SANWA

NEXT INNOVATION

Digital High Response Telemetry System

M12S

M12S

DIGITAL HIGH RESPONSE TELEMETRY SYSTEM

Telemetry System

SSL CODE-AUX
Synchronized Link

Sanwa Super Response
SSR

2.4 FH4T **GHz** Spread Spectrum Technology By **SANWA**

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<u>Liability Statement:</u>

Airtronics shall not be liable for any damage resulting from the use of this product. As Airtronics has no control over the use, setup, modification or misuse of this product, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of using this product, the user accepts all resulting liability. **In No Case Shall Airtronics' liability exceed the original cost of the purchased product.**

For information about charging and installing the included Li-Fe battery pack, see the
Charging the Transmitter Battery Pack and Installing the Transmitter Battery Pack sections on page 11.

⚠ The M12S Super transmitter is compatible with Airtronics and Sanwa FH3, FH4 and FH4T 2.4GHz surface receivers. Due to differences in the implementation of 2.4GHz technology among different manufacturers, only Airtronics and Sanwa brand 2.4GHz surface receivers are compatible with your radio control system. Telemetry functions is available only when used with FH4T Telemetry-capable receivers. Sanwa Synchronized Link (SSL) is available only when used with SSL-capable receiver and SSL-compatible ESC, gyro or other accessory. Additional receivers are available through your local Airtronics or Sanwa retailer.

IMPORTANT: The RX-472 2.4GHz FH4T Super Response SSL receiver included does not feature full Telemetry support (e.g., Temperature data and RPM/Speed data). Full Telemetry capability is supported only when used with a Sanwa Super Vortex series ESC plugged into the SSL slot. This is due to the fact that full internal Telemetry support slows the Response Time of the receiver and we've chosen to include a receiver that will allow you fastest Response Time possible for competition racing.

PACKAGING

The packaging of your radio control system has been specially designed for the safe transportation and storage of the system's components. After unpacking, do not discard the packaging materials. Save them for future use if you ever need to send your radio control system to us for service or to store your radio control system if you don't plan on using it for an extended period of time.

SAFETY   GENERAL

GENERAL

This is a high-output, full-range radio control system that should well exceed the range needed for any surface model. For safety, the user should perform a range test at the area of operation to ensure that the radio control system has complete control of the model at the farthest reaches of the operational area. We recommend that the user enlist the help of a fellow modeler to walk the model to the farthest reaches of the track (or for boats, to walk the shore line well in excess of the operational distance of the boat), then test for proper operation. In addition, please observe the following:

• Be certain to read this User's Guide in its entirety. Think 'Safety First' for yourself, others and your equipment. Always observe all the rules of the track, lake or field where you operate your radio control equipment.

• If at any time during the operation of your model, should you feel or observe erratic operation or abnormality, end your operation as quickly and safely as possible. DO NOT operate your model again until you are certain the problem has been corrected.

• Your model can cause serious damage or injury. Please use caution and courtesy at all times during use.

• Do not expose the radio control system to water or excessive moisture. Waterproof the receiver and servos (not included) by placing them in a water-tight radio box when operating R/C model boats.

• If you have little to no experience operating R/C models, we recommend you seek the assistance of an experienced modeler or your local hobby shop for guidance.

• The Low Voltage Alert alarm will sound when the transmitter battery voltage drops to the default threshold of 4.6 volts. If this occurs, stop using the transmitter as soon as is safely possible, then replace or recharge the transmitter batteries.

⚠ This radio control system operates on the 2.4GHz frequency band. The 2.4GHz connection is determined by the transmitter and receiver pair. Unlike ordinary crystal-based systems, your model can be used without frequency control.

SERVICE AND SUPPORT   GENERAL

This product is warranted against manufacturer defects in materials and workmanship, at the original date of purchase. This warranty does not cover components worn by use or damage caused by improper voltage, tampering, modification, misuse, abuse, improper wiring, reverse polarity, moisture or using outside its intended scope of use. **Terms of this warranty can vary by region. Please read the warranty card included with your radio control system for specific warranty information.**

If you have any questions or concerns, we're here to help. If you encounter a problem with your radio control system, first check the Troubleshooting Guide section on pages 111 through 113. If you require further help, please contact the Airtronics or Sanwa service center in your region. **For a complete list of distributors in your region, please visit www.sanwa-denshi.com/rc/distributors.html.**

For Service In North America:

Global Hobby Distributors
18480 Bandilier Circle
Fountain Valley, CA 92708

Telephone: (714) 963-0329
Fax: (714) 964-6236
Email: service@airtronics.net

Factory Service:

Sanwa Electronic Instrument CO., LTD.
1-2-50 Yoshida-Honmachi
Higashiosaka, Osaka, 578-0982 Japan

Telephone: 81-729-62-1277
Fax: 81-729-64-2831
Email: rcintl@sanwa-denshi.co.jp

2.4GHZ FREQUENCY BAND PRECAUTIONS — GENERAL

- The 2.4GHz frequency band may be used by other devices, or other devices in the immediate area may cause interference on the same frequency band. Always before use, conduct a bench test to ensure that the servos operate properly. Also, conduct checks with the transmitter as distant as possible from your model.

- The response speed of the receiver can be affected if used where multiple 2.4GHz transmitters are being used, therefore, carefully check the area before use. If response seems slow during use, stop your model immediately and discontinue use.

- If the 2.4GHz frequency band is saturated (too many transmitters turned ON at once), as a safety precaution, the transmitter and receiver may not pair. This ensures that your radio control system does not get hit by interference. Once the frequencies have been cleared, or the saturation level has dropped, your transmitter and receiver should pair without any problems.

TRANSMITTER PRECAUTIONS — GENERAL

- To prevent possible damage to your servos or a runaway model, turn the transmitter ON first, then turn the receiver ON. After operating your model, turn the receiver OFF first, then turn the transmitter OFF.

- Before use, double-check that the transmitter and receiver batteries have sufficient power.

- The transmitter antenna is mounted internally and is located in the vertical back portion of the carrying handle. Do NOT cover the carrying handle in any way during use! Doing so can block the RF signal, resulting in loss of control of your model.

- During use, hold the transmitter so that its orientated as close to vertical as possible at all times. This provides the best RF signal between the transmitter and the receiver. Try not to ever 'follow' your model with the transmitter, as this can result in a weakened RF signal.

- Do not expose the transmitter or any other components to excessive heat, moisture, fuel, exhaust residue, etc.

- If the outer case becomes dirty, it can be cleaned with a soft dry cloth. If the outer case becomes soiled, it can be cleaned with a damp cloth and liquid detergent.
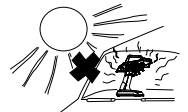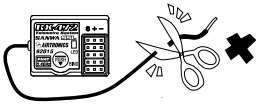
- Do not use any solvents to clean the outer case. Solvents will damage the finish.

RECEIVER PRECAUTIONS — GENERAL

- The antenna consists of a coaxial cable and a reception wire (the thin tip at the end of the coaxial cable). When you mount the antenna, do not bend the reception wire. Reception performance decreases if the reception wire is bent.

- The antenna is delicate, therefore, handle with care. Do not pull on the antenna with force. Do not cut or extend the antenna.

- The coaxial cable (the thicker portion of the antenna) can be bent into gentle curves, however, do not bend the coaxial cable acutely, or repeatedly bend it, or the antenna core can be damaged.

- The antenna should be installed into a vertical plastic tube per your model's assembly instructions. Keep the receiver antenna as far away from the motor, battery and ESC as possible.

- There is a danger of runaway operation if connectors shake loose during use. Make sure that the receiver, servo(s) and switch connectors are securely fitted.

- The receiver is susceptible to vibration, shock and moisture. Take appropriate measures to protect against vibration and moisture. Failure to take appropriate measures could result in runaway operation or damage to the receiver. We suggest wrapping the receiver in shock-absorbing foam or securing it with double-sided foam tape when installing it into your model.

- When routing the antenna, avoid contact with any carbon or metal chassis components. Contact between metal or carbon parts can result in electrical noise, which can adversely effect receiver performance and possibly result in runaway operation and result in damage to your model.

- With electric-powered models, be sure to fit any brushed motors with a noise suppression capacitor. Without a noise suppression capacitor, excessive electrical noise generation can cause runaway operation and result in damage to your model.

SERVO CONNECTORS — GENERAL

The receiver uses Airtronics 'Z' connectors, which are electronically compatible with the servos of other radio control system manufacturers. The connectors are rugged, but should be handled with care.

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- = Negative (Black)
+ = Positive (Red)
S = Signal (Blue)
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If using another brand of servo, double-check the polarity of the servo connector prior to plugging it into the receiver.

When unplugging the servo connector, don't pull on the servo wire itself. This could result in damage to the servo wire pins in the plastic plug. Always grasp the plastic connector itself.

SYSTEM FEATURES · GENERAL

- 4-Channel 2.4GHz FH4T Digital High-Response Telemetry System with Advanced Programming and SSL Support
- Large LCD Screen Features STATUS, ASSIGN and TELEMETRY Screens with Optional White or Blue Backlight
- High-Power FH4T Technology Provides the Best Reception and Connectivity, Giving Racers Added Assurance
- Includes 2S 6.6V 1850mAh Li-Fe Battery Pack and AC Charger
- Includes RX-472 2.4GHz FH4T Super Response SSL Receiver
- 50 Model Memory w/ Direct Model Select Up to 3 Models
- Steering and Throttle Channel Response Mode LED Indicators
- 10 Car Type Templates Including 3 Crawler Setups
- User-Selectable Start-Up Screen
- BASIC Programming Mode
- PC LINK Allows PC-Connectivity (Requires Mini USB Cable)
- Receiver Safety Link
- Large, Easy-to-Read LCD with Smooth Scrolling
- Telemetry Logging and Servo Monitor
- Five Racing Modes Allow Setup Changes on the Fly While Driving
- Model Select, Naming, Copy, Clear and Sort
- Model Templates Make Programming Difficult Models Easier
- Selectable Modulation Type
- Programmable Push-Button Switches, Trim Switches, Lever and Dial
- Telemetry Assign Allows External Device to Control Transmitter Functions
- Customizable Vibration Alarms and Timers
- Servo Reversing
- Steering, Throttle and Brake Dual Rate
- End Point Adjustment
- Exponential, ARC and Curve Adjustments
- Servo Speed Adjustment
- Anti-Lock Braking
- User Naming
- Throttle Offset and Throttle Hold
- Lap Timer, Two Interval Timers and Countdown Timer
- Large, Easy-to-Read Lap Timer Display
- Two Compensation Mixers
- Two Telemetry Mixers
- Channel Set Custom Menu
- Normal, SHR and SSR Channel Response Modes
- Center or Parallel Trim Types
- Programmable Fail Safe
- Receiver Battery Voltage Fail Safe
- Digital Trims and Servo Sub-Trim
- Control Calibration Function
- Selectable Throttle Bias
- Adjustable Key Volume and Tones
- Programmable Low Voltage Alert and Limit Alarms
- Separate Display Mode Button
- Inactivity and Over Voltage Alarms
- Digital Battery Voltage Monitor
- Adjust for Right-Handed or Left-Handed Use

WHAT'S INCLUDED? · GENERAL

The following accessories are included with your M12S Super. If an accessory is missing or the radio system appears damaged in any way, please contact the Airtronics or Sanwa service center in your region. For more information, see the Service and Support section on page 3. **Contents may vary and are subject to change without notice.**

- M12S Super FH4T Digital High-Response Transmitter
- RX-472 FH4T Super Response SSL Receiver
- 2S 6.6V 1850mAh Li-Fe Battery Pack
- 7.3V 500mAh AC Wall Charger
- Receiver On/Off Switch
- Optional Grips (Large and Small)
- Optional Steering Wheel Angle Plates (Right and Left)
- Optional Large Diameter Steering Wheel
- Optional Steering Wheel Offset Plate w/Upper Cover
- Optional Steering Wheel Springs (Soft and Hard)
- Optional Throttle Trigger Angle Brackets (Thin and Thick)
- Optional Throttle Trigger Covers (Medium and Thick)
- Receiver Dust Boot Covers
- Transmitter Wrist Strap Mount

SYSTEM SPECIFICATIONS · GENERAL

Transmitter:

- Model: M12S Super
- Output Power: 100mW
- Nominal Input Voltage: 4.8v to 7.4v (6.6v Default)
- Operating Voltage Range: 4.0v to 9.0v
- Dry Weight: 19.9oz (564g)
- Frequency: 2.4GHz FHSS
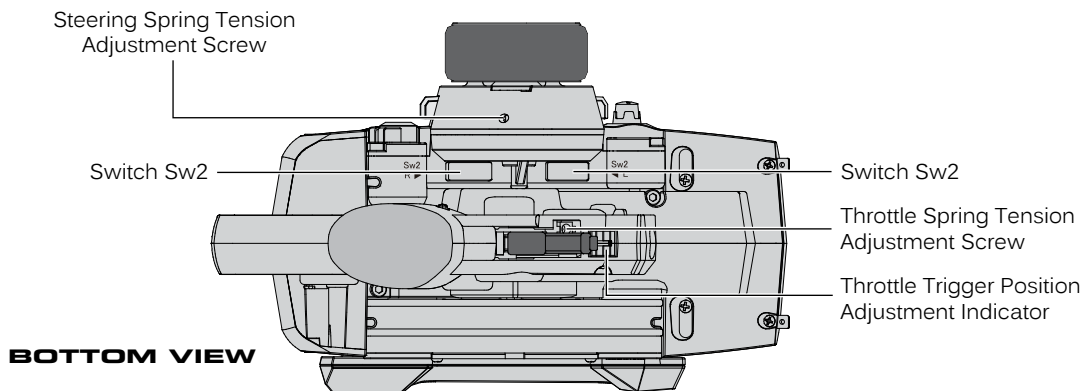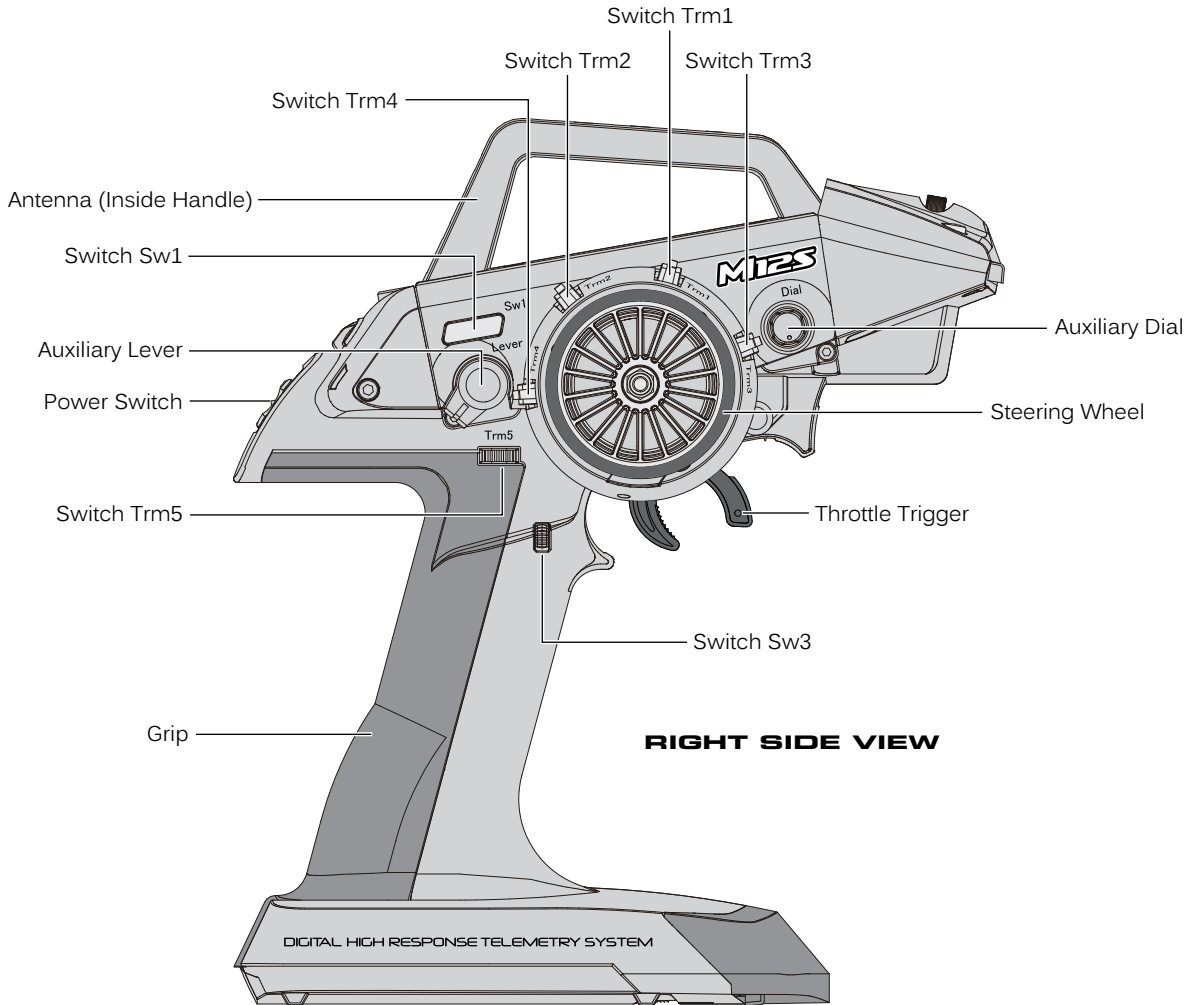- Modulation Type: FH3, FH4T (Varies by Region)

Receiver:

- Model: RX-472 (92015) Super Response SSL
- Nominal Input Voltage: 3.7v to 7.4v
- Weight: 0.23oz (6.6gr)
- Dimensions: 1.18 x 0.91 x 0.55in (30.0 x 23.3 x 14.0mm)
- Frequency/Modulation Type: 2.4GHz / FH3, FH4T (Varies by Region)
- Fail Safe Support: Yes (All Channels)
- Battery Voltage Fail Safe Limit: 3.5 to 5.0v (FH3) / 3.5 to 7.4v (FH4T)

GENERAL

TRANSMITTER OVERVIEW DIAGRAMS

GENERAL

Use the diagrams in this section to familiarize yourself with the layout of your transmitter. Descriptions of these features can be found in the Transmitter and Receiver Overview Diagram Descriptions section on pages 8 through 10.

⚠ The transmitter antenna is mounted internally and is located in the vertical back portion of the carrying handle. Do NOT cover the carrying handle in any way during use! Doing so can block the RF signal, resulting in loss of control of your Model. During use, hold the transmitter so that its orientated as close to vertical as possible at all times. This provides the best RF signal between the transmitter and the receiver. Try not to ever 'follow' your Model with the transmitter, as this can result in a weakened RF signal.

Switch Trm1
Switch Trm2
Switch Trm3
Switch Trm4
Antenna (Inside Handle)
Switch Sw1
Auxiliary Lever
Power Switch
Switch Trm5
Grip

Auxiliary Dial
Steering Wheel
Throttle Trigger
Switch Sw3

RIGHT SIDE VIEW

DIGITAL HIGH RESPONSE TELEMETRY SYSTEM

Steering Spring Tension Adjustment Screw
Switch Sw2
Switch Sw2
Throttle Spring Tension Adjustment Screw
Throttle Trigger Position Adjustment Indicator

BOTTOM VIEW

TRANSMITTER OVERVIEW DIAGRAMS   **GENERAL**

GENERAL

PC LINK Input
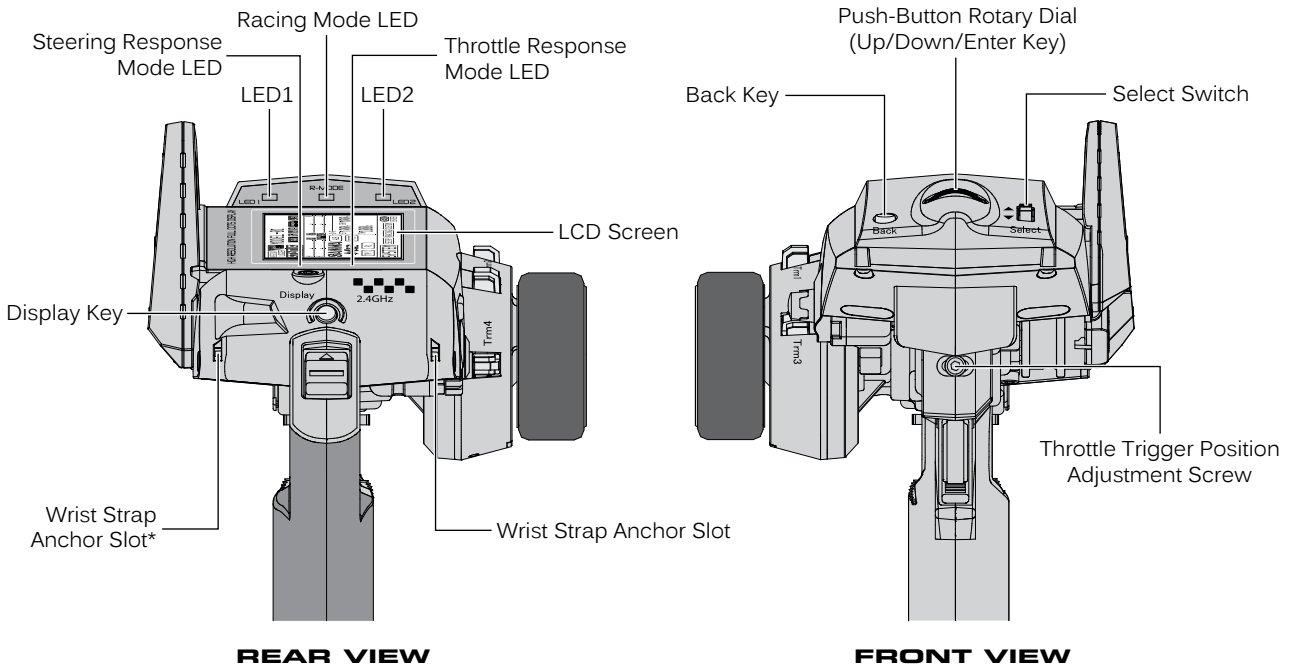(Under Cover)

Earphone Jack

Switch Trm5*

Throttle Trigger Cover
Retaining Screw

Earphones (not included) can be plugged into
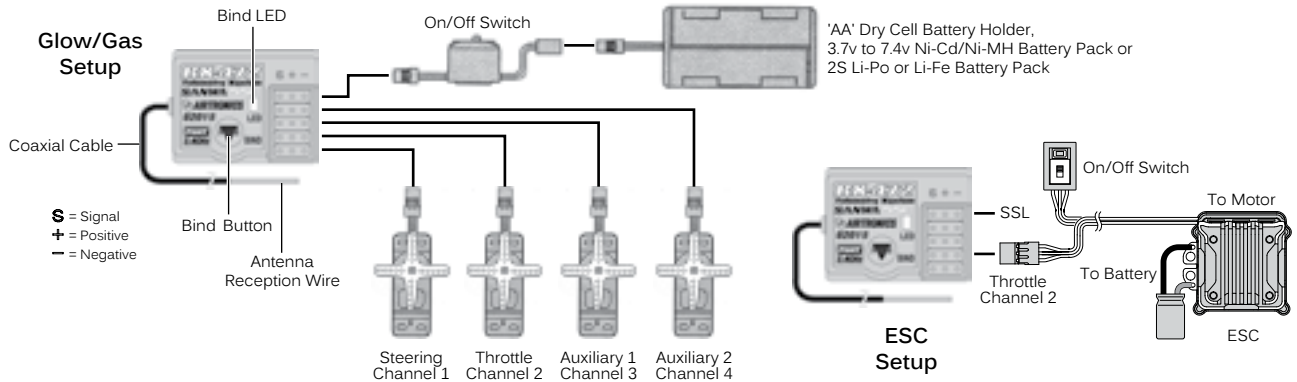the Earphone Jack to hear audible key tones,
alerts and alarms.

Switch Sw3*

LEFT SIDE VIEW

*For Left-Handed Use

Battery Compartment

Steering Response
Mode LED

Racing Mode LED

Throttle Response
Mode LED

Push-Button Rotary Dial
(Up/Down/Enter Key)

LED1

LED2

Back Key

Select Switch

LCD Screen

Display Key

Throttle Trigger Position
Adjustment Screw

Wrist Strap
Anchor Slot*

Wrist Strap Anchor Slot

REAR VIEW   **FRONT VIEW**

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RECEIVER OVERVIEW DIAGRAM, CONNECTIONS AND MOUNTING   GENERAL

Use the diagrams in this section to make receiver connections and to familiarize yourself with the RX-472 2.4GHz FH4T Super Response SSL receiver included with your M12S Super radio control system. Descriptions of the features can be found in the Transmitter and Receiver Features Descriptions section below and on the next two pages.

Glow/Gas Setup — Bind LED, On/Off Switch, 'AA' Dry Cell Battery Holder, 3.7v to 7.4v Ni-Cd/Ni-MH Battery Pack or 2S Li-Po or Li-Fe Battery Pack, Coaxial Cable, Bind Button, Antenna Reception Wire

S = Signal
+ = Positive
– = Negative

Steering Channel 1, Throttle Channel 2, Auxiliary 1 Channel 3, Auxiliary 2 Channel 4

ESC Setup — SSL, On/Off Switch, To Motor, Throttle Channel 2, To Battery, ESC

⚠ If using a Sanwa Super Vortex series ESC or other SSL-compatible device, plug the ESC or device into the SSL slot, otherwise SSL features and Telemetry Data will not be available. All other ESC's should be plugged into CH 2.

IMPORTANT: The RX-472 2.4GHz FH4T Super Response SSL receiver does not feature full Telemetry support on its own (e.g., Temperature data and RPM/Speed data). Full Telemetry capability is supported only when used with a Sanwa Super Vortex series ESC plugged into the SSL slot. This is due to the fact that full internal Telemetry support slows the Response Time of the receiver and we've chosen to include a receiver that will allow you fastest Response Time possible for competition racing.

The receiver's Nominal Input Voltage is 3.7 to 7.4 volts. A 2S Li-Po or 2S Li-Fe battery pack can be used to power the receiver without the use of a voltage regulator. In addition, this allows you to take advantage of the higher torque and speed provided by using 7.4 volt digital servos.

Use a 2S Li-Po or 2S Li-Fe battery pack ONLY if your servos are rated to handle the higher voltage!

- We suggest Binding the transmitter and receiver and making all receiver connections to check for correct operation prior to mounting the receiver in your model.

- Route the receiver antenna up through a plastic tube so that it is in the vertical position. Do not bend the reception wire. Reception performance decreases if the reception wire is bent. Do not pull on the antenna with force. Do not cut or extend the antenna. The coaxial cable can be bent into gentle curves, however, do not bend the coaxial cable acutely, or repeatedly bend it, or the antenna core can be damaged.

Antenna Reception Wire, Coaxial Cable, Antenna Tube

- To protect the receiver from vibration and other damage, we recommend wrapping the receiver in shock absorbing foam or using double-sided foam tape when installing it in your model.

- As a safety precaution, set your model on a stand so the wheels are off the ground before turning on your radio control system.
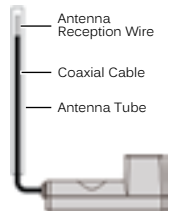
Bind LED Condition Indicator:

The receiver's Bind LED will alert you to various receiver conditions, as shown in the below below.

LED COLOR	LED CONDITION	RECEIVER STATUS
Blue	ON	Receiving RF Signal
Blue	Slow Flash/Fast Flash	Binding Operation
Red & Blue	Flash	Receiver Battery Fail Safe Activates
Red	ON	No RF Signal After Receiver Battery Fail Safe Activates

TRANSMITTER AND RECEIVER OVERVIEW DIAGRAM DESCRIPTIONS   GENERAL

Antenna: Transmits the signal from the transmitter to the receiver in the model.

Antenna Reception Wire: The portion of the receiver antenna that receives the transmitter signal. The Antenna Reception Wire should never be bent or it could be damaged and limit the range of your model.

Auxiliary Dial: The Auxiliary Dial can rotate 360º and is programmable to perform a different function depending on what function is Assigned to it. In the default configuration, it controls Auxiliary 1 High and Low servo travel.

Auxiliary Lever: The Auxiliary Lever is programmable and will perform a different function depending on what function is Assigned to it. In the default configuration, it controls Auxiliary 2 High and Low servo travel.

M12S SUPER *Telemetry System with Sanwa Synchronized Link Support*
2.4GHZ FH4T RADIO CONTROL SYSTEM USER'S GUIDE

GENERAL

TRANSMITTER AND RECEIVER OVERVIEW DIAGRAM DESCRIPTIONS GENERAL

Back Key: Pressing the BACK key returns the Programming Cursor to the previous menu. Press the BACK key repeatedly to return to the STATUS screen.

Battery Compartment: Houses the 2S Li-Fe battery pack that powers the transmitter.

Bind Button: Used in the process of Binding the transmitter and receiver.

Bind LED: Displays the current operating status of the receiver.

Coaxial Cable: The portion of the receiver antenna that extends the Antenna Reception Wire. The Coaxial Cable can be bent into gentle curves, however, do not bend it acutely, or repeatedly bend it or the antenna core can be damaged.

Display Key: Turns the transmitter's LCD Screen ON without actually turning the transmitter ON. This allows you to check and/or change programming options without actually turning the transmitter ON. To turn only the LCD Screen ON, press and HOLD the DISPLAY key for approximately 3 seconds. To turn the LCD Screen OFF, press the DISPLAY key once.

Earphone Jack: Used with earphones (not included) to hear audible key tones, alerts and alarms.

Grip: The Grip is molded from rubber in an ergonomic shape for increased comfort, control and feel.

LED1: Displays the current RF signal output status of the transmitter. When illuminated, an RF signal is being transmitted. When extinguished, no RF signal is being transmitted. In addition, LED1 is used to indicate various transmitter conditions.

LED2: Displays the current status of the Telemetry connection. When illuminated, no Telemetry connection is present. When extinguished, the Telemetry connection is Active. In addition, LED2 is used to indicate various transmitter conditions.

LCD Screen: The heart of the programming and display features of the transmitter. All programming and transmitter display functions are shown on the LCD Screen. The M12S Super features a large, backlit LCD Screen with smooth scrolling.

PC LINK Input: When used with an USB cable with a Mini USB connector (available separately), the PC LINK Input allows you to save Telemetry Data Logs, Model Programming Data and Model Templates to your PC. In addition, it also allows you to load saved Model Programming Data and Model Templates from your PC and update the M12S Super's Firmware version.

Power Switch: Turns the transmitter ON and OFF.

Push-Button Rotary Dial: The Push-Button Rotary Dial (also referred to as the UP key, DOWN key and ENTER key) is used along with the BACK key and the SELECT switch to facilitate transmitter programming. It allows you to quickly and easily navigate the various Programming Menus and switch between the STATUS, ASSIGN and TELEMETRY screens (with BASIC Mode OFF).

Push-Button Switches: The transmitter features three Push-Button Switches in different locations (Sw1, Sw2 and Sw3). Each Push-Button Switch is programmable and will perform a different function depending on what function is assigned to it. For example, Sw1 can be used to operate a reverse servo in a gas- or glow-powered model and Sw3 can be used to toggle Anti-Lock Braking ON and OFF. Sw2 is a Rocker Switch that can be pressed from either the Front or the Back.

Racing Mode LED: Displays the currently Active Racing Mode. The color of the LED will vary depending on which of the five Racing Modes is Active. When extinguished, Racing Mode is Inhibited.

Select Switch: Used along with the Push-Button Rotary Dial and the BACK key to facilitate transmitter programming. Use the SELECT switch to scroll through the STATUS screen's main menus, scroll through the TELEMETRY pages and make selections in many of the Programming Menus.

Steering Response Mode LED: Displays the currently Active Steering Response Mode. The color of the LED will vary depending on which of the three Response Modes is Active.

Steering Spring Tension Adjustment Screw: Used to adjust the spring tension of the Steering Wheel to best suit the feel of the user. Turning the Steering Spring Tension Adjustment Screw clockwise increases Steering Wheel spring tension and turning the Steering Spring Tension Adjustment Screw counter-clockwise decreases Steering Wheel spring tension.

Steering Wheel: Proportionally operates the model's Right and Left Steering control. The Steering Wheel features a foam grip for increased comfort, control and feel. The Steering Wheel's position, angle and spring tension can all be adjusted.

Throttle Response Mode LED: Displays the currently Active Throttle Response Mode. The color of the LED will vary depending on which of the three Response Modes is Active.

Throttle Trigger: Controls the speed of the model, both forward and backward, or the model's Brake. The Throttle Trigger position, angle, thickness and spring tension can all be adjusted.

Throttle Spring Tension Adjustment Screw: Used to adjust the spring tension of the Throttle Trigger to best suit the feel of the user. Turning the Throttle Spring Tension Adjustment Screw clockwise increases Throttle Trigger spring tension and turning the Throttle Spring Tension Adjustment Screw counter-clockwise decreases Throttle Trigger spring tension.

Throttle Trigger Cover Retaining Screw: Secures the Trigger Cover to the Throttle Trigger. Optional Trigger Covers are included to customize the size of the Throttle Trigger.

Throttle Trigger Position Adjustment Indicator: Indicates the current position of the Throttle Trigger. As the Throttle Trigger position is adjusted forward or backward, the Throttle Trigger Adjustment Position Indicator will move forward or backward.

Throttle Trigger Adjustment Position Screw: Used to adjust the position of the Throttle Trigger either Forward or Backward, to change the feel of the Throttle Trigger.

| TRANSMITTER AND RECEIVER OVERVIEW DIAGRAM DESCRIPTIONS | GENERAL |

Trim Switches: The transmitter features five separate Trim Switches - four positioned around the Steering Wheel (Trm1, Trm2, Trm3 and Trm4 and one positioned below the Auxiliary Lever (Trm5). Each Trim Switch is programmable and will perform a different function depending on what function is assigned to it. For example, Trm1 and Trm2 can be used to adjust Steering and Throttle Trim and Trm4 and Trm5 can be used to adjust Dual Rate and Steering EPA.

Wrist Strap Anchor Slot: Used to attach the wrist strap anchor to the transmitter.

| TRANSMITTER LED CONDITION INDICATORS AND WARNING ALARMS | GENERAL |

The M12S Super is equipped with several different Audible Warning Alarms to warn you of an abnormal transmitter condition. In addition, LED1, LED2 and the Response Mode LEDs and R-MODE LED are used to indicate various conditions at a glance.

LED Condition Indicators

LED1, LED2 and the Response Mode LEDs and R-MODE LED are used to indicate various transmitter conditions at a glance. Some of the conditions indicated by the LEDs may also be accompanied by an audible alarm and/or and on-screen warning.

TRANSMITTER STATUS	LED1	LED2	R-MODE LED	ST R-MODE LED	TH R-MODE LED
Display Mode	OFF	------	------	------	------
RF Output Signal	ON	------	------	------	------
Throttle Offset Function Active	0.1 Sec. Flash	------	------	------	------
Telemetry Logger Function Active	0.5 Sec. Flash	------	------	------	------
RF Binding - Sending Bind Code	0.35 Sec. Flash	------	------	------	------
PC LINK USB Send/Receive Active	0.05 Sec. Flash	------	------	------	------
Inactivity Alarm Active	------	0.1 Sec. Flash	------	------	------
Telemetry Alarm Active	------	0.1 Sec. Flash	------	------	------
Telemetry Connection Active	------	OFF	------	------	------
No Telemetry Connection	------	ON	------	------	------
Low Voltage Alert Alarm Active	------	0.35 Sec. Flash	------	------	------
Low Voltage Limit Alarm Active	------	0.05 Sec. Flash	------	------	------
Over Voltage Alarm Active	------	0.05 Sec. Flash	------	------	------
Transmitter Error	1 Sec. Flash	1 Sec. Flash	OFF	------	------
Programming Data/Update Error	------	1 Sec. Flash	OFF	------	------
Unrecoverable Update Error	------	------	OFF	------	------
Racing Mode 1 Active	------	------	Green	------	------
Racing Mode 2 Active	------	------	Magenta	------	------
Racing Mode 3 Active	------	------	Cyan	------	------
Racing Mode 4 Active	------	------	Yellow	------	------
Racing Mode 5 Active	------	------	White	------	------
Racing Mode Function Inhibited	------	------	OFF	------	------
NOR Channel Response Mode	------	------	------	OFF	OFF
SHR Channel Response Mode	------	------	------	Red	Red
SSR Channel Response Mode	------	------	------	Blue	Blue

Audible Warning Alarms

The audible alarms listed below and on the next page may also be accompanied by an on-screen warning.

Inactivity (Power ON) Alarm:

The Inactivity Alarm will sound if the transmitter is left on for a period of 10 minutes without any control input from the user. This alarm alerts you to prevent unwanted draining of the transmitter battery. To clear this alarm, either turn the transmitter OFF or press the BACK key or the ENTER key.

Over Voltage Alarm:

The Over Voltage Alarm will sound if the transmitter battery voltage is greater than 9.6 volts. To clear this alarm, turn the transmitter OFF and replace the transmitter battery with one that when fully charged does not exceed 9.6 volts.

TRANSMITTER LED CONDITION INDICATORS AND WARNING ALARMS — GENERAL

Audible Warning Alarms

Low Voltage Alert Alarm:

The Low Voltage Alert alarm will sound when the transmitter batteries reach the Low Voltage Alert alarm voltage value programmed in the SYSTEM > BATTERY menu. The alarm will sound each time the transmitter battery voltage decreases by 0.1 volt. To clear this alarm, press the BACK key or the ENTER key.

Low Voltage Limit Alarm:

The Low Voltage Limit alarm will sound when the transmitter batteries reach the Low Voltage Limit alarm voltage value programmed in the SYSTEM > BATTERY menu. This alarm can only be cleared by turning the transmitter OFF and recharging or replacing the transmitter batteries.

CHARGING THE TRANSMITTER BATTERY PACK — GENERAL

The M12S Super includes a 2S 6.6V 1850mAh Li-Fe battery pack for lighter weight and longer run time. A matching 7.3V 500mAh AC charger is included to charge the battery pack. Please observe the Transmitter Battery Precautions and Warnings below before charging and installing the battery pack.

Transmitter Battery Precautions and Warnings:

- Do not use a 3S Li-Po or 3S Li-Fe battery pack or the transmitter will be damaged.

- The M12S Super does not feature a charge jack. For the safety of both the Li-Fe battery pack and the transmitter itself, the battery pack must be removed from the transmitter during the charging process.

- Charge the battery pack in an open area free of any obstructions. Do not attempt to charge any other type of battery with the included charger.

- Do not leave the battery pack unattended during the charging process.

- If the battery pack appears swollen or otherwise damaged, do not use it or charge it. It should be discarded and replaced.

- Damage to the transmitter caused by improper use, wrong battery type, incorrect voltage or reverse polarity will not be covered under warranty!

- Negative (Black)

+ Positive (Red)
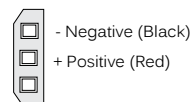
Battery Connector
Polarity Diagram

Charging the Li-Fe Battery:

1) Plug the charger into an AC wall outlet or power strip. The Status LED will illuminate red.

2) Plug the connector from the battery into the matching connector on the charger, observing correct polarity. The Status LED will illuminate green, indicating the battery is charging.

3) Allow the battery to charge. When fully charged, the Status LED will illuminate red. Remove the battery from the charger, then unplug the charger from its power source.

   The charger's output is 500mA. Depending on how discharged the battery pack is, it could take up to 3.5 hours to fully charge.

INSTALLING THE TRANSMITTER BATTERY PACK — GENERAL

1) Remove the battery cover from the bottom of the transmitter by pushing firmly on the battery cover in the direction of the arrow.

2) Plug the connector from the battery pack into the matching connector inside the battery compartment.

3) Place the battery pack into the battery compartment, then slide the battery cover back onto the transmitter and push it firmly until it 'clicks' closed. **Be careful not to pinch the battery lead when installing the battery cover.**

TRANSMITTER BATTERY OPTIONS — GENERAL

The M12S Super transmitter's Operating Voltage Range is 4.0 to 9.6 volts and has a Nominal Input Voltage range of 4.8 to 7.4 volts. This allows you to use several different battery options other than Li-Fe, depending on your preference.

Ni-Cd/Ni-MH - A Ni-Cd or Ni-MH battery pack of desired capacity can be used. Higher capacity battery packs will provide adequate run time. This is not considered an upgrade from the included Li-Fe battery pack.

Li-Po - A 2S Li-Po battery pack can be used. These battery packs are popular due to their light weight and high capacity for long usage time between charges. This is an upgrade from the included Li-Fe battery pack and will also require a different charger.

⚠ Transmitter power output, range and speed are the same, regardless of the battery type used. **If using a different battery type other than the Li-Fe battery pack included, please see the IMPORTANT note below.**

IMPORTANT: If you're using a battery pack with a cell type that is different from the Li-Fe battery pack included, you must change the transmitter battery Low Voltage Alert and Low Voltage Limit alarms to match the battery cell type you're using or else you may receive erroneous low voltage alarms during use, or worse run your battery down so low as to damage it. For more information, see the BATT Menu section on pages 54 through 56.

STEERING WHEEL AND THROTTLE TRIGGER TENSION ADJUSTMENT — GENERAL

The spring tension of the Steering Wheel and Throttle Trigger can be adjusted to best suit the user. Some users may prefer the Throttle Trigger and/or Steering Wheel to feel firmer and some users may prefer them to feel softer. It all depends on your personal preference.

To adjust the Throttle Trigger spring tension, follow the step below:

1) To Increase the spring tension of the Throttle Trigger (make firmer), use a 1.5mm hex wrench to turn the Throttle Spring Tension Adjustment Screw (A) clockwise. To Decrease the spring tension of the Throttle Trigger (make softer), turn the Throttle Spring Tension Adjustment Screw counter-clockwise.
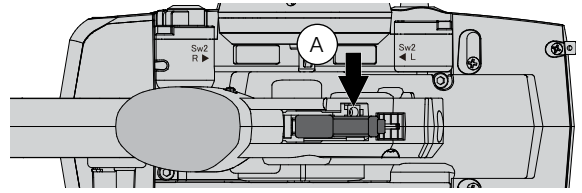
To adjust the Steering Wheel spring tension, follow the step below:

1) To Increase the spring tension of the Steering Wheel (make firmer), use a 1.5mm hex wrench to turn the Steering Spring Tension Adjustment Screw (A) clockwise. To Decrease the spring tension of the Steering Wheel (make softer), turn the Steering Spring Tension Adjustment Screw counter-clockwise.
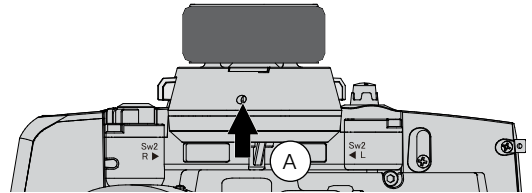
OPTIONAL STEERING WHEEL SPRING INSTALLATION — GENERAL

Two optional Steering Wheel springs (one soft and one hard) are included should adjusting the spring tension as described above not give you the desired feel. Use the hard spring for a firmer feel and soft spring for a softer feel.

To install one of the optional Steering Wheel springs, follow the steps below:

1) Use a 7mm nut driver to remove the Steering Wheel retaining nut, then pull the Steering Wheel straight off.

2) Use a small Philips head screwdriver to remove the spring cover retaining screw (A), then remove the plastic spring cover.

3) Using a small pair of needle nose pliers, carefully unhook the top of the spring from the metal peg, then remove the spring.

4) Carefully install the desired optional spring, then reinstall the plastic spring cover and the Steering Wheel. Installation is the reverse of removal.
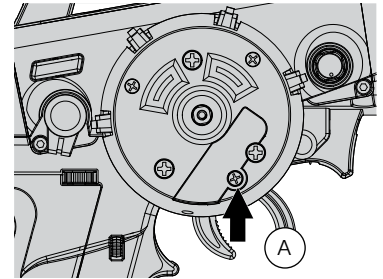
STEERING WHEEL TRAVEL ADJUSTMENT — GENERAL

The maximum Right and Left travel of the Steering Wheel can be adjusted to best suit the feel of the Steering Wheel and your driving style. Some drivers prefer to limit the travel of the Steering Wheel as it makes them feel more 'connected' to their model.

To adjust the maximum travel of the Steering Wheel, follow the steps below:

1) Remove the foam Steering Wheel grip from the Steering Wheel by firmly pulling it straight off.

2) To limit the maximum travel of the Steering Wheel, use a 1.5mm hex wrench to turn both grub screws in the Steering Wheel adapter hub clockwise equally the desired amount. To maximize the travel of the Steering Wheel, turn both grub screws in the Steering Wheel adapter hub counter-clockwise equally the desired amount.

⚠ After making Steering Wheel travel adjustments, you must use the Variable Rate Adjustment function to ensure your Steering servo travel limits are equalized. For more information, see the CALIBRATION Menu section on pages 52 through 54. Limiting the maximum travel of the Steering Wheel will Increase the sensitivity of the steering. We recommend setting Negative Exponential or ARC percentage values to Soften the control feel around Neutral. For more information, see the CURVE Menu section on pages 90 through 94.
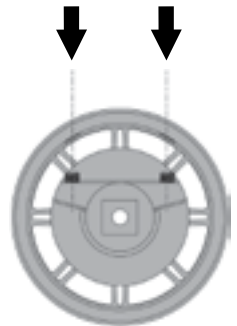
THROTTLE TRIGGER COVER INSTALLATION — GENERAL

Optional medium and thick Throttle Trigger Covers are included to change the feel of the Throttle Trigger during use. Some users may prefer a thicker Throttle Trigger if they have a smaller trigger finger. It all depends on your personal preference.

To install one of the optional Throttle Trigger Covers, follow the steps below:

1) Using a small Philips head screwdriver, remove the Throttle Trigger Cover Retaining Screw, then pull the Throttle Trigger Cover off the Throttle Trigger.

2) Slide the desired Throttle Trigger Cover onto the Throttle Trigger, then install and tighten the Throttle Trigger Cover Retaining Screw.
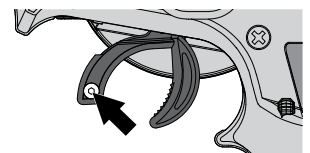
GENERAL

OPTIONAL STEERING WHEEL INSTALLATION — GENERAL

An optional larger diameter Steering Wheel is included to best suit the user. Some user's feel that the larger diameter Steering Wheel makes the Steering operation seem finer.

To install the optional larger diameter Steering Wheel, follow the steps below:

1) Use a 7mm nut driver to remove the Steering Wheel retaining nut, then pull the Steering Wheel straight off.

2) Remove the foam Steering Wheel grip from the Steering Wheel by firmly pulling it straight off.

3) Pull the Steering Wheel adapter hub from the original Steering Wheel then push it into the optional Steering Wheel.

4) Slide the foam grip over the new Steering Wheel, then reinstall the Steering Wheel. Installation is the reverse of removal.

OPTIONAL GRIP INSTALLATION — GENERAL

Two optional grips (one small and one large) are included to best suit the user. Some user's may find that one of these two grips feels more comfortable than the normal size stock grip.

To install one of the optional grips, follow the steps below:

1) Remove the original grip from the handle by firmly pulling down on the back of the grip (at the top), then by pulling the grip out along its edges.

2) To install the new grip, align the molded tabs in the grip with the matching slots in the handle, then firmly push the molded tabs into the slots, working your way around the grip until the edges of the grip are flush with the handle.
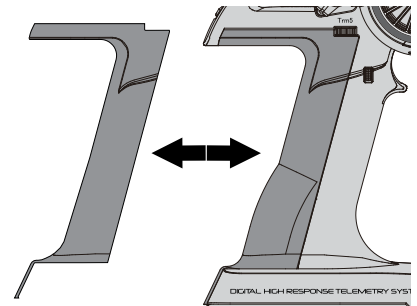
THROTTLE TRIGGER ANGLE ADJUSTMENT — GENERAL

The angle of the Throttle Trigger can be adjusted Right or Left to change the feel of the Throttle Trigger during use. Some users may prefer the Throttle Trigger straight while some users my prefer the Throttle Trigger angled toward the Right or Left. It all depends on your personal preference. Two Throttle Trigger adjustment plates are included to fine-tune the angle.

To adjust the Throttle Trigger angle, follow the steps below:

1) Use a Philips head screwdriver to remove the Throttle Trigger mounting screw (A) from the Left side of the transmitter.

2) Use the tip of a modeling knife to carefully pop the trigger adjustment plate (B) out of the transmitter.
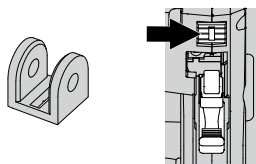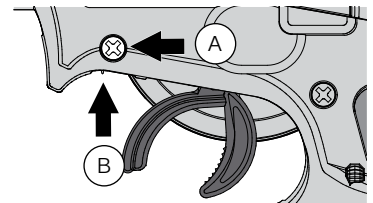
A - Throttle Trigger Centered (Stock)
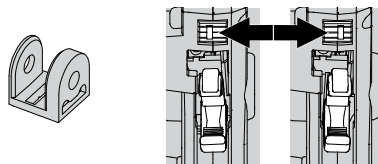
B - Throttle Trigger Angled Slightly. Angle Right or Left Depending on Orientation.
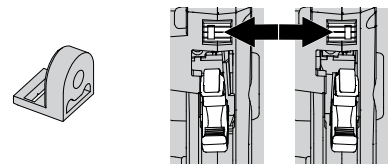
C - Throttle Trigger Angled More. Angle Right or Left Depending on Orientation.

3) Carefully press the desired trigger adjustment plate (B) into the transmitter, making sure to orientate it in the direction you want to angle the Throttle Trigger, then reinstall and tighten the Throttle Trigger mounting screw (A).

WRIST STRAP ANCHOR INSTALLATION — GENERAL

A wrist strap anchor is included that can be installed onto the transmitter to facilitate the use of a wrist strap (not included).

To install the wrist strap anchor, follow the steps below:

1) Using a 2.5mm hex wrench, remove the wrist strap anchor mounting screw (A) from the Right side or Left side of the transmitter.

2) Slide the wrist strap anchor into the mounting slot in the back of the transmitter, then reinstall and tighten the wrist strap anchor mounting screw (A).

⚠ When installing the wrist strap anchor, note its orientation. The U-Shaped groove (B) in the base of the wrist strap anchor should be pointing down.
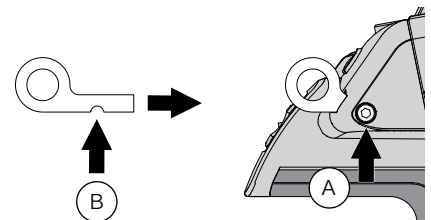
THROTTLE TRIGGER POSITION ADJUSTMENT — GENERAL

The position of the Throttle Trigger can be adjusted forward or backward to change the feel of the Throttle Trigger during use. Some users may prefer the Throttle Trigger positioned farther forward and some users my prefer the Throttle Trigger positioned farther back. It all depends on your personal preference.

To adjust the Throttle Trigger position, follow the steps below:

1) Use a Philips head screwdriver to loosen the Throttle Trigger Mounting Screw (A) from the left side of the transmitter.

2) To move the Throttle Trigger backward, use a 2.0mm hex wrench to turn the Throttle Trigger Position Adjustment Screw (B) counter-clockwise. To move the Throttle Trigger forward, turn the Throttle Trigger Position Adjustment Screw (B) clockwise.

3) When satisfied with the adjustment, tighten the Throttle Trigger Mounting Screw (A).
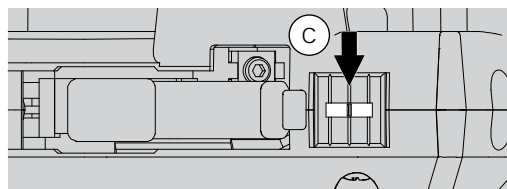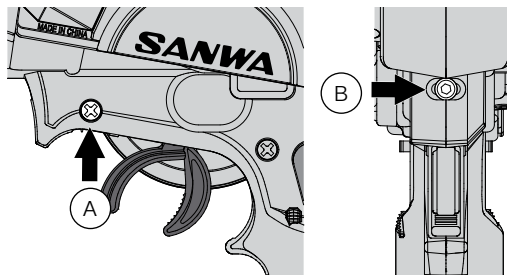
⚠ As you adjust the Throttle Trigger position, the Throttle Trigger Position Adjustment Indicator (C) will move, indicating the current position of the Throttle Trigger. The total adjustment range is approximately 5mm. Do not attempt to adjust the Throttle Trigger position beyond the limits indicated by the Throttle Trigger Position Adjustment Indicator or damage may result. Moving the Throttle Trigger position does not affect the physical movement of the Throttle Trigger.

OPTIONAL STEERING WHEEL OFFSET PLATE INSTALLATION — GENERAL

An optional Steering Wheel Offset Plate is included that lowers the position of the Steering Wheel and the Trim Switch Ring. Some users may find the Lower Steering Wheel position more comfortable, not only for hand position, but also for the overall balance and feel of the transmitter.

To install the Steering Wheel Offset Plate assembly, follow the steps below:

1) Use a 7mm nut driver to remove the Steering Wheel Retaining Nut (A), then pull the Steering Wheel (B) and the Steering Wheel Adapter (C) straight off and set them aside.

2) Using a Philips head screwdriver, remove the three M3 x 20mm tapping screws (D), then carefully pull the Trim Switch Ring (E) off the transmitter and very carefully unplug the two connectors.

3) Feed the connectors from the Trim Switch Ring through the hole in the center of the Offset Plate, then carefully plug them into the matching connectors in the transmitter.

⚠ We recommend feeding the wires from the Trim Switch Ring through the hole in the center of the Offset Bracket prior to installing the Offset Bracket. It's more difficult to feed the wires through after the Offset Bracket is installed.

Fore   Centered   Aft
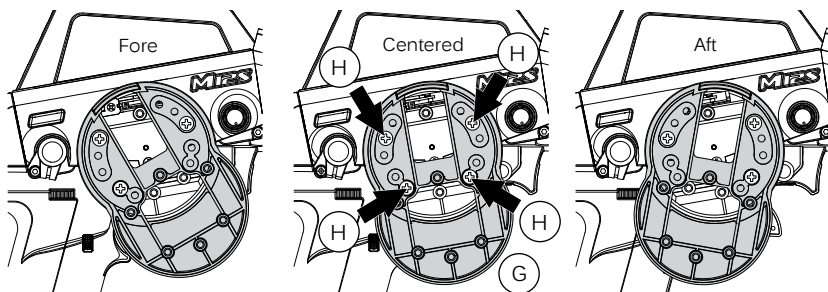
4) Install the Steering Wheel Offset Plate (G) to the transmitter at the desired angle, using four M3 x 8mm tapping screws (H) included.

⚠ The Trim Switch Ring must be left loose so you can install the two lower tapping screws. If necessary, any excess wiring should be pushed into the transmitter to prevent kinking or otherwise damaging the wires.

5) Place the Bracket Cover (F) in place, then reinstall the Trim Switch Ring (E), using the three M3 x 20mm tapping screws (D) you removed previously.

6) Reinstall the Steering Wheel Adapter (C) and the Steering Wheel (B), then secure them into place using the Steering Wheel Retaining Nut (A). Installation is the reverse of removal.
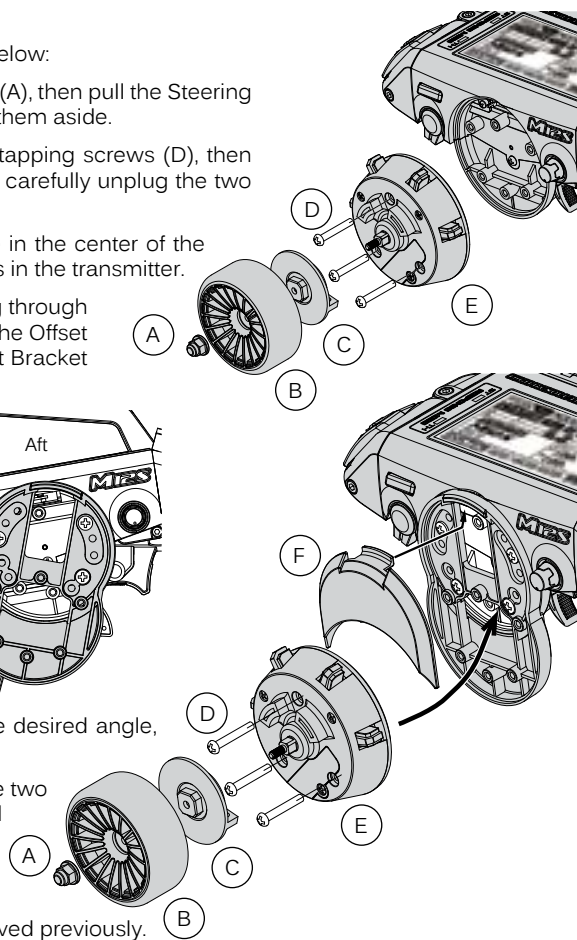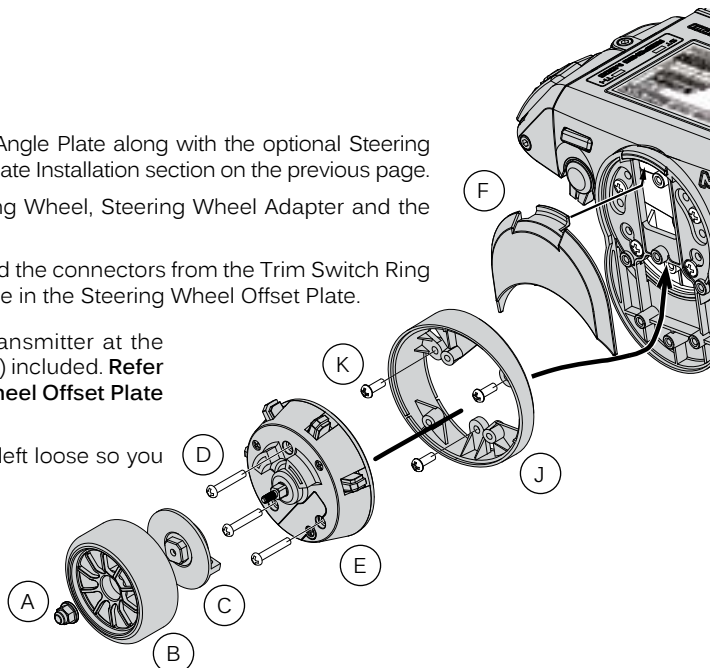
OPTIONAL STEERING WHEEL ANGLE PLATE INSTALLATION   **GENERAL**

Two optional Steering Wheel Angle Plates (one Right and one Left) are included that changes the angle of the Steering Wheel and Trim Switch Ring. Some users may find that angling the Steering Wheel to the Right or Left may be more comfortable during use.

⚠ 'R' and 'L' are molded into the Angle Plates to differentiate them. The 'R' Angle Plate will angle the Steering Wheel toward the Right and the 'L' Angle Plate will angle the Steering Wheel toward the Left.

To install the Right or Left Steering Wheel Angle Plate, follow the steps below:

1) Use a 7mm nut driver to remove the Steering Wheel Retaining Nut (A), then pull the Steering Wheel (B) and the Steering Wheel Adapter (C) straight off and set them aside.

2) Using a Philips head screwdriver, remove the three M3 x 20mm tapping screws (D), then carefully pull the Trim Switch Ring (E) off the transmitter and very carefully unplug the two connectors.

Installation Without Steering Wheel Offset Plate:

The installation procedures below outline installing either Angle Plate without the optional Steering Wheel Offset Plate described in the previous sections. Complete steps 1 and 2 above before proceeding.
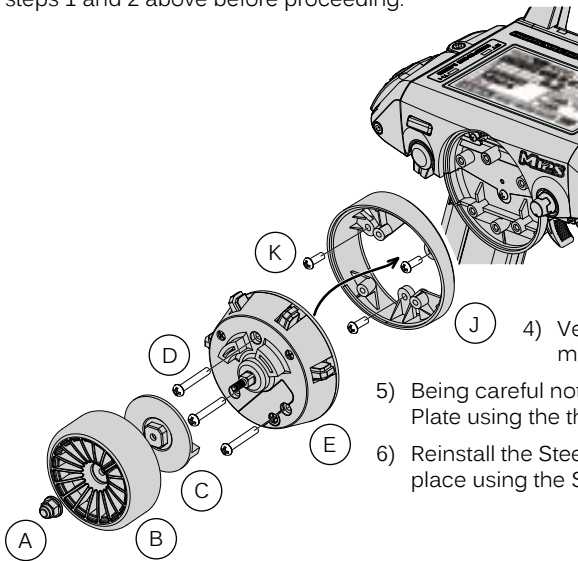
3) Choose which Angle Plate you want to install, then align and secure the Angle Plate (J) to the transmitter, using three M3 x 8mm tapping screws (K) included. There are small notches in both the Trim Switch Ring and the Angle Plate that line up with corresponding small tabs in the Angle Plate and the transmitter to ensure both the Trim Switch Ring and the Angle Plate are installed in the correct orientation.

4) Very carefully plug the connectors from the Trim Switch Ring into the matching connectors in the transmitter.

5) Being careful not to pinch any wires, align and secure the Trim Switch Ring to the Angle Plate using the three M3 x 20mm tapping screws (D) you removed previously.

6) Reinstall the Steering Wheel Adapter (C) and the Steering Wheel (B), and secure them in place using the Steering Wheel Retaining Nut (A). Installation is the reverse of removal.
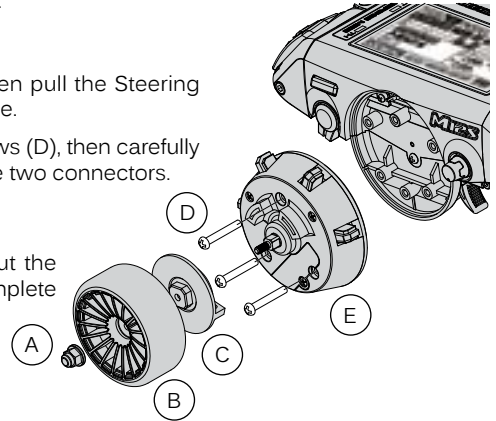
Installation With Steering Wheel Offset Plate:

The installation procedures below outline installing either Angle Plate along with the optional Steering Wheel Offset Plate described in the Steering Wheel Offset Plate Installation section on the previous page.

1) Complete steps 1 and 2 above to remove the Steering Wheel, Steering Wheel Adapter and the Trim Switch Ring.

2) Choose which Angle Plate you want to install, then feed the connectors from the Trim Switch Ring through the Angle Plate and on through the center hole in the Steering Wheel Offset Plate.

3) Install the Steering Wheel Offset Plate (G) to the transmitter at the desired angle, using four M3 x 8mm tapping screws (H) included. **Refer to the drawing on the previous page for Steering Wheel Offset Plate mounting options.**

⚠ The Trim Switch Ring and Angle Plate must be left loose so you can install the two lower tapping screws.

4) Place the Bracket Cover (F) in place, then install the Angle Plate (J) onto the Steering Wheel Offset Bracket, using three M3 x 8mm tapping screws (K).

5) Install the Trim Switch Ring (E) onto the Angle Plate (K), using the three M3 x 20mm tapping screws (D) you removed previously.

6) Reinstall the Steering Wheel Adapter (C) and the Steering Wheel (B), and secure them in place using the Steering Wheel Retaining Nut (A). Installation is the reverse of removal.

DRIVING POSITION ADJUSTMENT   GENERAL

The position of the Steering Wheel can be switched from the Right side to the Left side to accommodate left-handed drivers. This makes the M12S Super much more comfortable for natural left-handed drivers to use.

To change the driving position for left-handed use, follow the steps below:

1) Using a 2.5mm hex wrench, remove the three socket cap screws (A) that hold the Display Switch Cover in place, then carefully pull the Display Switch Cover off.
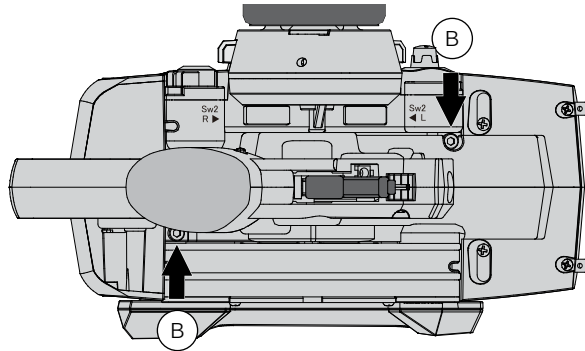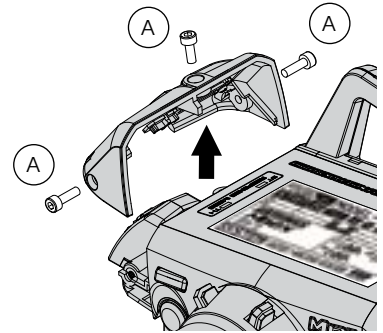
2) Using a 2.5mm hex wrench, remove the two socket-cap screws (B) from the bottom the transmitter that hold the main body in place.

