

# Enhanced Single Band Mobile Radio Installation Manual



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# **Contents**

List of Figures	7
List of Tables	11
Foreword	12
Copyrights	13
Notations Used in This Manual	
Related Publications	15
Commercial Warranty	
I. What This Warranty Covers And For How Long	
II. General Provisions	
III. State Law Rights (Applicable Only in U.S.A.)	
IV. How To Get Warranty Service	
V. What This Warranty Does Not Cover	
VI. Patent And Software Provisions	
VII. Governing Law	18
Chapter 1: Introduction	
1.1 Mobile Radio Description	
1.1.1 Dimensions	
1.2 Standard Configurations	23
1.2.1 Dash Mount Configuration	
1.2.2 Remote Mount Configuration	25
1.2.3 Multi Control Head	30
1.3 Motorcycle Configurations	30
1.4 Base/Control Stations	30
1.5 Tools Required for Radio Installations	30
Chapter 2: Standard Configurations	32
2.1 Planning the Installation	32
2.1.1 Installation Examples	32
2.1.2 Wiring Diagrams	34
2.1.3 Radio Operation Wiring for Dash and Remote Configurations	45
2.1.3.1 Dash Mount: Power, Ignition, and Emergency Cable Installation	45
2.1.3.2 Remote Mount: Power, Ignition, and Emergency Cable Installation	45
2.1.4 Ignition Sense Switch (Radio Wide Advance)	47
2.1.5 Siren/PA Configuration and Programming	48
2.2 Radio Mounting	49
2.2.1 Dash Mount with Trunnion	50

2.2.2 Remote Mount with Trunnion	52
2.2.2.1 Remote Mount Control Head Installation	52
2.2.2.2 Multiple Control Head Installation	55
2.2.2.3 Cable Installation	56
2.2.2.4 Setting the Initial Control Head ID	56
2.2.2.5 O3 Control Head and Remote Mount Cabling	58
2.2.3 Radio Locking	60
2.2.3.1 Locking Kit	60
2.3 Power Cables (Transceiver and Control Head)	61
2.3.1 Optional Locking Feature for High-Power Chassis Power Cables	61
2.3.2 O2, O3, O5, O7, O9 or E5 Control Head Power Cables	63
2.3.3 Battery Selector Switch	64
2.4 Antenna Installation	65
2.4.1 Antenna Installation on a Metal Body Vehicle	65
2.4.2 Distance Between Antennas	66
2.4.3 Mini-UHF Connection	67
2.4.3.1 Installing Mini-UHF Connection	68
2.4.4 GPS Antenna Placement	69
2.4.5 QMA Connection	69
2.4.6 GPS/GLONASS and Wi-Fi Antenna Connection	70
2.5 Installing the Speaker	70
2.5.1 Internal Speaker Disassembly	71
2.6 Microphone Hang-Up Clip	73
2.7 RFID (Option)	74
2.7.1 RFID Reading	74
2.7.2 Programming RFID (If Equipped)	76
2.8 Completing the Installation	77
Chapter 3: Universal Relay Controller Installation	78
3.1 Universal Relay Controller Mounting	78
3.2 O7/O9 Universal Relay Controller Cable Assembly	80
3.2.1 Installing the Power Cable	80
3.2.2 Installing Ground Cable	80
3.2.3 Installing the Wires	81
3.2.4 Installing the O7/O9 to URC Cable	83
Chapter 4: Options and Accessories Installation	84
4.1 Dash-Mount Accessory Installation	84
4.1.1 Dash-Mount Emergency Pushbutton or Footswitch Installation	84
4.1.2 Dash-Mount Horn and Lights (External Alarms) Relays	85
4.2 Installing Remote-Mount Accessory	85

