DT300
Series
Digitrax Throttle Manual

Includes:
DT300 Series Throttles,
IR Operation with UR90 & UR91
Radio Operation with UR91

DIGITRAX DT300 SERIES THROTTLE INSTRUCTION MANUAL

Table of Contents

1.0 Introduction

Congratulations on your purchase of a Digitrax DT300 Throttle!

The design of the Digitrax DT300 Throttle provides you with more control for operating your layout. With LocoNet you simply connect system components to build the layout control system that you've always wanted! DCC throttles are the handhelds you use to tell the command station what you want the decoders to do. You will probably have several throttles on your layout if you have more than one person running trains at a time.

The DT300 Throttle is a full-function hand held controller that includes 2 independent throttles and a common keypad to control up to 9 functions (0-8), turnouts and programming. The DT300 Throttle does not require a battery in normal walk-around operation. If you do not install a battery, the throttle display will be off while you are unplugged from the system. The DT300 requires a 9 Volt battery for infrared operation. The DT300R requires a 9 Volt battery for radio operation. The DT300 Throttle is available in two versions:

- The DT300 connects into LocoNet by a 7' cable. The cable allows flexibility in movement. The throttle can be disconnected to move to another point on the layout and reconnected to LocoNet without losing the acquired locomotive. The unit will also work wireless using Infrared signals when used with the appropriate Universal Panel receiver, UR90 or UR91.

- The DT300R is a radio control throttle with a 1' cable to connect into LocoNet. The throttle is plugged into LocoNet to select and acquire a locomotive and then can be disconnected to allow freedom to roam around the room while you run your locomotive. Radio operation requires a special UR91 Universal Panel receiver.

This manual contains information about running your layout with infrared and/or radio tetherless operation.

There are many different combinations of Digitrax components that you can use to set up a layout control system that is just right for you. You can combine Digitrax products with compatible decoders, boosters and computer software made by other DCC companies.

Your success with and enjoyment of our products are very important to us. After all, this is a hobby and it is FUN!!! Please read this manual carefully before you install your system. We have included lots of hints and operating ideas based on our experience with the Digitrax system. If you have questions not covered by this manual please contact your dealer or Digitrax technical support. The answers to many questions can also be found on our web site.

2.0 DT300 Front Panel Controls and Indicators

Before you select and run a locomotive, let's take a few minutes to look at the DT300's controls and display. We will be referring to these controls and displays, shown in the diagrams on the following page, throughout the manual.

2.1 L THROTTLE and R THROTTLE KNOBS

The DT300 Throttle has two throttle knobs, allowing you to select and control two locomotives. Throughout this manual we refer to the throttle knob on the left side as the **L THROTTLE** and the throttle knob on the right side as the **R THROTTLE**. This corresponds to the **L** and **R** labels that appear on the DT300 near the throttle knobs.

The throttle knobs on the DT300 use "encoders" to control speed and direction of the locomotive. The encoder can be pressed or rotated to "activate" the throttle. Pressing the throttle knob once activates that encoder. Pressing the knob twice will change the direction of the loco controlled by that knob. The encoders provide very smooth, fine speed control. In 128 speed step mode it takes four complete rotations of the knob to go from stop to full speed. When you select a locomotive that is already moving on either throttle knob, that throttle will continue to run the locomotive at the same speed and in the same direction in which it was traveling before being selected to the throttle.

As you turn the DT300 throttle knobs you will feel a mechanical detente (and hear a beep if your throttle is set up for beeps and clicks). Each time you move the knob, the system processes information. In some cases, the LCD display will not change each time you feel the detente. In the case of increasing and decreasing loco speed, this is because each detente does not equal an increase or decrease of 1% speed. If your DT300 is set up for ballistic tracking, the speed you rotate the encoder (throttle knob) will affect how the display changes.

You can customize the tracking characteristics of these knobs for either **straight line (normal) tracking or ballistic tracking**. With straight line tracking each movement of the knob causes a fixed rate of change. With ballistic tracking, the faster you increase or decrease the the throttle knob, the faster the data changes in the throttle. Your DT300 was shipped with ballistic tracking as the factory default setting. To change this setting see Section 19.

The throttle knobs on the DT300 are also used to select a new locomotive address, access the recall stack and select a locomotive to run on a throttle, or to reverse the direction of the locomotive currently selected on that throttle. See Section 4– How to Select Loco Addresses.

2.2 Liquid Crystal Display (LCD)

The display screen provides information on the status of the locomotives on your layout.

2.2.1 Loco Icon

The L and R Loco icons are used to indicate whether an address is available for

DT300/DT300R Throttle Controls

L THROTTLE KNOB   **R THROTTLE KNOB**
(Section 2.1)

LCD DISPLAY
(Section 2.2)

FN/F0 KEY
also a shift key
(Section 2.6)

STOP KEY
(also a shift key)
(Section 2.3)

MODE KEY
(Section 2.5)

SELECT KEY
(Section 2.4)

L/t KEY
(Section 2.7)

c/R KEY
(Section 2.7)

Y/+ KEY
(Section 2.8)

N/- KEY
(Section 2.8)
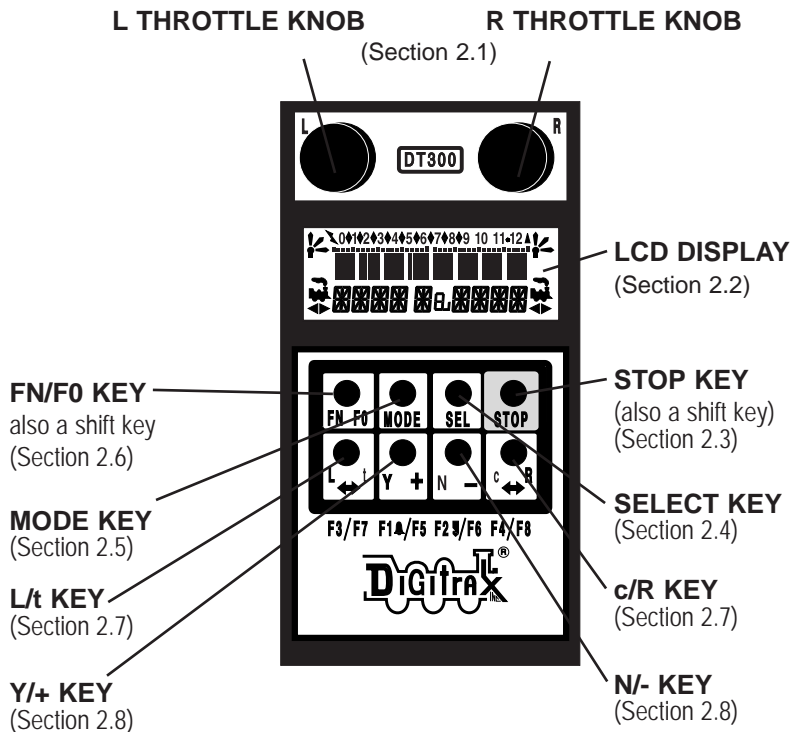
DT300/DT300R Throttle Display

Functions 0-8
(Active Throttle)

L Bar Graph   R Bar Graph

Tetherless Indicator

Track Power
Indicator

L Semaphore

R Semaphore

Text Area

L Smoke Icon

R Smoke Icon

L Loco Icon

R Loco Icon

L Throttle Direction
Indicators

Mode
Indicator

R Throttle Direction
Indicators

L Throttle
Address
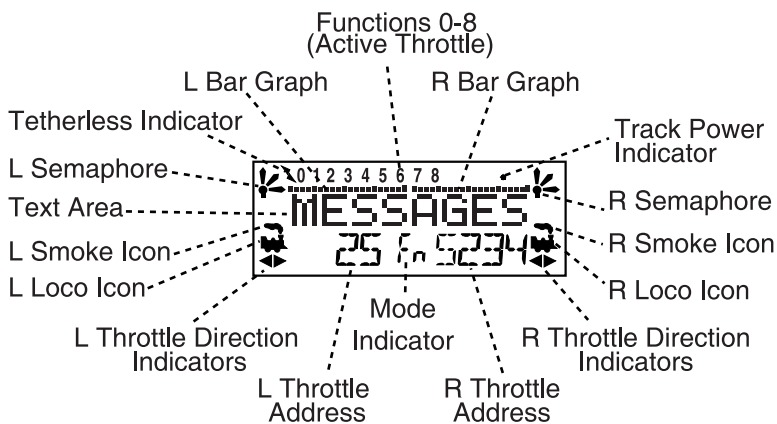
R Throttle
Address

selection. A Blinking Loco icon means that the address is available for selection and a Steady Loco icon means that the loco address is currently selected or in use by another throttle.

2.2.2 Smoke Icon

The Smoke Icon is located just above each Loco Icon and appears with the Loco Icon when an address has been selected on the throttle. When a loco is selected on a throttle, the Loco with Smoke icon will appear below the **THROT-TLE KNOB** and beside the address of that loco. If no address is selected, there will be no Loco icon and the address area will show SEL. A Blinking Smoke icon indicates that the **THROTTLE** is currently active. Since both throttles must share the keypad, only one at a time can have access to the keypad and function controls. The active throttle has access to the function controls and the status of the functions for the active throttle are displayed in the top line of the LCD. To make either throttle the active throttle simply click it once or turn the **THROTTLE** knob a little.

No Loco Icon = nothing selected on this throttle.

Loco with steady smoke = Keypad and function display not active for locomotive address selected on this throttle.

Loco with blinking smoke = Keypad and function display active for the locomotive address selected on this throttle.

2.2.3 Direction Indicators

The direction indicators are located in the LCD Display of the DT300 directly below the Loco Icon. There are separate indicators for the L (left) and R (right) throttles. If the arrow points to the front of the loco, the throttle is in the forward direction. If the arrow points to the back of the loco, then the throttle is in the reverse direction. If there is not a locomotive selected on a throttle the loco icon and direction arrow will not appear.

= Forward Direction   = Reverse Direction

Note: These direction indicators are for DCC equipped locos only. They will indicate direction based on the normal direction of travel (NDOT) that you set up for your DCC equipped loco. If you are using an analog loco, the direction indicator may or may not match the actual direction of the analog loco.

2.2.4 Text Area

The Text Area of the LCD consists of the eight characters in the middle line of the display. This is where information like locomotive speed, decoder status, turnout position, fast clock, text prompts, messages and programming data are displayed.

2.2.5 Mode Indicator

The mode indicator, located at the bottom center of the LCD, shows the DT300's current mode of operations. The DT300 automatically defaults to the Lo (Loco) mode and returns to this mode after about 6 seconds of inactivity in Mu (Multi Unit) or Sw (Switch) modes.

DT300 Mode Indicator Display

Display	Mode	Used For
Lo	Loco	Normal locomotive operation
Fn	Function	Function mode for toggling functions on or off.
Mu	MU	Multiple unit (consist) operation set up and break up
Sw	Switch	Accessory decoder control (turnouts, etc.)
SE	Status Edit	Change locomotive speed steps to 14, 28, or 128 as needed
PG	Programming	Paged-Digitrax preferred method
Ph	Programming	Physical Register
Pd	Programming	Direct
Po	Programming	Operations Mode (Ops Mode) programming on the mainline.
RE	Recall	Recall one of the last 4, 8, or 16 locomotive addresses used
Ec	Edit Clock	Edit the time shown on the fast clock
EF	Edit Clock Rate	Edit the fast clock rate
EA	Edit Alarm	Edit the alarm time set for the throttle

2.2.6 L Throttle and R Throttle Address

The decoder address selected on the **L THROTTLE** is displayed on the bottom line of the LCD to the left of the Mode Indicator. The decoder address selected on the **R THROTTLE** is displayed to the right of the Mode Indicator. The address can show as either the 2-digit or the 4-digit decoder address. If no address is selected the display will show "SEL." If a 2-digit address is selected (00-127), the display will show two or three digits (25 is shown in the example). If a 4-digit address is selected (0128 -9983), the display will show all four digits including the leading zero (5234 is shown in the example). See Section 4 – How To Select Loco Addresses.
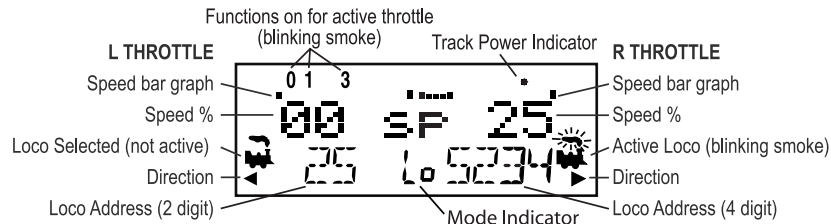
2.2.7 L and R Bar Graph

Each throttle has a bar graph located just above the text area of the LCD. Each of these indicates the speed setting of the **L THROTTLE** and **R THROTTLE** graphically from a single dot (0% throttle) to 20 dots (full throttle). This is useful when the text area is showing information other than speed.

Bar Graph showing 0% speed on R Throttle

100% Bar Graph Speed Mark
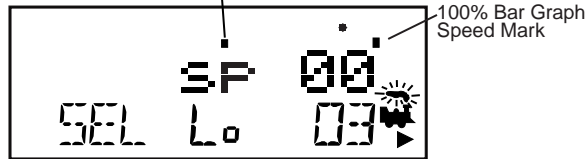
Bar Graph showing 50% speed on R Throttle
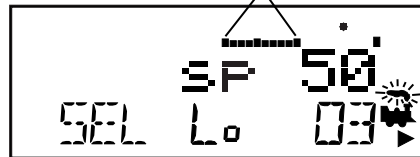
Bar Graph showing full speed on R Throttle
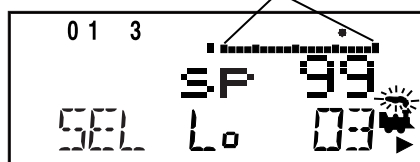
2.2.8 Function Display

Whether functions 0-8 are on or off for the currently active loco address is displayed on the top line of the LCD. The number for the activated functions for the active throttle (the one with blinking smoke) are displayed. Up to eight functions can be controlled by the DT300. To view the function status of either throttle, simply press the throttle knob to display the active functions for that throttle.

Functions 0,1 & 3 are on.
Functions 2,4,5,6,7 & 8 are off.

L THROTTLE

R THROTTLE

Speed bar graph

Speed %

Active Loco (blinking smoke)

No Loco Selected

Direction

Loco Address (2 digit)
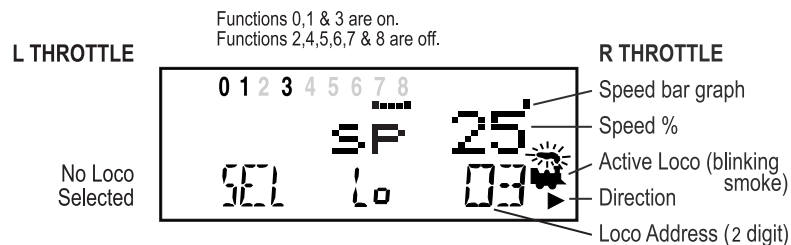
2.2.9 Track Power Indicator

This very small star shaped dot located just above the bar graph display in the LCD on the right side indicates the status of the track power.

