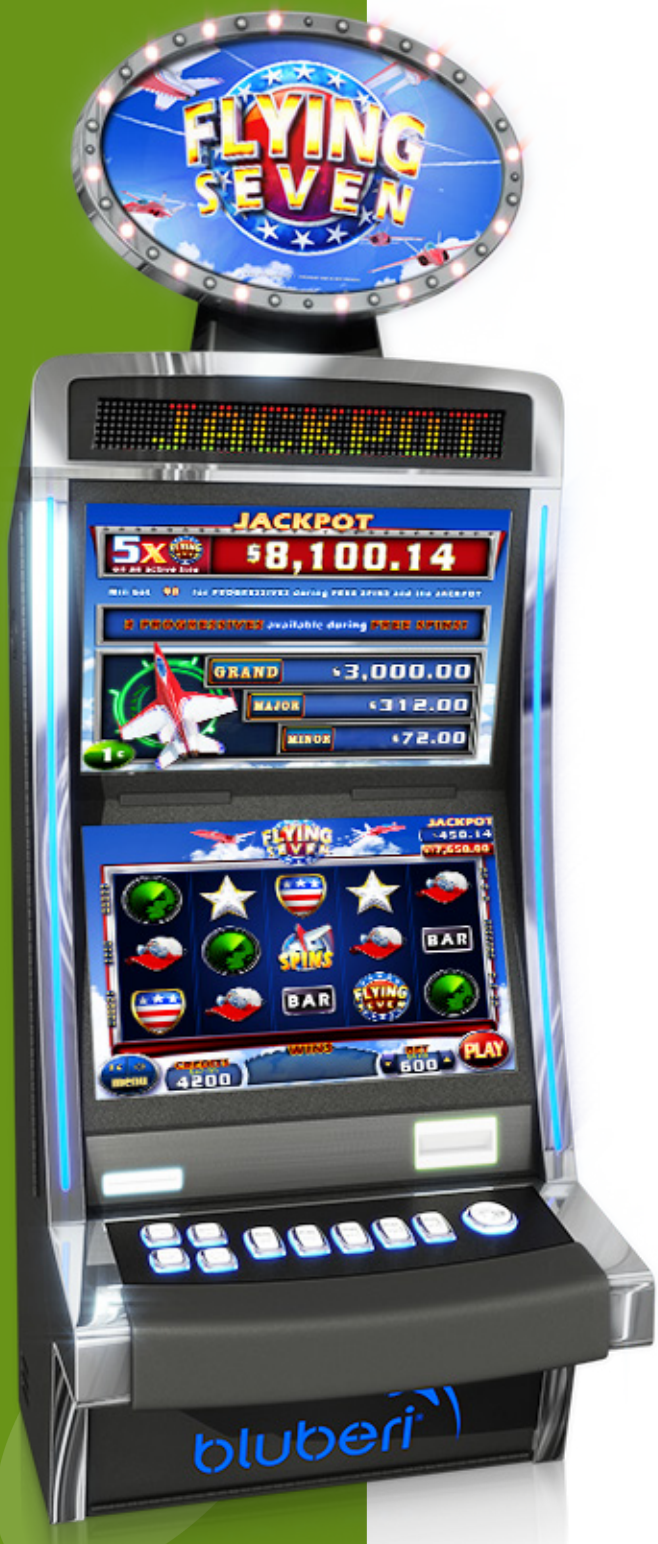


BB-NITRO-001

Technical Manual

TEC-RE-03754
Version 1.3.0

2015-02-20

bluberi®

Version History

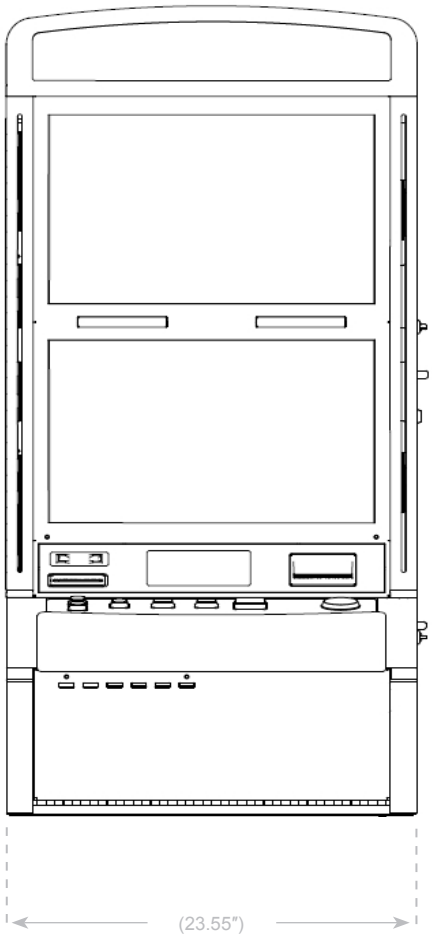
Version	Department	Date	Comments
1.0.0	Technical Documentation	2014-02-17	Original version
1.1.0	Technical Documentation	2014-07-25	Power input
1.2.0	Technical Documentation	2014-07-25	Update
1.3.0	Technical Documentation	2015-02-20	Update Button Panel section

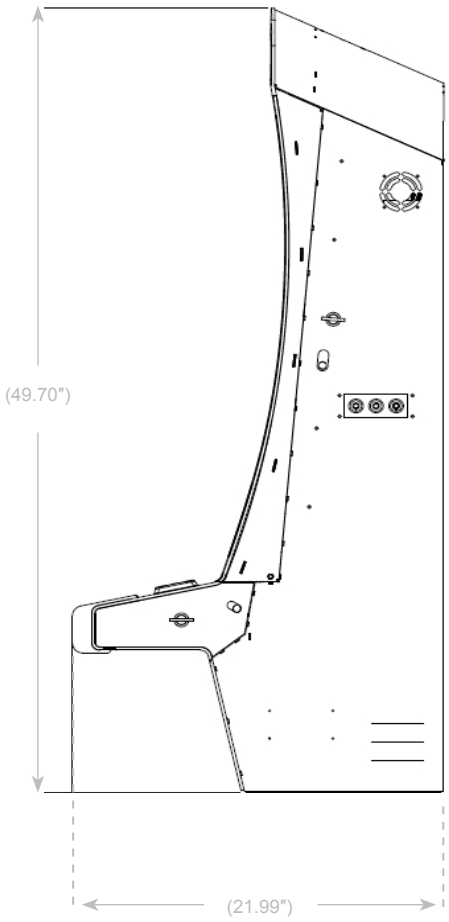
Contents

Technical Information

Physical Components

Cabinet Dimensions





Weight = 113 kg (250 lbs)

The second screen displays the pay table and/or the bonus.