	4.2.1 Installing Emergency Pushbutton or Footswitch	86
	4.2.2 Horn (External Alarm) Relay Installation	87
	4.2.3 Lights (External Alarm) Relay Installation	87
	4.2.4 Gunlock Installation	87
	4.2.5 Horn-Ring Transfer	88
	4.2.6 Record Audio Out Jack of Transmit and Receive Audio	89
	4.2.7 Earphone Jack	89
	4.2.8 USB Data Cables	89
	4.2.9 RS232 Cables	90
	4.3 Vehicle Interface Port Overview	90
	4.3.1 VIP Output Connections	90
	4.3.2 VIP Input Connections	92
	4.4 Compatibility of Emergency when Attaching a Siren	92
	4.5 Accessory Connector Assembly Details (P2)	93
	4.5.1 Disassembly and Assembly	94
	4.5.1.1 Disassembly	94
	4.5.1.2 Assembly	94
	4.5.2 Adapter Cable	95
	4.6 Memory and Three-Day Secure Key Retention Option	97
Cha	pter 5: Motorcycle Radio Installation	98
	5.1 Motorcycle Radio Description	98
	5.1.1 Transceiver Enclosure	98
	5.1.2 Control/Display Unit	98
	5.1.3 Control Head Cable	
	5.1.4 Microphone	99
	5.1.5 External Speaker	99
	5.1.6 Headset Capability	99
	5.1.7 Antenna	99
	5.1.8 Ignition Sense (ACC) Wire	99
	5.2 Installation Overview	99
	5.2.1 Important Installation Hints	. 100
	5.2.2 Parts Identification	. 101
	5.2.3 Order of Installation	101
	5.3 Universal Mounting Plate	102
	5.3.1 Installing the Universal Mounting Plate	102
	5.4 Speaker and Control Head Installation	103
	5.4.1 Handlebar Installation with Speaker and Control Head Mounted Together	103
	5.4.1.1 Installing Handlebar with Speaker and Control Head Mounted Togethe	r 104

5.4.2 Fuel Tank Console Installation with Speaker and Control Head Mounted  Together	105
5.4.3 Handlebar Installation with Speaker and Control Head Mounted Separately.	
5.4.3.1 Installing Handlebar with Speaker and Control Head Mounted Separately	107
5.4.4 Fuel Tank Console Installation with Speaker and Control Head Mounted Separately	107
5.5 Installing the Speaker	109
5.6 Microphone Hang-Up Clip Installation	109
5.6.1 Extension Bracket Mounting	109
5.6.2 Speaker/Control Head Bracket Side Mounting	110
5.6.3 Other Hang-Up Clip Mounting	110
5.7 Installing Antenna Base and Cables	110
5.8 Installing the Antenna	113
5.9 Cable Routing	113
5.10 Installing the Weather-Resistant Enclosure	115
5.11 Transceiver and Cabling Installation	116
5.11.1 Installing Cabling in the Enclosure	117
5.11.2 Installing the Transceiver	118
5.12 Installing the Emergency Switch Option	120
5.13 Installing the External Alarm Relay Option	120
5.14 Installing the Headset Accessory	120
5.15 Installing the O5 and E5 Control Head Sunshield	121
5.16 Horn/Lights Wiring	123
5.17 Emergency Switch Wiring	124
Chapter 6: Finishing the Installation	125
6.1 Cable Connection	125
6.1.1 Connecting the Cables for O2 Control Head	125
6.1.2 Connecting the Cables for O3 Control Head	125
6.1.3 Connecting the Cables for O5, E5 and O7 Control Heads	126
6.1.4 Connecting the Cables for O9 Control Head	126
6.2 Dust Cover Installation	126
6.3 Miscellaneous Information	128
Chapter 7: Best Practices: Installation and Troubleshooting	129
7.1 Checking the Wiring of Ignition and Radio Ignition Sensing	129
7.2 Checking the Physical Installation of Radio Ground and Radio Accessory Wiring	130
7.3 Improving the Electrical Quality of the Power and Ignition Lines	130
7.4 Minimizing the Effect of Poorly Grounded Antennas	131
7.5 Jump-Starting the Vehicle	131
7.6 Eliminating Noise/Howling from PA Speaker	131

# MN005720A01-AB Contents

Appendix A: Replacement Parts Ordering	132
A.1 Service Information	133
A.2 Service Information – APAC	134
Glossary	137

