Service Manual & User Guide

BLUEBIRD™

Upright (BBU) Video Gaming Devices

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Documentation Copyright

Game Copyright, Trademark, and Patent Laws

Strict legal regulations protect the gaming device. Unauthorized modifications may be illegal under international law. This principle also applies to WMS logos, designs, publications, and assemblies. Facsimiles of WMS equipment (or any feature of it) may be illegal. This principle applies to facsimiles manufactured with or without WMS components.

Check Local Laws

Operation of gaming devices may be subject to state and local laws and regulations. This manual does not solicit sale of gaming devices where they may not lawfully operate.

CE Marking

The CE Marking appears on gaming devices that meet the requirements of the EU directives. On these products, a Declaration of Conformity states that they satisfy all applicable EMC and safety requirements.

Customer Product Support Center

Contact the Customer Product Support Center by phone at 1-866-967-4457 or by E-mail at CustomerSupport@WMS.com for twenty-four hour a day assistance.

Conventions

For clarity, this Service Manual uses the following conventions:

Text Conventions

- Items that appear on a **Screen Display** (video screen) are identified in bold text.
- Button names are shown in ALL CAPS text.
- Individual parts, like the Printer or Coin Mechanism, are capitalized.
- Data that is shown on an **LED display** are indicated with the special LED TYPEFACE.

Safety Symbols and Information

When required, information is provided in procedures about potential challenges and dangers. The terms WARNING, CAUTION, and NOTE are used for specific safety reasons. For emphasis, WARNING and CAUTION appear beside the characteristic triangle symbol. Table 1 lists notice icons used in this guide.

Table 1 *Notice Icon Descriptions*

Icon/Format	Description
NOTE:	Information note about important features or instructions but is not critical data.
CAUTION:	Caution alerts you to potential damage to a program, system, or device.
WARNING:	Warning indicates a situation that may cause personal injury or death.
WARNING:	Warning indicates a situation that may cause personal injury or death due to a potential electrical hazard.
ESD:	ESD alerts you to take proper grounding precautions against electrostatic discharge (ESD) before handling a product.

Preventing Injury and Damage

This section provides instructions for preventing electrical injury and protecting components from ESD damage.

Prevent Shock and ESD

Depending on the procedure, one or more of the measures listed below must be taken to prevent electrical shock and/or electrostatic discharge (ESD) when servicing the game.

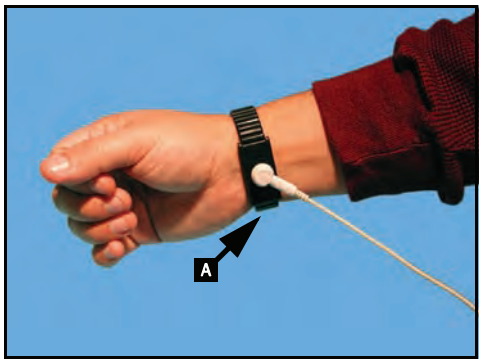
Power Game or Top Box OFF at the Power Switch

The game and, if applicable, the Top Box, have a red Power Switch that must be set to OFF when servicing the game.

ESD Wrist Strap

Fasten a resistive type (1 or 10 Meg) ESD wrist strap on arm and ensure that it makes good skin contact, Figure 1-1 (A). Secure the clip end of the wrist strap to a ground braid on a game.

Figure 1-1 *ESD Wrist Strap on arm.*

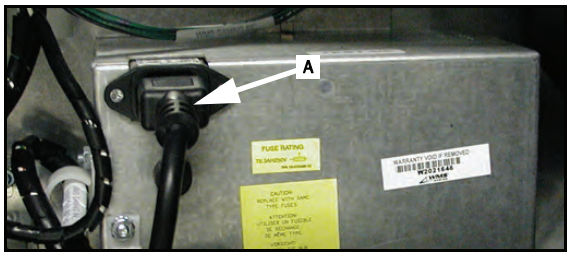


Disconnect Power Cord from Game (When not Handling ESD-Sensitive Equipment)

Disconnect the Power Supply Cord from the Power Entry Assembly, Figure 1-2 (A), and, if applicable, the Top Box Line Cord from the outlet. If one is installed, remove the Hopper to access the Power Entry Assembly.

WARNING: *Disconnecting the game Power Supply Cord is the only means of disconnecting the game from power.*

Figure 1-2 *Power Supply Cord plugged into Power Entry Assembly.*



Special Instructions for PCBs

Whenever accessing any printed circuit boards (PCBs) or components in direct contact with PCBs, including EPROMs, CompactFlash® Cards, and PCB connectors, use the following procedure to prevent ESD damage to sensitive components.

CAUTION: *Opening the game and unplugging the Power Supply Cord defeats the grounding system on the game, as the grounding pin on the Power Supply Cord ultimately connects the game to ground.*

1. Verify that the game power switch is set to OFF.
2. Verify that the ESD wrist strap is firmly secured to a game ground braid.
3. Connect/reconnect the Power Supply Cord to the Power Entry Assembly.
4. Complete all necessary PCB or component handling steps.
5. If additional steps are required for this procedure, ensure the game power switch is still set to Off, and disconnect the game Power Supply Cord before proceeding.

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Reference Documentation

See Table 1-1 for a list of relevant Service Manuals available from WMS:

Table 1-1 *Reference Documentation.*

Service Manual	Description
16-020832-xx Manual: CPU-NXT/CPU-NXT2 Operating System	Contains installation and configuration steps for the CPU-NXT Operating System, which runs on either CPU NXT1 or CPU NXT2 hardware. The manual includes troubleshooting steps and a tilt code reference.
16-020838-xx Manual: Bluebird Slant Video Cabinet	Contains an overview of the BBS features, installation steps, maintenance procedures, a troubleshooting chapter (with tilt code reference), a complete list of replacement parts, and a set of exploded view drawings.
16-020839-xx Manual for Bluebird Peripheral Components	Contains installation and maintenance procedures for Bluebird Peripheral Components, including the Coin Acceptor, Bill Acceptor, Hopper, Printer, LCD, and Progressive Meters. The manual also includes all replacement part numbers, some exploded view drawings, and all available vendor documentation.

Introduction

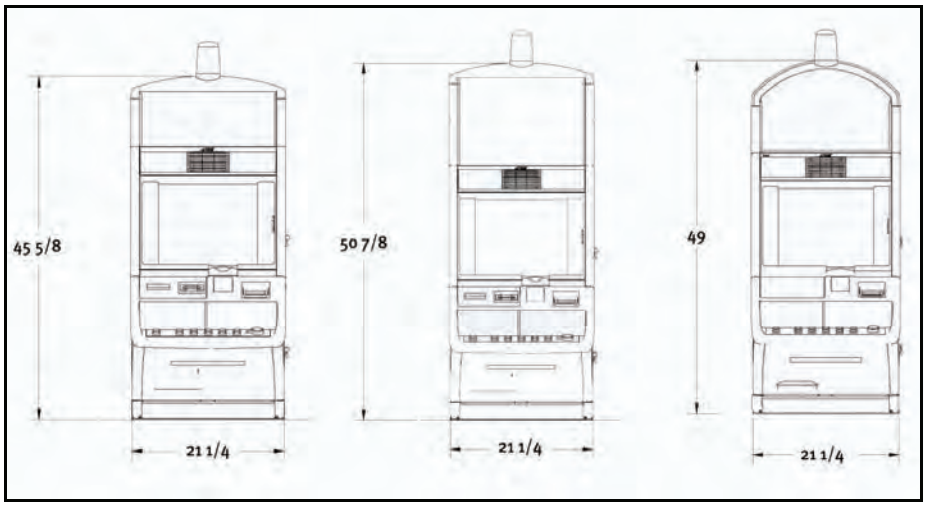
The Bluebird Upright cabinet (BBU) from WMS is designed from an end-user point-of-view. Listening to their customers and technicians, engineers designed Bluebird with a lower button panel and a modified coin tray to provide both comfort and security. The sound system features two mid-range speakers for an encompassing audio effect. Operators and technicians will also find that the cabinet is revolutionary with its dual-support Hopper/Printer capability and reversible DC coin Hopper, and the ability to fit a wide-range of Bill Acceptors.

This chapter provides basic information about the gaming machine and the procedures for the initial setup. The game is delivered mostly assembled and only requires a review of the components, light assembly, and preparation for software installation and configuration.

Base Game Dimensions and Weights

To understand the size of the game cabinet, see the dimensions (in inches) of the game in Figure 1-1.

Figure 1-1 *Dimensions of BBU with 7" Top Box (left), 12" Top Box (center), and 13" Round Top (right).*



Weight

The weight of the game is provided in Table 1-2.

Table 1-2 *Game weight.*

Game Part	Weight
Base Game	286.31 lbs (129.86 kg)
Skid	25 lbs (11 kg)

CAUTION: *The maximum weight of a game is 452 lbs. (205 kg). Verify that any non-WMS game stand specifications meet this weight requirement before mounting the game. Using inadequate game stands voids the WMS Warranty and may lead to distortion of the game cabinet, including the inability to close and lock the Main Door.*

Power Dissipation

Table 1-3 lists the power dissipation and BTU ratings for the BBU-Video and BBU-Video Dual Screen. Current values for all machines are based on a 120VAC configuration, with Bill Acceptors installed.

The British Thermal Units (BTUs) were calculated by using the following equation:

*BTUs = 3.413 * voltage * current*

Any decrease in BTUs due to actual work performed (spinning Hopper motor) was neglected. The BTU calculation for game play should be used when determining air conditioning requirements, as Hopper payout occurs infrequently when compared to standby and play conditions.

Table 1-3 *Heat/Electricity Dissipation.*

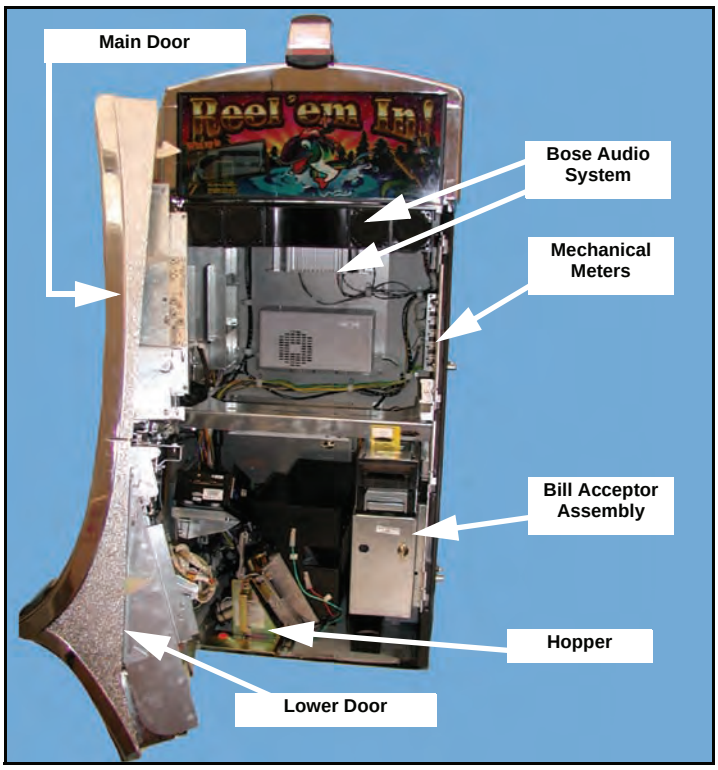
Type of Current	BBU-Video	BBU-Video Dual Screen
BTUs STANDBY CURRENT (no Hopper)	651 BTUs	1069 BTUs
STANDBY CURRENT (Hopper on)	1.66A	2.68A
BTUs STANDBY (Hopper on)	680 BTUs	1098 BTUs
STANDBY MAX CURRENT	3.16A	3.10A
BTUs STANDBY MAX CURRENT	1294 BTUs	1270 BTUs

Features: Doors

The BBU features easy serviceability and quick access to parts:

The BBU Main Door and Lower Door provide access to many of the internal components, Figure 1-2.

Figure 1-2 *Open BBU Doors.*

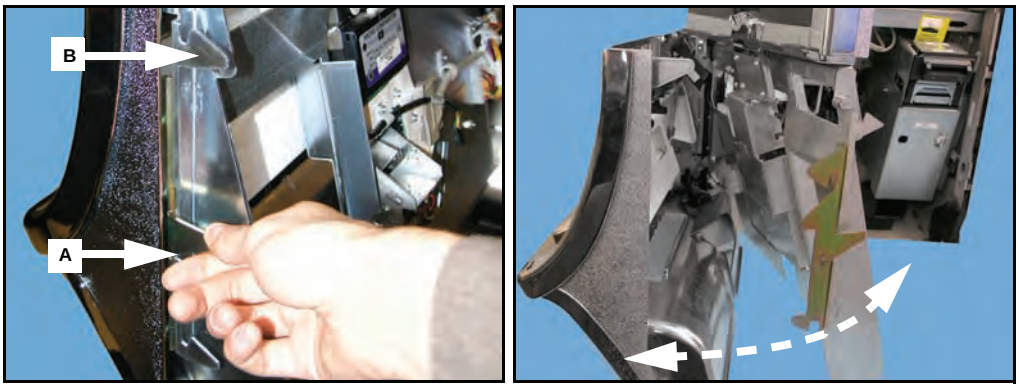


Main Door and Lower Door

The Bluebird Main Door is a two-part design comprised of the following:

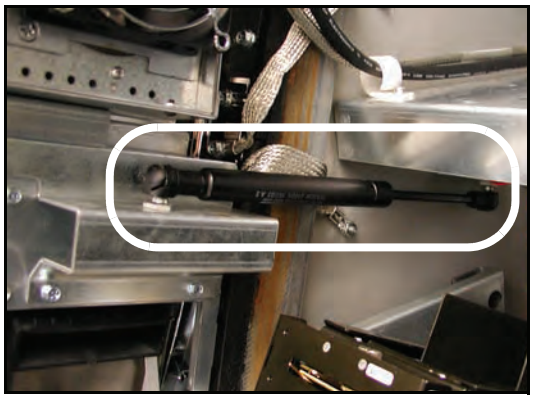
- An individual lower door, Figure 1-3, which opens with the lower latch, Figure 1-3 (A)
- The full Main Door, which opens with the upper latch, Figure 1-3 (B)

Figure 1-3 *Latches to separate doors (left) and Lower Door separated (right).*



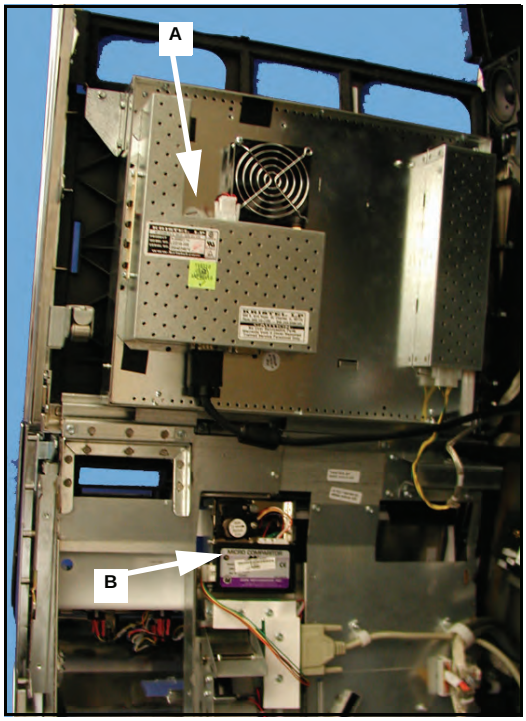
When the door is opened, it is safely held in place by a gas strut, Figure 1-4.

Figure 1-4 *Gas strut.*



The LCD, Figure 1-5 (A), is seated inside the Main Door, as is the Coin Acceptor, Figure 1-5 (B).

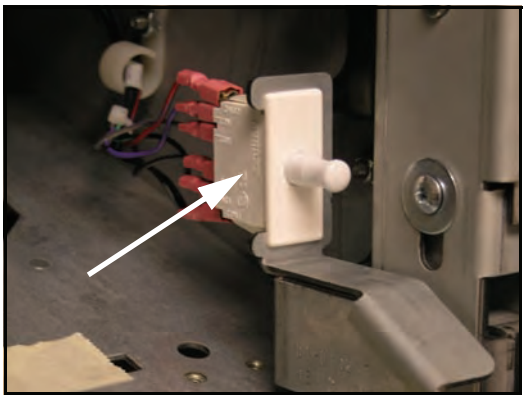
Figure 1-5 *Components in Main Door.*



Door Switches

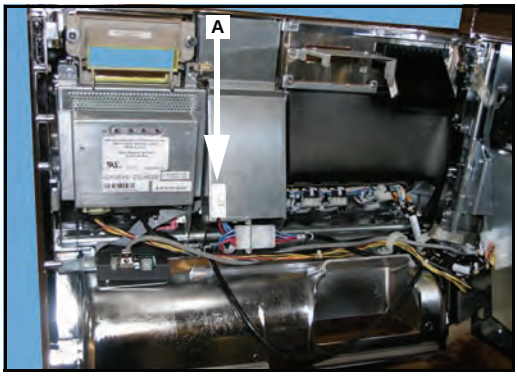
The Main Door switch confirms that the door is closed properly and places the game into play mode. The switch is located on the right side of the cabinet, above the shelf, Figure 1-6.

Figure 1-6 *Main Door Switch above LCD Shelf.*



The Belly Door switch confirms that the Belly Door is closed. The Belly Door Switch is located in the center of the inside of the Belly Door, Figure 1-7 (A).

Figure 1-7 *Belly Door Switch in center of inside of Belly Door.*

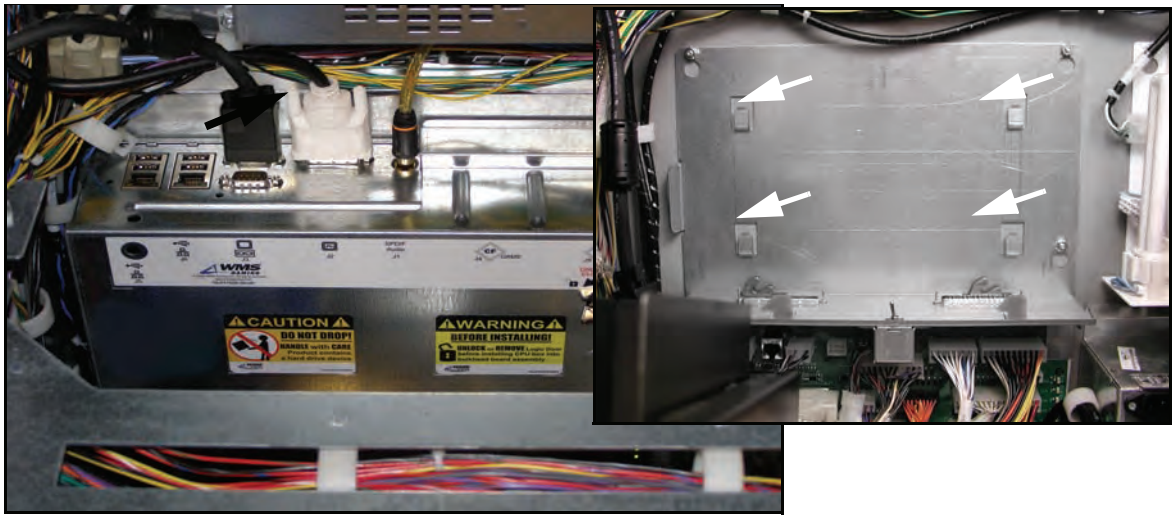


Both switches are accessible with one hand, enabling easy maintenance and testing of game functionality.

CPU Enclosure

The CPU Enclosure protects the CPU Board and is completely removable from the game. Four square tabs on the back of the enclosure seat the CPU Enclosure, Figure 1-8.

Figure 1-8 *CPU Enclosure installed (left) and four mounting tabs (right).*



Hard Meters

The hard meters, Figure 1-9, are located behind the Main Door on the right side of the game, and track the following information:

- (**A**) Coins In
- (**B**) Coins Out
- (**C**) Coins Drop
- (**D**) Bills In
- (**E**) Jackpots
- (**F**) Blank

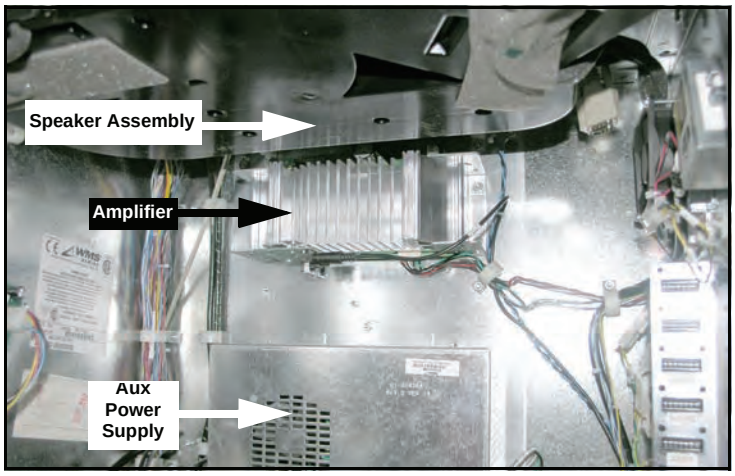
Figure 1-9 *The Hard Meters inside BBU (left) is visible through the LCD Bezel (right).*

The meters can be viewed through a window in the front glass by putting your eye up against the LCD Bezel on the right side of the LCD, Figure 1-9, and turning the attendant key to activate a light.

Bose® Audio System

The Bluebird features a Bose Audio System that includes the Speaker Assembly and the Primary Amplifier, Figure 1-10.

Figure 1-10 *Installed Bose Wave Guide Sound System components (Reel Shelf removed for clarity).*



Top Box Connector Plate

The Top Box Connector Plate, Figure 1-11, connects the Top Box and/or Player Tracking System to the base game:

Figure 1-11 *Top Box Connector Plate.*

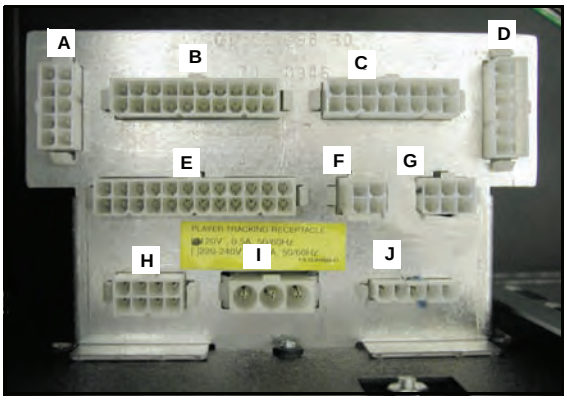


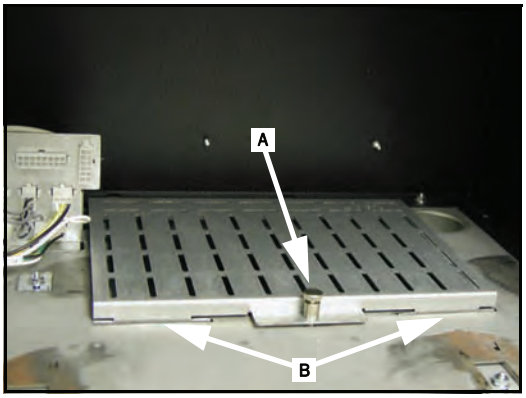
Table 1-4 *Cabinet Top Box Connector Plate Designations.*

Connector	Function
A	Top Box/Aux Logic Player Tracking switched inputs
B	Top Box Serial Interface and I/O interface
C	Lamp Matrix
D	Player Tracking Power/Switch Interface
E	Player Tracking Door Switch
F	Top Box/Aux Logic switched inputs
G	Tower Light
H	Aux/secondary DC Power
I	Unswitched AC Power
J	Switched AC Power

Player Tracking SMIB Mounting Plate

Most Player Tracking Systems will reside in the Top Box and mount to the Slot Machine Interface Board (SMIB) Mounting Plate, Figure 1-12. The SMIB Mounting Plate may be removed.

Figure 1-12 *WMS SMIB Mounting Plate in Top Box.*

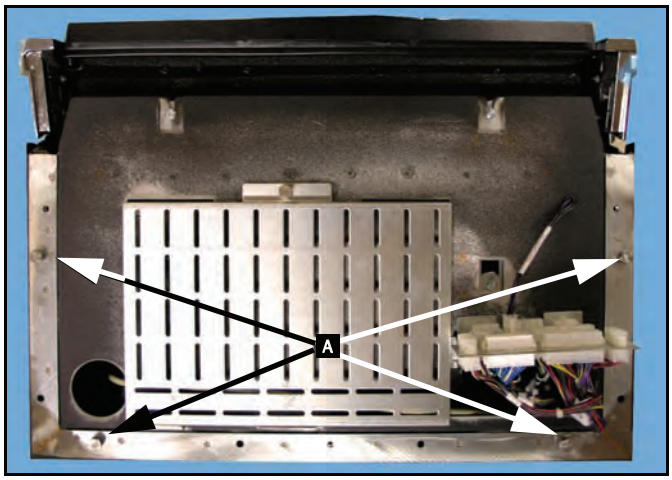


1. Disengage the pull pin securing the WMS SMIB Mounting Plate to the Top Box, Figure 1-12 (A).
2. Lift and pull the pull pin towards you to disengage the mounting tabs, Figure 1-12 (B).

Top Box Mounting Hardware

The mounting hardware includes mounting posts that engage the Mounting Keyholes on the Top Box, Figure 1-13 (A).

Figure 1-13 *Video Top Box mounting hardware.*



In-Game Progressive Meter

If applicable, the Progressive Meter, Figure 1-14 (A), mounts into the game Top Box. The In-Game Progressive Meter enables compact Top Boxes to contain all the features of larger Top Boxes and Marquees for Progressives.

Figure 1-14 *In-Game Progressive Meter location.*

CPU Enclosures (RoHs CPU-NXT and CPU-NXT2)

This section contains information about the RoHS CPU-NXT and CPU-NXT2.

RoHs CPU-NXT: Board Identification

All components are on the top side of the Printed Circuit Board (PCB). Reference Figure 1-17 and Table 1-6 to identify the components on the PCB.

CAUTION: *If necessary, replace the complete CPU Enclosure Only. Do not remove the PCB from the CPU Enclosure.*

Figure 1-15 *Layout of RoHS CPU-NXT PCB.*

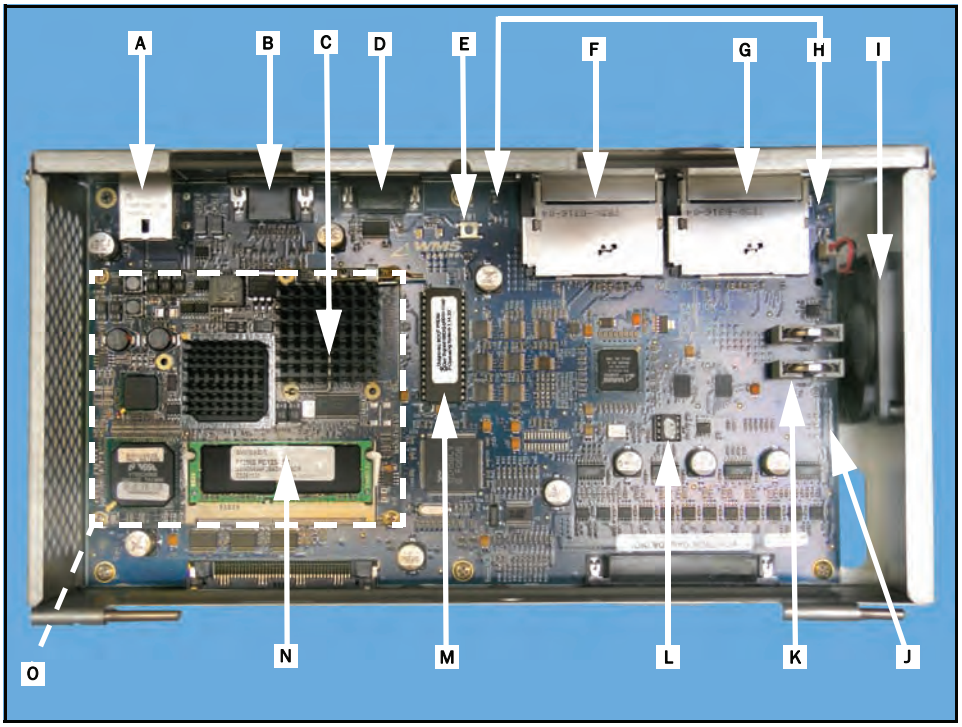


Table 1-5 *Layout of RoHS CPU-NXT.*

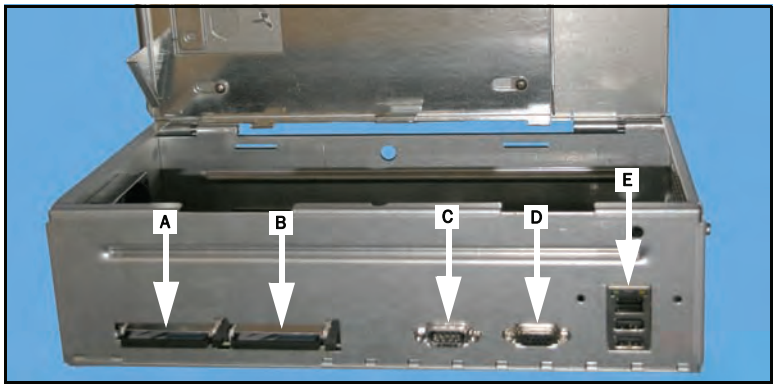
ID	Connector
A	Ethernet/Dual USB Connector
B	Video Port
C	Intel Celeron® 650 MHz Processor (under heat sink)
D	Auxiliary Serial Port
E	Reset Switch
F	CompactFlash Drive (game software)
G	CompactFlash Drive (OS software)
H	CompactFlash Drive Activity LEDs
I	CPU Enclosure Fan
J	Power LEDs
K	Batteries (2) for SRAM subsystem
L	Jurisdictional EPROM
M	Boot EPROM (8Mbit)
N	SDRAM Memory Module
O	CPU Module

RoHS CPU-NXT: CompactFlash Slots and Cable Connectors

The RoHS CPU-NXT has two CompactFlash slots and five cable connectors on the outside of the CPU Enclosure:

- CompactFlash slot for OS software, Figure 1-18 (A)
- CompactFlash slot for game software, Figure 1-18 (B)
- Auxiliary Serial Connector, Figure 1-18 (C)
- Video Connector, Figure 1-18 (D)
- Ethernet/Dual USB Connector, Figure 1-18 (E)

Figure 1-16 *CompactFlash slots and cable connectors.*



CPU-NXT2 Board Identification

On CPU-NXT2, all components are on the top side of the Printed Circuit Board (PCB). Reference Figure 1-17 and Table 1-6 to identify the components on the PCB.

