72-2982-250
7/03

Lionel ZW Controller and PowerHouse Power Supply Set

CAUTION–ELECTRICALLY OPERATED PRODUCT

NOT RECOMMENDED FOR CHILDREN UNDER EIGHT YEARS OF AGE. AS WITH ALL ELECTRIC PRODUCTS, PRECAUTIONS SHOULD BE OBSERVED DURING HANDLING AND USE TO REDUCE THE RISK OF ELECTRIC SHOCK.

TRANSFORMER RATINGS - INPUT : 120 VAC 60 HZ ONLY.

AC OUTPUT : 18V, 180 VA PER CHANNEL (WITH 180 WATT POWERHOUSE)

4 CHANNEL CONTROLLER

Patent 6 441 570

Congratulations!

Congratulations on your purchase of the Lionel ZW Controller and PowerHouse Power Supply Set! This powerful system is ready to go to work on your layout with all the operating features of the original ZW Controller, as well as many additional features that are accessible with your CAB-1 Remote Controller in the TrainMaster Command Control environment.

Read this manual thoroughly before using the system. It has important information on the setup and operation of your controller and transformers. If you have any questions, contact your local authorized Lionel Service Center or call Lionel Service at 586-949-4100.

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PowerHouse Power Supplies

Your Lionel PowerHouse Power Supplies are listed by Underwriters Laboratories Inc. and have been carefully designed and tested to ensure peak performance. Refer to Figure 1 to identify the features of these devices.

Warning! When using electrical products, basic safety precautions should be maintained including the following:

- Read this manual thoroughly before using these devices.
- These devices are not recommended for children under eight years of age.
- Parents should periodically inspect the PowerHouse Power Supplies for potential hazards and have the units repaired or replaced if necessary by an authorized Lionel Service Center. Do not operate the units until they have been repaired.
- The PowerHouse Power Supplies are intended to be used indoors. Do not use if water is present. Serious or fatal injury may result.
- Use the PowerHouse Power Supplies for only their intended purpose. The units were designed to operate with the ZW Controller, PowerMaster, and select Lionel controllers only.
- The PowerHouse Power Supplies are designed to operate on 120-volt, 60-Hertz power. Do not connect them to any other source of power.
- Do not operate the PowerHouse Power Supplies with a damaged cord, plug, or case.
- To avoid the risk of electrical shock, do not disassemble the units. There are no user-serviceable parts inside. If damaged, take the PowerHouse Power Supplies to your authorized Lionel Service Center. A list of Service Centers is packed with these units.

Caution! Do not operate these devices unattended. Obstructed accessories or stalled trains may overheat, resulting in damage to your layout.

- If the circuit breaker trips, turn the PowerHouse Power Supplies OFF. After you correct the problem, reset the circuit breaker and turn the power ON to resume operation.
- *Always* unplug the PowerHouse Power Supplies from the power source when not in use.

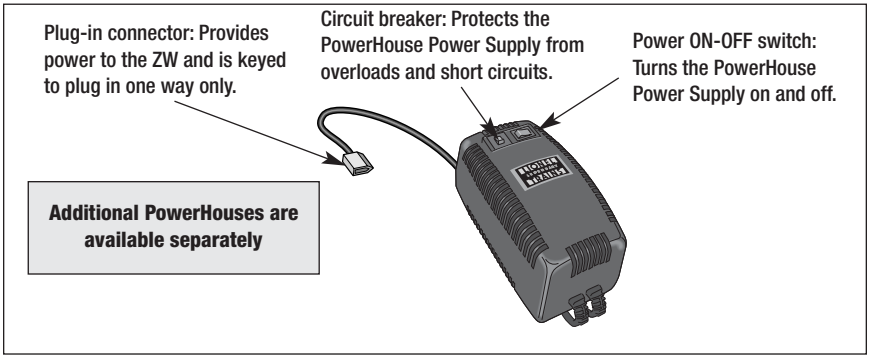


Figure 1. Features of the PowerHouse Power Supply

The ZW Controller—the basics

The ZW Controller

The ZW Controller and PowerHouse Power Supplies are made to operate on 120-volt 60-cycle alternating current, the normal house power used in the United States. With four 180-watt PowerHouse Power Supplies, the maximum wattage rating of the ZW Controller is reached — 760 watts. The ZW Controller can be powered by any combination of up to four 180-watt PowerHouse Power Supplies. The PowerHouse Power Supplies are available in both 135-watt and 180-watt versions. The ZW Controller comes with two 180-watt PowerHouse Power Supplies. If more power is needed, up to two additional PowerHouse Power Supplies can be added to the system.

Installing your ZW Controller-PowerHouse Power Supply system

For best performance, use 18-gauge wire to connect the ZW Controller to your track. We recommend using the "A-U" and "D-U" terminal pairs for your track connections because they have throttle, direction, bell, and whistle controls. The "B-U" and "C-U" pairs have only voltage control.

For best results, use spade lugs (U-shaped connectors) on all ZW Controller connections, and no more than two wires on each terminal. On larger layouts where several track connections are required, the use of separate junctions/terminal strips is recommended to prevent voltage drops.

Caution! Make sure all connections are very secure. A loose connection can produce extremely high temperatures. For this reason, do not touch terminals or track connections during use. Also, do not locate scenery materials such as lichen or ground foam near the terminals.

