

BITER BATTLES CHAMPIONSHIPS

Scenario details & ChangeLog v0.96

Scenario is based on FreeBB github "<https://github.com/Factorio-Biter-Battles/Factorio-Biter-Battles>", and was forked on 07/30/2021. It was originally created by MewMew from Comfy's servers.

Summary : Original - Alpha - Betas - Notes & values

ORIGINAL VERSION - NO CHANGE

- ✧ Pollution is deactivated
- ✧ Map sides are perfectly symmetrical.
- ✧ There is no cliff on the map.
- ✧ Turrets (2 to 16 magazines), walls, wooden chests are randomly placed around spawn.
- ✧ Few rocks may be added to spawn.
- ✧ Turrets can't be placed near nests (dist=64), what about radars ?
- ✧ River is large enough to avoid any PvP and cannot be landfilled.
- ✧ Robots can't interact with other side.
- ✧ Mines, Artillery, Nuclear bomb are disabled.
- ✧ Satellite and Silo researches are granted once you have researched speed-module-3.
- ✧ Ammo damage upgrades (*rework of ammo damage upgrades - bonuses from gun turret itself is removed, bonuses from ammo is buffed - so handheld weapons is much better - lasers buffed*)
- ✧ Etc.

Everything not mentioned below is same as the Public game (before modifications they made after 07/30/2021, see <https://github.com/Factorio-Biter-Battles/Factorio-Biter-Battles>)

ALPHA VERSION - CHANGES FROM PUBLIC GAME

- ✧ Values are mostly the same see [1] below for details.
- ✧ Little animation on player joined, new map-intro frames.
- ✧ 4 Starter Packs (regular|science|robot|combat), pack Robot comes with 2 levels of robot-speed.
- ✧ Players have empty inventory, items of the starter pack are split into 3 chests.
- ✧ "Reroll up to twice" feature in Team Manager and "?" button for procedure, tournament mode is locked.
- ✧ Revealing spawn area (127x127) 10sec after init/reroll.
- ✧ GameID in Team Manager (4+ digit for official matches, "scrim" for scrim, "training" for training mode).
- ✧ Spec/God mode, 2 levels of larger view (for specs that are admins ie streamers and referee).
- ✧ Difficulty vote changed to League, cannot be changed after match has started.
- ✧ Blueprint library on/off switch depending on league chosen (no need to go to admin panel).
- ✧ Ready for maxims (statements etc.) in left GUI for players and teams.

- ✧ Timer in left GUI measures real time played (frozen time is deduced), 10 sec countdown when match starts, 3 sec countdown after “Freeze/Unfreeze”
- ✧ Time is set at dawn on starting game (daytime = 0.6), Evo=0, Threat=9
- ✧ Automatic clear-corpses every 15 min (for better UPS), command << /clear corpses >> is maintained.
- ✧ Ore generation in spawn, plus oil [2], Silo has now 3 turrets (instead of 2) with 12 magazines each.
- ✧ First set of biter groups will attack randomly north or south.
- ✧ Science can be sent as soon as the game starts.
- ✧ Worms are half closer to the spawn, scraps give always same items (removed randomness).
{5 iron | 2 copper | 1 steel | 5 coal | 5 stone | 2 gear | 2 GC | 2 belts | 1 inserter}
- ✧ Groups of biters attack from all sides [3] and will repeat their attack angle to opponent side later for better equity (slightly randomized)
- ✧ Groups of biters can be “mixed”(50%), “full biters”(30%) or “full spitters”(20%). [3]
- ✧ Evo starts at 0%, Threat starts at 9 (avoid weird ratios at the beginning)
- ✧ No change in ratio of groups between north and south (depending on threats, 7 groups total every 2 min). Minimum of 2 groups every 2 min to each side unless threat is negative. In training mode, 3 to 6 (random) groups will attack every 2 min.
- ✧ Freeze also freeze biters (but not turrets nor factory nor researches nor craftings).
- ✧ Armageddon [4] mode after 2 hours (paused time deduced), meaning that both team will be at least at 90% evolution after 30 minutes, regardless of natural evo and science sendings. Lower EVO at 2h will grow slower than other, minimum is 1% per min (this rule aims to end games before 3h). Armageddon boosts of evo are not logged in the Mutagen Log pane.
- ✧ Results & many stats Frame at the end and exporting to files "script-output/game_(Id).json" and "script-output/game_(Id).txt"
- ✧ Mvp's GUI shows quantities of built entities (minus walls) and walls separately.
- ✧ << /force-map-reset >> commands are stored in stats (organisation will double check this)
- ✧ Removed trusted and anti-grief functionalities, players can't destroy their silo (it will respawn with 9 health), everyone can use deconstruction planner and cut/copy/paste and ingame blue prints .

