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SPM-1033
Safe 8
Channel
Receiver

SPEKTRUM SPM-1033 Safe 8 Channel Receiver Instruction Manual

Contents

SPEKTRUM SPM-1033 Safe 8 Channel Receiver

Specifications

- **Type:** AR8360T+ DSM2/DSMX AS3X+ Telemetry Receiver
- **Application:** Air
- **Channels:** 8
- Remote Receiver (not included)
- **Modulation:** DSM2/DSMX
- **Telemetry:** Yes
- **Failsafe:** Yes
- **Band:** AS3X+

Product Usage Instructions

Receiver Power System Requirements

Ensure the power system meets the recommended guidelines.

Perform tests to verify power system performance:

1. View receiver voltage on transmitter's telemetry screen.
2. Load control surfaces while monitoring voltage at the receiver.
3. Voltage should remain above 4.8 volts even when all servos are loaded.

Installing the AR8360T+ Receiver

1. Mount the receiver using double-sided servo tape in a square position with the fuselage.
2. Connect servos to their respective ports on the receiver based on the provided list.

CAUTION: Always perform a control surface check and AS3X+ control surface response test before flying a new setup or after any setup changes to prevent crashes.

FAQ

Q: What age group is this product suitable for?
A: This product is not for children under 14 years old. It is intended for hobby-grade, remote-controlled vehicles.

Q: How should I handle throttle cut?
A: Throttle cut should be engaged when the aircraft is powered on and not in operation to prevent the motor from rotating. Only install the propeller once the throttle has been confirmed to operate correctly and failsafe has been set.

NOTICE
All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, LLC. For up-to-date product literature, visit horizonhobby.com or towerhobbies.com and click on the support or resources tab for this product.

Meaning of Special Language

The following terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

WARNING: Procedures, which if not properly followed, create the probability of property damage, collateral damage, and serious injury OR create a high probability of superficial injury.

CAUTION: Procedures, which if not properly followed, create the probability of physical property damage AND a possibility of serious injury.

NOTICE: Procedures, which if not properly followed, create a possibility of physical property damage AND a little or no possibility of injury.

Age Recommendation: Not for children under 14 years. This is not a toy.

WARNING: Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

This is a sophisticated hobby product. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the product or other property. This product is not intended for use by children without direct adult supervision. Do not attempt disassembly, use with Incompatible components or augment product in any way without the approval of Horizon Hobby, LLC. This manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or serious injury.

WARNING AGAINST COUNTERFEIT PRODUCTS: Always purchase from a Horizon Hobby, LLC authorized dealer to ensure authentic high-quality Spektrum product. Horizon Hobby, LLC disclaims all support and warranty with regards, but not limited to, compatibility and performance of counterfeit products or products claiming compatibility with DSM or Spektrum technology.

NOTICE: This product is only intended for use with unmanned, hobby-grade, remote-controlled vehicles. Horizon

Hobby disclaims all liability outside of the intended purpose and will not provide warranty service related thereto.

AR8360T+ AS3X+ and SAFE Telemetry Receiver

The Spektrum™ AR8360T+ Receiver is full range with telemetry, and is compatible with all Spektrum™ DSM2®
and DSMX® technology transmitters. Perform the setup for the AR8360T+ receiver through a compatible
Spektrum Transmitter with Forward Programming. The Spektrum PC Programmer can be used for firmware
updates.

IMPORTANT: The AR8360T+ receiver only uses forward programming for the configuration, do not use the
AS3X+ menu in the main transmitter menu.

WARNING: If equipped, the propeller should not be installed on the motor during the setup procedure. Only install
the propeller once the throttle has been confirmed to operate correctly and the failsafe has been set.

As an additional safety feature, we recommend the throttle cut is enabled. Throttle cut should be engaged any
time the aircraft is powered on and not in operation. The motor will not rotate when throttle cut is in the ON
position.

Specifications

AR8360T+	
Type	DSM2/DSMX AS3X+ Telemetry Receiver
Application	Air
Channels	8
Remote Receiver (not included)	SRXL2™ Remote Receiver Optional [SPM9747, SPM4651T]
Modulation	DSM2/DSMX
Telemetry	Integrated
Failsafe	Yes
Band	2.4GHz
Dimensions (LxWxH)	49 x 30 x 15mm
Weight	16g
Input Voltage	3.5–9V
Resolution	2048

Bind Button
SRXL2 Port
XBUS Port
Voltage Sensor Port
Smart Port
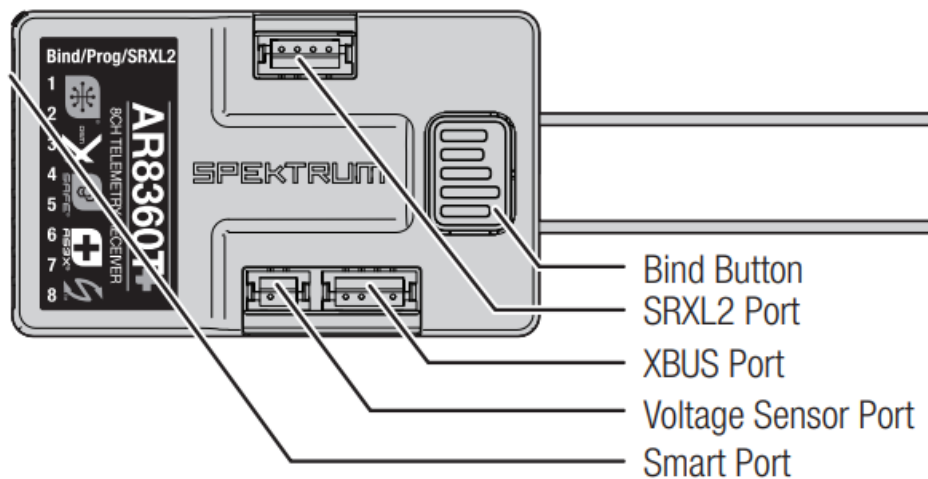
Smart Throttle

With Smart Technology the normal servo connector delivers the throttle signal to the ESC, plus the ESC can send telemetry data like voltage and current back to the receiver. The AR8360T+ receiver throttle port (Channel 1 port only) will automatically detect when a Smart compatible ESC is connected. ESCs with Smart and IC series connectors can also pass along battery data from compatible Spektrum Smart batteries. Spektrum Avian™ ESCs are compatible with the AR8360T+ receiver for Smart Technology features.
For Smart to function you must have a Smart ESC paired with a Smart telemetry receiver, and a Spektrum DSMX transmitter with telemetry. An update for your transmitter may be required for Smart features. See www.spektrumrc.com

to register and update your transmitter.

