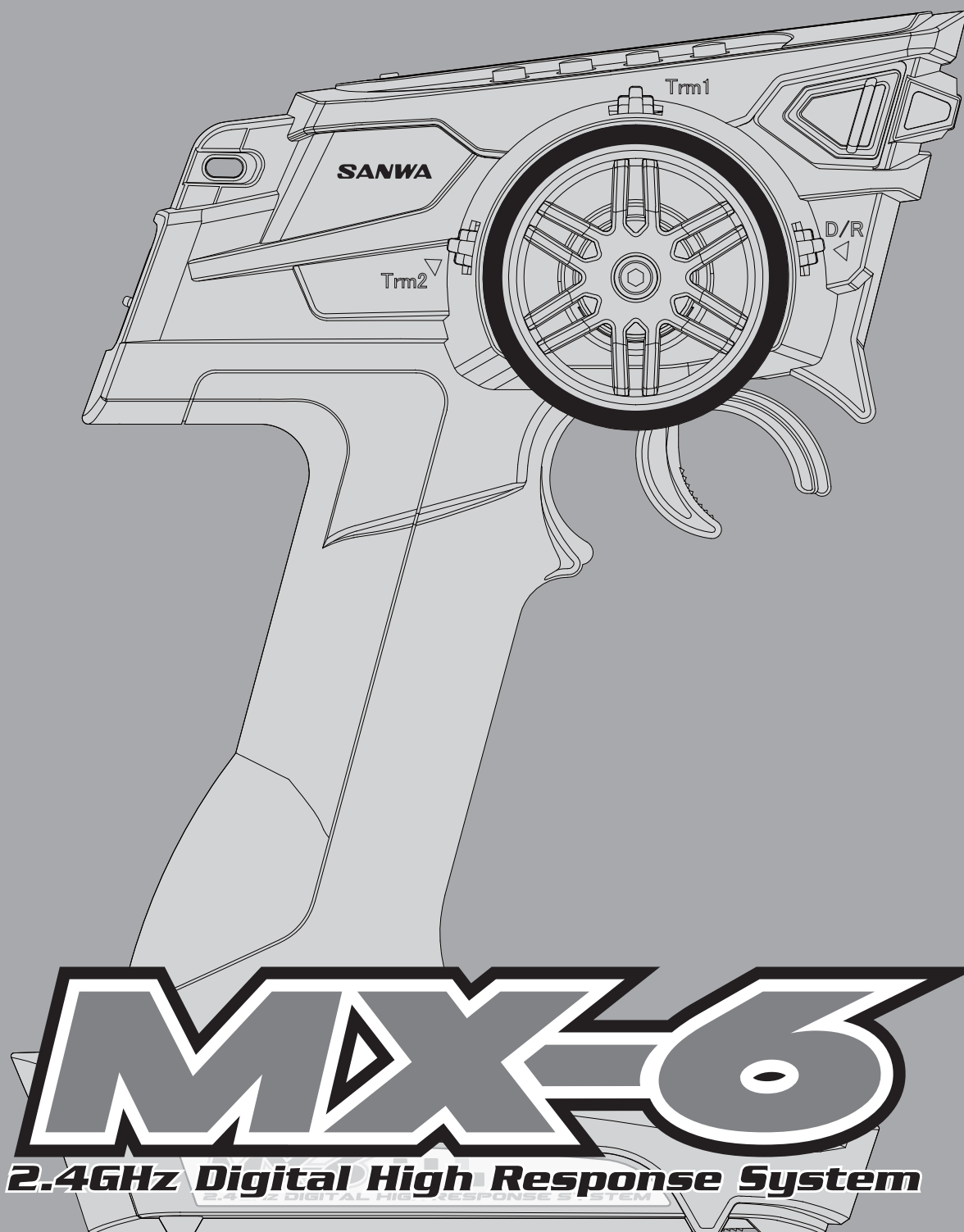


SANWA



2.4 FH4T
GHZ

Spread Spectrum
Technology By **SANWA**

User's Guide

MX-6 3-CHANNEL 2.4GHZ RADIO SYSTEM USER'S GUIDE

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INTRODUCTION

Congratulations! We appreciate your purchase of the SANWA MX-6 3-Channel 2.4GHz FHSS-E radio control system. This User's Guide is intended to acquaint you with the many unique features of your new radio control system. Please read this User's Guide carefully so that you may obtain maximum success and enjoyment from the operation of your new radio control system.

