

Undertale Modding Documentation

This document is intended to serve as a reference for some of the basic functionality of the game's scripts. This includes an explanation of the global variables, frequently used local variables, NPC types and how they work, as well as handy global scripts.

Global Variables

Flags and Properties

global.plot - How far the plot has advanced.

Note: the list of values is pretty large. It's best to refer to events in the area you're modding to see what the expected plot is.

Values:

0 - Game start

1 - Begin Flowey Encounter

2 - End Flowey Encounter

...

11 - End Napstablook Encounter

...

25 - End Toriel Battle

...

51 - End Dogi Encounter

...

101 - End Papyrus Battle

...

116 - End Mad Dummy Encounter

...

122 - End Undyne Battle

...

Values in Hotland/Core drastically differ based on route (many values are completely skipped in the genocide route)

...

201 - Finish Judgment Hall

...

999 - Epilogue

global.flag - An array of 512(?) numbers that represent the game's state at that moment.

A list of flags and what they do can be found at <https://pcy.ulyssis.be/undertale/flags>. Updates and corrections can be found later in this document.

Global Variables for Player State

global.interact - determines player state

Values other than 0 will lock the player out of movement and interacting with objects

Values:

0 - Free movement, not interacting with anything

1 - Cutscene or when interacting with an object

2 - Specific to Ruins, post-spare Toriel cutscene in basement

3 - Room transition (entering battle, shops, and some cutscenes count as well)

4 - Used when falling through the floor. Examples are the cracked tiles in Ruins and falling off the Snowdin ice puzzle

5 - Menu is open. Setting to any other value will close the menu if it is open

6 - Specific to Ruins, used when Toriel leads you across the bridge of spikes

99 - Specific to Ruins, used when you flip a “plot switch” (wall-mounted switch to disable spikes) and during Toriel’s hand-holding cutscene in her house.

Note: it is possible to have `global.interact` set to 0 and yet not be able to use the menu. This behavior is determined by global flag 17 and is used in Mettaton’s Hotland cutscenes and Undyne’s chases.

Global Variables for Text and Dialogue

global.text_data_en - A map data structure that contains all of the in-game English text.

Defined in `gml_Script_textdata_en.gml`

global.text_data_ja - A map data structure that contains all of the in-game Japanese text.

Defined in `gml_Script_textdata_ja.gml`

global.msc - Message case. Determines what dialogue will be shown. Used when executing the script `gml_Script_SCR_TEXT`

global.msg[] - String array for the lines of dialogue that will be shown

global typer - Determines what the text font and voice will be

global.facechoice - Determines the character whose face will appear, if any

Values:

1 - Toriel

2 - Flowey

3 - Sans

4 - Papyrus

5 - Undyne

6 - Alphys

7 - Asgore

8 - Mettaton

9 - Asriel

global.faceemotion - Determines which specific face will appear for that character

Global Variables for Battles

global.battlegroup - A number that denotes the encounter the player will face when invoking the battler

global.mercy - Integer in the range [0, 3]:

0 - Can spare and flee. Used for random encounters, Toriel, and Undyne's red phase.

1 - Cannot flee. Used for most scripted encounters and all bosses (including minibosses) except Toriel and Asgore.

2 - Mercy button is unavailable. Only used for Asgore(?).

3 - Can only Act. Only used for Asriel's final form.

global.mnfight - Number denoting attack state:

0 - Not in attack mode

1 - Battle box is transitioning to attack, and speech bubbles exist

2 - An actual attack is in progress

3 - Battle box transitioning out of an attack, which once done returns this state to 0

4 - Seems to be a spear-blocking attack mode

5, 98, 99, -1, -2, -6, -99, -999, etc. - Seem to be arbitrary values for some cutscenes, to disable attacks and also not transition back just yet

global.myfight - Number denoting miscellaneous menu states:

0 - Default

1 - Attacking (as in, a target is on-screen)

2 - Reading text, such as ACT text

3 - Choicer (seems to be in tandem with global.bmenuno being 6)

4 - Reading item text, having just spared, or fleeing

global.mercyuse - When global.myfight is 4, this value denotes:

0: Attempting to spare

1: Attempting to flee

-1: Other (such as reading text)

-1 -2, -999, 999, 98, etc. - Arbitrary values used in some cutscenes, usually when all interaction is locked. Changes some small details, notably button highlighting.

global.bmenucoord[] - Menu selections in various menus, stored as integers:

[0] - Which battle button is selected

[1] - Which monster is being targeted (either in FIGHT or ACT)

[2] - Which action in ACT is being selected, in this orientation:

0	3
1	4
2	5

[3] - Which item is being selected in the current ITEM page, in this orientation:

0	1
2	3

[4] - Whether Spare/Flee is selected in MERCY

[5] - Unused

[6] - Which option is selected in a choicer

[7-10] - Unused

global.bmenuno - Number denoting the current sub-menu during a battle (when not in an attack):

0 - Selecting a button (i.e., FIGHT, ACT, ITEM, MERCY)

