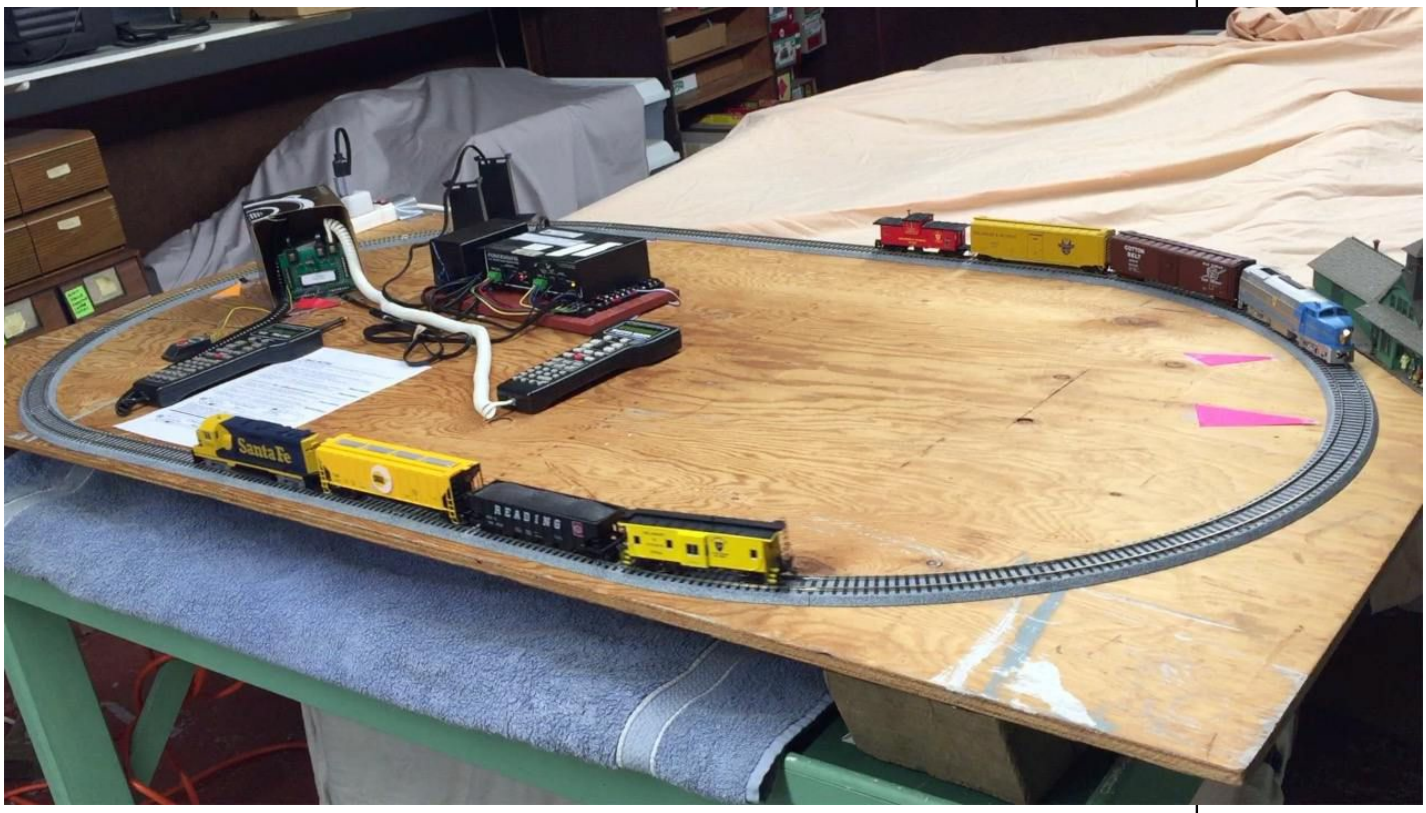
NCE Mini Panel 11-i2: Getting Started Exercises 11/10/2016

Inp	S	Command	Entry	Action	Summary

Overview:

This is the "Command Documentation File" for AutoControls.org 5-part Video #816, titled "**Getting Started Exercises for NCE DCC Mini-Panel Automatic Train Control Exercises**".

