AIRTRONICS
Get The Advantage

2.4GHz FHSS-3
DIGITAL PROPORTIONAL SYSTEM

P.N.90105

SANWA
SD-10GS
BLACK VERSION

OPERATING MANUAL

AIRCRAFT • HELICOPTER • SAILPLANE

# TABLE OF CONTENTS

## PACKAGING

The packaging of your Airtronics SD-10GS 2.4GHz FHSS-3 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.

> **IMPORTANT** When you receive your SD-10GS 2.4GHz FHSS-3 radio control system, the transmitter battery may be unplugged. Before attempting to charge the transmitter battery, open the battery cover by first pushing the two latches inward, then by pulling up on the bottom of the battery cover. Carefully plug the connector from the battery into the matching slot in the transmitter case. The battery connector is polarized and can therefore be plugged in only one way.

# INTRODUCTION

We appreciate your purchase of the new Airtronics SD-10GS 2.4GHz FHSS-3 radio control system. This Operating Manual is intended to acquaint you with the many unique features of your new state of the art SD-10GS 2.4GHz FHSS-3 radio control system. In designing the SD-10GS 2.4GHz FHSS-3 radio control system, our engineers listened to input from our test-pilots and feedback from our users to design a radio control system that will allow you to extract the maximum performance from your model, while at the same time making the programming process as easy as possible to accomplish.

Because the SD-10GS 2.4GHz FHSS-3 radio control system is highly advanced and is packed with many features for different model types, this Operating Manual is quite long. Don't be intimidated! This Operating Manual is layed out in such a way as to make it as easy as possible to find, understand, and learn to use the features you require. Please read this Operating Manual carefully so that you may obtain maximum success and enjoyment from the operation of your new SD-10GS 2.4GHz FHSS-3 radio control system. The SD-10GS 2.4GHz FHSS-3 radio control system has been designed for the utmost in comfort and precise control of all types of models. We wish you the best of success and fun with your new purchase.

⚠ An index is provided in the back of this Operating Manual to make it easy to find the information that you're looking for. Keep this Operating Manual in a safe place with your transmitter so that you can use it as a reference book for any questions you might have regarding your SD-10GS 2.4GHz FHSS-3 radio control system.

## ADDITIONAL RECEIVER INFORMATION

Additional 2.4GHz receivers can be purchased and paired with the SD-10GS transmitter through the Binding operation. Please note that due to differences in the implementation of 2.4GHz technology among different manufacturers, only Airtronics brand 2.4GHz FHSS aircraft receivers are compatible with your radio control system.

Compatible receivers currently include the 92104 10-Channel 2.4GHz FHSS-3 receiver and the 92824 8-Channel 2.4GHz FHSS receiver. Please see your Airtronics dealer for more information about compatibility of receivers released after this printing.

## TRANSMITTER SIGNAL RANGE

This is a high-output full-range radio control system that should well exceed the range needed for any 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 a the farthest reaches of the operational area. A range test can be accomplished using Low Power Mode. For more information, see page XX.

## 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 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.

**WARNING:** 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. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

# SAFETY AND USAGE PRECAUTIONS

In addition to the FCC Compliance section on the previous page, please observe the following safety and usage precautions when installing and using your new Airtronics SD-10GS 2.4GHz FHSS-3 radio control system.

## SAFETY

- Be certain to read this Operating Manual in its entirety.

- 'Safety First' for yourself, for others, and for your equipment.

- Observe all the rules of the flying site or anywhere 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, so please use caution and courtesy at all times.

- Do not expose the radio control system to water or excessive moisture.

- Please waterproof the receiver and servos by placing them in a water-tight radio box when operating model boats.

- If you have little to no experience operating models, we strongly recommend you seek the assistance of experienced modelers or your local hobby shop for guidance.

- The low voltage alarm will sound when the transmitter battery voltage drops to 6.7 volts. If this occurs, stop using the transmitter as soon as possible, then recharge the transmitter battery. For more information, see page XX.

⚠ 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.

## 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 a range test at the area of operation to ensure that the radio control system has complete control of the model a the farthest reaches of the operational area.

- The response speed of the receiver can be affected if used where multiple 2.4GHz radio control systems are being used; therefore, carefully check the area before use. Also, if response seems slow during use, discontinue use as quickly as possible.

- 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.

- Observe any applicable laws and regulations in place at your flying site when using the 2.4GHz radio control system.

- Unlike frequency bands used with earlier radio control systems, reception with this 2.4GHz radio control system can be adversely affected by large obstructions and concrete or steel structures between your model and the transmitter. Also, wire mesh and similar barriers can adversely affect operation. Keep this mind to ensure the safety of your model.

## TRANSMITTER PRECAUTIONS

- Turn the transmitter ON first and then turn the receiver ON. After using your model, turn the receiver OFF first, then turn the transmitter OFF. It can be dangerous if you activate the components in reverse order as the servos may start up inadvertently.

- Before use, double-check that the transmitter and receiver batteries are sufficiently charged.

- Never touch the transmitter antenna during use. Doing so may cause loss of transmitter output, making it impossible to control your model.

Keep Antenna Perpendicular to Ground
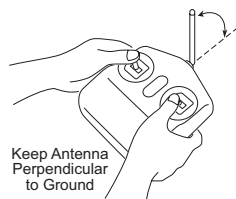
- Before use, the transmitter antenna should be pulled up completely and angled so that the antenna is as close to perpendicular to the ground as possible during use. After use, to prevent any chance of damaging the antenna, the antenna should be lowered and moved into the horizontal stowed position.

- Do not expose the transmitter to water or excessive moisture.

- Do not expose the transmitter to excessive heat or direct sunlight. Leaving the transmitter out in direct sunlight can damage the LCD Display.
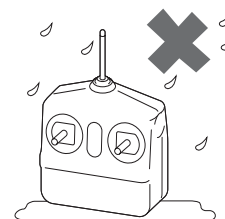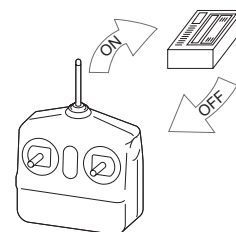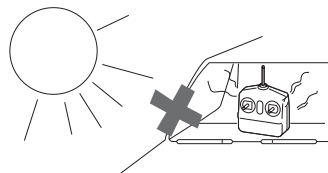
Do Not Expose to Moisture or Direct Sunlight

# SAFETY AND USAGE PRECAUTIONS

## RECEIVER PRECAUTIONS

- The receiver antenna wires consists of two coaxial cables and two reception wires (the thin tip at the end of the coaxial cables). When you mount the receiver antenna wires, do not bend the reception wires. Reception performance decreases if the reception wires are bent.

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

- The coaxial cables (the thicker portion of the antenna wires) can be bent into gentle curves; however, do not bend the coaxial cables acutely, or repeatedly bend them, or the antenna cores can be damaged.

- When installed in an electric-powered model, keep the receiver antenna wires as far away from the motor, battery, and electronic speed control (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 harness connectors are securely fitted.
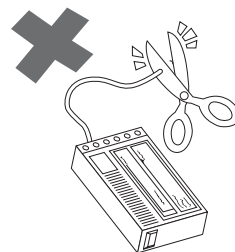
- The receiver is susceptible to vibration and moisture. Take appropriate measures to protect against vibration and moisture. The receiver should be wrapped in foam and the foam should be secured around the receiver to hold it in place. The foam should not be secured too tightly or the vibration dampening quality will be reduced. Failure to take appropriate measures could result in damage to the receiver.

- When installing the receiver, the antenna reception wires (the thin tip at the end of the coaxial cables) should not come into contact with any carbon or metal components (conductive components). Aircraft fuselages and helicopter frames may contain conductive components. If mounting the receiver surrounded by conductive materials (for example, a carbon fiber fuselage), mount the receiver so that the antenna reception wires can be extended outside of the model. Reception can be blocked if the antenna reception wires are shielded inside a carbon fiber fuselage.

- The manufacturer disclaims all responsibility for damages resulting from use of components other than genuine Airtronics components.

⚠ It is extremely important to install the receiver and route the antenna wires correctly in your model. This will ensure that your model receives control signals no matter what its posture, attitude, or heading. For more information, see page XX.

## AMA INFORMATION

The Academy of Model Aeronautics (AMA) is a national organization representing modelers in the United States. We urge you to examine the benefits of membership, including liability protection in the event of certain injuries. The Academy has adopted simple and sane rules which are especially pertinent for radio controlled flight as the Official AMA National Model Aircraft Safety Code, which we have partially reprinted below:

- I will not fly my model aircraft in sanctioned events, airshows or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.

- I will not fly my mode higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give the right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft. Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.

- I will have completed a successful radio equipment ground range check before the first flight of a new or repaired model.

- I will not fly my model aircraft in the presence of spectators until I become a qualified flyer, unless assisted by and experienced helper.

- I will perform my initial turn after takeoff away from the pit or spectator areas, unless beyond my control.

