## Chapter 2  - Setting Up Stations

**Default and Minimum Data Items**

Before we start making changes to the data managed by ProTrak ProTrak, let's talk for a moment about default data items and minimum data items.

ProTrak is designed so that when a blank screen is opened to allow you to add or edit something (a station for example) a number of items will be displayed in several of the data fields. These are the default data items. You could simply save that default data as is, but that probably is not what you want. We can edit these default items where necessary to make the entry appropriate to our railroad.

There is a minimum amount of data that needs to be present for ProTrak to operate.  From this point onwards you'll be provided with the names of the items that <u>must</u> have data in them in order for ProTrak to operate. You will see a heading of "Minimum Data Items" followed by a list of the items that must have data in them. The items will be identified by the name of the data item followed, in parenthesis, by the text in front of the item. An example of this would be:

      Station name (The named point is)

**Fast Clock Settings**

Before we actually get into setting up stations, we first need to briefly look at the Fast Clock settings and adjust them to fit our needs.  When we run our sessions later we'll not initially start the fast clock.  The Fast Clock settings, however, have an impact on some of the computed data shown when we set up our stations so we need to make sure we're all working with the same settings.

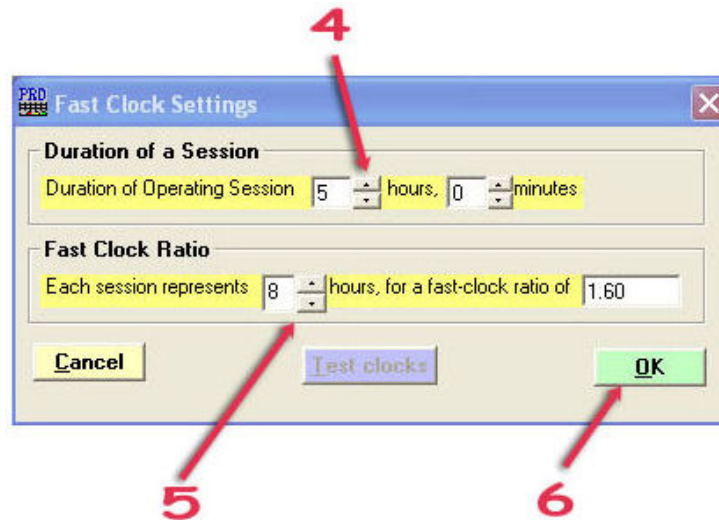1.  Figure 2-1 shows the Fast Clock settings that are supplied with the sample railroad.

*Figure 2-1*

2. To bring up the "Fast Clock Settings" window, click on "Signals" on the ProTrak toolbar, then choose "Fast clock settings" from the dropdown list.

3. We want to make sure the 'Duration of Operating Session' and 'Each Session Represents' values are set to what we want.

4. If your window does not already show this, using the arrows beside "Duration of Operating Session... hours" data field, adjust the hours setting to read "4".

5. Similarly, if your window does not already show this, using the arrows beside the "Each session represents... hours" data field, adjust the hours setting to read "24".

   Note that as you changed these two fields, the "...fast-clock ratio of" data field has been adjusted automatically to show "6.00".

6. Figure 2-2 shows what the "Fast Clock Settings" window should now look like.  Once the data fields have been adjusted, click on "OK" to close the window. In case you were wondering, the "Test clocks" button is only enabled if you have the Grapevine signaling system installed. Grapevine signaling is not covered in this book.

*Figure 2-2*

Next we'll tackle setting up the stations and staging tracks, and the tracks connecting them.

## Station 1 – East Staging Yard

As explained in 'The Recipe Book', station 1 is "the east most (or north most) station" [1] on the railroad and is normally a staging yard. That is the station that we will be working with first.

1. Click on "The Railroad" on the ProTrak toolbar, then choose "Stations on core segment" from the dropdown list (note that this may also show as "Stations on Middle"). This will bring up the window shown in Figure 2-3 (don't worry about trying to read it here) [2]. Note that the stations shown in Figure 2-3 are a copy of those in the 'sample railroad (North South)' and have been copied from the ProTrak CD when we did the initial setup for our railroad.

---

[1] In our case it will be the most eastward as we set up our railroad in chapter 1 as running east/west.
[2] On the core segment only, clicking on the "name" column heading of the "stations on core segment of Middle" will flip the station order.

| # | Name | Spot | DS Tracks | Interval | Interval grade | Siding length | Siding grade | Elevation | Milepost | MP: Inches |
|---|------|------|-----------|----------|----------------|---------------|--------------|-----------|----------|------------|
| 1 | North Staging | NOR | 1 | 0.0 | | 116.0 | 0.00 | 40.0 | 0.96 | 116.0 |
| 2 | First Station | FST | 2 | 100.0 | 2.00 | 120.0 | 0.00 | 42.0 | 2.77 | 336.0 |
| 3 | Second Station | ST2 | 2 | 100.0 | 1.61 | 120.0 | 0.00 | 43.6 | 4.58 | 556.0 |
| 4 | New | | 1 | 78.0 | 0.00 | 45.0 | 0.00 | 43.6 | 5.59 | 679.0 |
| 5 | Flag Station | FLG | 1 | 120.0 | 2.19 | 0.0 | | 46.2 | 6.58 | 799.0 |
| 6 | South passing track | SPS | 2 | 90.0 | -1.75 | 99.0 | -1.19 | 44.7 | 8.14 | 988.0 |
| 7 | South Staging | | 1 | 110.0 | -1.19 | 116.0 | -1.00 | 42.2 | 10.00 | 1214.0 |

