Level Data

Level Pointers

World Pointers

0x24226: Number of worlds to load in the game.
0x24234: Pointer to world pointers.
B9 1C C1
0x2431C: Determines the number of levels to load for each world.
00 05 0A 0E 13 17 1B 20

Map Pointers

0x2423C: Pointer to map pointers.
B9 24 1C
0x24324: Determines what map number to load for each level.

```
25 29 C0 26 60          World 1
28 29 01 27 62          World 2
24 35 20 63             World 3
22 29 41 2C 61          World 4
2A 31 26 62             World 5
2E 23 2D 60             World 6
33 29 01 27 64          World 7
30 32 21 65             World 8
```

Addrress Pointers

0x24292: Pointer to level address low byte (B9 94 C1).
0x24394: Level address low byte.
08 71 0D
0B 74 C3 1B B0 2F 9A F1 7A E7 F1 35 4A BB 28 A3 D5 6D EB 6B CA F5
2D D2 76
17 D2 FA D8 D4 01
Simply insert the value for the low byte.
0x24297: Pointer to level address high byte (B9 B6 C1)
0x243B6: Level address high byte.
D6 D6 D7
CC CC CC CD CD CE CE CE CF CF CF D0 D0 D0 D1 D1 D1 D2 D2 D3 D3 D3
D4 D4 D5
C6 C6 C7 C8 C9 CB
Insert as high byte.
0x2429D: Determines the page to load the level data from (04).

Midway Points

0x1A286: Pointer to midway point data (BC 50 A0)
0x1A250: Data for midway points.

```
56 40       World 1
65 70       World 2
66 40       World 3
66 40       World 4
66 40       World 5
66 60       World 6
65 70       World 7
00 00       World 8
```

The first digit of the first byte is the midway point for level 1.
The second digit is for level 2.
The first digit for the second byte is level 3.
The second digit is level 4.

Level Addresses

All bytes until FD are objects for that level

BEGIN	END (FD)	LEVEL	REPEAT	MAP NUMBER
0x24817	0x248D1	W1-4	W6-4	60
0x248D2	0x249F9	W4-4		61
0x249FA	0x24AD7	W2-4	W5-4	62
0x24AD8	0x24BD3	W3-4		63
0x24BD4	0x24D00	W7-4		64
0x24D01	0x24E0A	W8-4		65
0x24E0B	0x24E73	W3-3		20
0x24E74	0x24EC2	W8-3		21
0x24EC3	0x24F1A	W4-1		22
0x24F1B	0x24FAF	W6-2		23
0x24FB0	0x2502E	W3-1		24
0x2502F	0x25099	W1-1		25
0x2509A	0x250F0	W1-3	W5-3	26
0x250F1	0x25179	W2-3	W7-3	27
0x2517A	0x251E6	W2-1		28
0x251E7	0x251F0	Pipe Entrance		29
0x251F1	0x25234	W5-1		2A
0x25235	0x25249	Sky Bonus Area (Day)		2B
0x2524A	0x252BA	W4-3		2C
0x252BB	0x25327	W6-3		2D
0x25328	0x253A2	W6-1		2E
0x253A3	0x253D4	W4-2 Warp Zone		2F
0x253D5	0x2546C	W8-1		30
0x2546D	0x254EA	W5-2		31
0x254EB	0x2556A	W8-2		32
0x2556B	0x255C9	W7-1		33
0x255CA	0x255F4	Sky Bonus Area (Night)		34
0x255F5	0x2562C	W3-2		35
0x2562D	0x256D1	W1-2		C0
0x256D2	0x25775	W4-2		C1
0x25576	0x25807	Underground Bonus Area		C2
0x25808	0x25870	Underwater Bonus Area		00
0x25871	0x2590C	W2-2	W7-2	01
0x2590D	0x25975	W8-4 Underwater		02

Header

The first two bytes of a level are its header.