CAUTION: *Do not remove the PCB from the enclosure.*

Figure 1-17 *Layout of CPU-NXT2 PCB.*

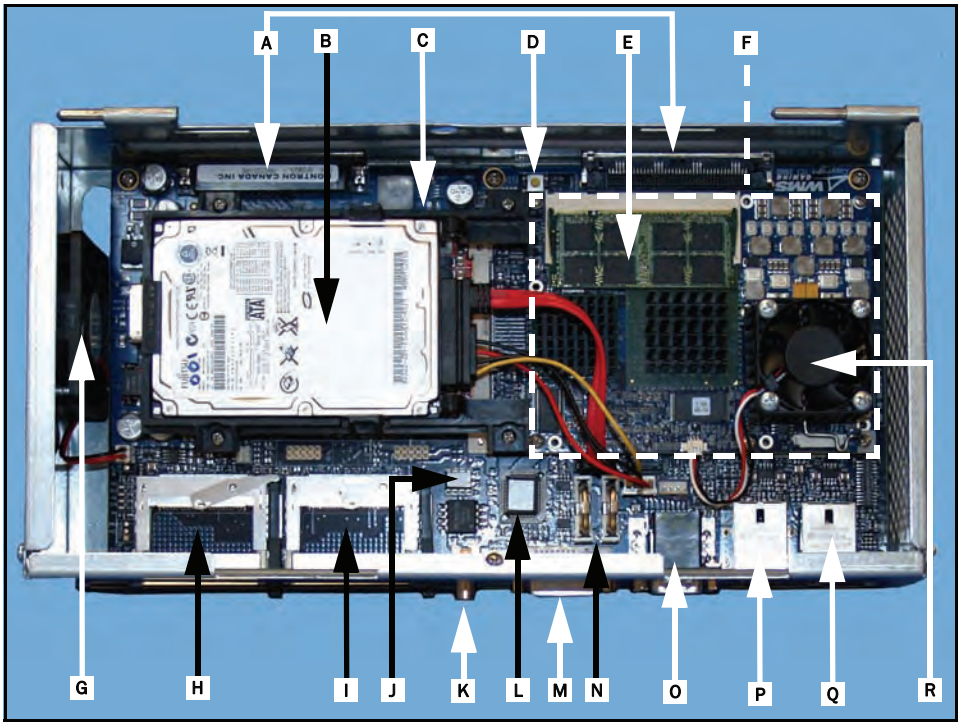


Table 1-6 *Layout of CPU-NXT2.*

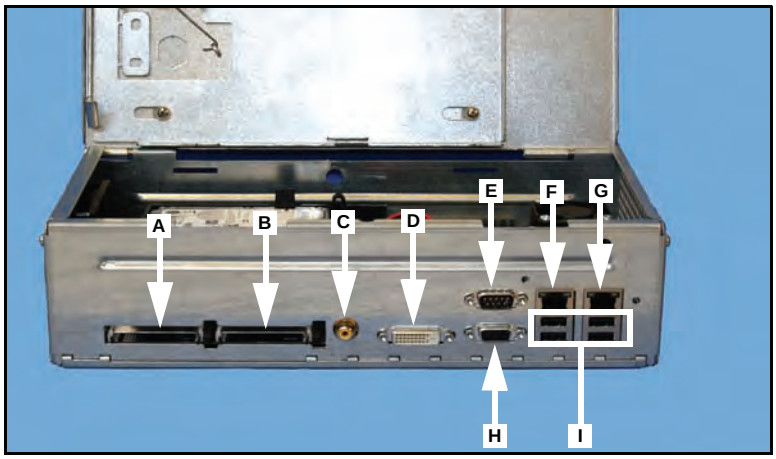
ID	Connector
A	Blind Mate Connectors
B	Hard Drive
C	PCI Express Video Card (under hard drive)
D	Reset Switch
E	SDRAM Memory Module
F	CPU Module
G	CPU-NXT2 Enclosure Fan
H	CompactFlash Drive (OS software)
I	CompactFlash Drive (game software)
J	Jurisdictional EEPROM (SPI)
K	Digital Audio (SPDIF) Connector
L	BIOS Firmware Hub
M	DVI Video Port
N	Batteries (2) for NVRAM subsystem
O	VGA Video Port/Auxiliary Serial Port
P	10/100/1000 Ethernet/Dual USB Connector
Q	10/100 Ethernet/Dual USB Connector
R	Intel Celeron® M 370, 1.5 GHz Processor

CPU-NXT2: CompactFlash Slots and Cable Connectors

The CPU-NXT2 has two CompactFlash slots and ten cable connectors on the outside of the Enclosure:

- CompactFlash slot for OS software, Figure 1-18 (A)
- CompactFlash slot for game software, Figure 1-18 (B)
- SPDIF, Figure 1-18 (C)
- DVI Video Port, Figure 1-18 (D)
- Auxiliary Serial Port, Figure 1-18 (E)
- 10/100/1000 Ethernet/Dual USB Connector, Figure 1-18 (F)
- 10/100 Ethernet/Dual USB Connector, Figure 1-18 (G)
- VGA Video Port, Figure 1-18 (H)
- Four USB Connections, Figure 1-18 (I)

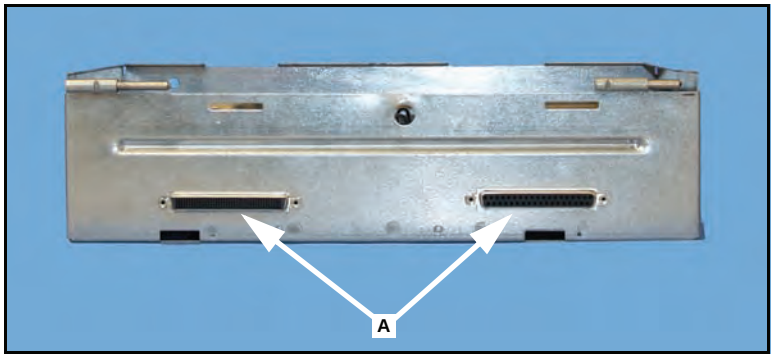
Figure 1-18 *CompactFlash slots and cable connectors.*



Blind Mate Connectors for Bulkhead Board

The CPU Enclosure attaches to the Bulkhead Board via two blind mate connectors, Figure 1-19 (A), on the outside of the Enclosure.

Figure 1-19 *Blind Mate Connectors on outside of CPU Enclosure.*



Logic Door

The Logic Door, Figure 1-20 (A), covers the PCB and two slots for the CompactFlash cards.

NOTE: *CPU-NXT2 cannot be installed or removed without unlocking and/or removing the Logic Door, as indicated on the yellow warning label on the Logic Door, Figure 1-20 (B).*

Figure 1-20 *Open Logic Door (left) and warning label on Logic Door (right).*

Security Wire Holes

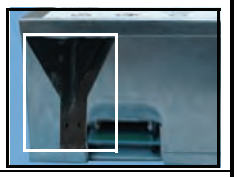
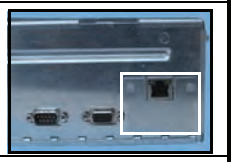
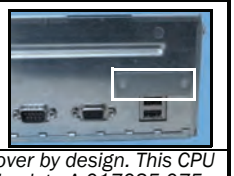
A metal wire can be looped through the two security holes, Figure 1-21 (A), in the CPU Enclosure to deter theft of the PCB and components.

Figure 1-21 *Security Wire Holes.*

Ethernet/USB Port Cover Plate (in select jurisdictions)

In select jurisdictions, a metal cover plate protects the Ethernet/USB ports on CPU-NXT and CPU-NXT2 enclosures. Table 1-7 lists the CPU Enclosures and corresponding cover plates.

Table 1-7 *Ethernet/USB Port Cover Plates.*

CPU Enclosure (P/N)	Function	Part Number	Photo
CPU-NXT - non-RoHS (A-010785-07)	Ethernet and USB ports cover NOTE: *Image shown covering Ethernet port.*	01-020155-00-00	 
CPU-NXT - RoHS (A-017096-00-03)	USB ports cover	01-020073-00-01	
CPU-NXT2 (A-017999-01-01)	USB ports cover	01-020073-00-02	
CPU-NXT (A-017096-00-03)	Ethernet port (single) cover	01-018003-00-01	
NOTE: *CPU A-010785-075, a previously released non-RoHS CPU-NXT enclosure, included an Ethernet cover by design. This CPU enclosure is no longer available. If needed, order:* A-017096-00-03; *01-018003-00-01 in place of the obsolete A-017085-075.*			
CPU-NXT2 (A-017999-01-01)	Ethernet ports (dual) cover	01-018003-00-02	
CPU-NXT2 (A-017999-01-01)	Ethernet and/or USB cable protection	01-020116-00-00	

Bulkhead Board

Most game components, including peripherals, connect to the Bulkhead Board, Figure 1-22 and Table 1-8.

NOTE: *The current revision of the Bulkhead Board is compliant with the Restriction on use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS; Directive 2002/96/EC) regulations.*

Figure 1-22 *Bulkhead Board.*

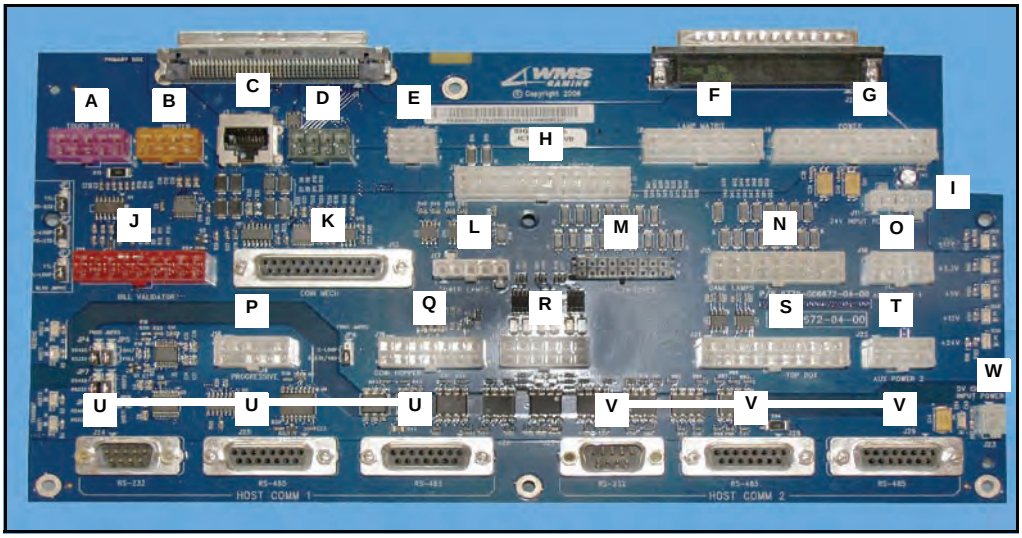
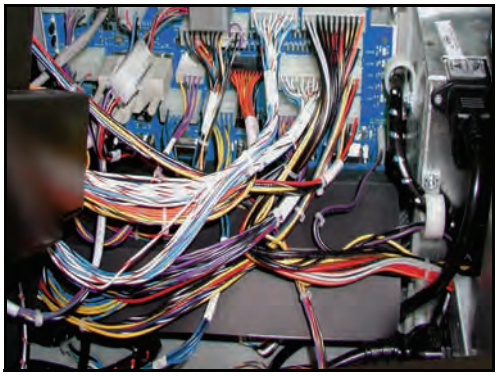


Table 1-8 *Bulkhead Board connectors.*

ID	Connector	ID	Connector	ID	Connector
A	Touch Screen (pink)	I	+24 V	Q	Hopper
B	Printer (yellow)	J	Bill Acceptor (red)	R	Meter
C	SPN	K	Coin Acceptor	S	Top Box
D	Audio (green)	L	Tower Lamp	T	aux/secondary Power (DC)
E	Spare	M	Game Button Switches	U	Host Comm 1
F	Lamp Matrix	N	Game Lamps	V	Host Comm 2
G	Primary Power	O	aux/secondary Power (DC)	W	Isolated 5 volts and ground
H	Door Switch	P	Progressive		

The Bulkhead Board is located on the back wall of the game, Figure 1-23.

Figure 1-23 *Bulkhead Board inside game.*



Safety Features

Several safety features are included in the Bluebird Upright cabinet.

Liquid Diversion

The liquid diversion parts on the game are designed to handle less than one liter of liquid. During game setup, verify that all parts are securely installed and adequately cover the sensitive components.

WARNING: *Removal or alteration of any liquid diversion component violates CSA water safety regulations.*

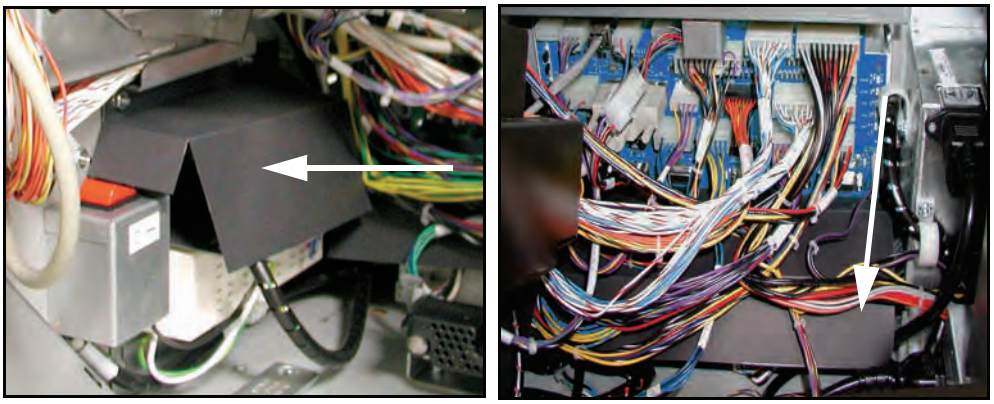
To protect AC components of the game from electrical damage, and to prevent a fire/shock hazard, several liquid diversion parts are included in the game. The plastic shields, Figure 1-24, divert liquids to the bottom of the base cabinet or out of the game, and the foam above the speakers, Figure 1-25, guides liquids down the sides of the cabinet and out of the game.

CAUTION: *To avoid electrical shock, always remove power from the game when servicing. Take all necessary precautions to avoid spillage of any liquids on or near the game to protect critical game components from damage.*

Plastic Shield for Power Components

A plastic shield is placed above the power components to deflect liquids, Figure 1-24.

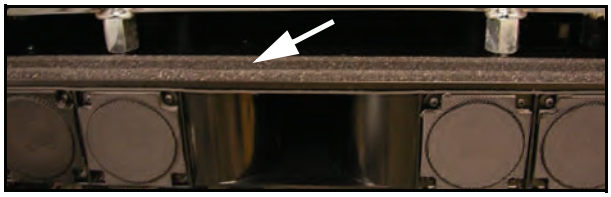
Figure 1-24 *Plastic shield for AC components, located behind the power switch (left) and below Bulkhead (right).*



Foam Above Speakers

Foam is placed above the speakers to seal out liquids, Figure 1-25.

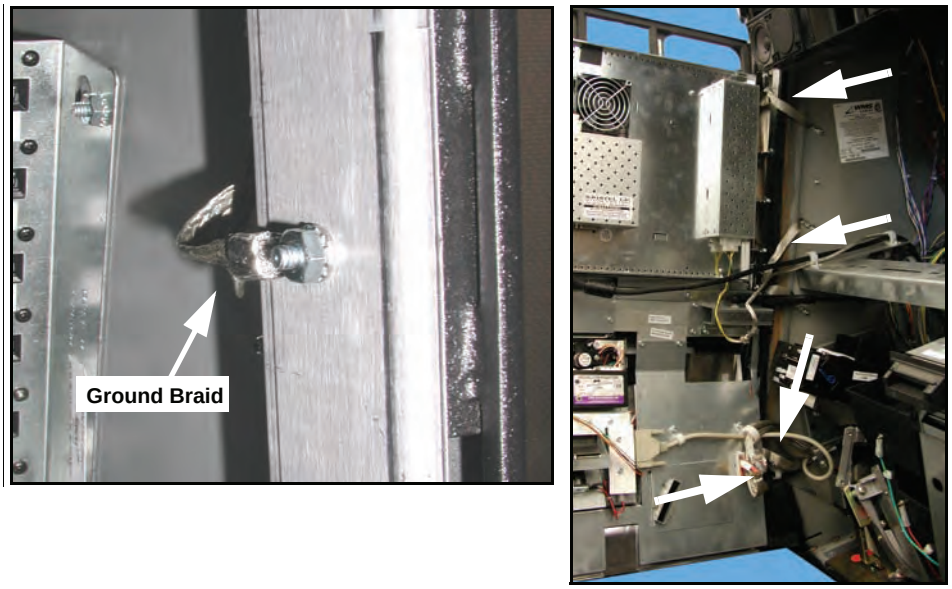
Figure 1-25 *Two foam strips above the speakers.*



Ground Braids

When the game is open, the ground braids provide ESD protection for the components on the door. The ground braids also are a convenient location to attach the ESD wrist strap when maintaining the game, Figure 1-26.

Figure 1-26 *Ground braids from door locking bar.*



Electrical Requirements

Review the following to confirm electrical safety requirements:

WARNING: *Plugging the game into an improper line voltage source may create a fire and/or electrical shock hazards. An improper line voltage or frequency can also cause game damage or malfunctions. Check the voltage configuration label on your game, located next to serial plate, for proper line voltage.*

Locate the socket outlet close to the installed position of this game and confirm that the power output matches the game system requirements defined in Table 1-9.

Table 1-9 *Game Power Requirements.*

Voltage	120 VAC or 220-240 VAC
Line Frequency	50/60 Hz
Current	maximum 4 amps at 120 VAC or maximum 2 amps at 220-240 VAC

Properly Ground Gaming Devices

Avoid electrical shocks by using proper grounding at all times. Do not plug in the gaming device until you inspect and verify the outlet. Only connect the WMS device to grounded, three-wire outlets. Do not use a cheater plug to defeat the power cord's ground pin. Do not cut off the ground pin. After servicing a gaming device, ensure that ground wires are secure.

Use Functional Power Supply Cord

If the power supply cord is damaged, it must be replaced by the manufacturer, a service technician, or a similarly qualified person to avoid a hazard.

Outdoor Use

This device is not suitable for outdoor use.

Game Maintenance

When performing any maintenance or modification to the gaming device, ensure the power supply cord is disconnected from the outlet. Unplugging all power supply cords is the only means of disconnecting the game.

Radio Interference

Please be aware of the safety notices listed below. Pending approval, some or all of the following may apply:

- **FCC Interference Notice**. This equipment has been tested and complies with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used according to the instruction manual, this equipment may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. The user must correct interference at their expense.

- **Canadian Interference Notice**. This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

- **EU Interference Notice.** This Class B digital apparatus meets all requirements of the EURO (CISPR 22) EMC specifications and safety requirements.This Gaming Device is not intended for use by young children or infirm persons without supervision. Young children should be supervised to ensure they do not play with this Gaming Device.

Replacement Fuse

Use proper ESD precautions when changing a fuse, including wearing a wrist strap and eliminating power from the game (see *Prevent Shock and ESD*). Power Entry Assembly, Figure 1-27 (A). To avoid electrical shock, use the correct replacement fuse indicated on the specification label. The replacement must match the original fuse type, voltage rating, and current rating. See Table 1-10 for information on the acceptable replacement fuse.

WARNING: *When changing the main voltage, use the appropriate main fuse. Service and convenience receptacles voltage is the same as the applied mains voltage.*

Figure 1-27 *Power Entry Assembly.*

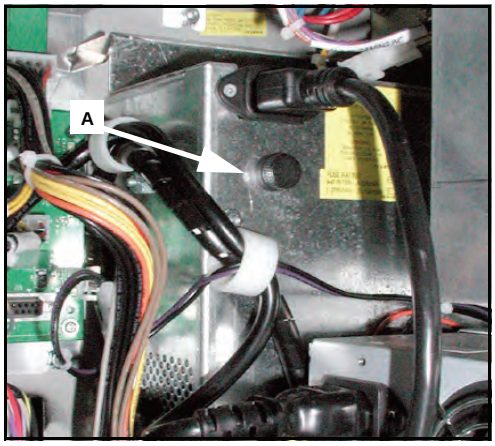


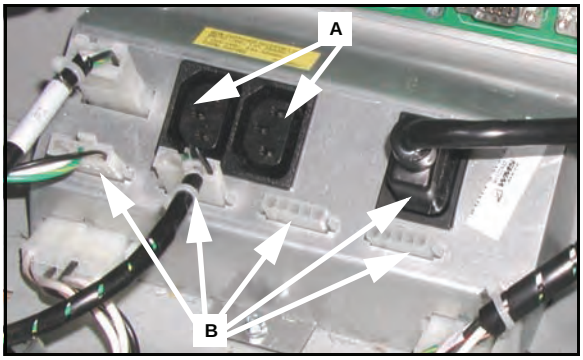
Table 1-10 *Fuse type.*

Voltage	Ampage	Size
120/220 V~	T6.3AH250V~	5 x 20 mm

Service Receptacle

Using an optional line cord, the service receptacle provides unswitched AC line voltage power, Figure 1-28 (A).

Figure 1-28 *Power Strip Detail.*



The switched outlets, Figure 1-28 (B), provide power to system AC devices when the power switch is in the ON position.

For safety, a line voltage label identifies the rating of an unswitched receptacle, Figure 1-29.

Figure 1-29 *Warning label.*

Operating equipment using the wrong voltage may cause lethal shocks, serious burns, and equipment damage. If the game does not include a properly marked label, call WMS immediately.

WARNING: *Do NOT plug into or unplug from an unswitched receptacle. Ensure the game power is OFF prior to plugging or unplugging wires to/from the service receptacle.*

Power Strip/Service Receptacle

The two-part power supply and AC power distribution strip provide power to many game components and accessories, Figure 1-28. The auxiliary power source is 24V DC power.

The power switch located on the left just inside the door, turns the game ON or to standby mode. In standby mode, the switched outlet(s) and many game components are turned OFF, while the unswitched outlets continue to be powered.

The unswitched outlets, Figure 1-28 (A), power AC devices when the power switch is in either the standby or in the ON position. This is primarily used to power player tracking systems, the service lamp, and service outlet.

The switched outlets, Figure 1-28 (B), provide power to system AC devices when the power switch is in the ON position. This includes primary and auxiliary power supplies, installed display devices, and all AC-based illumination in the cabinet, with the exception of the service lamp.

The service receptacle information is listed in Table 1-11.

Table 1-11 *Service Receptacle information.*

Voltage	Amperage	Hertz
120 VAC	4A	50/60Hz
220-240 VAC	2A	50-60Hz

Line Voltage Auto-Detect

The main power supply used in WMS Bluebird products has a line voltage feature that automatically detects the proper line voltage needed for the game and adjusts accordingly.

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Introduction

This chapter describes the basic installation of a BBU Video Cabinet, including installation onto a Game Stand, Bulkhead Board Jumper Settings, and Top Box Installation.

Preparation

This section provides instructions for preparing the game.

ESD Prevention

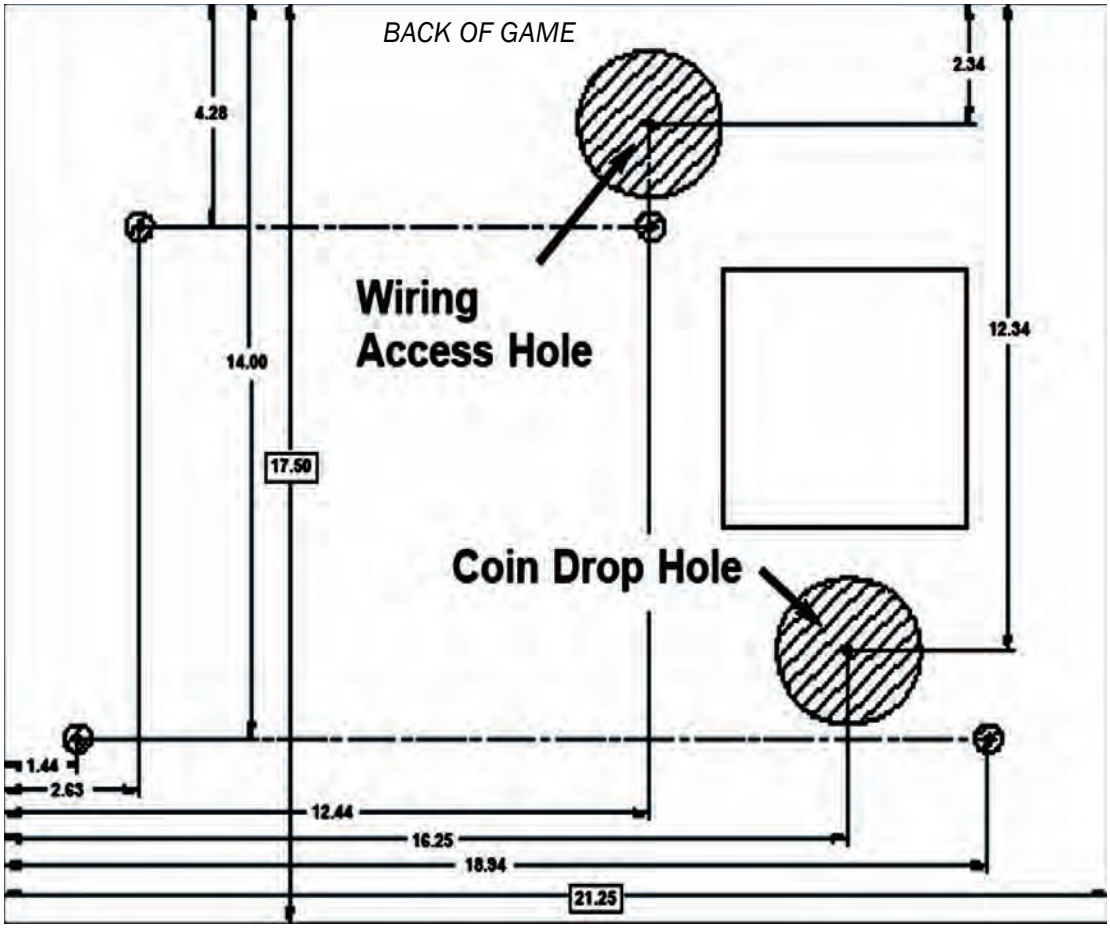
Depending on the procedure, measures must be taken to prevent electrical shock and/or electrostatic discharge (ESD) when servicing the game. See *Preventing Injury and Damage* in the *About This Guide* chapter for details on ESD prevention.

Install Game onto Stand

Complete the following steps to mount the game. WMS recommends using the plastic Bluebird Drill Fixture (31-010020), Figure 2-1. To obtain the fixture, contact WMS Field Service.

CAUTION: *The maximum weight for any BBU game is 452 lbs (205 kg). Verify that any non-WMS game stand specifications meet this weight requirement before mounting the game. Using inadequate game stands voids the WMS Warranty and may lead to distortion of the game cabinet, including the inability to close and lock the Main Door.*

Figure 2-1 *Bluebird Drill Fixture.*



FRONT OF GAME

NOTE: *Space the games at least 6" apart.*

1 Use one of the following three methods to:

- Attach the game drop stand to the floor with carriage bolts.
- Mount machines back-to- back on a common stand.
- Mount machines on separate stands, but bolt the bases together back to back.

CAUTION: *Improper mounting can cause the stand to tip over, risking damage and injury.*

2 WMS recommends using the Drill Fixture to drill four anchor clearance holes and two access holes into the top of the stand. Position the template by setting it flush with the back of the drop stand, then centering it.

3 Pull the Hopper out of the game to gain access to the bolt holes. Carriage bolts are recommended for mounting the game for security and ease of assembly.

4 Drop four 3/8" x 2" carriage bolts down through the clearance holes and secure the cabinet to the drop stand with the hex nuts.

NOTE: *Adhere to the following details:*

- *All pilot holes are 0.13" diameter*
- *Large shaded holes are 2.75" diameter*
- *Small shaded holes are 0.50" diameter*

CAUTION: *WMS requires that all BBU games are mounted to Game Stands using four bolts for stability and security. Failing to do so may lead to cabinet warping.*

Lock Specifications

Replace the shipping locks with locks according to the specifications in Table 2-1 and Table 2-2:

Table 2-1 *Lock Specifications (inches).*

Lock Location	Designed Length	Extended Length*	Cam Description	Cam Part No.	Rotation to Lock (viewed from key end)
Upper (Main) Door	5/8"	1/2" inside or outside	1 1/2" lg. 1/4" offset	01-001614-04	clockwise
Lower (Belly) Door	5/8"	1/4" inside, 1/2" outside	1 1/2" lg. 1/4" offset	01-001614-04	clockwise
CPU Enclosure	5/8"	1/2" outside	Special	01-010849	clockwise
CPU Enclosure (NJ)	5/8"	1/2" outside	1 1/4" flat	01-12793-08	clockwise
Bill Acceptor Cassette Door	5/8"	1/2" outside	7/8" flat	01-12793-10	clockwise
Progressive Meter Enclosure	5/8"	1/2" inside	15/16" flat	01-12793-07	clockwise
Secondary LCD Door (Top Box)	5/8"	1/2" outside	Special	20-9741-G	clockwise

*Conditions:

- Extending the lock inside requires a new cam.
- Extending the lock outside requires a spacer.

Table 2-2 *Lock Specifications (metric)*

Lock Location	Designed Length	Extended Length*	Cam Description	Cam Part No.	Rotation to Lock (viewed from key end)
Upper (Main) Door	16 mm	13 mm inside or outside	38 mm lg. 6 mm offset	01-001614-04	clockwise
Lower (Belly) Door	16 mm	6 mm inside, 13 mm outside	38 mm lg. 6 mm offset	01-001614-04	clockwise
CPU Enclosure	16 mm	13 mm outside	Special	01-010849	clockwise
CPU Enclosure (NJ)	16 mm	13 mm outside	32 mm flat	01-12793-08	clockwise
Bill Acceptor Cassette Door	16 mm	13 mm outside	22 mm flat	01-12793-10	clockwise
Progressive Meter Enclosure	16 mm	13 mm inside	24 mm flat	01-12793-07	clockwise
Secondary LCD Door (Top Box)	16 mm	13 mm outside	Special	20-9741-G	clockwise

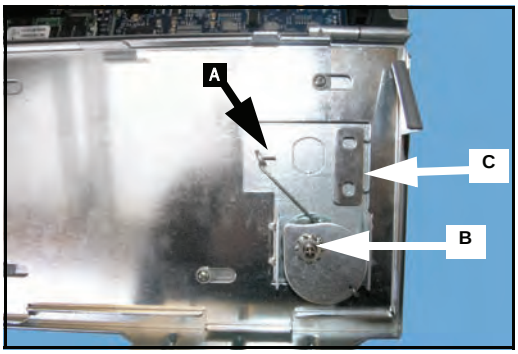
*Conditions:

- Extending the lock inside requires a new cam.
- Extending the lock outside requires a spacer.

Change CPU Shipping Lock(s)

To ensure that the CPU Enclosure Shipping Lock, for the RoHS CPU NXT and the CPU NXT2, does not open during transport, a Torsion Spring keeps the lock from slipping open, Figure 2-2. The Torsion Spring must be removed when the Shipping Lock is replaced.

Figure 2-2 *Shipping Lock on the inside of the CPU Enclosure door.*



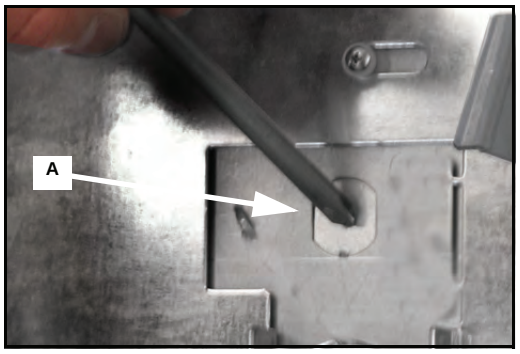
1. Ensure that the Power Switch is set to Off and the AC Line Cord is not connected to the outlet.
2. Remove CPU Enclosure from the game.
3. Release the Torsion Spring, which is no longer needed to hold the CPU Enclosure Lock in place, Figure 2-2 (A).
4. Remove the Shipping Lock, Figure 2-2 (B).
5. When the Shipping Lock is removed, discard the Torsion Spring.
6. Remove the cam for the new lock, Figure 2-2 (C), using a screwdriver to bend the cam until it breaks off.
7. Install the new lock according to casino protocol. Ensure that the cam removed in the previous step is installed with the new lock.

Remove Cover Plate To Install Second Lock (If necessary)

If a second lock is required in the place of the cover plate, Figure 2-3 (A), complete the following steps to remove the cover plate:

1. Use a screwdriver to punch the perforated cover plate out of the CPU Enclosure Door, Figure 2-3 (A).

Figure 2-3 *Shipping Lock on the inside of the CPU Enclosure door.*



2. Install the second lock according to casino protocol.
3. Reattach the door for the CPU Enclosure.

Cashbox Locks

Please note the following:

- *On JCM 12 and 13 WBAs, the new cam is taped to the Cashbox.*
- *Do not lose the cam. If the cam is lost, a new Cashbox must be ordered.*

Power Setup

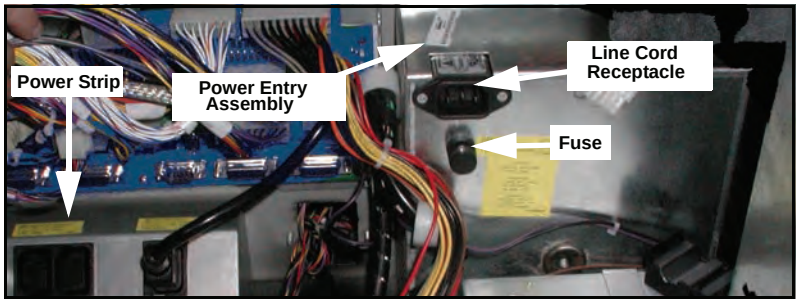
Complete the following steps to connect the BBU to an approved power source:

WARNING: *Plugging your game into an improper line voltage source may create a fire and/or electrical shock hazards. An improper line voltage or frequency can also cause game damage or malfunctions.*

CAUTION: *The Socket Outlet is the means of disconnection, and should be installed near the equipment and be easily accessible.*

1. Verify that the line voltage at the outlet is either 120 VAC or 220-240 VAC, per the rating of the specific game.
2. Use an outlet tester to check for properly implemented ground, hot and neutral outlet wiring. Only use a grounded AC outlet. The gaming device accepts a line frequency of 50 to 60 Hz. Plugging your game into an improper line voltage source may create a fire and electrical shock hazard. If the outlet checks okay, proceed to the next step.
3. Confirm that the game is switched Off at the power switch. Feed the AC power cord through the rear floor access hole, and through the stand. Plug the female end of the line cord into the line cord plug, Figure 2-4. Then plug the male end of the line cord into the tested socket.

