

Chapter 12 - Add Castle Rock and Run Sessions

In this Chapter we will be extending the run of Train 202 to go from Actonvale to Berwick then on to Castle Rock; turn and finally return to Actonvale via Berwick. Here's what we will be doing:

- We'll add a number of customers at Castle Rock. Chapter 6 deals with Customers;
- Since some of these new customers have material that will be moved in freight cars that we've not presently got on the railroad, we need to add some additional freight cars. Chapter 7 deals with Freight Cars;
- Once the customers have been added at Castle Rock, we need to add waybills and car-orders for the new customers at Castle Rock. Chapter 8 deals with Waybills and Car-Orders;
- Since one of the new customers at Castle Rock supplies material that can be used by NSEL, we'll change two waybills to allow material to be moved between two on-line industries.
- Since Train 202 will no longer turn at Berwick but rather at Castle Rock, we need to create a new reporting point at Castle Rock. Reporting Points are dealt with in Chapter 5;
- We need to change Train 202 to run from Actonvale to Castle Rock, turn and return to Actonvale. We'll also rename Train 202 as the "Castle Rock Turn" rather than the "Berwick Turn". Chapter 5 also deals with Switching Trains;
- Since we've changed the route of Train 202 we need to re-visit our timetable and make some changes. We dealt with timetables in Chapter 11;
- We'll look at how ProTrak can do scheduling for us; and
- We'll run a few more sessions to make sure customers at Castle Rock are being serviced.

Click-by-click shorthand

In the interests of trying to keep the size of this manual manageable, while at the same time making sure you, the reader, can follow along with what we're doing, the way that directions are given is going to change. In the past, we've seen instructions like 'On the ProTrak toolbar, click on "Traffic" then select "Customers" from the dropdown list. On the ProTrak toolbar click on "Edit" then select "New on-line-customer" from the dropdown list'. In lieu of this very wordy direction in some cases you will see a shorthand style of instruction. The instructions will appear in *italics* and the format of this shorthand instruction will look like this:

(Toolbar selection / item in drop down list to be selected [window that will be displayed])

If more than one set of instructions needs to be followed, an arrow (→) will indicate this. Here's what the shorthand version of the example used in the first paragraph would look like:

(Traffic / Customers [Customers and Loading Points] → Edit / New on-line customer [Changing customer: X of: Y])

Here's how to read this short-hand. The "*Traffic / Customers*" portion indicates you should click on "Traffic" on the ProTrak Standard toolbar then select "Customers" from the dropdown list. Once the selection has been made you should see the "Customers and Loading Points" window. Once you have completed the "Traffic / Customers" selection, you need to complete the portion following the arrow – "*Edit / New on-line customer*". Again you need to click on "Edit" on the ProTrak Standard toolbar, then select "New on-line-customer" from the dropdown list; this will cause the "Changing customer: X of: Y" window to be displayed.

If selecting an item from a dropdown list generated a second dropdown list, there would be a second "/" followed by the selection from the second dropdown list and repeating the "/" and selection as often as needed – ex. *Edit / Show / Show All cars by location / Show cars at Customer spots*. If two sets of actions are required as was the case in adding a new customer, an arrow will indicate that there are two separate actions that start on the ProTrak toolbar. Unless otherwise indicated, all of the actions will start on the ProTrak Standard toolbar. If the actions to be taken require you to be in Operations mode, the instruction will start with the word "Operations" – ex. *Operations / Yardmaster/Route Cars at Yards & Customers*. Similarly, if the actions need to take place on a toolbar in a window, the instruction will start with the window name and the word toolbar ex. *String Diagram toolbar / Working on train data field*

A few things to note:

1. In all cases where the shorthand notation is used, you will be supplied with a reference to the chapter where the full detailed procedure has been discussed.
2. If it will make more sense in a particular instance or if a completely new procedure is to be discussed, I will revert to the detailed 'click-by-click' format.
3. When directions are given to enter data while we are using the shorthand notation you will be provided with all of the required data. Any fields which have not had data supplied are to be left with the default value.

Adding Customers at Castle Rock

We need to add some new Customers at Castle Rock. Here is a chart showing what those Customers are and what they ship (i.e. out) and/or receive (i.e. in) together with the type of car that the material will be shipped in:

Siding/ SPOT	Customer Name	Commodity	In/ Out	Car Type
CAS10	Ideal Cement	Portland Cement	In	LO 36'
CAS11	Wilkins Forest Industries	Dimensional Lumber	Out	XM
		Dimensional Lumber	Out	FBC
		OSB	Out	FBC
		Adhesive	In	LU
CAS12a	Pioneer Ag Services	Bulk Fertilizer	In	LO
	(Agri-center)	Anhydrous Ammonia	In	T109A
		Farm Supplies	In	XM
CAS12b	Pioneer Ag Services	Wheat	Out	LO
	(Elevator)	Oats	Out	LO
		Canola	Out	LO
CAS13	Comfort Fuels	LPG	In	T109A
		Heating Oil	In	T103
		Coal	In	H

Table 12-1

Let's briefly talk about the individual industries.

- Ideal Cement receives Portland cement – the powder used to make concrete – and sells it to the firms which make concrete.
- Wilkins Forest Industries has a sawmill where lumber is produced as well as an OSB plant adjacent to the sawmill. Much of the trimmed waste from the sawmill is used in the production of OSB.
- Pioneer Ag Services serves the agricultural community, both by supplying material they require as well as buying their harvested grain.
- Comfort Fuels, as the name implies, sells various fuels.

Let's get on with entering the customer data.

1. Table 12-1 shows the names of the customers and what they ship and/or receive, as well as the car types that will be used. Note that "Pioneer" has two siding SPOTs – one for the delivery of material to the agricultural supply building and one for the grain elevator.

- Table 2 in Appendix B has all of the information you need to add the four new customers. Using this information, add the four new customers. You may do this by using the new customer process (*Traffic/Customers [Customers and Loading Points] → Edit/New online customer [Changing Customer: X of: Y]*) or by copying an existing customer (*Traffic/Customers [Customers and Loading Points] → Edit/Copy an online customer [Changing Customer: X of: Y]*) and changing it to suit. As in the past, whichever method you chose is up to you.
- Once the new customers have been added your “Customers and Loading Points” window should look like Figure 12-1.

Customers and Loading Points								
No.	Firm name	City/State	Siding name	SPOT	Capacity	Occ	Switching train	Blk#
1	Actonvale Station	Actonvale		ACT-01	5 PAX			
2	Weigh scale	Actonvale	weigh scale	ACT08z	Cars: 2	0	202	22
3	Team track	Actonvale	team track	ACT-14	Cars: 2	0	202	19
4	Twin State Fruit	Actonvale	door spot	ACT17a	Cars: 1	0	202	F-2
5	Twin State Fruit	Actonvale	platform loading	ACT17b	Cars: 1	0	202	F-5
6	ACT Yard	Actonvale		ACT-Yd	5 tracks			
7	Wilson & Sons Scrap Metal	Berwick	scrap iron /40211	BER-11	Cars: 3	0	202	29
8	North Star Eng. Lmbr	Berwick		BER-10	Cars: 4	1	202	F-32
9	reporting point	Berwick	reporting point	BER02y	reporting point	0		
10	Ideal Cement	Castle Rock		CAS-10	Cars: 2	0	202	34
11	Wilkins Forest Indust.	Castle Rock		CAS-11	Cars: 4	0	202	35
12	Pioneer Ag Services	Castle Rock	Agri-Center	CAS12a	Cars: 3	0	202	37
13	Pioneer Ag Services	Castle Rock	Elevator	CAS12b	Cars: 3	0	202	38
14	Comfort Fuels	Castle Rock		CAS-13	Cars: 2	0	202	39

Figure 12-1

Trailing Point vs Facing Point Switches

Before we carry on, we need to have a discussion regarding the concept of trailing and facing point switches. Since we are only concerned about trackage in this manual and not with electrical issues, I have opted to use the more prototypical term of “switch” as opposed to “turnout”. To refresh your memory, a facing point switch is one where the train approaches from the single-track end of the switch whereas a trailing point switch is one where the train arrives from one of the two diverging routes. To put this concept in even simpler terms, A facing point switch is one that a locomotive moving forward can pull into whereas a trailing point switch is one where the locomotive has to back into it ^{(1) (2)}

¹ Thanks to Bruce Metcalf for this definition.

² The term ‘facing point customer’ is sometimes also used. Here’s a definition of a ‘facing point customer’, this time from Jim Moir: “A ‘facing point customer’ is a customer whose access switch is a facing-point movement for the present service train.”

1. If we look at Figure 12-2 below, a train coming eastbound at point “A” views the switch as a facing point switch. A train westbound at either point ‘B’ or point ‘C’ views the switch as a trailing point switch.

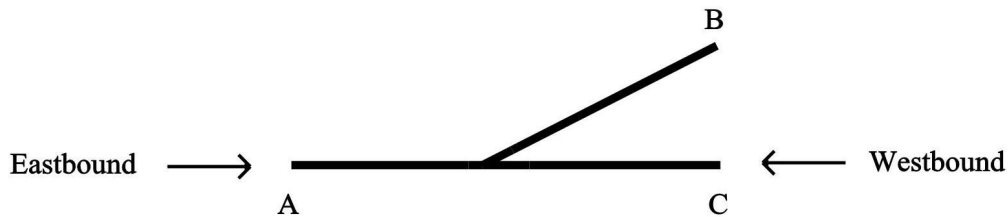


Figure 12-2

2. There are two things to keep in mind as you look at a customer's switch:
 - a. The concept of “facing point switches” applies to a combination of a customer plus a train; it is not solely a property of the customer.
 - b. The concept of “facing point switches” applies to customers that are served by a particular train, only if that train is a turn. If the train is uni-directional the customer is switched regardless of the orientation of the switch.
3. What happens when a customer is switched by a single direction train (for instance if train CHSL were to switch CAS-10)? Switches for all customers switched by single direction trains are considered to be defined as “Trailing point switch, or switched in either direction”. This is because any customer switched by a single direction train must be dealt with during the one and only time that the train passes that customer. If the train approaches the points from the single track end then it must use the closest runaround track to get the car in front of the locomotive. If no suitable runaround track exists then a customer should not be assigned to a single direction train.
4. For the most part, deciding whether to indicate that the switch for a particular customer is trailing point or facing point is pretty easy using the definition in para 4. Where there some confusion arises is the case where the customer is at the location of a train's turning point.
5. In a situation where a customer is at located a train's turning point, we define the customer's switch as a trailing point switch ⁽³⁾. At the location of the turning point, the train is going both directions – one way outbound, then after turning, inbound in the opposite direction. At a turning point location, a customer will be switched regardless of how the

³ In truth, the switch can be defined as either facing or trailing as ProTrak will automatically treat it as a trailing point switch..

- switch is defined – facing or trailing point. Let's look at an example. Refer back to the Figure Intro-1 in the introduction to the PTBM. Ideal Cement (CAS-10) and Wilkins Forest Industries (CAS-11) have trailing point switches and will be switched when the train arrives at Castle Rock, prior to turning for the trip back to Actonvale. Once the train has turned, Pioneer Ag Services (CAS-12a and CAS-12b) and Comfort Fuels (CAS-13) can be switched, and by this time, the switches will be viewed as trailing point switches for the train. I had a discussion with Jim Moir about "facing point" and "trailing point" switches and he commented that "facing point" only makes sense at intermediate stations (i.e. ones between the origin station and the station where the turn occurs).
6. With Jim's comment in the last para in mind, refer to Figure 12-1 and look at North Star Eng. Lmbr which shows as a facing point switch. You can tell that NSEL is set up with a facing point switch by looking at the entry for NSEL under the column "Blk #". As you can see, the block number is shown as "F-32" with the "F" signifying that the switch for this customer is a facing point switch. You can also check by looking back at Figure Intro-1 in the Intro Chapter. You can see that when train 202 traveled from Actonvale to Berwick, Wilson & Sons (BER-11) was seen as having a trailing point switch while NSEL (BER-10) as having a facing point switch. When we turned train 202 at Berwick, NSEL was switched after train 202 turned for the return trip. Because, at the location of a turn, ProTrak treats all switches as trailing point, NSEL was switched regardless of how the switch was defined (facing point or trailing point). Now that we are not turning train 202 at Berwick, how the switch for NSEL is defined does matter. Since we had defined NSEL as having a facing point switch the definition is correct and there is no need to make any changes.
 7. So far, we've discussed situations where only one train switches a customer. If a customer is switched by more than one train (an advanced topic not yet covered), each train is evaluated for facing or trailing point status independently. For example, let's imagine that we have a yard at Castle Rock and that, in addition to train 202 which originates at Actonvale and turns at Castle Rock, we have a second train (303) which originates at Castle Rock and turns at Actonvale (i.e. a reverse of train 202). If NSEL was switched by both 202 and the imaginary train (303), NSEL should be defined as a facing point switch for train 202 and a trailing point switch for train 303. For now we'll leave the topic of multiple switching trains for a later chapter and get back to the task at hand – adjusting train 202 to turn at Castle Rock..
 8. Let's look at how the cars should be blocked in train 202 when it departs Actonvale:

	Blk #							
Engine	29	34	35	37	38	39	32	EOT

Cars in blocks 29 and 32 are for SPOTs at Berwick; cars in block 29 are switched on the way out. Cars in blocks 34, 35, 37, 38 and 39 are for SPOTs at Castle Rock. Cars in blocks 34 and 35 are switched before train 202 turns; those in blocks 37, 38 and 39 are switched after train 202 turns. Cars in block 32 are switched at Berwick on the way back. How you deal with cars in block 32 is really up to you. One option is to set the cars out at Berwick and leave them in the siding while the train continues on to Castle Rock. On the way back through Berwick, the cars are picked up again and moved to NSEL. The other option is to take the cars along to Castle Rock then switch them out once the train reaches Berwick on the return.

