



# North Raleigh Model Railroad Club

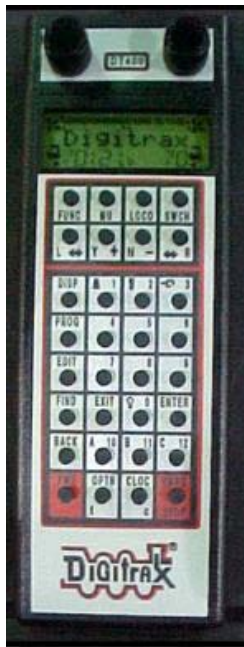
## Digital Command Control

### Summary Throttle Operations Digitrax DT402D Duplex Radio Throttles

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Questions, comments, corrections and suggestions should be addressed to the author at wallisjm@att.net

This Appendix provides summary operating instructions and helpful hints for the Digitrax DT402D Duplex throttles that may be used on the DCC portion of NTRAK show layouts. The use of DT402D Duplex throttles requires a UR92 Duplex Radio Transceiver to be operational on the layout. Refer to this Appendix as needed for help. The information offered will provide improved performance and radio signal reception.



**Throttle Knob Movements.** When operating in radio mode, throttle knob tracking will feel slightly different than when connected to LocoNet. *In radio mode, slow movement of the throttle knob will result in improved response.* It will also provide less congestion to the radio receivers and LocoNet.

**Throttle Orientation.** The optimum orientation to hold the throttle in normal usage is from horizontal to 30° upward in a

natural hand position about 12" out from your body. This gives the best radio coverage. Although there are usually several UR92 radio receivers located in and about the layout, occasionally wiring, metal plumbing, HVAC ducting and other items may cause small areas of poor radio reception. **Moving about 6" – 24" in any direction or varying the orientation of the DT402D will typically overcome any dropouts.**

**Display Power Down.** If an untethered DT402D throttle detects no user throttle activity for about 3 minutes, it will enter Power Saver Mode and display r-PS on the display until a throttle or button action restores normal activity and displays. If the DT402D has a locomotive assigned to it and is in Power Saver Mode, it will continue to "check in" with the system every 60 seconds telling the system "I'm still here." This keeps the system from releasing the locomotive back to "common." **The easiest and fastest way to signal the DT402D to exit from Power Saver Mode is to hold down either the + or - button.** Optionally you can disable Power Saver Mode as described later in this Appendix.

#### Join the DT402D to the Duplex Group

In order to operate untethered with the layout's UR92 transceivers the DT402D must join the Duplex Group, the unique identifier for the UR92s in the layout. This can be done either tethered (easy — recommended) or untethered (more difficult — not recommended). Note that DT402D Duplex Radio Throttles remember the last joined Duplex Group, even if the battery is removed, so when re-powered it will automatically wirelessly rejoin this particular Duplex Group if it is within duplex radio range.

**Tethered Method of Joining a Duplex Group.** Connect a DT402D Duplex Radio Throttle to any LocoNet jack or the front jack of the UR92 for at least 2 seconds.

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Disconnect the DT402D from the LocoNet jack. The DT402D will briefly display an 8 character Duplex Group name and the Channel Number (#11 through 26) being used by the Duplex Group. The DT402D can now be operated wirelessly just as if it were connected by wires to the LocoNet.

**Wireless Method of Joining a Duplex Group.** The DT402D will remember the last Duplex Group that it joined and display that Group Name upon startup. If the Duplex Group is available the DT402D will rejoin the group. If the Group is not available, the screen will display Idle. To select a Group do the following:

- Make sure there is a battery installed in the DT402D. Press the **OPT/T** button. If you are starting from the **Idle** screen hold the button down for about 3 seconds to power up the throttle.) You will see **Options/OpEdit** displayed.
- Press the **FIND** button to display the rf search mode and scan the last active channel. **ScanNets** will briefly appear on the display

and if there is no Group available on the last channel (e.g. 19) you will see **NoRfNet/Ch19 Sn**.

