

EX-1 Mars

COMPUTERIZED FM PROPORTIONAL SYSTEM

Operation Manual

CAN BE SELECT SYSTEM LEVEL
FULL SELECTABLE ET. LEVER
THROTTLE SPEED & ACC
ACTIVE BRAKE CONTROL
STEERING SPEED



LATEST LEADING

KO PROPO

RADIO CONTROL TECHNOLOGY

Read First

Thank you for purchasing the EX-1 Mars.

Read this manual carefully in order to obtain maximum performance from the unit and store it carefully.

The auxiliary channel of this unit (3ch) can not be used with the included 2ch receiver (KR297FZ).

It is necessary to purchase an additional adapter (optional).

How to find information in this manual.

What can be done with this transmitter?	Contents	(P3-4)
What do you want to do or know?	Contents	(P3-4)
What does this mean on the LCD?	Index	(P87)
What does this word mean? Where to find it?	Index, Terminology	(P83-87)
Want to know details of the function.	Contents	(P3-4)
How to call up the LCD display?	LCD screen table	

Notes on Application, Exportation and Modification of the Products

1. This product is only for the control of models.
2. (a) If the product is exported from Japan, the prior approval of the Ministry of Radio/Telecommunications by the country of destination is required.
(b) If this product is re-exported from other countries, it may be subject to restrictions on such re-export and prior approval of government authorities may be required.
3. KO is not responsible for any use of this product that is not in compliance with applicable law and disclaims all responsibility for any modification or alteration of the product, including the incorporation of the product into other products by third parties, that is not in compliance with applicable law.

Others

- It is illegal to reproduce the contents of this manual without permission.
- The contents of this manual are subject to changes without notice.
- Although every effort has been made to ensure the accuracy of the information contained in this manual, please contact us if you have any questions or if you find any errors.
- We can not assume any responsibility for any damage arising from the use of this product by the customer.
- Notes to KO CPU transmitter users.
 - (1) The basic operation in the LCD screen is the same. Use the UP/DOWN keys to change the function screen and call out the Sub Menu by the Select key. Use the +/- keys to change the figure data. There are two modes: Function and System.
 - (2) The Direct mode is not independently functioned as before, it will change to the Function Mode immediately.
- Note to EX-1 user about RF Module.

Caution! Although you can install the former EX-1 RF Module, and electric wave will not be emitted correctly because the high frequency tuning is different.

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For the Safe Usage of this Unit

With the nature of radio controlled models, misoperation will result in danger.
In order to avoid these circumstances and to use this unit safely,
please read the contents thoroughly.

Explanation of warnings and signs

Meanings of
warning
and signs

In this manual, following warnings and signs should be noted carefully.



Failure to observe the matter discussed in such an item poses a serious threat of death or severe injury.



Failure to observe the matter discussed in such an item poses a possibility of death or severe injury, and a great likelihood of damage to the equipment or property.



Failure to observe the matter discussed in such an item poses a possibility of injury or damage to the equipment or property.

Meaning of picture indications



Prohibited matters

Not allowed to do.



Enforcement matters

Must carry out!

Meaning of picture indications

Warning



Be certain to use only KO Propo genuine crystal sets (transmitter and receiver).
*Other crystals may vary in frequency, which could lead to misoperation or loss of control.



Prevent metal parts in the model (Car, or Boat) from touching caused by vibration.



This product is only designed for surface radio control models. Do not use for any other purpose.



If a nicad battery pack is used in the transmitter, be sure to charge properly before use.
*If batteries are not fully charged, the model may run out of control.



Be sure to connect all equipments correctly.
*If connections are loose, the model may run out of control.
*The vibration may damage the servo and the model may run out of control.



Be sure to install a receiver with thicker double sided tapes.
*A strong shock or vibration may result in the model running out of control.



Do not cut or bundle the aerial wire with other cords.
*It may result in decreasing the sensitivity of a receiver and may result in the model running out of control.



When operating each servo, check that there is no unnecessary force on the push rod.
*It may damage the servo or increase the consumption of batteries.



Be sure to use grommets and to prevent the servo from touching any metal or carbon plates directly.
*The vibration may damage the servo and the model may run out of control.

Notes Before Installation

Caution

! Caution!



Be careful not to reverse the polarity of the transmitter and the receiver. Reverse polarity could damage the unit.

! Caution!



Be sure to use genuine KO Propo products e.g. transmitter, receiver, ESC and other optional parts.

*We cannot assume any responsibility for the use of other companies' products with this unit.

Notes on Driving (Sailing)

Warning

! Warning!



When turning on the power switch, be sure that the frequency band is available.
*The models using the same frequency will run out of control.

! Warning!



Do not use this unit in thunderstorms.
*There is a possibility of lightning striking the antenna.

! Warning!



Do not use the transmitter in the rain or in a location where water might get on it.
*The unit may become wet, which causes loss of control.

! Warning!



Do not run the model in the following places.
①Near to other radio control car circuits. (within 3km)
②Near to people or on the road.
③The surface of the water where there are actual sized boats.
④Near to electric wires and communication facilities.
*In the case of the model running out of control, it will be very dangerous.

! Warning!



Do not run the model when you experience difficulties in concentration through tiredness, alcohol or medication.
*The mis-judgement may result in accidents.

! Warning!



Be sure to extend the aerial of the transmitter to full length.
*The emission of incorrect signals will cause the model to run out of control.

! Warning!



Do not allow any plastic parts to come in contact with fuel and exhaustion.
*Doing so causes risk of damage.

! Warning!



Be sure to confirm that the model memory is matched to the models currently running.
*Not doing so may cause the model to run out of control.

! Warning!



When you make functional changes, be sure to stop the engine or disconnect the motor lead wire.

Caution

! Caution!



Always turn on the switch on the transmitter first, followed by the receiver. When turning off the switch, always turn off the receiver first, followed by the transmitter.
*If you don't follow the correct order, the receiver may get interference and run out of control.

! Caution!



Attach a band plate when you operate the unit.
*Display your frequency clearly to other people.

! Caution!



Do not touch the engine, motor, ESC where heat is generated.
*May result in burning.

! Caution!



Because the transmitter emits high-frequency energy, do not touch the antenna while the transmitter is in use.

Notes on Driving (Sailing)

Warning

Warning!



In the case of an electric-powered car, be sure to disconnect the nicad battery afterwards.

*It may cause fire or the model to run out of control in case of the switch being left on.

Warning!



When storing the transmitter, batteries, and models, be sure to keep them out of the reach of children.

*It may result in damage by chemicals.

Caution

Caution!



Be sure to disconnect the battery from the transmitter when not in use for a long time.

*It may damage the transmitter if you leave the battery in the transmitter for a long time.

Caution!



Do not store the transmitter in the following places.

① Extremely hot or cold places (+40°C, -10°C).

② Direct sunshine.

③ Places with high humidity.

④ Dusty places.

*If you store the unit under these circumstances, it may result in misoperation or damage to the unit.

Notes on Charging Nicad Battery and Hydropack (sold separately)

Danger

Danger!



Do not short the battery terminals.

*It is dangerous because it may cause the outbreak of fire or explosion.

Danger!



Never incinerate the batteries.

*It is very dangerous because they may explode.

Danger!



Be sure to use KO Propo charger and to use correct charging current. (1A)

*Avoid over charging the battery. Over charging does not only damage the battery, but can cause excess heat build-up and possibly fire, which results in serious accidents.

*There is a possibility that the auto cut-off function will fail to operate by other company's chargers.



In the case of liquid leaking from battery, Avoid eye/skin contact with the liquid. Burns and blindness may occur. Apply large amounts of water and contact a doctor immediately for treatment.

Danger!



Do not apply a big shock to the batteries.

*It may damage the battery and result in short circuits and possibly a fire.

Danger!



Do not dismantle or modify the battery.

*Dismantling the battery may cause liquid to leak out and it is very dangerous.

Danger!

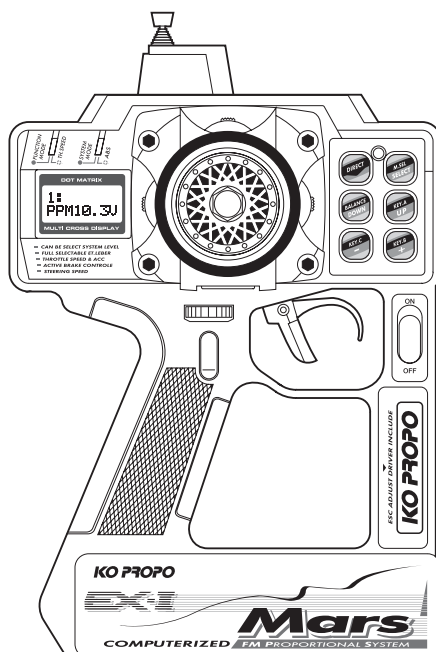


Do not wet batteries and do not charge wet batteries.

*It may cause excess heat build-up and damage.

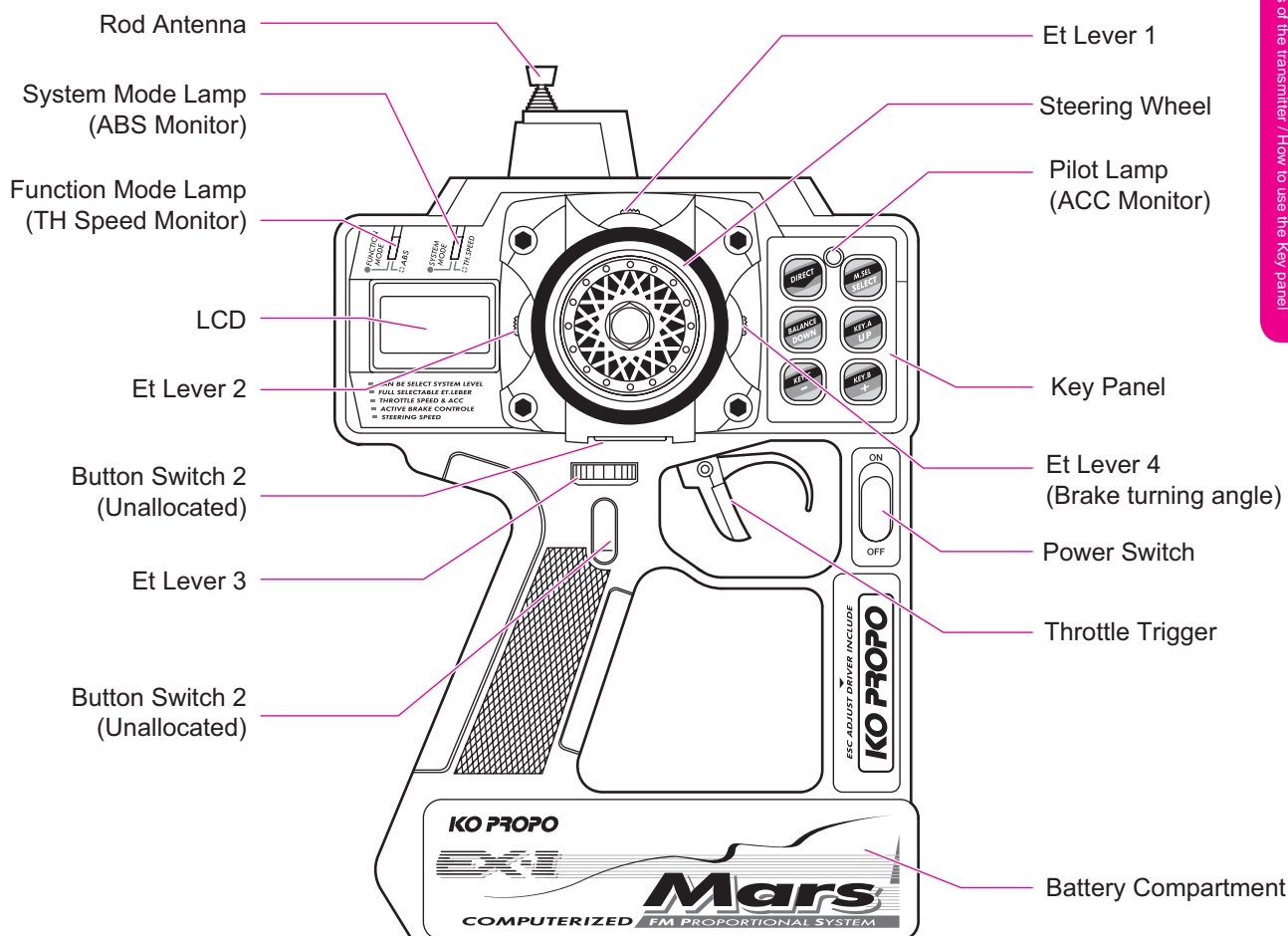
Nicad batteries are recyclable. Please support recycling.

Contents : How to use the transmitter



●Names of parts of the transmitter.	P9
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Name of the Parts of the Transmitter



●Notes on switching power off!

After the operation of function keys, trim, and Et levers, do not switch off for at least one second, otherwise the setting data won't be read.

How to Use the Key Panel

Direct Key

Once the Direct key is pressed, the unit enters Direct Mode. In addition, pressing this key twice call up the Initial Screen from any other screens.

Down Key

Can scroll the screen down, switching the function. In Direct Mode, it will become the Balance Key.

- (Minus) Key

The figure on the display becomes (-) value. When both keys (+/-) are pressed simultaneously, it will reset the value. In Direct Mode, it will become the Custom Key(Ky-C).

Select Key

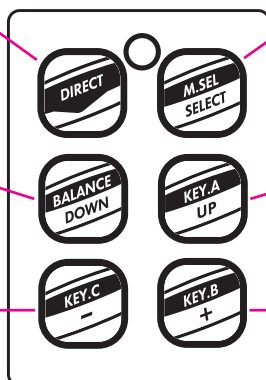
Calling up the sub menu or select the LCD display except for figure data. In Direct Mode, it will become the Model Select Key.

Up Key

Can scroll the screen up, switching the function. In Direct Mode, it will become the Custom Key (Ky-A)

+ (Plus) Key

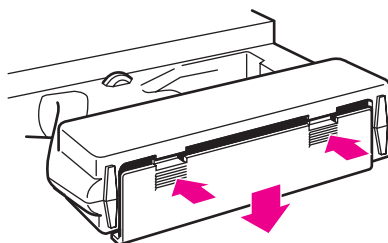
The figure on the display becomes (+) value. When both keys (+/-) are pressed simultaneously, it will reset the value. In Direct Mode, it will become the Custom Key (Ky-B).



Custom Keys...If setting these keys in the Set Up function, these operation keys become Custom Keys. The function screen can be called up immediately in the Direct Mode.

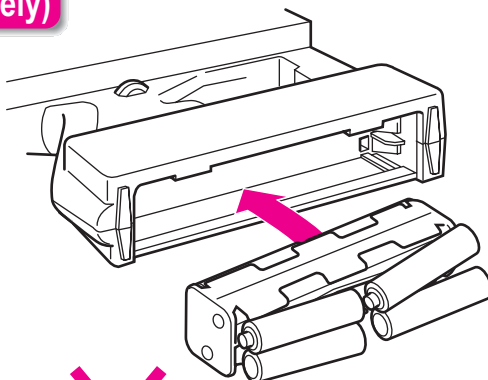
How to Open the Battery Cover

Press down and slide the battery compartment cover as shown.



How to Insert Dry Cells (sold separately)

- (1) Insert eight AA size batteries into the battery box.
- (2) Insert the battery box matched with battery box terminals (+)(-) and transmitter terminals.
- (3) Close the battery compartment with cover.



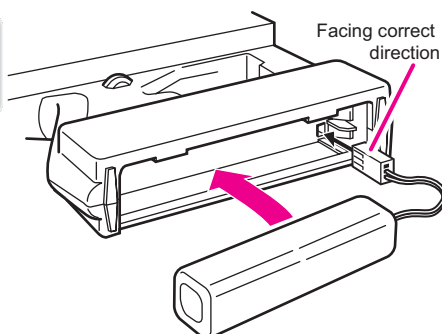
Warning!

Do not use AA size Ni-cad battery. It may cause corrosion inside the transmitter with gas when charging.



How to Insert a Ni-cad Battery or Hydropack (sold separately)

- (1) Plug in the connector of a Ni-cad battery pack.
- (2) Insert a Ni-cad battery or Hydropack correctly. Close the battery compartment with cover.
- (3) Be sure not to catch battery lead in between compartment and cover.



Charging (Ni-cd pack only)

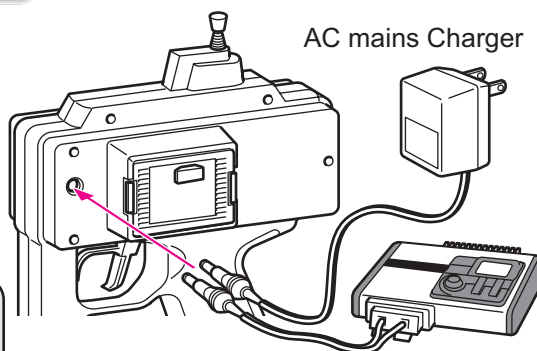
Connect AC mains charger or DC 12V charger (KO Propo product).

The charging time from flat condition is 14-16 hrs for Ni-cad and 25-35 hrs for Hydropack.



Warning!

Do not charge when using dry cells. If you charge dry cells, it could cause damage to the transmitter.



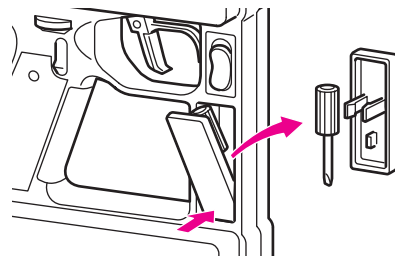
AC mains Charger

DC 12V rapid Charger
(sold separately)

charging current less than 1A

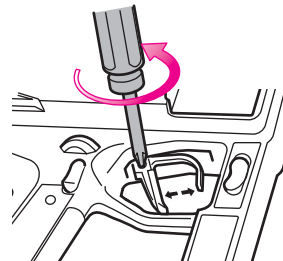
Tuning Screwdriver

- As shown in the diagram, push to the bottom of the small cover with your finger to open. After removing the cover, turn it around and put it back so that the tuning screwdriver is taken out.
- When putting the screwdriver back inside the compartment, turn the grip upward to store. (as shown in the illustration). Otherwise, it will be difficult to open the cover again.



Trigger Bar Adjustment

- As shown in the illustration, use a Phillips screwdriver to loosen the screw located at the base of the trigger and adjust the trigger bar to fit your finger.
- When fixing the trigger bar, be careful not to overtighten the screw.
- If the trigger pad comes loose, glue it back in the place.



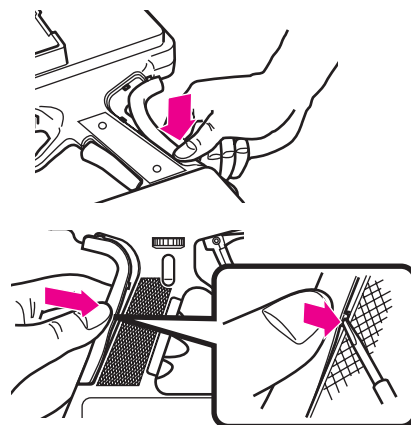
Replacing the Color Pad

Removing the Pad

Put your fingernail in the edge of the color pad and pull the pad off.

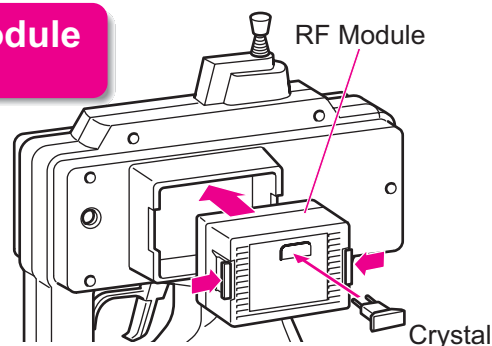
Attaching the Pad

- (1) Position the tabs on the pad so that they are in place, starting from the bottom.
- (2) Next, work your way up the handle, pushing the tabs into their slots. If a particular tab does not go into its slot easily, use a standard flat-tip screwdriver to push the tab in.
- (3) Squeeze the grip so that the pad fits the shape of the handle.



Replacing the High-Frequency Module and crystals.

- Replace the RF Module for changing the frequency range.
- Replace the crystals for changing the frequency. (band)
- Be sure to turn off the switch when changing the RF Module or crystals.
- Insert the crystal properly.



The signals won't emit by taking off the RF Module when you want to adjust the transmitter during the race.

Warning!

When changing the crystals, be sure to use genuine FM-type transceiver crystals by KO Propo. (both transmitter and receiver) *Crystals by other manufactures may operate at slightly different frequencies, which results in loss of control.

Caution!

The former EX-1 RF Module cannot be used because of the different tuning.

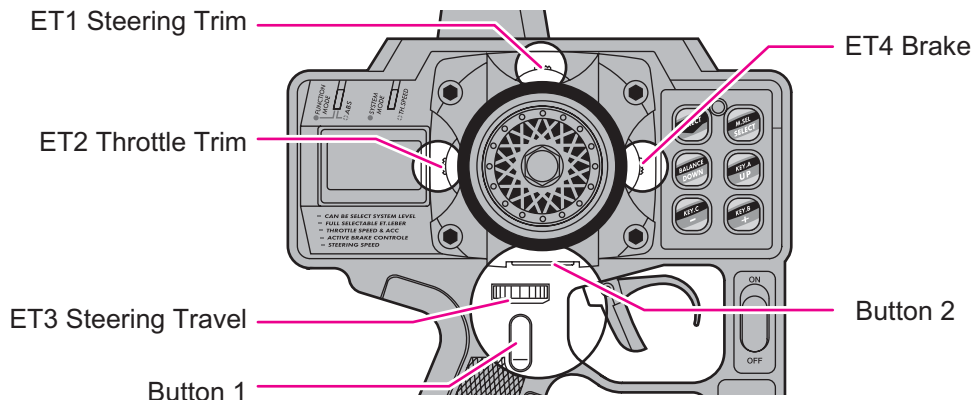
How to Use the Transmitter

● How to Use the Trim

When the unit is released, it has been assigned as Et Lever 1 for Steering Trim, Et Lever 2 for Throttle Trim. At any rate it is the KO original Center Trim. Even though the trim is adjusted, left and right turning angle points will not be changed. However, if there is a big difference between left and right turning angles, use the Sub Trim (p25) to adjust.

● How to Use each ET Lever

Et is the abbreviation for Electric Trim which can be set any functions. It can be assigned in the Set Up screen. When the unit is released, it has been assigned as Et Lever 1 for Steering Trim, Et Lever 2 for Throttle Trim, Et Dial 3 for Steering Travel, Et Lever 4 for Brake.