This "Command Documentation File", plus the Wiring Diagram, plus the Figures used in the video – can all be accessed by using the forwarding domain name "**mp.autocontrols.org**".



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Inp	S	Command	Entry	Action	Summary
				Configuration Memory	
		Default=3, keep		Mem addr 0 = **3 (Cab bus address)** (MUST be Adr 3 when used with PowerCab) (Enter Addr=0 to return to default settings)	
		Default=5 keep		Mem addr 1 = 5 (Debounce timer)	
		Default=0, keep		Mem addr 2 = 0 (Format display unknown cmds)	
		Def.=0, chg. To **4**		Mem adr 3 = **4** (**Continuous memory 4** & above)	
		Def.=0, chg. To **4**		Mem addr 4 = **4** (**Disabled inputs 4** and above)	
		Default=0, keep		Mem addr 5 = 0 (Interrupting wait commands)	
		6 & above not used		Mem addr 6	
		##========== ENGINE SETTINGS ========##			
				Cab: Momentum Multiplier = 1, deaccl = 1 x acc	
				#1216 ROCO D&H SHARKNOSE	
		M=1 (CV3 accel, CV4 decel)		F0= light, F8=audio mute (sound)	Spd = 7
				#3364 KATO SF GEEP GP-35	
		M=1 (CV3 accel, CV4 decel)		F0= light, F5=strobe, F8=audio mute (sound)	Spd = 16
		##========== COMMAND LIBRARY ========##			
cmd		**Command**	**Entry**	**Action**	
1		Accy: **7** Norm	1, **7**, **1**	Set turnout # **7** STRAIGHT (**1** = straight)	
2		Accy: **10** Rev	1, **10**, **2**	Set turnout # **10** CURVED (**2** = curved)	
3		Delay 1/4 sec: **4**	5, 1, 2, **4**	Delay 1 second (¼ sec x **4**)	
4		Delay 4 sec: **2**	5, 1, 1, **2**	Delay 8 seconds (4 sec x **2**)	
5		End (Terminate)	5,7,1	Terminate (stop executing commands)	
6		Link to Input: **9**	5, 3, **9**	Go to Input **9** (go back and repeat sequence)	
7		nop	5,5,1	No Operation (do nothing, go to next step)	
8		>Select Loco: **003**	3, 1, **003**	Select Loco #3: (need "*" to indicate long adr)	
9		. Speed Fwd: **10**	3, 2, 2, **10** F	START loco	
10		Skip if Inp:**16** Grnd	5, 6, 1, **16**	Skip next command if reed sw. #**16** is closed	
11		Skip if Inp: **16** Open	5, 6, 2, **16**	Skip next command if reed sw. #**16** is open	
12		Wait Inp: **16** Ground	5, 2, 1, **16**	wait till reed sw. #**16** closed (resistance decr)	
13		Wait Inp: **16** Open	5, 2, 2, **16**	wait till reed button. #**16** released	
14		Macro **14**	2, **14**	Set both turnouts STRAIGHT (macro in Cmd. Stn.)	
15		Macro **15**	2, **15**	Set both turnouts CURVED (macro in Cmmd. Stn.)	

* This file can be downloaded using links at http://mp.autocontrols.org (the actual directory is at **http://track2.com/ingram/plans/816**).

* Most of these experiments are done using the "Test" mode part of Programming mode. It will be noted where "Run" mode (non-programming mode) is used.

* Note pushbuttons will NOT work when Mini-Panel is in Test mode (only Run mode)

* Most of these demos run continuously, so we have to use the Reset button to stop execution. (The exception is demo 8B, which uses an 'End' command.)
* Most of these Terminate commands are never executed; they're just filling "ususued" space.