Figure 2-4 *Power Components.*

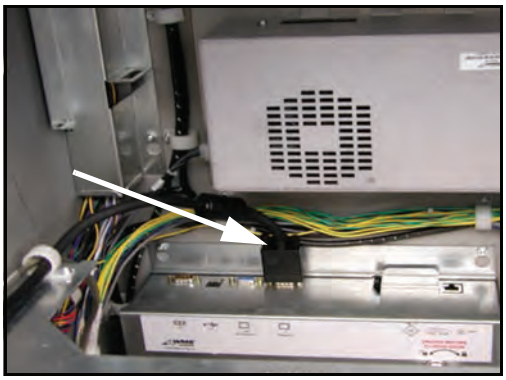


4. If applicable, plug the male end of the Top Box line cord into a tested socket external to the game, not into the power strip.

Verify LCD Connection

If a Belly LCD is installed, verify the VGA cable is connected to the CPU Board, Figure 2-5.

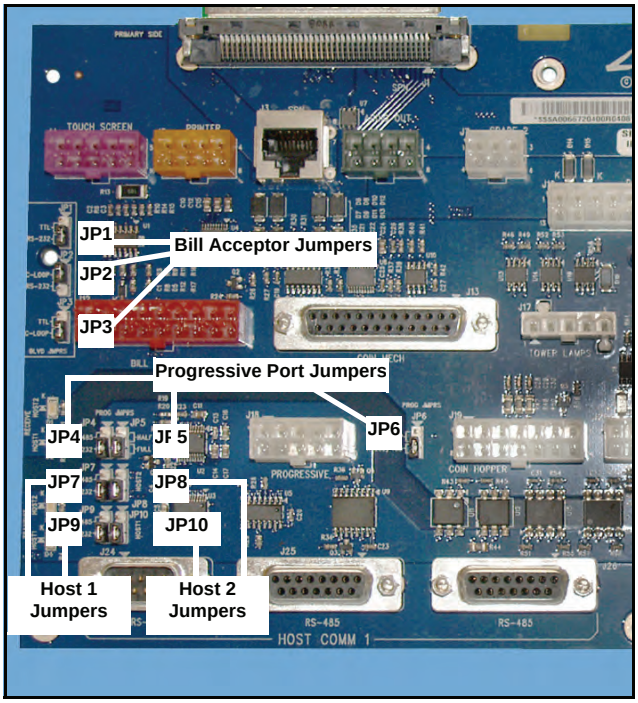
Figure 2-5 *LCD connection to CPU Enclosure.*



Bulkhead Board Jumper Settings

The Bulkhead Board includes ten jumpers, Figure 2-6, that determine the game communication interface with the Bill Acceptor, Progressive System, and the Host System(s). If a feature is not used by the game, then jumper settings have no effect on game functionality.

Figure 2-6 *Bulkhead Board Jumper locations.*



Bill Acceptor Jumpers

Three jumpers on the Bulkhead Board control the Bill Acceptor interface option used by the game, Figure 2-7. Three interface options are available, including RS-232, TTL, and Current Loop.

Figure 2-7 *Bill Acceptor Jumpers.*

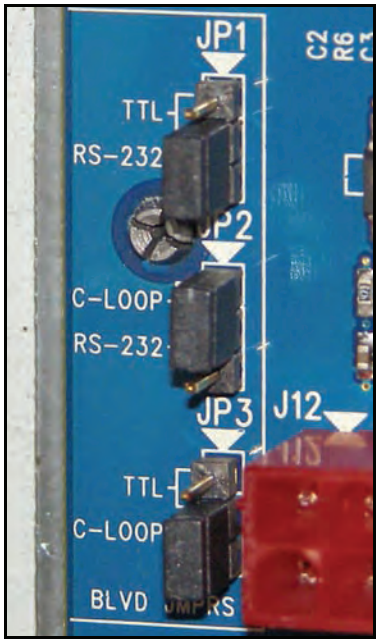


Figure 2-8 *Diagram of Bill Acceptor Jumpers.*

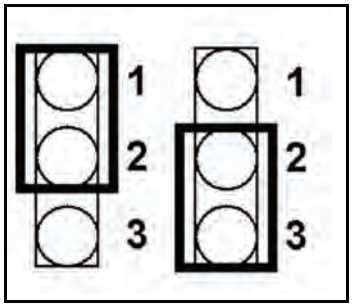


Table 2-3 *Bill Acceptor jumpers.*

Interface	JP1	JP2	JP3
JCM UBA or WBA	Position 2/3	Position 2/3	Either Position
MEI (formerly Mars)	Position 2/3	Position 2/3	Position 2/3

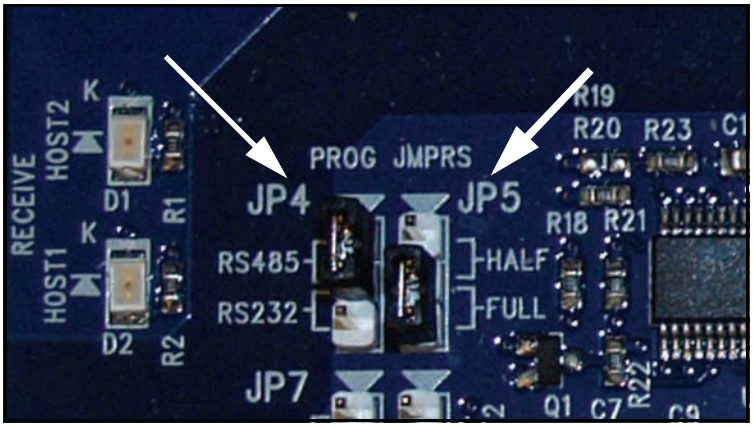
There are two possible jumper positions, which are referenced in Table 2-3 as 1/2 and 2/3, Figure 2-8. While the pins are not actually numbered on the board, the assumption is that in text-legible board orientation, the top pin is 1, and the bottom pin is 3.

Progressive Port Jumpers

Three jumpers on the Bulkhead Board control the type of progressive system and interface used by the game. If applicable, confirm that the Progressive Jumpers (PROG JMPRS) at JP4, JP5, and JP6, are set to work with a Progressive System:

- The Jumper at JP4 must be set to RS485, Figure 2-9.

Figure 2-9 *Jumper setting at JP4 on Bulkhead Board.*



- The Jumper at JP5 must be set to FULL, Figure 2-9.
- The Jumper at JP6 must be set to RS232/485, Figure 2-10.

Figure 2-10 *Jumper setting at JP6 on Bulkhead Board.*

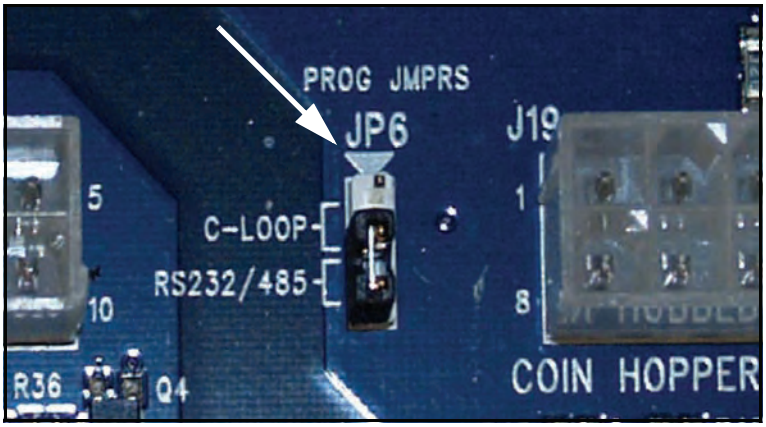


Table 2-4 provides the jumper settings for each interface.

Table 2-4 *Progressive Port jumpers.*

Interface	JP4	JP5	JP6
RS-232	Position 2/3	Either Position	Position 2/3
R-485 Half Duplex	Position 1/2	Position 1/2	Position 2/3
R-485 Full Duplex	Position 1/2	Position 2/3	Position 2/3
Current Loop (C-Loop)	Either Position	Either Position	Position 1/2

Host 1 Jumpers

Bluebird may be configured as a dual host system. Two jumpers control the Host 1 communication interface, Figure 2-11. The two options are RS-232 and RS-485, Table 2-5.

Figure 2-11 *Host 1 (bottom) and Host 2 (top) jumpers, both set to RS-232.*

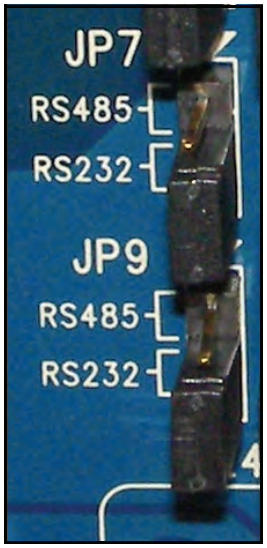


Table 2-5 *Host 1 jumpers.*

Interface	JP9	JP10
RS-232	Position 2/3	Position 2/3
RS-485	Position 1/2	Position 1/2

Host 2 Jumpers

Two jumpers control the Host 2 communication interface, Figure 2-11. The two options are RS-232 and RS-485, Table 2-6.

Table 2-6 *Host 2 jumpers.*

Interface	JP7	JP8
RS-232	Position 2/3	Position 2/3
RS-485	Position 1/2	Position 1/2

Installing the Top Box

This section describes the steps to secure and connect the Top Box to a BBU.

ESD: *Ensure that you take the following measures to prevent ESD:*

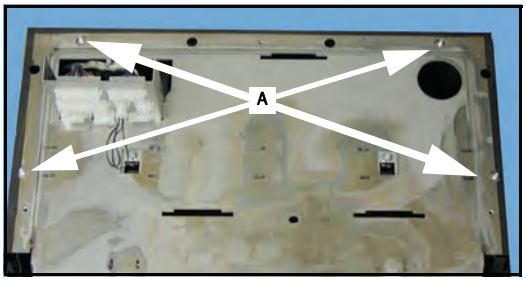
- *Turn the game OFF at the Power Switch.*
- *Remove the AC Line Cord from the Power Entry Assembly.*
- *Wear an ESD wrist strap.*

Mount Top Box

Complete the following steps to install the Top Box onto the BBU:

1 Confirm that the previous Top Box is removed. To perform the installation properly, ensure that the four Mounting Studs or Posts on top of the cabinet are accessible, Figure 2-12 (A).

Figure 2-12 *Location of Top Box Mounting Studs or Posts.*



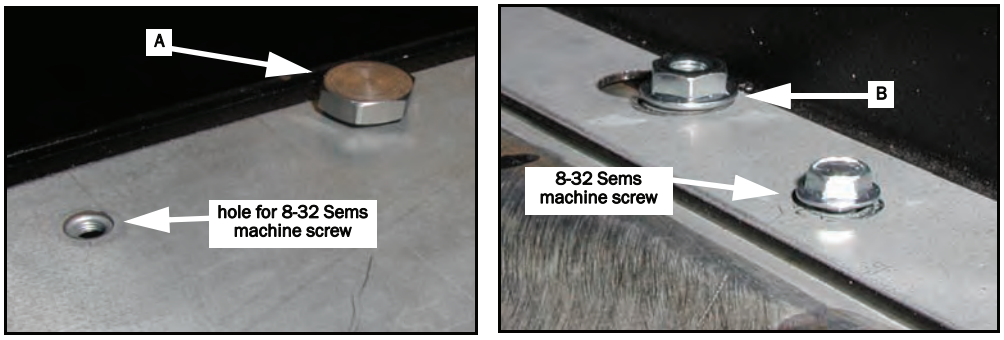
2 Lift the Top Box onto the game.

3 Align the base of the Top Box with the outside of the BBU, ensuring that the Mounting Studs/ Posts on the game engage the Mounting Keyholes on the Top Box.

4 Determine the following:

If the BBU has...	then...
four Mounting Posts (02-011507-02), Figure 2-12 (A) and Figure 2-13 (A)	**1** Place the large end of the four Mounting Keyholes on the Top Box over the four Mounting Posts on the game. **2** Push the Top Box back to engage the Mounting Posts.
four mounting studs, Figure 2-12 (A)	**1** Place the smaller end of the four Mounting Keyholes on the base of the Top Box over the four Mounting Studs on the game. **2** Use a 3/8" nut driver to secure with four 10-32 flange grip nuts (4410-01141-01), Figure 2-13 (B).

Figure 2-13 *Two mounting configurations for BBU Top Box.*



5 For both mounting setups, use a Phillips screwdriver or 1/4" nut driver to secure the Top Box to the Bluebird cabinet with two 8-32 x .38 hex head screws (4008-007026-06), in the holes provided on both sides of the game, Figure 2-13.

Install Two Crown Pieces

Two Crown Pieces, located in the final packet assembly of certain Top Boxes, are mounted to the front of the Top Box Frame. Each Crown Piece is made up of two components: the outside rail and the inside bracket, Table 2-7. These two components are combined, with only the part number for the inside bracket being visible.

Table 2-7 *Part Descriptions for Crown Pieces.*

Part Numbers	Description
01-012374-01-01	bracket: tooth gap filler left **(visible part number on left Crown Piece)**
21-011055-01D01	rail: top box chrome left
01-012374-01-02	bracket: tooth gap filler right **(visible part number on right Crown Piece)**
21-011055-02D01	rail: top box chrome right

Complete the following steps to install the two Crown Pieces:

1. On the left side of the Top Box Frame, engage the 8-32 mounting stud on the left Crown Piece, Figure 2-14 (A), with the slot provided on the Top Box, Figure 2-15 (A).

Figure 2-14 *One of two Crown Brackets.*

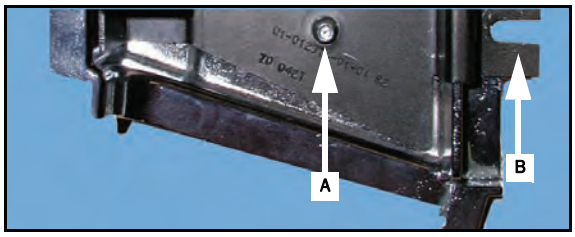
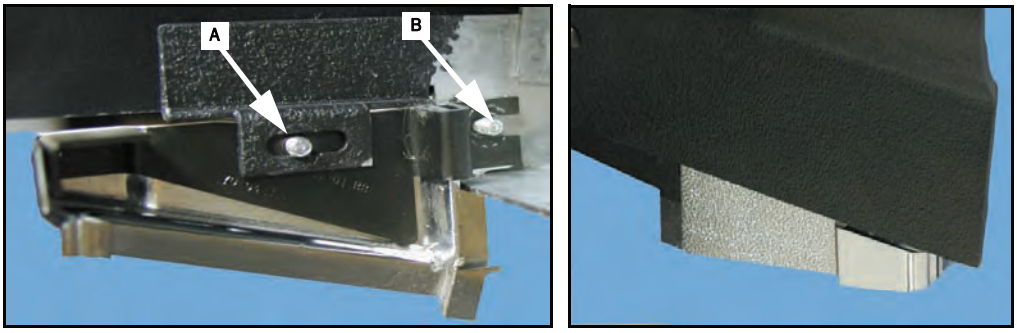
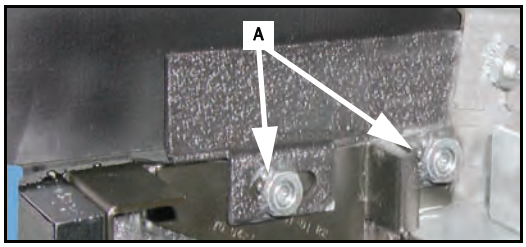


Figure 2-15 *Mounting setup for left Crown Piece (left) and the outside view of properly mounted crown (right).*



2. Engage the mounting tab on the Crown Piece, Figure 2-14 (B), with the 8-32 mounting stud on the Top Box, Figure 2-15 (B).
3. Use an 11/32" nut driver or socket wrench to secure the two mounting studs with two 8-32 Keps nuts (4408-01128-00), Figure 2-16 (A).

Figure 2-16 *Secured Crown Piece.*



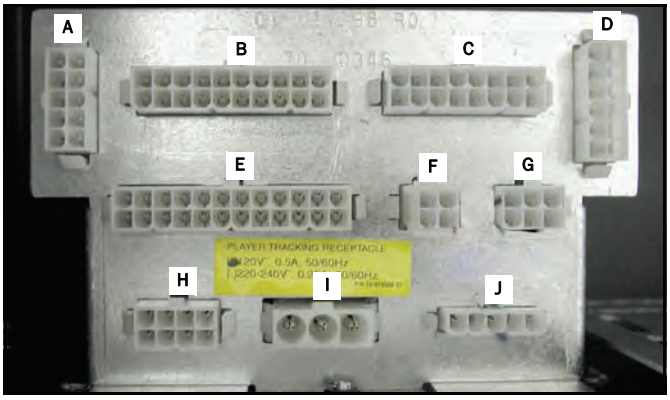
4. Repeat the previous three steps to install the right crown piece.

Electronic Connections

Complete the following electronic connections to the Top Box Connector Plate, Figure 2-17 and Table 2-8.

1 Gather all of the cables from the Top Box and confirm that there is access to the Top Box Connector Plate, which is in the left section of the Top Box, Figure 2-17.

Figure 2-17 *Top Box Connector Plate.*



2 Make connections as needed based on the Top box being installed. Refer to Figure 2-17 and Table 2-8 as needed.

Table 2-8 *BBU Cabinet Top Box Connector Plate Designations.*

Connector Plate Item	Function
A	Top Box/Aux Logic Player Tracking switched inputs
B	Top Box Serial Interface
C	Lamp Matrix
D	Player Tracking Power/Switch Interface
E	Player Tracking Door Switch
F	Top Box/Aux Logic switched inputs
G	Tower Light
H	Aux DC Power
I	Unswitched AC Power
J	Switched AC Power

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Overview

WMS games function optimally with periodic maintenance. The tasks in this section are performed by personnel that fit into three categories:

- Drop Crew
- Attendants
- Technicians

Table 3-1 identifies the tasks performed by these personnel:

Table 3-1 *Division of maintenance responsibilities*

Tasks	Drop Crew	Attendants	Technicians
Removing the Cashbox	X		
Collecting Coins from the Drop Box	X		
Filling the Hopper		X	X
Removing Coin Acceptor		X	X
Cleaning game exterior		X	X
Installing paper into printer		X	X
Adjusting coin diverter		X	X
Removing Coin Acceptor			X
Teaching Coin Acceptor			X
Unlearning a coin			X
Routing Coin Acceptor cables			X
Reading meters			X
Maintaining Bill Acceptor components			X
Maintaining the Hopper			X
Removing hex optical boards			X

Information on maintenance of certain game components is also available in the VENDOR MATERIALS section of this manual, which features the manufacturer's documentation.

ESD Prevention

Depending on the procedure, measures must be taken to prevent electrical shock and/or electrostatic discharge (ESD) when servicing the game. See *Preventing Injury and Damage* in the About This Guide chapter for details on ESD prevention.

Cleaning the Game

Cleaning of the game exterior should be performed every day. This section describes how to clean the game and the proper cleaning materials to use.

CAUTION: *This game must not be cleaned by a water jet, and is not suitable for installation in an area where a water jet is used.*

Game Cabinet

Use a small vacuum cleaner to clean hard-to-reach and narrow places on the cabinet. Then, use a non-ammonia, non-alcohol cleaning solution to clean the game exterior. Never spray the solution directly onto the game. Instead, spray a soft, lint-free cloth and wipe the game exterior.

LCD

A 50/50 mixture of distilled water and isopropyl alcohol is acceptable to use on the LCD. Never spray liquid directly onto the LCD. Spray liquid onto a non-abrasive, soft cotton cloth and wipe the LCD. Never use materials such as paper towels, which can cause scratches and damage the LCD.

CAUTION: *The following cleaners should NOT be used on the LCD:*

- *Acetone*
- *Ethyl alcohol*
- *Ethyl acid*
- *Ammonia*
- *Methyl chloride*

Bill Acceptor

The Bill Acceptor should be cleaned with a cotton swab and hot, soapy water.

Removing the Bill Acceptor and Cashbox

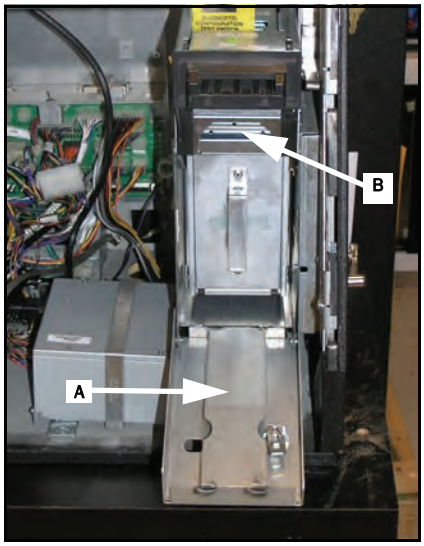
The procedures in this section describe how to remove the Bill Acceptor and Cashbox from the BBU.

Remove the Bill Acceptor

Complete the following steps to remove the Bill Acceptor from the game:

1. Unlock and open the Belly Door.
2. Unlock and open the Bill Acceptor door, Figure 3-1 (A).

Figure 3-1 *Open Bill Acceptor Door.*



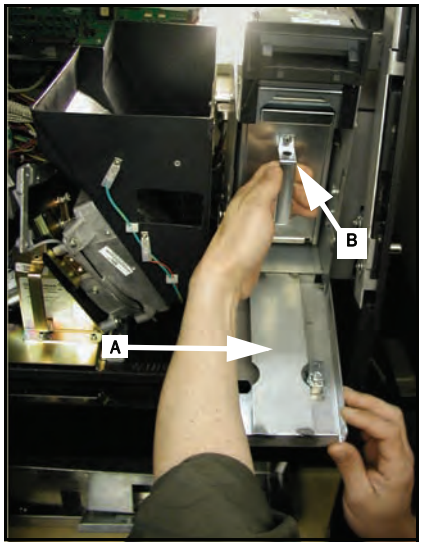
3. Press down on the release lever, Figure 3-1 (B), and slide the Bill Acceptor out of the game.
4. Close the Bill Acceptor door.
5. Close and lock the Belly Door.

Remove the Cashbox

When the *Stacker Full* tilt displays, the Cashbox must be emptied. Complete the following steps:

1. Unlock and open the Bill Acceptor door, Figure 3-2 (A).

Figure 3-2 *Open Bill Acceptor Door.*



2. Press down on the release lever, Figure 3-2 (B), and slide the Cashbox out of the game.
3. Replace the Cashbox with an empty one.
4. Close and lock the Bill Acceptor door.

Button Panel Maintenance

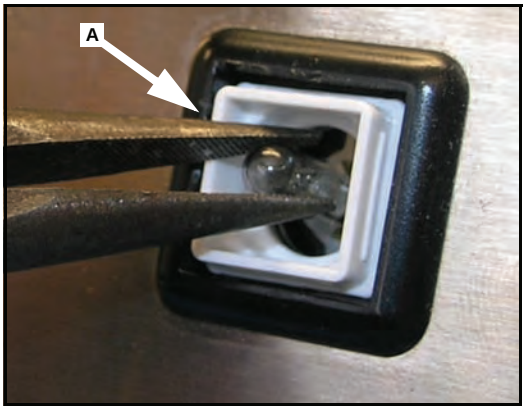
This section contains maintenance procedures for the Button Panel.

Inserting the LED

To remove the button lamp and insert the LED, complete the following steps:

1. Using the needle-nose pliers, gently grip the lamp within the button, Figure 3-3 (A).

Figure 3-3 *Gripping the lamp.*



2. Slowly and carefully pull the lamp out of the Button socket, Figure 3-4.

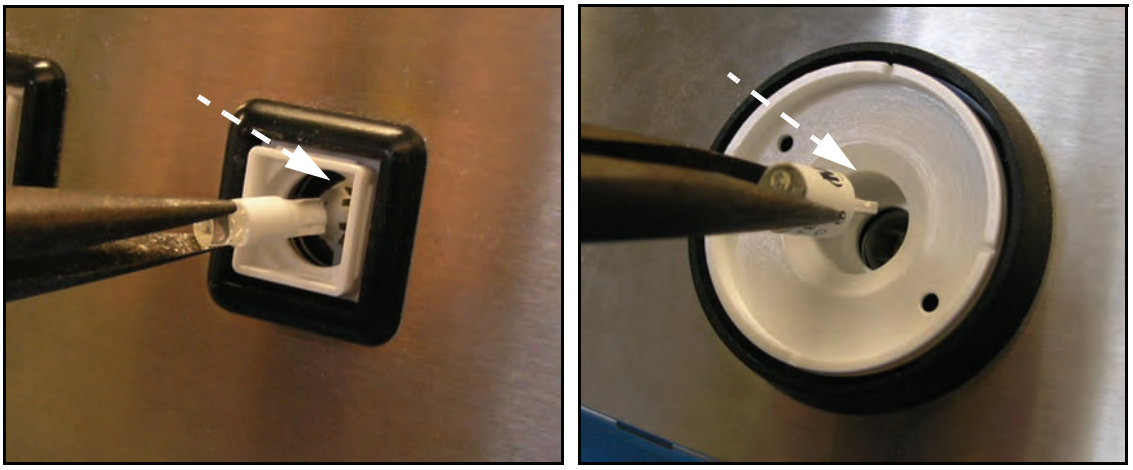
Figure 3-4 *Pulling the lamp from the socket.*

3 Using the needle-nose pliers, insert the LED into the button socket by determining the following in Table 3-2:

Table 3-2 *Bulb size.*

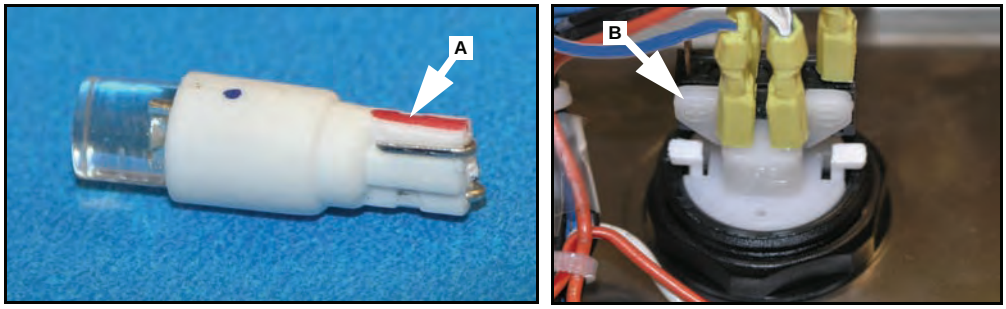
If the button is a...	then...
small square unit	use LED 24-018185-00-00.
large circular unit	use LED 24-018186-00-00.

Figure 3-5 *Inserting the LED into the small button (left) and large button (right).*



NOTE: *The smaller LED (24-018185-00-00) is polarity marked with a red stripe Figure 3-6 (A). Algin the stripe with the positive side of the button light socket. The positive side is marked at the cable connections on the rear of the button, Figure 3-6 (B).*

Figure 3-6 *Polarity stripe on LED (left) and positive marking on rear of button (right).*



4 Turn on the game and perform a diagnostic check to confirm that the LEDs light.

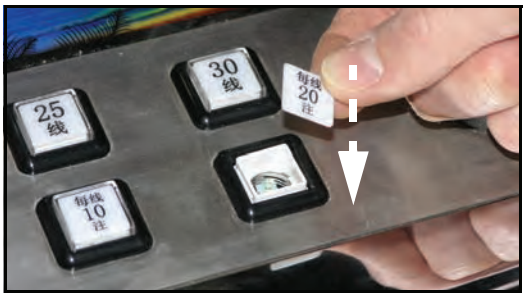
NOTE: *If the LED does not light, power OFF the game, remove the LED, rotate the LED, and reinsert with the opposite polarity. Repeat step 4.*

Replacing the Button Panel Lenses and Inserts

Replace the lens and button insert by completing the following steps:

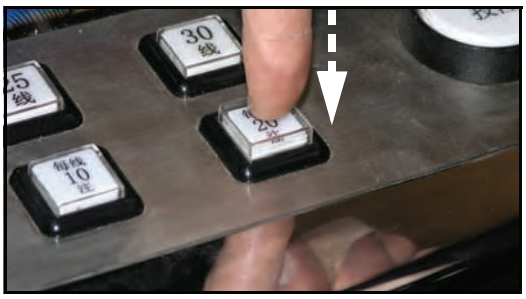
1 Replace the saved insert onto the button, Figure 3-7.

Figure 3-7 *Replacing the button insert.*



2 Snap the lens back onto the button by using the forefinger pushing straight down at the center, Figure 3-8.

Figure 3-8 *Snapping the lens into the button.*



3 Confirm all four sides of the lens are snapped into the button.

Remove Button Panel

Use the following instructions to remove the Button Panel:

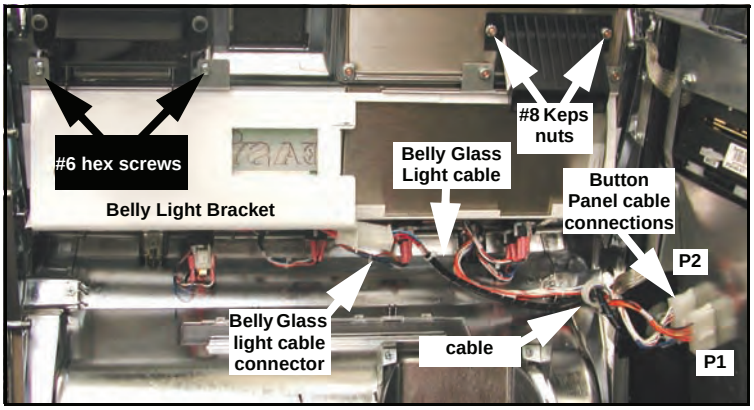
1 Before beginning this procedure, follow the instructions for disconnecting the game.

WARNING: *Disconnect the line cord before servicing to avoid electrical shock.The game must be powered off before the Button Panels are removed or inserted. Button Panels are not hot-swappable.*

2 Unlock and open the Belly Door.

3 On the interior of the Belly Door, remove the Cable and the Belly Light cable from the Belly Door cable clamps, Figure 3-9.

Figure 3-9 *Original Button Panel and cables.*



4 Disconnect Button Panel cable branches P1 and P2 from their connectors on the Main Door, Figure 3-9.

5 Disconnect Belly Light cable from the Belly Light cable connector, Figure 3-9.

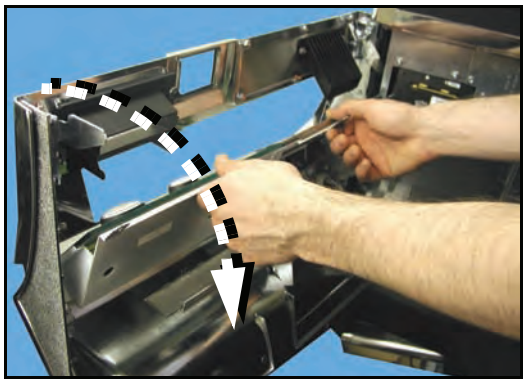
6 Using a 1/4" nut driver, remove the two #6 hex screws securing the Belly Light Bracket, Figure 3-9.

