

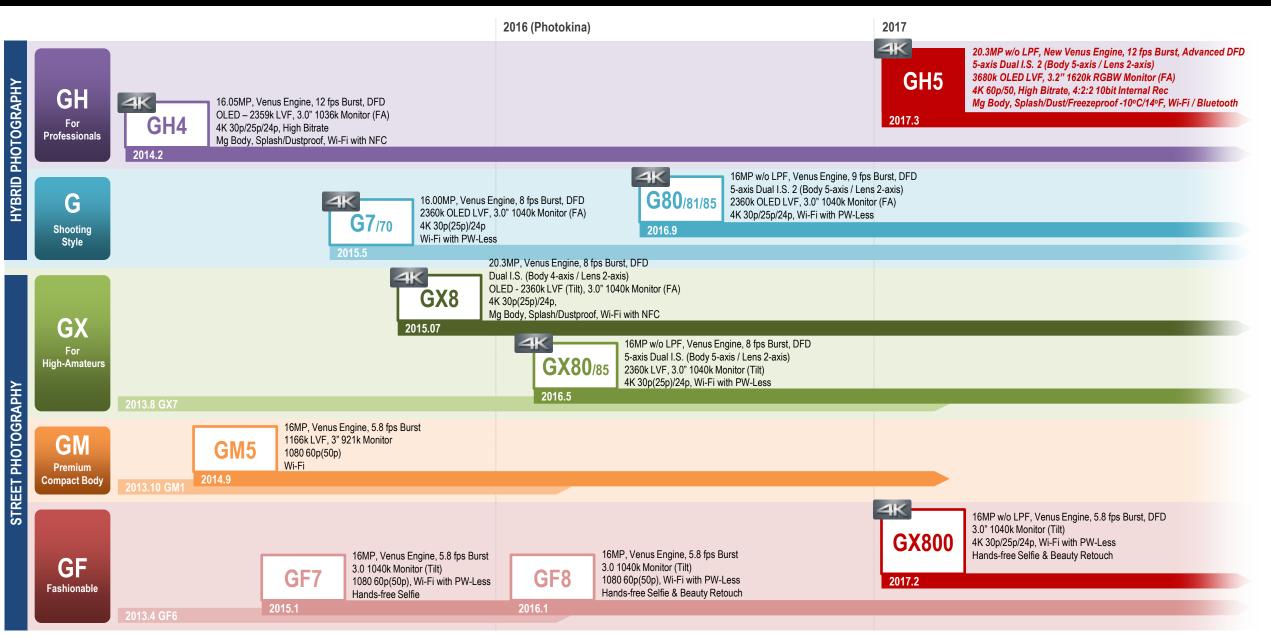
# LUMIX GH5

EMBARGO: 6:45PM (UTC/GMT), 4TH JAN, 2017



## 2017 LUMIX G Road Map

Confidential / Internal Use Only / Embargo: 6:45pm (UTC/GMT), 4th Jan, 2017





## **GH5** Target Users

# High-end, Hybrid, High-performance

## **Photo Enthusiast**

The highest-ever picture quality in LUMIX and high mobility that is advantages of Micro Four Thirds.

- Specializing in FIELD PHOTOGRAPHERS with its compact size & lightweight body.
- Dominating the field of <u>NATURE and DOCUMENTARIES</u> by enhancing mobility and overcoming image quality.
- Attracting <u>HYBRID PHOTOGRAPHERS</u> who want to expand their business with video in addition to still pictures by improving their cinema / video shooting skills.

# **Pro Videographers**

Professional video recording performance to lead DSLR/DSLM video camera market

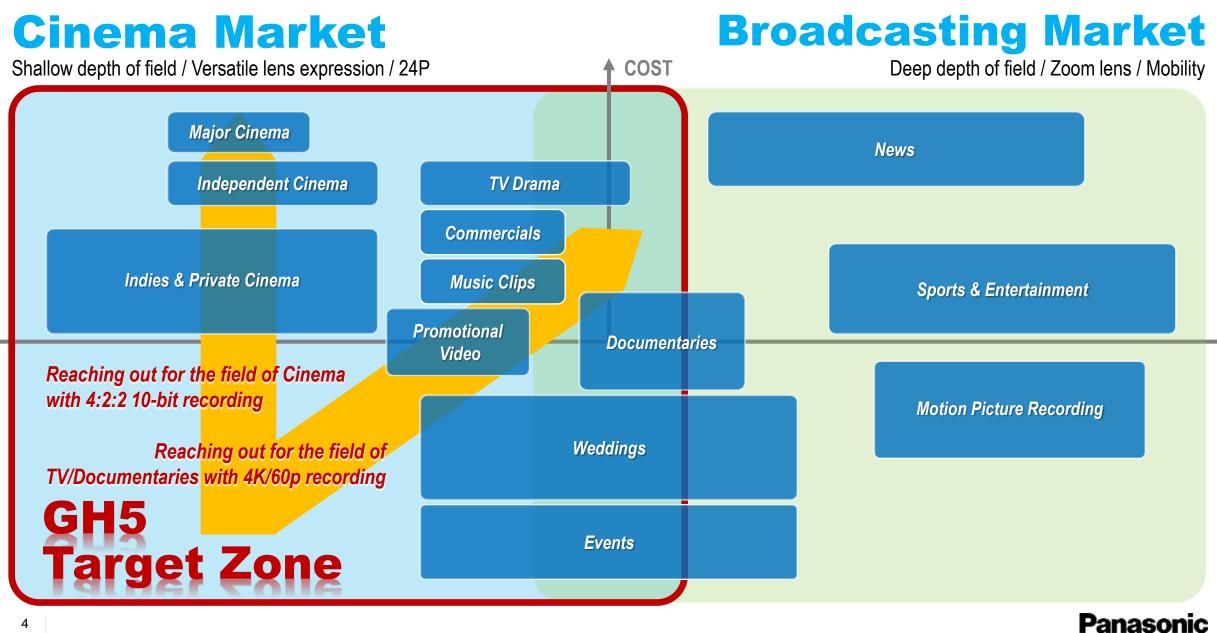
#### For <u>CINEMA or FILM CREATORS</u> with its large sensor, interchangeable lenses and 4K.

- For the field of <u>EVENT, WEDDINGS and YOUTUBERS</u> by enhancing mobility.
- Dominating the field of <u>NATURE and DOCUMENTARIES</u> by 4K 60p/50p high-quality video recording.

### Lumix G

## GH5 Target User (Video)

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## LUMIX GH5

## The Highest-Ever Picture Quality and Professional 4K Video Shooting Performance PHOTOS. VIDEOS. Explore New Frontiers.

3

5



New 20.3MP Sensor w/o LPF / NEW Venus Engine / 5-axis Dual I.S. 2 The Highest-Ever Picture Quality in LUMIX

2 4K60p / 4:2:2 10bit 4K30p / No Cropping / Unlimited Recording Time Pro Shooting Performance for Video Production

0.05 sec AF with Advanced DFD / 6K PHOTO 30fps / 4K PHOTO 60fps

Intuitive Response to Photographer's Intention

Splash/Dust/Freezeproof / Mag Alloy Body / 200k Shutter Life / Double SD Slot High Reliability and Durability for Professionals

Bluetooth / Wi-Fi 5GHz / HDMI Type A / USB 3.1 / XLR Mic Adaptor (Optional) System Expandability for Professionals \* 5GHz Wi-Fi is not available in some countries.

Body
 L Kit: 12-60mm/F2.8-4.0 (H-ES12060)
 A Kit: 12-35mm/F2.8 (H-HSA12035)
 M Kit: 12-60mm/F3.5-5.6 (H-FS12060)

AFS 12 fps / AFC 9 fps Burst Shooting 3,680k-dot 0.76x OLED LVF 3.2" 1,620k-dot Free-angle Monitor

Battery Grip (Optional)

### Panasonic

LUMIXG

## LUMIX GH5 Improvement

		GH5	GH4		
Sensor		New Digital Live MOS 20.3MP w/o LPF	Digital Live MOS 16.05MP		
ISO sensitivity		ISO200-25600, Extended ISO100	ISO200-25600, Extended ISO100		
View finder		3,680k-dot OLED, 21mm, 0.76x	2,360k-dot OLED, 21mm, 0.67x		
Rear monitor		3.2" 3:2 1,620k-dot RGBW LCD, Free-angle, Static touch	3.0" 3:2 1,040k-dot OLED, Free-angle, Static touch		
AF		Advanced DFD, Approx. 0.05sec	DFD, Approx. 0.07sec		
Chutter	Shutter speed	1/8,000-60, Electronic first curtain shutter (1/2,000 -60), Bulb 30min, X=1/250	1/8,000-60, Bulb 60min, X=1/250		
Shutter	Shutter life	200,000 times	200,000 times		
Built-in flash		- (External flash burst function is added)	GN12 (ISO100), 24mm		
Durat aboating		AFS 12fps, AFC 9fps	AFS 12fps, AFC 7fps		
Burst shooting		JPEG: Approx. 600 images, RAW: Approx. 60 images	JPEG: Approx. 100 images, RAW: Approx. 40 images		
Body image stab	vilizer	5-axis / 5 stops			
6K PHOTO / 4K		6K PHOTO: 18MP 30fps (HEVC recording)	-		
ON PHUIU/4N	PHUIU	4K PHOTO: 8MP 60fps (H.264 recording)	4K PHOTO: 8MP 30fps		
Toughness		Mg alloy body, Splash/Dust/Freezeproof -10°C/14°F	Mg alloy body, Splash/Dustproof		
	Format	MOV, AVCHD Progressive, MP4	MOV, AVCHD Progressive, MP4		
		4K60/50p (4:2:0 8bit)	-		
	Recording rate	4K30/25p/24p (4:2:2 10bit)	4K30/25p/24p (4:2:0 8bit)		
Video		No cropping	Cropping		
Video	VED (Variable Frame Data)	4K: Max. 60fps	-		
	VFR (Variable Frame Rate)	FHD: Max. 180fps	FHD: Max. 96fps		
	Manitan autout	4:2:2 10bit output & internal recording (4K60p/50p is output only)	4:2:2 10bit (no internal recording)		
	Monitor output	4:2:2 8bit output & internal recording	4:2:2 8bit output & internal recording		
SD card slot		2, UHS-II U3	1, UHS-I U3		
Wi-Fi / Bluetooth / NFC		802.11a/n/ac (5GHz) / Bluetooth4.2 (Low Energy) / -	802.11h/a/a (2.4CH=) / / Vac		
		* 5GHz Wi-Fi is not available in some countries.	802.11b/g/n (2.4GHz) / - / Yes		
Dimensions (W x H x D)		138.5 x 98.1 x 87.4 mm (excluding protrusions)	132.9 x 93.4 x 83.9mm (excluding protrusions)		
Weight		Approx. 725g (SD card, battery, body)	Approx. 560g (SD card, battery, body)		
A		Battery grip (BGGH5)	Battery grip (BGGH3)		
Accessory		Gun mic (MS2), XLR mic adaptor (XLR1)	Gun mic (MS2), Interface unit (YAGH)		



# **The Highest-Ever Picture Quality in LUMIX**

## Digital Live MOS Sensor



New Digital Live MOS Sensor achieves high-quality, high-sensitivity image recording with quick response.

### <u> 20.3MP w/o LPF - Higher Resolution</u>

- Pixel count increased 25% (GH4 16.05 MP  $\rightarrow$  GH5 20.3MP)
- Maximized the resolving power of the lens by Removing the LPF

### **<u>1.66 Times Faster Readout Speed (vs GH4)</u>**

- Still picture: GH4 approx. 40ms  $\rightarrow$  GH5 approx. 24ms
- 4K video: GH4 approx. 22ms  $\rightarrow$  GH5 approx. 15ms
- Fast continuous shooting
- No Cropping 4K 60p/50p video
- Suppressed Rolling Shutter Distortion when using an electronic shutter or while video recording.



Venus Engine improvements achieve "Natural Texture Expression."

### **Improved Resolution**

Multipixel Luminance Generation & Intelligent Detail Processing realize natural, high-resolution expression and improve color moiré suppression.

### **Rich Color Expression**

Three-dimensional Color Control improves color reproduction of bright and shadow areas.

### Natural and True-to-life Image

Natural image from low to high sensitivity.

### **1.3 Times Faster Processing (VS GH4)**

1.3 times faster processing by 5 Core Codecs realizes no cropping 4K 60p/50p video and 30fps 6K PHOTO (HEVC / H.265).