3) Carefully pull the main body up and off the base (C), being careful not to damage any of the wiring.

4) Rotate the main body 180º (D), then push it back down onto the base (E), being careful not to pinch any of the wiring.

5) Reinstall the two socket-cap screws you removed previously to secure the main body to the base.

6) Reinstall the Display Switch Cover. Installation is the reverse of removal.
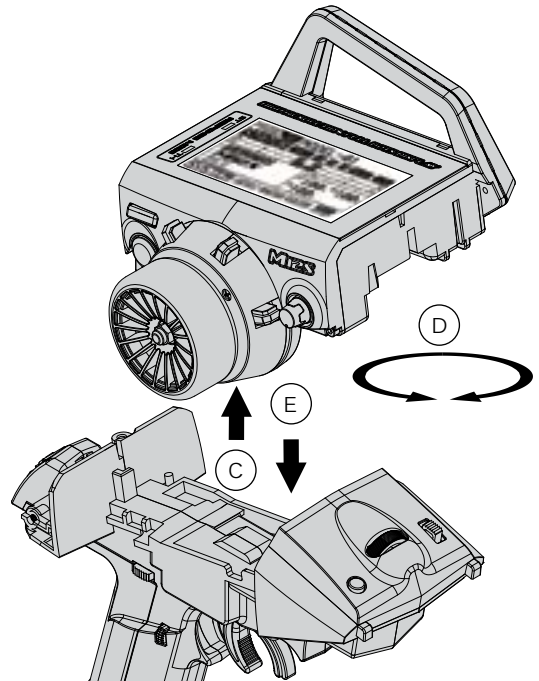
⚠ When reinstalling the Display Switch Cover, make sure to install the two machine screws into the sides of the cover and the one self-tapping screw in the top of the cover.

Activating the Left Side Switches:

Two duplicate switches (Sw3 and Trm5) are positioned on the left side of the transmitter for use in the left-handed driving position. In the default configuration, these switches are Inhibited for right-handed use. When you switch the driving position as described above, you will want to Activate these switches for ease of use.

To Activate the Sw3 and Trm5 switches on the Left side of the transmitter, follow the steps below:

1) Remove the grip from the handle by firmly pulling down on the back of the grip (at the top), then by pulling the grip out along its edges.

2) Flip the switch that's in the back of the handle. When the switch is in the DOWN position, the left-hand switches will be Active and when the switch is in the UP position, the right-hand switches will be Active.

3) Reinstall the grip by aligning the molded tabs in the grip with the matching slots in the handle, then firmly pushing the molded tabs into the slots, working your way around the grip until the edges of the grip are flush with the handle.
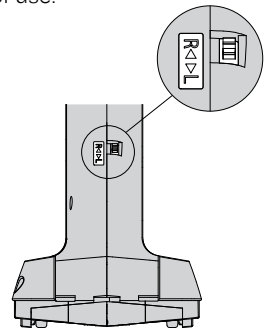
Changing the Programming Cursor Scroll Direction:

When you switch the driving position as described above, the direction the Push-Button Rotary Dial moves the Programming Cursor will be reversed. If desired, the direction the Push-Button Rotary Dial moves the Programming Cursor can be changed.

The direction the Push-Button Rotary Dial moves the Programming Cursor is changed in the INFORMATION > KEY menu. For more information, see the changing the Changing the Programming Cursor Scroll Direction section on page 72.
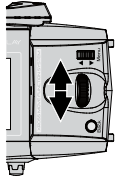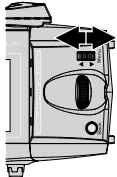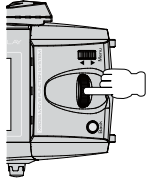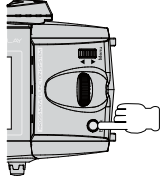
PROGRAMMING KEYS OVERVIEW AND FUNCTIONS   GENERAL

GENERAL

Navigating through the various Display Screens, Programming Menus and changing Programming Values is accomplished using the ENTER key (Push-Button Rotary Dial), the SELECT switch and the BACK key.

PRO TIP: While navigating Programming Menus and changing Programming Values, keep the following in mind: to choose a menu from the STATUS screen, use the SELECT switch. To open a menu, press the ENTER key. To choose an option to program, scroll UP or DOWN to highlight the desired option, then press the ENTER key. The highlighted option will flash, indicating the Programming Value can be changed. Once you've changed the Programming Value, press the ENTER key again or press the BACK key and the highlighted option will stop flashing, indicating you can scroll UP or DOWN to highlight another programming option. To reset a programming option to its default value, highlight the option and press the HOLD the ENTER key.

PROGRAMMING KEY	NAME	FUNCTION
	▲ ▼ Push-Button Rotary Dial (Scroll UP/DOWN)	Scrolls between STATUS, ASSIGN and TELEMETRY screens* Scrolls the Programming Cursor RIGHT or UP and LEFT or DOWN. Increases or Decreases Programming Values.
	◄ ► SELECT Switch	Used to Select various menus*. In addition, the SELECT switch's function will vary depending on the menu chosen and will be indicated in the menu's Message Display Window.
	Push-Button Rotary Dial (Push ENTER)	Opens the Selected menu or programming option. Press and HOLD to reset the Selected programming option to its default value.
	BACK Key	Returns to the previous menu. Repeatedly press to return to the STATUS screen.

*BASIC Mode Must Be Turned OFF.

DISPLAY SCREENS OVERVIEW   GENERAL

GENERAL

In the default configuration, when you turn the M12S Super ON, the transmitter will start-up and display the BOOT screen temporarily, then display the STATUS screen.
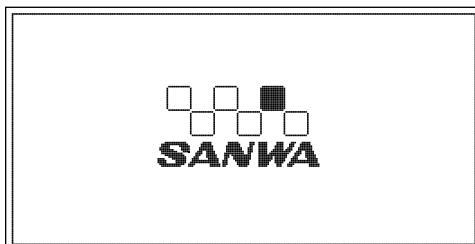
BOOT Screen
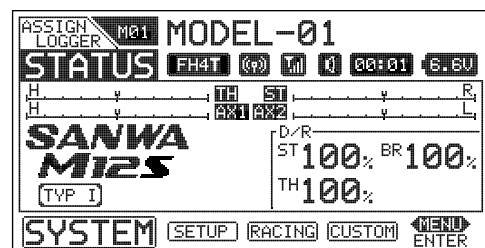
STATUS Screen (BASIC Mode OFF)

BOOT Screen: The BOOT screen is displayed when the transmitter is turned ON. The BOOT screen can be disabled. For more information, see the INFORMATION Menu section on pages 71 and 72.

STATUS Screen: The STATUS screen is displayed after the BOOT screen and displays important information about the transmitter. It's also the base from which you access other Programming Menus. For more detailed information, see the STATUS Screen Overview section on the next two pages.

DISPLAY SCREENS OVERVIEW

GENERAL

Use the information in this section to familiarize yourself with the layout and different indicators and displays that comprise the STATUS screen. The STATUS screen displays all pertinent information, such as the Model Name, Modulation Type, Timer, Voltage and much more. The STATUS screen will always be displayed after the BOOT screen unless you change that option in the SYSTEM > BOOT menu. For more information, see the INFORMATION Menu section on pages 71 and 72.

STATUS Screen Overview Diagram:
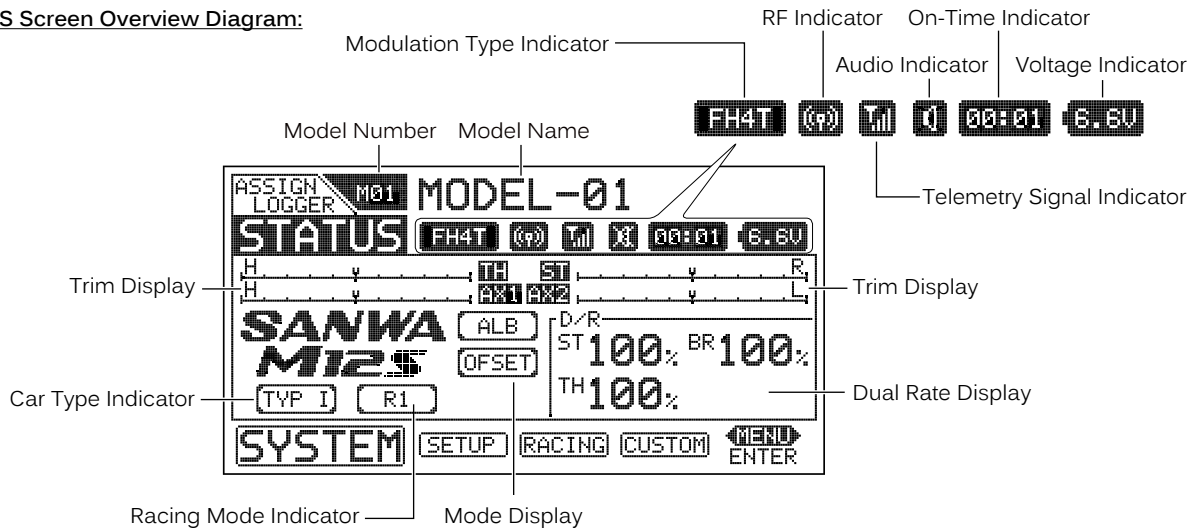
From the STATUS screen, use the Push-Button Rotary Dial to scroll UP or DOWN to display the ASSIGN and TELEMETRY screens. To return to the STATUS screen, either scroll to it or press the BACK key.

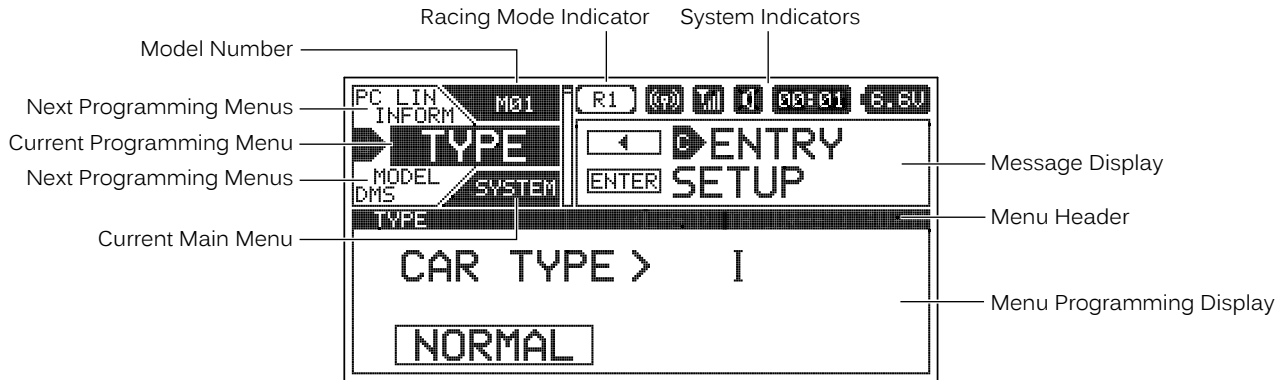⚠ BASIC Mode must be turned OFF to view the ASSIGN and TELEMETRY screens. For information about turning BASIC Mode ON and OFF, see the INFORMATION Menu section on pages 71 and 72.
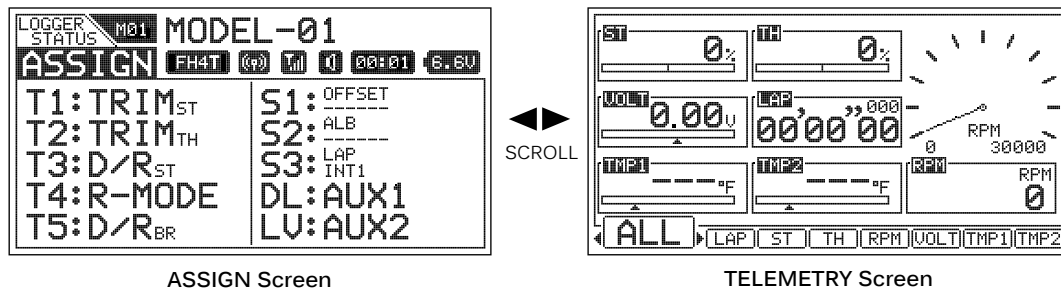
ASSIGN Screen   TELEMETRY Screen

ASSIGN Screen: The ASSIGN screen displays the functions that are currently Assigned to the Push-Button Switches, the Trim Switches, the Auxiliary Dial and the Auxiliary Lever, all in one convenient location.

TELEMETRY Screen: The TELEMETRY screen displays Telemetry Data, such as RPM or Speed, Temperature, Receiver Voltage and more. Use the SELECT switch to switch between ALL and LAP, ST, TH, RPM, VOLT, TMP1* and TMP2* pages.

*Default name and function. Can be renamed if using different Telemetry accessories (available separately). For more information, see your local Airtronics or Sanwa retailer.

⚠ Telemetry integration requires the use of an Airtronics or Sanwa 2.4GHz FH4T Telemetry-capable surface receiver or SSL-compatible ESC (e.g. Super Vortex series ESC). Steering and Throttle Output and Lap Times can still be viewed when used with non-Telemetry capable receivers.

STATUS Screen Overview Diagram Descriptions:

Audio Indicator: Indicates whether Audible Key Tones and Transmitter Alarms are Muted or not.

Car Type Indicator: Indicates the current Car Type selected.

Dual Rate Display: Displays the current Dual Rate percentage value of channels that Dual Rate can be programmed for. Channels displayed will vary based on the currently selected Car Type.

Mode Display: Displays any special Programming Modes that are Active, such as Throttle Offset or Anti-Lock Braking.

Model Name: Displays the Name of the currently selected Model.

Model Number: Displays the number of the currently selected Model.

Modulation Type Indicator: Indicates the current Modulation Type that the transmitter is set to.

DISPLAY SCREENS OVERVIEW   GENERAL

STATUS Screen Overview Diagram Descriptions, Continued:

On-Time Indicator: Displays the current cumulative On-Time of the transmitter in Hours and Minutes.

Racing Mode Indicator: Indicates whether Racing Mode is Active or Inhibited and which Racing Mode (R1 through R5) is Active.

RF Indicator: Indicates whether the transmitter is sending an RF signal or not.

Trim Display: Displays the current position of channel Trim. Trim Indicators (ST, AUX1, etc.) displayed will vary based on the currently selected Car Type.

Telemetry Signal Indicator: Indicates the current signal strength of the Telemetry connection between the transmitter and receiver.

Voltage Indicator: Indicates the current Voltage of the transmitter batteries.

MENUS STRUCTURE OVERVIEW   GENERAL

The M12S Super features two Modes (BASIC Mode ON and BASIC Mode OFF) and various Programming Menus within those two Modes. With BASIC Mode ON (default), various general-use Programming Menus are accessible via the BASIC menu. With BASIC Mode OFF, you are able to access the SYSTEM menu, SETUP menu, RACING menu and the CUSTOM menu, which contain all of the M12S Super's various Programming Menus (including those in the BASIC menu). To access these menus from the STATUS screen, use the SELECT switch to highlight the desired menu, then press ENTER key to open the selected menu.

<u>BASIC Menu:</u> Page 25.

Simplifies transmitter use by featuring only general-use Programming Menus.
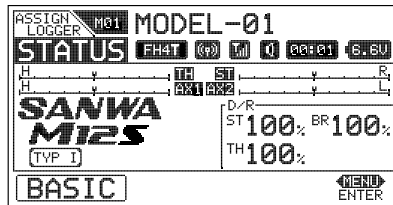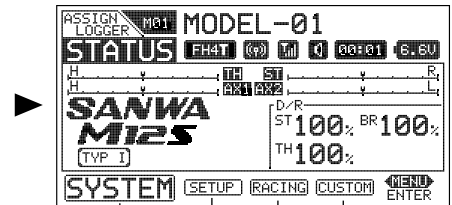
BASIC MODE ON   **BASIC MODE OFF**

<u>SYSTEM Menu:</u> Pages 27 through 72.

Features system-specific Programming Menus, such as Car Type, Key Assign, LCD Contrast, Binding, Auxiliary Type, Trim Type and more.

ENTER

SELECT
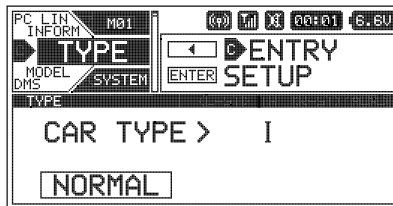
<u>SETUP Menu:</u> Pages 73 through 86.

Features basic Model-specific Programming Menus, such as EPA, Sub-Tim, Servo Reversing, Timers and more.

ENTER

SELECT
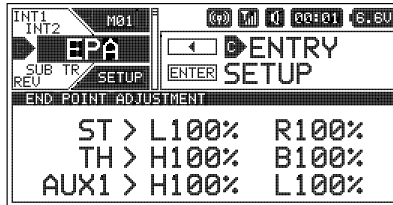
<u>RACING Menu:</u> Pages 87 through 109.

Features more complex Model-specific Programming Menus, such as C-Mixing, Anti-Lock Braking, Servo Speed, Curves and more.

ENTER

SELECT
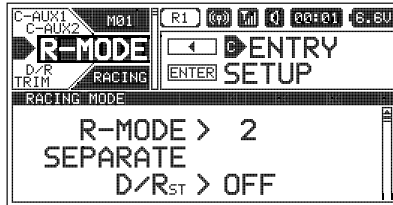
<u>CUSTOM Menu:</u> Pages 109 through 111.

Features the Channel Set Programming Menu and any favorite Programming Menus that you add yourself.
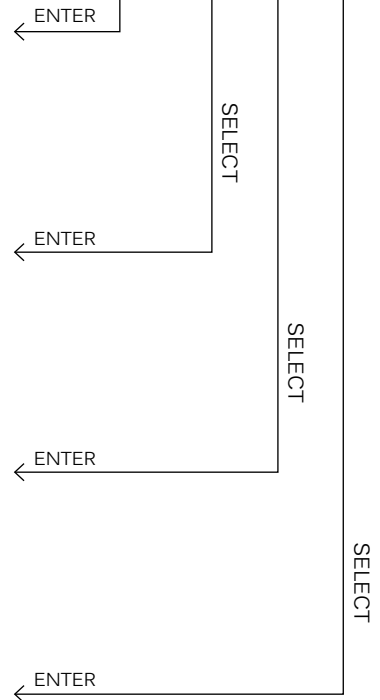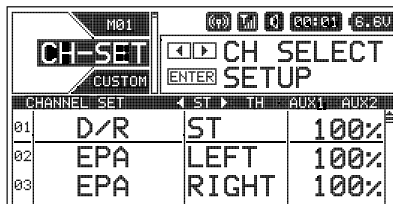
ENTER

⚠️ For information about turning BASIC Mode ON and OFF, see the INFORMATION Menu section on pages 71 and 72. BASIC Mode must be turned OFF to access the SYSTEM, SETUP, RACING and CUSTOM menus.

MENUS OVERVIEW | **GENERAL**

Each of the menus described in the previous section all share the same basic layout as illustrated below. Use this information to familiarize yourself with the layout and the information presented.

Racing Mode Indicator   System Indicators

Model Number

Next Programming Menus
Current Programming Menu
Next Programming Menus

Current Main Menu

Message Display
Menu Header
Menu Programming Display

Current Main Menu: Displays the currently Active main menu, either BASIC, SYSTEM, SETUP, RACING or CUSTOM.

Current Programming Menu: Displays the currently Active Programming Menu.

Menu Header: Displays the name of the currently Active Programming Menu. In some cases, programming options may also be found within the Menu Header.

Menu Programming Display: Displays all programming information pertinent to the currently Active Programming Menu.

Message Display: Displays different Programming Key functions based on the currently Active Programming Menu. For more information, see the illustrations and descriptions below.

Model Number: Displays the number of the currently selected Model.

Next Programming Menus: Displays the next two Programming Menus within the current main menu.

Racing Mode Indicator: Indicates which Racing Mode (R1 through R5) is Active or Inhibited.

System Indicators: Indicates current transmitter status information as described in the Display Screens Overview section on pages 17 through 19.

The function of the SELECT switch and the ENTER key will vary depending on the specific Programming Menu displayed.
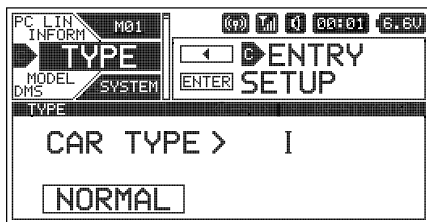
In This Menu Style:

The SELECT switch Saves or Removes the current Programming Menu from the CUSTOM menu.

The ENTER key opens the highlighted Programming Menu. Scroll UP and DOWN to choose different Programming Menus.
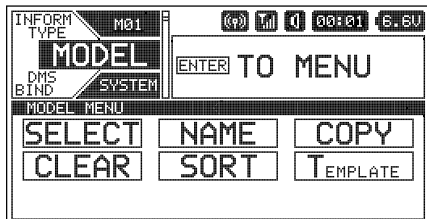
In This Menu Style:

The ENTER key opens a Sub-Menu. Scroll UP and DOWN to choose different Sub-Menus.
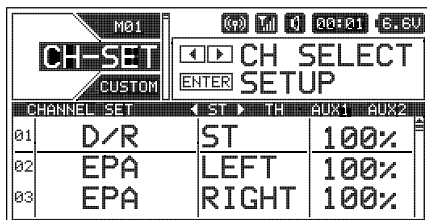
In This Menu Style:

The SELECT switch scrolls RIGHT or LEFT to Select different channels.

Scroll UP and DOWN to choose the desired function Programming Value, then press the ENTER key change the Programming Value.

TELEMETRY SCREEN OVERVIEW

GENERAL

The TELEMETRY screen displays Telemetry Data, such as RPM or Speed, Temperature, Receiver Voltage and more.

For information about making Telemetry option changes that effect how and what Telemetry Data is displayed on the various TELEMETRY pages, see the LOG SETUP Menu section on pages 56 through 66.

⚠ Telemetry integration requires the use of an Airtronics or Sanwa 2.4GHz FH4T Telemetry-capable surface receiver or SSL-compatible ESC (e.g. Super Vortex series ESC). Steering and Throttle Output and Lap Times can still be viewed when used with non-Telemetry capable receivers.

From the STATUS screen, use the Push-Button Rotary Dial to scroll UP or DOWN to display the TELEMETRY screen. Remember, BASIC Mode must be turned OFF.

Throttle Output Display

Steering Output Display

Receiver Voltage Display
Lap Time Display
Temperature 1 Display

RPM/Speed Gauge

RPM/Speed Display

Temperature 2 Display
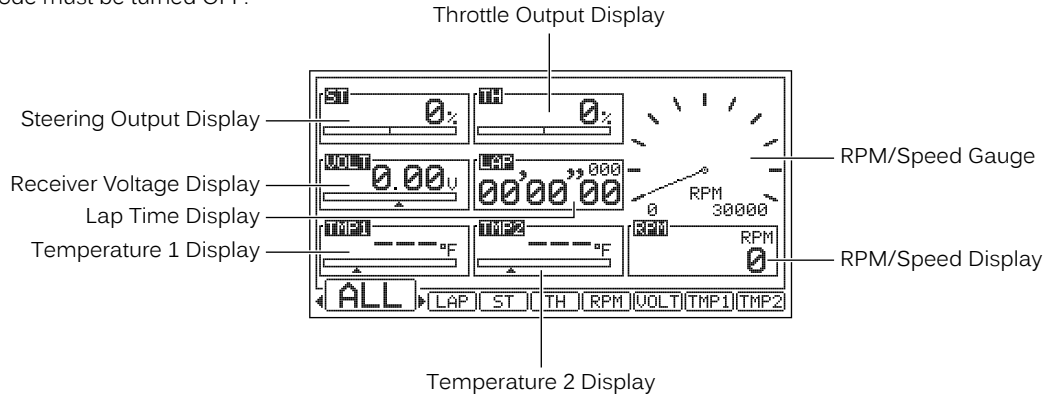
Use the SELECT switch to switch between ALL and LAP, ST, TH, RPM, VOLT, TMP1* and TMP2* pages. These pages display more detailed Telemetry Data and allow you to review Telemetry Data and Save the current Telemetry Data Log to your PC for archiving or viewing at a later time.

*Default name and function. Can be renamed if using different Telemetry accessories (available separately). For more information, see your local Airtronics or Sanwa retailer.

⚠ The layout of the information displayed on the ST, TH, RPM, VOLT, TMP1 and TMP2 pages is similar, so only the STEERING page is shown in this section. For information about viewing Lap Times, see the Viewing Lap Times section on page 84.

Telemetry Data Graph   Cursor Indicator

Page Indicator

Lap Indicator

Status Indicator

Direction/Max/Min Indicators

Numerical Telemetry Data

Elapsed Time

Data Point Scale

Lap Number   Lap Time
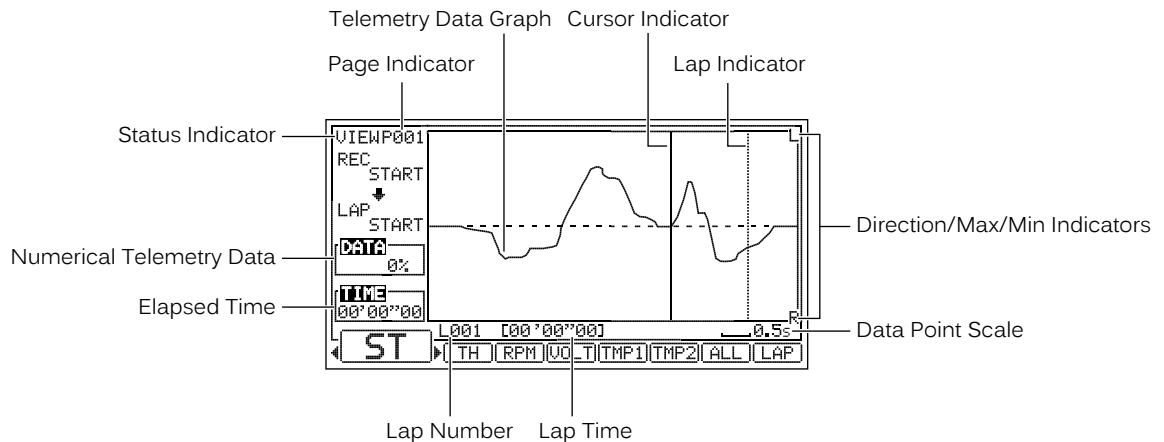
TELEMETRY Screen Overview Diagram Descriptions:

Cursor Indicator: Indicates the current position of the Cursor when reviewing Telemetry Data. The Cursor Indicator will only be displayed when in VIEW Mode.

Data Point Scale: Indicates the time in Seconds between recorded Telemetry Data Points. This value is fixed at 0.5 seconds.

Direction/Max/Min Indicators: Indicates Control Movement Direction or Programmed Maximum and Minimum Telemetry Data values, depending on the current TELEMETRY page being displayed.

Elapsed Time: Displays the current position in Time of the Cursor Indicator within the current Telemetry Data Log.

Lap Indicator: Indicates the position along the Telemetry Data Stream that a Lap Time was counted.

Lap Number: Displays the current Lap Number.

Lap Time: Displays the Lap Time of the currently Selected Lap Number.

Lap Time Display: Displays the current Lap Time in Minutes, Seconds and 1/100th of a Second, and the current Lap Number.

GENERAL

TELEMETRY SCREEN OVERVIEW | **GENERAL**

TELEMETRY Screen Overview Diagram Descriptions, Continued:

Numerical Telemetry Data: Displays the Telemetry Data in a numerical format.

Page Indicator: Indicates the current Page within the Telemetry Data Stream that Telemetry Data is currently being displayed on.

Receiver Voltage Display: Displays the current Voltage of the receiver battery. The tick mark indicates the current Voltage relative to the programmed Maximum Voltage value.

RPM/Speed Display: Displays the current RPM or speed in MPH or KM/H.

RPM/Speed Gauge: Displays the current RPM or speed in MPH or KM/H in graphical format. The needle indicates the current RPM or Speed relative to the programmed Maximum RPM or Speed value.

Status Indicator: Indicates the current Status of the Telemetry system. When VIEW is displayed, the Telemetry system is in VIEW mode, allowing you to view and analyze Telemetry Data. When REC is displayed, the Telemetry system is Recording Telemetry Data. When LOG is displayed, the Telemetry system is in Standby.

Steering Output Display: Displays the current position of the Steering channel as a percentage of Steering Wheel travel.

Telemetry Data Graph: Displays the Telemetry Data Stream in a graphical format.

Temperature 1 Display: In the default configuration, displays the current temperature in Fahrenheit or Celsius of the Temperature Sensor plugged into the TEMP1 Sensor Port in the receiver. The tick mark indicates the current temperature relative to the programmed Maximum and Minimum Temperature values. This label can be changed if using different Telemetry accessories.

Temperature 2 Display: In the default configuration, displays the current temperature in Fahrenheit or Celsius of the Temperature Sensor plugged into the TEMP2 Sensor Port in the receiver. The tick mark indicates the current temperature relative to the programmed Maximum and Minimum Temperature values. This label can be changed if using different Telemetry accessories.

Throttle Output Display: Displays the current position of the Throttle channel as a percentage of Throttle Trigger travel.

Reviewing Telemetry Data:

When the Telemetry Data Recorder has Stopped, you are able to view Telemetry Data in more detail. For more information about Starting and Stopping the Telemetry Data Recorder, see the Telemetry Data Recording section on pages 56 and 57.

1) After Stopping the Telemetry Data Recorder, press the SELECT switch to open the desired TELEMETRY page, either ST, TH, RPM, VOLT TMP1 or TMP2.

2) Press the ENTER key. The VIEW menu will open and PAGE will be surrounded by a box.

3) Scroll UP or DOWN to select the desired VIEW menu option.

   CURSOR - When chosen, scrolls through the Telemetry Data Stream in 0.5 second intervals.

   PAGE - When chosen, scrolls through the individual pages of the Telemetry Data Stream.

   LAP - When chosen, scrolls through each counted Lap Time along the Telemetry Data Stream.

   LAP-LT - When chosen, displays Total, Best and Average Lap Times, in addition to individual Lap Times.

   SAVE - When chosen, allows you to Save the Telemetry Data Log to your PC.
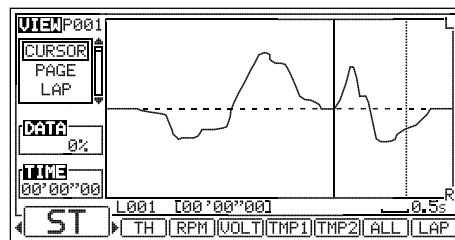
4) Press the ENTER key to highlight the desired VIEW menu option, then scroll UP or DOWN to scroll through the Telemetry Data Stream via the VIEW menu option you chose. You can also press the SELECT switch RIGHT or LEFT to view different TELEMETRY pages.

   ⚠️ If you choose the SAVE option to Save the Telemetry Data Log to your PC, see the PC LINK Menu > Saving the Telemetry Data Log section on pages 67 and 68 for information on how to do this.
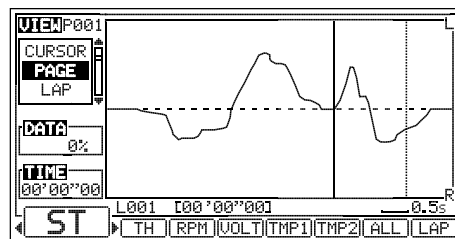
5) To choose a different VIEW menu option, press the BACK key, then repeat steps 3 and 4 to choose and highlight the desired VIEW menu option.

   ⚠️ When viewing the Telemetry Data Stream using the VIEW option menu, keep these things in mind: When a VIEW menu option is surrounded by a box, scroll UP or DOWN to choose a different VIEW menu option. When a VIEW menu option is highlighted, scroll UP or DOWN to scroll through the Telemetry Data Stream. Press the BACK key to cancel the highlighted VIEW menu option and choose another VIEW menu option.

   ⚠️ As you're scrolling through the Telemetry Data Stream, press the ENTER key at any time to Open a detailed list of Telemetry Data Entries. The highlighted Telemetry Data Entry at the top of the list is the one where you pressed the ENTER key.

TRANSMITTER AND RECEIVER BINDING

The Binding function allows you to Bind the transmitter and receiver pair. When new, it is necessary to pair the transmitter and receiver to prevent interference from transmitters operated by other users. This operation is referred to as 'Binding'. Once the Binding procedure is complete, the setting is remembered even when the transmitter and receiver are turned OFF, therefore, this procedure usually only needs to be done once.

⚠ The M12S Super features a Safety Link function that is used to program a unique code to each receiver/model pair, preventing the transmitter from controlling a model that it's not currently programmed for. The Safety Link function is compatible only with FH4 or FH4T receivers. It's not compatible with FH3 receivers.

> **IMPORTANT:** This section details Binding the RX-472 FH4T Super Response SSL receiver with a Safety Link Model number of 1 and with the Channel Response Mode set to SHR mode. If you are Binding an FH3 receiver, or if you prefer to change the Safety Link Number or the Channel Response Mode, see the BIND Menu section on pages 34 through 36.

⚠ Before beginning the Binding procedure, connect the switch harness, servos and the receiver battery to your receiver, using the diagram in the Receiver Overview Diagram, Connections and Mounting section on page 8. **Make sure that both the transmitter and the receiver are turned OFF.**

1) Turn the transmitter ON. The STATUS screen should be displayed.

2) If BASIC Mode is turned ON (default), press the ENTER key to open the BASIC menu. If BASIC Mode is turned OFF, press the SELECT switch to highlight the SYSTEM menu, then press the ENTER key to open the SYSTEM menu.
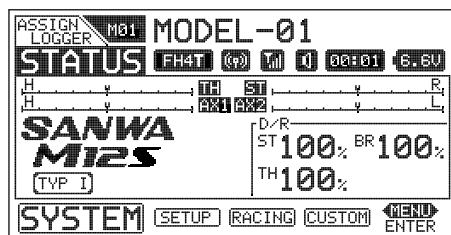
3) Scroll UP or DOWN to highlight the BIND menu, then press the ENTER key to open the BIND menu.
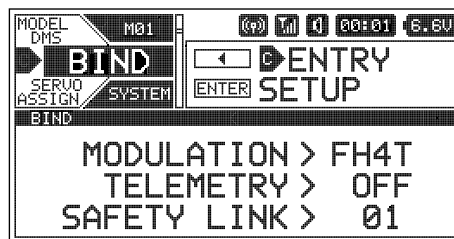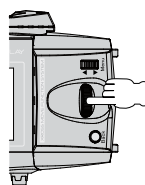
⚠ Double-check that Modulation is set to FH4T, Telemetry is turned ON, Safety Link is set to 01 and that each channel is set to SHR. If you want to change any of these settings, see the BIND Menu section on pages 34 through 36.

4) While holding down the Bind Button on the receiver, turn the receiver ON. The Bind LED on the receiver will flash slowly. Release the Bind Button. The Bind LED will continue to flash slowly.
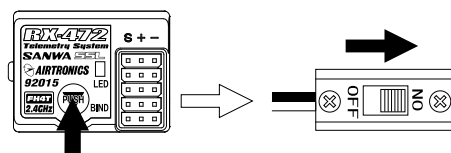
⚠ You must complete step 5 below within 10 seconds or the Bind LED will go out, indicating the receiver has timed out. If this occurs, turn the receiver OFF, then repeat step 4.

5) Scroll DOWN to highlight the BIND [ENTER] option, then press the ENTER key. The [ENTER] command and LED1 on the transmitter will begin to flash and the Bind LED on the receiver will flash rapidly, then go out.
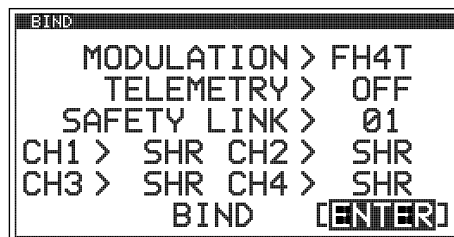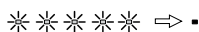
6) After the Bind LED on the receiver goes out, press the ENTER key a second time. Both the Bind LED on the receiver and LED1 on transmitter will illuminate solid, indicating that the Binding procedure is complete.

7) Move the Steering Wheel and Throttle Trigger to verify that the servos are operating normally, then repeatedly press the BACK key to return to the STATUS screen.

⚠ Under some circumstances, the receiver may not operate after turning the transmitter and receiver ON. If this occurs, perform the Binding procedure again.

BASIC MODE MENU OVERVIEW   BASIC

The M12S Super features a BASIC Mode that simplifies transmitter use. The accompanying BASIC menu contains some of the more common, general-use Programming Menus that a user will require for basic programming. When BASIC Mode is turned ON, not only are these various Programming Menus in one easy place to find them, so you don't need to spend time finding them in one of the other four menus, but it also removes the TELEMETRY and ASSIGN screens to simplify transmitter use.
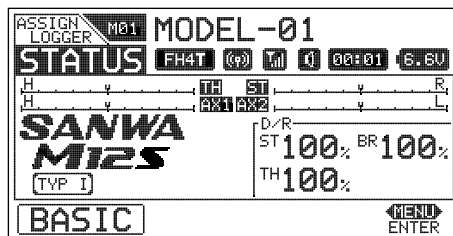
To access the various BASIC menu Programming Menus, turn the transmitter ON, then press the ENTER key to open the BASIC menu.

Scroll UP or DOWN to highlight the desired Programming Menu, then press the ENTER key to open that menu.

The following Programming Menus are available within the BASIC menu:

MENU	MENU DESCRIPTION	PAGE #
SELECT	Select Your Model	PG. 28
BIND	Bind, Choose Modulation Type, Safety Link Number and Channel Response Mode	PG. 34
D/R	Adjust Steering, Throttle and Brake Dual Rates	PG. 89
EPA	Adjust Channel End Points to Balance Servo Travel	PG. 73
CURVE	Adjust Channel Exponential, Adjustable Rate Control (ARC) and Curves	PG. 90
SPEED	Adjust Servo Speed in the Forward and the Return to Neutral Directions	PG. 95
TRIM	Adjust Servo Trim, Including Auxiliary Channel Trim	PG. 89
SUB TRIM	Adjust Servo Centering to Center the Servo Horns	PG. 74
REV	Change the Direction of Servo Travel	PG. 75
F/S	Program Fail Safe Settings	PG. 80
ALB	Turn Anti-Lock Braking ON or OFF and Choose Anti-Lock Braking Options	PG. 96
NAME	Name Your Model	PG. 29
COPY	Copy Model Programming Data From One Model to Another	PG. 30
INFORMATION	View Firmware Version, Change Boot Screen, Turn BASIC Mode ON and OFF, and More	PG. 71

TURNING BASIC MODE ON AND OFF   BASIC

1) Press the ENTER key to open the BASIC menu, then scroll UP or DOWN to highlight the INFORMATION menu.
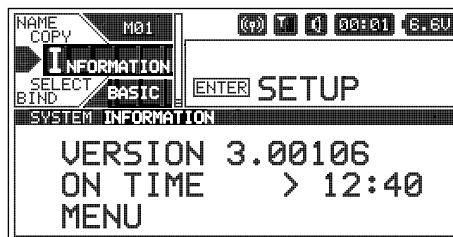
⚠ If BASIC Mode is turned OFF, press the SELECT switch to highlight the SYSTEM menu. Press the ENTER key a second time to open the SYSTEM menu, then scroll UP or DOWN to highlight the INFORMATION menu.

2) Press the ENTER key to open the INFORMATION menu. The cursor will default to ON TIME > XX:XX.

3) Scroll UP or DOWN to highlight BASIC > ON or BASIC > OFF.
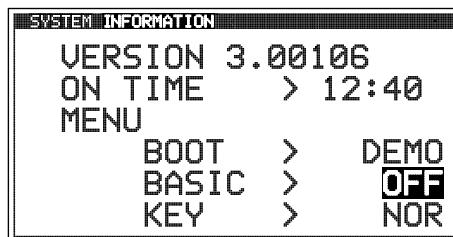
4) Press the ENTER key, then scroll UP or DOWN to select the desired option, either ON or OFF. When ON is selected, BASIC Mode will be turned ON and when OFF is selected, BASIC Mode will be turned OFF.

SYSTEM MENU OVERVIEW   SYSTEM

To access the various SYSTEM menu Programming Menus, turn the transmitter ON, press the SELECT switch to highlight the SYSTEM menu, then press the ENTER key to open the SYSTEM menu.

Scroll UP or DOWN to highlight the desired Programming Menu, then press the ENTER key to open that menu.
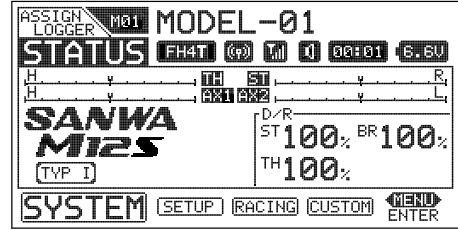
⚠ BASIC Mode must be turned OFF to access the SYSTEM menu. For more information, see the Turning BASIC Mode ON and OFF section on the previous page. In addition, depending on the Car Type chosen, some Function Programming Value Names may differ from those shown in this section.

The following Programming Menus are available within the SYSTEM menu:

MENU	MENU DESCRIPTION	PAGE #
TYPE	Choose Car Type Templates From Normal to Crawler	PG. 27
MODEL	Model Select, Model Name, Model Copy, Model Clear, Model Sort and Model Templates	PG. 28
DMS	Direct Model Select - Use to Quickly Select Your Favorite Models	PG. 34
BIND	Bind, Choose Modulation Type, Safety Link Number and Channel Response Mode	PG. 34
SERVO	Use the Servo Monitor to View Servo Travel Digitally	PG. 36
ASSIGN	Assign Functions to the Switches, Rotary Dial, Auxiliary Lever and Telemetry	PG. 37
BUZZER	Turn Audible Key Tones and Alarms ON and OFF and Control Their Pitch and Volume	PG. 46
VIBRATOR	Turn Vibrating Alerts and Alarms ON and OFF	PG. 47
LCD	Adjust the Contrast, Brightness and Display Mode of the LCD Screen	PG. 48
AUX TYPE	Choose the Operating Mode of the Two Auxiliary Channels	PG. 50
TRIM TYPE	Choose the Desired Servo Trim Type - Either Parallel or Centered	PG. 51
TH TYPE	Choose the Desired Throttle Bias Type	PG. 51
CALIBRATION	Calibrate Steering, Throttle and Auxiliary Lever Controls	PG. 52
BATT	Specify Transmitter Battery Low Voltage Alert and Limit Alarms	PG. 54
LOG SETUP	Program TELEMETRY Screen and Telemetry Recording Options	PG. 56
USER NAME	Change the Name Displayed Above the M12S Super Logo on the STATUS Screen	PG. 66
PC LINK	Save Telemetry Logs, Save and Load Model Programming and Update Firmware	PG. 67
INFORMATION	View Firmware Version, Change Boot Screen, Turn BASIC Mode ON and OFF, and More	PG. 71

TYPE MENU {CAR TYPE TEMPLATES}   SYSTEM

The Type function allows you to quickly set up the transmitter's Mixing options based on the type of model you're driving. Common templates for Car or Truck and Crawler Car Types are provided. For example, if your Crawler features separate Front and Rear Steering servos, choosing one of the Crawler Car Types will automatically program the transmitter for Four Wheel Steering. The TYPE menu will also display what receiver channels to plug the servos into since this will vary depending on the Car Type chosen. This takes the guess-work out of setting up your model.

> **WARNING:** TYPE menu selections are designed to be used when setting up a new model and should be done prior to making any programming changes to your model. When the Type function is used to change the Car Type, all Programming Data (including custom Programming Data) for the current model will be RESET!

Choosing a Car Type:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the TYPE menu.
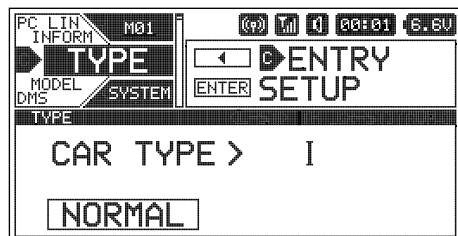
TYPE MENU {CAR TYPE TEMPLATES}   SYSTEM

Choosing a Car Type, Continued:

2) Press the ENTER key to open the TYPE menu. The cursor will default to CAR TYPE > I.

3) Press the ENTER key, then scroll UP or DOWN to Select the desired Car Type as shown in the table below. The TYPE Menu Programming Display shows the Car Type (Normal or Crawler) and which servos should be plugged into what receiver channel ports. For example, CAR TYPE > VII is a Normal Car Type that might be used for a 1/5th scale off-road gas buggy that uses two Steering servos and a separate second Brake servo. In this example, the Left Steering servo should be plugged into channel 1, the Right Steering servo should be plugged into channel 3, the Throttle/first Brake servo should be plugged into channel 2 and the second Brake servo should be plugged into channel 4.

4) Press the ENTER key. MODEL DATA CLEAR? NO/YES will be displayed.

5) Scroll UP or DOWN to highlight YES, then press the ENTER key. EXECUTING will be displayed and the current Model Programming Data will be reset with the Selected Car Type options.

⚠ If you want to go back and change the Car Type or you don't want to create the new Car Type for any reason, choose NO or press the BACK key prior to EXECUTING.

⚠ Your particular model may not require the use of all four channels, even though each Car Type template may show them. In this case, those channels will simply go unused.

This table shows the various channel functions based on the selected Car Type:

TYPE CH	TYP I	TYP II	TYP III	TYP IV	TYP V	TYP VI	TYP VII	TYP VIII	TYP IX	TYP X
CH 1	ST	ST	ST	ST	L-ST	L-ST	L-ST	F/ST	ST	F/ST
CH 2	TH+BR	TH	TH+BR	TH	TH+BR	TH	TH+BR	TH+BR	F/TH+BR	F/TH+BR
CH 3	AUX1	BR	BR2	BR	R-ST	R-ST	R-ST	R/ST	R/TH+BR	R/ST
CH 4	AUX2	AUX	AUX	BR2	AUX	BR	BR2	AUX	AUX	R/TH+BR

ST=Steering • TH=Throttle • BR=Brake • BR2=Brake 2 • R-ST=Right • L-ST=Left • R/ST or R/TH=Rear • F/ST or F/TH=Front
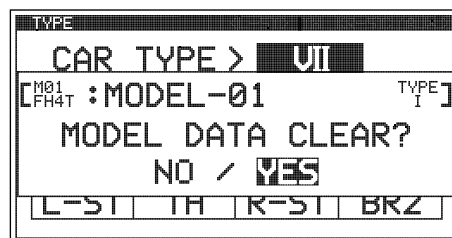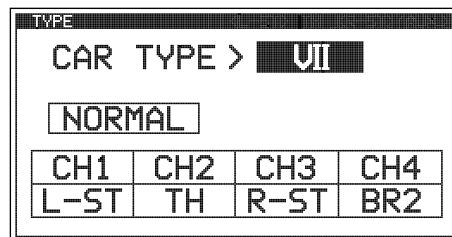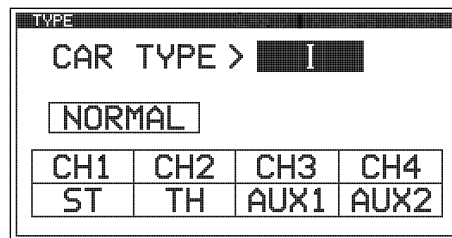
MODEL MENU {SELECT, NAME, COPY, CLEAR, SORT AND TEMPLATE}   SYSTEM

The MODEL menu allows you to Select different models, Name your saved models, Copy Programming Data from one model to another model, Clear Programming Data from one or more models and Sort your saved models into a Custom List. A Model Template function allows you to store up to five Pre-Programmed Data Templates that allow you to more easily set up the transmitter for models that require more time-consuming and complicated programming. Two Model Templates are factory-programmed for use with the Super Vortex ZERO and Super Vortex Type-D ESCs to get you started.

Model Select

The Model Select function allows you to load the Programming Data for the particular model you wish to drive. The MODEL SELECT menu displays the currently Selected Model, along with a list of available models that can be Selected. The current Modulation Type and Car Type of each model is also displayed. Programming Data for up to 50 different models can be stored in the transmitter's memory.

Selecting a Model:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the MODEL menu.
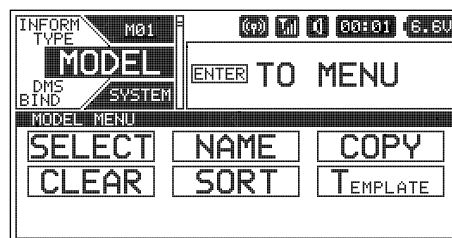
MODEL MENU {SELECT, NAME, COPY, CLEAR, SORT AND TEMPLATE}   **SYSTEM**

Selecting a Model, Continued:

2) Press the ENTER key to open the MODEL menu. The SELECT menu will be highlighted and the currently Selected Model will be displayed in brackets at the top of the Model Select List.
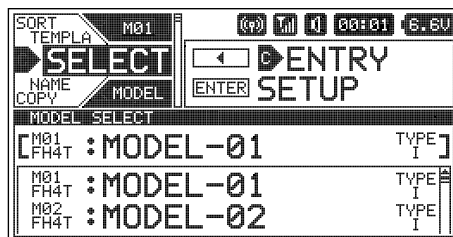
3) Press the ENTER key to open the SELECT menu, then scroll UP or DOWN within the Model Select List to highlight the model you would like to load Programming Data for.
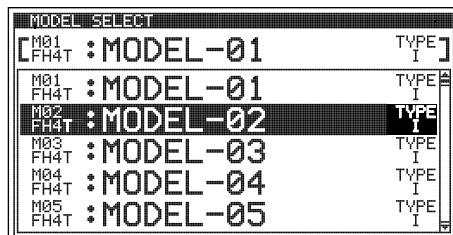
4) Press the ENTER key. MODEL SELECT OK? NO/YES will be displayed. Scroll UP or DOWN to highlight YES, then press the ENTER key.

⚠ If you want to go back and change models or you don't want to select a different model for any reason, choose NO or press the BACK key prior to EXECUTING.
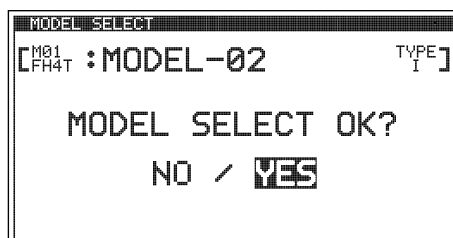
5) EXECUTED will be displayed and the model that you just selected will be displayed in brackets above the Model Select List.

⚠ When a model is Selected, the Programming Data for that model will be loaded immediately.
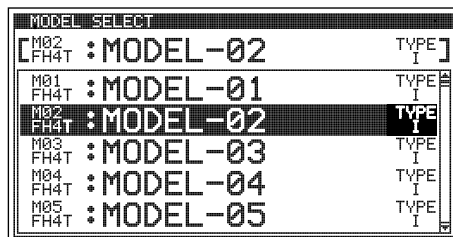
Model Name

The Model Name function allows you to name each of the 50 individual models. This makes it easy to keep track of multiple models. The Model Name can consist of up to 14 letters, numbers or symbols. Choose from capital letters, Lower case letters, numbers and various symbols. A model must be Selected before a Model Name can be entered or modified. In the default configuration, M01:MODEL-1 is selected. To enter a Model Name for another model, that model must first be selected using the Model Select function.

Entering a Model Name:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the MODEL menu.
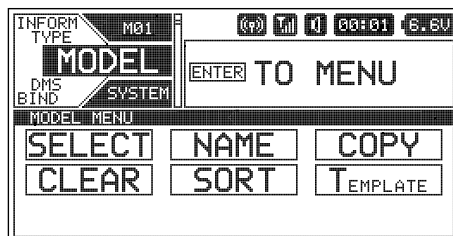
2) Press the ENTER key to open the MODEL menu, then scroll UP or DOWN to highlight the NAME menu.
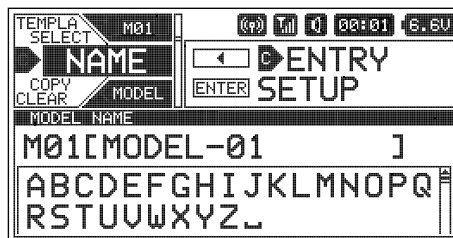
MODEL MENU {SELECT, NAME, COPY, CLEAR, SORT AND TEMPLATE} | **SYSTEM**

Entering a Model Name, Continued:

3) Press the ENTER key to open the NAME menu. The underscore will be positioned under the first character in the Model Name.
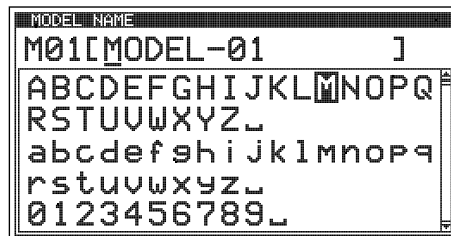
4) Press the SELECT switch RIGHT or LEFT or scroll UP or DOWN to move the underscore under the character you want to change, then press the ENTER key.

5) Scroll UP or DOWN and press the SELECT switch RIGHT or LEFT to highlight a character in the Character List. Press the ENTER key to select the highlighted character. That character will be displayed in the Model Name and the underscore will advance to the next space. **If at any time you can't move the underscore, press the BACK key to re-gain control of the underscore.**
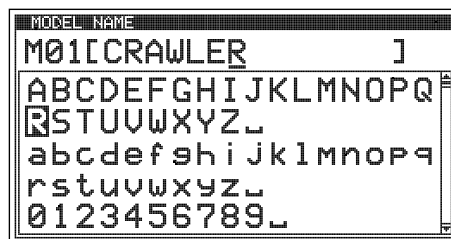
6) Repeat step 5 to enter the rest of the characters. Up to 14 characters can be entered. If desired, press the BACK key to re-gain control of the underscore, then use the SELECT switch or scroll UP or DOWN to move the underscore RIGHT or LEFT. To add a space (or spaces) in your Model Name, use the ▄▄ character.

Deleting a Character:

1) Press the SELECT switch RIGHT or LEFT or scroll UP or DOWN to move the underscore under the character in your Model Name you want to delete.

2) Press the ENTER key, then scroll UP or DOWN and press the SELECT switch RIGHT or LEFT to highlight the ▄▄ character in the Character List. Press the ENTER key. The character in your Model Name will be deleted and the underscore will advance to the next space.

Deleting a Model Name:

1) Press the SELECT switch RIGHT or LEFT or scroll UP or DOWN to move the underscore under the first character in your Model Name.

2) Press the ENTER key, then scroll UP or DOWN and press the SELECT switch RIGHT or LEFT to highlight the ▄▄ character in the Character List. Continuously press the ENTER key to delete each character in your Model Name.

Model Copy

The Model Copy function allows you to copy the Programming Data FROM the currently TO another model. For example, if you have two models that are similar, you can copy the Programming Data from the first model to the second model to use as a base to start fine-tuning the programming for the second model. Make sure that prior to using the Model Copy function, you first select the desired model you want to copy Programming Data FROM, using the Model Select function.

Copying Model Programming Data:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the MODEL menu.
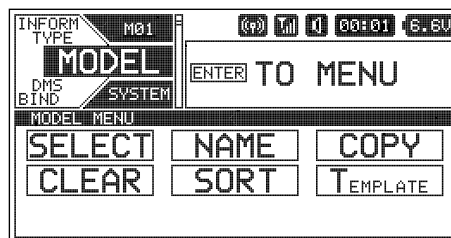
2) Press the ENTER key to open the MODEL menu, then scroll UP or DOWN to highlight the COPY menu.
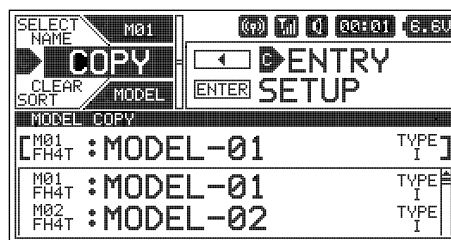
MODEL MENU {SELECT, NAME, COPY, CLEAR, SORT AND TEMPLATE} | **SYSTEM**

Copying Model Programming Data, Continued:

3) Press the ENTER key to open the COPY menu. The currently will be displayed in brackets above the Model Copy List.

4) Scroll UP or DOWN within the Model Copy List to highlight the model you would like to copy the current Model's Programming Data TO.

5) Press the ENTER key. MODEL COPY OK? NO/YES will be displayed. Scroll UP or DOWN to highlight YES, then press the ENTER key.

⚠️ All Model-specific Programming Data, including the Model Name will be copied to the highlighted model. If you want to go back and change models or you don't want to Copy the Programming Data for any reason, choose NO or press the BACK key prior to EXECUTING.

6) EXECUTED will be displayed and the model you just copied Programming Data TO will be highlighted in brackets and the top of the Model Copy List.
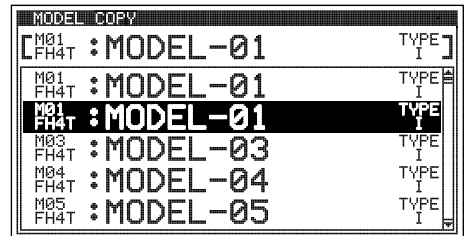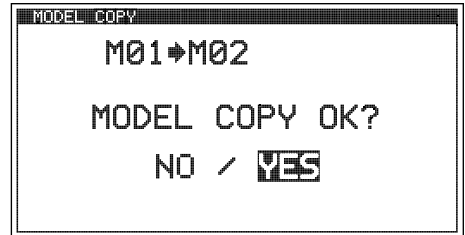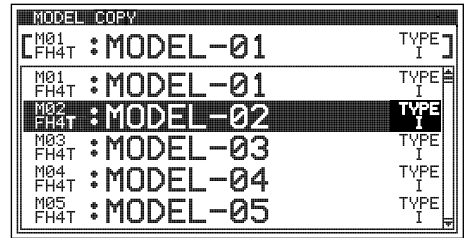
Model Clear

The Model Clear function allows you to reset model-specific Programming Data for the currently Selected Model back to the Factory Default settings. Make sure that prior to using the Model Clear function, you first Select and load the desired model you want to clear the Programming Data for, using the Model Select function.

⚠️ When the Model Clear function is EXECUTED, all custom Programming Data for the currently Selected Model will be reset to the Factory Default settings!

Clearing Model Programming Data:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the MODEL menu.

2) Press the ENTER key to open the MODEL menu, then scroll UP or DOWN to highlight the CLEAR menu. The currently Selected Model will be displayed.

3) Press the ENTER key. MODEL CLEAR OK? NO/YES will be displayed. Scroll UP or DOWN to highlight YES, then press the ENTER key. EXECUTED will be displayed and all Programming Data for the currently Selected Model will be reset to the Factory Default settings.

⚠️ If you want to go back and change models or you don't want to Clear the Programming Data for any reason, choose NO or press the BACK key prior to EXECUTING.
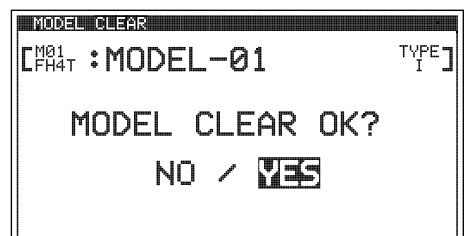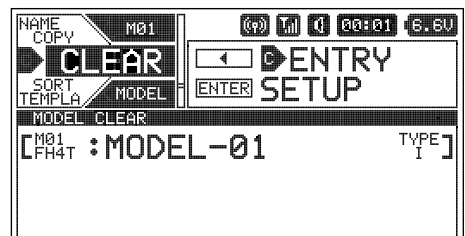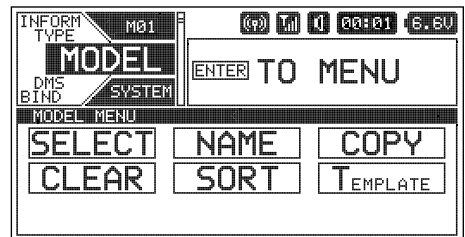
SYSTEM

MODEL MENU {SELECT, NAME, COPY, CLEAR, SORT AND TEMPLATE} **SYSTEM**

Model Sort

The Model Sort function allows you to change how your models are displayed in the Model Select List by allowing you to swap the currently Selected Model with other models. For example, you might want to Sort your models so that your most frequently used models are at the top of the Model Select List, or you might want to Sort your models by type, such as crawlers, on-road, etc.

Sorting Models:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the MODEL menu.
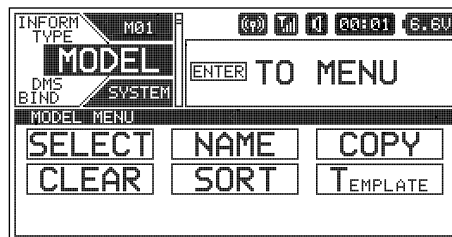
2) Press the ENTER key to open the MODEL menu, then scroll UP or DOWN to highlight the SORT menu.
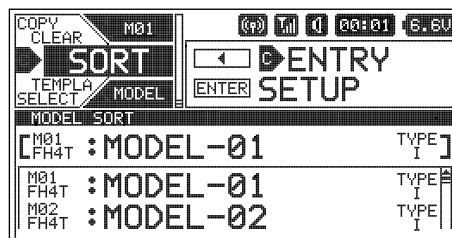
3) Press the ENTER key to open the SORT menu. The currently Selected Model will be displayed in brackets above the Model Sort List and the first model in the Model Sort List will be highlighted.
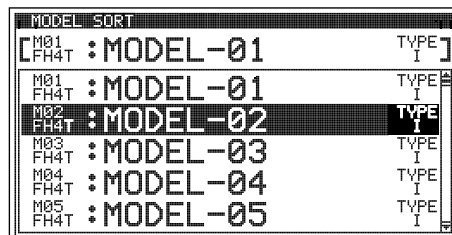
4) Scroll UP or DOWN within the Model Sort List to highlight the model you would like to swap the currently Selected Model with and move to the top of the Model Sort List. For example, the currently Selected Model is M01. Highlight M02 to swap M01 with M02 and move it to the top of Model Sort List.

5) Press the ENTER key. MODEL SORT OK? NO/YES will be displayed. Scroll UP or DOWN to highlight YES, then press the ENTER key.

⚠️ If you want to go back and choose a different model or you don't want to Sort the for any reason, choose NO or press the BACK key prior to EXECUTING.
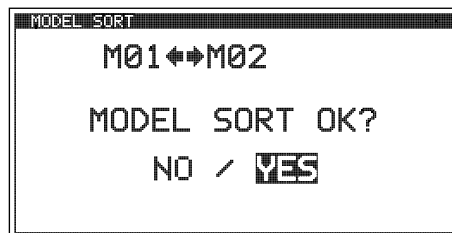
6) EXECUTED will be displayed and the model you highlighted (i.e. M02) will be swapped with the currently Selected Model and moved to the top of the Model Sort List.
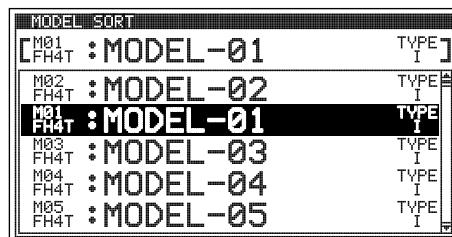
7) Repeat steps 4 through 6 to continue Sorting Models by swapping with the currently Selected Model. To swap with a different model, you must Select that desired model using the Model Select function first. For more information, see the Model Select section on pages 28 and 29.

Model Template

The Model Template function allows you to store up to five downloaded Pre-Programmed Model Templates that allow you to more easily set up the transmitter for models that require more time-consuming and complicated programming. Two Model Templates are factory-programmed for use with the Super Vortex ZERO and Super Vortex Type-D ESCs to get you started. If your model uses one of these ESC's, you can Copy the desired Model Template to the Selected Model and the Auxiliary Type and CODE functions will already be programmed for you. Model Templates can be Saved and Loaded using the PC LINK function.

Selecting a Model:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the MODEL menu.

2) Using the Model Select function, select the model you would like to copy Template Programming Data to. For more information, see the Model Select section on pages 28 and 29.

