STEEL BEASTS
Professional PE
3.0 Release Notes

SB Pro PE 3.0 (Full Release)

Version History and Release Notes

This is a *new version* of SB Pro PE (neither patch nor up-grade) – so don't install it willy-nilly over an existing version. This Steel Beasts version is intended to be in-stalled separately. We strongly suggest **uninstalling previous versions of Steel Beasts Pro PE and the CodeMeter runtime software before installing it!**
To make sure that there are no leftovers from even older in-stallations, we recommend using the Windows System Settings' "Add/Remove Programs" utility.

Note: **This version will not run without an existing license for Steel Beasts Pro PE 3.0!**

Licenses may be purchased from the eSim Games web store: http://www.eSimGames.com/purchase.htm (for de-tails, see below)

Hardware recommendations

Downloading, unpacking the self-extracting archive, and imme-diate installation requires up to approximately 7.5GByte harddisk space temporarily. Of these, *Steel Beasts* will claim about three GByte free harddisk space permanently; the rest may be freed up through deletion and/or burning the installa-tion files to DVD.

In comparison to previous Steel Beasts versions, the hardware requirements are now more demanding. We recommend a 2.5GHz multi-core CPU (faster is better), 2GByte RAM (or up to four), 512MByte video RAM (1GByte or more necessary for the highest settings of shadowmapping), and generally a DirectX 9.0c graphics card supporting Shader Model 3.0.
Mouse, keyboard, and monitor are mandatory. A sound card and internet connection are strongly recommended. Joysticks and selected control handle replicas are supported.

DirectX 9.0c is not part of the download; you may need to download and install it separately;

Web Installer: http://www.microsoft.com/en-us/download/details.aspx?id=35

Full Installer: http://www.microsoft.com/en-us/download/details.aspx?id=8109

Installation

Steel Beasts uses an installer which does not change the Windows Group Policies (access privileges) of the folder containing all the map data of SB Pro. Therefore you may need to change the security properties of

C:\ProgramData\eSim Games\Steel Beasts\maps

so that normal user accounts may have write access to it and its subdirectories. **Otherwise** you will receive an error message and the **access to the Map Editor will be denied**.

Windows 7 users have an alternative: Right-click the SBProPEcm.exe in the ..\Release folder of the Steel Beasts installation, open the Properties dialog box, and in the "Compatibility" tab select the option to "Run the program as Administrator" – or run the setup program in the security context of an administrator account.

Time-limited licenses

With version 3.0 eSim Games now also offers a software rental option. This option is primarily aimed at users who do not already own a CodeMeter USB stick. Time-limited licenses are issued for one, four, and twelve months respectively:

- Licenses are bound to the computer on which they are installed.

- Only one license can be installed per computer. Activating multiple licenses on the same computer will only extend the duration of the single license, not add multiple licenses to the same computer. For example, if you buy a four-month and a one-month license, activating both will result in one license valid for five months.

- There is **no automatic renewal of licenses**; it is not a subscription fee that requires termination. Instead a warning will appear on program start if the license is about to expire (or if it already has expired).

- Licenses that have been purchased need not necessarily be activated immediately. You may buy five licenses but activate only one at a time if you wish. You just need to save the email with the ticket URL for future reference.

Online Support & Documentation

Experienced users of Steel Beasts Pro PE may already be regular visitors the official fan page www.SteelBeasts.com. If you are reading this, and haven't been there yet, we strongly recommend that you do so. Whether you like discussion boards or not, its integrated search function may yield valuable information.

An important part of the site, though less immediately visible, is the collective effort to maintain an online documentation, **the Steel Beasts Wiki**:
http://www.steelbeasts.com/sbwiki/index.php/Main_Page

Even without access to the internet there is a **serious amount of documentation included with** *Steel Beasts* **itself** (although an updated version of the user manual can only be supplied with the next update, currently scheduled for December 2013 (*as of this writing — Sep. 18, 2013*).
This additional information can be found in a subdirectory of the Steel Beasts program group of the Windows Start Menu (*curse you, Windows 8!*), incidentally named "**Documents**"; apparently it's still one of the best kept open secrets since about August 2000. It contains a PDF of the **User's Manual** and other ancillary information, e.g. the **US Field Manual 101-5-1** about tactical signs and military map symbology as used in *Steel Beasts*.

News about *Steel Beasts* will usually be published first in the forum of the fan site, and also on eSim Games' homepage www.eSimGames.com which you may want to check out occasionally.

User Interface Changes

Multiple Parties

Steel Beasts may now have **up to twelve different parties** per scenario which can be allied, hostile, or **neutral** to each other. It is also possible for a side to **change attitude**.
Mission Designers are reminded however that more sides in a scenario also mean more line of sight calculations which may have an adverse effect on performance. For most purposes four sides should be sufficient (Blue and Red cannot be deleted, add two neutral sides of which one may change attitude during a mission – that should keep most players busy enough).
Irrespective of their basic attitude (hostile, friendly, or neutral) 3D characters may be *"armed, if…"* or *"discard weapon, if…"* the conditions are met (set this in the MISSION EDITOR). Computer-controlled units will only shoot **armed** characters with a hostile attitude. They will never shoot unarmed characters, even if they are known to be hostile.

Added a new dialog in the MISSION EDITOR:
- **Add** and **Delete** parties
- Change a party's name
- Set its relationship with other parties
- Possible relations are **'Enemy'**, **'Neutral'**, **'Ally'**
- Specify conditions which will cause these relationships to change; if both **'neutral if'**, **'ally if'**, and **'enemy if'** conditions are specified, and multiple conditions are true, **'ally if'** dominates **'enemy if'**, which in turn overrides **'neutral if'**
- These conditions are checked once per second (the relationships between parties may change dynamically)
- **'Blue'** and **'Red'** parties may never be deleted

Nav Meshes

Nav meshes are an essential aid to the navigation of computer-controlled units – their ability to avoid complex obstacles and to find the shortest route to their intended target. We're using them also for a few comfort features (see below).
Most terrain files already contain a nav mesh. So often all that's needed to enable a nav mesh in an old scenario is to simply perform a map refresh, or to create one when prompted for it in the MISSION EDITOR: When creating a new scenario or loading an old scenario in the MISSION EDITOR, Steel Beasts will ask the user whether a **nav mesh** is supposed to be generated. Usually this is a good thing, and will require only a moderate amount of time. For rather complex map, up to 15 minutes computing time may be required. As it is an iterative optimization process the actual duration cannot be predicted with accuracy.
Nav meshes are the prerequisite for a number of new features to work properly. Mission designers are encouraged to update their scenarios with a nav mesh to let the players take advantage of these new options.

For **automatic path optimization**, Steel Beasts will add vertices (turn points) to your route, usually to avoid obstacles that aren't visible on the map. These vertices will be rendered in magenta. User-defined vertices are shown the traditional way as black dots. Automatically

generated vertices may be converted into user-defined by simple click & drag action.

Movement paths will get optimized by Steel Beasts with a present nav mesh. You will quickly get used to it if you memorize the following **modificator keys for plotting routes**:

When creating routes

- Hold **Shift** to force road-bound navigation between the current route node and the next (similar to the "snap to road" function of previous versions)
- Hold **Alt** to disable route optimization between the current route node and the next (direct route, like what it was in Steel Beasts since 1998)
- Hold **Ctrl** and click to delete a vertex
- Without a modifier hotkey, the route will be optimized for obstacle avoidance in off-road navigation
- Aircraft routes will not be modified whatsoever but always take the direct route; if there is unexpected route optimization, simply hold the **Alt** key when plotting a route (see above)

Nav meshes are stored in the terrain map (*.TER) file by default, and from there copied into the individual scenario; they may however also be created for a specific scenario, and be embedded like other map data in the *.SCE file as well:

- When loading a scenario with embedded nav mesh: No action
- When loading a scenario (in the MISSION EDITOR) without embedded nav mesh: User is prompted whether to build the nav mesh
- When applying a map refresh in the MISSION EDITOR: User *may be* prompted whether to build the nav mesh (if the TER file doesn't already contain a nav mesh)
- When loading a scenario without embedded nav mesh in order to play it: No action
- Added compression to nav meshes (this reduces scenario file sizes)

    Compression preferences are NOT saved in the **Options.dat** file
    Compression can be set to "OFF", "LOW", and "HIGH" compression; "Low" is a speed-optimized setting used for the autosave, "High" should be used only as the finishing touch when working on a scenario (may take between a few seconds and up to a minute or so per save command)

It is also possible to create nav meshes from the command line. If you have a large number of maps that need conversion, we recommend using an extra tool (*SB Navmesh Builder*; see below) to set up a batch conversion process. The command line options are

- Syntax: **SB2.exe --buildnavmesh --innavfile "file path\file name.ter" --outnavfile "file path\new file name.ter" --ignoreexistingnavmesh**
- The optional **--ignoreexistingnavmesh** will force a new build of the nav mesh even if one already exists in the input file
- **SB NAV MESH BUILDER** is a tool that most users of the Personal Edition will not need; it is made available as a separate download however at http://www.eSimGames.com/Downloads.htm
- If nav meshes are being built via command line option, alert boxes with error messages about eventual command line parsing errors will be suppressed

Civilians: Source and Drain Regions

Steel Beasts scenarios may no longer contain just friend and foe. They can now also be filled with a local population, refugees, commuters — in short: Autonomous traffic of cars and pedestrians alike.

To achieve that, the MISSION EDITOR allows the creation of custom *source* (spawn), and *drain* regions. The mission designer doesn't have to script the behavior of each individual (which would be impossible for all practical purposes). The key to achieving this is to create a "clone army" of autonomously acting characters.
Note that a prerequisite for autonomous characters is the presence of a **nav mesh** (see above).

Agents, i.e. one or more pedestrians, mixed civilian formations (e.g. parents and their children), or cars can be referenced for a source region as the source's "prototype unit". Multiple source regions can reference the same prototype units.
Set how many clones the "actor pool" should contain. The actors will spawn at a random location inside the source region (pedestrians start inside of buildings, cars on streets), they will then pick a random location in the drain region, and move there autonomously. When reaching the destination, they disappear and are returned to the agent pool (where they get recycled in an environment-preserving way; after some plastic surgery and change of dress they may reappear in a new place).
You can have more prototype units than the size of the actor pool. If you have referenced 10 prototype units and a pool size of five, only half of the units will appear at any given time. If you have only one prototype unit and a large pool size, many identically looking "clones" will walk or drive around. Usually you will probably want to avoid that.
You can set how often an actor should appear in the source region. They may appear in regular intervals, or with a bit of a random distribution. The shorter the interval and the less varied the prototype units, the more the resulting action will resemble a "Lemming stream".
Source regions may have multiple drain regions, including themselves.
You can set start and end conditions for the spawning of autonomous actors. That way you could create a rush hour in the morning from suburbs to a city center, or from the city center to the suburbs in the evening.

A useful addition is probably the fact that in the MISSION EDITOR, some objects can now have randomized colors through their context menu (especially civilian cars and container obstacles), or be set with one or several specific color (each vehicle will only have one base color, but if multiple clones are generated from a prototype, all clones will have one of the selected colors and no other). Use CTRL-CLICK to select multiple colors among which the car colors will be randomized

The looks of selected troop units (e.g. mortar teams, motorcyclists) may now be switched to civilian clothing
In the MISSION EDITOR it is now possible to create a large group of civilian characters in one step.

This feature requires 6 available (empty) companies to work, one company per category (business/casual/child/elderly/sportive/afghan). The game will loop through all companies looking for empty ones; it will report an error (and abort the creation) if an insufficient number could be found. Each type will be assigned one squad with one unit each.

Also added the feature to (multi)select units in the MISSION EDITOR and to assign them as prototype units to spawn zones (by clicking the new **'use as prototype'** item in the context menu). Note that only already existing spawn zones will be added to the list of regions that will be displayed. If a specific unit is added multiple times as a prototype for the same region it will only be used once.

General advice:
When creating 'pool units' from killed vehicles, keep in mind that killed vehicles cannot have a certain status (e.g. blind). Therefore, spawned clones of the dead unit can also not be blind.

Operations Editor

An **'Operation'** is a number of scenarios (henceforth called **'Operation Phases'**) linked together into some kind of tree structure (there's only one root - the start phase - but there may be multiple tips (where the operation ends). Unlike real trees, branches of an operation may merge and loop back into themselves.

To illustrate the new feature, the **1973 SINAI OPERATION** was added. Another operation is in preparation, but will only be released in a future update.

Advice for Players

Unlike normal scenarios, games that are part of an operation cannot be saved in progress. They do however save automatically at the beginning of a new phase (that is, when you end the AAR of the current scenario). That means you can immediately replay the current phase of the Operation. Also, you can end at any time in the planning phase.
New file types:
- *.opc: Operation Control file
- *.ops: Operation State file

Advice for Mission Designers

To create a new operation, open the MISSION EDITOR
1) Go to **File**, then select **Create** or **Edit Operation**
2) **Create Operation** will set up the framework & definition of phases. It opens a dialog box where to enter the **Title** of the operation as later displayed for the player. Type in (yes, the user interface is rather basic at the moment) the name of the folder in which you want to collect all relevant files. The folder must be a subdirectory of "**My Operations**" (you probably want to create it in the Windows™ Explorer in a second window while working with *Steel Beasts*).
   Once that the work on the operation has been finished the entire directory can be moved to the "Operations" folder and/or published as a ZIP file. It will also contain eventual savegames of the player.
   Another field to type in is the (optional) picture for the operation. It can be of the image file formats *.BMP, *.JPG, or *.PNG. Images should be 4:3 aspect ratio. Finally, enter a descriptive text for the operation that provides the player with some information about what to expect.

3) The next dialog box will appear once that you click **Phases**: Here, type in the **Title**, the **Filename**, and the **Description** for each phase, then click **Add**.
   Note that the phases of the operation aren't linked yet. Each of the phases that you list on the left will eventually require an equivalent scenario file. At this point however it's just about outlining the "construction plan" for the "mission tree".
   The next step is to define **Phase Successors** (click **Add**).
   At least one phase without a successor is needed as the (proper) end of the operation; while it is technically possible to loop every branch back into the mission tree (if every single phase has a successor) this is hardly promising satisfying gameplay.
   Also note that **End Phases** actually have **no** scenario equivalent. They are merely the phase where the operation's success (or failure) will be determined and illustrated. Therefore, for an **End Phase** do not add a (scenario) filename - just a picture, and the description text.
4) Once that the operation's phase hierarchy (or flow logic) is set, it is now time to set the conditions that will determine the choice of the successor phases (if there are more than one). First click **Add** to, well, add conditions.
   This presents you with a choice between the previous mission's **score**, or the previous mission's state of its **control logic** at the end, or the state of **Operation Events**; operation events are like normal scenario events, but persistent in their state for the duration of the entire operation and not just the individual scenario.
   As the next step, mark both the successor phase and the condition that you just created, then click **Assign**; each successor may only have one condition assigned to it.
   If you haven't done so, now it's time to start creating the scenarios for the operation.
5) Important Advice!
   Be consistent with the callsigns and unit identities in all the scenarios that are supposed to belong to the same operation, **if** your intent is to follow a specific unit's fate through a series of missions. (e.g. if 1/A is an Ulan IFV platoon in the first mission, 1/A should remain an Ulan IFV platoon in successor scenarios).
   Of course that's not the only way to define an operation; the various operation phases could still be linked by a common narrative yet be relatively independent. Future expansions of functionality may introduce unit state tracking. So, **if** you want it to be about one specific company, consistency in callsigns and unit types will reduce your future workload tremendously if you want to update an operation with these features.

Previous draft on the Operations Editor

*The following passage of two and a half pages may be safely skipped when reading these release notes for the first time. It doesn't contain a refined and succinct text about the **Operations Editor** but may still contain valuable nuggets for intrepid scenario designers setting out to explore the possibilities of it, and who may find the previous passage lacking detail.*
*I have therefore decided to keep it in this document despite feeling guilty about not editing it properly before publication. Should passages directly contradict the precious section, chances are that the previous section is right. We will also publish some text about this in the **Steel Beasts Wiki** at www.SteelBeasts.com*

The Operation Designer specifies which phase gets to be played once the current one has been completed. This can either be done

- unconditionally (phase B follows phase A regardless of its outcome),
- depending on the scenario's outcome (either mission score or state of any one of the scenarios logic states [events/triggers/conditions]), or
- depending on an **'Operation Event'** (which is just like an event in a scenario but persists for the duration of the operation.

These three conditions (*LAST PHASE SCORE*, *LAST PHASE LOGIC STATE*, *OPERATION LOGIC STATE*) can also be used to govern the appearance of certain units in a phase. This is done by placing a party's units into a **'Operation Spawn Zone'** and assigning them a route similar to a *'jump-to-end-if'* condition (which only allows for the three aforementioned conditions; it's menu entry is "*Enable for Operation*"). Units placed into the **'Operation Spawn Zone'** but without routes, or with routes whose conditions are not satisfied, **will not show up** during the mission. In other words, a unit must be 'enabled for operation' in order to become visible and playable.

- **Operation Events** can be referenced normally in the scenario's control logic
- Added an OPERATIONS entry in the MAIN MENU

    It will open a browser for existing operations. They are split, just like scenarios, into **'My Operations'** and **'Operations'**.

    By selecting an operation, the PHASE SELECTION screen opens. Here one may either start a new operation, or resume a saved one.

    The associated scenario file will load normally. Only after the AAR phase has been completed (and if the operation has not yet been finished) the user will be taken back to the PHASE SELECTION screen

    If the operation has been completed, the user gets taken to a preliminary OPERATION END screen

- An operation will consist of an **Operation control file** (*.OPC suffix) and a collection of scenarios, stored in a subdirectory. This directory – named after the Operation in progress- will also hold all the user's savegames. The folder will always be in the user's **'My Operations'** folder since he's not allowed to write into the common **'Operations'** directory

- In addition, an **Operation state file** (with *.OPS suffix) keeps track of which phase of an operation the user has reached

    In other words: *Operations will track in which phase you are.* You can save and exit an operation and later automatically resume with the scenario following the one that you completed last.

