

Stills Photography with the Lumix G7

Preface

Modern digital cameras are marvellous pieces of technology that are capable of capturing wonderful images. However, most are needlessly complex. We typically face four shooting modes, three metering modes, at least three focus modes, and a number of auto-focus modes (typically five or more on Lumix G cameras). This gives the user at least **one hundred and twenty** possible combinations to choose between. And that is before we consider ISO (sensitivity), white balance (colour management), exposure compensation, drive mode and a host of other settings!

Lumix G cameras are highly configurable, have a consistent and relatively user-friendly interface, and most have a number of programmable buttons and other controls. This lets you set them up to support the way you work, but adds yet another level of complexity.

It has taken me years of use to find the best (for me) ways of using and configuring Lumix G cameras. Having done so, I find them a delight to use. Features and capabilities hidden in the menus and documentation can be programmed onto buttons and made directly accessible and highly usable.

This manual attempts to distil this experience into a relatively short document. It is not intended to replace the official Panasonic manuals, which can be downloaded from Panasonic's web site. I have not attempted to cover the basic details of camera operation (such as installing batteries). Please refer to the Panasonic manuals for these.

The manual is directed at aspiring stills photographers. It does not cover the intelligent auto mode or taking video. Don't let this put you off using intelligent auto. It does work well and you only need to move to the techniques in this manual if you want to make full use of your camera's capabilities. On the other hand, the techniques in this manual are just as simple to use as intelligent auto mode when you don't need to adjust the focus or exposure, which can be the case for many photographs.

The manual is organised as follows:

- The first chapter gives an overview of the controls, so you can follow the rest of the manual.
- The second chapter describes the use of the custom modes provided in the setup given in [Appendix 1](#). It includes details of how to manually adjust focus and optimise exposure when necessary.
- The third chapter summarises the technical capabilities and use of the cameras. It provides more details of capabilities for you to refer to as needed.
- The functions and settings of the cameras are summarised in [Appendix 1](#), along with instructions on how to set up (program) your camera before using it. This should be the first thing you do. It's a little tedious and time consuming but it is absolutely necessary that you work through it carefully before starting on the first chapter. Having a thought out set of custom modes and settings to support them will make your camera far easier to use (and explain).

I hope you enjoy using your camera.

Note: For reasons discussed in [Appendix 2](#), the custom modes used in this manual work exclusively with program (P) shooting mode. However, I do use other shooting modes for specific tasks, such as dedicated portrait sessions and astrophotography, without programming them as custom modes. Many of you will prefer to use A, S or M shooting modes – you should find it straightforward to modify the custom modes to meet your needs.

Introduction to the G7 and its controls

This chapter provides a brief overview of the controls: see the photographs on the next page.

Insert a charged battery and memory card, following the instructions in the camera manual. Turn on your camera using the ON / OFF switch. It's obvious how to turn it off again.

Before proceeding further with this manual, please set up your camera as instructed in [Appendix 1](#), which also describes the functions in the menu system. The setup makes the frequently-used features of your camera readily accessible. It puts the most frequently-used functions onto the dials, programmable function buttons and screen icon 'buttons'¹. For example, the FOCUS AREA SET (Fn4 - lower left) button lets you enable use of the touch screen and cursor keys to position the AF (auto-focus) area. The use of the other buttons and dials is discussed below.

The next most frequently used functions are presented on the (customised) Q.MENU, where they can be quickly accessed. The remaining functions have to be accessed via the full MENU system.

The viewfinder and LCD screen

The camera is set up so that either the viewfinder or the touch screen is active. Toggle between them by pressing the LVF button next to the viewfinder². When you turn the camera on it will use the display you were using when you last switched it off.

Use the dioptre adjustment, beneath the viewfinder, to focus the viewfinder image.

When using the viewfinder, use the buttons and dials to control most functionality – you have to use the cursor keys to move the AF area. With practice, you can locate them by touch. When viewing the screen, you can use either the buttons and dials or the touch screen.

The Q.MENU

The recommended setup allocates the STABILIZER, AFS/AFF, SELF TIMER, QUALITY, and ELECTRONIC SHUTTER functions to the Q.MENU. These are the functions that are most important for stills photography, after those allocated to dials and buttons.

To change a function setting using the Q.MENU, press the Q.MENU button. Then:

- Select the function to change, using the rear dial, left/right cursor keys or touch screen.
- Select the setting for the function using the front dial or touch screen. (Or click on the rear dial or press SET, and then use the rear dial or cursor keys to select the setting.)
- Press SET or half-press the shutter button to save the setting. Press BACK to leave the setting unchanged.

The MENU system

All functions (except those with dedicated controls) can be accessed by pressing MENU. The menu system has tabs for REC (still photographs), MOTION PICTURE, CUSTOM(isation), SETUP and PLAYBACK. Use the rear dial, cursor keys or touch screen to move between tabs and functions and press SET (or the right cursor key) to select an item. Press DISP to move to the next page for a tab. You can use the front dial to move between tabs.

Use the rear dial, cursor keys or touch screen to change a function setting. Press SET to confirm the change, or press BACK (or the left cursor key) to leave the setting unchanged. Half-pressing the shutter button will close the menu system at any time, without saving a function setting.

Most of these operations can also be achieved using the touch screen, once the menu is displayed.

¹ The screen icon functions are accessed (and hidden) by touching the small tabs to the right of the screen. They are not available using the viewfinder.

² Set EYE SENSOR, LVF AUTO to ON if you want to switch from the screen to the viewfinder as you put the viewfinder to your eye. I don't use this as I can get longer battery life by switching manually, because the EVF switches off when I take my eye from the viewfinder.

Switching between shooting and playback

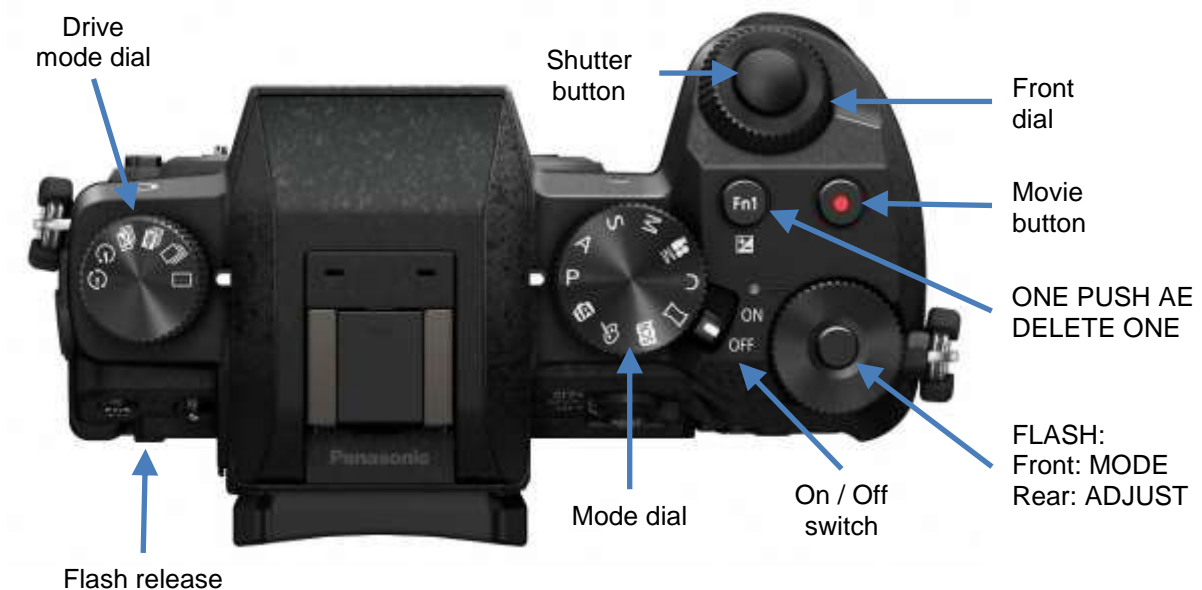
- Press the playback button (▶) to view photographs and videos you have taken, in playback mode.
- Half-press the shutter button, or press the playback button again, to return to shooting mode.

