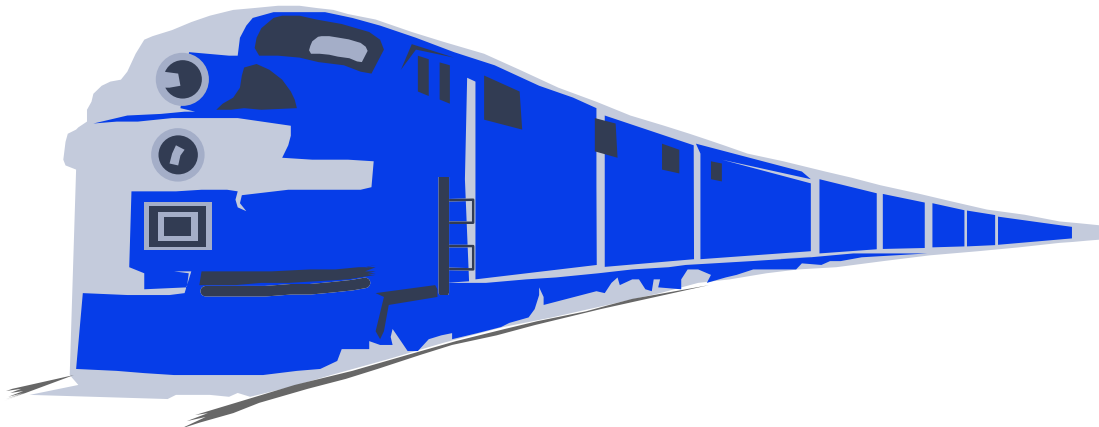




# **CAROUTE**

**Version 2  
Decapod Systems**



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## **1.0 General**

### **1.1 Installing the software**

#### **WINDOWS 98 Setup**

The software is written in Visual Basic for Windows 98. The software loads from the two diskettes provided and sets up a directory to run on your PC.

To Install the software on the PC:

1. Insert the floppy disk #1 into the floppy drive A.
2. Click on the WINDOWS EXPLORER icon to start File Manager/Explorer.
3. Click on the Floppy Disk Drive.
4. When the file list comes up, Double Click on the file named **SETUP.EXE**.
5. Follow the prompts to install the software.
6. The setup program will default to putting the program in C:\WINDOWS\START MENU\PROGRAMS\CAROUTE. I suggest you change the install directory to C:\CAROUTE. The software will always default to this folder when you start up the program. You may want to pick a folder and location that is convenient to store your data in.
7. Copy the sample data files from disk #2 to a directory on your PC, if you want to use them.
8. If you have CAROUTE files from Version 1, copy them to the directory where the program is installed. The input/output commands will always default to this directory.
9. To run the software, click on the START button at the lower left of the screen. Then CLICK on CAROUTE and within that menu, click on CAROUTE.

#### **WINDOWS 95 Setup**

To Install the software on the PC:

1. Insert floppy disk #1 into the A drive (or whichever drive you use for floppies).
2. Click on the WINDOWS EXPLORER icon to start File Manager/Explorer.
3. Click on the Floppy Disk Drive.
4. When the file list comes up, Double Click on the file named **SETUP.EXE**.
5. Follow the prompts to install the software.
6. The setup program will default to putting the program in C:\WINDOWS\START MENU\PROGRAMS\CAROUTE. I suggest you change the install directory to C:\CARWIN. The software will always default to this folder when you start up the program. You may want to pick a folder and location that is convenient to store your data in.
7. If the program tells you that some files need to be updated in order to install, you should click on OK. The software was developed in a Windows 98 environment and sometimes has trouble loading in early releases of Windows 95. It will update the files and may require you to re-boot your machine and restart the setup. The setup comes up with an obvious big blue screen, so it is easy to figure out that it is loading. Early versions of Windows 95 may need to be upgraded to be able to use this software.
8. Copy the sample data files from disk #2 to a directory on your PC, if you want to use them.
9. If you have version 1 of CAROUTE, copy your data files to the directory where the program is installed.
10. To run the software, click on the START button at the lower left of the screen. Then CLICK on CAROUTE and within that menu, click on CAROUTE.

**NOTE:** The software will always default to the directory where the program is located anytime you do any file saves or loads. If your data is not in this directory, you will have to be careful to always select the directory where your data is located.

## To setup a WINDOWS icon to run the software (Both Windows 95 and 98)

1. Open the Windows Explorer.
2. Go to the directory where the software is loaded. If you used the default, the directory is C:\WINDOWS\START MENU\PROGRAMS\CAROUTE.
3. Right Click (use the right mouse button) on the file name CAROUTE.EXE.
4. A menu will popup, click on the option "Create Shortcut".
5. Right Click on the new SHORTCUT file.
6. Click on RENAME, type in CAROUTE (or whatever you want to call the program).
7. Click and hold down the mouse button on the shortcut file; drag the file to the folder called DESKTOP on your Explorer window.

To run the software with the icon, simply double click on the icon.

To Uninstall the software

To remove the software if you want to reinstall it or for some other reason, open your "Settings" menu and click on "Control Panel". Run the application "Add/Remove Programs" to remove the software and all ties to it.

## 1.2 Sample Data

Included on the system disk is a set of files containing the data needed for using the system with a simple model railroad. The railroad and data are described in the appendix. You can use this data to generate sample switchlists for the system as an example. You can try out the system with this sample data to see how it works.

Copy the following files from Disk #2 to a directory on your PC. Then start the program, go to that directory and load the SETUP file.

<b>SETUPA</b>	setup file for railroad A
<b>TRAINSA</b>	train data for railroad A
<b>TOWNSA</b>	town data for railroad A
<b>CARSA</b>	car data file for railroad A
<b>CARSA2</b>	alternate car data file for railroad A
<b>INDUSTA</b>	industry data for railroad A

## 1.3 Hints for setting up your data.

If you have a very large layout, a suggestion might be to break your data down into multiple sets to represent the system. For example, if you have cars such as coal hoppers that you want to move in unit trains or special coal only trains, you could place these movements and cars in a separate set of files. Although it is entirely possible to put passenger operations and freight operations in the same set of files, I would suggest strongly that all passenger operations be in a separate set of files. Separating the data this way has three advantages:

1. It saves some memory allowing more total cars on the layout.
2. It avoids having a passenger car assigned to a coal train or a hopper inadvertently assigned to the Broadway Limited.
3. It allows you to easily annul some trains if a full operating crew does not show up for a session. Just set the passenger (or whatever) switchlists aside for the next session.

The program tries to assign cars to the first train in the schedule that picks up in the location town for the car and sets out in the destination town for the car. Therefore, trains should be in sequence of preference for various moves.

Cars always are shipped from the same industry they entered on the previous session.

The switchlist is printed in the order that the trains were entered into the data file. It might be convenient to place the trains in a certain order.

Trains generally should originate, terminate, or pass through a yard to insure that transfers between trains occur. A common example might be a through freight that originates at an interchange and terminates at another interchange. It would probably stop at a yard along the way to drop off and pick up cars for local service. Another example would be a local that originates in a yard and goes out on the line to do its work. It then might return to the yard to end its journey.

Generally, the direction codes assigned to trains should match the sequence of towns entered for the train. That is, an eastbound train with a direction code of 1 must have the town codes in descending order such as 10, 7, 5, 4, 1. Westbound trains must have the town codes in ascending order.

As with everything else, there is a limit as to how large a railroad can be modeled. The amount of data that can be stored is limited by the amount of memory that the BASIC language can address, not the memory in your computer. In addition, for practical purposes, the data can get very difficult to manage if it gets too large.

The following data limits exist in the programs:

	Number
Towns	200
Industries	300
Trains	100
Cars	1500

This manual will illustrate computer prompts in upper case characters and expected or sample responses in lower case characters in parenthesis. For example, to indicate press RETURN, the manual will have (return)

Computers are very dumb machines. They require that data be entered exactly as they expect it, in order to understand it. They consider lower and upper case characters as two different things. Therefore, we need to establish a standard. It is especially necessary to be consistent when individual data is entered. This primarily applies to car types. The car type data entered in the car file must be the same case (lower or upper) as is entered for the car types handled by each train. If you use upper case in one, use it in the other two. If you are not consistent, the program will not be able to assign cars to trains for building switchlists.

The program assumes that the printer is operating as a parallel printer on LPT1.

### 1.4 Outline for developing your data

To develop the system for your railroad, the following steps should be followed:

**FIRST:** Develop a point to point schematic for the railroad. The system assumes that the railroad is point to point. It does not matter if the track plan is really a loop, you now need to describe it logically for operation. It needs to be point to point for shipping purposes.

**SECOND:** Locate the industries on the schematic of the railroad. Consider that larger industries may be broken down into two or more industries to make it easier to assign destinations to specific car types. Trains serve the industries.

