The PGE *.LVLX file file description

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This is a level map TEXT file. All parameters have each markers and separated by sections which contains only items of defined type.

Introduction

Standart parameters:

Standart size of one block	32x32 pixels
On screen can showing height	19 blocks
On screen can showing width	25 blocks
Big height of screen	600 pixels (19 blocks without 8 pixels)
Big width of screen	800 pixels (28 blocks)
Small width of screen	512 pixels (16 blocks)
Small height of screen	480 pixels (15 blocks)

Default section positions

(Section Center)	Section (X and Y axis ranges)
-200000	**01** (-190000 : -219999)
-180000	**02** (-170000 : -189999)
-160000	**03** (-150000 : -189999)
-140000	**04** (-130000 : -149999)
-120000	**05** (-110000 : -129999)
-100000	**06** (-90000 : -109999)
-80000	**07** (-70000 : -89999)
-60000	**08** (-50000 : -69999)
-40000	**09** (-30000 : -49999)
-20000	**10** (-10000 : -29999)
0000	**11** (9999 : -9999)
20000	**12** (10000 : 29999)
40000	**13** (30000 : 49999)
-60000	**14** (50000 : 69999)
80000	**15** (70000 : 89999)
100000	**16** (90000 : 109999)
120000	**17** (100000 : 129999)
140000	**18** (130000 : 149999)
160000	**19** (150000 : 169999)
180000	**20** (170000 : 189999)
200000	**21** (190000 : 209999)

- The standard size of one section zone is 29999×29999 pixels
- Y is always equal to X as Section center coordinates
- where x=0 and y=0 – is a center of 11'th section.

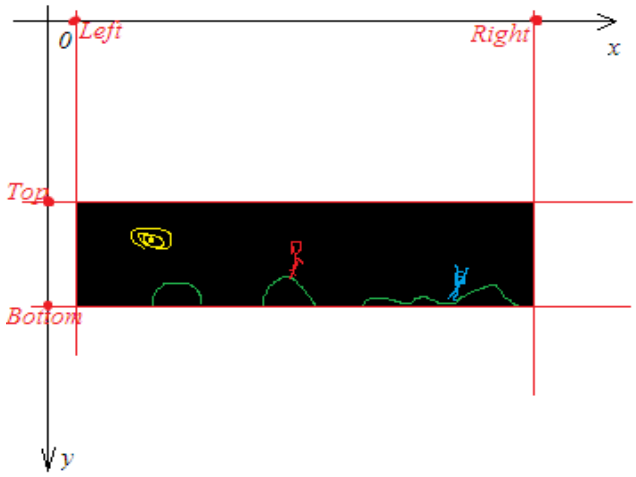
For converting from absolute coordinates to the relative of center by one section:

$$X_{n-section} = X_{absolute} - X_{Current\ section\ center}$$

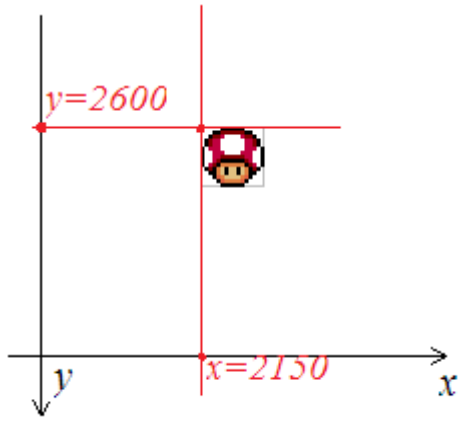
$$Y_{n-section} = Y_{absolute} - Y_{Current\ section\ center}$$

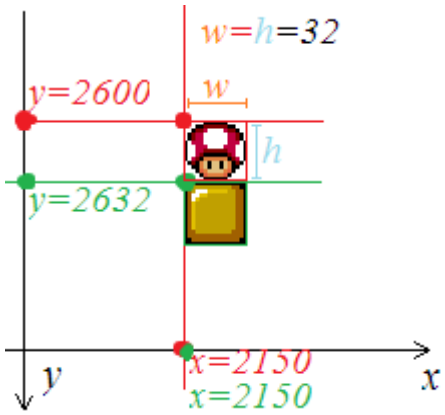
The section size and position are defined by the position of each side of the section.
height and width are calculated with a formula:

$W = |L\text{-}R|$ $H = |T\text{-}B|$



The coordinates of an object's placement is set concerning its upper left corner:
In this example, the mushroom's coordinates on the current section is: X=2150; Y=2600
and the block coordinates are: X=2150; Y=2632
Remember!
As the Y axis is turned to move an object down, it is necessary to add to the Y offset and to move up, it is necessary to subtract.





File Format Specification

The reference designations:

- standart parameter
- **Comment title**
- Comment description
- **loop**
- variable
- *Special option, using only under special conditions, differently is absent*
- File format version limit
- Data type

File format version:

The version number of the file format defines data present or absent in the file.

