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# *Revolution*<sup>™</sup> Eyemo

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## Installation Instructions

Manufactured by  
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*Revolution* is a trademark of NCS Products

## Introduction

Congratulations on your purchase of a *Revolution Motor (RM)* for the 35mm Eyemo. The *Revolution* uses advanced motor driving techniques to minimize vibration for single-frame, time-lapse and sync filming.

When shooting single-frames, the motor is accelerated from the stopped position for least stress on the cameras. Sync capable models ramp to the target sync speed, then decelerate to a stop.

## The Models

There are two models available. A time-lapse only version, and a combination unit which does both time-lapse and sync-speed running. Note that your Eyemo is still too loud for sync-*sound* filming. Time-lapse models will run at slow (1-6fps) sync-speeds.

## Overview

The RM consists of the motor unit and the control box. Power is supplied to the motor unit via a standard 4-pin XLR connector. Pin 1 is ground, pin 4 is positive.

With the non-sync motor, you can use any input voltage from 12V to 18V.

The sync models have an on-board 36V generator. It expects 12V-14V input. The current draw when shooting sync can be as much as 4A. Make sure you have a strong battery for proper operation.

The control box is connected to the motor unit via a 6-pin RJ-12 cable. A short and long curly cable is provided.

The control box will not be damaged if you plug (or unplug) it from the motor unit while power is applied. However, sometimes the control box will not be properly initialized. Switching the motor unit off then on will reset it, but it is easiest to hook up the control box before applying power.

## Sync Version

On the top of the sync motor unit is a toggle switch. This is *not* an on-off switch (remove the power to turn the unit off). It is a *voltage selection* switch to select whether the motor will run off the voltage supplied at the XLR jack, or will run off the 36V generated by the on-board high-voltage generator (it's the square thing on the front—it will get slightly warm during

operation). You have to pull up on the toggle to switch to the other setting. For sync filming, it must be set at 36V—towards the red dot. Disconnect the power before changing the voltage selection switch.

For most time-lapse filming, you can leave it set at 36V. For extended time-lapse filming (i.e. a few days of time-lapse), you can switch to 12V and the drain on the battery when waiting in between frames will be reduced slightly.

## Installation

The motor unit installs using the motor mounting hole on the rear of the camera. The standoff goes into that hole and the drive coupling goes into the 8:1 shaft hole.

**The trigger on the camera must be set so that the mechanism can turn freely when driven through the 8:1 shaft.** This can be done either by pulling the trigger backwards, or pushing it forwards and locking it in the “run” position.

On some Eyemos the trigger can slip from the run position to the stopped position easily. You might have to use gaffer's tape to make it stay. If it slips into the stopped position, the motor will make lots of noise, but will not turn the camera.

**The speed governor on the camera must be turned to the fastest speed.** Don't forget this!

To install the RM, loosen the standoff (turn the knurled part counterclockwise). It will wiggle around in its hole. Loosen the thumbscrew on your camera.

Push the unit onto the camera. The coupling might not be aligned with the 8:1 shaft hole, so the unit might not go all the way in.

Turn the coupling with your fingers to align it with the drive shaft. When the coupling comes into alignment with the drive shaft, the unit will slip right on.

Gently tighten the knurled standoff and the thumbscrew on your camera.

Check again that the mechanism is free to turn. Try turning the motor shaft with your fingers. If it doesn't turn easily, check that the trigger is completely in the “run” position. It might be difficult to turn the shaft with your fingers—you can insert a 5/64” Allen key in the shaft set-screw and use that for leverage.

## Threading Film

On either model of the *Revolution* Eyemo, you can use the slow sync speeds (6:06 for 6 fps) when threading the camera.

Our copy of the Eyemo manual states **9 sprocket holes on the top loop, 11 sprocket holes on the bottom loop.** To adjust number of visible holes, “always push the film through the open sprocket, do not pull it.”

It’s a good idea to run the camera a little bit with the door open to make sure the loops do not buckle or alter shape when running. Press your finger gently on the feed spool to minimize the film unspooling when stopping.



Shutter at bottom

## Shutter Alignment [0:nn]

To align the shutter (important for correct time lapse exposures), turn the thumbwheels to 0:20 and hold down the pushbutton. The motor will slowly turn the shutter. Release the pushbutton when the shutter is down by the bottom of the frame (see illustration).

