Editing Large Helmets From Scratch

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

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.



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• 8

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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.

Select block	×	
Prefix offsets with x for hex.	ОК	
Offset of start of selection: x1119D	Cancel	
- Select how many bytes		
 Select up to and including offset: 		
×114A1		
C Number of bytes to select:		
Fill selection with		×
Fill selection with: Input 💌 File:		Browse
FF		
Assignment operator		
• = • = • &= • • = • • • • • • • • • • • • • •	Cancel	
Size of input (Odd	# Times input	P : 1
Start of selection End of selection Size of selection the digits doubled?	hite in colochon	Bemainder

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.

1	C:\Progra	ım File	s\F	lon	15\U	JSFL	\Hel	[C:\Program Files\Roms\USFL\Helmets.nes *] - Translhextion														
Eile	Selection	Offs	e <u>t</u>	Ins	ert	Sea	rch	Book	kmark	s S	cript	Op	tions	Vie	w <u>t</u>	<u>H</u> elp						
:		C (F	FF 1	9F 80	3F 01	95 02	03	97 3D	80 03	3F 01	C0 04	03 FF	C2 FF	FF FF	9F FF	3D FF	00 FF	Æÿ.?.	?à.åÿ = = 🗷♡♡♡♡♡		
•																					▶	
Offs	Offset 70058=0x111AA Bits=11111111										Ur	nsigne	ed: B:	255,	W:65	535,	L:429	4967295	ANSI / OVR / L	Size: 393232		

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.

2	\$ [:\Program	n Files	\Ro	ms\l	JSFL	\He	lmet	s.ne	s] - 1	Trans	slhex	ction									_ 0	
	File	Selection	Offse	<u>t</u> Ir	nsert	Sea	rch	Book	kmarł	cs S	Script	Op	tions	Vie	w I	<u>H</u> elp							
			F6 FF	70 FF	FF FF	FF FC	FF 04	FC F8	03 36	F8 3A	36 91	39 CC	91 AB	A2 17	AB F6	17 70	F6 FF	70 FF	opyyy yyyu	<mark>ÿü.ø69′¢«.</mark> öp .ø6:′Ì«.öpÿÿ			
•	•																					•	1
	Selec	ted: Offset	67280=	=0x1	06D0	to 67	7293	=0x1	06DD	(14	byte((s))								ANSI / OVR / L	S	lize: 393232	

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.

2	\$ [0	C:\Program	m Files	\Ro	ms\l	JSFL	\Hel	met	s.ne	s] - 1	Frans	slhe	ction	i .										
	Eile	S <u>e</u> lection	Offset	<u>t</u> In	sert	Sea	rch	Book	cmark	s S	Script	Ор	tions	Vie	w <u>t</u>	<u>H</u> elp								
:[F6 FF	70 FF	FF FF	FF FC	FF 04	FC F8	03 36	F8 3A	3A 91	38 CC	91 AB	8D 17	AB F6	17 70	F6 FF	70 FF	öpÿÿ vvvu	<mark>ÿü.ø:8′</mark> .ø6:′Ì«	. <mark></mark> öp .öpvv			-
: .	•																							Þ
	Select	ted: Offset	67280=	=0x1	06D0	to 67	293	=0x1(06DD	(14	byte((s))								ANSI	/OVR/I	-	Size: 39323	32

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

Eile NES Config Tools Help			
BUFFAL	O BILLS	AFC EAST	r
	<u>RESULTS</u>	WON LÖST FIED	000
TM	PLAVE OF STA DF STA PLAV E	RS DAT ARTERS ARTERS BOOK	A
ROSTER			
0≜ @B 14 FRA 144 THU 41 JAEN 200 JAEN 880 880	BILLS NK REICH RMAN THOMAS IE MUELLER NETH DAVIS SMITH ES LOFTON	8671 5659 75	PETE XENT JOHN JOHN WILL HOWA
82 DON	BEEBE	11	SCOT
84 KET	EDWHRDS TH MCKELLER	10	RICK

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).

File	Selection	Offset	In	sert	Sea	rch	Book	mark	s So	ript	Opt	ions	Vier	w <u>t</u>	<u>H</u> elp						
		0F 26	0F 12	0F 30	0F 12	30 10	0F 30	0F 12	0F 00	25 00	30 2C	16 30	12 26	10 1C	30 2C	30 2C	12 26	0 &.0	% <mark>000.</mark> 00&&		
elec	ted: Offset	146809	=0x	23D7	9 to 1	468	16=0)	x23D8	80 (8	byte	(s))								ANSI / OVR /	L	Size: 393232

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

	1	2	3	4	5	6	в	9	A	В	C	D	1 3	1.3	
5															
1															
2															
з															

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.

	C:\Program	n Files	\Ro	ms\l	JSFL	\Hel	met	s.nes] - Tra	nslh	extio	1								
Eile	Selection	Offset	<u>I</u> r	nsert	Sea	rch	Book	mark	s Sc <u>r</u> i	ot g	Options	Vie	ew	Help						
-		0F 30	0F 12	0F 30	0F 12	30 10	0F 30	0F 12	0F 2 00 0	50 202	9 30 C 30	26 26	10 1C	30 2C	26 2C	09 26	(0.0.	0% <mark>.08</mark> .008	<mark>e . 0& .</mark> e &e	
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Selec	ted: Offset	146809	=0x	23D7	9 to 1	1468	16=0	x23D8	80 (8 b)	te(s))							ANSI	/OVR/L	Size: 393232

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.

1	[C:\Progra	m Files \	Roms\	USFL\He	lmets.nes '	*] - Tra	nslhextic	n			
Eil	e S <u>e</u> lection	Offset	Insert	Search	<u>B</u> ookmarks	Script	Options	<u>View</u> <u>H</u> elp			
:		28	12 02	01 02	12 22 3	30 12	43 40	40 40 41	43 40 ("O.C <mark>@@@AC@</mark>	
•											•
Of	set 147034=	0x23E5A	Bits=0	1000000			Unsign	ed: B:64,W:1	6448,L:1094729792	ANSI / OVR / L	Size: 393232

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.