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302
Phone (800) 435-9262
Fax (765) 741-0057
www.modelaircraft.org

# FEATURES AND SPECIFICATIONS

## GENERAL FEATURES

- 10-Channel Digital Proportional Computer Radio with Advanced Programming for Competition Aircraft, Helicopters, and Sailplanes
- New 2.4GHz FHSS-3 Technology
- Full-Range 92104 10-Channel 2.4GHz FHSS-3 Receiver
- Compatible with Airtronics 2.4GHz FHSS Aircraft Receivers
- 6 Cell 1500mAH Rechargeable NiMH Transmitter Battery
- Direct Model Select
- Programmable Custom Menu
- Easy-to-Read LCD Display
- Simple Wing and Model Templates
- Servo Reversing, Centering, EPA, and Limits
- Six Digital Trim Switches
- LCD-Only Display Switch
- 3-Axis Triple Rates and Triple Expo
- 3-Position Programmable Switches
- 2 Programmable Side Levers
- Battery Monitor
- User Naming
- Model Naming and Model Select
- FHSS, FHSS-3, and PPM-8 Modulation Selection
- Low-Power Range Test Mode
- 10-Channel Programmable Fail Safe
- Adjustable Battery Fail Safe Voltage
- Trainer System
- User-Selectable Modes
- Custom Channel Assignments
- Custom Switch Assignments
- Stick Switch Function
- Stop Watch, Rhythm, System, and Integral Timers
- Data Copy, Reset, and Transfer
- 20 Model Memory
- Add-On Expansion Memory and PC Connectivity

## AIRCRAFT-SPECIFIC FEATURES

- Servo Monitor
- Stick Monitor
- A/E/R Dual Rates
- A/E/R Exponential
- 9-Point Throttle Curve
- Throttle Hold
- Throttle Cut
- Idle Down
- Aileron Differential
- A/E/R Offset
- Channel Delay
- Sub-Trim
- Trim Step Resolution
- Trim Authority
- Cross Trim
- 2 Programmable Snap Rolls
- 10 Programmable Mixes
- 5 C-Mixes with 9-Point Curves
- Variable Rate Assign
- 5 Flight Modes
- Flight Mode Copy, Delay, and Naming

## HELICOPTER-SPECIFIC FEATURES

- Advanced Swashplate Control
- Servo Monitor
- Stick Monitor
- A/E/R Dual Rates
- A/E/R Exponential
- 9-Point Throttle and Pitch Curves
- Throttle Cut
- 8-Point Hover Throttle
- 8-Point Hover Pitch
- A/E/R Offset
- Channel Delay
- Sub-Trim
- Trim Step Resolution
- Trim Authority
- 3 Gyro Gains
- 3 Governers
- 3 Programmable Mixes Plus Revo Mixing
- 5 C-Mixes with 9-Point Curves
- Variable Rate Assign
- 5 Flight Modes
- Flight Mode Copy, Delay, and Naming

## SAILPLANE-SPECIFIC FEATURES

- Six Servo Wing Capability
- Landing Override Mode
- Servo Monitor
- Stick Monitor
- A/E/R Dual Rates
- A/E/R Exponential
- Aileron Differential
- Landing Differential
- Landing Flap Freeze Point
- Landing Crow
- Camber and Camber Point
- Channel Delay
- Sub-Trim
- Trim Step Resolution
- Trim Authority
- Cross Trim
- 10 Programmable Mixes
- 5 C-Mixes with 9-Point Curves
- Variable Rate Assign
- 5 Flight Modes
- Flight Mode Copy, Delay, and Naming

## TRANSMITTER AND RECEIVER SPECIFICATIONS

**Transmitter**

Model: SD-10GS (90105)

Output Power:

Operating Voltage: 6.7v - 11.0v

Power Supply: 7.2v 1500mAH NiMH (NH6N-1500S)

Current Drain:

Temperature Range:

Pulse Width:

Weight:

Frequency: 2.4GHz FHSS-3

Model Memory: 20

Expansion Card: Proprietary, 30 Models

**Receiver**

Model: 92104

Frequency: 2.4GHz FHSS-3

Input Voltage: 4.8v - 6.0v

Weight: 0.52oz (15gr)

Dimensions: 1.94 x 1.05 x 0.61in (49.5 x 26.8 x 15.5mm)

Fail Safe Limit: 3.8v - 4.6v Adjustable

Connector Type: Universal 'Z'

## SERVO SPECIFICATIONS - AVAILABLE SEPARATELY

We recommend using Airtronics brand servos with your SD-10GS 2.4GHz FHSS-3 radio control system. See your local Airtronics dealer for more information and availability.

**94091Z Super Micro Servo**

Torque:  18oz/in (1.3kg/cm @ 4.8v)
          23oz/in (1.7kg/cm @ 6.0v)

Speed:   0.12 sec/60º @ 4.8v
          0.10 sec/60º @ 6.0v

Dimensions: 0.91 x 0.44 x 0.87in
             (23.1 x 11.1 x 22.0mm)

Weight: 0.32oz (9gr)

**94761Z  Micro Digital High-Torque High-Speed Ball Bearing Servo**

Torque:  55oz/in (4.0kg/cm @ 4.8v)
          66oz/in (4.8kg/cm @ 6.0v)

Speed:   0.15 sec/60º @ 4.8v
          0.12 sec/60º @ 6.0v

Dimensions: 1.06 x 0.47 x 1.18in
             (26.9 x 11.9 x 29.9mm)

Weight:  0.80oz (23gr)

**94322Z  Precision Heavy Duty Ball Bearing Standard Servo**

Torque:  46oz/in (3.3kg/cm @ 4.8v)
          58oz/in (4.2kg/cm @ 6.0v)

Speed:   0.19 sec/60º @ 4.8v
          0.15 sec/60º @ 6.0v

Dimensions: 1.54 x 0.79 x 1.42in
             (39.1 x 20.0 x 36.0mm)

Weight: 1.59oz (45.0gr)

**94780M Digital High-Torque Metal Gear Ball Bearing Servo**

Torque:  361oz/in (26.0kg/cm @ 4.8v)
          423oz/in (30.5kg/cm @ 6.0v)

Speed:   0.19 sec/60º @ 4.8v
          0.15 sec/60º @ 6.0v

Dimensions: 1.60 x 0.83 x 1.50in
             (40.6 x 21.0 x 38.1mm)

Weight:  2.33oz (66gr)

**94358M ERG-VB High-Torque Metal Gear Ball Bearing Servo**

Torque:  160oz/in (11.5kg/cm @ 4.8v)
          200oz/in (14.4kg/cm @ 6.0v)

Speed:   0.13 sec/60º @ 4.8v
          0.10 sec/60º @ 6.0v

Dimensions: 1.54 x 0.79 x 1.47in
             (39.1 x 20.0 x 37.3mm)

Weight: 2.12oz (60gr)

**94746M Digital Low-Profile Metal Gear Ball Bearing Servo**

Torque:  80oz/in (5.1kg/cm @ 4.8v)
          89oz/in (6.4kg/cm @ 6.0v)

Speed:   0.10 sec/60º @ 4.8v
          0.08 sec/60º @ 6.0v

Dimensions: 1.59 x 0.83 x 1.04in
             (40.3 x 21.0 x 26.4mm)

Weight:  1.77oz (50gr)

⚠ Both analog and digital servos will work with your SD-10GS 2.4GHz FHSS-3 radio control system; however, to get the most out of your experience, we recommend the use of digital servos.

## OPTIONAL ITEMS - AVAILABLE SEPARATELY

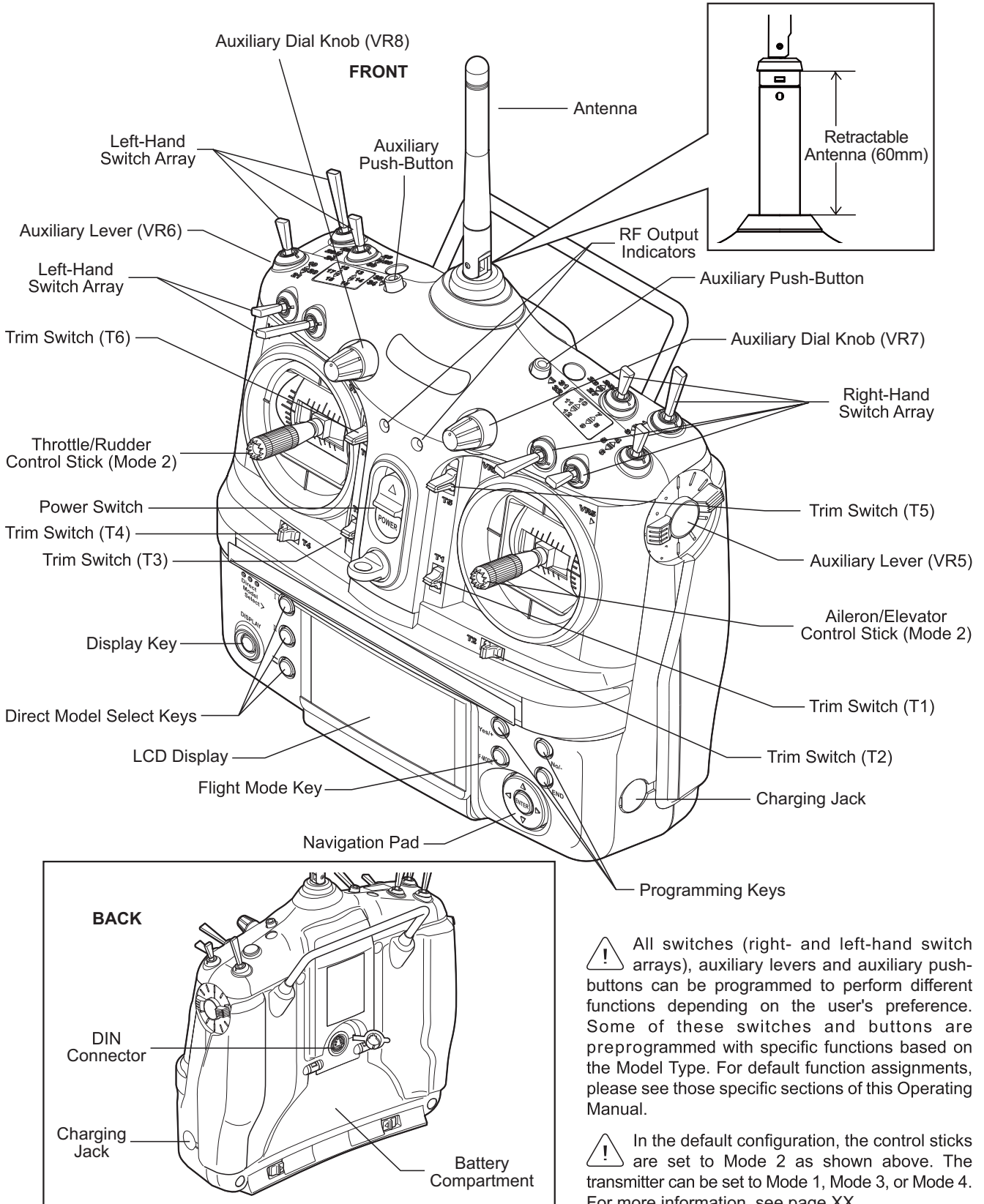The following Airtronics items are available separately for your SD-10GS 2.4GHz FHSS-3 radio control syste

| 978411 | Aluminum Carrying Case | 492777 | Stick Tip Extensions | XXXXX | Trainer Cable |
| 479103 | Adjustable Neck Strap | 492780 | Anodized Gold Stick Tips | XXXXX | Memory Expansion Card |

# FEATURES FAMILIARIZATION

## TRANSMITTER CONTROL FEATURES DIAGRAMS

Use the diagrams below to familiarize yourself with the different control features of your new SD-10GS transmitter. Descriptions of these features can be found on page XX.

⚠ The features referenced below are general in nature. Features specific to the Model Type (aircraft, helicopter, or sailplane) can be found in those specific sections of this Operating Manual.



