AR7200BX User Guide

NOTICE

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, Inc. For up-to-date product literature, visit horizonhobby.com and click on the support 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:

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

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

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

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 and NOT a toy. 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, Inc. 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.

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

WARNING AGAINST COUNTERFEIT PRODUCTS

Thank you for purchasing a genuine Spektrum product. Always purchase from a Horizon Hobby, Inc. authorized dealer to ensure authentic high-quality Spektrum product. Horizon Hobby, Inc. 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.

WARRANTY REGISTRATION

Visit www.spektrumrc.com/registration today to register your product.

The AR7200BX combines the proven BeastX™ flybarless technology with a Spektrum™ 7-channel, high-speed, 2048 receiver. This combination provides the ultimate in performance and simple installation. The AR7200BX is perfect for mini (up to 450 class) helicopters. Using an optional DSMX remote receiver adds necessary path diversity for even the largest electric, glow, gas and turbine-powered helicopters.The AR7200BX is compatible with all Spektrum and JR® aircraft radios that support DSM2™ and DSMX technology. **The AR7200BX receiver is not compatible with the Spektrum DX6 park flyer transmitter.**

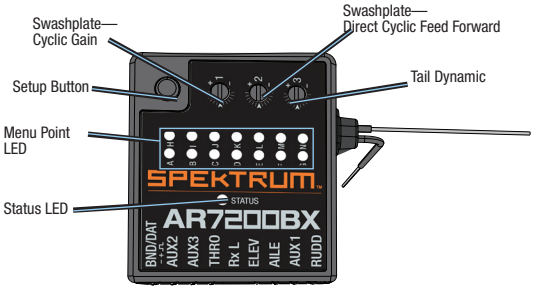
While the AR7200BX provides maximum agility and precision for intermediate and professional pilots, it is not a flying aid for beginners.
IMPORTANT: When using the AR7200BX with larger helicopters (500-size and larger): It is necessary that you connect a DSMX remote receiver (not included) to the AR7200BX before binding. See "Receiver Installation" for more information.

⚠ **CAUTION:** DO NOT use DSM2 remote receivers with the AR7200BX. Doing so will cause the helicopter to crash, resulting in property damage and injury.

Box Contents	Optional Parts
AR7200BX	DSMX Remote Receiver (SPM9645)
Bind Plug	USB interface
Gyropads	
Adjustment tool	
Instruction Manual	
Program Guide	

Preflight Safety Precautions and Checklist

- Read all safety precautions and literature prior to use of this product.
- Always ensure the receiver and transmitter are properly bound before flight.
- Always ensure batteries are fully charged and have proper capacity for the flight time you intend.
- Always exit programming mode before flying.
- Always use the included gyropads and ensure they are properly mounted and in good condition before each flight.
- Power your transmitter on first and then the receiver.
- Always allow the AR7200BX to initialize before flight.
- Confirm the cyclic and tail rotor servos do not bind at the full range of the throw.
- Perform a control test, ensuring controls move in correct directions.



Features

- Integrated BeastX flybarless technology and Spektrum 7-channel receiver
- Optional DSMX remote receiver capable
- SmartSafe™ failsafe system
- Flight Log and Telemetry compatible (optional)
- 2048 Resolution
- High-speed 11ms operation when used with capable transmitters

Applications

- 250–800 sized nitro, gas and electric flybarless 3D helicopters
- Scale flybarless helicopters

⚠ **CAUTION:** Do not use with flybar helicopters or airplanes.

⚠ **WARNING:** For first-time use or when making mechanical changes that involve throw, always ensure you reset the servo limits to prevent binding. Not doing so will cause the helicopter to crash, resulting in property damage and injury.

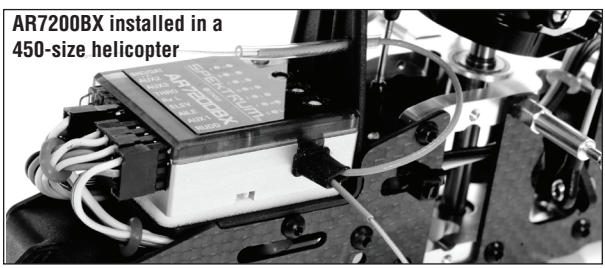
Specifications

Type: DSM receiver and BeastX flybarless technology
Channels: 7 (8 channels are available, however, Channel 5 is only used as an internal gain channel for the tail gyro).
Modulation: DSM2, DSMX
Main Receiver Dimensions: 36mm x 28mm x 13 mm/
1.42 in x 1.1 in x .51 in
(Length x Width x Height)
Main Receiver Weight: 0.66 oz (18.6 g)
Voltage Range: 3.5 to 8.5V
Resolution: 2048
Frame Rate: 11ms
Compatibility: All DSM2 and DSMX aircraft transmitters and module systems

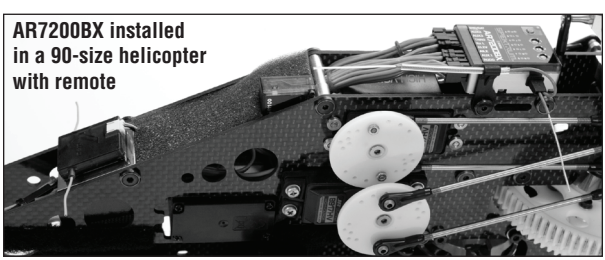
Antenna Polarization

For optimum RF link performance, mount the antennas in an orientation that allows for the best possible signal reception when the helicopter is in all possible attitudes and positions. Orient the internal receiver antennas perpendicular to each other (see Receiver Installation).

When using a DSMX remote receiver—Use double-sided foam tape to mount the remote receiver so that the antenna is perpendicular to the longer main receiver antenna. The remote receiver antenna must be at least 2 inches away from the main receiver's antenna. The AR7200BX is compatible with all DSM2 and DSMX transmitters, even when using the optional DSMX remote receiver.



AR7200BX installed in a 450-size helicopter

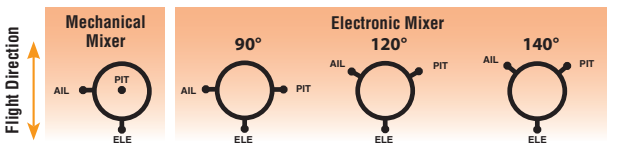


AR7200BX installed in a 90-size helicopter with remote

Servo Connections and Auxiliary Channels

Servo Selection

Select servos that are adequate for flybarless operation. The servos must have high torque in addition to being fast and precise. Using high-quality servos that are suited for flybarless helicopters increases the rotor blade options. A poor servo-rotor blade combination will cause several issues including oscillations in hover and unwanted reaction in fast forward flight. Connect all servos to the AR7200BX. Refer to the diagram below for your particular helicopter's cyclic servos. Connect the pitch (PIT) servo to AUX1 on the AR7200BX.



Auxiliary Channel

While the AR7200BX is a 7-channel receiver, Aux 3 is additionally offered for more channel functions. The Gear channel is internal to the receiver used for tail gain.

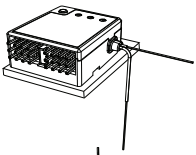
Preparing the Transmitter for Flybarless Operation

1. Create a new model in your transmitter's model memory.
2. Be sure all trims/sub-trims are disabled (zeroed) and all servo travel values are 100%.
3. Set your transmitter's swash type to mechanical mixing (1 servo 90° mixing). Never enable your transmitter's eCCPM or revo-mixing functions. This is handled by the AR7200BX.
4. Do not adjust the pitch curve at this time. During setup, the pitch curve must be linear from -100% to +100% (or 0% to 100% depending on radio brand).
5. Again, make sure that there are no mixing functions active (for example revo-mixing).

Receiver Installation

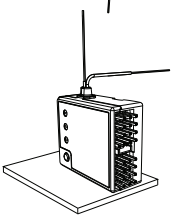
Attach the AR7200BX receiver using one of the provided gyropads. The AR7200BX must be in a low vibration position, such as the receiver or gyro platform. The mounting platform must be perpendicular to the main shaft. Helicopters usually have enough room on the frame to separate the main feeder antenna and the optional remote receiver. If necessary, make a mount using clear plastic to attach the remote receiver.

The AR7200BX can be attached flat, upright or inverted under the helicopter. The servo connector pins must always point toward the front or rear of the helicopter. Make sure the edges of the AR7200BX are all parallel with the corresponding axes of the helicopter.



Y-Harnesses and Servo Extensions

Do not use amplified Y-harnesses and servo extensions with Spektrum equipment. Only use standard non-amplified Y-harnesses and servo extensions. When converting existing models to Spektrum devices, replace all amplified Y-harnesses and servo extensions.

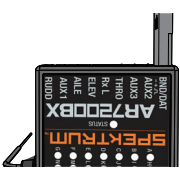


Binding

You must bind the receiver to the transmitter before the receiver will operate. Binding is the process of programming the receiver to recognize the GUID (Globally Unique Identifier) code of a single specific transmitter..

To bind an AR7200BX to a DSM2 or DSMX transmitter:

1. Insert the bind plug in the BND/DAT port on the receiver.
2. Power on the receiver (The AR7200BX can be powered through any open port). The H LED on the AR7200BX and external remote receiver (if connected) should be flashing, indicating the receiver is in bind mode.
   To bind a helicopter with an electronic speed controller that powers the receiver through the throttle channel, insert the bind plug into the BND/DAT port in the receiver and the ESC lead into the throttle (THRO) port.
3. Move the sticks and switches on the transmitter to the desired failsafe positions (low throttle and neutral control positions).
4. Follow the procedures of your specific transmitter to enter Bind Mode. The system will connect within a few seconds. Once connected, the H LED will turn off and the AR7200BX will start the initialization process.
5. After setting up your model, rebind the system so the true low throttle positions are set in the failsafe.
6. Remove the bind plug from the BND/DAT port on the receiver before you power off the receiver and transmitter. Store the bind plug in a convenient place.



AR7200BX with bind plug inserted

NOTICE: Remove the bind plug to prevent the system from entering bind mode the next time the power is turned on.

Setup Procedure

Power on the transmitter first. The AR7200BX initializes when the receiver is powered on. Do not move the AR7200BX or the helicopter while the receiver is initializing. You can lay the helicopter on its side to prevent it from moving in windy conditions.

Receiver Initialization Cycle

1. LEDs cycle and then the firmware version will display for 3 seconds.
2. LEDs H through N cycle to initialize the receiver inputs.
3. LEDs A through G cycle to calibrate the sensors.
4. The swashplate moves a small amount and the Status LED turns solid after initialization completes.

Status-LED

Purple Solid	Tail gyro is in Normal-Rate mode
Blue Solid	Tail gyro is in Heading Lock mode

5. One of the LEDs A–N will light for 10 seconds to show the amount of tail gain.
   (A) = 0% to (N)=100%.

Switching Between Menu Levels

The AR7200BX has two menu levels—Setup Menu and Parameter Menu. You must be in flight-ready mode (A–N LEDs off) to switch between menu levels.

Setup Menu—Access all basic settings for helicopter setup.

To access the Setup Menu: Press and hold the setup button until LED (A) stops flashing and lights up solid.

Parameter Menu—Access settings to adjust the helicopter's flight characteristics. The Parameter Menu is used at the flying field.

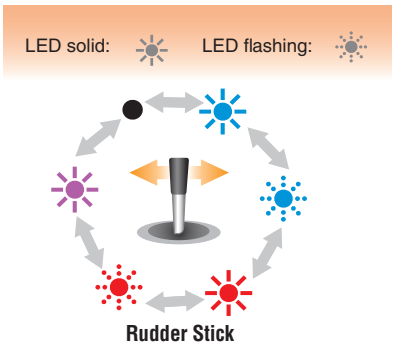
To access the Parameter Menu: Press the setup button until LED (A) flashes rapidly. Release the setup button when LED (A) flashes.