Exterior View of the Machine

Tower light

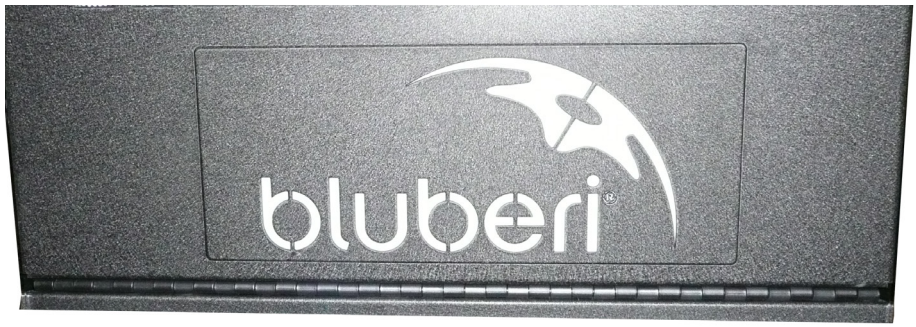
Available in 2 or 3 levels, the tower light signals different events, such as a door opening, an attendant call or a jackpot win.

Topper (optional)

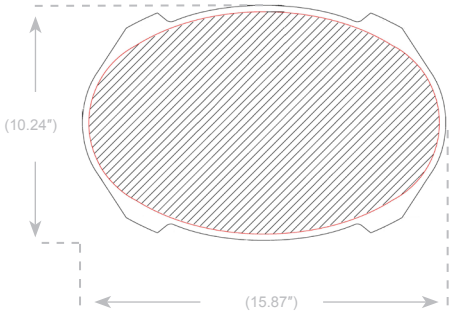
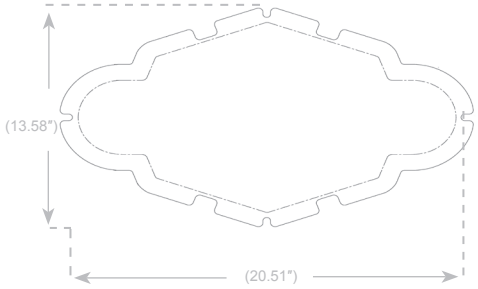
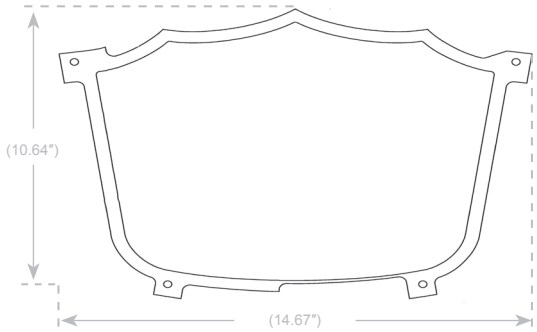
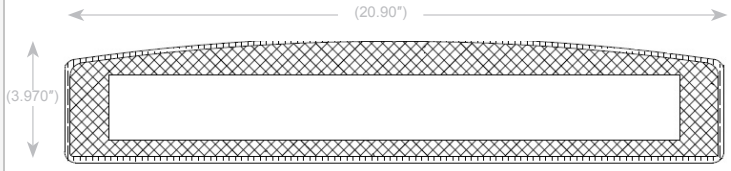
(choice of models: Mini-Ellipse, Shield or Ringo)

Removable/replaceable backlit belly logo

The default Bluberi logo may be replaced by any personalized customer or casino logo or simply removed.



Glass Dimensions

Type	Technical Design
Mini-Ellipse Topper	
Ringo Topper	
Shield Topper	
Top Glass	

Doors

Whenever a door is open, the tower light flashes. You can open a door safely without losing statistics or interrupting the game in progress.

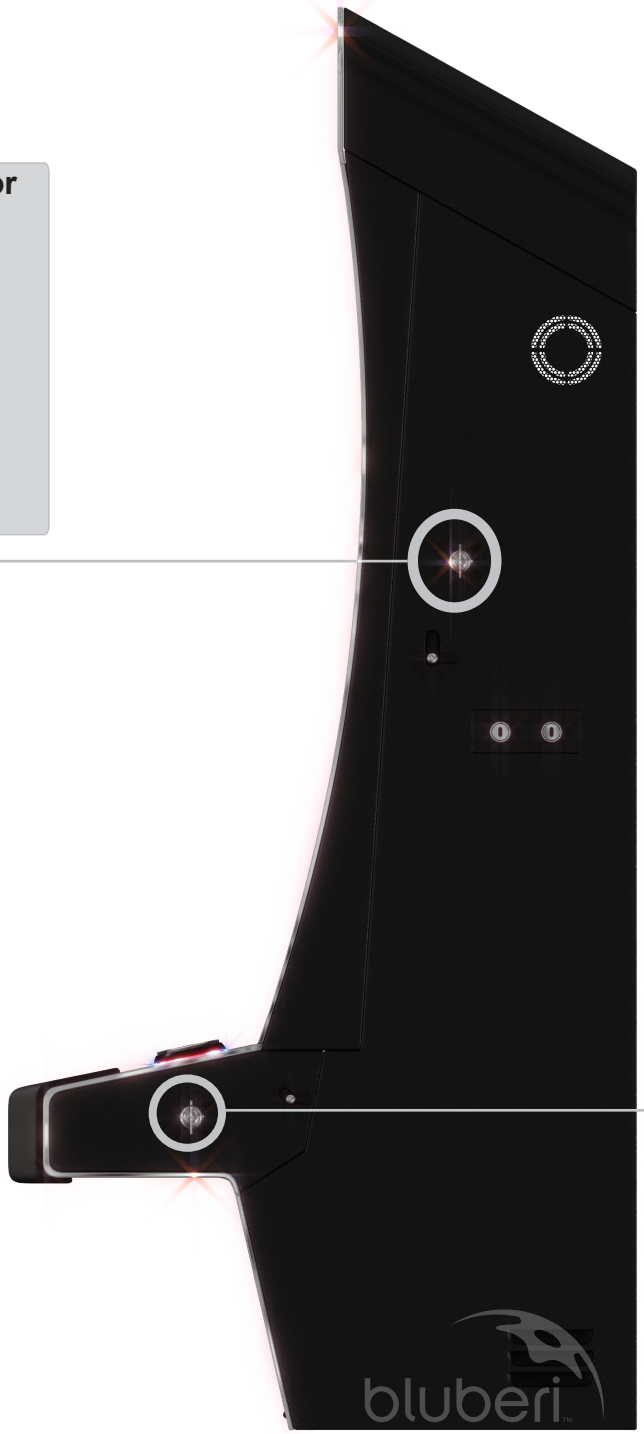
Keys are provided to unlock various parts of the gaming machine: the main door, the lower door, the logic box door (see page 7) and the bill acceptor door (see page 5).

NOTE: All keylocks use standard 5/8" locks.