O-27 and O gauge track

Begin by attaching a Lionel Lockon (available separately) to any section of straight track as illustrated in Figure 2 on page 5. To do so, fit the lip of the Lockon onto the edge of the outside rail and press the Lockon upward so that the clip snaps onto the center rail. Next, attach a wire to either the A or D terminal on the ZW Controller and connect it to the No. 1 (center rail) terminal on the Lockon. Attach another wire to the U terminal on the ZW Controller and connect it to the No.2 (outside rail) terminal on the Lockon.

Lock-On connections: Press down on the top of the terminal clip so that a metal loop is formed. Slide the bare end of the wire into the exposed loop. See Figure 2. Release pressure on the terminal clip, allowing the crimped metal to pinch the end of the wire in the metal loop. Gently tug on the wire to check if the hold is secure.

Note! All of the U terminals are common; accessory ground connections can be made to the track.

FasTrack power terminal section

If you have a FasTrack layout, simply connect the red spade-shaped connector on a FasTrack power terminal section (available separately, 6-12016) to the A or D terminal on the ZW Controller. Connect the black spade-shaped connector to the U terminal.

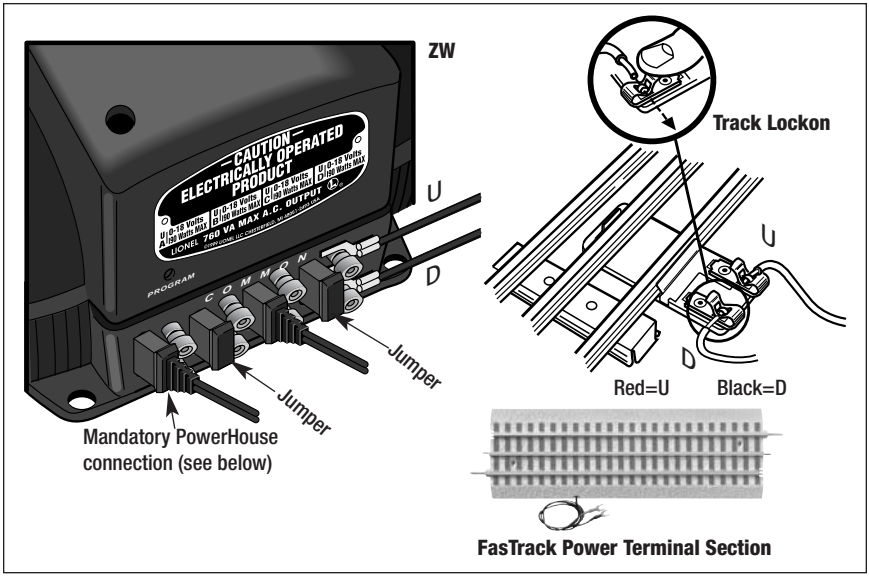


Figure 2. Lock-On connections

Next, connect the PowerHouse Power Supplies to the ZW Controller by inserting their connectors into the input jacks on the ZW Controller as illustrated in Figure 3 on page 6. Plug the Power Supplies into a wall outlet (120 volts, 60 Hertz), then switch them ON. Always switch OFF the Power Supplies when not in use. When the ZW Controller is receiving electricity from the Power Supplies, the green light on the ZW Controller illuminates.

One PowerHouse Power Supply must connect to the input jack to the left of the "A-U" thumbscrew terminal pair, regardless of other PowerHouses connected. Refer to figure 2. If you are using two PowerHouse Power Supplies, we recommend connecting the PowerHouse Power Supplies to the first and third input jacks to evenly distribute the power. Be sure to place jumpers in any open input jacks. See Figure 3.

Installing your ZW Controller-PowerHouse system (continued)

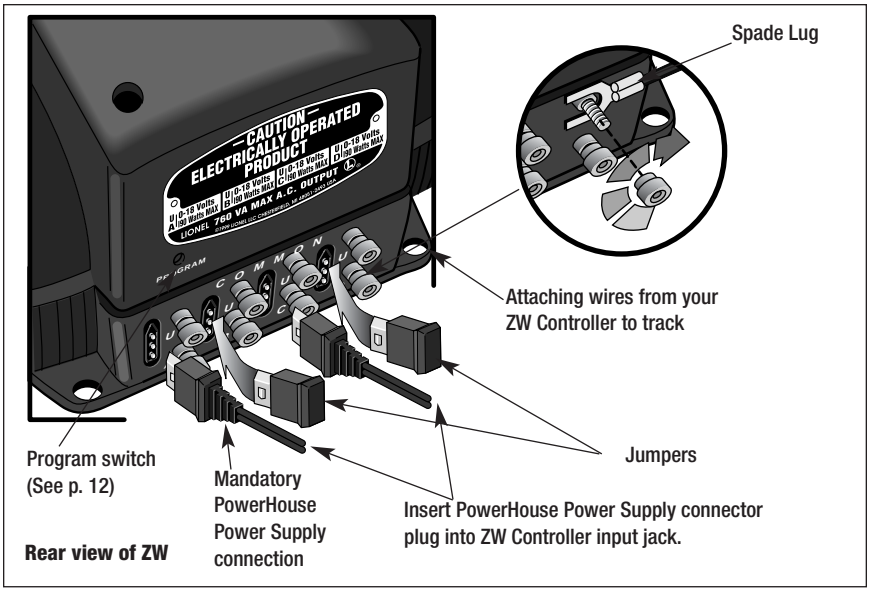


Figure 3. PowerHouse connections

Note! One PowerHouse Power Supply **must** be plugged into the input jack next to the A terminal. Refer to Figure 3. Placing a jumper plug into an input jack allows that set of terminals to share power with the terminals to its left. To evenly distribute the power from two PowerHouse Power Supplies among all four channels, the PowerHouse Power Supplies should be plugged into jacks A and C, and jumpers should be placed in jacks B and D. Refer to Figure 4 on page 7 for a diagram of the output terminals on the back of the ZW Controller.