If a standard ESC or servo is plugged into the throttle port on the AR8360T+ receiver, the throttle port will operate normally (PWM signal) like any conventional RC system.

Receiver Power System Requirements

Some of the power system components that affect the power supply to the receiver include:

- Receiver battery pack (number of cells, capacity, cell type, state of charge).
- The ESC's capability to deliver adequate voltage to the receiver when the servos demand high current
- The switch harness, battery leads, servo leads, regulators etc.

  The AR8360T+ has a minimum operational voltage of 3.5 volts; it is highly recommended the power system be tested per the guidelines below.

Recommended Power System Test Guidelines
We recommend performing the following tests on any new setup to verify power system performance:

1. View the receiver voltage during this test on your transmitter's telemetry screen.
2. Load the control surfaces (apply pressure with your hand) while monitoring the voltage at the receiver.
3. The voltage should remain above 4.8 volts even when all servos are loaded.

How QuickConnect™ Technology Works

- When the receiver voltage drops below 3.5 volts, the system ceases to operate.

- When power is restored, the receiver immediately attempts to reconnect.
- If the transmitter was left on, the system reconnects typically in about 4/100 of a second.

QuickConnect allows you to fly safely through most short duration power interruptions; however, to prevent a crash, correct the root cause of these interruptions before the next flight.

NOTICE: If a brownout occurs in flight, determine the brownout cause and correct it.

Installing the AR8360T+ Receiver

1. Mount the receiver using double-sided servo tape. The receiver may be mounted upright, upside down or on its side, but it should be square with the fuselage in its mounting position. The receiver cannot be mounted at an odd angle.
2. Connect the servos to their respective ports on the receiver using the list below.

CAUTION: Incorrect installation of the receiver could cause a crash. Always perform a control surface check and AS3X+ control surface response test before flying a new setup, or after any setup changes.

Default Receiver Port Assignments

Bind/Prog/SRXL2= Bind, Aux Device Support, Program

1. = Throttle (Smart Throttle)
2. = Aileron
3. = Elevator
4. = Rudder
5. = Gear
6. = Aux 1
7. = Aux 2
8. = Aux 3

IMPORTANT: When using Y-harness or servo extensions with Spektrum equipment, do not use reversing harnesses. Using reversing Y-harnesses or servo extensions may cause servos to operate erratically or not function at all.

Antenna Installation
The AR8360T+ receiver has coaxial style antennas. We recommend installing the antennas oriented 90º from each other and as far as possible from metal, batteries, carbon fiber or fuel tanks to maximize signal reception performance.

Active portion
of antenna
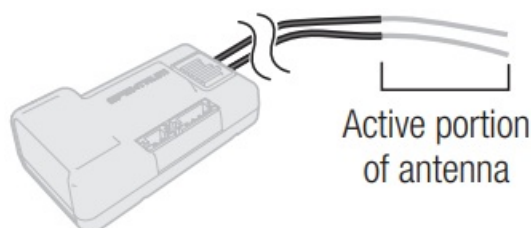
NOTICE: Do not cut, kink, or modify the antennas. Damage to the coaxial portion of an antenna will reduce the

performance of the antenna. Shortening or cutting off the 31mm tip will reduce the range.

Telemetry
The AR8360T+ features full range telemetry and will provide receiver battery voltage, flight log data, and variometer* and altitude* data without any additional sensors. Additional telemetry devices such as voltage sensors can be connected to the volt port, and XBus telemetry sensors can be connected through the XBus connector. Every XBus telemetry device has two XBus ports,and XBus telemetry sensors can be connected in a daisy chain in any order.
See **www.spektrumrc.com** for more information about telemetry accessories.

Transmitter and Receiver Binding
Programming the AR8360T+ receiver requires a Spektrum™ DSM2®/DSMX® compatible transmitter with Forward Programming.

Binding
The AR8360T+ receiver must be bound to your transmitter before it will operate. Binding is the process of teaching the receiver the specific code of the transmitter so it will only connect to that specific transmitter.
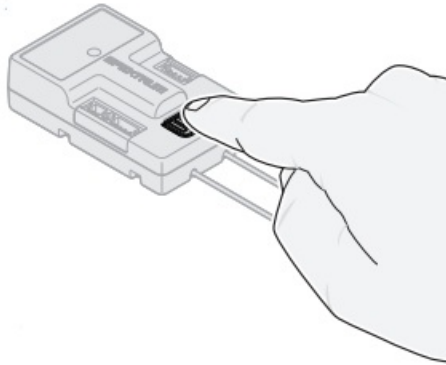
1. Connect up to two optional SRXL2 remote receivers (SPM9747 or SPM4651T) and any telemetry sensors to the main receiver.
2. Push and hold the bind button on the receiver while powering the receiver on.
   -OR-
   Power the receiver on and then press the bind button.
   IMPORTANT: The receiver will not enter bind mode if any previously bound transmitters are powered on before the receiver is powered on.
3. Release the bind button once the orange LED starts to flash continuously, indicating the receiver is in bind mode.
   TIP: It is still possible to use a bind plug in the bind port if desired. This can come in handy if the receiver needs to be mounted in a location that is difficult to access, in which case a servo extension may be used for binding.
   If using a bind plug, remove after binding to prevent the system from entering bind mode the next time the power is turned on.
4. Put your transmitter in bind mode.
5. The bind process is complete when the orange LED on the receiver is solid.

Failsafe

In the unlikely event the radio link is lost during use, the receiver will enable the selected failsafe mode. Smart Safe + Hold Last is the default failsafe mode on the AR8360T+. Preset Failsafe and SAFE Failsafe modes are only available through Forward Programming.

SmartSafe + Hold Last

If loss of signal occurs, SmartSafe™ technology moves the throttle channel to the failsafe position (low throttle) set during binding. All other channels will hold their last position. When the receiver detects the signal from the transmitter, normal aircraft operation resumes.

Preset Failsafe

With preset failsafe, you can set the specific control surface positions you want to use if the signal is lost. When the receiver detects the signal from the transmitter, normal aircraft operation resumes.
Preset failsafe mode is only available through Forward Programming.