Auxiliary Dial Knob (VR8)

**FRONT**

Antenna

Left-Hand Switch Array

Auxiliary Push-Button

Retractable Antenna (60mm)

Auxiliary Lever (VR6)

RF Output Indicators

Auxiliary Push-Button

Left-Hand Switch Array

Auxiliary Dial Knob (VR7)

Trim Switch (T6)

Right-Hand Switch Array

Throttle/Rudder Control Stick (Mode 2)

Power Switch

Trim Switch (T5)

Trim Switch (T4)

Trim Switch (T3)

Auxiliary Lever (VR5)

Aileron/Elevator Control Stick (Mode 2)

Display Key

Direct Model Select Keys

Trim Switch (T1)

LCD Display

Trim Switch (T2)

Flight Mode Key

Charging Jack

Navigation Pad

Programming Keys

**BACK**

DIN Connector

Charging Jack

Battery Compartment

⚠ All switches (right- and left-hand switch arrays), auxiliary levers and auxiliary push-buttons can be programmed to perform different functions depending on the user's preference. Some of these switches and buttons are preprogrammed with specific functions based on the Model Type. For default function assignments, please see those specific sections of this Operating Manual.
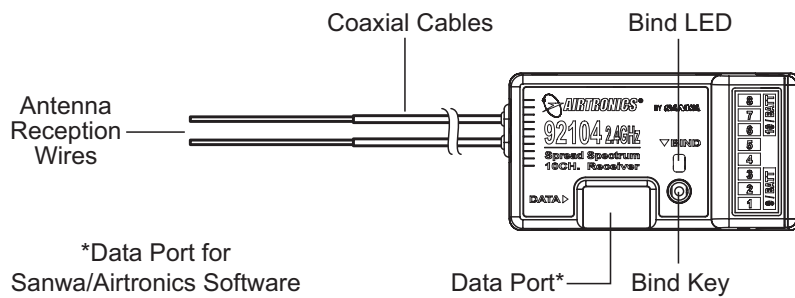
⚠ In the default configuration, the control sticks are set to Mode 2 as shown above. The transmitter can be set to Mode 1, Mode 3, or Mode 4. For more information, see page XX.

# FEATURES FAMILIARIZATION

## RECEIVER FEATURES DIAGRAMS

Use the diagram below to familiarize yourself with the 92104 10-Channel receiver included with your new SD-10GS 2.4GHz FHSS-3 radio control system. Descriptions of these features can be found below.



Coaxial Cables · Bind LED · Antenna Reception Wires · *Data Port for Sanwa/Airtronics Software · Data Port* · Bind Key

⚠ All receiver channel assignments can be programmed to suit the user. For example, in the default configuration, receiver channel slot 1 controls Elevator; however, this channel slot can be programmed to control Aileron or control Rudder, etc. This allows the utmost control for nearly any custom configuration you may require.

The default receiver channel slot configurations are shown in the table below:

| RECEIVER CHANNEL SLOT | AERO | GLIDER | HELI |
|---|---|---|---|
| Channel Slot 1 | Elevator | Elevator | Elevator (Fore/Aft Cyclic) |
| Channel Slot 2 | Aileron | Left Aileron | Aileron (Left/Right Cyclic) |
| Channel Slot 3 | Throttle | Motor | Throttle |
| Channel Slot 4 | Rudder | Rudder | Rudder (Tail Rotor) |
| Channel Slot 5 | Gear | Gear | Gyro |
| Channel Slot 6 | Flaps | Right Aileron | Pitch (Collective) |
| Channel Slot 7 | Auxiliary 4 | Flaps | Auxiliary 4 |
| Channel Slot 8 | Auxiliary 3 | Auxiliary 3 | Auxiliary 3 |
| Channel Slot 9/BATT** | Auxiliary 2 and Battery | Auxiliary 2 and Battery | Auxiliary 2 and Battery |
| Channel Slot 10/BATT** | Auxiliary 1 and Battery | Auxiliary 1 and Battery | Auxiliary 1 and Battery |

** To utilize this channel slot along with the battery, you must plug a Y-Harness into the channel slot, then plug the servo into one side of the Y-Harness and the battery switch harness into the other side of the Y-Harness.

## FEATURES DESCRIPTIONS

**Aileron/Elevator Control Stick:** Controls the Aileron and Elevator axes in the default Mode 2 configuration. For information on changing transmitter modes, see page XX.

**Antenna:** Transmits the signal from the transmitter to the receiver in the model. The Antenna should be extended (pulled up as shown in the diagram on the previous page) and pivoted into the vertical position during use. When not in use, the Antenna should be pushed down and collapsed into the horizontal position to prevent damage during handling and transport.

**Antenna Reception Wires:** The portion of each of the antenna wires that actually receives the transmitter signal.

⚠ The Antenna Reception Wires should never be bent or they could be damaged and limit the range of the receiver.

**Auxiliary Dial Knob:** The Auxiliary Dial Knob is programmable and will perform a different function depending on what function is assigned to it. For example, the Auxiliary Dial Knob can be programmed to remotely adjust your engine's carburetor mixture.

**Auxiliary Lever:** Two Auxiliary Levers are featured, one on each side of the transmitter. Each Auxiliary Lever is programmable and will perform a different function depending on what function is assigned to it. For example, an Auxiliary Lever can be programmed to control the tow hook release on a glider.

**Auxiliary Push-Button:** Two Auxiliary Push-Buttons are featured. Each Auxiliary Push-Button is programmable and will perform a different function depending on what function is assigned to it. For example, an Auxiliary Push-Button can be programmed to control the Stopwatch function.

**Battery Compartment:** Houses the 6 cell 1500mAH NiMH battery that powers the transmitter. The transmitter uses a 6 cell battery for lighter weight and better feel, while still providing long usage time.

**Bind Key and Bind LED:** Used in the process of Binding the transmitter and receiver. For information on Binding the transmitter and receiver, see page XX.

**Charging Jack:** Used for onboard charging of the 6 cell 1500mAH NiMH battery. For information on charging the transmitter battery, see page XX.

⚠️ Only use the charger included with your SD-10GS 2.4GHz FHSS-3 radio control system to charge the battery through the Charging Jack. Use of any other charger can damage the transmitter.

**Coaxial Cables:** The portion of each antenna wire that extends the Antenna Reception Wires. The Coaxial Cables can be bent into gentle curves; however, do not bend the Coaxial Cables acutely, or repeatedly bend them, or the antenna wire's cores can be damaged. For information on mounting the receiver and antenna wires, see page XX.

**DIN Connector:** The DIN Connector is where the trainer cable (available separately) is plugged into. It is also used to plug the Airtronics USB data cable (available separately) between the transmitter and your computer. An adapter to use the transmitter with a flight simulator can also plugged into the DIN Connector.

**Direct Model Select Keys:** The Direct Model Select Keys allow you to select one of three of your most-used models from memory without going through the Model Select menu. For information on using the Direct Model Select Function, see page XX.

**Display Key:** Activates the transmitter's LCD Display without actually turning the transmitter ON. This allows you to check and/or change programming settings without actually turning the transmitter ON. To turn only the LCD Display ON, press and hold the DISPLAY Key for ~ 2 seconds. To turn the LCD Display OFF, press the DISPLAY Key once.

**Flight Mode Key:** Allows you to cycle through the five different Flight Modes while in the Flight Mode Programming menu.

**LCD Display:** The heart of the programming and display features of the transmitter. All programming and transmitter display functions are shown on the LCD Display. The Navigation Pad, the three Programming Keys, and the F-MODE Key to the right of the LCD Display facilitate transmitter programming. The contrast of the LCD Display can be customized by the user to make it easily readable in multiple lighting conditions.

**Left-Hand Switch Array:** The switches grouped on the left side of the transmitter are programmable and each will perform a different function depending on what function is assigned to it. Each switch has a molded reference number next to it that corresponds to the programming function in the Switch Assignment menu (the printed label corresponds to the two switches on the front of the transmitter). Each of the five switches is a three-position toggle switch except for the switch labeled 19/20/21 which is a spring-loaded switch.

**Navigation Pad:** The Navigation Pad is used in conjunction with the Programming Keys and the F-MODE Key to faciliate transmitter programming. The Navigation Pad allows you to quickly and easily move the Programming Cursor up and down, and right and left. The ENTER Key in the center of the Navigation Pad is used to open the selected menu or programming option.

**Power Switch:** Turns the transmitter ON and OFF.

**Programming Keys:** The Programming Keys are used in conjunction with the Navigation Pad and the F-MODE Key to faciliate transmitter programming. The three Programming Keys consist of the YES/+ (Increase) Key, the NO/- (Decrease) Key, and the END Key.

**RF Output Indicators:** Both indicators illuminate when the transmitter is turned ON and transmitting a signal. If one or both of the RF Output Indicators fails to illuminate, RF output is limited or non-existent. In this case, you should not fly.

**Right-Hand Switch Array:** The switches grouped on the right side of the transmitter are programmable and each will perform a different function depending on what function is assigned to it. Each switch has a molded reference number next to it that corresponds to the programming function in the Switch Assignment Menu (the printed label corresponds to the two switches on the front of the transmitter). Each of the four switches is a three-position switch.

**Throttle/Rudder Control Stick:** Controls the Throttle and Rudder axes in the default Mode 2 configuration. For information on changing transmitter modes, see page XX.

**Trim Switch:** Six separate Trim Switches (T 1, T 2, T 3, T 4, T 5, and T 6) are featured. Each Trim Switch will control a different trim axis depending on which Model Type is selected.

## SERVO CONNECTORS

The 92104 10-Channel receiver included with your new SD-10GS FHSS-3 2.4GHz radio control system uses universal 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.



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

⚠️ When unplugging the servo connectors, it's best not to pull on the servo wire itself. This could result in damage to the servo wire pins in the plastic plug.

# TRANSMITTER ALARMS

The SD-10GS transmitter features several differet safety features that will sound an audible alarm when triggered.

