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Track Making Tutorial Thread

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Author	Message
Butter_ Champion Driver  Joined: 25 Feb 2003 Posts: 827 Location: State College, PA	Posted: Mon Jun 30, 2003 3:52 pm Post subject: Track Making Tutorial Thread quote edit delete IP **INTRODUCTION** Ok, I am starting this thread as a step by step tool to help those out there in making a track. I am currently working on a track called Lonesome Pine Raceway located in VA. The track is used on the USAR Hooters Pro Cup circuit, and was a request that I make it. Let me start by saying that I work 55 hours a week, and am married, so track making is not my #1 priority, so this will be about a 3-4 month project. Please bare with me and I will let you know everything I do about making a track. We are going to start this one from scratch! Updates to what I am doing, and fairly detailed notes of each step with be posted in this thread. I am starting another thread for you to post questions, so that people trying to follow this make-shift tutorial don't get too lost. Look for my first notes later today. Last edited by Butter_ on Fri Aug 01, 2003 8:30 pm, edited 1 time in total Back to top profile pm email www
Butter_ Champion Driver  Joined: 25 Feb 2003 Posts: 827 Location: State College, PA	Posted: Mon Jun 30, 2003 9:18 pm Post subject: quote edit delete IP **TOOLS** Ok, lets start by gathering the tools that we need for making a track. 1. We need Rhino 3d evaluation copy as it is free (Rhino3d.com) 2. We obviously need centerline, avaliable from theuspits.com 3. We need a xml editor, I prefer the free Microsoft XML Notepad (google search) 4. We need Fred's nobu Rhino scripts avaliable here http://www.tptcc.com/board/viewtopic.php?t=218 Make sure that you follow Fred's instuctions and remember that you may need to change the path for the rhino toolbar buttons. 5. Winmip2 http://www.horbra.de/winmip/ Later on I may have to refer to some spreadsheets, but hopefully not. If I do, I will try to contact the makers of those sheets to allow permission to post them. I am sure there is something I am missing right now, so I will add it to the list later.

First off, go look at our required file list, I was an idiot and forgot Winmip2!

Ok, now that we have all of the programs that we need for now, lets get two reference webpages bookmarked for frequent visits and get started.

http://www.igcomputers.net/track_making/

and

http://www.psuracing.com/xmltut.html

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Butter_
Champion Driver

Joined: 25 Feb 2003
Posts: 827
Location: State College, PA

Posted: Tue Jul 01, 2003 1:04 am Post subject: quote edit delete IP

STEP 1

Since the Nobu scripts are based off of North Carolina, that means that the file they are going to create is going to contain references to mips and 3do's buried in the north_carolina.dat file and the track folder, so we want to COPY the north carolina track folder to our desktop and rename the entire folder to "ourtrack" We also need to rename the .dat and .cam file that are inside of the track folder to ourtrack.dat and ourtrack.cam. While we are in the folder, we need to delete all of the .lp files (there are 10 of them). Next, open up the track.ini file and change the second line so that it reads "track_name_short = ourtrack" obviously without the quote marks. Now, lets move that folder back to our tracks folder in N2003 and load up the game. Go to a test session (single race may not work) and select "ourtrack" and give it a spin. Right now it is just a renamed Rockingham.

Well, since we want to create our own track, we need to go back out and do some EDITING

Oh, you got a couldn't load track error didn't you Ok, what we don't have in the folder is a ourtrack.ptf. To get one, you either take the rockingham xml file and export as ourtrack.ptf into the ourtrack track folder or you can use winmip2 to unpack the ourtrack.dat file and rename the ptf file to ourtrack.ptf and place in the ourtrack track folder. Now you can load the game and run on our renamed rockingham track.

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Butter_
Champion Driver

Joined: 25 Feb 2003
Posts: 827
Location: State College, PA

Posted: Tue Jul 01, 2003 1:48 am Post subject: quote edit delete IP

STEP 2 (RHINO)

Now we have a track folder that we know works, lets get a little dirtier. We need to find some reference pics of our track and all the nitty gritty info we can get. Is it a rough surface, what is the banking, does it have 1 or 2 pit roads, is it run at night or during the day? We can ask a million questions, but it all depends what you can find and how much you care for the track to be as realistic as possible. Here is a link to a picture of Lonesome Pine that I used for my reference material http://www.tptcc.com/board/images/board/Dsc00033.jpg . I also like to hand draw out a picture so I know how many segments I am going to have and here is a copy of that picture http://www.tptcc.com/board/images/board/lphanddraw.jpg . Hey, no one ever called me an artist As you will see, I drew a rough picture of the track that had the walls and stuff as you need to know how many segments you are going to have and how you want them drawn out in centerline.

What I did for this track was I found a satelite shot of it and rotated that shot so that the front straight was perfectly horizontal. I took the shot at a zoomed in amount of 1 meter since we deal in meters in the game. I also found the approximate center of the track and laid a copy of the 1 meter scale from the satelite photo website so I could scale my track later. Ideally I would have been able to gather the exact front stretch information for the track, but I wasn't able to, so I had to draw it in Rhino to get the right lenght for the straightaway. I opened the evaluation copy of Rhino and started a new file in meters. I then moved the dividers so the only view I could see was the top, as we are drawing our centerline from a top view (like being in a helecopter). You probably will have to zoom out some so you can draw everything you need to in Rhino. I also disabled the grip under the tools/options area. For sanity, I turned on snap as well. So, after I got Rhino all set up for what I needed, I loaded my scaled copy of my satelite photo You want to bring your copy of the track in as a background image by going to view/background bitmap/place. Here is a copy of my background image http://www.tptcc.com/board/images/board/lpback.jpg (it has to be in bmp form to load in Rhino). Once you initially place it, you need to go back and align it so that your scale of 0 to 100 is matched up with the red line in rhino so that the 0 is on the leftmost end of the red line and the 100 is on the rightmost end of the red line. Then you just use the line, extend line, and extend arch to draw your track. In my case, it was easiest to trace the inside line of the track (line seperating banking and apron) as it stuck out the most in the satelite photo. If I remember right, I started at 0,37 and ended at 7-3,37 for the first part of the front straight then the turns were perfectly symetrical so I just came around with the extend arc button to -73,-37 then a straightaway via extend line to 73,-37 and extend arc to 73,37 and then extended line back to 0,37. At this point, you want to join all, then explode all and check segment direction. You then need to run the find larger curves script. It will instruct you to select your first segment, and it will cut all turns that are over 90 deg into smaller segments so it will load in the game. Then you want to run the kobe script and select the first segment again and you should then be able to save the file whereever you are going to keep your track .xtf file. You will actually save as ourtrack.clx , but that is the same as a xtf file, which is a xml file. I renamed my ourtrack.clx file to ourtrack.xtf extention so that it was recognized in centerline (CL) without changing the pulldown menu every time. DO NOT close your Rhino program at this time as we are going to come right back to it in a minute. Anyways, you want to open CL and load the the ourtrack.clx file. Look at the lenght in miles and it should be .33 miles. That is good because LP is a 3/8 mile (.375) but our centerline is drawn around the inside line, so it should be just a touch shorter. Now, we wanted to get our segments to look like our hand drawn version of the track, so we could get our walls and fences and banking transitions and pit road and stuff to start and end where we need to recreate this track according to our reference photos. So, if you look at my hand drawn picture, you will notice that I have each segment a length in meters (if a straight) or a % of turning angle (if a turn). You want to use this to approximate where to put "points" on your rhino centerline then explode your rhino centerline at each of these points. If you properly join, then place your points between each segment and explode, you should wind up with 19 segments on your rhino centerline to run the kobe script on and save as your ourtrack.clx file and load in centerline. I know I am getting a little advanced here, but if you play around, doing what I just said, you will understand what I am talking about. If not, try step 2 (CL method) in the post below this one. You now want to compile this track in CL and export as ourtrack.ptf and place that file in the ourtrack folder. Now load N2003 and go to test session and select ourtrack and try it out.