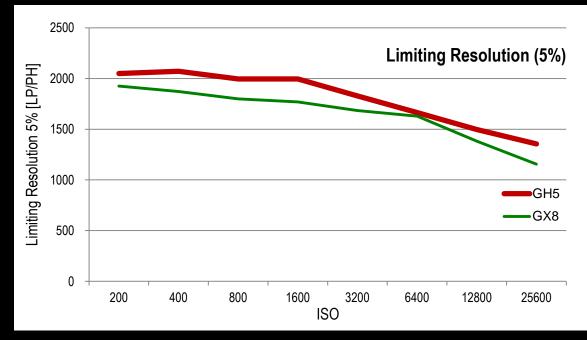
### New Sensor

NEW

## 20.3MP Digital Live MOS Sensor w/o Low Pass Filter

**Approx. 5% Improvement in Limiting Resolution** 





Removing the LPF improves limiting resolution by approx. 5% compare to the GX8 while minimizing moiré by the high performance Venus Engine.

Crisp, Clear, Impressive Images with High-Resolution, True-to-Life Details



New Venus Engine

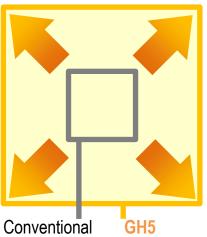
## **High Resolution with Natural Texture**

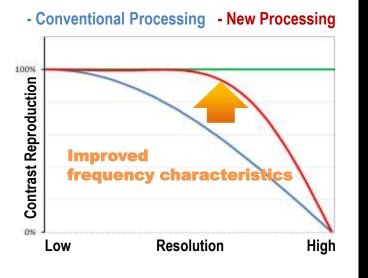
Multipixel Luminance Generation & Intelligent Detail Processing & New Sensor with No Low Pass Filter

### **Multipixel Luminance Generation**

Reference of a 9 times wider range of pixel information improves frequency characteristics compared to conventional demosaic processing.

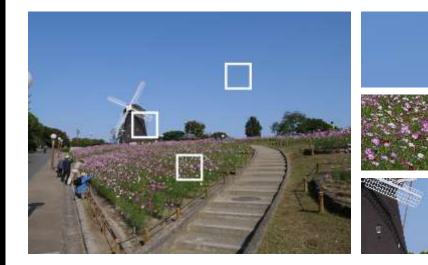
### 9 Times Area





### **Intelligent Detail Processing**

This separates the subject into flat, detailed, or edged areas by analyzing the characteristics of the subject for each pixel to control the edge emphasis.



Flat Area No emphasis

**Detailed Area** Edge emphasis

Edge Area Supressing unnatural edges

It Reproduces Subjects in Detail to Achieve Higher Resolution

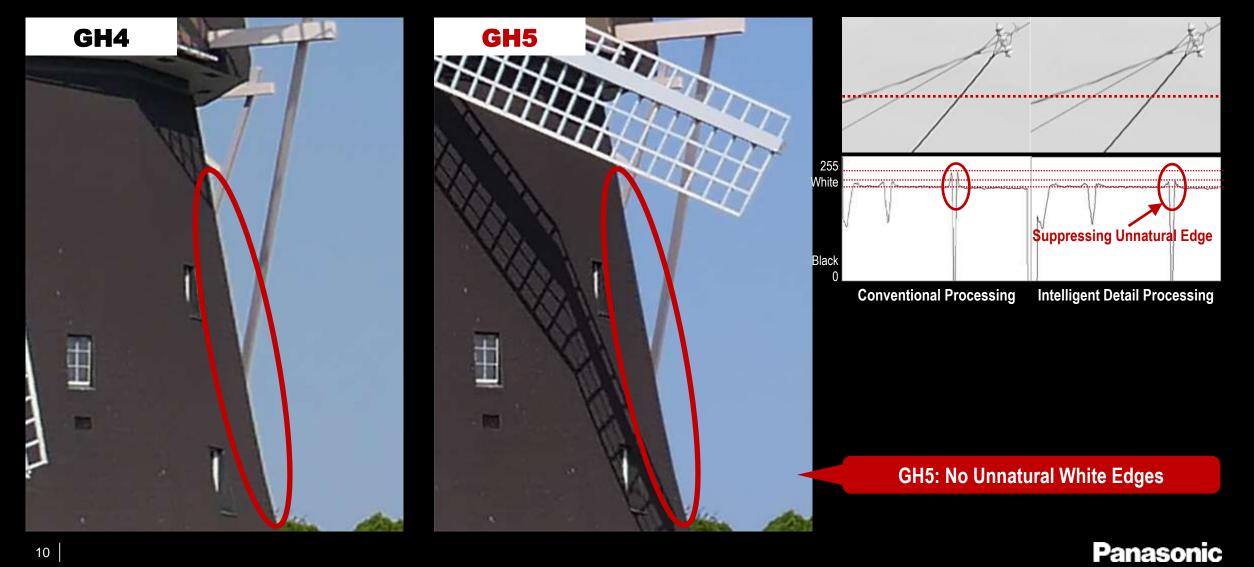
**Details Are Emphasized While Suppressing Unnatural Edges** 



**Picture Quality Evolution** 

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## Natural, High Resolution without Unnatural Edges



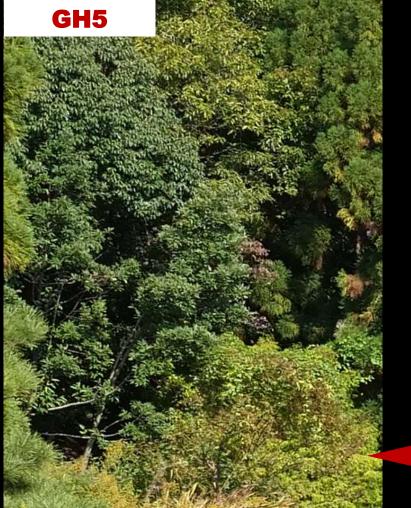


**Picture Quality Evolution** 

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## Natural, High Resolution in Details







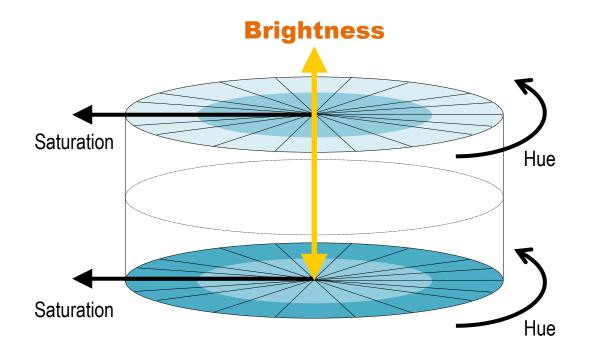
**GH5: Individual Leaves are Clear** 



New Venus Engine

## New Three-dimensional Color Control - Rich Color Expression

The bright parts and the dark parts are separately reproduced by adopting color control according to brightness.





Skin color is extracted from the approximate color, and reproduced with faithful, smooth gradation.

## **Rich Color Expression from Dark Parts to Bright Parts**



**Picture Quality Evolution** 

## New Three-dimensional Color Control - Rich Color Expression

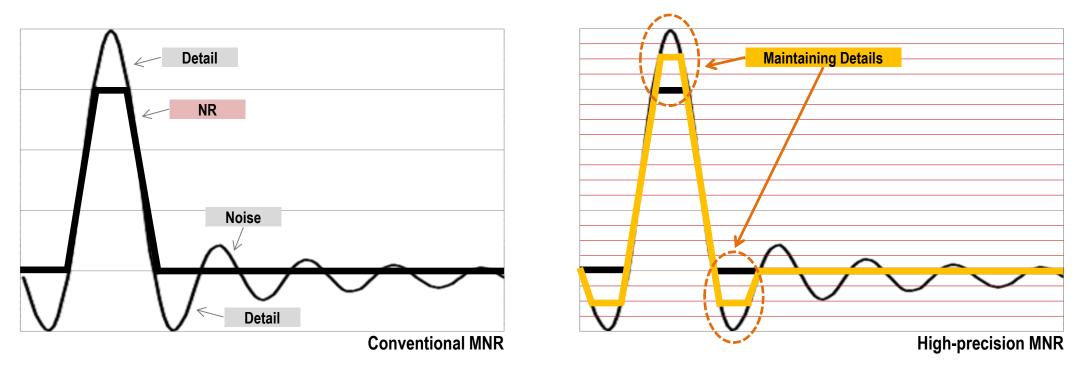




New Venus Engine

## High-precision Multi Process NR - Natural, Stereoscopic Effects

Noise identification with four times higher resolution improves noise suppression maintains details.



**Maintains Details When Suppressing Noise** 





**Picture Quality Evolution** 

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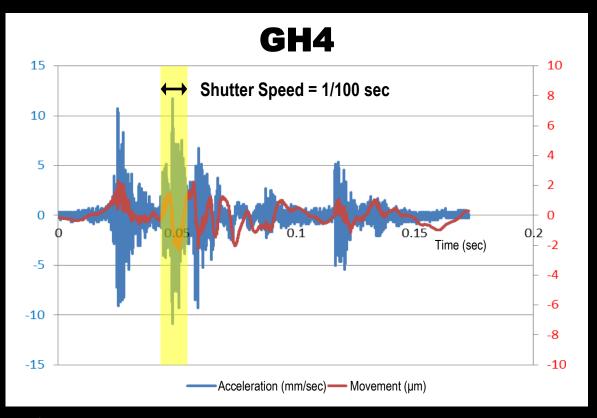
## Natural, Stereoscopic Effects Even at High ISO Settings

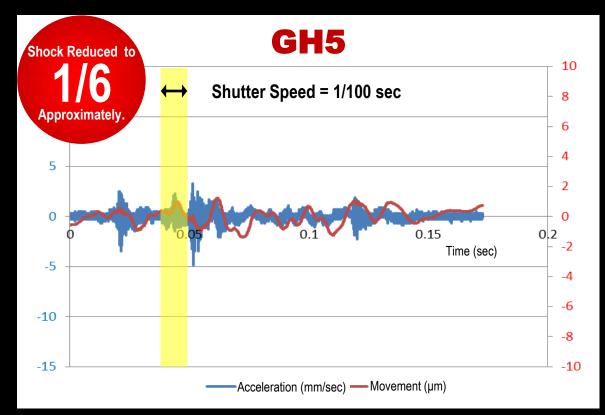


### Shutter Unit

## High-performance Shutter Unit – 200k Releases & Shock Reduction Down to 1/6

- Durable shutter unit withstands approximately 200,000 releases.
- The LUMIX GH5 uses the spring drive system in the same way as the GH4, but a floating construction for the shutter frame greatly reduces shock to the camera body.





Approximately.

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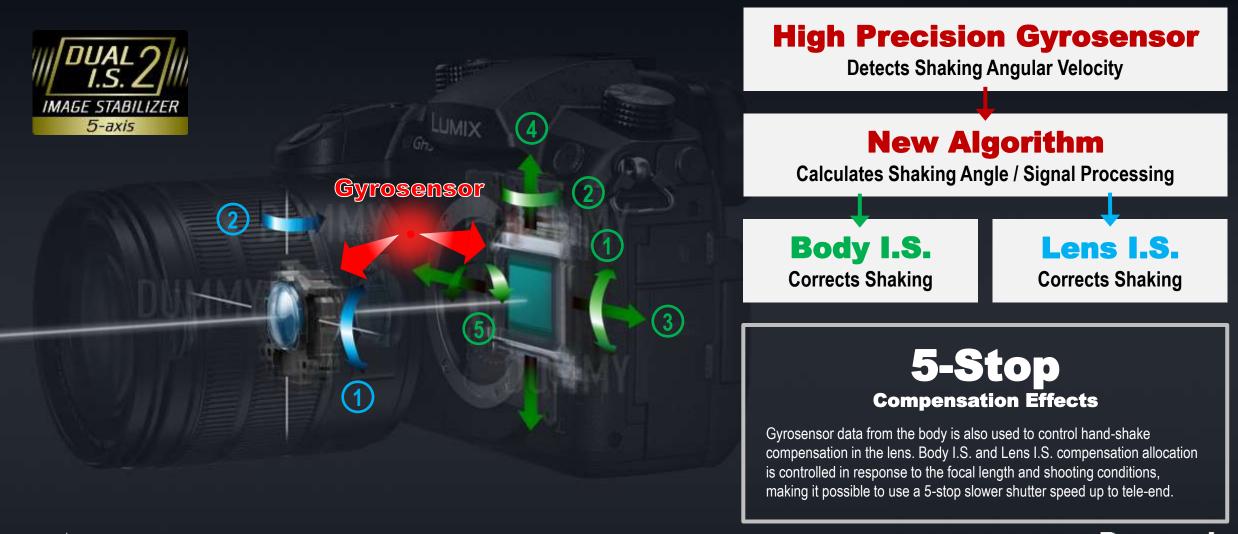


# No More Blurred Images



5-axis Dual I.S. 2

# 5-stop Correction Power Up to Tele-end\*

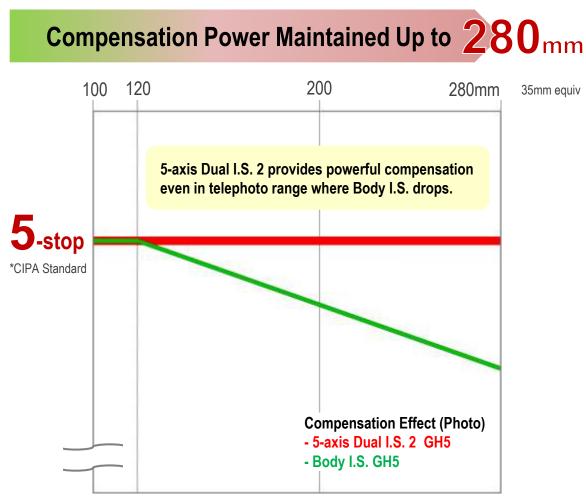


### LumixG

## Benefits

## Blur-free Shots Even at 5-stop Slower Shutter Speed Up to 280mm

NEW



\* In combination with a 5-axis Dual I.S. 2 compatible lens.



