

EX-5

2 CHANNEL SYSTEM
FOR EXPERT RACING

INSTRUCTION
MANUAL

KO PROPO

Thank you for buying the KO EX-5 proportional radio control system. The KO EX-5 is a state-of-the-art radio control system, developed by KO PROPO using the newest technology in this field. The EX-5 outperforms products of other manufacturers in terms of its weight, balance, control, and features. Please read this manual carefully to insure maximum performance and many years of enjoyment.

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FOR THE SERIOUS RACER

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Contents of The Package and Optional Parts

☐ Contents of the Package

	Standard	Mini	Racing
Transmitter	KT-287EX	KT-287EX	KT-287EX
Receiver	KR-285A	KR-285A	KR-285A
Servos	2xPS201S	2xPS51S	1xPS51s
RX Battery	Dry	Dry	
Speed Control			CX-IIR
Others	Servo horns, flag, manual, hardware, etc.		

☐ Optional Parts (may be purchased at your hobby dealer's)

- | | |
|---|---|
| <ul style="list-style-type: none">o Crystal seto Dry battery holder (TX or RX)o Servo horn seto TX NiCd battery packo RX NiCd battery packo PS-201S Standard servoo PS-301BH Heavy duty servoo PS-51S Mini servo | <ul style="list-style-type: none">o KR-285A Micro receivero KR-283A Standard receiver (27MHz only)o BEC Switch harnesso CX-II Speed controlo CX-IIR Speed controlo RM7-FET Speed controlo Servo extensiono Servo Y extension |
|---|---|

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Features

● Transmitter

- Advanced pistol grip design for excellent balance on all 3 axes.
- Thumbwheel control of steering rate.
- Push button reverse switch.
- Adjustment panel with see-through dust cover.
- Easy-to-read calibrated TX voltmeter.
- Wiring for NiCd battery pack installed.

● Receiver

- Micro-sized receiver
- Narrow bandwidth
- Molded three-pin connector
- Excellent range and interference rejection

● Servos

- Long life motors and pots
- High torque & speed
- Water resistant
- Synthetic resin gears

Specifications

● Transmitter (KT-287EX)

- Style..... Pistol grip
- Available frequencies..... 27 & 75 MHz bands
- Output power..... Max 500 mw
- Power..... 9-12 v
- Current consumption..... 160 ma @ 10 v
- Pulse width..... 1.85 +/ - .5 ms

● Receiver (KR-285A)

- Type..... single conversion AM
- Available frequencies..... 27 & 75 MHz bands
- Power..... 4-6.5v
- Current consumption..... 10 ma @ 6 v
- Dimensions..... 52 x 29 x 16 mm
- Weight..... 25 g

● Servos

● PS-201S

- Travel angle..... +/ - 45 deg
- Torque..... 3.5 Kgs/cm
- Speed..... 0.3 sec/70 deg
- Dimensions..... 41 x 35 x 21 mm
- Weight..... 43 g

