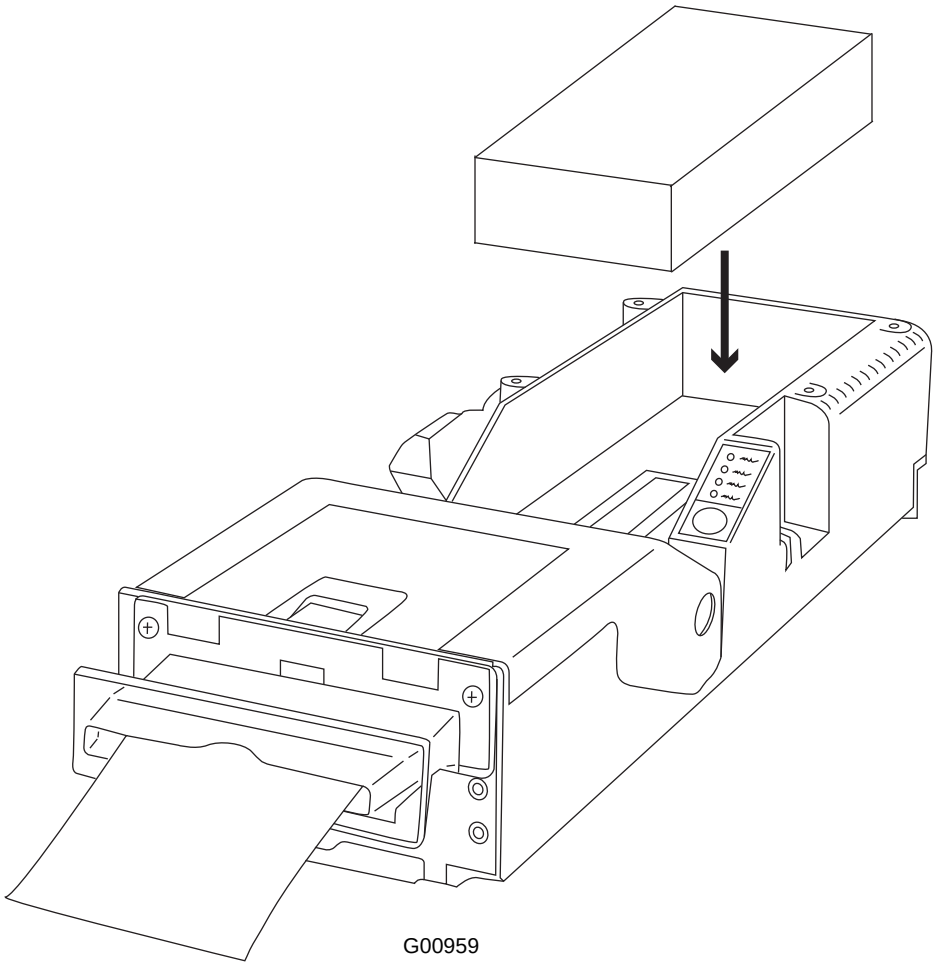


Legend			
1	Production Cable - Rear of Unit	3	Bezel Port - 3 Pin
2	Base Port - 12 Pin	4	RS232 Port - 12 Pin

9.2.2 Loading Vouchers

Use the automatic paper-loadingh feature to simplify this process to two steps: putting the paper stack into the paper tray and feeding the paper to the paper loading slot of the printer.

Figure 9-3 Loading Vouchers into the Ithaca Epic 950 Printer



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Loading Vouchers:

1. Pull open the printer drawer until the paper tray is completely accessible.
2. Place the paper stack in the printer as indicated by the bank around the stack and the label on the bottom of the paper tray.
3. Feed the paper into the paper-loading slot and release it once the motor engages and the printer grasps the paper. The printer automatically pulls through a voucher or two, leaving it set at the top of the next voucher.
4. Remove the excess vouchers from the printer.

9.2.3 Care and Maintenance

No user maintenance is required for the Futurelogic PSA-66-ST2 Printer.

9.2.4 Removal and Replacement Procedures

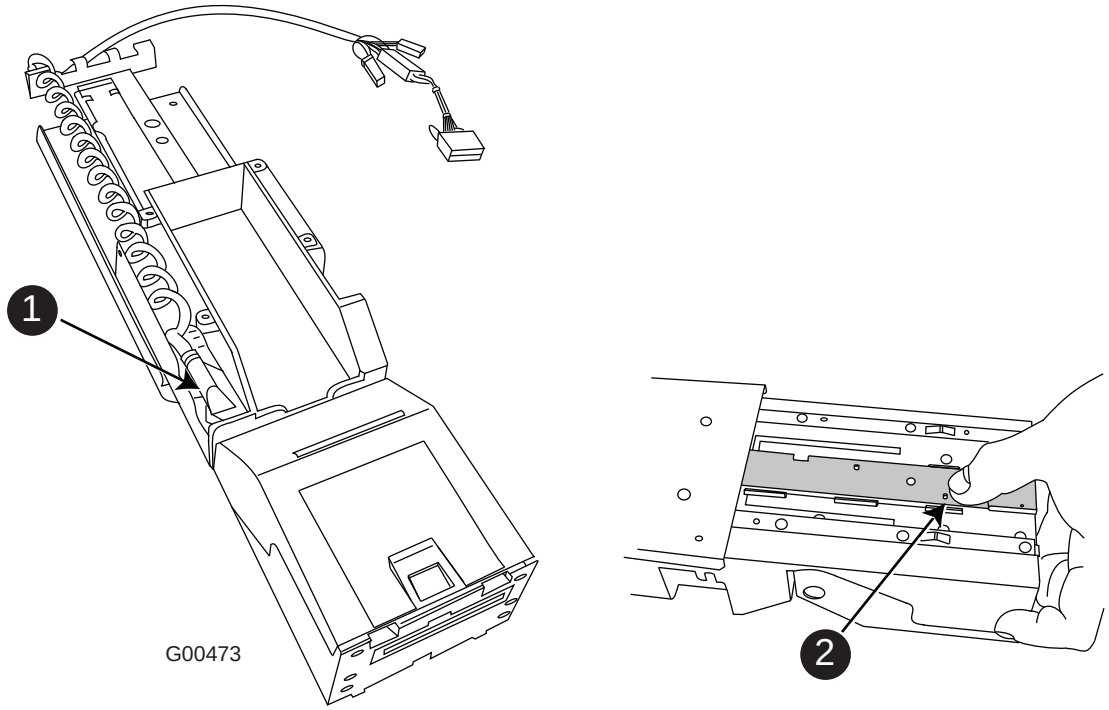
Removal

To remove Futurelogic Printer assembly:

1. Open the lower main door and switch OFF EGM.
2. Slide printer out until it catches.
3. Disconnect loom at side of printer.
4. Push back release catch underneath printer.
5. Slide printer out.

Replacement is reversal of the removal procedure.

Figure 9-4 Futurelogic Printer disassembly



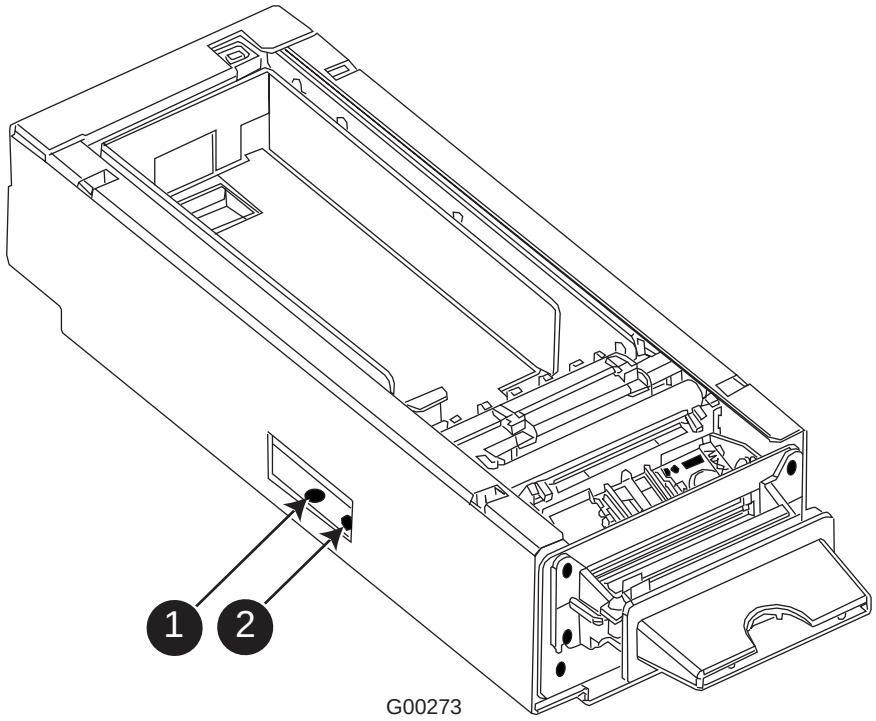
Legend			
1	Loom	2	Release Catch

It is advisable to run a printer test or a complete EGM test after replacement.

9.3 Nanoptix Paycheck 3 Printer (if fitted)

The Nanoptix Paycheck 3 Printer is a thermal printer which outputs the vouchers from the front.

Figure 9-5 Nanoptix Paycheck 3 Voucher Printer



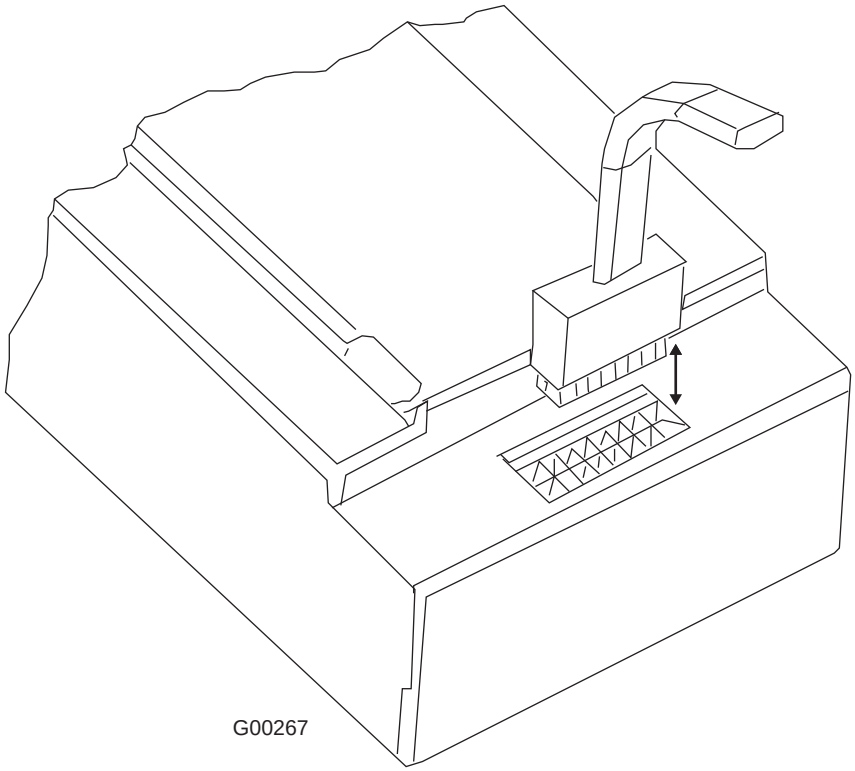
Legend			
1	Paper Feed button	2	LED

9.3.1 Printer Controls

Printer Reset

To reset the printer, unplug and reconnect the cable. When reconnected, the printer goes through a startup routine and resets itself.

Figure 9-6 Nanoptix Printer Reset



Paper Feed Button

Use the Paper Feed Button to advance the paper. The paper will automatically feed. Tear off the advanced form and the printer will be ready to print on a full form.

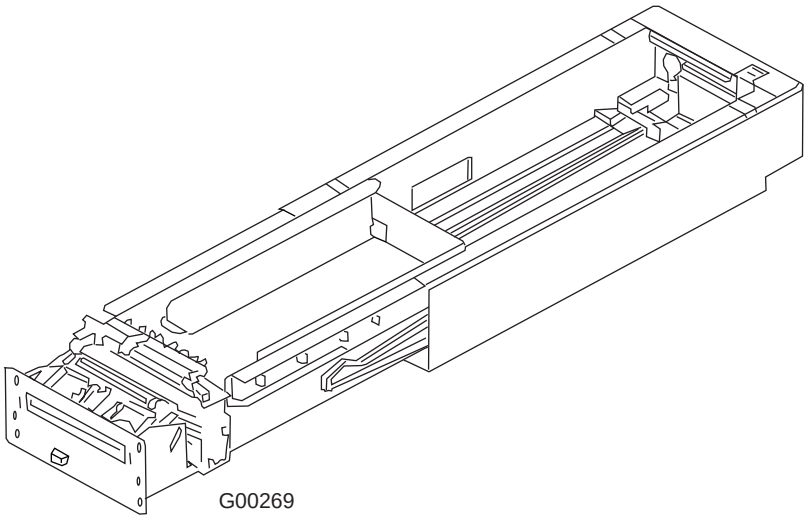
9.3.2 Loading Vouchers

Load a stack of vouchers into the printer. The maximum stack that will fit in the voucher cartridge varies depending on the cartridge size.

Procedure:

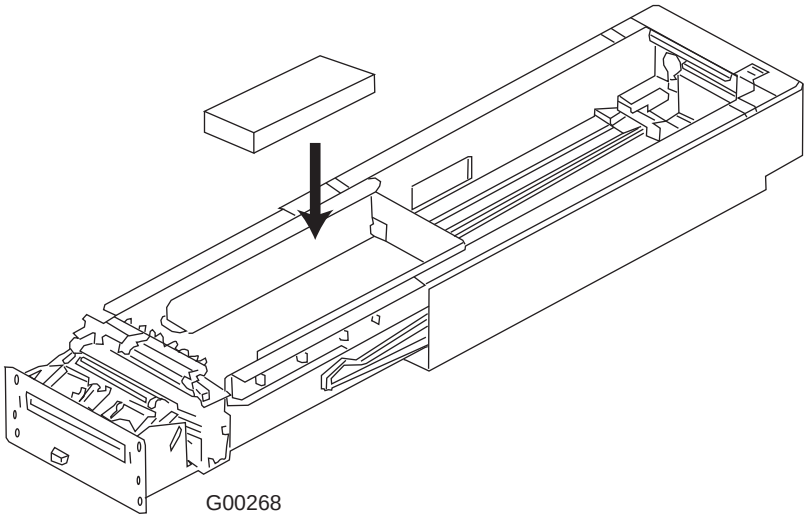
1. Open lower main door.
2. Pull open drawer to fully open position.

Figure 9-7 Nanoptix Printer Drawer fully open



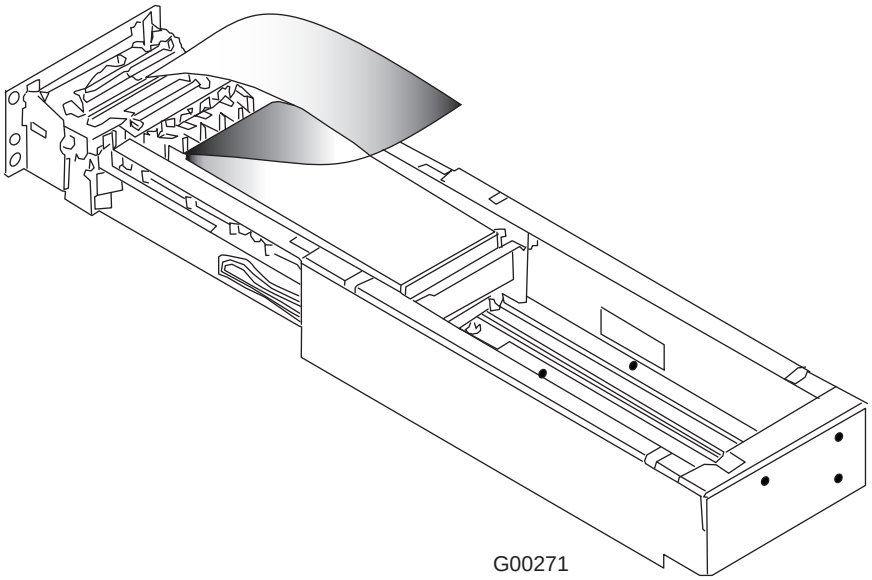
3. Drop voucher stack into voucher cartridge in the orientation indicated on the label in the bottom of the cartridge.

Figure 9-8 Nanoptix PrinterVoucher stack



4. Feed voucher into printer mechanism until resistance is met.

Figure 9-9 Nanoptix Printer Feeding the Voucher



5. Paper will feed automatically; voucher is ready to print.
6. Slide the printer back into its working position.
7. Shut lower main door.

9.3.3 Care and Maintenance

Under normal operating conditions, the minimum interval for cleaning the Nanoptix Paycheck print head should be 3 months or 5 km (3.10 mi) of paper printed, which ever comes first.

To remove excess dust:

1. Slide printer drawer open and remove voucher tray.
2. Remove excess dust using a portable vacuum or wipe clean with a moistened cloth.

To clean print head:

1. Press down on the paper guide assembly and pull one side of the roller towards the front and remove the roller.
2. Clean the roller with a cotton swab and isopropyl alcohol.
3. Clean the print line (black line on the print head) with a cotton swab and isopropyl alcohol. Take care not to wet other parts of the printer .

9.3.4 Troubleshooting

The printer is simple and generally trouble-free, but from time to time problems may occur. Follow these procedures to determine the cause and resolution of any problems the printer may be having. If the procedures in this section do not correct the problem, contact a service representative.

Table 9-2 LED Conditions

Status LED (red)	Error LED (green)	Condition
OFF	ON	Paper Out
OFF	MED BLINK	Temperature Error
OFF	SLOW BLINK	Voltage Error
ON	FAST BLINK	Print Head Error
ON	FAST BLINK	Missing Black Index Mark
ON	FAST BLINK	Paper Jam

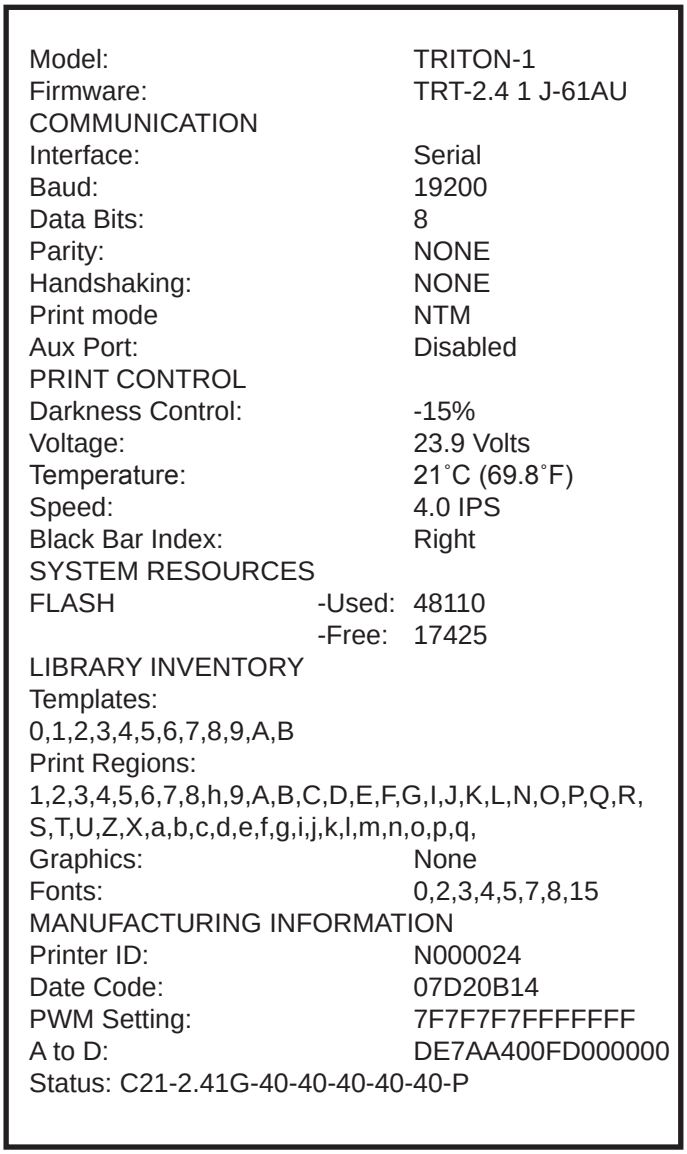
Self-test Voucher

Run this test to check the printer. The test prints and cuts a resident test voucher. Verify this voucher to judge the printing quality.

To print the test voucher:

1. Power-on the printer while pressing and holding the Paper Feed Button for approximately 3 seconds. A test voucher similar to above will be printed approximately 5 seconds after.
2. Press the paper feed button once more and the voucher will feed. Pressing the button again will result in blank vouchers.

