



# **MAINTENANCE and REPAIR Reference Manual**

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Automated Scoring and Technology Division

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## INTRODUCTION

The *BOSS Scoring™ System Maintenance and Repair Manual* contains the information you need to maintain and replace the components of the BOSS Scoring™ system.

If any component of the BOSS Scoring™ system fails to function during the first year it is installed, AMF ships you a replacement. If any component fails to function after the first year it is installed, AMF will determine whether to have you service the component or purchase a replacement part.

## HOW TO USE THIS MANUAL

The repair information in this manual assumes you have contacted AMF technical support to troubleshoot the problem and have been told by the AMF Technical Support technician to replace the component.

Contact AMF Technical Support at the local number(s) listed at the front of the *Installation Reference Manual*.

## TOOLS

Refer to the Tools section in the *Installation Reference Manual*.

## WARNINGS

Read and follow the safety information on the IMPORTANT SAFETY INFORMATION pages at the front of the *Installation Reference Manual*.



This safety symbol indicates potential injury. It is placed at any installation step that is potentially hazardous. Follow all safety messages with this symbol to avoid injury or death.



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## CURTAIN WALL and LANE COMPONENTS

### CPU

#### Maintenance

- As needed, clean the housing using a general-purpose cleaning product and a soft, non-abrasive cloth.
- Every three months, vacuum the fan vent.

#### Repair

1. Disconnect the power and communication cables.
2. Unfasten the security strap.
3. Remove the non-functioning CPU from the hanger.
4. Install the new CPU in the hanger. If applicable, ensure the vent faces AWAY from the Curtain Wall.
5. Tighten the security strap.
6. Connect the communication and power cables.
7. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

### VGA to TV CONVERTER

#### Maintenance

- As needed, clean the housing using a general-purpose cleaning product and a soft, non-abrasive cloth.

#### Repair

1. Disconnect the power and communication cables.
2. Remove the non-functioning VGA-to-TV converter from the shelf.
3. Attach the appropriate Velcro™ strip on the new VGA-to-TV converter. (If shelf has “hooks” side, attach “loops” side to new VGA-to-TV converter – or vice versa.)
4. Secure the new VGA-to-TV converter to the shelf.
5. Connect the communication and power cables.
6. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.



## EXTERNAL VIDEO SWITCH

### Maintenance

- As needed, clean the housing using a general-purpose cleaning product and a soft, non-abrasive cloth.
- Every three months, vacuum the fan vent.

### Repair

1. Disconnect the power and communication cables.
2. Loosen (for units with keyhole slots) or remove screws to remove the external video switch from the Curtain Wall. If applicable, set aside the screws.
3. Secure the new external video switch to the Curtain Wall. For units without keyhole slots, use the same mounting holes and screws from the non-functioning unit.
4. Connect the communication and power cables.
5. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

## VIDEO SPLITTER

### Maintenance

- As needed, clean the housing using a general-purpose cleaning product and a soft, non-abrasive cloth.

### Repair

1. Disconnect the power and communication cables.
2. Remove the non-functioning Video Splitter from the shelf.
3. Attach the appropriate Velcro™ strip on the new video splitter. (If shelf has “hooks” side, attach “loops” side to new Video Splitter – or vice versa.)
4. Secure the new Video Splitter to the shelf.
5. Connect the communication and power cables
6. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

## MACHINE INTERFACE UNIT

### Maintenance

- As needed, clean the housing using a general-purpose cleaning product and a soft, non-abrasive cloth.

### Repair

1. Disconnect the power and communication cables.
2. Loosen the screws then remove the non-functioning MIU from the Curtain Wall.
3. Mount the new MIU then tighten the screws to secure it in place.



4. Connect the communication and power cables.
5. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

## Cluster Switch

### Maintenance

- Every year, lubricate the shafts with a drop of lightweight, non-synthetic machine oil (3-in-1™ or similar).