● Auto Display

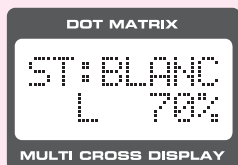
When the Et Lever or Button is activated, the LCD display will automatically show its function, and the current position or value can be confirmed. It will return to the previous screen display after approx. 3 seconds. When this screen appears, the System Mode or Function Mode Lamp will go off temporarily.

● How to Use Each Button

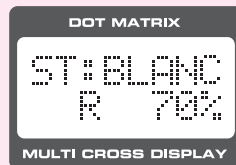
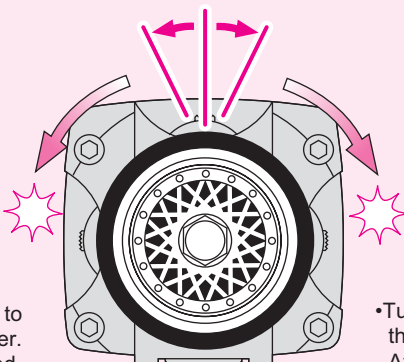
Button 1 and Button 2 can be used for ON/OFF operation such as timer function and ABS function. When the unit is released, it has been with factory default setting, and it can be set up on the Set Up Screen. (p44)

● Balance Adjustment by the Trim Lever

The Et Lever has been assigned as Steering Trim, which can adjust the left and right turning angles (Steering Balance) of the steering servo separately.



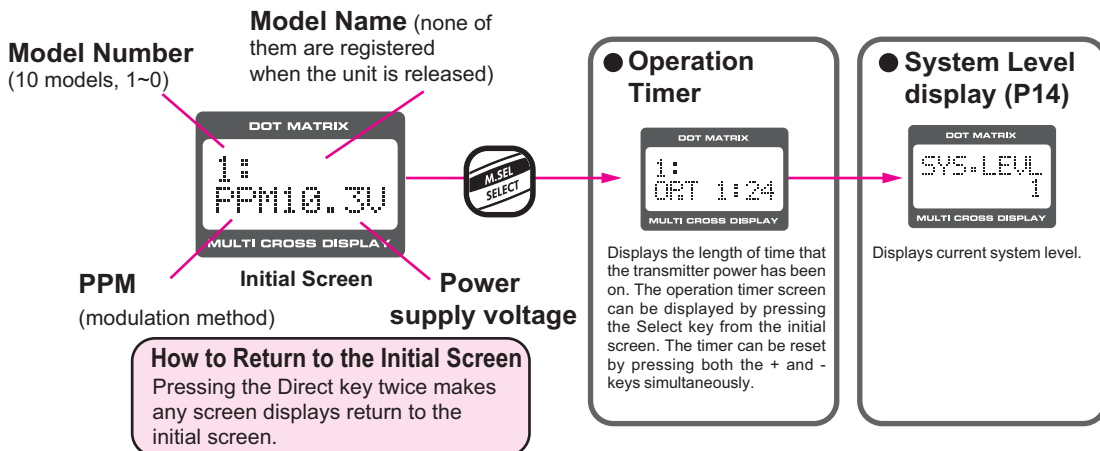
- Turn the steering wheel fully to the left, and operate the lever. The screen will be displayed, and the left turning angle can be adjusted.



- Turn the steering wheel fully to the right, and operate the lever. After the screen will be displayed, the right turning angle can be adjusted.

Initial Screen

This screen is displayed when the power is turned on. Pressing the Select key in regular sequence will change the display to Operation Timer and System Level.



Warning Display in the LCD

Battery Alarm

If the battery voltage drops to 9.0V or less while the transmitter is in operation, the alarm will go off and (BATTERY) will be displayed on the LCD screen. In this case, replace or recharge the battery.

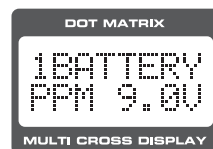


Warning!



If the alarm goes off, collect the model immediately.

*The radio signals will become weaker, which could cause loss of control.



Memory Error

[MEMORY ERROR] appears on the LCD screen with alarm if something wrong happens to the CPU.

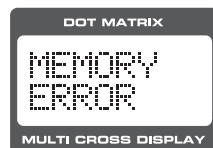


Warning!



If [MEMORY ERROR] appears, send the transmitter to our repair service department.

*Although it seems to function normally, sudden misoperation may occur.



About the display of each lamp

Pilot Lamp

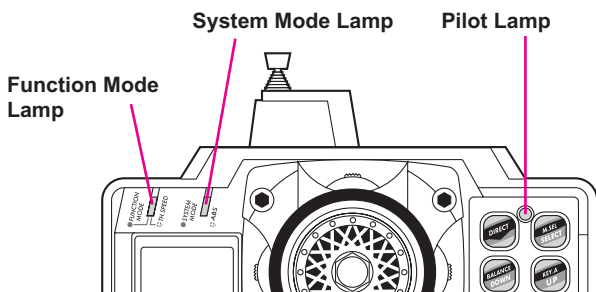
It is lighted on by turning the power switch on. It blinks when Throttle ACC (P76) is turned on.

System Mode Lamp

It is turned on when the unit is in the System Mode. It blinks when ABS (P62) is turned on.

Function Mode Lamp

It is turned on when the unit is in the Function Mode. It blinks when Throttle Speed (P40.60.74) is turned on.



System Level

Due to the continuous development of computer technology, radio control transmitter have also become more sophisticated and multi functioned. The operation of transmitter has become complicated despite the advanced control of RC cars. We have been making every effort to achieve a simple operation method by our original man-machine interface with rather complication functions. However, we understand that the current system is already difficult to master in order to obtain the maximum performance from the unit with more new functions and features. (Much more functions and features but the simple operation) In order to make it possible, we have developed the selectable number of functions (System level changeable function). There are four different levels shown as in the table on next page . Please select the level that you feel most comfortable with.

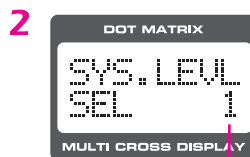
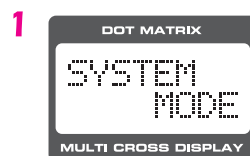
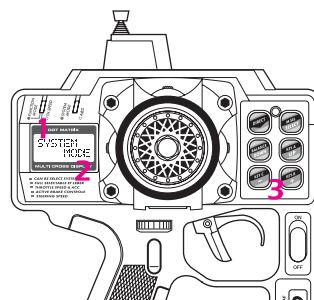
○ Changing the System Level (System Level Select)

- Changing the system level (p18). Can be step up by own preference but always start with Level 1 (factory default).

1 After switching the power on, enter the System Mode from the Initial screen.

2 Press the Up key until the System Level Select screen appears.

3 Use the +/- keys to select the level.



Caution

When you select a lower level, please note the followings.

- (1) The timer must be stopped. It may not stop when timer function is still turned on.
- (2) The data of the function which has become unavailable due to level down will still be stored. Therefore, be careful with trim rate, etc.
- (3) Each item of the Set Up screen will be reset. However, it will be stored to BTN1 for safety reasons, if the Ch3 is assigned to any button.



System level can be set for each model.

Function Table for Each Level

Function Mode

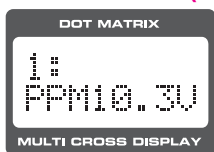
Name	Level 1	Level 2	Level 3	Level 4	Reference Page
Timer 1		○	○	○	P35
Timer 2			○	○	P54
Throttle Pre Set			○	○	P56
Automatic Start			○	○	P57
Steering Travel	○	○	○	○	P21
Steering Balance	○	○	○	○	P22
Steering Punch				○	P71
Steering Curve		○	○	○	P38
Steering Speed			○		P58
Steering Speed (2 Way)				○	P72
Throttle High Point	○	○	○	○	P23
Throttle Brake	○	○	○	○	P24
Throttle Curve		○	○	○	P39
Throttle Punch			○	○	P59
Throttle Speed (1P)		○			P40
Throttle Speed (2P)			○		P60
Throttle Seed (3P)				○	P74
Throttle Acceleration				○	P76
Active Brake System			○	○	P62
Position Display		○	○	○	P45
Sub Trim	○	○	○	○	P25
Model Select	○	○	○	○	P26

System Mode

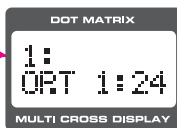
Name	Level 1	Level 2	Level 3	Level 4	Reference Page
Set Up		○	○	○	P42
Trim Rate		○	○	○	P45
Reverse	○	○	○	○	P29
LCD Contrast	○	○	○	○	P30
System Level	○	○	○	○	P14
Channel Select		○	○	○	P46
Auto Display			○	○	P65
Model Name	○	○	○	○	P28
Memory Recall		○	○	○	P47
Model Copy			○	○	P65
Adjust VR			○	○	P66

LCD Screen Table Screen table for Level 4

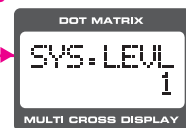
Initial Screen (P13)



Operation Timer Screen (P13)



System Level Screen (P14)



Use the Select key to change the screen

The Explanation of Mode Group

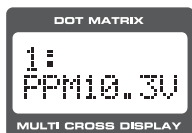
It is difficult to find a function gathering into one group because this unit has so many LCD function appears. Therefore, less frequent use functions have been put into one group as System Mode and more frequent use functions for the other group as Function Mode.

In former systems, Direct Mode was functioned as independent mode, however, in this unit it is a one touch calling up mode among the Function Mode. Three of five keys can be assigned to the functions easily.

Function Mode

How to Enter ... Enter by pressing the UP or Down key while the Initial Screen is displayed. It can be confirmed by the function mode lamp.

Initial Screen



The screen indicated with an asterisk (*) will not appear unless you assign the BTN in the Set Up screen (P44)

Use the Up/Down keys to scroll the screen.



Sub Menu

*Up Timer (P35)



*Down timer (P54)



*Throttle Pre Set (P56)



Automatic Start (P57)



Steering Travel (P21)



Change the Sub Menu by the Select Key

Use the Up/Down keys to scroll the screen.

Steering Balance (P22)



Steering Punch (P71)



Steering Curve (P38)



Steering Speed (P72)



Steering Speed Point (P73)



Throttle High Point (P23)



Throttle Brake (P24)



Throttle Curve (P39)



Throttle Punch (P59)



Throttle Speed (P74)



Throttle Speed Point (P75)



*Throttle Acceleration (P76)



ABS(P62)



Sub Trim (P25)



Position Display (P27)



Model Select (P26)



Direct Mode

Can call up the function screen in the function mode immediately.

Press first



Direct Mode



Steering Balance



Model Select



Can select the function in the Set Up screen(P43).



Change the Sub Menu by the Select Key

Speed Return



Speed Point Return



Brake Curve



Brake Punch



High Range Speed



Middle Range Speed



Speed Point M/H



Low Position



High Position



Cycle



Start Position



Cycle

Delay

Duty

Throttle Sub trim

Sub Menu

LCD Screen Table 2

System Mode

There are two ways to enter.

Use the Up/Down keys to scroll the screen.

Sub Menu

KEY.A UP **BALANCE DOWN** + ON

(1) Press and hold the Up and Down keys, and then turn on the switch.
Can be confirmed by the System Mode Lamp.



(2) Enter by pressing the +/- /Select keys simultaneously while the Initial Screen is displayed.

KEY.B + **KEY.C -** + **M.SEL SELECT**

Set Up (P42)

Trim Rate (P45)

Reverse (P29)

LCD Contrast (P30)

System Level Select(P14)

Channel Select (P46)

*Auxiliary Channel (P46)

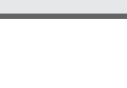
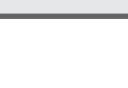
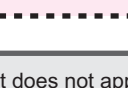
Auto Display (P65)

Model Name (P28)

Memory Recall (P47)

Model Copy (P65)

Adjust VR (P66)



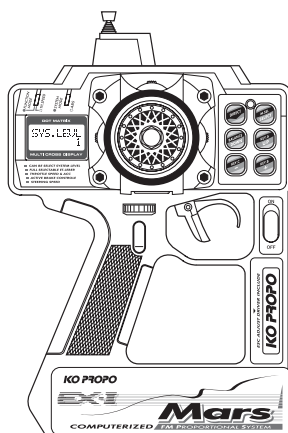
Use the Select key to select

Memory Restore

Memory Reset

* It does not appear unless 3ch is selected.

Level 1: Contents



- Most simple level. The most basic functions gathered together for driving.
- What is the current System Level?(Press the Select key twice from the Initial Screen)
- If you want to change the System Level, please refer to the P14

Function Mode

- Adjusting steering servo angle Steering Travel (P21)
- Adjusting Left/Right steering servo angles Steering Balance (P22)
- Adjust forward direction of the throttle servo angle Throttle High Position (P23)
- Adjusting brake direction of the throttle servo angle Throttle Brake (P24)
- Adjusting the trim lever to the center Sub Trim (P25)
- Adjusting the trim so that the horn is perpendicular when the trim is centred Sub Trim (P25)
- Switching to another model's settings in memory Model Select (P26)

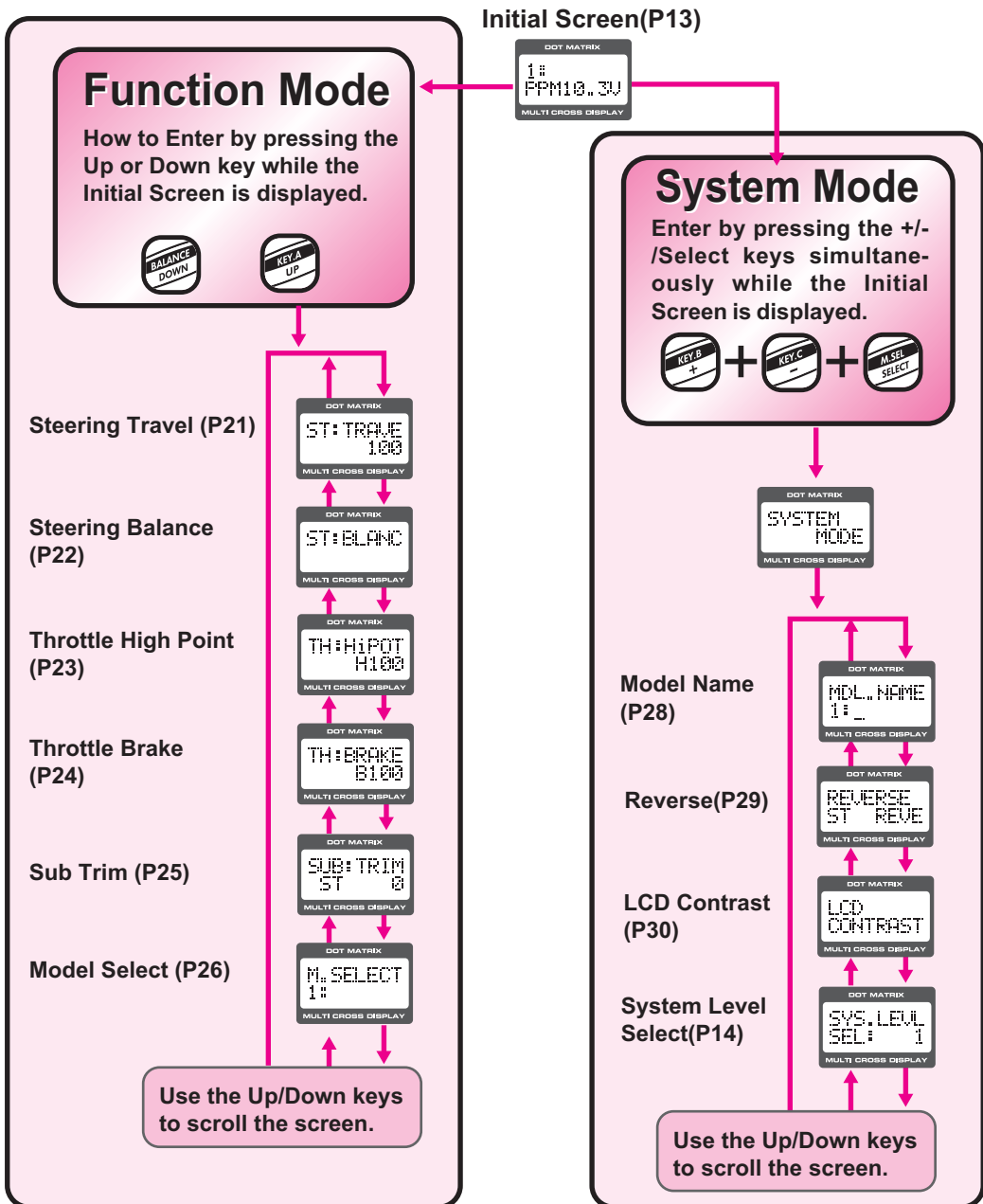
System Mode

- Change the System Level System Level Select (P14)
- Want to change the beeper pitch Beeper Pitch Shift. (P27)
- Edit names in the Model Memory Model Name (P28)
- Changing moving direction of servo and ESC Reverse (P29)
- Adjusting the LCD contrast LCD Contrast (P30)

How to call Up each LCD Screen

LCD Screen for Level 1

LCD Screen Table for Level 1



Direct Mode

Can call up the function screen in the function mode immediately.

Press first



Direct Mode



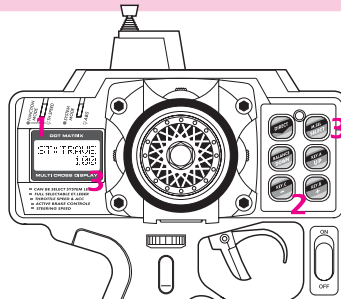
Steering Balance



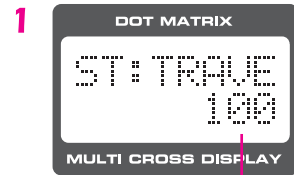
Model Select

Adjusting Steering Servo Angle (Steering Travel)

- Allows you to adjust the left and right steering servo angles at the same time when tuning the steering wheel fully.



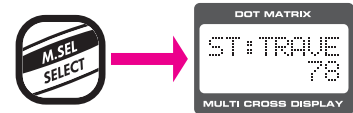
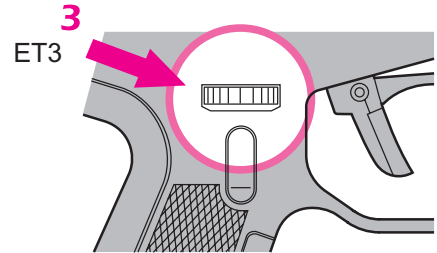
1 After switching the power on, press the Up key until the steering travel screen is called up from the Initial Screen.



2 Adjust the maximum turning angle by pressing the +/- keys.



3 The maximum value that you can adjust by the Et dial is fixed with the value of this screen. The current value appears by pressing the Select key.



Advice

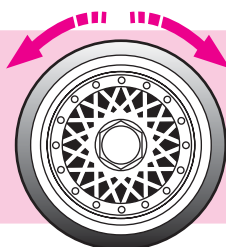
- Be sure to set the Travel Dial position of the Et dial at a maximum value before adjusting the linkage.
- Can be assigned to the Custom key and Et. (Set Up screen P42)
- Can assign to Custom Keys/Et, at above Level 2

Warning!

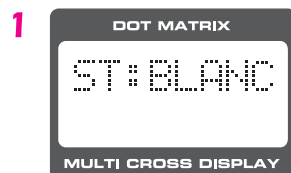
Be sure to check that there is no unnecessary forces on the push rod by turning the wheel fully after adjusting the linkage.
*It may damage the servo, and the model may run out of control.

Adjusting the steering servo turning angle in the left and right directions independently. (Steering Balance)

- Adjust the steering servo turning angle in the left and right directions independently when turning the wheel fully. The figure on the screen is expressed as a percentage of the steering travel as 100% setting.



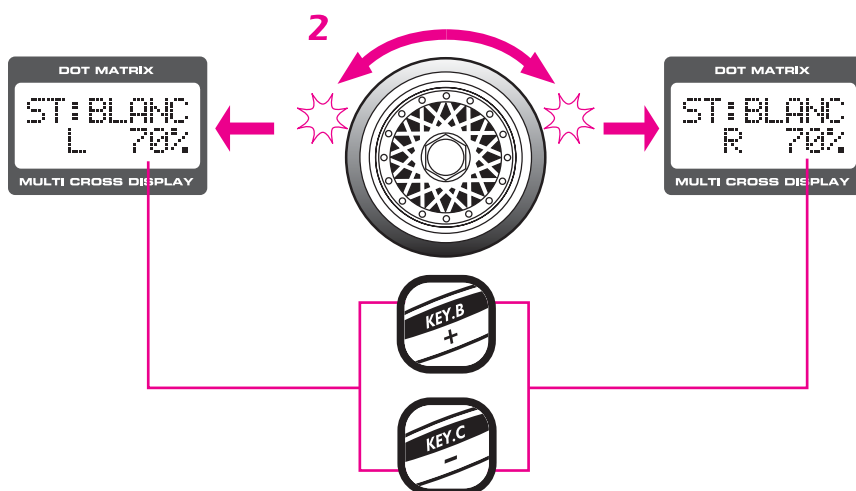
- 1** After switching the power on, press the Up key until the Steering Balance screen is called up from the Initial Screen.



[It also can be displayed in the order of Direct to Down keys. (Direct Mode)]



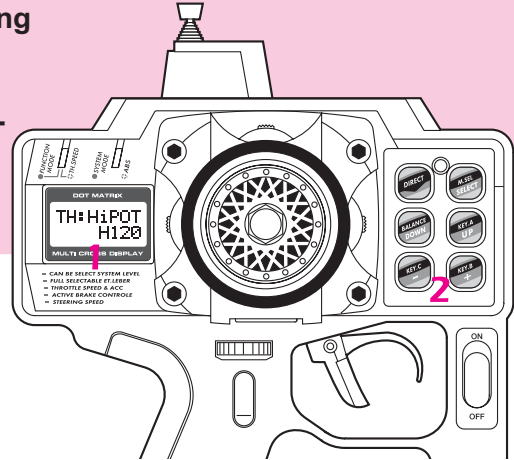
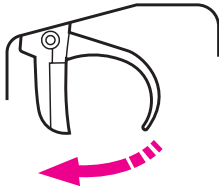
- 2** When the wheel is turned to the left or the right, the R/L sign appears on the screen, and the setting can be made for each direction by pressing the +/- keys.



- Can be called up by the Direct Mode
- If the original chassis is assembled properly, this function is not particularly necessary. You should not rely on the function too much to resolve a tendency to drift left or right in your car.

