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OLYMPUS

OM
SYSTEM

MANUAL FOR
FLASHPHOTO GROUP

• Table of Contents	1	• Ultra High-Speed Flash Photography	10	• Ring-flash Photography . . .	19
• The Pleasures of Flash Photography	3	• Multiple Flash Photography	11	• Daylight Synchronization .	21
• Direct Flash Photography .	6	• Exposure Compensation . .	14	• Characteristics of the OM Flashphoto Group	23
• Bounce Lighting	7	• Close-Up Flash Photography	15	• Flashphoto Group System Chart	25
• Diffused Lighting	9				



- Types of Lightings,
Selection of Flash Mode
and Basic Assemblies
 - On-camera flash
 - On-grip flash
 - Multi-flash
 - Close-up flash 27~32
- Selection of the
Flash Mode 33
- Selection of the Camera . . 35
- Selection of the Flash Unit 38
- Selection of the Mount . . 43
- Selection of the
Power Source 45
- Selection of Cords and
Cases 48
- Combination with Units of
Other Groups 49
- In this booklet "OM-2" repre-
sents the OM-2N and OM-2 cam-
eras; and "OM-1", the OM-1N
and OM-1.



A remarkable number of people have the idea that flash photography is difficult. However, the whole point of flash is to make photography easy when lighting conditions are poor. Nonetheless, it must be admitted that, with conventional manual flash units, the annoying problem of calculating the exposure setting according to the guide number made the use of flash troublesome for many photographers. This problem was solved with the introduction of automatic flash units. Flash units able to get the right exposure automatically, in the same way as automatic cameras, eliminated the need for time-consuming calculations and made flash photography a much faster, more positive business.

For most beginners, shooting in dim light is a big problem, because slow shutter speeds inevitably result in blurred pictures.

Equally, color photography in artificial light, such as fluorescent lighting, frequently leads to disappointing pictures because the color balance is distorted. In both these circumstances, electronic-flash photography is the answer. Without having to worry about camera shake or poor color balance, the photographer can shoot with confidence. "In dim light, use an electronic flash." is a maxim that has rapidly become accepted as the best method for beginners to keep failures to a minimum.

There are several reasons why electronic flash has become accepted as the best form of artificial lighting for photographers, and therefore grown widely popular. ❶ Because the color and quality of electronic flashlight closely resemble those of sunlight, normal daylight color film can be used without the need for special filters, etc. ❷ Be-

cause electronic flash is extremely fast, even rapidly moving subjects can be stopped and captured without any blurring. ❸ The compact size of electronic flash units makes them easy to carry, while the fact that they contain their own power source means they can be used anywhere. ❹ Because the flash emission is so powerful, the lens aperture can be closed down far enough to guarantee sharply focused pictures. ❺ Because electronic flash units give several hundred flashes with one set of batteries, or one recharging, they are also very economical.

These features have led to electronic flash being called "portable sun". What is more, whereas the real sun will not change its brightness and position to suit the photographer's requirements, electronic flash can be freely controlled to provide precisely the illumination desired. Thus, by

making available light of pre-determined quality and intensity, wherever and in whatever direction required, electronic flash actually makes photography easier.

That is not all. The extremely short duration of the flash emission means the person you are photographing is not inconvenienced by the brilliant light or heat of, for example, studio lamps. Therefore babies, children or pets can be captured naturally. This makes electronic flash almost indispensable for casual family photography.

Apart from these general applications, electronic flash is also a highly valued expressive tool for the experienced cameraman. Among the many ways in which flash can help him achieve better pictures are daylight synchronization to relieve the shadows with backlit subjects and reduce excessive contrast in harsh sunlight,



bounce flash, diffused lighting, the use of several flashes at the same time, etc. These capabilities enable him to gain a new mastery over the creative process.

In addition, recent automatic flash units have opened up entirely new possibilities in the field of close-up photography. With a flash duration of as little as 1/40,000 sec., they can stop movement far too quick to be noticed by the human eye. For instance, by sharply capturing the wing movements of small insects or birds, they can reveal to us a side of nature we could appreciate in no other way.

Normally extreme close-up photography is very difficult. The lens must be stopped down to get adequate depth of field, and slow shutter speeds become inevitable even though the subject is probably moving or blowing in the wind. The use of compact electronic flash completely

changes the picture, by allowing the lens aperture to be closed right down for adequate depth of field and at the same time flashing fast enough to eliminate all risk of movement spoiling the photograph.

The Flashphoto Group, by providing automatically controlled lighting, makes a whole range of versatile techniques easy, and should prove of the greatest interest to the photographic community. (Akio Kojima)

whole room into sharp focus, or make the main subject stand out from the background.

(Akio Kojima)

Direct flash photography involves pointing the flash unit directly at the subject from the same direction as the camera. In most cases the flash unit is fitted directly into the camera accessory shoe.

When the flash unit is held or fixed close to the camera lens, the subject will be brightly lit with few shadows, as in the example shown here. However, the further the flash unit is away from the lens, the bigger the risk of strong shadows thrown by the main subject onto the background. Bear in mind also that if the flash unit is pointed directly at a mirror or similar reflective material, harsh flash reflections will enter the camera lens directly.

For normal souvenir photographs and records, this kind of bright, direct frontal lighting is ideal. And by varying the F stops, the photographer can bring the





The strong directional effect makes the light harsh in quality. This is fine for photographs that require only clear, sharp illumination, but unsuitable for softer, more lyrical treatment that makes use of the interplay of shadows in the overall composition. Generally bounce lighting is used: ① to obtain a soft lighting effect, ② to bring out a three-dimensional effect through the exploitation of a full range of tone gradations, ③ to reduce light volume to balance brightness levels with main light, and ④ to scatter light to cover the picture area of wider-angle lenses. Two bounce lighting methods are possible with the OM System Flashphoto Group units. As shown in the illustration at right, the simple method uses the Electronic Flash T32 clipped on the camera, with the flash surface turned up toward the ceiling so that the subject is illuminated

by soft, reflected light.

In the more advanced method, the T45 is used, or the T32 is slipped into the hot shoe of the Power Bounce Grip 2, with the bounce head rotated to the right or left, or tilted back ward pointing at a wall. The sidelighting method gives more natural, three-dimensional results than those obtained by the simple method above. Accurate and easy sidelighting can be achieved by exploiting the TTL Centralized Control Flash capability of the OM-4 (OM-2). A word of warning when you are using bounce flash: If the ceiling or wall you are using to bounce the light is colored, this will have an effect on the color of the photograph. In manual flash mode, correct exposures for bounce lighting cannot be calculated by guide numbers, as the reflection factors of the walls, ceilings, etc. are not constant. (Akio Kojima)



When a translucent piece of cloth or some similar material is placed between the flash and the subject, the result is known as diffused lighting. The purpose of this method is mainly: ① to convert the electronic flash (a point source) into a surface source to obtain a soft lighting effect, ② to scatter the light to match the coverage of wide-angle lenses, and ③ to illuminate the subject with different quality light by the aid of color filters, polarizing filters, etc. Covering the flash unit directly with a handkerchief will scatter the light and increase the angle of illumination, but the soft lighting effect cannot be obtained. For this effect it is advisable to keep the diffuser at a suitable distance (at least 40cm) from the flash, and make sure the area of the diffuser is large enough.

(Akio Kojima)



The flash duration of an ordinary compact electronic flash is a fraction of one hundredth of a second at full power flash. However, an **automatic** flash operating at close distances adjusts the flash emission automatically by cutting it off to achieve the correct exposure, thereby reducing flash duration even further. At very close distances the flash duration is reduced to extremely short times measured in fractions of one ten-thousandth of a second. We are able to make use of such ultra fast flash emissions to stop and capture on film movement far too fast to be perceived by the human eye. Examples are the wings of an insect in flight, or the bursting of a balloon.

