OPERATORS MANUAL

SPEED OF LIGHT

© LAI Games

SAFETY PRECAUTIONS

The following safety precautions and advisories are used throughout this manual and are defined as follows.

> ## * WARNING! *
>
> *Disregarding this text could result in **serious injury**.*

> ## * CAUTION! *
>
> *Disregarding this text could result in damage to the machine.*

> ## * NOTE! *
>
> *Is an advisory text to hint or help understand .*

MACHINE INSTALLATION and INSPECTION

When installing and inspecting ***Speed of Light***, pay attention to the following points to ensure that players can enjoy the game safely.

- Always turn Off mains power before removing safety covers to work on the machine, and refit all safety covers when work is completed.
- When unplugging the game from an electrical outlet, grasp the plug, not the line cord.
- Always connect to a grounded electrical outlet with a securely connected ground line.
- Do not install the game cabinet outdoors or in areas of high humidity, direct water contact, dust, high heat or extreme cold.
- Always use a digital multimeter, logic tester or oscilloscope for testing integrated circuit (IC) logic PC boards. The use of a continuity tester is not permitted.
- Do not connect or disconnect any of the integrated circuit (IC) logic PC boards while the power is ON.
- Do not use any fuse that does not meet the specified rating.
- Before switching the machine on be sure to check that it has been set on the correct voltage for your area.
- Check that the feet levelers are set correctly on the floor so that the game cabinet is level and stable.
- Always make complete connections for the integrated circuit (IC) logic PC Boards and other connectors. Insufficient insertion can damage the electrical components.
- Only qualified personnel should inspect or test the integrated circuit (IC) logic PC Boards.

INTRODUCTION

Congratulations on your purchase of *Speed of Light*, the competitive, speed and reflex game by LAI Games. We hope you take the time to read this manual and learn about the many other features and user-friendly adjustments that can be made to fine-tune the game for maximum earning potential.

DESCRIPTION

The player has to press randomly illuminated lights on the button matrix. Six lights are illuminated at once. Each time one is pressed, it goes out and another is illuminated. Gameplay is fast and frantic, with the aim to get as high a score as possible within a designated time.

PACKAGING

At delivery, the machine should arrive in good condition. To move the packaged machine for transport or placement, use a forklift and take care not to hit the package or stack heavy objects on top, as this may cause damage to the machine.

CONTENTS

- The Speed of Light cabinet
- Keys
- 2 x coin door keys
- 2 x back door keys
- 2 x ticket door key
- Operator's manual
- IEC Power Cord (In cash box)
- Parts & Accessories   (In cash box)
- Bonus and Gameplay signage

SPECIFICATIONS

DIMENSIONS

- Weight: 250 kg   (551 lb)
- Width: 187cm   (74")
- Depth: 164cm   (65")
- Height: 237cm   (93")
- Power: Maximum   1.2 - 1.3 A (220AC) 2.4 - 2.6 A (110AC)

ELECTRIC SUPPLY

The game has the option to operate on a 100V, 110V, 120V, 220V or 240V AC 50/60Hz single phase mains electric supply. **The supply must be a three wire grounded supply.**

> *** CAUTION! ***
>
> **Before** switching the machine on be sure to check that it has been set on the correct voltage for your area.

UNPACKING

Carton

Header

Rear Bars

Platform

Pallet
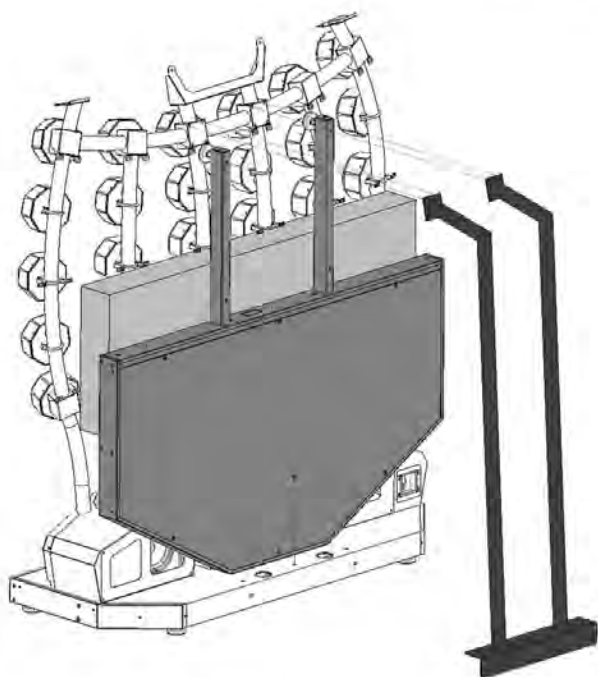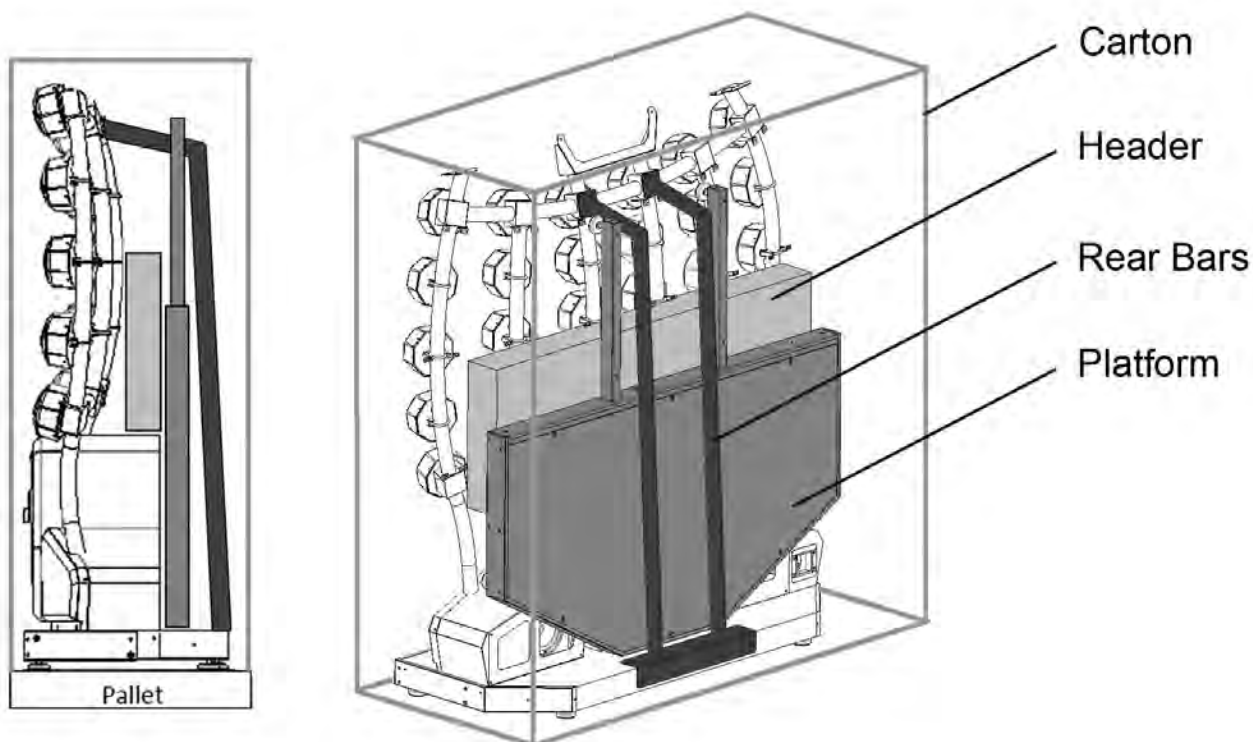
To unpack *Speed of Light*, first remove the exterior carton.

The header and platform are both located securely inside the Rear Bar mounting.

Remove the 9 bolts from the Rear Bars (4 at each bar top, one at the base), then remove the Rear Bars.

Carefully take out the platform and the header. Now re-bolt the Rear Bars to the main cabinet.

Additional bolts are required at the base of the Rear Bars, but this is done later in the assembly.

ASSEMBLY

THE HEADER

BOLT
M6 = 8 Pcs
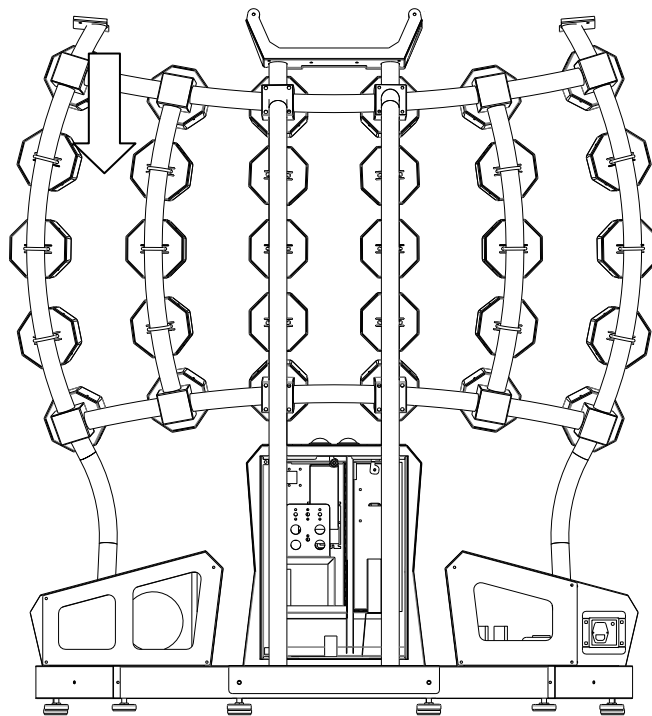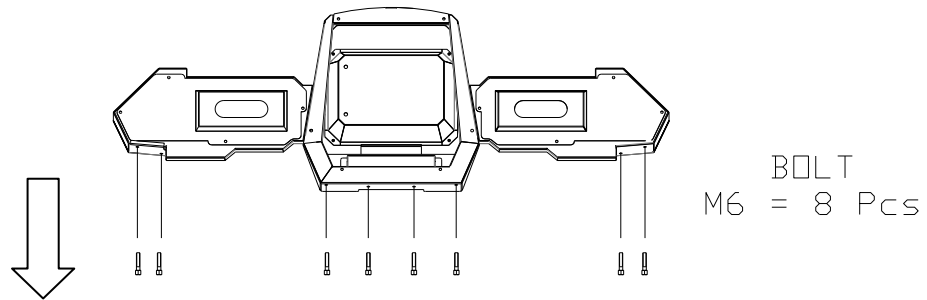
Open and remove the back panel on the middle section of the header so you have access to the header cables. These cables are to be connected to the cable coming up through the center two tubes in the button matrix. Position the header on top brackets and secure with the 10 bolts supplied. Leave the bolts loose until all are fitted, then tighten them. Connect the left and right speakers, score display, and LED connectors from inside of the header, then replace the back panel on the Header and tighten all the bolts.

THE PLATFORM

1
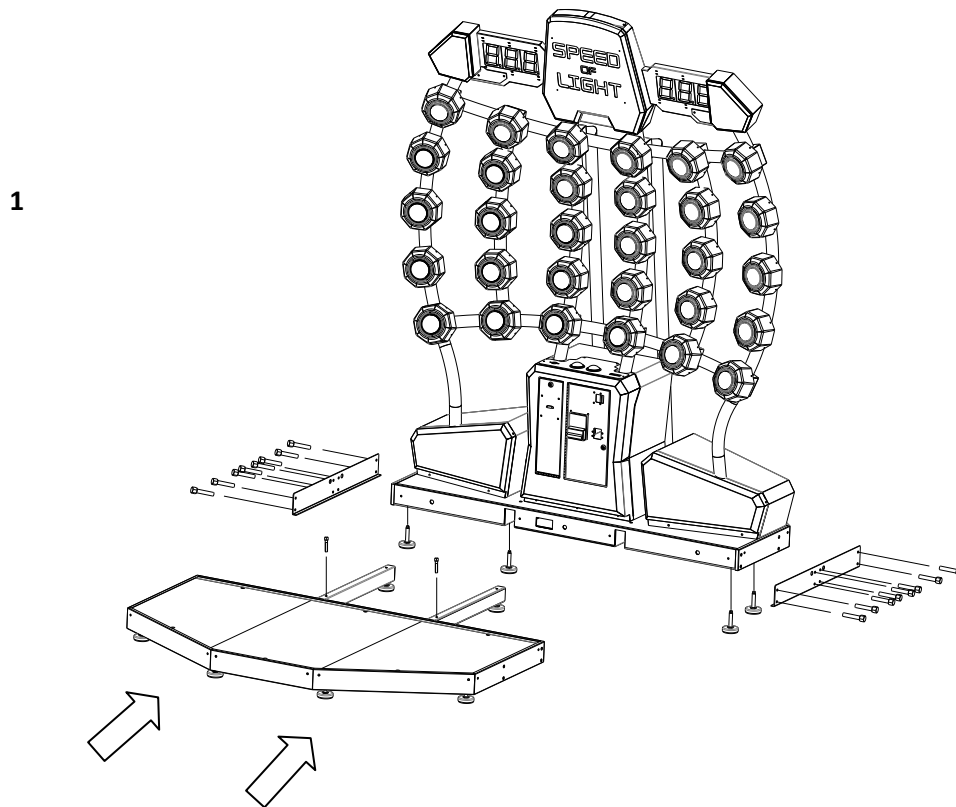
The cabinet will arrive with the platform separate from the cabinet. Position the platform as per drawing 1.

Adjust the feet on the platform to allow the bars to slide into the front of the cabinet as pictured. Slide the platform close to the cabinet and plug together the wiring connectors (Platform Wiring) then slide the platform fully into place. Once the platform and the cabinet are together, secure the platform from the back of cabinet first. Use the two bolts at the very back to pull the platform into the correct position before installing the remaining bolts that secure the platform and cabinet. Then add the side brace plates, and tighten everything up to finish the assembly.

