

# WHELEN<sup>®</sup>

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## Operating Guide MPC-NFPA Multi-Purpose Controller

### Automotive: Serial Communication

#### Safety First

This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely. Important information is contained herein that could prevent serious injury or damage.

- **Proper installation of this product requires the installer to have a good understanding of automotive electronics, systems and procedures.**
- **If mounting this product requires drilling holes, the installer MUST be sure that no vehicle components or other vital parts could be damaged by the drilling process. Check both sides of the mounting surface before drilling begins. Also de-burr any holes and remove any metal shards or remnants. Install grommets into all wire passage holes.**
- **If this product is mounted with tape or Velcro™, clean the mounting surface with a 50/50 mix of isopropyl alcohol and water and dry thoroughly.**
- **Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owners manual for the air bag deployment area. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.**
- **For this product to operate at optimum efficiency, a good electrical connection to chassis ground must be made. The recommended procedure requires the product ground wire to be connected directly to the NEGATIVE (-) battery post.**
- **If this product uses a remote device to activate or control this product, make sure that this device is located in an area that allows both the vehicle and the device to be operated safely in any driving condition.**
- **Do not attempt to activate or control this device in a hazardous driving situation.**
- **If this product contains strobe light(s), halogen light(s) or high-intensity LED's, do not stare directly into these lights. Momentary blindness and/or eye damage could result.**
- **Use only soap and water to clean the outer lens. Use of other chemicals could result in premature lens cracking (crazing) and discoloration. Lens' in this condition have significantly reduced effectiveness and should be replaced immediately. Inspect and operate this product regularly to confirm its proper operation and mounting condition. Do not use a pressure washer to clean this product.**
- **It is recommended that these instructions be stored in a safe place and referred to when performing maintenance and/or reinstallation of this product.**
- **FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!**

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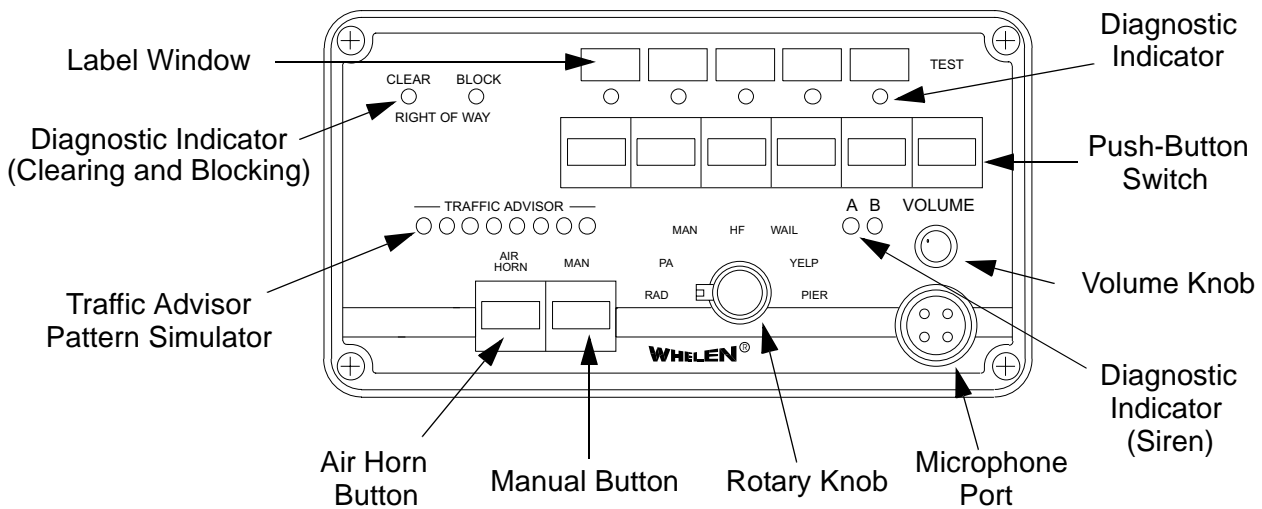
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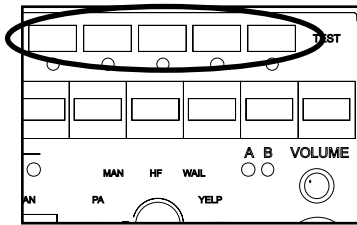
## Understanding serial communication...

A serial communication system is a local area network designed to enable the user to operate and monitor any and all installed serial communication components. Serial control is handled through the MPC-NFPA Multi-Purpose Controller, the heart of the serial communication network. The MPC-NFPA has been programmed by Whelen (or an authorized Whelen representative), based upon not only what serial components are installed in your vehicle, but exactly how you wanted these components configured. Being that the number of possible configurations is staggering, this manual uses a basic, standard configuration to outline how the MPC-NFPA is used.

