Canon T90

Canon

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INNOVATION:
THE SOUL OF THE PHOTOGRAPHER, THE HEART OF THE CANON T90.

The creation of the T90 was very much like the creative process of photography itself. Like any good photographer, Canon looked on its task as a relentless pursuit of innovation, a search for new and striking images, a fresh way of seeing.

Canon looked for innovative new solutions to many of the old problems and limitations of SLR photography—and found them. Entirely new systems were designed for exposure, metering, film transport, information input and display, flash photography, and microcircuitry.

The result of Canon's effort is a remarkably versatile photographic tool. Never has a camera been more closely tuned to the experienced photographer's needs, or more helpful in surpassing the photographer's own limitations.

And never has a camera been designed to so completely satisfy the photographer's feel for quality, or eye for beauty.

The Canon T90: the photographer's vision is now a reality.

FEATURES THAT STRETCH THE LIMITS OF THE PHOTOGRAPHICALLY POSSIBLE.

TRENDSETTING BODY DESIGN
Superb balance and handling
Shutter release positioned for maximum comfort
Large, non-slip grip
Logical, uncluttered control layout
Elegant, rounded design fits into the photographer's hands

BUILT-IN AUTOMATIC FILM TRANSPORT SYSTEM
Powerful built-in motor drive with only four size-AA batteries
Maximum 4.5 fps, 2 fps, and single-frame film transport
Automatic 4.5-to-2 fps low-power speed changeover
Automatic film loading (ready to shoot in approx. 2 sec.)
Automatic film rewinding (approx. 8 sec. for 24-exposure roll)
Preset multiple exposures

THREE BUILT-IN METERING SYSTEMS
Center-weighted average metering
Partial metering with AE Lock
Spot metering, with 30-sec. memory and AE Lock
Multi-spot metering for up to 8 readings
8-step variable Highlight/Shadow controls

HIGH-SPEED SHUTTER
1/4000 sec. maximum shutter speed
1/250 sec. maximum flash sync

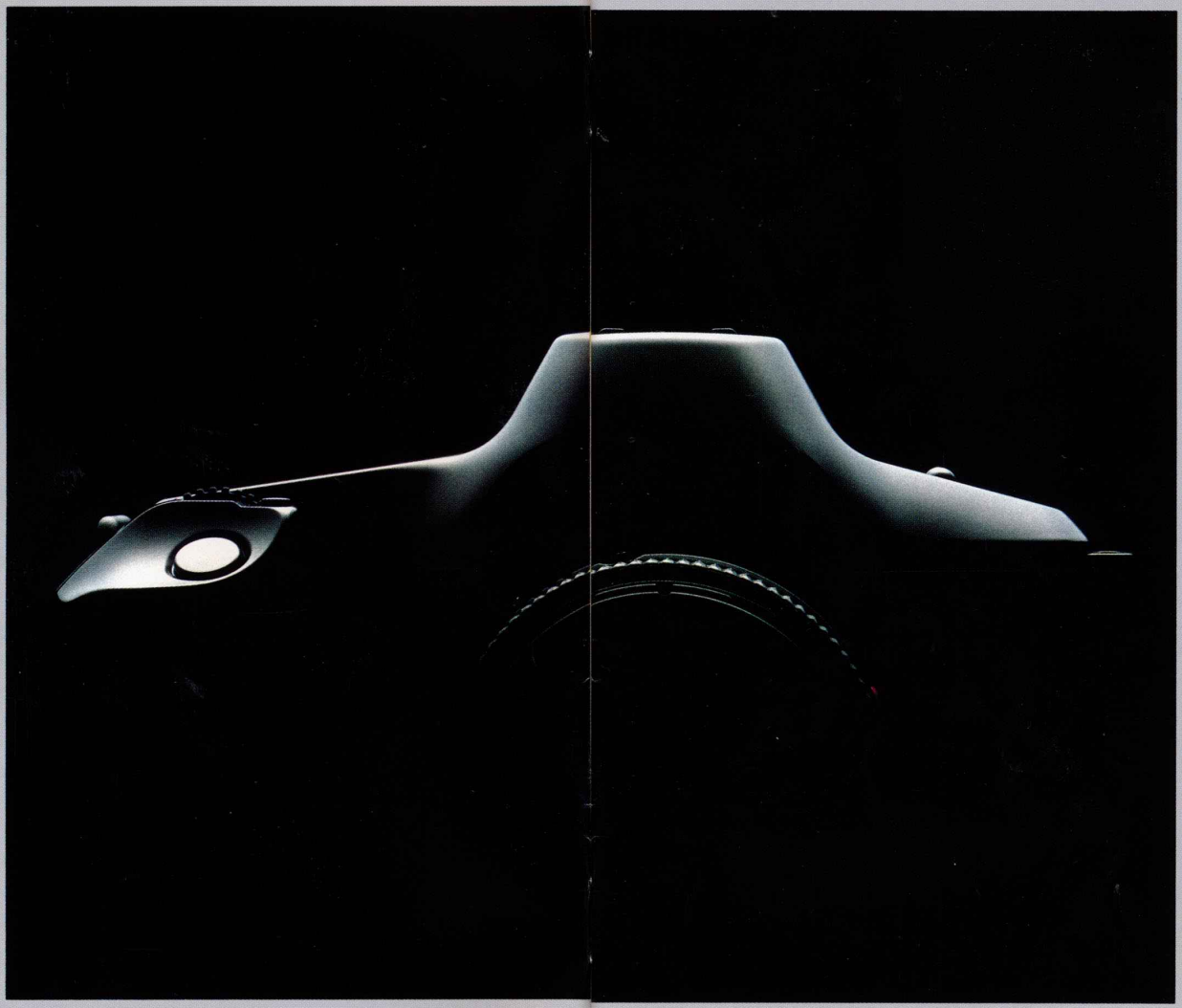
MULTIPLE AE MODES
Variable-shift Program AE with 7 program settings
Standard Program AE
Aperture-priority AE (with switchable Safety Shift function)
Shutter-priority AE (half-step shutter-speed settings with switchable Safety Shift function)
Stopped-down AE, manual and bulb modes
1/3-step exposure compensation system

COMPREHENSIVE INFORMATION INPUT AND DISPLAY
Electronic Input Dial inputs 121 items of information
LCD Display Panel displays 226 items of information
Complete viewfinder information display including multi-spot metering scale
Automatic DX film speed and film length setting
Only necessary items are displayed to eliminate information clutter

A-TTL SPEEDLITE 300TL
A-TTL control system for automatic flash in Program, Aperture-priority and Shutter-priority AE modes
FE Lock TTL control system for accurate exposure of off-center subjects
FE Lock flash operation with spot metering and Highlight/Shadow controls
Second-curtain flash sync

TTL MACRO RING LITE ML-2
For accurate and automatic close-up flash photography

EXPERIENCE A RARE MASTERPIECE OF CAMERA DESIGN.



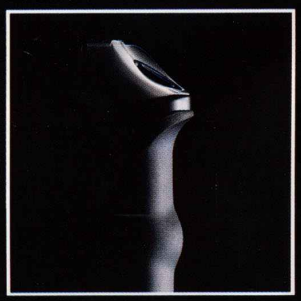
Canon now invites you to experience the most striking new direction in SLR body design in many years.

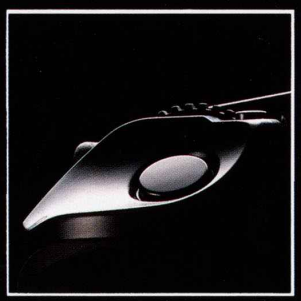
Take a few minutes to give the T90 a careful looking over. Notice the clean surfaces and sleek, sensual lines, the uncluttered layout, the superb balance and proportion. The tool of the creative photographer has itself become a work of art.