To open the main door

1. Unlock the door.
2. Lift the lever.
3. Open the door.

Main door key

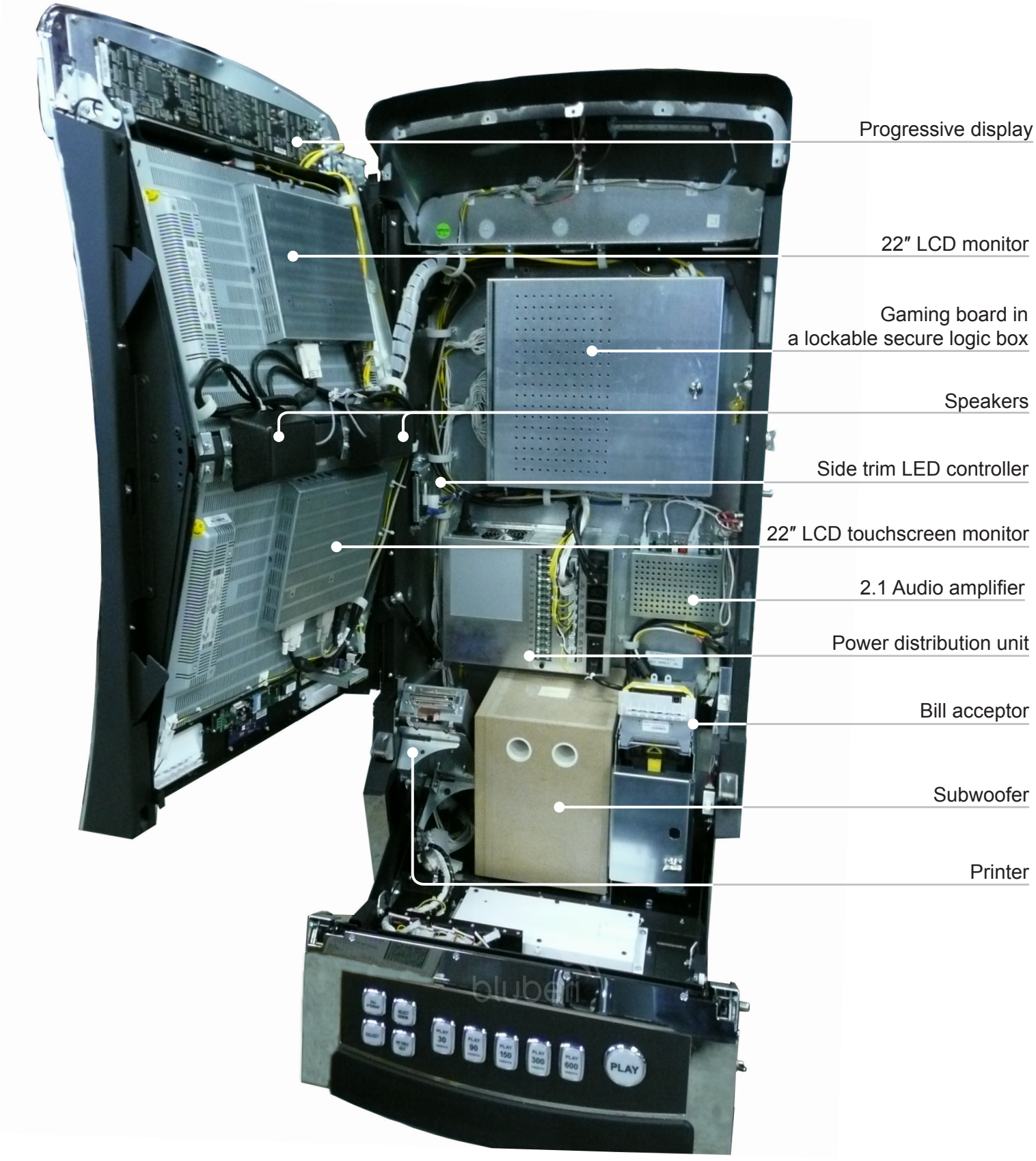


To open the lower door

1. Unlock the door.
2. Lift the lever.
3. Open the door.

Lower door key

Inside View of the Machine

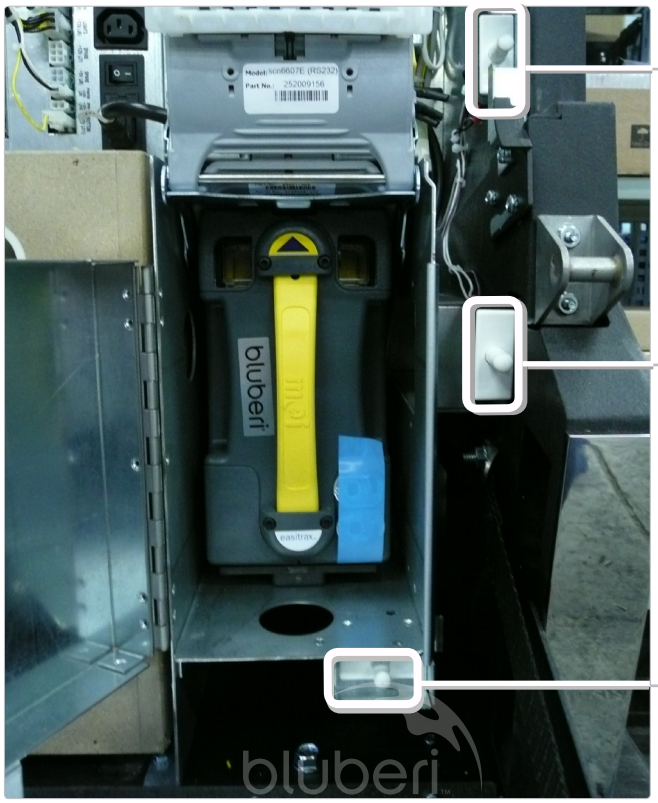


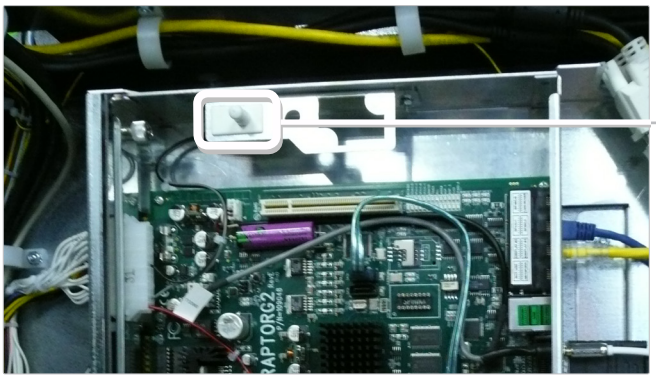
Door Switches

Four switches detect door opening and closing:

- the main-door switch
- the lower-door switch (button pannel)
- the bill-door switch
- the logic-door switch

All switches operate in a “Normally Closed” mode. Each time a door is opened, its switch closes the electronic circuit, and this event is created and recorded in the event log kept in the gaming board memory.





Switch Locks

A single key either provides access to the Operator Menu or is used to clear errors, depending on the switch lock it is inserted into.

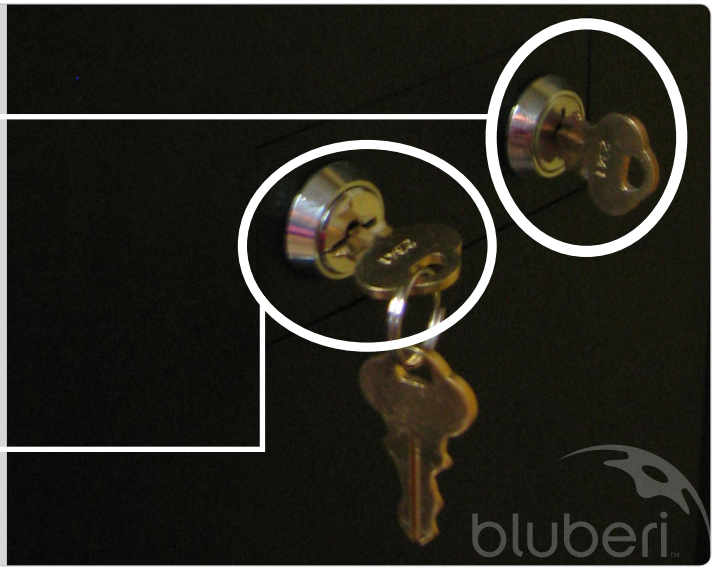
The Operator Menu switch lock gives access to the Operator Menu that allows the configuration of the game, self-diagnostic, statistics, and other options. The Clear Error switch lock allows the operator to clear errors once the problem has been solved.