* For most of these demos using a reed switch, you can manually use a pair of wires (1 to ground, 1 to the input) to simulate a reed switch if you don't have one.

* When reviewing commands, you can use the INCR, INCR FAST, DECR FAST buttons & the thumbwheel - in addition to the ENTER key (this is NOT in the manual).

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Inp	S	Command	Entry	Action	Summary
1	1	**Link** to Input: 4	5, 3, 4	Go to Input #4 and START Sequence (when	
1	2	End (Terminate)	5,7,1	pushbutton #1 is closed)	
1	3	End (Terminate)	5,7,1		
1	4	End (Terminate)	5,7,1		
Demo 9 – Turn on lights/strobe/sound (inp. 2); turn them off (Inp. 3)					This comes after
		The next 4 commands turn **ON** the loco's headlights, rooftop strobe light, & sound.			Demo 8 on pg. 4
Inp	S				
2	1	>Select Loco: 3364	3, 1, 3364	Select Loco #3364: Kato SF gray GP-35 diesel	
2	2	F0-F4: 0----	3, 3, 1 [0]	headlights on (F0)	
2	3	F5-F8: 5---	3, 3, 2 [5]	Strobe on (F5), sound on (audio mute F8 off)	
2	4	End (Terminate)	5,7,1	Terminate (stop executing commands)	
-	-				
		The next 4 commands turn **OFF** the loco's headlights, rooftop strobe light, & sound.			
Inp	S				
3	1	>Select Loco: 3364	3, 1, 3364	Select Loco #3364: Kato SF gray GP-35 diesel	
3	2	F0-F4: -----	3, 3, 1 [ ]	headlights off (F0 OFF)	
3	3	F5-F8: ---8	3, 3, 2 [8]	sound off (audio mute F8 on)	
3	4	Speed Fwd: 0	3, 2, 2, 0 F	STOP loco (Speed 0)	
-	-				
~========== II. DEMOS WITHOUT USING A LOCO ==========~					
		Demo 0 – Blink LED – using Reset Button			
		We can reset the Mini-Panel by grounding Terminal 31 - which will cause the LED to blink. . No commands are needed, just 2 wires or a pushbutton.			
		Demo 1 – Send Dummy Accy. Cmd (to blink LED) (test mode)			
		* We can cause the LED to blink repeatedly, by repeatedly sending a command. * (It is not necessary that the device being "commanded" must be hooked up.)			
4	1	Accy: 2000 Norm	1, 2000, 1	Set non-existent turnout # 2000 STRAIGHT (to blink Mini-Panel's LED)	Red clr=variable
4	2	Delay 1/4 sec: 2	5, 1, 2, 2	Delay 1/2 second (¼ sec x 2)	
4	3	Link to Input: 4	5, 3, 4	Go to Input 4 (repeat blinking every ½ second)	
4	4	End (Terminate)	5,7,1	Terminate (stop executing commands)	
-	-			Note that it never gets to most of these Terminate commands, because of the 'Link' cmd.	
Inp	S	**Demo 2 – Use Pushbutton #1 & Demo 1 (Input 1, RUN mode)**			
		* Use RUN Mode. A pushbutton can be connected to Input 1, which will link to input 4 to start the blinking of the LED. * CHANGE: We're using normal "Run" mode instead of "Program" mode.			
Inp	S	**Demo 3 – Gnd Input 16 to Blink LED (use Wait cmd & pushbtn)**			
		* We can make the LED start blinking, by grounding Input 16 - using a pushbutton to simulate a reed switch being grounded. * We'll use the "Wait" command (wait until Ground). * CHANGE: We're checking an INPUT to trigger the routine.			
5	1	Wait Inp: 16 Ground	5, 2, 1, 16	wait till reed sw. #16 closed (resistance decr)	Use any input 4-30
5	2	Accy: 2000 Norm	1, 2000, 1	Set non-existent turnout # 2000 STRAIGHT (to blink Mini-Panel's LED)	
5	3	Delay 1/4 sec: 2	5, 1, 2, 2	Delay 1/2 second (¼ sec x 2)	
5	4	Link to Input: 5	5, 3, 5	Go to Input 5 (repeat blinking every second)	
-	-				

