Mario vs. Donkey Kong 2: March of the Minis

Level structure documentation

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HEX Header

These are always found at the very beginning of every level file. These codes are needed to load primary files.

0x00 = Unknown (always set on 0A 00 00 00)
0x04 = Loads actor values (always set on 14 00 00 00)
0x08 = Loads tileset values
0x0C = Links to HEX that loads level size values
0x10 = Links to HEX that loads level special features (pipes, water, etc)

Example from Room G-1

HEADER

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	0A	00	00	00	14	00	00	00	1C	00	00	00	70	1E	00	00
10	98	1E	00	00	01	00	00	00	03	00	00	00	16	00	00	00
20	22	3B	23	3C	29	0F	0E	0D	17	16	1A	15	18	1E	12	10
30	1B	2A	56	24	4A	33	00	00								

0x14 = Amount of loaded objects, in this case only one, the Minimario (ID 03)

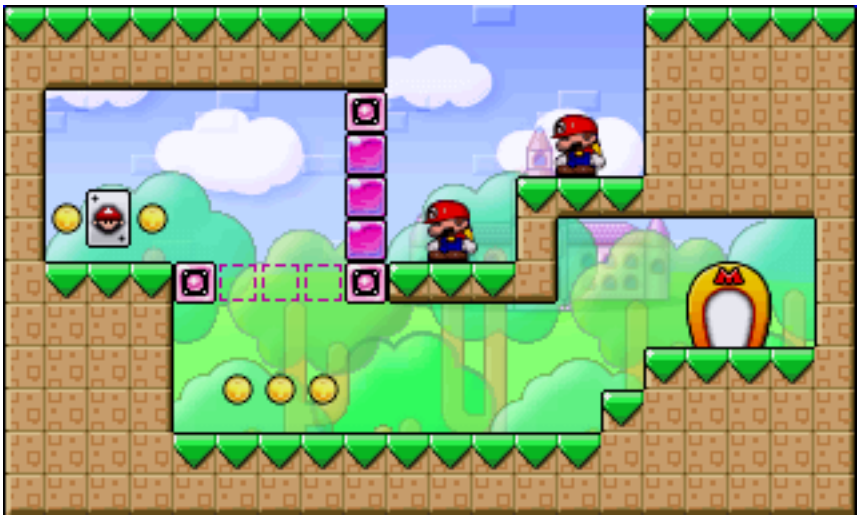
0x1C = Amount of tiles to load, in this case 22, but value is set to load 24. Every value is linked to its respective position in tileset graphic file.

All values starting at 0x20 are IDs of tiles loaded into level. For list of tileset IDs, see "HEX Tileset" paragraph.

LEVEL PROPERTIES (loaded at 0x1E70 in Room G-1)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
1E70	28	18	00	00	00	00	00	00	38	00	00	00	B8	07	00	00
1E80	B8	16	00	00	B8	16	00	00	78	1A	00	00	38	1E	00	00
1E90	60	1E	00	00	68	1E	00	00	00	00	00	00	A0	1E	00	00

0x1E70 = Level size. First value is horizontal size, second value is vertical size. HEX value is equal to its decimal * 2. In this case, 28x18 hex = 40x24 dec / 2 = 20x12 in-game tiles total.



Room G-1 is 20x12 tiles in size.

0x1E78 = HEX value where grid of object placement begins. In this case, it starts at 0x38.
0x1E7C = HEX value where grid of tileset placement begins. In this case, it starts at 0x7B8.
0x1E80 = HEX value where elevator and conveyor buttons, rotating pipes and water valves placement begins. In this case it's absent since nothing appears, so it takes same value of 0x1E84.
0x1E84 = HEX value where collision begins. In this case, it starts at 0x16B8.
0x1E88 = HEX value where warning signs begins. In this case, it starts at 0x1A78.
0x1E8C = HEX value where introductory camera begins. In this case, it starts at 0x1E38.
0x1E90 = HEX value where warp pipe algorithms begins. In this case, it starts at 0x1E60.
NOTE: since no warp pipe appears in this level, it's represented by a single byte with 00 00 00 00 value. Nevertheless, it must be put. Generally, it's signed with amount of warp pipes, and entrance/exit positions. More infos in "HEX Warp pipes" paragraph.
0x1E94 = Unknown HEX value. Leads to a byte after warp pipes values. In this case, 0x1E68.
0x1E98 = HEX value where water/lava is loaded. In this case it's absent since no water is present, so it's a simple 0 byte. Generally it's composed by 3 bytes. More infos in "HEX Water/Lava" paragraph.
0x1E9C = HEX value that should link to water/lava area size. In this case, it's 0x1EA0.
NOTE: since no water appears in this level, 0x1EA0 doesn't store any value.

