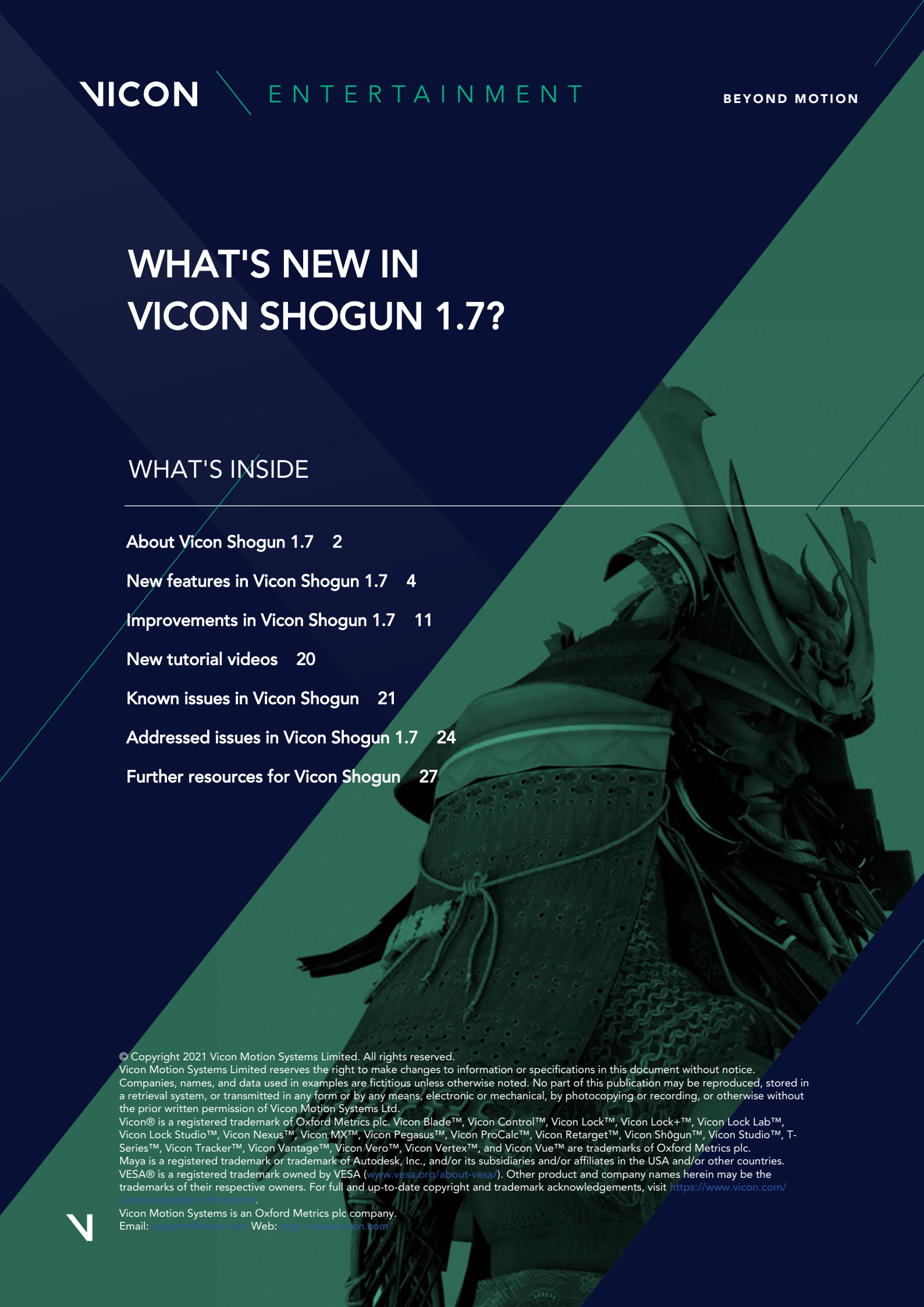
VICON ENTERTAINMENT

BEYOND MOTION

WHAT'S NEW IN VICON SHOGUN 1.7?



WHAT'S INSIDE

Vicon Motion Systems is an Oxford Metrics plc company.
Email: support@vicon.com Web: http://www.vicon.com

About Vicon Shogun 1.7

Shogun 1.7 is the seventh point release of Vicon's entertainment market software.