7 Using an 11/32" nut driver, remove the two #8 Keps nuts securing the Belly Light Bracket, Figure 3-9.

CAUTION: *Use care when performing the following step, as the Belly Glass is not secured once the bracket is removed.*

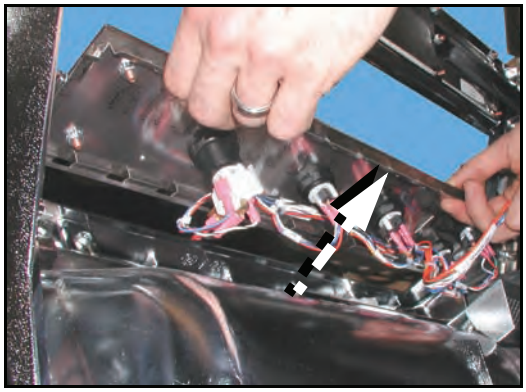
8 Slowly and carefully rotate down the top of the Belly Light Bracket backward on the two pivoting screws, Figure 3-10, and remove the bracket.

Figure 3-10 *Rotate the Belly Light Bracket backward.*



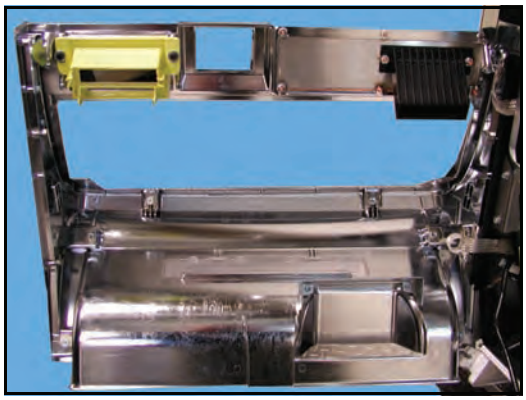
9 Slide out the existing Button Panel, Figure 3-11.

Figure 3-11 *Slide out the existing Button Panel.*



The game is ready for the installation of the replacement Button Panel, Figure 3-12.

Figure 3-12 *Empty Button Panel area.*

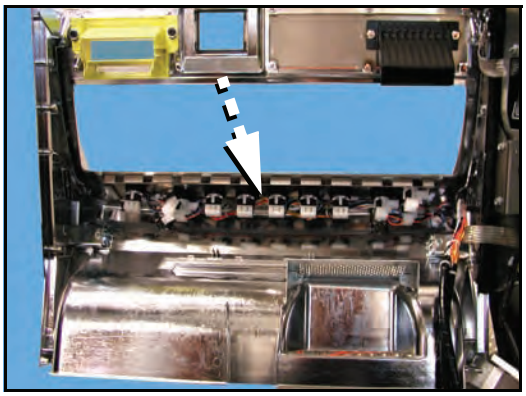


Install Button Panel

Use the following instructions to install the Button Panel:

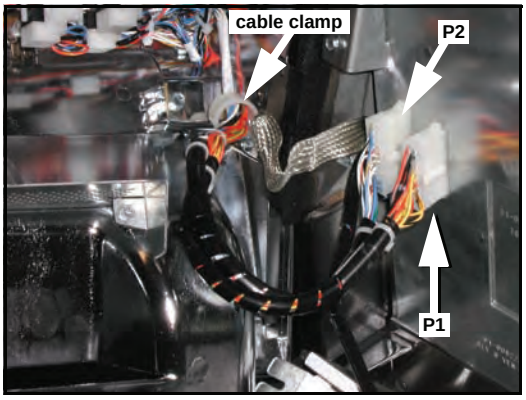
1 From the inside of the Door, slide the Button Panel into the bracket, Figure 3-13.

Figure 3-13 *Install the Button Panel.*



2 Route the Button Panel cables through the cable clamp, Figure 3-14.

Figure 3-14 *Connect Cables.*



3 Connect the Button Panel cable (H-012813-00) branches P1 and P2 to the connectors on the Main Door, Figure 3-14.

CAUTION: *Use care when performing the following step, as the Belly Glass is not secured once the bracket is removed.*

4 If required, replace the Belly Glass with glass corresponding to the new game.

Replace SPN Components

This section provides the procedure for replacing Smart Peripheral Network (SPN) components required for select SPN-controlled Button Panels.

Mount the Universal Animator to Bracket

Complete the following steps to mount the Universal Animator to the SPN Bracket.

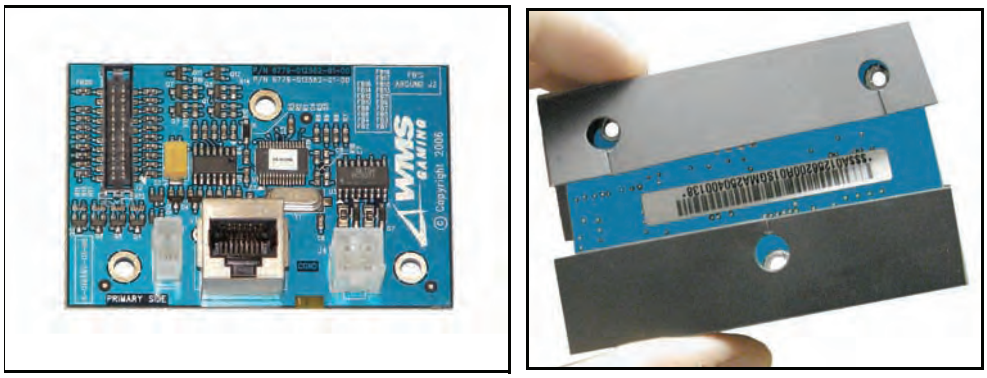
ESD: *Before handling the SPN Distribution Board, or any PCB, confirm ESD precautions are followed. See Preventing Injury and Damage in the About This Guide chapter for details on ESD prevention*.

1. Using a 1/4" nut driver, secure the Universal Animator Bracket (Non-Rail: 01-016185-01-00; Component Rail with LCD and without LCD: 01-016185-01-00) to the Belly Door with a #8-32 self-threading screw (4008-007027-04), Figure 3-15 (A).

Figure 3-15 *Secured Universal Animator Bracket.*

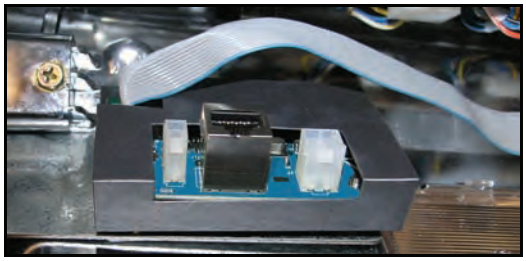
2. Fit on the black Formex Cover (03-012325) by engaging the three slots on the cover, Figure 3-16, with the studs in the middle of the Universal Animator Bracket.

Figure 3-16 *Universal Animator without Formex Cover (left) and with Formex Cover (right).*



3. Snap the Universal Animator (A-012562-01-00) onto the Bracket by aligning the mounting posts with the holes in the LED Board, Figure 3-17.

Figure 3-17 *Universal Animator seated on Bracket.*



Install the SPN Distribution Board

Complete the procedures below to mount and connect the SPN Distribution Board (A-012604-02-00).

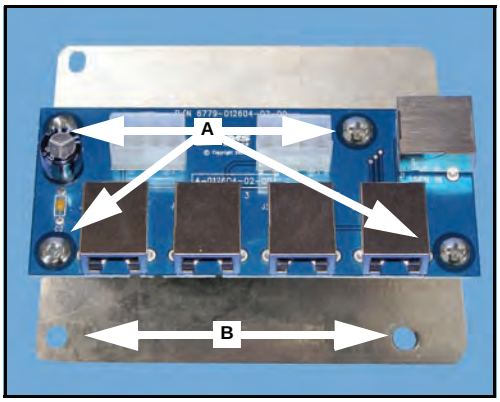
Mount SPN Board to SPN Bracket

Complete the following steps to mount the SPN Board to the SPN Bracket.

ESD: *Before handling the SPN Distribution Board, or any PCB, confirm ESD precautions are followed. See Preventing Injury and Damage in the About This Guide chapter for details on ESD prevention*.

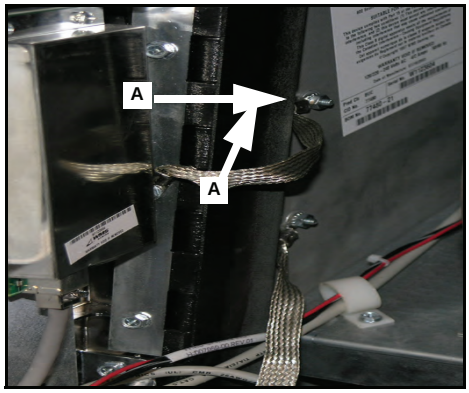
1. Align each of the four holes with the four standoffs on the SPN Bracket (01-012704).
2. Using a Phillips screwdriver, tighten the four pan head screws to secure the SPN Distribution Board to the SPN Bracket, Figure 3-18 (A).

Figure 3-18 *SPN Bracket and SPN Distribution Board.*



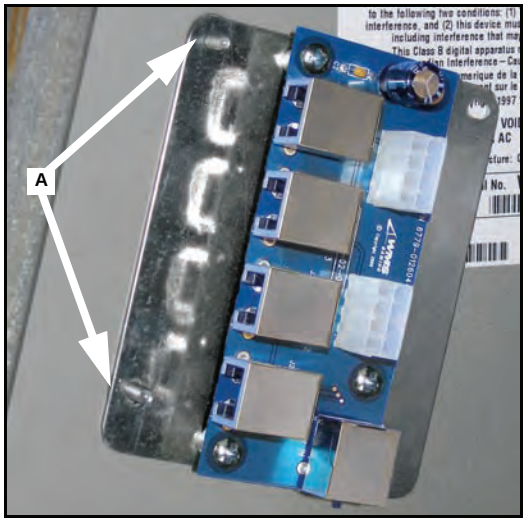
3. Ensure that the game power is set to OFF and disconnect the power cord from the outlet.
4. Using an 11/32" nut driver, remove the 8-32 Keps nut from the top ground braid on the left side of the inside of the cabinet, Figure 3-19 (A).

Figure 3-19 *Remove Top Ground Braid.*



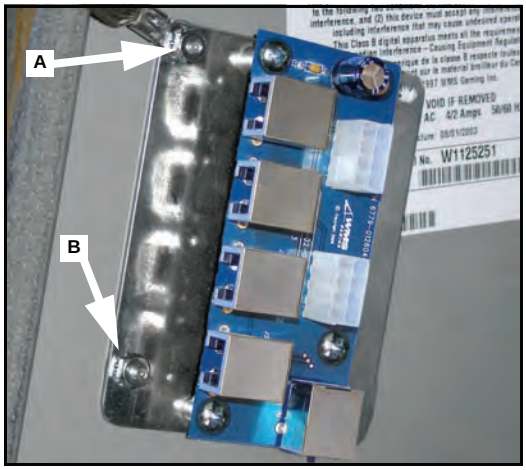
5 Align the two mounting holes on the SPN Bracket, Figure 3-18 (B), with the top two 8-32 mounting studs on the left wall of the cabinet, Figure 3-20 (A).

Figure 3-20 *Mount the SPN Distribution Board and Bracket.*



6 Replace the ground braid over the top 8-32 mounting stud and the SPN Distribution Board, Figure 3-21 (A).

Figure 3-21 *Replace ground braid.*



7 Add a second 8-32 Keps nut to the bottom stud, Figure 3-21 (B).

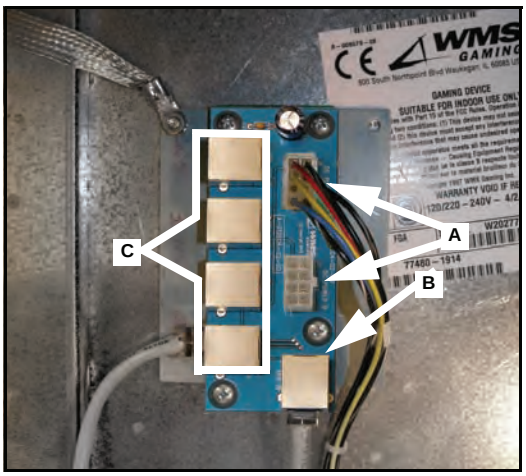
8 Use an 11/32" nut driver to tighten the two 8-32" Keps nuts, Figure 3-21 (A) and Figure 3-21 (B), to secure the SPN bracket and ground braid.

Connect the SPN Distribution Board

Complete the following steps to connect the SPN Distribution Board:

1. Connect either end of the 8-pin DC Power Cable (H-013768-04) to either of the 8-pin connectors on the SPN Distribution Board, Figure 3-22 (A).

Figure 3-22 *Connect the DC Power and two SPN Cables.*



2. Connect the other end of H-013768-04 to either J16 or J22 (labeled "Aux Power") on the Bulkhead Board.
3. Connect the 32-inch SPN Cable (5851-0077962-16) to J1 (labeled "SPN IN") on the SPN Distribution Board, Figure 3-22 (B).
4. Connect the other end of the 32-inch SPN Cable to J3 (labeled "SPN") on the Bulkhead Board.
5. Connect the 66-inch SPN Cable (5851-007962-33) to any of the "SPN Out" ports on the SPN Distribution Board, Figure 3-22 (C). The other end of this cable will be connected to the Universal Animator in the procedure, *Connect the Universal Animator (with SPN Distribution Board)*.

Connect the Universal Animator

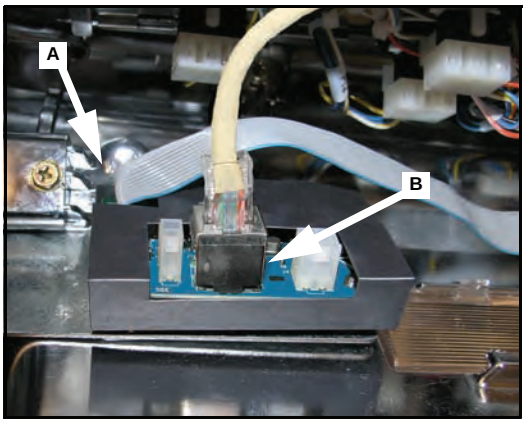
Follow the procedures in this section to connect the Universal Animator Board.

Connect the Universal Animator (with SPN Distribution Board)

Complete the following steps to connect the Universal Animator when an SPN Distribution Board is present:

1. Connect the 8-inch Ribbon Cable from the back of the large oval button to the Universal Animator, Figure 3-23 (A).

Figure 3-23 *Universal Animator connections.*



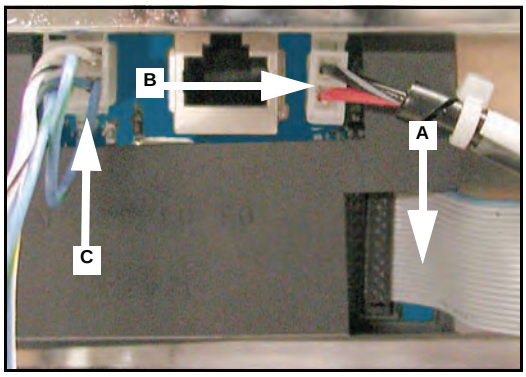
2. Take the other end of the 66-inch SPN Cable (plugged into the SPN Distribution Board in step 5 of the procedure, *Connect the SPN Distribution Board*), and connect it to the Universal Animator, Figure 3-23 (B).

Connect the Universal Animator (without SPN Distribution Board)

Complete the following steps to connect the Universal Animator when no SPN Distribution Board is present:

1. Connect the 8-inch Ribbon Cable to the Universal Animator, Figure 3-24 (A).

Figure 3-24 *Connect the Ribbon Cable to the Universal Animator.*



2. Connect the Button Panel (+5V~) cable (H-012478-01) to the Universal Animator, Figure 3-24 (B).
3. Connect the 4-pin Lamp Matrix portion of the Cable, Figure 3-24 (C), to the Universal Animator

Bose® Audio System Maintenance

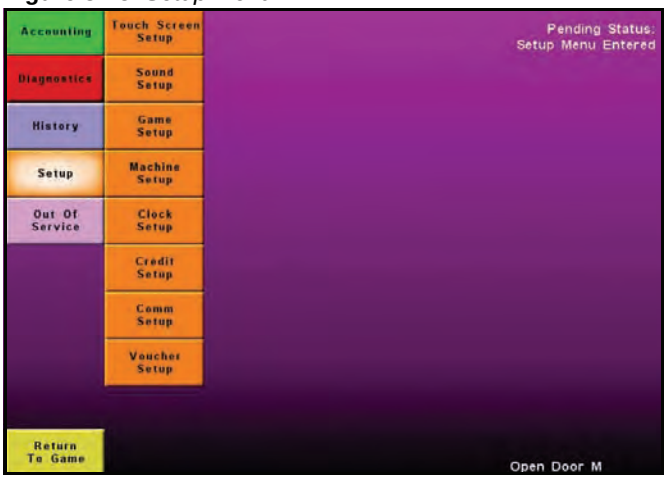
The Bose Sound System features superb sound quality and clear directionality. Complete the following steps to adjust the volume:

NOTE: *The Bose® Sound System contains no serviceable parts and must be replaced as a unit. Do not remove speaker screens.*

1 Press the **DIAGNOSTIC** button. The *Administration Menu* displays.

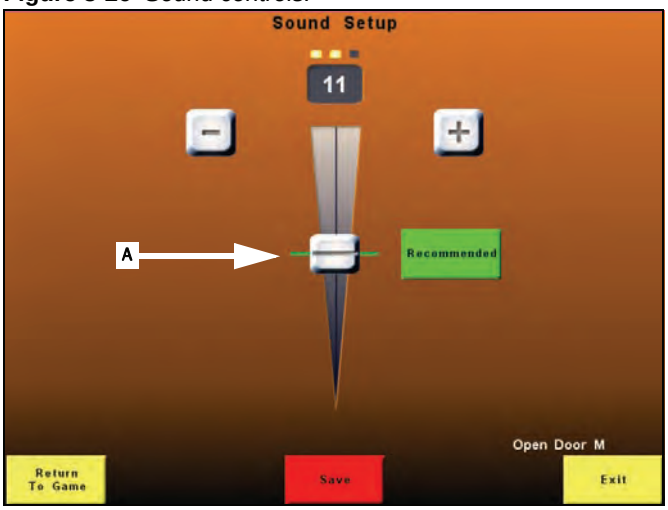
2 Select **Setup**. The *Setup Menu* displays, Figure 3-25.

Figure 3-25 *Setup Menu.*



3 Select **Sound Setup**. The *Sound Setup* screen appears, Figure 3-26.

Figure 3-26 *Sound controls.*



4 Adjust the volume by touching the slider, Figure 3-26 (A), and moving your finger up or down.

5 Slowly move the volume slider to the desired sound output level.

6 Once the volume is set to the preferred level, select **Save**. The *Setup Menu* displays.

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Overview

The purpose of this chapter is to guide the troubleshooting steps and considerations for the BBU Video game. In addition to several basic conditions, this chapter explains the functionality of diagnostic tools that thoroughly ensure game functionality, as well as tools for identifying operational errors in the game.

Errors in game functionality are communicated via **Tilt Codes**, which display on the LCD when the error occurs. Reference the tables in the Tilt Codes section of this chapter for a complete list of Errors and Solutions.

Tower Light Codes

The two-stage Tower Light on top of the game indicates status. The game employs both levels of the Tower Light to convey information. The following table contains the typical Tower Light indicators (some jurisdictions have different Tower Light functionality). The upper portion of the tower light is the Attendant indicator; the lower portion is the Service indicator. The lights illuminate for several reasons, and characterize the exact nature of the event causing the indication. Each light has five states--Off, On, Slow Flash, Medium Flash, and Fast Flash. Fast Flash blinks eight times a second, Medium Flash blinks four times a second, and Slow Flash blinks twice per second. The Tower Light codes are described in Table 4-1.

Table 4-1 *Tower Light troubleshooting.*

Typical Tower Light Codes Troubleshooting Guide		
Tower Light Section	**Tower Light Activity**	**Meaning**
Top	Off	Game is idle.
	On	Change request or game disabled.
	Slow flash	Tilt, Jackpot Mode, or low printer paper.
	Fast Flash	Administration mode.
Bottom	Off	Doors are closed and game is idle.
	On	Doors are closed and game is disabled.
	Slow flash	Jackpot mode.
	Med. Flash	Main door is open.
	Fast Flash	Drop door is open.

Basic Game Troubleshooting

Reference Table 4-2 for a list of basic BBU troubleshooting steps.

Table 4-2 *Basic Game Troubleshooting.*

Game Condition	Troubleshooting Steps
The game is plugged in and the LCD is blacked out.	**1** Check the power cord from the Power Entry Assembly to the power strip. **2** Check the power cord into the transformer. **3** Check the fuse on the transformer. **4** Reseat the CPU. **5** Check the LED lights on the right side of Bulkhead Board. **6** Check the power cable from the Bulkhead Board to the LCD. **7** Check the VGA cable from the CPU to the LCD. **8** Replace the LCD. **9** Replace the entire Power Entry Assembly. **10** Check the power strip under the game to see if it has been tripped (if applicable). **11** Replace the CPU.
No player tracking communication to the back end, Host Comm error, or Protocol error.	**1** Configure the game options. **2** Configure the player tracking options on both the game and the back end. **3** Check the two pin connection on the Bulkhead Board from the Power Entry Assembly. **4** Check the LED power lights on the Bulkhead Board. **5** Check the harness that goes connects the SMIB to Comm Ports 1 or 2 on the Bulkhead Board. **6** Replace the entire Power Entry Assembly. **7** Replace the SMIB.
Game comes up with a double call attendant window or No Trigger errors.	**1** Replace the BIOS chip. **2** Replace the SPI chip. **3** Replace both chips at the same time. **4** Replace the CPU.
Game keeps rebooting.	**1** Replace the entire Power Entry Assembly. **2** Replace the CPU.
Buttons are not working.	**1** Check the connection from the Button Panel to the Belly Door. **2** Check connection from Belly Door to the Bulkhead Board. **3** Check the button micro switches and replace where necessary. **4** Replace the CPU. **5** Replace the Bulkhead Board.
Game is not booting up all the way.	**1** Check the size of the OS memory card. **2** Replace the OS CompactFlash card. **3** Replace the game software CompactFlash Card. **4** Replace RAM Clear CompactFlash card. **5** Replace the BIOS chip. **6** Replace the CPU.
Assert fail.	**1** Replace RAM clear chip. **2** Replace CPU. **3** Replace OS CompactFlash card. **4** Replace software CompactFlash card.
Game and OS mismatch.	**1** Change OS CompactFlash Card. **2** Change game software CompactFlash Card. **3** Replace CPU.

Table 4-2 *Basic Game Troubleshooting. (continued)*

Game Condition	Troubleshooting Steps
Tower Light not working.	**1** Check to see if Tower Light is connected to Top Box Connector Plate. **2** Check connection to Bulkhead Board. **3** Replace Tower Light Bulbs. **4** Replace CPU. **5** Replace Bulkhead Board.
Errors showing T, or P (Top Box Logic Door or Top Box Switch) with no top LCD.	**1** Verify connection to Top Box Connector Plate. **2** Verify Connection to Bulkhead Board. **3** Replace CPU. **4** Replace Bulkhead.
Whole game is blacked out.	**1** Verify connection to outlet. **2** Verify the Power Strip under the game to see if it has been tripped (if applicable). **3** Check to see if the power plug is connected to the transformer. **4** Check fuse on transformer. **5** Replace transformer. **6** Replace Power Entry Assembly. **7** Replace Power Strip. **8** If necessary, install an entirely new set of Power Components (transformer, Power Entry Assembly, Power Strip). **9** Replace CPU.
Sleeping forever error.	Perform a RAM Clear.

Diagnostic Tools

CPU-NXT™ includes diagnostic tools to test game components and verify functionality. Some of the components that are tested using the *Administration Menu* include:

- Compact Flash
- EEPROMS
- Bill Acceptor
- Coin Acceptor
- Hopper
- Printer

Reference the following sections for detailed steps on troubleshooting these components.

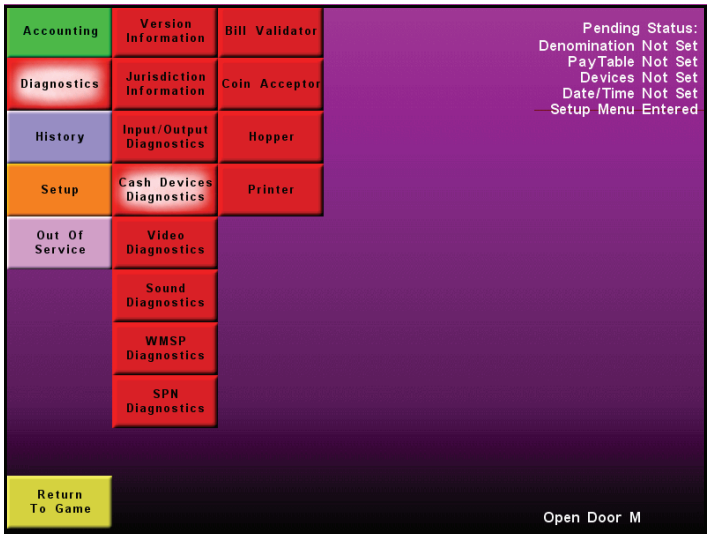
Cash Devices Diagnostics

The *Diagnostics Menu*, Figure 4-1, includes an added **Cash Devices** option, which allows you to perform the following tests:

- Bill Validator Test (for tickets and vouchers)
- Coin Acceptor Test (counting coins sent to either the Hopper or Drop)
- Hopper Tests (1-coin or 10-coin test, with counter displayed)
- Printer Test (printing a void ticket)

NOTE: *Before initiating any Cash Devices tests, ensure that the devices are correctly set. To set the device, select* **Device Setup** *from the Machine Setup screen,* Figure 4-1*.*

Figure 4-1 *Diagnostics Menu.*

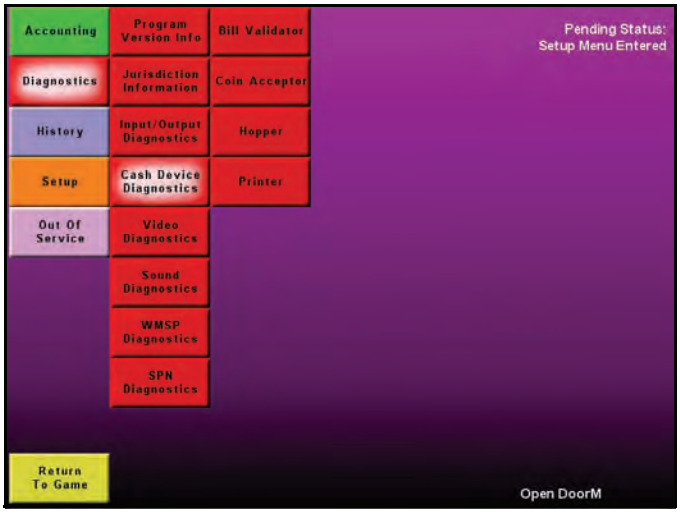


Bill Acceptor Test

Complete the following steps to initiate a *Bill Acceptor Test*:

1. From the *Administration Menu*, select **Diagnostics.**
2. Select **Input/Output Diagnostics**.
3. Select **Cash Device Diagnostics**, Figure 4-2.

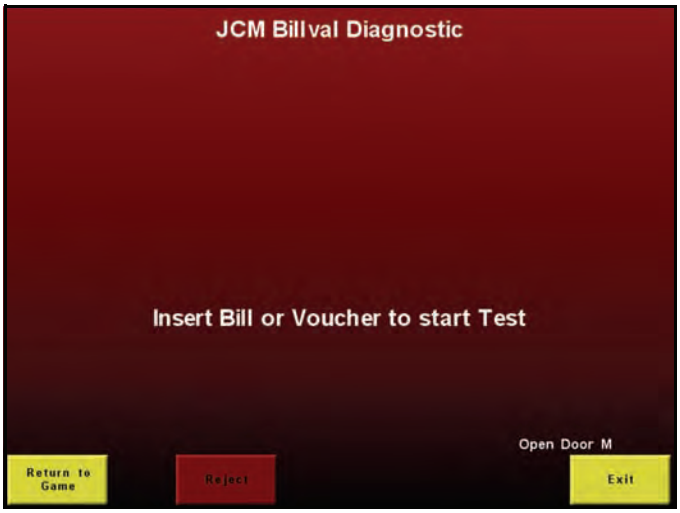
Figure 4-2 *Cash Device Diagnostics Menu.*



4. Select **Bill Validator**.

   The *Bill Validator Diagnostic* screen displays, Figure 4-3.

Figure 4-3 *JCM Billval Diagnostic screen.*



5. Insert a valid bill or voucher into the Bill Acceptor.

6 A message regarding the inserted bill or voucher displays, Figure 4-4 or Figure 4-5.

Figure 4-4 *JCM Billval Diagnostic screen: $20 bill example.*

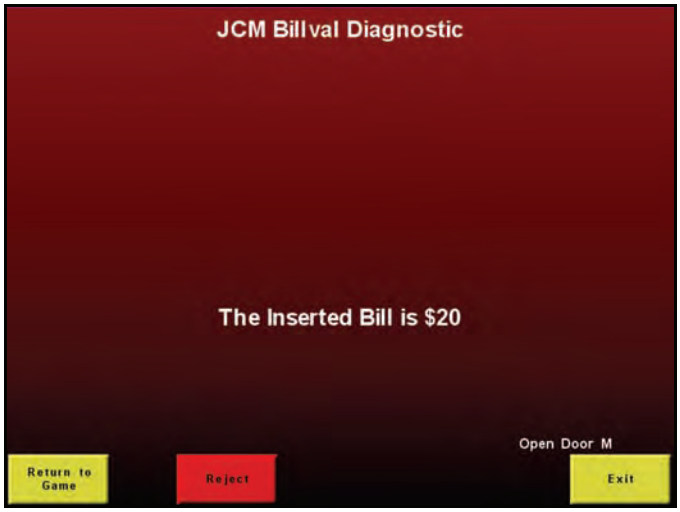
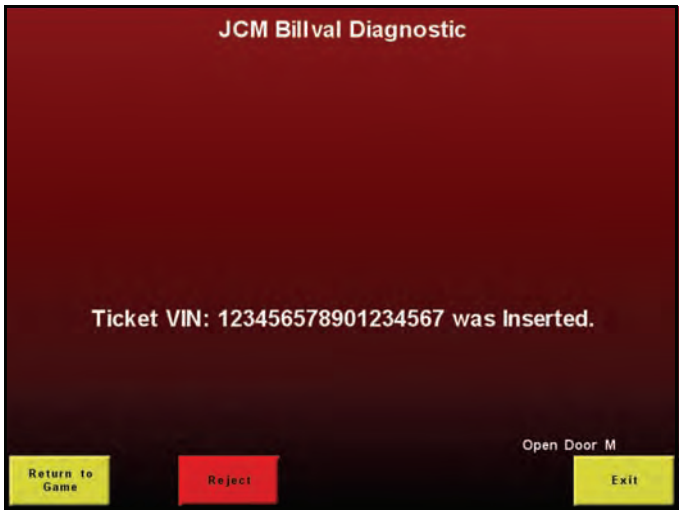


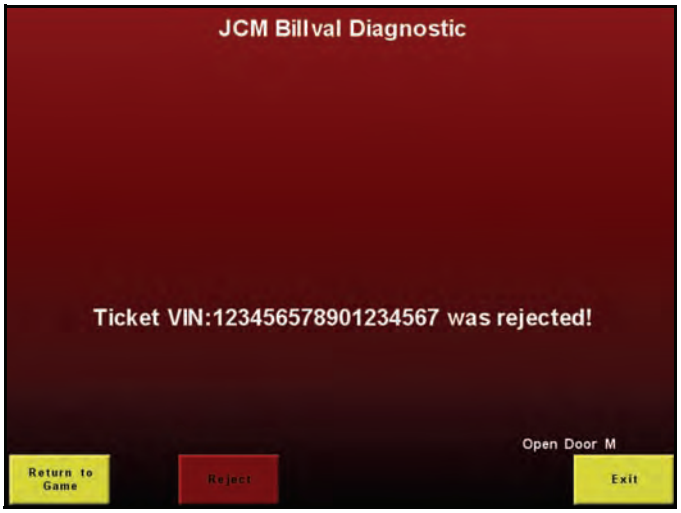
Figure 4-5 *JCM Billval Diagnostic screen: ticket.*



7 Select **Reject** to return the bill or ticket. A message displays to denote the successful rejection, Figure 4-6.

NOTE: *After a time-out period, the Bill Acceptor rejects the bill or voucher automatically.*

Figure 4-6 *JCM Billval Diagnostic screen.*



8 Press **Exit** or **Return to Game**. An *Exit* banner displays for 2.5 seconds, ensuring that the Bill Acceptor is disabled, Figure 4-7.

