

# **NASCAR**

## **USA Edition**

**(Coin-In, Ticket Out, Reel Feature. Optional Swipe Facility)**

**(Manual Moving Coin Entry)**

**2 - Player**

*Produced by :*

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## 1.1 **Receipt Of Machine**

Upon receipt of machine carefully remove all protective packaging and establish machine on a flat and level floor. Take care to protect the machine from sudden shocks etc. when lifting or manhandling.

The machine should only be situated indoors, and should not be subjected to any other environments. Ensure all ventilation grills have at least 4" (100mm) clearance from other surfaces to permit adequate cooling.

## 1.2 **Electrical Connection**

The Nascar machine should be connected to the mains supply via a suitable plug to suit your installation requirements (Ref: Section 2.1). A competent trained person should always carry this out. If in any doubt, consult a qualified electrician.

Mains wiring:	Live	Black
	Neutral	White
	Earth	Green or Green/Yellow

**THIS MACHINE MUST BE EARTHED/GROUNDED**

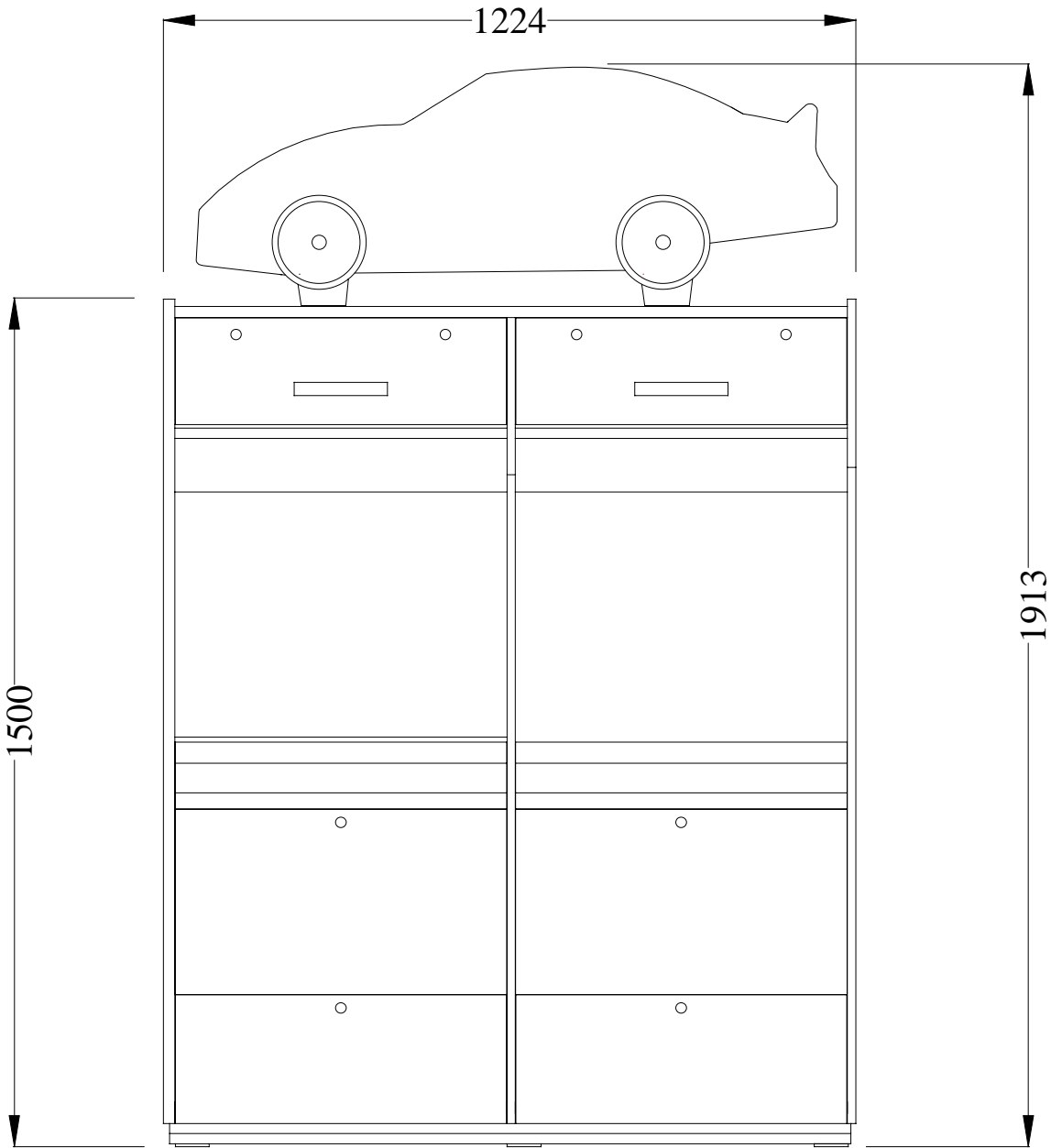
## 1.3 **Electrical Supply Entry**

This machine electrical supply connects at the rear.

The On/Off switch for the machine is located in the right hand lower compartment.

## 1.4 **Physical Dimension**

See following page....



## 1.5 Initial Operation

Connect the mains supply and switch ON (Ref: Section 1.3).

The Top-Sign and coin entry fluorescent lamps will light, the top sign Nascar lamps will sequence.

The pusher boxes will start moving.

Each reel will align its datum and rotate to its starting position.

The hoppers will run to clear any stray coins. Please check for foreign objects before floating.

A short time latter the 'Attract' sound will operate depending on the switch settings on the Sound Board. The volume level may be adjusted if required by means of a volume control fitted on the Sound Board. This is located in the left hand lower cabinet on the central web.

Insert a coin in to the coin entry chute; a sound will be heard as the coin is accepted. The corresponding section coin-in counter will increment and the player section will become active. The game is now initiated and will remain so for approximately 20 seconds.

