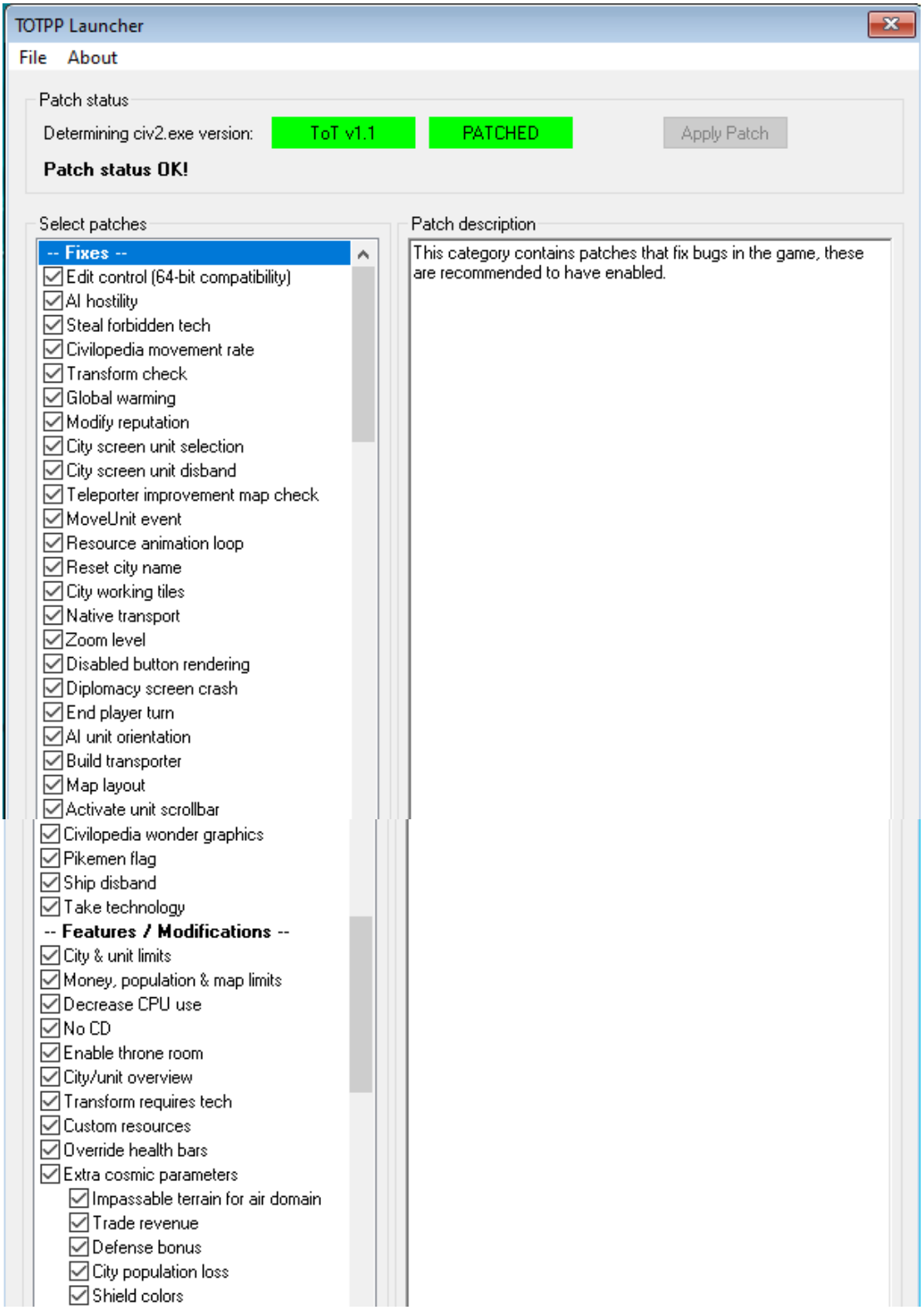
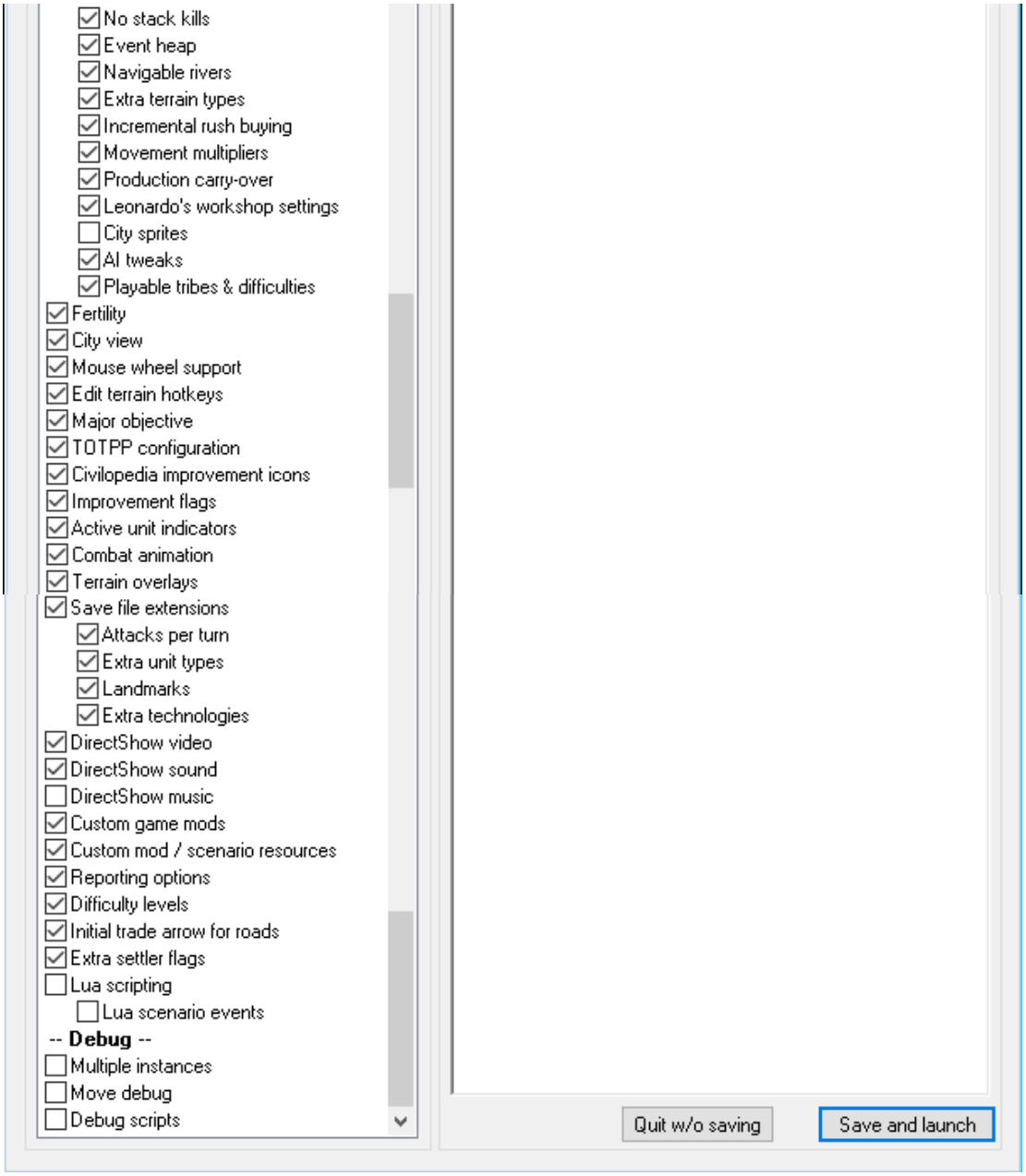
TOTPP v.018 by TheNamelessOne





