

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)

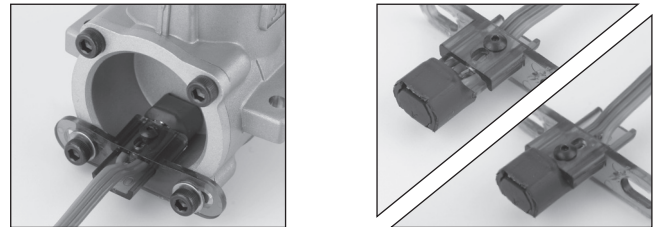


⚠ WARNING: For first-time use or when making mechanical changes that involve throw, always ensure you reset the servo limits to prevent binding. Not doing so will cause the helicopter to crash, resulting in property damage and injury.

RPM Sensor Installation

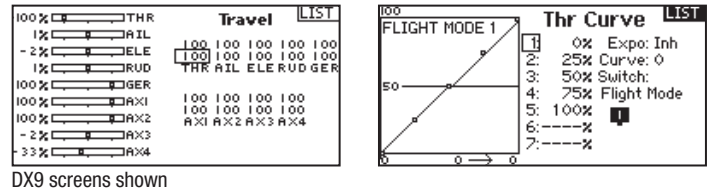
Mount the RPM sensor and bracket to the backplate screws of your engine as shown.

- 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.



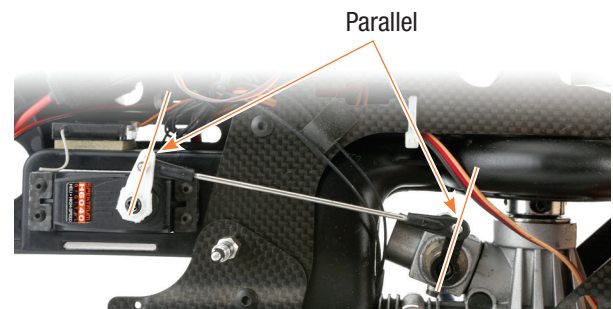
Preparing Your Transmitter

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.



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**.

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**.

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**.

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**.

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	Governor OFF
Red Solid	Governor ON

Status-LED

OFF	RPM Sensor OFF
Red Solid	RPM Sensor ON

Status-LED

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

Status-LED

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

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.

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).

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	Low
Red Flashing	Moderate
Red Solid	Medium
Blue Flashing	Fast
Blue Solid	Aggressive

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

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.