### Evolution

Panasonic

# 5-aix Dual I.S. 2 Compatible Lens : Max. 5-stop Correction Power from Wide to Tele Other Lenses incl. Classic Lens : Max. 5-stop Correction Power by Body I.S.

				LUMIX	K Lens		Classic Lens				
			A	Axis		Compensation Effects		xis	Compensation Effects		
			Still Video Wide <sup>*1</sup> Tele <sup>*2</sup>		Still	Video	Wide~*1	<b>Tele~</b> <sup>∗2</sup>			
CHE	5-axis	Body	5-axis	5-axis <sup>*3</sup>		<b>5</b> -stop	<b>3</b> -axis	5-axis <sup>*3</sup>	<b>5</b> -stop	-	
GH5	Dual I.S. 2	Lens	2-axis	<b>2</b> -axis	5-stop		-	-			
GH4	Lens I.S.		<b>2</b> -axis	<b>2</b> -axis	-	-	-	-	-	-	

\* 100mm (35mm camera equivalent). \*2 ~280mm (35mm camera equivalent). \*3 Hybrid 5-axis compensation (Optical+Electric).



## Compatible Lenses

		5-axis Dual I.S. 2	5-axis Dual I.S.	Body I.S.
	LUMIX G VARIO 12-60mm / F3.5-5.6 ASPH. / POWER O.I.S.	<ul> <li>Firmware Update</li> </ul>		
Kit Lens	LEICA DG VARIO-ELMARIT 12-60mm / F2.8-4.0 ASPH. / POWER O.I.S. New			
	WIX G VARIO 12-60mm / F3.5-5.6 ASPH. / POWER O.I.S.       ✓ Firmw         CA DG VARIO-ELMARIT 12-60mm / F2.8-4.0 ASPH. / POWER O.I.S. New          WIX G X VARIO 12-35mm / F2.8 ASPH. II / POWER O.I.S. New          WIX G X VARIO 35-100mm / F2.8 II / POWER O.I.S. New          WIX G VARIO 45-200mm / F4.0-5.6 II / POWER O.I.S. New          WIX G VARIO 100-300mm / F4.0-5.6 II / POWER O.I.S. New          WIX G VARIO 14-140mm / F3.5-5.6 ASPH. / POWER O.I.S. New          WIX G VARIO 14-140mm / F3.5-5.6 ASPH. / POWER O.I.S. New          WIX G VARIO 14-140mm / F3.5-5.6 ASPH. / POWER O.I.S.          VIX G VARIO 12-35mm / F2.8 ASPH. / POWER O.I.S.          WIX G X VARIO 12-35mm / F2.8 ASPH. / POWER O.I.S.          WIX G VARIO 12-35mm / F2.8 ASPH. / POWER O.I.S.          WIX G VARIO 12-35mm / F2.8 ASPH. / POWER O.I.S.          WIX G VARIO 12-32mm / F3.5-5.6 ASPH. / MEGA O.I.S.          WIX G VARIO 35-100mm / F4.0-5.6 ASPH. / MEGA O.I.S.          WIX G VARIO 35-100mm / F4.0-5.6 ASPH. / MEGA O.I.S.          WIX G VARIO 45-150mm / F4.0-5.6 ASPH. / MEGA O.I.S.          WIX G MACRO 30mm / F2.8 ASPH. / MEGA O.I.S.          WIX G MACRO 30mm / F2.8 ASPH. / MEGA O.I.S.          WIX G MACRO 30mm / F2.8 ASPH. / MEGA O.I.S.			
	LUMIX G X VARIO 35-100mm / F2.8 II / POWER O.I.S. New			
	LUMIX G VARIO 45-200mm / F4.0-5.6 II / POWER O.I.S. New			
	LUMIX G VARIO 100-300mm / F4.0-5.6 II / POWER O.I.S. New			
LUMIX G Lens	LUMIX G VARIO 14-140mm / F3.5-5.6 ASPH. / POWER O.I.S.	✓ Firmware Update	✓ Firmware Update	
	LEICA DG VARIO-ELMAR 100-400mm / F4.0-6.3 ASPH. / POWER O.I.S.	Firmware Update in Feb 2017		
	LUMIX G X VARIO 12-35mm / F2.8 ASPH. / POWER O.I.S.	Firmware Update in 2017	<ul> <li>Firmware Update</li> </ul>	
	LUMIX G VARIO 14-42mm / F3.5-5.6 II ASPH. / MEGA O.I.S.	Firmware Update in 2017	✓ Firmware Update	
	LUMIX G X VARIO 35-100mm / F2.8 / POWER O.I.S.	Firmware Update in 2017	<ul> <li>Firmware Update</li> </ul>	
	LUMIX G VARIO 12-32mm / F3.5-5.6 ASPH. / MEGA O.I.S.	Firmware Update in 2017	<ul> <li>Firmware Update</li> </ul>	
	LUMIX G VARIO 35-100mm / F4.0-5.6 ASPH. / MEGA O.I.S.	Firmware Update in 2017	<ul> <li>Firmware Update</li> </ul>	
	LUMIX G VARIO 45-150mm / F4.0-5.6 ASPH. / MEGA O.I.S.	Firmware Update in 2017	<ul> <li>Firmware Update</li> </ul>	
	LUMIX G MACRO 30mm / F2.8 ASPH. / MEGA O.I.S.	Firmware Update in 2017	✓ Firmware Update	
	LEICA DG NOCTICRON 42.5mm / F1.2 ASPH. / POWER O.I.S.	Firmware Update in 2017	✓ Firmware Update	
	LUMIX G 42.5mm / F1.7 ASPH. / POWER O.I.S.	Firmware Update in 2017	✓ Firmware Update	
	LEICA DG MACRO-ELMARIT 45 mm / F2.8 ASPH. / MEGA O.I.S.	Firmware Update in 2017	✓ Firmware Update	
	Other Lenses			V
Other Brar	nd Lens			<ul> <li>✓</li> </ul>

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# **Pro Video Shooting Performance**

Evolution - 1

## **Pro Shooting Performance for Video Production**



### **Smooth, High-resolution**





### **Rich Color Profiling**

4,096 x 2,160	<b>24.00p</b> etc.	150Mbps	4·2·2 10bit
3,840 x 2,160	<b>29.97p</b> etc.		LongGOP
1,920 x 1,080	<b>59.94p</b> etc.	100Mbps*	MP4/MOV

\* Firmware update in April 2017.



### **High Affinity for Non-linear Editing**

4,096 x 2,160	24.00p	400Mbpc**	4:2:2 10bit	
3,840 x 2,160	<b>29.97p</b> etc.	400101005	All-Intra	
1,920 x 1,080	<b>59.94p</b> etc.	200Mbps**	MP4/MOV	

\*\* *Firmware update in second half of 2017.* Ready for 400Mbps recording by Video-grade class 60 SD Card.





## **Pro Shooting Performance for Video Production**

## **Global Use**

System Frequency (59.94 / 50.00 / 24.00Hz)
 MOV, MP4 (AAC, LPCM), AVCHD Progressive
 Hybrid Log Gamma\* for 4K HDR Video New
 \* Firmware update in second half of 2017.

## **Versatile Video Expression**

- Variable Frame Rate 4K / FHD New
- Focus Transition *New*
- V-LogL\* & LUT Display Function New
- High-resolution Anamorphic Video\*\* *New*

\* Upgrade software key DMW-SFU1 is needed.

\*\* TBD. Firmware update in second half of 2017.

## **Pro Shooting Assist Features**

**Expandability** 

4:2:2 10bit HDMI Live Output & Internal Rec New

Double SD Slot & UHS-II U3 Compatibility New

- Heat-Dispersing Design & Unlimited Recording
- 5-Axis Dual I.S. 2 New

HDMI Type A Terminal *New* 

Optional XLR Mic Adaptor New

- Wave Form Monitor / Vectorscope New
- Like709 Gamma & Knee Control New
- Built-in Microphone with NR Structure New
- Luminance Level 64-1023 / 64-940 / 0-1023 (10bit) New



## C4K/4K Recording Formats

	Container	Recording Size	System Frequency	Frame Rate	Bitrate	Color Subsampling	Compression	Sound	GH5	GH4
					400Mbps		ALL-Intra		2nd half of 2017	-
		C4K	4,096 x 2,160	23.98p	150Mbps	4.2.2 1001			~	-
					100Mbps	4:2:0 8bit	LongGOP	LPCM	<b>v</b>	-
59.94Hz	MOV / MP4			59.94p	150Mbps	4:2:0 8bit		High-Res Audio	<b>~</b>	-
JJ.J4NZ					400Mbps	4:2:2 10bit	ALL-Intra	for MOV	2nd half of 2017	-
		4K	3,840 x 2,160	20.07n / 22.09n	150Mbps	4.2.2 1001			~	-
				29.97p / 23.98p	100Mbps	4:2:0 8bit	LongGOP		~	~
	MP4				roowaps	4:2:0 obit		AAC	~	~
		4K	3,840 x 2,160	50.00p	150Mbps	4:2:0 8bit	LongGOP	L-Intra	~	-
	MOV / MP4			25.00p	400Mbps	4:2:2 10bit	ALL-Intra		2nd half of 2017	-
50.00Hz					150Mbps	4.2.2 1001		High-Res Audio for MOV	~	-
					100Mbps	4:2:0 8bit	LongGOP		~	~
	MP4				roowups	4.2.0 obit		AAC	~	~
			4,096 x 2,160	15 10 24.00p 40	400Mbps	4:2:2 10bit	ALL-Intra		2nd half of 2017	-
		C4K			150Mbps			LPCM High-Res Audio for MOV	~	-
24.00Hz	MOV / MP4	MP4			100Mbps	4:2:0 8bit	LongGOP		~	~
24.0002					400Mbps	4:2:2 10bit			2nd half of 2017	-
		4K	3,840 x 2,160		150Mbps				<b>v</b>	-
					100Mbps	4:2:0 8bit	LongGOP		<b>v</b>	~