The anti abuse 'slam-tilt' alarm feature may be tested by thumping on a lower cabinet door. The alarm should sound, and the top sign lights go out. The count hopper will run, diverting any coins falling from the playfield into the cashbox. The count output from this hopper is ignored during tilt conditions, thus no awards made. The operation of the tilt or slam tilt alarm stops all games in progress and lasts approx 10 seconds.

A safety feature is incorporated which will stop the pusher drive motor should a jam or restriction occur. Simply holding back an advancing pusher box may test this. To effect reset of this feature, operate the reset switch located on the rear of the right hand cabinet.

## 2.1 Access To Machine

### **WARNING - DANGEROUS VOLTAGES EXIST WITHIN THIS MACHINE**

#### Playfield

Release the lock at the top of the glass and hinge backward far enough to get a firm handhold either side. Carefully lift clear of the machine and store safely.

#### Coin-Entry

Release the locks at the top of the door and hinge down.

#### Lower Cabinet

Release the locks, hinge outward, disconnect cables at connectors and lift clear.

#### Cashbox

Release the lock at the top, hinge outward, and lift clear. The cash box is located within.

#### Top-Sign

Release the lock on the rear door and lift clear.

From the front, the artwork panel may be unscrewed and removed.

### 3.1 **The Game**

#### Attract Mode

When not in active play, the machine lighting and pusher box mechanism operate continuously. The attract tune is played at intervals dependant on the settings made on the Sound Board

#### Active Play Mode

When coins of the correct type are inserted into a coin entry chute they are detected by an optical sensor activating that particular player section and then pass down the pin perspex to the playfield. Coins of the incorrect type fall through the chute and are collected in the reject trays, not activating the sensors.

#### Feature.

Coins passing down the trigger chutes trigger a spin. Correctly matching the halves of a car leads to a bonus win, as shown by the amount in the flashing lit window on the artwork.

#### Winnings.

When the player section is active, coins pushed off the playfield are detected by a microphone connected to the win chute, which in turn activates the count hopper. The coins are counted in to the cash box, and the count processed to generate the award of redemption tickets. After coin entry, a player section remains enabled for approximately 20 seconds, allowing the player the full benefit from the effects of his coin.

Coins in and tickets out are recorded on separate electro-mechanical counters. It is recommended that readings of these counters be taken regularly, to establish a clear pattern of usage/profit and thus any significant deviations may highlight a fault condition requiring attention.

### 3.2 **Priming The Playfields With Coins.**

Each player section requires approximately 750 coins, of which the first 650 may be hand placed on the playfield. The final 100 for each section should be played in to the machine via the coin entry slots in order to achieve the best possible visual appearance of the playfield area.

Remember to record the coin counter readings after priming for your records.

### 3.3 **General Maintenance & Care**

The Nascar is a robust and reliable machine, which looked after will give years of profitable service. Regular cleaning is the key to optimum condition and performance.

To maintain all visible surfaces in an 'as new condition':

3. Plastic and Glass Fibre - use a general purpose (non aggressive) water based detergent and finish with a quality furniture polish.
2. Laminated Cabinet trims - clean with an all purpose non-aggressive cleaner and finish to a high gloss using a furniture polish.
3. Glass and Chrome - clean with a quality window cleaning solution.

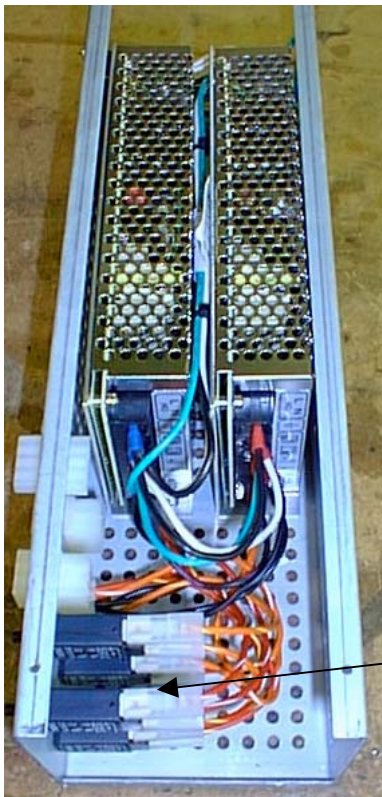
***Do not use caustic or abrasive cleaners. Always use cleaning products in accordance with the manufacturers instructions.***

The machine utilises 'sealed for life' type bearings and a high quality mechanical components that do not require regular greasing or regular servicing.

It is recommended an initial inspection be carried out after approximately two months usage, to check for any signs of wear on the moving parts. Adjust as required, and thereafter inspect annually.





