07/23/08

CE AND C SP US APPROVED

## 2 Wire Navigator Accessible Pedestrian Signal

# Installation Manual

### For CCUs with Rev 2.0 software or higher

## System Installation

Please read Operation Manual for description of products, functions and settings.

Please read these installation instructions completely before beginning an installation.

Overview

Installation involves installing the Central Control Unit (CCU) in the intersection control cabinet and the Push Button Stations (PBS) in the field. The PBS's replace any existing pedestrian push buttons mounted on poles.

Polara's recommended wiring is to have a dedicated pair of wires from the traffic cabinet to each button, or a dedicated pair to each crosswalk set/phase of buttons (see pg. 13). This method of wiring ensures the system fails safe should any conductor open.

The 2-Wire Navigator System will function with just one common for all buttons and one conductor for each crosswalk set/phase of buttons. However, if a single common wire is used for all buttons, or if a multi-conductor cable is run to each corner and one common is shared for two different phases/crosswalks, Polara recommends that our Ped Station Monitor (P/N: 2WPSM-001) be installed because a false walk indication can occur if the common becomes open between the buttons and the traffic cabinet.

Inside the traffic signal control cabinet, the CCU is wired between the push button wires and the PED button inputs to the traffic signal system. The CCU is also wired to the PED WALK and DON'T WALK load switches, and to a constant source of lightning protected AC line voltage. Additional wiring, for advanced functions, is optional. The PBS's receive operating power from the CCU over the two wires connected to them, and send and receive digital data over the same wires. **NOTE: This means that you can never operate a contact closure button on the same wires as Navigators, or temporarily substitute a standard push button for a PBS unless you rewire the cabinet back to normal for that phase, and use all standard push buttons for that phase. Also, do not use crimp-on forks on solid wire. If the crimp becomes loose, data may not transfer even though voltage conducts. Loop solid wire directly around screw.**

An experienced two man crew should be able to install an 8 push button intersection in 4 hours or less.

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# Summary of Installation Steps

Details for each step are found on pages 4 through 6

## STEP 1

Plan PBS locations (if special messages).

Verify arrow directions are correct.

Set IDs for each crossing/phase.
(temporary shop hook-up)

## STEP 2

Place intersection in PED Recall.

Determine CCU location in cabinet. Install.

Determine Fail-Safe Interconnect Board location. Install.

## STEP 3

Attach 50 pin connector/cable assembly to CCU.

Route cables to hook-up locations.

Connect wires per pages 12 -14.

## STEP 4

Disconnect CCU power cord from CCU.

Connect stripped power cord end to 115 VAC source.

DO NOT POWER UP CCU YET.

## STEP 5

Remove existing push buttons (if present).

Determine proper orientation for each PBS.

Drill and tap any necessary holes.
(template on page 22)

## STEP 6

Remove signs from PBS(s).

Install boot onto button wires.

Connect button wires to PBS. Seal boot. (see page 15).

Bolt PBS on pole.

Install sign.

## STEP 7

Perform system operational check.

**Make sure each PBS has its unique ID set.**

Set preferences with Configurator.

Complete final system sign-off sheet.

**PREPARATION**

Prior to the actual installation, some planning is required. The System supports 4 pedestrian phases. **You must establish a relationship between the intersection PED phase numbers and the CCU channels A, B, C and D.** Each channel can connect up to three PBSs, where the third PBS would be located on an island. It is recommended that, at a minimum, a diagram be drawn showing the pole unit locations along with phase and channel information. A diagram installation worksheet is provided on page 11. If possible, it is recommended you configure the system with a controller in the shop before installing in the field (See System Configuration section in the Operations Manual). This way, probably, only volume adjustments will be needed in the field. Tag/Mark each unit with its ID and location. Ex: NW Corner, Crossing Broadway, A1. **Proper assignment of individual ID's is critical for proper installation.** If a PBS has a custom message provided by Polara, it will have a label on the back denoting the street it is crossing. You must make sure you install each at its proper location and update or confirm its ID once installed.

NOTE: The Navigator can be provided with additional wires for connection to an auxiliary push button such as for a bike lane push button, etc... Call factory for details. The unit must be ordered with this option. You cannot just connect the auxiliary button to the terminals or to the button field wires. The auxiliary button will not work unless connected via special wires Polara provides for this purpose.

**Note: If a system is installed while it is raining you must keep water from getting inside the Push Button Stations and CCU. Warranty is void due to failures caused by internal water damage. If units must be opened to change the arrow direction or voice chip, we recommend this be done indoors prior to installation.**

**INSTALLING CCU IN TRAFFIC CONTROL CABINET**

1. Place the intersection in Ped Recall mode since the Ped buttons will not be available.
2. Choose a location inside the traffic control cabinet for the CCU. It can sit on a shelf, on top of an existing piece of equipment, or mount on the wall utilizing the optional mounting plate Polara offers (order P/N 850-172).
3. Plug in and screw down the 50 pin cable assembly to the CCU.
4. Refer to the wiring information on pages 12-14 for the following connections:

    4.1 Disconnect ped button field wires inside cabinet keeping track of phase information. We recommend you label each wire by phase and confirm the phase as you disconnect them. Polara provides a Fail-Safe Interconnect Board for fail-safe protection and clean wire connections. Connect the push button field wires (+ and -) to this board per phase. Connect the appropriate channel wires from the 7 conductor CCU cable (CCU Cable #1) and the Fail-Safe Interconnect Cable as shown on page 13.

    4.2 Connect the appropriate conductors on cable #2 to the ped inputs. **Be careful that the bare ends do not touch any 115 VAC feeds.**

**4.3** **Warning: The following connections are made to the ped head 115 VAC Walk and Don't Walk load switch feeds. We recommended you power down the Ped Heads or place the intersection in flash before making these connections.** Connect the appropriate conductors on cable #4 to the appropriate Ped Head load switch outputs (by phase) (See pg 12).

4.4 Note that the CCU power cord has a quick disconnect coupling. Unplug this before making the following connection. Connect the CCU power cord to the same lightning protected 115 VAC source and circuit breaker that powers the traffic controller. **Note: It should not be connected to a GFI protected outlet.**

**4.5** **Double check all of the connections per the wiring diagram. The CCU is ready for power up but do not power it up until all the Push Button Stations are installed.**

**INSTALLING PUSH BUTTON STATIONS ON POLES**

Remove existing push buttons from poles.

Determine if Navigator PBS's have special messages. If there is a label on the back with street names, then they have special messages. Determine location for each per the street being crossed.

The recommended button height from the ground to the center of the push button is 42" maximum. It can be lower, but should not be higher.

**Note: The visually impaired use the face of the push button station and the arrow on the button to determine the direction of travel. The arrow should point across the street in the direction of travel and, when mounted, the sign of the PBS should be parallel with the crosswalk. To ensure proper mounting orientation place the outside of your forearm against the sign with your fingers straight. Your arm should be parallel to the crosswalk and point to where the crosswalk ends across the street. If your arm does not point to where the crosswalk ends, remount the PBS so it does.**

Remove the sign from each PBS by removing the 4 screws holding the sign. If the arrow direction is correct there is no need to open the unit. If the arrow or the voice chip need to be changed, remove the 6 cover screws and carefully bring the cover to approximately 60° which frees the bottom hinge, then remove the cover. Place the cover on a flat surface with the backside facing you. To change the arrow direction, loosen the 4 screws that hold it 1-2 turns, then slowly press on the front of the button and turn the button diaphragm counter-clockwise. The button diaphragm assembly should pop out. Orient the arrow in the proper direction. Place the diaphragm so each tab goes into its pocket and tighten the 4 screws. The screws must not pinch and bind the diaphragm to the cover inhibiting its movement. Reinstall cover and six screws. **Be careful not to drop the cover and break the hinge. Also keep it away from metal pole or other metal objects. The magnet may pull the diaphragm assembly out and possibly damage it if it comes too close to other metal objects.**

Hold the PBS against the pole in the proper orientation (as described earlier) and mark on the pole for the two mounting holes (these are on 6" centers). Drill and tap them to ¼-20 thread. See page 22 for template.