Getting the split-second timing right for such photographs is extremely difficult, but success well repays the effort involved.

(Akio Kojima)



Because of its nature, electronic flash is often used for snapshots, photographs of moving subjects, informal shots of special events and other situations where there is not enough available light to provide a fast enough shutter speed. But tungsten lighting is considered more appropriate where elaborate and suitable lighting is required. Electronic flash, however, is compact and can produce a large volume of light instantaneously. It is also more advantageous than tungsten lighting from the viewpoints of portability and ease of handling. For these reasons, multiple electronic flash set-ups have recently become widely used.

When two or more electronic flash units are used together, exposure cannot be simply calculated from the guide numbers, nor is normal automatic exposure control possible. This exposure calculation is an obstacle to mul-

multiple flash photography.

This troublesome problem can now be solved by using the TTL Auto Connector, TTL Auto Cord and TTL Auto Multi Connector with the Olympus OM-4 (OM-2). All of the light from the electronic flash units illuminating the subject enters through the camera lens and the amount of light from each individual flash unit is centrally controlled by this system. The following are some uses of multiple flash photography.

- ① When only one key, or main, light is used a special auxiliary light can be used to eliminate the shadow on the background.
- ② For lighting with one key light from the side to show the form, a second auxiliary light can be used to keep the shadow side of the subject from being too dark and to produce the desired contrast.
- ③ A part of the subject can be

emphasized by creating highlights using strong, direct lighting. This is called accent lighting.

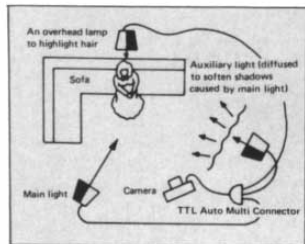
- ④ For subjects where the light from the camera position is not sufficient to illuminate the back part, other flash units can be placed in the back as auxiliaries.

Under actual conditions, the above methods can be combined to produce effective lighting that meets individual purposes and needs.

A technical point to consider in the use of multiple flash lighting is to previsualize the lighting effect and arrange the flash units according to a plan. The effect of the light from an electronic flash unit cannot be checked by eye; therefore, the ability to previsualize through experience is the only way. If you remember the rules of direct and reflected light, which are the basic types,

you will find that being able to previsualize the lighting effect that will be produced by any arrangement of lights is not that difficult.

One important factor in the use of multiple lighting is to use care concerning the balance between the main and auxiliary lights. One method of adjusting balance is to vary the distance from the flash to the subject, using the rule that light intensity is inversely proportional to the square of the distance. In other words, moving a flash two times



its original distance, from the subject will cut the light reaching the subject to a quarter. Another method is to weaken the intensity by using a diffuser or bounce flash, or to place a ND filter or soft white cloth over the flash head. It is best to avoid overlapping of the light from flash units of the same strength coming from different directions. This doubling of the light produces an unnatural effect.

Electronic flash units are often used as accent lights from the back or at an angle.

Thinking up an electronic flash arrangement where the effect of the total reflection from the surface of the subject has been calculated takes skill. Such arrangements frequently have flash units faced toward the camera, so care must be exercised to prevent halation.

The use of electronic flash for

multiple lighting encompasses many difficult problems such as these and some experience is required. But let's say that learning and using these advanced techniques can be as interesting as the resulting photographs.

(Akio Kojima)

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- ② The main subject is distant from the background wall, etc. (see the picture shown here).

(Akio Kojima)

Just as any automatic EE camera needs exposure compensation in certain conditions, the same compensation is necessary even with TTL Auto flash in the following subject conditions. The compensation is made simply by turning the exposure compensation dial on the OM-4 (OM-2) to the plus (+) or minus (-) side before shooting. Compensation for underexposure (turning the dial toward the plus side) is necessary when:

- 1 A bright background such as a white wall fills most of the viewfinder picture area.
- 2 Taking highly reflective subjects such as a person in white clothes or a picture in which specular objects are included.

Compensation for overexposure (turning the dial toward the minus side) is necessary when:

- 1 A black background or dark sky occupies most of the central area.



● The Need for Flash in Close-Up Photography

Electronic flash is extremely useful in close-up and macro-photography. It is especially effective for the photography of small moving creatures such as insects. One reason is that the use of extension tubes or bellows to magnify the subject greatly increases the exposure factor. Another is that, even using the same aperture as that for normal portraits, etc., the depth of field becomes exceedingly shallow, more or less restricting photography to motionless subjects. With the use of electronic flash, photography is possible even at such minimum apertures as F22, while the incredibly high speed of electronic flash is effective both in arresting fast moving subjects and in countering loss of quality from camera movement.

● The Drawbacks of Conventional Electronic Flash

However, although in theory electronic flash is ideal for close-up photography, in fact conventional flash units have several serious drawbacks. The worst is the difficulty of calculating correct exposure settings at close distances. Conventional flash units allow exposure calculation by the use of the guide number at distances above one meter, but with the higher magnifications and smaller apertures required for close-up pictures the system becomes unworkable, and getting the flash-to-subject distance and flash setting right becomes a matter of trial and error. Thus the photographer is obliged either to fix the flash-to-subject distance and vary the aperture, or fix the aperture and vary the flash-to-subject distance until repeated tests and experience show the correct exposure

values. Even then the results are not fully satisfactory because the differing reflection factors of different subjects modify ideal exposure requirements. In fact, the only way to get perfect exposures is by continuous testing for each new subject. Naturally, if a different film is used, the tests must be repeated over again. This makes the use of conventional electronic flash units for close-up photography extremely complicated.

● Easy-to-use TTL Auto Flash

When an OLYMPUS T Series flash unit is used with the OM-4 or OM-2, you are assured of perfect exposures regardless of the subject magnification, lens aperture setting or other factors. Especially with the extremely functional T28 Macro Single Flash 1 and T28 Macro Twin Flash 1 units, you can take close-up and macro flash pictures with the same ease as regular photo-

graphy. When the working distances are very small, or you require shadowless lighting, the T10 ring Flash 1 and the T8 Ring Flash 2 are particularly convenient. There is just one point to bear in mind: make sure the aperture is suited to the subject magnification. At these close distances opening the lens too wide can mean exceeding the limits of the flash working range, resulting in overexposure. (Too small an aperture can, conversely, lead to underexposure of the subject.) The appropriate range of apertures and image magnifications is shown in the table on page 17.

Sample Photo

The film speed is set on the OM-4, which is fitted with the Auto Bellows or Telescopic Auto Tube. With the camera in Auto mode, point towards the subject and check that the shutter speed is 1/60 sec. or slower. Then attach the flash unit and switch ON.

When the T28 Twin Flash is used with the 50mm macro lens at a subject magnification of 0.2x, you can select any aperture from F11 to F22.

Photo: OM-4 with Macro 50mm F3.5 and T28 Macro Single Flash 1.



