CX-3X900

Flybarless 3 Axis Gyro System

INSTRUCTION MANUAL

www.copterx.com

MENU

1. Introduction

Thank you for purchasing the CopterX CX-3X900 flybarless stabilization system.
With micro processor controlled MEMS gyro, Digital LCD setup box. Makes this one of the most advance system on the market. As this system have 3 MEMS gyro control Elevator, aileron and rudder functions, it is no longer necessary to run an extra gyro for rudder control. CopterX CX-3X900 system is you all in one solution for flybarless helicopter from 250 EP helicopter to 90 nitro helicopter.

1.2. Specifications

*MEMS Gyro Sensors in three axes
*Digital signal processor
*Operating voltage: 4-10 Volts, current < 80mA
*Temperature range: -10°C to +50°C
*Size: 33x34x18mm
*Weight: 15g
*Servo compatibility: 1520uS/333Hz, 1520uS/250Hz, 1520uS/167Hz, 960uS/333Hz and 760uS/500Hz digital servos, 1520uS/71Hz Analog servo.

1.3. Package Includes

*CopterX CX-3X900 flybarless system
*LCD setup box
*Wires for connection between gyro and receiver/ setup box
*Double sided pads and stainless steel anti vibration pad.
*Spare parts: foam and double-side adhesive tape and Stainless steel plate.

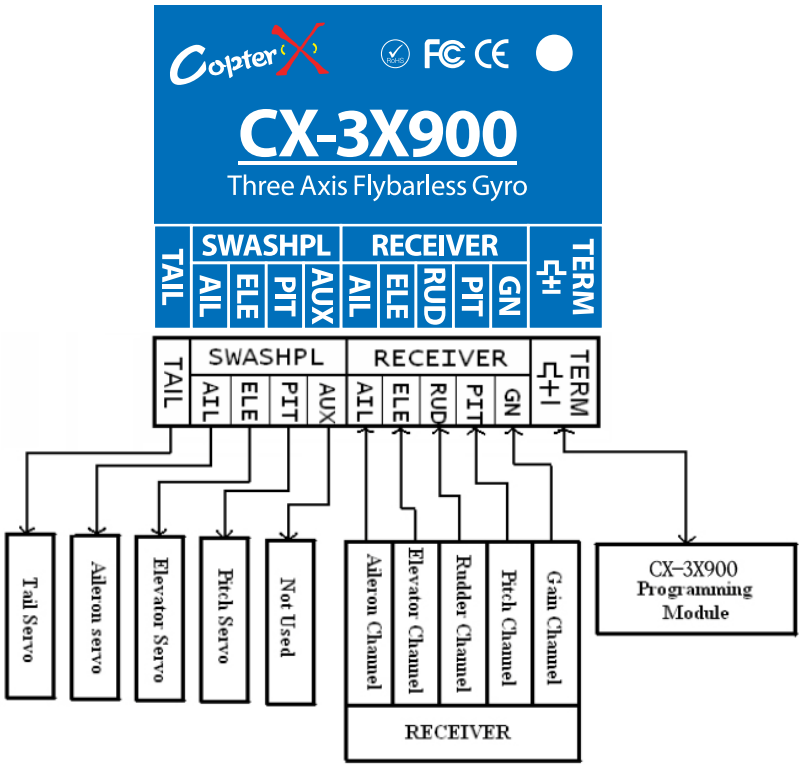
2.1. Installation for EP helicopter

To install the CopterX CX-3X900 flight stabilization system on your EP helicopter. Secure unit to helicopter by using the double sided pad included. Mount unit on gyro location according to your helicopter. Can be mount in normal or upside down location and in any of the direction. Please refer to the picture below of further details. To ensure accurate control please makes sure gyro will not come in contact with other part of the helicopter. To avoid vibration please use valco strips to secure wires and units accordingly.

2.2. Installation for GP helicopter

To install the CopterX CX-3X900 flight stabilization system on your GP helicopter. Secure unit to helicopter by using the stainless steel plate sandwiched between two double sided pads . Mount unit on gyro location according to your helicopter. Can be mount in normal or upside down location and in any of the direction. Please refer to the picture below of further details. To ensure accurate control please makes sure gyro will not come in contact with other part of the helicopter. To avoid vibration please use valco strips to secure wires and units accordingly.