Display screens

Press the DISP(ay) button to cycle through alternative displays on the screen or viewfinder (whichever is in use): with info; no info; level and info; level and no info; control screen; and off. The last two only apply to the screen. The control screen shows a number of function settings and allows you to change them.



CURSOR LEFT: AF MODE



Custom modes

The G7 lets you store 3 custom modes. Program them following the steps in [Appendix 1](#), as summarised in Table 1. The custom modes provide the framework for this manual and let me focus on describing the camera without referring to settings all the time. Modify them to meet your approach, if you need to.

Custom mode	Functionality	Metering mode	AF mode	Quality	AF/MF switch (*)	Drive mode dial (*)
C ₁	General shooting / photographing people	MULTI	FACE (49-AREA)	RAW	AFS	SINGLE
C ₂	Specify the subject	SPOT	1-AREA	RAW	AFS	SINGLE
C ₃	Movement / sports	SPOT	1-AREA	JPEG Fine	AFC	BURST

Table 1: Key settings for the programmed custom modes

(*) On the G7, you have to set FOCUS MODE on the AF/MF switch (and AFS/AFF setting) and DRIVE MODE on the Drive Mode dial. This is a disadvantage of dedicated dials for settings that cannot be programmed. You have to remember to set them each time you switch to a custom mode.

The built-in flash or a hot-shoe mounted flash can be used in any of the custom modes: see [Flash](#).

The following sections discuss using the cameras in each custom mode.

C₁: General shooting / photographing people

Select C on the mode dial and then select C₁ on the 'Custom Mode' menu. This is setup to use FACE DETECTION AF mode, but if no face is detected it will use 49-AREA AF mode. Follow these steps:

Compose the image.

Position the AF area: *Follow this step only if you need to hint where you want the autofocus system to search for focus.*

For people: Press the FOCUS AREA SET button and a yellow AF frame will appear. Use the touch screen or cursor buttons to position the AF frame over the face(s) to use for focus. Adjust the size of the frame using the rear dial. Half press the shutter button or press SET to accept. The corners of the frame will be displayed. When the corners are visible, press SET to cancel the hint.

For other subjects: Press the AF MODE button and select 49-AREA AF mode explicitly. Now press the FOCUS AREA SET button and 49 white rectangles will appear, with the central 9 outlined in yellow. Use the touch screen or cursor buttons to move the yellow frames over the area where you want the camera to focus. Half press the shutter button or press SET to accept. A white cross will appear in the chosen area. When the white cross is visible, press SET to cancel the hint.

Lock focus (and exposure): Either half-press the shutter button, which will lock both focus and exposure³, or press and release the AF LOCK button, which will only lock focus. If focus is obtained on a face, the frame around the face where focus has been taken will turn green. If focus is obtained elsewhere, one or more green frames will appear where focus has been taken. In both cases a green focus indicator will appear in the display. If you have time, check and adjust the focus as described in the box 'Checking and adjusting focus' on page 2.

Lock exposure: If you used AF LOCK, half-press the shutter button, which will now lock the exposure. If you have time, check the aperture, shutter speed, ISO value and exposure histogram. If necessary, adjust the exposure as described in the box 'Optimising exposure' on page 2.

Take photo and review: Fully press the shutter button to take the photograph. Review the photo: press DELETE if you want to delete it. Return to shooting mode by half-pressing the shutter button.

The next two custom modes follow roughly the same set of steps. Where the procedure is the same, you are referred back to the description in the same step in this mode.

³ In AFS focus mode the exposure is locked when you half-press the shutter button. The exposure really is locked, though the brightness of the display will vary if you move the camera with the shutter button half-pressed.

Checking and adjusting focus

You have either locked the focus by pressing and releasing the AF LOCK button or by keeping the shutter button half-pressed, or switched to manual focus using the MF/AF switch.

Having done this, you can, if necessary, enlarge the focus area by pressing the AF MODE (left cursor) button. This is easier to do if you use the AF LOCK button (or have switched to manual focus) as it avoids pressing two buttons at the same time. The enlarged AF area can be moved around using the cursor keys and the magnification varied using the rear dial. If you want, press BACK to close the enlarged area.

Turn the focus ring on the lens to bring your subject into sharp focus. A distance indicator will appear, showing roughly where you are focused (there is no distance scale). Edges that are in focus will be highlighted – this is referred to as focus ‘peaking’.

C₂: Specify the subject

To specify where focus and exposure should be taken, select C on the mode dial and then select C₂ on the ‘Custom Mode’ menu. A white AF frame and a blue spot-metering cross will be shown at the centre of the display. There are two ways of working:

Drag the AF frame and metering cross over the subject

Compose the image.

Position the AF area: Press the FOCUS AREA SET button and the AF frame will turn yellow. Use the touch screen or cursor buttons to move the AF frame over the area where you want the camera to focus. Adjust the size of the frame using the rear dial. Half press the shutter button or press SET to accept. The corners of the frame will turn white again, with a blue metering cross in the centre of the AF frame. To centre the AF frame in the display, press the FOCUS AREA SET button, press DISP and half press the shutter button or press SET.

Lock focus (and exposure): Proceed as for this step in the C₁ custom mode.

Lock exposure: Proceed as for this step in the C₁ custom mode.

Take photo and review: Proceed as for this step in the C₁ custom mode.

Centre the AF frame and metering cross over where you want to focus and meter

Lock focus (and exposure): Centre the AF frame over where you want to take focus and then proceed as for this step in the C₁ custom mode.

Lock exposure: If you used AF LOCK, centre the metering cross over where you want to take the exposure. This means that, if necessary, you can take focus and exposure at different points in the scene. Now proceed as for this step in the C₁ custom mode.

Compose the image.

Take photo and review: Proceed as for this step in the C₁ custom mode.

