

Crest CRE-55492 75 MHz On Board Wireless Radio Control System

Congratulations on your purchase of the CREST CRE-55492 On Board Train Engineer Wireless Control System. This product has been manufactured to the highest standards using only quality components and, with proper care, will provide you with reliable service. Although some of the more advanced features may be new to you, these features are easy to use and will add to your overall railroad operating pleasure while protecting your equipment.

INTRODUCTION TO THE CRE-55492 TRAIN ENGINEER

The CREST CRE-55492 On Board Train Engineer Wireless Radio Control System is designed for “plug and play” installation in any Aristo-Craft Locomotive with a DCC board. The receiver can also be installed in any large scale locomotive with the use of a supplied wiring adaptor. Locomotives without the Aristo-Craft DCC board will require wiring modifications to adapt to the receiver. General instructions for custom installations are given at the end of these instructions.

The On Board Train Engineer operates on 10 different radio frequencies in the 75 MHz band. The receiver is also adaptable to operate in the 27 MHz band with the use of the CRE-55489 27 MHz frequency chip to be compatible with the older Train Engineer equipment. At each frequency, there are ten different control channels so that up to 100 different receivers can be controlled independently. The transmitter and receiver both use frequency synthesizers to create the ten RF frequencies so that no crystal changing is required.

The On Board Train Engineer is designed to operate from constant DC power applied to the track or from on board batteries. To prevent unnecessary battery drain, the standby current of the On Board Train Engineer is very low. The operating voltage drop is also low to allow efficient use of the energy stored in the batteries.

While DC track power is preferred, the On Board Train Engineer will also operate on a DCC powered layout and it will also run from most regular power packs if they are turned all the way up. The preferred power

supply for the On Board Train Engineer system is any Crest power supply.

As is the case for any high current track power supply, the track power must be properly fused to prevent damage to your equipment in the case of a derailment. A Crest CRE-55401 10 Amp Control Pack Adaptor can serve as an electronic fuse to protect your equipment.

FEATURES

In addition to the ability to wirelessly control your trains, the On Board Train Engineer can control accessories such as sound and smoke with the addition of the CRE-55495 accessory adaptor. The On Board Train Engineer can also be set to help protect your trains from damage.

One of the most damaging things that can happen to any train is a quick change in direction. This not only applies unnecessary stress and wear on moving parts, but also can also strip the gears in a locomotive or cause a serious derailment. To alleviate these problems, the On Board Train Engineer incorporates an adjustable delay feature when changing directions. When the direction buttons are pressed and the train is moving, the train gradually slows to a stop, changes direction, and then returns to its prior speed. As with momentum, the delay period is user adjustable.

In real life, trains don't “jack rabbit” up to speed or “stop on a dime” so why should yours? The adjustable momentum control incorporated in the On Board Train Engineer allows you to increase and decrease the speed of your trains in a smooth and realistic manner. These gradual speed changes are also easier on your train's motors and gears.

The forward and rear headlights will respond to the current locomotive operating direction and will run at constant intensity as soon as the locomotive starts to move. The “F” button will turn the headlights on and off.

The On Board Train Engineer has a bridge rectifier for input polarity protection and a thermal circuit breaker for overload protection. The motor driver circuit is a Field Effect Transistor H-Bridge with electronic reversing so that a reversing relay is not required.

SYSTEM COMPONENTS

The CRE-55492 On Board Wireless Control System consists of three components, the CRE-55491 75 MHz receiver, the CRE-55003 75 MHz transmitter and a custom wiring adaptor.

In addition you will need the following (not supplied):

- Batteries: Four 1.5 volt "AA" alkaline cells to power the transmitter
- 12 to 24 volt DC power source connected to the track

ACCESSORY COMPONENTS

There are several accessories that are available to expand your On Board Train Engineer.

| | |
|-----------|--|
| CRE-55489 | Replacement 27 MHz RF module |
| CRE-55003 | Extra 75 MHz transmitter |
| CRE-55491 | Extra 75 MHz receiver |
| CRE-55495 | On Board Accessory Control Module |
| CRE-55074 | 75 MHz Accessory and Switch Controller |
| CRE-55075 | 75 MHz Switch Controller (controls 5 switches) |

