

# Operator/Installation Manual

AE/LZT 123 3256/1

Rev. H, Mar/07



## Vehicular Charger

BML 161 67/2 M-RK™

BML 161 67/22 Prism™ HP/LPE™-200/LPE-50

BML 161 67/62 JAGUAR™ 700P/Pi/P7100<sup>IP</sup>

BML 161 67/162 JAGUAR 700P/Pi/P7100<sup>IP</sup> Dual Position

 **Tyco Electronics**

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## MANUAL REVISION HISTORY

REV	DATE	REASON FOR CHANGE
G	Jan/06	Updated Dip Switch settings.
H	Mar/07	Updated rapid and trickle charging information and safety symbol conventions.

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Wireless Systems Business Unit  
M/A-COM, Inc.  
Technical Publications  
221 Jefferson Ridge Parkway  
Lynchburg, VA 24501

or fax your comments to: 1-434-455-6851

or e-mail us at: [techpubs@tycoelectronics.com](mailto:techpubs@tycoelectronics.com)



This product conforms to the European Union WEEE Directive 2002/96/EC. Do not dispose of this product in a public landfill. This product should be taken to a recycling center at the end of its life.

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# 1 SAFETY SYMBOL CONVENTIONS

The following conventions are used to alert the user to general safety precautions that must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere violates safety standards of design, manufacture, and intended use of the product. M/A-COM, Inc. assumes no liability for the customer's failure to comply with these standards.



WARNING

The **WARNING** symbol calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a **WARNING** symbol until the conditions identified are fully understood or met.



CAUTION

The **CAUTION** symbol calls attention to an operating procedure, practice, or the like, which, if not performed correctly or adhered to, could result in a risk of danger, damage to the equipment, or severely degrade the equipment performance.



NOTE

The **NOTE** symbol calls attention to supplemental information, which may improve system performance or clarify a process or procedure.



The **ESD** symbol calls attention to procedures, practices, or the like, which could expose equipment to the effects of Electro-Static Discharge. Proper precautions must be taken to prevent ESD when handling circuit modules.



The **electrical hazard** symbol indicates there is an electrical hazard present.

## 2 SAFETY INFORMATION

The operator of any mobile radio should be aware of certain hazards common to the operation of vehicular radio transmissions. **A list of several possible hazards is given:**

1. **Explosive Atmospheres** - Just as it is dangerous to fuel a vehicle with the motor running, similar hazards exist when operating a mobile radio, be sure to turn the power to the radio **OFF** while fueling the vehicle. Do not carry containers of fuel in the trunk of the vehicle if the radio is mounted in the trunk.
2. **Interference to Vehicular Electronics Systems** - Electronic fuel injection systems, electronic anti-skid braking systems, electronic cruise control systems, etc., are typical electronic systems that may malfunction due to the lack of protection from radio frequency energy present when transmitting. If the vehicle contains such equipment, consult the dealership and enlist their aid in determining the expected performance of electronic circuits when the radio is transmitting.
3. **Electric Blasting Caps** - To prevent accidental detonation of electric blasting caps, **DO NOT** use two-way radios within 1000 feet of blasting operations. Always obey the "Turn Off Two-Way Radios" signs posted where electric blasting caps are being used. (OSHA Standard: 1926.900).
4. **Radio Frequency Energy** - To prevent burns or related physical injury from radio frequency energy, do not operate the transmitter when anyone outside of the vehicle is within two feet of the antenna.
5. **Liquefied Petroleum (LP) Gas Powered Vehicles** - Mobile radio installations in vehicles powered by liquefied petroleum gas with the LP gas container in the trunk or other sealed-off space within the interior of the vehicle must conform to the **National Fire Protection Association** standard (*NFPA*) 58 requiring:
  - a) The space containing the radio equipment shall be isolated by a seal from the space containing the LP gas container and its fittings.
  - b) Outside filling connections shall be used for the LP gas container.
  - c) The LP gas container shall be vented to the outside of the vehicle.

## 2.1 SAFE DRIVING RECOMMENDATIONS FOR USERS OF MOBILE RADIOS RECOMMENDED BY AAA

- Read the literature on the safe operation of the radio.
- Keep both hands on the steering wheel and the microphone in its hanger whenever the vehicle is in motion.
- Place calls only when the vehicle is stopped.
- When talking from a moving vehicle is unavoidable, drive in the slower lane. Keep conversations brief.
- If a conversation requires taking notes or complex thought, stop the vehicle in a safe place and continue the call.
- Whenever using a mobile radio exercise caution.

## 2.2 OPERATING RULES AND REGULATIONS

Two-way FM radio systems must be operated in accordance with the rules and regulations of the Federal Communications Commission (*FCC*). As an operator of two-way radio equipment, you must be thoroughly familiar with the rules that apply to your particular type of radio operation. Following these rules helps eliminate confusion, assures the most efficient use of the existing radio channels, and results in a smoothly functioning radio network. When using your two-way radio, remember these rules:

1. It is a violation of FCC rules to interrupt any distress or emergency message. As your radio operates in much the same way as a telephone "**party line**", always listen to make sure that the channel is clear before transmitting. Emergency calls have priority over all other messages. If someone is sending an emergency message - such as reporting a fire or asking for help in an accident - ***KEEP OFF THE AIR!***
2. The use of profane or obscene language is prohibited by Federal law.
3. It is against the law to send false call letters or false distress or emergency messages. The FCC requires that you keep conversations brief and confine them to business. To save time, use coded messages whenever possible.
4. Using your radio to send personal messages (*except in an emergency*) is a violation of FCC rules. You may send only those messages that are essential for the operation of your business.
5. It is against Federal law to repeat or otherwise make known anything you overhear on your radio. Conversations between others sharing your channel must be regarded as confidential.