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Butter_
Champion Driver

Joined: 25 Feb 2003

Posted: Tue Jul 01, 2003 2:22 am Post subject:

STEP 2 (Centerline)

Well, if you look at my hand drawn picture (as mentioned in step 2 Rhino method above, you will see why the CL method can be easier, especially if you know your track straight and turn lengths. Through the help of others, I was able to get the following info about Lonesome Pine.

Posts: 827
Location: State College, PA

Specs
I sent an e-mail to management at LPIR and got the following specs:

Straight-away Lengths: Front Stretch-480 feet long
Front Stretch is 70 feet wide
Back Stretch is 50 feet wide
Straights banked five degrees

Turns is 450 feet long (measured center of track)
Turns is 65 feet wide plus 19 additional feet of apron
Turns banked 15 degrees

Thank you for your interest in the track.

Karen Phillips

If you do the math on the rhino centerline we made above [(73 meters + 73 meters) * 39.37] / 12 we find that our track we drew has straights 479 feet long, which is almost exactly what the track people say their straights measure out to.

So, using this info, we decide that the straights will be 146 meters long and if you look at the hand drawn picture, I portioned this up to 8 meters + 65 meters + 65 meters + 8 meters. Knowing that the turns are obviously 180 degrees at each end of the track, I portion this up so that the angles I have listed to the inside of each hand drawn turn equals 180 degrees. Once we know what we want each segment to be so it will join up properly and lock, we want to enter this information in CL. The best way to do this is to open the north_carolina_2003_04.xtf file found at theuspits.com and go under segments/segment edit. Make sure the segment edit tab is highlighted and delete all segments except for the first segment. Then, enter the info for segment 1 as found on the hand drawn picture. You want to remember from the rhino method that our starting y direction (what will be our radius for the curved segments) is 37. We want to draw our track just like it is on the paper on the hand drawn copy, so we will enter our sx and sy coordinates (start x and start y) as 0,37 and the so (start orientation) as 180 (you need to switch from radians to degrees via the tab in the upper right hand corner. Since we have decided to make segment 1 65 meters long, our ex, ey, and eo coordinates are as follows: -65,37,180 . The bellas we always leave as 0. The angle we set as 0 for a straight. The radius/length is obviously 65. The type is 0 for a straight and 1 for a curve. Now we want to copy this segment so we have a second segment to start segment 2 of our track. Segment 2 is also a straight, and it is going to be 8 meters long. When we copy a segment, it will automatically lock to the previous segment, so we don't have to worry about that, which is why I like to cut down to 1 segment then copy to get the track built. Anyways, we don't actually have to enter all of the info in each segment, for instance, for segment 2, we already have it locked to the previous segment, so sx,sy, and so don't have to be touched. Then, all you need to do is make sure angle is still 0 and type is still 0 and for segment 2, we want the length to be 8. If we just click on segment 1, then back to segment 2, we will see that the ex,ey, and eo have been calculated and entered for us. Now, we just copy that segment so we can begin segment 3. Segment 3 is a curve, so first thing we should do is change type to 1. Remember that sx,sy and so are already set for us, so we just need to enter our radius (remember that is 37 via our rhino centerline calculation) and our angle is 20 based on our hand drawn picture (see the number inside of segment 3). If we now click on another segment, then back to segment 3, you will see that the ex, ey, and eo are set for us again. We just repeat the copy and change for the same couple of lines all the way around the track. The best thing is that for instance, when we go to copy a segment for segment 9 or 12 or 18, you will see that you can just copy segment 2 and the length and everything will be already entered for you since we made them the same lenght. Anyways, if you follow the method above for straights and for curves, you should end up with a centerline that connects at the end (due to slight rounding, it may not lock if you run the validate tool, but it will still load in N2003). We now want to compile our track and give it a test in N2003. we want to export as ourtrack.ptf and put that file in the ourtrack folder and load N2003. Go to test session and select ourtrack and try it out.

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Butter_
Champion Driver

Joined: 25 Feb 2003
Posts: 827
Location: State College, PA

Posted: Tue Jul 01, 2003 3:14 pm Post subject:

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STEP 3

Ok, this step is to make sure we don't have any invisible walls. During this process we are going to make mistakes. Some of them on purpose so we can see what happens and why, and when a track refuses to load, we want to be able to determine why so things that will happen when it is loading. Obviously more on that later when we get to them.

To do step 3, we need to make sure that our x, w and f sections don't go outside of our parameters or you will either not get your track to load or you will hit invisible walls when you try to drive it. All you have to do is load your ourtrack.clx or ourtrack.xtf file in CL and go to the segments tab. You want to open the w section, f section and x section tabs. Go into each one and check to make sure that none of the parameters go inside of your radius. By this I mean for LP we have a radius of 37. If we try to put a x section at 40 (positive numbers are to the left (inside) of the centerline, negative to the right (outside)) it will crash the track when we try to load. If you run the validate tool, it will tell you what segments have illegal parameters for the curves, but does not tell you about the straights, so you have to check those yourself. Just start with the x sections and delete all of them that are greater than 30. Now take the most inside one that is left and change it's value to 30. The x section is the "frame" of your track that we "lay" the f and w sections over to form a track. If you can't figure out how to change segments, stretch the window out so that the stuff on the rightmost side is real small and you will see two buttons for previous and next segment. Once you do that for ALL segments with the x sections, you want to repeat the process for the f and w sections, just make sure that you don't put any f or w sections with a value greater than 25. If you were to put them on the edge (30) it would create problems because for a w section, it is placed from the middle, so some of it would hang over your x section frame at 30 and cause the track to crash. Ok, once you finish this, you will probably also remember that our banking was either flat (Rhino method) or choppy (CL method) when you drove around our track. We want it to be flat, so Rhino people can skip this step. You want to go into the x section tab and make all altitude and slope values 0 for each and every segment. Once we do this, lets export our track as explained above in step 2 and give it a try. You should have a flat track that has walls out of place and probably has the infield mip trying to cover the track surface  This is ok and to be expected. We don't care right now, because we now have a track that works 

Before we get too far ahead of ourselves, let save our xtf file as ourtrack1.xtf. From here on out, we want to work with ourtrack2.xtf so the ourtrack1.xtf will serve as a backup copy so if we mess up, we can come back to this point and go from there. Infact, if you want to, you can save as a new file after we successfully test each new step. I remember have no backup copy of Jennerstown when I was almost done back for N2002 and I accidentally saved over the xml file as a ptf and had to start all over. I was in a bad mood for like 3 days.

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Butter_
Champion Driver

Joined: 25 Feb 2003

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STEP 4

Ok, now that we have a track, lets clean it up a little bit so that it more resembles the real thing. This is by far not the final graffical cleanup, but it will help a lot. We need to make some rough calculations here, and some of those will change slightly over time, but only slightly. Ok, from the information that we have gathered, and if you look closely at our track (see reference photo linked above), the back straight wall covers the white line that goes around the inside of the track that