**THIRD:** Assign town names to locations on the layout. Create the town data file. Print a listing of the file with the assigned codes for the town names. These will be used for entering the industry data.

**FOURTH:** Enter the industry data. Remember, you can use industry names more than once to allow different tracks or spotting locations. When this is complete print a listing of the industries that will have the names and index numbers.

**FIFTH:** Develop a pattern or group of trains to serve the railroad. The trains need to make all the moves required to serve your industries. For example, you may need a train to run from the main yard to the interchange in Town 1 and another, of course, to run from the interchange to the yard. Then you may want a train to run from the yard to serve a

## Car Routing System

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bunch of industries in Town 3 and return. Each of these should probably be a separate train to the system. The industry code numbers assigned by the program when the industries are entered are used to create the car routing list. This is the set of destinations that the train serves.

**SIXTH:** Enter the cars. Each car will have a list of up to 20 destinations. The car will be routed to each destination on the list. When the last destination on the list is reached, the program will route the car to the first destination on the list and start the sequence again. The industry code numbers assigned by the program when the industries are entered are used to create the car routing list. This is the set of waybills that the car uses.

## 2.0 Systems Operation

### Starting a session

Double click on the icon for CARWIN if you created one. The program will start. If you did not create an icon, click on the ‘Start’ button, then the ‘Programs’ menu and find the program called ‘CARWIN’. Click on this to start the program.

### 2.1 System Menu (and Setup File)

When the program executes, the following screen will display.

The screenshot shows the CAROUTE system menu interface. It features a title bar with the text 'CAROUTE' and a small icon. Below the title bar, there are several input fields and buttons. The input fields are arranged in two columns. The left column contains labels for 'Railroad Name', 'Setup File', 'Industry File', 'Town File', 'Train File', 'Current Car File', 'Alternate Car File', and 'Lines Per Page'. The right column contains buttons for 'Convert From DOS', 'Editor', 'Switch List', 'New Setup', 'Save Setup', and 'EXIT'. The 'Setup File' field is highlighted with a dotted border. The 'Railroad Name' field contains the text 'AA RR'. The 'Setup File' field contains the path 'C:\AJim\PRR\vbcardat\Setupvb'. The 'Industry File' field contains the path 'C:\AJim\PRR\vbcardat\Industac'. The 'Town File' field contains the path 'C:\AJim\PRR\vbcardat\townsvb'. The 'Train File' field contains the path 'C:\AJim\PRR\vbcardat\Trainsvb2'. The 'Current Car File' field contains the path 'C:\AJim\PRR\vbcardat\Carsvb1'. The 'Alternate Car File' field contains the path 'C:\AJim\PRR\vbcardat\Carsvb2'. The 'Lines Per Page' field contains the number '56'.

Field/Label	Value
Railroad Name	AA RR
Setup File	C:\AJim\PRR\vbcardat\Setupvb
Industry File	C:\AJim\PRR\vbcardat\Industac
Town File	C:\AJim\PRR\vbcardat\townsvb
Train File	C:\AJim\PRR\vbcardat\Trainsvb2
Current Car File	C:\AJim\PRR\vbcardat\Carsvb1
Alternate Car File	C:\AJim\PRR\vbcardat\Carsvb2
Lines Per Page	56

#### 2.1a Getting started, the SETUP file

The program is designed to ease your data entry after you set the system up. The key to this is a master file called the ‘setup’ file. This file will contain the names of all of your data files, your railroad name, and the number of lines to print per page of output. It is probably a good idea to create this file after you create your first data file. When you save a data file such as the car file, it will write the name of the file in the appropriate box on the main screen. Then if you click on ‘Save Setup’, you can save a setup file. Type the name of your railroad and the number of lines in and then save the file using name to describe this set of data.

Create this setup file first and save it. The next time you enter the program, load it, and it will automatically read all of the data files you have already created. This helps your data entry. The program outputs the names that go with number indexes for industries, towns, and trains on the other screens that use this data when it is available.

When you are ready to begin running switch lists, the setup file is the only file you have to load. The program will use the information in the setup file to load all the data in all other files.

#### 2.1b Commands and Buttons

**Load Setup File** This loads whatever setup file you want to use. The setup file is described in section 2.1a. It makes it easier to load all your data with one file.

**Load Industry File** (also **Load Train File, Load Town File, Load Current Car File, Load Alternate Car File**) This loads the respective data file you want to use. These are not used when you use a setup file containing the files names. These can be used to change individual files within a given setup, or to load a single file for editing.

**Railroad Name** The railroad name box is where you can type in your railroad name as you want to appear on the switchlists.

**Lines per Page** This tells the system how many lines to print per page on any output. Generally I use about 62 lines per page. However if you are using an older printer with larger type, you may want to use less lines per page, perhaps 56.

**Exit** Press the exit button to end the session. You will be asked whether you want to save the setup file or not. If you have run a switchlist, you should always save the setup file.

**Alternate Car File** This file is used by the system to backup and rotate the car data between sessions. This is described in some detail in section 7. Basically, the program reads the current car file, writes the alternate car file, and then reverses the car file names in the setup file. When starting out, the Alternate Car File can be totally empty. It will be written the first time you generate a switchlist. However, you **MUST** put a file name in the alternate name block on your setup menu or the program will end in an error when you try to save a switchlist.

**Redo Previous List** This button reverses the current car file and the alternate car file, and then causes the program to re-read the car file. It essentially restores your backup car file to the status before the switchlist you have just run. This is only necessary if you have saved the car files when you exited the switchlist generator. It is here only for dire emergencies. After doing this, you need to go to the switchlist menu and generate a new switchlist.

**Loading Files** These buttons are used when you want to change the files used for the switchlist. When you click on the Load Industry File button, for example, you can choose a different industry file to read in and use. The program uses the standard Windows interfaces to select a file. When you click OK, the program will try to read the file. You should only load files that already have data in them. If you want to create a new file, go to the editor first and enter the data and save the file.

**Switchlist** This button takes you to the switchlist generator screen, see section 7.

### 2.1c Loading an existing setup

Click on the "Load Setup File" button. Using the standard Windows interface, identify the your setup file, click on OPEN and the setup file will open. In addition to loading the setup file, **the program will read all of the data files at the same time.** It will display all of the information from the setup file in the window.

### 2.1d Generating a new system

If you are just starting out, you have no data setup file to read in. The best way to begin would be to go to the editors for the various data files and create new files. When you save a file from the edit screen, its name will be added to the setup file screen. You do not have to do all the data entry at once, but you cannot run switchlists until all files are created. You should add the number of lines to print to the setup file screen and you may also add your railroad name. These can be changed at any time. Be sure to save your setup file also before exiting the program.

You may want to experiment with the sample data sets included on the program disk, before beginning your own data entry. They have been loaded to the directory where the programs are stored. SETUPA is the setup for Railroad A that is described in the appendix. Follow the instructions for loading an existing setup.

### 2.1e Changing an existing setup

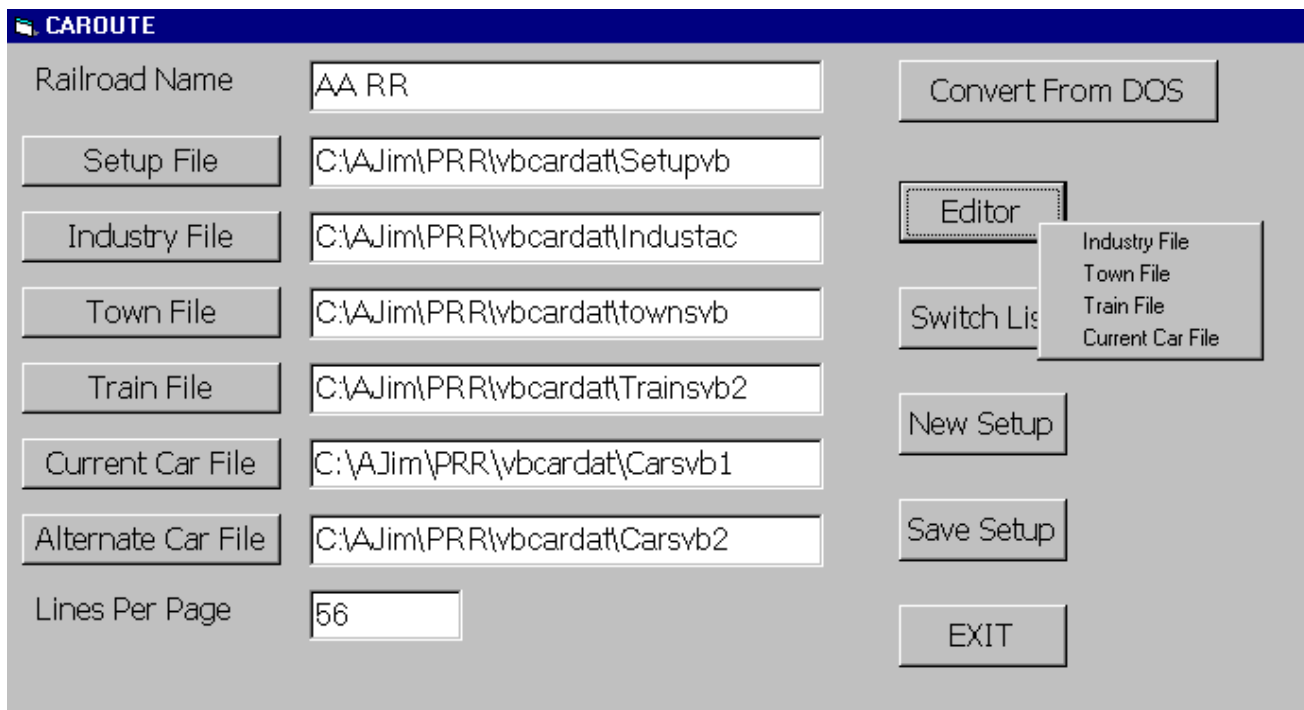
There are two ways to change the setup file:

