QUBICAAMF

EDGE RADARAY

EDGE FREE FALL Pinspotter Manual Supplement
Appendix H

These Original Instructions were written in English.

400-088-006-01 Rev. A
June 2022

ALL RIGHTS RESERVED

All rights to this manual including the diagrams, figures, and technical specifications are the property of QubicaAMF Worldwide, LLC. Reproduction or transmission of any of the material contained in this manual without the prior written permission of QubicaAMF Worldwide, LLC. is strictly prohibited. All of the product information in this manual was carefully prepared based on the latest information available and was believed to be correct at the time of printing. While every effort has been made to ensure accuracy, this publication may inadvertently contain typographical errors, inaccuracies, or errors of omission. QubicaAMF Worldwide, LLC cannot be held responsible for any claims resulting from these errors.

DOCUMENT UPDATES

This manual supersedes all previous versions of the EDGE Radaray Owner's Manual. QubicaAMF Worldwide, LLC. reserves the right to revise and/or update this manual at any time without obligation to notify any person or entity of such revision. The document number, revision level, and date below indicate the edition of this manual.

TRADEMARK NOTICES

QubicaAMF and the QubicaAMF logo are the registered trademarks of QubicaAMF Worldwide, LLC.

QubicaAMF TECHNICAL SUPPORT

(USA) 1-866-460-7263 option 3
(Europe – Middle East – Africa) +39 051 4192630

For more contact information, go to
https://www.qubicaamf.com/contact/find-your-closest-representatives

QubicaAMF Worldwide, LLC
8100 AMF Drive
Mechanicsville, Va. 23111

Copyright © 2022 QubicaAMF Worldwide, LLC
Document # 400-088-006-01 Rev. A
Issued Date: 06/10/2022

Radaray Foul Detector Manual

400-088-006-01 Rev. A

Summary of Changes

Change No.	ECR No.
Rev. A	22-0001

List of Effective Pages

Page	Change No.	Effective Date
All	Rev. A	6/10/2022

Appendix H. Radaray Foul Detector Manual

WORLDWIDE HEADQUARTERS
8100 AMF Drive - Mechanicsville, Va 23111 - USA
Tel: (804) 569-1000

EUROPEAN HEADQUARTERS
Via della Croce Coperta, 15 - 40128 Bologna - Italy
Tel: +39 051.4192.611

web: www.qubicaamf.com - email: info@qubicaamf.com - eshop: eshop.qubicaamf.com

Contents

Appendix H. Radaray Foul Detector Manual 1
1. GENERAL INFORMATION 3
2. INSTALLATION AND ALIGNMENT PROCEDURE 3
2.1. Installation 3
2.2. Alignment Procedure 4
2.3. Single Side Operation 6
3. OPERATION 6
4. MAINTENANCE 7
5. REPLACEMENT PARTS 9

WORLDWIDE HEADQUARTERS
8100 AMF Drive - Mechanicsville, Va 23111 - USA
Tel: (804) 569-1000

EUROPEAN HEADQUARTERS
Via della Croce Coperta, 15 - 40128 Bologna - Italy
Tel: +39 051.4192.611

web: www.qubicaamf.com - email: info@qubicaamf.com - eshop: eshop.qubicaamf.com

1. GENERAL INFORMATION

This manual describes the installation, alignment, and operation of the QubicaAMF EDGE Radaray Foul Detector, part number 088-000-222-01. This manual also contains information on maintaining the unit and provides a list of replacement parts.

The EDGE Radaray provides a means of detecting encroachment upon the foul line on a pair of lanes. The unit employs two (2) retro-reflective photoeyes. All that is required externally are reflectors mounted across the lanes from the Radaray unit. The EDGE Radaray is designed to be used only with the EDGE Free Fall Pinspotter System Controller (Chassis).

The unit is powered by 12 VDC at 0.1 Ampere from the EDGE Free Fall System Controller. When a foul is detected (the optical path between the unit and the external reflector is broken), an independent signal for that lane is sent to the System Controller, telling it that a foul occurred. Also, a sinking 12 VDC signal is activated for 12 seconds which lights the LED for that lane (mounted in the control unit cover) and causes a beeper to sound for approximately 13 seconds.

2. INSTALLATION AND ALIGNMENT PROCEDURE

2.1. Installation

Reflector Assembly

The reflector unit mounts at the end of the common lane division capping. The unit should be positioned so that the center of the reflector is in line with the approach edge of the foul line. The installation sequence is as follows:

1. Assemble the reflector base and cover (without the reflectors) and secure together with the 1/4-20 x ½" machine screws provided.