FIXES:

This category contains patches that fix bugs in the game, these are recommended to have enabled.

(NOTE: ***Title** indicates that section is new with version 0.180)

1. **Edit control**: Fixes a crash on 64-bit operating systems when an edit control is created. Recommended for 32-bit systems as well.
2. **AI Hostility**: Fixes the general hostility of the AI in the game. Caused by a bug in the game, which led to the attitude towards the player being set to the worst possible in some situations.
3. **Steal forbidden tech**: Fixes the rule 2 restrictions in @LEADERS2 so that forbidden technologies cannot be stolen.

4. **Civilopedia movement rate**: Fixes the movement rate listed for units in the Civilopedia so it displays correct numbers for cosmic road multipliers other than 3.
5. **Transform check**: Fixes the Transform order, which did not check if the terrain type could be transformed at all. This led to an undefined terrain type.
6. **Global warming**: Fixes global warming, which had the tendency to skip cycles of terrain change due to improper bounds checking.
7. **Modify reputation**: Allows a negative reputation modifier for the ModifyReputation event action, as stated in the documentation.
8. **City screen unit selection**: Allows selecting stationed units beyond the 16th in the city screen.
9. **City screen unit disband**: Disables the "Disband" option in the city screen's "Supported units" box for non-disbandable units.
10. **Teleporter improvement map check**: Adds a check to the teleporter city improvement so that units can not be teleported to cities on maps they are prohibited from entering.
11. **MoveUnit event**: Allows a unit type name as the "unit" parameter of the MoveUnit event action. Due to a bug, only "unit=AnyUnit" works in vanilla.
12. **Resource animation loop**: Fixes a bug where the last frame of a looping resource animation would be rendered even when animated resources were disabled.
13. **Reset city name**: Resets the city name counter when a new human-controlled civ is created.
14. **City working tiles**: Fixes a bug where two cities on opposite sides of the International Date Line (x-coordinate 0) could both work the same tiles.
15. **Native transport**: Makes native transport respect "not allowed on map" settings from @UNITS_ADVANCED.
16. **Zoom level**: Properly restores the zoom level from the saved game when loading a game. The default zoom level can be configured through the "TOTPP Configuration" menu.
17. **Disabled button rendering**: Fixes graphical rendering of disabled buttons (e.g. Civilopedia entries lacking a description).
18. **Diplomacy screen crash**: Fixes a potential crash (buffer overflow) in the diplomacy screen.
19. **End player turn**: Updates all remaining units when using "End player turn" (Ctrl-N). Units with orders are updated, while idle units are issued the "Skip Turn" order.
20. **AI unit orientation**: Fixes orientation of AI units when moving in a westerly direction.
21. **Build transporter**: Makes the build transporter map dialog not select invalid maps as the default option, and also fixes the check for invalid art types.
22. **Map layout**: Fixes a bug with rendering the status window when loading a game when the map layout is in classic mode.
23. **Active Unit scrollbar**: Adds a scrollbar to the activate unit dialog, making it possible to select more than 9 units. Also adds an option to the TOTPP Configuration menu, allowing the user to change the maximum number of units the dialog can contain without rendering a scrollbar.
24. **Civilopedia wonder graphics**: Fixes the rendering of wonder graphics in the Civilopedia.
25. **Pikemen flag**: Fixes the pikemen flag, which checked the actual movement rate after damage instead of the movement rate defined on the unit type.
26. **Ship disband**: Fixes a bug where disbanding a ship at sea would delete all units on the tile, including other ships.

27. ***Take technology**: Fixes a bug where removing technologies did not decrement the tribe's tech counter or update the tech's "researched" field. This would cause techs to remain "researched" and lead to rising tech costs when using civ.takeTech or the TAKETECHNOLOGY macro event.

-- FEATURES / MODIFICATIONS --

This category contains patches that add features to or modify the game.

28. **City & unit limits**: This patch increases the limits on the number of cities and units in the game.
    You can make changes to the limits below, up to an absolute limit of 32k, although very large numbers may cause stability issues.
    When loading a saved game, this patch will automatically update the home cities of all units to allow for the larger limits. Updated saved games should always be played with the patch enabled, even though they might work in the unmodified game. Changing the limits here is always possible, even for games in progress.
    Recommended: 1024 cities, 4096 units.
29. **Money, population & map limits**: Increases the limits on money (2 billion), population (10 billion) and map size (32,767).
30. **Decrease CPU use**: ToT normally keeps 1 core at 100% load to check for events, this patch changes the event loop to yield control while staying alert able, decreasing CPU use.
31. **No CD**: Disables the CD check on startup.
32. **Enable throne room**: Enables building of throne room improvements. This feature was never removed from ToT, just disabled. The patch also adds a new menu item to the game settings.
    The associated key bindings are Shift-H to view the throne room, and Shift-Q as a unit order to build an improvement (cheat-mode only).
    To make the menu item work as intended, add the string "Enable throne room" to @GAMEOPTIONS in GAME.TXT.
33. **City/unit overview**: Displays the number of cities and units for the player's tribe in the empire overview window.
34. **Transform requires tech**: Adds a check to the transform order to see if the tribe has the technology required to transform that particular terrain type. This allows the player to e.g. make transformations of "easy" terrain types available earlier in the tech-tree. Configurable by adding a @TRANSFORM section to RULES.TXT, consisting of one line per terrain type, containing a tech abbreviation and a comma, e.g.:

    ```
    @TRANSFORM
    U1, ;Drt
    nil, ;Pln
    ...
    X1, ;Oce
    ```

    Notes:
    - The order of terrain types is the same as in the @TERRAIN section.
    - "nil" means no tech requirement, though you will still need a unit with engineering capabilities.
    - @TRANSFORM1 .. @TRANSFORM3 can be used for secondary maps, similarly to @TERRAIN1-3.

The popup that shows up when the tribe doesn't have the required tech can be overridden in GAME.TXT using the key @TRANSFORM.

