



VISUAL INFORMATION SYSTEMS



VMS Operation and Maintenance Manual

Version 4.0



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1. Bartco Warranty Provision

Bartco Traffic Equipment Pty Ltd

- i. BARTCO warrants that our manufactured product sold, will be free from defects in material and workmanship for a period of two (2) years (excluding batteries) from date of supply, subject to the conditions and restrictions contained herein.
- ii. BARTCO further warrants that product repaired by Bartco, are covered within thirty (30) days from the date the repaired product is dispatched to the customer.
- iii. All Batteries supplied by Bartco are warranted from defects for a period of 1 (one) year.
- iv. Warranty is provided as a RTB Return to Base warranty in your Capital City. Product (s) to be returned are shipped at the Owner's expense and any supplied parts, must be returned in protective packaging for shipment. Shipment to and from the Owner is at the Owners risk. If shipping insurance is required, then this is also to be arranged by the Owner.
- v. This warranty does not apply to a product that has not been installed or maintained in accordance with BARTCO instructions, been subjected to damage in an accident, abused or neglected during operation, repaired or modified by persons not approved by BARTCO, or failed to have initial operator training undertaken and regular, routine maintenance.
- vi. BARTCO's responsibility in respect to warranty claims is limited solely to repair or replacement at our option, of product found by BARTCO to be defective. BARTCO does not pay for labour charges, transportation charges, cross hire charges or any incidental or consequential damages connected with removal of a product deemed to be defective or with installation or replacement of repaired product. Further, BARTCO disclaims any liability for any incidental or consequential damages, including lost or duplicated time or expense, accruing for any reason to the owner or user of any products sold by BARTCO, whether claim is made in contract or tort or under any warranty or in negligence or otherwise.
- vii. BARTCO reserves the right to make changes to its products without incurring any obligations to incorporate such improvements in any products previously sold or in service.
- viii. The terms and conditions of this warranty cannot be altered whatsoever without the written approval of BARTCO.
- ix. This warranty does not apply to any product which has not been paid for according to the terms under which the product has been invoiced. In addition, BARTCO will not honor any warranty claim from a customer whose account is not current according to BARTCO payment terms.
- x. BARTCO does not warrant certain batteries, lighting elements, and electrical ballast and items considered to be expendables as deemed by Bartco.
- xi. The foregoing warranty is exclusive and in lieu of all other express, statutory and implied warranties including those of merchantability and fitness for any particular purpose.

2. Introduction

The Bartco Full Matrix, Portable VMS/Radar Sign provides the ultimate in innovative design and performance. From the heavy-duty structural steel trailer to the user-friendly computer control system, the Bartco Full Matrix, Portable Sign is designed and built to provide years of trouble-free service with minimal care and maintenance. Bartco's philosophy of designed-in quality assures that your new sign will perform to your expectations now and into the future.

We recommend that you read this entire manual carefully and clarify any misunderstandings you may have prior to operating the equipment. Our personnel are always available to assist you with any questions you may have regarding the operation, programming, maintenance, or repair.

Remember, safety through knowledge works for everyone! Make sure that you and your operators are familiar with any tools or equipment before they attempt to use them.

RULES FOR SAFE OPERATION

The Bartco Full Matrix, Portable Sign was designed and manufactured to be as safe and easy to use as possible. However, as with any piece of equipment, it is of paramount importance that operating personnel be completely familiar with the unit and are properly trained in safe deployment and operating procedures. Make certain that any persons transporting or operating the Bartco Full Matrix, Portable Sign have thoroughly read and understand the Safe Operating Procedures as listed in this manual.

SAFE OPERATING PROCEDURE CHECKLIST

The operating procedures located in this manual, should be used anytime the Bartco Full Matrix, Portable Sign is transported or placed into service. These procedures help to ensure that proper operating procedures are followed and that certain items pertinent to the safe operation of the equipment are not overlooked.