Figure 9-10 Self-test Voucher



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9.3.5 Removal and Replacement Procedures

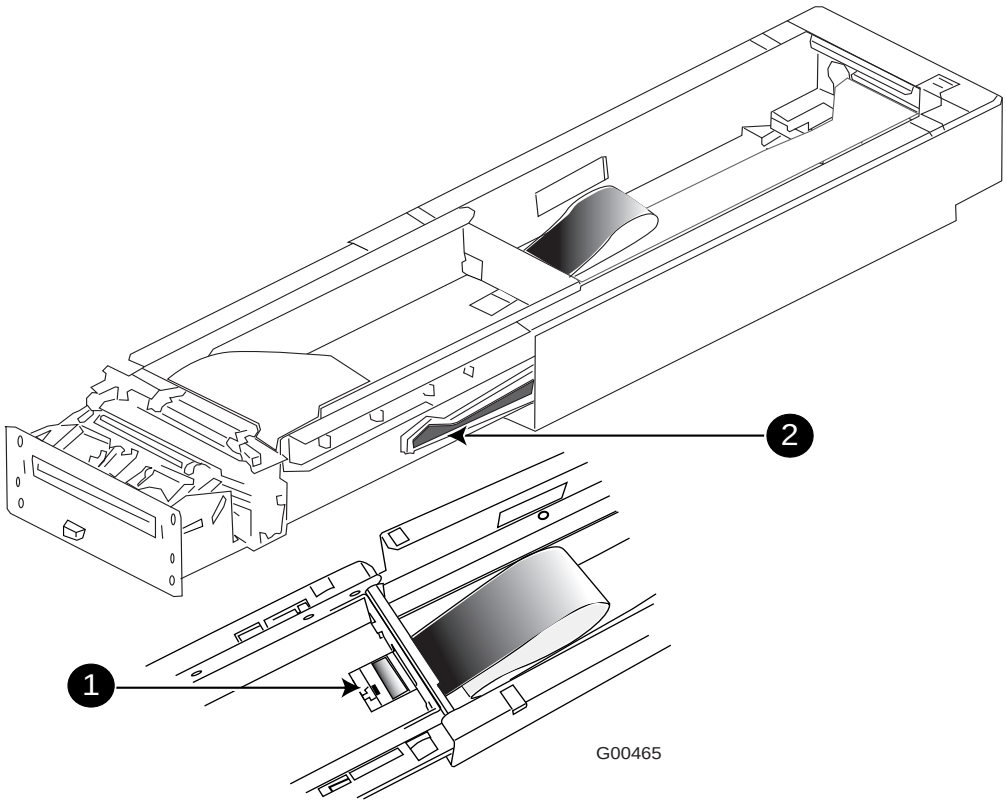
Removal

To remove Nanoptix Printer:

1. Open the lower main door and switch OFF EGM.
2. Pull printer out until it catches.
3. Press the button to release loom and pull the loom out.
4. Release lever on right hand side on printer and pull the last section of printer.

Replacement is reversal of the removal procedure.

Figure 9-11 Nanoptix Printer Disassembly



Legend			
1	Button to release loom	2	Release lever

It is advisable to run a printer test or a complete EGM test after replacement.

9.4 Maintenance

Printer maintenance varies depending upon the model. Perform appropriate maintenance as required. Standard tasks include:

9.4.1 Check Printer Function

Check that the unit is performing correctly:

- Perform a printer self-test.
- Check that all connectors are secure.
- Ensure that receipts are falling correctly into the chip tray.

9.4.2 Remove of Excess Dust

Use a soft brush or other appropriate method to clean the paper dust from inside the printer and chassis area. Remove paper dust from the sensor optics.

9.4.3 Clean Print Head

If streaking on the printed voucher is evident, the print head requires cleaning. Follow manufacturer's instruction to perform this task. See individual printer sections for further information.

Chapter 10

LCD Screens

List of Figures

List of Tables

10.1 Overview

The EGM cabinet may be fitted with up to two screens. They are:

- Main Screen - Located in the body of the cabinet, the main screen is the primary interface for the player, displaying games, voucher information, playing options and messages from the casino management system. The main screen is an LCD screen and has touch screen capability.
- Top Box Screen - Located in the top box, this screen is used for displaying additional graphics and jackpot information. The top box screen is an LCD screen and does not have touch screen capability.

When a touch screen is exchanged, it needs to be re-calibrated.

10.2 Main LCD Screen

The Liquid Crystal Display (LCD) panel is a 19.0” high-resolution display.

The LCD is used as the main screen for the EGM and includes a video cable, support bracket, touch sensor and controller. The LCD may also be used as a second display in the Top Box of the Aristocrat™ EGM. For full servicing details refer to the Wells-Gardner manuals.

The main LCD screen is **NOT** available without touch in US jurisdictions. Only the LCD for the top box is non-touch. Refer to the “LCD Touch Screen” section in this Chapter.

10.2.1 General Description

The LCD is a Color Active Matrix Liquid Crystal Display with an integral Cold Cathode Fluorescent Lamp (CCFL) backlight system. The matrix employs Thin Film Transistors (TFT) as the active element.

It is a transmissive type display operating in the normally black mode. This TFT-LCD has a 19.0” diagonal measured active display area with SXGA resolution (1024 vertical by 1280 horizontal pixel array) capability.

Each pixel is divided into red, green, blue sub-pixels or dots. Gray scale or the brightness of the sub-pixel color is determined with an 8-bit gray scale signal for each dot, thus, presenting a palette of more than 16.7M colors.

10.2.2 Technical Description

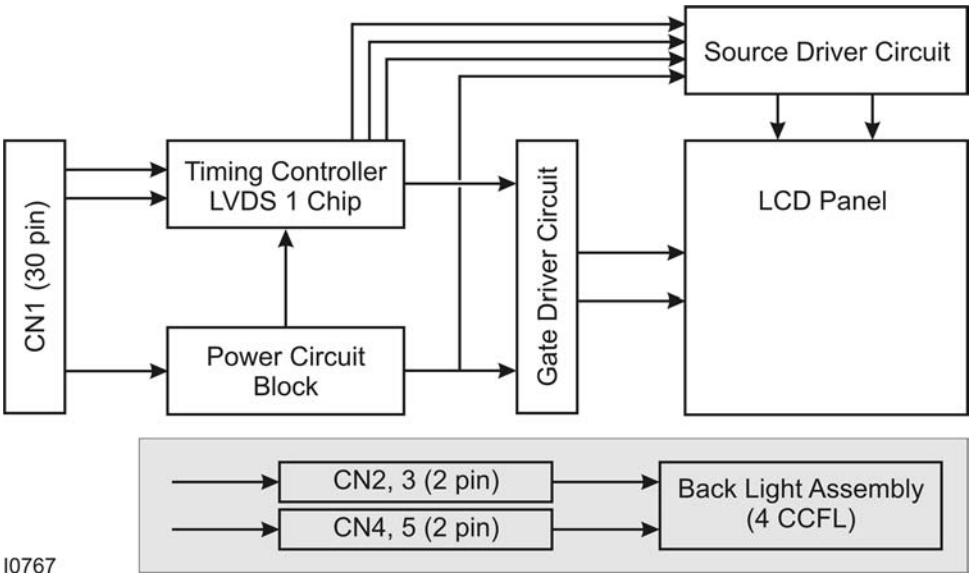
The LCD panel specifications are detailed in the following table.

Table 10-1 LCD Specifications (typical)

Item	Specification
Active Screen Size	481.84mm (19.0") diagonal
Outline Dimension	396mm (15.59") H x 324mm (12.76") V x 20mm (0.79") D typical
Pixel Pitch	0.294mm (0.1") RGB H x 0.294mm V (0.1")
Pixel Format	1280 horizontal by 1024 vertical pixels - RGB stripe arrangement
Display Colors	8bit (16.7M colors)
Luminance, White	270 cd/m² (25.08 cd/ft²) - typical center 1 point
Viewing Angle (CR>10)	R/L 178° (typical) U/D 178° (typical)
Power Consumption	Total 25.2 Watt (typical), 5.5 Watt in power save
Weight	2.97kg (6.55lb) typical
Display Operating Mode	Transmissive mode, normally black
Surface Treatments	Hard Coating (3H), Anti-glare treatment of the front polarizer

A functional block diagram is shown in the following figure.

Figure 10-1 LCD Functional Block Diagram



Electrical Specifications

The LCD screen is supplied with as a complete open frame product that consists of a 19.0” TFT LCD panel , an interface board and a CCFL power converter. The DC power to the main LCD screen is provided by the EGM. The main LCD screen is plug and play ready.

Sync Input Signal Characteristics

The LCD screen has the following input characteristics.

Table 10-2 Sync Input Signal Characteristics

Parameter	Unit	Data
Horizontal Frequency	kHz	29-80
Vertical Frequency	Hz	59-75

Sync Timing Schedules

The LCD Screen has multi-sync function and is preset according the following synchronous timing schedules.

Table 10-3 Preset Modes

	Mode	Res. Pixels	Hor. Freq. kHz	Ver. Freq. kHz	Sync. Polarity	Standard
1	New MkVI (Close to VGA/60)	640x480	31.47 (Measured)	59.94 (Measured)	H,- V,-	ATA
2	Hyperlink™ Blackbox (close to XGA/60 but reversed Sync Polarity)	1024x768	48.37 (Measured)	60.02 (Measured)	H,+ V,+	Paltronics
3	SVGA/60	800x600	37.88	60.32	H,+ V,+	VESA
4	SVGA/75	800x600	46.88	75.00	H,+ V,+	VESA
5	XGA/60	1024x768	48.36	60.00	H,- V,-	VESA
6	XGA/75	1024x768	60.02	75.03	H,+ V,-	VESA
7	SXGA/60	1280x1024	63.98	60.02	H,+ V,+	VESA
8	SXGA/75	1280x1024	79.98	75.03	H,+ V,+	VESA

Input Signal Connection

The loom connecting the main LCD screen to the EGM is a digital only cable compliant with the requirements of DVI-D.

LCD Power Detection and Power Save

One signal returned from the screen is sensed by the EGM to confirm the positive connection of the screen. Power save mode is initiated in compliance with the DVI standard.

Power Requirements

The main LCD screen works with DC power supply from the EGM, requiring +24V±2V voltage at the power identified previously in specifications.

When used in the top box the top box LCD screen turns on when the EGM is on, there is no separate power switch for the top box LCD screen. A green LED is used to indicate the power on/off status.

+24V Power Connection

A 4-pin Microfit jr connector is used to connect to the EGMs +24V power supply.

Image Specifications

The main LCD screen meets the requirements of the image specifications after a 10 minute warm up. However, the picture quality is very close to the specifications after switching on for less than 1 minute. Unless otherwise stated the specifications apply to the full range of brightness and across the range of operating temperatures.

Table 10-4 Picture Display Initiate Settings

Item	Setting Requirements
Default Sync Mode	SXGA Set at Full Screen Mode
Picture Center Deviation	± 1mm (0.04") Max.
Brightness (center)	180 ± 10 cd/m² (16.72 ± 0.93 cd/ft²) (about 53ftL) at full white screen
White Color Temperature (center)	D6500 CIE Coordinates: x = 0.313 ± 0.015 y = 0.329 ± 0.015

Brightness Adjustment Range

With Contrast control set at maximum level, adjusting Brightness control from minimum for maximum position, the light output of a white pattern is increased by more than 60cd/m².

White Color Uniformity

The white color temperature in any part of the screen is close to D6500 and within the following range:

x = 0.313 ± 0.02
y = 0.329 ± 0.02

White Color Tracking

The white color temperature in any part of the screen is close to D6500 and within the following range:

x = 0.313 ± 0.03
y = 0.329 ± 0.03

User Adjustment

The following user adjustments are available as On Screen Display (OSD) control and are adjusted on a remote control board.

Table 10-5 User Adjustments Functions Requirements

Brightness & Color	Tuning & Position
Brightness	Pixel Frequency
Contrast	Pixel Phase
R-Gain	H-Position
G-Gain	V-Position
B-Gain	
Recall (factory setting)	Auto-adjust

In addition:

- Auto Adjust functions only when it is selected on the OSD menu. It is not activated automatically when the main LCD screen is turned on.
- When the Recall function is selected the screen goes back to the Default Setting, including Sync Timing, Brightness, Contrast and Color Temperature.
- “No Signal Input” is displayed on the screen all the time when there is no video signal input.
- The main LCD screen shows data of the input sync, which includes input Resolution, Horizontal/Vertical Frequencies and Sync Pulse Polarities.
- The OSD indicates the revision of firmware installed in the control micro processor.

10.2.3 Removal and Replacement Procedures

To remove the main LCD screen:

1. Open the lower main door, and switch OFF the EGM.
2. Open the upper main door.
3. Disconnect video and power cables from the LCD mounted on the upper main door.
4. Unscrew the screen’s two side trims - two screws each.
5. Unclip the screen’s monitor mask - two clips at the top of the screen and two at the bottom.
6. Undo the four screws holding the LCD screen to the door frame.
7. Remove the LCD.

Replacement is a reversal of the removal procedure.

10.3 LCD Touch Screen Option

The main LCD screen can be fitted with a touch screen that enables games to be played by touching designated areas of the screen. The controller has an RS-232 interface. The controller receives 12V DC power from the screen.

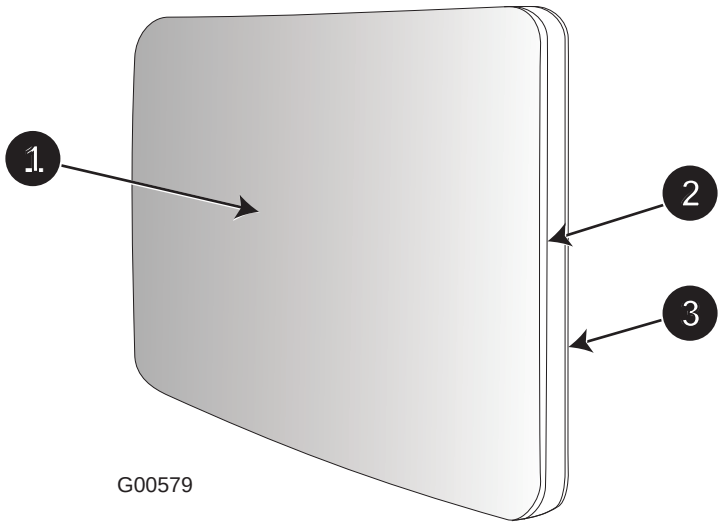
The main LCD screen is **NOT** available without touch in US jurisdictions. Only the LCD for the top box is non-touch.

Touch Screen Operation

The capacitive touch screen uses analogue capacitive touch technology. At the core of this technology is an all-glass sensor with a transparent, thin-film conductive coating fused to its surface. A glass overcoat is applied over the conductive coating, completely protecting and sealing the entire sensor. Along the edges is a narrow, precisely printed copper electrode pattern that uniformly distributes a low voltage, AC field over the conductive layer. This electrode is taped over on the completed touch screen to protect it. When a finger makes contact with the screen surface, it “capacitively couples” with the voltage field, drawing a minute amount of current to the point of contact.

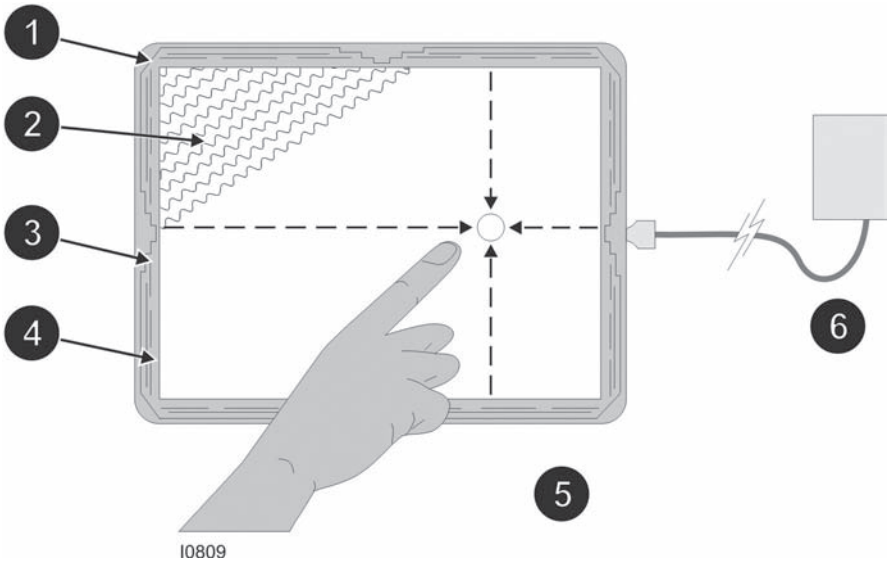
Current flow from each corner is related to the distance to the finger, and these flows are measured by the controller and used to locate the touch point.

Figure 10-2 All-Glass Capacitive Sensor



Legend			
1	Anti-reflective Etched or Polished Surface	3	Glass Overcoat
2	Conductive Coating		

Figure 10-3 Capacitive Sensing – Operation



Legend			
1	Voltage is applied to four corners of the screen	4	Black tape on edge to protect electrode
2	Electrodes spread out voltage, creating a uniform voltage field	5	Controller calculates the position of finger from the current flows
3	Electrode fused into a glass sensor	6	Touch of finger draws current from each side in proportion to the distance from the edge

Performance

The touch sensor has a resolution of 1,024 x 1,024 touch points. The controller averages the entire area of finger contact to a single point, giving users pixel-by-pixel control when touching the screen. The touch screen records a touch within 15ms of finger contact. This performance gives users virtually instant response. Because the point of capacitive coupling occurs exactly when a finger makes contact with the screen surface, only the slightest touch is required to register.

The touch screen is also very robust, allowing it to perform in contaminated environments. Contaminants such as grease, water, and dirt will not interfere with the capacitive screen's speed, accuracy, or resolution. In addition, the controller will not respond to stationary objects on the screen (e.g. food particles). The touch screen is also fitted with a gasket to prevent liquids or other contaminants from getting into the screen assembly.

The touch screen employs a solid-state sensor with no active or moving components. Its all-glass overcoat allows it to be resistant to scratches and not show wear over time. The controller enables it to eliminate noise from EMI, drifting caused by temperature shifts and humidity, and damage from static discharges. However, if the protective overcoat is damaged, either accidentally or maliciously, to such an extent that the underlying conductive coat is disturbed, severe inaccuracies in determining finger position will occur.

10.3.1 Machine Interface

The touch screen controller has an RS-232 connection to the EGM carrier board and is powered from the screen's internal power supply.

10.3.2 Touch Screen

Calibration

Calibration of the touch screen is particularly relevant when the prize awarded depends upon the accurate registration of a player's selection.

Calibration must be performed at least on the following occasions:

- Upon installing the EGM in the venue.
- Upon moving the EGM within the venue.
- Upon converting the game to another touch screen game.
- Upon adjusting the image height, width or position.

Upon repairing, replacing or exchanging the LCD screen.

Periodic recalibration is recommended.

Calibration of Touch Screen

Calibration MUST be performed with the door CLOSED, as described below:

1. Turn the Audit Key ON to access menus.
2. Open the lower main door.
3. Select the Test/Diagnostics Menu.
4. Select the Monitor Test Menu.
5. Close the lower main door.
6. Select Touch Screen Calibration option.
7. Select Calibration and follow the onscreen instructions.
8. When these steps have been completed perform the Touch Screen Test.
9. Once the touch screen calibration and test have been performed, turn the Audit Key OFF to return to the game.