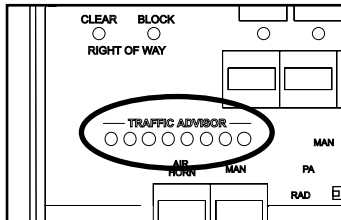
The MPC-NFPA also serves as a diagnostic tool, alerting you to any malfunctions occurring in your system. This feature is possible because every serial communication component contains computer processors that enable the MPC-NFPA to communicate with an individual component and confirm it's proper operation. If there is a malfunction (such as a burned out light) the MPC-NFPA alerts you to the failed components condition.

## Section 1: The MPC-NFPA Controls

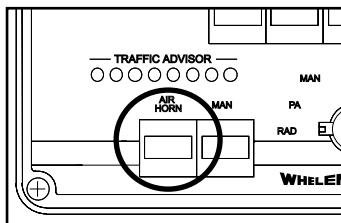




**Label Window** - The label window displays the names of the configurations for a specific switch or button (called controls). There are 8 label windows; one for each of the 8 controls. The label windows are backlit and are illuminated when the dashboard lights are turned on (via the vehicle's dashlight dimmer switch).

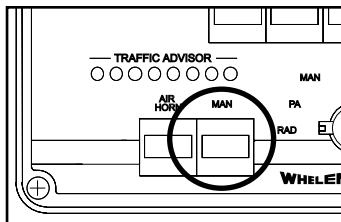


**Traffic Advisor Pattern Simulator** - If the vehicle is equipped with a Whelen Traffic Advisor, the Traffic Advisor pattern simulator displays the currently selected Traffic Advisor flash sequence (e.g.: If the Traffic Advisor is a flash-to-left pattern, the pattern simulator will sequentially flash from right to left).

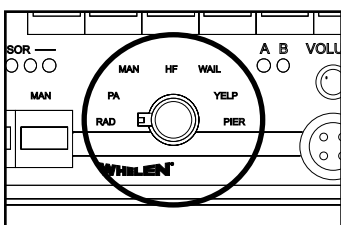


**Air Horn Button** - The Air Horn button produces a simulated air horn tone from your vehicle's loudspeaker. This tone is generated for as long as the Air Horn button is pressed.

**Note:** *The Air Horn button does not function when the Rotary Knob is in the RAD position.*



**Manual Button** - The Manual button generates a variety of tones depending on what position the Rotary Knob is in. For further explanation of this button's function, refer to the Rotary Knob section of this manual.



**Rotary Knob** - The Rotary Knob controls the siren and PA (Public Address) functions of the B-LINK™ network. There are 7 positions that may be selected. Each position and its function is outlined below:

**RAD (Radio Repeat)** - When the rotary knob is in the RAD position, any signal that is received by the vehicle's two-way radio will be simultaneously broadcast over the vehicle's loudspeaker (the two-way radio must be connected to the B-LINK™ network as described in the MPC-NFPA Installation Manual). This function overrides any other siren functions.

**PA (Public Address)** - When the rotary knob is in the PA position, public address functions are operational. Messages may be broadcast over the vehicle's loudspeaker when the microphone, connected to the Microphone Port, is in use. The volume level of PA transmissions is controlled by the Volume Knob. If the Manual button is pressed while the Rotary Knob is in this position, a "ramp-up" siren tone will be generated by your vehicle's loudspeaker. This tone is generated until the Manual button is released. The tone then changes to a "ramp-down". The Air Horn tone may be generated by pressing the vehicle's steering wheel horn button (if the vehicle's horn has been wired to the B-LINK™ Network).

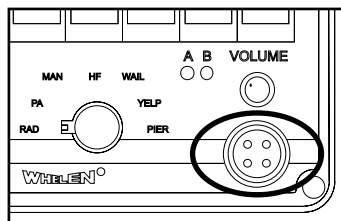
**MAN (Manual Siren)** - When the rotary knob is in the MAN position, pressing the Manual button generates a tone that rises in pitch to a preset level. This tone is generated for as long as the MAN button is pressed. The same tone may be generated by pressing the vehicle's steering wheel horn button (if the vehicle's horn has been wired to the network). Please note that the microphone will override the siren function.