Approximately 3⅜" (3.44") below the center of the bottom ¼-20 hole a wire exit hole is needed. If a push button frame was on the pole this hole may already exist. If a hole does not exist, drill a ⅝" minimum diameter hole. **Do not drill with the PBS open near the pole. The magnets on the speaker and button will attract shavings potentially causing problems.**

See exhibit on page 15 before performing following step. Slide rubber boot over button wires. Connect button wires to terminals observing polarity **(Do not use crimp on forks, they interfere with the rubber boot)**. Bend wires 90º to unit. Apply silicone to boot edge, then press boot into round cavity on back of PBS so that bellows portion collapses inward. Apply tape to wires then onto boot so boot is held firmly to the wires in this position. Make sure wires are well taped and sealed so water cannot follow wires into boot and terminal block area.

**NOTE: If water gets inside the boot/terminal area it will corrode and eat through the wires causing a failure.**

Bolt PBS to pole using two ¼-20 bolts and washers provided. Tighten until secure on pole.

If the PBS is going to be mounted on a wooden pole, mounting diagrams are available for download at http://www.polara.com/assistance.htm (or click on support button on main page). You can also contact Polara for more information.

**CCU/NAVIGATOR SELF CHECK FEATURE**

2-Wire Navigator systems with software versions 1.10 or later have a self-check feature. This feature identifies any unresponsive push button stations and places a constant ped call on the corresponding phase. All existing software revisions of the CCU and Navigator are still compatible with each other; however, any mixing of versions prior to 1.10 will disable the self-check feature.

This feature uses the unique identification programmed into each push button station (A1, A2, etc…) with the Configurator. System operation is possible prior to programming the IDs; however, the self-check feature will not work as intended.

A self-check is performed every 30 seconds. The CCU sends a special code simultaneously to all push buttons. Beginning 0.5 seconds later, the push buttons, one at a time, send a special code back. The response code contains identifying information based on the programmed ID. Also the timing of the response is based on the programmed ID, so the installer must be sure not to program any duplicate IDs.

Once the CCU has received a particular response code from each PBS, it learns to expect that code from then on, even after a loss of power (permanent memory feature added in CCU version 1.16). If the CCU fails to receive a particular code more than once in a row, it will flash that LED until the next cycle begins. If the CCU fails to receive a particular response code more than three times in a row, it tries to deal with it by resetting the channel (turns power off to the PBS for 8 seconds). After the $6^{th}$ missed response in a row, the CCU locks on a ped call for the affected channel. The channel whose call is placed is based on the ID of the missing response code, so it is essential that the programmed ID match the connected channel. If a non-responsive push button resumes its normal response, the ped call will turn off a few seconds later.

The individual LEDs are lit during normal operation of self-check. At the start of the self-test cycle all of the individual LEDs are turned off. The individual responses are sent by their corresponding PBSs and they are spaced at 0.5 second intervals. Upon receiving the response, the individual LEDs are lit.

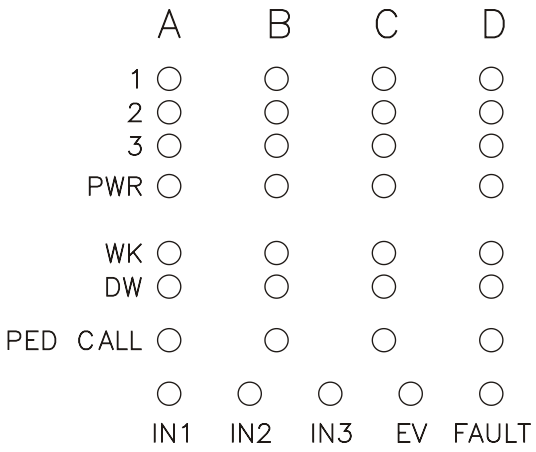
In the event that programmed IDs are changed such that a particular ID is no longer used or the CCU is putting in a locked call, the CCU ID memory can be cleared by using the Configurator. Go to a push button and establish communication with the Configurator. When you get where the display shows “PRESS EITHER READ SETTINGS”, press the CCU Read Settings button and wait for the display to show the first menu item. Then press the CCU Update Settings button. No setting changes are required here. The memory will be cleared either way.

The individual LEDs’ timing during the continuous self-check are shown here.

| Programmed ID | Time after CCU code sent (All individual lights are turned off) |
|---|---|
| A1 | 0.5 sec – A1 is lit until next cycle |
| A2 | 1.0 sec – A2 is lit until next cycle |
| A3 | 1.5 sec – A3 is lit until next cycle (only if third/island button installed) |
| B1 | 2.0 sec – B1 is lit until next cycle |
| B2 | 2.5 sec – B2 is lit until next cycle |
| B3 | 3.0 sec – B3 is lit until next cycle (only if third/island button installed) |
| C1 | 3.5 sec – D1 is lit until next cycle |
| C2 | 4.0 sec – C2 is lit until next cycle |
| C3 | 4.5 sec – C3 is lit until next cycle (only if third/island button installed) |
| D1 | 5.0 sec – D1 is lit until next cycle |
| D2 | 5.5 sec – D2 is lit until next cycle |
| D3 | 6.0 sec – D3 is lit until next cycle (only if third/island button installed) |

Table 1

**Description of CCU Front Panel Status Indicators**




1. **A1, A2, A3, B1, etc…** – The individual LEDs are lit when a response is received from the associated PBS. All individual LEDs are turned off at the start of the self-test cycle.

2. **PWR (POWER)** - Shows when power to pole units is on for a given phase. In general, power should be on whenever either WALK or DON'T WALK is on. This light also blinks whenever data is sent or received between CCU and PBS.

3. **WK (WALK)** - Shows presence of WALK signal for a given phase.

4. **DW (DON'T WALK)** - Shows presence of DON'T WALK signal for a given phase.

5. **PED CALL** - Pushing any PBS on a given phase should cause the light to turn on for the duration of the push and a non-responsive PBS.

6. **IN1-IN3 (GENERAL PURPOSE INPUTS)** - Shows when a given input is on.

7. **EV (EMERGENCY VEHICLE INPUT)** – Shows when any emergency vehicle input 1 through 4 is on.

8. **FAULT** - Indicates that the system self test has detected a problem, or another type of failure has occurred. A CCU fault condition also turns on all of the PED outputs. See Troubleshooting Guide for more information.

**SYSTEM OPERATIONAL CHECK**

Power up system by plugging CCU quick disconnect together, remove controller from Ped recall and restore cabinet to normal operation.

Watch the LEDs on the CCU for the proper blink sequences as described in the CCU/NAVIGATOR SELF-CHECK section above. If you are not getting the correct number of response blinks in each channel to match the number of installed buttons on each channel, confirm that each PBS has the correct unique ID. Then clear the CCU ID memory as described earlier. Once again verify that the LEDs on the CCU provide the proper blink sequence every 30 seconds.