MODEL MENU {SELECT, NAME, COPY, CLEAR, SORT AND TEMPLATE}   **SYSTEM**

Copying a Model Template:

1) From within the MODEL menu, scroll UP or DOWN to highlight the TEMPLATE menu.
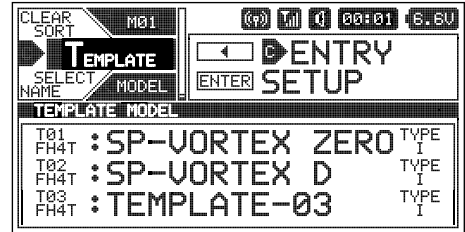
2) Press the ENTER key to open the TEMPLATE menu. The Template List will be displayed and the currently Selected Model will be displayed in brackets at the bottom of the Template List.
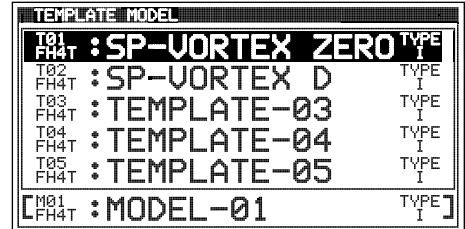
3) Scroll UP or DOWN within the Template List to highlight the Model Template you would like to Copy to the currently Selected Model.

⚠ When you Copy a Model Template to the Selected Model, that model's Programming Data will be overwritten.

4) Press the ENTER key. TEMPLATE MODEL OK? NO/YES will be displayed. Scroll UP or DOWN to highlight YES, then press the ENTER key. EXECUTED will be displayed and all Model Template Programming Data, including the Template Name, will be copied to the Selected Model.
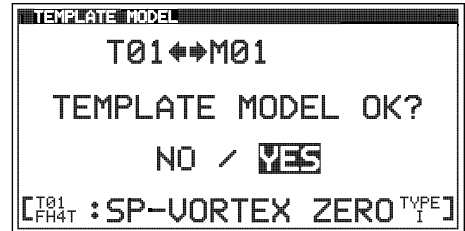
⚠ If you want to go back and choose a different Model Template or you don't want to Copy the Model Template to the Selected Model for any reason, choose NO or press the BACK key prior to EXECUTING.

⚠ It's not possible to change Model Template Programming Data or the Template Name prior to EXECUTING. However, you can change the Model Name and Programming Data after copying the Model Template to the Selected Model.

PRO TIP: Using the PC LINK function, new Model Templates can be downloaded from the Internet, saved to your PC, then Loaded into the TEMPLATE menu. Model Templates can also be saved to your PC for later use or to archive them if you have more than five Model Templates. In addition, model Programming Data, including the Model Name can be Saved as a Model Template. This allows you to share Model Templates with other users. For more information, see the Saving Model Templates section and the Loading Model Templates sections on pages 69 and 70, respectively.

The following two Model Templates are factory-programmed to get you started:

TEMPLATE T01		
Model Name	SP-Vortex ZERO	
Car Type	I	
Aux Type 1	CODE	
Aux Type 2	CODE	
Code Aux 1	CODE1 F-BR-R>0	Full Brake Rate
	CODE2 N-BR-R>0	Drag Brake
	CODE3 DRV-F>0	Drive Feel
	CODE4 N-BR-F>20	Drag Brake Feel
	CODE5 BR-F>0	Brake Feel
Code Aux 2	CODE1 BOST-R>0	Boost
	CODE2 TURBO>0	Turbo
	CODE3 PW-MOD>0	Power Mode
	CODE4 CODE4>0	
	CODE5 CODE5>0	

TEMPLATE T02		
Model Name	SP-Vortex D	
Car Type	I	
Aux Type 1	CODE	
Aux Type 2	CODE	
Code Aux 1	CODE1 TH-RES>0	Throttle Response
	CODE2 N-BR-R>0	Drag Brake
	CODE3 DRV-F>0	Drive Feel
	CODE4 N-BR-F>20	Drag Brake Feel
	CODE5 BR-F>0	Brake Feel
Code Aux 2	CODE1 BOST-R>0	Boost
	CODE2 RE-LMT>0	Rev Limiter
	CODE3 ACT-TH>0	Active Throttle
	CODE4 CODE4>0	
	CODE5 CODE5>0	

SYSTEM

DMS MENU {DIRECT MODEL SELECT}   SYSTEM

The DMS function allows you to choose up to three different models that can be selected when turning the transmitter ON. Simply press a key while turning the transmitter ON and the Programming Data for your favorite model will load automatically.

<u>Using the Direct Model Select Function:</u>

1) Make sure that the transmitter is turned OFF.

2) Press and HOLD the SELECT switch Right or Left, or press and HOLD the BACK key while turning the transmitter ON. The Model Programming Data associated with either of those key presses will automatically load.

<u>Changing Direct Model Select Models:</u>

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the DMS menu.
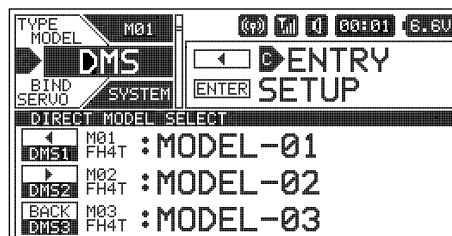
2) Press the ENTER key to open the DMS menu, then scroll UP or DOWN to highlight the Model Name adjacent to the DMS number you would like to change.
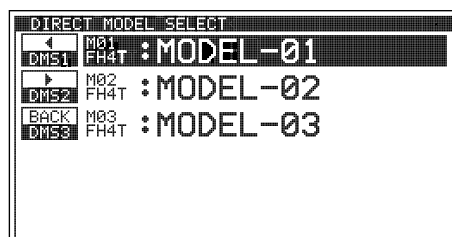
> SELECT switch LEFT controls DMS1, SELECT switch RIGHT controls DMS2 and the BACK key controls DMS3.

3) Press the ENTER key, then scroll UP or DOWN to choose the model you want to be controlled by that particular Direct Model Select switch.

4) Repeat step 3 to Assign any other desired models to the remaining Direct Model Select Switches.
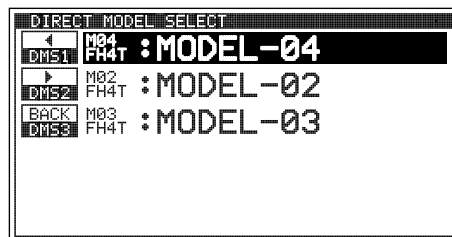
BIND MENU {BINDING, MODULATION TYPE, SAFETY LINK AND RESPONSE MODE}   SYSTEM

The BIND menu allows you to change the transmitter's Modulation Type, turn the Telemetry function ON and OFF, assign a Safety Link Number to your model's receiver, change the Channel Response Mode and Bind the transmitter and receiver pair.

All settings are model-specific, so you can have different settings to suit different models.

⚠ The Modulation Type and Safety Link Number must be chosen prior to Binding the transmitter and receiver. If these options are changed after Binding, you will need to Bind the transmitter and receiver pair again for the changes to take affect.

****Make sure the Modulation Type you choose matches the Modulation Type of the receiver you're using!****

The following Modulation Types* are available:

FH3 - Select this Modulation Type when using Airtronics or Sanwa 2.4GHz FH3 surface receivers.

FH4T - Select this Modulation Type when using Airtronics or Sanwa 2.4GHz FH4 or FH4T surface receivers (default).

*Modulation Type of FH3 and FH4T are illegal in EU market. For EU market, FH3E and FH4TE are available as Legal Modulation Type.

> **IMPORTANT:** Not all BIND menu functions are supported by all Modulation Types. Only supported functions will be displayed once a Modulation Type is chosen. For example, the FH3 Modulation Type does not support Telemetry, Safety Link or the SSR Channel Response Mode.

<u>Changing the Modulation Type:</u>

The Modulation Type function allows you to choose the transmitter Modulation Type. The Modulation Type should be changed to match the receiver you're using. For example, if you use an Airtronics or Sanwa 2.4GHz FH3 surface receiver with your transmitter, you would need to change the Modulation Type to FH3. The Modulation Type should be chosen prior to Binding the transmitter and receiver pair.

BIND MENU {BINDING, MODULATION TYPE, SAFETY LINK AND RESPONSE MODE}   **SYSTEM**

Changing the Modulation Type, Continued:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the BIND menu.

2) Press the ENTER key to open the BIND menu. MODULATION > FH4T will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to select the desired Modulation Type.

4) Press the ENTER key. SET TO FH3? (or the Modulation Type you selected) NO/YES will be displayed. Scroll UP or DOWN to highlight YES, then press the ENTER key.

   ⚠ If you want to go back and change the Modulation Type or if you don't want to change the Modulation Type for any reason, choose NO or press the BACK key.
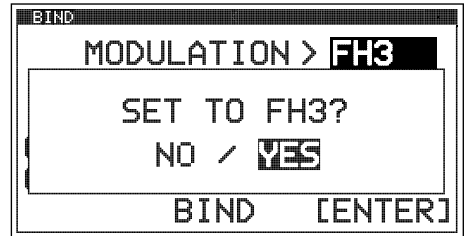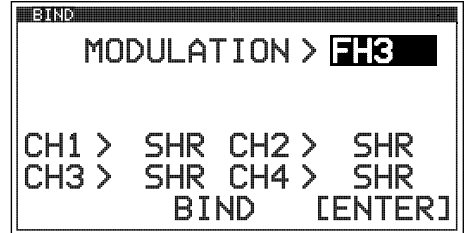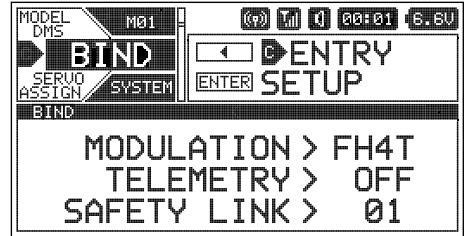
Turning the Telemetry Function ON and OFF:

1) From within the BIND menu, scroll down to highlight TELEMETRY > OFF.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Telemetry value, either ON or OFF.

   TELEMETRY setting range is ON or OFF. The default setting is OFF.
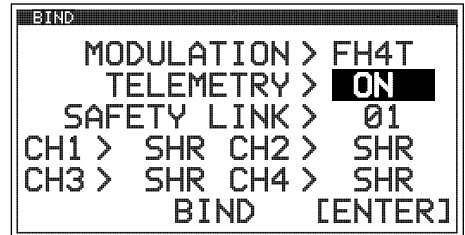
Changing the Safety Link Number:

The Safety Link function is used to program a unique code to each receiver/model pair, preventing the transmitter from controlling a model that it's not currently programmed for. This helps prevent a runaway model should you accidentally choose the wrong Programming Data for the intended model.

⚠ The Safety Link Number should be chosen prior to Binding the transmitter and receiver pair. To make it easier to keep track of what Safety Link Number goes to what model, we suggest making the Safety Link Number the same as the Model Number.

1) From within the BIND menu, scroll down to highlight SAFETY LINK > 01.

2) Press the ENTER key, then scroll UP or DOWN to highlight the desired Safety Link Number.

   SAFETY LINK setting range is 01 to 50. The default setting is 01.
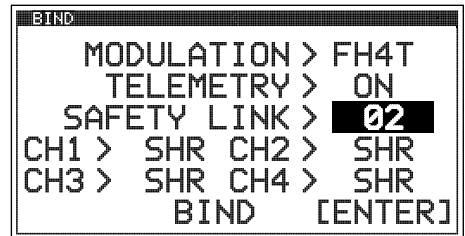
3) Press the ENTER key. SET TO LINK No.02? (or the Safety Link Number you selected) NO/YES will be displayed. Scroll UP or DOWN to highlight YES, then press the ENTER key.

   ⚠ If you want to go back and change the Safety Link Number or if you don't want to change the Safety Link Number for any reason, choose NO or press the BACK key.
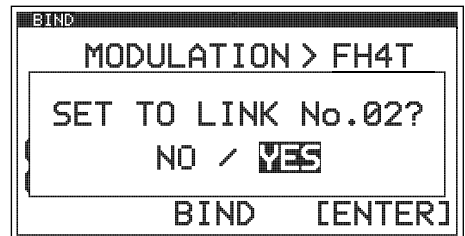
SYSTEM

BIND MENU {BINDING, MODULATION TYPE, SAFETY LINK AND RESPONSE MODE}   SYSTEM

Changing the Channel Response Mode:

The Channel Response Mode function is used to change the Response Mode of each channel to suit the type of servos you're using. The combination of using Digital servos and using the correct Channel Response Mode results in increased reaction speed and improved feel, making you feel more connected to your model than ever. For example, using the SHR Channel Response Mode with any brand of Digital servo will increase the servo's Response Time, even above the manufacturer's specification. For the fastest Response Time possible, use the SSR Channel Response Mode with Airtronics or Sanwa Super Response SRG Digital servos.

1) From within the BIND menu, scroll down to highlight the desired channel you would like to change the Channel Response Mode for.

```
┌─BIND─────────────────────┐
│                          │
│   MODULATION > FH4T       │
│    TELEMETRY >  ON        │
│   SAFETY LINK >  02       │
│  CH1 >  SHR   CH2 >  SHR   │
│  CH3 >  SHR   CH4 >  SHR   │
│           BIND   [ENTER]  │
└──────────────────────────┘
```

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Channel Response Mode value for that channel.

3) Press the ENTER key, then repeat steps 1 and 2 to choose the Channel Response Mode for any desired remaining channels.
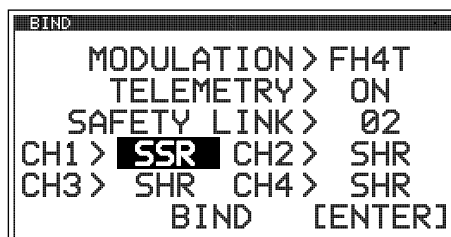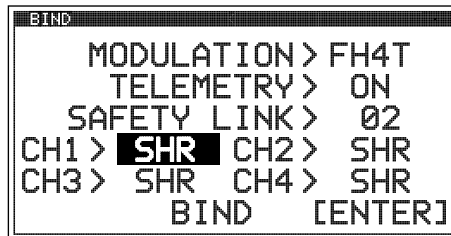
> CHANNEL RESPONSE MODE setting range is NOR, SHR and SSR. The default setting is SHR.

```
┌─BIND─────────────────────┐
│                          │
│   MODULATION > FH4T       │
│    TELEMETRY >  ON        │
│   SAFETY LINK >  02       │
│  CH1 >  SSR   CH2 >  SHR   │
│  CH3 >  SHR   CH4 >  SHR   │
│           BIND   [ENTER]  │
└──────────────────────────┘
```

The following Channel Response Modes are available:

NOR - Use with any brand of Analog or Digital servos (Slowest Response Time).

SHR - Use with any brand of Digital servos only (Faster Response Time).

SSR - Use with Airtronics or Sanwa Super Response SRG Digital servos only (Fastest Response Time) - FH4T Modulation Only.

WARNING: If you're using Analog servos in your model, DO NOT use the SHR or SSR Channel Response Mode for those channels. Use the NOR Channel Response Mode with Analog servos. Using SHR or SSR Channel Response Modes with Analog servos can result in poor performance or even damage to the servos and/or the receiver.

WARNING: SHR and SSR Channel Response Modes should only be used with Digital servos. While the SHR Channel Response Mode can be used with any brand of Digital servo, the SSR Channel Response Mode should ONLY be used with Airtronics or Sanwa Super Response SRG Digital servos.

IMPORTANT: Not all ESCs are compatible with SHR or SSR Channel Response Modes. If your ESC does not operate correctly, change the Throttle Channel Response Mode to NOR.

IMPORTANT: SSR Channel Response Mode is only available when used with compatible FH4 or FH4T Super Response receiver.

IMPORTANT: When switching between SHR and SSR Channel Response Modes, your model's End Point Adjustment (EPA) settings may be altered. In this case, you should double-check the EPA settings and readjust them if necessary.

Response Mode LEDs:

Two Response Mode LEDs (ST and TH), located on top of the transmitter, indicate the current Channel Response Mode for those channels. This allows you to view the Channel Response Mode at a glance: **NOR** - LED OFF / **SHR** - LED RED / **SSR** - LED BLUE.

Binding the Transmitter and Receiver:

To Bind the transmitter and receiver, please see the Transmitter and Receiver Binding section on page 23. Prior to Binding the transmitter and receiver, make sure to choose the desired Modulation Type and Safety Link Number.

SERVO MENU {SERVO MONITOR}   SYSTEM

The Servo Monitor displays the output levels of the four different channels in bar graph form, allowing you to monitor servo operation in a virtual manner. This is helpful to see servo movement when the controls are moved, and it allows you to visualize what is occurring with servo movements when you apply different Mixing values, exponential, etc. When used in conjunction with the DISPLAY key, the Servo Monitor allows you to see servo movement virtually and make programming changes without the transmitter actually transmitting a signal.
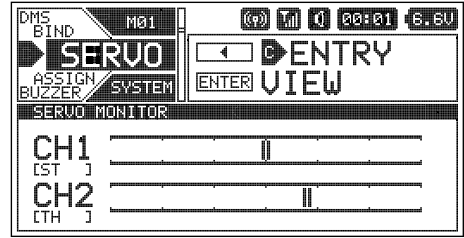
⚠ The channel names displayed will vary based on the Car Type selected in the TYPE menu.

SERVO MENU {SERVO MONITOR}   SYSTEM


Using the Servo Monitor:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the SERVO menu.

2) Press the ENTER key to open and view the full screen Servo Monitor. The hash marks represent the current channel output positions.
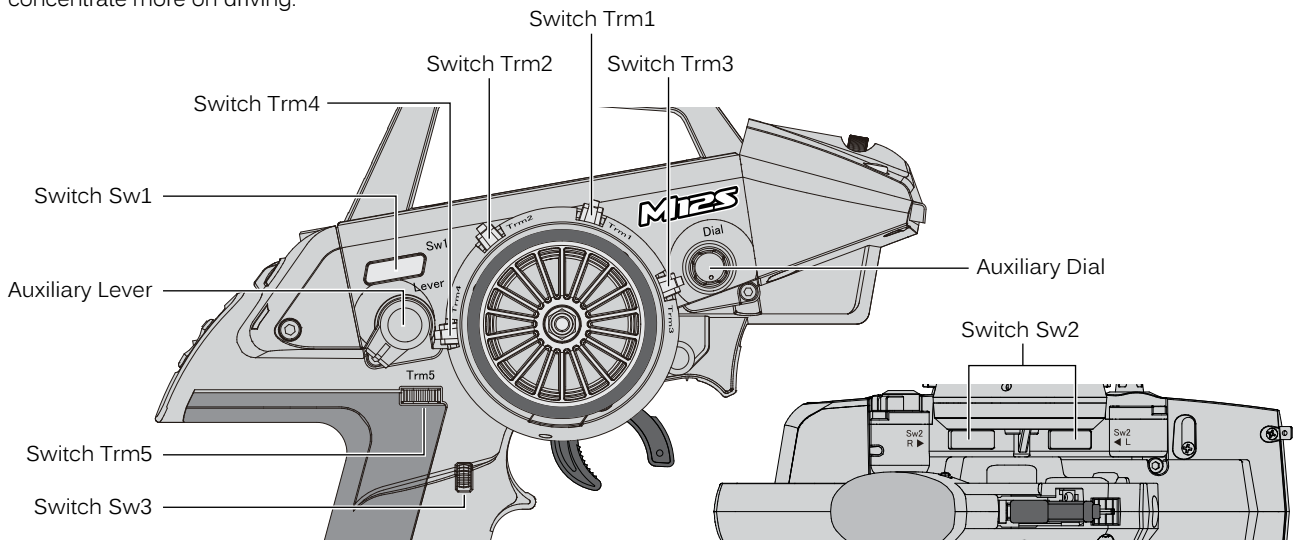
⚠ Depending on the current servo reversing settings, the hash mark may not move the same direction as the transmitter controls. This is normal.
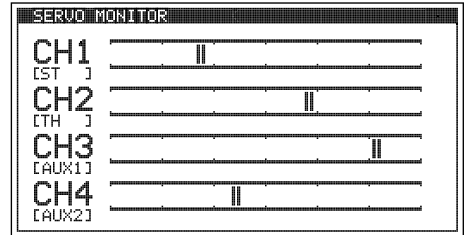
ASSIGN MENU {SWITCH, DIAL, LEVER AND TELEMETRY FUNCTION ASSIGNMENTS}   SYSTEM

The ASSIGN menu allows you to Assign different functions to each of the three Push-Button Switches, the five Trim Switches, the Auxiliary Dial and the Auxiliary Lever. Each of the three Push-Button Switches can have up to two functions Assigned to it and the ON/OFF behavior can be changed. The Direction of Travel and the Trim Resolution of the five Trim Switches and the Auxiliary Dial can also be changed. In addition, a Telemetry Assign function allows you to connect and remotely use an external device that features a push-button switch, a trim switch or dial, or a lever to control specific transmitter functions, such as the Lap Timer, Throttle Hold and much more. This allows a driver helper or a pit crew member to control transmitter functions, allowing you to concentrate more on driving.

Switch Trm1
Switch Trm2   Switch Trm3
Switch Trm4
Switch Sw1
Auxiliary Lever
Auxiliary Dial
Switch Sw2
Switch Trm5
Switch Sw3

Push-Button Switch Function Assignments

The Switch Assign function allows you to Assign various functions to the three Push-Button Switches Sw1, Sw2 and Sw3. This allows you to use the Push-Button Switches to turn functions ON and OFF while you're driving. Up to two different functions can be Assigned to each switch and the ON and OFF behavior of each switch can be changed to either PUSH or TOGGLE to suit the programmed function and your specific requirements.

Changing the Push-Button Switch Function Assignments:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the ASSIGN menu.
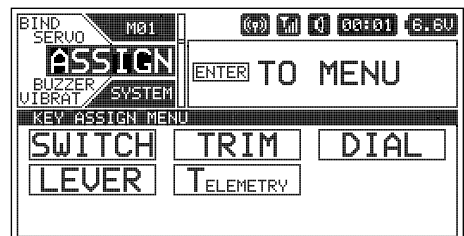
SYSTEM

ASSIGN MENU {SWITCH, DIAL, LEVER AND TELEMETRY FUNCTION ASSIGNMENTS} **SYSTEM**

Changing the Push-Button Switch Function Assignments, Continued:

2) Press the ENTER key to open the ASSIGN menu. The SWITCH menu will be highlighted.

3) Press the ENTER key to open the SWITCH menu. SW1 [FUNCTION 1] > OFFSET will be highlighted.

4) Scroll UP or DOWN to highlight the Switch Number and Function you would like to change. Choose from SW1 [FUNCTION 1 or 2], SW2 [FUNCTION 1 or 2] or SW3 [FUNCTION 1 or 2].

5) Press the ENTER key, then scroll UP or DOWN to choose the desired function for the Switch and Function Number you highlighted. A list of functions that can be Assigned to the Push-Button Switches are shown in the table below.

6) Press the ENTER key, then repeat steps 4 and 5 to program any other desired Push-Button Switch Function Assignments.

⚠ Although two different functions can be Assigned to the same Push-Button Switch, those functions cannot be controlled independently. AUX may control different functions depending on the Car Type.
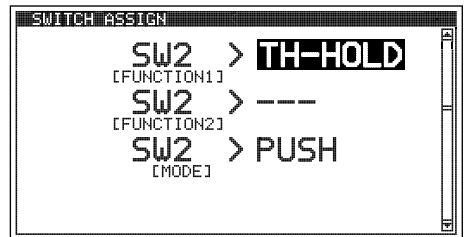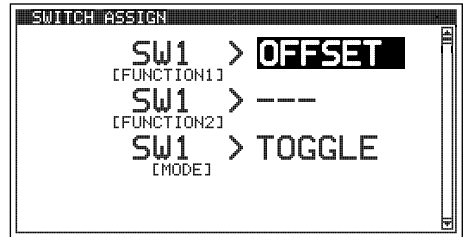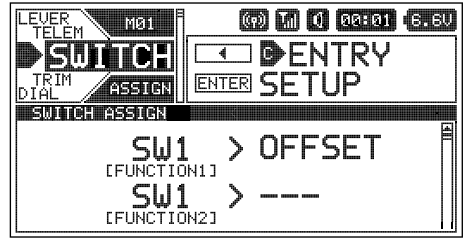
The table below shows the functions can be controlled by the three Push-Button Switches. The bottom half of the table indicates the default functions based on the Selected Car Type:

Model Type		TYP I	TYP II	TYP III	TYP IV	TYP V	TYP VI	TYP VII	TYP VIII	TYP IX	TYP X
Function		---	---	---	---	---	---	---	---	---	---
		ALB	ALB	ALB	ALB	ALB	ALB	ALB	ALB	ALB	ALB
		OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET
		AUX1	AUX	AUX	LAP	AUX	LAP	LAP	AUX	AUX	LAP
		AUX2	LAP	LAP	INT1	LAP	INT1	INT1	LAP	LAP	INT1
		LAP	INT1	INT1	INT2	INT1	INT2	INT2	INT1	INT1	INT2
		INT1	INT2	INT2	DOWN	INT2	DOWN	DOWN	INT2	INT2	DOWN
		INT2	DOWN	DOWN	TH-HOLD	DOWN	TH-HOLD	TH-HOLD	DOWN	DOWN	4WS
		DOWN	TH-HOLD	TH-HOLD	R-MODE*	TH-HOLD	R-MODE*	R-MODE*	4WS	R-MODE*	R-MODE*
		TH-HOLD	R-MODE*	R-MODE*		R-MODE*			R-MODE*		
		R-MODE*									
Sw1	F1	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET
	F2	---	---	---	---	---	---	---	---	---	---
	MODE	TOGGLE	TOGGLE	TOGGLE	TOGGLE	TOGGLE	TOGGLE	TOGGLE	TOGGLE	TOGGLE	TOGGLE
Sw2	F1	ALB	ALB	ALB	ALB	ALB	ALB	ALB	ALB	ALB	ALB
	F2	---	---	---	---	---	---	---	---	---	---
	MODE	PUSH	PUSH	PUSH	PUSH	PUSH	PUSH	PUSH	PUSH	PUSH	PUSH
Sw3	F1	LAP	LAP	LAP	LAP	LAP	LAP	LAP	LAP	LAP	LAP
	F2	INT1	INT1	INT1	INT1	INT1	INT1	INT1	INT1	INT1	INT1
	MODE	PUSH	PUSH	PUSH	PUSH	PUSH	PUSH	PUSH	PUSH	PUSH	PUSH

*Not a Function 2 option. Can only be Assigned to Function 1.

ASSIGN MENU {SWITCH, DIAL, LEVER AND TELEMETRY FUNCTION ASSIGNMENTS} | **SYSTEM**

Changing the Switch Mode:

The ON and OFF behavior of each Push-Button Switch can be changed to suit the programmed function and your specific requirements.

The following Switch Modes are available:

TOGGLE - Press the Push-Button Switch to turn the function ON and press the Push-Button Switch a second time to turn the function OFF.

PUSH - Press and HOLD the Push-Button Switch to turn the function ON and Release the Push-Button Switch to turn the function OFF.

1) From within the SWITCH menu, scroll UP or DOWN to highlight the Switch Number [MODE] you would like to change. Choose from SW1 [MODE], SW2 [MODE] or SW3 [MODE].
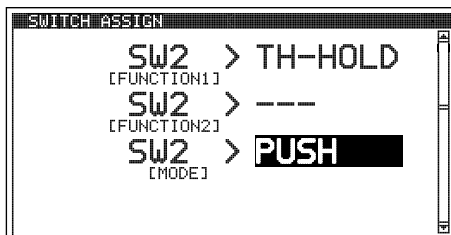
2) Press the ENTER key, then scroll UP or DOWN to change the desired Switch Mode value. Choose from either TOGGLE or PUSH.

> MODE setting range is PUSH and TOGGLE. The default setting for SW1 is TOGGLE and for SW2 and SW3 is PUSH.
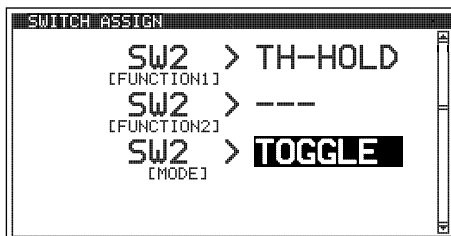
3) Repeat step 2 to change any other desired Switch Mode values.

Trim Switch Function Assignments

The Trim Assign function allows you to Assign a multitude of different functions to the five Trim Switches Trm1, Trm2, Trm3, Trm4 and Trm5. This allows you to use the Trim Switches to control those functions while you're driving. In addition, the Trim Resolution (Step value) and the Direction of Travel (REV) of each Trim Switch can be changed to suit the programmed function and your specific requirements.

Changing the Trim Switch Function Assignments:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the ASSIGN menu.
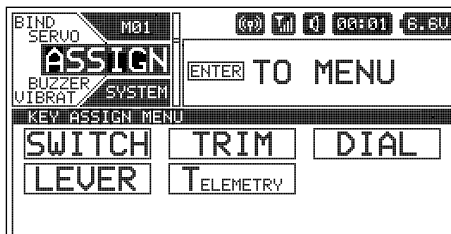
2) Press the ENTER key to open the ASSIGN menu, then scroll UP or DOWN to highlight the TRIM menu.
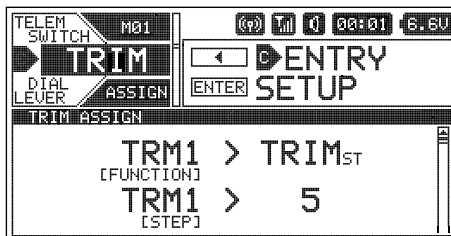
3) Press the ENTER key to open the TRIM menu. TRM1 [FUNCTION] > TRIMₛₜ will be highlighted.
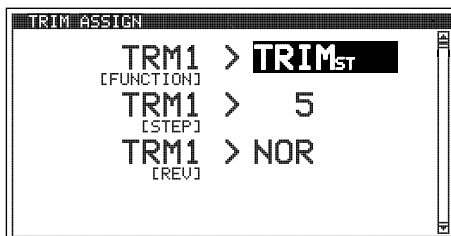
ASSIGN MENU {SWITCH, DIAL, LEVER AND TELEMETRY FUNCTION ASSIGNMENTS}   **SYSTEM**

Changing the Trim Switch Function Assignments, Continued:

4) Scroll UP or DOWN to highlight the Trim Switch Number you would like to change. Choose from TRM1, TRM2, TRM3, TRM4 or TRM5.

5) Press the ENTER key, then scroll UP or DOWN to choose the desired function for the Trim Switch Number you highlighted.

```
TRIM ASSIGN
TRM5 > EXPTH
   [FUNCTION]
TRM5 >    1
     [STEP]
TRM5 > NOR
     [REV]
```
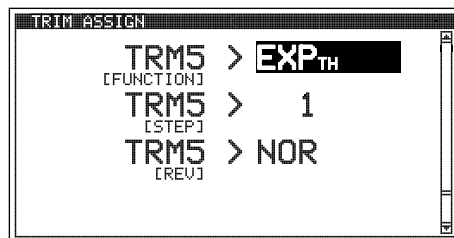
6) Press the ENTER key, then repeat steps 4 and 5 to program any other desired Trim Switch Function Assignments.

The table below shows the default Trim Switch functions based on the Selected Car Type. A complete list of functions that can be Assigned to the Trim Switches are shown in the Trim Switch, Auxiliary Dial and Auxiliary Lever Functions tables on pages 114 and 115.

Model Type		TYP I	TYP II	TYP III	TYP IV	TYP V	TYP VI	TYP VII	TYP VIII	TYP IX	TYP X
Function	TRM1	TRIM ST	TRIM ST	TRIM ST	TRIM ST	TRIM ST	TRIM ST	TRIM ST	TRIM ST	TRIM ST	TRIM ST
	TRM2	TRIM TH	TRIM TH	TRIM TH	TRIM TH	TRIM TH	TRIM TH	TRIM TH	TRIM TH	TRIM TH	TRIM TH
	TRM3	D/R ST	D/R ST	D/R ST	D/R ST	D/R ST	D/R ST	D/R ST	D/R ST	D/R ST	D/R ST
	TRM4	R-MODE	R-MODE	R-MODE	R-MODE	R-MODE	R-MODE	R-MODE	R-MODE	R-MODE	R-MODE
	TRM5	D/R BR	D/R BR	D/R BR	D/R BR	D/R BR	D/R BR	D/R BR	D/R BR	D/R BR	D/R BR

Changing the Trim Switch Step Value:

The Step function allows you to adjust how far a servo travels or a function moves when a Trim Switch is pressed. You can Increase the Trim Resolution by Decreasing the Step value, so that the amount of travel is less when you press the Trim Switches. This makes it possible to fine-tune travel extremely accurately.

Alternately, you could Decrease the Trim Resolution by Increasing the Step value, so that the amount of travel is more when you press the Trim Switches. This may not be as accurate, but it allows you to command large amounts of travel or function movement at a time.

```
TRIM ASSIGN
TRM1 > TRIMST
   [FUNCTION]
TRM1 >    5
     [STEP]
TRM1 > NOR
     [REV]
```

1) From within the TRIM menu, scroll UP or DOWN to highlight the Trim Switch Number [STEP] you would like to change. Choose from TRM1 [STEP], TRM2 [STEP], TRM3 [STEP], TRM4 [STEP] or TRM5 [STEP].
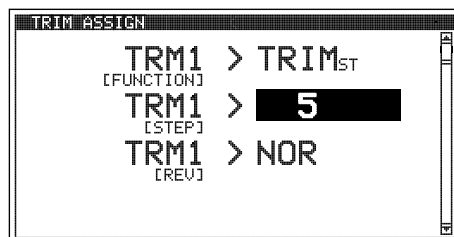
2) Press the ENTER key, then scroll UP or DOWN to change the desired Trim Switch Step value.
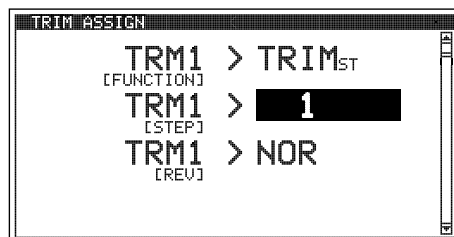
> STEP setting range is 1 to 100. The default setting is 1 or 5 depending on the Trim Switch Number. The Step value is a percentage of travel.

```
TRIM ASSIGN
TRM1 > TRIMST
   [FUNCTION]
TRM1 >    1
     [STEP]
TRM1 > NOR
     [REV]
```

3) Repeat step 2 to change any other desired Trim Step values.

Changing the Trim Switch Direction of Travel:

The direction that the Trim Switches move the servos or function values can be changed from Normal to Reverse. In Normal mode, the Trim Switches will move the servos toward the High Side or Increase function values when the Trim Switches are pushed Forward. In Reverse mode, the Trim Switches will move the servos toward the Low Side or Decrease function values when the Trim Switches are pushed Forward.

```
TRIM ASSIGN
TRM1 > TRIMST
   [FUNCTION]
TRM1 >    1
     [STEP]
TRM1 > NOR
     [REV]
```

1) From within the TRIM menu, scroll UP or DOWN to highlight the Trim Switch Number [REV] you would like to change. Choose from TRM1 [REV], TRM2 [REV], TRM3 [REV], TRM4 [REV] or TRM5 [REV].
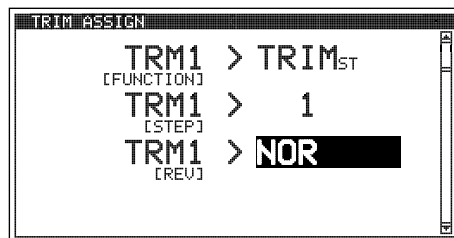
ASSIGN MENU {SWITCH, DIAL, LEVER AND TELEMETRY FUNCTION ASSIGNMENTS}   **SYSTEM**

Changing the Trim Switch Direction of Travel, Continued:

2) Press the ENTER key, then scroll UP or DOWN to change the desired Trim Switch Reverse value.

> REV setting range is NOR and REV. The default setting is NOR.

3) Repeat step 2 to change any other desired Trim Switch Reverse values.
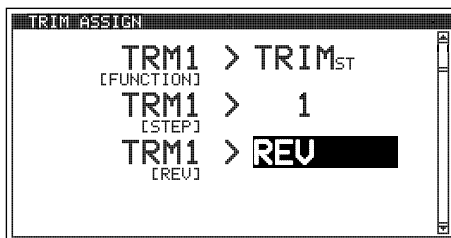
Auxiliary Dial Function Assignments

The Dial Assign function allows you to Assign a multitude of different functions to the Auxiliary Dial. This allows you to use the Auxiliary Dial to control those functions while you're driving. The Auxiliary Dial can control either of the two Auxiliary channels or it can control a function, such as Steering Dual Rate or Steering Exponential. In addition, the Trim Resolution (Step value) and the Direction of Travel (REV) of the Auxiliary Dial can be changed.

Changing the Auxiliary Dial Function Assignment:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the ASSIGN menu.
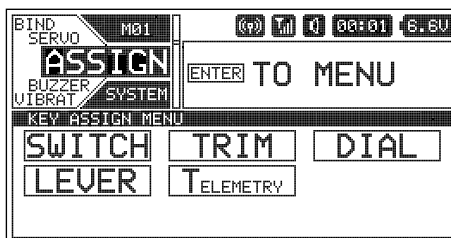
2) Press the ENTER key to open the ASSIGN menu, then scroll UP or DOWN to highlight the DIAL menu.
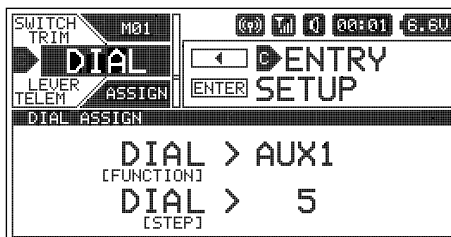
3) Press the ENTER key to open the DIAL menu. DIAL [FUNCTION] > AUX1 (or other value depending on the selected Car Type) will be highlighted.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired function you want to Assign to the Auxiliary Dial.

The table below shows the default Auxiliary Dial functions based on the selected Car Type. A complete list of functions that can be Assigned to the Auxiliary Dial are shown in the Trim Switch, Auxiliary Dial and Auxiliary Lever Functions tables on pages 114 and 115.

Model Type	TYP I	TYP II	TYP III	TYP IV	TYP V	TYP VI	TYP VII	TYP VIII	TYP IX	TYP X
Function	AUX1	AUX	AUX	---	AUX	---	---	AUX	AUX	---

Changing the Auxiliary Dial Step Value:

The Step function allows you to adjust how far a servo travels or a function moves when the Auxiliary Dial is turned. You can Increase the Trim Resolution by Decreasing the Step value, so that the amount of travel is less when you turn the Auxiliary Dial. This makes it possible to fine-tune servo travel or function movement extremely accurately. Alternately, you could Decrease the Trim Resolution by Increasing the Step value, so that the amount of travel is more when you turn the Auxiliary Dial. This may not be as accurate, but it allows you to command large amounts of servo travel or function movement at a time.

1) From within the DIAL menu, scroll UP or DOWN to highlight DIAL [STEP] > 5.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Auxiliary Dial Step value.

> STEP setting range is 1 to 100. The default setting is 5. The Step value is a percentage of travel.
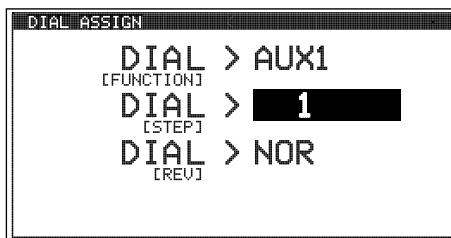
ASSIGN MENU {SWITCH, DIAL, LEVER AND TELEMETRY FUNCTION ASSIGNMENTS}   **SYSTEM**

Changing the Auxiliary Dial Direction of Travel:

The direction that the Auxiliary Dial moves the servo or function value can be changed from Normal to Reverse. In Normal mode, the Auxiliary Dial will move the servo toward the High Side or Increase a function value when the Auxiliary Dial is turned clockwise. In Reverse mode, the Auxiliary Dial will move the servo toward the Low Side or Decrease a function value when the Auxiliary Dial is turned counter-clockwise.

1) From within the DIAL menu, scroll UP or DOWN to highlight DIAL [REV] > NOR.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Auxiliary Dial Reverse value.
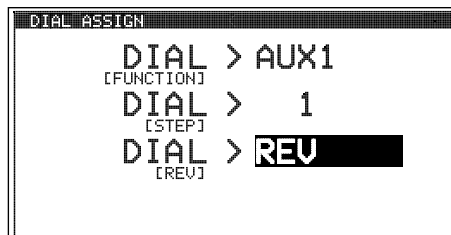
> REV setting range is NOR and REV. The default setting is NOR.

Auxiliary Lever Function Assignments

The Lever Assign function allows you to Assign various functions to the Auxiliary Lever. This allows you to use the Auxiliary Lever to control those functions while you're driving. The Auxiliary Lever can control either of the two Auxiliary channels or it can control a function, such as Steering Dual Rate or Steering Exponential. In addition, changing the High and Low Tweak values determines the amount of travel and direction.

Changing the Auxiliary Lever Function Assignment:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the ASSIGN menu.
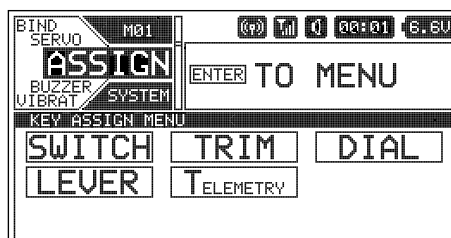
2) Press the ENTER key to open the ASSIGN menu, then scroll UP or DOWN to highlight the LEVER menu.
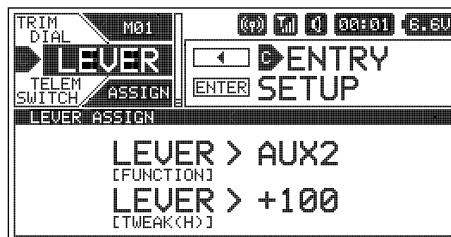
3) Press the ENTER key to open the LEVER menu. LEVER [FUNCTION] > AUX2 (or other value depending on the selected Car Type) will be highlighted.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired function you want to Assign to the Auxiliary Lever.
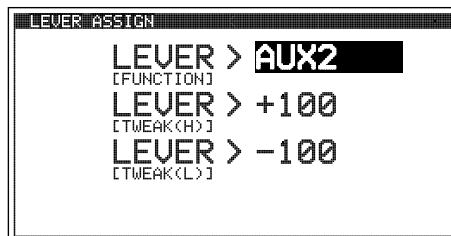
The table below shows the default Auxiliary Lever functions based on the selected Car Type. A complete list of functions that can be Assigned to the Auxiliary Lever are shown in the Trim Switch, Auxiliary Dial and Auxiliary Lever Functions tables on pages 114 and 115.

Model Type	TYP I	TYP II	TYP III	TYP IV	TYP V	TYP VI	TYP VII	TYP VIII	TYP IX	TYP X
Function	AUX2	---	---	---	---	---	---	---	---	---

Changing the High and Low Tweak Values:

The High and Low Tweak values both determine how far and in which direction the Auxiliary Lever controls the function Assigned to it when the Auxiliary Lever is moved Up and Down, regardless if the Auxiliary Lever is controlling a servo, such as Auxiliary Channel 2 or a function parameter, such as Steering Trim.

For example, if you Assign AUX2 to the Auxiliary Lever and adjust the Tweak values to +50 and -50, the Auxiliary 2 servo will be centered when the Auxiliary Lever is centered and will travel 50% in one direction when the Auxiliary Lever is moved Up and travel 50% in the other direction when the Auxiliary Lever is moved Down. Alternately, if you Assign TRIM ST to the Auxiliary Lever and adjust the Tweak values to +50 and -50, the Auxiliary Lever will control Steering Trim from 0% to 50%.

ASSIGN MENU {SWITCH, DIAL, LEVER AND TELEMETRY FUNCTION ASSIGNMENTS}   **SYSTEM**

<u>Changing the High and Low Tweak Values, Continued:</u>

1) From within the LEVER menu, scroll UP or DOWN to highlight LEVER [TWEAK (H)] > +100.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired High Side Tweak value. Increasing the Tweak value will Increase travel in the High Side direction and Decreasing the Tweak value will Decrease travel in the High Side direction. Using a Negative value will change the direction of travel.

LEVER ASSIGN
LEVER > AUX2 [FUNCTION]
LEVER > + 50 [TWEAK(H)]
LEVER > -100 [TWEAK(L)]
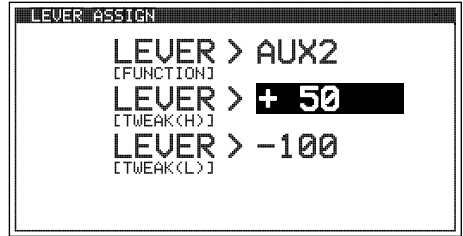
TWEAK (H) setting range is -100 to +100. The default setting is +100.

3) Scroll DOWN to highlight LEVER [TWEAK (L)] > -100.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Low Side Tweak value. Decreasing the Tweak value will Increase travel in the Low Side direction and Increasing the Tweak value will Decrease travel in the Low Side direction. Using a Positive value will change the direction of travel.

LEVER ASSIGN
LEVER > AUX2 [FUNCTION]
LEVER > + 50 [TWEAK(H)]
LEVER > - 50 [TWEAK(L)]
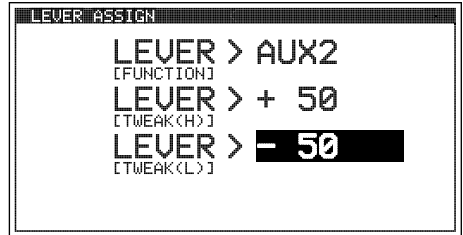
TWEAK (L) setting range is -100 to +100. The default setting is -100.

Telemetry Function Assignments

The M12S Super allows the use of a remote external device (available separately) to control many transmitter functions. This allows a driver helper or a pit crew member to remotely control transmitter functions, allowing you to concentrate more on driving. The Telemetry Assign function allows you to program the transmitter to suit the programmed function and the specific requirements of your external device, whether it features a push-button switch, a trim switch or dial, or a lever. Functions such as the Lap Timer, Throttle Hold and much more can now be controlled remotely by a 3rd party.

⚠ External devices available separately. For more information about availability, contact your local Airtronics or Sanwa retailer.

⚠ The M12S Super's Telemetry function must be turned ON, you must be using an Airtronics or Sanwa 2.4GHz FH4T receiver and the external device must be paired for this function to work. For detailed information about connecting and using the external device itself, refer to the User's Guide included with your external device.

<u>Changing the Telemetry Value:</u>

The Telemetry value allows you program the M12S Super's Telemetry Assign function to match the type of control on the connected external device. For example, if the external device you have features a push-button switch, choose SW, or if the external device features a lever, choose LEVER.

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the ASSIGN menu.
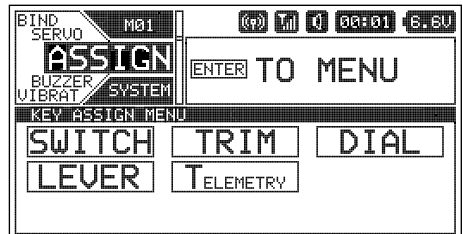
BIND SERVO | M01 | ((ŗ)) Ṯ̄ ◁ 00:01 6.6V
ASSIGN | ENTER TO MENU
BUZZER VIBRAT SYSTEM
KEY ASSIGN MENU
SWITCH | TRIM | DIAL
LEVER | TELEMETRY

2) Press the ENTER key to open the ASSIGN menu, then scroll UP or DOWN to highlight the TELEMETRY menu.

DIAL LEVER | M01 | ((ŗ)) Ṯ̄ ◁ 00:01 6.6V
TELEMETRY | ◁ ▶ENTRY
SWITCH TRIM ASSIGN | ENTER SETUP
TELEMETRY ASSIGN
TELEMETRY > SW
T1 > --- [FUNCTION1]
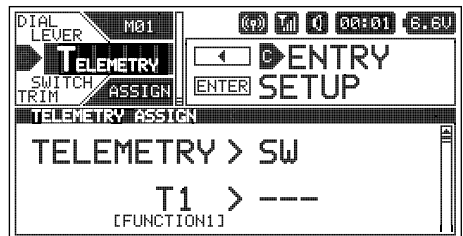
3) Press the ENTER key to open the TELEMETRY menu. TELEMETRY > SW will be highlighted.

4) Press the ENTER key, then scroll UP or DOWN to choose the Telemetry value that matches the type of control on the connected external device. Choose from SW (push-button switch), TRIM (trim switch or dial) or LEVER (lever).

TELEMETRY setting range is SW, TRIM and LEVER. The default setting is SW.
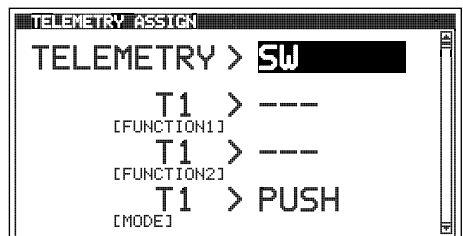
TELEMETRY ASSIGN
TELEMETRY > SW
T1 > --- [FUNCTION1]
T1 > --- [FUNCTION2]
T1 > PUSH [MODE]

SYSTEM

ASSIGN MENU {SWITCH, DIAL, LEVER AND TELEMETRY FUNCTION ASSIGNMENTS} — **SYSTEM**

Changing the Telemetry Push-Button Switch Control Function and Mode Values:

⚠ Follow the information in this section if you've programmed the Telemetry value to SW. If you've programmed the Telemetry value to TRIM or LEVER, please refer to those specific sections.
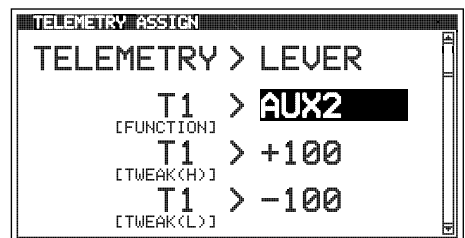
Up to two different functions can be Assigned to each Telemetry Switch (T1 and T2) and the ON and OFF behavior of each Telemetry Switch can be changed to either PUSH or TOGGLE to suit the programmed function and the specific requirements of your external device.

1) From within the TELEMETRY > SW menu, scroll UP or DOWN to highlight the Telemetry Switch Number and Function you would like to change. Choose from T1 [FUNCTION 1 or 2] or T2 [FUNCTION 1 or 2].

2) Press the ENTER key, then scroll UP or DOWN to choose the desired function for the Telemetry Switch Number and Function you highlighted. A list of functions that can be Assigned to the Telemetry Switches are shown in the table below.
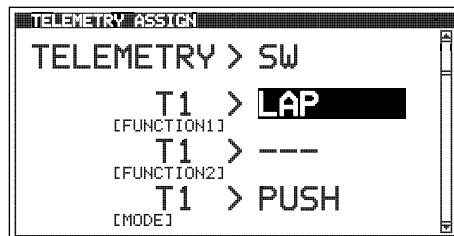
```
┌─TELEMETRY ASSIGN──────────┐
│ TELEMETRY > SW            │
│                          │
│      T1  >  LAP          │
│   [FUNCTION1]            │
│      T1  >  ---          │
│   [FUNCTION2]            │
│      T1  >  PUSH         │
│   [MODE]                │
└──────────────────────────┘
```

3) Press the ENTER key, then repeat steps 1 and 2 to program any other desired Telemetry Switch Function Assignments.

⚠ Although two different functions can be Assigned to the same Telemetry Switch, those functions cannot be controlled independently.

The table below shows the functions can be controlled by the two Telemetry Switches:

Model Type	TYP I	TYP II	TYP III	TYP IV	TYP V	TYP VI	TYP VII	TYP VIII	TYP IX	TYP X
	---	---	---	---	---	---	---	---	---	---
	ALB	ALB	ALB	ALB	ALB	ALB	ALB	ALB	ALB	ALB
	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET	OFFSET
	AUX1	AUX	AUX	LAP	AUX	LAP	LAP	AUX	AUX	LAP
	AUX2	LAP	LAP	INT1	LAP	INT1	INT1	LAP	LAP	INT1
Function	LAP	INT1	INT1	INT2	INT1	INT2	INT2	INT1	INT1	INT2
	INT1	INT2	INT2	DOWN	INT2	DOWN	DOWN	INT2	INT2	DOWN
	INT2	DOWN	DOWN	TH-HOLD	DOWN	TH-HOLD	TH-HOLD	DOWN	DOWN	4WS
	DOWN	TH-HOLD	TH-HOLD	R-MODE*	TH-HOLD	R-MODE*	R-MODE*	4WS	R-MODE*	R-MODE*
	TH-HOLD	R-MODE*	R-MODE*		R-MODE*			R-MODE*		
	R-MODE*									

*Not a Function 2 option. Can only be Assigned to Function 1.

The ON and OFF behavior of each Telemetry Switch can be changed to suit the programmed function and the specific requirements of your external device. The following Telemetry Switch Modes are available:

TOGGLE - Press the Push-Button Switch on your external device to turn the function ON and press the Push-Button Switch a second time to turn the function OFF.

PUSH - Press and HOLD the Push-Button Switch on your external device to turn the function ON and Release the Push-Button Switch to turn the function OFF.

4) From within the TELEMETRY > SW menu, scroll UP or DOWN to highlight the Telemetry Switch Number [MODE] you would like to change. Choose from T1 [MODE] or T2 [MODE].

5) Press the ENTER key, then scroll UP or DOWN to change the desired Telemetry Switch Mode value. Choose from either TOGGLE or PUSH.

```
┌─TELEMETRY ASSIGN──────────┐
│ TELEMETRY > SW            │
│                          │
│      T1  >  LAP          │
│   [FUNCTION1]            │
│      T1  >  ---          │
│   [FUNCTION2]            │
│      T1  >  TOGGLE       │
│   [MODE]                │
└──────────────────────────┘
```

MODE setting range is PUSH and TOGGLE. The default setting for both T1 and T2 is PUSH.
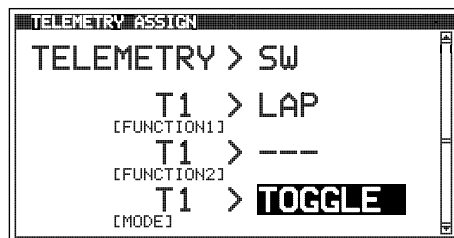
6) Repeat steps 4 and 5 to change any other desired Telemetry Switch Mode values.

Changing the Telemetry Trim Switch Control Function, Step and Reverse Values:

⚠ Follow the information in this section if you've programmed the Telemetry value to TRIM. If you've programmed the Telemetry value to SW or LEVER, please refer to those specific sections.

ASSIGN MENU {SWITCH, DIAL, LEVER AND TELEMETRY FUNCTION ASSIGNMENTS}　　**SYSTEM**

<u>Changing the Telemetry Trim Switch Control Function, Step and Reverse Values, Continued:</u>

A multitude of different functions can be Assigned to the Telemetry Trim Switch. In addition, the Step value and Direction of Travel can be changed to allow you to adjust how far a servo travels or how far a function moves and the direction it moves to suit both the programmed function and the specific requirements of your external device.

1) From within the TELEMETRY > TRIM menu, scroll UP or DOWN to highlight T1/T2 [FUNCTION] > - - -.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired function for the Telemetry Trim Switch.

⚠ A list of functions that can be Assigned to the Telemetry Trim Switch is shown in the Trim Switch, Auxiliary Dial and Auxiliary Lever Functions tables on pages 114 and 115.

```
TELEMETRY ASSIGN
TELEMETRY > TRIM
   T1/T2  > ━━━
       [FUNCTION]
   T1/T2  >    1
       [STEP]
   T1/T2  > NOR
       [REV]
```
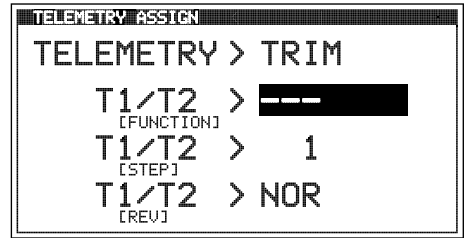
How far a servo travel or how far a function moves when the Telemetry Trim Switch on your external device is pressed can be changed. You can Increase the Resolution by Decreasing the Step value, so that the amount of servo travel or function movement is less when you press the Telemetry Trim Switch. This makes it possible to fine-tune servo travel or function movement extremely accurately. Alternately, you could Decrease the Resolution by Increasing the Step value, so that the amount of servo travel or function movement is more when you press the Telemetry Trim Switch. This may not be as accurate, but it allows you to command large amounts of servo travel or function movement at a time.

3) From within the TELEMETRY > TRIM menu, scroll UP or DOWN to highlight T1/T2 [STEP] > 1.

4) Press the ENTER key, then scroll UP or DOWN to change the desired Telemetry Trim Switch Step value.

> STEP setting range is 1 to 100. The default setting is 1. The Step value is a percentage of travel.

```
TELEMETRY ASSIGN
TELEMETRY > TRIM
   T1/T2  > TRIM_ST
       [FUNCTION]
   T1/T2  >    5
       [STEP]
   T1/T2  > NOR
       [REV]
```
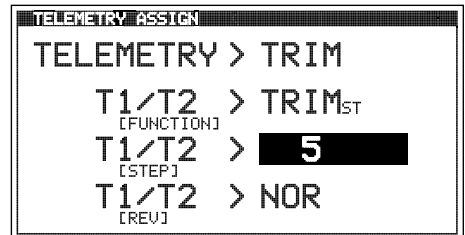
The direction that the Telemetry Trim Switch moves the servo or function can be changed from Normal to Reverse to suit the programmed function and the specific requirements of your external device.

5) From within the TELEMETRY > TRIM menu, scroll UP or DOWN to highlight T1/T2 [REV] > NOR.

6) Press the ENTER key, then scroll UP or DOWN to choose the desired Telemetry Trim Switch Reverse value.

> REV setting range is NOR and REV. The default setting is NOR.

```
TELEMETRY ASSIGN
TELEMETRY > TRIM
   T1/T2  > TRIM_ST
       [FUNCTION]
   T1/T2  >    5
       [STEP]
   T1/T2  > NOR
       [REV]
```
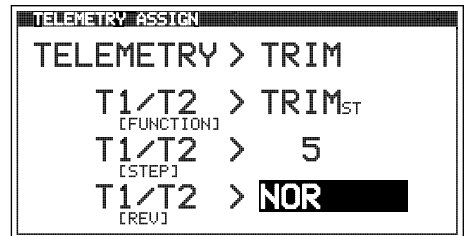
<u>Changing the Telemetry Lever Control Function and Tweak Values:</u>

⚠ Follow the information in this section if you've programmed the Telemetry value to LEVER. If you've programmed the Telemetry value to SW or TRIM, please refer to those specific sections.

A multitude of different functions can be Assigned to the Telemetry Lever. Up to two different functions can be Assigned to each Telemetry Lever (T1 and T2) and the High and Low Tweak values can be adjusted to customize how far and in which direction the Telemetry Lever controls the servo or function to suit both the programmed function and the specific requirements of your external device.

1) From within the TELEMETRY > LEVER menu, scroll UP or DOWN to highlight the Telemetry Lever Number and Function you would like to change. Choose from T1 [FUNCTION] or T2 [FUNCTION].

2) Press the ENTER key, then scroll UP or DOWN to choose the desired function for the Telemetry Lever Number and Function you highlighted.

⚠ A list of functions that can be Assigned to the Telemetry Lever is shown in the Trim Switch, Auxiliary Dial and Auxiliary Lever Functions tables on pages 114 and 115.

```
TELEMETRY ASSIGN
TELEMETRY > LEVER
     T1   > AUX2
       [FUNCTION]
     T1   > +100
     [TWEAK(H)]
     T1   > -100
     [TWEAK(L)]
```

3) Press the ENTER key, then repeat steps 1 and 2 to program any other desired Telemetry Lever Function Assignments.

The High and Low Tweak values both determine how far and in which direction the servo travels or the function moves when the Lever on your external device is moved, regardless if the Telemetry Lever is controlling a servo, such as Auxiliary Channel 2 or a function, such as Steering Trim.

ASSIGN MENU {SWITCH, DIAL, LEVER AND TELEMETRY FUNCTION ASSIGNMENTS}   **SYSTEM**

Changing the Telemetry Lever Control Function and Tweak Values, Continued:

For example, if you Assign AUX2 to the Telemetry Lever and adjust the Tweak values to +50 and -50, the Auxiliary 2 servo will be centered when the Lever on your external device is centered and will travel 50% in one direction when the Lever on your external device is moved Up and travel 50% in the other direction when the Lever on your external device is moved Down. Alternately, if you Assign TRIMₛₜ to the Telemetry Lever and adjust the Tweak values to +50 and -50, the Lever on your external device will control Steering Trim from 0% to 50%.

4) From within the TELEMETRY > LEVER menu, scroll UP or DOWN to highlight either T1 [TWEAK (H)] > +100 or T2 [TWEAK (H)] > +100.

5) Press the ENTER key, then scroll UP or DOWN to choose the desired High Side Tweak value. Increasing the Tweak value will Increase travel in the High Side direction and Decreasing the Tweak value will Decrease travel in the High Side direction. Using a Negative value will change the direction of travel.

> T1 TWEAK (H) and T2 TWEAK (H) setting range is -100 to +100. The default setting for both is +100.

6) Scroll UP or DOWN to highlight either T1 [TWEAK (L)] > -100 or T2 [TWEAK (L)] > -100.

7) Press the ENTER key, then scroll UP or DOWN to choose the desired Low Side Tweak value. Decreasing the Tweak value will Increase travel in the Low Side direction and Increasing the Tweak value will Decrease travel in the Low Side direction. Using a Positive value will change the direction of travel.

```
TELEMETRY ASSIGN
TELEMETRY > LEVER
    T1  > AUX2
 [FUNCTION]
    T1  > + 50
 [TWEAK(H)]
    T1  > � 50
 [TWEAK(L)]
```
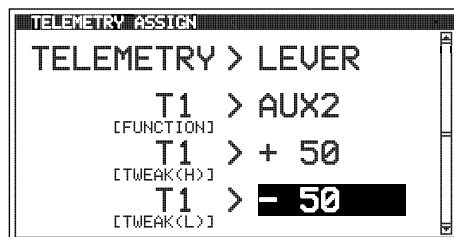
> T1 TWEAK (L) and T2 TWEAK (L) setting range is -100 to +100. The default setting for both is -100.

BUZZER MENU {AUDIBLE KEY TONES AND ALARMS}   **SYSTEM**

The Buzzer function allows you to change the Tone and Volume of many of the audible sounds that the transmitter makes. This ranges from sounds that are made when you press the Trim Switches and Push-Button Switches, scroll UP or DOWN or press the ENTER key, Lap and Interval Timer alarms, Telemetry Alert alarms, transmitter Voltage Limit alarm and more.

The Volume can be Increased or Decreased (or Muted) and the Tones can be changed to suit your preference. In addition, different Tones can be set separately for the first half and the second half of a Tone, making it easier to differentiate between the two halves.

The table below shows the functions that the Tone and Volume can be adjusted for:

FUNCTION	DESCRIPTION
CLICK	Controls Key Press Tones, Such as ENTER, BACK, SELECT and All Push-Button Switches
TRIM	Controls All Trim Switch Key Press Tones
CENTER	Controls the Trim Switch, Auxiliary Dial and Auxiliary Lever Neutral Point Indicator Tones
MULTI	Controls the Push-Button Rotary Dial scroll UP and Scroll DOWN Tones
TIMER SW	Controls the Lap Timer Start and Stop Tones
INT1 TIMER	Controls the First Interval Timer Start and Stop Tones
INT2 TIMER	Controls the Second Interval Timer Start and Stop Tones
LAP-PRE	Controls the Lap Timer Pre-Alarm Tones
LAP GOAL	Controls the Lap Timer Goal Alarm Tones
DOWN-PRE	Controls the Countdown Timer Pre-Alarm Tones
DOWN-FIN	Controls the Countdown Timer Final Alarm Tones
UP-1MIN	Controls the 1 Minute Count Up Timer Alarm Tones
OFFSET	Controls the Offset Function Alarm Tones
TLM VOLT	Controls the Telemetry Receiver Voltage Alert Alarm Tones
TLM1	Controls the Telemetry 1 (Default Temp 1) Alert Alarm Tones
TLM2	Controls the Telemetry 2 (Default Temp 2) Alert Alarm Tones
LIMIT	Controls the Transmitter Limit Voltage Alarm Tones

BUZZER MENU {AUDIBLE KEY TONES AND ALARMS}   `SYSTEM`

Changing the Audible Tones:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the BUZZER menu.