Selection Within Menu Points

The Status LED color indicates menu point options. The options are:

Move the rudder stick left to move counterclockwise through the options. Move the rudder stick right to move clockwise through the options. The available options depend on the menu point.

Status-LED
OFF
Purple Solid
Red Flashing
Red Solid
Blue Flashing
Blue Solid



Switching to the Next Menu Point

Quickly press the setup button to move to the next menu point. It is possible to skip menu points by pressing the setup button. Do not move the transmitter sticks when you are in a menu point you want to skip.

Exiting the Menu

When LED (N) is solid, quickly press the setup button to exit the menu. The AR7200BX will also automatically exit the menu after 4 minutes of inactivity. The AR7200BX will not automatically exit at points D, G, I and J to allow time for mechanical helicopter adjustments.

⚠ **CAUTION:** Never fly the helicopter when the AR7200BX is in the Setup or Parameter Menu. Gyro control and transmitter stick controls are disabled when the AR7200BX is in the Setup or Parameter Menu.

Factory Reset

To erase all AR7200BX settings:

In any setup menu (A through N), press and hold the setup button for at least 10 seconds until LEDs (A) – (N) and (J) quickly flash to confirm the reset.

Any previous programming is deleted during a reset.

⚠ **CAUTION:** Do not attempt to fly the helicopter without doing a complete setup procedure after a reset. If you do not complete the setup, the helicopter will crash, causing property damage and injury.

Unplug all servos and remove the servo horns before resetting the AR7200BX.

Setup Menu

The following section describes each menu point and the available settings.

A. Mounting Orientation

The AR7200BX can be mounted horizontally or vertically. The only restriction is that the servo plug connectors MUST point toward the front or rear of the helicopter.

Status-LED	
Red Solid	Vertical (on the side)
Blue Solid	Horizontal (flat)*

*=Factory Setting

Push the setup button to save the selection and move to menu point (B).

B. Swashplate Servo Frequency

⚠ **CAUTION:** If you do not know the maximum pulse rate for your servos, do not exceed 50Hz servo frequency. A higher servo frequency can lead to servo failure. Analog servos usually tolerate a maximum of 50Hz. Contact the servo manufacturer if you are unsure of the servo frequency.

Always use the highest servo frequency that the servos will handle for the best performance.

Status-LED	
OFF	User Defined (requires PC software)
Purple Solid	50Hz*
Red Flashing	65Hz
Red Solid	120Hz
Blue Flashing	165Hz
Blue Solid	200Hz

*=Factory Setting

Push the setup button to save the selection and move to menu point (C).

To see a complete Spektrum servo reference chart, refer to the servo chart on spektrumrc.com.

C. Tail Servo Center Position/Pulse Length

Almost all tail servos work with 1520µs (micro seconds). There are a few tail servos available that use a different center position pulse length.

Status-LED	Tail servo center position pulse length
OFF	User Defined (requires PC software)
Purple Solid	960µs
Red Solid	760µs
Blue Solid	1520µs*

*=Factory Setting

IMPORTANT: If a pulse length is selected (C) that does not allow a certain tail servo frequency (D), the frequency is automatically reduced. The center position pulse setting always has priority. A servo can operate without issue at a lower frequency but cannot operate with an incorrect center position pulse length.

Push the setup button to save the selection and move to menu point (D).

D. Tail Servo Frequency

⚠ **CAUTION:** If you do not know the maximum frequency for your selected tail servo, do not exceed 50Hz. Exceeding the maximum frequency for the tail servo can lead to servo failure.

For best performance, always use a high-quality tail servo capable of at least 270Hz. Depending on the selection chosen in menu point (C), you may not be able to select a frequency above 333Hz.

Status-LED	
OFF	User Defined (requires PC software)
Purple Solid	50 Hz*
Red Flashing	165Hz
Red Solid	270Hz
Blue Flashing	333Hz
Blue Solid	560Hz

*=Factory Setting

Attach a servo horn to the tail servo, making sure the tail linkage rod forms a 90° angle with the servo horn. Adjust the tail linkage rod according to your helicopter instruction manual. For most helicopters, the tail pitch slider should be centered on the tail shaft. The tail rotor blades will have a small amount of positive pitch to counter the torque from the main rotor.

IMPORTANT: Menu point (D) does not have a time limit.
Push the setup button to save the selection and move to menu point (E).

E. Setting the Tail Servo Endpoints

Adjust the limit of the tail rotor blades to achieve the best throw. The best throw is determined by either the maximum possible control travel of the tail slider or the maximum allowed tail rotor blade angle of attack. Make sure the tail rotor blades move in the correct direction (see your helicopter manual for more information). If the tail rotor blades move in the wrong direction, reverse the rudder direction in your transmitter.

To adjust the limits:

1. Move the rudder stick in one direction until the servo reaches the maximum endpoint without binding. If you move the servo too far, move the rudder stick in the opposite direction and move the tail pitch slider away from the limit.
2. Release the rudder stick.
3. Once the maximum endpoint is adjusted, don't move the rudder stick.
4. Wait for the Status LED to flash and then turn Solid Red or Solid Blue, depending on the direction. The servo limit for one direction is saved.
5. Adjust the servo limit in the opposite direction. Move the tail pitch slider to the other maximum endpoint and release the rudder stick.
6. The Status LED flashes, followed by Solid Purple, indicating that the servo endpoint adjustment is complete.

IMPORTANT: If the Status LED does not light or lights in an unexpected color, the servo throw is too small. Move the tail linkage ball farther in toward the center of the servo horn.

Push the setup button to save the selection and move to menu point (F).

F. Setting the Tail Sensor Direction

1. Move the helicopter nose to the right.
2. The tail rotor blades should move in the same direction as left rudder input.
3. If the tail rotor blades move in the wrong direction, you must reverse the sensor direction.
4. Move the rudder stick once in any direction. The Status LED will change color.

Status-LED	
Red Solid	Normal*
Blue Solid	Reversed

*=Factory Setting

5. Repeat the test as described above.
6. Push the setup button to save the selection and move to menu point (G).

G. Adjusting the Swashplate Servo Centering

Menu point G electronically adjusts the center point of the cyclic servos.

1. With all swashplate servos connected, the servos are now operating in their center position or “reference position”. The Status LED is Off.
2. Install the servo horns on the servos so the horns form an angle close to 90° with the linkage rod. The angle will not be a perfect 90°.
3. Move the rudder stick once to select a servo.

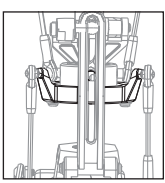
Status-LED

OFF	Swashplate servos at reference position
Purple Solid	Elevator servo center adjust
Red Solid	Aileron servo center adjust
Blue Solid	Pitch servo center adjust

4. Move the elevator stick forward and back to adjust the center position.
5. Move the rudder stick to select the next servo. Complete Steps 3 & 4 for each servo.

IMPORTANT: Menu point (G) does not have a time limit.

6. Adjust the cyclic/swashplate linkage rods according to your helicopter manual. The swashplate should be centered and the main blades should have 0° of pitch. Always make rod length adjustments from the bottom (servos) to the top (blade grips).
7. Push the setup button to save the selection and move to menu point (H).



H. Swashplate Mixer

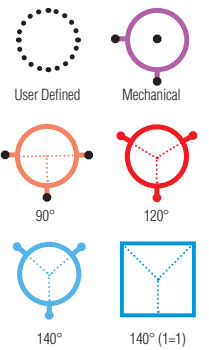
Select the electronic swashplate mixer required for your helicopter or choose “mechanical” if the helicopter uses a mechanical mixer. The AR7200BX supports 90°, 120° and 140° swashplates. You can also use any swashplate geometry by selecting User Defined (PC software required). Refer to your helicopter manual for more information on CCPM.

CAUTION: NEVER use your transmitter’s electronic swashplate mixing. All CCPM mixing is done by the AR7200BX.

Status-LED

OFF	User Defined
Purple Solid	Mechanical
Red Flashing	90°
Red Solid	120° *
Blue Flashing	140°
Blue Solid	140° (1=1)

*=Factory Setting



Push the setup button to save the selection and move to menu point (I).

I. Setting the Swashplate Servo Directions

Menu point (I) ensures the swashplate servos are moving correctly. Note that the proper aileron, elevator and collective pitch direction (right/left, up/down) will be corrected later using the servo reversing setting in the transmitter. Try each of the four possible combinations until the swashplate moves correctly. There is no need to adjust servos individually.

IMPORTANT: The direction of swashplate movement (e.g. Swashplate moving up when it should move down) is not important at this time. You will adjust the swashplate direction when the servos are moving together.

1. Move the collective pitch stick and observe the swashplate movement. The swashplate servos should all move together to raise or lower the swashplate.
2. If the swashplate is not horizontal when it moves, try a different servo combination by moving the rudder stick.
3. Repeat Steps 1 & 2 until the servos are all moving together.
4. Now make sure the swashplate is moving in the correct direction (Refer to your helicopter instruction manual).
5. If the swashplate is moving in the wrong direction (e.g. The swashplate is moving up when it should move down), use the servo reverse feature in your transmitter to reverse the appropriate channels.

Status-LED	AILE	ELEV	AUX1
OFF	normal	reverse	reverse
Purple Solid	normal*	normal *	reverse *
Red Solid	normal	reverse	normal
Blue Solid	normal	normal	normal

*=Factory Setting

IMPORTANT: Menu point (I) does not have a time limit. If the servos are still not reacting properly after using servo reverse, make sure the servos are connected to the proper receiver channels. Also, make sure any servo mixing in your transmitter is turned off.

Push the setup button to save the selection and move to menu point (J).

J. Teaching the Cyclic Pitch Geometry

CAUTION: Do not touch any stick on your transmitter when entering menu point (J). This will cause unwanted flight behavior.

1. Move the rotor blades so that they are parallel to the tail boom.
2. Attach a pitch gauge to a rotor blade. The swashplate should be in the neutral position and the blade should have 0° of pitch. If the swashplate is not neutral with 0° of blade pitch, repeat menu point (G) before proceeding.
3. Move the aileron stick left or right until the pitch gauge has exactly 6° of cyclic pitch.
   IMPORTANT: The Status LED should still be Blue at 6° of cyclic pitch. If the Status LED is Red, Purple or Off, you must mechanically adjust the helicopter. You can use:
   A.) Shorter servo horns
   B.) Shorter linkage balls on the inner swashplate ring or
   C.) Longer blade grip linkage levers
4. If the pitch gauge has more than 6° of cyclic pitch, move the aileron stick in the opposite direction until the pitch gauge is at 6°.
5. Release the aileron stick and press the setup button once.

K. Adjusting the Collective Pitch Range

CAUTION: Do not use any pitch curves in your transmitter while adjusting the Collective Pitch Range. Doing so will result in unwanted flight behavior.

1. Move the pitch stick all the way up (full positive pitch) and stay there.
2. Increase or decrease the maximum amount of positive pitch using the rudder stick.
3. When you have achieved the desired maximum pitch angle, move the pitch stick all the way down (full negative pitch).
4. Increase or decrease the maximum amount of negative pitch using the rudder stick.

CAUTION: Make sure the blade pitch angle is moving in the correct direction. Incorrect blade pitch angle can result in erratic flight behavior. If the blade pitch is moving in the wrong direction, reverse the pitch channel in your transmitter.

Push the setup button to save the selection and move to menu point (L).