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Inp	S	Command	Entry	Action	Summary
		Demo 4 – Gnd Input 16 to Blink LED (use Skip cmd & pushbtn)			Using SKIP instead WAIT
		* This accomplishes the same effect as previous Demo 3, using the same pushbutton, except we are using the "Skip" command instead of the "Wait" command. * CHANGE: We're using the "Skip" command.			
Inp	S				
6	1	Skip if Inp:16 Open	5, 6, 2, 16	Skip next command if reed sw. #16 is open	
6	2	Accy: 2000 Norm	1, 2000, 1	Set non-existent turnout # 2000 STRAIGHT (to blink Mini-Panel's LED)	
				* If Input 16 is Gnd, commands below will be executed. If not Gnd, will go back to Step 6-1.	
6	3	Delay 1/4 sec: 2	5, 1, 2, 2	Delay 1/2 second (¼ sec x 2)	
6	4	Link to Input: 6	5, 3, 6	Go to Input 6 (repeat blinking every second)	
-	-				
		Demo 5 – Same as above – But Hook up Reed Switch			
		* This experiment will blink the LED when a magnet is held next to a reed switch (which will ground Input 16). * CHANGE: We're using a magnet.			
		Demo 6 – Gnd Electric Eye 14 to Blink LED			
		(Reuse command space from previous demo.) * This is the same as previous Demo 5, except it uses an ELECTRIC EYE instead of a reed switch. We'll use the same memory locations and commands as previously entered, except the "Skip" command at Step 6-1 changes to "Ground" * I prefer reed switches to electric eyes. * CHANGE: We're using an electric eye.			
6	1	Skip if Inp:16 Grnd	5, 6, 1, 16	Skip next command if Eye #16 is ground (closed)	(nc, open when blocked
6			* The Electric Eye is "opposite" of a reed switch, i.e. normally closed (low resistance). * It goes to "open" (high resistance" when its light is blocked.		
6	2	Accy: 2000 Norm	1, 2000, 1	Set non-existent turnout # 2000 STRAIGHT (to blink Mini-Panel's LED)	
6	3	Delay 1/4 sec: 2	5, 1, 2, 2	Delay 1/2 second (¼ sec x 2)	
6	4	Link to Input: 6	5, 3, 6	Go to Input 6 (repeat blinking every second)	
-	-				