In this latest release, Shogun Live introduces the ability to capture uncompressed MOV files, Z-up labeling and solving skeleton templates, and Y-up origin support. These enhancements are in addition to multiple improvements made to subject calibration and Vicon Solving Setup (VSS) files.

Shogun Post has also received improvements to its offline subject calibration, with Auto-Skeleton now working with the new Z-up solving templates, and support has been added for VST 3.6.

These improvements enhance the performance and flexibility of tools introduced in Shogun 1.6, in response to direct customer feedback. Non Virtual Production users will also enjoy higher levels of precision in their subject calibration, with greater flexibility for non-standardized marker placements.

For a more detailed description, see:

- What's new in Shogun 1.7[1] on YouTube

- New features in Vicon Shogun 1.7 on page 4
- Improvements in Vicon Shogun 1.7 on page 11
- New tutorial videos on page 20

This release also benefits from ongoing maintenance, with a number of issues having been addressed (see Addressed issues in Vicon Shogun 1.7 on page 24).

For information on requirements for installing and running Shogun, see PC requirements in *Installing and licensing Vicon Shogun*.

For detailed information on PC requirements, visit the Vicon website FAQs[2] and select **Operating systems and PC** or contact Vicon Support[3].

1 https://www.youtube.com/watch?v=e_noQ8Ep-mQ
2 https://www.vicon.com/support/faqs/
3 mailto:support@vicon.com

About this guide

This guide describes the new features in Vicon Shogun 1.7.

The following documentation is available for Shogun, both as online documentation and as PDFs that you can download from docs.vicon.com[4]:

Document	Description
What's New in Vicon Shogun	Describes new features in the latest release.
Installing and licensing Vicon Shogun	Installation and licensing instructions.
Getting started with Vicon Shogun	Provides an end-to-end workflow overview, including system preparation, initial capture steps, data cleanup and solving, retargeting and export.
Getting more from Vicon Shogun	More advanced information to help you to take your use of Shogun further, for example, to add your own customizations, or to automate capture.
HSL scripting with Vicon Shogun	HSL scripting guidelines and commands.
Python scripting with Vicon Shogun	Basic information on using Python with Shogun.
Getting started with Vicon Retarget	Basic information on using Vicon's retargeting application.

For more documentation related to Shogun and other Vicon products, visit docs.vicon.com[5].

4 https://docs.vicon.com
5 https://docs.vicon.com

New features in Vicon Shogun 1.7

For descriptions of the new features in this release of Shogun, see:

Shogun Live 1.7 new features

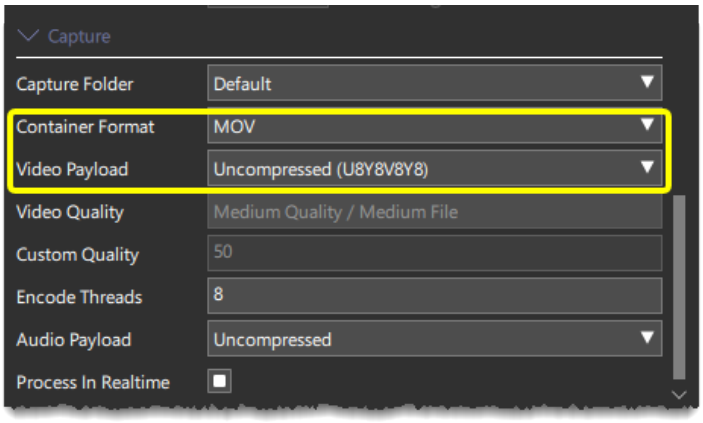
These are the main new features in this release of Shogun Live:

Capture to uncompressed MOV

You can now save uncompressed video directly to a *.mov* file so that you don't have to capture to Vicon Video file format (*.vvid*) and then convert to *.mov* in Vicon Video Converter.

To capture to uncompressed MOV format:

1. Ensure your Vicon system, including your video camera(s), is connected to Shogun Live.
2. On the **System** tab, select the video camera, and in its **Properties** section below, go to the **Capture** section and:
   a. In the **Container Format** field, select **MOV**.
   b. In the **Video Payload** field, select **Uncompressed** .



3. Ensure the other settings are as required and then capture the required movement.
   A MOV file is created in the specified location (either in the default Capture Folder, or in the custom Device Capture Folders).