### Repair

1. Disconnect the cable.
2. Remove the cluster switch from the Brunswick detector.
3. Prepare the replacement cluster switch as follows:
4. Set the pinsetter to zero.
5. Set the cluster switch to zero by completing the steps below:
  - a. Loosen the 2 screws on the zero degree microswitch.
  - b. Move the switch until the inner cam lobe activates (you will hear a click).
  - c. Re-tighten the 2 screws.
  - d. Set the cluster switch gear to the known zero.
6. Set the cluster switch gear to the known zero.
7. Mount the cluster switch assembly onto the Brunswick detector.
8. Set the pinsetter to second ball.
9. Advance the pinsetter until the 4-to-1 arm reaches the tip of the rake lever.
10. Move the outer cam until the notch on the cam engages the 44/144 microswitch (you will hear a click).
11. Activate the pinsetter and ensure the following:
  - a. The zero microswitch is activated when the pinsetter is at zero degrees and is not activated when the pinsetter is off zero degrees.
  - b. The 44/144 microswitch is activated when the pinsetter is at 44/144 degrees and is not activated when the pinsetter is off 44/144 degrees.
12. Connect the cable.
13. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.





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## CAMERA

### Camera

#### Maintenance

- As needed, clean the housing using a general-purpose cleaning product and a soft, non-abrasive cloth.

**IMPORTANT:** The camera lens is protected and does not need cleaning. Do not open the housing to clean the lens or you will void the camera warranty.

#### Repair

1. Disconnect the power and communication cables.
2. Remove the screws then lift the non-functioning camera from the lane capping or tunnel bracket. Set aside the screws.
3. Secure the new camera to the lane capping or tunnel bracket using the existing mounting holes and the screws set aside in step 2.
4. Connect the communication and power cables.
5. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

### Interfaces

#### Maintenance

- As needed, clean the housing using a general-purpose cleaning product and a soft, non-abrasive cloth.

#### Repair

1. Disconnect the power and communication cables.
2. Loosen (for units with keyhole slots) or remove the screws then lift the non-functioning interface from the kickback or lane capping. If applicable, set aside the screws.
3. Secure the new interface to the kickback or lane capping. For units without keyhole slots, use the existing mounting holes and the screws set aside in step 2.
4. Connect the communication and power cables.
5. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

### Power

#### Maintenance

- As needed, clean the housing using a general-purpose cleaning product and a soft, non-abrasive cloth.



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### Repair

1. Disconnect the power and communication cables.
2. Loosen (for units with keyhole slots) or remove screws then remove the non-functioning power supply unit from the Curtain Wall. If applicable, set aside the screws.
3. Secure the new power supply unit to the Curtain Wall. For units without keyhole slots, use the same mounting holes and screws from the non-functioning unit.
4. Connect the communication and power cables.
5. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

## BALL DETECTOR

### Detector

#### Maintenance

- Clean the detector head periodically using a mild soap and water solution and a soft, non-abrasive cloth.
- Cover detector head whenever performing a task that could result in liquids or chemicals coming in contact with the detector head.

#### Repair

1. Disconnect the power and communication cables.
2. Loosen (for units with keyhole slots) or remove the screws then lift the non-functioning detector from the kickback or lane capping. If applicable, set aside the screws.
3. Secure the new detector to the kickback or lane capping. For units without keyhole slots, use the existing mounting holes and the screws set aside in step 2.
4. Connect the communication and power cables.
5. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

### Reflector

#### Maintenance

- Clean the reflectors periodically using a mild soap and water solution and a soft, non-abrasive cloth.
- Cover reflectors whenever performing a task that could result in liquids or chemicals coming in contact with the detector head.

#### Repair

1. Unscrew the broken reflector from the reflector mount and discard it.
2. Screw on the new reflector.



## OVERHEAD and BOWLERS' AREA COMPONENTS

### BOWLER TERMINALS

#### KEYBOARD

##### Maintenance

- Clean the keyboard panel and housing using a general-purpose cleaning product with a soft, non-abrasive cloth.