# **List of Figures**

Figure 1: Front and Side View of O5 Control Head with Dash Mount Transceiver and Trunnion	. 20
Figure 2: Front and Side View of E5 Control Head with Dash Mount Transceiver and Trunnion	20
Figure 3: Front and Side View of O2 Control Head with Dash Mount Transceiver and Trunnion	. 21
Figure 4: Front and Side View of O7 Control Head with Dash Mount Transceiver and Trunnion	. 21
Figure 5: Front and Side View of O3 Control Head with Coiled Cable	21
Figure 6: Front and Side View of O2 Control Head with Remote Mount and Trunnion	22
Figure 7: Front and Side View of O5 Control Head with Remote Mount and Trunnion	22
Figure 8: Front and Side View of E5 Control Head with Remote Mount and Trunnion	. 22
Figure 9: Front and Side View of O7 Control Head with Remote Mount and Trunnion	22
Figure 10: Front and Side View of O9 Control Head with Trunnion	. 23
Figure 11: Top and Side View of O9 Universal Relay Controller (URC) with Trunnion (URC is an orderable accessory)	23
Figure 12: Dash Mount Configuration for O2 Control Head	. 24
Figure 13: Dash Mount Configuration for O3 Control Head	. 24
Figure 14: Dash Mount Configuration for O5 Control Head	. 24
Figure 15: Dash Mount Configuration for E5 Control Head	25
Figure 16: Dash Mount Configuration for O7 Control Head	. 25
Figure 17: Remote Mount Configuration with Mid Power Transceiver, Transceiver Interface Board, CHIB Rear Assembly, and O2 Control Head	26
Figure 18: Remote Mount Configuration with Mid Power Transceiver, Transceiver Interface Board, and O3 Control Head	26
Figure 19: Remote Mount Configuration with Mid Power Transceiver, Transceiver Interface Board, CHIB Rear Assembly, and O5 Control Head	27
Figure 20: Remote Mount Configuration with Mid Power Transceiver, Transceiver Interface Board, CHIB Rear Assembly, and E5 Control Head	27
Figure 21: Remote Mount Configuration with Mid Power Transceiver, Transceiver Interface Board, CHIB Rear Assembly, and O7 Control Head	28
Figure 22: Remote Mount Configuration with Mid Power Transceiver, Transceiver Interface Board, and O9 Control Head	28
Figure 23: Remote Mount Configuration with Mid Power Radio Transceiver, Universal Relay Controller (URC), and O7 Control Head (URC is optional)	. 29
Figure 24: Remote Mount Configuration with Mid Power Radio Transceiver, Universal Relay Controller (URC), and O9 Control Head (URC is optional)	. 29
Figure 25: Dash Mount Installation	32
Figure 26: Remote Mount Installation	33
Figure 27: Remote Mount Installation for Radio with O9 Control Head and Universal Relay	
Controller (URC is optional)	
Figure 28: Radio Installation (O2 Dash Mount)	. 34
Figure 29: Radio Installation (O3 Dash Mount)	35

Figure 30:	Radio Installation (O5 Dash Mount)	. 35
Figure 31:	Radio Installation (E5 Dash Mount)	.36
Figure 32:	Radio Installation (O7 Dash Mount)	. 36
Figure 33:	Radio Installation (O2 Remote Mount)	. 37
Figure 34:	Radio Installation (O3 Remote Mount)	. 37
Figure 35:	Radio Installation (O5 Remote Mount)	. 38
Figure 36:	Radio Installation (E5 Remote Mount)	. 38
Figure 37:	Radio Installation (O7 Remote Mount)	. 39
Figure 38:	Radio Installation of O9 Remote Mount with Transceiver (URC is optional)	.39
Figure 39:	Radio Installation (O9 Remote Mount with Pinouts)	.40
Figure 40:	Remote Control Head Pinouts	.41
Figure 41:	Cabling Interconnect Diagram for Dash Mount	. 42
Figure 42:	Cabling Interconnect Diagram for Remote Mount	. 43
Figure 43:	Cabling Interconnect Diagram for O9 Remote Mount (URC is optional)	.44
Figure 44:	Enhanced Single Band Mobile Radio Trunnion Orientation	. 50
Figure 45:	Transmission Hump Trunnion Mounting	. 51
Figure 46:	Below Dash Trunnion Mounting	. 51
	O5 Control Head Installation Exploded View (Also applicable for O2, O7 and E5 Heads)	. 53
Figure 48:	O9 Control Head Installation Exploded View	. 54
Figure 49:	O5 Control Head Rear View (Also applicable for O2, O7 and E5 Control Heads)	. 55
Figure 50:	O9 Control Head Rear View.	.55
Figure 51:	APX Mobile O5 Control Head Front View	. 57
Figure 52:	Radio Display with Current Control Head ID	. 57
Figure 53:	APX Mobile O5 Control Head Front View – Mode Knob	. 57
Figure 54:	O3 Control Head	. 58
Figure 55:	O3 Control Head Rear View.	.59
Figure 56:	Hang-Up Clip Installation Exploded View	.59
Figure 57:	Locking Kit (Optional)	. 60
Figure 58:	Inserting DC Cable to the Radio	.61
Figure 59:	Installing the Locking Bracket	.62
Figure 60:	Bracket Installation (Assembled State)	. 62
Figure 61:	Bracket Uninstallation (1 of 2)	. 62
Figure 62:	Bracket Uninstallation (2 of 2)	. 63
Figure 63:	HKN6188_ Power Cable with External Speaker Connector	.63
	HKN6187_ Power Cable with External Speaker Connector, Record Audio Output Jack n) and Earphone Jack (2.5 mm)	.64
Figure 65:	Battery Selector Switch	. 65
	Multiple Antennas Separation for locations 1–6	
Figure 67:	Mini-UHF Connection	. 68