● PS-51S

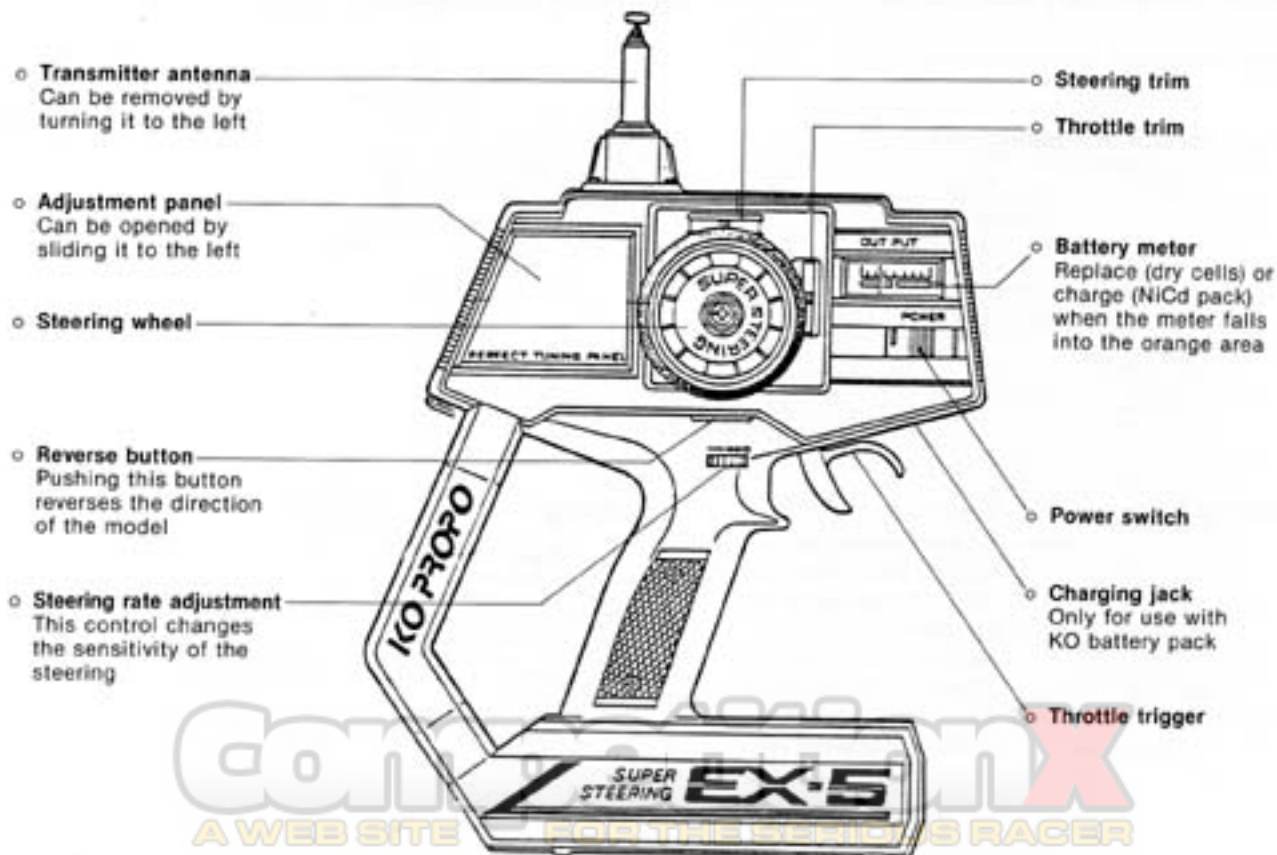
- Travel angle..... +/ - 45 deg
- Torque..... 2.2 Kgs/cm
- Speed..... 0.2 sec/70 deg
- Dimensions..... 33 x 30 x 16 mm
- Weight..... 23 g

(Specifications are subject to change without notice.)

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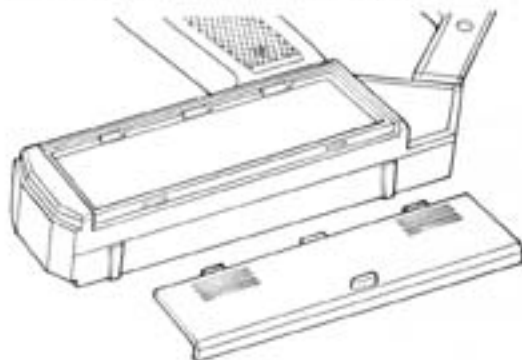
Transmitter Part Names



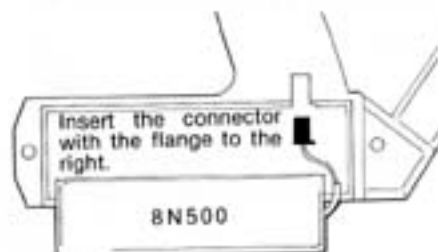
○ Batteries, Ni-Cds, and Charging

Opening the battery box cover

- Slide downward while pressing.