Go to each PBS and observe the following:

- That locate tone is sounding once per second during Don't Walk and Ped Clearance (takes up to 10-15 seconds following power up).
- That a call is placed at the controller, you hear a button click and the LED turns on when you push on the button.
- That when the Ped Walk comes up, you hear a walk sound/message.
- That during the Ped Clearance you hear the locate tone or a clearance sound. Note: If the countdown is chosen it must go through one complete cycle before you will hear the countdown during clearance.
- That the sound volume responds to ambient.

If everything appears to be working properly on each PBS, install signs making sure arrow on sign points in same direction as button arrow. If sign has Braille there should be a label on the backside with the name of the street the arrow is pointing across (street being crossed). Note: Braille bumps of sign are on the side that faces out.

**The units are now ready for final configuration. See pages 6-13 in Operation Manual.**

## Final System Operational Check

The person who performs this should sign off each test to the right of each test, sign below and keep copy in traffic cabinet.

Performed and approved by

Once all PBS's are fully installed and configured, verify the following:
These tests will require two people, one at the controller, the other operating each PBS.

1. Confirm each PBS plays the locate tone during the DON'T WALK mode. _____

2. Push each PBS and verify that the red LED above the push button turns on with the first push, and that a tick is heard for each push. Verify that each press lights the appropriate PED Out indicator on the CCU front panel and that the appropriate PED call is transmitted to the traffic signal controller on the correct phase. Ensure the walk cycle comes up, and based on the activation setting*, the PBS plays the proper walk message and the button vibrates. _____

3. Confirm the proper Clearance sound plays during the Clearance mode. _____

4. Set the traffic controller to a mode that lets you observe real time each button push. During a Don't Walk phase, while someone is watching the controller, have another person push each button 10 times (every 2-3 seconds). Observe that the corresponding Ped Out LED is lit during the push. Make sure the controller registers all 10 pushes. Do this for every PBS. This is to ensure there are no marginal connections or unusual conditions that prevent the control unit from seeing every button push. _____

5. Familiarize yourself with the Configurator, referring as needed to the System Configuration section (pgs. 6-13 in Operation Manual). At each PBS, establish communication with the Configurator, verify the proper ID is set, and get to the point following read setting for Push Button Station (it should read "LOCATE TONE MIN"). Push the Central Control Unit Read Settings button. You should see the two LED's on the Configurator flash for 3-4 seconds and the screen should read "INPUT #1 FUNCTION NONE". If this is what you get, push the Push Button Station Read Settings again. The two LED's should flash for approximately 2 seconds and "LOCATE VOL MIN" should show on screen. Do this two to three more times making sure the proper screen text appears each time. What this is doing is verifying that the communication from the Push Button Station to the CCU is good (wire in ground is good) and no data is being lost. **Correctly performing this test at each PBS is very important to ensure proper operation of the system.** _____

6. Confirm volumes are adequately set and respond to ambient noise. If each PBS performs all of the above correctly the system is operating correctly. _____

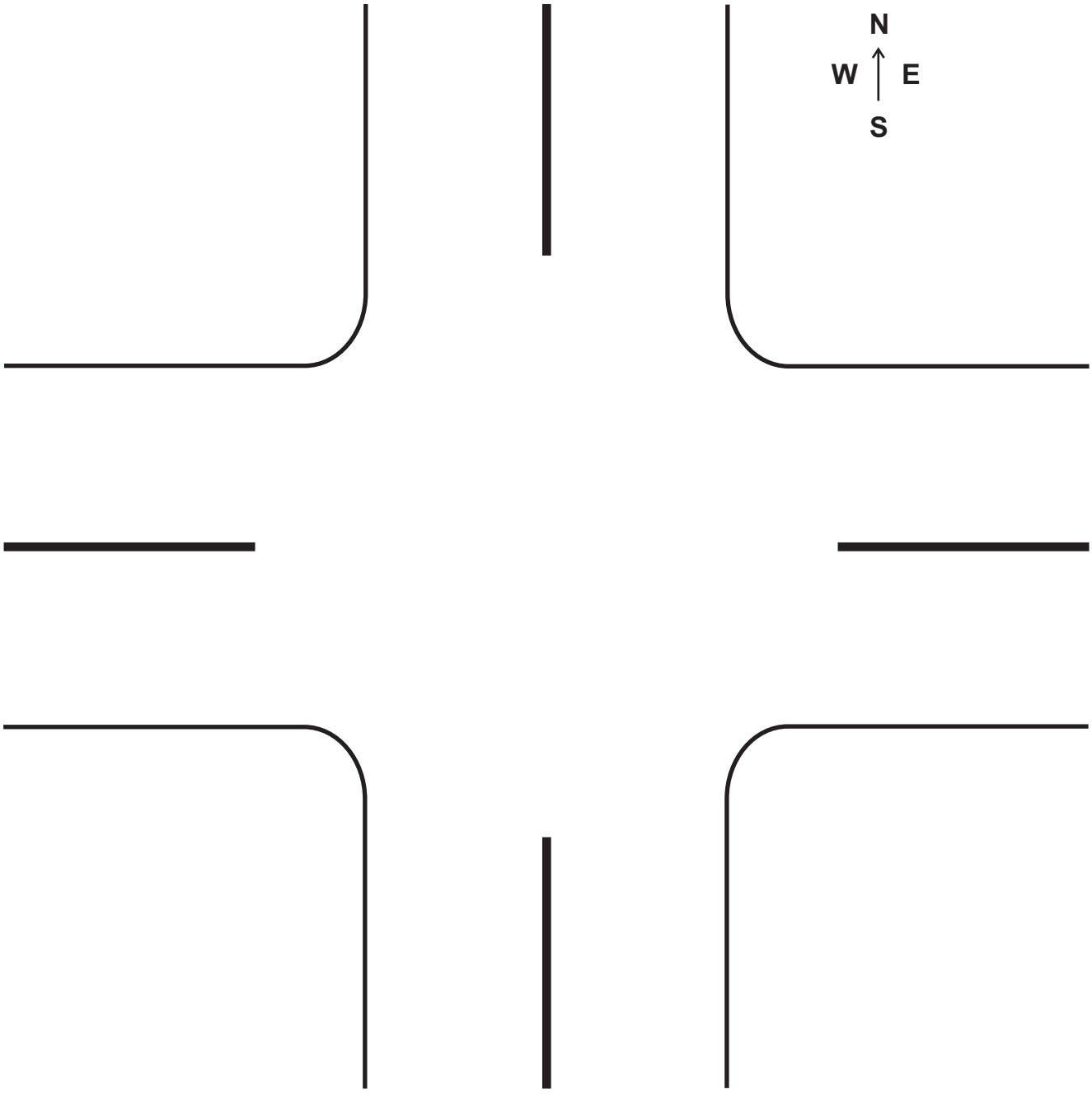
7. Disconnect the power cord from the CCU. Within 2 minutes the fail-safe feature should lock in a call on all phases. Reconnect power cord and the locked calls should clear within one minute. Ensure locked calls clear and LED self-tests blink correctly. _____

8. Disconnect field wire for one button (or one crosswalk) at the Fail-Safe Interconnect Board. Within 2 minutes a call should lock in on the traffic controller for that phase. Reconnect field wire and locked call should clear within 60 seconds. _____

9. During self test, which is occurring every 30 seconds, verify all the individual LEDs are lit according to Table 1. Also, verify Power, Walk & Don't Walk LEDs are on as expected. _____

*Confirm if the walk message is set to come on with any push or only an extended push and push the button accordingly.