Figure 10-4 Typical Calibrate Touch Screen Menu

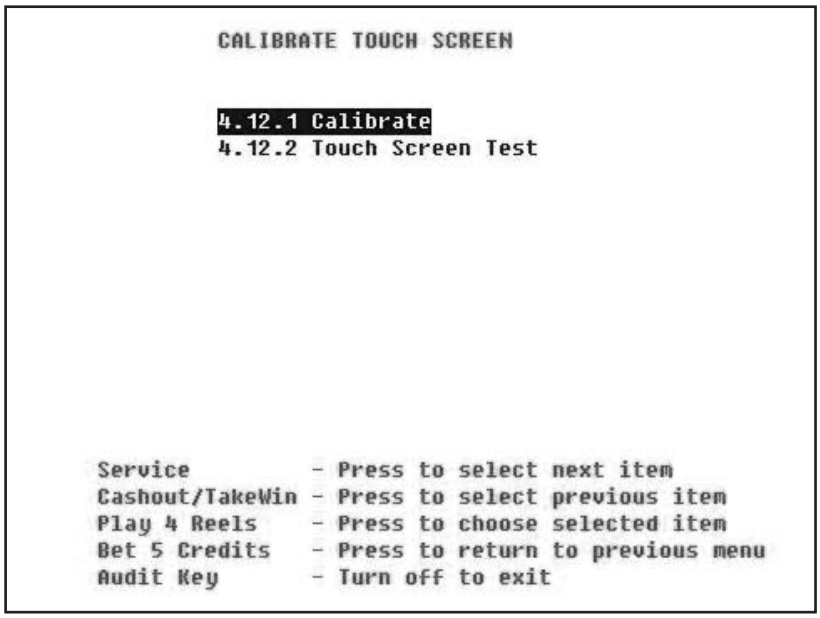
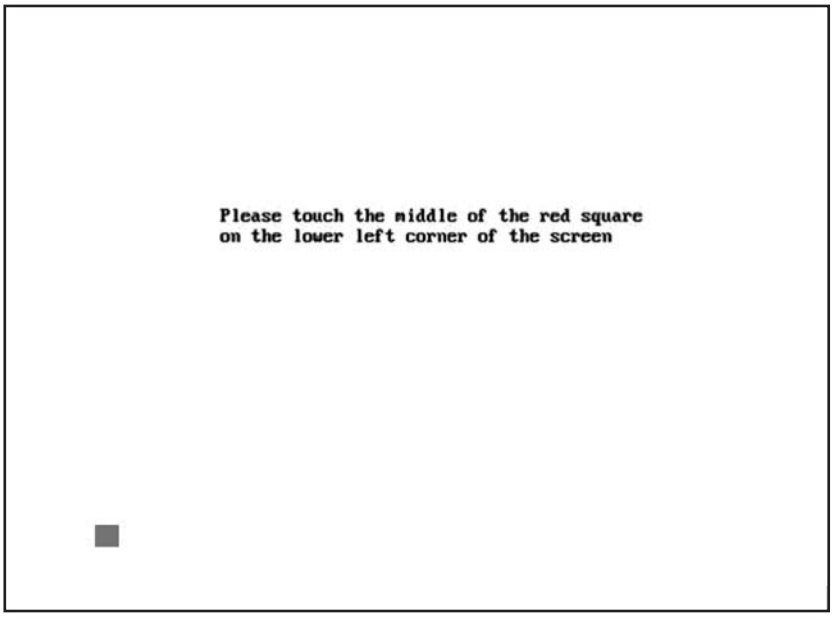
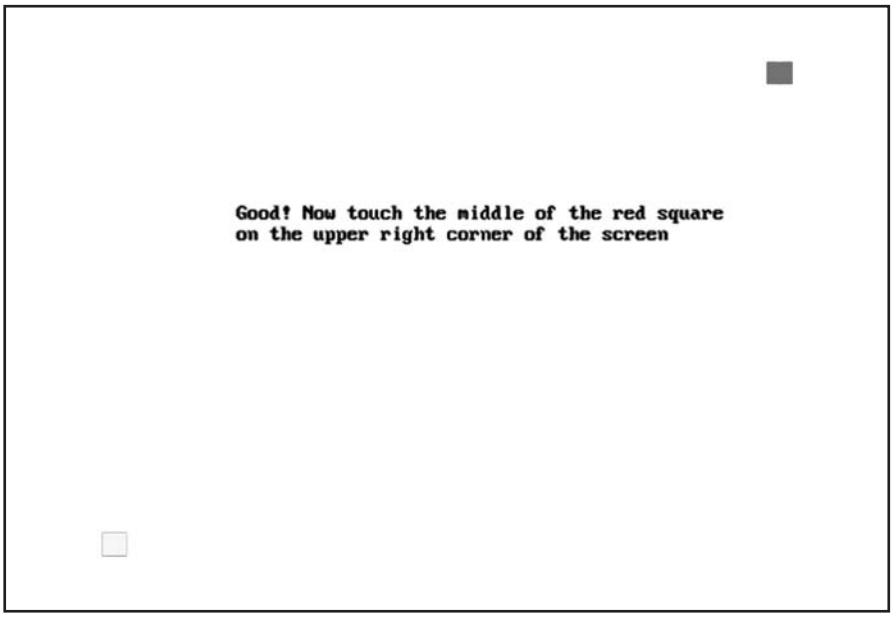


Figure 10-5 Typical Touch Screen Calibration Display 1



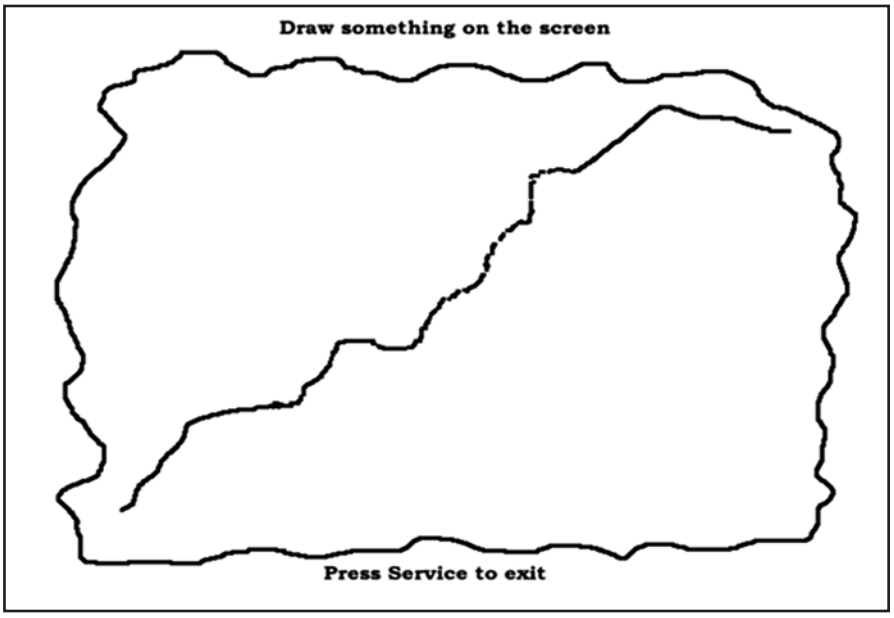
Be sure to touch and then lift the finger from the center of the square. Screen is calibrated with reference to where the finger is lifted from the screen.

Figure 10-6 Typical Touch Screen Calibration Display 2



Again, be sure to lift the finger from the center of the upper square.

Figure 10-7 Typical Touch Screen Test Display



Touch Screen Specifications

The following table provides detailed specifications for the LCD screen.

Table 10-6 Touch Screen Specifications

Item	Specification
Power Requirement	12V DC
Power Consumption	Less than 2W
Resolution	1024 x 1024 touch points
Baud Rate	2400 baud between controller and game
Communications Parameters	N81
Response Time	Better than 15ms
Touch Contact Requirement	3ms
Accuracy	±1% error
Output Communications	Bi-directional asynchronous RS-232C serial communication
Operating Temperature Range	0°C (32°C) - 55°C (131°C)
Operating Humidity Range	0-95% non-condensing

10.3.3 Handling the Touch Screen

The touch screen must be handled with care. The following precautions must be taken:

1. The touch screen has black tape protecting the electrodes at the edge of the screen. This tape must not be removed as it excludes light and dust.
2. When unpacking a screen, always lift directly out of the carton and place base-down on a flat bench.
3. Check the upper main door to ensure that no pressure is applied to the taped area. Excessive pressure on the taped area may result in edge breakages or vibrational wear damage to the electrode pattern.

4. Never remove the touch screen by gripping and pulling the flat cable. This may break the cable.
5. Handle the product with gloves to avoid leaving fingerprints or smudges. The transparency of the touch screen is critical.
6. Once removed from the original package, touch screens are not to be stacked, so as to avoid scratching of the screens.
7. Do not place heavy objects on the touch screen.
8. Prevent assembly tools from coming into contact with the touch screen. Whenever possible, use plastic tools.
9. Blow any contaminants from the surface with a filtered de-ionized air source before cleaning with a soft, lint-free cloth dampened with isopropyl alcohol. Ensure that there are no contaminants in the cloth.
10. Prevent liquids from contacting the edges of the touch screen.

When removing the touch screen for servicing, do not prise the touch screen off the LCD panel. Breakage may result in injury.

10.4 OSD

The On Screen Display (OSD) controls are operated from the push-button control PCBA which provides four push-buttons for changing the functional settings to best meet individual conditions.

Procedure Guidelines

The OSD provides the following functionality:

- The four control panel push-buttons are used to make user adjustments. The user presses Mode (/Exit) to enter the User Mode procedures and, at the completion of requirements, presses Mode (/Exit) to exit and return to normal screen operations. A wide blue line at the base of the screen indicates that User Mode is active. The RECALL function may be used in this mode to return all settings to factory settings.
- The procedure for making adjustments varies with each of the following groups:
  - BRIGHTNESS, CONTRAST, H.POSITION, H.SIZE, V.POSITION, V.SIZE, PINCUSHION, TRAPEZOID, PARRALLELOG, PIN BALANCE.
  - Color.
  - RECALL (Factory Reset).
  - LANGUAGE.

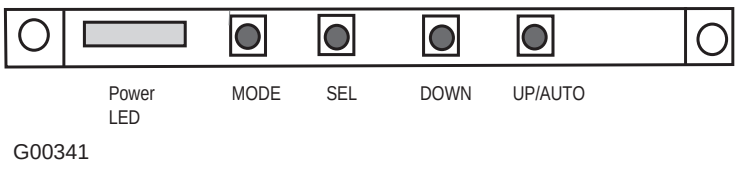
The LCD screen requires 1 minute to warm up before any adjustment is attempted.

10.4.1 Generation II/III OSD

User Controls

There are 4 buttons on the control panel. Adjustable Controls allow the best display status for individual requirements.

Figure 10-8 OSD Gen II/III - User Controls



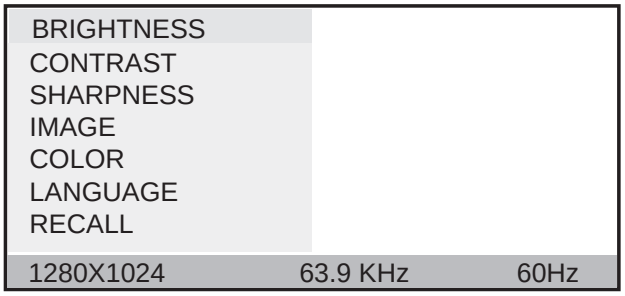
Key functions include:

MODE	Call the Main-Menu OSD
SEL	Call the Sub-Menu OSD
DOWN/UP	When the Main-Menu is displayed, you can select each function using these keys. When the Sub-Menu is displayed, you can change the setting of the selected function using these keys.

To adjust brightness:

1. Press the “MODE” key. The Main-Menu (below) appears on the screen.

Figure 10-9 OSD Gen II/III - Brightness Adjustment



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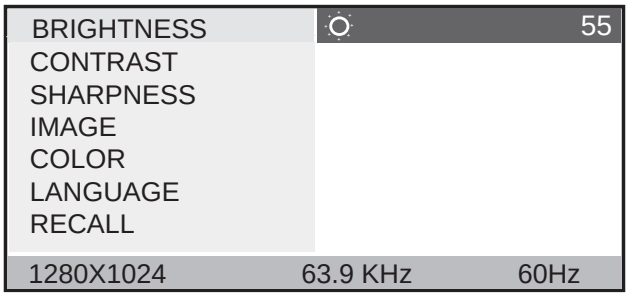
2. Select “BRIGHTNESS” using the “UP/DOWN” keys on the Main-Menu.
3. Press the “SEL” key to bring up the brightness Sub-Menu as shown below.

Figure 10-10 OSD Gen II/III - Brightness Sub-Menu



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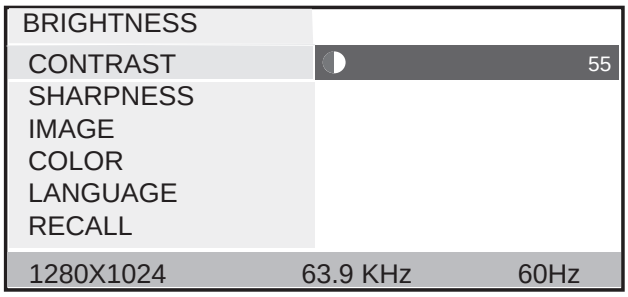
4. Adjust Brightness using “UP/DOWN” keys.
5. After finishing the Brightness adjustment, press the “MODE” key. The Brightness Sub-Menu disappears and saves the brightness automatically.
6. If you want to adjust other functions, select the function using the “UP/DOWN” keys, and then repeat the same procedures as described in the example of steps 3-5.
7. Press the “MODE” key again to finish adjustments and the OSD will disappear. If no action is taken in the OSD within 16 seconds, the menu will disappear by itself.

To adjust contrast:

1. Press the “MODE” key to show the Main-Menu OSD as shown above.
2. Highlight the “CONTRAST” Sub-Menu by using the “UP/DOWN” keys on the Main-Menu OSD.
3. Select “CONTRAST” by pressing “SEL” key. The Contrast Sub-Menu appears as shown.

Figure 10-11 OSD Gen II/III - Contrast Adjustment



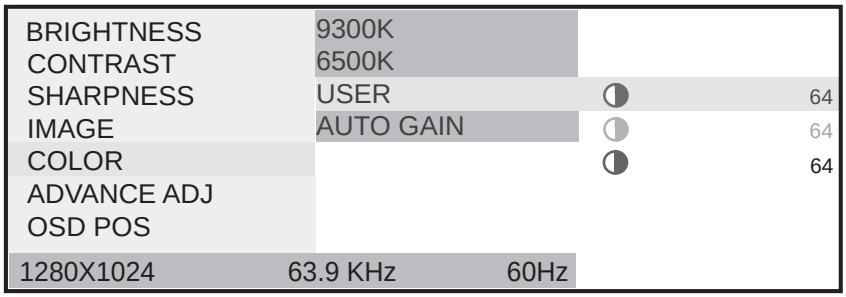
G00576

4. Adjust Contrast using “UP/DOWN” keys.
5. After finishing the contrast adjust, press the “MODE” key. The Contrast Sub-menu disappears.
6. Press “MODE” key again to finish adjustments and make the OSD disappear.

To adjust color:

1. Press the “MODE” key to show the Main-Menu OSD as shown above.
2. Highlight the “COLOR” Sub-Menu by using the “UP/DOWN” keys on the Main-Menu OSD.
3. Select “COLOR” by pressing the “SEL” key. The color Sub-Menu appears.
4. Highlight “USER” using the “UP/DOWN” keys. (“8500K” and “6500K” are adjusted in factory and are standard presets.)
5. Press “SEL” key to adjust Red, Green, and Blue. Each is selected by pressing the “SEL” key. The selected item is highlighted yellow as shown below.

Figure 10-12 OSD Gen II/III - Color Adjustment



G00577

6. Adjust Red, Green, and Blue using “UP/DOWN” key.
7. Press “MODE” to go back to the color Sub-Menu. Press “MODE” again to return to the Main-Menu.
8. Press the “MODE” key again to finish adjustments and make the OSD disappear.

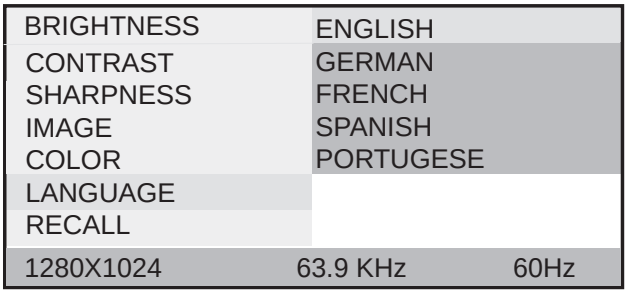
If the screen appears to differ in its brightness from others with the same model number, the AUTO GAIN feature will renormalize the light output.

To set language:

The Menu is available in 5 languages

1. Press the “MODE” key and the Main-Menu OSD will appear as in the previous figure.
2. Highlight the “LANGUAGE” Sub-Menu using the “UP/DOWN” key on the Main-Menu OSD.
3. Select “LANGUAGE” by pressing the “SEL” key. The Language Sub-Menu will appear as shown.

Figure 10-13 OSD Gen II/III - Language Adjustment



G00578

4. Highlight any language using the “UP/DOWN” key.
5. Select a language by pressing the “SEL” key.

6. Press “MODE” key to finish and save the selected language. Press the “MODE” key again to finish adjustment. The OSD will disappear.

To allow automatic adjustments:

This main LCD screen comes with an auto-adjust feature. To activate auto-adjust, press the “UP” key while the OSD is not active. The screen will turn black except for a box that reads “AUTO ADJUSTING ...” as shown. When finished, it will return to its previous display.

Figure 10-14 OSD Gen II/III - Auto Adjusting

G00350

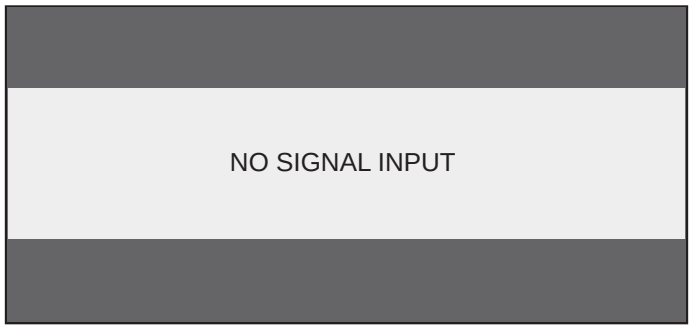
To recall factory settings:

When the “RECALL” option is selected from the Main Menu OSD, all user’s adjustment values are restored to factory defaults.

Power LED States:

The normal operation for the power LED is always on. If the LED begins flashing and the following is displayed on the screen, be sure to check the input signal.

Figure 10-15 OSD Gen II/III - No Signal Display



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10.5 Maintenance

10.5.1 General Care

For general maintenance of the LCD screens, ensure that the EGM is switched off and then:

1. Remove any dust or dirt from external surfaces.
2. Clean the LCD screen with a soft cloth and mild cleaning agents.
3. Ensure the LCD screen fits correctly when the cabinet door is closed.

Chapter 11

Main Logic Assembly

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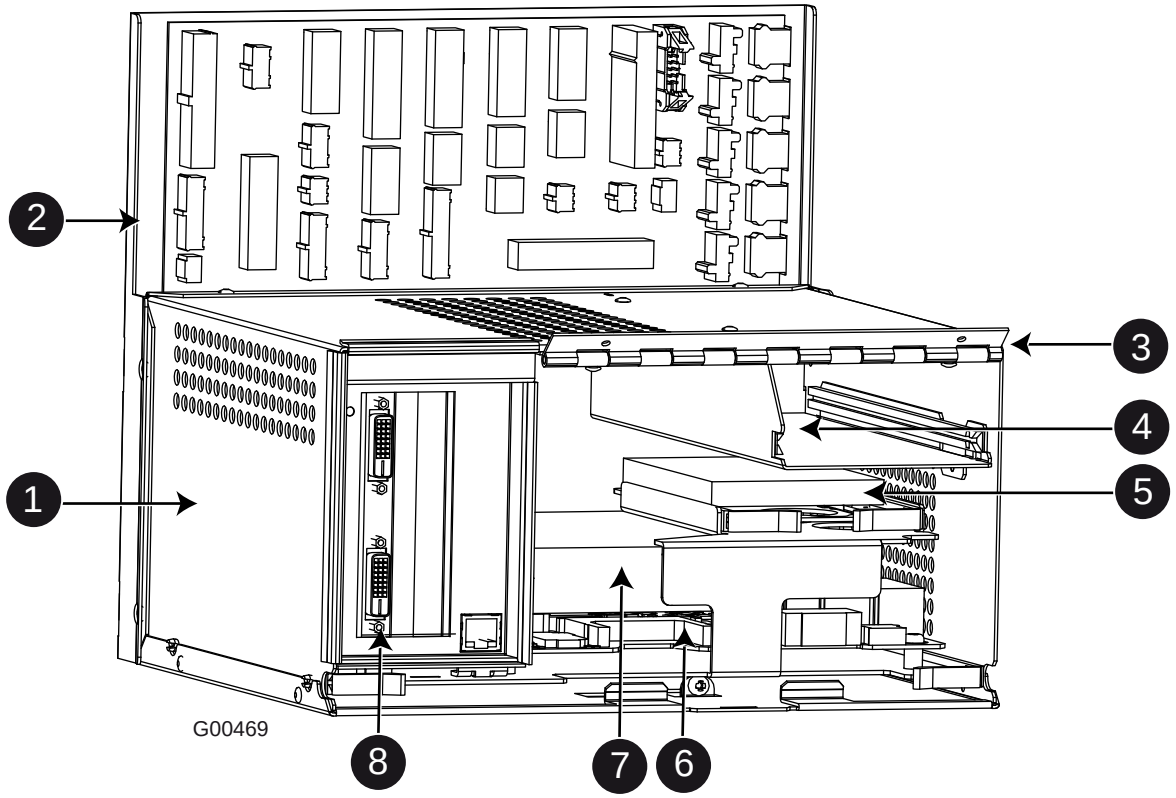
11.1 Overview

The main logic assembly provides central control of the Aristocrat™ Electronic Game (EGM). It consists of the carrier board assembly mounted on a metal tray that plugs into the logic cage.

11.1.1 Physical Description

The main logic assembly is located within the security logic cage. The logic cage is a lockable metal box which provides security and protection for its contents.

Figure 11-1 Logic Cage and Location of Carrier board



Legend					
1	Logic Cage	4	Cage for Jurisdiction specific Comms	7	COM Express (mounted on carrier board)
2	Backplane Board	5	Hard Disk (not present, future option only)	8	Video Board (mounted on carrier board)
3	Logic Cage Door Hinge (Door not shown)	6	Carrier board at base of cage (plugged into backplane board)		

11.1.2 Functional Description

The carrier board assembly interfaces with the following devices, depending on EGM features, via the backplane board:

- Main LCD screen / touchscreen (if fitted).
- Mechanical meter board (if fitted).

- Power supply assembly.
- Buttons and playbutton lamps.
- Network interface (if fitted).
- Link progressive system (if fitted).
- Player marketing module (if fitted).
- Security devices.
- Money management devices.
- Printer (if fitted).
- Mechanical security switches.
- Optical security switches.
- Key switches.
- Optional I/O connector.

Additional connectivity is provided at the front of the assembly:

- Network interface.
- GAT port.
- Debug port.

11.2 Carrier Board Assembly 578659

The major components of the assembly include:

- COM Express Module.
- Carrier Board.
- Logic cage tray.
- Mass storage device.
- Smart Card - content protection device.
- ADD2 Video Graphics Card.