SAFE Failsafe

SAFE Failsafe mode will work to automatically level your aircraft if the signal is lost. In the forward programming menu you can select the bank and pitch angles the aircraft will attempt to maintain during failsafe. We recommend setting bank and pitch angles so the aircraft flies a gentle gliding turn, preventing a flyaway.
You must complete First Time SAFE Setup before this option is available.
SAFE Failsafe mode is only available through Forward Programming.

Testing Failsafe

Secure the aircraft on the ground and remove the propeller. Test Failsafe settings by turning the transmitter RF output off and noting how the receiver drives the control surfaces.

Receiver Power Only

- The servo ports will not have a control signal if the receiver is turned on when no transmitter signal is present.
- All channels have no output until the receiver has linked to the transmitter.

Initial Setup

1. Verify your transmitter is updated to the latest Spektrum AirWare™ software to take advantage of Forward Programming. See your transmitter manual for updating instructions.
2. Install the receiver in your airplane.
3. Bind the receiver to your transmitter.
4. Complete the airplane setup on your transmitter including wing type, tail type, channel assignments, mixing, sub trim and travel the same as you would for any other aircraft without AS3X+. Verify the center of gravity is correct and test fly your aircraft.

IMPORTANT: Do not use open mixes for flight control surfaces when setting up a model with the AR8360T+ for AS3X+ and SAFE. Only use wing and tail type options to configure flight controls. Refer to your transmitter manual for more information about wing and tail type features.

Basic AS3X+ Setup

To use AS3X+ technology with the Spektrum AR8360T+ receiver, the receiver must be set up with a compatible, forward programming capable Spektrum transmitter.

- The model must be fully setup in the transmitter and flyable (actual flight testing/verification is preferable).

Things like wing/tail type, subtrims, reversing, travel, absolute travel, etc should all be configured before continuing.

- Ensure you have an empty channel to assign a gain channel.
    1. With the receiver on and bound, in the transmitter, enter Forward Programming iX series: Model Adjust > Forward Programming NX series: Function List > Forward Programming)
    2. In Forward Programming, go to Gyro Settings > First Time Setup.
       Confirm the model configuration prompt in the first 2 pages.
    3. In the orientation setup screen there are two options:
        ○ Use the automatic orientation detection by levelling the model, select Continue, point the model nose down 90 degrees from its level position,and select Continue. Note that for this test, the model doesn't have to be perfectly level in the first step, or perfectly pointing down in the second step. A margin of +/- 30 degrees should still result in a proper capture.
          -ORb.
          Manually set orientation. This is preferable on large models that are difficult to move/tilt while avoiding damage.
    4. Confirm/Select the receiver/sensors orientation in relation to the model and select Continue.
    5. Enter the Gain Channel Select menu:
        ○ For gain channel, choose the empty channel you wish to use for gain adjustment.
        ○ For switch, select the gain adjustment input (trimmer, knob/slider, or switch. Preferable in the provided order)
        ○ If using a trimmer, make sure to lower its value all the way to -100% before flying.
        ○ If using a switch, be aware that -100% is gain off. 0% is half gain, and 100% is full gain. "Switch" is not recommended until you've first found adequate values with a trimmer or knob.
    6. Select Next and then Apply. The receiver will reboot and first time setup should be complete.
    7. Select "Connect" to enter Forward Programming again, then go to Gyro Settings > System Setup > Utilities > Gyro Response Test.
    8. While in this page, move the model in the roll, pitch, and yaw axes. Verify the surface responses counteract the movements. When standing behind the model:
        ○ Rolling left should make the left aileron move down, and right aileron move up.
        ○ Pitching down should make the elevator move up.
        ○ Yawing left should make the rudder move to the right.
    9. Once responses are verified, the first time setup is complete!
        ○ If directions are incorrect, make sure the model's servo reversing on the radio was configured properly before setup. If corrections are made,go to Forward Programming > System Setup > Relearn Servo Settings,change All to Primary, and select Apply. This will retransfer the relevant transmitter model settings to the receiver.
    10. Before flying, make sure the gain channel (switch, knob, trimmer, etc…) is currently set to -100% (-100% is gain off, 0% is half gain, and 100% is full gain).
        Proceed to the Basic Tuning section, or optionally, go to the Advanced Tuning AS3X+ sections of the AS3X+ Setup Guide on the Spektrum Wiki page.

Scan the QR code to go to the Spektrum Wiki page for advanced tuning options

Basic Tuning (AS3X+ Normal Gain, No Flight Modes)

1. Follow the Basic AS3X+ Setup procedure to properly setup the gyro.
2. Before flying, verify the gyro response direction using the Gyro Response Test menu (Forward Programming > Gyro Settings > System Setup > Utilities > Gyro Response Test).
3. Use the gain channel to adjust gain in flight and evaluate the gyro response. Gain should be tuned while flying near or at max speed.
   - In most cases, the user will probably be able to find a gain channel value that offers improved performance without additional tuning of individual settings.
   - Due to the addition of the new parameter Stop Lock Rate delaying gain return from centering the stick, the gain might end up too high without the user noticing.
      - In initial flights, use short/quick stick inputs to induce movement in the model. Due to these delays, short/quick inputs will reduce gain much less, and will allow the model to stop more with the gyro as opposed to naturally.
      - An advanced method of addressing this is to temporarily increase Stop Lock Rate to 100% for all 3 axes. Then stick inputs can be used to evaluate the current gain. This will ensure having full or closer to full gain the moment the stick is released. Start with low gain and work up. If the model continuously oscillates/bounces more than once, then the AS3X+ gain is too high and needs to be reduced. One or two bounces are acceptable. Once the gain is set the Stop Lock Rate can be reset back to defaults to remove any small oscillations.
      - This may not be an issue on windy days as the turbulence should help induce oscillations when the gain is too high.
4. If any axis other than roll starts experiencing oscillations as gain is increased, pitch and yaw can be reduced in Gyro Settings > AS3X+ Settings > AS3X+ Gain.
5. If the gain channel is all the way up and no oscillations can be induced in the model, increase the multiplier (Gyro Settings > AS3X+ Settings).
6. If the gain channel is barely increased and oscillations occur, decrease the gain multiplier to provide a wider window of gain adjustment (Gyro Settings > AS3X+ Settings).
7. Once the desired gain is achieved, note the current value of the gain channel.
8. In the transmitter settings, change the gain channel assignment to a switch, and then using the radios Digital Switch setup menu, adjust the switch's channel outputs to -100% for gyro off, and then another position to XX% (whatever value was noted in the previous step) for gyro on.