2.3. Setup



1. Connect system to receiver. Do not connect any servo at this moment.
2. Set all sub-trim to neutral. And swashplate according to your helicopter.
3. Set a gain switch in your transmitter for switching flight mode
4. During your first powerup of CopterX CX-3X900 unit, Please hold the rudder stick to the left or right positon within 3 seconds after power on. The LED will stay on solid then flash 2 times, which indicate unit is in primary setting mode, the main purpose of this mode is to learn the direction of swashplate servos. After finishing the first calibration of middle point,
maximum travel and minimum travel of swashplate, the later calibration of middle point, high level and level of swashplate can be confirmed directly by LCD setting card, without entering primary setting mode. Except that the AILERON, ELEVATOR and PITCH directions of swashplate servos are changed.
5. Select the types of tail servo and swashplate servos according to setting guide for LCD setting card.
6. Connect the servos(rudder,aileron, elevation,pitch) to gyro.
7. check the operation of all servos and reverse at transmitter if necessary. Can check for binding for complete servo's movement and adjust accordingly.
8. adjust setting by LCD display card to preference.

2.4. Power up unit

During power up, Please let the helicopter sits on level ground and do not move any control stick for 3 seconds for unit to initialize. And makes sure unit will not come in contact with other parts of the helicopter during flight.

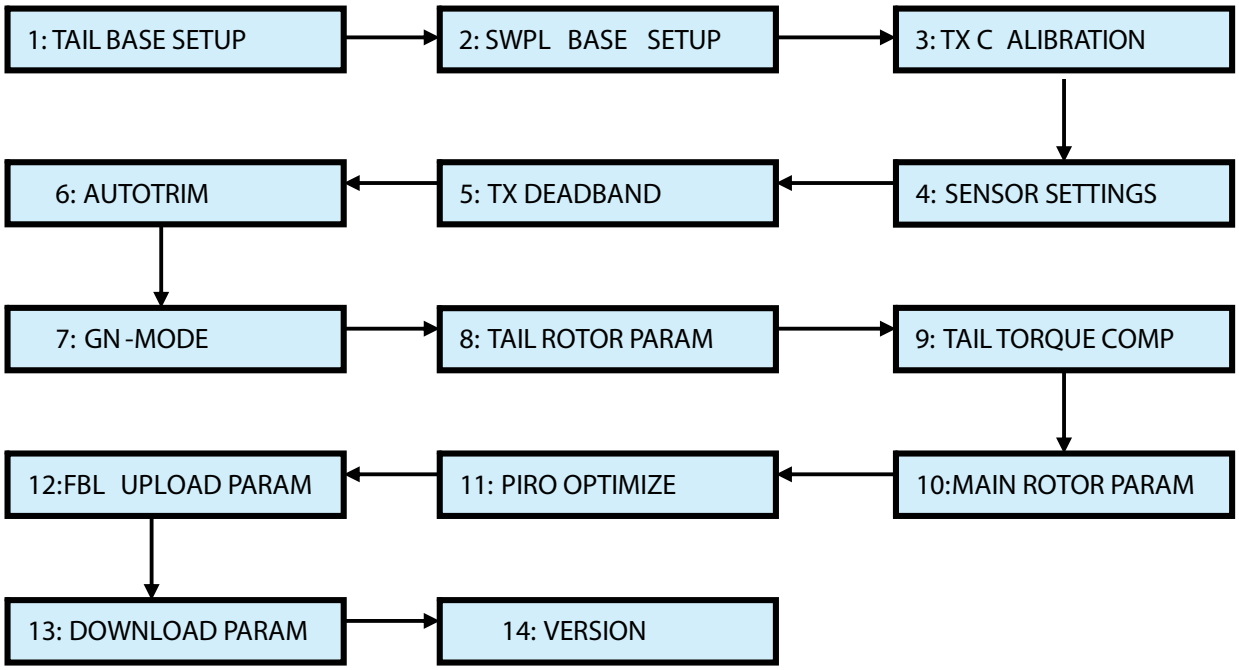
3.1. LED indicator

During normal operation the LED provides simple status information for users.