1. First, the best way is to use the "LOAD" buttons along the left side of the window for the particular file you want to load. This will change the data file name for setup and WILL also read in the new file.
2. Second, you can simply type a new name into the proper block. This will change the data file name for setup, but WILL NOT read in the new file.

In order to save the new file names to the setup file, you must click on the "SAVE SETUP" button in either case.

## 2.2 The Editor Button

Click on the "Editor" button and a submenu will appear that displays the 4 file types used in the system as displayed below.



Move the mouse to the file type you want to edit and click on it when the name is highlighted. It will bring up the edit screen for that file type. You cannot edit directly the alternate car file. It is a copy of the current car file and serves as a backup. See the section on running a switchlist for a description of how this is used.

## 2.3 Navigating the data files

When editing the files, the general movement within the files is basically the same for each type of data.

**UP** button: Click on this button to move "up" in the file with the first entry considered the top. Each click will cause the next previous data to be displayed until the first entry in the file is reached. Clicking on the up button at the first entry will generate a message telling you that you are at the top of the file.

**DOWN** button: Click on this button to move "down" in the file with the last entry considered the bottom. Each click will cause the next data to be displayed until the last entry in the file is reached. Clicking on the down button for the last entry will generate a message telling you that you are at the end of the file.

**GO TO INDEX:** Click on this button to move to a specific entry. You will be prompted to enter the index number for the entry. Click on the OK button and the edit screen will move to that entry.



### **Saving Files**

Click on the **SAVE** button. The standard WINDOWS save screen will pop up. The current file name will be displayed along with the current directory. To save the file with the same name in the same directory click on the SAVE button. To save the file with a new name, type the new name over the old one. To save in a different directory, use the mouse to select the new directory.

### **Return to Main Menu**

When all editing is completed on the file, click on **RETURN TO MAIN MENU** to return to the main menu screen. You will be prompted to save your data if you have not saved it.

## **2.4 Editing the data files**

### **Adding Data**

To add to the data, type in the information as described in the data sections for each data type and click on **ADD**. The TOTAL NUMBER OF records will increase by one. To continue to add data simply type in the data and click on ADD. When all additions are complete, save the updated file.

### **Changing Data**

Changing data is very easy with this version. Use the UP/DOWN or GO TO INDEX buttons to display the data for the element you want to change. Type over the data in any box that you wish to change. Click on the UP or DOWN button or the SAVE FILE button and the data will be changed.

### **Deleting Data**

To delete data, use the UP/DOWN or GO TO INDEX buttons to display the data you want to delete. When you have verified that this is the correct data element, click on the DELETE button and the data for that element (car, train, town, or industry) will be deleted. The number of records will be decreased by 1 and the indexes for all records following the one deleted will be reduced by 1.

## **2.5 Listing the file**

Before listing the file, you must enter the number of LINES PER PAGE on the main setup up screen and SAVE the setup file. Click on the PRINT button and the system will display a submenu for PRINTER or DISK FILE. Click on the selection and the program will output the data. Printing to a disk file puts a listing of the data in text format in the same layout as the printed file, into a disk file. This is not the same as saving the car data file.

### 3.0 Town Data

The list of towns on the railroad should be entered first to generate the town codes for use in the industry data. The attached schematic in the Appendix outlines the town for the railroad represented on the enclosed data files. On Railroad A in the appendix, the sequence is Ambridge, Monongehela, Bentleyville, and Beavercreek. A town for purposes of the system may be only part of a location. For example, assume Bentleyville has 2 factories, a freight station, and a power plant, and the power plant gets a lot of hopper cars. You enter the towns and the system applies numbers to the towns. The town names are used on the switchlist to help operators locate industries.

### 3.1 Entering town data

The town data screen displays all of the data for one town. The sample below is town 3 on Railroad A in the index. Any data displayed in a white boxes can be changed. Any data displayed with a gray background is for reference and will change when the data in the corresponding box is changed.

Go to your layout and write down a list of towns starting with the first town and working your way along the railroad from east to west.

Click the Town File button on the Editor submenu and the program will bring up the town editor screen.

1	AB-31
2	AM-21
3	AB-test
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	

1. Type in the town name in the first box at the left side of the screen.

2. Decide if you want to print a switch list for this town. If yes enter a 1 in the box labeled ‘Print Code’ underneath the town name. Otherwise leave a 0 (zero) in this box. Note that train switchlists are printed for all trains, and town switchlists are optional. The town switchlists shows the work for all trains in the town. Generally you will probably only want to print town switchlists for the towns where operators other than train crews do the local work.
3. If yes for the print code, enter the code numbers for the trains in the order you want them to print starting in the upper left corner of the boxes under ‘Schedule of Trains to Print’. You may enter up to 20.
4. Click on the ADD button to store the data in the computer memory.
5. Follow the same procedure for the next town.
6. When all data for this session is entered, click on the SAVE FILE button to write the file to the disk.
7. Click on the PRINT button to print a list of the towns with their town codes assigned for use in entering industry data.

The town name is the name that will appear on the switchlist for trains. It may be up to 25 characters long. This sample displays the Bentleyville for Railroad A in the examples.

The print code tells the system whether or not to print town switchlists for this town. A ‘0’ means do not print the town switchlists for this town, and a 1 means to print the switchlists for this town.

The schedule of trains to print is a list of the trains serving the town that should be included on the town switchlist. It is used only if the print code is set to 1. There are two columns in this list allowing for up to 20 trains. The order of the trains on the list is the order they will be printed on the town switchlist. This may help your yard operators plan their next moves by giving them a list of trains with setouts and pickups in order. This section must have a train index number or a zero in every box.

### 3.2 Editing the Town Data File

Click the Town File button on the Editor submenu and the program will bring up the town editor screen.

The file name can be changed on the setup menu or when saving a town file on the town data editor screen.

The total number of towns is maintained by the system. This will increase or decrease as you add or delete towns.

Any or all items in white boxes can be changed on the editor screen. After all changes for this entry have been made, click on the UP, DOWN, or GO TO INDEX buttons to change the data for this town.

Industries can be added to the file at any time. Simply type the data for the new town over any existing data and click on the ADD key.

To remove a town, use the UP, DOWN, or GO TO INDEX buttons to display the data for that town on the screen window. Then click on the DELETE key to remove the town from the data. A word of **caution** here. When a town is deleted, all town numbers for towns following it in the file are decremented by one. Hence you probably need to change the town codes for some industries whenever you delete an town.

When all changes to the town data have been made, click on the SAVE FILE button to write the changes in the file.

### **4.0 Industries**

Industries are the destinations and shippers on the railroad. An industry, for terms of this system is any location that receives and ships cars. This includes yards, team tracks, and interchanges. It could also include passenger facilities when cars such as diners, express, or sleepers are routed in and out of locations. Industries are described by name and located in the various towns by town code number.

A yard is unique industry. The program will send cars to a yard when they cannot travel to the current destination in one train. They will be dropped off at the yard and picked up by another train to move on later.

If you have a layout with multiple yards, you can route the cars via specific yards to insure that they move in the right directions to make connections.

### **4.1 Entering industry data**

Go to your layout and write down a list of industries starting with the first town and working your way along the railroad from east to west. Include the capacity of the siding in number of cars and the town where the industry is located.

Click the Current Industry File button on the Editor submenu and the program will bring up the industry editor screen. Note that the types of data are explained in detail in the following sections.

