Editing Large Helmets From Scratch

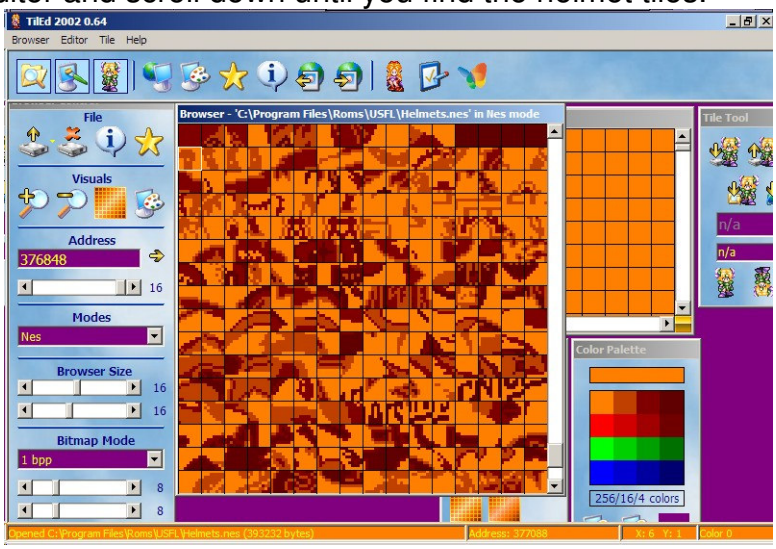
Needed:
ROM – A copy of TSB that we can destroy for fun
Tile Editor – I'm using TilEd 2002
Hex Editor – I'm using Translhextion
Emulator – I'm using FCEUXD

Tasks to accomplish:

1. Locate and edit the large helmet tiles
2. Design the logo
3. Direct the ROM to the proper tile bank and to the proper logo design
4. Move the logo on the helmet
5. Color the logo and helmet
6. Edit the type of helmet to be used

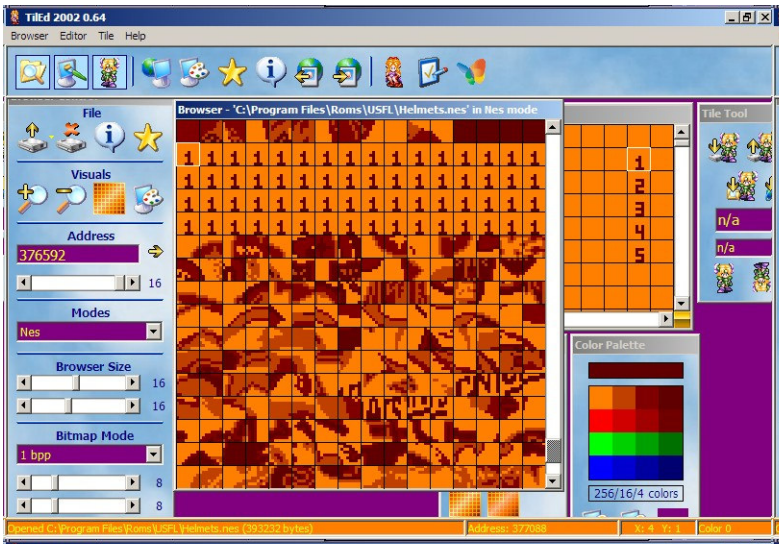
Task 1 (Locate and edit the large helmet tiles):

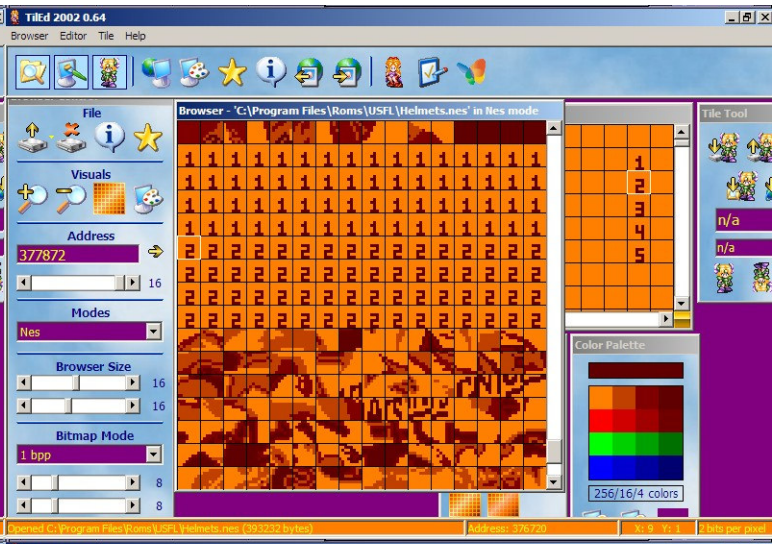
Load the ROM in the tile editor and scroll down until you find the helmet tiles.