Posts: 827
Location: State College, PA

seperates the banking from the apron. Since we know that the back straight is 50 feet wide (approximately 15.25 meters) we will move our x and w sections around to form a more driveable track that has the dimensions of the real one. Lets do x sections first. As I just stated, the back straight is going to be 15.25 meters wide, in fact, the whole track from where the banking starts to where the outside wall begins is going to be 15.25 meters wide. The rest of the width that the track has is contained on the apron in the turns and the front stretch. This helps us know where to place our walls on the inside at. Ok, so, from what we are finding out, we are going to need 4 x sections for our track. x section 1 is going to be the outermost edge of our track that we will place mips on. Then we want x section 2 to be the top of the racing surface (the part that is banked). x section 1 and x section 2 are going to be the same altitude (height) all the way around so that we have a flat, horizontal surface to place all of our outside the track 3do's on such as granstands and stuff. Now, if you had a situation where you wanted a hill like the grandstands on the backstraight at talladega, you would have to build that with x sections. Same thing with building rumble strips, but since we don't need that for our track, we will not really worry about it. Once you learn how to bank the track, all of that will come easily to you. Remember, we are building the frame to drap our w and f sections over. This is the easiest part of the track to build. Ok, we have determined what x section 1 and 2 are going to do for us, now what about the other 2? Well, x section 3 is going to be right where the apron meets the banking. That is an easy one. How about x section 4? Well, that is the innermost part of the track that we are going to draw a w or f section on. Remember that we already placed that one at 30 in the previous step. If you are in CL, make sure that each segment has 4, and only 4 x sections. For ease, lets place all x sections 1 at -50 (that is to the right of the centerline). Since we know from above that our track needs to be at least 15.25 meters wide, plus allow some room for the wall thickness, lets place x section 2 for each segment at -16. We absolutely know that x section 3 is at 0 because we built our centerline right where the banking meets the apron and x section 4 was already placed at 30 in the previous step and that worked for us, so lets leave it alone. Ok, this is great, we have our frame in place, so during the next step, we can add the banking and go. All we need now is to set up the walls so that they form a recognizable track. Well, not much need to place any walls outside of the racing surface, maybe a fence or something like LP has in turn 2 and down the backstraight, but for now we are not too concerned with that, so will will just place the fence with the outside wall and move it later. We just want to get on the track now Ok, there are many types of walls in the game. Since we built our track on North Carolina, lets look at the walls that track has. Wall type 2058 is a chain link fence and 2049 is a typical cement wall. From our pictures, we are going to need a maximum of 2 cement walls around the track on any given segment. An inside wall and an outside wall. This is excluding the little wall that the pit crew would jump over, but forget that, we will add it later as a close look at the pictures shows it is the kind of wall that pocono has on pit road, so we will need to borrow that later. We are also going to need a chain link fence around the outside of most of our track, so lets keep one of those. Ok, for a total, we are going to keep 1 w section of type 2058 (chain link) and 2 w sections of type 2049 (cement) for each section. Delete all of the others as we will not need them. Ok, lets place the one's we left so we can take a spin  The outside wall needs to be placed at 15.5 to account for the thickness so that the left face (inside) is at about 15.25 so our track is the correct width. While we are at it, lets place the chain link fence at 15.5 as well. Ok, so one w section of type 2049 and our one of type 2058 are now at 15.5 for each segment. Lets place the inside wall and go. Well, the inside wall is a bit more work as it is "broken" and not continuous around the track as the outside wall is. From our hand drawn picture, we have a wall that seperates pit road from the track, so lets do that one first. It is on segments 17,18,19, 1, 2, and 3. The front straight is 70 feet wide, so coming in from the outside wall at 15.25, we are going to place it at +6, which is very close to 70 feet wide for the front straight. So, for the second w section of type 2049 in segments 17,18,19,1,2 and 3, we put it at 6. Continuing around the track, we see that there is a randomly placed wall that would be in our segment 4. We will just guess as to where it is at, and place the start of it at 30 and the end at 20. This is just a guess and could be moved later. Segment 5 for us does not have an inside wall at the real LP, so we will just delete it from this segment. For segment 6, which is in the beginning of turn 2, we know that the turns are 65 feet wide, so we will place the begininning and end of this wall at +4.5 to get the width right. We do the same for segments 7, 8 and 9, although these may change slightly so that the wall flows nicely from one segment to the next, but this is much later on. Segment 10, we will begin the wall at 4.5, and end it at +0.25. This would put the edge of the wall right over our centerline, which is where it

is at on the real track. We place both ends at 0.25 for segment 11 as well. Segment 12 does not have a wall in real life, so we delete it. Segment 13 has another oddly placed wall in real life, so I approximated it to start at 10, and end at 3. I then started the inside wall for segment 14 at 3 and ended it at 4.5 to get our turn width back at 65 feet. The wall for segment 15 is also placed at 4.5 for the beginning and I ended it at 6, as it curves to allow an opening for the entrance to pit road. Our pictures show another random wall in this segment, so I copied this w section and placed it at 8 on both ends to replicate that wall. I removed all inside walls from segment 16 as this is the entrance to pit road and needs to be open. We already did segments 17,18 and 19 above so we are done moving w sections. Lets save and export and give it a drive. You should be on a flat track with no banking but at least the walls are now in place so it forms a recognizable track.

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Butter_
Champion Driver

Joined: 25 Feb 2003
Posts: 827
Location: State College, PA

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STEP 5

Banking

Ok, we get to shape our track here and have some fun. When we are done with this step, we will be able to run solo laps and should be able to run some competitive lap times to what the real boys run. I am hearing that for LP, a cup team tested there with their Martinsville setup and ran a 16.0 or a 16.1 or something and they expected a good cup time to be about a 15.8 if there was a real WC race there. So, knowing that, we will bank our track and take some laps

Ok, so we load our ourtrack2.xtf in CL and go to tools/banking edit. We know from step 4 that we are going to edit section # 2 in the x section, so we just do the following, first we will set the entire track to 5 degrees banking. We start with segment 1 and end with segment 19, and don't forget to put a 2 in the section # field. Then you just change the slider till it reads 5 and hit ok. Next we need to set the turns, so we do it again, but this time we start at segment 3 and end with segment 8. We set those to 16 degrees banking. Do the same for segments 13 thru 17. Then we just use the banking transition tool to smooth out the banking and we are good to go. Instructions are located below, near the bottom of the alternative method for banking editing. Also, don't forget to repeat for x section # 1 so the ground outside of the track is horizontal.

The alternate is to go to segments/x sections and edit each on by hand. The distance between the two x sections that we are going to use to form our banking is 16. These two x sections are x section 2 (the outside) and x section 3 (the inside). If we use this great online tool, we will have a good tool to help us with our banking. Be sure to thank Taz Chris for finding this tool.
http://school.discovery.com/homeworkhelp/webmath/rtri.html
You will enter the distance between x section 2 and x section 3 (in our case is 16) in the "a" box. We know our banking is 5 degrees, so we enter 5 in the "D" box. We want to know how much to raise x section 2, so we need to put a ? mark in box "b" (bottom right box). Then hit solve and this will calculate a number for us that comes out to be approximately 1.4. We want x section 2 to be 1.4 on all of the straights. This would be segments 1,2,9,10,11,12,18 and 19. Now the turns are banked at 16 deg. When we use the triangle again to solve this, we put 16 in box "D" this time and solve to find that we need to raise x section 2 in the turn segments to 4.6 meters. We want to make x segment 2 have a value of 4.6 for segments 3,4,5,6,7,8,13,14,15,16 and 17. Now, if we were to try to load our track now, it would work, but when on the racing surface, we would crash because between the straight segments and the turn segments there is such a huge altitude change it would be like hitting a brick wall. Lets fix that. We just go to the tools/banking transition edit and let CL do all of the dirty work for us. This little tool will calculate the perfect height for each section so that it transitions properly, as well as calculating the slope so that there is not a bump between each segment. Steam (a TheUSPits team member) released a spreadsheet some time ago that did this as well, and it is what Don used for the CL calculation. What you have to be aware of though, is

that on your first try, I bet you are going to try to transition between segments 2 and 3, but if you were to load that and drive it, you could now drive between the straight and turn segments, but it would still be too steep. As a general rule, you want to try to keep all slope numbers below .1. The way CL is right now, it does NOT mess with the altitude settings of the start and end segment, so since for LP, even though we want our transition to be between segments 2,3 and 4 for turn 1, we have to start with segment 1 and end with segment 5. I hope this makes sense. For the rest, we want to change segments 6,7,8 and 9 for turn 2, so we start with segment 5 and end with segment 10; segments 12, 13 and 14 for turn 3, so we start with segment 11 and end with segment 15; and between segments 16,17 and 18 for turn 4 we start with segment 15 and end with segment 19. This makes a nice driveable track with no extreme banking transitions.