TIP: There are other methods of gain changes/disabling the gyro in flight.
See the Advanced Tuning AS3X+ sections of the AS3X+ Setup Guide on the Spektrum Wiki page for more advanced tuning information.

Scan the QR code to go to the Spektrum
Wiki page for advanced tuning options

SAFE Setup

Setting up SAFE Technology on the AR8360T+ Receiver takes place in Forward Programming.

1. Complete the AS3X+ setup and verify operation in flight.
2. Forward Programming Setup: To add SAFE flight stabilization the Flight

Modes on the receiver need to be configured.

1. In your transmitter's menu select

   Forward Programming -> Gyro Settings -> First Time SAFE Setup

   IMPORTANT: Before proceeding with setup, read every information screen that will appear on your transmitter screen.

   Select NEXT at the bottom of each page to continue.
2. Select FM Channel-> Select the channel and switch you want to use for Flight Mode selection. You can select any channel that is not a control surface, throttle or gain. Select Continue.
3. Position the model in a level flight attitude, then select Level Model and Capture Attitude to teach the receiver the baseline setting. For taildragger aircraft be sure to raise the tail so the fuselage is level.
4. Assign SAFE to the desired flight modes. You can enable or disable SAFE for each flight mode. Take into account your flight mode switch position, and set the SAFE Mode as desired for the first switch position.
   - Envelope (Intermediate) mode does not use self leveling. The aircraft will fly like a normal AS3X+ setup, but it will be bank and pitch angle limited.
   - Self Leveling/Angle Demand will make the airplane return to level flight when the control stick is centered.
5. Set the Angle Limits as desired for the first switch position. These values determine how far the aircraft will be allowed to pitch or bank.
6. Move the Flight Mode switch to the other positions, a setup screen for SAFE Mode and Angle Limits will appear for each mode. Set the SAFE Mode and Angle Limits as desired for every mode.
7. After all the Flight Modes are configured as desired for SAFE Modes and Angle Limits, press Apply.
8. Test fly the airplane to verify the configuration.

Tuning SAFE Basics:

1. Perform a control surface direction test, and AS3X+ reaction test. You can verify which modes have SAFE enabled by performing the AS3X+ test, starting at the level flight attitude.
   - AS3X+ reaction will move the control surfaces in response to rotational movement, and then return to center when the rotation stops.
   - SAFE (Self Leveling) will cause the control surfaces to stay deflected as long as the aircraft is banked or pitched.
2. Test fly the airplane to verify the configuration in every flight mode.
3. If the airplane oscillates, immediately slow it down and reduce gain.

   Take note of which flight mode you are in and which axis the aircraft oscillates around. You can increase or decrease the base gain values of each axis separately for each flight mode within the Forward Programming

menu after landing.

4. Tune gain values for each axis within each flight mode.

SAFE Setting menu.
The First Time SAFE Setup should be sufficient to fly your airplane, but to fine tune the SAFE system there are many setup and tuning options.

Select Forward Programming -> Gyro Settings -> SAFE Settings ->

- SAFE Gains can be fine tuned for each axis within each Flight Mode.
- Angle Limits can be changed for each flight mode
- Fixed/ Adjustable Gain operates the same as this feature in AS3X+, but applies to SAFE gain. You can assign a separate SAFE gain channel for roll and pitch if you have enough free channels. Use a different gain channel for SAFE gain than what you have assigned for AS3X+. It is possible to have up to five different channels assigned for fine tuning gain. AS3X+ roll, pitch and yaw, and SAFE roll and pitch. If you are limited by channels, make your gain changes within Forward Programming.
- Capture Gyro Gains operates the same as this feature in AS3X+, but applies to SAFE operation

(AS3X+) System Setup
Select Forward Programming -> Gyro Settings -> System Settings ->

- Relearn Servo Settings can be accessed if any changes are made to the model configuration outside of Forward Programming. If any changes are made to servo reversing, travel, sub-trim, wing type or tail type, you can execute this function instead of restoring factory defaults and redoing the entire setup.
- Orientation can be changed from this menu if the receiver mounting is changed.
- Gain Channel enables you to change the channel you are using to manage gain.
- SAFE/Panic Mode Setup
    1. Panic

       Select a channel to trigger Panic mode. Chose any channel that is not used for a control surface, throttle, flight modes, or gain. We recommend assigning the momentary I button for Panic.

       Delay will cause a two second delay when exiting panic mode Panic Flight Mode selects a Flight Mode to pull the gain values from for Panic operation; select a Flight Mode that is setup with SAFE Roll and Pitch values on this page represent angle limits while in Panic mode.
    2. Throttle To Pitch

       Low Thr to Pitch Threshold determines the trigger point below which the airplane will descend nose down at the chosen angle.

       High Thr to Pitch Threshold determines the trigger point above which the airplane climbs at the chosen angle.
    3. Attitude Trim allows you to redo the Capture Level Flight Attitude, and/or manually fine tune the values based on flight testing.
    4. SAFE Failsafe Flight Mode allows you to select a flight mode (with SAFE configured) to act as a failsafe mode. Making this selection enables SAFE Failsafe.
    5. Failsafe Angles determine the attitude the aircraft will maintain in the event of a failsafe. Set pitch and bank angles to hold the aircraft in a gentle gliding turn, preventing a flyaway.
- Utilities -> Copy Flight Mode Settings

Select a Source and Target Flight Mode to transfer all Flight Mode settings from one Flight Mode to another. All settings in the Target Flight Mode will be overwritten.

Other Settings (Forward Programming)

System Setup
Select Forward Programming -> Other Settings ->

- Select Failsafe -> Select each channel and assign it to Preset or Hold Last. When you select a different channel for Output, a new group of settings appears.

  Capture Failsafe Positions ->

  Hold the control sticks in the desired failsafe positions and select Apply.

  Channel selections must be individually set in Forward Programming to apply the preset positions or each channel will default to Hold Last. The value captured will be reflected in the position shown for each channel.