6. The FCC requires that you identify yourself at certain specific times by means of your call letters. Refer to the rules that apply to your particular type of operation for the proper procedure.
7. No changes or adjustments shall be made to the equipment except authorized or certified electronic technician.

### **IMPORTANT**

Under U.S. law, operation of an unlicensed radio transmitter within the jurisdiction of the United States may be punishable by **a fine of up to \$10,000, imprisonment for up to two years, or both.**

## **2.3 OPERATING TIPS**

The following conditions tend to reduce the effective range of two-way radios and should be avoided whenever possible:

- Operating the radio in areas of low terrain, or while under power lines or bridges.
- Obstructions such as mountains and buildings.

In areas where transmission or reception is poor, some improvement may be obtained by insuring that the antenna is vertical. Moving a few yards in another direction or moving to a higher elevation may also improve communication.



### 3 INTRODUCTION

The *Vehicular Charger (VC)*, is designed to be vehicle mounted. The VC, product numbers BML 161 67/2, BML 161 67/22 and BML 161 67/62, will charge Nickel Cadmium (NiCd) type battery packs for all models of the Prism™ HP, LPE™-200, LPE-50, M-RK™, JAGUAR™ 700P/Pi and P7100<sup>IP</sup> radios. The VC, product number BML 161 67/162, will charge Nickel Cadmium (NiCd) and Nickel Metal Hydride (NiMH) batteries for the JAGUAR 700P/Pi and P7100<sup>IP</sup> radios.

The VC model BML 161 67/162 contains a Dual Position feature, which has two sets of battery charging contacts. If a speaker/microphone is attached to the radio before being inserted into the VC, the radio is configured in the First Position mode, which charges the radio battery through the first set of battery charging contacts. The radio will remain operational while charging using the radio antenna and the speaker/microphone.



**NOTE**

Use only speaker/microphones KRY 101 1617/185, KRY 101 1617/186 or KRY 101 1617/385 or equivalent with VC model BML 161 67/162. Using any other speaker/ microphone attached to the radio will cause severe damage to the charger, radio and/or speaker/microphone.

If a speaker/microphone is not attached to the radio before it is inserted into the VC (BML 161 67/162) the radio is configured in the Second Position mode and the second set of battery charging contacts allows the radio operate and function like VC BML 161 67/2, BML 161 67/22 and BML 161 67/62, which allows the VC to latch directly to the UDC of the radio.

Four models of the VC are available, and differentiated by the type of insert provided. The insert (*or sleeve*) is the part of the charger where the radio is placed to charge the battery pack. See Table 3-1 for a list of the Vehicle Charger product numbers and corresponding radio product for each.

**Table 3-1: Product Numbers**

PRODUCT #	USED FOR
BML 161 67/2	M-RK Radios
BML 161 67/22	Prism HP/LPE-200/LPE-50 Radios
BML 161 67/62	JAGUAR 700P/Pi/P7100 <sup>IP</sup> Radios
BML 161 67/162	JAGUAR 700P/Pi/P7100 <sup>IP</sup> Radios Dual Position

### 3.1 FEATURES

- Fast Charge
- Charge and Ready Indicator Lights
- Auto-Restart Charging
- Vehicular Repeater enable/disable circuit (*see note below*)
- Switched or Ignition Sense Power (*see note below*)




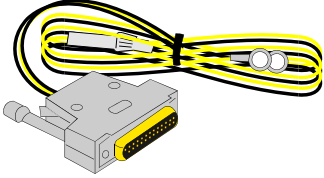
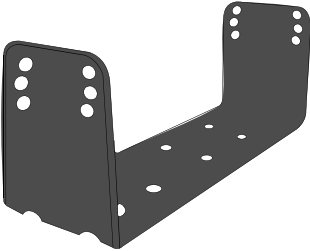

**NOTE**

A modification to the standard power cable is required to support Vehicular Repeater enable/disable and Ignition Sense Power. See STEP 4 - INSTALL POWER CABLE on page 12.

# 4 INSTALLATION

## 4.1 STEP 1 - UNPACK AND CHECK THE EQUIPMENT

Before starting the installation, carefully unpack the equipment and inspect the equipment for damage. If there is any damage, file a claim with the carrier immediately. The following equipment is included with the VC:

<p style="text-align: center;"><b>Vehicular Charger</b></p> <p>BML 161 67/2 (Prism HP/LPE-200/LPE-50) BML 161 67/22 (M-RK) BML 161 67/62 (JAGUAR 700P/Pi/P7100<sup>IP</sup>) BML 161 67/162 (Dual Position - JAGUAR 700P/Pi/ P7100<sup>IP</sup>)</p> 	<p style="text-align: center;"><b>Standard Power Cable</b> RPM 113 2864/1</p> 
<p style="text-align: center;"><b>Mounting Bracket</b> SXA 120 4492/1</p> 	<p style="text-align: center;"><b>Operator/Installation Manual</b> AE/LZT 123 3256/1</p> 
<p style="text-align: center;"><b>Mounting Hardware</b></p> <ul style="list-style-type: none"><li>• (4) four machine screws</li><li>• (4) four lock washers</li><li>• (6) six self-tapping screws</li></ul>	

## **4.2 STEP 2 - LOCATE THE TOOLS REQUIRED**

- Electric Drill
- No. 28 Drill Bit
- Hole Saw
- Phillips and Flat-Blade Screwdrivers

## **4.3 STEP 3 - PLAN THE INSTALLATION**

Before work actually begins, the installation of the Vehicular Charger should be carefully planned. It is recommended that the unit be installed by one of the many Authorized Service Centers located throughout the United States. Personnel at these centers are experienced in installations of this type of equipment and can provide a safe, neat and functional installation.

