IMPORTANT SAFETY WARNINGS !

This *Pinspotter Controller* is a low voltage, low current switching device and is not intended to control mains voltages. If you have any doubts about the installation and connection of this device, you should consult an authorised electrical contractor.

This *Pinspotter Controller* may activate the pinspotters *AT ANY TIME*. Appropriate safety or master switches *MUST* be used when working on the pinspotters.

Revision 3.0

1. Contents

2. Overview

This Pinspotter Controller connects between the front desk computer system and the pinspotting machinery, to allow the computer to automatically turn the pinspotters on and off, and perform various other functions.

There are three models available -

Model A is designed for AMF 8230 or 8270 type pinspotters, and allows the use of instructomat mode as well as the normal play mode. The unit also counts frames as the pinspotters cycle.

Model B is designed for use with Brunswick pinspotters and Brunswick AS80 type scoring systems. It provides all the functions of a Brunswick Source Command, including control of the scoring consoles, and supply of audio to the lanes.

Model S is for any centre that requires only basic on/off control of the pinspotters. There is no provision for frame counting, or for instructomat mode. This unit may be used with AMF or Brunswick pinspotters, or any other type that can be controlled with a 24VAC, 400mA switch.

Throughout this manual, paragraphs that apply to only one or more models will be prefaced with the model. eg:

"**Model A** - This paragraph applies to Model A only"

All models can only be used with a compatible front desk computer system. Compatible systems include:

- Touch Desk by A.K.Microsystems
- Lane Control System by A.K.Microsystems
- Purrfect Desk by Purrfect Score
- Conqueror Universal by QubicaAmf

3. Installation

Model A or S - The *Pinspotter Controller* is usually located close to the manager's machine switches at the front counter. Cables connect from the controller to the switches. Alternatively, the controller can be mounted on the curtain wall and connected directly to the pinspotters.

Model B - The *Pinspotter Controller* connects to existing lane cabling as per a Brunswick Source Command.

All Models - The controller must be connected to the front counter computer with a communication cable. There is also a power supply which must be connected to the mains.

Ensure that both the controller and the power supply are well ventilated. Do **NOT** place other equipment or objects on top of the controller or the power supply, or block the underside vent. The controller should **NOT** be placed in a cupboard or other restricted space unless there is adequate ventilation. The controller and power supply should be cleaned regularly to prevent a build up of dust.

3.1 Setting the Switches

There is one switch, one jumper and a trimpot inside the controller that must be set correctly. The controller will normally be supplied with all settings already correct for your application.

Remove the top of the case by unscrewing the two screws on the top, and the top two screws on each side.

A block of four switches is located on the main board at the rear of the unit.

SW2 - **ON** when connected directly to a Com port on the computer
　　　　OFF when connected to an SIU or Lane Interface

SW1,3&4　　　**All OFF**

A single jumper block is also located on the main board. The jumper is used to set the type of communications with the front desk computer.

There are two types – LIU and RS232. See <u>Connecting the Communication Cable</u> to determine the correct position.

The controller will have one of the jumper blocks as shown below.

<div align="center">

RS232 **[123]** LIU

or

RS232 **[123456]** *LIU*

or

[123]
[456]
RS232　　　　LIU

</div>

For 232, fit jumpers to positions 1&2 and 4&5 (if present). For LIU, fit jumpers to positions 2&3 and 5&6 (if present).

Model B - The trimpot on the mainboard is used to set the audio level. If the level is too high, the sound from the console speakers will be distorted. If it is too low, full volume will not be obtained. The level is best set after the system is installed. Send a loud signal from your audio equipment to the lanes, and set the volume to full in the Purrfect Desk. Adjust the trimpot so that the signal is as loud as possible without distortion. The setting will depend upon your audio equipment, but anywhere between half and full will normally suffice.

3.2 Connecting the Power Supply

Connect the supply to the mains and to the controller. Note that there are two types of supply. Model A and S require a 5 volt DC supply; Model B requires a 24 volt DC supply.