Figure 4-7 *Exit banner.*

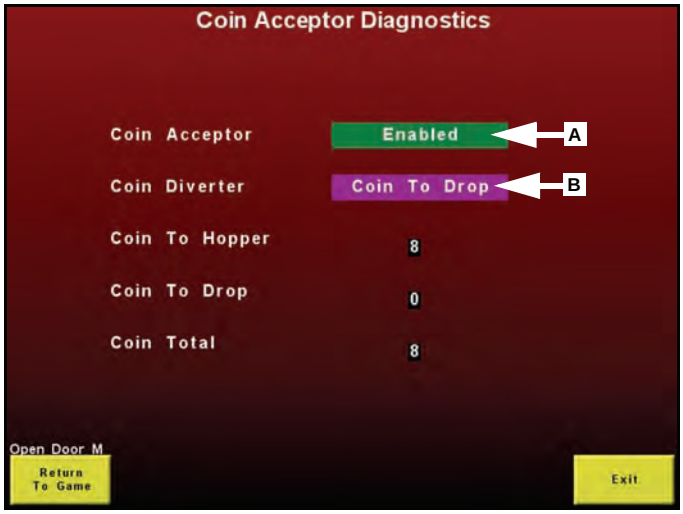
Coin Acceptor Diagnostics

Complete the following steps to access the Coin Acceptor Test:

1. From the *Administration Menu*, select **Diagnostics.**
2. Select **Input/Output Diagnostics**.
3. Select **Cash Devices Diagnostics**.
4. Select **Coin Acceptor**.

   The *Coin Acceptor Diagnostic* screen displays, Figure 4-8.

Figure 4-8 *Coin Acceptor Diagnostics screen.*



5. Touch inside the **Coin Acceptor** field to toggle the setting to **Enabled**, Figure 4-8 (A).
6. Touch inside the **Coin Diverter** field to toggle between **Coin To Hopper** and **Coin To Drop** to indicate where the coins are being routed, Figure 4-8 (B).
7. Insert coins.
8. The number of coins inserted increments each of the fields as follows:
   - *Coin To Hopper* = Coins routed to Hopper.
   - *Coin To Drop* = Coins routed to the Drop, or coins routed to the Drop once Hopper is full.
   - *Coin Total* = The total number of coins in the Hopper and Drop.
9. Verify that the coin count increments each time a coin is inserted.

NOTE: *The coin count accumulated during this Diagnostic Test does not affect the Accounting Coin In meter. This coin count is for the purpose of testing the Coin Acceptor only.*

10. When the test is complete, select **Exit**.
11. An *Exit* banner displays for 2.5 seconds to disable the Coin Acceptor.

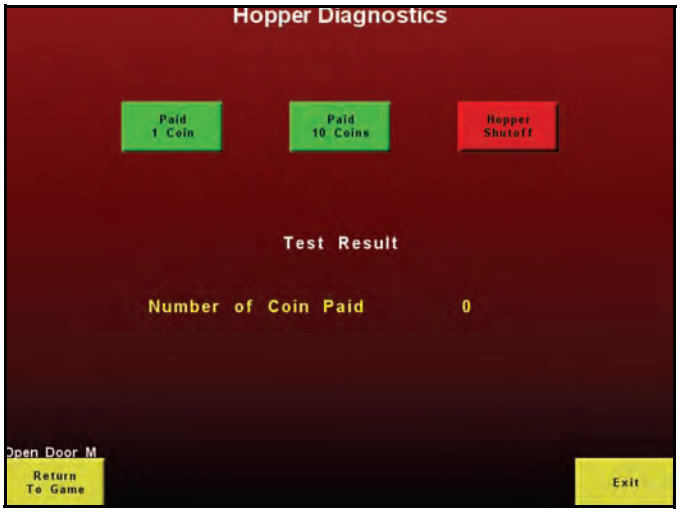
Hopper Diagnostics

Complete the following steps to test the Hopper:

1. From the *Administration Menu*, select **Diagnostics.**
2. Select **Input/Output Diagnostics**.
3. Select **Cash Devices Diagnostics**.
4. Select **Hopper**.

   The *Hopper Diagnostic* screen displays, Figure 4-9.

Figure 4-9 *Hopper Diagnostics screen.*



5. Perform a 1-Coin test:
   - **a** Select **Paid 1 Coin**.
   - **b** The Hopper dispenses a single coin.
   - **c** The *Coin Paid* counter increments to *1*.
6. Perform a 10-Coin test:
   - **a** Select **Paid 10 Coins**.
   - **b** The Hopper dispenses 10 coins.
   - **c** The *Coin Paid* counter increments to *10*.
7. If necessary, select **Hopper Shutoff** to stop the Hopper from dispensing coins.
8. When the test is complete, select **Exit**.
9. Under special circumstances, such as when the Main Door is closed as the test is completing, an *Exit* banner displays for 2.5 seconds.

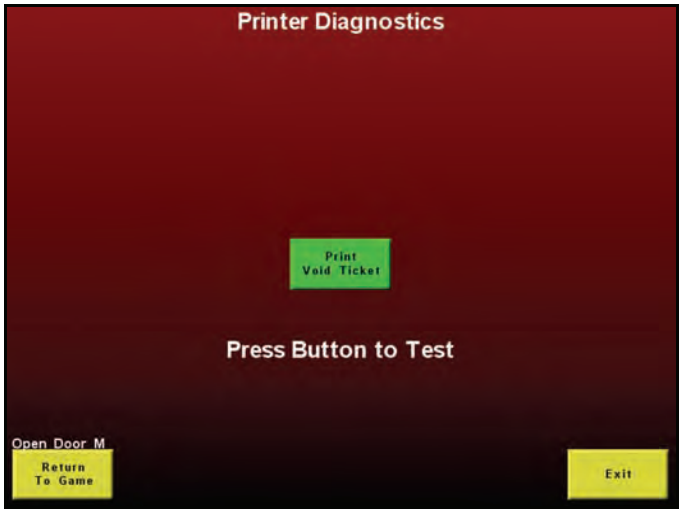
Printer Diagnostics

Complete the following steps to test the Printer:

1. From the *Administration Menu*, select **Diagnostics.**
2. Select **Input/Output Diagnostics**.
3. Select **Cash Devices Diagnostics**.
4. Select **Printer**.

   The *Printer Diagnostic* screen displays, Figure 4-10.

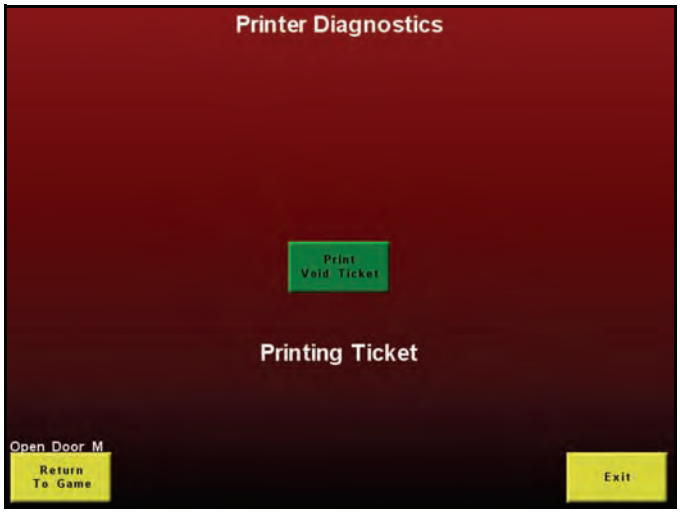
Figure 4-10 *Printer Diagnostics screen.*



5. Select **Print Void Ticket**.

   A ticket prints while displaying a message on the screen, Figure 4-11.

Figure 4-11 *Printer Diagnostics screen.*



6. Verify that a ticket printed.
7. Select **Exit** once the test is complete.

Progressive Diagnostics

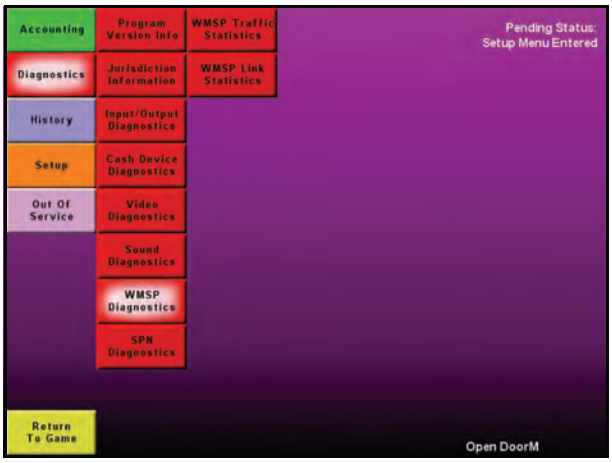
Reference this section for Progressive Diagnostics:

WMSP Diagnostics - Traffic Statistics

This function displays WMS Progressive traffic data corresponding to the game. Complete the following steps:

1. From the *Administration Menu*, select **Diagnostics.**
2. Select **WMSP Diagnostics**, Figure 4-12.

Figure 4-12 *WMSP Diagnostics menu.*



3. Select **WMSP Traffic Statistics**, Figure 4-12.

   The *WMSP Traffic Statistics* screen displays, Figure 4-13.

Figure 4-13 *WMSP Traffic Statistics screen.*

4. Select **Update Data** to refresh the displayed data.
5. Select **Exit** to return to the *Administration Menu*.

WMSP Diagnostics - Link Statistics

This function displays WMS Progressive statistical link data corresponding to the game. Complete the following steps:

1. From the *Administration Menu*, select **Diagnostics.**
2. Select **WMSP Diagnostics**, Figure 4-12.
3. Select **WMSP Link Statistics**, Figure 4-12.

   The *WMSP Link Statistics* screen displays, Figure 4-14.

Figure 4-14 *WMSP Link Statistics screen.*

4. Select **Update Data** to refresh the displayed data.
5. Select **Exit** to return to the *Administration Menu*.

SPN Diagnostics

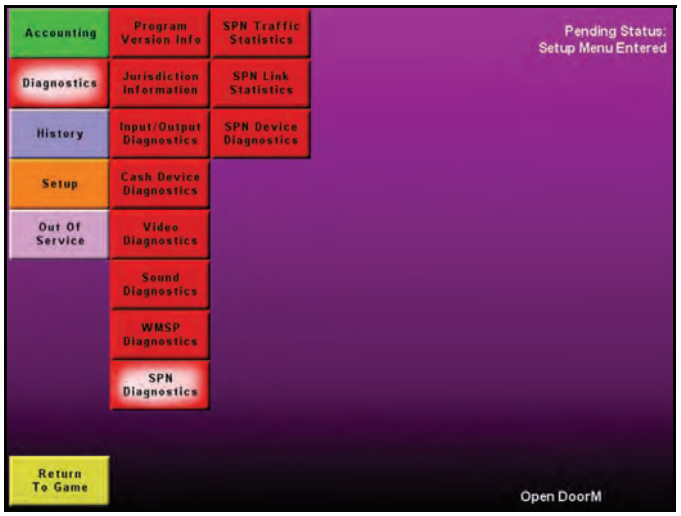
The Progressive System is a Smart Peripheral Network (SPN) device. Reference this section for SPN Diagnostics.

SPN Diagnostics - Traffic

This function displays SPN traffic data corresponding to the game. Complete the following steps:

1. From the *Administration Menu*, select **Diagnostics.**
2. Select **SPN Diagnostics**, Figure 4-15.

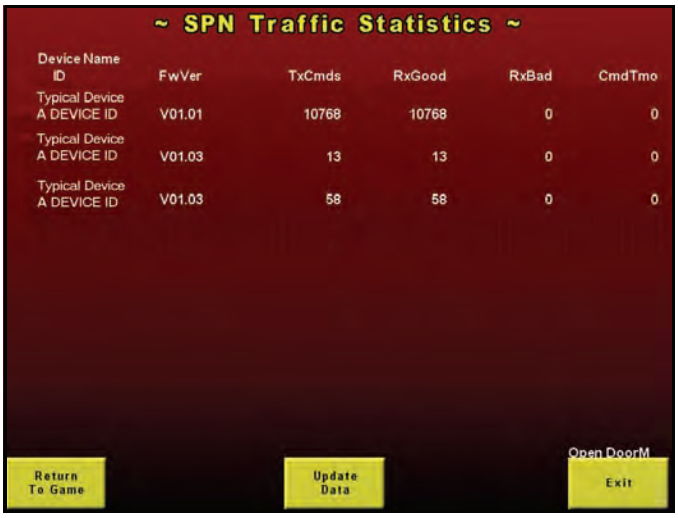
Figure 4-15 *SPN Diagnostics menu.*



3. Select **SPN Traffic Statistics**, Figure 4-15.

   The *SPN Traffic Statistics* screen displays, Figure 4-16.

Figure 4-16 *SPN Traffic Statistics screen.*



4. Select **Update Data** to refresh the displayed data.
5. Select **Exit** to return to the *Administration Menu*.

SPN Diagnostics - Link Statistics

This function displays SPN link data corresponding to the game. Complete the following steps:

1. From the *Administration Menu*, select **Diagnostics.**
2. Select **SPN Diagnostics**, Figure 4-15.
3. Select **SPN Link Statistics**, Figure 4-15.

   The *SPN Link Statistics* screen displays, Figure 4-17.

Figure 4-17 *SPN Link Statistics screen.*

4. Select **Update Data** to refresh the displayed data.
5. Select **Exit** to return to the *Administration Menu*.

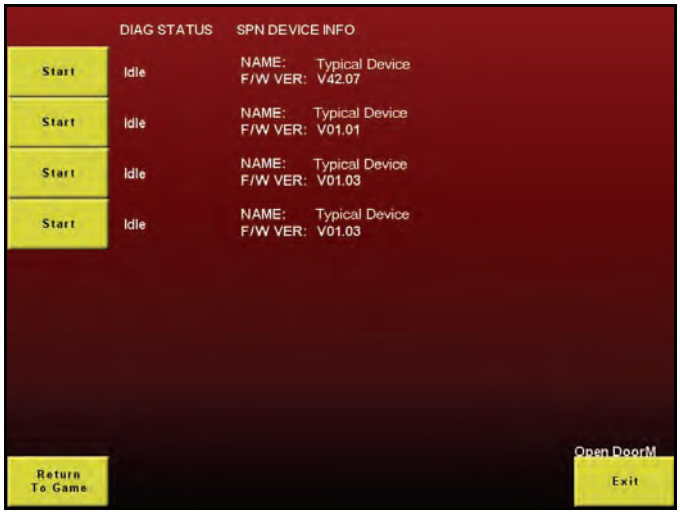
SPN Devices Diagnostics

This function displays data for each individual SPN device in the game. Complete the following steps:

1. From the *Administration Menu*, select **Diagnostics.**
2. Select **SPN Diagnostics**, Figure 4-15.
3. Select **SPN Device Diagnostics**, Figure 4-15.

   The *Device Diagnostics* screen displays with installed SPN devices and their firmware version data, Figure 4-18.

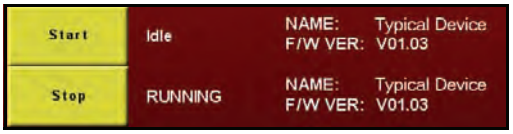
Figure 4-18 *SPN Device Diagnostics screen.*



4 To perform an SPN device diagnostic test, select **Start** next to the desired device.

The *Device Diagnostics* screen displays the device actively running its diagnostic test, Figure 4-19.

Figure 4-19 *Active SPN device diagnostic example.*



See Table 4-3 for information on the individual SPN device diagnostic tests.

Table 4-3 *SPN device diagnostic tests*

Test	Description
Progressive Meter	Changes the color of the Progressive Meter display.
Universal Animator	Lights up all the LEDs in the Animator Button.

5 To end the diagnostic test, select **Stop**.

6 Select **Exit** to return to the *Administration Menu*.

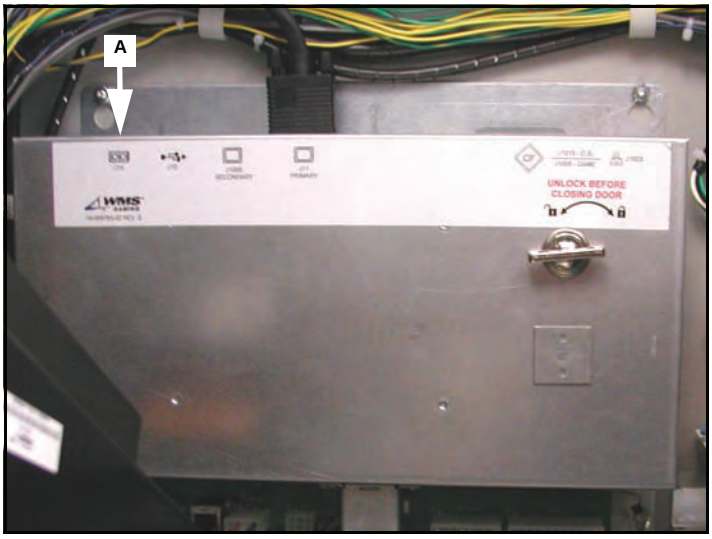
Using SVC/GAT

Complete the following steps to use a software verification (SVC)/game authentication terminal (GAT) to verify game software components:

1 Open the Main Door.

2 Using an SVC or GAT terminal, connect a standard serial cable to the J14 connector on the Bluebird Video CPU Board, Figure 4-20 (A).

Figure 4-20 *Bluebird (Upright) CPU Enclosure.*



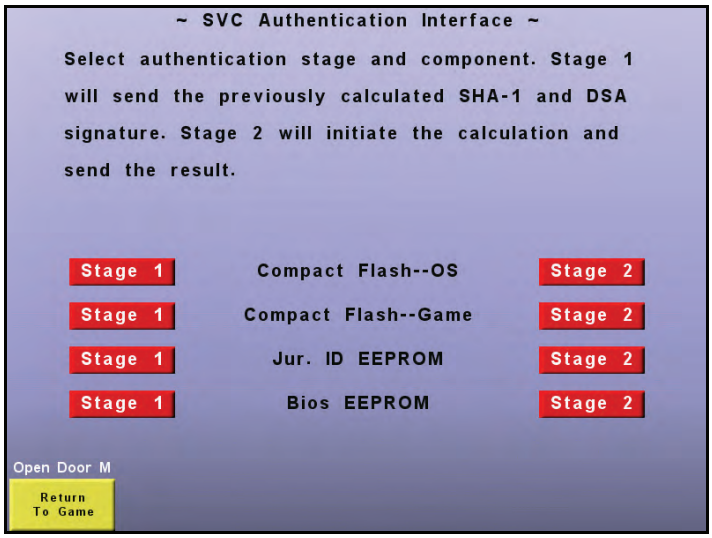
3 Press the DIAGNOSTIC button.

4 Select **SVC/GAT**, Figure 4-21.

Figure 4-21 *SVC/GAT on the Administration Menu.*

The *SVC Authentication Interface* screen displays, Figure 4-22.

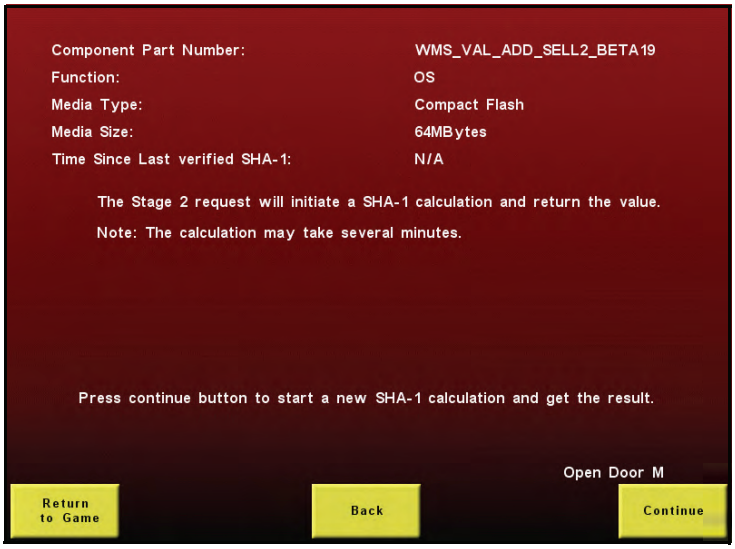
Figure 4-22 *SVC Authentication Interface screen.*



5 Select the **Stage 1** or **Stage 2** button to verify any of the available software components.

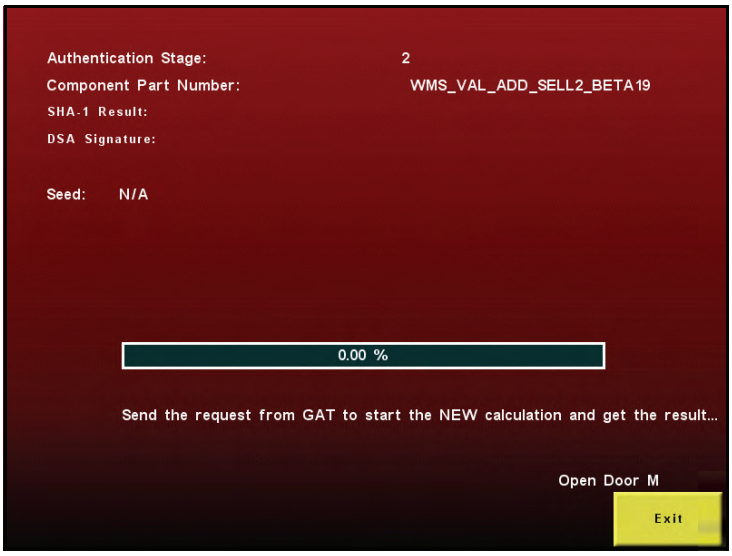
6 Depending on the component selected, an information screen displays, identifying the *Part Number*, *Function*, *Media Type*, *Media Size*, and *Time Since Last Verified*, Figure 4-23.

Figure 4-23 *OS Authentication Level 2 screen.*



7 Follow the instructions provided on the screen to perform the authentication, Figure 4-24.

Figure 4-24 *OS Authentication Level 2 screen example.*



8 Send the request from the SVC/GAT (as requested on the screen) to collect results.

9 The results display on the SVC/GAT. If necessary, consult the SVC/GAT documentation for more information on utilizing the application or terminal.

10 When testing is complete, select **Exit**.

Tilt Codes

Refer to Table 4-4 for a definition and possible solution(s) for the tilts displayed by a CPU-NXT game.

Table 4-4 *Tilt Codes .*

Display	Definition	Possible Solution(s)
Assert Fail	Message displays: Machine Fault Assert: Assertion=Success File=\SDG\framework\libslot\bid\twentylineproxy. Function=voidCtwentylineProxy:activate[]	■ When doing a RAM clear, be sure to wait for RAM clear to complete. ■ Check RAM clear chip. ■ Check CPU. ■ Check memory card. ■ Check software.
Bill Jam Service Door Open	Bill Acceptor Service Door is open.	■ Check the Bill Acceptor Service Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
BillVal Acceptor Jam	The Bill Acceptor reported that an inserted bill or ticket is jamming the acceptor.	Check the Bill Acceptor for jammed bills or tickets.
BillVal Com Error	The Bill Acceptor connector is disconnected or the Bill Acceptor head is removed.	■ Check the Bill Acceptor connection to the Bulkhead Board. ■ Check Device settings.
BillVal Device Error	The Bill Acceptor reported that one of the following components has failed: ■ Bill Acceptor ■ Stack Motor ■ Feed Motor ■ RAM ■ ROM	Replace the Bill Acceptor head.
BillVal Door Open	Bill Acceptor Door is open.	■ Check the Bill Acceptor Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
BillVal Port Error	An attempt to open, close, read, or write through the COM port on the Bulkhead Board has failed. The Bulkhead Board is not communicating with the Bill Acceptor through the COM Port.	■ Test UART on Bulkhead Board. ■ Reseat Bill Acceptor and check if communication is restored.
BillVal Reject Limit	More than ten bills or tickets were rejected in a row.	■ Open and close the Main Door. ■ Clean and calibrate (if applicable).
BillVal Stacker Full	The Cashbox is full.	Replace the full Cashbox.
BillVal Stacker Jam	The Bill Acceptor reports a jam in the Cashbox.	Check the Cashbox for jammed bills or tickets.
BillVal Stacker Open	The Cashbox is removed.	Replace the Cashbox or verify that it is properly seated. ■ Check connections on cherry switch ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
BillVal Tamper	The Bill Acceptor reported a tamper.	Check the Bill Acceptor for evidence of stringing or other cheating attempts.
CashOut To Host Failed	Displays when attempting to cashout to the host and host fails to respond.	Check host connection.
Closure B	Belly Door was closed.	No action required. Error clears after one game is played.

Table 4-4 *Tilt Codes (continued).*

Display	Definition	Possible Solution(s)
Closure D	Drop Door was closed.	No action required. Error clears after one game is played.
Closure H	Hatch Door was closed. (Slant ONLY)	No action required. Error clears after one game is played.
Closure L	Logic Door was closed.	No action required. Error clears after one game is played.
Closure M	Main Door was closed.	No action required. Error clears after one game is played.
Closure P	Top Box Logic Door was closed.	No action required. Error clears after one game is played.
Closure S	Bill Acceptor Cashbox Door was closed.	No action required. Error clears after one game is played.
Closure T	Top Box Main Door was closed.	No action required. Error clears after one game is played.
Closure V	Bill Acceptor Door was closed.	No action required. Error clears after one game is played.
Coin Acceptor Device Error	The Coin Acceptor reported a device error. For the MC40 and the IDX C480431, a device error is reported if: ■ A coin is behind the comparator (coil) ■ The lower optic is blocked (the lower optic before the upper optic) ■ A reverse coin was detected ■ The rake solenoid is faulty (the rake is held down) For the IDX C480435, a device error is reported if: ■ There was no sense signal with an optic signal ■ There was a sense signal with no optic signal	Check the Coin Acceptor and optics for coin jams.
Coin Acceptor Jam	The Coin Acceptor reported that one or more coins are jammed in the coin path.	Check Coin Acceptor and optics. Clear any jammed coins.
Coin Acceptor System Error	The Coin Acceptor detected that the coin in signals did not occur in the expected order.	Check the Coin Acceptor connection at the Bulkhead Board.
Coin Acceptor Tamper	The Coin Acceptor reported that a tamper occurred. For the MC40 and the IDX C480431, a tamper is reported if the sample coin was removed. For the IDX C480435, a tamper is reported if a reverse coin was detected.	Check the Coin Acceptor for evidence of stringing or other attempts at cheating. If a sample coin is used, verify the sample coin is correct and properly seated.
Double Call Attendant	Two separate Call Attendant messages display.	■ Replace the BIOS chip. ■ Replace the SPI chip. If this does not work, replace both the BIOS and SPI chips at the same time. ■ Replace the CPU Board.
Drop Door Open	Drop Door is open.	■ Check the Drop Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
EPROM Device Error	Critical error: An improper or non-functional device was detected and all processes were suspended.	Replace the Bulkhead Board.

Table 4-4 *Tilt Codes (continued).*

Display	Definition	Possible Solution(s)
EPROM System Error	Critical error: An invalid signature ID was detected and all processes were suspended.	Perform the corresponding solution: ■ RAM Clear ■ Replace the CPU Board battery and RAM Clear.
Extra Coin Out	The OS detected a coin out after the payout was complete.	Check Hopper and knife.
Hard Meter 1 disconnected	The meter connector is disconnected.	■ Check the meter connection. If necessary, replace the meter harness. ■ Replace the CPU Board. ■ Replace Bulkhead.
Hard Meter 2 disconnected	The meter connector is disconnected.	■ Check the meter connection. If necessary, replace the meter harness. ■ Replace the CPU Board. ■ Replace Bulkhead.
Hard Meter 3 disconnected	The meter connector is disconnected.	■ Check the meter connection. If necessary, replace the meter harness. ■ Replace the CPU Board. ■ Replace Bulkhead.
Hard Meter 4 disconnected	The meter connector is disconnected.	■ Check the meter connection. If necessary, replace the meter harness. ■ Replace the CPU Board. ■ Replace Bulkhead.
Hard Meter 5 disconnected	The meter connector is disconnected.	■ Check the meter connection. If necessary, replace the meter harness. ■ Replace the CPU Board. ■ Replace Bulkhead.
Hard Meter 6 disconnected	The meter connector is disconnected.	■ Check the meter connection. If necessary, replace the meter harness. ■ Replace the CPU Board. ■ Replace Bulkhead.
Hard Meter 1 shorted	The meter connector is shorted.	Check the meter connection. If necessary, replace the meter harness.
Hard Meter 2 shorted	The meter connector is shorted.	Check the meter connection. If necessary, replace the meter harness.
Hard Meter 3 shorted	The meter connector is shorted.	Check the meter connection. If necessary, replace the meter harness.
Hard Meter 4 shorted	The meter connector is shorted.	Check the meter connection. If necessary, replace the meter harness.
Hard Meter 5 shorted	The meter connector is shorted.	Check the meter connection. If necessary, replace the meter harness.
Hard Meter 6 shorted	The meter connector is shorted.	Check the meter connection. If necessary, replace the meter harness.
Hood Door Open	Hatch Door is open. (Slant ONLY)	■ Check the Hatch Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Hopper Device Error	The OS detected that the time between coin-out pulses was too short.	Perform a Hopper Test.
Hopper Empty	The OS detected that no coins were dispensed after a time out period.	Check or fill Hopper.
Hopper Jam	For the Gamesman, a jam condition is established if the motor stops during a payout.	Check the Hopper and clear any jams or debris from Hopper.
Hopper Runaway	The OS detected multiple coins out after the payout was complete.	Check Hopper electronics.
Hopper System Error	The OS detected an error not covered in the other error types.	Check the Hopper connection to the Bulkhead Board.

Table 4-4 *Tilt Codes (continued).*

Display	Definition	Possible Solution(s)
Hopper Tamper	The OS detected that the coin pulse was too short or the coin pulse occurred during no payout.	Check Hopper coin out switch.
IGM Bad Firmware Version	The firmware installed in the Progressive Meter is the incorrect version or it is outdated. The incorrect Progressive Meter hardware is installed.	Run SPN Diagnostics and make sure that the firmware version is correct. If the firmware is not correct, change the firmware and/or Progressive Meter.
InGameMeter Config Error	The Progressive Meter was not able to configure itself properly. The Progressive Meter may not be supporting all of the progressive levels configured in physical display.	Run SPN Diagnostics and make sure that the firmware version is correct. If the firmware is not correct, change the firmware and/or Progressive Meter.
Lamp Matrix Command Timeout	Lamp Matrix did not respond to the command sent.	Clear tilt by opening and closing Main Door. If the error continues, power cycle the game. Change the Lamp Matrix Controller Board if the problem persists.
Lamp Matrix Device Response Error	Lamp Matrix returned a bad response to the command sent.	Clear tilt by opening and closing Main Door. If the error continues, power cycle the game. Change the Lamp Matrix Controller Board if the problem persists.
Lamp Matrix Invalid Firmware Version	Lamp Matrix firmware version did not match the requirement.	Run SPN Diagnostics and make sure that the firmware version is correct. If the firmware is not correct, change the firmware.
Logic Door Open	Logic Door is open.	■ Check the Logic Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Machine Disabled	The Host has disabled the game.	Displays for various reasons, including SAS communication breakdown. Review Host System messages for detailed information.
Main Door Open	Main Door is open.	■ Check the Main Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
No Trigger XX Error (where X is a number)	Message displays: Machine Fault Assert: Assertion=Success File=\SDG\framework\libslot\bid\twentylineproxy. Function=voidCtwentylineProxy: activate[]	■ Replace the BIOS chip. ■ Replace the SPI chip. If this does not work, replace both the BIOS and SPI chips at the same time. ■ Replace the CPU Board.
NVRAM Battery 1 Low	The NVRAM battery 1 is low.	Replace CPU Battery at location BAT1.
NVRAM Battery 2 Low	The NVRAM battery 2 is low.	Replace CPU Battery at location BAT2.
NVRAM Corruption	Critical error: Corruption was detected in the Non-Volatile Random Access Memory (NVRAM) and all processes were suspended.	■ Turn the **Attendant Key** to display the fault information. ■ Turn the **Attendant Key** a second time to force a restart. ■ Replace the CPU Board.
NVRAM Device Error	Critical error: An improper or non-functional device was detected and all processes were suspended.	Replace the CPU Board.
NVRAM System Error	Critical error: An invalid signature ID was detected and all processes were suspended.	Perform the corresponding solution: ■ RAM Clear ■ Replace the CPU Board battery and RAM Clear.