No indicator = System track power is OFF

Indicator On Steady = System track power is ON

Blinking Indicator = System is in "STOP" and track power is ON
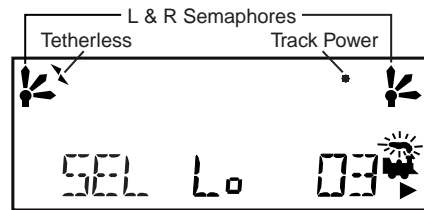
2.2.10 Tetherless Indicator

The tetherless indicator shows when your throttle is using either infrared or radio communications.

2.2.11 L and R Semaphores-Cab Signaling

The L and R Semaphores are used when cab signaling is implemented on the layout. More information about signaling and detection will be available on our web site, www.digitrax.com as these products become available. Information on how to activate these indicators will be included in the manuals for our detection and signaling products. Information will also be available from other LocoNet Certified manufacturers when they have implemented these features in their software.

The L and R Semaphores will display the following:

         = **Clear**

         = **Approach**

         = **Stop**

2.3 STOP Key

The **STOP** key has two functions: as an emergency stop for the locos on the layout and <u>as a *shift*</u> key used in conjunction with other keys.

2.3.1 Emergency Stop key

The factory setting for the **STOP** key is for **Local Emergency Stop** which stops just the locos controlled by the two throttle knobs on the DT300. The **STOP** key can also be set for **Global Emergency Stop** which will stop all of the locos on the layout. See Section 19–Customizing Your DT300.

2.3.2 Using the Stop key as a Shift Key

The **STOP** key is also used as a *shift key* in conjunction with other keys as described in other sections of this manual. When used as a shift key: press and hold the **STOP** key down (like the shift key on a keyboard) while pressing the second key. This will allow access to the alternative function of the second key. The **STOP** key is used as a shift key with the **Y/+**, **N/-** and **FN/F0** keys.

2.4 SEL Key

The **SEL** key, called the Select Key or Select/Set Key, is used for selecting loco addresses on to the throttles. This is sometimes referred to as "assigning locos to throttles."

This key is also used to select or complete (set) an operation.

2.5 MODE Key

The **MODE** key is used to move from one operational mode to another on the DT300 throttle and to dispatch selected addresses or consists to make them available for use by other throttles in the system. Lo (Loco) mode is the DT300's default mode since most of the time you are running locomotives.

Press the **MODE** key to cycle from Lo (Loco) mode to Sw (Switch) mode to Mu (Multi Unit) mode and back to Lo, and so on.The current operation mode will show in the middle of the bottom row of the LCD display (Section 2.2.5).

Dispatch: To Dispatch or offer a locomotive you have set up on a DT300 to another throttle in the system, press this key while in Select Address Mode.

Display: In programming mode the Mode Key can be used to read back a CV value from a decoder on the DCS100's service mode programming track.

2.6 FN/F0 Key

The **FN/F0** key is used to enter Fn (Function) mode and then turn on and off Function 0 (F0F/F0R) which is usually set up to control the headlight and rear light on the locomotive. **FN** is shorthand for function mode and **F0** is shorthand for Function 0 or the head light/rear light function.

The **FN/F0** key is also used as a shift key to access functions **F5, F6, F7** & **F8**. To use the **FN/F0** key as a shift key, press and hold the key down while you press any of the keys on the bottom row to turn on and off the labeled function.

In Edit and Programming modes the **FN/F0** Key is also used to cycle through several choices for each mode.

2.7 L/t AND c/R (Direction) Keys

The **L /t** and **c/R** keys are used for two purposes. When the throttle is in Lo (Loco) Mode, the keys control the direction of travel of the loco on the related throttle. The **L(left)/t** key changes direction of the address on the **L THROTTLE**. The **c/R(right)** key changes direction of the address on the **R THROTTLE**.

When the throttle is in Sw (Switch) Mode these keys are used to send commands to the switches as indicated below:

L / t(thrown) = thrown, turnout is set for the diverging route.

c(closed) / R = closed, turnout is set for the main line with routing through the straight leg of the turnout.

2.8 Y/+ and N/- Keys

The **Y/+** and **N/-** keys are used:

• To browse addresses and increase or decrease speed (used as plus and minus)

• To link and unlink locos during MUing (used as add and subtract)

• To accomplish tasks using system editors (used as yes and no keys)

The**Y/+** and **N/-** keys can be set up to act in two different ways:

Repeating (also called typematic) so that if you hold a key down it will continue to increase or decrease step by step until you release the key. This option is active when your throttle is set up for ballistic tracking. Your DT300 was shipped from the factory with this feature enabled.

Single Press so that you will must press the key each time you want to increase or decrease. This option is active when your throttle is set up for straight line tracking.

See Section 19–Customizing Your DT300 for information on changing this setting on your DT300.

2.9 Infrared Emitters

Your DT300 has two infrared LEDs in the cable end of the throttle case. These emitters send infrared signals that can be used by LocoNet compatible Infrared receivers to give you tetherless operation. See Section 17–Tetherless Operation of DT300/R for infrared operation information.

3.0 DT300 Throttle Hook Up

The following diagram and instructions will get you up and running quickly using the DT300 with a Digitrax system. This section assumes that you are using your throttle with an existing layout equipped with a Digitrax command station and LocoNet.

If your set is radio equipped, we recommend that you begin using the DT300 without using radio so that you can learn the basics first. When you are successfully running your throttle tethered to the system, then go to Section 17 to learn how to use the infrared/radio option. You will not need a 9V battery to start using your system.

Connecting your DT300 Throttle to your system

Power District (Double Gapped)

To Transformer

DB150

DB150 Configured as Command Station

LocoNet Cable from Command Station Port A or B plugs into either jack in rear of LocoNet Universal Panel

LocoNet® Network
(6 Conductor Flat Phone Cable)
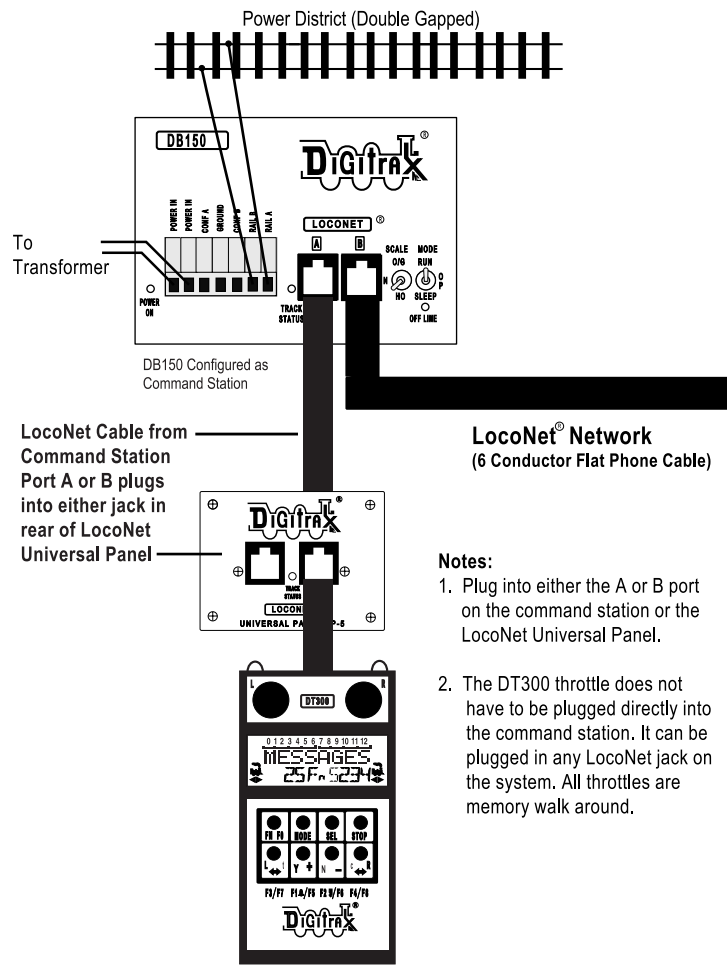
Notes:
1. Plug into either the A or B port on the command station or the LocoNet Universal Panel.

2. The DT300 throttle does not have to be plugged directly into the command station. It can be plugged in any LocoNet jack on the system. All throttles are memory walk around.

3.1 Plug In Your DT300 Series Throttle

1. Plug the DT300 series throttle into any available LocoNet jack on a Universal Panel or Command Station.

2. First, you will see the DT300 version number screen:This screen shows the DT300's software version number as well as most fields used in the display. It is displayed for a few seconds each time you power on the DT300.

```
↓↑↘0♦1♦2♦3♦4♦5♦6♦7♦8♦9 10 11•12▲↓↘↙
DT300vxx
00000o0103
```
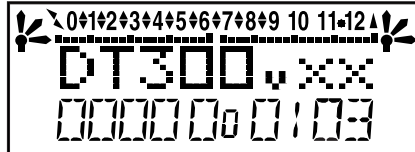
3. Next you will see the power indicator screen. This screen indicates the power available to the throttle. When you are plugged in to LocoNet, this value will be between 9 and 15 volts. When you insert a battery or unplug from LocoNet, the value displayed will be the battery power available. When this number is less than 6.2 volts it's time to consider replacing or recharging your battery. See Section 18 for more information about using batteries with your DT300.

```
Pwr10.9V
```
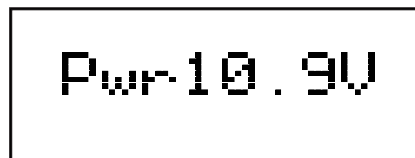
4. Next you will see a screen similar to the following. This is the start screen for a new DT300 throttle. The throttle is in Lo (Loco) mode with the right "SEL" blinking, indicating the **R (RIGHT) THROTTLE** is ready to select a locomotive. The Track Power indicator may be lit if the layout has been run using another throttle and not turned off after use.

```
              •
        SP
SEL   Lo SEL
```
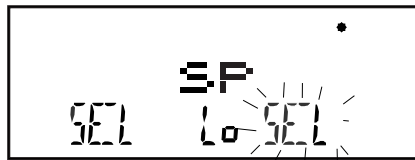
5. If you unplug the DT300 from LocoNet the LCD display will go off while it is unplugged. The display will come on again when you plug in to LocoNet again.

3.2 Turning Track Power On/Off

The Track Power indicator on your DT300 and the TRACK STATUS indicator on your command station show whether track power is ON or OFF. The first time you plug in your DT300 throttle, track power will usually be OFF. Before you can run trains, you will need to turn ON the track power. Look at your command station or DT300 to determine whether the track power is on or off.

1. The track power is OFF if:
    - The Command Station TRACK STATUS indicator is off,
    - The Command Station OFF LINE indicator is on, and
    - DT300 Track Power Indicator is off (track power indicator is a small dot (star) in the top line on the right side of the LCD).

2. The track power is ON if:
    - The Command Station TRACK STATUS indicator is lit,
    - The Command Station OFF LINE indicator is off, and
    - DT300's Track Power Indicator is on (small dot (star) in the top line on the right side of the LCD).

3.2.1 To Turn Track Power On

Press and hold the **STOP** key (like a shift key on a keyboard) then press the **Y/+** key while continuing to hold the **STOP** key down. Release both keys when the system beeps or Track Power Indicator on the DT300 Throttle illuminates (on solid). If the Track Power Indicator is blinking, press and hold the **STOP** Key then press the **Y/+** Key again to make it on solid.

3.2.2 To Turn Track Power Off

Press and hold the **STOP** key (like a shift key on a keyboard) then press the **N/-** key while continuing to hold the **STOP** key down. Release both keys when the TRACK STATUS Indicator on the Command Station and the Track Power indicator on the DT300 display go off.

Holding down the **STOP** key and alternately pressing the **Y/+** and the **N/-** keys will cause the track power to alternate between on and off.

4.0 How To Select Loco Addresses With Your DT300

Each DCC decoder that is installed in a locomotive is assigned a unique address. To select a locomotive and run it on either throttle, you must know the address assigned to the decoder. Digitrax decoders are set up at the factory with the "default" digital address of 03. This means that when you take a Digitrax decoder out of the package and install it in your loco, you can select address 03 on your throttle and run the decoder. The first Configuration Variable (CV) programmed by most DCC users is the decoder's address since it is not very useful to have all of your locos run on address "03" and responding to the same instructions. If you do not know the address of the DCC locomotive you want to run, you can simply program the decoder's address and select it to run using its newly programmed address. See Section 12 for using the DT300 to set the decoder address. With Digitrax DCS100 & DCS50 command stations, and others, it is possible to read back the decoder's address. See your Digitrax Starter Set Manual for information about reading back addresses. See your Digitrax Decoder Manual for a full discussion of decoder addressing.

Selection of a locomotive address is done in Lo (Loco) mode, which is the default mode for the DT300. It is the default mode because it is the mode that runs your trains. If you change to Sw (Switch) or Mu (Multi Unit) mode and there is no activity on the throttle, the DT300 will automatically return to Lo (Loco) mode after a few seconds.

4.1 DCC Address Ranges and Display

With most command stations there are three address ranges available for addressing and programming locomotives. Digitrax Command Stations allow use of all three address ranges at any time and in any combination you choose.

Address 00: The analog address used to run locomotives without decoders. All analog locos (those with no decoders) active on the layout will respond to the speed and direction commands issued to address 00.

2 digit addressing: Addresses in the range of 01 through 127. Also called short addressing, 2 digit addressing can be used with any DCC decoder. Show as the two or three digits, with no leading zero, of the address in the DT300 display. The DT300 does not support aliased two digit addressing.

4 digit addressing: Addresses in the range of 0128 to 9983. Also called Extended Packet Format or long addressing. Four digit addressing can be used with any DCC Extended Packet Format, or EPF, decoder that supports this four digit addressing. The decoder must also be set up to enable 4 digit addressing. See Section 12.1–Programming Decoder Addresses. Always shown as a four digit number, using leading zeros when required.
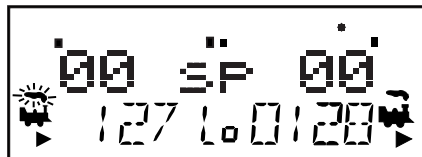
4.2 The SEL Message

If a throttle knob does not have a locomotive address selected when you make the throttle active by turning or pressing the **L** or **R THROTTLE** knob or **L/t** or **c/R** (direction) key, a flashing "SEL" will appear in place of the locomotive address in the LCD display. This is a prompt for you to select a locomotive address on that throttle.
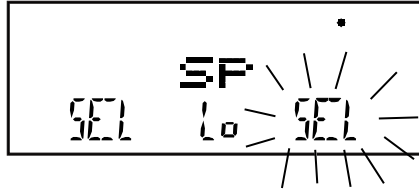
4.3 Selecting An Address On A Throttle

1. Choose which **THROTTLE** (L or R) you want to use to run a locomotive. Make it the active throttle by turning it a 1/4 turn in either direction or by pressing down on the knob. If there is no active address selected to the throttle, as shown above, SEL will blink to let you know that the throttle is ready to select an address.

