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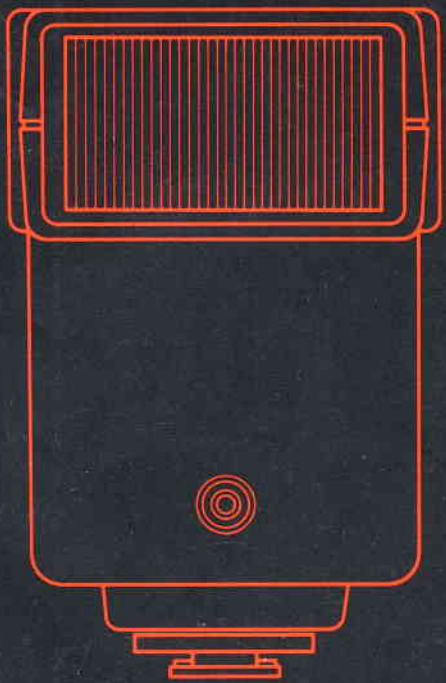

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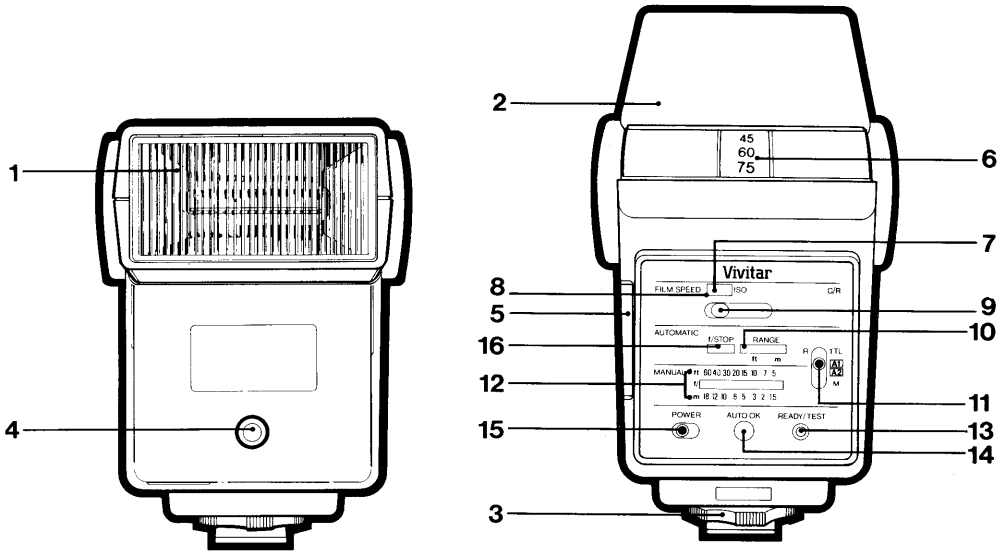

DESCRIPTION OF CONTROLS

1. Flash Head/Reflector
2. Adjustable Bounce Head (0°, 45°, 60°, 75° and 90°)
3. Mounting Foot with Locking Wheel
4. Light Sensor
5. Battery Compartment Cover
6. Bounce Angle Indicator
7. ISO Film Speed Scale
8. Film Speed Window
9. Film Speed Selector
10. Auto Exposure Range Window
11. Mode Selector
12. Manual f/Stop/Distance Scales
13. Flash Ready Light/Flash Test Button
14. Auto OK Indicator
15. Power ON/OFF Switch
16. Auto f/Stop Window

NOTE:
The Flash is available in 3 separate models by camera brand and is fully dedicated to most popular SLR cameras. The 3 models are CR for Canon and Ricoh, N for all Nikon models, and MPO for Minolta, Pentax and Olympus. **Make sure the Flash model you have matches the camera brand you are using.**

HERE IT IS

The Vivitar Flash has been designed to offer the easiest possible use in obtaining quality flash pictures. This section of the instruction manual is designed to show you the basic operation of this unit. Detailed instructions for use with your camera model follow this basic section.

