Nikon **Motor Drive**

MD-12

INSTRUCTION MANUAL

NOMENCLATURE

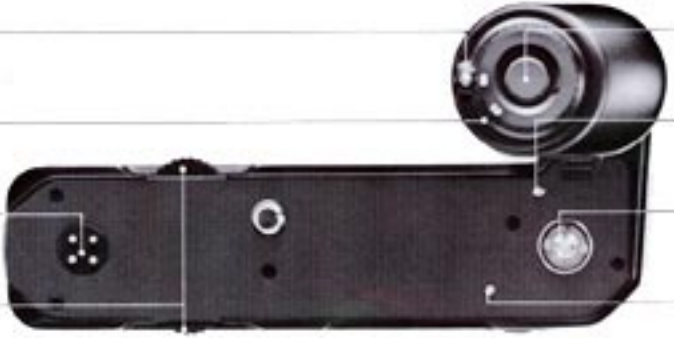
Battery chamber lid

Battery chamber lid

Pilot lamp

Power switch

Rewind slide



S-C selector lock

S-C selector

Camera electrical contacts

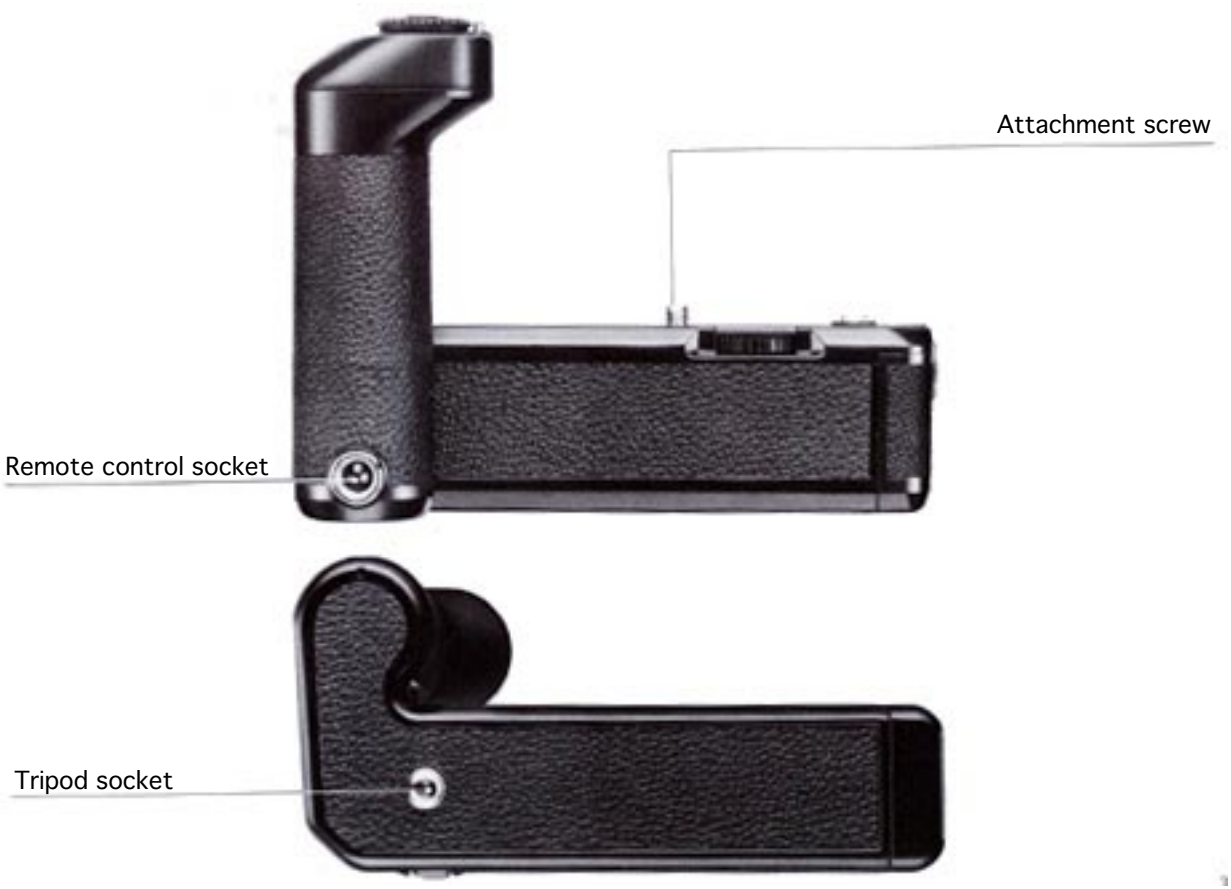
Attachment thumb wheels

Tripper button

Shutter release pin

Drive shaft coupling

Rewind button extension


Attachment screw
Remote control socket
Tripod socket

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FOREWORD

Although supplied as an accessory for the Nikon FM and FE compact cameras, the MD-12 was, in fact, a major feature in their design concept. Consequently, the only significant difference between operating these cameras with the motor drive attached, as opposed to without it, is that their operation is made considerably easier. So, rather than regarding your Motor Drive MD-12 unit as a special accessory for use only on rare occasions, you should consider it as the normal complement to your Nikon compact camera. For, in fact, the two together represent a major advance in camera-handling technique.

To obtain the best results from your Motor Drive MD-12, read the instructions in this manual carefully before use. Keep this booklet handy for quick reference until you have fully mastered operation. A few minutes preparation will help you avoid costly mistakes.

LOADING THE BATTERIES

The MD-12 is powered by eight 1.5V penlight (AA size) batteries which are housed in the unit's battery chamber. To load or replace batteries, turn the coinslotted locking screw on the battery chamber lid counterclockwise. The lid will come loose and the battery clip, which forms a single unit with the lid, can be removed. Load the batteries, taking care that they are inserted correctly. Referring to the diagrams on the sides of the clip that show the correct ~vay to insert the batteries, ensure that the positive (+) and negative (-) terminals of the batteries are properly positioned. If the batteries are loaded incorrectly, not only will they be depleted—the motor drive could also be damaged. When the batteries are correctly positioned, replace the battery clip. Push the chamber iid down gently until it seats correctly; then, tighten the locking screw on the lid with a coin or similar object until the battery clip fits securely into the battery chamber.