### LumixG

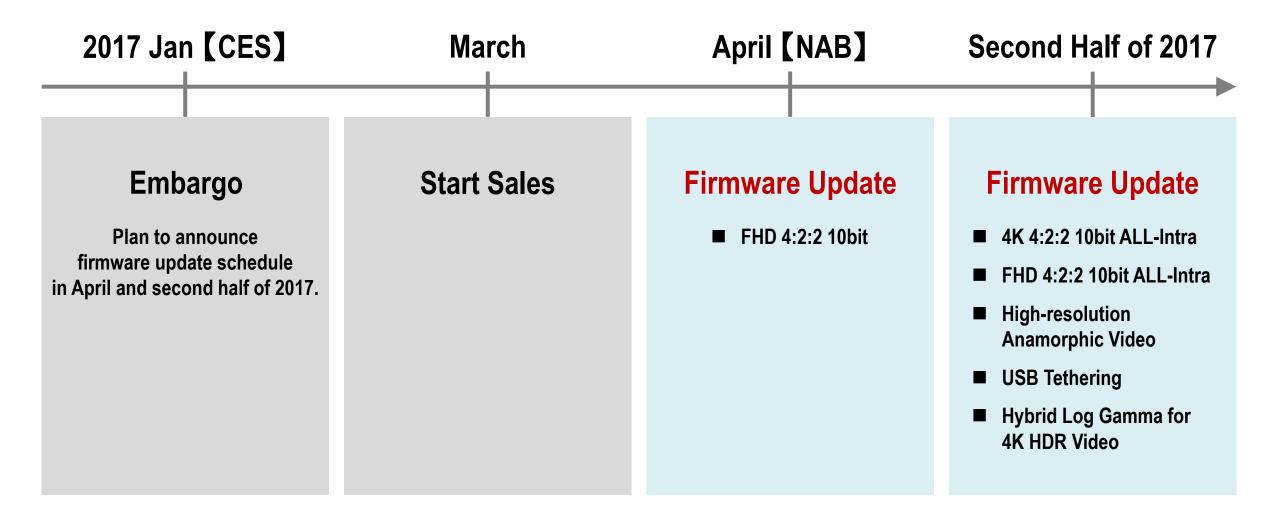
## FHD Recording Formats

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	Container	Recording Size	System Frequency	Frame Rate	Bitrate	Color Subsampling	Compression	Sound	GH5	GH4
				59.94p / 29.97p / 23.98p	200Mbps	4.2.2 405.4	ALL-Intra	LPCM	2nd half of 2017	(4:2:0 8bit)
59.94Hz	MOV / MP4	FHD	1,920 x 1,080		40000	4:2:2 10bit	L	High-Res Audio	April 2017	-
					100Mbps	4:2:0 8bit	LongGOP	for MOV	V	~
					200Mbps	4.0.0 4054	ALL-Intra	LPCM	2nd half of 2017	(4:2:0 8bit)
50.00Hz	MOV / MP4	FHD	1,920 x 1,080	50.00p / 25.00p	4000	4:2:2 10bit		High-Res Audio	April 2017	-
					100Mbps	4:2:0 8bit	LongGOP	for MOV	~	✓
					200Mbps		ALL-Intra	LPCM	2nd half of 2017	(4:2:0 8bit)
24.00Hz	MOV / MP4	FHD	1,920 x 1,080	24.00p	4:2:2 10bit	4:2:2 10bit		High-Res Audio for MOV	April 2017	-
					100Mbps	4:2:0 8bit	LongGOP		~	~
		- FHD	1,920 x 1,080	59.94p	28Mbps		LongGOP	AAC	~	~
	MP4			23.98p	24Mbps				~	~
59.94Hz				29.97p	20Mbps	4:2:0 8bit			~	~
59.94HZ				59.94p	28Mbps	4.2.0 001		Dolby	~	~
	AVCHD			59.94i / 23.98p	24Mbps				~	~
				59.94i	17Mbps				~	~
	MP4			50.00p	28Mbps				~	~
	WP4		1,920 x 1,080	25.00p	20Mbps			AAC	~	~
50.00Hz		FHD		50.00p	28Mbps	4:2:0 8bit	LongGOP	Dolby	~	~
	AVCHD			50.00i	24Mbps				~	~
				50.00i	17Mbps				~	~
24.00Hz	MP4	FHD	1,920 x 1,080	24.00p	24Mbps	4:2:0 8bit	LongGOP	AAC	<b>v</b>	~

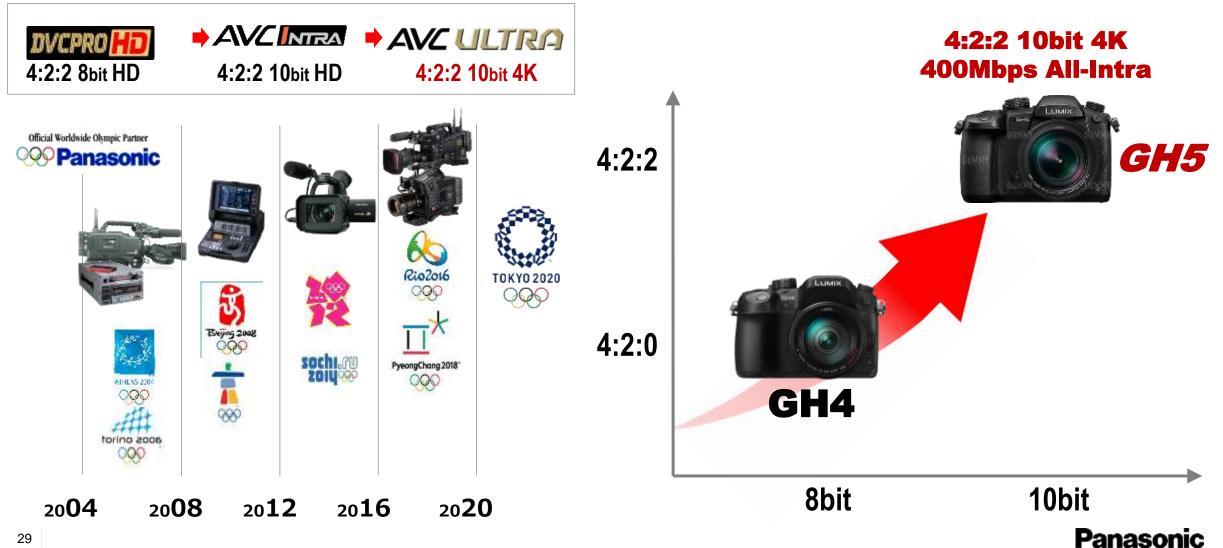
## Video Feature Comparison

			GH5		GH4	
4K video	4096 x 2160		24p		24p	
4K VIDEO	3840 x 2160	<b>60p / 50p /</b> 30p / 25p / 24p 🔫 🔫		30p / 25p / 24p		
Using sensor area			No cropping	+	Cropping	
4:2:2 10bit recording	4K		30p / 25p / 24p	-		
4.2.2 TODIL recording	FHD	2nd half of 2017	60p / 50p / 30p / 25p / 24p	-		
ALL-Intra high bitrate video recording	4K	2nd half of 2017	400Mbps (4:2:2 10bit)	-	- ·	
ALL-Intra high bitrate video recording	FHD	2nd half of 2017	200Mbps (4:2:2 10bit)	-	FHD 200Mbps (4:2:0 8bit)	
4K file container format (MP4 / MOV LP			$\checkmark$		✓	
System frequency is selectable (59.94H			<b>v</b>		✓	
Anamorphic (4:3) recording	High-resolution anamorphic video	2nd half of 2017	30p / 25p / 24p	-		
Anamorphic (4.5) recording	4K (H.264)		30p / 25p / 24p		30p / 25p / 24p	
HDMI live output			4:2:2 10bit output & Internal rec	-	4:2:2 8bit output & Internal rec / 4:2:2 10bit output (no internal rec)	
VFR	4K (3840 x 2160)		Up to 60fps	-	-	
VER	FHD		Up to 180fps	-	Up to 96fps	
	Cinelike gamma		<b>v</b>		✓	
	V-LogL (optional)		Yes with LUT display function	-	✓	
Photo Style	Like709 gamma (ITU-R BT.709)		Yes with knee control	-		
	Hybrid log gamma for 4K HDR video	2nd half of 2017	<ul> <li>✓</li> </ul>	-		
	Hue adjustment		<b>v</b>		V	
Luminance level adjustment		64-1023 / 64-940 / 0-1023 (10bit)			16-255 / 16-235 / 0-255 (8bit)	
Master pedestal adjustment			V		V	
Synchro scan (prevent flicker effect)			$\checkmark$		V	
Wave form monitor display			<ul> <li>✓</li> </ul>	-		
Operation type (Shutter Duration/ISO, A	ngle/ISO, Shutter Duration/dB)		<b>v</b>		✓	
Time code (rec run / free run)			V		V	
Color bars & 1kHz test tone			V		V	
Focus	Focus transition		<ul> <li>✓</li> </ul>	-		
	Focus assist (peaking)		✓		✓	
Zebra pattern / Histogram / Center mark	er		<ul> <li>✓</li> </ul>		✓	
	SD card slot		2 with relay rec & copy rec	-	1	
			UHS-II U3 (Vide grade 60)	-	UHS-I U3	
	Φ3.5mm mic socket		✓		✓	
Input / output terminal	Φ3.5mm headphone socket		<b>v</b>	V		
	HDMI output terminal		Туре А	-	Туре D	
	XLR audio input		DMW-XLR1 microphone adaptor (optional)	-	DMW-YAGH (optional)	
	4:2:2 10 bit SDI video output		-		DMW-YAGH (optional)	





## 4:2:2 10bit - High Picture Quality Used for Broadcasting



### LumixG

## 4:2:2 10bit enables faithful color grading, that is essential for professional work



- Delicate Color Adjustments can be reproduced to match the color grader's intent.
- **Dynamic Color Adjustments** can be made, such as turning daytime to evening.
- Green backgrounds can be eliminated during CG production.



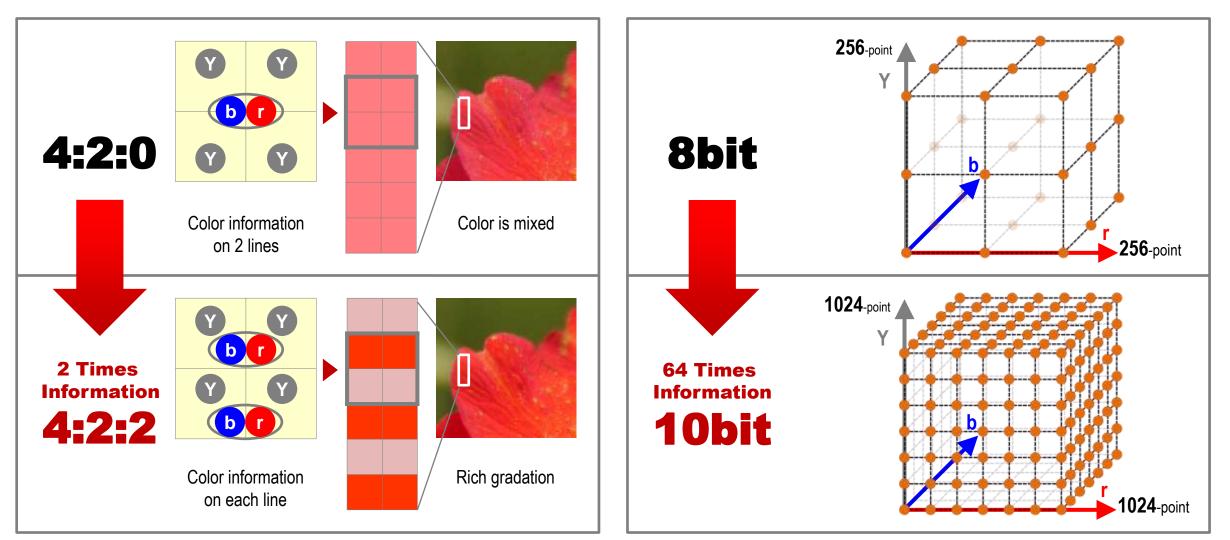




### 4:2:2 10bit

## 4:2:2 Color Subsampling

## **10bit Color Depth**





## **HDMI** Monitor-Through

## 4:2:2 10bit HDMI Live Output & Simultaneous Internal Recording

NEW

## Live Output to External Recorder

Usage examples)

- Apple ProRes/Avid DNxHD 4:2:2 10bit rec up to 4K60p/50p
- High quality recording in non-compression recorder



## **Simultaneous Internal Recording**

Usage examples)

- <u>4:2:2 10bit simultaneous rec for backup</u>
- High-quality internal recording in outdoor situations that required mobility

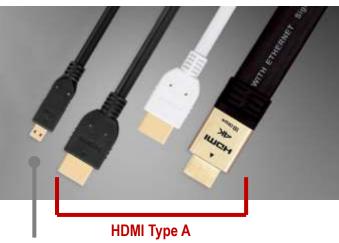


## HDMI Output / Input

## **Compatibility and Flexibility of Use with Other External Devices**

HDMI Type A Terminal

Rarely on digital still cameras, LUMIX GH5 is equipped with HDMI Type A terminal, that is widely used, for professional video production.



microHDMI Type D (for cameras or smartphones)

\* For [4K 60p] video output, use an HDMI 2.0 cable that has the HDMI logo on it, and that is described as "4K compatible".



Cable holder prevents the HDMI cable from getting disconnected by accident or the HDMI socket from being damaged.



## **Information Display**

It is possible to display information simultaneously on both the main unit's rear monitor and the external monitor.



## HDMI Output / Input

## **Compatibility and Flexibility of Use with Other External Devices**

## HDMI Time Code Output

Support for ATOMOS devices and devices that are compatible with ATOMOS expanded specifications. The aim is also to support external monitors capable of time code input via HDMI cable.



\* Setting is possible only in Creative Video mode. Frame frequency setting: Recording content = HDMI output. MP4 is not supported.

## HDMI Rec Control (Start / Stop)

Even when there is no SD card inserted and video cannot be recorded by the camera, output is possible by pressing the motion picture button and shutter button.



\* Setting is possible only in Creative Video mode. Frame frequency setting: Recording content = HDMI output. MP4 is not supported. When [HDMI Time Code Output] is set to [OFF], the REC control data is not output. Applicable devices only. Not possible with a Panasonic recorder.