Table 4-4 *Tilt Codes (continued).*

Display	Definition	Possible Solution(s)
Open Door B	Belly Door is open.	■ Check the Belly Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Open Door D	Drop Door is open.	■ Check the Drop Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Open Door H	Hatch Door is open. (Slant ONLY)	■ Check the Hatch Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Open Door L	Logic Door is open.	■ Check the Logic Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Open Door M	Main Door is open.	■ Check the Main Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Open Door P	Top Box Logic Door is open.	■ Check the Top Box Logic Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Open Door S	Bill Acceptor Cashbox Door is open.	■ Check the Bill Acceptor Stacker/ Cashbox Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Open Door T	Top Box Main Door is open.	■ Check the Main Top Box Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Open Door V	Bill Acceptor Door is open.	■ Check the Bill Acceptor Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Please Wait Transaction In Progress	Displays when transferring funds to/from the game.	Wait for the transaction to complete.
Power Cycle Required (OS SSOS-000-1300 and later).	Device setting was changed. NOTE: *In OS 1300 and later, the game no longer requires a RAM Clear due to machine device changes.*	Power cycle the game.

Table 4-4 *Tilt Codes (continued).*

Display	Definition	Possible Solution(s)
Power Fault while Printing	The Printer lost power while printing.	Check power connection to Printer.
Power Reset	The game powered up.	No action required. Error clears after one game is played.
Printer Carriage Jam	The Printer reported a carriage jam.	Check Printer head for jams.
Printer Close Error	The Printer reported an error after being closed.	Check Printer cabling.
Printer Com Error	The Printer communication was lost. A status reply has not been received from the Printer for ten seconds, during an Idle state.	Confirm that the Printer communication and power cables are sufficiently connected. Replace Printer Comm. Board.
Printer Com Lost During Print	During a print job, the Printer stopped replying to status requests.	Confirm that the Printer communication and power cables are sufficiently connected.
Printer Config Error	The Printer needs to be configured.	Check the Printer configuration in the *Administration Menu*.
Printer Device Error	The Printer reported an error with a component. ■ Head Failure ■ Voltage Failure ■ Temperature Failure ■ Bad Paper Index	Test or replace the Printer.
Printer Not Set	The Printer is not set up.	Set the Printer as a **Machine Device** from the *Setup Menu*.
Printer Off Line	The Printer reported an offline status.	Check Printer cabling.
Printer Open Error	The Printer reported an open status. For the Seiko/FutureLogic, the Printer detected a door open error, or a platen disengaged error.	Open and close the Printer.
Printer Out of Paper	The Printer detected an out of paper status, or a lost paper input status.	■ Refill the paper. ■ Check optic on printer.
Printer Paper In Chute	For the Netplex only, the Printer reported a paper in chute status.	Remove paper from chute.
Printer Paper Jam	The Printer reported a paper jam.	Check the Printer for jams and clear path.
Printer Paper Low	The Printer reported a paper low status.	■ Refill the paper. ■ Check optic on printer.
Printer Power Off	The Printer power is OFF.	■ Check the Aux. PDU. ■ Connections on Bulkhead.
Printer Receive Error	The Printer reported a receive error.	■ Check Printer cabling. ■ If necessary, replace cable.
Printer System Error	The Printer reported a system error. ■ Bad Library References ■ Bad Printer Region Data ■ Bad Buffer Space ■ Bad Job Memory ■ Bad Command	Test or replace the Printer.
Printer Timeout Error	For the Ithaca/Transact only, the Printer reported that a print process started with no errors, but the ticket complete flag was not reported.	Test or replace the Printer.
Printer Transmit Error	The Printer reported a transmit error.	Confirm the Printer communication and power cable connections.

Table 4-4 *Tilt Codes (continued).*

Display	Definition	Possible Solution(s)
Program Error	Critical error: A program detected an unrecoverable error and all processes were suspended.	■ Turn the **Attendant Key** to display the fault information. ■ Turn the **Attendant Key** a second time to force a restart. ■ A RAM Clear may be required.
Progressive Disabled	The game has received a valid progressive configuration from the Progressive Controller and is waiting for the Progressive Controller to enable the play function. The gaming device has lost communication with the progressive system.	■ This is cleared automatically when the game is enabled by Progressive Controller. ■ Inspect system to establish if a physical communication problem exists.
Progressive Response Error	The game has received certain information from the Progressive Controller which is unexpected or deemed incorrect, and the error cannot be automatically cleared.	Power cycle the game.
Progressive Sign Not Functioning	Displayed during game startup. If after game startup the error is still displayed, the attempt at In-Game meter configuration failed.	■ Enter and exit the game *Administration Mode* completely. ■ If the solution above is unsuccessful, replace In-Game Meter.
Progressive Unconfigured	The WMSP protocol has been configured and the Host has not recognized the required configuration information. This may be due to the following: ■ Game has not received a valid progressive configuration from the Progressive Controller. ■ There is no communication with the Progressive Controller or the communication is lost for more than 10 seconds. ■ Game was explicitly disabled by the Progressive Controller.	Perform the corresponding solution: ■ Verify connectivity to the Progressive Controller. Verify that game has been entered into the database at the controller and/or central system and that the data entered matches the actual game configuration. ■ Verify that the cables are functional. ■ Replace the Progressive Controller software. ■ Verify that the game has been configured in Admin.
Protocol Com Error	A com port error has occurred.	■ Check Host communication configuration in *Administration Mode*. ■ Verify that the game has been entered into the casino backend system.
Protocol Config Error	The protocol has not been configured or the Host has not sent the required validation information.	■ Check Host communication configuration in *Administration Mode*. ■ Verify that the game has been entered into the casino backend system.
RAM Error	Critical error: An unrecoverable error was detected in the Random Access Memory (RAM) and all processes were suspended.	■ Turn the **Attendant Key** to display error information. ■ Turn the key a second time to initiate a game restart. ■ If the problem continues, replace the RAM Module and the CPU.
Single Row Universal Animator Command Timeout	The Universal Animator Button did not respond to the command sent.	■ Clear tilt by opening and closing Main Door. If the error continues, power cycle the game. ■ Change the button if the problem persists. ■ Check or replace CAT 5.
Single Row Universal Animator Device Response Error	The Universal Animator Button returned a bad response to the command sent.	■ Clear tilt by opening and closing Main Door. If the error continues, power cycle the game. ■ Change the button if the problem persists.
Single Row Universal Animator Invalid Firmware Version	The Universal Animator Button firmware version did not match the requirement.	Run SPN Diagnostics and make sure that the firmware version is correct. If the firmware is not correct, change the firmware.
Sleeping Forever	Message displays: No more tasks for init - sleeping forever.	■ Reset the CPU board. ■ Check for bent pins on the Blind Mate Connectors on the Bulkhead Board.

Table 4-4 *Tilt Codes (continued).*

Display	Definition	Possible Solution(s)
Stacker Switch Open	Bill Acceptor Stacker Door is open.	■ Check the Bill Acceptor Stacker/Cashbox Door. ■ Check connections on cherry switch. ■ Replace switch. ■ Replace the CPU Board. ■ Replace Bulkhead.
Touch Screen Calibration Error	The controller reported an error during calibration.	■ Calibrate the Touch Screen. ■ Replace LCD.
Touch Screen Com Error	The controller connector is disconnected or a com port open error has occurred.	■ Check Touch Screen connectors. ■ Replace LCD.
Touch Screen Data Error	The controller sent invalid data.	■ Check the Bulkhead Board Touch Screen connector. ■ Replace LCD.
Touch Screen Device Error	The controller reported an initialization error.	■ Check the Touch Screen controller. ■ Replace LCD.
Waiting For Progressive Win Amount	A progressive win has occurred and the game is waiting to receive the confirmed progressive win amount from the Progressive Controller. This condition clears itself automatically once the confirmed win amount is received. If the game does not receive a confirmed win amount within 60 seconds of reporting the win to the controller, Tower Light flashes slowly to notify attendant that a manual payout of the win is required.	While waiting for the confirmed win amount to display, the operator may turn the Attendant Key to clear the error and cause the game to abort. If this occurs, it is then necessary to determine the confirmed win amount manually.

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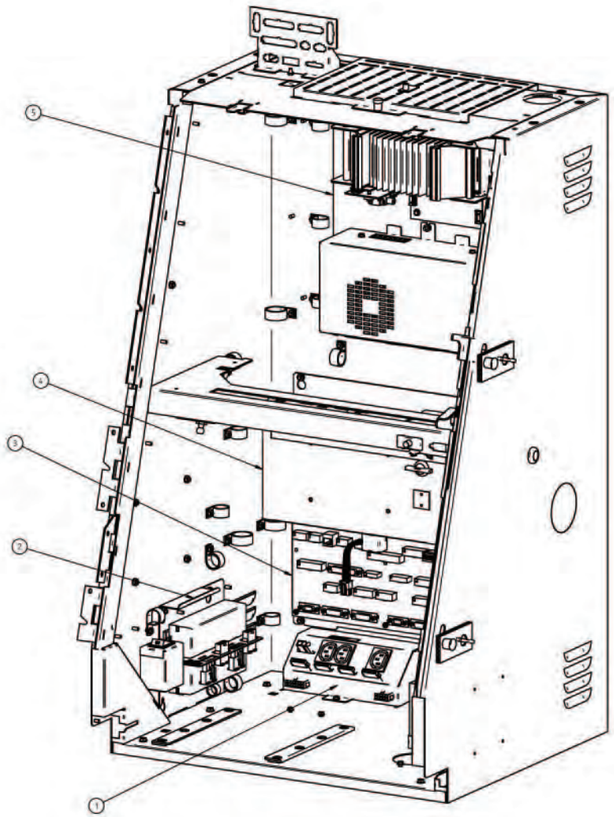
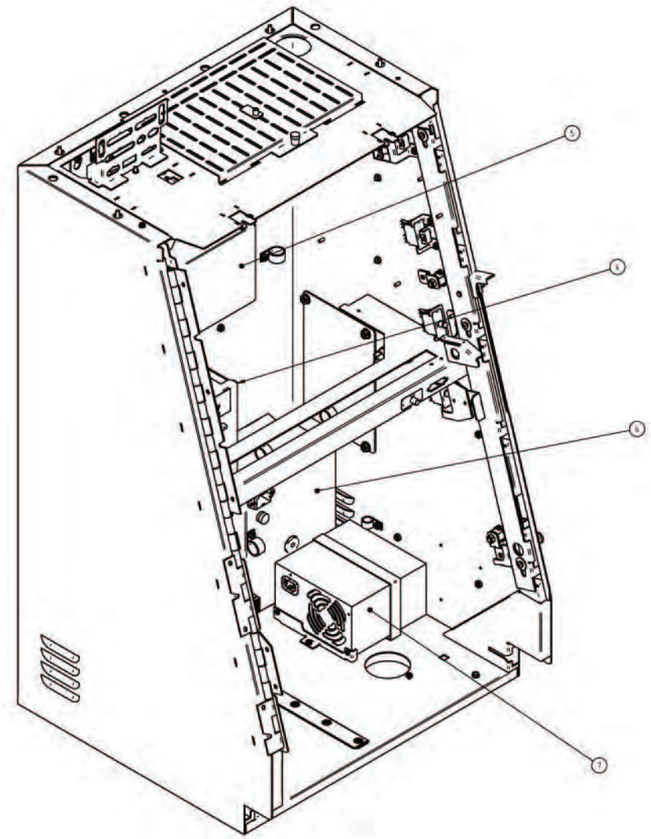
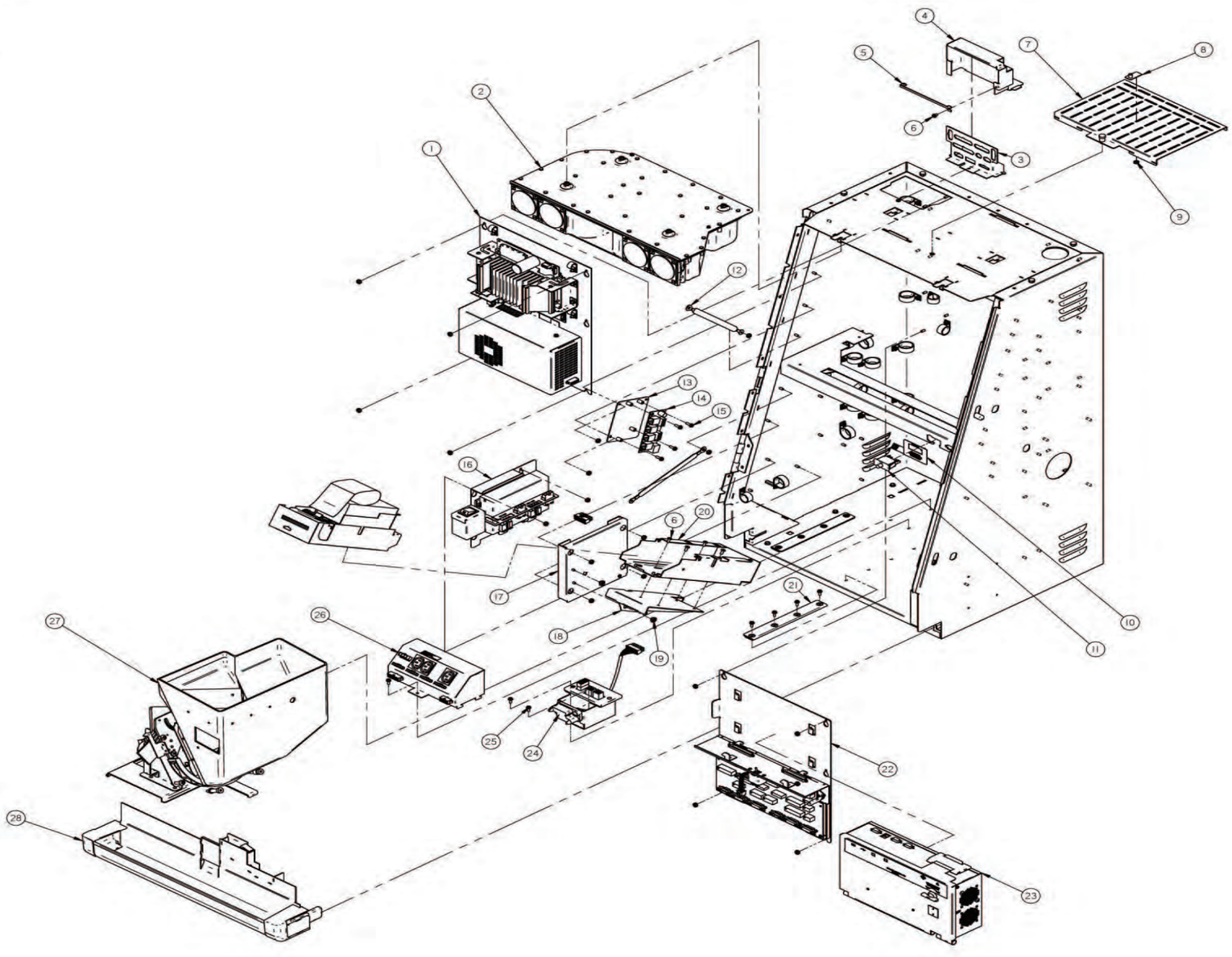
Bluebird Upright (BBU) Video Cabinet Power Components





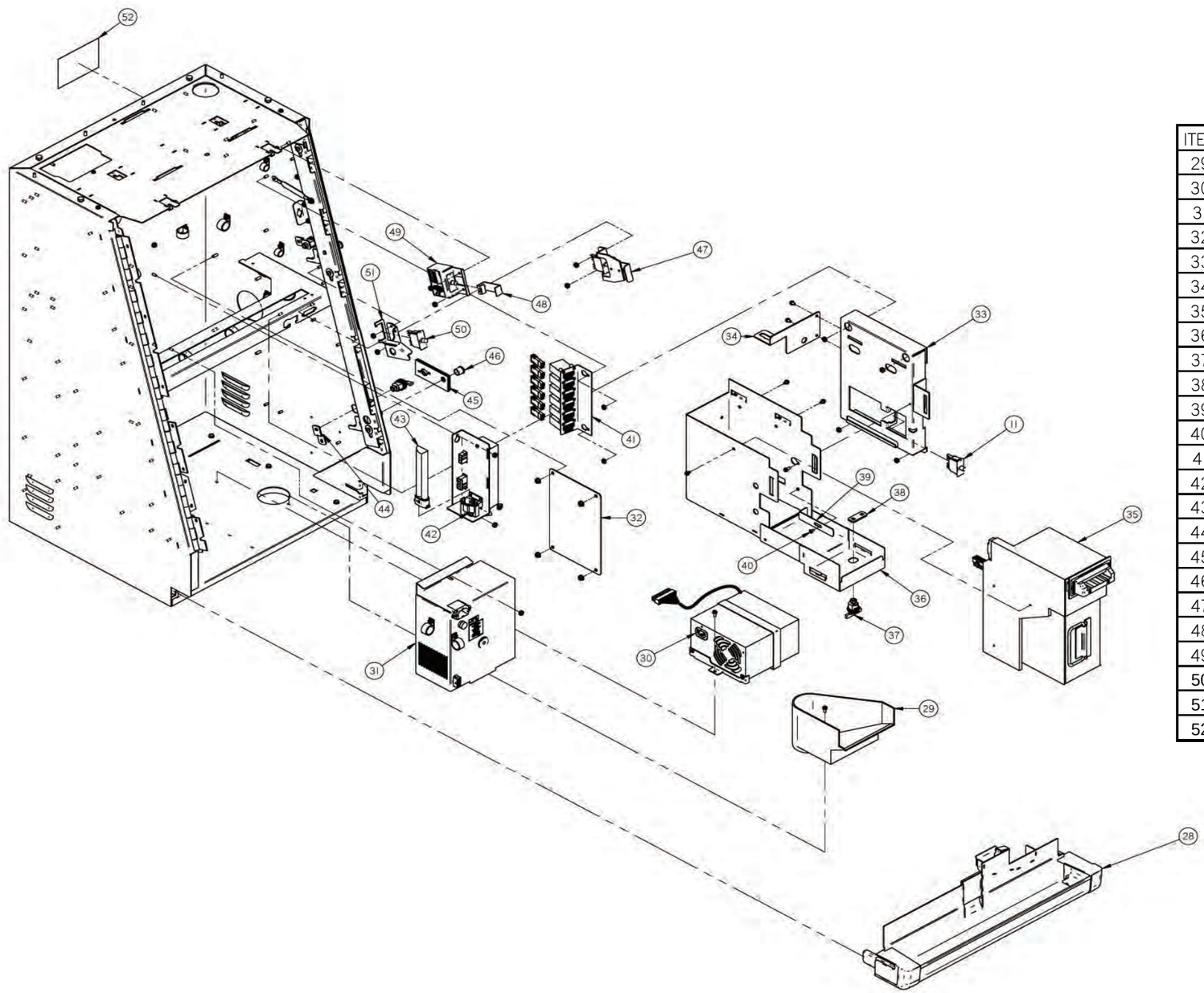
ITEM	DESCRIPTION
1	POWER STRIP
2	BALLAST/POWER SWITCH ASSEMBLY
3	BULKHEAD PANEL ASSEMBLY
4	CPU ENCLOSURE
5	24V POWER SUPPLY/BOSE AMP ASSEMBLY
6	POWER ENTRY ASSEMBLY
7	ATX DC POWER SUPPLY

Bluebird Upright (BBU) Video Cabinet (page 1 of 2)



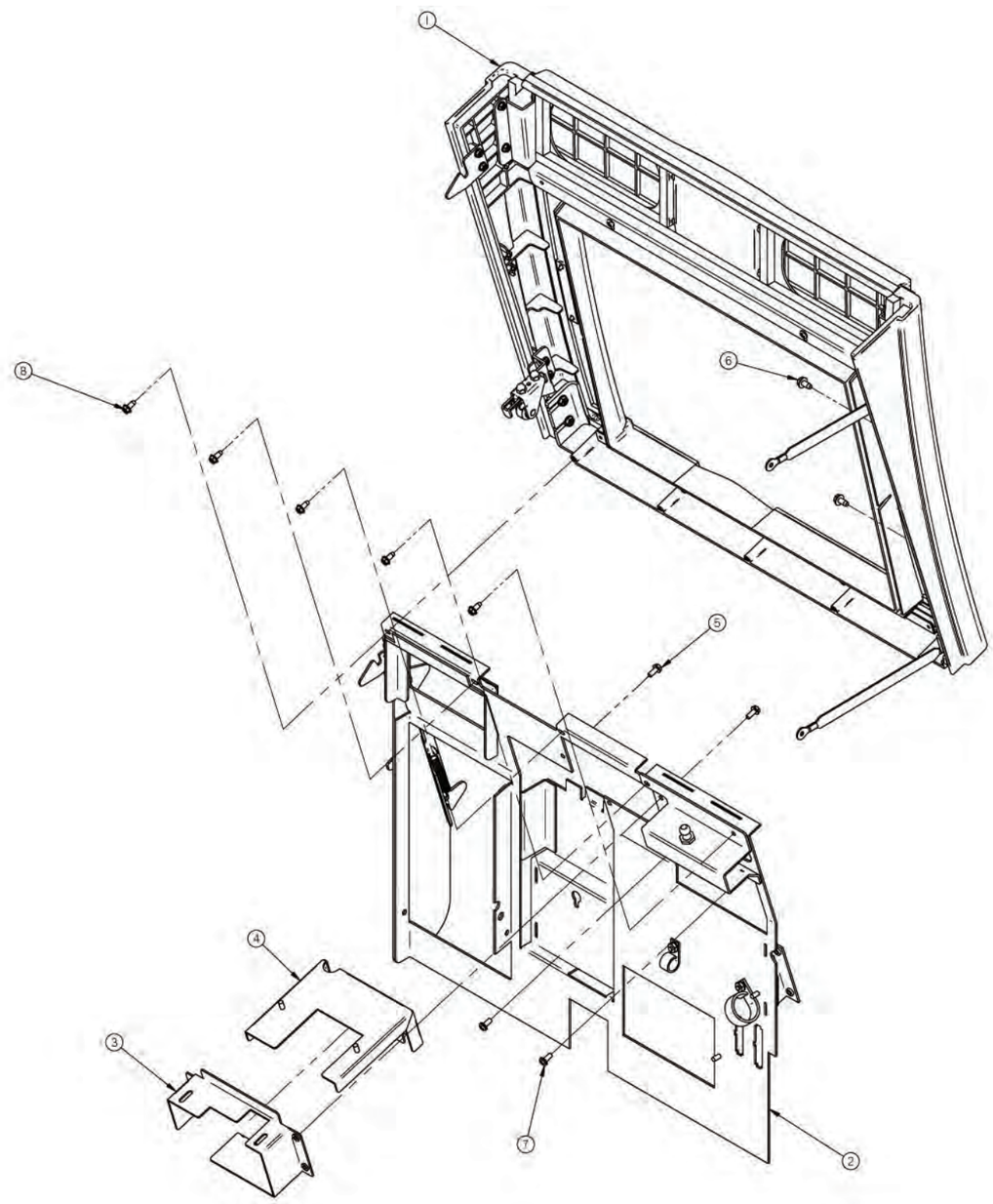
ITEM	PART NUMBER	DESCRIPTION	QTY
1	A-015733	ASY: 24V PWR SPLY W/AMP-BBU	1
2	6555-009823-01-00	ASSY: BOSE-WIDE-UBX	1
3	01-013211	BRKT: T/B CONN-BUX	1
4	01-018446-00-00	CVR TB CONN PLT-BBU	1
5	01-018447-00-00	BRKT: TB CONN CVR STRAP-BBU	1
6	4008-007026-04	8-32X04 PH L HX WF MS ST ZN	6
7	01-010229	PLT: SMB MTG-UBX	1
8	01-005914-XX	PLT: STNDOFF-SMB MTG-UBX	1
9	4408-011128-00	NUT: 8-32 KEPS ST ZN	38
10	16-010463	LBL: DGNSTC SW 50C	1
11	6643-14246-00-00	SW MOMENTARY DPDT INTERLOCK	2
12	6799-008989-00-04	BRAID GROUND #8 - 1/4 8"	2
13	01-012704	BRKT: SPN PCB MTG - BUX	1
14	A-012604-02-00	PCBA SPN DISTRIBUTION II	1
15	4008-007026-08	8-32X08 PH L HX WF MS ST ZN	4
16	A-009816-01	ASY: BLST PWR SWTCH-BUV	1
17	01-011915	BRKT: PRNTR-CAB MTG-UBX	1
18	01-013952	BRKT: PRNTR BASE-BUX	1
19	02-011506-01	POST: SHLDR 8-32 INT THD-.09 THK-BUX	2
20	BBU-OC-PRNTER	BBU-OC-PRNTER	1
21	A-010769	ASY: HOPPER MTG - UBX	1
22	A-010770	ASY: I/O PNL BULKHD-UBX	1
23	A-017096-00-XX	ASSY: RCHS CPU NXT	1
24	A-011074	BBU HOPPER BLNDMATE	1
25	4008-007026-06	8-32X06 PH L HX WF MS ST ZN	5
26	A-012492-01-00	ASY: POWER STRIP-BUX	1
27	A-013859-00-XX	HPR MC, BUC	1
28	A-019411-00-XX-YY	ASSY: CON TRAY-BUX	1

Bluebird Upright (BBU) Video Cabinet (page 2 of 2)



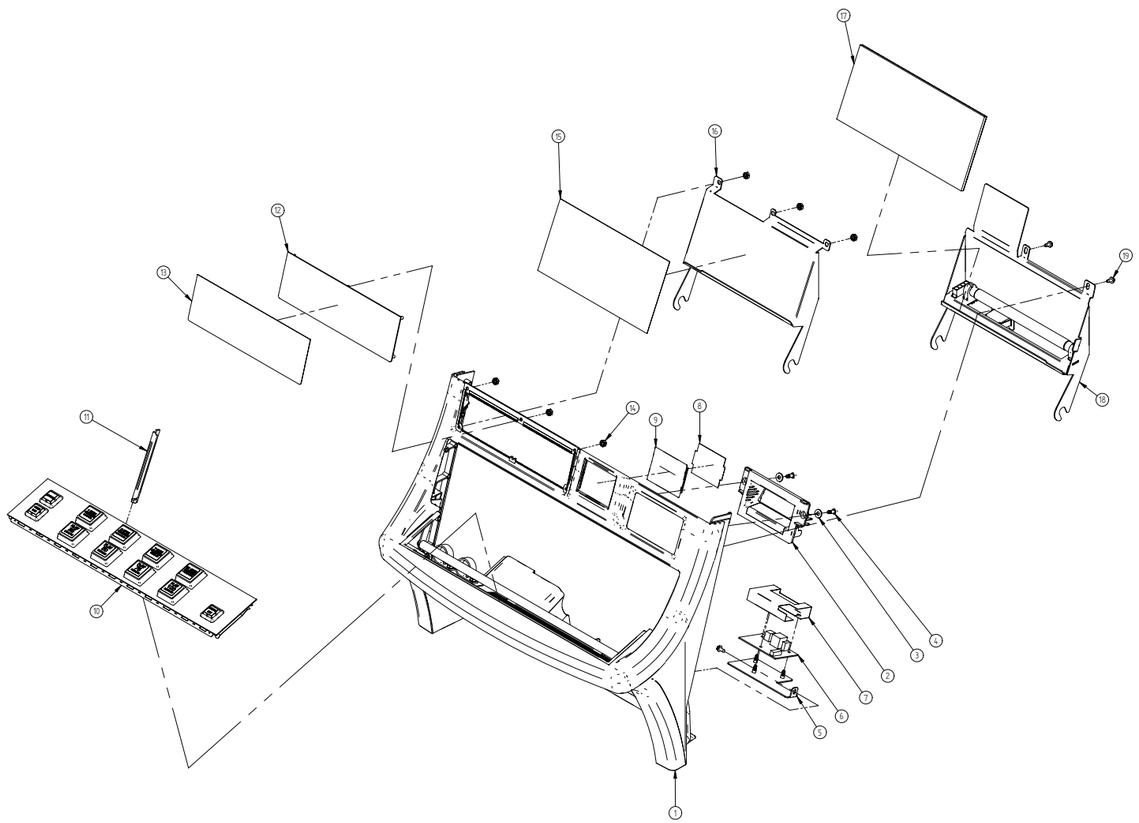
ITEM	PART NUMBER	DESCRIPTION	QTY
29	03-008255	CHUTE: CN XFER-UBX	1
30	A-010533	ASY: ATX DC PWR SPLY-UBX	1
31	A-015309-01-00	ASY: PDU, BUX	1
32	01-008307-ZZZ	CVR: CAB-A/MECH-UBV	1
33	01-010676-01-00	HSG: WBA/CAB-MTG-BUX	1
34	01-008248	BRKT: WBA-CONN MTG-UBV	1
35	BBU-OC-BILL VALIDATOR	BBU-OC-BILL VALIDATOR	1
36	01-013248-01-00	HSG: WBA - BUX	1
37	20-004576	LOCK: THUMB, NO KEY, SHIPPING	1
38	01-12793-08	CAM: FLT-1.25-DUAL MTG.	1
39	01-008302	BRKT: WBA-DR SW ACTR-UBX	1
40	4006-01027-04	6-32x04 PHL RDW MS ST ZN	1
41	A-010954	BBU METER	1
42	A-013324-01	ASSY: SERVICE LMP-DUAL-BUX	1
43	24-005467	BULB: 4PIN PL-9 W/O STARTER	1
44	01-001614-04	CAM: OFFSET-1.50x.25-DUAL MTG.	1
45	08-013053	SPT: SHIPPING LCK RTNR, BUX	1
46	03-013054	RTNR: CAP, VINYL, 7/16 I.D.	1
47	A-010771	ASY: LWR DR SW ACT UBX	1
48	01-008281	BRKT: DR-SW ACTR-UBV	1
49	A-015313-01-00	ASSY: SW-SRVC LMP-BUX	1
50	6643-13204-00-00	SW: INTRLCK-MNTRY/CHTR-E7X-20A	1
51	01-017005-00-00	BRKT: ROLLER RAMP-SW MTG-BUX	1
52	16-007629	LBL: WARNING, NO SHAKING, ENG/FR	1