Change station    Update profile    Minimum siding length    Middle Subdivisions

*Figure 2-3*

2.  As we go along we'll be making changes to a number of items for each station.  Table 1 in Appendix B contains the information that we will be changing as we go.  Don't worry about what some of the information means, we'll explain it as we go, just keep your printout of Appendix B handy.  Two of the terms in Table 1 and in the "Changing station" windows that may be somewhat confusing are 'clearance point' and 'interval'.  If you are not sure what either of these mean, see Appendix A for an explanation.

3.  Before we start to make any changes, we need to set up one more item.  Down at the bottom of the "Stations on core segment of Middle" window you will see a button marked "Minimum siding length".  Click on this and the window shown in Figure 2-4 will appear.
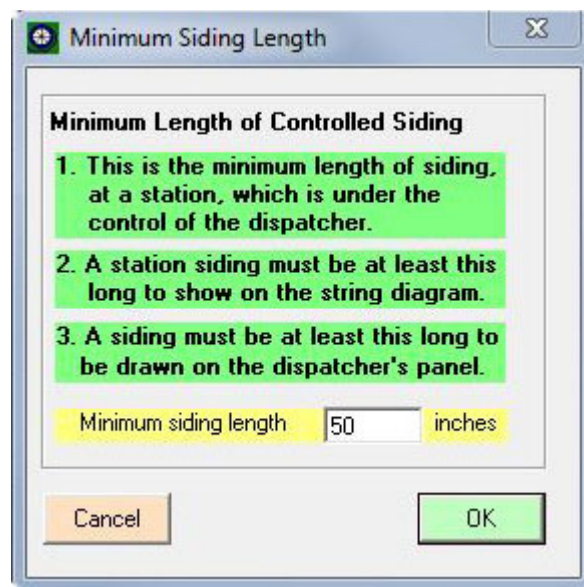


*Figure 2-4*

Looking at Table 1 in Appendix B, we see that the station with the shortest distance between clearance points, or in other words, a siding, is Berwick with a length of 25. Change the value in the "Minimum siding length" (tt) data field to "25" then click on "OK" to implement the change and close the "Minimum Siding Length" window [3].

4. Now that we're back at the "Stations on core segment of Middle" window, we can start to make changes to the station data. Station 1, currently identified as North Staging, will be changed to East Staging. To do this, double-click on the station name (tt) in line 1 and the "Changing station: 1 of: 7" window will appear (see Figure 2-5) [4].
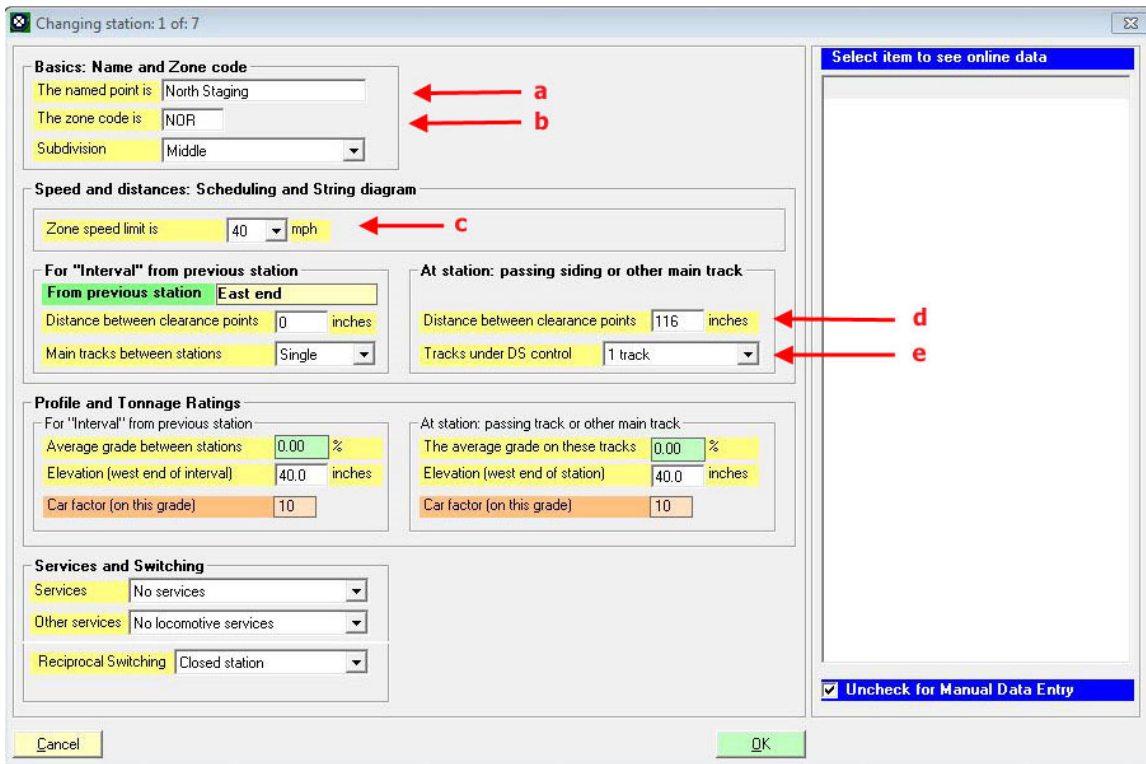