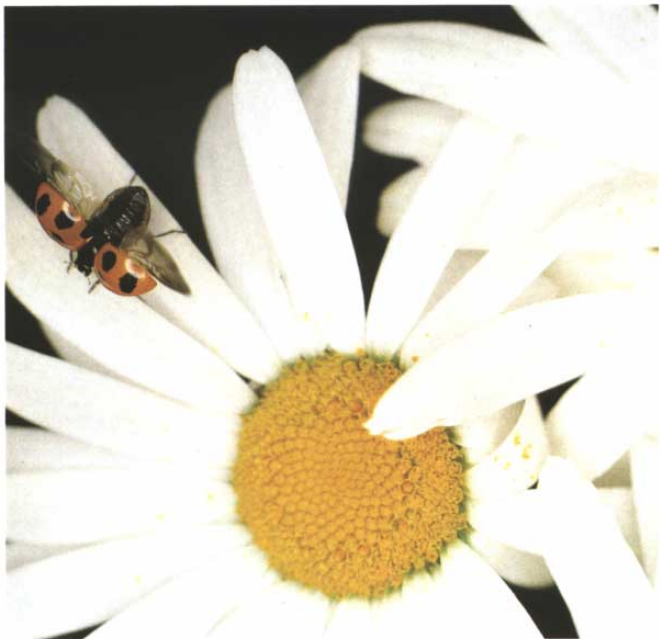
■ EFFECTIVE RANGE OF LENS APERTURES IN CLOSE-UP PHOTOGRAPHY (TTL AUTO, ISO 100.m)

Lens	Magnification	T28 Macro Single Flash 1	T28 Macro Twin Flash 1	T8 Ring Flash 2	T10 Ring Flash 1
ZUIKO MACRO 135 mm F4.5	0.1 ×	F 4.5 ~ 16		F 4.5 ~ 5.6	F 4.5 ~ 5.6
	0.2 ×	F 4.5 ~ 32		F 4.5 ~ 8	F 4.5 ~ 11
	0.3 ×	F 5.6 ~ 45		F 4.5 ~ 11	F 4.5 ~ 16
	0.5 ×	F 5.6 ~ 45		F 4.5 ~ 16	F 4.5 ~ 16
ZUIKO 1:1 MACRO 80 mm F 4 (+CLOSE UP LENS)	0.5 ×	F 11 ~ 32		F 4 ~ 32	F 4 ~ 32
	1 ×	F 16 ~ 32		F 4 ~ 32	F 5.6 ~ 32
	2 ×	F 16 ~ 32		F 4 ~ 32	F 5.6 ~ 32
	2 ×	F 22 ~ 32		F 5.6 ~ 32	F 5.6 ~ 32
ZUIKO MACRO 50 mm F3.5	0.1 ×	F 5.6 ~ 22		F 3.5 ~ 16	F 3.5 ~ 16
	0.2 ×	F 11 ~ 22		F 3.5 ~ 22	F 4 ~ 22
	0.3 ×	F 16 ~ 22		F 4 ~ 22	F 5.6 ~ 22
	0.5 ×	—		F 5.6 ~ 22	F 8 ~ 22
ZUIKO MACRO 38 mm F2.8	2 ×	F 5.6 ~ 16		F 8 ~ 22	—
	3 ×	F 5.6 ~ 16		F 8 ~ 22	—
	4 ×	F 5.6 ~ 16		F 8 ~ 22	—
	8 ×	F 2.8 ~ 11		F 4 ~ 22	—
ZUIKO MACRO 20 mm F 2	4 ×	—		—	—
	7 ×	F 2 ~ 5.6		—	—
	9 ×	F 2 ~ 8		—	—
	10 ×	—		—	—



Generally speaking, the very close working distances (the distance from the front of the lens to the subject) involved in macro-photography make location of the lighting unit(s) very difficult. The problem was first satisfactorily solved by the Ring Flash, mounted on the front of the taking lens.

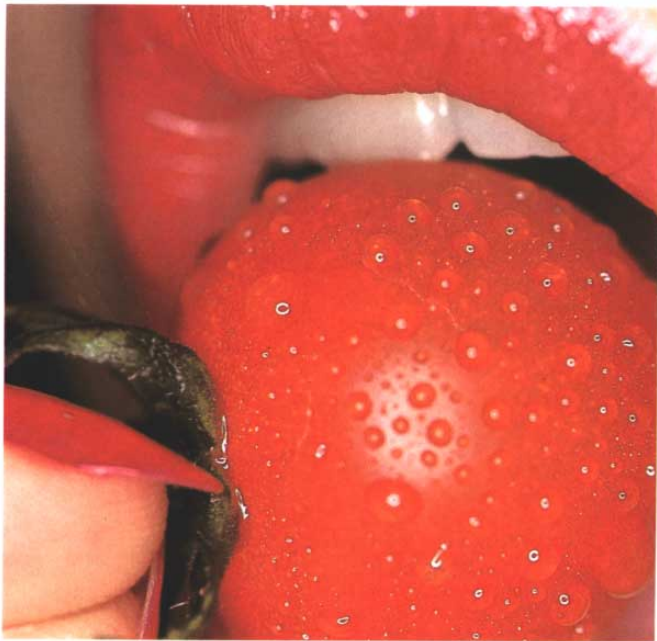
The T10 and T8 Ring flash units make possible shadowless lighting of the subject. However, depending on the distance from the background, and the variations in subject brightness, a uniform faint shadow is sometimes cast around the edge of the subject. These flash units are particularly good at bringing out subject details clearly and faithfully. Their ability to produce even illumination makes them very useful as supplementary light sources to fill in shadows, or to provide even lighting in



holes or cavities. This latter feature is of special importance in medical photography.

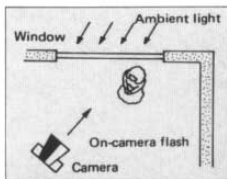
One point requiring care in ring flash photography is to prevent the appearance of ring shapes on the picture, a phenomenon caused by the extra brightness around the flash periphery. With the T10 Ring Flash 1, the special polarizing Ring Cross Filter POL solves the problem by cutting out direct reflected light. The T8 Ring Flash 2 is immune to the problem by design, as its light emission is bounced off the ring section so as to reach the subject only indirectly.

Bounce lighting is a technique frequently used in studio work to obtain extremely soft lighting effects. It creates pictures with delicate nuances of light and shade.



In natural light photography using the sun as the light source, we have no choice but to make use of the direction and quality of the light as we find it. Sometimes the direct light of the sun produces undesirably high contrasts, and often backlit pictures leave the face of the subject in darkness. Also, the sun cannot directly reach main subjects shadowed by trees, etc.,

Unlike when flash is used as the main light source, in daylight fill-in flash the brightness of the flash must be balanced with the brightness of the background. Rather than automatic flash which responds to the ambient light, the manual flash mode is more suitable to optimally balance the brightness levels, with the correct F stop calculated by guide numbers (with T45, GN45, 32, 22, 16, 11, or 8 / with T32, GN32 or 16 at ISO 100, meters).





The electronic flash unit acts as a man-made sun when the photographer is shooting at night or indoors. Its flash duration is virtually instantaneous so it can freeze fast moving subjects which are difficult for the naked eye to capture. Thus it has become indispensable for 35mm SLR photography.

The electronic flash unit comes in many forms. There are the manual flash (full light output is used), the earlier automatic flash (power is automatically adjusted for correct exposure depending on different focused distances and unused power is extinguished) and lately the series-circuit or thyristor automatic (unused power is conserved for next flash).

Because flash units have taken a separate path of development from that of cameras, procedures in actual use are inevitably complicated. For example, film speed

rating and F stop need to be set on both the flash unit and the camera. The appropriate shutter speed must be set on the SLR camera so that the shutter curtain is fully open to synchronize with electronic flash. Even automatic flash, which is generally accepted as a convenient device, suffers the disadvantage (among others) that its built-in light sensor has a fixed acceptance angle that cannot adapt to the different viewing angles of lenses. The Olympus camera designers considered the flash unit not as a device independent of the camera, but instead as an integral part of it and from this standpoint were able to organize the functions of each in a complementary manner. This more rational approach resulted first in the revolutionary OM-2/Quick Auto 310 combination, and now the more refined OM-4 (OM-2)/T-series Flash to make advanced

flash photography easy to achieve. Everything depends on the OM-4 (OM-2)'s TTL Direct "Off-the-Film" Light Measuring Method. It eliminates inconveniences and cumbersome operating procedures and simplifies lighting techniques such as bounce, diffused, ultra close-up and multiple flash which were previously possible only for professional photographers. All the units in the OM System Flashphoto Group are designed to assure consistent high reliability and system compatibility, from the T45 and T32 units that play a central role in the system, to the compact, lightweight T20, the versatile T10 Ring Flash 1, T8 Ring flash 2, T28 Macro Twin Flash 1 and T28 Macro Single Flash 1 macro flashes, the Power Bounce Grip 2 and other group units.

