

JD-Plays & Mukkie Spider Hunt

Abstract

A 2 team frontier map where both players are hunting massive spidertrons a long distance across a ribbon map. Heavy RCON used by both teams to affect the spiders and the players.

Playing Tips

Tips for new players to save them reading the whole document:

- Big scary spider far to the west. Aim is to kill the spider and take the reward coin back to your market to nuke the other team and win.
- The spider is a mega spidertron. It has lots of weapons including atomic bombs and artillery shells. The atomic-bombs are only used on high value targets. The spider never runs out of standard bullets, rockets and cannon shells, with the better ammo being given by chat (RCON).
- The spider is naturally immune to artillery and tank shells, but is also immune to atomic bombs. Attack with lasers, rockets and bullets.
- The spider roams a large area and can be moved by RCON commands. It has some basic reactive behaviour for fighting and intelligently pursuing enemies, so engage with caution. Once it's suffered considerable damage it will retreat further away from you.
- When you attack the spider all the nearby biters will attack towards you. This can be very large numbers, you have been warned.
- You can't interact with the team on the other side of the divide (electric wall) or walk a spidertron near/across the divide. You can steal each other's power, so be careful how close you build power poles to the divide. It's a race against your biters to the west, not directly against the other player's team.
- Each team has a starting area of resources with continuous water to the east on a thin ribbon map.

RCON Commands

A lot of RCON commands are included within the mod. Some are for runtime changes like moving the boss spider, and others are for setup purposes like setting the team's pretty (display) names in the score GUI.

All of the commands start with *spider_* and can be found detailed in this document under their appropriate sections. They are all low level headers and so are listed in the table of contents on the left hand side of the document browser.

All of the commands include ingame help text detailing syntax and valid options. This can be accessed ingame with */h COMMAND*, i.e. */h spider_set_movement_per_minute*.

Playing schedule

JD-Play's proposal: Stream time for this is currently set to just one night a week for 3-4 hours. I'd like to know mukkies thoughts but My plan is to have this 'event' run for a few months, at least 3 if not longer. Once he finishes his Saturday night maps there is a chance it could become 2 nights a week if I can move around my other commitments.

Features

Map

2 parallel frontier maps running west, 1 for each team.

Map generation settings

These should be forced when the surface is created by the mod.

- Water generation will be disabled.
- Cliffs may be enabled, but as the map is pretty wide they will never completely block access prior to cliff explosives.

Mirroring map

The surface can be created with 2 spawn points at the desired location via scripting. This will create basically equal starting areas for the 2 player teams. Then no map mirroring logic of any type should be required. The map should be viewed to make sure initial resource expansions are not vastly unfair.

Divide between teams

- Using the Great Wall to divide the players. This is a multi staged process to achieve the desired effect:
 - An electric visual for the wall, this doesn't do anything in itself.
 - A section of tiles (2 wide) that collides with just units and prevents the pathfinder ever trying to look for a way through. Has to be limited to these to allow cliffs and resources to span the divide nicely. Means the pathfinders high level chunk connectivity check views this as 2 islands with water between them. So biters will never try to cross there.
 - A 1 tile wide entity (indestructible) that is centered between the 2 tiles. So blocks everything normal from moving through or being built on the special tiles.
 - A 20 tiles wide entity that just collides with spider legs, centered between the 2 tiles. Prevents spiders stepping anywhere near the divide. They will act like there is invisible water 10 tiles out from it.
- Scripting to monitor all damage events and if it's player team to other player team the damage is undone. This should catch most/all undesirable damage bleeding across the devide, but it is possible some will from RCON or other unknown sources.
Accepted risk.

- Each player team will be set to have a ceasefire with all other forces other than the biters on their side. This will stop any automatic targeting of the wrong things.
- Power poles could be used to connect power across the divide and steal the other team's power. This is accepted as a risk by JD and no action to counter it is desired at present (to avoid extra script overhead, although it would be very low and infrequent).
 - An idea to counter it by script would be using the `on_entity_built` event and check for power pole types and then what entities they're connected to and then have the wire removed or a warning raised. As I can't see any wire connected events.
- Players can cross only by teleporting (RCON). A periodic script should check players positions and return the player & any vehicle to their correct side. Can just run every 5 minutes, although will be very light per run time anyways.
- If players try to build/ghost on to the wrong side a script will detect and remove (mine) these. Any use of a deconstruction planner on the other side of the divide, i.e. on trees, will also be cancelled so bots don't wander across the divide (low game impact either way). Cliffs being blown up by cliff explosives on the other side is still possible and not possible/sensible to prevent.