11.2.1 COM Express Module Part No. 432394

The COM Express module provides essential computing functions and contains the core system components of a modern PC.

COM Express is an open specification of the PICMG (PCI Industrial Computer Manufacturer Group). It is an embedded computing module concept, specifying a COM (Computer On Module).

The features of the COM Express module are listed on the following table.

Table 11-1 COM Express Module

Feature	Description
Physical	Extended COM Express Module, Type 2 size 155mm (6.10”) x 110mm (4.33”) x 13mm (0.51”)
Processor	Intel® Core™ (Yonah) family low power CPU Celeron M 440 1.86GHz 27W (Single Core)
Chipset	Intel 82945GM (Calistoga GM) and ICH7-M
Graphics Controller	Intel® Graphics Media Accelerator 950 (integrated in Intel® 945GM chipset)
Memory	Dual channel memory, 1GB (2 x 512MB 200-pin SODIMM (2 sockets) (Up to 4GB PC4200 DDR2 SDRAM)
Audio	Intel® High Definition Audio via ICH7M
Video	Dual Independent Displays via SDVO interface on the Intel 945GM Chipset (Compatibility with analog VGA and PCI-Express x16 Graphics)
Networking	IEEE 802.3 10/100/1000Base-TX (requires external magnetics)
I/O	8 x USB 2.0 Ports 2 x SATA Ports (only one port supported on the Carrier board) 1 x Enhanced IDE port (ATA/UDMA100) LPC/FWH, I2C Bus
Security	Trusted Platform Module Infineon TPM 1.2 SLB 9635
Expansion	PCI-Express x 1; PCI-Express x 16 PCI 32-bit 33MHz
Connectors	Two 220 pin COM Express standard connectors; Type 2 pinout
Power Input	Supply input: +12V +/-10%, 5V Stby optional Consumption: 25W typ. (M440)
Environmental Temperature	Temperature 0°C (32°F) – 60°C (140°F) [operating] Humidity 5 – 95% [operating, non-condensing]

11.2.2 Carrier board Part No. 494077

The carrier board provides two distinctive groups of functions. Part of the design interfaces to the COM Express module and adds connectivity based on PC technologies: SATA, PATA/CF, USB, PCI Express. The gaming specific circuitry in a large part reuses traditional circuitry successfully used by Aristocrat™ for a number of years. It integrates circuitry previously used on the main board and a number of interface cards. The various gaming specific functions are controlled and monitored through the PCI bus which in turn is connected to the COM Express Module.

Figure 11-2 Carrier board Layout

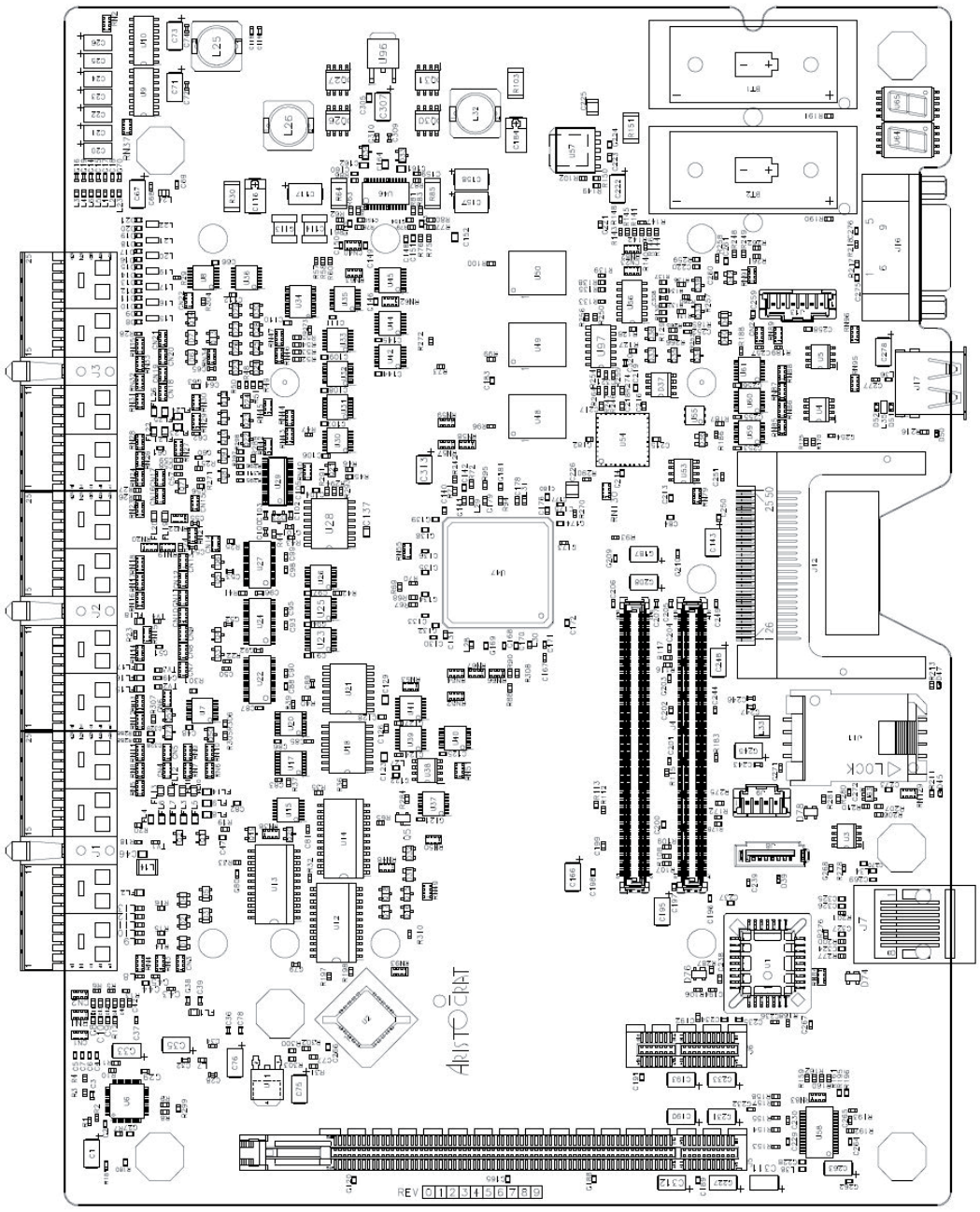


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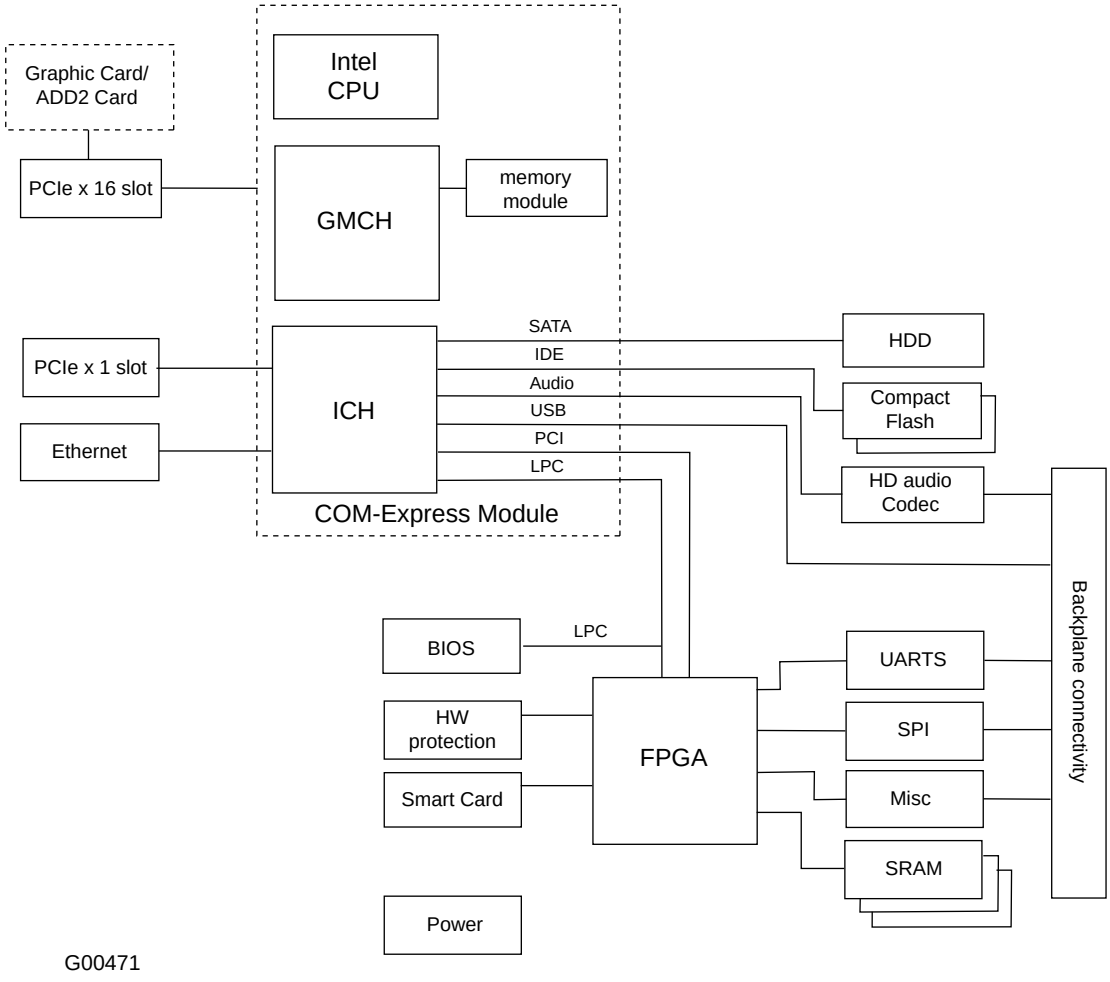
Figure 11-3 Carrier board Block Diagram



The carrier board provides mechanical support and connectivity for the COM Express module.

Audio

The COM Express provides an Intel High Definition Audio interface. The carrier board accommodates an audio CODEC device with multi channel audio output.

BIOS

The carrier board boots from a single BIOS chip and loads further data from the mass storage device.

The BIOS chip is connected directly to COM Express via LPC/FWH bus. The LPC bus is also connected to the FPGA for security purposes. There is no BIOS chip on the COM Express.

BIOS set up parameters are defined by EEPROM connected via an I²C bus and driven from the COM Express. If the EEPROM is not present, default parameters are used.

Ethernet

The carrier board implements a single gigabit ethernet port directly supplied from COM Express.

The ethernet connector is located on the front edge of the carrier board. Status LED's are provided on the connector where they are visible when the logic cage door is closed.

Standard LED Functions (depends on Ethernet driver functionality):

Left LED: LINK (LAN connection available).
Orange - 1000Base-T,
Green- 100Base-TX,
OFF - 10Base-T or no link.

Right LED: ACTIVITY,
Yellow light flashing to indicate activity (data packet transfers)

Evidence Tape

The BIOS chip, EEPROM, and CompactFlash may be sealed to the carrier board with evidence tape by regulators.

GAT Port

The carrier board implements a GAT3 serial port. The GAT port is positioned along the front edge of the carrier board where it can be easily accessible when the logic cage door is open.

Identification

A silicon ID device is embedded on carrier board to uniquely identify the assembly.

Serial Ports

For markets with specific communications requirements a communications board can be connected to the market dependent slot positioned inside the logic cage. Dedicated serial ports are allocated for peripherals as indicated in UART allocation table below.

Table 11-2 UART Allocation

UART	Function	EGM	Interface
0	Touch Screen	Main Touch screen	RS232
1	Bill acceptor	Bill Acceptor	RS232
2	Systems	Systems	RS232
3	Printer	Printer	RS232
4	Com 4	Progressives	RS232
5	Com 5	-	RS232
6	GAT port	GAT3	RS232
7	Com 7	-	RS232
8	Topbox	Second Touch Screen	FTB
9	Com 9	LAB1	RS232
10	Com 10	LAB2	RS232
11	Com 11	IrDA	TTL

ccTalk Interface

The ccTalk protocol is used for various types of cash handling equipment. One ccTalk interface is provided with the host controller on the carrier board. The ccTalk bus can be operated in point-to-point or multi-drop mode, thus allowing the connection of several slave devices.

Meter RAM

Three 512 Kb × 16 static RAM, power backed up from two batteries.

Battery Backup

Two long life BR-2/3A size lithium batteries provide back-up power for the SRAM's and also supply power for the RTC located on the COM Express Module. The batteries are designated BT1 and BT2 on the carrier board and secured by cable ties to their holders.

PCI Express

A PCI Express x 16 connector is provided on the carrier board and a PCI Express x 1 expansion connector is provided for future use.

USB

Eight USB 2.0 / 1.1 ports are supported by the carrier board. USB ch.0 for is dedicated for software development. The connector is located on the front edge and is only accessible when the logic cage door is open. USB ch1-5 are located on the backplane and connector types are based on GDS standard. USB ch. 6 is directly connected to a connector board connector. USB ch. 7 is directly connected to a market dependent connector.

Touch screen

USB Touch screen support is provided and a second USB touch screen port may be supported by an add-on hub. A serial port is provided for legacy main screen touch interface.

Serial Peripheral Interface

Eight Serial Peripheral Interface (SPI) channels are provided on the carrier board. Five are SPI channels for legacy interfaces and three are new fast SPI channels provided for new functionality.

Table 11-3 SPI Channel Allocation

SPI Channel	Function
1	Top Box Animation
2	Mechanical Meters Board
3	Player Button Lamps/LED
4	Player Button
5	Mechanical Security
6	LCD Edge Lighting
7	Light Tower
8	Top Box Lighting

FPGA

The carrier board accommodates Altera Cyclone II FPGA. A 32bit/ 33M PCI bus is connected to FPGA. All legacy interfaces are supported in the FPGA.

Buttons and Button Illumination

The carrier board accommodates circuitry for driving button illumination and switches. Design supports 24V incandescent lamps, 24V LED and 12V LED illumination.

POST Code Display

A pair of 7-segment displays are used to provide feedback about the operational status of the carrier board assembly.

All 7 segments:
All OFF – no power,
All ON – Reset
Decimal Point, Left: ON – 24V and 12V supply rails are within tolerance.
Decimal Point, Right: ON – 5V, 3.3V and 1.2V supply rails are within tolerance.

When the system is not in reset, BIOS POST codes or special operational codes are displayed. POST codes are 2-digit hexadecimal numbers.

The following security error status codes are of special significance:
F8 – BIOS security check failed.
e0 – Overbuild Protection check failed.
e8 – BIOS verification failed.

Status Indicator Lights

The following LED indicators are present on the board and provide feedback about the operational status of the carrier board assembly.

Table 11-4 Description of LEDs

LED	Color	Activity
D39	Red	SATA activity
D45 SCPWR	Red	Smart Card is active. Do not replace SmartCard while this indicator is lit.
D47 CFACT	Red	CompactFlash activity.
D50 VSB	Green	3.3V Standby voltage is present. NB: no accurate supply tolerance mesurement is provided.

Power

The carrier board is supplied from the 24V DC supply rail. All internal voltage rails are derived from this source. A 12V supply rail is used only for COM Express and the graphic card. Presence of mains voltage is detected by a hardware power fail signal generated by mains power supply and provides an early warning when the EGM power is down. Correct level of 12V and 24V rail is detected. A 5V stand by rail supplies power to the COM Express circuitry when in WOL mode. The 24V and 12V rails are without supply in this mode. Two independent batteries provide a power source for volatile data backup and for security monitoring.

Mechanical support

The carrier board with COM Express module, graphic card, CompactFlash/ HDD and cooling solution are mechanically mounted and supported by a metal bracket. The bracket provides mechanical protection for electronic assemblies and facilitates modularity design aspects. Ejector levers are located on the metal bracket. The bracket provides a good quality high frequency ground point.

11.2.3 Mass Storage Device

The Carrier board supports CompactFlash and hard disk drive (HDD) interfaces. The boot priority of the mass storage device is set in the BIOS.

CompactFlash (CF)

The carrier board supports one CompactFlash card interface.

The interface supports the maximum possible interface speed supported by the COM Express module and works with high speed cards such as SanDisk5000 (with sustained read performance of at least 10 Mbytes/s).

The CompactFlash connector is positioned along the front edge of the carrier board where it can be easily accessible with the logic cage door open.

The system does NOT support hot-pluggability for the CF card. It may only be installed or replaced while the EGM is powered down or on stand-by.

HDD

A standard SATA connector and proprietary power connectors with 5V power only are provided on the carrier board. Only mobile hard disk drives that do not require additional supply voltages are supported.

A mechanical space provision for 2.5” HDD is allocated inside the logic cage.The HDD is not installed.

The system does NOT support hot-pluggability for the HDD.

11.2.4 SmartCard

The carrier board accommodates an ID-000 25mm (0.98”) × 15mm (0.59”) ISO 7816 smart card. The smart card socket is mounted on the front edge of the carrier board so that the smart card can be replaced without removing the carrier board from the logic cage.

11.2.5 Video Graphics

The GMCH chip in the COM Express module provides an internal graphic core and also has the capability to support external graphic accelerators. The chip provides one dedicated analog output and two digital display ports. Digital SDVO ports are multiplexed with the PCI Express graphics interface. The SDVO ports are not available if an external graphic device/card is in use.

The carrier board implements PCI Express x 16. It provides an extension for ADD2 card or an external graphic card. A PCIe x 16 connector with retention clip is required on the carrier board for securing a graphic card.

Graphical resolution of 1280 x 1024 is supported by LCD screens. Other resolutions available from a graphic card may not be supported by display devices.

11.2.6 Description of Connectors

The following tables show the details of the principal external connectors on the carrier board.

Table 11-5 Description of Connectors

No.	Name	Type	Function
J1		CON 110W F RA HM 2mm (0.07") Au_30u" PF U	Backplane interface
J2		CON 110W F RA HM 2mm (0.07") Au_30u" PF U	Backplane interface
J3		CON 110W F RA HM 2mm (0.07") Au_30u" PF U	Backplane interface
J4		CON 2x220W M FH 0_5BTB 8H SM UL94	COM Express connectors
J5		CON 164W F ST PCIeX16 Au_FL TH UL	PCI Express or SDVO Graphics Card
J6		CON 36W F ST PCIeX1 Au_FL TH UL94	PCI Express x1
J7	GBE	CON 8W F ST MOD_RJ45 RA SHL_GND M	Gigabit Ethernet LAN Port
J8	SATA	CON 7W M ST SATA Au_15u" TH UL94V	SATA data
J9	SATAPWR	CON 4W M ST HDR uCLASP 2mm (0.07") TH UL9	SATA power
J10			Not Fitted.
J11	SC	CON 4W F ST USB_A RA SHLD UL94V0	Smart Card holder
J12	CF	CON 25Wx2 M ST CF2 RA PEG Au SM U	CompactFlash Card
J13		CON 6W M ST HDR uCLASP 2mm (0.07") TH UL9	Mechanical Security
J14			Not Fitted.
J15			Not Fitted.
J16	GATT	CON_2W_M_ST_HDR_St_6mm (0.23")	GAT3/GAT Port
J17	USB0	CON 7W M ST SATA Au_15u" TH UL94V	USB0 Port
J18			Unused reference.
J19			Not Fitted.
J20			Unused reference.
J21			Not Fitted.
J22			Not Fitted.
J23			Not Fitted.
J24			Not Fitted.

Backplane Connector - J1

Backplane interface connector J1.

Backplane Connector - J2

Backplane interface connector J2.

Backplane Connector - J3

Backplane interface connector J3.

COM Express Connector - J4

The COM Express module is plugged into this pair of connectors. Additional mounting posts are available to secure the COM Express module in correct position.

PEG Connector - J5

This socket provides PCI Express x16 or SDVO connectivity and PCI Express graphics or ADD2 video interface card may be plugged in. ADD2 card is used as the standard video configuration. This socket is also compatible with non-specified, optional PCI Express expansion cards.

PCI Express x1 Connector - J6

Optional PCI Express x1 expansion card may be plugged into this socket.

LAN Connector - J7

Gigabit ethernet LAN connector. This connector remains accessible when the logic cage door is closed.

SATA Connector - J8

SATA data connector.

SATA Power Connector - J9

SATA power connector. Only 5V is supplied for compatibility with 2 1/2” mobile hard drives.

SmartCard Connector - J11

“SIM” type smart card holder. It can accommodate ID-000 size cards.

CF Connector - J12

CompactFlash card connector/socket. It can accommodate both Type-I and Type II cards. The interface is directly connected to the IDE bus of the Intel chipset and hence it is not hot-plugging compatible. CompactFlash cards must be replaced while the carrier board power is off, although stand-by supply may be present.

Mechanical Security Connector - J13

Mechanical security connector. When not used, this connector must have a loop-back plug inserted.

GAT Connector - J16

GAT3 interface connector. This connector remains accessible when the logic cage door is closed.

USB0 Connector - J17

USB channel 0 connector.

11.3 Maintenance

11.3.1 Removal and Replacement Procedures

When handling electrostatic sensitive devices (ESDs) such as PCBs, take care to avoid physical contact with components. Do not place ESDs on metal surfaces. PCBs should be handled by their edges. Care must be taken to avoid flexing the PCB, as this may lead to physical damage.

Turn the EGM power off before removing PCBs from the logic cage.