ATTACHING THE MOTOR DRIVE

Mounting the MD-12 on your camera is simple; the unit has been designed such that it can be attached or removed at any time regardless of whether or not the camera is loaded with film. Before attaching the MD-12, make sure that its power switch is turned off. Then, position the motor drive on the camera's bottom plate, its handgrip should be at the same end of the camera as the film advance lever. Ensure that the raised ring around the drive shaft is correctly seated inside the locating collar, coaxial with the camera's film advance coupling. Then, fasten the motor drive's attachment screw, turning it clockwise by means of the thumb wheels on either side. Simultaneous use of both fore finger and thumb will speed up attachment. Make sure there is no gap between the motor drive and the camera body; then tighten the attachment screw firmly.

When the MD-12 is mounted on an FM camera (Serial No. below 3,000,000) *, the camera's mode selector switch around the shutter release button should be set to "M" (motor)—the red line on the selector being aligned with the line on the camera body. This is not necessary with FM cameras (Serial No. over 3,000,000)* or the FE, because the switchover from manual film advance to motor drive operation is made electronically and automatically when the motor drive is switched on. Then, turn the motor drive's power switch to "ON." If the film has been advanced prior to attaching the motor drive, the motor drive

will not operate until you make an exposure using the trigger button on the handgrip. If the film has not been advanced prior to its attachment, the motor drive will operate when its power is turned on, and advance the film and cock the shutter ready for the next exposure. The motor drive will stop and the pilot lamp go out after advancing the film one frame only, regardless of the setting of the S-C selector on the handgrip.

*The serial number appears on back of the camera body just below the film advance lever.