Biters force

The biter force will be a distinct force for each team's biters.

- The force of biter buildings will be changed to the specific team biter force on chunk generation. Then they will make that force's biters.
- Biter forces will have friendly fire disabled so that a spider firing nukes won't kill its own biters or itself.

Frontier scenario layout

- The map will be a ribbon map hard coded to 16 chunks (512 tiles) per team. Tested and it does work on a height of 1024 per team as well.
- The east side of spawn will be constant water with the map allowed to grow to the west.
- Building into the east water will be prevented as we will disable landfill.

Inter team activity

There is no way for each team to see or interact with the other team in any way other than radars that give some vision/scanning across the divide. Player teams aren't "friends" and so can't interact with each other entities.

Some un-intentional activity may be possible and should be mitigated as covered by the Map > Divide between teams section.

Spidertrons

Spidertron Battles SHOULD be hard, with a high chance that the team might find the spider and die in the process of taking out the spider. Spiders won't heal, so it might take a few battles to kill the spider and gain the magic item.

Map Position

- There is a spidertron on each team's map.
- It's on the biter's force so will auto target the players.
- It starts around 5k west of spawn.
- It will move west at a constant rate per minute the server is active (un-paused).
Suggested initial value is 3. Include a command to change this as mod settings don't align with JD Plays mod design. That would be 540 tiles per 3 hours playing, or 6,480 tiles for 3 months.
 - `spider_set_movement_per_minute [Distance]`
 - Distance is how far to move the spider's area by every minute. Supports positive numbers (further from spawn) and negative numbers (closer to spawn).
- RCON command to move the spidertrons areas further from spawn. Support for each team's spidertron and another for both team's spidertrons. Should pop up an alert GUI to say it's been done in game.
 - `spider_increment_distance_from_spawn [PrimaryTeamName] [PrimaryTeamDistance] [SecondaryTeamDistanceOrPercentage]`
 - PrimaryTeamName can either be "north", "south".
 - PrimaryTeamDistance is how far to move the primary team's spider's area from its current position. Supports positive integer numbers (further from spawn) and negative integer numbers (closer to spawn). Any fraction is rounded up.
 - SecondaryTeamDistanceOrPercentage is Optional. If provided it sets how far to move the other player team's spider's area by. It can either be provided as a number like the PrimaryTeamDistance or as a percentage ie. 50%. If a percentage value is given it's used to calculate a value as a percentage of the primary team's movement distance value. So the command `spider_increment_distance_from_spawn north 30 50%`, will move the south team's spider 15 tiles, as that's 50% of the north team's 30 tiles movement.
- Have a GUI that shows spidertron's distance from spawn for each player. Toggleable would be nice. If this can include how far forward from spawn the biters have been cleared (monitor biter bases?) and how much gap is remaining that would be nice.

Behaviour

- The spidertron will roam around an area rather than being static.
- If it gets attacked it will chase the target for a distance, allowing itself to fight nearby enemy distractions on the way.
- If the spider loses too much health too quickly (10%) it will retreat to the further end of its roaming area and fall back 1k additional tiles away from the attacker's spawn. This is to stop it just being blasted at range or cheesed with base defences in 1 go.
- Spider design is to try and give some variation in how to attack it and jeopardy in trying to clear biters within its roaming area. The spider is largely reactive and designed to be a crude beast, rather than a UPS intensive micro managed thing.

- When you hurt the spidertron you will anger all of the biters in a very large area who will attack towards your spawn. This can only be triggered once per time period, currently 5 minutes. This has been set to target 1,000 tiles east of the spider and not the player's spawn, mainly to reduce pathfinder delays and as it should give a suitable counter attack feel.

