RR-Track™

for Windows™

<u>M.T.H. RealTrax™ Edition</u>

Advanced graphical sectional track layout software

version 3.02

First printing, June 1999

RR-Track™ *for Windows™*

release 3.02

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Introduction

Thank you for buying **RR-Track™ for Windows™**, advanced sectional track layout software for the Microsoft Windows™ 3.1, Windows 95, and Windows NT operating systems. RR-Track™ can lay out sectional track from a wide variety of manufacturers in three-rail 'O' gauge, three-rail standard gauge, two-rail 'G' gauge, two-rail 'S' gauge, two-rail 'HO' gauge, Märklin 'HO' gauge, two-rail 'N' gauge, two-rail 'TT' gauge, and two-rail 'Z' gauge. This is accomplished by way of the Windows™ graphical interface, allowing you, the designer, to manipulate track sections on your PC's display just as you would on the layout. RR-Track is designed as a layout tool for constructing toy electric train layouts, but is just as, if not more useful, for considering "what if" situations in existing layouts, both indoor and outdoor, as well as "dream layouts" that are likely to never see the light of day.

Goals

The principal goal of RR-Track is to enable anyone to quickly, easily, and accurately create a track layout for toy trains from the principal building blocks, sectional track. Whether the layout be a simple Christmas display looping under and around the Yule tree, or a complex miniature railroad consisting of hundreds of pieces of sectional track connecting whimsical towns, village, factories and farms, it can be designed with RR-Track. RR-Track turns any Windows-based PC into a sheet of electronic graph paper, allowing for endless combinations and what-if scenarios without involving messy erasures and clumsy templates. The major advantage of computer-aided-design (CAD) is that the computer's drafting table is infinitely erasable and re configurable. Further, layout drawings may be saved at intermediate points in the design process, making retracing your steps to an earlier stage fast and easy.

In the course of design of your toy train layout/model railroad you will rapidly discover that it is much quicker and easier to 'game out' track configurations using RR-Track and your PC than to discover, on the floor, that O-72 curves won't quite fit between Grandma's antique china buffet and the Xmas tree. If the track doesn't fit in RR-Track, then it won't fit on the layout. All of the sectional track in the track libraries is accurate to less than 0.1 inch, making accurate assessments of clearances and distances easy.

RR-Track supports HO-gauge (16mm) two-rail sectional track from manufactures such as Atlas® , Märklin®, and Pilz/RailTech, O-gauge (32mm), three-rail, sectional track from Lionel® and K-Line® (O and O-27),Curtis HiRail,Ross Custom Switches, and GarGraves® Trackage. G-gauge (45mm), two-rail, sectional track from LGB®, AristoCraft®, andMicroEngineering® is available, and wide-gauge (54mm), three-rail track from Lionel® and Rydin Industries. There are also libraries for TT-gauge track from Pilz, for N-gauge track from Atlas® and Kato®, and Z-gauge from Märklin. Any and all of these may be included in one track layout, accommodating designs which call for mixing various gauges. There are also accessory libraries available for Lionel® pre-war, post-war, and modern items, American Flyer post-war items, Plasticville® O and S-gauge accessory items, and Pola® buildings in G-gauge, with other accessory libraries

planned for the future. If your favorite track manufacturer is not available yet, it will probably be available in the future.

What's new for release 3.02

(1) Multiple document interface: RR-Track™ v3.02 lets you have multiple layouts open for design simultaneously. This greatly facilitates cutting and pasting between layouts and quickly creating variations of a given layout.

(2) Layers. Layouts can incorporate up to 64 distinct, named layers (previous versions of RR-Track used only one drawing layer). You may assign these layers attributes such as working, active, inactive, grayed, and hidden; as well as assigning default drawing colors for any layer. Layer attributes may be changed at any time; layers may be added and deleted as needed. Multiple layers allow you to create very complex layouts without having to view the complexity all of the time.

 (3) Editable objects. All general purpose drawing objects (lines, circles, rectangles, polygons, trees, boulders, etc.) are now editable. You can alter their sizes and shapes at will after creating them, as well as scale the sizes of grouped objects. This makes it very easy to draw objects such as buildings and benchwork as accurately as you like.

 (4) Improved printing. RR-Track now lets you choose the printer used by RR-Track without having to resort to the Windows Control Panel; you may preview where RR-Track will place the layout on the page. You also have the option of printing your layout to a fixed scale rather than letting RR-Track automatically scale the layout to the printer page(s).

(5) Multi-function status bar. RR-Track's status window has been replaced by a multi-function status bar that shows the cursor position, zoom factor, and lets you quickly access the extended selection and joining modes, the working layer, the snap state and snap size. The multi-function status bar also provides access to a list of the last 10 distinct items added to the layout (this is a generalization of earlier versions of RR-Track which remembered only the last item added).

(6) Drag-and-drop client. RR-Track now register's itself with Windows as a drag/drop client. This means you can drag track layout files from the File Manager or Explorer to the RR-Track icon to open them. You may also open layout files by double-clicking on them from either the File Manager or the Explorer.

(7) Track library wizards. Most track libraries contain 'wizards' which may be used to automate some aspects of track laying, automatically filling gaps between track ends.

Many other incremental changes have been made from version 3.01 which correct a number of annoying bugs, and aid the layout design process.

Terminology in RR-Track

active layout or current layout: this refers to the track plan you are presently working with. RR-Track can have many layouts open at once, but you can only work on the one that is active. You can switch between layouts, changing active layout at any time by clicking anywhere on it.

block breaks: these are electrical breaks between track sections that are otherwise physically joined. Block breaks can be either *hard* or *soft*. *Hard* block breaks cannot be removed and are introduced by using special track from the manufacturer that is insulated at one or more rails. *Soft* breaks are breaks that you can set with RR-Track and are usually achieved by either using insulated connecting pins or rail clamps, or just not having any joining pin or clamp at that junction (there is no insulation like no insulation).

credits box: The credits box is a small box printed below your layout view that contains the file name, date and time, the layout size, the number of track, accessory, and objects the layout, and the layout scale. The credits are always printed using Arial Bold at 10pts.

drawing depth: The drawing depth is the vertical distance, in feet and inches, of the area you are allowed to lay track and place objects.

drawing width: The drawing width is the horizontal distance, in feet and inches, of the area you are allowed to lay track and place objects.

edit points: edit points are the 'corners' of a general purpose object that may be moved in order to resize it. Lines have two edit points (each end), rectangles have four edit points (each corner), and polygons have an edit point at each vertex.

elevated track: Elevated track is track that is at a non-zero height adjacent to one or more track sections that are also at the same non-zero height.

extended selection: Extended selections are track sections that are either physically, electrically joined to the track section under the cursor, or on the same grade or at the same height.

general purpose object: A general object is a shape such as a line, rectangle, polygon, or circle. There are also specialized general purpose objects such as buildings, trees, ponds, and boulders. Track sections are not general purpose objects, neither are accessories. General purpose objects may be grouped to form a more complex object.

grade track: Grade track is track that is at non-zero height and adjacent to one or more track sections at a different height, usually also non-zero. This track is marked by an arrow symbol to indicated that is on a grade, with the arrow pointing in the uphill direction.

layer: a drawing layer consists of objects and track that are grouped for the purposes of display. Layers can be working, active, inactive, grayed, or hidden. There can be only one working layer at any given time.

lead selection: This is the first item in the selected track list, indicated by bolder control points symbols. The lead selection in the select list may be changed by clicking the left mouse key will holding the cursor over the track section you wish to move the origin to.

shorthand menu: this is a menu containing the most commonly used commands in RR-Track and is called up by clicking the right mouse button.

selected track: Selected track is any and all track sections or other objects that are highlighted in red on the current view of the current layout.

selection box: The selection box is the rectangle swept out by the cursor when selecting track.

select list: The select list is a list of all track sections and objects that are selected (highlighted) in the current layout. The lead selection is indicated by bolder control point symbols.

spin buttons: small push-button type controls with up and down arrows. Pressing these allows you to increment or decrement an associated numerical field by a fixed amount.

track control point: these are the 'ends' of the track section to which other track sections may be joined. A straight or curved track has two, a simple turnout three, and a cross four. Up to six control points are allowed in RR-Track.

track list: The track list is a list of all of the track sections, types, and quantities that are in the current layout.

zoom factor: This is the amount by which a view has been magnified compared to the original, full view of the layout set when the width and height were set. The minimum zoom is 1, showing the full layout, while the maximum is 64.

System Requirements

RR-Track 3.02 requires the Windows™ 3.1 operating system in order to run. It will not work under Windows 3.0 since it makes use of dialogs in the Windows™ common dialog library (COMMDLG.DLL) which is not available in the 3.0 release of Windows™ (although you may possess it via a third party), and makes use of a number of printer commands which were introduced in the 3.1 release of Windows™. RR-Track is compatible with Windows for Workgroups 3.11, Windows 95, and Windows NT Workstation using either the standard shell or the v4.0 shell. Under Windows 95 or NT RR-Track enables long filename support.

Hardware: 386/486/Pentium PC, math co-processor suggested for 386 PC's, but not required. RR-Track makes extensive use of floating-point arithmetic for track translations and rotations.

Software: DOS 3.x or higher, 5.0 or above recommended. Microsoft Windows™ 3.1 in enhanced or standard mode, or higher versions of Windows as discussed above.

Fixed disk space: standard release 1.7Mb+ depending on the number of track and accessory libraries, and example layouts (which are optional on installation). This can range up to 7Mb.

Graphics board: VGA (640x480) or better, at least 16 colors. An accelerated card will speed up drawing of straight lines segments, but is not likely to enhance curve generation. We recommend 800 x 600 super-VGA as a minimum for adequate viewing of your designs.

Monitor: color highly recommended.

Pointing device: Microsoft Windows™ compatible mouse or trackball, bus or serial.

Installation Instructions

RR-Track is normally distributed as compressed files on a single 3-1/2 inch, 1.44Mb capacity diskette. This format has become the standard for IBM compatible PC's. If you have special requirements, such as 5-1/4 inch 1.2Mb or 600Kb floppy diskettes, please contact R&S Enterprises to make special arrangements.

File List: Full release

RRTRACK.EXE	the main application executable
RRTRACK.HLP	the companion help file
RR3LIB.HLP	the track library help file
RRTRACK.INI	application initialization file
MUSCROLL.DLL	support library for custom controls
CTL3DV2.DLL	support library for custom controls
TEAROFF.DLL	support library for custom controls
SPINNER.DLL	support library for custom controls
EFFECT3D.DLL	support library for custom controls
FADER.DLL	support library for custom controls
README.WRI	last minute release notes and instructions

one or more of the following track libraries

O-gauge

RR3CHRGG.DLL	Curtis HiRail O-gauge track library
RR3RCS.DLL	Ross Custom Switches O-gauge track library
RR3GGRV.DLL	GarGraves® O-gauge track library
RR3REGO.DLL	Lionel® O-gauge track library
RR3O27.DLL	Lionel® O27 gauge track library
RR3SPRO.DL	LLionel® Super-O gauge track library
RR3MTH.DLL	MTH O-gauge track library
RR3ATLSO.DLL	Atlas O-gauge track library

S- and standard gauge

RR3AMF.DLL	Am. Flyer/GarGraves/Am. Models S-gauge track library
RR3STD3.DLL	Lionel®/Rydin standard gauge track library

G-gauge

RR3LGB.DLLL	GB® G-gauge track library
RR3MEC.DLL	MicroEngineering® G-gauge track library
RR3ARIST.DLL	AristoCraft® G-gauge track library
RR3LLGS.DLL	Llagas Creek G-gauge track library
RR3TDV.DLL	TDV s.s. G-gauge track library

HO-gauge

RR3ATLAS.DLL	Atlas® HO-gauge track library
RR3MARKK.DLL	Märklin®-K HO-gauge track library

RR3MARKM.DLL	Märklin®-M HO-gauge track library
RR3MARKC.DLL	Märklin®-C HO-gauge track library
RR3PZ100.DLL	Pilz code 100 HO-gauge track library
RR3PZ83.DLL	Pilz code 83 HO-gauge track library
RR3KATO.DLL	Kato® UniTrack HO-gauge track library
RR3HRBHO.DLL	Hornby® OO/HO gauge track library
RR3PCOHO.DLL	Peco® HO gauge track library
RR3SHNHO.DLL	Shinohara® HO-gauge track library

N-gauge

RR3ATLN.DLL	Atlas® N-gauge track library
RR3KATON.DLL	Kato® UniTrack N-gauge track library
RR3PECON.DLL	Peco® N-gauge track library
RR3TOMXN.DLL	Tomix N-gauge track library

TT-gauge

RR3PZTT.DLL	Pilz® TT-gauge track library

Z-gauge

RR3PECOZ.DLL	Peco® Z-gauge track library
RR3MKLNZ.DLL	Märklin® Z-gauge track library

Accessories

AC3LNLPR.DLL	Lionel® pre-war accessory library
AC3LNLPO.DLL	Lionel® post-war accessory library
AC3LNLMD.DLL	Lionel® modern accessory library
AC3GLBRT.DLL	Gilbert/American Flyer accessory library
AC3MTH.DLL	MTH accessory library
AC3PLSTC.DLL	Plasticville accessory library
AC3PIKOG.DLL	Piko® G-gauge accessory library
AC3POLAG.DLL	Pola® G-gauge accessory library

and the track library initialization files, xxxxxxxx.INI.

Installing RR-Track

RR-Track 3.02 comes with an installation program, SETUP.EXE, on the distribution diskette. The SETUP application asks you questions, and takes care of the details of installing the application files in the appropriate directory on your fixed disk, and, optionally, sets up an appropriate group in your Program Manager (PROGMAN.EXE). The following example assumes that your floppy diskette is in drive 'A' while your fixed disk is drive 'C' (NOTE: SETUP is a Windows application and cannot be run from either DOS or a DOS shell in Windows):

1. Insert the distribution diskette into floppy drive 'A'.

2. From either the Windows™ File Manager or the Program Manager, start the setup application, SETUP.EXE, on the distribution diskette. From the Program manager this may be accomplished by pulling down the <u>File</u> menu and selecting <u>Run...</u>. In the Command Line box type "a:\setup.exe" and press the OK button. From the File Manager this may be accomplished by pulling down the <u>File</u> menu and selecting <u>Run...</u> as with the Program Manager, or by opening up a directory-file list window, setting it to drive A, and double-clicking with the mouse on the SETUP.EXE file.

3. A window appears, such as that to the right. Press the <u>Continue</u> button to start the setup process. The RR-Track setup utility is similar to that you have seen for other software, leading you step-by-step through the installation process. At any time you may go back and change something, or abort the setup process. After pressing <u>Continue</u>, RR-Track Setup prompts you for an installation directory, and suggests C:\RRTRACK3 for the installation directory. If you do not want to install RR-Track into this directory, either type in another, valid path, or press the button to the right of the text box. This will let you browse through the directory tree on your PC, similar to the Windows™ Open File dialog. Using this browsing tool, click on the folder that you wish to install the RR-Track folder in. When you are satisfied, press the <u>Continue</u> button. If you wish to abort the installation at this point, press <u>Cancel</u>.

4. The installation program copies all of the files in the file list to the installation directory, and then asks you if you wish to create a Program Manager group for RR-Track (if you are using Windows 95 or Windows NT 4.0, this will also create a Start Menu entry). If you do, press <u>Create</u>, otherwise press <u>Skip</u> (you can also tell Setup to install RR-Track's icons in an existing group, using the scrolling list window to select another group). Setup will report the success or failure of the installation, and then you may exit.

5. The first time you run RR-Track, you will be prompted to enter the serial number from your installation diskette. RR-Track then registers itself in the Windows Registry. If you have any need to contact R & S Enterprises concerning your RR-Track installation, be sure and have this serial number handy. You can find out your serial number by either referring to your installation diskette, or by pulling down the Help menu and choosing Help|About.. The ensuing dialog shows the release number, the building number, and your serial number.

Acknowledgments

Getting Started

RR-Track is started by (1) double-clicking its icon in the Program Manager (or whatever Windows shell you use), or (2) by double-clicking RRTRACK.EXE in a File Manager directory listing, or (3) by using the Run... command in either the File or Program Manager. For more information on starting applications, see your Windows 3.1 manual. You may also start RR-Track by double-clicking on a .RRT file in the File Manager/Explorer, or by right-clicking on said file and choosing Open.

A number of windows are created when RR-Track starts: the main window, track list window, select list window, and the status bar. Not all of these are initially visible; initial visibility is determined by the settings in the RRTRACK.INI file, which are themselves set from the RR-Track main menu, and are remembered between sessions. RR-Track has two distinct sets of options, those that affect every layout you open (things like joining defaults, confirmations, default background colors) and things that affect a single layout (snap settings, extended selection mode settings, track labels, etc.). More information on the settings in the initialization file can be found in the chapter on miscellaneous material. In this manual, some of the dialogs and windows you will see are shown as they appear under Windows™3.1 while others are shown as they appear under Windows 95; this is so that you are familiar with the appearance of RR-Track under both Window's shells.

At startup, RR-Track displays a picture of a toy train layout, and a menu bar with File on the left and Help on the right. The File menu has three items, New..., Open..., and Exit. Select New... to start a new track layout, Open... to open an existing layout file (such as one of the example files included on the distribution diskette). The function of Exit is obvious. The Help menu has items for Contents, Search For Help On..., Getting Started, and About RR-Track. Selecting Contents will open up the RR-Track hypertexting help file and show the table of contents, Search will open up the help file and display the help search dialog, while Getting Started opens up the track laying tutorial.

Track laying tutorial

In order to get started building your own layout, the following tutorial will guide you through building an oval of track, and then editing it to include a turnout and spur. Following this, we will expand the layout vertically. Finally, we will add and then remove an elevated track / grade combination from the layout.

If you are reading this, you must have RR-Track running, and are probably staring at a roughly drawn image of an old steam locomotive or a train layout. The menu bar at the top of the main window, in this case, will have two entries: File and Help. Pull down the File menu and select New. This action pops up the *Drawing Size dialog*. Using the *spin buttons*, set the width of the layout at 10 feet and the depth at 7 feet. When this is done, press the OK button with the mouse cursor. To give yourself the maximum screen space to work in, press the maximize

button on the new layout window. At this point the main window will change to look something like:
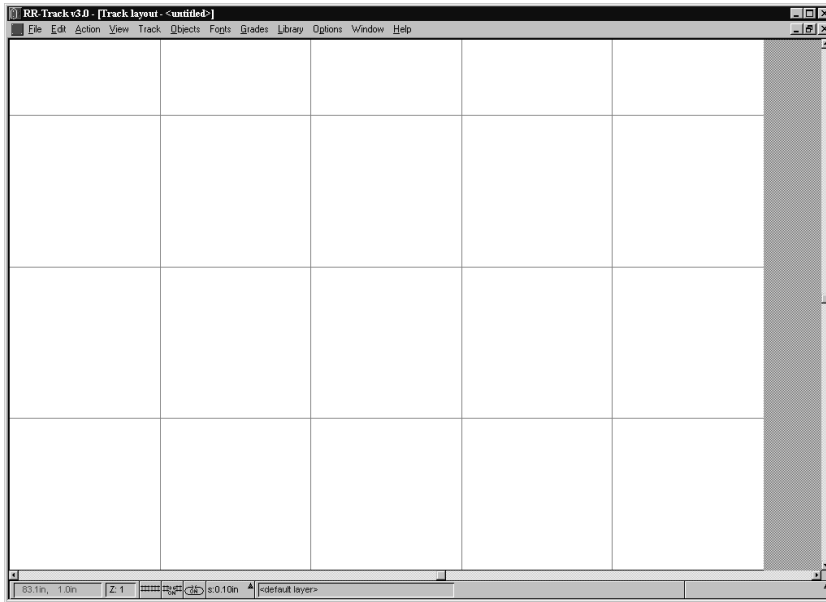

We will build an oval out of Lionel® O-gauge three-rail track, but you could just as well build the oval out of LGB® track, Atlas® HO track, or any of the other track libraries. Pull down the Library menu and select Lionel® O-gauge. A check mark will be placed next to this item, indicating that Lionel® 'O' is the current track library. Pull down the Options menu and verify that Detailed Track Render is checked. If not, select it so that it is checked. While you have the Options menu down, verify that Selections Include Joints is checked. If it is not, select it so that it is checked. Then, pull down the Options menu and select Options.... The dialog shows the state of all of the options that apply to all layouts. Check and make sure the Auto-close Loops option, found in the upper left corner, is checked, as well as Allow Track Breakaways , Auto-join track , and Proximity joining. Choose Layout options... to bring up a dialog showing the options you previously manipulated using the Options menu as well as others. Verify that Detailed Track Render, Label Track, Grade Symbols, and Block breaks are set. At this point you are ready to begin laying track.

Next, pull down the Track menu and select O-Straight|Single from the list of straight track sections available. The cursor will change to a diagonal arrow with either the word 'Autojoin' below it. Without depressing the left mouse key, move the track to somewhere in the lower left region of the layout, then depress and release the left-mouse key (this depressing and releasing of the left-mouse button is termed '*releasing the track*'). A straight track will now be drawn at this point with label 'O:s10', while the cursor returns to the Windows™ arrow. Repeat this process, except use the Last Track command from the Track menu to get another piece of 10 inch straight track. Bring this near (within 12 inches) of the previous track section, depress and then release the left mouse key. The new piece of track immediately attaches itself to the first piece, forming a combination of two straight pieces. Again, repeat this process, but this time get the track section by first clicking the

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right mouse button, with the cursor over nothing, to bring up the shorthand menu, and then use the cursor and click the left mouse button to select Last Track. Bring the new piece near the first combination, then depress and release the left mouse button, adding the third track section to the first two. Next, move the mouse cursor to a point on the screen where it is not over a track section, and double-click the left mouse button. You will see another straight section of O-gauge track appear under the cursor. Move this to one end of the other three track sections and let it go so that it automatically joins to them. Finally, go down to the status bar, put the cursor on the button labeled 'Lionel O single straight' and press the button. You will see yet another section of O-gauge track appear under the cursor. Move this to the end of the four track sections and join it to them. At this point the screen should look something like this:
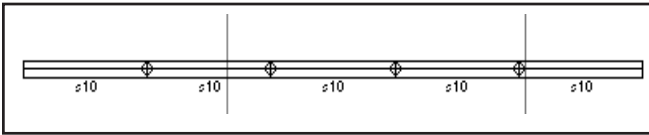
You have assembled five pieces of track using all five ways of calling up a new piece of track (Track Menu|O-Straight|Single, Track Menu|Last Track, Shorthand Menu|Last Track, left mouse double click, and multifunction status bar last track list.). Now we tackle building the first curve. We will build a semicircular (180°) curve out of four sections of O-31 track. Pull down the Track Menu and select O-Curve|O-31 left, bring the left side of the curve down near the right end of the straight combination and release it, automatically joining it to the other three sections of track. Double-click the left mouse button with the cursor in a blank area, giving you another O-31 curve, bring the new curve's left side near the right end of the previous curve, and release, joining the curve to the previous five track sections. Repeat this process two more times, giving you four O-31 curves in all, joined to form a semicircle. The layout should now look something like this:
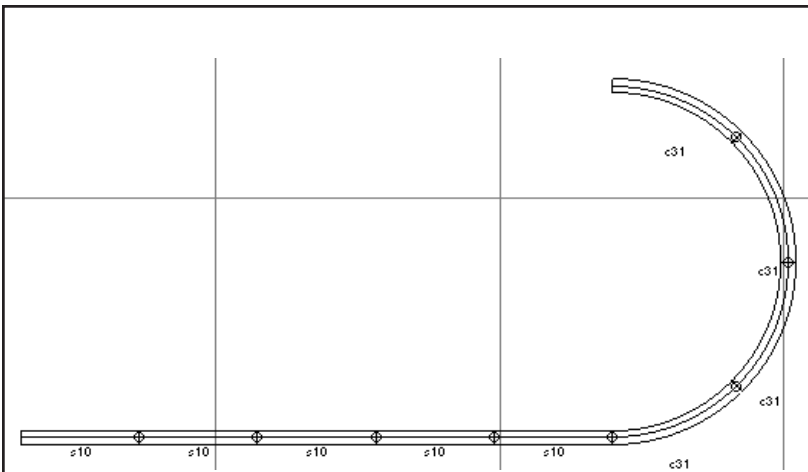
If the layout does not look similar to that in the figure, look back through the previous section and see what you left out. If the last track section was joined in an errant manner (which is any manner that is not the way you wanted) you can select the Undo last track item on the

shorthand menu and remove the last piece of track (pop this up by clicking the *right mouse* button when the cursor is over nothing).

Pull down the <u>View</u> menu and select <u>Show Track List</u>. The track list window should say you have five Lionel® O 10 inch straights and four Lionel® O O-31 curves, eight pieces in all. For your information, both left- and right-hand curves are identical; they are both included to make it a bit easier for you when you are placing new pieces of track. Left- and right-hand turnouts are not identical, needless to say. If you do not have five straight sections and four curves, please add/ delete track sections as necessary. When finished, you can dismiss the Track List Window (by *double-clicking* on the control menu in the upper left hand corner).

Now pull down the <u>View</u> menu and select <u>Show Selects</u> <u>List</u>. This window should have nothing listed because no track items are selected. Move the cursor over one of the straight sections and *single-click* it. The select list window should now show one O-gauge 10 inch straight. Move the cursor over another of the straight sections and *double-click* the left mouse button. All nine of the track sections
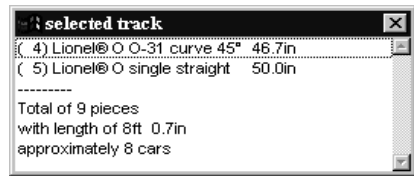
should highlight at this point, with the Select List Window showing five straight and four curved sections. Keeping the cursor ver the straight track section, *double-click* the left mouse button. The highlighted track returns to the one straight section, which is reflected in the Select List Window. You can close the Select List Window now, and deselect the highlighted track by single-clicking the left mouse button in a blank area of the layout. An important item to note is that you moved between choosing a single track section and choosing all of the connected track sections simple by single-clicking or double-clicking the left mouse button. Many times you are interested in carrying out some action on individual track sections, while at other times you want to grab the entire, contiguous set (for moving or rotating as an example). The ability to move back and forth between these capabilities is controlled by whether you *single-click* or *double-click* on a track section when selecting it. *Single-clicking* selects only the item under the cursor, while *double-clicking* selects that track section and all of the others that are joined to it in some manner, either physically, electrically, or in elevation (this is determined by the *Selections Include Joints / Selections Include Blocks / Selections Include Grades* items on the <u>Options</u> menu). This is called extended selecting. The current extended selection mode may be found by either (1) pulling down the <u>Options</u> menu and checking for a checkmark next to one of these items, or (2) by watching the *multifunction status bar*. <<>> It is a good idea to get in the practice of glancing at the status bar from time to time to check on the state of these features since they control what happens when you double-click the left mouse button.

We are going to complete the oval by using five more straight sections and four more curves, as you would expect. This can be done in several ways. The most straightforward would be to repeat

the process just carried out by serially selecting four more 10 inch straights and four more O-31 curves. A faster way, the one we will use, is to:

(1) copy the existing track,

(2) paste it back into the layout,

(3) rotate it 180°,

(4) join it to the first cane-shaped set of track, and then

(5) close the track loop.

We can merge the first two operations, if desired, by Duplicating all of the track in the layout.

