

INSTRUCTION MANUAL FOR BOARD PROCESSOR MS-025

Dear customer,

thank you for purchasing a genuine MS Composit product.

MS – 025 Usage

This board processor is designed for twin – rotor helicopter models (tandem), which use 2x CCPM rotorhead control system. This microcontroller was specifically designed for use in MS Composites CH- 46 Sea Knight RC model.

Operation description:

The MS-025 microcontroller transforms the transmitter control signals for control of the twin-CCPM systems. The transmitter uses standard four – channel rotorhead control system H1, the collective pitch control is assigned to channel 6.

The microcontroller uses one free mix to eliminate the change of torque momentum between rotors when the elevator steering occurs.

The microcontroller is fully transparent, i.e. The transmitter setup is the same related to the servo travel or orientation as for standard H1 type helicopter model.

Of course, any steering function can be stabilized using a proper gyroscope.

The microcontroller MS-025 is pre-set for use with the CH-46 Sea Knight model. The only setup required is to set the proper inverted or direct sense of the steering signal (servo reverse) on the transmitter.

MS-025 Installation

The MS-025 is equipped with cables for receiver and rear mechanics servo connection, the cable length was optimised for the CH-46 model. The front mechanics servos are attached directly to the MS-025 connectors, no additional cables are needed.

The MS-025 operates regardless its position in the model, the installation is made simply by using self adhesive foam tape (double sided).

Neither the MS-025, or the cables must come in touch with sources of electromagnetic interference – motor, speed controller.

Also, the cables must not come in contact with rotating elements of the model.

Max. Operating Voltage is 6V, if exceeded, irreversible damage of the microcontroller might occur.

Prevent the microcontroller from overheating (do not attach it to the battery cells), as the temperature over 50°C may cause controller destruction.

Electrical installation

Pay attention to the proper cable polarity (conector orientation) of the control signals (receiver to controller). The connector pins are to be connected to the receiver signal output. If any cable has wrong polarity, the system will not work at all.

All cables and connectors are marked by numbers on the printed circuit board (PCB) of the microcontroller.

The numbers relate to the channel numbers as follows:

Receiver side

Three – wire cable No. 1 must be attached to receiver channel for ROLL control. At the same time, it serves as power supply.

The four – wire cable (coloured) serves for the other control signals transfer (from receiver to the

microcontroller), and the separate wires must be connected to the particular receiver output – only to the signal pins!

Wire No. 2 – **black** attaches to NICK (elevator) function.

Wire No. 4 – **red** attached to RUDDER (tail rotor) function.

Wire No. 5 – **yellow** attaches to channel No. 5 (normally free).

Wire No. 6 – **blue** attaches to PITCH function.

If used in CH-46 model, the piezo-gyroscopes are used to stabilize the NICK (Channel 2) and RUDDER (Channel 4), this means, that the gyroscopes are installed between the receiver and the microcontroller on the particular channels.

Servo installation

The rear mechanics servos are attached to the controller output cables in following way:
(Again, the cable numbers are printed on the PCB.)

Cable No. 4 - servo attached to the right swashplate ball link

Cable No. 5 – servo attached to the front swashplate ball link

Cable No. 6 – servo attached to the left swashplate ball link

The front mechanics servos are attached directly to the microcontroller output connectors.
Attention – the polarity of the connectors is marked by the connector number position. The connector pin, where is the connector number placed, is always the signal output (on the servo cable white, yellow, or orange wire).

Connector No. 1 – servo attached to the right swashplate ball link

Connector No. 2 – servo attached to the front swashplate ball link

Connector No. 3 – servo attached to the left swashplate ball link

Terms „left“, „right“, „front“ are ment when looking at the model from top down.

Transmitter setup

To use the MS-025 microcontroller, at least 6 channel transmitter is required. Also, the transmitter must be equipped with the H1 system control program, and one free programmable mix.

Basic transmitter setup:

- 1) Select HELI model type.
- 2) Choose the H1 control system.
- 3) Set all trims and control sticks to neutral position. Do not forget to clear the stored trims, if any.
- 4) Set all servo travels to 100%.
- 5) Switch on the board electronics in the model and check for correctnes of the control signal – element response sense. If needed, reverse the control function (servo reverse).
- 6) If the elevator gyro provides a remote gain control, attach the gyro gain to channel 7 if provided, assign the Channel 7 to a free slider and set the gain value to approx. 40%.
- 7) Set the 5th Channel control ino approx. 75% position. If needed reverse the control signal sense. This function range is 75%-100%, and it serves for compensation of the momentum change, caused by the elevator control on twin rotor helis. The proper sense is set, when if the elevator stick is moved forward, both swashplates nick forward. At the same time, on the front mechanics the pitch is *decreased* – the swashplate moves up, and on the rear mechanics the pitch is slightly *increased* – the swashplate moves down. And vice versa.

8) Activate the free mix, set elevator as master, rudder as slave. The mixing ratio for basic setup is 100% elevator, 50% rudder. Check the function sense, and if needed, reverse it. The proper function means, that if the elevator stick is moved forward, both swashplates nick forward, at the same time the front swashplate „rolls“ to the right, and rear swashplate „rolls“ to the left. And vice versa.

