ASU-70

Auto pit timeout Switch

For AMF 82-70 Pinspotter

BACKEND CONTROL BOX VERSION

The ASU-70 shuts down the backend motor and ball return (optional) after a period of bowling inactivity, saving on power and maintenance costs

The time period is selectable.

Machine starts up again when a ball is bowled or reset switch is activated.

Maznufactured by

CS Cybernetic Solutions
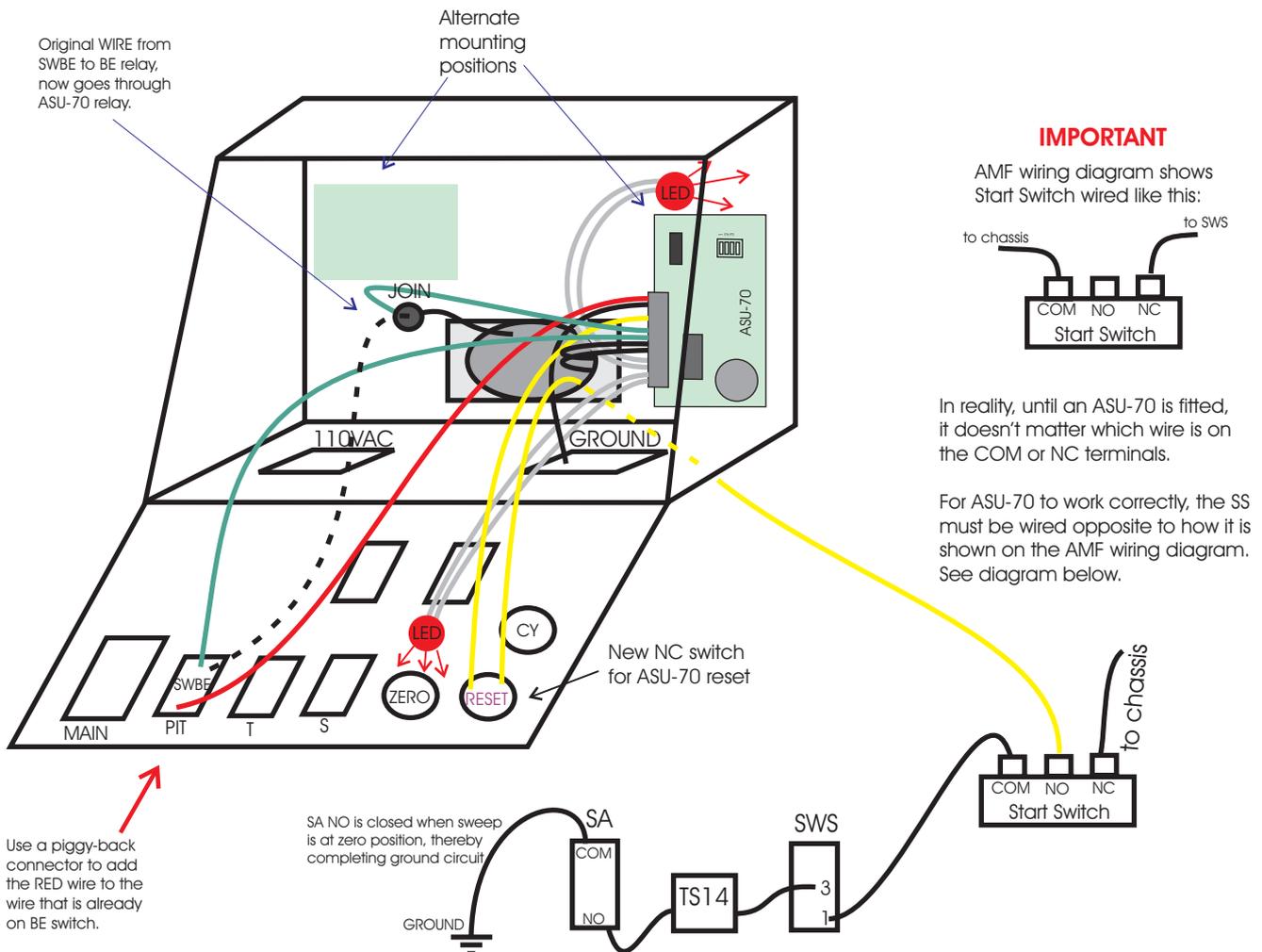www.cybernetic.com.au

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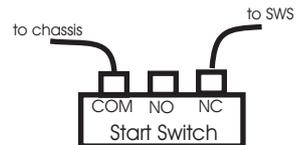Installation diagrams can also be downloaded from
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For this device to function correctly,
it is necessary to retain the SS cushion
microswitch even if infra-red triggering
is being used.