Byte 1								Byte 2							
T	T	P	P	P	B	B	B	-	S	S	G	G	B	B	B

T=Time: Determines starting time.
00=Not Set
01=400
10=300
11=200

P=Mario's Y-Position: Determines where Mario starts at the beginning of the level (X-Position always 1.5).
000=(Y=-1) Falling From Sky
001=(Y=-1) Start of Area: X, From Another Room; Falling From Sky
010=(Y=10) Start on Ground
011=(Y=4) Halfway off Ground
100=(Y=-1) Falling From Sky
101=(Y=-1) Falling From Sky
110=(Y=10) Autowalk on Ground
111=(Y=10) Autowalk on Ground

B=Background: The first four affect the background while the last four affect the palette.
000=Nothing
001=Water Tilesets
010=???
011=Over Water
100=???
101=???
110=???
111=???
S=Scenery: Determines Layer 1 scenery.
00=None
01=Clouds
10=Mountains
11=Fence
G=Ground: Determines what Islands look/act like and affects the palette of the Layer 1 scenery somewhat.
00=Green and Trees
01=Orange and Mushroom
10=Bullet Machines
11=Cloud as ground
B=Brick: Determines ground structure of level.
0000=None
0001=Basic Floor
0010=Basic Floor and Ceiling
0011=Basic Floor and 3 Layer Ceiling
0100=Basic Floor and 4 Layer Ceiling
0101=Basic Floor and 8 Layer Ceiling
0110=5 Layer Floor and Ceiling
0111=5 Layer Floor and 3 Layer Ceiling
1000=5 Layer Floor and 4 Layer Ceiling
1001=6 Layer Floor and Ceiling
1010=Ceiling
1011=6 Layer Floor and 4 Layer Ceiling
1100=9 Layer Floor and Ceiling
1101=Basic Floor, 3 Layer Gap, 5 Layer Bricks, 2 Layer Gap, and Ceiling
1110=Basic Floor, 3 Layer Gap, 4 Layer Bricks, 3 Layer Gap, and Ceiling
1111=All

Level Format

Byte 1	Byte 2
X X X X Y Y Y Y	- P O O O O O O O

The first byte of an object determines its coordinates.

X X X X Y Y Y Y
X=X-Coordinate: Self explanatory.
0000=Leftmost coordinate of page
1111=Rightmost coordinate of page
Y=Y-Coordinate: If the Y-Coordinate is beyond 1011 (0x0B), the object data changes.
0000=Highest possible coordinate
1011=Lowset possible coordinate
1100=Creates extendable objects
1101=Mostly Page skip
1110=Changes background or brick and scenery
1111=Creates vertically extendable objects
The end of a level is represented by the XY byte being 0xFD.

The second byte of an object determines the object itself.

P O O O O O O O

P=New Page Flag: determines whether the object is the first one to appear on a new page/screen.

O=Object: List of objects (in hex).

00=Question Block (Mushroom)
01=Question Block (Coin)
02=Hidden Block (Coin)
03=Hidden Block (1UP Mushroom)
04=Brick (Mushroom)
05=Brick (Beanstalk) (Y-coordinate must be lower than 7)
06=Brick (Star)
07=Brick (Multiple Coins)
08=Brick (1UP Mushroom)
09=Sideways Pipe
0A=Used Block
0B=Trampoline
0C=Reverse L Pipe
0D=Flag Pole
0E=Bowser's Bridge (Legnth=1 Y=5)
0F=Nothing
10-1F=Island/Cannon
20-2F=Horizontal Brick
30-3F=Horizontal Block
40-4F=Horizontal Coins
50-5F=Vertical Brick
60-6F=Vertical Block
70-77=Pipe (Player Can't Enter)
78-7F=Pipe (Player Can Enter)

Objects for 1100.