2. Press the **SEL** key. The active throttle display will begin flashing the Loco Icon, the last loco address selected on the throttle and the Lo mode indicator. Sel loco will be displayed in the Text Area of the LCD display.
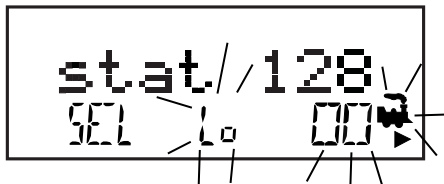
3. To select a 4 digit address, rotate the **L THROTTLE** knob to dial up the first two digits (1000s and 100s) of the address you want to select and rotate the **R THROTTLE** knob to dial up the last two digits (10s and 1s) of the address you want to select. Alternately, you can rotate the **R THROTTLE** knob to browse through all of the addresses in sequence from address 00 (analog) to 01-127 (2 digit addresses) to 0128-9983 (4 digit addresses).

4. To select a 2 digit address, rotate the **L THROTTLE** knob counterclockwise until you see 00 appear in the display, then rotate the **R THROTTLE** knob to dial up a 2 digit address between 00 and 127.

5. As you browse through addresses, the LCD will display any current information for each address including current speed on the bar graph, current status in the Text Area, active functions on the top line of the LCD. The Loco icon will blink if the loco address is selectable and will be steady if the loco selected on another throttle. If the Loco Icon is steady, see Section 4.5–Stealing: Forcing An Address Selection.

Track Power Indicator ON

2 digit address 03 on R Throttle Running at 25% speed In Forward Functions 0, 1, & 3 on.

Blinking Loco icon indicates that the loco is not currently selected on another throttle.
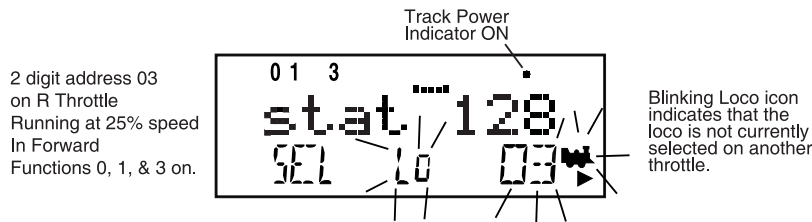
6. Once the address you want to select is displayed, press the **SEL** key once again to select this address on the active throttle. The LCD screen will show the locomotive's address, speed information and functions on/off for the loco you just selected.

7. The Loco icon will appear in the display with a direction arrow and blinking smoke. The blinking smoke indicates which side of the throttle is active (is displaying function information on the top line of the LCD).

8. Repeat the process to select a different address on the **L THROTTLE**. You can run two different locos at the same time on the DT300. The Blinking Smoke above the loco icon tells you which throttle is active in the DT300 display.

4.4 Recalling A Loco Address

Your DT300 stores the last 4, 8 or 16 unique loco addresses used by either of the throttles in a recall stack. Your DT300 factory setting is a 4-address recall stack. This makes it convenient to reselect locos that you have used previously.

For example if the last 4 addresses you selected on either throttle were: 00, 1987, 52 and 0673, these addresses will be in the recall stack in that order. The recall stack is not stored in numeric order. If you have selected any of these addresses more than once, it will not be stored twice, only the addresses not already stored will be added to the stack. See Section 19– Customizing Your DT300– for information on how to set the recall stack depth.

To Recall the last 4, 8 or 16 addresses on the R Throttle
1. Press and hold the **R THROTTLE** knob. The word "Recall" will appear in the text line of the display.

2. When "Recall" appears in the display, release the knob. "Re" will appear in the mode indicator in the center of the bottom line on the display. The right side address display will begin to flash prompting you to select a locomotive. If you hold the button more than 6 seconds or if you don't do anything for 6 seconds, the throttle will "time out" and return to Lo (Loco) mode.

3. Turn the **R THROTTLE** knob or press the **Y/+** or **N/-** keys to browse through

the last 4, 8 or 16 addresses selected by the throttle. Whether you browse 4, 8 or 16 addresses depends on how you set up your throttle's options. As you browse through the addresses, the throttle will display their current speed on the bar graph and their status in the text line of the LCD. Addresses are displayed in the order they were used by the throttle (not in numeric order).

4. Press and release the **R THROTTLE** knob or the **SEL** key to select the desired loco address. Once the locomotive is selected the **R THROTTLE** knob will control the speed and direction of that locomotive.

Follow the same procedures to Recall a locomotive using the **L THROTTLE**.

4.5 Stealing: Forcing An Address Selection

If you try to select a loco address that is already selected on another throttle the DT300 will display "Steal?=Y" in the text area. This is a safety interlock to prevent operators from taking control of locos that are already selected on other throttles. Occasionally it is necessary to override this interlock to gain control of a loco that is "lost" for whatever reason. This override is called stealing and can result in having a single loco address selected on two different throttles at the same time.

4.5.1 To Steal An Address With The DT300:

1. Press the **SEL** key to enter selection mode.

2. Dial up the address of the loco you want to steal and press the **SEL** key again.

3. The DT300 will display "Steal?=Y" in the text area if the loco can be stolen.
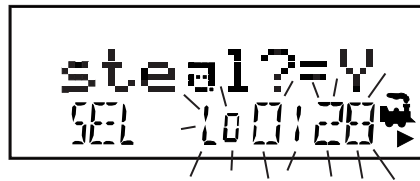
4. Press **Y/+** key if you want to steal.

5. Press **N/-** key (or any other key) if you do not want to steal.

Once a throttle has "stolen" a loco address, the slot following mode becomes active and both throttles will update speed and direction information for the loco address. This can result in strange locomotive behavior especially if one throttle is trying to to stop the loco and the other is trying to speed it up at the same time.

When you have gained control of the stolen loco and are finished running it, release it from your throttle. See Section 10–Releasing An Address.

4.5.2 Slot Following

When a DT300 detects that a loco address that is in-use on one of its throttles is being changed by another throttle or computer, it will cause the DT300 to "click" every time it sees a remote throttle change its locomotive settings. If that locomotive is in the active throttle, its speed display will also show the

changes. This is called slot following. This allows two DT throttles to run a single locomotive address with both throttles being able to send commands to the loco. Both throttles will show the current speed and direction of the locomotive in their displays.

Slot following is useful for training new operators. The supervisor can "steal" a locomotive that is selected on a trainee's throttle and be able to "look over the trainee's shoulder" and closely supervise that locomotive's control. The supervisor can gain instant override control without having to physically "grab" the trainee's throttle. This lets you have unskilled visitors participating and enjoying operations without too much anxiety for either party.

Slot following also allows a computer on LocoNet to run CTC and routing control programs with automated control over locomotives. The computer can control speed and stop engines automatically while letting the engineer with the throttle in his hand know what is happening.

4.6 "slot=max" Message

If the text area of the DT300 shows the message slot=max during the selection process this means that the command station has reached its limit of locomotive addresses that it can manage at one time. If you want to select additional addresses, you will need to release one or more loco addresses to continue the selection process. See Section 10–Releasing An Address From A Throttle.

If you often reach this limit, you should consider upgrading your command station to a Digitrax DCS100 which can be set up to handle 120 loco addresses.

5.0 Locomotive Speed Control

To control the speed of a locomotive:

1. Activate the loco address on either throttle by either pressing the **c/R** key or the **R THROTTLE** knob to gain control of the loco on the right side of the display and the **L/t** key or the **L THROTTLE** knob to gain control of the loco on the left.

2. Turn the **THROTTLE** knob clockwise to increase speed and counterclockwise to decrease speed **or**

3. Use the **Y/+** and **N/-** keys to increase and decrease speed.

The percentage of full speed will be displayed in the text line of the display above the loco address. The percentage of full speed will also be displayed on the Bar Graph above the Text Area in the display.

L Throttle (*Active*) Track Power Indicator ON R Throttle

2 digit address 03 Running at 20% speed In reverse Functions 0, 1, & 3 on.

An analog loco address 00 Running at 25% speed The direction arrow below the Loco Icon **does not** indicate actual direction for Analog locos.

Throttle in normal operations mode indicated by Lo.
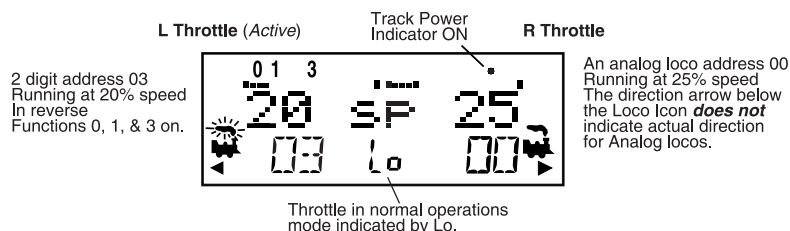
If a loco address is part of a consist and is not the "TOP" (or controlling loco-motive) and you try to change its speed the LCD screen will show "cn" or "mid" in the text area where % speed would normally appear. The "cn" and "mid" lets you know that the loco you have selected is part of a consist and that you cannot change the speed or direction of this loco independently of the consist. See Section 9 for information on setting up and running a consist.

6.0 Stopping Your Locomotives

There are three basic ways to bring a locomotive to a stop: setting the speed to zero, emergency stops and turning track power off.

6.1 Setting A Loco to Zero Speed

Turn the **THROTTLE** Knob that controls the the loco to be stopped counter-clockwise until the speed display shows 00 and the loco stops moving. This lets you slow down your loco and stop it prototypically. You can also use the **N/-** key to reduce the speed to zero.

If you have set up deceleration for the loco and you move the throttle knob to 0% speed, your loco will slow down and come to a stop at the programmed deceleration CV value. We strongly recommend that you run your locos with the factory setting of no deceleration until you are familiar with your system.

If the deceleration CV value you set for a particular loco is very large, this can make it look like the loco is not stopping on command because the deceleration CV value is causing the loco to take a long time to come to a stop. See the Digitrax Decoder manual for more information on customizing decoders.

6.2 Emergency Stop

DT300s have three ways of causing an emergency stop. Each DT300 can be set up for either local or global emergency stop. DT300s are shipped with local stop as their factory setting. The third method of doing emergency stop is available on all DT300s.

1. **Local STOP (Factory Setting on DT300)**: Stops only the locos controlled by the DT300. Press and hold the **STOP** key for about 1 second to stop both of the addresses selected on your **L** and **R THROTTLES**. Locomotives go to zero speed with this type of stop. To resume operation, use the throttle knobs to increase the loco's speed.

2. **Global STOP (Optional setting on DT300)**: Stops all locos on the layout when the **STOP** key is pressed and held for about 1 second. The DT300's Track Power Indicator will blink and all of the locos on the layout will stop. Press and hold the **STOP** key again for about 1 second and the locomotives will return to the speed they were running prior to Global **STOP** mode.

3. Pressing the **STOP** key and the **Y/+** key while the track power is on will cause the system to go into emergency stop. All locomotives will stop immediately but, track power will stay on. The DT300's Track Power Indicator will blink. Press and hold the **STOP** key again for about 1 second and the locomotives will start running again at the same speed they were running prior to **STOP** mode.

6.3 Turn Off Track Power

Press the **STOP** key and hold it down (like a shift key on a keyboard) while you press the **N/-** key to turn off track power. This will stop everything on the layout. Press **STOP** key and hold it down (like a shift key on a keyboard) while you press the **Y/+** key to turn track power on. All locos will resume running as they were before track power was turned off.

7.0 Locomotive Direction Control

There are two ways to change the direction of the locomotive being controlled by the DT300. The Direction Indicator (triangle) under each Loco Icon in the display will indicate the direction of that loco. When you change direction while a loco is moving it will slow down to 0 speed and then speed up to the commanded speed according to the decoder's programmed CV values for deceleration and acceleration. See you decoder manual for information on changing setting these CV values.

You can set up (program) each decoder with acceleration and deceleration rates that simulate the scale effects of braking the train. Then when you command an instant reverse, the system will simulate braking by slowing down the locomotive at the programmed deceleration rate, come to a stop and then accelerate at the programmed acceleration rate in the opposite direction.

7.1 Using The Throttle Knob To Reverse Direction Of A Locomotive

1. Double click the Throttle knob that is controlling the locomotive. Press down on the knob quickly two times (2 key presses within 1/2 second). The locomotive selected on that throttle will change direction. For DCC controlled locos, the Direction Indicator (triangle) under the Loco Icon on each side of the display will indicate the direction of that loco.

2. Repeat the process to reverse direction again, etc.

3. Double clicking the **R THROTTLE** knob will reverse only the locomotive running on that throttle. Double clicking the **L THROTTLE** knob will reverse only the locomotive running on that throttle.

7.2 Use The L/t Or c/R Direction Keys To Reverse Direction

The **L/t** key (left direction key) controls the direction of the loco selected on the **LEFT THROTTLE**. Press the **L/t** key (left direction key) to reverse the direction of the loco selected on the **LEFT THROTTLE**. Press the key again to reverse the direction back to the original direction. The Direction Indicator (triangle) under the Loco Icon on the left side of the LCD will indicate the direction of that loco (DCC only).

The **R/c** key (right direction key) controls the direction of the loco selected on the **RIGHT THROTTLE**. Press the **R/c** key (right direction key) to reverse the direction of the loco selected on the **RIGHT THROTTLE**. Press the key again to reverse the direction back to the original direction. The Direction Indicator (triangle) under the Loco Icon on the right side of the LCD will indicate the direction of that loco (DCC only).
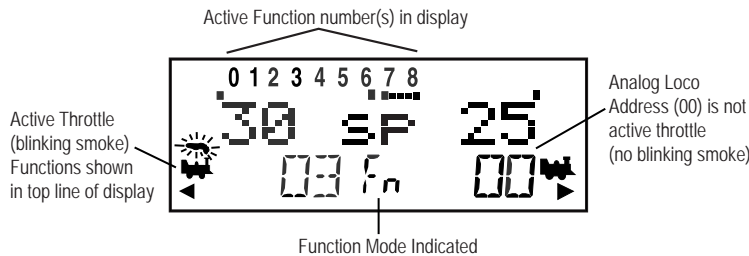
8.0 Controlling Functions

The DT300 will control up to 8 functions of a decoder(s) that is equipped to provide the functions. Functions include locomotive lights and sounds that can be set up for prototypical operation. See your decoder manual for information on functions available and how to wire them for operation with your loco. The most common functions are F0F and F0R which are used for the headlights and rear lights on a locomotive. To control the functions of the decoder, you must have the throttle that controls the loco active and then enter Fn (Function) mode. You cannot control functions on an analog locomotive (loco without a decoder).

8.1 Function Mode

1. Determine which throttle you want to control functions on and make it the active throttle by pressing down on the **THROTTLE** knob or by turning the **THROTTLE** knob a couple of clicks. You can also use the **L/t** key or **R/c** key (direction keys) to make a throttle active.