*Figure 2-5*

We'll make the following changes.
In the block labeled "Basics: Name and Zone code":
a) The named point (tt)                               East Staging

---

[3] The "Minimum Siding Length" setting can also be accessed by clicking on "Administration" on the ProTrak toolbar then selecting "Minimum siding length" from the dropdown list.
[4] As with many things in ProTrak, there are several ways to access the editing window. You may also click on line 1 to select the station then click on the "Change station" button on the bottom of the window.

2-5

    b) The zone code is (tt)                       EAS

In the block labeled "Speed and distances: Scheduling and String diagram":

    c) Zone speed limit is                       20 mph
    d) At station, passing siding or other main track:
           Distance between clearance
               points is (tt)                       60
    e) Tracks under DS control (tt)             Staging

All of the other information will be left as is.

In order to help you understand how ProTrak works, here's some information about the data fields on this window.

In the section titled "Basics: Name and Zone code":
- "The named point". This is the name of the station or staging yard.
- "The zone code is". This is used as part of the ID that will be used by ProTrak to identify where a car is, or where it is to go. More about this later as we go on. The zone code must be unique and may be 1 to 4 characters in length (the default is 3). If the siding number is 5 or less characters without a '-' (ex: AAA10), ProTrak will insert a '-' between the letter(s) and the number(s) (ex. AAA-10). While IND could be used as a zone code, it isn't very meaningful, so choose something that will be easy to remember, for example we've used EAS for East Staging. There is a further explanation of how ProTrak works with the zone code in Appendix A.
- "Subdivision". Since we only have one subdivision, we obviously can't choose any one but the Middle. If we had more, we could select from the dropdown list which subdivision this station was on.

In the section titled "Speed and Distances: Scheduling and String diagram"
- "Zone speed limit is" (tt). Self explanatory.
- "For "Interval" from previous station". This portion of the window deals with the track between two stations. In the case of the first station, there is nothing before it; however it will become important for all the remaining stations.
  - "From previous station". This displays the name of the previous station – the one where measurements are being made from. Since this is the first station, rather than a station name, we see the words 'East end'. Watch this field as we work with other stations.
  - "Distance between clearance points" (tt). As is explained in the Recipe Book, it is the distance from the clearance point of the last turnout at the previous station to the clearance point of the first turnout on the main track at the start of this station (see Appendix

A for an explanation of "clearance points"). Whatever point you use for this measurement should obviously be used consistently when making other measurements. For station 1, the distance between clearance points is set to 0 (zero) since there is no station before it.

- "Main tracks between stations". As the label would suggest, this is used to identify how many tracks you have between this station and the previous station. Most often this will be "Single" but if you are modeling something like a commuter rail service into a major city, you may have 2 (or more) tracks

- "At station…" These all deal with the information about the main track at the station itself.

  - "Distance between clearance points" (tt). This is the distance from the clearance points at either end of the station. If this is station 1, the clearance point at one end will be the end of the longest track in the staging yard. If it is one of the other stations, the clearance point will be the point where you stopped measuring for the "Distance between clearance points" between stations as described above. For East Staging, this has been set to 60 inches.

  - "Tracks under DS control (tt)". How many through tracks are there at this station (not industries). If this is a Staging Yard, select Staging, as we have done for East Staging.

In the section titled "Profile and Tonnage Ratings"

- "For "Interval" from previous station".

  - "Average grade between stations (tt). Again, self explanatory. Station 1 will again be set to 0 (zero) for the same reason as noted before.

  - "Elevation (west end of interval)" (tt). Again, pretty much self explanatory. This measurement should be made at the same point as where you measured **to** for the "Distance between clearance points is" as noted above. For our purposes, station 1 is set to 40 which is the default value. [5]

    Note that entering a value in either "Average grade between stations" or "Elevation (west end of interval)" will automatically adjust the other value once you leave that data field. You, therefore, only need to enter one value –

---

[5] One caveat to the "Elevation" issue deals with layouts that have more than one level. The following is a quote from an email posted by John Mitchell (thanks John): "A wise friend told me to represent my layout in ProTrak as it should be run, not as it is built because of physical constraints". If for instance you have two levels (staging tracks on a level below the main part of the layout) it is important to view the lower level as if it were built directly off the main part of the layout. Using the staging track example, if you indicate that the staging track level is 12 inches lower than the main part of the layout you may discover that ProTrak is trying to assign helpers and/or trying to have you double the hill.

the other is given as a check. You can refer to Appendix A for a definition of the term 'interval'.