The Electronic flash T45 is a powerful professional type unit

with an impressive guide number of 45 (ISO/ASA 100, meters) that makes the usual shoulder pack power unit unnecessary. The T32 has a guide number of 32 (ISO/ASA 100, meters). It is a high performance unit with a flash angle wide enough to virtually cover the picture area of a 24mm super wide angle lens. With a guide number of 20 (ISO/ASA 100, meters), the T20 is the smallest and lightest flash unit in its class.

Used together with the wide choice of OM System macro lenses plus Auto Bellows or Telescopic Auto Tube 65-116, the T10, T8 and the two T28 units comprise a sophisticated and highly versatile macro flash system.

A unique feature of the T45, T32 and T20 is their choice of three flash modes: TTL Auto, normal Auto and Manual; which can be selected freely according

to the camera model and the photographic techniques being adopted.

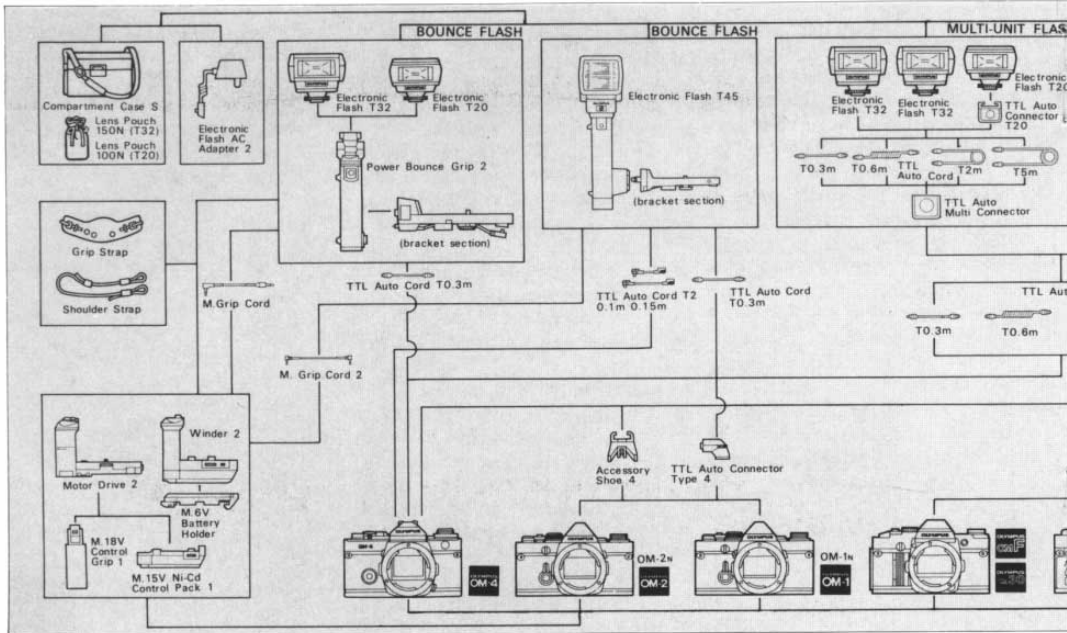
In addition to the up or down bounce capability built into the basic T32 unit, with the Power Bounce Grip 2 it permits universal angling for an unlimited range of bounce lighting effects. More remarkable still, together with a motor drive or winder unit, the special shutter release on the grip guarantees exceptionally smooth system function.

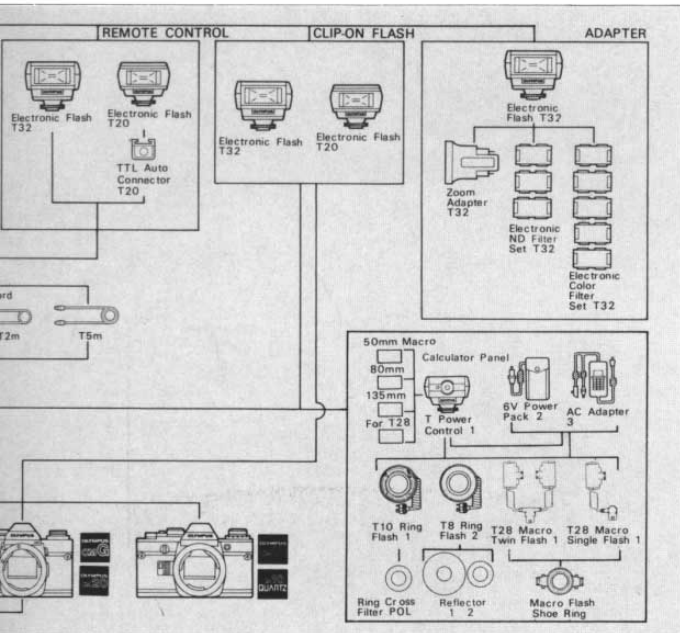
Another excellent feature: there is no risk of a flash cord being accidentally disconnected during shooting. With the customary OM System attention to detail the cords are designed to satisfy strict professional requirements, and can only be detached by pulling on the metal ring section.

The OM System Flashphoto Group is fully integrated into the overall OM System, assuring all

flash units function integrally with the cameras. It is designed to assure easy operation and complete satisfaction in flash photography for professional and amateurs alike, and surely approaches the ideal in SLR flash systems.

OM SYSTEM FLASH PHOTO GROUP SYSTEM CHART





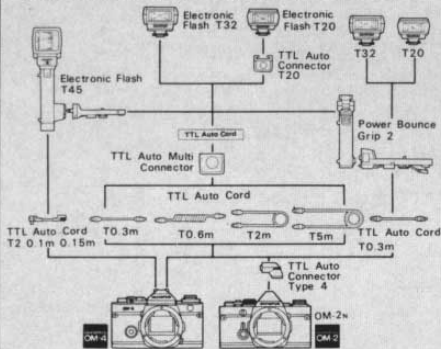
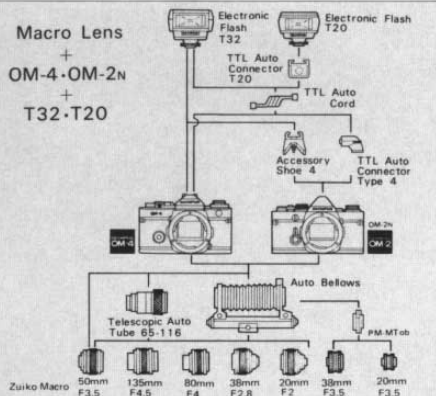
■ Types of Lighting, Selection of Flash Unit Function, and Basic Assemblies

In flash photography the first essential is to select the type of lighting and flash unit function according to the photographic conditions and your creative intentions. When this is determined the units you need will become clear. The tables on the following pages show the range of flash methods possible with various combinations of OM cameras and Flashphoto Group units. Use the tables to help select the flash function and flash unit most suitable for your picture making intentions and the type and mode of photography you will employ. Refer to Selection of Flash Unit Function section on pages 33-35 for an explanation of the difference between TTL Auto, Normal auto and Manual Flash function.