Adjusting forward direction of the throttle servo turning angle. (Throttle High Point)

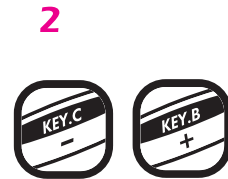
- Adjusting the throttle servo turning angle when the trigger is pulled fully.
- This function can be used for setting the maximum speed point of ESC or high throttle point of engine.



1 After switching the power on, press the Up key until the Throttle High Point screen is called up from the Initial Screen.



2 Use the +/- keys to adjust the value.



Advice

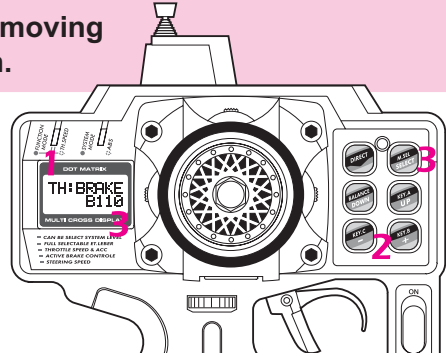
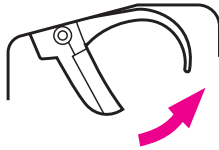
- Can be set to the Custom key for immediate call up.
- In case of an electric-powered car, first adjust the high point of the ESC, and then find adjustment should be made by this function.

Warning!

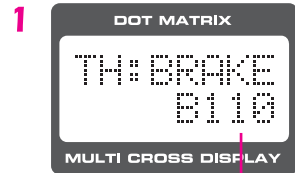
Be sure to check that there is no unnecessary force on the push rod by pulling the trigger fully after the linkage.
*It may damage the servo, and the model may run out of control.

Adjusting brake direction of the throttle servo turning angle. (Throttle Brake)

- Adjust the servo turning angle when moving the trigger fully to the brake direction.



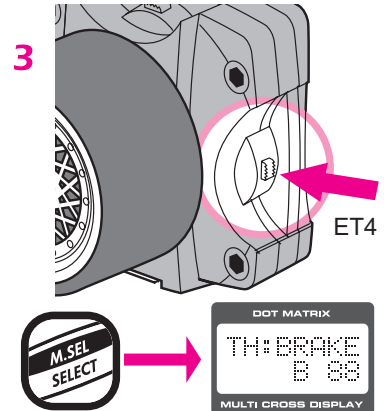
- 1 After switching the power on, press the Up key until the Throttle Brake screen is called up from the Initial Screen.



- 2 Use the +/- keys to adjust the maximum turning angle.



- 3 The maximum value adjusted by the Et Dial is fixed with the value of this screen. Current value of the dial can be seen by pressing the Select key.



Advice

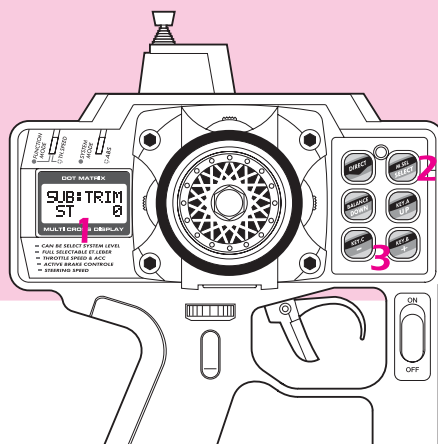
- The Custom keys can be set to Et. (Set Up P42,43)
- When the unit is shipped from the factory, the Brake is assigned to the Et 4.
- Be sure to set the Brake lever of the Et at a maximum value before adjusting the linkage.

Warning!

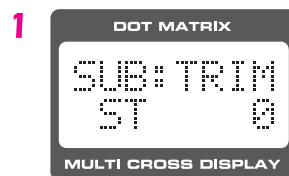
Be sure to check that there are no unnecessary force on the push rod by moving the trigger fully after adjusting the linkage.
*It may damage the servo, and the model run out of control.

Adjust a center of the servo horn by using the Sub Trim, keeping the Et trim neutral. (Sub Trim)

- The trim operated by the Et lever is a center trim, however; the trim used on this screen is a normal trim which moves the whole positions of the servo horn. Use this function to set a centered position of the servo saver horn or move the trim lever to the middle position.



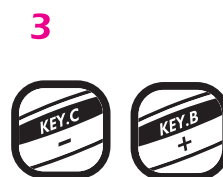
- 1** After switching the power on, press the Up key until the Trim screen is called up from the Initial Screen.



- 2** Selecting the channel by using the Select key.



- 3** Use the +/- keys to adjust.



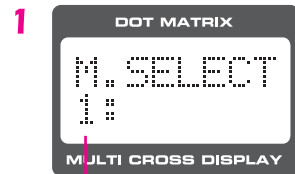
Advice

- Can be set to the Custom keys for immediate call up(P43).
- During the linkage process, make sure to try to set the servo horn as close to neutral as possible. Then, perform the Sub Trim operation. Do not set the Sub Tim to a large value. Doing so may cause a 'dead' space in the steering wheel. Try to set the value within 40.

Changing Model Memory (Model Select)

- This transmitter can store all settings for up to 10 models, and this function is used to switch models among these settings.

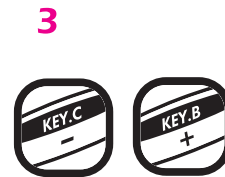
1 After switching the power on, press the Up key until the Model Select screen is called up from the Initial Screen.



2 It also can be displayed in the order of Direct to Down keys. (Direct Mode)



3 Use the +/- keys to select the model number. Can select between 1 and 0



Caution!

When the model memory is in use, be careful that the position will be stored in the memory if you change the model memory after moving the Et level or trims.

Advice

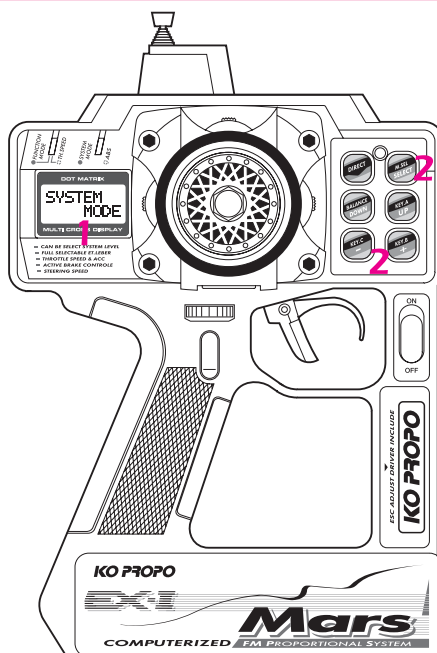
- The position of each Et will be stored when the power of the model or the model memory is switched off.

! Caution! !

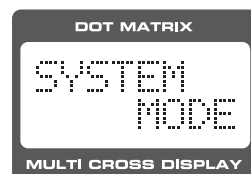
Be sure to use the Model Select after you fully understand the functions. Incorrect operation may cause the model to run out of control.

Beeper Pitch Shift

- The basic pitch of the beep can be changed. Change the pitch of the beeper on your own transmitter with making sure no one uses the pitch your select.



- 1 Change the LCD display to the System Mode.



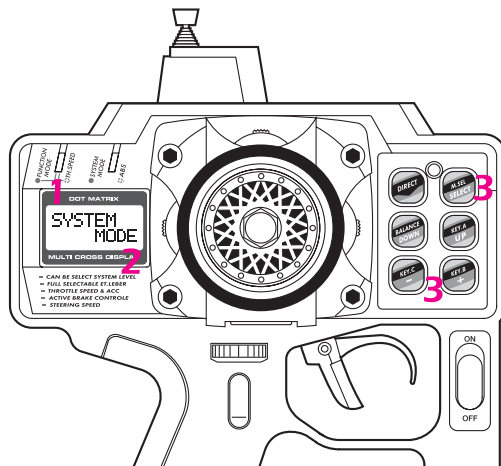
- 2 While holding down the Select key, press the +/- keys to change the pitch.



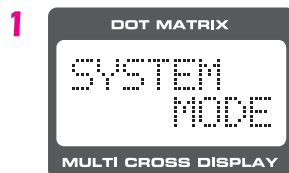
Press and hold

Edit names in the Model Memory. (Model Name)

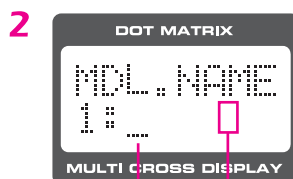
- Up to six letters or symbols can be stored in each Model Memory.



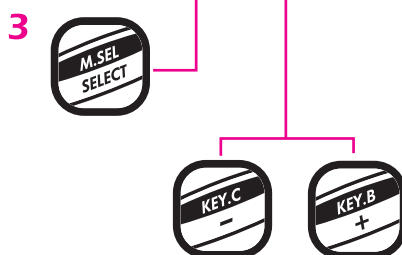
- 1** After switching the power on, enter the System Mode from the Initial Screen. (P18)



- 2** Press the Up key until the Model Name screen is displayed.

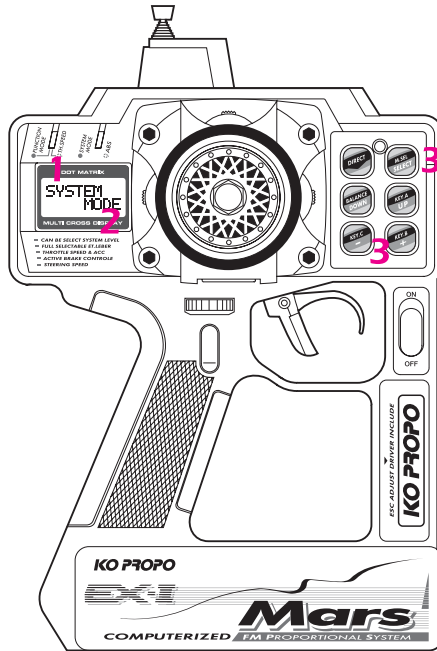


- 3** Use the Select key to move the cursor (under line) and the +/- keys to select the characters.

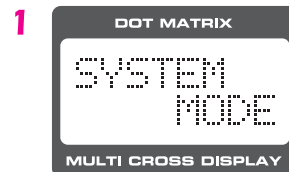


Changing the direction of servo and ESC (Reverse)

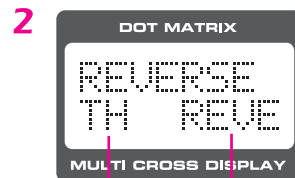
- Use this function when the turning direction of servo is opposite to the wheel/trigger operation.



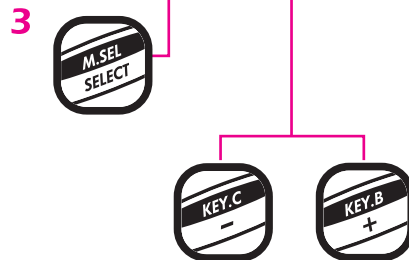
- 1 After switching the power on, enter the System Mode from the Initial Screen(P18).



- 2 Press the Up key until the Reverse screen is displayed.

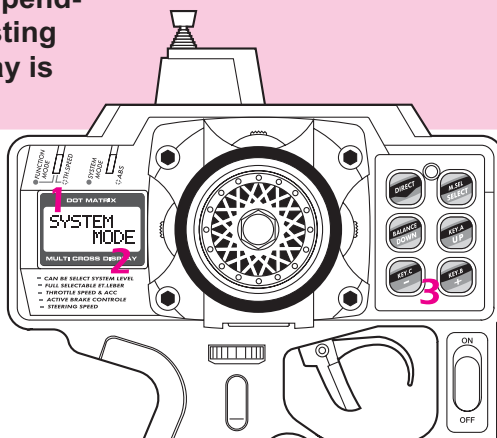


- 3 Use the Select key to select the channel, and use +/- keys to set the turning direction.

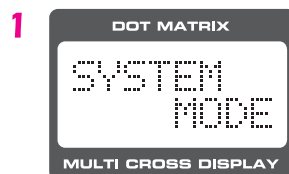


Adjusting the LCD Contrast

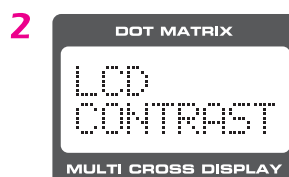
- The LCD contrast changes depending on the temperature. Adjusting the contrast so that the display is easy to see.



- 1 After switching the power on, enter the System Mode from the Initial Screen(P18).



- 2 Press the Up key until the LCD Contrast screen is displayed.



- 3 Use the +/- keys to adjust the contrast.



Caution!

Adjusting the contrast to a very light setting at high room temperature may make characters become invisible at low outside temperatures . Please note.



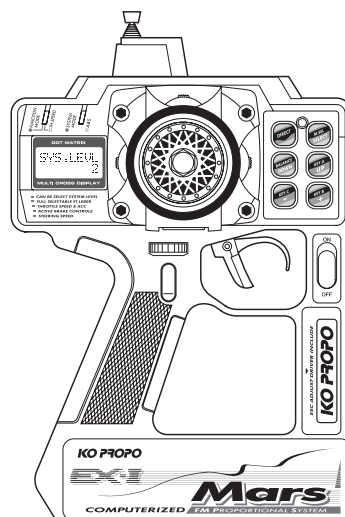
Light



Deep

Level 2: Contents

- What is the current System Level? Press the Select key twice from the Initial Screen.
- This section explains added functions to Level 1
- If you want to change the System Level, please refer to the p14



Function Mode

- Use the Up/Lap Timer Timer 1 (P36-37)
 - Use the Lap Timer Lap Timer (P36)
 - Set the Race Time Alarm (P37)
 - Set the Pre-alarm Time Pre Alarm (P37)
 - Review the Lap Memory Lap Review (P37)
 - Input the Target Lap Time (Alarm) Lap Navigation (P37)
- Adjusting steering servo angle with the wheel operation Steering Curve (P38)
- Changing the Fwd/Brk throttle servo angle separately with trigger operation Throttle Curve (P39)
- Adjusting the speed of the throttle servo Throttle Speed (P40)
- Adjusting the changing point of throttle servo speed Throttle Speed Point (P41)

System Mode

- Change a role of Et lever or Dial Set Up (P42)
- Set up the function to the Custom key operation Set Up (P43)
- Set up the timer to the button Set Up (P44)
- Switch On/Off the throttle speed with the button Set Up (P44)
- Adjusting the amount of movement corresponding to one step of trim Trim Rate (P45)
- To see the current position of the trim or Et lever Position Display (P45)
- Using 3ch Channel Select (P46)
- Selecting 3ch Auxiliary Channel (P46)
- Recall memory data Memory Recall, Restore, Reset (P47-48)
 - Delete up to previous 5 values Memory Recall (P47)
 - Returning to last switch ON setting or last setting in a selection change. Memory Restore (P48)
 - Returning to the factory default settings Memory Reset (P48)

How to call up each LCD screen at Level 2 / LCD screen table 1 for Level 2

Function Mode



Initial Screen (P13)



Enter by pressing the Up or Down keys from the Initial Screen and can be confirmed by the Function Mode Lamp.

Use the Up/Down keys to scroll the screen.

*Up Timer (P35)



Steering Travel (P21)



Steering Balance (P22)



Steering Curve (P38)



Throttle High Point (P23)



Throttle Brake (P24)



Throttle Curve (P39)



Throttle Speed (P40)



Throttle Speed Point (P41)



Sub Trim (P25)



Position Display (P45)



Model Select (P26)



Sub Menu



Lap Timer



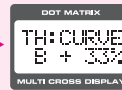
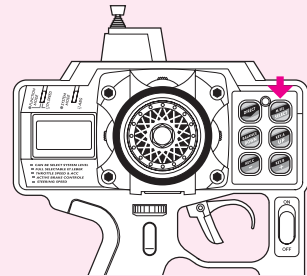
Alarm / Pre Alarm



Lap Navigation



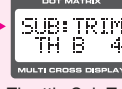
Change the Sub Menu by the Select Key



Brake Curve



Speed Point of H



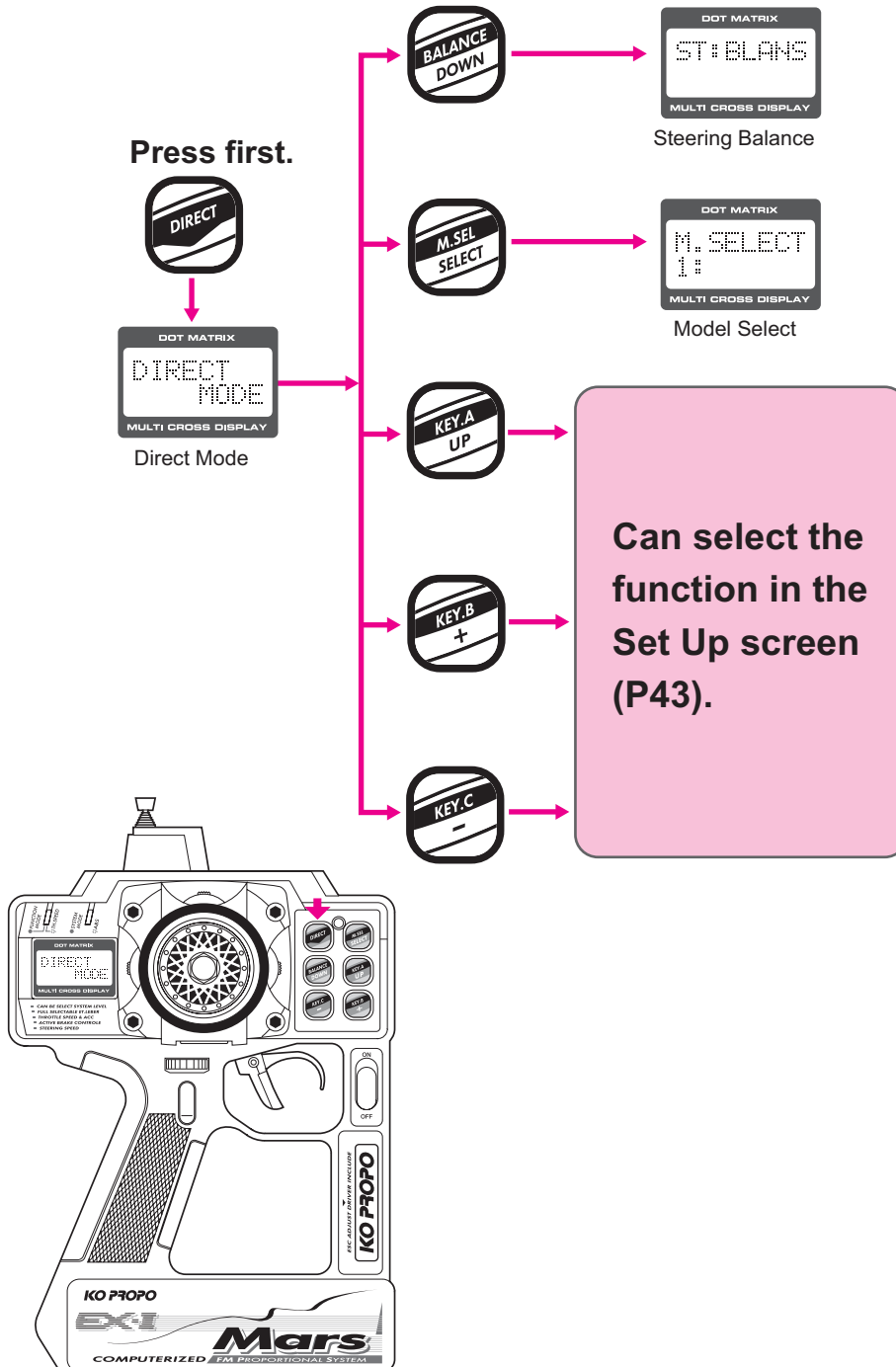
Throttle Sub Trim

The screen indicated with an asterisk (*) will not appear unless you assign the BTN in the Set Up screen (P44)

LCD Screen table 2 for Level 2

Direct Mode

Can call up the function screen in the Function Mode immediately.



LCD Screen Table for Level 2

System Mode

There are two ways to enter

KEY A UP **BALANCE DOWN** **+ON**

(1) Press and hold the Up and Down keys, and then turn on the switch.
Can be confirmed by the System Mode Lamp.



Can be confirmed by the System Mode Lamp

(2) Enter by pressing the +/- /Select keys simultaneously while the Initial Screen is displayed.

KEY B + **KEY C -** **M SEL SELECT**

Use the Up/Down keys to scroll the screen.

Set Up (P42)

Trim Rage (P45)

Reverse (P29)

LCD Contrast (P30)

System Level Select (P14)

Channel Select (P46)

*Auxiliary Channel (P46)

Model Name (P28)

Memory Recall (P47)



Sub Menu



Set Up Ky



Throttle Trim Rate



Throttle Reverse



Set Up BTN



*3ch Reverse



Change the Sub Menu by the Select key



Memory Restore



Memory Reset

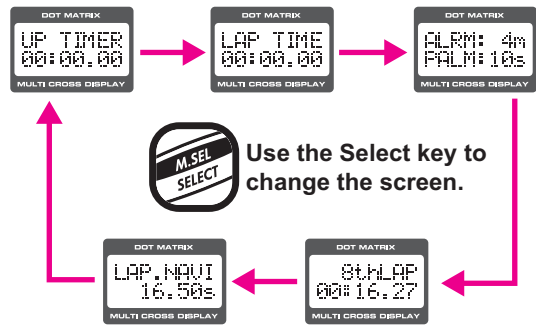
* It does not appear unless 3ch is selected.

Timer Function (TIM 1)

- This timer function does not appear on the display if BTN is not set to TIM 1 on the Set Up screen (P44).

Caution ! To delete the Timer screen, use both the Custom key and the button in the Set Up screen.

- Can be set to the Custom key for immediate call up.
- It is possible to select either the Up Timer or the Lap Timer. The optional functions used with each are shown in the following table. Finally, the set up of optional function will be stored in each model memory.



Optional Functions

	Lap Review	Navigation	Alarm/Pre Alarm	Trigger start
UP Timer	not available	available	available	available
Lap Timer	available	not available	available	available

○ Using the Up Timer (Up Timer)

- Keeps time from start to stop.
The timer can be started in two ways: by pressing the button or by moving the trigger.
- An alarm indicating the passage of time sounds every minute.
- Once the timer starts, it continues to operate even after the display is switched to another screen.

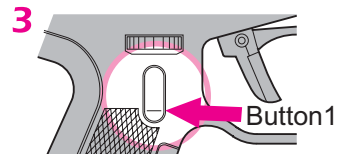
1 Assign the TIM 1 to the BTN on the Set Up Screen. (p44)



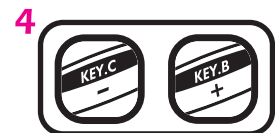
2 After switching the power on, press the Up key until the Up Timer screen is called up from the Initial Screen.