The ASU-70 acts as a switch placed in series in the Backend Motor and Ball Return circuits to cut power during periods of bowling inactivity.

Original WIRE from SWBE to BE relay, now goes through ASU-70 relay.

Alternate mounting positions

IMPORTANT

AMF wiring diagram shows Start Switch wired like this:

to chassis   to SWS

COM   NO   NC
Start Switch

In reality, until an ASU-70 is fitted, it doesn't matter which wire is on the COM or NC terminals.

For ASU-70 to work correctly, the SS must be wired opposite to how it is shown on the AMF wiring diagram. See diagram below.

JOIN

LED

ASU-70

110VAC   GROUND

LED   CY

ZERO   RESET

MAIN   PIT   T   S

New NC switch for ASU-70 reset

Use a piggy-back connector to add the RED wire to the wire that is already on BE switch.

SA NO is closed when sweep is at zero position, thereby completing ground circuit

SA
COM
NO

GROUND

TS14

SWS
3
1

COM   NO   NC
Start Switch

to chassis

IMPORTANT

Without an ASU-70, a pinspotter will happily run and cycle properly whichever way the two wires are connected to the COM and NC terminals of the cushion Start Switch.

AMF originally wired the machine (see AMF schematics) with SS COM being connected to the chassis (Input Circuit E) and SS NC being connected to Ground through the SWS, TS14 and SA NO.
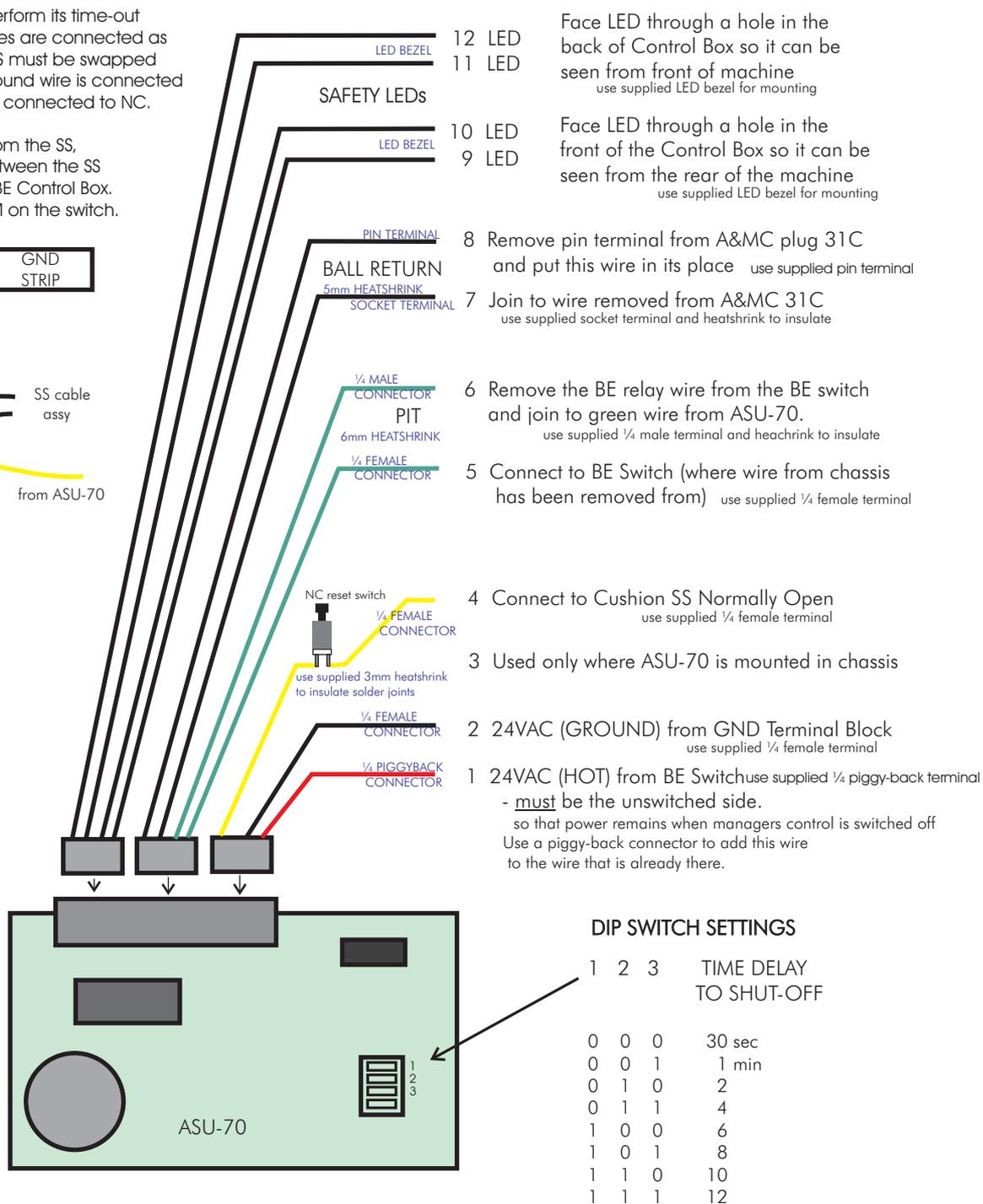
However, the ASU-70 will not perform its time-out (STAND-BY) function if the SS wires are connected as original. The two wires on the SS must be swapped with each other so that the Ground wire is connected to COM and the chassis wire is connected to NC.