- CAUTIONS & WARNINGS -

DO NOT ATTEMPT TO OPERATE THIS EQUIPMENT UNTIL YOU HAVE READ THOROUGHLY AND HAVE COMPLETELY UNDERSTOOD ALL INSTRUCTIONS AND PRECAUTIONS CONTAINED IN THIS MANUAL. FAILURE TO COMPLY CAN RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

SETUP & OPERATION

Portable Changeable Message Signs are primarily intended to supplement other traffic control devices in diverting or rerouting traffic and generally informing motorists about activities and conditions around road works sites. Thanks to Bartco's development of a full-matrix display, being able to create custom graphics and animations means the increased use of these signs for advertising and promotional purposes. This combined with the added feature of a speed radar sign opens up a whole new avenue of uses. You should consult with the local council/roads authority before placing message signs or any other traffic control devices. Proper placement of Variable Message Signs are essential to their effectiveness.

TRANSPORTING, SETTING UP AND TAKING DOWN SIGN

A safety check should be performed on the message sign before transporting the unit over the road.

TRANSPORTING THE SIGN



The Maximum towing speed recommended for this portable Message Sign is 80 km/h.

CAUTION: Before Transporting the sign, make sure:

- The Sign is fully lowered into the transport support bar, and
- Sign is not operational

STEP 1

Close and lock all battery/hydraulic compartments.

STEP 2

Using the Outrigger Jacks, raise trailer coupling to appropriate level and attach to appropriately sized ball.

STEP 3

Retract all 4 Outrigger Jacks, and raise into Transport Position

STEP 4

Connect Safety chains to towing vehicle

STEP 5

Attach trailer light connector to towing vehicle. Make sure all lights are operating correctly

STEP 6

Inspect the trailer and check brake fluid level and tyre pressures.

In situations where the work site is a significant distance away, stop periodically and check the integrity of the coupler and safety chains and for any excess heat buildup in the tyres and wheel bearings.

SETTING UP SIGN AND TRAILER

Upon arriving at the work site, first check the immediate area for any overhead power lines or obstructions. Also, check the surrounding area for any tall buildings, trees, or other obstructions nearby that might shade the solar array during part of the day and interfere with the proper operation of the solar electric charging system. Many times, just moving the unit a few metres can make the difference between getting an adequate supply of sunlight to maintain the charge level of the battery bank.

Once the appropriate site has been selected, the unit can be positioned and set up for operation. Block the trailer wheels before disconnecting the coupler from the tow vehicle hitch. It is best to position the trailer as close to the chosen location as possible with the tow vehicle because of the substantial weight of the unit. Locate the trailer so that the trailer is parallel to the direction of traffic flow.

Ensure that the Wheel Lock Plate is passed through the wheel and locked using a secure padlock into position to ensure that the wheel is secured and cannot rotate.

STEP 1

Position the Trailer and level it using the four adjustable Outrigger Jacks. Note: The trailer must be level with 5° toe equally distribute load between the four jacks.

STEP 2

Loosen the sign rotation brake by pulling upwards on the locking brake arm. Raise the sign using the raise/lower button located in the main control box.

STEP 3

Rotate Sign to desired to final position and pull down on the brake locking arm.

PREOPERATIONAL CHECK

If sunlight is available, check the solar electric charging system to make sure it is active and functioning properly. The PV Voltage OK, PV Current OK, and Charging indicators (red LEDs) on the charge controller will all be on. If the battery bank is at or near a full state of charge, the Finishing indicator on the charge controller may also be on. When the battery bank is fully charged, the charge controller will switch off the current flow from the solar array to prevent overcharging of the batteries. The charge controller will automatically switch current flow from the solar array on and off as needed to maintain the charge level of the battery bank. The charge controller is located in the main control box.

Periodically check the solar array for dust and dirt build-up and check the fluid level in the batteries. Every 30 days should be adequate except in extreme conditions of dust or low sunlight. The solar panels can be easily cleaned with clear water and a squeegee.

The battery bank may require a few recharge cycles before it reaches its full energy storage capacity. New lead acid batteries generally do not reach their full capacity until they have gone through 10 to 15 charge/discharge cycles.

If programming your sign remotely, ensure that the modem is in service. Bartco modems utilise the digital network which has considerable coverage. To ensure the modem is in service check the light on the modem (located in the computer console) should be blinking.