- • "Car factor (on this grade)". This is a figure used to calculate the "Adjusted Tonnage" or "Equated Tonnage" for a train. See the "Car Factor" definition in Appendix A for more information on "Car Factor".
- - "At the station…" These all deal with the information about the main track at the station itself.
  - • "Average grade on these tracks is " (tt). Self-explanatory. In most cases these will likely be zero.
  - • "Elevation (west end of station)" (tt). Again, pretty much self-explanatory. This measurement should be made at the clearance point of the last turnout on the main track.
  - • The same situation exists here with "Average grade on these tracks is" and "Elevation (west end of station)". Only one of the two values need be entered.
  - • "Car factor (on this grade)". This is the same explanation as previously shown.

In the section titled "Services and Switching"
If you did not select Staging, the next three items are available.
- • "Services" (tt).
- • "Other services" (tt).
- • "Reciprocal Switching" (tt).
These are *very advanced* operation items. For our purposes, leave them as they are defaulted, or as directed in this manual.

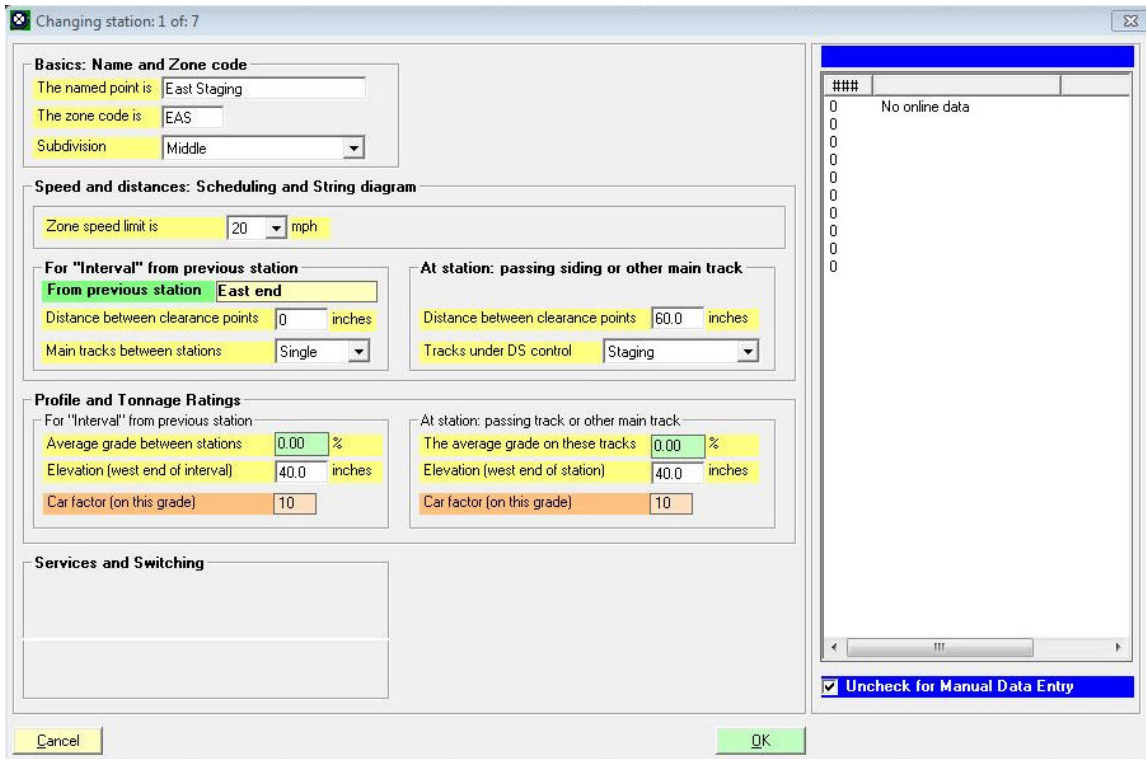Figure 2-6 is what the window should look like after the changes:

*Figure 2-6*

Once you have made those changes, click on "OK".  You will now see the window shown in Figure 2-7.
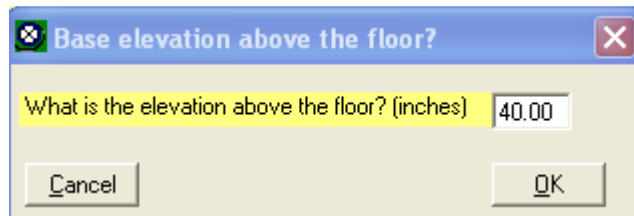


*Figure 2-7*

The "Base elevation above the floor?" window will only appear for station 1 and will be used as the base elevation for your railroad.  All other station elevations will be calculated relative to this value.  You may choose to measure from the floor to anything (bench work, roadbed or top of rail for example), as long as you are consistent in what reference you use for all other elevation measurements.  It makes no sense to measure from the floor to the top of the rail in one case, and to the bottom of the sub-roadbed in another.  For our purposes, we'll leave this set to 40.  Click on "OK" to continue and you should be back at the "Stations on core segment of Middle" window.

5. Before we move on, let's look at one more item on the "Stations on core segment of Middle" window.  **Single click** on line 1 in the "Stations on core..." window to select Station 1.  At the bottom of the window you will see that the button labeled "Update Profile" (tt) has become enabled.  If you click on the "Update Profile" button the elevations for stations in that segment of the railroad are recalculated.  ProTrak handles things differently for the core segment than it does for the other subdivisions

   a. For the core subdivision the recalculation starts at the selected station and continues to the last station.  For example if you click on Station 4 then click on the "Update Profile" button, all the elevations for station 4 to the end are re-calculated.

   b. For the subdivisions other than the core, the recalculation is done for the entire subdivision regardless of which station has been selected.