2

BOLT
M8 = 7 Pcs

3
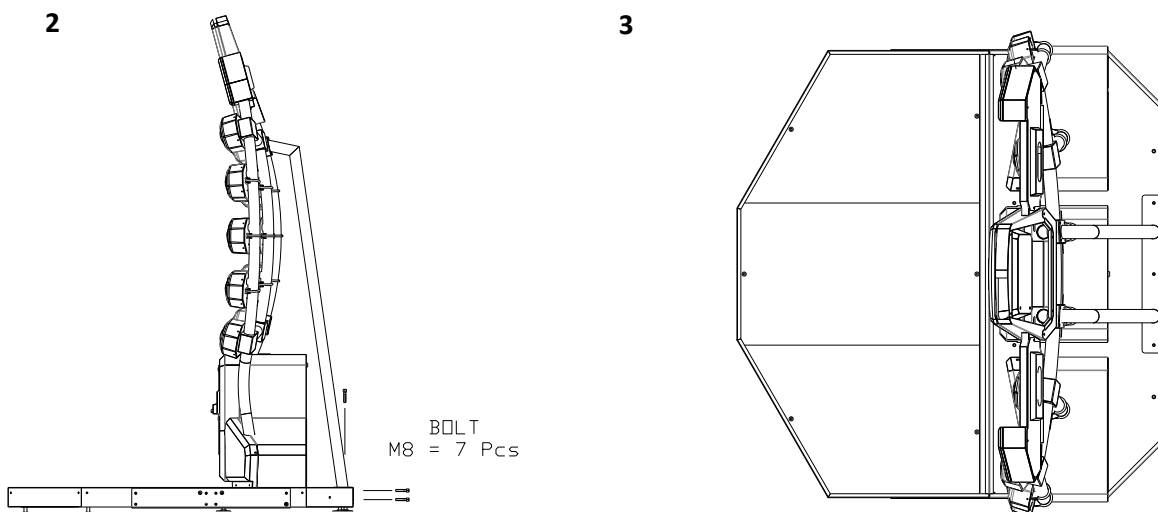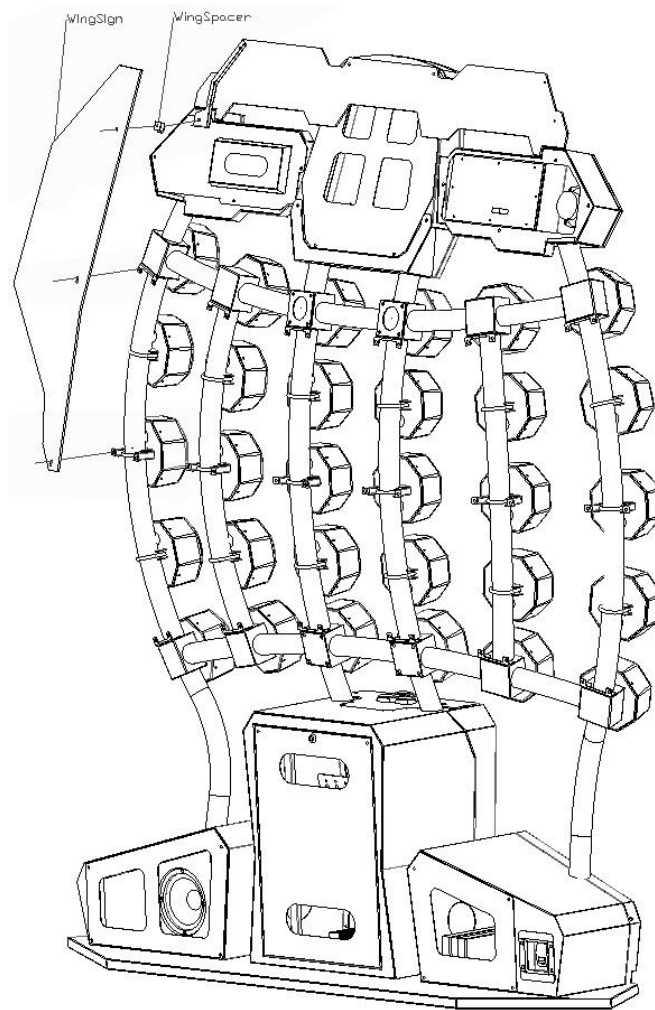
WING SIGNS

To attach the wing signs, first bolt each wing to the external side, and top corner brackets as illustrated. Next, bolt the top of the wing to the back of the bonus header bracket, using the spacer provided.

GAMEPLAY

OBJECTIVE

Players hit as many illuminated buttons as they can within the designated time limit. Bonus points are awarded for hitting the lit buttons continuously at a high speed. At the end of normal game time, there is a three-second bonus round in which all the buttons are illuminated at once, and the player hits as many as they can.

HOW TO PLAY

- Pay to play.
- Select your game mode (1 player, 2 player, link mode)
- Hit the lit buttons as fast as you can within the time limit
- Hit as many buttons as you can in the three-second bonus round
- Win tickets based on:
    - Score (points per ticket)
    - Beating the high score
    - Reaching the top score of 999
- Or win bonus credits based on:
    - Beating the high score
    - Reaching the top score of 999

TWO PLAYER

- Players stand shoulder to shoulder and play on half of the playfield each
- The winner is the player with the highest score at the end of the game
- The machine pays out the sum of both players ticket winnings at once
- Winner takes all, or they can divide the tickets as they see fit
- If card swipe system is installed, there is an option that allows the sum of both players tickets go to the winners card (Note: two card swipers are needed)
- High score/999 bonuses can also be won in two player

CHEATING

The software is programmed to identify when two or more people are playing a one player game. Once identified, the following occurs:

- The speed bonus per button press (usually 1-5 points) is disabled, and the players receive 1 point per button press.
- Their score, if high, is not displayed as the day's high score
- They do not receive any bonuses for beating the high score or reaching a score of 999

OPERATION

The "Speed of Light" game has five operational modes: Attract mode, Play mode, Test mode, Programmable Adjustments Mode and Audits Mode.

OPERATIONAL DIAGRAM
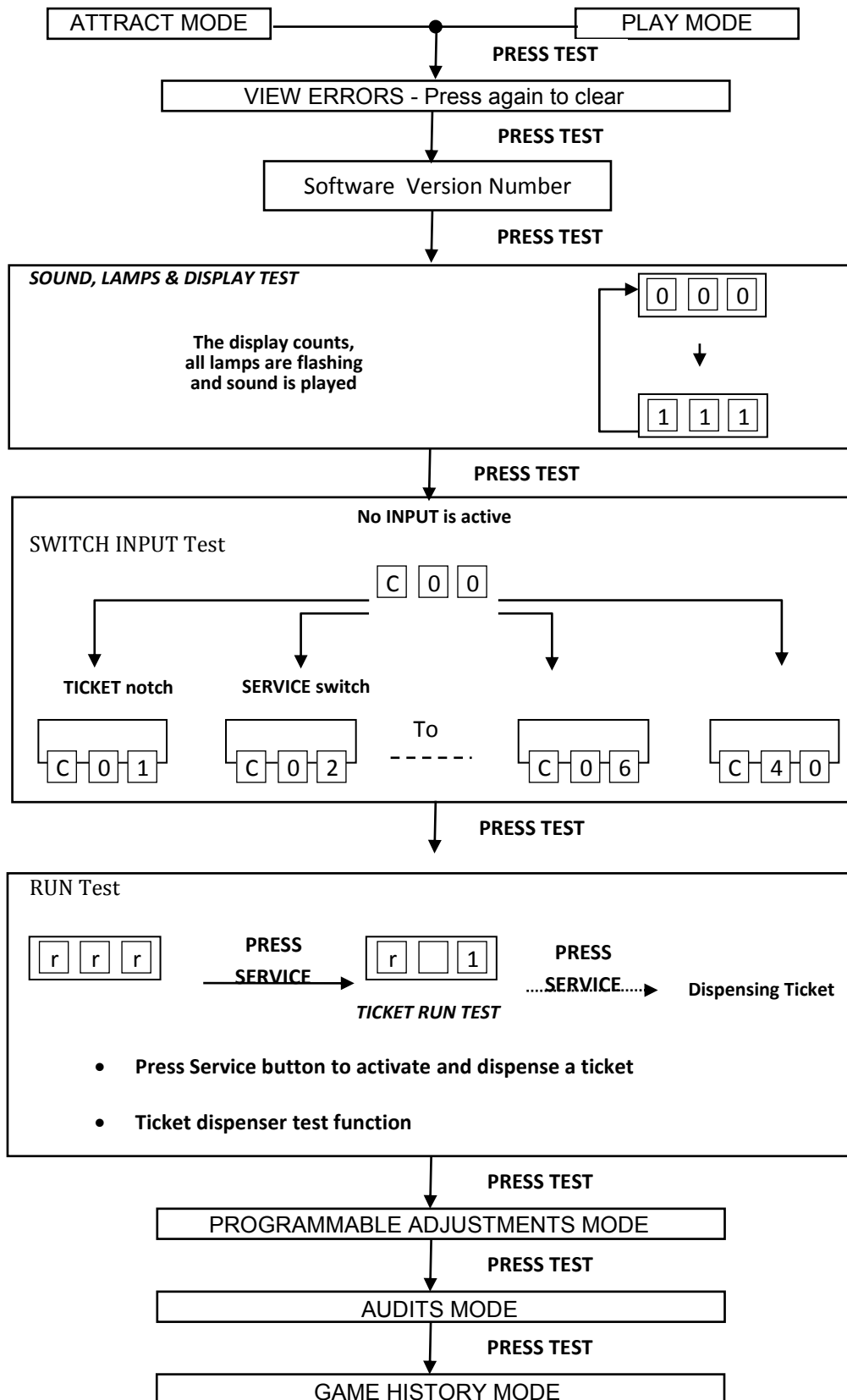
ATTRACT MODE

The Attract mode provides a light and sound display while the game is not being played. This feature is to attract potential customers to play the game. The attract mode sound can be turned on and off

PLAY MODE

Speed of Light has two play modes. The standard *Coin Play* mode, where a coin, or coins are inserted. Or *Free Play* mode where no coins are necessary.

COIN PLAY

The *Coin Play* mode is entered from *Attract mode*, by inserting coins in any of the two coin slots on the front of the machine cabinet, then following the instructions in the "How to Play" section of this manual.

FREE PLAY

Free play can be set in one of three ways:

- From attract mode by holding the green service button for longer than five seconds (this is reset to normal play when the machine is turned off and back on)
- Or by setting the P-01 setting to FrEE (this is fixed, and stays set to free until this setting is changed)
- For a single free game, just press the green *service* button once. When issuing single free games in this manner, prizes can be won as normal.

ERRORS

Button, ticket and machine errors can be alerted in multiple ways. A voiceover during the attract mode, a silent red light flashing on the front of the machine, or both. The silent red button is the default setting. To identify the error in this mode, press the red test button once. To clear the error, press the red test button once more. The game will check if the error is fixed. If the reason for the error is gone, the game will continue as normal. If the error has not been fixed, error will remain on the display.

CODE	ERROR DESCRIPTION	SOLUTION
Err1	TICKET ERROR - Jammed tickets, no tickets, or no ticket notch pulse for longer than 3 seconds	Clear ticket dispenser jam or replenish tickets.
Err2	GAME MODE BUTTON JAM - active for longer than 30 seconds	Check button function using switch test
Err3	EEPROM ERROR - Problem with on-board EEPROM	The main MCU is getting errors reading the EEPROM (24C16 IC on MCU).
Err4	PLAYFIELD BUTTON ERROR - active for longer than 30 seconds	Check button function using switch test and clear the jam button or faulty switch

Err1 - TICKET ERROR

This error usually occurs if the game has run out of tickets or there is a ticket jam. If the game was out of tickets, replace them, and the error will automatically clear as well as feed any outstanding payout. Less common reason is if the game PCB tries to dispense tickets but does not get a notch pulse for approximately three seconds. Use the switch test function to

detect a notch pulse by passing a ticket in and out of the notch sensor. An active notch will be display as C1.

Err2 - START/STOP BUTTON JAMMED
This error is usually displayed if the Start/Stop button is active for longer than 30 seconds. Use the switch test function to clarify. An active button will be display as C3.

Err3 - EEPROM ERROR
This Error is only displayed in test mode, and means that the CPU cannot read the EEPROM, or is receiving errors during communication with the EEPROM (The 23C16 IC on the main MCU PCB). This could cause problems with the game audits and program settings.

If this occurs, firstly try switching the machine OFF and ON for at least 2 cycles. If the message still appears, replace the EEPROM IC Atmel 24C16 on the CPU PCB with a new EEPROM. If the error message remains, send your main MCU PCB to the nearest authorized LAI Games dealer for repair.

Err4 – PLAYFIELD BUTTON ERROR
This error is usually displayed if one or more buttons are jammed, or a button switch is faulty. Test the button function by using both the Run Test and Switch Test. Switch Test should display numbers between C11 – C40.

TEST MODE

The *Speed of Light test mode* allows you to run sound/lamp/display, switch, and run tests. Cycle through these test modes with the red test button.

> *** NOTE! ***
>
> - Entering Test Mode will clear any credits remaining in the game.

GAME SWITCHES

All game switches have a code from C1 to C40 as tabled below. By activating any of the switches, their code will be displayed on the 4-digit display.
If there are no switches active, C - 00 be displayed.
If several switches are activated simultaneously, the display will consecutively show their codes, indicating which switches are active.