- In the MISSION EDITOR, the following menu entries were added:

    File | Operation description
    This will bring up a new dialog to load/save/reset operations, and to edit an operations' description (similar to a mission summary). The description will be shown while browsing operations

    File | Operation phases
    This screen allows to define phases and to link them. It features 3 listboxes, from left to right:

    - All the operation's phases (the order does not matter, except that the first one is the start phase)
    The currently selected phase's child (successor) phases. If they are conditioned, the ID of the condition will be shown next to its name

    - All the operation's conditions. *Meaningful naming is strongly recommended!*
    In the lower left edit the selected phase's title, description and its scenario name. Note that phases without a scenario name are considered 'end states'. Their description will be the one shown to the user, after that, the operation is completed.
    In order to *add or delete a successor phase* to the selected phase, use the dropdown box in the 'successors' group box.
    To *add/remove or edit operation conditions*, use the buttons in the lower right 'conditions' group box. Pressing **'Add'** or **'Edit'** will bring up the operation conditions window. Note that

clicking 'Edit' does not allow to change a condition's type (e.g. turning an *operation event condition* into a *score condition*). To do that the original condition must be deleted, and a new condition be created. Be careful to check all phases to make sure that they didn't 'lose' a condition!

To assign an *operation condition* to a child phase, mark the phase in the middle listbox, mark the condition, and press the **'assign'** button (there is also an **'unassign'** button).

- **Successor phases**

  If a phase has two successor phases, one conditioned, one unconditioned, the game will first evaluate the condition; only if not true unconditioned phase is chosen. Note that at this point the order of evaluation for multiple conditioned and unconditioned child phases is not specified.

  Another note about phase conditions: Currently only one condition may be specified. It is not possible to check for multiple events

- **Control Logic | Create Operation Spawn Zone**

  First clicking somewhere on the map, then selecting this option will create the 'operation spawn zone' (multiple clicks with the zone already existing will do nothing). This zone is set to be transparent (so the user does not see it), and may be resized and moved. Units placed in it will retain all the normal context menus.

  However, routes originating from these units will only have one menu option, **'Enable for operation'**; clicking on this entry will bring up the operation condition dialog.

  These routes work just like **'jump to end if…'** conditions. If the enabling condition is satisfied units will appear at the waypoint at the end of the route (and, annoyingly, report that they reached their waypoint once the scenario has started)

- **Control Logic | Operation Events**

  Operation events get their name from the 'normal' Event dialog box (so if you assign a name to 'operation event 42', this is the name the event will have wherever it is being referenced. On the other hand, once a scenario has been loaded in the editor, and if a operation has also been loaded, its operation events will be initialized from the names from the operation

The logic governing which phase succeeds another one can now handle up to 7 **Operation Conditions** (using the same logical setup as the scenario conditions); however, at this point, there can only be one condition specified in the UI

Added **Operation Events** to the Mission Debugger (however, Operations cannot be tested from the Mission Editor yet)

If a scenario is quit while still in the planning phase the operation state will be rolled back (so the scenario 'never happened' instead of being interpreted as being played and immediately quit)

In the operation end screen. The path of the image can be specified in the phase description window's **'Picture'** editbox for the end phase (= a operation phase without successor) in question. There is no limit on how many phases can hold pictures

Introduced a new **'Continue Operation'** screen (looking like the **'End of Operation'** screen) which will be displayed once a scenario has been finished and the AAR concluded.

This screen will offer the user to **continue** the operation, **save** the current operation state or to **quit** the operation. In addition, this screen allows the operation designer to display a picture (just like the end of operation screen; see below).

Note that there still will be an autosave file be created after each operation scenario has been played

Operation phase successor 'score' conditions now use a percentage value of actual mission score vs maximum score

If run with the **--loglevel DEBUG** command line option, it will now write out the score values

Mech units: Mount/Dismount, if…

Added "**Mount, if…**"/"**Dismount, if…**" command to vehicles, waypoints, and routes

- Routes and waypoints now have general mount/dismount properties. Like other properties for routes and waypoints, the mount/dismount properties get passed on to a unit when it arrives at a waypoint or embarks on a route

- One important distinction concerning dismounting is that a **waypoint dismount** will cause the dismounted troops to act as if it also just arrived at the waypoint, thus *allowing them to embark* on routes that start from that waypoint. On the other hand, a **route dismount** will force the troops to simply *stay where they are* (at the start of the route or between waypoints, depending on when the dismount condition becomes true). This is the (only) way to leave troops behind until a **Mount** command is given again.

- Also, if dismounted troops and the mounting vehicle are travelling along the same route at slow speed, the vehicle will coordinate its movement with the troops. It will let them advance before proceeding. At faster speeds, the vehicle will ignore the troops

- A human player can order a unit he owns to mount/dismount during a session or set the mount/dismount property for a route or waypoint as well, in which case his orders will override the scripted orders

- Changed route default speed setting to TOP SPEED for retreat routes for consistency. Units should start retreat routes in reverse then go to the route's speed after traveling the minimum backup distance

Weather

In the MISSION EDITOR, a 'Weather Control' window has replaced the old Visibility menu entry. This allows setting a timeline with weather and visibility changes as "weather control points". The Weather Control window determines the following parameters:

Crosswind
- Will affect ballistics
- Will let smoke and dust drift across the landscape (must be considered when laying a smoke screen with artillery)
- All scenarios (including old ones) have a default constant wind of 1.4m/s out of the NW

Air temperature
- Will **not** affect ballistics

Barometric Pressure
- Will **not** affect ballistics

Cloud lower level
- Will one day (but not in this version) limit the Hellfire missile engagement ranges (it could lose its target lock if the missile climbed into the could layer)

Cloud upper level

Cloud density

Improved workflow and usability of the Weather control dialog
- Renamed **OK** button to **Close**
- **Add** button will display only after the time for a new control point has been set
- **Update** button will display only after the settings for an existing control point have been changed
- The **Delete** button will remain greyed out if the current selection is not a valid choice

Different cloud settings in the Weather control dialog will now show in the 3D preview (for the first weather control point)

Clouds density will now adjust with different settings from one weather control point to the next

Could altitude will now adjust with different settings from one weather control point to the next

Adjusted fogging in the horizontal plane

Added a new variable in the MISSION EDITOR to artificially elevate the horizon for scenarios with especially short render distances. It is presented in the Weather Control dialog box as a slider, though *it is not a time-dependent variable*. At this point, no visual effect will actually come from it

Horizon superelevation will be applied at visibility ranges under 1000m. Visibility settings under 500m are considered as "fog" conditions. Under fog conditions the sky and clouds will eventually fade out completely if the visibility is 200m or less.

To illustrate the effects, a YouTube video has been published on the *Steel Beasts Channel* - http://www.YouTube.com/user/eSimGamesDtl - in the Tutorials section.

Artillery

The artillery aspects have been greatly expanded to offer players more options and flexibility. However, as a result, artillery management has become far more complex. During network sessions it may be advisable to leave the entire artillery battle to players who have studied the new aspects and become 'specialists'. This additional complication may be detrimental to training requirements for military users. Therefore the old artillery model is still available. Choose wisely.

3D Artillery can now replace the traditional off-map fire support. In place of the old 'universal' artillery Steel Beasts now incorporates specific types, including mortar, howitzers, and rocket artillery — each with realistic ranges and properties (the terminal effects of mortars are still under revision).

Artillery units that have been eliminated can obviously no longer deliver support. If the target is out of range of that particular type of weapon no support is possible. If an artillery unit is on the move to a new firing position to evade the threat of counter-battery fire, it cannot perform a fire mission. If the unit has run out of ammunition, the guns will fall silent. In short, your life has just become a lot more complicated. For network sessions it may make sense to leave the entire artillery battle to one or two specialist players.

With **Realism** set to "**High**", neither planned nor active artillery strikes will be shown on the map screen, just in the fire support queue list.

That means, as an artillery observer you really need to know your target dimensions, attitude etc.

Artillery shell fuzes have been modified. The gun crews will fire with variable timer (VT) fuze if the (soft) target is reported to be "in the open".

More, and more detailed information can be found in the Steel Beasts Wiki as listed in section "Online Support & Documentation" on page 3.

Other User Interface Changes

Yes, you're antsy to try out the new toy ... but eventually you'll need to know about this, so keep reading:

3D Engine:

Added a dialog box to set details of the 3D rendering (**Alt+G**)

- HDR BLOOMING artificially increases the brightness/contrast in scenes. Some like it – some don't. Find out for yourself to which user group you belong
- ANTI-ALIASING will usually not influence the frame rate much, except for integrated Intel HD chipsets
- SHADOWMAPPING is the single most influential factor on the frame rate now. Settings 4 and 5 are recommended only for fast graphics cards with 1GByte video memory or more
- VOLUMETRIC CLOUDS will not influence the frame rate unless looking up high in the sky, provided that there actually ARE clouds to begin with

Armored Recovery and Supply Vehicle Behavior:

Hitch/unhitch conditions can now also be assigned to routes and formations, not only to checkpoints (so a ARV driving along a route can pick up a cripple)

With multiple ARV vehicles in a formation they will coordinate recovery so that each crippled vehicle is only 'targeted' by one ARV

An ARV will conduct a search for a crippled ARV within its vicinity (250m) every 5 seconds. If one is found, it will drive to a point 5 meters to its front at high speed, and start hitching. The formation will enter a 'recover status' which takes precedence over finding battle positions but should still allow to avoid artillery attacks

'Hitch if' and 'Release if' may be set simultaneously

Waypoints that belong to a recovery vehicle show a light blue circle to denote the area where they may autonomously look for recovering immobilized vehicles

There's a similar, light pink circle for supply vehicles and their waypoints to denote their zone of influence

Optional Weapons:

Reorganized the "optional weapon" sub menu. Attached guns with multiple options will get their own sub-menus which hold these entries (like weapon type and PILAR/50x zoom etc).

Helicopters:

Helicopters may now be scripted to land (set flight height "ground level"); while troops mount or dismount, route embarkation is suspended even if the conditions are met. This also means that in order to mount or dismount troops, the waypoint need not be assigned a battle position tactic

The flight height setting will now automatically change from "No change" to "NOE" if the previous flight height was "Ground level"

Airborne helicopters can now be forced to land by using the "load troops" command

Helicopters may now have up to six aircraft in a single formation
Tripled the spacing of aircraft in formations
Staggered the flight heights of aircraft in formation
Aircraft collisions are ignored for the moment

Infantry/3D Characters:

Vulnerability: Some infantry units are now better protected with fragmentation/weak bullet proof vests. Helmets will also add to the protection level (in comparison to civilians and irregular fighters without such equipment)
Added movement/speed types
- Crawl
- Walk upright
- Walk crouched
- Jog

Added postures
- Kneel
- Stand

Added a basic stamina model, preventing human-controlled units from unlimited sprinting
- added a status bar that shows the stamina level
- adapted the code for the restrictions to the stamina level
- adjusted stamina rates to double the distances that infantry may sprint (80m), or jog (150…200m)
- Artillery observers and MG3 gunners may move at any speed (within the general infantry speed limits)

Adjusted the stamina balance
- Resting takes 5 minutes from full exhaustion to full stamina, and 90 seconds each for green (=rested) and yellow (=tired) state
- Crouched walking and crawling does add to the exhaustion, but not very much
- Upright walking depletes no stamina
- Set the resting period to 30 seconds

Mounting and dismounting infantry will jog, if their stamina balance allows it
Infantry will go prone immediately if under direct fire
Weapon teams will always move forward in their "up" pose
On "**March**" routes
- infantry will now walk upright (also when resuming a march route after a period of manual control by the human player)
- Infantry will no longer do "rest pauses"

Will no longer do the instantaneous 180° turn if **X** is pressed
Default movement style on all routes (except **March**) with **Slow** speed settings is crawling
Infantry on a March route may now be halted
Infantry will adopt new speed and movement posture settings if the properties of a waypoint or route are changed (they will kneel if no tactic is set, otherwise go prone); furthermore, added a menu to set the default behaviors
Changed the default prone animation
Improved animation blending
Adjusted the walking sound
Adjusted walking speed to approx. 6.7km/h
Movement speed may now be set by mouse click
Entering and leaving buildings is done running now

After exiting a vehicle, soldiers will go prone
Movement speed changes:
- If soldiers can only walk and go prone (like the weapon teams), the walk triangle is now at the same place where it is for normal soldiers
- If soldiers stand idle, they use an animation where they hold the weapon before the body (unarmed civilians still use the old one)
- They check if they have the stamina to change speed if you press ('W') to avoid unnecessary transitions
- Weapon teams do not use the new movement methods for now
- If soldiers crawl in a weapon team, they use the right speed
- Irregular combatants may use any infantry-specific movement style
- Combatants will always enter houses running (or crawling if exhausted)

Updated the vulnerability definition of infantry character models
Infantry on a march route will now kneel down if the movement speed is set to **Halt**
Infantry in water will now move without making sounds
Irregular fighters will now make sounds while moving

Map Editor:

The MAP EDITOR now stores the last position of the **Object Placement Window**; speaking of which,
- The new "Object Place" window, which allows filtering all objects (Buildings and "plain" actors) by category. Next to the 14 predefined categories the user will be able to define four categories of his own by editing the '%APPDATA%\eSim Games\Steel Beasts\options\customMapObjectPalette.txt' file. In addition, the window will show the 18 most recently placed objects (it is possible to minimize the window so that only 9 are shown).
- The custom category file has the following syntax:
  - '#' at the beginning of the file designates the line as a comment; it will be ignored
  - one category per line with comma as a separator; first is the category name, then the IDs of the objects. There is no limit on the number of objects per category; the category name must not exceed 12 characters
  - only the first 4 category lines will be evaluated
  - incorrect object IDs will be ignored, and do not invalidate the whole category

This new window is only active when placing objects - trees, rocks, bridges, 'line objects' and the object selection still use the 'old-style' mesh selection window
- Will now show the compression level of the nav mesh for an existing *.TER file
- The 3D preview will now show medium cloud cover

Mission Editor:

It is now possible to be more selective with automatic **Map Screen Updates** (updating only the positions of own forces, aka. "**BlueFor Tracking**")

Made it easier to select text objects in the MAP SCREEN (be it in the MISSION EDITOR or in the Planning Phase)

The new default RPG is RPG-7

The function "Set look of infantry" will do *just that*. It will change the *look* of 3D characters but not their party, or attitude towards other units. Think of irregular or special forces disguising themselves in the uniform of the enemy, or as civilian characters. If they are supposed to *behave* differently than the party to which they belong, create a new party that is allied with the "original" party but not necessarily hostile to others in order to infiltrate successfully. If they are supposed to attack at some point, you will need to make sure that they are both "Armed, if..." and "Hostile, if...".

3D View:

Added STOP SUPPRESSION command (menu item) in 3D view

In 3D driver positions it is now possible to lean forward towards the vision blocks by pressing (N)

Network Sessions:

Changed the UI behavior in the ASSEMBLY HALL: Clicking on a crew position occupied by oneself will no longer boot oneself into the observer's position but remain in the current position

Audio Options Menu

Added a master volume setting to the options file, a master volume slider control to the 'Audio' options and (unmapped) hotkeys to increase or decrease the volume during a scenario.

One hotkey-press will change the value by 1%, pressing the buttons in quick repetition will change it in 10% steps. Old option files will cause the volume to be set to 100%

Other UI changes

- Adjusted damage handling:
  Coax and Stabilization damage may now be repaired while the tank is moving
  These repairs will start immediately, and no longer require a combat and movement pause of 60 seconds duration
- LOCALIZATION:
  Added **UK** voices
  Added **Russian** voices and tutorial translations
  Updated **Danish** strings
  Updated **English (AU)** loader's voice
  Updated **English (UK)** voices, strings
  Updated **English (US)** loader's voice, strings
  Updated **Finnish** strings, tutorial translations, INSTANT ACTION, and TANK RANGE briefings
  Updated **French** strings
  Updated **German** strings
  Updated **Spanish** voices, strings
  Updated **Swedish** strings
  Removed obsolete strings
  Corrected a few string tokens and length

> Added back a few missing strings

- Computer-controlled wingman helicopters will now attempt to land if the player's helicopter is ordered to shut off its engines while still landed (if still flying, the order will be ignored)

Other Important Changes

- Changed the Operating System minimum requirements from Windows 2000 to Windows XP
- Changed the hardware requirements. The new 3D engine requires a 3D capable graphics card supporting Shader Model 3.0 and must have a video memory of at least 512 MByte (1GByte+ recommended). Also recommended are 2.5GHz or faster multi-core CPUs.
- Added digital certificate to installer
- In scenarios where the thermal visibility range exceeds the optical visibility limit, most units equipped with the thermal imager may not identify targets at ranges exceeding 3000m (which is already a rather generous limit). Selected units with a higher than normal magnification may however identify targets out to twice that range
- More than 100 "Western" civilian- and Afghan-looking 3D characters have been added to the object library to populate the scenery as pedestrians
- Enabled the "repair, if…" function for troops
- Enabled vehicle-borne IEDs and suicide bombers (right-click a car and select the corresponding menu entry *"Explode, if…"*)
- Moved texture files into new file paths:
    C:\Programs \eSim Games\Steel Beasts\mods\textures\textures\desert\normals
    C:\Programs \eSim Games\Steel Beasts\mods\textures\textures\desert\speculars
    C:\Programs \eSim Games\Steel Beasts\mods\textures\textures\winter\normals
    C:\Programs \eSim Games\Steel Beasts\mods\textures\textures\winter\speculars
    C:\Programs \eSim Games\Steel Beasts\mods\textures\textures\woodland\normals
    C:\Programs \eSim Games\Steel Beasts\mods\textures\textures\woodland\speculars
- When firing with *open bolt*, the ammunition type display in the upper right corner will no longer blink if the Cdr's requested type is other than the currently used maingun ammo type (but it should still blink if Cdr requested COAX but Gnr uses ATGM)
- Reduced the minimum tree clearance distance for helicopter landing zones to about 10…16m
- If not moving, choppers will avoid only those trees under them. This will allow to land in a smaller LZs
- Steering wheel (or joystick) game controller input is now reversed if the vehicle is driving backwards (and in the vehicle script file either the REVSTEER XFLAG or WHEELED and NONZEROTURN-RADIUS is defined, similar to how it's done for keyboard input
- Added some hotkeys to the MISSION EDITOR:
    CTRL+N   will create a new scenario
    CTRL+O   will open a scenario
    CTRL+S   will save the scenario
    CTRL+P   will print the blank map
    SHIFT+P   will print the map as displayed
- Added some hotkeys to the MAP EDITOR:
    CTRL+N   will create a new map
    CTRL+O   will open a map
    CTRL+S   will save the map

        R toggles the rendering of road width between real width and
        1 pixel
        F flips start and end point of a line object (useful mostly
        for the guardrail, if you find that the rail is on the side
        facing away from the road)

- Added new hotkey "Toggle HUD Overlay" (**ALT+H**); it toggles the display
  of HUD/UI overlay elements in the 3D world, i.e. damage messages,
  timer, frame counter, info bar, pause message etc... to allow for
  "clean" screenshots/videos

- Mission designers may now set the following damages:
        DAMAGE_GRENADELAUNCHR
        DAMAGE_LASERWARN
        DAMAGE_MISLAUNCHER
        DAMAGE_SEARCHLIGHT
        DAMAGE_AUTOLOADER

- Updated a number of projectile parameters and terminal ballistic
  performance estimates

- Reduced crosswind susceptibility for most medium and large cali-
  ber rounds

- Added "**.PNG**" screenshot option in addition to the existing "**.BMP**"
  and "**.JPG**" formats.
        PNG uses lossless compression; it offers the same image qual-
        ity as the BMP format at a fraction of the file size. JPG
        still offers the smallest file size, but with noticeable com-
        pression artifacts

- Copying and pasting routes will now also retain properties like
        For routes
        ▪ mount command
        ▪ ARV hitch and unhitch conditions
        For checkpoints:
        ▪ mount command
        ▪ formation style
        ▪ ARV hitch and unhitch conditions

- Adjusted movement behavior. Upon arrival on a checkpoint with no
  tactics / battle position set, and an eventual embark condition
  of the following route being true, units will no longer stop for
  a brief moment; they will however still stop to allow for a troop
  mount or dismount order

Known Issues

The LEOPARD 1A5-GE (cast turret) has the 3D interior of the LEOPARD 1A5-DK
(welded turret). The LEOPARD 2A5A2 has the turret roof of the LEOPARD 2A5-
DK. *Squint harder!*

The **Autosave** function is not recommended to be used when working with
scenarios based on the **Terrastan** map. These scenarios tend to exceed
100MByte in size, and writing all that junk to disk while you are plot-
ting a route for a unit especially in that area with the many walled
fields in the northern part of the map can make it nearly impossible to
get any meaningful work done because of the frequent and time-consuming
disk accesses.