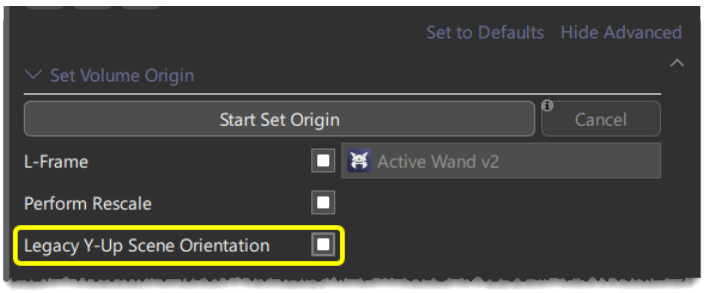
For more information on setting up video cameras, see Prepare video cameras in *Getting started with Vicon Shogun*.

Y-up origin control

For productions and projects working in Y-up coordinate systems, an advanced control in the Camera Calibration panel puts Shogun into Y-up mode.

To set the Shogun Live scene to Y-up mode:

- In the **Camera Calibration** pane, ensure the **Advanced** properties are displayed and in the **Set Volume Origin** section, select **Legacy Y-Up Scene Orientation**.



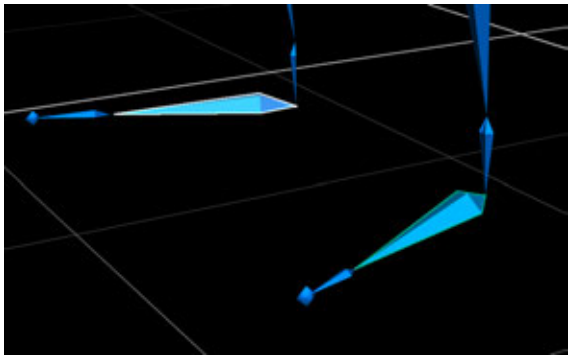
Z-up skeletons

The labeling and solving skeleton templates that are supplied with Shogun 1.7 are now Z-up, instead of Y-up. This means that the subject models are now defined in the same axis as Shogun (Z-up).

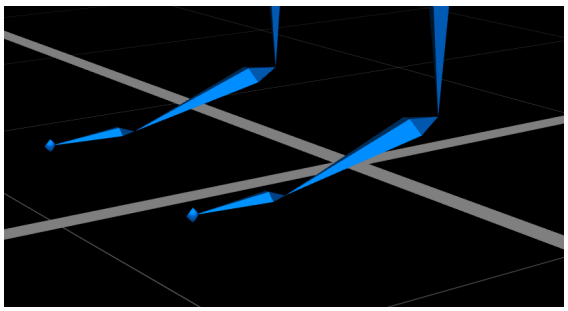
> **Note**
> VSS live calibration and traditional offline calibration in Shogun 1.7 is only compatible with 1.7 templates. VSS calibration only works with subjects that use solving skeleton templates (VSS) version 3.6 and later. These are the templates that are installed with Shogun 1.7. If you try to calibrate with a subject using an earlier version of the templates, an error message is displayed as a reminder. Labeling calibration continues to work with older versions of the labeling skeletons.
> Auto-Skeleton is compatible with both Shogun 1.6 and 1.7 VSS templates.
> You can continue to use calibrated VSS files from Shogun 1.6 or earlier for solving in Shogun Post.
> If you have scripted the importing of templates and aren't yet ready to use the new Z-up versions of the templates, modify your script to point to the older, Y-up versions. They can be found in:
> *C:\Program Files\Vicon\ShogunLive1.6\Configuration\ModelTemplates*

In addition, the foot bones have been simplified, so that the leftForeFoot and rightForeFoot bones have been removed, leaving only Foot and ToeBase.

Shogun Post 1.6 template, showing the ForeFoot bone:



Shogun Post 1.7 template, showing the simplified foot bones:



Improvements have also been made to the neck and spine, resulting in skeletons that more accurately fit the data and provide a smoother solve.

These enhancements also contribute to a better overall calibration.

Shogun Post 1.7 new features

There are no new features for Shogun Post with this release.

Improvements in Vicon Shogun 1.7

Shogun Live 1.7 improvements

These are the main improvements in this release of Shogun Live:

Improvements to subject calibration

Shogun 1.7 introduces improved Live subject calibration, enabling you to calibrate subjects in Shogun Live in real time with greater speed and accuracy.