- Initiate Receiver Bind Mode

  Gives you the option of putting the receiver into Bind Mode from this menu.

- Factory Reset

  Select this option to put the receiver back to factory defaults.

  All settings will be wiped with this selection.

- Restore From Backup

  Select this option to re-instate the model file saved into backup.

- Save to Backup

  The AR8360T+ can store a second model setup file for backup. Use this option if you want to store the settings you have while you test setup changes.

SAFE (Self Leveling) Flying Tips
When flying in SAFE Self Leveling/Angle Demand mode, the aircraft will return to level flight any time the aileron and elevator controls are at neutral. Applying aileron or elevator control will cause the airplane to bank, climb or dive. The amount the stick is moved will determine the attitude the airplane flies. Holding full control will push the aircraft to the pre-determined bank and roll limits, but it will not go past those angles.
When flying with Self Leveling/Angle Demand, it is normal to hold the control stick deflected with moderate to full aileron input when flying through a turn. To fly smoothly with Self Leveling/Angle Demand, avoid making frequent control changes and don't attempt to correct for minor deviations. Holding deliberate control inputs will command the aircraft to fly at a specific angle, and the model will make all corrections to maintain that flight attitude.
When flying with Self Leveling/Angle Demand, you have the option to enable throttle to pitch angle demand. Throttle to pitch will make throttle dictate climb angle. Full throttle will cause the aircraft to pitch up and climb slightly. Mid throttle will keep the airplane flying level. Low throttle will cause the airplane to descend slightly nose-down.

Return the elevator and aileron controls to neutral before switching from Self Leveling/Angle Demand mode to AS3X+ mode. If you do not neutralize controls when switching into AS3X+ mode, the control inputs used for Self Leveling/Angle Demand mode will be excessive for AS3X+ mode and the aircraft will react immediately.

Differences between Self Leveling/Angle Demand and AS3X+ modes
This section is generally accurate but does not take into account flight speed battery charge status, and other limiting factors.

		Self Leveling/ Angle Demand	Envelope
Control Input	Control stick is neutralized	Aircraft will self level	Aircraft will continue to fly at its present attitude
	Holding a small amount of control	Aircraft will bank or pitch to a moderate angle and maintain the attitude	Aircraft will continue to pitch or roll slowly, and stop at the predetermined bank angle limits
	Holding full control	Aircraft will bank or pitch to the predetermined limits and maintain the attitude	Aircraft will continue to roll or pitch rapidly, and stop at the predetermined bank angle limits
	Throttle (Optional: Thr to Pitch)	Full throttle: Climb Mid throttle: Level flight Low throttle: Descend nose-down	Throttle will not affect flight response

AS3X+		
Control Input	Control stick is neutralized	Aircraft will continue to fly at its present attitude
	Holding a small amount of control	Aircraft will continue to pitch or roll slowly
	Holding full control	Aircraft will continue to roll or pitch rapidly
	Throttle (Optional: Thr to Pitch)	Throttle will not affect flight response

Channel Limitations

The AR8360T+ can use up to seven extra channels for AS3X+ and SAFE functions; one for Flight Mode selection, one for Panic Mode, and up to five for Gain. You may use any channel up to 20 that is not a control surface or throttle
for these functions, and you do not need to use channels 5–10, keeping those channels and ports on the receiver open for normal servo operation. However, you may run into channel limitation depending on the number of channels on your transmitter and the number of channels you use on the receiver.

TIP: If you are experiencing limitations because of channel count, here are a few options:

- You can operate the AR8360T+ without a channel assigned to Flight Mode, but you will only have access to AS3X+ options, not SAFE.
- You can set up one self-leveling mode to serve as Panic Mode so you don't need to dedicate a separate channel for Panic Mode.
- You can operate the AR8360T+ without a gain channel assigned, and just use fixed gain values throughout the configuration. To do this, first assign flight mode to a channel, then change all gain values to fixed for flight mode 1, then you can unassign the flight mode channel and it will remain in fixed.

Flight Log
Flight Log data can help you optimize the control link for your aircraft. Flight Log data is displayed on telemetry-capable Spektrum transmitters.

Using the Flight Log

- **A –** Fades on main receiver
- **B** – Fades on remote receiver
- **L** – Fades on remote receiver
- **R –** Not available on AR8360T+
- **F –** Frame losses H – Holds

Fades
Represents the loss of one bit of information on one receiver. Fades are used to evaluate the performance of each individual receiver. If a fade value is showing higher than the others, inspect or reposition the antenna to optimize the RF link.

Frame Loss
A frame loss occurs when one complete data packet is missed. A single frame loss does not represent a loss of control, but frame losses should be monitored.
In the air it's normal to experience as many as 100 frame losses per minute of flight. On the ground the number of frame losses will be higher because the signal is hampered by the dirt and moisture.

Hold
A hold occurs when 45 consecutive frame losses occur. This takes about one second, and in this event the receiver moves the channel outputs to the failsafe settings. If a hold ever occurs, it's important to re-evaluate the system and check every component. If your system displays a hold, diagnose the cause and resolve the issue before flying again.
It is normal to see a hold logged if you power OFF your transmitter and back ON.

IMPORTANT: The Spektrum Flight Log (SPM9540) is not compatible with the AR8360T+ receiver.

Range Testing
Before each flying session, and especially with a new model, it's important to perform a range check. All Spektrum aircraft transmitters incorporate a range testing system, which reduces the output power to allow a range check.

1. With the model resting on the ground, stand approximately 100 feet (30 meters) away from the model.
2. Face the model with the transmitter in your normal flying position and put your transmitter into range test mode.
3. You should have total control of the model in range test mode at 100 feet.
4. If you have control issues, review the flight log data to help reposition your antenna(s), and repeat the range test.
5. If control issues persist, call Horizon Product Support for further assistance.

Advanced Range Testing
The standard range testing procedure is recommended for most sport aircraft.
For sophisticated aircraft that contain significant amounts of conductive materials (e.g. turbine powered jets, scale aircraft with metalized finishes, aircraft with carbon fuselages, etc.), the following advanced range check will confirm that all receivers in the system are operating optimally as installed.

This advanced range check allows the RF performance of each receiver to be evaluated independently. A telemetry-equipped Spektrum Transmitter is required for the advanced range test.