2) Press the ENTER key to open the BUZZER menu. CLICK [TONE1] > 1 will be highlighted.

3) Scroll UP or DOWN to highlight the Function Tone Number you would like to change. Refer to the table on the previous page for more information.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Tone value for either [TONE1] and/or [TONE2]. Increasing the Tone value will Increase the Tone of the selected function and Decreasing the Tone value will Decrease the Tone of the selected function.
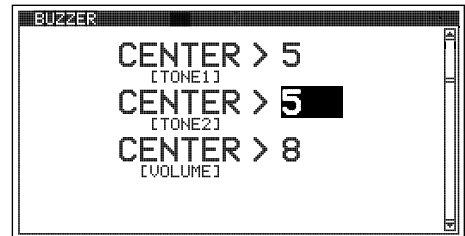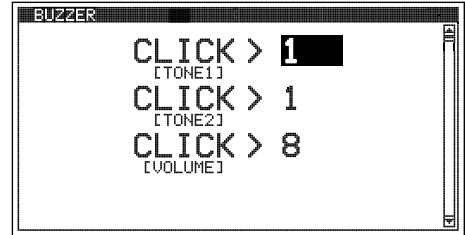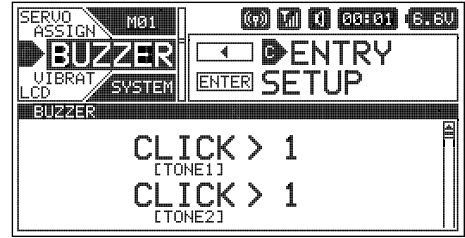
> TONE1 and TONE2 setting range is 1 to 7. The default setting is 1. TONE1 changes the first half Tone and TONE2 changes the second half Tone.

5) Press the ENTER key, then repeat steps 3 and 4 to change the Audible Tones for any other desired functions.

Changing the Volume:

1) From within the BUZZER menu, Scroll UP or DOWN to highlight the Function Volume Number you would like to change.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Volume value. Increasing the Volume value will Increase the Volume of the selected function and Decreasing the Volume value will Decrease the Volume of the selected function. Choosing OFF will Mute the selected function.

> VOLUME setting range is OFF and 1 to 10. The default setting is 8.
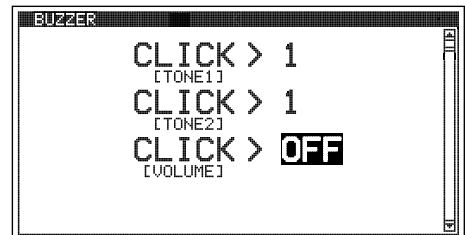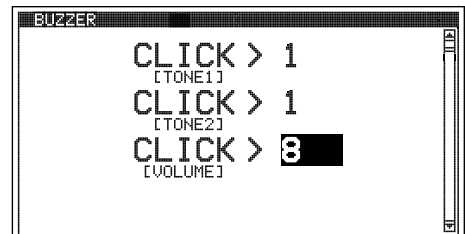
3) Press the ENTER key, then repeat steps 1 and 2 to change the Volume value for any other desired functions.

VIBRATOR MENU {VIBRATION ALERTS AND ALARMS}   `SYSTEM`

The Vibrator function makes the transmitter vibrate like a cell phone to make you aware of different alerts and alarms that you might encounter during use. For example, you can program the transmitter to vibrate when the an Interval Timer starts or stops or when you reach a Lap Timer Goal Time. You can also program the transmitter to vibrate when the transmitter reaches the programmed Voltage Alert value or when the transmitter is turned ON and more. In addition, you can adjust the level of vibration. The Vibrate function is particularly useful if you've Muted any of the related audible alerts and alarms. The Vibrate function can also be used along with the related audible alerts and alarms to provide a level of tactile feedback while you're driving.

VIBRATOR MENU {VIBRATION ALERTS AND ALARMS}   SYSTEM

Adjusting the Vibration Level:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the VIBRATOR menu.

2) Press the ENTER key to open the VIBRATOR menu. VIB LEVEL > 4 will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to choose the desired Vibration Level value. Increasing the value will Increase the Vibration Level and Decreasing the Vibration Level value will Decrease the Vibration Level. This setting affects all Vibration Functions the same when they're turned ON
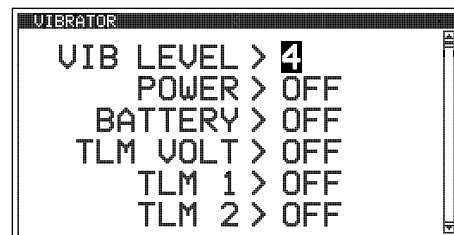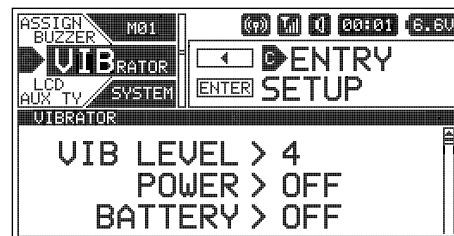
> VIB LEVEL setting range is 1 to 5. The default setting is 4.

Turning Vibration Functions ON and OFF:

1) From within the VIBRATOR menu, scroll UP or DOWN to highlight the function you would like to change the Vibration value for.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Vibration value, either ON or OFF.
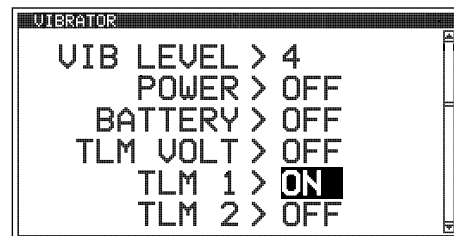
> VIBRATOR setting range is OFF or ON. The default setting is OFF.

5) Press the ENTER key, then repeat steps 3 and 4 to change the Vibration value for any other desired functions.

The table below shows the Vibration Functions that can be turned ON or OFF:

FUNCTION	DESCRIPTION
POWER	Vibrates When the Transmitter is Turned ON
BATTERY	Vibrates to Indicate the Transmitter Voltage Alert Value is Reached
TLM VOLT	Vibrates to Indicate the Telemetry Receiver Voltage Alert Alarm Value is Reached
TLM 1	Vibrates to Indicate the Telemetry 1 (Default Temp 1) Alert Alarm Value is Reached
TLM 2	Vibrates to Indicate the Telemetry 2 (Default Temp 2) Alert Alarm Value is Reached
INT1 TIMER	Vibrates to Indicate When the First Interval Timer Starts and Stops
INT2 TIMER	Vibrates to Indicate When the Second Interval Timer Starts and Stops
LAP-PRE	Vibrates to Indicate When the Lap Timer Pre-Alarm Time is Reached
LAP GOAL	Vibrates to Indicate When the Lap Timer Goal Time is Reached
DOWN-PRE	Vibrates to Indicate When the Countdown Timer Pre-Alarm is Reached
DOWN-FIN	Vibrates to Indicate When Zero on the Countdown Timer is Reached
UP-1MIN	Vibrates to Indicate 1 Minute Count Up Timer Alarm Tones

LCD MENU {DISPLAY OPTIONS}   SYSTEM

The LCD menu allows you to change the contrast of the LCD, the brightness of the LCD Backlight, the Backlight Mode, the Backlight On-Time and the Backlight Color.

Changing the Contrast, Brightness and Backlight Color settings can make it easier to view the LCD in different lighting conditions and changing the Backlight Mode and Backlight On-Time affects how the Backlight is turned ON and how long the Backlight stays ON.

> **IMPORTANT:** Increasing the brightness of the LCD Backlight and/or leaving the LCD Backlight ON at all times will increase battery consumption. In addition, Decreasing the Contrast value near the lower limit can result in the LCD text becoming difficult to read. Be careful not to set the Contrast value too low.

LCD MENU {DISPLAY OPTIONS}   SYSTEM

Changing the LCD Contrast:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the LCD menu.

2) Press the ENTER key to open the LCD menu. CONTRAST > 15 will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to choose the desired Contrast value. Increasing the Contrast value will Increase the contrast of the LCD and Decreasing the Contrast value will Decrease the contrast of the LCD.

> CONTRAST setting range is 10 to 20. The default setting is 15.
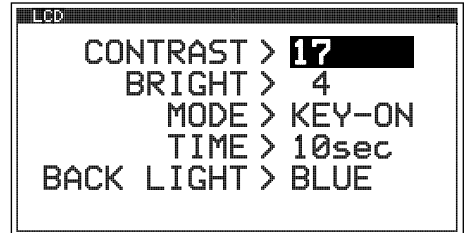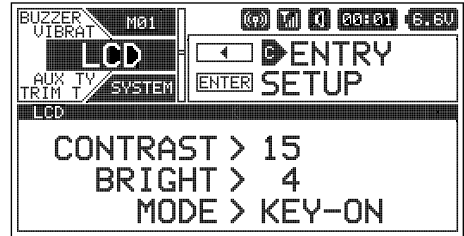
Changing the LCD Backlight Brightness:

1) From within the LCD menu, scroll UP or DOWN to highlight BRIGHT > 4.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Brightness value. Increasing the Brightness value will Increase the brightness of the LCD Backlight and Decreasing the Brightness value will Decrease the brightness of the LCD Backlight.

> BRIGHT setting range is 1 to 5. The default setting is 4.
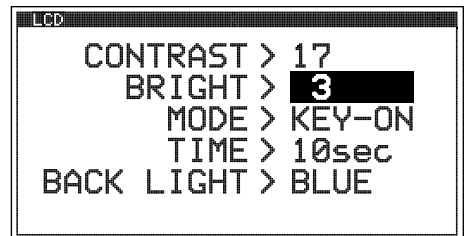
Changing the LCD Backlight Mode:

1) From within the LCD menu, scroll UP or DOWN to highlight MODE > KEY-ON.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired LCD Mode value. Choose from OFF, KEY-ON or ALWAYS. When set to OFF, the LCD Backlight will be turned OFF. When set to KEY-ON, the LCD Backlight will turn ON when a key-press is made. When set to ALWAYS, the LCD Backlight will stay ON at all times

> MODE setting range is OFF, KEY-ON and ALWAYS. The default setting is KEY-ON.
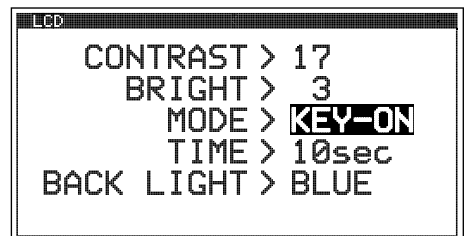
Changing the LCD Backlight Color:

1) From within the LCD menu, scroll UP or DOWN to highlight BACK LIGHT > BLUE.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired LCD Back Light value, either Blue or White.

> BACK LIGHT setting range is Blue or White. The default setting is Blue.
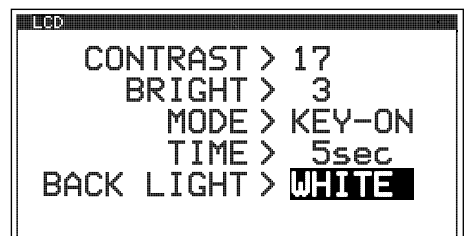
Changing the LCD Backlight On-Time:

1) From within the LCD menu, scroll UP or DOWN to highlight TIME > 10sec.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired LCD Time value. The Time value (in seconds) determines how long the LCD Backlight will stay ON before turning OFF automatically. This helps save battery power.

> TIME setting range is 1 to 30 seconds. The default setting is 10 seconds.
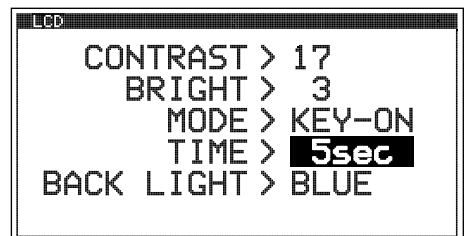
SYSTEM

AUX TYPE MENU {AUXILIARY CHANNEL OPERATING MODE}   **SYSTEM**

The Auxiliary Type function allows you choose the Operating Mode for Auxiliary 1 and Auxiliary 2, making it possible to change the way these two Auxiliary channels function.

⚠ This section details how to change the Operating Mode of the two Auxiliary channels. For details about programming and using each of the Auxiliary functions, see the POINT AUX1 Menu section on page 76, the POINT AUX2 Menu section on page 77 or the CODEAX1 and CODEAX2 Menu section on pages 108 and 109.

The Operating Mode of Auxiliary 1 and Auxiliary 2 can be changed to suit your specific requirements. The following Operating Modes are available:

NOR - When selected, the Auxiliary channel(s) operate as Normal proportional linear channels, like the Throttle or Steering channels.

POINT - When selected, up to six Point positions can be programmed along the entire length of servo travel. You are then able to cycle back and forth through those Point positions. This option is ideal if your model requires a three or more position switch to operate a feature. This mode is not proportional. It's a 'Stepping' mode.

CODE - This option is for use with SSL-compatible accessories, such as an ESC, whose Programming Parameters can be changed directly via the transmitter. For example, you can change the ESC's Driving Modes directly using the Auxiliary Dial to suit different conditions while you're driving. This mode allows you to program up to 5 CODE functions per Auxiliary channel.

CODE10 - This option is the same as the CODE option above, but allows you to program up to 10 CODE functions per Auxiliary channel. Use this mode with SSL-compatible accessories that require more than 5 CODE functions for operation.

⚠ Depending on the Car Type selected in the TYPE menu, Auxiliary 2 options may not be available. This is normal.

Changing the Auxiliary Channel Operating Mode:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the AUX TYPE menu.

2) Press the ENTER key to open the AUX TYPE menu. AUX1 > NOR will be highlighted.

3) Scroll UP or DOWN to choose which Auxiliary Channel you want to change the Operating Mode for, either AUX1 or AUX2.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Auxiliary 1 or Auxiliary 2 Operating Mode.
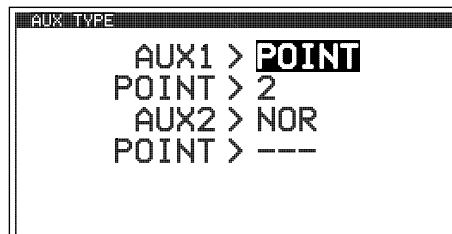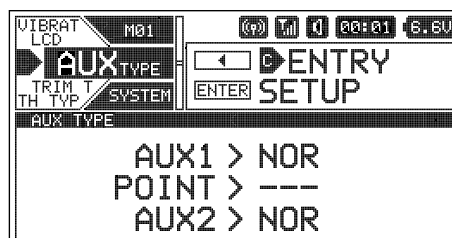
AUX1 and AUX2 setting range is NOR, POINT, CODE and CODE10. The default setting for both AUX1 and AUX2 is NOR.

Changing the Number of Points Value:

After changing the Auxiliary 1 or Auxiliary 2 Operating Mode to POINT, you are able to change the number of points you want the servo to travel through. For example, if you want to be able to cycle your servo from 0 to 20 to 40 to 60 degrees and back again, choose POINT > 4.

⚠ When AUX1 and AUX2 values are set to NOR, CODE or CODE10, POINT options cannot be programmed.

1) After choosing the POINT option, scroll UP or DOWN to the desired POINT value, either AUX1 POINT or AUX2 POINT.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired number of Point positions to program.

POINT setting range is 2 to 6. The default setting is 2.
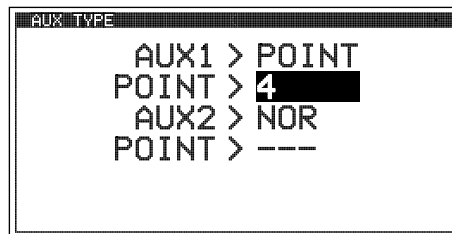
IMPORTANT: When set to POINT, please observe the following: We recommend using either the Auxiliary Dial or one of the Trim Switches to operate the Auxiliary channel. The Auxiliary Lever is not suitable for use in this situation. In addition, the Step value for the Auxiliary Dial and/or Trim Switch should be set to 1, otherwise the transmitter won't cycle properly through the programmed Points.

TRIM TYPE MENU {SERVO TRIM TYPE}   SYSTEM

The Trim Type function allows you choose the way servo Trim and servo End Point Adjustments interact with each other. When you apply Trim to a servo, the Neutral Point of the servo shifts toward the High Side or the Low Side. When you do this, the servo travels less in one direction and more in the other direction because the servo End Points are stationary. In order to balance the servo travel, you would need to manually readjust the servo End Points. Using the Trim Type function allows you to make the servo End Points shift toward the High Side or the Low Side when you apply Trim. This maintains balanced servo travel without the need to manually readjust the servo End Points.

⚠ The Trim Type function does not effect servo Sub-Trim. It only effects servo Trim that's input using the Trim Switches, Auxiliary Dial or Auxiliary Lever. Servo Sub-Trim, which is different, always uses Parallel Trim.

Two Trim Types are available:

CENTER - When selected, servo End Points are stationary. In order to balance servo travel, you would need to manually readjust the servo End Points, if desired.
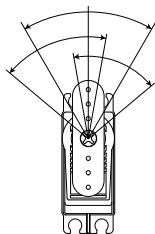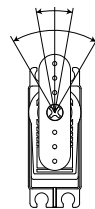
PARALLEL - When selected, servo End Points shift toward the High Side or the Low Side automatically when you apply Trim. This maintains balanced servo travel without the need to manually readjust the servo End Points, however, this could result your model's control linkages binding in one direction or the other.

Changing the Trim Type:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the TRIM TYPE menu.

2) Press the ENTER key to open the TRIM TYPE menu. ST > CENT will be highlighted.

3) Scroll UP or DOWN to highlight the desired channel you would like to change the Trim Type value for. Choose from either ST (Steering), TH (Throttle), AUX1 (Auxiliary 1) or AUX2 (Auxiliary 2).

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Trim Type value for that channel.

5) Press the ENTER key, then repeat steps 3 and 4 to change the Trim Type value for any other desired channels.
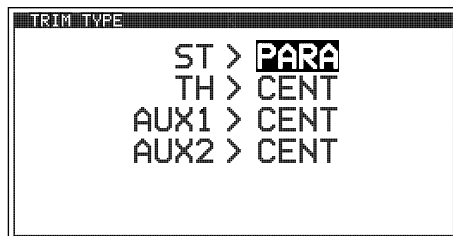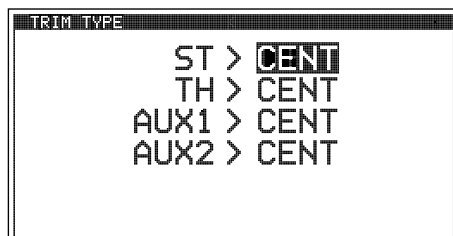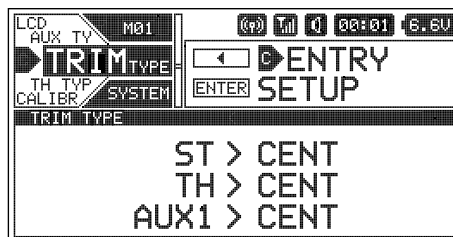
TRIM TYPE setting range is CENT and PARA. The default setting for all channels is CENT.

TH TYPE MENU {THROTTLE BIAS RATIO}   SYSTEM

The Throttle Type function allows you to change the ratio between Throttle High Side servo travel and Throttle Brake Side servo travel. In the default configuration, the Throttle Type is set to F70:B30. This Throttle Type shifts the Throttle Neutral Point toward the Brake Side, resulting in more servo travel toward the High Side and less servo travel toward the Brake Side.

Some users may prefer the ratio between Throttle High Side servo travel and Throttle Brake Side servo travel to be balanced (F50:B50) so that servo travel is equal. The F70:B30 Throttle Type is most common for general-use and racing, while the F50:B50 Throttle Type is most common for Rock Crawling.

TH TYPE MENU {THROTTLE BIAS RATIO}   SYSTEM

Two Throttle Types are available:

F70:B30 - When selected, the Throttle Neutral Point is shifted toward the Brake Side which provides more High Side servo travel (70%) and less Brake Side servo travel (30%). This is most common for general-use and racing.
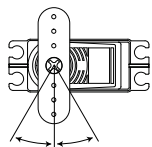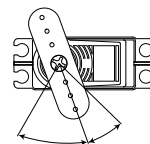
F50:B50 - When selected, the Throttle Neutral Point is centered, which provides the same amount of High Side and Brake Side servo travel (50% each). This is most common for Rock Crawling or boats.

Changing the Throttle Type:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the TH TYPE menu.
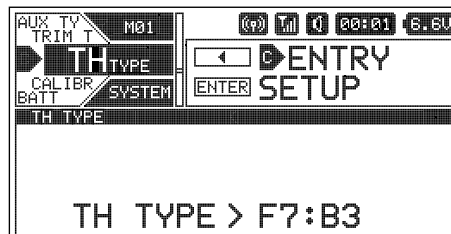
2) Press the ENTER key to open the TH TYPE menu. TH TYPE > F7:B3 will be highlighted.
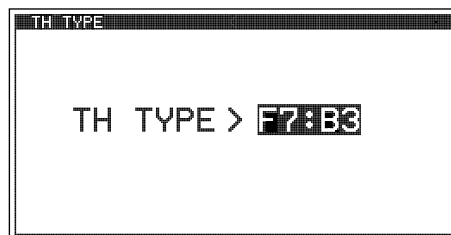
3) Press the ENTER key, then scroll UP or DOWN to choose the desired Throttle Type value.

   TH TYPE setting range is F7:B3 and F5:B5. The default setting is F7:B3.

4) Press the ENTER key. Either Set to F70:B30? NO/YES will be displayed or Set to F50:B50? NO/YES will be displayed. Scroll UP or DOWN to highlight YES, then press the ENTER key.
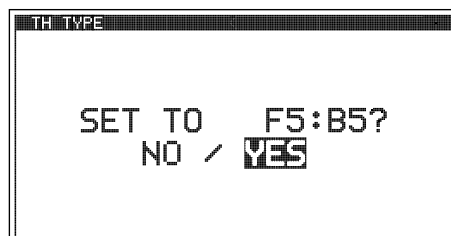
   ⚠ If you want to go back and change the Throttle Type or if you don't want to change the Throttle Type for any reason, choose NO or press the BACK key.

CALIBRATION MENU {CONTROL CALIBRATION ADJUSTMENT}   SYSTEM

The Calibration function allows you to calibrate the operation of the Steering Wheel, Throttle Trigger and Auxiliary Lever End Points and Neutral positions. Over time, it's possible that the End Points and/or Neutral positions of these controls may change slightly or you may purposely limit the travel of the Steering Wheel to suit the best feel of the Steering Wheel and your driving style. Being able to calibrate these controls ensures precise operation at all times and in all conditions.

In addition to being able to store custom Calibration values, you are also able to reset the Calibration values back to the Factory Default values.

⚠ We recommend using the Calibration function as part of a periodic maintenance schedule or after adjusting the Steering Wheel travel as described in the Steering Wheel Travel Adjustment section on page 12.

IMPORTANT: After using the Calibration function, you should double-check the End Point Adjustments of each saved model. If the End Points have moved, they will need to be readjusted using the End Point Adjustment function. For more information, see the EPA Menu section on pages 73 and 74.

CALIBRATION MENU {CONTROL CALIBRATION ADJUSTMENT}　　　**SYSTEM**

⚠ The steps required to calibrate the operation of the Steering Wheel, Throttle Trigger and Auxiliary Lever are the same. The example shown in this section details calibrating the Steering Wheel.

Two Calibration Options are available:

FACTORY - When selected, control End Points and Neutral positions are set to the original Factory Default Calibration values. This option should be used if there is a problem with the User Calibration values or you want to restore the Factory Default Calibration values.

USER - When selected, the user manually calibrates the control End Points and Neutral positions. This option should be used in most all cases as part of a routine maintenance schedule or if you've limited or otherwise adjusted the travel of the Steering Wheel.

<u>Calibrating the Steering, Throttle and Auxiliary Lever Controls:</u>

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the CALIBRATION menu.
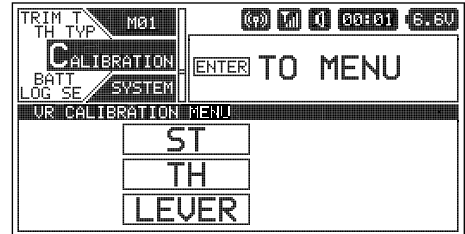
2) Press the ENTER key to open the CALIBRATION menu. The ST (Steering) menu will be highlighted.

⚠ If you want to calibrate a different control, scroll UP or DOWN to highlight the control option you would like to calibrate, either TH (Throttle) or LEVER (Auxiliary Lever).
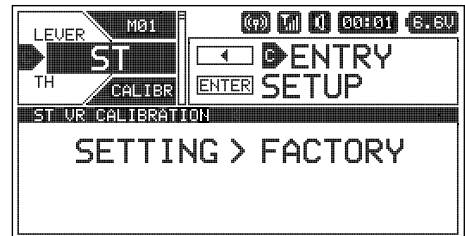
3) Press the ENTER key to open the ST VR CALIBRATION menu (or the TH VR CALIBRATION menu or the LEVER VR CALIBRATION menu, depending on your selection in step 2). SETTING > FACTORY will be highlighted.
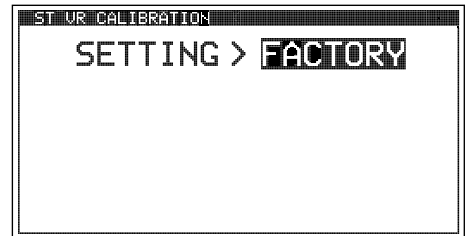
4) Press the ENTER key, then scroll UP or DOWN to highlight SETTING > USER. Calibration value information specific to the control you're calibrating will be displayed. If you're calibrating the Steering Wheel, NEUT > LEFT and RIGHT values will be displayed. If you're calibrating the Throttle Trigger, NEUT > HIGH and BRAKE values will be displayed and if you're calibrating the Auxiliary Lever, NEUT > HIGH and LOW values will be displayed.
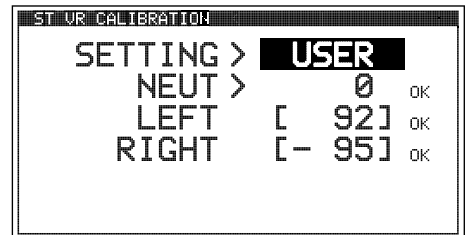
IMPORTANT: When completing the steps below, do not complete the steps out of order or the calibration process may not work correctly.

5) To calibrate the control's Neutral Point, scroll DOWN to highlight NEUT > 0. **Depending on the current state of calibration, a value other than 0 may be displayed.**
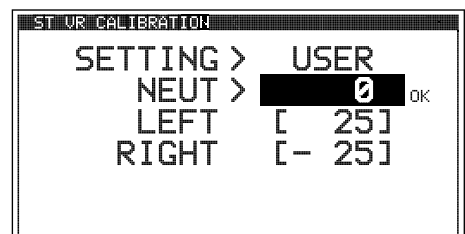
6) With the Steering Wheel (or Throttle Trigger or Auxiliary Lever) centered, press the ENTER key. NEUT > 0 OK will be displayed.

CALIBRATION MENU {CONTROL CALIBRATION ADJUSTMENT}　　SYSTEM

Calibrating the Steering, Throttle and Auxiliary Lever Controls, Continued:

7) Slowly move the Steering Wheel (or Throttle Trigger or Auxiliary Lever) all the way in one direction. Allow the control to return to Neutral, then slowly move the Steering Wheel, Throttle Trigger or Auxiliary Lever all the way in the opposite direction. A series of values and ADJUST OK? NO/YES will be displayed.
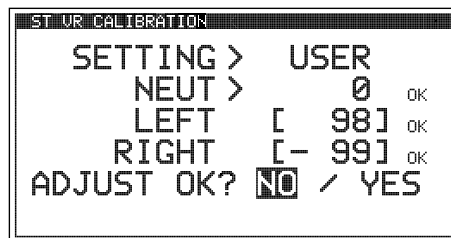
8) Scroll UP or DOWN to highlight YES, then press the ENTER key. After the calibration process completes, NEUT > 0 will be highlighted.

⚠ If you want to go back and repeat the calibration process or if you don't want to finish the calibration process for any reason, choose NO or press the BACK key.

9) Press the BACK key to return to the CALIBRATION menu and repeat steps 2 through 8 to calibrate the remaining controls.

Resetting the Steering, Throttle and Auxiliary Lever Calibration Values:

The Calibration values can be reset to the Factory Default values quickly and easily should you require it.

1) From within the CALIBRATION menu, scroll UP or DOWN to highlight the control option you would like to reset the Calibration values for, either ST (Steering), TH (Throttle) or LEVER (Auxiliary Lever).
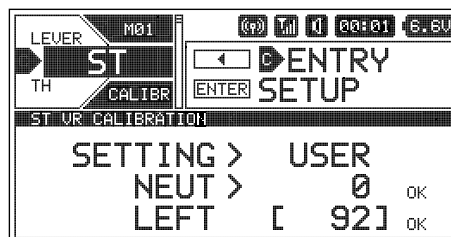
2) Press the ENTER key. SETTING > USER will be highlighted.
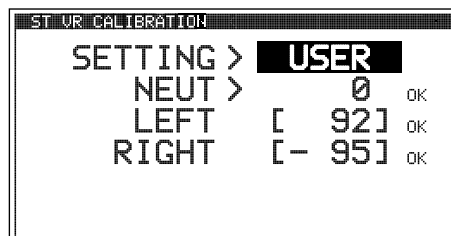
3) Press the ENTER key, then scroll UP or DOWN to choose the SETTING > FACTORY option.

4) Press the ENTER key. The Calibration values for that control will be reset to the Factory Default values.

5) Press the BACK key to return to the CALIBRATION menu and repeat steps 1 through 4 to reset the desired remaining controls.

BATT MENU {LOW VOLTAGE ALERT AND LIMIT ALARMS}　　SYSTEM

The BATT menu allows to specify the voltage at which the transmitter Low Voltage Alert and Low Voltage Limit alarms will sound. This allows you to choose custom Low Voltage values to match the type of transmitter battery you're using. For example, if you're using a 2S Li-Po battery pack, you can set the Low Voltage Alert alarm and the Low Voltage Limit alarm voltage values to suit. In addition, you are able to variably limit Throttle channel travel when both the Low Voltage Alert and Low Voltage Limit alarms sound to slow the maximum speed of your model, making is safer to operate until you are able to stop and recharge the transmitter battery. **In the default configuration the alarm voltage values are programmed for the 2S Li-Fe battery included.**

The tables below show the different Low Voltage Alert and Low Voltage Limit values we recommend using:

BATTERY TYPE	ALERT VALUE	LIMIT VALUE	BATTERY TYPE	ALERT VALUE	LIMIT VALUE
4 Cell Alkaline	4.6 Volts	4.4 Volts	2S Li-Po	7.2 Volts	6.8 Volts
6 Cell Ni-CD/Ni-MH	7.0 Volts	6.6 Volts	2S Li-Fe	6.3 Volts	6.1 Volts

WARNING: To ensure the safety of your transmitter battery, we suggest using the Low Voltage Alert and Low Voltage Limit values shown in the tables above. We don't suggest using values lower than those shown.

BATT MENU {LOW VOLTAGE ALERT AND LIMIT ALARMS}

SYSTEM

Changing the Low Voltage Alert Alarm Value:

The Low Voltage Alert alarm will sound to indicate the transmitter battery is getting low and should be recharged. We suggest stopping use as soon as safely possible and recharging the transmitter battery. The Low Voltage Alert alarm will sound for approximately 5 seconds each time the transmitter battery voltage decreases by 0.1 volt. To clear this alarm before it turns off automatically, press the BACK key or the ENTER key.

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the BATT menu.
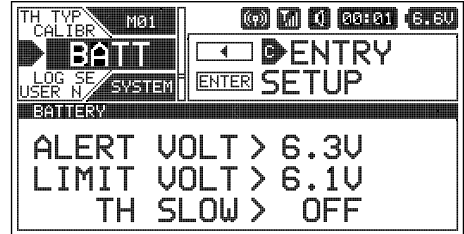
2) Press the ENTER key to open the BATT menu. ALERT VOLT > 6.3V will be highlighted and the current transmitter battery voltage will be displayed.
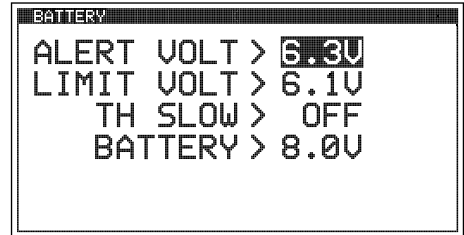
3) Press the ENTER key, then scroll UP or DOWN to choose the desired Low Voltage Alert alarm voltage value. We suggest using the value listed in the table on the previous page that matches the type of transmitter battery you're using.

ALERT VOLT setting range is 4.4V to 9.0V. The default setting is 6.3V.

⚠ The Low Voltage Alert alarm voltage value cannot be set lower than the Low Voltage Limit alarm voltage value.
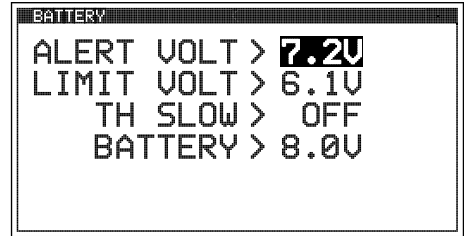
Changing the Low Voltage Limit Alarm Value:

The Low Voltage Limit alarm will sound to indicate the transmitter battery is dangerously low and should be recharged right away. The Low Voltage Limit alarm cannot be cancelled. When the Low Voltage Limit alarm sounds, you should stop use as soon as it's safe, then recharge the transmitter battery.

1) From within the BATT menu, scroll UP or DOWN to highlight LIMIT VOLT > 6.1V.
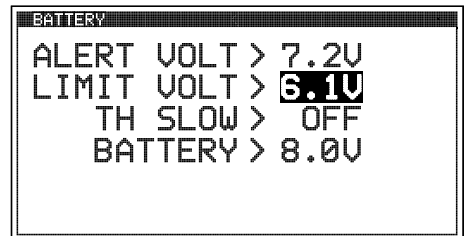
2) Press the ENTER key, then scroll UP or DOWN to choose the desired Low Voltage Limit alarm value. We suggest using the value listed in the table on the previous page that matches the type of transmitter battery you're using.

LIMIT VOLT setting range is 4.0v to 9.0v. The default setting is 6.1V.

⚠ The Low Voltage Limit alarm voltage value cannot be set higher than the Low Voltage Alert alarm voltage value.
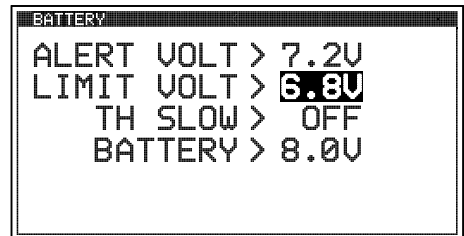
WARNING: Continuing to use the transmitter after the Low Voltage Limit alarm sounds can result in loss of control of your model. When the Low Voltage Limit alarm sounds, stop use as soon as it's safe, then recharge the transmitter battery.

WARNING: When using a Lithium battery in your transmitter, NEVER allow the battery to discharge below 3.0V per cell (Li-Fe) or 3.3V per cell (Li-Po), or damage to the battery can occur, which can also result in damage to the transmitter if severe enough.

SYSTEM

BATT MENU {LOW VOLTAGE ALERT AND LIMIT ALARMS}   **SYSTEM**

Changing the Throttle Slow Value:

The Throttle Slow function allows you to variably limit Throttle channel travel when both the Low Voltage Alert and Low Voltage Limit alarms sound to slow the maximum speed of your model, making is safer to operate until you are able to stop and recharge the transmitter battery. Programming this function is optional, but it's recommended for added safety.

1) From within the BATT menu, scroll UP or DOWN to highlight TH SLOW > OFF.

```
BATTERY
  ALERT VOLT > 7.2V
  LIMIT VOLT > 6.8V
     TH SLOW >  OFF
     BATTERY > 8.0V
```
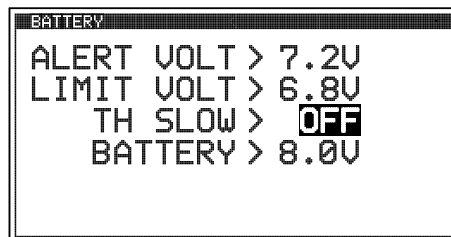
2) Press the ENTER key, then scroll UP or DOWN to choose the desired Throttle Low value. When set to ON, the maximum Throttle travel will be limited to approximately 1/2 throttle when the Low Voltage Alert alarm value is reached and will be limited to approximately 1/4 throttle when the Low Voltage Limit alarm value is reached. When set to OFF, the Throttle will operate normally regardless of which Low Voltage Alarm value is reached.
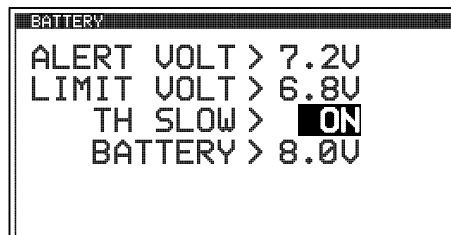
> TH SLOW setting range is OFF or ON. The default setting is OFF.

```
BATTERY
  ALERT VOLT > 7.2V
  LIMIT VOLT > 6.8V
     TH SLOW >   ON
     BATTERY > 8.0V
```

LOG SETUP MENU {TELEMETRY DISPLAY AND RECORDING OPTIONS}   **SYSTEM**

The LOG SETUP menu allows you to turn Telemetry Recording ON and OFF and configure how Telemetry Data is displayed on the TELEMETRY screen. For example, you are able to change the values at which the different Telemetry Sensor alarms sound, change how Speed and RPM are displayed and much more. Telemetry 1 and Telemetry 2 can be completely customized to read different telemetry values other than Temperature. You're able to rename Telemetry 1 and Telemetry 2, customize the Unit value and adjust the Offset and Rate to match the specific requirements of the Telemetry Sensor (or Sensors) you're using. You can even customize Telemetry 1 and Telemetry 2 Pop-Up messages.

When only the DISPLAY is turned ON using the DISPLAY key, the M12S Super can be placed in Receiver Mode, allowing it to Bind with another Airtronics or Sanwa FH3 or FH4T transmitter and read Telemetry Data from it. For example, if using an FH4T transmitter like the Airtrtonics MT-4S or MT-4, Telemetry Data can be viewed on the M12S Super's TELEMETRY screen, or, if using an FH3 transmitter like the Airtronics MX-3X or M11X that doesn't support Telemetry, Steering and Throttle Output Data can still be viewed on the M12S Super's TELEMETRY screen. This capability allows the M12S Super to be used as a separate Telemetry Viewer and Recorder.

⚠ For information about saving Telemetry Data to a PC, see the Saving the Telemetry Data Log section on pages 67 and 68. For information about using the TELEMETRY screen and viewing Telemetry Data, see the TELEMETRY Screen Overview section on pages 21 and 22.

> **IMPORTANT:** Full Telemetry integration requires the use of an Airtronics or Sanwa 2.4GHz FH4T Telemetry-capable surface receiver or SSL-compatible ESC (e.g. Super Vortex series ESC), although Throttle and Steering Output Data can still be viewed on the TELEMETRY screen and recorded if using an FH3 or FH4 receiver.

Telemetry Data Recording

The Telemetry Data Recording function records Telemetry Data when the Lap Timer is Started. When the Lap Timer is Stopped, Telemetry Data Recording is also Stopped. One Telemetry Data Log is kept in memory at a time and will be available for viewing even after the transmitter is turned OFF. When the Lap Timer is Started again, the current Telemetry Data Log will be erased and a new one Started. If you want to Save the current Telemetry Data Log, use the Save Log option in the PC LINK menu.

⚠ Prior to turning the Telemetry Data Recording function ON, you must turn Telemetry ON. For more information, see the Turning the Telemetry Function ON and OFF section on page 35.

Turning Telemetry Data Recording ON and OFF:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the LOG SETUP menu.
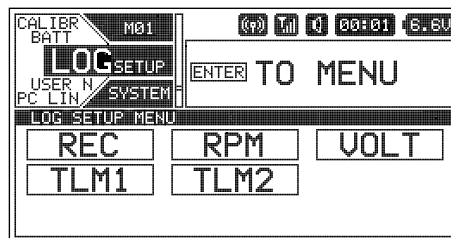
```
CALIBR   M01        (φ) Tⁱⁱ 🔋 00:01 6.6V
BATT
  LOGSETUP     ENTER TO MENU
USER N
PC LIN  SYSTEM
LOG SETUP MENU
  REC      RPM      VOLT
  TLM1     TLM2
```

LOG SETUP MENU {TELEMETRY DISPLAY AND RECORDING OPTIONS}   **SYSTEM**

Turning Telemetry Data Recording ON and OFF, Continued:

2) Press the ENTER key to open the LOG SETUP menu, then scroll UP or DOWN to highlight the REC menu.

3) Press the ENTER key to open the REC menu. REC > ON will be highlighted.

4) Scroll UP or DOWN to choose the desired Record value, either ON or OFF. When set to ON, Telemetry Data will be Recorded. When set to OFF, Telemetry Data will not be Recorded.
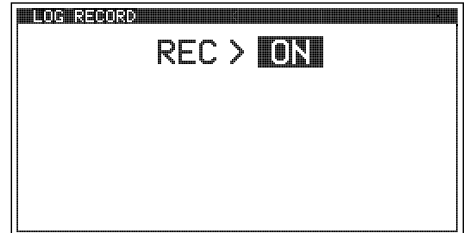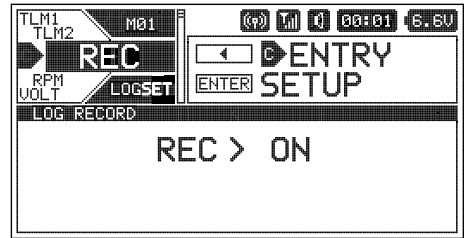
> REC setting range is ON or OFF. The default setting is ON.

RPM and Speed Telemetry Data Display Options

The RPM menu allows you to change the way RPM and Speed information is displayed on the TELEMETRY screen ALL and RPM pages. For example, you can choose to display RPMs, MPH or KM/H. The RPM Gauge and the RPM Digital Display names will even change from RPM to MPH or KM/H depending on the RPM Unit value chosen. In addition, you can define the Maximum Telemetry Data values that are displayed and the RPM sensor can be calibrated to ensure that the most accurate RPM or speed in MPH or KM/H is displayed for your specific model.

Changing the RPM Unit Value:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the LOG SETUP menu.

2) Press the ENTER key to open the LOG SETUP menu, then scroll UP or DOWN to highlight the RPM menu.

3) Press the ENTER key to open the RPM menu. UNIT > RPM will be highlighted.

4) Press the ENTER key, then scroll UP or DOWN to change the RPM Unit to the desired value. When RPM is chosen, the RPM of whatever the RPM Sensor is attached to will be displayed. When MPH or KM/H is chosen, the speed of your model will be displayed in either MPH or KM/H, respectively.
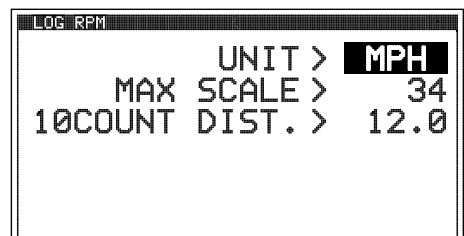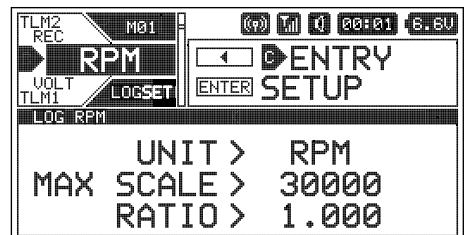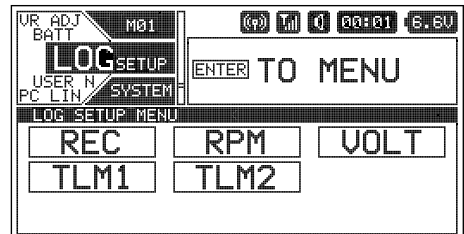
> UNIT setting range is RPM, MPH and KM/H. The default setting is RPM.

⚠ When you choose UNIT > MPH or UNIT > KM/H the RATIO > value will be replaced with a 10COUNT DIST. > value.

Changing the Maximum Scale Value:

1) From within the RPM menu, scroll UP or DOWN to highlight the MAX SCALE > value. This value will vary depending on the UNIT > value chosen previously.

SYSTEM

LOG SETUP MENU {TELEMETRY DISPLAY AND RECORDING OPTIONS}   **SYSTEM**

```
LOG RPM
              UNIT >   MPH
        MAX SCALE >      60
  10COUNT DIST. >   12.0
```
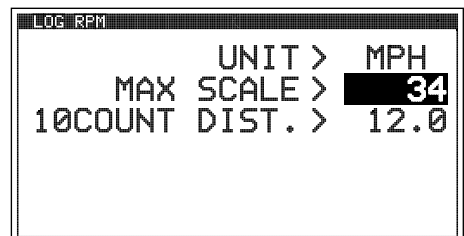
Changing the Maximum Scale Value, Continued:

2) Press the ENTER key, then scroll UP or DOWN to change the Maximum Scale value. This value determines the maximum RPM, MPH or KM/H value that will be displayed on the TELEMETRY screen ALL and RPM pages.
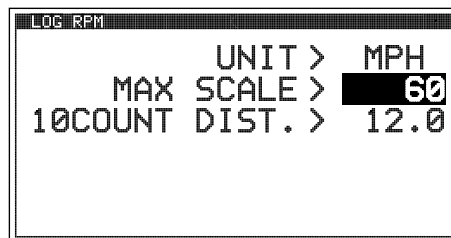
MAX SCALE setting range is 500 to 127500 RPM, 1 to 999 MPH and 1 to 999 KM/H. The default setting is 30000 RPM, 34 MPH and 54 KM/H.

The Maximum Scale MPH and KM/H setting range will vary based on the 10Count Distance value programmed when you calibrate the RPM Sensor. For more information, see the Calibrating the RPM Sensor - Changing the 10Count Distance Value section on pages 58 and 59.

Calibrating the RPM Sensor - Changing the Ratio Value:

The Ratio value can be changed if you've selected UNIT > RPM. By changing the Ratio value you are able to read actual motor or engine RPM even though the RPM sensor may be mounted to your model's spur gear and not to the motor's pinion gear or the engine's flywheel.

```
LOG RPM
           UNIT >   RPM
     MAX SCALE >   30000
         RATIO >  1.000
```

1) From within the RPM menu and with UNIT > RPM Selected, scroll UP or DOWN to highlight RATIO > 1.000.
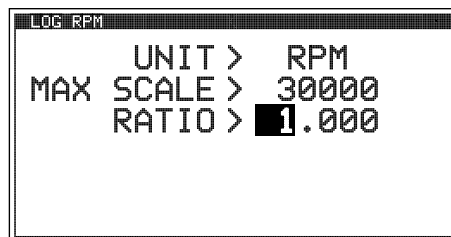
⚠ The Ratio value is the gear ratio between the two gears that the RPM sensor is mounted to. For example, if the RPM sensor is mounted to your spur gear, the Ratio value will be the gear ratio of your spur gear and pinion gear.

IMPORTANT: To calculate the gear ratio, divide the number of teeth in the spur gear by the number of teeth in the pinion gear. For example, if your spur gear is 60T and your pinion gear is 14T, the gear ratio is 60 / 14 = 4.28.

```
LOG RPM
           UNIT >   RPM
     MAX SCALE >   30000
         RATIO >  4.000
```

2) Press the ENTER key, then scroll UP or DOWN to choose the desired first Ratio value. If using the example above, choose 4.
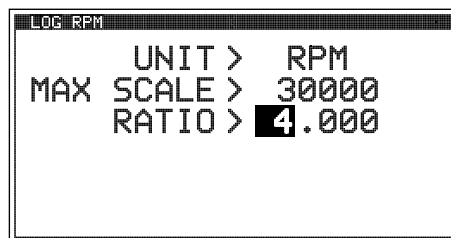
3) Press the ENTER key, then scroll DOWN to highlight the second Ratio value. Press the ENTER key, then scroll UP or DOWN to choose the desired second Ratio value. If using the example above, choose 28.

```
LOG RPM
           UNIT >   RPM
     MAX SCALE >   30000
         RATIO >  4.280
```

4) If necessary, press the ENTER key, then scroll DOWN to highlight the third ratio value. Press the ENTER key, then scroll UP or DOWN to choose the desired third Ratio value.
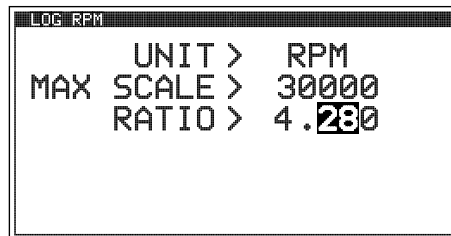
RATIO setting range is 1.000 to 64.999. The default setting is 1.000.

⚠ If the RPM sensor is mounted to your engine's flywheel or your motor's pinion gear to read the RPM directly, the Ratio value should be set to 1.000.

Calibrating the RPM Sensor - Changing the 10Count Distance Value:

The 10Count Distance value can be changed if you've selected UNIT > MPH or UNIT > KM/H. By changing the 10Count Distance value you are able to calibrate the RPM sensor to read your model's actual speed, in either MPH or KM/H.

LOG SETUP MENU {TELEMETRY DISPLAY AND LOGGING OPTIONS}   **SYSTEM**

Calibrating the RPM Sensor - Changing the 10Count Distance Value, Continued:

1) With your transmitter and receiver turned ON, and with an Active Telemetry connection, place your model on the ground.

2) Measuring in inches (or centimeters if using KM/H) from where you set your model on the ground, slowly push your model and measure the distance covered to complete 10 full revolutions of the RPM sensor (the Bind LED on your receiver will flash 10 times, indicating 10 full revolutions).
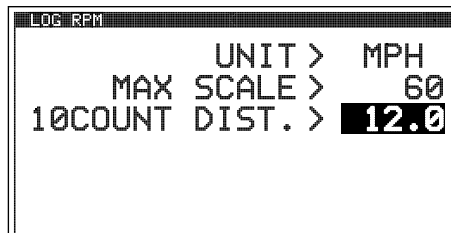
3) From within the RPM menu and with UNIT > MPH or UNIT > KM/H selected, scroll UP or DOWN to highlight 10COUNT DIST > 12.0 or 10COUNT DIST > 30, depending on the UNIT > value selected previously.

4) Press the ENTER key, then scroll UP or DOWN to change the 10Count Distance value to match the measurement obtained in step 2 above. For example, if your model traveled 2 feet (61cm) to complete 10 full revolutions, enter 24.0 (for MPH) or 61 (for KM/H).
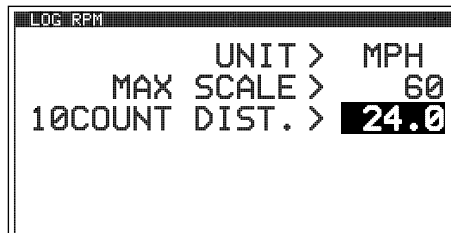
> 10COUNT DIST setting range is 0.5 to 118.0 for MPH and 1 to 300 for KM/H. The default setting is 12.0 for MPH and 30 for KH/H.

> **IMPORTANT:** Changing the 10Count Distance value will change the Maximum Scale value. After calibration, you should reset the Maximum Scale value back to the value you chose previously.

Battery Low Voltage Telemetry Data Display and Alert Alarm Options

The VOLT menu allows you to change the way receiver or motor battery Voltage information is displayed on the TELEMETRY screen ALL and VOLT pages and when the receiver Low Voltage Alert alarm sounds. For example, the Maximum Voltage value can be adjusted to calibrate the VOLT Indicator on the TELEMETRY screen ALL page. In addition, you can adjust the Voltage value that the receiver Low Voltage Alert alarm will sound at to match the type of receiver or motor battery you're using.

Changing the Maximum Voltage Value:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the LOG SETUP menu.
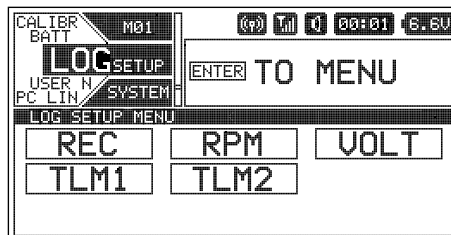
2) Press the ENTER key to open the LOG SETUP menu, then scroll UP or DOWN to highlight the VOLT menu.
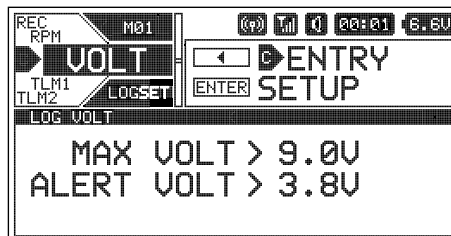
3) Press the ENTER key to open the VOLT menu. MAX VOLT > 9.0V will be highlighted.
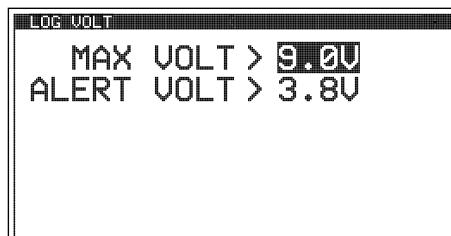
LOG SETUP MENU {TELEMETRY DISPLAY AND LOGGING OPTIONS}   SYSTEM

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Maximum Voltage value. This value determines the Maximum Voltage that will be displayed on the TELEMETRY screen VOLT page and also calibrates the VOLT Indicator on the TELEMETRY screen ALL page. We suggest using a value that matches as closely as possible the peaked voltage value of your receiver or motor battery after it's pulled off your charger.
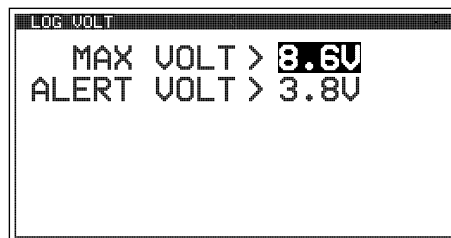
> MAX VOLT setting range is 3.0V to 9.0V. The default setting is 9.0V.

⚠ The Maximum Voltage value cannot be set Lower than the Alert Voltage value. If necessary, you may need to Lower the Alert Voltage value prior to lowering the Maximum Voltage value.

IMPORTANT: This function is really designed for use if you're using a separate receiver battery, such as in a glow- or gas-powered model. If you're using an ESC, your motor battery's voltage may exceed the Maximum Voltage value that can be set. This is normal. In this case, set the Maximum Voltage value to 9.0V.

Changing the Alert Voltage Value:

The Alert Voltage value determines the voltage at which the receiver Low Voltage Alert alarm will sound. For example, you can set the Alert Voltage value to alert you to when your model's receiver battery is getting low and needs to be recharged, or if you're using an ESC, you can set the Alert Voltage value to alert you to when your model's motor battery reaches its cut-off voltage value. When the Alert Voltage value is reached, the Voltage Alert alarm will sound and LED2 will flash. The Low Voltage Alert alarm will sound for approximately 5 seconds, however, LED2 will continue to flash until you recharge the receiver or motor battery. The audible portion of the Low Voltage Alert alarm can be cleared by pressing the BACK or ENTER keys.

1) From within the VOLT menu, scroll UP or DOWN to highlight ALERT VOLT > 3.8V.

2) Press the ENTER key, then scroll UP or DOWN to change the Alert Voltage value. The Alert Voltage value is the voltage that the receiver Low Voltage Alert alarm will sound at.
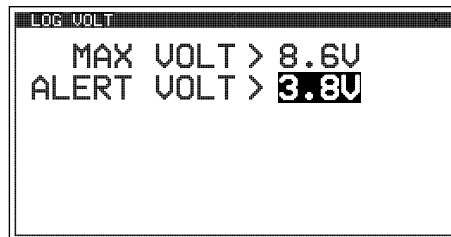
> ALERT VOLT setting range is 3.0V to 9.0V. The default setting is 3.8V.

⚠ The Alert Voltage value cannot be set Higher than the Maximum Voltage value. If necessary, you may need to raise the Maximum Voltage value prior to raising the Alert Voltage value.

IMPORTANT: Refer to the manufacturer of your receiver or motor battery to determine the safest Alert Voltage value to use. In general, the Alert Voltage value should be high enough to alert you when it's time to recharge your receiver or motor battery.

Telemetry 1 and Telemetry 2 Data Display and Alert Alarm Options

The TLM1 and TLM2 menus allow you to fully customize the way Telemetry 1 and Telemetry 2 information is displayed on the TELEMETRY screen ALL and TLM1 and TLM2 pages (in the default configuration, labeled TMP1 and TMP2). You're able to rename Telemetry 1 and Telemetry 2, change the Unit value and adjust the Offset and Rate values, all to match the specific requirements of the Telemetry Sensor (or Sensors) you're using. Customizable pop-up warning messages inform you of custom Telemetry Alerts. In the default configuration, Telemetry 1 and Telemetry 2 are configured to read Temperature 1 and Temperature 2, respectively.

⚠ This section covers both the TLM1 and TLM2 menus, since programming each of them is exactly the same. Choose either the TLM1 or the TLM2 menu depending on which of the two receiver Telemetry Ports you want to make changes to.

Changing the Telemetry Name:

The Telemetry Name can be changed to help you identify the Telemetry Sensor you're using and in which Telemetry Port. For example, if your using a Temperature Sensor in Port 1, the name can be TMP1, or if you're using a Fuel Level Sensor, the name can be FUEL. The Telemetry Name can consist of up to 4 letters or numbers.

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the LOG SETUP menu.
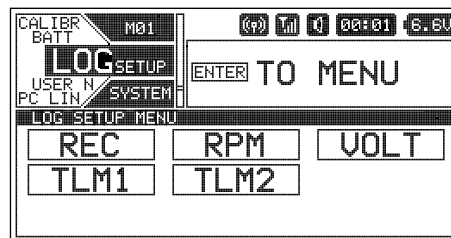
LOG SETUP MENU {TELEMETRY DISPLAY AND LOGGING OPTIONS}   SYSTEM

Changing the Telemetry Name, Continued:

2) Press the ENTER key to open the LOG SETUP menu, then scroll UP or DOWN to highlight either the TLM1 or the TLM2 menu depending on which of the two Telemetry Ports you want to make changes to. In this example, we've selected the TLM1 menu.
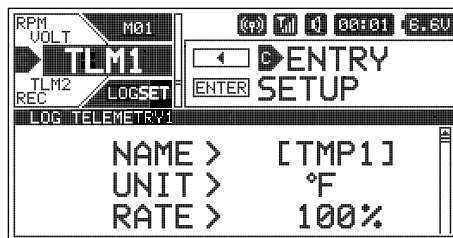
3) Press the ENTER key to open the TLM1 (or TLM2) menu, then scroll UP or DOWN to highlight NAME > [TMP1] or NAME > [TMP2].

4) Using the same methods that you used to change the Model Name, change the Telemetry Name to a name that matches the type of Telemetry Sensor that you're using (to make it easily identifiable on the TELEMETRY screen. For more information, see the Model Name section on pages 29 and 30.
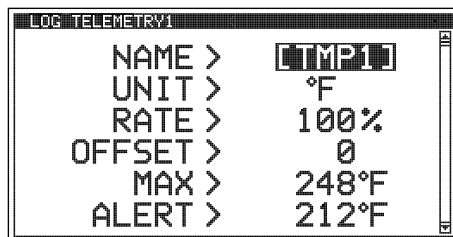
Changing the Unit Value:

1) From within the LOG TELEMETRY menu, scroll UP or DOWN to highlight UNIT > °F.

2) Press the ENTER key, then scroll UP or DOWN to change the Unit value. Choose from °F, °C (for a Temperature Sensor), or a custom value for another type of Telemetry Sensor.
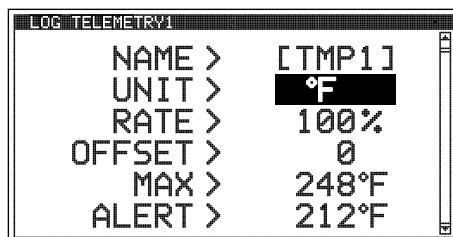
⚠ If using a custom Unit value, refer to the User's Guide included with your Telemetry Sensor to determine what value to use. For information about Naming a Custom Unit value, see the Changing the Unit Value Name section below.

UNIT setting range is °F, °C and [ ] Custom. The default setting is °F.

Changing the Unit Name (Custom Unit Value Only):

If using a custom Unit value, the Unit Name can be changed to match the type of Telemetry Sensor you're using. The Unit Name can consist of up to 2 letters or numbers. Refer to the User's Guide included with your Telemetry Sensor to determine what Unit Name to use.

1) After choosing UNIT > [ ] in step 2 above, press the ENTER key a second time to open the TELEMETRY UNIT menu.
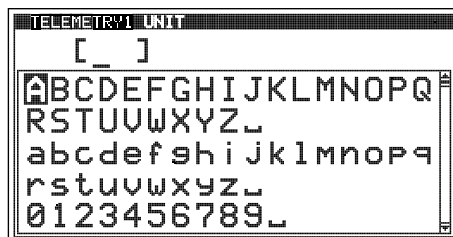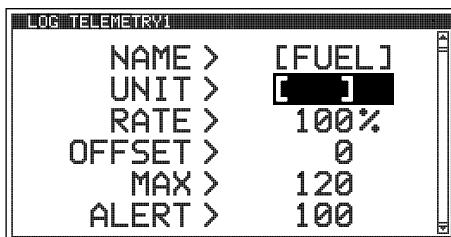
2) Using the same methods that you used to change the Model Name, change the Unit Name to match the type of Telemetry Sensor you're using. For more information, see the Model Name section on pages 29 and 30. You will notice that the MAX, ALERT and MIN values will automatically change to reflect the new Unit Name.
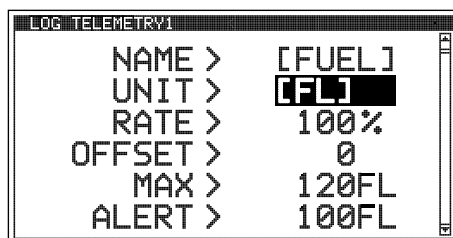
Changing the Rate and the Offset Values:

The Parameter Data of Telemetry 1 and Telemetry 2 is generated by the Voltage on the receiver Temperature Telemetry Ports (RX-461 and RX-462 receivers). The Rate and Offset values can be changed to correct the Telemetry Parameter Data to match the desired Telemetry Display when using a different type of Telemetry Sensor, such as a Fuel Level Sensor, plugged into the TMP1 or TMP2 Telemetry ports. For more information, refer to the User's Guide included with your Telemetry Sensor.

SYSTEM

LOG SETUP MENU {TELEMETRY DISPLAY AND LOGGING OPTIONS}   **SYSTEM**

Changing the Rate and the Offset Values, Continued:

⚠️ The Rate and Offset values don't need to be changed if you're using a Temperature Sensor plugged into the TMP1 and/or TMP2 Telemetry Ports on the RX-461 or RX-462 receivers. Rate and Offset values are changed only in you have a different type of Telemetry Sensor plugged into one of these ports. Refer to the User's Guide included with your Telemetry Sensor to determine what values to use.

1) From within the LOG TELEMETRY menu, scroll UP or DOWN to highlight RATE > 100%.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Rate value. The Rate value changes the total Telemetry Parameter Data value and the value you choose (and if you even need to change this value) will depend the type of Telemetry Sensor you have installed.
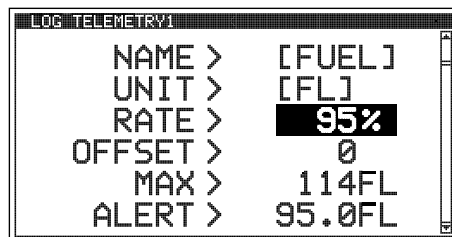
> RATE setting range is 0% to 200%. The default setting is 100%.

```
LOG TELEMETRY1
   NAME >    [FUEL]
   UNIT >    [FL]
   RATE >      95%
 OFFSET >       0
    MAX >    114FL
  ALERT >   95.0FL
```

3) From within the LOG TELEMETRY menu, scroll UP or DOWN to highlight OFFSET > 0%.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Offset value. The Offset value changes the neutral position of the Telemetry Parameter Data and the value you choose (and if you even need to change this value) will depend the type of Telemetry Sensor you have installed.
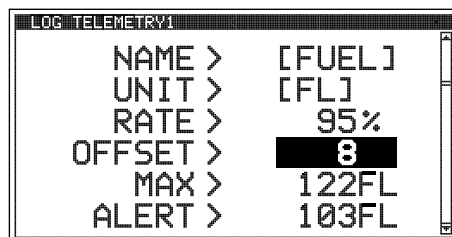
> OFFSET setting range is -254 to 254. The default setting is 0.

```
LOG TELEMETRY1
   NAME >    [FUEL]
   UNIT >    [FL]
   RATE >      95%
 OFFSET >       8
    MAX >    122FL
  ALERT >    103FL
```

Changing the Maximum Value:

The Maximum value determines the Maximum Telemetry Parameter Data value that will be displayed on the TELEMETRY screen TLM1 or TLM2 page and also calibrates the High Side of the TLM1 or TLM2 Indicator scale on the TELEMETRY screen ALL page.