BETA VERSION 0.90 - 10/06/2021

- ✧ Spec/god goes back to spectator force when reroll/reset.
- ✧ Added ores in spawn shouldn't be placed in water.
- ✧ Tweak values to increase ore in mixed patch and to slightly increase pure ore in spawn when needed [2].
- ✧ Groups of biters have 5 preferred default-way-points they use 80% of the time (with 5% chance to change one of those default-way-points). Other cases (20%) they go to random way-point (which is stored to be repeated later to the opponent team).
- ✧ Admins cannot be switched into team unless training or scrim mode .
- ✧ Tech button (research pane) only active if match has started and player is “spectator & admin”.
- ✧ Scraps give now {5 iron-2 copper-1 steel-5 coal-5 stone-2 gear-2 GC-2 belt-1 inserter}.
- ✧ Admins (streamers) have access to Crafting|Inventory|Armor|Weapons when clicking on the player name in the left GUI (not applied in this version, everyone can see it).
- ✧ More verbose : “armageddon is coming up in xx minutes/seconds”.
- ✧ New stats : *science_score* for players & teams, and sum of *deaths|killscore|built|walls|mined* for teams.

BETA VERSION 0.91 - 10/12/2021

- ✧ New command “ `/training` ” (*training mode only*), will send to self : `qty` of one `science` every `x` min.
- ✧ “You have no flask” shows with color and sprite.
- ✧ Changed way-points to global values (debug desync).
- ✧ Don't show vote if game has started (when admin joins).
- ✧ Corrected team names in Mvp's.
- ✧ Debug infinite copies of new stats (v0.9) in stats pane and exported files.
- ✧ Mutagen Log shows the correct timings of sendings.
- ✧ Minimum of 2 groups every 2 min unless threat is negative.

BETA VERSION 0.92 - 10/18/2021

- ✧ New command “ `/wavetrain` ” (*training mode only*), will set number of groups attacking self.
- ✧ Added grenades to pack4:Combat (5,5,20)→(10,10,30), removed 100 fishes & 200 stone bricks.
- ✧ Type of groups (biter|spitter|mix) are stored to be reproduced to the other team later.
- ✧ Halved the correction factor when boosts are set for Armageddon mode (so Diff is bigger) **[4]**
- ✧ Referee / streamers can see Player's camera (*click on © in leftGUI, need to be admin+spec ~~but not applied in this version, everyone can see it see v0.93~~*).
- ✧ Removed useless tabs in Fish panel (top left).
- ✧ Added mutagen values to “League” button tooltip.

BETA VERSION 0.93 - 10/28/2021

- ✧ ~~Removed “ `debug-options` ” (F4/F5) for non-admin (anticheat) (see v0.96).~~
- ✧ Correction to Armageddon in training mode (minimum boost set to 1%).
- ✧ Now, only admins as spectators can access player's camera and crafting/inventory.
- ✧ ~~Command for admins to pause the game : “ `/s-game.tick_paused=true` ” (See v0.94).~~
- ✧ Debug spec-god mode.

BETA VERSION 0.94 - 11/07/2021

- ✧ Admin “ `Pause` ” button for real pause while chat still active (*3s countdown after “ `UnPause` ”*) (see v0.96).
- ✧ Auto & Manual “ `/clear-corpses` ” remove 90% of corpses and remnants of stone furnaces and walls.
- ✧ Maxims in tooltip of players Gui (hard coded for now).
- ✧ Team manager shows spec_gods and count them.
- ✧ Updated procedure window in team manager.