Weapons, armour and ammo

- The spidertron will have health and bonus resistances:
 - Health: 100,000
 - Resistances bonuses: same structure as vanilla spider, but double flat and +20% percentage.
 - Spiders are naturally immune to mines, artillery, tank shells and fire. Can only be hurt by bullets, lasers, rockets, and explosives.
 - Changed the atomic bomb to not hurt a spidertron boss. As it is just too powerful and trying to reduce the damage it does to a spidertron boss would make rockets pointless. By default a direct hit with a nuke will do around 4,000 damage.
- The spidertron will have equipment (armour grid):
 - Larger spider grid filled with:
 - 15 PLDs
 - 18 Solar panels
 - 7 mk2 batteries.
- The spidertron will have weapons:
 - Either multiple spiders (1 per weapon class) or floating gun turrets that follow the spidertron.
 - If done as turrets:
 - Will have to teleport the turrets frequently to keep them with the spider.
 - To try and avoid a script trying to balance the ammo between turrets I'll aim to use vanilla mechanics, i.e. a shared storage tank for the flamers and magic inserters with a single ammo chest for the gun types. Will also try an invisible spider that follows the main one as this could well solve the issue without scripting.
 - Done so the different weapon types can all fire simultaneously and don't lock its weapon auto change feature from no valid target for a single weapon type.
 - Each gun/weapon should be dedicated to one type of ammo. So that if different quantities of each ammo type are loaded the better guns run out first.
 - Weapons:
 - Arty - 1/10th default cool down for rapid fire with the same range as unupgraded manual artillery firing - done as a turret so it doesn't target units. Moved once per second (lowest UPS) and tweaked visuals to minimise appearance of this often delayed firing position.
 - 2 rocket launchers - for use with regular and explosive rockets. Separately nukes are only fired at player characters, spidertrons and large groups of turrets. Nukes have a 5 second cooldown to avoid overkill and wastage and are done separately to standard rockets due to the cooldown and their increased range (vanilla Factorio feature).

- Tank cannon x4 - fires special shells that don't collide with non enemy force units. These have a slight range increase to 36 to match the rocket launcher as it makes the spider fight turrets much better.
 - Tank SMG x3
 - Flamethrower (only 1 ammo type) - fires a special ammo that acts like the players flamethrower when fired from within a vehicle, rather than the tank flamethrower.
- The basic ammo for each weapon type will never run out: firearm-magazine, rocket, cannon-shell, flamethrower.
- The spidertron's will start with weapon & damage tech:
 - Max weapon reload bonuses (non space science).
 - Max weapon damage bonuses (non space science).
- The spidertron will start with one RCON ammo pack.
- The spidertron will gain ammo for each weapon via a rearm RCON command. Support for each team's spidertron and another for both team's spidertrons. Should pop up a GUI message to say which spiders have been re-armed.
 - spider_full_rearm [PlayerTeamName]
 - PlayerTeamName can either be "north", "south" or "both".
 - Gives spider ammo:
 - Arty: 10 shells
 - All other weapons 1 stack per ammo type (see gun to ammo type in weapons list).
- The spidertron can be given a specific amount of ammo via RCON command. Support for each team's spidertron and another for both team's spidertrons. Should pop up a GUI message to say which spiders have been re-armed.
 - spider_give_ammo [PrimaryTeamName] [AmmoName] [PrimaryTeamQuantity] [SecondaryTeamQuantityOrPercentage]
 - PrimaryTeamName can either be "north" or "south".
 - AmmoName is a friendly name of an ammo type. As in some cases special modded ammo has to be used by the spiders. AmmoNames are: piercingBullet, uraniumBullet, explosiveRocket, atomicRocket, explosiveCannonShell, uraniumCannonShell, explosiveUraniumCannonShell, artilleryShell.
 - PrimaryTeamQuantity is an integer number for the quantity of ammo to give to the primary team's spider. Positive integer numbers only and any fractions are rounded down.
 - SecondaryTeamQuantityOrPercentage is Optional. If provided it sets how much ammo the other player team's spider's will be given. It can either be provided as a number like the PrimaryTeamQuantity or as a percentage ie. 50%. If a percentage value is given it's used to calculate a value as a percentage of the primary team's quantity value. So the command spider_give_ammo north atomicRocket 4 25%, will give the south team's spider 1 atomic rocket, as that's 25% of the north team's 4 atomic rockets. Final quantities of 0 or less will be silently ignored.