1) From within the TLM1 or TLM2 menu, scroll UP or DOWN to highlight MAX > 248ºF (or other value depending on the selected Unit value).

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Maximum value.
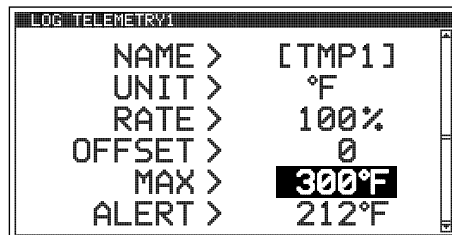
> MAX setting range is 0.00 to 254, but will vary depending on the selected Unit value. The default setting is 248ºF, 120ºC and 120 [ ] Custom.

```
LOG TELEMETRY1
   NAME >    [TMP1]
   UNIT >      °F
   RATE >     100%
 OFFSET >       0
    MAX >    300°F
  ALERT >    212°F
```

⚠️ The Maximum value cannot be set Lower than the Alert value or the Minimum value. If necessary, you may need to Lower the Alert value prior to lowering the Maximum value.

Changing the Alert Value:

The Alert value determines the value at which the Telemetry Alert alarm will sound. For example, you can set an Alert for your nitro engine that will alert you when your engine's cylinder head temperature is getting too hot, or you could set an Alert value for when your nitro car's fuel level is getting low.

When the Alert value is reached, the Telemetry Alert alarm will sound and LED2 will flash. The Alert alarm will sound for approximately 5 seconds, however, LED2 will continue to flash until the Telemetry Parameter Data value drops below the Alert value. The audible portion of the Alert alarm can be cleared by pressing the BACK or ENTER keys.

1) From within the TLM1 or TLM2 menu, scroll UP or DOWN to highlight ALERT > 212ºF (or other value depending on the selected Unit value).

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Alert Temperature value.
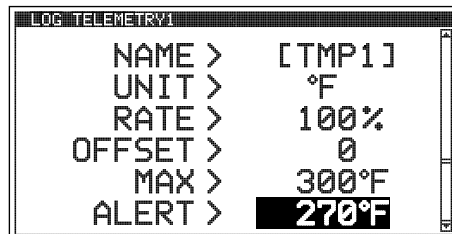
> ALERT setting range is 0.00 to 254, but will vary depending on the selected Unit value. The default setting is 212ºF, 100ºC and 100 [ ] Custom.

```
LOG TELEMETRY1
   NAME >    [TMP1]
   UNIT >      °F
   RATE >     100%
 OFFSET >       0
    MAX >    300°F
  ALERT >    270°F
```

⚠️ The Alert value cannot be set Higher than the Maximum value or Lower than the Minimum value. If necessary, you may need to Lower the Minimum value prior to lowering the Alert value.

LOG SETUP MENU {TELEMETRY DISPLAY AND LOGGING OPTIONS}   **SYSTEM**

Changing the Minimum Value:

The Minimum value determines the Minimum Telemetry Parameter Data value that will be displayed on the TELEMETRY screen TLM1 or TLM2 page and also calibrates the Low Side of the TLM1 or TLM2 Indicator scale on the TELEMETRY screen ALL page.

1) From within the TLM1 or TLM2 menu, scroll UP or DOWN to highlight MIN > 68ºF (or other value depending on the selected Unit value).

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Minimum value.

```
LOG TELEMETRY1
        MIN >      102°F
   MESSAGE >
        [              ]
   POP-UP >  DEFAULT
```
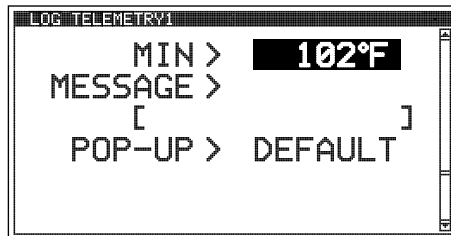
MIN setting range is 0.00 to 254, but will vary depending on the selected Unit value. The default setting is 68.0ºF, 32.0ºC and 20.0 [   ] Custom.

⚠ The Minimum value cannot be set Higher than the Alert value or the Maximum value. If necessary, you may need to Increase these values prior to Increasing the Minimum value.

Changing the Message Name and Message Pop-Up Behavior:

A custom Message Name can be programmed and the Message Pop-Up behavior can be changed to customize Telemetry 1 or Telemetry 2 Message Alerts. For example, if you're using a Fuel Level Sensor, you can program a Message that says "Low Fuel" that will pop up on the LCD screen when the Telemetry Alert Alarm value is reached.

1) From within the TLM1 or TLM2 menu, scroll UP or DOWN to highlight MESSAGE > [   ].

2) Press the ENTER key to open the TELEMETRY MESSAGE menu.

```
LOG TELEMETRY1
        MIN >     102°F
   MESSAGE >
        [              ]
   POP-UP >  DEFAULT
```

```
TELEMETRY1 MESSAGE
   [_            ]
ABCDEFGHIJKLMNOPQ
RSTUVWXYZ_
abcdefghijklmnopq
rstuvwxyz_
0123456789_
```
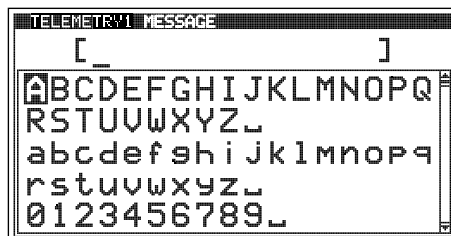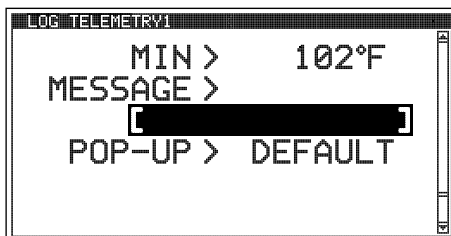
3) Using the same methods that you used to change the Model Name, change the Message Name as desired. For example, HIGH TEMP or LOW FUEL. For more information, see the Model Name section on pages 29 and 30.

```
LOG TELEMETRY1
        MIN >     102°F
   MESSAGE >
        [HIGH TEMP     ]
   POP-UP >  DEFAULT
```

4) From within the TLM1 or TLM2 menu, scroll UP or DOWN to highlight POP-UP > DEFAULT.

5) Press the ENTER key, then scroll UP or DOWN to choose the desired Telemetry Alert Pop-Up value.

```
LOG TELEMETRY1
        MIN >     102°F
   MESSAGE >
        [HIGH TEMP     ]
   POP-UP >  MESSAGE
```

Three Pop-Up Options are available:

DEFAULT - When selected, a Pop-Up Telemetry Alert that shows the current Telemetry Parameter Data value will be displayed when the Telemetry Alert value is reached.

MESSAGE - When selected, a Pop-Up Telemetry Alert with your custom Message will be displayed when the Telemetry Alert value is reached.

OFF - When selected, the Telemetry Alert Pop-Up Message will be turned OFF.

POP-UP setting range is DEFAULT, MESSAGE and OFF. The default setting is DEFAULT.

SYSTEM

LOG SETUP MENU {DISPLAY ONLY TELEMETRY OPTIONS}　　　　　　　**SYSTEM**

When only the DISPLAY is turned ON using the DISPLAY key, the M12S Super can be placed in Receiver Mode, allowing it to Bind with another Airtronics or Sanwa FH3 or FH4T transmitter and read Telemetry Data from it. For example, if using an FH4T transmitter, such as the MT-4, MT-4 Telemetry Data can be viewed on the M12S Super TELEMETRY screen or, if using an FH3 transmitter, such as the MX-3X or M11X that doesn't support Telemetry, Steering and Throttle Output Data can be viewed on the M12S Super TELEMETRY screen. This capability allows the M12S Super to be used as a separate Telemetry Viewer and Recorder.

To use this feature, first Bind your other transmitter to its receiver, then place the M12S Super in Receiver Mode and Bind it to your other transmitter. With your other transmitter turned ON and operating your model, you can use the M12S Super in DISPLAY mode to view Telemetry Data from the other transmitter.

This section details placing the M12S Super in Receiver Mode and making Steering and Throttle Point adjustments so that your paired transmitter's Steering and Throttle Output Data is displayed correctly on the M12S Super's TELEMETRY screen.

⚠ The menus shown in this section are only visible when using DISPLAY mode. They are not visible if the M12S Super is turned ON using the Power Switch. To turn DISPLAY mode OFF, press the DISPLAY key a second time.

Receiver Mode

Using the RX MODE menu, you are able to place the transmitter in Receiver Mode, which allows you to Bind the M12S Super transmitter to another Airtronics or Sanwa FH3 or FH4T transmitter and read Telemetry Data from it.

Enabling Receiver Mode:

1) With the M12S Super turned OFF, press and HOLD the DISPLAY key to turn only the Display ON.

2) From within the SYSTEM menu, scroll UP or DOWN to highlight the LOG SETUP menu.
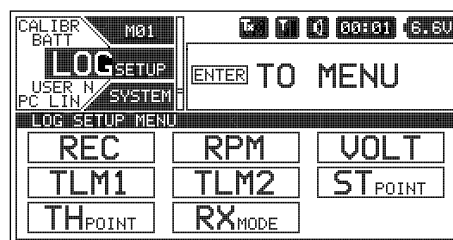
3) Press the ENTER key to open the LOG SETUP menu, then scroll UP or DOWN to highlight the RX MODE menu.
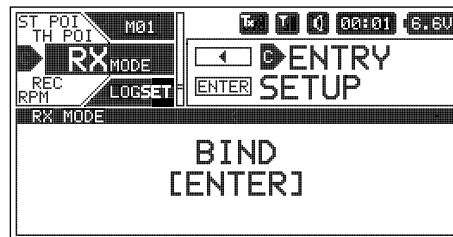
4) Press the ENTER key to open the RX MODE menu. BIND will be displayed and [ENTER] will be highlighted.

5) Turn your other transmitter ON, then navigate to that transmitter's BIND menu and highlight the [ENTER] option. For more information, refer to your transmitter's User's Guide.
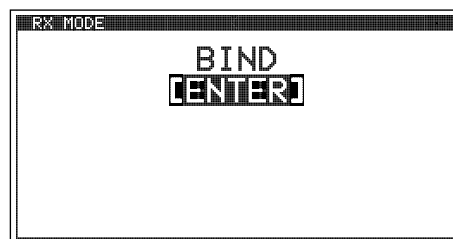
6) Press the ENTER key on the M12S Super to begin the Binding process. SEARCH will flash slowly.

7) Press the ENTER key on your other transmitter. RECEIVE will flash fast on the M12S Super.
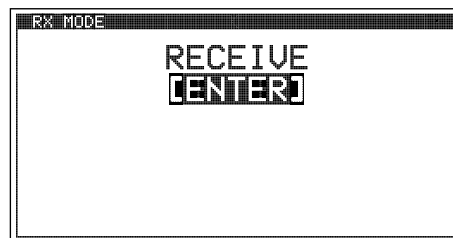
8) Press the BACK key, first on the M12S Super, then on your other transmitter, to complete the Binding process. The Bind LED on your other transmitter should illuminate solid and both LED1 and LED2 on the M12S Super should be extinguished.

9) Press the BACK key to return to the STATUS screen, then scroll UP or DOWN to open the TELEMETRY screen. You should now be able to view the other transmitter's Steering and Throttle Output Data on the M12S Super TELEMETRY screen. In addition, if your other transmitter supports Telemetry, you should be able to view that transmitter's Telemetry Data on the M12S Super TELEMETRY screen as well.

LOG SETUP MENU {DISPLAY ONLY TELEMETRY OPTIONS}   **SYSTEM**

Steering and Throttle Output Data Display Adjustments

The Steering Point and Throttle Point functions allow you to calibrate the TELEMETRY screen ALL page Steering and Throttle Output Data Displays, so the Output Data displayed matches your paired transmitter's Steering Wheel and Throttle Trigger movement.

⚠ If you don't use the Steering Point and Throttle Point functions to calibrate the Steering and Throttle Output Data Displays, incorrect Output Data will be displayed. These steps should be performed after placing the M12S Super in Receiver Mode and Binding it to your other transmitter.

Calibrating the Steering Output Data Display:

1) With the transmitter turned OFF, press and HOLD the DISPLAY key to turn only the Display ON.

2) From within the SYSTEM menu, scroll UP or DOWN to highlight the LOG SETUP menu.

3) Press the ENTER key to open the LOG SETUP menu, then scroll UP or DOWN to highlight the ST POINT menu.

4) Press the ENTER key. The ST POINT menu will be displayed and NEUTRAL POINT > 127 will be highlighted.

5) With your other transmitter turned ON and paired with the M12S Super, do the following:

   A) Center the other transmitter's Steering Wheel, then press the ENTER key on the M12S Super.

   B) Scroll DOWN to highlight LEFT END > 212. Rotate and HOLD the other transmitter's Steering Wheel all the way to the LEFT, then press the ENTER key on the M12S Super.

   C) Scroll DOWN to highlight RIGHT END > 42. Rotate and HOLD the other transmitter's Steering Wheel all the way to the RIGHT, then press the ENTER key on the M12S Super.

   ⚠ The values displayed in the ST POINT fields don't represent actual Steering Wheel movement and may vary. Steering Wheel movement is displayed as a percentage below the ST POINT fields.
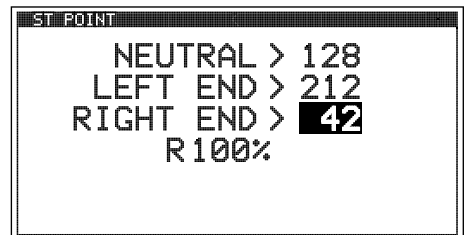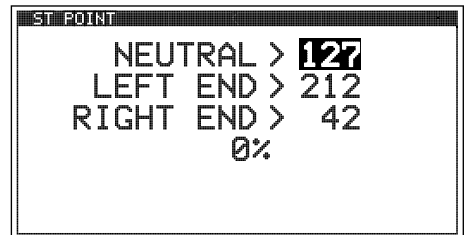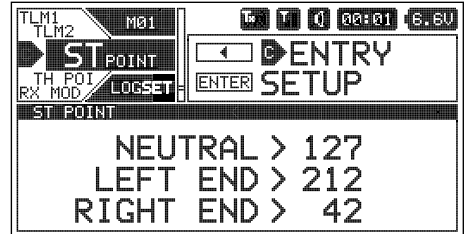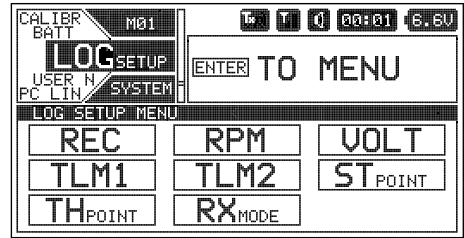
Calibrating the Throttle Output Data Display:

1) Without turning the transmitter ON, press and HOLD the DISPLAY key to turn only the Display ON.

2) From within the SYSTEM menu, scroll UP or DOWN to highlight the LOG SETUP menu.

3) Press the ENTER key to open the LOG SETUP menu, then scroll UP or DOWN to highlight the TH POINT menu.
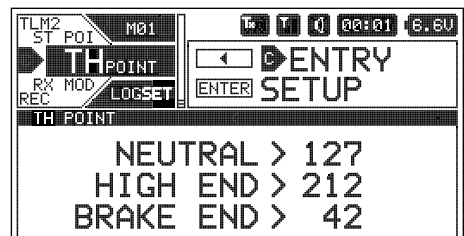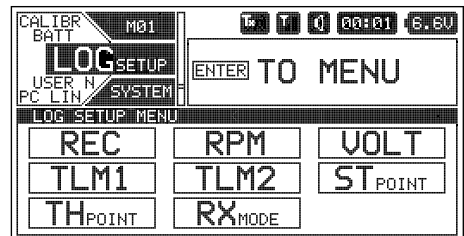
LOG SETUP MENU {DISPLAY ONLY TELEMETRY OPTIONS}	SYSTEM

Calibrating the Throttle Output Data Display, Continued:

4) Press the ENTER key. The TH POINT menu will be displayed and NEUTRAL POINT > 127 will be highlighted.

5) With your other transmitter turned ON and paired with the M12S Super, do the following:

   A) Center the other transmitter's Throttle Trigger, then press the ENTER key on the M12S Super.

   B) Scroll DOWN to highlight HIGH END > 212. Pull and HOLD the other transmitter's Throttle Trigger all the way BACK, then press the ENTER key on the M12S Super.

   C) Scroll DOWN to highlight BRAKE END > 42. Push and HOLD the other transmitter's Throttle Trigger all the way FORWARD, then press the ENTER key on the M12S Super.

   ⚠ The values displayed in the TH POINT fields don't represent actual Throttle Trigger movement and may vary. Throttle Trigger movement is displayed as a percentage below the TH POINT fields.
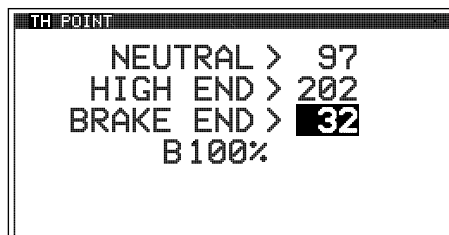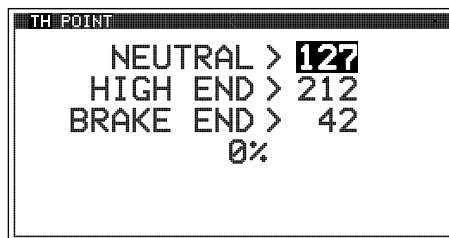
USER NAME MENU {TRANSMITTER USER NAMING}	SYSTEM

The User Name function allows you to enter a User Name that is displayed on the STATUS screen, just above the M12S logo. This allows you to personalize your transmitter by naming it. The User Name can consist of up to 14 letters, numbers or symbols. Choose from capital letters, Lower case letters, numbers and various symbols.

⚠ If the User Name is left blank, the Airtronics or Sanwa logo will be displayed in its place. The logo displayed will vary based on region.

Entering a User Name:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the USER NAME menu.

2) Press the ENTER key to open the USER NAME menu. The underscore will be positioned under the first space in the User Name. Press the ENTER key a second time

3) Scroll UP or DOWN and press the SELECT switch RIGHT or LEFT to highlight a character in the Character List. Press the ENTER key to select the highlighted character. That character will be displayed in the User Name and the underscore will advance to the next space. **If at any time you can't move the underscore, press the BACK key to re-gain control of the underscore.**

4) Repeat step 3 to enter the rest of the characters. Up to 14 characters can be entered. If desired, press the BACK key to re-gain control of the underscore, then use the SELECT switch or scroll UP or DOWN to move the underscore RIGHT or LEFT. To add a space (or spaces) in your User Name, use the ⌴ character.
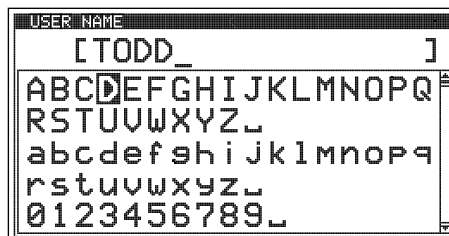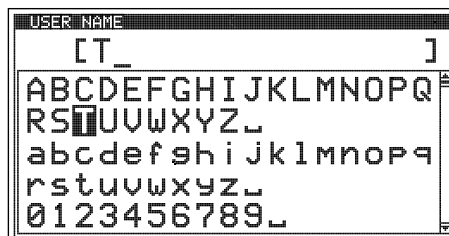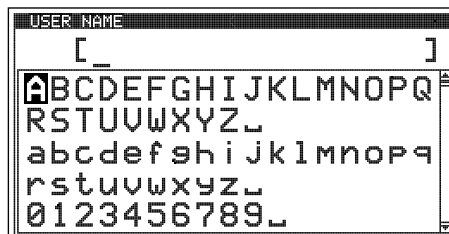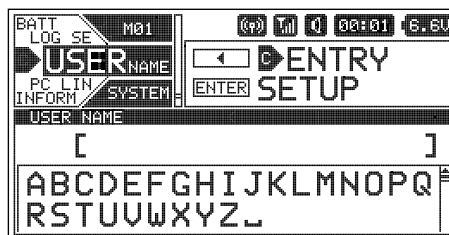
USER NAME MENU {TRANSMITTER USER NAMING} — SYSTEM

Entering a User Name, Continued:

5) When you return to the STATUS screen, your User Name will be displayed above the M12S logo.
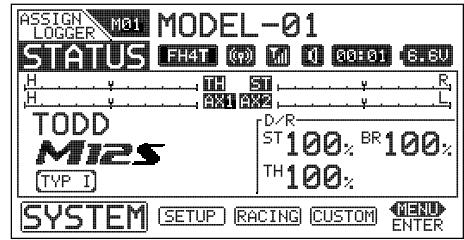
Deleting a Character:

1) Press the SELECT switch RIGHT or LEFT or scroll UP or DOWN to move the underscore under the character in your User Name you want to delete.

2) Press the ENTER key, then scroll UP or DOWN and press the SELECT switch RIGHT or LEFT to highlight the ▭ character in the Character List. Press the ENTER key. The character in your User Name will be deleted and the underscore will advance to the next space.

Deleting the User Name:

1) Press the SELECT switch RIGHT or LEFT or scroll UP or DOWN to move the underscore under the first character in your User Name.

2) Press the ENTER key, then scroll UP or DOWN and press the SELECT switch RIGHT or LEFT to highlight the ▭ character in the Character List. Continuously press the ENTER key to delete each character in your User Name.

PC LINK {SAVE TRANSMITTER DATA AND UPDATE FIRMWARE} — SYSTEM

The PC LINK menu allows you to Save the current Telemetry Data Log to your PC for viewing at a later date. Once a Telemetry Data Log is Saved to your PC, the data can be read using a spreadsheet program, such as Microsoft Excel. In addition, you're able to Save Model Programming Data and Model Templates to your PC, Load saved Model Programming Data and Model Templates from your PC, and use your PC to update the M12S Super transmitter's Firmware version.

Downloading the PC LINK Manager Software:

To use the various PC LINK functions, a Mini USB cable (not included) and Sanwa PC LINK Manager version 3 software will be required. To download the PC LINK Manager version 3 software, visit the M12S Super product page at http://www.airtronics.net. For users outside of North America, visit the web page of your Sanwa regional distributor or Sanwa directly at http://www.sanwa-denshi.com.

PC LINK Input
(Under Cover)
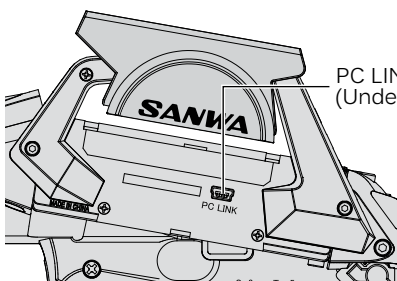
⚠ Model Programming Data, Templates and Firmware are not compatible with the standard M12 transmitter or any other Airtronics or Sanwa transmitter.

IMPORTANT: Before proceeding, make sure that the transmitter is turned ON and connected to your PC, and that the PC LINK Manager 3 software is installed on your PC and running. For more information, refer to the User's Guide included with the PC LINK Manager 3 software.

Saving the Telemetry Data Log

The Save Log function allows you to Save the current Telemetry Data Log for viewing or archiving on your PC. The Telemetry Data Recording function records Telemetry Data when the Lap Timer is Started. When the Lap Timer is Stopped, Telemetry Recording is also Stopped. One Telemetry Data Log is kept in memory at a time and will be available for viewing even after the transmitter is turned OFF. When the Lap Timer is Started again, the current Telemetry Data Log will be erased and a new one Started. If you want to Save the current Telemetry Data Log, follow the steps in this section.

Saving the Telemetry Data Log:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the PC LINK menu.
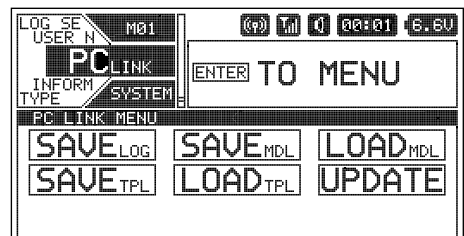
PC LINK {SAVE TRANSMITTER DATA AND UPDATE FIRMWARE}   **SYSTEM**

Saving the Telemetry Data Log, Continued:

2) Press the ENTER key to open the PC LINK menu, then scroll UP or DOWN to highlight the SAVE LOG menu.

3) With the PC LINK Manager 3 software running and the transmitter connected, press the LOG SAVE TX > PC button on the PC LINK Manager 3 software.

4) Navigate to the folder you would like to save the Telemetry Data Log to, then type a name for the file and press the Save button. **Do not press the Start button on the PC LINK Manager 3 software yet!**
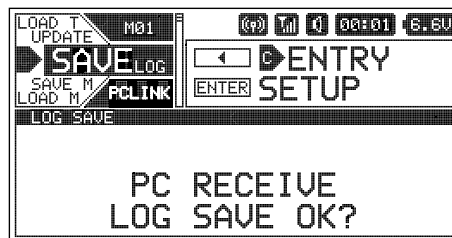
5) Press the ENTER key. PC RECEIVE LOG SAVE OK? NO/YES will be displayed.

6) Scroll UP or DOWN to highlight YES, then press the ENTER key. PC START will be displayed.

   ⚠ If you want to go back or if you don't want to Save the Telemetry Data Log for any reason, choose NO or press the BACK key.
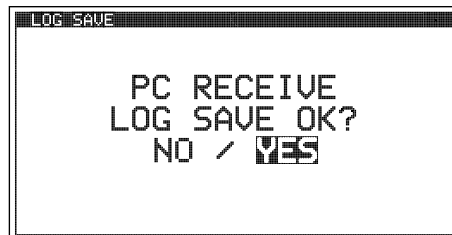
7) Press the Start button on the PC LINK Manager 3 software and allow the Data Transfer to complete. Once completed, EXECUTED will be displayed momentarily on the M12S Super and The Operation Was Completed will be displayed on your PC.

Saving Model Programming Data

The Save Model function allows you to Save the currently selected model's Programming Data to your PC, either for archiving or for sharing with other M12S Super transmitter users. For example, you can Save your current model's Programming Data to your PC, then share the file with a friend or fellow driver. They can then upload that Programming Data to their M12S Super using the Load Model function.

⚠ Only the currently selected model's Programming Data will be Saved. To Save the Programming Data for a different model, you must select that model first, using Model Select function. For more information, see the Model Select section on pages 28 and 29.

Saving Model Programming Data:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the PC LINK menu.
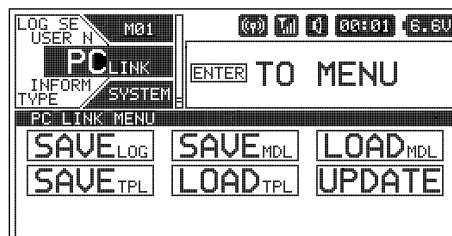
2) Press the ENTER key to open the PC LINK menu, then scroll UP or DOWN to highlight the SAVE MDL menu.

3) With the PC LINK Manager 3 software running and the transmitter connected, press the MODEL SAVE TX > PC button on the PC LINK Manager 3 software.

4) Navigate to the folder you would like to save the Model Programming Data to, then type a name for the file and press the Save button. **Do not press the Start button on the PC LINK Manager 3 software yet!**
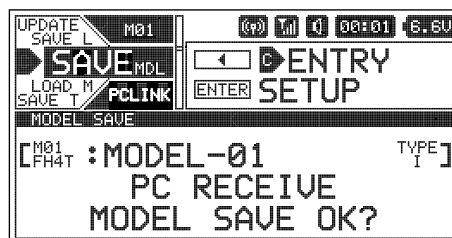
5) Press the ENTER key. PC RECEIVE MODEL SAVE OK? NO/YES will be displayed.

6) Scroll UP or DOWN to highlight YES, then press the ENTER key. PC START will be displayed.

   ⚠ If you want to go back or if you don't want to Save the Model Programming Data for any reason, choose NO or press the BACK key.
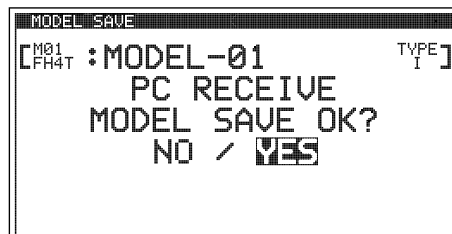
7) Press the Start button on the PC LINK Manager 3 software and allow the Data Transfer to complete. Once completed, EXECUTED will be displayed momentarily on the M12S Super and The Operation Was Completed will be displayed on your PC.

PC LINK {SAVE TRANSMITTER DATA AND UPDATE FIRMWARE}   **SYSTEM**

Loading Model Programming Data

The Load Model function allows you to Load Model Programming Data from your PC onto your transmitter. For example, if you've archived a Model's Programming Data onto your PC, you can restore it onto the transmitter or you can Load a Model's Programming Data that a friend or fellow driver has provided to you.

WARNING: When you Load Model Programming Data from your PC, that Model Programming Data will overwrite the Programming Data of the currently Selected Model. Please make sure you first load a model that you don't want to overwrite! For more information, see the Model Select section on pages 28 and 29.

<u>Loading Model Programming Data:</u>

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the PC LINK menu.

2) Press the ENTER key to open the PC LINK menu, then scroll UP or DOWN to highlight the LOAD MDL menu.

3) With the PC LINK Manager 3 software running and the transmitter connected, press the MODEL LOAD PC > TX button on the PC LINK Manager 3 software.

4) Navigate to the folder where your Saved Model File is, then select the file and Press the Open button. **Do not Press the Start button on the PC LINK Manager 3 software yet!**

5) Press the ENTER key. PC TRANSMIT MODEL LOAD OK? NO/YES will be displayed.

6) Scroll UP or DOWN to highlight YES, then press the ENTER key. PC START will be displayed.

   ⚠ If you want to go back or if you don't want to Load the Model Programming Data for any reason, choose NO or press the BACK key.

7) Press the Start button on the PC LINK Manager 3 software and allow the Data Transfer to complete. Once completed, EXECUTED will be displayed momentarily on the M12S Super and The Operation Was Completed will be displayed on your PC.
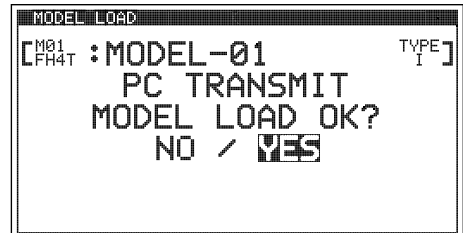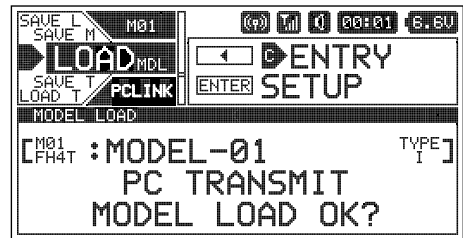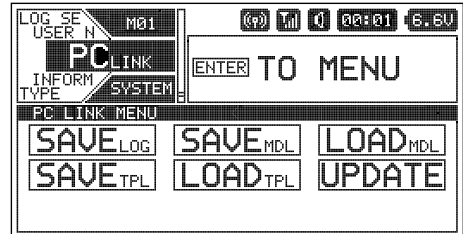
Saving Model Templates

The Save Template function allows you to Save any of the five Model Templates to your PC, either for archiving or for sharing with other M12S Super transmitter users. For example, you can Save a Model Template to your PC, then share the file with a friend or fellow driver. They can then upload that Model Template to their M12S Super using the Load Template function.

<u>Saving a Model Template:</u>

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the PC LINK menu.

2) Press the ENTER key to open the PC LINK menu, then scroll UP or DOWN to highlight the SAVE TPL menu.

3) With the PC LINK Manager 3 software running and the transmitter connected, press the (TEMPLATE SAVE) button on the PC LINK Manager 3 software.

4) Navigate to the folder you would like to save the Model Template to, then type a name for the file and press the Save button. **Do not press the Start button on the PC LINK Manager 3 software yet!**
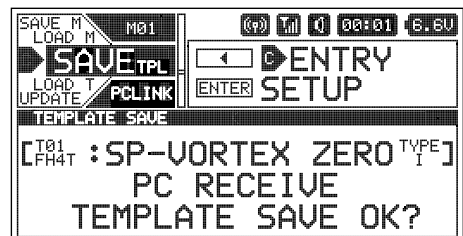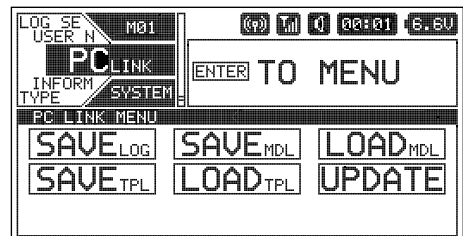
SYSTEM

PC LINK {SAVE TRANSMITTER DATA AND UPDATE FIRMWARE}   **SYSTEM**

<u>Saving a Model Template, Continued:</u>

5) Press the ENTER key. PC RECEIVE TEMPLATE SAVE OK? NO/YES will be displayed.

6) To select the Model Template you want to Save, press the SELECT switch Right or Left.

7) Scroll UP or DOWN to highlight YES, then press the ENTER key. PC START will be displayed.

⚠ If you want to go back or if you don't want to Save the Model Template for any reason, choose NO or press the BACK key.

8) Press the Start button on the PC LINK Manager 3 software and allow the Data Transfer to complete. Once completed, EXECUTED will be displayed momentarily on the M12S Super and The Operation Was Completed will be displayed on your PC.
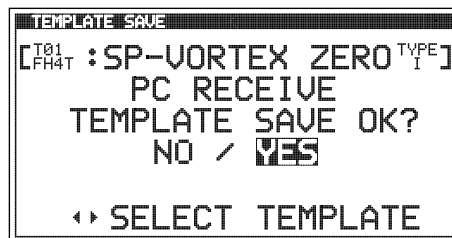
Loading Model Templates

The Load Template function allows you to Load Model Templates from your PC onto your transmitter. For example, if you've archived a Model Template onto your PC or if you've downloaded a new Model Template from the Internet and saved it onto your PC, you can Load it into the transmitter's Model Template menu.

> **WARNING:** When you Load a Model Template from your PC, that Model Template will overwrite the Programming Data of the Model Template you Select in step 6 below. If you don't want to overwrite the selected Model Template, either choose another Model Template to overwrite or use the Save Template function to archive that Model Template to your PC.

<u>Loading a Model Template:</u>

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the PC LINK menu.

2) Press the ENTER key to open the PC LINK menu, then scroll UP or DOWN to highlight the LOAD TPL menu.

3) With the PC LINK Manager 3 software running and the transmitter connected, press the (TEMPLATE LOAD) button on the PC LINK Manager 3 software.

4) Navigate to the folder where your Saved Model Template is, then select the file and Press the Open button. **Do not Press the Start button on the PC LINK Manager 3 software yet!**
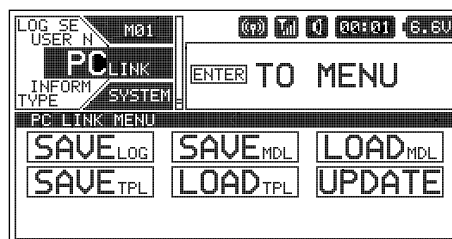
5) Press the ENTER key. PC TRANSMIT TEMPLATE LOAD OK? NO/YES will be displayed.

6) To select the Model Template you want to overwrite, press the SELECT switch Right or Left.

7) Scroll UP or DOWN to highlight YES, then press the ENTER key. PC START will be displayed.

⚠ If you want to go back or if you don't want to Load the Model Template for any reason, choose NO or press the BACK key.

8) Press the Start button on the PC LINK Manager 3 software and allow the Data Transfer to complete. Once completed, EXECUTED will be displayed momentarily on the M12S Super and The Operation Was Completed will be displayed on your PC.
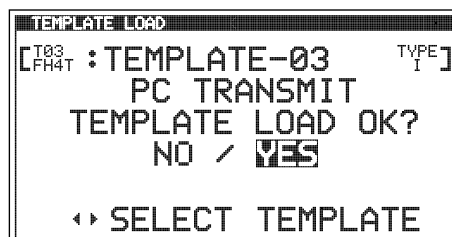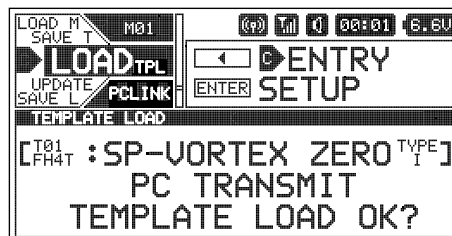
Updating Transmitter Firmware

The Update function allows you to Update the transmitter's Firmware to the latest version available. This allows you to keep your transmitter up to date with the latest features.

The Firmware version that your transmitter is currently running is shown in the INFORMATION menu. For more information, see the INFORMATION Menu section on page 71.

PC LINK {SAVE TRANSMITTER DATA AND UPDATE FIRMWARE}	SYSTEM

⚠ Before proceeding, download and save the latest Firmware version to a convenient location on your PC. Updates (when available) can be downloaded from the M12S Super product page at http://www.airtronics.net. For users outside of North America, visit the web page of your Sanwa regional distributor or Sanwa directly at http://www.sanwa-denshi.com.

> **WARNING:** The Update process will take approximately 5 to 10 minutes. Make sure that before starting the Update process that the transmitter's battery voltage is sufficient to complete the Update process. Once started, DO NOT STOP the Update process and DO NOT unplug the transmitter from your PC!

Updating the Transmitter Firmware Version:

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the PC LINK menu.
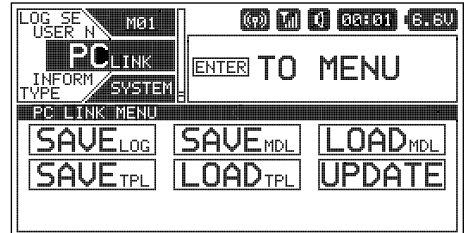
2) Press the ENTER key to open the PC LINK menu, then scroll UP or DOWN to highlight the UPDATE menu.
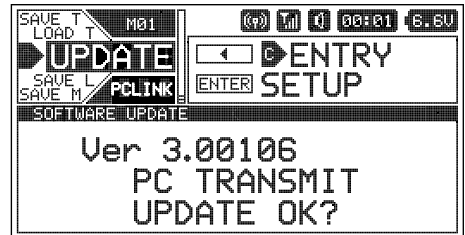
3) With the PC LINK Manager 3 software running and the transmitter connected, press the SOFTWARE UPDATE button on the PC LINK Manager 3 software.

4) Navigate to the folder where you Saved the new Firmware version (.tom file), then select the file and press the Open button. **Do not press the Start button on the PC LINK Manager 3 software yet!**

5) Press the ENTER key. PC TRANSMIT UPDATE OK? NO/YES will be displayed.

6) Scroll UP or DOWN to highlight YES, then press the ENTER key. PC START will be displayed.
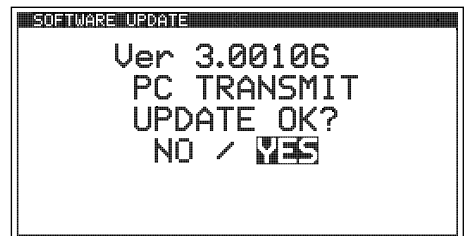
> ⚠ If you want to go back or if you don't want to Update the Firmware version for any reason, choose NO or press the BACK key.

7) Press the Start button on the PC LINK Manager 3 software and allow the Update process to complete. Once completed, The Operation Was Completed will be displayed on your PC and the transmitter will Reset. Turn the transmitter OFF, unplug the USB cable from the transmitter, then turn the transmitter back ON to finalize the Update process.

8) You can view that the Firmware update was successful by checking the new Firmware version in the INFORMATION menu.

INFORMATION MENU {FIRMWARE VERSION, BOOT SCREEN, AND BASIC MODE}	SYSTEM

The INFORMATION menu allows you to view the transmitter's current Firmware version, in addition to the transmitter's cumulative On-Time in Hours and Minutes, and allows you to change the BOOT menu behavior, turn BASIC Mode ON and OFF and change the direction the Push-Button Scroll Wheel moves the Cursor.

Resetting the On-Time:

Cumulative On-Time will accrue whether the transmitter is turned ON or if only the Display is turned ON using the DISPLAY key. If Reset to 00:00 after changing or recharging the transmitter batteries, it can be used to determine battery discharge time. The On-Time is displayed in Hours : Minutes.

1) From within the SYSTEM menu, scroll UP or DOWN to highlight the INFORMATION menu.
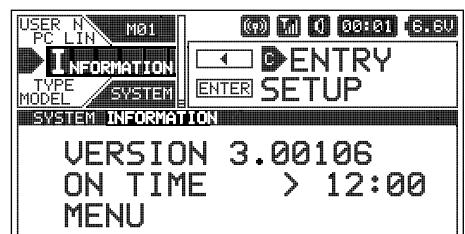
INFORMATION MENU {FIRMWARE VERSION, BOOT SCREEN, AND BASIC MODE}   SYSTEM

```
SYSTEM INFORMATION
VERSION 3.00106
ON TIME    > 00:00
MENU
    BOOT    >    DEMO
    BASIC   >    OFF
    KEY     >    NOR
```

Resetting the On-Time, Continued:

2) Press the ENTER key to open the INFORMATION menu. ON TIME > 00:00 (or the actual Cumulative On-Time) will be highlighted and the current Firmware version will be displayed.

3) Press and HOLD the ENTER key to Reset the ON TIME to 00:00.
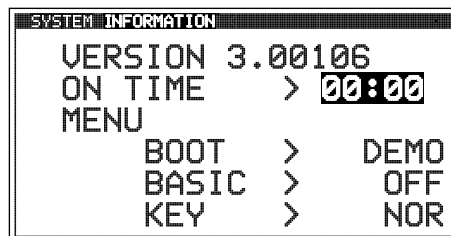
Changing the Boot Options:

The Boot function allows you to change the default start-up behavior of the transmitter when it's turned ON.

```
SYSTEM INFORMATION
VERSION 3.00106
ON TIME    > 00:40
MENU
    BOOT    >    DEMO
    BASIC   >    OFF
    KEY     >    NOR
```

1) From within the INFORMATION menu, scroll UP or DOWN to highlight BOOT > DEMO.
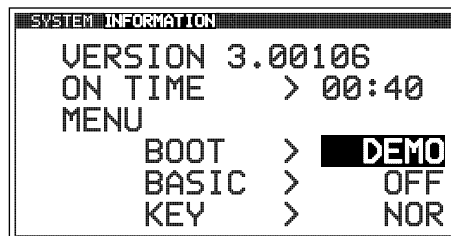
2) Press the ENTER key, then scroll UP or DOWN to choose the desired Boot value. When DEMO is selected, the Logo will be displayed during the start-up process, then default to the STATUS screen. When RESUME is selected, the transmitter will display the last Programming Menu you were in when the transmitter was turned OFF. When TOP is selected, the transmitter will default to the STATUS screen when turned ON.

```
SYSTEM INFORMATION
VERSION 3.00106
ON TIME    > 00:40
MENU
    BOOT    >    RESUME
    BASIC   >    OFF
    KEY     >    NOR
```
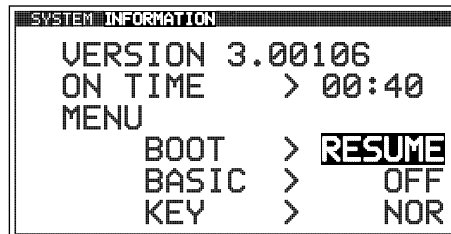
BOOT setting range is DEMO, RESUME and TOP. The default setting is DEMO.

Turning BASIC Mode ON and OFF:

The M12S Super features a BASIC Mode that simplifies transmitter use. The accompanying BASIC menu contains some of the more common, general-use Programming Menus that a user will require for basic programming.

When BASIC Mode is turned ON, not only are these various Programming Menus in one easy place to find them, so you don't need to spend time finding them in one of the other four menus, but it also removes the TELEMETRY and ASSIGN screens to simplify transmitter use.

```
SYSTEM INFORMATION
VERSION 3.00106
ON TIME    > 00:40
MENU
    BOOT    >    DEMO
    BASIC   >    OFF
    KEY     >    NOR
```

1) From within the INFORMATION menu, scroll UP or DOWN to highlight BASIC > OFF.

2) Press the ENTER key, then scroll UP or DOWN to select the desired option, either ON or OFF. When ON is selected, BASIC Mode will be turned ON and when OFF is selected, BASIC Mode will be turned OFF.
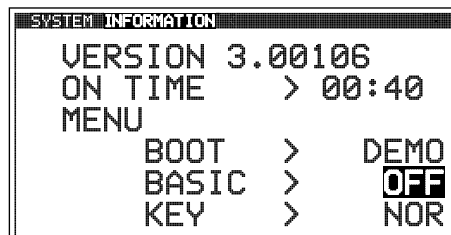
BASIC setting range is ON and OFF. The default setting is ON.

Changing the Programming Cursor Scroll Direction:

The direction the Push-Button Rotary Dial moves the Programming Cursor can be changed. For example, you might want to reverse the direction the Programming Cursor moves relative to the Push-Button Rotary Dial is you've switched the transmitter to the left-handed driving position.

```
SYSTEM INFORMATION
VERSION 3.00106
ON TIME    > 00:40
MENU
    BOOT    >    DEMO
    BASIC   >    OFF
    KEY     >    NOR
```

1) From within the INFORMATION menu, scroll UP or DOWN to highlight KEY > NOR.

2) Press the ENTER key, then scroll UP or DOWN to select the desired option. Choose from either NOR (Normal) or REV (Reverse).
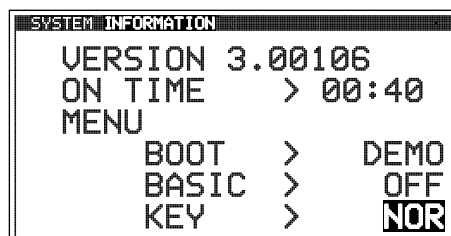
KEY setting range is NOR and REV. The default setting is NOR.

SETUP MENU OVERVIEW   SETUP

To access the various SETUP menu Programming Menus, turn the transmitter ON, press the SELECT switch to highlight the SETUP menu, then press the ENTER key to open the SETUP menu.

Scroll UP or DOWN to highlight the desired Programming Menu, then press the ENTER key to open that menu.
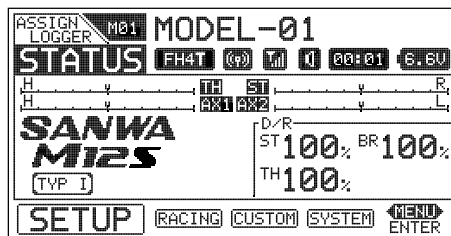
⚠ BASIC Mode must be turned OFF to access the SETUP menu. For more information, see the Turning BASIC Mode ON and OFF section on page 25. In addition, depending on the Car Type chosen, some Function Programming Value Names may differ from those shown in this section.

The following Programming Menus are available within the SETUP menu:

MENU	MENU DESCRIPTION	PAGE #
EPA	Adjust Channel End Points to Balance Servo Travel	PG. 73
SUB TRIM	Adjust Servo Centering to Center the Servo Horns	PG. 74
REV	Change the Direction of Servo Travel	PG. 75
POINT AX1	Adjust Auxiliary 1 Point Values to Change the Servo Stepping Behavior	PG. 76
POINT AX2	Adjust Auxiliary 2 Point Values to Change the Servo Stepping Behavior	PG. 77
MOA MIX	Adjust and Change Dual Motor Mixing options (Crawler Car Types Only)	PG. 77
4WS MIX	Adjust and Change Four Wheel Steering Mixing Options (Crawler Car Types Only)	PG. 79
FEELING	Adjust Steering and Throttle Channel Latency Values	PG. 80
F/S	Program Fail Safe Settings	PG. 80
B-F/S	Program Receiver Battery Fail Safe Settings to Ensure Optimum Servo Performance	PG. 81
LAP TIMER	Program the Lap Timer Goal Time, Pre-Alarm and Lap Timer Start Options	PG. 82
INT1	Program Interval Timer 1 and Change its Start Options	PG. 84
INT2	Program Interval Timer 2 and Change its Start Options	PG. 84
DOWN	Program the Count-Down Timer and Change its Start Options	PG. 85

EPA MENU {CHANNEL END POINT ADJUSTMENTS}   SETUP

The End Point Adjustment function allows you to adjust servo travel in each direction. This makes it possible to balance servo travel in both directions and set the maximum desired amount of servo travel. For example, on a gas-powered model, if you pull the Throttle Trigger and the carburetor does not open completely, you can Increase the Throttle High End Point Adjustment so that the carburetor opens completely. Another example is with steering. If your model turns sharper to the Right than to the Left, you can Increase the Steering Left End Point Adjustment to balance the steering.

The End Point Adjustment function can be adjusted for the Steering channel (Right and Left), the Throttle channel (High and Brake), the Auxiliary 1 channel (High and Low) and the Auxiliary 2 channel (High and Low).

IMPORTANT: Before making End Point Adjustments, the servo horn needs to be centered. Install the servo horn onto the servo, making sure it's as close to being centered as possible, then use the Servo Sub-Trim function to center the servo arm exactly. For more information, see the SUB TRIM Menu section on pages 74 and 75.
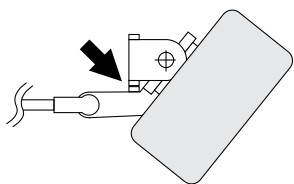
⚠ End Point Adjustment percentage values should not be increased to the point where your linkages and servos bind when moved all the way to the Right or Left. Binding will cause the servos to 'buzz', resulting in a quicker loss of receiver battery power and eventual damage to the servos or to your model.

Changing the Channel End Point Adjustment Percentage Values:

1) From within the SETUP menu, scroll UP or DOWN to highlight the EPA menu.
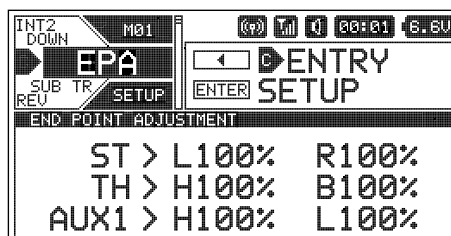
EPA MENU {CHANNEL END POINT ADJUSTMENTS}   SETUP

Changing the Channel End Point Adjustment Percentage Values, Continued:

2) Press the ENTER key to open the EPA menu. The cursor will default to either ST > L100% or ST > R100%.

```
END POINT ADJUSTMENT
  ST >  100%   R100%
  TH > H100%   B100%
AUX1 > H100%   L100%
AUX2 > H100%   L100%
```
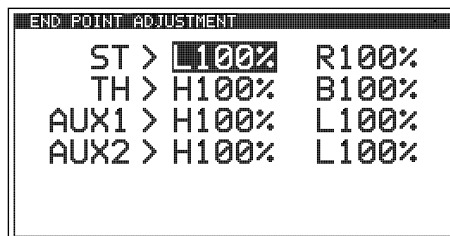
3) Scroll UP or DOWN to highlight the desired End Point Adjustment percentage value you would like to change.

4) Press the ENTER key, then scroll UP or DOWN to Increase or Decrease the End Point Adjustment percentage value. Increasing the percentage value will Increase servo travel in that direction and Decreasing the percentage value will Decrease servo travel in the that direction.

```
END POINT ADJUSTMENT
  ST >  L 95%   R100%
  TH > H100%   B100%
AUX1 > H100%   L100%
AUX2 > H100%   L100%
```
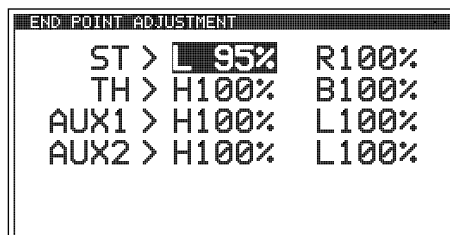
5) Press the ENTER key, then repeat steps 3 and 4 to change any other desired End Point Adjustment percentage values.

```
END POINT ADJUSTMENT
  ST > L 95%   R105%
  TH > H125%   B 95%
AUX1 > H100%   L100%
AUX2 > H 50%    85%
```
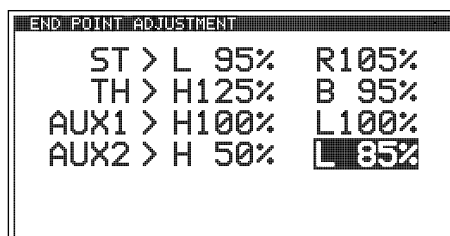
> ST L and R setting range is 0% to 150%, TH H and B setting range is 0% to 150%, AUX1 H and L setting range is 0% to 150% and AUX2 H and L setting range is 0% to 150%. The default setting for all channels is 100%.

⚠ If you're using an ESC, the Throttle High and the Throttle Brake End Point Adjustment percentage values are both generally set to 100%, although the Throttle High direction may need to be increased to achieve full power. In some cases, Throttle and Brake End Point Adjustments can also be set directly via the Electronic Speed Control.

SUB TRIM MENU {SERVO CENTERING}   SETUP

The Sub-Trim function allows you to correct the Neutral Trim setting for the Steering, Throttle, Auxiliary 1 and Auxiliary 2 channels, making it possible to center the Trim Switches while ensuring the servo horns remain centered.

It's not unusual that when you center a servo and install the servo horn, the servo horn is not exactly centered. The Sub-Trim function allows you to center the servo horn exactly, without altering the servo End Point travel. This is especially useful when using a Mix, such as Four Wheel Steering Mixing. For example, you can use the Sub-Trim function to adjust the Neutral Trim setting of your Front and Rear Steering servos independently to ensure your Model tracks straight.
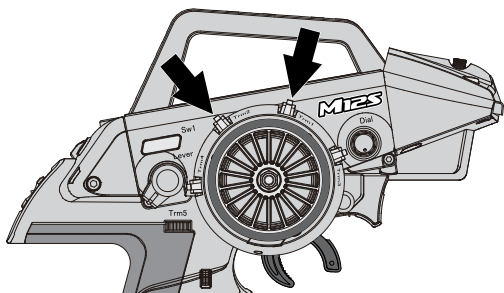
⚠ Before changing the Sub-Trim values you should set the Steering and Throttle Trim to 0% using the Trm1 and Trm2 Trim Switches.

Changing the Servo Sub-Trim Values:

1) Install the servo horn (or servo saver for the Steering servo) onto your servo, making sure that the servo horn (or servo saver) is as close to being centered as possible. In some cases, you can get the servo horn closer to being centered by rotating the servo horn 180º and reinstalling it.
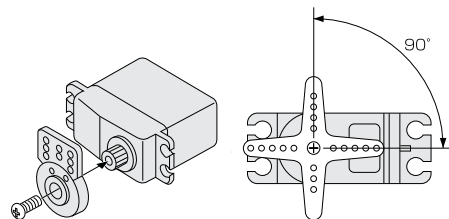
SUB TRIM MENU {SERVO CENTERING}   SETUP

Changing the Servo Sub-Trim Values, Continued:

2) From within the SETUP menu, scroll UP or DOWN to highlight the SUB TRIM menu.

3) Press the ENTER key to open the SUB TRIM menu. The cursor will default to ST > 0.

4) Scroll UP or DOWN to highlight the desired Sub-Trim value you would like to change.

5) Press the ENTER key, then scroll UP or DOWN to Increase or Decrease the Sub-Trim value only enough to center the servo horn.

6) Press the ENTER key, then repeat steps 4 and 5 to change any other desired Sub-Trim values.
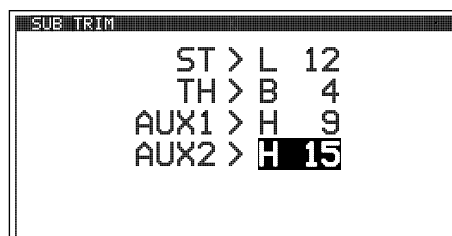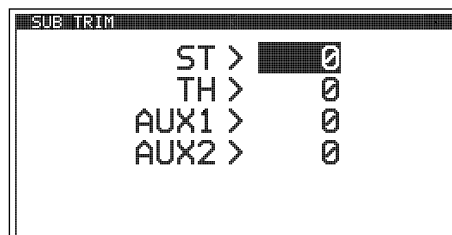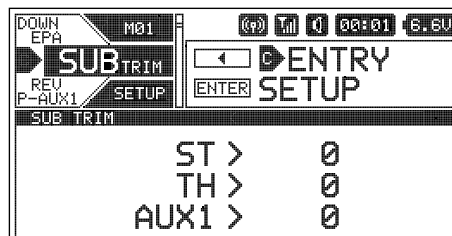
> ST setting range is R150 to L150, TH setting range is H150 to B150, AUX1 setting range is H150 to L150 and AUX2 setting range is H150 to L150. The default setting for all channels is 0.

> **IMPORTANT:** Changing the Sub-Trim values will alter the servo's End Points. After changing the Sub-Trim values, use the End Point Adjustment function to Reset the servo End Point Adjustment Percentage Values. For more information, see the EPA Menu section on pages 72 and 73.

REV MENU {SERVO REVERSING}   SETUP

The Servo Reversing function allows you to electronically switch the direction of servo travel. For example, if you rotate the Steering Wheel to the Right, and the Steering servo moves to the Left, you can use the Servo Reversing function to make the Steering servo move to the Left. The Servo Reversing function is available for all four channels.

⚠ When you change the direction of servo travel, the servo horn may no longer be centered. If this occurs, use the Servo Sub-Trim function to center the servo horn. For more information, see the Changing the Servo Sub-Trim Values section on pages 74 and 75.

Changing the Servo Reversing Values:

1) From within the SETUP menu, scroll UP or DOWN to highlight the REV menu.

2) Press the ENTER key to open the REV menu. The cursor will default to ST > NOR.
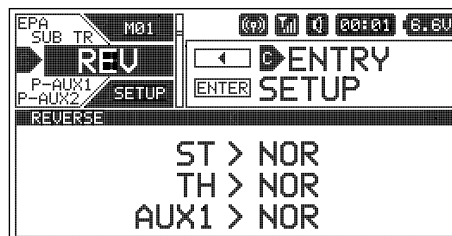
SETUP

REV MENU {SERVO REVERSING} **SETUP**

3) Scroll UP or DOWN to highlight the desired Servo Reversing value you would like to change.

4) Press the ENTER key, then scroll UP or DOWN to change the Servo Reversing value. Choose from either NOR (Normal) or REV (Reverse).

5) Press the ENTER key, then repeat steps 3 and 4 to change any other desired Servo Reversing values.

```
REVERSE
        ST > NOR
        TH > REV
      AUX1 > REV
      AUX2 > NOR
```
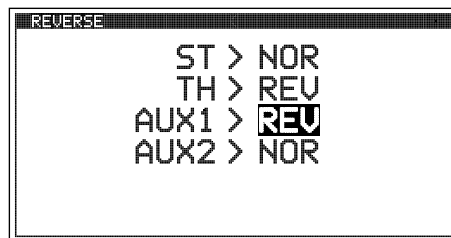
ST, TH, AUX1 and AUX2 setting range is NOR and REV. The default setting for all channels is NOR.

POINT AUX1 MENU {AUXILIARY 1 POINT VALUES} **SETUP**

The Point Auxiliary function allows you to program the Auxiliary 1 servo to move up to 6 different Points along its travel, then cycle through those Points using one of the Trim Switches or the Rotary Dial. For example, if your model requires a separate 3-position or more switch to operate a feature, the Point Auxiliary function can be customized to control this. This section details how to change the actual Point values. For example, if you have 4 Points programmed, you can change the Point values to cycle your servo from 0 to 20 to 40 to 60 degrees and back again.

Use one of the five Trim Switches or the Auxiliary Dial to cycle through the Point Positions while you're driving. The Auxiliary Lever is not suitable for use in this situation. The Point Auxiliary function can be toggled OFF and ON while you're driving by Assigning AUX1 to one of the three Push-Button Switches.

⚠ Prior to programming the Auxiliary 1 Point values, you must first change the Auxiliary Channel Operating Mode to POINT, then choose the number of Points you want to program. For more information, see the AUX TYPE Menu section on page 50.

⚠ The Step value for the Auxiliary Dial or Trim Switch should be set to 1, otherwise the transmitter won't cycle properly through the programmed Points. For more information, see the Changing the Trim Switch Step Value section on page 40 or the Changing the Auxiliary Dial Step Value section on page 41.

```
SUB TR            M01        ((•)) 📶 🔈 00:01 6.6V
 REV
   POINT AX1       ◄ ⏵ENTRY
 P-AUX2   SETUP   ENTER SETUP
 FEELIN
 POINT AUX1
   P1 > L100   P2 > L 60
   P3 > L 20   P4 > H 20
```

Changing the Auxiliary 1 Point Values:

1) From within the SETUP menu, scroll UP or DOWN to highlight the POINT AX1 menu. In the example shown in this section, we've programmed 4 Points in the AUX TYPE menu.
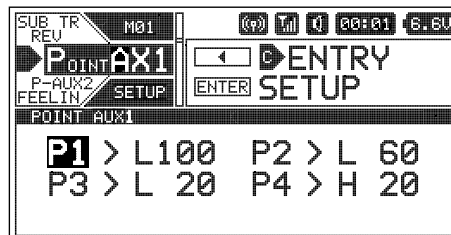
2) Press the ENTER key to open the POINT AX1 menu. The cursor will default to P1 > L100 and the current Point will be highlighted.
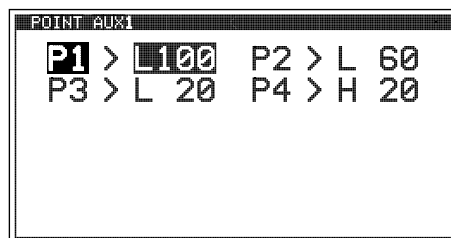
```
POINT AUX1
   P1 > L100   P2 > L 60
   P3 > L 20   P4 > H 20
```

3) Scroll UP or DOWN to highlight the desired Point value you would like to change.

4) Press the ENTER key, then scroll UP or DOWN to change the Point value. Choosing an H or L value will determine the direction the servo travels.

5) Press the ENTER key, then repeat steps 3 and 4 to change any other desired Point values.

```
POINT AUX1
   P1 >    0   P2 > H 20
   P3 > H 40   P4 > H 60
```

P1 though P6 setting range is H100 to L100. The default setting for P1 is L100, for P2 is L60, for P3 is L20, for P4 is H20, for P5 is H60 and for P6 is H100. These values are a percentage of Auxiliary 1 servo travel.

6) Cycle forward and backward through the Points using the Auxiliary Dial (default) or the Trim Switch you Assigned AUX1 to. You will notice that as you cycle through the Points, the current Point will be highlighted and in addition, the current Point will be displayed in a pop-up window.

POINT AUX2 MENU {AUXILIARY 2 POINT VALUES}   SETUP

The Point Auxiliary function allows you to program the Auxiliary 2 servo to move up to 6 different Points along its travel, then cycle through those Points using one of the Trim Switches or the Rotary Dial. For example, if your model requires a separate 3-position or more switch to operate a feature, the Point Auxiliary function can be customized to control this. This section details how to change the actual Point values. For example, if you have 4 Points programmed, you can change the Point values to cycle your servo from 0 to 20 to 40 to 60 degrees and back again.

Use one of the five Trim Switches or the Auxiliary Dial to cycle through the Point Positions while you're driving. The Auxiliary Lever is not suitable for use in this situation. The Point Auxiliary function can be toggled OFF and ON while you're driving by Assigning AUX2 to one of the three Push-Button Switches.

⚠️ Prior to programming the Point Auxiliary 2 Point values, you must first change the Auxiliary Channel Operating Mode to POINT, then choose the number of Points you want to program. For more information, see the AUX TYPE Menu section on page 50.

⚠️ The Step value for the Auxiliary Dial or Trim Switch should be set to 1, otherwise the transmitter won't cycle properly through the programmed Points. For more information, see the Changing the Trim Switch Step Value section on page 40 or the Changing the Auxiliary Dial Step Value section on page 41.