Basic Assemblies	OM-4 · OM-2N + T32 · T20						OM-4 · OM-2N + { Power Bounce Grip 2 + T32 · T20 T45					
Type of Lighting	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed
Flash Mode												
TTL Auto Flash	⊙	○*	⊙	—	○*	⊙	⊙	⊙	⊙	—	⊙	⊙
Normal Auto Flash	○	○*	—	—	—	○	○*	○**	—	—	—	○*
Manual Flash	○	○*	○	—	—	—	△	△	△	—	—	—
Remarks	* T32 has built-in bounce mechanism.						* Normal auto sensor pointed at subject ** With T32 only					

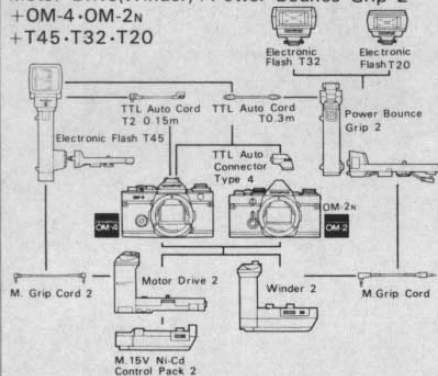
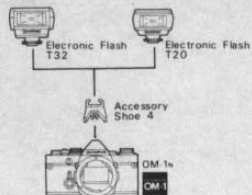
⊙ Recommended ○ Possible △ Calculations and experience are required — Not Possible

OM-4·OM-2N+Multi Connector+T45·T32·T20

Macro Lens
+
OM-4·OM-2N
+
T32·T20

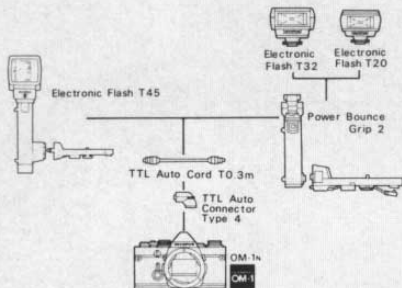
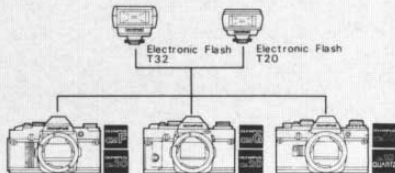
Type of Lighting Flash Mode	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed
TTL Auto Flash	○	○	○	○	○	○	○	○	○	—	○*	○
Normal Auto Flash	—	—	—	—	—	—	—	—	—	—	—	—
Manual Flash	△	△	△	△	—	—	△	△**	—	—	△	—
Remarks							Up to 1:1 with T32 on camera ** On-camera... with T32 only					

○Recommended ○Possible △Calculations and experience are required —Not Possible

Motor Drive(Winder)+Power Bounce Grip 2
 +OM-4·OM-2N
 +T45·T32·T20

OM-1N+T32·T20


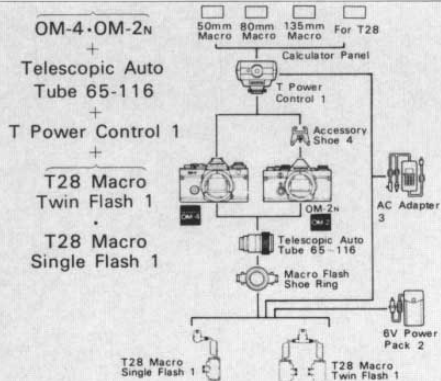
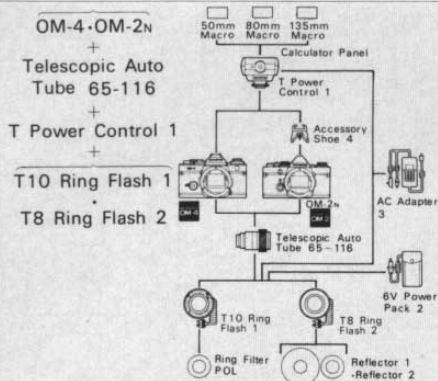
Type of Lighting Flash Mode	Motor Drive(Winder)+Power Bounce Grip 2						OM-1N+T32·T20					
	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed
TTL Auto Flash	⊙	⊙	⊙	—	⊙	⊙	—	—	—	—	—	—
Normal Auto Flash	○	△*	—	—	—	○	⊙	○*	—	—	—	○
Manual Flash	△	○	○	—	—	—	△	△*	△	—	—	—
Remarks	* Possible with T32.						* T32 has built-in bounce mechanism.					

⊙ Recommended ○ Possible △ Calculations and experience are required — Not Possible

OM-1N+ { Power Bounce Grip 2 + T32·T20
T45OM30·OM20·OM10·OM10 QUARTZ + T32·T20
(OM-F)(OM-G)

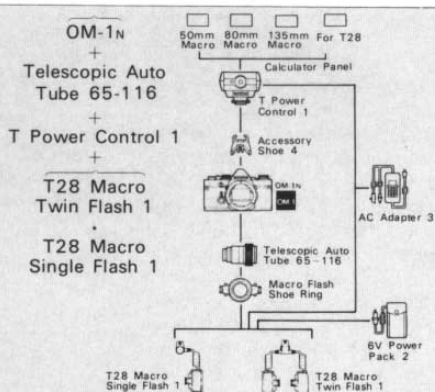
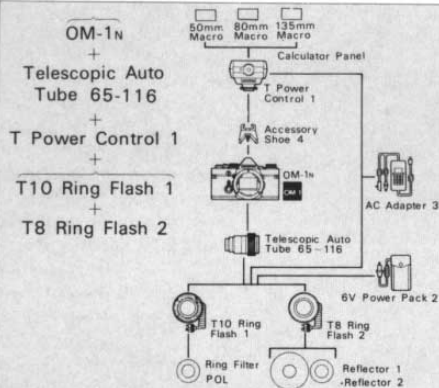
Type of Lighting Flash Mode	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed
TTL Auto Flash	—	—	—	—	—	—	—	—	—	—	—	—
Normal Auto Flash	⊙	⊙*	—	—	—	⊙**	⊙	⊙	—	—	—	⊙
Manual Flash	△	△	△	—	—	—	△	△*	—	—	—	—
Remarks	With OM-1 (not OM-1N) use built-in sync cord on bracket. * Normal auto sensor pointed at subject.						* T32 has built-in bounce mechanism.					

⊙ Recommended ⊙ Possible △ Calculations and experience are required — Not Possible



Flash Mode	Type of Lighting						Type of Lighting					
	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed
TTL Auto Flash	○	—	—	○*	○	○	○	○	○	○	○	○
Normal Auto Flash	—	—	—	—	—	—	○	—	—	—	—	—
Manual Flash	○	—	—	△	△	—	○	△	△	△	△	—
Remarks	* Possible with T32											

○Recommended ○Possible △Calculations and experience are required —Not Possible

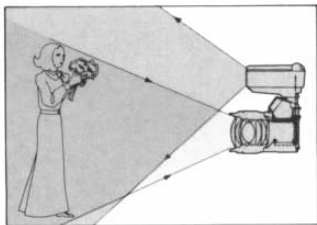


Flash Mode	Type of Lighting						Type of Lighting					
	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed	Direct	Bounce	Diffused	Multiple Flash	Close-up	Ultra-high Speed
TTL Auto Flash	—	—	—	—	—	—	—	—	—	—	—	—
Normal Auto Flash	—	—	—	—	—	—	○	—	○	—	—	—
Manual Flash	○	—	—	△	△	—	○	△	△	△	△	—
Remarks												

○ Recommended ○ Possible △ Calculations and experience are required — Not Possible

Analysing flash photography methods by the function of the flash unit, there are three possibilities; manual flash, normal auto flash and TTL Centralized Control Flash. With manual flash, the volume of light emitted by the flash unit is always constant. Although it involves manual setting of the f/stop according to the subject distance, this mode is the most suitable for daylight synchro flash. Normal auto flash is a more convenient method in which a few f/stops are specified and the flash unit automatically regulates the flash volume for correct exposures through its built-in auto sensor and light measuring circuit.