L. Adjusting the Cyclic Swashplate Limit

Menu point (L) adjusts the maximum possible tilting of the swashplate for aileron and elevator. The deflection is limited in a circular path, similar to a cyclic ring function, preventing swashplate binding at full aileron and elevator travel.

1. Carefully move the sticks for aileron, elevator and pitch to all maximum endpoints. Watch for binding or lack of movement in the swashplate, linkage rods and servos.
2. Move the rudder stick right or left to increase or decrease the aileron and elevator throw limiter. Always try to achieve the maximum possible cyclic throw without causing binding.
3. The Status-LED should still be Blue when the swashplate is at the maximum limit. If the Status-LED is Purple or Off, you must mechanically adjust the helicopter to increase the available throw.

IMPORTANT: If you make any modifications to menu points (G), (J) or (K) in the future, you must repeat menu point (L) again.
Push the setup button to save the selection and move to menu point (M).

M. Setting the Swashplate Sensor Directions

1. Tilt the helicopter forward. The swashplate should tilt backward.
2. Tilt the helicopter backward. The swashplate should tilt forward.
3. Roll the helicopter left. The swashplate should roll right.
4. Roll the helicopter right. The swashplate should roll left.
5. If the swashplate does not move in the correct direction, you will need to reverse the sensor direction by moving the rudder stick to select one of the following options. There are four options:

Status-LED	Elevator	Aileron	
OFF	reversed	reversed	
Purple Solid	reversed	normal	
Red Solid	normal	reversed	*=Factory Setting
Blue Solid	normal*	normal*	

6. Repeat Step 5 until both sensors are working in the correct direction.
7. Push the setup button to save the selection and move to menu point (N).

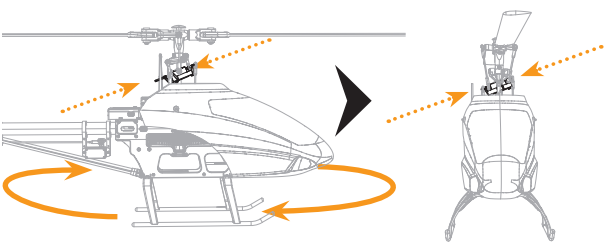
N. Setting the Pirouette Optimization Direction.

1. Note the direction the swashplate tilts when entering menu point (N). The swashplate will tilt forward or back; the direction does not matter.
2. Hold the helicopter at the rotor head and spin the helicopter by hand around the main shaft.
3. The swashplate should remain in the same tilt direction regardless of the rotational direction of the helicopter.
4. If the swashplate changes direction and rotates against the direction of the helicopter, use the rudder stick to change the direction.
5. Push the setup button to save the selection and exit the Setup Menu (N).

The setup steps of the AR7200BX are finished. It is now necessary to continue setting up the dials and parameters options.

Status-LED	Pirouette Optimization Direction
Red Solid	Normal*
Blue Solid	Reversed

*=Factory Setting



AR7200BX Power System Requirements

All flybarless gyro systems require uninterrupted power.

During even a short duration power interruption/brownout, the flybarless unit must reboot and reinitialize.

CAUTION: If a power interruption/brownout occurs during flight, a crash will occur. It is your responsibility to ensure the AR7200BX has sufficient power without interruption.

Some of the power system components that affect the ability to properly deliver adequate power include:

- The switch harness, battery leads, servo leads, regulators etc.
- Receiver battery pack (number of cells, capacity, cell type, state of charge)
- The ESC's BEC capability to deliver current to the receiver when load is placed on the servos. This is the #1 cause of power interruptions in electric helicopters.

The AR7200BX has a minimum operational voltage of 3.5 volts; it is highly recommended the power system be tested per the following guidelines.

Recommended Power System Test Guidelines

Perform the following test with a voltmeter. The Spektrum Flight Log or Telemetry Modules (TM1000/TM1100) work well for this test.
Plug the Flight Log into an open channel port in the receiver and, with the system on, load the servos by applying pressure to the swashplate with your hand for 3 minutes. Monitor the voltage at the receiver. It is important to load the swashplate for 3 minutes. If a voltage regulator becomes hot, it can lose it's ability to supply current. An alternate method is to power on the system and rapidly move the control sticks (stir the sticks) with no load on the servos for 3 minutes. The voltage should remain above 4.8 volts in both cases.

SmartSafe™ Failsafe

SmartSafe is a safety feature on the throttle channel only that offers the following benefits:

- Prevents electric motors from operating when the receiver only is turned on (no transmitter signal present)
- Prevents the speed controller from arming until the throttle is moved to low throttle position after connection is made
- Powers off electric motors and reduces gas/glow engines to idle if signal is lost
  (Must bind the receiver at throttle off or idle position).
- If throttle is at any position other than low, the ESC won't arm
- If connection is lost in flight:

SmartSafe sets the throttle to the position it was in during the binding process (normally low throttle or idle).

How To Program

SmartSafe is automatically set when the system is bound. It's important to have the throttle stick in the low position to store low throttle during binding.

To Test

Electric helicopters: Remove the pinion gear from the motor before testing.
Gas or glow helicopters: Test the servo positions with the engine off.
Confirm the failsafe setting is correct by turning off the transmitter. The throttle should go to the preset low throttle position. All other channels should hold the last commanded position.

Range Testing

Before each flying session, and especially with a new model, perform a range check. All Spektrum aircraft transmitters incorporate a range testing system which, when activated, reduces the output power, allowing a range check.

1. With the model on the ground and the motor/engine off, stand 30 paces (approx. 90 feet/28 meters) away from the model.
2. Face the model with the transmitter in your normal flying position and place your transmitter into range check mode. This causes reduced power output from the transmitter.
3. You should have total control of the model in range test mode at 30 paces.
4. If control issues exist, call the Horizon Product Support office.

Dials and Tail Gyro Gain

To adjust the dials: Only use the original Spektrum AR7200BX adjustment tool to prevent damage to the dials.

Dial 1: Swashplate—Cyclic Gain

Turn Dial 1 clockwise to increase the swashplate gain.

Factory setting for Dial 1 is horizontal (50% swashplate gain). Use the factory setting for your first flights. Typically this setting is ideal for 450 class helicopters. If you are flying larger helicopters it may be necessary to slightly increase the cyclic gain positions.

The higher the gain, the more aggressively the helicopter will stop after cyclic movement and the helicopter will feel more stable in the air.

Cyclic Gain Too High	Helicopter feels "soft" in flight and tends to oscillate on the elevator axis.
Cyclic Gain Too Low	The helicopter will feel softer, slower and less direct.

Dial 2: Swashplate—Direct Cyclic Feed Forward

Turn Dial 2 clockwise to increase the swashplate's direct cyclic stick feed forward.

The direct cyclic stick feed is the part of the stick input going directly to the servos. When correctly adjusted, the direct stick feed allows the control loop to make small corrections and work more efficiently.

Factory setting for Dial 2 is horizontal.

Direct Cyclic Feed Forward Too High	This causes over-control in your cyclic input. When set too high, the control loop overshoots and needs a steer back correction. This causes pitch backs (bobbles) on cyclic stops and imprecise fast forward flight.
Direct Cyclic Feed Forward Too Low	The helicopter will feel softer, slower and less direct.

Increasing the direct cyclic feed forward will cause more cyclic stick input to go directly to the aileron and elevator on the swashplate giving a more responsive feel. Decreasing the direct stick feed forward does the opposite.

The optimal setting depends on many factors, including blades, servos, head speed, size and mass of the helicopter.

IMPORTANT: The direct cyclic feed forward does not affect the maximum rate of rotation. If the helicopter rotates too slowly:

1. Check the swashplate limiter settings in Setup menu point (L)
2a. Change the control behavior in Parameter menu point (B) or
2b. Increase the servo travels or dual rate in your transmitter

Dial 3: Tail Dynamic

Turn Dial 3 clockwise to increase the tail dynamic or counterclockwise to decrease the tail dynamic.

Factory setting for Dial 3 is horizontal

Make sure the maximum possible tail gyro gain has already been determined before adjusting the tail dynamic.

Increasing the Tail Dynamic	This will lead to harder stopping behavior and more aggressive response to tail stick inputs.
Tail Dynamic Too High	The tail will bounce back shortly after a hard stop and feel soft when making fast direction changes.
Tail Dynamic Too Low	Stopping might be too soft.

The tail should stop perfectly to the point without making any flapping noises.

Transmitter adjustment: Tail Gyro Gain

Tail gain can be adjusted using the transmitter's gear channel. Most transmitters have a gyro screen that allows gyro adjustments. It is important that the gyro function is assigned to the gear channel in the transmitter.

Status-LED

Purple Solid	Rate Mode
Blue Flashing	Heading Lock Mode
Blue Solid	

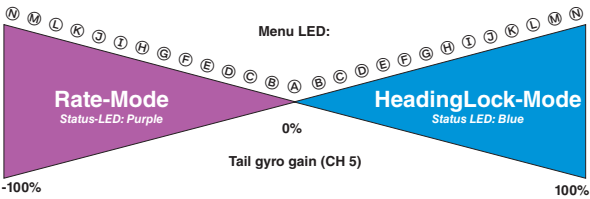
The color of the Status LED indicates the selected mode when the AR7200BX is ready for operation.

When the gain channel is centered, LED A = 0% gain. The maximum adjustable tail gain is 100% in both modes (LED N = 100%). One of the LEDs A–N will light for 10 seconds to show the amount of tail gain. (A) = 0% to (N)=100%.

For the first flights, do not use a gain higher than F or G in Heading Lock mode.

To find the optimal gain:

1. Start with a low gain value where the tail will feel very weak.
2. Increase the gain step by step until the tail feels more precise and holds better on sudden pitch inputs.
3. If the gain is too high, “wagging” will appear in fast forward or backward flight.



Parameter Menu

To enter the Parameter Menu:

1. When the AR7200BX is ready for flight, press and hold the setup button until the LED flashes next to menu point (A).
2. Release the setup button.
3. Press the setup button once to move to the next menu point. The Parameter Menu only has 8 menu points (A through H).
4. Press the setup button once at menu point (H) to exit the Parameter Menu.

It is possible to skip menu points. Do not move the transmitter sticks when you are in a menu point you want to skip. Quickly press the setup button again to move past the menu point you want to skip.

⚠ **CAUTION:** Never fly the helicopter when the AR7200BX is in the Setup or Parameter Menu. Gyro control and transmitter stick controls are disabled when the AR7200BX is in the Setup or Parameter Menu.

A. Swashplate Cyclic Center Adjustment

NOTICE: ***NEVER USE TRANSMITTER TRIMS WITH THE AR7200BX!***
The AR7200BX will interpret the trim as a control command, NOT as servo trim.

Menu point A allows you to easily adjust your servo centers at the flying field if the helicopter is wobbling during pirouettes or not climbing out straight on quick pitch inputs.

Parameter menu point (A) adjusts both the aileron and elevator servo centers without regard to the individual servos.
To adjust the aileron and elevator servo centers:

1. Move the aileron or elevator stick in the desired direction.
2. Repeatedly move the stick or hold the stick to move several trim steps at once.
3. To delete the trimming, move the tail stick in any direction.

IMPORTANT: Unlike digital trims in the transmitter, menu point (A) is not a separate trim function. If the new center position is saved once in Parameter menu point (A), it will also change the servo center position in Setup menu point (G).
Once the center position is saved in menu point (A), it is no longer possible to delete the trimming.
Press the setup button once to move to Parameter menu point (B).

B. Control Behavior

Menu point (B) allows you to select between different control behaviors for your helicopter, including the maximum rotation rate and exponential.
Factory setting is "Sport", which should be suitable for most pilots.
"Normal" has a decreased rotation rate for cyclic and tail controls, as well as increased exponential. When you are comfortable flying in "Normal", find your personal preference by increasing the Control Behavior one option at a time.
To use your own transmitter settings instead of the presets, select Status LED: Blue Solid.