HEX Actors (grid)

Grid for placement of actors follows a 8x8 pattern, so it means objects can be placed one object every half tile through whole level, both horizontally and vertically.

Using Base-10 system for better understanding, one must first duplicate number of tiles used for height of the level. This is required as actors work for every 1/2 of in-game tiles. Note that the first row matches with the top-left-most corner of the room, and it goes over the top.

For example, in Room G-1, grid of actors starts at 0x38 and ends at 0x7B8, which means it features 1,920 nybbles (780 in hex) of actor placement grid. This is confirmed by doing the following operation: 80 * 24 = 1,920.

80 is equal to value of columns that make the width of level multiplied by number of nybbles that make actors, in this case 20*4.
24 is double value of total rows that make height of level.

HEX Actors (values)

Values in brackets must be placed as additional value to second nybble. (i.e Minimario facing left: 03 80 00 00)
To-do: find more istances

Legend:
HEX AA BB (decimal value) = Object [extra values]

01 00 (001) = Empty
03 00 (003) = Minimario [00 = Right | 80 = Left | 20 = Gold Right | A0 = Gold Left]

04 00 (004) = Crashes the game
05 00 (005) = Empty
06 00 (006) = Empty
07 00 (007) = Empty
1C 00 (028) = Empty
2B 00 (043) = Door
63 00 (099) = Fish Bob-omb
64 00 (100) = Bob-omb
65 00 (101) = Spark
66 00 (102) = Oil drums (work like candles)
67 00 (103) = Minimario fireball
68 00 (104) = Thwomp
69 00 (105) = Cuttacutta (mechanical crab) [00 = Right | 80 = Left]
6A 00 (106) = Piranha Plant [30 = Up | 22 = Right | 68 = Down | A4 = Left | 02 = Right, open mouth | 10 = Up, open mouth | 48 = Down, open mouth | 84 = Left, open mouth]
6B 00 (107) = Piranha Plant fireball
6C 00 (108) = Boss 1 window
6D 00 (109) = Blooper
6E 00 (110) = Bob-omb fish
6F 00 (111) = Podoboo
70 00 (112) = Empty
73 00 (115) = Candle
74 00 (116) = Snapjaw [00 = Right | 80 = Left]
75 00 (117) = Snapjaw on liana
96 00 (150) = Elevator platform
97 00 (151) = Donut block (duplicate of C0)
98 00 (152) = Water/Lava moving platform [00 = Right | 80 = Left]
99 00 (153) = Empty
9A 00 (154) = Rock Blocks (destroyable with Bomb Blocks)
9B 00 (155) = Bomb (generated from Bomb Blocks)
9C 00 (156) = Shy Guy [00 = Right | 80 = Left]

9D 00 (157) = Wooden barrel
9E 00 (158) = Wooden crate
9F 00 (159) = Blue springboard
A2 00 (162) = Balance Beams [A2 XX 00 00 | XX = Rope height (XX*1/4)]
A3 00 (163) = Donkey Kong (boss 1)
A4 00 (164) = Yellow Vertical Gate (needed to load tiles)
A5 00 (165) = Yellow Switch (needed to load tiles)
A6 00 (166) = Hammers
A7 00 (167) = Red Vertical Gate (needed to load tiles)
A8 00 (168) = Red Switch (needed to load tiles)
A9 00 (169) = Blue Vertical Gate (needed to load tiles)
AA 00 (170) = Blue Switch (needed to load tiles)
AB 00 (171) = Rotating pipe (90° angle)
AC 00 (172) = Rotating pipe (180° angle)
AD 00 (174) = Yellow Horizontal Gate (needed to load tiles)
AE 00 (175) = Circus Kong
B2 00 (178) = Capture Kong [00 = Right | 80 = Left]
B5 00 (181) = Yellow springboard
B7 00 (183) = Spy Guy [00 = Right | 80 = Left]
B8 00 (184) = Fire Bar [00 = Clockwise | 80 = Counterclockwise]
B9 00 (185) = Crash Kong [00 = Right | 80 = Left]
BA 00 (186) = Cool Kong [00 = Right | 80 = Left]
BB 00 (187) = Moving platform on track (needed to load tiles)
BF 00 (191) = Konga (Thwomp Kong)
C0 00 (192) = Donut Block
C1 00 (193) = Polterguy [A2 = Red, facing left, Y movement, down | 21 = Red, facing right, Y movement, up | 08 = Blue, facing right, X movement, right | 89 = Blue, facing left, Y movement, down | 09 = Blue, facing right, Y movement, up | 8A = Blue, facing left, Y movement, up | 88 = Blue, facing left, X movement, left | 01 = Yellow, facing right, Y movement, down | 82 = Yellow, facing left, Y movement, up]
C2 00 (194) = Boo (unused) [00 = Right | 80 = Left]