3. Introducing Bartco Web Studio

Bartco VMS Web Studio[®] is the most advanced and state of the art, VMS programming and asset management system available for VMS.

Features include:

- Web Interface (easily accessible from any internet enabled PC)
- Secure Logins
- Multiple users (perfect for hire/rental companies)
- Quick and easy operation
- Clean user-friendly interface
- Asset Grouping
- Real Time Asset Tracking
- Program Multiple VMS instantly

Whether you are upgrading from VMS Studio or using Web Studio for the first time, I'm sure you will find the system quick and easy to use.

Refer to the ***Bartco VMS Web Studio User Manual*** for Operational details.

4. Maintenance

The Bartco Full Matrix Sign is designed and manufactured to provide years of trouble free service, while demanding a minimum amount of care and maintenance. Aside from keeping the display panel and the solar array clean and free from debris, your sign will consume very little of your equipment maintenance resources.

CLEANING

The sign panel should be cleaned periodically as required to maintain optimum visibility of the display. Use plenty of water to minimise scratching of the surface by abrasive dust and debris that may accumulated. A mild detergent can be used to remove any accumulated oil or grease deposits. Rinse the surface thoroughly to completely remove the dirt and detergent residue. Avoid using strong alkali detergents or petroleum-based solvents. Certain solvents will cause severe damage to the polycarbonate surface and are not necessary for effective cleaning. Periodic application of a cleaning and polishing product such as Meguires Mirror Glaze will dramatically improve the service life of the polycarbonate panel as well as help to reduce dirt accumulation in the field.

The solar panels used in the solar array have a tempered glass upper surface and can be cleaned using the same techniques as those employed in cleaning the sign display. In the event that the solar array becomes covered with snow or ice, the excess residue should be removed as soon as possible. It is not necessary, nor desirable, to aggressively scrape frozen snow or ice accumulation from the panels.

General overall cleaning of the entire unit is recommended as a part of the routine maintenance schedule to optimise the performance and life expectancy of the message sign. A mild detergent and plenty of water is all that should be required to remove accumulated dust and road film. Avoid using strong alkali or abrasive cleaning compounds. They are not necessary and may damage the finish.

LUBRICATION

Although, under typical operating conditions, very little lubrication service is required, it is still an important aspect of maintaining trouble free operation and minimising rust and corrosion problems. The sign panel lifting mechanism employs a hydraulic system.

The dolly wheel and stabilising jacks should be lubricated regularly. Apply a small amount of chain lube at the hole located at the top of the swivel jack outer tube to lubricate the internal screw mechanism. Lubricating these and other pivot points not only ensures that these mechanisms remain free and easy to operate, but also that rust and corrosion are kept to a minimum.

The trailer axle wheel bearings should be cleaned and repacked with a good grade of lithium-based bearing grease at least once a year, more frequently if the trailer is used heavily, particularly in excessively dusty environments or if the axle has been submerged in water. Remove the dust cap from the axle hub, remove and discard the cotter key, and remove the castle head nut. Remove the wheel and hub from the axle spindle, being careful to prevent the bearings from falling and becoming contaminated with dirt. Clean the old grease from the bearings, hub and spindle. Repack with clean wheel bearing grease and reassemble. Always replace the cotter key with a new one to ensure secure retention of the spindle nut

BATTERIES

When servicing the batteries, as with any lead acid type battery, there are a few precautions that should be observed:

- i. Never expose the area over and around an open battery compartment to a spark or open flame. Lead acid type batteries produce hydrogen gas during a recharge cycle and an accumulation of the gas exposed to a spark or flame could result in an explosion! Since hydrogen gas is much lighter than air and dissipates very quickly, the only area of concern is immediately above and around the battery compartment.
- ii. Always exercise extreme care when using metal tools around the battery terminals. The batteries used in your sign have an extremely large energy storage capacity and can generate several thousand Amperes of current if the terminals are shorted out by a metal tool. This high current will cause the tool to heat up very quickly and possibly spray molten metal at the point of contact. The battery bank operates at a very low voltage level, specifically 12 volts, which is not high enough to present any danger of electrical shock. However, the battery bank's ability to generate very high current necessitates the exercising of extreme caution when working around the battery terminals.
- iii. The electrolyte used in lead acid batteries, whether liquid or gel, is highly corrosive and can cause skin irritation and burns. Use caution, whenever batteries are being serviced or replaced, to avoid spillage or case damage. If any of the electrolyte comes into contact with skin or clothing, remove it immediately by flushing with plenty of clean water.