2. Position the assembly on the common lane division, aligning the center of the cutout in the side of the cover with the approach edge of the foul line. Using a felt-tip pen, make a mark on the division and extend it onto the metal base in the center of the cutout.

3. Remove the cover from the base and position the base on the division so that the mark on its side aligns with the mark on the division.

4. Mark the location of the two mounting holes using the base as a template, then drill pilot holes as necessary for the two mounting screws. A typical pilot hole should be 5/32" in diameter.

5. Secure the reflector base with the two self-tapping #10 x 1" hex head screws.

6. Install the reflectors and cover using the two 1/4-20 x ½" machine screws.

WORLDWIDE HEADQUARTERS
8100 AMF Drive - Mechanicsville, Va 23111 - USA
Tel: (804) 569-1000

EUROPEAN HEADQUARTERS
Via della Croce Coperta, 15 - 40128 Bologna - Italy
Tel: +39 051.4192.611

web: www.qubicaamf.com - email: info@qubicaamf.com - eshop: eshop.qubicaamf.com

Foul Detector Base Assembly

The Foul Detector base mounts above the underlane track. It should be positioned as square as possible with the lanes for ease of alignment and proper operation. Each sensor has two lenses, one used to emit the light signal, and one to receive it.

Note - USBC equipment specifications require that “The beam of the foul detecting device shall be set not more than 1/4 inch beyond the approach side of the foul line”. Be sure that the installation of your Radaray unit complies with the USBC specifications.

The installation sequence is as follows:

1. Align the alignment marks on the sides of the foul detector base (see Figure 1) with the approach side of the foul line and mark the location of the three mounting holes using the EDGE Radaray base as a template. Drill pilot holes as necessary for the three mounting screws. A typical pilot hole should be 5/32" in diameter.

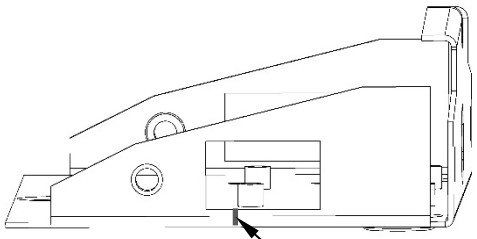


Figure 1

2. Plug the ten-position connector on the foul detector cable (088-000-015) into the receptacle on the back of the unit.

3. Secure the base with the three self-tapping #10 x 1" hex head screws provided.

4. Before installing the cover, complete the alignment procedure in accordance with section 2.2.

5. Once aligned, insert a lens in each opening in the sides of the cover, orienting the alignment tab at the top of the lens with the recesses in the cover, and install the cover. Secure each side using the 1/4-20 x 1/2" screws provided.

2.2. Alignment Procedure

The Foul Detector is prealigned at the factory. On installations where the mounting surface is level and the foul detector is square to the lanes, additional alignment may not be necessary. In any event, alignment should be verified after installation.

Each optical assembly accommodates a slight front to back and left to right adjustment. It is only necessary to slightly loosen the mounting screws to align the optics.

An orange indicator lamp (LED) is built into the optical assembly and is used to indicate the proper alignment of the optics. **When NOT ALIGNED, the LED will be LIT. When ALIGNED, the LED will NOT BE LIT.**

To align the optical assemblies, use the following procedure:

Make certain that there is a clear path between the foul detector optics and the retro-reflector mounted in the housing across the lane from the unit.

1. Turn on the Radaray from the pinspotter chassis or handheld unit (See Section 3.0, *Operation*).

WORLDWIDE HEADQUARTERS
8100 AMF Drive - Mechanicsville, Va 23111 - USA
Tel: (804) 569-1000

EUROPEAN HEADQUARTERS
Via della Croce Coperta, 15 - 40128 Bologna - Italy
Tel: +39 051.4192.611

web: www.qubicaamf.com - email: info@qubicaamf.com - eshop: eshop.qubicaamf.com

2. Remove the Radaray cover.

3. Verify that the lenses on the sensor assembly are aligned vertically. If not, loosen the plastic nut securing the sensor to the bracket, rotate the unit until the lenses are aligned vertically, and tighten the nut. Do not overtighten.

4. If beam adjustment is necessary, loosen the two bracket mounting screws slightly, allowing the optical assembly to move from side to side. Position the assembly until the LED light goes out, and tighten the screws. The horizontal beam alignment is now complete.