Nikon FM

OPERATION

The camera/MD-12 combination operates in virtually the same manner as the camera on its own. Please refer to your camera's instruction manual for details. When the MD-12 is attached, leave the film advance lever flush with the camera body. Then, when the motor drive's power switch is turned on, the camera's meter can be activated by halfway depressing the trigger button. After releasing your finger from the button, the meter will remain on for approx. 50 seconds giving you enough time to set the correct exposure or adjust the controls. Then the meter will turn itself off automatically to conserve battery power.

With the motor drive attached all exposures should be made via the trigger button on the motor drive grip. Concentric with this triggering button is the motor drive S-C selector, giving you a choice of either single frame (S) or continuous (C) shooting. To set the motor drive to either S or C, depress the lock and turn the selector to the required setting.

Single-frame shooting: In this mode, depressing the trigger button on the motor drive grip fires the shutter, advances the film one frame and cocks the shutter. You can lift your finger from the trigger button even before the exposure is completed since the electronic interlock prevents the film from advancing until the shutter has completed its travel. The usable shutter speed range when the MD-12 is set at "S" is from 1 second to 1/1000 second with the FM. With the FE, in addition to the automatic setting (AUTO), you can set any of the marked speeds including M90. The "B" setting cannot be used with either camera.

Continuous shooting: In this mode, the motor drive will automatically trigger the shutter and wind the film for as long as the trigger button is depressed. Framing rate will depend on the shutter speed setting, as the motor drive's electronic interlock with the camera's shutter automatically advances the film as soon as the exposure is completed. Maximum framing rate is approximately 3.5 frames per second (fps) at shutter speeds faster than 1/125 sec.

Remember that continuous shooting at the maximum rate of 3.5 fps will result in a standard 36 exposure cassette being completely exposed in a little less than 11 seconds. Consequently, you should exercise restraint when operating with the motor set for continuous shooting. Many photographers, however, prefer to leave the camera set for continuous shooting, lifting their finger off the trigger button the instant the exposure is made. This technique results in single-frame operation, but readies the photographer for taking sequence photographs should the situation or need arise. The usable shutter speed range when the MD-12 is set at "C" is from 1/2 second to 1/1000 second with the FM. With the FE, in addition to the automatic setting (AUTO), you can set any of the marked speeds including M90. The "B" setting cannot be used.

The FE's automatic exposure capability allows you to follow subjects as they pass through areas of differing brightness, yet still obtain~ correctly exposed results.

Although widely varying brightness changes of EV 4 or more may sometimes result in over- or underexposure for the first frame following the transition, this situation is rare in practice and thus likely to be of little consequence to the average photographer.

Important! After shooting, make sure that you turn the motor drive off.

Note: The camera/MD-12 combination is designed to work smoothly under a wide range of climatic conditions. Sub-zero (centigrade) temperatures, however, have a very severe effect on any mechanism. For faultless performance under these conditions, we recommend that, for continuous shooting, you do not use shutter speeds of less than 1/30 sec. The use of slower shutter speeds may result in erratic operation. If it is imperative to use shutter speeds of less than 1/30 sec., switch to single frame shooting.

FILM REWINDING

When the roll of film in the camera has been fully exposed, the MD-12's motor will automatically stop, releasing film tension, with the pilot lamp remaining lit. Turn the power switch off to prevent unnecessary battery drain. Then, push the rewind slide on the motor drive up. Rewind the film normally. See your camera's instruction manual for details.

MANUAL FILM ADVANCE

If at any time you wish to manually advance the film without removing the MD-12 from the camera, turn off the motor drive's power switch after it has finished advancing the film from the previous exposure. Then, in the case of the FM (Serial No. below 3,000,000), turn the mode selector switch so that the black line (white, on black camera bodies) is adjacent to the line on the camera body. As for the FM (Serial No. over 3,000,000) or the FE, it switches automatically from motor drive to manual film advance operation when the motor drive is switched off.

DOUBLE/MULTIPLE EXPOSURES

Your camera has a special double/multiple exposure provision built-in in the form of the multi-exposure button or lever. Merely depressing this button or lever allows you to superimpose any number of pictures on the same frame. This provision not only continues to function with the motor drive attached, but opens up creative possibilities that are just not possible when the camera is operated manually.