Removal

To remove the carrier board:

1. Open the lower main door and switch OFF the EGM.
2. Open the logic cage door.
3. Standard Electro Static Discharge (ESD) prevention procedures should be followed when handling PCBAs.
4. Lever the PCBA out of the runners using the board extractors, and withdraw the board from the logic cage.
5. The PCBA should be placed in an antistatic bag immediately.

You must place a fault tag on any faulty boards.

Replacement is a reversal of the removal procedure. Both sides of the replacement PCBA should be inspected for any signs of physical damage.

Chapter 12

Backplane Board
Part No. 494083

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12.1 Overview

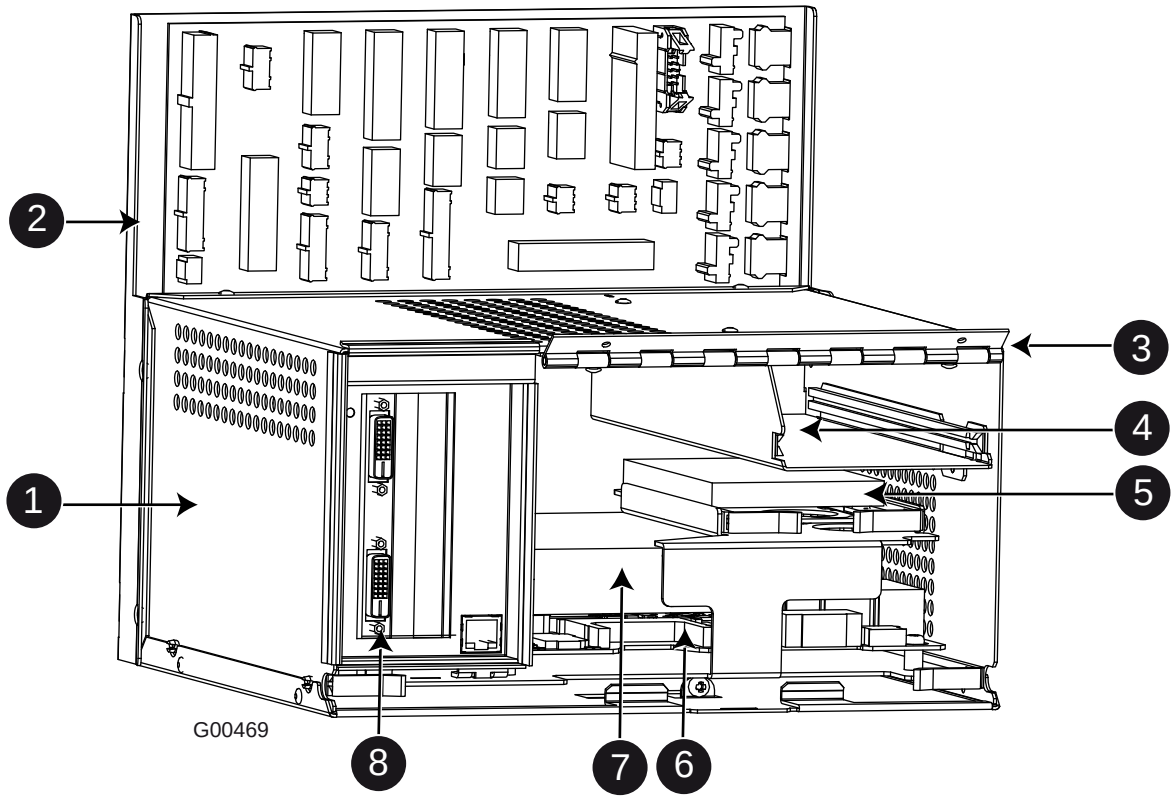
12.1.1 Physical Description

The backplane board is a single Printed Circuit Board Assembly (PCBA) mounted vertically in the cabinet, at the back of the logic cage. The backplane board is used to electrically connect the carrier board to all peripheral PCBAs and subsystems.

The carrier board connects directly to the backplane board within the logic cage. The optional expansion board connects directly to the backplane board, within the logic cage. All other PCBAs and peripherals are connected to the backplane board via ribbon cables or wire looms.

The board location and the component layout of the backplane board are shown below.

Figure 12-1 Backplane Board



Legend					
1	Logic Cage	4	Cage for Jurisdiction Specific Communications	7	COM Express (mounted on Carrier Board)
2	Backplane Board	5	Hard Disk (not present, future option only)	8	Video Board (mounted on Carrier Board)
3	Logic Cage Door Hinge (Door not shown)	6	Carrier Board at base of cage (mounted on Backplane Board)		

12.1.2 Technical Description

The backplane board provides electrical connection for the following boards and peripherals:

- Amplifier.
- Bill acceptor.
- Cabinet.
- Carrier board.
- Connector board.
- Edge lighting.
- Expansion board.
- Fan.
- Light tower.
- Meters.
- Mic.
- Optics.
- Buttons.
- PMM.
- Power supply.
- Printer.
- Progressive jackpot controllers.
- Top box.
- Touch screen.

The backplane board has no active components.

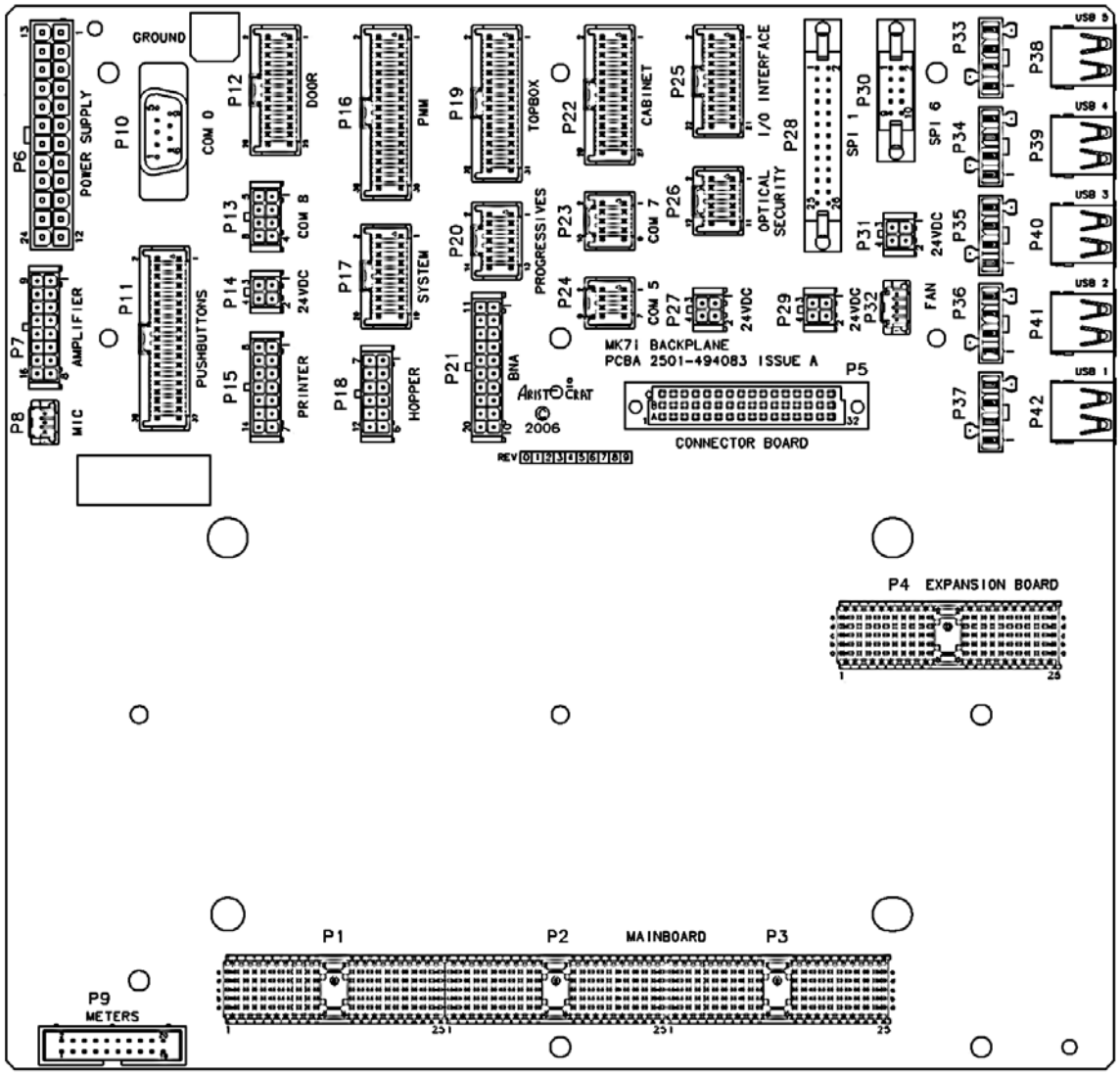
The connectors that require security are placed on the board so that they are within the logic cage after installation. They are:

- Carrier board connectors (P1, P2 and P3).
- Expansion board connector (P4).
- Mechanical meters connector (P9).

All connectors are unique in size to prevent incorrect connection.

12.2 Backplane Board Part No.494083

Figure 12-2 Backplane Board Component Locations



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12.2.1 Technical Description

The following table lists the function and type of each connector on the backplane board.

Table 12-1 Backplane Connection Function and Type

Designator	Title	Function	Connector
P1,P2,P3	Carrier Board	Carrier Board Interconnect	110W 2.0mm (0.08") Hard Metric Type A Vertical Header
P4	Expansion Board	Market Expansion Board Interconnect	110W 2.0mm (0.08") Hard Metric Type A Vertical Header
P5	Connector Board	Connector Expansion	48W DIN41612 Half C Vertical Receptacle
P6	Power Supply	Power Supply	24W Mini-Fit Jr. Dual Row Vertical Header
P7	Amplifier	Amplifier Power (24VDC), Low Level Audio Output (5.1), S/PDIF Digital Audio Output	16W Micro-Fit 3.0 Dual Row Vertical Header
P8	Mic.	Microphone Input	3W MicroClasp Single Row Vertical Header
P9	Meters	Mechanical Meters (x8), Meter Illumination LEDs, IrDA, Meter Security Switch	20W Shrouded Box Vertical Header
P10	Com 0	Primary LCD Touchscreen (Com 0)	9W D-Sub Standard Male Vertical Header
P11	Buttons	Playbutton Switches (x16) Playbutton LEDs (x16)	38W MicroClasp Dual Row Vertical Header
P12	Door	Belly Door Security Switch, Belly Door Fluoro Ballast, Main Door Optics (also on P22)	26W MicroClasp Dual Row Vertical Header
P13	Com 8	Feature Top Box	8W Micro-Fit 3.0 Dual Row Vertical Header
P14	24VDC	Auxiliary 24VDC	4W Micro-Fit 3.0 Dual Row Vertical Header
P15	Printer	Printer (Com 3)	14W Micro-Fit 3.0 Dual Row Vertical Header
P16	PMM	Player Marketing Module, PMM Fluoro Ballast	36W MicroClasp Dual Row Vertical Header
P17	System	System Communications (Com 2) System Security Switch	20W MicroClasp Dual Row Vertical Header
P18			12W Micro-Fit 3.0 Dual Row Vertical Header
P19	Top Box	Top Box Security Switch, Top Box Fluoro Ballast, Light Tower (SPI Channel 7), Oval Topper, Jackpot Bell Output	32W MicroClasp Dual Row Vertical Header
P20	Progressives	Progressive Jackpot Communications (Com 4)	14W MicroClasp Dual Row Vertical Header
P21	Bill acceptor	Bill Acceptor (Com 1), Bill acceptor Drop box Security Switch	20W Micro-Fit 3.0 Dual Row Vertical Header
P22	Cabinet	Audit Switch, Jackpot Reset Switch, Mech. Meters Illumination Switch, Main Door Optics (also on P12), Main Door Security Switch, Drop box Security Switch, Handle Output	28W MicroClasp Dual Row Vertical Header

Designator	Title	Function	Connector
P23	Com 7	Com 7	10W MicroClasp Dual Row Vertical Header
P24	Com 5	Com 5	8W MicroClasp Dual Row Vertical Header
P25	I/O Interface	Auxiliary Carrier Board Inputs (x4) Auxiliary Carrier Board Outputs (x4) Auxiliary Expansion Board I/O (x8)	22W MicroClasp Dual Row Vertical Header
P26	Optics	Optical Security Channels 1, 2 & 3	12W MicroClasp Dual Row Vertical Header
P27	24VDC	Auxiliary 24VDC	4W Micro-Fit 3.0 Dual Row Vertical Header
P28	SPI 1	SPI Channel 1	26W Shrouded Box Vertical Header with Latch
P29	24VDC	Auxiliary 24VDC	4W Micro-Fit 3.0 Dual Row Vertical Header
P30	SPI 6	Edge Lighting (SPI Channel 6)	10W Shrouded Box Vertical Header with Latch
P31	24VDC	Auxiliary 24VDC	4W Micro-Fit 3.0 Dual Row Vertical Header
P32	Fan	Logic Cage Fan	4W MicroClasp Single Row Vertical Header
P33	Power	USB Peripheral Power (GDS Std.)	4W Mini-Fit Jr. Single Row Vertical Header (with custom first make – last break pins)
P34	Power	USB Peripheral Power (GDS Std.)	4W Mini-Fit Jr. Single Row Vertical Header (with custom first make – last break pins)
P35	Power	USB Peripheral Power (GDS Std.)	4W Mini-Fit Jr. Single Row Vertical Header (with custom first make – last break pins)
P36	Power	USB Peripheral Power (GDS Std.)	4W Mini-Fit Jr. Single Row Vertical Header (with custom first make – last break pins)
P37	Power	USB Peripheral Power (GDS Std.)	4W Mini-Fit Jr. Single Row Vertical Header (with custom first make – last break pins)
P38	USB 5	USB 2.0 Port 5	4W USB Type A Right Angle Receptacle
P39	USB 4	USB 2.0 Port 4	4W USB Type A Right Angle Receptacle
P40	USB 3	USB 2.0 Port 3	4W USB Type A Right Angle Receptacle
P41	USB 2	USB 2.0 Port 2	4W USB Type A Right Angle Receptacle
P42	USB 1	USB 2.0 Port 1	4W USB Type A Right Angle Receptacle

12.3 Maintenance

12.3.1 Removal and Replacement Procedures

When handling electrostatic sensitive devices (ESDs) such as PCBAs, take care to avoid physical contact with components. PCBAs should be handled by their edges. ESDs should not be placed on metal surfaces. When handling PCBAs, take care to avoid flexing the PCBA, as this may lead to permanent damage.

Removal

The procedures for removing and replacing the backplane board are detailed in the Cabinet chapter, under the section describing how to remove and disassemble the logic cage.

A fault tag must be placed on any faulty equipment.

Run a complete machine test after replacing the backplane board.

Chapter 13

Hard Meter Board
6 Meters Part No. 494124

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13.1 Overview

13.1.1 Electromechanical Meter Assembly

The electromechanical meter assembly is located on the right-hand-side of the EGM cabinet. The hard meter board may be fitted with up to 8 meters.

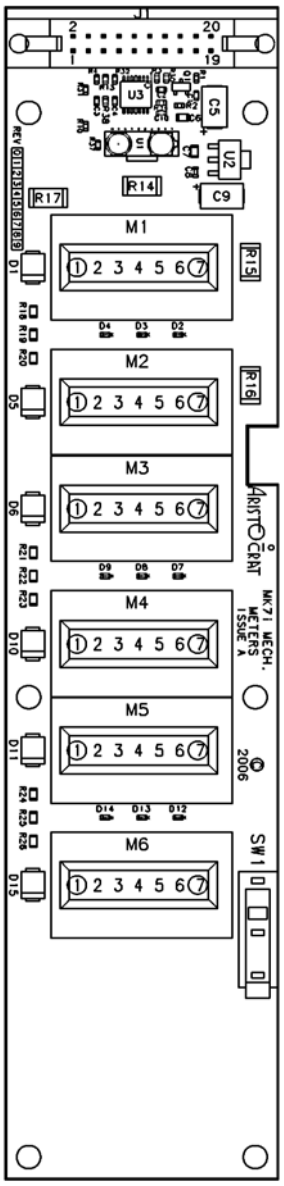
13.1.2 Electromechanical Meters

The mechanical meters are used to record audit information such as games played, credits won, and other data as defined by jurisdictional authorities and customers. The specifications of the meters are as follows:

Table 13-1 Meter Specifications

Description	Specification
Number of digits	7
Rated voltage:	24 V DC
Power consumption:	46 mA 1.1W
Operating voltage range	90 to 110% of rated voltage
Count speed:	20 CPS (standard)
Allowable ripple ratio	<10%
Ambient temperature.	-25°C (77°F) to +60°C (140°F) operating
Dielectric strength	1500 V AC, 50/60 Hz for 1 minute

Figure 13-1 Hard Meter Boards - 6 Meters



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13.2 Functional Description

The hard meter board functions provide:

- A physical location for up to eight electromechanical meters.
- A physical location for a tamper switch.

The hard meter board connects directly to P9 on the backplane board.

13.2.1 Overcurrent Protection

An intelligent power driver is used for switching power on and off through the meter drive outputs. The power switch used incorporates built-in overcurrent sensing and protection.

13.2.2 Security Interface

The security interface provides a connection from the hard meter board to a mechanical security switch for monitoring meter accesses.

13.2.3 Meter Detection

Data received from the carrier board logic is written to an output chip and then read back. If there is a discrepancy between the initial data written and the data read back, the hard meter board informs the carrier board logic of a malfunction.

13.2.4 IrDA Interface

The IrDA interface is an infra red communications interface. When activated by the meter switch, it sends out information on the meter values. This can be read by a PDA or a computer equipped with an IrDA interface. This function can be disabled in the software.

13.3 Connector Pin Assignments

The hard meter board connector for power and signals is a 20-way ribbon cable. The connector pin assignments are listed in the table below:

Table 13-2 Connector Pin Assignments

Pin	Function	Comments
1	GND	Ground
2	Meter1	Meter1
3	Meter2	Meter2
4	Meter3	Meter3
5	Meter4	Meter4
6	Meter5	Meter5
7	Meter6	Meter6
8	Meter7	Meter7
9	Meter8	Meter8
10	24V	+24V
11	MeterLED	Input to drive Meter LED. Drive with open collector to ground, Current is 80mA.
12	MSS(2)	Security Switch
13	MSSO(2)	Security Switch, Normally Open
14	IRMODE	Mode Select
15	IRFIR	FIR Select
16	GND	Ground
17	TXD	TX to IrDa
18	GND	Ground
19	RXD	RX from IrDa
20	GND	Ground

13.4 Maintenance

13.4.1 Removal and Replacement Procedures

When handling electrostatic sensitive devices (ESDs) such as PCBAs, take care to avoid physical contact with components. PCBAs should be handled by their edges. ESDs should not be placed on metal surfaces. When handling PCBAs, take care to avoid flexing the PCBA, as this may lead to permanent damage.

To remove the electromechanical meters kit:

1. Open the lower main door, and switch OFF the EGM.
2. Break the security seal, if fitted, and remove the 2 nuts that holds the external cover and viewing window in place on the cast mounting housing. (It may be necessary to remove the bill acceptor housing to gain adequate access to these nuts.)
3. Swivel the cover and window anti-clockwise to remove from the housing.
4. Remove the 1 screw that secures the meter assembly to the housing and remove the assembly.
5. Unclip the lightpipe from the meter board (if required)
6. Disconnect the looms from the kit.
7. Unclip the meter board from the bracket (if required).

Replacement is a reversal of the removal procedure.

13.4.2 General Maintenance

For general maintenance of the electromechanical meters kit:

- Remove any dust or dirt from external surfaces.
- Check that all connectors are in good condition and are secure.

Notes

Chapter 14

Standalone Jackpots

This chapter is not required in this manual.

Chapter 15

Hyperlink & Mystery Jackpots

This chapter is not required for this manual.

Chapter 16

Comms Interface Board - 494111 (if fitted)

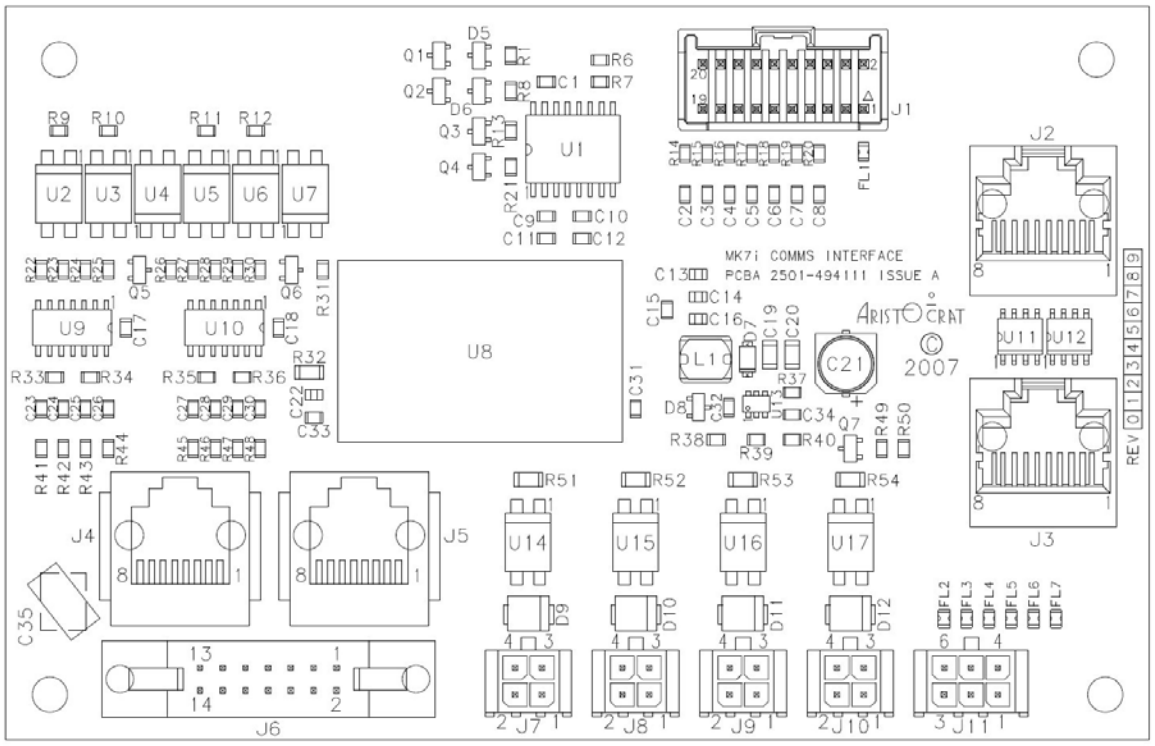
List of Figures

16.1 Technical Description

16.1.1 Physical Description

The Comms Interface Board is located at the bottom rear of the back wall of the cabinet.