35. **Custom resources**: Adds support for maps with custom resource placement. Maps both with and without custom resources can be combined when loading maps in-game.
    Saved games with custom-resource maps are incompatible with the vanilla game.
    When loading a custom-resource map, the dialog that asks whether to randomize resources and huts will only randomize huts.
    In cheat mode, custom resources can be enabled/disabled for a map by pressing Ctrl-F8. Subsequently, they can be placed on tiles with Ctrl-1 (resource #1) and Ctrl-2 (resource #2). Ctrl-0 removes a resource from a tile.
36. **Override health bars**: Allows hiding of unit health bars for specific unit types, by setting the 16th bit of the flags in @UNITS (i.e. by adding a 1 on the left).

Begin Extra cosmic parameters:

Enables an extra section for cosmic parameters in RULES.TXT, @COSMIC2. Unlike @COSMIC, this is a collection of keys followed by a number of values, terminated by a blank line. E.g.

@COSMIC2
TradeGoldMultiplier, 50
TradeScienceMultiplier, 50
FortifyDefense, 3
FortressDefense, 4
CityWallsDefense, 6
MountainHeight, 48, 48, 32, 32

This patch itself does not change anything visible to the game, but makes these parameters available to other patches.

37. **Impassable terrain for air domain**: Enables the @COSMIC2 keys 'ImpassableAir'.

    When set to 1, air units respect impassable terrain. This can still be overridden in @UNITS_ADVANCED on a per unit basis. Defaults to 0.
38. ***Trade revenue**: Enables the @COSMIC2 keys **'TradeGoldMultiplier'**, **'TradeScienceMultiplier'** and **'TradeWonderMultiplier'**.

    For the first two, their value is a percentage applied to the gold/science revenue when a trade route is created. So at 50, revenues are halved. For 'TradeWonderMultiplier' it's a percentage of the cost of the trade unit that will be added to the wonder under construction, if the respective option is selected. Defaults to 100.

39. **Defense bonus**: Enables the @COSMIC2 keys **'FortifyDefense'**, **'FortressDefense'** , **'CityWallsDefense', ' CoastalFortressDefense ', ' AegisVSAirDefense', ' AegisVSMissileDefense ' , ' SAMDefense ', ' SDIDefense' and 'TerrainDefenseForAir'** .

Configurable defense bonuses in @COSMIC2. Values should be multiplied by 50% to get the percentage of the normal defense value a unit defends with. E.g. 3 * 50% = 150% of normal defense.

Currently, the following keys are defined (default value in parentheses):
- FortifyDefense (3): Bonus for fortifying.
- FortressDefense (4): Bonus for fortress tiles (doesn't stack with fortifying)
-CityWallsDefense (6): Bonus for city walls (doesn't stack with fortifying).
- CoastalFortressDefense (4): Bonus for coastal fortress.
- AegisVSAirDefense (6): Bonus for AEGIS units against air units.
- AegisVSMissileDefense (10): Bonus for AEGIS units against missiles.
- SAMDefense (4): Bonus for SAM Missile Battery versus missiles (stacks with SDI).
- SDIDefense (4): Bonus for SDI Defense versus missiles (stacks with SAM).

Also, there are two keys, '**TerrainDefenseForAir**' & '**TerrainDefenseForSea**', which, when set to 0, disable the defensive bonus from terrain for air/sea units respectively. Default to 1.

40. **City population loss**: Enables the @COSMIC2 keys **'CityPopulationLossAttack'** and **'CityPopulationLossCapture'**. They determine whether a city suffers population loss after a successful attack/capture. Valid values are 0, 1 and 2:
    0 - default, will lose population;
    1 - will not lose population;
    2 - will lose population, except when size=1 and the loss would destroy the city
41. **Shield colors**: Enables the @COSMIC2 key **'UnitShieldColor'**.

    Its values determine the color of a unit's shield. It takes up to 2 values, for the primary and the secondary (used for unit stacks) shield. Values are between 0 and 31, with 0 - black, 31 - tribe color. The values in between are darker (lower values)/lighter (higher values) hues of the tribe's color. Defaults to "16, 8".

    Default shield colors can be configured through the "TOTPP Configuration" menu.
42. **No stack kills**: Enables the @COSMIC2 key **'NoStackKills'**
    When enabled with value 1, unit stacks are not removed in their entirety after defeat.

    The particular mechanics depend on the domain:
    - For land stacks, only the defender is killed;
    - For ship stacks carrying land units the defender is sunk together with its cargo;
    - For ships carrying air units (i.e. carriers or submarines) the defender is sunk and the air units remain.

    Defaults to 0, disabled.
43. **Event heap**: Enables the @COSMIC2 key **'EventHeapSize'**

    Taking up to 2 values, the first is the (initial) heap size to be used for events in bytes. The second value flags static/dynamic memory allocation. When set to 1, it allows the event heap to dynamically allocate more memory when needed. Dynamic mode is especially recommended when making use of delayed events, in which case a particularly expensive "defragmentation" operation to reclaim space is skipped. Defaults to "106480, 1".

44. **Navigable rivers**: Allows a naval unit to sail on rivers by setting the 9th bit (the rightmost bit is the first) of column G in @UNITS_ADVANCED to 1. This flag only affects units whose domain is 2.

    By default only movement in intercardinal directions is allowed on rivers, this can be overridden by setting the @COSMIC2 key "NavigableRiversIntercardinal" to 0.
45. **Extra terrain types**: Allows a maximum of 16 terrain types in-game, as opposed to 11 in vanilla. To use this feature in a scenario, it is necessary to make the following changes:

    Rules.txt:
    Set the @COSMIC2 key "**NumberOfTerrainTypes**" to the desired number of terrain types, one value per map. Valid values are between 11 and 16, the default is 11. A valid configuration for four maps would be: "NumberOfTerrainTypes, 16, 13, 15, 11".

    Add entries to @TERRAIN:
    The entries for the extra terrain types go right below 'Ocean'. Their abbreviations are 'Bbb', 'Ccc', 'Ddd', 'Eee' and 'Fff', use these to refer to them for terrain changes. Also add resource entries; type 1 entries go below 'Fish', type 2 entries below 'Whales'. Rinse and repeat for @TERRAIN1-3.

    Graphics:
    Edit Terrain1.bmp and add extra tiles. These go directly below the ocean tiles as well, so road/railroad tiles shift down. Do the same for Terrain3.bmp, Terrain5.bmp and Terrain7.bmp, if applicable.

    Describe.txt:
    To make the Civilopedia work with the new terrain types, it is important to update @@TERRAIN_INDEX. This list needs to have the same order as the terrain entries in Rules.txt. Set the extra entries to -1 for a quick fix (no description).