Mechanical installation guidelines include mounting the unit:

- in a location that is safe for the operator and any passengers in the vehicle.
- in a location that is convenient for the operator to use.
- in a location that allows proper clearance for cables.
- so that it can be easily removed for servicing.

## **4.4 STEP 4 - CONFIGURE THE CHARGER**

The VC is equipped with a dip switch bank. The dip switch bank configures the charger for each application. There are eight (8) dip switches on the bank. Table 4-1 provides a list of all the dip switches along with the factory default setting.

### **4.4.1 Accessing the DIP Switches**

1. Locate the dip switch access panel located on the bottom of the charger.
2. Using your finger (or a flat blade screwdriver), bend the locking tab toward the front of the charger and then pull up on the locking tab to remove the access panel.

**Table 4-1: Factory Default DIP Switch Settings**

<b>SWITCH</b>	<b>DEFAULT SETTINGS</b>	<b>DESCRIPTION</b>
1	OFF	N/A
2	ON	N/A
3	ON	N/A
4	ON	N/A
5	OFF	N/A
6	OFF	N/A
7	ON – 1.5 amps (default) OFF – 750 milliamps	Charge Rate Selector
8	ON - M-RK OFF - Prism HP/LPE-200/LPE-50/JAGUAR 700P/Pi/P7100 <sup>IP</sup>	Radio Selector

#### **4.4.2 Switches 1 – 6**

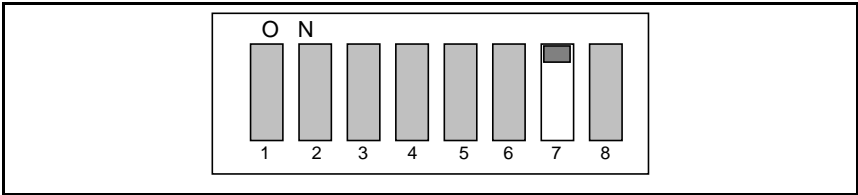
Switches 1 through 6 do not affect the operation of the charger. They **must** be left in the factory default settings.

#### **4.4.3 Switch 7: Charge Rate**

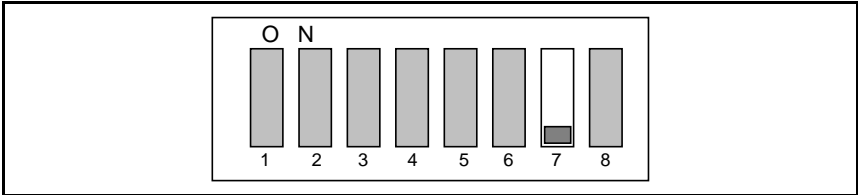
Use switch 7 to configure the charge rate. The VC can be configured to charge at 750 milliamps or 1.5 amps. By default, switch 7 is set in the ON position as shown in Table 4-1 and Figure 4-8. This configures the charger to rapid charge at a rate of 1.5 amps. The 1.5 amp charge rate is the preferred rapid charge rate for most applications.

When the battery is placed in the charger, the fast or "rapid" charge feature, is normally applied immediately. When the rapid charge is applied to the battery repeatedly in a short period of time, a high internal battery temperature may result. This high battery temperature will prevent the battery from charging and may reduce battery life.

In applications where the battery is removed from and inserted in the charger repeatedly within a short period of time, the 750-milliamp charge rate should be used. For a 750-milliamp-charge rate, set switch 7 to OFF as shown in Figure 4-2. For more information on charging the battery and battery life, see the section named Operation on page 20.



**Figure 4-1: 1.5 Amp Charge Rate**



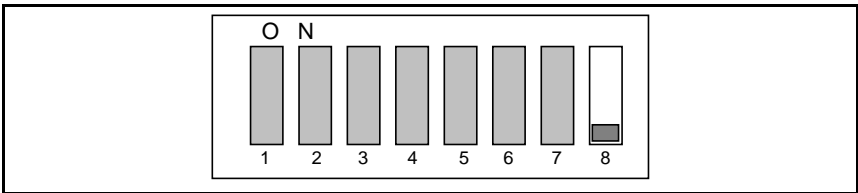
**Figure 4-2: 750 Milliamp Charge Rate**

#### **4.4.4 Switch 8: Radio Select**

Your Vehicular Charger can be used with Prism HP/LPE-200/LPE-50, M-RK, JAGUAR 700P/Pi or P7100<sup>IP</sup> radios. Switch 8 defines the type of radio that will be used with the charger. The type of radio is also physically or mechanically dependent on the insert or sleeve installed in the charger. The sleeve is the part of the charger the radio is placed in to be charged. From the factory, this switch is set according to the sleeve installed. The sleeves are interchangeable, therefore if the sleeve type is changed; the dip switch must also be changed.



