



QUICK REFERENCE GUIDE INSTALL PSO+ TRANSMITTER/RECEIVER MODULES

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Version B.1

The following procedure should be used when installing Phase Shift Overlay Plus (PSO+) Track Circuits utilizing PSO+ Transmitter, 7A481 and PSO+ Receiver, 7A483.

WARNING

VERIFY THAT THE PSO+ TRANSMITTER'S AND RECEIVER'S SOFTWARE, FREQUENCY, AND ADDRESS FORMATS ARE AS SPECIFIED BY THE RAILROAD'S OR AGENCY'S APPROVED DESIGN. FAILURE TO DO SO MAY LEAD TO INCORRECT OR UNSAFE OPERATION OF THE TRACK CIRCUIT.

IF ANY RECEIVER IS CALIBRATED IN POOR BALLAST CONDITIONS, IT MUST BE RE-CALIBRATED WHEN BALLAST CONDITIONS IMPROVE.

FAILURE TO FOLLOW THE RAILROAD'S OR AGENCY'S APPROVED DESIGN REGARDING RECEIVER SETTINGS AND CALIBRATION MAY LEAD TO POSSIBLE UNSAFE OPERATION OF THE TRACK CIRCUIT.

AFTER CALIBRATION, VERIFY THAT THE TRACK CIRCUIT DE-ENERGIZES WHEN THE TRACK CIRCUIT IS SHUNTED WITH THE APPROPRIATE CALIBRATION RESISTANCE (0.06, 0.2, 0.3, 0.4, OR 0.5 OHMS). FAILURE TO DO SO MAY LEAD TO INCORRECT OR UNSAFE OPERATION OF THE TRACK CIRCUIT.

FOLLOWING INSTALLATION OR AFTER ANY RECEIVER MENU CHANGES HAVE BEEN MADE, RECALIBRATE THE RECEIVER AND TEST FOR PROPER OPERATION PER THE REQUIREMENTS SPECIFIED IN TABLE 6-4 AND TABLE 6-5 OF SIG-00-10-16, PSO+ I & I MANUAL.

9. Press and hold the MENU Button for approximately two (2) seconds until TLVL=XXXX (e.g., TLVL=LOW) appears. Transmitter programming is complete.
10. Press and hold the MENU button for approximately two (2) seconds. The top level menus displays PSO+ XXXX TX (Code) (e.g., PSO+ 4000 TX A) appears in the 4-Character Display in four letter segments.

CONFIGURE PSO+ RECEIVER:

1. Observe the face of the Receiver. Either DIAG is flashing or PSO+ XXXX RX (Code) (e.g., PSO+ 645 RX C) scrolls in the 4-Character Display.
2. If desired frequency appears in the window, proceed to CALIBRATE PSO+ RECEIVER. If PSO+ XXXX RX (Code) (e.g., PSO+ 645 RX C) shows the wrong frequency in the 4-Character Display, proceed to step 4. If DIAG is flashing, proceed to step 3.
3. If DIAG is flashing, press and hold the MENU button for approximately two (2) seconds. DIAG stops flashing. Navigate to the RFRQ menu. Press and hold the MENU button for approximately two (2) seconds. NONE flashes in the 4-Character Display. Proceed to step 5.
4. If PSO+ XXXX RX (Code) (e.g., PSO+ 645 RX C) appears in the 4-Character Display and the frequency is not the desired frequency, press and hold the MENU button for approximately two (2) seconds. The currently selected frequency (e.g., 645) flashes in the 4-Character Display.
5. Press and hold the MENU button for approximately two (2) seconds. The currently programmed frequency or NONE appears. Press the DATA button until the desired frequency appears, then press and hold the MENU button for approximately two (2) seconds. SET RFRQ = XXXX? (e.g., SET RFRQ=156?) appears.
6. Press and hold the MENU Button for approximately two (2) seconds until RFRQ=XXXX (e.g., RFRQ=156 HZ) appears. Receiver programming is complete.
7. Press and hold the DATA button for approximately two (2) seconds. The top level menus displays PSO+ XXXX RX (Code) (e.g., PSO+ 156 RX C) appears in the 4-Character Display in four letter segments.