Status-LED	Control Behavior
OFF	User Defined
Purple Solid	Normal
Red Flashing	Sport*
Red Solid	Pro
Blue Flashing	Extreme
Blue Solid	Transmitter

*=Factory Setting

If you select one of the preset Control Behaviors, do not use Exponential and/or Dual Rates in your transmitter. Slightly increasing servo travel in your transmitter should not cause any problems with the Control Behaviors.
The option "User Defined" allows you to define your own settings using the optional PC Software.
Press the setup button once to move to Parameter menu point (C).

C. Swashplate – Pitching Up Compensation

1. While in fast forward flight, apply sudden collective pitch inputs. The helicopter should remain in its horizontal path during climb and descend.
2. If the nose of the helicopter pitches up and down, increase the Pitch Up Compensation.
3. If the value is too high, the helicopter may feel sluggish. Try to find the lowest suitable setting.
4. If the helicopter still pitches up at the highest value, increase the swashplate gain (Dial 1).

5. If the helicopter continues to pitch up after increasing the swashplate gain, you may need to use faster and stronger servos or blades designed for flybarless helicopters.

Status-LED	Pitching Up Behavior
OFF	User Defined
Purple Solid	Very Low
Red Flashing	Low
Red Solid	Medium*
Blue Flashing	High
Blue Solid	Very High

*=Factory Setting

The option “User Defined” allows you to define your own settings using the optional PC Software.
Press the setup button once to move to Parameter menu point (D).

D. Tail Heading Lock Gain

Heading Lock gain determines how constant the tail will maintain the rotation rate from the rudder stick.

1. Start with Heading Lock gain set to low or very low and maximize the tail gain in your transmitter.
2. Increase the Heading Lock gain in the AR7200BX until the desired result are achieved.

Heading Lock Gain Too Low	Pirouettes are inconsistent in fast forward flight or in crosswind conditions.
Heading Lock Gain Too High	Fast tail-direction changes are more difficult to control. The tail may also move gently while hovering or flying around and will bounce back when stopping the rotation.

When the appropriate setting is determined, it is usually necessary to re-adjust the tail gyro gain in the transmitter.

Status-LED	Tail Heading Lock Gain
OFF	User Defined
Purple Solid	Very Low
Red Flashing	Low
Red Solid	Medium*
Blue Flashing	High
Blue Solid	Very High

*=Factory Setting

IMPORTANT: If the tail pirouettes and stops unevenly in both directions, set the tail gyro to Normal-Rate mode. Test whether the tail will drift in a particular direction during hover. If it does, adjust the tail link rod length so the tail rotor blades have the required compensation for pitch. If you adjust the tail link rod length, you must reset the tail rotor limits (Setup menu point (E)). If you chose "Transmitter" in the Control Behavior (Parameter menu point (B)), make sure you are not entering the free spinning range, which can cause inconsistent rotation.

The option "User Defined" allows you to define your own settings using the optional PC Software.

Press the setup button once to move to Parameter menu point (E).

E. Stick Deadband

Stick deadband is the range around the very center of the stick where the AR7200BX will not react. Depending on the calibration of the transmitter, the sticks may not be in the exact same center position each time they return to center. This can cause unwanted rotation on the axis of stick movement.

Stick Deadband Set Too Low	It is difficult to find a stick position where no input is sent to the AR7200BX. A setting too low can lead to a helicopter tipping on takeoff or a helicopter that is difficult to control.
Stick Deadband Set Too High	You will feel a large range of stick movement where you have no control. A setting too high can lead to difficult precision hovering.

Status-LED	Stick Deadband
OFF	User Defined
Purple Solid	1
Red Flashing	2*
Red Solid	3
Blue Flashing	4
Blue Solid	5

*=Factory Setting

The option "User Defined" allows you to define your own settings using the optional PC Software.
Press the setup button once to move to Parameter menu point (F).

F. Tail—RevoMIX

The AR7200BX can pre-compensate for torque variations on the tail before any noticeable change. RevoMIX relieves the tail control loop and improves tail performance on helicopters with insufficient tail authority and/or high powered electric helicopters.

To see the compensation direction:

1. Move the collective pitch, roll and elevator stick at any time. The tail rotor has to deflect to counter the rotor torque. The tail rotor blades deflect the least when the main rotor is at 0° pitch (the point where the main rotor produces the least torque).
2. Pitch positive or negative direction, move the aileron or elevator control. A deflection is added to the tail rotor to counter the torque. The height of the deflection depends on the collective pitch angles in Setup menu point K. The deflection may vary depending on the direction of pitch.
3. A helicopter with a clockwise rotation main rotor will steer the nose of the helicopter to the right. When control input is given, the tail slider/tail rotor will move slightly in a given direction.
4. Cycle through the options and find the direction that matches your model. You then have four options: Off, Low, High or By Computer.

Status-LED	Torque Precompensation
OFF	User Defined
Purple Solid	Off*
Red Flashing	Low—Normal Direction
Red Solid	High—Normal Direction
Blue Flashing	Low—Reverse Direction
Blue Solid	High—Reverse Direction

*=Factory Setting

The option “User Defined” allows you to define your own settings using the optional PC Software.

Press the setup button once to move to menu point (G).

G. Cyclic Response

Menu point (G) adjusts how aggressively the AR7200BX responds to cyclic commands (roll and pitch). Adjusting the cyclic response can reduce the linear control feeling of flybarless systems and make the helicopter response feel more like a flybar helicopter.

The factory setting is "Normal". To use the cyclic response feature, select "Slightly Increased" from the options. Gradually increase the cyclic response until you reach the desired level.

Cyclic Response Too High: Results in uncontrollable, inaccurate rotation and deteriorated stopping behavior.

The maximum amount of cyclic response is determined by many factors, including: heli size, swashplate servos, main rotor blades, head speed, servo power supply and helicopter setup.

The option "User Defined" allows you to define your own settings using the optional PC Software.

Press the setup button once to move to menu point (H).

Status-LED	Cyclic Response
OFF	User Defined
Purple Solid	Normal*
Red Flashing	Slightly Increased
Red Solid	Increased
Blue Flashing	High
Blue Solid	Very High

*=Factory Setting

H. Pitch Boost

Pitch boost is useful in 3D aerobatics when rapid pitch changes are necessary for certain flight maneuvers. Additional collective pitch will be added as you move the pitch stick faster.

Pitch boost will not exceed the maximum pitch value set in Setup menu point (K). Start from the "low" setting and gradually increase to the desired level.

The maximum amount of pitch boost is determined by many factors, including: maximum pitch values, pitch curve, swashplate servos, main rotor blades and head speed.

Pitch Boost Setting Too High: Can cause the rotor blades to stall when you input fast pitch commands. The collective pitch will feel slow, the opposite of the desired effect.

Status-LED	Pitch Boost
OFF	User Defined
Purple Solid	Off*
Red Flashing	Low
Red Solid	Medium
Blue Flashing	High
Blue Solid	Very High

*=Factory Setting

The option “User Defined” allows you to define your own settings using the optional PC Software.
Press the setup button once to exit the Parameter menu.

The First Flight

After powering on the receiver, wait for the AR7200BX to initialize completely (Short movement of swashplate servos and Status LED is Solid Blue or Solid Purple).

It is not necessary for the helicopter to be horizontal. Do not move the helicopter at any time during the initialization. You can lay the helicopter on its side to prevent shaking in wind.

⚠ **CAUTION:** Always complete a control direction test with the transmitter and make sure the sensors are correcting in the proper directions when you tilt, roll and yaw the helicopter by hand.

It is normal for the swashplate to slowly move back to its original position after a stick input and for the servos to not move at the same speed as your control sticks.

When using a flybarless rotor head, you are controlling rotational rates while the AR7200BX controls the servos. You are not directly controlling the servos with the transmitter.

Heading Lock Mode: It is normal for the tail servo to:

1. Stay in its end position after a tail stick input or tail movement.
2. Not react immediately to a stick input.
3. Move to the endpoints with small stick inputs.

⚠ **CAUTION:** Remove main and tail rotor blades before the first flight. Allow the motor/engine to run at all speeds. Watch for the swashplate to automatically tilt in one direction or begin to twitch at a specific speed. These are signs that the helicopter has mechanical vibration that will disturb the AR7200BX sensors.

Correct any sources of mechanical vibration before the first flight.
Just before lift off, make sure the swashplate is horizontal and the tail pitch slider is near centered.

Avoid excessive steering during lift off, otherwise the helicopter may tip over and crash!
Give direct collective pitch input to quickly lift the helicopter into the air. This will require some practice if you do not have experience with flybarless helicopters.

Version Display

After the AR7200BX initializes, the Status LED turns Solid Red for 3 seconds. The first two digits of the internal firmware version are displayed.

Representation of Values

The representation of all values using the menu LEDs is in binary. A lighting menu LED stands for a 1, an off LED for 0. The least significant bits are Ⓐ and Ⓗ.

Firmware Version

The firmware version consists of three values X, Y, and Z which are displayed for X and Y during the initialization, and for Z if the button is pushed during this initialization. X is displayed though menu LEDs Ⓐ - Ⓖ, Y through Ⓗ - Ⓝ and Z is using all LEDs Ⓐ - Ⓝ.

Data Version

The data version consists of two values X and Y, which are displayed at the same time through menu LEDs Ⓐ - Ⓖ for X and Ⓗ - Ⓝ for Y.

Hardware Version

The hardware version consists of two values X and Y, which are displayed at the same time through menu LEDs Ⓐ - Ⓖ for X and Ⓗ - Ⓝ for Y.

Servo Reference Chart

Servo	Swashplate				Tail	
	Frequency		Center-Position		Frequency	
	Color	Hz	Color	µs	Color	Hz
SPMSH3000	Red Flashing	65 Hz	Blue Solid	1520 µs	Purple	50 Hz
SPMSH3020	Blue Solid	200 Hz	Blue Solid	1520 µs	Red Flashing	165 Hz
SPMSH5000	Blue Solid	200 Hz	Blue Solid	1520 µs	Red Flashing	165 Hz
SPMSH5010	Blue Solid	200 Hz	Blue Solid	1520 µs	Red Flashing	165 Hz
SPMSH6010	Red Flashing	65 Hz	Blue Solid	1520 µs	Purple	50 Hz
SPMSH6040	Blue Solid	200 Hz	Blue Solid	1520 µs	Red Flashing	165 Hz
SPMSH6080G	Blue Solid	200 Hz	Blue Solid	1520 µs	Blue Flashing	333 Hz
SPMSH5020G	Blue Solid	200 Hz	Blue Solid	1520 µs	Solid Red	270 Hz

AR7200BX Overview

SETUP MENU *Menu LED solid*

	Status-LED:	OFF	Purple	Red Flashing	Red Solid	Blue Flashing	Blue Solid
A	**Mounting orientation**				upright (vertical)		flat (horizontal)*
B	Swashplate servo - **frequency**	**User defined**	50 Hz*	65 Hz	120 Hz	165 Hz	200 Hz
C	Tail servo - **center position pulse length**	**User defined**	960 µs		760 µs		1520 µs*
D	Tail servo - **frequency**	**User defined**	50 Hz*	165 Hz	270 Hz	333 Hz	560 Hz
E	Tail servo - **rotor endpoints**	Tail stick - move to right endpoint and wait/left endpoint and wait					
F	Tail - **sensor direction**				normal*		reversed
G	Swashplate - **servo centering**	reference position	ELE center pos.		AIL center pos.		PIT center pos.
H	Swashplate - **mixer**	**User defined**	mechanical	90°	120°*	140°	140° (1=1)
I	Swashplate - **servo directions**	nor|rev|rev	nor|nor|rev*		nor|rev|nor		nor|nor|nor
J	Swashplate - **cyclic pitch geometry**	Aileron stick – adjust 6° cyclic pitch on the roll axis (blades aligned with fuselage)					
K	**Collective pitch range**	Collective stick on max and min position and use tail stick to adjust desired pitch					
L	Swashplate - **cyclic limit**	Move aileron, elevator and pitch sticks – adjust max limits with tail stick					
M	Swashplate - **sensor directions**	rev | rev	rev | nor		nor | rev		nor | nor*
N	**Pirouette optimization direction**				normal*		reversed