Adding Additional Cars

As was noted in the introduction to this Chapter, we need to add some additional cars to our roster. Chapter 7 showed us how to manage the freight car entries in ProTrak.

1. Table 3 in Appendix B contains a list of all of the freight and passenger cars we expect to need for the operation of the ProTrak Demonstrator Railroad. We already have cars 1 through 9 entered, so let's add all of the remaining cars except for the last 7 cars – the 3 passenger coaches, the dining car, the KRL depressed center flat car and the 2 PRO flat cars. This means adding cars 10 through 55 (*Traffic / Freight and passenger cars [Rolling stock (Cars)]*). As with other data additions you may choose to copy a car (*Edit/Copy a car [Changing active car...]*) or add a new car (either (*Edit/New car [Changing active car...]*) or the Single New car button at the bottom of the "Rolling stock (Cars)" window ⁽⁴⁾. If you choose to copy an existing car, pay attention to the "Length over couplers" and "Volume" ⁽⁵⁾ figures as some of the new cars differ from ones we've already entered. Some things to note:

⁴ As you entered additional cars, the window was refreshed and the cars at the top of the list moved up. At some point, car 1 'disappeared' from view. To have the screen show the list starting at car 1, click on the "#" (tt) in the heading and the list will be reset with car 1 at the top.

⁵ When we entered the cars in Chapter 7 we accepted the default values for each car's volume; we now have valid data to enter. When you enter your own cars you should be able to find the volume printed on the side of the car.

- a. Cars 39 to 42 and cars 45 to 52 have a commodity in the "Notes" column. Enter this commodity in the "Load restricted to" data field for each of those cars;
 - b. Cars 43 and 44 each have a different "Car Kind" and each have a different length and different volume.
 - c. You may, if you wish, change the "Model car is owned by" data field for car 23 (C&NE 5872) to read "Jim Moir". As noted in the footnote on page B-6, the C&NE is Jim's own railroad and he has graciously allowed you to have one of his cars on your railroad. Click in the "Model car is owned by" data field then, if the "Uncheck for Manual Data Entry" box at the bottom of the right hand panel is checked, uncheck the box. You can now type Jim's name in the "Model car is owned by" data field.
2. Most of the cars will be straight forward, but if you copy a tank car which is restricted as to commodity and you change the "Load restricted to" field you will be asked about cleaning the tank car (see Figure 12-3). We'll send our car to "Maryland Rail Car, Elk Mills, MD" through staging track "NYC01s, New York, NY". Use the dropdown arrows beside each data field to select the correct values.

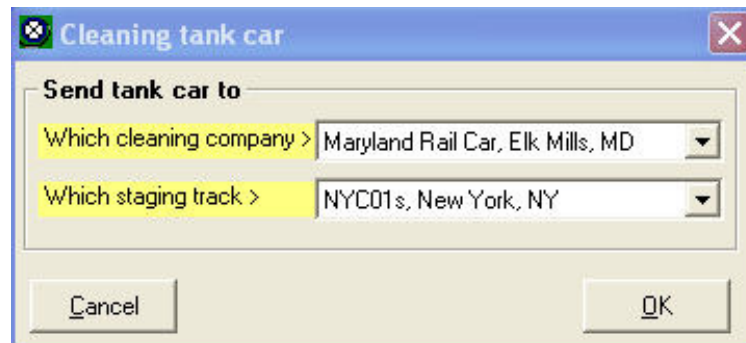


Figure 12-3

3. Figure 12-3 shows what the "Cleaning tank car" window will look like once this information is entered (selected). Note that this action will only occur if you chose to copy an existing tank car with a value in the "Load Restricted to" data field. If you enter the car as a "New Car", you will not be asked about cleaning.
4. Cars 49 and 50 have "anhydrous ammonia" as the commodity. When you scroll down through the lists of commodities you will notice that there are two entries for "anhydrous ammonia" but with different STCCs. Use the entry with the STCC of 2819815. When Jim Moir was asked about the reason for the two different entries, here is a summary of his reply:

The 49 series STCC is the HazMat (Hazardous Material) equivalent of other STCCs, including the 28 series STCC. Which STCC is used optionally on the customer "Siding name" data field (if any is used) does not matter. However if a car is restricted to a commodity the waybill must show the same STCC as on the car. The same STCC/commodity entry should be selected for both the car and on the waybill.

In order to be consistent, we will always chose the non-HazMat STCC for our entries and thus avoid any confusion when we make up waybills.

5. While we are in the "Rolling stock (Cars)" window there are three other thing to do:
 - a. First, remove the restrictions on the commodity for the 1st two cars (THB 3667 and EABX 6008). As it stands, these cars can only be used for "wheat flour" and "anti knock compound" respectively. We remove the restrictions by blanking out the data in the "Load restricted to" data field.
 - b. Second, change the volume for cars 3 through 6 to those shown in Table 3. This will make all of the cars have meaningful volume measurements.
 - c. Finally, activate car 9 – TCAX 20115. On the ProTrak Standard toolbar, click on "Traffic" then select "Freight and passenger cars" from the dropdown list. In the "Rolling stock (Cars)" window, single click on car 9 to highlight the car, then at the bottom of the "Rolling stock (Cars)" window click on the "Activate car" button.
6. Once you have completed entering the additional cars, you should have a total of 55 cars on the roster, all of them active.

Adding Waybills

We've got new customers at Castle Rock and we've added cars to allow the new customers to send or receive shipments of goods. Now we need to add waybills for these new customers. Chapter 8 dealt with waybills.

1. Table 4 in Appendix B has the waybills listed in it. We've already got waybills 21 to 31 entered (remember waybills 1 through 20 are reserved) so we need to add waybills 32 through 46. Open the "Bill of Lading/Waybills" window (*Traffic/Bills of Lading and Waybills [Bill of Lading/Waybills showing...]*). As with other data additions you may choose to copy a waybill (Edit/Copy a Bill of Lading/waybill) or add a new waybill (Edit/New Bill of Lading/waybill). Again which you chose is up to you.

2. As you saw in Chapter 8, when you enter a waybill and save it you may be presented with the window in shown Figure 12-4. Since we're adding a bunch of waybills at this time, we'll click on the "No" button and add the car-orders later.

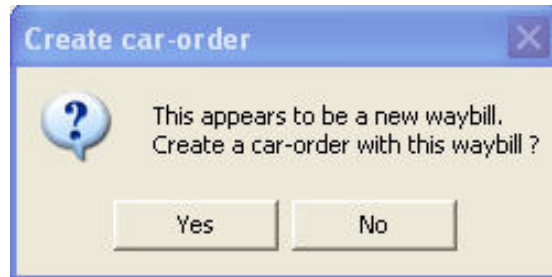


Figure 12-4

3. Most of the waybills will be straight forward, but a few require a note of explanation:
 - a. Waybill 39 is for an offline shipper that does not currently exist in the ProTrak default data. Since there is no requirement to have an offline shipper in the database, we could simply type in the details of the new shipper in the shipper area of waybill 39. In order to add to our knowledge of ProTrak though, we will go through the process of adding a new shipper to our data. You may want to add an offline shipper to the database in cases where you expect to use the shipper regularly. The details of how to add an offline shipper are detailed below. You should add the new offline shipper before starting to add the waybills
 - b. Waybill 43 requires that we add a commodity - canola. Chapter 8 dealt with adding a commodity. Use "rapeseed" as the commodity to copy. Again, you should add the new commodity before starting to add the waybills ⁽⁶⁾.

Adding an Offline Shipper

One of the commodities that we do not have an offline shipper for is "anhydrous ammonia". This commodity is used by the agricultural community as a fertilizer. It is shipped in liquid form in pressurized tank cars and when injected into the soil by the farmer/rancher it turns to a vapor and is absorbed by the soil moisture.

⁶ You may see a commodity for "canola, rapeseed oil". This entry is for the pressed oil. The new commodity we're entering is the just-harvested seed which will be pressed to make canola oil.

1. A search of the Internet reveals a number of domestic producers of anhydrous ammonia. We have chosen Agrium, Inc in Borger TX as our supplier.
2. On the ProTrak Standard toolbar, click on "Traffic" then select "Offline Shippers & consignees" from the dropdown list. A list of all offline customers will be displayed in the "Offline Shippers & Consignees" window.
3. On the ProTrak Standard toolbar, click on "Edit" then select "New offline customers" from the dropdown list. A window similar to Figure 12-5 will appear.

Changing customer: 1105 of: 1105

Company name: New

Plant / facility name:

City/Town:

State/Province:

Commodity:

Standard Transportation Commodity Code (STCC):

Switching railroad:

Railroad subdivision:

Year spur was placed in service: 1895

Year spur was out of service: 1999

☐ This customer is an online shipper/consignee

ProTrak Industries (All states)

###	Spot	Firm
3	ACT-14	Team track
4	ACT17a	Twin State F
5	ACT17b	Twin State F
7	BER-11	Wilson & Son
8	BER-10	North Star E
10	CAS-10	Ideal Cement
11	CAS-11	Northern For
12	CAS12a	Pioneer AG S
13	CAS12b	Pioneer AG S
14	CAS-13	Comfort Fuel
15		Alcan Chemic
16		Allied Chemi
17		American Ins
18	STLM3s	Anglo-Americ
19		Armstrong FI
20		Arthur Farme
21		Atheam
22	VF-60	Barrington M

Show by State

☒ Uncheck for Manual Data Entry

Figure 12-5

4. Here's the information we will enter:
 - a) Company name: Agrium, Inc
 - b) Plant/facility name: [blank]
 - c) City/Town: Borger
 - d) State/Province: TX
 - e) Commodity: anhydrous ammonia (select from list in right hand panel)
 - f) STCC: 2819815 (gets filled in automatically)
 - g) Switching railroad: UP (select from list)
 - h) Railroad subdivision: [blank]

- i) Leave the two "Year" data fields as is and leave the box in front of the "This customer is an online shipper/consignee" unchecked.

Figure 12-6 shows what your final window should look like.