HOW TO USE IT

To prepare the unit for operation, take a moment to familiarize yourself with its controls and indicators. Please turn to the Description of Controls page and fold out the illustration section (inside front cover). Locate all the controls, indicators and other features that are called out, so you will be able to find them easily when they are referred to in the instructions.

Please note that the rear of the Flash is divided into 4 separate areas to make your flash easy to use:
Area 1 is for **Film Speed** setting and has the Film Speed Window (8) and the Film Speed Selector (9).
Area 2 is for **Automatic** operation and has the A1 or A2 f/stop Window (16), the Auto Exposure Range Window (10), and the Mode Selector (11).
Area 3 is basically for **Manual** operation and has the manual f/stop/Distance Scales (12). This area is also used for TTL operation to indicate maximum TTL auto exposure distance.
Area 4 has the Power ON/OFF Switch (15), the Auto OK Indicator (14), and the Flash Ready Light/Flash Test Button (13).

Now proceed as follows:

1. INSTALL THE BATTERIES

Open the Battery Compartment Door (5) by sliding it in the direction of the arrow. Install four fresh, size AA alkaline or fully-charged NiCad batteries, being sure that the + and — polarity markings correspond to the markings inside the battery compartment. Push down on the batteries with your thumb and slide the Battery Compartment door closed.

2. MOUNT THE FLASH ON THE CAMERA

IMPORTANT:

When attaching or removing the flash from the camera, *always* have the flash ON/OFF Switch in the OFF position to prevent the possibility of damage to your camera.

Slide the unit onto the camera's hot shoe. Turn the knurled lock wheel in the direction of the arrow to insure secure mounting to the camera.

3. ENERGIZE UNIT

Slide the Power ON/OFF Switch (15) to the ON position to energize the unit. The Ready Light (13) will glow when the unit is ready to be used.

4. SELECT FILM SPEED

Slide the Film Speed Selector (9) to the right or left until the film speed displayed in the Film Speed Indicator Window (8) matches the film speed you are using in your camera. FAILURE TO SET THE CORRECT FILM SPEED MAY RESULT IN IMPROPER EXPOSURES WHEN THE UNIT IS USED ON SOME DEDICATED CAMERAS.

5. SELECT DESIRED FLASH MODE

Try the four settings of the Mode Selector (11). In the A1 and A2 settings, automatic exposure will be determined by the flash unit sensor and an f/stop number will appear in the Auto f/Stop Window (16). Set this f/stop on your camera lens. (Note: certain cameras may do this automatically.) The corresponding Auto Range will appear in the Auto Exposure Range Window (10) and indicates the distance range (in feet and meters) over which this setting will give good exposures.

Setting A1 will provide the greatest auto range, from 6-40 ft., with a relatively shallow zone of sharp focus (depth of field). Setting A2 provides an auto exposure range from 3-20 ft., with an increased zone of sharp focus. For fastest recycle time and more flashes per set of batteries, we recommend using position A1 wherever possible. Of course, your lens must be able to be set at the corresponding auto f/stop.

In the "M" (manual) setting, there is no auto exposure capability (Nikon owners see Specific Dedicated Function Instructions section) and the

Auto f/Stop Window (16) and Auto Exposure Range Window (10) will be blank. However, the Manual Distance Scale (12) will indicate a range of f/stops between the feet and meter scales. To use this scale, determine your flash-to-subject distance and note the f/stop opposite this distance on the scale. Set your camera lens to this f/stop to make your exposure. For proper exposure in the manual mode, you must select a different f/stop setting as you change flash-to-subject distances.

When the Mode Selector is set to the TTL position (for Nikon owners, the M/TTL position), automatic exposure will be determined by the camera metering system. The Auto Exposure Range Window (10) and the Auto f/Stop Window (16) will be blank. To determine the maximum auto exposure distance for TTL, observe the distance on the Manual Distance Scale (12) opposite the f/stop you have chosen, or check the TTL f/Stop Distance Chart at the rear of this manual.

Note for Canon/Ricoh model users: In the R/TTL position, the Flash performs most dedicated functions on the Ricoh XR-P camera, including TTL and auto fill-flash. The R/TTL setting has no function for Canon cameras and when flashed in that setting on a Canon camera, the Flash produces a full power manual flash without automatic exposure.