Industry Editor

Current File C:\AJim\PRR\vbcardat\Industar

Total Industries 11

Industry

1 Interchange PRR

Town 1 Ambridge

Capacity 20

Yard Code 0 No

Layovers 1

Up

Down

Add

Delete

Go To Index

Save File

Print

Return to Main Menu

1. Type in the first industry name in the first box at the left side of the screen.
2. Type in the town code in the next box on the left, using the codes assigned by the program when the town data was entered. It is helpful to have a printed listing of the towns with their assigned codes when you do this.
3. Enter the siding capacity in number of cars.
4. Enter the industry type, 0 for active, 1 for yard. See the explanation below for type of industry.
5. Enter the number of layovers for the industry.
6. Click on the ADD button to store the data in the computer memory.
7. Follow the same procedure for the next industry.
8. When all data for this session is entered, click on the SAVE FILE button to write the file to the disk.
9. Click on the PRINT button to print a list of the industries with the assigned destination codes. This is needed to complete the car waybills.

## 4.2 Industry Characteristics

The industry name is the name that will appear on the switchlist for the industry. It may be up to 25 characters long. This example displays the PRR Interchange for Railroad A in the examples.

The town is entered by entering the index number for the town in the box. The actual town name will be displayed next to data. The town indexes are assigned by the town file editor. This is why it is necessary to enter the towns data and print a list of it before entering the industry data.

Capacity is the number of cars that the industry can hold.

Industry type describes the inherent characteristics of the industry. There are currently 2 possible types of industries:

1. Enter a 0 for an active industry. Most of the industries are of this type. Cars are only routed to these industries based on waybill routings.  
Note: Interchanges with other railroads are considered active industries in this system.
2. Enter a 1 for a Yard. A yard location is a place that can be used as an intermediate transfer point for one train to drop off cars and another train to pick them up and move them to a final destination. It is the only place to transfer cars from one train to another. A yard for this purpose may be an actual yard or one end of a siding or passing track in a junction. If a train cannot be found to move the car from its location to its destination, the car will be routed to a "yard". The assumption is that another train will exist to move the car on to its destination in the next session. Waybills may specifically make these routings, or the system will try to make them.

**Note: Interchanges with other railroads are active industries in this system, not yards.**

The number of layovers is the number of sessions the car will stay at an industry to be loaded or unloaded. A (1) means that the car will be processed (loaded or unloaded) between sessions and will be moved at the next session. A (2) means that the car will not be moved again until the second session from the one it is set out in. A 3, 4 etc. works the same way. There is no limit on the number of layovers, but remember, each car will stay that number of sessions before it moves again. Placing a large number such as 20 will probably not serve much practical purpose.

### 4.3 Car Types Used by the industry

With this system, all routing is done by the car waybills. If the waybill routes the car to the industry, the industry will accept it. There is no data to check if the car is appropriate at an industry.

### 4.5 Loads and empties

The waybill attached to the car specifies whether it is a load or empty at this destination.

### 4.4 Shipping destinations for industries

After the number of layovers has elapsed, the car is routed to the next destination on the waybill list

### 4.6 Editing industry data

Click the Current Industry File button on the Editor submenu and the program will bring up the industry editor screen.

The screen displays all of the data for an industry.

Any data displayed in a white box can be changed. Any data displayed with a gray background is for reference and will change when the data in the corresponding box is changed.

The file name can be changed on the setup menu or when saving an industry file.

The total number of industries is maintained by the system. This will increase or decrease as you add or delete industries.

Click on the UP, DOWN, or GO TO INDEX button to enter the changes for this industry.

When all changes to the industry data have been made, click on the SAVE FILE button to write the changes in the file.

## Car Routing System

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Industries can be added to the file at any time. Simply type the data for the new industry over any existing data and click on the ADD key.

To remove an industry, use the UP, DOWN, or GO TO INDEX buttons to display the data for that industry on the screen window. Then click on the DELETE key to remove the industry from the data. A word of **caution** here. When an industry is deleted, all destination numbers for industries following it in the file are decremented by one. Hence you probably need to change all of the destination lists for all other industries whenever you delete an industry. In many cases, it may work just as well to remove the industry from the routing lists for the cars and ignore it. That way all other industry indexes are still valid.

## **5.0 Current Car File**

Click the Current Car File button on the editor submenu and the program will bring up the car editor screen.

### **5.1 Starting a new rolling stock file**

Enter the car information for a car in the white blocks displayed on the screen.

The ROADNAME is the identification marking of the railroad that owns the car. It may be up to 7 characters. Examples are

PRR, Pennsylvania RR,  
NYC, New York Central  
B&O, Baltimore & Ohio,  
CB&Q, Burlington

The NUMBER is the car number. This may be up to 8 digits and/or characters.

The TYPE is the car type code. The following is a suggested list of character codes. Because each character takes up memory, The system only allows codes up to 3 characters. These are used on the switchlist to help identify the car by type. You should codes that are familiar for your operators.

X = boxcar	G = gondola
H = hopper	F = flatcar
R = reefer	L = covered hopper
T = tank car	S = stock car
E = express	P = pullman
D = diner	

You can add any additional codes you might need or you can use all your own codes.

The CURRENT LOAD STATUS sets the starting load/empty status. A "1" means the car is loaded and a "0" means that it is empty. For example, if hopper cars are starting at the coal mine, they should be coded as loaded cars. On industries that accept both loaded and empty cars, the starting status may not matter much.

The CURRENT LOCATION is the industry code number where the car will be located when the program begins operation. This is the code number assigned by the editor to each industry when the industry was loaded. It is a number from 1 to the maximum number of industries.

The CURRENT DESTINATION is the industry code number for a destination for the car when the program begins operation. This can be the same as the location, or it can be a routing. If the car is to be loaded and located in a yard, you must enter a destination that is not a yard. This is the code number assigned by the editor to each industry when the industry was loaded. It is a number from 1 to the maximum number of industries.

The CURRENT LAYOVERS is how many sessions the car has been at its current location. When entering a new car, this can be left at 0.

A sample input for a car might be:

Car Editor

Current File
C:\AJim\PRR\vbcardat\Carsvb1
Destination Waybills

Total Cars 25

Roadname Number Car Type

1

Current

Location  Olsen's Merchantile

Waybill Step

Layover

Up

Down

Add

Delete

Go To Index

Save File

Print

Return to Main Menu

1	Interchange PRR	1	Load
5	Olsen's Merchantile	0	Empty
1	Interchange PRR	1	Load
6	Spang Chalfant Pipe Mfg	0	Empty
1	Interchange PRR	1	Load
7	Freight Station	0	Empty
9	Car Shops	1	Load
1	Interchange PRR	0	Empty
11	Derrick Envelope	1	Load
0		0	
0		1	
0		0	
0		1	
0		0	
0		1	
0		0	
0		1	
0		0	
0		1	
0		0	

When you have completed the entry for a car, click on the ADD button and the car will be added to the list. The display will not change, the number for total number of cars will increase by 1. To enter another car, type the new information over the information in the boxes and click ADD again.

Important note: The destination list section must have an industry index number or a zero in every box and the load/empty section must have a 0 or 1 in every box.

## 5.2 Loading an Existing Rolling Stock File

The procedure for loading an existing file is described in the main editor screen section.

### File Information

There are two items of information displayed on the editor screen that cannot be changed directly. At the top of the screen, the FILENAME is displayed with a gray background. This is the name of the file you are currently editing. If you save the file as a new name this name will change. To edit a different file, you must return to may setup screen.

Below the filename, the TOTAL NUMBER OF CARS is displayed. This is maintained by the editor program and is changed automatically when you add or delete cars.

### Navigating the file

**UP button:** Click on this button to move “up” in the file with the first entry considered the top. Each click will cause the next previous data to be displayed until the first entry in the file is reached. Clicking on the up button at the first entry will generate a message telling you that you are at the top of the file.

**DOWN button:** Click on this button to move “down” in the file with the last entry considered the bottom. Each click will cause the next data to be displayed until the last entry in the file is reached. Clicking on the down button for the last entry will generate a message telling you that you are at the end of the file.

**GO TO INDEX:** Click on this button to move to a specific entry. You will be prompted to enter the index number for the entry. Click on the OK button and the edit screen will move to that entry.



### Saving car Files

Click on the SAVE button. The standard WINDOWS save screen will pop up. The current car file name will be displayed along with the current directory. To save the file with the same name in the same directory click on the SAVE button. To save the file with a new name, type the new name over the old one. To save in a different directory, use the mouse to select the new directory.

### Return to Main Menu

When all editing is completed on the car file, click on RETURN TO MAIN MENU to return to the main menu screen.

## 5.3 Editing the Car file

**Adding Rolling Stock Data:** To add to the car data, type in the information as described in entering a new car and click on ADD. The TOTAL NUMBER OF CARS will increase by one. To continue to add cars simply type in the data and click on ADD. When all additions are complete, save the updated car file. The additions may be typed in when any car information is displayed.