Sections

Each data type separated by markers:
started from line **DATA1** and closed with line **DATA1_END**

for example:

SECTION
SC:1;L:-32445;R:-32436;T:-43623;B:-32677;MZ:43;MF:"test.ogg";BG:34; ← some data
SECTION_END

List of available sections:

Marker	Description
HEAD	File header
SECTION	Level sections
STARTPOINT	Player's start points
BLOCK	Blocks present on the map
BGO	BGO present on the map
NPC	NPC present on the map
PHYSICS	Physical environment zones on the map
DOORS	Warps and doors available on the map
LAYERS	Layers
EVENTS	Action-styled events
EVENT	Sub-section of action-styled events, contains list of actions
EVENTS_CLASSIC	SMBX64-compatible classic events

Data

Each data entry have each line. Parameters separated with a semicolon “;”. All parameters must have a markers. Marker and value separated by colon “:”. Non-exist markers will be skipped. Not allowing to use parameters without markers. Data-type for each parameter defining by its internal. Data-types closed by its markers. Always possible add new marker with possible to save compatible with old versions.

Example of data entry:

```
ID:24;X:-4146;Y:23566;V:-1;ZO:0;SP:-1;L:"Default"
```

Data types syntax:

12345	unsigned int/long
-31414	signed int/long
13.45	unsigned float/double
-34.772	nsigned float/double
"Hello world"	string
H48656c6c6f20776f726c64	hex encoded string
[123,54,243,33]	int/long array
["test", "cat", "dog"]	string array
0/1	bool
011011010	bool array

Also inside strings can be used sprcial safe constants:

\n	New line
\”	Safe Quotes
\\	Safe slash
\;	Semicolon
\:	colon
\[	[
\]	]
\,	Comma
\%	Percent

User's variables:

@p@	Current character's name

Data markers

File header:

Marker	Description
TL	(string) Level title
SZ	(unsigned int) Number of stars
CN	(string) Game config key.
GS	(bool) Use episode global switches (switch states will be saved)
PS	(int) Physics type (Internal physics configuration ID)
CC	(bool array) Controls flags (allow/deny control features for whole level)
CT	(int) Start level with character ID ([-1] – last used character)
TL	(long) Time limit in seconds (0 - disabled)
TA	(int) Time limit type (Kill player, Trigger event)

Level Section:

Marker	Description
SC	(unsigned int) Number of section
L	(long) Left side position X
T	(long) Top side position Y
B	(long) Bottom side position Y
R	(long) Right side position X
MZ	(unsigned int) Internal music ID
MF	(string) Custom music relative file path
BG	(unsigned int) Internal background ID
BF	(string) Custom background relative file path
CS	(bool) Connect sides flag
OE	(bool) Offscreen exit flag
SR	(bool) Right-way scroll only (No Turn-back)
SL	(bool) Left-way scroll only
GR	(int) Gravity Value
WE	(bool) Section wind flag
WD	(int) Section wind direction
WF	(int) Wind strength value
WT	(int) Weather effects
CC	(bool array) Controls flags (allow/deny control features for this section only)

Players start points:

Marker	Description
ID	(unsigned int) Player ID
X	(long) Position X
Y	(long) Position Y
D	(int) Start direction

Blocks:

Marker	Description
ID	(unsigned long) Block ID
X	(long) Position X
Y	(long) Position Y
W	(unsigned int) Width
H	(unsigned int) Height
CN	(unsigned int) NPC Content
IV	(bool) Invisible flag
SL	(bool) Slippery flag
LR	(string) Layer
ED	(string) Event slot “Destroyed”
EH	(string) Event slot “Hit”
EE	(string) Event slot “Layer is empry”

Background object:

Marker	Description
ID	(unsigned long) Background object ID
X	(long) Position X
Y	(long) Position Y
ZO	(double) Z-Offset
ZP	(int) Z-Position (Frg-2 / Frg / Default / Backgrnd / Backgrnd-2)
SP	(int) SMBX64 array sort priority (will used only on save into SMBX LVL file)
LR	(string) Layer

Non-Playable Characters:

Marker	Description
ID	(unsigned long) Background object ID
X	(long) Position X
Y	(long) Position Y
D	(int) Direction
S1	(long) Special option 1
ZP	(int) Z-Position (Frg-2 / Frg / Default / Backgrnd / Backgrnd-2)
S2	(long) Special option 2
GE	(bool) Generator flag
GT	(int) Generator type
GD	(int) Generator direction
GM	(unsigned int) Generator delay
MG	(string) NPC message
FD	(bool) Friendly flag
NM	(bool) Idle flag
BS	(bool) Boss algorithms
LR	(string) Layer
LA	(string) Attach layer
EA	(string) Event slot “Activate”
ED	(string) Event slot “Death/Take/Destroy”
ET	(string) Event slot “Talk”
EE	(string) Event slot “Layer is empty”

Physical environment zones:

Marker	Description
ET	(unsigned int) Environment type
X	(long) Position X
Y	(long) Position Y
W	(unsigned int) Width
H	(unsigned int) Height
GV	(int) Overwrite gravity value
HN	(bool) Enable hurtful for NPC
HP	(bool) Enable hurtful for Player
HV	(int) Hurtful strength (<0 – health up, 0 – safe, 1 – damage, 2, fast damage, 10 – fataly [as lava])
ST	(bool) Stream (for example, wind or water stream)
SD	(int) Stream direction
SS	(int) Stream strenght