*=Factory Setting

PARAMETER MENU *Menu LED is flashing quickly*

	Status-LED:	OFF	Purple	Red Flashing	Red Solid	Blue Flashing	Blue Solid
A	Swashplate - **cyclic center adjustment**	Aileron and elevator stick – reset with tail stick					
B	**Control behavior**	**User defined**	normal	sport*	pro	extreme	**transmitter**
C	Swashplate - **pitching up behavior**	**User defined**	very low	low	medium*	high	very high
D	Tail - **HeadingLock gain**	**User defined**	very low	low	medium*	high	very high
E	**Stick deadband**	**User defined**	1	2*	3	4	5
F	Tail - **torque precompensation**	**User defined**	off*	low - nor	high - nor	low - rev	high - rev
G	**Cyclic response**	**User defined**	normal*	slightly increased	increased	high	very high
H	**Pitch boost**	**User defined**	off*	low	medium	high	very high

*=Factory Setting

1-Year Limited Warranty

What this Warranty Covers

Horizon Hobby, Inc., (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 years 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, or (v) Products not purchased from an authorized Horizon dealer.

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 direct your email to productsupport@horizonhobby.com, or call 877.504.0233 toll free to speak to a Product Support representative. You may also find information on our website at www.horizonhobby.com.

Inspection or Services

If this Product needs to be inspected or serviced, 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 under the Support tab. 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 cashiers 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/Service/Request/.

Warranty and Service Contact Information

Country of Purchase	Horizon Hobby	Address	Phone Number/Email Address
United States of America	Horizon Service Center (Electronics and engines)	4105 Fieldstone Rd Champaign, Illinois 61822 USA	877-504-0233 Online Repair Request: visit www.horizonhobby.com/service
	Horizon Product Support (All other products)	4105 Fieldstone Rd Champaign, Illinois 61822 USA	877-504-0233 productsupport@horizonhobby.com
United Kingdom	Horizon Hobby Limited	Units 1-4 Ployters Rd Staple Tye Harlow, Essex CM18 7NS United Kingdom	+44 (0) 1279 641 097 sales@horizonhobby.co.uk
Germany	Horizon Technischer Service	Christian-Junge-Straße 1 25337 Elmshorn Germany	+49 (0) 4121 2655 100 service@horizonhobby.de
France	Horizon Hobby SAS	14 Rue Gustave Eiffel Zone d'Activité du Réveil Matin 91230 Montgeron	+33 (0) 1 60 47 44 70 infofrance@horizonhobby.com
China	Horizon Hobby – China	Room 506, No. 97 Changshou Rd. Shanghai, China 200060	+86 (021) 5180 9868 info@horizonhobby.com.cn

FCC Information

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.

This product contains a radio transmitter with wireless technology which has been tested and found to be compliant with the applicable regulations governing a radio transmitter in the 2.400GHz to 2.4835GHz frequency range.

Customer Service Information

Country of Purchase	Horizon Hobby	Address	Phone Number/Email Address
United States of America	Sales	4105 Fieldstone Rd Champaign, Illinois 61822 USA	(800) 338-4639 sales@horizonhobby.com
United Kingdom	Horizon Hobby Limited	Units 1-4 Ployters Rd Staple Tye Harlow, Essex CM18 7NS United Kingdom	+44 (0) 1279 641 097 sales@horizonhobby.co.uk
Germany	Horizon Hobby GmbH	Christian-Junge-Straße 1 25337 Elmshorn Germany	+49 4121 46199 60 service@horizonhobby.de
France	Horizon Hobby SAS	14 Rue Gustave Eiffel Zone d'Activité du Réveil Matin 91230 Montgeron	+33 (0) 1 60 47 44 70 infofrance@horizon-hobby.com
China	Horizon Hobby – China	Room 506, No. 97 Changshou Rd. Shanghai, China 200060	+86 (021) 5180 9868 info@horizonhobby.com.cn

Compliance Information for the European Union

Declaration of Conformity

(in accordance with ISO/IEC 17050-1)

No. HH2011111302

Product(s):	AR7200BX 7CH Flybarless Control System
Item Number(s):	SPMAR7200BX
Equipment class:	1

The object of declaration described above is in conformity with the requirements of the specifications listed below, following the provisions of the European R&TTE directive 1999/5/EC:

CE **EN 301 489-1 V1.7.1: 2006**
EN 301 489-17 V1.3.2: 2008

Signed for and on behalf of:
Horizon Hobby, Inc.
Champaign, IL USA
November 13, 2011

Vice President
International Operations and Risk Management
Horizon Hobby, Inc.

Instructions for disposal of WEEE by users in the European Union

This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collections point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

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US 7,391,320. Other patents pending.
Created 11/11 32660

SPEKTRUM
Innovative Spread Spectrum Technology

AR7200BX

Unique SmartSafe Functionality of AR7200BX

The AR7200BX features a unique SmartSafe™ failsafe function that operates in the following manner:

During power up and before the RF connection, no output pulses are present on the throttle. The ESC will not arm.

- When the RF connection is made between the transmitter and receiver, the throttle servo output pulse is driven to the bound failsafe position (normally low throttle) regardless of the throttle stick position. The output pulse remains at the bound failsafe position until the throttle stick is returned to low throttle. At this point the ESC is armed, however, the receiver is “locked” at low throttle.
- When you move the throttle stick to the low position, the system allows normal throttle control of the throttle output pulses.

This feature was developed to prevent the throttle from returning to a high throttle position (idle up active) after a brown out, as the cyclic servos will not recover until re-initialization.

The Issue

To enter the programming, calibration, or data reset modes, many ESCs (Castle, E-flite, Align and others.) require the first pulse to be at full throttle (1.9ms). SmartSafe, as described above, prevents this from happening with the AR7200BX.

Recommended Solution

Using a Separate Receiver Pack to Pre-Connect the AR7200BX

1. **It is highly recommended that you first disengage the gear train by removing the pinion gear anytime you plan to access the programming mode.**
2. Disconnect the battery from the ESC and disconnect the ESC from the receiver.
3. Carefully remove the red wire from the ESC throttle lead connector. This will prevent the possibility of damaging the BEC when you power the receiver using a separate receiver pack.
4. Turn on the transmitter.
5. Using a separate receiver pack, plug the receiver pack connector into any port (other than throttle) in the AR7200BX. Allow the system to connect and initialize.
6. Release the throttle output pulse by moving the throttle to the low position. Move the throttle to the full throttle position to enter programming mode.
7. With the throttle at full, plug in the ESC throttle lead connector (with the red wire disconnected) into the AR7200BX throttle port and plug in the main LiPo battery. Power on the LiPo battery through the ESC or switch harness, if applicable. The ESC should enter the programming mode.
8. Program the ESC as normal. Disconnect the LiPo battery and the receiver pack after you finish programming the ESC.
9. Attach the red wire to the ESC throttle lead connector. Plug the throttle lead connector into the throttle port on the AR7200BX.

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36829 Printed: 2/2012

AR7200BX Overview

SETUP MENU *Menu LED solid*

	Status-LED:	OFF	Purple	Red Flashing	Red Solid	Blue Flashing	Blue Solid
A	**Mounting orientation**				upright (vertical)		flat (horizontal)*
B	Swashplate servo - **frequency**	**User defined**	50Hz*	65Hz	120Hz	165Hz	200Hz
C	Tail servo - **center position pulse length**	**User defined**	960 µs		760 µs		1520 µs*
D	Tail servo - **frequency**	**User defined**	50Hz*	165Hz	270Hz	333Hz	560Hz
E	Tail servo - **rotor endpoints**	Tail stick - move to right endpoint and wait/left endpoint and wait					
F	Tail - **sensor direction**				normal*		reversed
G	Swashplate - **servo centering**	reference position	ELE center pos.		AIL center pos.		PIT center pos.
H	Swashplate - **mixer**	**User defined**	mechanical	90°	120°*	140°	140° (1=1)
I	Swashplate - **servo directions**	nor|rev|rev	nor|nor|rev*		nor|rev|nor		nor|nor|nor
J	Swashplate - **cyclic pitch geometry**	Aileron stick – adjust 6° cyclic pitch on the roll axis (blades aligned with fuselage)					
K	**Collective pitch range**	Collective stick on max and min position and use tail stick to adjust desired pitch					
L	Swashplate - **cyclic limit**	Move aileron, elevator and pitch sticks – adjust max limits with tail stick					
M	Swashplate - **sensor directions**	rev | rev	rev | nor		nor | rev		nor | nor*
N	**Pirouette optimization direction**				normal*		reversed

*=Factory Setting

PARAMETER MENU *Menu LED is flashing quickly*

	Status-LED:	OFF	Purple	Red Flashing	Red Solid	Blue Flashing	Blue Solid
A	Swashplate - **cyclic center adjustment**	Aileron and elevator stick – reset with tail stick					
B	**Control behavior**	**User defined**	normal	sport*	pro	extreme	**transmitter**
C	Swashplate - **pitching up behavior**	**User defined**	very low	low	medium*	high	very high
D	Tail - **HeadingLock gain**	**User defined**	very low	low	medium*	high	very high
E	**Stick deadband**	**User defined**	1	2*	3	4	5
F	Tail - **torque precompensation**	**User defined**	off*	low - nor	high - nor	low - rev	high - rev
G	**Cyclic response**	**User defined**	normal*	slightly increased	increased	high	very high
H	**Pitch boost**	**User defined**	off*	low	medium	high	very high

*=Factory Setting

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AR7200BX Übersicht

SETUP Menü *(Menü LED leuchtet)*

	Status-LED:	AUS	Violett	blinkt Rot	leuchtet Rot	blinkt Blau	leuchtet Blau
A	**Einbaulage**				hochkant (vertikal)		flach (horizontal)*
B	Taumelscheibenservo - **Ansteuerfrequenz**	**Benutzer-definiert**	50Hz*	65Hz	120Hz	165Hz	200Hz
C	Heckservo - **Mittenimpuls**	**Benutzer-definiert**	960 µs		760 µs		1520 µs*
D	Heckservo - **Frequenz**	**Benutzer-definiert**	50Hz*	165Hz	270Hz	333Hz	560Hz
E	Heckservo - **Endanschläge**	Mit Hecksteuerknüppel linke Position anfahren und warten/rechte Position anfahren und warten.					
F	Heck - **Sensorrichtung**				normal*		reversiert
G	Taumelscheibe - **Servomittenposition**	Referenzposition	Kanal 1 Mittenposition		Kanal 2 Mittenposition		Kanal 3 Mittenposition
H	Taumelscheibe - **Mischer**	**Benutzer-definiert**	Mechanisch	90°	120°*	140°	140° (1=1)
I	Taumelscheibe - **Servolaufrichtungen**	nor|rev|rev	nor|nor|rev*		nor|rev|nor		nor|nor|nor
J	Taumelscheibe - **Regelweganpassung**	Mit Rollsteuerknüppel 6° zyklisches Pitch auf der Rollachse einstellen. Rotorblatt parallel zum Heckrohr.					
K	**Kollektive Pitcheinstellung**	Pitchsteuerknüppel auf Maximum und Minimum - mit Hecksteuerknüppel gewünschten Wert einstellen.					
L	Taumelscheibe - **zyklische Begrenzung**	Roll, Nick und Pitch bewegen - mit Hecksteuerknüppel gewünschten Wert einstellen.					
M	Taumelscheibe - **Sensorrichtung**	rev | rev	rev | nor		nor | rev		nor | nor*
N	**Pirouetten-Optimierungsrichtung**				normal*		reversiert