1 - Inside FIGHT, selecting a monster

2 - Inside ACT, selecting a monster

10 - Inside ACT, making an action

3 - Inside ITEM, page 1

3.5 - Inside ITEM, page 2

11 - Unused, maybe meant for using an item on a monster

4 - Inside MERCY

6 - Text choicer

999 - Weird value used by Sans, doesn't do anything in particular

global.heard - Boolean used by monster objects to track whether a message (such as from an ACT command) has been received and processed yet.

global.turntimer - Fairly obvious from its name, this is a counter that counts down every frame, tracking the duration of an attack.

global.border - Number defining what battle box size and position to use, as defined in the script `gml_Script_SCR_BORDERSETUP`, which assigns **global.idealborder[]**. This array contains the coordinates for [0] - X left position, [1] - X right position, [2] - Y top position, [3] - Y bottom position.

global.hurtanim[] - Array of hurt animation states for each monster in battle. This is first assigned by a target object (`obj_targetchoice` as an example) to 1 or 5. The values are generally as follows:

1 - Performing an attack animation (such as slicing)

Monsters typically immediately set the value to 3 after detecting this value.

They assign an alarm to *global.damagetimer*, which is also previously assigned.

This alarm usually shakes the monster, after which assigns this value to 2.

- 2 - Post-shaking or other animation, often checks whether alive or not, and deducts HP.
Resets state to 0 if not dead, often usually destroys otherwise (calling Destroy event).
- 5 - Miss text being displayed.

global.mytarget - The index of the currently targeted enemy, used for attacking and acts.

global.mntrg - The object of the currently targeted enemy.

global.talked - Rarely-used variable that is often the same as a monster's *whatiheard* variable (see below), but is also assigned in other cases. Those cases are:

- 1 - Default value assigned each turn (specifically when selecting a button)
- 90 - Attempting to flee
- 91 - Using any item

global.monster[] - An array of booleans, signifying whether a monster is alive/present or not. 0 is for the first monster, 1 is for the second, and 2 is for the third.

global.monsterinstance[] - An array of monster objects. 0 is the first monster, 1 is the second and 2 is the third.

Common Local Variables

Some local variables are common to different scripts.

myinteract - The "interact state" of an instance of `obj_interactable`:

- 0 - Default state
- 1 - Triggered (interacting with the object)
- 2 - Pre-Action (alarm[0] is set for readable objects)
- 3 - Action (usually text, goes to 0 once all the text is read)
- 4 - Savepoint Action (same as 3, but goes to 5 instead after the text (if any))
- 5 - Save Menu Open (for savepoints, is never reset to 0 for some reason)

uncan - Whether or not an object can interact or be interacted with

whatiheard - Number used in battle objects to track what ACT command has been used, and various other scene-related purposes. (See *global.bmenucoord[2]*.) This is also assigned to 6 and 7 respectively for choicers in battle (based on *global.bmenucoord[6]*).

mercymod - Likely standing for "mercy modifier," this variable is usually used to make a monster spareable, by setting it to a high or low value (the higher, the more likely to be able to

spare). This value is used in the script `gml_Script_scr_mercystandard`, which calculates whether a monster is spareable based on HP and other factors, as well as this variable.

General Functionality

Text and Dialogue

Most text and dialogue is handled by the object "OBJ_WRITER" which extends "obj_base_writer". When making a text box and dialogue appear, you will often want to first set some global variables, such as `global.msc`, `global.typer`, `global.facechoice`, `global.faceemotion`. You can then create the dialogue box with the command:

```
mydialoguer = instance_create(0, 0, obj_dialoguer)
```

This will call a script `gml_Script_SCR_TEXT` which reads the variable **global.msc** to decide which dialogue it should execute. In each of those cases, the script sets a bunch of values in the `global.msg[]` variable, and then calls a function that will make it all execute.

If you have set **global.msc** to 0, then it will expect you to provide your own values for **global.msg[]** in the local NPC script. An example of this can be found in `gml_Object_obj_nicecreamguy_Alarm_0.gml`. In this script, it sets `global.msc` to 0, and sets its own `global.msg[]` values before creating the dialoguer.

Global Flag Updates/Corrections

Data is from Undertale v1.09.

Flag	Name	Type	Notes
4	<code>undyne_trigger_override</code>	debug bool	This is less of a correction and more like a clarification. You can have exactly 1 kill. No more.
9	<code>flowey_seen_stalking</code>	range	A counter for how many times you catch flowey stalking you. Unaccessed.