⚠ Safety features vary depending on the Model Type selected. Default configuration shown in parenthesis.

| ALARM DISPLAY | AERO | GLIDER | HELI |
|---|---|---|---|
| Low Voltage Alarm | ALWAYS ACTIVE | ALWAYS ACTIVE | ALWAYS ACTIVE |
| Throttle High Warning Alarm | ACT/INH (ACTIVE) | N/A | ACT/INH (ACTIVE) |
| Flight Mode Warning Alarm | ACT/INH (ACTIVE) | ACT/INH (INHIBITED) | ACT/INH (ACTIVE) |
| Trainer Mode Warning Alarm | ALWAYS ACTIVE | ALWAYS ACTIVE | ALWAYS ACTIVE |
| Power Switch Warning Alarm | ACT/INH (ACTIVE) | ACT/INH (ACTIVE) | ACT/INH (ACTIVE) |

## AUDIO LOW VOLTAGE ALARM

The SD-10GS transmitter is equipped with a Low Voltage Alarm that will sound when the transmitter battery reaches 6.7 volts. If the Low Voltage Alarm sounds while you are flying, you should land immediately, then recharge the transmitter battery.

⚠ If the Low Voltage Alarm sounds even after the transmitter battery has been fully charged it indicates that there is a problem with either the transmitter or the transmitter battery. If this occurs, please contact Airtronics Customer Service.

## THROTTLE HIGH WARNING ALARM

The SD-10GS transmitter is equipped with a safety feature that will not allow you to use the transmitter if the throttle control stick is not in the lowest position when you turn the transmitter ON. If the throttle control stick is not in the lowest position when you turn the transmitter ON, the Throttle High Warning alarm will sound continuously, the red RF Output Indicator will blink, and the LCD Display will read TH-STICK Hi !! To clear the Throttle High Warning, pull the throttle control stick down to the lowest position. The LCD Display will read normally, the Throttle High Warning alarm will cease, and both the red and green RF Output Indicators will be illuminated.

## FLIGHT MODE WARNING ALARM

The SD-10GS transmitter is equipped with a safety feature that will not allow you to use the transmitter if the Flight Mode is not set to 'N' (Normal) when you turn the transmitter ON. If the Flight Mode is not set to 'N' when you turn the transmitter ON, the Flight Mode Warning alarm will sound continuously, the red RF Output Indicator will blink, and the LCD Display will read F-MODE NOT 'N' !! To clear the Flight Mode Warning, set the Flight Mode to 'N' using the Flight Mode Switch (this is different from the F-MODE Key). The LCD Display will read normally, the Flight Mode Warning alarm will cease, and both the red and green RF Output Indicators will be illuminated.

⚠ In the default AERO configuration, the Flight Mode Switch is switch 10/11/12. In the default HELI configuration, the Flight Mode Switch is switch 22/23/24. In the default GLIDER configuration, the Flight Mode Warning alarm is INHIBITED.

## TRAINER MODE WARNING ALARM

The SD-10GS transmitter is equipped with a safety feature that will warn you when the transmitter is set to Trainer - Master or Trainer - Slave when the transmitter is turned ON. If the transmitter is set to Trainer - Master when you turn the transmitter ON, the Trainer Mode Warning alarm will sound continuously, the red RF Output Indicator will blink, and the LCD Display will read TRAINER MODE MASTER !! If the transmitter is set to Trainer - Slave when you turn the transmitter ON, the Trainer Mode Warning alarm will sound continuously, the red RF Output Indicator will blink, and the LCD Display will read TRAINER MODE SLAVE !! To clear either of the Trainer Mode Warnings, press any of the three Programming Keys, the F-MODE Key, or the ENTER Key. The LCD Display will read normally, the Trainer Mode Warning alarm will cease, and both the red and green RF Output Indicators will be illuminated (if set to Slave, only the green RF Output Indicator will blink).

⚠ Clearing the Trainer Mode Warning does not change the Trainer setting of the transmitter. When the Trainer Mode Warning is cleared, the transmitter will still be in Trainer Mode - either set to Master or set to Slave.

## POWER SWITCH WARNING ALARM

The SD-10GS transmitter is equipped with a Power Switch Warning alarm that will warn you when the transmitter is turned ON and there has been no movement of the control sticks or switches for 15 minutes. If the transmitter is left on for 15 minutes or longer without any input the Power Switch Warning alarm will sound continuously and the LCD Display will read POWER SW ON !! To clear the Power Switch Warning, either turn the transmitter OFF or press any of the three Programming Keys, the F-MODE Key, or the ENTER Key.

# CUSTOM TRANSMITTER ADJUSTMENTS

Every effort has been made to engineer the optimum transmitter weight, balance, and feel in the design of your SD-10GS FHSS-3 2.4GHz radio control system. For example, the transmitter control sticks are ball bearing-supported for smooth control and use springs that result in superior feel for most pilots. Some aspects of the transmitter are customizable though, to suit the user's particular taste.

## CONTROL STICK LENGTH ADJUSTMENT

The length of the control sticks can be adjusted to best suit the way you hold them. In general, pilots who place their thumbs on top of the control sticks prefer the control sticks to be shorter, and pilots who grasp the control sticks prefer the control sticks to be longer.

⚠ In the default configuration, the control sticks are adjusted to the shortest length.

1) While holding the base of the control stick, turn the top half of the control stick counter-clockwise to loosen it.

2) To lengthen the control stick, turn the top half of the control stick counter-clockwise.

⚠ When lengthening the control sticks, we strongly suggest that you leave at least four threads inside the top half of each control stick. This will ensure that the control sticks maintain optimum mechanical security. If you thread the control sticks out too far, the control sticks might come loose during use.

3) Once your are satisfied with the length of the control stick, thread the bottom half of the control stick up and tighten it gently against the top half of the control stick.
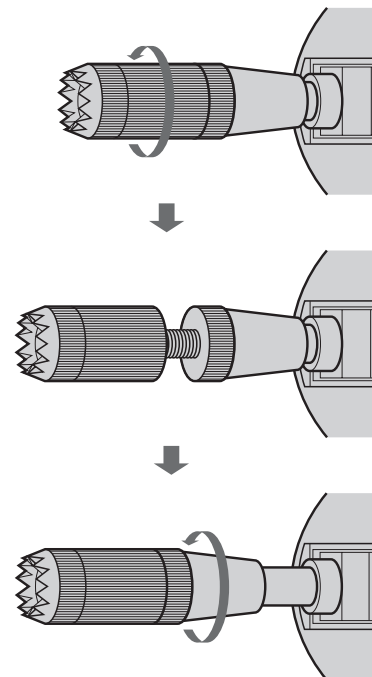
## CONTROL STICK TENSION ADJUSTMENT

The spring tension of the control sticks can be adjusted to suit your preference. Increasing the spring tension makes the control stick's movement firmer. Decreasing the spring tension makes the control stick's movement softer. The throttle control stick ratchet can also be adjusted. Loosening the throttle control stick ratchet will make the throttle detents less noticeable. Tightening the throttle control stick ratchet will make the throttle detents firmer. The throttle detents can even be eliminated for those helicopter pilots who prefer to have no throttle ratchet.
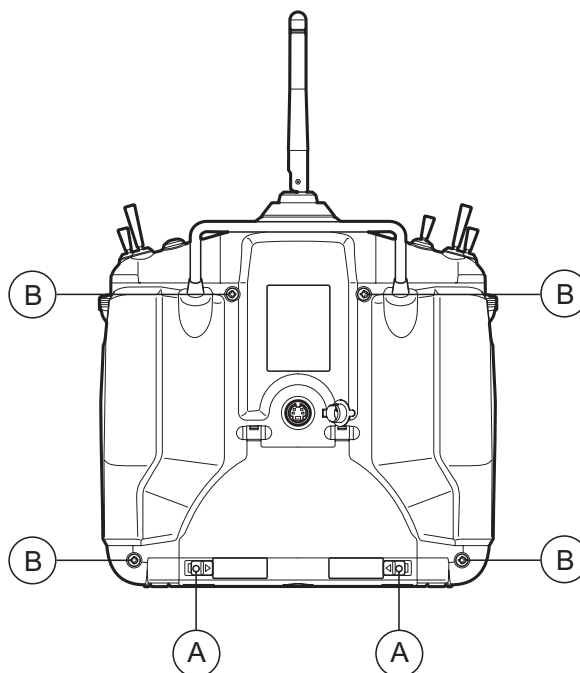
1) Open the battery cover by first pushing the two latches (A) inward, then by pulling up on the bottom of the battery cover.

2) Unplug the battery from the transmitter and remove it. Set the battery aside for now.

3) Remove the four philips head screws (B) from the back of the transmitter, then very carefully pull the back half of the transmitter off.

⚠ There are no wires attached between the back half of the transmitter and the circuit boards inside the transmitter. When the back half of the transmitter is removed, it can be safely set aside.

⚠ Pull the back half of the transmitter straight off to avoid bending or damaging the battery pins.

4) To increase the spring tension of the control sticks, tighten (turn clockwise) the three socket-cap screws (C), using a 1.5mm hex wrench. To decrease the spring tension of the control sticks, loosen (turn counter-clockwise) the three socket-cap screws (C), using a 1.5mm hex wrench.

5) To make the throttle control stick detents less noticeable, loosen the socket-cap screw on the outer ratchet plate (D), using a 1.5mm hex wrench. To make the throttle control stick detents firmer, tighten the socket-cap screw on the outer ratchet plate (D), using a 1.5mm socket-cap wrench.

6) Some helicopter pilots prefer to eliminate the throttle ratchet completely. To do this, loosen the socket-cap screw on the outer ratchet plate (D), using a 1.5mm hex wrench until the the throttle detents can't be felt anymore. Next, tighten the socket-cap screw on the inner throttle plate (E), until you're satisfied with the throttle control stick resistance.

Spring Adjuster
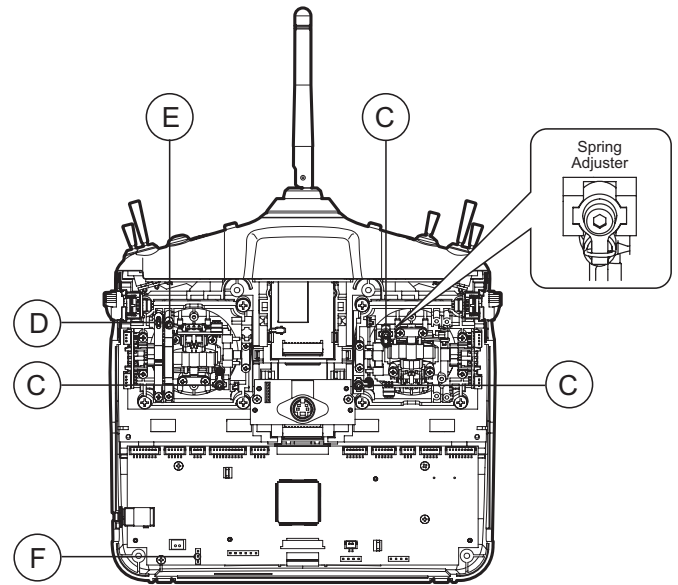
6) When satisifed with the results carefully reinstall the back half of the transmitter, then reinstall the transmitter battery and plug it back in. The battery connector is polarized and can therefore be plugged in only one way.