6. AUTO OK INDICATOR (Sufficient Light Indicator)

The Auto OK Indicator (14) operates only in the A1, A2 and TTL auto settings. The Auto OK Indicator confirms that your subject will be correctly exposed. For proper use of the Auto OK Indicator at the A1 or A2 settings, aim the flash at your key subject and press the Flash Test Button (13) while watching the Auto OK Indicator. The Auto OK will light up and glow green if the subject is within the auto range. If no green light is seen, reduce your flash-to-subject distance, or if you are using A2 switch to A1.

When using the TTL setting, the Auto OK will only work if an actual exposure is made with the flash attached to the camera. In that case film must be loaded in the camera. Or, for test purposes, a light-toned piece of paper should be positioned at the film plane as a film substitute and the camera back must be closed. Please note that light-toned paper may give incorrect responses due to its difference in reflective quality versus actual film. In either case, an actual flash "exposure" must be made by depressing the camera shutter release button.

7. BOUNCE FLASH

By "bouncing" flash off reflective surfaces such as the ceiling, subjects can be more softly lighted. Avoid colored reflective surfaces when using color film, since bounced light will be influenced by such colors, affecting results accordingly. To determine correct operating range under "bounce" conditions, check the Auto OK Indicator explained above.

8. DEDICATED FUNCTIONS

Please refer to the Specific Dedicated Function Instructions section for your particular camera brand and model.

9. TO TAKE A PICTURE

Once you have gone through the familiarization procedure described above, you will understand the workings of the flash unit well enough to begin to utilize its great potential. However, the following checklist is provided as a convenient reference for the picture-taking procedure.

a) Load camera with film and set the film speed.

b) *With flash power OFF,* mount flash on camera and turn lock ring down against shoe. Flash shoe must be securely locked on camera to prevent intermittent contact and malfunction.

c) Set camera to automatic mode or X-sync speed. (On most modern 35mm SLR cameras with dedicated function, your Flash will make the setting for you, automatically.)

d) Set film speed on flash unit.

e) Set flash Power Switch to ON.

f) Set flash Mode Selector to mode desired.

g) If necessary set required f/stop on your camera lens.

h) Focus, compose the picture, and shoot.

10. USE OF OPTIONAL COLOR FILTERS

The optional color filters should be used only with the flash set to the Manual mode. The following chart is provided as a guide ***only***. Specific data may vary as you adapt filtered-flash to your creative style. Experimentation is highly recommended.

Filter	General Effect	Exposure Compensation Guide
Red	Produces red-colored flash illumination	Open lens 2 f-stops
Blue	Produces blue-colored flash illumination	Open lens 2 f-stops
Yellow	Produces yellow-colored flash illumination	Open lens 1 f-stop
85-B	A warming filter which converts flash illumination for use with Type B (tungsten) color films — no change in ISO film speed	Open lens 1 f-stop

GENERAL SPECIFICATIONS

Guide Number (ISO 100)	ISO/ft	DIN/m
Basic flash	80 (50mm)	24 (50mm)

Angle of Coverage: 34° x 46°

Power Source: 4 AA alkaline or NiCad batteries

Recycle Time, Average
(with 4 AA alkaline):
Auto: 0.5—4.0 sec.
Manual: 4.0 sec.
(with fully charged NiCads):
Auto: 0.5—3.0 sec.
Manual: 3.0 sec.

Number of Flashes, Average
(with 4 AA alkaline):
Auto: 450—1800
Manual: 450
(with fully charged NiCads):
Auto: 200—750
Manual: 200

Auto Circuit: Thyristor

Automatic f/Stops and Corresponding Auto Exposure Flash Ranges with ISO 100 Film:
A1 (f/2): 6—40 ft (2.0—12 m)
A2 (f/4): 3—20 ft (1.0—6 m)
(For TTL operation, see the TTL f/Stop/Distance Chart at the rear of this manual.)

Sensor Measuring Angle: Approx. 18°

Flash Duration:
Manual: 1/1,000 sec.
Auto: 1/1,000—1/30,000 sec.

