

# GENERAL ELECTRIC TRANSPORTATION SYSTEMS



**C30-7 USER MANUAL  
FOR TRAIN SIMULATOR 2017**

# CONTENTS

<b>GENERAL DATA</b>	<b>3</b>
<b>OPERATING CONTROLS</b>	<b>5</b>
EXTERIOR	5
MASTER CONTROLLER	7
BRAKESTAND	10
HEAD OF TRAIN DEVICE	12
ENGINE CONTROL PANEL	13
ENGINE CONTROL PANEL 2	17
ENGINE START COMPARTMENT	19
MISCELLANEOUS CONTROLS	20
<b>OPERATIONS</b>	<b>21</b>
PRE-ENGINE STARTUP	21
STARTING THE ENGINE	21
PRE-OPERATION EOT SETUP	23
PRE-OPERATION HTD SETUP	26
CONTROL NOTES	27
THE C30-7 FOR TRAIN SIMULATOR	29
SCENARIO CHEAT SHEETS	31
APPENDIX I: CREATING FAULTS IN SCENARIOS	33

## GENERAL DATA

<b>Model</b>	<b>C30-7</b>
Horsepower	3000
Type (AAR Symbol)	C – C
Engine	GE-FDL16

### MAJOR DIMENSIONS

Length	67 ft-3 in.
Width	10 ft-3-1/4 in.
Height	16 ft.
Length Between Bolster Centers	40 ft-11 in.
Truck Wheel Base	13 ft-7 in.

### MINIMUM CURVE

Locomotive Alone	273' or 21 degrees
Coupled to Train	273' or 21 degrees

### DRIVE

Traction Motors	Six GE-752
Wheel Diameter	40 in.

### WEIGHT

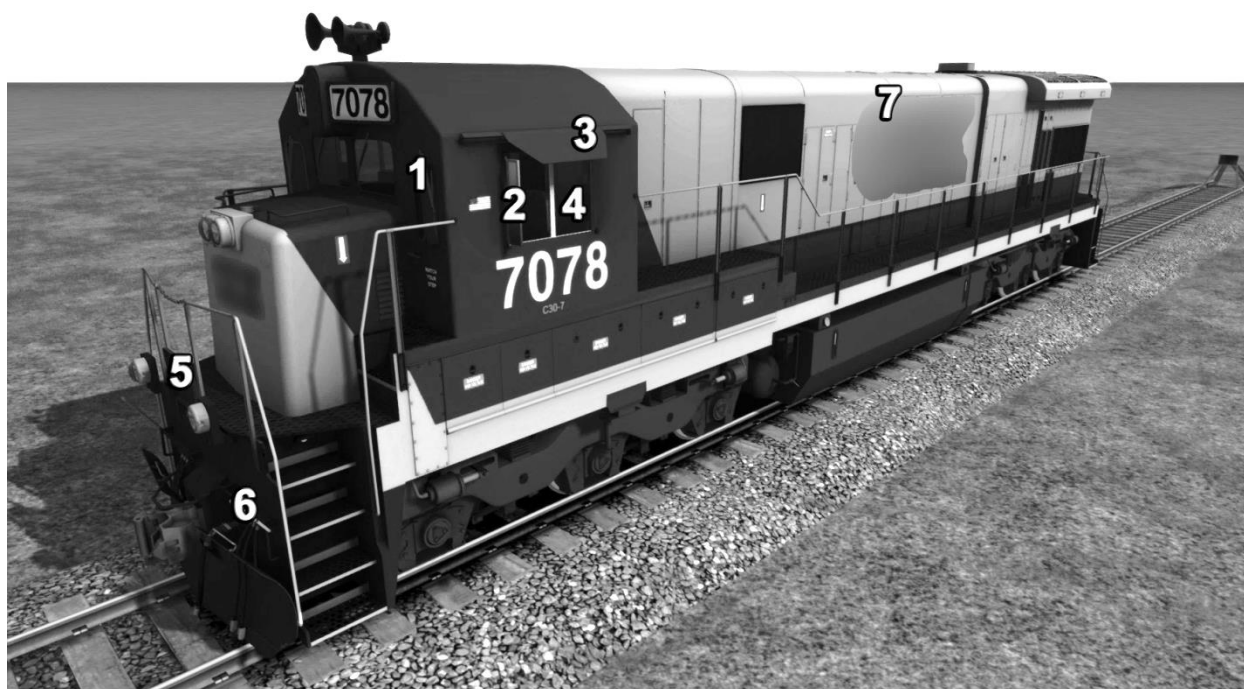
Minimum	366,000 lbs.
Maximum	420,000 lbs.

### SUPPLIES

Fuel Min/Max	3250/4000 gal.
Cooling Water	365 gal.
Lubricating Oil	380 gal.
Governor Oil	2 qt.
Sand	60 cu. ft.

<b>Model</b>	<b>C30-7</b>
Dates Manufactured	1976-1986
Total Units Manufactured	1,105
Purchasing Railroads:	Santa Fe – 157 Burlington Northern – 242 Conrail – 60 Ferrocarril del Pacifico – 26 Louisville & Nashville – 44 Ferrocarriles Nacionales de Mexico -305 Norfolk and Western – 80 Seaboard Coastline – 51 Union Pacific - 140

## EXTERIOR



REF.	DESCRIPTION	REF.	DESCRIPTION
1	Cab Doors	5	Kick Plates
2	Cab Mirrors	6	Uncoupling Levers
3	Cab Shades	7	Engine Hood Doors
4	Cab Windows		

**FIG. 1. EXTERIOR CONTROLS**

### **Cab Doors**

These allow access to the interior cab of the locomotive.

Controls Conductor Door: Cab; Keystroke ( Shift+M )

Controls Engineer Door: Cab; Keystroke ( Shift+N )

### **Cab Mirror**

Rear-facing mirrors for viewing the train from the operator / rider positions.

Controls Conductor Mirror: Cab; Keystroke ( Ctrl+Shift+M )

Controls Engineer Mirror: Cab; Keystroke ( Ctrl+Shift+N )

### **Cab Shades**

Covers for shading the operator / rider positions.

Controls Conductor Shade: Cab; Keystroke ( Ctrl+Shift+S )

Controls Engineer Shade: Cab; Keystroke ( Shift+S )

### **Cab Windows**

Grasp the frame and clasp for opening and closing the cab windows.

Controls Conductor Window: Cab; Keystroke ( M )

Controls Engineer Window: Cab; Keystroke ( N )

### **Kick Steps**

Plates that are placed to facilitate ease of movement between connected locomotives.

Controls Front: Cab; Keystroke ( Ctrl+K )

Controls Rear: Keystroke ( Ctrl+Shift+K )

### **Uncoupling Levers**

On the prototype, these handles are used to trigger the glad-hand uncoupling mechanism.

Controls Front: Keystroke ( Shift+U )

Controls Rear: Keystroke ( Ctrl+U )

### **Engine Hood Doors**

These doors facilitate access to the interior engine functions.

Controls Start Compartment Doors: Cab; Keystroke ( Shift+V )

Controls Prime Mover Doors: Keystroke ( Ctrl+V )

# OPERATING CONTROLS

All of the operating devices, manual and visual, normally used by the engineman during locomotive operation are located near the operator's position. Most of these devices are located either on the master control console or on the engine control panel in the rear of the cab. Customer equipment specifications may cause the controls to vary in appearance and operation from those shown in this manual.

NOTE: Each description will have the appropriate simulation control that is assigned to it in the game. These controls can, but may not include all of, Cab, Keystroke, HUD, and Gamepad. If no control methods are listed after the control description, then the control is non-interactive.