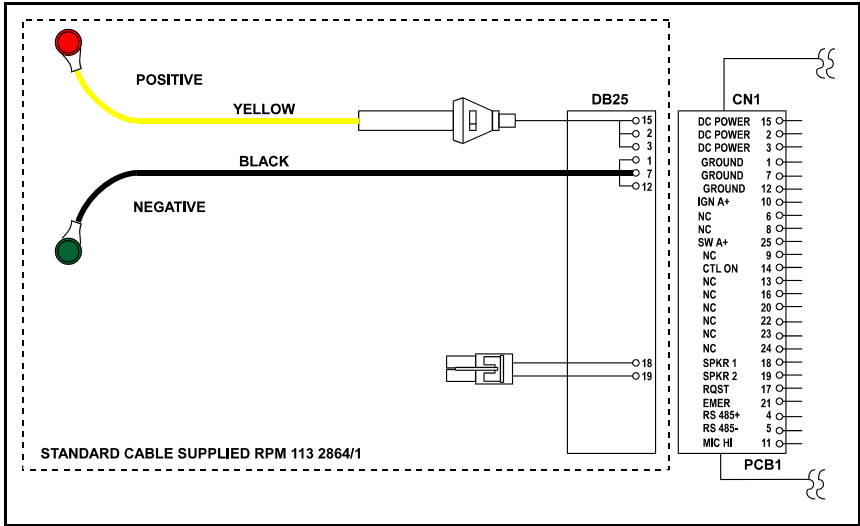
**Figure 4-3: Setting for M-RK Radios**



**Figure 4-4: Setting for Prism HP/LPE-200/LPE-50/  
JAGUAR 700P/Pi/P7100<sup>IP</sup> Radios**

## 4.5 STEP 5 - INSTALL POWER CABLE

The Standard Power Cable (RPM 113 2864/1) supplied with the charger, is approximately eight (8) feet long and consists of a DB-25 connector and two leads. The YELLOW (positive) lead includes a fuse holder and 5-ampere fuse located near the battery end. See Figure 4-5: Standard Power Cable (RPM 113 2864/1). The power cable must be connected to the vehicle's battery. The vehicle must have a negative-ground electrical system.

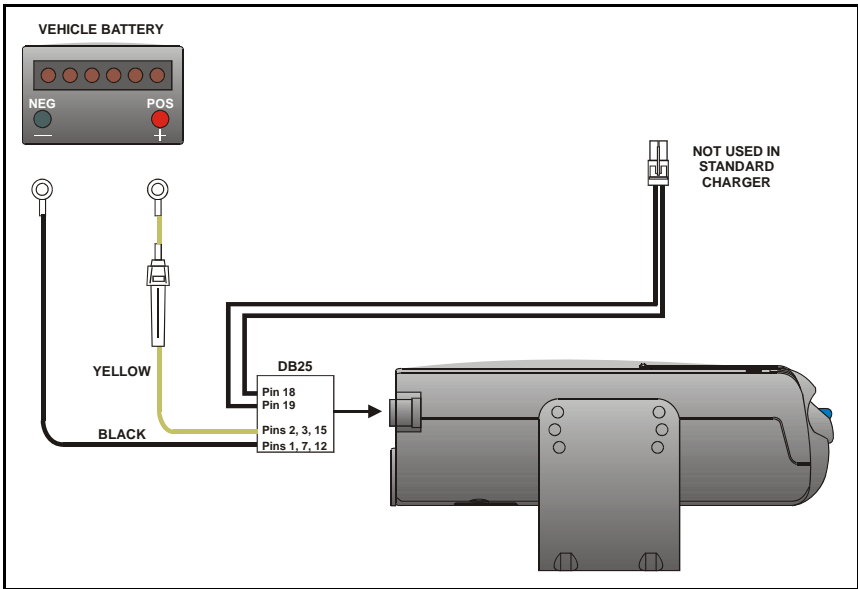


**Figure 4-5: Standard Power Cable (RPM 113 2864/1)**

1. When the charger is wired directly to the vehicle's battery it is necessary to route the power leads through the vehicle's firewall. If an existing hole is not conveniently located in the firewall, drill a small hole and install an appropriately sized rubber grommet before routing the leads through the firewall. This grommet is required to prevent lead chaffing. Additional grommets may be required if the leads must pass through shields or guards in the engine compartment between the firewall and battery.

Route the leads away from high heat sources in the engine compartment that may cause lead damage and introduce a fire hazard. In addition, the leads **should not** be routed near electrical noise sources such as electronic ignition modules or cruise control modules.

2. Connect the BLACK lead to the negative power source ("NEG" or "-" battery post) and connect the YELLOW lead to the positive power source ("POS" or "+" battery post). See Figure 4-6: Power Cable Installation Diagram.



**Figure 4-6: Power Cable Installation Diagram**



**NOTE**

The power source must have adequate current supply capability.

This connection wires the charger to an un-switched power source so the charger can operate when the vehicle ignition switch is turned OFF. However, if desired, the charger can be controlled by a switched power supply. See Section 4.5.1 Connecting to a Switched Power Source.

The Vehicular Charger contains an enable/disable circuit for a separately installed vehicular repeater. For this feature, a modification to the power cable is required. See Section 4.5.2 Vehicular Repeater Enable/Disable on page 17.