   It is important to do things in order – the core segment first, then each of the subdivisions off the core segment, then any subdivisions, off one of the subdivisions off the core segment, etc.

## Minimum Data Items - Stations

Station name (The named point is)
Zone Code (The zone code is)

## FAQs Stations

Section B of Appendix L deals with subdivisions, **stations**, zones and "Yd" yards.

## Other Stations

Now that we've set up station 1 – East Staging, we need to set up the balance of the stations.  Before we actually make changes to any of the entries, let's look at the list of stations as they exist right now (Figure 2-3).

The fifth entry – Flag Station – is just about what we want for JT Junction.  The problem is that if we look at the track plan in Figure Intro-1 in the introduction section, Flag Station is in the wrong place in the order of the stations to allow it to be used for JT Junction.  To fix this, single click on entry 5 to select it, click on "Edit" on the ProTrak toolbar and select "Move Station" from the dropdown list.  This will bring up the window shown in Figure 2-8.
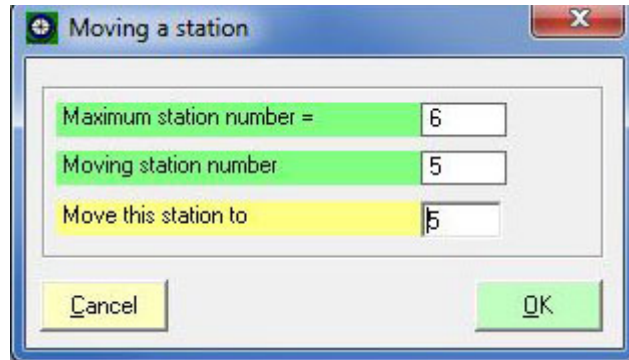
2-10

*Figure 2-8*

Change the "5" in the "Move this station to" data field to "3" by typing in the box, then click on "OK". Flag Station is now Station 3 in the list – just where we want it in order to change it to JT Junction. The purpose of moving the station is to put it in the correct place in the order of the stations.

Figure 2-9 shows what the "Stations on core segment of Middle" should now look like (for now, ignore the second from last column, the one headed "Milepost").

Stations on core segment of Middle

| # | Name | Spot | DS Tracks | Interval | Interval grade | Siding length | Siding grade | Elevation | Milepost | MP: Inches | Interval Car Factor | Siding Car Factor |
|---|------|------|-----------|----------|----------------|---------------|--------------|-----------|----------|------------|---------------------|-------------------|
| 1 | East Staging | EAS | staging | 0.0 | | 60.0 | 0.00 | 40.0 | 0.49 | 60.0 | 10 | 10 |
| 2 | First Station | FST | 2 | 100.0 | 2.00 | 120.0 | 0.00 | 42.0 | 2.31 | 280.0 | 10 | 10 |
| 3 | Flag Station | FLG | 1 | 120.0 | 2.19 | 0.0 | | 46.2 | 3.30 | 400.0 | 10 | 10 |
| 4 | Second Station | ST2 | 2 | 100.0 | 1.61 | 120.0 | 0.00 | 43.6 | 5.11 | 620.0 | 10 | 10 |
| 5 | New | | 1 | 78.0 | 0.00 | 45.0 | 0.00 | 43.6 | 6.12 | 743.0 | 10 | 10 |
| 6 | South passing track | SPS | 2 | 90.0 | -1.75 | 99.0 | -1.19 | 44.7 | 7.68 | 932.0 | 10 | 10 |
| 7 | South Staging | | 1 | 110.0 | -1.19 | 116.0 | -1.00 | 42.2 | 9.54 | 1158.0 | 10 | 10 |

*Figure 2-9*

Before we continue editing the data, we need to deal with the extra station in our list. We have only 6 stations on our railroad but the sample data has 7. If we look at the sample data, station 5 shows as 'New' which probably means that a station was added, but the adding process wasn't completed. The process to delete a station is similar to moving a station but there is no request to confirm the deletion so use caution.

To delete station 5, single click on entry 5 to select it, click on "Edit" on the ProTrak toolbar and select "Delete Station" from the dropdown list. Station 5 is now gone from the list of stations and all of the following station entries have been moved up one line..