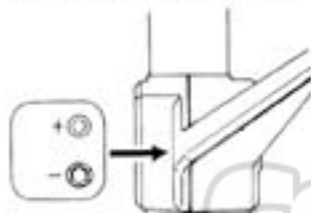


Installing Ni-Cd battery pack



- Insert the 8N500 Ni-Cd battery pack into the battery box as shown in the figure at left.

Installing batteries



- Insert eight AA alkaline batteries into the battery box. Never use old and new batteries together.
- Insert batteries as shown in the figure at left.
- Replace batteries with new ones when the voltage indicator drops into the orange area.

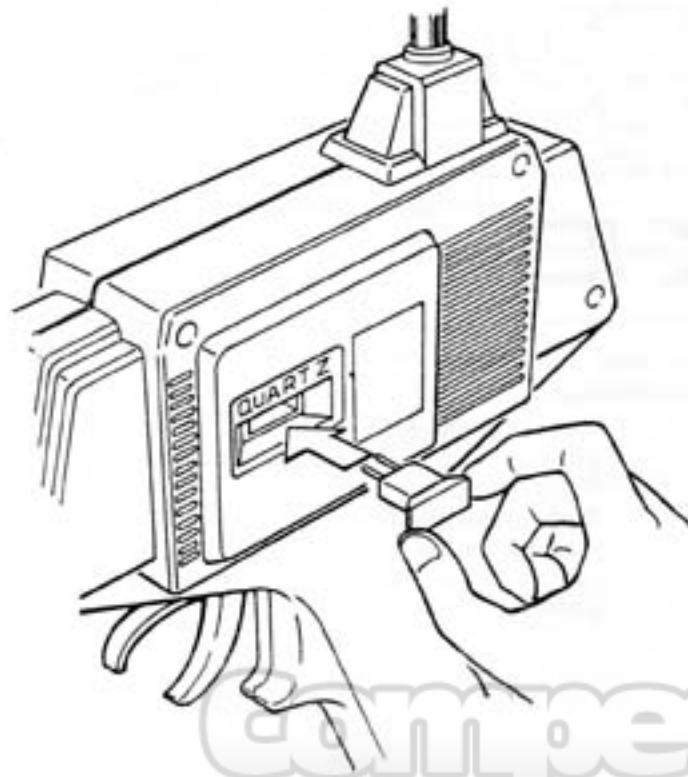
Charging



- Connect the battery charger to the jack shown at left.
- Charge the battery 15 to 20 hours when using it for the first time. After that, charge it 12 to 15 hours after each use.
- Charge the battery unit 15 to 20 hours again when it has not been **used** for more than one month.
- The **batteries** of the transmitter and receiver can be charged at the same time or separately.

○ Replacing the Quartz Crystal

- When replacing the crystal, do as shown to the left.
- Be sure to use a genuine Kondo crystal to assure correct frequency.



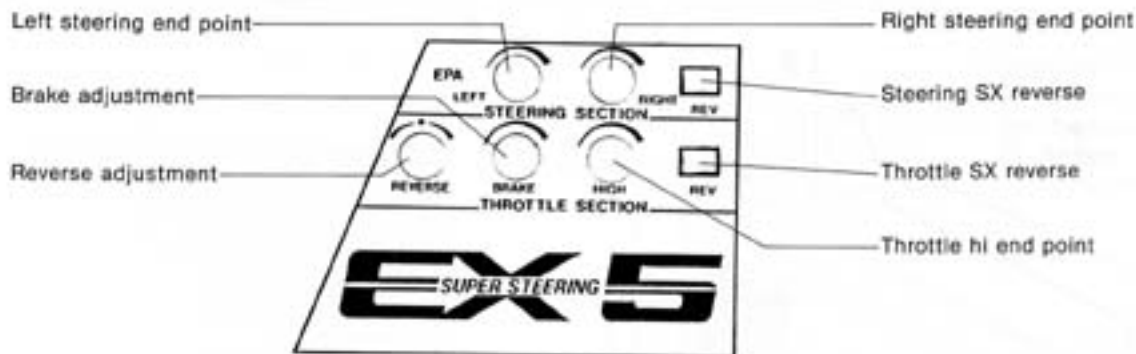
Available frequencies:

Channel	Frequency	Flag Color
1	26.995 MHz	Brown
2	27.045 MHz	Red
3	27.095 MHz	Orange
4	27.145 MHz	Yellow
5	27.195 MHz	Green
6	27.255 MHz	Blue
62	75.430 MHz	Blue/Red
64	75.470 MHz	Blue/Yellow
66	75.510 MHz	Blue/Blue
68	75.550 MHz	Blue/Gray
70	75.590 MHz	Violet/Black
74	75.670 MHz	Violet/Yellow
76	75.710 MHz	Violet/Blue
78	75.750 MHz	Violet/Gray
80	75.790 MHz	Gray/Black
82	75.830 MHz	Gray/Red
84	75.870 MHz	Gray/Yellow

- A 27 MHz crystal cannot be used in a 75 MHz transmitter or receiver or vice-versa.
- Never use 72 MHz crystals!

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Adjustment Panel



- **Left steering end point**
Adjusts the maximum point the steering servo will travel to the left of neutral.
- **Right steering end point**
Adjusts the maximum point the steering servo will travel to the right of neutral.
- **Reverse adjustment**
Sets the reverse position for the throttle servo.

- **Throttle high end point**
Adjusts the maximum high throttle position of the throttle servo.
- **Brake adjustment**
Adjusts the maximum position of the throttle servo for braking. This is usually less than the reverse position.

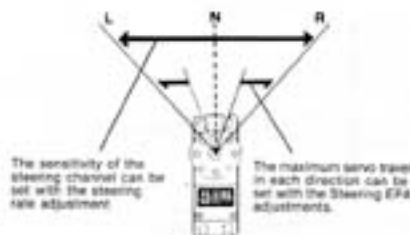
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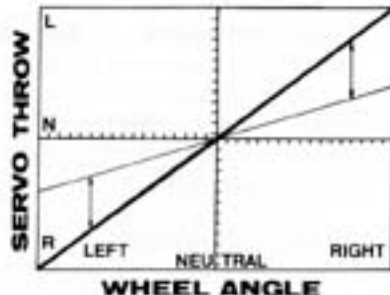
Special Steering Functions

Steering rate control

Adjustment of this control with the left thumb will change the sensitivity of the steering function equally in both directions. The steering servo is installed and adjusted with the steering rate at its highest position. The rate is then reduced while operating the model until the proper amount is achieved.



Steering servo



Servo reversing switches

Allows assembly of the linkage of the servo systems of all channels regardless of the rotational direction of the servo motors. Rotation of each servo motor can be set to either direction with the switch for the corresponding channel.

Steering EPA (end point adjustment)

These controls allow the maximum movement of the steering servo to be set in each direction separately. This is used to compensate for models which do not steer equally well in both directions.

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Special Throttle Functions

o High end point Fig. A

Adjust the maximum full throttle servo position. May not be needed when using a speed control which already has this adjustment built in.

o Brake adjustment

Adjusts the maximum travel of the steering servo when the throttle trigger is pushed instead of pulled. When reverse is used, this adjustment should be set so that reverse cannot be activated without using the reverse button.