00-0F=Hole
10-1F=Balance's Horizontal Rope
20-2F=Bridge (V=7)
30-3F=Bridge (V=8)
40-4F=Bridge (V=10)
50-5F=Hole Filled with Water/Lava
60-6F=Horizonatl ?Block (V=3)
70-7F=Horizontal ?Block (V=7)

Objects for 1101.

00-3F=Page Skip
40=Reverse L Pipe
41=Flag Pole
42=Bowser's Axe
43=Rope for Axe
44=Bowser's Bridge
45=Scroll Stop (Warp Zone)
46/47=Scroll Stop
48=Red Cheep-cheep (Fly)
49=Continous Bullet Bills/Cheep-cheeps
4A=Stop Continuation
4B=Loop Command
4C-7F=DO NOT USE

Objects for 1110.

00-3f:Changes properties of second byte header.
40-47=Defines New Background Type (repeats)

The setup for objects ending in 1111 are rather odd.

Nintendo designed them in an akward format to help support all tiles

for castle and underwater levels. These objects use 3 bytes rather than the standard 2 bytes.
Objects ending in 1111 are formatted like so:
X X X X 1 1 1 1 - Y Y Y Y O O O O - P O O O V V V V
X=X-Coordinate: Self explanatory, works just like the original.
0000=Leftmost coordinate of page
1111=Rightmost coordinate of page
Y=Y-Coordinate: The original Y-coordinate is at 1111 (0x0F), so a new bit value is made to support Y-coordinates for certain objects.
P=New Page Flag: determines whether the object is the first one to appear on a new page/screen.
0=No
1=Yes
O=Object: This can be a little difficult to understand... First, use the first four bits of the third byte, then the last four bits of the second byte to get -P O O O O O O-
That looks better on the eyes, the following values will be based off that bit order.
V=Variable: The final four bits are what change the object. Below is the list of what the bits should be to get their values. Using values other than those specified will crash the game.
Objects for 0000 (Y is ommitted for these objects).
00-0F=Lift's Vertical Rope
10-1F=Vertical Rope For Balance Lift
20-2A=Castle****
2B-2F=DO NOT USE
30-3F=Stairs
40-4F=Long Reverse L Pipe
50-5F=Vertical Balls/Rope/Tree for climbing
60-7F=Nothing
Objects for 0010.
00-2F=DO NOT USE
30-3F=Stairs for begining
40-7F=DO NOT USE
Objects for 0100.
00-2F=DO NOT USE
30-3F=Square Ceiling Tiles
40-7F=DO NOT USE
Objects for 0110.
00-2F=DO NOT USE
30-3F=Horizontaly Extendable Edges (Right) (recomended at legnth 0)
40-7F=DO NOT USE
Objects for 1000.
00-1F=DO NOT USE
20-2F=Vertically Extendable Ceiling Tiles
30-3F=Horizontaly Extendable Edges (Left) (recomended at legnth 0)
40-7F=DO NOT USE
Objects for 1010.
00-2F=DO NOT USE
30-3F=Horizontally Extendable Bottom Left Wall (recomended at legnth 1)
40-7F=DO NOT USE
Objects for 1100.
00-2F=DO NOT USE
30-3F=Horizontally Extendable Bottom Right Wall (Includes Top Ground)
40-7F=DO NOT USE
Objects for 1110.
00-2F=DO NOT USE

30-3F=Vertical Sea Block
00-7F=DO NOT USE

Example:

To better understand how the objects are listed, look at the example
:3F 49 28:
It's bit value is :00111111 01001001 00101000:
It's X-coordinate :**0011**1111 01001001 00101000: (0x03)
It's Y-coordinate :00111111 **0100**1001 00101000: (0x04)
The Page flag :00111111 01001001 **0**0101000: No
It's Value :00111111 01001001 0010**1000**:
The Object :00111111 0100**1001** 0**010**0000: (0101001=0x29) Length=9
Vertically Extendable
Ceiling Tiles

(Note that the value is the first digit of the third byte and last digit of the second byte.
This applies in all cases.)