OK, let's move on with entering the data. Double-click on entry 2 and you will see the "Changing station: 2 of: 7" window. Using the data from Appendix B, Table 1, change the data fields as required bringing them into line with what we want. Figure 2-10 shows what the "Changing station: 2 of:

2-11

6" window should look like when you're finished. Click on "OK" once all of the data for station 2 has been changed. Note that the field "From previous station" now shows 'East Staging' rather than 'East end'.
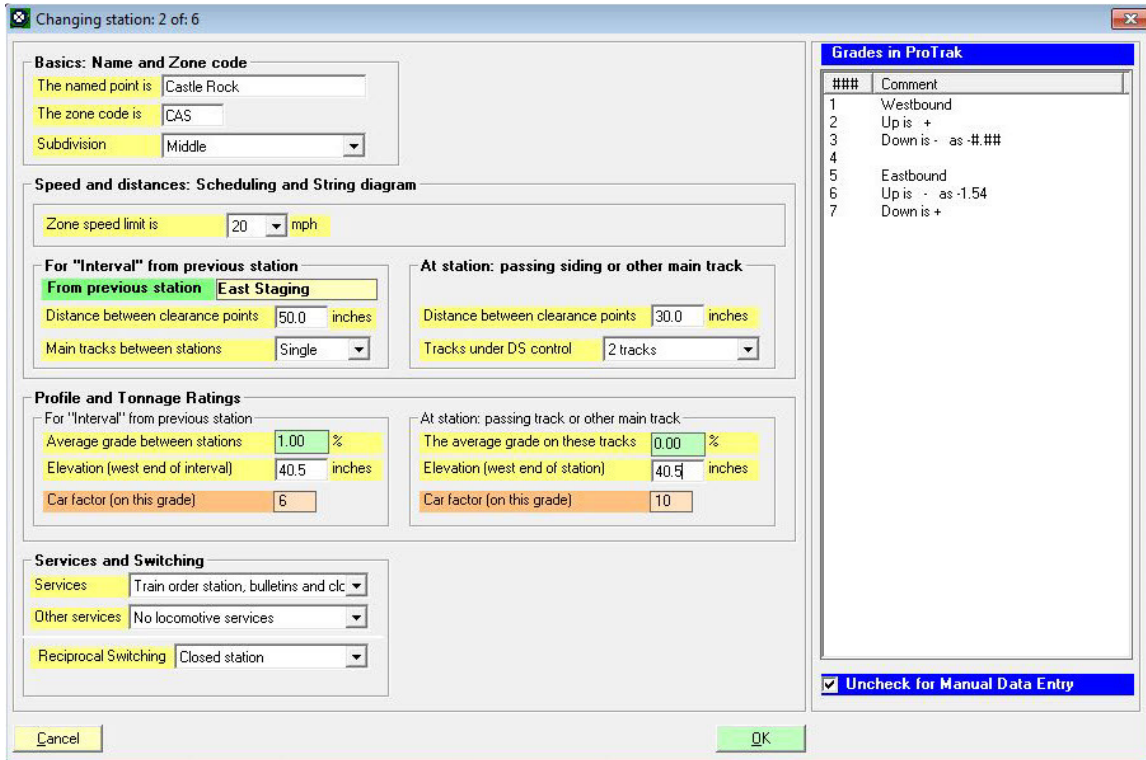


*Figure 2-10*

Continue with stations 3 through 6.  Note that the grade between Actonvale and West Staging is a down grade so the grade entry is a negative value of -1.57%.  Once you have made all the changes, your station list should look like that shown in Figure 2-11.  If it doesn't (with the exception of the columns headed "Milepost" and "MP inches"), go back and make the appropriate changes.  (A larger version of Figure 2-11 can be found in Appendix C).



Stations on core segment of Middle

| # | Name | Spot | DS Tracks | Interval | Interval grade | Siding length | Siding grade | Elevation | Milepost | MP: Inches | Interval Car Factor | Siding Car Factor |
|---|------|------|-----------|----------|----------------|---------------|--------------|-----------|----------|------------|---------------------|-------------------|
| 1 | EastStaging | EAS | staging | 0.0 | | 60.0 | 0.00 | 40.0 | 0.49 | 60.0 | 10 | 10 |
| 2 | Castle Rock | CAS | 2 | 50.0 | 1.00 | 30.0 | 0.00 | 40.5 | 1.15 | 140.0 | 10 | 10 |
| 3 | JT Junction | JTJ | 1 | 10.0 | 0.00 | 0.0 | | 40.5 | 1.24 | 150.0 | 10 | 10 |
| 4 | Berwick | BER | 2 | 60.0 | 1.00 | 25.0 | 0.00 | 41.1 | 1.94 | 235.0 | 10 | 10 |
| 5 | Actonvale | ACT | 2 | 50.0 | 1.50 | 30.0 | 0.00 | 41.9 | 2.60 | 315.0 | 10 | 10 |
| 6 | West Staging | WST | staging | 70.0 | -1.57 | 60.0 | 0.00 | 40.8 | 3.67 | 445.0 | 10 | 10 |

*Figure 2-11*

6.  One of the items that we've not dealt with so far in this window is the "Milepost" figures.  The calculation of mileposts involves some serious

2-12

math, but suffice it to say that if you change the fast clock ratio (Signals/ Fast-clock settings) your milepost will likely differ from the example here. If you need to change the fast clock settings, refer to the section titled "Fast Clock Settings" at the beginning of this chapter for instructions.

7.  If everything looks OK [6], click on "Close" to exit the "Stations on core segment of Middle" window.

We've one last chore to complete before we're finished setting up the railroad. The sample railroad that is supplied with ProTrak, the ES (or NSOU) railroad, has a number of subdivisions. At this point, with the exception of the "Middle" subdivision, we do not want the remaining subdivisions in our new railroad, so let's get rid of them.