**Changing Rolling Stock Data:** Changing car data is very easy with this version. Use the UP/DOWN or GO TO INDEX buttons to display the data for the car you want to change. Type over the data in any box that wish to change. Click on the UP or DOWN button or the SAVE FILE button and the data will be changed.

**Deleting Rolling Stock Data:** To delete car data, use the UP/DOWN or GO TO INDEX buttons to display the data for the car you want to delete. When you have verified that this is the correct car, click on the DELETE button and the data for the car will be deleted. The number of cars will be decreased by 1 and the indexes for all cars following the one deleted will be reduced by 1.

## 5.4 Listing the file

Before listing the file, you must enter the number of LINES PER PAGE on the main setup up screen and SAVE the setup file. Click on the PRINT button and the system will display a submenu for PRINTER or DISK FILE. Click on the

## Car Routing System

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selection and the program will output the data. Printing to a disk file puts a listing of the data in text format in same layout as the printed file, into a disk file. This is not the same as saving the car data file.

### **6.0 Train Data**

On this system a schedule means the sequence of towns that a train must service regardless of time. If you want to include times in your schedules, you can easily add them manually.

Train data is entered to identify the trains that will operate on your railroad and to assign them to specific service. Generally, a train must have a direction and a list of industries it will service. This system is designed to route car movement and makes no provision for timetables for train moves. In addition, the only trains that it is interested in are trains that move rolling stock from one location to another using a switchlist. This means that a train which runs over the railroad, but is not expected to make any pickups or setouts, does not need to be included.

#### **6.1 Sequence of Trains in File**

The sequence that you enter trains into the data file affects two things. First, the switchlists are printed out in this same sequence. Second, a car is assigned to the first train that can make its required moves. If you have two trains that might do the same job, but one is the primary service and the second is only a backup, the primary one should be first in the file.

#### **6.2 Editing Train Files**

Click the Train File button on the Editor submenu and the program will bring up the train editor screen.

**Train Editor**  
Printer Options

Current File C:\AJim\PRR\wbcardat\Train Industries Served

Total Trains 5

Train Name

Direction  Eastbound

Max Length

8	yard
1	Interchange PRR
2	Freight Station
3	Newman Packing Co.
4	Herring's Coal and Fuel
5	Olsen's Merchantile
6	Spang Chalfant Pipe Mfg
7	Freight Station
8	yard
1	Interchange PRR
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	
0	

This screen displays all of the data for a train. This is train 3 on Railroad A in the index. Any data displayed in a white box can be changed. Any data displayed with a gray background is for reference and will change when the data in the corresponding box is changed.

### 6.3 Entering train data

The file name can be changed on the setup menu or when saving a train file. The total number of trains is maintained by the system. This will increase or decrease as you add or delete trains.

The train name is the that will appear on the switchlist for trains. It may be up to 25 characters long. This sample displays the WB-2 for Railroad A in the examples.

The Direction designates a standard east or west routing for the train. A "1" means that this is called an Eastbound train and a 2 means that it is called a Westbound train. In addition, the logic of the program assumes that town #1 is the east end of the railroad and the last town entered is the west end. If you do not follow these conventions, the car assignments to trains may not work correctly.

The Max Length is the maximum number of cars the train may contain during its travels. It limits the amount of work a train does and maintains the maximum as it goes about its duties. For example, if the maximum length is 10 cars, it can leave the yard with only 10 cars. However, if it sets out 4 cars at the first industry, it can pick up 4 cars to maintain the 10 car maximum. This feature also allows a morning train and afternoon train to service the same industries. Generally,

if you use this feature to limit train length, you should allow a second train for any short trains to make sure the moves can be made. If the second (or third) train is empty, just don't run it.

### 6.4 The Industries Served by the train

Important note: The industry list section must have an industry index number or a zero in every box.

On this system a schedule means the sequence of industries that a train must service regardless of time. If you want to include times in your schedules, you can easily add them manually.

Passenger trains that handle express cars, sleepers, diners, or mailcars (or even coaches) that are moved or added to the train should be put into the system. Passenger trains that run with a fixed consist need not be entered. Also such things as unit coal trains may not need to be entered, since they always follow the same pattern. Any train can be entered, however, if you want the switchlist generated.

Cars will be assigned to the **FIRST** train with available capacity, that makes pickups at the industry where the car is located and continues to the industry that the car is routed to. Capacity means that the train has not exceeded the maximum number of cars you have assigned to it. The capacity of the train takes into account pickups and setout along the way. If a train meets all other criteria but has had the maximum number of cars assigned, the program will look for another train. If no train services both locations, the program will try to assign the car to a train that is going in the proper direction and that will stop at a yard after it picks up the car. The car will then be set out at the yard. During the next session, it will be picked up by another train that services the yard and the destination town. Theoretically, this transfer through intermediate destinations is not limited and could go through many steps. However, if too many steps are required, the program may not find the final move for the car and keep shuffling it between yards. A word of caution: in order for the transfers to work, the trains that pickup and deliver must share a common yard location in their schedules. This is an obvious requirement when you consider it. If a car cannot move from its current location to its destination through a combination of trains, your transportation system has failed. It is also logical that all trains will originate, terminate, or pass through yards. Finally, through trains will stop at the yards to make connections with locals servicing the subdivision. A "yard" does not necessarily have to be a large yard, or any yard; it could be a siding designated as a location for connecting trains to setout and pickup cars.

To create a train for special service such as only going from the mine to the powerplant, simply route the train between these two destinations.

A train can run from the yard to its destination and return. Generally local trains do this. The direction code should be set to the direction at origin for the train. The industries should then be entered in order to describe the train's route. For example if the train originates in a yard 3, serves industries 4 and 5, and returns. The industry sequence would be; 3, 4, 5, 4, 3. You may want to set the sequence of industries so that the train serves industries in a sequence to avoid facing point sidings as much as possible.

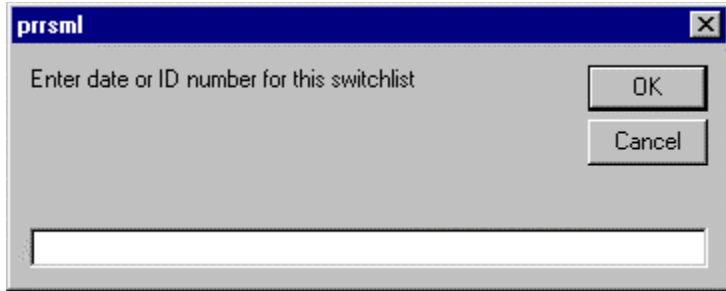
Although normal procedures indicate that industries should be entered in directional sequence, this is not a mandatory requirement.

The industry codes are the sequence numbers assigned to the industries in the industry data entry section. These codes are listed when a printout of the industry data is requested and the listing makes a good reference for train data entry. In the section on industry data entry, the procedure for placing the industries in the data in the proper sequence is discussed. The instructions provided give the simplest way to set up the system, but other ways may be established as you gather more experience. For example, assume you have 5 industries, Industry 1 is the East end of the railroad, and Industry 5 is the West end of the railroad. All westbound trains would have industry lists in increasing order i.e. 1,2,3,4,5. All eastbound trains would have industry lists in decreasing order i.e. 5,4,3,2,1. Local trains that go out from a location and return will have sequences that both ascend and descend such as 1,2,3,2,1 or 5,4,3,4,5. Since all trains do not have to service all industries, the list might only be 1,3,4 or 5,1.

### **6.5 Car types handled by train**

The train will handle all car types sent to industries served by the train. To control the types of cars in a given train, assign it to serve industries that use those specific car types.

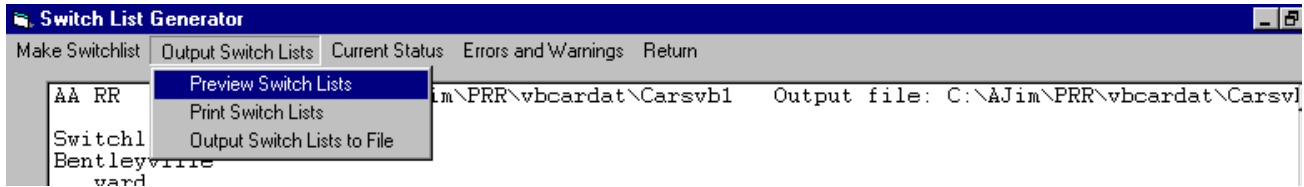




Enter the date or some other identification number that you want printed on the switchlists and click on OK. The switchlist will be generated and stored along with any error messages and the current status report. At the bottom of the screen, there is a status bar that will report the what is happening as the program executes.