⚠ When resinstalling the back half of the transmitter, be very careful that you don't bend or otherwise damage the battery pins (F). These long battery pins should be carefully slid through the matching holes in the back half of the transmitter before pushing it down into place.

⚠ Any other modifications made to the transmitter other than adjusting the control stick tension will void any and all warranties covered by Airtronics, Inc.

## TRANSMITTER MODE ADJUSTMENTS

The SD-10GS transmitter has the ability to operate in four different Modes as shown in the table below. Changing Modes can be done by the user and requires changing the Mode Setting in the System Menu, then swapping the springs and throttle ratchet on the control sticks. For information on changing Modes, see page XX.

⚠ In the default configuration, the transmitter is set to Mode 2, which is most commonly used in North America.

| CONTROL STICK | MODE 1 | MODE 2 | MODE 3 | MODE 4 |
|---|---|---|---|---|
| Left-Side Control Stick | Rudder/Elevator | Throttle/Rudder | Elevator/Aileron | Throttle/Aileron |
| Right-Side Control Stick | Throttle/Aileron | Elevator/Aileron | Throttle/Rudder | Elevator/Rudder |

## EXPANSION MEMORY

## TRAINER SYSTEM

The SD-10GS transmitter features a Trainer System that allows you to connect two SD-10GS transmitters together for the purpose of training a new pilot or for training a more experienced pilot on a new model. For information on connecting two SD-10GS transmitters together, and programming and using the Trainer System, see page XX.

⚠ The Trainer System is compatible ONLY with another SD-10GS transmitter. You MUST use the SD-10GS Trainer Cable XXXXXZ. See your local Airtronics dealer for more information and availability.

# CHARGING THE BATTERY

The SD-10GS FHSS-3 2.4GHz transmitter features a 6 cell 7.2v 1500mAH NiMH battery for lighter weight and longer battery life. The battery is charged directly through the transmitter, using the charging jack located in the left side of the transmitter. Please observe the Safety Precautions and Charging Warnings below when charging the transmitter battery.

## *PLUGGING IN THE TRANSMITTER BATTERY*

When you receive your SD-10GS 2.4GHz FHSS-3 radio control system, the transmitter battery may be unplugged. Before attempting to charge the transmitter battery, open the battery cover by first pushing the two latches inward, then by pulling up on the bottom of the battery cover. Carefully plug the connector from the battery into the matching slot in the transmitter case. The battery connector is polarized and can therefore be plugged in only one way.

- = Negative (Black)
+ = Positive (Red)
- = Negative (Black)
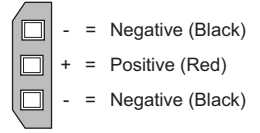
## *SAFETY PRECAUTIONS AND CHARGING WARNINGS*

- Always follow the charging procedures described below to ensure safe and correct use of your NiMH battery.

- The NiMH battery is not fully charged when purchased. It is necessary to charge the NiMH battery before operation.

- Before charging the NiMH battery, double-check that the transmitter power switch is in the OFF position.

- Overcharging reduces the life of the battery and can result in electrolyte spills, overheating, and bursting. This may cause personal injury and/or property damage.

- Do not plug the charger into anything other than an AC 110v power outlet. Plugging the charger into anything other than AC 110v outlet may result in smoking, sparks, or fire.

- Do not throw the NiMH battery or abuse it in any manner. Do not dispose of the NiMH battery in the fire or allow it to overheat.

- Do not short-circuit the NiMH battery terminals with wire or any other object.

## *CHARGING THE TRANSMITTER BATTERY*

1) Plug the round connector from the charger into the charging jack in the grip of the transmitter.

2) Plug the supplied charger into a 110v AC wall socket. The charger LED will illuminate red indicating that the charger is plugged in and charging.

3) Transmitter charger output is 150mAH, therefore, it will take approximately 10 hours to recharge a fully-discharged battery. We suggest leaving the charger on overnight.

⚠ If the charger is plugged into the wall socket, but not to the charging jack in the transmitter, the LED will illuminate green.

110v Wall Outlet

To Charging Jack
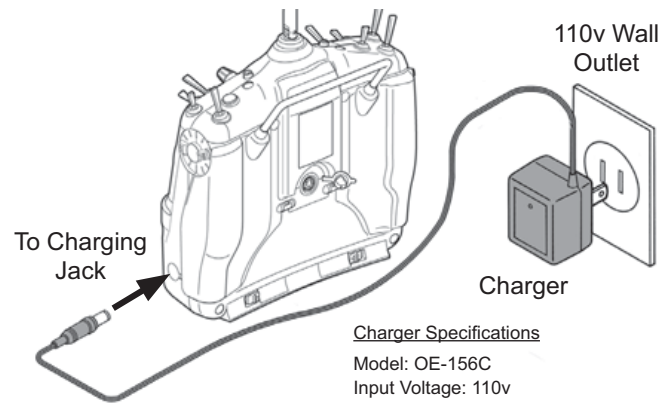
Charger

Charger Specifications
Model: OE-156C
Input Voltage: 110v
Tx Output Voltage: 8.5v@150mA

⚠ It's safe to charge a full-discharged battery from 10 to 15 hours. We do not suggest allowing the battery to charge for more than 15 hours.

> **WARNING** An after-market peak-detection charger and/or cycler can be used to charge the NiMH transmitter battery, however, the battery must first be removed from the transmitter to be charged. The circuitry within the transmitter will interfere with the peak-detection charger's normal operation, resulting in over-charging and damaging the battery and possibly the transmitter itself. Damage caused by charging the battery through the transmitter using anything other than the charger included with the SD-10GS transmitter will not be covered under warranty.

## *USING A TRANSMITTER LI-PO BATTERY*

An after-market Li-Po battery can be used in place of the stock 6 cell 7.2v 1500mAH NiMH transmitter battery. If you decide to replace the stock battery with a Li-Po battery, please observe the following:

- Use ONLY a 2 Cell 7.4v Li-Po battery of desired capacity. **DO NOT USE A 3 CELL 11.1V LI-PO BATTERY.**

- You MUST remove the battery from the transmitter to charge the battery.

- When you change the connector on your Li-Po battery, please observe correct polarity. See diagram above.

# AIRBORNE SYSTEM CONNECTIONS

Use the diagram below to familiarize yourself with how to connect the switch harness, servos, and receiver battery to your 92104 10-Channel receiver.

⚠ A receiver battery is not included. The receiver can be powered by a 4.8v - 6.0v NiCD or NiMH battery pack of desired capacity. The receiver can also be powered by a 2 cell Li-Po battery. See the Using a Receiver LI-PO Battery section below.
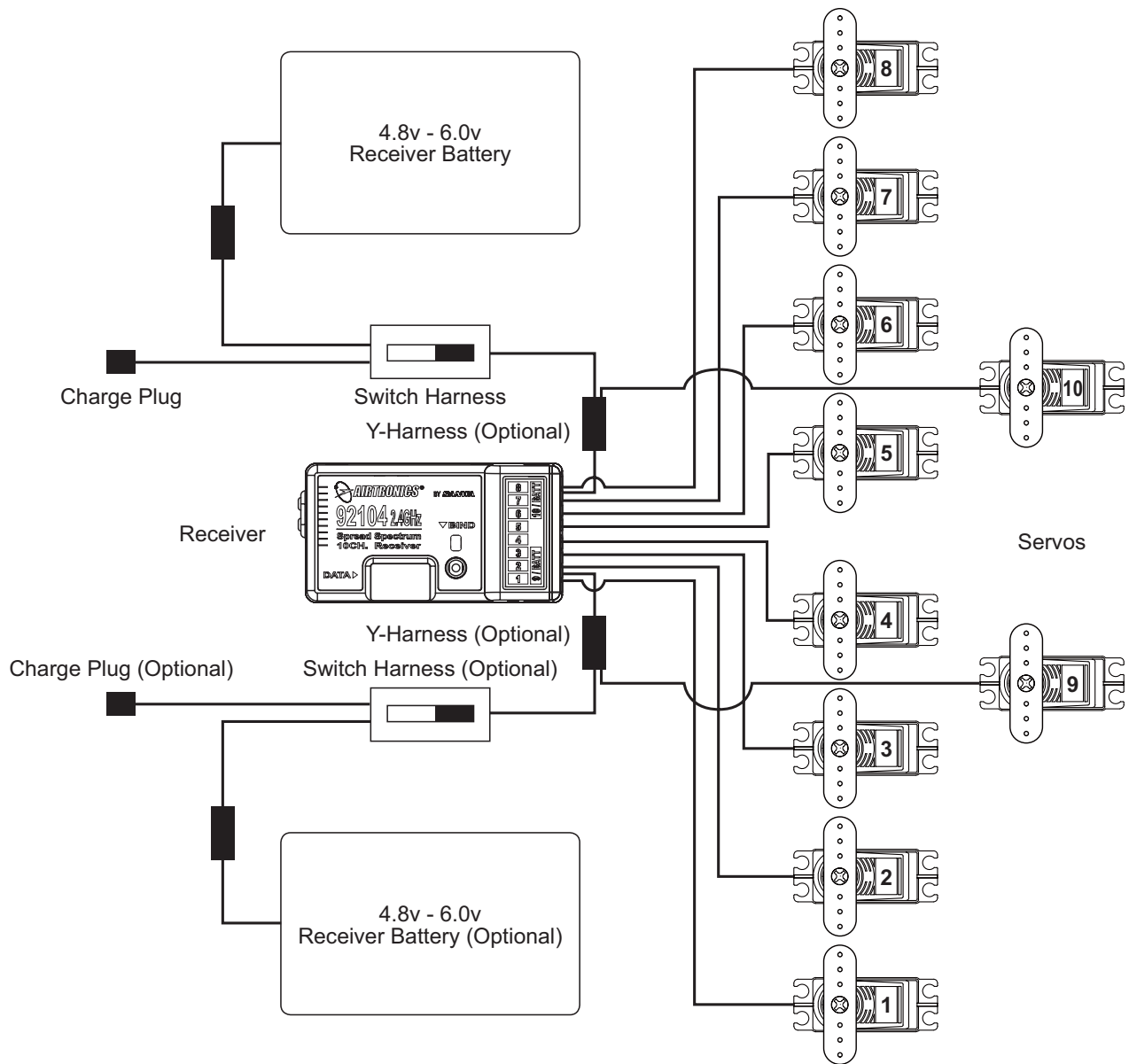


⚠ Up to 10 servos can be plugged into the receiver separately. To utilize the Channel 9/BATT and the Channel 10/BATT slots, a Y-Harness must be used to plug the servo into if a battery is also used in that slot.