    Note: Resources for extra terrain types will by default NOT be animated, because these are usually missing from Resource.spr. If you do have a custom resource sprite file, they can be enabled with the @COSMIC2 key "**NumberOfAnimatedResources**", which takes the number of terrain types for which resources should be animated, one value per map.

46. **Incremental rush buying**: Enables the @COSMIC2 key **'NoIncrementalRushBuy'**
    When enabled with value 1, incremental rush buying is disabled. This is implemented by locking city production for the remainder of the turn after using the buy button.

    Defaults to 0, disabled.
47. **Movement multipliers**: Allows configuration of the cost of movement along railroads, roads and rivers as well as the movement cost for units with the alpine flag..

    These multipliers are configured using the @COSMIC2 keys '**RailroadMultiplier**', '**RoadMultiplier**', '**RiverMultiplier**' and '**AlpineMultiplier**' and can be enabled individually.They take 2 values, the first needs to be set to 1 to enable the multiplier, while the second value determines the movement cost. E.g. setting 'RailroadMultiplier' to 1, 6 means a

unit can move 6 tiles along a railroad for 1 movement point. Setting the movement value to 0 means the movement cost of the underlying terrain is used, setting it to -1 means movement is unlimited.

In game, all enabled movement multipliers are combined into an aggregate movement multiplier (exactly their least common multiple). This number multiplied by the movement rate from @UNITS must be less than 256 for each unit. You'll get a friendly warning when this limit is exceeded.

If Lua is enabled, registers the 'totpp.movementMultipliers' table.

48. **Production carry over**: Enables the @COSMIC2 key **'ProductionCarryOver'**.
When enabled with value 1, excess shields carry over to the next item after city production is completed.

When specifying three values instead of one, this behaviour can be configured per production type (Units, Improvements & Wonders respectively).

Defaults to 0, disabled.
49. **Leonardo's workshop settings**: Enables the @COSMIC2 key **'LWPreserveVeterancy'**.

When enabled with value 1, veterancy of units is preserved when units are upgraded by the workshop.

Defaults to 0, disabled.
50. **City sprites**: Enables the @COSMIC2 keys "**CitySpritesPerTribe**" and "**CitySpritesPerMap**". When enabled with value 1, they override default city/city flag sprites from CITIES.BMP with per tribe/map files.

When only "CitySpritesPerMap" is enabled, sprites are read from CITIESM<m>.BMP (with <m> from 0 to the number of available maps - 1, max. 3);
When only "CitySpritesPerTribe" is enabled, sprites are read from CITIEST<n>.BMP (with <n> from 0 to 7);
When both "CitySpritesPerTribe" and "CitySpritesPerMap" are enabled, sprites are read from CITIESM<m>T<n>.BMP (with <m> and <n> as above).

Note: Fortification and airbase sprites are still read from CITIES.BMP.
51. **AI Tweaks**: Adds configurable tweaks for AI behaviour to @COSMIC2.

Available keys are:
- "**AICapitalizationLimit"**: Number of units after which the AI switches to Capitalization. Default is 512.
- **"BarbOffensiveUnitLimit"**: Maximum number of offensive barbarian units per landmass. When this limit is reached, barbarian cities stop producing units. Default is 16.
- **"BarbUnitSupport"**: When set to 1, allows barbarian units to have a home city. Normally, barbarian-produced units have none. Defaults to 0.
- **BarbResearch**: When set to 1, allows the barbarian tribe to own technologies. Defaults to 0.

52. **Playable tribes & difficulties**: Limits the playable tribes and difficulties in a scenario through the @COSMIC2 keys '**PlayableTribes**' and **'PlayableDifficulties**'.

'PlayableTribes' is a bitmask taking a 0 (not playable) or 1 (playable) for every tribe, in the same order as column A of @UNITS_ADVANCED (leftmost bit purple tribe, rightmost bit red tribe). Prefix with "0b" to force correct interpretation.

For example, PlayableTribes, 0b00000110 (or equivalently just 0b110) only allows the player to play the white and green tribe. In practice, the rightmost bit is ignored, since the red tribe is never playable.

'PlayableDifficulties' is also a mask, with the rightmost bit difficulty 0 (i.e. Chieftain).

For example, PlayableDifficulties, 0b100000 only allows difficulty 5 (i.e. Deity) to be played.

End of Extra cosmic Parameters

53. **Fertility**: Enables a new section in RULES.TXT, @**FERTILITY**.
This allows customizing the terrain types the AI players will settle, normally limited to just grasslands and plains.
The @FERTILITY section consists of a list of terrain types, optionally accompanied by 3 values ("fertility coefficients", see below):

@FERTILITY
Desert
Plains
Grassland, 0, 0, 0
Forest
Tundra, 6, 0, 0

Adding a terrain type to this section allows it to be settled by the AI. Conversely, terrain types not in this section will never be settled by the AI.

The "fertility coefficients" can be used to make a terrain type more or less desirable, these 3 values are multiplied by the food, shields and trade values of the terrain type, respectively. The sum of these multiplications determines the fertility value. In the above example, a grassland tile will get a fertility value of 0, since all its coefficients are 0. Tundra on the other hand, will get a fertility value of 6, given its default tile production of 1 food, 0 shields, 0 trade. By default, these coefficients are 3, 2 and 1.

Notes:
- As an alternative to the name of the terrain, its ordinal index can be used. "0" is the same as "Desert", etc.
- @FERTILITY1 .. @FERTILITY3 can be used for secondary maps, similarly to @TERRAIN1-3.
- In the absence of a @FERTILITY section for a map, defaults are used. Defaults are game type specific, usually 1, 2 (i.e. plains and grasslands), except for the Fantasy game, where the defaults are 3, 5 for map 2 and 3, 4, 5 for map 3.
- This patch also fixes a minor bug in the default fertility calculation where a tile with resource #2 was using the production values from resource #1. Therefore, just having this patch enabled without any @FERTILITY sections will give slightly different fertility values for such tiles compared to the vanilla game.

54. **City view**: Enables the city view from MGE by pressing 'v' in the city screen.

55. **Mouse wheel support**: Enables mouse wheel support for all dialogs with scrollbars. Holding shift while scrolling scrolls with increments of 5.
56. **Edit terrain hotkeys**: Adds keyboard shortcuts for changing terrain / tile improvements. In cheat mode, change terrain with 0 (Desert) to 9 (Jungle) and Ctrl-3 (Ocean) to Ctrl-8 (Extra terrain 5). Use Ctrl-9 to add/remove a river.