Inp	S	Command	Entry	Action	Summary
		~====== ========== III. DEMOS REQUIRING A LOCO ==========~			
		Demo 7 – Start Loco (keeps running)			
		* This simple routine starts up the loco and leaves it running. * We have to turn off command station to stop the loco, since there is no other way to stop it.			
Inp	S				
7	1	>Select Loco: **3364**	3, 1, **3364**	Select Loco #**3364**: Kato SF gray GP-35 diesel	
7	2	Speed Fwd: **16**	3, 2, 2, **16** F	START loco Speed **16**	
7	3	End (Terminate)	5,7,1	Terminate (stop executing commands)	
7	4	End (Terminate)	5,7,1	Terminate (stop executing commands)	
–	–				
		Demo 8 – Start Loco, Run, Stop			
		This routine starts up the loco, runs it for 10 seconds, then stops it. * CHANGE: It stops the loco.			
Inp	S				
7	1	>Select Loco: **3364**	3, 1, **3364**	Select Loco #**3364**: Kato SF gray GP-35 diesel	
7	2	Speed Fwd: **16**	3, 2, 2, **16** F	START loco Speed **16**	
7	3	Delay 1/4 sec: **40**	5, 1, 2, **40**	Delay 10 second (¼ sec x **40**)	
7	4	Speed Fwd: **0**	3, 2, 2, **0** F	STOP loco (Speed 0)	
–	–				
8	1	End (Terminate)	5,7,1	Terminate (stop executing commands)	
		Demo 9 (Turn On/Off Lights & Sound) is on Pg 2, Inputs 2 & 3)			
		Demo 10 – Start Loco, Run, Stop – then REPEAT			
		(Reuse command space from prevous demo.) * CHANGE: It starts and stops the loco REPEATEDLY. * We have to use the Reset button (while loco is stopped) to stop execution.			
Inp	S				
7	1	>Select Loco: **3364**	3, 1, **3364**	Select Loco #**3364**: Kato SF gray GP-35 diesel	
7	2	Speed Fwd: **16**	3, 2, 2, **16** F	START loco Speed **16**	
7	3	Delay 1/4 sec: **40**	5, 1, 2, **40**	Delay 10 second (¼ sec x **40**)	Run for 10 sec
7	4	Speed Fwd: **0**	3, 2, 2, **0** F	STOP loco (Speed 0)	
–	–				
8	1	Delay 1/4 sec: **24**	5, 1, 2, **24**	Delay 6 second (¼ sec x **24**)	Park for 6 sec
8	2	Link to Input: **7**	5, 3, **7**	Go to Input **7** (go back and repeat sequence)	
8	3	End (Terminate)	5,7,1	Terminate (stop executing commands)	
8	4	End (Terminate)	5,7,1	Terminate (stop executing commands)	
		Demo 11 – Install & Test Reed Switch			
		• Use "blink" routine from Demo 4 (Input 6). • Roll car with magnet on bottom over top of reed switch, and verify the LED on MP blinks, which verifies magnet is closing reed switch.			

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Inp	S	Command	Entry	Action	Summary
		Demo 12 – Start Loco, Run, Stop; REPEAT – Using Reed Switch			
–	–	* The routine starts and stops the loco repeatedly. CHANGE: It stops the loco right after it crosses the reed switch. * We still have to use the Reset button (while loco is stopped) to stop execution. • Note we could simulate a reed switch with wires between GND and Terminal 16 • The "Accy 2000" cmd at 10-4 "consumes" an extra input; could be eliminated.			
Inp	S				
10	1	>Select Loco: **3364**	3, 1, **3364**	Select Loco #**3364**: Kato SF gray GP-35 diesel	
10	2	Speed Fwd: **16**	3, 2, 2, **16** F	START loco Speed **16**	
10	3	Delay 1/4 sec: **40**	5, 1, 2, **40**	Delay1=10 sec (¼ sec x **40**) (Cruise for 10 sec)	Control mult. laps
				Chg delay to 50 sec (200x1/4) to make 2 laps	(35 sec/lap)
10	4	Accy: **2000** Norm	1, **2000**, **1**	Set turnout #**2000** Straight (blink MP's LED when	Blink 'Delay' ends
–	–				
11	1	Wait Inp: **16** Ground	5, 2, 1, **16**	wait till reed sw. #**16** closed (resistance decr)	Look for reed switch
11	2	nop	5,5,1	No Operation (do nothing, go to next step)	Use this line next demo
11	3	Speed Fwd: **0**	3, 2, 2, **0** F	STOP loco (Speed 0)	STOP
11	4	Delay 1/4 sec: **24**	5, 1, 2, **24**	Delay3 = 6 second (¼ sec x **24**)	Park for 6 sec
–	–				
12	1	Link to Input: **10**	5, 3, **10**	Go to Input **10** (go back and repeat sequence)	
12	2	End (Terminate)	5,7,1	Terminate (stop executing commands)	
12	3	End (Terminate)	5,7,1	Terminate (stop executing commands)	
12	4	End (Terminate)	5,7,1	Terminate (stop executing commands)	
		Demo 13 – Start Loco, Run, Stop; REPEAT – Use Delay at Step 11-3			Modify above cmds
–	–	(Reuse command space {Inputs 10-12} from previous demo.) * The routine starts and stops the loco repeatedly, but adds a "Delay" command at Step 11-3. * CHANGE: It stops the loco further "downstream" from the reed switch.			
Inp	S				
10	1	>Select Loco: **3364**	3, 1, **3364**	Select Loco #**3364**: Kato SF gray GP-35 diesel	
10	2	Speed Fwd: **16**	3, 2, 2, **16** F	START loco Speed **16**	
10	3	Delay 1/4 sec: **40**	5, 1, 2, **40**	Delay1=10 sec (¼ sec x **40**) (Cruise for 10 sec)	Control mult. laps
				Chg delay to 50 sec (200x1/4) to make 2 laps	(35 sec/lap)
10	4	Accy: **2000** Norm	1, **2000**, **1**	Set turnout #**2000** Straight (blink MP's LED when	Blink 'Delay' ends
–	–				
11	1	Wait Inp: **16** Ground	5, 2, 1, **16**	wait till reed sw. #**16** closed (resistance decr)	Look for reed switch
11	2	Accy: **2000** Norm	1, **2000**, **1**	Set turnout #**2000** Straight (blink MP's LED when	Blink reed sw.
11	3	Delay 1/4 sec: **48**	5, 1, 2, **48**	Delay2 = **12** sec. bring #3364 to station	<-Park more downstrean
				The above delay allows us adjust where the loco stops, without repositioning the reed switch.	
11	4	Speed Fwd: **0**	3, 2, 2, **0** F	STOP loco (Speed 0)	STOP
–	–				
12	1	Delay 1/4 sec: **24**	5, 1, 2, **24**	Delay3 = 6 second (¼ sec x **24**)	Park for 6 sec
12	2	Link to Input: **10**	5, 3, **10**	Go to Input **10** (go back and repeat sequence)	
12	3	End (Terminate)	5,7,1	Terminate (stop executing commands)	
12	4	End (Terminate)	5,7,1	Terminate (stop executing commands)	