Improving performance here is on the work list, but could not be com-
pleted in time for this release.

New/Updated vehicles with crew positions

ASCOD Pizarro:

Changed PIZARRO turret power hotkey to Joy7 to avoid conflict
Updated 3D interior artwork
Adjusted vulnerability model
Added new 30mm ammo types
Added Oerlikon AP round as alternative ammo
Corrected an error in the lead implementation
The unity sight (as seen from the distance) is now blacked out if primary sight has been damaged (eye view inconsistency)

ASCOD ULAN (new vehicle!):

Added Commander's position (**F7**)

Added Driver's position (**F9**)

Added Gunner's position (**F6**)

Added Squad Leader's position (**F11**)

- Available views are the view out of the cupola (**F4**), the forward vision block (**Alt+F1**) and the rearward vision block (**Alt+F2**)

Adjusted ammunition counts
- AP: 120 stowed, 80 ready, 200 total
- HE: 80 stowed, 120 ready, 200 total
- MG: 1200 ready

Added Oerlikon AP round as alternative ammo
Note that the assumption is that one feed holds HE, the other AP; if both feeds hold AP or HE the ballistic computer might not function correctly if an HE ammo type is selected via the thumbwheel
Fire Control System notes:
- Added a new hotkey "**Auto Target Tracking**"
  Pressing this while stabilization is enabled and TI is in narrow view (and with a vehicle in the crosshairs), the tracker will pick up and automatically follow the target (and will continue for up to 3 seconds after LOS was lost). Pressing the key another time will deactivate tracking.
  The ULAN has dual-axis stabilized view and dynamic lead, which is activated by pressing the laser key. The reticule will stay on target but the gun will jump, and the gunner may fire
- Added the "gun shot through" error (in case the gun was fired with no round loaded). In this case the gun will have to be recocked (press REAR NORM and, once the gun has been charged, REAR SERV) and the TWK "reset" button has to be pressed for the shown error to go away
- While the laser is turned off (and not disconnected in the '*Geräteauswahl*', the FCS will show error 170, with the 'KOMM REE-LEM' text displayed

After an invalid range input the red FCS light will blink until a valid range is being entered
- Lead is only calculated once the LASE button was pressed for about 2 seconds. It then "sticks" until the next measurement
- If stab and power traverse is enabled when the crew opens a hull hatch, both will be disabled. As soon as the hatch

> is closed again, power traverse will come on automatical-
> ly, but **stabilization will stay off**

- For a mixed crew the thermal imager will show the cross-
  wind value set by the human commander while the computer-
  controlled gunner will use the actual crosswind (this is
  intentional). For a purely human crew, the ballistic com-
  puter will use the values entered by the commander
- Shot counter display in central panel: it will be dis-
  played during and after a salvo has been shot, until the
  set/next button has been pressed
- STAB EIN button - if it's pressed while the power trav-
  erse is still booting, it will blink until power traverse
  is ready
- The ballistic computer may be disabled by any (turret)
  crew member

There is no need (or possibility) to clear the empty shell
bag, as this is assumed to be done by the crew during the
regular reload procedure

Cdr and Gnr may independently open/close their ballistic
sight doors. In offline sessions the computer-controlled gun-
ner will always follow the action of the TC (except in arty
barrages where he closes it by himself)

The Cdr's TI screen will black out as the gunner's ballistic
shield door is closed

'*GURTENDE*' (end-of-belt) should be displayed only if a volley
was prematurely ceased due to this limit being reached

Both daysight and TIS reticules will blink if an invalid
range was entered

While troops are mounted, the driver will have access to the
'Altview 2' (the view through the vision block in the troop
ramp). This is to simulate the troops giving the driver manu-
al navigation commands while backing out of a firing posi-
tion)

The Cdr may not change the TI's magnification without over-
riding the gunner

The crew may now bring the breach safely forward by pressing
'*REAR NORM*' and the trigger

The smoke grenade launcher box shows the tubes' load status.
Green for smoke, red for HE (these only in tubes 5/6 on ei-
ther side). Smoke grenades are fired in salvos (two for each
side if only smoke grenades are loaded), HE grenades are
fired individually

The computer-controlled Cdr may launch smoke while unbuttoned

Enabled the '*Laser*' button on the laser assembly (3D interi-
or)

Changed the LRF behavior: If the lase button is only pressed
for under 1500ms the locked lead will NOT be changed. This
allows the gunner to track the target and do a quick range
update without discarding the integrated angular turret ve-
locity

Changed the LRF accuracy to 1m resolution

The crosswind 'left/right' arrows will be set based on the
'left/right' switch setting, not based on the entered value
(where a value of 0 always meant 'left->right')

BILL-1 ATGM team *(new system!)*:

Specified a thermal sight cool-down time to prevent its imme-
diate readiness after repositioning

The BILL-1 primary sight field of view is 45°

Final Version – For public release   18-Sep-2013

Bushmaster:

      Troops now visible inside
      Updated some texture files

Centauro:

      Fixed four bugs that flooded network sessions with status messages, making internet based games with this vehicle practically unplayable
      Computer-controlled crews will no longer switch off the thermal imager, but close the ballistic shield doors instead if they come under artillery fire
      Fixed the SGL power cover on the commander's smoke launcher control panel
      Unmapped the "CCP/GCP Power" command (which was mapped to joystick button 6) since inadvertent use will lock the GPS mirror
      Enabled five new main gun sounds
      Enabled the gunner panel's power button
      Added US diffuse texture to mimic STRYKER MGS

Challenger 2:

      Added a few tutorial scenarios
      Adjusted vulnerability model
      Added rudimentary 3D interior for the commander's place
      Commander's TI screen now rendered inside the 3D interior
      Replaced the blitted gunner's unity sight with a 3D version
      Updated some texture files
      Updated Gunnery Range scenario
      Corrected erroneous location of the auxiliary sight
      Changed combat mass from 62.5 to 70t
      Adjusted power-to-mass ratio accordingly
      Added new sounds
      Removed the ammo door sound (it doesn't have one)
      Updated default ammunition loadout

Cougar MRAP:

      Troops now visible inside
      Enabled M240 7.62mm MG
      Updated some sounds
      If equipped with a manually controlled gun, the gun now is mounted on a rotating mount (just like on the FUCHS, BUSHMASTER, M113, …)
      Added two glass meshes
      Added a missing UN texture

CV90/30-FI:

      Added and updated a large number of tutorials
      Added INSTANT ACTION scenario
      Added GUNNERY RANGE scenario
      Added a number of PDF tutorial files for CV90/30-FI
      Adjusted vulnerability model
      Adjusted vehicle script file
      Updated some texture files
      Fire Control System changes
- Range values in the ballistic computer are now adjusted with the vehicle's movement, even while manual range or battlesight are selected

- While a human player is in the gunner's or commander's position, the FCS will use the crosswind and wind speed settings as specified through the TA4 panel. The entered value is relative to the hull and will not be updated if the hull changes orientation (the FCS will calculate correct crosswind speeds for the current turret position)
- When switching to 'Air' FCS mode, it is now possible to use the laser range finder
- The user may now enter minimum laser range, battlesight range, and manual range
- Lasing with closed ballistic doors, open unity sight, or with no echo will now always return a range of 9995
- If an invalid laser range measurement was performed, the FCS will reset after one second to its previous lased range (if any), or to battlesight range
- The FCS now tracks if a 'measured' (lased) range is stored and reacts accordingly (e.g. with palm switches off the GPS/VIS/TA4 will show '----'; if no measured range is stored, the FCS will revert to battlesight if an invalid lase attempt was made
- Improved air target mode:
  - Corrected readouts in TIS and day sights
  - Corrected the lase frequency to 4s at 4Hz, 6s at 2Hz, 20s at 1Hz, 18s pause, repeat - stop by letting go of palms or pressing 'range sel' switch)
  - The view will no longer 'go wild' in burst mode
  Note that manual lasing (after the first lase to initiate auto lasing) is not possible
- The FCS now stores the Cdr's and Gnr's target mode setting, and will apply each crew position's setting while it controls the gun
- In emergency FCS mode the FCS will no longer be aware of the type of round loaded, and change superelevation/lead
- Changed default battlesight distances to 1000m for main gun, 200m for coax; the default manual range is 500m
- FCS emergency mode will now force 'stationary' target mode. Enabling it will also enter battlesight range into the ballistic computer
- Ballistic computer damage will zero wind range and direction
- *Moving* target mode now works as soon as a valid range is being entered (by any means)
- Adjusted the slow mirror movement in 'emergency FCS' mode. This can only be an approximation; the pitch axis will move much faster (yet still slower than before) than the yaw axis

User Interface changes
- Added mechanical gun safety. If this is set to ON, the gun will eject rounds without firing them.
  Note that the FCS will not detect that a round was fired and hence will not decrease the round count!
  Note that this switch cannot be seen from the gunner's default view position; the user will have to enter the "Altview1" (**Alt+F1** hotkey) to see it!
- While switching target modes, AA mode will not cause battlesight range to be selected until it has been active for one second
- Added the commander's air target sight

- The commander may toggle the AA reticule display us-
  ing the 'GAS Reticule' hotkey ('R' by default).
  Note that this reticule requires turret power to be
  enabled
- Pressing the emergency button in the troop compartment
  will no longer cause a VIS icon or a VIS alarm state to
  be set
- Enabled the firing of smoke grenades with only turret
  power active (circumstances permitting)
- **FCS power** can no longer be activated immediately after pow-
  ering up the turret – a delay of a few seconds is now en-
  forced (by the time the ventilation fans start up)
- Added coax safety and charging handle (the coax has to be
  cocked when starting 'not combat ready', after reloading,
  and after it was repaired)
- The language of the strings in the TIS will be controlled
  by the VIS language
- In "eye" and "vision block" view modes, the gunner may
  now slew the view using the joystick (when using "real
  control handles" this works only when the palm switch is
  not pressed - otherwise the handles control the gun).
- Ballistic shield doors may now only be operated while
  turret power is switched on
- End-of-belt overrides are no longer automatically reset
  upon reloading
- The gunner's day sight will now longer show the true ammo
  type, just what the crew entered into the ballistic com-
  puter
- May now load both AP and HE rounds into either gun feed
- Added coolant damage
- Added "TC TIS" damage; will affect both day and unity
  sight
- Added a preparation time to the reloading process (to
  open turret basket doors etc before actual reloading can
  commence).
- The player's viewpoint now remains properly focused on
  the VIS while the turret may be turning
- PKT may now only be cocked if safety is off
- With weapon power disabled, weapons can still be manually
  fired by the TC
- Without weapon power loading the gun is no longer possi-
  ble
- The 'override end of belt' buttons may now be activated
  even if the EOB warning is not yet active. Reloading will
  not reset the state of these buttons
- Corrected reloading times (pre-reload: 30s upper chute,
  45s lower chute, 12s if crew is helping; post-reload
  15s; 5s per round; 60s penalty (per round) if amount is
  below EOB limit)
- Changed coolant leak time from 30 to 5 minutes. The cool-
  ant temp (drawn in a dial in the 'chassis' VIS screen)
  should raise accordingly now. The VIS will only show an
  error if the temperature rose to 90% of its maximum val-
  ue.
- Enabled the auxiliary trigger (foot pedal) for burst fire
- While zoomed in to the VIS (Altview2) it is no longer
  possible to slew the view using the joystick

- Selecting different feeds in EMERGENCY mode will change the computer's ballistic solution
- Weapon selection on the gunner's handles will now require the TA4 switch set to 'gunner handle'
- The 'range toggle' switch now disables AIR mode
- TURRET damages now display text messages in the 'suggested action' VIS menu
- Changed mouse control for the 3D turret interior view (if 'real control handles' are selected); the control handles now exclusively control the turret movement and the mouse exclusively controls the view
- Changed end of belt signal for upper chute to 28 rounds
- While COAX is selected the shooting mode (single/auto/burst) is being displayed again

Instrument related changes, sights

- Day sight reticules are now gold, not red
- Added a black border to the bottom of the gunner's day-sight (behind the LED readouts)
- Added '*HÄTÄTOIMINTA*' (EMERGENCY) string to TIS if FCS is in emergency mode
- Changed the color of the day sight reticules to be simply black
- Fixed the 'auto' functionality of the barrel cam reticule
- Set the barrel cam reticule's BLACK mode to also use the 'pure' black color
- Removed the yellow light in the gunner's daysight while no measured range is available
- GNR daysight status LEDs remain visible even if LRF is damaged

Instrument related changes, **TA2**

- Corrected "**gun power**" light (see VIS entry)

Instrument related changes, **TA3**

- Corrected "**gun power**" light (see VIS entry)

Instrument related changes, **TA4**

- TA4 display is now continuously refreshed while set to show "used range" (as it will change while the vehicle is moving)
- min/max VO value range will not depend on feed any more, but on the ammunition type specified for each feed
- The TA4 weapon selection switch no longer disables the gunner control's functionality to switch ammo feeds

Instrument related changes, **TA6**

- Activated the VALM switch on the TA6, and the "IR OK", "KP OK" and "VALM" LEDs
- Various other buttons on the TA6 panel will now illuminate

Instrument related changes, **VIS**

- Added an '**Active**' (**Toimet**) menu in the VIS which will show in-depth information about the selected alarm
- the 'weapon' status bar icon in the VIS will light up in red if the weapon is jammed
- Added "**suggested action**" screen to the VIS.
  Depending on actual error, there may be different errors reported (e.g. a LRF error may be reported as "Fault in laser emitter" or "Fault in laser unit RAM"). During the course of a scenario, these error types will not change (and in MP scenarios, the same error should be reported for all partic-

ipants), but if the scenario is rerun, another error type may be reported
- The VIS will now remember the last used video mode
- Corrected color of some VIS alarm group icons
- Corrected (visual) behavior of "**GCU Ready**" readout in the VIS and on the "**gun power**" TA2/TA3 panel:
  - After gun power has been enabled, the "**GCU**" dot on the VIS will be filled in
  - the "**gun power**" light on the TA2/TA3 will blink with 1Hz for 3 seconds - then it will be lit up steadily
  - the "**GCU ready**" dot in the VIS will be filled in as well
- Damage icons in the VIS are now shown even if the monitor frame is not being rendered
- hull batteries show as fully charged even if 'battery damage' (DAMAGE_SPOTLIGHT) occurred; turret emergency mode must be selected

Instrument related changes, **other**
- the electrical safety, safety loop, SGL and coax lights do not require gun power to light up
- Ammo temperature and manual range are now shared values for both ammo feeds
- Corrected damage display of safety circuits (WNA_TEMP) and turret damage
- The voltage dials will go down to their minimum value (~18V) if batteries are damaged and turret emergency power is applied

3D interior model
- Added articulated coax
- vision block bases
- TA2/TA3 buttons are now shared for TC/GNR
- The manual feed selector knob should will now work reliably
- Corrected the display of the power-status of subsystems in case of damage
- Added a 'vision block' (F4) view for the driver which allows him to see more of the vehicle's glacis
- The 'emergency FCS' hotkey will now set the state of switch and its cover in the 3D interior

Added Nammo AP round as alternative ammo
Added "damage screen" to barrel cam
Added PKT recock sound
Added new sounds when flipping a few switches
varied the pitch of the SOUND_I_30BUSHMASTER_EJECT sample somewhat between shots
Added "peri control", "peri electrics" and "peri azimuth" to the missing systems
Added dedicated hotkeys for the CV9030 FI's fire control modes (note that there is no control category for this vehicle)
The vehicle now starts with ballistic shield doors closed if not battle ready
Has now its own track texture
Adjusted PKT muzzle velocity
Corrected sound being played if 30mm feed is being changed
In the Finnish version the 'APC_STOPPAGE.WAV' sample will be played if the COAX is damaged/down.