CODE	DISPLAY	SWITCH FUNCTION	SWITCH LOCATION
C0	C - 0 0	No Switch Active	-
C1	C - 0 1	Ticket Notch 1 Active	Ticket Door (if fitted)
C2	C - 0 2	Service Switch Active	Service Panel
C3	C - 0 3	Player 1 Start Button Active	Control Panel
C4	C - 0 4	Coin 1 Switch Active	Coin Door
C5	C - 0 5	Coin 2 Switch Active	Coin Door
C6	C - 0 6	Ticket Notch 2 Active	Only Used For Card System Mode
C7	C - 0 7	Not Used	
C8	C - 0 8	Not Used	
C9	C - 0 9	Not Used	
C10	C - 1 0	2 Player Start /ink Button Active	Control Panel
C11 – C40		Playfield Button (See Diagram)	Playfield

PLAYFIELD DIAGRAM (C--)
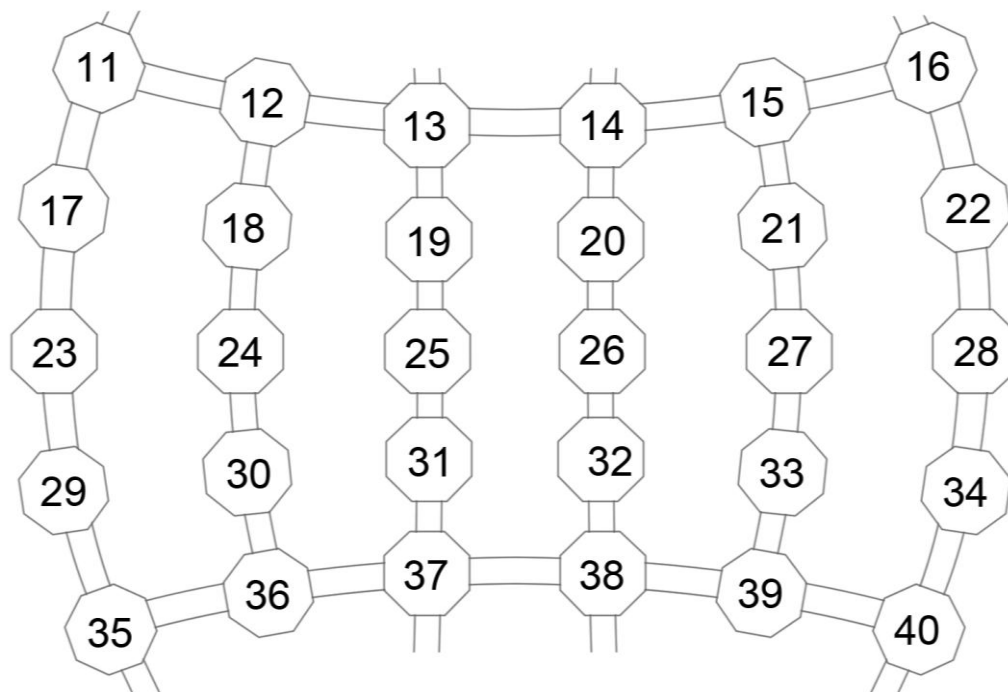
PROGRAMMABLE ADJUSTMENTS (P-Settings) REFERENCE TABLE V1.5.0

No	Description	Range	Default
P01	Coin 1: number of coins	FrEE..20	1
P02	Coin 1: number of credits	1..20	1
P03	Coin 1: Activate multiple bonus pricing	On/Off	Off
P3-1	Coin 1: Number of coins bonus pricing level 1	Off,1…99	Off
P3-2	Coin 1: Number of bonus credits at pricing level 1	Off,1…99	Off
P3-3	Coin 1: Number of Coins for Bonus Pricing Level 2	Off,1…99	Off
P3-4	Coin 1: Number of Bonus Credits at Bonus Pricing Level 2	Off,1…99	Off
P3-5	Coin 1: Number of Coins for Bonus Pricing Level 3	Off,1…99	Off
P3-6	Coin 1: Number of Bonus Credits at Bonus Pricing Level 3	Off,1…99	Off
P04	Coin 2: number of coins	1..20	1
P05	Coin 2: number of credits	1..20	1
P06	Coin 2: Activate Multiple bonus pricing,	On/Off	Off
P6-1	Coin 2: Number of Coins for Bonus Pricing Level 1	Off,1…99	Off
P6-2	Coin 2: Number of Bonus Credits at Bonus Pricing Level 1	Off,1…99	Off
P6-3	Coin 2: Number of Coins for Bonus Pricing Level 2	Off,1…99	Off
P6-4	Coin 2: Number of Bonus Credits at Bonus Pricing Level 2	Off,1…99	Off
P6-5	Coin 2: Number of Coins for Bonus Pricing Level 3	Off,1…99	Off
P6-6	Coin 2: Number of Bonus Credits at Bonus Pricing Level 3	Off,1…99	Off
P07	Attract Mode sound	On/Off	On(1)
P08	Beat the High Score: bonus type	0 – None 1 – Credit 2 – Tickets	2
P09	Beat the High Score: Number of bonus credits or tickets 1 – 10 credits (P08 setting on Credits) 1 – 100 tickets (P08 setting on Tickets)	Credits 1, 2, 3...10 Tickets 1, 2, 3..100	20 tickets or 1 credit
P10	Reach a 999 Score: Bonus type	0 – None 1 – Credit 2 – Tickets	2

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P11	Reaching a 999 score: Number of bonus credits or tickets for reaching a score of 999 1 – 10 credits (P10 setting on Credits) 1 – 100 tickets (P10 setting on Tickets)	Credits 1, 2, 3...10 Tickets 1, 2, 3..100	50 tickets or 2 credits
P12	Ticket Payout: Number of points per ticket	1 … 100	20
P13	Ticket Payout: Minimum ticket payout	0..30	8
P14	Ticket Payout: Maximum ticket payout	No, (P13) … 100	No (No Max)
P15	Ticket Payout: Pay tickets on free mode	On/Off	Off
P16	Default high score	50-700	500
P17	Current high Score	(P16)...990	*500*
P18	Retain the High Score when game is turned off/on	On/Off	On(1)
P19	Ticket payout	On/Off	On
P20	Game linking type (optional)	0- None 1- Master 2- Slave	0
P21	Error message option	1..4	4
P22	Combine coin1 and coin2	On, Off	On
P23	2 Player Game - one credit	On, Off	Off
P24	Card system Mode (2 Swipers and 2 Ticket outputs)	On, Off	Off
P25	Competition mode	Off, 1…4	Off

Note: Default P-Setting give 15-20 ticket payout average (50c play , 1c ticket)

PROGRAMMABLE ADJUSTMENTS DETAILED

- **P01 – Coin 1 – Number of <u>coins</u> per credit** *(Default 01, adjustable FrEE – 20)*
  This sets the number of coins that need to be inserted into coin mechanism one, for each credit. It can be set between 1 to 20 coins for one credit. The default setting is 1. Setting P01 to "FrEE" enables free play mode. This stays active when the machine is switched on and off.

- **P02 – Coin 1 – Number of game <u>plays</u> per credit** *(Default 01, adjustable 1 – 20)*
  This sets the number of games for each credit inserted into coin mechanism 1. This can be set from 1 to 20 plays for each credit. The default setting is 1.

- **P03 – Coin 1 -<u>Activate</u> multiple bonus pricing** *(Default OFF adjustable ON – OFF)*
  This turns on the multiple bonus credit system and activates the settings for up to 3 bonus levels on coin mechanism 1. It can be set to ON or OFF. The default setting is "OFF". This means that multiple bonuses is disabled. If set to "ON", the multiple bonus setting will be active, and open the sub-menu P03-1 to P03-6.

  Note: Settings P03 and P03-1 to P03-6 are only used for the setting of bonus credit levels. For example if a setting like this is required:

    o $0.50 = 1 play
    o $1.00 = 3 plays
    o $2.00 = 7 plays
    o $5.00 = 20 plays

- **P03-1 – Coin 1- Number of <u>coins</u> needed to reach bonus credit level 1** *(Default OFF, adjustable OFF-99)*
  This sets the number of coins (or bills) that need to be inserted into coin mechanism 1 to reach the bonus credit level 1. It can be set to either OFF for no bonus, or 1 to 99 coins.

- **P03-2 – Coin 1- Number of <u>bonus</u> credits given at bonus level 1** *(Default OFF adjustable OFF-99)*
  This sets the number of bonus credits that are given when credit Level 1 is reached. This is the number of bonus credits given, on top of what has been paid for. It can be set either to OFF, or from 1 to 99 bonus credits. The default setting is "OFF". This means that P03-3 will not open.

- **P03-3 – Coin 1- Number of <u>coins</u> needed to reach bonus credit level 2** *(Default OFF, adjustable OFF-99)*
  This sets the number of coins (or bills) that need to be inserted into coin mechanism 1 to reach the bonus credit level 2. It can be set to either OFF for no bonus, or 1 to 99 coins.

- **P03-4 – Coin 1- Number of <u>bonus</u> credits given at bonus level 2** *(Default OFF adjustable OFF-99)*
  This sets the number of bonus credits that are given when credit level 2 is reached. This is the number of bonus credits given, on top of what has been paid for. It can be set either to OFF, or from 1 to 99 bonus credits. The default setting is "OFF". This means

- **P03-5 – Coin 1- Number of <u>coins</u> needed to reach bonus credit level 3** *(Default OFF, adjustable OFF-99)*
  This sets the number of coins (or bills) that need to be inserted into coin mechanism 1 to reach the bonus credit level 3. It can be set to either OFF for no bonus, or 1 to 99 coins.

- **P03-6 – Coin 1- Number of <u>bonus</u> credits given at bonus level 3** *(Default OFF adjustable OFF-99)*
  This sets the number of bonus credits that are given when credit level 3 is reached. This is the number of bonus credits given, on top of what has been paid for. It can be set either to OFF, or from 1 to 99 bonus credits. The default setting is "OFF".

BONUS CREDIT EXAMPLES

Examples	(Base price $0.25c)	(Base Price $0.50c)	(Base Price $0.50c)	(Base Price $1.00)
P Setting Adjustment	1 *play* **$ 0.25c** 3 *plays* **$ 0.50c** 7 *plays* **$ 1.00** ($0.25c coins or DBA set on $0.25c pulses)	1 *play* **$ 0.50c** 3 *plays* **$ 1.00** 7 *plays* **$ 2.00** ($0.25c coins or DBA set on $0.25c pulses)	1 *play* **$ 0.50c** 3 *plays* **$ 1.00** 8 *plays* **$ 2.00** 22 *plays* **$ 5.00** ($0.25c coins or DBA set on $0.25c pulses)	1 *play* **$ 1.00** 3 *plays* **$ 2.00** 8 *plays* **$ 5.00** 18 *plays* **$ 10.00** ($0.25c coins or DBA set on $0.25c pulses)
P01 / P04	1	2	2	4
P02 / P05	1	1	1	1
P03 / P06	ON	ON	ON	ON
P3-1 / P6-1	2	4	4	8
P3-2 / P6-2	1	1	1	1
P3-3 / P6-3	4	8	8	20
P3-4 / P6-4	3	3	4	3
P3-5 / P6-5	OFF	OFF	20	40
P3-6 / P6-6	OFF	OFF	12	8

- **P04 – Coin 2 – Number of <u>coins</u> per credit** *(Default 01, adjustable 1 – 20)*
  This sets the number of coins that need to be inserted into coin mechanism 2, for each credit. It can be set between 1 to 20 coins for one credit. The default setting is 1.

- **P05 – Coin 2 – Number of game plays per credit** *(Default 01, adjustable 1 – 20)*
  This sets the number of games for each credit inserted into coin mechanism 2. This can be set from 1 to 20 plays for each credit. The default setting is 1.

- **P06 – Coin 2 – <u>Activate</u> coin 2 multiple bonus pricing** *(Default OFF adjustable ON – OFF)*
  This turns on the multiple bonus credit system and activates the settings for up to 3 bonus levels on coin mechanism 2. It can be set to ON or OFF. The default setting is "OFF". This means that multiple bonuses is disabled. If set to "ON", the multiple bonus setting will be active, and open the sub-menu P06-1 to P06-6.

  Note: Settings P06-1 to P06-6 set the bonus credit levels. For example:
  - $0.50 = 1 play
  - $1.00 = 3 plays
  - $2.00 = 7 plays
  - $5.00 = 20 plays

- **P06-1 – Coin 2 – Number of <u>coins</u> needed to reach bonus credit level 1** *(Default OFF, adjustable OFF-99)*
  This sets the number of coins (or bills) that need to be inserted into coin mechanism 2 to reach the bonus credit level 1. It can be set to either OFF for no bonus, or 1 to 99 coins.

- **P06-2 – Coin 2 – Number of <u>bonus</u> credits given at bonus level 1** *(Default OFF adjustable OFF-99)*
  This sets the number of bonus credits that are given when credit Level 1 is reached. This is the number of bonus credits given, on top of what has been paid for. It can be set either to OFF, or from 1 to 99 bonus credits. The default setting is "OFF". This means that P06-3 will not open.

- **P06-3 – Coin 2 – Number of <u>coins</u> needed to reach bonus credit level 2** *(Default OFF, adjustable OFF-99)*
  This sets the number of coins (or bills) that need to be inserted into coin mechanism 2 to reach the bonus credit level 2. It can be set to either OFF for no bonus, or 1 to 99 coins.

- **P06-4 – Coin 2 – Number of <u>bonus</u> credits given at bonus level 2** *(Default OFF adjustable OFF-99)*
  This sets the number of bonus credits that are given when credit level 2 is reached. This is the number of bonus credits given, on top of what has been paid for. It can be set either to OFF, or from 1 to 99 bonus credits. The default setting is "OFF". This means

- **P06-5 – Coin 2 – Number of <u>coins</u> needed to reach bonus credit level 3** *(Default OFF, adjustable OFF-99)*
  This sets the number of coins (or bills) that need to be inserted into coin mechanism 2 to reach the bonus credit level 3. It can be set to either OFF for no bonus, or 1 to 99 coins.

- **P06-6 – Coin 2 – Number of <u>bonus</u> credits given at bonus level 3** *(Default OFF adjustable OFF-99)*
  This sets the number of bonus credits that are given when credit level 3 is reached. This is the number of bonus credits given, on top of what has been paid for. It can be set either to OFF, or from 1 to 99 bonus credits. The default setting is "OFF". This means

- **P07 – Attract Mode Sound** *(Default ON)*
  This adjustment turns the *attract mode sound* **ON** or **OFF**. This is the sound and music that the game generates to attract customers when not being played. The music will loop approximately every 3 minutes.