2. Press the **FN/F0** key once to enter F0 (Function) mode for the active throttle. The Mode Indicator in the center of the lower line on the LCD will show Fn. The active Functions will be displayed as numbers on the top row of the display. The bottom row of keys on the DT300 are now function keys.

Active Function number(s) in display

Active Throttle (blinking smoke) Functions shown in top line of display

Analog Loco Address (00) is not active throttle (no blinking smoke)

Function Mode Indicated

To access functions F0, F1, F2, F3 and F4 press the **FN/F0** key <u>and release</u>, the display will then show Fn (Function) mode, then press the appropriate key, **F3/F7**, **F1/F5**, **F2/F6** or **F4/F8,** to toggle the first listed function of the key on/off. Press **SEL** or wait approximately 6 seconds and the display will return to Lo (Loco) mode.

To access the functions F5, F6, F7 and F8 press the **FN/F0** key <u>and hold it down</u> (like the shift key on a keyboard) then press the appropriate key **F3/F7**, **F1/F5**, **F2/F6** or **F4/F8** to toggle the second listed function of the key on/off. Press **SEL** or wait approximately 6 seconds and the display will return to Lo (Loco) mode.

F3/F7 F1▲/F5 F2▼/F6 F4/F8
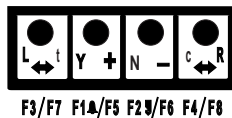
The DT300's bottom row of keys is used to control functions 1-8.

Once you are in Fn (function) mode you can change as many functions as you want before returning to LOCO mode.

Note: The **FN/F0** key is used both to access the Fn (Function) mode and as the shift key to access the top four functions. If you press and release **FN/F0** to enter Fn mode then press the **FN/F0** key again to use it as a shift key for the upper level functions, F0 will toggle on/off. To avoid turning F0 on/off while accessing the upper level functions, return to Lo mode after setting the lower functions then press and hold the **FN/F0** key to both enter Fn mode and access the upper level functions before releasing the FN/F0 key.

8.1.1 Function 0 (F0)
Access function mode by pressing the **FN/F0** key. Press the **FN/F0** key again to toggle F0 between on and off. Each time the **FN/F0** key is pressed while in function mode, F0 will change from off to on or vice-versa. The top line of the LCD will display a 0 when the F0 is on and will be blank when F0 is off. F0 is most often used for head lights (F0F) and rear lights (F0R) but can be set up for other functions as well.

8.1.2 Function 1, 3, and 4 (F1, F3, F4)
Press the key in the bottom row of the DT300 keyboard that corresponds to the function you want to toggle on or off. The function must be wired to work and the decoder must have the functions

F1 is labeled with a **Bell** symbol to remind you that this is the preferred function for bell operation.

8.1.3 Function 2 (F2)
Press the key in the bottom row of the DT300 that corresponds to F2. F2 is labeled with a **Whistle** to remind you that this is the preferred function for whistle operation. F2 is a special non-latching function. This means that if F2 is used to control a whistle or horn sound from the decoder, it will only sound when F2 is being held down. This lets you vary the length of time that the whistle blows, just like the prototype.

To latch F2 on:
1. When in Fn mode press and hold the **F2/F6** (**N/-**) key.
2. While holding the F2 key down, return to Lo mode by doing one of the following:
   a. Press the **MODE** key **or**
   b. Press down on the either **THROTTLE** knob **or**
   c. Turn either **THROTTLE** knob.
3. Release the **F2** key after returning to Lo Mode.
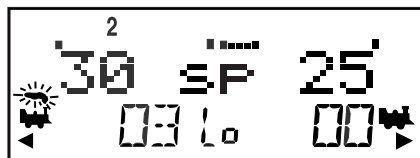
To turn F2 off after latch on:

1. Press the **FN** key to enter Fn (Function) mode.

2. Press the **F2/F6** (**N/-**) key to turn the function off. The function is now returned to working as a momentary switch.

8.1.4 Functions 5 through 8 (F5, F6, F7, F8)

Access function mode by pressing the **FN/F0** key and continue holding the key down for use as a shift key. Then press the Function key in the bottom row that corresponds to the function you want to toggle on or off. The decoder must have the functions available for use and the function must be wired to work.

8.2 To Exit Function Mode

1. If there is no function activity for about 6 seconds, the Mode Indicator will return to Lo (Loco) mode for running trains.

2. To exit function mode immediately

   a. Press the **MODE** key twice to change to Mu Mode then to Lo Mode **or**

   b. Press down on the either **THROTTLE** knob **or**

   c. Turn either **THROTTLE** knob

8.3 Controlling Functions On Consisted Locomotives

Even though an individual locomotive is part of a consist and you can't control its speed and direction separately from the consist, you can still control its function outputs independently as follows:

1. Press the **SEL** key and use the throttle knobs to browse for the address of a locomotive that is a part of consist (or use the Recall feature, Section 4.4).

2. Press the **SEL** key again to select the loco address to your throttle.

3. Turn on/off the functions on the consisted loco as instructed above.

4. Exit Fn (function) mode when you are finished. It is probably a good idea to release the consisted loco from your throttle in preparation for running another loco address.

9.0 Multiple Unit Operations

Many prototype trains use multiple locomotives to provide the necessary power to pull or push the train. This practice is called Multiple Unit consisting, usually shortened to MU or consisting. The DT300 Throttle can provide three methods of consist control:

1. The **Basic Consisting** method is to program all the locomotives in a consist to the same address and run them on one throttle. In this case all the locomotives must be headed in the same direction, head to tail, head to tail, head to tail. If you use decoders that allow you to set the normal direction of travel of each loco, you can program locos in a basic consist to run head to head and/or tail to tail. You probably won't use this method very often in your operations because of its limitations. The basic method is the only method available to most basic command stations. We mention it here only because it is an option.

2. The **Advanced Consisting** method handles consist information in decoders that are capable of doing advanced consisting. When you use advanced consisting, your options are somewhat limited because you can't use all DCC decoders and you can't include analog locos in your consists. If you choose to use Advanced Consisting, please see the information about status editing in your system manual and decoder manual for set up.

3. The **UniVersal Consisting** method handles consist information in the command station and allows you to consist locomotives with any DCC format decoder and analog locos as well. Locomotives can be added to and removed from the consist in any orientation, head to head or tail to tail. This method has the advantages of flexibility and the ability to use all DCC decoders in consists. UniVersal Consisting is the Digitrax preferred method of consisting.

With UniVersal Consisting you can add a locomotive to a consist in either orientation and in any physical location in the train. When you send commands to the consist you use a single address and the command station handles the rest of the commands to the other locomotives in the consist. Since the address you will use to control the consist is not necessarily the address of the lead or head end loco, Digitrax has chosen the term **"TOP"** locomotive address for this special address. It usually will be the train number.

- Digitrax defines the TOP loco as the loco on the **R THROTTLE** knob at the time when the MU add is performed. By definition, Digitrax always adds loco addresses to the "TOP" loco address in a consist.

- The "TOP" loco is special–it is the address that receives the speed and direction commands for the entire consist.

- All loco addresses added to the consist are controlled by commands sent to the "TOP" loco. Once added to a consist, the text area above the address will display cn for a single loco and mid for the top loco of a nested consist

- The TOP locomotive address does not have to be a physical loco on the track, it can be a phantom.

- All loco addresses in a consist will have the same status as the TOP loco. They will all be common, in-use or idle based on the state of the TOP loco.

- Each loco within a consist maintains its original advanced 28/128 or standard 14 speed step mode setting.

- A consist can be released by one throttle and then selected and run by any other throttle.

- A consist TOP address can be dispatched and acquired on another throttle just like any other address. See Section 11–Dispatching An Address.

### 9.1 Adding A Locomotive To A UniVersal Consist

DT300 Radio and infrared throttles must be plugged in to LocoNet to add loco addresses to consists. To set up a consist using your DT300 throttle:

1. Select the loco address of the TOP loco on the **R THROTTLE** knob. This can be an existing locomotive number or a new number chosen for the assembled train. In this example the top loco is the loco number 25.

2. Select the address of the loco you want to **add** to the consist on the **L THROTTLE** knob. In the example it is address 6104.

```
 ▪     ▪▪
 00 =P 00
☀️
▶6104Lo   25◀
```
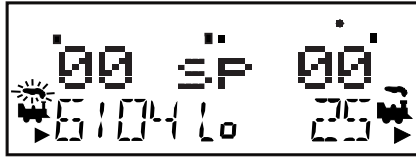
3. Physically move the two locomotives into position. The front of the locomotives can be headed in either direction. They can be adjacent to each other in the train or one unit can be the mid train helper or a pusher at the end of the train. They can be configured head to tail, tail to tail or head to head.

4. Before consisting the locos, make sure that both are traveling in the **SAME PHYSICAL DIRECTION ON THE TRACK.** (The direction indicators may or may not match, the important thing is that the locomotives are set up to move in the same direction and are not pulling against each other.)

5. Press the **MODE** key twice until the Mu (Multi Unit) mode indicator appears in the LCD display. The word CONSIST will briefly appear in the text area. The loco address in the **L THROTTLE**, 6104 in the example below, side of the display will blink to show that it is the address that will be consisted to the address on the **R THROTTLE**, 25 in the example**.**

```
       ▪
  CONSIST
◀▶6104Mu   25◀▶
```
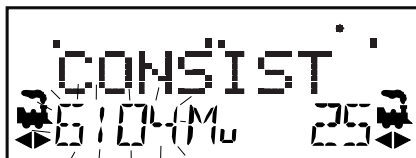
6. The DT300 display will then prompt you to press the **Y/+** key to add the loco address or the **N/-** key to remove the loco address from the consist controlled by the TOP loco address selected on the **R THROTTLE**. You will see the LCD alternate between the following two screens to remind you of which key to press.

```
  + = add
◀▶6104Mu   25◀▶
```
```
  - remove
◀▶6104Mu   25◀▶
```
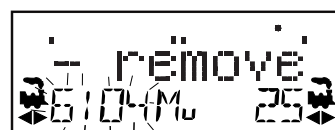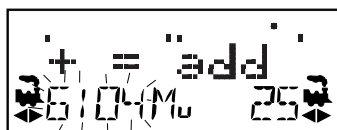
7. Press the **Y/+** key to add the left address to the consist. The address on the left side will stop blinking and cn will appear above the address to indicate it is part of the consist. The **R THROTTLE** display shows the address of the TOP loco address and its current % of full speed. The **R THROTTLE** is now in control of the speed and direction of both locomotives in the consist.

```
 cn =P 00
◀▶6104Lo   25◀▶
```
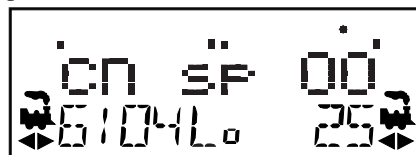
8. You will not be able to change the speed or direction of any loco that is part of a consist unless it is the TOP loco address. You can access the functions of the any loco in the consist by selecting the consisted loco to a throttle and using the function keystrokes outlined in Section 8.

Once a consist is set up and linked to the TOP locomotive, this TOP loco can be released and selected to run from either throttle on your DT300. The consist can also be selected and run on another throttle or it can be dispatched to another throttle.

9.1.1 Keeping a record of consists

It is good practice to keep records of your Multi Unit consists to help you remember which locos are MUed together. A simple form like the sample below is all that is needed.

MU Worksheet

Top Loco Address (Train Number)	
MUed Loco	
MUed Loco	
MUed Loco	
MUed Loco	
MUed Loco	

9.2 Removing A Loco From A UniVersal Consist

Radio and infrared throttles must be plugged in to LocoNet to remove loco addresses from consists.

1. Select the loco address that you want to remove from a consist on the **L THROTTLE**.

2. Press the **MODE** key twice, the Mu mode indicator will appear on the LCD.

3. Press the **N/-** key to remove the loco address from the consist.

4. The **L THROTTLE** automatically becomes active with the loco you just removed from the consist. If you remove the loco from the consist while the consist is moving, the removed loco will be broken out of the consist at the same speed and direction that it was moving in the consist. You can uncouple and run the removed loco as an independent loco again!

9.3 Nested Consisting

The loco that was selected on the **L THROTTLE** to be added to the consist can itself be the "TOP" loco of another consist. When it is added to the current **R THROTTLE** "TOP" loco it will become a "nested" consist. In this case the whole nested consist is linked and itself will be part of the new consist.

The loco that is selected on the **L THROTTLE** to be removed from the consist can itself be the "TOP" loco of a nested consist that was linked into the current

R Throttle "TOP" loco. The Display will show "mid" to indicate it is the top address of the nested consist. In this case the whole nested consist is removed from the consist and returned to the **L THROTTLE** as a consist. Individual locos from this nested consist can now be removed from the formerly nested consist.

9.4 MU of Mismatched Locomotives

If all the locomotives in the consist have performance characteristics that are closely matched, you can run all the consisted locomotives in 128 step mode. If the units are completely mismatched (for example if you are running two different brands of locos with noticeably different characteristics), then we recommend speed matching the locos by programming Loadable Speed Tables (See your Mobile Decoder Manual more information).

10.0 Releasing An Address From A Throttle

When you are finished running a locomotive address, you should release it from your throttle so that it is available for other throttles to select and run.

Radio and infrared throttles must be plugged in to LocoNet to release an address from your throttle. You can disable this safety feature by setting your DT300's OP#3 to one of the values that allows tetherless release. See Section 19–Customizing Your DT300.

To release an address from a throttle:

1. Use the **THROTTLE** knob to select the loco and make its speed zero. This step is optional but strongly recommended. **Note:** If the loco speed is not set to zero, the loco will continue to run at the set speed until selected by another throttle. If the loco is removed from the track, the address will still be active in the command station taking up an address slot and when the loco is returned to the track it will "runaway" at the previously set speed and direction.

2. While the loco's address and speed information is displayed on the LCD, press the **SEL** key to go into Sel (Select) mode. This will release the address from your throttle immediately.

3. If you do not press any key within about 6 seconds, the throttle will time out normally and show SEL in the address display area.

4. If you press the **SEL** key again, the throttle will begin flashing the address you just released. You can re-select that address by pressing the **SEL** key or you can use the **THROTTLE** knobs to browse to a new address.

11.0 Dispatching Addresses or Consists

Dispatching is a special feature incorporated into the LocoNet "language" to meet the needs of operators that wish to enforce a strict discipline in how operators gain access to locomotives during an operating session. Dispatching also lets you run consists with basic throttles that can't set up their own consists and run four digit addresses on basic throttles that only have two digit capability. It lets you have newcomers run trains on the layout without giving them access to the entire operation.

When you dispatch a locomotive address or consist to your LocoNet system, you make it available to be acquired by another throttle. Only one address at a time can be marked as a dispatched address in the system. The dispatched loco address is acquired by the first throttle to request it by pressing the **ACQ** key to select it for use on that throttle.

11.1.1 To dispatch a locomotive using a the DT300

1. Press the **SEL** key to enter address selection mode, browse to the address you want to dispatch. Press **SEL** key again to select the address.