ZW Controller-PowerHouse Power Supply operation

Connecting accessories

While output terminals "A-U" and "D-U" are designed for train control, "B-U" and "C-U" are intended to supply power for lights, switches, accessory equipment, and Command Control only layouts. The output terminals are labeled in Figure 4. The two control levers located next to the throttle controls regulate the voltage. Refer to the illustration on page 8 for the location of the control levers. Most illuminated accessories operate on 12 to 14 volts, while operating accessories work on voltage ranging from 10 to 16 volts depending on the condition of the accessory.

To adjust the proper voltage for your accessories, connect the accessory terminals to the "B-U" or "C-U" posts of your transformer and slowly adjust the corresponding control levers until you get the desired brightness of illumination or satisfactory operation of the mechanism. In the case of illuminated accessories, be sure to avoid setting the voltage too high, or you will burn out the lamps. If you operate with the lowest voltage possible, you will greatly extend the life of your lamps and other equipment. In the event that you have several accessories that require the same voltage, it is possible to use the same transformer binding posts for all of them.

Note! Be sure to consult your accessory's owner's manual for recommended voltages and wiring hints.

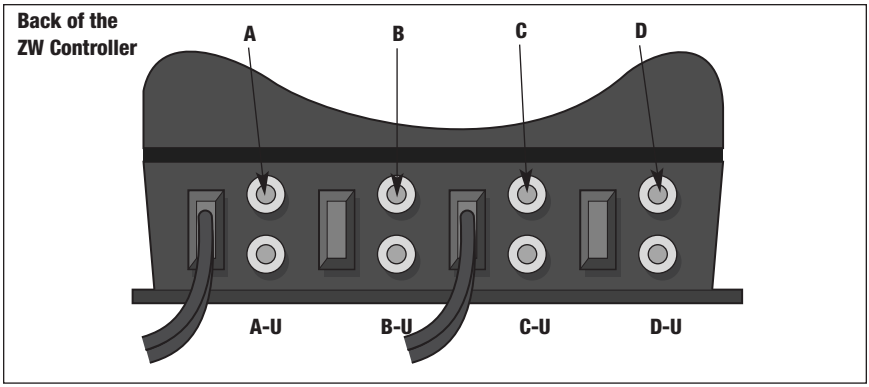
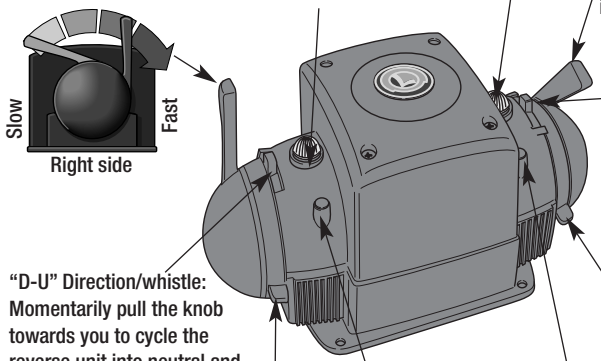


Figure 4. Output terminals

ZW Controller-PowerHouse Power Supply operation

Operating the ZW Controller-PowerHouse Power Supply system manually

On power up, the voltage from all four output channels will reflect the respective handle setting. If a layout does not contain a Command Base (or if the ZW Controller is programmed as Track 0), the ZW Controller will operate much like an old ZW Controller. The "A-U" and "D-U" output terminals have added Bell control buttons.



"D-U" Throttle: Controls your locomotive's speed. Rotate the throttle forward to increase speed, pull towards you to slow it down.

Fault/program indicator: The red lamp blinks when your ZW Controller has a short, and flickers to let you know its receiving program instructions. (See pages 10-11).

Power-on indicator: The green lamp illuminates when your ZW Controller is On.

"A-U" Throttle: Controls your locomotive's speed. Rotate the throttle forward to increase speed, pull towards you to slow it down.

"A-U" Throttle Direction/whistle: Momentarily pull the knob towards you to cycle the reverse unit into neutral and then again for the new direction. Move the knob forward to blow the whistle.

"B-U" Accessory/auxillary throttle. Used for accessory power or as a throttle. Rotate forward to increase voltage, pull towards you to decrease voltage.

"D-U" Direction/whistle: Momentarily pull the knob towards you to cycle the reverse unit into neutral and then again for the new direction. Move the knob forward to blow the whistle.

"C-U" Accessory/auxillary throttle: Used for accessory power or as a throttle. Rotate forward to increase voltage, pull towards you to decrease voltage.

"D-U" Bell: Starts or stops the tolling bell in any Railsounds sound system equipped locomotive. Press BELL to begin the sound. Press BELL again to stop it.

"A-U" Bell: Starts or stops the tolling bell in any Railsounds sound system-equipped locomotive. Press BELL to begin the sound. Press BELL again to stop it.

Note! The throttle markings do not indicate the actual voltage.

ZW Controller-PowerHouse Power Supply operation

Controlling the ZW Controller with your CAB-1 Remote Controller

The ZW Controller can also be controlled remotely in the TrainMaster Command Control environment with the addition of a Command Base and a CAB-1 Remote Controller (both available separately). As illustrated in Figure 5, simply attach a wire to the U terminal on the Command Base and connect it to any of the U terminals on the ZW Controller transformer.