    For tile improvements, the following keys can be used in cheat mode when no unit is selected:
    r: Road
    o: Railroad
    i: Irrigation
    m: Mine
    l: Farmland
    f: Fortress
    e: Airbase
    p: Pollution

57. **Major objective**: Restores the x3 major objective for cities as in Fantastic Worlds.
58. **TOTPP Configuration** : Adds the "TOTPP Configuration" entry to the main menu, for in-game patch configuration. In-game, the menu can be displayed by pressing Ctrl-Shift-T.
59. **Civiliopedia improvement icons**: Uses the larger icons from Improvements.bmp for the improvements & wonders sections of the Civilopedia.
60. **Improvement flags**: Adds 8 binary flags per improvement to the @IMPROVE section of RULES.txt. Flags can be added at the end of the line, e.g.:
    Barracks, 4, 1, nil, 00000001

    When set, their effects are as follows (the rightmost bit is the first):
    - Bit 1: Prevents selling of the improvement.
    - Bit 2: Do not destroy on city capture.
    - Bit 3: Always destroy on city capture. When both this and bit 2 are set, the result is random.
    - Bits 4-8 are currently undefined.
61. **Active unit indicators**: Adds configurable active unit indicators to the TOTPP Configuration menu. The options are:
    - Blinking marker: The ToT default, a blinking tile marker. 0 to disable, 1 to enable.
    - Blinking unit: The default of MGE and earlier versions, a blinking unit. 0 to disable, 1 to enable.
    - Blink interval: The blink interval in milliseconds. Allowed range is 50 - 1000. This also affects the unit animation timer.
62. **Combat animation**: Enables the 8-frame combat animation from Icons.bmp when animated units are disabled. For an example and placement see the 8 frames in Icons.gif in the ToT root folder, starting from coordinates (1, 356).
63. **Terrain overlays**: Enables custom overlays from TERRAIN2.bmp for arbitrary terrain types.

    Overlays are configured with a new section @OVERLAYS in RULES.txt. This section consists of a list of terrain types followed by 3 numbers, e.g.:

    @OVERLAYS
    Forest, 16, 32, 133
    Hills, 16, 32, 297

Mountains, 16, 48, 199
Boreal Forest, 16, 48, 363
Jungle, 3, 48, 461

- For the terrain type you can either use its ordinal index (0-15), the abbreviation used in @TERRAIN (Drt, Pln, etc.), or the full name as in this example.
- The first number is the number of tiles to read, either 1, 3 or 16. When 16, tiles are read in 2 rows of 8, similar to the original overlays. When 1 or 3, tiles are read from a single row.
The use for the 3-tile overlay is to prevent the dithering used between different terrain types to render on top of the tile. These tiles correspond to the three tiles in TERRAIN1.bmp.
- The second number is the height of the tiles, 32, 48 or 64.
- The third number is the y-coordinate in TERRAIN2.bmp from where to start reading the tiles. The starting x-coordinate is always 1.

Notes:
- Tiles are expected to be separated from each other by a one-pixel border.
- River tiles are always read from their original position of (1, 67). River mouths and coastal tiles shift down, they are read from right below the bottommost overlay.
- In the absence of an @OVERLAYS section, overlays are defined to correspond to a default TERRAIN2.bmp file.
- This patch replaces the mountain height patch, but respects the "MountainHeight" key in COSMIC2 for compatibility when no overlays are defined.
- @OVERLAYS1 .. @OVERLAYS3 can be used for secondary maps, similarly to @TERRAIN1-3.

64. **Save file extensions**: Allows patches to store arbitrary data in the saved game file, by extending the format. Saved games with extensions are stored with version number '3' (ToT 1.1 uses '2'), so they cannot be read by the vanilla game.
Purely infrastructural, this patch does not modify anything visible in the game by itself, but makes extension data available to other patches.

Technical details:
Extension information is stored towards the end of the file (right after the 'Destroyed tribes' block, but before multiplayer / event data).
The first 4 bytes are the number of extensions, followed by that many extension blocks.
An extension consists of 3 parts, length (4 bytes), extension name (4 bytes, ASCII), and extension data ('length' bytes).
65. **Attacks per turn**: Enables a new section in RULES.TXT, @ATTACKS.
The numbers in this section define the number of attacks per turn per unit type. The section itself consist of a list of numbers, 10 per line, corresponding in order to the entries in @UNITS. For the Original game, it would look like this:

@ATTACKS
1, 2, 1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 3, 2, 2, 2, 2, 2,

2, 2, 3, 1, 1, 1, 2, 10, 8, 6,
14, 12, 3, 3, 4, 4, 4, 6, 5, 5,
4, 3, 5, 5, 12, 16, 2, 3, 1, 2,
1, 1, 4, 8, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1, 1, 1,

The number of attacks is limited by the movement rate, as each attack still costs 1 movement point.

The popup shown when a unit is out of attacks can be overridden in GAME.TXT using the key @ATTACKSPERTURN.

66. ***Extra unit types**: Allows a maximum of **189** unit types in-game, as opposed to 80 in vanilla. To use this feature in a scenario or mod, it is necessary to make the following changes:

    Rules.txt:
    Set the @COSMIC2 key "**NumberOfUnitTypes**" to the desired number of unit types. Valid values are between 80 and 189, the default is 80.

    Add entries to @UNITS and @UNITS_ADVANCED:
    The entries for the extra unit types can be added at the bottom right below the last entry.

    Add entries to @SOUNDS (optional):
    Custom sounds for the extra unit types can be added at the bottom as well. If not set, the default sound will be used.

    Graphics:
    Edit Units.bmp and add extra rows of tiles at the bottom of the image. The barbarian diplomat unit has to be put in the tile immediately following the regular units, so be careful to move it all the way to the end.

    Describe.txt:
    To make the Civilopedia work with the new unit types, it is important to update @@UNIT_INDEX. This list needs to have the same order as the unit entries in Rules.txt. Set the extra entries to -1 for a quick fix (no description).

    Sprites (optional):
    Static and animated sprites are not by default enabled for the extra units. This can be done with the @COSMIC2 keys "**NumberOfStaticUnitSprites**" and "**NumberOfAnimatedUnitSprites**", respectively. Valid values are between 80 and 189, and both default to 80. If "**NumberOfAnimatedUnitSprites**" is greater than 80, the train animation from "unit99.spr" is read from "unit999.spr" (note the extra '9') to avoid conflicts with the animation for unit 99.

    Note: this patch also changes the unit statistics in the defense minister screen (F2) to hold values of more than 255 per unit, as well as changing the layout somewhat.

67. **Landmarks**: Allows custom text to be added to map tiles (landmarks). You can access the landmark editor for a tile with Ctrl-Shift-F2. Removing the label for an existing landmark will delete it.

    Saved games containing landmarks are incompatible with vanilla.

68. ***Extra technologies**: Allows a maximum of 253 techs in-game, as opposed to 100 in vanilla. To use this feature in a scenario or mod, it is necessary to make the following changes:

Rules.txt:
Set the @COSMIC2 key "NumberOfTechs" to the desired number of techs. Valid values are between 100 and 253, the default is 100.

Add entries to @CIVILIZE and @CIVILIZE2:
The entries for the extra techs can be added at the bottom right below the last entry.