REF.	DESCRIPTION	REF.	DESCRIPTION
1	Head of Train Device	4	Air Gauge: Brake Cylinder and Pipe
2	Speedometer	5	Air Gauge: Air Flow (optional)
3	Air Gauge: Main and Eq Reservoir	6	Ammeter

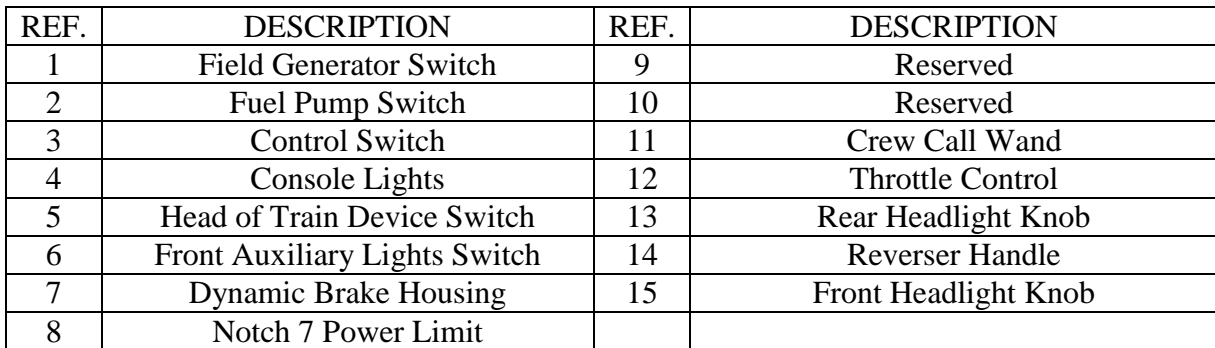
**FIG. 2. OPERATIONAL CONTROL CONSOLE**

## Air Gauges

## Speedometer

## Head of Train Device (HTD)

Refer to Figure 4 for a description of controls for this device.



## Field Generator Switch

Controls: Cab

Enables control of the fuel pump from the control stand. This must be enabled for locomotive start and run operations.

Controls: Cab

Enables control from the operator's position. Must be enabled for locomotive start and run operations.

Controls: Cab



**Console Lights**

Turns on the lights panels and gauges on the Master Controller.

Controls: Cab; Keystroke ( L )

**HTD Switch**

Turns on the Head of Train Device. Refer to Figure 4 for in depth operating instructions.

**Front Auxiliary Light Switch**

Turns on the front-facing “ditch” lights.

Controls: Cab

**Dynamic Brake**

Provides braking through engine power resistance.

Controls: Cab; HUD; Keystroke ( . / , ) Gamepad - Right Trigger / Right Bumper.

**Notch 7 Power Limit**

Limits the locomotive to Notch 7 power for compatibility with older locomotives and wheel slip control.

Controls: Cab

**Crew Call Wand**

Activates the bell to alert the crew to locomotive power or movement.

Controls: Cab

**Throttle Control**

In conjunction with the Reverser, the Throttle controls speed of the locomotive and consist.

Controls: Cab; Keystroke (A Increase / D Decrease); HUD; Gamepad - Left Trigger / Left Bumper.

**Rear Headlight Knob**

Three position switch that operates the rear headlight.

Controls: Cab; Keystroke (); HUD; Controller

**Reverser Handle**

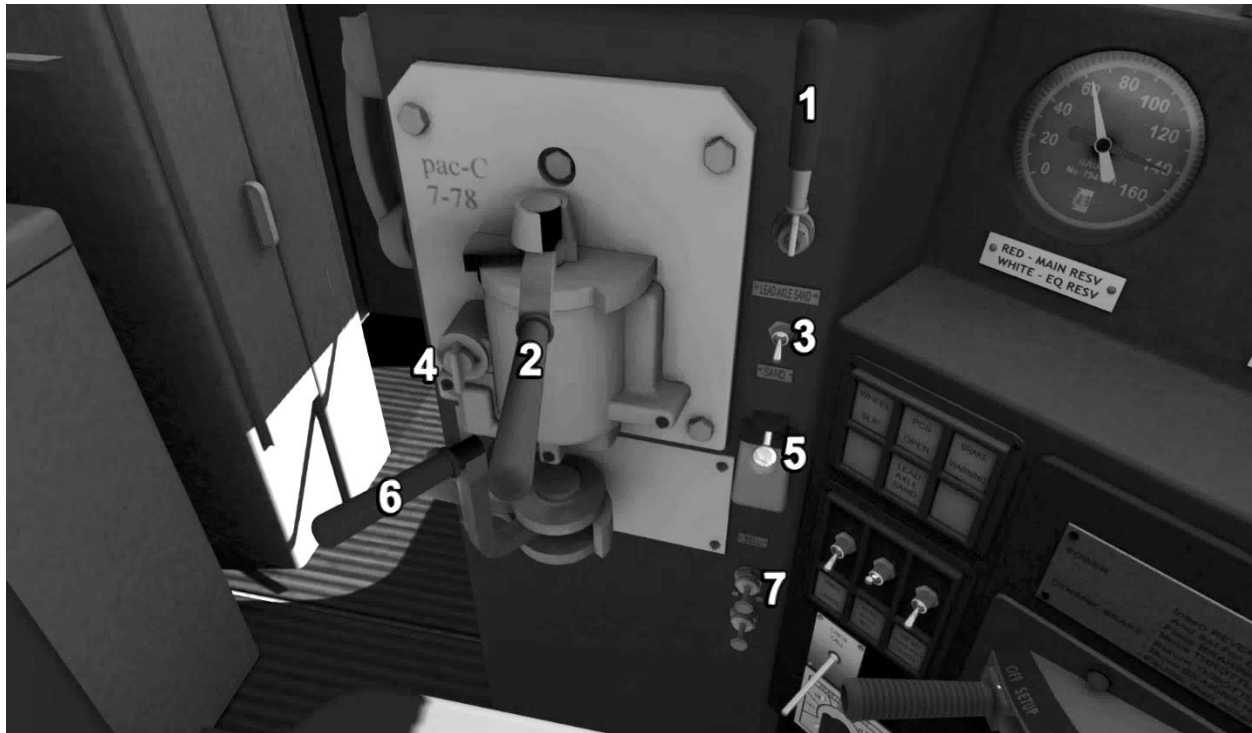
Determines locomotive / consist direction of movement. The Reverser handle points to direction the locomotive will be moving towards.

Controls: Cab; Keystroke (W Forward / S Reverse); HUD; Gamepad - Left Stick Up/Down

**Front Headlight Knob**

Three position switch that operates the front headlight.

Controls: Cab; Keystroke (H Increase / Shift+H Decrease); HUD; Gamepad - (A) Left/Right Directional Pad to select.



REF.	DESCRIPTION	REF.	DESCRIPTION
1	Horn Handle	5	Sander Handle
2	Train Brake Handle	6	Locomotive Brake Handle
3	Lead Axle Sand Switch	7	Bell Valve
4	Train Brake Cutout		

**FIG. 3. BRAKE STAND CONTROLS**

### **Horn Handle**

Handle activates the locomotive horn.

Controls: Cab; Keystroke ( Spacebar ); HUD; Controller – Left Stick Push

### **Train Brake Handle**

Discharges and recharges the train air pipe, allowing the train to slow down or stop.

Controls: Cab; Keystroke ( ; Apply / ‘ Release ); HUD; Gamepad – Left Trigger and Left Bumper.

### **Lead Axle Sand**

Switch applies sand to the front truck only.

Controls: Cab

### **Train Brake Cutout**

Cutout cock that disables the train brake control.

Controls: Cab

**Sander Handle**

Activates sanding for both locomotive trucks

Controls: Cab; Keystroke ( X ); HUD

**Independent Brake**

Brake for the locomotive only.

Controls: Cab; Keystroke ( [ Apply / ] Release ); HUD

**Bell**

Pull valve controls the exterior warning bell.

Controls: Cab; Keystroke ( B ); HUD; Gamepad – (A) then Left/Right directional pad to select.



REF.	DESCRIPTION	REF.	DESCRIPTION
1	Accessory Display	4	Message Display
2	Selector Button	5	Brake-Pipe Display
3	Power Indicator	6	ID Code Entry

**FIG. 4. HEAD OF TRAIN DEVICE**

### Accessory Display

### Selector Button

This allows the operator to choose between Acceleration, Distance Counter, and Length of Train functions.