Changing customer: 1098 of: 1098

Company name: Agrium, Inc

Plant / facility name:

City/Town: Borger

State/Province: TX, Texas

Commodity: anhydrous ammonia

Standard Transportation Commodity Code (STCC): 2819815

Switching railroad: UP

Railroad subdivision:

Year spur was placed in service: 1895

Year spur was out of service: 1999

☐ This customer is an online shipper/consignee

Cancel OK

Railroads in Official Guide

###	Initial	Railroad
1	PRO	ProTrak Demonstrator
2	ATSF	Atchinson, Topeka &
3	BN	Burlington Northern
4	CR	Conrail
5	CSX	Chesapeake Seaboard
6	NS	Norfolk Southern Rai
7	SP	Southern Pacific
8	UP	Union Pacific
9	CP	CP Rail
10	CP	Canadian Pacific
11	CN	Canadian National
12	A&EC	Atlantic & East Caro
13	AA	Ann Arbor
14	AA	Michigan Interstate
15	AC	Algoma Central
16	ACL	Atlantic Coast Line
17	AD	Atlantic & Danville
18	ΔDN	Ashland, Oregon & North

☒ Uncheck for Manual Data Entry

Figure 12-6

5. Click on "OK" to add the offline customer ⁽⁷⁾.
6. Now that we've got the offline shipper added we can work on the waybills themselves. Go ahead and enter waybill 32. Once you've entered it, click on the "Save" button at the bottom of the window (note: not the "Save and Close" button). Now click on the "Test for possible cars for this shipment" radio button. Did you get the message "No car for this shipment"? Why? You've entered three LO cars dedicated to cement service so why don't they show up. The problem is the weight on the waybill (84 tons or 168,000 lbs) exceeds the capacity of any of the cars.
7. Let's look at one way that we can fix the problem:
 - a) On the "Uniform Bill of Lading. Not Negotiable: 32 of: 55" window, click on the "Scaled weight" data field.
 - b) Change the value in the "Scaled weight" data field to read 50 tons (or 100,000 lbs) then Tab or click on the "Volume" data field.

⁷ Note that it is not necessary to add a customer to a waybill – we can simply type the name, etc. into the waybill field. Refer to the note at the end of the answer to Question C2 in Appendix L.

- c) Once you leave the "Scaled weight" data field, a popup window like the one in Figure 12-7 will appear.



Figure 12-7

- d) Click on "Yes" and a window like Figure 12-8 will appear. If this shipment is from an off-line shipper (i.e. from staging) answer "Yes". If the shipment was from an on-line shipper and you have a weighscale, working or not, on your layout (which we do), click on the "No" button. This will cause the car to be sent to the weighscale for weighing before being sent onward. Since the shipper for waybill 32 is off-line and the shipment will have been weighed before it arrives at staging track CHI02s, we will click on "Yes"

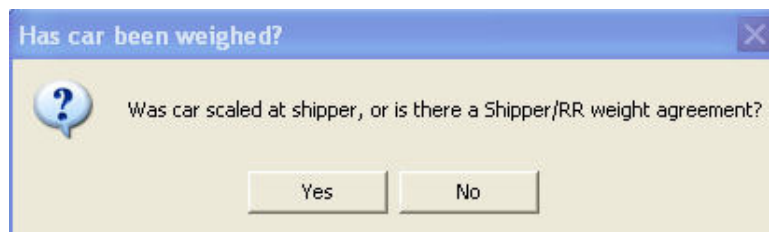


Figure 12-8

- e) You will now see a window like the one in Figure 12-9⁽⁸⁾. This window allows this waybill to be restricted as to the months it is used. In our case we can just click on "OK".

⁸ I'm sure you're wondering why you're seeing the "Shipping Season" window. When we pressed the "Tab" key to force the "Fill car to capacity" process, we are also telling ProTrak that once the "Fill car to capacity" process has been completed; place the cursor in the next data field. If you look at the waybill window for this car (Uniform Bill of Lading. Not Negotiable: ...) you will see that the data field immediately following the "Volume" data field is the "Ship during months" data field. Figure 12-9 is there to allow you to select which months the waybill will be used.



Figure 12-9

- f) Now that we're back to the "Uniform Bill of Lading..." window we can again check to see if there are any cars available by clicking on the "Test for possible..." radio button. You should see nine LO cars – the four we designated for cement service as well as five which are not designated for any particular service ⁽⁹⁾. I asked Jim Moir about how we make sure that the larger 55 foot cars don't get assigned to cement service and here's a paraphrase of his reply.

"I have many 35 footers for cement and sand service as well as a whole bunch for grain, plastic pellets and resins. They are all designated as LO type cars. ProTrak has several optimizers in the waybill -> car assignment routines. The car-orders are sorted and amongst other things, checks are done on 'best volume' when finding cars. This handles the cement in plastic pellet LO car issue. Times when I do need to separate cars such as the larger LO cars is when I want to keep cars that have been used for resins from being used for plastic pellets. In this case I assign a car to a specific commodity or shipper." ⁽¹⁰⁾

⁹ You may need to close the "Uniform Bill of Lading..." window and re-open it to see the cars.

¹⁰ Jim Moir noted that he has taken the approach of keeping a car as un-restricted as possible, and only restricting a car if absolutely necessary.

- g) One last thing to notice is that the label beside the "Scaled weight" data field has changed and now reads "Fill to Scaled".

Before we leave the "no car for this shipment" situation let's look at one of the cars we set up for cement service.

8. Open the "Rolling stock (cars)" window (*Traffic/Freight and passenger cars [Rolling stock (cars)]*). Once the "Rolling stock (cars)" window appears, double click on car number 39 – UP 218113 and a "Changing active car..." window will appear. Figure 12-10 shows what that window should look like.

Changing active car: 39 of: 55

Reporting marks	UP	Car kind	LO
Number	218113	Car class	LO
Length over couplers, ft	41	Plate	C
Volume, cuft	3000		
Built date	Nov 1973	Gross Wgt, lbs	220,000
Bearing	D 220,000 lbs	Light Weight, lbs	55,100
Bearing kind	Roller	Load Limit, lbs	164,900
Return Empty To	Home road via connections		
Load restricted to	portland cement		
Restrictions on use	H		
Waybill	0	Contents	mtl 0 tons
Location of car	ACT-Yd	B-end faces	West
Consignee is	first shipper	at	ACT-Yd
Weight of model car, oz	4.0	Rolling resistance, %	1.0
Model last inspected on	4 Nov 2009		
Model car is owned by	John Smith		

Railroads in Official Guide

###	Initial	Railroad
1	PRO	ProTrak Demonstrator
2	ATSF	Atchinson, Topeka &
3	BN	Burlington Northern
4	CR	Conrail
5	CSX	Chesapeake Seaboard
6	NS	Norfolk Southern Rai
7	SP	Southern Pacific
8	UP	Union Pacific
9	CP	CP Rail
10	CP	Canadian Pacific
11	CN	Canadian National
12	A&EC	Atlantic & East Caro
13	AA	Ann Arbor
14	AA	Michigan Interstate
15	AC	Algoma Central
16	ACL	Atlantic Coast Line
17	AD	Atlantic & Danville
18	ADN	Ashley, Drew & North
19	AL	Almanor Railroad
20	ALM	Arkansas & Louisiana
21	ALS	Alton & Southern
22	AMR	Aracata and Mad Rive

Buttons: Show, Private Lines, Uncheck for Manual Data Entry, Cancel, De-activate, Inventory, OK

Figure 12-10

9. If we look at the "Bearing" data field we see that has a value of "D 220,000 lbs." Now look at the "Light Weight, lbs" data field and we see that is has a value of "55,100". If you subtract 55,100 from 220,000 you get a remainder of 164,900 lbs. Since Waybill 32 originally was for 84 tons or 168,000 lbs, ProTrak would not use this car for that waybill. When I looked at my model of the car I saw that the "Load Limit" showed as "207,900". We can make car UP 218113 have the same Load Limit by changing the "Bearing" data field to "E 263,000 lbs." If the Load Limit

- had been 207,900 rather than 165,900 the “No car...” message would not have appeared ⁽¹¹⁾.
10. Click on “OK” to close the “Changing active car...” window, then close the “Rolling stock (cars)” window. You should now be back at the “Uniform Bill of Lading...” window. Before we move on we need to make the bearing change to the other three cars designated for cement service (cars 40 thru 42).
 11. Now that we understand the “No car for this shipment” issue and solution we can go ahead and add waybills 33 to 46. As you add each waybill remember to check for cars and go through the routine to correct things if the “No car...” message appears. Also remember, when adding a commodity which appears twice in the list of commodities, add the non-HazMat version (i.e. the one with an STCC that starts with 28).
 12. The one item that may puzzle you with waybill 46 (coal) is why both NS 34091 (HT) as well as CSX 30074 (HM) show up when you clicked on the “Test for...” button. ProTrak treats both HM and HT as related car types and, taking into account ‘volume’ and ‘capacity’ limits, will use either car type interchangeably to fill the car order (which was for an HT car). The same situation exists when a car order is for an HM type car – ProTrak will use either an HM or and HT car type to fill the car order. You can cause ProTrak to use only HT car types by specifying a larger volume. HM type car typically are 2200 cu. ft. or less while HT type cars are over 2500 cu. ft.

Changing North Star Engineered Lumber Waybills

As was noted in the introduction to this chapter, Wilkins Forest Industries produces material that can be used by North Star Engineered Lumber (NSEL). NSEL is going to take advantage of the proximity (and better price) offered by Wilkins Forest Industries. We’ll change two waybills to take advantage of this.

1. If it is not already open, open the “Bills Of Lading/Waybills” window (*Traffic/Bills of Lading and Waybills [Bill of Lading/Waybills, showing...]*).
2. Double click on Waybill 21. Change the shipper from “Simpson Timber” to “Wilkins Forest Industries”. Click on “Save and Close” to make the change permanent.
3. Repeat step 2 for waybill 23.

¹¹ We chose to use the “Fill car to capacity” process since this allows more flexibility in loading. As we will see later, we will have two different sizes of hopper cars to be used for shipping coal. The waybill can be used to fill either hopper to the maximum weight it can carry.

4. Close the "Bill of Lading/Waybills, showing..." window.

Adding Car-Orders

Now that we've got the Waybills setup, we need to add the car-orders for the customers at Castle Rock. Car-Orders are discussed in Chapter 8.

1. Open the "Car-Orders: Customers and Loading Points" window (*Traffic/Car-Orders to/from online customers [Car-Orders: Customers and Loading Points]*).
2. Double click on "Ideal Cement" and add car-orders for Monday only - one car from each of the two suppliers (Dixon-Marquette and Lehigh).
3. Click on "Close"
4. Repeat steps 2 and 3 for each of the other four customers requesting one shipment for each of the waybills (remember Pioneer Ag Services is treated as 2 customers since there are two spots). For Pioneer Ag Services, the "in" waybills only apply to the Agri-center and the "out" waybills only apply to the Elevator.
5. Since we want to use the on-line to on-line waybills we just changed for NSEL, we need to look at the car-orders for NSEL. Open the car-orders window (*Traffic/Car-Orders to/from online customers [Car-orders: Customers and Loading Points]*). Now double-click on customer 8 – NSEL. Once the "Rule 15 Record of Car-Orders" window opens, click on the "Order cars" button to open the "Rule 15: Agency Record of a Shipper's Request for Cars" window.
6. Something doesn't seem quite right here. The waybills we expected for NSEL (21, 23, 25, 27 and 29) are shown in the left hand panel however if you look at the list of Possible Bills-of-Lading/Waybills shown in the right hand panel you will note that waybills 21 and 23 do not show up. Why you ask? If both customers (shipper and consignee) are on-line the waybills will only appear when ordering cars for the **shipper**. Since NSEL is the consignee, waybills 21 and 23 don't appear. These were dealt with when we added the car orders for Wilkins Forest Products. We can see that we don't need to make any changes to NSEL. NSEL has car-orders for waybills 21, 23 (on-line to on-line) and 25 (off-line to online), all incoming and 27 and 29 (on-line to off-line), both outgoing.

Creating a new Reporting Point

As was noted in the introduction to the chapter, we need to create a new reporting point at Castle Rock since train 202 will now turn at Castle Rock rather than at Berwick. We can leave the existing reporting point in Berwick – it won't cause any harm.

1. Create a new “y” yard as a reporting point (*Traffic / Yards and Interchanges [Yards and Interchanges] → Edit New yard [Changing a yard]*). In Chapter 5 we discussed this process in detail.
2. Enter the data for this reporting point::
 - This is a “y” yard
 - City is Castle Rock
 - Spot Code is CAS-02y
 - Used as (and named) reporting point
 - Length 10'
 - No re-blocking will be allowed.
3. Click on “OK” to accept the data and close the “Changing a yard” window, then close the “Yards and Interchanges” window.

Adjusting Train 202's Route

Now that we've got the new reporting point established, we need to make some changes to Train 202. We need to:

- Change where the train turns; and
 - Change the name of Train 202.
1. On the ProTrak Standard toolbar, click on “Scheduling” then choose “Establish Train jobs and yarding” from the dropdown list.
 2. Double click on Train 202.