Fixed a bug that caused wildly diverging laser ranges between TC and GNR in network sessions
'*EI KAIKUA*' (no return) should not be displayed if there has not been any attempt at lasing yet
Fixed a bug where gun in burst mode went off-target
Fixed a bug preventing the selected range type to be displayed in the thermal screen
Fixed a bug that limited the 30mm burst length to four rounds
Fixed an issue with the gun not keeping its current angular speed (ignoring gunner input) while firing in 'burst' mode during movement

CV90/35:

Observers can no longer hear certain sounds; this may also fix bug #2459

CV90/35-DK:

Updated 3D interior model
- Added the mechanical gun safety, driveshaft and driveshaft cover features
- Added driver's position (3D interior); removed the full-screen VIS mode

Implemented 'peek holes' in the gunner's and TC's ballistic shield doors for some (limited) visibility in the thermal imagers
Updated some sounds

User Interface:
- The driver will no longer see a thermal-like scene when accessing the rear camera view
- The turret crew may now click on the MFP display; doing that will take them to a fixed, zoomed-in "MFP" view (similar to the VIS views). It is also possible to enter this view by pressing the "View 3 (alt)" hotkey
- The driver's VIS will now automatically switch to rearcam while driving backwards
- The gear indicator in the VIS 'chassis status' screen will switch to 'D2' if driving forward and 'R2' if driving backward
- The troop commander may now click the VIS to zoom in
- Removed the "Override end-of-belt" hotkey from the CV90/35 hotkey category since that command is actually not used there
- The coax handle will no longer be actuated on (ALT+B) command to close the (non-existent) troop hatches
- Coax will reload automatically only while the commander is inside the 3D turret, in eye view mode (F1)
- the new hotkeys for the TC's left/right palm switches are now also mapped to the 'arrow down' and 'arrow up' keys (so that they're analogous to the ZÜ/KH keystrokes)

Fire control system:
- added the salvo counts to the 'Weapon' status screen ABM modes
- While a human player is in the gunner's or commander's position, the FCS will use the crosswind and wind speed settings as specified through the TA4 panel. The entered value is relative to the hull and will be automatically updated if the hull changes orientation (as long as the

GPS system is not damaged). The FCS will calculate correct crosswind speeds for the current turret position. **Note** that the CV90/35-DK allows the user to enter wind direction in mils while in the CV90/35-NL the values are entered in "o-clock" notation

- Implemented the 'resume' functionality where the gunner, if he keeps his palm switches pressed while being overridden by the Cdr, may return the turret to its original azimuth by pressing the 'resume' button (for up to 60 seconds after the TC ceased overriding).
  For this a new hotkey was introduced; note that this hotkey is NOT mapped by default!

Instruments:

- The correct battlesight ranges will now be shown in the MFP for the selected weapon
- The manual range and battlesight range readouts are no longer swapped in the VIS "operational" screen
- The 'GPS I' symbol in the 'operational' VIS screen will be darkened while 'GlobalPosSys' damage is applied
- The VIS 'weapon' screen will now display the left/right feeds' remaining ammunition as bars under the weapon symbols. The bars will go yellow if 15 rounds remain and red if 7 rounds are left
- The 'dynamo' gauge in the VIS 'battery' screen will be drawn in green if the engine is running
- The VIS 'operational' screen will now animate the TC's and Gunner's line of sights (drawn as a blue line) to reflect their azimuths
- The video selection dial on the TA4 will no longer control the output of the VIS, but the greenscale video tube of the TA4
- The 'safety loop' readout in the MFP's main screen will no longer reflect the status of the turret emergency switch (since driver's hatch and turret basket doors are not tracked)

CV90/35-NL (new vehicle!):

Added Commander's position (**F7**)
Added Driver's position (**F9**)
Added Gunner's position (**F6**)
Added Squad Leader's position (**F11**)
Added GUNNERY RANGE scenario
Added INSTANT ACTION scenario
Added some laser warning receiver sounds
The turret crew may click on the MFP display; doing that will take them to a fixed, zoomed-in "MFP" view (similar to the VIS views). It is also possible to enter this view by pressing the "View 3 (alt)" hotkey
Fire Control System note: In the CV90/35-NL the wind bearing relative to the hull is entered into the VCS, and the FCS automatically calculates the required lead depending on turret position and changes in hull orientation ... as long as the GPS system is not damaged). Computer-controlled crews will always use actual wind values; if either TC or GNR is human it is up to them to enter correct values!
Note that the CV90/35-DK allows the user to enter wind direction in mils while in the CV90/35-NL the values are entered in "o-clock" notation

Cdr and Gnr may independently open/close their ballistic sight doors. In offline sessions the computer-controlled gunner will always follow the action of the TC (except in arty barrages where he closes it by himself)

Closing the gunner's ballistic shield doors will not black out the TCs independent thermal imager (unlike CV90/35-DK)

Coax will reload automatically only while the commander is inside the 3D turret, in eye view mode (F1)

CV90/40-A/B:

Added 3D interior for CV90/40-A/B (replacing the 90/40-C artwork)

Updated 3D artwork

Updated some sounds

Corrected the smoke grenade count to one salvo, and three reloads

CV90/40-C:

Updated 3D artwork

Updated some sounds

Corrected the smoke grenade count to one salvo, and three reloads

Eagle IV:

Updated 3D artwork

Troops now visible inside

LEMUR screen may now be clicked (brings up LEMUR full screen)

Added an 'eye reticule' in the eye view mode

ERCWS-M RWS *(new system!)*:

Can be equipped with 7.62mm MG3, cal .50 Browning, or 40mm automatic grenade launcher Mk 19. Other optional elements are "stabilization" and "commander's position" (the latter giving a well-endowed vehicle's commander a screen replicating the gunner's view). Note that "well-endowed" in this context is an attribute of the vehicle, not necessarily of its commander. If you spotted this passage you are a very thorough reader and earned yourself a chuckle. OK ... that's enough!

In powered traverse mode, pressing the 'Dynamic lead' hotkey for a number of seconds while tracking the target will cause a lead to be computed and the reticule to shift. This lead can be cancelled by pressing 'Dynamic lead' again.

In stabilized mode, tracking the target and pressing, then letting go of the 'Dynamic lead' button will cause automatic target tracking (ATT) to be activated.

Pressing 'Dynamic lead' again will end automatic target tracking. If LOS is lost, the RWS will continue moving at the current angular speeds for 5 seconds. This works in both DAY and TIS modes, for both TC and GNR, in any magnification.

Lasing and firing while ATT is active is possible.

For the gun to work, the commander has to enable both EFWS and HAUPTSCHALTER power switches (located between driver and TC seat), and the gunner will have to first enable power traverse (middle switch above the panel) and (if the hatches are open) the hatch override button. Only then can the gun be armed (note that the GNR arm button will only apply to his handle, and the TC's arm button only his). The gunner can also slew and fire the gun manually: for this, the azimuth and elevation locks on the gun have to be disabled, then he can slew and fire the gun in the "Altview 1" view mode.

User may now set manual daysight zoom level
User may now set manual reticle brightness
Warnings are now displayed if

- hatches are open
- invalid ballistic values were entered
- gun safety override is active upon startup
- gun is moving to/from observation mode and upon success-ful recock

Display error if the gun safety override was active upon startup
The gun type is now correctly set (.50, 7.62mm, 40mm), the ammunition selections correspond to the gun type but are most likely still wrong
Now manual range entry is not influenced (and limited) by the minimum lase distance
User entry of ballistic parameters is now correctly checked to stay within FCS limits
Various displayed menus are now grayed out if they are inac-tive
Implemented the absolute maximum zoom level which can only be achieved by using the +/- buttons on the panel frame ("nar-row" FOV is actually not the maximum zoom)
Enabled weapon type switching (even though no system reboot is required)
Enabled ammo type switching (note that the available ammuni-tion types still need to be tuned)
The commander may now slew the gun
Added TI communication and weapon contradiction errors
Added reticule-out-of-FOV warning
Corrected blankframe for LRF and spotlight
Corrected FoVs for day and thermal sight
Changed 40mm grenade launcher maximum amount of ammo to 32
Corrected behavior so that the commander continues overriding the gunner (even if his palm switch is not pressed) if locked lead was enabled
Fixed issue with the control sensitivity not being restored to normal values after ATT was forcibly terminated (and gun control lost to the other crewmember)
Fixed some issues with menus not being correctly grayed out and font sizes
Fixed some issues with joystick input (it now cancels mouse input, palm switches have to be pressed in order to be able to fire etc)
In network sessions with human TC and GNR, only the GNR should be able to pop smoke
Added parallax compensation. Note that this means that the laser beam may not hit the area inside the reticule!
Added 'system settings' menu which allows turning off the LRF and the TI
Added 'maintenance' menu, and PIN entry
Added reduced control sensitivity after target tracking was forcibly quit - this sensitivity remains until the controls have been recentered
Added 'gun is in forbidden zone' warning, added correct Eng-lish and German texts for the other warnings
If the human commander overrides the (human) gunner and ap-plies locked lead, he will remain in control of the gun as long as the locked lead is active - even if he lets go of the palm switch (!)

Locked lead will now only be applied once the user has let go of the ATT button (not automatically after 2 seconds)

The commander's ARM switch will now automatically disarm once that traverse power was disabled

The gun will now always follows the sight, even in unstabilized mode

If one of the crew members enters the 'system settings' or 'gun' menu, the other crew member's panel will replicate this view and deny any input until the menu is exited again (the menu elements should be grayed out).

The smoke grenade launcher controlbox now shows the 'loaded' status of its tubes

The gunner may now fire the smoke grenades in network sessions more reliably

Enabled stabilization as the default selection

Disabled the transport lock on the 3D model

Updated normal map texture

Clicking 3D control elements will no longer recenter the mouse cursor

Fixed a bug where the vehicle commander saw an empty panel even though no panel was mounted at all

Fixed a bug where in network sessions the 'ammo count' menu would not be removed from the commander's display after it was closed by the gunner

Fixed a bug where the zoom factor could not be cycled by using keyboard or joystick after it was manually increased past its predefined max value.

Fixed a bug preventing computer-controlled units to shoot straight while in stabilized mode

EUROSPIKE-LR ATGM *(new system!)*:

Will use the BILL launcher artwork (squint harder)

Specified a thermal sight cool-down time to prevent its immediate readiness after repositioning

Missile lock is set with the lase hotkey (this will start the activation timer and start the seeker cool-down process)

The missile may lock on buildings, bridges, friendly (and enemy) vehicles

Arrow keys and coolie hat will shift the set impact coordinate

Currently the missile's cooling capacity is assumed to be 30 seconds, after that time TI will not be available

Currently only the high flight trajectory is implemented

SPIKE is categorized as a tandem HEAT warhead

FIST-V:

Adjusted vulnerability model

Added manual control of the FISTV's sensor head. The damage conditions and computer-controlled driver behavior with the head elevated are the same as with the M901, the difference is that the vehicle will suffer 'turret' damage instead of 'missile launcher' damage.

Fuchs 1A6:

Will now stow the roof MG in the forward position, if not in use

Fuchs 1A6/Eng *(new vehicle!)*:

Added Commander's position (**F7**)

Added Driver's position (**F9**)

Fuchs 1A7:

Will now stow the roof MG in the forward position, if not in use

FV107 SCIMITAR reconnaissance vehicle (new vehicle!):

Added commander's position (**F7**)

▪ the TC peri does not turn at this point, and it most likely has an incorrect sight picture

Added Driver's position (**F9**)

Added Gunner's position (**F6**)

▪ the 'Palm switch' hotkey will toggle between 'fast' and 'slow' turret rotation (yaw) speeds

▪ both TC and GNR crew stations have a 1:1 outlook, accessible via the 'Altview4' viewmode

the gun has 2 firing modes, single shot and burst (like on WARRIOR)

Added basic 3D interior (the TC's peri does not yet turn, and there's no view rendered to its viewport)

The gunner's sight will wander slowly towards the upper right with each shot

Corrected a small problem with track mesh in LOD1

Changed the way the computer-controlled commander reloads the clip to be hopefully more robust and more suited to the type of target

Updated vulnerability file

Fixed a bug with the rotation direction of the center guides on inside surfaces of track

While Gunner/Commander are in eye view, a reticule will still be shown now

Re-classified as "tank"

Added UN diffuse texture (decals still missing)

Added new sounds

Updated specular map texture

FV510 Warrior IFV (new vehicle!):

Added Commander's position (**F7**)

Note that the commander can't fire the gun. He can override the gunner in azimuth only. He must reload the gun; the idea is that the ready rack represents one 3 round clip, so the gun can only be reloaded once this clip has been shot out, and one clip can only hold the same type of rounds.

Added Driver's position (**F9**)

Added Gunner's position (**F6**)

▪ primary sight & vision block only
The gunner cannot select between KE/HE round types (using his hotkeys), the correct round type will automatically be selected for him (and shown in the upper right corner).

▪ The "**Ctrl**" (lase) hotkey toggles between slow and fast manual traverse mode

Added Squad Leader's position (**F11**)

▪ Available views are the eye view (**F1**), the left (**Alt+F1**) and right vision block (**Alt+F2**)

Updated some texture files

Commander's and Gunner's sight are zeroed to 1,500m range

Currently used ammunition is 30mm x 173 (for 30mm Mauser gun, as in ASCOD Pizarro and Ulan)

Added a gunnery range scenario

Added a basic 3D interior (to get the vision blocks working)

Gunner's/commander's reticule may now change color (use the *GAS reticule* hot key (**R**) while in the GPS/GPSE view mode)

Implemented the unity sight for TC/GNR. This is mapped to 'Altview 4'

Gunner and commander may now toggle the air defense symbology in the unity sight (*GAS reticule* hotkey)

Adjusted the sight magnifications (daysight is now 8x, night sight is set to 2x/6.5x)

Fixed an issue with superelevation not being displayed correctly)

It is now possible to toggle single shot and auto for the gun

While the crew hatches are open the turret is now limited to the forward hemisphere (09:00…03:00)

Corrected the aim procedure of the computer-controlled gunner

Implemented powered traverse for the gunner (only active if palm switch is depressed), and "coarse control behavior"

Implemented night vision reticule

The gun will now wander slightly (0.5 mil) 'up and right' with each shot (so it must be re-laid for maximum precision)

Corrected the target height in the range estimation stadia to 1.90m

Adjusted hue of woodland and winter textures

Changed the way the computer-controlled commander reloads the clip to be hopefully more robust and more suited to the type of target

While Gunner/Commander are in eye view, a reticule will still be shown now

Added new sounds

Added engine startup and shut down sound

Updated external engine sound

Changed the computer-controlled crew behavior so that if a human player order a change of ammunition type, the gunner will fire off the current clip with the old settings before the next ammo clip is being loaded

Fixed a bug that occasionally prevented switching off the NVGs

Fixed bug similar to #2782 (see below)

GTK Boxer/Eng (new vehicle!):

Added Commander's position (**F7**)

Added Driver's position (**F9**)

IVECO LMV (new vehicle!):

Added Commander's position (**F7**)

Added Driver's position (**F9**)

Added Gunner's position (**F6**)

Can be equipped with the ERCWS-M remote weapon station (see entry above)

When set to **Combat Ready**, the vehicle will start the mission with hatches closed

Javelin ATGM team:

Added 3D model artwork

Updated missile sight; may now switch polarity in the thermal view, adjusted field of view for the different zoom factors

The user may now lock the missile on the intended target (lase hotkey; this also fixes bug #2083) instead of a random lock (this fixes bug #1605)

Low/High trajectory can be toggled (in seeker view only) using the 'fuse cycle' hotkey (this also fixes bug #2082)

Currently the TI cool-down of the CLU is not modeled; it is always cooled down (see further below for other missiles)

The BCU lasts for 4 minutes; once it has run out it will be automatically replaced (this takes 30 seconds), after this the seeker has to be cooled down again (BCU supply is unlimited)

Specified a thermal sight cool-down time to prevent its immediate readiness after repositioning

JAVELIN is now categorized as a tandem HEAT warhead

Adjusted the launcher assembly and disassembly times

LEMUR RWS:

Added a tutorial

Updated other tutorials

Disabled the autofocus function in the Lemur's thermal view

Prevented gun cocking if gun movement is disabled

Fixed problem that caused gun to move up with active combat correction and range so far that the superelevation is beyond the screen height

Corrected the zeroing procedure

Reduced tick size of the aiming reticule

Adjusted the firing rate of the cal .50

Controlled bursts are now at 200 rounds/min => 300 ms

Full auto bursts are now at 520 rounds/min => 115 ms

When switching from laser to manual range mode, automatic lead will now be canceled and the manual range be set to 500m

In darkness, the control elements of the monitor should now be better visible

Disabled crosswind input for the current user interface

Fixed a bug with non-impotent subprojectiles

Fixed a bug with azimuth traversal

Fixed a bug with zeroing in static mode

Added an option to equip a weapon team with a Lemur on tripod

▪ Control panel/video screen can be accessed from the team commander's position (**F7**), (**F2**) view

▪ Computer-controlled crews will attempt to detect and track targets exclusively from the RWS camera view position; at this point there is no scanning motion

Added a function to toggle the MAP SCREEN/gun view

Added rear camera view

Added ammunition types "12.7mm Blank" and "12.7mm LRTA", both of which are irrelevant for combat

The 'turret clock' at the bottom of the screen now works as intended

Removed a redundant 'Lemur 12.7mm' readout in the status bar in the map view

In the **Data Input** menu, removed the V0 entry

Wind is now being calculated in clockwise direction (**Data Input**)

Adjusted button assignments (please send illustrating screenshots if more changes are needed)

Replaced **POL** with the **DEL LIMIT** button

Crosswind will now be compensated in **Static** firing mode

LEMUR 2013X RWS *(new system!)*:

Disabled the autofocus function in the Lemur's thermal view

Added option to place a stationary Lemur ("sentry gun") in the virtual 3D environment; create a Lemur team. Move it to the desired location. Right-click it and select "**Put gun near to soldier**". Then, from the same context menu, select "**Set gun position**" and move it to the desired location with **Ctrl+A**, **D**, **W**, **X**, **Q**, and **Z**

When moving the selected LEMUR 2013X in the MISSION EDITOR, a small window is shown listing the hotkeys to move the object

Added two new ammunition types; with LRTA selected, the ballistics of 12.7MM M/84LS will be used

Added a **Set to default** button to the *Set Limits* dialog

The default settings for a certain altitude are no longer updated if only the altitude was changes (update only on reset)

For RWS OPERATOR units, the LEMUR 2013X is now an optional weapon

Changed the tactical icon for RWS Operator units

Removed the black reticule

The auto scan mode is now activated via hotkey **Shift+TP3** (before it was activated if TP3 and TP4 were pressed within one second of each other)

Changed the maximum wind speed setting to **60m/s**

The **Autoscan** buttons now store the values directly, without the **Store** button

In manual mode, the range will now reset to **500m** if the **Return** button is pressed