⚠ Two separate 4.8v - 6.0v batteries and switch harness can be used at one time. This will allow redundancy should a battery or switch harness fail. Receiver battery circuitry is wired in parallel, so battery voltage will remain the same, yet capacity will be increased.

## USING A RECEIVER LI-PO BATTERY

An after-market Li-Po battery can be used to power the receier instead of the standard NiCD or NiMH battery. If you decide to use a Li-Po battery to power the receiver, please observe the following:

- Use ONLY a 2 Cell 7.4v Li-Po battery of desired capacity. **SEE WARNING BELOW.**



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

- When you change the connector on your Li-Po battery, please observe correct polarity.

**WARNING** The receiver can use a battery pack rated from 4.8v to 6.0v. A 2 cell Li-Po battery pack is 7.4v. Because of the higher voltage, you MUST use a voltage regulator plugged in between the switch harness and the Li-Po battery to drop the Li-Po battery voltage to 6.0 volts. If you do not use a voltage regulator, damage to the receiver will result.
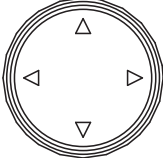
# LCD DISPLAY AND PROGRAMMING KEYS

The SD-10GS 2.4GHz FHSS-3 transmitter features three Programming Keys, an F-MODE key, and a Navigation Pad and ENTER Key, all used in  conjunction to facilitate programming. This section summarizes the functions of these features in addition to detailing the main areas of the LCD Display.

## PROGRAMMING KEYS OVERVIEW

Moving around the LCD Display and programming the transmitter is accomplished using the Navigation Pad and ENTER key, the three Programming Keys, and the F-MODE key positioned on the right half of the transmitter.

Yes/+ Key

END Key

No/- Key

ENTER Key

F-MODE Key      Navigation Pad
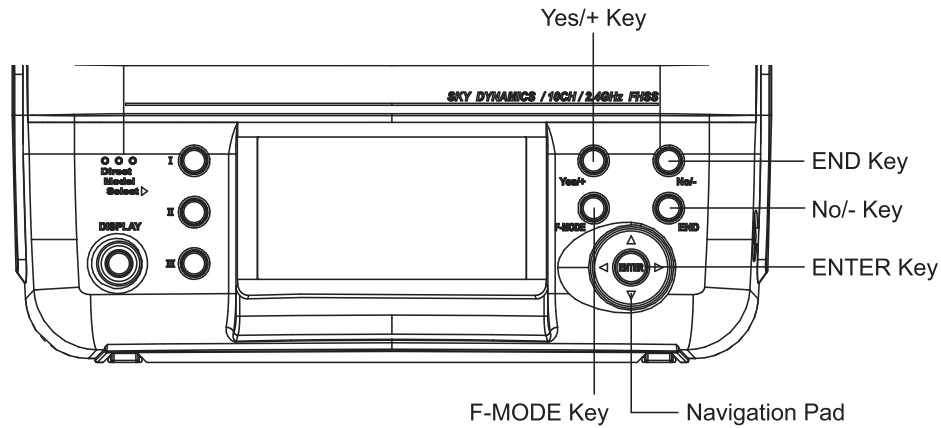
⚠ The Display Key activates the transmitter's LCD Display without actually turning the transmitter ON. This allows you to check and/or change programming settings without actually turning the transmitter ON. To turn only the LCD Display ON, press and hold the DISPLAY Key for ~ 2 seconds. To turn the LCD Display OFF, press the DISPLAY Key once.

| KEY | NAME | FUNCTION |
|---|---|---|
| Yes/+ | YES/+ Key | Increases numerical programming values and selects ON/OFF, NOR/REV, and ACT/INH programming options. Also verifies function settings. |
| No/- | NO/- Key | Decreases numerical programming values and selects ON/OFF and NOR/REV programming options. |
| F-MODE | F-MODE Key | Cycles through the five flight modes within the Fllight Mode menu. Also locks/unlocks programming changes in the Surface menu. |
| END | END Key | Returns to the previous menu. Press several times to return to the Top menu. |
| Navigation Pad | Navigation Pad | Moves the Programming Cursor Up ▲, Down ▼, Right ▶, and Left ◀. |
| ENTER | ENTER Key | Opens the selected menu or programming option. Advances the cursor in the User Name and Model Name menus. |
| Yes/+   No/- | YES/+  NO/- Key Sequence (Reset) | Pressing both keys together will Reset the selection to the Factory Default Setting. Also resets the Timer display on the Top menu. |

## LCD DISPLAY OVERVIEW
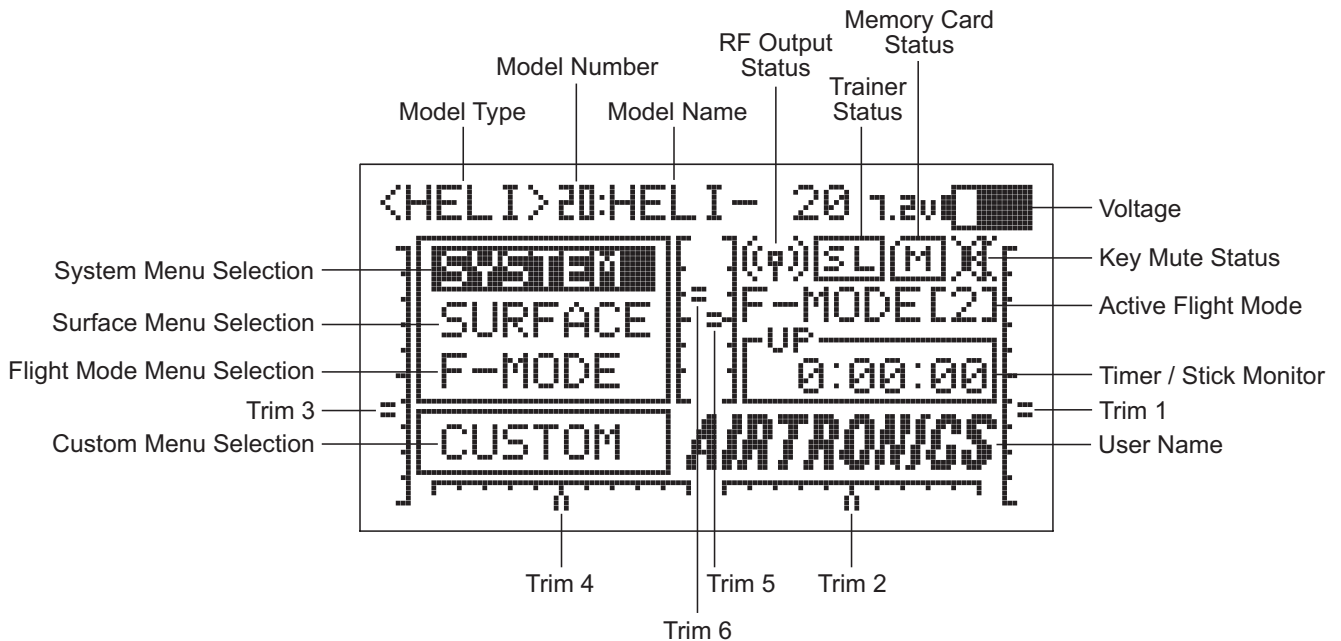


**Active Flight Mode:** Displays the currently active Flight Mode.

**Custom Menu Selection:** Displays the Custom menu. The Custom menu is used to access your most-used programming options.

**Flight Mode Menu Selection:** Displays the Flight Mode menu programming options for each of the five programmable flight modes. Flight Mode menu programming options vary depending on the Model Type selected.

**Key Mute Status:** Displays the current status of the Key Mute function. When active a tone will sound with each key-press. When disabled the tone will be muted with each key-press.

**Memory Card Status:** Displays when the Memory Expansion Card is installed in the transmitter.

**Model Name:** Displays the name of the currently selected model.

**Model Number:** Displays the number (1-20) of the currently selected model.

**Model Type:** Displays the currently active Model Type loaded into memory, either Aero, Glider, or Heli.

**RF Output Status:** Displays the current RF Output Status of the transmitter. When the transmitter is turned ON and transmitting a strong signal (ꙮ) is displayed. When the signal is low or otherwise degraded (ꙮ) is displayed. When the transmitter is turned OFF, but the LCD Display is turned ON is displayed.

**Surface Menu:** Displays the Control Surface Menu programming options. Surface Menu programming options vary depending on the Model Type selected.

**System Menu:** Displays the System Menu programming options. System Menu programming options are the same for each of the three Model Types.

**Timer / Stick Monitor:** Displays the currently active Timer. Can also display the currently active Stick Monitor.

**Trainer Status:** Displays when the transmitter Trainer function is active. If the transmitter is in Master mode, MS will be displayed. If the transmitter is in Slave mode, SL will be displayed.

**Trim 1-6:** Displays the current position of the specific trim switch [T1 Elevator, T2 Aileron, T3 Throttle, T4 Rudder, T5 Hovering Throttle (Heli only), and T6 Hovering Pitch (Heli only)]. When each of the trim switches are moved to center (zero), an audible tone will sound.

**Voltage:** Displays the current voltage of the transmitter battery. When the voltage reaches 6.7 volts, a low voltage alarm will sound.

**User Name:** Displays the currently programmed User Name. The default User Name is AIRTRONICS.

# TRANSMITTER AND RECEIVER BINDING

When new, it is necessary to pair the transmitter and receiver to prevent interference from radio controllers operated by other users. This operation is referred to as 'binding'. Once the binding process 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.

A Safety Link function is featured which can be used to program a unique bind code to each receiver/model pair, preventing the transmitter from controlling a model that it's not currently programmed for.

⚠ Although the SD-10GS transmitter can be used with Airtronics FHSS-1 2.4GHz receivers, such as the Airtronics 92824 2.4Ghz receiver included with the RDS8000 2.4GHz radio control system, the Safety Link feature is not supported.