Controls: Cab

### Power Indicator

### Message Display

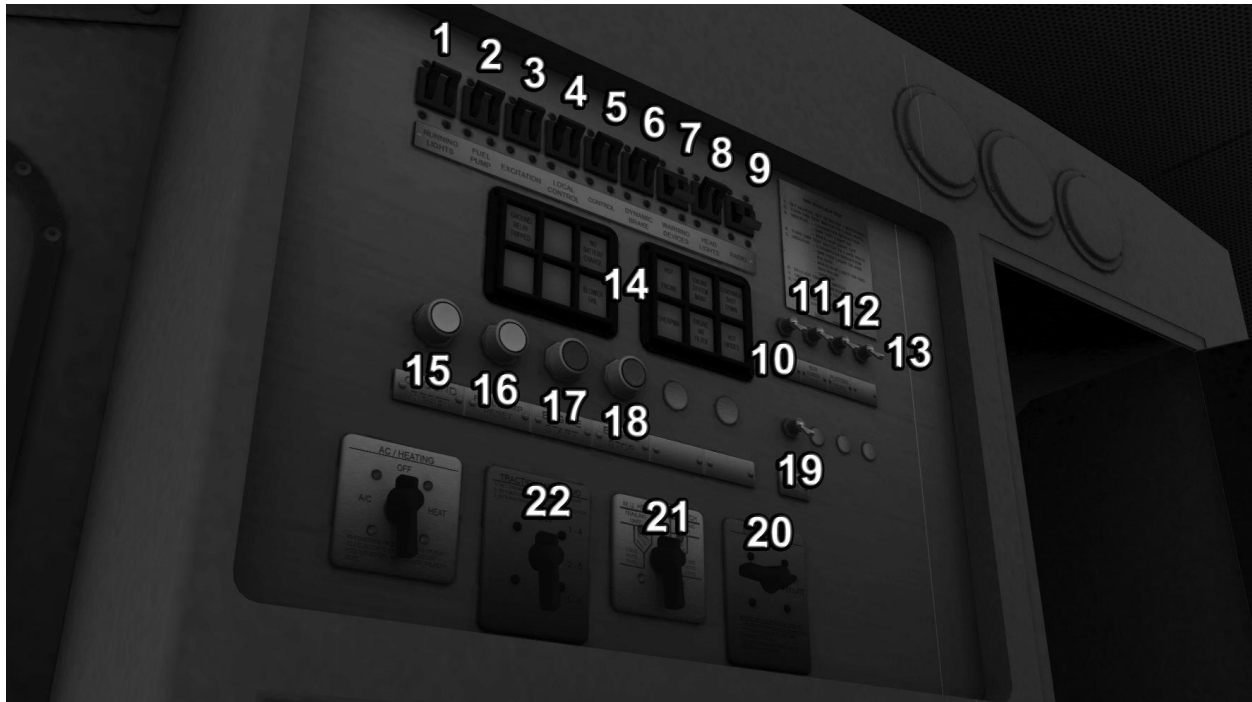
### Brake Pipe Pressure Display

### Selector Button

Roller control that allows the operator to input the syncing code for the End of Train Device.

Controls: Cab

©2017 Virtual Rail Creations, in conjunction with Dovetail Games, LLC



REF.	DESCRIPTION	REF.	DESCRIPTION
1	Running Lights	13	Reserved
2	Fuel Pump	14	Information Panel
3	Excitation	15	Ground Fault Reset
4	Local Control	16	Fuel Pump Reset
5	Control	17	Engine Start Button
6	Dynamic Brakes	18	Engine Stop Button
7	Electronic Devices	19	Engine Room Light Switch
8	Headlights Breaker	20	Isolate / Start Switch
9	Radio Breaker	21	MU Headlight Setup
10	Forward Number Boards Switch	22	Traction Motor Cutout
11	Rear Number Boards Switch		
12	Platform Lights		

**FIG. 5. ENGINE CONTROL PANEL (REAR)**

### **Running Lights**

Control breaker that must be in the closed position in order to use various light fixtures on the locomotive.

Controls: Cab, Keystroke ( Shift+L)

### **Fuel Pump**

Control breaker that enables the pumping of fuel to the engine.

Controls: Cab

### **Excitation**

Control breaker that enables power to be delivered to the traction motors.

Controls: Cab

©2017 Virtual Rail Creations, in conjunction with Dovetail Games, LLC

### **Local Control**

Control breaker that enables control from the lead motor.

Controls: Cab

### **Control**

Control breaker that enables the Master Controller.

Controls: Cab

### **Dynamic Brake**

Control breaker that enables the Dynamic Brake controller.

Controls: Cab

### **Electronic Devices**

Control breaker that enables optional electronic equipment, such as the HTD.

Controls: Cab

### **Headlights**

Control breaker that enables control of forward and rear headlights.

Controls: Cab

### **Radio**

Control breaker that enables optional radio equipment.

Controls: Cab

### **Forward Number Boards**

Switch for turning on the forward number ID lights.

Controls: Cab; Keystroke ( K )

### **Rear Number Boards**

Switch for turning on the rear number ID lights.

Controls: Cab; Keystroke ( Shift+K )

### **Platform Lights**

Switch for turning on the locomotive deck and step lights.

Controls: Cab; Keystroke ( Shift+D )

## Information Panel

These following are engine fault indicator lights.

1. Ground Fault (White) – Indicates that electricity is flowing through the frame of the locomotive to ground. To reset, place the Throttle in Idle, allow the RPM's to fall to idle level, then press the Ground Fault Reset button ( #15 ) to reset. If the ground fault occurs again within the same operating session, then the locomotive should not be used until shop personnel can locate and fix the problem.
2. Replay Tripped (White) – Indicates a possible alternator failure, and will result in reduced locomotive power. To reset, place the Throttle in Idle, allow the RPM's to fall to idle level, then press the Ground Fault Reset button ( #15 ) to reset. If the fault occurs again within the same operating session, then the locomotive should not be used until shop personnel can locate and fix the problem.
3. No Battery Charge (Blue) – Indicates that the batteries are not being charged. This light will also illuminate if the locomotive is in shutdown condition and the Battery Disconnect breaker is still closed.
4. Self-Load Box (White) – Indicates that the locomotive is in self-load test mode. The locomotive will not operate properly under this condition.
5. Reduced Excitation (White) – Indicates that less than optimal current is being supplied to the traction motors. The locomotive will operate at reduced power, and the Reduced Excitation indicator will come on when the power handle is put in Idle. The locomotive may continue to operate depending upon rules of the particular railroad.
6. Locked Axle (White) – Indicates one of the locomotive axles has locked down. Power will be removed from the traction motors to prevent further damage. The locomotive may continue to operate if the locked axle can be isolated. After inspecting for a locked axle, follow the procedure for using the Traction Motor Cutout (pg. 16) to remove the damaged traction motor/axle from service.
7. Hot Engine (Red) – Indicates a condition in which the lubricating oil and/or the coolant exceed specified heat ratings. If this condition is prolonged it may result in damage and shutdown to the engine.
8. Engine System Maintenance (White) – Indicates that a fault has occurred. Will stay on until reset by shop mechanical personnel.
9. Governor Shutdown (Orange) – Indicates that the Governor has faulted due to a low engine water or oil condition. This can be confirmed by checking the Lube Oil gauge in the starting compartment, and Engine will operate at reduced power.
10. Overpower (Red) – Indicates that a crank case overpressures fault has occurred. The engine will shut down and will not restart.
11. Engine Air Filter (Red) – Indicates obstruction of the air filters. It may be possible to clear whatever debris is blocking the intakes. Place the Throttle in idle and stop the locomotive. After inspecting and removing any debris that may be found, press the Engine Air Filter indicator to reset the fault and return to normal operation.
12. Hot Diode (Red) – Indicates that one or more of the rectifiers has reached an over-temperature condition. The locomotive will operate at reduced power under this condition. After the diodes have been given time to cool, place the throttle in idle and press the Hot Diode indicator to reset the fault and return to normal operation.

**Ground Fault Reset**

Push button to reset ground faults.

Controls: Cab

**Fuel Pump Reset**

Push button to reset fuel pump or fuel breaker faults.

Controls: Non-Interactive

**Engine Start Button**

Easy mode engine start.

Controls: Cab; Keystroke ( Z ); Gamepad ( Right Stick Push In )

**Engine Stop Button**

Easy mode engine shut down.

Controls: Cab, Keystroke ( Ctrl+Z )

**Engine Room Light Switch**

Turns on the engine room light.

Controls: Cab

**Isolate / Start Switch**

Controls the locomotive Start and Run modes. Must be in Start/Isolate in Expert Mode to start the Engine, then must be turned to Run.

Controls: Cab

**MU Headlight Setup**

Controls the headlight positions for lead and trailing units.