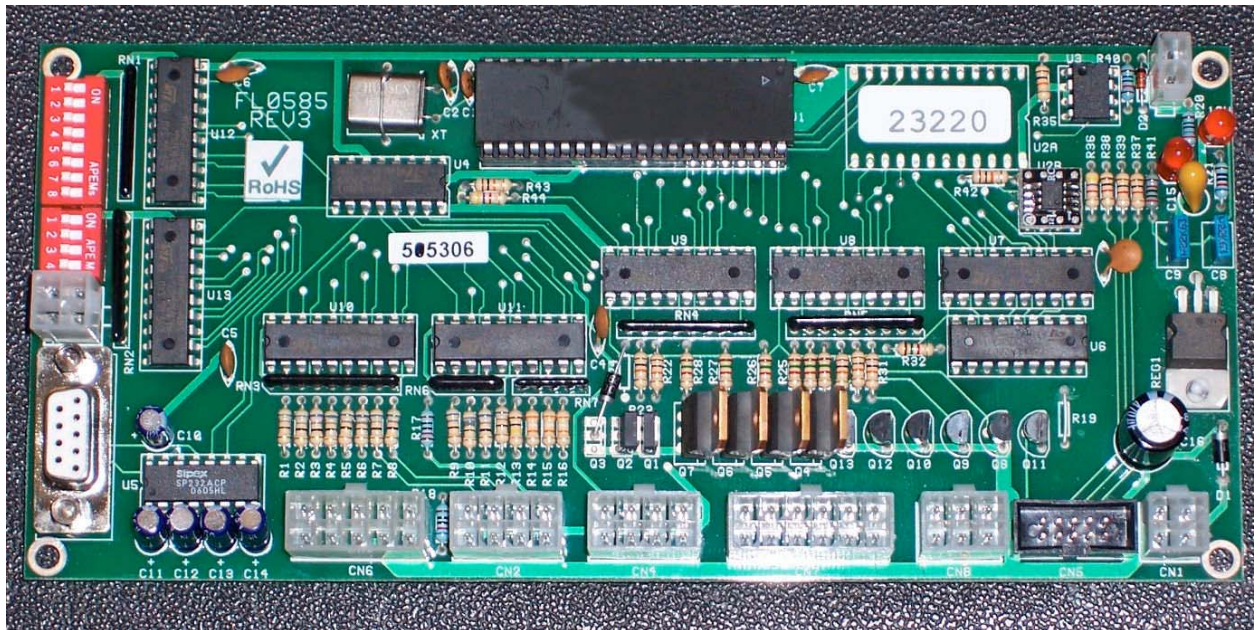


Power  
Supply  
Box

Circuit Breakers

#### 4.2 Logic Board

Each section Logic board is located on the left hand web of each section lower compartment.



*Nascar 2-Player Logic PCB*

Program: NASC\_02 V1.0

DIP Switch Settings:

**DIP Switch Bank 1**

Poles 1 & 2: Ticket on coin in

<u>1</u>	<u>2</u>	<u>Qty Award</u>
off	off	0
on	off	1
off	on	2
on	on	3

Poles 3 & 4: Win Select Table

<u>3</u>	<u>4</u>	<u>Upper LH</u>	<u>Upper RH</u>	<u>Lower LH</u>	<u>Lower RH</u>
off	off	5	10	15	20
on	off	2	4	6	8
off	on	3	6	9	12
on	on	10	20	30	40

Poles 5 – 8: Tickets per coin pushed from playfield

<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>Tickets</u>
Off	off	off	off	1
On	off	off	off	2
Off	on	off	off	3
On	on	off	off	4
Off	off	on	off	5
On	off	on	off	6
Off	on	on	off	7
On	on	on	off	8
Off	off	off	on	9
On	off	off	on	10
Off	on	off	on	11
On	on	off	on	12
Off	off	on	on	13
On	off	on	on	14
Off	on	on	on	15
On	on	on	on	16

## **Notes on calculating percentages:**

To calculate percentages, the value of a ticket is taken as 1cent. So, 1 ticket is 4% of the payout. Values different from this need to have a conversion factor applied to each part of the calculation.

The 'nominal % payout' (below) is calculated by adding together the playfield percentage and the feature percentage. In practice, this means that you set the amount that the playfield pays, and the feature pays out the rest. Mercy tickets are not included in this calculation.

- 1) Decide on the percentage you wish to pay out.
- 2) If you wish to issue mercy tickets, decide how much of the total percentage is paid by these tickets and deduct it from (1) e.g. issue 1 mercy ticket per coin-in, deduct 4% from the total.
- 3) Set the switches (below) to the value nearest to this calculation.
- 4) Decide on the percentage to be paid from playfield winnings. Set the switch bank 1 poles 5-8 accordingly. The remaining percentage is paid by reel feature winnings.

The reel feature payout fluctuates about the mean, and is more or less stable after about 20,000 coins have passed through the game.

## **DIP Switch Bank 2**

Poles 1-3:            Payout ratio – Nominal % payout

<u>1</u>	<u>2</u>	<u>3</u>	
off	off	off	20
on	off	off	25
off	on	off	30
on	on	off	35
off	off	on	40
on	off	on	45
off	on	on	50
on	on	on	55

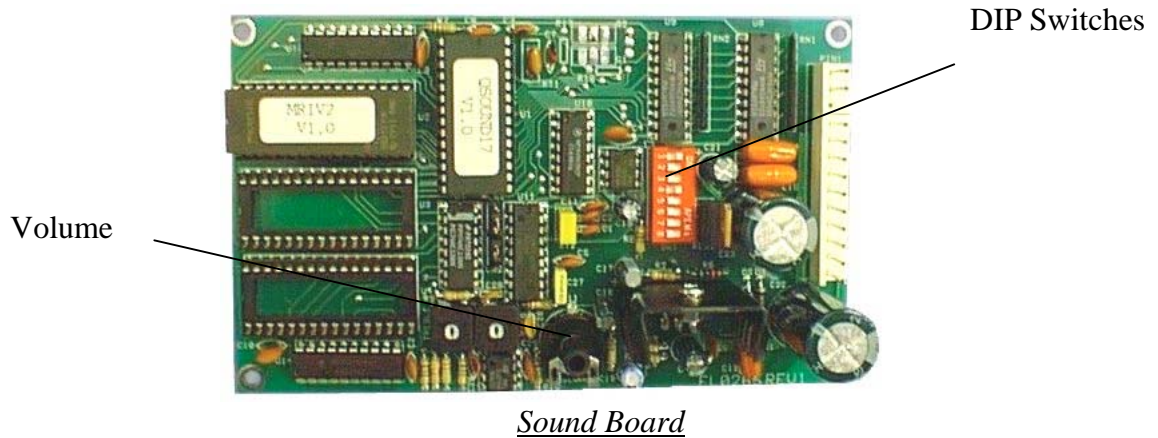
## **Pole 4: Percentage Reset**

To reset percentage calculation registers to nominal value, with machine switched off, set pole 4 ON.

Switch machine on, set pole 4 OFF. A sound will indicate success.

Repeat for all sections as required.

The sound board is located in the left hand section on the central web.