Figure 68: Mini-UHF Connector Tool	69
Figure 69: GPS/GLONASS and Wi-Fi Antenna Connector on the radio	70
Figure 70: Speaker Mounting	71
Figure 71: Removing the screws on the Control Head	72
Figure 72: Removing the Control Head	72
Figure 73: Disconnecting the Speaker Connector	73
Figure 74: Reattaching the Control Head	73
Figure 75: RFID Location	74
Figure 76: Read Angle for Enhanced Single Band Mobile Radio	74
Figure 77: Tag Angle for Enhanced Single Band Mobile Radio	75
Figure 78: Examples of Reader and Tag Aligned (Reader Orientation)	75
Figure 79: Example of Reader and Tag Misalignment (Reader Orientation)	75
Figure 80: Universal Relay Controller Orientation	78
Figure 81: Universal Relay Controller Installation Exploded View	79
Figure 82: Power and Ground Cable Glands	81
Figure 83: Cable Gland Assembly with Gasket	81
Figure 84: Wires Installation	82
Figure 85: Wire Installation with Black Stick	82
Figure 86: O7/O9 to URC Cable Installation.	83
Figure 87: Emergency Switch Wiring Diagram	84
Figure 88: Horn/Light Wiring Diagram	85
Figure 89: Emergency Jumper Removal in Remote Mount	86
Figure 90: Gunlock Switch Redundancy Diagram	88
Figure 91: Siren/PA Horn-Ring Connections	89
Figure 92: Remote Control Head Pinouts	90
Figure 93: HKN6196_ VIP Connector Detail	90
Figure 94: Relay Coil	91
Figure 95: Field adjustment for Emergency Operation with Siren Accessory	92
Figure 96: Location for Pin 8	93
Figure 97: Exploded View of Accessory Connector Assembly (HLN6863_)	95
Figure 98: Rear Accessory Connector Audio Configuration	96
Figure 99: Rear Accessory Connector Data Configuration	96
Figure 100: Universal Mounting Plate Installation (Part of Radio Enclosure Kit)	102
Figure 101: Motorcycle Control Head Cabling (3075217A01)	103
Figure 102: Handlebar Installation with Speaker and Control Head Mounted Together	. 104
Figure 103: Fuel Tank Console Installation with Speaker and Control Head Mounted Together	105
Figure 104: Handlebar Installation with Speaker and Control Head Mounted Separately	. 106
Figure 105: Fuel Tank Console Installation with Speaker and Control Head Mounted Separately	108
Figure 106: Location of Antenna Port	111

#### MN005720A01-AB List of Figures

Figure 107: Enhanced Single Band Mobile Radio Antenna Band Identification	111
Figure 108: Routing the Coaxial Cable for GPS/Wi-Fi	112
Figure 109: Routing the Coaxial Cable for Antenna	112
Figure 110: Cable Routing	114
Figure 111: Weather-Resistant Enclosure Installation	116
Figure 112: Installing Cables	117
Figure 113: Installing the Transceiver	119
Figure 114: Motorcycle Wiring Harness Rework	121
Figure 115: Remote Mount Trunnion with Sunshield	121
Figure 116: Position the Sunshield	122
Figure 117: Slide the Control Head onto Trunnion	122
Figure 118: Position Control Head as Desired	123
Figure 119: Horn/Lights Wiring Diagram	123
Figure 120: Emergency Switch Wiring Diagram	124
Figure 121: Dust Cover Installation Locations	127

# **List of Tables**

Table 1: Tools Required for Radio Installations	30
Table 2: Dash O2, O3, O5, O7, or O9 Radio Operations Dependent Upon A+ and Ignition Connections	46
Table 3: Remote O2, O3, O5, E5, O7, or O9 Radio Operations Dependent Upon A+ and Ignition Connections	46
Table 4: Remote O2, O3, O5, E5, O7, or O9 Radio Operations Dependent Upon A+ and Ignition Connections	
Table 5: Ignition Sense Switch Settings in CPS	47
Table 6: Power Level Configurations	49
Table 7: Mid Power Trunnion Kit	51
Table 8: Available CAN Cables	56
Table 9: Ignition Interface Cables	56
Table 10: Power Cables	61
Table 11: Model Number Chart in 12-Digit ASCII Format	76
Table 12: Serial Number with Radio Band/Tier/Power	76
Table 13: VIP Output Connections	91
Table 14: VIP Input Connections	92
Table 15: Adapter Cable	95
Table 16: Transceiver Installation Parts List	119
Table 17: Service Information – Telephone Numbers and Addresses of the Asia and Pacific	134

# **Foreword**

This manual includes all the information necessary to maintain peak product performance and maximum working time, using levels 1 and 2 maintenance procedures.