To clear errors

Insert and turn the key in the switch lock dedicated to this function.

To gain access to the Operator Menu

Insert and turn the key in the Operator Menu switch lock.

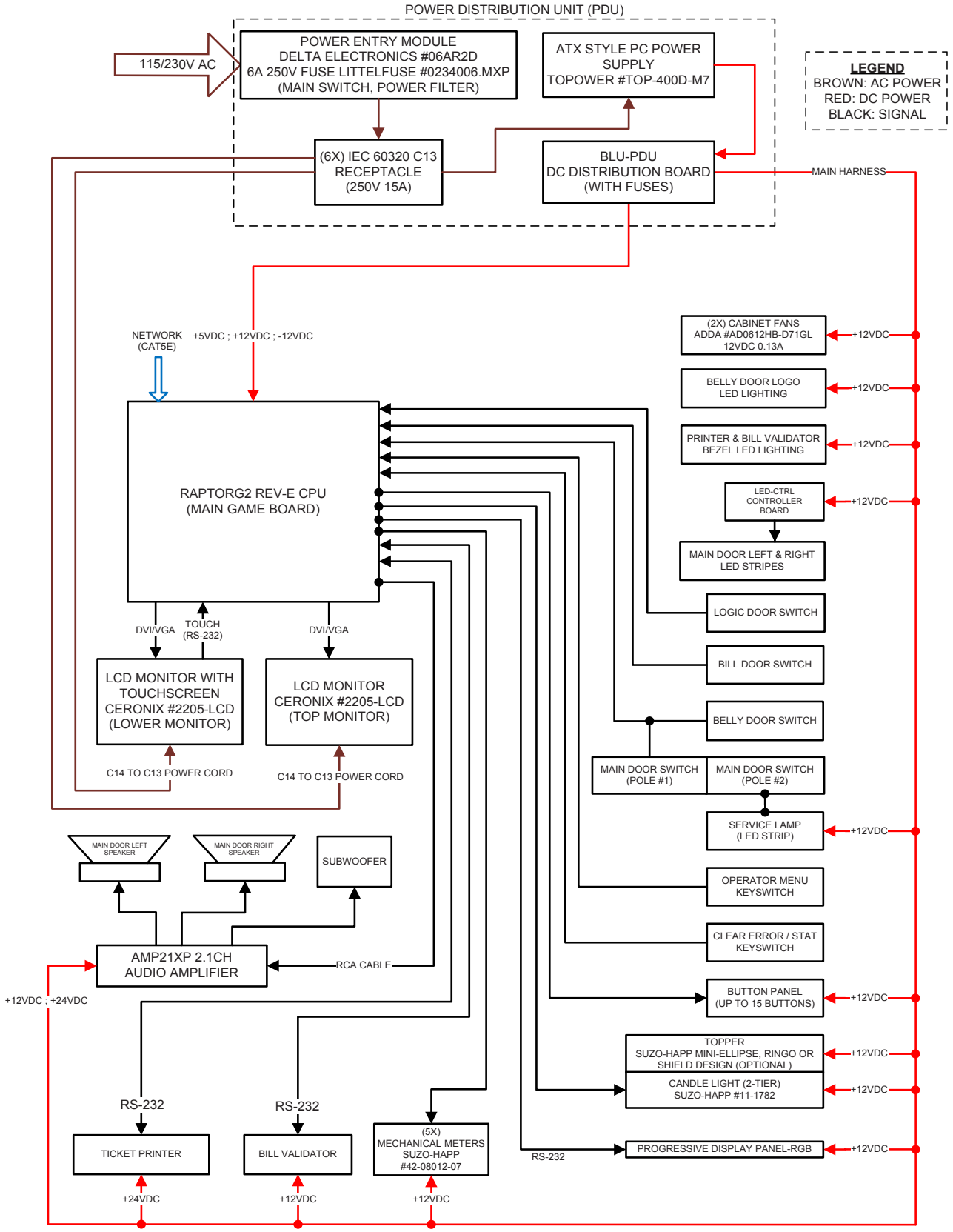


Logic Box

The logic box is a covered metal box housing the gaming board. A door switch detects the opening of the logic box cover. The gaming board reads the state of the logic door switch even when the power is off. The logic box is located at the back of the gaming machine, locked with a key and linked to the machine I/Os through the backplane or through the device connectors.