Program: PIC: QSOUND75 V1.0  
 EPROMS: NASSND A1 V1.0  
 NASSND A2 V1.0

DIP-Switch settings

<u>Pole</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>Select</u>
	off	off	off	No attract music
	on	off	off	30 sec attract music interval
	off	on	off	60 sec attract music interval
	on	on	off	90 sec attract music interval
	off	off	on	120 sec attract music interval
	on	off	on	150 sec attract music interval
	off	on	on	180 sec attract music interval
	on	on	on	210 sec attract music interval

<u>Pole</u>	<u>4</u>	<u>5</u>	<u>Number of tunes</u>
	Off	off	1
	On	off	2
	Off	on	3 (Default)
	On	on	4

<u>Pole</u>	<u>6</u>	<u>7</u>	<u>Not used</u>
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<u>Pole</u>	<u>8</u>	<u>Tune Select</u>
	Off	Single line select
	On	Binary Select (Default)

Loudspeaker (6979)

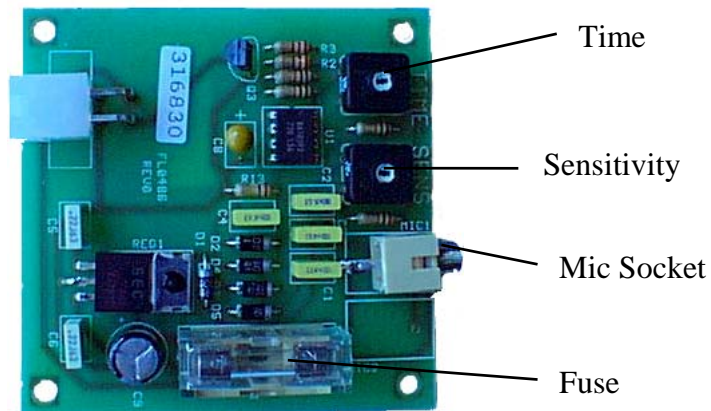
The loud speakers are located in the top sign Nascar wheels. They are rated at 8 Ohms 15 watts.

4.4 Hoppers

The hopper fitted in each player section is a 'count' hopper. This hopper is used solely to count the number of coins that fall over the edge of the playfield, directing it's output to the cashbox. This hopper does not need initial priming with coins and should always 'run to empty'. Each section hopper is controlled in its operation by the logic board.

#### 4.5 Hopper Microphone PCB

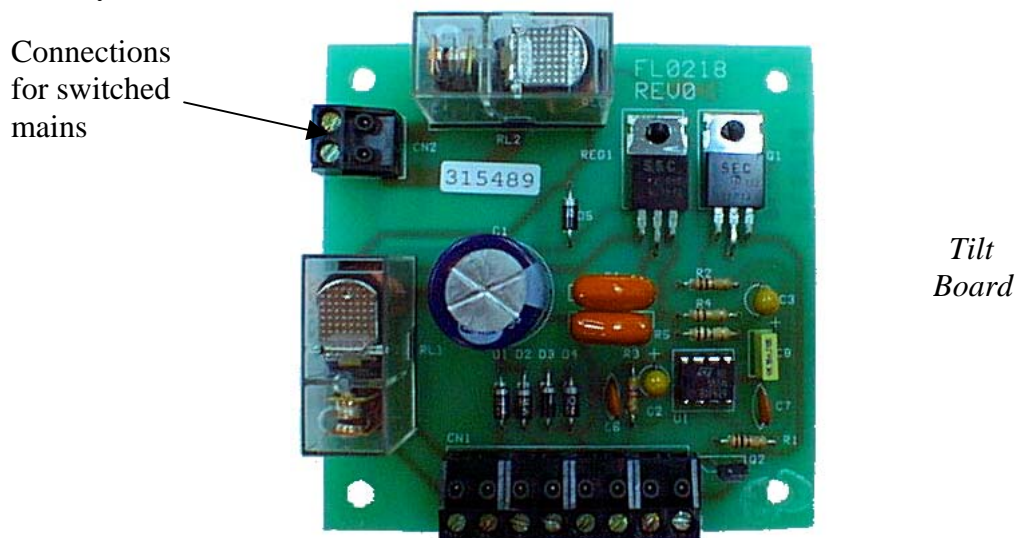
Each player section has a Piezo coin detector microphone. The Piezo microphone is part of the win chute assembly. The sound detector PCB is located in the lower cabinet of each section on the left hand side wall.



*Microphone PCB (Sound Detector)*

#### 4.6 Tilt board

The Tilt board is located in the 110v power box in the lower right cabinet. This board has a pendulum tilt device (located in the top sign) and the slam tilt switches (all lower compartment doors) as its inputs. Should any one of these inputs be activated, the tilt board immediately activates an audible alarm (located in the top sign) and switches off the mains lighting in the top sign, so as to indicate which machine is being tampered with. The count hoppers are activated and emptied to the cash boxes. No ticket awards are made. Provided there are no further inputs, the tilt alarm condition will only remain active for a short period of time, when it will then automatically reset.



*Tilt Board*

#### 4.7 Power Supplies

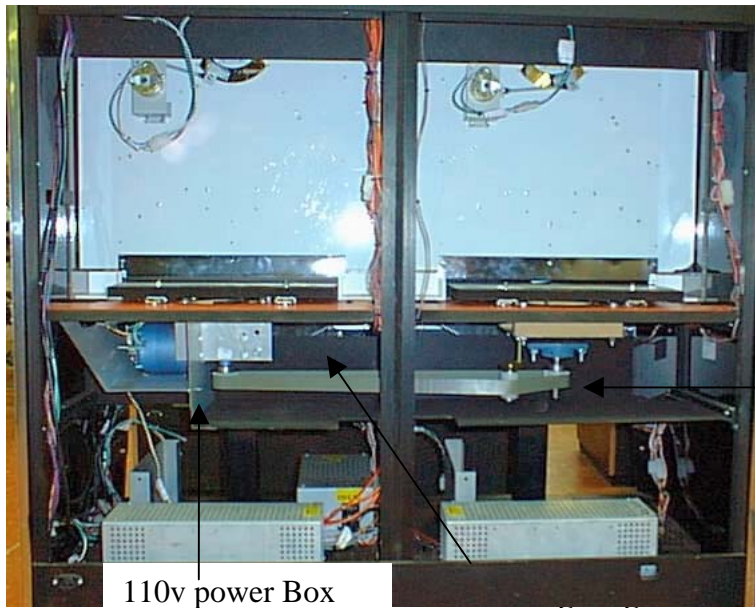


***WARNING - Dangerous voltages (115 V) - Disconnect from the mains supply!***

The main power supply unit contains 12 and 24 volt switch-mode power supply units and their associated circuit breakers. This unit provides all the DC supplies for use in the machine.