After the initial setup, the model is ready for flight. All the other settings are based only on the pilots choice (GAS 1, 2, 3 e.t.c.).

Technical data:

Dimensions	30x30x6mm
Weight incl cables:	14g
Nominal input Voltage:	4 - 6V
Input of H1 functions	5
Output	6 (2xCCPM)

Problems and resolution

No control response, or only some servos react on control input:

Case A

∞one or all controller inputs are wrongly connected to the receiver output - check and repair

Case B

All inputs are correct, still some servos do not move

Check not moving servos for proper attachment to the microcontroller

Check, if the transmitter was set to heli mode, system H1

All is correct, the controller still does not work

∞no power. Check the cable 1 connectrion from the receiver.

∞Damaged microcontroller – return for exchange.

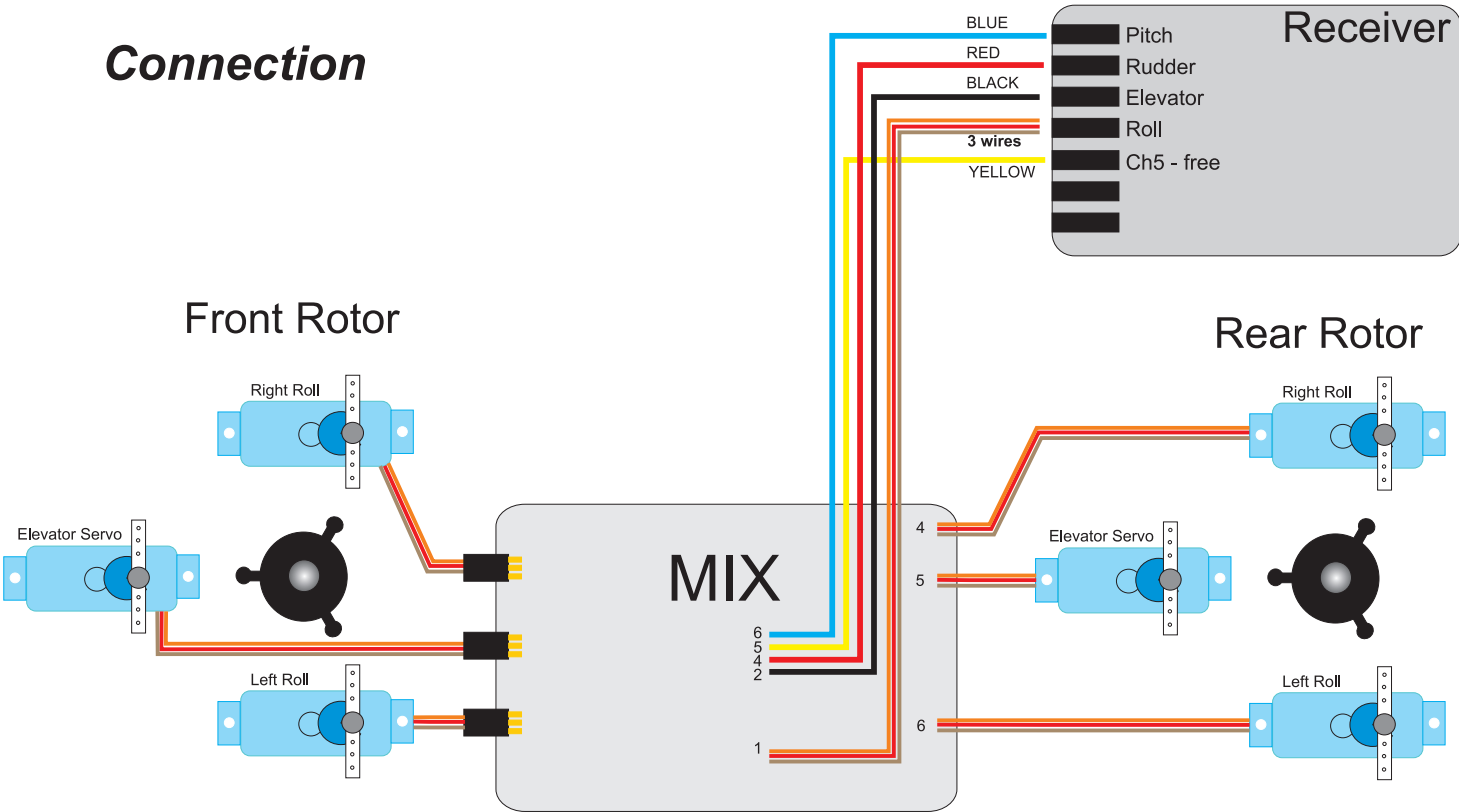
Attention

The warranty covers the errors in material and craftsmanship. By the warranty terms are not covered errors, caused by disassembly, repair attempts, product modifications of any kind, overheating, operating outside of the nominal voltage range.

The warranty does not cover products with removed shrink-wrap foil.

MS 25 Board Processor

Connection



Pins description