8.  Select "The Railroad" from the ProTrak toolbar and then select "Subdivision Junctions, names and notes" from the dropdown list. The window shown in Figure 2-12 will appear.
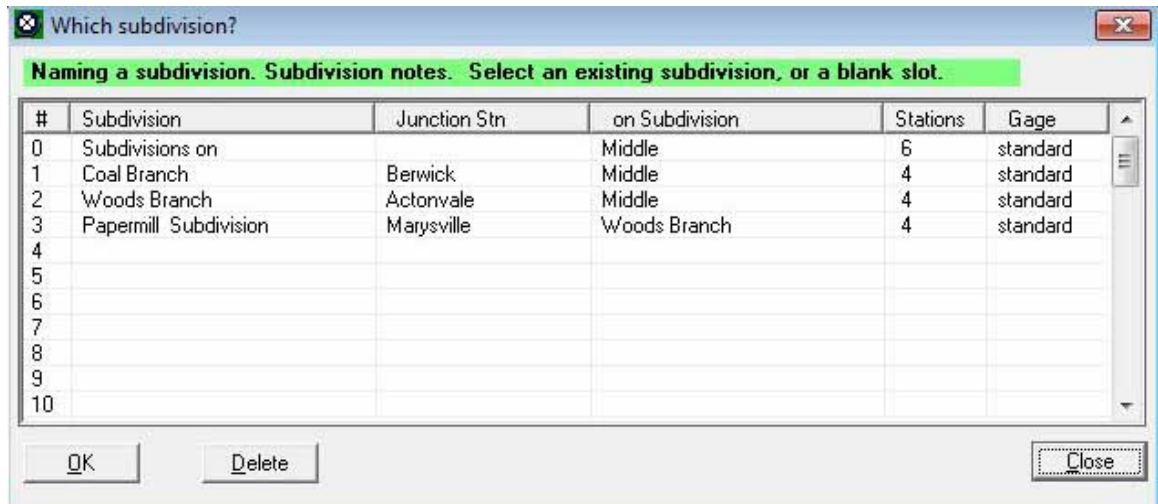


*Figure 2-12*

As you can see, there are four subdivisions listed. Subdivision 0 is the main subdivision – the one we've been working with. We need to delete the other three. Before we delete them, let's just take a look at something in the list. If you look at subdivisions 1 and 2, you will see that the column "on Subdivision" shows Middle. For subdivision 3, the

---

[6] If some of the calculated figures do not exactly match those shown in Figure 2-11 (Interval grade and Milepost for example), it is likely due to rounding and display issues. As long as the values you entered match those shown, all is correct.

"Papermill Subdivision", this shows "Woods Branch" clearly indicating that you can have a branch taking off from a branch, just as the real railroads do.  OK, on with the cleanup.

9.  As it is easier to do the deletions from the bottom up, click on entry 3 to select it, then click on the "Delete" button.  You will be asked to confirm your actions (see Figure 2-13).
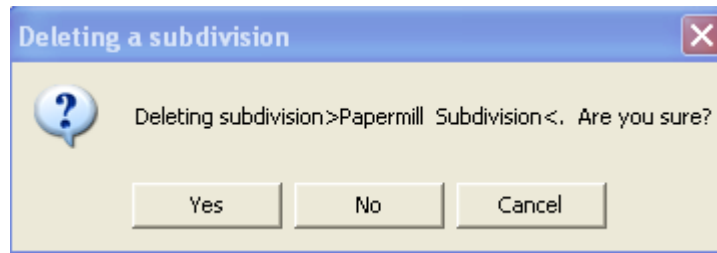


*Figure 2-13*

Click on "Yes" and you will see that entry 3 no longer exists.  Do the same to entries 2 and 1.  You should now see only entry 0 left on the list.  Figure 2-14 shows what your window should look like at this point.
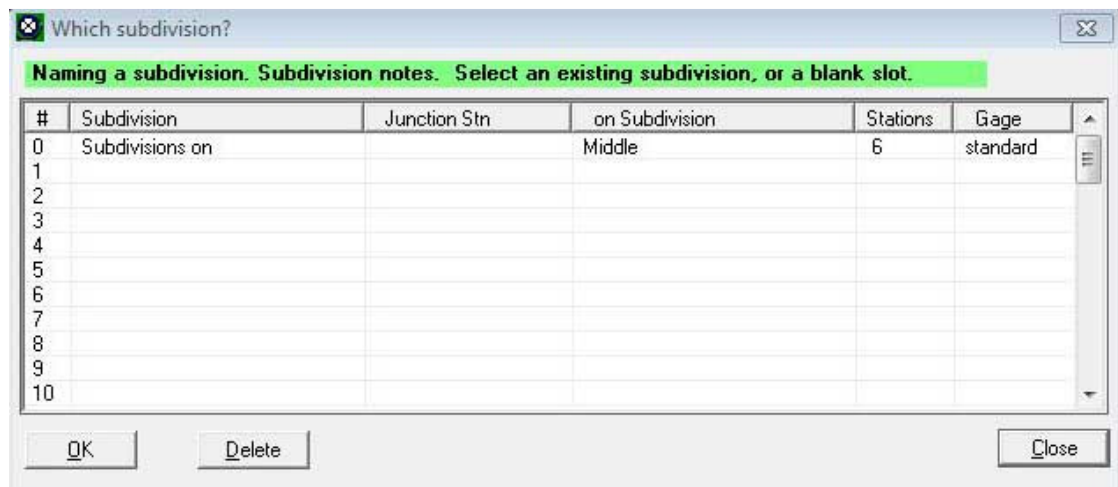


*Figure 2-14*

10. Click on "Close" to close that window to keep your screen uncluttered.  Note that if you click on 'OK' you will be asked if you want to create a new subdivision which is not what we want to do.