If a layout contains a Command Base and the ZW Controller is programmed with a track/train (TR) ID# of 1-6, the ZW Controller will be in TrainMaster Command Control mode when it is powered up.

The voltage of the "B-U" and "C-U" terminal pairs is initially set by their corresponding control levers. See Figure 4 on page 7 for their locations. The CAB-1 Remote Controller can adjust the voltage below this setting.

The voltage of the "A-U" and "D-U" terminal pairs will initially be set to zero. The CAB-1 Remote Controller is used to increase the voltage. Use the handles on the ZW Controller transformer to set the maximum voltage. The CAB-1 Remote Controller will not be able to increase the voltage past the level designated by the handle positions. For FULL power, set the handles all the way forward.

Note! The speed steps will be compressed into the voltage ranges you set. For example, if you set the throttle to half power, the value of each speed step will be cut in half. The number of speed steps never changes during normal operation. Refer to Table 2 on page 11.

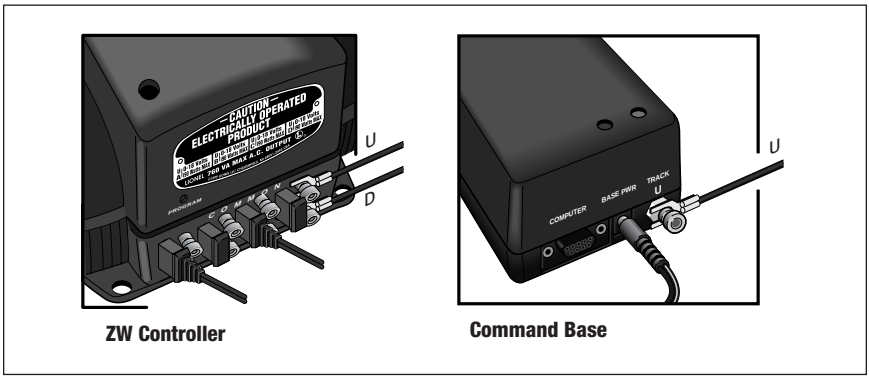


Figure 5. Command Base connection

Note! Do not plug in the ZW Controller and the Command Base to the same power strip. You must power up the Command Base before the ZW Controller.

As illustrated in Figure 6 on page 10, instructions are sent as a radio signal from the CAB-1 Remote Controller and received by the Command Base. The Command Base sends signals to the track, where it is received by the ZW Controller.

ZW Controller-PowerHouse Power Supply operation

Controlling the ZW Controller with your CAB-1 Remote Controller (continued)

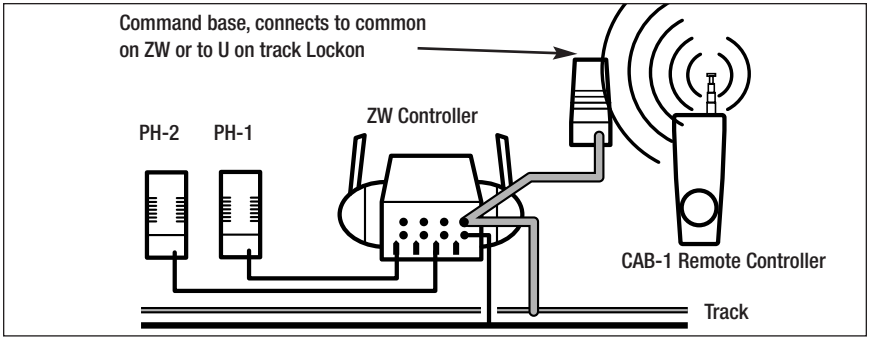


Figure 6. TrainMaster Command Control and the ZW Controller

As listed in Table 1 below, the CAB-1 Remote Controller unlocks the features of the ZW Controller.

Sounds horn while button is held. Can be accessed from the CAB-1 Remote Controller for all four channels. Can be accessed from the ZW Controller for A or D channels.

Pressing the button toggles bell on and off. Can be accessed from the CAB-1 Remote Controller for all four channels. Can be accessed from the ZW Controller for A or D channels.

Momentarily interrupts track voltage to cycle conventional reversing units. Can be accessed from the CAB-1 Remote Controller for all four channels. Can be accessed from the ZW Controller for A or D channels.

Momentarily increases track voltage. Accessible from the CAB-1 Remote Controller for all four channels.

Momentarily decreases track voltage. Accessible from the CAB-1 Remote Controller for all four channels.

Stall: The stall voltage is the minimum voltage supplied when a track is throttled down using the CAB-1 Remote Controller. It is used to prevent an engine from going into neutral when stopping, and to improve the response when re-starting a locomotive. The stall is set by pressing **SET** once, getting the locomotive moving, slowing until it stops, and then pressing **SET** again. The first **SET** command drops the track voltage to zero, the second **SET** command sets the stall voltage at the current level. The maximum voltage is set by the handle position.

Table 1. CAB-1 Remote Controller buttons

Note! The red light on the ZW Controller will flicker to indicate that its recieving a command from the CAB-1 Remote Controller.

ZW Controller-PowerHouse Power Supply operation

Controlling the ZW Controller with your CAB-1 Remote Controller (continued)

In the Command environment, the voltage of output channels B and C will reflect their handle settings on power-up. The voltage can then be controlled using the CAB-1 Remote Controller by pressing **TR** and the individual track ID number on the CAB-1 Remote Controller, and then rotating the throttle. Track voltage can also be controlled by moving the handle on the ZW Controller.