**OUTPUT SWITCHLISTS** Click on this button to output the switchlists. A popup menu will appear with 3 options.

1. Preview Switch Lists
2. Print Switch Lists
3. Output Switch Lists to Disk File



Click on Preview Switch Lists to bring up a display of the switch lists in the large window on this screen. There is a scroll button on the left side of the screen that will allow you to scroll up and down in the preview list and look at any part of it. Periodically the words “New Page” are displayed. This is a flag to show you where each page starts. These will not be printed on the hard copy or the disk file copy.

Click on Print Switch Lists to print the switch lists to your printer. This will print to the printer set up as default through your Windows Controls.

Click on Output Switch Lists to Disk File to write the switch lists to a disk file as text. This option allows you to save them and read them into any text editor for modifications and customizing. The default file type is “.txt” along with the name you provide. The standard Windows output screen appears. Click on OPEN to write the file after selecting the directory and file name. The current CARCARDS directory is the default.

**CURRENT STATUS** Click on this button to output the current status report. A popup menu will appear with 2 options.

1. Preview Current Status
2. Print Current Status

Click on Preview Current Status to bring up a display of the current status in the large window on this screen. There is a scroll button on the left side of the screen that will allow you to scroll up and down in the preview list and look at any part of it. Periodically the words “New Page” are displayed. This is a flag to show you where each page starts. These will not be printed on the hard copy or the disk file copy.

Click on Print Current Status to print the current status report to your printer. This will print to the printer set up as default through your Windows Controls.

The Current Status Report is a list by town and industry of all cars in the system. The towns will be listed in sequence from “East” to “West” and the industries will be in sequence of the data within the town listing. The cars at each industry

will be listed along with the industry code number for the current destination, and the number of sessions that the car has been at that location.

This report can serve as a check on the system and allow you to setup of the system if a number of cars have been moved for some reason such as an open house or visiting relatives.

Errors and Warnings Click on this button to output the current status report. A popup menu will appear with 2 options.

1. Preview Errors
2. Print Errors

Click on Preview Errors to bring up a display of the errors and warnings generated when this switch list was run. There is a scroll button on the left side of the screen that will allow you to scroll up and down in the preview list and look at any part of it.

Click on Print Errors to print the errors and warnings report to your printer. This will print to the printer set up as default through your Windows Controls.

The Errors and Warnings Report is a list of any problems the program had when trying to move specific cars.

It is good to review this report to look for things that continue to repeat. These are indicators that you may have some data that is not totally correct. They may also point to problems with the railroad setup. For example if you continue to get a lot of warnings that your destinations are full, it may mean that you have too many cars on the layout. The errors are discussed below in the section describing how cars are routed.

Return Click on this button to return to the main menu. You will be prompted to update the data files. If you are planning to use the switchlist you just generated, you must update the car data files.

If you click on "Continue", the car data will not be updated to the new locations.

### **7.2 Final Car Status**

The program changes status to set up the data for the next switch list. This is done when you return to the main menu from the switchlist menu. You will be given an option to save the update the car status or not. If you want to update it, click on The empty/load status of all cars that have reached their final destination is changed. Loads become empties and empties become loads. The status of cars going to intermediate locations is not changed. The status of any cars in yards is not changed. In addition, any cars that have not moved, do not have their status changed. The current location of all cars is then changed to the destination printed on the switch lists.

If you do not want to update the current car status and use the switchlist, return to the main menu without saving.

### **7.3 Saving the New Car Status**

When the data is updated, it will be saved to prepare for the next operating session. The program will store the car data in the alternate car file after the first session. It will also change the SETUP file to make the alternate file as the input, and the primary car file as the output. It will continue to rotate these two files as input and output after each session. Whichever file is input to the session, becomes the output for following session.

This procedure allows you to recover if some unforeseen problem occurs. You can re-set the primary and alternate car files on the main menu screen.

You must also save the new setup before closing the program to save the updated file names.

### 7.4 Routing the Cars

The program will now begin routing the cars to new destinations. In the first step, the program looks at each car and determines if should be routed to the next destination on its waybill list. If the car is at the destination corresponding to current routing step in the waybill list and has been there the right number of layovers, the car is routed to the next destination in the waybill list. The destination is not updated if the car is in transit, or if the car has not met the right number of layovers for the current industry. If the destination siding capacity is full, a warning message is issued and the car is not routed in this session. You should take note of the warnings. If you consistently get warnings that a given destination is full (over about 5-6 switchlists), you probably need to reroute some cars to other destinations.

### 7.5 Assigning the Cars to Trains

The program will then look at each car and find a train to assign it to. It will first look for a train that services both the industry where the car is located and the industry where it is routed. It checks to see if the pickups assigned to that train are less than the maximum allowed for the train. If the train is full, it looks for another train that can make the same move. If no train is found to complete the move, it searches for a train that services the location industry and goes in the direction in which the car needs to move. It also assures that the train will reach a yard in that direction. If neither of these sets of conditions are met, it searches for a train that stops at the location and moves on to a yard in the other direction. It tries 2 times for 2 consecutive yards in each direction. This multiple search insures that a car will move and eventually make a connection that takes it to its destination. If no trains can be found to move the car, the program will pause and print an error message on the screen. The message will list the current location, destination, and car type. You can write this information down, and press return to allow the program to continue. The waybill has routed the car, but the train data has no train to make all or part of the move requested. One or the other needs to be changed. This is a definite data error and should be corrected for a smooth running system. Cars in transit at yards are assigned to trains during this stage also.

There is also a warning message that might printed during the train assignment. At this point the logic checks to see if the destination industry for a car has capacity to receive it. This is a double check to avoid missing cars in transit in yards. If an industry siding is full, a warning message is printed listing the shipper, car, and receiver. The program will continue to try to move the car at subsequent sessions.

### 7.6 Tuning the data and typical problems

Creating custom switchlists for a railroad requires a complex inter-related set of data in order for the system to work properly. Trains must be able to make the moves that the waybills create. Trains must handle the car types required by the waybills. Train schedules must have the proper trains in the proper sequence, This generally means that your data will require some tuning after the initial entry. I know mine usually requires quite a bit of tuning! Print off a few switch lists in sequence and look them over for things that do not seem right. For example, all your hoppers have been sent to the mine, but never shipped back out (after a few sessions). This might mean that there is no train to move them back out, or that the destination is always full. Another problem might be that one train picks up a bunch of cars and moves them to the yard and there they sit forever. It probably means that no other train connects with the same yard and the destination for the cars.

You are now ready to enjoy CARCARDS and provide yourself with interesting and diversified operations.

## 8.0 Data Analyzer

This module is designed to review the data and summarize the overall system. It will also find some potential problems or errors in the system. The data analyzer programs generally require that all of the data files be completed before they can generate accurate reports. Attempting to run them without all of the data files may result in system errors causing your program to abort.

### 8.1 Data Analyzer Master Menu

There are 4 reports that can be run with the system. Each one can be reviewed on the screen, dumped to a disk file, or printed on a printer.

1. Industry Summary: This report is summary of the industry capacities and shipping information.
2. Car Mix Summary: This report list all the car types in the system and the percentage they represent of total cars in the system.
3. Car Mix by Industry: This report provides a detailed list of the car mix by industry.
4. Train Service for Industries: This report list the trains that serve each industry.

### 8.2 Industry Summary Report

This report gives an overall view of the railroad and its capacity to handle cars. The total capacity in number of cars for the railroad is listed at the top of the first page. This report is generally only 1 page.

Ind Code	Capacity	Waybill Count	Percent Capacity	Percent Waybills	
1	Interchange PRR	20	100	31.25	36.1
2	Freight Station	3	4	4.69	1.44
3	Newman Packing Co.	2	2	3.12	0.72
4	Herring's Coal and Fuel	2	14	3.12	5.05
5	Olsen's Merchantile	2	17	3.12	6.14
6	Spang Chalfant Pipe Mfg	4	11	6.25	3.97
7	Freight Station	3	11	4.69	3.97
8	yard	15	2	0	0.72
9	Car Shops	3	23	4.69	8.3
10	Vesta Mine	8	60	12.5	21.66
11	Derrick Envelope	2	8	3.12	2.89
Total	64	277			

SUMMARY REPORT COMPLETE

The first column contains the industry index number and the second column contains the industry name.

The third column is the capacity of the industry in number of cars.

The fourth column is the number of waybill destinations to that industry that listed on all cars in the system.

The fifth column is the percent of capacity of the railroad represented by the capacity of the current industry. In other words, it describes what percentage of total railroad capacity the current industry represents. A yard is not included in this, because it does not receive shipments.

