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Canon **F-1** MOTOR DRIVE UNIT



INSTRUCTIONS

English Edition

The Canon Motor Drive Unit is a precision built, electrically powered film advance apparatus that is attachable to any F-1 and usable with all related accessories and system equipment. Through the adoption of electronics, not only is a wide range of photography with the timer possible, but also short interval photography of three exposures per second and continuous photography of 36 exposures. It also enables stabilized and unmanned EE (automatic exposure control) photography when jointly used with Film Chamber 250 and the Servo EE Finder.

Main Features

- 1 Easily attachable on any F-1 body with no adjustments necessary.
- 2 Short interval continuous photography in high speed of three exposures per second possible.
- 3 Single-frame shooting is possible.
- 4 A wide range timer is built in.
- 5 Any shutter speed except "B" is usable.
- 6 Remote control is possible.
- 7 Unmanned photography is possible with the combined use of the Servo EE Finder.
- 8 Photography with long roll film is possible in combination with Film Chamber 250.
- 9 Automatically stops upon completion of photography.
- 10 Error-free operation with a safety device.
- 11 Direct-connect type battery case for hand-held photography available soon.

Technical Data

Circuit Construction: 5 transistors, 2 diodes, 5 condensers, 1 SCR.

Shooting Intervals: 1/3 sec. to 60 sec./frame.

Timer Scale: 7-stage. "T.OFF", 0.5, 1, 2, 5, 10, 60 sec. Time allowance, $\pm 12\%$.

Power Source: DC 15v. Exclusive NiCd Battery 500 FZ, or 10 penlight batteries. Loaded in Battery Case and connected with Battery Connector MD.

Battery Check: By Battery Checker MD.

Photographing Capacity: NiCd Battery 500 FZ; 36 frames x approx. 80 rolls at full charge. Penlight batteries, Alkaline, 36 frames x 80 rolls or more. Manganese, 36 frames x 50 rolls or more.

Frame Counter: Counts the number of the unexposed frames. Automatically stops at "0".

Remote Control: Connect the Remote Switch MD to the terminal on the Battery Connector. Length of cord is 5 meters. An extension cord (10 meters) is available. Ultrasonic Remote Switch, Wireless Remote Switch, Parallel Switch Box, Extended-time Timer are under development.

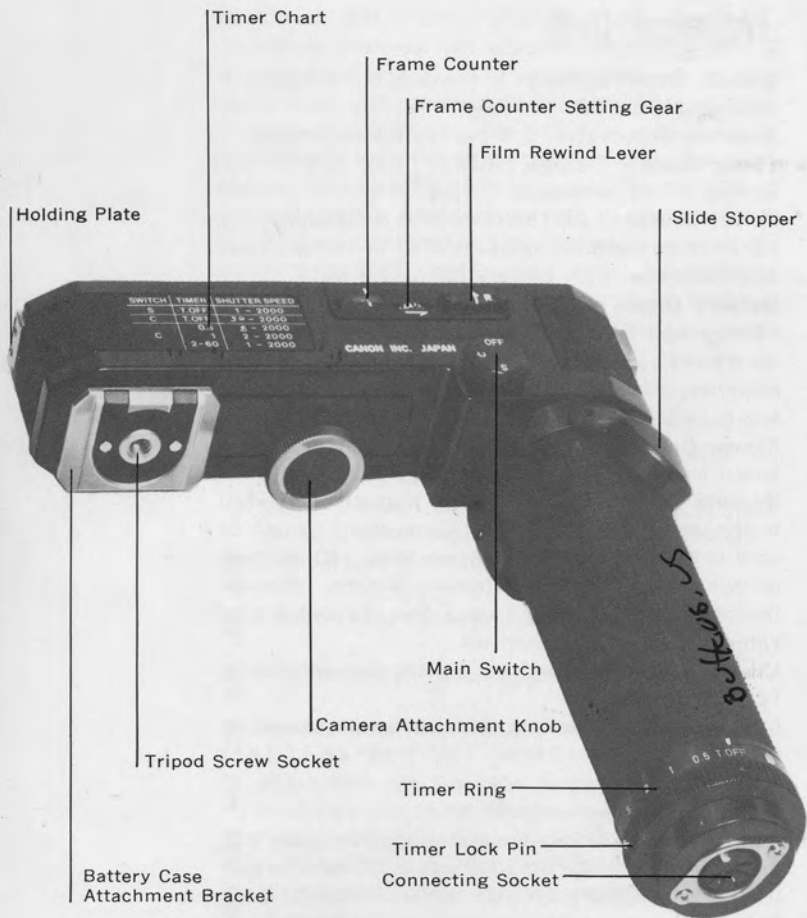
Unmanned Photography: By coupling with Servo EE Finder.