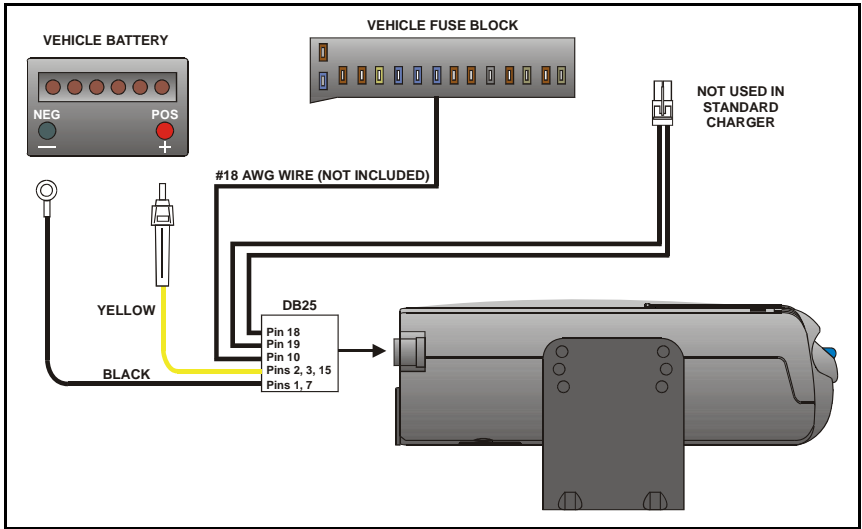
### **4.5.1 Connecting to a Switched Power Source**

To control the charger by a switched power source, an #18 AWG wire (not supplied by M/A-COM) must be installed between the DB-25 connector and the ignition switch power. Install the wire as described in the following instructions:

1. Using a small Phillips head screwdriver, disassemble the DB-25 Power Cable connector.
2. Solder one end of the #18 AWG wire to Pin 10 of the DB-25 connector. Make sure enough lead is provided to make the connection.



3. Reassemble the connector.
4. Connect the other end of the wire to an ignition "ON" sense point (preferably an "Accessory" point in the vehicle fuse panel) that is switched on when the vehicle ignition switch is in the ACCESSORY and RUN positions. This lead should be connected so the vehicle fuse protection is used. See Figure 4-7: Switched Power Supply Installation Diagram.



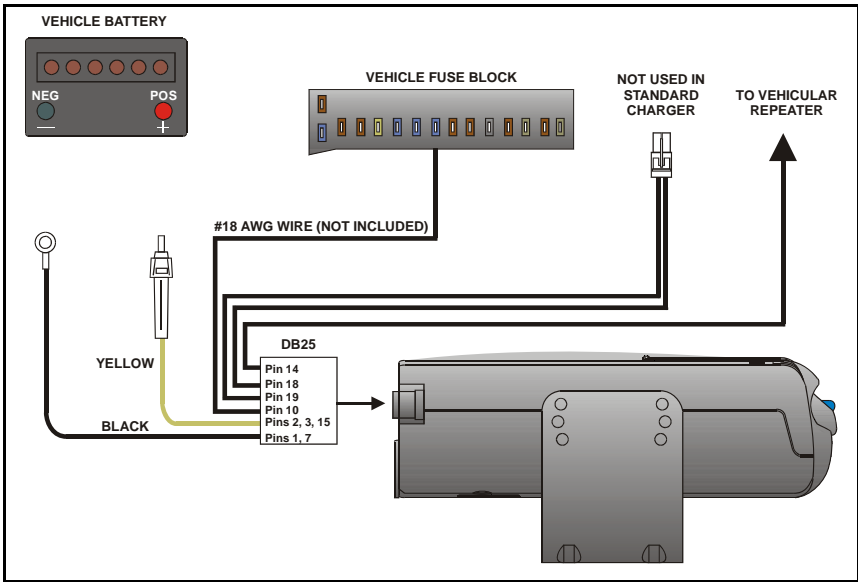
**Figure 4-7: Switched Power Supply Installation Diagram**

## **4.5.2 Vehicular Repeater Enable/Disable**

The Vehicular Charger contains an enable/disable circuit for a separately installed vehicular repeater. The Vehicular Repeater is enabled (TTL high) at the DB-25 connector pin 6, when the radio is out of the Vehicular Charger.

To enable/disable a separately installed Vehicular Repeater, a #18 AWG wire (customer supplied) must be installed between the DB-25 connector and the vehicular repeater. Install the wire as described in the following instructions:

1. Using a small Phillips head screwdriver, disassemble the DB-25 Power Cable connector.
2. Solder one end of the #18 AWG wire to Pin 6 of the DB-25 connector. Make sure enough lead is provided to make the connection.
3. Re-assemble the connector.
4. Connect the other end of the wire to the Vehicular Repeater. See the appropriate manual for the Vehicular Repeater.



**Figure 4-8: Repeater Installation Diagram**

## 4.6 STEP 6 - MOUNT THE UNIT

1. Select a mounting location as described previously.



NOTE

Failure to use the supplied mounting bracket provided can result in improper mounting forces applied to the charger. Using an alternate mounting bracket or method may cause improper operation and can damage the charger and/or radio.

2. Using the mounting bracket as a template, mark six mounting screw hole locations on the mounting surface.
3. Using the No. 28 drill bit, drill holes into the mounting surface at the marked locations.



NOTE

Before drilling a hole in the vehicle mounting surface, careful consideration should be given to the bottom or backside of the mounting surface. This will prevent damage to the vehicle.