> **IMPORTANT** The information in this section assumes that you're binding a new SD-10GS transmitter and receiver in the default configuration. For more information on Modulation and Safety Link settings, and how they're used, see page XX.

1) Turn the transmitter ON. If this is the first receiver/model pair you are binding, verify that the currently selected model number is 01:SANWA-01 (new radio default model). If it is not, select model 01 via the MODEL SELECT menu. For more information, see page XX.

2) Verify that SYSTEM is highlighted, then press the ENTER key to display the SYSTEM menu. If SYSTEM is not highlighted, press the END key until SYSTEM is highlighted.

3) Press the Navigation Pad ▼ to highlight MODULATION, then press the ENTER key to display the MODULATION menu. The cursor will default to MODULATION > FH3.

```
MODULATION            ▰▱
MODULATION   >FH3
SAFETY
    LINK NO.>1
TRANSMIT
   BIND CODE>OFF
```

4) Press the Navigation Pad ▼ to to move the cursor to SAFETY LINK NO. By default the number should be 1, which matches the currently selected model (01:SANWA-01).

5) Press the Navigation Pad ▼ to move the cursor to TRANSMIT BIND CODE. OFF will be displayed.

6) While holding down the Bind Button on the receiver, turn the receiver ON. The Bind LED on the receiver will blink slowly. After ~ 2 seconds release the Bind Button. The Bind LED on the receiver will continue to blink slowly.
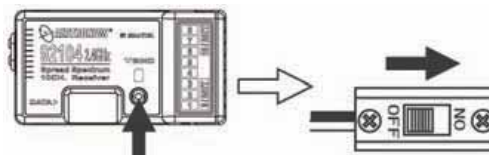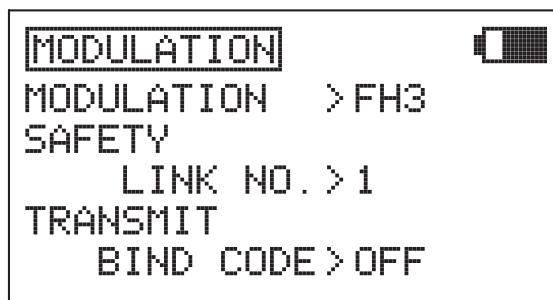
⚠ Use the tip of a pencil or a 1.5mm hex wrench to reach the Bind Button in the receiver.

5) Quickly press the YES/+ key. The green RF Output Indicator will blink, the TRANSMIT BIND CODE selection will change to ON, and BINDING will blink. The Bind LED on the receiver will blink rapidly for ~ 3 seconds, then go out.

```
MODULATION            ▰▱
MODULATION   >FH3
SAFETY
    LINK NO.>1
TRANSMIT
   BIND CODE>OFF BIND
```
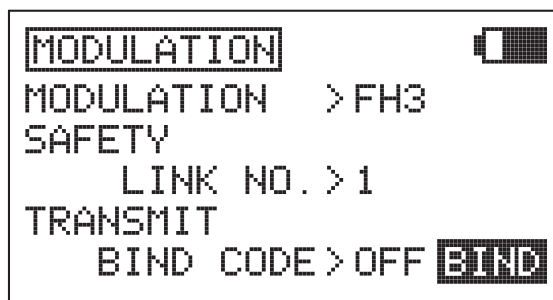
6) After Bind LED on the receiver goes out, press the END key. The Bind LED on the receiver, as well as the green RF Output Indicator, will turn solid and the LCD Display will revert to the SYSTEM menu indicating the binding process is complete. Press the END key two times to return to the Top menu.

⚠ When the binding procedure is successful, the Bind LED on the receiver will stay solid blue when both the transmitter and receiver are turned ON. If the Bind LED on the receiver is blinking rapidly or not ON at all, the transmitter and receiver are not paired. In this case, turn both the transmitter and receiver OFF, then repeat the binding procedure.

⚠ The SD-10GS transmitter is compatible with FHSS-3 and FHSS-1 Airtronics 2.4GHz receivers. To bind the transmitter to an FHSS-1 receiver, such as the Airtronics 92824 2.4Ghz receiver included with the RDS8000 2.4GHz radio control system, the transmitter modulation must first be changed to FH1. For more information, see page XX.

# MOUNTING THE RECEIVER

When mounting the receiver in your model, it's important to mount the receiver exactly as described. In addition, the receiver should be wrapped in foam rubber to protect it from vibration. Failure to mount the antenna wires as described can result in poor reception, or in some cases, complete loss of reception.

⚠ We recommend that you bind the transmitter and receiver prior to mounting the receiver into your model.

The receiver should be mounted securely in your model and the antenna wires installed per the diagram below. The two antenna wires should be mounted to a wood or plastic non-conductive part of your model and angled so that the reception wires are positioned 90º apart. Under no circumstances should the antenna reception wires be parallel to each other.

**WARNING** It is extremely important that the antenna wires be mounted as described. This will ensure that your model receives control signals no matter what its posture, altitude, or heading.



Receiver    Receiver    Receiver    Receiver



Coaxial Cables

Reception Wire   90°   Reception Wire
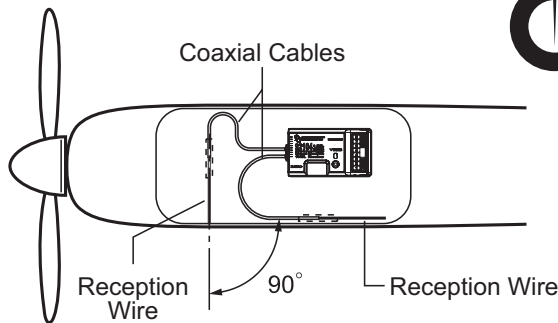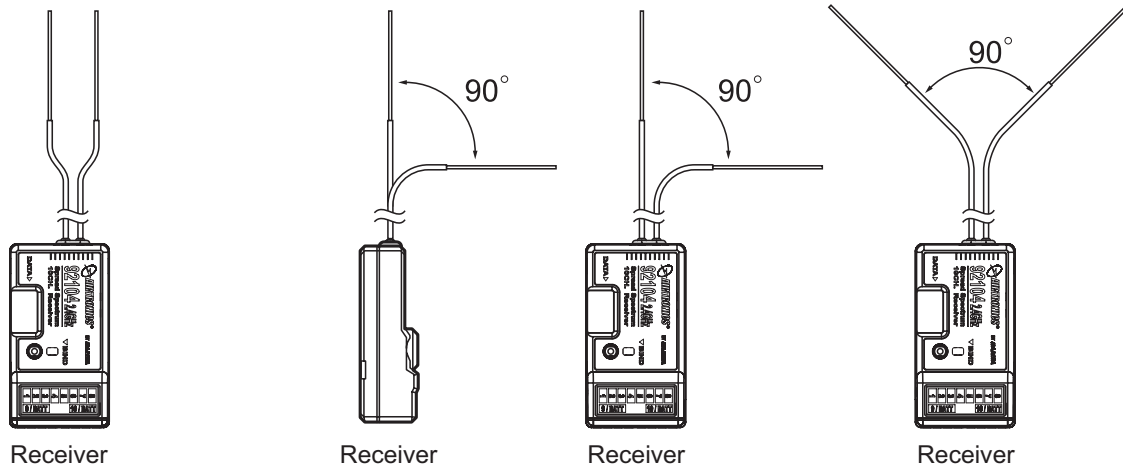
⚠ If mounting inside a carbon fiber fuselage, the antenna reception wires must be run outside of the model as described in the notation below.

Plastic Tube    Reception Wire
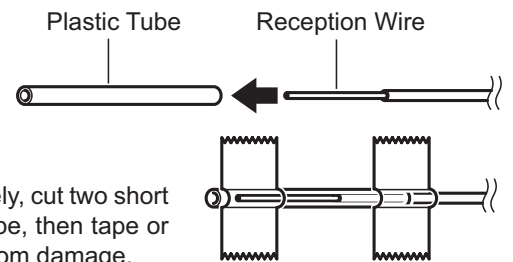


Tape can be used to secure the antenna reception wires to your model. Alternatively, cut two short pieces of plastic tube and slide one antenna reception wire into each piece of tube, then tape or glue the tube to your model. The tubes will protect the antenna reception wires from damage.

- The receiver antenna wires consists of two coaxial cables and two reception wires (the thin tip at the end of the coaxial cables). When you mount the receiver antenna wires, do not bend the reception wires. Reception performance decreases if the reception wires are bent.

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

- The coaxial cables (the thicker portion of the antenna wires) can be bent into gentle curves; however, do not bend the coaxial cables acutely, or repeatedly bend them, or the antenna cores can be damaged.

- When installed in an electric-powered model, keep the receiver antenna wires as far away from the motor, battery, and electronic speed control (ESC) as possible.

- When installing the receiver, the antenna reception wires (the thin tip at the end of the coaxial cables) should not come into contact with any carbon or metal components (conductive components). Aircraft fuselages and helicopter frames may contain conductive components. If mounting the receiver surrounded by conductive materials (for example, a carbon fiber fuselage), mount the receiver so that the antenna reception wires can be extended outside of the model. Reception can be blocked if the antenna reception wires are shielded inside a carbon fiber fuselage.

# RANGE CHECKING (LOW POWER MODE)

The SD-10GS 2.4GHz FHSS-3 radio control system features a Low Power Mode function which lowers the transmitter's RF output level to check radio signal reception. Use this function to check radio signal reception on the ground, prior to flight.

> **IMPORTANT**  The radio control system should be Range Checked prior to the day's first flight and prior to the first flight after a hard landing or after a repair. This will ensure that the transmitter and receiver are communicating properly prior to flight. This ensures the safety of your model, yourself, and the people around you.