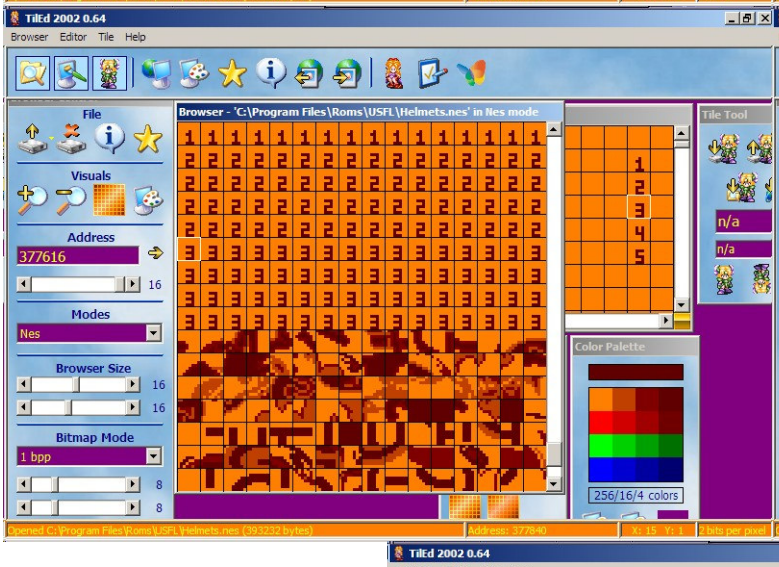


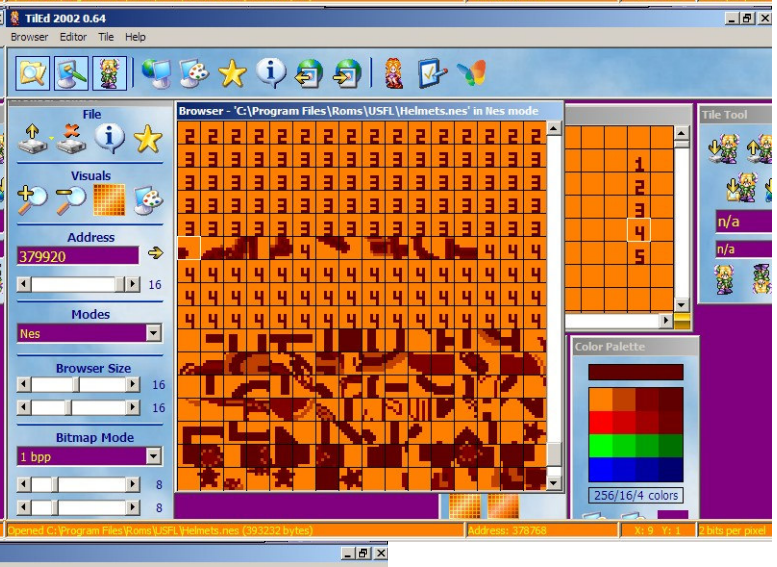
NES ROMs can only load so many tiles at once for usage; each section is called a bank. TSB has 5 banks that hold the helmet tiles and each bank contains 64 tiles. Each bank has its tiles numbered in hex from 00 to 3F. Banks 4 and 5 in TSB contain tiles that are used elsewhere by the ROM.