Figure 16-1 Comms Interface Board - Component Layout



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16.1.2 Basic Operation

The board is intended to provide the functionality of the MK6 XP Main Board and Comms Config Boards which does not exist in the new architecture.

It is also intended to provide the functionality of the MKV VLC Comms Inlet Board, the MKV Progressive Interface Comms Inlet Board and some of the functionality of the US Driver Board. Finally, it will provide protection against electrical interference from external sources; such as Ethernet, RS-485 and Cashbox signals.

The board will convert the RS-232 signals from the EGMs carrier board to the RS-422/RS-485 signals if required by external systems.

The Mikohn pulse signals component of the board can drive upto four Mikohn progressive controllers.

16.2 Removal and Replacement Procedures

The Comms Interface Board is located at the bottom rear of the back wall of the cabinet. It is located inside a metal housing.

To remove the Comms Interface Board:

1. Open door(s) as required & switch OFF the EGM.
2. Remove looms from the board.
3. Remove the hopper (if fitted).
4. Remove the screw (bottom center) that holds the metal cover over the board.
5. Lift up the cover until it is clear of the locating tab at the rear and remove.
6. Remove the Comms Interface Board from the Snap-Top standoffs on the holding plate at the rear of the cabinet. (There are no screws holding the board to the plate.)

Replacement is a reversal of the removal procedure.

16.3 Maintenance

For general maintenance:

- Remove any dust or dirt from external surfaces.
- Check that all connectors are in good condition and are secure.

Chapter 17

Fiber Optic Interface
Part No. 494035
(if fitted)

List of Figures

17.1 Overview

EGMs may be connected to a network communications system to monitor security, record accounting information, provide performance analysis, and facilitate player communications. To connect to a network, each EGM must be fitted with a communications interface.

17.1.1 Fiber Optic Interface

The function of the Fiber Optic Interface (FOI) PCBA is to provide a communications link between the RS-232 interface of the EGM and the fiber optic interface of the Site Controller system.

The FOI assembly consists of a mounting bracket, base plate, the FOI PCBA, a metal or plastic cover and a mains powered source of low voltage. The assembly is located on the rear wall of the cabinet.

The FOI power supply can be connected to the IEC female socket located on the side of the EGM power supply unit. This socket is clearly labeled “Warning: This output is not controlled by the main power switch”, and the interface power switch is clearly labeled “ON”, “OFF”. This enables the FOI to remain powered even if the EGM has been turned off.

17.1.2 Functional Description

The FOI board consists of the following ports and connectors:

- An fiber optic (FO) transmitter.
- An fiber optic (FO) receiver.
- An RS-232 port.
- A power input connector.

The FOI board is a repeater, i.e. it echoes all received FO data-in and RS-232 data-in to the FO data-out. A jumper on the FOI board, when removed, disables the FO data-in from being echoed to the FO data-out (this does not affect data to the RS-232 interface). FO data-in is always echoed to the RS-232 data-out.

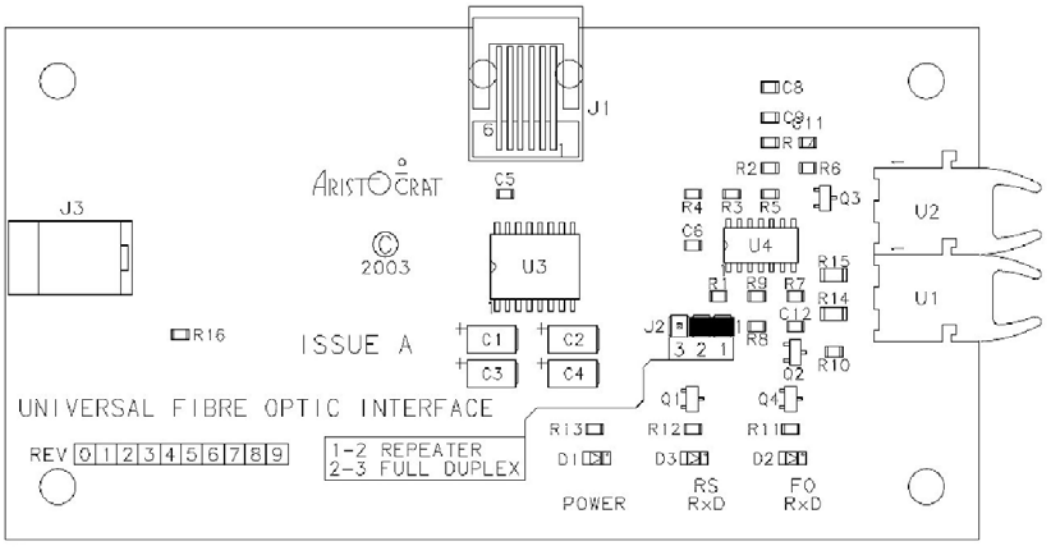
The FOI has the following indicator LEDs:

- A 5V DC power good LED (yellow).
- An FO Rx Data LED (green).
- An RS Rx Data LED (red).

The LEDs are clearly visible through an opening in the FOI cover.

17.2 Fiber Optic Interface - 494035

Figure 17-1 Fiber Optic Interface Board



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17.2.1 Technical Description

The FOI design can be divided into three blocks:

- EGM Interface Logic.
- Fiber Optic Logic.
- Power Supply.

EGM Interface Logic

The EGM connects to the FOI via the RS-232 interface. The RS-232 logic supports upto 19200-baud communication. The FOI unit provides +/-15 kV ESD protection on the input side. LED D4 (red) indicates if the RS-232 port is receiving data. In idle mode, the LED is off.

Fiber Optic Logic

The fiber optic port uses HP Versatile HFBR-0508 transceivers. Current fiber optic cable limits the speed to 5 Mbit/s and a maximum distance of 50m (164ft). LED D2 (green) shows the activities of the FO receive line. Jumper J2 selects one of two operating modes for the Fiber optic port:

Mode 1, or Repeater Mode

Mode 1, or Repeater Mode is a loop mode and is used to connect up to 32 EGMs on one fiber optic loop. The receiver line of one fiber optic interface is looped back to the transmitter line and then to the next EGM's receiver port.

Pins 1 and 2 shorted.

In this mode, data received on FO receiver line is echoed/looped directly to the FO transmit line, and is passed as well to the EGM. At the same time, pin 12 of U3 (R1 OUT) line is “high”, no data is received from the EGM, or if the fiber optic port is not connected to the EGM. In this mode, only HALF-DUPLEX mode of communication between the EGM and the site controller is possible. If data were echoed back and at the same time the EGM sends data, corrupted data would be sent through the fiber optic transmitter HFBR-1528 to the next EGM or site controller.

Mode 2 or Full Duplex

In Mode 2, or Full Duplex Mode, pins 2 and 3 are shorted. The received data is passed to the EGM and is not looped/echoed to the FO transmitter line. Pin 2 of J2 is pulled up with R9 and enables the data received from the EGM to be passed to the FO transmitter HFBR-1528. In this mode, a direct, point to point connection between the EGM and a site controller is possible (Full Duplex mode).

Power Supply

The FOI is supplied with 5V DC from an external wide range power supply unit (PSU). LED D1 (yellow) indicates if the FOI is powered.

17.2.2 Interface Connections

The FOI communicates with the carrier board using RS232 and with the site controller system using a fiber-optic link. The RS232 port is configured on generic serial channel 2 (P15 on the Interface Board). The channel has six I/O signals, including data I/O. High speed optoisolators used on channel 2 allow this port to support baud rates greater than 9600.

Power Interface

The FOI connects to the auxiliary output on the EGM PSU, via a wide range PSU and a standard IEC cable. The power connector on the FOI board is a low voltage DC power jack.

RS-232 Port

This port connects the FO interface card to the EGM. The FO interface card has one RS-232 port meeting the following specifications:

- The physical interface is via a 6 circuit RJ-12 connector.
- The FO RS-232 connector cable color must be cream. Austel approved 4-way flat modular cable is recommended.

17.3 Maintenance

Do not attempt component level repair without access to a workshop facility.

For general maintenance:

- Remove any dust or dirt from external surfaces.
- Check that all connectors are in good condition and are secure.

17.3.1 Removal and Replacement

The FOI assembly consists of a backplate on which the FOI board is mounted and an front cover over the top of the board. The assembly is mounted on a plate. The plate is flat if the unit is mounted on a housing plate or L shaped if the plate is mounted directly on the floor or the rear wall of the cabinet.

To remove the FOI board:

1. Remove door(s) as required and switch OFF the EGM.
2. Remove the hopper (if fitted).
3. Disconnect 4 cables - the fiber optic transmitter, the fiber optic receiver, the RS-232 and the power connector.
4. Remove the 3 or 4 nuts holding the FOI backplate in place.
5. Remove the FOI assembly from the cabinet.
6. Remove the 3 nuts holding the assembly front cover over the board.

Replacement is a reversal of the removal procedure.

Chapter 18

LAB Communications Board

This chapter is not required in this manual

Chapter 19

Serial Protocol Converter (SPC2)
Part No. 574682
Part No. 571186

List of Figures

19.1 Overview

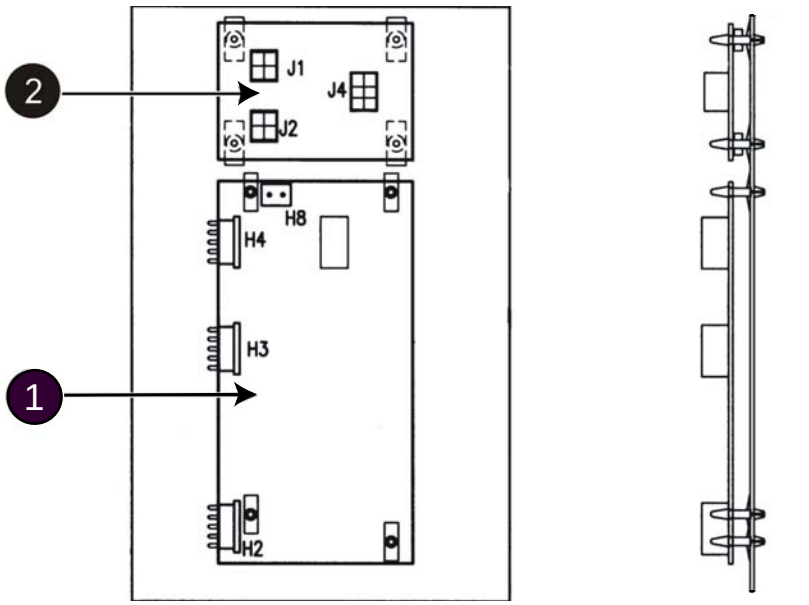
The Serial Protocol Converter (SPC2) is a machine interface enabling the Aristocrat™ EGM ASP–RS485 Protocol (Aristocrat™ Serial Protocol) to be converted and made available for interfacing to SAS–RS232 compatible devices including central monitoring and control systems.

Functional units include:

- Serial Protocol Converter 2 board (Part No. 442037).
- DC converter 24 V to 5V 500mA board (Part No. 494027).

The Serial Protocol Converter 2 (SPC2) kit (Part No. 574682) is either mounted on top of the logic cage or inside the logic cage, depending on other components installed and jurisdictional requirements.

Figure 19-1 SPC2 Kit with SPC2 Board and DC Converter Board



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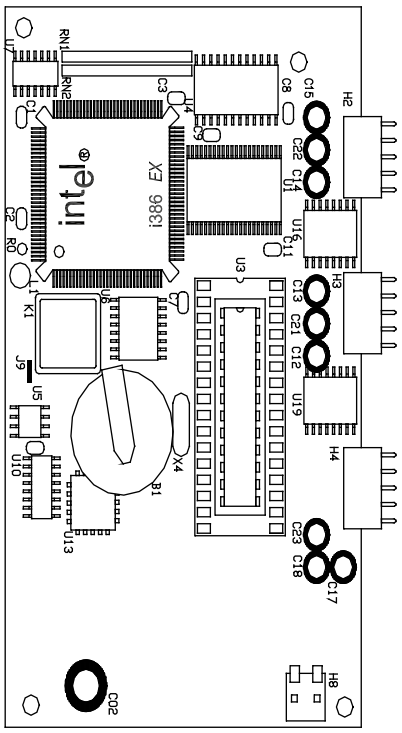
Legend			
1	SPC2 Board	2	DC Converter Board

19.2 SPC2 Board

The Serial Protocol Converter 2 (SPC2) Board converts the ASP 5000 version 1 protocol used by the EGM to the SAS 4.02 protocol.

The H2 connector on the SPC2 Board connects to PSIM on the Paltronic SEI Board (if Hyperlink™ fitted) or to P15 on the Backplane Board using an RS232 interface. The H4 connector on the SPC2 Board provides the interface to the SAS-RS232 compatible device.

Figure 19-2 Serial Protocol Converter 2 (SPC2) Board



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19.2.1 SPC2 LED Operation

The LED is located at L1 near the main processor on the SPC2 Board. Its function is to reveal the status of the board to the operator. The LED has 6 flashing sequences, listed below:

Power Up and Normal operation

When the SPC2 Board is powered up the LED flashes twice repeatedly. This indicates that the RAM has been cleared and that the board is polling the EGM and the MCS. When communication with the EGM and the MCS has been established, the LED flashes continuously at a fast rate signaling that the board is now operating normally.

Flashes Once

When the LED flashes once repeatedly at a slow rate communication does not exist on port H2. Communication with the EGM is lost.

Flashes Twice

When the LED flashes twice repeatedly communication does not exist on port H3. This port is currently not used.

Flashes Three Times

When the LED flashes three times repeatedly communication does not exist on port H4. Communication with the SAS device has been lost.

Flashes Four Times

When the LED flashes four times repeatedly the non-volatile RAM is corrupt and needs to be reset. Refer to the section on RAM Clearing.

Flashes Five Times

When the LED flashes five times repeatedly the EGM address is not set. The LED also flashes five times repeatedly for a short period after the RAM has been cleared as described in the RAM Clearing section below.

19.2.2 RAM Clearing

To clear the RAM on the SPC2 board:

1. Switch off the power to the SPC2 Board.
2. Put in the jumper pin on 11 and 13 of plug J2 on the SPC2 Board.
3. Switch on the power to the SPC2 Board.
4. The LED will flash four times, and then flash fast repeatedly.
5. Switch off the power to the SPC2 Board.
6. Remove the jumper on pin 11 and 13 of plug J2 on the SPC2 Board.
7. Switch on the power to the SPC2 Board.
8. The LED will now flash two times, and then flash fast repeatedly. Normal operation should now resume.

Block diagrams showing EGMs with, and without, Paltronics Hyperlink™™ Jackpot Controller systems follow.

Figure 19-3 Europe EGM with Hyperlink™™ & SPC2 Protocol Converter

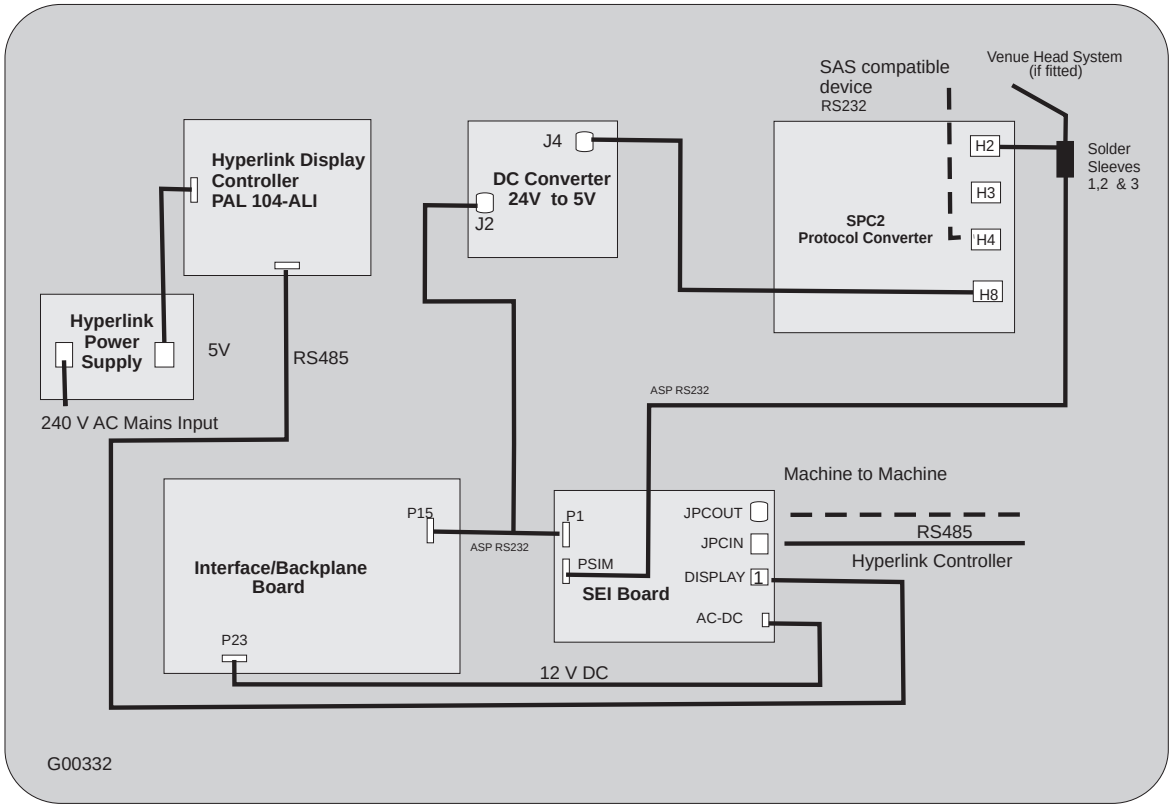
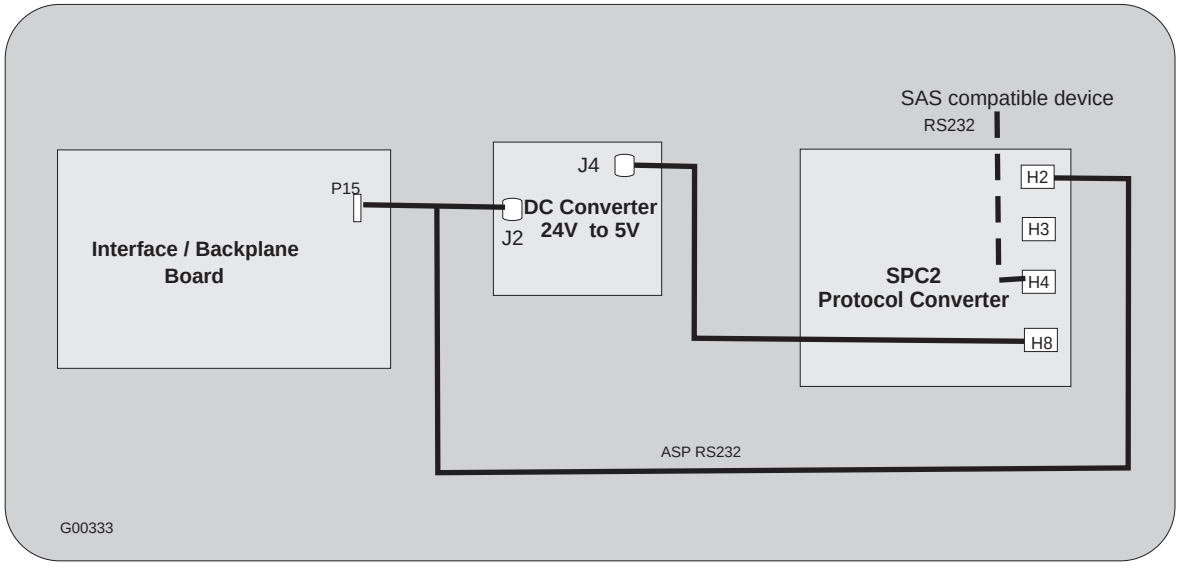


Figure 19-4 Europe EGM with SPC2 Protocol Converter



19.3 SPC2 Board - 574682

19.3.1 Connectors and Pinout

Connectors and pinouts are listed below for both Paltronic Hyperlink™ and non-Hyperlink™ systems.