On	AVCS and Normal mode. Rudder stick at neutral.
Long time OFF and short 2 times ON	Rudder stick is not at neutral.
Long time ON and short 2 times OFF	The rudder stick is detected to move to the left end or right end within 3 seconds after power on.
OFF	Lose of gain signal.
Repeating flash	Error. Gyro not receiving valid signal from the receiver.

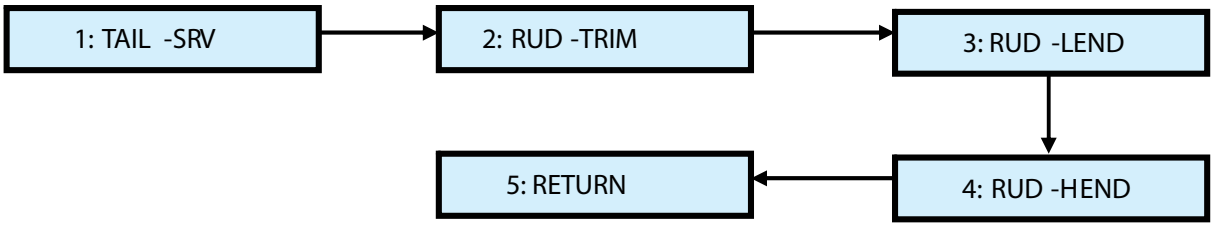
3.2. Main menu

Main menu for setup:

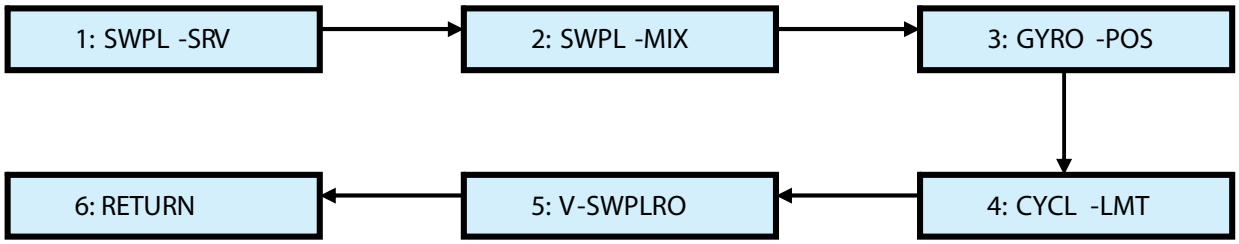


3.3. Sub menu

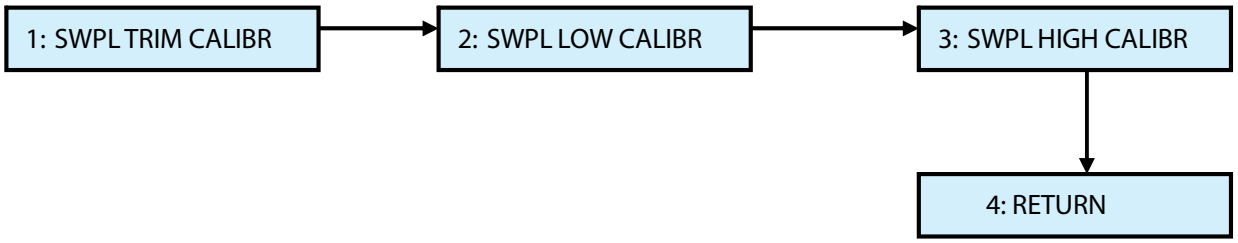
3.3.1 Tail Base setup



3.3.2 SWPL base setup

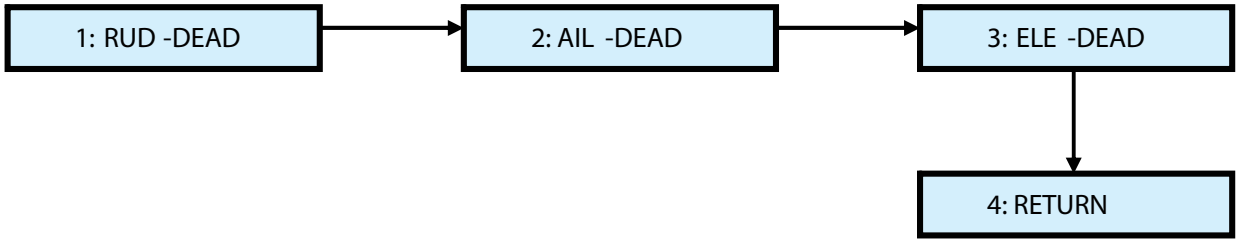


3.3.3 TX calibration



3.3.4 Sensor settings

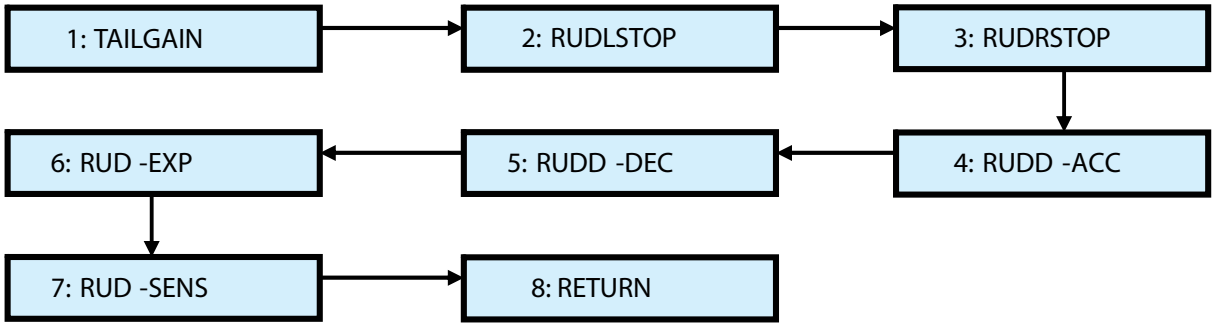
3.3.5 TX Deadband



3.3.6 AutoTrim

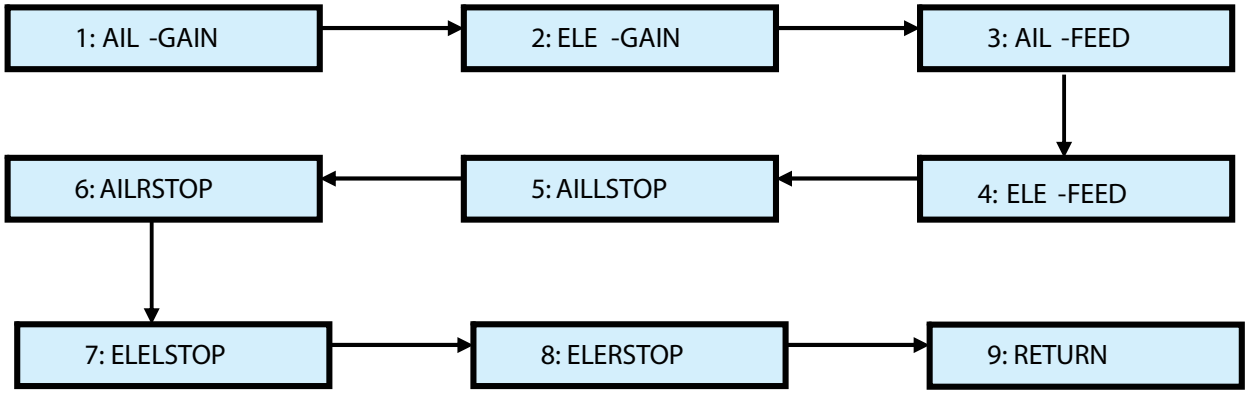
3.3.7 GN-mode

3.3.8 Tail Rotor Param



3.3.9 Tail Torque Comp

3.3.10 Main rotor Param



3.3.11 Piro Optimize

3.3.12 FBL Upload Param

3.3.13 Download Param

3.3.14 Version

4.1. Gyro setting

4.1.1 Power up

Power up with LCD setting card connected. LCD will display “HELLO”. After 5sec. display card will enter main menu.

4.1.2 Default setting

When “HELLO” is display, press +10 and -1 buttons simultaneously. Configuration will return to default value.

4.1.3 System reset

Reset button is located at the bottom of LCD configuration card.

4.1.4 Return to main manual

Press FUNC+ or FUNC- buttons, select “return” menu when Scroll up/down sub menu. Press any button of +10, -10, +1, -1, return to previous menu.