Hold the T90, and discover how sophisticated outward appearance reflects its inner quality. The T90 rests in the hands naturally, comfortably—like no other camera. It has the unmistakable feel of solid quality. Its controls are unobtrusive, but absolutely accessible.

Experience complete unity of form and function in a rare masterpiece of design: the Canon T90.


MODE
MULTI EXP.
METERING & / CLEAR






T90

ADVANCED CAPABILITIES TO SERVE THE NEEDS OF THE SERIOUS PHOTOGRAPHER.

The T90 was designed entirely from the photographer's point of view. So it is perhaps sensible to talk not about what the camera does, but rather about what the photographer can do with the camera.

The photographer can do so much with the T90: Shoot at shutter speeds up to a lightning-fast 1/4000 sec. or flash sync up to 1/250 sec. Determine light values with one of three different metering systems, including sophisticated multi-spot metering. Decide exposure according to an incredible variety of AE modes, including seven different program modes and an array of exposure compensation features.

The T90 collects and processes an enormous amount of information, yet it does so without clutter and confusion. There is nothing to come between the photographer and the image he seeks.

BUILT FOR THE ULTIMATE IN HIGH-SPEED PHOTOGRAPHY.

1/4000 SECOND SHUTTER SPEED
The T90's ultra-fast shutter allows the photographer mastery over subjects far too fast for the eye to catch. The briefest instant is frozen in time. The 1/4000 sec. shutter speed, combined with the built-in motor drive, makes the T90 an incomparable tool for action photography.

MAXIMUM 4.5 FRAMES-PER-SECOND SHOOTING WITH BUILT-IN MOTOR DRIVE
A high-speed motor drive is more a necessity than a luxury for sports photography or just keeping track of the action. That's why a two-speed film transport is designed as an integral part of the compact T90 body—and why it is designed to operate on just four size-AA batteries. There's no bulky additional motor drive to get in the way when speed and agility are essential.

SOPHISTICATED EXPOSURE CONTROL WITH MULTI-SPOT METERING AND HIGHLIGHT/SHADOW CONTROLS.

with multi-spot metering

MULTI-SPOT METERING

The T90 offers multi-spot metering for those pictures which demand a delicate balance among several picture elements. The photographer takes spot meter readings of up to eight points, which are averaged by the camera to determine a final exposure setting. An easy-to-read viewfinder display shows each reading. In this example, three spot readings were taken: one on the trees in the background and two separate readings—for extra emphasis—on the model's face. The result is a well-balanced photograph with the main subject correctly exposed. With average metering (*small photo*), the model is underexposed.

with average metering

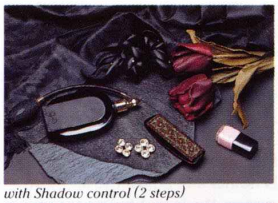
with Highlight control (2.5 steps)

with Highlight control (2 steps)

without Highlight control

HIGHLIGHT CONTROL

All cameras tend to reproduce predominantly white scenes with a dull gray cast. The T90's variable Highlight control uses spot metering to let the camera see whites as they really are. And unlike other H/S controls, the T90 system allows the photographer to compensate for different levels of brightness by adjusting Highlight compensation up to 4EV in half steps. Two "good" exposures are shown in this example: one with 2.5 steps of Highlight compensation (*top*) and another with 2 steps (*center*). Both examples bring out the brilliant whites of the subject and background. Without Highlight compensation (*bottom*), the result is a dull gray tone overall.



with Shadow control (2 steps)

with Shadow control (1 step)

without Shadow control

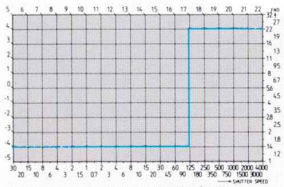
SHADOW CONTROL

The Shadow control works like the Highlight control to keep blacks dark—the way they appear to the human eye. And, like the Highlight control, compensation can be adjusted according to how dark the subject is. Again, variable compensation has been used for two versions of the subject, both with attractive, deep, dark tones. Which is the "better" image is simply a matter of personal preference. In the first photo (*top*), 2 steps of compensation were used, and in the second photo (*center*), 1 step. Without Shadow compensation (*bottom*), black tones are weak and washed out.

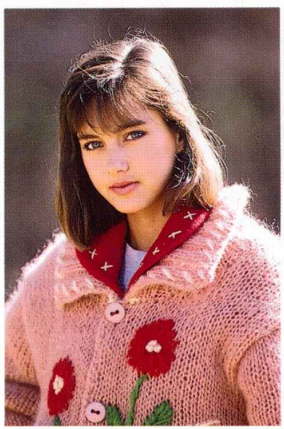
VERSATILE AE MODES

SHUTTER-PRIORITY AE

In the Shutter-priority AE mode, the photographer sets the shutter speed at any point between 1/4000 and 30 sec., including half-step settings, for an unprecedented 36 shutter-speed settings in all. The camera sets the aperture automatically. This extraordinarily fine degree of control has long been in demand by sports photographers and other professionals. The T90's Safety Shift can be switched on to automatically override the set shutter speed to avoid over- or underexposure. In the example (*above*), the photographer chose just the right shutter speed to stop the action without freezing each droplet of water—a difficult and highly successful balancing act.

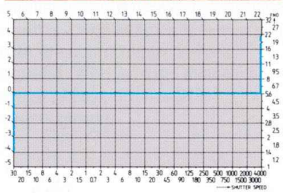


Shutter-Priority AE with Safety Shift (shutter speed set at 1/125 sec. with FD 50mm f/1.4 lens).



APERTURE-PRIORITY AE

The T90's Aperture-priority AE mode provides the photographer with easy and complete control over depth-of-field. The aperture is set using the T90's exclusive Electronic Input Dial and clearly displayed both on the LCD Display Panel and in the viewfinder—there is no need to adjust the aperture ring on the lens. Shutter speed is set automatically. With Safety Shift switched on, aperture is automatically adjusted to prevent over- or underexposure. In this example (*left*), a larger aperture was chosen to isolate the subject from the background, a useful effect in portrait photography.



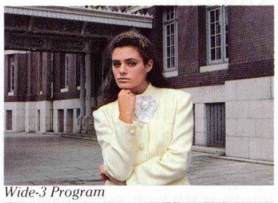
Aperture-Priority AE with Safety Shift (aperture set at f/5.6 with FD 50mm f/1.4 lens).

PROGRAM AE

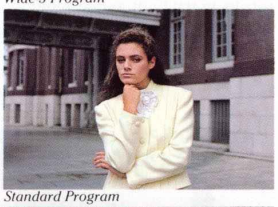
This mode helps the photographer catch momentary images before they're gone forever. The T90 makes all exposure adjustment according to a standard program suitable for situations in which there are no special exposure problems.

VARIABLE-SHIFT PROGRAM AE

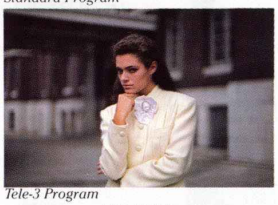
For the photographer who demands both a high level of creative control *and* the speed of Program AE shooting, the T90 offers Variable-Shift Program AE. The photographer chooses from among seven exposure programs: Standard Program, three small-aperture-priority "Wide" programs, and three high-shutter-speed-priority "Tele" programs. The "Wide" programs can be used to blur fast action or maintain maximum depth-of-field, and are most often appropriate for use with wide-angle lenses. The "Tele" programs freeze the subject in time and isolate the subject against the background. They are especially suited for use with telephoto lenses.