Note - It is very unlikely that the vertical beam alignment will be incorrect. Apply some slight pressure on either side of the sensor bracket to determine if it needs to be adjusted. Remember, vertical adjustment should only be done if the horizontal alignment adjustments do not result in the LED light turning off. If the vertical alignment is not correct, carefully use a pair of needle nose pliers and slightly bend the sensor bracket to tilt the sensor up or down as needed.

5. Replace the Radaray cover and test the unit to make sure that everything is still aligned.

WORLDWIDE HEADQUARTERS
8100 AMF Drive - Mechanicsville, Va 23111 - USA
Tel: (804) 569-1000

EUROPEAN HEADQUARTERS
Via della Croce Coperta, 15 - 40128 Bologna - Italy
Tel: +39 051.4192.611

web: www.qubicaamf.com - email: info@qubicaamf.com - eshop: eshop.qubicaamf.com

2.3. Single Side Operation

In an installation where only one detector is used (an odd number of lanes, for example), the foul detector for the unused lane can be deactivated through the chassis using the procedure mentioned in Section 3.0 *Operation*.

3. **OPERATION**

The pinspotter chassis is capable of showing when a lane has the foul detector on or in warning mode. On the Main Screen, you will see symbols just to the left of the lane numbers that tell you what mode the foul detectors are in (shown in Figure 2). If neither of the icons for the foul detector is displayed, then the foul detector is off.

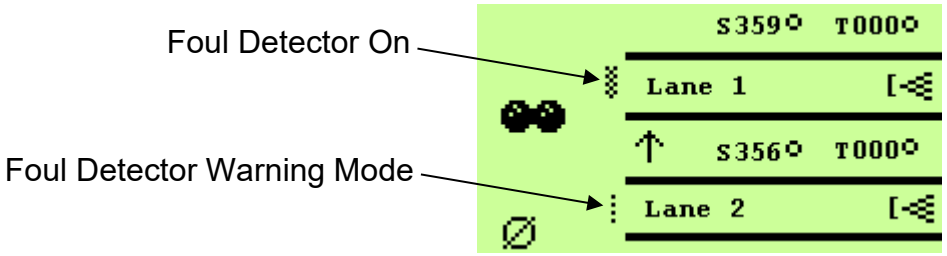


Figure 2, Foul Detector Icons

Foul Detector On - Foul turns light on, sounds buzzer, and a foul will count for scoring purposes.

Foul Detector Warning - Foul turns light on and sounds buzzer, but a foul will not affect the score.

The foul detector modes can be changed through the pinspotter chassis or handheld unit by using the following steps (see Figure 3).

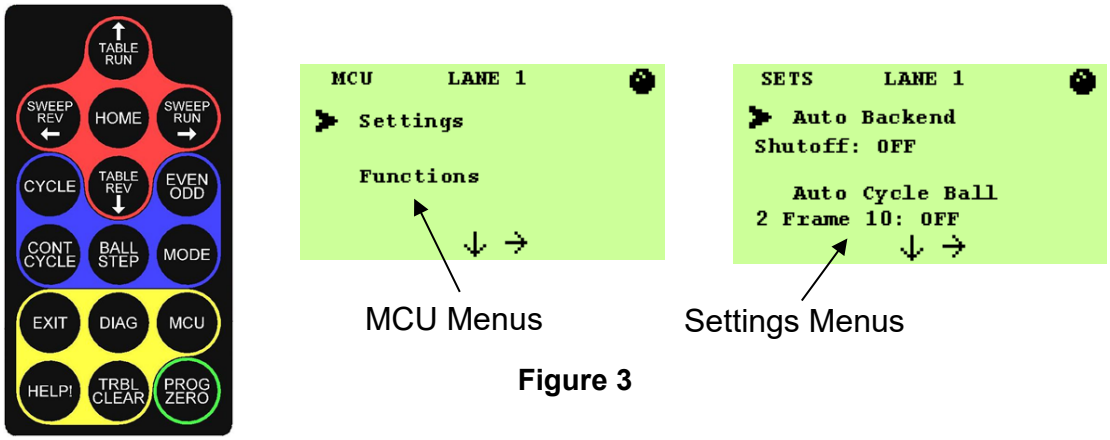


Figure 3

1. Press the **[MCU]** button to go into the *MCU Menus*.
2. Press the **[→]** button to select the *Settings Menus*.
3. Scroll down by using the **[↓]** button until the flashing arrow is next to *Foul Detector*.
4. Pressing the **[→]** button will cycle through the possible choices for the foul detector.

