Fujifilm develops the new "Pixel Shift Multi-Shot" function to capture and generate the world's highest resolution[*1] of 400MP images with accurate color reproduction

-Applying the FUJIFILM GFX100 mirrorless digital camera for digital archiving of cultural assets

-Providing firmware and software that enable the use of this function from today

TOKYO, November 25, 2020 − FUJIFILM Corporation (President: Kenji Sukeno) is pleased to announce the development of a new function "Pixel Shift Multi-Shot" for the FUJIFILM GFX100 (GFX100), a mirrorless digital camera that features a Large Format sensor[*2]. The Pixel Shift Multi-Shot function can capture and generate 400MP images, the highest resolution in the world, with advanced color reproduction accurate to real tones, making it ideal for digitally archiving artworks, architectures and other cultural assets.

Today, Fujifilm has also released a free firmware upgrade (Ver.3.00) for the GFX100 and free software "FUJIFILM Pixel Shift Combiner" (Pixel Shift Combiner) to enable the use of the Pixel Shift Multi-Shot function.

Preserving artworks, architectures and other invaluable cultural assets in their present state and beauty without degradation is an important task for future generations. One of the solutions currently being used is digital archiving, recording and saving cultural assets in the form of digital information.

In June 2019, Fujifilm launched the GFX100, equipped with a 102MP Large Format sensor, the "X-Processor 4" high-speed image processing engine and a high-precision in-body image stabilization (IBIS) mechanism. It has been embraced by professional photographers and enthusiasts alike. Fujifilm has developed the Pixel Shift Multi-Shot function to broaden GFX100's scope of applications to cover digital archiving as well as general photography.

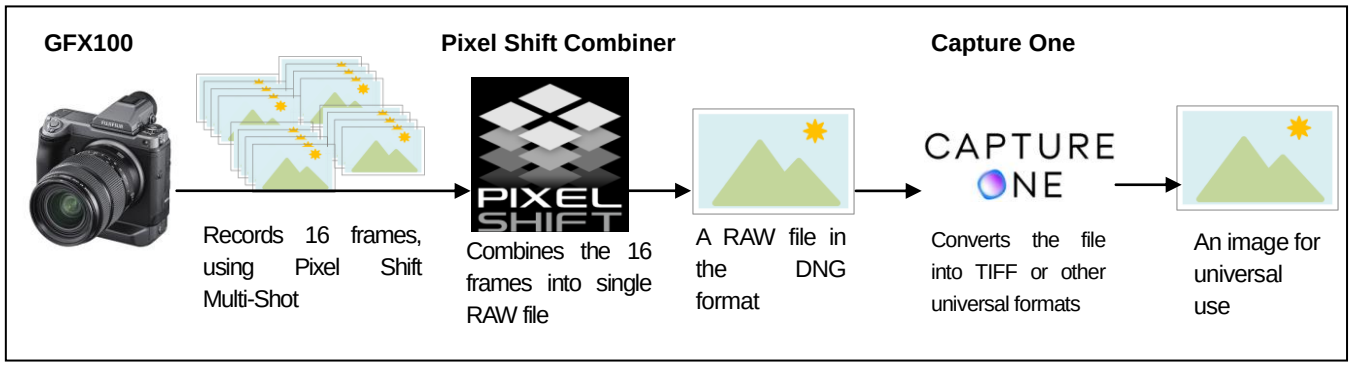
The Pixel Shift Multi-Shot function automatically records 16 frames with a single shutter release, shifting GFX100's image sensor at ultra-high precision at each frame. The GFX100's IBIS mechanism is used to precisely control the movements of the image sensor. Then, the Pixel Shift Multi-Shot function produces single 400MP image, the world's highest image resolution, from these frames using new dedicated software "Pixel Shift Combiner."

Generally, an image sensor records only red (R), green (G) or blue (B) information with each of its pixels. Information about the other two colors is estimated and complemented based on information from surrounding pixels. The Pixel Shift Multi-Shot function automatically takes images while shifting the camera's image sensor to record information about all three colors for each of its pixels, thereby allowing accurate color reproduction and delivering an advanced level of image resolution to capture the finest details.

Pixel Shift Combiner is used to process captured data into a single RAW file[*3] in the Digital Negative (DNG)[*4] format. These RAW files can be processed in the "Capture One[*5]" photo editing software to create images in TIFF[*6] and other universal formats.

The Pixel Shift Multi-Shot function is ideal for digital archiving, as it can photograph colors, textures and other fine details of a wide variety of items including precious cultural assets to present them accurately, even the atmosphere they exude.

[Digital archiving workflow using “Pixel Shift Multi-Shot”]



With the introduction of the Pixel Shift Multi-Shot function, Fujifilm will explore latent digital archiving demand to contribute to the preservation of cultural assets into the future.

*1 For commercially available mirrorless digital cameras as of November 25, 2020, according to Fujifilm.
*2 Image sensor that measures about 55 mm diagonally (43.8 mm x 32.9 mm) and is approx. 1.7 times larger than a 35 mm full-frame format.
*3 One of the formats used by images taken by digital cameras, indicating unprocessed data.
*4 Image file format developed by Adobe Inc. Adobe is a registered trademark or trademark of Adobe Systems Incorporated in the United States and/or other countries.
*5 Capture One and the Capture One logo are registered trademarks or trademarks of Capture One A/S in EU and /or other countries.
*6 One of the recording formats for still images.