3 Press the button to start and stop.



4 Press the +/- keys simultaneously (approx. 1sec) in order to reset the timer.



○Time the lap time (Lap Time)

- Each lap time can be stored like an auto lap counter used in an actual race.
- Alarm indicating the passage of time sounds every minute.

1 Set TIM1 to BT1 or 2 on the Set up Screen (p46)



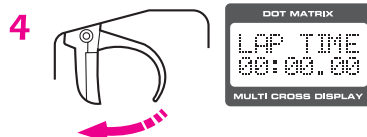
2 First, set the alarm time (race time).



3 Switch to the Lap Time screen by the Select key, and then press both the +/- keys simultaneously to enable the auto Start function. (READY flashes on and off)



4 The timer starts when pulling the trigger. Press the button each time a lap is completed in order to count laps.



5 At the end of the race, the alarm sounds. The timer then stops by the button operation, and the race results are displayed.



6 The timer can be paused by pressing the Select key and to restart the timer, press the Select key again.

Caution!

- The lap count shows up to 99 laps, however the lap record will consist of the last 40 laps.
- The memory of each lap will be stored from the number of laps displayed in the Lap Review screen.
- The goal time of the race is stored in the next lap after the final lap.
- The minimum interval is 3 seconds. It cannot be input for less than 3 seconds. During the timing, lap time indication will be held for 3 seconds when the button is in operation.



- When READY is blinking or pausing the timer, settings on other screens can be changed.
- Can be used without alarm setting. In this case, press the +/- keys simultaneously to reset, which stops the timer.

Optional Function

○Set the race time (Alarm)

- Input the race time here, and the alarm sounds at the set time.

- 1 Use the Select key to change to the Alarm screen (flashing colon), and then use the +/- keys to reset the timer from 1-99 minutes.



○Set the Pre-alarm. (Pre-alarm)

- Set the pre-alarm before the end of the race time. This is different from the alarm sound.

- 1 Use the Select key to change to the pre-alarm screen (flashing colon), and then use the +/- keys to set the time from 1~30 seconds.

○Reviewing the Lap memory. (Lap Review)

- This screen is used to review and erase lap times.
- The memory of each lap will be stored from the number of laps displayed on the Lap review screen.

- 1 Use the Select key to change to the Lap Review screen, and then use the +/- keys to select each of the lap times/ If 41 or more laps are stored, the new laps overwrite the old laps, starting from lap 1. The finishing time of the race is stored at the next lap after the final lap record.



- 2 Press both the +/- keys simultaneously to reset each lap. Press the +/- keys and Select key simultaneously to clear all of the laps.

○Set the target lap time. (Alarm) (Lap Navigation)

- Input your own target lap time. When the timer starts, the alarm will sounds after the Up Timer starts.

- 1 Use the Select key to change to the Lap Navigation screen, and then use the +/- keys to set the time.



- 2 The alarm will sound at the set time after the Up Timer start.

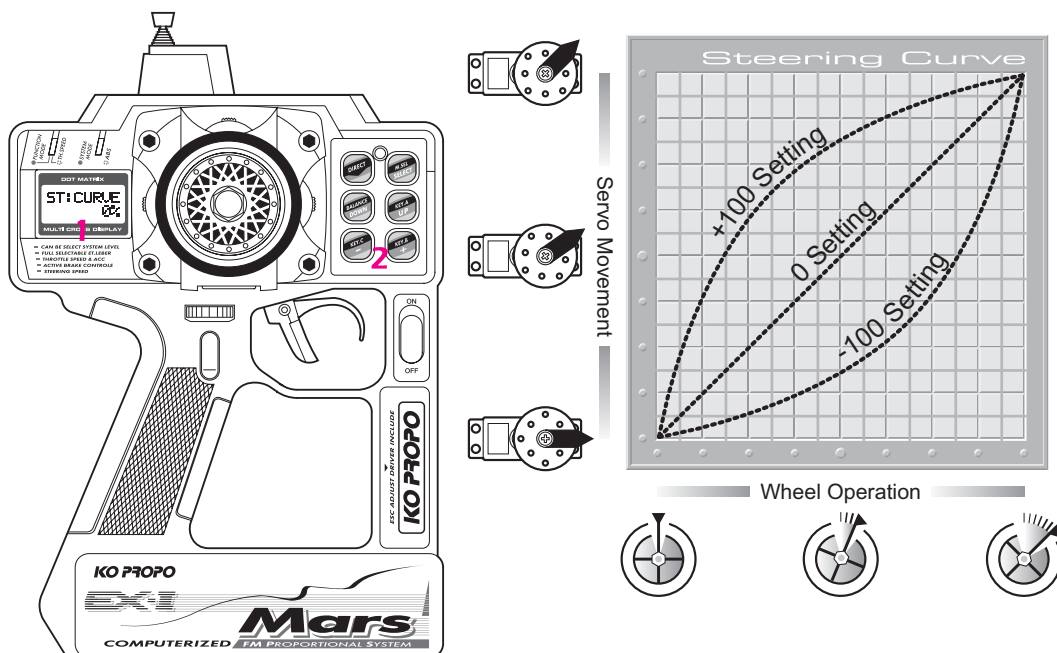
- 3 The navigation time can be restarted by pressing the button again.



• You can judge by the position of your car whether the time is faster or slower than your target time. Even if your driving rhythm is disrupted, you can press the button to re-start the timer.

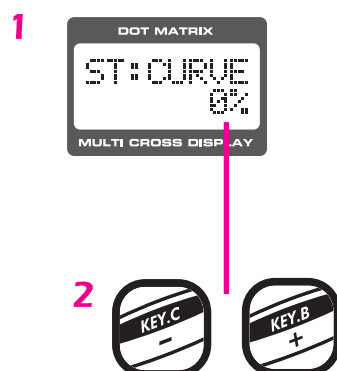
Adjusting the steering servo turning angle with the wheel operation.

- Change the angle that the servo moved in response to the angle that the wheel is moved, as shown in the graph.
- When set to the (+) side, response is very sensitive near the neutral position.
- When set to the (-) side, response is more sluggish.



1 After switching the power on, press the Up key until the Steering Curve screen is called up from the Initial Screen.

2 Use the +/- keys to set the value. With a 100 setting, maximum curve is applied.

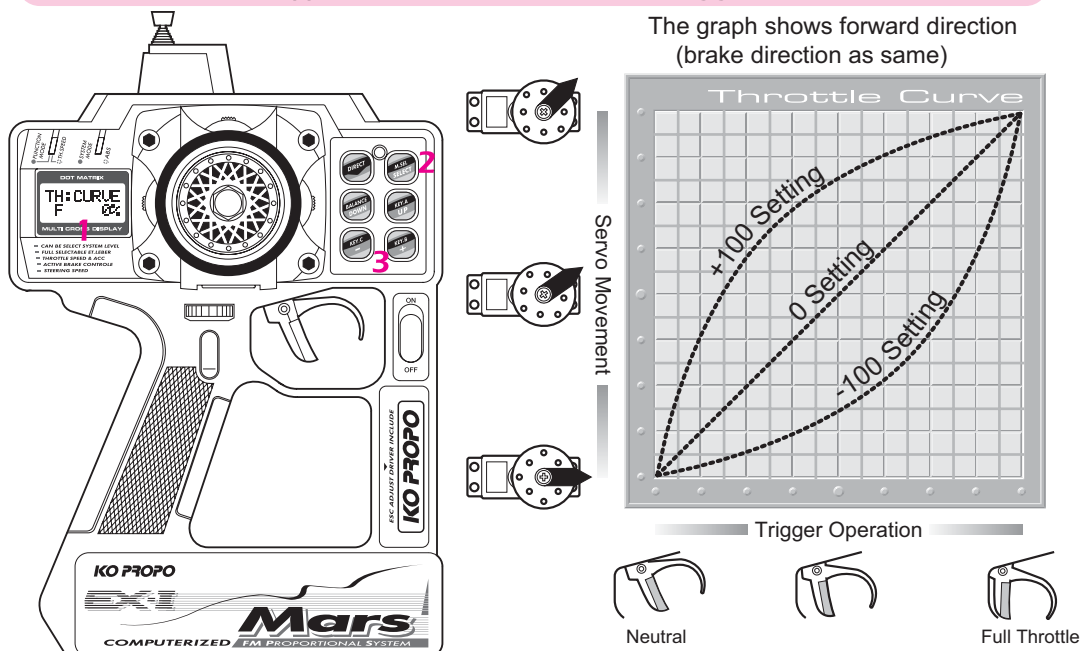


Advice

- Can be set to the Custom key for immediate call up (P43).
- The function changes the steering curve. To change the initial response, use the Steering Punch (P71).

Moving the servo angle to forward and backward separately in response to trigger operation. (Throttle Curve)

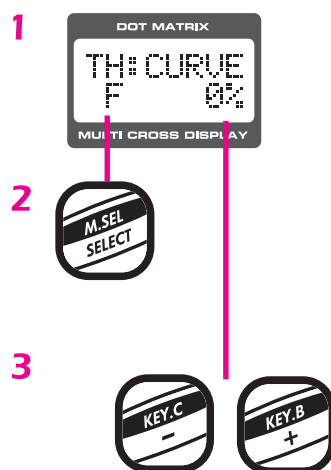
- Change the servo angle in response to the moving angle of the throttle trigger, as shown in the graph.
- Forward/Brake directions can be set separately.
- When set to the (+) side, response is very sensitive near the neutral position.
- When set to the (-) side, response is more sluggish.



1 After switching the power on, press the Up key until the Throttle Curve screen is called up from the Initial Screen.

2 Use the Select key to select forward direction (F) or brake direction (B).

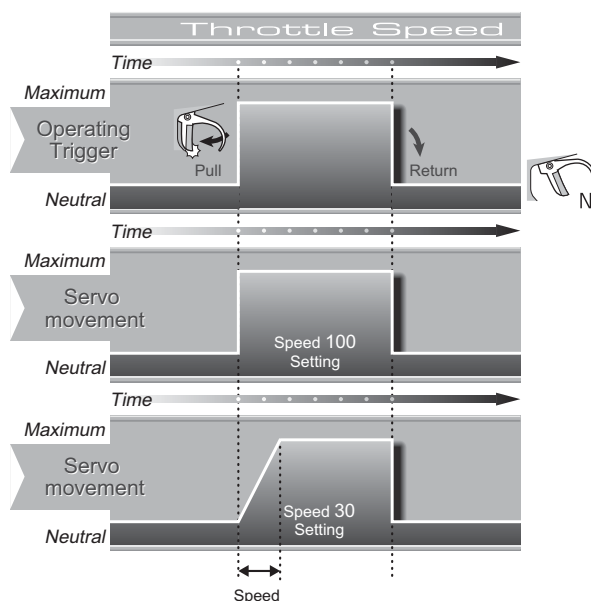
3 Use the +/- keys to set the value. With a 100 setting, maximum curve is applied.



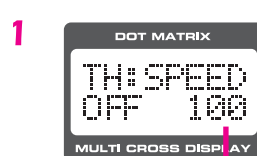
- Can be set to the Custom key for immediate call up(P43).
- This function changes the throttle curve. To change the initial response, use the Throttle Punch (P59).

Adjusting the speed of the throttle servo (Throttle Speed)

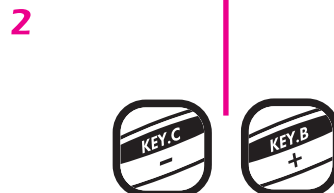
- Limits the maximum turning speed of the servo in response to quick (sudden) trigger operation.
- Limit the speed in the range of throttle speed position(P41).
- The direction of return or brake operation cannot be affected.
- It has the same effect in case of using ESC



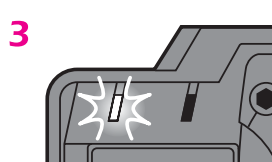
1 After switching on the power, press the Up key until the Throttle Speed screen is called up from the Initial Screen.



2 Use the +/- keys to set the value. Less value means more limit to the speed.



3 The Function Mode Lamp blinks when Throttle Speed is on.



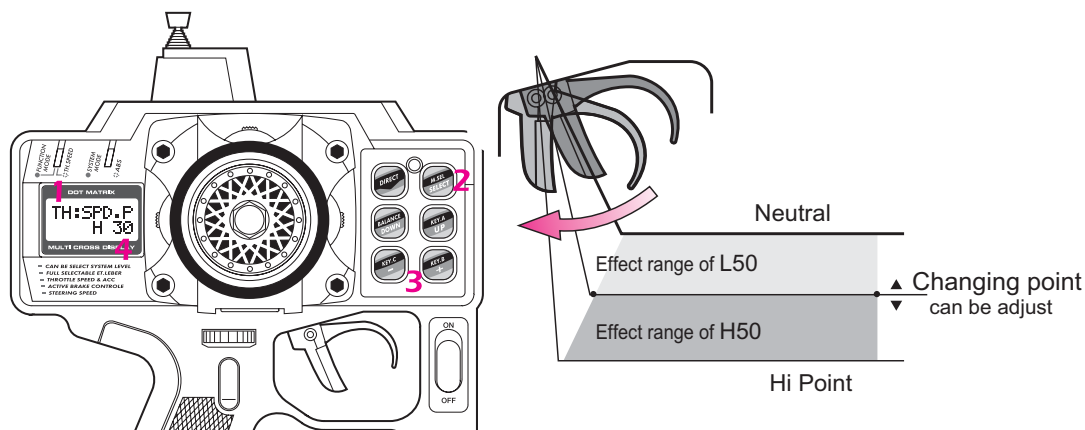
4 When this function is assigned to the Et, the speed can be adjusted assuming the value displayed on the screen as a maximum value.



- This function can be turned on and off by pressing the button on the Set Up screen (P44). The pilot lamp will be linked with the button and Et.

Adjusting the changing point of the throttle speed. (Throttle Speed Point)

- Specify the range of speed limit.



1 After switching the power on, press the Up key until the Throttle Speed Point screen is called up from the Initial Screen.

2 Use the Select key to select either high or low point. The speed will be adjusted in the range from the point to the full throttle (H) and from the neutral to the point (L).

3 Use the +/- keys to set the value. OFF means unlimited speed for the entire range, and ALL means limited speed for the entire range.

4 The speed limit is applied while "Act" is displayed on the LCD screen.



- Can be set to the Custom key for immediate call up.
- Should apply this function for the entire range until you get used to it. (indicate as "ALL")

Changing the function of Et Lever, Custom Key and Button. (Set Up Function)

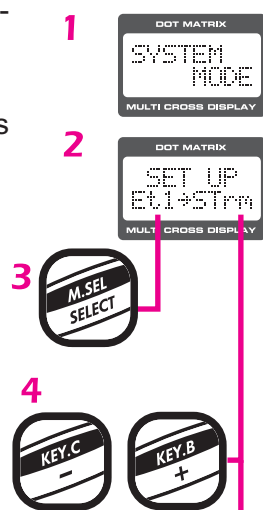
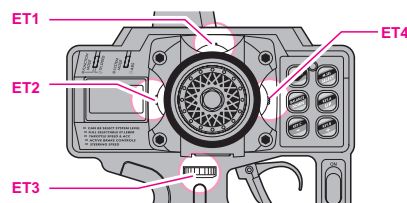
On this screen;

- Change part of Et lever or dial.
 - Set up the function to the Custom key for immediate call up.
 - Assign ON/OFF switch of timer or other functions to the button.
- The three settings as mentioned above can be set up.

○ Change part of Et lever. (Set Up)

- Can select the item in which values are adjusted by the Et lever or Dial.

- 1 After switching the power on, enter the System Mode from the Initial Screen.
- 2 Press the Up key until the Set Up screen is displayed.
- 3 Use the Select key to select the Et1~5.
- 4 Use the +/- keys to set each item. The items assigned to the Et will blink and if you continue to select, previous items will be set to OFF.



Et Setting Table

	System Level	Possible to set Et	Name
STrm	1	1.3.4	Steering Trim (P9)
TTrm	1	2.4	Throttle Trim (P9)
TRAV	1	2.3.4	Steering Travel (P21)
BRAK	1	2.3.4	Throttle Brake (P24)
THsp	2 only	2.3.4	Throttle Speed (P40)
TspL	3	2.3.4	Throttle Speed Low (P60.74)
TspM	4	2.3.4	Throttle Speed Middle (P74)
TspH	4	2.3.4	Throttle Speed High (P60.74)
AB.W	3	2.3.4	ABS Width (P62)
AB.P	3	2.3.4	ABS Position (P63)
AB.C	3	2.3.4	ABS Cycle (P63)
Ac.W	4	3.4	ACC Width (P76)
Ac.C	4	3.4	ACC Cycle (P78)
BTN	2	1.2.4	Button (note)

Note :

If setting BTN (Button) to Et lever, you can operate BT1 and 2.

○ Set up the Function to the Custom Key (Set Up)

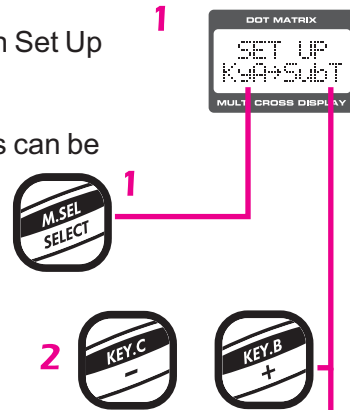
- When in Direct Mode, operation keys (Up,+, -) become Custom keys and the function screen can be called up with one touch operation. This function allows you to change or select the functions which can be called up with these keys.



1 Use the Select key to select KyA~C on Set Up screen.

2 Use the +/- keys to set each item. This can be set overlapped.

3 The key pads can be replaced after the completion of Custom key A~C settings. Use the stickers included in this kit for the replacement. This is useful when you use the Custom key operation.

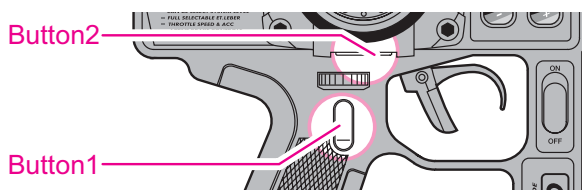


Key Setting Table

	System Level	Name
ATst	3	Automatic Start (P57)
TIM1	2	Up, Lap Timer (P35)
TIM2	3	Down Timer (P54)
PRST	3	Throttle Pre-set (P56)
TRAV	1	Steering Travel (P21)
STpc	4	Steering Punch (P71)
STcv	2	Steering Curve (P38)
STsp	3	Steering Speed (P58.72)
SspP	4	Steering Speed Point (P73)
HIGH	1	Throttle High Point (P23)
BRAK	1	Throttle Brake (P24)
THcv	2	Throttle Curve (P39)
THpc	3	Throttle Punch (P59)
THsp	2	Throttle Speed (P40.60.74)
TspP	2	Throttle Speed Point(P41.61.75)
Acc	4	Throttle Acceleration (P76)
ABS	3	Active Brake System (P62)
SubT	1	Sub Trim (P25)
DISP	1	Position Display(P45)

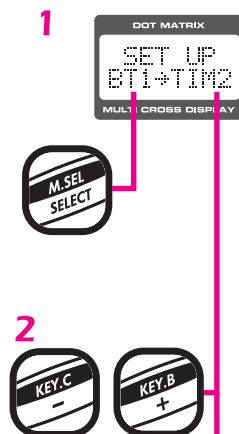
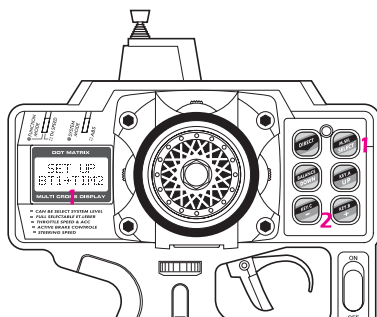
○ Set Up the Timer to the Button (Set Up)

- Can be set so that item can be turned ON/OFF by the button 1, 2.



1 Use the Select key to select the BT1~2 on the Set Up screen.

2 Use the +/- keys to set each item. The items assigned to the Et will blink. If you continue to select, previous items will be set to OFF.



BTN Setting Table

	System Level	Name
TIM1	2	Up, Lap Timer (P35)
TIM2	3	Down Timer (P54)
PRST	3	Throttle Pre-set (P56)
THsp	2	Throttle Speed (P40.60.74)
ABS	3	Active Brake System (P62)
AccP	4	Acceleration Push (P76)
AccT	4	Acceleration Toggle (P76)

Caution!

- If 3ch has been assigned to the BTN on Auxiliary Channel screen (P49), it can only be left in OFF position.
- If you select System Level 1, the set up function will not be available. Therefore, each setting will be set to factory default setting.

! Caution! !

Please use set up the functions after you fully understand each function.

*Incorrect settings can cause loss of control.

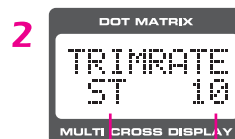
Adjust the Amount of Servo Movement for One Step of Trim (Trim Rate)

- Set the servo angle of movement for one step of trim.

- 1 After switching the power on, enter the System Mode from the Initial Screen(P18)



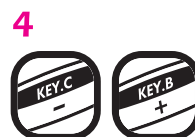
- 2 Press the Up key until the Trim Rate screen is displayed.



- 3 Use the Select key to select the channel.



- 4 Use the +/- keys to set the value. The amount of movement for one step increases in proportion to the value.



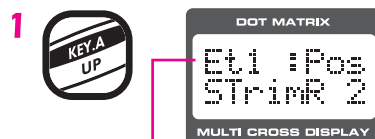
Advice

If the trim movement is too small, increase the value. If the trim movement is too big, reduce the value.

To see the position of the trim or Et. (Position Display)

The position of the Trim lever or Et lever can be confirmed. This screen is displayed automatically when you operate each lever.

- 1 After switching the power on, press the Up key until the Model Select is called up from the Initial Screen.



- 2 Change the screen Et1~Et4, BTN1~2 by pressing the Select key.



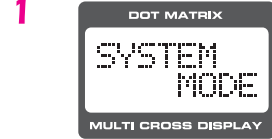
- 3 The value of each screen can be reset by pressing both the +/- keys simultaneously.



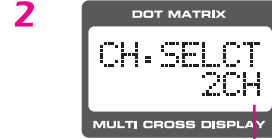
Using 3ch (Channel Select)

- Must be selected 3 Channel on this screen, before using 3 ch. It is necessary to purchase an auxiliary channel adapter in order to operate 3ch.
- While pressing the button, the servo is moved to one direction (the direction of the pulse extension).
- It is suitable for EG Remote Control Unit.