WORLDWIDE HEADQUARTERS
8100 AMF Drive - Mechanicsville, Va 23111 - USA
Tel: (804) 569-1000

EUROPEAN HEADQUARTERS
Via della Croce Coperta, 15 - 40128 Bologna - Italy
Tel: +39 051.4192.611

web: www.qubicaamf.com - email: info@qubicaamf.com - eshop: eshop.qubicaamf.com

Once you have finished selecting the appropriate setting for the foul detectors, press the **[EXIT]** button twice to return to the *Main Screen*.

4. **MAINTENANCE**

The system is designed to operate properly with a significant amount of dust and dirt accumulation on the optics. However, it is advisable to perform periodic cleaning of the reflector surfaces and optical windows.

Note - IT IS RECOMMENDED THAT THE OPTICAL SURFACES BE COVERED DURING ANY LANE MAINTENANCE THAT GENERATES LARGE AMOUNTS OF DUST AND DIRT OR ALLOWS CHEMICALS TO SPLASH ABOUT SUCH AS WHEN REFINISHING LANES.

Cleaning recommendations:

1. Use a clean non-abrasive cloth to gently wipe the face of the reflectors on the reflector unit and the optics window on the EDGE Radaray base cover.
2. If gently wiping does not remove the dirt, as may be the case for oil or cleaner accumulation, a mild soap (such as dishwashing liquid soap) and water solution may be used. First wash and then gently wipe dry.

DO NOT USE ABRASIVE CLEANERS OR STRONG SOLVENTS AS THEY MAY PERMANENTLY DAMAGE THE SURFACES!

3. The black plastic covers may be cleaned with a protective cleaner such as Armor All®, but care should be taken to protect the optical windows as described above. For this reason, it is recommended that the user spray the solution onto a non-abrasive rag and then gently wipe the cover clean.

Armor All® is a registered trademark of Armored AutoGroup, Inc.

WORLDWIDE HEADQUARTERS
8100 AMF Drive - Mechanicsville, Va 23111 - USA
Tel: (804) 569-1000

EUROPEAN HEADQUARTERS
Via della Croce Coperta, 15 - 40128 Bologna - Italy
Tel: +39 051.4192.611

web: www.qubicaamf.com - email: info@qubicaamf.com - eshop: eshop.qubicaamf.com

ORDER PARTS ONLINE

eshop.qubicaamf.com

BENEFITS

- Drill Down Menu by Machine Type
- Assembly Drawings with Hotspots
- Up-To-Date Cross-References
- Quick Order Form
- Thousands of High-Quality Photographs