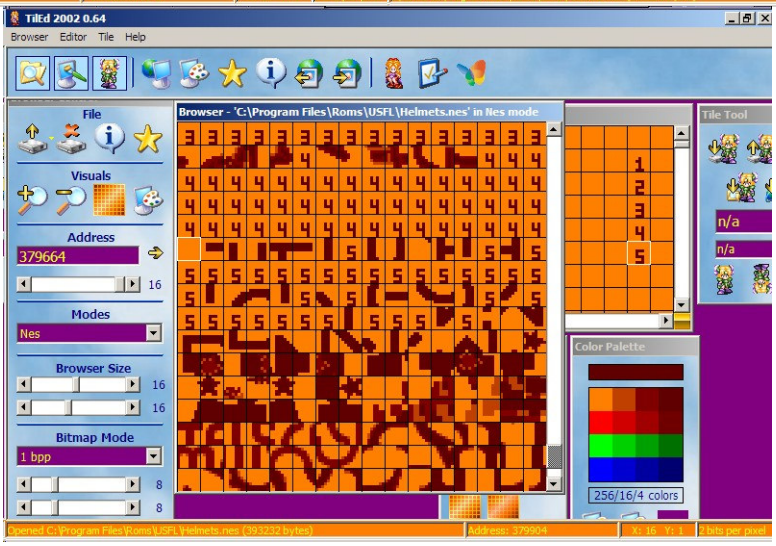
I'm going to replace every tile with the # of the bank that tile is in. You only need to replace bank 1.


TiLEd 2002 0.64
Browser Editor Tile Help
File
Visuals
Address
376592
Modes
Nes
Browser Size
Bitmap Mode
1 bpp
Browser - 'C:\Program Files\Roms\USFL\Helmets.nes' in Nes mode
Tile Tool
n/a
n/a
Color Palette
256/16/4 colors

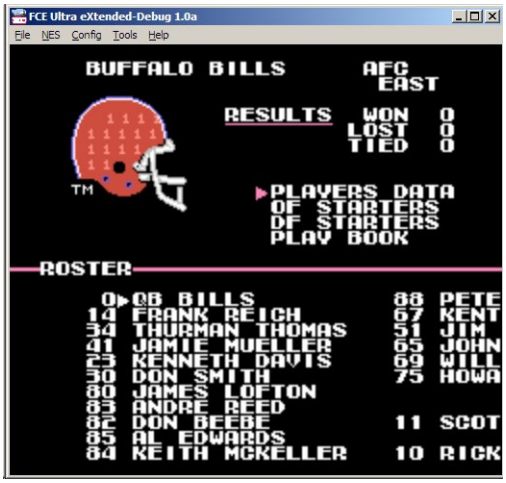

TiLEd 2002 0.64
Browser Editor Tile Help
File
Visuals
Address
377872
Modes
Nes
Browser Size
Bitmap Mode
1 bpp
Browser - 'C:\Program Files\Roms\USFL\Helmets.nes' in Nes mode
Tile Tool
n/a
n/a
Color Palette
256/16/4 colors


TiLEd 2002 0.64
Browser Editor Tile Help
File
Visuals
Address
377616
Modes
Nes
Browser Size
Bitmap Mode
1 bpp
Browser - 'C:\Program Files\Roms\USFL\Helmets.nes' in Nes mode
Tile Tool
n/a
n/a
Color Palette
256/16/4 colors


TiLEd 2002 0.64
Browser Editor Tile Help
File
Visuals
Address
379920
Modes
Nes
Browser Size
Bitmap Mode
1 bpp
Browser - 'C:\Program Files\Roms\USFL\Helmets.nes' in Nes mode
Tile Tool
n/a
n/a
Color Palette
256/16/4 colors