We start by selecting the track. Place the cursor over one of the nine contiguous track sections and double-click the left mouse button. All nine track sections should now be highlighted in red (if they are not, pop up the shorthand menu by clicking the right mouse button away from the track sections and select Selections Include Joints so that it is checked. All nine sections should highlight at this time.). Pull down the Edit menu and select Copy (or popup the shorthand menu and select Copy). The track sections have now been copied into the RR-Track clipboard. Next, we paste the copied track back into the layout, duplicating it. Pull down the Edit menu and select Paste (or popup the shorthand menu and select Paste). The duplicated cane-shaped track should now be somewhere in the upper left corner of the layout, and highlighted in red. The layout should look something like:
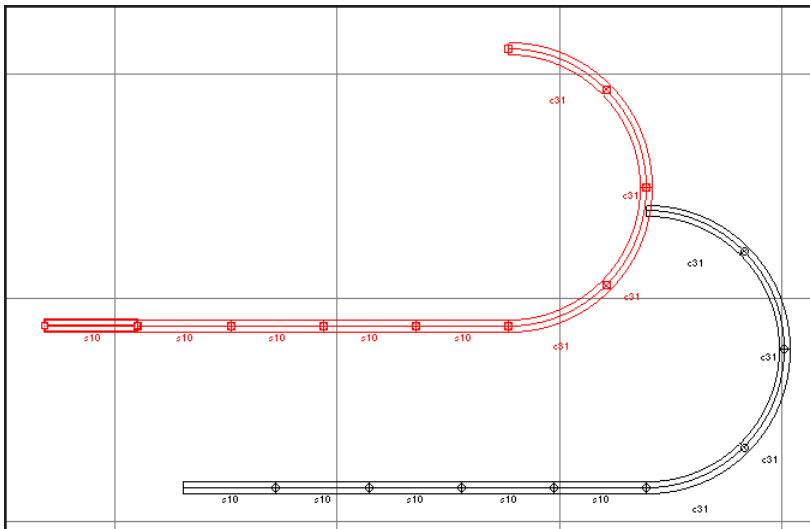
At this point, we could pull down the Action menu and selection Rotate.., which will let us carry out a manual track rotation on the newly pasted track, but there is a simpler and faster method. We will make use of the automatic track joining capabilities of RR-Track. Place the mouse cursor over the last section of straight track (the end section) and depress and hold the left mouse button. After something like 1/2 second, the

cursor changes to 'Move'. While holding the left mouse button down, drag the free end of the straight section to within one track width (1.25") of the free end on the last curve section of the non-highlighted track (see *moving track*). (**Note**: while RR-Track has a capture distance for joining of 12" for O gauge track when adding new track from the Track menu, the capture radius changes to 1.25" when joining existing track, that is track already on the layout. This is true for all track libraries, the capture distance for joining is the track width when manipulating existing track. This change in the capture distance is to avoid unwanted joining when moving track around in busy areas). When you have them close enough, release the left mouse button. RR-Track will automati-

cally rotate and join the highlighted sections to the existing sections. It will also find the other free end, notice that it is close enough to close the loop, and ask if you want to do so (the sections RR-Track wants to close are high-lighted in cyan). Choose Yes (there should be 0.00" of track error). You now have an oval of 18 track sections which look something like that above.
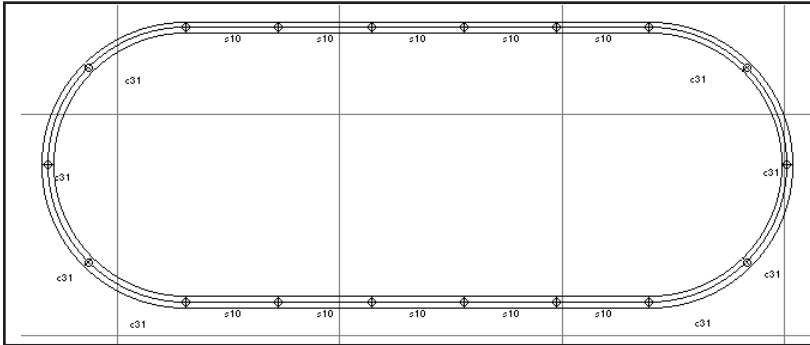
Adding a turnout and spur track

Having mastered creating a simple loop, let us now move onto adding a turnout and spur siding. Move the cursor over the right O-31 curve track on the bottom of the oval, and select it by clicking the left mouse button once (see *selecting track*) and holding down the left mouse button. After a short pause, the track section will highlight and the cursor change to 'Move'. Continuing to hold the left mouse button down, drag this curve away from the rest about 1/10th of the screen width, and then release the left mouse button. RR-Track will break the connections and let you move the curve to its new position. This single section of track should be highlighted as shown at right:
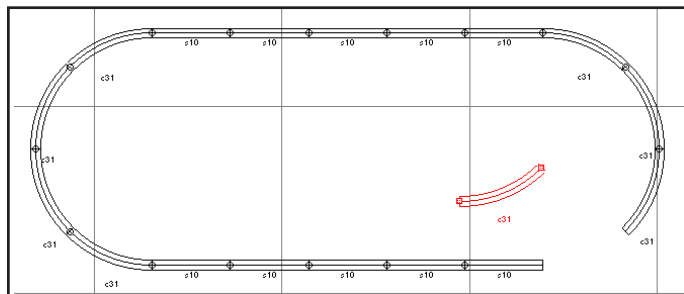
The single O-31 curve should be off alone, leaving a gap in the

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oval. Zoom in on the gap by pulling down the <u>View</u> menu and selecting <u>Zoom in 2x</u>, centering the zoom rectangle on the gap, and clicking the left mouse button.

Next, pull down the <u>Track</u> menu and select <u>O-turnouts|O-31(modern) left</u>, place it near the gap so that the turnout curved section is closest to the oval's track ends (we don't want to join the turnout thru track to the oval) and release it. RR-Track joins the turnout to the oval. Since adding the turnout will also close the loop, RR-Track will do this either by *proximity joining* or *automatic loop closing* since both options should have been set by you at the start. If RR-Track does not close the loop, you will have to perform this task manually. Do this by selecting the entire loop of track (double-click on one of the track sections), pull down the <u>Action</u> menu and select <u>Close Contiguous Loop</u>. After asking you for confirmation, the loop is closed.

An important item to note is that you removed the curved section from the existing oval by using a continuous click-hold mouse button-drag-release motion. You could have easily reinserted the curved section you removed by reversing this process: selecting and dragging the curved section back to the gap in the oval, and releasing it when the ends were within 1.25" of gap sections. Get used to doing this, it makes if very easy to rearrange track layouts, something useful when you are trying out new configurations, or trying to find the best arrangement of curved and straight track that will cover part of your layout.

Now we add the spur. From the <u>Track</u> menu select <u>O-Curve|O-31 left</u> and place it near the turnout spur, joining the two. Next, select another O-31 curve and add this to the previous curve. Repeat again, making three curves in all. Now select and drag the old O-31 curve we removed from the layout, or add another O-31 curve from the Track menu, and place this on the end of the spur to create a 180° arc, bending back into the oval. At this point your track should look like:

Now we add the last O-31 turnout. Put the cursor over the O-31 curve on the upper right of the oval, where the turnout will be going (this should be obvious). Single-click the left mouse button to highlight this curve, and then delete it using either the DELETE key or pulling down the <u>Edit</u> menu and selecting <u>Delete</u>. This will leave you with three dangling track ends perfectly positioned for an O-31 right-hand turnout. Pull down the Track menu and select <u>O-turnouts|O-31(modern) right</u> and place this such that it joins to all three dangling ends (RR-Track should go through two automatic loop
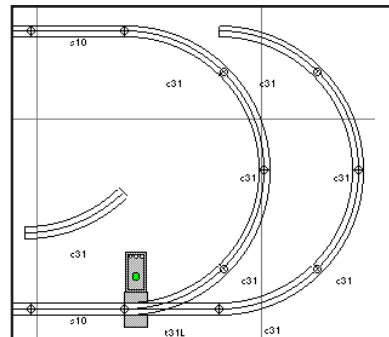
closing cycles to close both the main oval and the bypass. Your layout should now look like:
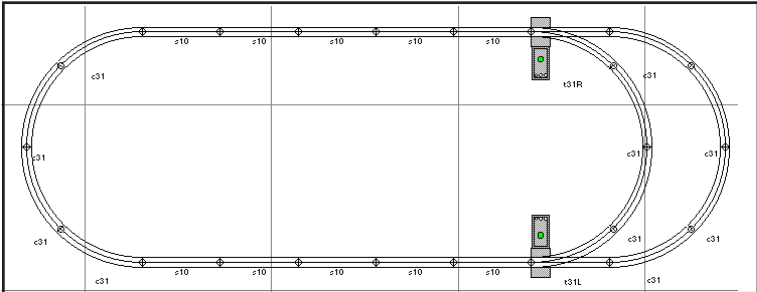
Expanding the loop

Now, move the cursor so that it is above and to the left of the loop, then, while holding down the left mouse button, drag out a selection box that includes track in the upper half of the loop. When you have completed the selection box, release the left mouse button. All of the track in the upper half of the loop should be highlighted. If it is not, carry out the selection process again until you have all of the track in the upper half highlighted.
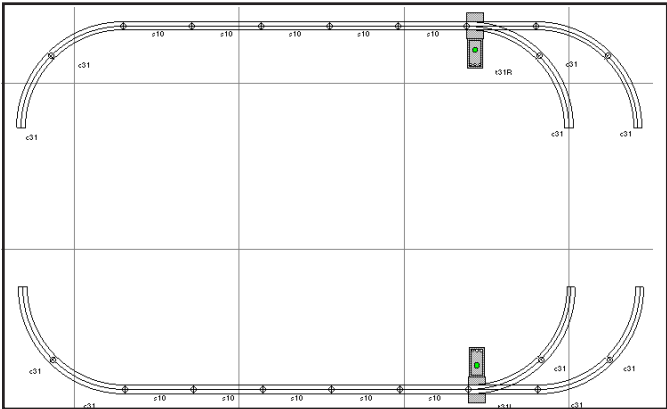
When you have the upper track highlighted, place the cursor on one of the sections, and depress and hold the left mouse button. Then, while holding the button down, drag the highlighted track upwards far enough so that when you release the mouse button, the layout will be split into two halves like:

Now, pull down the Track menu and select O-Straight|Single, and join this track section to the far left vertical on the lower loop half; select another O-Straight|Single and join this track section to the center vertical on the lower half. Now, pull down the Track menu and get an O-Straight|Half section, and add two of these to each of the single straights you just added. Finally, place the cursor on one of the track sections in the upper loop half, double-click the left mouse and hold the button down. When the entire half-loop highlights, and the cursor changes to 'Move', drag the half loop down close enough so that RR-
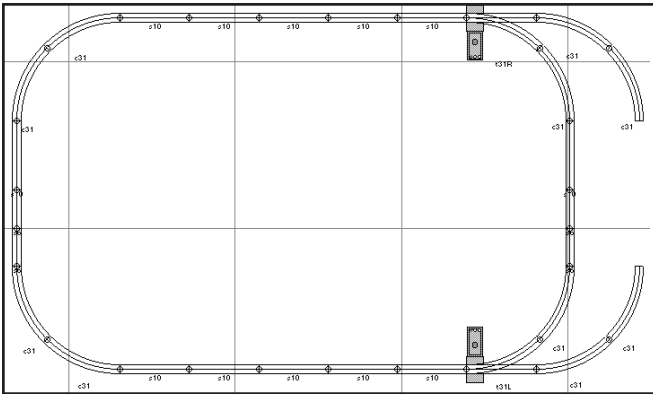
Track can join up the left and middle verticals. Your layout should now look like that to the left.

This leaves us with a gap on the far right passing siding. Select the O-31 curves that we put on this siding and delete them. Now, pull down the Track menu and select <u>O-Curve|K-Line® O-42 Left</u> , and add this to the lower turnout spur. Repeat this five times, placing three curves on the lower spur and three on the upper spur. Your layout should now look like that to the left.
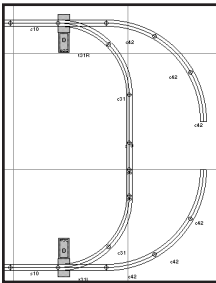
Next, move the cursor near one of the gapped ends, depress and hold the ALT-key while depressing and holding the right mouse button. The cursor will change to a ruler, with an endpoint snapping to the nearest track junction, which should be one of the track junctions on either side of the gap. While holding down both the ALT and right mouse buttons, move the cursor near the other side of the gap, and release the ALT and right mouse buttons. A dialog appears showing the vertical, horizontal, and total distances between the two track junctions.
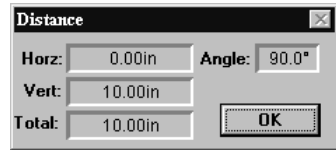
This should be a little more than 10.0 inches, just the size of an O-Straight. Choose one of these from the track menu and drop it in the gap so that it automatically joins to both sides (you could also go down to the status bar and press the small uparrow on the Last Track list button and then choose an O-Straight from here). This completes the first part of the tutorial. Your layout should now look like that below at this point.
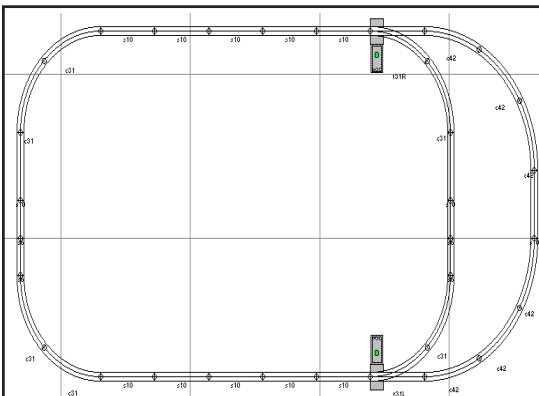
You have now constructed a simple oval loop of track, added a passing siding, and then expanded the oval vertically using the track joining/unjoining features of RR-Track. The next thing to do is add a simple grade to the left side of this layout. Doing so will familiarize you with the various commands and tools for dealing with grades, all of which are found under the <u>Grades</u> menu.

Adding a grade

Start the grade by going over to the far left side of the layout and selecting (you remember how to do this) all three of the straight track sections, the two half sections and the full straight. Then pull down the Grades menu and choose Change elevation. The *Change Track Elevation dialog* appears as shown at left:
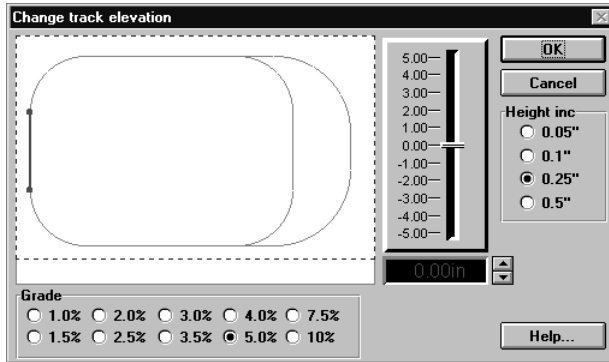
The grade preview window on the left shows the track you have highlighted in red (this is the track whose elevation we are going to change), the rest of the layout in black, and the edges of the layout in dashed blue lines. Below the preview window is a set of radio buttons that you use to set the required grade. The fader control on the right of the preview window, as well as the up/down spin buttons below the fader and adjacent to a panel readout that shows the change are used to set the elevation of the selected track sections.
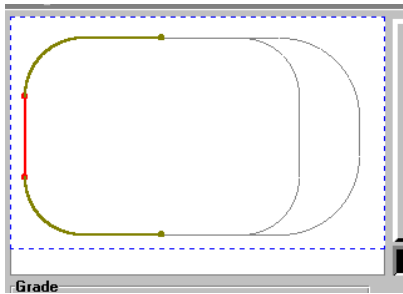
Leaving the grade set at 5.0 per cent for the moment, and the height increment set at 0.25 inch, either grasp the fader slider and move it up so that a height of 2.00 inches is shown in the panel readout, or click the up spin button eight times to achieve the same result. The preview window should now look like that at left:

Notice that RR-Track has calculated you must pick up four track sections in height on each side of the elevated track (two O-31 curves and two O straights) in order to satisfy grade requirements of 5.0 per cent and an elevation of 2.0 inches.
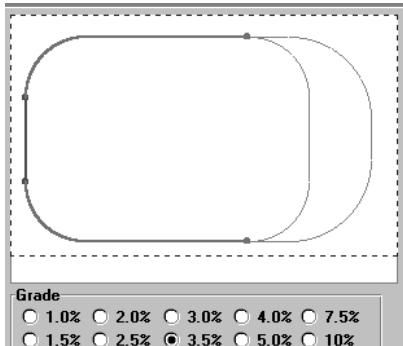
To see the effect of changing the grade without changing the elevation, go down to the set of radio buttons below the preview window and select 3.0 per cent as the grade. RR-Track immediately recalculates the grade track and shows you that, in order to meet an elevation of 2.0 inches with a grade of 3.5 per cent, you will have to pick up track sections all the way to the turnouts as shown at left:

Of course, the problem now is that 2.0 inches is not enough clearance for an O-gauge train (here you need at least 4.5 inches and probably 5.0 inches). It is clear, in order to raise the track up high enough to clear another train, we will need to either increase the grade, or build a bigger layout. You can play around both with different elevations and different grade values to see how they trade off in terms of track sections that will have to be picked up in order to accommodate the grade.

Go down to the set of grade radio buttons and choose 7.5 per cent for the grade (this is approximately the grade imposed by a Lionel® trestle set. At the same time, by using either the fader or the spin buttons, change the track elevation to 5.0 inches. RR-Track recalculates the grades, and shows you a preview like that at left.
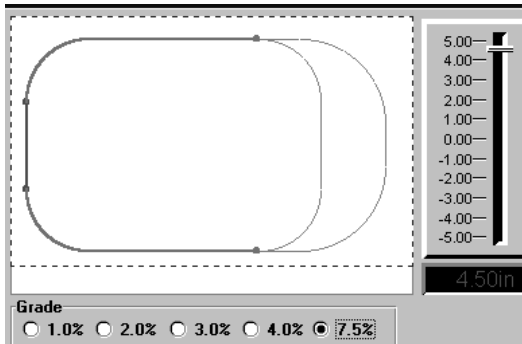
You can see that with a combination of 5.0 inches of elevation and a grade of 7.5 per cent, we can accommodate the grade without having to pick up the turnouts as well. To enter this grade into the layout, press the OK button. RR-Track now applies the elevation and grade heights to the affected track in the layout, and redraws these items. Your layout should now look like that shown at right.

The triangular arrow symbols on the grades show that this a grade track section; the arrow points in the direction of increasing height (uphill if you wish). The tags showing dimensions denote the heights of the track junction on a given section that is furthest removed from the elevated track, i.e. the downhill end. This is the height you would have to make your structural supports in order to build this layout design (If you don't see either the grade symbols or the junction heights, pull down the Options menu and select Options and then Layout Options (or pull down the Control Menu at the upper left of the layout window and choose Options). When you see the *Layout Options dialog*, look to the lower right and make sure that the grade symbols and grade heights boxes are checked).
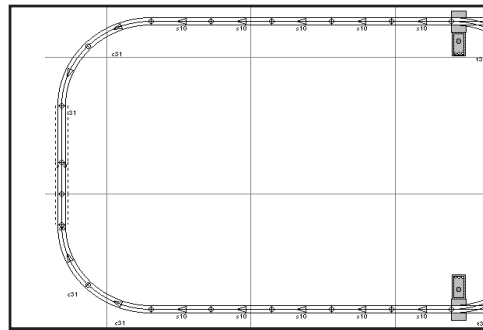
Pull down the Options menu and select Selections Include Grades. Then, move the cursor over one of the elevated track sections (one of the straight track sections to the left which we originally selected and moved up) and double-click the left mouse button. All three sections should be highlighted as they are all in one elevation. Now move the cursor over one of the grade track sections (any one with an arrowhead grade symbol, it doesn't matter which one) and double-click

the left mouse button. All of the grade track sections should highlight. Now, pull down the Grades menu and choose Information. You will see a dialog like that at right.
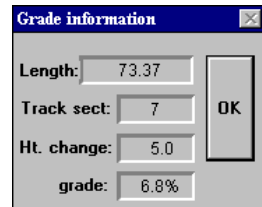
It shows a grade length of 73.37 inches comprised of 7 track sections. There is a total height change of 5.0 inches and this works out to a grade of 6.8 per cent, a little less that the 7.5 per cent we set when we created the grade. This is because RR-Track picks up track sections wholly; grades always start at a track junction and end at a track junction and they don't start in the middle of track. In this manner you won't have to bend any track to create the grade, and you will always get a final grade that is equal to or less that the set grade.

Go back to the elevated straight track and double-click it with the left mouse button. Again,all three elevated sections highlight. Now we will remove the grade we just put in. Pull down the Grades menu and choose Remove elevation. RR-Track immediately finds all of the grade track connected to the elevated track, resets the height to zero, and removes all grade symbols. You will see a layout that is identical to that you started with for we just took out all of the elevated and grade track that we had put in. For more information on using the *Change Elevation dialog*, and other commands found in the Grades menu, see elevating track.

Using multiple layers

Another feature of RR-Track is the ability to design your layout without having to always see every detail. This is done by introducing the concept of *layers* to the track layout. Despite the name, layers having nothing to do with the height of track, accessories, or objects. A *layer* is a conve- nient name for items that are associated in some other fashion (for example you could have a benchwork layer for all of the support structures, or a mainline track layer, or an upper level track layer). In order to add, remove, or modify layers, you have to go through the *Layer Setup dialog*. Pull down the Options menu and choose Layers...
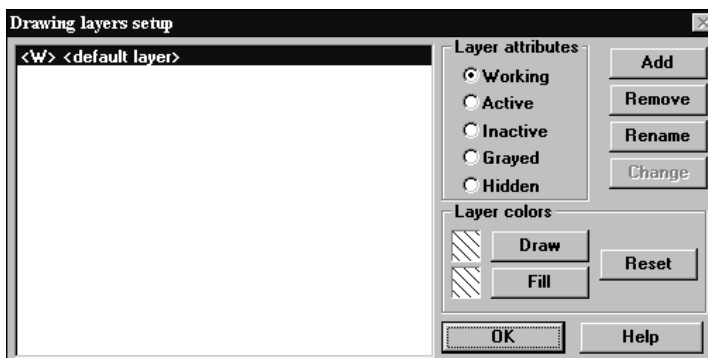
Every layout you create has at least one layer in it which RR-Track sets up for you. This is the <default layer>, as shown at left. You can't remove or rename this layer. At the moment, all of the track that we have added to the layout in this tutorial is in the <default> layer. This layer is also the working layer, as signified by the prepended <W>. The

working layer is the layer in which new items are placed (see **Creating, Changing, and Removing Drawing Layers** for more information about layers).

Let's add a new layer. Press the <u>Add</u> button, and when the *Layer Name dialog* appears, type in "upper level track". Then press <u>OK</u>. The list of drawing layers should change to reflect this additional layer, as shown at right. The working layer is still the default layer at this time. Double-click on the 'upper level track' layer in order to quickly change this layer to the working layer, and leave the <default layer> as active (which means you can do anything you want to it but add items). The layer list changes to:

Now that you have added a new layer for some upper level track, press the <u>OK</u> button on the *Layer Setup dialog* so that we can get back to laying some track.
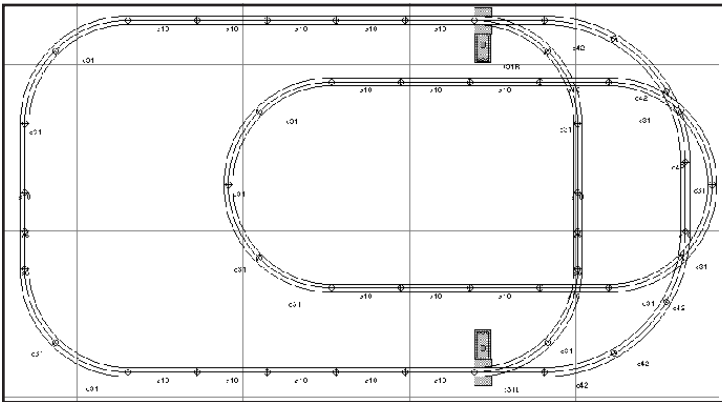
Build a loop of O-gauge track, using the techniques we just went through, that looks something like that at left.

Next, we want to raise this entire loop of track up to 5 inches or so (the exact amount doesn't matter for this tutorial, but to be consistent we will set the height at 5 inches). Do this by:

(1) double-clicking on the new loop to select all of the track.

(2) Pull down the <u>Grades</u> menu and choose <u>Set Track Height</u>.
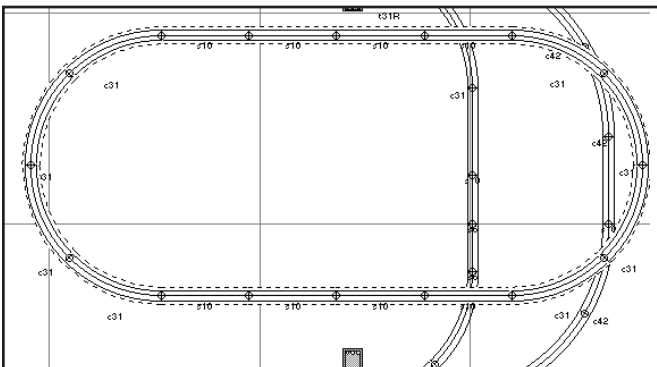
(3) In the *Set Track Height dialog*, use the spin buttons to set a height of 5 inches, and then press <u>OK</u>. This raises the track sections up and makes them all overpasses. Now the layout should appear as at left.

Note that the elevated track sections are drawn as passing over those that are not elevated. Now, let's return to the *Drawing Layer*

Setup dialog and change the properties of the 'upper level track' layer. Pull down the Options menu and select Layers to get the *Drawing Layer Setup dialog*.

The 'upper level track' layer should be highlighted since it is the working layer (remember we set this before we started creating the second loop). Go to the *Layer Attributes* radio buttons and check Grayed. As soon as you have done this, press the Change button (changing the layer attribute to grayed doesn't take effect until you press the Change button). Notice that RR-Track automatically makes the <default layer> the working layer when you do this. Then press OK to go back to track laying. RR-Track redraws the upper level track so that your layout now looks like:
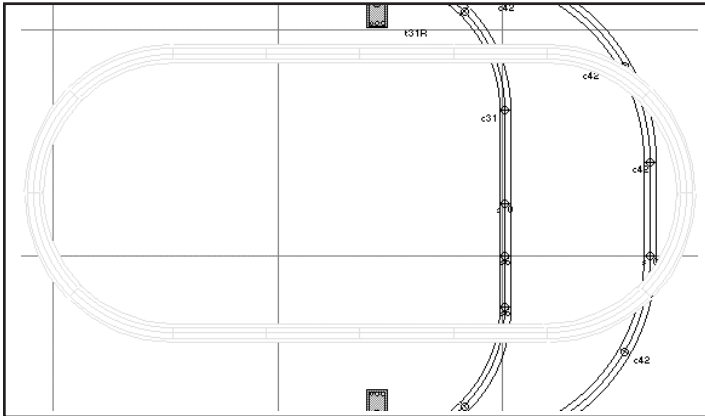
Try going back to the *Drawing Layers Setup dialog* and changing the 'upper level track' layer attributes to *Hidden* or *Inactive* and see what happens. If you want to change the color of the track in the 'upper level layer', press the Draw and Fill buttons to get the Windows Color Chooser.

Creating and editing objects

You can use RR-Track's set of general purpose drawing objects to draw in all of the scenery and structures that you want. The only limit on detail is your own time and patience. To show what can be done, we will draw a simple building.

Make sure the working drawing layer is the <default layer> (you can check this by looking at the status bar at the bottom of the RR-Track main window — the current working layer is shown in blue). If the working layer isn't the <default layer>, make it so by bringing up the *Drawing Layers Setup dialog*. Now, pull down the Objects menu, then the Buildings menu, and choose Hip-roof building. Sweep out a building that is about 8 x 6 inches (the exact size doesn't matter) somewhere on the left side of the layout. Next, place the cursor on the building you just created and click the left mouse button to select it, just as you have for track. The building should look something like that at right. Notice that each corner has a small red circle, and the corner at the upper left has an additional box around the circle. The red circles are the object's *edit points*, while the edit point with the box is the object's *origin*. Whenever an object is the first item selected, RR-Track displays its edit points so that you can resize or rescale it.

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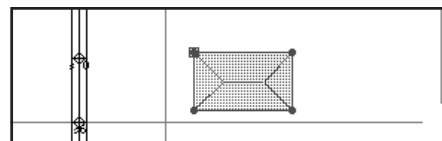
Place the cursor arrow point over the edit point on the lower right of the building and depress and hold the left mouse button until the cursor changes to an arrow with the word 'Edit' below it (if you aren't exactly over the red circle, you will either get the 'Move' cursor to show that RR-Track thinks you want to move the building around the layout, or if you miss completely, the building will be deselected and you will have to start over). Slowly drag the edit point to the right. RR-Track displays a small window in the upper right corner of the layout window that shows the new size, and the per cent change in scale in both the horizontal and vertical directions. When you reach the new size that you want, release the left mouse button. RR-Track redraws the building at the new size. There is no limit to the number of times you can edit an object.

While this tutorial does not cover every feature in the application, it does introduce you to the methods of laying track implemented in RR-Track. You can see that it is easy to both build a new layout, and modify existing layouts using RR-Track. Feel free to examine both the demonstration layout files that came with RR-Track, and/or the example layouts found in the EXAMPLES subdirectory. You can use these to play with, to get ideas from, or to use as starting points for your own layout.

Windows, Menus, and Displays

RR-Track™ windows

RR-Track creates a number of windows in addition to the main layout window. These windows visibility is set using commands under the View menu.

main frame window
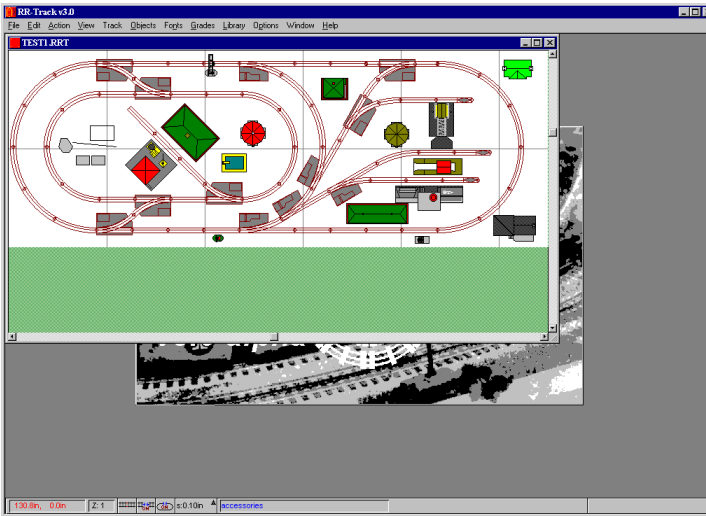
The main frame window contains the viewing area for all of your track layout windows. RR-Track 3.02 is a Multiple Document Interface (MDI) application. This means that the main RR-Track window is a holding area for any number of layout windows that contain the individual track layouts you are designing. You can switch from layout to layout by clicking on the one you want in the title area, or by pulling down the Windows menu and choosing the layout that you want to bring to the top (this is called 'setting the input focus' in Windows). A layout window can be maximized to fill the main window viewing area by choosing the up arrow button (for Windows 3.x) or the maximize button (for Windows 95 and Windows NT 4.0).
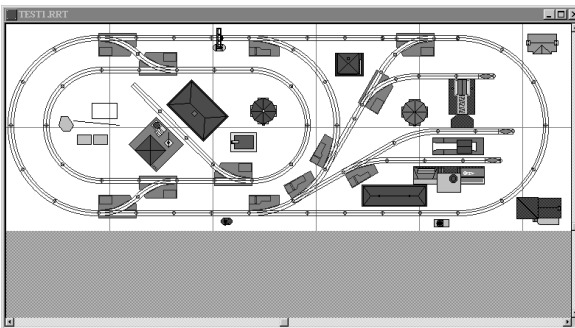
layout window

The layout window contains the viewing area for the track layout as well as horizontal and vertical scroll bars which may be used for panning around the layout. It is in this window that all track and objects appear as they are currently located and connected on the layout. Using the zoom commands under the View menu, you may change the magnification factor, in increments of two and

four, at which the layout is drawn in the main window. The commands on the top level menu bar act on track and objects in this window. These menu items will change as you change layout windows from one layout to the next.

track list window

The track list window displays a list of all the track sections in the current layout, sorted both by type and family. For each entry, the number of sections of that type are shown, their cost, as well as a summary at the end of each track family of both the number of pieces and the cost. The cost for each track item is user editable and is found in the initialization file associated with that track library. For more information see the section on initialization files. The contents of the track list window change as you change the layout window that has the focus (i.e. the layout window you are working on).