One last thing before you go for a spin. You want to get the outside x section raised up to the same altitude as x section 2 in each segment so outside your track is flat so you can place your 3do's and other items later on. You can either copy the altitudes and slopes over manually or you can just set the straight altitudes at 1.4 and the turns at 4.6 as previously done for x section 2 in each segment, then use the banking transition to smooth it out just as you did in each turn before. When done with that, try the following. When you get in the game transfer over the default fast martinsville setup. In fact, with the default fast martinsville setup and track grip of 1.12 for North Carolina, we did a 16.2 in testing the other night, which is extremely close to our target speed we decided on above of about a 15.8. At this point save and enjoy turning some laps on your track.

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Butter_
Champion Driver

Joined: 25 Feb 2003
Posts: 827
Location: State College, PA

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STARTING FILE

Ok, I have put together a little file that will help make life a lot easier when starting a track such as this one. Remember how we had to strip out all of x, w, and f sections that we didn't want, or where outside of the parameters? Then we had to make all the x altitudes and slopes 0 and move them to where we needed, and move all the walls, then later on, you will see how we have to change all the mip names and unk values, etc, etc. If you use this file, and then go a step further and change the mip names how you want and the placement of the x, w and f sections of these 2 segments in the xtf file I am providing, you will be able to save hours of work.

Anyways, here is the link: http://www.tptcc.com/board/files/start.zip (Thanks Jan)

Here is the readme file that comes with it:

This file contains a starting point xml and track.ini based off of Richmond-Night. To make this work, you just copy the Richmond-Night folder and name it what you are going to call your new track. For example, you would name it "testtrack" Then you open the folder and remove the 10 .lp files, and rename the .cam and .dat files to testtrack.cam and testtrack.dat. Now put this track.ini file in the folder. Then open up CenterLine (CL) and open the start.xml. Make your centerline by using the 2 base segments that are there. One for a straight and one for a turn. Then export to your "testtrack" folder by naming it "testtrack.ptf" Just load N2003 and go to a test session and load your track (if you did not change the name in the track.ini file, it will be called "Start") The reason behind this file is so that you have some x, w and f sections laid out with proper unk values and all to make the process easier. The best way to do this is to open the xml file in an xml editor and place your x, w and f sections where you need from your calculations for your track before you get started so when you copy these 2 base segments to form your track in CL, everything is in place for you. Saves a ton of time

Also, to change to a day track, just open the xml file and the first couple of lines, you will see a lined called "night" the value entered is 1, just change that to a 0 and change the values on the next three lines "unk_1, unk_2, and unk_3" from .5 to say .22. This will change the lighting so it is

now a day track and get rid of the night tach in the car. You will also have to bring over a day horizon from another track, just that is easy.

Butter_

Last edited by Butter_ on Fri Aug 01, 2003 8:39 pm, edited 1 time in total

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Butter_
Champion Driver

Joined: 25 Feb 2003
Posts: 827
Location: State College, PA

Posted: Mon Jul 28, 2003 4:17 am Post subject:

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CLEAN UP

New files and a complete redo with the starting point file!

Ok, we got to a point where we have lots of things started, but nothing really complete or completely set in stone. By this, I mean that we have the following "problems":

1. Our centerline does not lock due to rounding.

We can fix that fairly easily. Go here: http://www.tptcc.com/board/files/lpexcel.zip and open the lonesomepine file in excel. You will see some columns toward the right that are highlighted in yellow. These are the fields that you change in the excel file to get what you need calculated for you. This is exactly what centerline does for you but without pictures, so it helps if you draw it first in centerline like we did and then do the excel file to get the properly locked segments. Thanks to D_River for this file. You will see that you need to put a 1 for a curve or a 0 for a straight, and then put either the radius (37) and angle in degrees for a turn or the length of the straight for a straight just as in centerline. I told you they were similar Then you can just copy and paste the info over to the centerline version so it will lock. For the orientations, just look for the first white column to the left of the yellow one where you put the 0 or 1 for segment type. Remember that beginning orientation is from the segment before and ending orientation is the segment you are working on.

3. Finalizing our x, w, and f sections.

We said in the step above that we needed to pick our mips for our f sections. Well, I went a step further and based our track on the start.xml that I linked in the step above, since we want a nice dark track texture to replicate the real life lonesome pine and we want a night track. Also, this file had some dashed lines going around it, so it was easier to use I also moved the second x section from -16 to -17 to keep our wall from getting too close to the x section and thus sitting at some wierd angles and not matching up properly.

Here is what I have in my xml file:

X sections

-50
-17
0
30

W sections

-15.5 outside concrete wall
20 inside concrete wall

Also, we have a w section at 6 on all straights that is a concrete wall as a seperator between pit road and the track.

F sections

-50 asphalt5
-17 asphalt5 (remember that w and f sections can not cross a x section)
-12.2 paint_01 (dashed white line)
-12 asphalt5
-8.2 paint_01
-8 asphalt5
-4.2 paint_01
-4 asphalt5
-0.2 paint (yellow line)
0 asphalt5
3 asphalt5
15 asphalt5
15.2 asphalt5
20 asphalt5

I know we aren't crossing any x sections for the last couple of f sections, so you may wonder why we broke those down. It is because of the different unk values that we must assign for pit road to work properly. We will get more indepth with this when the time comes, but right now all of our values would work for a pit road with 1 exception, so you could move your starting point in the track.ini and get yourself some pit service if you wanted.

4. Banking needs fixed.

Since we moved the x section from -16 to -17, we need to adjust our banking. Through some quick calculations just as above in the banking step, you find that for our 5 degree straights the altitude is 1.5 and for the 16 degree turns the banking is 4.9. We just want to enter the 1.5 for every straight segment in the second x section slot as done in the banking step above, and put 4.9 for every turn segment. Then we just need to fix the slope

5. Slopes are a little off and need touched up to be finalized. This is expecially true because we broke up those 2 segments going into turn 3.

In a previous step, we used centerline to calculate and place the slopes of each segment for us. I appologize to Axaptacoder, but I slightly mislead him on the calculation for CL4 for slopes so they are a little off. On a flat track, this is hardly noticable, but on a track like ours that is small and has high banking, it makes the track undrivable close to the wall. We have a nice excel spreadsheet again for this. This one was created by Steam and works really well. You have to do this for all four turns, and the one I included in the zip file above shows how to do going into turn 3 where we broke up the track as I figured it would be the hardest to figure out for you. First off, you only change things that are blue. The first thing you want to change is the h0 and h1. h0 is the beginning altitude and h1 is the ending altitude. In this case we are going from a staightaway (altitude of 1.5) and ending in the turn (altitude 4.9) so you can see where we got those numbers from. Next we enter the lengths of each segment we are going to smooth the banking over. In this case we are going to do it just as above, smoothing it over the last straight segment and the first 2 turn segments, except we broke our staight segment into 2 pieces, so it is now smoothed over 2 staights and 2 turns. The straights are easy to calculate because the lengths are just how long they are. In this case, the first one is 6 meters and the second is 2 meters. The turns are a little trickier, but not so hard. See, centerline does some of the math for you, so you need to go to the segments tab in CL and find the first turn segment in turn 3. This is segment 15 now that we added those 2 new segments. Make sure that CL is in radians! There is a number toward the bottom that says angle. It is .349xxxxxx. You take this number, times the radius of the turn to get the length of your segment. Easy right? Not so fast! I bet you used 37 meters as your radius. Wrong! Because you are doing this for x section #2, and you are 17 meters beyond the centerline, your radius is actually 54. (37+17). See, this is the mistake I passed on the Don and CL. Sorry. Anyways, you just

calculate those two lenghts (given in the excel sheet). Now you just copy over the h(x) and m(x) for each segment with the h(x) being the altitude and the m(x) being the slope. The value across from your segment lenght is the beginning value and the one for the next segment is the ending value. IE, the first segment you are changing is segment 13, which is the 6 meter straight piece. As you can see, the beginning altitude stays as 1.5 and the slope is 0, and the ending altitude is 1.56xxx and the slope is 0.02xxxx. Now those ending values for that segment become the beginning values for the next segment and so on. Now you just have to do this for all 4 turns, but it takes 10 minutes tops.