3.3 Connecting the Communication Cable

The communication cable connects the controller to the *Lane Interface Card* in the front desk computer. There are two types of connections,

depending upon the type of scoring system. There is a jumper inside the controller which must be set correctly for each type of scoring.

- **AMF or Touch Score scoring with Lane Interface Card.**

The controller connects to the *Lane Interface Card* using the 4 pin Magicscore connector on the *Lane Interface Card* cabling.

The splitter cable supplied with your controller will have two connectors on one end. Connect one of these to the 4 pin Magicscore connector on the cable connected to the *Lane Interface Card*. The other connector is used to connect to the cable from the scorers (Magicscore and Accuscore I only), which was originally connected directly to the *Lane Interface Card* cable.

Connect the other end of the controller cable to the controller.

Ensure that the jumper inside the controller is in the LIU position, and that switch 2 is OFF.

- **Brunswick scoring with Lane Interface Card.**

The controller connects directly to the 4 pin *Pinspotter Controller* connector on the *Lane Interface Card* cabling.

Ensure that the jumper inside the controller is in the 232 position, and that switch 2 is OFF.

AMF or Touch Score with Scorer Interface Unit (without USB port) and DOS version of Lane Control System

The controller connects to the Acc I port along with the scoring using a splitter cable as above.

Ensure that the jumper inside the controller is in the LIU position, and that switch 2 is OFF.

- **All Scoring types with Scorer Interface Unit (with USB port).**

The controller connects to the 4 pin *Pinspotter Controller* connector on the *Scorer Interface Unit* (white box).

Ensure that the jumper inside the controller is in the 232 position, and switch 2 is OFF.

- **Ethernet scoring (such as Frameworks, XL or Boss) with Pinspotter controller connected directly to a com port on the computer.**

The controller connects to a standard RS232 serial com port.

Ensure that the jumper inside the controller is in the 232 position, and that switch 2 is ON.

3.4 Connecting to the Pinspotter Switches

The *Pinspotter Controller* is designed to switch low voltage (24VAC maximum), low current (400mA maximum) circuits. If you are not sure that your installation complies with these limits, then consult an authorised electrical contractor. **EXCEEDING THESE LIMITS MAY SERIOUSLY DAMAGE THE CONTROLLER, AND MAY EVEN RESULT IN FIRE !**

Model B - Use existing cabling to connect all functions as per a Brunswick Source Command. Note that two audio line in jacks are provided, but only one needs to be connected. The other is for use with stereo equipment, the left & right signals are mixed together by the controller.

Model A - Each 25 way plug on the front of the controller can control 8 pinspotters. There are three connections for each pinspotter, coded **A, B** and **C.** The connections are detailed below. See the chapter on *Specifications* for colour coding of the cables. If your centre has already been wired for an AMF LIU, see the section below on *AMF LIU Compatibility.*

Model S - Each 37 way plug on the front of the controller can control 16 pinspotters. There are only two connections for each pinspotter, coded **A** and **B**. The connections are detailed below. See the chapter on *Specifications* for colour coding of the cables

3.4.1 AMF 82-30 (single pole double throw switch)

The **A** wire is connected to the pole (centre) position of each lane switch
The **B** wire is connected to the bowl (usually down if the lane is turned on by flicking the switch up) position of each lane switch.
The **C** wire is connected to the instructomat (usually up if the lane is put in instructomat by flicking the switch down) position of each lane switch.

3.4.2 AMF 82-70 (double pole double throw switches)

The **A** wire is connected to the pole (centre) position of each lane switch. The two poles should already be wired together, so either pole can be used.
The **B** wire is connected to either the top or bottom of the switch, but to the side which already has the top and bottom connected together.
The **C** wire is connected to the ground position. The ground for all lanes is usually connected together in the centre of the box.

3.4.3 Brunswick Pinsetters

The **A** wire is connected to the terminal of the lane switch which is also connected to the frame counter.
The **B** wire goes to the other side of the switch, such that the **A** and **B** wires are across the terminals that are closed when the switch is ON
The **C** wire goes to the terminal on the frame counter that is not connected to the lane switch.