You may toggle between showing and hiding the track list window by selecting the Show Track List item on the View menu. A check mark indicates that the window is visible. It can be moved around the screen like any other window using the mouse cursor. You may also minimize this window by pressing the minimize box on its title bar.

The track list window has a menu with four items, Copy , Action, Font, and Help. The Copy command copies the track list text to the Windows Clipboard so that you may paste it into other applications for, as an example, preparing an order to one of the track manufacturers. You may also have the Copy command activate and send the track list information to **Windows™ Write (**this is WordPad in Windows 95**)** for text formatting and printing. Under the Action menu is a single command, Hilite. This command is disabled until you click on one of the entries in the track list window. If you then choose the Hilite command, all of the track in the layout of the chosen type will be selected and highlighted. This is useful for seeing where you are using a given radius of curve, or where you have put cut track sections. The Font command allows you to change the display font used in both the Track List Window and the Select List Window, and is the same as the List Font command found under the Fonts menu item on the menu bar.   The Help command starts the Windows Help engine and opens the topic to the items relevant to the track list window.

You may get detailed information about any of the track types in the list by double-clicking on that item with the left mouse button. This will activate another track list window which gives detailed information about the location, orientation, and size of each of the track sections of that type. An example of this window is shown to the left. Like

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the primary track list window, the secondary track list window has <u>Copy</u> commands so that you may copy the track information to either the clipboard, or activate and place the information into **Write**. The <u>Action</u> command in this window lets you highlight all of the track sections in this list. This is useful for seeing where you have place various track types, and whether you have placed cut track sections up against each other.

select list window
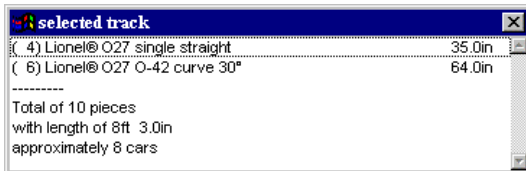
The select list window displays a list of all track sections that are currently in the select list and highlighted in red. The total length of each of the track types is shown in the column at right, while the total length of all of the selected track, in inches, is shown at the end of list, as well as the approximate number of cars of the appropriate gauge which will fit on this length of track. This is useful for checking on the length of spurs, sidings, and passing tracks in order to see if their lengths meet your needs.

You may toggle between showing and hiding this window by selecting the <u>Show Select List</u> item on the <u>View</u> menu. A check mark indicates that the window is visible. It can be moved around the screen like any other window using the mouse cursor.

multifunction status bar
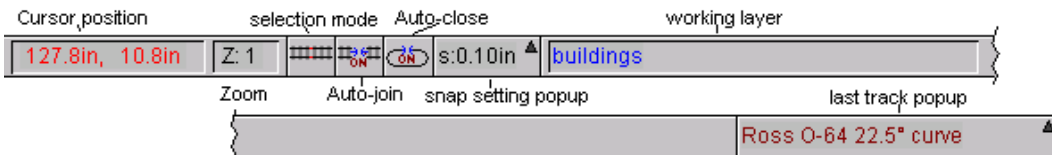
RR-Track has a multifunction status bar which appears at the bottom of the main window. The status window maintains a display showing the current values and state of RR-Track's most important settings, as well as short cuts to changing the most popular of these.

To the left is a small pane that shows the current cursor position in the active layout window. Next to that is a smaller pane that shows the current Zoom factor (in the example the zoom is 1). Next the Zoom pane is a set of three buttons that both show, and let you change, the current extended selection mode, the auto-join mode, and the auto-loop close mode respectively. You can cycle through the extended selection modes (from joints to electrical to grades and back to joints) by repeatedly clicking the selection mode button. You can toggle auto-join between ON and OFF by clicking the auto-join button, and you can toggle auto-loopclose between ON and OFF by clicking the auto-close button.

The next button is the Snap-Size / Mode button. It displays the current snap size, or OFF if snap-to-grid is toggled OFF for the active layout. By clicking on the button, you can toggle the snap-to-

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grid setting for the active layout between ON and OFF. By clicking over the little uparrow symbol, you will pop up a list of the available snap settings with the current one highlighted. You can choose a new snap setting from this list by clicking on it with the left mouse button (choosing a snap size will also turn snap-to-grid ON if it was OFF). If you don't want to choose a new snap setting, click somewhere outside of this list.

The next pane is informational and shows the current working layer (for more information about drawing layers and their attributes, see Working with layers).

At the right end of the multifunction status bar is the Last Item List button. This button displays the last item (track or accessory, not object) added to any of the layout windows (this last item list covers all of the layout windows). You can get another of whatever you added last by clicking this button (this is the same as using the Last Track command under the track menu, or double-clicking over blank space). You may also click on the small uparrow symbol to pop up a list of the 10 most recently added distinct items. You can then choose one of these items.

You may toggle between showing and hiding the status bar by selecting the Show Status item on the View menu. A check mark indicates that the multifunction status bar is visible.

Track and symbols in RR-Track™

To the left and right are shown typical images of track, as displayed by RR-Track. These are, going down the page and from left to right, an O-gauge 10.0 inch straight track, an O-gauge O-72 curved track, an O-gauge O72 turnout, and an O-gauge, 45° cross. There are other more special-ized track sections found in some of the libraries, such as double-crossovers and three-way turnouts, but these illustrate typical track sections. Three-rail track is drawn with three-rails and two-rail track is drawn with two-rails. The ties are not drawn, since the overhang of locomotives and long cars goes further to dictate clearances than ties do. In some track libraries where the track is integral with the ballast, such as Märklin®-M HO track and Kato UniTrack®, short lines indicating the extent of the ballast are drawn at each of the track ends.

The round, filled circles at the track ends are the track control points. These are the locations where track sections are connected to each other. The presence of a filled circle means that that track end is physically joined to another track section. The presence of a double circle, larger than the track width, indicates that that track junction is electrically discon-tinuous, i.e. insulating pins are used at this junction to effect a block break (see designating an isolated electrical block for more information).
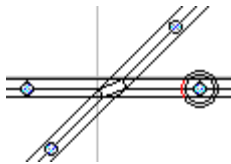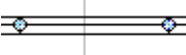
Using the mouse

The mouse, or trackball, is a vital part of the RR-Track user interface. Windows™ by its nature, is graphically oriented and does not adapt well to keyboard-only use. RR-Track makes full use of the graphical nature of the Windows™ environment by deriving little of its input from the keyboard.

RR-Track changes the cursor (the shape of the mouse pointer) to inform the you of what kind of operation the mouse is currently being used for. If the cursor is the standard Windows™ arrow, RR-Track is awaiting your instructions. An arrow cursor with the word 'Break' under it means you are to designate a track joint for breaking. An arrow with the word 'Autojoin' under it means the track section you are adding to the layout will be automatically joined to the nearest available track section when you release the track section by depressing and releasing the left mouse button. An arrow with the word 'Move' below it means you are currently moving an existing or new track section from one location to another. A box with four inward pointing arrows and the word 'Zoom' means you are selecting an area to zoom in on, either by a factor of two or four. A crosshair with a diagonal arrow and the word 'Select' means you are designating a selection rectangle for the purpose of selecting (highlighting) objects for action. A simple crosshair means you are being asked to designate the starting point of a rectangular object, a line, or the center of a circle. When the left mouse button is depressed, the cursor position will be used for this point. The cursor then changes to an arrow with the word 'Size' meaning you are to drag out the size of the object while holding down the left mouse button. When you release the button the object is drawn. An arrow with either a small hexagon or a sawtooth line and the word 'Point' below it mean that you are to designate the next point in either a polygon or a polyline (the last point is indicated by *double-clicking* the left mouse button).

Left mouse button: The left mouse button is used to select track or objects for further action such as movement, rotation, joining, aligning, grouping. To designate, you position the cursor over the item you want to choose, and then click the left mouse button (see <u>selecting track or objects</u>). If you follow the same script, but *double-click* rather than single click, you designate an *extended selection*. Whether the extended selection includes all physically connected track, all electrically connected track, or all track at the same height or on the same grade is determined by which extended mode you have currently set using the Options menu. *Double-clicking* over an extended selection collapses the selection back to only the item under the cursor. *Double-clicking* over an object (rectangle, building, tree, etc.) will call up the Object Properties dialog, or, for text labels, the Text Label dialog, so that you may make changes to the editable features of the object. *Double-clicking* over nothing (no track, accessory, or object beneath the cursor) will act as choosing the <u>Last Track</u> item on the Track menu, and put a piece of track identical to the last chosen under the cursor for placement. *Double-clicking* over nothing while holding down the CONTROL-key will act to choose the last *object* selected from the Object menu (this is a handy way to draw a lot of trees or buildings quickly without going back to the Object menu). If you position the cursor over a non-highlighted item and depress and hold down the left mouse button, RR-Track will, after a pause of 1/4 to 1/2 second, assume you want to move that item, highlight it and change to the move cursor, allowing you to drag the object to a new position (see <u>selecting</u>

<u>track or objects</u>). This may also be done when double-clicking a track section to create an extended selection; just don't let up on the mouse button after the second click.

To sweep out a rectangular area for selecting objects, to move selected items, or to designate the size of all general purpose objects you use a *depress - drag - release* sequence with the left mouse button. Here you position the cursor over the previously selected item, depress and hold the left mouse button, move the cursor while holding down the left mouse button to move or designate a region or size, and then release the button when you are satisfied with your designation (see <u>moving track</u> for another description of this).

To choose or unchoose track or objects in addition to those already selected (highlighted), position the cursor over the item, and click the left mouse button while holding down the SHIFT key (see <u>selecting track</u> for more information).

To cause the view to automatically scroll when you move the cursor, hold down the SHIFT key without depressing any of the mouse buttons. When the cursor gets near the edge, the view of your layout will automatically scroll in the appropriate direction.

Right mouse button: The right mouse button is used to measure distances on the layout using the ruler function, to pop up a short menu (shorthand menu) of the most commonly used commands, to tear off menus from the menu bar for later use, and as a property inspector for both track and objects.

To bring up the <u>shorthand menu,</u> position the cursor over nothing and click the right mouse button.

To use the ruler function, depress the SHIFT key, position the cursor over the starting point, depress and hold both the SHIFT and right mouse buttons, drag the cursor to the ending point, and release both the SHIFT and right mouse buttons. To make the ruler function snap the endpoints to the nearest track junctions, depress the ALT key rather than the SHIFT key. For more information see <u>measuring distances</u>.

To find out the gory details about a track or object item, position the cursor over that item and click the right mouse button. This action calls up a dialog box showing you more than you probably want to know about that item.

The right mouse button is also used to tear menus off, and leave them on the screen for further use and reference (see <u>tearing off menus</u>).

Mistakes and pitfalls: probably the biggest source of problems with the mouse functions comes when you use the Mouse Control Panel Object to reconfigure your pointing device. If you are having the wrong action occur when you click a mouse button, such as a menu appearing when you press the left mouse button, check to see whether you have remapped the right and left mouse buttons. To be sure, use the Mouse Control Panel Object to reset the mouse buttons in the standard fashion. RR-Track looks for specific mouse messages from Windows; if you remap the buttons mass confusion can easily result.

Another set of difficulties arises from either too long or too short double-click times, or too much cursor acceleration, both of which may be set from the Mouse Control Panel Object. If you are having trouble single- and double-clicking, check the Mouse settings in the Control Panel. A number of frustrating events can occur if you have the double-click time set to be either too long or too short for the actual speed at which you are executing double-clicks.

RR-Track Menus

The main menu bar in RR-Track, running across the top of the screen, contains the commands which may be used to interact with your layout. These have been divided up into standard submenus which are discussed in detail below. An additional menu, the *shorthand* menu called up by clicking the right mouse button, contains a subset of the most commonly used commands so that you may quickly access them.

File menu
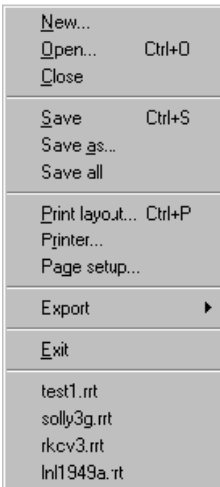
The file menu contains the commands that create new layout files, open existing layout files, save layout files, and print layout files. The file menu commands vary depending on the current state of RR-track. When first started, the available commands are:

New...create a new track layout

Open...open an existing track layout (for example, *mylayout.rrt*).

Close close the active layout window.

Exit close all layout windows and RR-Track.

When either a new track layout has been created,or an existing layout is opened,the file menu changes, adding the following commands:

Save save the active layout.

Save as...save the current layout to a disk file, or save the current screen image to a Windows Bitmap (BMP) file.

Save all saves all of the open layout windows.

Print layout... print the entire layout. You can indicate on the preview window which pages of the layout you wish to print, as well as configure fonts and labels, and printer and printer settings.

Page setup set up the look and style for the current screen view when printed
Printer... set the printing characteristics (page orientation, resolution, etc.) of the RR-Track printer. You can also choose which of your printer(s) RR-Track should use as the RR-Track printer.

Export lets you export the current screen display to a Windows™ Bitmap (.BMP) file.

Below the Exit (which lets you close RR-Track) command are a list RR-Track maintains of the last four layouts opened. Press any of these to open the corresponding layout, without having to wade through the Windows Open File dialog.

At any given time during the course of creating or modifying a track layout, commands in this menu will be enabled or disabled(grayed) reflecting the courses of action available.

Edit menu

The Edit menu encompasses the commands that operate on track and other layout objects. As is the case for many menu items, the commands under the edit menu will be enabled and disabled reflecting the current state of the track layout.

Undo delete : un-does the last delete of 100 or fewer items. You must undo your deletions before you add/subtract further items from the layout, rotate objects, move objects, or make any other layout changes.

Cut delete the selected items from the layout and copy it to the RR-Track clipboard

Copy copy the selected items to the RR-Track clipboard.

Paste paste the RR-Track clipboard contents into the layout.

Delete delete the selected items from the layout. Deletes of up to 100 items will be placed in the Undo Delete buffer; deletes of more than 100 items will be confirmed with a prompt from RR-Track.

Duplicate duplicate the selected items on the layout. This command combines Copy and Paste, destroying the clipboard contents in the process.

Duplicate parallel creates a duplicate set of track / items parallel to, and offset from, the selected track. You work through the Duplicate Parallel dialog to set and preview the offset. This command, like the simpler duplicate command, combines Copy and Paste, and destroys the clipboard contents in the process.

Select all selects all of the track, accessories, and objects in the layout.

Select all in layer... selects all of the items (track, accessories, objects) in the layer you choose from a dialog.

Select all visible selects all of the items that are visible regardless of layer (only items that are grayed or hidden will be exempt).

In order for the cut,copy,delete , duplicate, and duplicate parallel items to be enabled, track or other layout objects must be selected (highlighted). The paste command is disabled when the RR-track clipboard is empty, but enabled otherwise. The undo delete command is only enabled immediately after deleting 100 or fewer items (more than 100 RR-Track asks for confirmation;

after this you are on your own). The commands in this menu are also accessible using the keyboard shortcuts shown in the drop-down menu.

Action menu

The action menu contains the commands that carry out operations on selected objects in the layout. These operations consist of rotating track and other objects, creating or breaking joints between track sections, aligning joints between track sections, and moving track sections in order to minimize the alignment errors at junctions.

Rotate... perform angular rotations on selected items.

Move... summons the *Move dialog* (see moving track and objects) that lets you move selected items incrementally rather than drag them around with the mouse. This command is useful for fine adjustments of position.

Move to layer... summons the *Layer chooser dialog*, and then moves the selected items to the chosen layer. This command is only useful if you are using more than one layer.

Unjoin selected track break all joints in, and between the selected track and the rest of the layout.

Join to nearest track create a joint between the selected track and the nearest unjoined track.

Close contiguous loop closes loops in the selected track. Normal track joining will not close a contiguous loop since the join command will not allow track to be joined to itself.

Break Joint breaks single joints in the selected track. This is different from Unjoin track, which breaks all the joints in the designated track.

Object alignment commands:

Align : this submenu allows you to access three commands for aligning track and objects with the coordinate grid, or other track/objects. The alignment commands consist of:

    Align to coordinate grid: lets you align one or more edges or centers of the selected track to the coordinate grid at the current snap resolution.

    Align to designated object : lets you align the edges and/or centers of the selected track to another track section or object.

    Align to nearest track : lets you align the selected track with the nearest unjoined track. Like joining, but the track sections are not actually joined.

Object grouping commands:

Group objects groups all *objects* in the select list. This does not include track or accessories.

Ungroup objects ungroups the first grouped object in the select list.

Display ordering commands:

Move to front moves the lead selection to the last of the display list so that it will be drawn on top of all other track or objects.

Send to back moves the lead selection to the first of the display list so that it will appear behind all other track or objects.

Electrical block commands:

Set/Clear block breaks:sets/clears the placement of an electrical block break at the designated joint in the selected track. The track is still physically joined. This command is used to set individual electrical breaks; use the Create block command to set an entire block.

Clear all blocks:removes all of the electrical block breaks in the selected track. The track is still physically joined.

Create block: sets electrical block breaks at all of the ends of the selected track. The track is still physically joined. This is a faster way to create blocks than using the Set/Clear block break command, which is used to set/clear a single break.

Item locking commands:

Lock selected items: locks the selected objects and track into place on the layout. When objects are locked they can neither be moved nor rotated until they are unlocked. Handy for keeping you from accidentally moving stuff you have finished with.

Unlock selected items: unlocks all of the selected objects and track. You must unlock locked items before you can move, delete, or rotate them.

Relax selected track configuration adjust the position of the selected track to minimize junction alignment errors.

The items in this menu will only be enabled if track or other layout objects have been selected (highlighted).

View menu

The view menu contains the commands that manipulate the location and zoom of the RR-track windows. These include zooming in and out on the track display, redrawing the display at any time, and showing or hiding the auxiliary information windows. The center position of the track display may also be adjusted by using the horizontal and vertical scroll bars at the bottom and right margins.

Zoom in 2x zoom in on the layout by a factor of 2.

Zoom in 4x zoom in on the layout by a factor of 4.

Zoom out 2x zoom out the layout view by a factor of 2.

Zoom out 4x zoom out the layout view by a factor of 4.

Last view return to the previous view.

Home view set the upper left corner of the screen to the upper left corner of the layout, and returns the zoom factor to one. This gives you a full overview of your layout.

Fit in window is similar to home view, except that not only is the zoom factor set to one, but the overall scaling is set for maximum utilization of the layout window area. This is a very useful command when you have resized a layout window. It is automatically invoked whenever you maximize a layout window at a zoom factor of one.

Redraw force a redraw of the current view.

Show status toggle between showing and hiding the multifunction status bar.

Show track list toggle between showing and hiding the track list window.

Show select list toggle between showing and hiding the select list window.

Show locked items highlights all locked track, accessory, and objects.

The four zoom commands, together with the home view and fit in window commands and the scroll bars at the bottom and left margins, collectively control the display scale for the screen display. The three show commands control the display of the auxiliary information windows that show mouse location and display mode, the list of the track in the layout, and the list of objects that are currently selected (highlighted).

RR-Track has a one item deep view stack, which operates like the stack on a reverse Polish notation calculator. Whenever you change the view, the previous view is put on the view stack. When you select Last View, the current view and the view on the view stack are swapped, with the last view becoming the current view and the current view becoming the last view. You can use this feature to maintain an overview of your track layout, while zooming in to do some work, and then darting back out by selecting Last View. RR-Track maintains separate view stacks for each layout window.

Track menu
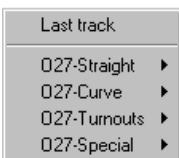
The track menu consists of track types available in the current track library. This menu changes when a different track library is selected since the detailed varieties of track sections vary between the different families. In general, all track libraries have straight sections, curved sections, turnouts, and a number of special purpose track sections such as bumpers, uncoupling sections, insulated sections, etc. Some track libraries, due to their complexity, will

contain more subdivisions than the basic ones shown to the left. The first item on the track menu is Last Track and simply allows you to add a track section to the layout that is identical to whatever section was previously added. You may also invoke the Last Track command by double-clicking the mouse when the cursor is not located on either an object or a track section.

Many track libraries, notably LGB® and Curtis HiRail, allow for custom cut-to-length straight sections up to the maximum flexible track size in that family, and custom curved sections, where you can set the radius of curvature, the arc length, and the angle subtended. When you select these track types, you are presented with a dialog box in which you enter the information required to produce those track types. By combining both cut-to-length straight sections and custom curves, you can approximate flexible track sections. You can then *select* these sections in order to find out the approximate length of a new piece of flexible track that will accommodate them.

If you place a new piece of track, and decide you do not want it, you can call up the Undo Last Track item from the *shorthand* menu. Selecting this item will delete the last track section added to the track list. Undo Last Track is limited to one level of undo.

When you use the Library menu to change to an accessory library, the Track menu title changes to Accessories. The entries for the accessories are located in this menu in an analogous manner to that for track sections.

Changing track libraries destroys any track library submenus that you may have torn off and left up on the screen.

Objects menu
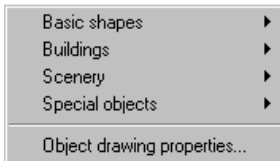
The Objects menu contains commands that allow you to create simple geometrical shapes and add them to your layout. The simple objects available consist of rectangles, circles, polygons and lines. Once placed into your layout, these objects may be selected, moved, and rotated just as you would manipulate track sections. They may not, however, be joined to track sections. Somewhat more specialized objects such as a railroad bridge, turntable, hip-roof building (both subtypes of the rectangle object), and various trees (a subtype of circles) are available for placement in your layout.

The Objects menu is divided into four submenus: *Basic shapes*, *Buildings*, *Scenery*, and *Special objects*, as well as a command use to set object drawing properties found at the bottom of the menu. The submenus may be torn off and left on screen just as for any other menu in RR-Track.

Basic shapes: the basic shapes consist of rectangles,circles,polygons, straight lines, and polylines;filled rectangles,filled polygons, and filled circles . Polylines are multiple connected line segments and can be considered the same as unfilled polygons without the end points connected.

40
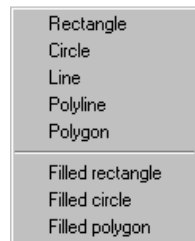
Buildings: the basic buildings include a plain building, hip-roof building, a water tower, a railroad bridge/overpass, and a turntable. Plain buildings are drawn with a single vertical roof line in the center of the buildings. Hip-roof buildings have the hip-roof lines automatically drawn in to fit the building rectangle. Water towers consist of a square base with a circular structure fit into the base. Turntables are circular/polygon structures with 24 connection points spaced every 15° and a suitable moving platform shown in the center. Track can be placed at the connection points, but there is no facility for joining track to turntables in the manner that track is connected to other track.

plain building
hip-roof building
water tower
railroad bridge
turntable
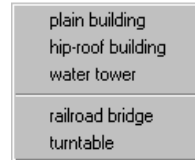
Scenery: these include deciduous trees, evergreen trees, a more realistic tree, a spring time tree, fall tree, and winter tree. Other scenery consists of embankments, ponds, and boulders. The realistic tree is drawn with 24 randomized edges in a medium green color, the spring tree is drawn with 24 randomized edges in a randomized color around medium green, the fall tree is drawn with 24 randomized in a randomized color around orange-yellow, while the winter tree is drawn with 24 randomized branches (no foliage). Boulders are drawn with six randomized edges, while ponds and embankments are designated like polygons, but filled in with blue and hatched brushes respectively.

deciduous	tree
evergreen	tree
realistic	tree
spring	tree
fall	tree
winter	tree
boulder	
embankment	
pond	

Special objects: these include electrical connections and text labels.

Object drawing properties: this command calls up a dialog which you use to set the drawing properties of current and future objects. You can use this command to change the line style, color, and fill color of the selected object, or the text of a text label, or, if no objects are

electrical connection
text label...

selected you can set the default line style, color, and fill color of subsequent objects. An alternative way to invoke this command is to double-click on the object you want to edit.
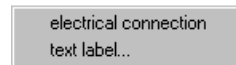
To create a new object, pull down the Objects menu and select the type of object you wish. The cursor will change to a crosshair, indicating that RR-Track is waiting for you to designate the object origin (this is one corner for rectangles, the starting endpoint for lines, the center for circles, and the first vertex for polygons). Do this by moving the cursor to the point you wish to place the object, then depress and hold the left mouse button down. The cursor will change to an arrow with the word 'size' below it. While holding the left mouse button down, move the cursor. The object is drawn as you move the cursor, with the status window continuously updating the size of the object (radius for circles, width and height for rectangles, length and angle for lines). When you have reached the desired size, release the left mouse button. The object is immediately drawn, and the cursor returns to Windows arrow. You don't have to get either the size or the location of the object correct the first time since you can both move and edit objects (see **Editing objects** for more information). You may select objects just as you select track for movement and rotation.

Polygon and *polyline* objects (which include ponds and embankments) are designated in a bit different manner. Here you click the leftmouse button to designate the first vertex, then move the

cursor to each successive vertex, clicking the leftmouse button for each one. When you reach the last vertex, double-click the leftmouse button. RR-Track automatically closes polygon objects; you don't have to come back to the initial vertex (polylines are not closed, of course).

The current setting of both the Snap To Grid command and the Snap Size affect all objects and track. If Snap To Grid is enabled (checked on the Options menu) then the origin and size of the object you create will be 'snapped' to the nearest point that is an integral multiple of the snap size. For example, if the snap size is set to 0.5 inches, then an object cannot be created with a dimension finer than 0.5 inches. This applies to designation of polygon vertices as well.

To draw many objects of the same type rapidly (such as trees or rocks), *double-click* the left mouse button while both holding the cursor over nothing and holding down the CONTROL-key. In a fashion similar to calling up the last track selected, RR-Track will call up the last object selected just as if you had pulled down the Objects menu and done this yourself. The cursor immediately changes to appropriate designating cursor for that type of object, and you proceed as before.

Fonts menu

The Fonts menu is used to specify the fonts used for various elements in RR-Track.

Track labels...
List windows...
Status window...
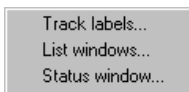
Track labels this command allows you to set the font used for the track labels and grade heights. The presence/absence of both track labels and grade heights is controlled with the Global Options dialog invoked by Options command under the Options menu.

List windows... this command allows you to set the font used for both the Track List and Select List windows.

Status window... this command allows you to set the font used by the Multifunction Status Bar.

Grades menu

The Grades menu contains the commands used to change track elevations, remove elevated track, and get information about existing grades and elevated track. Many of these commands will be grayed out unless there is both selected track and the extended selecting mode is set to selections include grades.

Change elevation...
Remove elevation
Reconcile grade
Create grade

Set track height...
Zero track height

Information...
Calculator...

Show grade track
Show elevated track

Change elevation... this is the fundamental command for elevating or depressing a section(s) of track. Choosing this command will bring up the *Change Track Elevation dialog* with the currently selected track sections highlighted. You interact with the controls in the dialog to graphically alter the elevation of the selected track sections while RR-Track automatically carries out grade calculations. For more information see *elevating track*.

Remove elevation this command returns the elevated track and all of its connected grades to zero height.

Reconcile grade this command examines the selected grade and removes any non-uniformity's which may have resulted from the interaction and collision of grades from the elevation of several pieces of track.   The track junction heights are recalculated as a result of this command. You can also use this command to add and subtract track sections from an existing grade. For more information see *elevating track*.

Create grade: this command is used to manually insert a grade into your layout. It may be used in conjunction with the Set track height command to set or edit grades and elevations. This command takes the selected track, examines the heights of the connection track at the ends of the selected track, and smoothly interpolates grade heights.

Set track height: this command is used to set the absolute height of one or more track sections, objects, or accessories. It may be used in conjunction with the Create grade command to set new or edit existing elevations.

Zero track height: a catchall command that will take the height of the selected track, regardless of whether it is connected to other elevated track sections, and set it to zero. This command is used when all else fails to remove unwanted dangling grades.

Information... summons the grade information dialog which displays the number of track sections, change in height, total length, and per cent grade for the selected grade. Useful for checking up on the exact slope parameters for a given grade.

Calculator... summons the grade calculator, a dialog that lets you play around with track height changes, lengths, and the per cent grade.

Show grade track selects and highlights all of the track in the layout that is on a grade. Graphically shows you where the grades are at on your layout.

Show elevated track similar to the above command, but instead shows all of the track sections at non-zero height and not on a grade.

For more information on all of these commands and their interactions, see **elevating track**.

Library menu

✓ Lionel® O-27	(32mm)
Lionel® O-gauge	(32mm)
Curtis HiRail O	(32mm)
Ross Custom Switches O	(32mm)
LGB® G-gauge	(45mm)
Lionel®/Rydin std gauge	(54mm)
Lionel® pre-war	accessories
Lionel® post-war	accessories
Lionel® modern	accessories
Plasticville	accessories

The Library drop-down menu is used to set the active track or accessory library. Entries exist on the menu for all of the track libraries in your copy of RR-Track; a check mark indicates the currently active library whose components are represented on the Track menu. The dimension at the far right, expressed in millimeters, shows the gauge (distance between the outside rails) of that particular track library The track and accessory libraries are (planned libraries are in *italics*):

Options menu

The options menu controls properties of all layout windows. These span a wide range and include the physical size of the drawing, the type of coordinate overlay, what style of track/object rendering is desired, and the joining and selecting modes. These commands control individual layout options (such as rendering detail, labeling, snap size, etc.), with the exception of the Options... command, which lets you change settings that apply to all layout windows.
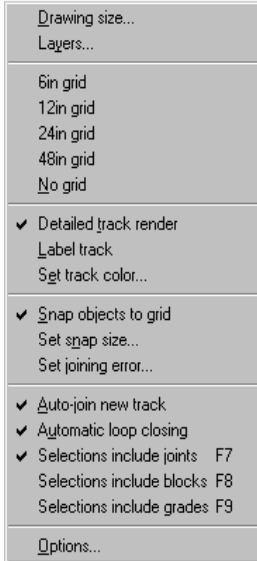
The following commands sets the drawing size and layer attributes:

Drawing size... allows the physical size of the active layout to be changed. See **changing the layout size** for more information.

