

# Ball Speed Display Manual

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Congratulations on purchasing the exciting new Ball Speed Display from Joystick Scoring. This product gives your existing scoring system sophisticated new features found only on the latest state of the art scoring equipment, such as:

- a) Ball speed display - in miles per hour or kilometers per hour.
- b) Speed sensitive machine triggering (smart trigger).
- c) Pinsetter safety interlock.

The solid state LED display features three, 4" high digits. The display can be mounted anywhere that is convenient on either the curtain wall or masking unit. The large digits make it easily seen anywhere in the playing area, even in rock'n bowl or glow bowl conditions.

The Ball Speed Display features the following for ease of installation:

- a) Uses existing pinsetter power.
- b) Pinsetter safety interlock eliminates the need for an external rake drop switch.
- c) Retro-reflective ball detectors with tri-color alignment indicators and fast two axis mounting system.
- d) Smart wiring system reduces required cabling.
- e) All required cables, connectors and hardware is supplied.

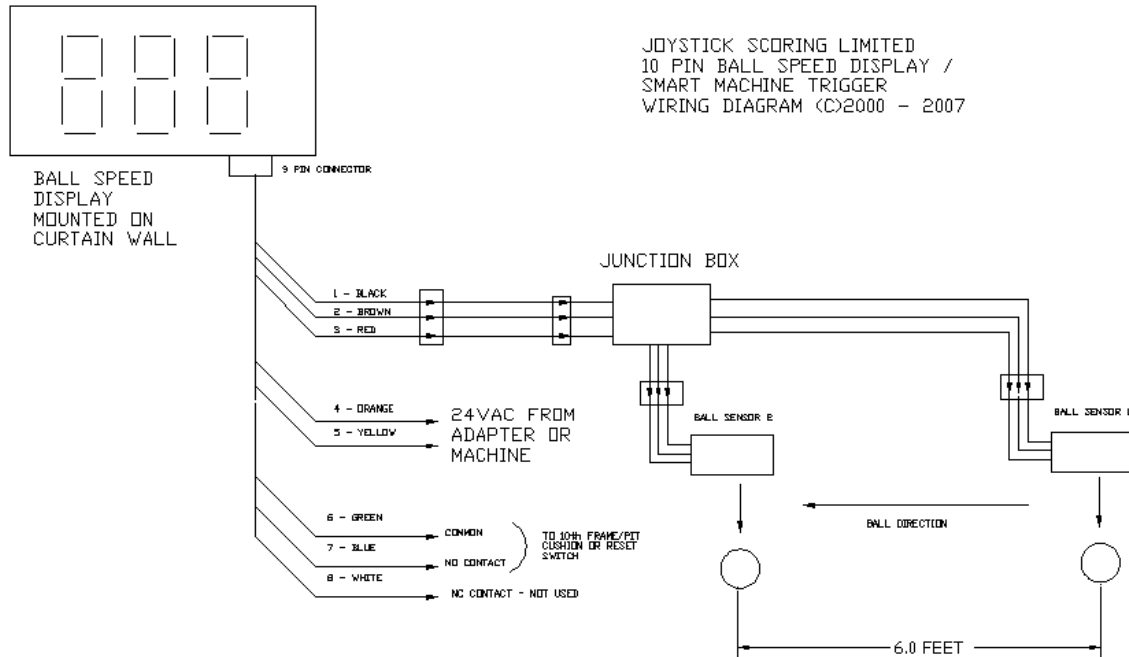
## Installation Instructions:

1/ Remove the four screws from the red plastic cover on the front of the display to reveal the display board. To the top and bottom of the display board are four mounting holes. Use the #8 x 1/2 " screws supplied to mount the display on the curtain wall or masking unit, making sure that the 8 conductor cable supplied is long enough to reach the control panel on the pinsetter (extension cables can be specially ordered if needed). Note: If the mounting surface is not solid use an appropriate plug or hollow wall fastener (available from any hardware store).

2/ Plug the 8 conductor cable into the 8 conductor connector on the display. Rout the cable to the control box on the pinsetter (see fig1). Fasten the cable to the wall as required. If wire staples are used, be sure not to crush the cable by stapling to hard.

3/ Plug the 3 conductor extension cable into the 3 conductor plug on the end of the 8 conductor cable. The 3 conductor extension cable is plugged into the junction box.

The second ball detector is plugged into the short cable on the junction box, and the first ball detector is plugged into the long cable on the junction box (see fig 1).