CALIBRATE PSO+ RECEIVER:

1. Observe face of PSO+ Receiver. Verify the Calibration Required (Cal Req) LED is on.

2. When the track ballast is good, connect a track test shunt (hardwire, 0.06-ohm, 0.2-ohm, or as required) across the track at the receiver track connections. When the ballast is poor, connect the shunt across the track at a point 30 feet beyond the receiver track connections. Verify solid connections of the shunt to each rail.
3. To Calibrate the Receiver
 - Navigate to the CAL menu.
 - Press the MENU Button until *CAL appears. Release the MENU Button. The calibration process begins.
 - *CAL and CAL alternately flash during the calibration process.
 - PASS or FAIL appears for twenty (20) seconds when calibration is complete. When PASS appears, continue to Step 4. If FAIL appears, the CALIBRATION REQUIRED LED remains lit and DIAG will flash on the 4-Character Display.

WARNING

IF "FAIL" APPEARS ON THE DISPLAY, THE CALIBRATION REQUIRED LED REMAINS LIT, OR THE RELAY DRIVE (RLY DR) LED DOES NOT LIGHT, THE CALIBRATION PROCESS DID NOT COMPLETE. SHOULD THIS HAPPEN, CYCLE THE UNIT POWER AND THEN REPEAT STEP 3. IF THE UNIT FAILS TO COMPLETE THE CALIBRATION PROCESS, FURTHER TROUBLESHOOTING IS REQUIRED.

4. Remove the test shunt. The Cal Req LED should go out. If Cal Req LED does not go out, the calibration process has failed (refer to the WARNING above). Inspect all equipment and connections and repeat steps 1 & 2. If the calibration fails again, further troubleshooting is required.
5. The RLY DR LED should light once the test shunt has been removed. If not, proceed to Appendix B, Troubleshooting.

NOTE

In the text on this side of the document and on the drawing on the reverse side of the document, all references to Section numbers are those section numbers found within the Siemens Phase Shift Overlay Plus (PSO+) Installation and Instruction Manual, SIG-00-10-16.

INSTALL PSO+ UNITS

1. Install and connect all PSO equipment per the railroad's or agency's approved design.
2. Connect all required wiring per the railroad's or agency's approved design.

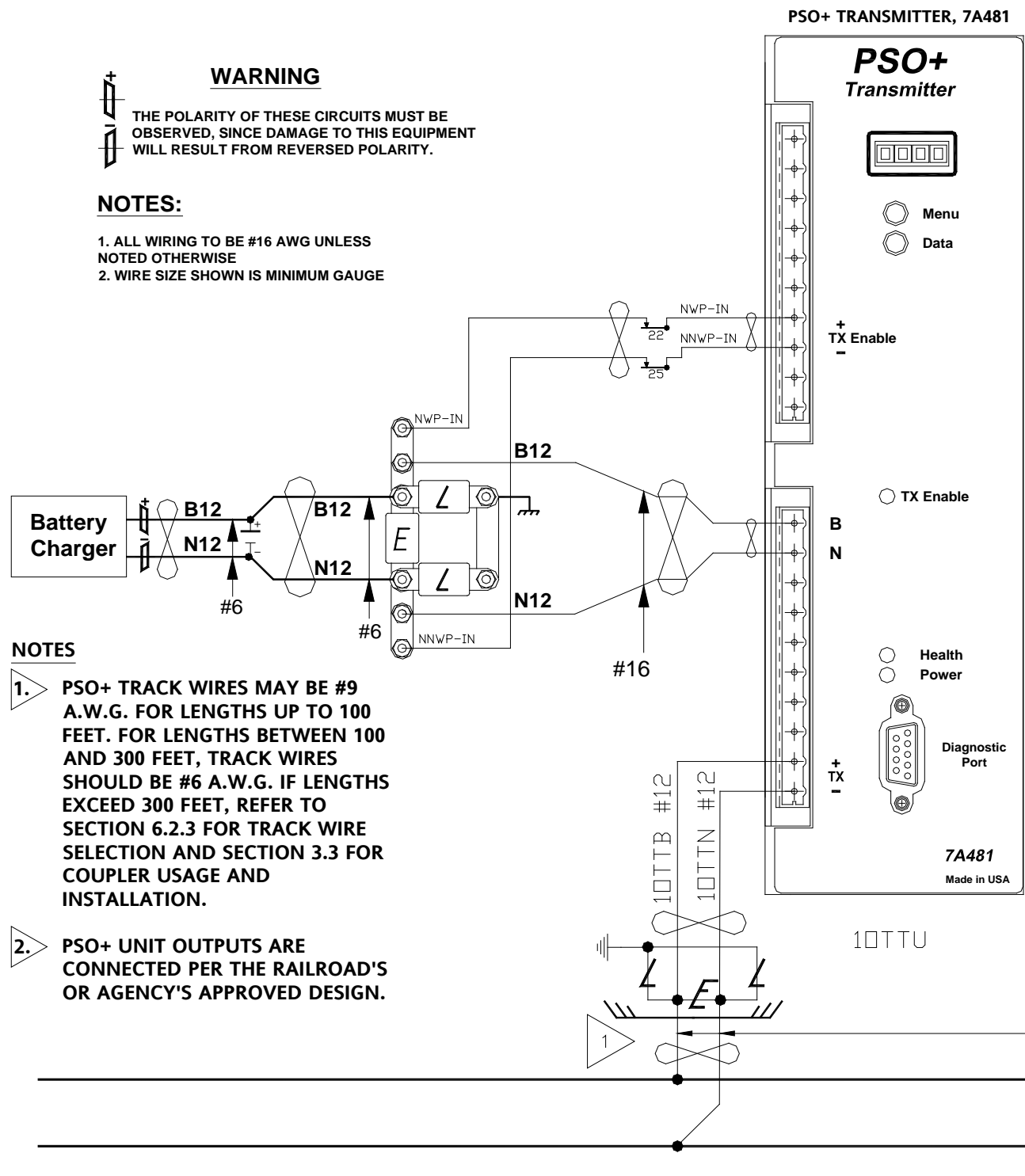
CONFIGURE PSO+ TRANSMITTER:

1. Observe the face of the Transmitter. Either DIAG is flashing or PSO+ XXXX TX (Code) (e.g., PSO+ 645 TX A) scrolls in the 4-Character Display.
2. If desired frequency appears in the window, proceed to step 7. If PSO+ XXXX TX (Code) (e.g., PSO+ 645 TX A) shows the wrong frequency in the 4-Character Display, proceed to step 4. If DIAG is flashing, proceed to step 3.
3. If DIAG is flashing, press and hold the MENU button for approximately two (2) seconds. DIAG stops flashing. Navigate to the TFRQ menu. Press and hold the MENU button for approximately two (2) seconds. NONE flashes in the 4-Character Display. Proceed to step 5.
4. If PSO+ XXXX TX (Code) (e.g., PSO+ 645 TX A) appears in the 4-Character Display and the frequency is not the desired frequency, press and hold the MENU button for approximately two (2) seconds. The currently selected frequency (e.g., 645) flashes in the 4-Character Display.
5. Press and release the DATA button until the desired frequency appears, then press and hold the MENU button for approximately two (2) seconds. SET TFRQ = XXXX? (e.g., SET TFRQ=4000?) appears in the 4-Character Display.
6. Press and hold the MENU Button for approximately two (2) seconds until TFRQ=XXXX (e.g., TFRQ=4000 HZ) appears. Shortly afterward, the Transmit Level (TLVL) setting appears.
7. If the written instructions state that currently depicted transmit level will be used, proceed to step 10; transmitter programming is complete. If the other setting will be used, press and hold the MENU button for approximately two (2) seconds. The current value (e.g., HIGH) flashes in the 4-Character Display.
8. Press the DATA button until the desired value (e.g., TLVL=LOW) appears. Press and hold the MENU button for approximately two (2) seconds. SET TLVL = XXXX? (e.g., SET TLVL=LOW?) appears in the 4-Character Display.

WARNING
 THE POLARITY OF THESE CIRCUITS MUST BE OBSERVED, SINCE DAMAGE TO THIS EQUIPMENT WILL RESULT FROM REVERSED POLARITY.