**HF (Hands Free Operation)** - When the rotary knob is in the HF position, the siren functions of the B-LINK™ Network are placed in a stand-by mode. Siren tones are activated by a single “tap” on the MAN button or a single “tap” on the vehicle's steering wheel horn button (if the vehicle's horn has been wired to the network). This enables the vehicle operator to control siren functions without having to remove their hands from the steering wheel. The first “tap” produces a “Wail” tone (a steady, rise and fall sound). A second “tap” produces a “Yelp” tone (a fast, rise and fall tone). A third “tap” produces a “Piercer” tone (an extremely fast, rise and fall tone). The next “tap” returns the siren to a “Wail” tone and the cycle repeats itself. Two, short “taps” will stop the siren.

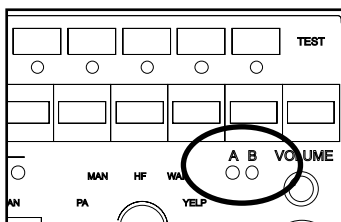
**WAIL (Wail Tone)** - When the rotary knob is in the WAIL position, a steady, rise and fall tone is produced. A single “tap” on the MAN button or a single “tap” on the vehicle's steering wheel horn button (if the vehicle's horn has been wired to the network), changes the siren tone to a “Yelp” pattern (a fast, rise and fall tone). A second “tap”, and the siren returns to the “Wail” tone. Please note that the microphone will override the siren function.

**YELP (Yelp Tone)** - When the rotary knob is in the YELP position, a fast, rise and fall tone is produced. Pressing the MAN button or the vehicle's steering wheel horn button (if the vehicle's horn has been wired to the network), changes the siren tone to a Piercer™ tone. Pressing the button again causes the siren to return to the “Yelp” tone. Please note that the microphone will override the siren function.

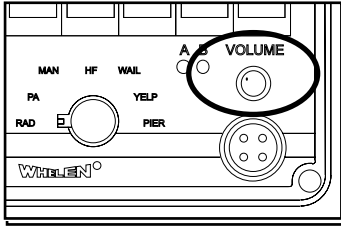
**PIER (Piercer™ Tone)** - When the rotary knob is in the PIER position, an extremely fast, rise and fall tone is produced. Pressing the MAN button or the vehicle's steering wheel horn button (if the vehicle's horn has been wired to the network), changes the siren tone to a simulated Air Horn tone for as long as the button is pressed. Releasing the button causes the siren to return to the “Piercer™” tone. Please note that the microphone will override the siren function.



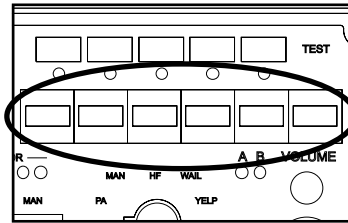
**Microphone Port** - The mounting location for the microphone. A microphone must be connected to this port if the PA functions of the network are to be used.



**Diagnostic Indicator (Siren)** - These diagnostic indicators monitor any speakers connected to the network. Indicator “A” monitors speaker #1. Monitor “B” will monitor a second speaker (if the vehicle is equipped with a second speaker). When a speaker is active, or in use, it's indicator will be on. If a problem is detected with a speaker, it's indicator will flash, thus alerting the operator to the failed speaker's condition. If enabled by the factory or a factory authorized representative, a series of 3, separate alarm tones will be heard from the MPC-NFPA whenever a failure is detected.



**Volume Knob** - The Volume Knob controls the volume of the Radio Re-broadcast feature and Public Address functions. Volume is increased by rotating the knob clock-wise. Rotating the Volume Knob counter-clockwise decreases the volume produced by these features. The Volume Knob has no effect on any siren tones produced.



**Push-Button Switches** - The push-button switches activate specific, pre-programmed functions of the network. These 6 buttons are referred to as controls 1 (furthest button to the left) through 6 (furthest button to the right). If you are not sure exactly how each control is configured, the configuration report, included with the MPC-NFPA, details the customized functions for each control. Although each control is custom configured, controls 5 and 6 handle specific functions of the network:

**Control 5** - Control 5 is typically designated to control Traffic Advisor functions, if the vehicle is equipped with a Traffic Advisor. There are 4 patterns that are pre-programmed by the factory. Although specific patterns can be configured at the customer's request, the basic, non-custom patterns are described here for example purposes:

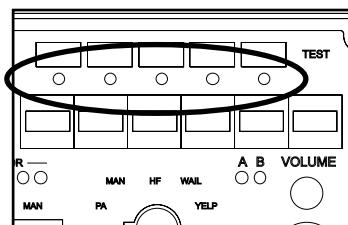
- Press Control 5**..... Sequence to Left
- Press Control 5 a second time**..... Sequence to Right
- Press Control 5 a third time**..... Split Pattern
- Press Control 5 a fourth time**..... Flashing Pattern

**Press and Hold Control 5** to terminate Traffic Advisor operation.

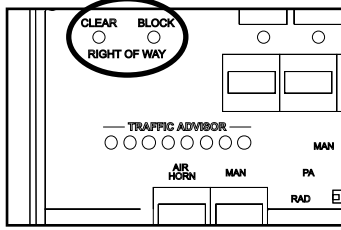
**Control 6** - Control 6 is also the Si-Test™ initiation button. (Refer to the Si-Test™ section below.)