**IMPORTANT:** DO NOT use acetone-based products or you will damage plastic components.

##### Repair: Replace The Ribbon Cable

1. Remove the screws from the back of the console to release the front cover and set them aside.
2. While holding the front cover, disconnect the ribbon cable from both the front cover and the bowler terminal board. Set aside the front cover. Discard the ribbon cable.
3. Connect the new ribbon cable to the bowler terminal board and front cover.
4. Reinstall the front cover on the console using the screws set aside in step 1.

##### Repair: Replace The Bowler Terminal Board

1. Remove the screws from the back of the console to release the front cover and set them aside.
2. Disconnect the ribbon cable and ground wire from the front cover. Set aside the front cover.
3. Disconnect the power and signal cables from the bowler terminal board.
4. Remove the screws holding the bowler terminal board in place and set them aside.
5. Remove the bowler terminal board.
6. Set the switches on the new bowler terminal board. Refer to the *Bowler Terminal Installation and Troubleshooting Reference Manual* (400-286-056) for information about the switches.
7. Connect the power and signal cables to the new bowler terminal board then secure the bowler terminal board in place with the screws set aside in step 4. Refer to the *Bowler Terminal Installation and Troubleshooting Reference Manual* (400-286-056) for information about the cable connections.



8. Secure the front cover onto the console using the screws set aside in step 1.
9. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

**Repair: Replace The Keyboard**

1. Remove the screws from the back of the console to release the front cover and set them aside.
2. Disconnect the ribbon cable and ground wire from the front cover.
3. Disconnect the intercom connector from the back of the keyboard.
4. Remove the 4 nuts securing the keyboard to the front cover. Set aside the nuts.
5. Remove the keyboard from the front cover.
6. Insert the new keyboard on the front cover and secure it in place with the nuts set aside in step 3.
7. Reconnect the ribbon cable, ground wire, and intercom cable to the front cover.
8. Secure the front cover to the console with the screws set aside in step 1.

**IMPORTANT** Ensure the cables and wires are not caught between the front cover and console.

9. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

## **TOUCHSCREEN**

### **Maintenance**

- Clean the touchscreen panel and housing using a 50/50 solution of isopropyl alcohol and water and a soft, non-abrasive cloth.

**IMPORTANT:** DO NOT use acetone-based products or you will damage plastic components.

- Run the Calibrate function each week. Refer to *the Bowler Terminal Installation and Troubleshooting Reference Manual* (400-286-056) for information about the function.

### **Repair: Replace Console**

1. Remove the screws that attach the console to the angle bracket (floor mount) or bracket (table mount). Set aside the screws.

**NOTE:** Hold the console so it cannot does not dangle by the cables.

2. Loosen the 2 screws from the underside of the back of the console and remove the rectangular cover. Set aside the cover and screws.
3. Cut the wire tie around the video cables then disconnect the power, video, communication, and intercom cables.



4. On the new console, loosen the 2 screws from the underside of the back of the console and remove the rectangular cover. Set aside the cover and screws.
5. Connect the intercom, communication, video, and power cables to the new console. Secure the video cables with a wire tie and trim off any excess wire tie.
6. Tuck the cables into the openings.
7. Align the holes on the rectangular cover with the holes on the new console and tighten the screws you loosened in step 4 to secure it in place.
8. Tuck any excess cable into the angle bracket (floor mount) or bracket (table mount).
9. Align the holes on the bracket with the holes on the back of the new console and secure the new console in place with the screws set aside in step 1.
10. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

### **Touchscreen Underlane Control Box Maintenance**

- As needed, clean the housing using a general-purpose cleaning product and a soft, non-abrasive cloth.

### **Repair: Replace Bowler Terminal Board**

1. If cable length permits, lift the Underlane Control Box up onto the approach.
2. Turn off the power switch and disconnect the main power plug.
3. Remove the screws attaching the top and side walls to the front and back walls. Set the screws, top, and side walls aside.
4. Disconnect the cables from the bowler terminal board.
5. Remove the screws holding the bowler terminal board in place in the control box. Set aside the screws.
6. Remove the non-functioning bowler terminal board.
7. Insert the new bowler terminal board and secure it in place with the screws set aside in step 4.
8. Connect cables to the new bowler terminal board.
9. Reattach the side walls and top with the screws set aside in step 3.
10. Set the switches on the new bowler terminal board. Refer to the *Bowler Terminal Installation and Troubleshooting Reference Manual* (400-286-056) for information about the switches.
11. Reconnect the main power plug and turn on the power switch.
12. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.