To use techs with index 100 (old techs have indexes 0-99) or greater as prerequisites, their abbrevations are X64 .. XFC ("X" + their index in hex).

Describe.txt:
To make the Civilopedia work with the new techs, it is important to update @@ADVANCE_INDEX. This list needs to have the same order as the tech entries in Rules.txt. Set the extra entries to -1 for a quick fix (no description).

Example of new tech entries numbering in Rules.txt file:

```
Tech With ID 100, 3, 0, no, no, 0, 0 ; X64
Tech With ID 101, 3, 0, no, no, 0, 0 ; X65
Tech With ID 102, 3, 0, no, no, 0, 0 ; X66
Tech With ID 103, 3, 0, no, no, 0, 0 ; X67
Tech With ID 104, 3, 0, no, no, 0, 0 ; X68
Tech With ID 105, 3, 0, no, no, 0, 0 ; X69
Tech With ID 106, 3, 0, no, no, 0, 0 ; X6A
Tech With ID 107, 3, 0, no, no, 0, 0 ; X6B
Tech With ID 108, 3, 0, no, no, 0, 0 ; X6C
Tech With ID 109, 3, 0, no, no, 0, 0 ; X6D
Tech With ID 110, 3, 0, no, no, 0, 0 ; X6E
Tech With ID 111, 3, 0, no, no, 0, 0 ; X6F
Tech With ID 112, 3, 0, no, no, 0, 0 ; X70
Tech With ID 113, 3, 0, no, no, 0, 0 ; X71
Tech With ID 114, 3, 0, no, no, 0, 0 ; X72
Tech With ID 115, 3, 0, no, no, 0, 0 ; X73
Tech With ID 116, 3, 0, no, no, 0, 0 ; X74
Tech With ID 117, 3, 0, no, no, 0, 0 ; X75
Tech With ID 118, 3, 0, no, no, 0, 0 ; X76
Tech With ID 119, 3, 0, no, no, 0, 0 ; X77
Tech With ID 120, 3, 0, no, no, 0, 0 ; X78
Tech With ID 121, 3, 0, no, no, 0, 0 ; X79
Tech With ID 122, 3, 0, no, no, 0, 0 ; X7A
Tech With ID 123, 3, 0, no, no, 0, 0 ; X7B
Tech With ID 124, 3, 0, no, no, 0, 0 ; X7C
Tech With ID 125, 3, 0, no, no, 0, 0 ; X7D
Tech With ID 126, 3, 0, no, no, 0, 0 ; X7E
Tech With ID 127, 3, 0, no, no, 0, 0 ; X7F
Tech With ID 128, 3, 0, no, no, 0, 0 ; X80
Tech With ID 129, 3, 0, no, no, 0, 0 ; X81
Tech With ID 130, 3, 0, no, no, 0, 0 ; X82
Tech With ID 131, 3, 0, no, no, 0, 0 ; X83
Tech With ID 132, 3, 0, no, no, 0, 0 ; X84
Tech With ID 133, 3, 0, no, no, 0, 0 ; X85
Tech With ID 134, 3, 0, no, no, 0, 0 ; X86
Tech With ID 135, 3, 0, no, no, 0, 0 ; X87
```

```
Tech With ID 136, 3, 0, no, no, 0, 0 ; X88
Tech With ID 137, 3, 0, no, no, 0, 0 ; X89
Tech With ID 138, 3, 0, no, no, 0, 0 ; X8A
Tech With ID 139, 3, 0, no, no, 0, 0 ; X8B
Tech With ID 140, 3, 0, no, no, 0, 0 ; X8C
Tech With ID 141, 3, 0, no, no, 0, 0 ; X8D
Tech With ID 142, 3, 0, no, no, 0, 0 ; X8E
Tech With ID 143, 3, 0, no, no, 0, 0 ; X8F
Tech With ID 144, 3, 0, no, no, 0, 0 ; X90
Tech With ID 145, 3, 0, no, no, 0, 0 ; X91
Tech With ID 146, 3, 0, no, no, 0, 0 ; X92
Tech With ID 147, 3, 0, no, no, 0, 0 ; X93
Tech With ID 148, 3, 0, no, no, 0, 0 ; X94
Tech With ID 149, 3, 0, no, no, 0, 0 ; X95
Tech With ID 150, 3, 0, no, no, 0, 0 ; X96
Tech With ID 151, 3, 0, no, no, 0, 0 ; X97
Tech With ID 152, 3, 0, no, no, 0, 0 ; X98
Tech With ID 153, 3, 0, no, no, 0, 0 ; X99
Tech With ID 154, 3, 0, no, no, 0, 0 ; X9A
Tech With ID 155, 3, 0, no, no, 0, 0 ; X9B
Tech With ID 156, 3, 0, no, no, 0, 0 ; X9C
Tech With ID 157, 3, 0, no, no, 0, 0 ; X9D
Tech With ID 158, 3, 0, no, no, 0, 0 ; X9E
Tech With ID 159, 3, 0, no, no, 0, 0 ; X9F
Tech With ID 160, 3, 0, no, no, 0, 0 ; XA0
Tech With ID 161, 3, 0, no, no, 0, 0 ; XA1
Tech With ID 162, 3, 0, no, no, 0, 0 ; XA2
Tech With ID 163, 3, 0, no, no, 0, 0 ; XA3
Tech With ID 164, 3, 0, no, no, 0, 0 ; XA4
Tech With ID 165, 3, 0, no, no, 0, 0 ; XA5
Tech With ID 166, 3, 0, no, no, 0, 0 ; XA6
Tech With ID 167, 3, 0, no, no, 0, 0 ; XA7
Tech With ID 168, 3, 0, no, no, 0, 0 ; XA8
Tech With ID 169, 3, 0, no, no, 0, 0 ; XA9
Tech With ID 170, 3, 0, no, no, 0, 0 ; XAA
Tech With ID 171, 3, 0, no, no, 0, 0 ; XAB
Tech With ID 172, 3, 0, no, no, 0, 0 ; XAC
Tech With ID 173, 3, 0, no, no, 0, 0 ; XAD
Tech With ID 174, 3, 0, no, no, 0, 0 ; XAE
Tech With ID 175, 3, 0, no, no, 0, 0 ; XAF
Tech With ID 176, 3, 0, no, no, 0, 0 ; XB0
Tech With ID 177, 3, 0, no, no, 0, 0 ; XB1
Tech With ID 178, 3, 0, no, no, 0, 0 ; XB2
Tech With ID 179, 3, 0, no, no, 0, 0 ; XB3
Tech With ID 180, 3, 0, no, no, 0, 0 ; XB4
Tech With ID 181, 3, 0, no, no, 0, 0 ; XB5
Tech With ID 182, 3, 0, no, no, 0, 0 ; XB6
Tech With ID 183, 3, 0, no, no, 0, 0 ; XB7
Tech With ID 184, 3, 0, no, no, 0, 0 ; XB8
Tech With ID 185, 3, 0, no, no, 0, 0 ; XB9
Tech With ID 186, 3, 0, no, no, 0, 0 ; XBA
Tech With ID 187, 3, 0, no, no, 0, 0 ; XBB
Tech With ID 188, 3, 0, no, no, 0, 0 ; XBC
Tech With ID 189, 3, 0, no, no, 0, 0 ; XBD
Tech With ID 190, 3, 0, no, no, 0, 0 ; XBE
Tech With ID 191, 3, 0, no, no, 0, 0 ; XBF
```

```
Tech With ID 192, 3, 0, no, no, 0, 0 ; XC0
Tech With ID 193, 3, 0, no, no, 0, 0 ; XC1
Tech With ID 194, 3, 0, no, no, 0, 0 ; XC2
Tech With ID 195, 3, 0, no, no, 0, 0 ; XC3
Tech With ID 196, 3, 0, no, no, 0, 0 ; XC4
Tech With ID 197, 3, 0, no, no, 0, 0 ; XC5
Tech With ID 198, 3, 0, no, no, 0, 0 ; XC6
Tech With ID 199, 3, 0, no, no, 0, 0 ; XC7
Tech With ID 200, 3, 0, no, no, 0, 0 ; XC8
Tech With ID 201, 3, 0, no, no, 0, 0 ; XC9
Tech With ID 202, 3, 0, no, no, 0, 0 ; XCA
Tech With ID 203, 3, 0, no, no, 0, 0 ; XCB
Tech With ID 204, 3, 0, no, no, 0, 0 ; XCC
Tech With ID 205, 3, 0, no, no, 0, 0 ; XCD
Tech With ID 206, 3, 0, no, no, 0, 0 ; XCE
Tech With ID 207, 3, 0, no, no, 0, 0 ; XCF
Tech With ID 208, 3, 0, no, no, 0, 0 ; XD0
Tech With ID 209, 3, 0, no, no, 0, 0 ; XD1
Tech With ID 210, 3, 0, no, no, 0, 0 ; XD2
Tech With ID 211, 3, 0, no, no, 0, 0 ; XD3
Tech With ID 212, 3, 0, no, no, 0, 0 ; XD4
Tech With ID 213, 3, 0, no, no, 0, 0 ; XD5
Tech With ID 214, 3, 0, no, no, 0, 0 ; XD6
Tech With ID 215, 3, 0, no, no, 0, 0 ; XD7
Tech With ID 216, 3, 0, no, no, 0, 0 ; XD8
Tech With ID 217, 3, 0, no, no, 0, 0 ; XD9
Tech With ID 218, 3, 0, no, no, 0, 0 ; XDA
Tech With ID 219, 3, 0, no, no, 0, 0 ; XDB
Tech With ID 220, 3, 0, no, no, 0, 0 ; XDC
Tech With ID 221, 3, 0, no, no, 0, 0 ; XDD
Tech With ID 222, 3, 0, no, no, 0, 0 ; XDE
Tech With ID 223, 3, 0, no, no, 0, 0 ; XDF
Tech With ID 224, 3, 0, no, no, 0, 0 ; XE0
Tech With ID 225, 3, 0, no, no, 0, 0 ; XE1
Tech With ID 226, 3, 0, no, no, 0, 0 ; XE2
Tech With ID 227, 3, 0, no, no, 0, 0 ; XE3
Tech With ID 228, 3, 0, no, no, 0, 0 ; XE4
Tech With ID 229, 3, 0, no, no, 0, 0 ; XE5
Tech With ID 230, 3, 0, no, no, 0, 0 ; XE6
Tech With ID 231, 3, 0, no, no, 0, 0 ; XE7
Tech With ID 232, 3, 0, no, no, 0, 0 ; XE8
Tech With ID 233, 3, 0, no, no, 0, 0 ; XE9
Tech With ID 234, 3, 0, no, no, 0, 0 ; XEA
Tech With ID 235, 3, 0, no, no, 0, 0 ; XEB
Tech With ID 236, 3, 0, no, no, 0, 0 ; XEC
Tech With ID 237, 3, 0, no, no, 0, 0 ; XED
Tech With ID 238, 3, 0, no, no, 0, 0 ; XEE
Tech With ID 239, 3, 0, no, no, 0, 0 ; XEF
Tech With ID 240, 3, 0, no, no, 0, 0 ; XF0
Tech With ID 241, 3, 0, no, no, 0, 0 ; XF1
Tech With ID 242, 3, 0, no, no, 0, 0 ; XF2
Tech With ID 243, 3, 0, no, no, 0, 0 ; XF3
Tech With ID 244, 3, 0, no, no, 0, 0 ; XF4
Tech With ID 245, 3, 0, no, no, 0, 0 ; XF5
Tech With ID 246, 3, 0, no, no, 0, 0 ; XF6
Tech With ID 247, 3, 0, no, no, 0, 0 ; XF7
```

```
Tech With ID 248, 3, 0, no, no, 0, 0 ; XF8
Tech With ID 249, 3, 0, no, no, 0, 0 ; XF9
Tech With ID 250, 3, 0, no, no, 0, 0 ; XFA
Tech With ID 251, 3, 0, no, no, 0, 0 ; XFB
Tech With ID 252, 3, 0, no, no, 0, 0 ; XFC
```