Optimising exposure

The dynamic range of your camera is sufficiently large that the exposure of many photographs can be adjusted 'in post'; that is, on your computer. But you should always be asking the following questions:

- **Do I want to influence the depth of field?** making it either shallower or deeper (to ensure that enough of your subject is in focus)? Use a wider aperture (smaller f number) to obtain a shallow depth of field, typically for a portrait, to blur the background. Use a narrower aperture (larger f number) for a deeper depth of field and the best sharpness, for, say, landscapes. Too small an aperture (say beyond f/8 or f/11) will reduce sharpness due to diffraction. Turn the front dial to adjust the aperture. You will see the aperture value change in the display and a yellow, arrowed indicator will appear to the left of the aperture value. Adjusting the exposure in this way is referred to as 'Program Shift'. Any Program Shift you have applied remains in effect for subsequent photographs until you cancel it by pressing the ONE PUSH AE button (or you change mode or switch off the camera).

You will not be able to see the final depth of field in the display, although the aperture selected will influence the depth of field in the captured image. This is because your camera operates with the aperture fully open to make focusing easier and to display the scene. So you need to review the image after it has been taken and, if necessary, adjust the aperture and take the photograph again. (But see the section on depth of field preview in the next chapter.)

- **Are any bright areas of the scene being over-exposed?** This would result in the brightest areas being recorded as fully white and you would lose detail in the bright areas of the scene. If so, turn the rear dial to apply exposure compensation to darken the image somewhat. The exposure histogram will help you judge this. As a rule, it is easier to retrieve detail from underexposed areas than from fully saturated areas of an image.
- **Is my subject a dark one, against a bright background?** In this case, you may wish to use exposure compensation to brighten the image and reveal the detail in your subject. The background may be over-exposed, but this may be acceptable or even desirable.
- **Do I want to minimise noise in the image?** If you are working in dim light, at small apertures or at fast shutter speeds (or a combination of the three) the camera will increase the ISO of the sensor (its sensitivity) to compensate; but this may result in noise, especially in dark areas of the image. To control noise, you may want to set the ISO value by pressing the ISO button and adjusting the setting. You can adjust the ISO LIMIT for AUTO ISO and iISO with the front dial whilst in the ISO menu. Of course, a slower ISO will require a wider aperture and / or a slower shutter speed, possibly to the point where you need a tripod or other support!
- **Is there any movement in the scene** and, if so, is my shutter speed fast enough to avoid motion blur, or slow enough to create motion blur if it is wanted? See the next section: 'C₃: Moving subjects'.

C₃: Moving subjects

Photographing moving subjects requires a fast shutter speed to avoid motion blur (enabled by a wider aperture and/or higher ISO) and you need the ability to track the motion of your subject. The wider aperture implies a shallower depth of field, which can make focusing harder. You usually don't have time to manually adjust focus or exposure whilst taking the shot or burst of shots. You either have set up focus in advance or rely on automatic focus and use a reliable metering mode.

Turn the drive mode dial to BURST (burst rate is set to M, which leaves the display active to allow you to track your subject⁴) and the AF/MF switch to continuous focus mode (AFC). Select C on the mode dial and then select C₃ on the 'Custom Mode' menu. This uses P shooting mode, SPOT metering (which takes exposure in the AF frame), and 1-AREA AF⁵ mode. AF/AE LOCK is set to AF-ON and SHUTTER AF is set to OFF so that AF is only activated whilst the AF/AE LOCK button is pressed. This allows you to start

⁴ The G7 does offer higher burst rates, but these blank out the viewfinder.

⁵ The G7 also has a TRACKING AF mode. I've not had a lot of success with it.

tracking and focusing on a subject before pressing the shutter button to start taking a burst of images. ISO LIMIT is set to OFF to allow faster shutter speeds, at the expense of more noise. QUALITY is set to JPEG FINE resolution, to enable longer bursts of images to be captured in the camera's buffer.


I find that P shooting mode usually uses a sensible shutter speed, taking the lens' focal length into account. However, you can often check the shutter speed that will be used in advance and, if necessary, adjust it with the front dial before shooting. The Program Shift will be applied to subsequent photographs until it is cancelled with the ONE PUSH AE button.

The rule of thumb is that your shutter speed should be at least the inverse of the (35mm sensor equivalent) focal length. So, for a 300mm lens on a micro four thirds camera (a 600mm equivalent focal length) you would look for a shutter speed of 1/600 second or faster. Image stabilisation can improve this by around 2 to 4 stops. You will have to experiment with the lens you are using to determine how slow a shutter speed you can manage. However, although image stabilisation lets stationary subjects be photographed in low light, it is not a substitute for a fast lens for photographing moving objects.

AF is activated by holding down AF ON (the AF/AE LOCK button). This is often referred to as '**Back button AF**'. It allows you to use one of two operating sequences, without changing any settings:

1. **Lock focus:** Locate the subject in the centre of the viewfinder and press **and release** AF ON (the AF/AE LOCK button) to lock the focus. Fully depress and hold the shutter button to take a sequence of photos with the focus locked at the set distance. You will obtain a higher frame rate, as the camera is not continually checking for focus, and there is no risk of the focus jumping to another object. Of course, your subject must remain at, or pass through, the focused distance.
2. **Track focus:** Locate the subject in the centre of the viewfinder and press **and hold** the AF/AE LOCK button to start focus tracking. Fully depress and hold the shutter button to take a sequence of photos, keeping the subject in the AF area. The camera will track focus on the subject.

Panorama mode

Turn the mode dial to . Access the settings for the Panorama mode through the PANORAMA SETTINGS sub menu on the REC menu. Set the direction to scan and whether you want a STANDARD or WIDE panorama.

To take a panorama, aim the camera at one end of the scene, press and hold the shutter button, and scan the scene slowly and steadily in the intended direction. It takes some practice to complete successful scans. If you are having problems, try moving to a shorter focal length (wider angle of view), slowing down your scan rate, and / or using a lens that focuses more quickly.

Summary of camera controls and capabilities

Exposure (Metering) Controls

Shooting modes

The shooting modes are (mainly) metering modes. Turn the mode dial to select a shooting mode:

- In program (P) shooting mode the camera selects the best combination of aperture and shutter speed. Turn the front dial to adjust the balance between shutter speed and aperture – this is known as ‘Program Shift’. A yellow arrowed indicator will be shown to the left of the aperture value. The rear dial controls exposure compensation. The custom modes in this manual only use program (P) shooting mode, for reasons discussed in [Appendix 2](#).

Any Program Shift will be applied to the next photograph. To cancel Program Shift, press the ONE PUSH AE button.

- In aperture priority (A) shooting mode you set the aperture using the front dial and the camera will set the shutter speed for correct exposure. The rear dial controls exposure compensation.
- In shutter-speed priority (S) shooting mode you set the shutter speed using the front dial and the camera will set the aperture for correct exposure. The rear dial controls exposure compensation.
- In manual (M) shooting mode you set aperture and shutter speed. See the appendix on [Manual Exposure](#).
- Intelligent Auto (iA) shooting mode is a fully automated ‘point-and-shoot’ mode. It may be all you need. It is not covered in this manual.
- The G7 also has SCENE and CREATIVE modes, which are not covered in this manual.

Metering modes

The metering modes control where the camera measures the exposure. Access these via the METERING MODE button (Fn3).

Multi-metering: The camera sets the most suitable exposure, taking into account the variation in brightness over the whole scene, the focus mode and where focus is obtained.

Centre-weighted metering: Takes an average meter reading weighted around the centre of the image.