Print Name _____ Signature _____ Date _____




Date Installed: _____

Installed By:

Company: _____

Personnel: _____

Special Notes: _____

_____

_____

_____

_____

# CCU CABLE/CONNECTOR WIRING DETAIL

## #1 7 CONDUCTOR CABLE

CONNECTOR PIN NUMBERS

| | | |
|---|---|---|
| COM | BLK | 46 |
| A | BRN | 15 |
| B | RED | 31 |
| C | ORA | 14 |
| D | YEL | 30 |
| COM | GRN | 47 |
| +22 | BLU | 13 |

Disconnect button field wires in cabinet from where they normally connect to and connect field wires to Fail-Safe Interconnect Board according to phasing.

Used for options only

Used for options only

## #2 5 CONDUCTOR CABLE

| | | |
|---|---|---|
| PED COM | WHT/BLK | 34 |
| PED A | WHT/BRN | 18 |
| PED B | WHT/RED | 19 |
| PED C | WHT/ORA | 1 |
| PED D | WHT/YEL | 2 |

Connect to terminals where button field wires used to connect. Matching colored wires of Fail-Safe Interconnect Board connect to these same terminals.

## #3 12 CONDUCTOR CABLE

**USED ONLY FOR OPTIONAL SPECIAL FUNCTIONS**

| | | |
|---|---|---|
| GP IN COM | BLK | 23 |
| GP IN 1 | BRN | 4 |
| GP IN 2 | RED | 39 |
| GP IN 3 | ORA | 21 |
| EV1 | YEL | 5 |
| EV2 | GRN | 38 |
| EV3 | BLU | 22 |
| EV4 | VIO | 37 |
| EV COM | GRY | 6 |
| FAULT COM | WHT | 35 |
| FAULT NO | WHT/BLK | 20 |
| NOT USED | WHT/BRN | |

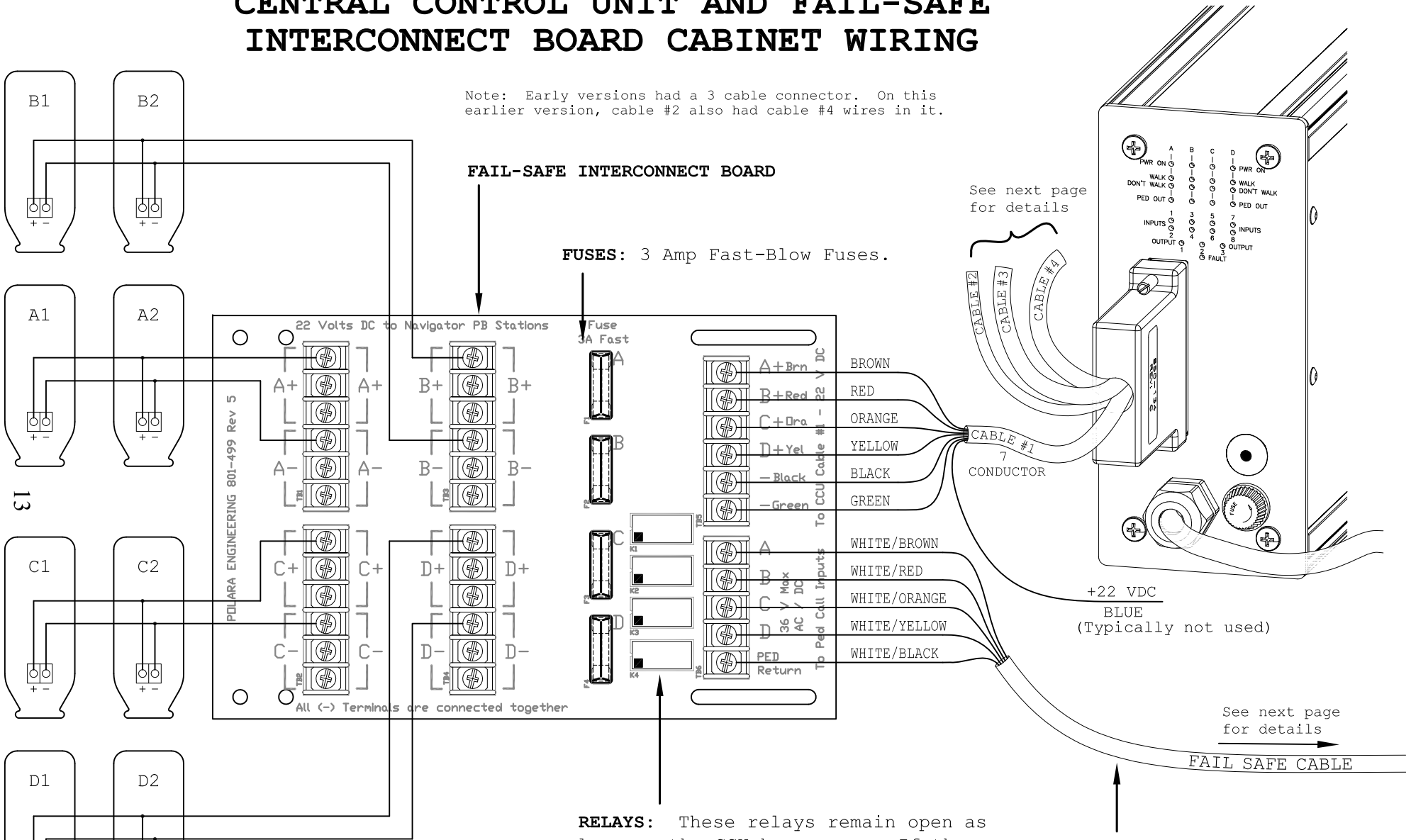
## #4 10 CONDUCTOR CABLE

| | | |
|---|---|---|
| W/DW COM | WHT | 11 |
| A W | BRN | 25 |
| A DW | RED | 43 |
| B W | ORA | 42 |
| B DW | YEL | 8 |
| C W | BLK | 26 |
| C DW | BLU | 9 |
| D W | VIO | 27 |
| D DW | GRY | 10 |
| NOT USED | GRN | 12 |

Connect to 115VAC feeds to ped heads according to phasing.

# CENTRAL CONTROL UNIT AND FAIL-SAFE INTERCONNECT BOARD CABINET WIRING

Note: Early versions had a 3 cable connector. On this earlier version, cable #2 also had cable #4 wires in it.