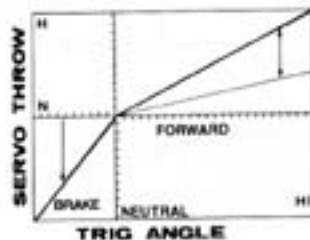
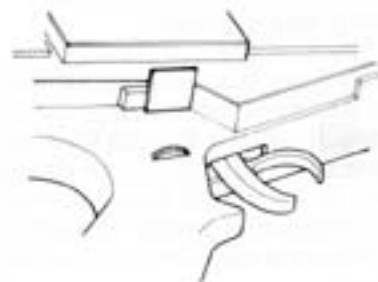
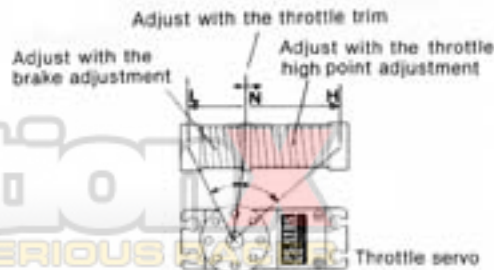


Fig. A



o Reverse button

Pressing this button causes the throttle servo or speed control to go to a position preset by the reverse adjustment. This is usually beyond the brake position. A small piece of plastic or aluminum can be taped to this switch to make access easier.

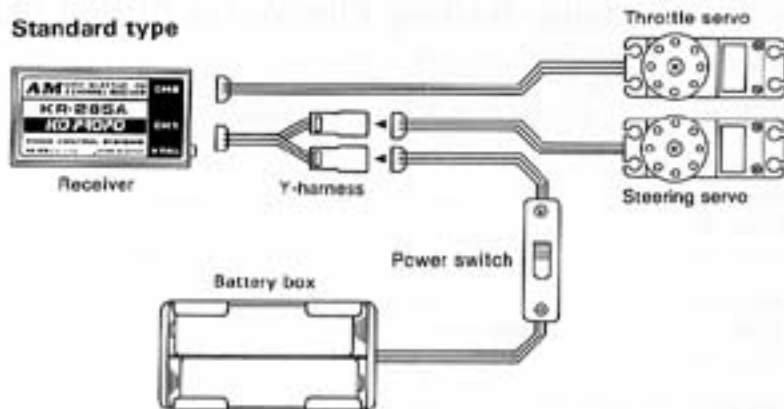


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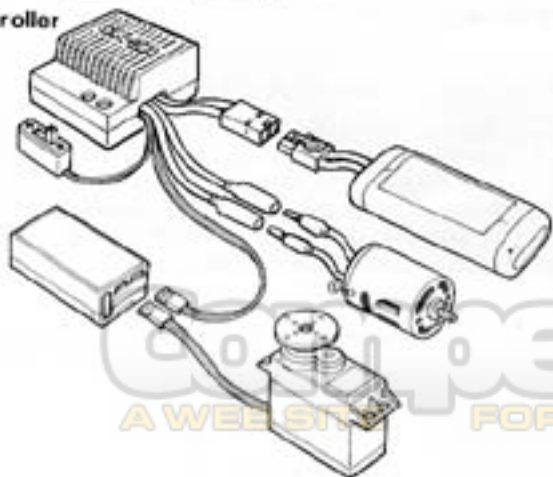
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Connecting the Receiver and Servos

Standard type



Speed controller type



BEC type



- o The Y-harness may be connected to either channel 1 or channel 2.
- o The Y-harness is not used when an electronic speed control with battery eliminator is used. The speed control is connected to channel 2.
- o When a speed control or a BEC switch harness is used, the battery box can be eliminated.
- o The receiver will not work when a 75MHz crystal is plugged into a 27MHz set or vice-versa. Use ONLY KO PROPO CRYSTALS! Use of any other crystals may cause difficulty in controlling your model or interference to other models.
- o In gas-powered models the receiver must be padded and wrapped in a fuel-proof plastic bag.
- o Do not let the receiver antenna come in contact with any metal parts. Never shorten or modify the antenna in any way. Doing this will void your warranty and reduce the range of your radio.
- o Mount the on-off switch so that it cannot be accidentally switched off during a collision.