<u>Changing the Auxiliary 2 Point Values:</u>

1) From within the SETUP menu, scroll UP or DOWN to highlight the POINT AX2 menu. In the example shown in this section, we've programmed 2 Points in the AUX TYPE menu.

2) Press the ENTER key to open the POINT AX2 menu. The cursor will default to P1 > L100 and the current Point will be highlighted.

3) Scroll UP or DOWN to highlight the desired Point value you would like to change.

4) Press the ENTER key, then scroll UP or DOWN to change the Point value. Choosing an H or L value will determine the direction the servo travels.

5) Press the ENTER key, then repeat steps 3 and 4 to change any other desired Point values.

P1 though P6 setting range is H100 to L100. The default setting for P1 is L100, for P2 is L60, for P3 is L20, for P4 is H20, for P5 is H60 and for P6 is H100. These values are a percentage of Auxiliary 2 servo travel.

6) Cycle forward and backward through the Points using the Auxiliary Dial or the Trim Switch you Assigned AUX2 to. You will notice that as you cycle through the Points, the current Point will be highlighted and in addition, the current Point will be displayed in a pop-up window.

MOA MIX MENU {MOTOR ON AXLE MIXING}   SETUP

The Motor on Axle Mixing function provides you with two Throttle channels. It is typically used for Rock Crawlers and allows you to control either the Front and Rear motors together or independently, giving you Dig and Burn functions. In addition, you can variably change the power distribution between the Front and Rear motors, allowing you the utmost in functionality. Use one of the five Trim Switches, the Auxiliary Dial or the Auxiliary Lever to Activate the Dig and Burn functions while you're driving.

⚠️ When using the Motor on Axle function, it's important to adjust the F/TH channel and R/TH channel Sub-Trim values so both motors are OFF when the Throttle Trigger is in the Neutral position. In addition, you are able to adjust many functions, such as Exponential, Servo Speed and much more for each Throttle channel independently to allow for the optimum Motor on Axle Mixing setup.

⚠️ The Motor on Axle Mixing function is available only when either Car Type IX or Car Type X is selected.

MOA MIX MENU {MOTOR ON AXLE MIXING}　　　　　　　　　SETUP

Choosing the Motor on Axle Power Distribution Values:

You are able to program Dig and Burn functions by changing the Power Distribution between the two motors. When both Front and Rear values are balanced, Dig and Burn functions are Inhibited.

1) From within the SETUP menu, scroll UP or DOWN to highlight the MOA MIX menu. In the example shown in this section, we've selected Car Type X in the CAR TYPE menu.
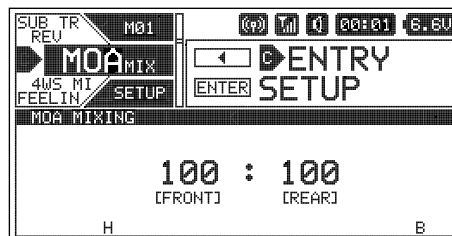
2) Press the ENTER key to open the MOA MIX menu. 100 [FRONT] : 100 [REAR] will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to change the Power Distribution between the Front and Rear motors. Reducing the [REAR] value will reduce the available power to the Rear motor (Dig) and reducing the [FRONT] value will reduce the power to the Front motor (Burn).

⚠ Use the Servo Monitor at the bottom of the MOA MIXING screen to view Throttle channel output.
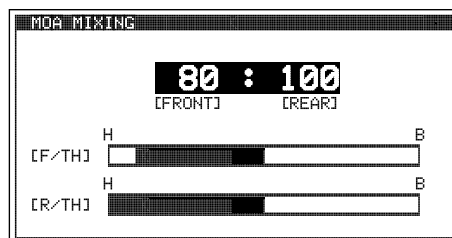
The following Motor on Axle Mixing options can be programmed by changing the Power Distribution values:

OFF (Balanced) - When set to 100:100 or other balanced value, power will be evenly distributed between the Front and Rear motors.
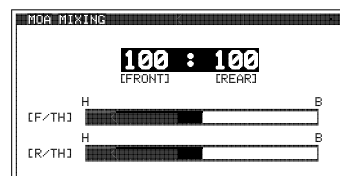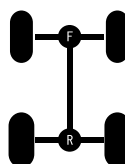
REAR Throttle (BURN) - When set to 0:100, power will only be distributed to the Rear motor. Power can be distributed proportionally between the Front and Rear motors from 0:100 to 99:100.
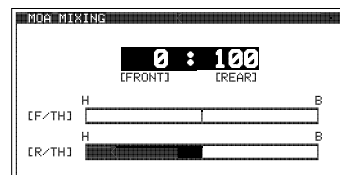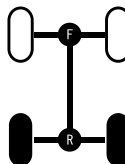
FRONT Throttle (DIG) - When set to 100:0, power will only be distributed to the Front motor. Power can be distributed proportionally between the Front and Rear motors from 100:0 to 100:99.
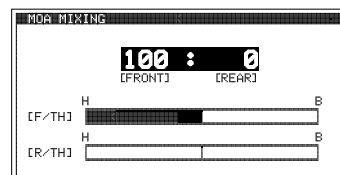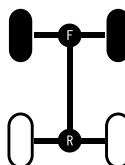
Controlling the Motor on Axle Mixing Function:

1) In order to control the Motor on Axle function, the MOA MIX function must be Assigned to either one of the five Trim Switches, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

2) Use the Trim Switch, Auxiliary Dial or Auxiliary Lever to adjust the Power Distribution values to achieve the desired results - either OFF, Dig or Burn, as described above. A pop-up window will display the current Power Distribution values.

> **PRO TIP:** In the default configuration, switching between OFF, Dig and Burn will happen gradually as you move the Trim Switch or Auxiliary Dial. This allows you to vary the Power Distribution between the Front and Rear motors. If you prefer to switch between OFF, Dig and Burn as if they were Assigned to an ON/OFF switch, change the Trim Switch or Auxiliary Dial Step value to 100. For more information, see the ASSIGN Menu section on pages 37 through 46.
>
> Alternately, switching between OFF, Dig and Burn can be controlled using the Auxiliary Lever. This allows you to quickly switch between OFF, Dig and Burn and still have the ability to variably change the Power Distribution between the Front and Rear motors. To set this up, Assign MOA MIX to the Auxiliary Lever, then change the TWEAK (H) value to +100 and the TWEAK (L) value to -100. For more information, see the ASSIGN Menu section on pages 37 through 46.

4WS MIX MENU {FOUR WHEEL STEERING MIXING}   SETUP

The Four Wheel Steering Mixing function provides you with two Steering channels. It allows you to control either the Front or Rear Steering independently or Mix the Front and Rear Steering to have Parallel Four Wheel Steering (Crab) or Tandem Four Wheel Steering. Use one of the five Trim Switches or the Auxiliary Dial to cycle through the different Four Wheel Steering options while you're driving. The Four Wheel Steering Mixing function can be toggled OFF and ON while you're driving by Assigning 4WS to one of the three Push-Button Switches.

⚠️ When using the Four Wheel Steering function, it's important to adjust the F/ST channel and R/ST channel Sub-Trim values to center both Steering servos when the Steering Wheel is centered. This will ensure that your model tracks straight. In addition, you are able to adjust many functions, such as Exponential, Servo Speed and much more for each Steering channel independently. This allows for the optimum Four Wheel Steering Mixing setup.

⚠️ The Four Wheel Steering Mixing function is available only when either Car Type VIII or Car Type X is selected.

Choosing the Four Wheel Steering Mixing Options:

1) From within the SETUP menu, scroll UP or DOWN to highlight the 4WS MIX menu. In the example shown in this section, we've selected Car Type X in the CAR TYPE menu.

2) Press the ENTER key to open the 4WS MIX menu. The last Four Wheel Steering Mixing option selected will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to highlight the Four Wheel Steering Mixing option you would like to use.

4) Press the ENTER key to Activate that option.

⚠️ Use the Servo Monitor at the bottom of the 4WS MIXING screen to view Steering channel output.
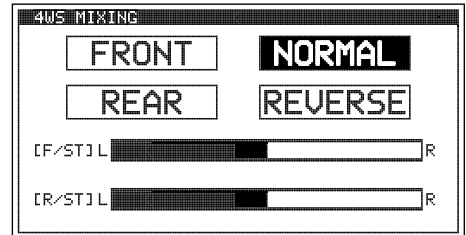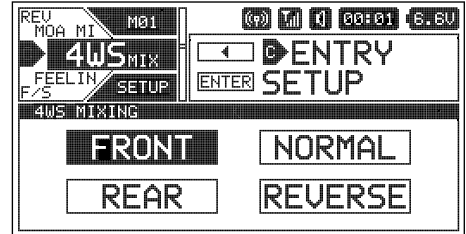
The following Four Wheel Steering Mixing options are available:

FRONT Wheel Steering - When Active, only the Front Steering will operate.
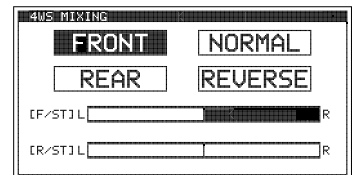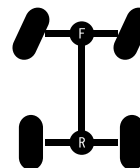
REAR Wheel Steering - When Active, only the Rear Steering will operate.
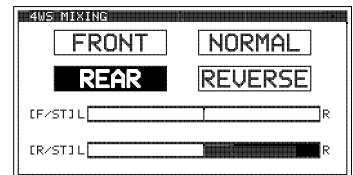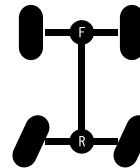
NORMAL (Parallel/Crab) Four Wheel Steering - When Active, both the Front and Rear Steering will operate in Parallel.
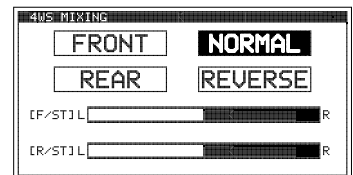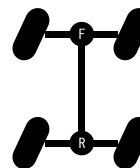
REVERSE (Tandem) Four Wheel Steering - When Active, both the Front and Rear Steering will operate in Tandem.
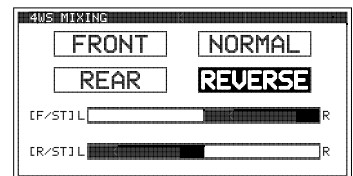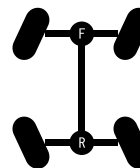
⚠️ If the Steering servos do not operate as described above, you can use the Servo Reversing function to change the direction that each servo operates. For more information, see the REV Menu section on pages 75 and 76.

SETUP

4WS MIX MENU {FOUR WHEEL STEERING MIXING}   SETUP

Controlling the Four Wheel Steering Mixing Function:

1) In order to control the Four Wheel Steering function, the 4WS MIX function must be Assigned to either one of the five Trim Switches or the Auxiliary Dial. For more information, see the ASSIGN Menu section on pages 37 through 46.

2) Use the Trim Switch or Auxiliary Dial to cycle through the various Four Wheel Steering Mixing options. A pop-up window will display the currently Active option.

⚠ The Step value for the Trim Switch or Auxiliary Dial should be set to 1, otherwise the transmitter won't cycle properly through the Four Wheel Steering Mixing options. For more information, see the Changing the Trim Switch Step Value section on page 40 or the Changing the Auxiliary Dial Step Value section on page 41.

FEELING MENU {STEERING AND THROTTLE CHANNEL RESPONSE TIME}   SETUP

The Feeling function allows you to adjust the Response Time of the Steering and Throttle channels to fine-tune the sensitivity of these controls. The M12S Super has an extremely fast Response Time (low Latency), which results in the driver feeling extremely connected to their model. This ultra-fast Response Time can be felt by the racer, particularly during on-road racing where the vehicle reacts extremely quickly to control inputs due to the increased traction between the vehicle and the track. After getting used to this fast Response Time, it allows for quicker, smoother control of your model, which gives you an advantage over other drivers.

Some users may find that the Response Time is in some cases too fast, therefore, we've made it adjustable to suit the driver's driving style, car type and track conditions. The Feeling function works with Airtronics and Sanwa FH3, FH4 and FH4T receivers.

⚠ The Feeling function differs from the Channel Response Mode function, in that the Feeling function fine-tunes the overall 'Feel' of the Steering or Throttle controls, whereas the Channel Response Mode function is used to match the Channel Response Mode to the specific type of servo (or servos) you're using. We suggest choosing the correct Channel Response Mode first, then adjust the Feeling function to achieve the desired overall result.
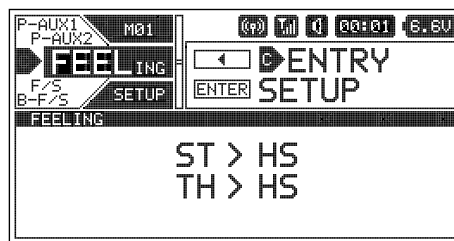
Changing Steering and Throttle Response Time Values:

1) From within the SETUP menu, scroll UP or DOWN to highlight the FEELING menu.

2) Press the ENTER key to open the FEELING menu. ST > HS will be highlighted.

3) Scroll UP or DOWN to highlight the desired channel you would like to change the Response Time value for, either ST (Steering) or TH (Throttle).

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Response Time value for that channel. Increasing the 'S' value Increases Response Time and Increasing the 'F' value Decreases Response Time. HS is the fastest Response Time.
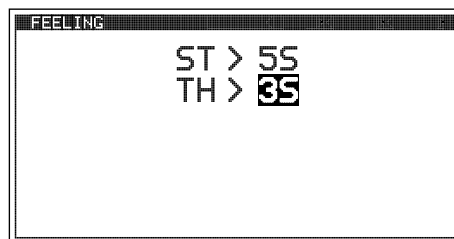
ST and TH setting range is HS, 5S to 1S and 1F to 5F. The default setting is HS.

F /S {FAIL SAFE}   SETUP

The Fail Safe function automatically moves the servos to a predetermined position in the event that the signal between the transmitter and the receiver is interrupted, whether due to signal degradation or to low transmitter battery voltage. The Fail Safe function can be programmed to HOLD the servos in the last position they were in when the signal was lost or the servos can be programmed to move to a custom position when the signal is lost. For example, the Throttle servo (or ESC) can be programmed to move toward the Brake Side to engage the Brakes and stop your model, or, if you're driving a boat, the Fail Safe function could be set to Lower the Throttle servo (or ESC) to idle and turn the rudder slightly Left or Right so that the boat will continue in slow circles.

Fail Safe settings can be programmed for each of the four channels individually. In addition, Fail Safe settings are model-specific, meaning you can have different Fail Safe settings for each of your models. The Fail Safe settings will be retained even if the transmitter loses power or if the transmitter and receiver must be paired again.

Three Fail Safe options are available for each channel as described below:

FREE - Fail Safe is Disabled for this channel. Servos can move freely when the signal is lost.

HOLD - When Fail Safe Activates, the servo will be held in the last position it was in when the signal was lost.

% (PERCENTAGE) - When Fail Safe Activates, the servo will travel to the programmed position when the signal is lost.

WARNING: The Fail Safe function will NOT OPERATE if the receiver loses power. For example, if the receiver battery were to die or come unplugged. It will operate only if the transmitter and receiver signal is interrupted or if the transmitter loses power.

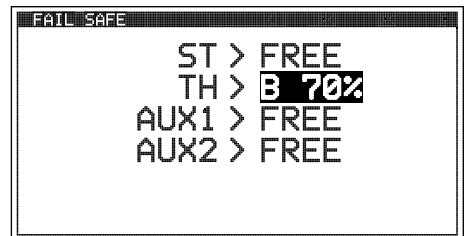## F /S {FAIL SAFE}   SETUP

Choosing the Fail Safe Settings:

1) From within the SETUP menu, scroll UP or DOWN to highlight the F/S menu.

2) Press the ENTER key to open the F/S menu. ST > FREE will be highlighted.

3) Scroll UP or DOWN to highlight the desired channel you would like to change the Fail Safe value for.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Fail Safe value for that channel. If you choose to program a % value, see step 5 below.
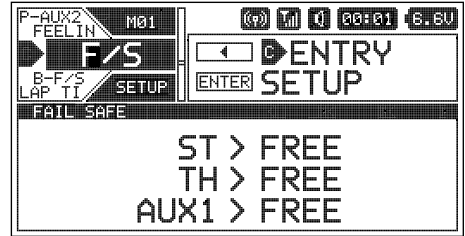
> F/S setting range is FREE, HOLD or %. The default setting for all channels is FREE.

5) To program a Fail Safe % value, move the transmitter control (e.g., the Throttle Trigger) the desired amount, then press and HOLD the ENTER key until an audible Tone sounds. The direction and percentage the servo will travel will be displayed. For example, to set the Brakes to Engage when the Fail Safe function Activates, push the Throttle Trigger toward the Brake Side the desired amount, HOLD the Throttle Trigger in that position, then press and HOLD the ENTER key.

Checking the Fail Safe Settings:

1) To check to ensure your Fail Safe settings are working properly, do the following:

   A) Make sure that both the transmitter and receiver are turned ON.

   B) While someone is holding your model, turn the transmitter OFF. The servos should react correctly based on the Fail Safe values chosen.

   ⚠ If using a Car Type that features two Steering channels or two Throttle channels and you're programming a Fail Safe % value, you may need to adjust the percentage value of the second channel several times, making small adjustments each time, until the two values match. This will ensure the first channel won't be fighting the second channel when the Fail Safe function Activates.

B - F /S {RECEIVER BATTERY VOLTAGE FAIL SAFE}   SETUP

The Receiver Battery Voltage Fail Safe function is designed to alert you when your receiver battery requires recharging. This ensures that the receiver battery's voltage doesn't drop so low that your servos aren't provided adequate voltage to operate optimally. When Activated, the servo (or servos) will move to the predetermined position that you programmed in step 5 in the Choosing the Fail Safe Settings section above to indicate your receiver battery's voltage has dropped below the programmed Voltage value.

When used with an FH4 or FH4T receiver, the Receiver Battery Voltage Fail Safe function can be Activated for all four channels independently. When used with an FH3 receiver, the Receiver Battery Voltage Fail Safe function can be Activated only for the Throttle channel.

> **IMPORTANT:** This function is designed for use with glow- or gas-powered models that use a separate receiver battery pack. We don't recommend using this function with an electric model that uses a motor battery to power the servos and receiver.

Choosing the Receiver Battery Voltage Value:

1) From within the SETUP menu, scroll UP or DOWN to highlight the B-F/S menu.
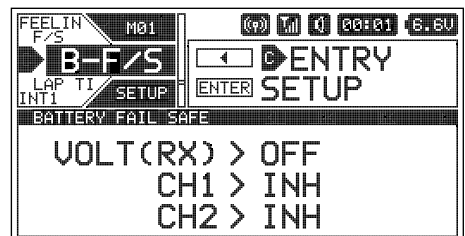
SETUP

B · F /S {RECEIVER BATTERY VOLTAGE FAIL SAFE}   SETUP

Choosing the Receiver Battery Voltage Value, Continued:

2) Press the ENTER key to open the B-F/S menu. VOLT (RX) > OFF will be highlighted.

```
BATTERY FAIL SAFE
VOLT(RX) > OFF
      CH1 > INH
      CH2 > INH
      CH3 > INH
      CH4 > INH
```

3) Press the ENTER key, then scroll UP or DOWN to choose the desired Receiver Battery Voltage value. Many factors, such as the current draw of your servos and how many servos you're using, etc., will determine what value to use. A good starting point would be 3.7V.

⚠️ If it appears your servos are slow or not producing adequate torque when the Receiver Battery Voltage value is reached, Increase the Receiver Battery Voltage value. Conversely, if your servos are still operating normally when the Receiver Battery Voltage value is reached, it's safe to Decrease the Receiver Battery Voltage value.

```
BATTERY FAIL SAFE
VOLT(RX) > 3.7V
      CH1 > INH
      CH2 > INH
      CH3 > INH
      CH4 > INH
```

VOLT (RX) setting range for FH4 and FH4T receivers is OFF and 3.5V to 7.4V. VOLT (RX) setting range for FH3 receivers is OFF and 3.5V to 5.0V. The default setting is OFF regardless of the Modulation Type chosen.

Activating the Receiver Battery Voltage Fail Safe Function:

The Receiver Battery Fail Safe function can be Activated for one or more channels, however, in most cases you will want to Activate this function only for the Throttle channel. When Activated, the Throttle servo will move to the predetermined position that you programmed in step 5 in the Choosing Fail Safe Settings section on the previous page to indicate your receiver battery's voltage has dropped below the programmed Receiver Battery Voltage value. When this happens, stop using your model and recharge the receiver battery.

⚠️ A % value must be programmed to be able to Activate the Receiver Battery Voltage Fail Safe function. If FREE or HOLD is programmed for any of the channels, you cannot Activate the Receiver Battery Voltage Fail Safe function.

1) From within the B-F/S menu, scroll UP or DOWN to highlight desired channel number you want to Activate the Receiver Battery Voltage Fail Safe function for.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Battery Fail Safe value, either ACT or INH.

3) Press the ENTER key, then repeat steps 1 and 2 to change any other desired Battery Fail Safe values. If you are using the FH3 Modulation Type, CH2 will change to ACT or INH automatically when you choose the Receiver Battery Voltage value as described in the previous section.

```
BATTERY FAIL SAFE
VOLT(RX) > 3.7V
      CH1 > INH
      CH2 > ACT
      CH3 > INH
      CH4 > INH
```
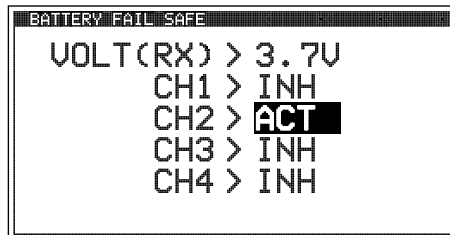
CH1, CH2, CH3 and CH4 setting range is INH and ACT. The default setting for all channels is INH.

LAP TIMER MENU {VIEW LAP TIMES AND CHOOSE LAP TIMER OPTIONS}   SETUP

The Lap Timer function allows you to measure and record Lap Times for up to 250 Laps. The total number of Laps, the Current Lap Time, the Best Lap Time and the Average Lap Time are all displayed. After the Lap Timer is Stopped, the Cumulative Time will be displayed. Lap Times are displayed in the following format: 00':00".00 (Minutes : Seconds : 1/100th of a Second).
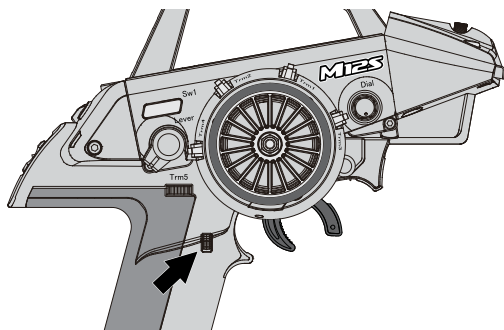
In addition to being able to view Lap Times, a Goal Time function is featured that will sound when you reach your Goal Time. For example, you can set the Goal Time value to the total time you would like to finish your race under. If desired, a Pre-Alarm function can be programmed to Alert you to your upcoming Goal Time.

Lap Times can be viewed within the LAP TIMER menu or on the TELEMETRY screen ALL and LAP pages. In addition, a pop-up window will display when the Lap Timer Starts and Stops, and each time a Lap Time is counted.

In the default configuration, placing the Lap Timer in Standby, Starting and Stopping the Lap Timer, and counting Lap Times, is controlled using the Lap Timer Switch (Push-Button Switch Sw3). In addition, if desired, the Throttle Trigger can be used to Start the Lap Timer after it's been placed in Standby.

LAP TIMER MENU {VIEW LAP TIMES AND CHOOSE LAP TIMER OPTIONS}　　**SETUP**

Setting the Goal Time:

When the Lap Timer is counting Up, a long audible Tone will sound when the Goal Time is reached. For example, if you set the Goal Time value for 5 Minutes, a long audible Tone will sound when the Lap Timer reaches 5 minutes.

⚠️ When the Goal Time is reached the Lap Timer will continue counting Up, but you will no longer be able to continue counting Lap Times. The next time you press the Lap Timer Switch, the Lap Timer will Stop.

1) From within the SETUP menu, scroll UP or DOWN to highlight the LAP TIMER menu.
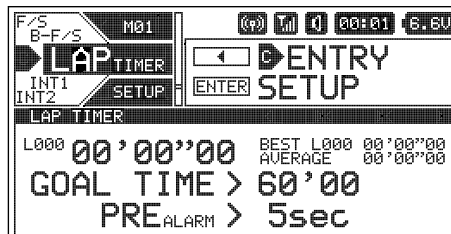
2) Press the ENTER key to open the LAP TIMER menu. GOAL TIME > 60'00 will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to choose the desired Goal Time value in Minutes : Seconds.

   GOAL TIME setting range is 10 Seconds to 60 Minutes (00'10 to 60'00) and is adjustable in 10 second intervals. The default setting is 60 Minutes.

Setting the Pre-Alarm Time:

The Pre-Alarm function is used to alert you that your Goal Time is approaching. You can program the Pre-Alarm to sound once every second the desired number of seconds prior to reaching your Goal Time. For example, if the Pre-Alarm value is set to 5 Seconds, a short audible Tone will sound every second, 5 seconds prior to reaching your Goal Time. If desired, the Pre-Alarm value can be set to OFF to turn the Pre-Alarm OFF.

1) From within the LAP TIMER menu, scroll UP or DOWN to highlight PRE ALARM > 5sec.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Pre-Alarm value in Seconds.
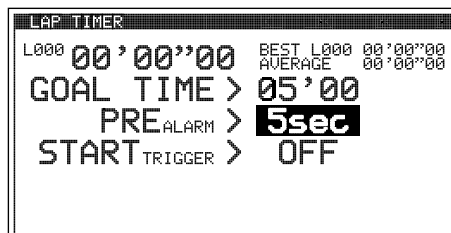
   PRE ALARM setting range is OFF and 1 to 20 Seconds. The default setting is 5 Seconds.

Choosing the Optional Throttle Trigger Start:

The Throttle Trigger can be used to Start the Lap Timer after the Lap Timer as been placed in Standby. This is much more convenient and accurate than pressing the Lap Timer Switch again to Start the Lap Timer when you're trying to start your race.

1) From within the LAP TIMER menu, scroll UP or DOWN to highlight START TRIGGER > OFF.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Start Trigger value, either ON or OFF.
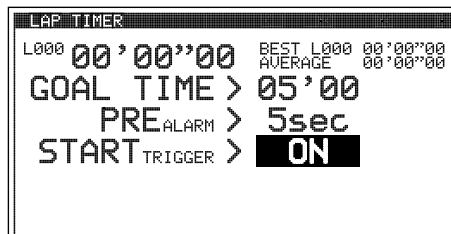
   START TRIGGER setting range is OFF and ON. The default setting is OFF.

Starting the Lap Timer and Counting Lap Times:

1) In the default configuration, the Lap Timer Switch (Push-Button Switch Sw3) controls the Lap Timer. Press and HOLD the Lap Timer Switch for 3 seconds. An audible Double-Tone will sound and LAP [STANDBY] will be displayed momentarily in a pop-up window, indicating the Lap Timer is in Standby. To start the Lap Timer, press the Lap Timer Switch a second time or pull the Throttle Trigger if you've Enabled the Start Trigger function. An audible Double-Tone will sound and the Lap Timer will start counting Up.

2) Press the Lap Timer Switch a second time to store the first Lap Time and begin counting a second Lap Time. Each time you press the Lap Timer Switch, an audible Tone sounds, the previous Lap Time is stored, a new Lap Time begins and the current Lap Time is displayed momentarily in a pop-up window.

SETUP

LAP TIMER MENU {VIEW LAP TIMES AND CHOOSE LAP TIMER OPTIONS}   SETUP

Stopping the Lap Timer:

1) To Stop the Lap Timer, press and HOLD the Lap Timer Switch for 3 seconds. An audible Double-Tone will sound and LAP [STOPPED] will be displayed momentarily in a pop-up window, indicating the Lap Timer is stopped.

⚠️ The Cumulative Time cannot be manually cleared. It will be automatically cleared when the Lap Timer is put in Standby again.

Viewing Lap Times:

The Cumulative Lap Time, the Best Lap Time and the Average Lap Time, in addition to up to 250 individual Lap Times can be viewed on the TELEMETRY screen LAP page.

1) From the STATUS screen, scroll UP or DOWN to open the TELEMETRY screen. Press the SELECT switch Right or Left to open the LAP page.

2) Press the ENTER key, then scroll UP or DOWN to view the individual Lap Times.

⚠️ Lap Times are stored until you Restart the Lap Timer. When the Lap Timer is Restarted, old Lap Times are Cleared and new Lap Times are Stored.

INT1 AND INT2 MENU {INTERVAL 1 AND INTERVAL 2 TIMERS}   SETUP

The Interval Timer function is used to notify you when a set Interval elapses while you're driving. When the Interval Time is reached, an audible Double-Tone will sound, then the Interval Timer will Reset and begin counting Up again from zero. Interval Times are displayed in the following format: 00':00".00 (Minutes : Seconds : 1/100th of a Second). The Interval Timer can be programmed to work independently or programmed to work along with the Lap Timer function.
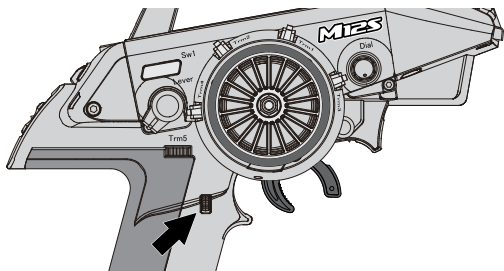
There are two Interval Timers. These Interval Timers can be Started and Stopped independently by Assigning each one to a different Push-Button Switch or they can be Started and Stopped simultaneously by Assigning both of them to the same Push-Button Switch. If desired, different Tones can be Assigned to each Interval Timer to differentiate them. In addition, the Throttle Trigger can be programmed to Start the Interval Timer(s).

In the default configuration, Interval Timer 1 is Started and Stopped along with the Lap Timer, using the Lap Timer Switch (Push-Button Switch Sw3).

⚠️ This section covers both the INT1 and INT2 menus, since programming each of them is exactly the same. Choose either the INT1 or the INT2 menu depending on which of the two Interval Timers you want to program.

Setting the Interval Timer:

1) From within the SETUP menu, scroll UP or DOWN to highlight either the INT1 or the INT2 menu depending on which Interval Timer you want to program. In this section, we show programming Interval Timer 1.

2) Press the ENTER key to open the INT1 menu. INTERVAL > 00' will be highlighted.

3) Scroll UP or DOWN to highlight the desired Interval Timer value you would like to change, either 00' (Minutes) , 00" (Seconds) or 00 (1/100th Seconds).

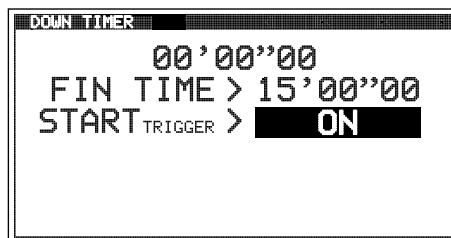4) Press the ENTER key, then scroll UP or DOWN to choose the desired Interval Timer value.

5) Press the ENTER key again, then repeat steps 3 and 4 to change any other desired Interval Timer values.
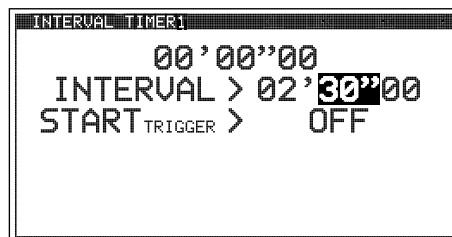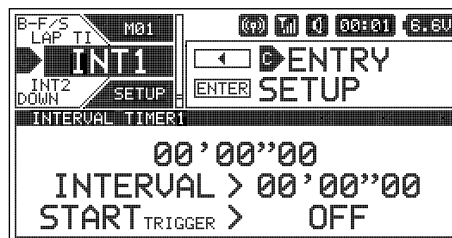
INT1 and INT2 INTERVAL setting range is 00:00:00 to 99:59:90. The default setting for both Interval Timers is 00:00:00.

Choosing the Optional Throttle Trigger Start:

The Throttle Trigger can be used to Start the Interval Timer after the Interval Timer as been placed in Standby by pressing the Push-Button Switch it's Assigned to. This is much more convenient and accurate than pressing the Push-Button Switch again to Start the Interval Timer when you're trying to start your race.

INT1 AND INT2 MENU {INTERVAL 1 AND INTERVAL 2 TIMERS}   SETUP

Choosing the Optional Throttle Trigger Start, Continued:

1) From within the INT1 menu, scroll UP or DOWN to highlight START TRIGGER > OFF.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Start Trigger value, either ON or OFF.

```
INTERVAL TIMER1
          00'00"00
   INTERVAL > 02'30"00
   START TRIGGER >    ON
```
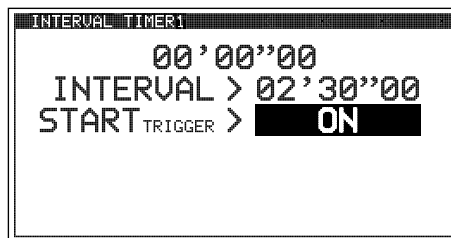
> INT1 and INT2 START TRIGGER setting range is OFF and ON. The default setting for both Interval Timers is OFF.

Starting the Interval Timers:

In the default configuration, the Lap Timer Switch (Push-Button Switch Sw3) controls both the Lap Timer and Interval Timer 1. To control Interval Timer 2, it must first be Assigned to a Push-Button Switch. If desired, the Interval Timers can be Started and Stopped independently by Assigning each one to a different Push-Button Switch or they can be Started and Stopped simultaneously by Assigning both of them to the same Push-Button Switch. Regardless of what you decide, follow the step below to control the Interval Timer(s).

1) Press and HOLD the Push-Button Switch you've Assigned the Interval Timer(s) to for 3 seconds. An audible Double-Tone will sound and INT1 [STANDBY] or INT2 [STANDBY] will be displayed momentarily in a pop-up window, indicating the Interval Timer is in Standby. To Start the Interval Timer, press the Push-Button Switch a second time or pull the Throttle Trigger if you've Enabled the Start Trigger function. An audible Double-Tone will sound and the Interval Timer will start counting Up. Each time the Interval Time elapses, an audible Double-Tone will sound and the Interval Timer will Reset and start counting Up again from zero. If desired, you can manually Restart the Interval Timer from zero by pressing the Push-Button Switch while the Interval Timer is running.

   ⚠ If the Interval Timer is Assigned to the same Push-Button Switch as the Lap Timer and the Lap Timer is Assigned to Switch Function 1, LAP will flash and Lap Time information will be displayed in a pop-up window, but the Interval Timer will still run in the background.

   ⚠ When both Interval Timers are Assigned to the same Push-Button Switch, only the Interval Timer Assigned to Switch Function 1 will be displayed in the pop-up window when the Interval Timers Start and Stop, however, if the Interval Timers are set to different values, each Interval Timer will be displayed in the pop-up window as the Interval Times are reached.

   ⚠ If you program the Lap Counter to Start when you pull the Throttle Trigger, the Interval Timer will not Start unless you also program it to Start when you pull the Throttle Trigger, and vice-versa. For the Throttle Trigger to Start both Timers, both the Lap Timer and the Interval Timer Start Trigger function must be programmed to ON.

Stopping the Interval Timers:

1) To stop the Interval Timer(s), press and HOLD the Push-Button Switch you've Assigned the Interval Timer(s) for 3 seconds. An audible Double-Tone will sound indicating the Interval Timer(s) is stopped.

   ⚠ When Stopped, the Interval Timer will read 00'01"00. This is normal. This value will be cleared when the Interval Timer is placed in Standby again (press and HOLD the Push-Button Switch for 3 seconds).

DOWN MENU {COUNTDOWN TIMER}   SETUP

The Countdown Timer function can be used to notify you of your model's running time. For example, you can set the Countdown Timer to alert you when it's time to refuel. When the Countdown Timer expires, a long audible tone will sound and the Count Up Timer function begins automatically. This allows you to check the time elapsed since the Countdown Timer ran out.

The Countdown Time is displayed in the following format: 00':00".00 (Minutes : Seconds : 1/100th of a Second). The Countdown Timer can be programmed to work independently or programmed to work along with the Lap Timer function.

The Countdown Timer can be Started and Stopped by Assigning it to a Push-Button Switch and the Throttle Trigger can be programmed to Start the Countdown Timer. If desired, different Tones can be Assigned to the Countdown Timer to differentiate it from other Timers, such as the Lap Timer or an Interval Timer.

```
INT1
INT2       M01        (ip) Tll 0 00:01 6.6V
    DOWN          ◄  ► ENTRY
EPA                ENTER SETUP
SUB TR    SETUP
DOWN TIMER
          00'00"00
   FIN TIME > 60'00"00
   START TRIGGER >   OFF
```

Setting the Finish Time:

1) From within the SETUP menu, scroll UP or DOWN to highlight the DOWN menu.
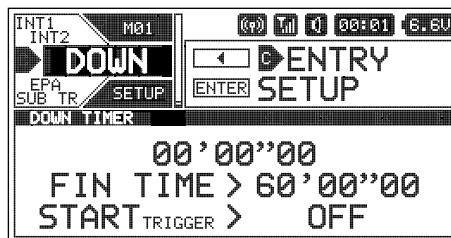
DOWN MENU {COUNTDOWN TIMER}　　　　　　　　　　　　　　　　　　　　　　　**SETUP**

Setting the Finish Time, Continued:

2) Press the ENTER key to open the DOWN menu. FIN TIME > 60' will be highlighted.

3) Scroll UP or DOWN to highlight the desired Finish Time value you would like to change, either 00' (Minutes) , 00" (Seconds) or 00 (1/100th Seconds).

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Finish Time value.

```
┌─────────────────────────────┐
│ ▐DOWN TIMER▌                 │
│          00'00''00          │
│  FIN TIME > 15'00''00       │
│  START TRIGGER >    OFF      │
│                             │
└─────────────────────────────┘
```
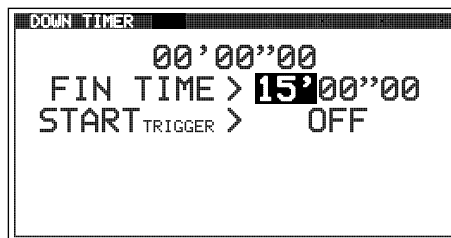
5) Press the ENTER key again, then repeat steps 3 and 4 to change any other desired Finish Time values.

> FIN TIME setting range is 00:00:00 to 99:59:90. The default setting is 60:00:00.

Choosing the Optional Throttle Trigger Start:

The Throttle Trigger can be used to Start the Countdown Timer after the Countdown Timer as been placed in Standby by pressing the Push-Button Switch it's Assigned to. This is much more convenient and accurate than pressing the Push-Button Switch again to Start the Countdown Timer when you're trying to start your race.

1) From within the DOWN menu, scroll UP or DOWN to highlight START TRIGGER > OFF.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Start Trigger value, either ON or OFF.

> START TRIGGER setting range is OFF and ON. The default setting is OFF.

```
┌─────────────────────────────┐
│ ▐DOWN TIMER▌                 │
│          00'00''00          │
│  FIN TIME > 15'00''00       │
│  START TRIGGER >    ON       │
│                             │
└─────────────────────────────┘
```

Starting the Countdown Timer:

To control the Countdown Timer, it must first be Assigned to a Push-Button Switch. If desired, the Countdown Timer can be Started and Stopped by Assigning it to its own Push-Button Switch, or it can be Started and Stopped along with the Lap Timer by Assigning it to the same Push-Button Switch as the Lap Timer. Regardless of what you decide, follow the step below to control the Countdown Timer.

1) Press and HOLD the Push-Button Switch you've Assigned the Countdown Timer to for 3 seconds. An audible Double-Tone will sound and DOWN [STANDBY] will be displayed momentarily in a pop-up window, indicating the Countdown Timer is in Standby. To Start the Countdown Timer, press the Push-Button Switch a second time or pull the Throttle Trigger if you've Enabled the Start Trigger function. An audible Double-Tone will sound and the Countdown Timer will start counting Down. An audible tone will sound in 1 second intervals 5 seconds before the Countdown Timer reaches zero. When zero is reached, a long audible tone will sound and the Countdown Timer will begin counting Up.

> ⚠ If the Countdown Timer is Assigned to the same Push-Button Switch as the Lap Timer and the Lap Timer is Assigned to Switch Function 1, LAP will flash and Lap Time information will be displayed in a pop-up window, but the Countdown Timer will still run in the background.

> ⚠ If you program the Lap Counter to Start when you pull the Throttle Trigger, the Countdown Timer will not Start unless you also program it to Start when you pull the Throttle Trigger, and vice-versa. For the Throttle Trigger to Start both Timers, both the Lap Timer and the Countdown Timer Start Trigger function must be programmed to ON.

Stopping the Countdown Timer:

1) To stop the Countdown Timer, press and HOLD the Push-Button Switch you've Assigned it to for 3 seconds. An audible Double-Tone will sound indicating the Countdown Timer is stopped. Press and HOLD the Push-Button Switch again for 3 seconds to reset the Countdown Timer to the programmed Finish Time and place it in Standby again.

RACING MENU OVERVIEW   RACING

To access the various RACING Programming Menus, turn the transmitter ON, press the SELECT switch to highlight the RACING menu, then press the ENTER key to open the RACING menu.

Scroll UP or DOWN to highlight the desired Programming Menu, then press the ENTER key to open that menu.
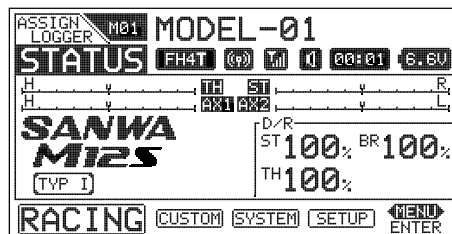
⚠ BASIC Mode must be turned OFF to access the SETUP menu. For more information, see the Turning BASIC Mode ON and OFF section on page 25. In addition, depending on the Car Type chosen, some Function Programming Value Names may differ from those shown in this section.

The following Programming Menus are available within the RACING menu:

MENU	MENU DESCRIPTION	PAGE #
R-MODE	Turn Racing Mode ON or OFF and Choose Racing Mode Options	PG. 87
D/R	Adjust Steering, Throttle and Brake Dual Rates	PG. 89
TRIM	Adjust Servo Trim, Including Auxiliary Channel Trim	PG. 89
CURVE	Adjust Channel Exponential, Adjustable Rate Control (ARC) and Curves	PG. 90
SPEED	Adjust Servo Speed in the Forward and the Return to Neutral Directions	PG. 95
ALB	Turn Anti-Lock Braking ON or OFF and Choose Anti-Lock Braking Options	PG. 96
OFFSET	Turn Throttle Offset ON or OFF and Choose Throttle Offset Options	PG. 98
BR-MIX	Program Dual Brake Mixing Option (Dual Brake Car Types Only)	PG. 99
TH-HLD	Turn Throttle Hold ON or OFF and Choose Throttle Hold Options	PG. 100
C-MIX1	Program Compensation Mixing 1 Options	PG. 101
C-MIX2	Program Compensation Mixing 2 Options	PG. 101
T-MIX1	Program Telemetry Mixing 1 Options	PG. 104
T-MIX2	Program Telemetry Mixing 2 Options	PG. 104
ACKER	Program Ackerman Angle Options (Left and Right Steering Servo Car Types Only)	PG. 107
R-DLY	Program a Delay When Switching Between Racing Modes	PG. 108
CODE AX1	Program Code Auxiliary 1 Options	PG. 108
CODE AX2	Program Code Auxiliary 2 Options	PG. 108

R-MODE MENU {RACING MODE}   RACING

The Racing Mode function provides you with five separate Racing Modes that you can switch between while you're driving. For example, due to changing track conditions or other variables, such as tire wear, different Racing Modes can be selected at any time to change your model's setup. A number of functions, such as Dual Rate, Exponential, Curves, Compensation Mixing and more, that might commonly be required to be changed during the course of a race can be programmed with different Programming Values for each Racing Mode. This ensures that your model can operate with the best-suited setup for ever-changing track conditions throughout an entire race, giving you an advantage over other drivers.

Functions can be programmed the same for all five Racing Modes or functions can be programmed independently, allowing you to have different function Programming Values for each of the five Racing Modes and switch between them while driving.
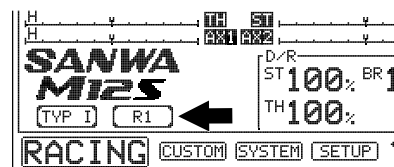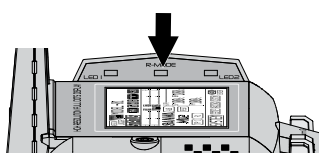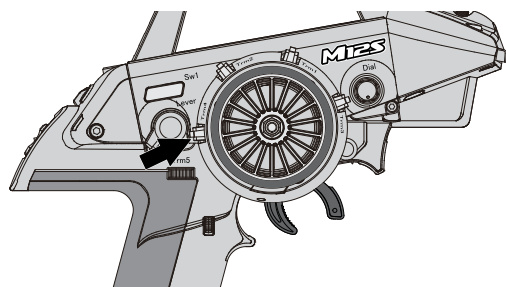
Active R-MODE LED Colors:

MODE / LED	OFF	R1	R2	R3	R4	R5
COLOR	OFF	GREEN	MAGENTA	CYAN	YELLOW	WHITE

R-MODE MENU {RACING MODE}   RACING

In the default configuration, after Activating the Racing Mode function, you can switch between Racing Modes using the Racing Mode Switch (Trim Switch Trm4). The R-MODE LED will change color to indicate the currently Active Racing Mode (see table on previous page). In addition, the currently Active Racing Mode will be displayed on the STATUS screen. When you switch between Racing Modes, the currently Active Racing Mode will be momentarily displayed in a pop-up window.

⚠️ Racing Mode functions will vary depending on the current Car Type. For a complete list of Racing Mode functions based on Car Type, see the Racing Mode Functions by Car Type tables on pages 113 and 114.

Turning Racing Mode ON and OFF:

1) From within the RACING menu, scroll UP or DOWN to highlight the R-MODE menu.

2) Press the ENTER key to open the R-MODE menu. R-MODE > INH will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to choose the desired R-MODE value, either 2, 3, 4, 5 or INH (Racing Mode OFF). The number you choose determines how many different Racing Modes you can program and switch between while driving.
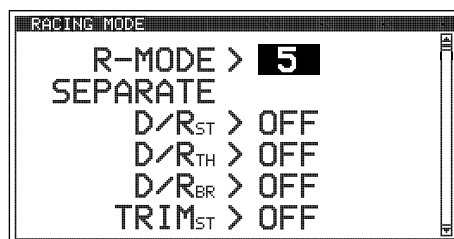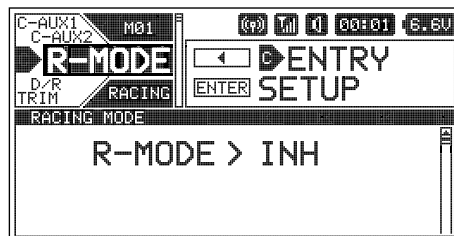
> R-MODE setting range is 2, 3, 4, 5 and INH. The default setting is INH.

Turning Separate Functions ON and OFF:

When Racing Mode is turned ON (R-MODE > 2, 3, 4 or 5), various functions can be programmed the same for all Racing Modes or they can be programmed independently, allowing you to have different function Programming Values for each of the Racing Modes. For example, with D/R ST set to ON, you can choose a Dual Rate Steering percentage value of 100% for Racing Mode 1, a Dual Rate Steering percentage value of 90% for Racing Mode 2 and so on.

1) From within the R-MODE menu, scroll UP or DOWN to highlight desired function you would like to turn ON or OFF.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired value, either ON or OFF. When set to ON, you will be able to choose different function Programming Values for each Racing Mode. When set to OFF, function Programming Values will be the same for all Racing Modes.

3) Press the ENTER key, then repeat steps 1 and 2 to change any other desired values. For a complete list of Racing Mode functions based on Car Type, see the Racing Mode Functions by Car Type tables on pages 113 and 114.
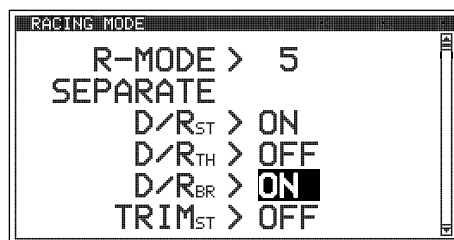
> SEPARATE functions setting range is OFF and ON. The default setting for all functions is OFF.

Switching Racing Modes to Program Separate Functions:

If you've chosen to program one or more Racing Mode functions separately, a Racing Mode Icon will be displayed within the specific function Programming Menu to indicate which Racing Mode you're currently programming the function for.

To program different values for each Racing Mode, make sure to switch to the desired Racing Mode first. For example, with SEPARATE D/R ST > ON, open the D/R menu. An R1, R2, R3, R4 or R5 Racing Mode Icon will be displayed next to the Steering function, depending on which current Racing Mode is Active.

Use the Racing Mode Switch (Trim Switch Trm4) to switch to Racing Mode 1. R1 will be displayed next to the ST > 100% percentage value. Choose the desired Steering Dual Rate percentage value for Racing Mode 1, then press Trim Switch Trm4 to switch to Racing Mode 2. R2 will be displayed next to the ST > 100% percentage value. Choose the desired Steering Dual Rate percentage value for Racing Mode 2. While you're driving, you can now switch to different Dual Rate settings simply by switching Racing Modes.
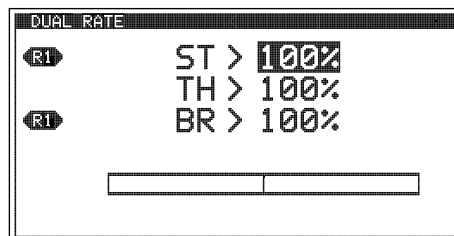
⚠️ The Racing Mode Icon will only be displayed for Programming Menus within the RACING menu and only if the specific function's Separate value is set to ON in the R-MODE menu. If no Racing Mode Icon is displayed, the function Programming Value will be the same regardless of which Racing Mode is currently Active.

D /R MENU {DUAL RATES}　　　　　　　　　　　　　　　　　　　RACING

The Dual Rate function allows you to change the control authority of the Steering, Throttle High Side and Throttle Brake Side by changing the amount of servo travel relative to control input. For example, by Increasing the Steering Dual Rate, you can make the Steering servo travel more, which might prevent your model from pushing during turns. Alternately, if your model over-steers during turns, you can reduce the amount of Steering Dual Rate.

> **IMPORTANT:** Prior to programming the Dual Rate function, you should adjust the maximum Left and Right (or High and Low) End Points. For more information, see the EPA Menu section on pages 73 and 74.
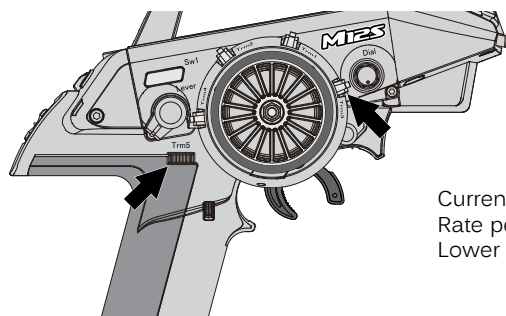
In the default configuration, Trim Switch Trm3 controls Steering Dual Rate and Trim Switch Trm5 controls Brake Dual Rate. Throttle Dual Rate can be changed while you're driving by Assigning the Dual Rate function to another Trim Switch or the Auxiliary Dial. For more information, see the ASSIGN Menu section on pages 37 through 46.

Current Steering, Throttle and Brake Dual Rate percentage values are displayed in the Lower Right corner of the STATUS screen.
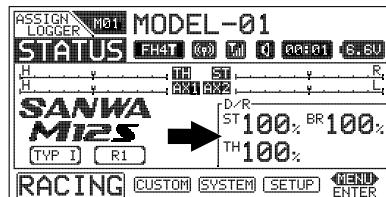
<u>Changing the Dual Rate Percentage Values:</u>

1) From within the RACING menu, scroll UP or DOWN to highlight the D/R menu.
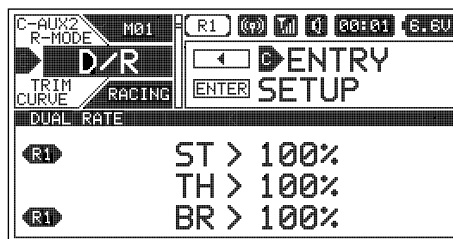
2) Press the ENTER key to open the D/R menu. ST > 100% will be highlighted.
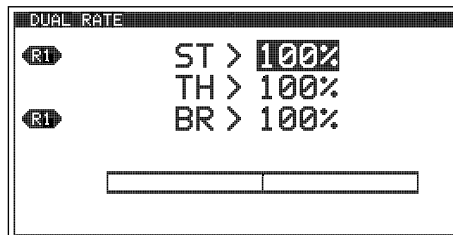
3) Scroll UP or DOWN to highlight the desired Dual Rate percentage value you would like to change.

4) Press the ENTER key, then scroll UP or DOWN to Increase or Decrease the Dual Rate percentage value. Increasing the percentage value will Increase servo travel and Decreasing the percentage value will Decrease servo travel.
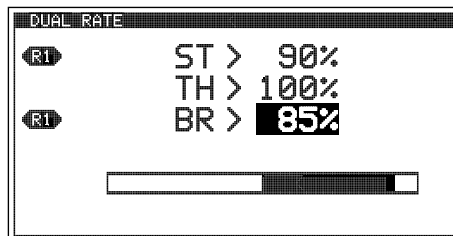
5) Press the ENTER key, then repeat steps 3 and 4 to change any other desired Dual Rate percentage values.

> DUAL RATE setting range is 0% to 100%. The default setting for all channels is 100%.

⚠ Dual Rate is a percentage of End Point Adjustment. For example, if you set the Steering Dual Rate percentage value to 100%, the Steering will travel the same amount defined by your End Point Adjustment programming. Alternately, if you set the Steering Dual Rate percentage value to 50%, the Steering will travel half the amount defined by your End Point Adjustment programming.

TRIM MENU {SERVO TRIM}　　　　　　　　　　　　　　　　　　　RACING

The Trim function allows you to view the current Trim value for each of the four channels and, if desired, allows you to change the Trim values using the Push-Button Rotary Dial from within the TRIM menu. For example, if you don't Assign Auxiliary 1 Trim to a Trim Switch, you can still Trim the Auxiliary 1 channel from within the TRIM menu.

TRIM MENU {SERVO TRIM}   RACING

The M12S Super features Digital Trim Memory. Any amount of Trim that you set during use using the Trim Switches or through the TRIM menu is automatically stored in memory for that specific channel and for that specific model. The Trim values for each model will automatically be loaded when the transmitter is turned ON.

Each time you move a Trim Switch a short audible Tone is heard. When the Trim value reaches 0 (Centered), a longer audible Tone sounds. This indicates to you that the Trim is centered without the need to look at the transmitter.

⚠ In the default configuration, Trim Switch Trm1 and Trm2 move the Steering and Throttle/Brake Trim in 5% increments. If you want to Increase or Decrease the Trim Resolution, see the Changing the Trim Switch Step Value section on page 40.

PRO TIP: The Trim function features two different Trim Type options that you can choose from. Choose from either Center Trim or Parallel Trim. For more information, see the TRIM TYPE Menu section on page 51.
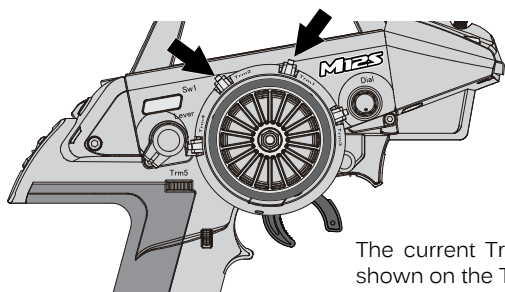
In the default configuration, Trim Switch Trm1 controls Steering Trim and Trim Switch Trm2 controls Throttle/Brake Trim. Auxiliary channel Trim can be changed while you're driving by Assigning the Trim function to another Trim Switch or the Auxiliary Dial. For more information, see the ASSIGN Menu section on pages 37 through 46.

The current Trim positions for all four channels is shown on the Trim Displays on the STATUS screen.
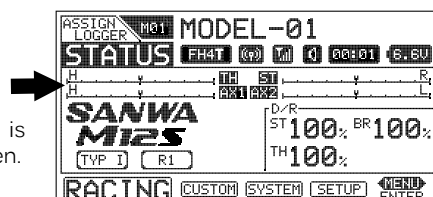
⚠ Before changing the Trim values, first verify that all Trim values are set to 0, then adjust the servo Sub-Trim values to center the servo horns perfectly. For more information, see the SUB TRIM Menu section on pages 74 and 75.

Changing the Trim Values:

1) From within the RACING menu, scroll UP or DOWN to highlight the TRIM menu.

2) Press the ENTER key to open the TRIM menu. ST > 0 will be highlighted.

3) Scroll UP or DOWN to highlight the desired Trim value you would like to change. Press the ENTER key, then scroll UP or DOWN to Increase or Decrease the Trim value in the desired direction.

4) Press the ENTER key, then repeat step 3 to change any other desired Trim values.
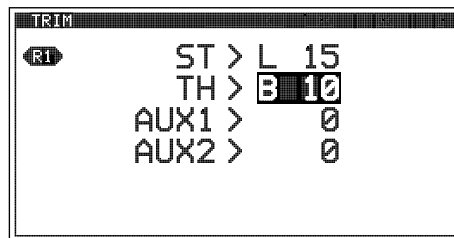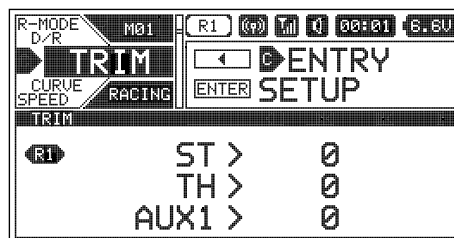
TRIM setting range is 0 to 100 in each direction. The default setting for all channels is 0.

CURVE MENU {EXPONENTIAL, ADJUSTABLE RATE CONTROL AND CURVE}   RACING

The CURVE menu allows you choose what method you would like to use to vary the amount of servo travel in relation to the amount of control movement. Choose from Exponential, Adjustable Rate Control (ARC) and Point Curve functions. Each of these three functions offers something different, and which function you choose to use for each channel will be determined by many factors, including your Car Type, track conditions, driving style and more.

EXPO - Vary the amount of servo travel in relation to the amount of control movement with a fixed Neutral Point.

ARC - Vary the amount of servo travel in relation to the amount of control movement with an adjustable Neutral Point.

POINT - Vary the amount of servo travel in relation to the amount of control movement with nine adjustable Points.

⚠ Curve functions can be programmed for each of the four channels. Programming options will differ within each function depending on the specific channel you're programming. For example, if your Car Type features Front and Rear Steering and Front and Rear Motors (such as Car Type X), only ST and TH channel options will be programmable, however, both Front and Rear channels will be programmed with the same Programming Values.

CURVE MENU {EXPONENTIAL, ADJUSTABLE RATE CONTROL AND CURVE}　　RACING

Exponential Programming

The Exponential function allows you to vary the amount of servo travel in relation to the movement of the Steering Wheel and Throttle Trigger (or in some cases, the Auxiliary Dial and/or the Auxiliary Lever) near the Neutral positions to change the way those functions react to control movement.

Decreasing the Exponential Rate percentage value will Soften the control feel around Neutral and Increasing the Exponential Rate percentage value will Heighten the control feel around Neutral. Using a Lower Negative value allows for smoother control. Using a Higher Positive value may result in more 'twitchy' control response.
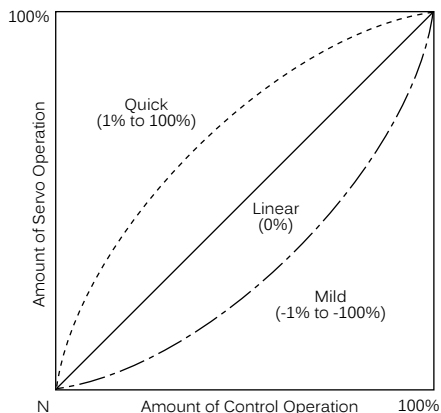
Exponential Rate percentage values can be adjusted from Mild through Linear to Quick to allow you to set the most effective control response for your model. For example, if your model over-steers, reduce the Steering Exponential Rate percentage value and if your model under-steers, Increase the Steering Exponential Rate percentage value.

For another example, reduce the Throttle High Side Exponential Rate percentage value on a slippery track or with a model that has a higher-torque motor or engine, and Increase the Throttle High Side Exponential Rate percentage value on a high-grip track or with a model that has a lower-torque motor or engine.

For the utmost in precision control, Exponential Rate percentage values can be adjusted separately for the Throttle High Side and the Throttle Brake Side. In addition, the Exponential Tweak Right and Tweak Left function allows you to balance Exponential for Right and Left Steering.

A graph that depicts the control output and Exponential Curve relationship is featured to help visualize the changes you make.

⚠ Exponential Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

Choosing the Channel and the Curve Type:

1) From within the RACING menu, scroll UP or DOWN to highlight the CURVE menu.

2) Press the ENTER key to open the CURVE menu. The < ST > channel will be selected.

3) Press the SELECT switch RIGHT or LEFT to choose the desired channel you would like to program Exponential for.
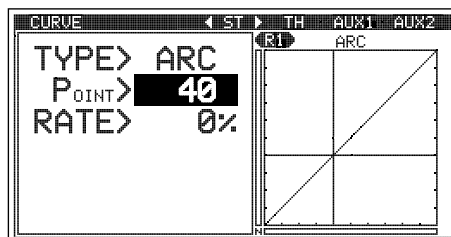
4) From within the CURVE menu, scroll UP or DOWN to highlight the TYPE > value.

5) Press the ENTER key and scroll UP or DOWN to choose TYPE > EXP.
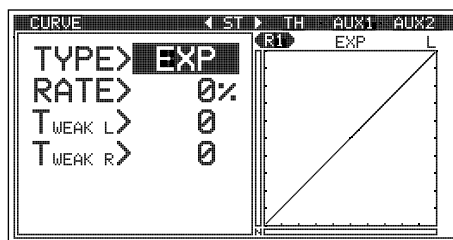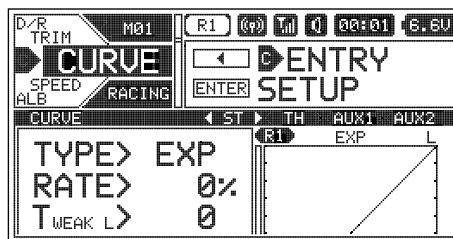
Changing the Rate Percentage Value:

The Rate percentage value determines the amount and type of Exponential, either Quick, Mild or Linear (see diagram on the previous page). When a Positive or Negative Exponential percentage value is programmed, a Curve will be created from a fixed Neutral Point. This Curve will be equal on both sides, except for the Throttle channel. For more information, see the notation on the next page.


1) From within the CURVE menu, scroll UP or DOWN to highlight RATE > 0%.

2) Press the ENTER key, then scroll UP or DOWN to Increase or Decrease the Rate percentage value. Using a Negative Rate percentage value will Soften the control feel around Neutral and using a Positive Rate percentage value will Heighten the control feel around Neutral.
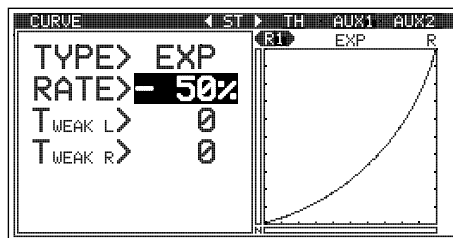
> RATE setting range is -100% (Mild) to 100% (Quick). The default setting is 0% (Linear).

RACING

CURVE MENU {EXPONENTIAL, ADJUSTABLE RATE CONTROL AND CURVE}　　RACING

Changing the Rate Percentage Value, Continued:

⚠ You are able to adjust the Rate percentage value for the Throttle High Side and the Throttle Brake Side separately. In addition, you can even program Exponential for one side and ARC or Point Curve for the other side.
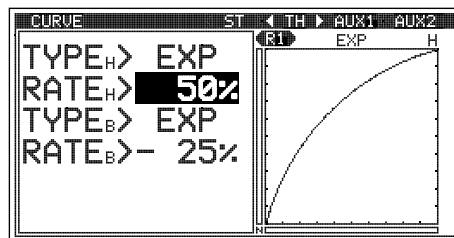
Changing the Steering Tweak Right and Tweak Left Values:

The Tweak function allows you to make small Exponential adjustments to the Right and/or Left sides of the Steering channel Neutral Point to fine-tune the balance between the two sides. Tweak value adjustments are effective whether you program a Negative or a Positive Rate value, or even program a Linear Rate value (0).