3.4.4 Other Pinspotters

The *Pinspotter Controller* can be used to control most types of pinspotters, however you will need to determine how to connect the unit from the information below.

Model A - The circuit for each lane consists of two electronic switches, and an electronic detector for frame counting. One switch is used to turn the pinspotters on, the other to select Instructomat mode.

Model S - The circuit for each lane consists of a single electronic switch.

Each switch is rated at 24VAC, 400mA.. Exceeding these limits may seriously damage the controller, and may even result in fire !

The **A** wire is the common wire for both switches.

The BOWL switch is connected between the **A** and **B** wires.

Model A - The INSTRUCTOMAT switch is connected between the **A** and **C** wires. There is a diode in series with this switch so that current may only flow when the **C** wire is more positive than the **A.**

Model A - The frame counter circuit detects when the **C** wire goes negative with respect to the **A** wire. Pulses of 1/2 second or so are required to register a frame.

Typically, you can wire the **A** and **B** wires across the back of the managers switch, and this will provide basic on/off control. Frame counting and Instructomat mode may not be available on all pinspotters.

The software (typically the *Lane Control System* or *Purrfect Desk*) supports three basic types of pinspotters, AMF 8230, AMF 8270 and Brunswick. The only difference between the AMF modes is that the BOWL switch is not activated when the Instructomat switch is activated for 8230s. For 8270s, the BOWL switch is activated when in Instructomat mode. The Brunswick mode has no instructomat or cycle capabilities.

3.4.5 AMF LIU Compatibility

The *Pinspotter Controller* wiring has been designed to be compatible with AMF's LIU cabinet. If your centre has previously been connected to an LIU cabinet via 26 way ribbon cable, then you can use this existing connection.

An adaptor kit can be purchased from your supplier which will allow this cable to plug directly into the *Pinspotter Controller*.

Alternatively, you can make your own adaptor. You will need a 25D Female IDC connector, a 26 WAY DIL IDC Socket, and a few inches of 26 way ribbon cable. Fit the two connectors to either end of the ribbon cable, ensuring that pin 1 on both connectors lines up with the stripe on the ribbon cable. You will need to peel back and trim the 26th wire in the ribbon cable for the end that is fitted with the 25D connector.

Note that the **A** wire corresponds to the BLACK wire in an AMF LIU cabinet connection, **B** corresponds to Orange, and **C** to Yellow.

3.5 Connecting the Audio Equipment.

Model B - Two phono jacks are provided at the rear of the controller. These are used to input an audio source from a video recorder, sound system etc for playing at the players' console speakers. Two jacks are provided to allow for connection to stereo equipment. If your equipment is mono, you need only connect one of the jacks.

The jacks should be connected to the LINE-OUT socket on your equipment.

3.6 Configuring the Software

Once the unit is installed, you must ensure that your software is configured correctly. See your software manual for more information.

For the *Lane Control System*, select *Maintenance* then *System Configuration*. Enter the correct pinspotter type as prompted. If your pinspotter is not one of the types shown, see the previous chapter on *Other Pinspotters*. You must restart the *Lane Control System* before any changes you have made will take effect.

Model A - The *Lane Control System* version 5.4 or later is required.
Model B - Not supported by the *Lane Control System*
Model S - The *Lane Control System* version 6.5E or later is required.

For Touch Desk or the Purrfect Desk, run the Lane Communication Manager Setup program. Click on Start , Programs, Lane Communication Manager Setup. Select one of :

- A.K.Micro's STANDARD controller (Model S)
- A.K.Micro's AMF type controller (Model A)
- A.K.Micro's BRUNSWICK type controller (Model B)

Then select the correct type of pinspotter, and click on OK.

4. Using the Pinspotter Controller

Once the controller is installed, turn all the manager's switches to the off position. You should now be able to control the pinspotters from the computer. See your software manual for instructions. Note that not all functions (ie Instructomat and cycling) will work with all pinspotters

Note that the pinspotters will operate whenever the *Pinspotter Controller* activates them *OR* the manager's switch is turned on. In the event of a break down of the *Pinspotter Controller* or front desk computer, you can use the manager's switches to override the controller.