2. Use the **THROTTLE** to make the locomotive's speed zero. This step is optional but strongly recommended.
   Note: If the loco speed is not set to zero, the loco will continue to run at the set speed until selected by another throttle. If the loco is removed from the track, the address will still be active in the command station taking up an address slot, and when the loco is returned to the track it will "runaway" at the previously set speed and direction.

3. Press the **SEL** key then the **MODE** key to dispatch your address to the LocoNet system. The throttle display will return to SEL in the display.

The dispatched address can be a single locomotive address, either two digit or four digit, or a consist that was set up by the DT300. The TOP locomotive in a consist or MU can be dispatched to transfer control of the entire consist to another throttle.

12.0 Decoder Programming And Configuration With The DT300

Your DCC Decoders have many different configuration variables (CVs for short) that let you customize the operating characteristics for each decoder installed in each locomotive.

Each of these CVs controls a characteristic of the decoder. See the decoder manual that came with your decoder for a list of the most commonly used CVs and their meanings. Each decoder comes pre-programmed from the factory with the default settings outlined in your decoder manual. You can change your decoder's performance characteristics by changing the CV values entered in the CVs for the designated characteristics. Each of these CVs can be set up using the DT300 Throttle when your command station is in the programming mode or by using the Digitrax PR-1 Computer Programmer and your PC. The CVs are remembered in the decoder until it is reprogrammed with a different CV value. Please refer to your Digitrax Decoder Manual for a complete listing of the CVs supported by each Digitrax decoder.

It is a good idea to run your decoders with the factory settings for the CV values until you get used to the system and what it can do for you. Once you are comfortable with running the trains, then you can begin customizing loco characteristics.

The command station sends programming information to the decoders through the rails. Programming is usually done on a separate track. See your system manual for details on setting up a programming track.

12.1 Programming Decoder Addresses With The DT300
Radio and infrared throttles must be plugged in to LocoNet to program CVs on the programming track. Radio throttles can do Ops Mode programming without plugging in to LocoNet.

12.1.1 Programming Setup
1. Be sure that only the loco you want to program is on the programming track. If you are using operations mode programming, the loco you want to program can be anywhere on the layout but it must have a decoder that is capable of Ops mode programming installed.

2. Press and hold the **STOP** key then press the **FN/F0** key at the same time to enter programming mode. Program in the text area indicates that you are in programming mode.

```
Program
CVNo Pg dAt
```
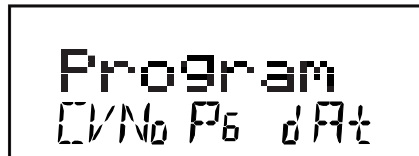
The program mode indicator in the center of the bottom line of the LCD shows which programming mode the throttle was using the last time it was in programming mode. Pressing the **FN/F0** key will cycle through the programming modes:

Pg = Paged mode (Digitrax Preferred Programming Mode)

Ph = Physical register mode

Pd = Direct mode

Po = Operations mode. In ops mode, the left side of the display will show the address that will have programming commands directed to it. Ops mode is discussed separately in Section 12.3.

3. After a few seconds, the LCD will display the last CV and CV Value you programmed. If you have not programmed any CVs, the following screen will appear. Ad2 indicates that you are in 2 digit addressing mode. If the display does not show Ad2 =???, turn the **L THROTTLE** knob counterclockwise until you see Ad2 in the left side of the display:

```
Ad2=???
CVNo Pg dAt
```
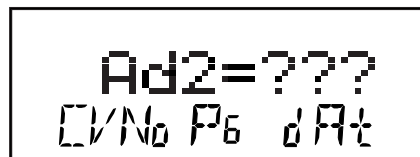
You are now ready to begin programming a new address into your decoder.

12.1.2 Programming A 2 Digit Address
1. With the screen displaying the Ad2 =???, use the **R THROTTLE** knob to dial in the address you want to program into the decoder. The address will

appear to the right of the equal sign in the display replacing the ???s. Two digit addresses range from 001-127.

2. Press the **SEL** key to write the selected address to the decoder. The decoder automatically enables 2 digit addressing.

3. When the **SEL** key is pressed, the throttle will beep and display Ad2=wr■ with the square blinking during programming. When programming is complete, the display will briefly show Ad2=good followed by Ad2=xxx where xxx is the 2 digit decoder address you just selected.

4. Exit programming mode by pressing and holding the **STOP** key (shift key style) as you then press the **FN/F0** key to return to Lo mode.

5. To select and run the loco programmed, press the **L** or **R THROTTLE** to activate it, press the **SEL** key, dial up the address and press the **SEL** key again to select the address on the throttle.

12.1.3 Programming A 4 Digit Address

1. With the screen displaying the Ad2 =???, press the **R THROTTLE** once to change to 4 digit addressing. The following screen will appear. Ad4 indicates you are now in 4 digit addressing mode. (You can toggle between 2 and 4 digit address programming screens by pressing down on the **R THROTTLE** Knob.)

```
Ad4=???
CVNo P6 dAt
```
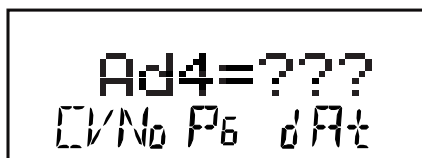
2. To program a 4 digit address, use the DT300 Throttle knobs to dial in the 4 digit address you want to program into the decoder. Use the **L THROTTLE** to dial up 100s and 1000s and the **R THROTTLE** to dial up 1s and 10s.

3. Press the **SEL** key to write (program) the selected address to the decoder. The throttle will beep and display Ad4on?=Y. This prompt allows you to access 4 digit addressing mode when you respond with a Yes (**Y/+**).

4. Press the **Y/+** (**YES**) key to enable the 4 digit address. If you don't do this within 6 seconds before the throttle times out, simply press the **SEL** key again to program the address followed by the **Y/+** key to enable it. The DT300 automatically makes the necessary adjustments to CV29 to allow 4 digit addressing.

5. When programming is complete, the display will show the 4 digit address that you just programmed and enabled.

6. Exit programming mode by pressing and holding the **STOP** key (shift key style) as you then press the **FN/F0** key to return to Lo mode with track power off. To turn track power on, press and hold the **STOP** key as you then press the **Y/+** key.

7. To select and run the loco programmed, press the **L** or **R THROTTLE** to activate it, press the **SEL** key, dial up the address and press the **SEL** key again to select the address on the throttle.

12.2 How to Program Other Configuration Variables
12.2.1 Hex Display And Decimal Display
All CV values except for 2 digit and 4 digit addresses can be displayed as either decimal or hexadecimal numbers by the DT300. When programming Configuration Variables, you use the **L THROTTLE** knob to browse through CVs 002 through 255 and the **R THROTTLE** knob to set the value for the CV you have selected. By default, the DT300 displays the CV values as decimal numbers 000-255 (###).

To view the numbers as hexadecimal simply press the **R THROTTLE** knob and you will see the CV value change to the hex equivalent of the decimal. Hex numbers are displayed with a leading "x" as x##. For example the decimal value of 006 = x06, the hex value. The decimal value 045= x2D. The ability to toggle between decimal and hex gives you an instant conversion table.

Program CV02 (Start Voltage) — CV value (dAt) 045 (decimal)

Paged Mode
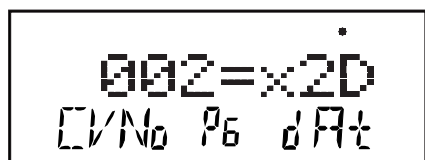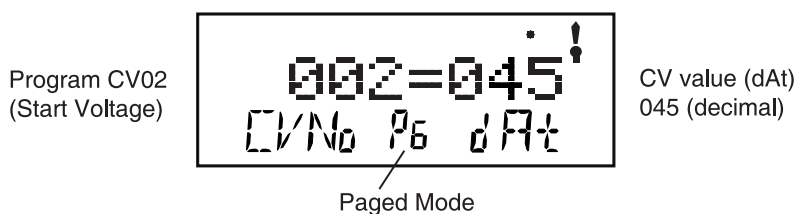
Press the R Throttle Knob to display CV value of 045 decimal as x2D hex

12.2.2 Programming CVs Other Than Addresses
There are many different CVs that have been defined to handle many characteristics you might want to use for your locomotives. See following charts for most commonly used CVs. Your decoder manual has a complete listing of CVs that are available in specific decoders, what they do and suggested value.

1. Place the decoder equipped locomotive you want to program on the programming track. Be sure that only the loco you want to program is on the programming rack.
2. Enter Program Mode by holding down the **STOP** key and pressing the **FN/F0** key at the same time. The display will show Program in the text line and the last CV and CV Value you programmed.
3. Select the programming mode you wish to use by pressing the **FN/F0** key until the method you want appears in the Mode Indicator. Pressing the **FN/F0** key will cycle through the programming modes: Pg, Ph, Pd and P0.
4. To program CVs other than addresses, use the **L THROTTLE** to dial up the CV# you want to program and the **R THROTTLE** to dial up the CV value

you want to enter. Remember that you can use the **R THROTTLE** to display the CV value in either decimal or hexadecimal format by pressing down on the **R THROTTLE** Knob.

5. Press the **SEL** Key to write the selected value into the selected CV.

    Note: You can program additional CVs and their values by repeating step 4 and 5 until all of the CVs are programmed. See following table.

6. To exit programming mode, use the **STOP** key as a shift key and press the **FN/F0** key. The LCD will return to normal Lo (Loco) mode with track power off.

7. Both the command station's TRACK STATUS indicator and the DT300 throttle's Track Power indicator will be off. Use the **STOP** key as a shift key and then press the **Y/+** key to turn track power on after programming.

8. To select and run the loco you just programmed, press the **L** or **R THROTTLE** to activate it, press the **SEL** key, dial up the address you want just programmed and press the **SEL** key again to select the address on the throttle.

12.3 Operations Mode Programming

Operations mode programming lets you program CVs in DCC locomotives equipped with Extended Packet Format decoders while they are on the mainline. A typical use for Ops mode programming would be to change the acceleration rate (CV03) or the deceleration rate (CV04) of a locomotive to simulate the weight and braking capability of the train to compensate for changing the number of cars or power units on a train.

Your DT300 can use ops mode programming to change the CV value in ANY CV, including 2 digit and 4 digit addresses. Ops mode programming can be performed by any DT300 at any time since the throttles are not competing for usage of the single programming track.

Radio equipped throttles do not need to be plugged in to LocoNet during Ops Mode Programming, except to change the decoder address. Ops mode is the only programming mode that will be available on the radio throttle unless you plug in to LocoNet.

1. Select the loco address that you want to program on either the **L** or **R THROTTLE.** In our example (display shown in step 4) we have selected address 597. Be sure that the address you want to program is the active throttle, with the blinking smoke, when you enter programming mode.

2. Press and hold the **STOP** key and then press the **FN/F0** key at the same time. Release both keys when the program display comes on. Program will be displayed in the text line of the display.

3. Press the **FN/F0** key to cycle from Pg, Ph, Pr and Po until Po appears in the mode indicator in the middle of the bottom line of the display. The DT300 display will display the address that was selected on the active throttle in the right side of the bottom line of the display. This is the address that you are preparing to program.
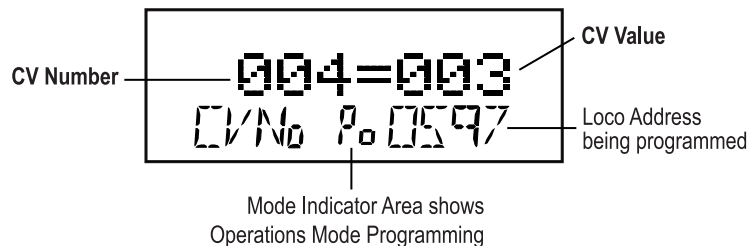
Most Commonly Used Configuration Variables (CVs)

CV	Used For	Decimal Value Display Range	Hexadecimal Value Display Range
Ad2 (01)	Loco 2 digit address	000-127	
Ad4 (17 &18)	Loco 4 digit address	0000-9983	
02	Start voltage (Vstart)	000-255	x00-xFF
03	Acceleration rate	000-031	x00-x1F
04	Deceleration	000-031	x00-x1F
05	Max voltage (Vmax)	000-255	x00-xFF
06	Mid-point voltage (Vmid)	000-255	x00-xFF
29	Configuration register	See Table	See Table IV

CV29, The Configuration Register

Value in CV29		Features Controlled		
Decimal	Hex	Speed Steps	2 or 4 Digit Adr	Analog Conversion
000	x00	14 (Standard)	2 digit	No
002	x02	28/128 (Advanced)	2 digit	No
004	x04	14 (Standard)	2 digit	Yes
006	**x06**	**28/128 (Adv)**	**2 digit**	**Yes**
022	x16	Enable Loadable Speed Table	2 digit	Yes
032	x20	14 (Standard)	4 digit	No
034	x22	28/128 (Advanced)	4 digit	No
036	x24	14 (Standard)	4 digit	Yes
038	x26	28/128 (Advanced)	4 digit	Yes
054	x36	Enable Loadable Speed Table	4 digit	Yes

4. Use the **L THROTTLE** knob to dial up the CV you want to modify. In the example below, we have selected CV4, the deceleration rate. Use the **R THROTTLE** knob to dial up the CV value you wish to program We have entered a value of 03, a small amount of deceleration.

CV Number —— 004=003 —— CV Value

CVNo Po0597 —— Loco Address being programmed

Mode Indicator Area shows
Operations Mode Programming

5. When the CV and the value you want to program for that CV appear in the display, press the **SEL** Key to send the programming commands.

6. To return to Lo (Loco) mode from Operations mode programming, simply press and hold the **STOP** key and then **FN/F0** key, releasing both at the same time.

7. With ops mode programming, the command station does not turn off track power so, you do not need to turn it back like you did with service mode programming.

12.4 Busy Or Fail Message

If you get a "Busy" message in the display in response to any programming task, the system is temporarily busy and you will have to try the task again until you get a "Good" response.

If you get a "Fail" message in the display in response to any programming task, check to be sure that there is a loco on the programming track and that the programming track is powered.

12.5 Reading Back CV Values Programmed

Your DCS100/DCS50 and DT300 together can read back the CV values programmed into your decoders. Since you must use the programming track for this, infrared and radio throttles must be plugged in to LocoNet to read back CVs & their values. Systems with a DB150 command station are not able to read back CV Values programmed into decoders.

To read back CV values:

1. Place the decoder equipped locomotive you want to program on the programming track. You can also do an ops mode read back with Digitrax transponding decoders if you have a LocoNet device that allows ops mode read back plugged in to LocoNet.

2. Enter Program Mode by holding down the **STOP** key and pressing the **FN/F0** key at the same time. The display will show Program in the text line and the last CV and CV Value you programmed.

3. Select the programming mode you wish to use by pressing the **FN/F0** key until the method you want appears in the Mode Indicator. Pressing the **FN/F0** key will cycle through the programming modes: Pg, Ph, Pd and P0.

You can read back in P$_G$, P$_H$, P$_d$, or P$_o$ modes with the following restrictions:

> P$_G$ Paged Mode no restrictions
> P$_H$ Physical Register Mode can only read CV01-CV08.
>> You should not rely on values in the display for CVs
> above 08 when reading back in physical register mode.