Layers... lets you add/subtract layers from your layout and change the attributes (visible, grayed, hidden, etc.) of the layers in the active layout window.

The following commands set the scale of the display coordinate grid:

6" grid sets the display coordinate grid to 6-inch boundaries.

12" grid sets the display coordinate grid to 12-inch boundaries

24" grid sets the display coordinate grid to 24-inch boundaries.

48" grid sets the display coordinate grid to 48-inch boundaries.

(note: if you have selected the metric units option in the Global Options dialog, these coordinate grid sizes will be 10cm, 25cm, 50cm, and 1m respectively).

No grid turns off the display coordinates. Setting of the coordinate grid size affects only the active layout (i.e. each layout window's coordinate grid may be individually set).

The following commands control the layout rendering:

Detailed track render toggles the track rendering between simple and detailed.

Label track : toggles whether labels are drawn with track and accessory items. This is the same as the label track control in the Global Options dialog. This does not affect the display of track heights and grades.

Set track color : this calls up a dialog which lets you set the drawing and fill colors for the track libraries. These colors are used for the entire track library; you cannot set the color of individual track sections. You can, however, set the default track color for the track in a given layer using the Layers... command discussed previously.

The following commands control the designating and placement of general purpose objects:

Snap Objects To Grid toggles forcing track and objects to be snapped to an underlying coordinate grid set using the Snap Size dialog. This may also be toggled from the multifunction status bar.

Set Snap Size invokes a dialog letting you select the current snap size. The snap size and settings only affect the placement of objects, or the alignment of isolated track sections. This may also be set from the multifunction status bar.

The following commands control the track joining and selecting modes:

Autojoin new track toggles the joining mode for newly added track between automatic and manual. This also toggles the proximity joining of track sections you are moving around on the layout. This may also be toggled from the multifunction status bar.

Automatic Loop Closing toggles whether RR-Track searches for other track junctions near the ends of the last added track section, and, if they meet certain criteria, asks if you wish to join these points and close a track loop. A loop is a contiguous collection of joined track sections that turns back on itself. *Automatic loop closing* is distinct from *proximity joining*, which merely joins track junctions because they are close together irrespective of whether they belong to the same loop. This may also be toggled from the multifunction status bar.

Selections include joints sets the extended selecting mode to all track physically connected to the track under the cursor.

Selections include blocks sets the extended selecting mode to all track electrically connected to the track under the cursor.

Selections include grades sets the extended selecting mode to all track either (1) at the same height as the track under the cursor, or (2) on the same grade as the track under the cursor.

You may also cycle through the extended selection modes from the multifunction status bar.

The following command enables access to further application controls that affect <u>all</u> layout windows:

Options...displays a dialog box allowing detailed control of the track display. You can also access settings for the active layout through this dialog. See **setting global options** for more information.

Help menu

Contents	F1
Search for Help on...	
Getting started	
About RR-Track	
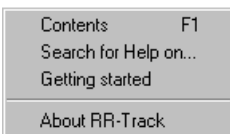
The help menu commands control the access to the Windows™ hypertext help utility. The RR-track help file, part of which you are reading, contains help and information on topics germane to the track layout application. The help topics may be accessed using the commands in this menu and the Help button found in most dialog boxes.

Contents... starts the help utility and displays the RR-track help table of contents.

Search for help on...starts the help utility and opens the keyword search window.

Getting started... starts the help utility and opens the track laying tutorial.

About... displays the About message for the RR-track application. The About dialog shows the release version of RR-Track, the build number (sort of a sub-release version), and your serial number which you need when asking for assistance.

Control menu

The control menu is the menu that you get when you single-click on the small square (Windows 3.x, Windows NT 3.x) or the miniature icon (Windows 95, Windows NT 4.0) in the upper left corner of a layout window. Most of these commands are standard Windows system commands (Minimize, maximize, close, etc.) but RR-Track appends two commands to the system menu:

Options... this command gets you a dialog which lets you directly manipulate settings that apply only the that layout window (for instance coordinate grid size, track labels, background color, etc.). This is distinct from the Options command at the bottom of the Options menu which lets you manipulate settings that affect all layout windows.

Info... this command shows you a dialog which displays some statistics about the layout.

Shorthand (right mouse) menu

The shorthand menu contains a subset of the most used commands from the main menu accessed though the menu bar. This menu may be called up by clicking the right mouse key when not engaged in some other graphical operation such as moving track or drawing a selection rectangle. The cursor must not be over some item when you click the right mouse button, otherwise you will bring up the Item Property Inspector (used for extracting the gory details some track, accessory, or object that you have drawn) instead. The commands on the shorthand menu are:

Last track: selects another piece of track identical to the last one added to the track layout. This item will be grayed out if track families have been changed and a new track section from the current family has not been added to the layout. This is the same as double-clicking with the mouse over an empty area, or choosing the last track button on the multifunction status bar.

Undo last track: removes the last track section added to the layout from the track list. This item will be grayed out if the last track section has just been removed, and another has not been subsequently added to the layout.

Copy: copies the selected track or other objects to the RR-Track clipboard.

Paste: pastes the RR-Track clipboard contents into the track layout.

Delete: deletes the selected track or objects from the track layout.

Duplicate: duplicates the selected track or objects.

Rotate...: rotates the selected track or other objects.

<u>Toggle overpass</u>: toggles the overpass attributes of the selected track. If the track is currently set as an overpass, the overpass attribute is cleared and the rendering returned to normal; the display list position is not affected. If the overpass attribute is not currently set, it is now set and the track rendered as an overpass and brought to the front of the display list.

<u>Layers...</u> lets you add/subtract layers from your layout and change the attributes (visible, grayed, hidden, etc.) of the layers in the active layout window.

<u>Snap size...</u> calls up a dialog that lets you set the snap size for the layout.

<u>Zoom in 2x</u>: zooms in 2x. Same as the Zoom in 2x command under the View menu.

<u>Zoom out 2x</u>: zooms out 2x. Same as the Zoom out 2x command found under the View menu.

Track Laying Procedures

Aligning track sections

You may *align* track sections with each other in the same manner that you *join* track sections, the only difference is that aligned track sections are physically placed together, but their *control points* are not marked as joined, unlike joined track where the adjoining control points are marked as joined.

Three CAD -like commands are available in RR-Track for aligning track, and optionally general purpose objects, with either the underlying coordinate grid or other track and objects. These three commands, found under the <u>Align to</u> submenu under the <u>Action</u> menu are:

<u>Align to| coordinate grid</u> : this command lets you align any side or middle of the selected track and objects with the coordinate grid, at the current snap resolution.

<u>Align to| designated object</u> : this command is similar to aligning with the coordinate grid, except you may instead align the selected track and objects with another piece of track, or object, which you designate with the cursor.

<u>Align to| nearest track</u> : this command lets you practice join the selected track to the nearest available track end. It does everything but actually shove the pins together.

<u>Align To Nearest Track</u> is exactly analogous to <u>Join To Nearest Track</u>,except that the track sections are not physically joined, just moved into alignment as if they were joined. Alignment of track can be very useful for what if scenarios, and test configuration of track, saving you the trouble of breaking joins you don't wish to keep.

RR-Track scans the non-selected portion of the track list for the nearest unused <u>control point</u>,and matches that with the closest unused control point in the selected track list. These points are then brought into alignment as if they were physically joined.

Procedure:

1.   *Select* the track you wish to move into alignment. The track is highlighted in red.

2.   Move the selected track near to the track you wish to align with. RR-Track will align in both position and orientation the closest pair of unused control points.

3.   Select <u>Align To Nearest</u> from the <u>Action</u> menu. The track is aligned immediately

You can align the selected track and objects to the underlying coordinate grid by selecting the <u>Align to| Coordinate Grid</u> command found under the <u>Action</u> menu. In order to align the selected track, they must be free of connections to track that is not selected, exactly as required when rotations are performed. When select the <u>Align To| Coordinate Grid</u> command, you will see the dialog at left:

The following buttons and controls appear on the *Align To Coordinate Grid dialog*:

Align with group: this contains four check boxes used to designate one or more sides which you wish align to the coordinate grid.

Left: checking this box tells RR-Track you wish to align the left side of the selected items to the coordinate grid.

Right: checking this box tells RR-Track you wish to align the right side of the selected items to the coordinate grid.

Top: checking this box tells RR-Track you wish to align the upper side of the selected items to the coordinate grid.

Bottom: checking this box tells RR-Track you wish to align the lower side of the selected items to the coordinate grid.

These check boxes may be combined in any manner that you see fit. For instance, to align the upper left side of the selected track or objects to the coordinate grid, check the Left and Top boxes. In order to align the *middles* of the selections to the coordinate grid, you check both of the appropriate boxes.

> **Example**: to align the *left/right middle* to the coordinate grid check both the Left and Right boxes. To align the geometric *center* of the selections to the coordinate grid, check all four boxes.

OK : this button aligns the designated side(s) of the selected track to the coordinate grid at the current snap resolution.

Set snap size : this button lets you change the current snap resolution. See setting the snap size for more information on this topic.

Cancel : this button lets you bail out without aligning anything.

Help : this button displays instructions for using the Align To Grid command.

Procedure:
1. *Select* the track or objects you want to align with the coordinate grid, and then select the Align to| Coordinate Grid command from the Action menu.
2. Check the Align To boxes as appropriate. Be sure and remember that Left means the left side of the entire selection, not just the lead selection.
3. Press the OK button. RR-Track immediately moves the selected items into the demanded alignment with the coordinate grid, at the current snap resolution. The Align dialog stays up until you press the *Cancel* button so that you may execute multiple alignments without having to re-invoke the Align command.

You can abort the Align command at any time by pressing the *Cancel* button.

You can align the selected track/objects to another object which you designate, by selecting the Align to| Designated Object command found under the Action menu. In order to use this dialog to align the selected track, none of the selected track items may be joined to track that is not selected,

i.e. the selected track must be free, exactly as require to rotate it. When you invoke the <u>Align To|</u> <u>Designated Object</u> command, you will see the following dialog:
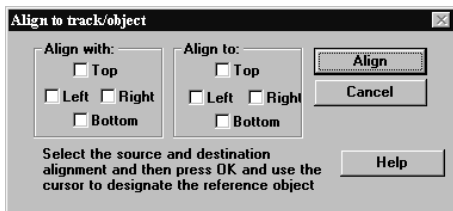
The following buttons and control groups appear on the Align To Object dialog:

Align with group: this contains four check boxes used to designate one or more sides which you wish align to another object.

Left: checking this box tells RR-Track you wish to align the left side of the selected items.

Right: checking this box tells RR-Track you wish to align the right side of the selected items.

Top: checking this box tells RR-Track you wish to align the upper side of the selected items.

Bottom: checking this box tells RR-Track you wish to align the lower side of the selected items.
Align to group: this contains four check boxes used to designate one or more sides which form the reference track or object. This is the object to which the selected items are aligned.

Left: checking this box indicated you want to use the left side of the item as a reference.

Right: checking this box indicated you want to use the right side of the item as a reference.

Top: checking this box indicated you want to use the bottom side of the item as a reference.

Bottom: checking this box indicated you want to use the lower side of the item as a reference.

Remember, these side designations refer to the entire selection and not just the <u>lead selection</u> for the Align With or source objects, and they refer to the single track or object you designate for the Align To or reference object. These check boxes may be combined in any manner that you see fit. For instance, to align the *upper left* side of the selected track or objects to another object, check the <u>Left</u> and <u>Top</u> boxes. In order to align the *middles* of the selections to the another object, you check both of the appropriate boxes.

Example: to align the *left* and *right middle* to another object check both the <u>Left</u> and <u>Right</u> boxes.

To align the geometric center of the selections to the coordinate grid, check all four boxes. These combinations also apply to the Align To or reference object.

Example: to align the *left* side of the selections with the *left/right middle* of another object, check the <u>Left</u> box in the Align With group and both of the <u>Left</u> and <u>Right</u> boxes in the Align To group.

Obviously, it does not make sense to try to align left and right sides to upper and lower sides, and RR-Track will let you know when you try to carry out a meaningless alignment.

Align: depressing this button causes RR-Track to evaluate the alignment conditions set by the Align With and Align To check boxes. If a legal alignment is indicated (no attempt to align

horizontal and vertical features with each other) the cursor changes to an arrow with the word Align beneath it. At this point you designate the object to align to and RR-Track moves the selections as appropriate.

Cancel: this button lets you bail out without aligning anything, or terminate the Align To Object dialog after carrying out your alignments.

Help: displays information on this operation on your screen.

When using the Align To Object dialog, the setting the current snap resolution has no effect on the alignment of the selected track/objects.

Procedure:

1.   Select the track or objects you want to align with another object, and then select the Align to| Designated Object command from the Action menu.
2.   Check the Align With and Align To boxes as appropriate. Be sure and remember that Left means the left side of the entire selection, not just the lead selection.
3.   Press the *Align* button. If the alignment you have set is legal, RR-Track changes the cursor to an arrow with the word 'Align' beneath it. At this point you move the cursor to designate the object you wish to Align To. This is done by positioning the cursor over the object and clicking the left mouse button.
4.   RR-Track immediately aligns the selected track/objects to the reference object you designated. The cursor changes to the Windows arrow, while the Align To Object dialog stays up. At this point you can either carry out further alignments or return to the main menu by pressing the *Cancel* button.

If you wish to abort the alignment after you have gotten to the point where RR-Track displays the align cursor, move the cursor to a spot that is over nothing, and click the left mouse button. RR-Track will beep to let you know you have designated no reference object, and return the cursor to the Windows arrow. You can now alter your alignment criteria, or press Cancel and return to the main menu.

see also:
selecting track,moving track and objects, joining track, marking track control points

Breaking a single track joint

You can break single track joints instead of breaking all of the joints in a track section by using the Break Joint command under the Action menu. As with other commands under the Action menu, you must have first *selected track* in order to break any joints since the Action menu will be grayed out unless there is highlighted track.

Procedure:

1.   Select Break Joint from the Action menu. The cursor changes to a diagonal arrow with the word 'Break'. All other menu commands, except Help, are disabled at this time.

2.   Place the cursor on the highlighted track section where you wish to break the connection. It should be nearest the joint you wish to break.

3.   Click the left mouse button. RR-Track will find the closest joint in the track section and break it at this time. If there are no joints in that track section, or if you click outside a track section, RR-Track makes no breaks. The cursor returns to the Windows arrow, and the menu bar is enabled.

see also:
unjoining track, selecting track

Changing the layout size

The Drawing Size command is used to set the lateral (width) and vertical (depth) extents of the drawing. These extents represent the area that you may lay track in; the area outside this (when visible) is painted in gray. At any time, you may resize the layout you are working on by selecting this command.

When you select the Drawing Size command, the RR-Track displays the following dialog box:
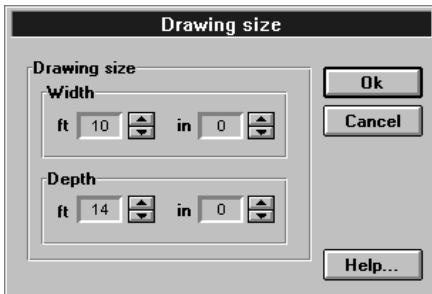
There are four sets of numerical windows which you use to set the drawing size, one window for feet and one for inches for both the *width* and *depth* settings. *Spin buttons* are used to set the dimensions for all four values, with the up-button increasing values and the down-button decreasing values. The OK button tells RR-Track to take the new width and depth values and resize the layout, while the Cancel button leaves the layout at its current size.

You may resize the layout at any time simply by selecting the Drawing Size command. Use the spin buttons to set the new values and press **OK**. The layout will be rescaled and redrawn on the screen.

When you change the size of the main window, by grabbing one of the corners and dragging it, RR-Track does not automatically rescale the layout. If you wish to rescale the layout to the new window, without changing the layout size, simply select the Drawing Size command as above, and immediately press the OK button. RR-Track will take the current drawing size and rescale to fit the window.

Changing the drawing order

Track and general purpose objects such as rectangles, lines, circles, trees, etc. are generally drawn in the order they have been added to your layout, that is, items first placed are drawn first, and those placed last are drawn last. This is sometimes inconvenient for accurately depicting vertical relationships between track and objects or accessories. For example, if you had selected an overpass or bridge from an accessory library, and added it to the layout after the track sections

running over it were placed, the overpass would be drawn after the track sections, making the track appear to run beneath rather than on top of the overpass. The commands Move To Front and Send to Back under the Action menu are used to change the order in which track, accessories, and objects are drawn. To use these commands for altering the order of track/object rendering do the following:

Procedure:

1. *Select* the track section, accessory, or object you wish to alter using the mouse cursor. If you select more than one item, only the lead selection will be affected by the subsequent display list command.
2. Choose the Move To Front command under the Action menu in order to make the object appear in front of all of the other objects, or choose the Send To Back command to make the selected item appear behind the other track and objects.
3. The track layout is re-rendered with the new display list order, and the selected items are deselected.

Changing the working track family

Track is organized into 'libraries' in RR-Track. The libraries currently supported are Z, N, TT, HO, O-27, O, G, standard gauge, and S-gauge. RR-Track allows joining of O and O-27 track (this includes Lionel® O-27, Lionel® O, Curtis HiRail, Ross Custom Switches, and GarGraves® at present), G (this includes LGB® , Aristocraft®, and MicroEngineering), and standard gauge (Lionel® and Rydin Industries). Any and all track libraries may be mixed in one layout, but physical joining is only allowed between track of the same gauge, and same electrical layout (you cannot join Märklin® HO track to Atlas® HO).

Changing libraries is simple. Pull down the Library menu and select the track library that you want to use. RR-Track places a check mark next to that family, and changes the Track menu to reflect the components of that family.

Closing a loop of track

When you have a loop of track (simple oval, part of a figure eight, etc.) which you wish to close upon itself, the various join commands are not usable since they will not allow a continuous set of track sections to join to itself. For this purpose, you must tell RR-Track you wish to close a loop. The track list will be scanned for the continuous set of track sections that has the closest pair of unused ends (*control points*) with a minimal amount of angular mismatch. You will be asked to confirm that you wish to close this loop; if so, the unmatched ends are 'joined', which closes the loop.

The more complex the track configuration, the greater the number of loops. A simple figure eight using one cross has two loops. An oval with two turnouts that are connected by an outside loop of track also has two loops. A track loop is any set of continuous track sections that is joined to itself.

Procedure:

1.   *Select* the loop of track you wish to close on itself using the mouse cursor.
2.   Pull down the Action menu and select the Close Contiguous Loop command.
3.   When a suitable loop is located, RR-Track highlights the ends that must be joined in cyan, informs you of the mismatch in location, and asks for confirmation. Press *OK* to close the loop, and *Cancel* to abort. If no suitable loop is found, you will be told of this, and the closing operation aborted.
4.   The loop is closed if confirmed, with the loop left highlighted and selected.

(Hint: If you enable the Automatic Loop Closing option in the Global Options dialog, loops will be closed automatically by RR-Track for you; we suggest you lay track with this option turned on**).**

Note: loop closing is not the same as proximity joining. When track junctions are closed by proximity joining, the only requirement is that the ends be within a certain distance of one another (1/4 of the track width or gauge) and have less than 2.5° of angular mismatch. No attempt is made to ascertain whether the track sections are either physically or electrically connected to one another. In loop closing, RR-Track ascertains that the track sections in question be physically connected to one another by way of other sections of track (the rest of the loop). In practice, there is little difference between the two, but they are individually settable options.

*see also***:**
selecting track

Copying track

The Copy command from the Edit menu allows you to copy *selected track or objects* to the RR-Track clipboard. Unlike the Cut command, the Copy command does not delete the selected (highlighted) track or other objects. The copied objects replace whatever was previously in the RR-track clipboard. Like any clipboard objects, these are available for pasting into the current layout at any time, using the Paste command.

Procedure:

1.   *Select* one or more track sections or objects using the mouse cursor.
2.   Choose the Copy command from the Edit menu, or from the *shorthand* menu called up by clicking the right mouse button.
3.   The selected track or objects are placed in the RR-Track clipboard. This action enables the Paste command in both the main and *shorthand* menus.

Note that you can also use the Duplicate command to quickly replicate the selected track and objects without separately invoking the Copy and Paste commands.   Duplicate Parallel is similar in action, but goes through a dialog where you specify the parallel spacing between the original and duplicated track. Items copied to the clipboard can be pasted into any open layout.

Copying track between layouts

To quickly clone new layouts, you may wish to copy track from one layout to another. This is easy to do using the RR-Track clipboard. There is a limitation in that RR-Track can only hold approximately 400 objects in its clipboard at any given time (if you try to exceed this you will be told you cannot copy that many items).

Procedure:

1. Open the layout file you wish to copy the track sections from.
2. *Select* the track sections you wish to copy, and use the Copy command under either the Edit or *shorthand* menus to copy this track to the clipboard
3. Open the layout file you wish to copy the track to, or, optionally, create a New layout.
4. Select the Paste command from either the Edit or *shorthand* menus. The previously copied track is pasted into the new layout near the upper left.

A related operation is cloning a layout.

Creating ,changing, and removing drawing layers

Layers are a feature of RR-Track which allow you to create very complex layouts without necessarily having to be aware of the complexity at all times. A layer is simply a grouping of track and objects which have some common feature (such as they are all on the ground level, or they are all on the upper level, or they are all on the inner loop, etc.) A layer has assignable attributes which govern its visibility, selectability, and color. For example, a train with two levels of track can, at the very least, have two layers — the layer that has the lower level of track and that which has the upper level. In this manner you can hide the upper level while you work on the lower level, and vice versa.

Every layout you create automatically sets up one layer for itself which it names <u><default></u>. This <default> layer can neither be renamed or removed in order to safeguard you against accidentally creating a layout file with no layers. This is the equivalent of previous releases of RR-Track which used only one drawing layer. When you create a new layout, the <default> layer is set as the working layer, i.e. the layer in which items are added. Layers that you subsequently add can have any name you like, up to 48 characters in length. You should choose names that have significance for you.

To add a layer, modify a layer, or remove a layer from a layout, pull down the Options menu and choose Layers... You will see a dialog like that at left:
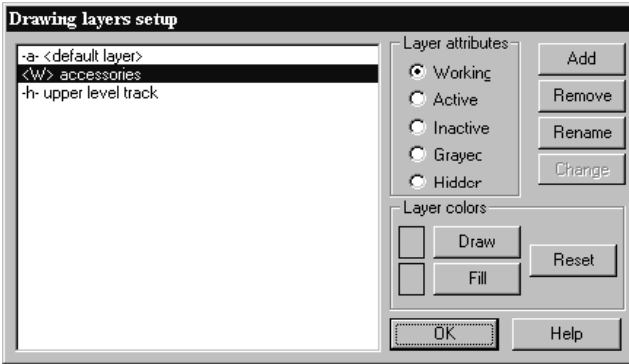
The list box on the left shows the existing layers in the layout. RR-Track prepends a modifier to the layer name to indicate, at a glance, its attributes (*<W>* working, *-a-* active, *-i-* inactive, *-g-* grayed, *-h-* hidden). There are two groups of controls that are used to set or change layer attributes. The set of radio buttons are used to both set and indicate the visibility and selection attributes of the layer that is highlighted in the list box. The command buttons in the Layer Colors group are used to set and clear the default layer drawing colors. The command buttons on the right compose the set of actions that can be taken on the layer attributes.

Layer Attributes: a layer can have one of five attributes (listed in decreasing order of activity): *working*, *active*, *inactive*, *grayed*, and *hidden*. The *working layer* is the layer that items are added to when you add track, accessories, or objects to your layout; there can be only one working layer. You can select items in the working layer, move them, join them, unjoin them, rotate them, and delete them. Obviously, the working layer is visible. An *active layer* is the same as a working layer, except that items are not added to an active layer, only to the working layer. As for the working layer, items in an active layer can be selected, moved, joined, unjoined, rotated, and deleted. Any number of layers can be active layers; active layers are visible. An *inactive layer* is visible, just as for the working and active layers, but items in inactive layers cannot be selected (the are invisible to the mouse), and hence cannot be manipulated (until you change the layer attributes). Inactive layers are similar to Windows wallpaper; you can seem them but you can't touch them. A good use for inactive layers is for benchwork while you are working on the track. *Grayed layers* are like inactive layers but items in grayed layers are drawn using a pale gray pen; objects and accessories are only drawn in rough outline form. Grayed layers are useful when you need to see underlying items for the purpose of registration with other items, but you don't want to be plagued with all of the details. Hidden layers are just that; they are not visible at all. *Hidden layers* are useful when you don't want the details of upper level track to bother you while you are working on the lower level. The table above summarizes the properties of the different layer attributes.

Attribute	Visible	Selectable	Additions
working	Yes	Yes	Yes
active	Yes	Yes	No
inactive	Yes	No	No
grayed	sort of	No	No
hidden	No	No	No

Layer colors: layers can have a default drawing and fill color which will override the intrinsic color for a track library (but not for the intrinsic colors used for accessories and objects). In this manner you can change the default color of track by assigning the track to another layer, and then setting the default layer colors to that which you want for the track. For instance, if you have two loops of track, one of which is the outer mainline and the other the inner mainline used for connection to yards, sidings, etc., you could place the track in the outer loop in a layer (called Outer Mainline) and the inner loop in a layer (called Inner Mainline). If the assign the Inner Mainline layer a drawing color different from that normally used by the track library (set using the Set Track Color command found under the Options menu, see *setting the track color*) then the two loops of track are drawn with different colors.

If you are adding a new layer, removing an existing layer, or modifying the attributes of an existing layer, you will use the controls in the **Layer Attributes** section of the *Layer Setup* dialog. The Change button is only enabled when one of the attributes radio buttons is clicked.

To add a layer:

To add a layer to a layout you use the Layers... command found under the Options menu. The *Drawing Layers Setup* dialog will be displayed, at which point you choose the Add button to create a new layer.
Procedure:
1. From the menu bar, select Options and then Layers... from the drop-down menu. RR-Track displays the *Drawing Layers Setup* dialog.
2. Press the Add button. RR-Track shows the *New Layer Name* dialog. Enter the name you want for the new layer and press OK. If you decide not to add a layer, press Cancel. If you pressed OK, RR-Track creates a new layer with the name you chose, sets its attribute to inactive and adds it to the list.

You can then change the new layer's attributes to whatever you want. When you are finished with the set up of the layout's layers, press the OK button on the *Drawing Layers Setup* dialog.

To remove a layer:

As for adding a new layer, you remove an existing layer using the Layers... command.
Procedure:
1. From the menu bar, select Options and then Layers... from the drop-down menu. RR-Track displays the *Drawing Layers Setup* dialog.
2. Using the mouse, choose the layer you want to remove by single-clicking it with the left mouse button.
3. Press the Remove button. If there are no items in the layer, RR-Track immediately removes it.   If there are items in the chosen layer, you will be advised of this and informed that the layer cannot be removed until those items are either deleted or moved to another layer.

To rename a layer:

Renaming a layer is similar to both adding a layer and removing it. As for adding and removing, you start with the Layers... command.

1. From the menu bar, select Options and then Layers... from the drop-down menu. RR-Track displays the *Drawing Layers Setup* dialog.
2. Using the mouse, choose the layer you want to rename by single-clicking it with the left mouse button.
3. Press the Rename button. RR-Track shows the *New Layer Name* dialog. Enter the name you want for the new layer and press OK. If you don't want to change the name, press either OK without typing in a new name, or press Cancel.

When you are finished with the set up of the layout's layers, press the OK button on the *Drawing Layers Setup* dialog.

To change a layer's attributes:

As for the layer creation, deletion, and renaming, modifying a layer's attributes starts with the Layers... command.

Procedure:

1. From the menu bar, select Options and then Layers... from the drop-down menu. RR-Track displays the *Drawing Layers Setup* dialog.
2. Using the mouse, choose the layer you want to modify by single-clicking it with the left mouse button. As you change the chosen layer, the Layer Attributes radio buttons change to reflect the current attributes of the chosen layer.
3. Go to the Layer Attributes radio buttons and select the attribute you want from the choice of *working*, *active*, *inactive*, *grayed*, and *hidden*.
4. Press the Change button. RR-Track changes the layer attributes, and, if necessary, reduces the status of the former working layer to active.

Whenever a layer's attributes are changed to working, the previous working layer is switched to active, meaning that you can still choose and manipulate items in that layer, but newly added items will go into the new working layer. A quick way to change the working layer is to combine steps 2, 3, and 4 above by double-clicking rather than single-clicking on the layer you want to make the working layer.

To change a layers default colors:

As mentioned in the introduction, you can also set the default drawing colors for a layer. If a layer has defined drawing colors, it will use them in lieu of the standard track library colors when rendering track. When you modify a layers drawing colors, you use the command buttons in the *Layer Colors* group:

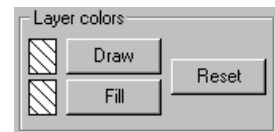As usual, you start with the *Layer Setup dialog*.

Procedure:
1.   From the menu bar, select Options and then Layers... from the drop-down menu. RR-Track displays the *Drawing Layers Setup dialog*.
2.   Using the mouse, choose the layer you want to rename by single-clicking it with the left mouse button.
3.   Press the Draw button to change the outline drawing color (this is the color used for the rails and outlines of switch machines, etc.), or press the Fill button to change the fill color (this is the color used to fill in switch machines and joining symbols). RR-Track displays the *Windows Color Chooser*.
4.   Select the color you want and then press OK. If you don't want to change the color, press Cancel. If you press OK, RR-Track takes the new color and makes it either the outline drawing color or the fill color as denoted above. The layout is not redrawn until you press the OK button on the *Layer Setup dialog*.

If you want to reset the layer colors to the defaults (that is, draw the track with the standard track library colors), choose the layer using the above procedure, but press the Reset button rather than the Draw or Fill buttons.