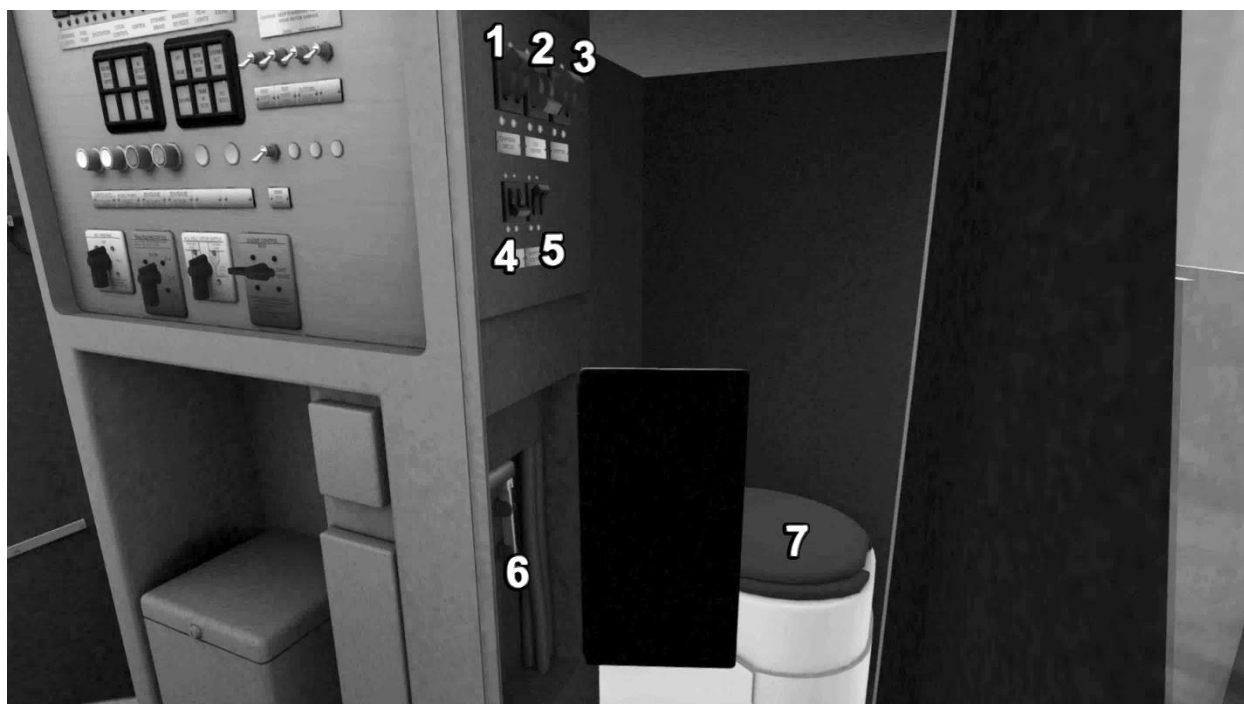
Controls: Non-Interactive

**Traction Motor Cutout**

This switch controls removal of traction motors from service. The motors must be removed in pairs, so locomotive power will be cut by 1/3<sup>rd</sup>. In order to use this switch, the Engine Throttle must be in idle, the Engine must be stopped, and the Start/Isolate switch must be in the “Start” position. After cutting out the desired traction motors, move the Start/Isolate switch back to the “Run” position.

Controls: Cab





REF.	DESCRIPTION	REF.	DESCRIPTION
1	Charging Circuit	5	Inverter Control Circuit
2	Cab Heater	6	Battery Disconnect
3	Inverter	7	Toilet
4	Toilet Control Breaker	8	Exterior Access (Not Shown)

**FIG. 5A. ENGINE CONTROL PANEL (REAR)**

### **Charging Circuit**

Controls charging between the alternator and batteries

Controls: Cab

### **Cab Heater**

Controls the cab heating system,

Controls: Non-Interactive

### **Inverter**

Controls the inveter.

Controls: Cab

### **Toilet Control Breaker**

Turns on various devices pertaining to the toilet.

Controls: Cab

### **Inverter Control Circuit**

Controls the inverter.

Controls: Cab

©2017 Virtual Rail Creations, in conjunction with Dovetail Games, LLC

### **Battery Disconnect**

This knife switch disconnects the batteries from the locomotive charging system. This should only be opened if locomotive is undergoing maintenance.

Controls: Cab

### **Toilet**

Toilet.

Controls: Non-Interactive

### **Exterior Access**

Access door to the toilet and cab compartments from outside of the locomotive.

Controls: Cab



REF.	DESCRIPTION	REF.	DESCRIPTION
1	Turbocharger Gauge	5	Ready Indicator
2	Fuel PSI Gauge	6	Lube / Prime Button
3	Lube PSI Gauge	7	Engine Start Button
4	Wait Indicator		

**FIG. 6. ENGINE START COMPARTMENT**

#### **Turbocharger Gauge**

Shows the amount of turbocharger pressure available during engine operation.

#### **Fuel PSI Gauge**

Shows the amount of pressure in the fuel delivery system.

#### **Lube PSI Gauge**

Shows the amount of pressure in the lubrication pumping system.

#### **Wait Indicator**

This tells the operator the status of the engine during the starting process.

#### **Ready Indicator**

This tells the operator that the engine is ready to be started.

#### **Lube/Prime Button**

The button to use to prime the engine before startup.

Controls: Cab

#### **Engine Start Button**

Pressing this button after the lube/prime cycle completes will start the engine.

Controls: Cab

©2017 Virtual Rail Creations, in conjunction with Dovetail Games, LLC

## MISCELLANEOUS CONTROLS

### **Sunshield Visors**

Located above the operator forward window and above the rider door, these can be pulled down to block sunlight from blinding the occupants.

Controls: Cab

### **Cab Interior Lights**

Located above the operator / rider seats, these can be switched on to provide illumination in darkened conditions. The Running Lights breaker on the ECP must be closed before these lights will become active.

Controls Conductor: Cab; Keystroke ( Ctrl+L )

Controls Engineer: Cab; Keystroke ( L )

### **Wipers**

The wipers can be turned on from the pull-switch positions above the operator / rider seats.

Controls: Cab; Keystroke ( V ); HUD; Gamepad – (A) then directional pad to choose control.

### **Handbrake**

The handbrake wheel is located on the short nose of the unit on the operator's side.

Controls: Cab; Keystroke ( / ); HUD; Gamepad – (A) then directional pad to choose control.

# PRE-ENGINE STARTUP

## CONTROLS FOR MULTIPLE UNITS

These units are set up so that control of an entire MU consist can be done from the primary (front) locomotive. If you try to control the train from any of the trailing units in the consist after the primary unit has been started, the locomotives will shut down and restart with the cab of the locomotive that you are currently in becoming the primary unit.

It has been noted that in some cases it may be desirable to have lights or other accessories in the trailing units to be in the on position. If this is the case, then use the following manual procedure to activate them without switching the primary unit off.

### **Before Startup:**

If in the beginning of the Scenario the locomotives have not been started, then use CTRL + or CTRL - to move between the cabs of the engines. You may turn on whatever accessories are necessary. Be sure that the Battery Disconnect for each unit is engaged and that the proper circuit breakers are in the “on” position. For example, if you want to run the Dim Lights on a trailing unit, then the Headlights Breaker must be on.

### **After Startup:**

If you have already started the consist, or it is Auto-started at the beginning of the scenario, moving into the cab of a trailing unit will shut down the consist. Instead, wait until after the train has started moving to move between trailing cabs and turn on any desired accessories. However, if you touch or move any primary controls (brake, throttle, selector, reverser) while the train is running, the game will assume you are taking control of the train from the cab of the selected unit and will shut down the engines.

# STARTING ENGINE

## SIMPLE MODE

In simple mode, the locomotive will already be started and all necessary controls switched on to allow for immediate control. This control mode is best for using a game-pad type controller. However, in this mode you will lose some of the advanced functions and physics this locomotive has to offer.

## INTERMEDIATE MODE

For quick start-up in Expert Mode, press the “Engine Start” control on the rear control panel. This will throw all necessary switches into their “On” positions. However, you will need to check your auxiliary switches (Lights, Headlights, etc.) to be sure they are on. Wait until the engine has attained 450 RPM before operating the unit.