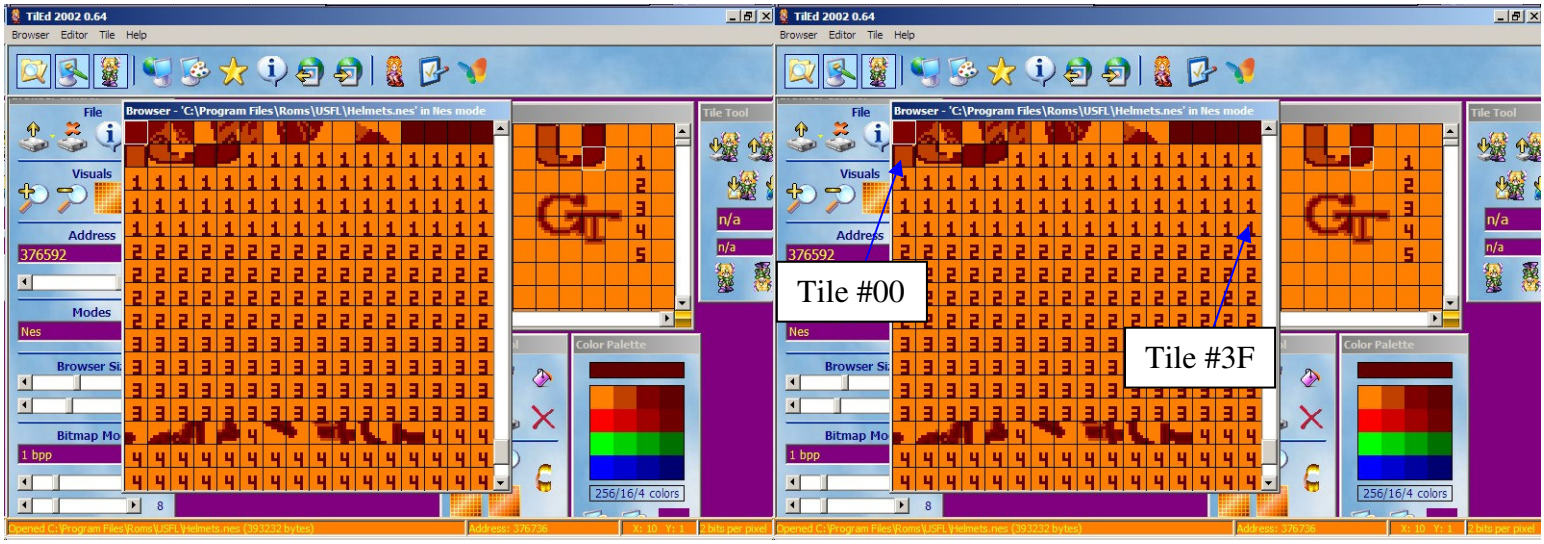

TiLEd 2002 0.64
Browser Editor Tile Help
File
Visuals
Address
379664
Modes
Nes
Browser Size
Bitmap Mode
1 bpp
Browser - 'C:\Program Files\Roms\USFL\Helmets.nes' in Nes mode
Tile Tool
n/a
n/a
Color Palette
256/16/4 colors

Once you've replaced the tiles with numbers and saved. Load up the ROM in an emulator and view Buffalo. Their helmet should now appear as:



Now return to the tile editor and let's place the logo design of the University of Miami into the ROM.

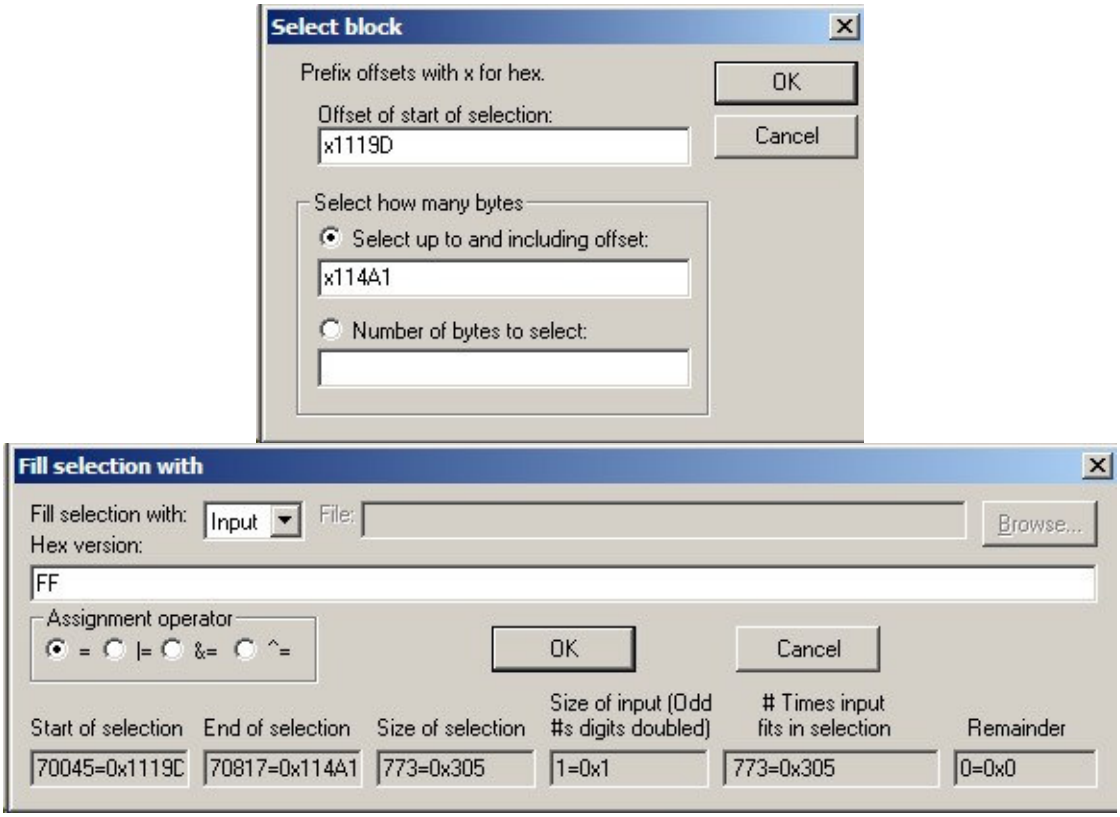
Now draw the logo and place Miami in Bank 1 tiles 00 to 04 and as shown and save.