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BETA VERSION 0.95 - 11/29/2021

- ✧ “ **Config training** ” GUI : Single sending, Auto-sendings, Limit number waves, Simulator (choose a pattern of science sendings from previous match and fight against them, and send science to them too).
In other words : natural evolution and sendings are correctly handled in simulation mode. Also hidden function to export sendings.
- ✧ “ **spec-god** ” mode inactive until game has started. No more red dots on maps.
- ✧ Command “ **/starting-sequence** ” to initiate official match (*same as /force-map-reset*).
- ✧ “ **League** ” is saved between rerolls/resets.
- ✧ “ **blueprint on/off** ” in tooltip of league button.

BETA VERSION 0.96 - 13/20/2021

- ✧ **Important to read** : “ **rules & updates** ” window shows when “ **/starting-sequence** ”.

A/GAMEPLAY

- ✧ Slow game speed to 0.1 during countdowns (*meaning **unpause** lasts 0.3s instead of 3 seconds*).
- ✧ Players can deconstruct fishes (bots) close to river border (*8 tiles ~ max reach range*).
- ✧ Add a shortcut for clear-corpses : use command “ **/zz** ”.
- ✧ Corpses are relocated to spawn when expire (*15 min*).
- ✧ Referee can relocate inventory of disconnected player to spawn (*e.g. substitute get back the inventory*).
- ✧ Silo is deactivated until “ **speed-module-3** ” is researched so it's not blinking anymore (*rocket silo & space-science are still granted for free*).
- ✧ Night is slightly more bright *which caused a bug in terrain generation (fixed)*.
- ✧ Removed “ **debug options** ” (*F4/F5*) for non admin (*anticheat*). Command has to be run from server console : “ **/config set allow-debug-settings false** ”

B/MANAGERS

- ✧ New “ **Manager role** ” (*previously called Spy/Coach/Substitute*) : Manager spots in the lake (*with speaker i.e. megaphone and swinging team name*). Managers see “ **crafts/inventory/camera** ” of their players.
- ✧ Managers send messages/pings to own team. Managers can run “ **/clear-corpses** ” or shortcut “ **/zz** ”.
- ✧ Managers see “ **starting** ” and “ **completed** ” researches of their team.
- ✧ Managers don't have access to “ **spec-god** ” mode, nor to “ **research** ” GUI.

C/TRAINING

- ✧ Buttons to select “ **team** ” or “ **all** ” in list of patterns. Updated patterns as of 16-dec-2021.
- ✧ Debug “ **wavetrain** ” (*could be set to 2 waves in the wrong place*).

D/SPECTATORS & GODS (streamers)

- ✧ Spec-gods and spectators share chat. Spec-gods see player died events and north/south chat.
- ✧ Spec-gods and spectators see “ **starting** ” and “ **completed** ” researches.
- ✧ Spec-gods now see player killed events in chat.
- ✧ Add command “ **/vision on/off** ” (*totally useless for now*).

E/INVENTORIES (managers and streamers)

- ✧ Up to 3 screens of inventories at the same time : Player, North, South. Screens are movable.
Note : you can change size of windows in options > interface > UI scale.
- ✧ Inventories show Craftings, Health, Armor (with equipment / energy charge), Weapons, Ammos, Cursor stack, Inventory. Buttons to “ **refresh** ” and “ **close** ”.
- ✧ Patch so inventories are not impacted by comfy_panel (fish button). Add command “ **/clear-guis** ”.

✧ Improved inventories (less UPS, movable with location stored). (continues next page)

F/TAB-PANES and RESULTS/STATS

- ✧ **MutagenLog** is first tab, first to the left of fish tab-panes (*qol for streamers*).
- ✧ **Scoreboard** shows both teams (instead of own force) and dead biters, no more global stats.
- ✧ New scoreboard **stats** : destroyed and damage delt to own walls, destroyed own furnaces and other entities, ratio [damage to own walls / kill biter score] (*lower is better*).
- For each side biters : total killed, walls/furnaces/entities **they** killed.
- ✧ Add “ **insidious** ” MVP : player who damaged the most walls.
- ✧ Add end game stats : self killed entities, self dmg walls, biters killed entities.
- ✧ Add info if max_waypoint_reached during game (to check if waves are balanced).