Creating a new track layout

You may create a new layout at any time using the New command from the File menu. The drawing size dialog will be displayed, at which point you set the new layout's width and depth (these may be altered at any time using the Drawing Size command in the Options menu).

Procedure:
1.   From the menu bar, select File and then New... from the drop-down menu. The current layout, if any, will be saved.
2.   Using the *spin buttons* set the width and depth of the new drawing.
3.   Click the *OK* button if you are satisfied with the new dimensions, or *Cancel* if you change your mind and wish to return to the RR-Track main window.

see also:
opening a layout file, saving a layout file

Creating a text label

You can create and place text labels in our layout using the Text Labels object under the Object menu. Text labels are like other objects and may be moved and grouped as you see fit (but not rotated). Text labels may also be edited through the Object Properties dialog. When you choose this object, you immediately see a dialog like that to the left:
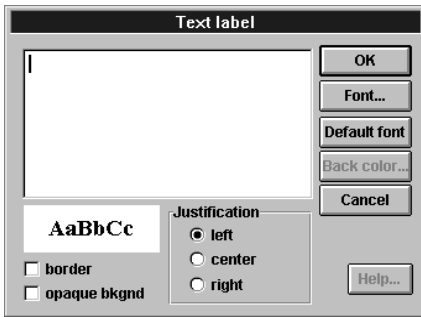
You enter the text you want to add to the layout in the large edit box in the upper left, including carriage returns if you want multiple lines. The other controls are used to set the properties of the text label.

Font... pressing this button calls up the Windows Font Chooser letting you select the type face, size, color, and other attributes of the font used for the text label.

Default font : pressing this key sets the currently selected font as the default font for any subsequent text labels. You do not have to use the default font, but if you want a lot of labels with a certain type face and size, this is useful.

Back color: pressing this button calls up the Windows Color Chooser so that you can select the background color for the text label. This is only active if you have checked the Opaque Background button.

Border: draws a rectangular border around the text the same color as the text color.

Opaque Background: sets the background opaque rather than transparent, which is the default. When you check the Opaque background button, you may now also set the background color by pressing the Background Color button.

Justification group:

Left, centered, and right : these control the current text justification setting with left justified the default.

Cancel: aborts creating a text label.

OK: takes the current setting of the dialog, and the text in the edit box and creates a text label. The dialog disappears and a box which bounds the text appears under the cursor. You can move this box to wherever you wish, placing it by single-clicking the left mouse button. A text label object is like any other object, and may be moved around as you wish. You may even edit the content and properties after you have created the text label by setting the cursor over the text label and clicking the right mouse button. This will call up the Object Properties dialog which shows you the details of the text label object, and has an Edit button. Pressing the Edit button will allow you to go back and change the text label and its associated properties.

Note: RR-Track stores the font information that you use for labels as a physical height, rather than a pointsize. This is because the fonts must be scaled as you zoom in or out, and when you print. One of the effects of this is to change the font size as seen by Windows when you create a text label and then zoom in or out. If you go to edit this label at the new zoom factor, you will see a font size reported by Windows that is different from what you previously set. This is not something to be concerned with; Windows always reports the font size in screen pixels and not in printer points, or some other fixed system.

see also:
setting object properties

Deleting track or objects

The Delete command from the Edit menu allows you to delete selected track or other objects. Unlike the Cut command, the delete command does not copy the selected (highlighted) objects to the RR-Track clipboard. The contents of the RR-Track clipboard are not changed by this command. You may also delete objects by pressing the keyboard's delete key.

Procedure:
1. *Select* one or more track sections using the mouse or other pointing device.
2. Choose the Delete command from the Edit menu, or from the shorthand menu accessed by clicking the right mouse button. From the keyboard you may use the **delete** key.
3. The selected track/objects are removed from the current layout and the track list, which is updated to reflect this change. The contents of the select list are cleared, with the select list window reflecting this change.

When deleting track and objects, you will be asked for confirmation if the Confirm All Deletes option is set in the *Global Options dialog*. In any event, you will always be asked to confirm deletes of more than 100 items. Deletes of less than 100 items may be recovered using the Undo Delete command under the Edit menu. RR-Track maintains an undelete buffer for each layout window; track deleted in one layout does not affect deletes in another layout.

see also:
copying track, selecting track

Designating isolated electrical blocks

You may designate and change electrical blocks in two ways. The simplest is to use the Create Block command to set block breaks at the ends of all of the selected track, and the Clear all block breaks command to remove the electrical breaks within, and at the ends of, the selected track.. The second method uses the Set/Clear block breaks command to individually designate or destroy electrical breaks. The display of block breaks, denoted by a double circle, is set or cleared using the Global Options dialog, accessed with the Global Options command under the Options menu. You may only set and clear electrical blocks in track sections that are highlighted, the same as for any other command under the Action menu.

RR-Track distinguishes between *soft* block breaks, which are those that you create using the <u>Create block</u> and <u>Set/Clear block breaks</u> commands, and *hard* breaks which are associated with special pieces of track found in some manufacturers track libraries that are not electrically continuous at one end. You cannot remove a *hard* block break.

To set, and clear, individual block breaks, you use the <u>Set/Clear block breaks</u> command found under the Action menu. The <u>Set/Clear block breaks</u> command lets you toggle the electrical continuity of the nearest track joint in the selected (highlighted) track, while the <u>Clear block breaks</u> command removes all electrical breaks in the selected track sections.

To set or clear a single electrical break:

1. *Select* the track sections containing the electrical break junction.
2. Pull down the <u>Action</u> menu and choose <u>Set/Clear block breaks</u>. The cursor will change to an arrow with the words 'Block break' under it.
3. Move the tip of the arrow close to the joint you want to change the electrical continuity status. Click the left mouse button. If the cursor is not inside any of the selected track sections, you will here a beep advising you that no joint can be found, otherwise the electrical state of the nearest joint will change immediately, with a double circle indicating a break (only if you have enabled displaying block breaks in the <u>Options</u> dialog).
4. The cursor returns to the Windows arrow with the new status of the block displayed. The track sections remain selected.

To create an electrical block with the selected track:

1. *Select* the track sections containing the electrical breaks you wish to clear.
2. Pull down the <u>Action</u> menu and choose <u>Create block</u>. Break points will be placed at the ends of the selected track; breaks interior to this are unaffected.

To clear all breaks in the selected track:

1. *Select* the track sections containing the electrical breaks you wish to clear.
2. Pull down the <u>Action</u> menu and choose <u>Clear all block breaks</u>. All break points will immediately be removed and their status updated.

To display electrical block breaks:

In order to display electrical block breaks on your drawing you must enable this option through the <u>Options dialog</u> which may be accessed either through the Options command in the Control Menu, or the Layout Options button in the Global Options dialog. In this dialog you change the display status of electrical blocks by checking or unchecking the *Display block breaks* option.

It is useful to be able to selected track sections which are not only physically joined to one another but also electrically contiguous. You can change the extended selecting mode of track to electrically connected track by using the <u>Selections include blocks</u> commands under the Options menu. By choosing <u>Selections include blocks</u> you place an additional constraint on the selection of

adjoining track sections by requiring they also be electrically connected. For example, if you have set Selections include blocks and double-click on a track section between two block breaks, you will highlight that track section under the cursor and all of the track connected to it that is between the two block breaks. This makes it easy to see which sections of track you have tied together electrically.

Soft block breaks are automatically removed when you unjoin a track section that is at a block break. This, of course, does not apply to special isolation track sections in some manufacturers libraries that set a *hard* block break at a junction.

see also:
global options dialog, selecting track

Duplicating track and objects

The Duplicate item on the Edit menu lets you duplicate any items that you have selected (high-lighted). RR-Track pastes a copy of the items starting at the last point the left mouse button was clicked on in the layout. The duplicated items are highlighted. This is basically a one mouse-click combination of Copy and Paste, except that the duplicate command clears the RR-Track clipboard contents.

A more specialized duplication of track occurs when you choose the Duplicate parallel command from the Edit menu. This command is used to replicate track parallel to, and offset from the selected track. When you choose the Duplicate parallel command you will see a dialog like the one below:
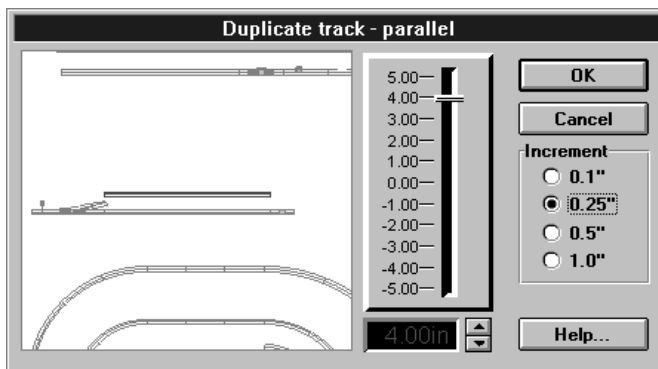
The Duplicate-track parallel dialog has a preview window to the left which dynamically shows you the position of the newly duplicated track. There are a number of controls to the right which are used to both set and display the offset distance, as well as control the offset increments.

The vertical control to the right of the preview window that looks like a stereo amplifier's fader is used to set the offset distance. Positive values correspond to offsets that raise the track up, while negative values correspond to those that push it downward (for horizontal track). Directly below the fader is a panel readout which is used to display the current offset distance, with up/down spin buttons adjacent to the panel readout. The radio buttons directly below the OK and Cancel buttons, labeled as an Increment group, are used to set the current increment resolution for the offset distance. As you select different increment values, the range of available offsets shown on the

fader control change. The fader control can reach any offset in the range shown, while the up/down spin buttons increase/decrease the offset by the value indicated with the radio buttons in the Increment group. Using the up/down spin buttons, you can reach any offset distance, and are not limited to those shown by the fader.

Procedure:
1. *Select* the track you wish to create a parallel duplicate of.
2. Pull down the Edit menu and choose Duplicate parallel. The duplicate parallel dialog appears.
3. Using the fader control, and/or the up/down spin buttons, set the parallel offset that you want. The preview window updates every time you change the offset so that you can see exactly where the parallel trick will be placed.
4. When you are satisfied with the parallel offset, push the OK button. The selected track is parallel duplicated in the indicated offset position. The selected track remains highlighted after duplication and you are returned to the layout window. If instead you wish to abort the parallel duplication, press the Cancel button.

see also:
**cut, copy, paste, selecting track and objects**

Editing objects

RR-Track allows you to edit any general purpose object that you create, and to rescale any set of grouped objects. This editing capability means that you do not have to draw an object exactly correctly the first time; you can go back at any time and resize or rescale it. Resizing refers to moving an individual corner or edit point, resulting in an over all shape change. Rescaling refers to changing the overall size of an object at equal scale in all directions.

All editing in RR-Track is done with the mouse. You use the mouse to 'grab' an edit point on the object your are editing, and then drag it to where you want it, letting go when you reach the desired size or position. This is similar to the way that you move an object around the screen, except here you move just one part of an object.

Ordinarily, RR-Track does not display the edit points on an object. When you select the object, RR-Track not only highlights it but displays the object's edit points, as for the rectangle at right (when selecting multiple objects, RR-Track shows the edit points of the *lead selection* if the *lead selection* is an editable object). RR-Track draws an object's edit points as small, filled circles. Here there are four edit points, one on each corner. One of the edit points, that at the upper left, has a box drawn around it. The box signifies that this edit point is the origin of the object, but you may move this edit point as you would any of the other three. At left is a six-sided filled polygon. Each vertex is an edit point, with the left-most vertex also the origin of the polygon. At right is a group consisting of three rectangles. The edit points for the group are the corners of the group bounding box; note that the origin is not at any of the edit points.
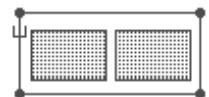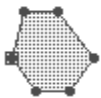
When resizing or rescaling an object, the current snap settings are in affect, but they are applied in the coordinate system that is intrinsic to the object. For rectangle objects (and buildings which are derived from rectangles) and grouped objects, the intrinsic coordinate system is along the width and height of the bounding box, even if you subsequently rotate the object. For all other objects, the intrinsic coordinate system is the same as the overall coordinate system for the layout. In order to resize or rescale an object, the following routine is recommended:

Procedure:
1. *Select* the object you wish to edit. RR-Track highlights the object and displays the edit points.
2. Place the cursor over the edit point that you want to move (it must be over the point in order to grab it) and depress and hold down the left mouse button. RR-Track changes the cursor to an arrow with the word 'Edit' below it to indicated that you are about to resize or rescale the object (if you miss the edit point, the cursor will change to an arrow with the word 'Move' below it indicating you are about to move the entire object). At the same time RR-Track shows a small readout window in the upper right corner of the layout window. This readout window shows the relevant current and changing size settings of the object.
3. While continuing to hold down the left mouse button, drag the edit point to the position you want. While you move the edit point, RR-Track continuously updates the readout window, telling you the size and position, and the per cent change in size or position.
4. When you reach the desired size or position, release the left mouse button. RR-Track immediately updates the objects new size, and dismisses the readout window.

You can repeat the above procedure as many times as you like; there is no limit to the number of times you can edit an object. Grouped objects can only be rescaled isotropically; this is enforced by RR-Track. Polygon objects (this includes trees and turntables) allow each of their individual vertices to be edited; this can upset the overall symmetry of these objects if carried to an extreme.

Elevating track

RR-Track allows you to change the elevation (height) of a section or sections of track while performing the calculations for the grades on either side automatically. RR-Track distinguishes track that is not at zero height (flat on the table or ground) as one of two types; elevated track or grade track. Elevated track are those sections, which are contiguous, that are all at the same height. Grade track are those sections, on one or more sides of an elevated track, that have both non-zero height and a non-zero slope (i.e. the track sections one either side are at different elevations). Grade track is denoted by a small arrow symbol at the center which points in the direction of increasing elevation. There are four commands, all located under the Grades menu, which change the elevation of track: Change elevation, Remove elevation, Set Track Height, and Zero Track Height. Another command, Reconcile grade recalculates the track junction heights of an existing grade. In order to use most of the commands on the grade menu, except for the Change elevation , Set Track Height, and Zero Track Height commands, you must have the extended selecting mode set to *Selections Include Grades*.

In order to change the elevation of some track, you first select it with the mouse and then choose the Change track elevation command found under the Grades menu. When you do this, you will see the dialog shown below:
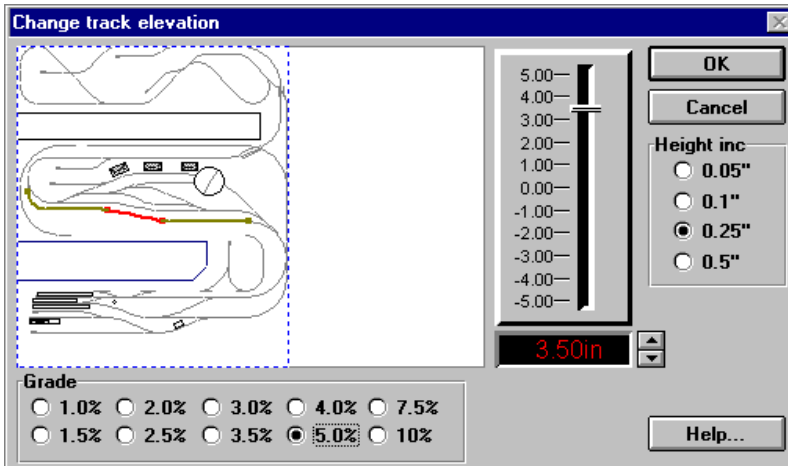
Description: below is a preview window which shows a rough drawing of the track layout zoomed out so that the entire layout is visible. Existing elevated track is shown in dark red; existing grades are shown in magenta. The track you have chosen to elevate is shown in red. As you change elevations, any new grades are shown in orange if they are above table level, or blue if they are below table level.

Immediately below the preview window are a set of radio buttons in the *Grade* group that are used to both indicate and set the required grade. These grades are expressed in per cent. Per cent grade is an engineering term which merely indicates the ratio of the rise of the track to the run along the table (for example, a five per cent grade means that the track rises 5 inches for every 100 inches along the table). You have fixed grade choices ranging from 1.0 to 10 per cent. Keep in mind that a five per cent grade is steep; most real railroads try to hold this to 1.0 or 1.5 per cent and hi-rail layouts to 2.5 per cent — Lionel® trestle sets use grades between 7.5 and 10 per cent.

To the right of the preview window is a fader control similar to that on a stereo amplifier. Immediately below the fader control is a panel readout which shows the change in elevation for the selected track. The up/down spin buttons next to the panel readout work, in conjunction with the fader, to let you vary the change in elevation. The set of radio buttons to the right of the fader, in the *Height Inc.* group, are used to set the incremental height changes used both by the fader control and the up/down spin buttons.

The Change Track Elevation dialog is designed to let you graphically change the elevation of the selected track, highlighted in red, while RR-Track dynamically calculates the number and height of the grade track sections on either side which are required to accommodate this height change. You can change the grade by selecting one of the radio buttons in the *Grade* group and instantly have RR-Track update the preview window, showing the track sections that will be picked up to accom-

modate this grade. You can leave the grade fixed, and vary the height using either the fader or the spin buttons. Similar to the interaction between the fader and the distance increments in the Duplicate Parallel dialog, as you change the height increment with the radio buttons in the *Height Increment* group, the range on the fader updates (to get a larger fader range, increase the increment). The spin buttons are not bound by the fader range, and can change the height to any value in increments set by the radio buttons in the *Height Increment* group.

When RR-Track changes the elevation of track sections, by using the Change Elevation command, the Remove Elevation command, or the Zero Track Heights command, the track display list is sorted to force rendering the track with the lowest elevation first, and that with the highest rendered last. This automatically makes higher track sections appear to pass over lower ones, although you will still be required to set overpass characteristics for the grade track. RR-Track automatically sets the elevated portion to overpass status.

To change an existing track elevation

To change the elevation of track, use the following method:
Procedure:
1. *Select* the track section(s) you wish to elevate.
2. Pull down the Grade menu and choose Change Elevation. The Change Track Elevation dialog appears, as shown above.
3. Using the fader and/or the spin buttons, move the selected track to the required elevation. As you change the elevation of the track, RR-Track will show the grade track sections on the ends of the elevated track that are required to accommodate the grade set in the Grade group.
4. Manipulate a combination of the grade buttons, fader, and spin buttons until you reach both an elevation you want, and the grade that you can live with.
5. When you are satisfied with your grade design, press the OK button. RR-Track immediately applies the grade changes to the layout track, updating the layout display. If you decide you do not like your choice of grades, press Cancel to return to the layout with the track elevation unchanged.

Another way to change track elevation is to use the Set Track Height command discussed a little further on in this manual. In contrast to the Change Elevation command, when using the Set Track Height command, RR-Track does not automatically create grades on the ends of the elevated or depressed track.

To remove an existing track elevation

In order to remove an existing track elevation, carry out the following steps:
**Procedure**:
1. Pull down the Options menu and change the extended selecting mode to *Selections Include Grades*, if it is not already set so.
2. *Select* the elevated track (not grade track) which you wish to return to zero height.
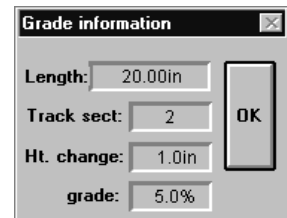
3. Pull down the <u>Grades</u> menu and choose <u>Remove Elevation</u>. If this command is grayed out, return to step one and make sure the extended selecting mode is set to include grades.
4. RR-Track immediately zeros the elevation of the elevated track and all grade track contiguous with it, reordering the display list as necessary to reflect the new heights.

Getting details on grade and elevated track

After you have set some elevations and grades in a layout, getting some detailed information on the elevated track sections, and especially the grade sections, is quite useful. You can access this information with the <u>Information</u> command under the <u>Grades</u> menu. Doing so is straightforward: *select* the elevation or grade you want to examine by double-clicking on it with the extended selecting mode set to *Selections Include Grades*. The pull down the <u>Grades</u> menu and choose the <u>Information</u> command. When you do so you will see one of two dialogs depending on whether you have selected elevated track or grade track:
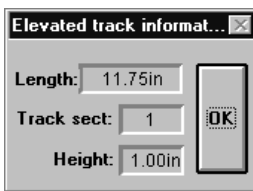
For elevated track, you will see the total length, the number of track sections in the elevation, and the elevation height. For grade track you will see the total length, the number of track sections, the height change (from low to high end), and the exact per cent grade. Press OK to dismiss the dialog and return to your track layout. Note that the grade shown in the Grade Information dialog may be somewhat less that that you requested when you used the Change Elevation dialog to set the elevation and grade originally. This is because RR-Track creates grades by picking up integral pieces of track, and does not bend a track section in the middle somewhere. RR-Track chooses the number of track sections necessary to create the chosen grade, but not a grade steeper than the chosen grade.

Reconciling grades

When several elevations are introduced into a track layout, it is quite common to end up with a non-smooth grade between adjacent track elevations (a non-smooth grade is a contiguous set of grade track with an unequal per cent grade, i.e. some track descends and then changes to ascending as you traverse the grade). You can see this if you have RR-Track display the track junction elevations on grade (see <u>Global Options</u>). You can have RR-Track smooth out the grade and recalculate the track junction heights by using the <u>Reconcile grade</u> command. In order to reconcile a grade, carry out the following steps:

Procedure:
1. Pull down the <u>Options</u> menu and change the extended selecting mode to *Selections Include Grades*, if you have not already done so.
2. *Select* the grade track you want to reconcile by double-clicking on it with the left mouse button.

3. Pull down the Grades menu and choose Reconcile grade. RR-Track immediately recalculates the track junction heights in the grade and shows you the Grade Information dialog.
4. Press the OK button on the dialog when you are finished viewing the grade information. You are returned to the layout with the newly smoothed grade.

Manual Grade editing

While automatic grade calculation during creation of elevated track is simple, there are many situations in which you would like to gain some further measure of control over the grades and elevations in your layout. The following topics cover common grade editing procedures that use the Set Track Height, Create Grade, and Reconcile grade commands.

Adding to and subtracting from grades: You can use the Reconcile grade command, in conjunction with some of the other commands, to both add to and subtract from an existing grade. Since RR-Track creates symmetric grades (i.e. the grade track on both sides of elevated track has the same slope), this is a way to create asymmetric grades.
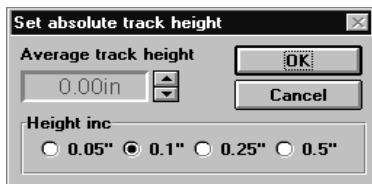
       To add to an existing grade:

1. With the extended selection mode set to *Selections Include Grades*, select the grade you want to add to by double clicking on one of its track sections. The grade will then highlight.

2. Select the track section(s) you want to add to the grade by adding them to the selected track (hold down the SHIFT key while clicking on them with the left mouse). Any track you add to the grade must be contiguous with the grade (RR-Track will check for these and advise you if you err).

3. Pull down the Grades menu and choose Reconcile grade. You will see a dialog which shows the composition of the new grade, as well as its slope. Click the OK button. RR-Track immediately updates the grade, adding the new track sections .

       To subtract from an existing grade:

1. Choose the track sections you want to remove from the grade by clicking on them with the left mouse button.

2. Pull down the Grades menu and choose Zero Track Height. RR-Track immediately sets their height to zero, and recalculates any connecting grades to reflect changes precipitated by setting the selected track to zero height .

Setting the absolute track height: You can use the Set Track Height command to set the absolute height of one or more track sections, accessories, or objects. This command is useful for creating asymmetrical grades, or setting up intermediate elevated areas on existing grades (for more complex grade systems). When you choose the Set Track Height command, you will see a dialog box like that at left:

The readout control shows the height of the selected items (this will be the actual height of a single item, or the average height of any multiple selections). The up/down spin buttons are used to change the height in the readout control. The increment used

by the spin buttons is determined by the radio buttons just below the readout control. Use the up/down spinner to set the new height, and press OK to have RR-Track set the new height, or Cancel if you decided not to change the height.

To set the absolute track height:

1. Select the track sections, accessories, or objects whose height you want to set.

2. Pull down the Grades menu and choose Set Track Height. The Set track height dialog appears.

3. Use the up/down spin buttons to set the new height, and then press OK. RR-Track sets the selected items to the set height, and automatically recalculates any attached grades.

Manually setting grades: You can use the Create Grade command to manually place a grade in your layout. This command is generally used in conjunction with the Set Track Height command, which is used to manually set the absolute track height. Track sections selected for a new grade must not include objects or accessories or existing grades sections.

To create a grade:

1. Select the track sections you want to include in the grade, taking care that they are contiguous. They must not include existing grade sections, accessories, or objects.

2. Pull down the Grades menu and choose Create Grade. RR-Track analyzes the selected track for continuity and other restrictions, and then displays a dialog showing the calculated per cent grade, number of track sections, and height change.

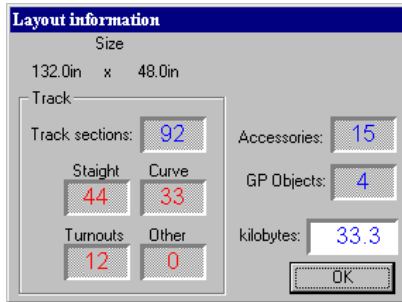3. Press the OK button. RR-Track immediately creates the grade .

Note that you can use the Set Track Height and Create Grade commands to not only insert new elevations and grades into your layout, but also to edit and fine tune existing elevations and grades. For instance, you can use these commands to set intermediate elevations on existing grade sections created when you used the Change elevation command.

Notes and limitations: RR-Track measures heights and elevations from the layout base which is either the top of your benchwork or the floor for layouts on the floor. This position is considered zero height; track that descends some below your benchwork level is a negative elevation as far as RR-Track is concerned. RR-Track is restricted to changing the track elevation of selected track with 16 or fewer ends, and is also limited to a maximum of 200 track sections in each grade on those ends. These limits will meet almost all grade situations. RR-Track is further limited to calculating simple grades; that is if RR-Track encounters a non-simple track section on a grade (such as a turnout or any other track section with more than two ends) it will continue the grade calculation using only the straight-through path (for a turnout this is the thru track) and will ignore any other ends. For these cases you will need to break up the grade into a combination of elevations (using the turnout as one of the elevations) with connecting grades.

Finding out layout information

You can find out statistical information about a layout by pulling down the Control Menu for that layout and choosing Info... RR-Track then displays the *Layout Information dialog*, as shown at left.
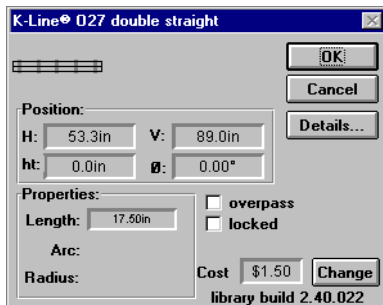
The *Layout information dialog* displays the size of the layout, the total number of track sections of all types, the total number of accessories of all types, and the total number of general purpose objects of all types. The track sections are further broken down into quantities of straight track, curved track, turnouts/switches, and other track (crosses, uncoupling tracks, power tracks, etc.). When you are finished studying the layout information, press the OK button.

Finding out track and object properties

You can access the details on a given items properties by positioning the cursor over it and clicking the right mouse button. When you do so over track, you will see a the *Track Properties dialog* like that below:
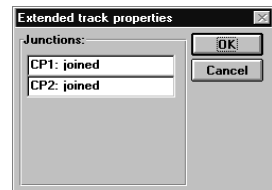
Position group: this tells you the location of the origin for the track and its current orientation (angle) in degrees measured counter-clockwise from the horizontal axis.
Properties group: this shows you the length, and arc angle and radius for a curved track section; and the total length and radius for a turnout transition track.
Details button: pressing the Details button will show you the connection properties of all of the track junctions in a dialog such as that at right:

Junctions group: this shows you the joining and block break status for each of the track junctions. Straight and curved tracks have two junctions, turnouts three, crosses four, etc.

The *overpass*, *locked*, and in some track libraries *swap switch machine* check boxes show the current overpass status, locking status, and whether the switch machine has been swapped for this track section. You may change these track properties by checking or unchecking all of these controls. If you set the overpass status of the track section, RR-Track will redraw it and bring it to the top of the display list immediately after you press the OK button. Pressing the Cancel button will cancel any changes you have made to the locking, overpass, and switch machine status. For more information on changing overpass attributes see *overpass track*.

The cost readout tells you the cost of this item, as set in the .INI file for that track library. You may change the cost, on-the-fly, by pressing the Change button. When you do so you will see a dialog like the one at right:

Simply type in a new cost (dollars and decimal cents) and press the OK button. To dismiss the dialog without changing the price, press Cancel. Price changes take effect immediately.

When you click the right mouse button while over a drawing object, you will see a dialog like that below:
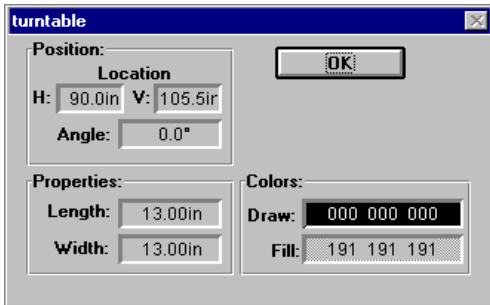
Position group: this shows the position and orientation of the drawing object in the current units system. As for track, angular positions are measured around counterclockwise from the horizontal.

Properties group: this shows the relevant dimensions for the object (length for lines, radius for circles, etc.).

Colors group: this shows the drawing (outline) and fill colors, if applicable, for the object.

For text label objects, there is an Edit button which you can use to bring up the Text Label dialog and edit the text label.

Pressing the OK button dismisses the dialog and returns you to RR-Track.

see also:
creating text labels

Grouping and ungrouping objects

In order to build up more complex drawing objects out of the basic shapes of lines, rectangles, and circles that exist under the Object menu, you may group them so that they are treated as a single object by RR-Track. When grouped, they may be selected and moved, rotated, copied, and deleted as a single entity. This makes creating complex diagrams of structures and accessories on your layout a more simple task. Even more complicated objects can be created by building them up from groups of simpler groups, for instance a combination watering, coaling, and sanding station put together from separate watering, coaling, and sanding facilities.