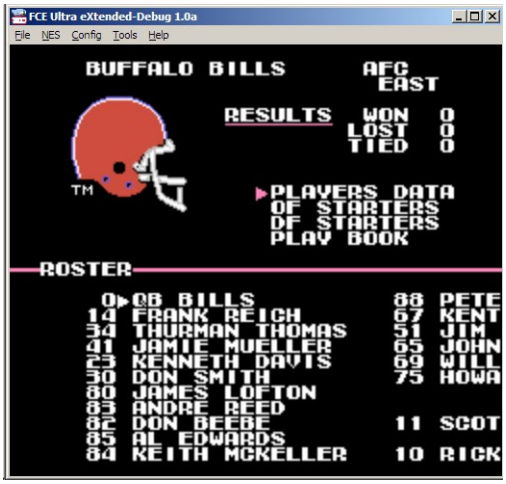
Task 2 (Design the logo):

Load the ROM in a hex editor. The large helmet logo designs are from x1119D to x114A1.

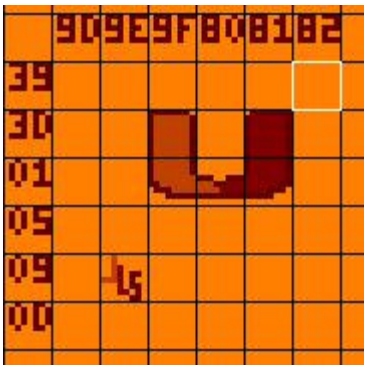
First we want to erase all the helmet designs so select x1119D to x114A1 and then fill it with FF. Using Translhextion this is easy using Ctrl+E and then Ctrl+Shift+F as shown.



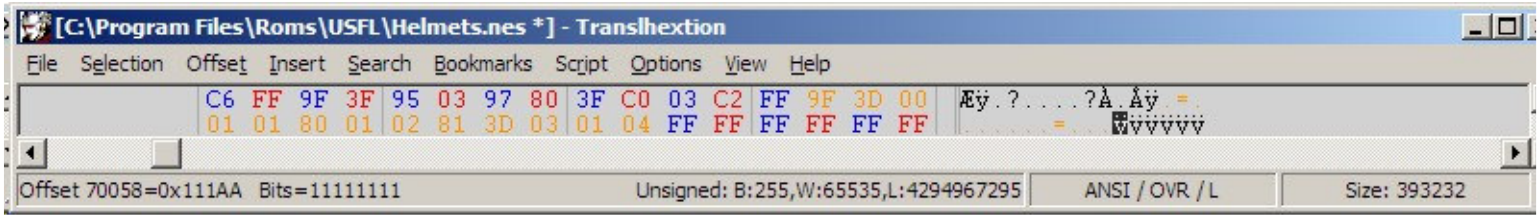
Save and load the ROM in an emulator and view Buffalo. Their helmet should appear as follows:



Now return to the hex editor and move to x1119D so we can design the logo. The logos are drawn on a grid; main columns are 9B 9C 9D 9E 9F 80 81 82 and the main rows are 39 3D 01 05 09 0D 11 or by using 79 7D 41 45 49 4D 51 the tiles will be mirrored. Using the graphic below, my initials are located at column 9E row 09 and the selected tile is at column 82 row 39.