- Press the **Y/+** or **N/-** button to change the channel up or down. At each channel the display will show **Hit Find** to search for a Duplex Group name operating on that channel.
- When the DT402D discovers a Duplex Group the name will blink in the display. A default name might be, for example, **Dtx0048**.
- Press the **ENTER** button to join the Group. The throttle will now operate untethered for locomotive address selection and train operation.

**DT402D Duplex Throttle Operations**

The tables below provide directions for the operations of the DT400R and DT402R throttles normally encountered during NTRAK shows. First, however, the DT402D must join the Duplex Group in operation on the layout.

Select Locomotive to Drive	Control Lights & Functions	Loco Speed/Direction Control
<ul style="list-style-type: none"> <li>• Turn desired throttle knob at least ¼ turn in either direction or by pressing the throttle knob.</li> <li>• Press <b>LOCO</b>. Display shows <b>SEL</b> under activated knob.</li> <li>• Use the numeric keypad to enter the desired address (either 2-digit or 4-digit).</li> <li>• Press <b>LOCO</b> to select the address. The loco icon associated with the throttle knob shows a direction arrow and blinking smoke. The blinking smoke indicates which throttle knob is associated with the top line of the display.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure the throttle knob to be used is in normal function mode, as it is during normal locomotive operations. If not sure press <b>FUNC</b>.</li> <li>• For the light function (F0) press the <b>LAMP 0</b> button to toggle <b>F0</b> on and off.</li> <li>• For function 1–12 press the button on the numeric keypad that corresponds with the desired function to be turned on/off. Note that <b>F2</b> is a non-latching function and only is on as long as button 2 is held down. To latch <b>F2</b> hold down button 2 then press the <b>PWR</b> button the release both simultaneously.</li> <li>• To control functions <b>F13-F19</b>, while holding the <b>FUNC</b> button down, press the <b>1</b> key then release both buttons simultaneously. Next press the last digit of the desired function</li> <li>• To control functions <b>F20-F28</b>, while holding the <b>FUNC</b> button down, press the <b>2</b> key then release both buttons simultaneously. Next press the last digit of the desired function</li> <li>• To exit either the <b>+10</b> or <b>+20</b> function mode, just push the <b>FUNC</b> button once</li> </ul>	<ul style="list-style-type: none"> <li>• Turn throttle knob for loco whose speed is to be changed. The <b>Y+</b> and <b>N-</b> buttons can also be used.</li> <li>• % of full speed will be displayed in the text line of the display on the <b>L</b> or <b>R</b> side depending on throttle knob that is controlling the locomotive.</li> <li>• To change direction <b>double click</b> the throttle knob controlling the locomotive or press the <b>L</b> or <b>R Reverse</b> button.</li> </ul>
<p><b>Dispatching/Releasing Loco</b></p> <ul style="list-style-type: none"> <li>• Ensure the locomotive/consist speed is <b>00</b>.</li> <li>• Un-consist locomotives first.</li> <li>• Press <b>LOCO</b> then press <b>DISP</b>. The DT402D display will show <b>SEL</b>.</li> </ul>		<p><b>Stealing a Locomotive</b></p> <ul style="list-style-type: none"> <li>• Press <b>LOCO</b> to enter selection mode.</li> <li>• Dial address to be stolen &amp; press <b>LOCO</b> again.</li> <li>• If address can be stolen, the DT402D will display <b>Steal?=Y</b> in the test area.</li> <li>• Press <b>Y+</b> to steal or <b>N-</b> to not steal.</li> <li>• Slot following mode is active.</li> </ul>

**DT402D Throttle Options**

You can customize the way your DT402D throttle operates. Throttle options can be changed either tethered or untethered with a battery installed, as follows:

- Press the **OPT/T** button to access the Options menu. The display shows **Options/OpEdit**.
- Use the **R** throttle knob to scroll through the options. The name will blink in the display during this part of the process.
- Use the **Y/+** or **N/-** buttons to toggle through the values for each option until the desired value appears on the display.
- To change another option repeat the previous two steps.