RATINGS

| | |
|---------------------------------|----------------|
| Average Output Current | 3 amps |
| Peak Output Current | 5 amps |
| Standby Current | 25 mA |
| Average Lighting Current | 200 mA |
| Surge Lighting Current | 500 mA |
| Recommended Input Voltage Range | 12 to 24 volts |
| Starting RF Frequency | 75.41 MHz |
| Frequency Step | 40 Khz |
| Maximum Range (Theoretical) | 300' |
| Typical Range (Practical) | 50' |

ABSOLUTE MAXIMUM RATINGS

| | |
|---------------|----------|
| Input Voltage | 28 volts |
|---------------|----------|

INSTALLATION

Receiver

The On Board Train Engineer is intended to be mounted within a locomotive, tender, or in a battery trail car. If the locomotive is equipped with an Aristo-Craft DCC compatible main circuit board, the installation is plug and play. If the locomotive does not have an Aristo-Craft DCC compatible main circuit board, see the custom installation instructions at the end of this instruction sheet.

- 1) Remove the locomotive shell. Depending on the model of the locomotive, the screws that need to be removed may or may not be marked with an arrow under the locomotive frame.
- 2) Remove the jumper plug on the DCC socket and set it aside. You can restore the locomotive to its pre-installation state by reinstalling the jumper plug.
- 3) Install the On Board Train Engineer in the 12 pins DCC socket and the 10 pin accessory socket.
- 4) Route the antenna wire around the inside of the shell as high up as you can get it. Try not to overlap the antenna wire and don't trim the wire.
- 5) Locate a place to install the code set switch where it will be accessible from the outside, yet obscured from view.
- 6) If needed, drill a 1/16" hole in the shell and attach the switch with hot glue or epoxy.
- 7) Reinstall the shell.

Note the code set switch can be replaced with a magnetic reed switch for activating the code set function externally with a magnet. This allows installation without drilling any holes.

There is a second code set switch on the receiver. It is accessible with a pencil point through a hole in the corner of the smaller RF board.

Transmitter (Figure 2)

- 1) Unscrew the two recessed Phillips head screws in the back of the transmitter case and remove the back cover.
- 2) Unscrew the Phillips head screw next to the word “Antenna” etched into the top of the circuit board. Insert this screw through the loop at the bottom of the provided antenna and place this assembly on the circuit board so that the antenna fits in the circular cradle in the case. Retighten the screw until it is snug but not overly tight.
- 3) Insert four 1.5 volt “AA” batteries making sure that they face in the directions indicated on the battery holders.
- 4) Press a button on the transmitter; if any LED comes on, the transmitter is working. If not, inspect for proper installation of the batteries.
- 5) Replace the back cover and tighten the two screws until they are snug.

NOTE

- If the LEDs on the transmitter flash quickly and then go out when a button is pressed, the batteries are low and need to be replaced.
- When the batteries are removed, replace them within 30 minutes. The memory of the transmitter will be erased after 30 minutes and it will be necessary to reestablish links to the receivers.

SELECTING THE RADIO FREQUENCY

Press the “FRQ” button and hold it for 2 seconds. The LED that represents the current radio frequency will begin flash. Press the “FRQ” button again to move the indicator to the right to the desired frequency. Press any *other* button or simply wait for the LED indicator to extinguish to accept the changed frequency.

Use of different frequencies will prevent two or more transmitters from interfering with each other. For the most reliable operation, each transmitter operated within a few hundred feet of another should be set to a different frequency.

SELECTING THE CHANNEL NUMBER

Press either of the Channel Select buttons, “C-L” or “C-R” (located right under the LED indicator panel on the transmitter). The LED that represents the current channel number will begin to flash. Press either channel select button to move the indicator left or right to the desired channel. Press any *other* button or wait until the flashing indicator extinguishes to accept the new channel setting.

Use the Channel setting to control multiple locos from a single transmitter, as it is quicker to change a Channel setting than a Frequency setting.

LINKING THE TRANSMITTER AND RECEIVER

IMPORTANT NOTE: If you have performed a custom installation, you **MUST** wire your headlights or an indicator LED to the lighting outputs of the On Board Train Engineer. Without this lighting connection, there will be no visual feedback available to help you link and program the receiver.