Just a little note that after I wrote this step of the tutorial I got some updated pictures of the track and found out that they close the outside entrance to the track during a race with a gate, so I went back and took out these two segments that I added, so the banking (altitude) and slope for turn 3 was reworked to reflect the change back to the original track layout.

Now, we save as a different version and test! We should have a nice night track that needs some lights It does have properly spaced dashed lines, the basis for pit road, the right colored asphalt, proper banking and slopes and a locking centerline.

We have finished the x sections and will not touch that again!

Next we will concentrate on w sections.

Just a side note that is for more advanced editing. Lets say that you had a track like North Wilkesboro where the track changed elevation. You do this with the altitudes. So, using what we did above, say that from the end of turn 2 to the beginning of turn 3 the track rose up 1 meter. Instead of putting all straight pieces at 1.5 meters, we would calculate it like a banking change and use Steams excel file to do it for us because the slope would no longer be 0. Couple this with some banking changes as well and it gets complicated. But, based on what I just said, on a straight elevation change, our banking going into turn 3 on the first segment we are going to use the slope caculator for, it would be more like 2.4 meters instead of 1.5. This in turn would raise the ending altitude (banking in the turn) to 5.8. Then we would plug the same segment lenght values in the excel file. The only difference is that because you have a non-zero beginning slope because of the elevation change, you have to enter that into the m0 slot beside the h0. Then you just copy and paste the h(x) and m(x) values as above. If you have any further questions about this, just ask.

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Jan Kohl
US Pits Crew

Joined: 19 Feb 2003
Posts: 3286
Location: Charlotte, NC

Posted: Wed Aug 06, 2003 12:41 pm Post subject:

ADDENDUM 1

Wall Types

10 - Extreme Left
2049 - Very hard, armco, etc.
2050 - Same as 2049
2051 - Soft, 'elastic'
2052 - Like 2051, but not as 'elastic'
2053 - Soft, hay bales
2054 - Soft, car sinks into (hedge?)
2055 - Soft, softer than 2054 (tirewall)
2056 - Hard, not metal, cars bounces off a bit
2057 - Hard, metal, armco
2058 - Soft - hay bales
2059 - Hard, metal, armco
2060 - Bouncy rubber

Surface types
1 Asphalt
2 Concrete
3 Paint
4 Grass
5 Dirt
6 Sand
7 Gravel
8 Water
9 Unknown/Doesn't Exist
10 Left Edge
11 Unknown/Doesn't Exist
12 rumble strip

Last edited by Jan Kohl on Mon Aug 25, 2003 3:08 am, edited 1 time in total

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Morse-HCR
Car Chief

Joined: 11 Apr 2003
Posts: 85

Posted: Thu Aug 07, 2003 3:23 am Post subject:

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To help have a 2 groove track...

put your asphault on the outside groove and concrete on the inside, set it as a concrete patch on the inside but .mip it over so the track looks like 1 surface type...

with diff grip values, 2 grooves will easily come into play and it will be an awesome 2 groove race track

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Butter_
Champion Driver

Joined: 25 Feb 2003
Posts: 827
Location: State College, PA

Posted: Thu Aug 07, 2003 4:13 am Post subject:

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Step 6

Wall Placement

Thanks Jan and Bowtie for the list of wall types and surface types. Fit perfectly between these 2 steps. Also a great tip by Morse. That is how papy did the high groove at Hillside.

This step goes way beyond what we did in step 4. Step 4 was just placing the basic walls somewhere around the track, this here is the final calculations for each wall and what type of wall they are. When we are done with this step, we will not touch the walls again except to lay the mips!

Well, we want to place the walls on our track in this step. This entire step was done using CL. We have to pick out the types of walls we want and where to place them. You need to look at your reference photos and see what you want. Linked at the beginning of this thread is the main lp site and it has some photos on there of the track. The one I use the most is the one taken outside of turn 1 that shows the entire track. I also have some photos taken this year during a race that show the chain link fences a little better for subtle little things such as height. We basically need 3 kinds of walls for this track.

1. A chain link fence (type 2058 on any papy track)
2. A cement wall (type 2049 on any papy track)
3. A armco (type 2050 at Watkins Glen)

Now, we will use different mips to cover these walls, and they will be different heights and widths at places, but they will be the only 3 types of walls we use.

The outside wall around the track is continuous, but it is pieced together between cement walls on the straights and armco in the turns. Overall, this is a easy process, but it just takes time (have you all gotten that theme yet?)

You want to change all of the outside cement walls to type 2050 so they are of armco type. Then you want to change the dimensions so it takes the shape of an armco wall. Right now, all of my outside wall is at height 1.25 and width .25. We will leave the armco the same height, as that is how it is in real life, but it is obviously thinner, so we want to make the width of our armco .1 This is for both start and end width, and we also have to change unk3 and unk 4 to be .1 as well, as this sets where the car reacts to the wall and since this wall is thinner, we are going to slightly move it and this would create a huge problem if we were close to the wall getting into or off of the turn. After some minor experimenting, I also learned that unk 5 needs to be 0. A 0 means that the wall sits perpendicular to the racing surface and a 1 means it sits perfectly vertical no matter what angle the track is at. The wall at the real track sits perpendicular to the track, so 0 is what we want. I did some calculation and .25 (the cement wall width) - .1 (the armco width) = .15 (pretty good math skills huh) Well, this means we want to move our armco in .15 meters so it creates a smooth, continuous wall around the track. Since the cement wall sits at 15.5 from the centerline, we move the armco to 15.35 and it matches perfectly.

If you were to save the xml here and load the track, you would be like, that doesn't look like a armco. Well, that is because you didn't copy over the mip name yet. This is step 7, and well will forget about it right now, lets just get the walls set.

Ok, so we now have done these same changes to every segment of the track that is a turn. Well, there is a gate on the backstretch, so find segment 12 (the 8 meter segment going into turn 3) and make it an armco too as that is what the gate is made of.

Let's do the chainlink fence then we can do pit road Coming down the front stretch, there is a chain link fence right at the cement wall. I placed mine at -16. That is placed in segments 18, 19, 1 and 2. If you are using the start file, there is one minor error in there, and the unk 3 and unk 4 values need changed from .25 to .05. Since this fence is outside of the track, it is not that big of a deal, but still worth it for realism sake. From the photos I have, the chain link fence in this area is fairly tall, so I left it at 4 meters as I have in the start file. Then when you get to segment 3, the fence curves away from the cement wall some and is only about half the height. The fence continues about 4 meters from the cement wall all the way around to the middle of turn 2. So, the height for these segments I changed to 2 meters and the placement was moved to -20 to get it that distance from the cement wall. Obviously, segment 3 has a start value of -16 and a end value of -20 so the fence is continuous just like real life, and shows the abrupt height change when it starts to curve away. I continued the fence around thru segment 7. This is where the fence ends. Going down the backstretch, there is a chainlink fence there that is the same height as the front stretch one, but it is a good 8-10 meters from the track, behind some flags and stuff. I placed this fence at -25 for segments 9, 10, 11 then there is an obvious gap in the fence where segment 12 is so vehicles can get into the track, then it begins again where segment 13 is so I started it at -25, but instead of curving with the track, it continues straight and ends. So I did a end value of -29 to get it to look just like the real life one. That is all of the chain link fence around the track. All it involves is copying and pasting the same wall to each of these segments and changing the start and end values where needed and the height in that one place. Really easy.