When the motor drive S-C selector is set to "S," the double/multiple exposure situation is exactly the same as for the camera alone, except that the trigger button on the motor drive is used to trigger the exposure. Remember to depress and hold the multi-exposure button or lever, with your left hand, before you remove your finger from the trigger button. Otherwise, the film will be advanced.

On the "C" setting, triggering the release button, while holding the multi-exposure button or lever depressed, will produce multiple images on the same frame. Either the motion of the subject or your movement of the camera will result in the images being separated, producing an original and interesting effect. Hold the multi-exposure button or lever depressed with your left hand, while holding the camera normally with the right. Remember to release the multi-exposure button or lever just before the last exposure, so that the camera is left ready for the next sequence with an unexposed frame in the film gate. If not, cap the lens and make one "blank" exposure. The camera is then ready for the next shot.

Nikon FE

Nikon FM

TIME LAPSE

Time lapse photography, the taking of a series of photographs over a period of time from a fixed position, is easily accomplished with your MD-12 equipped camera and a suitable timing device. Timing devices for time lapse photography—the Nikon Intervalometer MT-1,for example—usually have two variable controls: one for puIse duration and the other for interval time. Pulse duration refers to the length of time that the triggering pulse lasts. Interval time is the time interval between pulses and governs the frequency of the photographs. Additionally, the S-C selector on the MD-12 provides you with the option of taking single photographs or shooting in bursts.

With the S-C selector set to "S," one exposure will be made for each triggering pulse, the motor winding on automatically at the end of the triggering pulse or the exposure, whichever is longer. The interval time can be set at any duration, but avoid setting the trigger pulse longer than the interval time. Otherwise continuous or erratic operation will occur.

With the S-C selector set to "C," if the triggering pulse's duration is longer than the shutter speed set (or 0.25 sec. in the case of the higher shutter speeds), bursts will be fired at each interval. For example, if the shutter speed is set at 1/1000 sec., and the trigger pulse duration is 2 sec., then approximately 7 exposures will be made at each interval.

Generally speaking you will find that operation with the S-C selector set to "S" and the trigger pulse duration set between 0.1 and 0.25 sec. is advisable for the majority of time lapse situations. The variable trigger pulse duration found on some intervalometers is a feature necessitated by the design of the older generation of motor drives, and is largely redundant with the MD-12. Time lapse photography is not possible with the shutter speed dial set to "B." Should you attempt this, the camera's mirror may lock up, with the shutter remaining open, making operation impossible. To restore normal operation in the event of this happening, merely turn the shutter speed dial away from the "B" setting.

ACCESSORIES

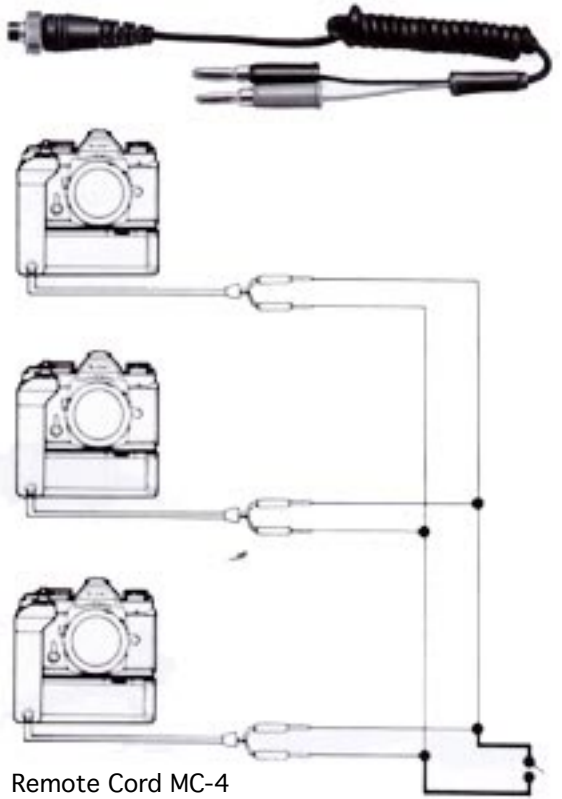
Remote Cord MC-4

The Remote Cord MC-4 serves two purposes: it can be used singly as a remote cord or in combination with other MC-4 cords for simu Itaneous operation of multiple motor-driven cameras. One end of the MC-4 features a plug for connection into the camera's remote control socket while the other end has plus and minus banana-type plugs.