Auto OK Circuit: Green lamp, extended on-time

Flash Ready Light: Orange neon tube

Flash Test Button: Combined with Flash Ready Light

Color Temperature: 6000° Kelvin

Calculator Scale: ISO 64, 100, 200, 400, 1000, 1600

Hot Shoe: Locking, with dedicated contacts

Vertical Bouncing: 0, 45, 60, 75 and 90°

Dedicated Functions: Variable per camera (see specific camera/flash instruction section)

Optional Accessories:
Wide Angle Lens and Color Filter Kit

Specifications subject to change without notice.

SPECIFIC DEDICATED FUNCTION INSTRUCTIONS

CANON AE-1

(FLASH POWER SWITCH MUST BE IN THE OFF POSITION BEFORE MOUNTING FLASH ON OR REMOVING FROM CAMERA.)

AUTOMATIC OPERATION

1. *Film Speed Setting* — Set the ASA/ISO for the film in use on both camera and flash.
2. ***On-Camera** Mode and Shutter Dial Setting* — Set to any speed except "B".
3. ***On-Flash** Mode Selector* — Set to A1 or A2. For best flash performance, use A1 whenever possible.

   NOTE: The R-TTL position is for Ricoh cameras. If used on Canon cameras, it will result in full manual output of flash and will in no way adversely affect your Canon camera.
4. *Lens f/stop Setting* — Set to green "A" or green indicator past minimum f/stop.
5. Turn flash on and when the ready light glows shutter and f/stop are automatically set for flash. Take the picture.
6. *Viewfinder Information* — When shutter release is depressed halfway, lens is automatically set and needle points to the f/stop shown in the Automatic f/stop Window on the back of the flash.
7. *Auto Exposure Verification (AUTO OK)* — Auto exposure is verified by glowing green "AUTO OK" on the back of the flash. To activate the "AUTO OK", take a flash picture or push the "READY/TEST" BUTTON on the back of the flash. Check the "AUTO OK" immediately after the flash fires. If no "AUTO OK" and using A2, move closer to the subject or switch to A1. If no "AUTO OK" with A1, move closer to subject.

MANUAL OPERATION

For Manual Flash Output, simply set Flash Mode Selector to "M". After focusing, obtain subject distance from lens barrel. Find this distance on Manual f/stop/Distance Scale on the back of the flash. Set your lens to the f/stop opposite the distance. "AUTO OK" does not function when flash is in the manual mode.

CANON AE-1 PROGRAM

(FLASH POWER SWITCH MUST BE IN THE OFF POSITION BEFORE MOUNTING FLASH ON OR REMOVING FROM CAMERA.)

AUTOMATIC OPERATION

1. *Film Speed Setting* — Set the ASA/ISO for the film in use on both camera and flash.
2. ***On-Camera** Mode and Shutter Dial Setting* — Set to "Program" or any shutter speed.
3. ***On-Flash** Mode Selector* — Set to A1 or A2. For best flash performance, use A1 whenever possible.

   NOTE: The R-TTL position is for Ricoh cameras. If used on Canon cameras, it will result in full manual output of flash and will in no way adversely affect your Canon camera.
4. *Lens f/stop Setting* — Set to green "A" or green indicator past minimum f/stop.
5. Turn flash on and when the ready light glows shutter and f/stop are automatically set for flash. Take the picture.
6. *Viewfinder Information* — When shutter release is depressed halfway, lens is automatically set and LED displays the same f/stop shown in the Automatic f/stop Window on the back of the flash. A green lightning bolt is also displayed and indicates flash ready.

7. *Auto Exposure Verification (AUTO OK)* — After taking the picture, keep the Shutter Release depressed and note the green lightning bolt in the viewfinder. If the lightning bolt blinks, it indicates enough light was produced for a good exposure. Auto exposure verification is also indicated by the glowing green "AUTO OK" on the back of the flash. It can be activated by taking a picture or by depressing the "READY/TEST" BUTTON on the back of the flash. Check the "AUTO OK" immediately after the flash fires. If no "AUTO OK" and using A2, move closer to the subject or switch to A1. If no "AUTO OK" with A1, move closer to subject.