A further refinement on normal auto flash is the Olympus pioneered Centralized Control Flash.



■ TTL "OTF" Centralized Control Flash

This method is the most advanced auto flash method for SLR cameras. It only becomes possible through the use of the OM-4 (OM-2) in combination with the T45, T32, T20, T28 Macro Flash or T10, T8 Ring Flash. In this new method, the light sensors and electronic brain are built into the OM-4 (OM-2) camera. Because the light is measured through the lens, factors such as lens brightness and taking angle, subject brightness, etc. are all taken into account,

and the OM-4 (OM-2) is able to centrally control the light emission of the flash unit. This explains the name TTL "off-the-film" Centralized Control Flash. Just as TTL (through-the-lens) exposure measuring has become the norm for SLR cameras with their interchangeable lens capability, so TTL Centralized Control Flash is the ideal electronic flash system for this kind of camera. While normal auto flash units can also give a correct exposure, they are far less versatile and convenient in use. Drawbacks include the need to set film speed and lens aperture on both the camera and the flash unit, restrictions on the F number that can be used, inability to change the light measuring angle of the sensor according to the taking angle of the chosen lens, etc. TTL Centralized Control Flash fully overcomes these drawbacks by offering the fol-

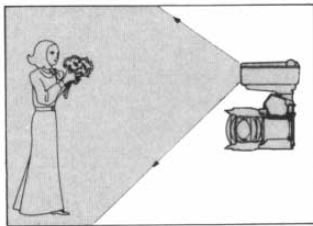
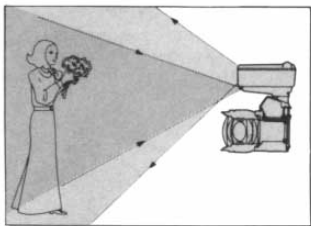
lowing entirely new features.

① No need to set film speed: once the film speed has been set on the camera there is no need to reset it on the flash unit. ② No need to set the aperture F number either: Because the aperture is already set on the camera lens, there is no need to reset it on the flash unit. This also eliminates exposure error caused by mistaken aperture alignment.

③ F number can be selected freely: Because the light is measured through the taking lens, there is no restriction on the choice of lens aperture. ④ Photographic range is vastly increased: At maximum output with the 32 guide number and at F1.2, subjects can be photographed from as far as 26 meters. The minimum distance at F22 is a mere 18cm, and this can be reduced still further if the light is diffused with a handkerchief or such like. This feature is very

important for SLR photography, which is so well suited for close-ups. ⑤ Light measuring angle is automatically adjusted for taking angle of lens: The angle of measurement is increased with wide-angle lenses and decreased with telephoto lenses. An extremely apt feature for SLR photography. ⑥ Simple bounce, diffused lighting and ultra close-up flash photography: The fact that the exposure is calculated inside the camera means that the location and method of using the flash unit are entirely unrestricted. ⑦ Simplified multi-flash operation: Simultaneous flash employing two or more flash units can be done easily without complicated exposure calculations, as the SBC sensors measure the light reflected off the film and electronic brain centrally regulates the flash emission. ⑧ Ease of operation: The only procedure required of the photo-

grapher is to flip the selector lever on the OM-4 (OM-2) to "AUTO" and switch the T flash unit on.



■ Normal Auto Flash

Conventional auto flash units need a light sensor to measure the brightness of the subject. It reads the light reflected by the subject and, when the light volume reaches a predetermined value, sends a signal to the control section, which cuts off the light emission. The T45, T32 offers a choice of three aperture values (F4, F5.6 and F8, ISO 100), and the T20 two values (F4 and F8, ISO 100).

■ Manual Flash

With this method the correct exposure must be obtained by setting the lens aperture to admit the proper amount of light. The aperture value is determined by dividing the guide number of the flash unit by the subject distance. The T45 offers a choice of High or Low output (GN45, 32, 22, 16, 11, 8 ISO 100, meters). The desired output is set on the calculator panel at the rear of the unit, which then automatically displays the appropriate aperture-to-distance scale.

Because the latest flash system, TTL Centralized Control Flash, depends on a light emission control function built into the camera, it is possible when the OM-4 or OM-2 camera is used. In the case of auto-exposure (EE) compact cameras on which the aperture cannot be set manually, normal auto flash is also impossible, and only manual flash can be used. In short, suitable flash units and flash methods will vary according to the capabilities of the camera selected. Thus the choice of camera must be governed by the flash performance and flash method required.

■ OM-4

Permits use of all three flash modes: ① TTL auto, ② normal auto and ③ manual flash. The T32 and T20 can be used as camera mounted units. With the T45, or when the T32 or T20 is used with the Power Bounce Grip, a



TTL Auto Cord is necessary. Full flash charge, correct flash exposure confirmation, under- or overexposure indications appear in the camera viewfinder.

■ OM-2N (OM-2)

All three flash modes can be used: ① TTL Centralized Control Flash, ② normal auto flash, and ③ manual flash. The Accessory Shoe 4 (OM-2N) or Accessory Shoe 3 (OM-2) is needed to mount the flash unit directly on the camera. For use with the



T45, or Power Bounce Grip 2, the accessory shoe must be removed, and the TTL Auto Connector (Type 4 with OM-2N, Type 3 with OM-2) is screwed into the hot shoe socket and connected to the bounce grip via the TTL Auto Cord.

■ OM-1N (OM-1)

The available flash modes are: ① normal auto flash, and ② manual flash. To mount the flash unit directly on the camera, the Accessory Shoe 4 (OM-1N) or Accessory Shoe 1 (OM-1) is used. When the T45 or Power Bounce Grip 2 is used, the electrical connec-



tion is made by the TTL Auto Connector Type 4 / TTL Auto Cord (in the case of OM-1N to make use of the viewfinder flash indication) or the synch cord built in the bracket section (the viewfinder flash indication cannot be seen).

■ OM-30 (OM-F)

Can be used with normal auto and manual flash modes. The T32 or T20 units are mounted in the camera hot shoe. The only settings required on the flash units are to switch ON and set the correct aperture value. The



LSI controlling indicator functions show flash photo status via viewfinder LED.

■ OM-20 (OM-G)

Can be used with normal auto and manual flash modes. The T32 or T20 is mounted in the camera hot shoe and switched ON, and the OM-20's Mode Selector Dial is set to AUTO. Doing this automatically sets the shutter speed



to 1/60 sec. for correct flash synchronization. Full flash charge and correct flash exposure confirmation are indicated in the viewfinder. The bounce grip can also be used.

■ OM-10·OM-10 QUARTZ

The available flash modes are: ① normal auto flash and ② manual flash. The synch circuit is set to "X" and the shutter speed to 1/60 sec. automatically when the T32 or T20 is slipped into the built-in accessory shoe and turned on. These cameras incorporate



the viewfinder flash indication. The Power Bounce Grip 2 cannot be used with these cameras. When using the T20 on the OM-10 with its manual adapter **make sure** the Manual Adapter is set to 1/30 sec. or slower (light blue) for correct flash synchronization.

The variety and range of lighting available will depend on the performance of the flash unit. There are two basic electronic flash unit formats: the small, light-weight clip-on type and the professional grip type.

In terms of function, there are manual flash and auto flash. Among auto flash units, there is the type using the inexpensive bypass method. There is also the type using the expensive series method. This type makes possible fast repeated flash performance.

Further, depending on the location of the light sensor, there are two kinds of auto flash: normal auto flash and TTL "OTF" Centralized Control Flash. Other criteria for the selection of the flash unit include the guide number (GN) and angle of coverage.