The low voltage AC supply for the dichroic lighting is provided from a transformer mounted in a separate unit. The unit provides a circuit breaker for each dichroic lamp.

Rear  
view  
of  
Machine



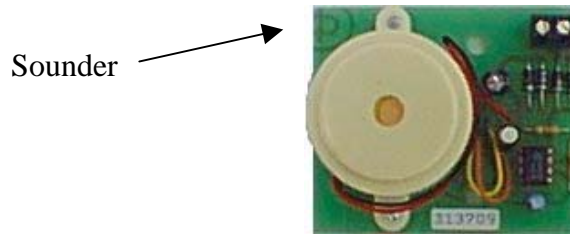
Power  
Supply  
Box

110v power Box

The 110v Power box contains the motor control board, tilt board and wiring to distribute the switched 110v supply to the various components in the machine.

#### 4.8 **Alarm Board** (7819)

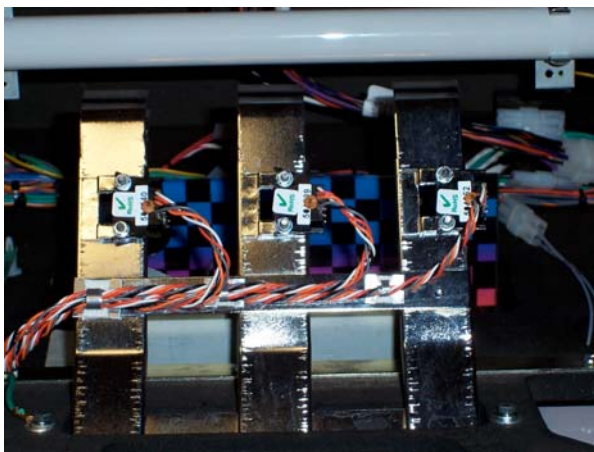
Located in the topsign, this board drives a sounder to produce the alarm tone for tilt, motor jam etc.



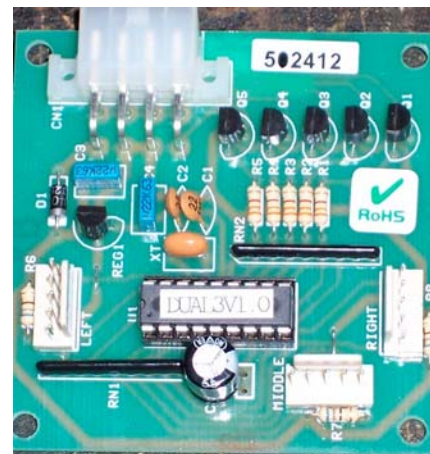
*Alarm Board*

#### 4.9 Coin-In Sensor

When a coin is entered via one of the coin chutes it passes through a twin-beam opto sensor. If valid, the interface board sends a signal to the main logic board, and the game is now 'live' for the player.



*Dual Opto Sensors*



*Dual Opto Interface Board*

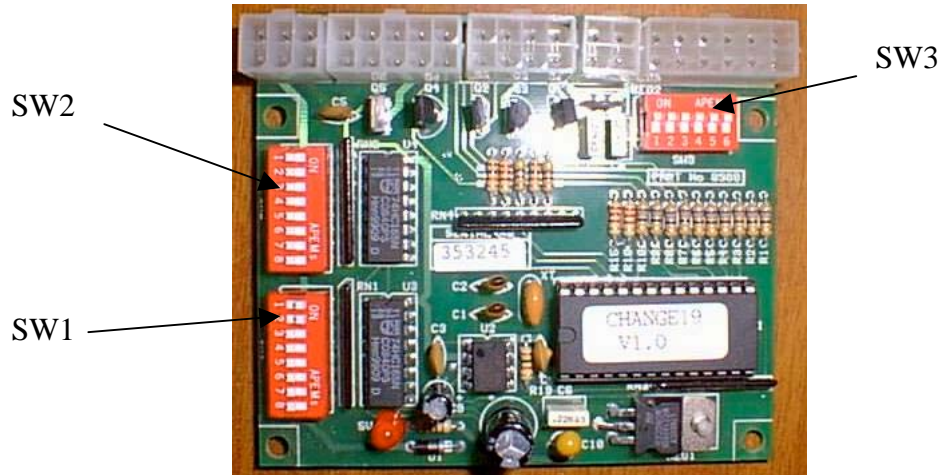
#### 4.10 Counters

Electro-mechanical counters are provided in each player section, located in the coin entry compartment of each section. These counters record the number of coins-in, tickets issued and feature awards. Taking readings of these counters regularly will obviously facilitate the monitoring of the machine performance and assist in cash accounting.

#### 4.11 Swipe Change Facility (Optional Fit)

The machine may be interfaced with a swipe card change facility. Wiring for a change board and interface relay is provided, but a change board and swipe relay board should be purchased separately. This is 'interface' circuitry, and the swipe card system needs to be installed by a trained person. The supplied installation basically provides for a pulsed input, inhibit relay output and payout hopper control.

There are free-ended Yellow and Black wires, which carry the swipe pulse input (black wire is the zero volt reference for this input). A Green and Grey pair of wires are the volt free contacts of the inhibit relay. These lengths of wire are coiled and secured with cable ties to adjacent machine harness in the coin entry area.