MANUAL OPERATION

For Manual Flash Output, simply set Flash Mode Selector to "M". After focusing, obtain subject distance from lens barrel. Find this distance on Manual f/stop/Distance Scale on the back of the flash. Set your lens to the f/stop opposite the distance. "AUTO OK" does not function when flash is in the manual mode.

CANON A-1

(FLASH POWER SWITCH MUST BE IN THE OFF POSITION BEFORE MOUNTING FLASH ON OR REMOVING FROM CAMERA.)

AUTOMATIC OPERATION

1. *Film Speed Setting* — Set the ASA/ISO for the film in use on both camera and flash.
2. ***On-Camera** Mode and Shutter Dial Setting* — Set to any mode. Set shutter to any speed except "B"
3. ***On-Flash** Mode Selector* — Set to A1 or A2. For best flash performance, use A1 whenever possible.

NOTE: The R-TTL position is for Ricoh cameras. If used on Canon cameras, it will result in full manual output of flash and will in no way adversely affect your Canon camera.

4. *Lens f/stop Setting* — Set to green "A" or green indicator past minimum f/stop.
5. Turn flash on and when the ready light glows shutter and f/stop are automatically set for flash. Take the picture.
6. *Viewfinder Information* — When shutter release is depressed halfway, shutter speed and f/stop that have been automatically set are displayed in bottom of viewfinder.
7. *Auto Exposure Verification (AUTO OK)* — Auto exposure is verified by glowing green "AUTO OK" on the back of the flash. To activate the "AUTO OK", take a flash picture or push the "READY/TEST" BUTTON on the back of the flash. Check the "AUTO OK" immediately after the flash fires. If no "AUTO OK" and using A2, move closer to the subject or switch to A1. If no "AUTO OK" with A1, move closer to subject.

MANUAL OPERATION

For Manual Flash Output, simply set Flash Mode Selector to "M". After focusing, obtain subject distance from lens barrel. Find this distance on Manual f/stop/Distance Scale on the back of the flash. Set your lens to the f/stop opposite the distance. "AUTO OK" does not function when flash is in the manual mode.

CANON T-50

(FLASH POWER SWITCH MUST BE IN THE OFF POSITION BEFORE MOUNTING FLASH ON OR REMOVING FROM CAMERA.)

AUTOMATIC OPERATION

1. *Film Speed Setting* — Set the ASA/ISO for the film in use on both camera and flash.

2. ***On-Camera** Mode and Shutter Dial Setting* — Set to "Program".
3. ***On-Flash** Mode Selector* — Set to A1 or A2. For best flash performance, use A1 whenever possible.

   NOTE: The R-TTL position is for Ricoh cameras. If used on Canon cameras, it will result in full manual output of flash and will in no way adversely affect your Canon camera.
4. *Lens f/stop Setting* — Set to green "A" or green indicator past minimum f/stop.
5. Turn flash on and when the ready light glows shutter and f/stop are automatically set for flash. Take the picture.
6. *Viewfinder Information* — When shutter release is depressed halfway, "P" and ϟ lightning bolt are displayed.
7. *Auto Exposure Verification (AUTO OK)* — Auto exposure is verified by glowing green "AUTO OK" on the back of the flash. To activate the "AUTO OK", take a flash picture or push the "READY/TEST" BUTTON on the back of the flash. Check the "AUTO OK" immediately after the flash fires. If no "AUTO OK" and using A2, move closer to the subject or switch to A1 If no "AUTO OK" with A1, move closer to subject.

MANUAL OPERATION

For Manual Flash Output, simply set Flash Mode Selector to "M". After focusing, obtain subject distance from lens barrel. Find this distance on Manual f/stop/Distance Scale on the back of the flash. Set your lens to the f/stop opposite the distance. "AUTO OK" does not function when flash is in the manual mode.

CANON T-70

(FLASH POWER SWITCH MUST BE IN THE OFF POSITION BEFORE MOUNTING FLASH ON OR REMOVING FROM CAMERA.)