3. Once the "Changing train..." window appears:
 - a. Change the "Marketing name" field to read "Castle Rock Turn";
 - b. Change the "Terminal Station" field to read "Castle Rock" (chosed from list); and
 - c. Change the "Yard blocking field to read as follows ⁽¹²⁾:
 - 1) ACT-Yd
 - 2) CAS02y (choose from list)
 - 3) ACT-Yd.
4. Once the changes have been made, the "Changing train..." window should look like Figure 12-11.

Changing train: 3 of 5

Identifier
 Symbol/number: 202 Class: X
 Marketing name: Castle Rock Turn
 Operating Railroad: PRO, ProTrak Demonstrator

Work and Blocking
 Origin station: Actonvale
 Terminal station: Castle Rock
 Departure at: 6:30 AM on Daily
 Yard blocking: 1) ACT-Yd 6)
 These are the train reporting locations: 2) CAS02y 7)
 3) ACT-Yd 8)
 4) 9)
 5) 10)

Traffic
 Traffic: All traffic all traffic

PRO Train Numbers/Symbols

###	Symbol	Origin
1	SLCH	St Louis, MO
2	CHSL	Chicago, IL
3	202	Actonvale
4	SENY	Seattle, WA
5	NYSE	New York, NY

Reports
 Switchlist: Primary
☐ Assign work notes at work locations
 Print yard cutlist by: car standing order in train

Speeds
 Maximum allowed speed, mph: 50
 Minimum speed, based on: Drag

Tonnage, HP/Ton Ratings
 Maximum length, in cars: 10 or 440 feet
 Maximum rated tonnage: 858 tons 1,716 1:1 tons
 HP/Ton rating: 1.0 HP required: 1,716
 Lashup/consist: with HP/ton HP

Train turns at CAS02y

☒ Uncheck for Manual Data Entry

Cancel OK

Figure 12-11

5. Click on "OK" to make the changes permanent then close the "listing of train jobs" window.

Adjusting the Timetable

¹² You may wonder why Berwick is not shown in the yard blocking list. ProTrak will load cars for all customers between Actonvale and Castle Rock, provided the customer has Train 202 shown as the Switching train. From Jim Moir: "Cars are assigned to the train on the basis that: 1) cars are for customers that are to be switched by a train; and 2) cars are being routed through this train to another train in the car's route".

With the changes to Train 202, we need to adjust the timetable to reflect those changes. At the same time, let's look at all of the trains and make some changes to make their timings more meaningful. In fact, we'll do the latter first.

When we established our timetable in Chapter 11, we stated that all trains run at a maximum speed of 20 mph. That speed is not a very realistic speed, unless the railroad is in serious disrepair track wise. Let's assume that we've managed to get some funding and have done some serious work on our track and now all trains can run at 40 mph.

1. In Chapter 11 we assumed that it takes 1 fast-clock hour to travel 60 inches. Since we've upgraded our track to allow a maximum speed which is twice what it was in Chapter 11, I think it is now safe to assume that it takes 1 fast-clock hour to travel 30 inches. Here's the revised times to travel to and from various points on the railroad.

From/To	Distance	Travel Time	Total Time
East reversing loop	60"	30 min.	
East Staging to Castle Rock	50"	25 min.	
) 95 min.
Track at Castle Rock	30"	15 min.	
Castle Rock to JT Junction	10"	5 min.	
JT Junction to Berwick	60"	30 min.	
Track at Berwick	25"	12.5 min	
Berwick to Actonvale Yard	65"	32.5 min	
Actonvale Yard to West Staging	85"	42.5 min	
West reversing loop	60"	30 min.	

2. As we did with Berwick, we'll assume that the reporting point at Castle Rock is at the far end of the track – the point we've identified in the table above as "CAS exit".
3. We need to change some of our assumptions about train 202's work times:
 - a) On the outbound leg, train 202 will switch Berwick for 45 minutes;
 - b) At Castle Rock, train 202 will perform local switching for 2 hours; and
 - c) On the return leg, train 202 will switch Berwick for 45 minutes.

Let's recalculate the times

4. Trains "NYSE" and "CHSL" run from East Staging to Actonvale Yard then on to West Staging and around the reversing loop:
- a) East Staging to Castle Rock 25 min
 - b) Castle Rock to Actonvale Yard 95 min or 1 hr 35 min.
 - c) Switching time at ACT 1 hr.
 - d) Actonvale Yard to West Staging 42.5 min.
 - e) West reversing loop 30 min.
5. Trains "SLCH" and "SENY" run from West Staging to Actonvale Yard then on to East Staging and around the reversing loop:
- a) West Staging to Actonvale Yard 42.5 min
(shown in table as Actonvale Yard to West Staging)
 - b) Switching time at ACT 1 hr.
 - c) Actonvale Yard to Castle Rock 95 min or 1 hr 35 min
(shown in table as Castle Rock to Actonvale Yard)
 - d) Castle Rock to East Staging 25 min
 - e) (shown in table as East Staging to Castle Rock)
 - f) East reversing loop 30 min

Here's the revised times for train 202 for the outbound leg. The return leg will take the same amount of time.

From/To	Distance	Travel Time
ACT Yd to ACT exit	15"	7.5 min
ACT exit to BER entrance	50"	25 min
BER entrance to BER exit	25"	12.5 min
BER exit to JT Junction	60"	25 min
JT Junction to CAS entrance	10"	5 min
CAS entrance to CAS exit	30"	15 min

6. Train 202 runs from ACT Yd to Berwick, on to Castle Rock, back to Berwick and finally back to ACT Yd.
- a) ACT Yd to BER 32.5 min.
 - b) Local work at Berwick 45 min.
 - c) BER to CAS 30 min.
 - d) Local work at Castle Rock 2 hrs.
 - e) CAS to BER 30 min.
 - f) Local work at Berwick 45 min.
 - g) BER to ACT Yd 32.5 min.

With these timings, we can now revise our timetable. The revised timetable is shown in Appendix K as "Timetable 2" (Figure K-5).

7. Now that we've got the timetable completed, we need to construct a "String Diagram" of this to look at scheduling conflicts. The "String Diagram" for Timetable 2 is shown in Appendix K as "Timetable 2 – String Diagram (Figure K-6)".
8. Once we have the "String Diagram" completed, we can see that there is an issue with trains NYSE and 202 – they are currently scheduled to meet between Berwick and JT Junction where there is only one track. We can eliminate that problem if we change train NYSE's departure time to 6:00 am. This will allow trains NYSE and 202 to meet at Berwick where there are two tracks.
9. The adjusted timetable and "String diagram" are shown in Appendix K as "Timetable 2 - Revised Timetable" (Figure K-7) and "Timetable 2 - Revised String Diagram" (Figure K-8).

Changing Zone Speed Limits

Now that we've changed the timetable to reflect an increase in speed, we need to adjust the settings in ProTrak

1. Open the "Stations on core segment of Middle" window (*The Railroad / Stations on Middle [Stations on core segment of...]*).
2. Double click on "East Staging" and change the "Zone speed limit is" data field to read 40 mph (use the dropdown arrow). Click on "OK" to make the change permanent.
3. Repeat step 2 for the other 5 stations.

Changing Train Departure Times

Since we changed the departure time for Train "NYSE" in our timetable and associated string diagram we need to change the departure time for Train NYSE in the Listing of Train jobs.

1. Open the "Listing of train jobs" window (*Scheduling / Establish Train jobs and yarding [Listing of train jobs]*).
2. Double click on train "NYSE" and change the departure time to read 6:00 am. Click on OK to make the change permanent.

3. Update the line-up of trains (*Scheduling / Line-up of Trains [Line-up of Trains for...]*). Finally close the “Line-up of Trains for...” window.

Scheduling Using ProTrak

Now that you’ve seen the effort it took to generate the timetable and string diagram manually, I’m sure you’ll be pleased to know that ProTrak can do this for us with much less work on our part.

ProTrak has the ability to do the scheduling using either a timetable or a string diagram and to ‘create’ the other from the data entered during the first (i.e. if you create a string diagram, ProTrak automatically creates the timetable – it is the same data just displayed in two different ways).

In this section we’ll look at both ways since one method is better suited for use in some situations; the other method is better suited for use in other situations and either method is suitable for use in some. While which method you use – string diagram or timetable – is up to you, it is Jim’s recommendation that the ‘string diagram’ method be used except in situations where a train crosses from one subdivision to another ⁽¹³⁾.

Before we go on we need to review the timings that we established earlier on for train SLCH:

Depart	West Staging	1:01 am
Arrive	Actonvale	1:44 am
Depart	Actonvale	2:44 am
Arrive	East Staging Exit	5:09 am

These seem to be perfectly normal but these are times for the prototype being modeled, not the model railroad. Look at the amount of time it takes to go from West Staging to Actonvale – 43 minutes. Even with a fast clock ratio of 6:1 this means that we need to wait almost 7 ¼ minutes for a train to go that distance. Now you and I know that the first rule of model railroading is to have fun. Waiting and waiting while watching the clock slowly make its way to 1:44 am so that you can enter Actonvale yard and do the yard work makes no sense – its booorrring!!

¹³ Jim Moir commented that the prototype railroads use the string diagram to set up the schedules and then develop the timetables from that. Using a string diagram makes it much easier to see train-to-train interferences.

The ProTrak Scheduler uses the amount of real time it takes a train (train SLCH for example) to go from West Staging to Actonvale⁽¹⁴⁾. Here's how we determine what that will be:

1. As we established in Chapter 1 when we setup our railroad, the ProTrak Demonstrator Railroad is modeled in HO scale. For HO scale, assume that a scale speed of 60 miles per hour is in reality 1 foot of travel per second⁽¹⁵⁾. Using this scale speed we see that a model train with a 'model speed' of 40 mph will in reality travel at a speed of 8 inches per second. This is how we got to that:

$$40 \text{ mph divided by } 60 = 40/60 \text{ or } 2/3$$

$$2/3 \text{ of } 12 \text{ inches (one foot)} = 8 \text{ inches.}$$

Another way of calculating this is:

$$\text{Speed (40) * feet in a mile (5280) / number of seconds in an hour (60 * 60 or 3600) / scale (87 for HO) * inches per foot (12),}$$

or without the explanatory notes:

$$40 * 5280 / 3600 / 87 * 12 = 8 \text{ inches}$$

2. We know from our earlier discussions that it is a total of 85 inches from West Staging to Actonvale Yard. If we use a fast clock ratio of 6:1 we will see that it will take 1.06 actual minutes to get from West Staging to the entry to Actonvale yard and here's how we arrived at that figure:

Distance (85") divided by 'real scale speed' (8 in/sec) times fast clock ratio (6) divided by the number of seconds in a minute (60) we get the following formula:

$$85 / 8 * 6 / 60 = 1.06$$

or as a rounded figure of 1 minute. I'm sure you'll agree that 1 minute is a much better time to spend moving train SLCH the 85 inches than the 1 hour and 25 minutes that the prototype timetable showed (see the section titled "Adjusting The Timetable" earlier in this chapter).

¹⁴ You may be asking why we went to the trouble of setting up the timetable earlier. Let's just say it was a learning experience so that you understand the way the prototype railroads deal with scheduling and train-to-train interference issues.

¹⁵ Scale speed is defined as a "model mile divided by human time". Scale speed can be calculated by replacing the "scale" in the following formula by the ratio applicable to your scale (N = 160, HO = 87, S = 64, O = 48, etc.):

Speed * 5280 / 3600 / scale = actual feet per second

For those wondering what the numbers 5280 and 3600 are, 5280 is the number of feet in a mile and 3600 is the number of seconds in an hour (60 minutes times 60 seconds)

3. We've looked at the timing for the West Staging to Actonvale Yard portion but not the Actonvale Yard to East Staging portion. The total distance from Actonvale Yard to East Staging is 300 inches as follows:

Actonvale Yard to Berwick	65"
Trackage at Berwick	25"
Berwick to JT Junction	60"
JT Junction to Castle Rock	10"
Trackage at Castle Rock	30"
Castle Rock to East Staging	50"
East reversing loop	60"

We can use the formula in point 2 above substituting the Actonvale to East Staging distance of 300 inches:

$$200 / 8 * 6 / 60 = 3.75$$

again rounded to 4 minutes.