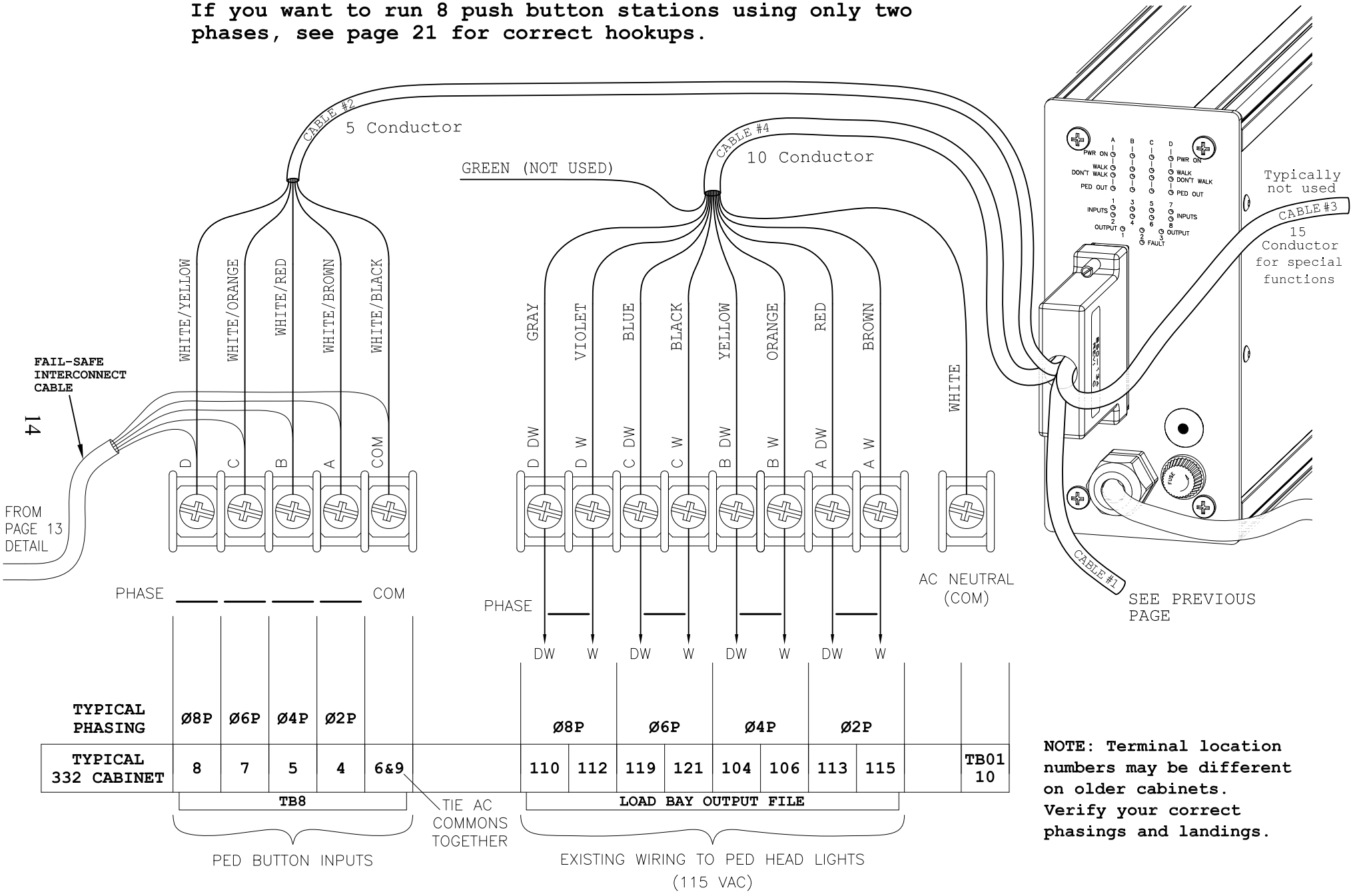

**Common Wiring: The common (-) wires connected to the Navigator PBS units should NOT connect to any other cabinet common or neutral. Separate commons should be dedicated to each channe/phase.**

**RELAYS:** These relays remain open as long as the CCU has power. If the CCU loses power these relays close and lock in a call to the traffic controller ensuring a pedestrian does not get stranded.

**FAIL-SAFE INTERCONNECT CABLE:** The wires on the other end of this cable connect to the same PED input terminals that the matching colors of cable #2 connect to. You will have two wires connecting to each Ped Input. One from cable #2 and one from this cable.

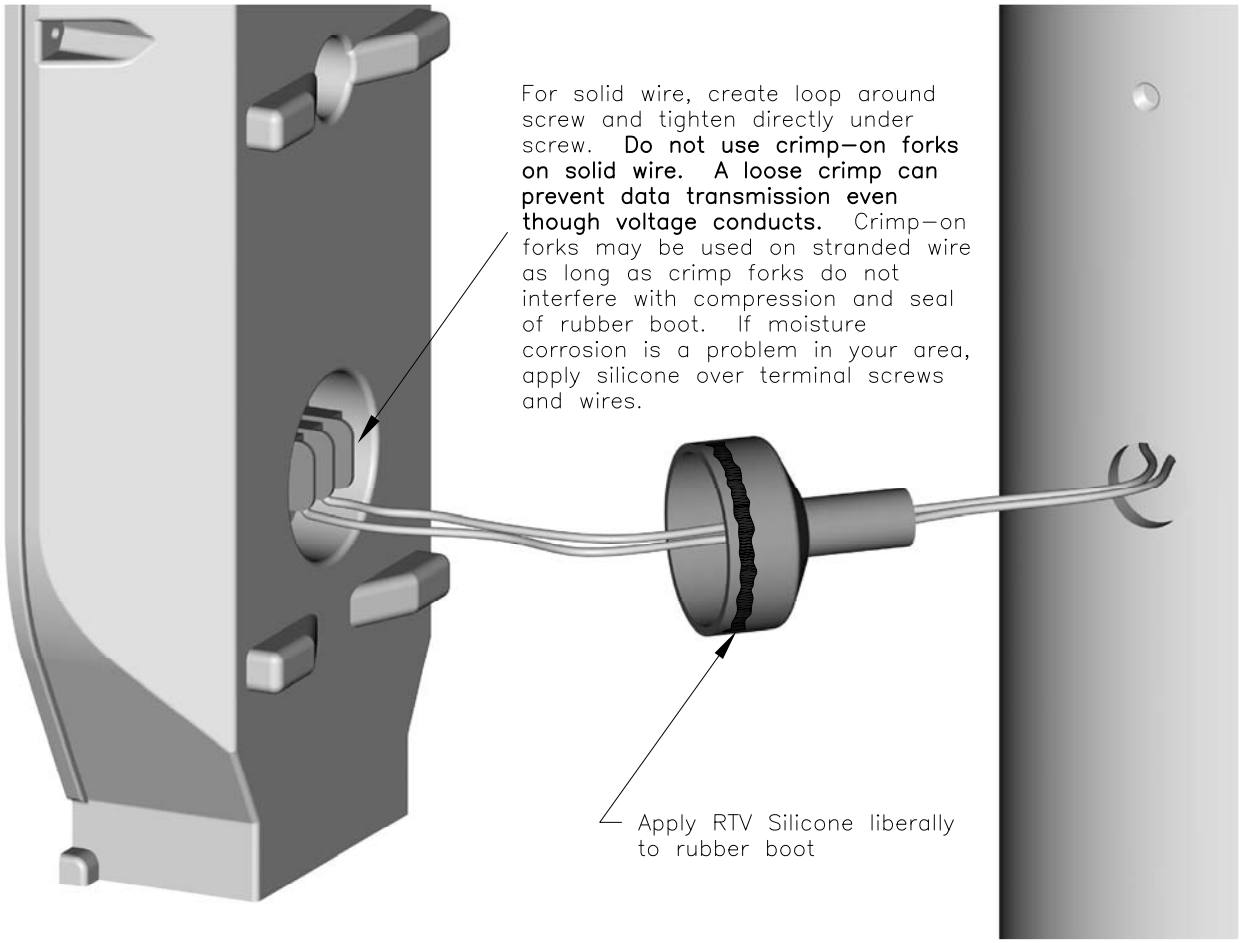
# CENTRAL CONTROL UNIT CABINET WIRING (cont.)