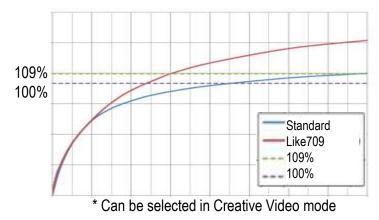
LumixG

## Like709 & Knee Control Suppress Overexposure by High Luminance Video Signals

### **"Like709" Gamma Curve**

**Close to Video/HDTV Standard Rec.709 Gamma** 

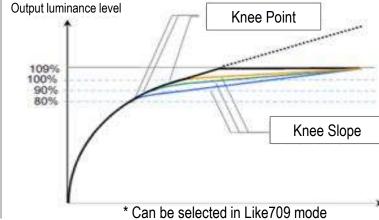




### **Knee Control**

### **Pro Video Users' Standard Function**





- Knee mode: AUTO/MANUAL selectable

MANUAL mode parameter
 Master point setting: "80.0" - "107.0%"
 Master slope curve: "0"-"99"

Input luminance level



### LuміхG



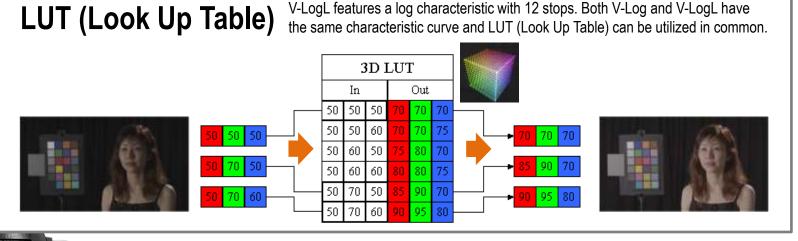
## V-LogL Recording with DMW-SFU1 (Optional) & V-LogL View Assist Function

Upgrade Software Key DMW-SFU1 (Optional) enables log video recording (V-LogL).

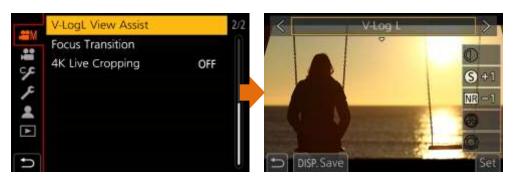
## V-Log / V-LogL have been developed to achieve a similar characteristic curve to

Cineon which is a characteristic curve of film digitalization.





## **V-LogL View Assist Function**



Images with LUT data applied can be displayed on the camera's shooting screen. Up to four sets of LUT data stored on an SD card (Folder 1) can be registered.

Applicable LUT data complies with VARICAM 3DLUT REFERENCE MANUAL Rev.1.0, in ".vlt" format.

\* The recommended LUT file for this upgrade is the same as that of Varicam35, a LUT complies with ITU-R BT.709. The link to the page for this LUT will be announced at the Firmware Update Ver2.3 page. Reference) http://pro-av.panasonic.net/jp/varicam/35/dl.html

#### Panasonic

NEW

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Hybrid Log Gamma

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\* Available after firmware update in second half of 2017

# Hybrid Log Gamma for 4K HDR Video

#### **Recording in Hybrid Log Gamma**

#### **Playback with HDR Compatible TV**



Full-Time Live View Recording by New Venus Engine





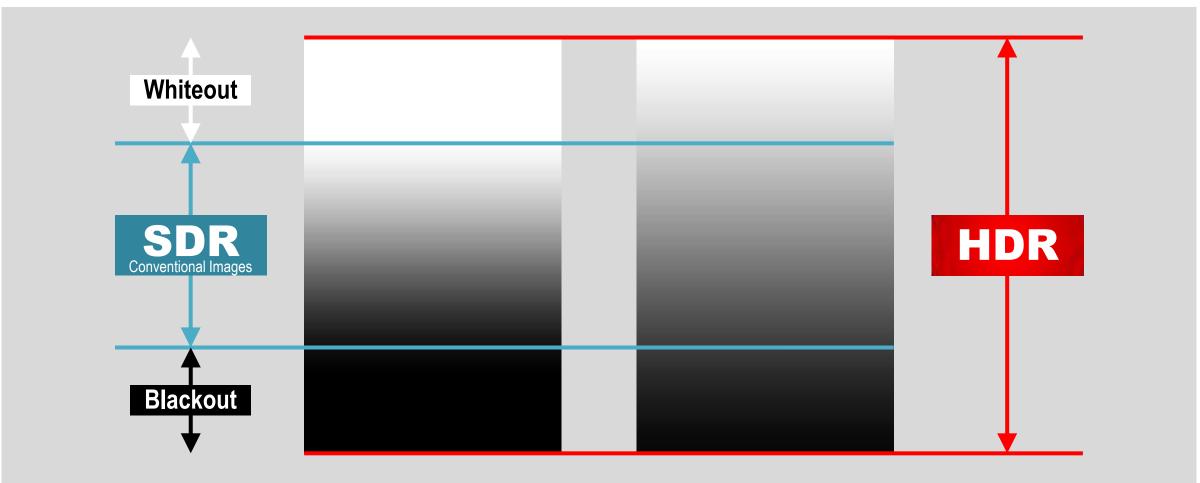
Standards are being advanced to link with HDR still pictures by 2018.



# Hybrid Log Gamma

\* Available after firmware update in second half of 2017

HDR expresses both bright parts and dark parts at the same time to achieve images that are close to what you see with your own eyes





## Anamorphic Shooting

# 4K Video in 4:3 Aspect for Shooting with Anamorphic Lens

NEW

#### A video recording mode for 4K-equivalent resolution in 4:3(1:1.33) is available.



GH5+Lens





Recording Aspect Ratio 4:3 (1:1.33)





Postproduction Aspect Ratio = 1:2.39 (cinemascope size)

Anamorphic 4K		MOV / MP4 3,328 x 2,496	59.94p	150Mbps	4:2:0 8bit	LongGOP	LPCM High-res audio for MOV when XLR1 is attached	
	59.94Hz		29.97p 23.98p	400Mbps	4:2:2 10bit	ALL-Intra		2nd half of 2017
	<b>39.94</b> ΠZ			150Mbps				April 2017
				100Mbps	4:2:0 8bit	LongGOP		
	50.00Hz		50.00p	150Mbps	4:2:0 8bit			
			25.00p	400Mbps	4:2:2 10bit	ALL-Intra		2nd half of 2017
				150Mbps		LongGOP		April 2017
				100Mbps	4:2:0 8bit			
	24.00Hz		24.00p	400Mbps	4:2:2 10bit 4:2:0 8bit	ALL-Intra		2nd half of 2017
				150Mbps		LongGOP		April 2017
				100Mbps				
<b>High-resolution Anan</b>	norphic Video							2nd half of 2017



## **Focus Transition**

# Auto Focus Transition with at a Constant Speed

NEW

#### 1. Pre-set the focus arrival position manually



Set the focus to the stop position (tree)

#### 2. Set the focus to the start position and start REC.



Set the focus to the start position (building).

The focus point automatically shifts to the tree at a constant speed.

- Focus Arrival Position: 3 points
- Transition Speed: 5 speed
- REC. Start Link: ON/OFF
- Waiting Time: OFF/5sec./10sec.

You can also simulate composition and focus position before recording for accurate video creation.

#### LumixG

# VFR (Variable Frame Rate)

# Dramatic Slow Motion Video or Unique Quick Motion Video in 4K / FHD

	59.94Hz		24.00Hz	50.00Hz	
	29.97p	23.98p	24.00p	25.00p	
	-	180fps Max.		-	
	-	168fps 7		180fps	
	-	156fps Slow		175fps	
	180fps	144fps		150fps	
	165fps	132fps		-	
	150fps	120fps		125fps	
	135fps	108fps		100fps	
Slow Motion	120fps	96fps		87fps	
	105fps	84fps		75fps	
	90fps	72fps Max.		62fps	
	75fps	60	fps 2,5)	60fps (4K only)	
	60fps	48	fps Slow	50fps	
	45fps	36fps		37fps	
	34fps	28fps		30fps	
	32fps	26fps		27fps	
	30fps	24fps		25fps	
	28fps	22fps		23fps	
Outob Motion	26fps	20fps		21fps	
Quick Motion	15fps	12fps		12fps	
	2fps	2fps		2fps	



# **Recordable in 4K**

Panasonic

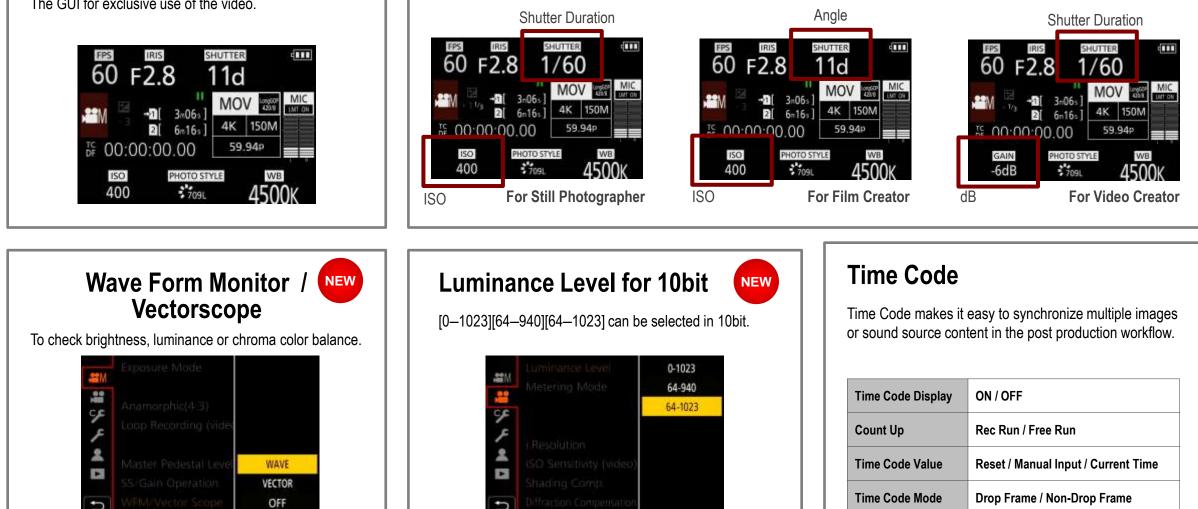
NEW

Shutter Duration/ISO, Angle/ISO, Shutter Duration/dB

**Operation Type** 

#### **Control Panel**

The GUI for exclusive use of the video.



#### **Other Features**

#### **Hue Adjustment**

Hue adjustment is newly added to the Photo Style mode.

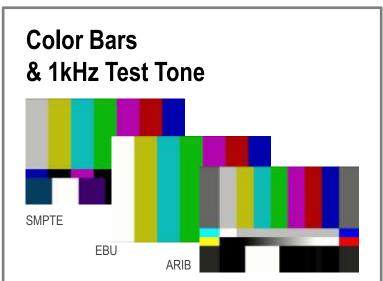


#### **Cinelike Gamma**

This gives the video rich, cinema-like gradation. Cinelike D or Cinelike V is selectable.







#### Master Pedestal Level



Adjusts the black level in 31 steps.

#### Synchro Scan



You can reduce flickering and stripes on images in Creative Video Mode.

#### Zebra Pattern



Indicates parts that may be washed out through overexposure in a zebra pattern.

#### **Center Marker**



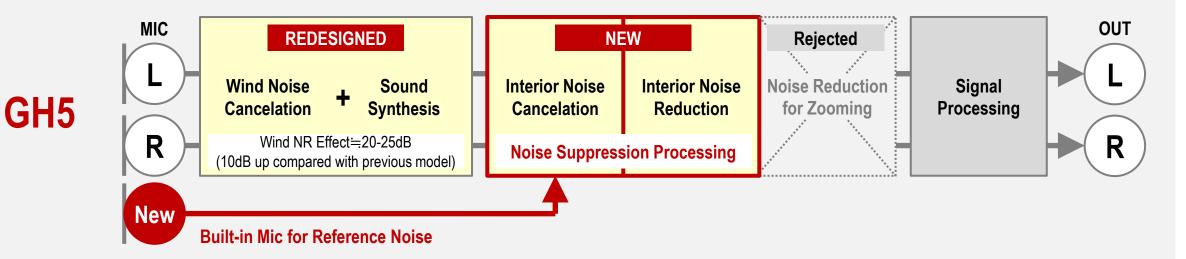
Displays [+], which indicates the center of the recording screen.