- **P08 – Beat high score bonus type** *(Default tickets)*
  This is the type of bonus awarded to the player for beating the high score. It can be set to none, credits, or tickets.

- **P09- Number of bonus credits or tickets for beating the high score** *(Default, 20 tickets)*
  This is the number of tickets or credits awarded to the player for beating the high score and is adjustable 1-100 is P08 is set for Tickets or 1-10 if P08 is set for Credits

- **P10- Reach score of 999, bonus type** *(Default, tickets)*
  This is the type of bonus awarded to the player for reaching 999.It can be set to none, credits, or tickets.

- **P11- Number of bonus credits or tickets for reaching a score of 999** *(Default, 20 tickets)*
  This is the number of tickets or credits awarded to the player for reaching a score of 999 and is adjustable 1-100 is P10 is set for Tickets or 1-10 if P10 is set for Credits.

- **P12- Number of points per ticket** *(Default, 20)*
  This is the number of points the player must score to accumulate each ticket and it is adjustable 1-100.

- **P13- Minimum ticket payout** *(Default, 8)*
  This is the minimum number of tickets that will be paid out, no-matter the score the player reaches. It is adjustable from 0 to 30

- **P14- Maximum ticket payout** *(Default, no max)*
  This is the maximum number of tickets that will be paid out to the player. It is adjustable from no (No Maximum) to 100 tickets

- **P15- Pay out tickets on free mode** *(Default Off)*
  This is whether tickets are paid out when the machine is set to free mode and can be set to on or off

- **P16- Default high score** *(Default, 500)*
  This is the high score the machine starts with, and resets to if P18 is set to off, it is adjustable from 50 to 700.

- **P17- Current high Score** *(Default, 500)*
  This setting is used to manipulate the current high score and the score can be change up or down and is adjustable down to the P16 setting and up to 990.

- **P18- Memorise the High Score** *(Default, on)*
  This sets whether or not the machine remembers the last high score when switched off.

- **P19-Ticket payout** *(Default, on)*
  This sets ticket payouts on or off

- **P20- Game linking type** *(Default, 0 none) (optional)*
  This sets the machine to either master or slave when linked with another ***Speed of Light*** machine. It can be either 0 (no linking), 1(Master or 2 (Slave)

- **P21- Error message option** *(Default, 4)*
  This sets the manner in which errors are alerted. The default silently flashes the red light on the front of the machine. It is adjustable from 1-4 as per the table below.

Setting	Voice Over	4 Digit Display	Red Lamp
1	Played	Displayed	Flash
2	Played	Will display when test button pressed.	Flash
3	Not Played	Displayed	Flash
4	Not Played	Will display when test button pressed.	Flash

- **P22- Common coin** (Default, off)
  This controls the dual coin system. When set to OFF, both coin systems are separate (double coin system), when set to ON, both coin inputs will be combined and into a single accumulated pool. Note the value of both inputs needs to be the same. Example: This is often used with a DBA set on 25c pulses and 25c coin mech.

- **P23- Double player - one credit** (Default, off)
  This allows the two-player mode to be played with just one credit instead of the default 2 credits.

- **P24- Card system** (Default, off)
  This allows splitting of the coin inputs for 2 player games, allowing the winner of a 2-player game to be credited their winnings. This mode requires two card swipers installed on the game and the Card system wired to the 2nd Ticket Dispense connector.

- **P25- Competition mode** (Default, off. Adjustable 1-5)
  This setting allows for adjustment of the bonus ramp for in store competitions. Exceptional players may be able to reach 999 on a regular basis. By adjusting this setting, it can be assured players never reach 999, and thus the winner of a tournament can be established. The settings (1-5) represent the max points per button press. The recommended setting for a competition is 3.

AUDITS MODE

The *Audits Mode* provides statistics on all areas of gameplay. This enables the operator to make calculated adjustments and fine tune the machine to maximize earning potential. The *Audits Mode* stores records of the games played since the audits were last reset. While in this mode, the game audits can be reset to zero by holding down the 1 Player Start button for longer than 5 seconds.

Speed of Light has a total of 40 audits that can be viewed. They are A01 to A40 and their codes and values are displayed alternatively on the 4-digit credit display. For example, code **A01** would be displayed as A☐0️⃣1️⃣, and a value of **421** as ☐4️⃣2️⃣1️⃣.

Large values such as **21589** are displayed as ➖➖➖2️⃣ and 1️⃣5️⃣8️⃣9️⃣.

---

* NOTE! *

- For audit values that are greater than 4 digits the audits' values will be displayed in two steps.

- The first number, which is displayed as ➖➖➖2️⃣, has leading dash symbols The second value is displayed as 1️⃣5️⃣8️⃣9️⃣, which has no dash symbols.

ENTER AUDITS MODE

The *Audits Mode* is entered from the *Attract Mode* by pressing the red test button five times. A A A A will be displayed on the 4-digit display.

CYCLE THROUGH AUDITS

Starting from the A A A A display, the green service button is pressed for cycling through the audits.

RESET AUDITS

The entire set of user audits can be reset during any of the audit configurations by holding the start button for longer than 5 seconds. The display will be cleared, and will return to that audit when the start button is released. The value of all audits will be reset to 00,000.

EXIT AUDITS

The *Audits Mode* is exited into *Game History* mode by pressing the Test button once.

---

* NOTE *

Audits will stop incrementing when the value reaches 60,000

Audits must be reset to 00 000 by holding the start button for longer than 5 seconds while in audits mode

---

AUDITS QUICK REFERENCE TABLE

No	Description
A01	Total number of games played (resettable)
A02	Total 1 player games played (resettable)
A03	Total 2 player games played (resettable)
A04	Total multi-player games played (resettable)
A05	Total Coin Mech. 1
A06	Total Coin Mech. 2
A07	Total Service Credits
A08	Total Link Games
A09	Total 1 player high score bonus wins
A10	Total 2 player high score bonus wins
A11	Total multi-player high scores
A12	Average tickets per game
A13	Highest 1 player game score
A14	Highest 2 player game score
A15	Highest multi-player game score
A16	Total 1 player 999 game scores
A17	Total 2 player 999 game scores
A18	Total multi-player 999 game scores
A19	Total games played (not resettable)
A20	Total 1 player games played (not resettable)
A21	Total 2 player games played (not resettable)
A22	Total multi-player games played (not resettable)
A23	Manufacturer Audits (Total Link Games)
A24	Manufacturer Audits (Highest game score 1PL not resettable)
A25	Manufacturer Audits (Highest game score 2PL not resettable)
A26	Manufacturer Audits (Highest game score MPL)
A27	Manufacturer Audits (High Score Bonus Win 1PL not resettable)
A28	Manufacturer Audits (High Score Bonus Win 2PL not resettable)
A29	Manufacturer Audits (High Score Bonus Win MPL not resettable)
A30	Manufacturer Audits (Total Highest score = 999 1PL not resettable)
A31	Manufacturer Audits (Total Highest score = 999 2PL) not resettable
A32	Manufacturer Audits (Total Highest score = 999 MPL not resettable)
A33	Manufacturer Audits (Total Game Plays not resettable)
A34	Manufacturer Audits (checksum for game audits not resettable)
A35	Manufacturer Audits (coin 1 counter not resettable)
A36	Manufacturer Audits (coin 2 counter not resettable)
A37	Manufacturer Audits (checksum for coin counter not resettable)
A38	Manufacturer Audits (Total Tickets not resettable)
A39	Manufacturer Audits (Total Game Plays not resettable)
A40	Manufacturer Audits (checksum for Average not resettable)

---

* NOTE! *

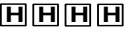"Multi-player" refers to multiple people playing a one-player game

AUDITS DETAILED

- **A01 - TOTAL NUMBER OF GAMES PLAYED**
  Displays the total number of games played since the audits were last cleared

- **A02 - TOTAL 1 PLAYER GAMES**
  Displays the total number of 1 player games played since the audits were last cleared

- **A03 - TOTAL 2 PLAYER GAMES**
  Displays the total number of 2 player games played since the audits were last cleared

- **A04 - TOTAL MULTI-PLAYER GAMES**
  Displays the total number of multi-player games played since the audits were last cleared

- **A05 - TOTAL COIN MECH 1**
  Displays the total number of coin mech 1 pulses since the audits were last cleared

- **A06 - TOTAL COIN MECH 2**
  Displays the total number of coin mech 2 pulses since the audits were last cleared

- **A07 - TOTAL SERVICE CREDITS**
  Displays the total number of service credits issued since the audits were last cleared

- **A08 - TOTAL LINK GAME**
  Displays the total number of link mode games played since the audits were last cleared

- **A09 - TOTAL 1 PLAYER HIGH SCORE BONUS WIN**
  Displays the total number of 1 player games that won the "beat the high score bonus" since the audits were last cleared

- **A10 - TOTAL 2 PLAYER HIGH SCORE BONUS WIN**
  Displays the total number of 2 player games that won the "beat the high score bonus" since the audits were last cleared

- **A11 - TOTAL MULTI-PLAYER HIGH SCORE**
  Displays the total number of multi-player games that "beat the high score" since the audits were last cleared

- **A12 - AVERAGE TICKETS PER GAME**
  Displays the average number of tickets won per game, since the audits were last cleared

- **A13 - HIGHEST 1 PLAYER GAME SCORE**
  Displays the highest 1 player game score since the audits were last cleared

- **A14 - HIGHEST 2 PLAYER GAME SCORE**
  Displays the highest 2 player game score since the audits were last cleared

- **A15 - HIGHEST MULTI-PLAYER GAME SCORE**
  Displays the highest multi-player game score since the audits were last cleared

- **A16 - TOTAL 1 PLAYER 999 GAME SCORES**
  Displays the total number of 1 player games that reached a score of "999" since the audits were last cleared

- **A17 - TOTAL 2 PLAYER 999 GAME SCORES**
  Displays the total number of 2 player games that reached a score of "999" since the audits were last cleared

- **A18 - TOTAL MULTI-PLAYER 999 GAME SCORES**
  Displays the total number of multi-player games that reached a score of "999" since the audits were last cleared

- **A19 - TOTAL GAMES PLAYED** (Non-resetable)
  Displays the total number of games played, and is non-resettable

- **A20 - TOTAL 1 PLAYER GAMES PLAYED** (Non-resetable)
  Displays the total number of 1 player games played, and is non-resettable

- **A21 - TOTAL 2 PLAYER GAMES PLAYED** (Non-resetable)
  Displays the total number of 2 player games played, and is non-resettable

- **A22 - TOTAL MULTI-PLAYER GAMES PLAYED** (Non-resetable)
  Displays the total number of multi-player games played, and is non-resettable

- **A23 to A40 - MANUFACTURE AUDITS ONLY** (Non-resetable)
  These are non-resettable audits, and are for manufactures use

GAME HISTORY MODE

By using the Game History Mode the operator can view the score of the last 10 games and the type of game played. The credit display shows the game number, and the corresponding score is viewed on the header display

- **ENTER GAME HISTORY MODE**
  The Game History mode is entered from Audits mode by pressing the red test button once, or from the attract mode by pressing the red test button six times. ⛶⛶⛶⛶ will be displayed on the 4-digit display.

- **CYCLING THROUGH GAME HISTORY**
  The green Service button is pressed for advancing each step through the set of game histories. Starting from the ⛶⛶⛶⛶ display, H01 is the first step, continuing through to H10. This will loop until the mode is exited.

- **EXIT**
  You exit the Game History mode by pressing the red test button once

SECTION A: SERVICE INSTRUCTIONS

NOTE

Be sure to read the following carefully before servicing the machine

---

LOCATING AND ACCESSING PARTS

REACH 999
TO WIN A BONUS
50 TICKETS

BEAT THE HIGH SCORE
TO WIN A BONUS
20 TICKETS

SPEED OF LIGHT

500 TIMER

0 SCORE

3" Speaker

BAFB45 4" Display

1 Player Start Button

4-digit credit display

2 player Start/Link

Error light

Coin Cradle

Ticket Dispenser

DBA (optional)

Cash Box (inside coin door)
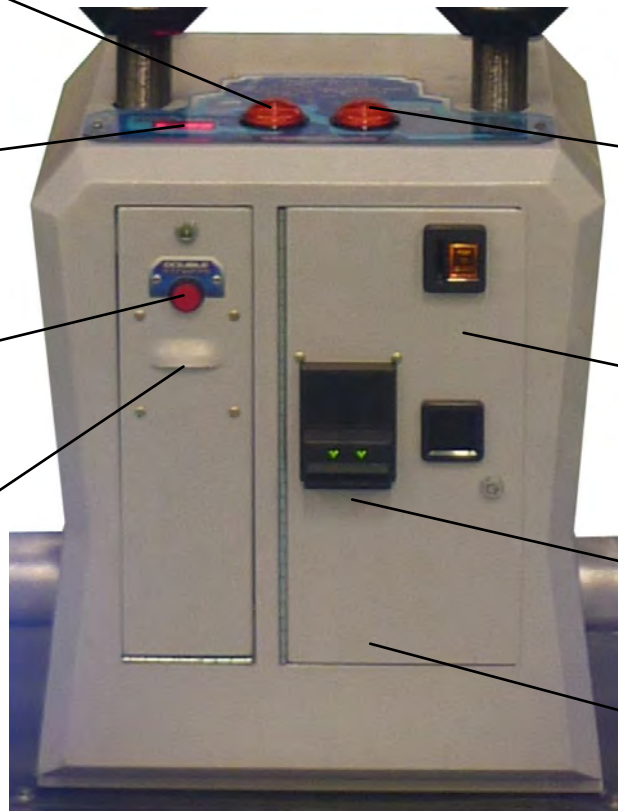
ELECTRONIC DETAIL POSITION