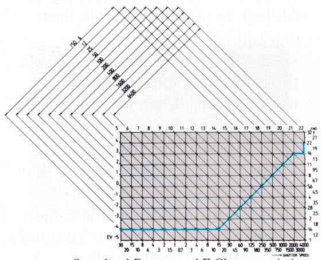
Wide-3 Program



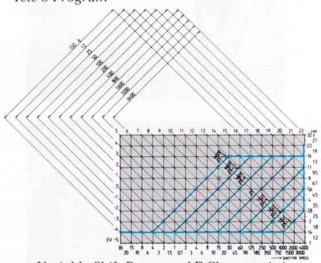
Standard Program



Tele-3 Program



Standard Program AE Characteristics (with FD 50mm f/1.4 lens).



Variable-Shift Program AE Characteristics (with FD 50mm f/1.4 lens).

MANUAL OVERRIDE

For full control of exposure, simply set the T90 to the Shutter-priority AE mode and move the lens off of the "A" mark. Shutter speed is set on the camera and aperture is set using the lens aperture ring, referring to the metered aperture value displayed in the viewfinder. The example here was deliberately overexposed to bring out the light on the horizon.

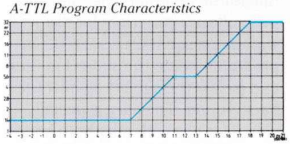
THE ULTIMATE IN FLASH SOPHISTICATION

When used with the 300TL dedicated flash unit, the T90 is capable of taking flash photos impossible with any other camera. New features like A-TTL (Advanced TTL), FE Lock (Flash Exposure Lock), and second-curtain sync combine with the T90's 1/250 sec. flash sync speed to make a great variety of complex flash effects as simple as ordinary available-light photography.

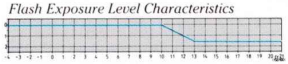
MAXIMUM 1/250 SEC. SYNC SPEED WITH A-TTL

With the flash unit attached, the T90's shutter speed can be set manually or automatically anywhere between 1/250 and 30 sec., giving the photographer great control over subject movement, depth-of-field and ambient light. Canon's new A-TTL system balances exposure of the background and subject for superb flash results in daylight and at night.

A-TTL Program Characteristics



Flash Exposure Level Characteristics



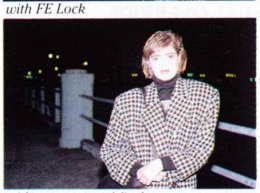
with FE Lock

with conventional flash

CANON'S EXCLUSIVE FE LOCK

The 300TL's FE Lock mode employs spot metering and the principle of AE lock to provide accurate flash exposure of the subject in any situation. In the first example (*top*), the model was spot metered by means of a 1/20 strength pre-flash. With that reading locked in, the photographer was then free to re-frame the shot. The result was an excellent exposure, totally unaffected by the position of the subject or the reflectivity of the background. In a nighttime flash situation (*bottom two photos*), FE Lock exposes the model correctly, even though she is positioned off center.

with FE Lock



with conventional flash

FE Lock Program Characteristics

FE LOCK AND H/S CONTROLS FOR BALANCED EXPOSURE OF SUBJECT AND BACKGROUND

Once the subject is metered and locked in with the Speedlite 300 TL's FE Lock, the viewfinder display shows how bright or dark the background is in relation to the correctly exposed subject. The H/S controls can then be used to bring the background into balance with the subject, as shown above.

FE LOCK AND H/S CONTROLS FOR INDEPENDENT EXPOSURE OF SUBJECT AND BACKGROUND

The H/S controls can also be used to vary the background according to the photographer's intentions, as in the three versions of the same subject shown on the left. Note, though, that while background exposure may vary, FE Lock ensures that the model is properly exposed.

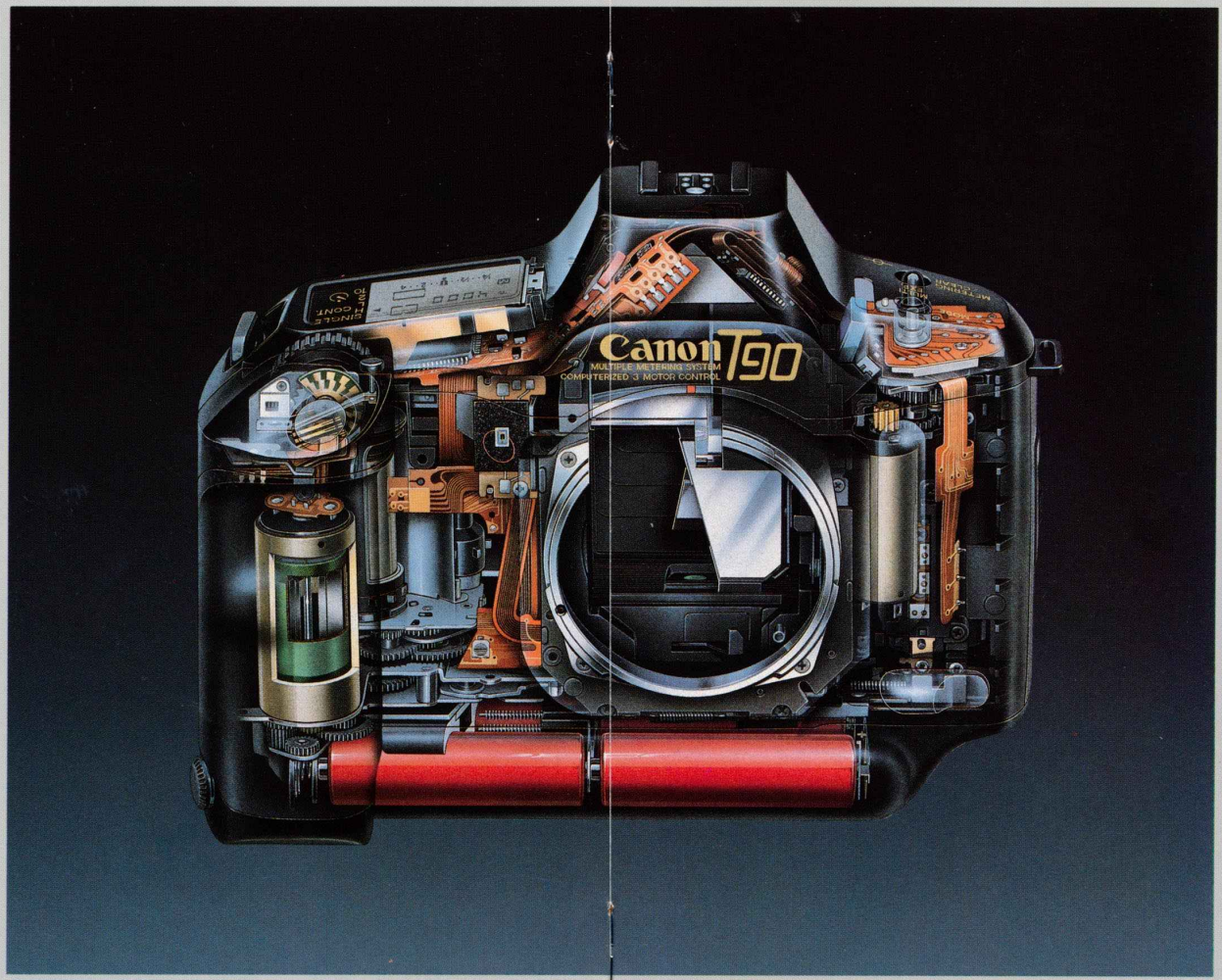
SECOND-CURTAIN SYNC

Until now, flash synchronization has always been timed for when the first shutter curtain is fully open. Now, the T90 and Speedlite 300TL offer the alternative of flash output just before the second shutter curtain begins running. In this example, the flash discharge comes at the very end of a long exposure, so that the lights trace the movement of the car—a fascinating effect never before possible.