Removed the scan limit - now only the gun limit is used

Reassigned hotkeys
- Polarity: **Num[-]**   **Joy10**
- Static mode: **L**   **Joy13**

The autoscan feature will now also replicate changes in pitch

Static mode is now moved from joystick button #13 to #10

Fixed a bug preventing proper **autoscan** mode

Fixed a number of network related bugs

Fixed a number of bugs with the autoscan feature

Fixed a bug related to 360° rotations

Leopard 1 (all variants):

Corrected sound volumes of external movement sound

Leopard 1A5-DK:

Adjusted vulnerability model

Added UN texture

Updated 3D interior artwork

Updated 3D artwork

Updated some common texture files

Enabled five new main gun sounds

Reduced smoke grenade salvo count to 1 (to achieve a full cover effect; IOW, both sides of the smoke discharger will be fired)

Fixed an animation with the gun recoil

Corrected a navigation aid "antenna" on the rear hull

Leopard 1A5-GE (new vehicle!):

Added Commander's position (**F7**)

Added Driver's position (**F9**)

Added Gunner's position (**F6**)

Known issue: Unbuttoned turret exterior is the welded turret, not the cast turret with add-on armor

Leopard 2 series:

Updated some common texture files
Updated GUNNERY RANGE scenario
Enabled five new main gun sounds
Set the ammo and air temperature ranges to +/-50°C each
Pressing the master blaster button (or hotkey) will now always fire the main gun, irrespective of HW/MG settings on Gunner's Control Panel, provided that the firing circuit selector switch has been set from "HAUPT" to "NOT"
Smoke grenades from left and right launcher are no longer shared ammo types
Corrected sound volumes of external movement sound

Leopard 2A4:

- Commander:

    The peri is now powered off if the tank starts **not** combat ready (note that the peri's startup time is not simulated)
    With the peri powered off, none of its modes (KP, KH, KW, ZÜ) are available and its magnification cannot be changed
    KW mode may now be entered from **any** mode *but KH*. Letting go of the TC palm switch in this mode will set the peri into ZÜ
    KH mode may only be canceled by either pressing the **peri cancel** button or by releasing the palm switch
    KW mode may only be activated after the thermal imager has cooled down. This also means that KW mode cannot be chosen while the thermal imager is damaged
    Fixed a bug where ammo drift (coax) and crosswind were not applied in KH mode

- Gunner:

    The coax may be fired even if the main gun is disarmed
    In real life, while in **Beobachten** mode the gunner's control handle controls the hydraulic valves of the powered traverse directly (rather than their electrical operation by the stabilization system in **Stab Ein** mode). Operating the valves requires substantial physical effort, and doesn't offer much fine control.
    To simulate this, the deadzone for joystick and mouse control has been substantially increased, and will then jump in the response curve for sudden and relatively fast movement. For fine control, use the hand cranks (yes, they work in **Beobachten** mode now, as they should)

- General:

    Adjusted vulnerability model
    Updated turret roof artwork
    Updated 3D artwork
    Updated 3D interior artwork
    Updated some texture files
    Default platoon strength is now set to four

LEOPARD 2A5 (all variants):

Added the switches
- "Anzeige" on the commander's display unit
- "Not/Haupt" firing circuit selector on the main gun
- Laser key on the ballistic computer's control panel (BCCP), also
- Crosswind
- Air temperature
- Air pressure (not all of them have an effect on ballistic behavior yet)

Implemented the 'crosswind auto/man' switch on the BCCP; with this switch set to 'auto', a crosswind of 0km/h will be assumed by the ballistic computer. Computer-controlled crews will always use the correct crosswind parameter
With the laser key in the off position, the primary sight will now read 0/F999x instead of a manual range or battle-sight distance
Updated 3D interior artwork
Added 3D interior for the driver
Enabled dynamic lead for coax
Fixed a visual glitch with the track texture center guides
Fixed an issue with the commander's display unit
Updated interior and changer textures
Corrected stowed grenade counts; default count is now 2|2 HE, and 2|4 smoke

LEOPARD 2A5 (German version) (new vehicle!):

Added Commander's position (**F7**)
Added Driver's position (**F9**)
Added Gunner's position (**F6**)

Leopard 2A5-DK:

Adjusted vulnerability model
Updated 3D artwork
Updated some texture files
Corrected the smoke grenade count to two salvos of four, and up to eight single smoke or HE grenades
Left and right salvo now have to be fired separately
Corrected the ammo count capacity

Leopard 2A5A1-DK (new vehicle!):

Visually identical to original LEOPARD 2A5-DK, but with a different default ammunition loadout (DM11 HEF-T instead of DM12A1 HEAT-T, and DM53 for APFSDS-T) and a new auxiliary sight reticule
Increased the maximum engagement range to 5000m

Leopard 2A5A2-DK (new vehicle!):

Like LEOPARD 2A5A1. In addition,
- Slat cage add-on armor to neutralize selected RPG-7 munitions
- *Barracuda* camouflage net, reducing the thermal signature

Will not receive a UN texture due to integrated *Barracuda* camo

Leopardo 2E:

Adjusted vulnerability model
Updated 3D artwork

Updated some texture files

(Deliberately) incorrect external ballistics for 120mm DM12A1 are no longer present in this version for the sake of a more consistent user interface

Corrected the smoke grenade count to two salvos of four, and up to eight single smoke or HE grenades

Corrected stowed grenade counts; default count is now 2|2 HE, and 2|4 smoke

Left and right salvo now have to be fired separately

Adjusted the pitch of the driver's vision blocks for a better view of the terrain

Updated the 3D-interior (fixed issues with objects blocking the upper vision blocks and objects being unattached)

Leopard AS1:

Adjusted vulnerability model

Updated 3D artwork

Updated some texture files

Modified gunnery range scenario

Enabled five new main gun sounds

Added generic OpFor *Desert* texture

Added alternate camouflage pattern texture (1A3 GE)

M1 Abrams (all variants):

Standardized KE:HEAT default load ratio

- 120mm = 70% KE
- 105mm = 60% KE

M1 Abrams:

Adjusted vulnerability model

Updated 3D artwork

Updated some texture files

Enabled five new main gun sounds

Updated maximum ballistic range and maximum laser range finder range

M1A1 Abrams (new vehicle!):

Added Commander's position (**F7**)

Added Driver's position (**F9**)

Added Gunner's position (**F6**)

Added GUNNERY RANGE scenario

Changed default smoke grenade type from '**multispectral**' to '**normal**'

Updated maximum ballistic range and maximum laser range finder range

M1A1(HA) Abrams:

Adjusted vulnerability model

Updated 3D artwork

Updated some texture files

Updated maximum ballistic range and maximum laser range finder range

M1IP Abrams (new vehicle!):

Added Commander's position (**F7**)

Added Driver's position (**F9**)

Added Gunner's position (**F6**)

Updated maximum ballistic range and maximum laser range finder range

M1A2 SEP Abrams:

Added Commander's position (**F7**)

- **'Add'/'Drop'** buttons on the commander's display unit (CDU): They will change the range in 10m steps when pressed once; while being held down they will change in 50m steps (after 8 seconds 100m steps)
- Pressing the stadia/range button (on the commander's control handle) will cancel battlesight entry
- Changed the view mode to access the commander's CAL .50 HMG from 'Altview1' to 'Altview3' to make it consistent with the T-72M(1)
- Adjusted the commander's stadia reticule
- The CITV is now unstabilized in EMERGENCY fire control mode

Added Driver's position (**F9**)

Added Gunner's position (**F6**)

- The gunner may now also fire the coax in bursts while in manual fire control mode
- The Gunner's BIOC will now be black and without reticule while on standby

Added an INSTANT ACTION scenario

Added a GUNNERY RANGE scenario

This vehicle may identify targets with its thermal sensors out to 6,000m (the usual limit is 3,000m)

Added a missing track texture

Corrected the turret roof thermal texture

Fire Control System:

- The smoke grenade launcher must be powered on before it can be fired
- While battlesight is enabled, changing the ammunition type will also change indexed range (to the battlesight range entered by the gunner for the selected weapon type)
- Ammo slots #3 and #4 may now hold ammunition other than M1028 and DM33 PELE; adjusted assignment for corresponding ammo index buttons in the 3D interior
- Updated maximum ballistic range and maximum laser range finder range
- If a lased range exceeds the limits of the ballistic computer, the range will be displayed but the old range will be used for all ballistic calculations

M2A2/M3A2:

Adjusted vulnerability model

Adjusted vehicle script file

Updated 3D artwork

Updated some texture files

Internal 3D view remains more fixed on the roll angle bubble gauge while the turret is rotating

Adjusted the behavior of the end-of-belt signal.

- Firing will stop as soon as the EOB threshold is reached, and can only be resumed if the EOB button on the weapon control panel is pressed
- If the EOB is reached, the LED on the weapon panel above this button will blink, if the EOB stop is overridden, the LED will be lit steadily. Note that this EOB stop only applies to the currently active feed, so if you are

eg. with AP below EOB, but with HE above it, switching from HE to AP will require the crew to override EOB, and switching then from AP to HE will reset it. Changing back to AP from HE will necessitate another 'override EOB' action (the gun can not be fired otherwise).

- If an ammo reload is ordered before or immediately after the EOB signal interrupts the ammunition feed, there is no longer a time penalty. Override the EOB interrupt with the corresponding switch on the central control panel, or with the hotkey (as listed in the Controls dialog box)
- Note that on the M2/M3, computer-controlled vehicles will always immediately override EOB

M2A2/ENG (new vehicle!):

Added Commander's position (**F7**)

Added Driver's position (**F9**)

Added Gunner's position (**F6**)

When towing MICLIC, the ramp will not be lowered

M113A1:

Adjusted vulnerability model
Updated some texture files
Updated to support attached gun and hi-res interior model
May now mount different HMGs

M113A2 (new vehicle!)

Added Commander's position (**F7**)

Added Driver's position (**F9**)

M113A3:

Adjusted vulnerability model
Updated 3D interior model
May now mount different HMGs
Corrected smoke grenade salvo count

M113AS4:

Adjusted vulnerability model

M113G4 (new vehicle!)

Added Commander's position (**F7**)

Added Driver's position (**F9**)

Wire fence add-on armor to neutralize selected RPG-7 munitions
Added UN texture

M901:

Adjusted vulnerability model
Updated some texture files

MAN 10t GL cargo truck (new system!)

Added Commander's position (**F7**)

Added Driver's position (**F9**)

Added LEMUR and .50 CAL RWS types

Note that the vehicle commander may only to open the overhead hatch if the truck is carrying the MG3!

NZLAV:
Added gun fan and troop door sounds
Updated some sounds

Piranha III-C:
Updated some sounds

SensoCopter UAV *(new system!)*:
The default organic UAV for infantry squads (if equipped with it in the Mission Editor)
Note that a unit can only be equipped with **either** UAV **or** UGV. The UAV currently uses the helicopter flight model – which will be changed and replaced by a simple 6DOF flight model. Two new hot-keys were added to deploy and pick up UAVs. The UAV's camera can only be changed in elevation; the whole vehicle has to turn to slew the view. At least for now the camera is unmagnified. This micro-UAV will not have a trace on the map screen
May now be controlled from the Observer's position as well (does not require to assume the squad leader's position (**F7**) first) by using the **F2** view (remote control) or the **F3** view (UAV camera sight)
F3 view will now also show compass/bearing and flight height

Strv122:
Updated 3D artwork
Enabled dynamic lead for coax
Added capability to also fire regular (non-multispectral) smoke
In the 3D interior, removed the (untextured) AK-5 and cleaned the mesh

T-55:
Added new textures
Adjusted vulnerability model
Updated 3D artwork
Corrected the default ammo loadout
Updated turret/gun position for reload
Updated ammunition load times; loading times have been substantially increased (between best and worst possible case)
Changed ready/stored ammo loadout; all ammunition is now considered "ready"

T-62:
Added Commander's position (**F7**)
Added Driver's position (**F9**)
Added Gunner's position (**F6**)
Adjusted vulnerability model
Updated 3D artwork
Updated some texture files
Adjusted gun loading position
Corrected the default ammo loadout
Updated turret/gun position for reload
Updated ammunition load times; loading times have been substantially increased (between best and worst possible case)
Changed ready/stored ammo loadout; all ammunition is now considered "ready"
Replaced the blitted gunner's unity sight with a 3D version

T-72 (all variants):
Corrected sound volumes of external movement sound

T-72M:
Added Commander's position (**F7**)

Added Driver's position (**F9**)

Added Gunner's position (**F6**)
Adjusted vulnerability model
Updated 3D artwork
Adjusted coincidence window
Handles identically as the T-72M1 except for the absence of smoke grenade launchers
Corrected the default ammo loadout

T-72M1:
Added tutorial files
Adjusted vulnerability model
Updated 3D artwork
Adjusted volume level of autoloader internal sound effects
Adjusted coincidence window
Adjusted the searchlight decal texture

Technical 2.7t 4x4-F mercenary truck *(new system!)*:
Added Gunner's position (**F6**)
Corrected steering wheel rotation axis
Changed max platoon strength to six
Reduced maximum speed to 120km/h
Slightly reduced the cross-country performance

Technical-T:
Added Gunner's position (**F6**)
Adjusted vulnerability model
Adjusted vehicle script file (reduced off-road performance)
Added/enabled mounted DShK and NSVT gun for the 1.2t TECHNICAL-T
May now be placed in platoons of up to 6 in strength
Removed obsolete textures

Technical-T 106mm RR:
Added new 106mm recoilless rifle bang sound

Wiesel 1/TOW missile carrier:
Adjusted vulnerability model
Belongs to the "Other" vehicles class

Wisent ARV:
Added Commander's position (**F7**)
- Added a basic 3D interior, featuring an input panel which displays the map screen and optionally a clone of the gunner's LEMUR view
- Blacked out all but the commander's vision block in his eye view

Added Driver's position (**F9**)

Added Gunner's position (**F6**)
- Added optional weapon: LEMUR RWS
Added LEMUR screen to crew positions
Added an 'eye reticule' in the eye view mode

Changes for vehicles without crew positions

2S1 GVODZIKA 122mm SPH:
> Will now fire regular artillery missions
> Added new 122mm munitions
> Added back the HEAT rounds for the 2S1 howitzer's self-
> defense
> Adjusted vulnerability model
> Updated some texture files
> Corrected the location of the primary sight frame

2S3 AKATSIYA 152mm SPH *(new system!)*
> Added new 152mm munitions

2S6 Tunguska:
> Fixed a visual glitch in the LOD1

AH-64A APACHE gunship helicopter *(new system!)*:
> If the helicopter is on the ground with less than 1% fuel the
> crew will not be rendered sitting in the cockpit
> Improved helicopter loop sound
> Adjusted the firing sequence for the HELLFIRE missiles

ASLAV-25:
> Fixed bug #2855 (see below)

AMX-13 light tank *(new system!)*
> Added suitable 75mm ammunition
> Added 90mm ammunition as an option. The 3D model artwork will
> continue to show a 75mm gun however (squint harder)
> Changed tactical icon from light tank to tracked reconnais-
> sance vehicle

BM-21 GRAD 122mm MLRS *(new system!)*

BMP-1:
> Adjusted vulnerability model
> Adjusted sounds
> Updated 3D artwork
> Added sounds for hatches
> Corrected the near external fire sound index

BMP-1/Ambulance *(new system!)*
> Adjusted (desert) diffuse texture file

BMP-2:
> Adjusted vulnerability model
> Adjusted sounds
> Updated 3D artwork
> Added sounds for hatches
> Improved the smoke grenade count and type available

BMP-3 IFV *(new system!)*
> 100mm low pressure gun not activated

BRDM-2:
> Adjusted 3D model

BRDM-2/AT:
>   Adjusted 3D model

BTR-50 *(new system!)*

BTR-80:
>   Updated engine and startup sound

Centurion:
>   Changed the default KE ammo from 105mm L64A4 to L52
>   Improved the cross-country mobility by changing a suspension parameter
>   Updated the vulnerability model
>   Removed an erroneous mesh object from the LOD1 model

CH-146 GRIFFON transport helicopter:
>   Adjusted vulnerability model

CH-47 transport helicopter:
>   Adjusted vulnerability model

Crew-served weapon teams:
>   Updated 3D artwork

Fennek light reconnaissance vehicle *(new system!)*
>   The FENNEK will raise its mast whenever it is in a battle position
>   Note however that at this time this is purely cosmetic; no actual scanning will be done with it and its actual height does not influence the computer-controlled driver's hull/turret down location selection
>   Added German texture
>   Added UN texture

FV101 Scorpion *(new system!)*:
>   Added the following 76mm ammunition types
>   ▪ L24A2 HE-T
>   ▪ L29 HESH
>   ▪ L32A5 Smoke
>   ▪ L33A1 Canister
>   Re-classified as "tank"

Leopard 1A2 main battle tank *(new system!)*
>   Adjusted olive drab base color(diffuse texture) to RAL6014

M1064 120mm mortar carrier *(new system!)*
>   Will now position itself with the back to the enemy, and the mortar tube rotated to the back; this also fixes bug #2282
>   Corrected the ammunition loadout
>   The rear door will now operate normally
>   Adjusted the rear door opening time

M109A3 155mm SPH:
>   Added new 155mm munitions
>   Will now fire regular artillery missions
>   Corrected the HMG ammo count

M60A3 MBT:
>   Adjusted vulnerability model

Updated 3D artwork
Updated some texture files
Adjusted the MAX_BAL and MAX_LRF range
Adjusted the stabilization quality (the vehicle must stop to engage long range and moving targets)
Added generic OpFor *Desert* texture

Marder 1A3:
Adjusted vulnerability model
Updated some texture files
Default platoon strength is now set to four
Utilized new 20mm autocannon sounds
Closed some gaps in the model's LOD1

Mı-24 HIND-E gunship helicopter:
Adjusted vulnerability model
Improved flying sound
Added new sounds
Adjusted exit frames so that dismounting troops no longer appear to crawl out of the ground

Milan ATGM team:
Updated 3D artwork
Specified a thermal sight cool-down time to prevent its immediate readiness after repositioning

MRH-90 transport helicopter:
Improved helicopter loop sound
Adjusted vulnerability model

Pıranha III-C:
Added US diffuse texture to mimic Sᴛʀʏᴋᴇʀ

PRP-3 Artillery Observer *(new system!)*

PT-76 light amphibious tank *(new system!)*
Updated 3D model artwork (rear doors)
Updated desert texture
Updated LOD1 model and texture