## EXPERT MODE

Before attempting to start the locomotive:

- 1). Move the Engine Control switch to the “Start/Isolate” position.
- 2). Close the following breakers on the rear control panel (FIG. 5):
  - a. Fuel Pump
  - b. Excitation
  - c. Local Control
  - d. Control
  - e. Dynamic Brake
- 3). Close the following breakers on the rear auxiliary control panel (FIG 5A):
  - f. Inverter
  - g. Charging Circuit
  - h. Inverter Control Circuit

NOTE: The breaker box below the auxiliary control panel should be checked to be sure that the Battery Disconnect is engaged. This disconnect switch should only be opened if maintenance is being performed on the engine electric circuit.

- 4). Close the Gen Field, Fuel Pump, and Control breakers on upper right side of the Master Controller (FIG 2A).
- 5). Once these controls are active, move to the first set of doors at the engine compartment. Open them and locate the Remote Start pendant (FIG 6).
- 6.) Press the Pre-lube/Prime button on the pendant and hold. This will begin circulating oil through the engine. When this is finished, the “Ready” light will illuminate and the Prime Pump will begin feeding fuel to the engine.
- 7.) Once the Prime has finished, press and hold the “Start” button for two seconds, until the engine begins generating RPM.
- 8.) Back inside the cab, on the rear cabinet (FIG 5), turn the isolate switch to run before operating engine.

## EXPERT MODE - TROUBLESHOOTING STARTUP ISSUES

- The engine will fail start-up if the Lube/Prime button is held longer than necessary. A two minute cool down period is required before trying to start the engine again.
- If “Wait” light does not illuminate when pressing the prime button, go back and check to be sure that all required breakers have been closed.
- If the Lube Prime cycle completes but the oil and fuel pressures drop when the “Start” button is pressed, the engine will start and immediately shut down. Check all required breakers to be sure they have been closed.

## STARTUP FOR SCENARIO DEVELOPERS:

By default, the C30-7 locomotive is unpowered at the start of a scenario. If you wish to have the locomotives start automatically at the beginning of a scenario without user input, then you need to insert the following code into your scenario script and link it to the scenario through the Timetable Editor:

```
if event == "boarding" then
```

```
SysCall ( "PlayerEngine:SetControlValue", "ShortcutStartup", 0, 1 );
```

```
return TRUE;
```

```
end
```

In the first line, “boarding” is a name that links the script command to the Timetable Editor. A simple message trigger with this name placed in it is usually enough to start the locomotive. You could also use the timestamp to trigger the startup later, or include a message to the player.

## PRE-OPERATION

### SETTING UP THE EOT

The HTD (Head-of-Train-Device) supplements the information that is already available to train personnel via the console controls. Using the HTD, the train crew can monitor conditions throughout the entire train and act accordingly. Please note that even if the HTD is not synced to the EOT, it will still monitor brake pipe pressure and alert accordingly if the pressure in the brake pipe begins to fall.

An End of Train device is provided to mark the end of the train. On the prototype, this device marks the end of the train for visibility to other railroad crews, and also monitors train length and air-pipe pressure. Of note, this model replicates a battery powered prototype. To conserve battery power, the EOT does not flash in daytime conditions.

To set up the EOT that is provided for Train Simulator, use the following procedure:

- 1.) If the train does not already have an EOT, switch to the Scenario Editor.
- 2.) From the Freight Car filter, select End of Train Device.



- 3.) Place the EOT on the tracks. In actuality, this is a 40' long invisible freight car with an EOT on the end. Manipulate the EOT just as you would a freight car. Grab the EOT to move along the track or to turn the EOT to the correct end for use.

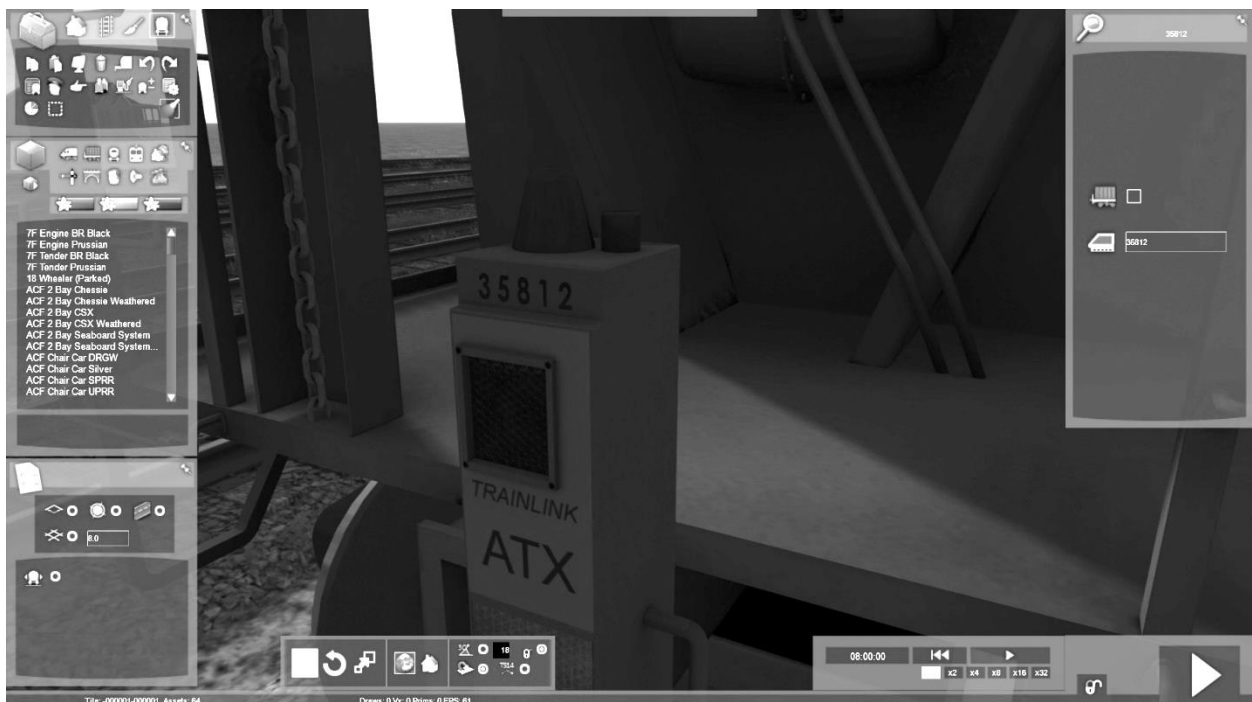




- 4.) After making sure the EOT is pointing the correct way, push the unit to the end of the freight car until it couples. If the coupling is successful, click F2 to save or the Save button in the Scenario editor and exit to the game.



- 5.) After entering the game, look at the EOT to make sure it is functional, and also to be sure that there is a numeric code printed on the EOT body. Just like a freight car, you can use the auto-generated number, or you can click on the EOT while still in the Scenario Editor and assign a five digit number of your own, from 10000 – 99999.



## SETTING UP THE HTD



Once the EOT is placed, enter the cab. Switch on the HTD using the HTD/Speedo switch on the console (FIG 2A). Now, enter the code from the EOT casing into the HTD using the ID CODE counter thumbwheels (5). If the correct code is entered, then the HTD will sync its signals with the EOT and will begin receiving telemetry.

During normal operation, the synced HTD/EOT will provide acceleration, distance travelled, train length, and brake pipe pressure information. The unit will also give a periodic alarm in the form of three beeps when the pressure in the brake pipe falls. If for some reason the EOT is disconnected from the end of the train, the display will go blank until the EOT is connected again.

To display the Distance Counter functions, use the following procedure:

- 1.) Turn on the unit using the switch provided on the Master Controller console.
- 2.) By default, the Locomotive Distance Counter display will show the Accelerometer. This function will show locomotive acceleration and deceleration.
- 3.) To access the Locomotive Distance Counter, press the Count/Hold/Off button once. The Distance Counter will be set at zero. Moving the locomotive forward or backward from this point will cause the counter to count up or down, up to 18,888 feet in either direction.
- 4.) To stop the Distance Counter, press the Count/Hold/Off button again. This will stop the counter, and the number displayed will begin to flash.
- 5.) To access the Train Length display, press the button again. The length of the train, counted from the locomotive to the EOT, will be displayed. This will also reset the Distance Counter.

6.) Press the Count/Hold/Off button again to return to the Accelerometer.