AUTOMATIC OPERATION

1. *Film Speed Setting* — Set the ASA/ISO for the film in use on both camera and flash.
2. ***On-Camera** Mode and Shutter Dial Setting* — Set to any mode.
3. ***On-Flash** Mode Selector* — Set to A1 or A2. For best flash performance, use A1 whenever possible.

   NOTE: The R-TTL position is for Ricoh cameras. If used on Canon cameras, it will result in full manual output of flash and will in no way adversely affect your Canon camera.
4. *Lens f/stop Setting* — Set to green "A" or green indicator past minimum f/stop.
5. Turn flash on and when the ready light glows shutter and f/stop are automatically set for flash. Take the picture.
6. *Viewfinder Information* — When shutter release is depressed halfway, if lens set to "A" or green indicator past minimum f/stop, the automatic f/stop is displayed along with a green lightning bolt indicating flash ready. If the lens is set to any f/stop, a blinking red "M" will be displayed.
7. *Auto Exposure Verification (AUTO OK)* — Auto exposure is verified by glowing green "AUTO OK" on the back of the flash. To activate the "AUTO OK", take a flash picture or push the "READY/TEST" BUTTON on the back of the flash. Check the "AUTO OK" immediately after the flash fires. If no "AUTO OK" and using A2, move closer to the subject or switch to A1. If no "AUTO OK" with A1, move closer to subject.

MANUAL OPERATION

For Manual Flash Output, simply set Flash Mode Selector to "M". After focusing, obtain subject distance from lens barrel. Find this distance on Manual f/stop/Distance Scale on the back of the flash. Set your lens to the f/stop opposite the distance. "AUTO OK" does not function when flash is in the manual mode.

CANON T-80

(FLASH POWER SWITCH MUST BE IN THE OFF POSITION BEFORE MOUNTING FLASH ON OR REMOVING FROM CAMERA.)

AUTOMATIC OPERATION

1. *Film Speed Setting* — Set the ASA/ISO for the film in use on both camera and flash.
2. ***On-Camera** Mode and Shutter Dial Setting* — Set to any mode.
3. ***On-Flash** Mode Selector* — Set to A1 or A2. For best flash performance, use A1 whenever possible.

   NOTE: The R-TTL position is for Ricoh cameras. If used on Canon cameras, it will result in full manual output of flash and will in no way adversely affect your Canon camera.
4. *Lens f/stop Setting* — Set to green "A" or green indicator past minimum f/stop.
5. *Viewfinder Information* — After flash is turned on and ready light is glowing, depress the shutter release halfway. "P" and lightning bolt will appear, indicating everything is automatically set and you are ready for flash photography. Take the picture.
6. *Auto Exposure Verification (AUTO OK)* — Auto exposure is verified by glowing green "AUTO OK" on the back of the flash. To activate the "AUTO OK", take a flash picture or push the "READY/TEST" BUTTON on the back of the flash. Check the "AUTO OK" immediately after the flash fires. If no "AUTO OK" and using A2, move closer to the subject or switch to A1. If no "AUTO OK" with A1, move closer to subject.

MANUAL OPERATION

For Manual Flash Output, simply set Flash Mode Selector to "M". After focusing, obtain subject distance from lens barrel. Find this distance on Manual f/stop/Distance Scale on the back of the flash. Set your lens to the f/stop opposite the distance. "AUTO OK" does not function when flash is in the manual mode. The viewfinder information will change from "P" to "M" when the f/stop ring on the lens is set to an f/stop instead of the automatic setting.

RICOH XR-P

(FLASH POWER SWITCH MUST BE IN THE OFF POSITION BEFORE MOUNTING FLASH ON OR REMOVING FROM CAMERA.)

AUTOMATIC OPERATION

1. *Film Speed Setting* — Set the ASA/ISO for the film in use on both camera and flash.
2. ***On-Camera** Mode and Shutter Speed Dial Setting* — Set mode to "PD", "P" or "PA". Set the shutter dial to "A" or any setting except "TV". "PA" will give the greatest flash range when lens set to "P". If shutter is set to other than "A", shutter will fire at set speed up to 125. If set over 125, shutter will fire at 125.