BAFB66A
Main PCB

BAFB152
Lamp Driver
PCB

BAFB106
Sound PCB

BAFB162
I/O Expansion
PCB

BAFB53 Sub Woofer &
Stereo Amplifier PCB

S-150-12

12 VDC PSU

1A Toroid Transformer
for Sub Woofer Amp

Fuses for
Transformer Output
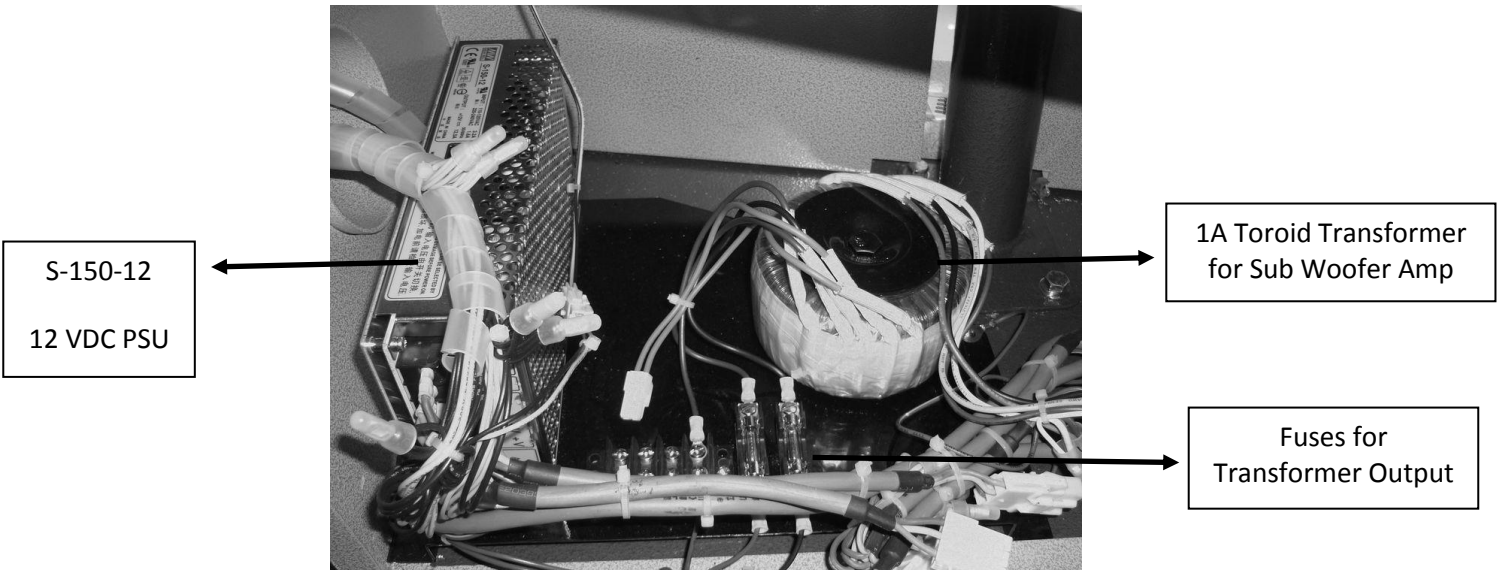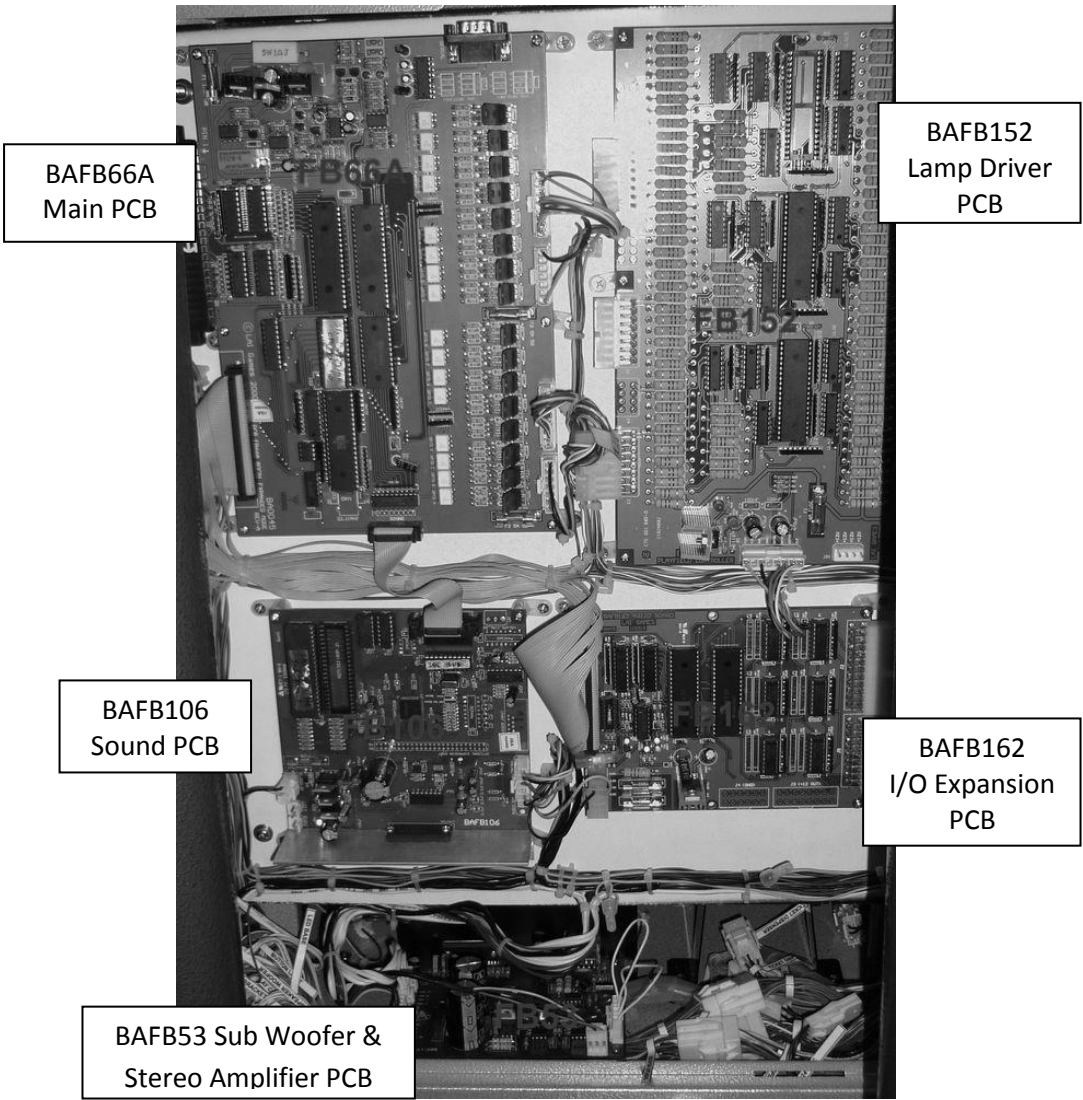
PARTS DESCRIPTION

COIN MECHANISMS
The coin mechanisms are located inside the coin door, at the front-right of the machine cabinet.

CASH BOX
The cash box is located inside the coin door on the front of the machine cabinet.

SPEAKERS
Two speakers are located in the games header and the subwoofer is mounted in a speaker enclosure in the bottom right hand cabinet box. Access for all speakers is through their rear service panels.

SERVICE CONTROLS
Are located on the service panel, mounted behind the coin door.

GREEN SERVICE BUTTON
Use to input credits to the game without activating the coin counter, and to perform test procedures in combination with the red test button.

RED TEST BUTTON
Used to enter and access the test modes.

VOLUME KNOB
Use to adjust the speaker's sound level.
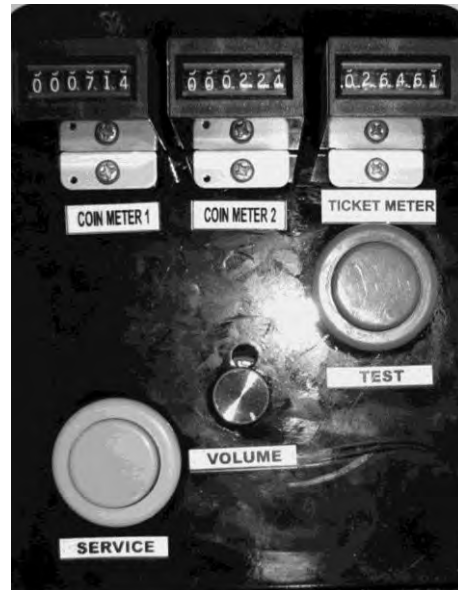
POWER CORD
This is a standard IEC power cord, and is plugged in to the power inlet socket at the rear of the machine.

POWER INLET
It is a standard IEC inlet socket, located at the rear of the machine, on the right-hand side as viewed from the rear. **Note:** there is a main power fuse internal in this IEC socket .

MAINS SWITCH
The mains switch is located on the power inlet assembly, along with the mains fuse and IEC inlet socket.

FUSES- MAIN AC SUPPLY FUSE (1 x 6 AMP FAST BLOW, M205 TYPE)
This fuse is for the main AC supply and is situated in the IEC mains input socket.

---

* WARNING! *

ALWAYS turn **OFF** mains power and unplug the game before replacing any fuses, and **ALWAYS** use the correct rated fuse.

PCB's
For location of all game PCB's, refer to the parts location diagram.

POWER SUPPLY

The power supply is located at the back of the cabinet, and is accessed via the rear service door of the machine. It is a 12VDC 12.5A 150-Watt switching power supply.

LAMPS

COIN DOOR LAMPS (LED)

The coin door lamps all are 12V/DC T10 LED or equivalent and can be accessed via the coin door.

BUTTON LAMPS (LED)

The button lamps all are super-bright 12V/DC T10 LED or equivalent and can be accessed via the coin door or back door.

PLATFORM LAMPS

There are multiple white LED Strip Lights 12V/DC inside the platform and Blue LED strip Lights underneath the platform.

HEADER LIGHTING

There is White LED Strip lights 12V/DC above the BAFB45 4" Display, and behind the header logo and also Blue LED Strip lights in each speaker housing. Each have rear access.

LEFT AND RIGHT CABINET BASE LIGHTING

There are blue LED strip lights in the left and right base cabinet units. Each has access from the front.

---

* WARNING *

- Always turn OFF mains power and unplugged the game, before replacing any lamps.
- Always replace the lamps with the same or equivalent size, wattage and voltage**.**

MAINTENANCE

EXTERIOR

Regularly dust and clean the external cabinet areas as required, using a soft water-damp cloth and mild soap. Check for blown bulbs and replace as required.

Any scratches or marks in the acrylic can be buffed out using car polish or cut and polish. Do not use solvents on the panels as it may affect the finish or artwork.

INTERIOR

Regularly dust and vacuum the interior of the cabinet, taking care to remove any objects that may have fallen on the PCBs. Check and tighten all fixing hardware and fasteners as required.

---

* WARNING! *

Always turn OFF mains power and unplug game before cleaning the machine interior

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BUTTONS

The game buttons get a lot of hard use, so regularly check that all displays, button lamps and button switches are operating correctly through the Sound, Lamps and Display, and Switch Test. Replace any globes, micro switches or buttons that are not work correctly.

SECTION B: TECHNICAL DETAILS

> ⚠️ It is advised that anybody using SECTION B for repairing or modifying any of the components of the game should be a qualified technician, having at least a basic knowledge of digital components, integrated circuits and electricity. ⚠️
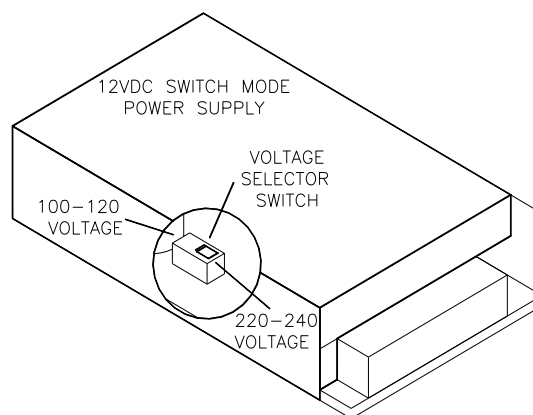
MAINS VOLTAGE ADJUSTMENT

POWER SUPPLY

The Switch Mode Power Supply has a switch to set the mains voltage range. It is located at the rear of the game cabinet, and is accessed via the back door. Use a thin blade screwdriver to move the selector switch to the desired mains voltage (See Diagram)


TRANSFORMER CONNECTORS

Locate the machine transformer(s) in the base of the cabinet. If unsure of the location of the transformer(s), refer to Parts location diagram of this manual. Change the position of the 'ACTIVE' or 'HOT WIRE' input, (marked brown on the diagram), to the position for the desired mains voltage. (See Diagram Below)
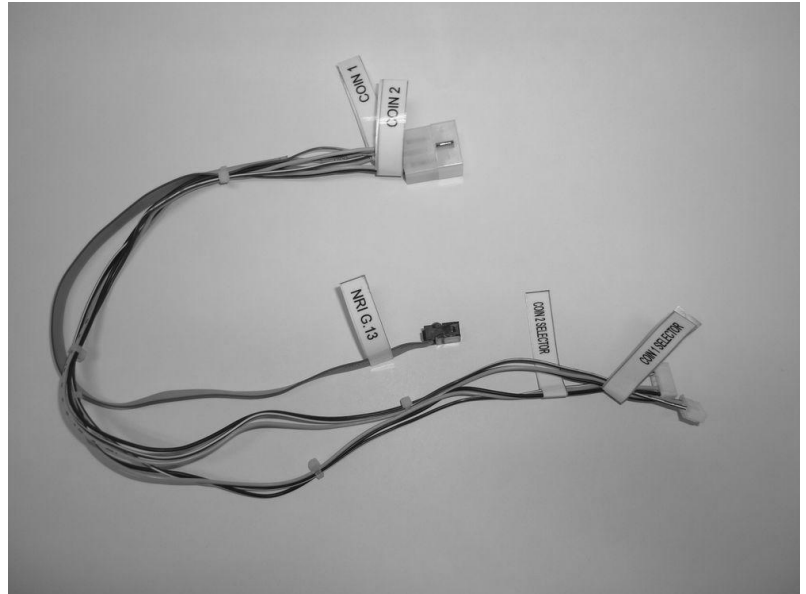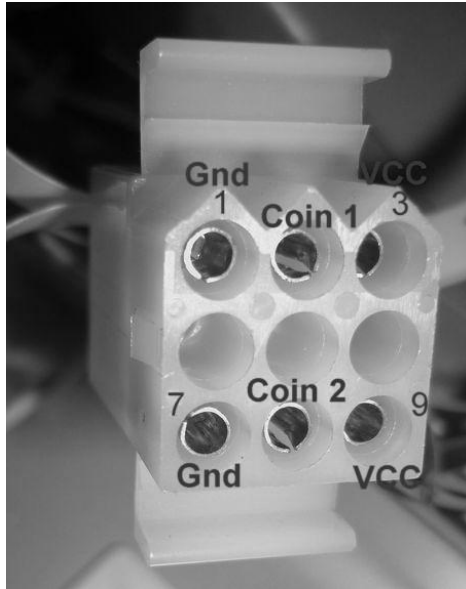
6 WAY CONNECTOR PINOUT