FIRST-CURTAIN SYNC

With the T90 and Speedlite 300TL, it is also possible to make long flash exposures with conventional first-curtain sync. In this case, the flow of light does not describe the subject's movement up to that point.

NEW TECHNOLOGIES THAT EXTEND YOUR PHOTOGRAPHIC REACH.



Canon's goal in creating the T90 was to put at the photographer's disposal the widest possible range of photographic tools. To do this, Canon had to stretch the limits of the technically possible, searching out new solutions to some of photography's most basic problems.

The search for innovation took many directions and yielded far-reaching results. Canon took a new look at the way data is input by the photographer and improved information readout. And much more: Canon developed its own high-speed electronic shutter. Revolutionized automatic film transport. Set new standards of sophistication in microcircuitry. Found startling ways to use less power to do more work.

The T90 is an unprecedented technological achievement. And with the T90, every contribution to the science of camera engineering is also a contribution to the art of photography.

EXTRAORDINARY INNOVATIONS AT THE CRUCIAL INTERFACE BETWEEN CAMERA AND PHOTOGRAPHER.

One of Canon's most important design objectives for the T90 was to make the camera's many high-performance functions and technologies instantly accessible to the photographer. This was a fascinating challenge; never before had so many sophisticated features been built into a body so sleek and compact.

Canon met the challenge with an impressive range of innovations in camera control engineering. The most extraordinary new idea is the versatile Electronic Input Dial—the centerpiece of the camera's intelligent control system. In addition, the T90 features a superb display system—both on the T90's display panel and in the viewfinder—that keeps the photographer constantly updated on all relevant camera functions. The result is a camera that is totally responsive to even the slightest demands.

THE T90'S MASTER CONTROL:THE NEW ELECTRONIC INPUT DIAL

The Electronic Input Dial is one of those rare design concepts that transcend existing technical limits. It inputs an incredible volume and variety of information with amazing speed and simplicity. It serves the function of numerous separate controls, thus keeping the layout of the T90 simple and clean.

To achieve this, Canon took the two most common camera control mechanisms—the mechanical dial and electronic pushbuttons—and combined them into an ideal hybrid that offers the advantages of both.

The Electronic Input Dial operates something like a mechanical shutter speed dial. The user can move it quickly from the top of the scale to the bottom in less than a second. But unlike a purely mechanical system, the Electronic Input Dial is not limited by how many settings can be legibly printed on the control.

The technology of the Electronic Input Dial is totally electronic. Since information is input electronically, it can be used for multiple functions with almost any number of settings for each function. But it does not force the user to move slowly, one step at a time, from one setting to another as with electronic pushbuttons.

The Electronic Input Dial is used together with several other controls to input the following:

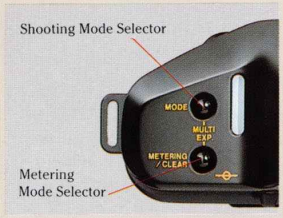
The Electronic Input Dial: Information Input

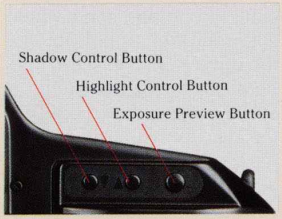
Function / mode	Number of items input
AE modes	10
Shutter speeds (in half steps)	36
Aperture settings	20
Metering sensitivity patterns	3
Manual ISO film speed settings	31
Exposure compensation settings	12
Multiple exposure settings	9

That adds up to seven functions and a total of 121 separate items of information —all input simply and without confusion using the Electronic Input Dial.

A RATIONAL ARRAY OF CAMERA CONTROLS

All of the T90's controls are designed for maximum ease and speed of operation. For the most frequently used controls, the photographer need not move his hands from the standard shooting position. Other controls are placed out of the way, but accessibly, along the bottom edge of the camera back. Important, but less frequently used, controls are set into the right side of the camera, tucked away behind the hinged palm wing.





Shutter Button

Based on in-depth ergonomic studies, the T90 shutter release is positioned at the point where the right index finger rests naturally. The large handgrip also facilitates shooting.

Spot Metering Button

For one-point spot metering, simply center the spot metering mark on the subject and press the Spot Metering Button. The spot meter reading is stored in the camera's memory for 30 seconds. For multi-spot metering, press the button repeatedly for up to eight spot readings. Multi-spot readings are averaged for a final exposure value.

Shooting Mode Selector

The Shooting Mode Selector is located on the top of the T90. Press it while moving the Electronic Input Dial to select any of 10 AE shooting modes.

Metering Mode Selector

Press the Metering Mode Selector, located just behind the Shooting Mode Selector, while moving the Electronic Input Dial to set one of the T90's three metering modes.

Multiple Exposure Selection

When shooting multiple exposures, press both the Shooting Mode Selector and Metering Mode Selector while moving the Electronic Input Dial to set the T90 for up to nine exposures on the same frame.

Shadow Control Button

Located on the back of the camera, within easy reach of the photographer's right thumb, is the Shadow Control Button. To emphasize deep shadows and dark areas to the desired degree, select a dark area of the composition with the Spot Metering Button, then press the Shadow Control Button from one to eight times to correct exposure up to 4 EV in half steps.

Highlight Control Button

The Highlight Control, located beside the Shadow Control, works just like the Shadow Control to keep highlights

bright. Highlight compensation is also adjustable up to 4 EV in half steps.

Exposure Preview Button
Press the Exposure Preview Button, located beside the Highlight Control Button, to activate the viewfinder information display.

Main Switch
To turn the T90 on, move the Main Switch, located along the lower edge of the camera back, from L (lock) to A (advance). The T90 is now ready to shoot.

Film Speed Button
The ISO film speed is set automatically by the camera when DX-coded film is used. To set the correct ISO film speed for non-DX film, press the Film Speed Button, located beside the Main Switch, while moving the Electronic Input Dial.

Exposure Compensation Button
To set the exposure compensation level, press the Exposure Compensation Button, located beside the Film Speed Button, while moving the Electronic Input Dial. Exposure can be corrected to ±2EV in 1/3 steps.

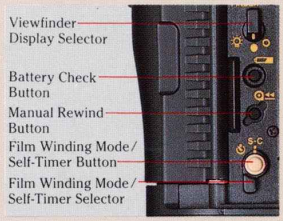
Stop-Down Lever
Depress the Stop-Down Lever, located to the left of the lens, for stopped-down photography.

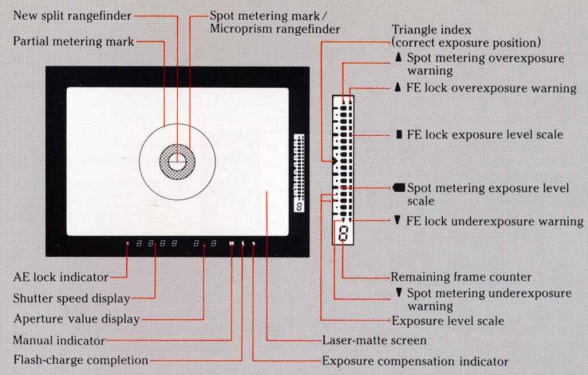
Viewfinder Display Selector
The Viewfinder Display Selector, located inside the palm wing, has three settings: viewfinder information display off, viewfinder information display on, and illumination of LCD Display Panel and Viewfinder LCD Display on.

Battery Check Button
Also inside the palm wing is the Battery Check Button, which activates the battery charge level display on the LCD Display Panel.

Manual Rewind Button
By pressing the Manual Rewind Button, located inside the palm wing, the film can be rewound immediately from any point on the film.