4/ Mount the ball sensors on top of the capping with 6' between them. This is the distance that is required for the display to calculate the speed of the balls. The second ball sensor is usually mounted on the bottom step of the kick back as shown in fig. 2. When ball sensor 1 is mounted six feet up the lane (towards the bowler) it should be just behind the camera.



Fig 2.

5/ Ball sensor 2 must be mounted on the kickback, whereas ball sensor 1 must be mounted directly on top of the capping.

6/ Mount the reflectors on the brackets supplied, opposite the ball sensors.

7/ Complete all plug in connections as shown in fig 1 and properly staple or tie-wrap all cables, being careful that they are not in the way of any balls, or moving parts on the pinsetter.

8/ Connect the display to the pinsetter. The connections are as follows:

pin 1 - black	ball sensor common (3 wire female connector)
pin 2 - brown	ball sensor signal " " "
pin 3 - red	ball sensor +12VDC " " "
pin 4 - orange	24-32 VAC from pinsetter.
pin 5 - yellow	24-32 VAC from pinsetter.
pin 6 - green	set common.
pin 7 - blue	set NO contact.
pin 8 - white	set NC contact (not used).
pin 9 - n/a	spare pin - no wire.

**CAUTION! Always turn the main pinsetter power off before making connections!**

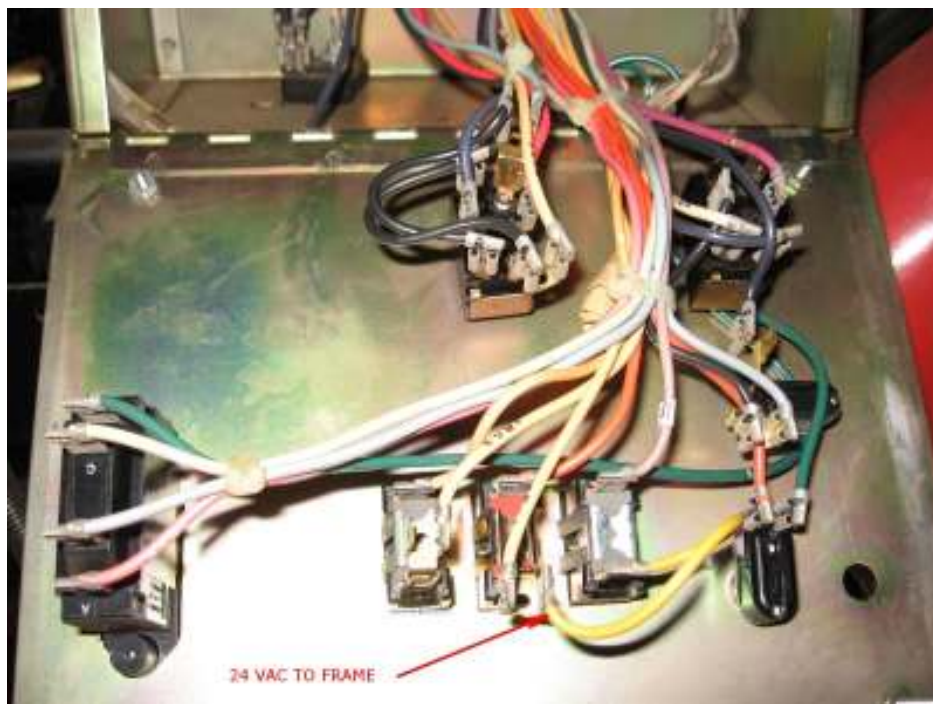
9/ To avoid any unnecessary damage to the pinsetter or speed display always check the pinsetter schematic and use an AC mutimeter to test for expected 24VAC power before making any connections.

Always turn the main pinsetter power is off before doing ANY wiring. Connect the SET relay output (green & blue wire) to the reset or 10<sup>th</sup> frame input with the insulation piercing connectors supplied,24VAC power can also be obtained from the pinsetter as follows;

**AMF WIRING**

For AMF pinsetters you will find an extra 20' 4 conductor cable supplied that allows easy connection to the back end of the machines for both set and power.

On the 82-70 pinsetter run the 4-conductor extension through the raceway to the back end control box. There you can easily disconnect old the pit cushion switch, and then connect the machine green and blue wires to allow the speed display to trigger the pinsetter. 24 Volt AC power is also easily obtained by connecting to the short wire connecting the S & T switches and chassis ground.