The standard real-time subject calibration process (see Create and calibrate a subject in *Getting started with Vicon Shogun*) in Shogun 1.7 offers the following improvements:

- Support for the new skeleton templates (VST 3.6): calibration now handles more natural spine and neck animation for the solving skeletons.
  - The skeleton model has been reparameterized (waist, shoulders, spine, neck, feet).
  - Kinks in the poses have been greatly reduced, which overall gives smoother solves than in previous releases of Shogun.

  For more information, see VST 3.6 and the new skeletons on page 15.

- Lower latency during calibration: more frequent refinements during the calibration process for both the labeling skeleton and the solving skeleton, synchronous booting of the labeling and the solving skeletons.
  - Priors have less importance, which gives a better fit.
  - The Range of Motion can be short, but must be comprehensive.
  - System is less tolerant of ranges of motion that are incomplete or lack the full range of movement required.
  - Improved finger calibration.
- Skeleton booting from A-pose has been fully revised.
  - Increased robustness with non-standard marker placements (for example, for larger subjects, or thigh marker placements near the knees).
    - A number of booting issues have been fixed.
  - Higher precision and recall when classifying A-poses as valid or invalid.
    - Prevents bad poses from initializing the subject calibrator.
    - Requires the subject to stand in a valid A-pose (for example, T-poses are no longer valid).
    - The A-pose booting threshold gives flexibility if needed.
  - More effective booting of finger skeletons

This table gives further details of differences between Live subject calibration in Shogun 1.7 and previous versions.

Change	Live subject calibration in earlier versions	Live subject calibration in 1.7
Latency between booting labeling skeleton and solving skeleton	A few seconds	Immediate
Booting quality	Marker re-calibration damped by target priors. This could lead to tracking failures.	• Enhanced marker re-calibration. • Labeling and solving skeletons initially have identical scales. • Hands are initially approximately scaled. Functional calibration produces more accurate scaling later.
Solving skeleton calibration	• Most calibration parameters inherited from labeling skeleton. • Optimization more stable, but less dependent on the data.	• Fully optimized skeleton. • Optimization more dependent on the data (and therefore fits better). When the results are unstable, particularly at the start of a ROM, more data is needed for a good calibration estimate.
Labeling clusters	Attachment occurred sooner but was less reliable.	• Attachment occurs after 10 calibration frames. • The same rule applies to marker-only recalibration: the subject must not remain static.

VST 3.6 and the new skeletons

The new skeletons:

- Are tagged with 3.6 as the VST version number.

```
<!-- Generated by changeset:fbec6d77cfd5:-->
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<KinematicModel MODEL="Production" VERSION="3.6" MODEL-VERSION="30">
```

  VST 3.6 skeletons support new A-pose constraints that apply to limbs such as the neck and the spine.

- Are supported by the Auto-Skeleton feature in Shogun Post.
- Have new symmetric population statistics, for both targets and joints.

> **Tip**
> Correct population statistics are key to labeling quality. Manually changing the population statistics may result in labeling failures as well as booting failures across live subject calibration and the normal processing graph.

Custom skeletons:

- Must have the VST version number set to 3.6.
  To set the version number for an older file, see Upgrade a 3.5 subject to 3.6 on page 16.
- Should ideally be derived from one of the supplied Shogun templates.
  - We recommend that you keep the statistics intact for human skeletons. For each joint and for each target, import the following fields from new templates:
    - MEAN
    - COVARIANCE
    - RANGE-CENTRING-STATE
    - RANGE
    - TPOSE-MEAN
    - TPOSE-COVARIANCE
  - Statistics generally remain appropriate if there is no significant change in joint pre-rotations.

Legacy skeletons:

- Are supported if:
  - VST version number is set to 3.6 (see above)
  - Statistics are updated using one of the new templates
- May struggle to boot in Shogun Live if statistics are not updated.

If you need more help with A-pose booting and calibration, see Troubleshoot subject calibration in *Getting started with Vicon Shogun*.