- 1) Apply power to the track
- 2) Place the locomotive on the track. Note: the direction the locomotive faces has no relation to the relative direction buttons on the transmitter.
- 3) Press the code set button once. The headlights will begin to blink rapidly. If the lights fail to blink, your power source may not be acceptable. See the section below on power sources.
- 4) Press and hold one of the Alpha buttons (A-F) on the transmitter until the headlight blinking slows, then release the button. This step sets the receiver address and the momentum. If you use the A key in this step, no momentum will be used. The F key produces the most momentum. See Table #1 for momentum settings.
- 5) Press and hold one of the Alpha buttons (A-F) on the transmitter again until the lights stop blinking. Release the button. This step sets the reversing delay. See Table #1 for the reverse delay settings.
- 6) Complete the linking operation by pressing either the A or F button. This sets the memory state. Using the A button will cause the receiver to remember its previous speed and direction upon power up. Pressing the F button turns this memory off.

The receiver will revert to zero speed when power is restored. Enabling the memory will provide smoother operation when the track gets dirty.

- 7) To link other receivers, set the desired Channel and Frequency on the Transmitter and repeat steps 2 through 6.
- 8) Multiple locomotives can be linked to the same frequency and track channel (address) to create a locomotive consist.
 - a) First, using an address for each locomotive, follow steps 3 through 6 to ensure all locomotives are running in the desired direction.
 - b) Then using one address follow steps 3 through 6 again to link each locomotive into the consist.
You should use the same momentum, reverse delay, and memory for each locomotive in the consist.
 - c) Depending on the locomotives, it may be possible to turn the locomotives off. If this is your case using one address, follow steps 3 through 6. Shut each locomotive off after they are linked to the transmitter and running in the desired direction. After the last locomotive is linked, turn all the locomotives on.

If you have not wired headlights or an indicator light to help in programming, you can still program the unit blind. Press the code set button on the receiver and then press and hold the A button on the transmitter for 3 seconds and release 3 times.

Plug and play installations in Aristo-Craft locos designed to accept the On Board Train Engineer automatically connect the headlights to the receiver.

HOW TO CHECK THE SPEED OF THE TRAIN

To check the relative speed of a locomotive while underway, press the "SPD" button. The number of lights that come on gives a relative indication of the speed of the train. Note that a speed change button has to be held for about a second before the speed of a train will actually change.

CUSTOM INSTALLATION INSTRUCTIONS

Many locomotives do not come equipped to accept the On Board Train Engineer in a plug and play installation. In this case, the wiring of the locomotive will require modification to accept the receiver. To facilitate custom installations, a wiring adapter is provided. The wires on the

adapter follow standards used by DCC manufacturers. The adapter has 12 pins. Pin one is marked with a small arrowhead (triangle). With the arrowhead to your left, wire the adapter to your locomotive as indicated in Table 3 and Figure 1.

The On Board Train Engineer is designed to work from either track power or on board battery power. The unit is self-protected for polarity and input current. However, if you use a battery, you should install a 3-amp fuse directly from the battery before any other wiring is connected. The fuse will protect your wiring and the battery from damage in case of an accidental short circuit.

Before the On Board Train Engineer can be installed in a locomotive, the motor(s) **MUST** be isolated from **ALL** other wiring. This is critically important. Failure to isolate the motor circuit will cause the receiver to malfunction or possibly fail. After the motor wires are located and disconnected from the locomotive, use an ohmmeter to check the resistance between the motor wires and any other wires that you can find in the locomotive. If any connection is indicated at all, locate the connection and fix it.

For the easiest installation, the wires that used to go to the motor can be connected to the track power wires (wire #1 and wire #7) of the receiver. Then wire #2 and wire #6 can be connected back to the motor(s). The track power wires are not polarity sensitive. The motor wires are. If the headlights and the direction of the locomotive do not agree, reverse wire #2 and wire #6 motor wires.

The headlights will most likely require rewiring as well. Again, all the wiring to the headlights **MUST** be isolated from all other wiring. (See Figure 3 & Figure 4) Power for the lights is derived from two diodes, one from each rail. If you use an incandescent lamp, a surge-limiting resistor of at least 100 ohms is recommended. If you run from an on board battery, you can delete the diodes and connect the current limiting resistors to the positive terminal of the battery through an appropriate power switch and fuse.

