JOYSTICK CONTROL SYSTEM
MACS-KM
**MACS-KM** integrate operation of CPP, thruster, rudder to joystick and dial, and moves to free direction and turn in boat by optimal control program of a computer.

**MACS-KM** add the steerage characteristics that is altitude more to other original propulsion performance, plays a big role for modernization of ship in future.

**Operation Mode**
- Automatically Heading hold control mode
- Joystick control mode
- Actuator discreteness control mode
- Disturbance correction control function (feed forward control of wind effect)

**System Modules**

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**Joystick control**

![Joystick control diagram](example) MMS-50MK II

**Automatic heading hold**

![Automatic heading hold diagram](example) MK I - III
### Equipment object ship

<table>
<thead>
<tr>
<th>MMS-50 MK I</th>
<th><img src="image1.png" alt="Diagram" /></th>
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</thead>
<tbody>
<tr>
<td>Bow Thruster x 1</td>
<td></td>
</tr>
<tr>
<td>CPP x 1</td>
<td></td>
</tr>
<tr>
<td>High Lift Rudder x 1</td>
<td></td>
</tr>
<tr>
<td>#Can’t move to this course</td>
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<table>
<thead>
<tr>
<th>MMS-50 MK II</th>
<th><img src="image2.png" alt="Diagram" /></th>
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<tbody>
<tr>
<td>Bow Thruster x 1</td>
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<tr>
<td>Stern Thruster x 1</td>
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<tr>
<td>CPP x 1</td>
<td></td>
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<tr>
<td>Rudder x 1</td>
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<thead>
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<th>MMS-50 MK III</th>
<th><img src="image3.png" alt="Diagram" /></th>
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<tbody>
<tr>
<td>Bow Thruster x 1</td>
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<tr>
<td>CPP x 2</td>
<td></td>
</tr>
<tr>
<td>Rudder x 2</td>
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</tbody>
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### Options
- **Wing Panel extension**
  Build more it, and 1 of them is possible to 2 of them in total.

- **Master Panel extension**
  Install it in a console, and can change plural wing panel and steerage location.

- **Center of rotation select**
  Under the turn, select the center of rotation, FORE, MIDSHIP, AFT.

- **Log speed keep function**
  Log speed degree to 0 knots with having held a control set BRG.

- **Counter-wind attitude conservation function**
  Keep constant stem BRG for direction of the wind provided from anemometer and log speed frequency to about 0 knots.

- **Actuator configuration modification**
  System construction is possible even beside the actuator configuration mentioned above.
Equipment outline dimension

Wing panel (ab. 5kg)

Control panel (ab. 80kg)

Normal accessory Junction box x 2, Connection cable (5m) x 1

Master panel (ab. 8kg) (option)
PRODUCTS

- Fixed pitch propeller (FPP)
- Controllable pitch propeller (CPP)
- Side thruster
- K-7 Rudder (Flap rudder)
- Stern shafting arrangement
- Optimum Propulsion control system (PRO-CON CX-300)
- Control system
- A CPP system for double-ender

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