C3 00 (195) = Mummy Guy [00 = Right | 80 = Left]
C5 00 (198) = Snifit [00 = Right | 80 = Left]

HEX Grid (tileset)

Same process for grid for actors, but result must be multiplied with the number of a tile nibbles, which is 8 (for instance, 18 00 00 00 00 00 00 00. Note that last 4 nybbles are used as well for half tile position, generally used for coins, cards and doors).

For example, in Room G-1, grid of tiles starts at 0x7B8 and ends at 0x16B8, which means it features 3,840 nybbles (F00 in hex) of tileset placement grid. This is confirmed by doing the following operation: 160 * 24 = 3,840.

160 is equal to value of columns that make the width of level multiplied by number of nybbles that make tiles, in this case 20*8.
24 is double value of total rows that make height of level.

On simpler matters, amount of nybbles of tileset is exactly the double of nybbles of actors -> 3,840 = 1,920*2

HEX Tileset

These are values set to load tileset. Every HEX is relative to the tile placement and tileset in general. The only difference is HEX used to load tiles is 0-based, while tiles used in level structure are 1-based.

Colored gates have special values that must be set correctly in order to be loaded properly. Aside actors needed to load sprites, specific values must be set:

AA BB 00 CC

AA = Tile ID
BB = Color ID (00 for blue, 01 for yellow, 02 for red)
CC = Direction (00 for right, 80 for left)

Nevertheless chosen tile, color ID must be set in order to load it correctly.

E.G. In Tropical Island, 01 00 00 80 will load a blue horizontal gate, left direction. In Pipe Works, 0F 02 00 00 will load a red vertical gate.

To-do: adding rest of floor tilesets

MUSHROOM VALLEY

00 = Conveyor Belt (middle, left)
01 = Conveyor Belt (left-most, left)
02 = Conveyor Belt (right-most, left)
03 = Conveyor Belt (middle, right)
04 = Conveyor Belt (left-most, right)
05 = Conveyor Belt (right-most, right)

06 = Elevator’s base
07 = Elevator’s column
08 = Elevator’s buttons
09 = Elevator’s top
0A = Middle Rivet Tile
0B = Left Rivet Tile
0C = Right Rivet Tile
0D = Bottom-Left Tile
0E = Bottom Tile
0F = Bottom-Right Tile
10 = Left Row Tile
11 = Empty
12 = Middle Row Tile
13 = Right Row Tile
14 = Empty
15 = Left Tile
16 = Middle Tile
17 = Right Tile
18 = Top-Left Tile
19 = Empty
1A = Top Tile
1B = Top-Right Tile
1C = Empty
1D = Bottom Column Tile
1E = Middle Column Tile
1F = Top Column Tile
20 = Empty
21 = 16x16 Tile
22 = Pink Blocks
23 = Pink Blocks (disappear effect, linked with 0x3C)
24 = Pink Blocks (divisors)
25 = 16x16 Spike Block

26 = Left Spike Block
27 = Middle Spike Block
28 = Right Spike Block
29 = Pink Blocks (appear effect, linked with 0x3B)
2A = Door
2B = Unknown
2C = Elevator's middle spot
2D = Elevator's middle spot
2E = Elevator’s platform
2F = Elevator's top
30 = Conveyor Belt’s directional button
31 = Unknown
32 = Big Coin
33 = Coin
34 = Empty
35 = Empty
3B = Pink Blocks (appear effect, linked with 0x29)
3C = Pink Blocks (disappear effect, linked with 0x23)
42 = Right-To-Bottom/Top-To-Left angle Pipe
43 = Bottom pipe entrance
44 = Right pipe entrance
45 = Vertical pipe
46 = Unknown
47 = Left pipe entrance
4A = Minimario Card (M)
4B = Minimario Card (I)
4C = Minimario Card (N)
4D = Minimario Card (I)
4E = Minimario Card (M)
4F = Minimario Card (A)
50 = Minimario Card (R)
51 = Minimario Card (I)