*=Werkseinstellung

PARAMETER MENÜ *(Menü LED schnell blinkend)*

	Status-LED:	AUS	Violett	blinkt Rot	leuchtet Rot	blinkt Blau	leuchtet Blau
A	Taumelscheibe - **zyklische Servomittenposition**	Steuerknüppel mit Roll und Nick - Reset mit Hecksteuerknüppel.					
B	**Steuerverhalten**	**Benutzer-definiert**	Normal	Sport*	Pro	Extreme	**Sender**
C	Taumelscheibe - **Aufbäumkompensation**	**Benutzer-definiert**	sehr niedrig	niedrig	mittel*	hoch	sehr hoch
D	Heck - **Heading Lock Anteil**	**Benutzer-definiert**	sehr niedrig	niedrig	mittel*	hoch	sehr hoch
E	**Steuerknüppel Totband**	**Benutzer-definiert**	1	2*	3	4	5
F	Tail - **torque precompensation**	**Benutzer-definiert**	Aus*	low - nor	hoch - nor	low - rev	hoch - rev
G	**Zyklisches Ansprechverhalten**	**Benutzer-definiert**	Normal*	etwas erhöht	erhöht	hoch	sehr hoch
H	**Pitchverstärkung (Pitch Boost)**	**Benutzer-definiert**	Aus*	niedrig	mittel	hoch	sehr hoch

*=Werkseinstellung

Vue d'ensemble de l'AR7200BX

MENU SETUP *La DEL de menu fixe*

	DEL de statut	OFF	Violette	Rouge clignotante	Rouge fixe	Bleue clignotante	Bleue fixe
A	**Orientation du récepteur**				Sur le flanc		A plat*
B	**Fréquence des servos du cyclique**	**Personnalisé**	50Hz*	65Hz	120Hz	165Hz	200Hz
C	**Position centrale et longueur d'impulsion du servo d'anticouple**	**Personnalisé**	960 µs		760 µs		1520 µs*
D	**Fréquence du servo d'anticouple**	**Personnalisé**	50Hz*	165Hz	270Hz	333Hz	560Hz
E	**Réglage des fins de course du servo d'anticouple**	Manche d'anticouple- déplacez la fin de course à gauche et patientez/course à droite et patientez					
F	**Réglage du sens du gyro d'anticouple**				normal*		inversé
G	**Réglage des neutres des servos du plateau cyclique**	neutre	neutre de la profondeur		neutre des ailerons		neutre du pas
H	**Mixage du plateau cyclique**	**Personnalisé**	mécanique	90°	120°*	140°	140° (1=1)
I	**Réglage des directions des servos de cyclique**	nor|rev|inv	nor|nor|inv*		nor|inv|nor		nor|nor|nor
J	**Réglage de la géométrie du cyclique**	Manche des ailerons-ajustez à 6° le pas cyclique sur l'axe des ailerons					
K	**Réglage de la course du pas collectif**	manche du collectif aux positions mini et maxi, utilisez le manche d'anticouple pour régler le pas à la valeur désirée.					
L	**Réglage des limites du plateau cyclique**	déplacez les manches d'ailerons,profondeur et de pas-ajustez les limites maximales avec le manche d'anticouple.					
M	**Réglage du sens des capteurs de cyclique**	inv | inv	inv | nor		nor | inv		nor | nor*
N	**Réglage du sens de compensation de pirouette**				normal*		inversé

*= Par défaut

MENU DE PARAMÉTRAGE *La DEL de menu clignote rapidement*

	DEL de statut	OFF	Violette	Rouge clignotante	Rouge fixe	Bleue clignotante	Bleue fixe
A	**Réglage du neutre du plateau cyclique**	Manche d'ailerons et de profondeur-remise à zero avec le manche d'anticouple					
B	**Comportement en vol**	**Personnalisé**	normal	sport*	pro	extrême	**radio**
C	**Compensation d'autocabrage au cyclique**	**Personnalisé**	très faible	faible	moyen*	élevé	très élevé
D	**Taux de conservateur de cap**	**Personnalisé**	très faible	faible	moyen*	élevé	très élevé
E	**Zone morte des manches**	**Personnalisé**	1	2*	3	4	5
F	**Précompensation de couple -RevoMix**	**Personnalisé**	off*	faible - nor	élevé - nor	low - inv	élevé - inv
G	**Réponse au cyclique**	**Personnalisé**	normal*	très faible	faible	élevé	très élevé
H	**Accélération du pas**	**Personnalisé**	off*	faible	moyen	élevé	très élevé

*=Par défaut

Panoramica AR7200BX

SETUP MENU *LED fisso*

	Status-LED:	OFF	Viola	Rosso lampeggiante	Rosso fisso	Blu lampeggiante	Blu fisso
A	**Orientamento nel montaggio**				verticale		orizzontale*
B	Servi del piatto - **frequenza**	**Definito dall'utente**	50Hz*	65Hz	120Hz	165Hz	200Hz
C	Servo di coda - **Lunghezza impulso centrale**	**Definito dall'utente**	960 µs		760 µs		1520 µs*
D	Servo di coda - **frequenza**	**Definito dall'utente**	50Hz*	165Hz	270Hz	333Hz	560Hz
E	Servo di coda - **fine corsa rotore**	Stick coda - portare a fine corsa a destra e aspettare / fine corsa a sinistra e aspettare					
F	Tail - **direzione sensore**				normale*		invertito
G	Piatto oscillante - **centraggio servi**	posizione di riferimento	pos. centrale ELE		pos. centrale AIL		pos. centrale PIT
H	Piatto oscillante - **mixer**	**Definito dall'utente**	mechanical	90°	120°*	140°	140° (1=1)
I	Piatto oscillante -**direzione servi**	nor|rev|rev	nor|nor|rev*		nor|rev|nor		nor|nor|nor
J	Piatto oscillante - **geometria passo ciclico**	stick alettone – regola 6° sull'asse di rollio (pale allineate alla fusoliera)					
K	**Escursione passo collettivo**	Collettivo al max e al min, regolare il passo con stick di coda					
L	Piatto oscillante - **cyclic limit**	Muovere stick alettone, elevatore e passo –regolare limite max con stick coda					
M	Piatto oscillante - **direzione del sensore**	rev | rev	rev | nor		nor | rev		nor | nor*
N	**Ottimizzare direzione piroetta**				normale*		invertito

*=Impostazione di fabbrica

MENU PARAMETRI *I LED lampeggiano velocemente*

	Status-LED:	OFF	Viola	Rosso lampeggiante	Rosso fisso	Blu lampeggiante	Blu fisso
A	Piatto oscillante - **regolazione centro del ciclico**	Stick alettone ed elevatore – reset con stick coda					
B	**Controllo del comportamento**	**Definito dall'utente**	normale	sport*	pro	extreme	**trasmettitore**
C	Piatto oscillante - **compensazione „pitch up"**	**Definito dall'utente**	molto basso	basso	medio*	alto	monto alto
D	Tail - **Sensibilità „heading lock"**	**Definito dall'utente**	molto basso	basso	medio*	alto	monto alto
E	**Zona morta stick**	**Definito dall'utente**	1	2*	3	4	5
F	Tail - **Pre-compensazione coppia**	**Definito dall'utente**	off*	basso - nor	alto - nor	basso - rev	alto - rev
G	**Reazione del ciclico**	**Definito dall'utente**	normale*	leggermente aumentato	aumenta-to	alto	monto alto
H	**Spinta sul passo**	**Definito dall'utente**	off*	basso	medio	alto	monto alto

*=Impostazione di fabbrica

ENGLISH

AR7200BX Servo Reference Chart

	Swashplate		Tail			
	Frequency		Center-Position		Frequency	
Servo	Color	Hz	Color	µs	Color	Hz
SPMSH3000	Red Flashing	65Hz	Blue Solid	1520µs	Purple	50Hz
SPMSH3020	Blue Solid	200Hz	Blue Solid	1520µs	Red Flashing	165Hz
SPMSH5000	Blue Solid	200Hz	Blue Solid	1520µs	Red Flashing	165Hz
SPMSH5010	Blue Solid	200Hz	Blue Solid	1520µs	Red Flashing	165Hz
SPMSH6010	Red Flashing	65Hz	Blue Solid	1520µs	Purple	50Hz
SPMSH6040	Blue Solid	200Hz	Blue Solid	1520µs	Red Flashing	165Hz
SPMSH6080G	Blue Solid	200Hz	Blue Solid	1520µs	Blue Flashing	333Hz
SPMSH5020G	Blue Solid	200Hz	Blue Solid	1520µs	Solid Red	270Hz
SPMSH310	Blue Solid	200Hz	Blue Solid	1520µs	Solid Red	165Hz
SPMSH410	Blue Solid	200Hz	Blue Solid	1520µs	Solid Red	270Hz
SPMSH6160	Blue Solid	200Hz	Blue Solid	1520µs	Solid Red	165Hz
SPMSH6200	Blue Solid	200Hz	Blue Solid	1520µs	Solid Red	333Hz
SPMSH6210	Blue Solid	200Hz	Blue Solid	1520µs	Solid Red	333Hz

DEUTSCH

Servo Referenz Karte

	Taumelscheibe		Heck			
	Frequenz		Mittenimpuls		Frequenz	
Servo	Farbe	Hz	Farbe	µs	Farbe	Hz
SPMSH3000	blinkt Rot	65Hz	leuchtet Blau	1520µs	Violett	50Hz
SPMSH3020	leuchtet Blau	200Hz	leuchtet Blau	1520µs	blinkt Rot	165Hz
SPMSH5000	leuchtet Blau	200Hz	leuchtet Blau	1520µs	blinkt Rot	165Hz
SPMSH5010	leuchtet Blau	200Hz	leuchtet Blau	1520µs	blinkt Rot	165Hz
SPMSH6010	blinkt Rot	65Hz	leuchtet Blau	1520µs	Violett	50Hz
SPMSH6040	leuchtet Blau	200Hz	leuchtet Blau	1520µs	blinkt Rot	165Hz
SPMSH6080G	leuchtet Blau	200Hz	leuchtet Blau	1520µs	blinkt Blau	333Hz
SPMSH5020G	leuchtet Blau	200Hz	leuchtet Blau	1520µs	leuchtet Rot	270Hz
SPMSH310	leuchtet Blau	200Hz	leuchtet Blau	1520µs	leuchtet Rot	165Hz
SPMSH410	leuchtet Blau	200Hz	leuchtet Blau	1520µs	leuchtet Rot	270Hz
SPMSH6160	leuchtet Blau	200Hz	leuchtet Blau	1520µs	leuchtet Rot	165Hz
SPMSH6200	leuchtet Blau	200Hz	leuchtet Blau	1520µs	leuchtet Rot	333Hz
SPMSH6210	leuchtet Blau	200Hz	leuchtet Blau	1520µs	leuchtet Rot	333Hz