Electrical Components

Powering Diagram

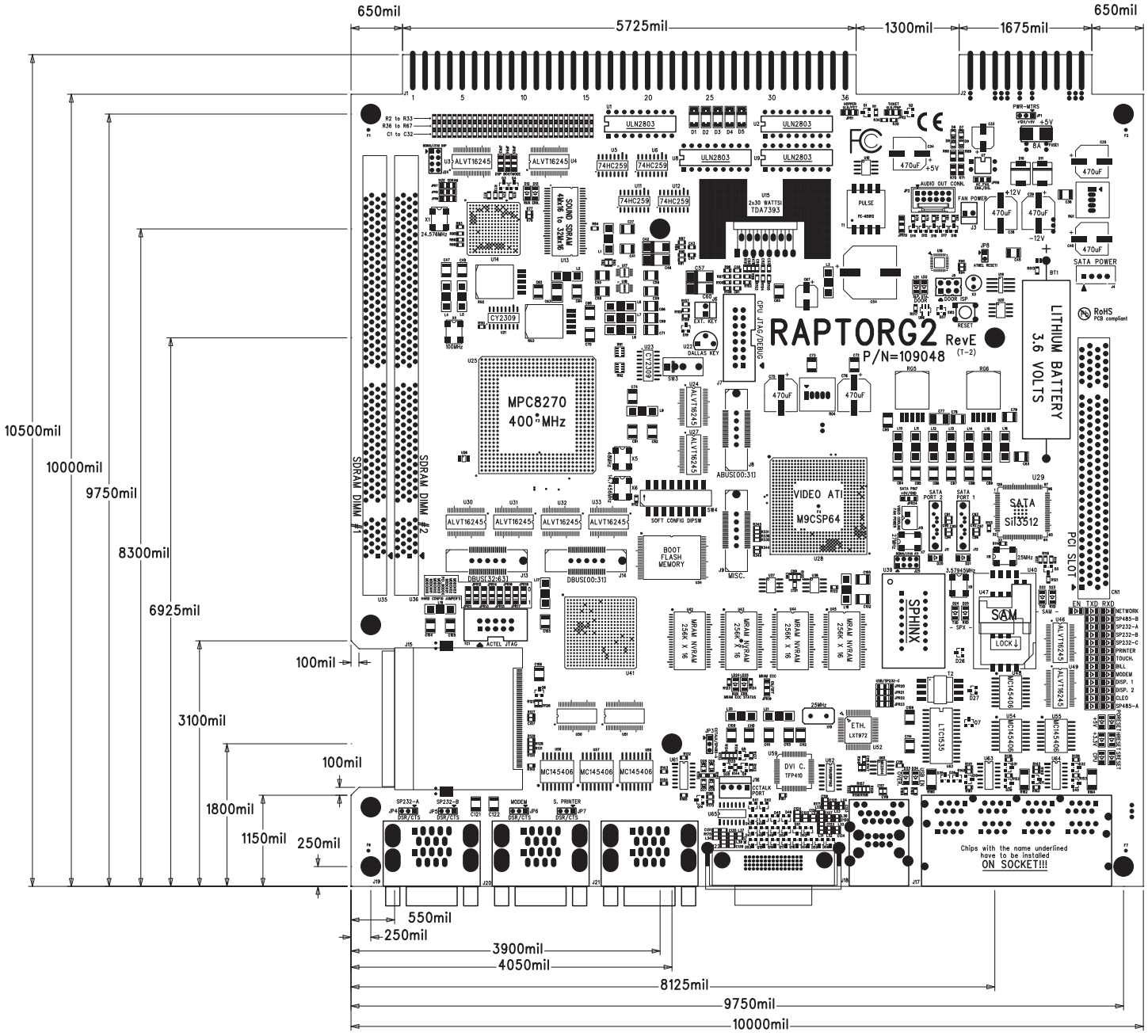


List of Electrical Components

Component		Quantity	Manufacturer	Model
Power supply		1	Topower	TOP-400D-M7
Fan		2	Adda	AD0612HB-D71GL
Gaming board		1	Bluberi Gaming Technologies Inc.	RAPTORG2 Rev-E
LCD touchscreen monitor		1	Ceronix	CPA3071
LCD monitor		1	Ceronix	CPA3084
Standard button panel		4 to 15	Gamesman	800 or 1200 series
OLED button panel		1	Esterline Technologies	EMQLBP0014
Door switch	Lower	1	Cherry Switch	E79 microswitch
	Main	1	Cherry Switch	E79 microswitch
	Bill	1	Cherry Switch	E79 microswitch
	Logic	1	Cherry Switch	E69 microswitch
Switch lock		2		IGT style 2341 1 momentary (Clear Error) 1 constant (Operator Menu)
Mechanical meter		5	Suzo-Happs	42-08012-07
Tower light		1	Suzo-Happs	11-1782
Side trim LED controller		1	Bluberi	LED-CTRL
Progressive display controller		1	Bluberi	Panel-RGB
Sound amplifier		1	Bluberi	AMP21XP
Speaker		4	Fountek	FR58EX