Pit road walls. Walls have unk values just like f sections that determine pit road and stuff, but we are not set on how pit road is going to be as we will probably modify it a little from real life to fit more cars into the game. We will set these unk values then, so lets just ignore them right now. We need the pit road wall that seperates it from the racing surface and the wall the pit crews jump over. From some previous calculations mentioned above, the seperator wall is at 6 meters inside of the centerline. This is for segments 19, 20, 21, 1, 2, and 3. It is .8 meters high and .25 meters wide. Make sure you have that all in place. Looking at our photos, we have a wierd wall where segment 4 is, so we left it a curved wall, with a start value of 30 and a end value of 20. Segment 5 has no inside wall. Segment 6 has a cement wall that starts at 4.5 meters inside of the centerline

(see above steps and calculations) and continually moves out to be at .25 by segment 9. This takes some trial and error to get it to look smooth. The only way to do this is to pick some setting, export and load the track. View it, exit, come back and start all over. Repeat until happy. My settings are as follows end value segment 6/start value segment 7 is 3, the end value segment 7/start value segment 8 is 1.75 and the end value segment 8/start value segment 9 is .25 This makes it look like one continuous wall as in real life. The cement wall continues down the back stretch along segments 9, 10, 11 at .25. Then segment 12 has that obvious gap and it begins again at another wierd angle for segment 14. This starts at value 13 and ends at value 6. Then segment 15 continues this wall at value 6 and ends at value 4.5, with the wall have a value of 4.5 at both ends for segment 16 where it ends. There is also an out of place wall in segment 16 that has start and end values of 21 and is a straight wall. This means you have to change that unk value from a 0 to a 1 if you copy it from a curved segment. Ok, we just placed our cement wall of height .8 around the infield, now we just need to pit crew wall of height .5. Pit road is tight on a short track, but must have some room for the AI to manuever around. I think that 15 meters wide is pretty good as it gives a tight feel, but not too tight that it creates headaches later on. So, we just set a wall the height .5 and paste in segments 17, 18, 19, 1, 2 and 3 at a start and end value of 21 (6 + 15) for this wall. Really simple. Now do the same for the backstretch pits by pasting the same height wall at 15 (.25 + 15 rounded) in segments 9, 10, 11. This wall is there in real life, but I don't believe they use this set of pits. We have now placed every wall at the real life track. The difference being, to fit more than 15 cars, we will probably have to use that back stretch pit, but since it really exists, I don't think this is going to be too much of an exaggeration.

Now you would save and load. You see that you can see through the end off all of our walls. That is ok, it will be fixed when we place the mips in the next step. It may not seem like we did much this step, but we just placed each wall and can eliminate any others that we have there. Now if you moved the cam files and took a picture from an angle similar to that on the lp site, you would be looking at a track that looks VERY similar now! Really cool that this is all taking shape.

Last edited by Butter_ on Thu Aug 07, 2003 1:40 pm, edited 1 time in total

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Butter_
Champion Driver

Joined: 25 Feb 2003
Posts: 827
Location: State College, PA

Posted: Thu Aug 07, 2003 1:38 pm Post subject:

Step 7a (CL4)

Wall faces and mips

Well, this is a step that can be a bit rough, but I will go into more detail than you can imagine so you will understand completely I hope.

Faces

Faces are the sides of the wall. You can have up to 5 faces for a wall, or you can have none. If you have none, you will not be able to see the wall, you will just hit it, so you probably don't want this. A fence like a chain link is so thin, that it only has 2 faces, a left and a right. A cement wall will have 3, 4, or 5. Three for a left, right and top and the 4th and 5th are the ends, that you may or may not need, depending on what connects or doesn't connect to it at the beginning and end of that track segment. For instance, as you drive into pit road at LP, we have no face on the end of our pit road seperator wall, so you can see through it. This is known as a "near" face since it is the side of the wall nearest you as you drive the right way around the track. When you get to the end of pit road, if you look in your mirror you will see we are missing the end face (far face) where the wall stops at that end of pit road. We are just going to place some faces on these ends that are not "capped" so we can't see through any fences on our track. Since we are going to do this, we should decide what mip name we are going to use so it is there and we can just adjust the coordinates as we need later on for it to look like we want. Lets call it wallend.mip. So, in CL, we will just start at segment 1 and work around to the last segment (19) and put end faces on all of our fences that need them.

Segment 1 has a wall of the same size connected to it on both ends, so we don't need any faces for those walls. Segment 2 is a different story. I know they all look connected in CL, but don't forget that the cement wall that ends at segment 2 is wider than the armco that begins in segment 3, so we want to put and end on the cement wall so it looks right. To do this, we find the w section that is -15.5 (the cement wall) in segment 2 and expand it. This shows something that says SubSection. We then expand that and it will say Right Face, Top Face, Left Face, Near Face, Far Face. This is our first face, so lets copy the right face (right click over where it says right face and select copy) and paste it (right click over where it says SubSection and select paste as far face. Now we just want to change the mip name. When you expand our new far face, you will see that is has 2 mip names that you can change. The first is the one we want to change, as the other is a shadow mip, and we are far from doing that kind of detailed editing so just ignore it. When you change the name to trackmat\wallend.mip CL is going to give you an error. Just hit continue and it will work fine. This is because of the shared value that must accompany any mip name in N2003 but it can be ignored and will work fine. Ok, we now have one face placed. Instead of needing to change that mip name every time we place a face, lets copy this one so we just have to paste. Segment 3 needs faces for the end of the pit road seperator wall and the end of the pit crew wall as they both end here. Segment 4 has that odd wall, so it needs a face on either end, so paste our face on both the near and far. Segment 5 needs nothing. Segment 6 needs a near face on the pit seperator wall. Segments 7 and 8 don't need any faces added. Remember that chain link fences are so thin that we don't need top, near or far faces for them so ignore that the chain link fence ends at segment 8. Segment 9 requires a near face for the pit crew wall and don't forget that you transition back to a cement wall there, so you need a near face for that as well. Segments 10 doesn't need anything. Segment 11 needs a far face for the pit seperator wall and the pit crew walls. Also, the cement wall ends here for the gate, so we need a far face for the cement wall as well. We need nothing for segment 12. Segment 13 requires a near face for the inside wall. Segment 14 doesn't need anything. Segment 15 needs both a near and far face for the odd wall and a far face for the regular inside wall that ends there. Segment 16 doesn't need anything. Segment 17 needs near faces for the pit seperator and pit crew walls. Segment 18 needs a near face for the cement wall so it doesn't have a hole in it and finally segment 19 doesn't need anything so we are done with the faces. Wow, that took 5 minutes tops. So easy. just remember that we need a mip called wallend.mip or the track will not load. A good thing to do would be just copy and rename a mip in our folder for now. We will be making mips later on so it in unimportant right now what it looks like. This mip needs to be placed in the trackmat folder inside of your ourtrack folder. I know, I know, you don't have on, so just create one and put the mip in there. Now the track will load with ends on all of your walls.

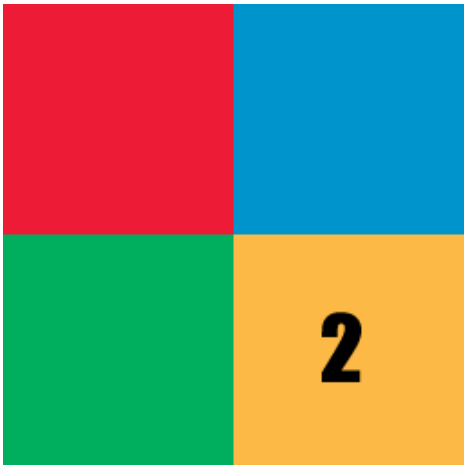
Mip Placement

Ok, now this is a little trickier. We have to learn what the values do and what they mean. How they work and which way the mip gets flipped. This is a royal pain. Try to think of it this way though. W section mips (wall mips) is like placing wall paper in a house. You want 1 strip down each wall from top to bottom and you just repeat that paper down the wall till it covers the wall end to end (corner to corner). F section mips are like laying an tough tile pattern on the floor, so that is why we start with the easy stuff 