52 = Minimario Card (O)
57 = Left-To-Top/Bottom-To-Right angle Water Valve
58 = Incident pipe
59 = Top Water Valve exit
5A = Right Water Valve exit
5B = Left Water Valve exit
5C = Bottom Water Valve exit
5D = Right-To-Bottom/Top-To-Left angle Water Valve
5E = Left-To-Bottom/Top-To-Right angle Water Valve
5F = Right-To-Top/Bottom-To-Left angle Water Valve
60 = Horizontal Water Valve
61 = Vertical Water Valve

TROPICAL ISLAND

00 = Blue Horizontal Gate
01 = Red Horizontal Gate
02 = Yellow Horizontal Gate
03 = Conveyor Belt (middle, left)
04 = Conveyor Belt (left-most, left)
05 = Conveyor Belt (right-most, left)
06 = Conveyor Belt (middle, right)
07 = Conveyor Belt (left-most, right)
08 = Conveyor Belt (right-most, right)
09 = Elevator’s base
0A = Elevator's top
0B = Elevator’s column
0C = Elevator’s buttons
0D = Fire Flower
0E = Unknown
0F = ? Block
10 = Blue Vertical Gate
11 = Red Vertical Gate

12 = Yellow Vertical Gate
13 = Middle Rivet Tile
14 = Left Rivet Tile
15 = Right Rivet Tile
16 = Bottom-Left Tile
17 = Bottom Tile
18 = Bottom-Right Tile
19 = Left Row Tile
1A = Unknown
1B = Middle Row Tile
1C = Right Row Tile
1D = Unknown
1E = Left Tile
1F = Middle Tile
20 = Right Tile
21 = Top-Left Tile
22 = Unknown
23 = Top Tile
24 = Top-Right Tile
25 = Unknown
26 = Bottom Column Tile
27 = Middle Column Tile
28 = Top Column Tile
29 = Unknown
2A = 16x16 Tile
2B = Pink Block (appear effect, linked with 0x55)
2C = Pink Blocks (disappear effect, linked with 0x56)
2D = Pink Blocks (divisors)
2E = Left Pipe Entrance
2F = Middle Horizontal Pipe
30 = Right Pipe Entrance
31 = Bottom Pipe Entrance

32 = Top Pipe Entrance
33 = Middle Vertical Pipe
34 = Incident Pipes
35 = Right-To-Bottom/Top-To-Left angle Pipe
36 = Left-To-Bottom/Top-To-Right angle Pipe
37 = Right-To-Top/Bottom-To-Left angle Pipe
38 = Left-To-Top/Bottom-To-Right angle Pipe
39 = 16x16 Spike Block
3A = Left Spike Block
3B = Middle Spike Block
3C = Right Spike Block
3D = Blue Switch
3E = Red Switch
3F = Yellow Switch
40 = Outlined Block (unknown color)
41 = Door
42 = Elevator's stalk
43 = Elevator’s middle point
44 = Elevator’s middle point
45 = Elevator’s base
46 = Elevator’s middle point
47 = Conveyor Belt’s directional button
48 = Conveyor Belt’s directional button (beta)
49 = Big Coin
4A = Small Coin
4B = Menu Star (what…?)
4C = Unknown
4D = Unknown
4E = Unknown
4F = Unknown
50 = Unknown
51 = Unknown

52 = Water Valve
53 = Unknown
54 = Unknown
55 = Pink Blocks (appear effect, linked with 0x2B)
56 = Pink Blocks (disappear effect, linked with 0x2C)
57 = Unknown
58 = Unknown
59 = Unknown
5A = Unknown
5B = Unknown
5C = Unknown
5D = Unknown
5E = Unknown
5F = Unknown
60 = Minimario Card (M)
61 = Minimario Card (I)
62 = Minimario Card (N)
63 = Minimario Card (I)
64 = Minimario Card (M)
65 = Minimario Card (A)
66 = Minimario Card (R)
67 = Minimario Card (I)
68 = Minimario Card (O)
69 = Used ? Block
6A = Static ? Block
6B = Fragile Block
6C = Fragile Block break
6D = Door animation
6E = Top Water Valve
6F = Right Water Valve
70 = Left Water Valve
71 = Bottom Water Valve