FRANÇAIS

Tableau des caractéristiques des servos

	Cyclique		Anticouple			
	Fréquence		Neutre		Fréquence	
Servo	Couleur	Hz	Couleur	µs	Couleur	Hz
SPMSH3000	Rouge clignotante	65Hz	Bleue fixe	1520µs	Violette	50Hz
SPMSH3020	Bleue fixe	200Hz	Bleue fixe	1520µs	Rouge clignotante	165Hz
SPMSH5000	Bleue fixe	200Hz	Bleue fixe	1520µs	Rouge clignotante	165Hz
SPMSH5010	Bleue fixe	200Hz	Bleue fixe	1520µs	Rouge clignotante	165Hz
SPMSH6010	Rouge clignotante	65Hz	Bleue fixe	1520µs	Violette	50Hz
SPMSH6040	Bleue fixe	200Hz	Bleue fixe	1520µs	Rouge clignotante	165Hz
SPMSH6080G	Bleue fixe	200Hz	Bleue fixe	1520µs	Bleue clignotante	333Hz
SPMSH5020G	Bleue fixe	200Hz	Bleue fixe	1520µs	Rouge fixe	270Hz
SPMSH310	Bleue fixe	200Hz	Bleue fixe	1520µs	Rouge fixe	165Hz
SPMSH410	Bleue fixe	200Hz	Bleue fixe	1520µs	Rouge fixe	270Hz
SPMSH6160	Bleue fixe	200Hz	Bleue fixe	1520µs	Rouge fixe	165Hz
SPMSH6200	Bleue fixe	200Hz	Bleue fixe	1520µs	Rouge fixe	333Hz
SPMSH6210	Bleue fixe	200Hz	Bleue fixe	1520µs	Rouge fixe	333Hz

ITALIANO

Tabella di riferimento dei servi

	Piatto oscillante		Coda			
	Frequenza		Posizione centrale		Frequenza	
Servo	Colore	Hz	Colore	µs	Colore	Hz
SPMSH3000	Rosso lampeggiante	65Hz	Blu fisso	1520µs	Viola	50Hz
SPMSH3020	Blu fisso	200Hz	Blu fisso	1520µs	Rosso lampeggiante	165Hz
SPMSH5000	Blu fisso	200Hz	Blu fisso	1520µs	Rosso lampeggiante	165Hz
SPMSH5010	Blu fisso	200Hz	Blu fisso	1520µs	Rosso lampeggiante	165Hz
SPMSH6010	Rosso lampeggiante	65Hz	Blu fisso	1520µs	Viola	50Hz
SPMSH6040	Blu fisso	200Hz	Blu fisso	1520µs	Rosso lampeggiante	165Hz
SPMSH6080G	Blu fisso	200Hz	Blu fisso	1520µs	Blu lampeggiante	333Hz
SPMSH5020G	Blu fisso	200Hz	Blu fisso	1520µs	Rosso fisso	270Hz
SPMSH310	Blu fisso	200Hz	Blu fisso	1520µs	Rosso fisso	165Hz
SPMSH410	Blu fisso	200Hz	Blu fisso	1520µs	Rosso fisso	270Hz
SPMSH6160	Blu fisso	200Hz	Blu fisso	1520µs	Rosso fisso	165Hz
SPMSH6200	Blu fisso	200Hz	Blu fisso	1520µs	Rosso fisso	333Hz
SPMSH6210	Blu fisso	200Hz	Blu fisso	1520µs	Rosso fisso	333Hz

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Updated 9/13 35537.3

Spektrum AR7200BX Governor Firmware Update

IMPORTANT: When using the AR7200BX with larger helicopters (500-size and larger): It is necessary that you connect a DSMX® remote receiver (not included) to the AR7200BX before binding . See “Receiver Installation” for more information.

IMPORTANT: You must download and install the latest AR7200BX receiver firmware at http://ar7200bx.beastx.com/ BEFORE installing the governor update.

Required

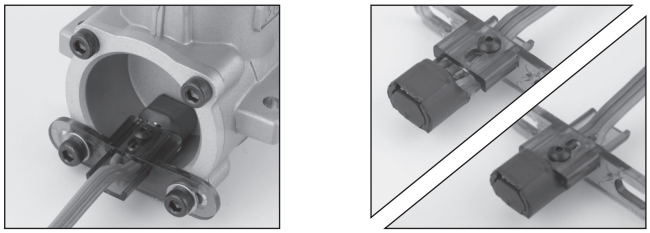
- Spektrum™ AR7200BX Flybarless Controller
- Spektrum AR7200BX USB Updater (SPMA3030 or BTXA76007)
- Governor Sensor
  – Aircraft RPM Sensor (SPM9560) or
  – RPM Sensor (optical sensor) (SPM1452)

⚠ **WARNING:** For first-time use or when making mechanical changes that involve throw, always ensure you reset the servo limits to prevent binding. Not doing so will cause the helicopter to crash, resulting in property damage and injury.

RPM Sensor Installation

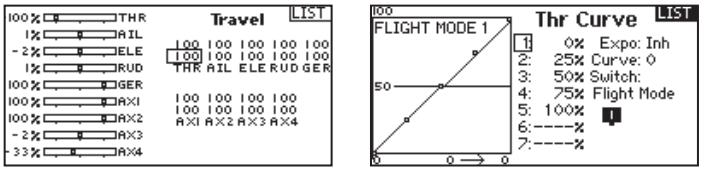
Mount the RPM sensor and bracket to the backplate screws of your engine as shown.

- Threadlock must be used on the screws.
- The RPM sensor bracket is adjustable by extending or retracting the rpm sensor and fastening the screw in place.
- Connect the RPM sensor to Aux 3.



Preparing Your Transmitter

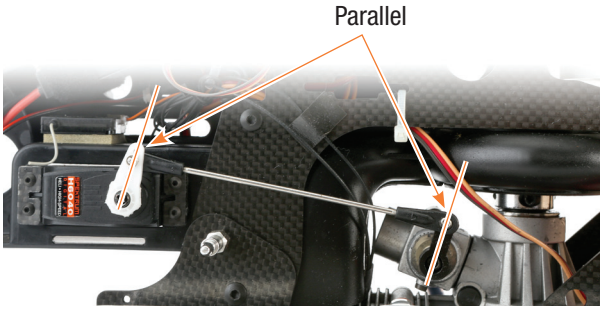
1. Program the throttle channel travel to 100% for both high and low endpoints.
2. Select a linear throttle curve. You will program your normal throttle curves later.



DX9 screens shown

Throttle Arm Setup

1. Disconnect the throttle linkage from the throttle arm.
2. Make sure the throttle curve in your transmitter is linear.
3. Move the throttle stick to 50% and make sure the throttle barrel is open 50%.
4. Adjust the throttle arm and the servo arm so they are parallel to each other.
5. Select holes in the servo horn and the throttle arm to achieve the full range of throttle motion. The transmitter servo travel must stay above 100%.
6. Program your normal throttle curves for flying.



Navigating the Governor Setup Menus

- Enter the Governor Setup Menu by pressing the Setup Button on the AR7200BX before power-up and holding it for approximately 2 seconds until the LED at menu point **(A)** illuminates.
- There are 9 menu points (Menu LED, **A, B, C, D, E, F, G, H, I**).
- Menu points are shown by the menu LEDs located to the right of the alphabetical letters on the case.
- Menu status is shown on the LED located next to “Status” close to the center of the case.
- Quickly press the Setup Button to move from one menu point to the next.
- Press and hold the Setup Button to change or save a value.

Menu A

Governor Off/On:

1. The first time you power on the AR7200BX, the governor will be OFF (Status LED will be OFF). You must turn the governor ON to access all of the menu options.
2. To turn the governor ON, press and hold the Setup Button until the Status LED is RED.
3. Quickly press the Setup Button to move to Menu **B**.

Status-LED

OFF	Governor OFF
Red Solid	Governor ON

Menu B

Sensor Test Mode:

Each time the RPM sensor is triggered, the Status LED will turn RED, indicating that the sensor is detecting crankshaft rotation.

Press the Setup Button to move to Menu **C**.

Status-LED

OFF	RPM Sensor OFF
Red Solid	RPM Sensor ON

IMPORTANT: The Sensor Test does not guarantee governor performance, but will confirm if the sensor is detecting crankshaft rotation.

Menu C

Setting the Throttle Low Point:

The Status LED will turn Solid Blue when the receiver detects a valid low throttle point.

1. Lower the transmitter throttle stick and confirm that the carburetor is fully closed (Not idle position).
2. Confirm that the Status LED is Blue.
3. Press the Setup Button to save the low throttle position. The AR7200BX will save the setting and move to Menu **D**.

Status-LED

OFF	Throttle is outside the valid range.
Blue Solid	Valid low throttle point

Menu D

Setting the Throttle High Point:

The Status LED will turn Solid Blue when the receiver detects a valid high throttle point.

1. Raise the transmitter throttle stick and confirm that the carburetor is fully open.
2. Confirm that the Status LED is Blue.
3. Press the Setup Button to save the high throttle position. The AR7200BX will save the setting and move to Menu **E**.

Status-LED

OFF	Throttle is outside the valid range.
Blue Solid	Valid high throttle point

Menu E

Checking Activation Points for Throttle and RPM channel:

- The Status LED will turn Blue when the throttle is above the activation threshold (above 25% throttle).
- The Status LED will turn Red when the RPM channel is above the activation threshold (5% above or below the center position).

To activate the governor, **ALL** of the following conditions must be met:

- The RPM channel is 5% above or below the center position.
- The throttle channel is above 25%.
- The RPM reaches 60% of the programmed target RPM.

The governor deactivates if ANY of the following conditions are met:

- The RPM channel is within 5% of the center position.
- The throttle channel is below 25%.
- The RPM is lower than 60 RPM.

After confirming the activation points, press the button to move to Menu **F**.

Status-LED

OFF	
Blue Solid	Above 25% throttle
Red Solid	5% above or below center position
Purple Solid	Both Red and Blue conditions are met.

Menu F

Setting the RPM Prescaler:

You can add equally-spaced magnets to the fan, clutch or mainshaft to increase the resolution of the sensor reading. The increased resolution is most helpful with low RPM, gasoline engines. If you are only using one magnet, Prescaler must be OFF. Otherwise, set the Prescaler to the total number of magnets. Options range from 2–7 magnets.

Status-LED	
OFF	Prescaler Off
Purple Flashing	Prescaler divide by 2
Purple Solid	Prescaler divide by 3
Red Flashing	Prescaler divide by 4
Red Solid	Prescaler divide by 5
Blue Flashing	Prescaler divide by 6
Blue Solid	Prescaler divide by 7

Menu G

Gear Ratio – First Digit:

You must set the appropriate gear ratio for your helicopter so the governor will work properly at your desired headspeed. The menu **G** parameter enables you to set the first digit **X** (where the gear ratio is X.YZ) in a range from 6 to 12.

Status-LED	X.
OFF	6
Purple Flashing	7
Purple Solid	8
Red Flashing	9
Red Solid	10
Blue Flashing	11
Blue Solid	12

Menu H and I

Gear Ratio – Second and Third Digits:

Menus **H** and **I** enable you to set the last two digits **.YZ** (where the gear ratio is X.YZ). Setting the last two digits for your gear ratio requires a combination of the **H** and **I** menus.

EXAMPLE: Needed Gear Ratio is 7.95 for .YZ = .95

Set Menu **H** to RED
Set Menu **I** to RED FLASHING

Exiting the Menu:
When LED **I** is solid, quickly press the setup button to exit the menu.

If the gear ratio for your helicopter is not shown, select the closest ratio from the chart.