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**Repair: Replace Power Supply Board**

1. If cable length permits, lift the Underlane Control Box up onto the approach.
2. Turn off the power switch and disconnect the main power plug.
3. Remove the screws attaching the top and side walls to the front and back walls. Set the screws, top, and side walls aside.
4. Remove the connections to the power supply board.
5. Remove the screws holding the power supply board in place and set them aside.
6. Remove the non-functioning power supply board.
7. Insert the new power supply board and secure it in place with the screws set aside in step 5.
8. Remake the connections to the power supply board. Refer to the *Bowler Terminal Installation and Troubleshooting Reference Manual* (400-286-056) for information about the power connections.
9. Reattach the side walls and top with the screws set aside in step 3.
10. Reconnect the main power plug and turn on the power switch.
11. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

**Repair: Replace Adapter Board**

1. If cable length permits, lift the Underlane Control Box up onto the approach.
2. Turn off the power switch and disconnect the main power plug.
3. Remove the screws attaching the top to the walls. Set the screws and top aside.
4. Remove the screws holding the adapter board in place.
5. Remove the non-functioning adapter board.
6. Insert the new adapter board and secure it in place with the screws set aside in step 4.
7. Reattach the top with the screws set aside in step 3.
8. Reconnect the main power plug and turn on the power switch.
9. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

## **OVERHEAD MONITORS**

### **Maintenance**

- Clean the screen using a general-purpose cleaning product with a soft, non-abrasive cloth.
- As needed, clean the housing using a general-purpose cleaning product with a soft, non-abrasive cloth.



## Repair: Replace VGA Monitor



**WARNING** Scaffolding must be used when installing overhead monitors and related components.

1. Turn off the power switch on the back of the monitor.
2. For dual OHM assemblies, remove the knob that secures the center cover (near the power inlet) over the space between the two monitors then slide out the center cover. Set aside the center cover and knob.
3. Disconnect the power and signal cables.
4. Remove the 2 bolts that secure the monitor to the hanger bar. Set aside the bolts.
5. Lift the non-functioning monitor off the hanger bar and out of the housing.
6. Lift the replacement monitor onto the hanger bar in the housing. Secure the monitor in place with the bolts set aside in step 4.
7. Connect the signal and power cables.
8. For dual OHM assemblies, reinstall the center cover.
9. Turn on the power switch.
10. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.

## Repair: Replace TV Monitor



**WARNING** Scaffolding must be used when installing overhead monitors and related components.

1. Disconnect the power and communication cables.
2. Remove the non-functioning monitor from the overhead assembly.
3. Install the new monitor in the overhead assembly.
4. Connect the communication and power cables.
5. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.



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## UNIVERSAL AC BOX

### Maintenance

None.

### Repair

1. Disconnect the power and communication cables.
2. Loosen the screws to remove the Universal AC Box off the overhead assembly support structure.
3. Mount the new Universal AC Box to the support structure and tighten the screws to secure it in place. .
4. Connect communication and power cables.
5. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.





## FRONT DESK and BACK OFFICE COMPONENTS

The information below applies to all the Front Desk and Back Office components:

CPU  
MONITOR  
BOSS™ KEYBOARD  
KEYBOARD  
MOUSE  
LASER PRINTER  
RECEIPT PRINTER  
POLE DISPLAY  
CASH DRAWER  
UPS

### **Maintenance**

- Follow the maintenance procedures described in the manufacturer's documentation.

### **Repair**

1. If applicable, turn off the power switch.
2. Disconnect the power and communication cables from the non-functioning component and remove it.
3. Position the new component and connect the communication and power cables to it.
4. If applicable, turn on the power switch.
5. Contact AMF Technical Support at the numbers listed in the front of the *Installation Reference Manual* for instructions about returning the component.



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