**CAUTION:** These servicing instructions are for the use of qualified personnel only. To reduce the risk of electric shock, do not service parts other than those contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

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# **European Union (EU) Waste of Electrical and Electronic Equipment (WEEE) directive**

The European Union's WEEE directive requires that products sold into EU countries must have the crossed out trash bin label on the product (or the package in some cases).

As defined by the WEEE directive, this cross-out trash bin label means that customers and end-users in EU countries should not dispose of electronic and electrical equipment or accessories in household waste.

Customers or end-users in EU countries should contact their local equipment supplier representative or service centre for information about the waste collection system in their country.

# **Notations Used in This Manual**

Throughout the text in this publication, you will notice the use of warning, caution, and notice notations. These notations are used to emphasize that safety hazards exist, and due care must be taken and observed.



**WARNING:** WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or injury.



**CAUTION:** CAUTION indicates a potentially hazardous situation which, if not avoided, might result in equipment damage.



**NOTICE:** NOTICE indicates an operational procedure, practice, or condition that is essential to emphasize.

# **Related Publications**

The following list contains part numbers and titles of related publications.

- 68012006035, ASTRO APX Mobile Radio O2 Control Head User Guide
- 6875946M01, ASTRO APX Mobile Radio O3 Control Head User Guide
- 6875947M01, ASTRO APX Mobile Radio O5 Control Head User Guide
- 68012006034, ASTRO APX Mobile Radio O7 Control Head User Guide
- 68007024014, ASTRO APX Mobile Radio O9 Control Head User Guide
- MN006147A01, ASTRO APX Mobile Radio E5 Control Head User Guide
- MN005718A01, Enhanced Single Band Mobile Radio Basic Service Manual
- MN005719A01, Enhanced Single Band Mobile Radio Detailed Service Manual
- PMLN6193, ASTRO APX Mobile Radio O2 Quick Reference Card
- PMLN5591, ASTRO APX Mobile Radio O3 Quick Reference Card
- PMLN5592, ASTRO APX Mobile Radio O5 Quick Reference Card
- PMLN6194, ASTRO APX Mobile Radio O7 Quick Reference Card
- PMLN5711, ASTRO APX Mobile Radio O9 Quick Reference Card
- MN006146A01, ASTRO APX Mobile Radio E5 Quick Reference Card (EMEA)
- MN006240A01, ASTRO APX Mobile Radio E5 Quick Reference Card (NALA)
- 6881095C99, RF Energy ExposureTraining and Product Safety Information for Mobile Two-Way Radios installed in Vehicles or as Fixed Site Control Stations
- MN000770A01, Dual-radio Control Head System Instruction Manual

# **Commercial Warranty**

#### **Limited Warranty**

For information on warranty terms, see the Support page at https://www.motorolasolutions.com.

## I. What This Warranty Covers And For How Long

Motorola Solutions Inc. ("Motorola Solutions") warrants the Motorola Solutions manufactured Communication Products listed below ("Product") against defects in material and workmanship under normal use and service for a period of time from the date of purchase as scheduled below:

Mobile Radios	One Year
Product Accessories	One Year

The radios additionally ship with a standard 1-year Repair Service Advantage (RSA) (for U.S. customers) or 1-year Extended Warranty (for Canada customers). However, at the time of order, you may choose to omit these warranties. For more RSA or Extended Warranty information, please refer to the price pages.

Motorola Solutions, at its option, will at no charge either repair the Product (with new or reconditioned parts), replace it (with a new or reconditioned Product), or refund the purchase price of the Product during the warranty period provided it is returned in accordance with the terms of this warranty. Replaced parts or boards are warranted for the balance of the original applicable warranty period. All replaced parts of Product shall become the property of Motorola Solutions.

This express limited warranty is extended by Motorola Solutions to the original end user purchaser only and is not assignable or transferable to any other party. This is the complete warranty for the Product manufactured by Motorola Solutions. Motorola Solutions assumes no obligations or liability for additions or modifications to this warranty unless made in writing and signed by an officer of Motorola Solutions. Unless made in a separate agreement between Motorola Solutions and the original end user purchaser, Motorola Solutions does not warrant the installation, maintenance or service of the Product.