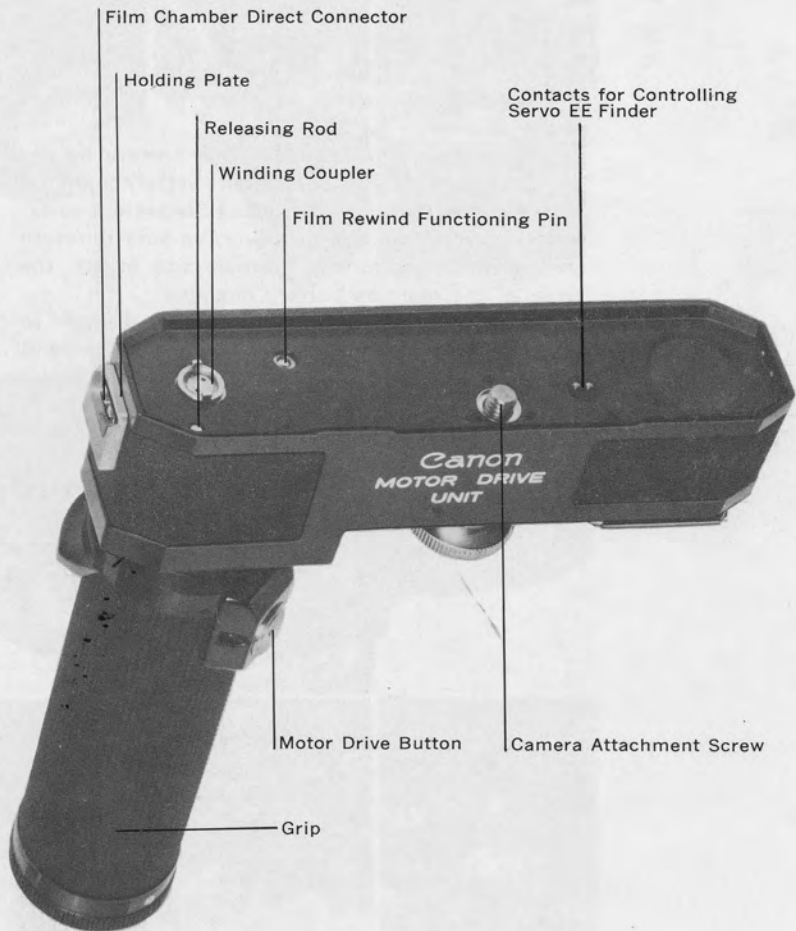
Shutter Release Button: With cable release socket.

Size: 150 x 170 x 34mm (5-15/16" x 6-11/16" x 1-5/16").

Weight: 720 grams (1.59 lbs.).

Accessories: Battery Case, Battery Connector MD, Remote Switch MD, Film Chamber 250, Film Loader 250, Film Magazine 250, Extension Cord MD, Case, Battery Magazine 15V, NiCd Battery 500 FZ, Battery Checker MD.





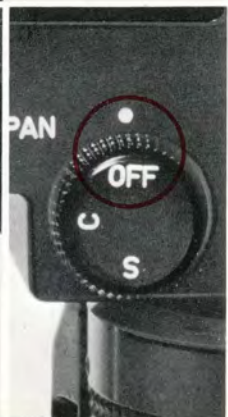
Attaching onto Camera

The Motor Drive Unit is attached to the bottom of the camera.