Now let's design the Miami logo using the graphic above. At x1119D, we will type in 9F 3D 00 01 01 80 01 02 81 3D 03 01 04 FF and this means Column 9F Row 3D place Tile# 00 Row 01 place Tile# 01 Column 80 Row 01 place Tile# 02 Column 81 Row 3D place Tile# 03 Row 01 place Tile# 04 and end the design with FF.



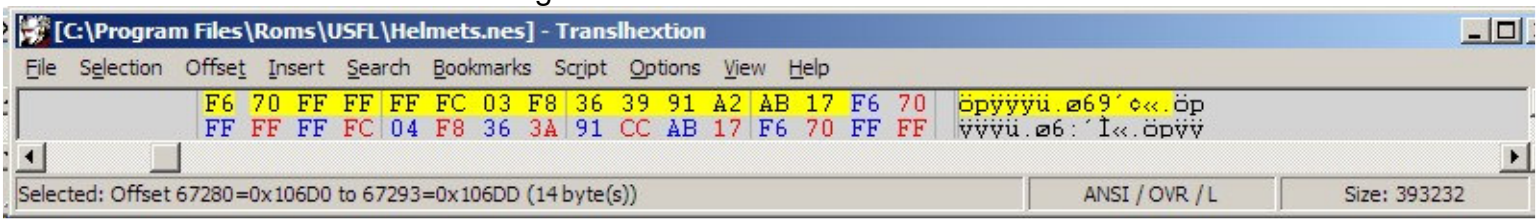
Task 3 (Direct the ROM to the proper tile bank and to the proper logo design):

First we need to use a pointer to find where our team's logo director is. Each team's pointer is listed below:

Team Offset Pointer
Buffalo x1008C C0A6
Indianapolis x1008A B2A6
Miami x1008E CEA6
New England x10090 DCA6
NY Jets x10072 F3A5
Cincinnati x10074 01A6
Cleveland x10076 0FA6
Houston x10078 1DA6
Pittsburgh x1007A 2BA6
Denver x1007C 39A6
Kansas City x1007E 47A6
LA Raiders x10092 EAA6
San Diego x10094 F8A6
Seattle x10084 88A6
Washington x1009A 22A7
NY Giants x10088 A4A6
Philadelphia x10096 06A7
Phoenix x10098 14A7
Dallas x10086 96A6
Chicago x1009C 30A7
Detroit x1009E 3EA7
Green Bay x100A0 4CA7
Minnesota x100A2 5AA7
Tampa Bay x100A4 68A7
San Francisco x100AC A0A7
LA Rams x100A8 84A7
New Orleans x100AA 92A7
Atlanta x100A6 76A7

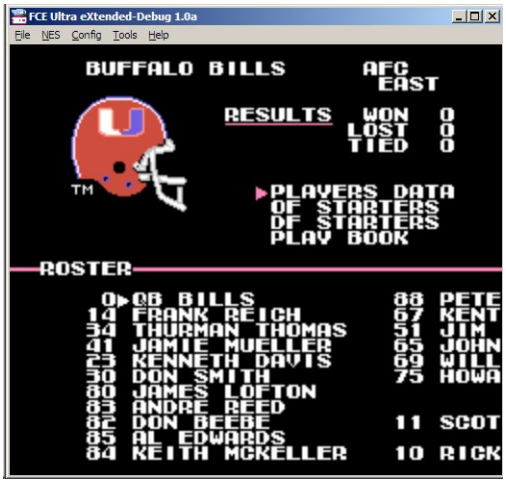
We want to go to Buffalo so our pointer is C0A6. We need to calculate the offset now. "C0" + "10" bytes for the header = D0 and "A6" + "60" = 106. Swap the two numbers we found and our offset is x106D0.

Go to x106D0 and what we are looking for is at x106D0 to x106DD.