## Schematic Map

11. Let's do one more thing to confirm that we've got things set up correctly. ProTrak gives us the ability to look at a schematic map (or schematic diagram) of the railroad.  To do this, click on "The Railroad" on the ProTrak toolbar, then select "Schematic map of ProTrak Demonstrator" [7] from the dropdown list.
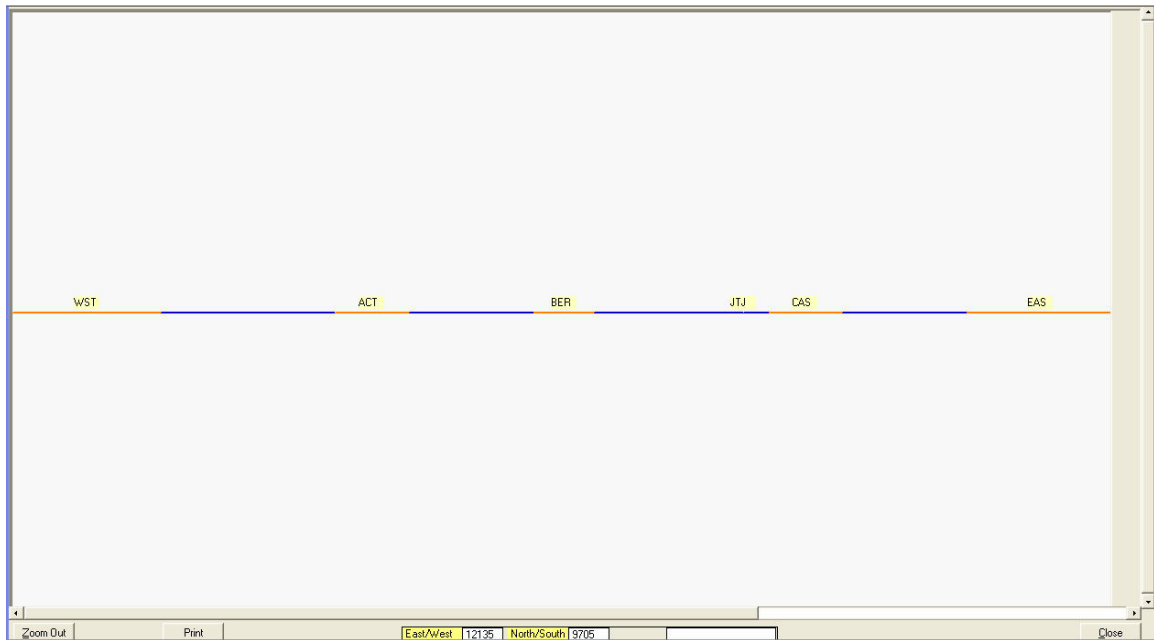


*Figure 2-15*

As you can see from Figure 2-15, we have the railroad set up in the same way as the drawing we showed you earlier in the introduction section, but without the details of sidings and industries.  If you look at the line representing the railroad, you can see it is in two colors –red and blue. The red portions represent the tracks at the station, while the blue portions represent the tracks connecting the stations [8].  This Figure may be difficult to see clearly since its size was reduced to fit on the page.  (A larger version of Figure 2-15 can be found in Appendix C).

A couple of other notes.  If you place the mouse arrow so that it is pointed on one of the stations, you will see that the station name appears in the box on the right at the bottom of the window.  The last note is that if you hover your cursor on a blank area of the schematic map, a help box pops up giving you directions on how to get more information.

---

[7] Note that this may also show "Schematic map of New Railroad". Which you get depends on whether you closed ProTrak and restarted it between chapters 1 and 2.
[8] A station will only appear on the "schematic diagram" if it is a place where trains can meet or pass.

Enough of this though, as it looks like we've got everything set up just the way we want it, so let's move on.

12. Click on "Close" to close the window with the schematic map.

**Summary**

In Chapter 2 you should have done the following:
- Adjusted the Fast Clock settings;
- Setup stations for your railroad;
- Added or deleted station information;
- Moved a station in the station order;
- Deleted unneeded subdivisions;
- Viewed the railroad in a schematic view

You have learned about the following:
- How to work with the Fast Clock Settings process;
- What a clearance point is and the importance of the point;
- What an interval is and how to measure;
- How to add, delete or move station within list;
- How to delete unneeded subdivisions;
- How to display a schematic diagram of the railroad.

Under "The Railroad" in the ProTrak menu you should be able to see:
- A schematic map of ProTrak Demonstrator;
- The stations on ProTrak Demonstrator;
- The subdivision junctions, names and notes;

We've now set up more of the "tombstone" data - stations this time.  We can now move on to Chapter 3 where we'll set up staging tracks for our railroad.