**Si-Test™** - Si-Test™ is a diagnostic feature of the serial communication network. When Si-Test™ is activated, the MPC-NFPA polls each installed network component and confirms it's operating status. To initiate a Si-Test™, press and hold control 6 for at least 5 seconds. As each component is tested, it's diagnostic indicator will turn on if there is no problem detected, or flash if a failure has been detected. If enabled by the factory or a factory authorized representative, a series of 3, separate alarm tones will be heard from the MPC-NFPA whenever a failure has been detected.

**Note:** *Network speakers are tested by generating an ultra-high frequency through each speaker. Although these tones are inaudible to humans, be sure that there is nobody within at least 5 ft. of vehicle's speakers when Si-Test™ is running.*



**Diagnostic Indicator** - There are 5 diagnostic indicators; one for each of the 5 controls. Below each Label Window, there is a diagnostic indicator that is programmed to monitor the operation of that window's control. When a diagnostic indicator lamp is on, all of the programmed functions for that control are functioning properly. If a diagnostic indicator is flashing, one or more of the components being monitored are not functioning. If enabled by the factory or a factory authorized representative, a series of 3, separate alarm tones will be heard from the MPC-NFPA whenever a failure has been detected.



**Diagnostic Indicators (Right of Way)** - These diagnostic indicators monitor the NFPA warning light systems connected to the network. The indicator labeled “CLEAR” monitors the “Clearing the Right of Way” operating mode. The monitor labeled “BLOCK”, will monitor the “Blocking the Right of Way” operating mode. When either warning system is active, or in use, it’s indicator will be on. If a problem is detected with the warning system of one or both system, it’s indicator will flash, thus alerting the operator to MPC-NFPA whenever a failure has been detected.

**Clearing the Right of Way** - The MPC-NFPA designates a switch for the emergency warning light systems on large fire apparatus following the NFPA standards. This switch activates the designated warning light system when responding to the scene of an emergency. Refer to the diagram.

**Note:** *When programming the MPC-NFPA use slide switch 3 for clearing functions.*

**Blocking the Right of Way** - This switch will activate the designated warning light system when at the scene of a call. Refer to the diagram on page 9 for wiring details.

**Note:** *When programming the MPC-NFPA use slide switch 2 for blocking functions.*

## Section 2: Additional Features

The MPC-NFPA has been designed to incorporate auxilliary input features into the network. Essentially, this allows non-network components to activate specific network functions through the MPC-NFPA.