*Change Board*

Program: CHANGE21 V1.1

##### Dip Switch Settings

##### SW1

Poles	1	2	3	4	5	6	Coins-per-Swipe
	Off	off	off	off	off	on	1
	On	off	off	off	off	on	2
	Off	on	off	off	off	on	3
	On	on	off	off	off	on	4
	Off	off	on	off	off	on	5
	On	off	on	off	off	on	6
	Off	on	on	off	off	on	7
	On	on	on	off	off	on	8
	Off	off	off	on	off	on	9
	On	off	off	on	off	on	10
	Off	on	off	on	off	on	11
	On	on	off	on	off	on	12
	Off	off	on	on	off	on	13
	On	off	on	on	off	on	14
	Off	on	on	on	off	on	15
	On	on	on	on	off	on	16
	Off	off	off	off	on	on	17
	On	off	off	off	on	on	18
	Off	on	off	off	on	on	19
	On	on	off	off	on	on	20



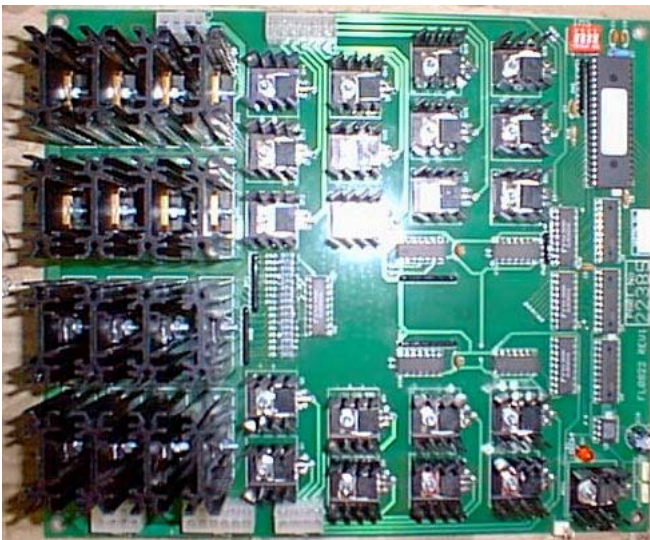
## Dip Switch Settings (continued).

Pole	1	2	3	4	5	6	Coins Per Swipe
	Off	off	on	off	on	on	21
	On	off	on	off	on	on	22
	Off	on	on	off	on	on	23
	On	on	on	off	on	on	24
	Off	off	off	on	on	on	25
	On	off	off	on	on	on	26
	Off	on	off	on	on	on	27
	On	on	off	on	on	on	28
	Off	off	on	on	on	on	29
	On	off	on	on	on	on	30
	Off	on	on	on	on	on	31
	On	on	on	on	on	on	32

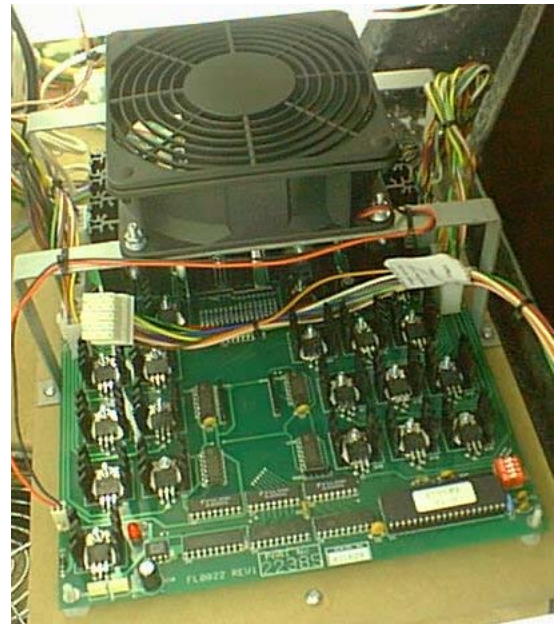
SW2 and SW3 are not used and all poles should be off.

### 4.12 Top Sign Flashing Lights Board & PSU

Located in the top sign, this board controls the lamp display of the top sign 'Nascar'. This board has a bank of DIP switches fitted, but they serve no purpose and there are no user settings associated with this board.



*Flashing Lights Control Board*



*Fan Assisted Cooling*

In order to cool the drive transistors used on this board, a dedicated cooling fan is mounted directly over the board to provide forced air cooling.

The lamps fitted in the top sign panel displays are 12V 1.2W 0.1A 5mm Wedge type. These lamps are multiplexed and driven from a 48V power rail in order to achieve high brightness.

## 5.0 Cabinet Lighting

### 5.1 Fluorescent Lighting

***WARNING – Dangerous Voltages (115v) - switch OFF prior to replacing!***

Fluorescent tube lighting is situated in the top sign area, with the attendant gear tray. A second gear tray provides for the coin entry lighting. The tilt board is located in the 110v Power Box (Section 4.7), and this interrupts the electrical supply to the Top Sign Fluorescent lamps in the event of a tilt or tamper condition.

### 5.2 Dichroic Lighting

Low voltage dichroic spot lamp lighting is situated at the top of each playfield. These lamps are easily replaced by simply pulling the old bulb free from the fitting, and pushing the replacement bulb back in place. These lamps are rated at 35W, and should only be replaced with a similarly rated lamp.