Here's the revised arrival and departure times for train SLCH:

Depart	West Staging	1:01 am
Arrive	Actonvale	1:02 am
Depart	Actonvale	1:12 am
Arrive	East Staging Exit	1:16 am

String Diagram Scheduling

Let's move on and actually schedule train SLCH using the string diagram method.

1. On the ProTrak Standard toolbar click on "Scheduling" then select "Create string diagram" from the dropdown list. A window like the one shown in Figure 12-12 will appear.

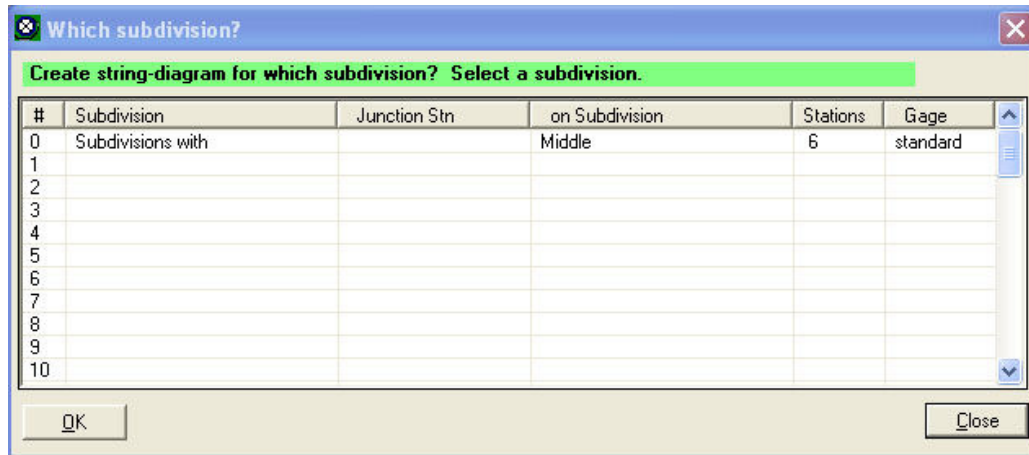


Figure 12-12

2. You can see that we are being asked to select the subdivision we want to create a string diagram for. In our case we currently only have one subdivision so all we need to do is either click on line 0 then click on “OK” or double-click on line 0. We’ll now see a window which looks like Figure 12-13 (a larger version of this window is in Appendix C).

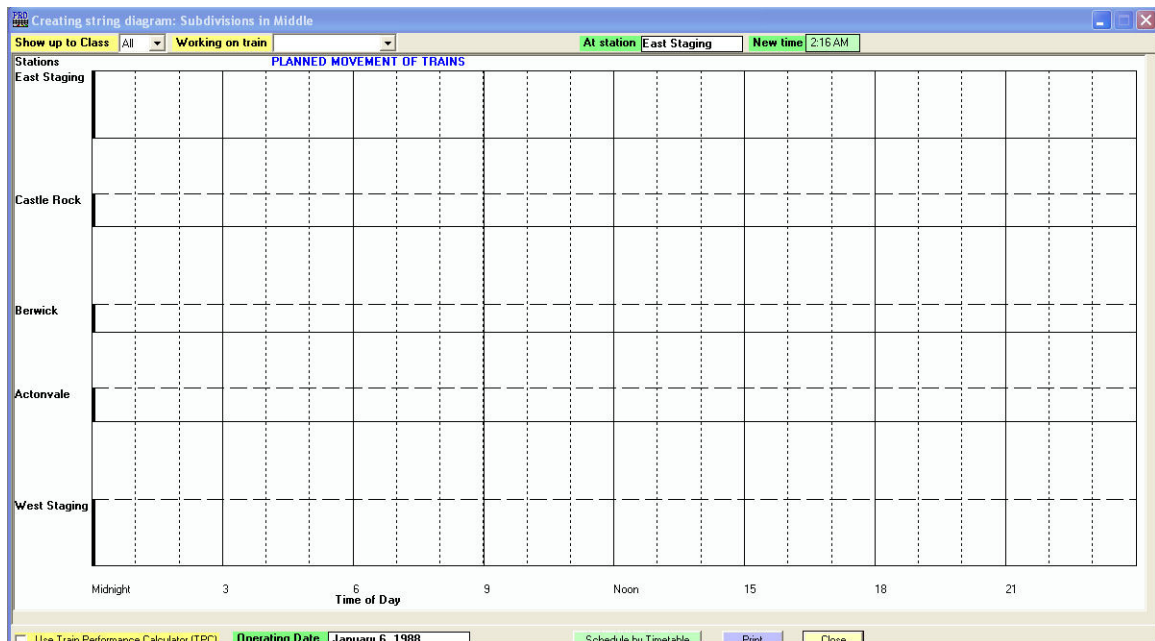


Figure 12-13

3. At the top of the window near the left corner of the window is a data field labeled “Working on train” with a dropdown arrow beside the data field. Click on the dropdown arrow and you will see a list of all currently established trains. From the list select train SLCH. ProTrak will

immediately draw the schedule of train SLCH on the graph in the window (see Figure 12-14). The times shown for train SLCH are those that have been calculated by ProTrak using the data we entered when we established the train, when we set up the stations and when we set up the fast clock ratio. ProTrak defaults all station stops to 10 minutes.

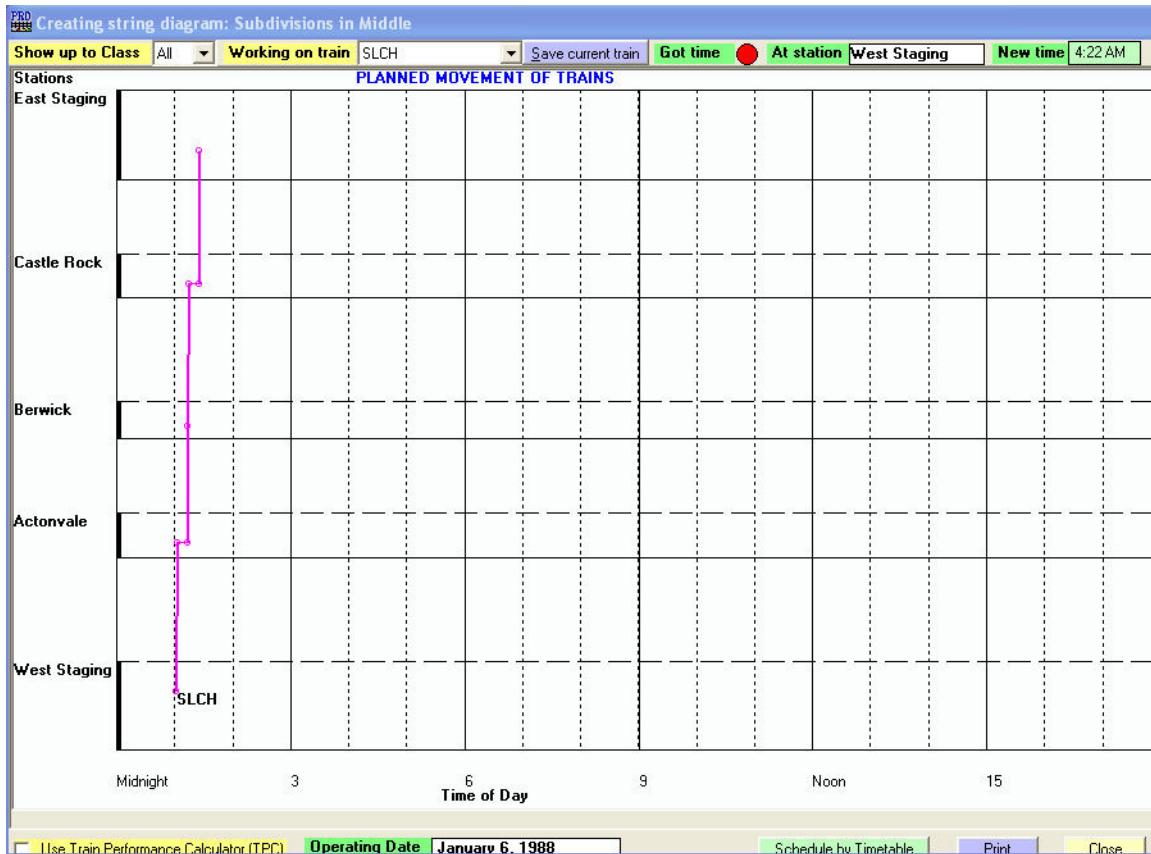


Figure 12-14

4. Before we start the editing process on train SLCH, let's take a further look at the "Creating string diagram..." window.
 - a. For the purposes of the discussions here, the term "the graph" is used to refer to the area encompassed by the outermost lines. In other words the area to the right of the station names and above the time of day figures at the bottom of the window. The line on the left side of the graph you can see is broken into a series of dark and light sections. The dark sections represent the distance at a station (or staging track) and the light sections represent the distance between stations. To the left of each of the dark sections is the name of the station that section represents. As you can see, not all the sections are the same length since each section is based upon the values that we set up in the "Distance between clearance points" data fields for each of the stations (see Chapter 2). Looking

at the graph, the section for Castle Rock is longer than the section for Berwick since the distances between clearance points at the station in Berwick is 25 inches while the distance at Castle Rock is 30 inches. It is also useful to note that the top and bottom of each of the dark sections have lines extending horizontally. These lines help you establish where the mouse pointer is when you are working with the graph

- b. On the toolbar of the “Creating string diagram...” window there are six controls. We’ve already looked at one of these, the “Working on train...” data field. The remaining five are as follows (from left to right):
 - i. The “Show up to Class” data field allows us to selectively add classes of trains ⁽¹⁶⁾. Suppose we want to schedule our passenger trains first then add the through freights, then the local ‘turns’, we can do this by assigning our passenger trains as, say Class 1, the through freights as Class 3, then all other trains as Class X. By choosing to schedule only the Class 1 trains on the first pass through the scheduler, we can add just the passenger trains. On the second pass we can add the through freights, fitting them in around the passenger schedule, and on the third pass, add the last of the trains.
 - ii. The “Save current train” button allows you to save any changes you have made.
 - iii. The “Got Time” indicator indicates whether you have ‘grabbed’ the line representing a train’s schedule to move it. We’ll look at this more later.
 - iv. The “At station” data field is managed by ProTrak and displays either the name of the station you are working with, the distance from the most easterly point on the railroad or the last station changed/entered. If your mouse pointer is on the graph and is between the two horizontal lines for a station, the “At station” data field will display the name of the station. If it is on the graph but not in the area just described it will show the distance, in inches, from the most easterly ⁽¹⁷⁾ point of the railroad. In our case this is the most easterly point of East Staging. If your mouse pointer is off the graph the “At station” data field will display the name of the last station changed or edited.
 - v. The “New time” data field is also managed by ProTrak and as with the “At station” data field, displays the time at the station. If you are editing a station, this time will change as you move the lines.

¹⁶ Note that the String Diagram classes of trains here do not reflect prototype train classes.

¹⁷ If your railroad is north/south oriented, this is the most northerly point.

- c. In the graph portion of the window, the lines representing the train you are working on are shown in magenta. Other trains are shown in blue⁽¹⁸⁾.
- d. For now we'll ignore the controls on the bottom line of the window.

Let's start to edit train SLCH.

5. If we look at the line that ProTrak has drawn which graphically represents train SLCH's schedule we can see a number of things, some are correct, some are not;
 - a. Train SLCH is scheduled to leave West Staging at 1:01 am (correct). We can check the time by moving the mouse pointer to the 'dot' on the end of the line in the West Staging area. The time where the mouse pointer is pointed is displayed in the data field labeled "New time" which appears at the right hand end of the top toolbar in the "Creating string diagram..." window.
 - b. Train SLCH is scheduled to arrive at Actonvale at 1:01 am (incorrect – we calculated the travel time from West Staging to Actonvale as 1 minute so this time should be 1:02 am. If you put your mouse pointer on the leftmost dot at Actonvale you should see that the "New Time" data field shows 1:01 am.
 - c. Train SLCH is scheduled to depart Actonvale at 1:11 am (incorrect). ProTrak, by default, sets station stops at 10 minutes which with a fast clock setting of 1:6 is the equivalent of 60 real minutes. The time of 1:11 am was correct for an arrival time of 1:01 but should read 1:12 since train SLCH arrives at 1:02. Again you can confirm the shown times by placing your mouse pointer on the rightmost dot at Actonvale.
 - d. There is no station stop at Berwick (correct).
 - e. There is a station stop at Castle Rock (incorrect).
 - f. Train SLCH is scheduled to arrive at East Staging at 1:23 am (incorrect – should be 1:16 am).