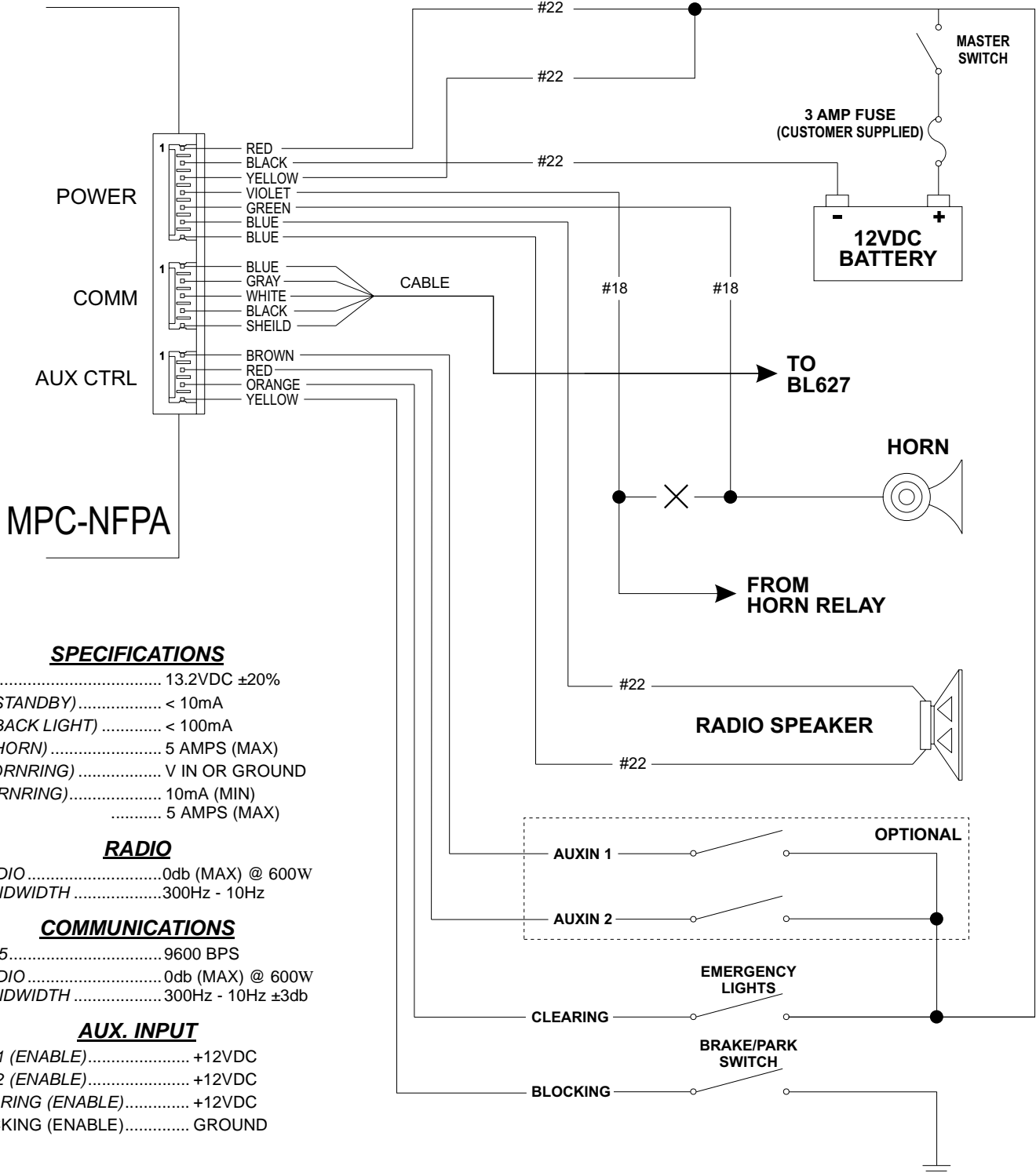
**Auxilliary Input:** The MPC-NFPA may be connected to 2, non-network components. This allows auxilliary switches, such as the vehicle’s neutral safety switch, a K-9 thermostat or a burglar alarm, to activate a pre-programmed, network component. For example: When the interior temperature of the vehicle has exceeded the K-9 thermostat’s pre-set level, the MPC-NFPA will automatically activate a specific, K-9 alarm that will alert the operator to the situation. Refer to the diagram on page 8 for wiring details.

**Auxilliary Output:** The MPC-NFPA may be connected to 2, non-network components. This allows the MPC-NFPA to control auxilliary relays, such as a gunlock. For example: Pushing control button 5 releases the vehicle’s gunlock. Refer to the diagram on page 8 for wiring details.

AUX. INPUT		
PIN #	COLOR	FUNCTION
1	BROWN	AUX IN 1
2	RED	AUX IN 2
3	ORANGE	CLEARING
4	YELLOW	BLOCKING

COMMUNICATION INPUT		
PIN #	COLOR	FUNCTION
1	BLUE	+RS485
2	GREY	-RS485
3	WHITE	AUDIO +
4	BLACK	AUDIO -
5	DRAIN	SHIELD

POWER INPUT		
PIN #	COLOR	FUNCTION
1	RED	+12V IN
2	BLACK	GROUND
3	YELLOW	BACK LIGHT
4	VIOLET	HORN RING
5	GREEN	HORN
6	BLUE	RADIO
7	BLUE	RADIO



**SPECIFICATIONS**

V IN..... 13.2VDC ±20%  
 I IN (STANDBY)..... < 10mA  
 I IN (BACK LIGHT) ..... < 100mA  
 I IN (HORN) ..... 5 AMPS (MAX)  
 V (HORNRING) ..... V IN OR GROUND  
 I (HORNRING)..... 10mA (MIN)  
 ..... 5 AMPS (MAX)

**RADIO**

V RADIO.....0db (MAX) @ 600W  
 BANDWIDTH .....300Hz - 10Hz

**COMMUNICATIONS**

RS485.....9600 BPS  
 V AUDIO.....0db (MAX) @ 600W  
 BANDWIDTH .....300Hz - 10Hz ±3db

**AUX. INPUT**

AUX 1 (ENABLE)..... +12VDC  
 AUX 2 (ENABLE)..... +12VDC  
 CLEARING (ENABLE)..... +12VDC  
 BLOCKING (ENABLE)..... GROUND