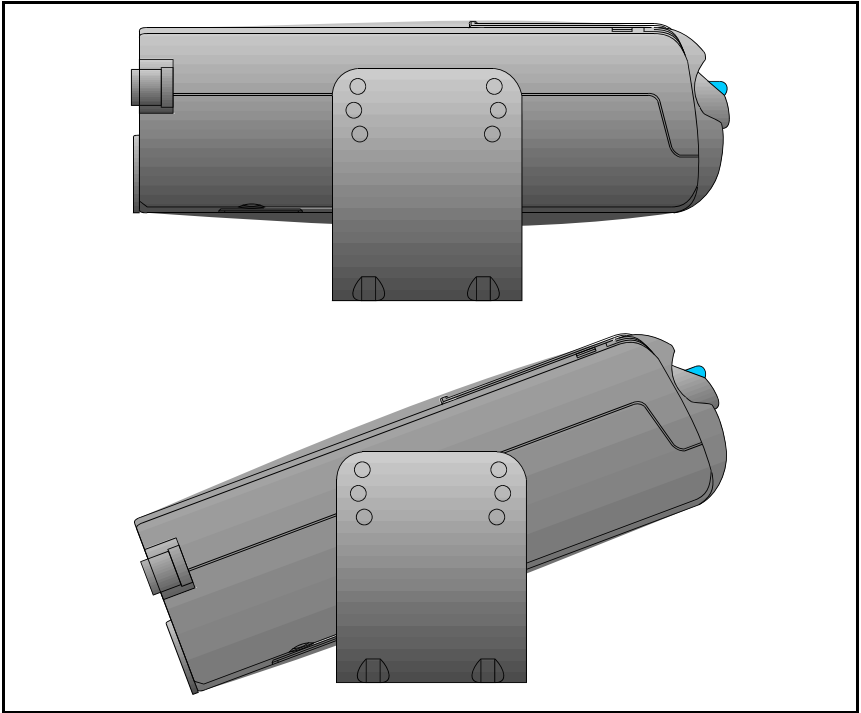
4. Using the six self-tapping screws, secure the mounting bracket to the mounting surface.



NOTE

Do not install the machine screws into the charger without the mounting bracket in place.

5. Using the four machine screws and lock washers, secure the unit to the mounting bracket. The charger can be fastened in any of three different positions: parallel to the mounting surface or tilted  $\pm 20$  degrees from the parallel position. See Figure 4-9: Mounting the Charger.
6. Plug the DB-25 connector in the back of the charger and secure with screws.



**Figure 4-9: Mounting the Charger**

## 5 OPERATION

The Vehicular Charger (VC), is designed to be vehicle mounted. The VC, product numbers BML 161 67/2, BML 161 67/22 and BML 161 67/62, will charge Nickel Cadmium (NiCd) type battery packs for all models of the Prism HP, LPE-200, LPE-50, M-RK, JAGUAR 700P/Pi and P7100<sup>IP</sup> radios. The VC, product number BML 161 67/162, will charge Nickel Cadmium (NiCd) and Nickel Metal Hydride (NiMH) batteries for the JAGUAR 700P/Pi and P7100<sup>IP</sup> radios.

The VC model BML 161 67/162 contains a Dual Position feature, which has two sets of battery charging contacts. If a speaker/microphone is attached to the radio before being inserted into the VC, the radio is configured in the First Position mode, which charges the radio battery through the first set of battery charging contacts. The radio will remain operational while charging using the radio antenna and the speaker/microphone.



The upper position (i.e. radio with speaker/mic attached) is designed for battery charging only. The radio may be on and receiving calls, but TX is not allowed. If an attempt is made to transmit during battery charging in the upper position, the charge cycle may be terminated early (battery incompletely charged). If this occurs, the charge must be restarted by removing and re-inserting the radio into the charger.



Use only speaker/microphones KRY 101 1617/185, KRY 101 1617/186 or KRY 101 1617/385 or equivalent with VC model BML 161 67/162. Using any other speaker/microphone attached to the radio will cause severe damage to the charger, radio and/or speaker/microphone.

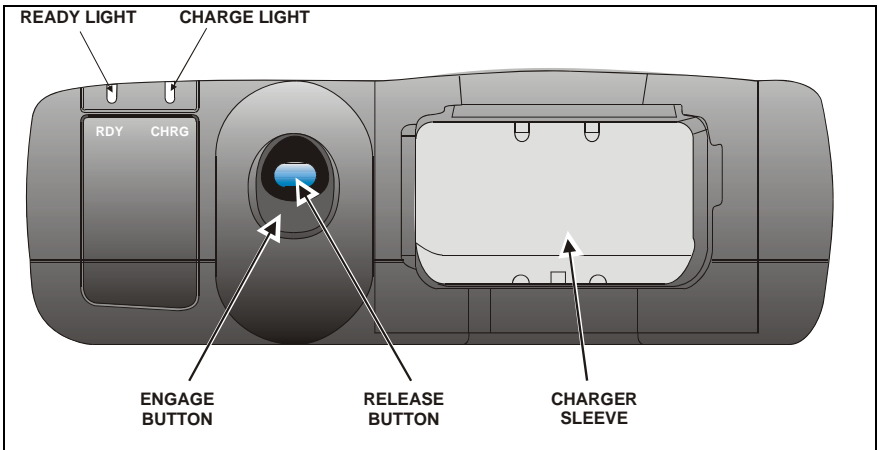
If a speaker/microphone is not attached to the radio before it is inserted into the VC (BML 161 67/162) the radio is configured in the Second Position mode and the second set of battery charging contacts allows the radio to operate and function like VC BML 161 67/2, BML 161 67/22 and BML 161 67/62, which allow the VC to latch directly to the UDC of the radio.