1 Detach the bottom cover of the camera by unscrewing the cover of the mercury battery chamber, taking out the battery, and pulling the bottom cover. After removing the bottom cover, be sure to return the battery to its former position and attach the cover of the mercury battery chamber.

2 Attach the Motor Drive Unit onto the camera so that its grip is on the right side when looking at the camera from the back side. Attach the Motor Drive Unit to the tripod socket of the camera with the attachment screw. Adjustment of the connecting section is unnecessary.

3 Set the main switch at "OFF" before connecting the power cord.



Battery Case

The Battery Case, containing NiCd Battery 500 FZ (two nickel cadmium batteries in a pack) or Battery Magazine 15V with ten penlight (size AA) batteries, is used as the power source for the Motor Drive Unit. The Motor Drive Unit and the Battery Case are connected by the Battery Connector MD.

- Replace ten penlight batteries simultaneously with a same make.
- Performance of the manganese batteries deteriorates in temperatures of -10°C (14°F) or under.

Loading Batteries

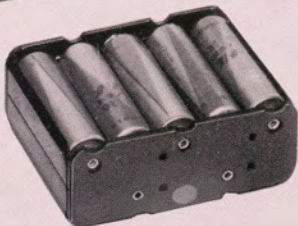
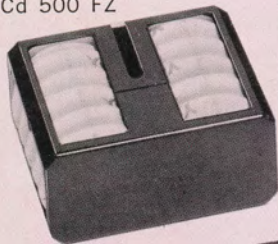
1 Load ten penlight (size AA) batteries into Battery Magazine 15V in their proper positions by inserting minus (-) poles first.

- The NiCd batteries come as a unit.



Battery Magazine 15V

NiCd 500 FZ



2 Remove the bottom cover of the Battery Case by sliding it either to left or right. Facing the battery contacts upwards, load NiCd Battery 500 FZ properly by matching the groove on the 500 FZ and the guide line inside the Battery Case, and replace the bottom cover.

The Battery Magazine 15V can be loaded by matching the green marks on the Magazine and inside the Battery Case.

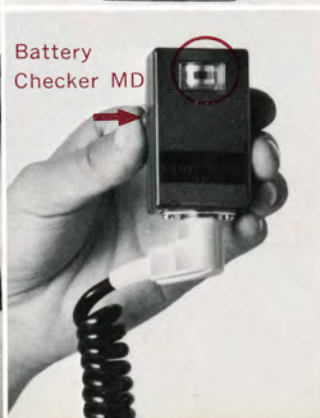
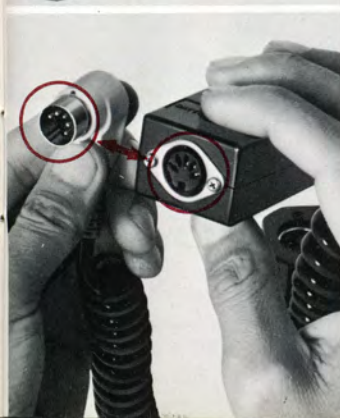
3 Replace the bottom cover of the Battery Case.

Connections and Battery Check

1 Align the socket of Battery Connector MD with the screw hole of the Battery Case and tighten them together with the tightening screw.

2 Connect the plug of the connector cord to Battery Checker MD. The power level of the batteries can be checked by pressing the battery check button and checking the position of the needle in the battery checker window. If the needle reaches the blue zone, the batteries have sufficient power level. Otherwise, the batteries must be replaced or recharged.

■ When using Remote Switch MD only, or when using it with Extension Cord MD, check the power level after connecting.



3 Plug the cord of the Battery Connector into the socket situated at the bottom of the Motor Drive Unit. The plug-in position is set by the matching groove.

Main Switch

1 The power circuit is disconnected when the main switch is set at "OFF".

2 Continuous shooting can be performed when the main switch is set at "C". Shooting is continued as long as the motor drive button remains depressed. When your finger is removed from the motor drive button, the final exposed frame will be wound up and operation stops. The same function is performed when the timer is in use.