**NOTE:** The EOT is currently designed to work with cars that can pass consist messages from the rear of the train to the HOTD, and cars that are generally available for Train Simulator. Currently, the cars that can pass consist messages and sync up with the numbers on the EOT are:

- 2 Bay ACF Hoppers and CSX 100Ton Coal Gondola that are supplied with this package.
- 100 Ton Open Top Gondolas that come with the Chessie U30C package (sold separately).

All other cars that cannot pass consist messages can sync up with the HOTD using the following hardwired code: 70186

## OPERATION

### Simple / Intermediate Modes

1. Place the Reverser in the forward or reverse position.
2. Move the Train and Independent braking lever to release.
3. Move the Power Lever to the desired position to begin moving the locomotive.

### Expert Mode

1. After the startup procedure is complete, move the Engine Control switch on the rear control panel to “Run”.
2. Place the Reverser in the forward or reverse position.
3. Move the Train and Independent braking lever to release.
4. Move the Throttle to the desired position to begin moving the locomotive.

### Dynamic Braking

1. Move the Throttle to the “Idle” position.
2. Move the Reverser lever to either the forward or reverse position.
3. Grab the Dynamic Brake portion of the Power Lever and move it to Setup. Wait for 10 seconds for the brakes to activate, then move to the desired position.

## CONTROL NOTES – ALL UNITS

### WARNING LIGHTS

Warning lights are defined as any light that has been added to the unit for the sole purpose of enhancing the safety of the train crew and general public by calling attention to the fact that a train is approaching.

On this unit, the HEADLIGHTS breaker must be in the closed position before operation warning lights.

©2017 Virtual Rail Creations, in conjunction with Dovetail Games, LLC

## **RUNNING LIGHTS**

Running lights on these locomotives include step lights, number boards, engine compartment lights, toilet lights, and any other light that provides access for crew-related functions.

In order to operate these lights, the RUNNING LIGHTS breaker on the rear control panel must be in the closed position.

## **EMERGENCY BRAKE RECOVERY**

If the emergency brake is applied, from either the Engineer or Conductor stations, a penalty time is enacted to allow the brake system to recharge. In order to recover from an E-brake application, you must hold the Train Brake handle in Emergency for at least 1 minute. Afterwards, hold the train brake in “Suppression” until the PCS light goes off. The unit will not generate power again until the Pneumatic Control Switch resets.

## **OVERSPEED**

The maximum powered speed for this locomotive is 70mph. Operation of the unit above the maximum speed can result in damage to engine or traction components. The locomotive is equipped with over speed control to prevent this. Once the unit has reached 70 mph, the PCS Relay will be tripped in an automatic attempt to reduce unit speed.

## **PCS RELAY AND RESET**

These units are equipped with a PCS (pneumatic control switch) relay that, in the event the train exceeds the maximum locomotive speed, will dump the brake pipe and reset the throttle to zero, no matter its current position. If the PCS relay is tripped, you must place the throttle to Notch 0, place the Reverser handle in neutral, and place the Train Brake in Suppression. Once the speed of the train has dropped below the maximum tolerable limit, the PCS relay will be reset.

The PCS reset can also be triggered if an electrical fault causes the AC Control breaker to disengage. You will need to make sure that this breaker is engaged before attempting a reset.

## THE GENERAL ELECTRIC C30-7 FOR TRAIN SIMULATOR

This package features the C30-7 locomotive in CSX Transportation licensed paint liveries, and contains the following downloadable content for use with Dovetail Game's Trains Simulator 2017 PC and video game:

C30-7 : CSX

C30-7 : CSX Weathered ( Light and Heavy )

40' CSX Two-Bay covered hopper, clean and weathered.

40' Chessie System Two-Bay covered hopper, clean and weathered.

40' Seaboard System Two-Bay covered hopper, clean and weathered.

45' CSX Three-Bay 100 Ton coal hopper.

End of Train Device

Quick Drive scenario for each locomotive.

Career Scenarios

## SCENARIOS

**C30-7 01. Sandbaggin'** – Make up a loaded train at the local Sand Plant and take it south.

**C30-7 02. Hobo Special** - Pick up empty loads from sidings along the division and take them to Jacksonville.

**C30-7 03. Scrap Iron Express, Parts I and II** – The company decides to retire the C30's, but "new" does not always mean "improved".

## QUICK DRIVE SCENARIOS

Each locomotive is enabled for Quick Drive. Simply click on the Quick Drive tile in Train Simulator and select one of the locomotives and a route to run it on.

## CREATING YOUR OWN SCENARIOS

These instructions are for creating a simple free-roam scenario using the C30-7 and freight cars. If you want to create a more sophisticated scenario or add special instructions you should consult the TS2016 user manual.

- After opening the Scenario Editor for the Scenario and Route of your choosing, click on the Object Filter pane (left middle pull-out).

- Click on the Provider Filter (box with arrow on it) to bring up the filter box (right-side pullout)

©2017 Virtual Rail Creations, in conjunction with Dovetail Games, LLC

- Scroll down through the list of providers and make sure that "VRC" is checked, as well as C30-7.
- Return to the object filter and click the Locomotive icon.
- Scroll through the list and choose one of the available C30-7 locomotives.
- Place the locomotive on the tracks as many times as desired.
- Add freight cars to the consist.
- Place a driver icon on the lead locomotive.
- Press F2 to save the scenario, then close it out.
- Once in the actual game, click on the locomotive to select it as your player avatar.

## SUPPLIED SCENARIOS CHEAT SHEETS

**WARNING: SPOILERS AHEAD.** If you want to play these scenarios without knowing the outcome, stop reading now!

**Scenario 01: C30-7 01. Sandbaggin'.** This is a straightforward route tour scenario. You begin your day on a siding at Northwood. After being given instructions and starting your locomotive, you move your light engines south to the sand plant and pick up two strings of loaded freight cars. After collecting the cars and setting your EOT, you head south to Hileah.

Tips:

- There is a northbound Amtrak train coming on the main you will be working on. It would not be a good idea to stop that train.
- Handle the cars at the sand plant carefully. They are backed against the buffers and can easily be derailed.
- Unless you are extremely fast in your switching, you will be passed by a southbound freight. Be on the watch for restricted signals and equipment on the tracks ahead of you.

**Scenario 02: C30-7 02. Hobo Special.** In this scenario, you will be following an Amtrak local north. This is the weekly Hileah-to-Jacksonville empty car collector, so you will have plenty of stops of your own to make.

Tips:

- Check your switching list to be sure that you make all of your drops and pick-ups.
- Make sure that all of your manual switches are lined correctly. The dispatcher will give you the track that you should be on, but you and your crew are responsible for making sure you are on that track. You will need to make sure that your route is lined before entering the sidings to avoid collisions with static rail cars.
- Several of the sidings that you are switching will have Restricted Signal protection. You need to ask Dispatch permission to pass them.
- The C30-7 is a slow, lumbering beast that is not meant for switching. It may take some patience and trial and error at the controls to get the hang of making multiple stops.

**Scenario 03: C30-7 03. Scrap Iron Express, Parts I and II.** It's 2003 and CSX is retiring its fleet of Dash 7's. Unfortunately, someone in the shop pencil whipped a work order, and the Dash 8 assigned to the move is not exactly up to the task.

Tips:

- This is a two part "no win" scenario. The first part will see multiple failures en-route to Waycross. The second part solves the issue by firing up one of the diesels that are about to be scrapped to continue the journey.



## APPENDIX 1: CREATING LOCOMOTIVE FAULTS IN SCENARIOS

The C30-7 Locomotive has been scripted to take advantage of as many realistic controls as is possible in this game. This includes a number of errors and faults that prototype railroad crews may encounter when operating this locomotive. These faults, described on page 15, can be triggered through scenario scripting in Train Simulator.

### CONTROL NAMES

In order to trigger locomotive faults, you first must know the Control Names that must be plugged into the script to activate them. The following are the fault names that are used. They must be put into the script exactly as written here:

GroundFault

OverloadRelay

Fault:ReducedExcitation

LockedAxle

HotEngineLight

Governer Fault

Failure:CrankCaseOverpressure

EngineAirFilter

HotDiodes

## SETTING UP THE SCENARIO

After setting up your consist with the C30-7 as the player locomotive, you will need to do a few things in the Scenario Editor to set up a failure.