Misc

- Command to reset a spider's state and teleport it home. Doesn't affect its health or ammo. For use if a spider gets stuck in an odd state. Take a save before using as this is hard to test and will only be used if something else has already broken/failed.
 - `spider_reset_state [PlayerTeamName]`
 - `PlayerTeamName` can either be "north", "south".
- Spiders will only be created physically on the map once they are needed.
 - This is to avoid creating lots of chunks on the map with low evo biters before the teams have reached the spider's position. As the spiders are moved via RCON this would likely cover thousands of tiles.
 - A team's spider will be created once either a chunk is generated within the spider's roaming area or a valid player entity is built within artillery range of the spider (560 tiles). Any chunk on the divider edge (6 or less chunks in) will be ignored as these can be generated by the other team across the divide. It is possible to trigger the other team's spider generation via artillery shells exploring, but this is unlikely and unavoidable.
 - Once a spider is created it will remain until killed, so the lower evo biters may occur at this point, but should be less noticeable than having bases start with small biters when the players have cleared to 10,000 tiles and would then be at big biters evo wise.
 - From testing killing all bases in a lane (with no time or pollution triggered evo):
 - Clear 5k: evo factor of 8.3~
 - Clear 10k: evo factor of 9.2~
 - The code logic supports the use of negative spider distance changes, so bringing the spider towards the player will also generate the spider's entities upon crossing the threshold.
 - The code logic supports ammo being given to the team's spiders before their entities exist. These extra ammo from RCON commands are cached until the spiders are created and then they receive them in full.

End game

- When a team kills its spidertron a single coin will be dropped.
- This coin can be used at a market at each team's spawn to buy a "Nuke other team" item. The markets will not be placed on top of ore or anywhere else "bad", and will be indestructible.
- Upon purchase of this market item a mod interface call will be made to Billbo's JD Goes Boom mod for a large explosion on each of the opposing team's online players. Billbo has added the interface:
 - `/c remote.call("JDGoesBoom", "ForceGoesBoom", "south", 60, 60)`
 - Syntax: `remote.call("JDGoesBoom", "ForceGoesBoom", [target_force], [size], [delay])`
 - Values of 0 are interpreted as the default value and not an actual zero value.
 - Size of 100 is 10 x nuke size. 44 is the regular nuke size.
 - Size of 50 will hopefully avoid the worst UPS lag.
 - Delay is in seconds.

Factorio disabled features

- Landfill tech will be disabled. There won't be any water west of spawn and this prevents filling in the water to the east.
- No need to disable arty range techs now as the Map > Divide between teams section includes protection against issues from this.

Team/player management

- Players who join will be placed in spectator.
- Any server admin will have a simple GUI to assign connected players to a team or to switch connected players between teams.
- A command to move/pre-assign a player to a team has been included:
 - `spider_assign_player_to_team [PlayersName] [TeamName]`
 - PlayersName is the player's name case sensitive.
 - TeamName can either be "north" or "south".
- When a player leaves a team all their gear will go in a corpse, so they can't "steal" things.
- When a player leaves the game nothing special will be done. An admin can raid their inventory if required.
- "JD-Plays" will default to being on the "north" team, with "mukkie" being on the "south" team. This is so they can hardcode their RCON commands with this knowledge.
- A command to set a "pretty" name for the teams that's used when GUIs and messages are shown. Commands must always use "north" or "south" still.
 - `spider_set_teams_pretty_name [TeamName] [PrettyName]`
 - TeamName can either be "north" or "south".
 - PrettyName is the text that's used. Wrap it in either single or double quotes if it has spaces in, i.e. "Mukkie's madmen". Escape any usage of the wrapping quotes within the pretty name with a \ prefix. You don't need to escape a mix of quotes; in the Mukkie example above no escape is needed for the single quote as the text string is delimited by double quotes.
 - Changes will apply to new GUI's and messages. Will require players to reload any persistent GUIs to see the change. This can be done via the GUI toggle shortcuts each player has.

Future ideas (not done)

- RCON commands to buff/nerf the spiders for a limited time.
 - Have it apply a fake resistance modifier through the `on_damaged_event`.
 - 1 RCON command per team's spider and 1 for both spiders. 1 command to Nerf and 1 to Buff.
 - Allow setting extra % reduction and time limit via command.
 - GUI message to last for the duration of the effect.

- Limit to max 1 effect at a time, but add any extras to the time remaining. A buff/nerf that conflicts with present should reduce the time from the current and then apply for the remaining time.

Notes

- Factorio versions:
 - 1.1.57 - developed and main testing done on this version.
 - 1.1.58 - tested core things still work and handed to JD for functionality review after this Factorio version was released.

TODO (fixes)

- none

Known Limitations

- The boss spider will shoot weapons at targets they can't hurt, i.e. cannon shells at enemy spidertrons. This can't be controlled while a spider entity is doing the shooting. To resolve either I'd need to use a turret to do the shooting or do these weapons targeting and shooting via Lua script. At present just left as-is.