4.2. Button Description

Total 7 function keys: FUNC+, FUNC-, +10, -10, +1, -1, Reset

Description	***Function***
FUNC +, FUNC -	Scroll up/down menu
+10, -10	Increase (+) or decrease (-) value by 10 units each time. Automatically change to 1 units if the maximum function value is less than 20. Enter for main menu and “RETURN”
+1, -1	Increase (+) or decrease (-) value by 1 units each time. Enter for main menu and “RETURN”
Reset	System reset

4.3. Tail base setup

1. Tail-SRV - rudder servo type selection

Menu items	*Description*
152-33 (Default)	Servo pulse width 1520us, working frequency 333Hz includes: Futaba: S9253, S9254, S9650, S9257, S3153 JR: 8900G, DS3405, DS3500 Hitec: HS-5084MG, HS-5925MG LogicTech: 3100G If the servos work in abnormal state, it doesn't adapt to 333Hz frequency, select the option with lower frequency of 152-25 (1520us/20Hz) or 152-07 (1520us/71Hz).
76-50	Servo pulse width 760us, working frequency 500Hz includes: Futaba: S9251, S9256, BLS251 LogicTech: 6100G
152-25	Servo pulse width 1520us, working frequency 250Hz includes: Futaba: S3154 JR: 8700G, 2700G Align: DS510, DS520, DS620
96-33	Servo pulse width 960us, working frequency 333Hz includes: LogicTech: 6100G, 3100G Hitec: 5083MG
152-07	Servo pulse width 1520us, working frequency 71Hz includes: Analog servo, low-speed digital servo
Suggestion	High-frequency digital servo is compatible to low-frequency pulse. If you did not know which kind of frequency the 1520us digital servo adapts. Choose 152-25 (1520us/250Hz) for trial firstly, if the heli is not working, choose 152-07 (1520us/71Hz) to analog the servo specification. If it works normally, rechoose 152-33 (1520us/333Hz) for trial. The frequency chosen is higher, the glight effect is better.

2. MID-TRIM - Rudder Servo Neutral Adjustment

Attention: Rudder SUB TRIM value of Transmitter should be set to zero. When CX-3X900 is at normal mode, perform mechanical adjustment of the tail servo horn and control linkage to achieve approximately 8deg tail pitch. Under AVCS mode, rapidly move rudder stick towards left and right for 3 times, then release rudder stick, or switch normal mode into AVCS mode to confirm whether the middle point of tail rotor is right.

Menu items	*Description*
-100~0~+100 (Default 0)	Fine tune rudder servo neutral point.

3. RUD-LEND - Rudder High Travel Limit

Menu items	*Description*
130~240 (Default 160)	Adjust rudder servo travel at end limit.
Suggestion	Suggested setting between 160~230. If setting is higher than 230, please install ball link to the outer hole of servo horn or use longer horns. If setting is lower than 140, please install ball link to the inner hole of servo horn or use shorter horns. It is recommended to keep difference between RUD-HEND and RUD-LEND within ±20.

4. RUD-HEND - Rudder Low Travel Limit

Menu items	*Description*
130~240 (Default 160)	Adjust rudder servo travel at end limit.
Suggestion	Suggested setting between 160~230. If setting is higher than 230, please install ball link to the outer hole of servo horn or use longer horns. If setting is lower than 140, please install ball link to the inner hole of servo horn or use shorter horns. It is recommended to keep difference between RUD-HEND and RUD-LEND within ±20.

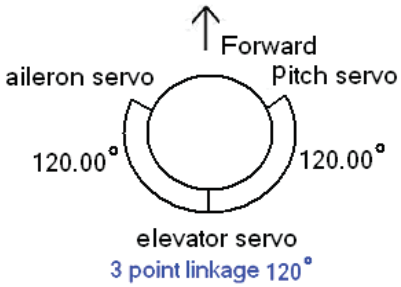
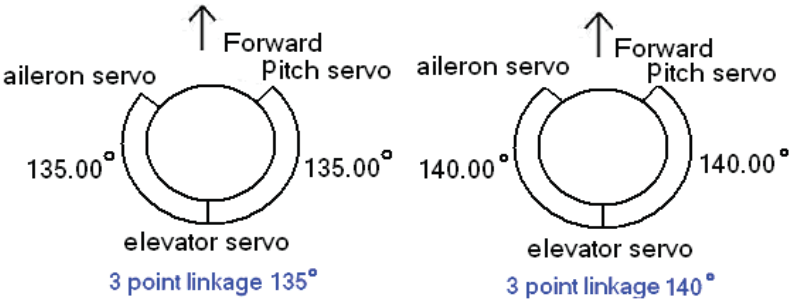
4.4. SWPL base setup