> P$_d$ Direct Mode no restrictions

> P$_o$ Operations Mode readback can only be used with Digitrax decoders that are capable of ops mode read back when there is a device attached to LocoNet that supports ops mode read back. Digitrax transponding decoders and DCS100 would allow ops mode readback.

4. **To read back the CV value programmed for the two digit address** (CV01), use the **L THROTTLE** to dial up Ad02 on the left side of the text area and then.press the **MODE** key. The text area will show Ad2 =rd followed by a flashing box. When the read back is finished, the CV value (the 2 digit address) will be displayed on the right side of the text area.

5. **To read back the four digit address that is programmed into the decoder** use the **L THROTTLE** to dial up Ad02 on the left side of the text area, then press the **R THROTTLE** to change to Ad4. The text area of the display will show Ad4=???? (disregard any value that appears at this time). Press the **MODE** key and the display will change to Ad4=8rd followed by the flashing box. When the read back is finished the 4 digit address will be displayed on the right side of the text area.

6. **To read back any other CV** start at AD2=??? (Use the **L THROTTLE** to dial in Ad2 on the left side of the display or if you were in four digit addressing, press the **R THROTTLE** once). Use the **L THROTTLE** to dial up the CV you want to read back or use the numeric keypad to enter the CV Number. Press the **MODE** key, the display will show the CV number=rd followed by the flashing box. When the read back is finished, the CV value for that CV will be displayed in the Right side of the text area.

7. Once you have read back any CV, you can change its value by dialing in the CV value you want to program and pressing the **SEL** key.

8. Exit Program Mode by holding down the **STOP** key and pressing the **FN/F0** key at the same time.

   You can read back and re-program as many CVs and their values as you want in a session. When you are finished, simply exit Programming Mode.

13.0 Status Edit Mode

Status Edit Mode allows you to set up a non Digitrax decoder to work with a Digitrax Command Station. Some decoders cannot read the 128 speed step commands that are part of the DCC packet standard with Digitrax Command Stations and decoders. Status Edit Mode allows you to run these decoders by telling the command station to treat these decoders as 14 step or 28 step decoders when it sends DCC signal packets.

Status editing has nothing to do with programming the decoder. Status edit mode is a command station control not a change in a decoder configuration variable (CV).

If you can't get a non-Digitrax decoder to work on your layout and you are sure you are using the correct address for the decoder, you probably need to use the status edit mode to run in 14 or 28 speed step mode. Check your decoder specifications to determine the Speed Step specification set by the manufacturer and then use the following steps to change the status to meet your decoder specifications.

13.1 Status Editing A Decoder

1. Press the **SEL** key to enter address selection mode, the LCD screen will begin flashing the address on the active throttle and will display Sel Loco in the text area to prompt you to select an address. Lo (Loco) mode will also be flashing.

2. Press the **FN/F0** key to enter SE (status edit) mode. The flashing Lo will change to SE and the current status code of the address will be displayed in the text area.
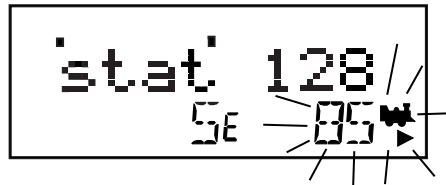
3. Use either **THROTTLE** knob or the **Y/+** or **N/-** keys to cycle through the status codes. The status code selected will be displayed in the right hand side of the display. See table below for explanations of the codes.

Display	Meaning
28	28 Speed Step Mode
tri	Motorola Trinary Format Mode
14	14 Speed Step Mode
128	**128 Speed Step Mode Digitrax Preferred Mode**
*28	FX 28 speed step-enable advanced consist mode
x01	Reserved, Do not use
x02	Reserved, Do not use
*128	FX 128 speed step-enable advanced consist mode

4. Once the status code you want to use for the address is displayed in the right side of the LCD text area, press the **SEL** key to change the status code of the locomotive and to select it to run.

5. If the loco address is in-use on another throttle or in a consist when you press the **SEL** key to complete the status edit process and select the loco on the active throttle, the DT300 will prompt you to Steal = Y. If you want to steal the address, press the **Y/+** key to complete the status edit. If the loco is part of a consist, it will not be selected and will remain part of the consist when the status is edited.

Note: If the throttle times out while status editing simply begin the procedure again.

13.2 Note for Non-Digitrax Decoder Users

If you have a decoder that does not have advanced 28/128 speed step mode available, you must "status edit" that locomotive to standard 14 speed step mode before running it with your Digitrax system. Changing the decoder's status will cause the system to handle this decoder as a 14 step decoder. Status editing does not reprogram anything in the decoder.

14.0 Switch Mode

Switch mode is used for sending commands to accessory decoders and for changing option switches in your LocoNet system. The most common use of switch mode is for operating turnouts on the layout. See your system manual for instructions for using the DT300 switch mode to set the option switches of your command station.

> **Note:** The accessory (stationary) decoders in the system are accessible to all throttles or control devices with switch control capabilities and are not reserved for use by a single throttle.

14.1 Enter Switch Mode And Set Switches

1. Press the **MODE** key until the mode indicator in the center of the bottom line of the DT300's LCD shows Sw. The **MODE** key will cycle through Lo, Sw and Mu modes.

2. The last switch decoder address selected by your throttle is displayed on the text line followed by a "t" or a "c".

   "t"   indicates that the switch was last "thrown" (for a turnout, the diverging route is set)

   "c"   indicates that the switch was last "closed" (for a turnout, the main-line route is set)

   If the "t" or "c" indicator is flashing it means that the LocoNet Command Station does not know the last command sent to the switch.

   Note: The display does not necessarily show the actual position of the switch, just the last command sent to it. If the switch has been manually changed the display will not indicate the new position, only the last command.

4. Dial up the switch address you want to change by using either throttle knob or the **Y/+** and **N/-** keys. You can also use the **L THROTTLE** knob to set the 100s and the **R THROTTLE** knob to set the 1s and 10s.
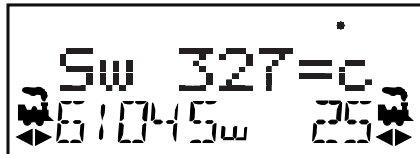
5. Once the desired switch address appears in the text area of the throttle, press either the **L/t** key to move the switch to the "thrown" position or the **c/R** direction key to move it to the "closed" position.

6. If the switch you selected is a turnout connected to an accessory decoder, it will change position from closed to thrown or vice-versa.

7. After commanding the switch "closed" or "thrown" the switch position display will stop flashing, since the command station has stored the latest command to the switch.

14.2 Exit Switch Mode And Return To Loco Mode

1. Pressing the **MODE** key twice (skipping past MU mode), **or**

2. Pressing down on either **THROTTLE** knob **or**

3. Wait for the 6 second inactivity time-out to return the DT300 to the Lo (Loco) default mode.

The next time you enter Sw mode, the DT300 will remember where you left off and start at the last switch address and position you accessed.

15.0 Fast Clock Operation

Many operators use a fast clock during operating sessions to simulate prototypical operations. Traditionally, this clock is on the wall and is set up to run at a faster than normal rate. LocoNet has its own networked fast clock for all Digitrax throttles connected to your system. **To use the Fast clock feature of the DT300, you must be plugged into a Digitrax command station.**

When there is no activity on your DT300 for more than about 6 seconds, the DT300 will revert to the default display. Your DT300 was shipped with Lo (Loco) mode, showing the current speed of selected loco(s), as the default display. You can change this to the fast clock as the default display. When you press any key or turn either throttle knob, the default display will change to reflect the current throttle activity. See Section 19.4 for information about how to change to the fast clock default display.

The Fast Clock is factory set to display a 4 digit 12 hour format that will appear in the text line of the display. You will see the following when the fast clock option is set to display. See Section 19.4 for information on changing to a 24-hour display format.
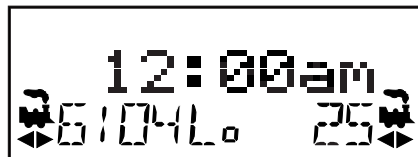
Any DT series throttle you plug in to your LocoNet system will update its fast clock time and synchronize with the rest of the system a couple of seconds after it is connected to LocoNet.

Each DT300 can be set up for an alarm time. When the current fast clock time matches the private alarm time set in any DT300, then that DT300 will beep and flash the message "Alarm" to indicate that the alarm time has elapsed.

The fast clock rate is user selectable from 1:1(real time) to 100:1 in steps of 1. The most popular range of values is 4:1 (4 real world prototype hours = 1 model operating hour) to 8:1 (8 real world prototype hours = 1 model operating hour). This allows you to simulate an 8-hour shift (prototype hours) in one to two hours of model operating time.

15.1 View Fast Clock

You can view the fast clock time even if you do not have the display option set to view the current fast clock time as a default display:

1. From Lo (Loco) mode, press the **MODE** key to change to Sw (Switch) mode.

2. Press the **FN/F0** key to change from Sw (Switch) mode to E (Editor) mode.

3. The mode indicator in the center of the bottom row of the display will show Ec (Edit Clock Mode) and the text area will show the current system time in either a 12 or 24 hour format.

4. Press the **FN/F0** key twice more to exit the clock function.

15.2 Edit Fast Clock Time, Rate And Alarm

Note: DT300 radio or infrared versions must be plugged in to LocoNet to edit the fast clock settings.

1. From Lo (Loco) mode, press the **MODE** key to change to Sw (Switch) mode.

2. Press the **FN/F0** key to change from Sw (Switch) mode to E (Editor) mode.

3. The mode indicator in the center of the bottom row of the display will show Ec (Edit Clock Mode) and the text area will show the current system time in either a 12 or 24 hour format.

4. Use the **L** and **R THROTTLE** knobs to dial up the desired start time. Use the **L THROTTLE** for hours and the **R THROTTLE** for minutes. You can only move time forward. Press the **FN/F0** key to set the time and change to EF.
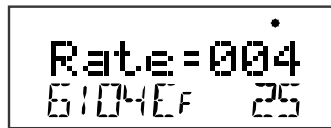
5. Once the time is set, the mode indicator will display EF (Edit Fast Rate) and the text will show Rate=nnn where nnn is the clock rate. Use the throttle knobs to dial up a clock rate that is between 000 (stop) and 100 (100:1). In our example we have set the fast rate at 4 to allow you to recreate a proto-typical eight hour shift in a two hour model operating session. Press the **FN/F0** key to set the fast clock rate and move to the EA (Edit Alarm) mode.

6. Once the time and fast clock rate are set, the mode indicator will display EA (Edit Alarm) and the text line will show a 12 or 24 hour time. If you want to set an alarm time, use the throttle knobs (step 4) to dial up the alarm time. Press the **FN/F0** key to set the alarm time and return to Lo mode.

7. Once the time, fast clock rate and alarm are set, you will automatically return to Lo mode (with fast clock display if you have set your DT300 throttle options for this option).

15.3 Stop The Fast Clock

Setting the clock rate to rate=00 (step 5 of Section 15.2) will stop the fast clock for the entire system at the currently displayed time. Fast time will re-start when a new non-zero rate value is set.

16.0 System Shut Down And Resume Procedures

When you are finished with your session, shut down the system by turning off power to the system using the DT300.

16.1 Dispatching a Locomotive

Some users prefer to "dispatch" or release all addresses active in their system before shutting down. This can prevent unexpected results when you power up the layout again.

1. Press the **SEL** key to enter the loco address selection, browse to the loco address you want to dispatch.

2. Set the loco speed to zero.

3. Press to the **MODE** key to dispatch it to your LocoNet system, that's all there is to it! Repeat steps 1 and 2 for all active locomotives.

16.2 System Shut Down

1. Turn track power off: Press and hold the **STOP** key (like a SHIFT key) then press the **N/-** key while continuing to hold the **STOP** key. Release both keys when the system beeps and the TRACK STATUS Indicator on the command station and the Track Power indicator on the DT300 display goes off.

2. Turn off (or unplug) the power supply to the system.

   Note: The power to the command station can be left on all the time if desired. In "sleep" mode, the command station consumes very little energy. In this state it provides keep alive power to all throttles that are connected to LocoNet.

16.3 Resuming Your Session

1. Turn on the power to the system.

2. Be sure the command station MODE switch is in the RUN position. All attached throttles will beep within a couple of seconds to indicate that LocoNet is active again.

3. Press and hold the **STOP** key followed by the **Y/+** key on the DT300. Release both keys when the command station and DT300's TRACK STA-TUS/Track Power indicators come on.

17.0 Tetherless Operation Of DT300

The DT300 is "InfraReady". The DT300R can operate tetherless on radio or "infraReady." Both units are also provided with a cable to attach into LocoNet when required. A 9 volt battery must be used to power both the DT300 and DT300R for tetherless operation. Using DT300 as a tetherless throttle is easy:

1. For Infrared operation, plug in at least one Digitrax IR receiver (UR90 or UR91) to your working LocoNet. Because infrared signals are line of sight, more than one receiver may be necessary for optimal performance in your layout room. See your system manual for information about installing UR90 and/or UR91s on your layout.

2. For Radio operation, plug in at least one Digitrax Radio Receiver UR91 to your working LocoNet. Most layouts only need one UR91. See your system

manual for information about installing UR90 and/or UR91s on your layout.

3. Install a 9 volt battery in your DT300. See Section 18 for battery installation information.

4. Plug your DT300 in to LocoNet and it will verify that at least one infrared and/or radio receiver is connected to LocoNet. The throttle will display either rA or Ir (depending on whether it finds an infrared or radio receiver first) followed by the current LocoNet ID. This example shows that the DT300 has detected an infrared receiver and that the current LocoNet ID is 03. The throttle has loco addresses 03 and 1280 selected.
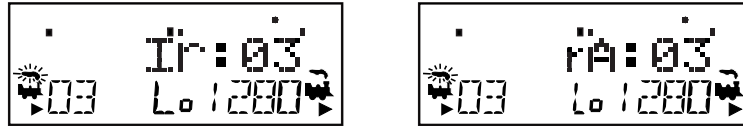
5. The DT300 will then log on to the LocoNet ID of the LocoNet it was plugged in to and will begin to operate as a tetherless throttle when you unplug it from LocoNet. When you unplug from LocoNet, the tetherless indicator will come on and the tetherless message will display for a few seconds indicating whether the throttle is running as Ir (infrared) or rA (radio). It will also display the LocoNet ID that the throttle is logged on to.
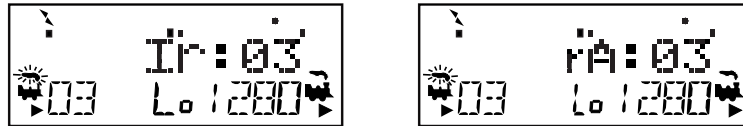
6. The connection display will be followed by a normal Lo (Loco) mode display with the tetherless indicator lit.