1) From within the CURVE menu, scroll UP or DOWN to highlight the desired Tweak value, either TWEAK L or TWEAK R.

2) Press the ENTER key, then scroll UP or DOWN to Increase or Decrease the Tweak value. Using a Negative Tweak value will Soften the control feel that side of Neutral and using a Positive Rate percentage value will Heighten the control feel around that side of Neutral.
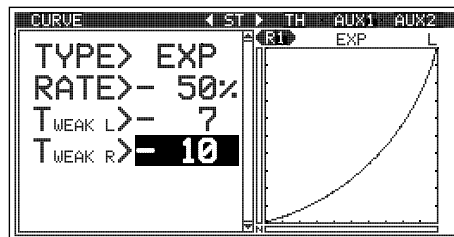
3) Press the ENTER key, then repeat steps 1 and 2 to change the other Tweak value, if desired.

> TWEAK L and TWEAK R setting range is -20 (Mild) to 20 (Quick). The default setting for both Tweak values is 0 (Linear).

Adjustable Rate Control Programming

The Adjustable Rate Control (ARC) function allows you to vary the amount of servo travel in relation to the movement of the Steering Wheel and Throttle Trigger (or in some cases, the Auxiliary Dial and/or the Auxiliary Lever) near the Neutral positions to change the way those functions react to control movement.

Decreasing the ARC Rate percentage value will Soften the control feel around Neutral and Increasing the ARC Rate percentage value will Heighten the control feel around Neutral. Using a Lower Negative value allows for smoother control. Using a Higher Positive value may result in more 'twitchy' control response.

The Adjustable Rate Control function works like the Exponential function, except that the Adjustable Rate Control function features the added benefit of being able to move the Neutral Point, whereas the Exponential function Neutral Point is fixed. In addition, the ARC Curve is more Linear than the Exponential Curve.
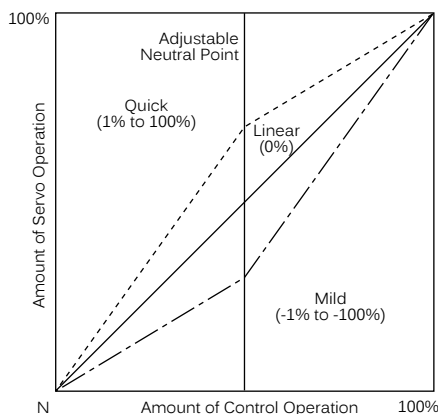
ARC Rate percentage values can be adjusted from Mild through Linear to Quick to allow you to set the most effective control response for your model. For example, if your model over-steers, reduce the Steering ARC Rate percentage value and if your model under-steers, Increase the Steering ARC Rate percentage value.

For another example, reduce the Throttle High Side ARC Rate percentage value on a slippery track or with a model that has a higher-torque motor or engine, and Increase the Throttle High Side ARC Rate percentage value on a high-grip track or with a model that has a lower-torque motor or engine.

For the utmost in precision control, ARC Point and Rate values can be adjusted separately for the Throttle High Side and the Throttle Brake Side. A graph that depicts the control output and ARC Curve relationship is featured to help visualize the changes you make.

⚠ Adjustable Rate Control Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

### Choosing the Channel and the Curve Type:

1) From within the RACING menu, scroll UP or DOWN to highlight the CURVE menu.
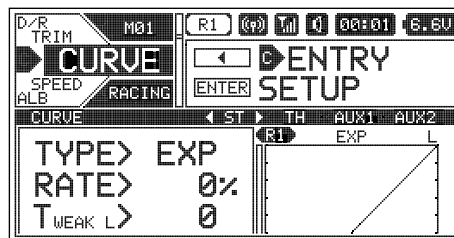
CURVE MENU {EXPONENTIAL, ADJUSTABLE RATE CONTROL AND CURVE}　　　**RACING**

Choosing the Channel and the Curve Type, Continued:

2) Press the ENTER key to open the CURVE menu. The < ST > channel will be selected.

3) Press the SELECT switch RIGHT or LEFT to choose the desired channel you would like to program ARC for.
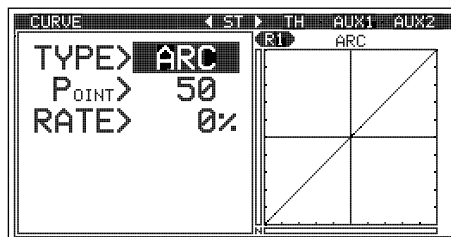
4) From within the CURVE menu, scroll UP or DOWN to highlight the TYPE > value.

5) Press the ENTER key and scroll UP or DOWN to choose TYPE > ARC.

Changing the Point Value:

The Point value determines the Neutral Point where the Rate percentage value begins. For example, you may not want the Neutral Point to be centered between the High and Low End Points. You might want the Neutral Point shifted to the Right or to the Left.

1) From within the CURVE menu, scroll UP or DOWN to highlight POINT > 50.

2) Press the ENTER key, then scroll UP or DOWN to Increase or Decrease the Point value. Increasing the Point value will shift the Neutral Point to one side of center and Decreasing the Point value will shift the Neutral Point to the opposite side of center.

POINT setting range is 5 to 95. The default setting is 50 (Centered).

Changing the Rate Percentage Value:

The Rate percentage value determines the amount and type of ARC, either Quick, Mild or Linear (see diagram on the previous page). When a Positive or Negative ARC percentage value is programmed, a Linear Curve will be created from the Neutral Point.

1) From within the CURVE menu, scroll UP or DOWN to highlight RATE > 0%.

2) Press the ENTER key, then scroll UP or DOWN to Increase or Decrease the Rate percentage value. Using a Negative Rate percentage value will Soften the control feel around the Neutral Point and using a Positive Rate percentage value will Heighten the control feel around the Neutral Point.
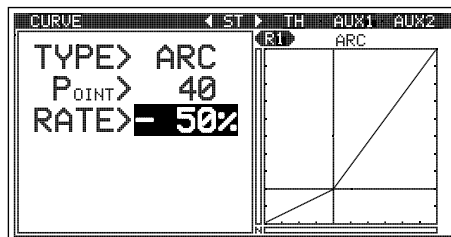
RATE setting range is -100% (Mild) to 100% (Quick). The default setting is 0% (Linear).

⚠ You are able to adjust the Point value and the Rate percentage value for the Throttle High Side and the Throttle Brake Side separately. In addition, you can even program ARC for one Side and Exponential or Point Curve for the other Side.
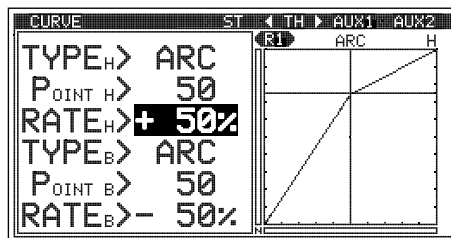
Point Curve Programming

The Point Curve function allows you to vary the amount of servo travel in relation to the movement of the Steering Wheel and Throttle Trigger (or in some cases, the Auxiliary Dial and/or the Auxiliary Lever) at different Points along the entire range of control travel to change the way those functions react to control movement. Nine programmable Points allow you to create your own custom Point Curve to suit any situation.

The Point Curve function works like the Exponential and ARC functions, except that the Point Curve function allows you to program up to 9 different Points along the entire range of control travel to suit whatever setup or situation is required. For example, you can customize the Point Curve to include Mild or Quick Points along the same Curve, or you can create a smooth Point Curve or a more Linear Point Curve.
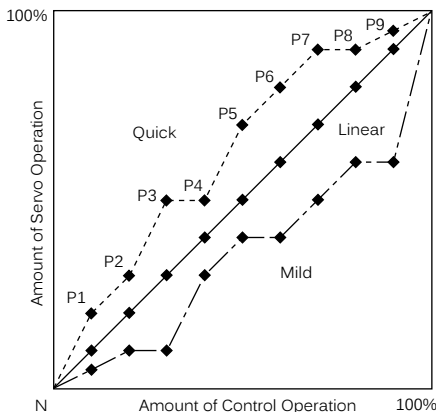
RACING

CURVE MENU {EXPONENTIAL, ADJUSTABLE RATE CONTROL AND CURVE}   RACING

Point Curve percentage values can be adjusted from Mild through Linear to Quick to allow you to set the most effective control response for your model. For example, if your model over-steers, reduce the Point Curve percentage values and if your model under-steers, Increase the Point Curve percentage values.

For another example, reduce the Throttle High Side Point Curve percentage values on a slippery track or with a model that has a higher-torque motor or engine, and Increase the Throttle High Side Point Curve percentage values on a high-grip track or with a model that has a lower-torque motor or engine.

For the utmost in precision control, Channel Curves can be programmed separately for the Throttle High Side and the Throttle Brake Side. A graph that depicts the control output and Point Curve relationship is featured to help visualize the changes you make.

⚠ Point Curve Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

Choosing the Channel and the Curve Type:

1) From within the RACING menu, scroll UP or DOWN to highlight the CURVE menu.

2) Press the ENTER key to open the CURVE menu. The < ST > channel will be selected.

3) Press the SELECT switch RIGHT or LEFT to choose the desired channel you would like to program a Point Curve for.

4) From within the CURVE menu, scroll UP or DOWN to highlight the TYPE > value, then press the ENTER key and scroll UP or DOWN to choose TYPE > CRV.
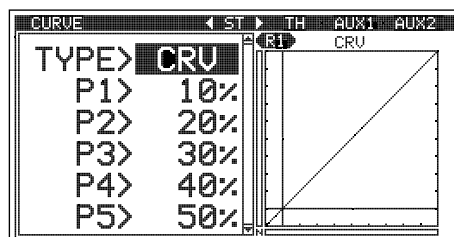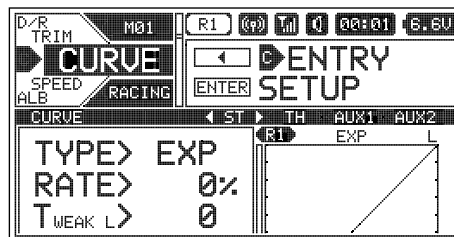
Changing the Point Percentage Values:

The Point percentage values determine the type of Point Curve, either Quick, Mild or Linear (see diagram above). Programming a Point percentage value that is Lower than the default value for that specific Point will Soften the control feel (Mild) and programming a Point percentage value that is Higher than the default value for that specific Point will Heighten the control feel (Quick).

1) From within the CURVE menu, scroll UP or DOWN to highlight the desired Point you want to change the Point percentage value for. Choose from P1 through P9.

2) Press the ENTER key, then scroll UP or DOWN to Increase or Decrease the Point percentage value. Using a Lower Point percentage value will Soften the control feel and using a Higher Point percentage value will Heighten the control feel.

3) Press the ENTER key, then repeat steps 1 and 2 to choose the Point percentage value for any other desired Points.
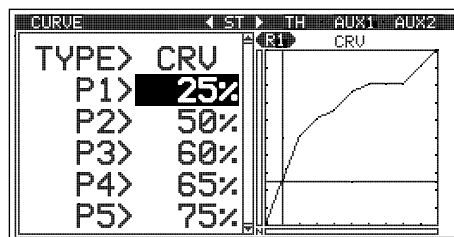
POINT 1 through 9 setting range is 0% to 100%. The default setting for P1 is 10%, for P2 is 20%, for P3 is 30%, for P4 is 40%, for P5 is 50%, for P6 is 60%, for P7 is 70%, for P8 is 80% and for P9 is 90%.

⚠ You are able to adjust Point percentage values for the Throttle High Side and the Throttle Brake Side separately. In addition, you can even program Point Curve for one Side and Exponential or ARC for the other Side.

SPEED MENU {SERVO SPEED}   RACING

The Servo Speed function allows you to slow the transit speed of the Steering, Throttle, Auxiliary 1 and Auxiliary 2 channels. When driving your model, proper Steering and Throttle control are vital. For example, lowering the transit speed of the Steering servo can help to limit excessive Steering, which will enable you to achieve smoother cornering. In addition, lowering the transit speed of the Throttle servo High Side can help to ensure smooth Throttle control. This function can be used in conjunction with the Exponential, ARC or Point Curve functions to increase the effect.
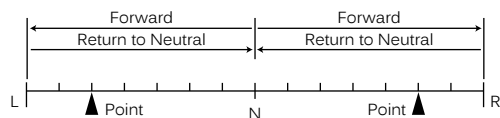
Servo transit speed can be slowed in the Forward and the Return to Neutral directions independently. In addition, you are able to program a Point on either side of servo travel, then define whether the servo transit speed is slowed down either Outside or Inside those two Points.

The Servo Speed function can be programmed for each of the four channels, however, depending on the current Car Type, not all channels may be able to be selected. For example, if your current Car Type features Front and Rear Steering and Front and Rear Motors (such as Car Type X), only ST and TH channel options will be programmable, however, both Front and Rear channels will be programmed with the same Programming Values.

Servo Speed Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

Choosing the Channel:

1) From within the RACING menu, scroll UP or DOWN to highlight the SPEED menu.

2) Press the ENTER key to open the SPEED menu. The < ST > channel will be selected.

3) Press the SELECT switch RIGHT or LEFT to choose the desired channel you would like to program the Servo Speed function for.
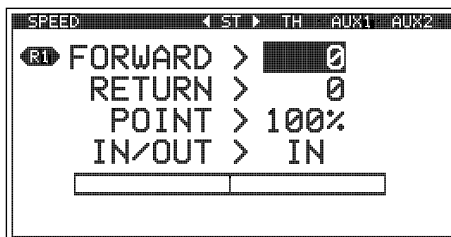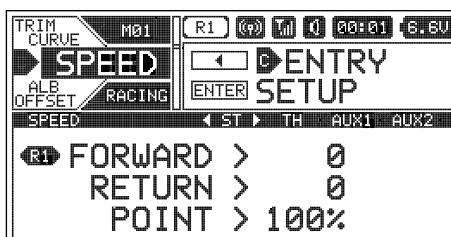
When the Throttle channel is selected, you are able to adjust Servo Speed function Programming Values separately for both the Throttle High Side (H) and the Throttle Brake Side (B). Scroll UP or DOWN to view High Side (H) and Brake Side (B) program options.

Changing the Servo Speed Forward Value:

1) From within the SPEED menu, scroll UP or DOWN to highlight FORWARD > 0.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Servo Speed Forward value. When 0 is selected, the servo will travel at its normal speed in the Forward direction. When a Negative value is selected, the servo transit speed will slow down in the Forward direction.
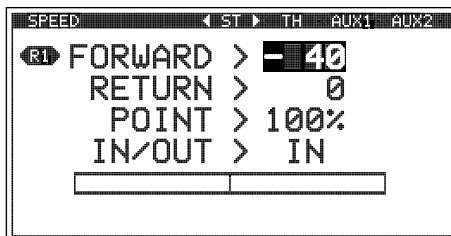
FORWARD setting range is 0 to -100. The default setting is 0 (Normal Speed).

Changing the Servo Speed Return Value:

1) From within the SPEED menu, scroll UP or DOWN to highlight RETURN > 0.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Servo Speed Return value. When 0 is selected, the servo will travel at its normal speed in the Return to Neutral direction. When a Negative value is selected, the servo transit speed will slow down in the Return to Neutral direction.
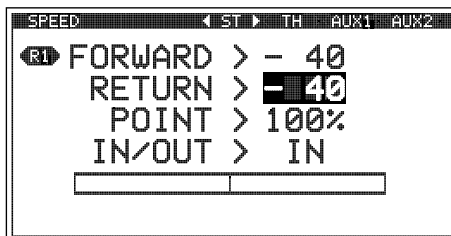
RETURN setting range is 0 to -100. The default setting is 0 (Normal Speed).

SPEED MENU {SERVO SPEED}   `RACING`

Changing the Point Percentage and IN and OUT Values:

The Point percentage value determines where along either side of servo travel that the servo's transit speed will be changed. The IN and OUT values determine whether the change in servo transit speed occurs between the two points (IN) or outside the two Points (OUT). See the diagram on the previous page.

⚠️ If a 100% Point percentage value is chosen, the servo's transit speed will be the same along the entire length of travel. IN and OUT values are only discernible if a Point percentage value other than 100% is chosen.

1) From within the SPEED menu, scroll UP or DOWN to highlight POINT > 100%.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Point percentage value.

> POINT setting range is 5% to 100%. The default setting is 100%.

```
SPEED          ◄ ST ►  TH  AUX1  AUX2
R1 FORWARD  > − 40
     RETURN  > − 40
      POINT  >  50%
     IN/OUT  >  IN
```
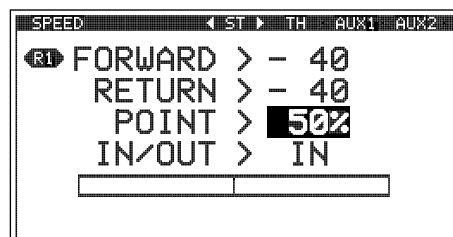
3) Press the ENTER key, then scroll DOWN to highlight IN/OUT > IN.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired IN/OUT value, either IN or OUT.
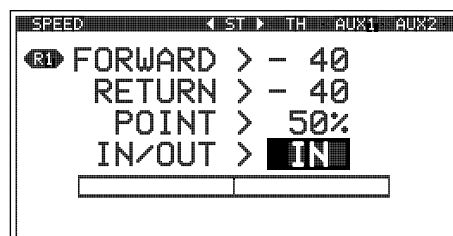
> IN/OUT setting range is IN or OUT. The default setting is IN.

```
SPEED          ◄ ST ►  TH  AUX1  AUX2
R1 FORWARD  > − 40
     RETURN  > − 40
      POINT  >  50%
     IN/OUT  >  IN
```

ALB MENU {ANTI-LOCK BRAKING}   `RACING`

The Anti-Lock Braking function makes it possible to achieve stable braking even on a slippery surface. With stable braking, your model is better able to trace an exact line under braking. When the Anti-Lock Braking function is turned ON, the Throttle servo will pulse when you apply Brake. Different Anti-Lock Braking options can be programmed, including how quickly the Brake pulsates, the Point at which the Anti-Lock Braking function Starts and more.

The Anti-Lock Braking function is primarily used on gasoline- or glow-powered models that feature a Throttle servo. It can be used on an electric model that uses an ESC, however, if your Electronic Speed Control features a reverse function, the Anti-Lock Braking function will not operate properly.

⚠️ The Anti-Lock Braking function operates only when the Throttle Trigger is moved from Neutral to the Brake Side. Set the hardest Braking you can obtain from your model by carefully setting the Anti-Lock Braking function right before the tires fully lock up but do not slip and lose traction. Be aware that using the Anti-Lock Brake function will never result in your model losing traction under braking. It only improves braking under less than ideal conditions.

With ABS ON   With ABS OFF
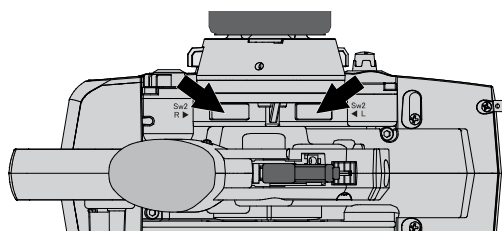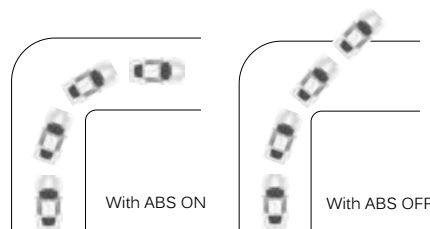
In the default configuration, Push-Button Switch Sw2 controls the Anti-Lock Braking Function. **Pressing and HOLDING the switch will turn Anti-Lock Braking ON and releasing the switch will turn Anti-Lock Braking OFF.**

⚠️ If desired, you can change the behavior of the switch from PUSH (default) to TOGGLE. For more information, see the Changing the Switch Mode section on page 39.

⚠️ Anti-Lock Braking Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

The diagram at right illustrates the relationship between the Point, Lag, Release, Hold and Stroke functions, all of which can be programmed separately to suit your specific Car Type, track conditions and Anti-Lock Braking behavior.
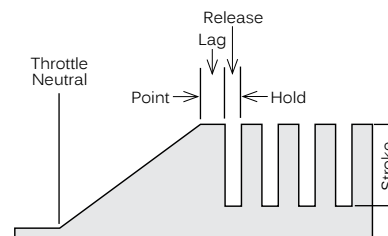
ALB MENU {ANTI-LOCK BRAKING}

RACING

Changing the Stroke Percentage Value:

The Stroke percentage value determines the amount of Brake that's applied automatically when the Anti-Lock Braking function is turned ON. A Stroke percentage value of 1% or greater must be programmed for the Anti-Lock Braking function work. If a Stroke value of OFF is chosen, the Anti-Lock Braking function will not work.

1) From within the RACING menu, scroll UP or DOWN to highlight the ALB menu.
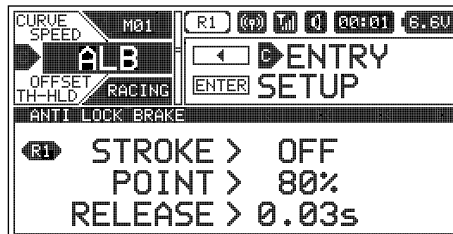
2) Press the ENTER key to open the ALB menu. STROKE > OFF will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to choose the desired Stroke percentage value. Increasing the Stroke percentage value will Increase Throttle servo travel in the Brake direction and Decreasing the Stroke percentage value will Decrease Throttle servo travel in the Brake direction.

> STROKE setting range is OFF to 100%. The default setting is OFF.
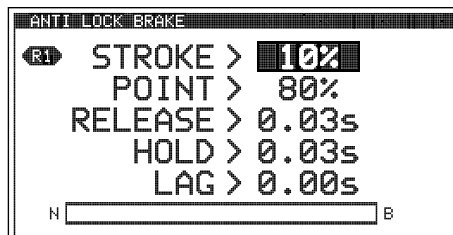
Changing the Point Percentage Value:

The Point percentage value determines the position along the length of Brake Side servo travel that the Anti-Lock Braking function Activates at when turned ON. For example, if set to 80%, you will have Normal Braking from the Throttle Neutral Point to 79% of servo travel. At 80% of servo travel and beyond, the Anti-Lock Braking function will Activate when turned ON.

1) From within the ALB menu, scroll UP or DOWN to highlight POINT > 80%.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Point percentage value. Increasing the Point percentage value will cause the Anti-Lock Braking function to Activate later and Decreasing the Point percentage value will cause the Anti-Lock Braking function to Activate sooner.

> POINT setting range is 5% to 100%. The default setting is 80%.
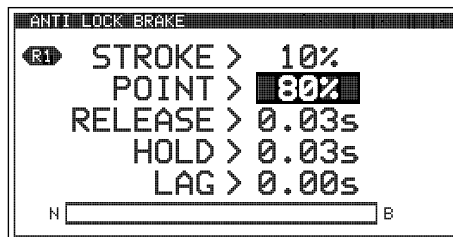
Changing the Release and Hold Values:

The Release and Hold values determine the speed at which the Brake pulsates. By changing the Release and Hold values, you can make the Brake pulsate Faster or Slower. The Release value determines how quickly the Brake moves from the Point setting to the Stroke setting and the Hold value determines how quickly the Brake moves from the Stroke setting back to the Point setting.

⚠ We recommend using equal Release and Hold values, although different values can be used to fine-tune how the Brake pulsates. Using Lower values make the Brake pulsate Faster and using Higher values make the Brake pulsate Slower.

1) From within the ALB menu, scroll UP or DOWN to highlight RELEASE > 0.03s.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Release value in Seconds. Increasing the Release value will cause the Brake to move from the Point setting to the Stroke setting Slower and Decreasing the Release value will cause the Brake to move from the Point setting to the Stroke setting Faster.

> RELEASE setting range is 0.01s to 1.00s. The default setting is 0.03s.
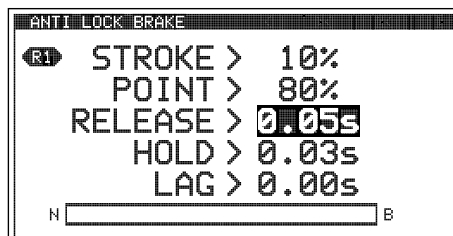
3) From within the ALB menu, scroll UP or DOWN to highlight HOLD > 0.03s.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Hold value in Seconds. Increasing the Hold value will cause the Brake to move from the Stroke setting back to the Point setting Slower and Decreasing the Hold value will cause the Brake to move from the Stroke setting back to the Point setting Faster.

> HOLD setting range is 0.01s to 1.00s. The default setting is 0.03s.
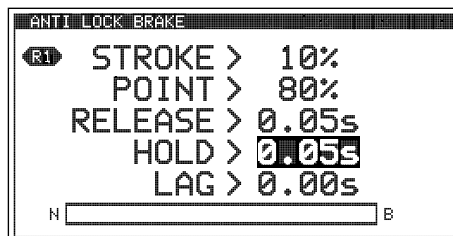
RACING

ALB MENU {ANTI-LOCK BRAKING}   RACING

Changing the Lag Value:

The Lag value determines the amount of Delay before the Anti-Lock Braking function Activates after reaching the Point setting.

1) From within the ALB menu, scroll UP or DOWN to highlight LAG > 0.00s.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Lag value in Seconds. Increasing the Lag value increases the Delay time to Activate the Anti-Lock Braking function after reaching the Point setting and Decreasing the Lag value decreases the Delay time to Activate the Anti-Lock Braking function after reaching the Point setting.
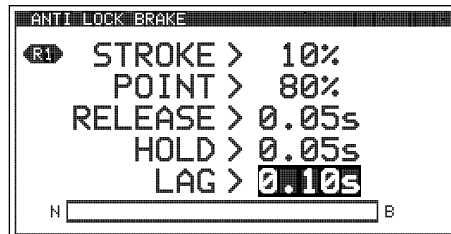
> LAG setting range is 0.00s to 1.00s. The default setting is 0.00s.

```
ANTI LOCK BRAKE
R1  STROKE >  10%
     POINT >  80%
   RELEASE > 0.05s
      HOLD > 0.05s
       LAG > 0.10s
N                          B
```

OFFSET MENU {THROTTLE OFFSET}   RACING

The Throttle Offset function allows you to shift the Neutral Point of the Throttle servo to a fixed position, either toward the High Side or the Brake Side, while still allowing you full control of the Throttle. For example, if you're driving a glow- or gas-powered model, you can use the Throttle Offset function to raise the engine idle for starting or you can program the Throttle Offset function to Increase the engine to a steady idle while you're refueling during a race. If your model features a separate Brake servo, a Brake Lock function is featured that can be programmed to apply Brake while the Throttle is increased to keep your model from moving.

⚠ The Throttle Offset function shifts the Neutral Point of the Throttle servo without affecting the High Side or Brake Side End Points. This allows you to have full control over the Throttle even when the Throttle Offset function is turned ON.
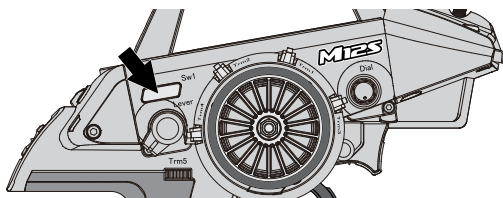
In the default configuration, Push-Button Switch Sw1 turns the Throttle Offset function ON and OFF. When the Throttle Offset function is turned ON, [OFFST] ON will be momentarily displayed in a pop-up window, LED1 will flash and an Audible Alarm will sound until the Throttle Offset function is turned OFF.

⚠ Throttle Offset Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

Changing the Position Percentage Value:

1) From within the RACING menu, scroll UP or DOWN to highlight the OFFSET menu.

2) Press the ENTER key to open the OFFSET menu. OFFSET > OFF will be highlighted.

3) Scroll UP or DOWN to highlight POSITION > 0%.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired High Side (H) or Brake Side (B) Position percentage value. The Position percentage value determines the position the Throttle servo Neutral Point will shift to when the Throttle Offset function is turned ON.
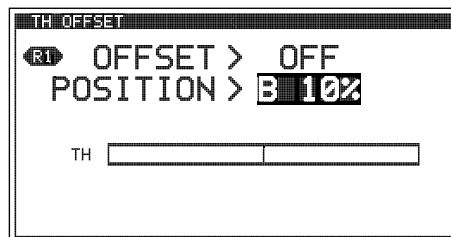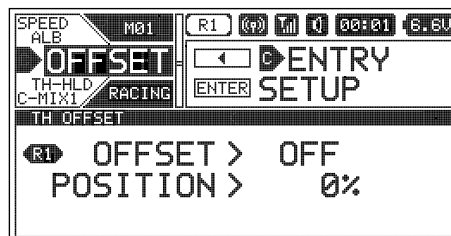
> POSITION setting range is H100% to B100%. The default setting is 0%.

```
SPEED    M01   R1 (y) Y 0 00:01 6.6V
ALB
 OFFSET      ◄  ▶ENTRY
TH-HLD  RACING  ENTER SETUP
C-MIX1
TH OFFSET
R1  OFFSET >  OFF
    POSITION >   0%
```

```
TH OFFSET
R1  OFFSET >  OFF
    POSITION > B 10%

   TH  [            ]
```

Turning the Throttle Offset Function ON and OFF:

1) From within the OFFSET menu, scroll UP or DOWN to highlight OFFSET > OFF.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Offset value, either ON or OFF.

> OFFSET setting range is ON and OFF. The default setting is OFF.

```
TH OFFSET
R1  OFFSET >  ON
    POSITION > B 10%

   TH  [      ■      ]
```

⚠ Remember, the Throttle Offset function can be turned ON and OFF using Push-Button Switch Sw1 without needing to access the OFFSET menu to turn it ON and OFF.

OFFSET MENU {THROTTLE OFFSET} **RACING**

<u>Changing the Brake Lock Percentage Value:</u>

When a Car Type that features a separate Brake channel (Car Type II, III, IV,VI or VII) is selected, the Brake Lock function can be programmed to apply Brake to keep your model from moving while the Throttle Offset Position is increased. If two separate Brake channels are featured, such as Car Type IV, the Brake Lock function percentage value will affect both Brake channels equally.

1) From within the OFFSET menu, scroll UP or DOWN to highlight BR-LOCK > OFF.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Brake Lock percentage value. The Brake Lock percentage value determines the position your separate Brake servo (or servos) will shift to when the Throttle Offset function is turned ON.
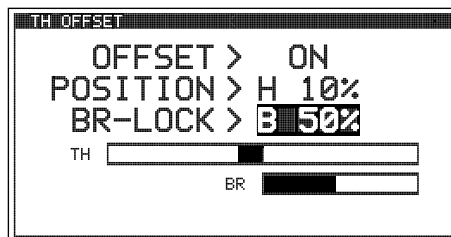
BR-LOCK setting range is OFF and 0% to 100%. The default setting is OFF.

BR-MIX MENU {DUAL BRAKE MIXING} **RACING**

The Brake Mixing function allows you change the Brake Bias between the Front and Rear Brakes and is used primarily with 1/5th scale gas-powered models that use separate Brake servos, although one of the separate Brake servos can be the Brake Side of the Throttle servo, such as when Car Type III is selected. The Brake Mixing function slows the transit speed of one or both Brake servos, which not only allows you to slow down the Braking action, but also allows you to set a Delay between them, which results in you being able to change the Brake Bias.

⚠ Brake Delay Programming Values can be changed while you're driving by Assigning the these functions to a Trim Switch or the Auxiliary Dial. For more information, see the ASSIGN Menu section on pages 37 through 46.

⚠ The Brake Mixing function is available only when either Car Type III, IV or VII is selected.

<u>Changing the Brake Delay Percentage Value:</u>

1) From within the RACING menu, scroll UP or DOWN to highlight the BR-MIX menu.

2) Press the ENTER key to open the BR-MIX menu. BR-DELAY > 0% will be highlighted.

3) Scroll UP or DOWN to highlight the Brake Delay percentage value you would like to change, either BR-DELAY or BR2-DELAY.
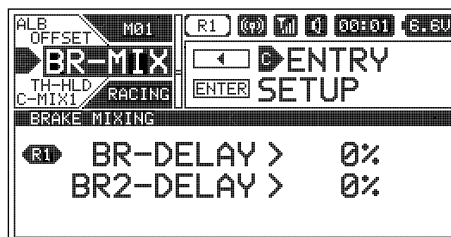
⚠ Which Brake Delay percentage value affects the Front or Rear Brake servo depends on how your Brake servos are plugged into the receiver and will vary.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Brake Delay percentage value. Increasing the percentage value will slow the transit speed of that Brake servo.

5) Press the ENTER key, then repeat steps 3 and 4 to change the other Brake Delay percentage value, if desired. The larger the difference between the two Brake Delay percentage values, the greater the Brake Bias.
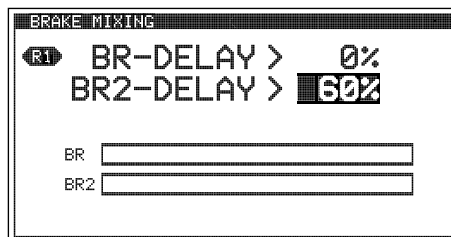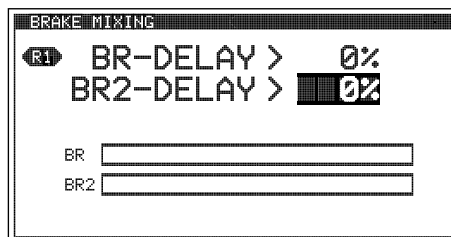
BR-DELAY and BR2-DELAY setting range is 0% to 100%. The default setting for both channels is 0%.

⚠ Setting both Brake Delay percentage values to the same percentage value will result in both Brake servos moving at the same speed. This allows you slow down the Braking action if that is desired. Using different percentage values will result in Brake Bias.

PRO TIP: You may find that you will need to use a larger percentage value to make a noticeable difference in Brake Bias.

RACING

TH-HLD MENU {THROTTLE HOLD}   RACING

The Throttle Hold function moves the Throttle servo to a fixed position, either toward the High Side or the Brake Side, and is used primarily with glow- or gas-powered models. For example, if you're driving a glow- or gas-powered boat, you can use can the Throttle Hold function to stop your engine with only the press of a button. This feature is often referred to as 'Engine Cut'. Alternately, you can use the Throttle Hold function to Increase the engine to a steady idle while you're refueling during a race. This feature is often referred to as 'Idle Up'. If your model features a separate Brake servo, a Brake ON/OFF function is featured that will allow you to lock out the Brake servo (ON) or allow you control of the Brake servo (OFF) while the Throttle Hold function is turned ON.
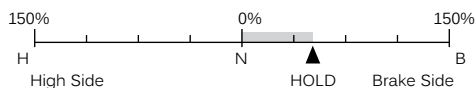
The Throttle Hold function moves the Throttle servo to a fixed position, either toward the High Side or the Brake Side. When the Throttle Hold function is turned ON, you will NOT have control of the Throttle. If your model has a separate Brake servo and you set the Brake ON/OFF function to OFF, you will still have control over your model's Brake. To regain Throttle control, you must turn the Throttle Hold function OFF.

WARNING: The Throttle Hold percentage value can be set Higher than your Throttle High Side and Throttle Brake Side End Points. To avoid damage to your model, we don't suggest programming a Throttle Hold percentage value that exceeds your Throttle High Side or Throttle Brake Side End Points.

So that the Throttle Hold function can be turned ON and OFF while you're driving, it must first be Assigned to a Push-Button Switch. For more information, see the Push-Button Switch Function Assignments section on pages 37 through 39. When turned ON and OFF, [TH-HOLD] ACT or [TH-HOLD] INH will be displayed momentarily in a pop-up window.

The Throttle Hold percentage value can be changed while you're driving by Assigning the Hold function to a Trim Switch or the Auxiliary Dial. For more information, see the ASSIGN Menu section on pages 37 through 46.

Changing the Hold Percentage Value:

1) From within the RACING menu, scroll UP or DOWN to highlight the TH-HLD menu.

2) Press the ENTER key to open the TH-HLD menu. HOLD > 0% will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to choose the desired Hold percentage value. The Hold percentage value determines the position the Throttle servo will move to when the Throttle Hold function is turned ON. Choosing a Positive Hold percentage value will move the Throttle servo toward the High Side and choosing a Negative Hold percentage value will move the Throttle Servo toward the Brake Side.
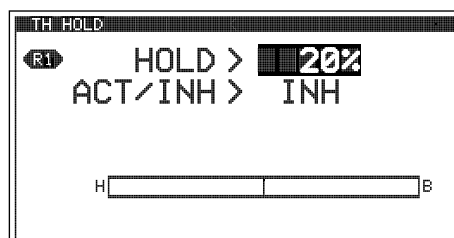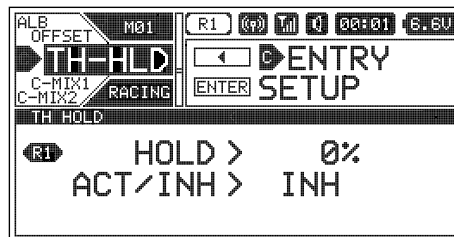
HOLD setting range is 150% to -150%. The default setting is 0%.

Turning the Throttle Hold Function ON and OFF:

As noted above, we suggest Assigning the Throttle Hold function to a Push-Button Switch so that you can turn it ON and OFF while you're driving without needing to access the TH-HLD menu.

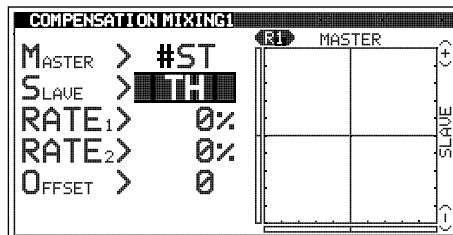The ON and OFF behavior will differ based on the ACT/INH setting you choose below. We recommend using the INH setting. With this setting, the Throttle Hold function will always be OFF until you turn it ON. If you choose ACT, the Throttle Hold function will always be ON until you turn it OFF.

1) From within the TH-HLD menu, scroll UP or DOWN to highlight ACT/INH > INH.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired ACT/INH setting, either ACT (Active ON) or INH (Inhibited OFF).

ACT/INH setting range is ACT and INH. The default setting is INH.
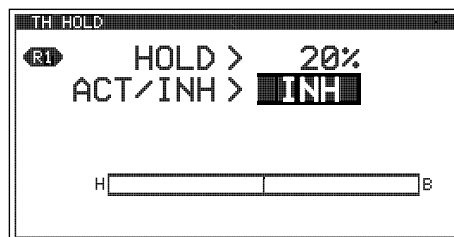
Changing the Brake Lock-Out Value:

When Car Type II, III, IV,VI or VII is selected, the Brake Lock-Out function can be programmed, which gives you the option to lock out the Brake servo(s) or retain control of the Brake servo(s). This gives you the option of controlling your separate Brake servo(s) to keep your model from moving, even when your engine's idle increases when the Throttle Hold function is turned ON.

TH-HLD MENU {THROTTLE HOLD}   RACING

Changing the Brake Lock-Out Value, Continued:

⚠ If your Car Type features two separate Brake channels, such as Car Type IV, the Brake Lock-Out function will affect both Brake channels equally.

1) From within the TH-HLD menu, scroll UP or DOWN to highlight BR > ON.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Brake value, either ON or OFF. When set to ON, your separate Brake servo(s) will be locked out along with the Throttle servo when the Throttle Hold function is turned ON. When set to OFF, you will retain control of your separate Brake servo(s) when the Throttle Hold function is turned ON.

```
TH HOLD
R1      HOLD >    20%
     ACT/INH >   INH
         BR >   OFF
  H                        B
```
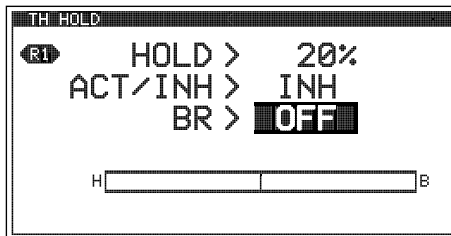
> BR setting range is ON and OFF. The default setting is ON.

C-MIX1 AND C-MIX2 MENU {COMPENSATION MIXING 1 AND COMPENSATION MIXING 2}   RACING

The Compensation Mixing function is used to create your own custom Mixes that allow you to control any number of desired functions in different combinations. For example, you can use the Compensation Mixing function to deploy an air-brake when you apply Brake or raise a wing as you increase Throttle. You could use the Compensation Mixing function to counter-act torque steer by applying a very slight amount of Steering in one direction when you increase Throttle. The possibilities are nearly endless.

Compensation Mixes are composed of a Master channel and a Slave channel. The Master channel always controls the Slave channel. Any of the four channels can be programmed as a Master or a Slave. The same channel can even be programmed as both a Master and a Slave.

Two Rate percentage values can be programmed to determine the direction and amount of travel that the Slave channel servo moves in relation to the Master channel servo. In addition, an Offset function is featured that allows you to shift the Neutral Point of the Slave channel servo to center the Slave channel servo or to shift the Slave channel servo's Neutral Point to change the starting point of your Mix.

Two Compensation Mixers are available, and each can be turned ON separately or both can be turned ON at the same time (using different Racing Modes). A graph is featured to help visualize the Compensation Mixing changes you make.

⚠ Compensation Mixing Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

⚠ This section covers both the Compensation Mixing 1 and Compensation Mixing 2 menus, since programming each of them is exactly the same. Choose either the C-MIX1 or the C-MIX2 menu depending on which of the two Compensation Mixers you want to program.

⚠ The Rate 1 and Rate 2 percentage values determine whether the Compensation Mixer is Active (turned ON) or Inhibited (turned OFF). When no Rate percentage values are programmed, the Compensation Mixer will be Inhibited and when either Rate percentage value is programmed, the Compensation Mixer will become Active. If you need to turn a Compensation Mixer ON and OFF while you're driving, you will need to program the Compensation Mixer with a Rate value to one Racing Mode (turned ON), then switch to a second Racing Mode that doesn't have any Compensation Mixer Rate values programmed (turned OFF).

Compensation Mixing 1 Steering to Throttle Mix Example:
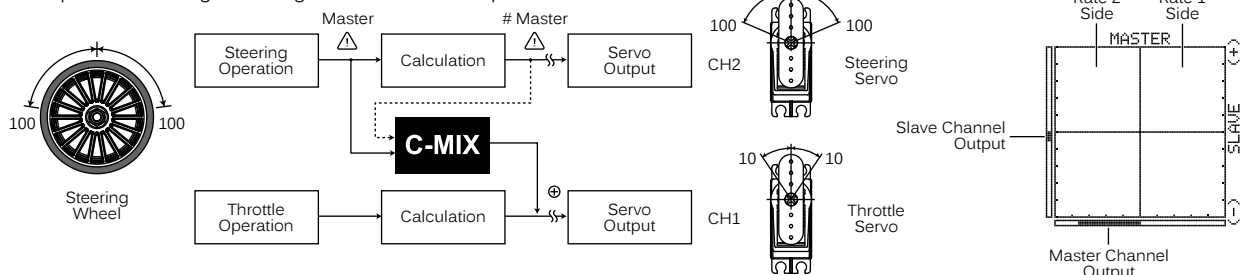
In the example above, Compensation Mixing 1 is programmed as follows: MASTER > ST, SLAVE > TH, RATE1 > 10%, RATE2 > 10% and OFFSET > 0. When you move the Steering Wheel 100% in each direction, the Steering servo will travel 100% in each direction and at the same time, the Throttle servo will travel 10% in each direction.

⚠ Compensation Mixing Rate percentage values are a Ratio of Slave channel servo travel to Master channel servo travel. For example, if both Rate percentage values are set to 10%, the Throttle servo will travel 1/10th the amount as the Steering servo travels in both directions. Compensation Mixes are Linear throughout the entire range of travel. If a Rate value of 0% is chosen, the Slave servo will not move in that direction.

C-MIX1 AND C-MIX2 MENU {COMPENSATION MIXING 1 AND COMPENSATION MIXING 2}   RACING

Available channels vary based on the Car Type currently chosen. The table below shows the available channels for each Car Type. See also the second table below that describes the Channel Output Data of each of these channels.

Channels denoted with a Pound sign (#) can be selected only as Master channels. All other channels can be selected as Master or Slave channels.

CH \ TYPE	TYP I	TYP II	TYP III	TYP IV	TYP V	TYP VI	TYP VII	TYP VIII	TYP IX	TYP X
CH 1	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST
	#ST	#ST	#ST	#ST	#L-ST	#L-ST	#L-ST	#F/ST	#ST	#F/ST
CH 2	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH
	#TH	#TH	#TH	#TH	#TH	#TH	#TH	#TH	#F/TH	#F/TH
CH 3	AUX1	BR	BR2	BR	----	----	----	----	----	----
	#AUX1	#BR	#BR2	#BR	#R-ST	#R-ST	#R-ST	#R/ST	#R/TH	#R/ST
CH 4	AUX2	AUX	AUX	BR2	AUX	BR	BR2	AUX	AUX	----
	#AUX2	#AUX	#AUX	#BR2	#AUX	#BR	#BR2	#AUX	#AUX	#R/TH

ST=Steering • TH=Throttle • BR=Brake • BR2=Brake 2 • R-ST=Right • L-ST=Left • R/ST or R/TH=Rear • F/ST or F/TH=Front

The table below shows the Channel Output Data of each Master channel. This is the Data that will be duplicated on the Slave channel when Compensation Mixing is turned ON. Channels denoted with a Pound sign (#) indicate that not only is the Raw Output Data duplicated on the Slave channel, but the other functions described are also duplicated on the Slave channel. For example, if MASTER > #ST is selected, any Master channel Steering Trim, End Point Adjustments, Dual Rate, Curve and Speed values, plus the Raw Output Data will be duplicated on the Slave channel. Alternately, if you select MASTER > ST, only Curve and Speed values, plus the Raw Output Data will be duplicated on the Slave channel.

CH.	CH. NAME	CH. OUTPUT DATA
ST	Steering	Raw Output Data, Plus CURVE and SPEED
#ST	# Steering	Raw Output Data, Plus TRIM, EPA, D/R, CURVE and SPEED
#L-ST	# Left Steering	Raw Output Data, Plus TRIM, EPA, D/R, CURVE and SPEED
#F/ST	# Front Steering	Raw Output Data, Plus TRIM, EPA, D/R, CURVE and SPEED
TH	Throttle	Raw Output Data, Plus CURVE, SPEED and BR-MIX
#TH	# Throttle	Raw Output Data, Plus TRIM, EPA, D/R, CURVE, SPEED, ALB, OFFSET, BR-MIX and TH-HOLD
#F/TH	# Front Throttle	Raw Output Data, Plus TRIM, EPA, D/R, CURVE, SPEED, ALB, OFFSET, BR-MIX and TH-HOLD
AUX1	Auxiliary 1	Raw Output Data, Plus CURVE and SPEED **(Referred to as AUX in some Car Types)**
BR	Brake	Raw Output Data, Plus CURVE, SPEED and BR-MIX
BR2	Brake 2	Raw Output Data, Plus CURVE, SPEED and BR-MIX
#AUX1	# Auxiliary 1	Raw Output Data, Plus TRIM, EPA, D/R, CURVE and SPEED
#BR	# Brake	Raw Output Data, Plus TRIM, EPA, D/R, CURVE, SPEED, ALB, OFFSET, BR-MIX and TH-HOLD
#BR2	# Brake 2	Raw Output Data, Plus TRIM, EPA, D/R, CURVE, SPEED, ALB, OFFSET, BR-MIX and TH-HOLD
#R-ST	# Right Steering	Raw Output Data, Plus TRIM, EPA, D/R, CURVE and SPEED
#R/ST	# Rear Steering	Raw Output Data, Plus TRIM, EPA, D/R, CURVE and SPEED
#R/TH	# Rear Throttle	Raw Output Data, Plus TRIM, EPA, D/R, CURVE, SPEED, ALB, OFFSET, BR-MIX and TH-HOLD
AUX2	Auxiliary 2	Raw Output Data, Plus CURVE and SPEED
#AUX2	# Auxiliary 2	Raw Output Data, Plus TRIM, EPA, D/R, CURVE and SPEED

Changing the Master Channel:

1) From within the RACING menu, scroll UP or DOWN to highlight either the C-MIX1 or the C-MIX2 menu depending on which Compensation Mixer you want to program. In this section, we show programming Compensation Mixer 1.
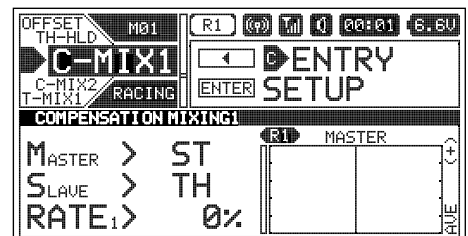
C-MIX1 AND C-MIX2 MENU {COMPENSATION MIXING 1 AND COMPENSATION MIXING 2}   RACING

Changing the Master Channel, Continued:

2) Press the ENTER key to open the C-MIX1 menu. MASTER > ST will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to choose the desired Master channel.
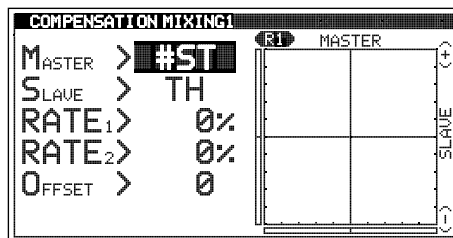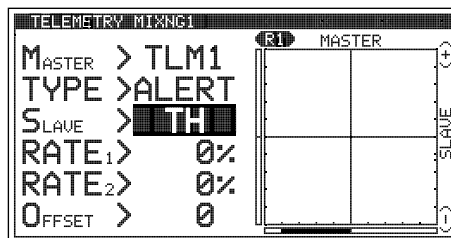
Changing the Slave Channel:

1) From within the C-MIX1 menu, scroll UP or DOWN to highlight SLAVE > TH.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Slave channel.

⚠️ Channels denoted with a Pound (#) sign cannot be chosen as Slave channels.

Changing the Rate 1 and Rate 2 Percentage Values:

The Rate percentage values determine the amount and direction of Slave channel servo travel. Use a Positive or Negative percentage value to change the amount and direction of travel. The Right side of the graph indicates Rate 1 percentage values and the Left side of the graph indicates Rate 2 percentage values.

1) From within the C-MIX1 menu, scroll UP or DOWN to highlight either RATE1 > 0% or RATE2 > 0%.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Rate 1 or Rate 2 percentage value.

RATE1 and RATE2 setting range is -150% to 150% . The default setting for both Rate percentage values is 0%.

WARNING: The Rate percentage values can be set Higher than your Slave channel servo End Points (up to 150% in either direction). To avoid damage to your model, we don't suggest programming Rate percentage values that exceed your Slave channel servo End Points.

⚠️ When the Master and Slave are set to the same channel, Mixing takes place within the channel itself. This causes servo travel to Increase for Positive Rate percentage values and servo travel to Decrease for Negative Rate percentage values.

Changing the Channel Offset Value:

The Offset function allows you to shift the Neutral Point of the Slave channel servo to compensate for any Master channel servo Trim or to change the actual starting point of your Mix.

1) With the Master channel control centered, check the Master Travel Indicator at the bottom of the graph to see if any Master channel Trim is displayed (see arrow at right).
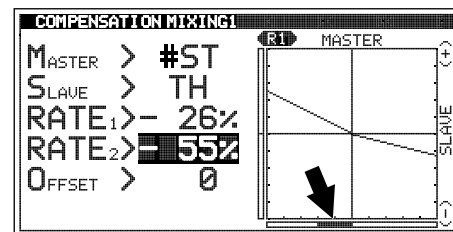
2) From within the C-MIX1 menu, scroll UP or DOWN to highlight OFFSET > 0.

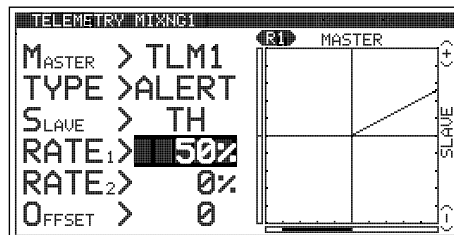3) Press the ENTER key, then scroll UP or DOWN to choose the desired Slave channel Offset value. Increase or Decrease the Offset value to move the vertical axis in the desired direction, adjusting the Slave channel servo Neutral Point.

OFFSET setting range is -150 to 150 . The default setting is 0.
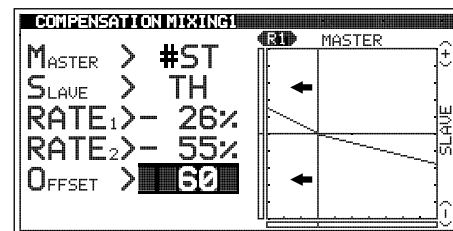
⚠️ Adjust the Offset value to move the vertical axis and erase the Trim Deviation from the Master Travel Indicator. If there is no Trim Deviation displayed, you can simply position the starting point of your Mix by choosing the desired Offset value.

RACING

C-MIX1 AND C-MIX2 MENU {COMPENSATION MIXING 1 AND COMPENSATION MIXING 2}   **RACING**

Changing the Channel Offset Value, Continued:

When the Auxiliary Dial is programmed to control Auxiliary 1 or Auxiliary 2 and you choose AUX1 or AUX2 (or #AUX1 or #AUX2) to be the Master channel, by setting the Offset value to 100 or -100, the Auxiliary Dial can control the full range of Mixing travel in one direction, instead of half the Mixing travel in one direction and half the Mixing travel in the other direction. This is useful if you want the full range of Mixing travel in only one direction.
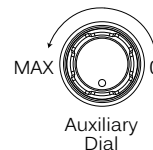
⚠ Setting the Offset value to a value greater than -100 or 100 will shift the Neutral Point of the Slave channel servo beyond the operation range of the Auxiliary Dial and is not recommended.

Following the example in the diagram at right, set the Rate 1 percentage value to 0% and the Rate 2 percentage value to -50%, then set the Offset value to -100. The full range of Mixing travel can now be adjusted in one direction when turning the Auxiliary Dial counter-clockwise.

⚠ This same technique can also be used if you're using the Auxiliary Lever to control either Auxiliary 1 or Auxiliary 2.
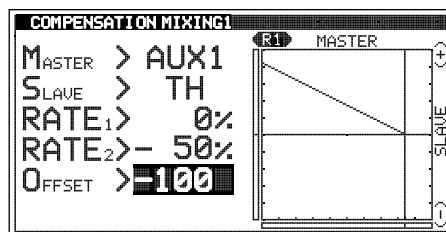
T-MIX1 AND T-MIX2 MENU {TELEMETRY MIXING 1 AND TELEMETRY MIXING 2}   **RACING**

The Telemetry Mixing function is similar to the Compensation Mixing function, in that you're able to create custom Mixes, this time using Telemetry Data or Telemetry Alerts. For example, if you're driving a nitro vehicle with a Temperature Sensor on the engine, you can use the Telemetry Mixing function to automatically lower the maximum amount of Throttle when and if your engine reaches the Temperature Alert value programmed in the TELEMETRY LOG > TLM1 menu. This can help prevent over-heating your engine. Alternately, if your model has an RPM Sensor on it, you can use the Telemetry Mixing function to raise and lower a wing as the RPM increases and decreases. The possibilities are nearly endless.

Telemetry Mixes are composed of a Master (Telemetry Data) and a Slave channel. The Master always controls the Slave channel. Two Rate percentage values can be programmed to determine the direction and amount of travel that the Slave channel servo moves in relation to the Telemetry Data. In addition, an Offset function allows you to shift the Neutral Point of the Slave channel servo to center the Slave channel servo or to shift the Slave channel servo's Neutral Point to change the starting point of your Mix.

Two Telemetry Mixers are available, and each can be turned ON separately or both can be turned ON at the same time (using different Racing Modes). A graph is featured to help visualize the Telemetry Mixing changes you make.

IMPORTANT: For the Telemetry Mixing function to operate, Telemetry must be turned ON and you must be using Telemetry Sensors in your model with a Telemetry-capable receiver (e.g. RX-481, RX-482, Super Vortex Plus series ESC, etc.)

⚠ Telemetry Mixing Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

⚠ This section covers both the Telemetry Mixing 1 and Telemetry Mixing 2 menus, since programming each of them is exactly the same. Choose either the T-MIX1 or the T-MIX2 menu depending on which of the two Telemetry Mixers you want to program.

⚠ The Rate 1 and Rate 2 percentage values determine whether the Telemetry Mixer is Active (turned ON) or Inhibited (turned OFF). When no Rate percentage values are programmed, the Telemetry Mixer will be Inhibited and when either Rate percentage value is programmed, the Telemetry Mixer will become Active. If you need to turn a Telemetry Mixer ON and OFF while you're driving, you will need to program the Telemetry Mixer with a Rate value to one Racing Mode (turned ON), then switch to a second Racing Mode that doesn't have any Telemetry Mixer Rate values programmed (turned OFF).

Telemetry Mixing 1 RPM to Auxiliary 2 Mix Example:
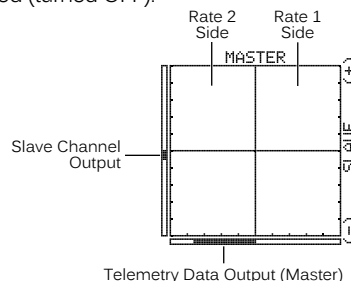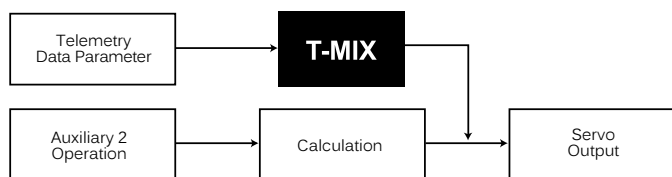
In the example above, Telemetry Mixing 1 is programmed as follows: MASTER > RPM, SLAVE > AUX2, RATE1 > 0%, RATE2 > 75% and OFFSET > 0. As the Throttle RPM changes, the Auxiliary Channel 2 servo will travel up to 75% in one direction.

⚠ Telemetry Mixing Rate percentage values are a Ratio of Slave channel servo travel to Telemetry Data values (Master). Telemetry Mixes are Linear throughout the entire range of travel. If a Rate value of 0% is chosen, the Slave servo will not move in that direction.

T-MIX1 AND T-MIX2 MENU {TELEMETRY MIXING 1 AND TELEMETRY MIXING 2}   RACING

Currently TMP1, TMP2, VOLT and RPM Master Telemetry Data options are available. As different types of Telemetry Sensors are developed, these will be added as Master Telemetry Data Options in future firmware updates. Available Slave channels vary based on the Car Type currently chosen. The table below shows the available channels for each Car Type.

TYPE CH	TYP I	TYP II	TYP III	TYP IV	TYP V	TYP VI	TYP VII	TYP VIII	TYP IX	TYP X
CH 1	ST	ST	ST	ST	L-ST	L-ST	L-ST	F/ST	ST	F/ST
CH 2	TH	TH	TH	TH	TH	TH	TH	TH	F/TH	F/TH
CH 3	AUX1	BR	BR2	BR	R-ST	R-ST	R-ST	R/ST	R/TH	R/ST
CH 4	AUX2	AUX	AUX	BR2	AUX	BR	BR2	AUX	AUX	R/TH

ST=Steering • TH=Throttle • BR=Brake • BR2=Brake 2 • R-ST=Right • L-ST=Left • R/ST or R/TH=Rear • F/ST or F/TH=Front

Changing the Master Telemetry Data Option:

1) From within the RACING menu, scroll UP or DOWN to highlight either the T-MIX1 or the T-MIX2 menu depending on which Telemetry Mixer you want to program. In this section, we show programming Telemetry Mixer 1.
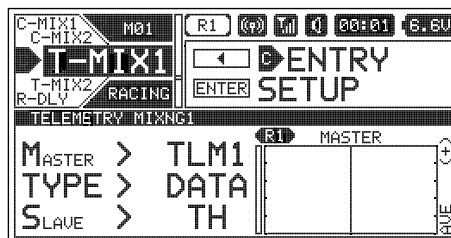
2) Press the ENTER key to open the T-MIX1 menu. MASTER > TLM1 will be highlighted.

3) Press the ENTER key, then scroll UP or DOWN to choose the desired Master Telemetry Data option.

⚠ TLM1 and TLM2 Telemetry Data will differ depending on what type of Telemetry Sensor you have plugged into those Telemetry Ports in the receiver. In the default configuration, TLM1 and TLM2 are used with Temperature Sensors.
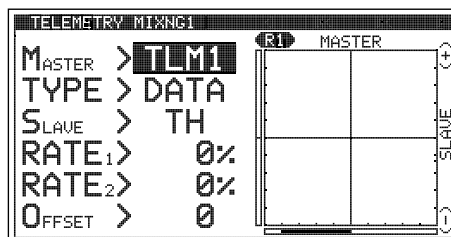
Changing the Telemetry Type:

The Telemetry Type value determines the Master Telemetry Data Type, either DATA or ALERT. When DATA is selected, the Slave channel servo will move relative to the current Telemetry Data value. For example, if Telemetry Mixing 1 is set to MASTER > TLM1 and TYPE > DATA, the Slave channel servo will move relative to the actual Telemetry Data value. The amount and direction of movement is determined by the Rate percentage values.

When ALERT is selected, the Slave channel servo will move to a programmed position (or the maximum amount of servo travel can be limited) when the Telemetry Alert Alarm value is reached, as programmed in the LOG SETUP menu. For example, if Telemetry Mixing 1 is set to MASTER > TLM1 and TYPE > ALERT, the Slave channel servo will move to the programmed position (or the maximum amount of servo travel limited) when the Telemetry (Temperature) Alert Alarm value is reached. Again, the amount and direction of movement is determined by the Rate percentage values. For information about programming a Telemetry Alert Alarm value, see the Telemetry 1 and Telemetry 2 Data Display and Alert Alarm Options section on pages 60 and 64.

⚠ The Telemetry Type cannot be changed when MASTER > RPM is selected.

1) From within the T-MIX1 menu, scroll UP or DOWN to highlight TYPE > DATA.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Type value, either DATA or ALERT.

> TYPE setting range is DATA or ALERT . The default setting is DATA.

Changing the Slave Channel:

1) From within the T-MIX1 menu, scroll UP or DOWN to highlight SLAVE > TH.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Slave channel.

RACING

T-MIX1 AND T-MIX2 MENU {TELEMETRY MIXING 1 AND TELEMETRY MIXING 2}   RACING

Changing the Rate 1 and Rate 2 Percentage Values:

The Rate percentage values determine the amount and direction of Slave channel servo travel. Use a Positive or Negative percentage value to change the amount and direction of travel. The Right side of the graph indicates Rate 1 percentage values and the Left side of the graph indicates Rate 2 percentage values.

1) From within the T-MIX1 menu, scroll UP or DOWN to highlight either RATE1 > 0% or RATE2 > 0%.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Rate 1 or Rate 2 percentage value.

RATE1 and RATE2 setting range is -150% to 150% . The default setting for both Rate percentage values is 0%.

WARNING: The Rate percentage values can be set Higher than your Slave channel servo End Points (up to 150% in either direction). To avoid damage to your model, we don't suggest programming Rate percentage values that exceed your Slave channel servo End Points.

Changing the Channel Offset Value:

The Offset function allows you to shift the Neutral Point of the Slave channel servo to change the actual starting point of your Mix.

1) From within the T-MIX1 menu, scroll UP or DOWN to highlight OFFSET > 0.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Slave channel Offset value. Increase or Decrease the Offset value to move the vertical axis in the desired direction, adjusting the Slave channel servo Neutral Point.
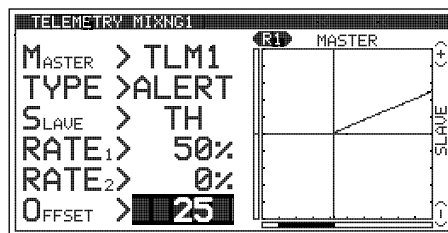
OFFSET setting range is -150 to 150 . The default setting is 0.

TELEMETRY MIXING EXAMPLES

The examples below detail programming several different Telemetry Mixing options that may be common in normal use. These examples should help you learn more about how the various Telemetry Mixing values work to get the results you want.