TABLE 1
Alpha Keypad Use in Receiver/Transmitter Linking Procedure

| Keypad Button | Step #4 Momentum Setting | Step #5 Reverse Time Delay | Step #6 Memory Setting |
|---------------|--------------------------|----------------------------|------------------------|
| A | No Momentum | 0.1 second | Memory On |
| B | #1 | 0.2 second | |
| C | #2 | 0.5 second | |
| D | #3 | 1 second | |
| E | #4 | 1.5 seconds | |
| F* | Maximum Momentum | 2 seconds | Memory Off |

*After linking process is complete Keypad Button "F" can be used to turn the headlights on and off

TABLE 2
Transmitter Keypad Buttons & Functions

| Button | Function |
|-----------------|--|
| C-L | Channel Select Change to Left |
| C-R | Channel Select Change to Right |
| Fast | Increase Speed |
| Slow | Decrease Speed |
| Arrow Buttons | Change Direction |
| Emergency Stop | Stops Locomotive(s) on the current frequency and channel |
| Alpha Keys(A-F) | See Table 1 |
| SPD | Speed Relative to Voltage |
| All Stop | Stops All Locomotives Controlled by that Transmitter |
| Frq | Frequency Set/Check |

TABLE 3
Wire use for the Wiring Adapter

| Wire Use | Wire Number |
|---------------------------|-------------|
| Track Power Pick-up-Right | Wire #1 |
| Motor-Right | Wire #2 |
| Front Headlight | Wire #3 |
| Common | Wire #4 |
| Rear Headlight | Wire #5 |
| Motor-Left | Wire #6 |
| Track Power Pick-up-Left | Wire #7 |