Procedure:
1. *Select* the objects you wish to group using the pointing device. The easiest way is to sweep out a selection rectangle around the objects you want to group.
2. Pull down the Action menu and select Group Objects. The selected objects are redrawn with a dashed rectangle around them indicating they are grouped. This dashed line only appears when the grouped objects are selected and highlighted.

You cannot form a group from a single object, and track sections are not allowed in a group and will be ignored if they are included in the selected objects. RR-Track maintains a distinction between track and objects since objects have spatial extent, but do not have junction points with positions and directions.

In order to ungroup a grouped object, simply select it and choose <u>Ungroup Object</u> from the <u>Action</u> menu. The first grouped object found in the list of selected objects will be ungrouped and redrawn without its telltale dashed grouping rectangle.

Joining track sections

Joining track sections is the most common operation carried out when building a toy train layout other than adding new track sections. RR-Track makes a distinction between physically joining track sections, which it then treats as a single entity when selecting, moving, or rotating, as opposed to aligning the track sections, which merely means the appropriate track control points are physically placed together, but not marked as joined (see **aligning track sections** for more information on aligning track).

There are two distinct methods for joining track: you may join selected track to the nearest unused track control point that is not contained in the selected (highlighted) track, or you may enable automatic track joining and simply bring the two ends you wished joined to within a track width of each other (this is 1.25" for O-gauge and 0.625" for HO track). The second method is the simpler, and is the most often used way of joining track sections.

The <u>Join to Nearest Track</u> item is the user initiated analog of automatic track joining (see the **Options** menu and see the section on <u>moving track</u>). RR-Track scans the track list for the smallest distance between unused track *control points* in the *select list* and the rest of the track list. When found, the track in the *select list* is joined as a unit to the nearest track in the unselected portion of the track list, if the distance is less than the capture radius for that track library (the capture radius when adding new track is 6.0" for HO track, 12.0" for O track, 18.0" for G track, etc. RR-Track uses a different capture radius when moving track which is equal to the width of the track i.e. 0.625" for HO, 1.25" for O-gauge, etc.). If <u>confirm track joining</u> is enabled, the closest track and joining points are highlighted in cyan, with a line drawn between the chosen control points, and user confirmation is asked for.

Procedure:
1. *Select* the track you wish to join. The track is highlighted in red.
2. Move the selected track near to the track you wish to join. RR-Track will join the closest pair of unused control points.
3. Select Join To Nearest from the <u>Action</u> menu. The track is immediately joined, subject to confirmation if that has been enabled.

To use the second, and easier method of joining track, simply bring them near each other, and make sure the automatic track joining option is checked in the <u>Global Options Dialog</u>. When

automatic track joining is turned on, you only have to move the track ends you wish to join within a track width of each other. I recommend this method (RR-Track automatically starts up when first used in this mode).

see also

selecting track,moving track, aligning track sections

Locking and unlocking track and objects

The Lock selected items and Unlock selected items pair of commands lets you fix track and objects on the layout so that they cannot be accidentally moved or rotated. As an example, you may have constructed an outside loop of track, and now wish to work on inner loops or yards, and want to reference the new track to the outside loop. To keep from accidentally moving the outside loop, you can lock it in place. Later on, when you are done, or want to move it, you can unlock it by selecting it and using the Unlock selected items command.

To lock items in place:

1. *Select* the items you wish to lock down using the mouse.

2. Pull down the Action menu and choose the Lock Selected Items command. RR-Track sets a lock on the selected items, keeping them from any subsequent moves or rotates.

To unlock locked items:

1. *Select* the locked items you wish to unlock using the mouse.

2. Pull down the Action menu and choose the Unlock Selected Items command. RR-Track removes the lock on all of the selected components.

If you try to move or rotate items in which some are locked, you will be advised of this condition and the requested move/rotation will be ignored.

Measuring distances on the layout

Often it is useful and even crucial to know the distances between objects and track sections on the layout in order to correctly space switchyards, unloading docks, or find out what length of track you need to fill a gap. Distances are simply measured using the measuring tool in RR-Track.

Procedure:

1. With the cursor showing the Windows arrow (i.e. you aren't in the middle of some other operation such as drawing an object), place the tip of the arrow where you wish to anchor one end of the distance line.

2. While holding down the SHIFT-key, depress and hold the right mouse button. The cursor will change to a ruler with a small star which denotes the aiming point. This signifies that you are using the measuring tool.

3. Still holding the SHIFT and right mouse buttons, move the aiming point to where you wish to end the measurement. RR-Track draws a line showing the distance that will be measured.

4. Release the SHIFT-key and right mouse button. A dialog, like that shown below, will tell you what the total distance is, the angle, and the horizontal and vertical components of this distance. Press the OK button when you are finished studying the measurement. The cursor returns to the Windows arrow.
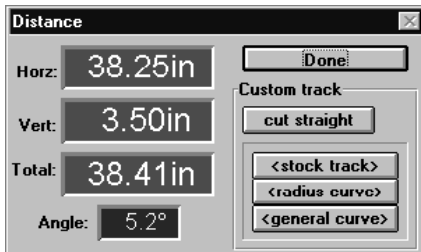
Performing the previous set of steps while holding down the ALT-key rather than the SHIFT-key will cause the measuring tool to snap the endpoints to the nearest track points. This is useful when you want to know the exact distance between track ends. While you are making the measurement, the x- and y-position readouts in the status window change from showing position to showing the instantaneous measured distance, handy for getting feedback on how far you have displaced the cursor.

The Distance dialog also contains command buttons, in a control group labelled Custom Track, which are used to engage any track wizards which the current track library, or the track library containing the two track sections that are connected by the measurement. *Stock track* tells the wizard to fill the gap with stock track sections, *radius curve* to fill the gap with the largest radius curve that will fit, and *general curve* to fill the gap with a general curve (a curve of constantly changing radius, like an easement).

Moving track and objects

Moving track sections and objects is very easy with RR-Track. Movement is done entirely through the mouse cursor in a what-you-see-is-what-you-get manner. The procedure is simple and straightforward.

Procedure:

1. *Select* the track or objects you wish to move.

2. Place the cursor over, or in, one of the track sections or objects you wish to move (for a general purpose object this will have to be on one of the drawn lines). Depress and hold the left mouse button. The cursor will change to a diagonal arrow with the legend 'Move'.

3. While holding the left mouse button down, move the cursor to where you want to place the track or objects. The track will move with you, with control points indicated, so that you may see exactly where the track will be placed.

4. When you reach the destination, release the left mouse button. The old track/object positions will be erased and the new ones drawn. The track sections remain selected; you must manually deselect them unless automatic track joining is enabled and a track join occurs.

If you have enabled automatic track joining, found both on the Options menu and in the Global Options dialog, then all you have to do to have track automatically join when moving sections

around is to bring the free end of the track you wish to join within one track width of the target track section. RR-Track will automatically join the track sections if you bring them to this proximity. For example, if you are using LGB® G-gauge track, you need to bring the track sections to within 1.77" of each other. For O-gauge track, the capture distance is 1.25".

> **Hint**: you may combine selecting an item and moving it into one mouse motion by placing the cursor over the object you wish to select and move, then depress and hold the left mouse button.   After approximately 1/4 to 1/2 second the item will be highlighted and the cursor change to the move cursor (an arrow with the word move below it). At this time you drag the item where you want it, and release the left mouse button.

Using the Move command: If you are not comfortable with moving items using the mouse, you can also move selected items by using the Move dialog, accessed by choosing the Move command from the Action menu. When you choose the Move command, you will see the Move dialog as shown to the left:

The readouts at the top show how far you have moved the selected items vertically and horizontally respectively. These are relative movements; that is the horizontal and vertical readouts show how far you have moved the selected items since you chose the Move command.

The four buttons with arrows are used to move the selected items one step in the indicated direction, where the step size is the current setting of the snap size in your layout. Each time you press one of these buttons, RR-Track immediately moves the selected items so that you can see where they are now located. You can access the *Snap Size dialog* to change the snap size by pressing the inc button.

The check box labeled '1/2 step' is used to change the move increment to half of the current snap size. You can turn this on or off as many times as you like during any given move session.

When you are finished moving the selected items, press the OK button. If you decide you do not want to move the selections, then press the Cancel button. RR-Track will then return the selections to their starting position, and return you to your layout.

see also:
selecting track
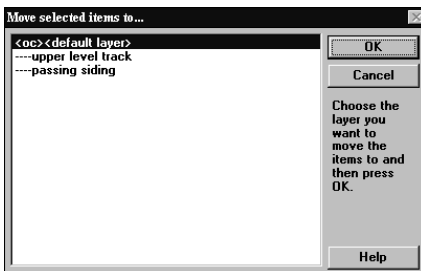
Moving items between layers

When you create a new layer, or want to get rid of an existing layer, you will more than likely want to move some items in existing layers to the new one, or move items in the old layer to some other layer so that you can remove the layer. In order to do this, you use the Move to layer command found under the Action menu. RR-Track displays the *Layer Chooser dialog* so that you can

choose the destination layer, and then moves the items. As soon as they are moved, they inherit the properties of the new layer. In other words if you move items from a visible layer to a hidden or grayed layer, they are redrawn as hidden or grayed.

Procedure:

1. Select the items you want to move to another layer.
2. Pull down the Action menu and choose Move to layer... The *Layer Chooser dialog* appears.
3. Select the destination layer from those in the list and press OK. Or, double-click on the destination layer combine choosing a layer and clicking OK. If you decide not to move the items, choose Cancel. RR-Track immediately moves the items to the destination layer.

See **creating, changing, and removing layers** for more information on layers.

Opening an existing layout

To open an existing layout file for viewing or editing, use the Open... command from the File menu. The current layout file, if any, will be closed. If any changes have been made to the current file since it was opened, you will be asked if you wish to save it. After taking action on the current file, RR-Track displays the Windows **Open File dialog** at which point you may indicated the drive, directory, and file you wish to open.

Procedure:

1. From the menu bar, select File and then Open... from the drop-down menu. The current layout, if any, will be saved.
2. From the choices shown in the Open File dialog, select the layout file (yourname.rrt) which you wish to open by manipulating the drive icon, the directory folder icon, and selecting the layout file from the file names listbox.
3. When satisfied with your choice, click the *OK* to open the file, or *Cancel* if you have changed your mind and wish to return to the RR-Track main window.

RR-Track remembers the names and locations of the last four layout files opened. These are found at the bottom of the File menu, in the order of recent use. You can quickly open one of these simply by clicking on the layouts file name.

see also:
saving a track layout file

Overpass track

RR-Track normally draws track as a see-through item; only the rails and end lines are rendered, as well as track joining accents, track and grade labels, and switch machines. However, when one track section is passing over another, it is visually useful to show the overpass track blanking the track underneath. In order to do so, you can set the overpass attribute for any track section on the layout. You may also remove the overpass attribute at any time; the overpass attribute is an editable characteristic in release 3.02 in contrast to earlier releases of RR-Track.

When you set the overpass attribute, RR-Track immediately moves the track sections with the overpass attribute to the top of the display; removing the overpass attribute has no effect on the position of a track section in the display list.

To change the overpass attribute:

You can change the overpass attribute in one of two ways, either by using the toggle overpass command found on the shorthand menu summoned from a right mouse click, or using the *track property inspector* summoned by a right mouse click when over the desired overpass track section.

Procedure when using the toggle overpass command:
1.   Select the track section(s) whose overpass attribute you want to change.
2.   Position the cursor over an empty screen space and click the right mouse button to bring up the shorthand menu.
3.   Choose the toggle overpass command. RR-Track toggles the overpass attribute of all selected track sections; those that are not overpasses are set as overpasses, and those that are over-passes are cleared. You are returned to the layout with the selected track still highlighted.

Procedure when using the *track property inspector*:
1.   Position the cursor over the track whose overpass attribute you wish to change. The track section does not have to be selected.
2.   While over the track section, click the right mouse button to bring up the Track Properties dialog.
3.   Find the overpass check box and check it if you want the track to be an overpass, or clear it if you don't.
4.   Press the OK button to apply your changes, or the Cancel button if you have decided to not make any changes. You are returned to the layout.

Pasting track into the layout

The Paste command from the Edit menu allows you to paste track sections or other objects from the RR-Track clipboard into the current layout. The pasted items will be placed at the upper left corner of the current view, and automatically selected (highlighted), replacing any previously selected objects. The contents of the RR-Track clipboard are not changed by this command. If the clipboard is empty, this command will be grayed out and you will not be allowed to select it.

Procedure:
1.   Select the Paste command from the Edit or *shorthand* menus, or hit Ctrl-V from the key-board.
2.   The track or other objects in the RR-Track clipboard will be added to the track layout near the upper left corner of the current view, and will be selected (highlighted). Both the track list and the select list are updated reflecting this change.

See also:
copying track, deleting track

Relaxing mismatched track

If you have been assembling sectional track for any length of time, you have noticed that the final 'fit' for a closed loop is not necessarily exact, and may in fact have quite a bit of error, well over an inch if all of the sections are properly joined. This residual 'slop' is soaked up by 'adjusting' the fit of a number of track sections on both sides of the closure point. The purpose of the Relax Track command is to do just that; incrementally adjust the location and rotation of track sections in order to minimize the mismatch at joints, i.e. spread the error out so that it is not concentrated at one junction.

RR-Track models the track sections that you tell it to 'fudge' as a set of fixed length objects that are connected by springs. It then moves the track sections searching for a configuration that minimizes the overall forces and 'energy' stored in the track-spring system. While not perfect, the resulting configuration isn't far in most cases from what you would do yourself. As a bonus, RR-Track displays statistics, both during the relaxation process and at the end, which can be used to judge for yourself whether this resulting configuration will be usable. While a minimized track configuration will always be found, large residual mismatches in both angle and displacement mean that the real track configuration will be rather strained, and likely to come apart in use unless well fastened to support of one kind or another.
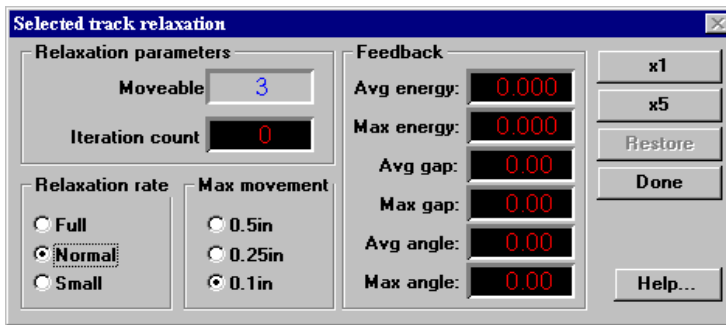
When you select the Relax Selected Track command from the Action menu, a dialog like that at left appears:

There are a lot of information displays on this dialog starting at the upper left.

Relaxation parameters: here there are two items displayed, **Moveable** which shows the number of track sections you allowed RR-Track to move around, and **Iteration count** which is the number of times RR-Track has gone over the moveable track and adjusted them for better fit.

Relaxation rate: here you have a choice of full, normal, and small. Normal is the default and is usually the best choice; when you are in the final stages of relaxing the track you can try changing this to small.

Max movement: this sets an upper limit on the distance RR-Track can move a piece of track on each iteration, regardless of how far it would like to move it. A maximum limit is set to minimize the chances of 'bouncing around' between two or more similar track configurations. Here you have a choice of 0.5 inches, 0.25 inches, and 0.1 inches. The default choice is 0.25 inches; when you are in the final stages of relaxing the track you can try changing this to 0.1 inches. RR-Track also adjusts this dynamically depending on the maximum gap error that it finds.

Feedback: RR-Track dumps out a lot of number to try to guide you through the relaxation process which is as much an art as it is a science. There are six parameters displayed: *average energy*, *max energy*, *average gap*, *max gap*, *average angle*, and *max angle*. The two most important of these are the *average gap* and the *max gap*. The average and max energy readouts show the current average energy and the maximum energy (in arbitrary units) of the movable track sections. If the average and maximum energies are similar, then the error is pretty much uniformly spread out over all of the movable track (which is what you are aiming for). The average and max gap are the track junction gap errors (in inches) of the movable track sections. Again, you are trying to make these nearly the same. If the maximum gap is a lot more than the average, this means one track section is stuck with most of the error. The average and max angle are the track junction angular errors (in degrees) for the movable track sections. Here you are usually interested in only the maximum angle since this shows you the worst aligned track junction. The greater this error, the more of a 'jerk' trains will experience when they traverse that junction. 5° is a very large angular error; you want to keep this below 1.5° if possible.

Command buttons: you have four actions you can take. <u>X1</u> makes one pass over the track sections at the current relaxation parameters adjusting the fit, and then displays the results. <u>X5</u> makes five passes, adjusting the fit each time, and then displaying the results. <u>Restore</u> is used when you decide you have hopelessly messed up the movable track sections, and want to get back to the starting configuration. Press <u>Done</u> when you are finished and want to go back to laying track. Press <u>Help</u> to bring up the help topic on relaxing track.

Procedure:

1. *Select* the track you wish to allow RR-Track to move in order to minimize joint mismatches. It is usually a good idea to choose a few track sections on either side of the joint with the biggest error; this is usually the point where the loop was closed (see **closing track loops**).

2. Select <u>Relax Selected Track</u> from the <u>Action</u> menu. The Relax Track dialog appears.

3. Set the Relax Track parameters as you desire and begin iterating the track minimization by pressing either the <u>x1</u> or <u>x5</u> buttons. It is usually a good idea to start with large maximum movements, and then steadily constrain the amount that RR-Track can move track. See **Relaxation Tips** for more information and suggestions about relaxing track sections.

4. When the maximum track error has reached an acceptably low value, around 0.1 to 0.2 inches, or whatever you like, press the <u>Done</u> button.

For further information, study the **Relaxation Tips** topic.

Rotating track and objects

In order to rotate track or other objects, you must first select the track as you would in order to take any actions. The <u>Action</u> menu on the main menu bar will then be enabled, allowing you to select

the <u>Rotate</u>... item.   After selecting this item, you are presented with a dialog like that shown at left:
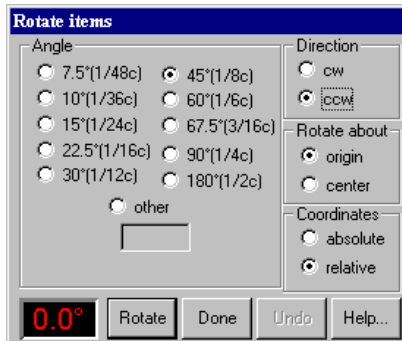
There are four primary control groups in the rotate dialog. The **angle controls** are on the left side, extending from top to bottom. The **direction controls** are immediately to the right of the angle controls, and at the top of the dialog. Immediately below the direction controls are the **rotate about controls**, while below these, at the bottom of the dialog, are the **coordinate controls**. There are four push buttons at the bottom labeled <u>Rotate</u>, <u>Done</u>, <u>Undo</u>, and <u>Help...</u> At the left bottom is a readout which displays the relative angle that the selected items are rotated through.

Angle controls: when rotating track, or other objects, RR-Track 'thinks' in terms of angles, expressed in degrees and decimal degrees, just like those on a common school protractor. However, when assembling sectional track, people tend to think in parts of a circle i.e. 12 sections to a circle, 16 sections, and so on. The angle controls contain a number of preset rotation angles which may be selected by pressing the button next to the angle you wish to rotate track. These span from 7.5° to 180°, and are chosen to represent the angular arcs that most sectional track systems have. For convenience, these preset angles are also labeled in terms of the fraction of a circle equivalent to the angle (for example, 15° is 1/24th of a circle, 45° is 1/8th of a circle, 90° is 1/4th of a circle). If the angle you wish to rotate through is not found in the list of preset angles, you may select **other**. This action puts up a text cursor in the box immediately below the other radio button, at which point you type in your angle (in degrees).

Direction controls: you may also rotate track, or other objects, in either direction, clockwise (**cw**) or counterclockwise (**ccw**). RR-Track defaults to counterclockwise, but clockwise rotations may be selected by clicking the *cw* button.

Rotate about controls: you may also tell RR-Track the point you wish to rotate the objects about (the center of the rotation circle). The choices consist of the origin and the **center**. The origin here is the origin of the *lead selection.* This will be the end of the track which is under the cursor when the track is first added to the layout (if you watch, you will see that new pieces of track have one end at the mouse cursor). If you select center, the rotation will be about the center of the lead selection.

Coordinate controls: finally, you may select whether the rotation you have chosen is to be **absolute** or **relative**. Absolute rotations rotate the selected track to an angle in terms of the overall coordinates of the track layout, i.e. 0° is horizontal running from left to right, 90° is vertical, running from bottom to top, 180° is horizontal, but runs from right to left. Relative rotations rotate the selected track by the chosen angle relative to the current angle of the track, not the overall layout coordinates. For example, if you have track that is oriented at 45° and you choose a 30°

counter-clockwise relative rotation, the new track angle will by 45° + 30° = 75°. Had you chosen a clockwise rotation instead, the new angle would be 45° - 30° = 15°. RR-Track defaults to relative, counter-clockwise rotations.

When you have finished selecting your rotation, apply it by clicking the <u>Rotate</u> button. The *selected track* will be rotated to its new position, and the angle readout will be updated. When you are finished rotating the selected items, press the <u>Done</u> button. If you need help while selecting your rotation options, click on the <u>Help</u> button. Press the Undo button to remove any applied rotations. When joined track sections are rotated, the track is rotated as a contiguous unit about the origin or center, as chosen, of the *lead selection*. If items in the select list are joined to items not in the select list, RR-Track will not carry out the rotation unless the *allow track breakaways* item in the <u>Global Options</u> dialog is checked.
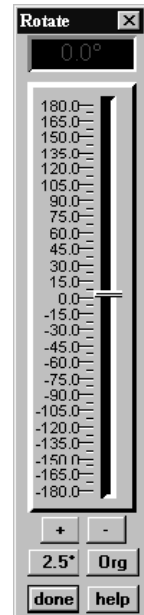
Procedure:

1. *Select* the track sections or other objects you wish to rotate.
2. Pull down the <u>Action</u> menu , and choose the <u>Rotate</u>... item.
3. In the *Rotate Options dialog*, click the radio buttons that correspond to the angle you wish to rotate, the direction, the origin, and whether the angle is relative or absolute. RR-Track defaults to counter-clockwise relative rotations about the track origin.
4. Click the <u>Rotate</u> button. The selected track rotates to the new position. The Rotate dialog stays up until you press the <u>Done</u> button to dismiss it. In this manner you can perform several trial rotations to get the angle right before leaving the Rotate dialog. If you want to return the track to its starting configuration, press <u>Undo</u>.

Another method: RR-Track also offers an alternative way to rotate items. You access this method by choosing the <u>Rotate</u>... command found in the *shorthand menu* (the shorthand menu pops up when you put the cursor over and empty area and press the right mouse button). When you choose the Rotate command from the shorthand menu, you will see the *Quick Rotate dialog*, shown in the figure at right, at the right edge of the active layout window..

The *Quick Rotate dialog* has most of the features of the standard *Rotate dialog*, and has a fader control that you can grab to rotate the selected items anywhere between + and - 180° from their current orientation.

The readout at the top shows the current orientation of the selected items, relative to their starting orientation. The fader control has markings every 15° to aid you in positioning the slider.   The slider only chooses angles that are integer multiples of the angle increment. The two buttons directly below the fader let you rotate the selected items one increment in either direction. The middle left button, labeled <u>2.5°</u> in the figure, is the angle increment, and lets you toggle between the standard rotation increments, which are 1, 2.5, 5, 7.5, 15, and 22.5°. Each time you press the angle increment button, RR-Track changes the angle increment to the next higher value, wrapping back around to 1° when you reach 22.5°. The label changes to

indicate the current increment. The middle right button, labeled <u>Org</u> in the figure, lets you toggle the rotation center between the origin of the lead selection (Org) and the geometric center of all of the selected items (Ctr). RR-Track displays a ⊕ on the layout window to show the current origin. To change origins simply press the button. When you are finished rotating the selected items, press the <u>Done</u> button.

Procedure*:*

1. *Select* the track sections or other objects you wish to rotate.
2. Pop up the *shorthand menu*, and choose the <u>Rotate</u>... item.
3. In the *Quick Rotate dialog*, grab the slider and move it to the angle you wish to rotate through. As you move the slider, the readout at the top shows the current angle. When you release the slider, RR-Track rotates the selections by the angle displayed in the readout. You can also rotate the selections in units of the angle increment by pressing the + and - buttons. You can rotate the selections as many times as you like.
4. Repeat step 3 until you are satisfied with the orientation of the selected items. You can change the angle increment at any time by pressing the middle left button; you can toggle the rotation center between the lead selection's origin and the geometric center of all the selected items at any time by pressing the middle right button. The *Quick Rotate dialog* stays up until you press the <u>Done</u> button to dismiss it.

*see also***:**
selecting track and objects, moving track and objects

Saving a layout file

The <u>Save</u>... command from the file menu allows you to save to disk the current layout. This command will be grayed out if no changes have been made to the layout since either <u>opening</u> it or saving it. After saving the file, RR-Track disables this command (graying it out) until a change has been made to the current layout.

Procedure:

1. From the menu bar, select <u>File</u> and then <u>Save as</u>... from the drop down menu. If the <u>Save as</u>... command is disabled (grayed out), there have been no changes to the current layout since either opening it or saving it.
2. RR-Track displays the Windows Save File dialog. Using the drive and directory folder icons, and the names in the file name listbox, you select an appropriate file name (such as *myfile.rrt*). You can also manipulate the file types icon in the lower left corner to change between saving as a track layout file (RRT) or a Windows bitmap file (BMP).
3. When you are satisfied with the file name you have chosen, click the *OK* button to save the current layout, or the *Cancel* button if you have changed your mind and wish to return to the RR-Track main window.

If you have chosen .BMP as a file type, RR-Track, rather than saving the layout, saves the current screen image to a Bitmap file. This Bitmap file can subsequently be included in other documents by either importing it, or copying it to the clipboard and then pasting it into the document.

see also:
opening a file

Selecting track and objects

Before you can do anything useful with track sections you have already placed in the layout, they must first be *selected*. Track items must be selected before they may be moved, copied, cut, deleted, rotated, joined, aligned, closed, and relaxed. Track selection is an action performed entirely with the mouse cursor, but is modified by the enabling/disabling of the <u>Selections Include Joints</u> item, the <u>Selections Include Blocks</u> item, and the <u>Selections Include Grades</u> item on the <u>Options</u> menu.   These properties are called <u>extended selections</u>. Extended selections occur when you *double-click* the left mouse button instead of single clicking. The current extended selection mode is denoted by a check mark in front of it on the menu. When the extended selection mode is set to *Selections Include Joints*, then all of the track physically joined to the track under the cursor will be highlighted when you make an extended selection. When the extended selection mode is set to *Selections Include Blocks*, then all of the track sections *electrically* connected to the section under the cursor are highlighted. This mode is very useful for checking the arrangement of electrical blocks on your layout. When the extended selections mode is set to *Selections Include Grades*, all of the track at the same height or on the same grade is selected.

Among track in the selected track list, the first track section is called the <u>lead selection</u>. This section is highlighted with larger control points than the secondary selections, and drawn using a double-width pen. The graphic below illustrates this:
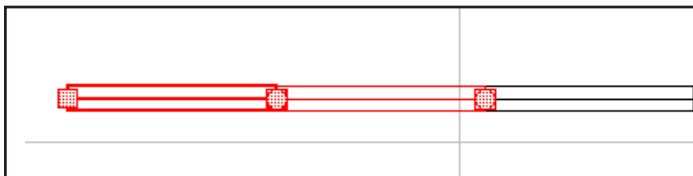
Note that the leftmost section has the large, filled squares denoting its *control points*. Circles denote points that are joined, while hollow squares are unused control points. The lead selection is the track section about which rotations occur, moves are referenced to, and which determines who is moved to whom when aligning or joining track and there is more than one possibility for movement.

Selection may be carried out in two distinct ways. The first allows you the select all of the track and general purpose objects in a rectangular region.

Procedure:

1. With the Windows arrow cursor showing (i.e. you aren't in the middle of some other procedure), position the cursor in an area where there are no objects or track sections, and you wish to start the select rectangle.

2. Depress and hold the left mouse button. The cursor changes to a diagonal arrow with the word 'Select'.
3. While continuing to hold down the left mouse button, sweep out the rectangle containing the objects you wish to select. It will be drawn as you move the cursor.
4. When you are satisfied with the region you have drawn, release the left mouse button. All track and other objects wholly within this region will be placed into the select list and highlighted. The cursor returns to the Windows arrow.

Using this method, the lead selection will be the first track section found in the track list that is in the region. Note that using the selection box does not select track that is not in the box, regardless of the setting of the extended selection mode.

The second method consists of manually moving the cursor over each item you wish to include in the select list. While slower than the first method at adding track to the list, it allows you to be more precise.

Procedure:
1. With the Windows arrow cursor showing (i.e. you aren't in the middle of some other proce-dure), position the cursor over the track section or object you wish to select and click the left mouse button. The object is highlighted in red.
2. To add objects or track sections to the select list, position the cursor in turn over the next objects and, while holding down the SHIFT-key, click the left mouse button. The new object is highlighted.
3. Repeat step two until you have highlighted the track or objects you wish to select.

You may both select and move at item in one operation by placing the cursor over that item, then depress and hold down the left mouse button for 1/4 to 1/2 second. RR-Track will assume you want to move the object(s) under the cursor, highlight them and then change to the 'move' cursor. In this manner you do not need two separate mouse clicks to initiate moving an object.