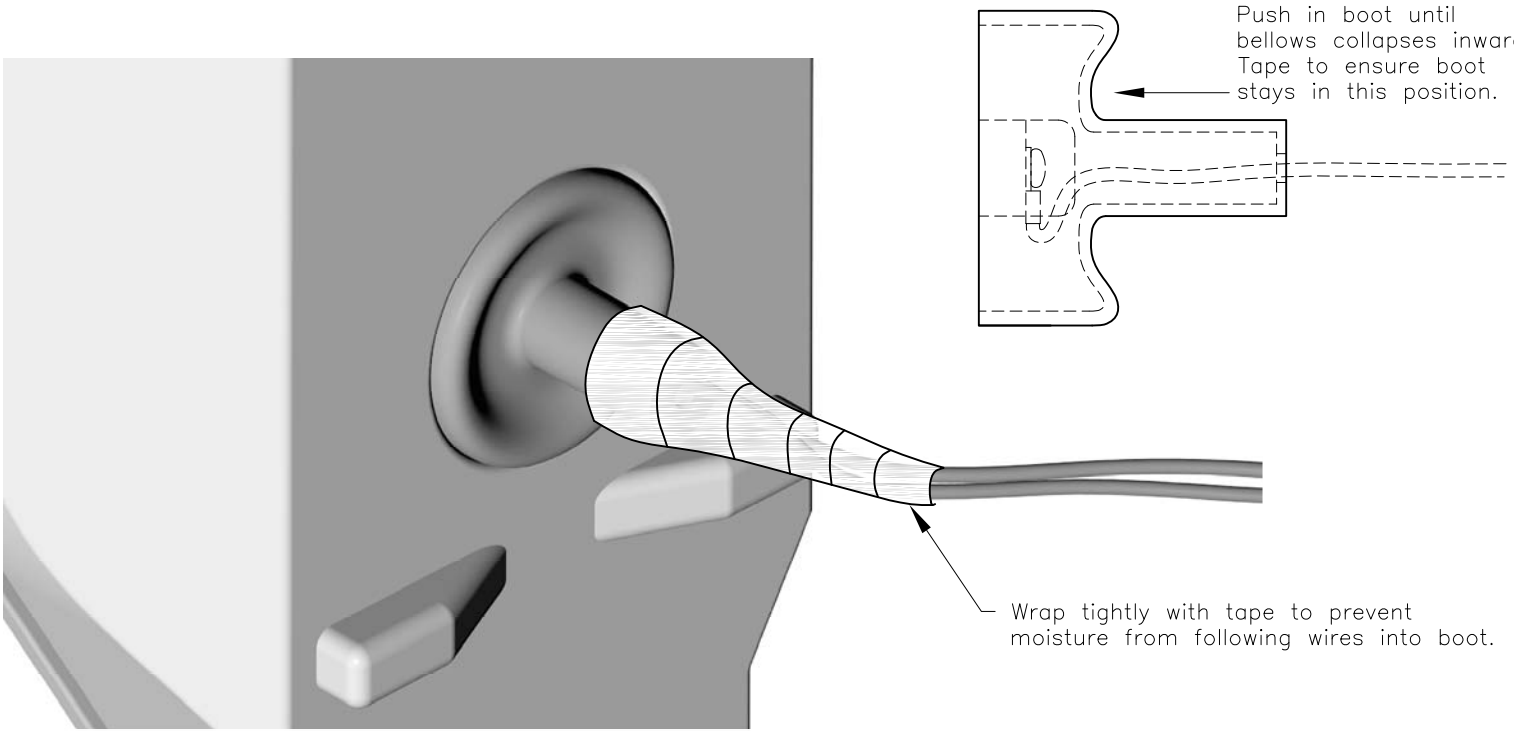
**If you want to run 8 push button stations using only two phases, see page 21 for correct hookups.**




**NOTE: Terminal location numbers may be different on older cabinets. Verify your correct phasings and landings.**

# WIRE ROUTING INSTRUCTIONS



# Default and Field Settings

City _____ State/Province _____ Install Date _____

Intersection: _____

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Street: | | | | | | | | |
| | Corner: | | | | | | | | |
| | ID: | | | | | | | | |
| | Phase: | | | | | | | | |
| | Defaults (Effective with Configurator v1.32, Nav2 v1.36 and Nav4 v1.32) | | | | | | | | |
| LOCATE VOL MIN | 0% | | | | | | | | |
| LOCATE VOL MAX | 50% | | | | | | | | |
| INFO MSG VOL MIN | 65% | | | | | | | | |
| STD WALK VOL MIN | 30% | | | | | | | | |
| STD WALK VOL MAX | 60% | | | | | | | | |
| EXT WALK VOL MIN | 60% | | | | | | | | |
| EXT WALK VOL MAX | 80% | | | | | | | | |
| VOL OVER AMBIENT | 0 dB | | | | | | | | |
| WALK MODE SOUND | STD MSG | | | | | | | | |
| WALK SOUND PAUSE | .5 SEC | | | | | | | | |
| WALK SOUND TRIG | ANY PUSH | | | | | | | | |
| SOUND/VIB TIMER | FULL WALK | | | | | | | | |
| SOUND/VIB RETRIG | BTN PUSH | | | | | | | | |
| CANCEL ON CLEARANCE | YES | | | | | | | | |
| CLEAR MODE SOUND | TONE 1 | | | | | | | | |
| CLEAR TONE PAUSE | 1 SEC | | | | | | | | |
| LOCATE SOUND | TONE 1 | | | | | | | | |
| LOCATE TONE TIME | 1 SEC | | | | | | | | |
| WAIT MSG | NO | | | | | | | | |
| DIRECTION MSG | NORTH | | | | | | | | |
| INFO MESSAGE | NONE | | | | | | | | |
| CANCEL ON WALK | YES | | | | | | | | |
| EXT PUSH TIME | 1.0 SEC | | | | | | | | |
| SECOND LANGUAGE | NO | | | | | | | | |
| THIRD LANGUAGE | NO | | | | | | | | |
| EXT PUSH PRIORITY | NO | | | | | | | | |
| WALK PING PONG | NO | | | | | | | | |
| CLEAR PING PONG | NO | | | | | | | | |

Special Notes: _____

_____

_____

_____

## **Default and Field Settings** (page 2 for islands)

| | | | | | |
|---|---|---|---|---|---|
| | ID: | | | | |
| | Phase: | | | | |
| | Defaults | | | | |
| LOCATE VOL MIN | 0% | | | | |
| LOCATE VOL MAX | 50% | | | | |
| INFO MSG VOL MIN | 65% | | | | |
| STD WALK VOL MIN | 30% | | | | |
| STD WALK VOL MAX | 60% | | | | |
| EXT WALK VOL MIN | 60% | | | | |
| EXT WALK VOL MAX | 80% | | | | |
| VOL OVER AMBIENT | 0 dB | | | | |
| WALK MODE SOUND | STD MSG | | | | |
| WALK SOUND PAUSE | .5 SEC | | | | |
| WALK SOUND TRIG | ANY PUSH | | | | |
| SOUND/VIB TIMER | FULL WALK | | | | |
| SOUND/VIB RETRIG | BTN PUSH | | | | |
| CANCEL ON CLEARANCE | YES | | | | |
| CLEAR MODE SOUND | TONE 1 | | | | |
| CLEAR TONE PAUSE | 1 SEC | | | | |
| LOCATE SOUND | TONE 1 | | | | |
| LOCATE TONE TIME | 1 SEC | | | | |
| WAIT MSG | NO | | | | |
| DIRECTION MSG | NORTH | | | | |
| INFO MESSAGE | NONE | | | | |
| CANCEL ON WALK | YES | | | | |
| EXT PUSH TIME | 1.0 SEC | | | | |
| SECOND LANGUAGE | NO | | | | |
| THIRD LANGUAGE | NO | | | | |
| EXT PUSH PRIORITY | NO | | | | |
| WALK PING PONG | NO | | | | |
| CLEAR PING PONG | NO | | | | |