For remote control operation, you can attach the banana plugs to a triggering circuit of your own design. The cable can be extended to any length, provided that circuit resistance does not exceed 1 kQ. For longdistance operation, however, you will find that Modulite orfadio control systems are more convenient.

For simultaneous operation, you can connect two or more motor-driven cameras in parallel using a circuit containing two or more MC-4 cords, plus additional wiring. (Refer to the diagram for details.) For troublefree operation, the common electrical leads (indicated by bold lines in the diagram) should be kept as short as possible. In particular, the total length of each connecting cord (including the MC-4 cord) from motor drive to switch and back again must not create a resistance of more than 5Q. In certain installations in which long cords are required, the use of a relay box is strongly recommended.

Note: When the MC-4 cord is connected to the MD-1 2's remote control socket, the camera's meter is switched on as soon as you turn on the motor drive's power switch.



Remote Cord MC-4

ACCESSORIES - continued

Remote Cord MC-10

With a convenient handgrip and trigger button, the Remote MC-10 Cord can be used to fire the MD-12 remotely at up to a distance of 3 meters (10 feet).

Note: When the MC-10 cord is connected to the MD-12's remote control socket, the camera's meter is switched on as soon as you turn on the motor drive's power switch.

Pistol Grip Model 2 and Connecting Cord MC-3

The Pistol Grip Model 2 screws into the tripod socket of the lens or motor drive to serve both as a means of support and as a means of motor triggering when working with long telephoto lenses. For electrical connection between the pistol grip and the remote control socket on the motor drive, you will also need an MC-3 cord.

Note: **When the MC-3 cord is connected to the MD-12's remote control socket, the camera's meter is switched on as soon as you turn on the motor drive's power switch.**

ACCESSORIES - continued

Intervalometer MT-1 and Connecting Cord MC-5

The Nikon MT-1 is a precision digital timing unit for slow sequence shooting of experiments or work study programs. Fully solid state, the unit requires only four AA size penlight batteries for operation; this makes it convenient for use on location, as well as in the laboratory. Use of the MT-1 in conjunction with your MD-12 equipped camera is merely a matter of connecting the two units w~th the MC-5 cord supplied with the intervalometer. Exposure intervals of up to eight minutes can be set on the MT-1 control panel.

Note: When the MC-5 cord is connected to the MD-12's remote control socket, the camera's meter is switched on as soon as you turn on the motor drive's power switch.

Modulite Remote Control Set ML-1 and Connecting Cord MC-8

With the ML-1 set, you can trigger your MD-12 equipped camera by remote control at distances of up to 60 meters. Using Nikon's modulated light system, the ML-1 set assures you of trouble-free remote control operation over moderate distances. The set's lightweight and compact size, plus its use of a 9V laminated dry battery, make it ideal for use in both field and studio applications. Connection to the motor drive's remote control socket is by the MC-8 cord supplied with the set.

Note: When the MC-8 cord is connected to the MD-1 2's remote control socket, the camera's meter is switched on as soon as you turn on the motor drive's power switch.

ACCESSORIES - continued

Radio Control Set MOO-1 and Connecting Cord MC-5

The MOO-1 provides you with a wireless, remote control triggering capability for your MD-12 equipped Nikon FM or FE. The set can operate up to three cameras, either simultaneously or individually, at ranges up to 0.7km. Battery powered, the MOO-1 is compact and lightweight, making it ideal for field use. it connects to the remote control socket on the MD-12 via the MC-5 cord supplied with the set.