Spot metering: Sets exposure at a point – a blue cross is shown at the point where exposure is metered. The location of the exposure point depends on the focus mode in use.

Photographers vary widely on how they like to use metering. The setup described in this manual provides a number of custom modes for different uses, each using appropriate metering modes. By starting from the custom modes you should find little need to change the metering mode. However, you may find you want to tweak which metering modes are programmed in the custom modes to match your own usage.

ISO speed

Press the ISO (cursor up) button and select AUTO ISO, intelligent ISO (iISO) or an ISO speed. Intelligent ISO increases the ISO setting when movement is detected in the scene. Adjust the ISO LIMIT for AUTO and iISO using the ISO LIMIT SET menu entry. You can also adjust the limit with the front dial whilst in the ISO menu. The ISO setting being used is displayed when the shutter is half depressed⁶.

A lens with a wider maximum aperture will let you use a lower ISO speed, with less noise.

The camera will produce images with the least noise if operated at as low an ISO speed as possible. A higher ISO speed will allow a faster shutter speed (with less motion blur) or operation in lower light.

If you can, use a tripod or other means of stabilising the camera, rather than using high ISO settings.

⁶ Except in Intelligent ISO, when the ISO setting is selected dynamically

Exposure lock

When using auto-metering, the exposure is taken and locked when you half-press the shutter button⁷ when using AFS focusing mode. It is not locked using AFF and AFC focusing modes, except when using the higher speed burst modes.

Beware, as once the exposure is locked the brightness of the display will vary as you recompose the image. Its brightness is always set for the whole of the image. So don't be confused – the exposure really has been locked!

Exposure compensation

If your intended subject appears to be over- or under-exposed look at the exposure histogram to see if values are all to one side or the other. One option is to adjust the exposure compensation so that your subject appears correctly exposed in the display and the histogram is more 'balanced'.

Rotate the rear dial to adjust the exposure compensation, increasing or decreasing the light reaching the sensor. Clicking on the rear dial will toggle the front dial to/from controlling flash exposure compensation (if Flash>'Auto Exposure Compensation' is set to ON) as well as showing a wide bar for the normal exposure compensation.

Exposure bracketing

You can take a series of photos with a range of exposures. Turn the DRIVE MODE dial to AUTO BRACKET. Select the number of shots and the EV separation on the AUTO BRACKET menu entry (Fn9 screen icon).

White balance and colour

Our eyes adjust to what we see depending on the light source illuminating the scene. Film is terrible at this but digital cameras are now good at determining the light source.

Press the WB (cursor right) button and select the white balance setting you require. Leave it on auto white balance (AWB) unless it fails to cope with specific lighting. If necessary, specify the type of lighting or program one of two custom white balance options by:

- Selecting one of WHITE SET 1 to WHITE SET 4 and then pressing WHITE SET.
- Fill the frame in the display with something white (a test card, paper ...) and then press SET.

You can also adjust the colour balance via the PHOTO STYLE menu entry. STANDARD should be fine for most purposes. There is also a Custom photo style.

Focusing Controls

Focus modes

You specify how auto-focus is obtained using the AF/MF switch and the AFS/AFF setting on the Q.MENU. The auto-focus modes are:

AFS: (single) focuses when the shutter button is half-depressed. In AFS focus mode, the camera will effectively switch to manual focusing if you press AF LOCK or turn the focus ring with the shutter button half depressed, so you may never need to turn on manual focusing.

AFF: (flexible) focuses when the shutter button is half-depressed and refocuses if the subject then moves, with no prediction. Higher power.

AFC: (continuous) focuses continually whilst the shutter button is half-depressed. Predicts where a moving object will be when the shutter opens. Highest power.

There are also QUICK AF and EYE SENSOR AF functions, which enable focusing **prior** to the shutter being pressed or when you put your eye to the viewfinder respectively. I leave these disabled.

⁷ You could program the AF/AE LOCK button to function as AE LOCK and press it to lock exposure. You would then half press the shutter button to lock focus before recomposing the image and taking the photo. However, I recommend using AF LOCK to lock the focus and the shutter button to lock the exposure.

Auto-Focus modes (and hinting at where to focus)

Press the left cursor button to select which auto-focus (AF) mode to use:

FACE DETECTION: Detects faces in the scene. If no faces are present 49-AREA mode is used.

AF TRACKING: Allows you to specify a (potentially moving) object to track and then maintains focus on it. Usually used with continuous auto focus (AFC). Centre the target in the centre of the screen on the object to track and half press the shutter button. The target should turn green when the object is accepted and you can release the shutter button. The target will turn yellow and track the object.

49-AREA: The camera chooses where to focus from among 49 areas across the scene.

CUSTOM: You can define which of the 49 areas will be used for focusing.

1-AREA: The camera focuses on a specific area, which is initially located at the centre of the scene, and which you can move and resize.

PINPOINT: The camera focuses on a specific point, which is initially located at the centre of the scene, and which you can move. When you half depress the shutter, an area around the focus point is enlarged for a short period to allow you to check focus. Not available with AFC.

You can provide a hint to each AF mode as to where to look for focus. Press FOCUS AREA SET and set the position (and size when relevant) of the AF frame, as described in the custom modes above.

- for FACE DETECTION AF mode, select a face;
- for AF TRACKING AF mode, select the object to track;
- for 49-AREA mode, select a region in the image;
- for CUSTOM AF mode, select or define a pattern from the 49 AF areas;
- for 1-AREA AF mode, move the area (use the rear dial to change its size);
- and for PINPOINT AF mode, move the focus point.

Focusing and focus lock

When using auto-focus, the focus is taken and locked when you half-press the shutter button⁸.

In AFS focus mode (but not AFF or AFC focus modes) you can adjust the focus using the focus ring on the lens, without switching to manual focus, in two ways:

1. Half press the shutter button to lock focus (and exposure) and keep it half pressed. You can then use the focus ring to adjust focus, although I find this rather fiddly and the next option far easier.
2. Before pressing the shutter button, press the AF/AE LOCK button⁹ to take and lock focus. You can then turn the focus ring without having to hold a button down. Exposure will subsequently be locked when you half press the shutter button, thereby separating where (and when) focus and exposure are locked.

Both of these options use manual focus, without having to switch to MF focus mode explicitly. Of course, if you need to focus fully manually you can switch to manual focus mode. Manual focusing operates as described in the previous paragraph: Select manual focusing (MF) on the MF/AF switch.

Specifying where focus and exposure are taken

If either correct focus or exposure is not being achieved on your intended subject, you can position the AF area, as described for the custom modes above, after pressing the FOCUS AREA SET button.

Alternatively, you can separately lock focus and exposure, as described above in [Focusing and focus lock](#).

⁸ Unless SHUTTER AF is OFF or you have already pressed AF LOCK to lock focus.

⁹ Programmed in the setup to function as AF LOCK. AF/AE LOCK HOLD is set to ON, so that you don't have to keep the AF/AE LOCK button depressed.

Where does auto-metering evaluate the exposure?

Where exposure is taken depends on the AF mode and the metering mode used, as shown in Table 2. Note that the combinations shaded in green in Table 2 explicitly link where focus and exposure are taken.