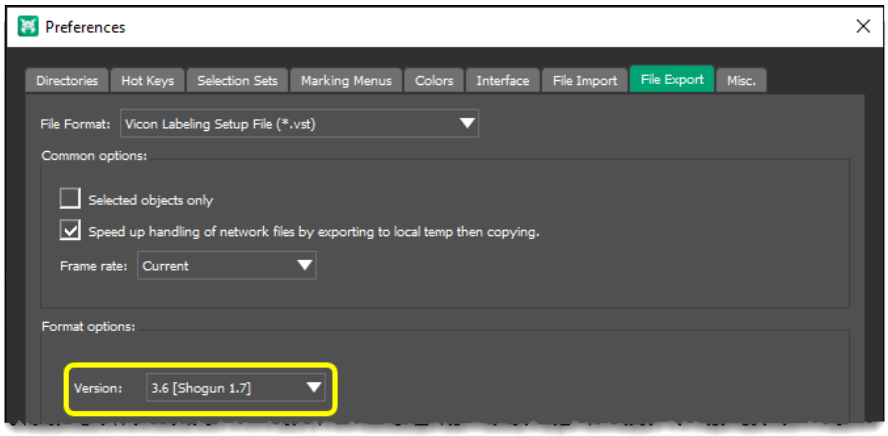
Upgrade a 3.5 subject to 3.6

To upgrade a subject that uses a custom skeleton saved in versions of Shogun earlier than 1.7, do one of the following:

- Use the Export preferences in Shogun Post:

  a. Import the VST into Shogun Post, and in the **Preferences** dialog box, click the **Export** tab and in the **File Format** field, select the required option (VST or VSK).

  b. In the **Format options** area, change the **Version** to **3.6 [Shogun 1.7]** and close the dialog box.



  c. Export the file.

or

- Use a text editor:

- In a text editor, open the VST file and change the VERSION to 3.6.

```
<!-- Generated by changeset:fbec6d77cfd5:-->
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<KinematicModel MODEL="Production" VERSION="3.6" MODEL-VERSION="30">
```

Shogun Post 1.7 improvements

This is the main improvement in this release of Shogun Post:

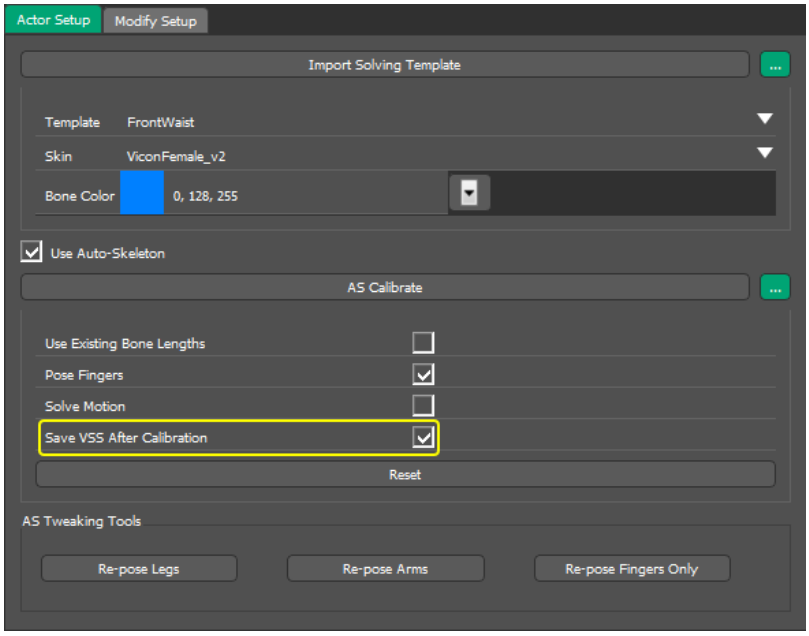
Auto-Skeleton

Auto-skeleton has been updated to work with the new, Z-up solving templates (see Labeling and solving template improvements on page 8). All VST and VSS files installed to *C:\Program Files\Vicon\ShogunPost1.7\ModelTemplates* are now Z-up skeletons.

Auto-skeleton now imports the solving template with the simplified foot bones, without the leftForeFoot and rightForeFoot bones, leaving only Foot and ToeBase. Auto-Skeleton calibrates a 1.7 template with the new foot setup.

In addition, the solving skeleton templates changes for 1.7 remove the need for the more complex constraint setup that was previously necessary. In the 1.7 the waist markers constrain only the waist, the neck and back markers constrain only Spine3, and the head markers only constrain the Head bone. The spine and neck bones are unconstrained.

An additional Auto-Skeleton option, **Save VSS after calibration**, which is selected by default, enables you to save the solving skeleton.