69. **DirectShow video**: Uses DirectShow for video rendering, supporting numerous file formats. Requires DirectX9.

    Files in the "Video" folder have hard-coded filenames, so they must be AVI files, but their video and audio streams can be reencoded freely. The PlayAVIFile event accepts any video file.

    Additionally, this patch adds an item to the "TOTPP Configuration" menu, allowing you to disable intro and event movies.
70. **DirectShow sound**: Uses DirectShow for sound playback, supporting numerous file formats. Requires DirectX9.

    Files in the main "Sound" folder have hard-coded filenames, so they still need the wav extension, but can be reencoded as mp3 for example. Unit sounds can be configured in RULES.TXT, so their filenames are free-form.This is also the case for the PlayWaveFile event. Only looping sounds (only menuloop.wav AFAIK) cannot be reencoded, since not all file formats support seamless looping.

71. **DirectShow music**: Uses DirectShow for in-game music and removes CD audio playback support. Requires DirectX9.

    Before enabling this patch, encode the tracks on the CD as mp3 and put them in a "Music" folder in the main ToT directory. Filenames should match the ToT sound track:

    Funeral March.mp3
    Ode to Joy.mp3
    Crusade.mp3
    Alien.mp3
    Mongol Horde.mp3
    The Apocalypse.mp3
    Jurassic Jungle.mp3
    New World.mp3
    Tolkien.mp3
    Mars Expedition.mp3
    Jules Verne.mp3
    They're Here.mp3
    The Dome.mp3
72. **Custom game mods:** Allows custom game mods to be launched from the ToT main menu, without the need to overwrite the Original game folder. Mods are similar to scenarios and support some scenario parameters, but have their own world-building phase.