G/TEAM MANAGER

- ✧ Redraw all “ **team manager** ” each time needed (*so all players see same team_manager gui*).
- ✧ Remove corpse on side when moved by referee from side to island (*corpse must be empty*).
- ✧ Disconnected players are shown on their side with tag “ **:D** ” (*to move player back to spectators for substitution, player inventory is translocated to spawn*).
- ✧ Text guis : “ **custom team name** ”, “ **gameld** ” can be confirmed with <<enter>> key (*qol*).
- ✧ New functions “ seed_history ” and “ seed_forcing ” to force a given seed *--not working--*
Add a confirmation before “ **reroll** ” instead.

H/STARTING-SEQUENCE

- ✧ Alert “ **not enough** ” & Info “ **too many** ” about number of players when starting match.
- ✧ Cannot start official match if **less than 2** players on one side.
- ✧ Not limiting max players (but alert if more than 3 players on one side).
- ✧ Cannot switch to official mode from training or scrim if admin is in a team.

I/STARTER PACKS

- ✧ Starter pack chosen is shown in top gui.
- ✧ **Reroll** as well as “ **/force-map-reset** ” and “ **/starting-sequence** ” will reset starter pack button.
- ✧ Debug that match could start while changing starter pack.

J/GAME ENDING

- ✧ Spec-gods are switched back to island when game ends (*instead of restart/reroll*).
- ✧ New screen “ **Team WINS !** ” (*then delayed stats screen*).
- ✧ Add default logo on team wins screen if team has no logo.
- ✧ Cannot pause when game has finished.

J/COSMETICS

- ✧ Play a sound on every action, evenement, etc.
- ✧ Debugged cleaning ores. Remove ore in Island and Manager spots (at tick=10).
- ✧ Rework the island tiles, clear trees/rocks, spawn few trees and compilatron (no spoil).
- ✧ Add team_logo over Silo (removed when silo dies)

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NOTES AND VALUES

[1] Values for weapons, biters and science

✧ Some **buff/nerf** about ammo and turrets *i don't really understand yet* (no change) :

Public.base_ammo_modifiers = { [bullet] = 0.16, [shotgun-shell] = 1, [flamethrower] = -0.6 }

Public.base_turret_attack_modifiers = { [flamethrower-turret] = -0.8, [laser-turret] = 0.0 }

✧ In short, gun turrets are slightly buffed, flamers more nerfed (*above previous huge nerf*) like 80% in total, lasers dont change. Also upgrades from research are modified by the code (*see functions.lua*).

✧ ["max_active_biters"] = 2048, ["max_group_size"] = 420, ["biter_timeout"] = 30min
and maximum_number_group=7 every 2 min (depending on the ratio of threats).

✧ **Threat values** (no change) :

[small-spitter] = 1.5 [small-biter] = 1.5

[medium-spitter] = 4.5 [medium-biter] = 4.5

[big-spitter] = 13 [big-biter] = 13

[behemoth-spitter] = 38.5 [behemoth-biter] = 38.5

[small-worm-turret] = 8 [medium-worm-turret] = 16

[big-worm-turret] = 24 [behemoth-worm-turret] = 32

[biter-spawner] = 32 [spitter-spawner] = 32

✧ **Science values** (no change)

[automation] =10 [logistic]=25 [military]=80 [chemical]=225

[production]=1050 [utility]=1200 [space]=5000

✧ **River** should be wide enough to avoid any pvp

[border_river_width] = 44

[2] Terrain generation

✧ **Generation** use the default factorio algorithm with these values :

[water] = math.random(15, 60) * 0.01

[starting_area] = 2.5

[terrain segmentation] = math.random(30, 40) * 0.1

[coal] = {frequency = 6.5, size = 0.4, richness = 0.40}

[stone] = {frequency = 6, size = 0.4, richness = 0.35}

[copper-ore] = {frequency = 7, size = 0.5, richness = 0.45}

[iron-ore] = {frequency = 8.5, size = 0.7, richness = 0.50}

[uranium-ore] = {frequency = 2, size = 1, richness = 1}

[crude-oil] = {frequency = 8, size = 1.4, richness = 0.45}

[trees] = {frequency = math.random(8, 28) * 0.1, size = math.random(6, 14) * 0.1, richness = math.random(2, 4) * 0.1}