   NOTE: With camera set to any P mode and lens set to "P", XR-P fill flash system will automatically set the correct f/stop for fill flash. Flash must be in TTL mode.
3. ***On-Flash** Mode Selector* — Set to A1, A2 or TTL.
4. *Lens f/stop Setting — **If using A1 or A2,*** set lens to same f/stop as shown in Auto f/stop Window on back of flash. ***If using R-TTL,*** set to "P" or any f/stop. Make sure subject is within flash range of f/stop chosen. To choose an appropriate f/stop, see the TTL f/stop Distance Chart at the back of this manual or the Manual f/stop Distance Scale on the back of the flash. Make sure subject distance is ***well within*** the range of the f/stop you select. The wider the f/stop selected (smaller the number) the greater the flash range and the better the overall flash performance.
5. *Viewfinder Information* — Turn the flash on and in a few seconds the ready light will glow. If lens is set to "P", an f/stop will be displayed at the bottom of the viewfinder and depends on the camera mode selected. See the Ricoh XR-P Maximum f/stop Chart at the back of the manual. A red LED and white bar will surround "125" and denotes flash ready and shutter automatically set for flash. Take the picture.
6. *Auto Exposure Verification (AUTO OK)* Auto exposure is verified by glowing green "AUTO OK" light on rear of flash immediately after flash is fired. If using TTL, an actual camera exposure must be made with film in the camera to activate "AUTO OK". If no "AUTO OK" in TTL, use smaller f/stop number or move closer to the subject. If using A1 or A2, push the "READY/TEST" BUTTON on back of flash or take a flash picture to activate "AUTO OK". If no "AUTO OK" and using A2, move closer or switch to A1 and re-set lens accordingly. If no "AUTO OK" in A1, move closer.

MANUAL OPERATION

1. *Film Speed Setting* — Set the ASA/ISO for the film in use on both camera and flash.
2. ***On-Camera** Mode and Shutter Dial Setting*— Set to any mode. Set to any speed except "TV" (flash will not fire if camera set to "TV").
3. ***On-Flash** Mode Selector* — Set to "M".
4. *Lens f/stop Setting* — After focusing, obtain subject distance from lens barrel. Find subject distance on Manual f/stop Distance Scale on back of flash and note f/stop opposite that distance. Set the f/stop on your lens. Turn the flash on and after ready light glows, take the picture.
5. *Viewfinder Information* — A red LED will appear next to 125 and indicates flash ready.
6. *Auto Exposure Verification (AUTO OK)* — Does not function in the manual mode.

Vivitar Flash

TTL f/Stop Distance Chart

Tableau des diaphragmes et distances en TTL

Tabelle von Blenden u. Entfernungen bei TTL-Betrieb

Tabla de diafragmas y distancias para TTL

ISO 25	50/64	100	200	400	800/1000	1600	Corresponding Ranges / Distances correspondantes / Entsprechende Reichweiten / Distancias correspondientes	
						1.4	34-220 ft. (12-68 m.)	
					1.4	2.0	24-160 ft. (8-48 m.)	
				1.4	2.0	2.8	17-110 ft. (5.8-34 m.)	
			1.4	2.0	2.8	4.0	12-80 ft. (4-24 m.)	
		1.4	2.0	2.8	4.0	5.6	8.6-57 ft. (2.9-17 m.)	
f/	1.4	2.0	2.8	4.0	5.6	8.0	6.0-40 ft. (2.0-12 m.)	A1
1.4	2.0	2.8	4.0	5.6	8.0	11	4.3-28 ft. (1.5-8.5 m.)	
2.0	2.8	4.0	5.6	8.0	11	16	3.0-20 ft. (1.0-6.0 m.)	A2
2.8	4.0	5.6	8.0	11	16	22	2.1-14 ft. (0.7-4.2 m.)	
4.0	5.6	8.0	11	16	22		2.1-10 ft. (0.7-3.0 m.)	
5.6	8.0	11	16	22			2.1-7.2 ft. (0.7-2.1 m.)	
8.0	11	16	22				2.1-5.0 ft. (0.7-1.5 m.)	
11	16	22					2.1-3.6 ft. (0.7-1.0 m.)	