With the wires disconnected from the SS, perform a continuity check between the SS wires and the GND strip in the BE Control Box. Connect the GND wire to COM on the switch.

GND STRIP

MEASURE CONTINUITY

SS cable assy

from ASU-70

COM   NO   NC
Start Switch
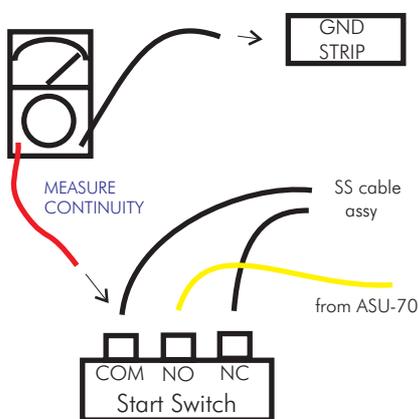
Perform this continuity test with sweep at zero position and wires disconnected from Start Switch

Also see diagram on PAGE 1

LED BEZEL

12 LED
11 LED

SAFETY LEDs

Face LED through a hole in the back of Control Box so it can be seen from front of machine
use supplied LED bezel for mounting

LED BEZEL

10 LED
9   LED

Face LED through a hole in the front of the Control Box so it can be seen from the rear of the machine
use supplied LED bezel for mounting

PIN TERMINAL

8 Remove pin terminal from A&MC plug 31C and put this wire in its place   use supplied pin terminal

BALL RETURN

5mm HEATSHRINK
SOCKET TERMINAL

7 Join to wire removed from A&MC 31C
use supplied socket terminal and heatshrink to insulate

¼ MALE CONNECTOR

PIT

6mm HEATSHRINK

6 Remove the BE relay wire from the BE switch and join to green wire from ASU-70.
use supplied ¼ male terminal and heachrink to insulate

¼ FEMALE CONNECTOR

5 Connect to BE Switch (where wire from chassis has been removed from) use supplied ¼ female terminal

NC reset switch

¼ FEMALE CONNECTOR

4 Connect to Cushion SS Normally Open
use supplied ¼ female terminal

use supplied 3mm heatshrink to insulate solder joints

3 Used only where ASU-70 is mounted in chassis

¼ FEMALE CONNECTOR

2 24VAC (GROUND) from GND Terminal Block
use supplied ¼ female terminal

¼ PIGGYBACK CONNECTOR

1 24VAC (HOT) from BE Switch use supplied ¼ piggy-back terminal
   - must be the unswitched side.
   so that power remains when managers control is switched off
   Use a piggy-back connector to add this wire
   to the wire that is already there.

ASU-70

DIP SWITCH SETTINGS

1	2	3	TIME DELAY TO SHUT-OFF
0	0	0	30 sec
0	0	1	1 min
0	1	0	2
0	1	1	4
1	0	0	6
1	0	1	8
1	1	0	10
1	1	1	12

NOTE: This ASU-70 is configured to be mounted in the Backend Control Box.
The ASU-70 can be mounted inside the chassis, but must be configured to suit -
ie. 5 boards with neons, 5 boards with optocouplers, Omega-Tek, XOP etc.
Please consult with us if you want to mount the ASU-70 in your chassis.