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#### **II. General Provisions**

This warranty sets forth the full extent of Motorola Solutions responsibilities regarding the Product. Repair, replacement or refund of the purchase price, at Motorola Solutions option, is the exclusive remedy.

This warranty is given in lieu of all other express warranties, implied warranties, including without limitation, implied warranties of merchantability and fitness for a particular purpose, are limited to the duration of this limited warranty. In no event shall Motorola Solutions be liable for damages in excess of the purchase price of the product, for any loss of use, loss of time, inconvenience, commercial loss, lost profits or savings or other incidental, special or consequential damages arising out of the use or inability to use such product, to the full extent such may be disclaimed by law.

# III. State Law Rights (Applicable Only in U.S.A.)

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long an implied warranty lasts, so the above limitation or exclusions may not apply.

This warranty gives specific legal rights, and there may be other rights which may vary from state to state.

## IV. How To Get Warranty Service

You must provide proof of purchase (bearing the date of purchase and Product item serial number) in order to receive warranty service and, also, deliver or send the Product item, transportation, and insurance prepaid, to an authorized warranty service location.

Warranty service will be provided by Motorola Solutions through one of its authorized warranty service locations. If you first contact the company which sold you the Product, it can facilitate your obtaining warranty service.

You can also call Motorola Solutions at 1-800-927-2744 US/Canada.

# V. What This Warranty Does Not Cover

This warranty does not cover the following conditions:

- Defects or damage resulting from use of the Product in other than its normal and customary manner.
- Defects or damage from misuse, accident, water, or neglect.
- Defects or damage from improper testing, operation, maintenance, installation, alteration, modification, or adjustment.
- Breakage or damage to antennas unless caused directly by defects in material workmanship.
- A Product subjected to unauthorized Product modifications, disassemblies or repairs (including, without limitation, the addition to the Product of non-Motorola Solutions supplied equipment) which adversely affect performance of the Product or interfere with Motorola Solutions normal warranty inspection and testing of the Product to verify any warranty claim.
- Product which has had the serial number removed or made illegible.
- Rechargeable batteries if:
  - Any of the seals on the battery enclosure of cells are broken or show evidence of tampering.
  - The damage or defect is caused by charging or using the battery in equipment or service other than the Product for which it is specified.
- · Freight costs to the repair depot.
- A Product which, due to illegal or unauthorized alteration of the software/firmware in the Product, does not function in accordance with Motorola Solutions published specifications or the FCC type acceptance labeling in effect for the Product at the time the Product was initially distributed from Motorola Solutions.
- Scratches or other cosmetic damage to Product surfaces that does not affect the operation of the Product.
- · Normal and customary wear and tear.



**WARNING:** The circuitry found on the control head and its associated interface boards is designed to function "as-is". Any attempt at modifying or altering the circuitry would void the warranty, and/or could result in radio malfunction or hazardous conditions for the radio and its associated vehicle.

#### VI. Patent And Software Provisions

Motorola Solutions will defend, at its own expense, any suit brought against the end user purchaser to the extent that it is based on a claim that the Product or parts infringe a United States patent, and Motorola Solutions will pay those costs and damages finally awarded against the end user purchaser in any such suit which are attributable to any such claim.

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- Motorola Solutions will have sole control of the defense of such suit and all negotiations for its settlement or compromise.
- Product or parts become, or in Motorola Solutions opinion be likely to become, the subject of a
  claim of infringement of a United States patent, that such purchaser will permit Motorola Solutions,
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  Product or parts or to replace or modify the same so that it becomes noninfringing or to grant such
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#### VII. Governing Law

This Warranty is governed by the laws of the State of Illinois, USA.

#### **Notice**

# Installation Requirements for Compliance with Radio Frequency (RF) Energy Exposure Safety Standards

**CAUTION:** This radio is intended for use in occupational/controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer, or any other use.

To ensure compliance to RF Energy Safety Standards:

- Install only Motorola Solutions approved antennas and accessories.
- Be sure that antenna installation is per Antenna Installation on page 65 of this manual.
- Be sure that the Product Safety and RF Safety Booklet enclosed with this radio is available to the end user upon completion of the installation of this radio.

Before using this product, read the guide enclosed with your radio which contains important operating instructions for safe usage and RF energy awareness and control for compliance with applicable standards and regulations.

For a list of Motorola Solutions-approved antennas and other accessories, visit <a href="http://www.motorolasolutions.com">http://www.motorolasolutions.com</a>.



**WARNING:** This equipment is compliant with Class A of EN55032. In a residential environment, this equipment may cause radio interference.