T-64A main battle tank *(new system!)*

T-64B main battle tank *(new system!)*
On the actual T-64B, ATGMs have to be loaded manually. The only way to represent this in SB is to have 1 ATGM ready, and the rest "stowed", all of which must be loaded manually on the actual tank -- which we represent by a 50 second transfer from stowed to ready. Also, the ready ammo (when taken with the +1 ATGM count) does not add up, but this again is intention within the limitation of the model (basically the 1 ready ATGM gives the T-64B one additional carousel slot)

T-72B (early):
Adjusted vulnerability model
Updated 3D artwork
Updated some texture files
Adjusted coincidence window
Corrected the default ammo loadout
The attached 12.7mm HMG should now work properly

Assigned period-fitting default APFSDS ammunition (1983)

T-72B main battle tank *(new system!)*

T-72M4:
>   Adjusted vulnerability model
>   Updated 3D artwork
>   Updated some texture files
>   Adjusted coincidence window

T-80U:
>   Adjusted vulnerability model
>   Updated 3D artwork
>   Corrected the default ammo loadout

T-90A main battle tank *(new system!)*

Technical ZU-23/2 AAA gun truck *(new system!)*
>   Will now position itself with the back to the enemy, and the gun rotated to the back
>   Will now provide suppression when given the "*Shoot here…*" command; this fixes bug #2317
>   Belongs to the Truck class (even though it hardly transports any personnel)
>   Improved aiming so that aircraft may actually be hit. Dedicated AAA vehicles will still perform markedly better
>   Improved the 23mm autocannon sound

TIGER ARH gunship helicopter:
>   Added new 30mm ammo types
>   Added new sounds
>   Added a generic OpFor texture

Toyota Pickup civilian truck **(new vehicle!)**

Toyota Technical mortar team transport *(new system!)*
>   May transport 60mm mortar teams
>   May transport 81mm mortar teams
>   May transport 120mm mortar teams
>   May transport 60mm (long barrel) mounted mortar
>   May transport 81mm mounted mortar (3D artwork remains 60mm)
>   Ammo box will now open while executing a fire mission
>   Dismounted MORTAR TEAMS may fire 60mm (short barrel) and 81mm shells (both HE and smoke); the artwork remains a (long) 60mm mortar however

UH-60 BLACK HAWK helicopter *(new system!)*
>   Improved helicopter loop sound

Unimog medium transport and utility vehicle *(new system!)*:
>   Added ambulance variant
>   Added supply truck variant
>   Added troop transport variant
>   Added UN textures

Ural-4320:
>   Updated some texture files
>   Adjusted the air intake point

STEEL BEASTS
Professional PE
3.0 Release Notes

YPR-765:

        Added UN texture set
        Updated 3D artwork
        Changed default ammunition to 25mm M791 APDS and M793 HE-I
        Updated vehicle vulnerability definition
        Will now default to four vehicles per platoon
        Corrected smoke grenade salvo count
        Corrected an error in the thermal signature
        Animated the trimvane
        Fixed a bug with the coax MG

YPR-765-CO:

        Added UN texture set
        Updated 3D artwork

YPR-765-PRAT:

        Added UN texture set
        Updated 3D artwork

ZSU-23/4:

        Adjusted the default AP ammunitions assignment
        Improved the 23mm autocannon sound

- Added 125mm APFSDS BM12 and BM46
- Changed the way the ready ammunition compartment is filled up:
Optionally it can be specified that the compartment does not contain (at least) one type of each loaded ammunition; instead it will be filled with the first specified ammunition type. On vehicles like WARRIOR/SCIMITAR where the ready ammo compartment is used to simulate a 'clip' this will make sure that it is properly filled. Default is the old behavior (and that the computer-controlled commander will properly reload it)
- The civilian flatbed truck (with crates) may now serve as a supply vehicle (for insurgents/irregular fighters)

Minor non-vehicle changes

- If the **Shift** key is held down while the MAP EDITOR or MISSION EDITOR main menu entries are clicked, the user will now be prompted to open an existing scenario/map instead of creating a (blank) one by default
- Added 3D hedges
- Infantry may now fire RPGs from the prone position
- Adjusted rate of fire (cyclic) for M2 BROWNING cal .50 HMG
- Added a tandem flag and reduced the "after-ERA-performance" for the following HEAT warheads:
  - AGM-114K HELLFIRE
  - AT-11B REFLEKS-M
  - MILAN 2-T
  - PzF 3-T
  - TOW-2A
- Introduced the option for object vulnerability files to define 'neutralizing' surfaces and their likelihood of neutralization, in preparation for slat/cage armors against RPG-7
- Added a digital map from **Kouvola**, Finland
- Added some more maps from Finnish training areas **Kouvostoliitto** and **Pahkajärvi**
- Added the **Paderborn.ter** and **.hgt** maps
- Completely reworked the **NTC** map
- Updated the **Hannover-Weserbergland.ter** map
- Updated **Terrastan** map (includes now material resistance values)
- Updated a number of THM files
- Updated a number of HGT files
- Removed a few obsolete TER files
- SB Pro now detects joysticks that are plugged in at runtime
- Disabled the **Ctrl** key as a modifier for keyboard commands. The command "Invert joystick selection" is now **Shift+J** (was **Ctrl+J**)
- Disabled the gunner's view yaw to follow the gun if he's sitting in a vehicle without a turret
- Added some 23 tutorial PDFs about vehicle-specific peculiarities
- Added Specialist Tutorial documentation
- All HE rounds will now ignore the angle of impact
- Added PK infantry machine gun, replacing some of the M240/MG3 that were used as stand-ins
- Added a number of new cal .50 and 14.5mm HMG rounds
- Updated ballistics data of 30mm munitions
- Updated ballistics data of most 105mm APFSDS ammunition; reduced maximum engagement ranges of about 3000m (there are a handful of exceptions)
- Added a number of alternative (weaker) RPG-7 munitions
- Added the 120mm DM11 HE grenade
- Added TOW (1), ITOW missiles
- Improved the password protection for scenarios
- Reduced the range estimation error for crews firing HMGs (based on the last detected range)
- Added Dutch callsign template (NL.cst)
- Fixed a parameter mismatch of BMP-2 30mm AP ammunition

eSim Games

P.O. Box 654 ○ Aptos, CA 95001 ○ USA
Fax: +1-(650)-257-4703

STEEL BEASTS
Professional PE
3.0 Release Notes

- Sorted entries alphabetically in the MISSION EDITOR'S "*New unit…*" context menu
- Disabled ground object collision checks while a vehicle is on a bridge
- Raised the maximum stored ammo count for missile teams from three to four. The default amount remains at two however (1|1)
- Introduced a 12km render range limit for thermal sights as long as the optical range doesn't exceed this value
- Added a new M2/M3 category to the hotkey filters
- Added the "Override end-of-belt" hotkey to the M2/M3A2 ODS BRADLEY and the ASCOD PIZARRO
- In network sessions, when client vehicles collide with a collapsible object the collapse will be resolved immediately on the client machine instead and only later be synchronized with the session host
- In the MISSION EDITOR, changed default platoon strength for all supply vehicles to four
- In the MISSION EDITOR, if dismounted troops are changed in visual appearance to look like civilians, they will also be disarmed by default. Eventual weapons need to be added back as a separate action
- In the MISSION EDITOR, vehicle crews may now be changed to look like civilians through a context menu entry for the vehicle or platoon, and for a selection of multiple units
- Added map graphics
  - *Aviation: Axis of advance* (Manoeuver: general)
  - *Aviation: Direction of attack* (Manoeuver: offensive)
- Added selected camouflage texture mods for some vehicles of the following nations:
  - CS (former Czechoslovakia)
  - DD (former East Germany)
  - EG (Egypt)
  - ID (Indonesia)
  - IL (Israel)
  - IR (Iran)
  - KP (North Korea)
  - SY (Syria)
- Added selected camouflage texture mods for infantry of the following nations:
  - EG
  - IL
  - KP
  - SY
- Added more folders for camouflage texture mods
- Added emplacement type "AMX-13"
- Added two new sounds for rocket artillery units
- Improved the sound for 500lb air strike
- Improved the generic turret traverse sound
- Updated two other braking and movement sounds
- Updated the US English loader's voice
- Artillery units: **Lines of fire** will now be displayed for 90 seconds
- Off-map artillery impact events will now play the long-distance 'incoming' sounds
- Added Russian folder and string file to ..**\loc** directory
- Updated Spanish voice localization

- With disabled joystick in the CONTROLS dialog box, not only axis but also button and POV inputs will now be ignored
- Computer-controlled commanders may now slew attached guns (if the gun supports it)
- Added smoke grenade capability to CAL .50 RWS
- Added seven new terrain textures (sand)
- Added a gun recoil animation
- Added or updated vegetation 3D artwork of
    Flowers
    Grass
    Wheat
    Winter vegetation
- Adjusted volume levels of some sounds
- Reduced the billboard render distance for tilting objects
- All FO units except MT-LB may now lase ranges of up to 20km
- Updated model script file of
    Church
    Iraqibuilding #1
- Updated 3D artwork of
    Minaret
    house model BLG_hs3s
    Sand terrain tiles
    Some apartment buildings
    A number of road signs
    Some coniferous trees
    Oiljack
    Is now animated. Some randomly picked units will be disabled to simulate maintenance
    Windmill
    The windmill will now point into the wind, its speed is some-what dependent on wind speed. Above a certain speed the ro-tors will stop turning.
    Some randomly picked units will be disabled to simulate maintenance
- Added a number of new houses (3D artwork)
- CO, XO units now default to the last platoon number of the compa-ny when created in the MISSION EDITOR. Unchecking CO, XO defaults back to the first platoon number
- Added categories "ULAN" and "ERCWS-M" to the CONTROLS dialog window
- Improved aim correction for computer-controlled vehicle crew to compensate for wind, bad ballistics, etc...
- Added the option for command line parameters
    '**--HELP**' shows the available command line parameters and option-al arguments
    '**--AARPATH**' (see bug #2217)
    - Path names (for --aarpath) should be set in quotation marks to handle eventual blank spaces in the path name
    '**--LOGLEVEL**' (controls the verbosity of the debug log text file)
    - The available arguments are (in descending order of de-tail): TRACE/DEBUG/INFO/WARN/ERROR
    - The default argument is WARN (which should produce about the same amount of information as earlier debug logs did). Lower log details only should be specified to help in error detection (as logging might impact performance)
    Steel Beasts will now keep a history of the last 12 log files in the 'Logs' folder. The 'current' logfile will always be

called 'DebugLog.txt' (like it used to), the second most re-
cent one will be called 'DebugLog_0.txt', the next oldest one
'DebugLog_1.txt' etc. Whenever a new SB instance is being
started, 'DebugLog.txt' is renamed to 'DebugLog_0.txt', 'De-
bugLog_0.txt' to 'DebugLog_1.txt' etc. Should 'De-
bugLog_12.txt' exist it will be deleted.
Logging happens asynchronously to minimize the impact of IO
operations on performance

- Syntax example: ' **"File Path\...\SBProCM.exe" --loglevel trace** '

Command line parameters need to be preceded by a double (!)
dash; when changing the links in the Windows Start Menu, add
the command line options AFTER the file path with its quota-
tion marks

Added the capability to insert nav meshes into terrain map
files from the command line '**--buildnavmesh**'

- Syntax: **SB2.exe --buildnavmesh --innavfile "file path\file name.ter" --outnavfile
  "file path\new file name.ter" –ignoreexistingnavmesh**

- The optional **--ignoreexistingnavmesh** will force a new build of
  the nav mesh even if one already exists in the input file

- If nav meshes are being built via command line option,
  alert boxes with error messages about eventual command
  line parsing errors will be suppressed

- Steel Beasts may now access more than the usual 32 bit applica-
  tion limit of 2GByte RAM (up to approximately 3.5GByte). Note
  that this still may be insufficient when attempting to add a nav
  mesh to a particularly large and detailed map like Hannover-
  Weserbergland.ter. In these cases the only workaround is to not add a
  nav mesh to the terrain map file, but to build it for the indi-
  vidual scenario file with a smaller map portion.

- The UGV now has a front and a rear-facing chassis camera. These
  can be activated by the 'Altview2' (front) 'Altview3' (rear) and
  'Altview1' (mast) hotkeys. By default, the mast camera will be
  active

- Reduced scenario file load times

- Modified the SCENARIO and MAP EDITOR's autosave feature

  Added option to "**delete autosave files**" (applies only to files relat-
  ed to the current scenario)
  Added option to "**delete all autosave files**" (applies to all autosave
  files, even if they are not related to the current scenario)
  Autosaves use a proper timestamp pattern now
  There will be up to 10 autosaves for one scenario (with the
  11th save action, the oldest will be overwritten)
  When loading a previous autosave, i.e. "*MyScenario_autosave_YYYY-MM-
  DD_HHmm.sce*", the editor will actually show and treat it as
  "*MyScenario.sce*". It may be saved under a different name however
  Autosaves will only be written if there actually are unsaved
  modifications
  Changed the default autosave frequency from **OFF** to **5min**

- The MISSION EDITOR'S **Callsign** configuration window will now list the
  range of company indices to which a listed template applies, i.e.
  '[1-2]: INF COY DK' which would mean that this template is applied to
  the first two companies (note that while it is possibly reach
  even finer granularity in control to which unit a template gets
  applied to - by specifying platoons - these are *not* listed in
  this configuration window)

- 'Lines of fire' will now be shown for their full range with artillery fire missions (untargeted shots will continue to be shown as rays of 2km length)
- ISO CONTAINERS now use multiple colors
    Added file '../images/RandomColorPalette_ISO.bmp'
    When containers are placed in the MISSION EDITOR, they can be assigned specific colors by the designer. Containers placed in the MAP EDITOR will always use random colors
- Added a **'Remove all'** entry to a party's callsign template list in the MISSION EDITOR
- Changed the callsign editor and scoring dialogs so that the input focus is correctly set (previously events like 'mousewheel scroll' would go to the wrong window, i.e. the map screen)
- Updated the credits slideshow
- RPGs hitting the ground outside of their nominal engagement range will now still cause a HE detonation
- Updated vulnerability definitions for all ATGM and RWS actors so their optics and other equipment gets damaged more often from small caliber projectiles
- Removed the **'dynamic lead'** hotkey from the ULAN category in the **Controls** window; added it to the LEOPARD 1 and PIZARRO categories

Bug fixes without database entry

Only about 15% of all entries will be listed here for the sake of clarity and brevity, as unlikely as this may sound:

- Corrected a bug that resulted in identical treatment of dU and tungsten long rod penetrator projectiles
- Changed network code so that the extension of sensor masts and the orientation of the camera should be correctly transmitted for both UAV and UGV
- Fixed a problem that resulted in massive loss of frame rate in the CV9040 B/Cs gunner position's vision block view
- The status message "**Smoke generator on/off**" will now only be shown if at least one unit in the platoon is actually equipped with one
- Removed obsolete scenarios
- Fixed a crash bug with the THEME EDITOR
- Fixed a bug in network sessions where host-controlled units would start reloading but would then reset the reloading if the owner jumped into the unit
- Fixed a network problem with the CENTAURO where, if the turret power was disabled, it flooded the network with unnecessary status update messages
- Fixed a bug so that buildings that aren't supposed to burn won't
- Attempt to fix the issue of SB Pro losing keyboard focus (despite being the active window), resulting in a lot of 'ding' sounds until using **Alt+Tab** to switch to another window and then return
- Fixed a number of issues in the ULAN and ERCWS-M that could lead to network problems (even up to lost connections) due to runaway message generation.
One consequence of these changes is that, if in a vehicle with an AI gunner, the (human) Ulan TC will have to enable power traverse and stabilization in the startup procedure.
- Fixed a user interface issue where a user's "ready" status in the assembly hall was being reset if the SB window was resized
- Fixed the LEO 2A5-DK'S E-WNA control light (GUNNER'S CONTROL PANEL)
- Fixed a bug that prevented helicopters from stopping at waypoints to mount troops when there also is a route with no embark condition
- Fixed a new bug that caused helicopters to climb forever while engaging targets
- Fixed a bug with seemingly unresponsive computer-controlled turret crews (waiting to sense a fall of shot)
- Fixed a bug resulting in premature ATGM aborts when (seemingly) fired at non-targets by a human (network/latency issue)
- Fixed a bug that may have resulted in 'empty' AARs
- Reduced network traffic generated by the BTR-80 if multiple people are crewing/observing that vehicle
- Fixed a bug with the use of the mouse wheel on the Peri index position switch of the LEOPARD 2 commander's TIM
- Fixed a bug that could result in a computer-controlled crew not engaging a valid target due to a mismatch of ammunition choice
- Fixed a bug where the flight height for routes was not set correctly
- Fixed a bug that made it possible to fire the coax while the barrel was actually changed
- Changed the behavior of guns in rotating mounts; they should now be properly accessible with both mouse and joystick control
- Fixed a bug with HMGs on a flex mount, e.g. ASLAV-PC, M1025, some M113, M88A1
- Fixed a bug with the rendering of roof and vision blocks for the WISENT and various M113S
- Fixed a bug where the laser range of certain attached objects – most notably the dismounted artillery observers' sights – were incorrect for short ranges. Ranges of 10,000m and more will still be discarded as "infinity"

Resolved Bugzilla entries

Bug description is listed only if the bug was already in version 2.654 or if the change is relevant because of user interface changes:

- Fixed bug (number unknown); improved the automatic route optimization when moving a route node to a different location. The pathfinding method cannot be assigned to each individual route node
- Fixed bug #158
- Fixed bug #162; the main gun breech is now animated in 3D vehicle interiors
- Fixed bug #163
- Fixed bug #249; the new .50 cal gun sight allows better aiming
- Fixed bug #258; all LEOPARD tanks (including STRV 122) should now fire the correct number of smoke volleys
- Resolved bug #270
- Fixed bug #279; in the Map Editor, the final placement of objects will now match better the pink preview of the line tool (it used to be to the right and above the line)
- Fixed bug #301, 463
- Resolved bug #621; this won't be addressed
- Modified fix for bug #664; computer-controlled crews will close ballistic shield doors in artillery barrages; with a human commander, the computer-controlled gunner will open the shield doors on his own initiative (since there is no such command available in the user interface). For vehicle crews that are entirely under computer control, it is the vehicle commander's task to order to doors to open. With a human gunner and computer-controlled commander, nothing will happen
- Fixed bug #700
- Fixed bug #707; detached vehicle parts (e.g. turret after ammunition deflagration) will no longer assume Blue textures but keep the assigned texture instead
- Fixed bug #784, 797
- Fixed bug #808; 3D artillery (and scripted artillery objects) may now fire multi-spectral smoke barrages
- Fixed bug #816; by default, killed tanks will no longer change gun elevation immediately; the behavior of tank-class vehicles may now involve *to raise or to drop* their guns slowly over time (assuming a gradual loss in hydraulic pressure). There's even a small chance that a (loaded) main gun will go off in the first 30 minutes after being killed if the tank is smoldering
- Fixed bug #827, 834, 841
- Fixed bug #861; infantry will now crawl to adjust their position while prone
- Fixed bug #922; helicopters may now be scripted to land
- Fixed bug #929; the default assumption for player preferences is now to accept other players in his own vehicles so that if ownership changes, other players can still hop into crew positions as they could before the unit was given to another player
- Fixed bug #961; it is now possible in the MISSION EDITOR to set map updates for each party individually, and whether the map updates are limited to the party's own forces ("**BlueFor tracking**")
- Resolved bug #981 as a duplicate of #179
- Fixed bug #982; in the MISSION EDITOR, existing routes, custom map regions, and custom map lines may now receive additional vertices (nodes) similar to the way how it is done to roads in the MAP EDITOR: CTRL+LEFT CLICK deletes a node, SHIFT+LEFT CLICK adds one
- Fixed bug #996; top attack missiles are now characterized by an asterisk in the name displayed in the MISSION EDITOR'S ammunition selection dialog
- Fixed bug #1022, 1046, 1047
- Resolved bug #1088
- Fixed bug #1092; CTRL+J inverts the joystick axis permanently
- Fixed bug #1093, 1111, 1115

- Fixed bug #1165; with (only) the ballistic computer damaged at mission start, LEOPARD AS1 and LEOPARD 1A5-DK will now still activate powered traverse
- Fixed bug #1173; Tube arty will now fire HE missions with variable timer (VT) fuze settings for all targets **not** designated as being 'under cover'. Detonation height is set to 15m. 'Smoke & HE' fire missions will use VT fuze for the HE rounds, impact fuze for the smoke rounds
- Fixed bug #1228, 1244, 1274, 1282, 1296, 1307
- Fixed bug #1318; air strikes are now independent from artillery and will no longer block artillery units in the fire support queue
- Fixed bug #1323; from the driver's buttoned view the mine clearing plow will no longer appear to be on top of the Glacis, and not in front of it
- Fixed bug #1346, 1360, 1371
- Fixed bug #1377; it is now possible in the MISSION EDITOR to set a flight height "landed"
- Fixed bug #1387; medium caliber HE rounds have consistent animations for impact
- Fixed bug #1422, 1433, 1475, 1485
- Fixed bug #1494; ricocheting bullets will now retain their tracer/no tracer status
- Fixed bug #1502, 1503, 1518
- Fixed bug #1536; vehicles equipped with a laser warning receiver (currently T-72M4, T-90A, CV90/35-NL) will now turn their turret towards the laser emission source and pop smoke, if not targeting some other combatant at that time
- Fixed bug #1543; it is now possible to set a "*Repair all*" condition.
  Note however that, since SB Pro rather aggressively removes redundant routes/conditions, it will not be possible for a vehicle to be killed, repaired and to resume a route (since the route was deemed redundant by the code – if applied to a dead vehicle after all - and removed)
- Fixed bug #1554; 30mm HE rounds detonate when impacting the ground
- Fixed bug #1560; extended the '**Incremental Time**' limit in conditions to 240 minutes
  Note that the **240min** entry only makes sense in open-ended scenarios, or those with a 200 minute time limit plus 20% random variance IF the referenced event happens exactly at mission start
- Fixed bug #1569; troops can enter building #85
- Fixed bug #1570; MT-LB no longer overshoots its targets
- Fixed bug #1572
- Fixed bug #1585; computer-controlled CENTAURO commanders ceased charging crew to carry KE contra trucks
- Fixed bug #1593 again; ATGM teams will now also preserve two missiles against vehicles
- Fixed bug #1605
- Further improved the already fixed bug #1641 by adding the LOS height slider to planning and AAR phase
- Fixed bug #1645; infantry may now assault an occupied building (troops under fire from a building may still enter that building)
- Fixed bug #1649; in network sessions, towed vehicles will no longer dip sharply into the ground; this might also fix bug #2277 (slingshot kills with towing vehicles)
- Fixed bug #1650
- Fixed bug #1667; in the Leo 2A4 the thermal imager will now store for the vehicle commander's place the human player's last thermal image settings (polarity, focus)
- Fixed bug #1668; the (gunner's) hotkeys to control the thermal sight settings may now also be used by the commander (be it directly in KW mode, or indirectly as a command to the computer-controlled gunner)
- Fixed bug #1689; Unlike the LEOPARD family, AFVs of the ABRAMS and BRADLEY lineage will no longer shut off their thermal sights if switching their fire control modes to *Manual*
- Fixed bug #1718; SB Pro can now handle tandem HEAT warheads, reactive armor, and other warhead-neutralizing surfaces
- Fixed bug #1721

- Resolved bug #1733 as invalid
- Fixed bug #1760, 1765, 1771
- Fixed bug #1783; all new APCs and IFVs now show their mounted infantry, where visible
- Fixed bug #1791, 1850, 1879, 1900
- Want to mooch a license? Be the first to send an email to Comments (at) eSim Games (.com) with the subject line pennyisafreeloader (no spaces)
- Fixed bug #1906; by changing the ownership of a personnel carrier the possession of eventually mounted infantry will also change
- Resolved bug #1907 as invalid
- Fixed bug #1087; the position indicator in the MAP EDITOR is now confined to the map window. It will disappear when the map is panned outside of its current position
- Fixed bug #1336; infantry will now obey a "shoot here" command even if an enemy AFV is in range
- Fixed bug #1941, 1962, 1967
- Fixed bug #1969; computer-owned infantry may dismount and re-mount player-controlled vehicles ("*load, if…*" command)
- Fixed bug #1970, 1978
- Resolved bug #1991 as a duplicate of #2546
- Fixed bug #1996, 1997, 2002, 2030
- Resolved bug #2032 as invalid
- Fixed bug #2033
- Fixed bug #2036; the "Troops" damage option has been eliminated. To achieve the same effect, unload troops in the MISSION EDITOR and delete them. In the "Damage, if…" menu, the Troops option is still available.
  For compatibility reasons, if a scenario is loaded where a "Troop" damage has already been applied to a unit the option remains visible to allow the mission designer to remove the option. Once removed it will not show up again
- Fixed bug #2043
- Fixed bug #2051; infantry will now occupy certain buildings which they did not before; however, the waypoint must be located *outside* of any building to let them occupy it
- Fixed bug #2055
- Fixed bug #2060; the reloading of ATGMs and RPGs will now be delayed until the missile has exploded
- Fixed bug #2061; helicopters now have a delay between engine startup and lift off
- Fixed bug #2063
- Fixed bug #2075; after given the battle position command ("E"), helicopters will no longer climb to maximum altitude. As a consequence, the autopilot is now turned off during engagements, requiring the player to manually steer the helicopter on target; the autopilot will now be disabled in helicopters under the following circumstances:
  When manually adjusting height when engaging a target while hovering
  When double tapping a height hotkey
- Fixed bug #2079; the MAP EDITOR's "Bridge Roads" command will now assign more suitable bridge types to the adjacent road type (e.g. railroad bridges)
- Fixed bug #2082, 2083, 2091, 2094, 2098, 2110, 2111, 2113, 2114
- Fixed bug #2115; the (human) ABRAMS gunner now must use the virtual 3D Computer Control Panel for manual range input; for the (human) commander the keyboard method is still available. This also fixes bug #2206
- Fixed bug #2119
- Fixed bug #2123; the following units may identify targets with their thermal sights out to 6,000m:
  All FO units with a thermal imager
  M1A2(SEP) ABRAMS
  TIGER
  AH-64/A APACHE

- Fixed bug #2124
- Fixed bug #2125; in the MISSION EDITOR'S "New unit" popup menu, non-crewable units will be shown in a slightly lighter color
- Fixed bug #2127, 2128
- Resolved bug #2130 as a duplicate of #2277
- Fixed bug #2131; the "Save Plan?" dialog box has been restored for the session host and will be automatically open once that all Clients indicated that they are ready to start the session. They should no longer lose connection if the host then saves the current plan
- Fixed bug #2134, 2136, 2137, 2138, 2139, 2140, 2141, 2142
- Resolved bug #2145 as invalid
- Fixed bug #2147; in the AAR, callsigns on map icons no longer use the same template for both sides
- Fixed bug #2148
- Resolved bug #2149 as invalid
- Fixed bug #2150, 2151
- Fixed bug #2153; using the middle mouse button for panning the map will no longer toggle an eventual palm switch in the player's vehicle
- Fixed bug #2156, 2159, 2161, 2162
- Fixed bug #2165; FASCAM may no longer be fired on just any priority target, just its target reference points
- Fixed bug #2167; there's now a command to "stop reloading" TOW missiles for the BRADLEY
- Fixed bug #2171
- Fixed bug #2172; changing ammo of dismounted "A-Teams" will no longer change ammo and weaponry of the dismounted "B-Teams" even if the '**apply to all**' checkmark is set
- Fixed bug #2174; AARs will now store azimuth and elevation for both integrated and attached guns
- Fixed bug #2175, 2176, 2177
- Fixed bug #2178; fuel leaks ("Low fuel" error message) can now be fixed with a *Repair, if…*-condition
- Fixed bug #2180, 2183, 2188, 2195, 2196, 2197, 2198, 2201
- Fixed bug #2205; when loading a PLN file a unit's position may not be changed unless the unit is in a deployment zone
- Fixed bug #2206; see entry for bug #2115
- Fixed bug #2208
- Fixed bug #2217; added an '**--AARPATH**' command line option for Steel Beasts. During a session, the AAR file will now be written to the local computer's "temp" folder (the same is done for the .txt file which caches a session's voice chats). At mission end, if the user agrees to save the file, the AAR file gets moved to the folder specified by the new '--AARPATH' command line variable. If the command line parameter is not specified, the default AAR path will be used.
- Fixed bug #2219
- Fixed bug #2220; Strv122 and Leopardo 2E will now show a vertical view slit if the peri cover has been closed
- Fixed bug #2222; artillery vehicles with no fire mission and no active target will keep the gun forward in travel position, with the doors closed, driver's hatch open, support spades retracted. Once tasked with a fire mission, driver's hatch is closed, doors open, support spades get deployed. When acquiring a target (self-defense) doors close, they will track the target's movement
- Don't tell anybody that you read this line. Instead, be the first to report it to Ssnake of eSimGames with the subject line "Hush Hush" to win something. Message must include your postal address
- Fixed bug #2224; disabled zoomed view for external observer's position except for Instructor, while testing a scenario from within the MISSION EDITOR, and in **Realism** settings low and medium
- Fixed bug #2232, 2233
- Fixed bug #2235; the ARV and Troops conditions windows are initialized with the following settings:
  "hitch if" / vehicle [this] is not towing vehicle
  "release if" / vehicle [this] is towing vehicle

> "load troops if" / vehicle [this] is carrying troops
> "unload troops if" / vehicle [this] is not carrying troops

- Fixed bug #2236; if NVGs are enabled for the vehicle commander, the external observer position will have access to it as well in the BUSHMASTER, CENTAURO, CH-146 GRIFFON, and CH-47 CHINOOK
- Fixed bug #2239
- Fixed bug #2240; for the first five minutes after spotting an infantry unit, only a general "troop" tactical icon will be displayed on the map screen so that forward observers and crew served weapon teams can no longer be easily selected by human players for priority fire
- Fixed bug #2241
- Fixed bug #2242; using a context menu in the MISSION EDITOR the user can now assign units ownership of triggers, obstacles, minefields, IEDs, fortification and reference points. The player owning these units is in control of these items and can move them in the planning phase (and in the case of triggers, activate them).
  (For the time being) at least in Pro builds, all network session participants can now load PLN files, as only items controlled by them will be influenced by the plan.
- Fixed bug #2244; TOW missile aborts will now occur only with the M2/M3A2 ODS BRADLEY, M113/TOW, M901, and M996 (HMMWV/TOW) after a movement of about 30m, or if the launcher gets damaged
- Partially fixed bug #2245
- Fixed bug #2249; after being killed, vehicles will drop their guns in the right direction now
- Fixed bug #2250
- Fixed bug #2252; the CV90/40-B now has only three magazines
- Resolved bug #2258 as a duplicate
- Fixed bug #2260; guns of vehicles marked as destroyed at mission start will now be in their maximum elevation or depression
- Fixed bug #2261; the MISSION EDITOR now displays the current version number in the upper right hand corner
- Fixed bug #2262; vehicles in emplacement positions will now properly perform the reload command
- Fixed bug #2263; in the MISSION EDITOR, the 16th platoon that could not be created anyway, is no longer shown in the callsign editor's drop-down list
- Fixed bug #2264; when selecting a map section in the MISSION EDITOR, the map dimensions will now be displayed
- Fixed bug #2265; in the status bar during the planning phase, the type of mine obstacle will now be displayed, e.g. *Minefield, Conventional, Buried*
- Fixed bug #2271
- Fixed bug #2273; addresses certain reticule irregularities in various thermal sights
- Fixed bug #2275, 2278, 2281, 2282, 2283, 2284
- Resolved bug #2285 as invalid
- Fixed bug #2286:
  > In the MAP EDITOR
  > - all hedges are shown in a green color slightly different from the colors used for woods so that they can be easily located
  > - Line objects with the NOMAPFOOTPRINT tag will be drawn as purple lines
  > - Line objects (other than Bocage style hedges) that would be visible on maps will be drawn in dark green color; note however that currently there are no such line objects
  > In the MISSION EDITOR all hedges are shown in the same color as the woods
  > During a mission (planning, execution, AAR) only the Bocage style hedges are shown, in the wood color (so they are invisible when used inside of forests)
  > This also fixes bug #2887 (see below)
- Fixed bug #2287, 2291
- Fixed bug #2293; removed some infantry that sneaked into some of the gunnery range scenarios and gave the infantry team leader a stern warning

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- Fixed bug #2294; the Periscope on M-109 will now be fixed on a common reference point for each platoon while executing a fire mission
- Resolved bug #2303 as a duplicate of #1370
- Fixed bug #2304; by default, civilian cars now have assigned a random color
- Fixed bug #2305
- Fixed bug #2307; multiple civilian characters can now be selected to set the following conditions:
  "Armed, if…"
  "Discard weapon, if…"
  "Explode combatant, if…"
  "Set look of infantry…"
- Fixed bug #2309, 2310, 2311, 2312
- Resolved bug #2314 as invalid
- Fixed bug #2317; the TECHNICAL ZU-23/2 AAA will now provide suppression when given the "*Shoot here…*" command
- Bug #2318 will not be fixed
- Fixed bug #2321, 2322, 2323, 2324
- Fixed bug #2325; all supply and fuel trucks now start at a default unit size of four (UNIMOG, MAN 10T, MAN SX45, HEMMT, URAL)
- Fixed bug #2327
- Fixed bug #2328; infantry weapon teams will now crawl when the facing of their current battle position is changed by the player
- Fixed bug #2329, 2333
- Partially fixed bug #2234; while testing a scenario, the user may now
  repair vehicles
  damage vehicles
  kill vehicles
- Fixed bug #2335; infantry movement speed can now be adjusted to let them crawl
- Fixed bug #2336, 2342, 2345, 2346, 2349, 2350, 2351, 2352
- Fixed bug #2354; for all LEOPARD 2 driver's positions with a 3D interior, adjusted the vision block points of view to show less vehicle and more surrounding terrain
- Fixed bug #2358
- Fixed bug #2359; holding **Alt** disables route optimization between last route node and next
- Fixed bug #2363, 2367
- Resolved bug #2374 as invalid
- Fixed bug #2380, 2382, 2383
- Resolved bug #2384 as invalid
- Resolved bug #2388 as invalid
- Fixed bug #2389
- Resolved bug #2391 as a duplicate of bug #827
- Fixed bug #2393, 2396
- Fixed bug #2397; "Center on me" command will no longer work with map screen updates disabled
- Fixed bug #2398
- Resolved bug #2399 as invalid
- Fixed bug #2400, 2401, 2403
- Fixed bug #2404; only non-playable vehicles will allow *their owner* the use of the binocular zoom from the external observer's position (in high realism settings)
- Fixed bug #2405
- Resolved bug #2407 as invalid
- Fixed bug #2409; the progress bar during the nav mesh generation indicates activity rather than to create the impression of an application that hangs (nav mesh generation will still take patience and time, however). Since the nav mesh generation is an iterating procedure of subsequent optimization passes no ab-

solute duration can be taken as a reference (only an upper limit of 15 minutes is set beyond which no more optimization passes will be started)