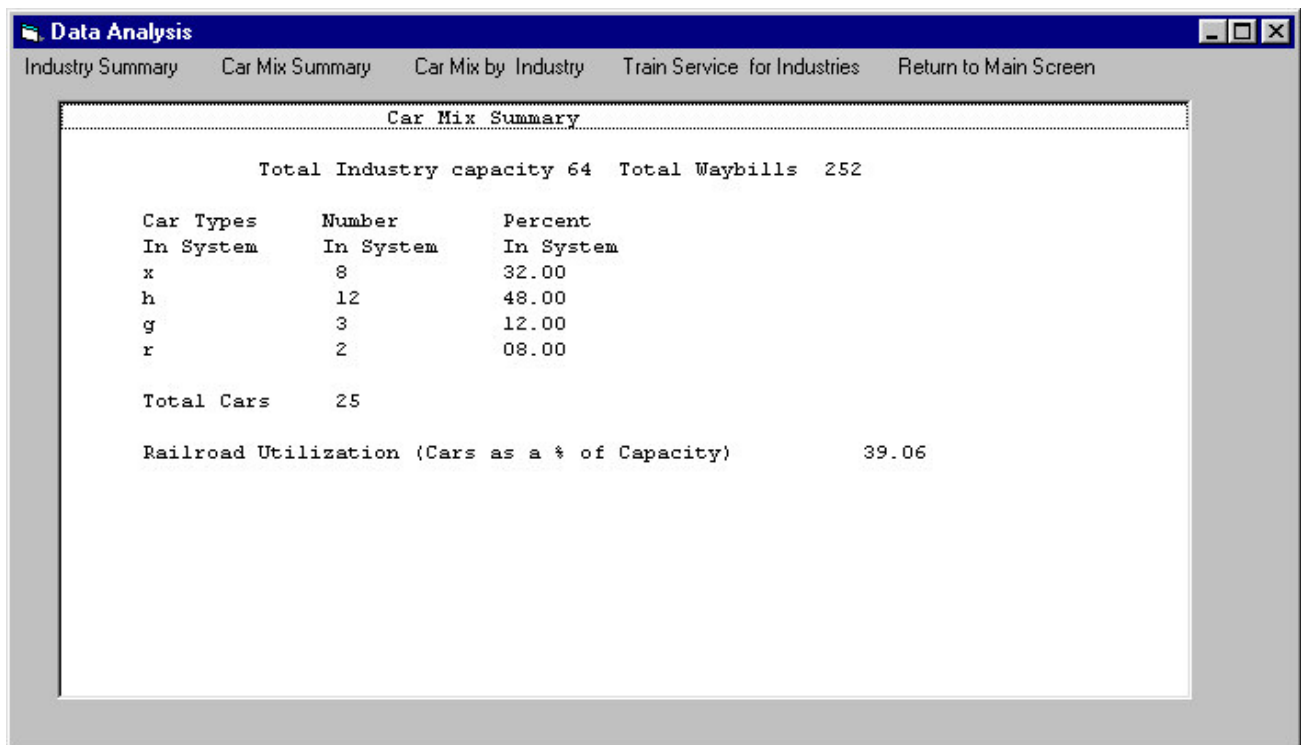
The Sixth column contains the percent of the total shipping waybills are aimed at the current industry. This is the percentage that column 4 represents of all waybill destinations in the system. Remember there can be as many as 20 waybills per car.

One major use of this report is to see how well the industry capacities are balanced with the ship to destinations. This is done by comparing columns 5 and 6. The numbers should be reflect similar patterns. It will be impossible to the numbers to match. However, it should be obvious that if an industry only has 5 % of your capacity, and 90 % of your waybills send cars there, there are too many waybills aimed at that industry. The two columns should follow a similar pattern.

A second use for this report is to identify industries that do not have any shippers. This report can help you find holes in your data.

### 8.3 Car Mix Summary Report

This report gives an overview of the car mix on the railroad.



The screenshot shows a window titled "Data Analysis" with a menu bar containing "Industry Summary", "Car Mix Summary", "Car Mix by Industry", "Train Service for Industries", and "Return to Main Screen". The main content area displays the "Car Mix Summary" report with the following data:

Total Industry capacity 64		Total Waybills 252	
Car Types	Number	Percent	
In System	In System	In System	
x	8	32.00	
h	12	48.00	
g	3	12.00	
r	2	08.00	
Total Cars	25		
Railroad Utilization (Cars as a % of Capacity)			39.06

The first column lists the car types in the system.

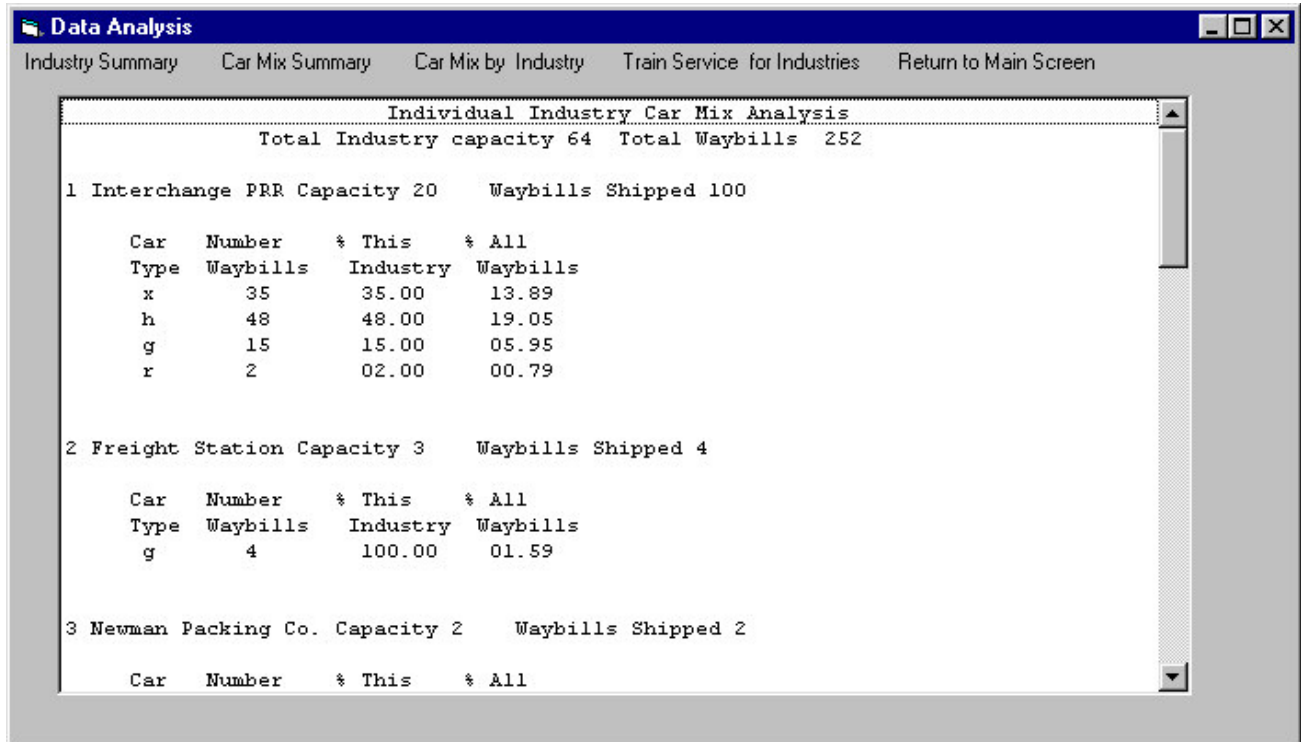
The second column lists how many of that car type are in the system.

The third column lists the percentage that the car type represents of the all cars in the system.

This report can be used to evaluate whether your railroad represents the type of operation you want to model. It can also be used to determine if you have too many of a given car type. If you have 50% reefers and only 1 industry with a capacity of 2, you probably have too many reefers.

### 8.4 Car Mix by Industry Report

This report gives list of car types that have waybills to ship to each industry.



The first line of each section lists the industry name and capacity and the total waybills in the system for that industry.

Column 1 lists the car types that ship to the industry.

Column 2 lists how many waybills for the car type ship to the industry.

Column 3 lists the percentage that the car type waybills represent for the industry.

Column 4 lists the percentage that the car type waybills for that industry represent for all waybills in the system.

This report is used to determine if the car mix matches what you expect for the industry and to determine if the industry has too many shippers relative to the entire system.