17.1 Power Save Mode

If an untethered DT300, operating as a tetherless throttle, detects no user throttle activity for about 3 minutes it will enter power save mode. The display will show:

The throttle may flash the normal Lo (Loco) Mode screen about every 60 seconds. This happens when the throttle "pings" the system to let the command station know that it is still part of the system. This keeps the system from releasing that locomotive back to the system and making it available to be

selected by another throttle.

Any key strokes or movement of the throttle knobs will bring the DT300 out of power save and return to the normal Lo (Loco) mode screen.

Fast clock caution: If you use power save mode, the DT300/R's local fast clock copy will deviate from the LocoNet system clock. The fast clock will re-synchronize with your LocoNet system fast clock when it is plugged in again.

17.2 LocoNet ID Change with IR or Radio

Your DT300 will log on to the LocoNet ID offered by compatible infrared receiver(s) it sees when plugged in to LocoNet. The default LocoNet ID is 00. It may be necessary to change the LocoNet ID if more than one club is operating in close proximity at a train show so that the commands sent by one club will not interfere with the commands sent by other clubs.

To change a LocoNet ID:

1. Disconnect a DT300 from the LocoNet where you want to change the LocoNet ID.

2. Press and hold down the **MODE** key on the DT300 and then plug it back in to LocoNet. Release the **MODE KEY** after plugging in.

3. The DT300 will display the current LocoNet ID "Ir:0n", where "n" is the current LocoNet ID. Use either throttle knob to change the LocoNet ID. You can set the LocoNet ID to be any number from 0 to 7.

4. Press the **SEL** key to set the system to the new LocoNet ID.

5. The DT300 used to change the LocoNet ID will automatically log on to the new LocoNet ID.

6. Unplug and reconnect any other DT throttles that will be used on this system so that they can log on to the new LocoNet ID number and be able to operate on the system.

Note: If you add a new UR90 or UR91 to the system and are using a LocoNet ID other than the initial default value of 0, you must to re-synchronize the LocoNet IDs in all the UR90s and UR91s by setting the LocoNet ID as described above.

If you are operating in an area where more than one LocoNet systems is operating nearby, be sure to coordinate with other layouts so that each one has its own unique LocoNet ID before beginning operations.

17.3 Selecting A Locomotive-Safety Selection

While tetherless, the DT300 operates as a one-way transmitter. The DT300 must be plugged into LocoNet to select an available locomotive address. After an address is selected on your DT300, you can unplug from LocoNet and run the selected addresses with infrared or radio depending on the model DT300. The throttle will automatically convert to infrared operation for all speed, direction, function, operations mode programming, and switch commands.

Digitrax uses a safety selection procedure that requires throttles to be plugged in to LocoNet to select a loco address to run. This is an important operational

safety feature. Digitrax chose not to allow one way address selection to prevent multiple operators from being able to select and send commands to the same addresses at the same time. Having multiple operators sending commands to the same address can result in serious problems in an operating session because locos can appear to be out of control.

17.4 Releasing A Locomotive Address
Two options are available for tetherless release. These options are set by DT300 Option #3, see Section 19 for instructions.

No tetherless release allowed (factory setting)**:** if the **SEL** key is pressed while the DT300 is running in tetherless mode, the addresses selected will not be released unless the throttle is plugged in to LocoNet.

Tetherless release allowed (must change Op#3)**:** if the **SEL** key is pressed while the DT300 is running in tetherless mode, the address selected on that side of the throttle will be released immediately and that throttle will become inactive. To re-select this loco address plug your DT300/R in to LocoNet and select the loco address on the throttle.

17.5 Multiple Unit Operations
Consists must be assembled and broken up while the DT300 is plugged in to LocoNet. MU assembly/disassembly operations are locked out while the DT300 is running tetherless. Once a consist is assembled, it can be operated normally using the DT300 in tetherless mode.

17.6 Programming
The DT300 will not program in infrared mode while the DT300 is operating as a tetherless throttle. The DT300 Radio version can program in Ops mode programming while operating as a tetherless throttle. If you press and hold the **STOP** key followed by the **FN/F0** key to enter programming mode, the DT300 running as tetherless will default to the Po mode (ops mode programming).

The DT300 must be connected to LocoNet to use service mode programming.

17.7 Switch Mode
The DT300 will operate in Sw (Switch) Mode while tetherless. It can operate turnouts and routes using the **L/t** and **c/R** keys in the normal manner.

17.8 Ballistic Tracking
While running tetherless, ballistic tracking will feel slightly different than while connected to LocoNet.

17.9 Fast Clock
When using the fast clock option, the DT300 will keep track of and display fast time based on the last synchronized system fast time when the DT300 was connected to LocoNet. If the fast time is edited by another throttle connected to LocoNet, the DT300 will not see this change until it is plugged into LocoNet at which time its display will be updated.

17.10 Keyboard Lock

While the DT300 is being used tetherless, there are occasions when you may want to disable the throttle's keyboard to prevent accidental commands being sent to the railroad. For example, your train is in a siding waiting for another train to pass. You put your throttle in your pocket and go take a break. By locking the keyboard, you will not be able to accidentally start your train if you bump your throttle or press the **Y/+** Key.

17.10.1 To Lock The Keyboard
 1. Press both the **Y/+** and the **N/-** keys simultaneously. When locking the keyboard, be sure to press both the **Y/+** and the **N/-** keys AT THE SAME TIME to avoid sending a speed command to the active loco.

 2. The throttle will display "Lock = +and-" in the display and none of the controls will function until you unlock the keypad.

17.10.2 To Unlock The Keyboard
1. Press both the **Y/+** and the **N/-** keys AT THE SAME TIME. This will return the throttle to normal operation.

2. Plugging the throttle into LocoNet will also unlock the throttle.

17.11 Track Power On/Off
While the DT300 is being used tetherless, you can turn track power on and off by pressing the **STOP** key and then the **Y/+** key to turn ON power and **STOP** key and **N/-** key to turn OFF power.

18.0 DT300 Battery

18.1 Battery Installation
For normal tethered operation, the DT300 does not need a battery. If you want to use your DT300/R as an infrared or radio throttle, you must install a 9 volt battery. When you install the battery, the throttle will report the battery voltage and then display Idle. Once you plug in to LocoNet, DT300s will begin operating infrared and DT300Rs will begin operating as radio throttles.

We recommend that you remove the battery from throttle if it is unplugged from the system to conserve battery life.

Batteries can be stored inside the DT300 by removing the battery and putting it back in the battery compartment with the polarity reversed.
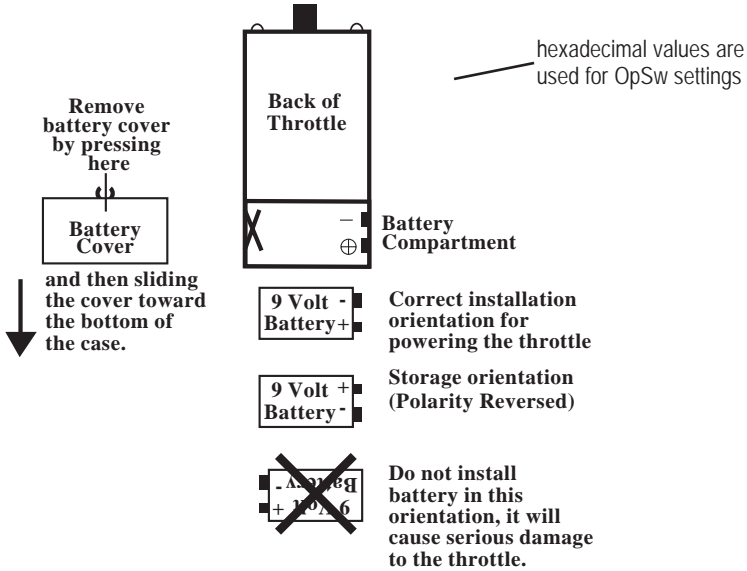
18.2 Low Power Indicator
While it is running as a tetherless throttle, the DT300/R automatically checks the power available to the throttle each time a battery is inserted and each time it is plugged into or unplugged from LocoNet. The power from the battery or from LocoNet will be displayed in the text area of the throttle briefly each time the throttle is plugged in or is unplugged from LocoNet.

When you plug in to LocoNet the number displayed will be the power provided by LocoNet. This value will be between 9 and 15 volts.
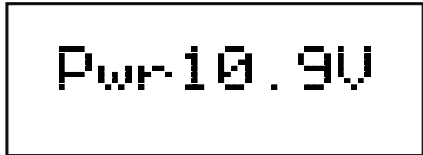
```
Pwr10.9V
```

When you insert a battery or unplug from LocoNet, the value displayed will be the battery power. When this number is less than 6.2 V you may want to consider changing the battery. The DT300/R will still continue to operate reliably for an extended period of time depending on the type battery is in use. 9 volt alkaline batteries are nearing the end of their life at 6.8 volts, but 7.2 volt NiCad rechargeable batteries may still have lots of life remaining. Experience will determine how long your DT300/R will operate with the batteries you are using.

DT300 Battery Installation

hexadecimal values are used for OpSw settings

Back of Throttle

Remove battery cover by pressing here

Battery Cover

and then sliding the cover toward the bottom of the case.

− ⊕ **Battery Compartment**

9 Volt - Battery+ — **Correct installation orientation for powering the throttle**

9 Volt + Battery- — **Storage orientation (Polarity Reversed)**

Do not install battery in this orientation, it will cause serious damage to the throttle.

18.3 Battery Replacement

When the battery is not supplying enough power to run your throttle in tetherless mode, you will see your throttle go "Idle". When this happens, plug in to LocoNet and complete any jobs you had in progress. Loco addresses selected on your throttle will continue running until you plug in and bring them to a stop. Loco addresses selected will not be "lost" when the battery goes down. Install a fresh battery and then you can unplug again and resume tetherless operation.

19.0 Customizing Your DT300 Using Option Switch Mode

You can customize the way your DT300 Throttle operates. The Options Switch mode allows you to choose between ballistic and normal tracking, whether the fast clock is displayed, whether the keys and knobs click when you operate them, whether a STOP command is local or global, how the throttle handles new decoders, how tetherless operation works, the brightness of the backlight in the display, whether the clock is in 24 or 12 hour format, the depth of the recall stack, the throttle ID#, and which radio frequency the throttle will use.

19.1 Accessing Option Switch Mode

1. Release all locos selected on the throttle before you begin.

2. Unplug the DT300 from LocoNet.

3. Press and hold the **SEL** key while plugging the DT300 back into LocoNet. You can also enter option setting by holding down the **SEL** key while installing a battery in your DT300 while it is not connected to LocoNet. Your throttle will display a screen similar to this:
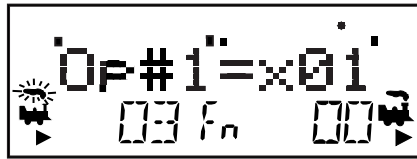
4. The DT300 display will show Op#1=x## where the x## represents the hexadecimal number of the current setting for Op#1. The default setting for Op#1 is x01 as shown in the example above. This display will appear for about 5 seconds, if no action is taken after 5 seconds, the DT300 will return to Lo (Loco) mode.

5. While Op#1=x## is in the display, use either **THROTTLE** knob to set the option value selected from the values table for Op#1.

6. Press the **SEL** key to set Op#1 and advance to Op#2=x##.

7. Repeat steps 6 and 7 for Op#2 and Op#3.

8. You should not need to change the values for Op#4, Op#F or Op#6 so press the **SEL** key three more times to step though these options or wait for about 6 seconds for the throttle to time out and go into Lo or Loco Mode.

19.2 Option Switch 1 (Op#1)

The factory setting for Op#1 for all DT300 throttles is Op#1=x01. This option controls Tracking, Fast Clock Display, Key/Knob Clicks and Stop, local/global.

19.2.1 Ballistic or Straight Line Tracking

With ballistic tracking, the faster you rotate the throttle knob, the faster the data changes in the throttle. When ballistic tracking is enabled so are typematic keys. With typematic keys, when you press and hold the **Y/+** or **N/-** keys, the values will continue to increase or decrease without having to do a separate key press for each increment. Your DT300 was shipped with ballistic tracking as the factory default setting.

With straight line tracking each movement of the throttle knob causes a fixed rate of change. When you use straight line tracking, typematic key action is off. This means that each time you press and release a key it causes a single action. Holding the key down does not cause continuous action.

19.2.2 Fast Clock Display On/Off
DT300 can be set up to display the fast clock or not to display the fast clock. Your DT300 was shipped with fast clock display disabled.

19.2.3 Key and Knob Clicks On/Off
DT300 can be set up to click each time you press a key or turn one of the knobs. Some users like to have this auditory feed back and others don't. Your DT300 was shipped with key and knob clicks enabled.

19.2.4 STOP Local or Global
The **STOP** key can be set up so that pressing it causes either a:

1. **Local emergency stop** which stops only the loco addresses selected on that particular DT300 or
2. **Global emergency stop** which will cause all loco addresses on the layout to execute emergency stop.

Table of Values for Op#1

Op#1 Value (hex) Factory Setting shown in bold	Ballistic Tracking & Typematic Keys	Fast Clock Display	Key & Knob Clicks	Run/Stop Local/Global
x00	No	No	Yes	Local
x01	**Yes**	**No**	**Yes**	**Local**
x02	No	Yes	No	Local
x03	Yes	Yes	Yes	Local
x04	No	No	No	Local
x05	Yes	No	No	Local
x06	No	Yes	Yes	Local
x07	Yes	Yes	No	Local
x10	No	No	Yes	Global
x11	Yes	No	Yes	Global
x12	No	Yes	No	Global
x13	Yes	Yes	Yes	Global
x14	No	No	No	Global
x15	Yes	No	No	Global
x16	No	Yes	Yes	Global
x17	Yes	Yes	No	Global

19.3 Option Switch 2 (Op#2)

The factory setting for the DT300 is Op#2=x23 with 128 step decoder setting and IR (infrared) tetherless operation enabled.

The factory setting for the DT300R (radio) is Op#2=x03 with 128 speed step decoder operation and tetherless operation for both radio and IR enabled.

19.3.1 Throttle Default Decoder Operation

Each DT300 can be set up to operate new decoders selected by them as any decoder status code you choose. New decoders are defined as decoders that have not been selected in your system. Your DT300 is set to expect to operate mostly decoders that are 128 speed step capable, so when a new decoder is selected the DT300 defaults to that status code. If you operate mostly decoders that are only able to recognize 28 speed steps, you can change this setting. See your decoder specifications and programming manual for more information.

19.3.2 Tetherless Operation Mode

Each DT300 can be set up with radio capability and/or infrared capability enabled, all tetherless operation disabled and power save enabled or disabled.