✧ Once the generation is done, we **count ores** in the spawn area, and we create :

one pure iron-ore patch if iron_qty<200k or iron_surface<750m²

one pure copper-ore patch if copper_qty<100k or copper_surface<350m²

one pure coal patch if coal_qty<80k or coal_surface<300m²

one pure stone patch if stone_qty<80k or stone_surface<300m²

one mixed-patch if two or more ores are missing (iron<500-600k, copper<250-300k, coal & stone<200-300k)

✧ We also **count oilfields** in a larger spawn area, and we adjust number to 2 to 5 oilfields.

✧ As much as possible, we try to not overlap patches and to avoid to put them in water.

You'll get more details in the scenario code "<https://github.com/ever-Lord/BBC>" (in terrain.lua).

[3] Biters groups behaviour, forming groups and repartition of groups

A/ In short, you can rely on repeated angles of attacks but you can be surprised at any time.

- ✧ **At the beginning**, we set up “init-waypoints” in the half ring (*radius 250 to 500*) around the spawn, with slightly more points vertically than horizontally.
- ✧ 5 of these waypoints are randomly chosen and put in the “default- waypoints” table.
- ✧ **80% of the time**, biters groups are sent to one of these 5 “default- waypoints”.
(*within 5% of the time, one “default- waypoints” is swapped with another random “init-waypoints”*).
- ✧ **20% of the time**, groups try to surprise and go to a random “init-waypoints”. That way-point is stored and will be repeated later to the other side (for better equity).

B/ Bigs and Behemoths appear as usual at 50% / 90% evolution, but first Mediums appear at 17% evo.

Groups are formed by this procedure :

- set `threat_counter = bb_threat * math_random(8, 32) * 0.01`,
- set `max_unit_count = min (math.floor(bb_threat * 0.25) + math_random(6,12), max_group_size)`,
- then 50% chance that the first part of the group is made of regular units that have spawned naturally.
Each biter/spitter added to a group deduces its threat_value to the threat_counter.
- if no biter (other 50%) or threat_counter is still positive : units are then created and added to the group, with 50% chance to be a mix of (biters/biters/spitters), 30% full biters, 20% full spitters.
- Groups are limited by `max_group_size=420`. *The process stops adding biters if the limit is reached.*
Also there is a maximum number of active biters on each side (2048). No clue where this is monitored.

C/ **Number of groups attacking each side** : 2 to 7 waves attack one side every other minute, the number depends on the ratio of threats. Low threat will have less groups attacking their side VS High threat will have more groups attacking their side. *If one threat is negative, no group will attack that side.*

[4] Armageddon and boost values

After 2 hours of gameplay, ARMAGEDDON is activated. Meaning that both teams will be at least at 90% evolution after 30 minutes, regardless of natural evo and science sendings. Lower EVO at 2h will grow very softly slower than the opponent, minimum is 1% per min. (This rule aims to end games before 3h).

- ✧ Set `Boost1 = (90-EvoMin)/30` [minimum value is =1]
Team 1 will reach 90% in 30 min, PLUS sendings from other team PLUS natural evolution of Evo)
 - ✧ Set `Boost2 = Boost1 x (EvoMax/EvoMin) x (1-Correction)`
where correction = (EvoMax-EvoMin) / (EvoMax+EvoMin) / 2
Team 2 will reach 90% in less than 30 min, PLUS sendings from other team PLUS natural evo of Evo)
(that means team that has less evo will have a lower boost than other)
 - ✧ In other words, leading team has and keep an advantage
 - ✧ Ex : say North has 65 Evo and South has 70 Evo at 120 min :
 - > at 130min NorthEvo=75, SouthEvo=80
 - > at 150min NorthEvo=95, SouthEvo=102
 - Woot, it should be 90, not 95 ?? No !! The minimum boost is 1 per min !*
 - > at 150min NorthEvo=125, SouthEvo=133
- So in this example, `boostNorth=(90-65)/30=0.83` but since it is <1, it is set to 1, and
`BoostSouth=1x(70/65)x(1-5/135/2)=1.057`

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