PIN	FUNCTION
1	240VAC
2	220VAC
3	120VAC
4	110VAC
5	0VAV (NEUTRAL)
6	EARTH
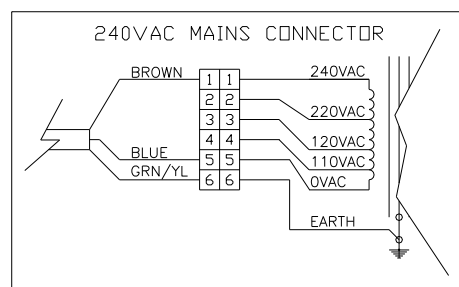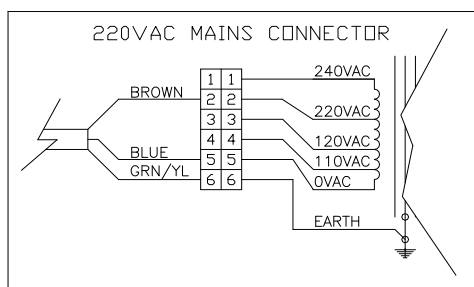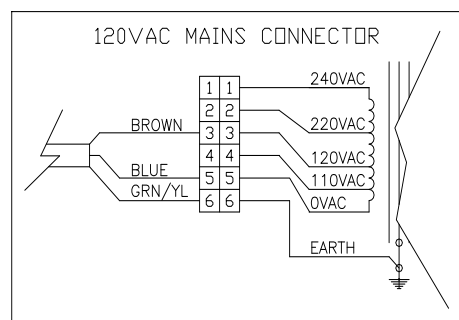
COIN OPTIONS REFERENCE GUIDE

LAI Games have installed on the coin door a 9 way Molex connector. This connector can be used to make adaptors for most electronic coin systems and comparators.

Please see below picture to understand the connection setup.

And the coin harness supplied with the game.

A coin harness that will fit NRI G13 and 2x Electronic Coin Comparator (LAI GAMES standard) is supplied with the game. Other types of coin electronic harnessing can be supplied as requested. Please contact your nearest LAI GAMES Distributor.

TICKET DISPENSER REFERENCE GUIDE

Your *Speed of Light* is fitted with an "Industry Standard" Deltronics DL-1275 ticket dispenser. For more information on this ticket dispenser go to www.deltroniclabs.com

MAIN PCB FB66 CONNECTOR WIRING

COMPONENTS SIDE		SOLDER SIDE	
GND	1	A	GND
GND	2	B	GND
+12VDC	3	C	+12V
+12VDC	4	D	+12V
	5	E	Test button
	6	F	Service button
	7	H	Player 1 Start Button
	8	J	Ticket 2 Notch
2 Player Start/Link mode button	9	K	Ticket 1 notch
	10	L	Coin1
	11	M	Coin2
	12	N	
(watch dog)	13	P	(watch dog)
	14	R	Credit Display 7seg clock
	15	S	Credit Display 7seg data
	16	T	
Player 2 Score Display Data	17	U	RSL Board 1 Data (FB152)
Player 2 Score Display Clock	18	V	RSL Board 2 Data (FB152)
Player 1 Score Display Data	19	W	RSL Board 3 Data (FB152)
Player 1 Score Display Clock	20	X	RSL Board Clock (FB152)
GND	21	Y	GND
GND	22	Z	GND

JST 7	JST 5
1.Base Light 1	1. (PNP) Ticket 1 motor drive
2. Base Light 2	2. (PNP) Ticket 2 motor drive
3. Leader Light	3. Coin1 counter
4. Base Light 3	4. Coin2 counter
5. Base Light 4	5. Ticket 1 counter
6. Base Light 5	6. Ticket 2 counter
7. Error Light	7. Start Button Light
8.	8

BAFB152 LAMP DRIVER PCB CONNECTOR WIRING

J1 (JST 8 Way)
1. +12V
2. -
3. GND
4. -
5. Data 1
6. Data 2
7. Data 3
8. Clock

JP1 (4 Way JST)
1. +12V
2. +12V
3. GND
4. GND

J2. (16 Way Mini Fit Connector)

PIN	Description	PIN	Description
1	Button 1 Lamp	9	Button 8 Lamp
2	Button 2 Lamp	10	Button 9 Lamp
3	Button 3 Lamp	11	Button 10 Lamp
4	Button 4 Lamp	12	Button 11 Lamp
5	Button 5 Lamp	13	Button 12 Lamp
6	Button 6 Lamp	14	Button 13 Lamp
7	Button 7 Lamp	15	Button 14 Lamp
8	+12V Out	16	+12V Out

J3. (16 Way Mini Fit Connector)

PIN	Description	PIN	Description
1	Button 15 Lamp	9	Button 22 Lamp
2	Button 16 Lamp	10	Button 23 Lamp
3	Button 17 Lamp	11	Button 24 Lamp
4	Button 18 Lamp	12	Button 25 Lamp
5	Button 19 Lamp	13	Button 26 Lamp
6	Button 20 Lamp	14	Button 27 Lamp
7	Button 21 Lamp	15	Button 28 Lamp
8	+12V Out	16	+12V Out

J5. (16 Way Mini Fit Connector)

PIN	Description	PIN	Description
1	Button 29 Lamp	9	-
2	Button 30 Lamp	10	-
3	-	11	-
4	-	12	-
5	-	13	-
6	-	14	-
7	-	15	-
8	+12V Out	16	+12V Out

BAFB162 INPUT LIST

J1. PWR

1. +12V
2. +12V
3. -
4. -
5. GND
6. GND
7. -
8. -

J2. INPUT (24 Way Mini Fit Connector)

PIN	Description		PIN	Description
1	Button 29		13	Button 11
2	Button 30		14	Button 12
3	Button 31		15	Button 13
4	Button 32		16	Button 14
5	Button 33		17	Button 15
6	Button 34		18	Button 16
7	Button 35		19	Button 17
8	Button 36		20	Button 18
9	Button 37		21	Button 19
10	Button 38		22	Button 20
11	Button 39		23	Button 21
12	Button 40		24	Button 22

J5. INPUT (20 Way Mini Fit Connector)

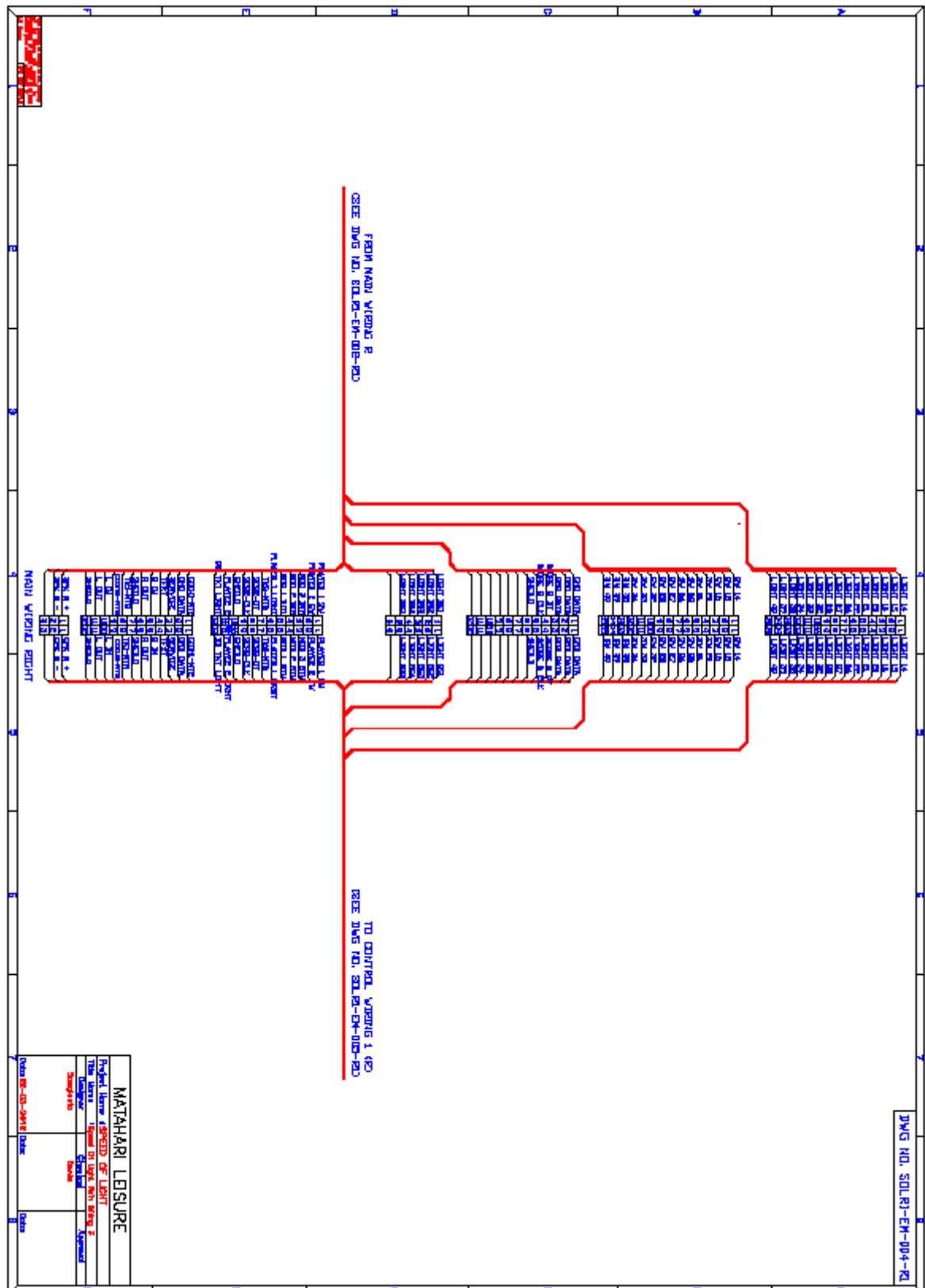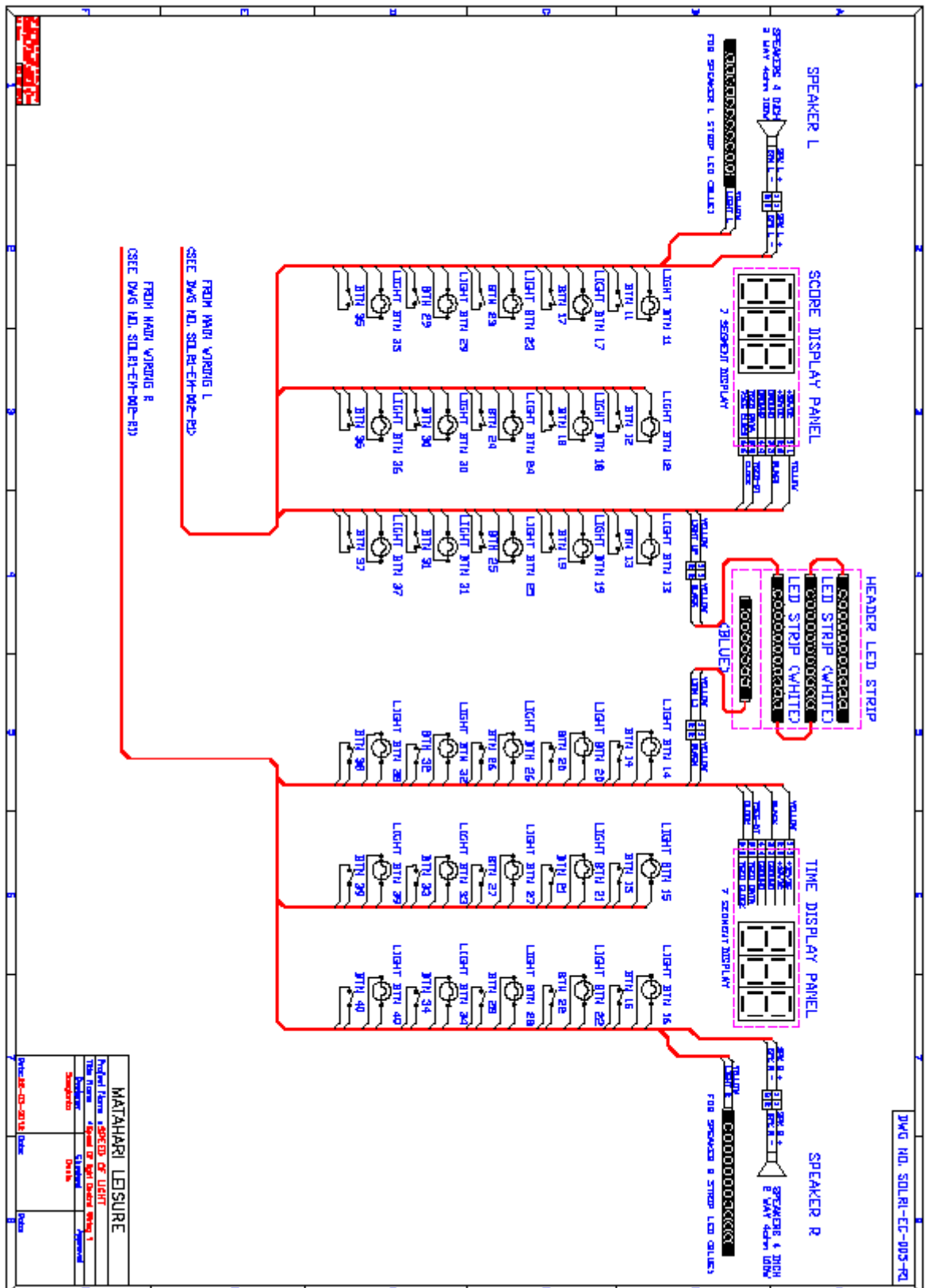| PIN	Description		PIN	Description
1	-		11	Button 23
2	-		12	Button 24
3	-		13	Button 25
4	-		14	Button 26
5	-		15	Button 27
6	-		16	Button 28
7	-		17	-
8	-		18	-
9	-		19	-
10	-		20	-