Paltronics SEI Board P1 Connector (for Hyperlink™)

The P1 connector (10-way Honda connector) on the Paltronics SEI Board connects to P15 Serial 2 connector on the backplane board when Hyperlink™ fitted.

Backplane Board P15 Connector (for Hyperlink™)

The P15 Serial 2 connector on the backplane board (16-way Mini Fit Junior Receptacle) connects to P1 SEI Board and J2 DC converter board when Hyperlink™ fitted.

Backplane Board P15 Connector (for Non-Hyperlink™)

The P15 Serial 2 connector on the backplane board (16-way Mini Fit Junior Receptacle) connects to H2 SPC2 board and J2 DC converter board when Hyperlink™ not fitted.

DC Converter Board J2 Connector

The J2 connector on the DC converter board (4-way Microfit connector) connects to P15 on the backplane board.

DC Converter Board J4 Connector

The J4 DC converter board connector (6-way Microfit Receptacle) connects to H8 on the SPC2 board.

SPC2 Board H2 Connector (for non-Hyperlink™)

The H2 connector on the SPC2 board (5-way Mascon connector) connects to P15 on the backplane board when Hyperlink™ is not fitted.

SPC2 Board H2 Connector (for Hyperlink™)

The H2 connector on the SPC2 board (if fitted) (5-way Mascon connector) connects to PSIM on the Paltronics SEI Board via Solder Sleeves 1, 2 and 3 for Hyperlink™.

Solder Sleeve 1 (for Hyperlink™ with SPC2 or Venue Casino management system)

The Solder Sleeve 1 connects to PSIM, J1 venue casino management system (if fitted), and H2 on the SPC2 board (if fitted) for Hyperlink™.

Solder Sleeve 2 (for Hyperlink™ with SPC2 or Venue Casino management system)

The Solder Sleeve 2 connects to PSIM, J1 venue casino management system (if fitted), and H2 on the SPC2 board (if fitted) for Hyperlink™.

Solder Sleeve 3 (for Hyperlink™ with SPC2 or Venue Casino management system)

The Solder Sleeve 3 connects to PSIM, J1 venue casino management system (if fitted) or H2 on the SPC2 board (if fitted), for Hyperlink™.

Venue Casino management system (for Hyperlink™ Venue Casino management system)

The J1 connector on the venue casino management system (if fitted) (10-way Honda connector) connects to PSIM on the Paltronics SEI board for Hyperlink™ via Solder Sleeves 1, 2 and 3.

PSIM (for Hyperlink™ with SPC2 or Venue Casino management system)

The PSIM connector on the SEI Board (10-way Honda connector) connects to H2 on the SPC2 board (if fitted) or J1 on the venue casino management system, for Hyperlink™ via Solder Sleeves 1, 2 & 3.

SPC2 Board H8 Connector

The H8 connector on the SPC2 board connects to J4 on the DC converter board.

SPC2 Board H4 Connector

The H4 SPC2 connector provides SAS-protocol output.

19.4 SPC2 Board - 571186

19.4.1 Connectors and Pinout

Connectors and pinouts are listed below for the SEI board.

SPC2 Board H2 Connector

The H2 SPC2 connector provides communication with the game.

SPC2 Board H4 Connector

The H4 SPC2 connector provides communications with the MCS.

SPC2 Board H8 Connector

The H8 SPC2 connector provides power to the SPC2 board.

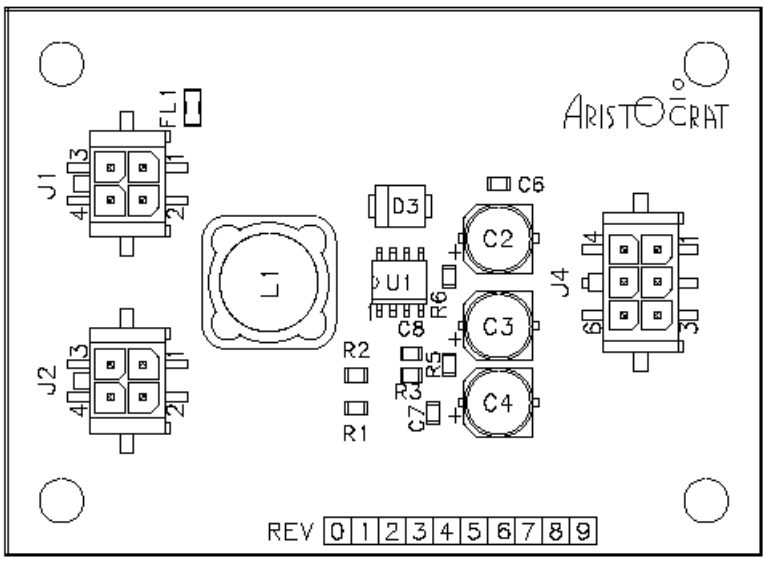
Backplane Board Connections

The P15 Serial 2 connector on the backplane board (16-way Mini Fit Junior Receptacle) connects to H2 SPC2 board and J2 DC converter board when Hyperlink™ not fitted.

19.5 DC Converter Board

The DC converter board is required to convert 24VDC to 5VDC for power to the Serial Protocol Converter 2 (SPC2) board. The SPC2 board requires 300mA at 5V. The DC converter board is necessary as 5VDC is not available from the backplane board or the power supply. The SPC2 board and the DC converter board are mounted on the same metal plate.

Figure 19-5 DC Converter Board Detail



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19.5.1 Connectors and Pinout

The board is fitted with 4 Microfit connectors.

24V Input – J1

The J1 connector (if used) is the input to the DC converter board. It requires 24V at 1A. J1 will usually be connected to the backplane board or directly to the power supply.

Auxiliary 24V– J2

The J2 Connector is connected in parallel with the input connector J1.

Not Used - J3

Not used on board.

5V 500mA (max) Output – J4

The J4 connector is the output from the DC converter that supplies a regulated 5V DC to a maximum of 500mA.

19.6 Maintenance

19.6.1 Removal and Replacement Procedures

When handling electro-static devices (ESDs) such as PCBs, take care to avoid physical contact with components. Handle PCBs by their edges. Do not place ESD items on metal surfaces. When handling PCBs, take care to avoid flexing the PCB. Flexing may cause physical damage.

To remove the SPC2 from the EGM:

1. Open the lower main door and turn off the EGM.
2. Open the upper main door.
3. Locate the SPC2 board. It is either mounted on top of the logic cage or in the jurisdictional slot inside the logic cage.
4. If it is mounted on top of the logic cage:
   The metal bracket supporting the SPC2 board and power supply is removed from the top of the logic cage by depressing the tags on the four plastic clips.
   OR
   If it is mounted inside the logic cage:
   The SPC2 assembly is removed from the logic cage using the board extractors and sliding the assembly out.
5. Disconnect all looms from the boards.
6. The SPC2 board and the DC converter boards can now be removed.

Replacement is a reversal of the removal procedure.

Ensure that the security switch contacts are closed when the interface cover is replaced.

The SPC2 board must not be pushed into position - use the board extractors to cam the board back into position.

Chapter 20

Machine Fault Finding

Table 20-1 Fault Finding

Fault	Probable Cause	Action
Equipment connected to auxiliary power socket & has no power.	Auxiliary power socket fuse is blown.	Replace auxiliary power socket fuse.
Machine has no power.	Power outlet supplying the machine is not live.	Check that the power outlet is live. If the mains socket is dead, check that the circuit breaker at the distribution board is on.
	Carrier Board not showing 2 lit red LEDs (ie, sequential display).	Turn off mains power for 5 seconds, then turn power on. Check Carrier Board seating and links. If condition continues, replace the Carrier Board.
No power-up cycle.	Cable fault.	Check that the looms are correctly seated and have continuity.
	Faulty Backplane Board.	If looms are OK, replace the Backplane Board.
	Faulty Carrier Board.	If there is still no power, replace Carrier Board.
Fluorescent lamps, animation lamp, and pushbutton LEDs not lit.	Faulty lamp, LED or fluorescent driver.	Replace fluorescent tube or driver, animation lamp, or the pushbutton LED or microswitch.
	Faulty power supply assembly.	Check that the power supply assembly is operating correctly. If not, replace the power supply assembly.
	Faulty loom between: • the fluorescent lamps and the power supply assembly.	Check cables and looms and ensure lamps are correctly seated.
	Faulty connection or loom between: • the animation lamps / pushbutton LEDs and Backplane Board. • the power supply assembly and the Backplane Board. • the Backplane Board and the Carrier Board.	Check cables, looms, boards, lamps and LEDs are correctly seated and have continuity.
	Faulty Carrier Board.	If there are still no lamps or LEDs lit, replace the Carrier Board.
Video monitor blank.	Faulty power supply assembly.	Check that power is available at the power supply. See Power Supply Assembly.
	Faulty video monitor.	Check that the mains power supply is available at the monitor. If available, replace the monitor.
	Faulty loom between the monitor and the power supply or between the Carrier Board and the monitor.	Check that the looms are correctly seated and have continuity.
	Faulty Carrier Board.	If condition persists, to replace Carrier Board.

Fault	Probable Cause	Action
Video monitor displays message NO SIGNAL	Faulty signal loom between monitor and backplane board.	Check that loom is correctly seated.
	Faulty or incorrectly seated Carrier Board.	Check if Carrier Board is correctly seated. Replace board if necessary.
Video monitor color or picture incorrect.	Monitor settings incorrect.	Carry out Basic Colors Test from the Video Monitor Test Menu in Operator Mode.
		Work through the procedure for adjusting and testing the LCD screen as detailed in the chapter LCD screen.
	Faulty monitor.	If the condition persists, replace the monitor.
Sound too loud or too soft.	Volume control requires adjustment.	Adjust the volume using Sound System Setup in the Operator Setup / Selections Menu. If condition persists, replace Backplane Board. If condition still persists, replace Carrier Board.
No sound.	Volume control requires adjustment.	Adjust the volume using Sound System Setup in the Operator Setup / Selections Menu.
	Speaker open circuit.	Remove the connectors from the speaker terminals and check that there is 6 to 8 Ω across the speaker terminals. If not, replace the speaker. Reconnect the speaker terminals.
	Faulty loom between the Backplane Board and the speaker.	If there is no power at the speaker, check that the looms are correctly seated and are physically sound.
	Faulty Backplane Board	If looms are OK, replace Backplane Board.
	Faulty Carrier Board.	If condition persists, replace Carrier Board.
3 WAY METERING ERROR message.	Corrupt data. Inconsistent data across all three electronic audit meter sets.	Perform a memory reset (see Machine Modes).
PRINTER FAULT message	Printer has detected an internal fault.	Open main door, service printer and close the main door
PRINTER DISCONNECTED message	Printer cable is disconnected or the printer is not responding.	Open main door, check that printer loom is connected correctly and close the main door.
PRINTER PAPER DEPLETED message	Paper roll has been depleted.	Open main door, replace paper roll and close the main door.
PRINTER PAPER LOW message	Paper low (non-lockup fault)	Open main door, replace paper roll or adjust paper low sensor and close the main door.
“Topbox monitor disconnected” message displayed in main monitor .	Game software can’t initialize the LCD	Check green LED on the LCD controller panel is illuminated. If not, check power lead. Check video cable connection. If all else fails, replace LCD.
“No signal” message on LCD.	LCD is not getting any video signal.	Check video cable.
LCD monitor is blank.		Check green LED on the LCD controller panel is illuminated. If not, check power lead. Check if EGM is in POWER SAVE mode. (Main monitor is also Off.)

Table 20-2 Fault Finding – Messages

Message (Attention, Error, Fault)	Probable Cause	Action
STARTUP MESSAGES: System EPROM checksum ok. DRAM ok. CPU ok. SRAM ok. Standard platform found. USA platform found. WIN32 platform found. Market AVL media present. Market AVL media header checksum ok. Market AVL media checksum ok. Game EPROM present. Game EPROM header checksum ok. Game EPROM checksum ok. AVL media present. AVL media header checksum ok. AVL media checksum ok. Game Version check ok. Program loading verification ok. \fFound 1 video chip.\n \fFound 2 video chips.\n Initialized in 3D mode.\n Using 16 bit display mode.\n Using 32 bit display mode.\n Using 16 bit textures (5-6-5 and 4-4-4-4).\n Using 32 bit textures (8-8-8-8).\n Loading resources...\n Restarting in 10 seconds...	These messages are shown as part of the normal startup procedures during which the software is loaded and the game screen is displayed. The messages are provided for "information only" purposes and simply show the progress of the startup procedures.	No action required.
Panic Messages: One from a number of different messages (e.g. Uninitialized Exception Vector) can display for a few seconds followed by the message: WATCHDOG RESET	A software failure has occurred. The machine automatically resets and restarts. The event is registered in the Panic Log (For details, see the chapter, Machine Modes)	The Aristocrat™ service organization should be informed in due time.
CPU Error! SRAM Error! Program loading verification error!	Problem on Carrier Board.	Technician to replace Carrier Board
Platform Unknown	Problem on Interface / Backplane Board	Replace Interface / Backplane Board.
System EPROM checksum error! Market AVL media header error! Market AVL media checksum error!	Faulty System EPROM	Technician to replace System EPROMs.
Game EPROM not present. Game EPROM header error. Game EPROM checksum error. AVL media not present. AVL media header error. AVL media checksum error. Game Version incompatible.	Faulty Game EPROM	Technician to replace Game EPROMs.
String not found.	Required string not in Game EPROM.	Call Technical Support.
Watchdog Reset.	Machine reset itself trying to recover from serious fault.	See Panic Messages above.
Audit Mode – Turn Audit Key ON	Audit Key was turned ON when machine was powered down.	After power up, turn Audit Key ON again.

Notes

Glossary

Accounting Meters	See Bookkeeping Meters
AFT	Advanced Funds Transfer
Animation Lamps	Lamps located in the top box for animation purposes
Any pays	Symbols are read anywhere on the payline, and not necessarily left to right or right to left.
ASIC	Application Specific Integrated Circuit
ASP	Aristocrat™ Serial Protocol
Attendant Pay	See Jackpot Lockup
Attendant	An employee with responsibilities to verify and pay jackpots
Attract Message	A downloaded or Operator-entered message appearing on screen to attract a potential Player
Attract Mode	If active, following a specific period of inactivity the EGM may display graphics, flash lamps, or play music to attract potential Players. It serves as a screen saver on video products.
Audit Key	(a.k.a. Reset Key) The key used to actuate the Audit Key Switch.
Audit key switch	To display the electronic audit meters on the monitor, insert the Audit Key and turn it 90 clockwise.
Audit meters	See electronic and electro-mechanical meters.
Audit Operator Meter key switch	Used to turn on meter illumination light as well as switch from game play mode to audit mode.
Autohold	An option selected during configuration that automatically holds suggested card combinations. A HELD message appears above those cards.
Awards Glass	See Feature Glass.
Awards Test	See Payout Test.
Backplane Board	A printed circuit board that provides interconnections between the MPU board and cabling.
Banner	See Attract Message.
Bar Top	A EGM manufactured to fit within a bar counter.
Base Amount	The starting amount of a progressive jackpot.
Base	A specially designed box unit on which the cabinet stands. The drop box is usually located securely within the base.
Basic Percentage	The payback percentage of a game, excluding the Bonus, for the maximum wager. See also Nominal Percentage and Bonus.
Baud	A measure of data transfer rate on a serial channel. One baud equals one bit per second.
Belly Glass	See Display Glass.
Bet Mode	A EGM option that configures how the EGM will accept wagers. The choices are Cash, Credit, Player Selectable.
Bill Acceptor Records	A listing of bill transactions by denomination.
Bill Acceptor Transaction History	A record of credits incremented for each of the last 10 bill transactions.
Bill Acceptor	An assembly that examines currency or coupons and communicates the value to the EGM. Accepted items register as credits, rejected items are returned to the Player.
Bill Drop	(a.k.a. Soft Drop) Controlled process of removing bills from bill acceptors.
BIPS	Bar Interface Poker System, used in Cashless Transfer.
Bonus	A reward for playing the maximum wager. For example, on a three multiplier game, a particular combination may pay 100 with one credit wagered, 200 with two wagered, and 500 (instead of 300) with the maximum three wagered. The 500 pay includes a 200 bonus for wagering the maximum.
Bonusing	An automated payout system for rewarding Players even without playing the maximum wager or winning a jackpot.
Book pay	After the player presses the COLLECT button, the credits are manually paid out to a player and recorded in the payout book.

Bookkeeping Meters	An electronic and electromechanical means of storing and displaying statistical data within the EGM. Typical information includes Total In, Total Out, Combined Drop, Attendant Paid, Bill Credits, etc.
Button panel	The series of buttons across the front of the cabinet which the player uses to control game play.
Button	One of the illuminated buttons on the button panel, used in game play.
Buy-a-Pay	A style of game where the Player 'buys' paying combinations by wagering more.
Cabinet	The major cabinet or casing in which the workings of the EGM are housed.
Cancel credit	When a player attempts to COLLECT a credit amount greater than the amount that the EGM can pay out, the EGM locks up. When this occurs, the Cancel Credit procedure allows for the player to be paid manually and the credit on the EGM to be cancelled to zero.
Cancelled Credits	Soft credits paid by an Attendant.
Candle	See Light Tower.
Card Reader	Device for monitoring and tracking Player activity, EGM maintenance, and Employee activity through insertions of magnetic stripe cards.
Card	See Player Card or Employee Card.
Cashout	An activity by a Player to transfer credits to a Player's card, or convert EGM credits to cash or payable vouchers by pressing the CASH/CREDIT button on the player panel, or the COLLECT screen icon.
Checksum	The result of an arithmetic operation on bits. Used to verify the integrity of data.
Clock	A timing device that generates the base signal used to synchronize operations in a computer (for time and date see RTC).
CMOS	Channel metal oxide semi-conductor.
Coinless Transaction	Where Players use vouchers or coupons, which are accepted by EGMs as credits, or where credits are transferred to the Player's card.
Console	See base.
Coupon	A note with no cash value used in place of currency to establish credits on a EGM.
CPU	(Central Processing Unit) (Same as microprocessor) The component of a computer system that has the circuitry to control the interpretation and execution of instructions.
CRC	(Cyclical Redundancy Check) Checksum technique to verify data. See also Checksum.
Credit	Currency inserted into the EGM register as credits. One unit of currency may equal more than one credit. Prizes are shown as credits until such time as the player chooses to collect them.
Credit Collect Lockup	A jackpot lockup upon a collect, from a EGM setting which, when equalled or exceeded by the available credits, requires an Attendant to pay the balance of credits remaining.
Credit Meter	A portion of the message center on a slot product and the area on a video screen where credits for play or collection are indicated to the Player.
CRT	(Cathode Ray Tube) A vacuum tube, such as a television picture tube, whose electron beam can be focused to show graphical data.
Current Credit Meter	Bookkeeping meter showing credits available to the Player when the EGM returns to revenue operation.
Current Draw	The amount of current required to operate the EGM. Usually measured in Amperes.
Cursor	The symbol on a display indicating where the next character will appear or where the next action will take place.
Cycle	The total number of symbol combinations on a gaming EGM.
D/A	Digital to analog.
DAC	(Digital to Analog Converter) An IC that provides a voltage or current output from a digital input.
Daisy Chain	A group of devices where a second device is connected to the first, a third device is connected to the second, etc.
Deck	Also referred to as the 'Player Panel', it is the area of the EGM's cabinet where the Player accessible buttons are located.

Denomination	The value of each credit. For example, a EGM configured for 25½ registers four credits for each dollar through the bill acceptor.
DES	Data Encryption System
DIP Switch	(Dual In-line Package Switch) A set of switches with a footprint similar to an IC for mounting on circuit boards.
Display Glass	(a.k.a. Belly Glass) The lower glass insert of the door of an upright EGM.
DMA	Direct memory access
Double Down	1) A secondary game where a Player may wager part or all of the winnings from the most recent game and possibly double the current winnings. 2) In Blackjack, doubling the initial wager when the value of the first two cards totals 10 or 11.
Double Up	See Double Down, definition 1.
DRAM	Dynamic Random Access Memory. A type of memory characterized by high density, multiplexed address bus and the need to refresh the stored data.
Drop Hold Percentage	The percentage of the total drop retained by the Operator. Calculated as (Combined Drop - [Fills + Attendant Paid]) / Combined Drop.
Drop	Bills collected from a EGM or the process.
DUART	(Dual Universal Asynchronous Receiver Transmitter) A communication IC that can interface between a microprocessor and a serial channel. See also UART.
EFT	Electronic Funds Transfer
EGM	Electronic Gaming Machine
EGM Options	Operator-selectable configuration available in slot and video products.
EHM	Electronic Hard Meters (see Electromechanical Meters)
Electromechanical Meters	Lifetime counters within the EGM that record accounting information. Commonly used meters are total in, total out, and combined drop. Usage varies with jurisdiction and configuration. These meters are non-resettable and are cumulative for the life of the EGM.
Electronic meters	The electronic audit meters that provide audit information.
End of Game Signal	A serial or discrete output from the MPU indicating that a game has completed.
Environmental Requirements	Physical space, heat load, and power requirements of the EGM.
Error Messages	See Exception Code.
ESD	Electrostatic discharge.
Exception Code	(a.k.a. XC, Tilt Code) A numeric message associated with operations of the EGM, or computer. If a malfunction or inappropriate operation of any device occurs, the code is logged for tracking and reporting.
Feature Glass	A silk-screened glass for the top box of an upright cabinet. It usually shows the pay table.
FEP	Front End Processor
FIP	Fluorescent Interface Panel
Firmware	Software stored in an IC
FPGA	Field Programmable Gate Array
FPLA	Field Programmable Logic Array.
GAM	Game Event Types
Game Authentication Terminal	(GAT) Interface for verification of the contents of the EGM's storage media.
Game Recall	Function that allows the Operator to review past games, including winning combination, amount collected, amount wagered, amount won, and the available credits.
Game	A program designed to operate on an EGM offering a Player the opportunity to win money by wagering on the outcome of the game's activity. There can be several games on one EGM.
GL5	Communications protocol for the bill acceptor
GMID	Gaming EGM Identification.
Gross Handle	Sum of all wagers accepted
GSA	Gaming Standards Association (formerly GAMMA)
GUI	Graphical User Interface
Handle	(Pulls) Games played.
Hard Credit	Any credit on a EGM derived from a winning combination.