- Fixed bug #2410, 2412, 2413
- Fixed bug #2415; added a range circle to refueling trucks (note that only two vehicles can get refueled at any time, even if more are in range)
- Fixed bug #2416, 2417, 2419, 2420, 2421, 2424, 2425
- Resolved bug #2426 as a duplicate
- Fixed bug #2432; on realism settings "High", artillery strikes will no longer be visible on the map screen (nor countdowns nor fire mission names), unless the user is testing a mission or is an **Instructor Host**. The 'Support' menu (which lists all the fire missions) will now also show the fire mission's status, so that the user can at least see if his call ended up in a queue (possibly because no arty is available) or is in progress
- Resolved bug #2436 as invalid
- Resolved bug #2437 as invalid
- Congratulations – you just found a 3.0 license if you are the first to send an email to Sales at eSim Games with the subject line "All Hail the_List!" and confess the sacrifice of a rodent. Perjuries welcome.
- Fixed bug #2438; the T-62's gun sight may now be adjusted by mousewheel or **Shift+Arrow Up/Dn**
- Fixed bug #2439, 2441, 2442, 2443, 2444, 2445, 2447
- Resolved bug #2448 as invalid
- Fixed bug #2449, 2450, 2452
- Fixed bug #2453; TRPs created by clients in a network session can now be moved and sent to other players
- Fixed bug #2454; new RPG-7 types are now selectable in the **Ammunition** combo box
- Fixed bug #2455, 2456, 2459
- Fixed bug #2460; the default hotkey for switching on/off the CHALLENGER 2's thermal imager was changed to **Num*** … again; this also fixes bug #1771. **Num+** will now toggle day/TI mode (like **Num***), the 'TIS on/off' function has been removed (as it did not serve any discernible purpose)
- Fixed bug #2461
- Resolved bug #2462 as invalid
- Fixed bug #2463; for the FV107 SCIMITAR the fast/slow speed mode for manual traverse works now (hold **Ctrl** key)
- Fixed bug #2467, 2468
- Resolved bug #2472 as a duplicate of bug #2474
- Fixed bug #2473, 2474, 2475, 2478
- Fixed bug #2479; in the MISSION EDITOR, while testing a scenario and selecting **Show … Unit icons (actual)** or **(Vehicle icons)** the user will only see 'actual' unit icons for a side which either is not password protected or for which he entered the password
- Fixed bug #2481; if a prototype unit consists of several characters, and if some get killed but one or more survivors will actually reach their destination in the drain zone, it will no longer revive the other group members. Units returning to the clone pool will only be repaired at this point, not rearmed
- Fixed bug #2483, 2488, 2492, 2494, 2495, 2497, 2498, 2500
- If you are the first to report this line to Ssnake (at) eSimGames.com with the subject line "Lucky Bastard" you will get a freebie. Be sure to include your postal mail address
- Fixed bug #2502; in the map screen, the "proceed to" command from the context menu of a unit that is at a waypoint with branching routes, the list of waypoints is now augmented with the tactics of the routes leading to them. This should help the player to identify the correct route quicker (as long as there aren't multiple routes with the same tactic)
- Fixed bug #2506, 2509, 2510
    - Eliminated "Blue" texture folder

Merged "Red" and "Blue" folder contents in the user interface with the "Troop uniform" folders. Is now referred to as "Camo" in the Options menu of the Mission Editor. The actual texture files are still organized in different folders however

Added three new "**Camo**" subdirectories, "**UN**", "**Red**" (generic OpFor), and "**Civ**"

Added the soldier 'mod' folders for the new nationalities (UN, Red, and CIV)

The executable tries to load vehicle textures in the following order

- My Documents\eSim Games\Steel Beasts\mods\textures\{current environment}\{nationality}
- C:\Programs\eSim Games\Steel Beasts\textures\{current environment}\{nationality}
- C:\Programs\eSim Games\Steel Beasts\textures\woodland\{nationality}
- C:\Programs\eSim Games\Steel Beasts\textures\{current environment}
- C:\Programs\eSim Games\Steel Beasts\textures\woodland

- Fixed bug #2511; under the user's **..\Mods/Textures/Winter** folder, there is now a sub-folder for **Red**
- Fixed bug #2512, 2513, 2514, 2516
- Resolved bug #2517 as a duplicate of #1762
- Fixed bug #2518; rocket artillery units may now cover an area of up to 1,000 x 1,000m² with a single fire mission, tube artillery remains limited to 400 x 400m²
- Fixed bug #2519, 2523, 2527
- Fixed bug #2529; the static sky textures are gone now, and a suitable new fogging method has been implemented
- Fixed bug #2533; chat messages, reference points and map graphics may now be sent to the Own or to All allied parties. To send these to enemy parties, the 'All' option must be used.
  Note that the '**lines of fire**' feature still either shows the lines of the 'Own' or of 'All other' parties (or of all), but *not* of only allied parties
- Fixed bug #2534, 2335, 2537, 2540
- Resolved bug #2548 as invalid
- Fixed bug #2549 by adding a "..\civ" subdirectory to the camouflage texture folder (see also bug #2510 above)
- Resolved bug #2550 as a duplicate of #2549
- Fixed bug #2552, 2553, 2555, 2556
- Fixed bug #2559; vehicles traveling on roads will now ignore (unarmed) allied *AND* neutral humans in their collision detection
- Fixed bug #2560, 2562
- Fixed bug #2563; a change in ammunition type (with the sole exception for FASCAM missions) will no longer reset the coordinate locations in the call for fire dialog box
- Fixed bug #2564; the artillery call for fire dialog will now default to six tubes
- Resolved bug #2570 as invalid
- Fixed bug #2571, 2572
- Fixed bug #2573;re-enabled the option to call artillery strikes from the map view while Realism is set to **High**; however, the resulting artillery impact area object will remain invisible
- Fixed bug #2576, 2577, 2579, 2580
- Resolved bug #2581 as a duplicate of #1628
- Bug #2582 will not be fixed
- Fixed bug #2583, 2584, 2585, 2586, 2590, 2591, 2592, 2594, 2595, 2596, 2597, 2598, 2599
- Fixed bug #2601; infantry will no longer leave a building when ordered to lay suppressive fire
- Fixed bug #2602, 2603, 2604, 2607
- Resolved bug #2609 as a duplicate of #2322
- Fixed bug #2610, 2612, 2613
- Fixed bug #2614; old scenarios without air support will be imported without adding some; scenarios with air strikes enabled will receive the full load of 15
- Fixed bug #2615, 2616, 2617
- Resolved bug #2618 as invalid

- Fixed bug #2620, 2621, 2622, 2624
- Resolved bug #2625 as invalid
- Fixed bug #2626, 2627
- Fixed bug #2628; civilian cars, even when hostile, will no longer be engaged by computer-controlled units
- Fixed bug #2629, 2630
- Fixed bug #2631; the M1A2 SEP ABRAMS' fire control computer will now accept range inputs up to and including 5,000m
- Fixed bug #2632, 2633, 2636, 2637, 2638, 2639, 2640
- Fixed bug #2641; in the M1A2 SEP ABRAMS, the commander may now use the laser range finder while overriding the gunner
- Fixed bug #2642, 2643, 2644, 2645, 2647, 2648, 2649, 2651, 2652
- Resolved bug #2654 as invalid
- Resolved bug #2655 as invalid
- Fixed bug #2657; reassigned **Num*** hotkey to make room for the universal shifting of the focal plane in thermal imagers; most previous **Num*** actions are now found on **Shift+Num*** with the sole exception being the thermal imager field of view, which has been (double-assigned) to the general field of view toggle command **N**
- Resolved bug #2658 as invalid
- Fixed bug #2660; only at about 900m range will RPG-7s be used by computer-controlled troops to create an air burst effect; RPG-7 air burst firing is limited to combatants using the Afghan character meshes (including *Burqa woman*)
- Partially fixed bug #2661
- Resolved bug #2662 as invalid
- Fixed bug #2663
- Resolved bug #2665 as invalid
- Fixed bug #2666, 2668
- Resolved bug #2669 as invalid
- Fixed bug #2671, 2675, 2676;
- Resolved bug #2681 as invalid
- Fixed bug #2684, 2686, 2687, 2688, 2689, 2690
- Fixed bug #2692; when starting or resuming an Operation the **'Continue Operation'** screen will be presented
- Fixed bug #2694, 2695, 2696, 2698, 2700
- Fixed bug #2701; in network sessions, routes of units owned by other players will no longer be shown on the player's map screen
- Fixed bug #2704, 2705 , 2707, 2708
- Resolved bug #2709 as a duplicate of #2147
- Fixed bug #2711, 2712, 2714
- Fixed bug #2716; for the CV90/30-FI
   When the ballistic computer/fire control system receives a damage, the corresponding yellow LED will now light up in the primary sight
   A certain text string ("firing prohibited") will no longer be shown if emergency firing mode is activated
- Fixed bug #2721, 2724
- Fixed bug #2725; loading a *.PLN file will update shifted unit positions
- Fixed bug #2726; the owning player's infantry squad will no longer automatically crawl when under direct or indirect fire, but defer to the owner's orders (that is, they will crawl if ordered to move at slow speed or while they are in a battle position)
- Fixed bug #2727, 2729
- Resolved bug #2730 as invalid

- Fixed bug #2731, 2732, 2734
- Resolved bug #2738 as invalid
- Resolved bug #2739 as a duplicate of #2849
- Fixed bug #2740, 2741
- Resolved bug #2742 as a duplicate of #2668
- Fixed bug #2743
- Fixed bug #2746; while in the external observer's position of a squad located inside a house, nearby trees will no longer block the player's view
- Fixed bug #2747, 2751, 2752, 2753
- Resolved bug #2757 as a duplicate of #2749
- Fixed bug #2758
- Fixed bug #2759; removed the dialog for sky texture selection (was: **Alt+S**)
- Fixed bug #2760; infantry will now crawl when adjusting the orientation of a prone firing position
- Fixed bug #2761
- Resolved bug #2762 as invalid
- Fixed bug #2763;
- Fixed bug #2764; sensing rounds (while adjusting fire) will never be air bursts (for now), irrespective of the settings for the actual fire mission
- Fixed bug #2766
- Resolved bug #2767 as a duplicate of #1494
- Fixed bug #2768, 2769, 2770, 2771, 2772, 2773, 2781, 27822783, 2791, 2793
- Resolved bug #2794 as a duplicate of #2779
- Fixed bug #2796; infantry now enter buildings running, unless exhausted
- Fixed bug #2797, 2799
- Fixed bug #2803; lines of fire can no longer be activated by normal players during solitaire or network sessions (except on Realism setting '**low**')
- Fixed bug #2805, 2808
- Fixed bug #2810; infantry is now forced to slow-down if the current route's speed settings exceed the stamina reserves
- Fixed bug #2811; weapon teams will only rest on the move if they are exhausted from normal movement
- Fixed bug #2814, 2816, 2819, 2821, 2822, 2823, 2824, 2825, 2826
- Bug #2827 will not get fixed
- Fixed bug #2828
- Resolved bug #2829 as a duplicate of #263
- Fixed bug #2830, 2832, 2834, 2836, 2837, 2839
- Bug #2840 will not get fixed as it is intentional behavior
- Fixed bug #2842
- Fixed bug #2843; Technical-T gunners will no longer scan the ground by moving their 106mm Recoilless Rifle. At speeds exceeding 5km/h the gun will be stowed in the 12 o'clock position
- Fixed bug #2844, 2845, 2846
- Fixed bug #2847; all guided, none fire-and-forget type missiles will now abort upon the firing platform being destroyed
- Fixed bug #2848; infantry will no longer fire light MGs at armored fighting vehicles
- Fixed bug #2849, 2852, 2854, 2855, 2858, 2859, 2864
- Fixed bug #2867; allied parties may now send map graphics to each other in network sessions
- Fixed bug #2869, 2872, 2873, 2875, 2876, 2877
- Resolved bug #2878
- Send the correct name of a Roman battle against Germans suspected in the vicinity of Holzminden (part of the Weserbergland near Hannover) via the Contact Us web form sheet at the eSim Games homepage. If you are among the first three readers to do so you will win something. Offer ends 48 hours after the release of SB Pro PE 3.0.

- Fixed bug #2879; enabled joystick signal inputs for non-gun-sight views for the following vehicles:

Boxer	Iveco LMV	MAN 10t GL
Centauro	Leopard 2A4	MAN SX45
Challenger 2	M113A1	Technical 4x4
Cougar MRAP	M113A2	Technical-T
Eagle IV	M113AS4	Unimog
Fuchs 1A6	M113G3/TOW	Ural
Fuchs 1A7	M2/M3A2 Bradley	Wisent
FV107 Scimitar		
FV510 Warrior	M966	

- Fixed bug #2881, 2882, 2883, 2884, 2885, 2886, 2887
- Fixed bug #2888; mounted MGs on the 4x4 Technical-F are now limited to a frontal arc in their aim (the cabin gets in the way)
- Fixed bug #2889, 2890
- Fixed bug #2895; improved the "Set look of infantry" dialog user interface
  - made the dialog wider and higher, so that up to 16 entries can be displayed simultaneously.
  - relocated the '**OK**' and '**Cancel**' buttons
  - if a single unit is selected, the '**Set look of infantry**', '**Set look of carried troops**' and '**Set look of crew**' dialogs will be initialized with the current look selection (important to adjust a previous change)
  - character looks are now assigned differently: For multiple unit selections, the list of characters is now applied to each carried unit
- Fixed bug #2891, 2893, 2901
- Resolved bug #2906 as invalid
- Fixed bug #2907, 2908
- Resolved bug #2911 as invalid
- Fixed bug #2913, 2914, 2915
- Fixed bug #2917; changed procedures of computer-controlled crew to adjust their fire after shooting over a target
- Fixed bug #2918
- Resolved bug #2919 as invalid
- Fixed bug #2921, 2922, 2924, 2927
- Fixed bug #2929; all infantry will now go prone more often (before firing their weapons, when under direct fire attack, when observing enemy combatants)
- Fixed bug #2930; AKM rifles will now user their own sound, western rifles will use a different set
- Fixed bug #2932, 2934, 2935
- Fixed bug #2936; terminal ballistics will now take eventual armor vests of infantry into account before calculating damage
- Fixed bug #2937, 2944
- Fixed bug #2945; assigned a specific sound to light MGs
- Fixed bug #2947, 2949, 2951, 2952, 2953
- Resolved bug #2954
- Fixed bug #2959; infantry under fire will no longer reposition themselves when taking a casualty
- Fixed bug #2960, 2961
- Resolved bug #2962 as a duplicate of #2874
- Fixed bug #2964, 2965, 2967, 2968, 2970, 2972
- Resolved bug #2975
- Fixed bug #2976, 2977
- Resolved bug #2981 as invalid
- Fixed bug #2984, 2985

- Fixed bug #2987 rather thoroughly; for infantry, the "battle position" status is now canceled if the height/posture setting is being changed – but being in prone position may still be changed if a squad no longer receives incoming fire
- Fixed bug #2989
- Fixed bug #2990; infantry will no longer sink too deep into the terrain
- Fixed bug #2991, 2992, 2994, 2997, 3001
- Fixed bug #3002; in an AAR reviewed immediately after the execution phase cars with random colors will keep their original color. This information will however not be retained if the AAR is saved to disk and then exited. Reviewing the file later will assign new random colors to these cars.
- The first reader to report this line to that legless reptile at eSimGames.com with the subject line "Pad Winner" will get a freebie. Be sure to include your postal mail address
- Fixed bug #3003, 3004, 3007, 3011, 3013, 3018, 3020
- Fixed bug #3022; allied units will now show up on the map screen but update their positions only at longer intervals; they cannot be clicked for a position update either
- Fixed bug #3027; as long as map updates are enabled units of allied parties will no longer be shown on the player's screen with the "enemy intelligence of position" feature (as allied units are now always shown per bug fix #3022); it still has a place however if map updates are disabled in order to denote to the player the approximate location of friendly units
- Fixed bug #3028, 3029, 3030, 3032, 3034
- Fixed bug #3037; by centering the control handles of the M1A2 SEP the lead calculation may be zeroed; eventual ammunition drift and crosswind compensation will still be applied
- Fixed bug #3038, 3039, 3041, 3045
- Fixed bug #3046; for the M1A2 SEP's CITV **Designate** in EMERGENCY mode will now work. In EMERGENCY mode, the CITV is slaved to the gun in both **CITV GLOS** and **GPS GLOS** modes (the commander may still control the gun in either mode when overriding). The commander may now also control the CITV in **MAN** mode even in MANUAL fire control mode; **Designate** or **Override** remain impossible
- Fixed bug #3047, 3048, 3049
- Fixed bug #3050; while CITV is in **MAN** or **AUTO** scan modes, no reticle will be shown in 13x, 25x, and 50x. While in **CITV GLOS** or **GPS GLOS** modes, the "**TC Stadia up**" and "**TC Stadia down**" buttons (default as Num8 and Num2) will fire the LRF
- Fixed bug #3052
- Resolved bug #3053 as a duplicate of bug #3054
- Fixed bug #3054
- Fixed bug #3055; sometimes words of the mission briefing file were not rendered if they fell into the line break zone
- Fixed bug #3056
- Fixed bug #3057; the MILAN missile sight will now pitch down by 6 mils once the missile has been fired so that the reticle's center is at the point previously aimed at using the 'arrow'
- Fixed bug #3058
- Fixed bug #3061; the JAVELIN ATGM gunner's sight may now lock on targets again
- Fixed bug #3062, 3063
- Fixed bug #3064; attached mine rollers will now stay on top of bridges
- Fixed bug #3065
- Resolved bug #3066 as invalid
- Fixed bug #3072
- Fixed bug #3073; reticules of various gun sights needed correction. This fix potentially changes gun sights of every single vehicle in Steel Beasts, both thermal and day, primary and auxiliary sight
- Resolved bug #3074 as invalid
- Fixed bug #3075; changed hotkey assignments and crew procedures for the M1A2 SEP ABRAMS' **CITV designate** and **override** modes

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while in the TC's 'CITV' view (F3), the TC's palm switch now needs to be pressed in order to slew the CITV in 'manual scan' mode

the TC's 'designate' function got moved to the 'O' key (it was 'V' before)

in order for the 'designate' function to work, the TC's palm switch has to be pressed as well

Notes:

In the TC's 'eye' view, the mouse/joystick will control

1. the view if the palm switch is not depressed
2. the turret if the palm switch is depressed and the CITV is set GPS GLOS mode
3. the CITV in all other modes

on the TC's handle the 'stadia' buttons (push, up/down) and the field of view buttons (zoom in/out) will work *without* requiring the palm switch to be depressed. All other functionality does however.

- Fixed bug #3076
- Fixed bug #3078; deep wadi areas are now excluded from the nav mesh generation (& autonomous path finding). Note that scripted movement is still possible
- Fixed bug #3079, 3083
- Resolved bug #3085 as a duplicate of bug #3084
- Resolved bug #3086 as invalid
- Fixed bug #3089, 3093, 3094, 3095, 3096
- Resolved bug #3098 as invalid; in the ASCOD Ulan, lead is being activated by holding the laser button for two seconds while tracking the target, not with a (dynamic) lead button
- Resolved bug #3099 as invalid; computer-controlled crew in the ASCOD Ulan are automatically switching the thermal imager on if the user attempts to switch it off
- Fixed bug #3103; assault rifles in the CV90/30-FI interior have now received a missing texture
- Resolved bug #3105 as invalid
- Resolved bug #3109 as invalid
- Fixed bug #3110
- Fixed bug #3111; eliminated an exploit to get into an ambulance's observer's position if a vehicle had radio damage
- Fixed bug #3112
- Resolved bug #3116 as a duplicate of #2718
- Fixed bug #3118

2.654 (official release)