AF mode	Metering mode		
	Multi-metering	Centre-weighted	Spot metering
49-Area	Evaluative.	Average over the scene, weighted to the centre of the frame.	At the centre of the AF region.
Face Detection	On detected face.		At the centre of the image.
Tracking	On tracked object.		At the centre of the image.
1-Area	Evaluative.		At the centre of the AF area.
Pinpoint	Evaluative.		At the AF point.
Manual	Evaluative.		At the centre of the MF Assist region.

Table 2: Where exposure is taken for each combination of AF and metering modes

Other controls and settings

JPEG / RAW formats and image resolution

Access QUALITY on the Q.MENU to specify whether to capture in JPEG and / or RAW formats and the amount of compression to apply to JPEG files. I usually just take RAW images and process them on a computer. However, you may want to share photographs directly from your camera, in which case JPEG files are smaller. You can choose to capture both RAW and JPEG at the same time.

Access PICTURE SIZE via the Fn7 screen icon and ASPECT RATIO on the REC menu to set the resolution and aspect ratio of your images. I usually use the full sensor resolution (Large) and native aspect ratio (4:3). However, when EX. TELE CONV is enabled and in JPEG format, reducing the resolution reduces the effective sensor size and thereby narrows the effective field of view, and hence magnification, of the lens.

Drive mode: single shot, burst mode, AEB and self-timer

Turn the DRIVE MODE dial and select:

SINGLE: Takes one photograph when the shutter is fully depressed.

BURST: Takes a series of photographs. Access BURST RATE via the Fn8 screen icon. Choose from super-high (SH), high (H), medium (M) or low (L). The last two continue to display the scene between shots but the first two do not. [SH is only available using JPEG?]

4K PHOTO: Access 4K PHOTO via the REC menu and select 4K BURST, 4K BURST S/S or 4K PRE-BURST. See the Panasonic manual for details. All produce 8M pixel JPEG images.

AUTO BRACKET: Access AUTO BRACKET via the Fn9 screen icon. Select the number of shots and the EV separation.

SELF TIMER: Set the timer delay on the SELF TIMER menu entry on the Q.MENU: 10 seconds (one shot); 10 seconds (3 shots); or 2 seconds.

TIME LAPSE / ANIMATION: Turn the DRIVE MODE dial to TIME LAPSE / ANIMATION and immediately press MENU twice or touch the icon on the screen. The TIME LAPSE / ANIMATION menu will be displayed. Choose time lapse or stop motion animation. The menu entries are self-explanatory.

Image Stabilisation

Many Panasonic lenses (but, currently, only the 300mm Olympus lens) include optical image stabilisation (OIS). On most lenses this can be turned on and off with a switch on the lens. If there is no switch then you have to turn the OIS on and off through the STABILIZER menu entry on the Q.MENU. This also lets you choose whether the stabilisation is effective in all directions or (for if you are panning / tracking an object) only in one direction.

The G7 does not have in-body image stabilisation.

Flash

An on-camera flash can be switched on by raising the built-in flash using the release button or by attaching a flash to the hot shoe. The settings for the flash are shown in Table 8 in Appendix 1. I recommend setting FIRING MODE to TTL¹⁰ (through the lens) and enabling AUTO EXPOSURE COMPENSATION. The camera will control the flash output to (try to) obtain the correct exposure. The remaining settings for use in this mode are:

- FLASH MODE (via the Fn8 screen icon): NORMAL or SYNCHRO. The latter uses a long exposure to expose a dark background and the flash to illuminate a foreground object. You may need OIS or a tripod.
- FLASH SYNCHRO: 1st or 2nd curtain. That is, at the start of the exposure or at the end of the exposure. A classic use of 2nd curtain is to use a long exposure to capture the trails of moving lights and then for the flash to fire to freeze moving objects (such as cars) at the end of the exposure.
- FLASH ADJUST: This allows you to over- or under-expose the flash by up to 3 EV.

Press the button in the centre of the rear dial. The front dial will then let you control FLASH MODE and the rear dial FLASH ADJUST.


Using a wireless flash or group of flashes is similar, but more complex to set up. See the Panasonic manual and your flash gun manual for details.

Electronic shutter

Select ELECTRONIC SHUTTER on the Q.MENU to control the electronic shutter. When you switch it on the mechanical shutter is disabled, eliminating shutter noise as well as any risk of shutter shock. The 'electronic shutter' exposes rows of the image sequentially. Each row is exposed for the same length of time but not at the same time. As a result, images of moving objects can be distorted. On some cameras the electronic shutter readout is faster than on others (leading to less distortion) but has fewer bits of dynamic range. I *think* that the G7 has a "fast" electronic shutter (taking about 1/25 second to scan the image) and only provides 10-bit readout, compared to the 12-bit readout with the mechanical shutter.

Touch shutter

You can fire the shutter by touching your subject on the screen. To do so:

- Display the screen icon buttons, if not already visible, by touching the < tab.
- Enable TOUCH SHUTTER by touching the  icon. The cross on the icon will disappear and the icon will turn yellow.
- Compose the photograph and touch the position on the screen where you want to take focus and exposure.
- The camera will take the photograph.
- When you don't need the icon buttons, close the tab by touching > on the tab.

Previewing depth of field and motion blur

The Fn10 screen icon is programmed to act as a PREVIEW button, to let you see the effects of aperture and shutter speed on depth of field and motion blur before taking a photograph. This used to be very useful on a film camera to avoid wasting film, but I don't use it much anymore with digital cameras. It's just as fast to take the picture and review the depth of field and motion blur on the display.

When you press PREVIEW once you will see a preview of both depth of field and motion blur ('Shtr Speed Effect On' is shown). Pressing it a second time displays only the depth of field ('Shtr Speed Effect Off' is shown). In both cases, the physical aperture of the lens is shut down to the selected aperture. Pressing PREVIEW a third time switches off preview display – the aperture is fully opened again.

¹⁰ If you set FIRING MODE to MANUAL you have to vary the flash output using MANUAL FLASH ADJUST and experiment to get the correct exposure.

Appendix 1: Configuring your camera

1. Configure the Menu Settings

Set the mode dial to P shooting mode. Press MENU and open each of the following menus in turn. Configure each setting, using the suggested default (you can change settings later). Settings on the SETUP menu rarely need changing. Those on the CUSTOM menu are accessed more and those on the REC menu are accessed most frequently. Settings are shaded as follows:

Dedicated buttons, dials, Fn buttons or Fn icons.	Q.MENU (see below).
Needed – access via full MENU.	Rarely changed after setup.