New tutorial videos

Since the previous release, the following educational materials have been produced:

- How do I optimize my live solve using Auto-Skeleton?[6]
- How do I get a good A-Pose to boot from?[7]
- How do I capture uncompressed mov footage?[8]
- How do I set up a Vicon-driven cine camera in Unreal Engine with lens distortion?[9]

6 https://www.youtube.com/watch?v=j1-_MGfP_zE
7 https://www.youtube.com/watch?v=IdpOqUsEISg
8 https://www.youtube.com/watch?v=-mgd15OqVHI
9 https://www.youtube.com/watch?v=rKbWF-wrURc

Known issues in Vicon Shogun

The following issues are known to exist in Vicon Shogun 1.7:

Description	Workaround
In Live, objects that have the property **Track With Object Tracker** enabled do not generate markers in the DataStream.	None at present. To be addressed.
Cluster markers are not considered in overall marker count.	None at present. To be addressed.
No feedback during subject recalibration.	None at present. To be addressed.
In Live, the viewport can hang, for example, if a video camera is unplugged.	Change the processing level and the viewport will reboot.
Eclipse data is missing after capture.	Please contact support@vicon.com[10] if you experience this issue and can reproduce it.

10 mailto:support@vicon.com

Known issues in Vicon Shogun

Description	Workaround
In Live, in systems with large numbers of cameras, a high number of dropped frames occurs.	Do one of the following: • Use Shogun's multi-machine feature (see Run Shogun processing on multiple machines in *Getting more from Vicon Shogun*). • Use the **Process in Realtime** option in Shogun Live (on the **System** tab, select the required camera(s) and in the **Capture** properties below, clear the **Process in Realtime** option). You can use this option to exclude cameras from reconstruction, while keeping them in the captured X2D and 2D workspace. **Important:** Remember that if you use this feature to exclude cameras, their data will not be present in the resulting MCP file. To include the data from excluded cameras, you must instead reprocess from the X2D file.
In Shogun Post, retargeting position constraint weights have a higher strength than rotation constraint weights.	Use lower values for retargeting position constraint weights. .01 or .001 position and 1.0 for rotation tend to work well.
In Post, the retargeting doesn't converge or fit well at the start.	Make sure you have set the map pose which copies rotation values to pre-rotations so that the target and source skeleton axes align as closely as possible. Otherwise pad the start of your takes by a couple of seconds.
In Post, occlusion fixing across a range is disabled.	Occlusion fixing must only be run once on the whole take. If occlusion fixing was turned on during capture in Shogun Live (the default setting) and there are issues with your data, Vicon recommends that you restore the data to its non occlusion-fixed state using the **Restore** feature in the **Marker Editing** panel. Then fix any marker issues like swaps or mislabels before re-running occlusion fixing on the whole take by selecting the required option in the **Processing** panel. For information on fixing marker issues, see the Vicon videos: 5 - Shogun Post – Labeling Data[11] and 6 - Shogun Post - Marker Editing[12].

11 https://vimeo.com/218945101
12 https://vimeo.com/218945104

Known issues in Vicon Shogun

Description	Workaround
In Live and Post, there are no Graphics compatibility mode shortcuts on the Windows Start menu.	You can run Shogun in graphics compatibility mode by using the appropriate command line flag: `--force-gles` (You may want to use graphics compatibility mode if the machine on which you need to run Shogun does not have a dedicated GPU.)

Addressed issues in Vicon Shogun 1.7

Vicon Shogun 1.7 resolves a number of issues, including the selection listed here.

Issues addressed in Shogun Live 1.7

- You can now capture to long capture paths (over 260 characters).
- You can no longer select the **Resynchronize** option during capture, or in any other modes, such as calibration and review, where system properties are not enabled.
- When you exit Shogun Live, any GPO programs that are running are now stopped. In addition, GPO settings are now retained when you exit and restart Shogun Live.
- The left foot is now correctly labeled during live subject calibration.
- If you try to calibrate cameras when **Use timecode** is not selected for one or more video cameras or if no timecode is present, you are now alerted by a warning at the top of the **Calbration** panel.
- Shogun Live no longer stops responding when you try to capture to an invalid video capture folder and/or 6-bit grayscale is produced from Vicon video cameras.
- To avoid accidentally rebooting all devices, if you select the **Reboot** > **System** option in the **System** panel, you are now asked to confirm your choice before you can proceed. In addition, to avoid accidental rebooting, the Reboot options are now unavailable during calibration and capture.
- You can no longer click **Start Wave (Selected)** if you have selected all the contributing cameras.
- When running live subject calibration, heavier subjects are now successfully labeled.
- When using Blackmagic drivers 12.#.# and later, Shogun Live now produces video as expected, without sync sessions constantly being created.
- As changing the Environmental Drift Tolerance does not affect objects that are tracked by the object tracker, a new setting, **Reprojection Threshold**, is now available for these objects.