We need to make changes to the schedule times to bring them into line with the times that we have calculated.

6. The easiest way to edit a train schedule on the string diagram is to start at the originating station and make changes as required and move on to the next station and so on. If you move, say an arrival time, ProTrak will automatically adjust all of the timings that follow.
7. Let's work on the schedule for train SLCH. We said that it takes train SLCH 1 minute to get from West Staging to Actonvale so it should arrive at 1:02 am not 1:01 am. Place your mouse pointer on the 'dot' representing the arrival time in the "Actonvale" area of the diagram.

¹⁸ Other colors that appear on string diagrams are red for switching trains and green for passenger trains.

8. Click and hold the left hand mouse button down; drag the end of the line to the right until the time in the “New time” data field on the “Creating string diagram...” window’s tool bar reads “1:02 AM” then release the mouse button.
9. You will have noticed two things:
 - a. Once you ‘grabbed’ the end of the line, the “Got time” indicator on the “Creating string diagram...” window’s top tool bar changed from red to green indicating that you were about to move the line. If the indicator had not changed color, ProTrak is telling you that you have not yet ‘grabbed’ the line and therefore will not be able to move the line
 - b. Once the Actonvale station stop line was extended and the mouse button released, the whole of the timetable following the station stop was also adjusted.
10. Figure 12-15 shows what the “Creating string diagram...” window looks like after the first change to train SLCH. Note that only the left portion of the window is shown for clarity sake.

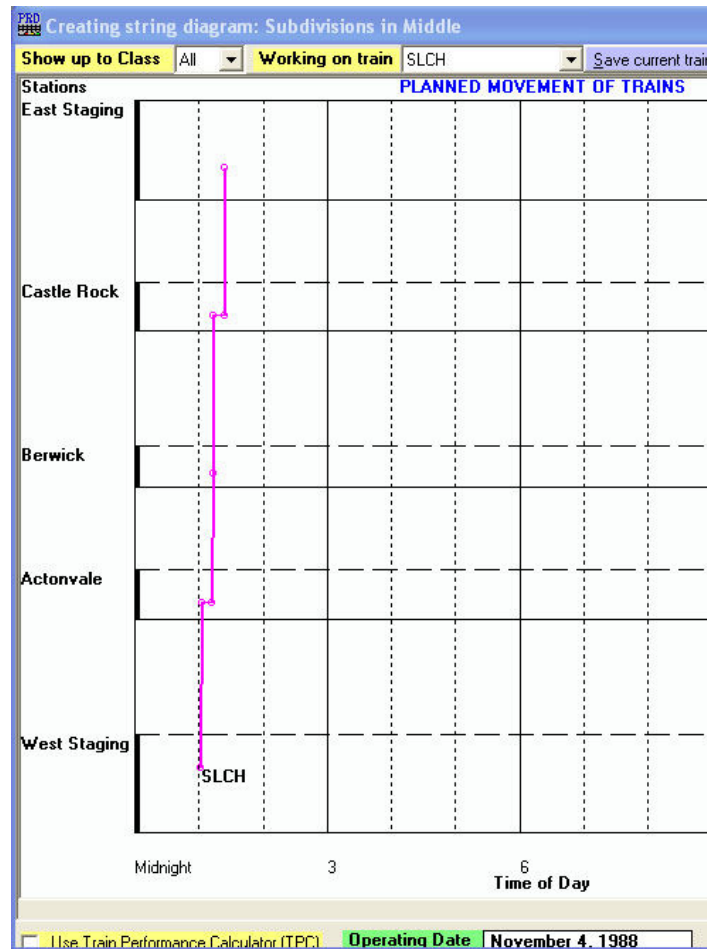


Figure 12-15

11. Admittedly, this doesn't look much different than Figure 12-14 but the arrival time at Actonvale has changed, as have all times that follow. We can check to see what time ProTrak now has for the departure of train SLCH from Actonvale. To do this, as we have in the past, place your mouse pointer on the 'dot' representing the departure time at Actonvale. You should see that that the "New Time" data field on the "Creating string diagram..." window's top tool bar now reads 1:12 am. If the "New Time" data field does not read 1:12 am, 'grab' the dot and drag it to the right until the "New Time" data field does read 1:12 am.
12. If we look at Berwick we can see that train SLCH is shown as only passing through – no stop. The same is not the case at Castle Rock. We need to get rid of the station stop at Castle Rock.
13. We first need to know what train SLCH's arrival time is currently slated for. As in the past, place your mouse pointer on the 'dot' representing the arrival time at Castle Rock; you can see that the "New Time" data field shows the time as 1:13 am. Since Castle Rock is slightly over half way

between Actonvale and East Staging and it takes 4 minutes for the full trip, SLCH should pass through Castle Rock at 1:14 am, 2 minutes after leaving Actonvale at 1:12 am. Similar to what we did in prior steps, place your mouse pointer on the 'dot' representing the arrival time at Castle Rock. You should see that this now reads 1:13 am. With your mouse pointer on the dot, click and hold the left mouse button down, drag it to the right until the time reads 1:14 am then release the mouse button.

14. To eliminate the station stop at Castle Rock we need to move the 'dot' representing the departure time to the left until the "New Time" data field shows 1:14 am – the same as the arrival time. Place your mouse pointer on the 'dot' representing the departure time in the "Castle Rock" area of the diagram. Click and hold the left hand mouse button down; drag the end of the line to the left until the time in the "New time" data field reads "1:14 AM" then release the mouse button. Figure 12-16 shows what the "Creating string diagram..." window now looks like. As you can now see, Castle Rock looks just like Berwick – train SLCH passes through without stopping.

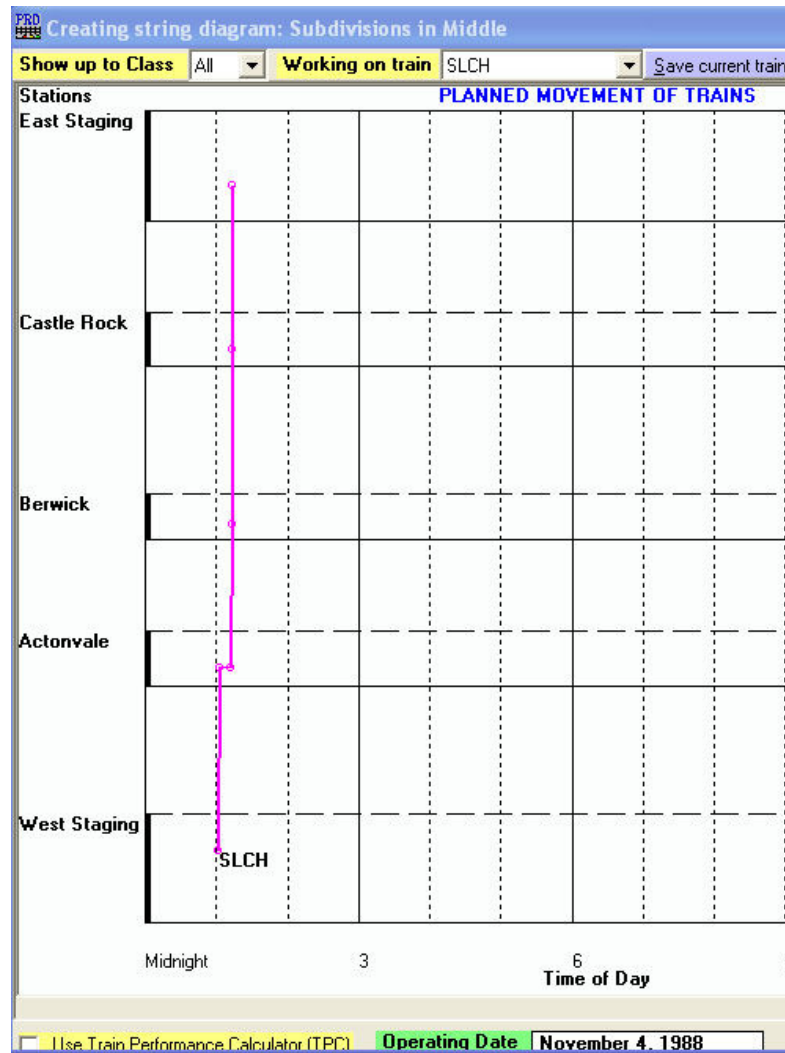


Figure 12-16

15. The one last item to check is the arrival time at East Staging. ProTrak has set the arrival time at East Staging at 1:12 am. Remember that we calculated it takes train SLCH 4 minutes to travel from Actonvale to East Staging. Since train SLCH left Actonvale at 1:12 am it will arrive at East Staging at 1:16 am (remember the train has to go around the reversing loop at the end of the staging tracks). Again click on the end of the line in "East Staging and drag the line to the right until the "New time" data field "1:16 AM". Once this has been done the "Creating string diagram..." window should look like Figure 12-17.

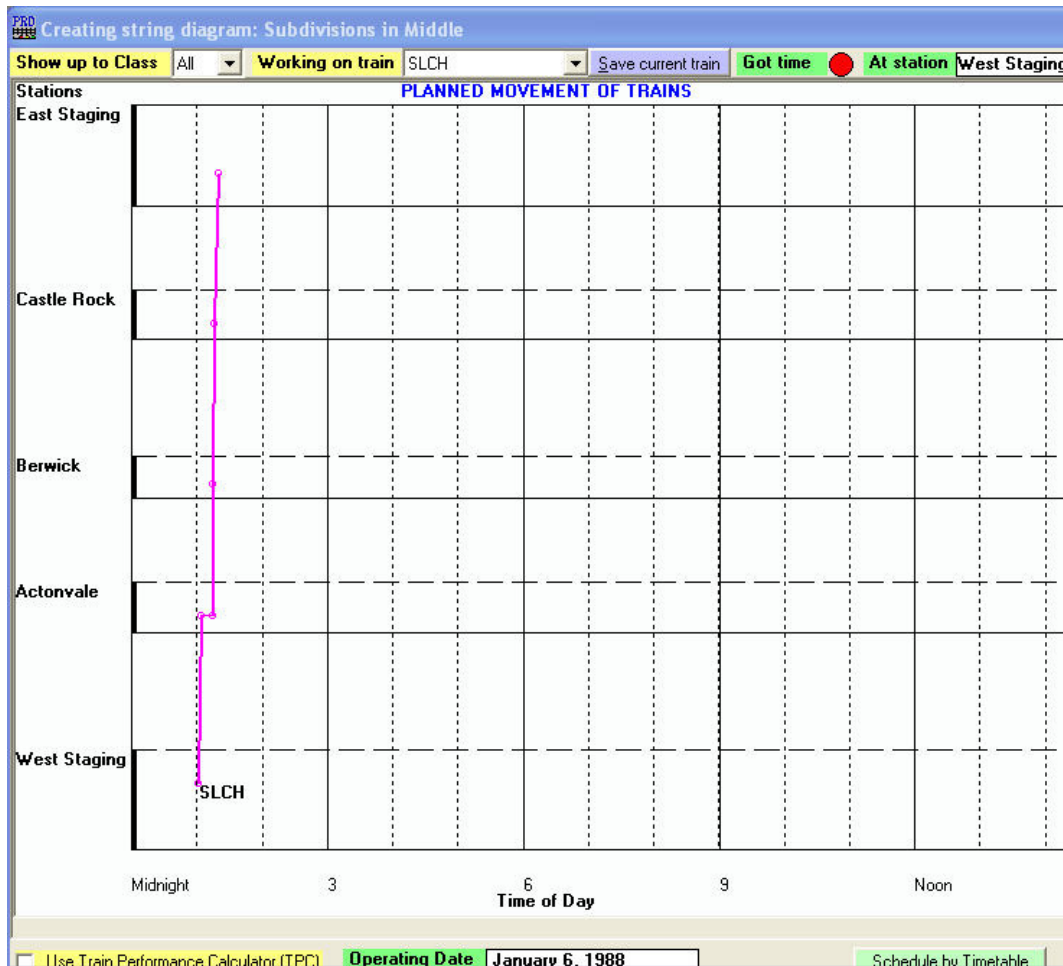


Figure 12-17

16. Let's check to see that what we thought we had done has in fact happened. We can do this by looking at the schedule in "Timetable" mode. Before we do this we need to save the changes we've made. In the set of controls on the "Creating string diagram..." window's top tool bar, near the middle of the five controls, there is a button marked "Save current train". Click on the "Save current train" button and the changes we've made to SLCH will be saved. Visual confirmation of the saving action is demonstrated by:
- the fact that the line representing train SLCH's schedule has changed from magenta to blue, and
 - The "Save current train" button is no longer visible.