The MX-6 3-Channel 2.4GHz FHSS-E radio control system has been designed for the entry level user, but still retains the easy programming, precise control and ergonomic layout found in our higher-end systems. The MX-6 boasts a number of features that will make it perfect for use with both cars, trucks and boats. We wish you the best of success and fun with your new purchase.

 Additional SANWA 2.4GHz receivers can be purchased and paired with the MX-6 transmitter. Please note that due to differences in the implementation of 2.4GHz technology among different manufacturers, only SANWA brand 2.4GHz FHSS-E surface receivers are compatible with your radio control system. Please visit your local SANWA dealer or our website at <http://www.sanwa-denshi.com> for more information.

PACKAGING

The packaging of your MX-6 3-Channel 2.4GHz FHSS-E radio control system has been specially designed for the safe transportation and storage of the radio control system's components. After unpacking your radio control system, do not discard the packaging materials. Save the packaging materials 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.

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SERVICE AND SUPPORT

This 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, tempering, 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 on Page 19.

If you require further help that cannot be solved using The Troubleshooting Guide, or if you have technical questions, please contact 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: Serpent America 5121 NW 79 Ave. Unit 03, Doral, Florida 33166 USA Telephone: (305)-677-3253 Fax: (305)-675-0415 Email: info@serpentamerica.com

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

Product features and specifications can vary by region. Not all products are legal for use in all regions.

 Please note that products purchased outside of North America cannot be serviced under warranty by Serpent America. In some cases, we can make repairs for products purchased outside of North America, however, applicable repair costs and shipping charges will be applicable. For warranty claims outside North America, please contact the service center in your region.

SAFETY

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. Rather than operating the model, 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.

- Be certain to read this User's Guide in its entirety.
- 'Safety First' for yourself, others and your equipment.
- Observe all the rules of the field, track or lake 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. TAKE NO CHANCES.
- Your model can cause serious damage or injury. Please use caution and courtesy at all times.
- Do not expose the radio control system to water or excessive moisture.
- Waterproof the receiver and servos 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 Alarm will sound when the transmitter battery voltage drops to the minimum threshold of 4.6 volts. If this occurs, stop using the transmitter as soon as is safely possible, then replace 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.

FCC COMPLIANCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the operating instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference, and....
- 2) This device must accept any interference received, including interference that may cause undesired operation.

 Changes or modifications made to this equipment not expressly approved by Airtronics may void the FCC authorization to operate this equipment.

RF Exposure Statement:

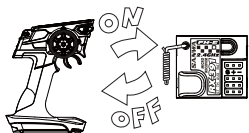
This transmitter has been tested and meets the FCC RF exposure guidelines when used with the Airtronics accessories supplied or designated for this product, and provided at least 50mm separation between the antenna the user's body is maintained. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

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2.4GHZ FREQUENCY BAND PRECAUTIONS

- 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 radio controllers 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 radio controllers on at once), as a safety precaution, the radio control system may not bind. 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 radio control system should be able to bind without any problems.

TRANSMITTER PRECAUTIONS



- To prevent possible damage to your servos or a runaway model, turn the transmitter ON first, then turn the receiver ON. After running 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 features an internal antenna installed inside the front portion of the transmitter.

Do NOT cover the front of the transmitter 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.



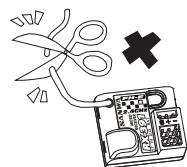
- Do not press the Bind Button during use. The signal is interrupted while the Bind Button is pressed. It may also require a short time to restore the signal after releasing the Bind Button, which can be dangerous.



- 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

- The antenna wire is delicate, therefore, handle with care. Do not pull on the antenna wire with force.
- Do not cut the antenna wire shorter or extend the antenna wire.
- The antenna wire can be bent into gentle curves, however, do not bend it acutely, or repeatedly bend it, or the antenna wire can be damaged.



- The antenna wire should be installed into a vertical plastic tube per your particular 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 installing the receiver and routing the receiver antenna, avoid contact with any carbon or metal chassis components. Contact between metal parts mounted on a model can result in electrical noise, which can adversely effect receiver performance and possibly result in runaway operation or 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/or result in damage to your model.
- The receiver does not feature BEC circuitry. If using an electronic speed control, verify that it features BEC circuitry to drop the receiver voltage between 4.8v to 7.4v.

SERVO CONNECTORS

The receiver included with your radio control system uses SANWA '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.