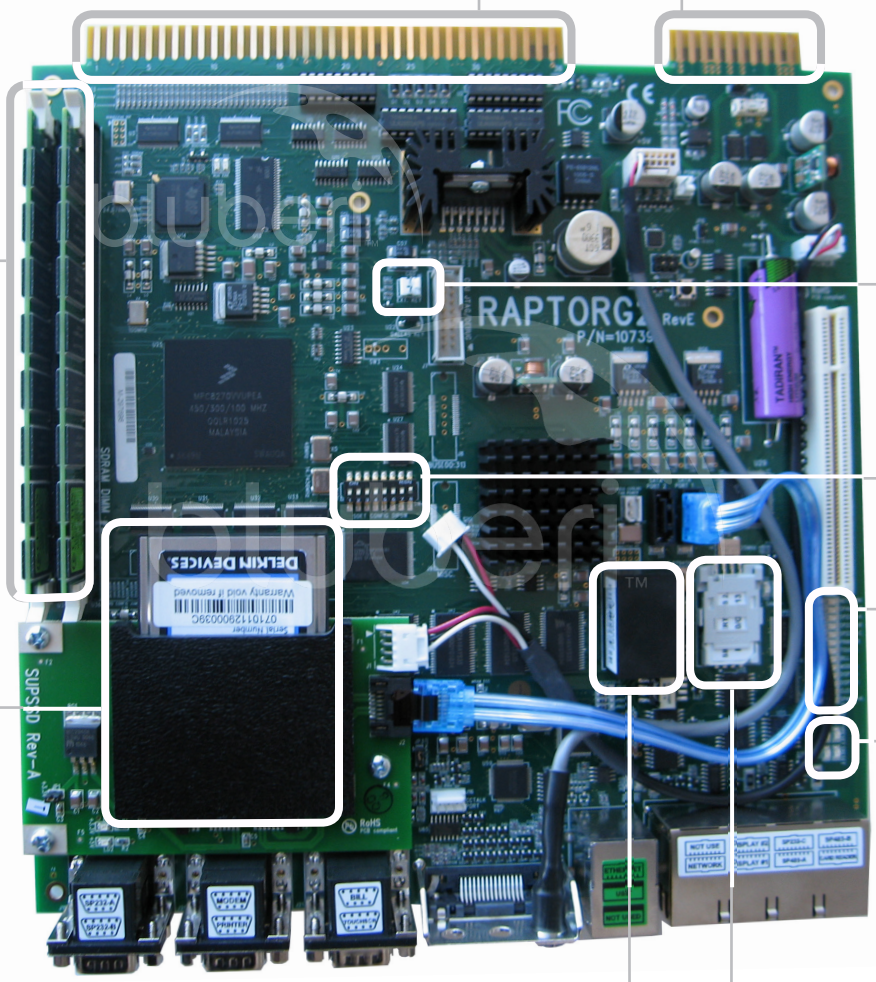
Gaming Board

Dimensions

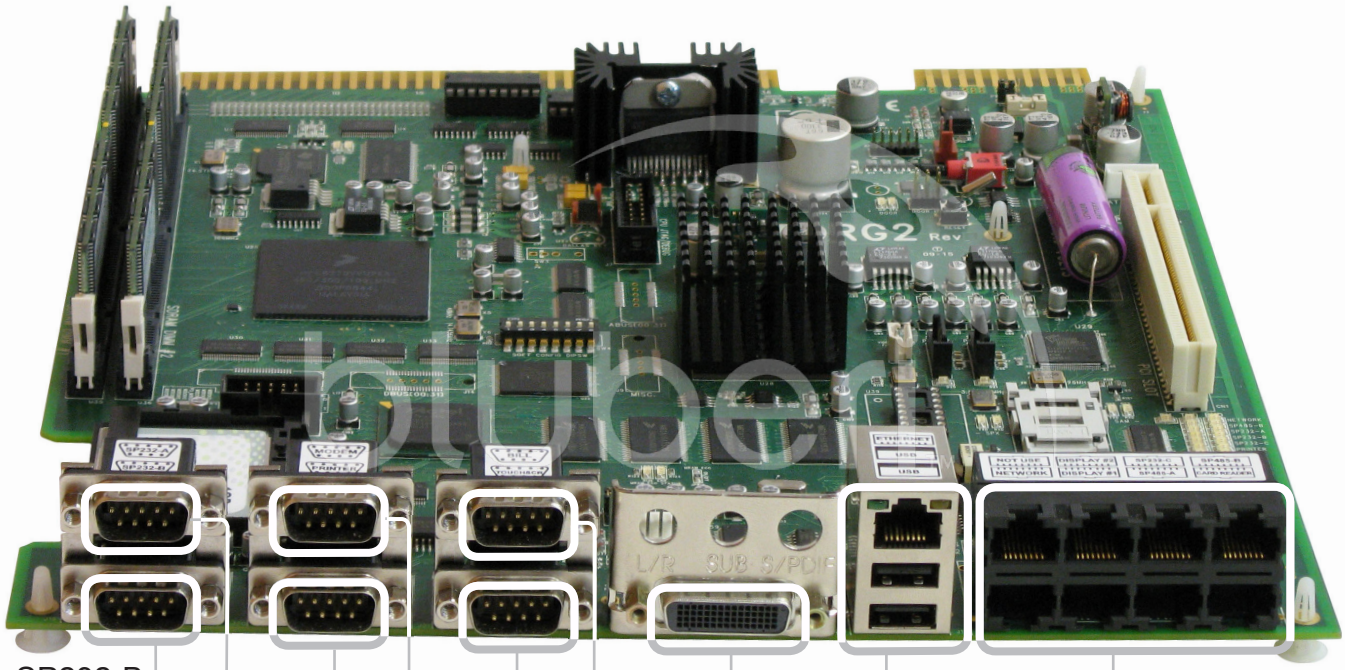


Main Components

Refer to document TEC-RE-02098 for further information on the RAPTORG2 gaming board.



Connectors



SP232-B

SP232-A
Secondary SAS

Printer

Modem
Primary SAS

Touchscreen

Bill acceptor

Dual VGA/DVI Video Output (LFH60)

Ethernet 10/100 Mbps
USB
USB (non-functional)

Not used	Display #2	SP232-C	SP485-B
Network	Display #1	SP485-A	Card reader

Edge Connector Pinout (J1 and J2)–5 Buttons BLU-EXT 5B (03426)

The following table presents a typical RAPTORG2 pinout for a 5-button game configuration.

Part Side	Pin	Solder Side
Big 72-pin		
	01	
	02	
Left_Speaker_Pos	03	
	04	Left_Speaker_Neg
	05	Right_Speaker_Neg
	06	
	07	
	08	
	09	Sw_Help
Sw_CallAttendant	10	Sw_Play
	11	Sw_Autoplay
	12	Right_Speaker_Pos
	13	Sw_Drop_Door
Sw_Paytable	14	Sw_Logic_Door
Sw_Bill_Door	15	Sw_Main_Door
	16	
+5 V (out)	17	
Sw_Slot#1	18	Sw_Slot#3
Sw_Slot#2	19	Enable_Coin
KeySw_Clear_Error	20	KeySw_Operator_Menu
	21	
	22	
Cash_In_Meter	23	GND
Cash_Played_Meter	24	
Credit_Drop_Meter	25	
Cash_Won_Meter	26	
	27	Lp_Paytable
Cash_Paid_Meter	28	Lp_CallAttendant
	29	
	30	
Lp_Help	31	Lp_Play
Lp_Autoplay	32	
	33	Lp_Tower_High
Lp_Tower_Mid	34	Lp_Tower_Low
	35	
GND	36	GND
Small 20-pin		
GND	01	GND
	02	
+5 V (in)	03	+5 V (in)
+5 V (in)	04	+5 V (in)
+12 V (in)	05	+12 V (in)
Power_Meter	06	Power_Meter
	07	
-12 V (in)	08	
GND	09	GND
GND	10	GND

Edge Connector Pinout (J1 and J2)–8 Buttons BLU-EXT 8B (03424)

The following table presents a typical RAPTORG2 pinout for an 8-button game configuration.

Part Side	Pin	Solder Side
Big 72-pin		
	01	
	02	
Left_Speaker_Pos	03	
	04	Left_Speaker_Neg
	05	Right_Speaker_Neg
	06	
	07	
Sw_Bet+	08	
	09	Sw_Help
Sw_Call_Attendant	10	Sw_Play/Spin/Repeat_Bet/Claim
	11	Sw_Max_Bet
	12	Right_Speaker_Pos
Sw_SelectDenom	13	Sw_Cash_Door
Sw_Language	14	Sw_Logic_Door
Sw_Bill_Door	15	Sw_Main_Door
	16	Lp_Collect
+5 V (out)	17	
Sw_Slot#1	18	Sw_Slot#3
Sw_Slot#2	19	Enable_Coin
KeySw_Clear_Error	20	KeySw_Operator_Menu
	21	Sw_Collect
	22	
Cash_In_Meter	23	GND
Cash_Played_Meter	24	
Cash_Drop_Meter	25	
Cash_Won_Meter	26	
	27	Lp_Language
Cash_Paid_Meter	28	Lp_CallAttendant
Lp_SelectDenom	29	
	30	
Lp_Help	31	Lp_Play/Spin/Repeat_Bet/Claim
Lp_Max_Bet	32	
Lp_Bet+	33	Lp_Tower_High
Lp_Tower_Mid	34	Lp_Tower_Low
	35	
GND	36	GND
Small 20-pin		
GND	01	GND
	02	
+5 V (in)	03	+5 V (in)
+5 V (in)	04	+5 V (in)
+12 V (in)	05	+12 V (in)
Power_Meter	06	Power_Meter
	07	
-12 V (in)	08	
GND	09	GND
GND	10	GND

Edge Connector Pinout (J1 and J2)–10 Buttons BLU-EXT 10B 20L (03440)

The following table presents a typical RAPTORG2 pinout for a 10-button game configuration.

Part Side	Pin	Solder Side
Big 72-pin		
	01	
	02	
Left_Speaker_Pos	03	
	04	Left_Speaker_Neg
	05	Right_Speaker_Neg
	06	Sw_Play_200_Credits
	07	
Sw_Play_300_Credits	08	
	09	Sw_PayTable/Help
Sw_CallAttendant	10	Sw_Play
	11	Sw_Play_500_Credits
	12	Right_Speaker_Pos
Sw_Play_100_Credits	13	Sw_Drop_Door
Sw_Play_20_Credits	14	Sw_Logic_Door
Sw_Bill_Door	15	Sw_Main_Door
	16	Lp_Collect
+5 V (out)	17	
Sw_Slot#1	18	Sw_Slot#3
Sw_Slot#2	19	Enable_Coin
KeySw_Clear_Error	20	KeySw_Operator_Menu
	21	Sw_Collect
	22	
Cash_In_Meter	23	GND
Cash_Played_Meter	24	
Cash_Drop_Meter	25	
Cash_Won_Meter	26	
Sw_SelectDenom	27	Lp_Play_20_Credits
Cash_Paid_Meter	28	Lp_CallAttendant
Lp_Play_100_Credits	29	Lp_Play_200_Credits
	30	
Lp_PayTable/Help	31	Lp_Play
Lp_Play_500_Credits	32	
Lp_Play_300_Credits	33	Lp_Tower_High
Lp_Tower_Mid	34	Lp_Tower_Low
Lp_Select_Denom	35	
GND	36	GND
Small 20-pin		
GND	01	GND
	02	
+5 V (in)	03	+5 V (in)
+5 V (in)	04	+5 V (in)
+12 V (in)	05	+12 V (in)
Power_Meter	06	Power_Meter
	07	Hopper_Drive_Low
-12 V (in)	08	
GND	09	GND
GND	10	GND

Edge Connector Pinout (J1 and J2)–15 Buttons BLU-EXT 15B (03425)

The following table presents a typical RAPTORG2 pinout for a 15-button game configuration.