72 = Right-To-Bottom/Top-To-Left angle Water Valve
73 = Left-To-Bottom/Top-To-Right angle Water Valve
74 = Right-To-Top/Bottom-To-Left angle Water Valve
75 = Left-To-Top/Bottom-To-Right angle Water Valve
76 = Vertical Water Valve
77 = Horizontal Water Valve
78 = Incident Water Valve
79 = Unknown

PIPE WORKS

00 = Blue Horizontal Gate
01 = Red Horizontal Gate
02 = Yellow Horizontal Gate
03 = Conveyor Belt (middle, left)
04 = Conveyor Belt (left-most, left)
05 = Conveyor Belt (right-most, left)
06 = Conveyor Belt (middle, right)
07 = Conveyor Belt (left-most, right)
08 = Conveyor Belt (right-most, right)
09 = Elevator’s base
0B = Elevator’s column
0C = Elevator’s buttons
0D = Blue Vertical Gate
0E = Red Vertical Gate
0F = Yellow Vertical Gate
10 = Middle Rivet Tile
11 = Left Rivet Tile
12 = Right Rivet Tile
13 = Bottom-Left Tile
14 = Bottom Tile
15 = Bottom-Right Tile
16 = Left Row Tile

17 = Unknown
18 = Middle Row Tile
19 = Right Row Tile
1A = Unknown
1B = Left Tile
1C = Middle Tile
1D = Right Tile
1E = Top-Left Tile
1F = Unknown
20 = Top Tile
21 = Top-Right Tile
22 = Unknown
23 = Bottom Column Tile
24 = Middle Column Tile
25 = Top Column Tile
26 = Unknown
27 = 16x16 Tile
28 = Pink Block (appear effect, linked with 0x4B)
29 = Pink Blocks (disappear effect, linked with 0x4C)
2A = Pink Blocks (divisors)
2B = Left Pipe Entrance
2C = Middle Horizontal Pipe
2D = Right Pipe Entrance
2E = Bottom Pipe Entrance
2F = Top Pipe Entrance
30 = Middle Vertical Pipe
31 = Incident Pipes
32 = Right-To-Bottom/Top-To-Left angle Pipe
33 = Left-To-Bottom/Top-To-Right angle Pipe
34 = Right-To-Top/Bottom-To-Left angle Pipe
35 = Left-To-Top/Bottom-To-Right angle Pipe
36 = 16x16 Spike Block

37 = Left Spike Block
38 = Middle Spike Block
39 = Right Spike Block
3A = Blue Switch
3B = Red Switch
3C = Yellow Switch
3D = Door
3E = Unknown
3F = Elevator's middle point
40 = Elevator's middle point
41 = Elevator's base
42 = Elevator's middle point
43 = Conveyor Belt's directional button
44 = Unknown
45 = Big Coin
46 = Small Coin
47 = Menu Star (what…?)
48 = Water Valve
49 = Unknown
4A = Unknown
4B = Pink Blocks (appear effect, linked with 0x28)
4C = Pink Blocks (disappear effect, linked with 0x29)
4D = Unused Pink Block
4E = Rotating Bar base
4F = Rotating Bar "stalk"
50 = Rotating Bar
51 = Rotating Bar conjunction
52 = Rotating Bar wheel
53 = Unknown
54 = Unknown
55 = Unknown
56 = Unknown

57 = Rotating Pipe (90° angle)
58 = Beta Bottom Pipe
59 = Beta Bottom Pipe
5A = Beta Left (or right?) Pipe
5B = Beta Left (or right?) Pipe
5C = Rotating Pipe (180° angle)
5D = Minimario Card (M)
5E = Minimario Card (I)
5F = Minimario Card (N)
60 = Minimario Card (I)
61 = Minimario Card (M)
62 = Minimario Card (A)
63 = Minimario Card (R)
64 = Minimario Card (I)
65 = Minimario Card (O)
66 = ? Block
67 = Static ? Block
68 = Used ? Block
69 = Fire Flower
6A = Door animation
6B = Horizontal Water Valve
6C = Incident Water Valve
6D = Top Water Valve
6E = Right Water Valve
6F = Left Water Valve
70 = Bottom Water Valve
71 = Right-To-Bottom/Top-To-Left angle Water Valve
72 = Left-To-Bottom/Top-To-Right angle Water Valve
73 = Right-To-Top/Bottom-To-Left angle Water Valve
74 = Left-To-Top/Bottom-To-Right angle Water Valve
75 = Vertical Water Valve
76 = Giant Vertical Pipe (used in DK Battle)