Turn the thumbwheels to 0:02. Now when you push the pushbutton, the RM will revolve 2/8 of a frame. Press the pushbutton. The shutter should be closed now.

For a test, turn the thumbwheels to 4:44. This is the ‘bulb’ setting. The shutter will open when you press the pushbutton and close when you release it.

The illustration shows the Eyemo with the shutter closed. A bright-colored square of electrical tape has been stuck on as a reference.

## Film Test

It is a good idea to test out the motor and your camera together with a full load of test film. Run through the film shooting time lapse at the fastest shutter speed you plan to use.

The shutter should not go out of alignment. With every exposure, it should end up at the same position. Putting a brightly colored piece of tape on the shutter will allow you to more easily see that it is working properly.

If the motor loses step when filming time-lapse, it is an indication that the motor does not have enough torque to turn the shutter. This can be because the shaft is binding or because the mechanism in your Eyemo needs adjustment or lubrication. This problem can be solved by either using slower shutter speeds or by having your Eyemo overhauled.

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Shutter Closed

# *Revolution*<sup>™</sup> Motor

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## Operating Instructions



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## Introduction

Congratulations on your purchase of a *Revolution Motor (RM)*. The *Revolution* uses advanced motor driving techniques to minimize vibration for single-frame, time-lapse and sync filming.

When shooting single-frames, the motor is accelerated from the stopped position for least stress on the cameras.

Sync-capable models ramp the motor speed to the target sync speed, then decelerate to a stop.

## Overview

The RM consists of the motor unit, which mounts on the camera, and the control box. Power is supplied to the motor unit via a standard 4-pin XLR connector. Pin 1 is ground, pin 4 is positive.

Please refer to the installation instructions provided for your specific motor.

The control box will not be damaged if you plug (or unplug) it from the motor unit while power is applied. However, sometimes the control box will not be properly initialized. Turn the motor power off then on again to reset it, or just hook up the control box before applying power.

## The Controls

The control box has a pushbutton, three thumbwheels, and two indicator LEDs.

The three thumbwheels are used to set the filming parameters. The first digit is used to specify what parameter to set, and the second two digits are used to set the value of that parameter.

## Time-Lapse Operation

The RM will be in *idle mode* when power is applied. The red light will flash at a 1-second rate. This indicates that the RM is ready to be programmed with your desired filming parameters.

The RM allows three time-lapse parameters to be set. *Exposures*, *shutter speed*, and *interval*.

When first powered on, *exposures* is set to 10 seconds of film (240 frames), *shutter speed* is set to 1/4 second and *interval* is set to 1 second.

*Exposures* controls how many frames are exposed. *Shutter speed* controls the duration of each exposure. And *interval* is the delay between exposures. Longer intervals compress time more.

If you want to shoot 240 frames of film with a 1/4 second shutter speed at a 1 second interval, you can just turn the first thumbwheel to “4” and press the pushbutton. However, you’ll probably want to pick your own settings.

You *do not* have to enter the three parameters in any specific order. Nor do you have to re-enter them every time you start filming (unless you disconnect power).

## Exposures [1:nn]

The RM allows you to set the maximum number of frames to expose (*exposures*). This value is entered in seconds, with each second representing 24 frames of film.

To set 10 seconds of film (240 frames), turn the thumbwheels to 1:10. For one minute of film, turn the thumbwheels to 1:60.

If you set the thumbwheels to 1:01, *exposures* will be set to one frame. This is useful for animation.

To set a value greater than 99 seconds, turn the thumbwheels to 1:00 and press the pushbutton. Both lights will start flashing. Then, turn the thumbwheels to the number of minutes and seconds you wish to film, and press the pushbutton.

For example, setting the thumbwheels to 3:20 will set *exposures* to three minutes and twenty seconds of film (140 seconds total, or 2880 frames).

## Shutter Speed [2:nn]

*Shutter speed* can be set to 1/8<sup>th</sup>, 1/4<sup>th</sup>, 3/8<sup>th</sup>, or 1/2 second (all crystal-controlled). Or, you can set a long-duration exposure up to 4 minutes.

Refer to the shutter speed chart. To set a speed of 1/4 second, turn the thumbwheels to 2:02. To set a shutter speed of two seconds, turn the thumbwheels to 2:12. Of course, you must press the pushbutton to enter the speed.