Part Side	Pin	Solder Side
Big 72-pin		
	01	
	02	Lp_20Lines
Left_Speaker_Pos	03	
Sw_1Line	04	Left_Speaker_Neg
	05	Right_Speaker_Neg
	06	Sw_Bet3
Sw_5Lines	07	Sw_15Lines
Sw_Bet4	08	Sw_10Lines
	09	Sw_Help/PayTable
Sw_CallAttendant	10	Sw_Play
Sw_20Lines	11	Sw_Bet5
	12	Right_Speaker_Pos
Sw_Bet2	13	Sw_Drop_Door
Sw_Bet1	14	Sw_Logic_Door
Sw_Bill_Door	15	Sw_Main_Door
	16	Lp_Collect
+5 V (out)	17	
Sw_Slot#1	18	Sw_Slot#3
Sw_Slot#2	19	Enable_Coin
KeySw_Clear_Error	20	KeySw_Operator_Menu
	21	Sw_Collect
	22	
Cash_In_Meter	23	GND
Cash_Played_Meter	24	Lp_1Line
Cash_Drop_Meter	25	
Cash_Won_Meter	26	
Sw_Autoplay	27	Lp_Bet1
Cash_Paid_Meter	28	Lp_CallAttendant
Lp_Bet2	29	Lp_Bet3
Lp_15Lines	30	Lp_10Lines
Lp_Help/PayTable	31	Lp_Play
Lp_Bet5	32	Lp_5Lines
Lp_Bet4	33	Lp_Tower_High
Lp_Tower_Mid	34	Lp_Tower_Low
Lp_Autoplay	35	
GND	36	GND
Small 20-pin		
GND	01	GND
	02	
+5 V (in)	03	+5 V (in)
+5 V (in)	04	+5 V (in)
+12 V (in)	05	+12 V (in)
Power_Meter	06	Power_Meter
	07	Hopper_Drive_Low
-12 V (in)	08	
GND	09	GND
GND	10	GND

Technical Specifications

Processor and Memory

- MPC8270 32-bit processor running at 400 MHz (main CPU)
- Communication Processor Module (CPM) running at 200 MHz
- Integrated PCI bridge (PCI 2.2 compliant)
- Door tracking controller monitoring access even when power is off, and keeping track of the date and time (Atmel ATMEGA 168V)
- 128 MB of flash memory for boot code
- CompactFlash connector support
- Support for 2 SATA (Serial ATA) hard drives dedicated to external data storage
- Entire program can be changed by replacing or reprogramming a single part
- Up to 1 GB (2 DIMMs) of SDRAM for CPU operations (PC100 or PC133)
- Up to 2 MB of battery backed-up RAM with hardware lock
- Actel ProAsic A3P600 for glue logic

Security

- SPHINX and SAM card for protection against piracy and software modification

Video Graphic Interface

- High performance ATI Mobility Radeon M9-CSP64 video controller
- PCI 66 MHz bus interface (experimentations show up to 240 Mb/s transfer speed on PCI)
- Analog RGB (VGA) or digital interface (DVI) output
- Can drive two monitors simultaneously
- 64 MB of internal video RAM
- Resolution up to 1600 x 1200 pixels supported and run-time adjustable by software
- Up to 32-bit colors for graphics
- Powerful 2D and 3D engines

Sound

- Digital Signal Processor (Texas DSP TMS320C6727)
- 16 parallel channels able to play WAV and MP3
- Subwoofer output with active low-pass filter available
- Powerful 30-W stereo amplifier
- SPDIF audio output available

Communication Ports

- Up to 14 serial ports available on six DB-9 and eight RJ-45 connectors
- TTL, RS-232 and RS-485 ports available
- Support for several TTL and RS-232 serial bill acceptors
- Support for most serial printers
- Support for most available touchscreens
- Dynamic Display support directly available from an RJ-45 connector
- RS-485 network capacity of up to 100 boards communicating at 115.2 Kbps fully isolated from electric surge
- 10/100 Mbps Fast Ethernet connection
- USB 1.1 Port available

Inputs and Outputs

- 31 inputs for buttons, key switches, coin switches, etc.
- 30 open-collector outputs available for lamps, meters, bell, etc.
- Hopper and ticket dispenser capabilities
- Dedicated MCU to monitor five doors 24 hrs a day, even while power is off
- Real-time clock
- 37 LEDs for maximum feedback on operations

Peripherals

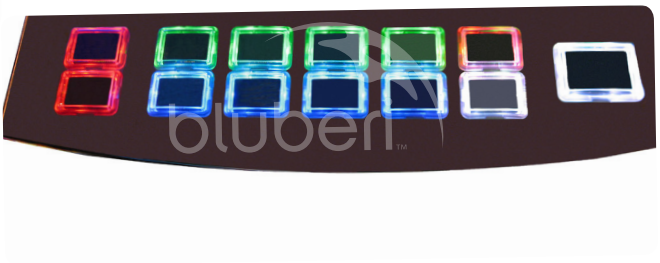
Bill Acceptor (Optional)

The bill acceptor communicates with the gaming board through an RS-232 link.

Manufacturer	Model	Nominal Voltage
JCM	UBA (UBA-10-SS)	12 VDC
JCM	iVIZION	12 VDC
MEI	Cashflow SC6607	12 VDC
MEI	SC Advance SCN6607	12 VDC
Cashcode	One (FLS-0310)	12 VDC

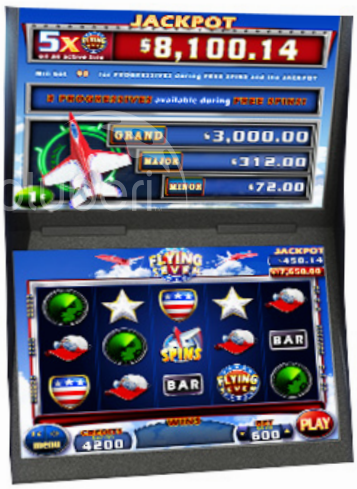
Button Panel

The button panel can easily be replaced to be compatible with games requiring other button configurations (5, 8, 10 or 15 buttons). A game pinout document describes the functionality of each button. It can also come with an OLED intelligent USB communicating with the main board.



LCD Monitors and Touchscreen

The LCD monitor screen measures 55,88 cm (22”). It is controlled by a VGA or DVI interface, thus maximizing the visual quality.



Input Power	Video Signal	Picture Ratio
100-240 VAC 50 Hz and 60 Hz	WSXGA mode (1680 × 1050 pixels)	16:10

The lower monitor is equipped with a touchscreen communicating with the gaming board through a serial RS-232 link.

Sìde Trim LED Controller

The LED-CTRL board allows changing the LED color and pattern on the main door side trims. This is controlled from the main board (CPU).