1. SWPL-SRV - Swashplate Servos Category Selection

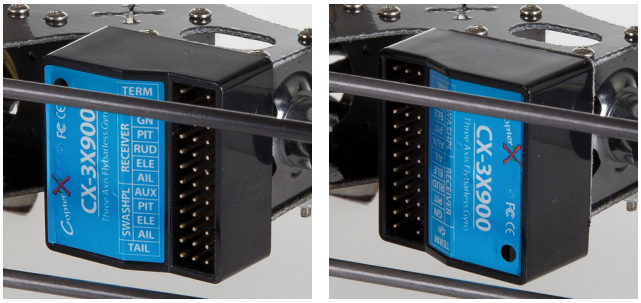
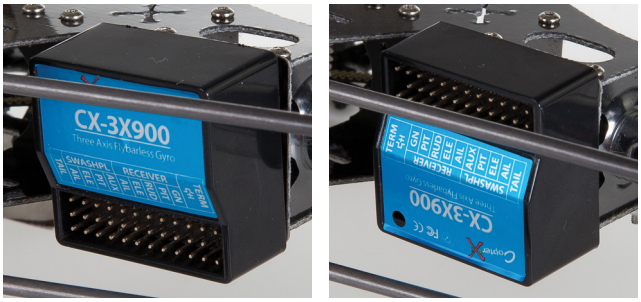
Item	*Content*
152-07 (Default)	Servo pulse width 1520us, working frequency 71Hz includes: Analog servo, low-speed digital servo.
152-33	Servos pulse width 1520us, working frequency 333Hz includes: Futaba: S9253, S9254, S9650, S9257 JR: 8900G, DS3405, DS3500 Hitec: HS-5084MG, HS-5925MG LogicTech: 3100G
76-33	Servos pulse width 1520us, working frequency 333Hz includes: Futaba: S9251, S9256, BLS251 LogicTech: 6100G
152-25	Servos pulse width 1520us, working frequency 250Hz includes: Futaba: S3153 JR: 8700G, 2700G Align: DS510, DS520, DS620 Ino-Lab: 202

152~167	Servos pulse width 1520us, working frequency 167Hz includes: Align: DS410, DS610 Low-speed digital servo.
Suggestion	High-frequency digital servo is compatible to low-frequency pulse. If you did not know which kind of frequency the 1520us digital servo adapts. Choose 152-16 (1520us/167Hz) for trial firstly. If the body oscillates, please reduce elevation and aileron hain. If the oscillation of body still can not be solved, choose 152-07 (1520us/71Hz) to analog the servo specification. If it works normally, rechoose 152-25 (1520us/250Hz) or 152-33 (1520us/333Hz) for trial. The frequency chosen is higher, the flight effect is better.

2. SWPL-MIX - Swashplate Mixing Type Selection

Item	***Content***
HR-3 (Default)	Transmitter should be in HR-3 model. CX-3X900 controls 3 swashplate servos by using 3-point (120°) link method. 
H-3	Transmitter should be in H-3 model. CX-3X900 controls 3 swashplate servos by CX-3X900 using 3-point (135°/140°) link method. 

3. GYRO-POS - CX-3X900 Placement Selection

Item	*Content*
NORM (Default)	CX-3X900 runs parallel to the helicopter (nose) and can be placed at the top and the bottom. It shall be powered on when changing the placement. 
ROT-90	CX-3X900 runs perpendicular to the helicopter (nose) and can be placed at the top and the bottom. It shall be powered on when changing the placement. 

4. CYCL-LMT - Setting for Limit of Ring Pitch of Swashplate

Item	*Content*
10~+540 (Default 240)	Incline limit of ring pitch, avoiding the swashplate's mechanical binding. And prevent the overcorrect of elevation sensor and aileron sensor.
Suggestion	Push the elevation stick or the aileron stick in the end. Adjust mixing ratio of aileron and elevator (SWASH AFR) in your transmitter. Adjust CYCL-LMT value until swashplate will not become mechanical binding.