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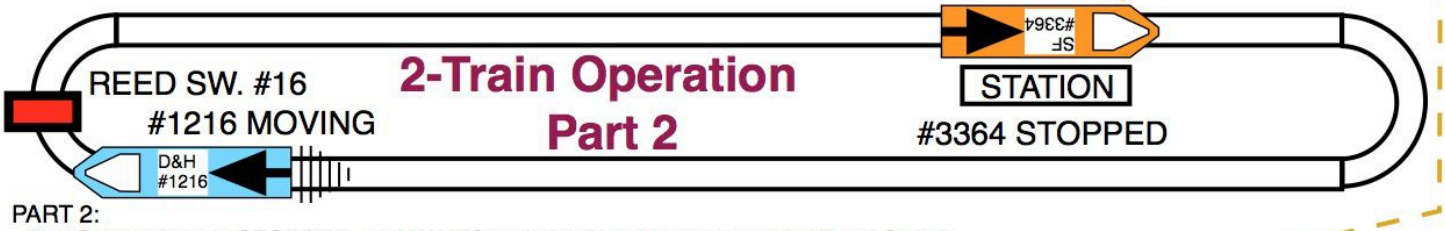
Demo 14 – Run 2 Trains

* These are almost the same set of commands used in previous Video #815 showing 2 trains running on 1 mainline using just 1 reed switch. The difference is that 'Skip' & 'Delay' commands used in Video #815 to add extra delay using a SPST switch have been eliminated, since this mainline is too short to add the extra delay.
* You can use the commands in the previous Demo 13 to adjust the trains' stopping distances individually, before you run both of them at the same time.