Table of Values for Op#2

Table IV: DT300 Throttle Option #2 Choices

Op#2 Value (hex) Factory setting is in bold	Throttle Default For Decoder Operation	Tetherless Operation Mode
x00	28 step decoder	Radio & IR
x02	14 step decoder	Radio & IR
x03 (DT300R)	**128 step decoder**	**Radio & IR**
x20	28 step decoder	IR Only Enabled
x22	14 step decoder	IR Only Enabled
x23 (DT300)	**128 step decoder**	**IR Only Enabled**
x24	28 step FX decoder	IR Only Enabled
x27	128 step FX decoder	IR Only Enabled
x28	Disable default decoder operation override	IR Only Enabled
x40	28 step decoder	Radio Only Enabled
x42	14 step decoder	Radio Only Enabled
x43	128 step decoder	Radio Only Enabled
x44	28 step FX decoder	Radio Only Enabled
x47	128 step FX decoder	Radio Only Enabled
x48	Disable default decoder operation override	Radio Only Enabled
x60	28 step decoder	IR & Radio Disabled
x62	14 step decoder	IR & Radio Disabled
x63	128 step decoder	IR & Radio Disabled
x64	28 step FX decoder	IR & Radio Disabled
x67	128 step FX decoder	IR & Radio Disabled
x68	Disable default decoder operation override	IR & Radio Disabled
x80	28 step decoder	Disable Power Save
x82	14 step decoder	Disable Power Save
x83	128 step decoder	Disable Power Save
x84	28 step FX decoder	Disable Power Save
x87	128 step FX decoder	Disable Power Save

19.4 Option Switch 3 (Op#3)
The factory setting for Op#3 for all DT300 throttles is Op#3=x01.

19.4.1 LCD Backlight Brightness Setting
The backlight intensity can be set for off, low, medium or high intensity. The brightness of the backlight affects battery life, the brighter the LCD, the shorter the battery life.

Note: When the DT300 is untethered, the backlight automatically reduces brightness by one setting to conserve battery power.

19.4.2 Fast Clock Format
The fast clock can be set up to display either 12 hour format or 24 hour format. The factory setting is 12 hour format.

19.4.3 Recall Stack Depth
The DT300 recall feature can be set to keep a list of the last 4, 8 or 16 addresses that were selected by either throttle of the DT300. The factory setting is a recall stack of 4 addresses.

19.4.4 Tetherless Release
The DT300 can be set up to allow for release of locos while in tetherless operation mode. The factory setting does not permit tetherless release.

Values for Op#3

Opt#3 Value (Factory setting shown in bold)	Backlight Brightness	Clock Format	Recall Stack Depth	Tetherless Release
x00	Off	12 hour format	4	No
x01	**Low intensity**	**12 hour format**	**4**	**No**
x02	Medium intensity	12 hour format	4	No
x03	High intensity	12 hour format	4	No
x04	Off	24 hour format	4	No
x05	Low intensity	24 hour format	4	No
x06	Medium intensity	24 hour format	4	No
x07	High intensity	24 hour format	4	No
x08	Off	12 hour format	4	Yes
x09	Low intensity	12 hour format	4	Yes
x0A	Medium intensity	12 hour format	4	Yes
x0B	High intensity	12 hour format	4	Yes
x0C	Off	24 hour format	4	Yes
x0D	Low intensity	24 hour format	4	Yes
x0E	Medium intensity	24 hour format	4	Yes
x0F	High intensity	24 hour format	4	Yes

chart continued on next page

Values for Op#3 (continued)

Opt#3 Value (Factory setting shown in bold)	Backlight Brightness	Clock Format	Recall Stack Depth	Tether-less Release
x10	Off	12 hour format	8	No
x11	Low intensity	12 hour format	8	No
x12	Medium intensity	12 hour format	8	No
x13	High intensity	12 hour format	8	No
x14	Off	24 hour format	8	No
x15	Low intensity	24 hour format	8	No
x16	Medium intensity	24 hour format	8	No
x17	High intensity	24 hour format	8	No
x18	Off	12 hour format	8	Yes
x19	Low intensity	12 hour format	8	Yes
x1A	Medium intensity	12 hour format	8	Yes
x1B	High intensity	12 hour format	8	Yes
x1C	Off	24 hour format	8	Yes
x1D	Low intensity	24 hour format	8	Yes
x1E	Medium intensity	24 hour format	8	Yes
x1F	High intensity	24 hour format	8	Yes
x20	Off	12 hour format	16	No
x21	Low intensity	12 hour format	16	No
x22	Medium intensity	12 hour format	16	No
x23	High intensity	12 hour format	16	No
x24	Off	24 hour format	16	No
x25	Low intensity	24 hour format	16	No
x26	Medium intensity	24 hour format	16	No
x27	High intensity	24 hour format	16	No
x28	Off	12 hour format	16	Yes
x29	Low intensity	12 hour format	16	Yes
x2A	Medium intensity	12 hour format	16	Yes
x2B	High intensity	12 hour format	16	Yes
x2C	Off	24 hour format	16	Yes
x2D	Low intensity	24 hour format	16	Yes
x2E	Medium intensity	24 hour format	16	Yes
x2F	High intensity	24 hour format	16	Yes

19.5 Option Switch 4 (Op#4)

Option # 4 sets the throttle ID of your throttle. Each throttle in your LocoNet system can have its own unique ID to support advanced LocoNet functionality. Products that use this feature will usually require each throttle in your system to have a unique ID. We recommend changing this ID only when specifically directed to do so by the manufacturer of a LocoNet compatible product that

requires unique throttle IDs for operation. You may use any ID in the range of values x00-x7F (hex) and you must be sure that every throttle in your system has a unique ID #.

19.6 Option Switch F (Op#F)

The radio frequency used by the throttle when in radio mode is factory set at Op#F=x0A. This value is informational only, users are not able to change this value.

19.7 Option Switch 6 (Op#6)

Option 6 sets the throttle type. All DT300s are throttle type x33. You should not change this value.

20.0 Troubleshooting

20.1 Clean Track

The majority of intermittent operation problems can be traced to bad connections and poor or noisy wheel pickups on locomotives. Check track cleanliness and quality of wheel pickups. The DCC digital packet communication strategy performs exceptionally well in a less than perfect environment, and will often mask bad connections until they are really impossible to work with!

20.2 The Quarter Trick

If your track does not have adequate power supply to the locomotives, then the DCC signal won't get through either. Take a quarter or screwdriver blade and go around your layout creating electrical shorts every 10 feet. Your command station should beep (or provide some other indication of the short) and shutdown when the short is present. When the short is removed, the booster should return to normal operation. If this does not happen, then you need to add more feeders to the track.

20.3 The LT1 Tester

Check your LocoNet cables with the LT-1 tester that came with your Digitrax system to be sure you don't have any cables that were made incorrectly.

20.4 Can't Select A Loco Address/Decoder Does Not Respond

Is the loco on powered track? If the Track Power indicator on the throttle is not on, press and hold the **STOP** key and the **Y/+** Key to turn on track power.

Use the "Quarter Trick" from Section 21.2 to test for track power at several locations around the layout.

Can you select the loco on your throttle? If not, is the loco in use by another throttle or is it part of a consist (do you see a cn or mid in the display when you try to select it)? See Section 4.5–Stealing or Section 9–Multiple Unit Ops.

Do the settings in CV29, the configuration register, match the command station output? If your decoder is a 14 step decoder running on an Empire Builder II, status editing will be needed. See Section 13–Status Editing

Have you reset any CVs since the last time you ran the loco? If so, go back and change them to their default CV values and then try to run the loco. It is possible to set acceleration so high that it will take 10 minutes for the loco to

start moving. See Section 12.2–Programming Other CVs.

Does your throttle display slot=max? This means that the system's capacity to handle operating locos is full. The DCS100 can run up to 120 addresses at the same time. If you have the "slot = max" message, be sure that all locos that are not running are released from throttles. The DCS100 that comes in the Super Chief II set has a system limit of 120 addresses. The DB150 command station that comes with Empire Builder II has a system limit of 22 addresses. The Zephyr set has a system limit of 10 addresses. See Section 10–Releasing A Locomotive From A Throttle.

Was the loco running just before it stopped? If the decoder is very warm it may be in thermal shutdown. Let it cool off and see if it starts again. Also check for localized track problems.

Are there burn marks on the decoder? You'll need to send it in for repair!

If all else fails, reprogram the decoder address and reset CVs to default values. See your decoder instructions for factory default settings.

20.5 Emergency Stop
If the layout starts to "get away" on you, either press the **STOP** key and the **N/-** key or, turn the track power to "SLEEP" on the command station. Either way will give you a chance to regain your composure, and you will be able to rejoin the operation.

20.6 Mechanical Drive Train Problems
Pay attention to the mechanical drive train and free movement of the locomotive wheel sets. This is especially important with inexpensive locomotives. Using Digitrax decoders with appropriate programming settings, you can achieve surprisingly good quality motion, if you carefully adjust the mechanisms for smooth running.

20.7 "Strange" Locomotive Lights
If you can't control the operation of the lights in your locomotive with the DT300 (in default 128, or 28 speed step mode), be sure that the decoder is programmed in advanced 28 speed step mode.

Do this by programming CV29 with a hex value of "06". Refer to Section 12.2.2 for complete programming instructions and table of values.

20.8 Nothing Is Responding
Is track power turned on? Is your throttle in Idle or stopped and displaying a flashing track power indicator in the LCD? Press and hold the **STOP** key followed by the **Y/+** key. You should see the track power indicator on the DT300 come on solid.

If all else fails, reprogram the decoder address and reset CVs to default values.

Your Digitrax decoder has been shipped programmed to 128 speed step mode. You may have changed your decoder's programming when performing the decoder test procedure. In any case, if you are not able to turn the locomotives

lights on and off, you will need to change CV 29 to hex value "06" to have proper light operation when using the DT300 in its optimum 128 speed step mode.

22.0 FCC Information

Radio or TV Interference: (this information is MANDATED by the FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different form that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: Any modifications to the equipment not expressly approved by Digitrax voids the user's authority to operate under and be in compliance with CFR 47 rules, as administered by the Federal Communication Commission. Digitrax believes any conscientiously installed equipment following guidelines in this manual would be unlikely to experience RFI problems.

The DT300R is certified for "unlicensed" operations within the United States by the US FCC and has the identifier: FCC ID: LV3RF1 or other as displayed on the unit case. Canadian ID for DT300R is 3015102960. See unit case for certification identifiers for other countries.

The DT300R is certified by the FCC and by Industry Canada using a 12" LocoNet cable only. Any modification to the cable may void the certification. For convenience, an extension cord may be attached with a 6 pin adapter for tethered use only.

For Canadian Users:
"This digital apparatus does not exceed the Class B limits for Radio noise emission from digital apparatus set out in the Radio Interference Regulation or the Canadian Department of Communications."

Le present appariel numerique n emet pas de bruits radio-electriques depassant les limites applicables aux appareils numeriques de la classe B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

23.0 Warranty and Repair Information

Digitrax gives a one year guarantee against manufacturing defects on DT300. These units are not user serviceable (opening the case voids your warranty). If a defect occurs, return the unit to us for service. We will repair or replace these units at our discretion at no charge to you for one year from purchase date. This warranty excludes damage due to abuse, such as failure to properly protect against input over current with a fuse or circuit breaker or applying excessive input voltage to the unit. We will make any repair needed because of physical damage or electrical abuse at fair and reasonable rates.

Please call tech support at (770) 441-7992 before you send anything to us for service so that we can try and resolve the problem by phone if possible.

All warranties on Digitrax products are limited to refund of purchase price or repair or replacement of Digitrax products at the sole discretion of Digitrax. In the event that Digitrax products are not installed or used in accordance with the manufacturer's specifications, any and all warranties either expressed or implied are void. Except to the extent expressly stated in this section, there are no warranties, express or implied, including but not limited to any warranties of merchantability or fitness for a particular purpose.

Digitrax, Inc. reserves the right to make changes in design and specifications, and/or to make additions or improvements in its products without imposing any obligations upon itself to install these changes, additions or improvements on products previously manufactured.

Specifications

Size (case): 4$1/4$" length x 2$3/8$" width x 1$3/8$" high
10.9 cm x 6 cm x 3.5 cm

Weight: **4** ounces, (5.6 oz with battery installed)
10 grams, (16 g with battery installed)

Caution: This electrical product is not a toy. Not recommended for unsupervised use by children under 12 years of age.

For protection against fire, electrical shock and other hazards, this unit must be operated from an isolated SAFETY EXTRA LOW VOLTAGE SUPPLY (SELV) with appropriate overload protection.

Battery: 9 volt, one required for tetherless operation.
(not supplied)

Patents: As of the date of this writing Digitrax, Inc. owns the rights to the following patents which may cover some or all of the products covered in this brochure: US 6,275,739, 6,536,716, 6,533,223, 6,367,742 B1, 6,533,224. Additional patent applications are pending.

Trademarks: As of the date of this writing Digitrax, Inc. owns the following trademarks which may cover some or all of the products covered in this manual: Digitrax, The Digitrax Train Lobos, LocoNet, Super Empire Builder, Super Chief, Transponding, Zephyr Jump and others. Additional trademark registrations are pending. Digitrax trademarks may not be used in any form without prior written consent of Digitrax, Inc.

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DT300 Series Throttle
LocoNet Throttle

Movin' Down The Tracks With Digitrax

Digitrax
Command
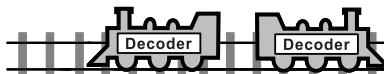**C**ontrol

Main Station

Starter Sets
LocoNet
Power Supplies

RADIO EQUIPPED
Available

Your Digitrax LocoNet® Starter Set is just the beginning of an exciting trip! Pick the one that's right for you!

Super **Chief** ™

Super **EMPIRE BUILDER** ™

ZEPHYR ™

LocoNet®

**LocoNet®
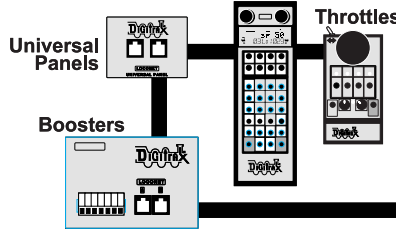The Digitrax
Difference**

Locomotive Shops

Mobile Decoders
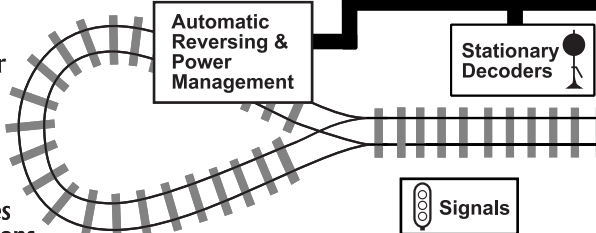Function Decoders

Decoder   Decoder

More Fun For Everyone

Add More Boosters,
Advanced & Simple Throttles,
Power Supplies,
Universal Panels,
IR and/or Radio
for more trains and operators.

Universal Panels

Throttles

Boosters

Maintenance Of Way

Make your
layout more
fun & simpler
to operate!

**Automatic
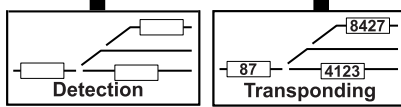Reversing &
Power
Management**

**Stationary
Decoders**

Computer Controls

PDA Throttles
& Applications
Computer Interfaces
Programmer

Signals

Putting It All Together

The Digitrax Big Book of DCC

Detection

8427
87   4123
Transponding

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