The SETUP Menu

	Options	Comments / instructions
CLOCK SET		Set the time, data and format.
WORLD TIME		Set home and destination time zones.
TRAVEL DATE	TRAVEL SETUP: LOCATION:	Off, or departure and return dates. Off, or location in text.
Wi-Fi		Wi-Fi settings.
LIVE VIEW MODE	30 / 60 fps	Frame rate of display.
BEEP	OFF and x levels	Volume of the beep and electronic shutter sound.
MONITOR / VIEWFINDER		Adjusts brightness / colour of the display in use.
MONITOR LUMINANCE	A / 1 / 2 / 3	Auto adjust / bright / standard / dark.
ECONOMY (1): SLEEP MODE: AUTO LCD OFF:	OFF, 1, 2 , 5, 10min. OFF, 15, 30sec	Half press shutter button to wake. If not OFF then SLEEP MODE is set to 2 min.
USB MODE	PC / Pictbridge / choose	Connect USB to PC or printer.
TV CONNECTION (OUTPUT)	NTSC / PAL, 16:9 / 4:3 aspect ratio, AUTO HDMI	
	VIERA Link: OFF/ ON	Panasonic's HDMI CEC implementation.
	3D/2D	Play 3D images in 3D or 2D.
MENU RESUME	OFF / ON	Opens each menu at last-used item.
MENU BACKGROUND		Set background colour for menus.
MENU INFO.	OFF / ON	Short help displayed.
LANGUAGE		Choose language.
VERSION DISP.		Displays firmware version of camera and lens.
EXPOSURE COMP. RESET	OFF / ON	Resets EC on mode change and power off.
NO. RESET		Resets file no. to 1 and increments folder no.
RESET		Resets REC/SETUP/CUSTOM menu settings.
RESET Wi-Fi SETTINGS		
PIXEL REFRESH		See the Panasonic manual.
SENSOR CLEANING		See the Panasonic manual.
FORMAT		Formats the memory card, deleting all contents.

Table 3: The SETUP menu – recommended settings in BOLD

Note (1): The ECONOMY function allows you to set the camera to switch off the display and/or enter standby after a period. It can greatly extend battery life. Press any button to restore the display. To return from standby half press the shutter button.

	Options	Comments / instructions
ASSIGN DIAL	Front F / Rear SS	Set front dial to F and rear dial to SS. (M mode.)
ROTATION	Direction	Change if you don't like the standard direction.
EXPOSURE COMP.	Rear dial.	F or SS on front dial in P, A and S modes.
DIAL OP SWITCH SETUP		Set front dial to FLASH MODE and rear dial to FLASH ADJUST.

Table 4: The Dial Set sub-menu – recommended settings in BOLD

The CUSTOM Menu

	Options	Comments / instructions
CUST. SET MEM		Stores current setting to one of the custom modes.
SILENT MODE	OFF / ON	Disables all sounds and light output.
AF/AE LOCK	AE/ AF /AF+AE/AF-ON	AF/AE LOCK button locks exposure, focus, both or engages AF.
AF/AE LOCK HOLD	OFF / ON	Off: Lock only held whilst Fn1 pressed (if configured). On: Pressing AF/AE LOCK engages / disengages lock.
SHUTTER AF	OFF / ON	On: Pressing shutter button halfway locks focus.
HALF PRESS RELEASE	OFF / ON	Shutter fires when button pressed halfway.
QUICK AF	OFF / ON	Focus continually at all times (before shutter pressed).
EYE SENSOR AF	OFF / ON	Focus continually when eye sensor activated.
PINPOINT AF TIME	SHORT / MID / LONG	Time enlarged when in pinpoint AF mode.
PINPOINT AF DISPLAY		Window or full AF assist screen in pinpoint AF mode.
AF ASSIST LAMP	OFF / ON	On: Lamp assists AF in low light conditions.
DIRECT FOCUS AREA	OFF / ON	Changes cursor buttons to move (and rear dial to adjust size of) the AF area. <i>Standard function of buttons is lost.</i>
FOCUS/RELEASE PRIORITY	FOCUS /RELEASE	Focus: Picture only taken once in focus. Release: Picture taken even if not in focus.
AF+MF	OFF / ON	On: Allows manual focus after AF (AFS mode only).
MF ASSIST	OFF / AF button / focus ring / either	Enlarges part of image when AF mode button pressed, focus ring turned, or either.
MF ASSIST DISPLAY		Window or full MF assist screen.
MF GUIDE	OFF / ON	Enables a guide bar showing relative zoom.
PEAKING	OFF / ON	In focus regions highlighted during MF.
HISTOGRAM	OFF / ON	Display of the histogram. Position it after turning on.
GUIDE LINE	OFF / grid choice	Sets the pattern of guide lines displayed when shooting.
CENTER MARKER	OFF / ON	Displays a cross in the centre of the screen.
HIGHLIGHT	OFF / ON	Clipped areas blink during review and playback.
ZEBRA PATTERN		Zebra pattern shows overexposed areas.
MONOCHROME LV		Black and white monitor display.
CONSTANT PREVIEW	OFF / ON	Shows effect of aperture / exposure (in M mode).
EXPO.METER	OFF / ON	Displays the large exposure meter – underexposed in red.
LVF DISP.STYLE	Border on/off	Choose the icon with no black border and a row of dots at the top and bottom.
MONITOR DISP.STYLE		
MONITOR INFO. DISP	OFF / ON	Adds an info screen to those toggled by the DISP button.
REC AREA	Still / Video	Crops display to 4:3 for still and 16:9 for video.
REMAINING DISP.	Shots / Time	Which to display as remaining on memory card.
AUTO REVIEW	Off / time / HOLD	Time that picture is displayed for review.
Fn BUTTON SET		Assign functions to Fn buttons.
Q.MENU	PRESET / CUSTOM	Enables customisation of Q.MENU.
DIAL SET	Sub-menu	See Table 4.
VIDEO BUTTON	OFF / ON	Enables video button. Use movie mode & shutter button.
POWER ZOOM LENS		See Panasonic manual on power zoom lenses.
EYE SENSOR	LOW /HIGH, Man/ Auto	
TOUCH SETTINGS	Sub-menu	See Table 6.
TOUCH SCROLL	H / L	High or Low speed scroll in playback.
MENU GUIDE	OFF / ON	Selection screen on switch to SCN/CUSTOM modes.
SHOOT W/O LENS	OFF / ON	Switch on with lenses / lens adaptors that have no contacts.

Table 5: The CUSTOM menu – recommended settings in **BOLD**

	Options	Comments / instructions
TOUCH SCREEN	OFF / ON	Enables or disables the touch screen.
TOUCH TAB	OFF / ON	Enables or disables to tabs to the right of the touch screen.
TOUCH AF	OFF / AF+AE / AF	On: AF point or AF and AE points can be set by touching the screen.
TOUCH PAD AF	OFF / OFFSET / EXACT	Enables touch on screen to move AF point whilst using the viewfinder.