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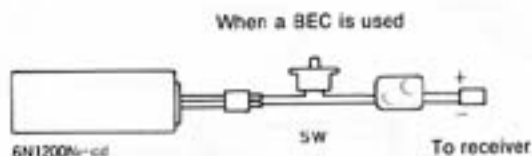
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Notes on Installation

- In electric powered models, the receiver and servos can be mounted with double-sided servo tape. The servos should be further supported with a large wire tie on each.
- In gas-powered models, the receiver should be wrapped in foam and sealed in a plastic bag. The servos should be mounted with grommets, screws, & eyelets.
- Never cut or modify the receiver antenna in any way! This will have a serious effect on range. Route it as far as possible from the servos or any electrical wiring. It is best to support it vertically with a piece of plastic tubing such as Ny-Rod.
- Electric-powered models **MUST** have motor capacitors from each pole to the case of the motor. Failure to install these capacitors can decrease the range by as much as 75%.
- The receiver battery pack can be eliminated by using a BEC switch harness. This will connect the receiver and servos to the 7.2 volt battery which runs the model. The BEC switch harness will regulate the receiver voltage to a safe level. **DO NOT** connect the receiver directly to the 7.2 volt battery as permanent damage to the radio will occur.

Using Battery Eliminator Circuit (BEC)

- Connect as shown in the figure below when using a common power supply for electrically powered cars and the receiver from the drive Ni-Cd battery.



CAUTION !!

- Never mistake the polarities when wiring the common power supply. Red indicates the plus and black indicates the minus. Connect leads of the same color.
- If reverse voltage is applied, the receiver and servos may be severely damaged and require expensive repair.

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All KO products have been carefully inspected prior to shipment. However, if you have any problems with a KO Propo product while using it under normal conditions or it has any defects, it will be repaired free of charge in accordance with warranty conditions. When requesting service, please observe the following guidelines.

1. Contact the service center listed below. They may be able to solve the problem on the phone saving you the time it takes to send the product to them.
2. If your set has been exposed to water, wash it with clean water and dry it prior to shipping. Neglecting to do this may make repairs impossible.
3. Please attach a letter to the unit describing the problem you are having or the service you are requesting. Do not send this letter separately.
4. When sending the set by mail be sure to package it in the original carton surrounded by a strong cardboard box. Never send anything which is not an original part of the product.
5. If the product has been modified or serviced by anyone other than the service department listed below, you will be charged for repair. Any modifications which impede normal service will be removed at your expense.
6. You may request a free estimate at the time you submit the product for service.

7. You are always responsible for any postage and handling charges.

Manufactured by: KONDO & Co., Ltd.

Serviced by: CIRRUS R / C SYSTEMS
18480 Bandilier Cr.
Fountain Valley, CA
92728-8610
Phone: (714) 963-0329

You are responsible for the proper operation of your station (transmitter) at all times and are responsible for observations, servicing, and maintenance as often as may be necessary to ensure proper operation. Each internal repair and each internal adjustment to an FCC type accepted R / C transmitter must be made in accordance with the technical regulations specified by the FCC. The internal adjustments should be performed by or under the immediate supervision and responsibility of a person certified as technically qualified to perform transmitter maintenance and repair duties in the private land mobile services and fixed services by an organization of committee representative of users in those services.

The FCC at this time does not require the modeler to obtain a special license for the operation of this unit. However, it is still the owner's responsibility to observe all FCC rules & regulations governing its use. For a copy of these rules write to:

Federal Communications Commission, Washington, DC 20554.

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- All KO products are shipped after passing a strict quality check. However, any defects in KO products that are the manufacturer's fault will be repaired free of charge, based on conditions given in the warranty. Please observe the following items if you send a unit to us for repairs:

1. Be sure to include a detailed problem report. It will help us make repairs quickly.
2. If the unit has been dropped in water, turn off the power immediately, wash it with fresh water, dry it, and then send it for repair. Otherwise, repairs may not be possible.
3. When you mail the unit, be sure to put it into the styrofoam case and package the case in a cardboard box (include a problem report and warranty information, and name, address, zip code, and telephone number along with the times you can be reached by phone).
4. If your set requires repair, please consult your dealer for assistance.

KONDO & CO., LTD.

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