1. Stand approximately 100 feet away from the model.
2. Face the model with the transmitter in your normal flying position and put your transmitter into range test mode.
3. Have a helper position the model in various orientations (nose up, nose down, nose toward the transmitter, nose away from the transmitter, etc.).

4. Observe the telemetry on your transmitter. Note any orientations that cause higher fades or frame loss values. Perform this step for at least one minute.
5. Reposition any remote receivers showing higher fades as necessary.
6. Retest to verify satisfactory results.
7. Repeat as neccesary.

After one minute, advanced testing should yield:

- H – 0 holds
- F – Fewer than 10 frame losses
- A, B, L – Fades will typically be fewer than 100. It's important to compare the relative fades. If a particular receiver has a significantly higher number of fades (2 to 3X) then the test should be redone. If the same results occur, move the offending receiver to a different location.

TIP: Use the fade values for A to investigate the telemetry link performance.

Hand Launch Assist (HLA) Setup

The following prerequisites are required for HLA setup:

- Complete the First Time Setup
- Complete the First Time SAFE Setup
- Configure a flight mode tuned with SAFE angle demand

Setup Procedure

1. With the receiver on and bound, enter Forward Programming.
2. In Forward Programming, go to Gyro Settings > System Setup > Hand Launch Assist.
3. Configure the parameters on this page as follows. Aside from the HLA flight mode, most defaults are typically a good starting point.
    - HLA Flight Mode: Assign a flight mode which has been configured and tuned with SAFE Angle Demand mode enabled. Having the highest SAFE gains as possible for this flight mode will yield the best results regarding the model properly achieving the desired climb angle as well as leveling itself from prop torque or poor launches.
    - Threshold G's: The default of 1.5 G's is a good starting point. If hand launching is not activating HLA properly, reduce this value. Increase this value if less sensitivity is desired. The max X axis G's value listed on the transmitter telemetry is a good way to gauge acceleration being reached on launch.
    - Threshold Throttle: Required throttle input % when launching the model to allow HLA to activate. Value should be the minimum throttle that is typically applied before hand launching the model.
    - Duration (S): Duration in seconds for HLA to remain active after hand launch is detected. 2 seconds is an adequate starting point to give the model time to climb and allow the pilot to put their hands back on the sticks.
    - Pitch Offset: Pitch up angle in degrees which will be applied when HLA is activated.
4. When the HLA configuration is done, go back to the Gyro Settings menu.

5. Enter the F-Mode Setup and select the Next page option.
6. The Hand Launch Assist option determines in which flight modes HLA is activated. Set this option to Act for any flight modes where hand launching may be desired.

Hand Launch Assist Testing and Operation
To use the hand launch assist, the following conditions must be met:

- The model must be freshly booted. HLA will always be ready after the first boot.
- Once the model has activated HLA during flight, it can return to a ready state if the following conditions are met:
  - Throttle is less than 5%
  - The model remains totally still for 2 seconds (the throttle must remain below 5% during this time)

Follow these steps to activate hand launch assist:

1. Set the flight mode to a flight mode with the HLA active.
2. Increase the throttle above the threshold throttle value entered in the HLA setup.
3. Launch the model.
   If HLA activates properly, the model should autolevel on the roll axis and climb at the Pitch Offset angle for the configured Duration.
   When this duration ends, the model should go back to normal operation of the currently selected flight mode.
   If HLA does not activate, reduce the Threshold G's value in the HLA setup.

Glossary

- **Angle Limits:** Only available in SAFE modes, these values define the limits for the bank and pitch angles.
- **AS3X+:** Stabilization technology that dampens wind and turbulence. Designed to support advanced flyers, AS3X+ does not include self-leveling technology.
- **Brownout:** If the receiver power supply drops below 3.5volts, the receiver will not have sufficient power for operation and the resulting loss of control is call a brownout. A brownout results from an inadequate power supply to the receiver, it is a failure outside of the receiver.
- **Flight Modes in Receiver:** Determine what stabilization modes the aircraft operates in. All the associated stabilization features to tune the flight stabilization can be adjusted per Flight Mode in the receiver (Base Gain,Priority, Heading, etc).
- **Flight Modes in Transmitter:** Manage rates, expo, voice/sound output, and other transmitter based configurations.
- **Forward Programming:** Programming directly on the receiver from the transmitter.
  The receiver has all screens, menus and settings in its internal memory. The receiver is using the telemetry link to the transmitter for the interface, the screen and buttons.
- **Gain:** Value given to the strength of the gyro response in relation to model movements due to external forces. The lower the value, the less the gyro responds. The higher the value the more the gyro responds. Increasing the value too high will cause oscillations in the given flight axis.
- **Gain Sensitivity:** Multiplies the AS3X+ gain value, allowing a higher or lower gain range in case the initial 0 to 100% gain range isn't adequate for the model. Values available are 0.25x, 0.5x, 1x, 2x, and 4x.
- **Heading:** An optional feature of AS3X+, heading will make the airplane try to hold its attitude when the control

is relaxed. This is not a self-leveling feature, it only makes the aircraft track accurately.

- **High Thr to Pitch:** This setting defines the angle the airplane will climb at when the throttle is raised above half. This is only available in Self Leveling modes. Low Thr to Pitch: This setting defines the angle the airplane will descend at when the throttle is lowered below half. This is only available in Self Leveling modes. Oscillation: Sometimes called a wag, this is a back and forth movement similar to a vibration that may appear like a wobble. It may occur around any axis, roll, pitch or yaw. It is most likely to occur on one axis, not all three. Overshoot: When the stability system makes corrections it is a balancing act, if the response is too strong the system will go past where it should stop, this is called an overshoot.
- **Panic Mode:** Sometimes called a bailout mode, Panic is a SAFE stabilization mode that can return an airplane to level flight from any attitude. It is usually assigned to a momentary button.
- **Priority:** Causes a reduction in gain based on the user stick input. The more stick input applied, the less gain there is. This prevents AS3X+ from interfering with user inputs. Values range from 0 to 200, with the default value being 140. SAFE Envelope: (Intermediate Mode) Stabilization technology that uses AS3X+ to deliver normal flight performance, but with limited bank and pitch angles to prevent the airplane from getting into extreme attitudes.
- **SAFE Self Level/Angle Demand:** Stabilization technology that will make the airplane return to level flight when the control stick is centered.
- **SRXL2:** A Bi-Directional data communication protocol that enables digital devices to communicate over a single signal wire.
- **Stop Lock Rate:** Allows the user to tune the stop response of the model without the need to reduce gyro gains/performance. Low values reduce the stop induced by the gyro when re-centering the stick. Higher values increases the gyro's effect on stops. Too high of a value can cause bounces/oscillations when re-centering the stick, even with low gyro gains.
- **Stop Release Rate:** Retains the gyro response/performance when quick minor stick inputs are made. Too low of a value can induce an expo effect as a stick input wont immediately reduce the gyro's effect. Too high of a value can cause the gain to go away quickly on a short/quick stick movement and increase overall delay on the model getting gains back when re-centering the stick from a quick movement. Throttle Cut: Disables throttle function