Value	Shutter Speed
2:01	1/8 <sup>th</sup> sec
2:02	1/4 <sup>th</sup> sec
2:03	3/8 <sup>th</sup> sec
2:04	1/2 sec
2:11-99	1-89 secs

Entering shutter speeds longer than 89 seconds is a two-step procedure.

First enter 2:00 and press the pushbutton. Both lights will flash. Then turn the thumbwheels to the desired shutter speed in *minutes:seconds*. The longest exposure that can be programmed is 4 minutes.

For example, 2:00 → 1:00 will give a 1 minute exposure. 2:00 → 3:30 will give a 3½ minute exposure.

If you need a shutter speed longer than 4 minutes, you can turn the shutter 180-degrees so it stops 'open' (0:04 will do this). Then use a long *interval* to expose the frame.

### Interval [3:nn]

*Interval* can be set from 1 second to 9 hours. You can set values from 1 to 99 seconds by entering the desired interval directly. For example, 3:05 will set *interval* to 5 seconds.

For longer intervals, set the thumbwheels to 3:00 and press the pushbutton. Both lights will start flashing. Then, set *interval* in minutes:seconds on the thumbwheels (minutes on the first thumbwheel, seconds on the second and third thumbwheels) and press the pushbutton again.

For example, turning the thumbwheels to 2:30 will set *interval* to two-and-one-half minutes.

To set *interval* in hours and minutes, turn the thumbwheels to 3:00, then press and release the pushbutton. Don't change the thumbwheels. Press and release the pushbutton again, then set the interval in hours:minutes on the thumbwheels (hours on the first thumbwheel, minutes on the second and third thumbwheels). Press and release the pushbutton one final time.

### Filming [4:xx]

Turn the first thumbwheel to 4 and press the pushbutton. Filming will start. Once the programmed number of *exposures* has been filmed, the unit will return to idle mode.

The second two thumbwheels can be at any number less than 80 (except for 44 and 50, which have special functions).

To stop filming at any time, press and hold the pushbutton until both lights come on. Release, and the RM will return to idle mode.

The motor will always stop with the shutter closed.

### Delay-before-Filming [4:50]

To program a delay before filming, turn the thumbwheels to 4:50 and press the pushbutton.

The next value you enter in will be the number of ¼ hour increments to delay. For example, 4:50 → 4:04 will cause filming to be delayed by one hour. 4:50 → 4:10 will cause filming to be delayed by 2½ hours. During this delay period, the light will flash quickly. Press the pushbutton to abort and return to idle mode.

### Changing Interval/Shutter Speed while filming

It is possible to change *shutter speed* and *interval* without stopping and re-starting.

To change *shutter speed*, turn the thumbwheels to 2:nn and press the pushbutton.

To change *interval*, turn the thumbwheels to 3:nn and press the pushbutton. *Interval* will now be nn seconds.

To stop filming, turn the first thumbwheel back to 4 and press the pushbutton.

### Presets

The RM has 10 memory locations. These locations store combinations of *exposures*, *shutter speed*, and *interval*. These memory locations are referred to as Presets.

You can program nine of these Presets, accessed by thumbwheel settings of 4:91 to 4:99. Preset 4:90 is special—it stores the values used the last time the RM was run.

To program a Preset with the current settings of *exposures*, *shutter speed*, and *interval*, first turn the thumbwheels to the desired Preset number minus 10 (between 4:81 and 4:89). Then, press and release the pushbutton. The Preset will be programmed, and will hold those values until reprogrammed.

For example, to program Preset 99, first set *exposures*, *shutter speed*, and *interval* as described earlier. Then, turn the pushbuttons to 4:89 and press the pushbutton. Now Preset 99 is programmed. Turn the thumbwheels to 4:99, press the pushbutton, and filming will commence.

### Automatic Filming with Preset 99

If you apply power to the RM with the thumbwheels set to 4:99, it will automatically start running with the contents of that preset.

This is useful if you have the power source to the RM controlled by a timer or hooked up to a switch.

## Automatic Filming of Multiple Presets [8:90-8:99]

The RM has a useful feature that allows you to tell it to film using the contents of multiple Presets, one after the other. This is called *chaining*.

For example, let us say Preset 91 contains an *interval* setting of 1 second and an *exposures* setting of 240 frames (10 seconds of film). Preset 92 contains an *interval* setting of 5 seconds and a *exposures* setting of 120 frames (5 seconds of film). To chain from Preset 91 to Preset 92, so that first 10 seconds of film are exposed with an interval of 1 second, and then 5 seconds of film are exposed with an interval of 5 seconds, do the following.