The voltage from output channels A and D will initially be zero. The A and D handles on the ZW Controller should be set to the maximum. The CAB-1 Remote Controller is then used to increase the voltage. If the ZW Controller handles are set at less than maximum, the handle position will dictate the maximum voltage available.

Throttling down occurs twice as fast as throttling up. For example, in low momentum mode, 3/4 clockwise revolution of the throttle is required to increase the voltage from 0 to 18 volts, but only 3/8 revolution is required to lower the voltage back to 0.

Reset: AUX1, **0** immediately lowers the addressed track's voltage to zero. It can be powered back up using the CAB-1 Remote Controller.

Pressing the **HALT** button on the CAB-1 Remote Controller immediately interrupts the voltage on all four channels, as long as a Command Base is present. Each track must then be addressed individually and throttled back up. (In single handle mode, throttling up channel A also throttles up channels B, C, and D, see page 15).

Choosing a higher momentum setting increases the number of speed steps available. The momentum for each of the four channels can be set individually by addressing the track number, **TR**, **1**, for example, and then pressing **L**, **M**, or **H** on the CAB-1 Remote Controller. As outlined in Table 1, the throttle movement necessary to decrease track voltage is half that required to increase voltage. This is done to allow trains to stop quickly when needed, even in the high momentum mode.

Momentum Setting	Speed Steps	CAB-1 Remote Controller Revolutions Clockwise	CAB-1 Remote Controller Revolutions Counter-Clockwise
Low	32	3/4	3/8
Medium	56	1 1/2	3/4
High	96	2 1/2	1 1/4

Table 1. Momentum settings and CAB-1 Remote Controller

ZW Controller-PowerHouse Power Supply operation

Assigning new ID#'s to your ZW Controller

To control your ZW Controller transformer by remote control, each pair of output terminals must have a unique track (TR) ID#. The four terminal pairs have been assigned track (TR) ID#s 1-4 respectively. The ID#s are automatically assigned in sequential order when you assign the "A-U" pair. For example, if you program "A-U" as ID# 2, "B-U" will become ID# 3; "C-U" will become ID# 4; and "D-U" will become ID# 5.

To assign the output ID#'s, use the special T-shaped tool (included) or any other non-metallic tool to press the PROGRAM button on the back of the ZW Controller. Refer to Figure 7 for the location of this button. The red light will begin to flash. On the CAB-1 Remote Controller, press **TR**, enter the first ID# (1-6), and press **SET**. At this point, all four ID#'s have been assigned.

Note! If you assign ID# 0, the ZW Controller will return to manual mode. Use the handles and levers on the ZW Controller—not your CAB-1 Remote Controller—to operate the controller. The ZW Controller will, however, respond to the **HALT** command from the CAB-1 Remote Controller. (To restore power after pressing **HALT**, momentarily turn off the PowerHouse Power Supply connected to the input jacks.)

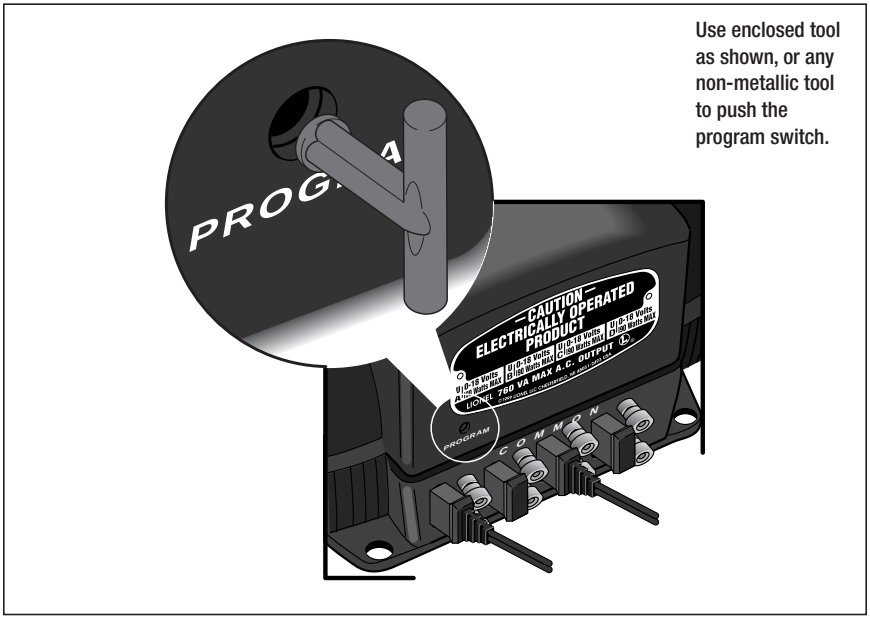


Figure 7. PROGRAM switch location

ZW Controller-PowerHouse Power Supply operation

Operation of the circuit breaker

To protect the transformer from overheating and damage due to short circuits, the ZW Controller-PowerHouse Power Supply system is equipped with built-in automatic circuit breakers. To prevent over-current on engine start-up, the voltage is reduced when the current exceeds 10.5 Amps. Using this method, a single channel of the ZW Controller is capable of running a lash-up of about six Lionel locomotives, depending on the condition of the units. If the current does not drop below 10.5 Amps within three seconds, a short circuit is assumed and that channel of the ZW Controller will drop to zero volts and the red light will begin flashing. After six seconds, the channel will attempt to resume normal voltage. If the short condition is still present, the channel will trip again. If the channel trips more than six times in a row, it will remain at zero volts, and the red light will continue to flash.