- When finished press **ENTER** to set all of the changes or **EXIT** to leave the options unchanged.

**DT402D Throttle Consisting**

The consisting methods that will be permitted at NTRAK shows will depend on the total number of operators expected to participate in the show, and whether the maximum of 120 slots in the DCS100 Command Station may be reached. Basic or Advanced (Decoder Assisted) Consisting use only use one memory slot per consist. UniVersal (Command Station Assisted) Consisting requires a memory slot in the Command Station per locomotive. Basic or Advanced Consisting can be set up prior to the Convention or at the Programming Stations; UniVersal consisting must be set up on the layout.

**UniVersal (Command Station Assisted) Consisting.** To set up a consist with the DT402D throttle do the following:

- The DT402D can be either tethered or untethered for consisting.
- Select the address of the **TOP** locomotive on the right throttle knob.
- Select the address of the locomotive to be consisted to the **TOP** locomotive on the **left** throttle knob.
- Ensure both locomotives are traveling in the same physical direction on the track, and that the left locomotive has its functions set.
- Press the **MU** button then the **Y/+** button to add the locomotive to the **TOP**.
- Repeat to add more locomotives to the consist.

To remove a locomotive from a consist do the following:

- Select the locomotive to be removed from the consist on the **left** throttle knob.
- Press the **MU** button to enter consist mode, then press **N/-** to remove the locomotive address from the consist. The left throttle becomes active with the locomotive just removed from the consist.
- Repeat to remove more locomotives from the consist.

### Programming Decoders

Throttle directions for programming decoders are not provided here since Programming Stations are available at most NTRAK show layouts. The programming staff is fully qualified to provide assistance as needed in programming decoders.

*Operations Mode Programming on the layout tracks is prohibited on NTRAK show layouts.* It is too easy to make an unintentional error with Operations Mode Programming that could cause problems for another locomotive or the entire layout.

### Throttle Problems & Maintenance

If problems with a throttle are encountered during the Convention check the following items. If these do not solve the problem the throttle should be taken to the on-duty Digital Master or a Programming Station, to be checked out.

**Battery.** Be sure the battery is installed with the correct polarity. Check this especially if the throttle display goes blank when unplugged from LocoNet.

A good battery is key to successful operation in the radio (tetherless) mode. A battery is not needed when the throttle is plugged into LocoNet. Whatever may appear to be wrong with a throttle, the first thing to suspect is the battery. Replace the 9V battery with a new or known good battery. Try two or three batteries before deciding there is a fault with the throttle. Examples of problems caused by weak or dying batteries include:

- The throttle operates correctly when plugged into LocoNet, but you cannot control the train after it is unplugged.
- The throttle loses control of a train after a period of time.
- The throttle makes beeping noises.

Don't assume that a newly purchased battery will always be a good battery. A new battery can have a high internal resistance that prevents it from putting out sufficient voltage and/or current to operate the throttle. Always purchase batteries from a store that sells lots of batteries and therefore always has fresh batteries on hand. Batteries have a "shelf life" as they will deteriorate even if not used.

**No Radio Operation.** If the throttle operates correctly when connected to LocoNet but not when untethered, even after ensuring the battery is good, the problem may be that radio transmission has been turned off. Bring the throttle to the on-duty Digital Master or a Programming Station to be checked out and make sure radio transmission is turned on.

**RJ12 Plug.** There are 3 potential problems relating to the RJ12 plug on the end of the stubby LocoNet cable:

- The locking tab breaks off,
- The contacts on the plug are bent or otherwise damaged (rare), or
- The wires are not making a good connection with the contacts in the plug.

The solution to any of these problems is to replace the RJ12 plug. The on-duty Digital Master is equipped to replace your damaged RJ connector.