Turn the thumbwheels to 8:91 and press and release the pushbutton. Both lights will start flashing. Turn the thumbwheels to 8:92 and press the pushbutton.

You can chain from any Preset to any higher Preset, for example, 91 to 99, or 93 to 96, but not from a higher Preset to a lower Preset.

To finish with the current exposure sequence but cancel pending exposure sequences, turn the thumbwheels to 8:00. To cancel all exposure sequences and stop filming immediately turn the thumbwheels to 8:00 and press the pushbutton

## Sync Filming [6:nn]

Sync-enabled units can turn the camera at sync speeds. The highest sync speed is different in the different *Revolution* models.

For the Bolex and Eyemo models, turn the thumbwheels to 6:24 for a 24 fps filming speed. Press and release the pushbutton to start filming. Press again to stop.

Bolex and Eyemo sync motors shipped after October of 2004 have the 0.1% slower video speeds built-in. Use 6:23 for 23.976 and 6:29 for 29.970.

The motor is accelerated to the target speed. When accelerating, the red light will be on. When sync speed is reached, the green light will turn on.

Generally, you won't know in advance how long the shot will be. But if you do know how long the shot will be, or would like to limit the

maximum length of a shot, you can preset the maximum number of *sync exposures*.

## Sync Exposures [7:nn]

The Eyemo and Bolex models allow you to preprogram the number of seconds of film you want to expose when using mode 6. *Sync exposures* is set the same way as time-lapse exposures are set (mode 1). When powered on, *sync exposures* is set to 2 minutes.

For example, if you'd like a 30-second take, turn the thumbwheels to 7:30 and press the pushbutton. When you film at sync, the camera will stop after 30 seconds of film have been exposed.

## Default Frames/Second

When setting *exposures*, the *Revolution* control box assumes 24 frames equals 1 second of film. For example, when you set *exposures* using 1:10, 240 frames will be exposed.

If you use the 25-fps system, you can change the frames/sec value to 25. Then, setting *exposures* using 1:10 will expose 250 frames.

Do this carefully, because if you enter the second number wrong, you can overwrite the wrong configuration variable. That might be bad.

It's a three-step procedure. First, enter 5:00. Press the pushbutton and both lights should start flashing. Next, enter 5:24. Again press the pushbutton and both lights should still be flashing. Finally, enter 5:25. Lights stop flashing. Enter 1:02 to program 50 frames and run to confirm that it stops after 50 exposures.

If you are transferring at 30 fps enter:

5:00→5:24→5:30

To return to the original USA setting enter

5:00→5:24→5:24

Note that this has nothing to do with sync-speed running (on sync-capable models). For 24-fps sync-speed, use 6:24. For 25-fps sync-speed, use 6:25.

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<end>

**Revolution Operating Summary**

The first digit on thumbwheels is the control digit.

0 - Manual Advance

**1 - Exposures (in seconds)**

**2 - Shutter Speed**

**3 - Interval**

**4 - Run**

5 - Special Function

6 - Sync Running

7 - Sync exposures

8 - "Chaining"

**0 - Manual Advance**

The motor will rotate while the pushbutton is held down. Set the speed (from 10-90) on the thumbwheels (lower is faster). Or use 0:01-0:08 to advance the shutter in 1 to 8 1/8<sup>th</sup> frame increments.

**1 - Exposures**

Enter the number of seconds of film you wish to expose on the thumbwheels (1 second equals 24 frames).

**2 - Shutter speed**

Value	Shutter Speed
<b>2:01</b>	1/8 <sup>th</sup> sec
<b>2:02</b>	1/4 <sup>th</sup> sec
<b>2:03</b>	3/8 <sup>th</sup> sec
<b>2:04</b>	1/2 sec
<b>2:11-1:99</b>	1-89 secs

**3 - Interval**

Enter the interval in seconds on the thumbwheels.

**4 - Start Time Lapse**

4:50 → 4:nn delay nn ¼ hours.  
4:44 bulb mode

**6 - Sync Running**

Run at the speed on the thumbwheels. Use 6:23 for 23.976 and 6:29 for 29.970 (Bolex, Eyemo models only).

**7 - Sync exposures**

Seconds of film to expose when sync running (Bolex, Eyemo models only).