    The patch adds a new item to the main menu, "Play a Mod", from which available mods can be selected. Mods are auto-discovered by the game, as long as they adhere to some rules:

    Location: Mods should be put in a subfolder of the main ToT directory.

Modify **RULES.TXT**: The first line of **RULES.TXT** should be @MOD. Parameters can be added in any order on subsequent lines (syntax reminiscent of the events macro language, optional parameters in brackets):

name=
The name of the mod.

gametype=
One of "**Original**", "**Scifi**" or "**Fantasy**".

[flags=0x]
A combination of the following flags (a subset of scenario flags):

0x01	Total War Flag
0x08	Reveal opponent cities
0x10	Forbid government switching
0x20	Forbid tech from conquest
0x40	Eliminate pollution
0x80	Terrain animation lockout
0x100	Unit animation lockout
0x200	.SPR file override

[startingyear=]
Starting year of the mod, positive values for A.D., negative for B.C.

[yearincrement=]
Turn year increment, positive values for yearly increments, negative for monthly increments.

[maxturns=]
Maximum number of turns till the game ends.

[advanced=]
Two-bit flag per item in @ADVANCED, to control advanced rule defaults:
01 Disable item
10 Check item

Items are counted from the right, the last two bits control the first item. The example below sets the following defaults:
Simplified Combat - unchecked, disabled (01)
Flat World - checked, disabled (11)
Select Computer Opponents - unchecked, enabled (00)
Accelerated Startup - unchecked, disabled (01)

Example:

```
@MOD
name=Colonization Mod
gametype=Original
flags=0x220
startingyear=1492
yearincrement=1
```

maxturns=300
advanced=0b01001101

73. ***Custom mod / scenarios resources**: Allows mods and scenarios to load custom resource DLLs and several other files that are ordinarily not customizable. These other files include dialog.bmp, city.bmp, city.gif, civwin_back.bmp, boarder1.bmp (this patch also allows this file to be renamed to border.bmp) and menu.txt

74. **Reporting options**: Allows the player to configure various aspects of UI dialogs and delays.

    This patch adds an item to the TOTPP Configuration menu with the following options:
    - Disable ships caught in port dialog: Disables the @**PEARLHARBOR** dialog.
    - Disable missile attack dialog: Disables the @**MISSILEATTACK** dialog.
    - Disable scramble dialog: Disables the @**SCRAMBLE** dialog.
    - Disable battery dialogs: Disables the @**BATTERY** and @**BATTERY2** dialogs.
    - Disable SDI dialog: Disables the @**SDI** dialog.
    - Disable amphibious assault dialog: Disables the @**AMPHIBMOTIZE** dialog.
    - Disable foreign wonder dialogs: Disables the @**STARTWONDER**, @**SWITCHWONDER** and @**ABANDONWONDER** dialogs.
    - Disable unit promotion dialog: Disables the @**PROMOTED** dialog.
    - Disable partisans dialog: Disables the @**PARTISANS** dialog.

    The "Delays" button opens a dialog to allow changes to various delays in the interface:
    - Attack animation frame delay (ms): Number of milliseconds between successive frames in the attack animation. Defaults to 64.
    - Nuclear alarm delay (ms): Number of milliseconds to wait after the nuclear alarm sound plays. Defaults to 5500.
    - Nuclear explosion frame delay (ms): Number of milliseconds between successive frames in the nuclear explosion animation. Defaults to 100.

75. **Difficulty levels**: Fixes the crash for difficulty levels above Deity, and accepts an unlimited number of difficulties in the @DIFFICULTY section of RULES.TXT. In practice though, the limit is around 10, as very high levels will cause AI food / shield rows to go negative.

76. **Initial trade arrows for roads**: Enables a new section in RULES.TXT, @ROADTRADE. This allows configuration of the initial trade arrow for roads that is hard-coded to the first three terrain slots by default.

    The @ROADTRADE section consists of a list of terrain types, e.g.:

    @ROADTRADE
    Plains
    Grassland
    Forest

    Notes:
    - As an alternative to the name of the terrain, its ordinal index or its abbreviation can be used. "0" and "Drt" are the same as "Desert", etc.
    - @ROADTRADE1 .. @ROADTRADE3 can be used for secondary maps, similarly to @TERRAIN1-3.

If Lua is enabled, this patch registers the 'totpp.roadTrade' table for in-game read/write access to these values. This table is indexed by map, and returns a bitmask representing the terrain types that are set.

77. **Extra settler flags:** Adds four extra flags to @UNITS_ADVANCED (column G), allowing configuration of behaviour originally hard-coded for settler-type units:

    - Reduce population when built (bit 10, the rightmost bit is the first)
    - Requires food support (bit 11)
    - Can found cities (bit 12)
    - Can improve tiles (bit 13) (can only be turned off for settler-type units, not on for regular units)

    Due to the all these flags being hard-coded true for settler-type units in vanilla, you turn the behaviour OFF for them by setting the flag to 1, while for regular units you turn it ON by setting the flag to 1. Hence a 1 for any of these flags should be interpreted as "use the non-default behaviour".

78. **Lua scripting**: Enables Lua scripting and the Lua console. The Lua console can be activated when cheat mode is enabled with Ctrl-Shift-F3.

    This patch registers the `civ` library globally in the console, which provides the bindings to interact with the game. For documentation on the available functions, see the civfanatics forums. For documentation on Lua in general, see lua.org.

    The console loads the file 'lua\init.lua' when it's initialized (this happens every time when starting/loading a game). You can return a function from the module, which is run when the console is destroyed. The file distributed with the project provides basic history functionality.

79. **Lua scenario events**: Allows Lua scripting to replace the scenario macro language. The patch looks for a file 'events.lua' in the scenario folder, if found, it prompts the user to load this instead of events.txt. To write Lua events, use the bindings provided by the `civ.scen` library.

    Examples and documentation on writing events be found in `Scifi\events.lua' and 'lua\migrating events to lua.txt', both distributed with the project. For more documentation, see the civfanatics forums.

    The patch provides the infrastructure to write scenario state to the saved game, such files are incompatible with vanilla.

DEBUG :

This category contains patches that can be used for debugging. These patches can be left disabled in general

80. **Mulitple instances:** Allow multiple instances of the game to run simultaneously, or run ToT and MGE together for example (they use the same mutex).

81. **Move debug**: Enables 'Move debug', showing tile scores on the map whenever a path is calculated. For debugging the goto-command.

82. **Debug scripts**: Adds an in-game menu from which scripts can be run. It can be accessed with Ctrl-Shift-F1.
    Available scripts are:
    - Unstack terrain: Removes all fortresses and airbases from the current map.
    - Create units: Creates a stack of 256 units.