Optional Accessories

Optional Accesories	
SPMA3065	USB Programming Cable
SPM9747	SRXL2 DSMX Remote Receiver
SPM4651T	SRXL2 DSMX Remote Receiver
Telemetry Sensors and Accesories	
SPMA9574	Aircraft Telemetry Airspeed Indicator
SPMA9587	Aircraft Telemetry GPS Sensor
SPMA9604	Aircraft Telemetry Receiver Battery Energy Sensor
SPMA9605**	Aircraft Telemetry Flight Pack Batt Energy Sensor**
SPMA9551	12″ Aircraft Telemetry Extension
SPMA9552	24″ Aircraft Telemetry Extension

For use with electric power system batteries that are separate from the receiver battery(s).

Troubleshooting Guide AS3X+

Problem	Possible Cause	Solution
Oscillation	Damaged propeller or spinner	Replace propeller or spinner
	Imbalanced propeller	Balance the propeller
	Motor vibration	Replace parts or correctly align propeller or other parts and tighten fasteners as needed
	Loose receiver	Align and secure receiver in fuselage
	Loose aircraft controls	Tighten or otherwise secure parts (servo, arm, linkage, horn and control surface)
	Worn parts	Replace worn parts (especially propeller, spinner, or servo)
	Irregular servo movement	Replace servo and/or servo extension(s)
	Gain too high	Reduce Gain
	Travel or Rates reduced causing reduced servo resolution	Move pushrod in on servo horn, or move pushrod out on control horn, and increase travel and/or rates. Use the full servo travel to achieve the desired throw.

Inconsistent flight performance	Trim changes after initial setup	If you adjust trim more than 8 clicks, select Relearn Servo Settings in the Forward Programming menu after landing
	Changes to Sub-Trim after initial setup	If you need to trim the aircraft during test flights, select Relearn Servo Settings in the Forward Programming menu after landing
	Aircraft was not kept immobile for 5 seconds after battery connection	With the throttle stick in lowest position. Disconnect battery, then reconnect battery and keep the aircraft still for 5 seconds.
Incorrect response to the AS3X+ Control Direction Test	Incorrect direction settings in the receiver, which can cause a crash	DO NOT fly. Correct the direction settings, then fly.

Troubleshooting Guide

Problem	Possible Cause	Solution
Aircraft will not respond to throttle but responds to other controls	Throttle not at idle and/ or throttle trim too high	Reset controls with throttle stick and throttle trim at lowest setting
	Throttle servo travel is lower than 100%	Make sure throttle servo travel is 100% or greater
	Throttle channel is reversed	(With battery disconnected from aircraft) Reverse throttle channel on transmitter
	Motor disconnected from ESC	Make sure motor is connected to the ESC
Aircraft will not Bind (during binding) to transmitter	Transmitter too near aircraft during binding process	Move powered transmitter a few feet from aircraft, disconnect and reconnect flight battery to aircraft
	Aircraft or transmitter is too close to large metal object, wireless source or another transmitter	Move aircraft and transmitter to another location and attempt binding again
	The bind plug is not installed correctly in the bind port	Install bind plug in bind port and bind the aircraft to the transmitter
	Flight battery/ transmitter battery charge is too low	Replace/recharge batteries
	Bind button not held long enough during bind process	Power off and repeat bind process

Aircraft will not connect (after binding) to transmitter	Transmitter too near aircraft during connecting process	Move powered transmitter a few feet from aircraft, disconnect and reconnect flight battery to aircraft
	Aircraft or transmitter is too close to large metal object, wireless source or another transmitter	Move aircraft and transmitter to another location and attempt connecting again
	Bind plug left installed in bind port	Rebind transmitter to the aircraft and remove the bind plug before cycling power
	Aircraft bound to different model memory.	Select correct model memory on transmitter
	Flight battery/ Transmitter battery charge is too low	Replace/recharge batteries
	Transmitter may have been bound to a different aircraft using different DSM protocol	Rebind aircraft to transmitter
Control surface does not move	Control surface, control horn, linkage or servo damage	Replace or repair damaged parts and adjust controls
	Wire damaged or connections loose	Perform a check of wires and connections, connect or replace as needed
	Transmitter is not bound correctly or the incorrect model was selected	Rebind or select correct airplanes in transmitter
	Flight battery charge is low	Fully recharge flight battery
	BEC (Battery Elimination Circuit) of the ESC is damaged	Replace ESC

1-Year Limited Warranty

What this Warranty Covers
Horizon Hobby, LLC, (Horizon) warrants to the original purchaser that the product purchased (the "Product") will be free from defects in materials and workmanship for a period of 1 year from the date of purchase.
What is Not Covered

This warranty is not transferable and does not cover (i) cosmetic damage, (ii) damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation or maintenance, (iii) modification of or to any part of the Product, (iv) attempted service by anyone other than a Horizon Hobby authorized service center, (v) Product not purchased from an authorized Horizon dealer, (vi) Product not compliant with applicable technical regulations, or (vii) use that violates any applicable laws, rules, or regulations.

OTHER THAN THE EXPRESS WARRANTY ABOVE, HORIZON MAKES NO OTHER WARRANTY OR

REPRESENTATION, AND HEREBY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

Purchaser's Remedy

Horizon's sole obligation and purchaser's sole and exclusive remedy shall be that Horizon will, at its option, either (i) service, or (ii) replace, any Product determined by Horizon to be defective. Horizon reserves the right to inspect any and all Product(s) involved in a warranty claim. Service or replacement decisions are at the sole discretion of Horizon. Proof of purchase is required for all warranty claims. SERVICE OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY.