Gloves and safety goggles should be worn anytime service or repair work is being performed on the batteries or electrical terminals!

The batteries, in general, require very little care and maintenance. The most important aspect of optimising the service life of the batteries is fluid level maintenance. The electrolyte level must always be maintained at a level above the plates inside the battery. If the electrolyte level drops below the tops of the plates, the portion of the plates that have been exposed will be permanently damaged. The electrolyte level is very easily maintained by simply adding distilled water as needed.

Simply remove the vent caps from each cell of the battery, check the level of the fluid, and add Distilled water, if necessary, to bring the electrolyte level up to the indicator ring located in the opening. A battery water dispenser, available at most auto parts stores, will expedite and simplify the process. Battery fluid level should be checked every three to four months in temperate climates and every 30 days in very warm climates. Remember!, if the fluid level is not maintained, the useful life of the batteries will be dramatically shortened!

The only other maintenance items that should be performed on the batteries can be completed at the same time that the electrolyte level is being checked. Make sure that the fasteners holding the cables on the battery terminals are tight and that any fluid or residue build up on the tops of the batteries is removed. Use a damp cloth or sponge to wipe off any build up. This will help prevent corrosion of the terminals and the battery compartment and minimize breakdowns due to loose or corroded electrical terminals.

5. Troubleshooting

Problem: LED's not lighting up as required

Possible Causes:

- **Connections**
- **Faulty regulator**
- **Cut wires (vandalism)**

Suggested solutions:

Check connection behind LED Panel: Open up sign cabinet and check connection behind the panel or panels that are having the issue. Ensure they are plugged in correctly.

Check connection into controller: Open up sign cabinet and check the LED panels connection into the controller. Ensure that they are plugged in correctly.

The LED panels are interchangeable. Change LED panel with another one from the sign to see if one panel is at fault.

Problem: Sign Stops operating

Causes/Solutions:

- **Sign has flat batteries**

Under normal operating conditions the sign should not go flat. Batteries may go flat for a few reasons, mainly due to the fact the sign is not getting enough solar energy to charge the batteries. Check the location of the sign to make sure the solar panels are not obstructed by trees etc. Also check whether or not the sign is under a streetlight. The sign is fitted with a sensor that detects ambient light and adjusts the LED output accordingly. If the sensor thinks it is daylight (because of the street light) then the LED output may be at maximum brightness at all times including at night and therefore draining the batteries.

- **Communications Problem (Sign won't answer)**

As sometimes occur with mobiles, communications may hang or issues may occur that require the Re-setting of the phone. The modem within the sign may also require re-setting. This is done by opening up the front display, and pulling out and replacing the green plug that goes into the main controller, located in the bottom right hand corner of the sign. Note every night at Midnight the controller will conduct its own automatic reset. Note, some VMS are fitted with on-off switches located in the battery compartment

Problem: Faulty Controller

Most of the issues relating to the electronic display stem from either a faulty connection or an issue with the main controller. The controller is a cigarette packet sized device that is connected by a few wires. The controller can be easily disconnected. A replacement controller can be sent to you upon request.

Problem: Sign Won't Raise/Lower

Possible Causes:

- **Blown Fuse**
- **Flat Batteries**
- **Tight Brake Locking Mechanism**
- **Problem with hydraulic pump and or motor**

Suggested solutions:

Check fuse located near raise/lower button
Test status of batteries to see if unit is flat.
Adjust sign locking mechanism



Note: If the sign has been operating for an extended period in its highest Raised position and it will not lower, rock the display back and forth whilst trying to lower the sign.

Notes