

## What is a Micromanipulator - 3

This issue of Narishige Web News discusses motorized manipulators which were developed in response to inquiries about operating a manipulator in a useful manner.

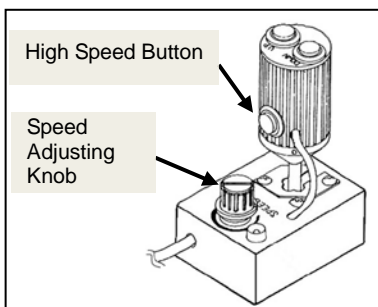
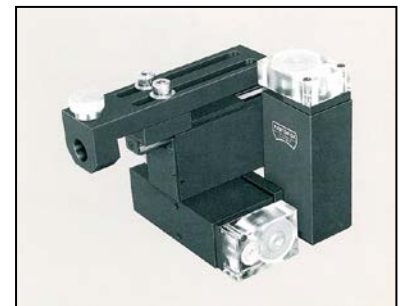
### Motorized Coarse Manipulators

Hydraulic micromanipulators made possible micromanipulation in high magnification of optical microscopes. However, hydraulic micromanipulators do not provide enough movement range for bringing a pipette tip into optical axis. To complement this function, a coarse manipulator is generally used in combination with a hydraulic micromanipulator.

Coarse manipulators are designed to bring a pipette briefly into view. Hand vibration does not really become an issue. Therefore, mechanical manipulators were conventionally good enough. However, as microscopes advanced, their size increased and it forced users to operate coarse manipulators with difficulties. The fact that hydraulic micromanipulators had already allowed useful operation created the demand for coarse manipulators to allow useful operation also.

This led to the launch of motorized coarse manipulators, namely the MM series.

The MM series was designed to be controlled electrically and realized operation remotely. The MM series were motorized and inherited the movement range of mechanical manipulators. This facilitates bringing a pipette into view and also provides flexibility in setup for varied microscope models.



The problem of speed and vibration of the motor was a problem. These problems were solved by employing gears which stabilized movement. For those users who might feel movement speed too slow or too fast, the MM series provides a control unit with a high-speed button that allows high-speed movement for bringing a pipette close to a sample. A speed adjusting knob is provided for operating at a slow speed. The control unit allows varied speed adjustments.

### Electrical Micromanipulators for Electrophysiology Applications

Unlike recent years, early electrical micromanipulators were not very popular due to the noises generated. Despite this, electrical micromanipulators for electrophysiology applications were desired by researchers since they could eliminate drift problems.

In response to the need, the EMM series was launched. The EMM series was designed to suppress motor vibration and electrical noise in order to achieve smooth movement. One of the distinctive features of electrical micromanipulators is their long movement range. The EMM series offers long movement range in both coarse and fine movement whereby no hydraulic system is required for precise manipulation.



### Future Micromanipulators

Micromanipulators evolved together with microscopes in response to customer's needs. Micromanipulators continue to evolve according to the technological advances of microscopy and in response to customer's requests.

If you have any questions or need further information, please contact us.

Narishige Group Website

URL: <http://narishige-group.com>