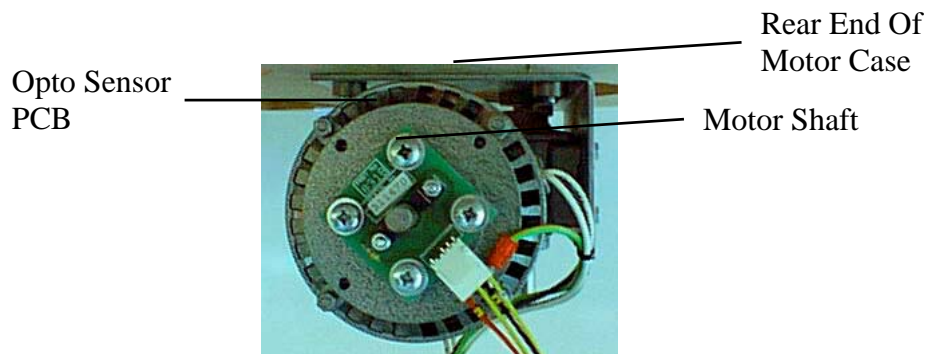
***WARNING - These lamps become very hot in operation - allow to cool before handling!***

## 6.0 Mechanical Systems

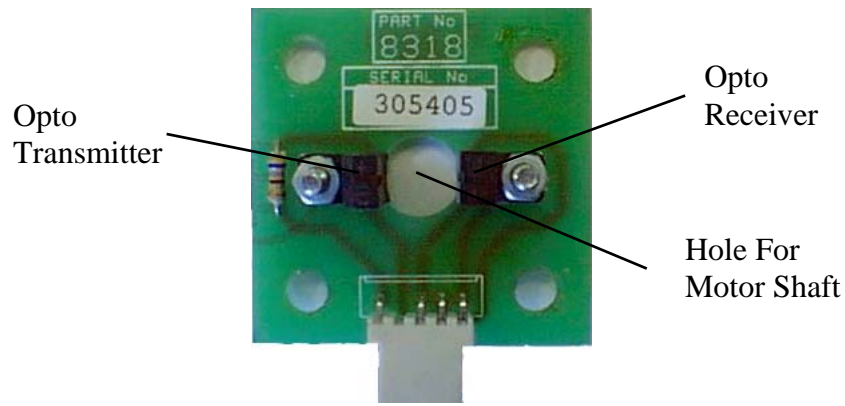
### 6.1 Pusher Box Motor Control

This system utilises an opto-electronic method to monitor the motor load, and stop the motor in the event of a restriction/jam.

The motor drive shaft extends some 35mm out of the rear end of the motor case. It is here that the opto sensor PCB is located, secured to the motor case. The motor shaft has a hole drilled through, which conduits the infra-red beam when correctly aligned. With the rotation of the motor shaft, this results in the beam being continually interrupted, and a resultant string of pulses produced by the opto receiver.



*Opto Sensor PCB Mounted To Motor*



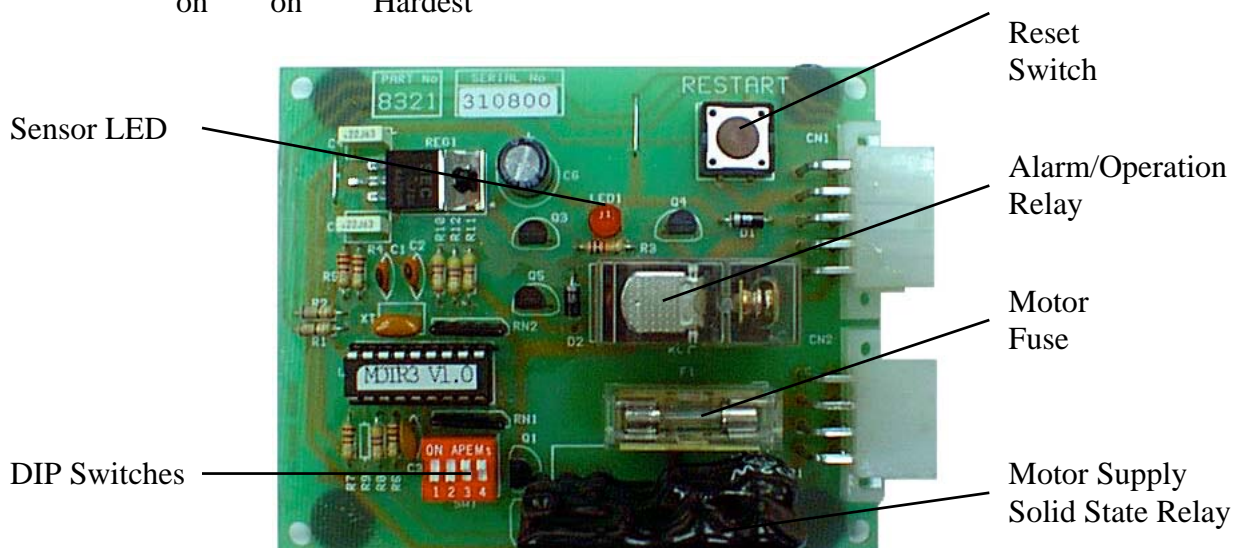
Close Up Of Opto Sensor PCB

The pulses produced by the opto receiver are monitored by the circuitry of the motor control PCB. This control circuit basically monitors for a given number of pulses within a set time frame. Should this number of pulses decrease beyond the tolerated amount, the supply to the motor is immediately switched off via a solid-state relay.

The control of the motor cut off point may be set by way of a 4 way DIP switch mounted on the motor control board (located in the 110v power box):

<u>Pole</u>	<u>1</u>	<u>2</u>	<u>Response</u>
	off	off	Fastest
	on	off	2nd Fastest
	off	on	2nd Slowest
	on	on	Slowest

<u>Pole</u>	<u>3</u>	<u>4</u>	<u>Stop Resistance</u>
	off	off	Weakest
	on	off	2nd Weakest
	off	on	2nd Hardest
	on	on	Hardest



When the system operates and stops the motor, the supply to the motor remains off until manual reset is initiated. This creates the opportunity to ensure the machine is in a safe state to re-start;

a visual check by the attendant ensuring that there is no longer any item causing the obstruction. Reset of the system is done by depressing the recessed button switch located on the rear of the machine on the right.

There is an LED on the Motor Control PCB, which indicates the output of the opto-sensor. In normal operation this will appear to be continuously ON, due to the high repetition rate of the pulses. This facility may be used to check the operation of the sensors, by manually rotating the motor shaft and observing the LED. The LED should turn on then off as the hole in the shaft passes between the sensors. Disconnect the motor 110v mains supply first.

The 20mm fuse on this PCB is to provide over current protection to the solid-state relay/motor combination.

The other relay (RL1) is used to provide a switching function upon system operation, which is used for signalling to other circuits for alarm operation etc.