Table 6: The Touch Settings sub-menu – recommended settings in BOLD

The REC (still photography) menu

	Options	Comments / instructions
PHOTO STYLE (2)	STANDARD , VIVID ...	Six plus custom to choose from. Use STD and post process.
FILTER SETTINGS		Settings for image effects (filters).
ASPECT RATIO (1)	4:3 , 3:2, 16:9, 1:1	Set to 4:3 and post process.
PICTURE SIZE (1)	L, M, S 4:3 :	L: 4592x3448, M: 3232x2424, S: 2272x1704 pixels.
QUALITY	FINE, STD, RAW	FINE and STD are JPEG. Can save both JPEG and RAW.
AFS / AFF	AFS / AFF	Standard or fast AF mode.
METERING MODE (2)	Multiple: Centre-weighted: Spot:	Camera evaluates the scene – linked to focus AF mode. Whole image, but weighted to centre. At the spot metering cross point.
BURST RATE	SH / H / M / L	20, 4, 3, 2 frames / sec. SH uses JPEG S picture size (via Drive Mode).
4K PHOTO		See Drive Mode dial description.
AUTO BRACKET	SETTINGS/STEP/ SEQUENCE	Bracket or not / how many shots – EV step / order of exposures.
SELF-TIMER	10s, 10s x3, 2sec	10s x3 takes 3 shots after a 10 second delay.
TIME LAPSE / ANIM.	Sub menu	Program time-lapse photography and stop motion animation.
HIGHLIGHT SHADOW		Allows adjustment of highlights and shadows
I.DYNAMIC (2)	OFF /LOW/STD/HIGH	Adjusts to cope with extreme high / lowlights in the image.
I.RESOLUTION	OFF /LOW/STD/ HIGH/EXTENDED	Varies JPEG compression and sharpening depending on the image.
iHANDHELD NIGHT SHOT		Night scenes composed from a burst of photos.
IHDR		Enable and control automated HDR (iA mode?)
HDR	Sub menu	Enable and control HDR – JPEG only.
MULTI EXP.	Sub menu	Enables multiple exposures onto one image.
PANORAMA SETTINGS	Sub menu	Only active in Panorama mode – can access settings from tab.
ELECTRONIC SHUTTER	OFF / ON / AUTO	On: Disables the mechanical shutter.
SHUTTER DELAY	0 , 1, 2, 4, 8 sec	Delay shutter firing after shutter button pressed.
FLASH	Sub menu	See Table 8.
RED-EYE REMOVAL	OFF / ON	Corrects red-eye in firmware in camera.
ISO LIMIT SET	OFF or value (3200)	Upper ISO limit in ISO AUTO and iISO. (access via ISO button).
ISO INCREMENTS	1/3 EV / 1 EV	User can select ISO in 1/3EV or 1EV steps.
EXTENDED ISO	OFF / ON	Extends ISO up to 25600.
LONG SHTR NR	OFF / ON	Applies more noise reduction at slow shutter speeds.
SHADING COMP.	OFF / ON	Corrects lens vignetting (shading in corners).
DIFFRACTION COMP.	OFF / ON	Attempts to correct for diffraction at small apertures.
EX. TELE CONV.	OFF / ZOOM / TELE CONV	JPEG only. Crops pixels from centre of image – use PICTURE SIZE to control the magnification. Also has settings for Video.
DIGITAL ZOOM (2)	OFF / 2x / 4x	Uses central pixels and interpolates to upscale. Use ETC.
COLOR SPACE	sRGB / AdobeRGB	Smaller / larger colour space.
STABILIZER	OFF / ON / PANNING	PANNING only compensates for vertical movement.
FACE RECOG.	OFF / ON / MEMORY	Not covered in this manual.
PROFILE SETUP	OFF / options	Not covered in this manual.

Table 7: The REC menu – recommended defaults in BOLD

Note (1): On the Q.MENU, ASPECT RATIO and PICTURE SIZE are combined in PICTURE SETTING.

Note (2): PHOTO STYLE, FOCUS MODE, METERING MODE, I.DYNAMIC and DIGITAL ZOOM are common to the REC and MOTION PICTURE menus. Changes can be made on either menu.

	Options	Comments / instructions
FIRING MODE	TTL / MANUAL	Through the lens metered or manual control (only if wireless off).
FLASH MODE	NORMAL / SYNCHRO / OFF	Synchro uses long exposure for background. Both with or without red eye reduction.
FLASH SYNCHRO	1ST / 2ND CURTAIN	Flash fires at start or end of exposure (only if wireless off).
FLASH ADJUST	-3EV to +3EV	Additional adjustment of flash (only in TTL mode and if wireless off).
AUTO EXPOSURE COMP	OFF / ON	On: flash output linked to exposure compensation.
MANUAL FLASH ADJUST	Fractions of output	Sets flash output to fraction of full output (only in flash manual mode).
WIRELESS	OFF / ON	Disables / enables wireless IR flash control.
WIRELESS CHANNEL	1CH, 2HC, 3CH or 4CH	Set camera and flash to same channel (only if wireless on).
WIRELESS FP	OFF / ON	Disables / enables using FP flash on gun (only if wireless on).
COMMUNICATION LIGHT	LOW/ STANDARD /HIGH	Set output power of IR communication light (only if wireless on).
WIRELESS SETUP	Sub menu	Sets operation of flash and wireless flash groups (only if wireless on).

Table 8: The Flash sub-menu – recommended settings in BOLD

WIRELESS SETUP allows you to set FIRING MODE and FLASH ADJUST (or MANUAL FLASH ADJUST) for the built-in flash and for each of three wireless groups (A, B and C). See your flash gun manual for more details.

2. Configure the Function Buttons

The G7 has seven fixed function buttons (video, AF/AE LOCK, PLAYBACK, DISP, ISO, AF MODE and WHITE BALANCE), an AF/MF switch, six programmable function buttons, three fixed screen icon buttons and five programmable screen icon buttons. To program a function button:

- Choose FN BUTTON SET from the CUSTOM menu (or press Fn on the 'control screen').
- Choose 'Setting in REC mode'.
- Select the function button or screen icon you wish to program using the cursor keys or touch screen.
- Press MENU/SET.

Program the function buttons and icons as follows:

Button, icon or menu	Function	Comment
Fixed on AE/AF LOCK button	AE/AF LOCK	AF-ON for custom mode C ₃ .
Fn1 button.	ONE PUSH AE	
Fn2 button (marked Q.MENU)	Q.MENU	
Fn3 button (cursor down button)	METERING MODE	Next to AF MODE
Fn4 button (lower left)	FOCUS AREA SET	
Fn5 button (marked LVF)	EVF / LCD toggle	
Fn6 screen icon	Wi-Fi	
Fn7 screen icon	PICTURE SIZE	
Fn8 screen icon	BURST RATE	
Fn9 screen icon	AUTO BRACKET	
Fn10 screen icon	PREVIEW	
Fn11 button (centre of rear dial)	DIAL OPERATION SWITCH	FLASH MODE / ADJUST on front / rear dials.
Fixed screen icon 1	TOUCH SHUTTER	
Fixed screen icon 2	TOUCH AE	
Fixed screen icon 3	PEAKING	

Table 9: Setup for function buttons and icons

Set the AF/AE LOCK button to AF LOCK for custom modes C₁ and C₂ and to AF ON for custom mode C₃ (see below and the section on custom modes).

3. Configure the Q.MENU

To customise the Q.MENU:

- Press Q.MENU to display the quick menu.
- Press the down cursor button or touch the EDIT Q icon at the lower left of the display.
- Accept the instructions, if they are displayed, by pressing SET/MENU or half pressing the shutter.
- Drag functions from those available in the top panel to where you want them in the bottom panel. The top panel has four pages of available functions. The bottom panel has the same three pages as the Q.MENU. If you drop a function over one already present on the bottom panel then the existing one will be moved back to the top panel.
- Drag any function you want to delete from the Q.MENU from the bottom panel and drop it in anywhere on the top panel.
- Press EXIT or half press the shutter button to complete programming the Q.MENU.