The operation of this product is very simple and requires very little interface from the user. The following is a list of all the steps necessary to operate this product:

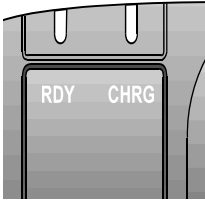
1. Understand the LED indicators and controls.
2. Insert the radio in the charger.
3. Secure or latch the radio in the charger.
4. Release/Remove the radio from the charger.

The following sections provide details for the four simple steps to operating the Vehicular Charger.

## 5.1 STEP 1 - UNDERSTANDING THE LED INDICATORS AND CONTROLS



**Figure 5-1: Front View of Vehicular Charger**



There are two LED indicators on the left front panel of the charger labeled **RDY** and **CHRG**.

**CHRG** (*amber*) - When the radio is inserted in the charger, this LED will flash for 3-5 seconds, and then light steady to indicate the battery is rapid charging. When the internal battery voltage and temperature is too high or too low, this LED will continue to flash after the 3-5 second period. See Section 5.5 BATTERY CHARGER DETAILS on page 24 for more information.

**RDY** (*green*) - This LED lights when the battery has reached 90-92% capacity indicating the charger has switched to trickle charge mode. Allow the battery to continue charging 1-2.5 hours depending on battery chemistry for full battery charge capacity.



**Latch Button** - The Latch Button secures the radio in place while the radio is charging.

**Release Button** - The Release Button releases the radio so the radio can be removed from the charger.

## 5.2 STEP 2 - INSERTING THE RADIO IN THE CHARGER



Carefully insert the radio into the VC avoiding impact with the VC UDC assembly.

The UDC cover must be removed from the radio prior to placing the unit into the charger.

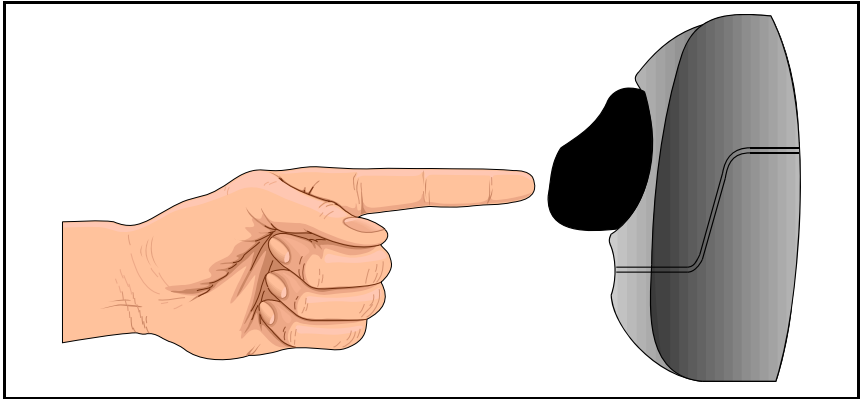
Insert the radio into the charger sleeve. The bottom of the radio or battery is inserted first with the back of the radio facing down.



The battery cannot be inserted into the charger unless the battery is attached to the radio. The charger secures the battery by engaging and latching to the radio UDC.

### 5.3 STEP 3 - SECURING OR LATCHING THE RADIO IN THE CHARGER

Using your thumb or finger, press the (black) latch button until the button clicks and latches in the depressed position. See Figure 5-2. This secures the radio in the charger while the battery is charging by engaging the UDC.



**Figure 5-2: Latch Radio/Battery in Charger**

## 5.4 STEP 4 - RELEASING/REMOVING RADIO FROM THE CHARGER

Using your thumb or finger, press the (blue) Release button until the button clicks. See Figure 5-3. This will release the Latch button and disengage the UDC on the radio.

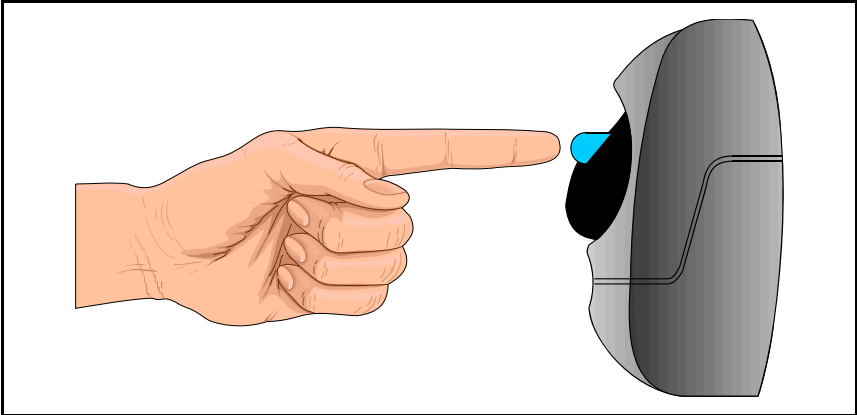


Figure 5-3: Release Radio/Battery from Charger

## 5.5 BATTERY CHARGER DETAILS

When a radio is placed in the charger, the fast or “rapid” charge feature normally is applied immediately, and is controlled by the microprocessor circuits within the charger. The following details apply to the battery charge feature:



VC, product numbers BML 161 67/2, BML 161 67/22 and BML 161 67/62, will charge Nickel Cadmium (NiCd) type battery packs for all models of the Prism HP, LPE-200, LPE-50, M-RK, JAGUAR 700P/Pi and P7100IP radios. VC, product number BML 161 67/162, will charge Nickel Cadmium (NiCd) and Nickel Metal Hydride (NiMH) batteries for the JAGUAR 700P/Pi and P7100IP radios.