Note: When the MC-5 cord is connected to the MD-12's remote control socket, the camera's meter is switched on as soon as you turn on the motor drive's power switch.

Terminal Release M R-2

Plugging into the remote control socket, this accessory provides an additional trigger button for firing the motor drive with the camera in the vertical position. It also allows the MD-12 to be triggered with either the Nikon Cable Release AR-2 or the Double Cable Release AR-4. By depressing the button halfway, you can take a meter reading; the meter will automatically stay on for approx. 50 sec. after pressure is removed from the button. To take the picture, depress the button all the way.

TROBLESHOOTING

Your MD-12 has been designed to make motor drive photography as simple and trouble-free as possible. However, should you operate the camera incorrectly or without clearly understanding what you are doing, minor "hitches" may occur. If this occurs, please follow the instructions below.

If the motor drive "jams" during operation, this usually means that the controls have either been operated incorrectly or in the wrong sequence, and the coupling mechanism has disengaged. Should this occur, turn the MD-12's power switch off and make one exposure with the camera's shutter release button, remembering, in the case of the FM (Serial No. below 3,000,000), to switch over to manual film advance. You may find that the motor drive did not finish advancing the film. If so, complete the film advance using the camera's film advance lever, then press the shutter release button. Do not advance the film. Switch the motor drive back on and, in the case of the FM (Serial No. below 3,000,000), revert to the motor drive mode. The motor drive should advance the film ready for the next exposure. If this does not clear the malfunction or you are unable to move the film advance lever at all, do not try to force the controls. Turn the motor drive off once more and simply remove the motor drive from the camera. This will clear the tension in the film advance mechanism, allowing you to advance or finish advancing the film and make one exposure, again do not advance the film. Reattach the motor drive and, in the case of the FM (Serial No. below 3,000,000), switch to motor drive operation. When you switch the motor drive back on, the film should then advance one frame ready for the next exposure.

Should you trigger the motor drive with the shutter speed dial set to "B" the absence of an "exposure complete signal" may result in the camera's mirror locking up and the shutter remaining open. To restore normal operation in the event of this happening, merely move the shutter speed dial away from "B."

At all times during motor drive operation, the film advance lever should remain flush with the back of the camera. If you move it out to its stand-off position, the motor_drive will stop. Returning the lever to its flush position will automatically start the motor drive once more.

BATTERY PERFORMANCE

Battery performance varies greatly, depending on its type and age, as well as on operating conditions, including temperature. Consequently, the number of rolls that can be exposed with one set of batteries cannot be accurately predicted. As a guide, however, you can expect to be able to expose more than a hundred 36-exposure rolls of film per set of alkaline-manganese batteries.

Since batteries have poor low-temperature characteristics, battery performance diminishes considerably as the temperature decreases. This results in slower shooting speed and reduced film transport capacity. Alkalinemanganese batteries, in particular, suffer severely at temperatures below 0 C.

SPECIFICATIONS

Camera fitting:	**Shooting speed:**
Shooting speed:	**3.5 fgs approx. maximum (at shutter speeds faster than 1/125 sec.)**
Shooting mode:	**Single frame (S)**
	Continuous (C)
Usable shutter speeds:	**At "S" setting**
	FM 1 ~ 1/1000 sec.
	FE 8 ~ 1/1000 sec., Auto, M90
	At "C" setting
	FM 1/2 ~ 1/1000 sec.
	FE 8 ~ 1/1000 sec., Auto, M90
Pilot lamp:	**LED lights up when in operation**
Power switch:	**On/off switch provided (also acts as camera's meter switch**
Meter switch:	**Trigger button also acts as meter "on" switch and automatically goes "off" approx. 50 seconds later**
Remote control:	**Possible; uses standard Nikon 3pin connector.**
Power source:	**Eight 1.5V penlight batteries (AA size, in integral battery chamber)**
Weight: Dimensions:	**Approx. 41 0g (without batteries)**
Nikon FM, Nikon FE	**Approx. 144 x 36 x 42mm; approx. 144 x 68.5 x 109.5mm (including the grip)**