- = Negative (Black)
+ = Positive (Red)
S = Signal (Blue)



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.

MX-6 3-CHANNEL 2.4GHZ RADIO SYSTEM USER'S GUIDE

SYSTEM FEATURES

- 3-Channel Full-Range 2.4GHz FHSS-E Digital Proportional Computer Radio for Cars, Trucks and Boats
- Compatible with all SANWA 2.4GHz FHSS-E Surface Receivers
- 4-Cell Battery Holder for Lighter Weight and Improved Balance
- Easy-to-Read LCD Screen
- 10 Model Memory
- Servo Reversing All Channels
- Dual Rate Steering
- End Point Adjustment All Channels
- Exponential Steering and Throttle
- Anti-Lock (ABS) Braking
- Digital Trim Display
- Servo Sub-Trim Steering and Throttle
- 3-Character Model Naming
- Battery Voltage Monitor
- Ergonomic, Comfortable Feel
- Textured grip to prevent slipping
- Battery-Less Memory Retention
- Throttle Fail Safe
- Low Voltage Alarm
- Over 600 Foot Range
- Compatible with Analog or Digital Servos

SYSTEM SPECIFICATIONS

Transmitter:

- Model: MX-6
- Power Supply: DC 6V from 1.5V*4cell "AA" alkaline battery
- Dry Weight: 290gr
- Frequency: 2405.5-2447.5 MHz

Receiver:

- Model: RX-391WP
- Weight: 9.5gr
- Dimensions: 24.0 x 37.0 x 18.2mm
- Frequency: 2405.5-2447.5 MHz
- Fail Safe Support: Yes (Throttle)
- Nominal Input Voltage: 4.8v ~ 7.4v

SERVO RECOMMENDATIONS

We recommend using SANWA brand servos with your MX-6 3-Channel 2.4GHz FHSS-E radio control system. These are a few of our more popular servos. Visit your local SANWA dealer or www.sanwa-denshi.com for pricing, availability and more selection.



Both analog and digital servos will work with your radio control system. To get the most out of your radio control system, we recommend the use of digital servos.

PGS-CX Programmable High-Power Digital Dual Ball Bearing Servo

Torque: 26.4kg•cm@7.4V
23.3kg•cm@6.0V
Speed: 0.11sec/60°@7.4V
0.13sec/60°@6.0V
Dimensions: 40.5x20.5x37.2mm
Weight: 62gr

PGS-CL Programmable Low-Profile Digital Dual Ball Bearing Servo

Torque: 16.6kg•cm@7.4V
14.7kg•cm@6.0V
Speed: 0.08sec/60°@7.4V
0.10sec/60°@6.0V
Dimensions: 40.5x20.5x26.5mm
Weight: 62gr

ERS-XR High-Power Digital Dual Ball Bearing Servo

Torque: 35.3kg•cm@7.4V
26.2kg•cm@6.0V
Speed: 0.11sec/60°@7.4V
0.14sec/60°@6.0V
Dimensions: 40.3x20.2x35.9mm
Weight: 57gr

ERS-971 Low-Profile Digital Dual Ball Bearing Servo

Torque: 9.2kg•cm@6.0V
Speed: 0.09sec/60°@6.0V
Dimensions: 40.8x20.2x25.5mm
Weight: 44.5gr

TRANSMITTER BATTERY RECOMMENDATIONS

The transmitter's Operating Voltage Range is 4.0 ~ 9.6 volts. This allows you to use several different battery options (not included), depending on your preference.

Alkaline - In the default configuration, the transmitter is designed to be powered using four 'AA' Alkaline batteries. This results in a transmitter that is lightweight and well-balanced for unmatched comfort.

Ni-Cd/Ni-MH - Rechargeable Ni-Cd or Ni-MH batteries of desired capacity can be used in place of the Alkaline batteries. Using rechargeable Ni-Cd or Ni-MH batteries is more convenient and cheaper in the long run. The higher capacity batteries will also provide longer usage time than most Alkaline batteries.

Li-Po or Li-Fe - A 2 cell Li-Po battery pack or a 2 cell Li-Fe battery pack can not be used to power the transmitter.



Rechargeable batteries will need to be charged with a dedicated charger outside of the transmitter. Transmitter power output, range and speed are the same, regardless of the battery voltage and type used. If using a Li-Po or Li-Fe battery pack, please observe the warnings in the *Battery Installation* section on page 7.