Issues addressed in Shogun Post 1.7

- In the **Cameras** view, static meshes no longer display as 3D overlays when the **3D** option is cleared in **View Filters**.
- Shogun Post does not now create a backup clip when importing calibration MCP files, regardless of whether an *.x2d* file exists.
- AutoSkeleton now has option to save the VSS (available both on the **Actor Setup** tab as **Save VSS After Calibration** and as the `-saveVSS` option of the autoSetupSolvingSkeletonOptions command).
- In the Marker Editing panel, in the Restore section, the **Create Backup** button now behaves as expected, ie, it is inactive when there is no clip available, but is active when a file is open and you can create a clip. When a clip already exists, the button is active, but when you click it, you are prompted to decide whether you want to override the existing clip.
- Python 3 GetSelectedRanges now works correctly with Shogun Post.
- Retargeting skin base and highlight color and opacity attributes are now hidden in Post as they are not needed for retargeting.
- You can now update reconstruction settings using the Python SDK.
- When the Other_Part attribute is set, the attribute value is now saved when Shogun exports to VSS and VSR files and is correctly displayed when a VSS or VSR is imported.

Further resources for Vicon Shogun

You can access further help on using Vicon Shogun from the following resources.

- Vicon Shogun videos on page 28
- Contact Vicon on page 30

Vicon Shogun videos

New videos for Shogun 1.7

- What's new in Shogun 1.7[13] on YouTube

Tutorial videos:

- How do I optimize my live solve using Auto-Skeleton?[14]
- How do I get a good A-Pose to boot from?[15]
- How do I capture uncompressed mov footage?[16]
- How do I set up a Vicon-driven cine camera in Unreal Engine with lens distortion?[17]

13 https://www.youtube.com/watch?v=e_noQ8Ep-mQ
14 https://www.youtube.com/watch?v=j1-_MGfP_zE
15 https://www.youtube.com/watch?v=IdpOqUsEISg
16 https://www.youtube.com/watch?v=-mgd15OqVHI
17 https://www.youtube.com/watch?v=rKbWF-wrURc

Videos from previous versions of Shogun

> **Note**
> As the videos were recorded using earlier versions of Shogun, although much of the content is still relevant, you may notice minor differences in the user interface.

Watch videos that walk you through all aspects of using Shogun:

- Vicon Shogun 1.3 Live Tutorials[18] on YouTube (playlist)
- Vicon Shogun 1.3 Post Tutorials[19] on YouTube (playlist)

- Vicon Shogun playlist on YouTube[20] (all Shogun videos)
- Vicon Shogun Live tutorials playlist on YouTube[21] (Shogun Live tutorial videos only)
- Vicon Shogun Post tutorials playlist on YouTube[22] (Shogun Post tutorial videos only)
- Vicon Shogun channel on Vimeo[23], beginning with 1 - Shogun Live - Introduction[24]

18 https://www.youtube.com/playlist?list=PLxtdgDam3USU1O76ZYN-wJ7iKPrTbeNFM
19 https://www.youtube.com/playlist?list=PLxtdgDam3USXX3qGWqbxeONpjj91SUHhI
20 https://www.youtube.com/playlist?list=PLxtdgDam3USVknig2N6QU1ARXR22LXJfJ
21 https://www.youtube.com/playlist?list=PLxtdgDam3USXIGzl52wuo84syXxBFNtuZ
22 https://www.youtube.com/playlist?list=PLxtdgDam3USX4-COtDQtRXzSy8xVtj5-I
23 https://vimeo.com/channels/1249217
24 https://vimeo.com/218944959

Further resources for Vicon Shogun

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Vicon trademarks[28]

25 mailto:support@vicon.com
26 mailto:support@vicon.com
27 mailto:support@vicon.com
28 https://www.vicon.com/trademarks/