The Installation of the ASU-70

1. Remove power to machine.

2. Mount ASU-70 circuit board in best position inside BE Control Box.

3. Mount safety indicator LEDs in best position by drilling holes in the BE Control Box.

4. Plug the LED plug into ASU-70 circuit board as shown on diagram on page 2.

The relay on the ASU-70 circuit board is a doule pole relay that will allow the PIT and BALL RETURN to run if power is lost or if the ASU-70 suffers a failure.

We need to route the control power to the PIT and BALL RETURN through the ASU-70 by breaking into those wires:

5. BALL RETURN - Remove wire from A&MC plug terminal 31C. Locate ASU-70 wiring plug with 2 GREEN and 2 GREY (or BLACK) wires, fit supplied pin terminal to one of the long wires and insert it into A&MC 31C.

6. Fit the supplied socket terminal to the other long wire of the ASU-70 plug, then take the wire previously removed fromA&MC 31C and join them together. Use the supplied heatshrink tube to insulate the join.

7. PIT (BACKEND MOTOR) - Remove the wire that goes to the BE relay from the back of the SWBE (PIT SWITCH) and join it to one of the GREEN wires on the ASU-70 plug using the supplied 1/4 male connector. Ensure this join is secure and well insulated.

8. Take the other GREEN wire from the ASU-70 plug and plug it onto the SWBE where the BE relay wire was just removed from. Use a supllied 1/4 terminal for this purpose.

9. Plug the the PIT/BALL RETURN connector into the ASU-70.

10. Mount the supplied NC (Normally Closed) push button switch in a convenient location on the BE Control Box.

11. REFER to the TWO drawings in this instruction manual that show the cushion Start Switch. If the SS is not connected as shown, the ASU-70 will allow the BE motor and BALL RETURN to run, but it will not time-out.

12. Take the YELLOW wire of the remaining plug (has RED/BLACK/YELLOW wires) and cut to a suitable length to enable it to reach comfortably from the ASU-70 to the newly installed NC switch.

13. There should be plenty of excess YELLOW wire after step 12. USe this excess to run from the NC switch to the cushion SS.

14. Solder one YELLOW wire to each terminal of the NC switch using supplied heatshrink tube to insulate.

15. Using a supplied 1/4 terminal, plug the YELLOW wire you just ran to the SS onto the NO termianl of the switch.

15. Using a supplied 1/4 termianl, connect the BLACK wire from the last ASU-70 plug to a GROUND terminal inside the control box.

16. Using a 1/4 connector, add the remaining RED wire to the "hot" side of the SWBE. This should be terminal 1 - the other terminal from the GREEN wire that was previously plugged into the SWBE. Terminal 1 of the SWBE should have power (24VAC) whenever the Pinspotter is on, regardless of whether SWBE is in the ON or OFF position.

17. Plug this last remaining plug into the ASU-70.

18. Check all connections and turn Pinspotter on. Confirm all functions as per the Operation description on the right side of this page.

The of Operation of the ASU-70

When machine is turned on, the STAND-BY WARNING LEDs will flash and the audible warning will sound for about 10 seconds. The BACKEND MOTOR and BALL RETURN will start and run for about 30 seconds and then shut down to STAND-BY MODE.

BALL RETURN STAND-BY depends on whether the other lane of the pair is turned on and/or timed out.

When a ball is bowled and the cushion SS is activated, an audible WARNING will sound for 10 seconds before the BACKEND MOTOR and BALL RETURN start up.

If the cushion SS is not activated for the period of the time delay (30 sec to 12 min - see page 2 for settings), the BACKEND MOTOR and the BALL RETURN will be shut down to STAND-BY MODE.

STAND-BY MODE continues until the cushion SS is activated or until the machine is turned off.

During STAND-BY MODE, the two WARNING LEDs will flash, indicating that the machine is turned on and the BACKEND MOTOR and BALL RETURN are waiting for the cushion SS to be activated.

When the SS is activated (by a ball or by hand), the audible WARNING will again sound for 10 seconds before the BACKEND MOTOR and BAll RETURN restart.

ASU-70 can be reset at any time using the NC switch (RESET SWITCH supplied with kit and is wired in series with cushion SS) to turn BACKEND and BALL RETURN on without cycling the machine. Time delay count-down will start again.

If RESET switch is held in while turning machine on from backend, buzzer will sound for 1 second and Backend and Ball Return will run continuously. This feature is for machine maintenance purposes. Turn machine off to end this mode.

The high brightness flashing LEDs should be mounted so that they can be seen from both back and front of machine. The LEDs flash when ASU-70 is in STAND-BY MODE for the safety of technical staff.