Bluebird Upright Video Cabinet (BBU) Upper Door



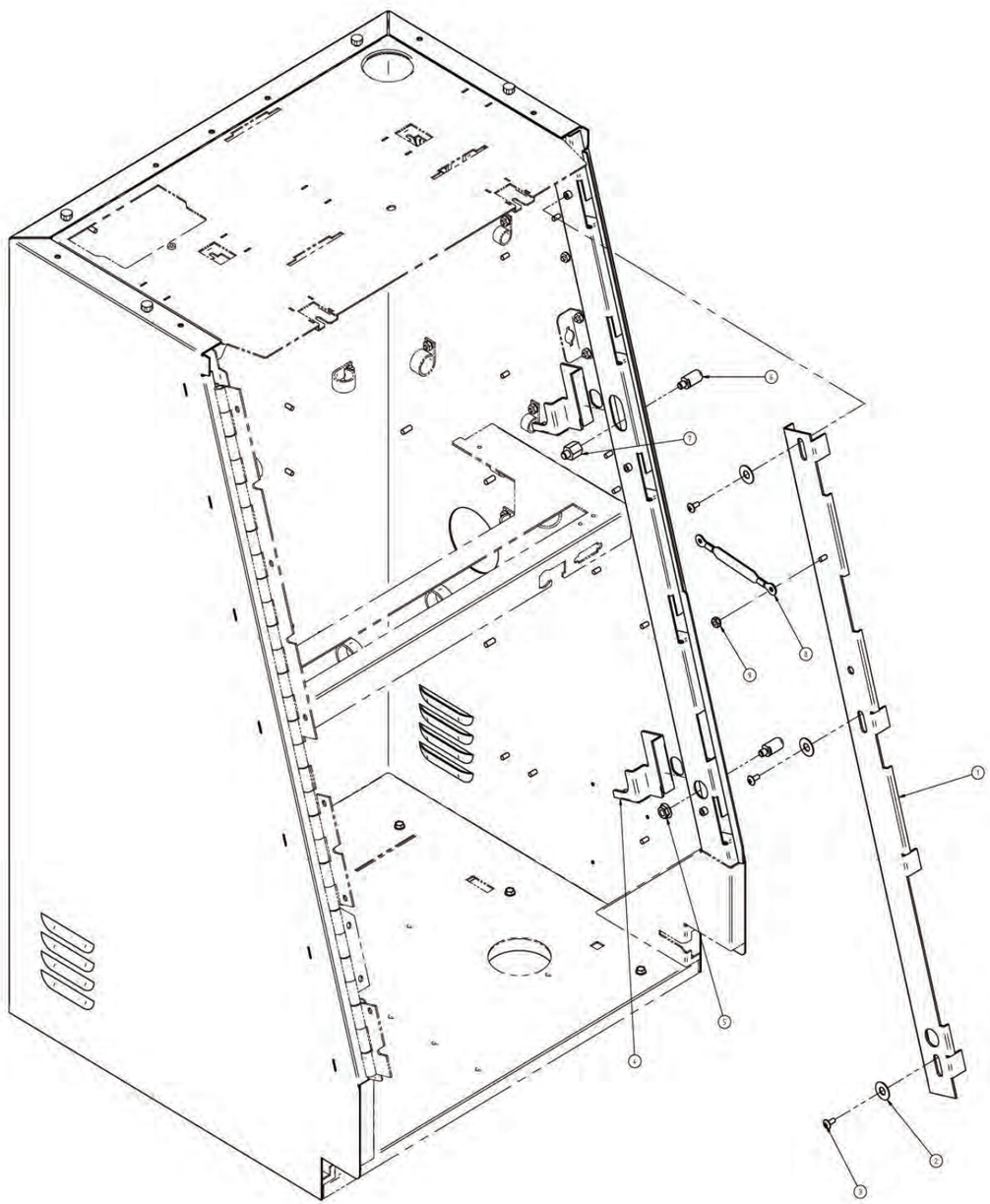
ITEM	PART NUMBER	DESCRIPTION	QTY
1	A-010582-XX-YY-ZZZ	ASSY: UPR DR CSTG-BUR	1
2	A-011048	BBU BARRIER PANEL ATO	1
3	01-013185-ZZZ	BRKT: BRR PNL-CRDR MTG-BBU	1
4	01-013186	CLLR: BRR PNL-CRDR MTG-BBU	1
5	4008-007026-06	8-32x06 phl hxw f ms st zn	2
6	4010-007027-06	10-24x06 phl hxw f tt st zn	2
7	4008-01015-08	8-32x08 phl pan tt st zn	2
8	4008-007027-06	8-32x06 phl hxw f tt st zn	5
9	A-018483-00-00	ASY: DSPLY PNL-5R MC/ML-BUR	1
10	20-016925-00-00	WINDOW: EMI	1
11	4008-007026-04	8-32x04 PHL HXW F MS ST ZN	2
12	6799-006989-00-02	BRAID: GROUND - #8, #8, 8"	1
13	4408-01128-00	NUT: 8-32 KEPS ST ZN	1
14	03-017288-00-00	HSG: PYLN HSG, INS-BUR	1
15	A-018026-01-00	PCBA: 20 LINE PAYLINE, 5 DIGIT	1
16	4106-01009-06	6-19x06 PHL PAN PLS ST ZN	4
17	01-018473-02-00	CVR: PYLN PCB-2 3 DIGIT-BUR	1
18	4006-01003-06	6-32x06 PHL PAN E MS ST ZN	6
19	20-10011-06	RIVET: SNAP-RICHCO SR-3545 W	7
20	03-018480-00-00	SBOX: LED PCB-7 7 5 DIGIT-BUR	1
21	A-016671-01-00	PCBA: LED DISPLAY-EXPANDED	1
22	01-018747-00-00	CVR: LED PCB-7 7 5 DIGIT-BUR	1
23	16-012957	LBL: TILT CODES-BUR	1
24	20-010892-01	GASKET: RF - 1"	2
25	20-010892-02	GASKET: RF - 2"	4
26	20-016036-00-08	GASKET: MTL FBRC "C-FOLD" .43W x .43H	1
27	20-016042-00-1150	GSKT: RF "RECT" .5W-.25H-11.50"	2
28	20-017027-00-1850	GSKT: RF "C." .675H-.590W-18.5"	1
29	HS-007962-00-08	CBL: SHLD, SPN RJ-45, 16IN	1
30	PA-016823	ASSY: PROGRAMMED MICRO	1
31	RM-22-23	TAPE: FOAM- 3/16 THK	26"

Bluebird Upright (BBU) Video Cabinet Lower Door



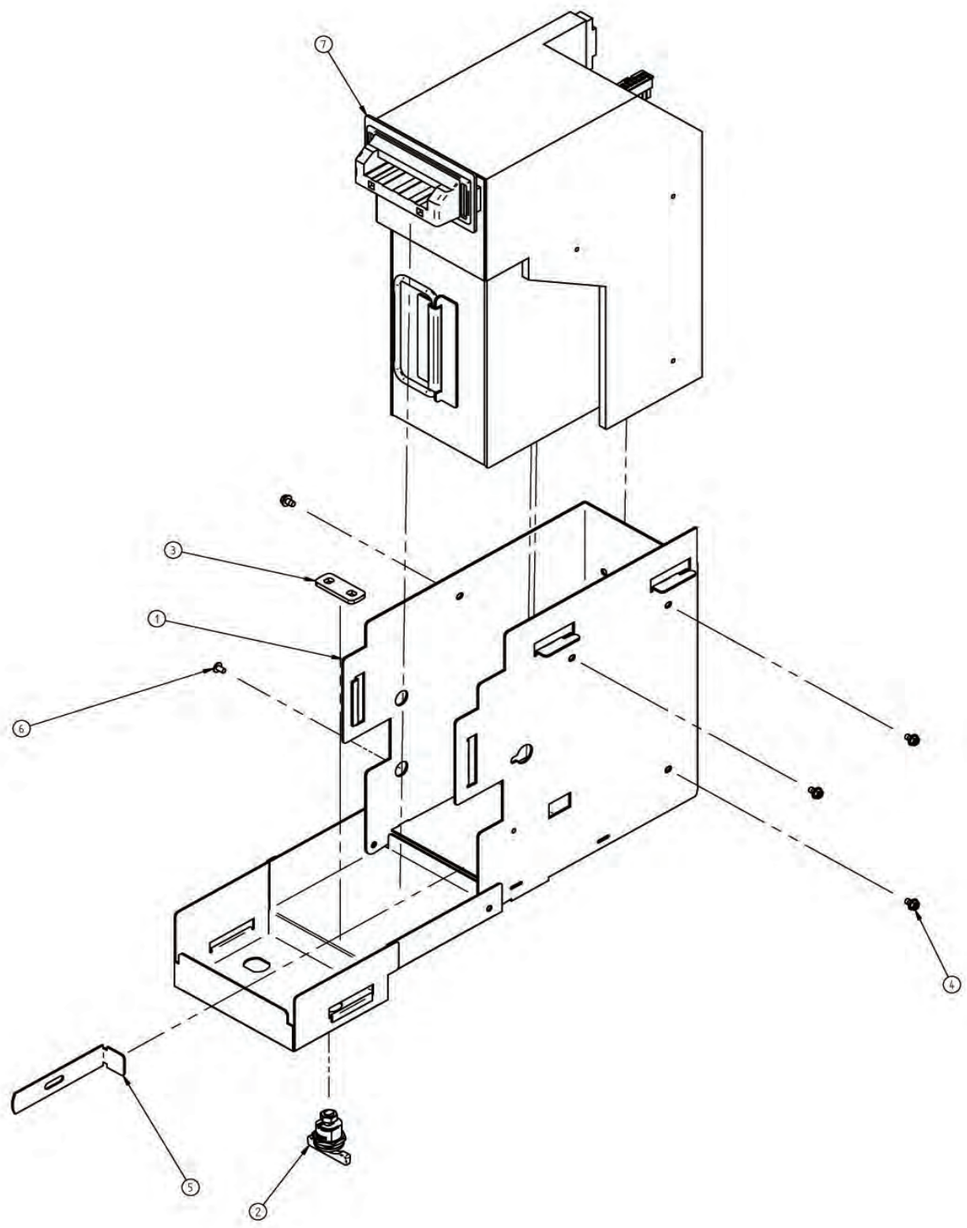
ITEM	PART NUMBER	DESCRIPTION	QTY
1	A-016753-00-00-ZZZ	ASY: LWR DR-BUX	1
2	03-008240	BZL: WBA-EXTN-UBV	1
3	4700-00060-00	FW: .219X0.500X.062 CRS ZN	2
4	4008-008342-05B	8-32X05 HEX SOC SHL ST ZN	2
5	01-016185-01-00	PLT: BAP PCB MTG-BUX	1
6	A-012562-01-00	ASY: PCB UNIVERSAL ANIMATOR CTRLR	1
7	03-012325	CVR: BAP PCB CNTRLLR-BUX	1
8	31-009912-XX	INS: PLAY MAX	1
9	03-008236	LENS: TCE-DENOM-CLR-UBV	1
10	G-014397	BTN ASY: BAS/BAP, LOWER DOOR, BBU	1
11	20-016108-00-00-ZZZ	SPCR: LWR DR-PLYR TRK-BUX	1
12	01-008245-XXZZZ	PLT: LWR DR-UBX	1
13	31-011169-XX	DCL: PLYTRK PLT	1
14	4408-01128-00	NUT: 8-32 HEX KEPS ST ZN	6
15	34-016182-00-XX	TMPLT: LWR DR-P/TRK-BUX	1
16	01-016114-00-XX-ZZZ	PLT: CRDR-BUX	1
17	31T-009756	TMPLT: LWR DR-MARQUE-UBX	1
18	A-016754-01-00	ASY: LWR DR LMP-NO LCD-BUX	1
19	4008-007027-06	8-32X06 PHL HXW F TT ST ZN	3

Bluebird Upright (BBU) Door Latch Mechanism



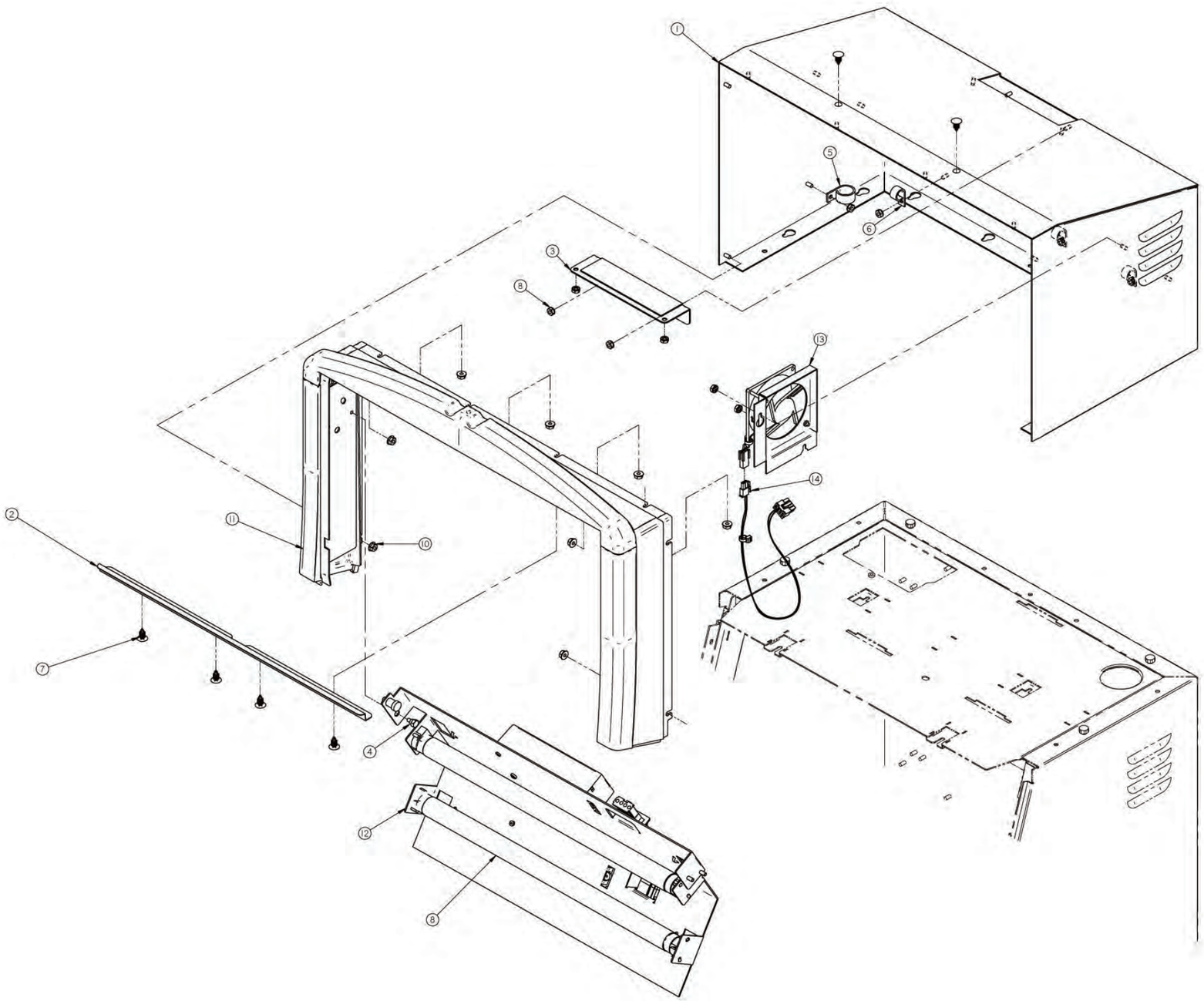
ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-008214	BAR: CAB-MAIN LOC-UBV	1
2	4700-002560-00	FW: .320x .750x.030 CRS ZN	3
3	4008-000203-06	8-32x06 PHL TRS MS ST ZN	3
4	01-010209	BRKT: CAB-DR REL-UBX	2
5	4420-01141-00	NUT: 1/4 - 20 FLANGRIP ST ZN	1
6	02-008218	PIN: MAIN DR-ACTR-UBX	2
7	02-008219	NUT: MAIN DR-ACTR REL-UBV	1
8	6799-006989-00-09	BRAID: GROUND #8 - #8, 6.5"	1
9	4408-01128-00	NUT: 8-32 HEX KEPS ST ZN	1

Bluebird Upright (BBU) Bill Acceptor



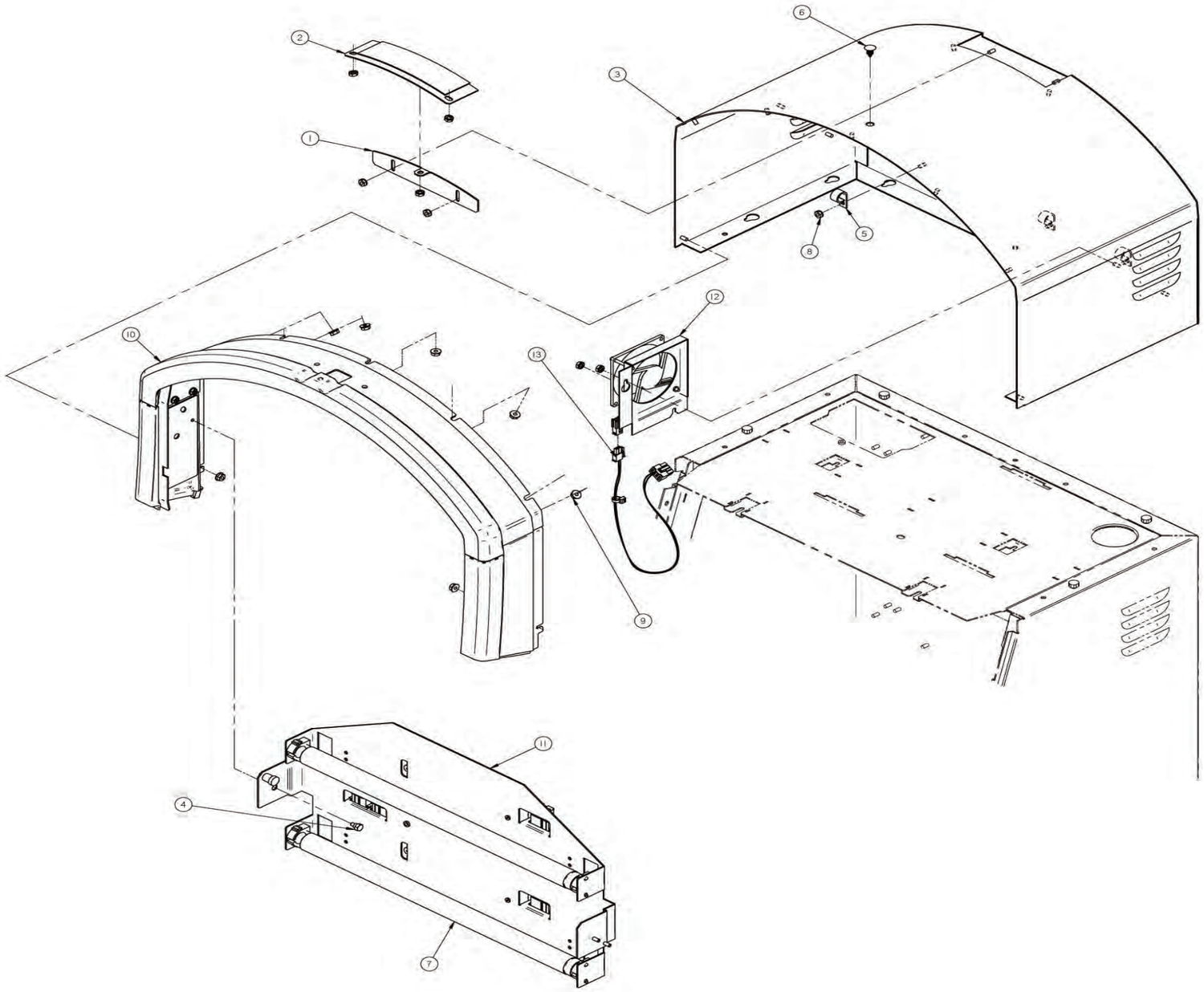
ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-013248-01-00	HSG: WBA - BUX	1
2	20-004576	LOCK: THUMB, NO KEY, SHIPPING	1
3	01-12793-08	CAM: FLT-1.25-DUAL MTG.	1
4	4008-007027-04	8-32x04 PHL HXW F ST TT ZN	4
5	01-008302	BRKT: WBA-DR SW ACTR-UBX	1
6	4006-01027-04	6-32x04 PHL RDW MS ST ZN	1
7	BBU-OC-BILL VALIDATOR	BBU-OC-BILL VALIDATOR	1

Bluebird Upright (BBU) 12-inch Top Box



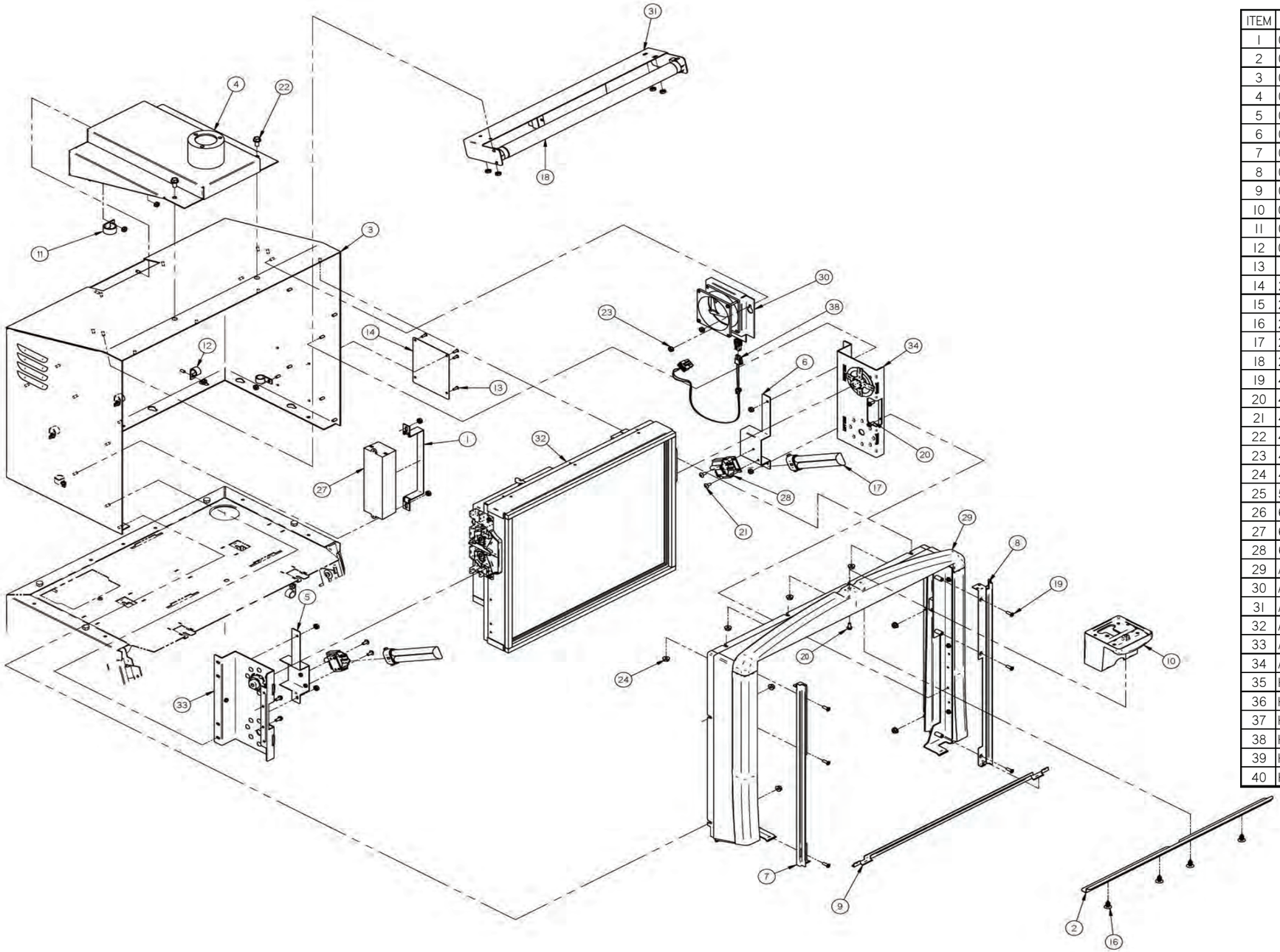
ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-010092-03ZZZ	T/B: CAB TTL HI-48" BUX	1
2	01-011471	CHNL: T/B GLS CVR-BUX	1
3	01-012051-ZZZ	CVR: T/B HOLE-UBX	1
4	02-012839-02	PST: 8-32 x .125 SHLDR	1
5	03-7655-12	CLAMP: CBL 3/4"	1
6	03-7655-8	CLAMP: CBL 1/2"	3
7	20-010653-01	FASTNER: PUSH-RICHCO BPF-F4410	6
8	24-8804	BULB: FLUOR-15W 18"-(F15T8CW)	1
9	4408-01128-00	NUT: 8-32 KEPS ST ZN	8
10	4408-01141-00	NUT: 8-32 FLANGEGRIP ST ZN	8
11	A-007668-04-ZZZ	ASSY: CRWN T/B 48" VIDEO-BUV	1
12	A-013399	ASY: 12" T/B-LMP/BRKT-MTG-BUX	1
13	A-010774	ASY: CAB FAN & BRKT-UBX	1
14	HD-012840-00-00	CBL: DC FAN, T/B,BUX	1
15	RM-22-22	TAPE: FOAM- 1/16 THK	16.5"

Bluebird Upright (BBU) 13-inch Round Top Box



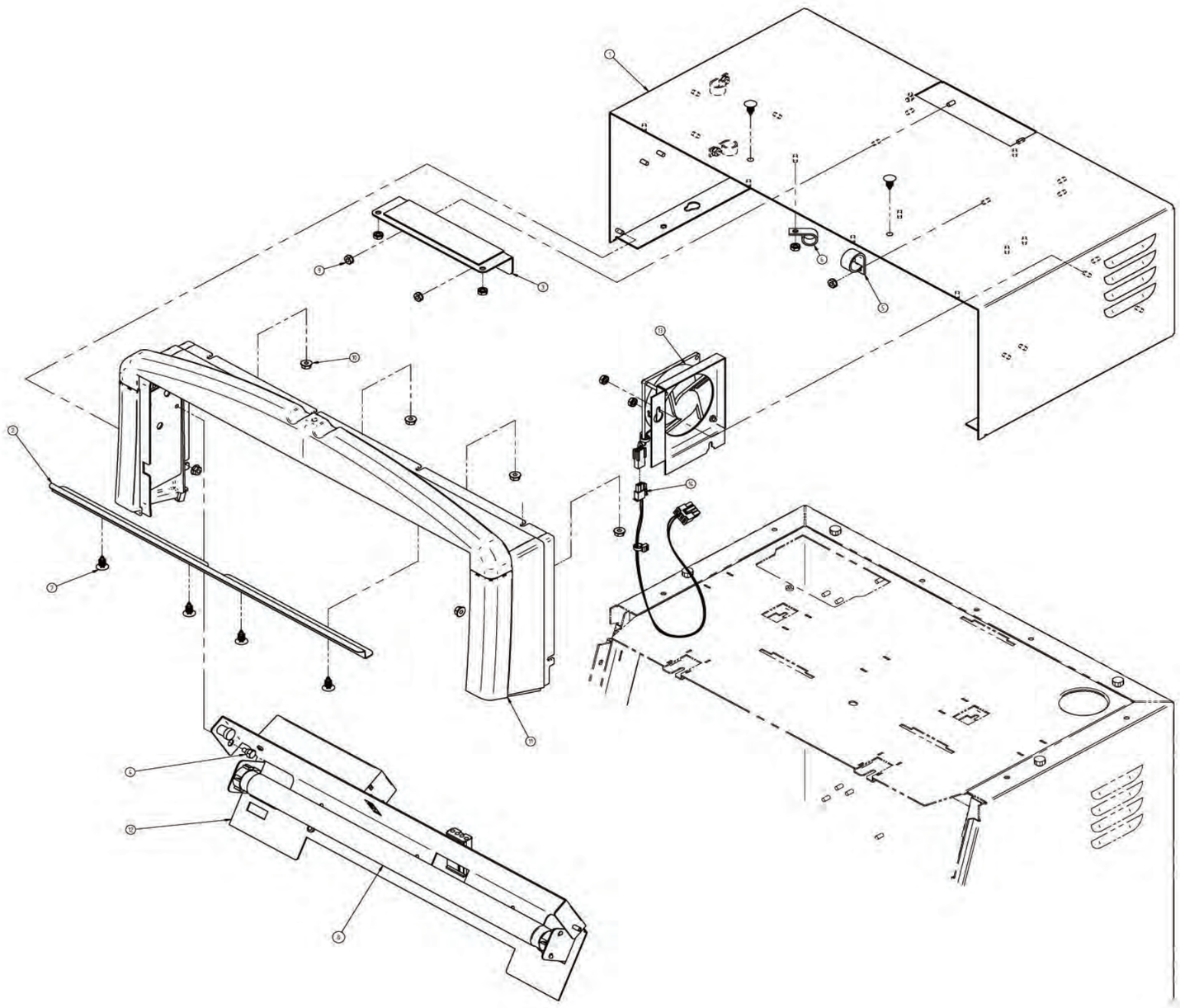
ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-012489-ZZZ	PLT: FILLER, VERT, RTOP	1
2	01-012490-ZZZ	PLT: FILLER, CURVED, RTOP	1
3	01-012858-ZZZ	CAB: 13: RTOP	1
4	02-012839-02	PST: 8-32 x .125 SHLDR	1
5	03-7655-8	CLAMP: CBL 1/2"	3
6	20-010653-01	FASTNER: PUSH-RICHCO BPF-F4410	6
7	24-8804	BULB: FLUOR-15W 18"-(F15T8CW)	1
8	4408-01128-00	NUT: 8-32 KEPS ST ZN	8
9	4408-01141-00	NUT: 8-32 FLANGEGRIP ST ZN	7
10	A-012399-07-ZZZ	ASY: CRWN RTOP, 13", BUV	1
11	A-012525	ASY: 13" RND T/B-LMP-BUX	1
12	A-010774	ASY: CAB FAN & BRKT-UBX	1
13	HD-012840-00-00	CBL: DC FAN, T/B,BUX	1

Bluebird Upright (BBU) 17-inch Top Box



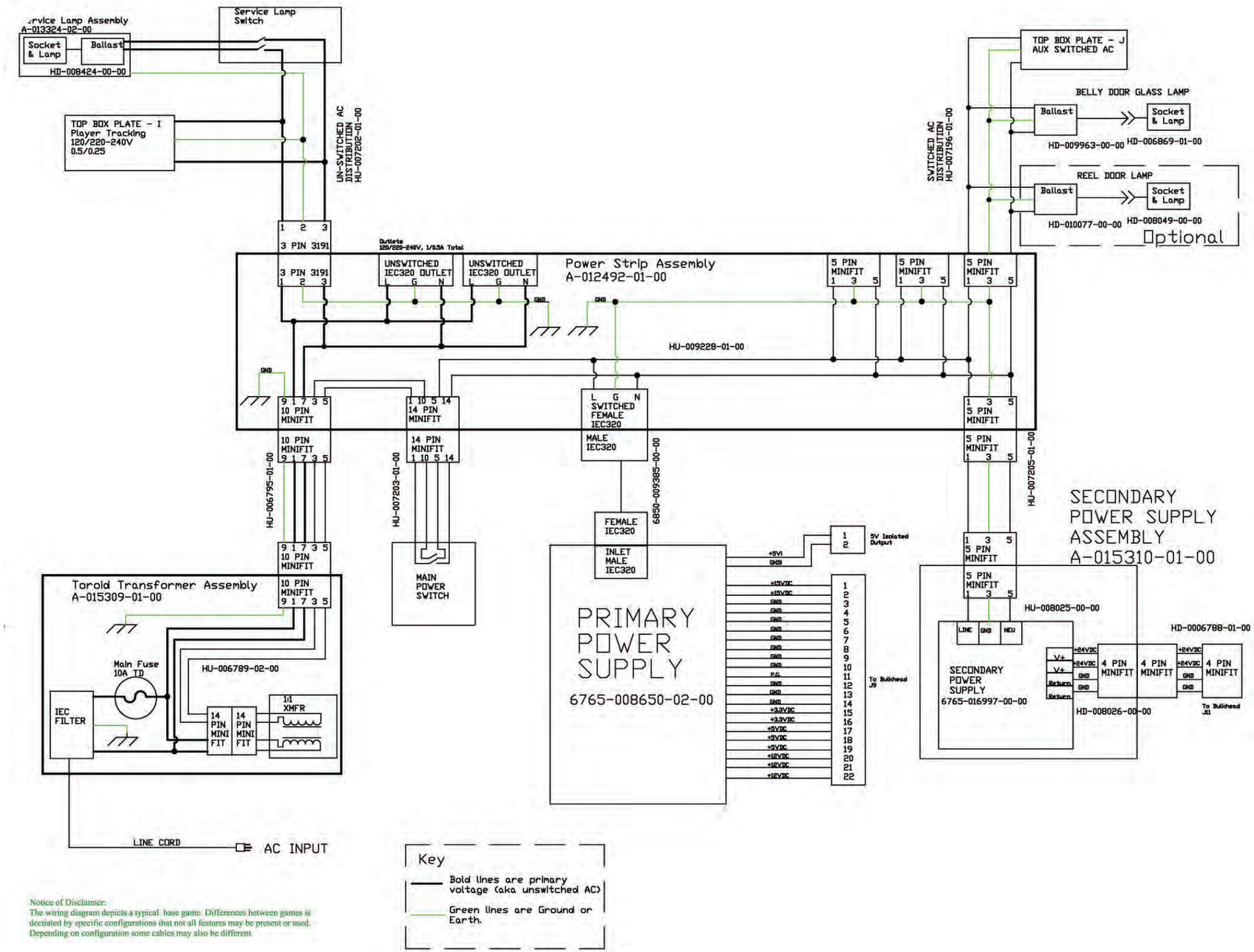
ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-010060	BRKT: BALLAST MTG	1
2	01-011471	CHNL: T/B GLS CVR-BUX	1
3	01-011987-01-ZZZ	T/B: CAB 17 FAST BK-BUX	1
4	01-012680-01-00-ZZZ	MTG: MARQUEE FOOT-BBU	1
5	01-013956-01	BRKT: LMP MTG-LH-LCD 19.0-BUX	1
6	01-013956-02	BRKT: LMP MTG-RH-LCD 19.0-BUX	1
7	01-014371-01	HSG: 17TB-VCTY LMP-LH-BUV	1
8	01-014371-02	HSG: 17TB-VCTY LMP-RH-BUV	1
9	01-014376-01-00	CHNL: TB GLS-DUAL DSPLY-BUX	1
10	03-009453	BASE: TWR LT-UBV	1
11	03-7655-12	CLAMP: CBL 3/4"	1
12	03-7655-8	CLAMP: CBL 1/2"	5
13	07-6700	RIVET: POP .126 x .327	4
14	20-007880-16	PLT: SPINE, NON GAMING	1
15	20-009260-01	GASKET: WIRE MESH - 1"	1
16	20-010653-01	FASTNER: PUSH-RICHCO BPF-F4410	4
17	24-005467	BULB: 4 PIN PL-9 W/O STARTER	2
18	24-8804	BULB: FLUOR-15W 18"-(F15T8CW)	1
19	4008-002563-08	8-32X08 PHL FLT I MS ST ZN	6
20	4008-007026-06	8-32X06 PHL HXW F MS ST ZN	5
21	4008-01041-06	8-32X06 PHL FLT MS ST ZN	4
22	4020-01178-08	1/4 -20x08 HXW MS ST ZN	2
23	4408-01128-00	NUT: 8-32 KEPS ST ZN	19
24	4408-01141-00	NUT: 8-32 FLANGEGRIP ST ZN	8
25	5797-005236-01	CBL: VGA, FPD	1
26	6556-001668-00-00	FERRITE: CORE, SNAP-ON .857x1.285 SQUARE	2
27	6620-008027-00-00	BALLAST: 100-240VAC, 9W, DUAL	1
28	6710-005466-00-00	SCKT: 4 PIN PL-9 FLUORESCENT	2
29	A-007668-01-15-ZZZ	ASY: CRWN T/B 17"-VCTY-BUV	1
30	A-010774	ASY: CAB FAN & BRKT-UBX	1
31	A-012232	ASY: LMP 18 FLUORESCENT	1
32	A-013786-01	ASY: T/B 17-LCD 19.0-DUAL-BUX	1
33	A-015254-01	ASY: LCD 19.0-DETENT-LH MTG-BUX	1
34	A-015254-02	ASY: LCD 19.0-DETENT-RH MTG-BUX	1
35	HD-008424-00-00	CBL: 4 PIN PL-S-FLUOR, 7IN	1
36	HD-011942-01-00	CBL: 18" AUX LCD INTFC, BUX	1
37	HD-012201-00-00	CBL: 4PIN PL, 40"	1
38	HD-012840-00-00	CBL: DC FAN, T/B,BUX	1
39	HU-011941-00-00	CBL: AC FLUOR W/18" AUX LCD, BUX	1
40	HU-012904-00-00	CBL: DUAL AC FEED, T/B BUX	1