1. Main features of the new function “Pixel Shift Multi-Shot”:

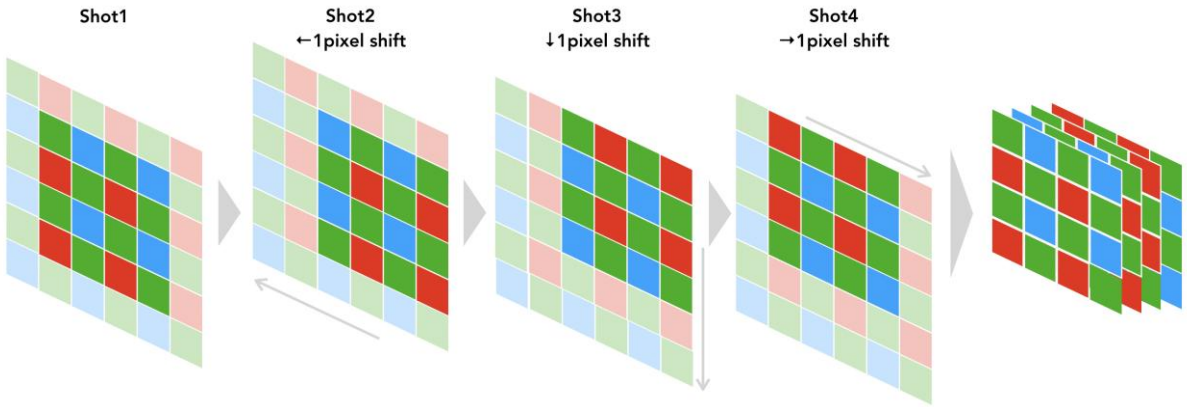
・ The function uses GFX100’s IBIS mechanism to automatically records 16 frames with single shutter release while shifting GFX100’s image sensor at ultra-high precision at each frame. Then, the Pixel Shift Multi-Shot produces single 400MP image, the world’s highest image resolution, from these frames with faithfully reproduced colors using the dedicated software “Pixel Shift Combiner.”

[Principle of “Pixel Shift Multi-Shot” (shifting of the image sensor)]

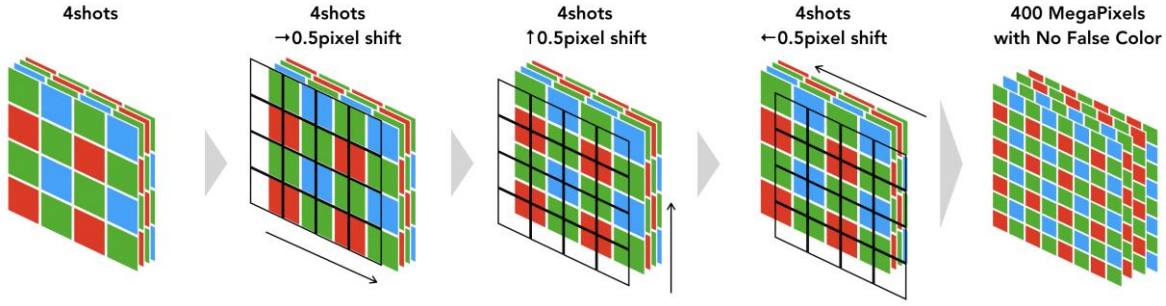
“Pixel Shift Multi-Shot” is achieved by the consecutive 16 frame shooting consisted of the following two processes.

① <u>The process of recording the accurate RGB information</u>

In order to record the accurate RGB pixel information with all pixels, the function shifts its image sensor by the size of one pixel to automatically shoot four frames to each pixel area.



② <u>The process of quadrupling pixels virtually</u>
The function shifts the image sensor by the size of 0.5 pixel to repeat the process described in ① four times to quadruple pixels, achieving 4x resolution.



・ The dedicated software “Pixel Shift Combiner” is used to combine the frames into single RAW file in the DNG format. These RAW files can be processed in the “Capture One” photo editing software to create images in TIFF and other universal formats, making it possible to generate 400MP images in a familiar workflow.

2. Release date: November 25, 2020

3. Distribution:
GFX100’s firmware upgrade (Ver.3.00) and dedicated software “Pixel Shift Combiner,” which facilitate the use of Pixel Shift Multi-Shot, can be obtained as free downloads from the following pages:

GFX100 firmware (Ver.3.00)
https://fujifilm-x.com/global/support/download/firmware/cameras/gfx100/

Dedicated software “Pixel Shift Combiner”
https://fujifilm-x.com/global/support/download/software/pixel-shift-combiner/

[Example of a digitally-archived image produced with the “Pixel Shift Multi-Shot”]
Nishi Hongwanji / Shiroshoin (National Treasure)

* Unauthorized copying, duplication and reproduction of the image are strictly prohibited.
* The original file is 400MP, but a compressed image is shown due to data capacity limit.

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