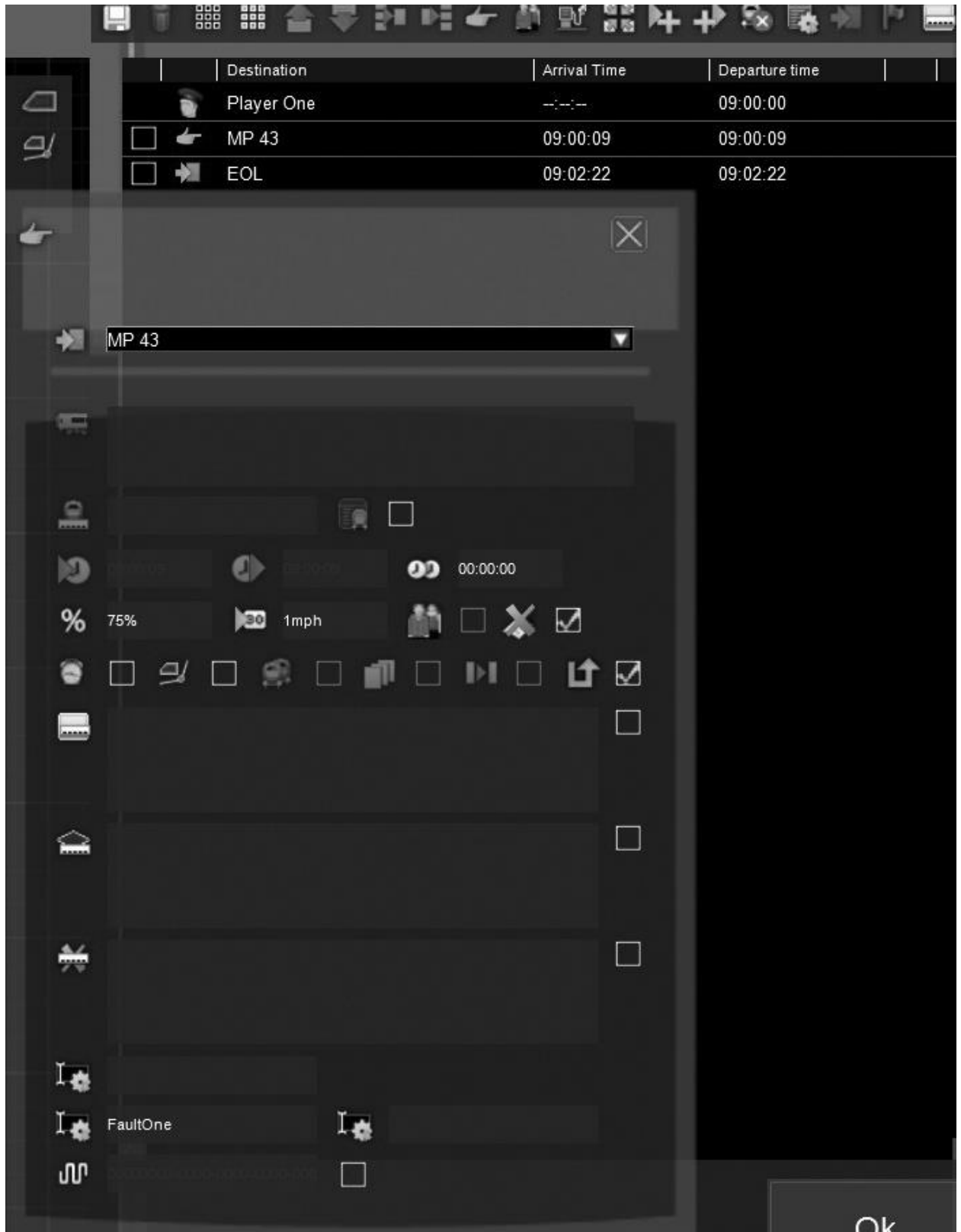
1. You will need to set up a marker to trigger the failure. You can either use a marker that is already present (i.e. a siding, destination, or platform marker), or you can set up a new one. If you do set up a new one, it's important to make it as inconspicuous as possible so that a player who is new to the scenario will not suspect that a failure is imminent. Name it after a nearby milepost, signal, or road crossing so it looks to be a natural part of the route.



**FIG. 7. TRIGGER MARKER**

2. After your trigger marker is set up, you will need to go into the Time Table Editor and find your consist. Insert a “Stop at Destinations” instruction and open it for editing. For the Destination, you will need to find the marker that you just created from the dropdown list. In this example, the marker is called MP43. For the speed, if you want your locomotive to be moving when it hits the marker, then put in 1mph or above. And to hide it from the player, check the “Hide in Taskbar” box.

Finally, in the Trigger Event Success field box, you need to put in a friendly name. This name will be what hooks the fault to the script. In this example, we will put “FaultOne” in the field.



**FIG. 8. DESTINATION INSTRUCTION**

3. Still in the Time Table Editor, got to the icon in the upper quadrant, second from the right, the Script Editor. Teaching you how to create a script from scratch is beyond the scope of this manual, so for starters you will want to copy and paste a copy of an already existing script from another scenario. Once you have done this, in the script editor, click on the “Edit” button to open the script in plain text. Notepad++ is the recommended editor used here.

When you open the script, you will see a lot of different stuff, but all that we are worried about comes between the word “function” and “end”. The first thing you need to do is plug in your “hook word” from the Time Table “Stop at Destinations” marker. That word was “FaultOne”, so that is what we are going to type in after the words “if event ==”. It should look like this:

```
if event == "FaultOne" then
```

The next part will be our fault trigger. In the second line that begins with “SysCall”, we are going to put in one of the Control Names that were listed earlier. Since it is a simple fault that can be reset by the player from the engine cab, in this example we are going to use the “GroundFault”. The line should look like this:

```
SysCall ( "PlayerEngine:SetControlValue", "GroundFault", 0, 1 );
```

What this line does is send a message to the Engine Blueprint to turn on the Ground Fault Light. When that happens, another script that governs how the engine behaves when this light comes on tells the locomotive what to do next. If all goes well, you have just caused a bit of a headache for the player.

Put altogether, the script should look like this. Don’t be intimidated by this, as lines 34 and 37 are all you really need to worry about.

NOTE: In the photo the script hook word shows “GroundFaultLight”. It should read “GroundFault”.

```

1  -- TrainSimulator 2016
2  -- Package: C30-7
3  -- Route: Miami
4  -- Scenario: SandBaggin'
5
6  -- true/false defn
7  FALSE = 0
8  TRUE = 1
9
10 -- condition return values
11 CONDITION_NOT_YET_MET = 0
12 CONDITION_SUCCEEDED = 1
13 CONDITION_FAILED = 2
14
15 -- Message box variable
16 MSG_TOP = 1
17 MSG_VCENTRE = 2
18 MSG_BOTTOM = 4
19 MSG_LEFT = 8
20 MSG_CENTRE = 16
21 MSG_RIGHT = 32
22
23 MSG_SMALL = 0
24 MSG_REG = 1
25 MSG_LRG = 2
26
27 -- Message types
28 MT_INFO = 0      -- large centre screen pop up
29 MT_ALERT = 1     -- top right alert message
30 --
31 -- Handle events
32 function OnEvent ( event )
33
34     if event == "FaultOne" then
35
36         SysCall ( "CameraManager:ActivateCamera", "CabCamera", 0 );
37         SysCall ( "PlayerEngine:SetControlValue", "GroundFaultLight", 0, 1 );
38         return TRUE;
39
40     end
41
42     return FALSE; -- unhandled/unknown event
43 end

```

FIG. 9. SCRIPTING HOOK

4. Now save your script and go back into the Time Table Editor. Still in the Scripting Screen, you need to push the button that reads “Compile/Generate MD5” to make the script active in the scenario. Do this each time that you change your script in order to update it in the game. Now, exit out of the script editor.
5. If you are done making changes to your scenarios, click F2 to save the scenario, click OK in the Time Table Editor to exit, and then click on the Play button in the lower left corner to enter your scenario. Start up the locomotive and move to the marker that is set up to make the locomotive fail. If you have done your work correctly, when you hit the marker, the rear ECP panel should look like this, and your locomotive should lose power.