H Status-LED	.YZ	I Status-LED
OFF	.00	OFF
OFF	.05	Purple Flashing
OFF	.10	Purple Solid
OFF	.15	Red Flashing
Purple Flashing	.20	OFF
Purple Flashing	.25	Purple Flashing
Purple Flashing	.30	Purple Solid
Purple Flashing	.35	Red Flashing
Purple Solid	.40	OFF
Purple Solid	.45	Purple Flashing
Purple Solid	.50	Purple Solid
Purple Solid	.55	Red Flashing
Red Flashing	.60	OFF
Red Flashing	.65	Purple Flashing
Red Flashing	.70	Purple Solid
Red Flashing	.75	Red Flashing
Red Solid	.80	OFF
Red Solid	.85	Purple Flashing
Red Solid	.90	Purple Solid
Red Solid	.95	Red Flashing

Governor Parameter Adjustments

To enter the Parameter Menu:

1. Once the AR7200BX is initialized, press and hold the setup button until the LED flashes next to menu point **(A)**.
2. Release the setup.
3. Press the setup button once to move to the next menu point. The 8 menu points (**A** through **H**) in the Parameter Menu are unchanged. The new menu points for governor functions are **I** through **K**.
4. Press the setup button once at menu point **(K)** to exit the Parameter Menu.

Parameter Menu I

Throttle Response In Unloaded Conditions:

Adjust Parameter **I** to prevent the governor from over speeding the rotor head or applying too much throttle when your helicopter goes from a loaded to an unloaded condition.

- Engines in larger 700-size helicopters should use the Low setting.
- Smaller .30-size engines should use the Aggressive setting.

Status-LED

OFF	PC Set
Purple Solid	Low
Red Flashing	Moderate
Red Solid	Medium
Blue Flashing	Fast
Blue Solid	Aggressive

Parameter Menu J

Initial RPM Spool-Up Rate:

The initial spool up rate is set in RPM/second, and defines how quick the RPM increases from the point where the governor is engaged, up to the final set RPM. This setting only applies when the governor activates by slowly increasing the throttle, otherwise the bailout function may activate (see Parameter **K**: Bailout Function for more information).

Status-LED

OFF	PC Set
Purple Solid	50 RPM/s
Red Flashing	100 RPM/s
Red Solid	200 RPM/s
Blue Flashing	300 RPM/s
Blue Solid	400 RPM/s

Parameter Menu K

Bailout Function:

⚠ **CAUTION:** The bailout function enables the governor to bring the engine back up to speed quickly. The blade bolts MUST be very tight or the blades may swing back under acceleration and cause a boom strike. If the helicopter has a boom strike in the air, it will be unrecoverable and the helicopter will fall to the ground.

The AR7200BX Governor supports an intelligent autorotation bailout function. When the throttle channel value changes from below 25% to above 60% very quickly, the governor selects a faster spool-up rate to compensate for a recovery from an autorotation (bailout).

Changing the settings in the parameter menu adjusts how aggressively the throttle increases after the bailout is activated. If this parameter is set to “Bailout OFF”, the special autorotation bailout spool up is disabled and the default spool up behavior is used.

Status-LED

OFF	PC Set
Purple Solid	Bailout OFF
Red Flashing	Smooth
Red Solid	Normal
Blue Flashing	Increased
Blue Solid	Heavy

Expected RPM for Aux 3 Value

Initial RPM Spool Up Rate:

Use the following chart to set the RPM you demand with the Aux 3 value.

Aux 3 (%)	RPM
5.5	350
10	476
15	616
20	757
25	897
30	1037
35	1177
40	1317
45	1458
50	1598
55	1738
60	1878
65	2019
70	2159
75	2299
80	2439
85	2579
90	2720
95	2860
100	3000

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BeastX is a trademark of Markus Schaack and is used with permission.
US 7,391,320. Other patents pending.

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EN

Downloading and Installing the Spektrum™/BeastX™ Software Bundle

1. Visit the BeastX website to download the Spektrum Software Bundle.

For Windows®:

http://ar7200bx.beastx.com/software/Windows/SpektrumSoftwareBundle.msi

For Mac®:

http://ar7200bx.beastx.com/software/MacOS/SpektrumSoftwareBundle.dmg

1. Save the Spektrum Software Bundle to your computer's hard drive.
2. Double-click on the installer and follow the instructions.

Connecting the AR7200BX to Your Computer

1. Power OFF the AR7200BX.
2. Connect the Spektrum™ USB Interface or BeastX USB2SYS to your computer.
3. Connect the servo extension to the USB interface and the BND/DAT slot on the AR7200BX.
4. Power ON the AR7200BX.

Retrieving the AR7200BX Firmware

1. Open the BeastX Updater.
2. Select the appropriate USB-Interface.
3. Highlight and Copy your AR7200BX Serial Number.
4. Visit the AR7200BX product page at http://ar7200bx.beastx.com/.
5. Enter your email address and paste your AR7200BX Serial Number and click Submit.
6. You will receive an email with the latest AR7200BX software.
7. Save the firmware file on your computer's hard drive.

Updating the AR7200BX Firmware

1. Open the BeastX Updater.
2. Connect and Power ON the AR7200BX.
3. Click "Open File…" and select the new firmware file.

IMPORTANT: DO NOT disconnect the USB interface or power off the AR7200BX during the update process.

4. Click "Start Update…" to install the firmware on the AR7200BX.
5. When the update processes is complete, power OFF the AR7200BX and disconnect the USB interface.

Using AR7200BX Microsettings application

1. Using the AR7200BX Microsettings requires version 3.1.0 or higher.
2. Refer to the updating instructions detailed above to update your AR7200BX to version 3.1.0.
3. Launch the AR7200BX Microsettings application.
4. Click "Connect" to modify the desired Setup Menu or Parameter Menu Settings.
5. Please refer to your Spektrum AR7200BX instruction manual for detailed programming.
6. Additional Microsettings features and instructions can be found at www.beastx.com.

DE

Laden und installieren Sie das Spektrum/ BeastX Software Bundle

1. Besuchen Sie die BeastX Website um das Spektrum Software Bundle herunterzuladen.

Für Windows®:

http://ar7200bx.beastx.com/software/Windows/SpektrumSoftwareBundle.msi

Für Mac®:

http://ar7200bx.beastx.com/software/MacOS/SpektrumSoftwareBundle.dmg

1. Speichern Sie das Spektrum Software Bundle auf die Festplatte ihres Computers.
2. Doppelklicken Sie auf den Installer und folgen Sie den Anweisungen.

Verbinden Sie den AR7200BX mit Ihrem Computer

1. Schalten Sie die Stromversorgung des AR7200BX AUS.
2. Verbinden Sie das Spektrum USB Interface (SPMA3030) oder das BeastX USB2SYS-Interface (BTXA76007) mit Ihrem Computer.
3. Verbinden Sie das Servokabel mit dem USB-Interface und dem BND/DAT Anschluss am AR7200BX.
4. Schalten Sie die Stromversorgung des AR7200BX EIN.

AR7200BX Firmware beziehen

1. Öffnen Sie den BeastX Updater.
2. Wählen Sie das entsprechende USB-Interface aus.
3. Markieren und kopieren Sie die Seriennummer ihres AR7200BX.
4. Besuchen Sie die AR7200BX Produktseite auf http://ar7200bx.beastx.com/.
5. Geben Sie Ihre Email-Adresse ein, fügen Sie die Seriennummer Ihres AR7200BX ein und drücken Sie auf Absenden.
6. Sie erhalten in Kürze eine Email mit der aktuellsten AR7200BX Firmware.
7. Speichern Sie die Firmware-Datei auf Ihre Festplatte.

Aktualisierung der AR7200BX Firmware

1. Öffnen Sie den BeastX Updater.
2. Verbinden Sie ihre AR7200BX und schalten Sie die Stromversorgung ein.
3. Drücken Sie auf "Open File…" und wählen Sie die Firmware-Datei aus.

WICHTIG: Trennen Sie während den Update-Prozess den AR7200BX NICHT vom USB-Interface oder der Stromversorgung.

4. Drücken Sie auf "Start Update…" um die Firmware des AR7200BX zu aktualisieren.
5. Nachdem der Update-Prozess erfolgreich abgeschlossen wurde können Sie die Stromversorgung abschalten und das USB-Interface abstecken.

AR7200BX Microsettings Applikation benutzen

1. Die AR7200BX Microsettings benötigen Firmware 3.1.0 oder höher
2. Befolgen Sie ausführlich die oben angegebenen Anweisungen um ihren AR7200BX auf Firmware 3.1.0 zu aktualisieren.
3. Starten Sie die AR7200BX Microsettings Applikation.
4. Verbinden Sie Ihren AR7200BX mit dem USB-Interface.
5. Drücken Sie "Connect" um die gewünschte Setup Menu oder Parameter Menu Einstellung zu ändern.
6. Bitte benutzen Sie ihre Spektrum AR7200BX Bedienungsanleitung für ausführliche Programmierung.
7. Zusätzliche Microsettings Besonderheiten und Anleitungen können unter www.beastx.com gefunden werden.

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FR

Téléchargement et installation du logiciel Spektrum / BeastX

1. Connectez-vous sur le site Internet BeastX pour télécharger le logiciel Spektrum.

Pour Windows ®:

http://ar7200bx.beastx.com/software/Windows/SpektrumSoftwareBundle.msi

Pour Mac ®:

http://ar7200bx.beastx.com/software/MacOS/SpektrumSoftwareBundle.dmg

2. Enregistrez le Logiciel Spektrum sur le disque dur de votre ordinateur.
3. Double-cliquez sur le programme d'installation et suivez les instructions.

Branchement de l'AR7200BX à votre ordinateur

1. Éteindre le AR7200BX.
2. Branchez le Spektrum ™ interface USB (SPMA3030) ou BeastX USB2SYS (BTXA76007) sur votre ordinateur.
3. Raccorder le cable de rallonge servo sur l'interface USB et la prise BND / DAT sur le AR7200BX.
4. Allumez le AR7200BX.

Récupération du firmware AR7200BX

1. Lancez le logiciel de mise à jour BeastX.
2. Sélectionnez l'interface USB approprié.
3. Mettez en surbrillance et copiez votre numéro de série AR7200BX.
4. Visitez la page produit AR7200BX à http://ar7200bx.beastx.com/.
5. Entrez votre adresse email et collez votre numéro de série AR7200BX et cliquez sur Submit.
6. Vous recevrez un e-mail avec la dernière version du logiciel AR7200BX.
7. Enregistrez le fichier firmware sur le disque dur de votre ordinateur.

Mise à jour du Firmware AR7200BX

1. Lancez le logiciel de mise à jour BeastX.
2. Branchez et allumez le AR7200BX.
3. Cliquez sur "Open File ..." et sélectionnez le fichier du nouveau firmware.

IMPORTANT: NE PAS débrancher l'interface USB ou éteindre le AR7200BX pendant le processus de mise à jour.

4. Cliquez sur "Start Update ..." pour installer le firmware sur le AR7200BX.
5. Lorsque le processus de mise à jour est terminé, éteindre le AR7200BX et déconnecter l'interface USB.

Utilisation de l'application Microsettings pour AR7200BX

1. L'utilisation de l'application Microsettings AR7200BX nécessite un firmware de version 3.1.0 ou supérieure.
2. Reportez-vous aux instructions détaillées de mise à jour ci-dessus et le cas échéant mettez à jour votre AR7200BX en version 3.1.0.
3. Lancez l'application Microsettings AR7200BX.
4. Connectez votre AR7200BX à l'interface USB.
5. Cliquez sur "Connect" pour modifier les réglages du menu Setup ou du menu Paramètres.
6. Référez-vous au manuel de votre Spektrum AR7200BX pour les détails sur la programmation des différents paramètres.
7. D'autres fonctionnalités et instructions de l'application Microsettings sont disponibles sur www.beastx.com.

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