Special Notes: _____

# 2 Wire Navigator Troubleshooting Guide

| Symptoms | Possible Causes | Solutions |
|---|---|---|
| Upon powering up CCU, one or more power lights turn on, but then turn off and flash every 8 seconds. | There may be a short in the field wiring or polarity at one or more PBS's is reversed. | Recheck that all polarities at PBS's are correct. If they are, check button field wiring for shorts. |
| | A rare possibility is low voltage from CCU internal power supply. This typically affects all four channels. | Measure voltage on Cable #1, blue wire and common. If voltage measures 20.5 volts or less, the power supply output voltage is low. Call Polara for instructions. |
| The used channel power lights are on, one or more channels in constant call (PED Out light(s) on), fault light may be on, one or more PBSs is dead. | - Defective channel in CCU<br>- Fuse on Interconnect board is blown<br>- Bad wiring between Interconnect board and PBS<br>- Internal problem in PBS | The following steps will eliminate each possible cause (in order): Measure the voltage at Interconnect board, where cable #1 connects, to verify that 22 VDC is present on all used channels. If 22 VDC is not present, CCU needs to be replaced. If 22 VDC is present, measure for voltage on each channel where button field wires connect to Interconnect board. If no voltage, fuse on Interconnect board is blown. If 22 VDC is present, remove cover of dead PBS. Measure voltage across red and black wires inside PBS. If no voltage, check connections of field wires to terminal block on backside of PBS and check for voltage on field wires. If 22 VDC is present on field wires, replace PBS. If there was 22 VDC on the red and black wires inside PBS, see if the unit has a replaceable fuse (older units had fuses). If fuse is blown, replace the fuse. If there is no fuse present or the fuse is good, observe the 2 LEDs on the PCB. The data LED should light when the button is pushed and the Mode LED should be on during Don't Walk, flash rapidly during Walk, and flash once per second during Clearance. If the LEDs do not operate this way, power down the PBS and try replacing the control chip. If it still does not work, replace PBS. |

| | | |
|---|---|---|
| One or more channels in constant call (PED Out light(s) on), Fault light may or may not be on, buttons appear to be working normally. | Individual IDs for each PBS not set correctly | Confirm each PBS is set with correct, unique ID. Clear CCU Log/Map (remap). Observe CCU operation for 3-5 minutes. If PED Outs do not turn on, system is working properly. |
| | CCU Self Test communication of IDs is corrupted by noise on power lines, map corrupted | To fix IDs corrupted by noise, the CCU must be upgraded to one with revision 1.31 or higher software. |
| Fault light on, all used channel power lights are on, PED Out light(s) on. | CCU has shut down a PBS 25 times or more due to numerous Self Test ID failures. | Requires CCU software upgrade to rev 1.31 or higher. |
| Fault light on, PED Out lights on, no other lights on. | Hardware failure or blown fuse in CCU | Check fuse, if blown, replace. If fuse is OK, replace CCU. |
| No sound, button LED lights when button is pushed, button vibrates during walk, button places call to CCU | Defective Speaker, Defective Voice IC, or Defective Control IC | Open PBS. Disconnect one speaker wire from PCB. Measure across speaker terminals. It should measure 6-9 ohms. If it does not, replace speaker. If it measures correctly, try replacing the voice IC. If still no sound, try replacing the control IC. If still no sound, replace the PBS. |
| PBS appears to operate normally but one or more PBS does not place a call to Traffic Signal Controller | Incorrect wire connections on Cable #2 | Recheck all cable #2 connections. |
| | Defective CCU | Replace CCU. |

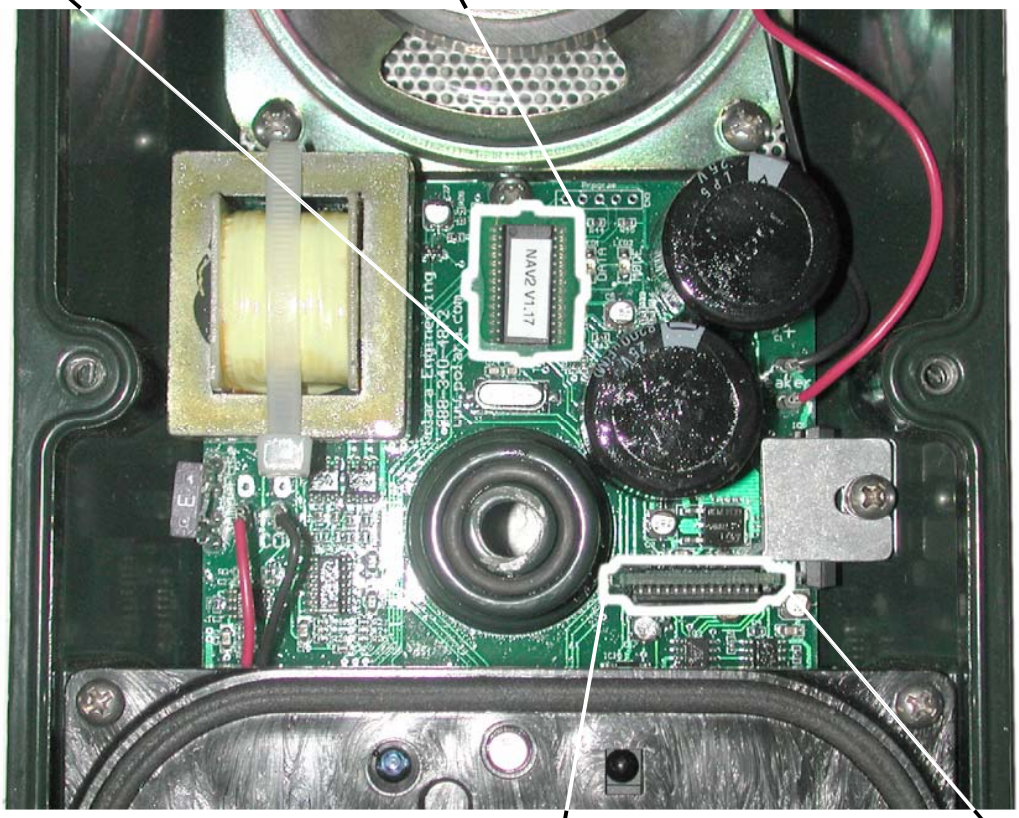
## Changing Control Chip and Voice Chip in the Field

# Before changing either chip, power down the unit.

Polarity Dot

## Control Chip:

To remove, pull chip directly out.
To replace, align connector on control chip with header on PCB and make sure polarity dot on chip is towards the top as shown.