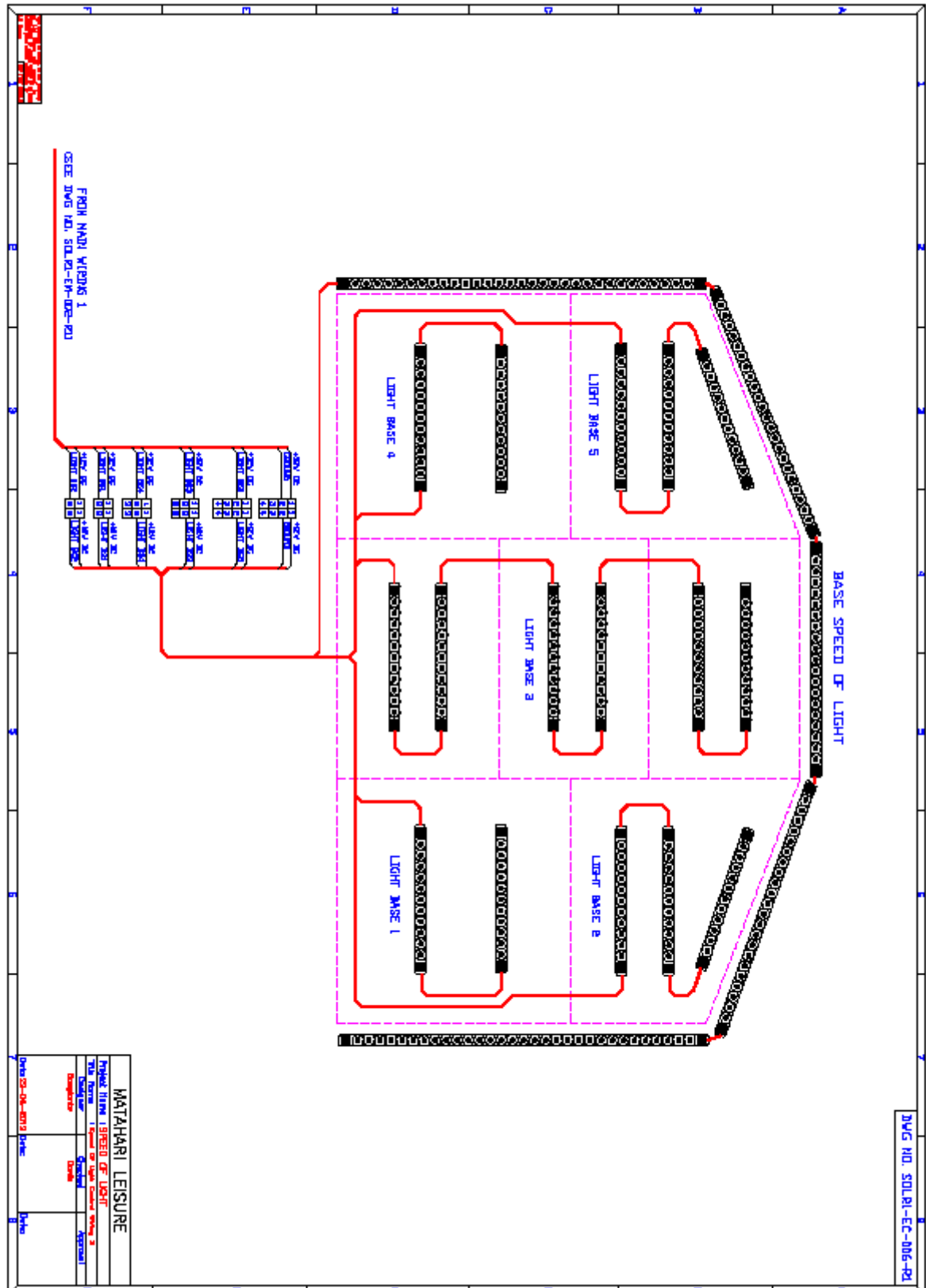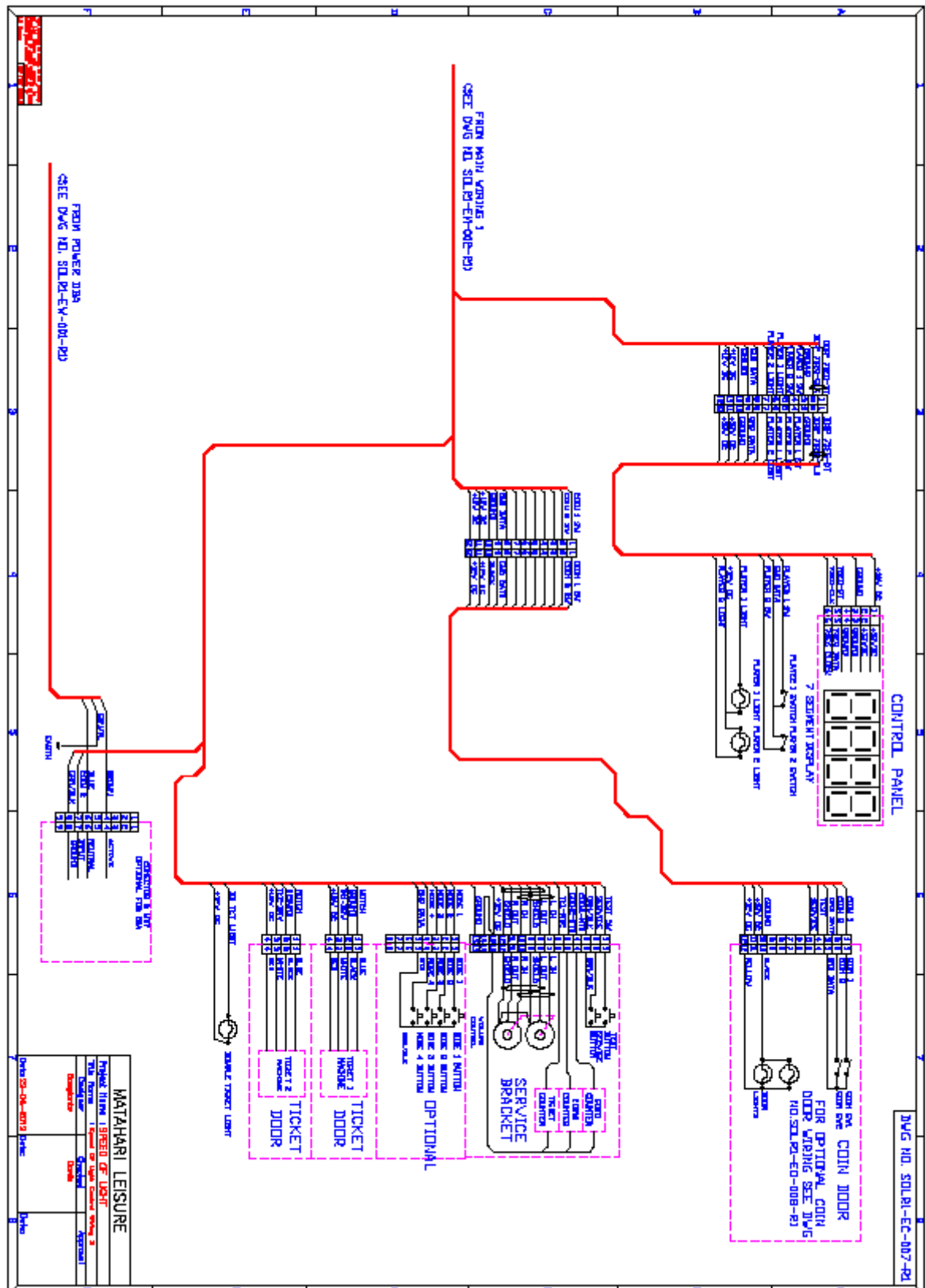# SPEED OF LIGHT MAIN WIRING DIAGRAM
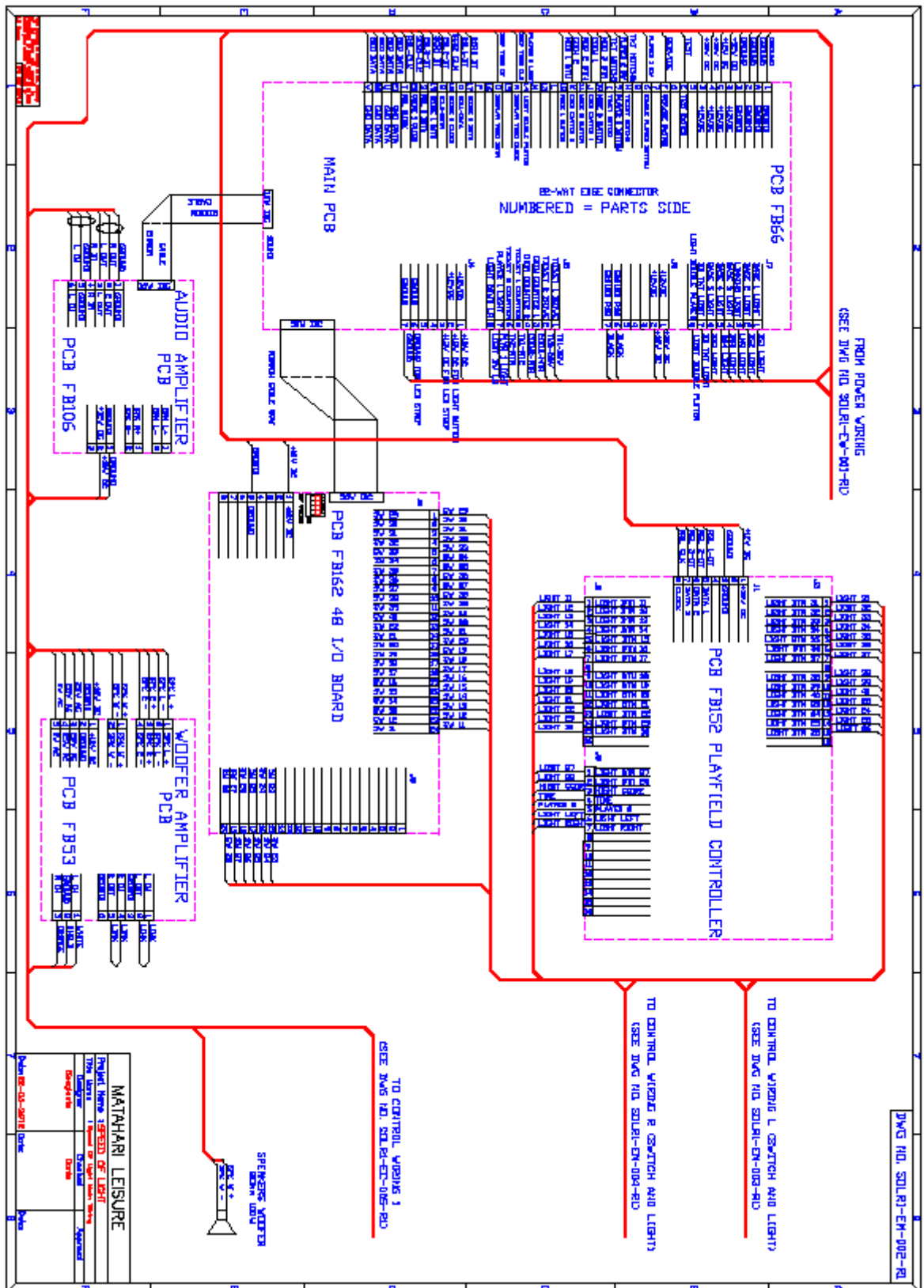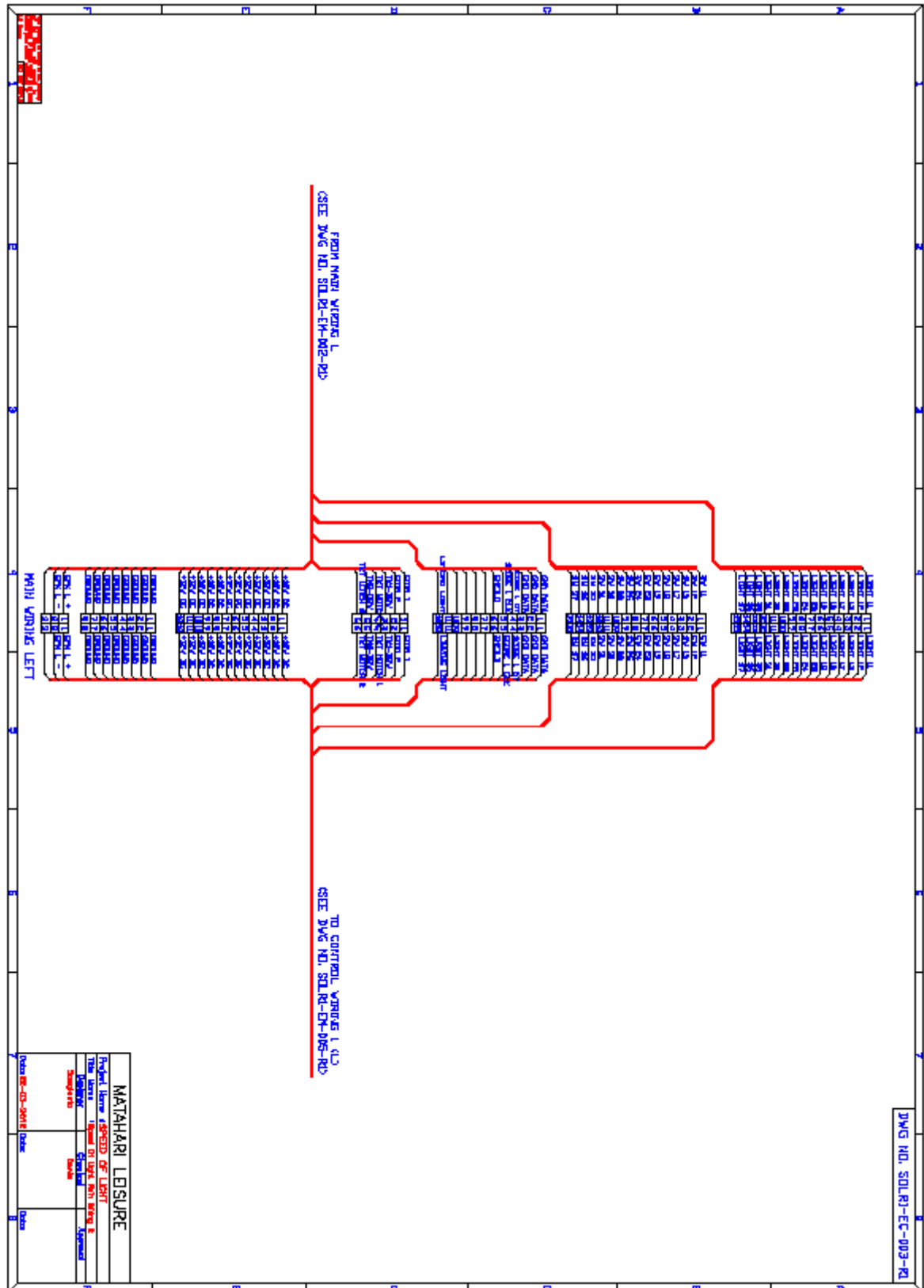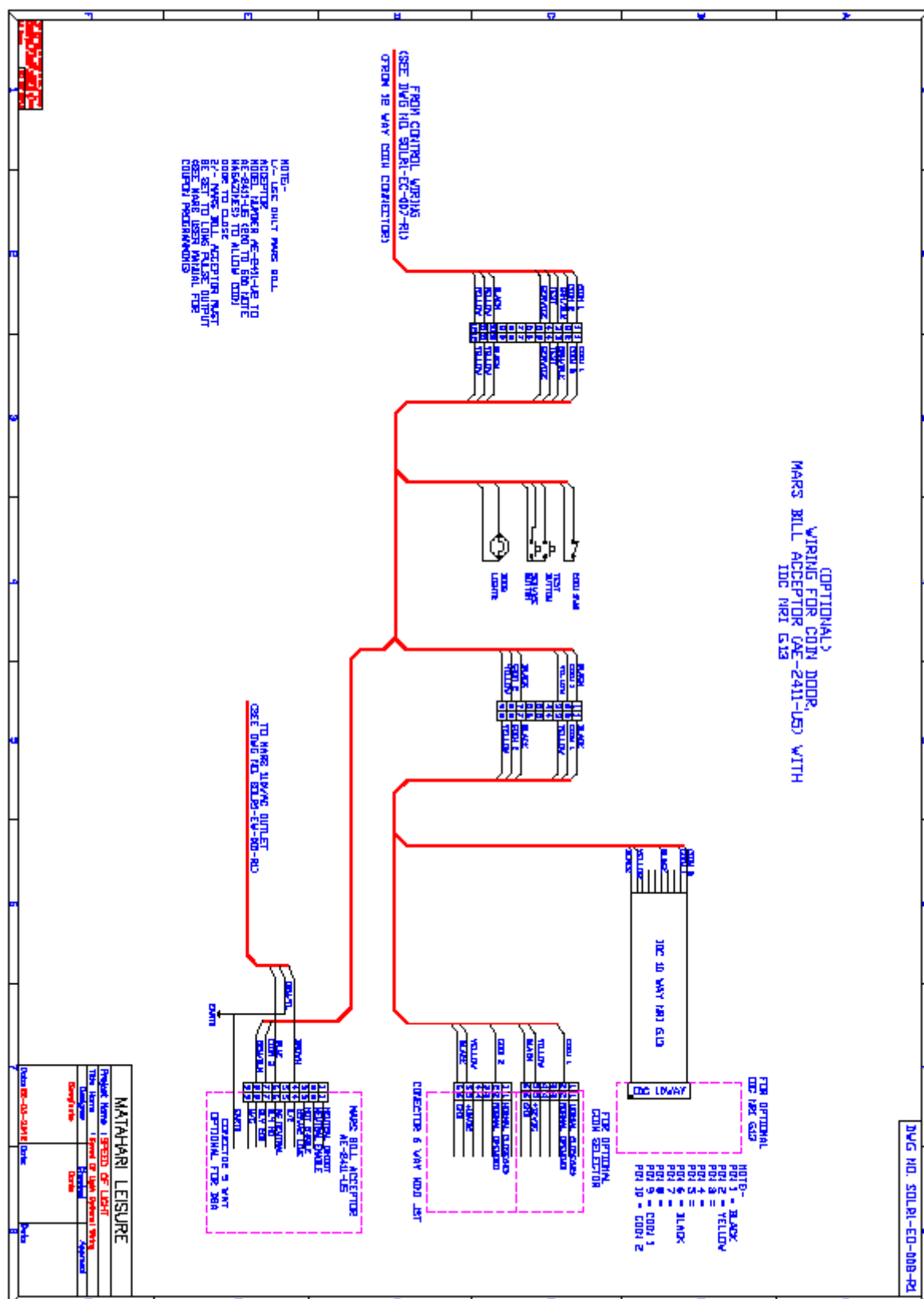
SPEED of LIGHT MAIN WIRING 3