# **Built-in Microphone with NR Structure for Clearer Sound Recording**

NEW





## Production System Example [A]

## Simple FHD, 4K Production System

- A simple, highly mobile style that excels for single-handed operation
- Selectable from 4:2:0 8-bit picture quality or 4:2:2 10 bit ( $\Rightarrow$ Page 27)
- Long GOP / All-Intra is selectable ( $\Rightarrow$ Page 27)



# Production System Example [B]

## **Production System**

- 4:2:2 10-bit recording with external video recorder and SD card
- Selectable from 4:2:0 8-bit picture quality or 4:2:2 10 bit ( $\Rightarrow$ Page 27)
- Long GOP / All-Intra is selectable (⇒Page 27)

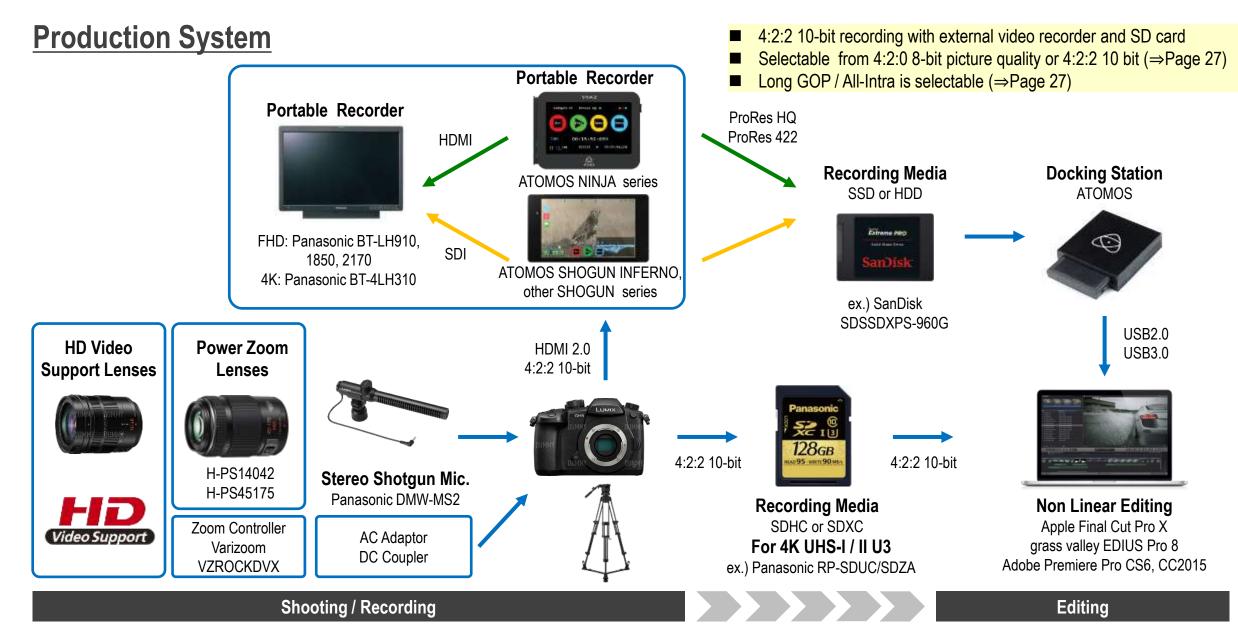




Editing

#### LumixG

# Production System Example [C]

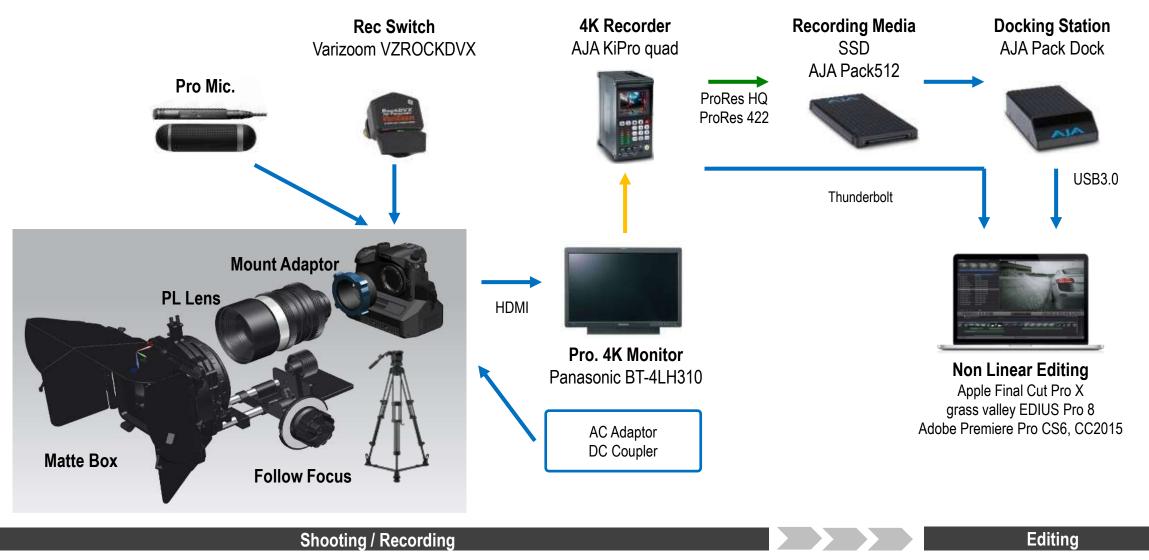


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# GH4 Production System Example [D]

## **Full 4K Production System**

Full 4K production system with PL lens
 4:2:2 10-bit high-quality video recording



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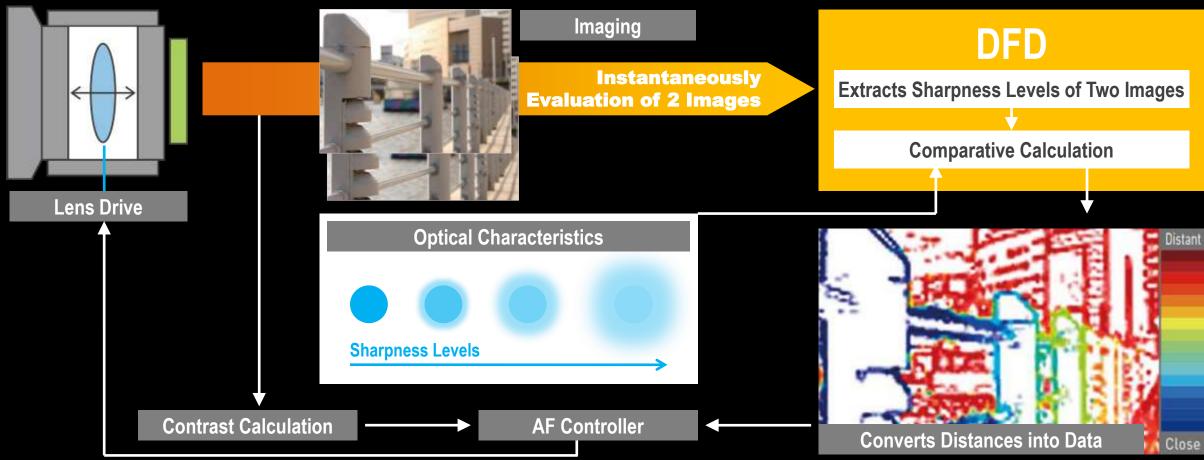
# Intuitive Response to Photographer's Intention



#### **DFD** Technology

# Contrast AF with DFD Technology - Panasonic's Original AF System





High Performance Even in Low Light Situations ! No Dedicated Device Required ! No Separate Calibration Required !

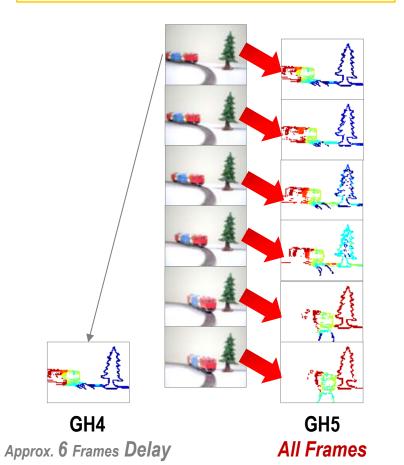
## New DFD

# Higher Speed, More Accurate DFD Technology Improves AF Performance

NEW

Calculating each frame by higher processing

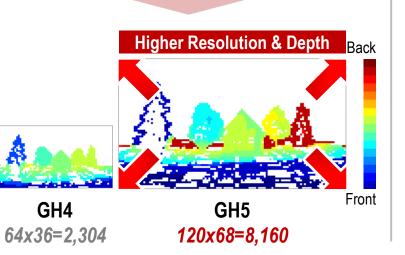
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Max. twice as high precision both resolution and depth



Converts Distances into Data



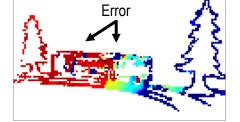
By adopting the motion detector to DFD, the moving subject is detected without error



Motion Detector Circuit OFF

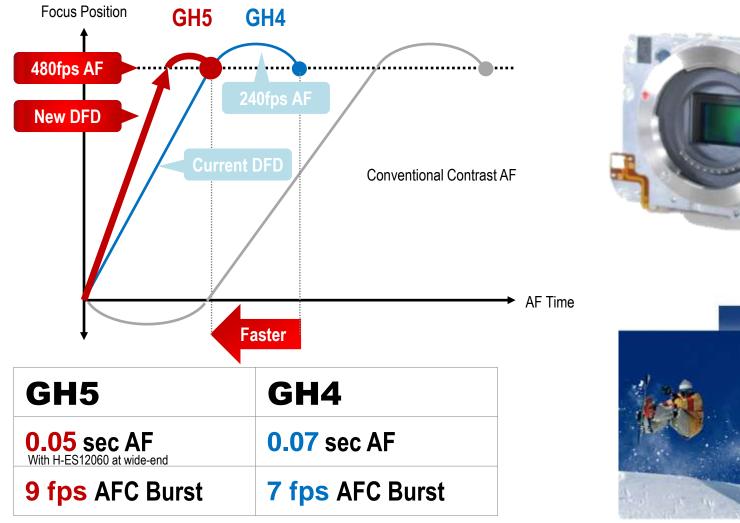
Motion Detector Circuit

ON





# Top Level of Fast AF Performance Thanks to the New DFD and 480fps AF Drive



# High-speed Processing Live MOS Sensor BIS Mount Unit with High-speed Mechanical Shutter

**Newly Developed** 

# Motion Detection & New DFD Improve Tracking Performance in Both Plane and Depth

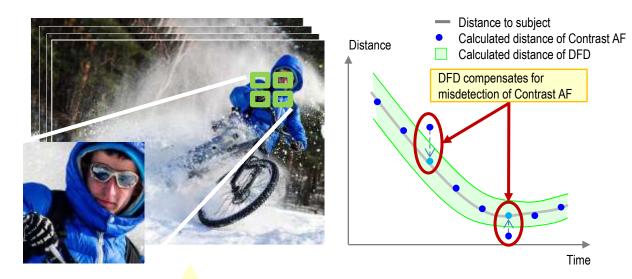
#### Plane: Tracking the Subject Even If It Moves





#### **Depth: Continuously Focusing on the Subject**

#### DFD for Subject Motion + Contrast AF for Precise Focusing



DFD identifies subject

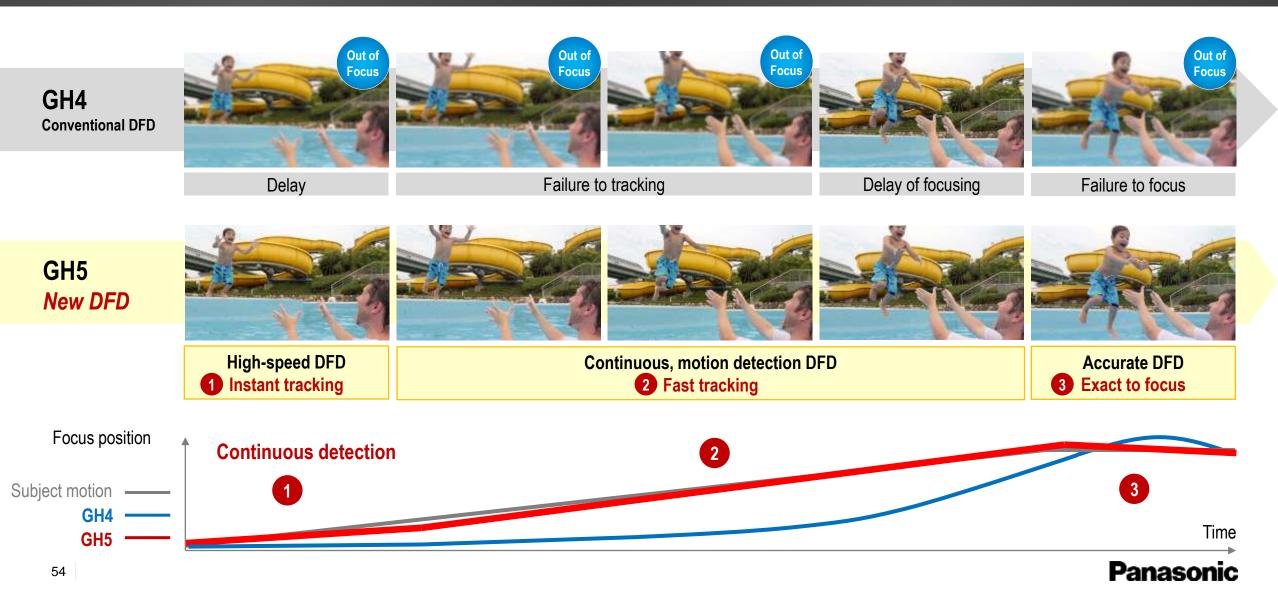
#### Motion estimation vector & **New Depth Information** strongly track AF frame

In addition to the contrast, DFD AF monitors the Distance of the Subject (Depth) and calculates the best focus position



## Evolution 3 – Fulltime AF

# Smooth 4K PHOTO/VIDEO & 6K PHOTO Recording Thanks to New DFD / AF



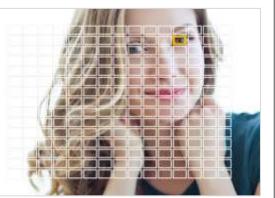


# 225-Area AF Surpassing High-end DSLRs & Intuitive Joystick Control



# 225-Area Multi AF

More precise focusing by increasing the number of AF areas surpassing high-end DSLRs.