Mechanical Meters

Mechanical meters display game data using seven digits:

- cash in (1)
- cash paid (2)
- drop (3)
- cash won (4)
- cash played (5)

These meters, which cannot be reset, confirm data contained in the gaming board memory. They increment each time a 12 VDC pulse is registered. The hard meters are visible when the lower door is open.

Network

The network connects gaming machines to a server through a 100Base-T Ethernet link, making it possible to manage progressives as well as cashless and accounting systems.

Power Distribution Unit

The cabinet is powered using a power distribution unit (PDU) for both AC and DC voltages.
PDU integrates the main AC power inlet with an EMI filter, a fuse and the main switch. It also integrates an ATX-style power supply for DC rails power.

Inputs: 100 to 240 VAC
50 Hz and 60 Hz
200 Watts

Outputs: +3.3 V
+5 V
+12 V
+24 V
-12 V

Maximum Output	
+ 3.3 V	24 A
+ 5 V	24 A
+ 12 V (V1)	20 A
+ 12 V (V2)	20 A
+ 24 V	9 A
- 12 V	0.5 A

Each component inside the cabinet is powered independently from the power distribution unit. Each segment is fuse-protected. To quickly determine whether a fuse is blown, check the LED under it.

LED ON: Fuse is OK
LED OFF: Fuse is blown

PDU DC Section	
CPU Tray (J1)	This output supplies power to the CPU enclosure (main board).
Audio (J2)	This output supplies power to the audio amplifier board.
Bill (J3)	This output supplies power to the bill validator.
Prog. (J4)	This output supplies power to the progressive LED display.
Topper (J5)	This output supplies power to the optional topper and the candle light.
Lights (J6)	This output supplies power to the side trim LED controller, fans, belly logo, and service lamp.
Printer (J9)	This output supplies power to the ticket printer.
Audio 24V (J10)	This output supplies +24V power to the audio amplifier board.
Button (J11)	This output supplies power to the button panel.
Expansion (J12)	This output supplies power to the CPU enclosure (expansion power).

Printer (Optional)

The ticket printer communicates with the gaming board through an RS-232 link.

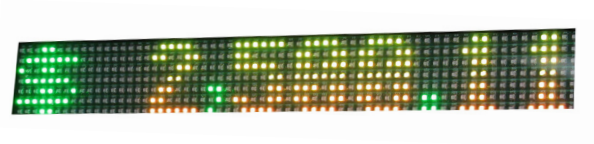
Manufacturer	Model	Nominal Voltage
Nanoptix	Paycheck 4	24 VDC
Future Logic	GEN II Universal (PSA66-ST2R)	24 VDC
Future Logic	GEN III Evolution (GLD-RS232)	24 VDC
Transact	Epic 950L	24 VDC

Progressive LED Display

The LED display shows the current progressive and messages. Both models communicate with the gaming board through an RS-232 interface.

Option 1: Panel-RGB

Seven lines of 64 LEDs (red, blue and green) can present 4096 different colors using a special technique based on duty cycle of the voltage applied to the LED.

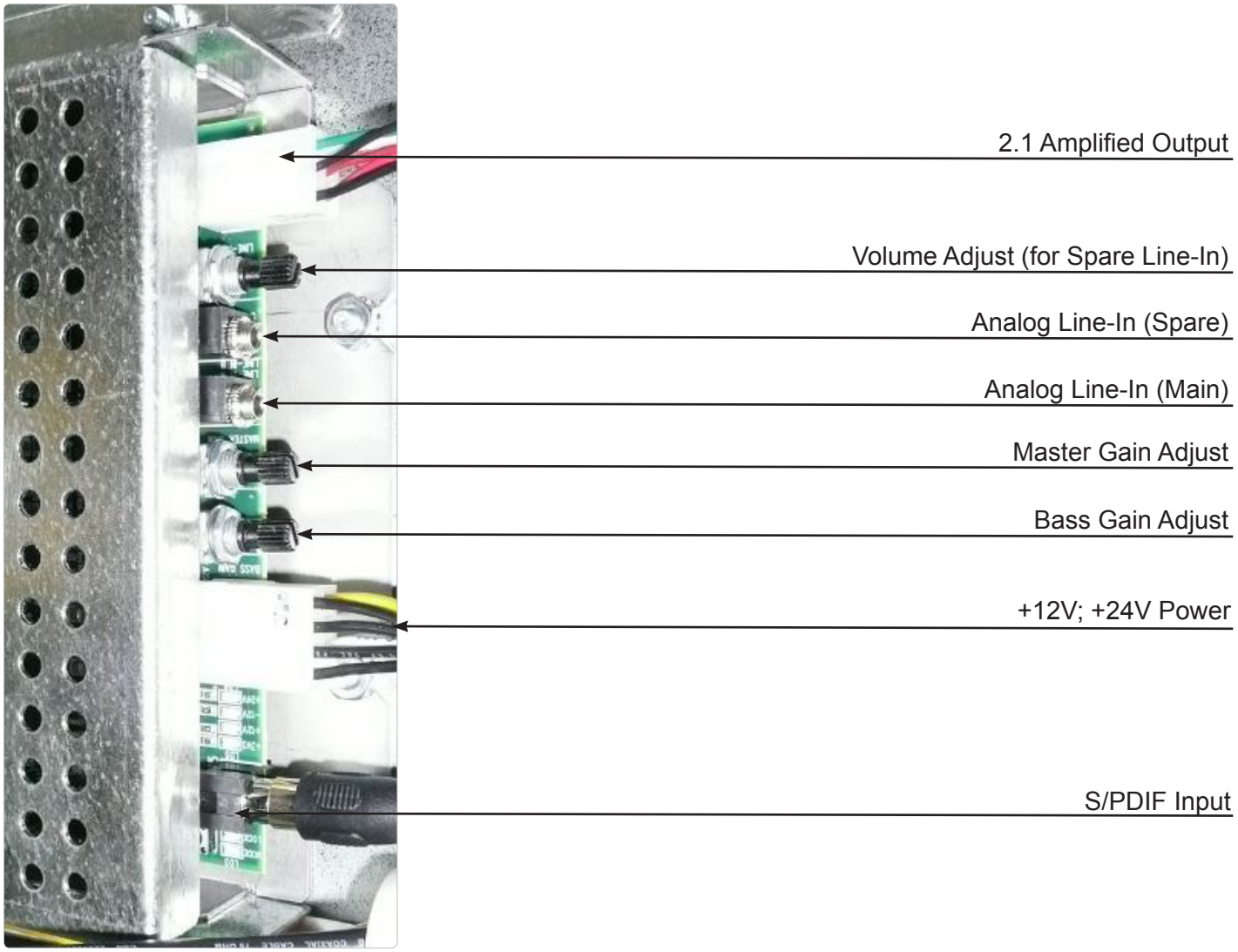


Option 2: SL-18

Seven lines of 60 bicolored LEDs (red and green) can present nine different colors using a special technique based on duty cycle of the voltage applied to the LED.

Sound Amplifier, Subwoofer and Speakers

The subwoofer and speakers are driven by the AMP21XP, a dedicated board amplifying the left and right outputs of the gaming board and adding a special output for a loudspeaker.



Speaker