Film Winding Mode/ Self-Timer Selector
With the selector set to S-C, press the Film Winding Mode Button to choose from among three available winding modes. The same button changes Self-Timer timing when the selector is moved to the Self-Timer ( ) position.





VIEWFINDER DISPLAY FOR ON-THE-SPOT INFORMATION

The T90's viewfinder displays important information that the photographer needs during the act of photo composition. All information is displayed outside the field of view, in bright LEDs or LCD indicators.

AE Lock Indicator
An LED asterisk indicates that the AE lock is in place. AE Lock can be used in the Partial and Spot Metering modes.

Shutter Speed Display
The shutter speed set by either camera or photographer is displayed in LED numerals.

Aperture Display
The f/number is also displayed in LED numerals. In manual operation, the LED shows the ideal aperture setting, which must be set manually.

Manual Indicator
An LED "M" appears in the viewfinder to indicate manual override.

Flash Charge-Completion Indicator
A green LED lightning bolt symbol ( ) appears to show that the flash is charged and ready to shoot.

Exposure Compensation Indicator
An LED plus/minus symbol (+ / −) appears to indicate exposure compensation has been selected.

Spot Metering Display
An LCD scale to the right of the picture frame indicates spot metering. In one-point spot metering, a dot ( ) appears at the center position on the scale. In multi-spot metering, reference spot readings appear first as a free dot ( ) on the scale. When the Spot Metering Button is pressed, the free dot is fixed and all spot readings in the memory are averaged around the center point. Over- or underexposure of more than 4.5 steps is indicated by an arrow ( ) at either end of the scale. Highlight/Shadow compensation is indicated by the spot metering dot array moving up or down the scale.

Analog/Digital Frame Counter
The same LCD scale is also used as a frame counter to show how many frames are left on the roll (DX film only). When more than 9 frames are left, the number of usable frames is displayed on an analog bar graph. The display switches to digital to count down the last 9 frames. This feature is easy to read, and extremely useful when shooting with continuous high-speed motor drive.

BASIC TECHNOLOGIES THAT OPEN UP A NEW WORLD OF POSSIBILITIES.

An impressive range of basic technologies lies behind the extraordinary functions and capabilities of the T90. Behind the incredibly efficient built-in film transport is a completely new drive system using three motors. Behind the ultra-fast shutter speed is a new type of shutter developed by Canon engineers exclusively for the T90. And behind the T90's exposure capabilities are a new system of data handling and a metering system of unprecedented versatility.

CANON CHALLENGES ACCEPTED THINKING ABOUT MOTOR DRIVES

Until Canon developed a solution in the T90, building a high-speed, professional motor drive into a compact SLR body was considered technically impossible. Too-high voltage levels—and therefore too many bulky batteries—were required to drive a high-speed film transport while also powering a high-speed shutter, film rewind and a modern camera's entire range of electronic functions. Motor drives have until now remained an expensive accessory.

Canon's revolutionary Three-Motor System

Like most creative breakthroughs, Canon's solution to the problems of high-speed film-transport mechanics is elegantly simple. Just use three highly specialized coreless motors instead of a single multi-purpose motor.

The T90 has one motor for automatic forward film transport, a second for charging the shutter, AE mechanism, and quick-return mirror, and a third for automatic rewind. There are several obvious energy-saving advantages to the Three Motor System.

First, each motor can be designed for maximum efficiency in its individual function. For instance, the film can be advanced quickly during auto-loading without activating the mirror.

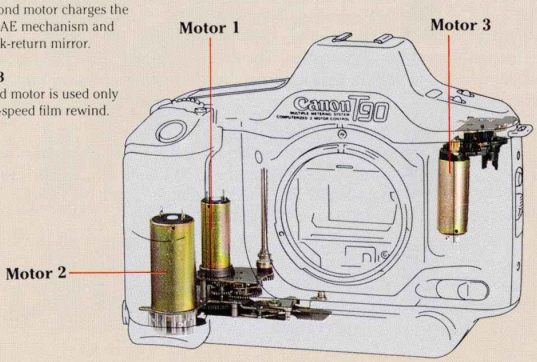
Then, each motor can be independently controlled, for greater flexibility and a more efficient distribution of the work burden.

Finally, each motor can be placed closer to the mechanism it drives, to improve transmission efficiency. In the case of the forward film-transport motor, Canon was even able to design the world's first two-speed automatic changeover function for motor drive.

Motor 1
The first motor is used exclusively for forward film transport. It features a unique two-speed, low-voltage changeover function

Motor 2
The second motor charges the shutter, AE mechanism and the quick-return mirror.

Motor 3
The third motor is used only for high-speed film rewind.



Two-speed changeover function

The T90 motor drive features an innovative automatic changeover function that automatically switches speed from the top speed of 4.5 fps to 2 fps whenever the battery voltage drops below a prescribed level. This saves battery energy and extends battery life, so more pictures can be taken with the same batteries.

Convenient one-second auto loading

The T90's automatic film loading system takes only about two seconds. Simply drop in the film cartridge, extend the leader to the orange mark and close the camera back. The film is automatically advanced up to the first frame at top speed.

Fast auto-rewind

With a coreless motor designed exclusively for film rewind, the T90 offers an exceptionally fast rewind speed—only about eight seconds for a 24-exposure roll. Rewind begins automatically after the last frame is exposed and stops automatically when the film is completely rewound.

CANON'S NEW CONCEPT IN HIGH-SPEED SHUTTERS

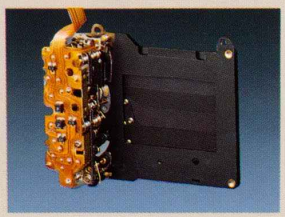
The T90's exclusive Permanent Magnet Shutter (PMS) was Canon engineers' original solution to the problem of achieving stable, durable, high-speed shutter operation at relatively low power levels. A few other cameras offer the same top 1/4000-second speed, but only the T90 powers both a high-speed shutter and high-speed motor drive on just four size-AA batteries. And no other shutter matches the T90's for accurate, reliable performance.

The PMS shutter was made possible by an ingenious combination of five important innovations in shutter mechanics.

First, Canon used strong, lightweight, specially coated superduralumin shutter blades—four in front and four in back. They were designed strong enough to withstand the shock of high-speed operation but light enough to move with maximum speed and minimum power.

Second, a high-precision boost spring mechanism, acting like an automobile's turbo-charger, supplies an additional burst of power to the shutter blades exactly when needed.

Third, two quick-return magnets, one for the back shutter blades and one for the front, achieve instantaneous release of the armature. This newly-developed component



ensures top speed and accuracy.

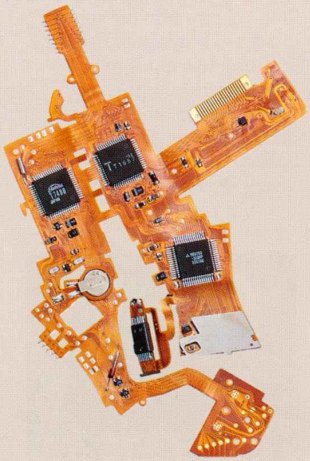
Fourth, the T90 shutter achieves a faster response speed by using an exceptionally high-voltage (15 V) drive. Power is boosted by a special DC/DC converter.

Fifth, an exclusive two-step shutter brake combines soft braking and hard braking mechanisms to absorb the powerful inertial force of the shutter blades completely and quickly.

A MAJOR STEP FORWARD IN CAMERA ELECTRONICS

To operate and control the T90's enormous range of functions, Canon has created a completely new microcircuitry system that combines unprecedented computing power with extraordinary energy efficiency.