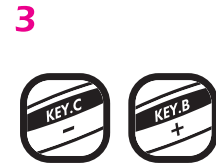
1 After switching the power on, enter the System Mode from the Initial Screen(P18).



2 Press the Up key until the Channel Select screen is displayed.



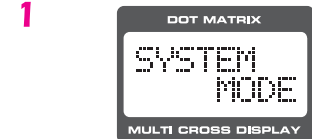
3 Use the +/- keys to select 2ch or 3ch.



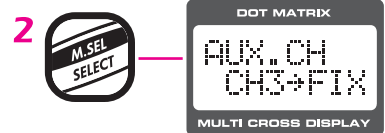
Selecting the 3ch Operation Button (Auxiliary Channel)

- If you selected 3ch as previously mentioned (Channel Select), this screen will be displayed.
- Select the button operating the 3ch. This setting takes precedence in the setting on Set Up screen, even over something assigned to the BTN.
- Select 2ch on the Channel Select Screen to delate 3ch.

1 After switching the power on, enter the System Mode from the Initial Screen(P18).



2 Press the Up key until the Auxiliary Channel screen is displayed.



3 Use the +/- keys to select the button. The 3ch won't work if you select " FIX "



BT1--Button1
BT2--Button2
FIX--Not Selected

Restoring the Memory Data (Memory Recall, Restore, Reset)

- This function allows you to cancel the wrong settings. It also allows you to restore the settings.

○ Cancel up to previous 5 setting values. (Memory Recall)

- Can recall the figure value setting data on the Function Mode screen up to five times. (excluding timers)
- Can only recall the figure data that was set by the +/- keys. The data adjusted in the Et cannot be recalled.

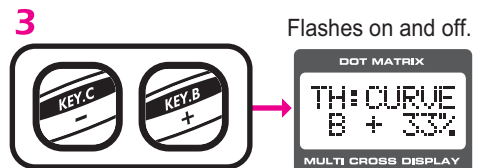
- 1** After switching the power on, enter the System Mode from the Initial Screen(P18).



- 2** Press the Up key until the Memory Recall screen is displayed.



- 3** This will be entered by the reset of the +/- keys. Data to be deleted will be displayed.



- 4** When there is no restored data or more than 6 steps, "EMPTY" will be displayed.



Note!

Because data will be deleted by the power OFF or a change of the Model Memory, it cannot be recalled.

Restoring Memory Data

○ Return to the Model change screen or the Power ON screen. (memory Restore)

- The Model Memory setting data currently in use will be returned to the power ON condition. However, if the Model change has been made after switching the power on, it will return to right after the Model change.

1 After switching the power on, enter the System Mode from the Initial Screen(P18).



2 Press the Up key until the Memory Recall screen is displayed.



3 Press the Select key to enter the Memory Restore screen.



4 This will be entered by the reset of the +/- keys.



○ Return to the factory default setting. (Memory Reset)

- Return all the Model Memory data to the factory default settings.

1 After switching the power on, enter the System Mode from the Initial Screen(P18).



2 Press the Up key to enter the Memory Recall screen.



3 Press the Select key to enter the Memory Reset screen.



4 This will be entered by the reset of the +/- keys.

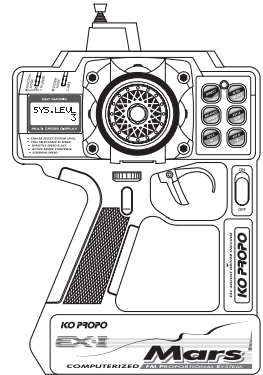


Warning!

Be sure to check the neutral position of the model when entering the reset.
*It may cause the model to run out of control by shifting the neutral position when you enter.

Level3:Contents

- What is the current System Level?
(Press the Select key twice from the Initial Screen.)
- This section explains only functions added to Level2.
- If you want to change the System Level, please refer to the p14



Function Mode

- Using the Down Timer. (Fuel Timer) Timer 2 (P54-55)
 - Set the time. Time set (P54)
 - Set the time automatically. Auto Time set (P55)
 - Set the Pre-alarm time. Pre Alarm set (P55)
- Fix the throttle position when pressing the button. Throttle Pre-set (P56)
 - Set the position of the throttle. Throttle Pre-set (P56)
- Getting a good start. Automatci Start (P57)
 - Set the position of the throttle. Throttle Set (P57)
 - Set the point to change to the full throttle. Trigger Shift Position (P57)
- Set the steering servo speed. (stable car cotrol) Steering Speed (P58)
- Increase the initial throttle characteristics to be quicker on Fwd/Brk separately. Throttle Punch (P59)
 - Want to eliminate the time lag before the clutch engages in a gasoline-powered car. Throttle Punch Fwd (P59)
 - Want to increase the initial response of ESC in an electric-powered car. Throttle Punch Fwd (P59)
 - Want to increase the initial response of the brakes in a gasoline-powered car. Throttle Punch Brk (P59)
 - Want to increase the initial response of the brakes in an electric-powered car. Throttle Punch Brk (P59)
- Adjusting the speed of the throttle servo speed in two steps. 2 Way Throttle Speed (P60)
- Adjusting the changing position of the throttle servo speed. (for 2 Way) Throttle Speed Point (P61)
- Applying the intermittent movement automatically and performing pumping brake effect. ABS (P62-64)
 - Set the pumping effect width. ABS Width (P62)
 - Set the starting point of pumping effect. ABS Position (P63)
 - Set the pumping effective cycle. ABS Cycle (P63)
 - Set the movement delay time of pumping effect. ABS Delay (P64)
 - Set the movement ratio of pumping effect. ABS Duty (P64)

System Mode

- Copying data between memories. Model Copy (P65)
- Switching ON/OFF the Auto Display Function. Auto Display (P65)
- Re-adjusting the VR of emaciated potentiometer i.g. wheel, trigger. Adjust VR (P66)

Level 3 : LCD Screen Table 1

Function Mode

How to Enter...Enter by pressing the UP or Down key while the Initial Screen is displayed. It can be confirmed by the function mode lamp.

Initial Screen



Use the Up/Down keys to scroll the screen.



*Up Timer (P35)



*Down Timer (P54)



*Throttle Preset (P56)



Automatic Start (P57)



Steering Travel (P21)



Steering Balance (P22)



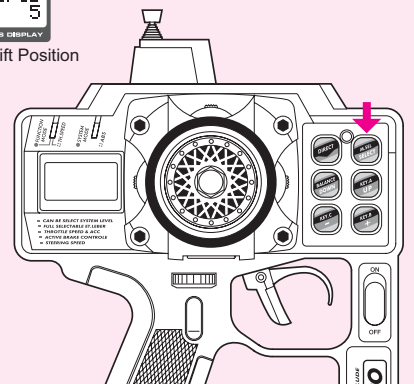
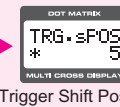
Steering Curve (P38)



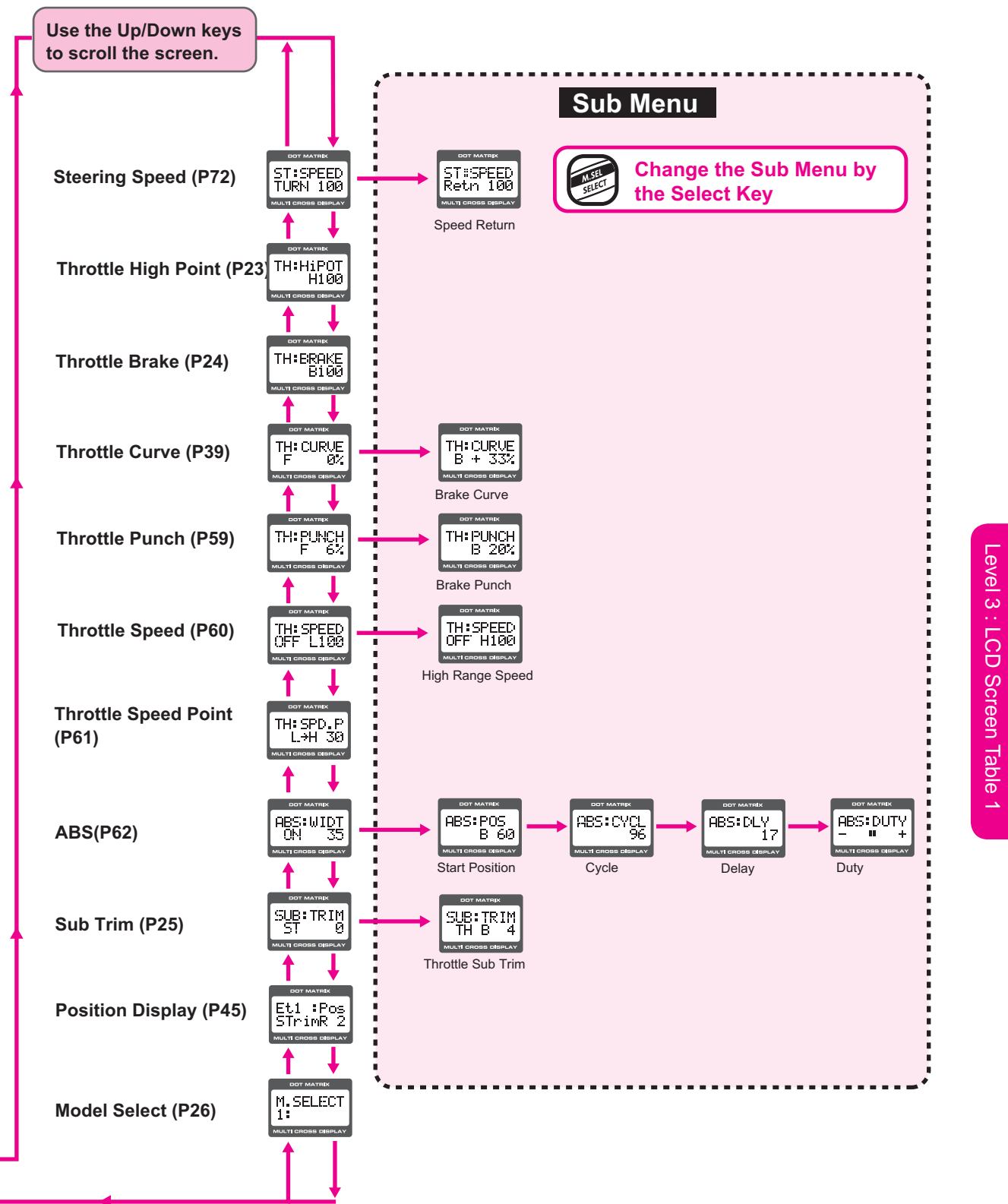
Sub Menu



Change the Sub Menu by the Select Key



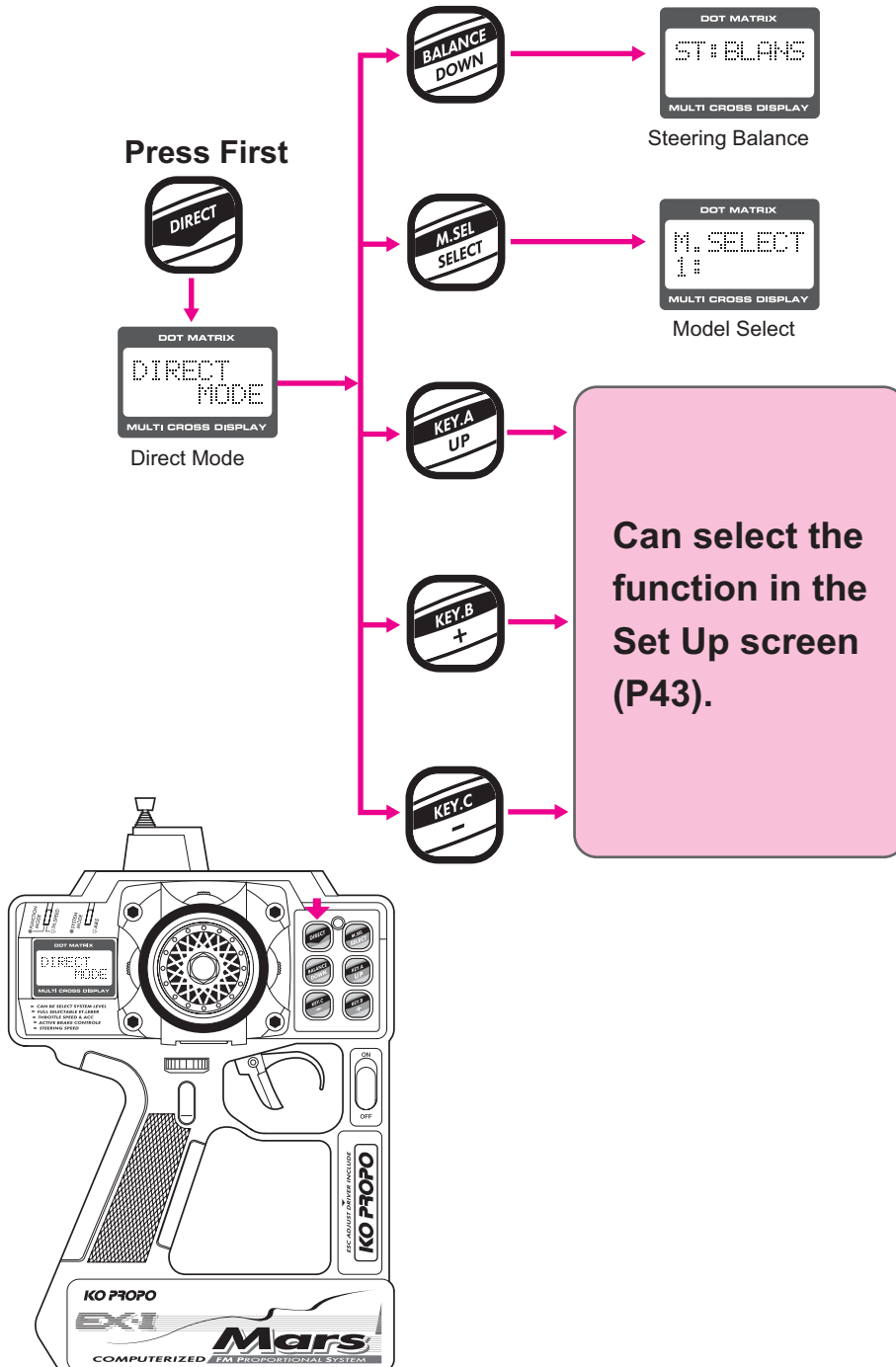
The screen indicated with an asterisk (*) will not appear unless you assign the BTN in the Set Up screen (P44)



Level 3 : LCD Screen Table 2

Direct Mode

Can call up the function screen in the Function Mode immediately.



Level 3 : LCD Screen Table 3

System Mode

There are two ways to enter

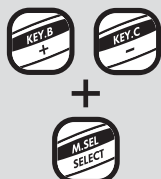


(1) Press and hold the Up and Down keys, and then turn on the switch.
Can be confirmed by the System Mode Lamp.



Can be confirmed by the System Mode Lamp

(2) Enter by pressing the +/- /Select keys simultaneously while the Initial Screen is displayed.



Use the Up/Down keys to scroll the screen.

Set Up (P42)

Trim Rate (P45)

Reverse (P29)

LCD Contrast (P30)

System Level Select (P14)

Channel Select (P46)

*Auxiliary Channel (P46)

Auto Display (P65)

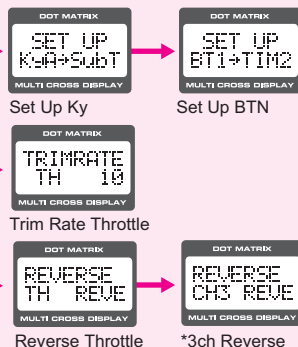
Model Name (P28)

Memory Recall (P47)

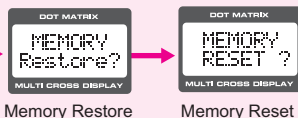
Model Copy (P65)

Adjust VR (P66)

Sub Menu



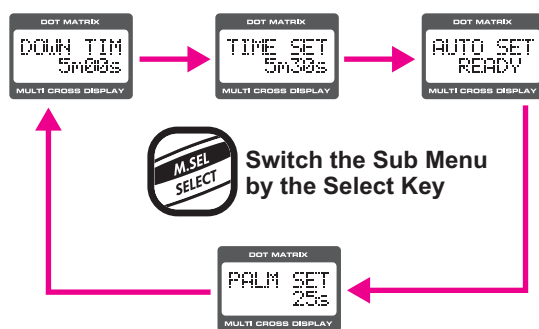
Change the Sub Menu by the Select key



* It does not appear unless 3ch is selected.

Using the Down Timer (TIM 2)

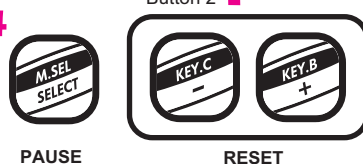
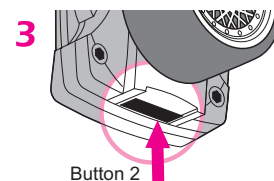
- This Timer function does not appear on the display if BTN is not set to TIM2 in the Set Up screen. (P44)
- This timer calculates the remaining time from a start.
- Pre-Alarm can be used as an fuelling timer.
- Can be set to the Custom key for immediate call up.



Note:

- To delete the Timer screen, use both the button in the Set Up screen and the Custom key.

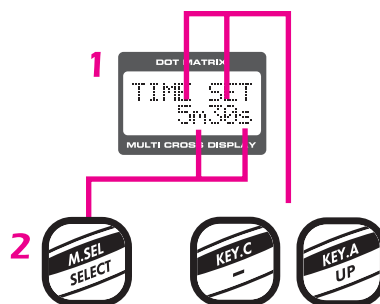
- 1** Assign the TIM2 to the BTN1 or 2 on the Set Up screen (P44)
- 2** Press the Up key until the Down Timer screen is displayed.
- 3** Can be started by pressing the button on any screens. Press again to restart the timer.
- 4** The timer can be paused by pressing the Select key, and press both the +/- keys simultaneously to reset the timer.



○ Set the Time (Time Set)

- Set the the timer.

- 1** Switch to the Time Set screen by pressing the Select Key.
- 2** After the " m " (min) and " s " (sec) blink by pressing the select key, input figure data.
- 3** Start by the button after switching to the Down Timer Screen or other screens.



○ Set the Time Automatically (Auto Set)

- It is useful when you are not sure how long fuel will last. Stop the timer when the fuel run out after the start, then this length of time can be set in the timer.

1 Use the Select key to change to the Auto Set screen.



2 Press the +/- keys simultaneously to operate this function, and " READY" will be blinking. Press the button to start and the time can be set if you press the button again after one minute.



3 Can be paused by pressing the Select key. Return to the initial setting by pressing both the +/- keys simultaneously.

○ Set the Pre-Alarm (Pre-Alarm Set)

- Pre-alarm can be set to predict the remaining time.

1 Use the Select key to change to the Pre-alarm screen.



2 Use the +/- keys to set the time.



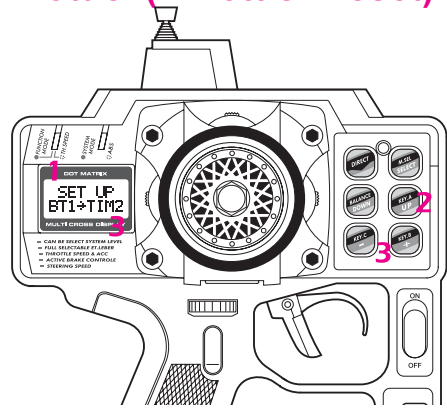
3 Start by the button after switching to the Down Timer Screen or other screens.

When pressing the button, this function is used to set the preset position at which the throttle is to be fixed. (Throttle Preset)

- This function does not appear on the display until the BTN is not set on the Set Up screen. (P44)
- While pressing the button, Set the throttle position to be fixed on this screen.

○ Set the Preset Position of the Throttle. (Throttle Preset)

- Set the position at which the throttle is to be fixed while pressing the button.



1 Assign the PRST to the BTN 1 or 2 on the Set Up screen. (P44)



2 Press the Up key until the Throttle Pre-set screen is displayed.



3 Use the +/- keys to set the preset position.



Advice

- Can be set to the Custom key for immediate call up. It can be used for the engine, full braking and reverse.

! Caution!

Do not assign to BTN when you are not using this function.
*Mis-operation may cause the model to run out of control.

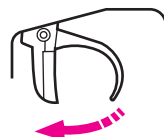
Get a Good Start (Automatic Start)

- The AT Start function switches the throttle to the preset position (Throttle Set) once at the start of the race when the trigger is moved to a certain position. (Trigger Shift Position)
Releasing the trigger even slightly cancel the preset.

1 After switching the power on, press the Up key until the Automatic Start screen is called up from the Initial Screen.



2 Press both the +/- keys simultaneously to enable this function and "READY" will be blinking. Next, the throttle will be shifted with "ON" indicator while moving the trigger.



○ Set the Position of the Throttle. (Throttle Set)

- Set the servo to the full throttle position.

1 Use the Select key to change to the Throttle Set screen.



2 Use the +/- keys to set the full throttle position.



○ Set the Changing Position to the Full Throttle. (Trigger Shift Position)

- Set the trigger position at which the throttle (Throttle Set) switches to the preset position.

1 Use the Select key to change to the Trigger Shift Position.



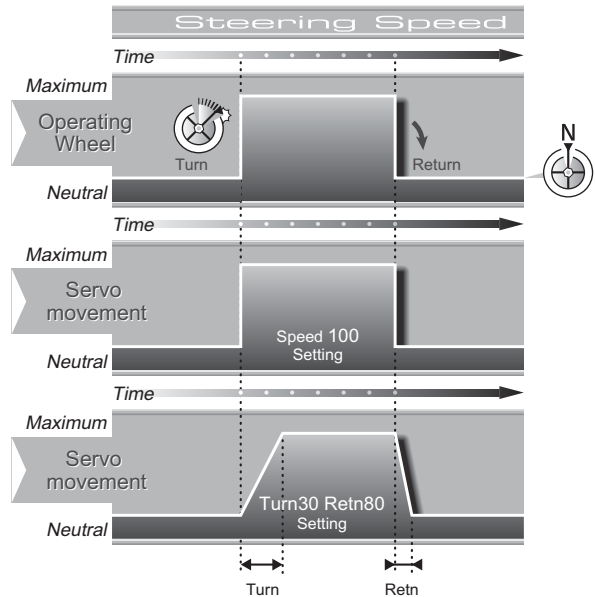
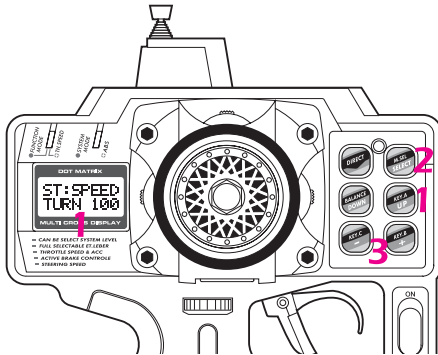
2 Use the +/- keys to set the point. The automatic start will not be functioned if you set to "OFF" on this screen.