SPEED of LIGHT CONTROL WIRING
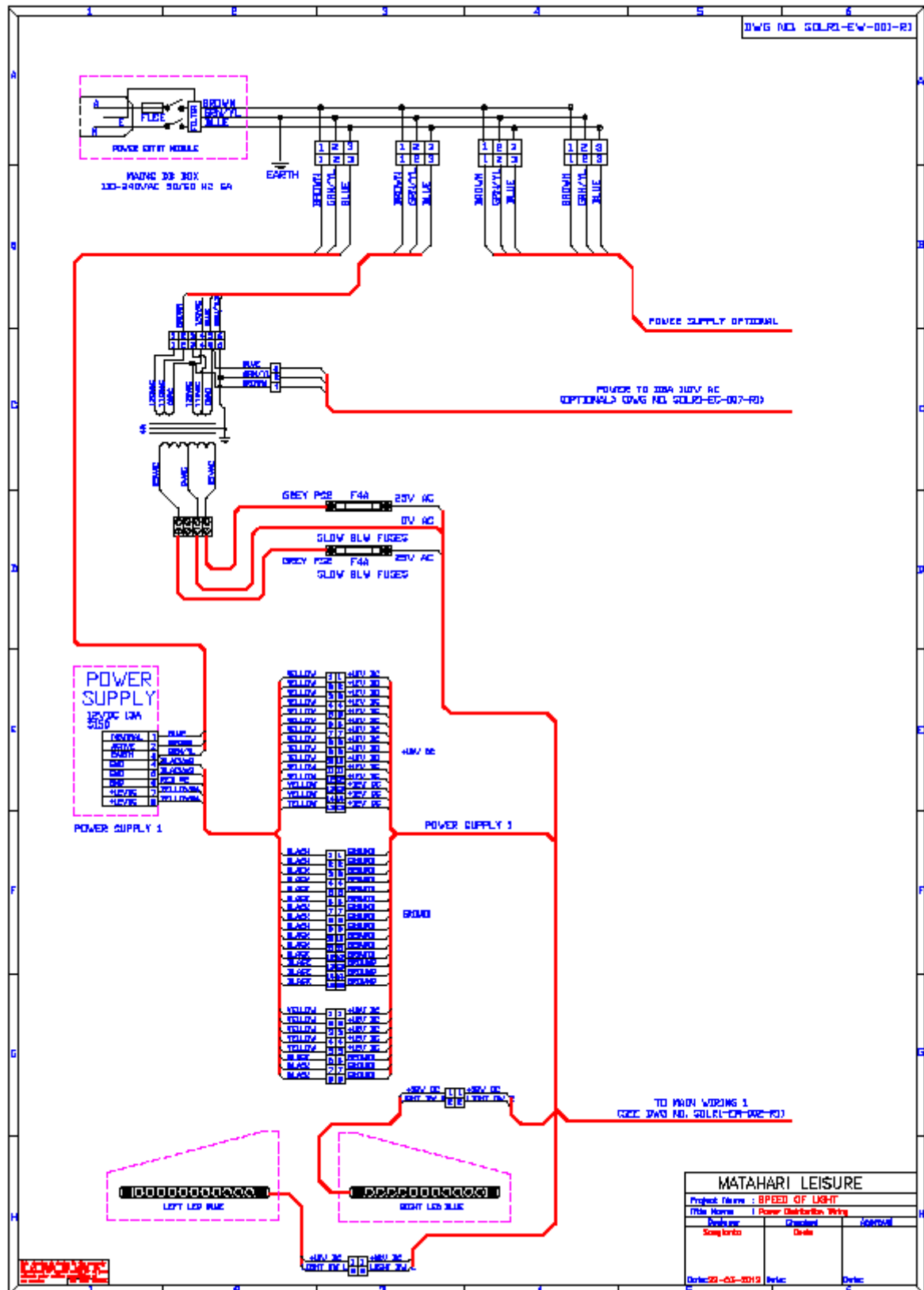
SPEED of LIGHT CONTROL WIRING 2

SPEED of LIGHT OPTIONAL WIRING

SPEED of LIGHT POWER WIRING

DISCLAIMER

OPERATOR WILL TAKE NOTE.

BY ACCEPTING DELIVERY OF AND PLACING THIS HARDWARE AND LICENSED SOFTWARE INTO OPERATION, OPERATOR REPRESENTS AND WARRANTS THAT IT WILL ONLY OPERATE THE HARDWARE AND LICENSED SOFTWARE PROVIDED BY LAI GAMES IN COMPLIANCE WITH THE REGULATORY REQUIREMENTS OF THE COUNTRY, STATE, AND/OR MUNICIPALITY IN WHICH THE HARDWARE AND LICENSED SOFTWARE ARE USED AND/OR OPERATED. LAI GAMES HAS PROVIDED THIS HARDWARE AND LICENSED THE SOFTWARE *ONLY* FOR LEGITIMATE AND LEGAL USE, AND ANY USE OF THE HARDWARE AND LICENSED SOFTWARE IN A MANNER THAT VIOLATES ANY LAWS OF THE COUNTRY, STATE, AND/OR MUNICIPALITY IN WHICH THE HARDWARE AND LICENSED SOFTWARE ARE USED AND/OR OPERATED IS WHOLLY UNAUTHORIZED AND SHALL BE AT OPERATOR'S SOLE AND COMPLETE RISK.

Operator assumes any and all risk and liability for any civil or criminal legal claims or causes of action arising from the unauthorized use and/or operation of the provided hardware and licensed software, such improper and unauthorized use specifically including, but not limited to:

(a) Operating or allowing the operation of the hardware and licensed software in a manner that violates the laws and regulations of the country, state, and/or municipality in which the hardware and licensed software are used or operated;

(b) Assembling or causing the assembly of the hardware in a manner not authorized by or disclosed in this manual;

(c) Any tampering with, changes to, or modifications of the licensed software that occur after the software leaves LAI GAMES factory that is not made by authorized LAI GAMES personnel and that is directly or indirectly caused by Operator; and

(d) Any tampering with the computer chip/electronic programmable read only memory (EPROM) by or on behalf of Operator that directly or indirectly causes the tamper-indicating holographic seal on the computer chip/EPROM to be broken or damaged in any way.

LAI GAMES shall have no liability related to such improper and unauthorized use and/or operation of the hardware and licensed software, and Operator shall indemnify, defend, and hold LAI GAMES harmless for any claim or cause of action brought against LAI GAMES arising from Operator's or Operator's representative's improper and unauthorized use and/or operation of the hardware and licensed software.

ANY IMPROPER AND UNAUTHORIZED USE SHALL COMPLETELY AND TOTALLY VOID ANY AND ALL WARRANTIES, BOTH EXPRESS AND IMPLIED, OF THE HARDWARE AND LICENSED SOFTWARE PROVIDED BY LAI GAMES.

WARRANTY

LAI Games warrants its manufactured products for a period of 3 months inclusive of parts and labor from the date of sale.

LAI Games exclusive obligation is to repair any item with any defects as a result of faulty workmanship or materials, providing the defective item or items of equipment are returned to the LAI GAMES distributor from which the machine was purchased.

LAI Games shall have no obligation to make repairs necessitated by negligence or interference to any component by any unauthorized personal. This will automatically void any existing warranty.

IF MAKING A WARRANTY CLAIM:

(a) A Copy of the sales invoice must accompany the claim.

(b) To and from Transport and freight costs are not covered by the warranty.

(c) Warranty is not transferable with the sale of a machine from one owner to another.