The channel can be reset by moving the handle to zero and bringing power back up. The channel can also be reset by addressing that track with the CAB-1 Remote Controller and turning up the throttle.

A short circuit is an excessive load on the transformer caused by a direct connection between the center rail and one of the outside rails. A derailed car or locomotive is the most frequent cause of short circuit, so make sure that all wheels of the locomotive and cars are properly set on the rails. If your transformer shows a short circuit even after all the rolling stock has been removed from the rails, it is probably due either to incorrect wire connections or to broken insulation on the power rail.

It is important to understand that the purpose of the circuit breaker is to protect the transformer itself. It operates only if the transformer is overloaded. It is possible, particularly in very large layouts, for the track to be "shorted" without causing the circuit breaker to operate or the red light to flash. In this case, although the transformer voltage may drop below the operating point of the trains, the transformer will not be damaged because it is not being overloaded beyond its safe limit.

Note! After your transformer has been operating for a while you will find it warm to the touch. It is the nature of all electrical power equipment to become warm when in use.

ZW Controller-PowerHouse Power Supply operation

Running non-Lionel locomotives with your ZW Controller

The ZW Controller was designed to be compatible with all locomotives operating on AC voltage from 0 to 18 volts. No modification of the locomotive is required.

Note! If you experience erratic operation of some non-Lionel locomotives (such as random horn and bell sounds), placing a lighted car on the track or connecting an accessory to track power should eliminate the problem.

Programming non-Lionel engines using the CAB-1 Remote Controller

If the voltage is at maximum, pressing the **AUX1** key and then the **9** key will cause the voltage to quickly drop to 6-8 volts and then return to normal. Pressing the **9** key again will cause this cycle to repeat. This function simplifies the programming of some non-Lionel locomotives.

Phasing your PowerHouse Power Supplies

To ensure that all PowerHouse Power Supplies are in phase with each other, we recommend plugging each unit into a 10 Amp power strip. To verify phasing, set track power to full and use an 18-volt light bulb to check for voltage between post A and B; A and C; and A and D. If the power supplies are in phase, the bulb will be dim or off. This is illustrated in Figure 8. If one is out of phase, the bulb will be bright. This may be caused by improper household wiring, but should be eliminated by plugging all PowerHouse Power Supplies into a single power strip.

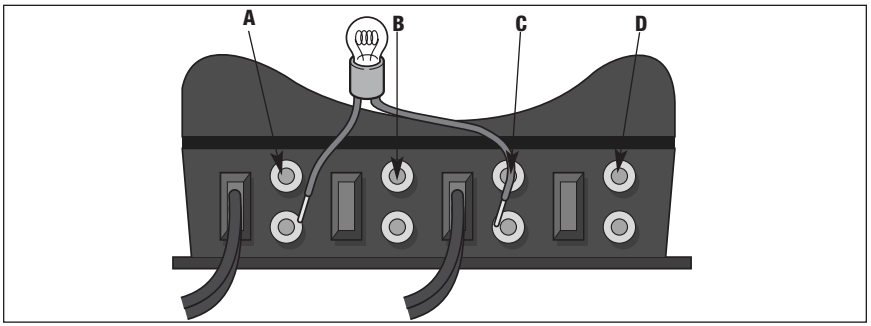


Figure 8. Checking the phase of your PowerHouse Power Supplies

Calibrating your ZW Controller controls

Electronic reversing units will not change direction properly unless the track voltage drops to zero volts. If the ZW Controller's track voltage does not drop to zero when the handle is at zero, the ZW Controller must be re-calibrated. All four channels can be calibrated by moving each handle to zero, and holding the program button in while the power is turned on. The red light will flash five times to indicate calibration is complete. This must be done with the Command Base disconnected. Calibration is done at the factory and should not be required with normal use.

ZW Controller-PowerHouse Power Supply operation

Single handle operation of your ZW Controller

As illustrated in Figure 9 on page 16, there is a jumper inside the case. If it is placed across the two pins on the circuit board, all four output channels will be controlled by handle A. This is beneficial for operating large track loops. Handles B, C, and D should be placed at their maximum. In this mode, the A channel BELL, WHISTLE, and DIRECTION buttons on the ZW Controller will simultaneously activate all four channels.

Caution! Always unplug your ZW Controller from all PowerHouse Power Supplies before removing the top cover. Always replace the top cover and screws before restoring power.

Using single handle operation on your layout

For single handle operation of your entire track layout, the loop should be divided using insulating pins. Any sections requiring less voltage would be connected to B, C, or D. The voltage of these outputs can then be reduced relative to that of channel A by lowering the respective handle to the desired voltage. For example, if a track loop contained a hill (see Figure 10 on page 17), the uphill portion would be connected to channel A. The downhill section would be connected to channel B, and handle B set to around 14 volts. Channels C and D could be connected to the flat portions of the loop, and their handles set to 16 volts. In this configuration, when the master handle, A, was set to full, output posts A would have 18 volts. B, C, and D would have 14, 16, and 16 volts respectively. A train can then be controlled through the entire loop by one control handle. The HORN, BELL, and DIRECTION can be controlled throughout the loop without the use of separate horn/bell actuators. The single handle control feature works for both remote control and manual modes.

Controlling a large Command Control layout

If a ZW Controller is used to power multiple Command Control loops (where no conventional operation is desired), the ZW Controller can be placed in single handle mode. Four separate loops can then be powered-up at the same time time by addressing channel A and turning the throttle on your CAB-1 Remote Controller. This also works with multiple ZW Controllers. If more than one ZW Controller is programmed with the same track ID number, all can be powered up at the same time.