Can be set to the Custom key for immediate call up.

Adjusting Steering Servo Speed. (Steering Speed)

- This function limits the maximum turning speed of the steering servo. The (TURN) and (Retn) speed of the wheel can be set separately.
- Can be set to the Custom key for immediate call up.



1 After switching the power on, press the Up key until the Steering Speed screen is displayed.

2 Use the Select key to select "TURN" or "Retn".

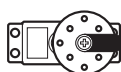
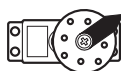
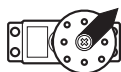
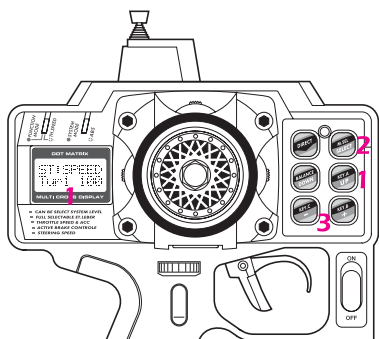
3 Use the +/- keys to set the value. Decreasing the value yields a slower turning speed, with a 100 setting applying no limits. When the setting is made on "TURN", the same setting applies to the "Retn" direction. The setting made on "Retn" applies only to the return speed.



• This function has a greater effect than expected for a car which is difficult to control.

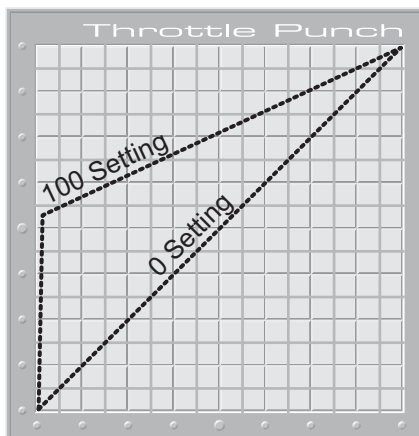
Increase the initial response to be quicker separately for driving forward and braking. (Throttle Punch)

- Trigger operation is set to OFF as shown in the graph. Increase the initial responses of the throttle and brake.
- Can be set to the Custom key for immediate call up.



Servo Movement

The graph shows forward direction (brake direction as same)



Trigger Operation



1 After switching the power on, press the Down key until the Throttle Punch screen is displayed from the Initial Screen.

2 Press the Select key to switch between the forward setting (F) and the brake setting (B).

3 Use the +/- keys to make the setting.



Advice on forward direction

- This function can eliminate the time lag before the clutch engages in a gasoline-powered car.
- This function can be used to control the initial response in an electric-powered car.

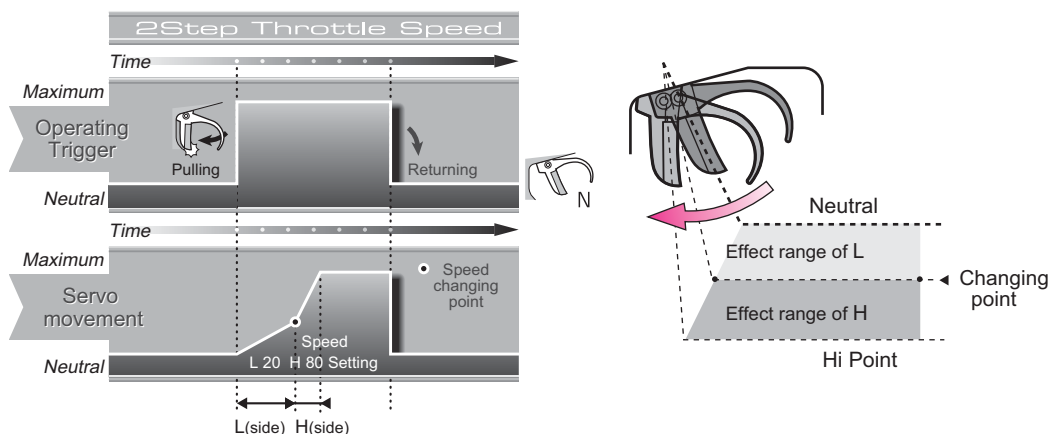
Advice on braking direction

- This function can improve the initial response of braking operation in a gasoline-powered car.
- This function can get improve initial braking response in an electric-powered car.

Caution: The setting are both greater than the angle that the servo moves through, the servo may operate in a fashion of a switch.

Adjusting the Speed of the Throttle Servo in Two Steps. (2 Way Throttle Speed)

- Limits the maximum turning speed of the throttle servo, which results in less response to quick (sudden) trigger operation.
- Set the point (Throttle Speed Position), and then set the High/Low speed range from the point separately.
- The direction of return or brake operation cannot be affected.



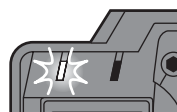
1 After switching the power on, press the Down key until the Throttle Speed screen is displayed.

2 Select high (H) or low (L) by the Select key.

3 Use the +/- keys to set each value. Less value means more limit to the speed.

4 The Function Lamp blinks when this function is on.

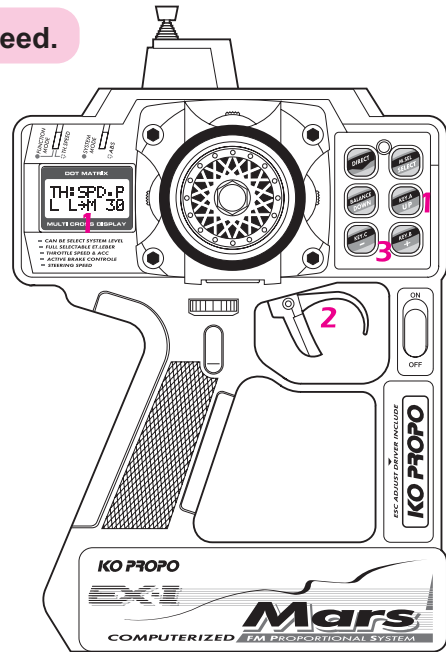
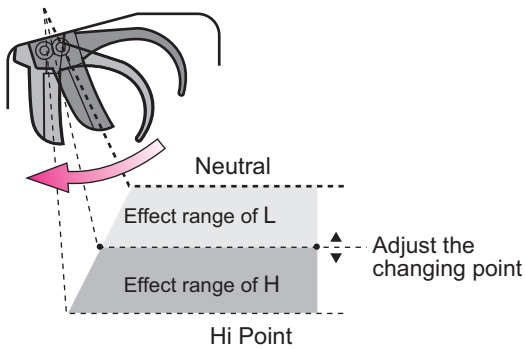
5 When this function is assigned to the Et, the speed can be adjusted assuming the value displayed on the screen as a maximum value.



- It is effective that a decrease in power is requested when the output feels glitch.
- This function can be turned on and off by pressing the button on the Set Up screen (P44). It also can be assigned to the Custom key. In addition, the pilot lamp will be linked with the button.

Adjusting the changing point of Throttle Speed function (for 2 Way)(Throttle Speed Point)

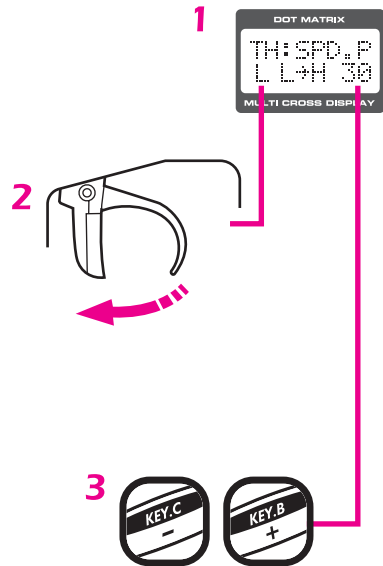
● Adjusting the changing point of the speed.



1 After switching the power on, press the Down key until the Throttle Speed Point screen is displayed.

2 If you move the trigger to that point, H/L indication in the LCD will be changed, which allows you to confirm the position where the changing point is.

3 Use the +/- keys to adjust.

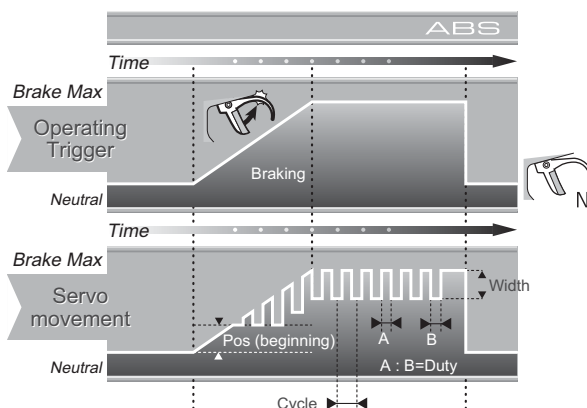


Advice

- Adjust the changing point with the power characteristics of the car.
- Can be set to the Custom key for immediate call up.

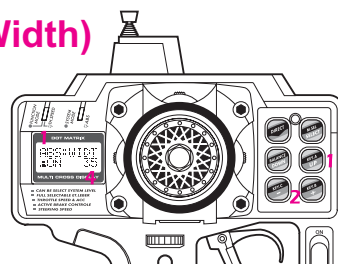
Apply the pumping effect automatically to the brake operation.(ABS)

- Can adjust the pumping effect into five steps. It allows you to set up this function in order to achieve smooth cornering compared to the former ABS system only focused on preventing a wheel locking.
- Can be set to the Custom key for immediate call up. This function can be turned
- On and Off by the button on the Set Up screen. (P44)



○Set the Pumping Effect Width (ABS Width)

- Set how far the servo returns from the point of the trigger operation in braking.

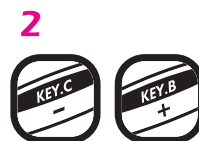


1 After switching the power on, press the Down key until the ABS Width screen is displayed.

2 Use the +/- keys to adjust.

3 The System Mode Lamp blinks when ABS is on.

4 When this function is assigned to the Et, it can be adjusted assuming the value displayed on the screen as a maximum value.



- This returns to ABS position.
- In case of a gasoline-powered car, this value should be about 30.
- Can be assigned to the Et.(P42)

○ Set the Start Point of Pumping Effect. (ABS Position)

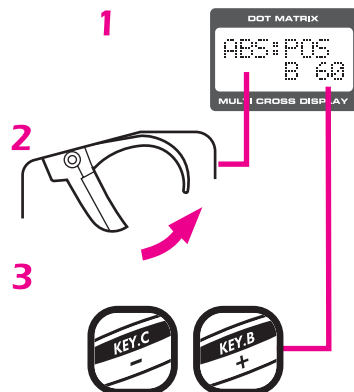
- It is a waste of energy to apply the pumping effect to the servo in an unnecessary range. Apply the pumping effect beyond the position which you set up here.

1 Switch to the ABS position screen by the Select key.

2 By the trigger operation, "Act" is displayed, which allows you to confirm that this function is activated.

3 Use the +/- keys to adjust the value.

4 When this function is assigned to the Et, it can be adjusted assuming the value displayed on the screen as a maximum value.



Advice

•In case of a gasoline-powered car, Start with a setting of around 60.

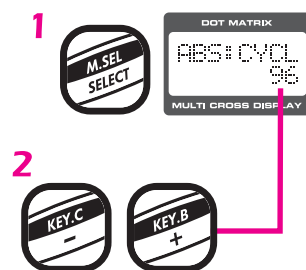
○ Set the Pumping Effect Cycle. (ABS Cycle)

- Set the turn and return cycle of the servo.

1 Switch to the ABS cycle screen by the Select key.

2 Use the +/- keys to adjust the value.

3 When this function is assigned to the Et, it can be adjusted assuming the value displayed on the screen as a maximum value.



Advice



Warning!

Do not set the cycle unnecessarily quick.

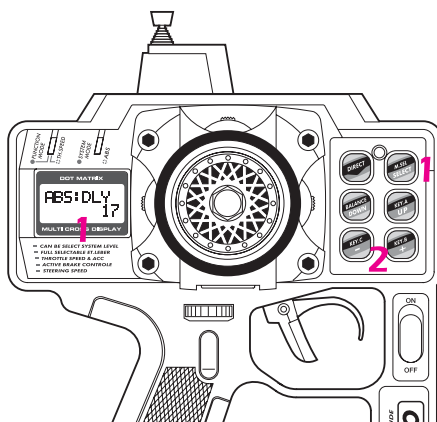
*The large current to the servo may result in the model running out of control.

•Please try a setting of around 98 in case of a gasoline-powered car, although it is different depending on the servos.

•When you are using a Fail Safe Adapter it is usual that the monitor lamp may blink. If you set the function to a quick cycle.

Set the Movement Delay Time of Pumping Effect. (ABS Delay)

- Set the time when the pumping effect starts after the braking operation.



1 Switch to the ABS Delay screen by the Select key.

2 Use the +/- keys to adjust.



•Use this function for the greater initial effect of the braking even though the ABS is applied.



○ Set the Movement Ratio of Pumping Effect. (ABS Duty)

- Adjusting the time ratio between ON/OFF brakes within the movement of the pumping effect.

1 Switch to the ABS Duty screen by the Select key.

2 Use the +/- keys to move the dots. Returning time decreased in (+) and increase in (-).



Copying Data Between Memories. (Memory Copy)

- All Model Memory data currently in use can be copied to other Model Memory.

1 After switching the power on, enter the System Mode from the Initial Screen.



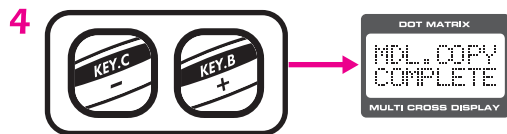
2 Press the Up key until the Model Copy screen is displayed.



3 Press the Select key to select the number that is copied.



4 This will be entered by pressing the +/- keys simultaneously.



Turning On/Off the Auto Display of the LCD. (Auto Display)

- When you operate the trim lever or the Et lever, LCD screen is displayed the position automatically as an indication. However, this can be disabled.

1 After switching the power on, enter the System Mode from the Initial Screen.



2 Press the Up key until the Auto Display screen is displayed.



3 Use the +/- keys to select On or Off.



Re-adjust the Worn Out Trigger or Wheel Volume . (Adjust VR)

- Although it is different depending on how often you use, the neutral position may be shifted by operating "Punch"/"Curve" after trigger or wheel volume is used for a long time. This function will adjust the difference.

1 After switching the power on, enter the System Mode from the Initial Screen.



2 Press the Up key until the Adjust VR screen is displayed.



3 Enter this function by pressing the +/-, and Select keys simultaneously.



4 On this screen, it will memorize the neutral position of the Steering VR. After turning the wheel slightly, release it and press the Select key. The left and right swing width adjustment screen will be displayed.



5 On this screen, it will memorize the left and right width of Steering VR. Turn the wheel to the left and right in a normal way and next release the wheel and press the Select key.



6 On this screen it will memorize the neutral position of the Throttle VR. After moving the trigger slightly then release it and press the Select key. Forward and backward swing width adjustment screen will be displayed.



7 On this screen, it will memorize forward and backward width of Throttle VR. Move the trigger in a normal way and next release the trigger and press the Select key.

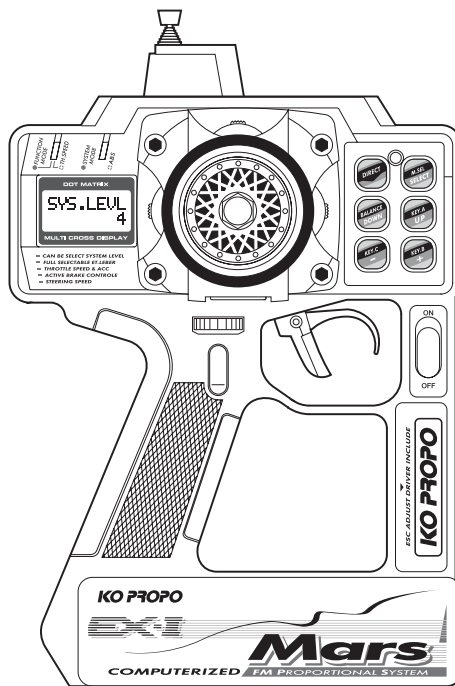


Caution!

- Please read the instructions and operate this function carefully. The service center normally takes care of it. If you concern about attempting this by yourself, please contact the service department.

Level 4: Contents

- What is the current level? (Press the Select key twice from the Initial Screen.)
- This section explains only added functions to Level 3
- If you want to change the System Level, please refer to the p14



Function Mode

- Increase the initial steering characteristics to be quicker Steering Punch (P71)
- Adjusting two different servo speeds by the position of the stick 2 Way Steering Speed (P72)
- Adjusting the changing position of servo speed Steering Speed Position (P73)
- Adjusting the speed of the throttle servo into three steps 3 Way Throttle Speed (P74)
- Adjusting the changing point of throttle speed (for 3Way) Throttle Speed Point (P75)
- Apply the swing effect automatically to the throttle operation Throttle Acceleration (P76-78)

System Mode

There is no added functions on Level 4

Level 4 : LCD Screen Table 1

Function Mode

How to Enter ... Enter by pressing the UP or Down key while the Initial Screen is displayed.



Use the Up/Down keys to change the screen.



* Up Timer (P35)



* Down Timer (P54)



* Throttle Preset (P56)



Automatic Start (P57)



Steering Travel (P21)



Steering Balance (P22)



Steering Punch (P71)



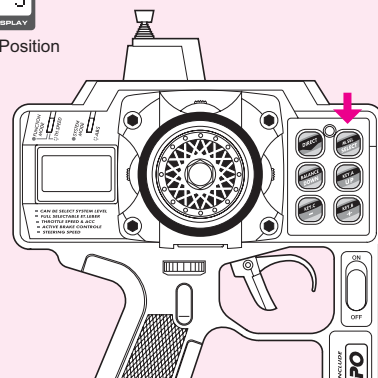
Steering Curve (P38)



Sub Menu



Change the Sub Menu by the Select Key



The screen indicated with an asterisk (*) does not appear unless you assign BTN in the Set Up screen (P44).

Use the Up/Down keys to change the screen.

Steering Speed (P72)

DOT MATRIX
ST: SPEED
Tur1 100
MULTI CROSS DISPLAY

DOT MATRIX
ST: SPEED
Ret1 100
MULTI CROSS DISPLAY

Speed Return

Steering Speed Point (P73)

DOT MATRIX
ST: SPD. P
Tur1 30
MULTI CROSS DISPLAY

DOT MATRIX
ST: SPD. P
Ret1 60
MULTI CROSS DISPLAY

Speed Point Return

Throttle High Point (P23)

DOT MATRIX
TH: HiPOT
H120
MULTI CROSS DISPLAY

Throttle Brake (P24)

DOT MATRIX
TH: BRAKE
B 80
MULTI CROSS DISPLAY

Throttle Curve (P39)

DOT MATRIX
TH: CURVE
F 0%
MULTI CROSS DISPLAY

DOT MATRIX
TH: CURVE
B + 33%
MULTI CROSS DISPLAY

Brake Curve

Throttle Punch (P59)

DOT MATRIX
TH: PUNCH
F 6%
MULTI CROSS DISPLAY

DOT MATRIX
TH: PUNCH
B 20%
MULTI CROSS DISPLAY

Brake Punch

Throttle Speed (P74)

DOT MATRIX
TH: SPEED
OFF L100
MULTI CROSS DISPLAY

DOT MATRIX
TH: SPEED
ON M 70
MULTI CROSS DISPLAY

Middle Range Speed

Throttle Speed Point (P74)

DOT MATRIX
TH: SPD. P
L+M 30
MULTI CROSS DISPLAY

DOT MATRIX
TH: SPD. P
M+H 80
MULTI CROSS DISPLAY

Speed Point M/H

* Throttle Acceleration (P76)

DOT MATRIX
Acc: WIDT
OFF 30
MULTI CROSS DISPLAY

DOT MATRIX
Acc: POS
Low 5
MULTI CROSS DISPLAY

Low Position

ABS(P62)

DOT MATRIX
ABS: WIDT
OFF 0
MULTI CROSS DISPLAY

DOT MATRIX
ABS: POS
B 60
MULTI CROSS DISPLAY

Start Position

Sub Trim (P25)

DOT MATRIX
SUB: TRIM
ST 0
MULTI CROSS DISPLAY

DOT MATRIX
SUB: TRIM
TH B 4
MULTI CROSS DISPLAY

Throttle Sub Trim

Position Display (P45)

DOT MATRIX
Et1: Pos
STrimR 2
MULTI CROSS DISPLAY

Model Select (P26)

DOT MATRIX
M. SELECT
1:
MULTI CROSS DISPLAY

Direct Mode

Calling up the screen in the Function Mode immediately.