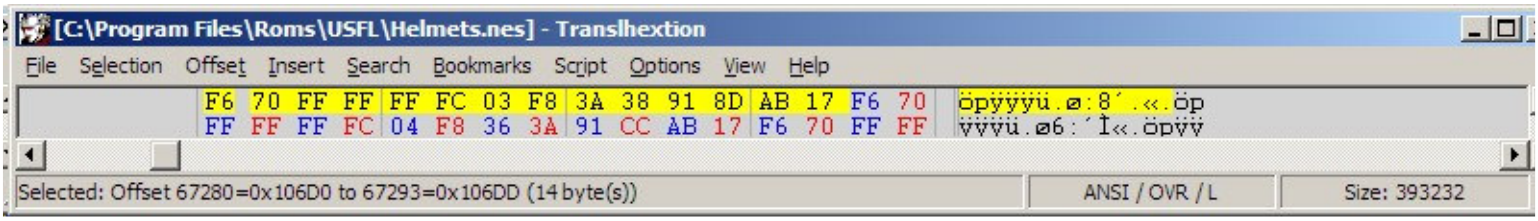
F6 70 determines which tile bank is to be used. 70 = Bank 1, 71 = Bank 2, 72 = Bank 3, 73 = Bank 4, and 74 = Bank 5. The current bank is correct so let's move along. 91 A2 is the pointer to the logo design. To calculate the pointer: "91" + "80" = 111 and "A2" + "10" = B2 so the offset is x111B2. Our logo is designed at x1119D so we need to change the pointer. "111" – "80" = 91 and "9D" – "10" = 8D so our pointer needs to be changed to 918D.

Save and load the ROM in an emulator and view Buffalo. The helmet should appear as follows:

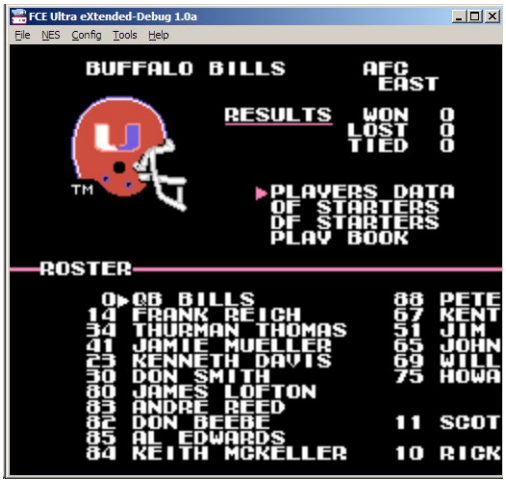


Task 4 (Move the logo on the helmet):

Return to the hex editor. 36 39 is where the logo is to be located. The first hex moves the team's logo up and down and the second hex moves the team's logo left and right. We want to change the location to 3A 38 as follows.

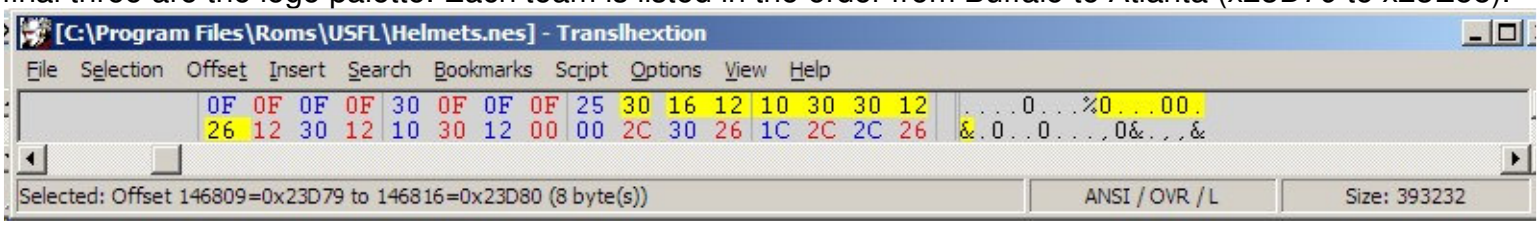


Save and load the ROM in an emulator and view Buffalo. The helmet should appear as follows:



Task 5 (Color the logo and helmet):

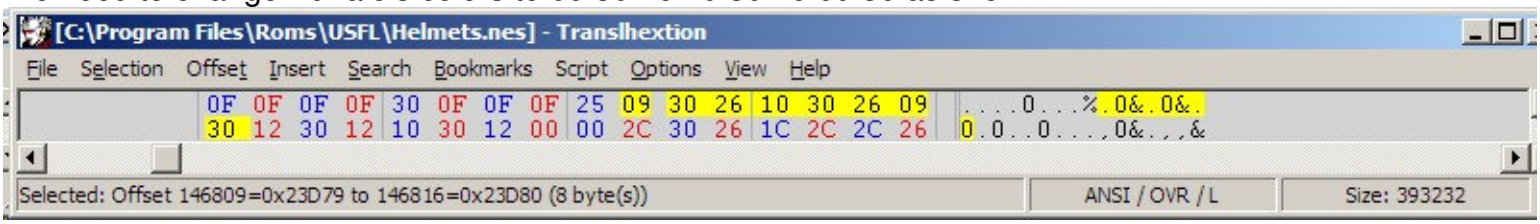
Return to the hex editor and move to x23D79. The following numbers 30 16 12 10 30 30 12 26 are the colors of Buffalo. The first three colors are the helmet palette, the next two are the facemask palette, and the final three are the logo palette. Each team is listed in the order from Buffalo to Atlanta (x23D79 to x23E58).