#### **Chapter 1**

# Introduction

This manual covers the installation procedures for ASTRO mobile and motorcycle radios with O2, O3, O5, E5, O7, and O9 control heads and accessories required to complete the radio system.

The radio system consists of a control head, radio, antenna, microphone, speaker, cabling, Universal Relay Controller (URC), and accessories.

1.1

#### **Mobile Radio Description**

This chapter covers the basic dimension of the mobile radio.

1.1.1

#### **Dimensions**

When installing the radio, make sure to plan the installation carefully and leave extra room in the rear of the radio for cabling and accessory connections. Leave extra space in the front of the radio for access, controls, and cabling (if remote mount) and to the sides of the radio so that you can access and install the trunnion screws/wing screws.



**NOTICE:** The rear accessory connector adds 0.75 in. to the overall length. The remote mount length is 244 mm.

Figure 1: Front and Side View of O5 Control Head with Dash Mount Transceiver and Trunnion

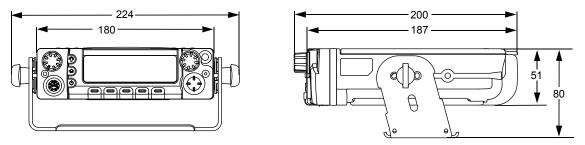


Figure 2: Front and Side View of E5 Control Head with Dash Mount Transceiver and Trunnion

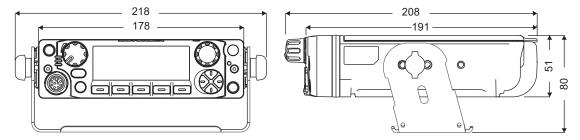
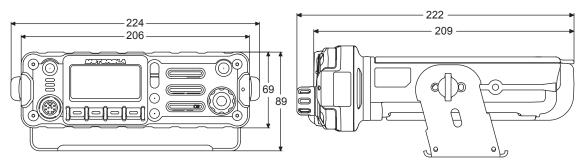


Figure 3: Front and Side View of O2 Control Head with Dash Mount Transceiver and Trunnion



**NOTICE:** The rear accessory connector adds 0.75 in. to the overall length. The remote mount length is 194 mm.

Figure 4: Front and Side View of O7 Control Head with Dash Mount Transceiver and Trunnion

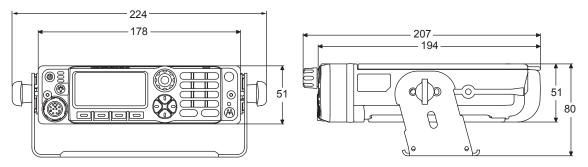


Figure 5: Front and Side View of O3 Control Head with Coiled Cable

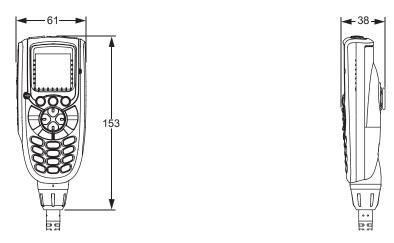


Figure 6: Front and Side View of O2 Control Head with Remote Mount and Trunnion

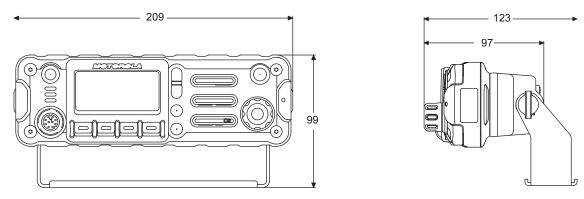


Figure 7: Front and Side View of O5 Control Head with Remote Mount and Trunnion

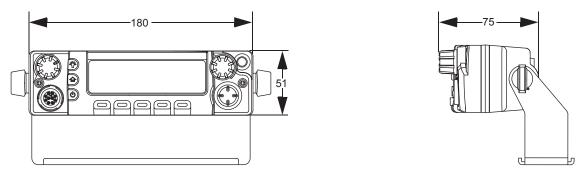


Figure 8: Front and Side View of E5 Control Head with Remote Mount and Trunnion

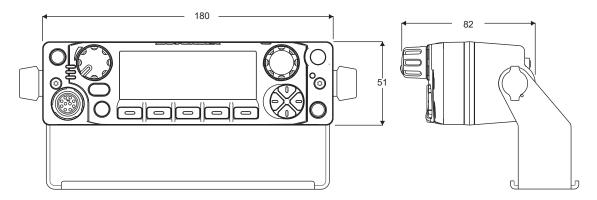
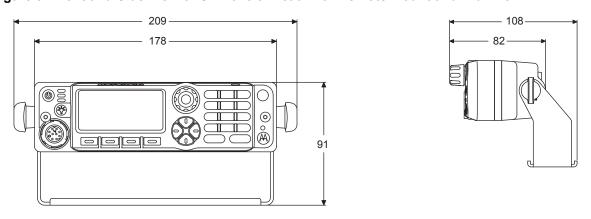