Press First



DIRECT MODE

Direct Mode



Steering Balance



Model Select



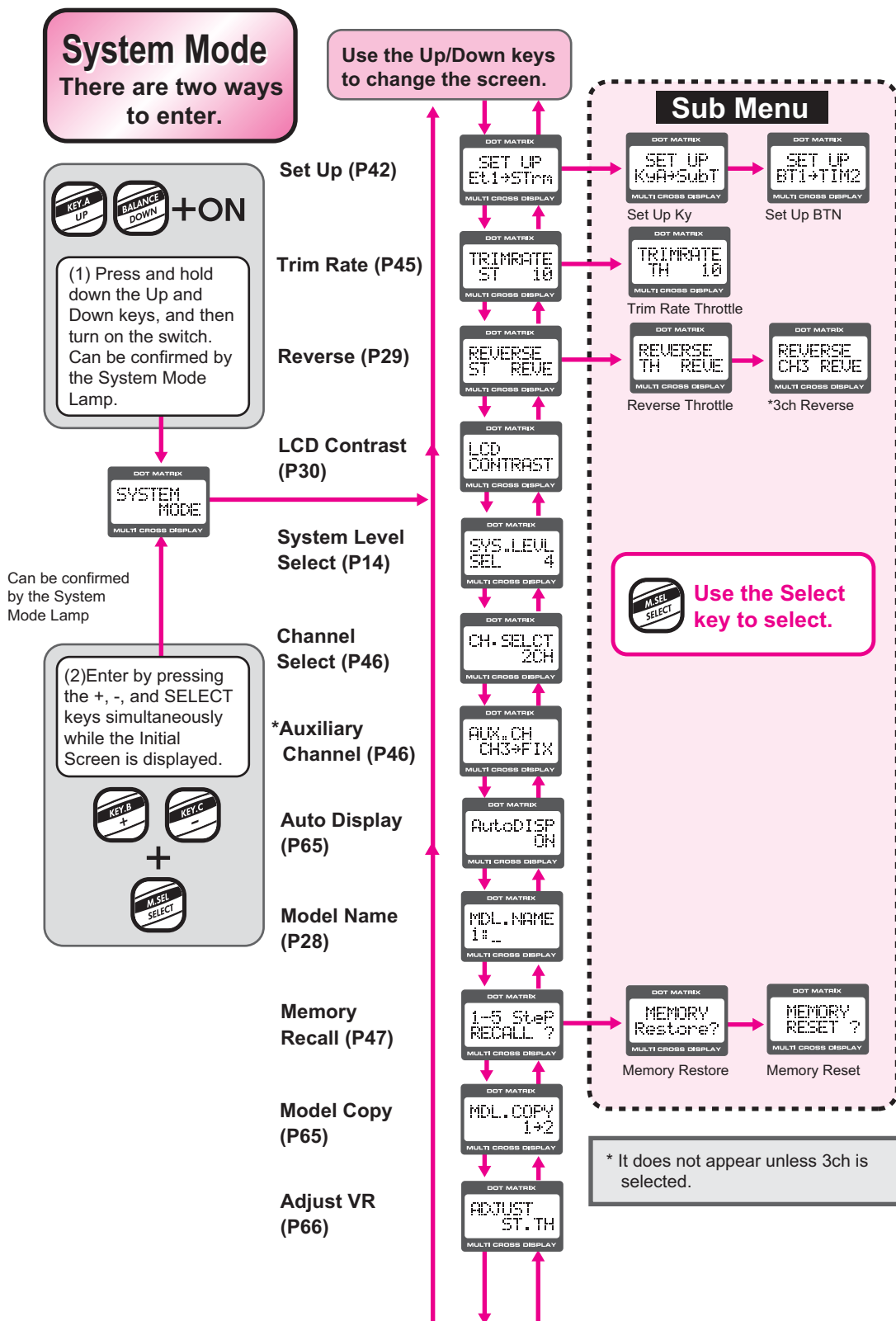
Can be selected the function in the Set Up screen. (P43)



Change the Sub Menu by the Select Key

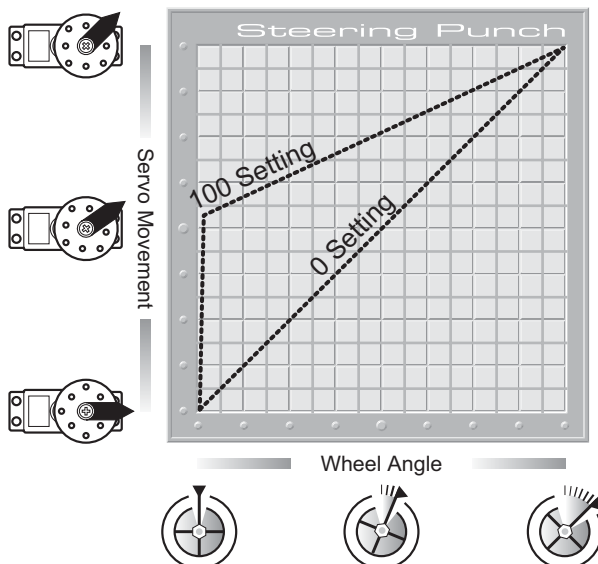
Sub Menu

LCD Table 2 for Level 4



Increase the initial steering characteristics to be quicker. (Steering Punch)

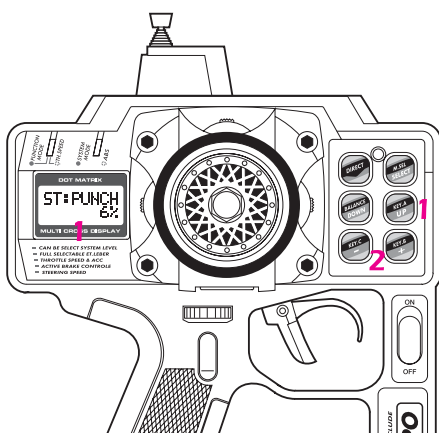
- Set up an offset (as shown in the graph) near to the neutral position.



- 1 After switching the power on, press the UP key until the Steering Punch screen is displayed from the Initial Screen.



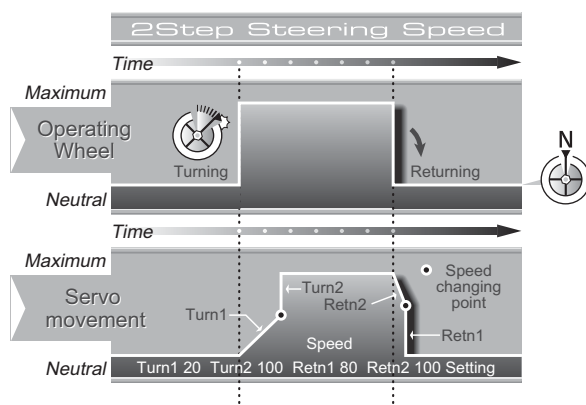
- 2 Use the +/- keys to set the value.



- Can be assigned to the Custom key for immediate call up.
- If you use this function on cars which have lots of loose linkage the initial response of the steering will be improved.

Adjusting two different servo speeds by the position of the stick (2Way Steering Speed)

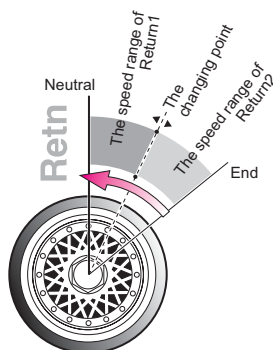
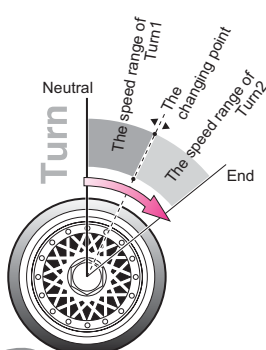
- In addition to the steering function on the Level 3, this function allows you to adjust each movement speed divided into two of the range from the neutral position to the maximum turning angle position.
- Can set each wheel movement both (TURN) and (Retn) in two way.
- Can be assigned to the Custom key for immediate call up.



1 After switching the power on, press the Up key until the Steering Speed screen is displayed.

2 Use the SELECT key to select either turn (TURN) or return (Retn).

3 According to the wheel position, the indication of 1, 2 changes on LCD screen. Hold the wheel on each position then use the +/- keys to adjust the value. When the setting made on (TURN), the same setting applies to the (Retn) direction. The setting made on (Retn) applies only to the setting on the return. Decreasing the value yields slower speed, with a 100 setting applying no limits.

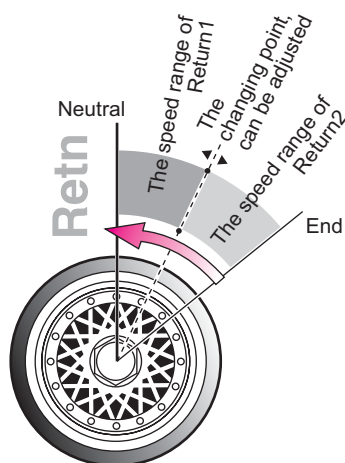
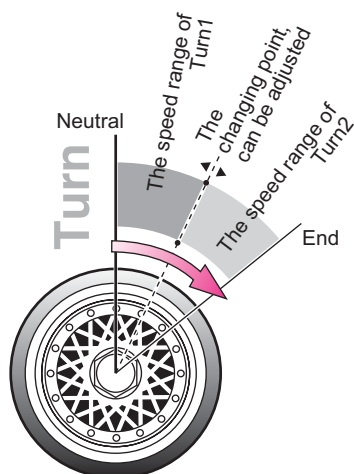


Advice

- This function allows you to set a slower response at the initial wheel turn and a quicker movement gradually.
- This function allows you to achieve stable cornering by reducing the initial servo speed (TURN1) when the car rolls on the high grip surface.
- The value can vary depending on the performance of the servo.

Adjusting the changing position of servo speed. (Steering Speed Position)

- Can set each changing point, both (TURN) and (Retn) separately.
- Can be assigned to the Custom key for immediate call up.



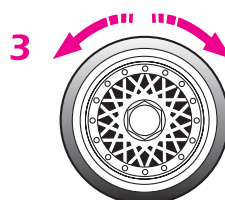
- 1** After switching the power on, press the Up key until the Steering Speed Position screen is displayed.



- 2** Use the SELECT key to select "Turn" or "Retn".



- 3** If you turn the wheel, an indicator will be changed from TURN1 to TURN2, allowing you to confirm the position where the changing point is.



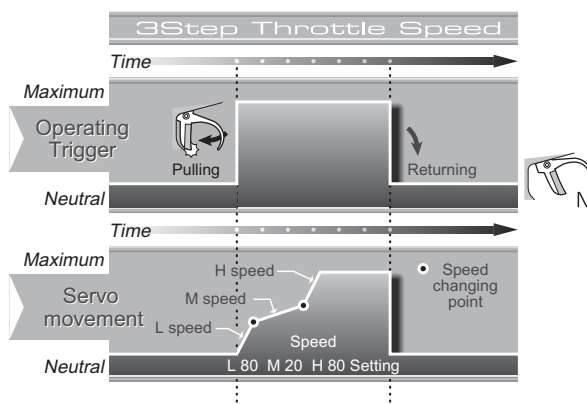
- 4** Use the +/- keys to adjust.



•When the unit is shipped from the factory, the Retn2 will not be displayed because it is set at 100.

Adjusting the speed of the throttle servo in 3 steps.(3 Way Throttle Speed)

- Allows you to adjust in 3 steps in addition to the 2Way Throttle Speed on Level 3.
- Limits the maximum turning speed of the throttle servo resulting in less response even in the event quick (sudden) wheel operation.
- It does not affect the speed of return direction of the trigger or brake operation.
- Set the point and then limit the speed on the range of low, middle and high separately.



1 After switching the power on, press the Up key until the Throttle Speed screen is displayed.

2 Use the Select key to select high (H), middle (M) or low (L).

3 Use the +/- keys to set each value. Less value means more limit to the speed.

4 The Function Mode Lamp flashes when this function is on.

5 When this function is assigned to the Et, the speed can be adjusted assuming the value displayed on the screen as a maximum value.

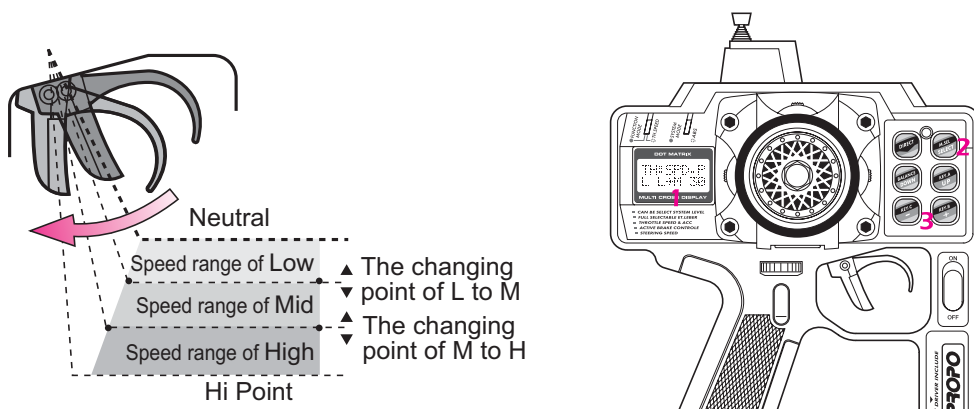


Advice

- This function can be turned on and off by the button on the Set Up screen (P44) and also can be assigned to the Custom key and the Et. In addition, the pilot lamp will be linked with the button.
- You can confirm in the Throttle Speed Point screen (next page) where the L/M/H position in the stick operation range is.

Adjusting the changing point of Throttle Servo Speed. (For 3Way Throttle Speed Position)

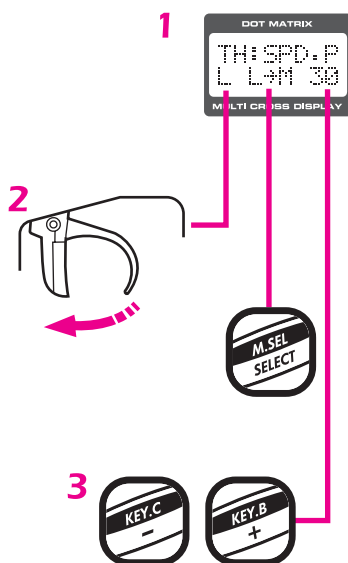
- Adjusting the changing points of the Low (L), Middle (M) and High (H).
- Adjusting the changing point of the speed.
- Can be set to the Custom key for immediate call up.



1 After switching the power on, press the Up key until the Throttle Speed Point screen is displayed.

2 Use the Select key to select the point of the low(L) to Middle(M) and the Middle(M) to High(H).
If you pull the trigger, the display of H/M/L on the bottom left of the screen will be changed.

3 Use +/- keys to adjust each point.

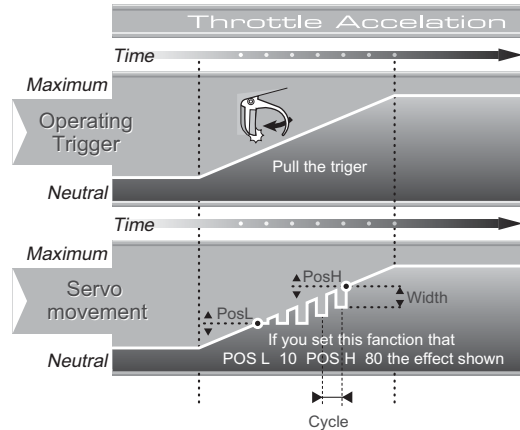


•Adjust each position against the power units, although it is different depending on a characteristics of the power units(Motor/Engine)

Apply the "Swing" effect to the throttle operation automatically. (Throttle Acceleration)

There is a technique used only by a small portion of the expert drivers which instigates the throttle during the acceleration. This is a grip control technique, by using the weight transfer of the car and this function reappears it.

- Use the button to turn it ON/OFF. It allows you to select either a push method which activates only while pressing the button or a toggle method, pressing the button for turning ON/OFF.
- Can be set to the Custom key for immediate call up.



○ Adjusting the "Swing Width" (Acceleration Width)

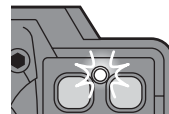
- This function does not appear unless it is assigned to the BTN in the Set Up screen (P44)
- Set the return amount from the operation position.
- Can be assigned to the Et.

1 After switching the power on, press the Up key until the Acc Width screen is displayed.

2 Use the +/- keys to adjust.

3 The pilot lamp blinks when this function is on.

4 When this function is assigned to the Et, the value can be adjusted assuming the value displayed on the screen as a maximum value.



•Try a setting from around 30.

Set the starting point of "Swing" effect. (Acceleration Low Position)

- Set the starting point of "Swing" effect by moving the trigger up from neutral position.

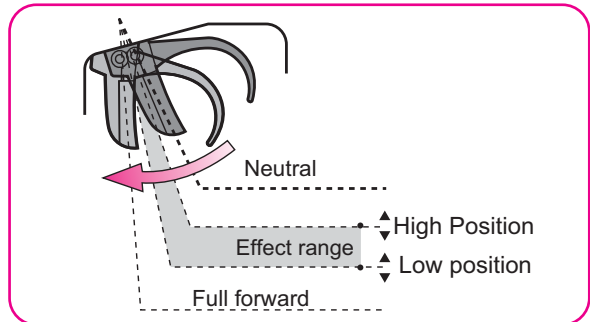
1 Use the SELECT key to enter the Acc Low Position.

2 An asterisk (*) appears in the range of acceleration when the trigger is in operation.

3 Use the +/- keys to adjust.

Advice

• Try a setting from around 5.



○ Set the ending point of "Swing" effect. (Acceleration High Position)

- Set the ending point of "Swing" effect.

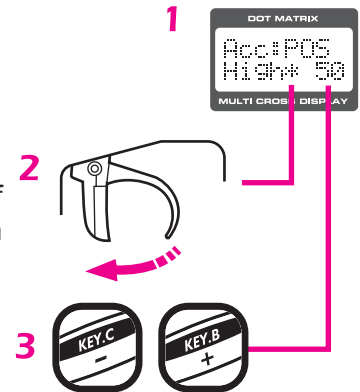
1 Use the SELECT key to enter the Acc High Position.

2 An asterisk (*) appears in the range of acceleration when the trigger is in operation.

3 Use the +/- keys to adjust.

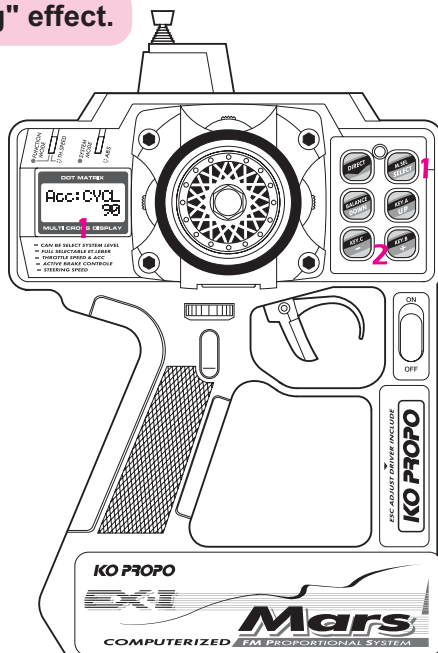
Advice

• Try a setting from around 50.



○ Set the cycle of "Swing" effect. (Acceleration Cycle)

- Set the repetition speed of "Swing" effect.



1 Use the SELECT key to enter the Acc Cycle screen.

2 Use the +/- keys to adjust.



3 When this function is assigned to the Et, the value can be adjusted assuming the value displayed on the screen as a maximum value.



- The value can vary depending on which speed controller or motor is being used. Try a setting of around

Connecting the Receiver

Warning!

Be certain to use only KO Propo genuine FM crystal sets(transmitter and receiver). Never use crystals produced by other companies since such crystals may vary in frequency, which could lead to misoperation or out of control

Warning!

Be sure to connect all equipment correctly. If connections are loosened by vibration,the model may run out of control.

Warning!

Do not cut or bundle the aerial wire with other cords. It may result in decreasing the sensitivity of the receiver and may result in the model running out of control.

Caution!

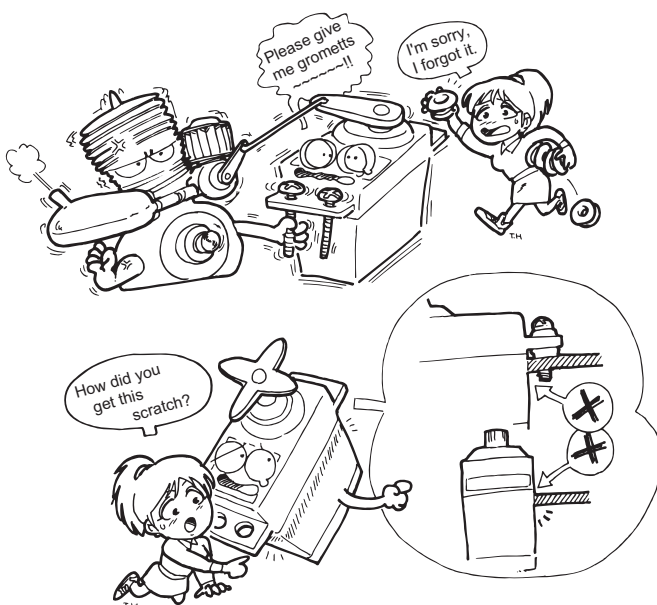
Be careful not to reverse the polarity of the transmitter and the receiver. Reverse polarity could damage the units.

Caution!

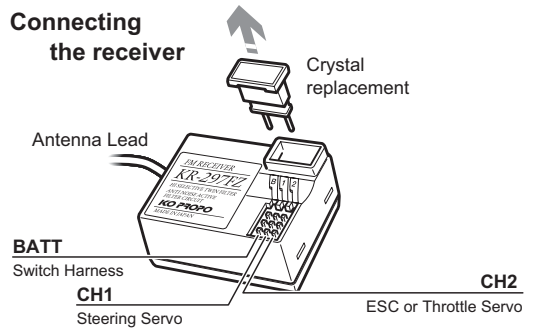
Be sure to use genuine KO Propo products e.g. transmitter,receiver, ESC and other optional parts.
* We cannot assume any responsibility for the use of other companies products with this unit.

Warning!

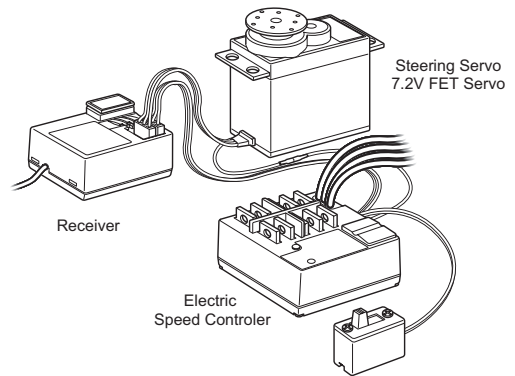
Be sure to use grommets and be sure that the servo is not touching any metal plates directly. * The vibrations may damage the servo and the model may run out of control.