If the power is lost from the *Pinspotter Controller*, all pinspotters will stop (unless the managers switch is ON). When power is restored, and the software on the computer is restarted, the pinspotters will return to their original condition. ie. pinspotters that were on before the power was lost will come on.

5. Troubleshooting Guide

Symptom: NO pinspotters will turn on.

Solution: Try turning the pinspotter on with the manager's switch. If this does not work, then it is not a problem with the *Pinspotter Controller*, but with the pinspotters themselves.

Check that the red light at the rear of the controller is flashing. If it is not coming on at all, then check that the controller is connected to mains power, and that the power is on. Disconnect and reconnect power to the controller.

If the red light flashes exactly one second on, then one second off, then you may have a faulty controller. Try disconnecting then reconnecting the power.

If the red light pulses briefly once every two seconds, with no interruption to this sequence even when you try to turn on a lane from the computer, then the computer is not communicating with the controller. Check your communication cable and connections. Check your software configuration. Check the jumper inside the controller is set to 232 for Brunswick scoring or 232 for other types. If you are using the *Lane Control System*, check that you have version 5.4 or later. Check in *System Configuration* for the correct pinspotter type. Check that switch number one inside the controller is OFF for the first or only controller, and on for the second controller (if two controllers are sharing a communication line).

If the red light flashes in any other pattern, then the *Pinspotter Controller* is most likely functioning correctly and communicating with the computer.

If this is a new installation, then perhaps all the pinspotters have been connected wrongly. Check the wiring to the pinspotters carefully. If you are using an existing AMF ribbon cable, check that the connectors are seated correctly, and are the correct way around on the cable. ie. Pin 1 on all the connectors should match the stripe on the cable.

Symptom: One or more pinspotters won't turn on.

Solution: Try turning the pinspotter on with the managers switch. If this does not work, then it is not a problem with the *Pinspotter Controller*, but with the pinspotter itself.

Swap the lane connectors at the controller and see if the problem moves to a different lane. For example, if you can not get lane 4 to come on, swap the cables for lanes 1-8 and 9-16 at the Pinspotter Controller. Now try to switch lane 12 on. lane 4 should come on. Try to switch lane 12 on, lane 4 should come on. If the problem moves to a different lane (eg lane 12 now won't come on, but 4 is O.K), then you have a faulty *Pinspotter Controller* I/O card. If the problem remains at the same lane (lane 4 still won't turn on), then the problem is in the cabling to the managers switch.

Note that your *Pinspotter Controller* will be fitted only with enough I/O boards for the number of lanes you have. For example, if you have 12 lanes, your controller will have only 2 boards fitted (2 x 8 lanes)

In some cases, it may be possible to "repair" faulty I/O boards by swapping the board so that the faulty channel is no longer required. For example, if lane 8 is faulty in a 12 lane centre, swap the position of the two I/O cards. You will need to open the top and front of the *Pinspotter Controller*. The faulty lane will now correspond to lane 16 which is not used.

If you have a faulty I/O card within the *Pinspotter Controller*, it was most likely caused by voltage or current spikes from the pinspotters. While the controller is designed to handle large level spikes and surges, it can not be immune to all levels. If you are repeatedly damaging I/O cards, you should check your pinspotters to determine the cause.

Symptom: Some functions, (eg instructomat, frame counting, or cycling) do not work, but the pinspotters turn on and off correctly.

Solution: Not all functions are available with all types of pinspotters. You may not have these functions in your centre.

If the problem occurs only on one lane, check the wiring for that lane. Test the *Pinspotter Controller* by swapping cables with another set of 8 lanes as described above.

Check that the managers switch for that lane is off. Some functions may not work correctly if the switch is not off.

Symptom: One Pinspotter won't turn off.

Solution: Check that the managers switch is off. Check that the override switch on the pinspotter itself is off.