**FIG. 10. GROUND FAULT**

## COMPLICATIONS

If you want to make things a bit more difficult for the player, then you could try a few of the following suggestions:

1. Create a success or failure for each event. When you create your Destination Instruction, in addition to your success condition ( "FaultOne" ), put a failure condition in the "Trigger Event Failure" field. Change the Speed box to "10mph". Making these changes would give you an and/or condition that could dictate whether the player triggers a failure or makes it successfully past that point. It would look something like this:



**FIG. 11. SUCCESS OR FAILURE**

You would then need to change your script to look like this:

```
function OnEvent ( event )

    if event == "FaultOnePass" then

        SysCall ( "PlayerEngine:SetControlValue", "GroundFaultLight", 0, 0 );
        return TRUE;

    end

    if event == "FaultOneFail" then

        SysCall ( "CameraManager:ActivateCamera", "CabCamera", 0 );
        SysCall ( "PlayerEngine:SetControlValue", "GroundFaultLight", 0, 1 );
        return TRUE;

    end

    return FALSE; -- unhandled/unknown event

end
```

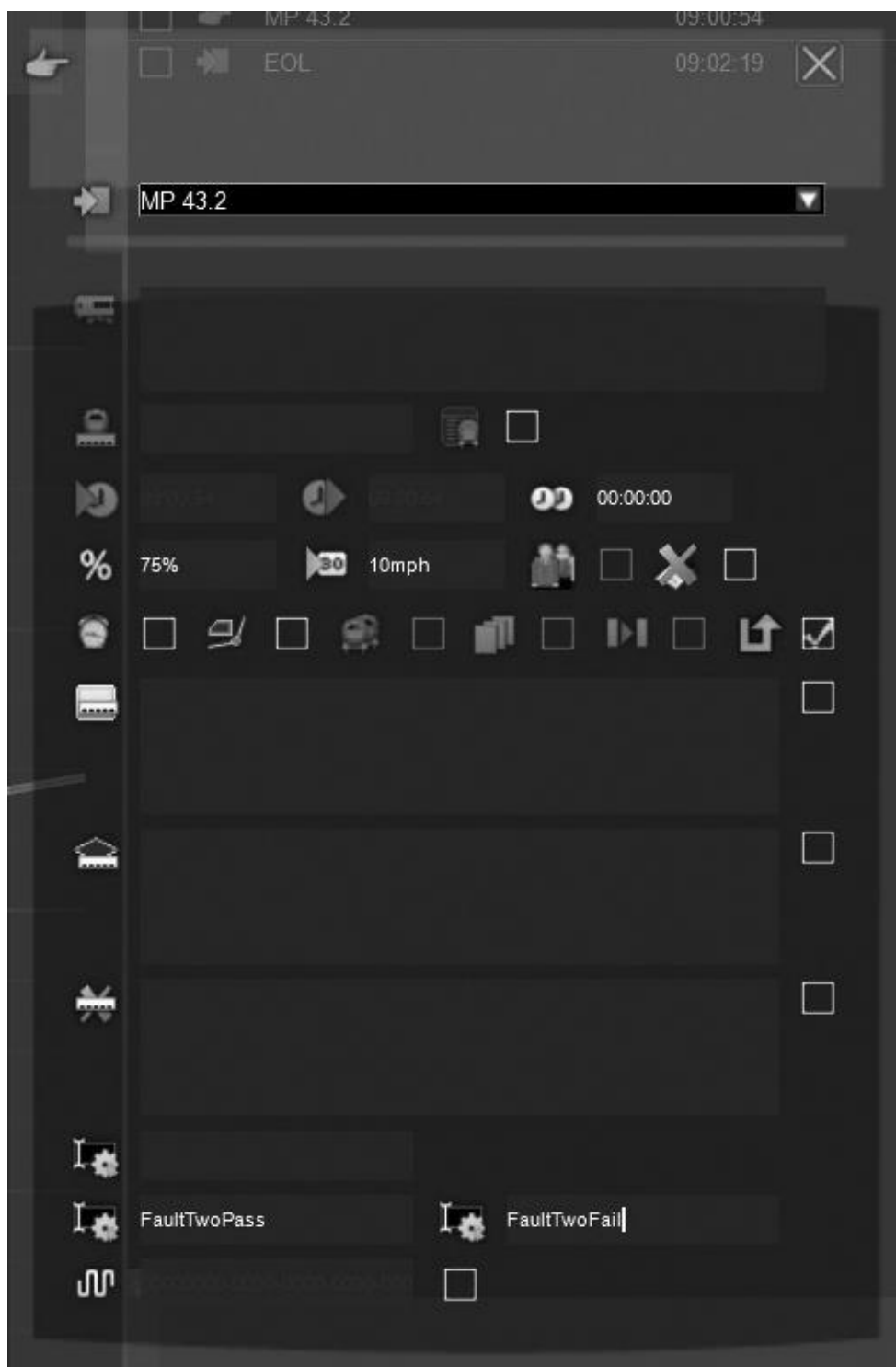
**FIG. 12. SCRIPT HOOKS**

What you have done is create a condition where if the player is driving the locomotive at a speed of greater than 10mph, the scenario will not trigger the failure. But, if the locomotive is going slower than 10mph, the failure would be triggered. This could be very useful to simulate failures in situations where the locomotive has been running at full power for long periods of time, such as hauling a heavy consist up Donner Pass.

2. The Hot Engine failure is a fault that would need more in depth scripting. You would need two points of failure for this one. The first would trigger the Hot Engine light. The second failure point would be like the one shown in the first example and could be loosely dependent on the first trigger.

For example: The locomotive is pulling a heavy consist up a long grade. You have done your homework as you created the scenario, so you know that the engine is going to experience at least ten minutes of running at maximum throttle. So, midway up the hill, around the five minute mark, you create your first Destination Marker failure and script it to turn on the Hot Engine Light. This is the first warning that something bad is about to happen. The Engineer will either need to throttle back or risk burning up the traction motors. So, a few thousand feet more up the hill, you would need to place a second destination marker, name it, and then put in the information in the Time Table Editor like so:





**FIG. 13. GROUND FAULT**

Then, you would need to change your script as follows:

```

function OnEvent ( event )

    if event == "FaultOnePass" then

        SysCall ( "PlayerEngine:SetControlValue", "HotEngineLight", 0, 0 );
        return TRUE;

    end

    if event == "FaultOneFail" then

        SysCall ( "CameraManager:ActivateCamera", "CabCamera", 0 );
        SysCall ( "PlayerEngine:SetControlValue", "HotEngineLight", 0, 1 );
        return TRUE;

    end

    if event == "FaultTwoPass" then

        SysCall ( "PlayerEngine:SetControlValue", "HotEngineLight", 0, 0 );
        return TRUE;

    end

    if event == "FaultTwoFail" then

        SysCall ( "CameraManager:ActivateCamera", "CabCamera", 0 );
        SysCall ( "PlayerEngine:SetControlValue", "HotEngineLight", 0, 1 );
        SysCall ( "PlayerEngine:SetControlValue", "GeneratorFieldSwitch", 0, 1 );
        return TRUE;

    end

end

```

## FIG. 14. TWO DESTINATION FAULTS

So, basically what we have done here is set up a destination marker that will activate a fault, and then if certain conditions are not met by the time the train runs over the next destination marker, the stakes will increase. The first fault will turn on the Hot Engine light. When the train reaches the next destination marker, if the train is travelling above ten miles per hour, which is about the lowest limit for DC traction motors in continuous service, then the Hot Engine light will go out and the train will be safe to continue. However, if the train is going less than ten miles per hour, then that means probably that the engine is running at full speed and is too hot to continue. Throwing in the GeneratorFieldSwitch means that power will be removed from the traction motors without killing the Prime Mover. On a hill such as the ones leading up to Donner Pass, this is pretty much game over, as they will never get the heavy consist restarted up the hill.

## **BIBLIOGRAPHY**

- Fallen Flags Locomotive Operations Manuals: GE New Series Diesel-Electric Locomotives.
- U Boats: General Electric's Diesel Locomotives – Greg McDonnell.

## **CREDITS AND THANKS**

Many thanks to the fine amateur rail fans and professional rail workers who have helped make this locomotive as realistic an experience as possible:

Anthony Wood

Ed Kaspriske

Eric Salter

Frank Sanfrank

CSX Transportation

The Illinois Railway Museum

The Tennessee Valley Railroad Museum