In single handle mode, the ZW Controller can be programmed as TR 1-9. All outputs will respond to the track ID programmed (they will not be programmed sequentially). All outputs will function like handle A. On power-up, the voltage will be zero. They can be throttled up using the CAB-1 Remote Controller to a maximum set by the ZW Controller throttle arm.

Caution! When powering multiple track loops, always make sure insulating pins are used to insulate the center rails between connected loops. Failure to do so will result in exessive current which can damage locomotives.

ZW Controller-PowerHouse Power Supply operation

Controlling a large Command Control layout (continued)

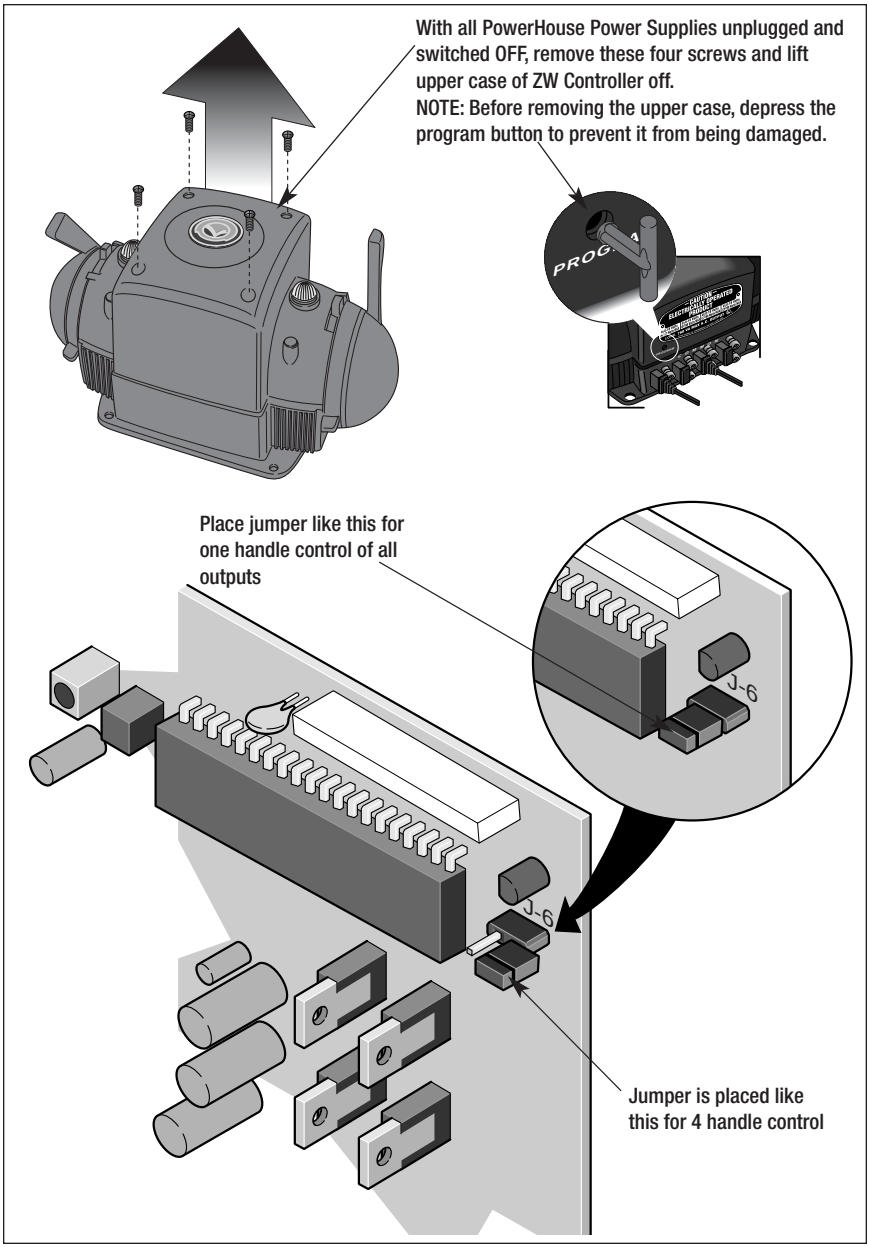


Figure 9. Setting the jumper

ZW Controller-PowerHouse Power Supply operation

Controlling a large Command Control layout (continued)