NOTES:

1. ALL WIRING TO BE #16 AWG UNLESS NOTED OTHERWISE
2. WIRE SIZE SHOWN IS MINIMUM GAUGE

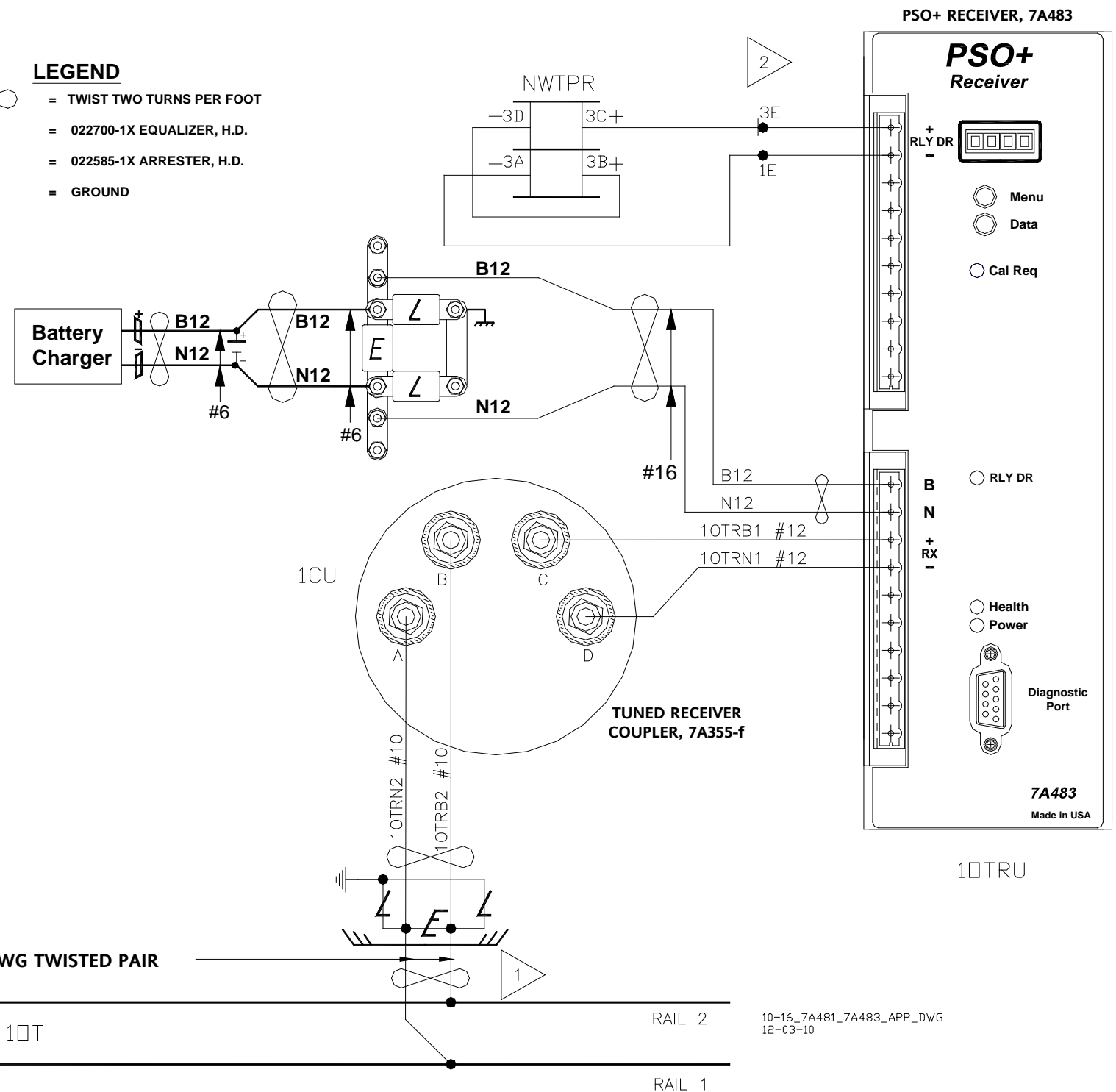


NOTES

1. PSO+ TRACK WIRES MAY BE #9 A.W.G. FOR LENGTHS UP TO 100 FEET. FOR LENGTHS BETWEEN 100 AND 300 FEET, TRACK WIRES SHOULD BE #6 A.W.G. IF LENGTHS EXCEED 300 FEET, REFER TO SECTION 6.2.3 FOR TRACK WIRE SELECTION AND SECTION 3.3 FOR COUPLER USAGE AND INSTALLATION.
2. PSO+ UNIT OUTPUTS ARE CONNECTED PER THE RAILROAD'S OR AGENCY'S APPROVED DESIGN.

LEGEND

- = TWIST TWO TURNS PER FOOT
- = 022700-1X EQUALIZER, H.D.
- = 022585-1X ARRESTER, H.D.
- = GROUND



Typical PSO NWP Application