17	menu_disabled	bool	Cannot open your menu if non-zero.
18	view_rotated	volatile bool	Obsolete, left-over from Undertale's Gamemaker 8 days. If non-zero, prevents obj_screen from running scr_begin and scr_end every frame (was used to draw the screen). Only set during Undyne's monologue before her battle.
37	dog_call_status	range	1 if you wait in room_ruins6 for at least 10 minutes and get the phone calls in the room. Calling Toriel in this state results in the text "* (Somewhere, signals deflected by a dog.)" Affects the dialogue in the next room (set to 2 afterward).
69	bpants_alt_dialogue	debug bool	1.00-1.001 only. Unused in later versions.
140	spared_nuzzle_champs	bool	Spare Dogamy and Dogaressa without the stick.
157	status_mewmew	range	1 if the door is open. 2 if spared. 3 if killed. Switch-only.
158	image_mewmew	range	Determines the sprite for Mad Mew Mew's NPC. Switch-only.
206	hide_hotland_npcs	debug bool	Hides Hotland NPCs in epilogue.
290	papyrus_special_attack	bool	If Papyrus uses his special attack or is encountered in Genocide. Alters dialogue for the box of attacks in his room.
291	geno_electric_puzzle	bool	If Papyrus' electric maze puzzle is encountered in Genocide. Alters Papyrus' phone call in that room if spared and dated later.
292	shrine_donation_amount	range	The amount of gold donated to the Dog Shrine.
293	shrine_donation_goal	range	The amount of gold needed to level up the Dog Shrine.
294	dog_shrine_level	range	The level the Dog Shrine has reached.
295	shrine_text_progression?	range	Determines Dog Shrine dialogue after reaching certain levels. May require further research.

296	donation_box_useable?	bool	Seems to determine whether you can use the donation box. Further investigation needed.
351	undyne_hp_left	range	Undyne's health. Used to persist hp while she chases you in the overworld (meaning it is, in fact, accessed).
360	rain_unmuted	bool	Whether the rain in Waterfall is making sound. Not part of save data.
361	rain_track1_volume	range (float)	The volume of one of the rain tracks. Not part of save data.
362	rain_track2_volume	range (float)	The volume of the other rain track. Not part of save data.
363	rain_track1	range	The sound index of rain track 1. Not part of save data.
364	rain_track2	range	The sound index of rain track 2. Not part of save data.
393	wizard_orb_special	range	Would hold the sound index of mus_star if you hold still for long enough in Madjick's battle after weakening his chaser orbs. Note that Madjick will try to caster_free this flag if it's non-zero despite it being technically unused content.
418	core_shooter_complete	bool	Do the shooter puzzle in the CORE. Turns off the bridge laser and unlocks the elevator.
419	warriors_path_complete	bool	Flip the switch at the end of the Warrior's Path in the CORE. Turns off the bridge laser and unlocks the elevator.
420	core_laser_timeout	bool	1 if you wait a full minute in room_fire_core_right for the laser to turn off. Unlocks the elevator.
421	warriors_path_progression	range	Status of the Warrior's Path in the CORE. Determines the next encounter.
475	killed_flowey	bool	This is indeed correct.
479	truelab_unsuppress_border	bool	Enables the True Lab dynamic border in room_truelab_elevator and room_truelab_hall1.

480	inside_truelab	bool	This is not a completion flag. Instead, it tells obj_mainchara to blend its sprites with gray to match the lighting.
481	truelab_red_key_status	range	1 if the key is on the ground. 2 if you pick it up. 3 if placed in its respective switch.
482	truelab_blue_key_status	range	See above.
483	truelab_green_key_status	range	See above.
484	truelab_yellow_key_status	range	See above.
485	truelab_complete	bool	This is the real complete flag. 1 if you finish watching the power switch cutscene.
486	truelab_sink_interact_count	range	The number of times you've interacted with a sink in room_truelab_operatingroom. Set to 10 after the Memoryhead encounter.
487	truelab_sink_key	range	Which sink is holding the red key. Was tempted to name "truelab_sink_how_bad_me_key" but didn't fit.
488	truelab_spared_reaperbird	bool	Spare Reaper Bird.
489	truelab_spared_lemon	bool	Spare Lemon Bread.
490	truelab_spared_endogeny	bool	Spare Endogeny. This flag is technically set as soon as you turn the fans off in room_truelab_fan, but doing so initiates the Endogeny encounter so it amounts to the same thing. Usually.
491	truelab_elevator_power	bool	1 if the power switch is flipped to turn on the elevators.
492	enable_alphys_date	bool	Locks the door to Alphys' lab. Opening the door with Undyne's Letter in either form will trigger the date.
493	true_pacifist_progression	range	8 after receiving Undyne's phone call. 9 after receiving Undyne's Letter. 10 after Alphys' date. 11 after receiving Papyrus' phone call. 12 after exiting True Lab. Must be at least 12 to get the True Pacifist Asgore cutscene.

500	but_it_refused	volatile bool	Cannot die.
502	refuse_count	range	Number of times you refuse to die.
504	asriel_turn_restore_point	range	Which turn Asriel should start at after his battle restarts.
505	saved_undyne	bool	Lost Soul Phase
506	saved_alphys	bool	Lost Soul Phase
507	saved_papyrus_sans	bool	Lost Soul Phase
508	saved_toriel_asgore	bool	Lost Soul Phase
509	decimal_hp_state	volatile range	Overrides HP display. 00.001 if 1 00.0001 if 2 00.000001 if 3 00.0000000001 if 4