Inp	S	Command	Entry	Action	Summary
13	1	>Select Loco: 3364	3, 1, 3364	Select Loco #3364: Kato SF gray GP-35 diesel	(startup)
13	2	Speed Fwd: 16	3, 2, 2, 16 F	START loco Speed 16	(startup)
13	3	Wait Inp: 16 Ground	5, 2, 1, 16	Wait to reach reed sw. #16	<==SENSOR
13	4	>Select Loco: 1216	3, 1, 1216	Select Loco #1216: D&H Sharknose Diesel	
–	–				
14	1	Speed Fwd: 7	3, 2, 2, 7 F	START loco Speed 7	**Shark Lv Station**
14	2	>Select Loco: 3364	3, 1, 3364	Select Loco #3364: Kato SF gray GP-35 diesel	
14	3	Delay 1/4 sec: 48	5, 1, 2, 48	Delay 12 sec. bring #3364 to station	
14	4	Speed Fwd: 0	3, 2, 2, 0 F	STOP loco (Speed 0) (Stop GP-35 at station)	**Geep at Station**
–	–				
========== Part 2 - halfway point in sequence) ==========					
15	1	Wait Inp: 16 Ground	5, 2, 1, 16	Wait to reach reed sw. #16	<==SENSOR
15	2	>Select Loco: 3364	3, 1, 3364	Select Loco #3364: Kato SF gray GP-35 diesel	
15	3	Speed Fwd: 16	3, 2, 2, 16 F	START loco Speed 16	**Geep Lv Station**
15	4	>Select Loco: 1216	3, 1, 1216	Select Loco #1216: D&H Sharknose Diesel	
–	–				
16	1	Delay 1/4 sec: 50	5, 1, 2, 50	Delay 12-1/2 sec. bring #1216 to station	
16	2	Speed Fwd: 0	3, 2, 2, 0 F	STOP loco (Speed 0) (Stop Sharknose at station)	**Shark at Station**
16	3	Link to Input: 13	5, 3, 13	Go back to Input #13 and REPEAT Sequence	
16	4	End (Terminate)	5,7,1	Terminate (stop executing commands)	

PART 1:
Initial Conditions: Blue loco stopped at Station, orange loco is travelling on mainline, upstream of the reed switch.
- The Blue loco is STOPPED, and WAITS until the Orange loco crosses the Reed Switch.
- Then, the Blue loco STARTS. The Orange loco travels on to the Station, and STOPS.
- The process REPEATS, when the Blue loco reachs the Reed Switch.

WARNING: The STOP command needs to be sent to the Orange loco when it reaches the Station, BEFORE the Blue loco travels around the loop and crosses the reed switch (or else Mini-Panel MISSES Blue loco crossing the reed switch, and have wreck).



PART 2:
- The Orange loco is STOPPED, and WAITS until the Blue loco crosses the Reed Switch.
- Then, the Orange loco STARTS. The Blue loco travels on to the Station, and STOPS.
- The process REPEATS, when the Orange loco reachs the Reed Switch.

WARNING: The STOP command needs to be sent to the Blue loco when it reaches the Station, BEFORE the Orange loco travels around the loop and crosses the Reed Switch (or else Mini-Panel MISSES Orange loco crossing the reed switch, and have wreck).
NOTE: See previous Video #815 for a more DETAILED logic diagram of 2 train operation with a single reed switch.