Making extended selections

RR-Track has three different extended selecting modes which may be set by pulling down the Options menu. These three modes are selections include joints, selections include blocks, and selections include grades. These modes select all of the track physically connected, electrically connected, and at the same height or grade respectively. To make an extended selection, you *double-click* the left mouse button when over the first track section you want to select. Depending on which extended selection mode is currently set, RR-Track will choose the track section under the cursor and all of the others joined to it, modified by the extended selection mode. If more than one track section is currently highlighted, and the left mouse button is double-clicked, RR-Track collapses the selected track to only that track section under the cursor, *regardless of whether the multiple selections occurred because of a previous double-click or not*. In other words, to return multiple selections to only the track under the cursor, you can double-click when over this section rather than manually deselecting track items using the SHIFT-left mouse combination. Identical to

single-clicking the left mouse to make a selection, double-clicking and holding down the left mouse button after the second click will cause RR-Track to change to the 'Move' cursor after 1/4 to 1/2 second. In this manner, a single double-click allows you to select a chunk of track and then move it to a new location.

Changing the lead selection

In order to change the lead selection of track that has already been selected, position the cursor over the track section you wish to become the lead selection and *single-click* the left mouse button.
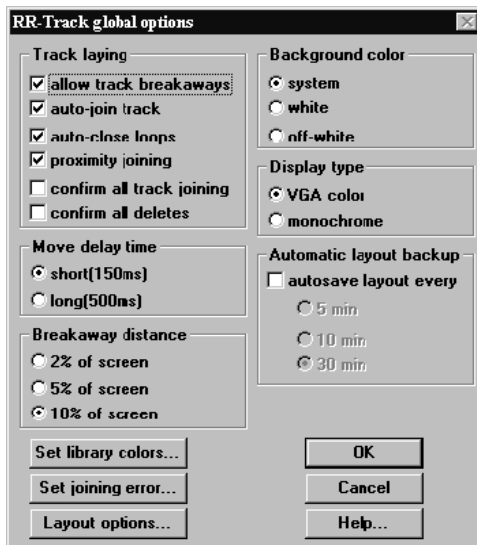
Deselecting objects

To deselect items, position the cursor over the already selected object and, while holding down the SHIFT-key, *single-click* the left mouse button. The object will be removed from the select list.

see also:
moving track

Setting Global Options

Selection of the global options item invokes a dialog box, like that below, which controls the selection and deselection of features related to the display and response of RR-Track. Global options consist of those items whose settings are applied to all layout windows. This is in contrast to local options (which you can get to either through the *Global Options dialog* or the Control Menu on the layout window) which affect only that layout. You access the *Global Options dialog* by choosing the Options... command from the Options menu.

The controls are grouped into sections which contain related features.

Track laying options:
allow track breakaways controls whether a single, joined track section may be moved without moving all track joined to it. When a track section is physically joined to neighboring track sections, it is usually not in your best interests to allow the joined pieces independent motion. However, it is also convenient to not have to manually break track junctions in order to move some track out of part of the layout (usually because you want to make some minor rearrangement). Checking this item will lift this restriction. The default state is to prohibit the independent motion of joined track. If

you do enable this option, you can break track away by selecting it and moving it at least 10 per cent of the current screen size. If you do this, RR-Track severs the junctions between the track ends and the rest of the layout automatically. If you don't move the track 10 per cent of the screen size, then RR-Track will not permit the track to be moved.

autojoin new track toggles the joining mode for newly added track between automatic and manual. RR-Track can join track either automatically, or manually. If automatic joining is enabled, the cursor will change to an arrow with the term 'autojoin' when a new track section is selected from the Track menu.

When joining track automatically, which occurs only when placing new track sections, RR-Track scans the track list for the closest available joining point (unoccupied track end) to the joining points (track ends) on the new piece. As the left mouse button is released, the tracks are joined. The best way to get the joint configuration that you desire is to move the new track section close to the point you wish to join it, and RR-Track will proceed from there.

If automatic track joining is enabled, and you do not wish a new track section joined to the existing track layout (for instance, starting a branch line, a second level, or an independent loop), simply press the Escape key on the keyboard before you place the new track section. The cursor will change to an arrow with the term 'move' indicating that automatic joining is not enabled. As soon as the new track is placed, automatic joining will be re-enabled.

auto-close loops: toggles automatic loop detection and closing. When turned on, RR-Track checks for loops whose free ends meeting the criteria for closing (less than a track width apart and aligned within 2.5° and physically contiguous) as each new track section is added to the layout. If RR-Track finds a pair of free ends that meet these criteria, they are highlighted and you are asked to confirm the closing of this loop.

proximity joining: toggles track proximity joining. When turned on, RR-Track checks all of the ends non-joined ends of a piece or pieces of track when they are moved. If it finds unconnected track junctions that are in close proximity with other track junctions (the proximity joining criteria are 1/4 track width spacing and 2.5° misalignment) they are automatically joined. Proximity joining is distinct from automatic loop closing in that the free track ends do not have to be physi-cally connected through a loop (for instance, they could be the other pieces in a siding).

confirm all track joining toggles user confirmation for all track joining on or off. You may select whether you wish to be consulted at every track joining operation. If you have chosen to confirm all track joining, RR-Track will highlight the two track sections it is about to join, and draw a line showing which ends will be used. If you wish to proceed, press the **OK** button; if you do not accede to the proposed joining, then press **Cancel** and the joining will be aborted. Confirmation of joining may become intrusive at times, especially when you are in autojoin mode,rapidly selecting and placing track sections. Typically joint confirmation is turned off, and only enabled when in critical sections.

<u>confirm all deletes</u> toggles user confirmation for all track and objects deletions. If left off, RR-Track will not ask for confirmation when you delete track or objects, unless you are deleting more than 25 items, in which case confirmation is always required.

Background color:
These are set of radio button which allow you to pick the background color that RR-Track uses when displaying the track layout. The choices are the system color, which you may set using the Windows Control Panel, while, and an off-white color. All are standard system colors which are available in any Windows display mode from 4-bit, 16 color VGA through 16.7million color, 24-bit true color. If you find that white and off-white are too boring, then set some psychedelic color of your own using the Windows Control Panel and selection the system color. Bear in mind that it is of fundamental importance for the background color to allow the foreground colors, i.e. those of the track and objects, to be easily discernible. This background color is the default color that is used if no specific background color is chosen for the layout. You can override this by setting the layout background color in the *Local Options dialog*.

Display type:
This set of radio buttons lets you choose whether you want the display colors associated with VGA color monitors, or the set of colors chosen for monochrome monitors. The default setting is VGA color, which is used for desktop systems. The monochrome setting is useful if you are using a laptop machine with no color display.

Move delay time
You can choose whether you want a long delay (1/2 second) or a short delay (1/6 second) between when you depress and hold the left mouse button down when selecting a track section, and when the cursor changes to the 'Move' cursor, letting you move the track. The way you want to set this will depend on how adept you are at single-clicking, double-clicking, and in general using the mouse cursor.

Breakaway distance:
You can set the size of the jitter for track breakaways by choosing either 2 per cent, 5 per cent, or 10 per cent of the screen width (previous versions of RR-Track were fixed at 10 per cent). The breakaway jitter distance dictates how far a piece of track that is joined to other pieces of track before RR-Track decides you really want to disconnect it.

Automatic layout backup:

If you want RR-Track to automatically create a backup file of your open layouts, check this box. You can then choose the time interval for backups, from 5 minutes to 30 minutes. RR-Track will create at backup file with the same name as the layout file, but with a file type of .RRB. Like layout files, whose type is .RRT, backup files are registered with Windows 95 and Windows NT as belonging to RR-Track. If RR-Track terminates prematurely, you most recent work will reside in the layout backup file. If you close the layout normally, RR-Track deletes the backup file.

Set Track Colors:

This command button calls up the *Set Track Colors dialog*, the same as if you had pulled down the Options menu and chosen Set Track Colors. See **Setting track colors** for more information.

Set Joining Error:

This command button calls up the Joining Error dialog which allows you to set a gap between track junctions to simulate junction expansions that you create when joining the real track on your layout. For more information see **Setting joining error**.

Layout options:

This command button calls up the Layout Options dialog which lets you configure those settings which are variable on a layout to layout basis. See **Setting local layout options** for more information.

Other settings in RR-Track, principally those which control the appearance of the layout windows and the appearance of the track can be configured on a layout to layout basis by using the local options dialog discussed in the ensuing topic.

Setting local layout options

RR-Track distinguishes between settings that are applied to all layouts and settings that apply only to the current or active layout. The settings which are configurable on a layout to layout basis are generally those that govern the appearance of the layout in the layout window in distinction to those which govern track laying.

Coordinate overlay:

Spacing

This control group sets the coordinate grid size.

6" grid sets the coordinate grid to 6 inch spacing.

12" grid sets the coordinate grid to 12 inch spacing.

24" grid sets the coordinate grid to a 24 inch spacing.

48" grid sets the coordinate grid to a 48 inch spacing. Useful for large garden layouts.

no gridlines turns off the coordinate grid.

The 6", 12", 24", 48", and none grid size commands under the Options menu also set the size of the coordinate grid displayed on the layout for view purposes only. The coordinate grid drawn when the layout view is printed is identical to that displayed on the screen; this is

a change from release 2.3. In order to specify a 6", 12", or 24" coordinate grid, select the appropriate item with the mouse. A check mark will be displayed alongside the current grid size. If you wish to dispense with the coordinate grid (which you may want from time to time), select the None item. Note that setting the Units to metric will change these coordinate grid options to 10, 25, 50cm, and 1m respectively.

Fine symbols

This control group sets the symbol used for the fine grid, which is drawn every 6 inches, and may be toggled on or off with the <u>display fine grid</u> selection.

<u>crosses</u> uses small crosses as symbols

<u>points</u> uses single points as symbols

<u>display fine 6" grid</u> toggles the display of the fine-scale, 6 inch grid. The fine-scale grid is an additional coordinate grid which may be include with main coordinate grid. Here points or crosses, as specified in the dialog, are drawn on six inch boundaries to aid in locating and positioning track an other objects.

Units

You can set the measuring units to either English (using feet and inches) or metric (using meters and centimeters) with these radio buttons. If you select metric units, useful for European track systems, then all distances will be displayed in meters and centimeters.

Display items and symbols group:

<u>detailed track render</u> toggles the track rendering between simple and detailed. Track may be rendered, both on the screen and the printer, at two levels of detail. When this option is selected track will be drawn at full detail. This implied three-rail track drawn with three rails, two-rail with two rails, ground throws or control boxes drawn for turnouts, guide rails, etc. All track types are drawn at their actual size between the rails. To this end, O-gauge track will be 1.25" wide, G-gauge 1.77"(45mm) wide, and standard gauge 2.125"(54mm) wide. At this time, ties are not drawn. This detail, of course, requires additional time, slowing the display speed. From time to time, especially on slower PC's, you may wish to turn off detailed rendering. This reduces all track sections to single lines, greatly increasing drawing speed at the expense of detail. Bear in mind that even accelerated Windows video cards, while they are fast at rendering straight lines, are slow at rendering curves. The longer the curves, the slower the rendering. This option may also be set using the <u>Detailed Track Render</u> item on the <u>Options</u> menu.

Underneath the <u>Detailed track render</u> check box are two that are labeled <u>Track</u> and <u>Objects</u>. These control whether track and objects are rendered or not. Checking the Track box renders all track sections, while checking the Objects box renders all objects. The default mode is rendering of both track and objects. Sometimes it is convenient to turn one or the other of these off for special purposes (such as only showing track items). If both are left unchecked, nothing is rendered.

<u>label track sections</u> toggles whether track and accessories have abbreviated labels drawn centered on them. The font used for the track labels is controlled under the <u>Fonts</u> menu.

<u>block breaks</u> toggles whether electrical block breaks are displayed. When they are visible, block breaks are marked by a double circle.

<u>solid joining symbols</u> toggles whether the joining symbols between tracks are solid, filled circles or outline circles.

grade symbols toggles whether track on a grade is rendered with an arrowhead which points toward the uphill direction of the grade. This useful to visually mark grades.

grade heights toggles whether elevated and grade track heights are displayed. When checked the heights are shown using the same font as that used for track labels. The heights for track on grades is given at the junction furthest removed from the elevated track sections. These will be the heights track supports at these junctions.

Miscellaneous

The miscellaneous settings are the Snap To Grid and Snap Size, the layout background color, and the layout coordinate grid color. Checking the Snap To Grid box is the same as choosing Snap To Grid from the Options menu. When set, all items are moved about on an underlying grid whose spacing is determined by the current snap size. The current snap size can be set by pushing the Snap Size button.

A layout may have an individual background color which you can set by pressing the Background color button.   Pressing this calls up the Windows Color Chooser which you use to select a background color for your layout. You can also choose a coordinate grid overlay color different from the default dark gray by pressing the Coordinate color button.

Applying settings

Pressing the Apply button applies all of the settings in the dialog to the layout; pressing the OK button does the same, but dismisses the dialog while the Apply button leaves the dialog up so that you can change more settings if you want. Set as default takes the current layout options, and makes them the default options for any further layouts that you open.

Setting joining error

One of the sources of discrepancies between layouts designed with CAD software like RR-Track and layouts you actually assembly is the accumulation of joining errors in track junctions. When RR-Track joins two pieces of track, it joins them exactly with no gap errors. The reality of track joinery is that is can be difficult to get pieces of track to join perfectly, even if you use the assistance of special track joining pliers, or beat on it with a hammer. For this reasons, RR-Track will let you set a constant small amount of gap error in each junction, if you like.

In order to set a non-zero joining error (zero is what RR-Track starts with), you have to bring up the *Track Junction Error dialog*, as show at right. RR-Track displays the current setting of the junction error (it is set to zero it start). You then choose your junction gap (0.20 inches or 5mm is the maximum allowed) and then press OK. Press Cancel if you don't want to change the error setting, and select 0.00 if you want to go back to no junction error.
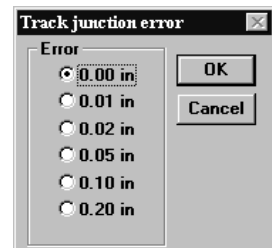
Every track junction formed after you press OK will now include this amount of additional gap, effectively lengthening the track by the amount of the junction error.

Setting object properties

To set the drawing properties of general purpose objects, you use the Set Object Properties command found on the Object menu. Choosing this command displays the following dialog:
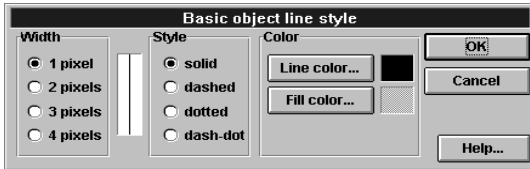
The property setting controls are organized into three groups: line width, line style, and drawing colors. A sample view of the current drawing line is displayed between the line width and style radio buttons, while a sample of the current outline and fill colors are shown to the right of their respective buttons.

Line Width: these radio buttons let you select a line width of one to four pixels. RR-Track defaults to one pixel on startup.

Line Style: these radio buttons let you choose between solid, dashed, dotted, and dash-dot line styles. Note that only the solid line style is allowed for line widths greater than one pixel (this is an internal Windows 3.x limitation).

Color: these two push buttons, one for outline or line colors and one for fill color, let you set the object drawing colors. Pushing the appropriate button calls up the *Windows Color Chooser*, where you may select the color graphically.

The Set Object Properties dialog has a dual-mode action, depending on whether an object is currently selected (highlighted) or not. If no objects are selected, then the dialog displays the current setting of the default drawing values, and any changes apply to the default values. This is how you change the settings for future objects. If one or more objects are selected, then the dialog displays the current settings for that object(s), and changes made are applied to those objects, but not to future objects.

To change an existing objects drawing properties:
1. Select the object(s) using the cursor.
2. Pull down the Object menu and choose the Set Object Properties command. The Set Object properties dialog appears.
3. Change any or all of the properties as you need, and then push the *OK* button.
4. RR-Track applies the changes to the selected objects, but they are left selected (highlighted) in case you want to carry out some other action on them. To view all of the new changes (like colors), deselect the objects by clicking the mouse somewhere else.

**To change the default object properties for future objects**:
1. Make sure no objects are selected (highlighted), and then pull down the Object menu and select the Set Object Properties command. The Set Object Properties dialog appears.
2. Change any or all of the properties as you need, and then push the *OK* button.

3.   RR-Track applies the changes to the default object properties. These new defaults will be used for any future objects.

The Set Object Properties dialog does not affect the manner in which track is drawn. When the Set Object Properties dialog is opened with a grouped object, the starting object properties are the current default values. If you press OK, the current settings in the dialog are applied to all of the objects in the group; this effect is not reversible except by ungrouping the objects and resetting them individually. The Set Object Properties dialog can be used to change the appearance of stock objects such as trees and buildings by first adding them to the layout, and then changing their properties with this command.

Setting track colors

You can set the colors of any, or all, track libraries by using the Set Track Colors command found under the Options menu. When you do so, you will see a dialog like the one below:
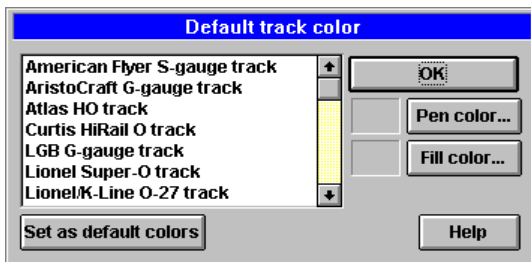
The list box shows you all of the available track libraries. Selecting one of these by clicking on it with the left mouse will display the highlighted library's current pen and fill colors in the sample color boxes. To change the pen color, push the Pen Color button. In a similar fashion push the Fill Color button the change the fill color. Both buttons call up the standard Windows Color Chooser dialog. If you want the change the color, select one of the standard colors and press OK, otherwise press Cancel.

Double-clicking on one of the libraries in the list box immediately invokes the Windows Color Chooser for the pen color, followed by the Color Chooser for the fill color.

To change the default track library colors, set the colors up in the fashion you wish using the above instructions, and then press the Set As Default button. This writes your current settings to RR-Track's initialization file so that the next time you start RR-Track, these colors will be used.

Note: track library colors are not saved with the layout files, but are instead a property of the application, and affect all layouts. Note further than putting track into a layer whose drawing and fill colors have been set to something other than the default color, will render track in the layer color, not the track library color.   This is a way to have RR-Track draw separate loops of track in different colors, or all sidings in colors different from the mainline.

Swapping switch machines

Some track libraries, notably Lionel® O and LGB® G allow you to change the placement of the turnout switch machines after the track is laid. In order to change the side of the turnout that the

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switch machine is on, you use the *track property inspector* to examine, and change, the editable properties of the turnout.

To change switch machine placement:
1. Position the cursor over the turnout whose switch machine you want to move, and click the right mouse button. The *track property* dialog appears, showing the position, orientation, and attributes of the turnout.
2. Find the swap switch machine check box (in the lower right quadrant) and click it with the left mouse button to toggle it from cleared to set, or set to cleared if it is already set (**note**: if you are not allowed to move this turnout's switch machine because it does not have that capability, this check box will not be present).
3. Press the OK button. RR-Track immediately redraws the turnout with the new switch machine placement.

There is no limit to the number of times you may change the position of a switch machine.

for further information see:
finding out track and object properties

Tearing off menus

A handy feature of RR-Track is the ability to tear off any of the menus and leave them up on the screen for quick reference. This is especially useful when used with the submenus associated with the Track menu. These usually, but not always, consist of straight, curved, turnouts, and special sections of track, and vary from track family to track family. If you have the screen space, you can conveniently leave up the submenus for straight, curved, and turnout sections on the screen for quick selection. To tear off a menu:

Procedure:
1. Pull down the menu you wish to tear off using the cursor and left mouse button as you normally would.
2. Instead of selecting a command or item, move the cursor over the newly appearing submenu and click the right mouse button.
3. A new window appears, with a small thumbtack in the upper left corner, the menu name in the usually window name area, and the menu items in the main drawing area of the window. You may position this window anywhere on the screen by putting the cursor in the title bar, depressing the left mouse button, and dragging — just as for any window.

You select an item from the tearoff menu by clicking it with the left mouse button just as for other menus. To dismiss a torn off menu, click the left mouse button with the cursor in the thumbtack area in the upper left-hand corner. If a torn off menu has submenus associated with it (like the main Track menu would), these may be torn off from the parent menu in exactly the same manner as above.

When you change track libraries, by selecting a new track system from the Options menu, all torn off menus associated with the previous track family are destroyed.

Note: under Window NT 3.5, 3.51, and 4.0, tearoff menus are disabled since they do not function correctly. There are some failures with repainting of tearoff menus under Windows 95.

Unjoining track sections

In the course of creating and modifying a track layout, you will have occasion to break previously made track joints. The Unjoin command, found on both the Action menu and the *shorthand* menu, is used for this purpose. This command breaks the connection between the *lead selection* and all track sections joined to it unlike the Break Joint command which breaks only single, designated track junctions. The unjoin command is useful when you wish to remove a track section that is joined at several of its *control points* rather than one.

Procedure:
1. Select the track section you wish to unjoin with the mouse cursor.
2. Pull down the Action menu or the shorthand menu and select the Unjoin Selected Track command.
3. The joints are immediately severed between the lead selection in the selected track.

Track may also be unjoined if you have the Allow breakaways option set in the Global Options dialog and move the track at least 10 per cent of the screen size. See *setting global options* for more information on this feature. The easiest way to unjoin a track section, if you have turned on the Allow breakaways option, is to position the cursor over the track, depress and hold the left mouse button until the 'Move' cursor appears, and then drag the track away, at least 10 per cent of the screen size.

see also:
breaking individual junctions, moving track and objects, selecting track

Zooming in or out on the layout

You can change you scale at which the track layout is displayed by zooming in or out using the four zoom commands found under the View menu, or the two zoom commands found in the *shorthand* menu. The four zoom commands are: Zoom in 2X, Zoom in 4X, Zoom out 2X, and Zoom Out 4X. Not all of these are enabled at any given time depending on the current zoom factor as shown in the status window. The range of allowable zoom factors is 1 to 64.

Zoom in 2x: This command allows you to zoom in by a factor of two on the track layout. By doing so, the current view becomes the last view, replacing the last view on the RR-Track view stack.

Procedure:

1. Select <u>Zoom in 2x</u> from the <u>View</u> menu. The cursor changes to a square with four inward point arrows, and a zoom box representing a 2x magnification surrounds the cursor.
2. Move the cursor around the layout until you are satisfied with the location of the zoom box.
3. Press the left mouse button. The portion of the track layout inside the zoom box is magnified until it fills the screen, representing a zoom in of 2x. The zoom factor in the status window is updated to reflect the new magnification, while the cursor location is updated to reflect the new cursor position. The scroll bars are also updated to reflect the new drawing position. The cursor returns to the standard Windows arrow.

Zoom in 4x: This command is similar in action to the <u>Zoom in 2x</u> command, but instead zooms in by 4x. By doing so, the current view becomes the last view, replacing the last view on the RR-Track view stack.

Procedure:

1. <u>Select Zoom in 4x</u> from the <u>View</u> menu. The cursor changes to a square with four inward point arrows, and a zoom box representing a 4x magnification surrounds the cursor.
2. Move the cursor around the layout until you are satisfied with the location of the zoom box.
3. Press the left mouse button. The portion of the track layout inside the zoom box is magnified until it fills the screen, representing a zoom in of 4x. The zoom factor in the status window is updated to reflect the new magnification, as is the cursor location. The scroll bars are updated reflecting the new drawing position. The cursor returns to the standard Windows arrow.

Zoom out 2x: This command is the reverse of the <u>Zoom in 2x</u> command, reducing the magnification by 2x rather than increasing the magnification.   When this command is selected, the center of the current view becomes the center of the new view, while the horizontal and vertical extents are doubled, bringing more of the layout into view. The status window is updated to display the new current zoom factor. Like the zoom in commands, the current view becomes the last view, replacing the last view on the RR-Track view stack.

Zoom out 4x: This command is the reverse of the <u>Zoom in 4x</u> command, reducing the magnification by 4x rather than increasing the magnification.   When this command is selected, the center of the current view becomes the center of the new view, while the horizontal and vertical extents are quadrupled, bringing more of the layout into view. The status window is updated to display the new current zoom factor. Like the zoom in commands, the current view becomes the last view, replacing the last view on the RR-Track view stack.

Printing Layouts

RR-Track can print your layout to any Windows supported printing device. These include dot matrix, ink jet, and laser printers. They also include plotters that are supported by Windows, such as those that understand the HPGL language from Hewlett-Packard. You may also print to any device supporting the PostScript language. When RR-Track prints, it re-scales the drawing so that all graphics is handled at printer resolution, not screen resolution. In general this results in higher quality output and finer lines on the printer than is on the screen. The only exception is cheaper dot matrix printers which have a resolution of 100 lines/inch or so, approximately the resolution of the CRT display screen.

Setting up the printer

Selecting the Printer Setup command from the File menu causes Windows to display the **Printer Setup dialog** for the current RR-Track printer. This dialog may also be accessed by selecting the printer icon in the Windows Control Panel. The printer setup dialog allows you, among other features, to select the orientation of the printer page (landscape or portrait),along with other features specific to your printer. If you wish to change the RR-Track printer, you must *Printer Info dialog* that is accessed from the *Print Layout dialog*. You can also setup the RR-Track printer from the *Print Layout dialog*. For more information on setting up printers, consult your Windows™ manual.

Procedure:
1. Select the Printer Setup command from the File menu. This displays the printer setup dialog for the current system default printer.
2. Select the options you wish from the printer setup dialog, and click *Close* if you wish to retain them, or *Cancel* if you change your mind and wish to return to the RR-Track main window.

Configuring the printer page layout

Selecting the Page Setup command from the File menu activates the page setup dialog which allows you to configure the secondary features of the printed version of the current view. The page setup dialog is shown below:

The check boxes control whether or not the printing credits are shown and whether to print coordinate grid labels, and whether to show the track in black (the default), or to print track in their set colors.

Procedure:
1. Select the Page Setup command under the File menu. This activates the Page Setup dialog.
2. Select the features which you wish displayed or excluded from the check box and radio button groups in the dialog.
3. When you are satisfied with your choices, click the OK button to record these and return to the RR-Track main window. Alternatively, if you have changed your mind and do not wish to

change the page setup settings for the current view, select the <u>Cancel</u> button which immediately returns you to the RR-Track main window.

Note: if you elect to print track in color, be sure you have not chosen a dithered color for the track. Many times printers will dither a drawing line color to non-existence, making the track disappear.

Printing your layout

A layout may be printed by selecting the <u>Print Layout</u> command under the <u>File</u> menu. When you do so, you are shown a dialog such as the one shown below:
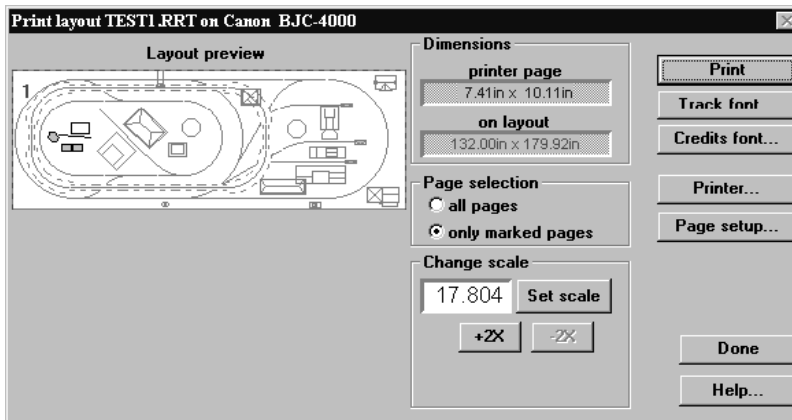
The *Print Layout dialog* shows the name of the layout and the printer it is going to in the caption, has a layout preview window on the left which shows a thumbnail view of your layout as well as an overlay of the printer page mapping, readouts showing the page sizes on both the layout and the printer, the current scale between the printer page and the layout, and command buttons that let you set things like the fonts used for track labels and coordinates, the printer used, the appearance of the printed page, and send the layout pages to the printer. When you print, your layout can be scaled to fit on one page, or blown up to cover up to 64 pages. You have complete control over how many, if any of these pages you actually print.

Layout preview: A numbered grid is superimposed on the layout preview, depicting the printer pages required at the current zoom level. The example at left will be fully covered at the current scale by using eight printer pages in portrait mode. A given page is marked for printing if it is displayed in crosshatch; only those pages marked are printed. You mark a page for printing by positioning the cursor over it and clicking the left mouse button.
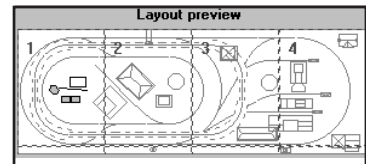

To choose a page for printing:
1. Position the mouse cursor over the page you want to print.
2. Click the left mouse button to change the print marking. If the page was not marked for printing, it will now be marked, and if it was marked for printing, it will now be cleared.

Marked pages are not printed until you press the Print button.

Page sizes: this is an informational area that shows you the size of the area that can be printed on both the printer page and what dimensions that corresponds to on your layout. The ratio between these two is the scale, which is shown to the right.
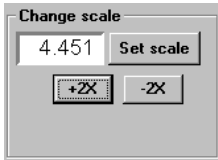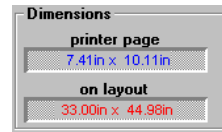
Printing Scale: RR-Track gives you a choice between automatically scaling the layout to the printer page to maximize the use of the page area in the current page orientation (portrait or landscape), or printing at a fixed scale which you select. When using automatic scaling (which is the default and is shown at the left) the +2x and -2x push buttons allow you to increment and decrement the zoom level by amounts of 2x, hence changing the scale by amounts of 2 or 1/2. When you change the zoom level, all previously marked pages will revert to unmarked since the page location will change. Zoom levels from 1 to 8 are allowed; a zoom of 8 results in 64 printer pages if you mark the entire layout for printing.

You can change to specifying a fixed scale by pressing the Set scale button. When you do so, the scale section of the Print Layout dialog changes to look like that at right:
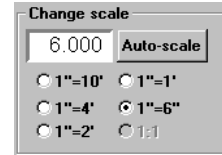
Here you can use the radio buttons to choose fixed scales between the layout dimensions and the printer dimensions. For example, in English units you have a choice of 1:1 (i.e. 1" on the printer is 1" on the layout), 1:6 (1" on the printer is 6" on the layout), all the way up to 1:120 (1" on the printer is 10 feet on the layout). Any fixed scales which will exceed 64 printer pages are grayed out and not accessible (most O-gauge layouts cannot be printed at 1:1 in 64 pages or less). To go back to automatic scaling, press the Auto-scale button.