Disconnect the lane cable for this lane from the front of the pinspotter. If the pinspotter is still running, then it is not a problem with the Pinspotter Controller, but with the pinspotter wiring or the pinspotter itself.

Test the *Pinspotter Controller* by swapping cables with another set of 8 lane as described above.

Note that some pinspotters may be fitted with timers, and they will not switch off immediately. Wait a couple of minutes to see if the pinspotter then switches off.

Symptom: Sound is too soft or distorted

Solution: The trimpot inside the controller may be set incorrectly. See *Setting the Switches* to correct the problem.

If the sound becomes distorted only after the controller has been running for a while, or after the volume has been set high for a while, then the controller may be overheating. Check that the vents of the controller are not obstructed. There should be nothing placed on or under the controller that might restrict airflow. Check that the fan or the inside of the controller has not become clogged with dust. Check that the power supply is operating correctly, and is correctly rated.

Symptom: After upgrading from a Lane Interface Card to an SIU, the pinspotter controller no longer works.

Solution: Check that the pinspotter controller is connected to the correct port on the SIU and that the RS232/LIU jumper is set correctly. See *Connecting the Communications Cable* above.

If you have an early model Pinspotter Controller that pre-dates the SIU, it may not be fully compatible with the SIU.

To determine if the controller is compatible, open the top and examine the type of RS232/LIU jumper.

If the jumper has 6 pins, it is compatible.

If it has only three pins, it may not be compatible. Check the part number on the IC O1. If it is 4N25 or 26, it may not be compatible. If it is 4N35 or 36 then it is compatible. Early units can be made compatible by exchanging the 4N25 for a 4N35. Contact your supplier for more details.

6. Specifications

6.1 Lane Connections

The following table shows the wiring of each lane cable. See the chapter on *Connecting the Pinspotter Switches* for more information.

6.1.1 Model A - 25 way connector

Note that there are two different cables that may be supplied. If the cable contains any orange or turquoise wires, then it is a type 2, else it is a type 1.

DB25 Plug	Lane & Function	Core Colour/stripe	
		Type 1 Cable	Type 2 Cable
1	1B	Yellow	Red
2	1C	Yellow/Brown	Blue
3	2B	White/Grey	Green
4	3B	Pink	Yellow
5	3C	Pink/Brown	White
6	4B	Purple	Black
7	5B	Red	Brown
8	5C	Red/Blue	Violet
9	6B	Grey	Orange
10	7B	Green	Pink
11	7C	Brown	Turquoise
12	8B	Brown/Red	Grey
13	n/c		
14	1A	White/Yellow	Green/Red
15	2C	White/Blue	Yellow/Red
16	2A	White/Green	White/Red
17	3A	White/Pink	Red/Black
18	4C	Blue	Red/Brown
19	4A	Black	Yellow/Blue
20	5A	White/Red	White/Blue
21	6C	Grey/Pink	Blue/Black
22	6A	Grey/Brown	Orange/Blue
23	7A	White	Yellow/Green
24	8C	Brown/Green	Green/Blue
25	8A	Brown/Blue	Grey/Blue

6.1.2 Model B

There are 3 types of connection -
- APC - Automatic Pinspotter Control turns the pinspotters on and off.
- ASC - Automatic Scoring Control turns the console screens on and off.
- Audio - Provides audio to the speakers in the console.

APC	Function	ASC	Function	Audio	Function
1,2	Com 1-8	1	Lane 1	1	Ln 1&2 Audio
3	Lane 1	2	Lane 2	2	Ln 1&2 GND
4	Lane 2	3	Lane 3	3	Ln 1&2 Shield
5	Lane 3	4	Lane 4	4	Ln 3&4 Audio
6	Lane 4	5	Lane 5	5	Ln 3&4 GND
7	Lane 5	6	N/C	6	Ln 3&4 Shield
8	Lane 6	7	Lane 6	7	Ln 5&6 Audio
9	Lane 7	8	Lane 7	8	Ln 5&6 GND
10	Lane 8	9	Lane 8	9	Ln 5&6 Shield
11,12	Com 9-16	10	Lane 9	10	Ln 7&8 Audio
13	Lane 9	11	Lane 10	11	Ln 7&8 GND
14	Lane 10	12	Lane 11	12	Ln 7&8 Shield
15	Lane 11	13	Lane 12		
16	Lane 12	14	Lane 13		
17	Lane 13	15	Lane 14		
18	Lane 14	16	Lane 15		
19	Lane 15	17	Lane 16		
20	Lane 16				

Note that the common for each lane's console control is also the common for the pinspotter control and is on the APC connector pins 1,2,11 or 12.