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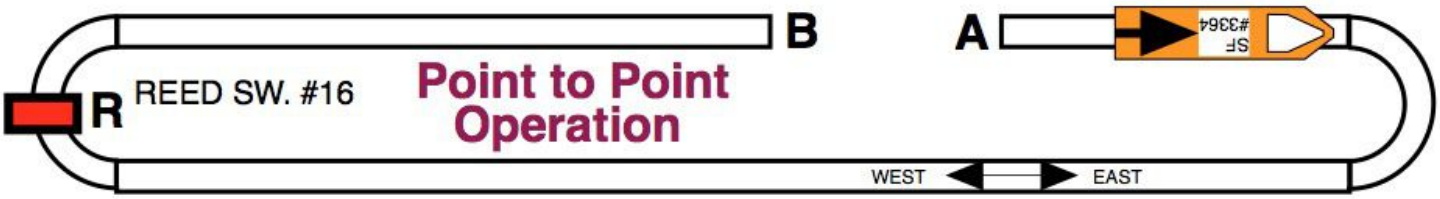
Inp	S	Command	Entry	Action	Summary
		Demo 15 – Point to Point – ONE Reed Switch at End or Middle			
		* We'll add a "Link" command at Input 2, to Link to Input 17. * We can then use a pushbutton at Input 2 (terminal 2) to start above routine. But we have to change to "Operating" mode to use the button, because pushbuttons won't work (Inputs won't be polled) when in "Program" mode. • The 'Accy 2000 Norm' cmds are for feedback to blink the MP's LED; they can be eliminated.			
				(Momentum=2)	
2	1	>Select Loco: 3364	3, 1, 3364	Select Loco #3364: Kato SF gray GP-35 diesel	
2	2	F0-F4: 0----	3, 3, 1 [0]	headlights on (F0)	
2	3	F5-F8: 5---	3, 3, 2 [5]	Strobe on (F5), sound on (audio mute F8 off)	
2	4	Link to Input: 17	5, 3, 17	Go to Input 17 (start Pnt. To Pnt. sequence)	
				We can use a pushbutton at Input 2, to turn on lights & sound, then start Pnt. To Pnt. At Input 17	
		========== Forward Trip, A to B ==========			
Inp	S				
17	1	>Select Loco: 3364	3, 1, 3364	Select Loco #3364: Kato SF gray GP-35 diesel	
17	2	Speed Fwd: 16	3, 2, 2, 16 F	START loco Speed 16	
17	3	Wait Inp: 16 Ground	5, 2, 1, 16	wait till reed sw. #16 closed (resistance decr)	Cross reed Sw.
17	4	Accy: 2000 Norm	1, 2000, 1	Set turnout #2000 Straight (blink MP's LED)	
–	–				
18	1	Delay 1/4 sec: 44	5, 1, 2, 44	====> Delay1= 11 second (¼ sec x 44)	Fwd to Pt. B
				Note we're using time to measure distance. So if we change speed, we need to adjust time.	
18	2	Accy: 2000 Norm	1, 2000, 1	Set turnout #2000 Straight (blink MP's LED)	
18	3	Speed Fwd: 0	3, 2, 2, 0 F	STOP loco (Speed 0)	STOP at Pt. B
18	4	Delay 1/4 sec: 36	5, 1, 2, 36	Delay2= 9 second (¼ sec x 36)	Ramp down+Park
		========== Reverse Trip, B to A ==========			
19	1	Speed Rev: 16	3, 2, 2, 16 R	START loco Speed 16 reverse (return)	
19	2	Wait Inp: 16 Ground	5, 2, 1, 16	wait till reed sw. #16 closed (resistance decr)	Cross reed Sw.
19	3	Accy: 2000 Norm	1, 2000, 1	Set turnout #2000 Straight (blink MP's LED)	
19	4	Delay 1/4 sec: 84	5, 1, 2, 84	====> Delay3= 21 second (¼ sec x 84)	Bkwd to Pt. A
–	–				
20	1	Accy: 2000 Norm	1, 2000, 1	Set turnout #2000 Straight (blink MP's LED)	
20	2	Speed Fwd: 0	3, 2, 2, 0 F	STOP loco (Speed 0)	STOP at Pt. A
20	3	Delay 1/4 sec: 36	5, 1, 2, 36	Delay4= 9 second (¼ sec x 36)	Ramp down+Park
20	4	Link to Input: 17	5, 3, 17	Go to Input 17 (go back and repeat sequence)	
–	–				



- **Initial Conditions:** Start loco "East" of the Reed Switch (as shown).
- Adjust "Delay" length on each side of the Reed Switch, to get desired stopping points.
- Optimum position for the Reed Switch is midway between ends, but not necessary. (Less accumulated error.)
- If the Reed Switch is at one END, then set that "Delay" to 1/4 sec (essentially zero).
- NOTE: TWO reed switches {1 at EACH end} are more dependable, whenever it's possible to use two.