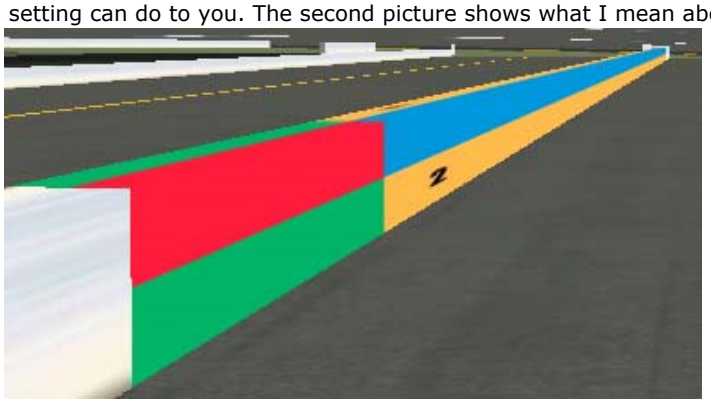
We will start with a basic mip to get us started. We will also place a number on it so we know if it is forward or backward or upside side since a mip is transparent in some respects. It is hard to describe, but if you take a piece of paper and draw a number 2 on it and rotate the paper 180 degrees then flip if over one of the axis then hold it up to a light and look through it, you will see that the number 2 is backwards. Well, because a mip is more transparent than a piece of paper, we definately need this number 2 just incase we get all flipped around so we can make sure our coordinates are correct and not just a mirror image.

Ok, lets make our base mip and call it base.mip. mips must be multiples of something or another, I really don't know because it doesn't matter to me, you just do it  I know the height and width must be one of the following numbers: 32, 64, 128, 256, 512, 1024, 2048 etc. The width and height don't need to be the same number, just one of these numbers. So, I made a bmp in

Photoshop that was 256 x 256 and split in into 4 equal corners (4 128 x 128 squares) and colored them completely different colors. I then put a number 2 in the bottom right corner for our check to make sure it doesn't get flipped. It looks like this

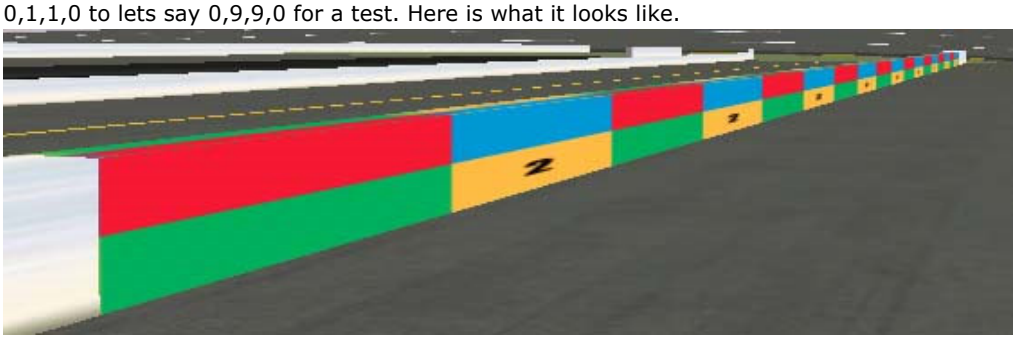


We then open winmip2 and make the bmp a mip. Select open file and open up your base.bmp. You will notice a few numbers and tabs on the right. Pull down the tab where it says bmp and change it to mip since you want to change the bmp to a mip. Then pull down the type tab and change the 10 to a 3. 10 requires an invisible color and we don't want on, so we just change it to 3 and it will work. Also change the mapp number from 3 to 0, otherwise the mip may not repeat correctly. I am not real sure of the winmip settings, I sometimes need some trial and error, but 3 works most of the time. Then select saveas and save as base.mip. Put this in your trackmat folder inside of your ourtrack folder. We want to use centerline and put the mip on a wall and see what it does. Lets use the pit seperator wall in segment 1 since our car begins right beside it, and it has a right, top and left face, so we can do multiple tests. We change the mip name just as above, remember to click continue to keep CL from crashing. Lets do this for only the right face first to get a feel for it before we move on too much. After we change the appearance name, expand the texture coord and highlight Mystery Coord 1. Make the 4 coordinates read 0, 1, 1, 0 down the list. For Mystery Coord 2, make them read 1, 1, 0, 0. Load the track and try it out. Here are 2 pictures to show you what you get. I am not sure why the mip is not even spaced over the wall and the last part repeats real wierd because for this pic I had the mapp set 3 for the mip and not 0 as you are instructed to show you what a wrong setting can do to you. The second picture shows what I mean about mips being placed inside out.



So, what happens when we change some of these values. Change Mystery Coord 1 to 1, 0, 0, 1 (opposite of what it is now) and see what it does. This centers the mip correctly, but it also flips it in a way we dont' want. We had it right the first time with 0, 1, 1, 0. You can experiment with all the different ways to get it to rotate, but I will save you the trouble and tell you that Mystery Coord 1 does the horizontal (lenght wise) of the mip and the Mystery Coord 2 does the vertical. You could flip the vertical layout of the mip be changing Mystery coord 2 to 0,0,1,1 and the green and yellow would be on top. You can also rotate the mip clockwise or counter clockwise by doing things like changing Mystery Coord 1 to 0,0,1,1 and stuff like that. No need to get that fancy, so lets just know that for a right face, we want 0,1,1,0 and 1,1,0,0 for the mystery coords to start with. Now we do a little more when repeating but that is a bit later. Here is the pick of our last test though.

Now, lets get that mip to repeat and we will be on our way to really understanding mip placement, for walls anyways. To repeat the mip along the wall (lenght wise), we change Mystery Coord 1 from 0,1,1,0 to lets say 0,9,9,0 for a test. Here is what it looks like.

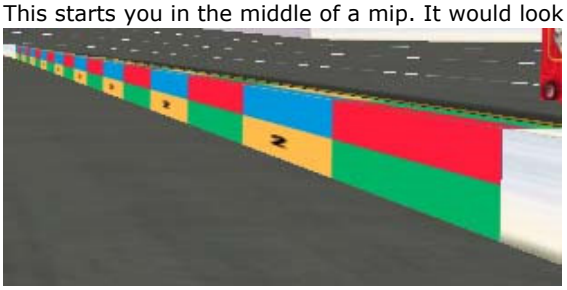


If you look closely at the top of the wall, and the inside wall picture above, you see that what is the top on the right face (red and blue) is the right side of the top face and the bottom of the left face. You can also see that the "2" is backwards, meaning that the mip is upside down. Lets fix that the best we can by doing the following.

For the top face, make the Mystery Coord 2 numbers be 1,1,0,0. For Mystery Coord 2 for the left face, make the numbers 0,0,1,1. I know the number will be backwards, but that is a problem with the Mystery Coord 1 numbers we will fix in a minute. Here is what it should look like right now.

To flip the left face wall, we change the Mystery Coord 1 numbers to 9,0,0,9. Then it looks like this

You can now read the number 2 properly, but you will see that the blue and yellow are on the right most side of the wall where on the other side, you have the red and green as the colors on that end of the wall. Since at LP, we are not doing any writing on the wall, just taking the plain while wall mip and using it backwards on the left face is ok, but if you had words and needed to get it to show up right, you would need a second mip for the left face. Now, if you have a track that has a pattern on the wall, such as Jennerstown that has a red and white wall and you need the red and white parts to line up all the way around the wall, all you do is start in the middle of a mip. How in the world do you do that? Well, you just change your Mystery Coord 1 from 9,0,0,9 to 9.5,0.5,0.5,9.5 This starts you in the middle of a mip. It would look like this.