77 = Giant Bottom Pipe (used in DK Battle)
78 = Rotating pipe animation (90° angle) (linked with 0x57)
79 = Rotating pipe animation (180° angle) (linked with 0x5C)

MAGNET MANIA
LAVA DOME
TOADSTOOL CASTLE
SPOOKY ATTIC
JUNGLE HIJINKS
ATTIC
BASEMENT
SPECIAL KIT 1
SPECIAL KIT 2
SPECIAL KIT 3

HEX Buttons

To make conveyor belts' and elevator's buttons work, you need to make sure that textures are loaded, object is present in the level and its flags are correctly set.
To code them properly, you must make a string of 8 nibbles right after the end of the tileset HEX codes string and before the collision strings. The 8 nybbles must be like the following example: AA 00 BB 00 CC DD 00 00
AA = X position (its value is the double in 10-base. e.g. HEX = 0A, 10-base = 10 (10/2 = 5))
BB = Y position (same as X position)
CC = Actor value (same tile ID from tileset)
DD = Flag number

HEX Collision

Collision grid, unlike other grids, follows a 4x4 pattern, 1/4 of a normal 16x16 tile.

Every 4x4 collision tile is formed by a single nybble. Collision for blocks is set in this way: first row of nybbles state top half of block, while second row bottom half.

01 = Elevator’s column
03 = Elevator’s top column spot
04 = Elevator’s middle column spot
05 = Pink Block (outlined)
0A = Water Valve
1E = Fire Flower
30 = Door
33 = Big coin
34 = Small coin
35 = Minimario card (M)
36 = Minimario card (I)
37 = Minimario card (N)
38 = Minimario card (I)
39 = Minimario card (M)
3A = Minimario card (A)
3B = Minimario card (R)
3C = Minimario card (I)
3D = Minimario card (O)
50 = Red rivet
51 = Elevator’s base
80 = Normal ground

81 = Pink Block (filled)
82 = Pink Block (divisor)
83 = Conveyor Belt (left)
84 = Conveyor Belt (right)
8B = Magnet
8E = Vertical Pipe Entrance (top) / Vertical Water Valve (top)
8F = Vertical Pipe Entrance (bottom) / Vertical Water Valve (bottom)
90 = Horizontal Pipe Entrance (right ->) / Horizontal Water Valve (right ->)
91 = Horizontal Pipe Entrance (left <-) / Horizontal Water Valve (left <-)
93 = Rotating Pipe (180° angle)
94 = Rotating Pipe (90° angle)
98 = ? Block
9A = Fragile Block
A7 = Water Valve
FE = Spike Floor

HEX Warn collisions

Warn collision grid works the same as the normal collision grid, so it's 4x4 based as well. Warn collision are what make Minimario pending over cliffs, or when they wait for elevators. Number of nibbles is exactly the same as collision ones, though the only used one time, where they should work.

20 = Elevator waiting
80 = Cliff warning

HEX Warp Pipes

Nybbles between 2F and 39 involve pipes. For a pipe that goes outside screen, this is what it looks like:

AA BB (i.e. 32 10 and 33 10, bottom entrance and top entrance, respectively, linked)

AA = Direction of pipe entrance (2F, 31, 32, and 33 only)
BB = Number must be the same for both entrance/exit, starting from 10 onwards.

Also, warp parameters are coded apart from the main code. The warp codes are listed right after the intro camera codes, and are set like this:
1st part: X and Y positions of all pipe blocks of a single pipe. Number depends of how many you've put. Number of nibbles per block is 4: AA BB 00 00, where AA is HEX for X position (double of actual in game tile), and BB is HEX for Y position (double of actual in game tile)
2nd part: ID pipe, set in 4 nibbles. AA 00 00 00, where AA is ID, starting from 01 onwards.