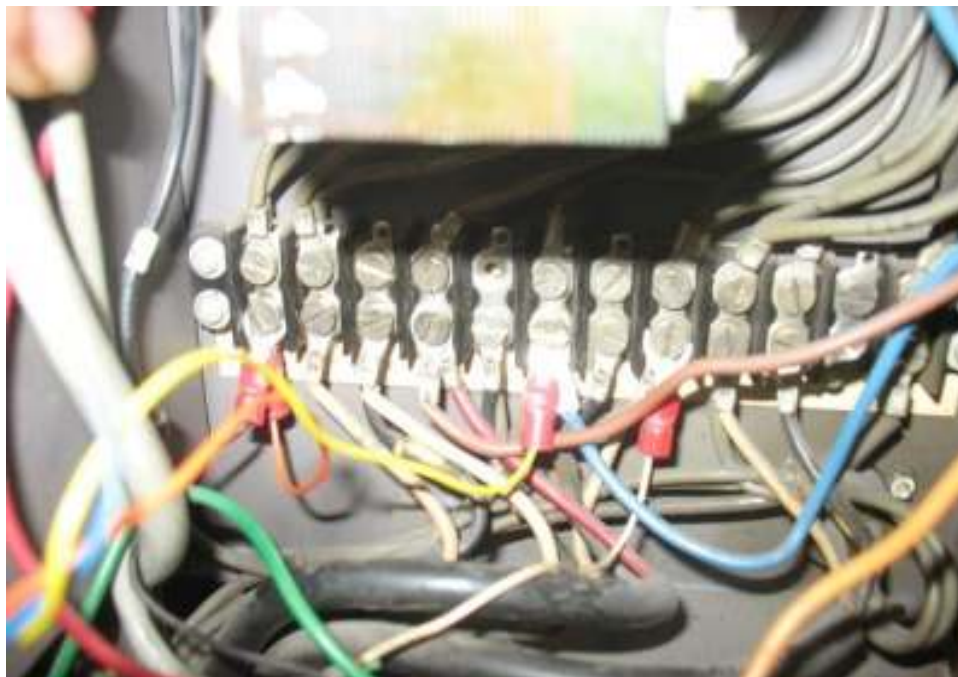
## BRUNSWICK WIRING

The 20' cable supplied is long enough in most cases to be fed directly to the pinsetter control box where there is usually enough space to route in into the box through an existing cable opening.



Brunswick "A2" machines can be connected in parallel with the "CONTROL TRIGGER SWITCH" to wires 56 and 69 with the insulation piercing connectors.

AC power is also obtained as shown below.



10/ After carefully checking all connections and that no wires will be caught by the pinsetter, turn on the pinsetter. If wired properly, the ball speed display will flash on briefly after the pinsetter is turned on showing the trigger delay trim adjustment value. The ball sensors should be off unless they are not aligned with the reflector properly.

11/ Check the alignment of the ball sensors. For normal operation the signal indicator must be off, and turn on only when the beam is broken. The beam should be centered on the reflector. A good method for checking alignment is to cover ½ of the reflector and the sensor should still function properly.

12/ Make sure that the switch located on the bottom of the display is set to the on position. It turns the display on or off. When the display is off, the machine trigger function will continue to operate, but ball speed is not shown.

Test the system by throwing balls. When the ball has passed ball sensor #2, the display will flash on with the ball speed in Mph (default) or Km/h.

If the ball speed is below 6 Mph the display will show "---" when the ball actually passes through ball sensor 2. The "---" display will stay up for 10 seconds or until the ball seen by ball sensor #2. The pinsetter will not set if ball sensor #2 does not see it. Chances are this is a very slow ball – possibly one that has stopped in the gutter.

15/ Check the trigger delay speed visually. The pinsetter should always set just as the ball hits the cushion, regardless of ball speed.

**Under normal conditions, the trigger delay setting should not need adjustment. When adjusting it be careful not to overturn and damage the potentiometer. Note: it can only do 1 turn.**

If it is setting too soon or waiting too long, adjust the trigger delay. The trigger delay is adjusted with a 1/8<sup>th</sup> " common screw driver, carefully inserted in the back of the display.

When turning the adjustment, the trigger delay value is shown on the display. The fastest setting is "00.0" and the slowest setting is "50.0". Factory Default is "25.2".

Note that once an acceptable value has been established, all displays can be set to the same setting. There is no need to figure out a different value for each lane.

16/ Replace the red plastic cover in front of the display with the screws supplied. Check if there is glare from lighting in the display when viewed from the playing area and tilt the display down slightly to eliminate this.

17/ The system is now complete. Bowl and enjoy!