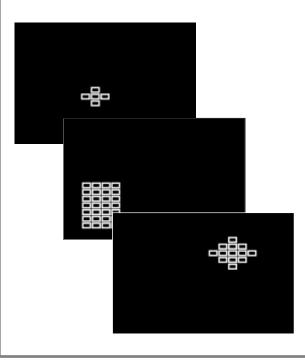
## Custom Multi (225-Area)

In Custom Multi mode, you can freely select the AF-area group.



# Zone AF

Focus area group size and position can be customized for Multi AF / Custom Multi AF.





#### Customize AF

NEW

# **Customize AF According to Shooting Intent**

With customize AF settings, it is possible to adjust AF directionality depending on the shooting scene.

SET 1		SET 2		SET 3		SET 4	
K Set 1	>	K Set 2	>	K Set 3	>	Set 4	>
AF Sensitivity	±0	AF Sensitivity	+1	AF Sensitivity	-1	AF Sensitivity	±0
AF Area Switching Sensitivity	±0	AF Area Switching Sensitivity	-1	AF Area Switching Sensitivity	+1	AF Area Switching Sensitivity	+1
Moving object prediction	+1	Moving object prediction	+2	Moving object prediction	±0	Moving object prediction	±0
Versatile and basic setting		For subjects that go in one direction and move at the constant speed.		Continue to track the subjects, ignoring possible obstacles.		For subjects that change speed and move unpredictably.	
DISP. Reset	Set	DISP. Reset	Set	DISP. Reset	Set	DISP. Reset	Set



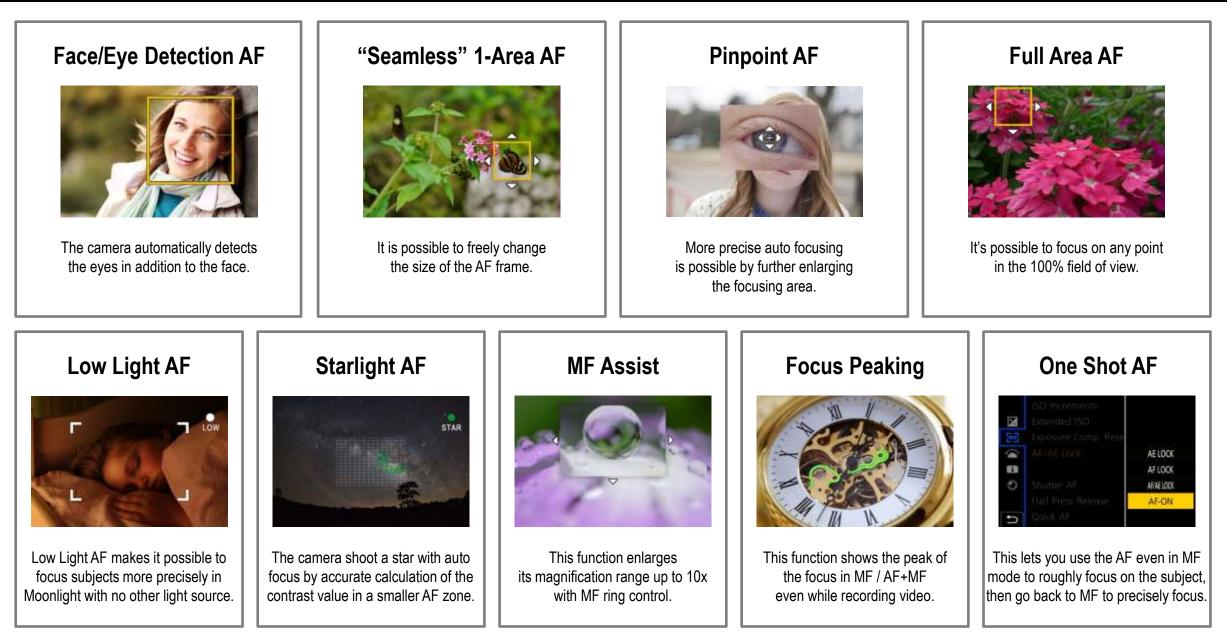






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# **Other Focusing Features**

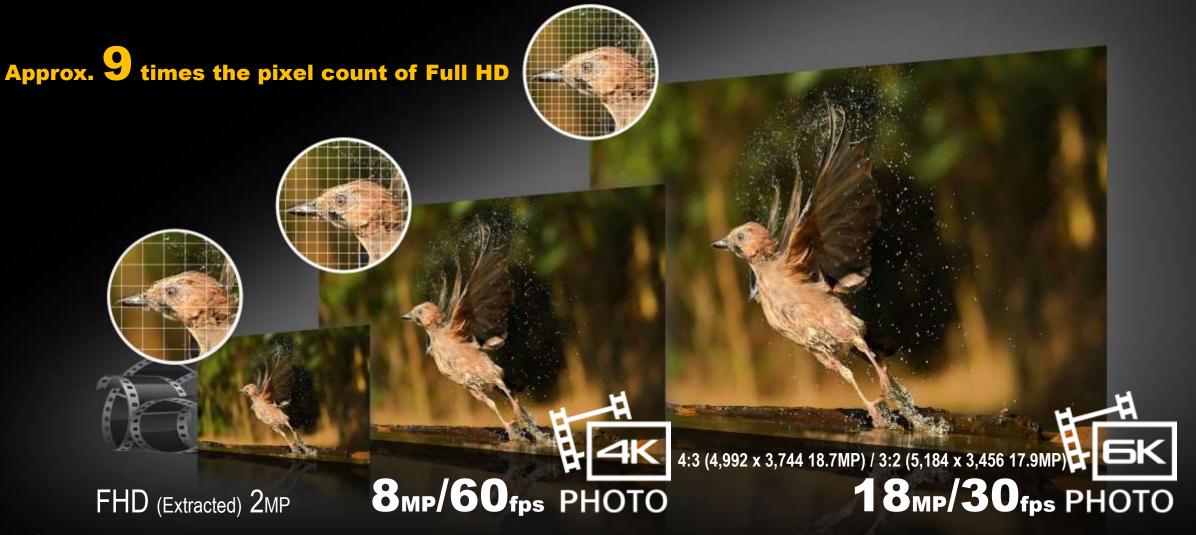




6K PHOTO / 4K PHOTO

NEW

# **18MP/30fps & 8MP/60fps Unlimited Shooting**



\* "6K PHOTO" is a high-speed burst shooting function that cuts a still image out of a 4:3 or 3:2 video footage with 18-megapixel (approx. 6000 x 3000 effective pixel count) that the 6K image manages.

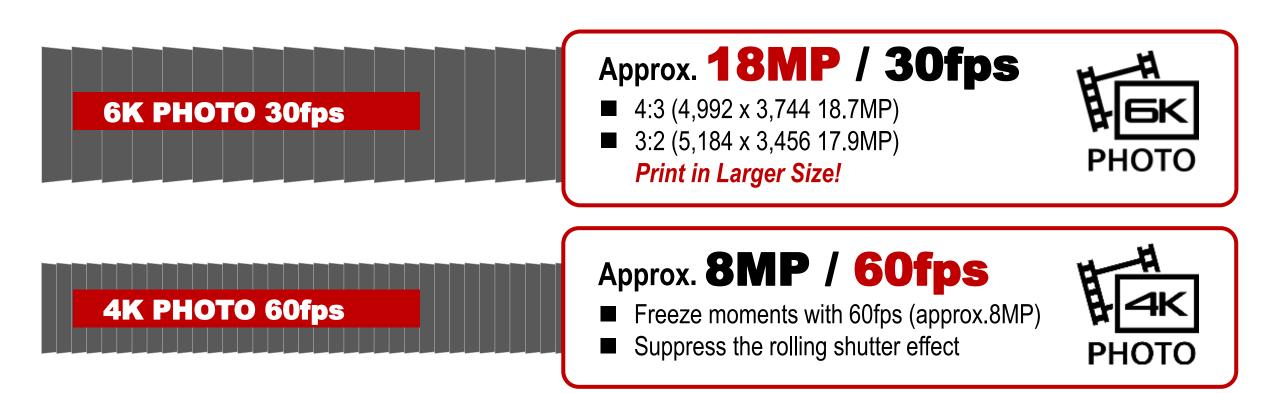


# **4K PHOTO Evolution**

Panasonic



**Conventional 4K PHOTO 30fps** 





# High-quality 6K PHOTO / 4K PHOTO by the Image Composition

NEW

# **Noise Reduction**

Auto noise reduction\* in high ISO setting / fast shutter speed recording. The picture is composed according to the result of motion estimation.



# **Rolling Shutter Distortion Correction**

The rolling shutter distortion occurred on panning shooting is corrected without changing the angle of view.





LUMIX G

Monitor

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# NEW 3,680k 0.76x OLED

**Super Resolution** 

# **1,620k 3.27 RGBW**

**Live View Finder** 

AFS/AFF • AFC •

MF.

3,680k-dot OLED Magnification 0.76x Eyepoint 21mm Eye sensor

#### **Rear Monitor**

1,620k-dot RGBW LCD 3:2, 3.2-inch Free-angle Static touch control





# Large 0.76x 3,680k OLED LVF – Evolved for Active Outdoor Shooting



# Clear 3,680k & Large 0.76x

High-resolution & high magnification make it **easy to see subtle image details**.



# Eye Point: 21mm

A long eye point distance is convenient for **people who wear glasses**.

# Wider Viewing Angle

<u>Clear image</u> even when the eye is moved away from the center of the viewfinder.

	GH5	GH4
Туре	OLED	OLED
Resolution	3,680k dots	2,360k dots
Magnification	1.52x / 0.76x (35mm)	1.34x / 0.67x (35mm)
Eye Point	21mm	21 mm

# GH4: 2,360k-dot 1.34x / 0.67x (35mm camera equiv.)

age



# GH5: 3,680k-dot 1.52x / 0.76x (35mm camera equiv.)

ASCE

FnS

# Large 3.2-inch 1,620k RGBW Monitor – High Visibility Even in Bright Conditions

**RGBW** (Red, Green, Blue, White) pixel structure achieves max. 2 times or more brightness compared to GH4, and enables higher visibility even in bright conditions.



#### Durability

# **Durability to Shoot Under Tough Conditions**



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# Freezeproof NEW

With freezeproof to -10°C / 14°F, the LUMIX GH5 supports shooting while skiing, snowboarding or skating.

# Splash/Dustproof

This construction was achieved by tightly sealing the sections of the camera body to enable shooting under extreme conditions.



# **Mg Alloy Body**

A magnesium alloy frame makes the body lightweight yet durable while bringing ruggedness to the compact size.



# **GUI** Improvement

# More Convenient Operation Meets the Requirements of Professional Users

More

-0

rofessional

volution

#### Conventional

- GUI looks dull due to unnecessary space between each item.
- Difficult to find the items (the number of menus has been increased).
- Some menu items are grayed out.
- A customizable menu is required.