Page Selection: these two radio buttons control whether or not the entire layout is marked for printing, or just individual pages. *All pages* marks the entire layout, while selecting *only marked pages* lets you control which pages are printed, by marking each individually as described above.

Command buttons

Print: depressing this button sends all of the marked pages to the printer for printing. You will see a dialog box that has a Cancel button to let you cancel printing the current page. This will only work if pressed before the progress meter below the button makes it all the way to right; after that you cannot abort the page. Note that on some laser printers, you may not be able to press the Cancel button quickly enough to abort the page.

Track font: depressing this button lets you change the font used for labeling track sections, if this has been enabled using the Global Options dialog. See track fonts.

Coords font: similar to the track font button, pushing this button lets you change the font used for printing the coordinate overlay labels.

Page setup: depressing this button lets you set up the details of the page layout, controlling which kind of coordinate overlay is used, whether a scale marker is displayed, and what kind of credits are displayed

Printer: pushing this invokes the *Printer Information dialog,* shown below. From this dialog you can change printers, reset the printer's configuration, and preview where RR-Track will place things on the page.
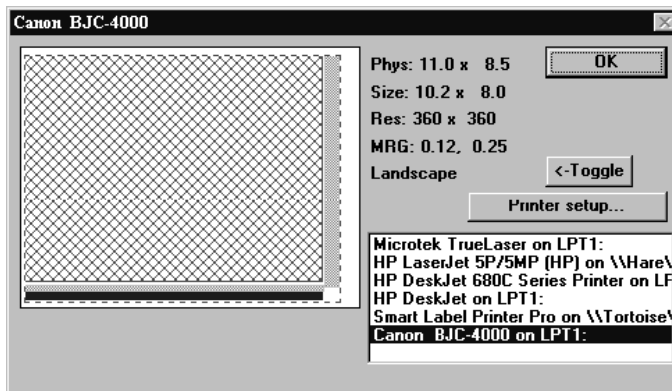
Printer Information: the *Printer Information dialog* both lets you set and configure the RR-Track printer, but also previews where RR-Track will place your layout drawing and other items on the printer page. The caption shows the name of the current RR-Track printer.

The **page preview window** is the large rectangular window at the upper left. RR-Track draws the paper size and orientation in white, the printable area of the page outlined in dotted red, the area of the page used for the layout drawing in cross-hatched red, the area of the page used for the coordinate labels in light gray, and the area of the page reserved for the credits (at the bottom) in blue.

Immediately adjacent to the preview window are a set of text displays which show you the current settings for the RR-Track printer. These are: **Phys**, the physical size of the page in inches. This is the actual size of the paper. **Size**: the printable area, in inches This is the maximum area that can be used for printing. **Res**: the resolution of the printer in dots per inch (DPI). MRG: the horizontal and vertical printer margins, in inches. **Landscape** or **portrait**: the current page orientation.

Available printers list: Immediately below the text displays is a list box of all the printers currently recognized by your PC. The current RR-Track printer is highlighted. To change RR-Track printers, double-click on the printer name in the list. RR-Track will switch to the new printer, using the default printer driver parameters for starters, and show the new page preview window and the new printer parameters.

Command buttons: the Toggle button lets you change between Landscape orientation and Portrait orientation without going to the printer setup dialog. The Printer Setup button brings up the Windows *Printer Setup dialog* for the current RR-Track printer. Using the *Printer Setup dialog*, you can reconfigure the current RR-Track printer's settings. Whatever you change will

affect only RR-Track; other applications and the printer's default settings are not affected. When you are finished with the Printer Information dialog, press the <u>OK</u> button to return to the *Printer Layout dialog*.

Printing tips

When setting up for printing your layout, or a portion of it, a bit of thought beforehand can be used to set the size of the printed page used by the printer.

First, be sure you know the orientation of the printer page, as shown in the Printer Setup dialog. Most mistakes occur when the page is set for portrait mode while you wished to print the layout in landscape mode. Most printing is typically done in landscape mode since this best matches the orientation and aspect ratio of the display screen. How RR-Track scales your layout to cover the printer's pages is in no way connected to the scaling used on the display.

In order to create a PostScript file (in this case an Encapsulated PostScript or EPS file) so that you may take the drawing output to some other device not connected to your PC, you must employ a small trick to make Windows create such a file. Go to the Windows Control Panel and double-click the printer icon. The Printer dialog comes up. If you do not already have a PostScript compatible printer set up, then press Add and select a PostScript printer from the drop-down list box that appears. Make this printer the current default printer. The press Setup, which gives you the Printer Setup dialog. Press Options and, in the control group governing output, select Encapsulated PostScript. Be sure and give Windows a file name for the output file. Then press OK all the way back. You default printer will now be set to a PostScript device, with the output going to a PostScript file. Be sure and reset the default printer when you are done printing the PostScript file.

If you are printing to a printer other than a laser printer, be aware that an RR-Track printout is a large, graphical object, and can take a long time to print on your PC, even with a Pentium processor. Typically ink jet and dot matrix printers have no on-printer rastering engine, and rely on the host PC for all of the rendering. If you have a Canon BJC color printer, for example, and set it for the best resolution and diffusion dithering for the nicest color appearance, a single page can easily take 20 minutes. Once the progress meter in the Cancel dialog has gone all the way to the right, you cannot abort the printing job except by manually resetting Windows printer queue.

Miscellaneous

Track library initialization files

Each track library has an associated .INI file. For example, the American Flyer library, *rrtamf.dll*, has a file *amf.ini* associated with it. All of the current libraries and their associated .INI files are shown below:

Each of these initialization files may be edited using the Note Pad editor included with Windows (NOTEPAD.EXE, usually found in your Accessories group). If you choose to edit these files with a word processor such as Microsoft Word, WordPerfect, AMI Pro, or whatever, be very careful and save the edited file as ASCII text only. If you save it in the word processors native file format, RR-Track won't be able to read it, and all of the track prices will default to zero. The track library initialization files are divided into four sections: [*straight track*], [*curved track*], [*turnouts*], and [*special track*]. For each type of track supported by the respective library there will be a line with an entry like

s10=

with a decimal number reflecting the price in dollars (RR-Track doesn't convert between currencies, but you could put in the price in pounds sterling, deutche marks, lire, or whatever and ignore the $ symbol). Simply change the price to reflect the price you can purchase this track section for. The track types are the abbreviated names that are used when the track sections are labeled on the screen or when printing (such as LGB:s1000 for an LGB® #1000 straight section) without the prepended track family name. When you are finished with editing the track prices, save the file and

Track libraries	
Lionel®/K-Line® O-gauge	LNLREGO.INI
Lionel®/K-Line® O27 gauge	LNLO27.INI
Curtis HiRail O-gauge	CHRGG.INI
Ross Custom Switches O	ROSSCS.INI
GarGraves® O	GARGRV.INI
Lionel® Super-O gauge	SUPERO.INI
LGB® G-gauge	LGB.INI
MicroEngineering® G-gauge	MEC.INI
AristoCraft® G-gauge	ARISTO.INI
Llagas Creek G-gauge	LLAGAS.INI
TDV G-gauge	TDV.INI
American Flyer/GarGraves S-gauge	AMF.INI
Lionel® /Rydin std gauge	STDG.INI
Atlas® HO gauge	ATLASHO.INI
Märklin® -M HO gauge	MARKMHO.INI
Märklin® -K HO gauge	MARKKHO.INI
Märklin® -C HO gauge	MARKCHO.INI
Hornby® OO/HO gauge	HORNBYHO.INI
Peco® OO/HO gauge	PECOHO.INI
Shinohara® HO gauge	SHINHO.INI
RailTech/Pilz® code 100 HO	PILZ100.INI
RailTech/Pilz® code 83 HO	PILZ83.INI
RailTech/Pilz® TT-gauge	PILZTT.INI
Atlas® N-gauge	ATLASN.INI
Kato® UniTrack® N-gauge	KATON.INI
Peco® N-gauge	PECON.INI
Tomix N-gauge	TOMIXN.INI
Märklin® Z-gauge	MARKLINZ.INI
Peco® Z-gauge	PECOZ.INI

then restart RR-Track. RR-Track only reads the price information on startup. You can also change track prices immediately by going through the Track Properties dialog (see *Finding out about track and objects* for more information).

For Lionel® accessory libraries, the abbreviated track type is the Lionel® part number (i.e. 300 for a Hellgate bridge, 164 for a log loader, etc.).

Accessory libraries	
Lionel® pre war accessories	ACPREWAR.INI
Lionel® post war accessories	ACPSTWAR.INI
Lionel® modern accessories	ACMODERN.INI
Plasticville® accessories	PLASTIC.INI
American Flyer accessories	ACGILBRT.INI
Piko® G-gauge accessories	ACPIKOG.INI
Pola® G-gauge accessories	ACPOLAG.INI

Note: for some track libraries there are more sections than are mentioned above. There is also a section for the default library color, as well as sections for other internal parameters.

Tips and suggestions

Manual track joining tips

There are instances when automatic track joining is insufficient to achieve the desired track configuration. In these cases, you must fall back to manual track joining, which is similar to what you do with your hands when you join two pieces of sectional track (there is no analog for auto-matic joining).

The simplest method is to move the track sections while turning on automatic track joining. When you do this, all you have to do to join the track sections is bring the ends you wish to join within one track width of each other (0.625 inches for HO-gauge, 1.25 inches for O-gauge, etc.). See **moving track** for additional information.

The second simplest method relies on the join to nearest track command which may be found both on the Action menu and the *shorthand* menu called up by the right mouse button.

Procedure:
1. Highlight the track section you wish to join by *selecting* it with the mouse.
2. Place it close (or at least closer than any other un-joined track site) to the track section you wish it joined (see **moving track or objects**).
3. Select Join To Nearest from either the Action or shorthand menu. The track will be joined, unless RR-Track can find no unoccupied, free, joining sites that are not already connected to the track section(s) you have decided to join. In this case you will be informed of the error, and no joining occurs.

Relaxation tips

Relaxing track to get good closure and minimize mismatch is a subject that could be discussed for many pages. Suffice it to say that the quickest and best minimization's occur with a combination of RR-Track computation and input by you, the user. Here are a few tips to help you out:

(1) **Don't expect to make up 3 inches of error with only three sections of track**. There is a limit to how much 'slop' each section of track can absorb and you will have to be the judge of what that limit is. If you don't mind a lot derailments, and having track come apart under the pounding of the trains, then perhaps you will be comfortable with 0.2" per track section (this is close to the physical limit given the size of the connecting pins). If you like smooth operation, then you will want to get the track ends as close as possible to the 'ideal' condition (zero mismatch) as you can before you started relaxing the track.

(2) **Choose track sections on both sides of the closure point**. If you have a joint mismatch of 1.0inches, and select six track sections on the right side for relaxing while only one on the left, then most of the error will have to be made up by moving the six sections leftward. This will both take longer and be less accurate. If possible, put an equal number of track sections on each side of the closure point.

(3) **Don't choose too many track sections.** Each track section represents three 'degrees of freedom' to the relaxation engine. If you choose 25 track sections for relaxation, then the relaxation engine will have 3 x 25 = 75 different ways to manipulate the track sections. It is a fundamental theorem of numerical computation that the more freedom you give a system of objects, the less sensitive the system will be to achieving the correct solution. Of course, you have to consider the comments of (1) also; you can't choose too few track sections either. I have successfully used up to 18 track sections, but a better working limit would be 8 or 10.

(4) **Start out allowing large maximum track displacements** (in the Relaxation Constraints group), and then steadily rein the process in. Usually the first few iterations can be run with everything 'wide open' (i.e. 0.5" displacement, allow both rotations and translations, etc.). Then begin to close the maximum displacement down, first to 0.25" and then 0.1". Usually, by the time the maximum track error is less than 0.5" you can set the maximum displacement at 0.1". At this stage you can take iterations five at a time using the *x5* button.

(5) **Pay attention to the final error report**. If the residual track mismatch energies are low (at zero error you would have zero energy) but one of the tracks has an angular error of 6°, you are likely to have derailments at that junction. You may have to back up and start over, repositioning some of the track sections (this can be done manually by using the <u>Allow Individual Moves</u> control in the <u>Global Options</u> dialog).

The more relaxation of track mismatches you do, the more adept you will become at this process which is as much an art as it is a science.

General tips

 (1) **Use the zoom-in and zoom-out commands and the view stack**. I have found it to be effective to start with a large overview, not necessarily of the entire layout but a large fraction of it, and then zoom in to where I want to do some work, the return to my overview using the Last View command under the <u>View</u> menu. Occasionally I move around the layout at high zoom factor using the scroll bars, but I find this less effective.

(2) **Don't always work with Selections Include Grades turned on**. The problem with this option is that it will only choose track either on the same elevation or same grade as the track under the cursor (when you double-click). I generally work using the extended selections set to *Selections Include Joints* since this is the most general purpose of the three, and only change to one of the others when I need to.

(3) **Use Align to Nearest Track**. A use this command, under the <u>Action</u> menu, to find out where to place a curve when I am closing a loop, or lining up turnouts, to place a couple of long straight sections on both sides of the closure point, letting them overlap and graphically show me the intersection. I can then place the curve or turnout I need pretty accurately by the 'calibrated eyeball' method, especially if you zoom in on the intersection. Be wary of zooming in too far on curves though; Windows graphics engine has trouble if the center point of a curved arc is too far off screen, and throws in the towel by not drawing the arc, leaving you with nothing to show you the location of the curved section. When done, just delete the unneeded alignment tracks, and replacement them with properly cut sections.

(4) **Work with AutoJoin turned on**. I always use the AutoJoin mode, and override this as necessary by hitting the escape key as needed, to temporarily turn AutoJoin off. Move the ends you want joined as close as possible, and then click the mouse. AutoJoin can fail if you are trying to add track in a densely populated area with a number of loose ends; sometimes the end you aren't watching is closer to another section of track than the end you are watching.

(5) **Make use of Copy, Paste, and Duplicate**. I use the Copy/Paste combination frequently to duplicated single or multiple sections of track that I will be adding several times (such as yard lines), and use the Duplicate command to replicate track sections that I only need one or two copies of (such as 90° and 180° curved arcs of track).

(6) **Add elevations and grades last**. It is usually better to design all, or almost all of the track plan before you begin raising/depressing track sections. Introducing elevations and grades always adds to the complexity of the layout, and makes it more difficult to change design parameters later (short of removing the entire elevation, which you can do by either using the <u>Remove Elevation</u> command or <u>Zero Track Height</u> command).

(7) **Use multiple drawing layers**. Setting up even simple, small layouts with multiple layers is a real help. You can put scenery in a layer, accessories in a layer, track in a layer. In this way you can set the track layer to *inactive* so that you can see it but you can't select it so that it doesn't get in your way when you are setting up accessories and scenery. This same thing is true for scenery:

you can draw some scenery, then set that layer to *inactive*, and then adjust track and/or accessory positions as necessary without the scenery getting in the way.

(8) **Use the track wizards**. Even if you don't agree with the solution that the wizard comes up with, especially when using stock track, it is a starting point which you can then manipulate to get something more in line with what you want. The track wizards will always seek to use the largest radius curve they can fit it whether you choose stock curves or radius curves. The wizards allow you to rapidly close loops and gaps in complex track configurations simply by snapping a measurement to the track endpoints.

Appendix

Tutorial on custom curve design

If you are using a track library where flexible track (usually referred to as FlexTrack) is available, such as Curtis/Ross/GarGraves® for O-gauge or LGB® for G-gauge or Atlas for HO gauge, it speeds up the layout process to use the existing tools in RR-Track to reduce the trial-and-error component of bending your own curves. The following is a quick tutorial on methods I use for designing custom curves. Of course, you still have to bend the track to the design specifications, but that is another story .

We will use a typical scenario, a turnout to a parallel siding on a thru-track, as shown below:
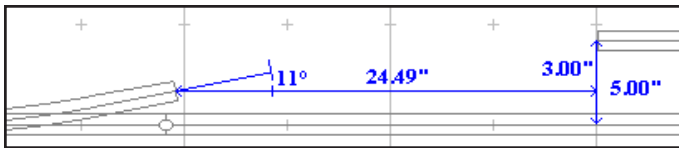
For this example I have used Curtis/Ross/GarGraves® track in O-gauge, but the principles apply just as well to other gauges. Using the ruler function, the separation between parallel tracks is 5.00 inches (close to the O-gauge working minimum), and the separation between the turnout and the parallel siding is 24.49 inches horizontally and 3.00 inches vertically. The turnout is a Curtis/GarGraves® standard turnout, with a separation angle of 11.0°. So, to start we know we need a right-hand bend of 11°, with a total length of around 25 inches.

The next step is to set up two tangents so we can construct the curve. For this purpose I use GarGraves® 36 inch straight sections, and temporarily join them to the two free ends of the siding as shown below.
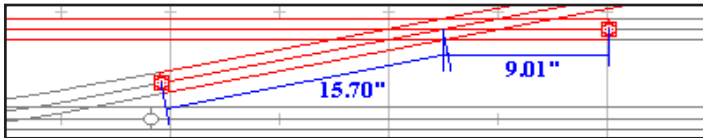
The next step is to use the measuring tool to measure along the tangents from the track ends to the intersection point, to see which is the longest leg, and to get an idea of the total arc length. These two measurements are shown in the example; 9.01 inches on the short leg from the siding to the intersection, and 15.70 inches from the turnout to the tangent intersection (it helps to zoom way in to make these measurements).

This tells us that we will construct the curve out of two sections of track: a curve with an arc length of approximately 18.0 inches (2 x 9.01) and an arc angle of 11°, and a straight section about 6.7 inches (15.7 - 9) in length. Before building and placing this curve, highlight the temporary straight that is connected to the parallel siding (the upper one) and delete it. Then, to get the curve, select the Custom Curve command under the *Curtis/Ross curves* section of the track menu, and set the following values in the dialog: length 18.0 inches, angle 11.0°, direction RIGHT. Attach this trial curve to the siding as shown below:
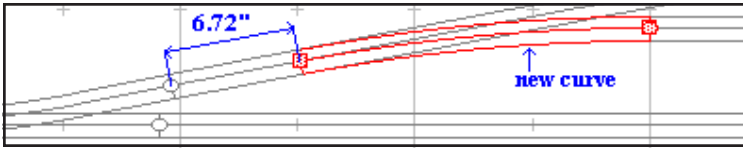
The new curve is shown in red for clarity. Zoom way in and closely examine the free end of the curve to see how well it lines up with the temporary straight joined to the turnout (in this example more than good enough). Now use the measuring tool in its snap-to-track mode (ALT-key) to measure the distance between the free end of the curve and the turnout: 6.72 inches.

Before building this cut straight, delete the last temporary GarGraves® straight connected to the turnout. Then select the Custom Straight command under the *Straight* section of the track menu, and choose 6.72 inches for the length. Press OK and join the new straight track in the gap between the siding and the turnout. The final assembly is shown below:
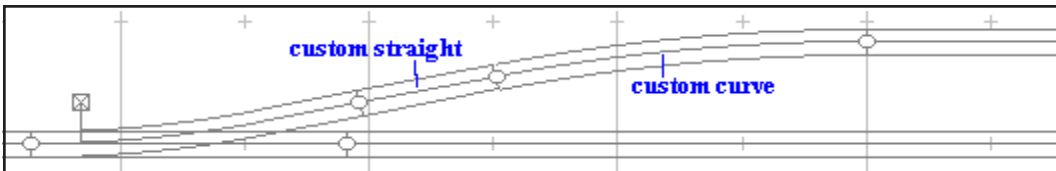
with both the new curve and the new straight indicated. Adding up the straight and curved sections, we have a total track length of 6.72 + 18.00 = 24.72 inches. While this was a particularly simple example, bear in mind that any gap may be closed using a combination of a custom curved track and a straight track.

Designers with track libraries of Curtis HiRail, Ross Custom Switches, or GarGraves Trackage will find some special track sections in these libraries. These are called Turnout Transition tracks, and are compound track sections consisting of a unified straight and curved section that will bring out the spur for some of the prototypical turnouts to fixed track centerline spacings. When you choose a Turnout Transition track, you will see a dialog like that at right:
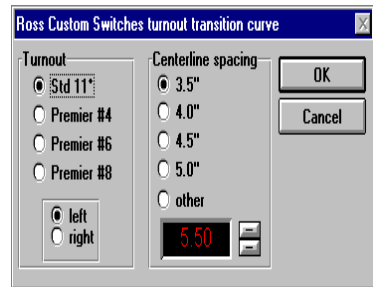
Select the turnout you want to create a transition track for by using the radio buttons in the Turnout group to the left, where you also choose whether this track is to fit a left or right-hand turnout (not a left or right-hand curve). Choose the centerline spacing you want using the radio buttons in the Centerline Spacing group: choose other and then manipulate the up/down spin buttons to get a spacing other than the fixed ones shown. Press OK when you are done, RR-Track calculates the required track angles and lengths and places the new track section under the cursor as for any other track section. Press Cancel if you don't want to add a turnout transition track. Turnout transition track sections are

created using a combination of an O-80 (40 inch radius) curve of the required arc length for the chosen turnout and a straight track section of the required length for the requested centerline spacing. **Note**: in track libraries that contain track wizards, the entire above procedure can be automated simply by snapping a measurement between the track ends and choosing one of the available track filling methods.

Creating benchwork

Many layouts are not strictly rectangular in shape, but are L-, C-, or U-shaped, or some more complex arrangement. It is a good idea to draw in the boundaries of your benchwork in order to act as a guide for laying the track. RR-Track will not stop you from laying track outside of the bench work boundaries, but at least you will be able to see where the edge of the layout is supposed to be.

We will start with a 20' x 12' layout which is composed of 4' x 8' sections; you could use any sizes but these will illustrate the basic idea. Start by creating a 4' x 8' unfilled rectangle. First, to make things easy, pull down the Options, select the Snap Size command, and choose a snap size of 6 inches. This will restrict the rectangle's size and position to 6 inch boundaries, making it easy to both create and place it. Next, let us create a benchwork layer. Pull down the Options menu again and choose Layers..., and then add a layer called 'benchwork'. Before you close the layers dialog, make the benchwork layer the working layer by double-clicking on it. Then pull down the Objects menu and select Basic Shapes|Rectangle and create a 4' x 8' rectangle, as seen at left:
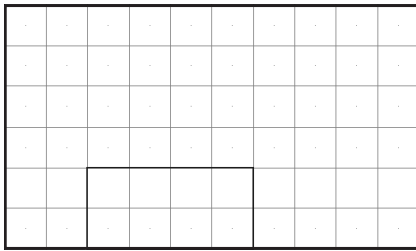
I have set the rectangle color to blue, and the line size to 2 pixels to make it easier to see; you can do this or not as you like. Next, duplicate the first rectangle by either drawing another (repeating the process previously described), or by selecting the rectangle and choosing the Edit|Duplicate command. Then rotate this rectangle by 90°, and place it so that the two rectangles look like that at right:
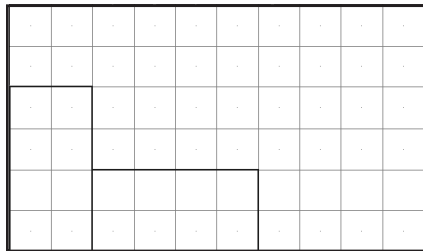
Now, duplicate the 4 x 8 rectangle three more times, and create an additional 4 x 4 rectangle and place as shown. Note that we have a perimeter layout, 4 feet deep everywhere with a total length of 32'.
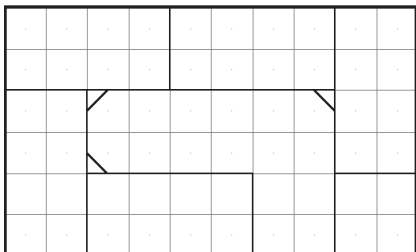
In order to get more usable space for inside curves, I have added small 45° sections to the three inside corners. Next, create a new layer, just like you did before, but call it 'walkway', and make it the working layer. Then, keeping
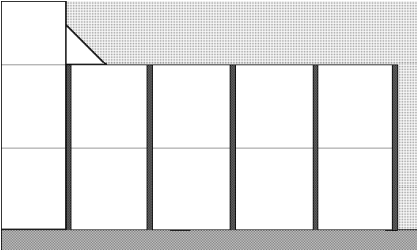
the snap size set at 6 inches, draw a filled polygon (by pulling down the <u>Objects</u> menu and selecting Basic shapes | Filled polygon) that covers the space not covered by the 4 x 8 tables. When you are done, you should have something about like that shown below where I have colored in the walkway light gray.
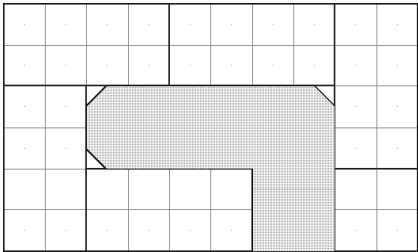
To make the walkway become a non-selectable background, pull down the <u>Options</u> menu and choose Layers... When you see the *Layer Setup dialog*, double-click on the 'benchwork' layer to make it the working layer, and then set the 'walkway' layer to inactive as shown at right:

```
-a- <default layer>
<W> benchwork
i  walkway
```

Now we are going to go into one of the 4 x 8 rectangles and draw in the actual bench structure. Zoom in on one of them and set the Snap Size to 0.5 inches. Then draw a vertical, filled rectangle that is 48 inches tall and 1.5 inches wide (this is the dimension of a standard milled 2x4 stud). Duplicate this four more times (either by using the Duplicate command or by using Copy and then Pasting four times). You should end up with something that looks like that at left. I have colored the 2x4 structure brown, but you can color it anything you like. Next, create a pair of horizontal 96 x 1.5 inch studs and place them at the top and bottom of the 4x8 rectangle. Finally, draw in four 1.5 x 3.5 inch nominal 2x4 legs and you should have something like that at right.

Here I have placed the legs in the corners and then grouped the entire assembly into one unit (you group objects by selecting them and then pulling down the <u>Action</u> menu and choosing Group objects). Grouping it
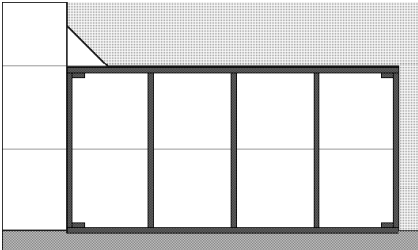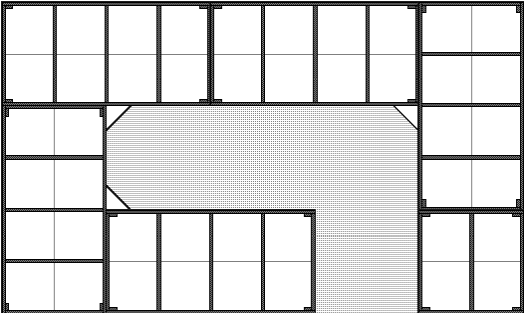
is required if we are to replicate it and place it in the other positions. Now, select the completed bench section and replicate it four more times, replacing the other 4 x 8 bench sections you already made. You can paste in a fifth 4 x 8, then ungroup it, edit it, and regroup it to make the single 4 x 4 section at the lower right. When you are done, you should have something

like that at left {bml bench08.bmp} As a final step, you can pop up the *Layer Setup dialog* (either by going back to the <u>Options</u> menu or double-clicking on the layer pane in the *multifunction status bar)* and change the 'benchwork' layer to hidden so that it is out of the way and you can begin to lay track in a new layer that you may want to call 'track'. That is left as an excercize for the student. If you are using 'L' girders rather than 2x4s, then just draw in the top dimensions of the girders rather than the 2x4's that I used. You can draw the benchwork to any level of detail that you want, and nothing stops you from also including a benchwork wiring layer, or any number of wiring layers up to the layer limit of 64 total layers.
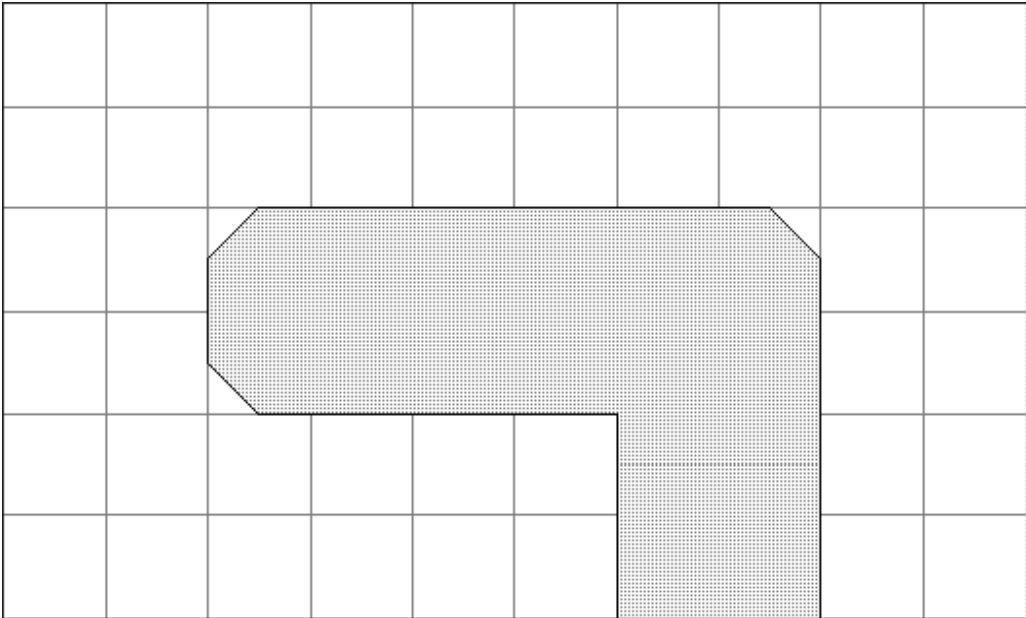
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