Bluebird Upright (BBU) 7-inch Top Box



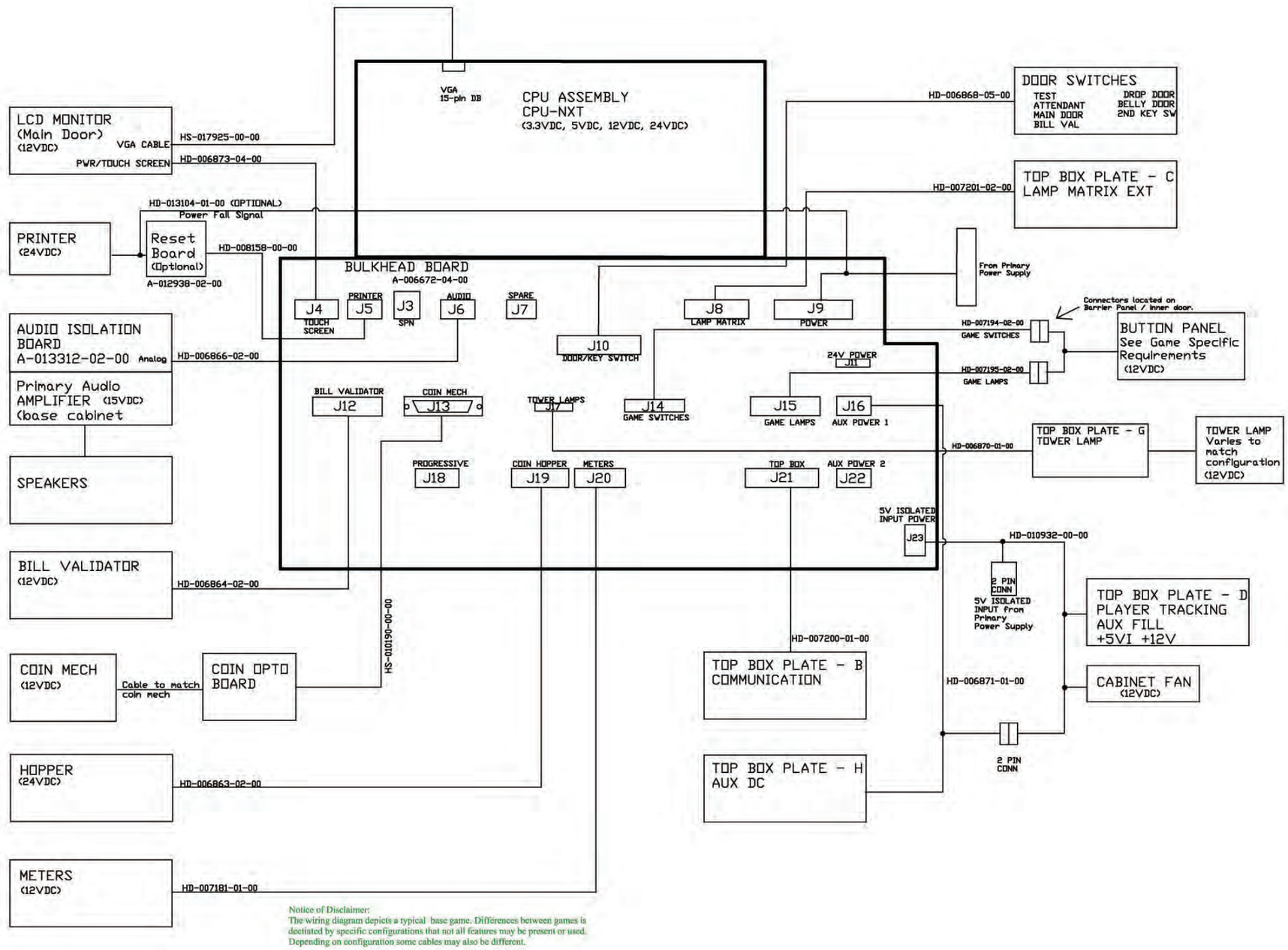
ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-010092-01ZZZ	T/B: CAB TTL HI-43" BUX	1
2	01-011471	CHNL: T/B GLS CVR-BUX	1
3	01-012051-ZZZ	CVR: T/B HOLE-UBX	1
4	02-012839-02	PST: 8-32 x .125 SHLDR	1
5	03-7655-12	CLAMP: CBL 3/4"	1
6	03-7655-8	CLAMP: CBL 1/2"	3
7	20-010653-01	FASTNER: PUSH-RICHCO BPF-F4410	6
8	24-8804	BULB: FLUOR-15W 18"-(F15T8CW)	1
9	4408-01128-00	NUT: 8-32 KEPS ST ZN	8
10	4408-01141-00	NUT: 8-32 FLANGEGRIP ST ZN	6
11	A-007668-01-ZZZ	ASSY: CRWN T/B 43" VIDEO-BUV	1
12	A-013398	ASY: 7" T/BX-LMP/BRKT-MTG-BUX	1
13	A-010774	ASY: CAB FAN & BRKT-UBX	1
14	HD-012840-00-00	CBL: DC FAN, T/B,BUX	1
15	RM-22-22	TAPE: FOAM- 1/16 THK	16.5"

Block Diagram for BBU AC Power Distribution



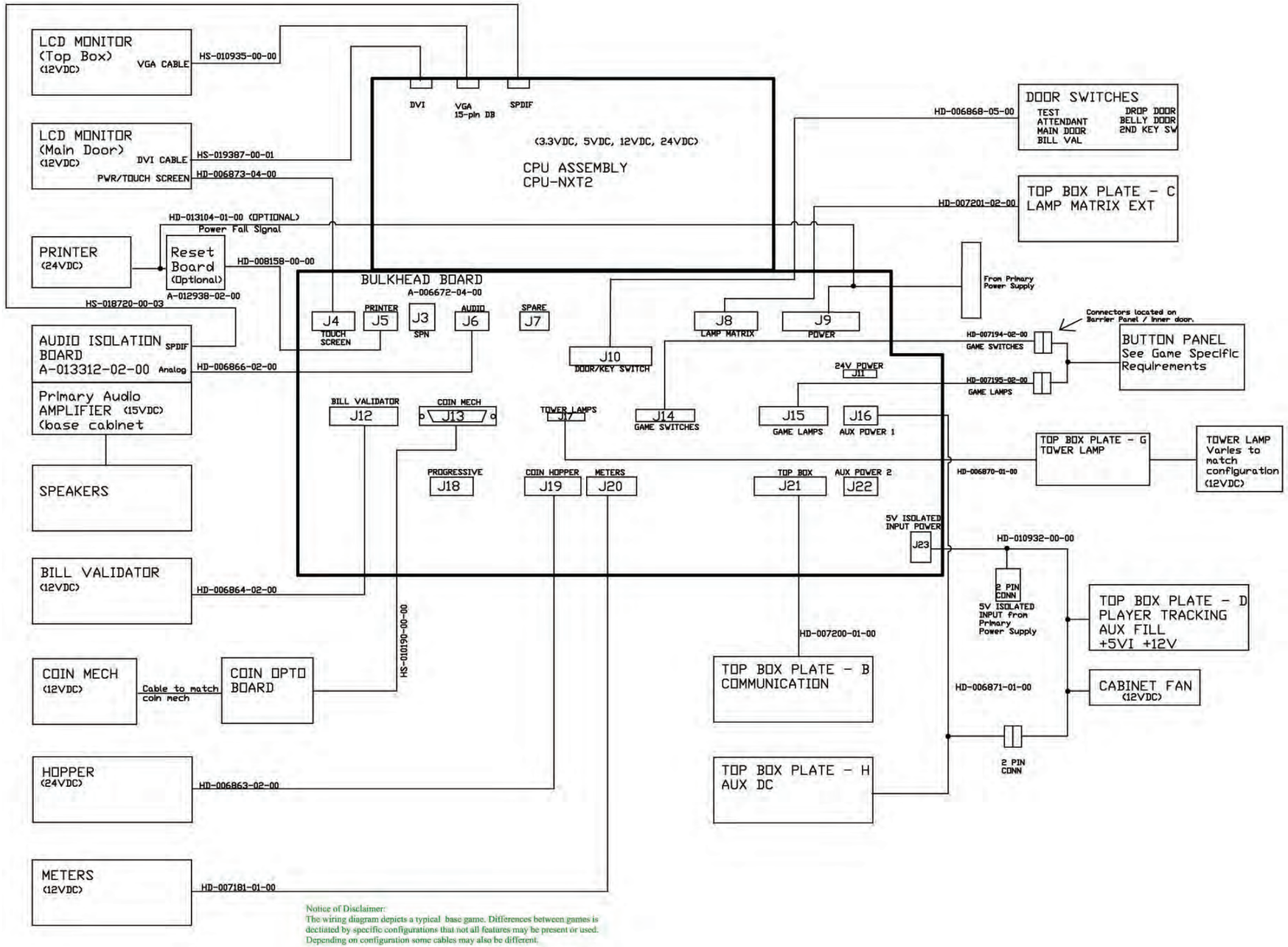
Notice of Disclaimer:
The wiring diagram depicts a typical base game. Differences between games is dictated by specific configurations that not all features may be present or used. Depending on configuration some cables may also be different.

Block Diagram for BBU Bulkhead (with CPU-NXT)



Notice of Disclaimer:
The wiring diagram depicts a typical base game. Differences between games is dectiated by specific configurations that not all features may be present or used. Depending on configuration some cables may also be different.

Block Diagram for BBU Bulkhead (with CPU-NXT)



Notice of Disclaimer:
The wiring diagram depicts a typical base game. Differences between games is dectiated by specific configurations that not all features may be present or used. Depending on configuration some cables may also be different.

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- **Electrical Parts 6-3**
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Overview

The purpose of this chapter is to identify select replacement parts for the Bluebird Upright (BBU) Video. These parts are current as of August 2007, and may change without notice.

CAUTION: *The use of any component not listed in this chapter or any other unapproved hardware causes non-compliance of the BBU. Only replace BBU components with WMS-approved components and parts to ensure compliance with all product and safety certifications and requirements.*

Ordering Parts

Replacement parts are ordered by contacting the Customer Resource Center at WMS: 866-967-4457.

Electrical Parts

The parts below reflect the current production Bluebird Upright Video.

Bulbs and Ballasts

Table 6-1 *Bulbs and Ballasts*

Part Numbers	Description
6620-008027-00-00	ballast: dual univ in 9w x 2
6620-018006-00-00	ballast: univ input, dual 6w
6620-004995-00-00	ballast: universal input, 15wS
24-005467	bulb: 4pin pl-9 w/o starter
24-014092	bulb: fluor, 4pin, 5w, w/o starter 4100k
24-8809	bulb: fluorescent 15w 18"
24-010167	bulb: t3.25 wedge 14v
24-008144	lamp: 9" 6w f6t5cw
6710-005466-00-00	socket: 4pin pl-9 fluorescent (service lamp)
6710-9848-00-00	socket: fluorescent lmp
24-8841	socket: mini bi-pin snap fit

Batteries

Table 6-2 *Batteries*

Part Numbers	Description
6880-017813-00-00	battery: coin cell, 3v, 20mm

WARNING: *Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Before discarding this appliance the batteries must be removed and disposed of safely. Disconnect the power supply cord(s) before removing the batteries.*

Button Panel, Buttons, and Button Inserts

Table 6-3 *Buttons and Button Lenses*

Part Numbers	Description
KIT-015880-01-07-*zzz*	10 Button Poker 
KIT-015880-01-07-*zzz*	10 Button Poker 
KIT-015671-00-08-zzz	11 Button Poker (Fish Button) 
KIT-015671-00-08-zzz	11 Button Poker (Fish Button) 
KIT-015880-00-12-*zzz*	12 Button w/ Green Feature 

Table 6-3 *Buttons and Button Lenses (continued)*

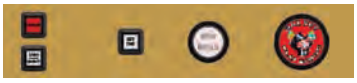
Part Numbers	Description
KIT-015880-00-12-*zzz*	12 Button w/ Green Feature 
KIT-015880-01-09-*zzz*	13 Button 
KIT-015880-00-15-zzz	13 Button (no 5 credit) 
KIT-015880-00-17-*zzz*	13 Button w/ Lrg Rnd 
KIT-015880-00-18-zzz	14 Button (std w/ See Pays) 
KIT-015880-00-16-zzz	14 Button w/ Green Feature 
KIT-015880-00-13-*zzz*	14 Button w/ Orange Feature 
KIT-015880-01-20-zzz	14 Button w/ Purple Feature 
KIT-015880-01-14-*zzz*	14 Button w/ Red Feature 
KIT-015880-01-19-zzz	14 Button w/ Yellow Feature 
KIT-015880-00-01-*zzz*	5 Button 
KIT-015880-00-03-D12	5 Button Monopoly Money 
KIT-015880-00-05-*zzz*	6 Button (Can't Lose) 

Table 6-3 *Buttons and Button Lenses (continued)*

Part Numbers	Description
KIT-015880-00-02-*zzz*	6 Button (See Pays) 
KIT-015880-00-04-D12	6 Button Monopoly Money (See Pays) 
KIT-015880-00-10-*zzz*	8 Button (Med Rnd Btns) 
20-001986-246	BTN: LRG. RND. W/O LENS/LGND PLT
20-018133-03-02-02-01	btn: med rnd w/o lens/lgnd-db5g b1aa sw
20-010135-03-02-02-01	btn: sq w/o lens/lgnd-db5g-b1aa sw
24-018186-00-00	bulb: 6v led lamp, T3-1/4 unidirectional
24-018185-00-00	bulb: led, t1-3/4
20-001986-441	ins med-Bet/Stand/Select Line
20-001986-529	ins: lg rnd deal draw rpt bet
20-001986-530	ins: sq max lines
20-001986-22	insert: sq 1 line
20-001986-194	insert: sq 15 lines
20-001986-26	insert: sq 5 lines
20-001986-69	insert: sq 9 lines
20-001986-27	insert: sq play 1 per line
20-001986-28	insert: sq play 2 per line
20-001986-29	insert: sq play 3 per line
20-001986-245	LENS: LRG. RND. CLEAR BTN
20-018133-01-00-00-00	Lens: m-rnd clear btn
20-018132-01-00-00-00	lens: sq clear btn vlt
01-009787-25-D04	pnl: lottery-10 btn bux
01-009788-22	rtnr: lottery-10 btn bux

Cables

Table 6-4 *Cables*

Part Numbers	Description
HS-13315-00-06	cbl: 6 meter f/o
HD-012802-00-01	cbl: f/o power cable (fiber optic)
HS-011762-00-01	cbl: f/o serial cable
HS-020015-00-08-004	cbl: rj45 mld 45deg rt/45 deg lt 162w yel
HS-020015-00-20-004	cbl: rj45 mld 45deg rt/str 40in yel
6850-14052-00-00	line cord: IEC 320 M/F jumper
6850-011816-00-00	LINE CORD: N. AMERICA - 3 PRONG - 120V

CAUTION: *Always replace a failing cable with a new cable of the same part number. Cables that appear similar but have different part numbers are not interchangeable.*

Electrical Assemblies/ Printed Circuit Boards

Table 6-5 *Electrical Assemblies/Printed Circuit Boards (PCBs)*

Part Numbers	Description
A-015310-01-00	assembly: 24v aux psply - bux
6555-009823-00-00	assembly: bose-w/gde-ubx
A-017999-*xx-yy*	assembly: cpu-nxt2
A-010786	assembly: lcd and brackets -ubv
A-015309-01-00	assembly: pdu, BUX
A-012492-01-00	assembly: pwr strip-ubx
A-017096-*xx-yy*	assembly: RoHs cpu nxt
A-013324-02-00	assembly: service lamp-ubx
A-006672-04-01	assy: bluebird bulkhead tito disabled
A-013312-02-00	pcb: audio isolation w/spdif
A-012938-02-00	pcb: Printer Power Fail Reset
A-006672-04-00	pcba: bluebird bulkhead
A-15895-01-00	pcba: fiber optic link

Fuses

Table 6-6 *Fuses*

Part Numbers	Description
6733-005797-00-00	fuse holder: panel 5mm x 20mm
6731-017329-00-00	fuse: 5x20mm, hc, sb, 10a, 250

Mechanical Assemblies

Table 6-7 *Mechanical Assemblies*

Part Numbers	Description
A-010779-01	assembly: bv/hsg-wba-13-ubx
A-009561-00-00	assembly: cntr, 7dgt, 12vdc w/conn
A-010770	assembly: i/o pnl bulkhd-ubx
A-009907-03-00	assembly: i/o pnl bulkhead mtg-bux
01-013832-01-*zzz*	cvr: coin tray endcp-std-lh *zzz* finish
01-013832-02-*zzz*	cvr: coin tray endcp-std-rh *zzz* finish
21-013831-01-*zzz*	endcp: coin tray-std-lh *zzz* finish
21-013831-02-*zzz*	endcp: coin tray-std-rh *zzz* finish
6651-018251-01-00	fan asy: 12vdc, 60x60x15mm, 2.5", KKF
01-013830-02-*zzz*	tray: coin-no j bend *zzz* finish
01-013830-01-*zzz*	tray: coin-std

Media

Table 6-8 *Media*

Part Numbers	Description
6769-020451-00-01	crd: compact flash, w/dma, w/dual plane, 128 MB
6769-020451-00-04	crd: compact flash, w/dma, w/dual plane, 1GB
6769-020451-00-02	crd: compact flash, w/dma, w/dual plane, 256 MB
6769-020451-00-05	crd: compact flash, w/dma, w/dual plane, 2GB
6769-020451-00-03	crd: compact flash, w/dma, w/dual plane, 512 MB
6769-020451-00-00	crd: compact flash, w/dma, w/dual plane, 64 MB
6345-007244-00	intgrated circuit: eprom 4k spi bus serial

RAM 256MB to 512MB Upgrade Kit

Table 6-9 *RAM 256MB to 512MB Upgrade Kit*

Part Numbers	Description
kit-013977	kit: CPU-NXT 512 MB upgrade - Bluebird (Kit includes parts listed below.)
20-011892-00	ASSY: PCB, SODIMM, 144 Pin, 512 MB
16-009785-04 Rev. 4	label: CPU DOOR - CPU-NXT - 512MB - "CPU-NXT - 512MB" label
16-009785-07 Rev. 4	label: CPU DOOR - CPU-NXT - 512MB - "CPU-NXT - 512MB" label
kit-013979	kit: CPU-NXT 512 MB upgrade - Legacy (Kit includes parts listed below.)
20-011892-00	ASSY: PCB, SODIMM, 144 Pin, 512 MB
16-013981-01	label: A-008316-19 board upgrade
A-010785-01	ASSY: Bluebird CPU-NXT, 256MB CPU Assembly
A-010785-05	ASSY: Bluebird CPU-NXT, 256MB CPU Assembly (hinged door)
A-010785-04	ASSY: Bluebird CPU-NXT, 512MB CPU Assembly
A-010785-07	ASSY: Bluebird CPU-NXT, 512MB CPU Assembly (hinged door)
A-008316-0*x*	ASSY: Legacy (550, 3601) PCB, 256 MB CPU
A-008316-19	ASSY: Legacy (550, 3601) PCB, 512 MB CPU

Switches

Table 6-10 *Switches*

Part Numbers	Description
6643-10059-00-00	switch: lck 0.25 term., mom.
6643-009187-00-00	switch: momentary dpdt chtbl 10a 250v
6643-14246-00-00	switch: momentary dpdt interlock
6643-13229-00-00	switch: momentary interlock
6643-13204-00-00	switch: momentary w/cheat-interlck
6642-002513-00-00	switch: rocker,dpst,non-illuminate

Miscellaneous Electrical Parts

Table 6-11 *Miscellaneous Electrical Parts*

Part Numbers	Description
6851-010666-00-00	conn: recept, iec320,.187 term
03-011913	cvr: f/o pcb
6651-002832-01-00	FAN ASSY: 12VDC, 80x80x25MM, 6.0", MFM
RM-22-xx	foam tape (Gasket used on LCD bezel and for water diversion)
6902-019380-00-00	hard drive: sata, 40g, 2.5", 5400 rpm (hard drive for the CPU-NXT2)
6102-002009-00-00	line filter: EMI 6a,250v ac,2-stage
6851-010666-00-00	outlet: IEC 320-FEMALE-one position (on power strip)
6792-009188-00-00	outlet: IEC 320-FEMALE-two position (on power strip)

Mechanical Parts

The parts below reflect the current production Bluebird Upright Video.

Cams

Table 6-12 *Cams*

Part Numbers	Description
01-12793-08	cam: flt 1.25 dual mtg (used on the Bill Acceptor enclosure door on BBS)
01-001614-04	cam: offset 1.50x.25 dual mtg
01-12793-02	cam: flt 1.30 dual mtg (used on the second CPU Enclosure lock)

Marquees

Table 6-13 *Marquees*

Part Numbers	Description
A-015061-01-xx	assembly: oval marq
HU-011866-00-00	cbl: bb marq switched ac (marquee AC Y-cable)
HD-012305-00-00	cbl: dc ext. y 8pmff-8pmfm (marquee DC Y-cable)
A-012487-01-xx	marq: cloud w/o art

Marquee Adaptor Kits

Table 6-14 *Marquee Adaptor Kits*

Part Numbers	Description
KIT-015933-00-01	kit: marquee mtg - bbu - 7" & 12”
KIT-015933-00-02	kit: marquee mtg - bbu - 12" & 17" (Fastback)
KIT-015933-00-03	kit: marquee mtg - bbu - 13" & 18”

Miscellaneous Mechanical Parts

Table 6-15 *Miscellaneous Mechanical Parts*

Part Numbers	Description
A-012866	assembly: cn deflector-bux (used on the Coin Tray)
A-011502-01	kit: spare parts, BBU
02-008221	post: b/pnl-l/dr sprg rel-ubv
02-010321	roller: brr-pnl-ubx
02-010320	shaft: brr-pnl-rlr-ubx
20-010203	spring: gas-door-ubx

Plates, Brackets, and Covers

Table 6-16 *Plates, Brackets and Covers*

Part Numbers	Description
A-016754-00-00	assembly: lwr dr lmp-no lcd-bur
01-010222	bracket: 7" Top Box-lmp-mtg-ubx
01-008210	bracket: atx pdu-mtg-ubx
01-010825	bracket: barrier pnl mtg crdr cvr
01-009821	bracket: bose-h/snk mtg-ubv
01-010209	bracket: cab-dr rel-ubx
01-010914	bracket: cab-meter mtg-red-bux
01-008276	bracket: cab-srvc-lmp-ubx
01-007685	bracket: cn mech chute-cnvtr-ubv
01-009911-01	bracket: cn mech-mtg-std-ubx
01-008281	bracket: dr-sw actr-ubv

Table 6-16 *Plates, Brackets and Covers (continued)*

Part Numbers	Description
01-008306	bracket: fan mtg-ubx
02-014798-00-00	bracket: lcd mtg btm-ubv
02-014797-01-00	bracket: lcd mtg-lh-ubv
02-014797-02-00	bracket: lcd mtg-rh-ubv
01-13533	bracket: line in cvr w/b
01-011594	bracket: lwr dr - hook - ubv
01-011594-01-00	bracket: lwr dr - hook - ubv
01-010422	bracket: lwr dr sw-actr-ubx
01-010421	bracket: lwr dr-sw mtg-ubx
01-010869	bracket: mtr lt mtg -buv
01-011857	bracket: roller ramp-sw mtg-ubx
01-008282	bracket: s/lmp-sw mtg-ubv
01-010645	bracket: strut cab mtg-ubx
01-014321	bracket: strut dr mtg - ubx
01-013211	bracket: Top Box conn-ubx
01-008248	bracket: wba-conn mtg-ubv
01-008302	bracket: wba-dr sw act-ubx
03-009532	cover: opto board
01-010591	plate: 24v & h/snk assy-bux

Transmissive Reels

Table 7 lists parts mentioned in this addendum:

Table 7 *Part Descriptions*

Part Numbers	Description
A-015476-01-00	asy: brr pnl upr dr-bux
A-019039-00-00	Asy: Reel Shield
03-018306-00-00	bezel: 20" lcd lava - bux
HS-019386-00-01	cbl: dvi, w/ferrites, 1 meter
A-019392-00-05	LAVA assembly, non-RoHS, 5-reel
20-018128-*xx-yy*	reel mech: lava 56mm
01-018307-00-00	tray: reel mtg 5rm lava - bux

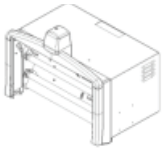
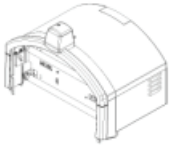
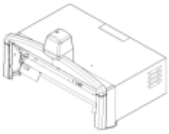
Top Box Glass Mounting Frame

Table 6-1 *Top Box Glass Mountaining Frame*

Part Numbers	Description
01-008256-05	bracket: Top Box 12" marquee mtg-ubv
01-008256-09	bracket: Top Box 17"marquee ubv
01-008256-01	bracket: Top Box 4" marquee mtg-ubv
01-008256-07	bracket: Top Box 4" marquee mtg-ubv
01-008256-03	bracket: Top Box 7" marquee mtg-ubv

Top Box Kits

Table 6-2 *Top Box Kits*

Part Numbers	Description
PSA-015929-03-*zzz-zzz*	psa: t/b-12" BBU Video 
PSA-015930-05-*zzz-zzz*	psa: t/b-13" Round BBU Video 
PSA-016679-00-*zzz-zzz*	psa: t/b-17" Fastback BBU Video LCD 
PSA-016992-00-*zzz-zzz*	psa: t/b-18" Round BBU Video 
PSA-015928-01-*zzz-zzz*	psa: t/b-7" BBU Video 

Tower Lights

Table 6-3 *Tower Lights*

Part Numbers	Description
20-008273-00-01	twr lt: 2 tier shrt-std-bux
20-008273-00-02	twr lt: 2 tier shrt-rnd-bux
20-012194-00-02	twr lt: 2 tier tall-rnd-bux
20-012194-00-01	twr lt: 2 tier tall-std-bux
20-012195-01-02	twr lt: 3 tier tall-rnd-bux
20-012195-01-01	twr lt: 3 tier tall-std-bux

Peripherals

For replacement parts related to peripheral devices (Printers, Hoppers, etc.), reference the "Replacement Parts" Chapter of *16-020839-xx: Manual for Bluebird Peripheral Components*.

Other Parts

Decals & Inserts

Table 6-4 *Insert Bill Here Decal*

Part Numbers	Description
31-015182-*xx*	decal: insert bill here (Canada)
31-011171-*xx*	decal: insert bill here (International)
31-009924-*xx*	decal: insert bill here (US)
31-009924-*xx*	decal: insert bill here (US)
31-009912-04	insert: tce

Labels

Table 6-5 *Labels*

Part Numbers	Description
16-010588-13	label: 5x20mm, 250ma, 250v, slo-blo
16-002747	label: battery disclaimer
16-010588-05	label: bb caution bonding
16-010588-05	label: bb caution bonding
16-010588-03	label: bb fuse rating
16-010588-04	label: bb fuse replacement mrkng
16-010588-04	label: bb fuse replacement mrkng
16-010588-02	label: bb non-switched receptacle
16-010588-07	label: bb plytrk receptacle
16-010588-07	label: bb plytrk receptacle
16-010588-07	label: bb plytrk receptacle
16-010588-06	label: bb pwr configuration
16-010588-06	label: bb pwr configuration
16-010588-06	label: bb pwr configuration
16-010588-01	label: bb switched receptacle
16-010588-08	label: bb tb* fuse rating
16-010588-09	label: game configuration, model tb*
16-010588-12	label: game configured
16-002750	label: grounding
16-002850-03	label: meter w/b see dwg legend
16-010588-11	label: mtg game to pedestal
16-009959	label: on/off sw
16-009959	label: on/off sw
16-009959	label: on/off sw
16-010588-10	label: t6.3ah250v, 5x20mm type
16-007629	label: warning no shaking eng/fr
16-007629	label: warning no shaking eng/fr
20-007880-05	plate: csa us/c

Top Award Inserts

Table 6-6 *Top Award Inserts*

Part Numbers	Description
31-011168-*xx*	insert: Top Award (black/gold)
31-011167-*xx*	insert: Top Award (gold/red)
31-011166-*xx*	insert: Top Award (green/gold)

Table 6-6 *Top Award Inserts (continued)*

Part Numbers	Description
31-011165-*xx*	insert: Top Award (purple/gold)
31-011164-*xx*	insert: Top Award (red/gold)
31-011163-*xx*	insert: Top Award (red/white)
31-014676-100	Monopoly Reel Riches Top Award Insert kit

Top Coin Entry Inserts

Table 6-7 *Top Coin Entry Inserts*

Part Numbers	Description
31X011100-SD-xxx	BB TCE Slant Demom Insert (International)
31-011100-SD-xxx	BB TCE Slant Denom Inserts
31-012000-SMD-xxx	BB TCE Slant Multi-Denom Inserts
31-009900-SMC-xxx	BB TCE Slant Play Max Credit Inserts
31X011100-UD-xxx	BB TCE Upright Demom Insert (International)
31-011100-UD-xxx	BB TCE Upright Denom Inserts
31-012000-UMD-xxx	BB TCE Upright Multi-Denom Inserts
31-009900-UMC-xxx	BB TCE Upright Play Max Credit Inserts

Tower Light Inserts

Table 6-8 *Tower Light Inserts*

Part Numbers	Description
A-016590-00-00	assembly: ins 2 tier short set brs - bux
A-016593-00-00	assembly: ins 2 tier short set chr - bux
A-016591-00-00	assembly: ins 2 tier tall set brs - bux
A-016592-00-00	assembly: ins 2 tier tall set chr - bux