6.1.3 Model S - 37 way connector

These models may have either a single 36 core cable, or four 8 core cables attached to each plug.

Single 36 core cable

DB37 Plug	Lane & Function	Core Colour/stripe
1	1A	Red
2	2A	Blue
3	3A	Green
4	4A	Yellow
5	5A	White
6	6A	Black
7	7A	Brown
8	8A	Violet
9	9A	Orange
10	10A	Pink
11	11A	Turquoise
12	12A	Grey
13	13A	Red/Blue
14	14A	Green/Red
15	15A	Yellow/Red
16	16A	White/Red
17	n/c	
18	n/c	
19	n/c	
20	1B	Red/Black
21	2B	Red/Brown
22	3B	Yellow/Blue
23	4B	White/Blue
24	5B	Blue/Black
25	6B	Orange/Blue
26	7B	Green/Blue
27	8B	Grey/Blue
28	9B	Yellow/Green
29	10B	White/Green
30	11B	Green/Black
31	12B	Orange/Green
32	13B	Grey/Green

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DB37 Plug	Lane & Function	Core Colour/stripe	
33	14B	Yellow/Brown	
34	15B	White/Brown	
35	16B	Brown/Black	
36	n/c		
37	n/c		

Four 8 core cables

DB37 Plug	Lane & Function	Core Colour/stripe	Cable
1	1A	Red	1
2	2A	Blue	1
3	3A	Green	1
4	4A	Yellow	1
5	5A	Red	2
6	6A	Blue	2
7	7A	Green	2
8	8A	Yellow	2
9	9A	Red	3
10	10A	Blue	3
11	11A	Green	3
12	12A	Yellow	3
13	13A	Red	4
14	14A	Blue	4
15	15A	Green	4
16	16A	Yellow	4
17	n/c		
18	n/c		
19	n/c		
20	1B	White	1
21	2B	Black	1
22	3B	Brown	1
23	4B	Violet	1
24	5B	White	2
25	6B	Black	2
26	7B	Brown	2
27	8B	Violet	2
28	9B	White	3
29	10B	Black	3
30	11B	Brown	3
31	12B	Violet	3

32	13B	White	4
33	14B	Black	4
34	15B	Brown	4
35	16B	Violet	4
36	n/c		
37	n/c		

6.2 Communication Connections

For AMF and Touch Score systems with *Lane Interface Card-*

Lane Interface Card DB25	Function	Pinspotter Controller
2,14,15,16	TX-	3
3	RX	1
7,8,19	GND	4
22,23,24,25	TX+	2

Note: Jumper in the LIU position, switch 2 **OFF**.

For Brunswick scoring systems with *Lane Interface Card-*

Lane Interface Card DB25	Function	Pinspotter Controller
4	TX	3
8	GND	4,2
9	RX	1

Note: Jumper in the 232 position, switch 2 **OFF**.

For all scoring systems with *Scorer Interface Unit -*

Scorer Interface Unit	Function	Pinspotter Controller
1	RX	1
2	GND	2
3	TX	3
4	GND	4

Note: Jumper in the 232 position, switch 2 **OFF**.

For connection directly to a computer's Serial Com Port -

PC's DB9 Serial Com Port	Function	Pinspotter Controller
3	TX	3
5	GND	4,2
2	RX	1

Note: Jumper in the 232 position, switch 2 **ON**.

6.3 Power Supply Connections

Power Connector	Function
1	GND
2	+5V DC @ 1.5 A (Models A & S only)
3	+24V DC @ 2.5 A (Model B only)