The backbone of the system is a dual CPU, with a main CPU to handle overall sequence control and the LCD panel, and a sub-CPU to control high-speed data-processing functions needed for exposure calculations, digital displays and motor sequence control. The two CPUs keep in touch by means of a high-speed serial digital I/O interface LSI. The main CPU, which must be kept operating continuously to respond to various input signals, operates at low power, and handles relatively small amounts of data.



The workhorse is the sub-CPU, which processes massive amounts of data, but operates only when needed—microseconds at a time. The sub-CPU alone has a ROM capacity of 6,144 words, a RAM capacity of 192 bytes, and runs 96 levels of sub-routines with command execution times as fast as two microseconds.

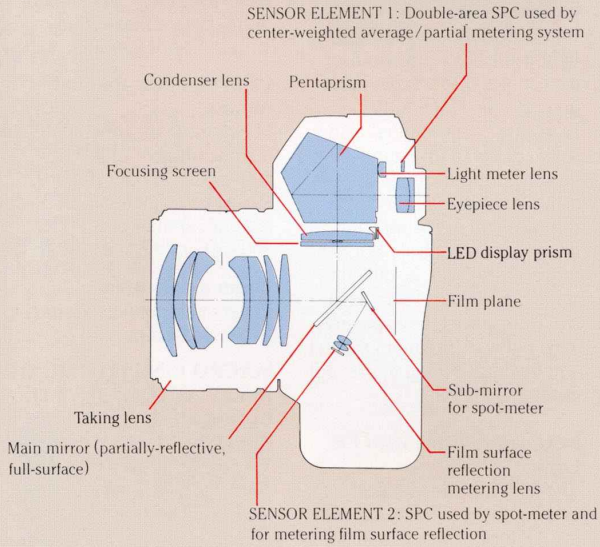
In addition, the T90 microcircuitry system contains six LSIs, four ICs, and a quartz oscillator.

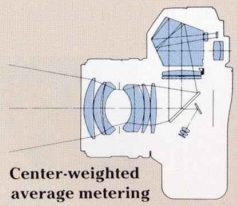
A VERSATILE METERING SYSTEM

As we have seen, the T90 features the world's most versatile built-in metering system, with three metering distribution patterns. Two of these—center-weighted average metering and partial metering—are measured by a double-area sensitivity silicon photo cell placed above the viewfinder eyepiece.

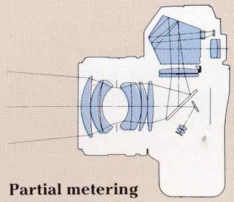
The third metering pattern—spot metering—is measured by another silicon photocell placed in the lower part of the mirror box. During spot metering, light coming through the lens is intercepted by a sub-mirror placed behind the main mirror, functioning as a half-mirror. From here, it is directed to the spot metering cell, where the center portion of the field of view is measured, providing the basis for spot metering exposure calculations. This silicon metering cell is also used for A-TTL and TTL flash metering with the 300TL and ML-2 flash units.

OPTICAL SYSTEM FOR FINDER/LIGHT METERING SYSTEM

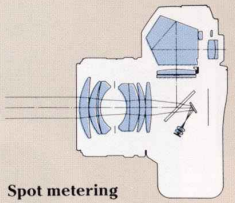




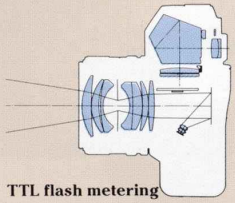
Center-weighted average metering



Partial metering



Spot metering



TTL flash metering

THE T90 SYSTEM: VERSATILE ACCESSORIES FOR THE MOST DEMANDING PHOTOGRAPHERS.

THE SPEEDLITE 300TL: A REVOLUTIONARY FLASH SYSTEM

A-TTL for advanced exposure control

In the 300TL's A-TTL mode, light is measured by a sensor as it comes through the lens and reflects off the film. Exposure is determined using software based on optimum flash algorithms obtained from actual photos combined with distance and exposure data derived from analysis of a near-infrared pre-flash. In difficult situations such as fill-in flash, A-TTL balances the exposure level between the main subject and the background to prevent unnatural effects.

New capabilities with FE Lock

The 300TL is the first flash unit ever to use spot metering and the AE lock principle in flash photography. At last, flash can be used for off-center subjects. FE Lock uses a 1/20 strength pre-flash from the main flash head and TTL metering to calculate the correct flash exposure for the subject. The background exposure can be controlled with the T90's Highlight and Shadow controls, for independent exposure of subject and background.

Second curtain synchronization

With the 300TL, it is possible to synchronize the flash either for the first shutter curtain opening, or just before the second curtain begins running.

High and Low manual modes

M Hi for manual operation with a guide number of 30 (ISO 100 • m) or 98 (ISO 100 • ft.), and M Lo for manual flash with a guide number of 7.5 (ISO 100 • m) or 24.5 (ISO 100 • ft.).

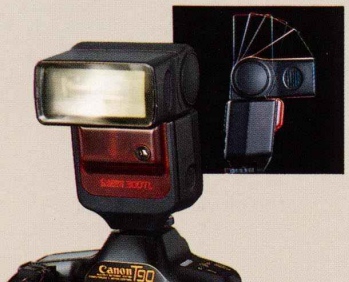
Zoom mechanism

Covers fields of view from 24 mm to 85 mm.

MACRO RING LITE ML-2: FULLY AUTOMATIC TTL CLOSE-UP PHOTOGRAPHY

The Macro Ring Lite ML-2 is a two-flash-tube ring-type TTL electronic flash designed for exceptionally simple close-up photography. Major features include:

- Two flash tubes can operate separately or together
- Convenient focusing lamp
- Versatile modeling light



MULTIPLE FLASH ACCESSORIES

With the T90's multiple flash accessories, automatic multiple TTL flash photography is possible with up to four flash units (Speedlite 300TL, Macro Ring Lite ML-2, or any combination of the two). The accessories include the TTL Hot Shoe Adapter, TTL Distributor, Off-camera Shoe Adapter, and Connecting Cords 60 and 300.

COMMAND BACK 90 FOR DATA IMPRINTING AND TIMING

The T90's Command Back 90 interchanges easily with the camera's standard back to give the photographer a host of data imprinting and timer control features. Data and timer functions can be used at the same time.

DATA MEMORY BACK 90

Data Memory Back 90 is a high-tech option that allows the photographer to store various types of important exposure control data. The data can then be read out on the unit's LCD monitor panel.

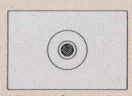
Note: With Interface Unit D.M.B., all data can be viewed on the screen of an MSX personal computer. (Data Memory Back 90, Interface Unit D.M.B. and the MSX computer are not available in North America and some other areas.)

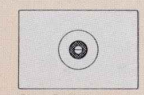
REMOTE CONTROL SHOOTING WITH WIRELESS CONTROLLER LC-2

The Canon infrared Wireless Controller LC-2 allows remote control of the camera shutter from up to five meters (16.4 ft.) away. The system's transmitter broadcasts on two channels, so it can be used to operate two remote cameras.

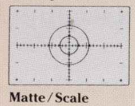
The LC-2 system operates in three different modes. The standard mode operates immediately when the transmission switch is pressed, the delay mode operates two seconds after pressing the switch, and the auto-sensing mode operates only when some object blocks the path of light between the transmitter and receiver.