The problem is that CL rounds our numbers, so we can't do the .5 stuff in CL, we have to do this by hand going into the xml file. It isn't that hard, because if you follow this guide http://www.psuracing.com/xmltut.html and look at the breakdown of CL, as you expand each thing, the things you need to expand in the xml are easy to find and understand. You expand the w section at 6 meters in the first segment. The last thing is the subsection which you expand and expand the texture coord one. There you have all of your mystery coords layed out and they look just like they do in CL. Change mystery coord 1 to the above mentioned 9.5, 0.5, 0.5, 9.5 and you then save and export to a ptf via CL and you will get a wall that looks just like it does in the picture right above. We are going to have to place all of you mips by hand because of this rounding error in CL, but we will just use an excel spreadsheet to do this for us.

End mips are easy to do, just the coords are a little different to get them to rotate right, but you will have to wait till after my vacation for the exact coords as I need to leave. When I get back, I will give you copies of each wall mip we are going to use, and why I picked them, and the spreadsheet and get them applied. Then we will be able to apply them in like 30 minutes tops. Then our walls will be done minus the unk value change when we set pit road!

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Butter_
Champion Driver

Joined: 25 Feb 2003
Posts: 827
Location: State College, PA

Posted: Wed Oct 08, 2003 10:13 pm Post subject: quote edit delete IP

Step 7b (Sandbox)

Basic wall mip placement

Ok, in step 7a, I gave a layout of how to do mips manually. I think that is good knowledge to have, but we are just going to take it one step further and let Sandbox do the work for us. Why use Sandbox and not CL? Simple, we are going to do our 3do's in Sandbox later and to do those in Sandbox, we need to do some other parts of the track in Sandbox to get it complient. Otherwise it remaps the mips for us and they get all crazy looking and we have to go back and redo them anyways. I have looked over Sandbox pretty well, and I would have to say that doing banking and initial setup and some other stuff down the line is much easier with CL, but for the mips and 3do's, I think we just have to do them in SB or it will cause more headaches for us, right when we want to be wrapping up this project.

We are going to take a look at Steam's Sandbox (SB) section on mips (in blue) as it is a great guide to tell us what we need to know. Also, I have developed a spreadsheet that does all of the calculating for you, so that makes it even easier.

To start off, lets get our track to load in Sandbox. To do this you should read the Sandbox tutorial if you get into trouble, but I will do what I can to explain it here. First, the best way I have found is to copy of the tracks folder to your desktop (or other favorite place). Second, install SB to your copy of the tracks folder. Third, you need to unpack the ourtrack dat file (in the ourtrack folder) and the shared dat file (in the shared folder) using WinMip2. Don't forget to move everything out of the unpack folder and into the ourtrack folder (copy and paste, but DO NOT overwrite). SB is able to open up the ptf file we have so just make sure you have to most current one in your special tracks folder. You can easily move things or change things in SB without even knowing it, so backing up your work is going to be especially important!

Ok, now we are loaded in SB. First thing that we want to do is put ourselves in the proper view. Click on View and make sure that Geometry Editing View is selected. This will allow you to change the values of your f and w sections. We will start with w sections since they are easy. Look at our track and click on the first segment. You can use the arrow keys to manuveur around to the f or w section that you want to work on, so lets start by getting ourselves to the wall (w section) that is at -15.50 for both the beginning and end points. Then go to the other window that SB brings up and look at it. Here is a picture of what we have done so far.

The picture shows you which w section we have highlighted by clicking on it, and the w/f section window it brings up. In that window, you can edit the wall type, wall mips, lightmap mips, mip settings, wall width, wall height, etc. We already have the wall set to be .5 meters wide and 1.25 meters high, be perpendicular to the track and straight (not curved at top). We also want the physical setting to be .5 as well, since this is where the car physically interacts with the wall, where the other sets the visual size of the wall. We had all of this set in CL, so we don't have to mess with it here. We just want to set the mips and move on to the AI. To set a mip, we want to look at what we have learned from Steam then plug it in this spreadsheet.
http://www.psuracing.com/mipsheet.zip

Texel size is the scale size in cm of one pixel in the mip. So, say you have a mip that is 1024 x 1024 and it represents an area of 15m x 15m. That would make the Texel size 1500cm / 1024 pixels or 1.46 for both U and V. Or say you have a wall that is 0.90m tall and the mip you are using for it is 512 by 128. That would make the V size 90/128 = 0.70. If the mip is supposed to cover the wall exactly one complete time from top to bottom, you could check the "Fixed" box for V and it should end up looking the same. If the mip has the same scale in both directions, then the U size

should also be 0.70 and the mip will repeat as required along the wall.

Ok, so for us, we are going to use the armco mips from Watkins Glen to do the guard rail portions of our walls and we are going to use the wall_01 mip to do our cement walls. For the armco mip, I opened those in Photoshop 7.0 and did an overlay of white and changed the transparency to 75% so it was a white wall but maintained the shading of the armco. If you look at the mipsheet you will see that I renamed these mip files guardi for inside guardrail, guardt for the top of the wall, and guardo for the outside portion. Also note that for things like the pit road seperator walls, we will use guardi on both sides as if there are two pieces of armco with their backs to each other since this is how it is at the track in real life.

Ok, since we have opened SB and selected the cement wall on the outside of our racing groove we will start there. Lets make that mip repeat every 10 meters, so in our mipsheet we enter the name wall_01 (whitewall) and it's size that we get from opening it in WinMip2, which is 1024 pixels long and 256 pixels high. You can see that I have those dimensions entered in the excel sheet. We put 10 in the lenght it is going to cover. This is the U direction since as Steam mentioned above, the V direction we don't want to repeat, so we just check the box so it only shows once. The number that the sheet calculates for us is 0.98 and we put that in the first U box as you can see in the picture above. Wait, before you do this make sure that it is set on the right face of the wall (the facet pulldown box) and that it is the base texture (the layer pulldown box). Also make sure that you change the mip name to wall_01 in the MIP pulldown box. Ok, now that you have that done and have entered the 0.98 value, lets continue with that wall and get it setup. We need to change the layer pulldown box so that it reads lightmap and change that mip to none. We are doing this becaue we will put the shadows in later and having them in there now will make our mips appear wrong at times when we try them out. Ok, since we want to cover all of the faces of this wall with the same mip, we will now go to the top mip (in the facet pulldown box) and get rid of the lightmap mip and change the base mip to wall_01. Don't forget to change the U value to 0.98 as well. Do the same for the left face. Ok, since we want to carry over this same mip setting to the next wall, we can just find the copy properties section (half way down on the left hand side) and hit the forward button. This copies these exact same settings to the next segment. This will only work if the walls join together correctly. If not, it could paste those setting to another wall that you don't want them to be copied to, so you shouldn't use it then. Now, go back to the first wall section and hit the back button on the copy properties and this copies it backwards to the wall before the s/f line. Hit the back button one more time and it will be copied to the wall before that. Good, we now have the outside frontstretch wall all covered with our base mips! You just repeat this same procedure for each section of wall you want to do. For instance, segments 3-8 I did with the right face being guardo.mip and the U value being 0.98 (see mipsheet), the top being guardt.mip and U value 0.49, and the left face (inside) being guardi.mip with U value 0.98. I then used the wall_01.mip on the outside wall for segments 9-12, then back to the guard mips for segments 13-18. For the inside walls, they were all done with the guard mips except that I used the guardi on both sides to simulate the back to back armco look. Also, the short walls that the pit crew comes over I did as the wall_01 mip. This would be the inside most wall for segments 19-21, and 1-3 on the frontstretch pit and segments 9-11.

To do the ends of the wall, which only need to be there on walls that you can see the ends of, you need to just select either the near or far ends and select a base mip. For a mip, I actually designed my own which is just a cut piece out of the wall_01 mip. I called it wallend.mip. It is 128x128.

I also want to note that I had a problem with the car being able to ride the wall and would cause some really wierd, unrealistic flips mid turn if you hit the wall, so I placed some invisible walls close to the edge of the track all the way around the inside and outside of the track. For some reason, doing this kept the car planted to the ground when it touched the wall. I will update this portion if someone can explain why this happened to me.

Last edited by Butter_ on Sat Oct 11, 2003 4:23 pm, edited 1 time in total

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