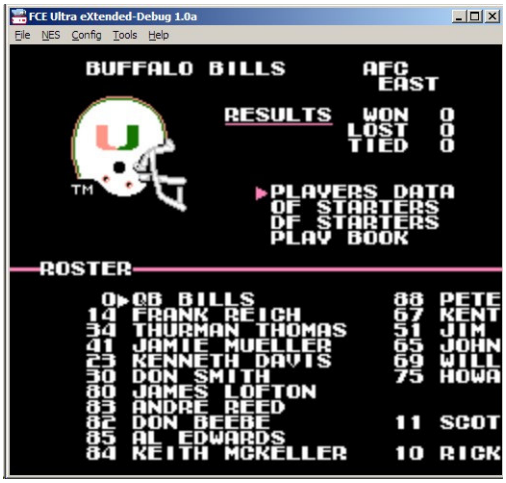
The NES palette is (not every emulator uses these exact colors but should be close):

Using the palette above 00 = Dark Grey, 30 = White, 0F = Black. The only restriction is 0D because it is a color the actual NES can't handle correctly so don't use it.

We need to change Buffalo's colors to 09 30 26 10 30 26 09 30 as shown.

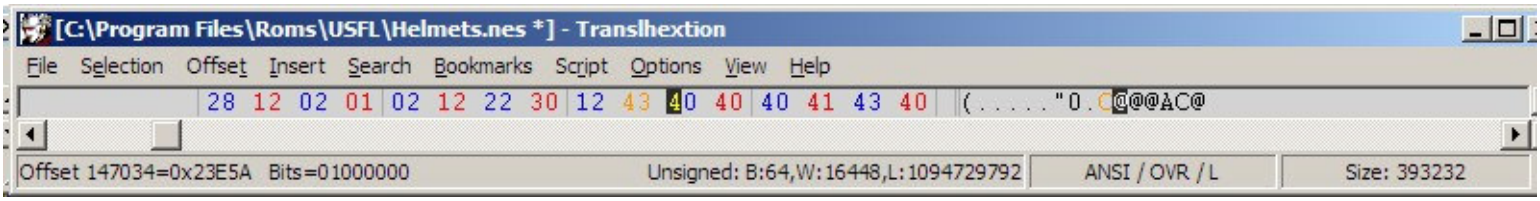


Save and load the ROM in an emulator and view Buffalo. Their helmet should be as follows:

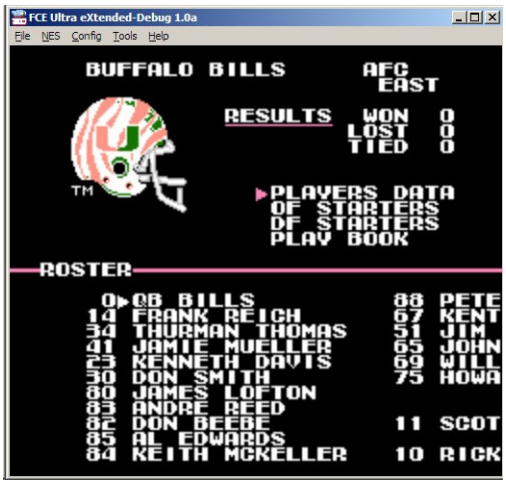


Task 6 (Edit the type of helmet to be used):

Return to the hex editor and move to x23E59. x23E59 to x23E74 tells the ROM what type of helmet is to be used for each team. 40 = 2-Striped Helmet, 41 = 1-Striped Helmet, 42 = Rams' Horn, and 43 = Bengals' Stripes. For the sake of experimentation, let's add the Bengals' Stripes to the Miami helmet. Change the first 40 to 43 as shown.



Save and load the ROM in an emulator and view Buffalo. Their helmet should be as follows:



If you have completed all the following, then congratulations you have edited a large helmet from scratch.