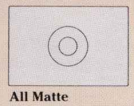
EIGHT INTERCHANGEABLE FOCUSING SCREENS


Microprism

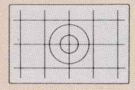

New Split/ Microprism

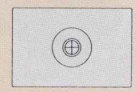

New Split


Matte/Scale


All Matte

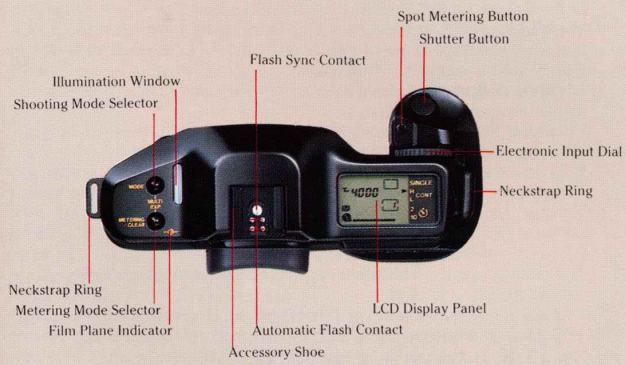

Double Cross-Hair Reticle


Matte/Section

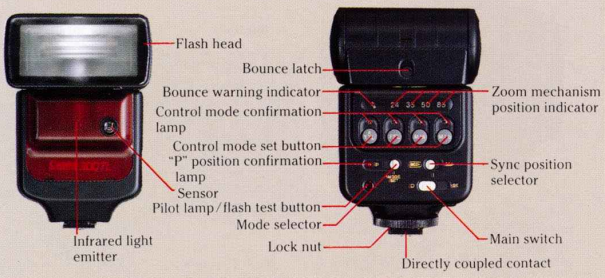

Cross Split-Image

NOMENCLATURE

T90 Camera



Speedlite 300TL



Macro Ring Lite ML-2

SPECIFICATIONS

T90 Camera

Type: 35 mm single lens reflex (SLR) camera with electronically controlled automatic exposure (AE), focal-plane shutter, and built-in motor drive.
Format: 24 × 36 mm.
Usable Lenses: Canon FD lenses (full aperture metering and stopped-down metering) and non-FD lenses (stopped-down metering).
Standard Lens: FD 50 mm f/1.4.
Lens Mount: Canon Mount
Viewfinder: Fixed eye-level pentaprism. Gives 94% vertical and horizontal coverage of actual picture area, and 0.77X magnification at infinity with a standard 50 mm lens.
Dioptric Adjustment: Built-in eyepiece is adjusted to standard –1 diopter (eyepoint: 19.3 mm).
Focusing Screen: Standard split-image/microprism rangefinder. Seven other types of interchangeable screens are available optionally.
Mirror: Quick return type half-mirror with shock and noise absorber.
Viewfinder Information: Displayed to the right and at the bottom of viewing area.
Bottom area:
(1) 7-segment LED digit display
1 Shutter speed (red)—flashes at 4 Hz to give out-of-metering range warning.
2 Aperture (red)—flashes at 4 Hz to give out-of-metering range warning.
3 All hyphens (red)—data imprint confirmation; displayed only when special accessories are attached.
(2) 7-segment LED character display
1 EEEE EE (red)—error warning; displayed when the lens is set to "A" during stopped-down operation.
2 HELP (red)—camera malfunction or operational error warning.
(3) 3-segment LED display
1 ✱ (red)—AE lock indicator in partial area metering and spot area metering.
(4) LED mask lighting display
1 M (red)—manual indicator.
2 ϟ (green)—flash charge-completion indicator.
3 +/- (red)—exposure compensation indicator.
Right area:
(1) Dot and 7-segment digit transparent LCD display
1 (white on blue background)—multi-spot metering indicator, H/S control indicator, and remaining frame display.
2 (white on blue background)—FE lock indicator when the Speedlite 300TL is used with the camera in the FE lock mode.
Light Metering System: Through-the-lens (TTL) full aperture metering for FD lenses, using silicon photocell (SPC). Three selectable metering patterns; center-weighted average metering, partial area metering, and spot area metering. When using lenses or accessories without FD signal pins, only stopped-down metering may be used.
Exposure Modes:
1 Shutter-priority AE with selectable Safety Shift function (ON/OFF possible).
2 Aperture-priority AE with selectable Safety Shift function (ON/OFF possible).
3 Standard program AE.
4 Variable-shift Program AE (selectable out of 7 programs).
5 Manual.
6 Stopped-down AE.
7 Stopped-down (fixed index) metering.
8 Flash AE (possible with specified Canon Speedlites).
Meter Coupling Range: EV 0 ~ 20 (with ISO 100 film and 50 mm f/1.4 lens).
Film Speed: ISO 6 ~ 6400. (ISO 25 ~ 5000 is automatically set by 1/3 step according to DX code standard.) Also can be set manually.
Exposure Compensation:
1 Exposure compensation index— ± 2 steps in 1/3 increments.
2 H/S control— ± 4 steps in 1/2 increments (can only be used during spot area metering, and in FE lock mode with Speedlite 300TL).
Shutter: Vertical-travel metal type focal-plane shutter. All speeds electronically controlled. Front and back curtains controlled by separate quick-return permanent magnets.
Shutter Speeds: 1/4000 ~ 30 sec. and bulb (X-sync = 1/250 sec.). Can also be set in 1/2 steps.
Self-Timer: Electronically controlled, with a delay of either approx. 10 sec. or approx. 2 sec. Indicated by blinking red LED of operation confirmation lamp.
Film Loading: Automatic. After the film has been positioned and the back cover closed, the film is automatically advanced to the first usable frame and then automatically stopped (approx. 2 sec.). The frame counter display then reads "1".
Film Wind: Automatic using the built-in coreless motor exclusively used for film transport. Continuous shooting is possible. Confirmation by the film transport bar marks on the LCD display panel.
Film Winding Mode: Three selectable modes; S (single exposure), H (max. 4.5 fps), and L (max. 2 fps). When operating in H mode, automatically switches to L mode when battery power drops below prescribed voltage to boost shooting capacity.
Film Rewind: Automatic using the built-in coreless motor exclusively used for film rewind. Automatically starts when the end of the film is reached and then automatically stops (approx. 8 sec. with 24-exp. film). Manual film rewind is also possible by pressing the manual rewind button.
Flash Contact: Coupled directly to the camera by means of the X-sync contact on the accessory shoe. When using the Speedlite 300TL, either the first shutter curtain synchronization or the second shutter curtain synchronization can be set.
Automatic Flash:
When the Speedlite 300TL is used and the camera is set to a program AE mode:
1. A-TTL flash-auto: Using A-TTL program of the camera and the near-infrared preflash of the Speedlite, the correct aperture value is automatically set according to the shooting distance and subject reflectivity. X-sync speed is also automatically set between 1/60 ~ 1/250 sec. upon flash charge-completion. TTL control system meters the light reflected from the film surface. Automatic fill-in flash is possible.
2. FE Lock TTL flash-auto: The camera's FE Lock program automatically sets the aperture. The main flash tube produces preflash and the reflection from the subject is measured by TTL spot metering and is entered into memory. X-sync speed is also automatically set between 1/60 ~ 1/250 sec. upon flash charge-completion. Automatic fill-in flash is possible.

Remote Control: Possible. With three-terminal contact for remote control. Remote Switch 60T3 is required.
Multiple Exposure: Set by pressing both the shooting mode selector and the metering mode selector at the same time. Continuous multiple exposure is possible. Reset/clear during shooting and preset up to 9 exposures are also possible. Automatically cleared upon completion of preset exposures.
Eyepiece Shutter: Provided.
Exposure Preview Button: Provided.
Finder Display Selector: All LCD/LED displays can be turned ON or OFF, LCD display to the right of the viewfinder and the display panel can be illuminated by the built-in illumination lamp.
LCD Display Panel: Displays only the information required at the time, e.g. shooting mode, metering mode, film winding mode, shutter speed, aperture, film speed, frame counter (additive type), self-timer operation time, bulb operation time, battery check, etc.
Power Source:
1 Main power source—four AA-size batteries. Alkaline-manganese batteries are standard but carbon-zinc and Ni-Cd batteries may also be used.
2 Memory back-up—built-in lithium battery (BR-1225 or CR-1220), battery life is approx. 5 years.
Battery Check: By pressing the battery check button. Three energy levels are shown by the battery check bar marks on the display panel.
Back Cover: Removable. Opened by sliding the latch with safety lock.
Dimensions: 153.1 (W) × 121 (H) × 69.4 (D) mm (6-1/4″ × 4-3/4″ × 2-3/4″)
Weight: 800 g (28-3/16 oz.) body only.