5. V-SWPLRO - Settings of Virtual Swashplate Rotation

Item	*Content*
-89~+89 (Default 0)	The phase compensation of swashplate, and the precision is 1°. Regarding 2-blade rotor head, this value is 0. Mainly used for the phase compensation of multi-blade (above 3 blades) rotor head.

4.5. TX calibration

1. SWPL TRIM CALIBR - Swashplate Middle Level Calibration

At primary setting mode, push forward pitch stick, check whether the directions of swashplate servos (AILERON, ELEVATOR and PITCH) are right. If wrong, the AILERON, ELEVATOR and PITCH in SERVOS REVERSE of your transmitter shall be adjusted until the directions of swashplate servos are right. After confirming the calibration of middle level, the later calibration shall be confirmed directly by this menu, without entering primary setting mode. Attention: The rudder stick must be pushed to the left end or right end within 3 seconds after power on. The LED shall illuminate for long time and go out shortly for 2 times, which shows that CX-3X900 enters primary setting mode.	
Push pitch stick to middle point, fine adjust AILERON, ELEVATOR and PITCH of your transmitter (SUB-TRIM item), press any key among +10, -10, +1 and -1 to confirm calibration, the LCD programmer card shall show “Calibration OK”, showing CX-3X900 is finished calibration. Meanwhile, the AUTOTRIM data in the memory shall be deleted.	
Calibration Suggestions	Once the values of ALIERON, ELEVATOR and PITCH of your transmitter on SUB-TRIM item are changed, the middle level of your transmitter mist be confirmed by LCD programmer card.

2. SWPL LOW CALIBR - Swashplate Low Level Calibration

When the pitch stick is at low end, adjust the low end travel of AILERON, ELEVATOR and PITCH of your transmitter (END POINT item), press any key among +10, -10, +1 and -1 to confirm calibration, the LCD setting card shall show “Calibration OK”, showing CX-3X900 is finished calibration.	
Calibration Suggestions	Once the low end travel values of AILERON, ELEVATOR and PITCH of your transmitter (END POINT item) are changed, the low end travel calibration of your transmitter must be confirmed by LCD programmer card.

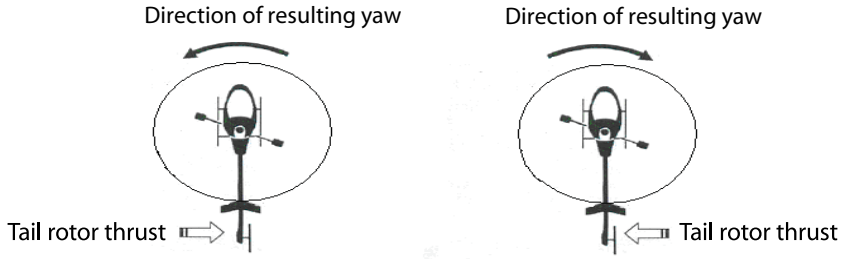
3. SWPL HIGH CALIBR - Swashplate High Level Calibration

When the pitch stick is at high end, adjust the high end travel of AILERON, ELEVATOR and PITCH of your transmitter (END POINT item), press any key among +10, -10, +1 and -1 to confirm calibration, the LCD programmer card shall show “Calibration OK”, showing CX-3X900 is finished calibration.	
Calibration Suggestions	Once the high end travel values of AILERON, ELEVATOR and PITCH of your transmitter (END POINT item) are changed, the high end travel calibration of your transmitter must be confirmed by LCD programmer card.

4.6. Sensor settings

1. RUD-DIRE - Rudder gyro direction selection

Attention: Check that the rudder direction matches the transmitter stick direction. Otherwise, please reverse the rudder direction in your transmitter.



Item	*Content*
NORM (Default)	Rotate the helicopter left (nose). Rudder servo should compensate to the right automatically. Otherwise, change value to “REV”. As shown in the diagram.
REV	Rotate the helicopter left (nose). Rudder servo should compensate to the right automatically. Otherwise, change value to “NORM”. As shown in the diagram.