#### GH5 Increased the number of items on each page to improve comprehensive usage and 1 visibility (5 lines $\rightarrow$ 8 lines). Re-designed the order and position of each menu item. 2 Custom set-up menu can be categorized. Cause of "gray out" is shown in a pop-up window. 3 4 Frequently used items can be memorized in "my menu" (up to 23 items). 1 8 lines displayed on each page. 2 Categorized custom set-up menu. Aspect Ratio K Exposure 4:3 0 Focus / Release Shutter Picture Size L 20M Quality Operation AFS/AFF AFS i Monitor / Display O Lens / Others Photo Style STD. Filter Settings OFF S RGB Color Space



# Main Parts & Controls

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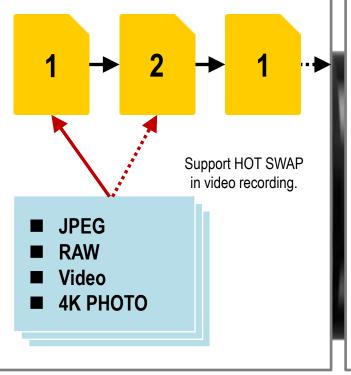
#### **Double SD Slot**

# Double SD Slot for Larger Capacity Recording & Efficient File Arrangement



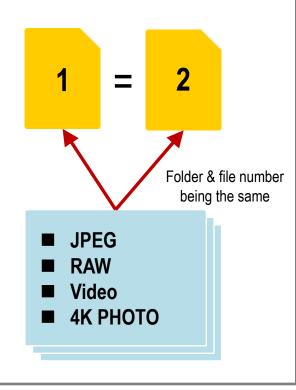


The recoding media switches automatically and seamlessly from "slot 1" to "slot 2".



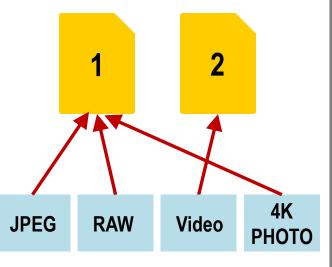
# Backup Rec

Identical data is recorded onto cards in both slots.



# **Allocation Rec**

You can select "slot 1" or "slot 2" to record RAW, JPEG, 4K PHOTO, and video data.



Folder and file number being the same in RAW and JPEG recording

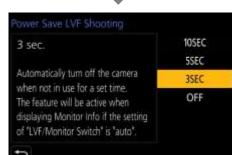


## Power Save LVF Shooting

# Approx. 1000 Images\* – About 2.5 Times Longer Battery Life

NEW

#### eadphone Volume conomy 60fps Live View Mode Δ\* Monitor Luminance Eve Sensor USB Mode Sleep Mode OFF Sleep Mode(Wi-Fi) ON Auto LVF/Monitor Off OFF Power Save LVF Shooting OFF





# Auto OFF After 3, 5 or 10 sec

The eye sensor detects that the eye has moved away, and the camera automatically enters Sleep mode\*\*.

Normal Setting

# **Quick ON**

When the shutter button is half-pressed, advanced LUMIX technology instantly restores the shooting mode!



\* With H-FS12060 (LVF). Under the test conditions specified by Panasonic based on CIPA standard. When the time to get in the sleep mode is set to 3 sec. \*\* When the rear monitor is set to an on-monitor recording information screen.

Power Save LVF Shooting

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# New Way of Photography



Post Focus & Focus Stacking

NEW

Combine

# **Only LUMIX! Focus Control "After Shooting"**

**DFD Technology** calculates the focus areas from a max. of 49 areas

**Metry 6K PHOTO**s are shot at 30fps while shifting the focus area.



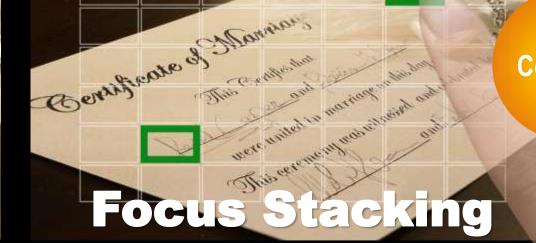




Select

# **Post Focus**

migrate of Mar day

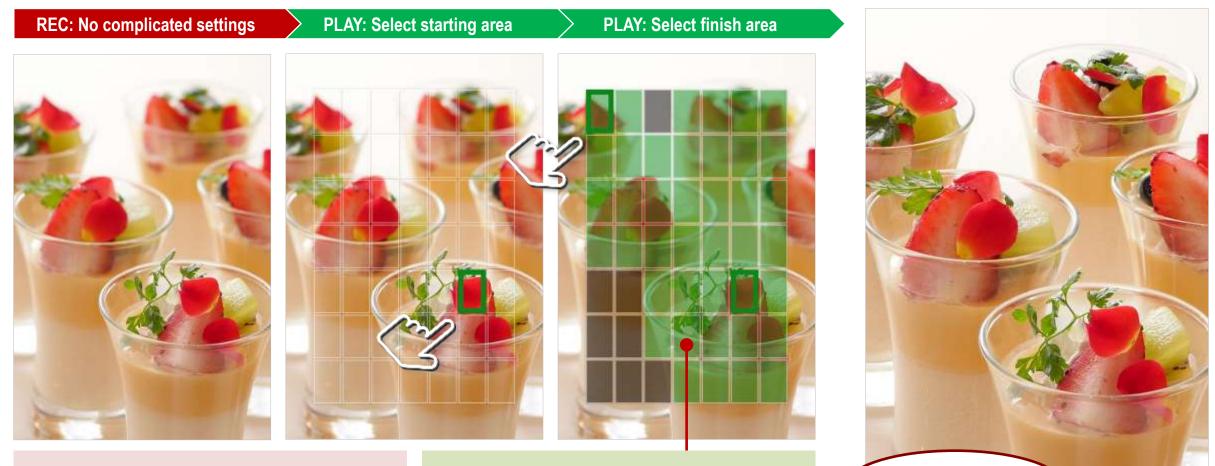


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## **Focus Stacking**

# **Control Depth of Field Area After Shooting with Focus Stacking**

NEW



- No need to focus before shooting.
- Supported by all LUMIX G/LEICA DG lenses.

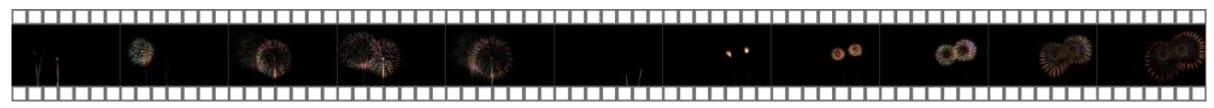
The green assist display shows the in-focus area to compose the image according to your intention.

**Composed** into

a single picture

# Light Composition

# Beautiful Night Scenery with Illumination by Multi-layering Images



#### **Composing to a Single Picture**

#### **Composite Merging (multiple fireworks)**

Select the frames (max. 40 shots) you wish to combine, and the camera superimposes the brighter parts of the image.

#### Range Merging (light traces)

Select the first and last frames, and the brighter parts of frames within that range will be superimposed.







## **Bracket Mode**

# Versatile Bracket Options to Select the Best Settings Later

#### **Bracket Menu**



- Exposure **Aperture Bracket**
- **Focus Bracket**
- **WB Bracket**

Select the Bracket mode to match the situation or conditions, and choose the best one after shooting.



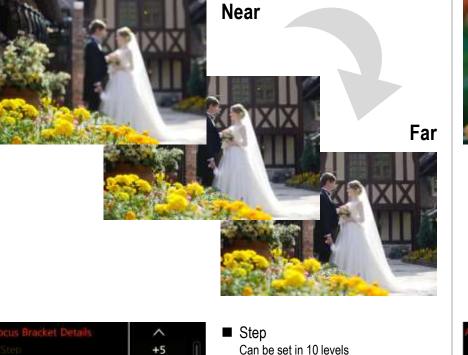


Image Count

■ Sequence

Can be set from 1 to 999 shots

Near to far, or alternately near and far

+5

+6

+7

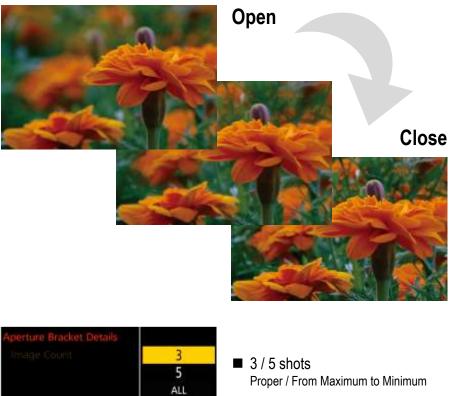
+8

+9

+10

V

# **Aperture Bracket**



ALL By 1-step



**Unique Built-in Camera Functions** 

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# Adjust, Develop, and Retouch – All Inside the Camera

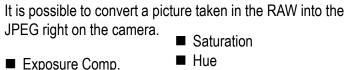
# **Highlight Shadow**



Highlight and shadow can be separately adjusted. 3 patterns of settings can be customized in addition to 3 preset patterns (Higher Contrast / Lower Contrast / Brighten Shadow).

# **RAW Data Development**





- Photo Style
- i. Dynamic
- Contrast
- Highlight Shadow

- Noise Reduction
- i. Resolution
- Sharpness
- White Balance
  - Color Space / Picture Size

# **Clear Retouch**



It is possible to erase unwanted objects or figures in an image by just tracing over them on monitor with a fingertip.

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# System Expandability



**Communication Feature** 

# Wi-Fi 5GHz(IEEE802.11a/n/ac)\*/2.4 GHz(IEEE802.11b/g/n) & Bluetooth v4.2(Bluetooth Low Energy)

# **Full-time Connection**

BLE enables full-time connection between camera and smartphone with **low energy consumption**.







Once paired, the auto smartphone connection is activated after the second and subsequent use with no camera operation.

# **Auto Transfer**

After shooting, it automatically switches to Wi-Fi connection, and transfers data to smartphone.



# Easy Remote Control

- Remote wake-up from smartphone
- Auto geo tagging with smartphone's GPS sensor







Other utilization: Smartphone detects your location at home, then camera automatically connects to Wi-Fi router and starts to backup photos to Cloud Service.

#### Panasonic

\* 5GHz Wi-Fi is not available in some countries.



# Extended Battery Life & Ergonomic Design



Buttons can be used in the same way as the GH5.



# XLR Microphone Adaptor for Professional Video Production

NEW



- For recoding high-grade stereo surround with attached XLR microphone (2ch).
- High-res sound recording in 96kHz/24bit.
   Sound recording format is set from the menu of the camera body. (GH5 MOV only)
- Good for lip-sync recording.
- DC power is supplied by the camera body via a shoe connector.

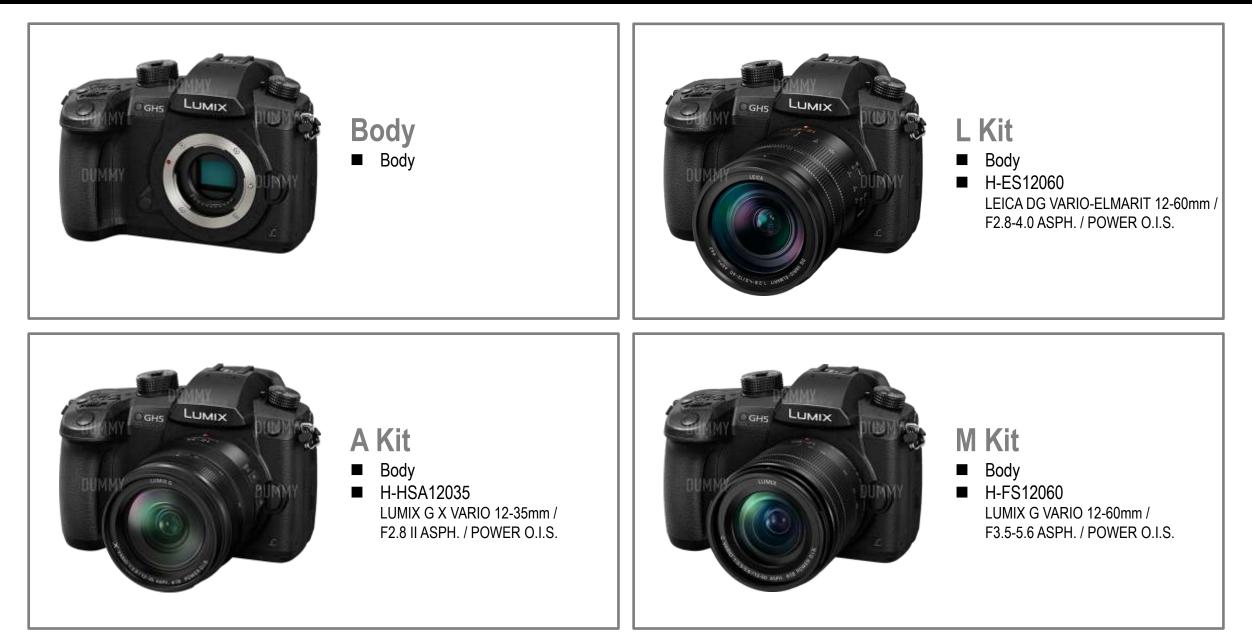
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# **Other Optional Accessories**



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#### Lens Kit



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