FIGURE 1
Adapter Wiring Diagram

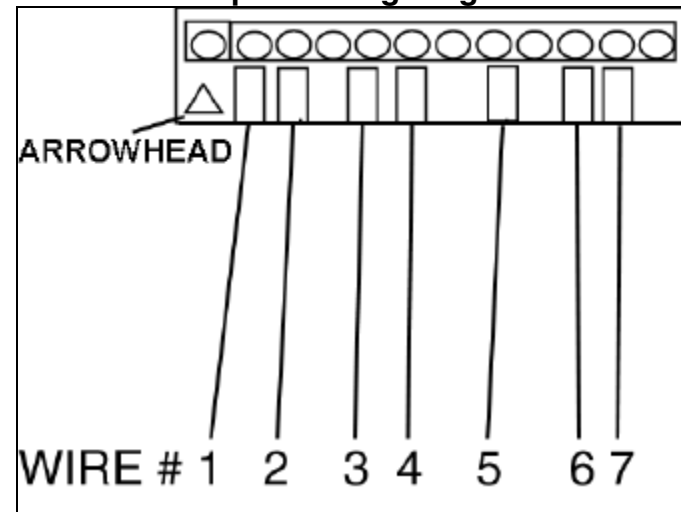


FIGURE 2

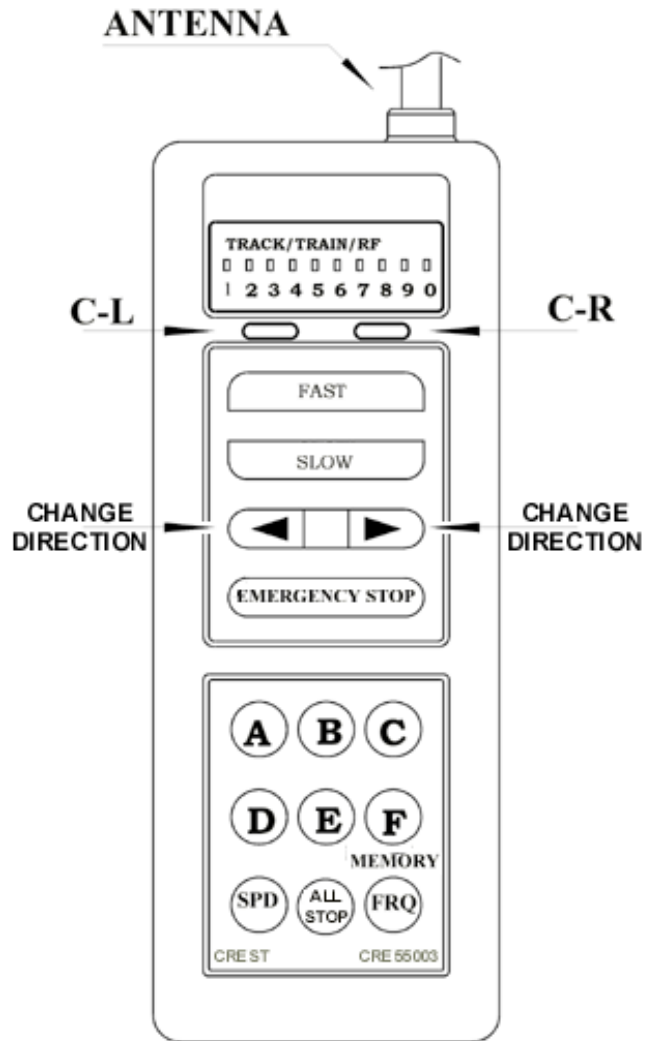


FIGURE 3

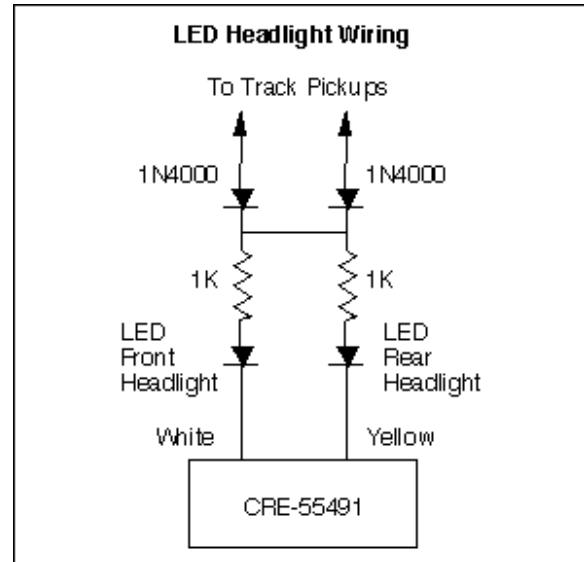
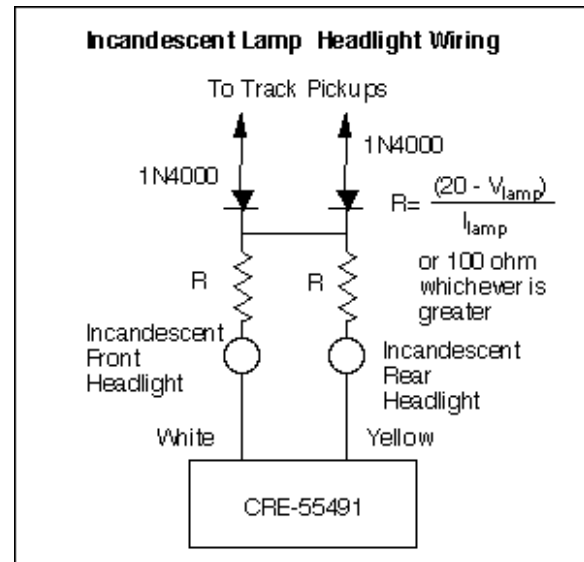


FIGURE 4



LIMITED WARRANTY

ALL CREST/ARISTO-CRAFT TRAINS products are under warranty for five (5) years from the date of purchase against defects in workmanship and/or materials. Proof of purchase *may be required* by CREST/ARISTO-CRAFT TRAINS.

Warranty covers manufacturer defects, not normal wear and tear. This warranty is void and does not apply to any products and/or parts and components which have been improperly installed by the purchaser/owner, abused or damaged in any way through improper operation such as but not limited to derailment, repairs or modifications performed by non-authorized service centers or technicians.

Should your CREST/ARISTO-CRAFT TRAINS product require warranty service, please return it in the original box, if possible, protected by a proper shipping carton. Send the product fully insured and prepaid. CREST/ARISTO-CRAFT TRAINS will not be responsible for any loss or damage incurred during shipping. Be sure to include a brief but thorough explanation of the problem, together with your name, street address (no Post Office Box please), city, state or province and country, if outside the United States. Also include a daytime phone number so that we may contact you if necessary. Your return address should also be clearly marked on the outside of the shipping carton.

If your item is not covered by warranty service, you will be contacted and a repair estimate given before any work commences. Warranty covers manufacturer defects, not normal wear and tear.

The shipping address to be used for repairs is:

CREST/ARISTO-CRAFT TRAINS
Repairs Department
698 South 21st Street
Irvington, NJ 07111 USA
Tel: (973) 351-9800

Written confirmation of receipt of items will be sent with estimated repair time by the CREST/ARISTO-CRAFT TRAINS repairs department.

Thank you for choosing the CREST On Board Train Engineer and we hope this innovative product enhances your enjoyment of the hobby. Enjoy!

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