Doors:

Marker	Description
IX	(long) Entrance position X
IY	(long) Entrance position Y
OX	(long) Exit position X
OY	(long) Exit position Y
IL	(unsigned int) Entrance lenght
OL	(unsigned int) Exit lenght
IV	(bool) Vertical entrance flag
OV	(bool) Vertical Exit flag
DT	(unsigned int) Door type
ID	(unsigned int) Entrance direction
OD	(unsigned int) Exit direction
WX	(long) World map exit X
WY	(long) World map exit Y
LF	(string) Target level file
LI	(unsigned int) Target Door ID. 0 – enter by default start point
ET	(bool) Is a level entrance
EX	(bool) Is a level exit
SL	(unsigned int) Stars needed for entrance
NV	(bool) Deny vehivles flag
AI	(bool) Allow items flag
LC	(bool) Locked flag
TW	(bool) Two-way door flag
PT	(bool) Projectile exit

Layers:

Marker	Description
LR	(string) Layer title
HD	(string) Hidden flag
LC	(string) Locked flag

Classic Events:

Marker	Description
ET	(string) Title
MG	(string) Message text
SD	(unsigned int) Play sound ID
EG	(unsigned int) End Game algorithm
LH	(string array) hide layers
LS	(string array) show layers
LT	(string array) toggle layers
SM	(string array) Music section sets
SB	(string array) Background section sets
SS	(string array) Size section sets
TE	(string) Trigger event
TD	(unsigned int) Trigger delay
DS	(bool) Disable smoke
PC	(bool array) Player's control hold keys
ML	(string) Movement layer
MX	(int) Movement layer speed X
MY	(int) Movement layer speed Y
AS	(int) Autoscroll section ID
AX	(int) Autoscroll speed X
AY	(int) Autoscroll speed Y

Event actions entry

Action-styled events contains only single entry with one marker ET, what used as level title

Actions entries example

ACT_XXX:”TEXT” ← Single-paranetric
ACT_XXX;ID:1;VL:”4564” ← Multi-parametric
DO_XXX ← Action without parameters

Actions list:

Show message: ACT_MSG

Marker	Description
-	(string) MessageText

Play sound: ACT_SND

Marker	Description
-	(unsigned int) Play sound

Hold player's keys: ACT_PCNT

Marker	Description
-	(bool array) Hold control keys

Reset player's hold keys: DO_PCNT_R

Marker	Description
-	-

Hide layers: ACT_LHIDE

Marker	Description
NS	(bool) without smoke effect
LS	(string array) layers

Show layers: ACT_LSHOW

Marker	Description
NS	(bool) without smoke effect
LS	(string array) layers

Toggle layers: ACT_LTOGGLE

Marker	Description
NS	(bool) without smoke effect
LS	(string array) layers

Toggle layers: ACT_LTOGGLE

Marker	Description
NS	(bool) without smoke effect
LS	(string array) layers

Change section music ID: ACT_SETMUS

Marker	Description
SI	(unsigned int) Section ID
MZ	(unsigned long) Music ID

Change section custom music file field: ACT_SETMUSF

Marker	Description
SI	(unsigned int) Section ID
MF	(string) Music file path

Change section background ID: ACT_SETBG

Marker	Description
SI	(unsigned int) Section ID
BG	(unsigned long) Background ID

Change section custom background file field: ACT_SETBGF

Marker	Description
SI	(unsigned int) Section ID
BF	(string) Background file path

Change section custom background file field: ACT_SRESIZE

Marker	Description
SI	(unsigned int) Section ID
L	(long) left side position X
T	(long) top side position Y
B	(long) bottom side position Y
R	(long) right side position X

Reset music ID to default: ACT_SMUS_R

Marker	Description
-	(unsigned int) Section ID

Reset background ID to default: ACT_SMUS_R

Marker	Description
-	(unsigned int) Section ID

Reset section size to default: ACT_SSIZE_R

Marker	Description
-	(unsigned int) Section ID

Reset custom music file field to default: ACT_SMUSF_R

Marker	Description
-	(unsigned int) Section ID

Reset custom background file field to default: ACT_SMUSF_R

Marker	Description
-	(unsigned int) Section ID

Set event trigger: ACT_TRIGGER

Marker	Description
TE	(string) Event title
TT	(unsigned int) Delay, d-seconds (1/10 sec)

Set layer speed motion: ACT_MOTEL

Marker	Description
LT	(string) Layer title
SX	(double) Speed X
SY	(double) Speed Y
AX	(unsigned double) Acceleration X
AY	(unsigned double) Acceleration Y

Set event trigger: ACT_AUTOSCRL

Marker	Description
SI	(string) Layer title
SX	(double) Speed X
SY	(double) Speed Y
AX	(unsigned double) Acceleration X
AY	(unsigned double) Acceleration Y

Delay next action: ACT_DELAY_NEXT

Marker	Description
-	(long) Delay time, ms