Figure 9: Front and Side View of O7 Control Head with Remote Mount and Trunnion



MN005720A01-AB Chapter 1: Introduction

Figure 10: Front and Side View of O9 Control Head with Trunnion

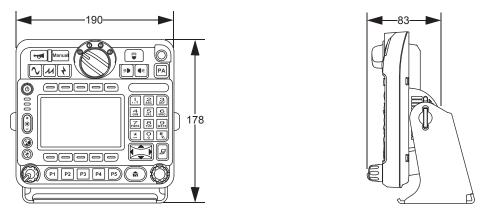
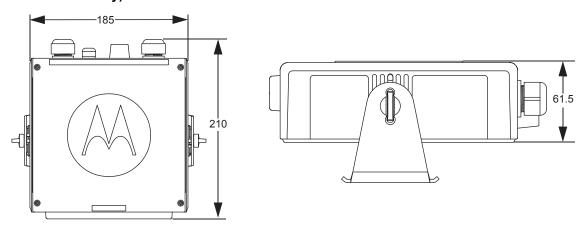


Figure 11: Top and Side View of O9 Universal Relay Controller (URC) with Trunnion (URC is an orderable accessory)



1.2

# **Standard Configurations**

This chapter covers the dash mount, remote mount, and multi-control head configurations.

1 2 1

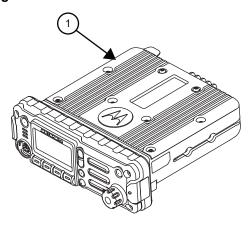
# **Dash Mount Configuration**

There are two versions of the mobile dash mount.

The first are the O2, O5, E5, and O7 control heads which are mounted on the front of the transceiver housing. The second is the O3 control head which is connected to the transceiver through a coiled cable, which is plugged into the CAN connector on the transceiver.

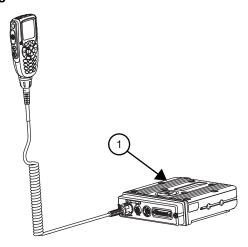
Electrical connection between the two takes place within the radio through a flexible circuit board between the connectors on the front of the transceiver and at the back of the control head for O2, O5, E5, and O7 and between the connectors on the front of the transceiver and at the back of the TIB for the O3.

Figure 12: Dash Mount Configuration for O2 Control Head



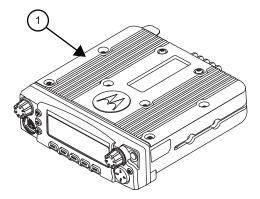
No.	Description
1	ASTRO 25 Subscribers Enhanced Single Band Mobile Radio

Figure 13: Dash Mount Configuration for O3 Control Head



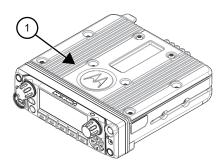
No.	Description
1	ASTRO 25 Subscribers Enhanced Single Band Mobile Radio

Figure 14: Dash Mount Configuration for O5 Control Head



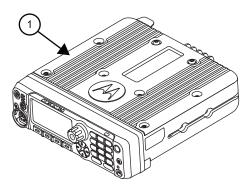
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Ī	1	ASTRO 25 Subscribers Enhanced Single Band Mobile Radio

Figure 15: Dash Mount Configuration for E5 Control Head



No.	Description
1	ASTRO 25 Subscribers Enhanced Single Band Mobile Radio

Figure 16: Dash Mount Configuration for O7 Control Head



No.	Description
1	ASTRO 25 Subscribers Enhanced Single Band Mobile Radio

1.2.2

# **Remote Mount Configuration**

In the remote control version, the transceiver and the control head are mounted separately in the vehicle.

The O2, O5, E5, and O7 control heads are mounted in remote trunnions near the operator. The O3 and O9 control heads are also mounted near the operator using extension cables. The transceiver and control head are mounted using a trunnion or other mounting hardware. If the transceiver is located in a car trunk, ensure that it is mounted securely and that sufficient cooling is provided. Do not cover the transceiver with baggage, blankets, and others.



**NOTICE:** The keypad mic should only be plugged into the Modified Modular Plug (MMP) connector located on the control head, in either dash mount or remote mount configuration.