1)  Turn the transmitter ON. Verify that SYSTEM is highlighted, then press the ENTER key to display the SYSTEM menu. If SYSTEM is not highlighted, press the END key until SYSTEM is highlighted.

```
LOW POWER MODE       ▐███

    POWER > NORMAL
```
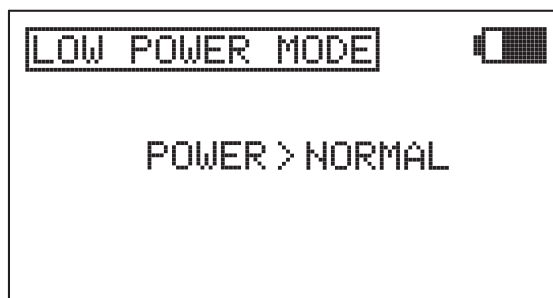
2)  Press the Navigation Pad ▼ to highlight LOW POWER MODE, then press the ENTER key to display the LOW POWER MODE menu. The cursor will default to POWER > NORMAL.

```
LOW POWER MODE       ▐███

    POWER > LOW
```

3)  Press the YES/+ or NO/+ keys to place the transmitter in Low Power Mode. The green RF Output Indicator will blink, the POWER selection will change to LOW, and an audible alarm will sound. The transmitter is now in Low Power Mode and you can begin the range check process.
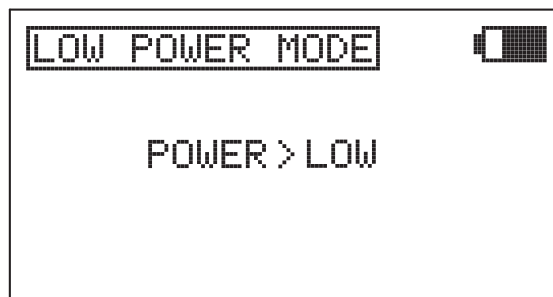
4)  With the transmitter in Low Power Mode, walk approximately 30 paces from your model (approximately 90 feet) and, with the help of another person, check to make sure that the servos move without any problems. If there is a problem with servo movement, try moving to a different position while still maintaining the same distance from your model, then check servo movement again. If there is still a problem, **DO NOT FLY**. Check to make sure that all receiver, servos, switch, and onboard battery connections are correct and secure. Check to ensure that the antenna wires are correctly mounted as described previously.

5)  After you have completed your range check, press the YES/+ or NO/- keys to place the transmitter back into NORMAL mode. In NORMAL mode, the RF Output Indicator will be solid green, the POWER selection will change to NORMAL, and the audible alarm will cease. Press the END key two times to return to the Top menu.

| POWER MODE | TRANSMITTER STATUS |
| --- | --- |
| Low Power Mode | Green RF Output Indicator Blinks, Power Selection > LOW, Audible Alarm |
| Normal Mode | Red and Green Output Indicators Solid, Power Selection > NORMAL, No Audible Alarm |

⚠ The transmitter will stay in Low Power Mode until you place in back into NORMAL mode by following step 5 above.

> **WARNING**  Do not attempt to fly with the transmitter in Low Power Mode. You will be unable to control your model once it is a certain distance away from you.

⚠ If, after checking all airborne system components and verifying correct antenna wire mounting, your radio control system still fails the Range Check, **DO NOT FLY**. Please contact Airtronics Customer Service.

The Fail Safe function automatically sets 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 battery. The Fail Safe function can be set to Hold the servos in the last position they were in when the signal was lost, or each of the servos can be set to move to a custom position when the signal is lost. For example, for a model aircraft, the Fail Safe can be set so that the throttle servo returns to low, the elevator moves slighly up, and the ailerons move slightly right or left, to result in a shallow downward decent.

⚠ Custom servo positions can be set independently for all 10 channels.

**IMPORTANT** In the default configuration, all Fail Safe settings are INHIBITED. In this configuration, if the signal between the transmitter and the receiver is interrupted, whether due to signal degradation or to low battery, the servos will stay in the last position they were in when the signal was lost.
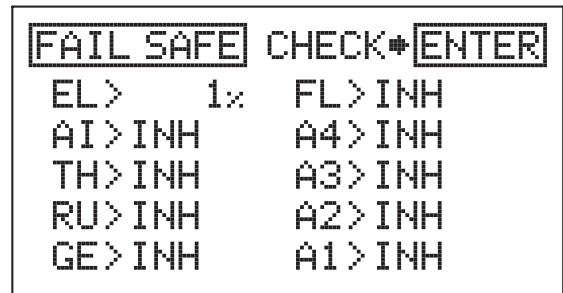
### Preprogrammed Fail Safe Settings

The SD-10GS transmitter features preprogrammed Fail Safe settings that differ by the Model Type currently selected. These Fail Safe setttings can be used, or you can program your own custom Fail Safe settings. See Custom Fail Settings on the next page.

1) Turn the transmitter ON. Verify that SYSTEM is highlighted, then press the ENTER key to display the SYSTEM menu. If SYSTEM is not highlighted, press the END key until SYSTEM is highlighted.

2) Press the Navigation Pad ▼ to highlight FAIL SAFE, then press the ENTER key to display the FAIL SAFE menu. The cursor will default to EL > INH.

3) With the cursor next to EL > INH, press the YES/+ key to set the preprogrammed elevator Fail Safe position. A percentage value will be displayed.

⚠ Press the Navigation Pad ▶ to move the cursor to the right column.

```
┌─────────────────────────┐
│ FAIL SAFE  CHECK◆ ENTER │
│   EL>    1%    FL>INH    │
│   AI>INH       A4>INH    │
│   TH>INH       A3>INH    │
│   RU>INH       A2>INH    │
│   GE>INH       A1>INH    │
└─────────────────────────┘
```

4) Press the Navigation Pad ▼ to move the cursor to AI > INH, then follow the same procedures to set the preprogrammed aileron Fail Safe position.

5) Repeat the same procedures to set the preprogrammed Fail Safe positions for the desired remaining channels. After setting the preprogrammed Fail Safe positions, check the Fail Safe settings. See Fail Safe Check on the next page.

| AERO | GLIDER | HELI |
|---|---|---|
| EL (Elevator) > 1% Up | EL (Elevator) > 1% Up | EL (Fore/Aft Cyclic) > 1% Up |
| AI (Aileron) > 0% Neutral | LA (Left Aileron) > -17% Down | AI (Left/Right Cyclic) > 0% Neutral |
| TH (Throttle) > -100% Down | MT (Motor) > -100% Down | TH (Throttle) > -100% Down |
| RU (Rudder) > 0% Neutral | RU (Rudder) > 0% Neutral | RU (Tail Rotor) > 0% Neutral |
| GE (Gear) > -100% Down | GE (Gear) > -100% Down | GY (Gyro) > 100% Up |
| FL (Flaps) > 0% Neutral | RA (Right Aileron) > 18% Up | PI (Collective) > -118% Down |
| A4 (Auxiliary 4) > 0% Neutral | FL (Flaps) > -118% Down | GV (Governor) >100% Up |
| A3 (Auxiliary 3) > -100% Down | A3 (Auxiliary 3) > 0% Neutral | A3 (Auxiliary 3) > -100% Down |
| A2 (Auxiliary 2) > 7% Up | A2 (Auxiliary 2) > -100% Down | A2 (Auxiliary 2) > -100% Down |
| A1 (Auxiliary 1) > 88% Up | A1 (Auxiliary 1) > 7% Up | A1 (Auxiliary 1) > 7% Up |

⚠ The percentage value is the percentage the servo will move. The percentage will be either negative or positive and is determined by the REV/NOR status of the channel. Percentages in the table above assume NOR channel status. If the channel is Reversed (REV), the percentage value will be the opposite of what is shown. If you change a servo direction AFTER setting the Fail Safe values, you should reset that Fail Safe value to ensure that the servo moves the correct direction. This will ensure that the control surface will move the direction described.

# FAIL SAFE

## Custom Fail Safe Settings

1) Turn the transmitter ON. Verify that SYSTEM is highlighted, then press the ENTER key to display the SYSTEM menu. If SYSTEM is not highlighted, press the END key until SYSTEM is highlighted.

2) Press the Navigation Pad ▾ to highlight FAIL SAFE, then press the ENTER key to display the FAIL SAFE menu. The cursor will default to EL > INH.

3) With the cursor next to EL > INH move the elevator control stick in the direction and the amount you want the elevator to move to when the Fail Safe activates.

4) While holding the elevator control stick in postion, press the YES/+ key to set the elevator Fail Safe position. A percentage value will be displayed.

```
┌─────────────────────────┐
│FAIL SAFE CHECK◆ENTER    │
│ EL>   12%   FL>INH      │
│ AI>INH      A4>INH      │
│ TH>INH      A3>INH      │
│ RU>INH      A2>INH      │
│ GE>INH      A1>INH      │
└─────────────────────────┘
```

5) Press the Navigation Pad ▾ to move the cursor to AI > INH, then follow the same procedures to set the preprogrammed aileron Fail Safe position.

⚠ Press the Navigation Pad ▸ to move the cursor to the right column.

```
┌─────────────────────────┐
│FAIL SAFE CHECK◆ENTER    │
│ EL>   12%   FL>INH      │
│ AI>   10%   A4>INH      │
│ TH>INH      A3>INH      │
│ RU>INH      A2>INH      │
│ GE>INH      A1>INH      │
└─────────────────────────┘
```

6) Repeat the same procedures to set the preprogrammed Fail Safe positions for the desired remaining channels. After setting the custom Fail Safe positions, check the Fail Safe settings. See Fail Safe Check below.

⚠ The percentage value is the percentage the servo will move. The percentage will be either negative or positive and is determined by the REV/NOR status of the channel. Regardless of the REV/NOR setting, the control surface will move the same direction the control stick is moved. If you change a servo direction AFTER setting the Fail Safe values, you should reset that Fail Safe value to ensure that the servo moves the correct direction.

## Fail Safe Check

1) With the cursor anywhere in the FAIL SAFE menu, press the ENTER key to check the Fail Safe settings. The servos will move to the predetermined positions for ~ 5 seconds, then return to normal.

⚠ Before flying make sure that the control surfaces are moving the correct direction when the Fail Safe function is activated.

```
┌─────────────────────────┐
│FAIL SAFE CHECK◆ENTER    │
│ EL>   12%   FL>INH      │
│ AI>   10%   A4>INH      │
│ TH>INH      A3>INH      │
│ RU>INH      A2>INH      │
│ GE>INH      A1>INH      │
└─────────────────────────┘
```

2) After verifying correct operation, press the END key two times to return to the Top menu.

⚠ Fail Safe settings are specific to each model. For example, you can have certain Fail Safe settings for Model 1 and different Fail Safe settings for Model 2, and so on.

⚠ The Fail Safe settings will be retained even if the transmitter loses power or if the transmitter and receiver must be paired again.

## Clearing Fail Safe Settings

1) In the Fail Safe menu, use the Navigation Pad to move the cursor to the desired channel you would like to clear the Fail Safe setting from.

2) To reset the Fail Safe setting to INH, press the YES/+ and NO/- keys at the same time, then repeat these procedures to reset the Fail Safe setting for the desired remaining channels. Press the END key two times to return to the Top menu.