Hard Meters	See Electromechanical Meters.
HCMOS	High speed CMOS logic.
Hit Frequency	The winning combinations occurring on the EGM as a percentage of all combinations. It is calculated by dividing the number of individual winning games by the number of possible outcomes.
Hold Percentage	The percentage of wagers retained by the Operator. It is calculated by subtracting the payback percentage from 100.
Host	A computer system operating where networked gaming EGMs are the target systems. The complexity of a Host can range from monitoring and compiling statistical information, to the electronic transfer of funds; and can include RNG and game outcome.
House	The club, casino or organization running the games.
I/O	Input/output.
IC	Integrated circuit
ICE	In-Circuit Emulator
Insert	A piece of glass or film that contains information not included in the feature, display, or reel glass. It can be a paytable or other important information. See also Decal.
Installation	A club, casino or other place which has a number of gaming EGMs.
Intelligent bezel	Sites the accept/reject slot for bill placement on the bill acceptor fascia panel.
Jackpot key switch	To reset the EGM after a cashier payout or after a EGM fault has been corrected, insert the Jackpot key, turn it 180 clockwise and back again.
Jackpot Lockup	A game state requiring intervention by an Attendant because the current win exceeds the setting at win lockup, or the current credits exceed the setting at credit collect lockup upon a cashout. The Attendant must pay the Player and release the jackpot lockup before the EGM is available for play.
Jackpot Reset Switch	See Audit Key Switch.
JPC	Jackpot Controller.
JTAG	Joint Test Action Group
Jumper	A removable connector (plug, wire, etc.) that electrically joins separate connections.
Jurisdiction	Area under the influence of a gaming control agency with the rights and power to interpret and apply the law as it applies to gaming.
Key Switch	A switch actuated by inserting and turning a key.
Knockoff Credits	The credits registered on the EGM when an Attendant activates the knockoff keyswitch.
LAN	(Local Area Network) A network of interconnected computers covering a relatively limited geographic area, such as one or more buildings at one location.
LCD	Liquid Crystal Display
LED Message Center	An arrangement of seven-segment LED arrays used on slot products to show information to the Player and Operator.
LED	(Light Emitting Diode) A semiconductor that glows when supplied with a current.
Left to Right Pay	Symbols are read from left to right for prize determination.
Light Tower	(a.k.a. Candle) The multi-lamp assembly mounted at the top of the EGM. It displays EGM states and game conditions using combinations of steady and flashing lamps.
Line Noise	Interference in a transmission line that may be caused by interference from a power source or poor connections within the line.
Linked Progressive	Several EGMs contributing to common jackpots.
Links	A series of EGMs are linked together by an external progressive controller. Each EGM contributes to a common progressively incremented jackpot and is displayed separately for the player to see.
Lockup	A lockup renders the EGM unplayable and is triggered either by a malfunction, when a jackpot has been won (if the program permits), or when the player has pressed the CASH OUT button when there is more than the cancel credit amount in credit.
Logic Cage	Secure cage containing motherboard and other sensitive equipment.

Lottery	A gaming system where all EGMs are usually connected to an off-site central computer.
Lower Display Glass	See Display Glass.
LPJS	Link Progressive Jackpot System.
Mag Card	(Magnetic Card) See Employee Card or Player Card.
Malfunction Codes	See Exception Codes.
Manual pay	A book payment made for any amount in excess of the cancel credit limit of the EGM.
Max Bet	A button which automatically bets the maximum amount possible on a game.
Max Bet Options	Operator selectable maximum and minimum wager for some games.
Message Center	See LED Message Center.
Meters	Electronic (soft) meters and electro-mechanical meters located within the EGM that record and display important audit information for the operator.
Microprocessor	The computer component which controls and processes game play instructions.
MMC	An abbreviation for EGM Monitoring and Control. Refers to Game-related Event Types.
Monitor CRT	(cathode ray tube), associated circuitry, and hardware for presenting game images and other information to the Player or Operator.
Monitor Video Frequency	See Refresh Rate.
MPU Board	The PCB assembly that contains the CPU, memory, and associated logic and driver circuits to control the EGM. Connects to the backplane.
MPU	(Microprocessing Unit) Circuitry that contains a microprocessor and memory, input/output interface, buffer, clock, and driver circuits. See also CPU.
Multi-Line Game	A game function that presents the Player with the opportunity to buy multiple paylines by increasing the amount wagered.
Multiline	A game in which a player bets on additional lines to multiply the chance of a prize.
Multiplier	A game in which a player bets additional credits on any one game to multiply the value of the prize.
NMOS NOCOMM	N-Channel Metal Oxide Semiconductor SDS Slots Not Communicating Report
Nominal Percentage	Payback percentage of a game including the bonus for the maximum wager. See also Basic Percentage and Bonus.
Nudge	Movement after a reel stop when a NUDGE symbol appears on the payline.
OEM	Original Equipment Manufacturer
Operator	Any person, partnership, company, or corporation and/or their legal representatives who own, operate, service, maintain and derive profit from their association with gaming equipment.
Operator Mode Menu	All electronic accounting information, diagnostic functions, and game configuration options are accessed from the Operator Mode menu in video products.
Opto-Isolator	A solid state device used to isolate electrical connections by using light emission and reception.
P SIM	Port Simulated, Pass Through Port
PAL	(Programmable Array Logic) An IC which can be programmed to function as an array of logic gates.
Pass Through Port	P SIM - Port Simulated
Payback Percentage	The amount the Player is expected to win divided by the amount of money played expressed as a percentage. On games where there is a bonus for the maximum wager, the payback percentage will vary slightly according to how many credits per game are played.
Payline	Where symbols align for award combinations. The Payline is determined by the game program. It can be vertical, horizontal, diagonal, or a combination of the three.
Payout book	Book used to record jackpot amount and cancel credit amount.
Paytable	A chart of pay amounts for winning combinations.
PCB	(Printed Circuit Board) Fiberglass on which electrical connections are formed by a printing and etching process. Integrated circuits and other electronic components are added, forming a functional unit.
PCBA	Printed circuit board assembly.

PCI	Peripheral Component Interface
PCM	Player Communications Module (sometimes referred to as Player Marketing Module).
PCMCIA	Personal Computer Memory Card International Association . A standard for small, card-sized devices called PC cards.
Peripheral	An intelligent device connected to the EGM, such as a touch screen, printer, or bill acceptor.
Play button	One of the illuminated buttons on the button panel, used in game play.
Play Speed	A EGM option controlling the rate at which game events occur, such as deal speed, duration of reel spin, etc.
Player Marketing Module	A computer, software and accessories connected to gaming devices that allow the Operator to identify a Player, accumulate data, and reward the Player accordingly.
Player	Any person who deposits money into a EGM for the purpose of playing the game.
PLD	Programmable logic device.
Poll	1) An electronic request for information, usually from a Host or other computer to peripheral devices. 2) The process of gathering meter information from each game and reporting it to the Host computer.
Port	The connection that allows communication between a digital system and an external device.
Probability	A number expressing the likelihood of the occurrence of a specific event. It is expressed as the ratio of the number of actual occurrences to the number of possible occurrences.
Progressive Controller	A system to track wagers, increment the jackpot accordingly, and reset it to the base amount when the jackpot is won.
Progressive jackpot	This is an additional jackpot to the game's normal jackpot. This jackpot increments by a fixed percentage of the EGM's turnover and is displayed separately for the player to see.
Progressive	1) A system of pooling a portion of each wager into a cumulative fund that is available for a win. 2) A game that increments the prize amount based on Player participation. See also MAPS, Linked Progressive, Stand Alone Progressive, and WAPS.
PROM	(Programmable Read Only Memory) An integrated memory circuit where data can be stored, and generally cannot be altered thereafter.
Protocol	The communication standard between two devices.
Pseudo Coin	A nonrevenue credit that allows the Operator to play the EGM while the main door is open.
PSU	Power Supply Unit.
Qualifying Play Achieved	Message generated when Operator-set parameters are met thereby qualifying a Player for a specified reward.
RAM	(Random Access Memory) Volatile read/write memory.
Random Number Generator	(RNG) A routine designed to yield a random number.
Real Time Clock	(RTC) See RTC.
Rebet	A function that allows a Player to duplicate the wager of the previous game by pressing REBET or the DEAL-SPIN-START button.
Reel Glass	The glass framing the reels.
Reel Map	A listing of the symbol distribution on each reel strip. It is shipped with the EGM and with model conversion orders.
Reel Tape	Plastic imprinted with game-specific symbols that is wrapped onto a slot reel.
Refresh Rate	The number of times per second the screen is redrawn. This is equal to the vertical synchronization frequency in a CRT. Expressed in Hertz (Hz).
Reserve	A button on the EGM which allows a player to indicate to others that the EGM is reserved. This reserve message remains lit for 3 minutes.
Reset Key switch	See Audit Keyswitch.
Reset Switch	The reset button on the MPU board used for a System reset.
RISC	Reduced Instruction Set Computer.
RNG	Random Number Generator

ROM	(Read-Only Memory) Semiconductor memory where data has been permanently stored.
RS-232	A serial communication standard that uses signals more negative than five volts for a high, and more positive than five volts for a low.
RS-485	A serial communication standard with balanced drivers and receivers, requiring two transmit and two receive lines, to sustain signals over long distances. Uses +5 volts (TTL).
RTC	(Real Time Clock) An IC for maintaining time and date information.
Scattered pays	Symbols can be above, below or on the payline to qualify for a prize.
Schematics	A graphical representation of an electrical circuit or assembly.
Screen Banner	See Attract Message.
SDS	(Slot Data System) A computerized accounting and EGM monitoring system developed by Bally Gaming and Systems, and the communication protocol used.
SEF	Subsidiary Equipment Function.
SEI	Subsidiary Equipment Interface
Sensor	The component that converts an input signal to a quantity that is measured and changed to a readable signal for an information gathering system.
SESI	Subsidiary Equipment Serial Interface.
SMIB	Smart Interface Board
Soft Count	The counting of currency generated by gaming operations and the location where the activity takes place.
Soft Credit	A credit from any source other than a winning combination (hard credit). For example, credits from bills, coupons, knockoff keyswitch, ECT, or EFT.
Soft Drop	The controlled process of removing bills from bill acceptors.
Soft meters	See electronic meters.
Solenoid	An electromagnetic device that converts electrical energy into mechanical energy. The solenoid consists of a coil which, when energized, becomes a magnet. The magnet then causes a metal component to move in order to activate a mechanical device.
SPI	Serial Peripheral Interface. The hardware/software interface connecting the CPU to the peripheral boards.
SRAM	Static Random Access Memory.
Standalone Progressive	A progressive award that can only be won on one EGM.
Stepper Motor	A motor used for precision motion control. Stepper motors rotate by applying a pulsating voltage to the windings. Each pulse causes the stepper motor shaft to rotate only a few degrees.
Symbols	The various designs on the reel strips. Common symbols include Jacks, Kings, Aces, Cherries, and Gold Bars.
Synchronous	The ability to perform two or more processes at the same time controlled by a mutual timing signal or clock.
System Clock	A circuit on the MPU board that provides timing pulses for synchronization.
System Reset	Function used to return the program pointer to a known value. A system reset button is provided on the MPU board assembly for the Operator to restore a EGM to operation after a malfunction.
System Test	The simulation of a running program to check for proper functioning of components and interconnections.
Top Box Glass	See Feature Glass
Top Box	An enclosed area at the top of the EGM that typically contains a light assembly, feature glass, light tower, and optional assemblies.
Tournament Operation	With additional hardware and enabled options, EGMs can operate in a nonrevenue state. Players compete with other Players to amass the most credits within a time period.
Tower Light	(a.k.a. Candle) The multi-lamp assembly mounted at the top of the EGM. It displays EGM states and game conditions using combinations of steady and flashing lamps.
Troubleshooting	(a.k.a. Fault Finding) The process of systematically locating and eliminating the source of a malfunction.
TTL TX/RX	Transistor-Transistor Logic Transmit/Receive

UART	(Universal Asynchronous Receiver Transmitter) Integrated circuit used in serial communication.
Upright	Any EGM model, except a slant or bar top. It is usually attached to a stand.
UPS	(Uninterruptable Power Source) A local backup power source for short term electrical power if the primary power fails.
Video Frequency	See Refresh Rate.
Video Products	Distinction made for EGMs using a CRT display to present games as opposed to slot products which use motor-driven reels for games.
VLT	(Video Lottery Terminal) A EGM that communicates with a central computer system. Video lottery Players often receive payment in the form of printed vouchers that are redeemable for cash.
Volatility	An index of the deviation from the expected hold of a game.
Voucher	A voucher from a video lottery terminal redeemable for cash.
WAPS	(Wide Area Progressive System) A progressive jackpot network linking several casinos. The games are played for a prize funded by the controlling agency.
Weighted Mapping	The variable statistical weights assigned to reel positions. An alternative to virtual reel. Wide Area Progressive System
Win Lockup	A jackpot lockup from a EGM option setting, which was equalled or exceeded by a win.
Win Lockup	A jackpot lockup from a EGM option setting, which was equalled or exceeded by a win.

Index

Appendix A

EGM Specifications

USA	
Bill acceptor	JCM
CAMs Manufacturer - Standard (Option)	Abloy (Bilok)
Coin Blanking Plate	Yes
Coin Validator	Coinless
Denomination - Machine	$1
Electromechanical Hard Meters	6 - Credits Bet, Credits Won, Coin Drop, Hand Pays, Bills In, Credit Collect
Casino management system	
Hopper	Coinless
Jackpots - Hyperlink Ability	Yes
Jackpots - Link Mystery Ability	Yes
Jackpots - Progressive Link Ability	No
Jackpots - Progressive StandAlone Ability	No
Key Switches	Audit and Jackpot Reset
Light Tower	2 tier
Lock manufacturer - Standard (Option)	Abloy (Bilok)
Lock Requirements	Main Door, Belly Door, Logic Cage, Cash box
Platform	Gen7
Printer	FGutureLogic/Nanoptix
PT - Player Tracking	Gamma
PT Comms Interface	
PT Manufacturer	
PT System Protocol	
Screen - Standard (Option)	19” LCD T/S + 19” nonT/S for Top Box
SEI/Comms	4 unit SEI housing - 1 to be used fior SEI power supply.
Sound System	Woofer, 2 standard speakers, 80W amplifier
Security Zones - Monitoring Required For	Main Door, Belly Door, Top Box Door, Logic Cage, Cash box
Tokenised	Yes
Top Box	Chop, Round, Casino

Appendix B

Wiring Diagram(s)

USA
0802-579079

PCB Identification

Balloon Ref. Nos.	PCB Name	Part Number
-	Carrier Board	494077
-	Backplane Board	494083

Notes

NOTES:

1)- LOOM 579073 PLUG BREAK TO BNA IS FOR GPT BNA ONLY. OTHER BNA PLUG BREAKS ARE SUPPLIED WITH BNA.

2)- 7 PUSHBUTTON LOOM 579082, 16 PUSHBUTTON LOOM 579076.

3)- CCFL LIGHT MODULE ASSY IS USED WHEN REQUIRED.

4)- WHEN LIGHT TOWER IS MOUNTED ON THE TOPPER, USE LIGHT TOWER EXTENSION LOOM 579084.

5)- TOPPER USED WHEN REQUIRED.

OPTIONAL

(N) BALLOON INDICATES OPTION DEPENDENT ITEM SEE BOM .

PART NUMBERS IN BRACKETS ARE ALREADY INCLUDED IN HIGHER ASSEMBLY, THEY HAVE BEEN SHOWN FOR INFORMATION ONLY.

LIGHT TOWER — (6) SEE NOTE 4 — J126

LIGHT TOWER TOPPER — (8) SEE NOTE 5 — P10

TOP BOX

CCFL ASSY 589973 — SEE NOTE 3

LED (LOWBOY) 590016 — J123

LCD — J124 POWER, VIDEO — (2) — (434004)

(579085)

OPTIONAL EDGE LIGHTING SEE KT-590180

CABINET

SPEAKER LEFT 579055 — J P 105

PMM — P104 P103 J100 P100 J101 P101 J102 P102

579070

579069

SPEAKER RIGHT 579055 — P J 106

SPCII 589617 — 574679 — 494027 5V DC CONVERTER — J1 J2 J4 H8 H4 H3 H2 — 442037

6x SEI BOARDS — PROG SEI, PROG SEI, MATCH MAN

AMPLIFIER 432374 — J1 J2

WOOFER ASSY 579056

579064

(579065)

TOP DOOR

563477

LCD WITH TOUCHSCREEN — TOUCH J107, POWER J108, VIDEO — (434005) — (1)

579029

579067

P6 P/SUPPLY, P7 AMP'FIER, P8 MIC, J10 COMMS, P11 PUSH BUTTON, P12 DOOR, P13 COMMS, P14 24V, P15 PRINTER, P16 PMM, P17 SYSTEM, P18 HOPPER, P19 TOP BOX, P20 PROGRESSIVE, P21 BNA, P22 CABINET, P23 COMMS, P24 COMMS, P25 I/O INT, P26 OPTICS, P27 24V, P28 SPI 1, P29 24V, P30 SPI 6, P31 24V, P32 FAN, P33 USB1, P34 USB2, P35 USB3, P36 USB4, P37 USB5, P38 USB1, P39 USB2, P40 USB3, P41 USB4, P42 USB5

P5 CONNECTOR BOARD

MAIN DR. SWITCH 2 — P J 110 — 579049

J/POT, AUDIT & METER SWITCH 579492 — P J 111

SEE NOTE 2

BACKPLANE 494083

LOGIC CAGE

VIDEO CARD — LOGIC SW (579051) — CARRIER ASSY 578659 — COM EXPRESS MODULE 432394, GRAPHICS CARD 432660 — MAIN BOARD (494077) — P1 - MAIN, P2 - MAIN, P3 - MAIN — P9 METERS — P4 EXPANSION BOARD — COOLING FAN

METER — J1 — (579078)

DOOR SECURITY OPTICS 494133

LOWER DOOR

SW1 ... SWn — PUSH BUTTON ASSY

CCFL ASSY 589973 — P 120 J — COIN VALIDATOR — DIVERTER SOLENOID OPTICS — J P 121 — J P 122

579074

579049 — P J 119 — BELLY DR SWITCH

579075

SOLENOID OPTICS 430785

563477

POWER SUPPLY 432666 — MAINS SWITCH — J118

SEE NOTE 1

579073 — J P 116 — BANK NOTE ACCEPTOR — STACKER SWITCH

579077

J P 128 — 579068

J115 HOPPER

578568

J114 PRINTER

(579119)

COMMS I/F KIT-579124 — COMMS BOARD (494111) — J1 — J P 127

(575195)

(4)

MAIN DR. SWITCH 1 — P J 113 — 579049

(5)

579036

C/BOX SWITCH

CASH BOX

WD-579079 SHT 1 OF 1

WD-579079 SHT 1 OF 1

3D MASTER PART DATA — PART NO. - — PART NAME - — PART REV. - — MODEL REV. -

F	WOOFER & AMPLIFIER P/NO ADDED, BALLOONS 3 & 7 REMOVED.	902441	0008348	SS	TC	VT	17.1.08
E	J/POT & AUDIT SWITCH 579492 WAS 579050.	040914	0007313	SS	TC	TC	2.10.07
D	OPTIONAL EDGE LIGHTING ADDED.	040914	0007313	SS	TC	TC	10.9.07
C	PRODUCT NAME CHANGED, WAS MK7i.COMMS KIT 579124 ADDED.	040914	0007313	SS	TC	TC	8.8.07
B	7 PUSHBUTTON LOOM ADDED.	040914	0007313	SS	TC	TC	3.8.07
A	INTRODUCTION	040914	0007313	SS	TC	TC	15.06.07
DWG. ISS.	DETAILS	PROJ #	ECO #	DRN	CHK	APP	DATE

ARISTOCRAT TECHNOLOGIES AUSTRALIA PTY LIMITED — A1

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DRAWING ISSUE F

SCALE: NTS — TOLERANCES: +10mm -0mm

DIMENSIONS IN MILLIMETERS — DRAWING GENERATED USING I-DEAS

PRODUCT: Viridian Gen7

PART: USA

DWG.: MACHINE WIRING DIAGRAM

PART NUMBER: 08 02 579079 — ISS: F — REV: NA