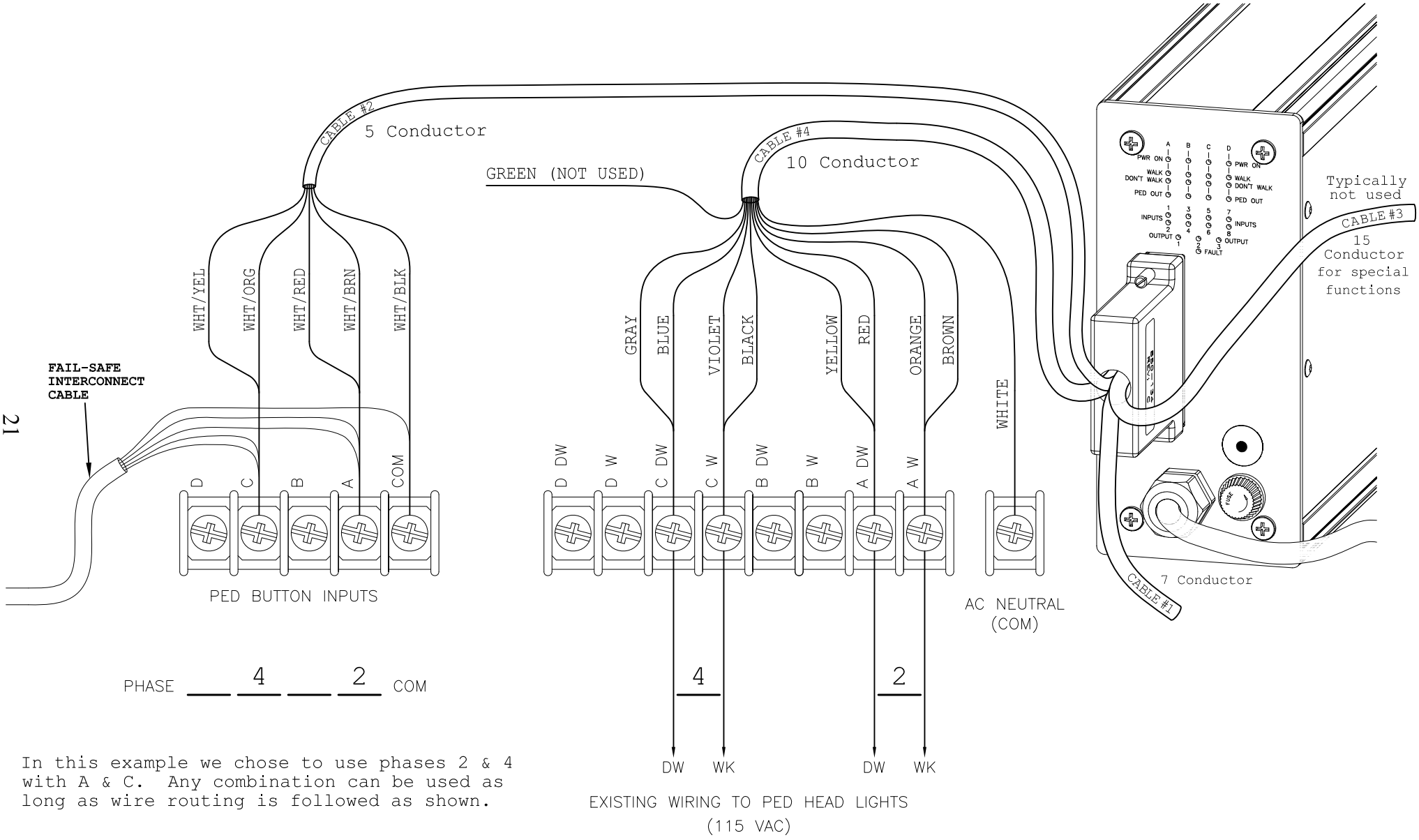



Match polarity dot on Voice Chip with dot on Main PCB (IC should face down).

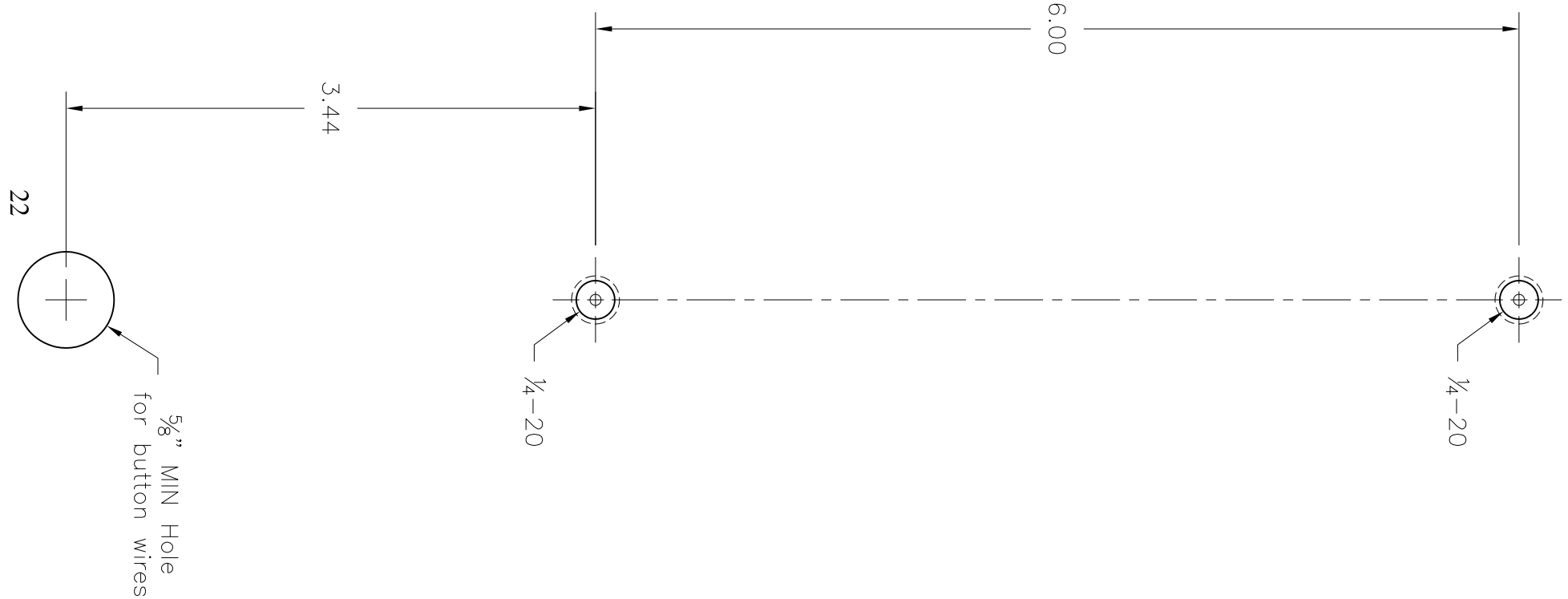
## Voice Chip:

To remove, pull chip directly out.
To replace, align connector on chip with header on PCB making sure the polarity dot on the chip matches with the polarity dot on the Main PCB.

# EXAMPLE FOR CENTRAL CONTROL UNIT CABINET WIRING USING FOUR CHANNELS ON TWO PHASES




In this example we chose to use phases 2 & 4 with A & C. Any combination can be used as long as wire routing is followed as shown.

# MOUNTING HOLE DIAGRAM
# FOR PUSH BUTTON STATION

When printing this page in Adobe Acrobat, be sure that "None" is selected in Print Scaling in the printing dialog box to ensure that document is printed to the correct scale. Otherwise, recreate template using dimensions shown.