3 Single-frame photography is performed when the main switch is set at "S". A single exposure is taken when the motor drive button is depressed and the exposed frame is wound when your finger is removed from the button. The timer should be set at "T.OFF".



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Power Off



Continuous
Shooting



Single-frame
Photography

Timer

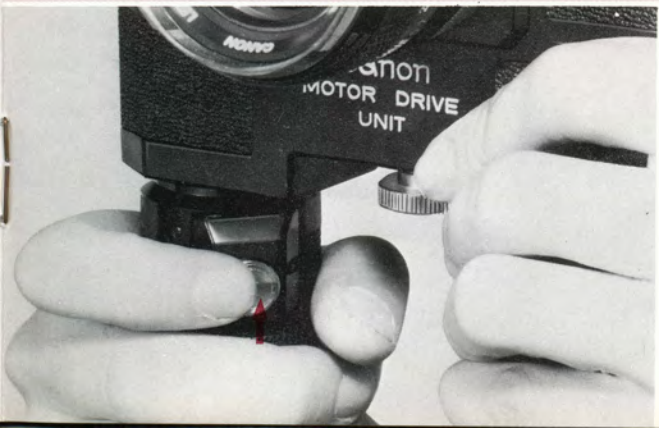
The timer ring can be turned and set after the timer lock pin is pressed in. The timer ring can be set at the following intervals of "T.OFF" (Timer-OFF) 0.5, 1, 2, 5, 10 and 60 sec.

1 By setting the timer ring at any one of the graduations and the main switch at "C", single exposures at the indicated intervals can be taken as long as the motor drive button is kept depressed.

2 By setting the timer ring at "T.OFF" and the main switch at "C", short interval continuous photography of three exposures per second becomes possible.

3 By setting the timer ring at "T.OFF" and the main switch at "S", single-frame exposures are performed.

■ Keep depressing the motor drive button as long as the shutter is being operated when the shutter speed is between 1/8 and 1 sec. with the main switch at "S" and the timer ring at "T.OFF."



Operations

1 Load the film, make two blank shots on the camera side, and set the film for the third frame by winding the film advance lever.

2 Set the frame counter of the Motor Drive Unit by turning its gear in the direction of the arrow.

The frame counter of the Motor Drive Unit counts the number of the unexposed frames and the Unit will automatically cease operating when the counter reaches "0".

■ Set the frame counter correctly.

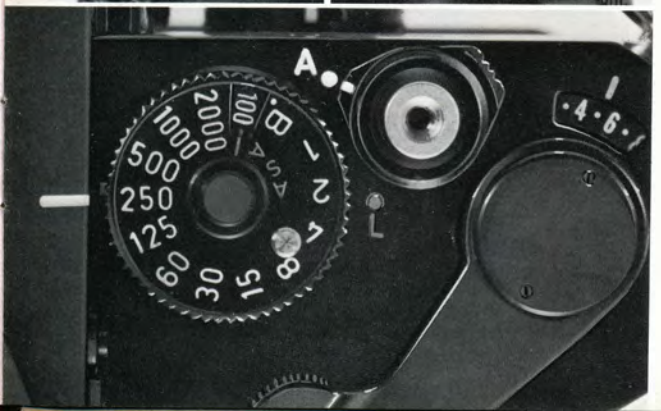
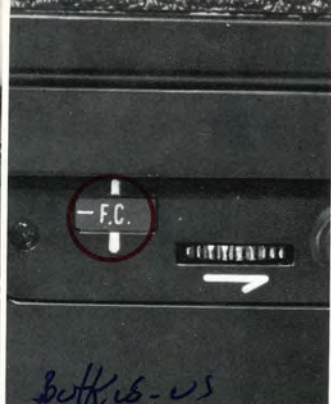
■ Do not set the frame counter at "20" when using a film with 36 exposures because the Unit will stop at the 20th exposure with 16 frames still left unexposed. If the frame counter is set at "36", when a film with 20 exposures is used, the Unit will start idling after the 20th exposure and stop when it reaches "0". It is best, at this time, to set the frame counter at "0".