- When the battery is first inserted, the amber **CHRG** LED will blink rapidly for 3-5 seconds, then glow continuously until the battery is near a full charge (between 90%-92%). At this time the charger switches to a slow or “trickle” charge rate for between 1 and 2.5 hours, depending on battery composition, and completes the charge. During “trickle” charge the green **RDY** LED is illuminated. The



charger will not go back into a rapid charge unless the radio is removed and then placed back into the charger.

- If the amber **CHRG** blinks at a slow rate after the first 3-5 seconds, the battery is not being charged by the Vehicular Charger. Several factors may cause this to occur. These include, dirty battery pack contacts, an extremely high or low internal battery temperature, or a defective battery pack. The following section provides more information on extremely high or low internal battery temperature.

## 5.6 HIGH/LOW INTERNAL BATTERY TEMPERATURE

To maximize nickel cadmium battery life, the Vehicular Charger is designed with automatic controls which limit the rapid charging of the battery if the internal battery temperature is below 0°C (+32°F) or above +45°C (+113°F). When this high or low internal battery temperature is sensed by the charger, the amber **CHRG** light will blink or flash at a slow rate.

If the **CHRG** LED is blinking at a slow rate, the operator must wait until the internal battery temperature stabilizes within the allowable range before restarting the charging procedure by removing and re-inserting the radio into the charger.

In a vehicular application, with high ambient temperature inside or outside of the vehicle, the automatic charging control will prevent rapid charging or limit the time of rapid charging.

In other situations, where the operator inserts and removes the radio many times during a short period of time, the automatic control will sense a high internal battery temperature (due to start-up rapid charging of the battery) and will prevent further rapid charging of the battery until the internal temperature of the battery stabilizes within the acceptable range.



NOTE

If the battery is deeply discharged, the radio must be turned OFF when inserted into the charger.

## 6 WARRANTY

- A. M/A-COM, Inc. (hereinafter "Seller") warrants to the original purchaser for use (hereinafter "Buyer") that Equipment manufactured by or for the Seller shall be free from defects in material and workmanship, and shall conform to its published specifications. With respect to all non-M/A-COM Equipment, Seller gives no warranty, and only the warranty, if any, given by the manufacturer shall apply. Rechargeable batteries are excluded from this warranty but are warranted under a separate Rechargeable Battery Warranty (ECR-7048).
- B. Seller's obligations set forth in Paragraph C below shall apply only to failures to meet the above warranties occurring within the following periods of time from date of sale to the Buyer and are conditioned on Buyer's giving written notice to Seller within thirty (30) days of such occurrence:
1. for fuses and non-rechargeable batteries, operable on arrival only.
  2. for parts and accessories (except as noted in B.1) sold by Seller's Service Parts Operation, ninety (90) days.
  3. for PANTHER™ Series handportable and mobile radios, two (2) years.
  4. for all other equipment of Seller's manufacture, one (1) year.
- C. If any Equipment fails to meet the foregoing warranties, Seller shall correct the failure at its option (i) by repairing any defective or damaged part or parts thereof, (ii) by making available at Seller's factory any necessary repaired or replacement parts, or (iii) by replacing the failed Equipment with equivalent new or refurbished Equipment. Any repaired or replacement part furnished hereunder shall be warranted for the remainder of the warranty period of the Equipment in which it is installed. Where such failure cannot be corrected by Seller's reasonable efforts, the parties will negotiate an equitable adjustment in price. Labor to perform warranty service will be provided at no charge during the warranty period only for the Equipment covered under Paragraph B.3 and B.4. To be eligible for no-charge labor, service must be performed at a M/A-COM factory, by an Authorized Service Center (ASC) or other Servicer approved for these purposes either at its place of business during normal business hours, for mobile or personal equipment, or at the Buyer's location, for fixed location equipment. Service on fixed location equipment more than thirty (30) miles from the Service Center or other approved Servicer's place of business will include a charge for transportation.
- D. Seller's obligations under Paragraph C shall not apply to any Equipment, or part thereof, which (i) has been modified or otherwise altered other than pursuant to Seller's written instructions or written approval or, (ii) is normally consumed in operation or, (iii) has a normal life inherently shorter than the warranty periods specified in Paragraph B, or (iv) is not properly stored, installed, used, maintained or repaired, or, (v) has been subjected to any other kind of misuse or detrimental exposure, or has been involved in an accident.
- E. The preceding paragraphs set forth the exclusive remedies for claims based upon defects in or nonconformity of the Equipment, whether the claim is in contract, warranty, tort (including negligence), strict liability or otherwise, and however instituted. Upon the expiration of the warranty period, all such liability shall terminate. The foregoing warranties are exclusive and in lieu of all other warranties, whether oral, written, expressed, implied or statutory. NO IMPLIED OR STATUTORY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, INDIRECT OR EXEMPLARY DAMAGES.

This warranty applies only within the United States.

**M/A-COM, Inc.**  
1011 Pawtucket Blvd.  
Lowell, MA 01853  
1-877-OPENSKY

**M/A-COM, Inc.**  
221 Jefferson Ridge Parkway  
Lynchburg, VA 24501  
1-800-528-7711

ECR-7047C

## NOTES



**Tyco Electronics Wireless Systems Segment**  
221 Jefferson Ridge Parkway  
Lynchburg, Virginia 24501  
(Outside USA, 1-434-385-2400) Toll Free 1-800-528-7711  
[www.macom-wireless.com](http://www.macom-wireless.com)

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