Right after pipe codes, there's a set of nibbles that takes you to the next 4 nibbles, which are actually entrance and exit parameters for a warp pipe. Each is set like this:
AA BB CC DD EE FF 00 00
AA = Number of pipe tiles that make the whole pipe.
BB = Pipe ID
CC = X position of 1st warp entrance/exit (double of actual in game tile, following grid order, from top-to-left to bottom-to-right)
DD = Y position of 1st warp entrance/exit (double of actual in game tile, following grid order, from top-to-left to bottom-to-right)
EE = X position of 2nd warp entrance/exit (double of actual in game tile, following grid order, from top-to-left to bottom-to-

right)
FF = Y position of 2nd warp entrance/exit (double of actual in game tile, following grid order, from top-to-left to bottom-to-right)

Finally, last 4 nibbles bring you to the beginning of warp codes.

Example from Room 1-6

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
2F 00									04	0B	00	00	04	0D	00	00
2F 10	04	0F	00	00	04	12	00	00	07	12	00	00	2E	07	00	00
2F 20	2E	05	00	00	2E	03	00	00	2E	01	00	00	2E	17	00	80
2F 30	2E	15	00	00	02	00	00	00	3C	2F	00	00	05	**01**	02	0A
2F 40	06	10	00	00	08	2F	00	00	06	**02**	2C	06	2C	14	00	00
2F 50	1C	2F	00	00	00	00	00	00								

0x2F08 = First warp path
0x2F1C = Second warp path
0x2F34 = Amount of warp pipes
0x2F3C = Pipe 1 parameters
0x2F48 = Pipe 2 parameters

HEX Intro Camera

DS' screen shows a map of 16x12 tiles. Camera can start in a totally different position from top-left, and this placement is made according to number of tiles.

Camera properties:
AA 00 00 00 BB 00 00 00

AA = Number of camera's movements (default value is 04, 4 camera movements).
BB = Whole camera duration (default value is B4)

Camera's movement must be thought as a path. Every node is 8 nybbles, like this:

AA 00 00 00 BB 00 CC 00

AA = HEX time value when node starts
BB = X position (must be a multiple of 16 dec)
CC = Y position (must be a multiple of 16 dec)

Example from Room G-1

INTRO CAMERA (loaded at 0x1E30 in Room G-1)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F

1E30									04	00	00	00	B4	00	00	00
1E40	00	00	00	00	40	00	00	00	31	00	00	00	40	00	00	00
1E50	8C	00	00	00	00	00	00	00	B3	00	00	00	00	00	00	00

0x1E38 = Amount of camera movements. In this case, four.
0x1E3C = Total time the introductory camera lasts.

Camera 1: Initial camera. Fixed at 4 tiles away from leftmost side.
Camera 2: Starts at 31 HEX time units, starts at 4 tiles away from leftmost side.
Camera 3: Starts at 8C HEX time units, moves towards leftmost side. In short, moves towards beginning of level.
Camera 4: Starts at B3 HEX time units, fixed at 0 tiles away from leftmost side. In short, fixed on beginning of level.

HEX Water/Lava

Nybbles for water and lava areas are stored in the very last strings of the Hex code. Every water/lava area is made by 12 nibbles each, with the following settings:
AA BB CC DD EE 00 00 00 00 00 00 FF

AA = X position (corresponds to AA*1/2 tile in-game)
BB = Y position (corresponds to BB*1/2 tile in-game)
CC = Width (corresponds to CC*1/2 tile in-game)
DD = Height (corresponds to DD*1/2 tile in-game)
EE = Water Valve flag (water only. 00 if level has no Water Valve, 01 or 02 if it has them. 01 is for 1st pool, 02 is for 2nd)
FF = Behavior (only water, usually set to 80, 00 for levels with Water Valves)

Example from Room 1-3

Room 1-3 features two water areas. Properties start at 0x4D90.

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
4D90					02	00	00	00	9C	4D	00	00	08	18	0A	06
4DA0	00	00	00	00	00	00	00	80	26	18	10	06	00	00	00	00
4DB0	00	00	00	80												

0x4D94 = Amount of water areas. In this case, two.
0x4D98 = HEX that links to each water area values. In this case, to 0x4D9C, just 4 nybbles later.
Water area 1: X at 4 (8 HEX, 8 dec), Y at 12 (18 HEX, 24 dec), width of 5 (A HEX, 10 dec), height of 3 (6 HEX, 6 dec)
Water area 2: X at 19 (26 HEX, 38 dec), Y at 12 (18 HEX, 24 dec), width of 8 (10 HEX, 16 dec), height of 3 (6 HEX, 6 dec)

1st water pool is 5x3, located at X: 4, Y: 12. 2nd water pool is 8x3, located at X: 19, Y: 12.