When Film Chamber 250 is in use, set the frame counter at "F.C." so that the counter will not function. The Unit will not automatically cease operating with the frame counter at "F.C.".

3 Set the main switch at "S" for single frame photography, and "C" for continuous photography.

4 Set the timer by depressing the timer lock pin and turning the timer ring.

5 Select an appropriate shutter speed within the combination range of the main switch and the timer.



Relations Between Main Switch, Timer Ring, and Shutter Speed

Main Switch	Timer Ring	Usable Shutter Speeds	Exposures
S	T.OFF	1/2000-1	One*
C	T.OFF	1/2000-1/30	Three per second
C	0.5	1/2000-1/8	Two per second
C	1	1/2000-1/2	One per second
C	2	1/2000-1	One every 2 seconds
C	5	1/2000-1	One every 5 seconds
C	10	1/2000-1	One every 10 seconds
C	60	1/2000-1	One every 60 seconds

* Keep depressing the motor drive button until the shutter release operation is completed.

6 Perform metering after focusing and composition of the picture have been decided.

7 Depress the motor drive button.

■ In the case of single-frame photography, the exposed frame is wound and the next unexposed frame is set into shooting position when your finger is removed from the motor drive button.

■ In the case of continuous photography, shooting is continued as long as the motor drive button is depressed. When your finger is removed from the button, shooting stops and the next unexposed frame is set into shooting position.

Unmanned Continuous Shooting with Cable Release

When a lockable cable release is attached to the motor drive button, with the timer set and the main switch set at "C", the motor drive button can be locked for unmanned continuous photography.



Remote Control

Connect the cord of Remote Switch MD to the remote control terminal of the Battery Connector and set the main switch of the Motor Drive Unit at "C" or "S".

Photography is controlled by depressing the release knob of the Remote Switch. Set the S-C switch of the Remote Switch at "S" for single-frame photography and at "C" for continuous shooting.

- The length of the cord for Remote Switch MD is five meters (approx. 16 ft.) and can be extended up to 15 meters (approx. 50 ft.) with an extension cord.
- The photographing capacity will decrease with the remote control operation because of the electric resistance of the cord.

Unmanned Continuous Shooting Using Remote Switch

Set both the main switch of the Motor Drive Unit either at "S" or "C", and the S-C switch of the Remote Switch at "C". Then slide the release knob in the direction of the arrow while depressing it. The release knob becomes locked and shooting will continue without touching it.

- The proper operation can be confirmed from a distance by the flash indicator on the Remote Switch.

Film Rewinding

- 1 When the frame counter reaches "0", the Unit automatically stops operating.
- 2 The film is rewound in the ordinary way with the film rewind crank on the camera after turning the film rewind lever of the Unit in the direction of the arrow. There is no need to keep depressing the lever.



3. 4. 5.



Note

- 1** Do not forget to replace the mercury battery when attaching the Motor Drive Unit.
- 2** Set the main switch at "OFF" when attaching the Motor Drive Unit.
- 3** Select the timer and set the shutter speed correctly. At slow shutter speeds, the exposure may be improper and the image may be blurred. The proper exposure also cannot be obtained when the shutter speed is set at "B".
- 4** It is necessary to check the power level when only two frames are advanced during short interval photography.
Do not use a battery with a low power level because it may stop functioning at an intermediate position. If this should happen, set the main switch at "OFF", detach it from camera, load it with a new battery, and start it functioning again. Attach it to the camera again after performing winding and shutter release operations on the camera side.
- 5** When using the self-timer with the Motor Drive Unit attached to the camera and start the self-timer with the shutter release button on the camera side.
- 6** Even when the camera is attached with the shutter release completed, the Motor Drive Unit will be set at a wound-up condition when the motor drive button is depressed.
- 7** Do not disconnect the power while depressing the motor drive button.
- 8** Since the performance of the batteries drop at temperatures of -10°C (14°F) or under, keep them warm until just before use.
- 9** Do not touch the film rewind crank of the camera during film winding.