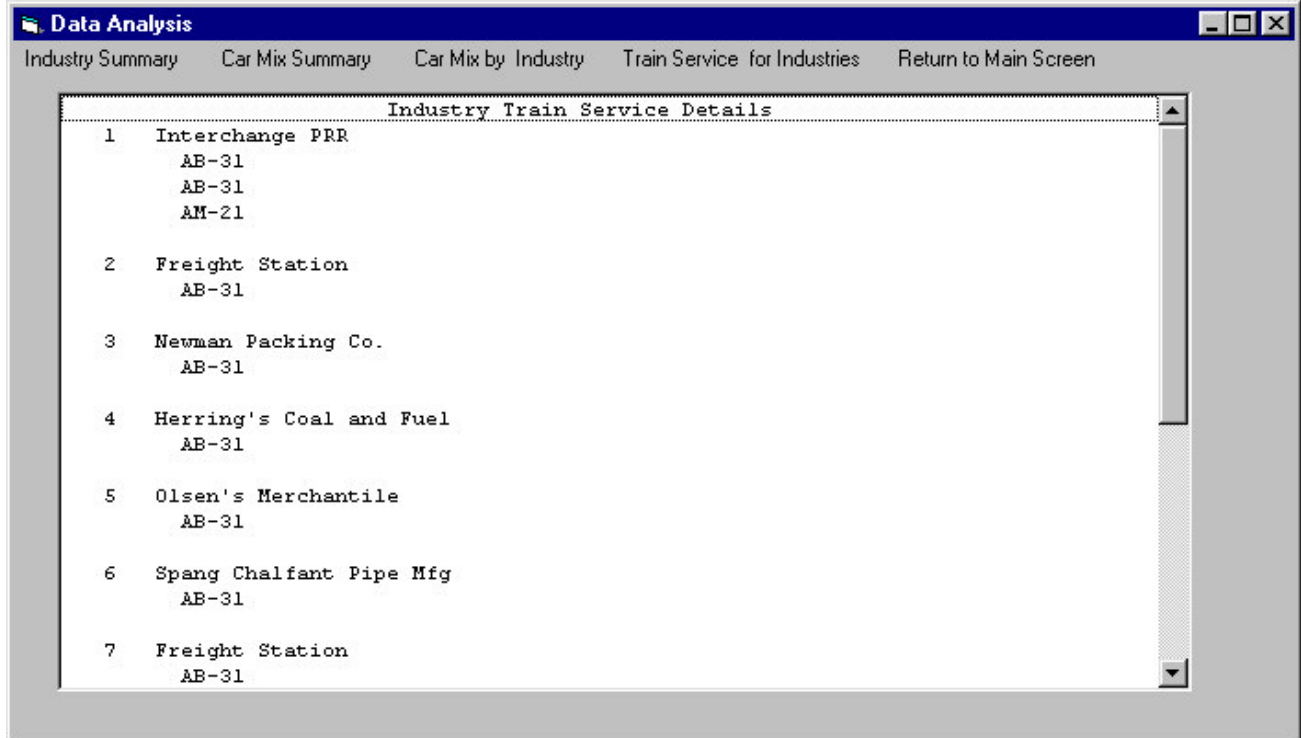
For example, if you have a coal mine and there are 20 waybills sending reefers to the coal mine, you may want to consider a change.

A more subtle thing to look for is if you have an industry with a small siding with a capacity of 1 or 2. Then if you have a high percentage of all waybills assigned to that industry, you have probably have too many.

This report can be lengthy also based on the number of industries.

### 8.5 Train Service for Industries Report

This report lists each industry and the trains that serve the industry. This is used to identify industries that may not be served or may be served by the wrong trains.

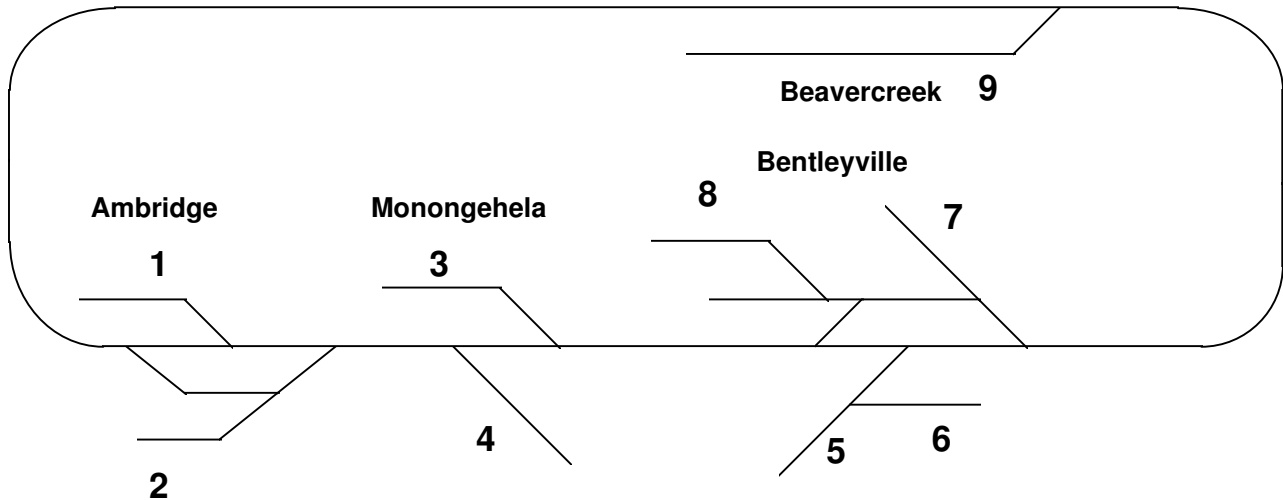


This report can be lengthy also based on the number of industries.

## Appendix A, Sample Railroad 1

### A.1 Schematic for Sample Railroad 1

This is a basic railroad with only 1 mainline and 4 towns. Town 1 has an "interchange" with another railroad. The cars enter the system at this town and are distributed over the railroad. The following diagram represents the railroad.



The line connecting Ambridge and Beaver Creek forms a loop on the actual layout. For operating purposes we will use this section of track as an interchange at town 1.

The industries are numbered to provide identification for the system. When you enter industry data, the program will assign code numbers to them in sequence and will use the code numbers for routing. For these sample systems the industries have been entered in the order listed and thus will have these code numbers.

A point to note is the use of the interchange as the offline connection. This industry is NOT designated as a yard to the system because yards do not request or ship cars. Yards only receive empties. It is more interesting when the offline connection can generate traffic. Also note that the offline connection requests cars only 20% of the time. This was done to allow the online industries to easily ship offline. If the offline industry were requesting 100% of the time it could fill up with cars it orders and have no space for online industries to ship to. A listing of the industry data generated by the Editor is included at the end of Appendix A.

### A.2 Trains to Service System 1

This is a small railroad which means the schedule should not be too formal. There will be a local passenger train that handles any express in a combine. This train could also be a railcar. Since it does no switching, it is not listed on the schedule. This railroad is a short line and connects through the interchange with the PRR. There are two trains each way daily (really 2 trains out and back). The first is a general service train that works all the towns. The second is a coal train that works between Beaver Creek and the PRR interchange. The mine is big enough to warrant this service especially since almost all coal is outbound over the PRR. Also, I personally like coal trains. The coal trains (25 and 26) are routed to the yard so that occasional cars can be passed to Herrings Coal & Fuel. The basic operation would be for train EB-1 to be called (railroad talk for start) in Bentleyville. The crew would first do any local switching as necessary and then head east to Monongehela and Ambridge. To illustrate the use of the train limits, EB-1 had been limited to 3 cars. A second train to provide the same service is EB-13. EB-13 will handle any additional cars on this service. After completing its work in Ambridge, the train then turns around (figuratively) and becomes WB-2. On a small railroad like this, a stream loco would run tender first in one direction. Turning the train would merely consist of running around it

with the loco at a passing siding. A strict conductor may want the cabooses switched to the rear for safety if the distances are long. The train then works back to Bentleyville. The coal train (25) also starts in Bentleyville because the engine house and the yard is there. The engine and cabooses run out to the mine and pick up all loads and head toward the PRR interchange at Ambridge. Here the loads are exchanged for empties and the train returns as 26. The train data listing is included.

### A.3 Rolling Stock

The data describes a mix of 25 cars that are used on this railroad. If you add up the various siding capacities, you will notice that there is much room for expansion of the car fleet. Since the railroad had a major coal mine, a relatively large number of hoppers are included. Boxcars are quite common, so many were also included and the rest of the list is just a mix of the remainder.

### A.4 The Data

This data has been compiled into the necessary files for the railroad. These files are included on your CARWIN Disk #2 and can be used to generate sample switch lists. You can generate a sequence of switch lists and follow the car moves starting from their current locations.

<b>SETUPVB</b>	setup file for railroad A
<b>TRAINSVB2</b>	train data for railroad A
<b>TOWNSVB</b>	town data for railroad A
<b>CARSVB1</b>	car data file1 for railroad A
<b>CARSVB2</b>	alternate car data file for railroad A
<b>INDUSTAC</b>	industry data for railroad A