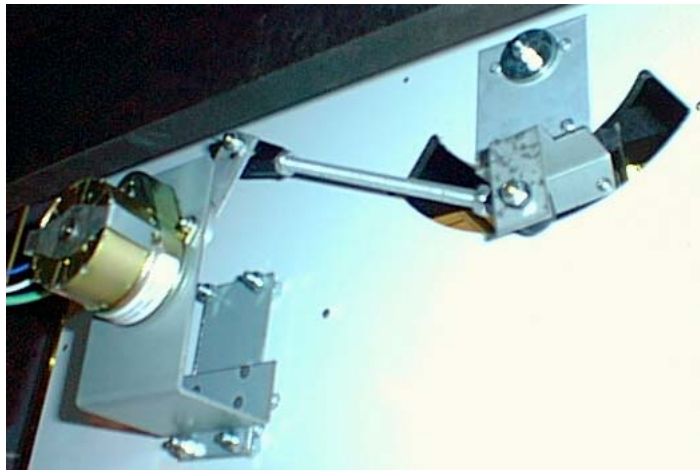
## 6.2 Coin Entry

Each player section has three coin entry chutes. The chutes are designed to reject fraud coins into a reject tray just inside the door.

This is not a high level of discrimination, but serves well and reliably in this application. Other than keeping the chutes clear and clean no specific maintenance is required

Coin entry chutes are situated on the front of the machine. The chutes are fixed and require no maintenance. Twin-opto sensors are fitted to detect coins, and to detect and discourage fraudulent intent.

The central chute on the pin-perspex is motorised as shown below.



*Moving Coin Entry Mechanism*

## 6.3 Pusher boxes

The pusher boxes are mounted on two Accuride slide bearings. An annual check to remove any build up of dust, and a light coat of grease will ensure many years of reliable service.

The belt system has pulleys, idlers and a tensioner. Check that the pusher boxes slide smoothly back and forth. Check the belts periodically for correct tension – they do not stretch, so do not attempt to over-tension them.

Ensure that the coin scraper system is fully intact and working smoothly and freely - replace any suspect parts.

## 7 **Fault Finding**

### 7.1 **Methodology**

It is of mutual interest that your pusher is kept in excellent working condition, therefore when required please order original replacement parts from your distributor or Harry Levy Amusement Contractor Ltd.

If a fault occurs with any electrical system **SWITCH THE MACHINE OFF**. Check that:-

- a) There is a suitable mains supply.
- b) All fuses are intact.
- c) All plugs and sockets are correctly mated.
- d) No wires are trapped, damaged or broken.
- e) All wires are properly secured to their terminals and pins.

#### Wiring check.

A visual inspection will reveal the general condition of the wiring. A more thorough test using a continuity tester will be needed to check apparently intact wires, however once a machine has been playing successfully for some time wiring is not usually at fault.

#### Device testing.

Disconnect the machine from the mains supply then check the physical condition and operation of the suspect device (remove from the machine if necessary). Bench test if possible using a suitable power supply.

In general PCB's are not user serviceable. Should a problem develop indicating a board fault it is recommended that the board be returned to your distributor/Harry Levy for repair.

### 7.2 **Systems Checking**

When a fault occurs that affects the whole of the machine, the power supply and regulation system should be investigated first.

Check the input, and output fuses.

Refer to schematics and drawings to check power connections, voltages etc.

If the fault is not visual, or easily measurable it is often helpful to disconnect the outputs from the PSU, check that the PSU is functioning then connect the loads one at a time.

It is easy to identify the faulty system, then use a similar technique within that system (such as disconnecting all hoppers) to identify the faulty component.

### 7.3 Basic Checks

<u>Symptom</u>	<u>Possible Fault</u>	<u>Remedy</u>
Will not start	Internal switch OFF Fuse blown	Check internal switch is ON Check plug fuse then circuit breakers.
No sound	Volume Speaker Sound board	Adjust volume Check wiring. Replace if faulty Check power supply & connectors, replace board if faulty.
Light failed	Tube failed  Starter failed Choke (ballast) failed	Check end caps & wiring Replace tube. Replace with same type. Replace with same rating.
Pusher boxes not moving	Power to motor Mechanical jam	Check for coins or swag causing jam. Clear & reset.
Tilt alarm not working	Pendulum stuck Door bump sensor Sounder Tilt P.C.B	Check pendulum & adjust. Check & adjust. Test connections & power Check connections & power.
Counter not working	Wiring Counter Opto sensor	Check connectors & loom Bench test / replace. Check every opto sensor.
Hopper not working	Hopper motor. Power. Jammed.	Bench test with power supply. Check supply & connections. Check for obstruction.

## 8 Spare Parts List

This spares list is by no means fully comprehensive. The following are some of the more commonly required items that you may need. If the item you require is not listed, please contact either your distributor or Harry Levy Amusements and we will be pleased to assist you.

<u>Description</u>	<u>Harry Levy Stock Number</u>
201 lock & keys	6278
301 lock & keys	6087
Accuride pusher box slide	6081
Circuit Breaker 1.5A	8878
Circuit Breaker 3A	8879
Circuit Breaker 5A	8881
Coin-In sensor board	23358
Counter – standard machine	8710
Electronic alarm board	7819
Fan 12 VDC	22046
Filter – Mains 6A	8178
Hopper – Coastal token	23163
Logic Board	23220
Microphone board	8498
Motor 115V 60Hz	8567
Motor control board	22964
Motor Opto board	8318
Power supply 12V 100W	8859
Power supply 24V 100W	8860
Sound board	23223
Speaker	22134
Starter – FSU (UL)	6119
Switch - ON / OFF	6036
Switch - pendulum tilt	CC004
Switch - reset	6127
Switch – slam tilt	6534
Tilt board	7917
Transformer Dichroic 200VA(UL)	8978
 <u>Swipe Changer Parts</u>	
Change board	22115
Hopper	23164
Keyswitch	6610
Relay Board	8641

Other items may be available on request.