Timetable Scheduling

1. As you can see from the buttons at the bottom of the “Creating string diagram...” window shown in Figure 12-17, we can switch from String Diagram mode to Timetable mode by clicking on the button labeled “Schedule by Timetable” – let’s do that now. Once the switch has taken place you should see a window like the one in Figure 12-18.

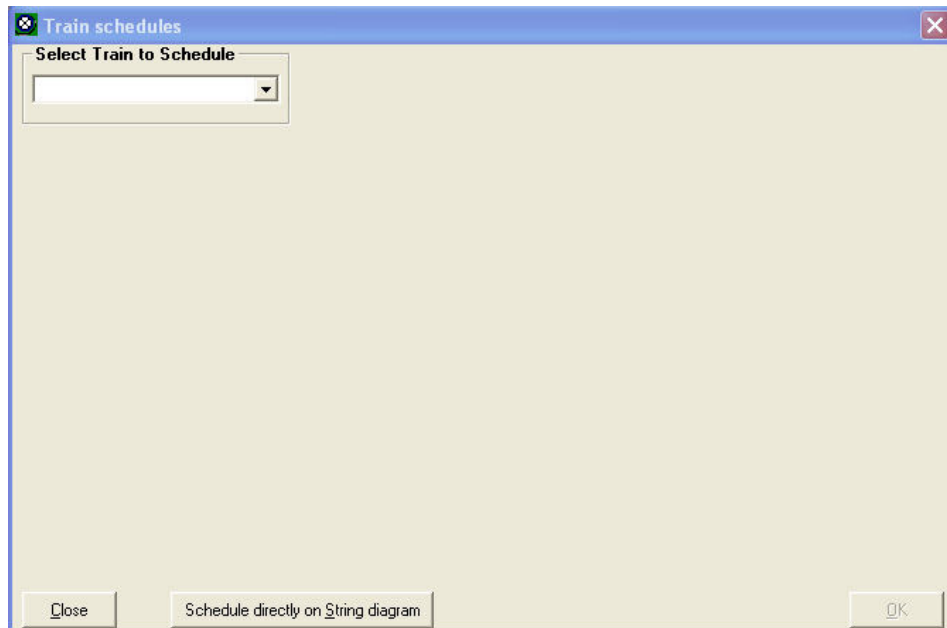


Figure 12-18

2. As we’ve done previously we need to select the train to edit. Click on the dropdown arrow beside the “Select Train to Schedule” data field and select “Symbol SLCH” from the list. A window like Figure 12-19 will appear. As we can see the timings that we had changed are correct.

Train

Symbol: SLCH

Call time: 1:01 AM

Train yarding plan

Yard siding 1: STL03s

Yard siding 2: ACT-Yd

Yard siding 3: CHI02s

Yard siding 4:

Yard siding 5:

Yard siding 6:

Yard siding 7:

Yard siding 8:

Yard siding 9:

Yard siding 10:

Arrival/Departure Times

#	Station	Arrival	Departure
1	St Louis, MO		1:01 AM
2	Actonvale	1:02 AM	1:12 AM
3	Berwick		1:13 AM
4	Castle Rock		1:14 AM
5	East Staging	1:16 AM	

Station: Arrival: Departure

All stations on PRO

#	Stations	Zone
1	East Staging	EAS
2	Castle Rock	CAS
3	JT Junction	JTJ
4	Berwick	BER
5	Actonvale	ACT
6	West Staging	WST

Instructions

Select next station from online data. Travel time between stations is between stations is calculated for you. To stop/wait at station, select 'Yes' and then enter a departure time later than arrival time.
 Note: Rule 5: If times are same, only departure time is shown.

Cancel Schedule directly on String diagram OK

Show ☒ Staging

Figure 12-19

- One other thing that you should note is that we can switch back and forth between the "String diagram" and "Timetable" methods. At the bottom of each window ("Creating string diagram..." and "Train schedules") you will see a button which is labeled "Schedule" followed by the name of the other mode ("Schedule directly on String diagram" and "Schedule by Timetable").
- Before we leave the "Timetable" mode window, let's look at how we can edit items while we're in "Timetable" mode. In the middle of the window there is a panel headed "Arrival/Departure Times". In this panel, double-click on the entry for Actonvale. You should see that the three data fields immediately below the "Arrival/Departure Times" panel now have data in them (see Figure 12-20).

Train schedules

Train
Symbol SLCH
Call time 1:01 AM

Train yarding plan
Yard siding 1) STL03s
Yard siding 2) ACT-Yd
Yard siding 3) CHI02s
Yard siding 4)
Yard siding 5)
Yard siding 6)
Yard siding 7)
Yard siding 8)
Yard siding 9)
Yard siding 10)

Arrival/Departure Times

#	Station	Arrival	Departure
1	St Louis, MO		1:01 AM
2	Actonvale	1:02 AM	1:12 AM
3	Berwick		1:13 AM
4	Castle Rock		1:14 AM
5	East Staging	1:16 AM	

Station Arrival Departure
Actonvale 1:02 AM 1:12 AM
Cancel Erase

All stations on PRO

#	Stations	Zone
1	East Staging	EAS
2	Castle Rock	CAS
3	JT Junction	JTJ
4	Berwick	BER
5	Actonvale	ACT
6	West Staging	WST

Instructions
Select next station from online data. Travel time between stations is between stations is calculated for you. To stop/wait at station, select 'Yes' and then enter a departure time later than arrival time.
Note: Rule 5: If times are same, only departure time is shown.

Cancel Schedule directly on String diagram OK

Show ☒ Staging

Figure 12-20

- As you can see there are two new buttons below the Station/Arrival/Departure data fields (Cancel and Erase).
- Click in the "Departure" data field and you will see that those two buttons have disappeared and have been replaced with two new ones (Cancel and Save stop) (see Figure 12-21).

Train schedules

Train
Symbol SLCH
Call time 1:01 AM

Train yarding plan
 Yard siding 1) STL03s
 Yard siding 2) ACT-Yd
 Yard siding 3) CHI02s
 Yard siding 4)
 Yard siding 5)
 Yard siding 6)
 Yard siding 7)
 Yard siding 8)
 Yard siding 9)
 Yard siding 10)

Arrival/Departure Times

#	Station	Arrival	Departure
1	St Louis, MO		1:01 AM
2	Actonvale	1:02 AM	1:12 AM
3	Berwick		1:13 AM
4	Castle Rock		1:14 AM
5	East Staging	1:16 AM	

Station Arrival Departure
 Actonvale 1:02 AM 1:12 AM
 Cancel Save stop

All stations on PRO

#	Stations	Zone
1	East Staging	EAS
2	Castle Rock	CAS
3	JT Junction	JTJ
4	Berwick	BER
5	Actonvale	ACT
6	West Staging	WST

Show ☒ Staging

Instructions
 Select next station from online data. Travel time between stations is between stations is calculated for you. To stop/wait at station, select 'Yes' and then enter a departure time later than arrival time.
 Note: Rule 5: If times are same, only departure time is shown.

Cancel Schedule directly on String diagram OK

Figure 12-21

7. The buttons shown in Figure 12-20 are used as follows:
 - c. "Cancel" does what the name would imply – it cancels the editing process and clears the data in the Station/Arrival/Departure data fields. At this point you could select a different station to edit.
 - d. "Erase" allows you to remove the station selected completely from that train's schedule **and all the stations that follow**. For example, if we were double-click on Berwick and use the "erase" function to remove Berwick from the schedule of train SLCH, we would not only remove Berwick but also Castle Rock and East Staging.
8. The buttons shown in Figure 12-21 are used as follows:
 - a. As with the Figure 12-20, the "Cancel" button cancels the editing process and clears the Station/Arrival/Departure data fields.
 - b. "Save stop" accepts any changes to the data in any of the three data fields – Station, Arrival and Departure.
9. It is important at this point to note that there are two separate "Cancel" buttons in the window – one immediately below the "Station/Arrival/Departure" data fields and one at the bottom left corner of the window. These perform different functions:
 - a. The "Cancel" under the "Station/Arrival/Departure" data fields cancels the changes made to the selected station (For want of a better name we'll call this button the "Station Cancel" button).

- b. The “Cancel” button at the bottom left of the window cancels all changes that have been made to any of the stations and/or arrival and departure times (we’ll call it the “Train Cancel” button).
10. A couple of other important things to note:
 - a. As soon as you click in the “Arrival” data field, the buttons change to read “Cancel” and “Save” (See Figure 12-22). The “Cancel” is as previously described and the “Save” functions as the “Save stop” did in para 8b above.
 - b. Once you have made all the changes required, you must click on the “OK” button in the bottom right corner of the “Train schedules” window to make the changes permanent. If you change a time of arrival for example, click on the “Save” button then click on the “X” to close the window, the changes made will not be saved. This is as if you had clicked on the “Save” button but then clicked on the “Train Cancel” button. The same situation applies to the “Save stop” button for changes of departure times.

The screenshot shows the 'Train schedules' window with the following sections:

- Train:** Symbol: SLCH, Call time: 1:01 AM
- Arrival/Departure Times:**

#	Station	Arrival	Departure
1	St Louis, MO		1:01 AM
2	Actonvale	1:02 AM	1:12 AM
3	Berwick		1:13 AM
4	Castle Rock		1:14 AM
5	East Staging	1:16 AM	
- Train yarding plan:**
 - Yard siding 1: STL03s
 - Yard siding 2: ACT-Y'd
 - Yard siding 3: CHI02s
 - Yard siding 4:
 - Yard siding 5:
 - Yard siding 6:
 - Yard siding 7:
 - Yard siding 8:
 - Yard siding 9:
 - Yard siding 10:
- Instructions:** Select next station from online data. Travel time between stations is calculated for you. To stop/wait at station, select "Yes" and then enter a departure time later than arrival time. Note: Rule 5: If times are same, only departure time is shown.
- All stations on PRO:**

#	Stations	Zone
1	East Staging	EAS
2	Castle Rock	CAS
3	JT Junction	JTJ
4	Berwick	BER
5	Actonvale	ACT
6	West Staging	WST
- Buttons:** Cancel, Save, OK, Schedule directly on String diagram

Figure 12-22

11. Enough of the explanations. Let’s change the arrival time at East Staging to read 1:18 am. To start the changes, double click on the “East Staging” entry in the “Arrival/Departure Times” panel to bring East Staging’s data into the edit area. Change the time in the “Arrival” data field to 1:18 am then click on the “Save” button below the “Departure” data field. You should see the data in the “Arrival/Departure Times” window updated as shown in Figure 12-23.

12. Note that in the case of an intermediate station like Berwick and Castle Rock, if you need to change both the arrival and the departure time for that station, **you must change each time separately then save the change before making the change to the other time.** If we were to change both the arrival and departure times for a station (Berwick for example), you would need to double-click on the station, change the departure time in the edit window below the list of stations, click on the "Save stop" button to save the departure time change. Back in the list of stations panel, double-click on the same station again, change the arrival time in the edit window then again click on the "Save" button to save the arrival time.

Train schedules

Train
 Symbol: SLCH
 Call time: 1:01 AM

Train yarding plan
 Yard siding 1: STL03s
 Yard siding 2: ACT-Yd
 Yard siding 3: CHI02s
 Yard siding 4:
 Yard siding 5:
 Yard siding 6:
 Yard siding 7:
 Yard siding 8:
 Yard siding 9:
 Yard siding 10:

Arrival/Departure Times

#	Station	Arrival	Departure
1	St Louis, MO		1:01 AM
2	Actonvale	1:02 AM	1:12 AM
3	Berwick		1:13 AM
4	Castle Rock		1:14 AM
5	East Staging	1:18 AM	

Station Arrival Departure

All stations on PRO

#	Stations	Zone
1	East Staging	EAS
2	Castle Rock	CAS
3	JT Junction	JTJ
4	Berwick	BER
5	Actonvale	ACT
6	West Staging	WST

Instructions
 Select next station from online data. Travel time between stations is between stations is calculated for you. To stop/wait at station, select "Yes" and then enter a departure time later than arrival time.
 Note: Rule 5: If times are same, only departure time is shown.