Joint Use with Servo EE Finder

When the Motor Drive Unit and the Servo EE Finder are jointly used, Cord 12V 2E is used to connect the Servo EE Finder to the socket of Battery Connector MD. After inserting the plug of the cord into the socket, fix the plug securely by tightening the outer ring.

Use a 1/15 sec. or faster shutter speed because of the metering mechanism of the Servo EE Finder. The higher shutter speeds are effective especially in the case of continuous photography.

The operation is performed by depressing the motor drive button of the Motor Drive Unit after setting the main switch of the Servo EE Finder at "L" for continuous metering.

When using the timer of the Motor Drive Unit, unmanned continuous EE photography can be performed by locking the motor drive button with the lockable cable release.

■ When shooting while separated from the camera, close the eyepiece shutter because the Servo EE Finder is metering.



Joint Use with Film Chamber 250

When the Motor Drive Unit and Film Chamber 250 are jointly used, long-length roll film with a maximum of 250 exposures can be used. In this case, the Motor Drive Unit can be used to its full advantage such as timer set, continuous, and high speed photography.

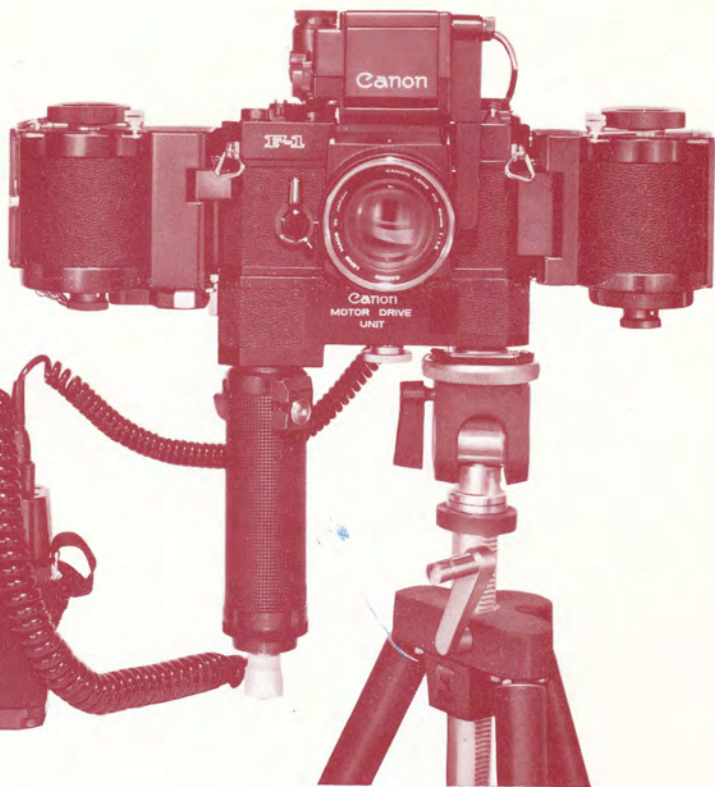
First, attach Film Chamber 250 to the camera, after removing the back cover of the camera, and then attach the Motor Drive Unit.

Film Chamber 250 is of the dual magazine type. The back cover open/close dials function in relation to the opening of the inside magazine. It is designed so that the the back cover cannot be removed unless the inside magazine closes, and the Motor Drive Unit will not function unless the magazine is opened. From the standpoint of accuracy, there is complete interchangeability between the F-1 and the Motor Drive Unit.

Joint Use with Film Chamber 250 and Servo EE Finder

When the Servo EE Finder is attached, in addition to Film Chamber 250, unmanned EE photography can be extended up to 250 exposures for continuous photography.

If exposures are to be taken at the rate of one per minute, the camera can be left untouched for four hours. Thus, it is very convenient for recording experiments and other observations.



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