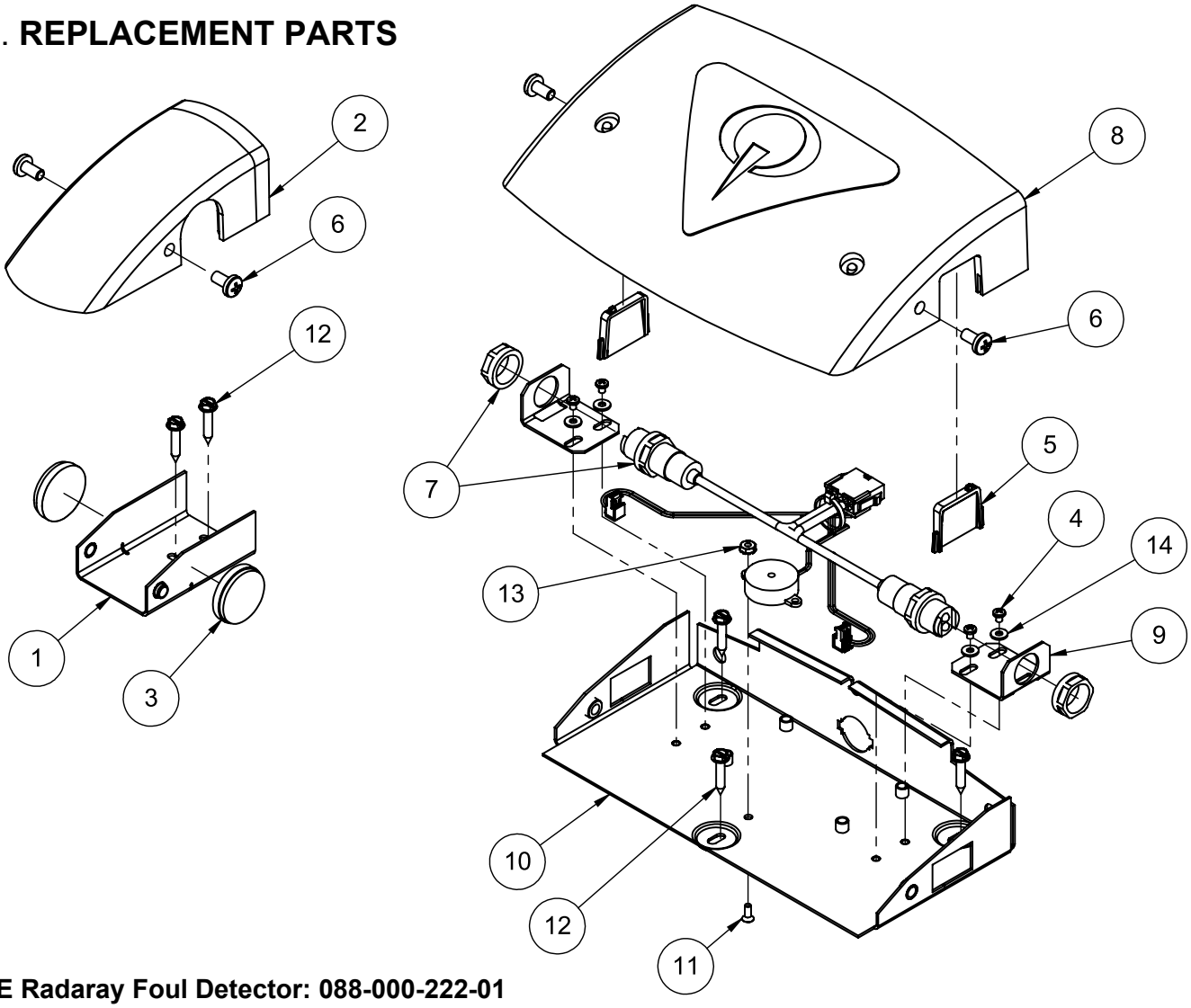
QubicaAMF eShop
AMAZINGLY EASY

WORLDWIDE HEADQUARTERS
8100 AMF Drive - Mechanicsville, Va 23111 - USA
Tel: (804) 569-1000

EUROPEAN HEADQUARTERS
Via della Croce Coperta, 15 - 40128 Bologna - Italy
Tel: +39 051.4192.611

web: www.qubicaamf.com - email: info@qubicaamf.com - eshop: eshop.qubicaamf.com

5. **REPLACEMENT PARTS**



EDGE Radaray Foul Detector: 088-000-222-01

Item	Qty	Part Number	Description
1	1	088-000-062	REFLECTOR MOUNTING BRACKET
2	1	088-000-075	REFLECTOR COVER
3	2	088-000-076	FOUL DETECTOR REFLECTOR
4	4	088-000-077	SCR, PANHDPHP, #6-32 X 3/16 ZN
5	2	088-000-079	LENS, FOUL DETECTOR
6	4	088-000-087	PHPMS 1/4-20 X 0.50 BO
7	1	088-000-283	FOUL DETECT WIRE HARNESS
8	1	088-000-221	QAMF XLI RADAR. CVR. LED BOARD
9	2	088-000-421	FOUL SENSOR BRACKET
10	1	090-005-891	FOUL DETECTOR BASE
11	1	812-027-061	FHPMS 6-32 X 0.38 BO
12	5	824-538-162	HWFTS 10 X 1.00 ZN TYA
13	1	843-127-002	KN 6-32 ZN
14	4	948-631-062	FW 6 SAE ZN
		088-000-128	Foul Detector Spare Reflector Kit, (includes items 1, 2, 3, 6, & 12)
		088-000-165	Foul Detector Base with Electrical, (includes items 4, 7, 9, 10, 11, 12, 13 & 14)

WORLDWIDE HEADQUARTERS
8100 AMF Drive - Mechanicsville, Va 23111 - USA
Tel: (804) 569-1000

EUROPEAN HEADQUARTERS
Via della Croce Coperta, 15 - 40128 Bologna - Italy
Tel: +39 051.4192.611

web: www.qubicaamf.com - email: info@qubicaamf.com - eshop: eshop.qubicaamf.com