Cancel Schedule directly on String diagram OK

Figure 12-23

13. Remember, at this point, however, only the data in the "Arrival/Departure Times" panel has been updated – the stored data remains as it was before we started to change East Staging. In fact if we closed the window or clicked on the "Schedule directly on String diagram" button, then re-examined train SLCH on the string diagram we would see that the entries looked exactly like the one in Figure 12-19.
14. To make the changes to train SLCH permanent we would to click on the "OK" button at the bottom right of the "Train schedules" window. Since we want to keep the schedule as we set it up on the string diagram we will click on the "Cancel" button instead.

We've now looked at the both the String Diagram mode and the Timetable mode. For the most part scheduling should be done using the String Diagram mode. The main uses for the Timetable mode are:

- a. Fine tuning arrival and departure times. As you noticed when using the String diagram mode, it is sometimes difficult to make the cursor stop on exactly the minute you want. While this is not an issue if you have only a few trains, it become more of an issue as you have more trains, particularly if these include passenger trains since passenger trains often have very brief station stops.
- b. Working with schedules for trains that cross from one subdivision to another. We'll look at scheduling trains that cross from one subdivision to another in a later chapter when we add the branch line.

Before we move on we need to add the remaining four trains to the ProTrak scheduler. Use the String Mode; but don't worry too much about getting things exact. For the staging-to-staging trains (all of them but train 202) you should probably get rid of any station stops at either Berwick or Castle Rock. For train 202, you might also want to extend the length of time for the stops at Berwick and Castle Rock. Remember to click on the "Save current train" button after making changes to each of the trains.

Once you have all five trains in the schedule, your string diagram should look something like the one in Figure 12-24 (a larger version is in Appendix C).

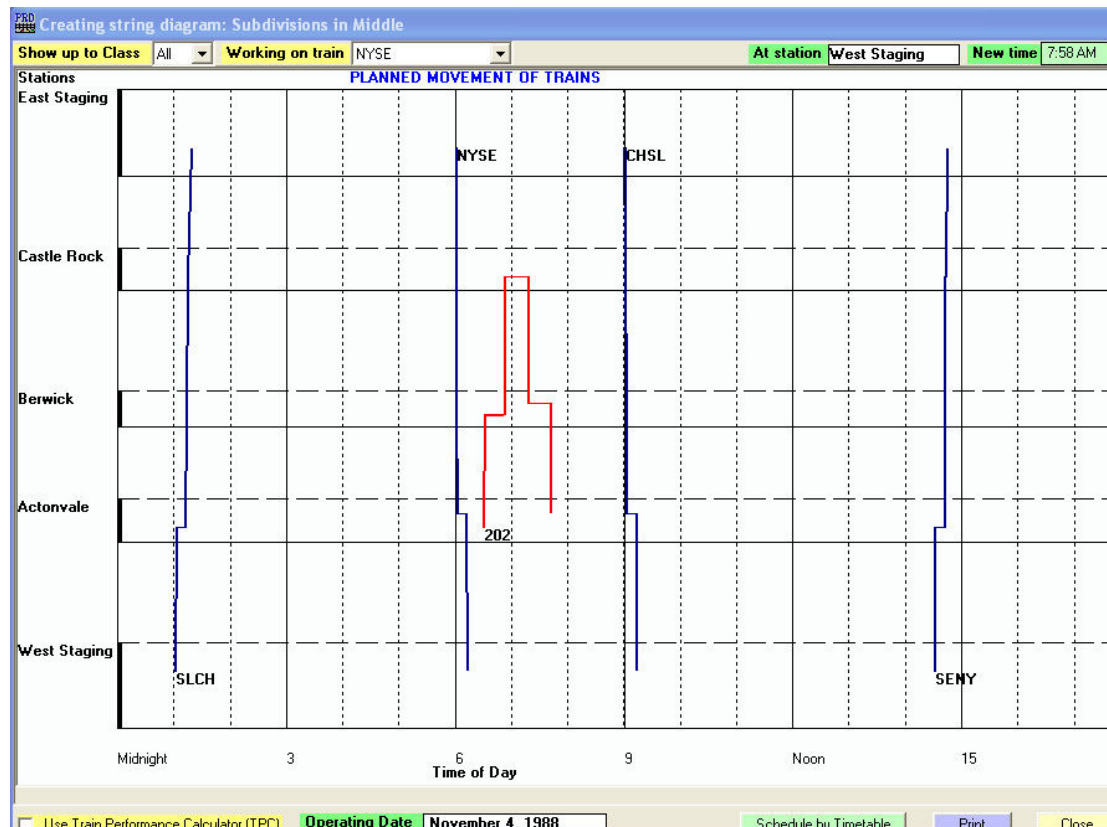


Figure 12-24

One last thing to note is that our through trains appear as a blue entry on the string diagram while train 202 which is a local turn is shown in red as are all local turns. In addition, when we add a passenger train in the next chapter, you'll see that passenger trains are shown in green

Deleting a train from the ProTrak Scheduler

Occasionally, you may need to remove a train from the scheduler, either because you have eliminated the train, or because you've got the schedule for an existing train all messed up and you want to start again. Here's how we go about deleting the train from the scheduler:

1. Open the string diagram (Scheduling/Create string diagram) and using the dropdown arrow beside the "Working on train" data field, select train "NYSE"
2. Click on the "Delete" key on your computer and a window like the one shown in Figure 12-25 will appear.

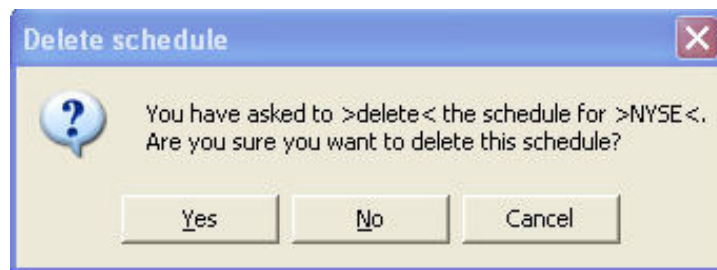


Figure 12-25

3. Click on "Yes" and the entry for train "NYSE" will be been removed **from the ProTrak scheduler only**.

You will note that the train still exists in the lineup of trains so we can re-enter it into the ProTrak scheduler. Let's add train "NYSE back in again.

4. Click on the down arrow beside the "Working on train" data field and select train "NYSE". As you can see, train NYSE has been added back into the scheduler.
5. We won't worry at the moment about editing the schedule to eliminate the stop at Castle Rock so just click on "Save" current train to make this addition permanent.

6. At the bottom of the “Creating Sting Diagram...” window, click on the “Schedule by Timetable” button and we’ll see how we can delete a train from the scheduler when we are in Timetable mode.
7. In the “Train schedules” window, click on the down arrow beside the “Select Train to Schedule” and select train “NYSE”.
8. Double-click on the 2nd entry, the one for Castle Rock.⁽¹⁹⁾ This will bring the entry into the edit area.
9. You should now see two buttons below the entry – “Cancel” and “Erase”. Click on “Erase”. At this point a new window like the one shown in Figure 12-26 will appear. Click on “Yes” then click on “OK” in the bottom right hand corner of the “Train schedules” window.

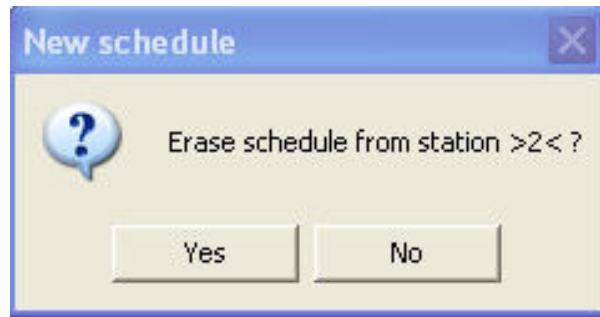


Figure 12-26

We have now erased the entry for train “NYSE” from the scheduler. You will still see the first line still showing the train departing New York, NY at 6:00 am however since train NYSE doesn’t go anywhere, it is effectively erased. We can check this by looking at the String Diagram

10. Click on “Close” on the “Train Schedules window, then re-open the String Diagram window (Scheduling/Create string diagram). As you can see, the entry for train “NYSE” has been removed (the label “NYSE” is still there).
11. We need to re-establish the schedule for train “NYSE” so repeat step 4 above. The schedule has been re-entered using the defaults that ProTrak has established, so we need to eliminate the station stop at Castle Rock, just as we did originally (If you need to go back earlier in this chapter to refresh on how we did that).
12. Once the schedule has been adjusted, click on “Save current train” then click on “Close” to close the “Creating string diagram...” window.

¹⁹ Why the 2nd entry? As you will see if you try, you cannot edit the initial starting point nor the time. These two items are taken from the “Origin Station” and “Departure at” data fields shown in the “Changing train... window” (see chapter 5)

Running more sessions

Now that we've made all of these changes, let's run at least 3 more sessions to get our customers at Castle Rock serviced. A few things to keep in mind:

- a) Since we've added some new cars we'll be asked to add routing (Chap 9). Here's the info you need to add the routing:
 - i. AOK – Arkansas-Oklahoma Railroad – STL03s
 - ii. NOKL – Northwestern Oklahoma Railroad – STL03s
 - iii. DWC – Duluth, Winnipeg & Pacific Railroad – CHI02s
 - iv. MDW – Minnesota, Dakota & Western Railroad – CHI02s
 - v. BNFE - Burlington Northern Fruit Express – SEA01s
- b) Train 202 no longer needs to be reported at Berwick; reporting now takes place at Castle Rock.
- c) Train 202 may need to be **double** reported at Castle Rock.
- d) Train 202 may need to have the car routing updated at Castle Rock. (Refer to Session 28 in Chapter 10 for the discussion on "Double Reporting" and on "Route cars at Yards & Customers").

As was suggested in Chapter 11, you may wish to make a list of what happens when to ensure you don't miss some action.

Hotbox Detector

ProTrak has a number of things which help to inject more realism into the operation of your model railroad. One of these items is a simulated Hotbox Detector. When I ran train 202 I received the message shown in Figure 12-27.

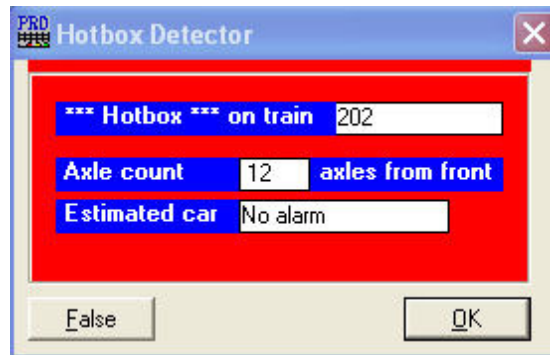


Figure 12-27

In the real world the train's engineer would be required to stop the train and a member of the crew would be required to go to the car to determine whether there was a hotbox or not. Specific instructions would be included in the railroad's rule book or employee timetable as to what action was to be taken

when a hotbox is detected. On your own railroad you can decide what you want to do. For example you may require that the train be stopped for '5' minutes then continue, in order to simulate the inspection of the suspect car. For the purposes of this manual, we'll just click on "OK" and continue.

Summary

Chapter 12 was a continuation of the expansion of the ProTrak Demonstrator Railroad. In this chapter we have done the following:

- Added all of the remaining customers at Berwick and Castle Rock.
- Added a 2nd reporting point at Castle Rock.
- Adjusted the schedule of train 202 to work all the way to Castle Rock rather than turn and return at Berwick.
- Created waybills and car-orders for the new customers at Castle Rock
- Changed two of the existing waybills to make them on-line customer to on-line customer shipments.

We dealt with three new concepts in Chapter 12

- How to add an offline supplier. While adding an offline supplier is new, the process used to do this is similar to many other like activities – adding a customer for example.
- How to use the ProTrak scheduler which automates the scheduling process. The ProTrak scheduler has both a timetable mode and a string diagram mode and we've seen how to work with both.
- How ProTrak simulates a Hotbox Detector. In ProTrak the hot-box detector simulation adds realism to operations.

We'll leave Freight operations alone for now and in Chapter 13 we'll cover the basics of Passenger train operations.