■ Electronic Flash T45

A fully automatic, grip-type flash unit that forms the core of the OM System Flashphoto Group. Despite the powerful 45 (ISO/ASA 100, meters) guide number, it requires no shoulder pack type external power source. All



three flash modes — TTL auto, normal auto and manual — can be set. An exciting feature is TTL Auto Flash with the OM-4 or OM-2. Both the auto light sensor and the computer controlling the flash emission are built into the camera body to

assure fully centralized control of flash function. Film speed, aperture, etc. are set on the camera only, not the flash unit. All aperture values available on the taking lens may be used freely. Even sophisticated techniques such as bounce flash, diffused flash and multi-flash are fully automatic. The T45 power source is a special rechargeable Ni-Cd battery pack that fits inside the grip section. Both the recycling time of 0.2–2.2 secs. and the 100–500 flashes per charge (with the special Ni-Cd battery pack) are about twice as good as with conventional flash units of this class. The built-in bounce mechanism permits angling through a range of 90° vertically and 340° horizontally.

■ Electronic Flash T32

Permits use of three flash modes: TTL auto, normal auto and manual. The guide number is 32 (ISO/ASA 100, meters). The basic unit incorporates vertical bounce angling from 90° up to 15° down. Provides over 100 full



flashes, with a recycling time from 0.2–10 secs. (both figures for alkaline batteries). Dimensions are 81 x 70 x 104mm and weight is 320 grams (without batteries).

■ Electronic Flash T20

The T20 features the vital compactness and light weight characteristics of the portable flash unit. Like the T32, it is an energy-saving, fully automatic "system" flash unit capable of TTL (OTF) Centralized Control flash (but with no provision for tilting the flash surface). It has a guide number of 20 (meters) or GN66



in feet (ISO 100) and a flash angle wide enough to give coverage of a 35mm wide-angle lens. The T20 provides over 100 flashes at full power, and has a recycling time of 0.2–10 seconds (with 2 alkaline batteries). It measures 77 x 68 x 57mm (3" x 2.7" x 2.2") and weighs 160g. (5.6 oz.) without batteries.

■ T Power Control 1

A compact power unit for the T10•T8 Ring Flashes and T28 Macro flash which mounts via accessory shoe to the top of the OM body. Offers TTL Direct "OTF" auto operation or manual flash. Powered by 4 AA size batteries or optional AC Adapter 2, 3.



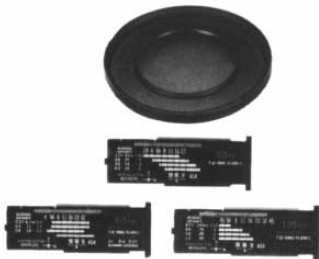
■ T10 Ring Flash 1

Designed principally for use with the OM System macro lenses, this unit provides full and even flash illumination at working distances far closer than possible with other flash units. Eight lamps are built in to aid in focusing in a dark location.



■ Ring Cross Filter POL

A cross-polarizing filter which minimizes direct reflections from the T10 Ring Flash 1 for highly reflective subject matter.



■ Calculator Panel for Macro Lenses

Fitted on to the back of the T10 Power Control 1 to provide easy-to-read distance/magnification/aperture exposure tables. The plate for 50mm lens comes equipped with the T10; other two types are optionally available.

■ T8 Ring Flash 2

This ring flash is particularly useful for medical and copying applications, etc. The bounce lighting effect obtained by the assembly of the T8 and its reflector (200mm and 150mm diameter types are available) is unpre-



cedently soft. Assures shadowless illumination for any subject smaller than the reflector unit. The guide number in TTL Auto mode is 8 (ISO/ASA 100, meters).

■ T28 Macro Single Flash 1

An exceptionally small and light TTL auto flash unit. It assures equally simple flash operation for normal photography and for close-up and macro subjects. The angle of flash coverage is 53° vertically and 74° horizontally. The



unit can be angled as much as 70° up, 45° down and 360° horizontally. In TTL Auto mode the guide number is 28. In Manual it can be switched between 28 and 14 (ISO/ASA 100, meters).

■ T28 Macro Twin Flash 1

A TTL Auto flash unit with two separate flash heads. Achieves extremely versatile effects, for example high contrast lighting with deep shadows, high-lighted backgrounds, etc. Each flash head can be angled as with



the T28 Single Flash 1. Each flash head can be fired separately, or both together. Single flash guide numbers are the same as with the T28 Single Flash 1. For both flashes together, the guide number is 22 in TTL auto mode, 22 or 9 in manual mode (ISO/ASA 100, meters).

■ Macro Flash Shoe Ring

An attachment unit that vastly increases the photographic range of the T28 Macro Single Flash 1 and the T28 Macro Twin Flash 1. The flash heads are fitted to the Shoe Ring after this unit has been secured to the front of the lens.



The shoe mount can be revolved freely and locked at any position desired. Can be used with the Zuiko Macro 38mm F2.8, 50mm F3.5, 135mm F4.5, 1:1 Macro 80mm F4, and standard OM System lenses.

■ Zoom Adapter T32

Offers concentrated flash beam with the T32 Electronic Flash sufficient for telephoto lenses 135mm and longer. The highest GN available is 42 (ISO 100 meters).



■ Wide Adapter-ND Filter Set T32

Special neutral density filters for reducing the light intensity without affecting color and contrast. Three types are available: the milky Wide Adapter (GN22) which covers a 21mm wide-angle lens, ND4 (GN16) and ND8 (GN11) at ISO 100, meters.



■ Color Filter Set T32

For special effects flash. Five colors are available: red, blue, yellow, orange and green.



At full flash (ISO 100, meters)

Indicator	GN (foot scale)	Angle of coverage vertical x horizontal
50	36 (118)	33° x 46°
75	38 (125)	25° x 35°
100	40 (131)	21° x 28°
135	42 (138)	17° x 24°

The mount referred to here is the mount used mainly for the attachment of the flash unit. On some cameras the mount (or accessory shoe) is fixed, making a choice impossible. The OM-1 and OM-2 camera bodies are designed to allow a choice of mounts for flash photography, depending on the photographic requirements. (The OM-10* has a built-in hot shoe). The available mounts include the Accessory Shoe which are mainly for on-camera direct flash, and the Power Bounce Grip 2 which allows a greater degree of versatility. It also incorporates a powerful additional power source, which is activated simultaneously, and works in tandem, with the power source housed in the flash unit, thereby speeding up the recycling time.

■ Accessory Shoe 1, 2, 3, 4

These mounts provide a direct contact when the flash unit is installed directly to the OM cameras. Refer to the table below for correct combinations of the accessory shoe and the camera.



■ TTL AUTO Connector 4, 3

The TTL Auto Connector is required for off-camera TTL Auto flash with the OM-2 and T32 (or T20) via TTL Auto Cord. It can also be used for off-camera normal auto flash with the OM-1N to make use of the viewfinder flash indication.



■ T32 (T20) Flash Photography

Camera	OM-2N	OM-1N	OM-2		OM-1
Selection of Shoe	Shoe 4	Shoe 4	Shoe 3	Shoe 2	Shoe 1
Selection of TTL AUTO Connector	Type 4	Type 4	Type 3	—	—
Selection of Flash Mode	<ul style="list-style-type: none"> ● TTL Auto ● Normal Auto ● Manual 	<ul style="list-style-type: none"> ● Normal Auto ● Manual 	<ul style="list-style-type: none"> ● TTL Auto ● Normal Auto ● Manual 	<ul style="list-style-type: none"> ● Normal Auto ● Manual 	<ul style="list-style-type: none"> ● Normal Auto ● Manual

■ Power Bounce Grip 2

Converts the T32 (or T20) into a grip type electronic flash unit. Consists of a bracket section and a grip section which contains 4 C batteries to provide a powerful supplementary power source. The bounce head can be angled



90° up, 20° down, 60° right and 240° left allowing free choice of bounce and close-up flash photography. Electrical connection with the camera is made via the TTL Auto Cord T and TTL Auto Connector.