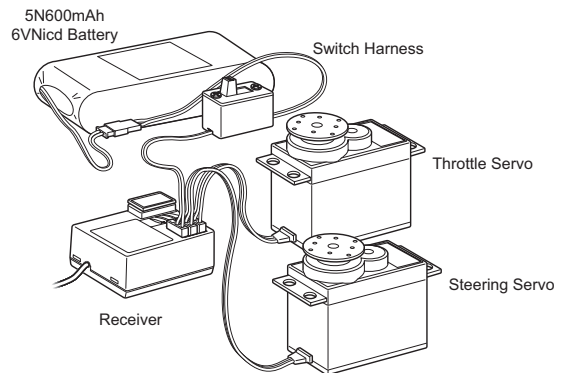
Connecting the receiver



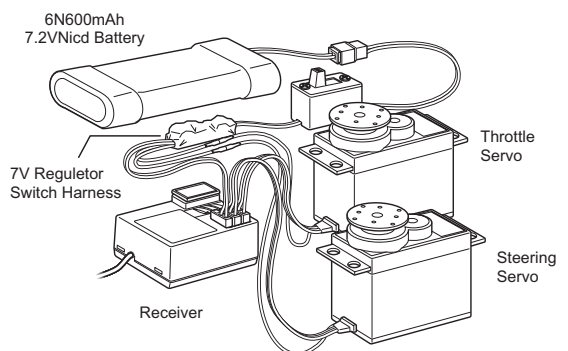
For an electric-powered car (FET servo + FET



For a gasoline-powered car (6V FET servos)



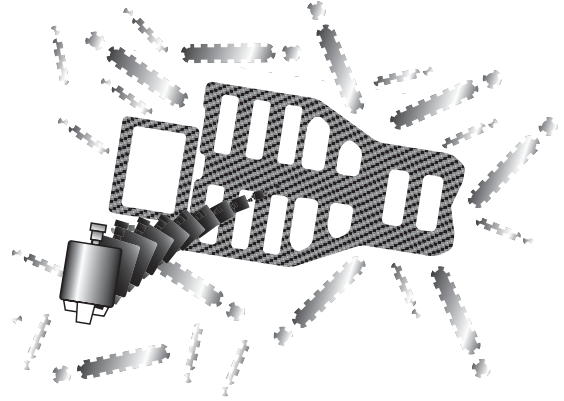
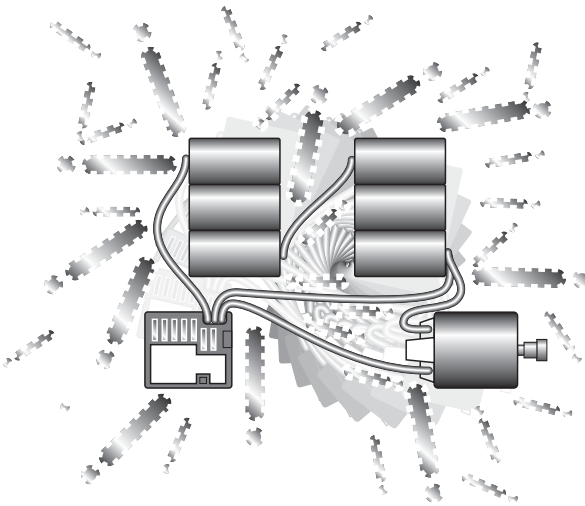
For a gasoline-powered car (7.2V FET Servos)



Notes on Receiver Usage

The Source of Noise and Electromagnetic Induction (Electric-powered car)

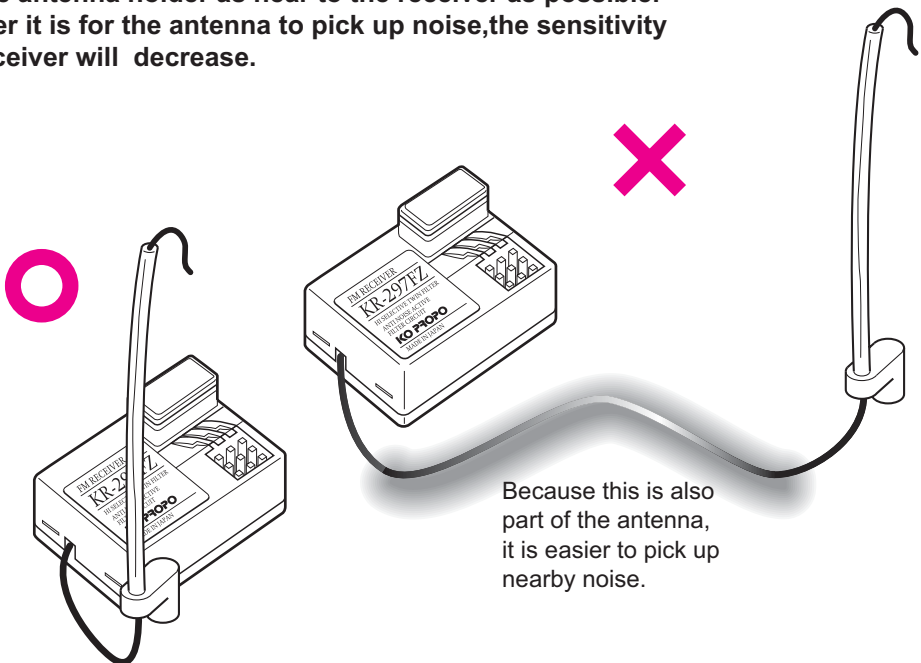
- Assume that all areas where large currents are flowing are generating noise! Locate antenna wires and receivers as far away from the motor, ESC, nicad batteries, and silicone wire as possible. Noise is a type of radio wave, and therefore is radiated (travel through the air) in the same fashion. Therefore, locating an antenna near a noise source increases the effect of the noise.



Metals and carbon can also conduct noise. As a result, you should never closely attach the antenna wire to the plate and carbon chassis.

Distance Between the Receiver and Antenna Holder

- Install the antenna holder as near to the receiver as possible. The easier it is for the antenna to pick up noise, the sensitivity of the receiver will decrease.



Because this is also part of the antenna, it is easier to pick up nearby noise.

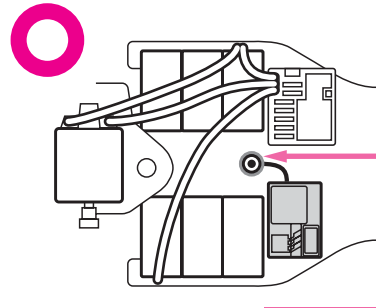
Notes on Receiver Usage

Notes on Installing the Receiver

- The installation position should be as far as possible from the motor, ESC, nicad batteries, silicone wires or other noise sources.

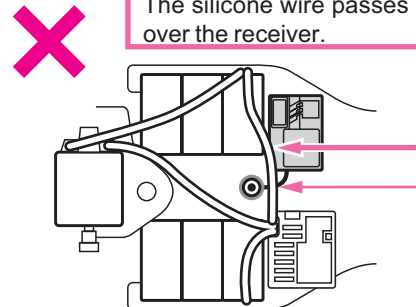
Especially, do not route the silicone wires next to the receiver. (must not be near to the crystal)

FET servo blue wire (7.2V wire) and switches can also generate noise, position them as far away as possible from the receiver and the antenna.



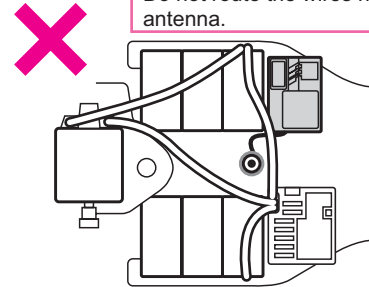
Antenna

The silicone wire passes directly over the receiver.



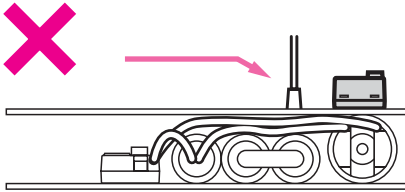
Do not allow the silicone wires to cross the antenna.

Do not route the wires near the antenna.

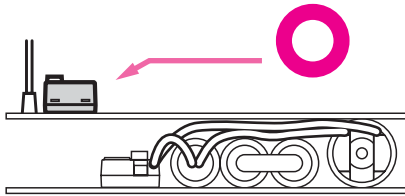


Do not position the antenna opening or the crystal near the nicad batteries, motor, or the carbon chassis.

Do not position the receiver or the antenna on the top of the motor or the nicad batteries.

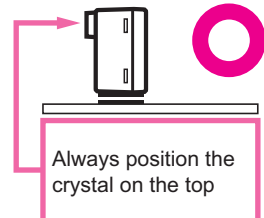
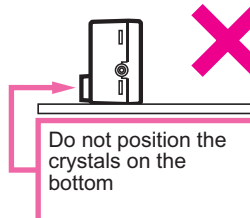
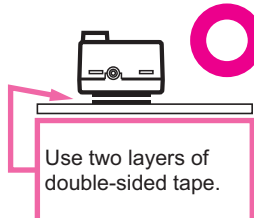
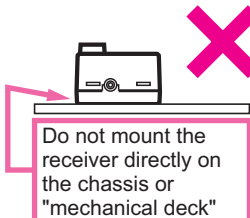


When mounting the receiver and antenna on the "upper deck", position them as far away from the nicad batteries and motor as possible.



Mounting the Receiver (Electric-powered car)

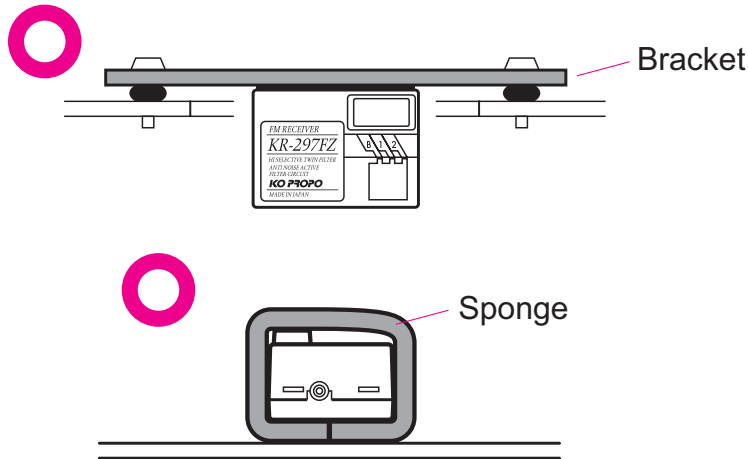
- When fixing the receiver in place on the chassis or on the "mechanical plate", **use two pieces of double-sided tape**, one on top of the other, as that the receiver is cushioned somewhat.



Notes on Installing the Receiver

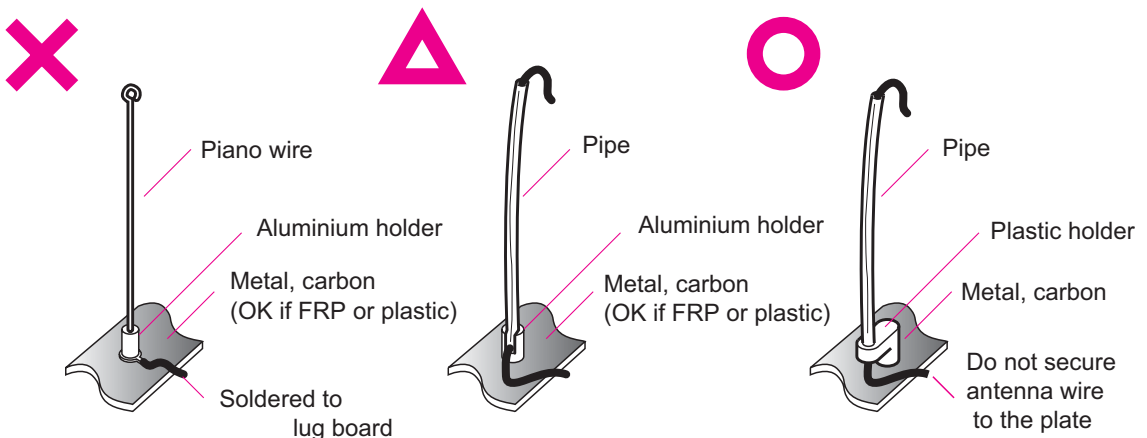
Notes on Installing the Receiver (Gasoline-powered car)

- Do not secure the receiver on the chassis or the "mechanical deck". Vibrations will cause the receiver to malfunction and may even cause internal damage to the receiver. Either use the bracket (receiver holder) provided with the kit, or else cushion the receiver with a sponge like material.



Notes on Antenna Installation

- Please follow the instruction as in the illustration below when you mount the antenna holder to the metal or carbon chassis. When using on FRP or carbon hollow antenna on a racing car, etc., do not pass the antenna wire through the pipe, allow it to trail away loosely outside.



Description 1

Terminology used in radio control mode usage.
Please refer to the Index for the terminology or wording of this transmitter.

A	AC Charger	The charger gets power supplied by AC mains.
	Alarm	Audible warning sounds from the transmitter.
B	Band Plate	Plate which indicates current frequency.
	Band	Frequency of the crystals. Can be changed by replacing the crystals within a frequency range.
C	Computer (CPU)	Central processor unit. the part of a computer which controls all other parts.
	Connector	Detachable electric terminal unit.
	Crystal	Interchangeable item which changes the frequency of the transmitter / receiver.
	Center Trim	Even if the trim is adjusted, overall turning angle point will not be changed.
	Channel	The number allocated to each servo, etc.
	Click	The stopper that holds the trims in place.
	Carburetor	The air / fuel regulator that controls the speed of engine.
	Clutch	The mechanism that controls the engagement of the final drive.
	Cycle	A set of events in a regularly repeated order.
D	DC Charger	The charger gets power supplied by 12V batteries or constant power supply unit.
	Discharger	The device which discharges the remaining energy from nicad batteries.
	Delay	Act slowly.
E	ESC	Electric speed controller which controls the RPM of the motor for electric-powered models.
F	FET Servo	The high class servo using FET transistor that increases the power output of the unit.
	FM (Frequency modulation)	A method of encoding data by varying the frequency of a constant carrier.
	Frequency Range	One of the wave bands i.e. 40Mhz, 27Mhz.
	Fridgity	The very small area where the servo does not respond to the stick movement.
G	Grommets	Rubber materials to prevent the vibration of the servo. Attach them to the servo mounts.
H	Hydropack	Assembled rechargeable nickel metal battery pack with higher capacity than a nicad battery.
	High Frequency ESC	The speed controller that controls the motor with a fast cycle of frequency. High efficiency and smooth control.
L	Linkage	Joint mechanism between servo and the model.
	LCD	Liquid crystal display.
	LED	Light emitting diode. Type of diode that emits light when current pass through.
M	Mechanical Plate	The plate where the servo or receiver is installed in the chassis.
	Memory	The device that can hold data in machine readable format.

Description 2

Terminology used in radio control mode usage.
Please refer to the Index for the terminology or wording of this transmitter.

N	Noise	Electrical interference that can cause incorrect signals to the receiver.
	Neutral	The position of the servo when releasing the stick or wheel of the transmitter.
	Nicad Pack	Assembled rechargeable nickel cadmium battery which is different from a dry battery cells.
O	Oversteer	The phenomenon that is caused by the model over reacting to the steering input. Resulting sharper turning angle than required.
P	Push Rod	Type of parts used in linkage.
	Pumping Effect	Intermittent braking action.
	Preset	The preset adjustment of settings.
R	Regulator	The device that stabilizes the input voltage to the necessary level.
	RF Module	a circuit controller that produces and emits electric wave.
	Rapid Charger	The charger which charges the nicad battery very quickly.
	Receiver (Rx)	The device that receives signals.
S	Swing	The instigation of acceleration by the stick operation.
	Spline	Exact location of the servo horn in to the neutral position.
	Servo	The part which changes the transmitted signals into the rotation movement.
	Servo Saver Horn	The shock absorbing device that is installed or in place of servo horn.
T	Travel	Servo turning angle.
	Transmitter (Tx)	The hand set that transmits signals.
	Trim	The device that adjust the neutral position of the servo.
	Turning Angle (Travel)	Turning angle of the servo horn.
	Trigger	A piece pulled with a finger to control the speed or brakes.
U	Understeer	The phenomenon that is caused by the model under reacting to the steering input. Resulting in wider turning angle than required.
V	VR (variable resistance)	It means the volume that detects the position of the stick.
W	Width	Size from side to side.
	Wheel	A circular frame which turns to allow cars to steer.

Index 1

It explains terminology used in KO transmitter

■ The words in this manual ■

A	Auxiliary Channel	(P46)	Alarm	(P37)
	Active Brake System	(P62)	Acceleration Push	(P76)
	Acceleration Toggle	(P76)	AC Charger	(P83)
	ABS	(P62)	Auto Display	(P68)
	Automatic Start	(P60)	Auto Set	(P55)
B	Band	(P84)	Battery Alarm	(P13)
	Buzzer Pitch Shift	(P27)	Brake Curve	(P39)
	Brake Punch	(P59)		
C	Connector	(P83)	Crystal	(P11.83)
	Contrast	(P30)	Custom Operation Key	(P9.43)
	Cycle	(P84)	Center Trim	(P12.83)
	Channel	(P83)	Channel Select	(P46)
D	Down Timer	(P54)	Direct Mode	(P16.17)
	Delay	(P83)	Duty	(P83)
E	Et Lever	(P12)	Et Dial	(P12)
F	Function Mode	(P16)		
H	Hydropack	(P84)		
L	Lap Navigation	(P37)	Lap Review	(P37)
M	Memory Error	(P13)	Memory	Recall (P47)
	Memory Restore	(P48)	Memory Reset	(P48)
	Memory Recall	(P47)	Mecha-Plate	(P84)
	Mode	(P16)	Model Memory	(P26)
	Model Select	(P26)	Model Name	(P26)
	Model Copy	(P65)		

Index 2

It explains terminology used in KO transmitter

■ The words in this manual. ■

N	Ni-cd	(P84)	Neutral	(P84)
	Noise	(P84)		
O	Operation Timer	(P13)		
P	Push Rod	(P84)	Pre-alarm	(P35.55)
	Preset	(P84)	Position Display	(P45)
R	Reverse	(P29)	Rapid Charger	(P83)
S	Steering Travel	(P21)	Steering Balance	(P22)
	Steering Punch	(P71)	Steering Curve	(P38)
	Steering Speed	(P58.72)	Steering Speed Position	(P73)
	Sub Menu	(P16)	Sub Trim	(P25)
	System Level	(P14)	System Mode	(P16)
	Servo	(P83)	Set Up	(P42)
	Select	(P10)	Spline	(P83)
	Timer 1	(P35)	Timer 2	(P54)
	Trim Rate	(P45)	Trigger Shift Position	(P57)
	Travel	(P84)	Turning Angle	(P83)
T	Trim Rate	(P45)	Throttle High Point	(P23)
	Throttle Brake	(P24)	Throttle Curve	(P39)
	Throttle Punch	(P59)	Throttle Speed	(P40.60.74)
	Throttle Acceleration	(P76)	Throttle Preset	(P56)
	Throttle Set	(P57)		
U	Up Timer	(P35)		
W	Width	(P84)		

Index 3

Explanations of Abbreviations on the LCD screen

❖Abbreviation on LCD screen❖

OP. T	Operation Timer (P13)	SYS. Level	System Level (P14)
UP TIMER	Up timer (P35)	LAP	Lap (P36)
ALRM	Alarm (P37)	PALM	Pre-alarm (P37)
LAP. NAVI	Lap Navigation (P37)	DOWN TIM	Down Timer (P54)
TIME SET	Time Set (P54)	AUTO SET	Auto Set (P55)
PALM SET	Pre-alarm (P55)	At : START	Automatic Start (P57)
THRT : SET	Throttle Set (P57)	TRG. sPOS	Trigger Start Position (P57)
TH : PRSET	Throttle Pre-set (P56)	ST : TRAVE	Steering Travel (P21)
ST : BLANC	Steering Balance (P22)	ST : PUNCH	Steering Punch (P71)
ST : CURVE	Steering Curve (P38)	ST : SPEED	Steering Speed (P58.72)
ST : SPD. P	Steering Speed Position (73P)	TH : HiPOT	Throttle High Point (P23)
TH : BRAKE	Throttle Brake (P24)	TH : CURVE	Throttle Curve (P39)
TH : PUNCH	Throttle Punch (P59)	TH : SPEED	Throttle Speed (P40.60.74)
TH : SPD. P	Throttle Speed Position (P41.61.75)	Acc : WIDT	Acceleration Width (P76)
Acc : Pos	Acceleration Position (P77)	Acc : CYCL	Acceleration Cycle (P78)
ABS : WIDT	ABS Width (P62)	ABS : POS	ABS Position (P63)
ABS : CYCL	ABS Cycle (P63)	ABS :DLY	ABS Delay (P64)
ABS : DUTY	ABS Duty (P64)	SUB : TRIM	Sub Trim (P25)
M. SELCT	Model Select (P26)	SET UP	Set Up (P42)
STrm	Steering Trim (P42)	TTrm	Throttle Trim (P42)
TRAV	Steering Travel (P42)	BRAK	Throttle Brake (P42)
TspL	Throttle Speed Low (P42)	TspM	Throttle Speed Middle (P42)
TspH	Throttle Speed High (P42)	AutoDISP	Auto Display (P65)
AB. W	ABS Width (P42)	AB. P	ABS Position (P42)
AB. C	ABS Cycle (P42)	Ac. w	Acceleration Width (P42)
Ac. c	Acceleration Cycle (P42)	PRST	Throttle Pre-set (P43)
ATst	Automatic Start (P43)	ATpc	Steering Punch (P43)
STcv	Steering Curve (P43)	STsp	Steering Speed (P43)
SspP	Steering Speed Position (P43)	HIGH	Throttle High Point (P43)
THcv	Throttle Curve (P43)	THpc	Throttle Punch (P43)
THsp	Throttle Speed (P43)	TspP	Throttle Speed Position (P43)
Acc	Acceleration (P43)	ABS	Active Brake System (P43)
SubT	Sub Trim (P43)	DISP	Position Display (P43)
TIM 1	Up / Lap Timer (P44)	TIM 2	Down Timer (P44)
AccP	Acceleration Push (P44)	AccT	Acceleration Toggle (P44)
TRMRATE	Trim Rate (P45)	REVERSE	Reverse (P29)
LCD CONTRAST	LCD Contrast (P30)	CH. SELCT	Channel Select (P46)
AUX. CH	Auxiliary Channel (P46)	MDL. NAME	Model Name (P28)
1-5 Step RECALL	5 Step Recall (P47)	MEMORY Restore	Memory Restore (P48)
MEMORY RESET	Memory Reset (P48)	MDL. COPY	Model Copy (P65)
ADJUST ST .TH	Adjust Volume (P66)		



Main Specifications



Transmitter KT-397FH

Operation method	Wheel + Trigger
Number of channels	3 Channels
Transmission frequency	Any band by changing crystals within the frequency range
Transmission frequency range	Any frequency range by switching RF modules
Modulation Method	FM-PPM
Neutral pulse	1.5 msec.
Memory	EEPROM
Supply voltage	8x AA size dry cell or 8 Cells Nicad
Current consumption	Less than 250 mA

Receiver KR297FZ

Reception method	FM-PPM
Number of channels	2 channels
Reception frequency	Any band by changing crystal within the frequency range
IF frequency	455 KHz
Supply voltage	3.5~6.5V
Dimensions	36.6x26x15.5 mm
Weight	13.5g (excluding crystal)

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EXTRA

KO PROPO

KONDO KAGAKU Co., Ltd



EX-1 Mars

COMPUTERIZED FM PROPORTIONAL SYSTEM