Limitation of Liability

HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY, REGARDLESS OF WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR ANY OTHER THEORY OF LIABILITY, EVEN IF HORIZON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability. If you as the purchaser or user are not prepared to accept the liability associated with the use of the Product, purchaser is advised to return the Product immediately in new and unused condition to the place of purchase.

Law

These terms are governed by Illinois law (without regard to conflict of law principals). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Horizon reserves the right to change or modify this warranty at any time without notice.

WARRANTY SERVICES

Questions, Assistance, and Services
Your local hobby store and/or place of purchase cannot provide warranty support or service. Once assembly, setup or use of the Product has been started, you must contact your local distributor or Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please visit our website at **www.horizonhobby.com**, submit a Product Support Inquiry, or call the toll free telephone number referenced in the Warranty and Service Contact Information section to speak with a Product Support representative. Inspection or Services If this Product needs to be inspected or serviced and is compliant in the country you live and use the Product in, please use the Horizon Online Service Request submission process found on our website or call Horizon to obtain a Return Merchandise Authorization (RMA) number. Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Horizon is not responsible for merchandise until it arrives and is accepted at our facility. An Online Service Request is available at **http://www.horizonhobby.com/content/service-center_render-service-center**. If you do not have internet access, please contact Horizon Product Support to obtain a RMA number along with instructions for submitting your product for service. When calling Horizon, you will be asked to provide your complete name, street address, email address and phone number where you can be reached during business hours. When sending product into Horizon, please include your RMA number, a list of the included items, and a brief summary of the problem. A copy of your original sales receipt must be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

NOTICE: Do not ship LiPo batteries to Horizon. If you have any issue with a LiPo battery, please contact the appropriate Horizon Product Support office.

Warranty Requirements

For Warranty consideration, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be serviced or replaced free of charge. Service or replacement decisions are at the sole discretion of Horizon.

Non-Warranty Service

Should your service not be covered by warranty, service will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost. By submitting the item for service you are agreeing to payment of the service without notification. Service estimates are available upon request. You must include this request with your item submitted for service. Non-warranty service estimates will be billed a minimum of ½ hour of labor. In addition you will be billed for return freight. Horizon accepts money orders and cashier's checks, as well as Visa, MasterCard, American Express, and Discover cards. By submitting any item to Horizon for service, you are agreeing to Horizon's Terms and Conditions found on our website **http://www.horizonhobby.com/content/service-center_render-service-center**.

ATTENTION: Horizon service is limited to Product compliant in the country of use and ownership. If received, a non-compliant Product will not be serviced. Further, the sender will be responsible for arranging return shipment of the un-serviced Product, through a carrier of the sender's choice and at the sender's expense. Horizon will hold non-compliant Product for a period of 60 days from notification, after which it will be discarded.

Warranty and Service Contact Information

Country of Purchase	Horizon Hobby	Contact Information	Address
United States of America	Horizon Service Center (Repairs and Repair Requests)	servicecenter.horizonhobby.com/ RequestForm/	2904 Research Rd. Champaign, Illinois, 61822 USA
	Horizon Product Support (Product Technical Assistance)	**productsupport@horizonhobby.com**.	
		877-504-0233	
	Sales	**websales@horizonhobby.com**	
		800-338-4639	
EU	Horizon Technischer Service	**service@horizonhobby.eu**	Hanskampring 9 D 22885 Barsbüttel, Germany
	Sales: Horizon Hobby GmbH	+49 (0) 4121 2655 100	

FCC Information

CONTAINS FCC ID: BRWSPMAR8360T
Supplier's Declaration of Conformity
Spektrum AR8360T+ Telemetry Receiver (SPM-1033)

This device complies with part 15 of the FCC Rules. 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.

CAUTION: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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 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 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.

Horizon Hobby, LLC
2904 Research Rd., Champaign, IL 61822
Email: **compliance@horizonhobby.com**
Web: **HorizonHobby.com**

IC Information

CONTAINS IC: 6157A-SPMAR8360T
CAN ICES-3 (B)/NMB-3(B)
This device contains license-exempt transmitter(s)/receivers(s) that comply with Innovation, Science, and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following 2 conditions:(1) this device may not cause interference, and (2) this device must accept any interference, Including interference that may cause undesired operation of the device.
Compliance Information for the European Union

EU Compliance Statement:
Spektrum AR8360T+ Telemetry Receiver (SPM-1033); Hereby, Horizon Hobby, LLC declares that the device is in compliance with the following: EU Radio Equipment Directive 2014/53/EU; RoHS 2 Directive 2011/65/EU; RoHS 3 Directive – Amending 2011/65/EU Annex II 2015/863.
The full text of the EU declaration of conformity is available at the following internet address:
https://www.horizonhobby.com/content/support-render-compliance.

Wireless Frequency Range and Wireless Output Power:
Frequency Band: 2404 – 2476 MHz Max EIRP: 19.42dBm

EU Manufacturer of Record: Horizon Hobby, LLC
2904 Research Road Champaign, IL 61822 USA

EU Importer of Record: Horizon Hobby, GmbH Hanskampring 9
22885 Barsbüttel Germany

WEEE NOTICE:
This appliance is labeled in accordance with European Directive 2012/19/EU concerning waste of electrical and electronic equipment (WEEE). This label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.

The Spektrum trademark is used with permission of Bachmann Industries, Inc.
All other trademarks, service marks and logos are property of their respective owners.
US 7,391,320. US 9,056,667. US 9,753,457. US 9,930,567. US 10,078,329. US 10,419,970.
US 10,849,013.

Documents / Resources

SPEKTRUM SPM-1033 Safe 8 Channel Receiver [pdf] Instruction Manual
SPM-1033, 921702.1, SPM-1033 Safe 8 Channel Receiver, SPM-1033, Safe 8 Channel Receiver, 8 Channel Receiver, Channel Receiver, Receiver

References

- **The Leader in Radio Control | RC Cars, Airplanes, and More**
- **The Leader in Radio Control | RC Cars, Airplanes, and More**
- **RC Cars, RC Trucks, RC Airplanes, and Model Trains at Tower Hobbies**
- **The Leader in Radio Control | RC Cars, Airplanes, and More**
- **The Leader in Radio Control | RC Cars, Airplanes, and More**
- **Horizon Hobby Service Center**
- **Spektrum RC Transmitters and RC Electronics | Spektrum**
- **User Manual**