■ TTL Auto Multi Connector

Allows two or more flash units (T-series flashes) to be combined to perform simultaneous flash photography. One side is provided with three socket terminals, each of which accepts a TTL Auto Cord which in turn is link-



ed to a flash unit. The opposite side having a single TTL Auto Cord socket is connected with the TTL Auto Connector which is screwed into the hot shoe socket of the camera.

■ TTL Auto Connector T20

Allows the T20 to be connected with the OM-4, OM-2 and OM-1 via the TTL Auto Cord and TTL Auto Connector for off-camera flash (hand-held or tripod mounted.)



The power sources for electronic flash units include penlight (AA) batteries, "C" batteries, household current converted by an Electronic Flash AC Adapter 2(3). The most suitable power source should be selected according to the particular photographic purpose. Among compact electronic flash units intended for normal amateur use, a large proportion relies on two or four penlight batteries as the power source. The number of flashes, specially with auto flash units, depends on the subjects distance, or in other words the volume of the flash, but with alkaline batteries is generally around 100 flashes. Recycling time is normally from around seven to ten seconds. While the use of penlight batteries as the power source brings great advantages in terms of compactness, lightness and handling, they are rather limited with respect

to recycling time and the number of flashes they provide. Electronic flash for professional level work must satisfy a number of additional requirements: the light output must be high, the number of flashes large, and the recycling time short, while at the same time the flash unit must still be easy to carry.

To satisfy these requirements, C batteries, which are considerably more powerful, are available. In the OM System Flashphoto Group, penlight batteries are accommodated inside the main flash unit, and supplementary C type batteries inside the grip. One more alternative is the use of household electric current with the Electronic Flash AC Adapter 2 (or 3).

■ T45 Ni-Cd Pack 1

The specially designed power source for the Electronic Flash T45. It is loaded into the grip section from the base. Provides from 100–500 flashes, with a recycling time from 0.2–2.2 secs.

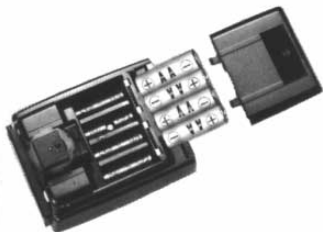


■ T45 Ni-Cd Charger 1

A charger designed specifically for the T45 Ni-Cd Pack 1. A full charge from normal household AC current takes about eight hours.

■ AA (Penlight) Batteries

This power source is for use with the basic T32 (T20) flash unit on its own. Four (two) penlight batteries fit inside the unit, to make an extremely powerful but compact flash with a guide number of 32 (20) in meters or 104 (66) in feet at ISO 100.



The number of flashes and recycling time depend on the conditions under which the flash is used, including whether it is set for TTL Centralized Control Flash, normal auto flash or manual modes. (Ni-Cd batteries can be also used.)

■ C Batteries

When the T32 (T20) is fitted into the bounce grip, these batteries can be installed inside the grip section to boost flash performance. The base plate of the grip section is removed to allow the installation of four fresh 1.5V C



batteries. With the use of alkaline batteries, recycling time is from 0.2 sec to a maximum of 9 sec. and around 200 full flashes can be obtained.

■ Electronic Flash AC Adapter 3

Enables operation of the Ring (Macro) Flash and its modelling lamp on AC current. Works also as an AC adapter for the Winder 2 unit.



■ 6V Power Pack 2

An auxiliary power source unit for the modelling lamp of the Ring (Macro) Flash or winder units. Powered by four D size batteries.

■ Electronic Flash AC Adapter 2



POLICE LINE
POLICE

DO NOT
DEPT.

[Selection of Cords]

As the great majority of modern electronic flash units are of the direct contact type, when the unit is clipped on to the camera for direct lighting no synch cord is needed. However, the selection of a synch cord to link the flash unit with the camera becomes necessary for lighting requiring sophisticated techniques, as in the case of bounce lighting, diffused lighting, extreme close-ups, and multiple flash.

[Selection of Cases]

Carrying cases for electronic flash unit include a case to hold the flash unit on its own, and a compartment case to carry the flash unit with the camera body and other system units.

■ TTL Auto Cord T0.3m, 0.6m, 2m, 5m

The TTL Auto Cord is required for off-camera flash in conjunction with the T32 (T20) and the OM-2N (OM-2, OM-1N). For multiflash, more than one TTL Auto Cord is used.

■ TTL Auto Cord T2 – 0.1m 0.15m

Connects the T45 with the OM-4.

**■ M. Grip Cord (M. Grip Cord 2)**

Connects the motor drive or winder unit with the bounce grip (or T45).

■ Lens Pouch 100, 150

The Lens Pouch 150 is a large-size case for interchangeable lenses, but is also ideally suitable for carrying the T32 on its own. The Lens Pouch 100 is also suitable for the T20.

**■ Compartment Case S**

This case can be used for carrying the T32 with the bounce grip and camera. The camera, flash unit, bounce grip (grip section and bracket section) are disassembled, and divided between two partition boards.

The OM System Flashphoto Group is not limited to use as a flash system in isolation. The realization of TTL "OTF" Centralized Control Flash extends the historic trend to through-the-lens flash control, with enormous advantages in convenience and performance when the flash is used with units of the following groups.

■ Zuiko Interchangeable Lens Group

The Electronic Flash T45 and T32 units have a super wide angle flash emission. This means not only that they can give virtually uniform coverage over the whole picture area of a 24mm super

Flash is that the angle of light received by the auto sensor is automatically the same as the angle of the taking lens, ideal for SLR cameras where lenses are constantly being changed. Furthermore, as all apertures of the taking lens can be used freely, the



wide angle lens, but also that in close-up photography the T32 bounce head can be angled down to correct for parallax. This illustrates how outstandingly suitable the T45 and T32 are for photography with wide angle lenses. Another big feature of TTL Auto

maximum flash range is extended to an impressive 37.5 meters (T45 with ISO/ASA 100 film and F1.2 aperture).

■ Motor Drive Group

The principal aims of the Motor Drive 1 and Winder 2 units are to automatize film wind-on and thereby increase the photographer's ability to capture fleeting scenes and sequences. For interior photography and other



situations when a supplemental light source is necessary, use of these units together with the T32 insures instant preparedness for single frame shooting. Although sequence photography capability is unavoidably limited by the recycling speed of the electronic

flash unit, when a strong power source is used for close-up flash photography, it is possible to shoot motor driven flash sequences of several frames.

■ Macrophoto Group

Even in close-up or macrophoto-

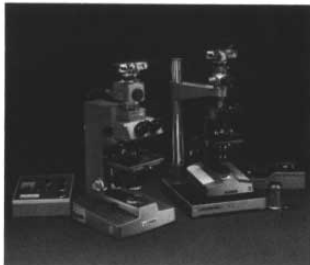


graphy using bellows or extension tubes, with the OM-4 or OM-2 and a T Series flash unit TTL Auto flash assures complete exposure accuracy with automatic simplicity. The capability of angling the T32 flash head 15° down makes this unit especially

convenient for close-up work.

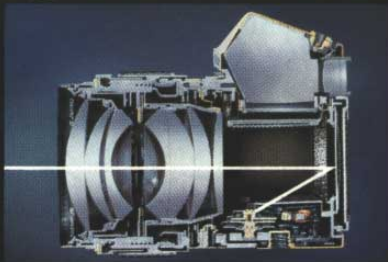
■ Other OM System Group

The applications of the Flash-photo Group are further greatly expanded by the possibility of



supplying an illumination source for microscope photography along with units of the Photomicro Group, used together with the Recordata Back 2, 3 and 4 of the Phototechnical Group, etc., etc.

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