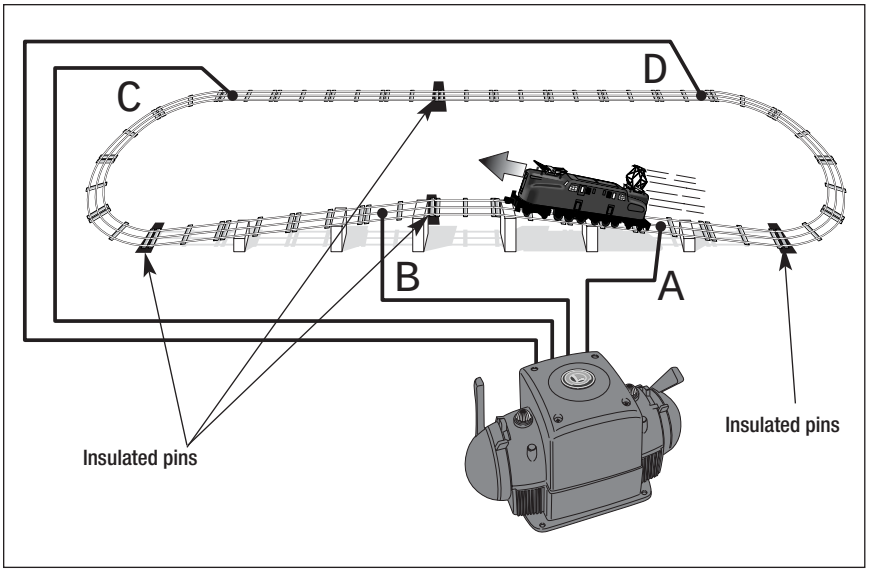


Figure 10. Control of various track blocks

ZW Controller-PowerHouse Power Supply maintenance

Replacing your ZW Controller's lamps

The lamps inside your ZW Controller should rarely require replacement. In the event that a lamp should expire, it should be replaced with Lionel part no. 6SP-2982-300 at your local authorized Lionel Service Center or Lionel Service only.

ZW Controller-PowerHouse Power Supply maintenance

Troubleshooting guide

PROBLEMS	SOLUTIONS
No lights or operation	• Be sure that the PowerHouse Power Supply is plugged into a working outlet. • Check the connection between the ZW Controller and the PowerHouse Power Supply. • Check that the PowerHouse Power Supply switch is ON.
Circuit breaker trips immediately when power is applied.	• Recheck the wiring, looking for short circuits. • Disconnect all wiring and reconnect the circuits until the defective circuit is found.
Train runs but WHISTLE/HORN, BELL, or DIRECTION will not work.	• Check the track connections to the ZW Controller. The manual WHISTLE/HORN, BELL, and DIRECTION buttons function only on track output terminals A and D. The WHISTLE/HORN, BELL, and DIRECTION functions on channels B and C can only be controlled from a CAB-1 Remote Controller.
No change when DIRECTION is pressed.	• Be sure that the locomotive reverse unit is in the ON position. • The ZW Controller may need calibration (see page 14).
Intermittent or absent accessory operation	• Check for loose, shorted, or improper wiring connections.
The locomotive runs slowly or the lights dim at far end of track	• On larger layouts, additional track resistance may cause a voltage drop. Attach additional Lockons to the remote portion of your track and connect them directly to the transformer.
Intermittent operation with repeated circuit breaker tripping	• The ZW Controller capacity may have been exceeded. Disconnect your accessories one at a time until problem ceases. • Check for track short circuits.
BELL button blows whistle; does not respond to the CAB-1 Remote Controller	• Check track wire connections. "U" should connect to outer rail. • Check to see that the Command Base is plugged in and the green light is on. Ensure that a wire is connected between the Command Base "U" terminal and a ZW Controller "U" terminal or the "U" terminal on a track Lock-On. Turn the PowerHouse Power Supply plugged into the input jack labeled "A" of the ZW Controller off and back on. • Check the batteries in CAB-1 Remote Controller. • The ZW Controller may be programmed as ENG or TR 0. Reprogram the ID# as TR 1-9 or ENG 1-99.

Limited Warranty/Lionel Service

This Lionel product, including all mechanical and electrical components, moving parts, motors and structural components, except for light bulbs, is warranted to the original consumer-purchaser, for **one year** against original defects in materials or workmanship when purchased through an authorized Lionel merchant.

This warranty does NOT cover normal wear and tear, light bulbs, defects appearing in the course of commercial use, or damage resulting from abuse or misuse of the product by the purchaser. Transfer of this product by the original consumer-purchaser to another person voids this warranty. Modification of this product voids this warranty.

Any warranted product which is defective in original materials or workmanship and is delivered by the original consumer-purchaser to Lionel L.L.C. or an authorized Lionel L.L.C. Service Center, together with proof of original purchase will, at the option of Lionel L.L.C., be repaired or replaced, without charge for parts or labor. In the event the defective product cannot be repaired, and a replacement is not available, a refund of the original purchase price will be granted. Any products on which warranty service is sought must be sent freight or postage prepaid, as transportation and shipping charges are not covered by the warranty.

In no event shall Lionel L.L.C. be liable for incidental or consequential damages.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.

This limited warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Instructions for Obtaining Service

If service for this Lionel L.L.C. product is required, bring the item, along with your dated sales receipt and completed warranty information to the nearest Authorized Lionel Service Center. Your nearest Lionel Service Center can be found by calling 1-800-4-Lionel, or by accessing our Website at www.lionel.com.

If you prefer to send your product back to Lionel L.L.C. for repair in Michigan, you must first call 586-949-4100 or FAX 586-949-5429, or write to Customer Service, P.O. Box 748, New Baltimore, MI 48047-0748, stating what the item is, when it was purchased and what seems to be the problem. You will be sent a return authorization letter and label to ensure your merchandise will be properly handled upon receipt.

Once you have received your return authorization and label, make sure that the item is packed to prevent damage during shipping and handling. We suggest that you use the product's original packaging. This shipment must be prepaid and we recommend that it be insured.

Please make sure you have followed all of the above instructions carefully before returning any merchandise for service. You may choose to have your product repaired by one of our Authorized Lionel Service Centers after its warranty has expired. A reasonable service fee will be charged.

Warranty Information

Please complete the information below and keep it, along with your dated sales receipt. You must present this and your dated sales receipt when requesting warranty service.

Name _____

Address _____

Place of Purchase _____

Date of Purchase _____

Product Number _____

Product Description _____