Speedlite 300TL

Type: Energy-saving, automatic electronic flash unit with pre-flash function. TTL metering function measuring light reflected from the film surface, and an automatic flash output control function using spot metering. Exclusive for use with the T90 camera. Clip-on type with directly coupled contacts.
Guide Number:

	Flash head position			
	24 mm	**35 mm**	**50 mm**	**85 mm**
M Hi	25 (ISO 100 • m)	30 (ISO 100 • m)	35 (ISO 100 • m)	40 (ISO 100 • m)
	82 (ISO 100 • ft.)	98 (ISO 100 • ft.)	114 (ISO 100 • ft.)	131 (ISO 100 • ft.)
M Lo	6.2 (ISO 100 • m)	7.5 (ISO 100 • m)	8.7 (ISO 100 • m)	10 (ISO 100 • m)
	20.5 (ISO 100 • ft.)	24.5 (ISO 100 • ft.)	29 (ISO 100 • ft.)	32.7 (ISO 100 • ft.)

The above figures are at full charge, i.e. 30 sec. after pilot lamp glows with new alkaline or fully charged Ni-Cd batteries.

Flash Coverage Angle: Covers more than the fields of view of 24 mm, 35 mm, 50 mm and 85 mm lenses.
Recycling Time: Alkaline-manganese batteries: Auto, approx. 0.2 to 13 sec.; M Hi, approx. 13 sec. Ni-Cd batteries: Auto, approx. 0.2 to 6 sec.; M Hi, approx. 6 sec. (Interval between firing of the flash and relighting of pilot lamp with new alkaline or fully charged Ni-Cd batteries.)
Number of Flashes: Alkaline-manganese batteries: approx. 100 ~ 700 times. Ni-Cd batteries: approx. 45 ~ 300 times. (Counted when flash is fired in 30 sec. intervals with new alkaline or fully charged Ni-Cd batteries.)
Flash Duration: Approx. 1/700 ~ 1/20000 sec.
Flash Control System: TTL series control system with pre-flash function. Automatic flash operation in A-TTL and FE Lock modes.
For Both the A-TTL and FE Lock Modes

	Shutter speed	Aperture value
Shutter-priority AE	Set between 30 and 1/250 sec.	Automatic setting (between the maximum and minimum aperture of the lens)
Aperture-priority AE	Automatic setting (30 ~ 1/250 sec.)	Set between the maximum and minimum aperture
Program AE	Automatic setting (1/60 ~ 1/250 sec.)	Automatic setting* (between the maximum and minimum aperture of the lens)

* In the FE Lock Mode, between either f/2 or the maximum and minimum settings of the lens.

Flash Exposure Level Control: A maximum of 1.5 BV steps in the A-TTL or FEL mode when subject illuminance is more than BV5 according to the center-weighted average metering system of the T90.
Automatic Shooting Distance Range:
(in program mode at ISO 100)
Zoom Head:
at 24 mm: 0.5 ~ 12.5 m (1.6 ~ 41 ft.)
at 35 mm: 0.5 ~ 15 m (1.6 ~ 49 ft.)
at 50 mm: 0.5 ~ 17.5 m (1.6 ~ 57.4 ft.)
at 85 mm: 0.5 ~ 20 m (1.6 ~ 65 ft.)
Film Speed Setting: Automatically set by the camera.
Bounce Angle: Upward: 0 ~ 90° (click-stop positions: 0, 60, 75, 90). Left side: 0 ~ 180° (click-stop positions: 0, 60, 75, 90, 120, 150, 180). Right side: 0 ~ 90° (click-stop positions: 0, 60, 75, 90).
Power Source: Four size-AA (LR6) alkaline-manganese or Ni-Cd batteries. SE (Save-Energy) mechanism: Power is automatically turned off after 5 minutes of non-use when the main switch is left on.
Pilot Lamp: Lights when the flash is ready for use and automatically switches to flash photography. Also used as a test button.
Size: 81 (W) × 119.4 (H) × 94 (D) mm (3-3/16″ × 4-11/16″ × 3-11/16″).
Weight: 395 g (13-15/16 oz.) body only.

Subject to change without notice.

Macro Ring Lite ML-2

Type: Energy-saving flash unit with TTL series control circuit. Clip-on type with direct contacts and lock.
Guide Number: 11 (ISO 100 • m)/36 (ISO 100 • ft.) in Manual Hi mode, 5.6 (ISO 100 • m)/18 (ISO 100 • ft.) in Manual Lo mode. (The above figures are at full charge, i.e. after pilot lamp blinks with new alkaline or fully charged Ni-Cd batteries.)
Flash Coverage Angle: More than 80° vertically and horizontally.
Recycling Time:

	Both flash heads	One flash head
Alkaline batteries	0.2 ~ 13 sec.	0.2 ~ 13 sec.
Ni-Cd batteries	0.2 ~ 6 sec.	0.2 ~ 6 sec.

(in Manual Hi mode)

(Interval between firing flash and pilot lamp relighting, with new alkaline or fully charged Ni-Cd batteries.)

Number of Flashes:

	Both flash heads	One flash head
Alkaline batteries	More than 100 times	More than 100 times
Ni-Cd batteries	More than 45 times	More than 45 times

(in Manual Hi mode)

(Counted when flash is fired in 30 sec. intervals, with new alkaline or fully charged Ni-Cd batteries.)

Flash Duration: 1/500 ~ 1/10000 sec.
Flash Control System: TTL control system: i.e, the sensor inside the camera body measures the light which passes through the lens and which is reflected from the film plane. When the subject has received the proper amount of light, the flash output is automatically cut off. Fill-in flash is possible.
Pilot Lamp (red): Glows when flash is sufficiently charged. As soon as it glows, the camera automatically switches to flash circuit. Starts blinking when flash is fully charged. Also serves as the modeling light.
Auto Check Lamp (green): Glows for approx. 2 sec. after actual firing of flash when subject is correctly exposed in the TTL AUTO mode.
Focusing Lamp: By pressing the focusing lamp, two small lamps between the two main flash tubes light up for approx. 30 sec.
Modeling Light: By pressing the pilot lamp, the two main flash tubes flash on and off for approx. 5 sec. Only one tube can be flashed on and off by illumination changeover switch.
Flash Head: Two main flash tubes are used on left and right sides. One-tube flash is possible by illumination changeover switch. Attached to lens by lens filter thread or through exclusive adapters.
Save-Energy Function: Operates by setting the main switch to "SE" position. When the main switch is left ON and the flash is not used for approx. 5 minutes, power to the flash unit is automatically cut off.
Film Speed: Film speed set on the T90 is automatically transmitted to flash.
Power Source: Four size-AA alkaline-manganese (LR6) or four size-AA Ni-Cd batteries.
Dimensions:
Control unit—74 (W) × 60.5 (H) × 106.5 (D) mm (2-15/16″ × 2-3/8″ × 4-3/16″).
Flash unit—101 (W) × 120.5 (H) × 20.6 (D) mm (4″ × 4-3/4″ × 13/16″).
Weight:
Control unit—235 g (8-5/16 oz.) body only.
Flash unit—115 g (4-9/16 oz.) body only.

(All data are based on Canon's Standard Test Method.)

Subject to change without notice.