RPM to AUX2 Mixing:

In this example, we're Mixing RPM to Auxiliary Channel 2 to operate a rear wing. As the RPM increases, the wing will raise and as the RPM decreases, the wing will lower. The movement is proportional throughout the RPM range. We adjust Rate 2 to raise the wing in the Forward direction. Since we don't want the wing to operate in the Reverse direction, we leave Rate 1 at 0%. *If required, you can adjust the Offset value to adjust the Neutral Point of the Slave servo to fine-tune the position of the wing when it's lowered.

MASTER >	RPM
SLAVE >	AUX2
RATE1 >	0%
RATE2 >	75%
OFFSET >	0*

TLM1 Alert to TH Mixing:

In this example, we're Mixing TLM1 (Temperature 1) to Throttle to Limit the maximum amount of throttle when the Temperature Alert Alarm value is reached. If and when the Temperature Alert Alarm value is reached, the maximum amount of throttle will be reduced to prevent the engine from overheating. We adjust Rate 1 to Limit the Throttle Forward direction.

MASTER >	TLM1
TYPE >	ALERT
SLAVE >	TH
RATE1 >	-50%
RATE2 >	0%
OFFSET >	0

⚠ When programming Rate 1 and Rate 2 percentage values, please note the current direction of the Master Telemetry Data Output Indicator at the bottom of the graph. This indicates the current Telemetry Data value. Slave channel Rate values will only work when programmed for the same side of the graph (Rate 1 side or Rate 2 side) that the Master Telemetry Data Output Indicator is on. For example, when programming the Slave channel servo to Limit the maximum amount of throttle as shown in the example above, Rate 1 must be programmed, because when the Temperature Alert value is reached, the Master Telemetry Data Output Indicator will move to the Rate 2 side of the graph.

ACKER MENU {ACKERMAN ANGLE ADJUSTMENT}   **RACING**

The Ackerman function allows you to change the Steering Angle of the front tires independently to prevent the tires from slipping during turns. Being able to change the Ackerman Angle can help improve your model's high-speed cornering and improve tire wear. In general, your model will corner better if the inner tire turns in at a sharper angle than the outer tire. The Ackerman function allows you reduce the turn-in angle of the outer tire, which increases the turn-in angle of the inner tire relative to it. In addition, the Ackerman function allows you to adjust the Toe Angle of each tire independently.

⚠ Ackerman Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

⚠ The Ackerman function is available only when either Car Type V, VI or VII is selected.

Changing the Toe Angle Values:

The Toe value allows you to change the toe angle of both the right and left tires independently. Use this function to make fine-tuned adjustments to the Toe Angle after you've adjusted your model's turnbuckles. **The Toe Angle should be adjusted prior to adjusting the Ackerman Angle.**

1) From within the RACING menu, scroll UP or DOWN to highlight the ACKER menu.

2) Press the ENTER key to open the ACKER menu. LEFT-ST TOE > 0 will be highlighted.

3) Scroll UP or DOWN to highlight the Toe Angle value you would like change. Choose from either LEFT-ST (Left Steering) or RIGHT-ST (Right Steering) TOE.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Toe Angle value. Use a value that fine-tunes the Toe Angle the desired amount.

5) Press the ENTER key, then repeat steps 3 and 4 to change the second Toe Angle value.

> LEFT-ST TOE and RIGHT-ST TOE setting range is L150 to R150. The default setting for both channels is 0.

⚠ Adjusting the Toe Angle Right or Left will shift the Steering End Points Right or Left, too, which could cause the steering linkage to bind or exceed the maximum desired Steering Angle. To prevent this, we suggest readjusting the Steering End Points after changing the Toe Angle values. For more information, see the EPA Menu section on pages 73 and 74.

Changing the Ackerman Angle Percentage Values:

1) From within the ACKER menu, scroll UP or DOWN to highlight the Ackerman Angle percentage value you would like change. Choose from either LEFT-ST (Left Steering) Left or Right, or RIGHT-ST (Right Steering) Left or Right.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Ackerman Angle percentage value. Reducing the Ackerman Angle percentage value will reduce the amount of control throw in that the direction for that specific servo.

3) Press the ENTER key, then repeat steps 1 and 2 to change any other desired Ackerman Angle percentage values.

> LEFT-ST L and R and RIGHT-ST L and R setting range is 0% to 100%. The default setting for both channels is 100%.
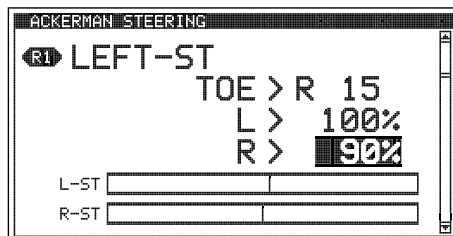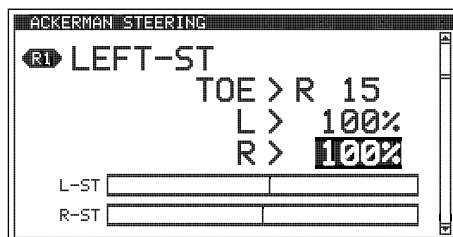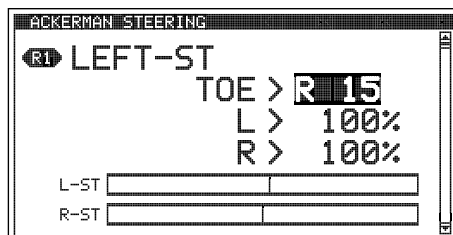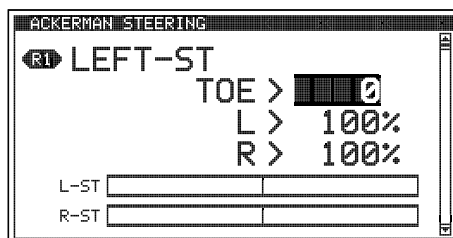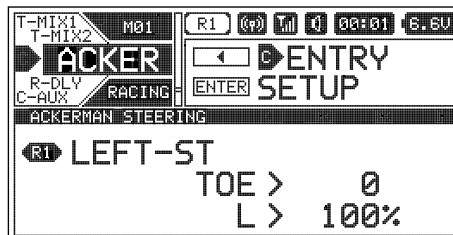
RACING

R-DLY MENU {RACING MODE DELAY}   RACING

The Racing Mode Delay function allows you to program a Delay for each of the four channels to help prevent drastic changes in channel function settings when switching between Racing Modes. For example, you might have one Dual Rate setting for Racing Mode 1 and a different Dual Rate setting for Racing Mode 2. The Racing Mode Delay function allows you to program a Delay in the Steering channel so that the transition to the different Dual Rates when you switch back and forth between Racing Modes is smooth and less noticeable.

⚠ Racing Mode Delay Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

Changing the Racing Mode Delay Percentage Values:

1) From within the RACING menu, scroll UP or DOWN to highlight the R-DLY menu.
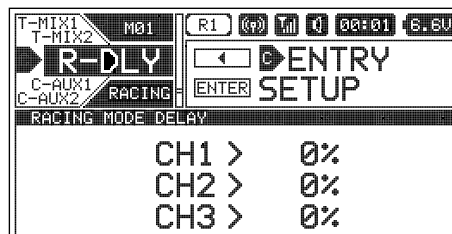
2) Press the ENTER key to open the R-DLY menu. CH1 > 0% will be highlighted.
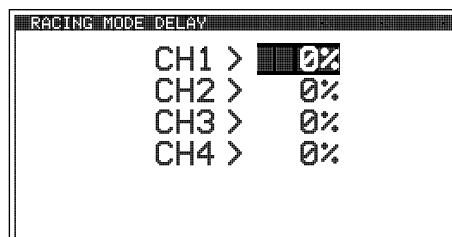
3) Scroll UP or DOWN to highlight the desired channel you want to change the Racing Mode Delay percentage value for.

4) Press the ENTER key, then scroll UP or DOWN to choose the desired Racing Mode Delay Percentage value. Increasing the Racing Mode Delay Percentage value will Increase the Delay when switching between Racing Modes.
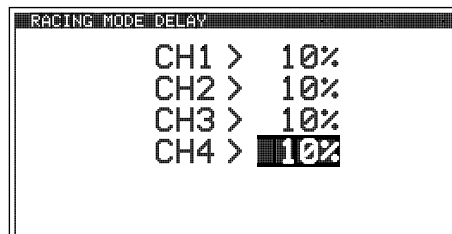
5) Press the ENTER key, then repeat steps 3 and 4 to change any other desired Racing Mode Delay percentage values.

CH1, CH2, CH3 and CH4 setting range is 0% to 100%. The default setting for all channels is 0%.

⚠ The Racing Mode Delay function changes the speed of the servos as they move to their new positions when you switch between Racing Modes. The Higher the Racing Mode Delay percentage value, the Slower the servos will transition to their new positions when you switch Racing Modes, but the smoother the transition will be. You will need to experiment with different percentage values to find a happy medium of smooth, yet quick transition. When the Racing Mode Delay Percentage value is set to 0%, there will be no Delay and the transition between Racing Modes will be immediate.

CODEAX1 AND CODEAX2 MENU {CODE AUXILIARY 1 AND CODE AUXILIARY 2}   RACING

The Code Auxiliary function is used with SSL-compatible accessories, such as a Super Vortex series ESC, whose Programming Parameters can be changed directly via the transmitter. For example, you can change the ESC's Driving Modes directly using the Auxiliary Dial to suit different conditions while you're driving. In addition, you are able to name the different CODE functions to differentiate them. For example, if you're using the Sanwa Super Vortex ZERO ESC, CODEAX1 CODE03 changes the Drive Feel, so you could rename CODE03 DRFEEL, or similar.

IMPORTANT: The Code Auxiliary function can only be programmed if the Car Type you've selected has one or more free Auxiliary channels (e.g. AUX1 and/or AUX2). If the Car Type uses all four available channels, such as Car Type X, the Code Auxiliary function will not be available, since this Car Type doesn't feature a free Auxiliary channel.

⚠ Depending on the Auxiliary 1 or Auxiliary 2 Operating Mode chosen, you can program either 5 CODE functions per Auxiliary channel or up to 10 CODE functions per Auxiliary channel. For more information, see the AUX TYPE Menu section on page 50.

⚠ Code Auxiliary Programming Values can be changed while you're driving by Assigning these functions to a Trim Switch, the Auxiliary Dial or the Auxiliary Lever. For more information, see the ASSIGN Menu section on pages 37 through 46.

CODEAX1 AND CODEAX2 MENU {CODE AUXILIARY 1 AND CODE AUXILIARY 2}   RACING

⚠ This section covers both the Code Auxiliary 1 and Code Auxiliary 2 menus, since programming each of them is exactly the same. Choose either the CODEAX1 or the CODEAX2 menu depending on which of the two Code Auxiliary functions you want to program.

Changing the Code Function Names:

1) From within the RACING menu, scroll UP or DOWN to highlight either the CODEAX1 or the CODEAX2 menu depending on which Code Auxiliary functions you want to program. In this section, we show naming and programming Code Auxiliary 1.
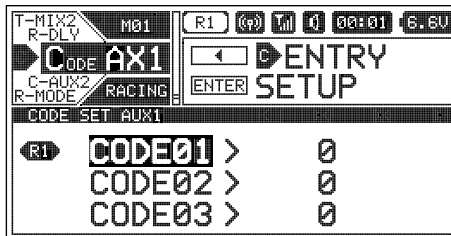
2) Press the ENTER key to open the CODEAX1 menu. CODE01 > 0 will be highlighted.

3) Scroll UP or DOWN to highlight the Code function you want to rename.
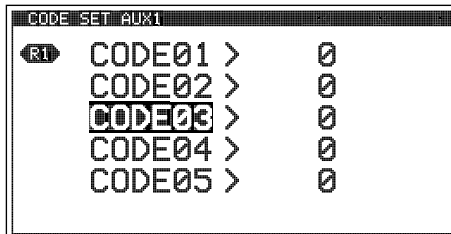
4) Using the same methods that you used to change the Model Name, change the Code Name as desired. For example, DRFEEL. For more information, see the Model Name section on pages 29 and 30.
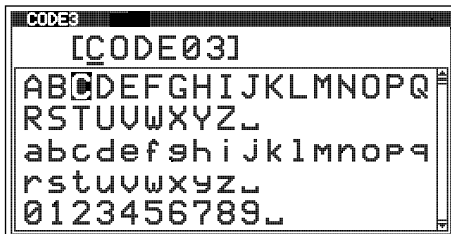
Changing the Code Auxiliary Values:

1) From within the CODEAX1 menu, scroll UP or DOWN to highlight the desired Code Auxiliary value you would like to change.

2) Press the ENTER key, then scroll UP or DOWN to choose the desired Code Auxiliary value. Refer the User's Guide of the SSL-compatible product you're controlling to know what Code Auxiliary values to use.
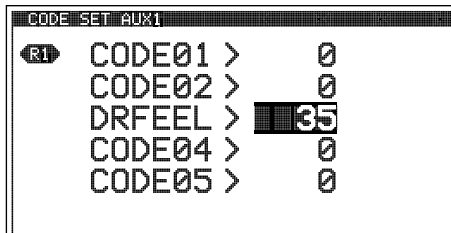
3) Press the ENTER key, then repeat steps 1 and 2 to change any other desired Code Auxiliary values.

CODE01 through CODE10 setting range is -100 to 100. The default setting for all Code Auxiliary functions is 0.

⚠ Depending on the Auxiliary 1 or Auxiliary 2 Operating Mode chosen, you can program either 5 CODE functions per Auxiliary channel or up to 10 CODE functions per Auxiliary channel. For more information, see the AUX TYPE Menu section on page 50.

CUSTOM MENU OVERVIEW   CUSTOM

To access the CUSTOM menu, turn the transmitter ON, press the SELECT switch to highlight the CUSTOM menu, press the ENTER key to open the CUSTOM menu.

The CUSTOM menu features the CH-SET menu and any other favorite Programming Menus you add to it. Scroll UP or DOWN to highlight the desired Programming Menu, then press the ENTER key to open that menu.
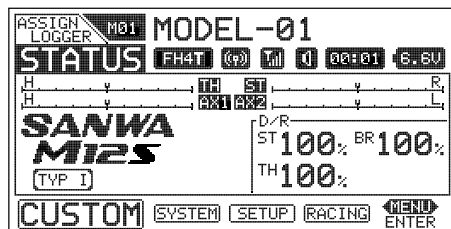
⚠ BASIC Mode must be turned OFF to access the SETUP menu. For more information, see the Turning BASIC Mode ON and OFF section on page 25. In addition, depending on the Car Type chosen, some Function Programming Value Names may differ from those shown in this section.

CUSTOM

CUSTOM MENU OVERVIEW   CUSTOM

The following Programming Menus are available within the CUSTOM menu:

MENU	MENU DESCRIPTION	PAGE #
CH-SET	Adjust Programming Values for Common Functions in One Convenient Location	PG. 110

CH-SET MENU {CHANNEL SET MENU}   CUSTOM

The CH-SET menu allows you to make a number of common function Programming Value changes to all four channels without the need to enter each of those function's Programming Menus separately. For example, you can make all of your desired Programming Value choices for functions such as End Point Adjustment, Exponential, Curves, Servo Speed, Fail Safe settings and more for each channel, all from within the same menu.

If Racing Mode is turned ON and if you've chosen to program one or more Racing Mode functions separately, a Racing Mode Icon will be displayed next to the function Programming Value to indicate which Racing Mode you're currently programming the function for. For more information, see the R-MODE Menu section on pages 87 and 88.

⚠ This section details how to use the CH-SET menu. For information about programming each of the Programming Menus within the CH-SET menu, refer to the specific Programming Menu sections detailed previously.

Choosing the Channel:

1) From within the CUSTOM menu, scroll UP or DOWN to highlight the CH-SET menu.

2) Press the ENTER key open the CH-SET menu. The < ST > channel will be selected.

3) Press the SELECT switch RIGHT or LEFT to choose the desired channel you would like to change function Programming Values for.
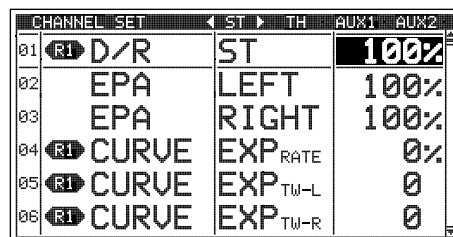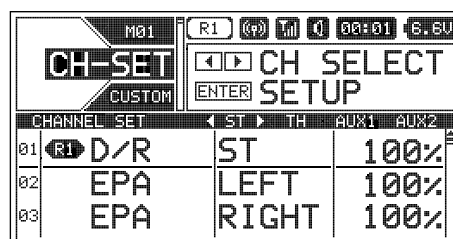
⚠ Channels and function Programming Values will vary depending on the current Car Type selected. In addition, you're unable to select a channel if it doesn't support the currently highlighted function. For example, AUX1 and AUX2 don't support Dual Rate, so you can't select AUX1 or AUX2 when D/R is highlighted.

Changing Function Programming Values:

1) After selecting the desired channel, scroll UP or DOWN to highlight the function Programming Value you would like to change.

2) Press the ENTER key, then scroll UP or DOWN to choose the selected function Programming Value.

3) Press the ENTER key, then repeat steps 1 and 2 to change any other desired function Programming Values.
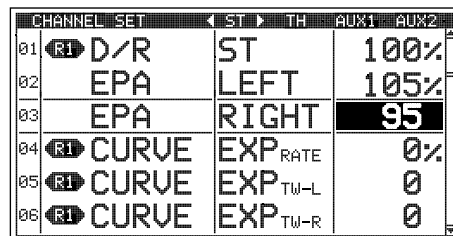
⚠ Certain function Programming Values may not be displayed in the CH-SET menu because they haven't been selected in the specific function's Programming Menu. For example, the CURVE EXP function Programming Value may be displayed in the CH-SET menu, but if you want to change the CURVE ARC function through the CH-SET menu, you will need to first choose the ARC function in the CURVE menu first. The CURVE ARC function Programming Value will then be able to changed through the CH-SET menu.

⚠ Function Programming Values changed from within the CH-SET menu are duplicated in the specific function's Programming Menu and vice-versa.

Adding Programming Menus to the CUSTOM Menu:

Many Programming Menus can be Added to the CUSTOM menu quickly and easily. This allows you to store and then access your most-used Programming Menus all in one place within the CUSTOM menu.

⚠ Not all Programming Menus can be added to the CUSTOM menu. If a Programming Menu can be added to the CUSTOM menu, 'C' ENTRY will be displayed in the Message Display Window when you highlight the Programming Menu.

CH-SET MENU {CHANNEL SET MENU}   CUSTOM

Adding Programming Menus to the CUSTOM Menu, Continued:

1) Highlight the Programming Menu you would like to add to the CUSTOM menu. 'C' ENTRY will be displayed in the Message Display Window.

2) Press the SELECT switch in the direction of the arrow (LEFT). A 'C' will be displayed in the Pointer next to the Menu Name, indicating the Programming Menu is now added to the CUSTOM menu and CANCEL will now be displayed in the Message Display Window.
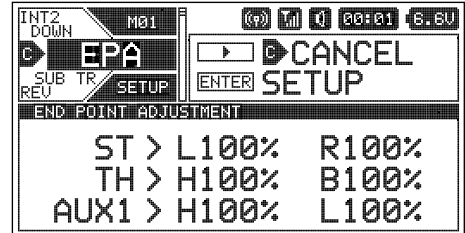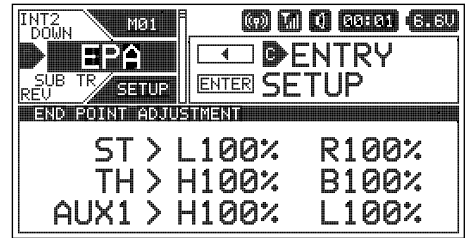
Removing Programming Menus From the CUSTOM Menu:

1) Highlight the Programming Menu you would like to remove from the CUSTOM menu. 'C' CANCEL will be displayed in the Message Display Window and a 'C' will be displayed in the Pointer next to the Menu Name, indicating the Programming Menu is part of the CUSTOM menu.

2) Press the SELECT switch in the direction of the arrow (RIGHT). The 'C' will be removed from the Pointer next to the Menu Name, indicating the Programming Menu has now been removed from the CUSTOM menu and ENTRY will be displayed in the Message Display Window.
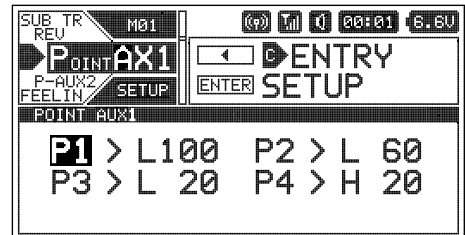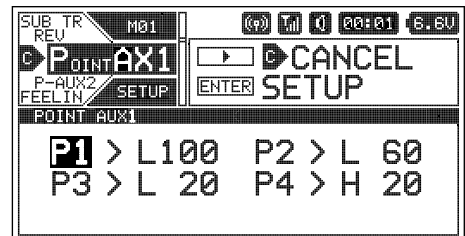
TROUBLESHOOTING GUIDE   REFERENCE

This troubleshooting guide below and on the next few pages can help you diagnose and solve some of the more common problems that you may encounter with your M12S Super radio control system. If you cannot solve the problem using this troubleshooting guide, please contact us directly using the information in the Service and Support section on page 3.

PROBLEM	CAUSE	SOLUTION
Transmitter does not turn ON	Transmitter batteries installed incorrectly	Reinstall batteries, observing correct polarity
	Battery tray not plugged in	Plug in battery tray
	Transmitter batteries are dead	Replace or recharge transmitter batteries
	Damage caused by using incorrect charger or reverse polarity	Contact Customer Service
Transmitter will not bind to receiver	Modulation Type incorrect	Change Modulation Type to match receiver
	Too much time elapsed after pressing receiver Bind Button	Quickly press ENTER key in BIND menu after releasing receiver Bind Button
	Attempting to Bind incompatible receiver	Use only Airtronics or Sanwa 2.4GHz FH3, FH4 or FH4T surface receivers
	Using Electronic Speed control (ESC)	Disconnect ESC and use dry cell battery for Binding procedure, then reconnect ESC after Binding
	Receiver batteries are dead	Replace or recharge receiver batteries
	Using incorrect Binding procedure	Follow Binding procedure carefully

PROBLEM	CAUSE	SOLUTION
Receiver won't power ON	Receiver batteries are dead	Replace or recharge receiver batteries
	Receiver batteries not installed correctly	Reinstall receiver batteries, observing correct polarity
	Incorrect polarity or loose connection	Double-check polarity and all connections
Audible alarm beeps continuously	Low transmitter battery voltage	Replace or recharge transmitter batteries
	Transmitter left ON 10 minutes or more without control input	Move Steering Wheel or Throttle Trigger, or press any key to clear alarm and continue operation
	Transmitter battery voltage too high	Use transmitter battery whose voltage is 9.6 volts or less when fully charged
One or more LEDs flashing	Indicates transmitter status	For more information, see the LED Condition Indicators table on page 10.
No key-press, Trim, alarm or alert sounds	Audible tones are Muted	Increase Tone volume in BUZZER menu
Servo movement is slow	Low receiver battery voltage	Replace or recharge receiver batteries
	Control linkages binding	Adjust control linkages to operate smoothly
	Using a negative Servo Speed value	Increase Servo Speed value
Servo does not move when using Trim Switch	Trim is outside of operational range	Center Trim Switches to '0', center the servo horn and control linkages
Inadequate transmitting range	Low transmitter battery voltage	Replace or recharge transmitter battery
	Low receiver battery voltage	Replace or recharge receiver batteries
	Receiver antenna not mounted correctly	Mount receiver antenna as recommended
Servo(s) move the wrong direction	Incorrect Servo Reversing setting	Change Servo Reversing setting
Servo Horn(s) not centered	Servo horn not installed correctly	Turn servo horn 180º and reinstall
	Servo Sub-Trim out of adjustment	Adjust Servo Sub-Trim to center servo horn
Control linkage(s) bind	To much servo travel	Decrease servo travel using EPA function
Servo moves too much or not enough when Trim Switch is pressed	Trim Step resolution requires adjustment	Adjust Trim Step resolution
Throttle servo moves to programmed position without input	Receiver battery voltage has reached programmed Receiver Battery Voltage Fail Safe voltage value	Replace or recharge the receiver batteries
Can't program Receiver Battery Voltage Fail Safe	Throttle channel Fail Safe value set to FREE or HOLD	Set Throttle channel Fail Safe to a percentage value
LCD is difficult to read	Transmitter left in direct sunlight too long	Place transmitter in shade
	Contrast setting too high or too low	Readjust contrast setting
Throttle servo pulsates	ABS function is turned ON	This is normal under Braking with ABS function ON
Model veers right or left without control input	Steering out of trim	Use Steering Trim Switch to adjust Steering Trim so model drives straight
Model accelerates without control input	Throttle out of trim	Use Throttle Trim Switch to adjust Throttle Neutral Point
	Throttle Offset function turned ON	Turn Throttle Offset function OFF
	Throttle Hold function turned ON	Turn Throttle Hold function OFF
Model does not react to Throttle	Throttle Hold function turned ON	Turn Throttle Hold function OFF
No Telemetry connection	Telemetry system turned OFF	Turn Telemetry system ON
	Using non-Telemetry capable receiver	Use FH4T Telemetry-capable receiver or Super Vortex series ESC
	Out of Telemetry receiving range	Shorten distance between transmitter and receiver
Can't change Racing Modes	Racing Mode Inhibited (turned OFF)	Activate (turn ON) Racing Mode
Can't program RACING menu functions separately for each Racing Mode	SEPARATE value for functions in R-MODE menu set to OFF	Change SEPARATE value in R-MODE menu ON for desired functions
	Not choosing desired Racing Mode first	Choose desired Racing Mode to program function for, then program function
Model seems extremely sensitive to control input	Dual Rate value(s) set too high	Decrease Dual Rate value(s)
	Feeling value set too high	Decrease Feeling value
There is no LCD Backlight	LCD Backlight is turned OFF	Set LCD MODE to Key-On or Always
LCD Backlight keeps turning OFF	LCD MODE is set to Key-On	This is normal to save battery power. Increase TIME value or set LCD MODE to Always

PROBLEM	CAUSE	SOLUTION
Transmitter does not control model	Safety Link Number doesn't match selected model	Choose correct model that matches receiver or Bind model again with correct Safety Link Number
	No RF Signal from transmitter	Transmitter is in DISPLAY Mode and not actually turned ON
	Transmitter in RECEIVER Mode	Turn DISPLAY Mode OFF, then turn transmitter ON
Servo(s) and/or ESC don't operate at all or operate erratically	Using incorrect Channel Response Mode setting	Use correct Channel Response Mode setting based on the type of servos and/or ESC you're using
Direction of travel shown on Servo Monitor is different from control input travel	This is normal	Direction of travel displayed will vary depending on Servo Reversing settings
Can't control underscore when changing Model Name,User Name etc	Cursor is Active in Character Select screen	Press BACK key to re-gain control of underscore
Telemetry Data doesn't record when Lap Timer is Started	Telemetry Data Recording function turned OFF	Turn Telemetry Data Recording function ON
	Telemetry system turned OFF	Turn Telemetry system ON
Can't clear Lap Timer	This is normal	Lap Timer will clear when you Start the Lap Timer again
Steering Wheel and/or Throttle Trigger won't center	Spring tension set too loose	Tighten spring tension
Steering Wheel, Throttle Trigger and/or Auxiliary Lever controls not centered or otherwise not working as expected	Controls require Calibration	Calibrate control End Points and Neutral positions using Calibration function
Unable to program the Code Aux function	Selected Car Type doesn't support a free AUX channel (e.g. Car Type X)	Select a Car Type that features one or more free AUX channels
Cannot Name or rename Model Templates	This is normal	Model Templates are saved using the current Model Name
Telemetry Assign function does not work	Telemetry system turned OFF	Turn Telemetry system ON
	External device not paired	Pair external device to system
	External device not compatible	Use compatible Airtronics or Sanwa external device
	Not using compatible receiver	Use Airtronics or Sanwa 2.4GHz FH4T receiver
Transmitter vibrates under certain conditions	Vibration Alerts turned ON	Turn Vibration function OFF for the desired Alerts
Can't turn C-Mixes and/or T-Mixes ON or OFF during use	C-Mixes and/or T-Mixes not Assigned to different Racing Modes	Assign one C-Mix or T-Mix with desired Rate values to one Racing Mode and another C-Mix or T-Mix with 0% Rate values to a different Racing Mode. Switch between the two Racing Modes to the turn the Mixes ON (one with Rate values) and OFF (one without).
Some functions, such as OFFSET and TH-HOLD not functioning	Function not Assigned to a Push-Button Switch	These types of functions must be Assigned to a Push-Button Switch to be turned ON and OFF.

RACING MODE FUNCTIONS BY CAR TYPE

The tables below and on the next page shows the available Racing Mode functions by Car Type and channel.

FUNCTION	TYPE	TYP I	TYP II	TYP III	TYP IV	TYP V	TYP VI	TYP VII	TYP VIII	TYP IX	TYP X
D/R	CH1	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST
	CH2	TH/BR	TH	TH/BR	TH	TH/BR	TH	TH/BR	TH/BR	TH/BR	TH/BR
	CH3	----	BR	BR2	BR	ST	ST	ST	ST	----	ST
	CH4	----	----	----	BR2	----	BR	BR2	----	----	----
TRIM	CH1	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST
	CH2	TH	TH	TH	TH	TH	TH	TH	TH	F/TH	F/TH
	CH3	AUX1	BR	BR2	BR	ST	ST	ST	ST	R/TH	ST
	CH4	AUX2	AUX	AUX	BR2	AUX	BR	BR2	AUX	AUX	R/TH
CURVE	CH1	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST
	CH2	TH/BR	TH	TH/BR	TH	TH/BR	TH	TH/BR	TH/BR	TH/BR	TH/BR
	CH3	AUX1	BR	BR2	BR	ST	ST	ST	ST	TH/BR	ST
	CH4	AUX2	AUX	AUX	BR2	AUX	BR	BR2	AUX	AUX	TH/BR
SPEED	CH1	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST
	CH2	TH/BR	TH	TH/BR	TH	TH/BR	TH	TH/BR	TH/BR	TH/BR	TH/BR
	CH3	AUX1	BR	BR2	BR	ST	ST	ST	ST	TH/BR	ST
	CH4	AUX1	AUX	AUX	BR2	AUX	BR	BR2	AUX	AUX	TH/BR

RACING MODE FUNCTIONS BY CAR TYPE `REFERENCE`

FUNCTION	TYPE	TYP I	TYP II	TYP III	TYP IV	TYP V	TYP VI	TYP VII	TYP VIII	TYP IX	TYP X
ALB	CH1	----	----	----	----	----	----	----	----	----	----
	CH2	BR	----	BR	----	BR	----	BR	BR	BR	BR
	CH3	----	BR	BR	BR	----	----	----	----	BR	----
	CH4	----	----	----	BR	----	BR	BR	----	----	BR
OFFSET	CH1	----	----	----	----	----	----	----	----	----	----
	CH2	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH
	CH3	----	----	----	----	----	----	----	----	----	----
	CH4	----	----	----	----	----	----	----	----	----	----
OFFSET (BR-LOCK)	CH1	----	----	----	----	----	----	----	----	----	----
	CH2	----	----	----	----	----	----	----	----	----	----
	CH3	----	BR	BR	BR	----	----	----	----	----	----
	CH4	----	----	----	BR2	----	BR	BR2	----	----	----
BR-MIX	CH1	----	----	----	----	----	----	----	----	----	----
	CH2	----	----	BR	----	----	----	BR	----	----	----
	CH3	----	----	BR2	BR	----	----	----	----	----	----
	CH4	----	----	----	BR2	----	----	BR2	----	----	----
TH-HOLD	CH1	----	----	----	----	----	----	----	----	----	----
	CH2	HOLD	HOLD	HOLD	HOLD	HOLD	HOLD	HOLD	----	----	----
	CH3	----	HOLD(B)	HOLD(B)	HOLD(B)	----	----	----	----	----	----
	CH4	----	----	----	HOLD(B)	----	HOLD(B)	HOLD(B)	----	----	----
ACKERMAN	CH1	----	----	----	----	LEFT ST	LEFT ST	LEFT ST	----	----	----
	CH2	----	----	----	----	---	----	----	----	----	----
	CH3	----	----	----	----	RIGHT ST	RIGHT ST	RIGHT ST	----	----	----
	CH4	----	----	----	----	----	----	----	----	----	----
C-MIX MASTER	CH1	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST
		#ST	#ST	#ST	#ST	#L-ST	#L-ST	#L-ST	#F/ST	#ST	#F/ST
	CH2	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH
		#TH	#TH	#TH	#TH	#TH	#TH	#TH	#TH	#F/TH	#F/TH
	CH3	AUX1	BR	BR2	BR	----	----	----	----	----	----
		#AUX1	#BR	#BR2	#BR	#R-ST	#R-ST	#R-ST	#R/ST	#R/TH	#R/ST
	CH4	AUX2	AUX	AUX	BR2	AUX	BR	BR2	AUX	AUX	----
		#AUX2	#AUX	#AUX	#BR2	#AUX	#BR	#BR2	#AUX	#AUX	#R/TH
C-MIX SLAVE	CH1	ST	ST	ST	ST	L-ST	L-ST	L-ST	F/ST	ST	F/ST
	CH2	TH	TH	TH	TH	TH	TH	TH	TH	F/TH	F/TH
	CH3	AUX1	BR	BR2	BR	R-ST	R-ST	R-ST	R/ST	R/TH	R/ST
	CH4	AUX2	AUX	AUX	BR2	AUX	BR	BR2	AUX	AUX	R/TH
T-MIX SLAVE	CH1	ST	ST	ST	ST	L-ST	L-ST	L-ST	F/ST	ST	F/ST
	CH2	TH	TH	TH	TH	TH	TH	TH	TH	F/TH	F/TH
	CH3	AUX1	BR	BR2	BR	R-ST	R-ST	R-ST	R/ST	R/TH	R/ST
	CH4	AUX2	AUX	AUX	BR2	AUX	BR	BR2	AUX	AUX	R/TH
CODE AUX	CH3	AUX1	----	----	----	----	----	----	----	----	----
	CH4	AUX2	AUX	AUX	----	AUX	----	----	AUX	AUX	----

TRIM SWITCH, AUXILIARY DIAL AND AUXILIARY LEVER FUNCTIONS `REFERENCE`

The tables below and on the next page shows the functions that can be Assigned to one of the five Trim Switches, the Auxiliary Dial or the Auxiliary Lever. Functions with an (*) Asterisk cannot be Assigned to the Auxiliary Lever. **Not all functions listed below can be Assigned to all Car Types. Functions will vary by Car Type.**

FUNCTION	DESCRIPTION
D/R ST	Dual Rate Steering
D/R TH	Dual Rate Throttle
D/R BR	Dual Rate Brake
D/R BR2	Dual Rate Brake 2
TRIM ST	Trim Steering

FUNCTION	DESCRIPTION
TRIM TH	Trim Throttle
TRIM BR	Trim Brake
TRIM BR2	Trim Brake 2
TRIM F/TH	Trim Front Throttle
TRIM R/TH	Trim Rear Throttle

TRIM SWITCH, AUXILIARY DIAL AND AUXILIARY LEVER FUNCTIONS | **REFERENCE**

FUNCTION	DESCRIPTION	FUNCTION	DESCRIPTION
TRIM AUX	Trim Auxiliary	ALB LAG	Antil-Lock Braking Lag
TRIM AUX1	Trim Auxiliary 1	OFFST POS	Throttle Offset Position
TRIM AUX2	Trim Auxiliary 2	OFFST LOCK	Throttle Offset Brake Lock
EXP ST	Exponential Steering	B-MX BR-DLY	Brake Mixing Brake Delay
EXPT ST-TW-L	Exponential Steering - Tweak - Left	B-MX BR2-DLY	Brake Mixing Brake 2 Delay
EXP ST-TW-R	Exponential Steering - Tweak - Right	TH-HLD	Throttle Hold
EXP TH	Exponential Throttle	C-M1 RATE1	Compensation Mixing 1 Rate 1
EXP BR	Exponential Brake	C-M1 RATE2	Compensation Mixing 1 Rate 2
EXP BR2	Exponential Brake 2	C-M1 OFFST	Compensation Mixing 1 Offset
EXP AUX	Exponential Auxiliary	C-M2 RATE1	Compensation Mixing 2 Rate 1
EXP AUX1	Exponential Auxiliary 1	C-M2 RATE2	Compensation Mixing 2 Rate 2
EXP AUX2	Exponential Auxiliary 2	C-M2 OFFST	Compensation Mixing 2 Offset
ARC ST-PNT	ARC Steering - Point	ACKER LS-L	Ackerman Left Steering - Left
ARC ST-RATE	ARC Steering Rate	ACKER LS-R	Ackerman Left Steering - Right
ARC TH-PNT	ARC Throttle - Point	ACKER RS-L	Ackerman Right Steering - Left
ARC TH-RATE	ARC Throttle - Rate	ACKER RS-R	Ackerman Right Steering - Right
ARC BR-PNT	ARC Brake - Point	R-DLY CH1	Racing Mode Delay Channel 1
ARC BR-RATE	ARC Brake - Rate	R-DLY CH2	Racing Mode Delay Channel 2
ARC BR2-PNT	ARC Brake 2 - Point	R-DLY CH3	Racing Mode Delay Channel 3
ARC BR2-RATE	ARC Brake 2 - Rate	R-DLY CH4	Racing Mode Delay Channel 4
ARC AUX-PNT	ARC Auxiliary - Point	AUX	Auxiliary
ARC AUX-RATE	ARC Auxiliary - Rate	AUX1	Auxiliary 1
ARC AX1-PNT	ARC Auxiliary 1 - Point	AUX2	Auxiliary 2
ARC AX1-RATE	ARC Auxiliary 1 - Rate	AXCODE01	Auxiliary Code 01
ARC AX2-PNT	ARC Auxiliary 2 - Point	AXCODE02	Auxiliary Code 02
ARC AX2-RATE	ARC Auxiliary 2 - Rate	AXCODE03	Auxiliary Code 03
CRV ST-P1~P9	Curve Steering - Point 1 ~ Point 9	AXCODE04	Auxiliary Code 04
CRV TH-P1~P9	Curve Throttle - Point 1 ~ Point 9	AXCODE05	Auxiliary Code 05
CRV BR-P1~P9	Curve Brake - Point 1 ~ Point 9	AXCODE06	Auxiliary Code 06
CRV BR2-P1~P9	Curve Brake 2 - Point 1 ~ Point 9	AXCODE07	Auxiliary Code 07
CRV AUX-P1~P9	Curve Auxiliary - Point 1 ~ Point 9	AXCODE08	Auxiliary Code 08
CRV AX1-P1~P9	Curve Auxiliary 1 - Point 1 ~ Point 9	AXCODE09	Auxiliary Code 09
CRV AX2-P1~P9	Curve Auxiliary 2 - Point 1 ~ Point 9	AXCODE010	Auxiliary Code 10
SPD ST-FWD	Speed Steering - Forward	AX1CODE01	Auxiliary 1 Code 01
SPD ST-RET	Speed Steering - Return to Neutral	AX1CODE02	Auxiliary 1 Code 02
SPD ST-PNT	Speed Steering - Point	AX1CODE03	Auxiliary 1 Code 03
SPD TH-FWD	Speed Throttle - Forward	AX1CODE04	Auxiliary 1 Code 04
SPD TH-RET	Speed Throttle - Return to Neutral	AX1CODE05	Auxiliary 1 Code 05
SPD TH-PNT	Speed Throttle - Point	AX1CODE06	Auxiliary 1 Code 06
SPD BR-FWD	Speed Brake - Forward	AX1CODE07	Auxiliary 1 Code 07
SPD BR-RET	Speed Brake - Return to Neutral	AX1CODE08	Auxiliary 1 Code 08
SPD BR-PNT	Speed Brake - Point	AX1CODE09	Auxiliary 1 Code 09
SPD BR2-FWD	Speed Brake 2 - Forward	AX1CODE10	Auxiliary 1 Code 10
SPD BR2-RET	Speed Brake 2 - Return to Neutral	AX2CODE01	Auxiliary 2 Code 01
SPD BR2-PNT	Speed Brake 2 - Point	AX2CODE02	Auxiliary 2 Code 02
SPD AUX-FWD	Speed Auxiliary - Forward	AX2CODE03	Auxiliary 2 Code 03
SPD AUX-RET	Speed Auxiliary - Return to Neutral	AX2CODE04	Auxiliary 2 Code 04
SPD AUX-PNT	Speed Auxiliary - Point	AX2CODE05	Auxiliary 2 Code 05
SPD AX1-FWD	Speed Auxiliary 1 - Forward	AX2CODE06	Auxiliary 2 Code 06
SPD AX1-RET	Speed Auxiliary 1 - Return to Neutral	AX2CODE07	Auxiliary 2 Code 07
SPD AX1-PNT	Speed Auxiliary 1 - Point	AX2CODE08	Auxiliary 2 Code 08
SPD AX2-FWD	Speed Auxiliary 2 - Forward	AX2CODE09	Auxiliary 2 Code 09
SPD AX2-RET	Speed Auxiliary 2 - Return to Neutral	AX2CODE10	Auxiliary 2 Code 10
SPD AX2-PNT	Speed Auxiliary 2 - Point	R-MODE	Racing Mode*
ALB STROKE	Anti-Lock Braking Stroke	4WS MIX	Four Wheel Steering Mixing*
ALB POINT	Anti-Lock Braking Point	MOA MIX	Motor on Axle Mixing (Dig and Burn)*
ALB RELEASE	Anti-Lock Braking Release	◄►	Select Right / Select Left*
ALB HOLD	Anti-Lock Braking Hold	INC/DEC	Increase / Decrease*

GLOSSARY OF TERMS
REFERENCE

Ackerman Angle: An engineered value that allows the inner tire to turn at a sharper angle than the outer tire to prevent the tires from slipping during turns.

Activate: To turn ON a particular function.

Adjustable Rate Control: Allows you to vary the amount of servo travel in relation to the movement of the Steering Wheel, the Throttle Trigger, the Auxiliary Dial or the Auxiliary Lever near the Neutral positions to change the way those functions react to control movement. The ARC function works like the Exponential function, except that the ARC function features the added benefit of being able to move the Neutral Point, whereas the Exponential function Neutral Point is fixed. In addition, the ARC Curve is more Linear than the Exponential Curve.

Antenna: Transmits the signal from the transmitter to the receiver in the model.

Antenna Reception Wire: The portion of the receiver antenna that receives the transmitter signal. The Antenna Reception Wire should never be bent or it could be damaged and limit the range of your model.

Anti-Lock Braking: Makes it possible to achieve stable Braking even on slippery surfaces. With stable Braking, your model is better able to trace an exact line under Braking.

Assign Screen: The ASSIGN screen displays the functions that are currently Assigned to the Push-Button Switches, the Trim Switches, the Auxiliary Dial and the Auxiliary Lever, all in one convenient location.

Audio Indicator: Indicates on the LCD screen whether Audible Key Tones and Transmitter Alarms are Muted or not.

Audible Key Tone: An audible Tone that is emitted from the transmitter each time the Push-Button Rotary Dial, the Trim Switches, the Push-Button Switches, the Auxiliary Dial or the Auxiliary Lever is used.

Auxiliary Dial: The Auxiliary Dial can rotate 360º and is programmable to perform a different function depending on what function is Assigned to it. In the default configuration, it controls Auxiliary 1 High and Low servo travel.

Auxiliary Lever: The Auxiliary Lever is programmable and will perform a different function depending on what function is Assigned to it. In the default configuration, it controls Auxiliary 2 High and Low servo travel.

Back Key: Returns to the previous menu. Repeatedly press to return to the STATUS screen.

Basic Mode: BASIC Mode simplifies transmitter use. The accompanying BASIC menu contains some of the more common, general-use Programming Menus that a user will require for basic programming. When BASIC Mode is turned ON, not only are these various Programming Menus in one easy place to find them, so you don't need to spend time finding them in one of the other four menus, but it also removes the TELEMETRY and ASSIGN screens to simplify transmitter use.

Battery Compartment: Houses the 2S Li-Fe battery pack that powers the transmitter.

Binding: The act of pairing the transmitter and receiver to prevent interference from transmitters operated by other users.

Bind Button: Used in the process of Binding the transmitter and receiver.

Bind LED: Displays the current operating status of the receiver.

Boot Screen: Displays the brand logo while the transmitter starts up after being turned ON.

Brake Bias: The ability to vary the rate of Braking between two Brake servos. For example, programming the Front Brake to Engage sooner than the Rear Brake can affect the handling characteristic of your model.

Brake Mixing: Allows you change the Brake Bias between the Front and Rear Brakes when two separate Brake servos are used.

Brake Side: Refers to the Throttle Trigger stroke that Engages the Brakes on your Model (pushing the Throttle Trigger).

Burn: Used mostly in Rock Crawling and in conjunction with the Motor on Axle function, power to the Front motor is reduced or turned OFF while keeping full control of the Rear motor.

Calibration: Allows you to calibrate the operation of the Steering, Throttle and Auxiliary Lever End Points and Neutral positions to ensure long term precise control operation.

Car Type Indicator: Indicates on the STATUS screen the current Car Type selected.

Car Type Templates: Allows you to quickly set up the transmitter's Mixing options based on the type of model you're driving. Common templates for Car or Truck and Crawler Car Types are provided.

Center Trim Type: A Trim technology that allows the servo End Points to remain stationary when you apply Trim. This can result in unbalanced servo travel. In order to balance servo travel, servo End Points need to be manually readjusted.

Channel Response Mode: Used to change the Response Mode of each channel to suit the type of servos you're using.

Channel Set: Allows you to make Programming Value changes to each of the four channels without the need to enter each Programming Menu separately.

Coaxial Cable: The portion of the receiver antenna that extends the Antenna Reception Wire. The Coaxial Cable can be bent into gentle curves, however, do not bend it acutely, or repeatedly bend it or the antenna core can be damaged.

GLOSSARY OF TERMS   REFERENCE

Code Auxiliary: The Code Auxiliary function is used with SSL-compatible accessories, such as a Super Vortex series ESC, whose Programming Parameters can be changed directly via the transmitter.

Compensation Mixing: Used to create your own custom Mixes that allow you to control any number of desired functions in different combinations.

Countdown Timer: This timer is used to notify you of your model's running time. For example, you can set the Countdown Timer to alert you when it's time to refuel.

Crab Steering: Used with Four Wheel Steering, both Front and Rear wheels pivot right and left together. Also referred to as Parallel Steering.

Cursor Indicator: Indicates on the TELEMETRY screen the current position of the Cursor when reviewing Telemetry Data.

Data Point Scale: Indicates on the TELEMETRY screen the time in Seconds between recorded Telemetry Data Points.

Dig: Used mostly in Rock Crawling and in conjunction with the Motor on Axle function, power to the Rear motor is reduced or turned OFF while keeping full control of the Front motor.

Digital Trim Memory: Allows the transmitter to store Trim values in its memory. Any amount of Trim that you set during use using the Trim Switches is automatically stored in memory for that specific channel and for that specific model. The Trim values for each model will automatically be loaded when the transmitter is turned ON.

Direct Model Select: Allows you to choose up to three different models that can be selected when turning the transmitter ON. Simply press a key while turning the transmitter ON and the Programming Data for your favorite model will load automatically.

Direction/Max/Min Indicators: Indicates on the TELEMETRY pages Control Movement Direction or Programmed Maximum and Minimum Telemetry Data values, depending on the current TELEMETRY page being displayed.

Display Key: Turns the transmitter's LCD Screen ON without actually turning the transmitter ON. This allows you to check and/or change programming options without actually turning the transmitter ON.

Dual Rate: Allows you to change the control authority of the Steering, Throttle High Side and Throttle Brake Side by changing the amount of servo travel relative to control input.

Dual Rate Display: Displays the current Dual Rate percentage value of channels that Dual Rate can be programmed for. Channels displayed will vary based on the currently selected Car Type.

Earphone Jack: Used with earphones (not included) to hear audible key tones, alerts and alarms.

Elapsed Time: Displays on the TELEMETRY screen the current position in Time of the Cursor Indicator within the current Telemetry Data Log.

End Point Adjustment: Used to adjust the desired amount of servo travel in both directions independently. This makes it possible to balance servo travel in both directions.

Enter Key: Opens the Selected menu or programming option. Press and HOLD to reset the Selected programming option to its default value.

Exponential: Allows you to vary the amount of servo travel in relation to the movement of the Steering Wheel and Throttle Trigger (or in some cases, the Auxiliary Dial and/or the Auxiliary Lever) near the Neutral positions to change the way those functions react to control movement.

Fail Safe: Automatically moves the servos to a predetermined position in the event that the signal between the transmitter and the receiver is interrupted, whether due to signal degradation or low transmitter battery.

Feeling: Allows you to adjust the Response Time of the Steering and Throttle channels to fine-tune the sensitivity of these controls. Some users may find that the Response Time is in some cases too fast, therefore, it's adjustable to suit the driver's driving style, Car Type and track conditions.

FH3 Modulation: Frequency Hopping 3rd generation FHSS technology. FH3 Modulation is used in newer-generation Airtronics and Sanwa radio control systems, such as the M11X and MX-3X.

FH4/FH4T Modulation: Frequency Hopping 4th generation FHSS technology. FH4 Modulation is the latest Airtronics and Sanwa 2.4GHz frequency modulation. FH4T frequency modulation is the same, but supports Telemetry.

FHSS: Frequency Hopping Spread Spectrum. FHSS is a Modulation Type which transmits data across the entire frequency spectrum by transmitting data on different channels at an extremely fast interval.

Firmware: The transmitter's operating software. You can check the Firmware version in the SYSTEM > INFORMATION menu and even update the Firmware if new Firmware becomes available.

Four Wheel Steering Mixing: Used to control either the Front or Rear steering independently, or Mix the Front and Rear steering so that they can be used together. Front or Rear Independent Steering, Parallel Four Wheel Steering and Tandem Four Wheel Steering options are available.

Goal Time: Used in conjunction with the Lap Timer, the Goal Time is designed to alert you when you reach the maximum desired elapsed time during your race or during practice.

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Grip: The Grip is molded from rubber in an ergonomic shape for increased comfort, control and feel.

High Side: Refers to the Throttle Trigger stroke that opens the Throttle and powers your Model (pulling the Throttle Trigger).

Hold Setting: Determines how quickly the Brake moves from the Stroke setting to the Point setting when the Anti-Lock Braking function is turned ON.

Inactivity Alarm: This alarm will sound if the transmitter is Left on for a period of 10 minutes without any control input from the user. This alarm alerts you to prevent unwanted draining of the transmitter battery.

Inhibit: To deactivate or turn OFF a particular function.

Interval Timer: Used separately or in conjunction with the Lap Timer, notifies you when a set Interval elapses while you are driving.

KM/H: Kilometers per Hour.

Lag: Controls the amount of Delay before the Anti-Lock Braking function Activates after reaching the Point setting.

Lap Indicator: Indicates on the TELEMETRY screen the position along the Telemetry Data Stream that a Lap Time was counted.

Lap Timer: Allows you to measure and record Lap Times for up to 250 Laps. The total number of Laps, the Current Lap Time, the Best Lap Time and the Average Lap Time are all displayed. Lap Times are displayed in the following format: 00':00".00 (Minutes : Seconds : 1/100th of a Second).

Latency: The Response Time between the transmitter and receiver. The M12S Super and RX-472 receiver combination offer an incredibly fast Response Time, making you feel more connected to your model than ever.

LCD Screen: The heart of the programming and display features of the transmitter. All programming and transmitter display functions are shown on the LCD Screen. The LCD screen features an adjustable backlight, adjustable contrast and smooth scrolling.

LED1: Displays the current RF signal output status of the transmitter. When illuminated, an RF signal is being transmitted. When extinguished, no RF signal is being transmitted. In addition, LED1 is used to indicate various transmitter conditions.

LED2: Displays the current status of the Telemetry connection. When illuminated, no Telemetry connection is present. When extinguished, the Telemetry connection is Active. In addition, LED2 is used to indicate various transmitter conditions.

Low Voltage Alert Alarm: The Low Voltage Alert alarm will sound when the transmitter batteries reach the Low Voltage Alert alarm voltage value programmed in the SYSTEM - BATTERY menu. The alarm will sound each time the transmitter battery voltage decreases by 0.1 volt. To clear this alarm, press the BACK key or the ENTER key.

Low Voltage Limit Alarm: The Low Voltage Limit alarm will sound when the transmitter batteries reach the Low Voltage Limit alarm voltage value programmed in the SYSTEM > BATT menu. This alarm can only be cleared by turning the transmitter OFF and recharging or replacing the transmitter batteries.

Mode Display: Displays on the STATUS screen any special Programming Modes that are Active, such as Throttle Offset or Anti-Lock Braking.

Model Clear: Allows you to reset model-specific Programming Data for the currently Selected Model back to the factory default settings.

Model Copy: Allows you to copy the Programming Data FROM the currently Selected Model TO another model.

Model Name: Allows you to name each of the 50 individual Models. This makes it easy to keep track of multiple models. The Model Name can consist of up to 14 letters, numbers or symbols.

Model Select: Allows you to load the Programming Data for the particular model you wish to drive. The transmitter can store Programming Data for up to 50 different models.

Model Sort: Allows you to change how your models are displayed in the Model Select List by allowing you to swap the currently selected model with other models.

Model Template: Allows you to store up to five downloaded Pre-Programmed Model Templates that allow you to more easily set up the transmitter for models that require more time-consuming and complicated programming.

Modulation Type Indicator: Indicates on the LCD screen the current Modulation Type that the transmitter is set to.

Motor on Axle Mixing: Used to control either the Front and Rear motors together or independently, giving you Dig and Burn functions.

MPH: Miles Per Hour.

NOR Channel Response Mode: Used with Analog servos or ESCs that don't support SHR or SSR Channel Response Modes. This mode has the slowest Response Time, but is compatible with all servos and ESCs.

On-Time Indicator: Displays on the STATUS screen the current cumulative On-Time of the transmitter in Hours and Minutes.

Operating Voltage: The safe voltage that the transmitter or receiver can operate within. Exceeding the minimum operating voltage can result in loss of power to the device(s). Exceeding the maximum operating voltage can result in damage to the devices(s).

Output Power: The power (in Milliwatts) that your transmitter transmits a signal.

Over Voltage Alarm: The Over Voltage Alarm will sound if the transmitter battery voltage is greater than 9.6 volts. To clear this alarm, turn the transmitter OFF and replace the transmitter battery with one that when fully charged does not exceed 9.6 volts.

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Page Indicator: Indicates on the TELEMETRY screen the current Page within the Telemetry Data Stream that Telemetry Data is currently being displayed on.

Parallel (Crab) Steering: Used with Four Wheel Steering, both Front and Rear wheels pivot right and left together.

Parallel Trim: A Trim technology that shifts the servo End Points toward the High Side or the Low Side automatically when you apply Trim. This maintains balanced servo travel without the need to manually readjust the servo End Points.

PC LINK Input: When used with a Mini USB cable (available separately), the PC LINK Input allows you to save and load Model Programming Data and Model Templates to and from your PC, in addition to saving Telemetry Data Logs and updating the transmitter's Firmware.

Point Auxiliary: Allows you to program the Auxiliary 1 or Auxiliary 2 channel servo to move up to 6 different Points along its travel, then cycle through those Points using one of the five Trim Switches or the Auxiliary Dial.

Point Curve: Allows you to vary the amount of servo travel in relation to the movement of the Steering Wheel and Throttle Trigger (or in some cases, the Auxiliary Dial and/or the Auxiliary Lever) at different Points along the entire range of control travel to change the way those functions react to control movement.

Point Setting: Locates the Point within the range of servo travel that you want a function to Start or Stop. This setting can vary depending on the actual function the Point setting is controlling.

Power Switch: Turns the transmitter ON and OFF.

Pre-Alarm: Used in conjunction with the Lap Timer, the Pre-Alarm is designed to alert you when you are nearing your Goal Time.

Push-Button Rotary Dial: Also referred to as the UP key, DOWN key and ENTER key, it is used along with the BACK key and the SELECT switch to facilitate transmitter programming. It allows you to quickly and easily navigate the various Programming Menus and switch between the STATUS screen, ASSIGN screen and TELEMETRY screen.

Push-Button Switches: The transmitter features three Push-Button Switches in different locations (Sw1, Sw2 and Sw3). Each Push-Button Switch is programmable and will perform a different function depending on what function is Assigned to it. Sw2 is a Rocker Switch that can be pressed from either the Front or the Back.

Racing Mode: Provides you with five separate Racing Modes that you can switch between while you're driving.

Racing Mode Indicator: Indicates on the LCD screen which Racing Mode (R1 through R5) is Active.

Racing Mode LED: Displays which Racing Mode is currently Active. The color of the LED will vary depending on which of the five Racing Modes is Active. When extinguished, Racing Mode is Inhibited.

Receiver Battery Voltage Fail Safe: Used to set a custom voltage that the Receiver Battery Fail Safe function will Activate at to alert you when your receiver battery needs recharging. This ensures that your servos continued to operate optimally at all times.

Receiver Voltage Display: Displays on the TELEMETRY screen the current Voltage of the receiver battery. The tick mark indicates the current Voltage relative to the programmed Maximum Voltage value.

Release Setting: Determines how quickly the Brake moves from Neutral to the percentage value determined by the Stroke setting when the Anti-Lock Braking function is Active.

RF Indicator: Indicates whether the transmitter is sending an RF (Radio Frequency) signal or not.

RPM: Revolutions Per Minute.

RPM/Speed Gauge: Displays on the TELEMETRY screen the current RPM or speed in MPH or KM/H in graphical format. The needle indicates the current RPM or Speed relative to the programmed Maximum RPM or Speed value.

Safety Link: Allows to program a unique code to each receiver/model pair, preventing the transmitter from controlling a model that it's not currently programmed for. This helps prevent a runaway model should you accidentally choose the wrong Programming Data for the intended model.

Select Switch: Used along with the Push-Button Rotary Dial and the BACK key to facilitate transmitter programming. Use the SELECT switch to scroll through the STATUS screen's main menus, scroll through the TELEMETRY pages and make selections in many of the Programming Menus.

Servo Monitor: Displays the output levels of the four channels in bar graph form, allowing you to monitor servo operation in a virtual manner.

Servo Reversing: Used to electronically switch the direction of servo travel.

Servo Speed: Used to slow down the transit speed of the servos. Servo transit speed can be slowed in both the Forward and the Return to Neutral directions.

SHR Channel Response Mode: When used with Digital servos, this will increase the servo's Response Time, even above the manufacturer's stated specification. Do not use with Analog servos!

SSR Channel Response Mode: When used with Airtronics or Sanwa Super Response SRG Digital servos, this will provide the fastest Response Time. This results in the ultimate feel and response, making you feel more in control of your model than ever. Use only with Airtronics or Sanwa Super Response SRG Digital servos!

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Status Screen: Displays information about the transmitter and is the base from which you access other Programming Menus.

Steering Output Display: Displays on the TELEMETRY screen the current position of the Steering channel as a percentage of Steering Wheel travel.

Steering Response Mode LED: Displays the currently Active Steering Response Mode. The color of the LED will vary depending on which of the three Response Modes is Active.

Steering Spring Tension Adjustment Screw: Used to adjust the spring tension of the Steering Wheel to best suit the feel of the user.

Steering Wheel: Proportionally operates the model's Right and Left Steering control. The Steering Wheel features a foam grip for increased comfort, control and feel. The Steering Wheel's position, angle and spring tension can all be adjusted.

Step Value: A preset amount that the servo will travel when a Trim Switch is pressed once. The Step value can be adjusted so that the servo either moves more or moves less when a Trim Switch is pressed.

Stroke: Determines the amount of Brake that's applied automatically when the Anti-Lock Braking function Activates.

Sub-Trim: Used to correct the Neutral Trim setting for the servos, making it possible to center the Trim Switches while ensuring the servo horns remain centered.

Suppression Capacitor: Primarily used on brushed electric motors, a suppression capacitor helps eliminate electrical noise that could interfere with the operation of your radio control system.

System Indicators: Indicates on the LCD screen transmitter status information.

Tandem Steering: Used with Four Wheel Steering, the Front wheels pivot opposite to the Rear wheels.

Telemetry: A connection between the transmitter and receiver that transfers Sensor Data from the receiver to the transmitter that can be viewed in real-time on the TELEMETRY screen.

Telemetry Alert Alarm: The Telemetry Alert alarm will sound when the Telemetry 1 and/or Telemetry 2 Data value reaches the programmed Telemetry Alert value.

Telemetry Alert Value: The programmed value at which a Telemetry Alert with sound.

Telemetry Assign: Allows the use of a remote external device (available separately) to control many transmitter functions. This allows a driver helper or a pit crew member to remotely control transmitter functions, allowing you to concentrate more on driving.

Telemetry Mixing: Similar to Compensation Mixing, you're able to create custom Mixes using Telemetry Data or Telemetry Alerts.

Telemetry Screen: Displays Telemetry Data, such as RPM or Speed, Temperature, Receiver Voltage and more. Use the SELECT switch to switch between ALL and LAP, ST, TH, RPM, VOLT, TLM1 (TMP1) and TLM2 (TMP2) pages.

Telemetry Signal Indicator: Indicates on the LCD screen the current signal strength of the Telemetry connection between the transmitter and receiver.

Telemetry Switch: Using a remote external device (available separately) to control many transmitter functions.

Temperature 1 Display: In the default configuration, displays the current temperature in Fahrenheit or Celsius of the Temperature Sensor plugged into the TEMP1 Sensor Port in the receiver. The tick mark indicates the current temperature relative to the programmed Maximum and Minimum Temperature values. This label can be changed if using different Telemetry accessories.

Temperature 2 Display: In the default configuration, displays the current temperature in Fahrenheit or Celsius of the Temperature Sensor plugged into the TEMP2 Sensor Port in the receiver. The tick mark indicates the current temperature relative to the programmed Maximum and Minimum Temperature values. This label can be changed if using different Telemetry accessories.

Throttle Bias: Allows you to change the ratio between Throttle High Side servo travel and Throttle Brake Side servo travel.

Throttle Hold: Moves the Throttle servo to a fixed position, either toward the High Side or the Brake Side, and is used primarily with glow- or gas-powered models.

Throttle Offset: Allows you to shift the Neutral position of the throttle servo, either toward the High Side or the Brake Side.

Throttle Output Display: Displays on the TELEMETRY screen the current position of the Throttle channel as a percentage of Throttle Trigger travel.

Throttle Response Mode LED: Displays the currently Active Throttle Response Mode. The color of the LED will vary depending on which of the three Response Modes is Active.

Throttle Trigger: Controls the speed of the model, both forward and backward, or the model's Brake. The Throttle Trigger position, angle and spring tension can all be adjusted.

Throttle Trigger Adjustment Position Indicator: Indicates the current position of the Throttle Trigger. As the Throttle Trigger position is adjusted forward or backward, the Throttle Trigger Adjustment Position Indicator will move forward or backward.

Throttle Spring Tension Adjustment Screw: Used to adjust the spring tension of the Throttle Trigger to best suit the feel of the user.

Trim Display: Displays the current position of channel Trim. Trim Indicators (ST, AUX1, etc.) displayed will vary based on the currently selected Car Type.

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Trim Step Resolution: Adjusts how far the servos travel when the Trim Switches are pressed. You can increase the resolution, so that the servos travel less when you press the Trim Switches. This makes it possible to fine-tune the settings extremely accurately.

Trim Switches: The transmitter features five separate Trim Switches - four positioned around the Steering Wheel (Trm1, Trm2, Trm3 and Trm4 and one positioned below the Auxiliary Lever (Trm5). Each Trim Switch is programmable and will perform a different function depending on what function is Assigned to it.

Tweak: Used in conjunction with the Steering Exponential function, allows you to make small Exponential adjustments to the Right and/or Left sides of the Steering channel Neutral Point to fine-tune the balance between the two sides. Also used to adjust the travel limits of the Auxiliary Lever.

User Name: Allows you to change the Name displayed above the M12S Super logo on the STATUS screen.

Vibrator: Makes the transmitter vibrate like a cell phone to make you aware of different alerts and alarms that you might encounter during use. This is particularly useful if you've Muted any of these related audible alerts and alarms or to provide a level of tactile feedback while you're driving.

Voltage Indicator: Indicates on the LCD screen the current Voltage of the transmitter batteries.

Wrist Strap Anchor Slot: Used to attach the wrist strap anchor to the transmitter.

Z-Connector: The type of servo and battery connector used by Airtronics and Sanwa. The Z-Connector is a universal connector which is electronically compatible with the components of other radio control system manufacturers.

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