I recommend mapping just five functions to the Q.MENU, as shown in Table 10, making it faster to use than if all fifteen entries are filled.

STABILIZER	AFS/AFF	SELF-TIMER	QUALITY	ELECTRONIC SHUTTER
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Table 10: Setup of the Q.MENU

4. Configure the CUSTOM modes

Any changes you make to the function settings for the PASM and iA shooting modes are retained as you switch between these modes and when you turn the camera off. This has the advantage that you don't lose any changes you make. However, it can be hard to remember where you left the settings and you may have a lot of changes to make for a new situation.

You can only store 3 sets of function settings away as custom modes on the G7 (compared to 5 sets on the GX7). Changes you make to the function settings of a custom mode are NOT retained as you switch between modes or switch power off. When you return to a custom mode the settings will be as you last saved them for that mode. Each custom mode should address a particular situation that you encounter a lot. It may also provide a good starting point from which a few function changes can be made to address other situations.

One factor that influences how to set up the custom modes is that you cannot change between PASM modes without using the mode dial. That is, you cannot start from, say, a custom mode using aperture priority (A) shooting mode and change to shutter priority (S) shooting mode. Because of this it is worthwhile programming at least one custom mode for each of the PASM modes that you use regularly.

Table 11 provides settings for the four custom modes described in the text. Choose three of these and program them onto the three custom modes, as follows:

- Set the mode dial set to P shooting mode and make sure that you have set each function to the defaults described in 'Configure the menu settings'. Also check that you have configured the function buttons and Q.MENU as described above.
- Work through the columns in Table 11 one at a time. For each column, set the mode dial to P, A or S and set each function as shown in the table. Store the setup to the custom mode that you want to store the setup to, using the CUST SET MEM entry on the CUSTOM menu.

Custom mode:	C ₁	C ₂	C ₃
Usage:	General / people	Specify subject	Sport / Movement
PASM MODE	P	P	P
METERING MODE	MULTI	SPOT	SPOT
AF MODE	FACE (+) DETECTION	1-AREA	1-AREA
FOCUS MODE	AFS	AFS	AFC
QUALITY	RAW	RAW	JPEG FINE
ISO	AUTO	AUTO	AUTO
ISO LIMIT SET	3200	3200	OFF
DRIVE MODE	SINGLE	SINGLE	BURST
BURST RATE	M	M	M
WIRELESS FLASH	OFF	OFF	OFF
AF/AE LOCK BUTTON	AF LOCK	AF LOCK	AF-ON
AF/AE LOCK HOLD	ON	ON	OFF
TOUCH AF	OFF	OFF	OFF
TOUCH PAD AF	OFFSET	OFFSET	OFFSET
SHUTTER AF	ON	ON	OFF
QUICK AF	OFF	OFF	Must be OFF

Table 11: Custom mode settings

(+) FACE DETECTION AF mode reverts to 49-AREA mode if a face is not detected.

You can often start from one of the custom modes and quickly change one or two settings to meet specific needs, rather than starting from scratch. For example, starting from the 'Movement' custom mode you could change from 1-AREA AF mode to AF TRACKING mode and from SPOT to MULTI metering mode to track a moving object.

Appendix 2: Choice of P, A and S modes

There are advantages in choosing to use P mode, A mode or S mode. Which should you use and why? This is a very personal choice and there is no correct answer.

In the past, I have set cameras up to use A mode for portraits and landscapes (I want to control the depth of field), S mode for moving subjects (I need to ensure the shutter speed is fast enough) and P mode for 'opportunistic shooting' (where I want to be able to capture shots quickly).

However, my experience with Lumix G cameras has affected my thinking on this, although I've not yet fully made up my mind:

- P mode on the cameras seems to do an excellent job of choosing an appropriate shutter speed. For example, it uses faster shutter speeds at longer focal lengths.
- In P mode, I note the aperture and shutter speed in the display and shift them if necessary by turning a dial, just as I would in A or S mode.
- In A and S mode I still miss shots (as I always did) because I don't have an appropriate aperture (or shutter speed) selected and don't have time to change it.

In addition, the continually increasing dynamic range of digital sensors has made achieving a 'perfect' exposure in camera less critical than it was – much can often be done in post. I now concentrate far more on focusing accurately.

Given these factors, I am experimenting with using P mode at all times. If you want to use A and S modes then you are right. Just update the relevant tables in this manual and program your camera accordingly.

Appendix 3: Manual Exposure

When the mode dial is set to M shooting mode, metering is fully manual. Vary the shutter speed, aperture and ISO to adjust for correct exposure on the small exposure indicator (in the location of the exposure compensation indicator) or the larger exposure meter (which you can enable via the CUSTOM menu). If desired, press DISP until you reach a display screen that shows the exposure meter. Now:

- Set the aperture with the front dial.
- Set the shutter speed with the rear dial.

Appendix 4: TRACKING AF mode

In TRACKING AF mode, the camera attempts to track a selected moving object and maintain focus on it. I've had more success with the approach described above and this section is included for completeness. It is not programmed to a custom mode.

TRACKING AF mode should be used in conjunction with MULTI-METERING. Focus and exposure will then be taken on the subject as it moves.

1. Set the magnification with the zoom ring if using a zoom lens.
2. Either:
 - Position the AF tracking frame over the object to be tracked and half press the shutter button to lock onto it. The AF frame will turn green when the camera has locked on.
 - Or touch the object to track on the screen. A yellow AF frame will appear when the camera has locked on.

For both cases: if lock fails the AF area will flash red; the AF area will remain yellow while the subject is being tracked; and you can cancel the tracking lock by touching OFF on the screen or pressing the SET button.

3. Half press the shutter button. A green frame will be shown where focusing has been achieved and the frame will track the moving object.
4. Fully press the shutter button to take a burst of photographs with the subject being tracked to maintain focus and exposure.

Appendix 5: Accessing shutter count

1. Insert a fully charged battery and insert a SD memory card.
2. Confirm that the camera is not intelligent auto mode [iA] or intelligent auto plus mode [iA+]. If the unit is in intelligent auto mode [iA] or intelligent auto plus mode [iA+], it does not display the initial settings menu.
3. Select AFS focus mode (not sure this is necessary).
4. Turn the power off.
5. Press the [AF/AE LOCK], [DISP] and [RIGHT CURSOR] buttons simultaneously and turn the power on. You can check you are in service mode by going to Menu - Setup – if so, page 6 will have a "ROM BACKUP" option.
6. Press the [AF/AE LOCK], [MENU/SET] and [LEFT CURSOR] buttons simultaneously once. Error codes will start to scroll down the screen.
7. Press the [AF/AE LOCK], [MENU/SET] and [LEFT CURSOR] buttons simultaneously again. An information page will appear.
8. Then press [DISPLAY] repeatedly to toggle between two information pages. One shows the shutter count and the camera number, etc.
9. Press the ([AF/AE LOCK], [MENU/SET] and [LEFT CURSOR]) buttons simultaneously again to return to the normal display and turn off the camera.