2. AIGY-DIR - Compensation Direction Selection for Aileron Sensor

Item	*Content*
NORM (Default)	Lift the helicopter, incline the body with left higher than right, the swashlate shall be compensated with left lower then right, if it is compensated with left higher than right, please adjust the data to “REV”.
REV	Lift the helicopter, incline the body with left higher than right, the swashlate shall be compensated with left lower then right, if it is compensated with left higher than right, please adjust the data to “NORM”.
Suggestions	First record the values of AIL-FEED, the values of AIL-FEED be set to zero, select the compensation direction of the aileron sensor by following the above procedures properly, and restore the values of AIL-FEED. If the helicopter turned on one side as take-off from the landing area, please inspect whether the compensation direction of aileron sensor is set inversely, if it is, please revise the compensation direction of aileron sensor.

3. ELGY-DIR - Compensation Direction Selection for Elevating Sensor

Item	*Content*
NORM (Default)	Lift the helicopter, incline the body with back higher than front, the swashplate shall be compensated with back lower than front, if it is compensated with back higher than front, please adjust the data to "REV".
REV	Lift the helicopter, incline the body with back higher than front, the swashplate shall be compensated with back lower than front, if it is compensated with back higher than front, please adjust the data to "NORM".
Suggestions	First record the values of AIL-FEED, the values of AIL-FEED be set to zero, select the compensation direction of the elevating sensor by following the above procedures properly, and restore the values of AIL-FEED. If the helicopter turned forward as take-off from the landing area, please inspect whether the compensation direction of elevator sensor is set inversely, if it is, please revise the compensation direction of elevator sensor.

4.7. TX Deadband

1. RUD-DEAD - Rudder Stick Dead Zone

Menu items	*Description*
5~100 (Default 6)	Rudder has no response if stick movement in the deadband zone. Useful to prevent minor unintentional rudder stick commands.
Suggestion	Rudder stick at neutral point. If LED continue Short blink 2 times, indicating that the rudder stick is not within deadband zone. Increase RUD-DEAD.

2. AIL-DEAD - Aileron Stick Dead Zone

Menu items	*Description*
5~100 (Default 6)	The swashplate shall be no response within the dead zone near middle point of aileron stick. The value is bigger and the dead zone is larger, the body shall be no response when slightly contacting the aileron stick.
Suggestion	If the aileron stick interferes with other sticks, increase AIL-DEAD value.

2. ELE-DEAD - Elevator Stick Dead Zone

Menu items	*Description*
5~100 (Default 6)	The swashplate shall be no response within the dead zone near middle point of elevator stick. The value is bigger and the dead zone is larger, the body shall be no response when slightly contacting the elevator stick.
Suggestion	If the elevator stick interferes with other sticks, increase ELE-DEAD value.

The following setting are all related to the flight mode, and CX-3X900 can set up the following four sets of parameters.

4.8. AutoTrim

AUTOTRIM - Optimize Swashplate Middle Point Level

Menu items	*Description*
FALSE (Default)	Disable sub-trim optimal at the swashplate level.
TRUE	Enable sub-trim optimal at the swashplate level.
Adjusting Suggestions	Under windless condition, the helicopter needs to hover stably for 20 seconds when optimizing the swashplate level for each group of flight mode. Optimize the swashplate level through switching gain switch on different modes. Disable AUTOTRIM function when flying normally.

4.9. GN-mode

The CX-3X900 is capable of flying with four switchable flight modes which are pilot selected from the transmitter. This is the same process as selecting the gain in your tail gyro but it can configure all the flight characteristics on three axis's. If you only plan on using one flight mode it is advisable to leave the gain wire off of the installation and move on to setup.

When setting up the CX-3X900 you use the transmitter to select which flight mode is being programmed. If you have the gain channel connected the pulse width on the gain channel controls which flight mode the CX-3X900 is in and which flight mode is being programmed. Simply switching to the desired flight mode will tell the CX-3X900 to change values for the selected mode. If the gain channel is not connected you will program Flight Mode 0. If you do not intend on using multiple flight modes it is best to not connect the gain channel.

Pulse width is used by Radio Control systems to communicate between the radio and receiver the channel value information. This information corresponds to desired servo positions, gain value etc. The pulse width different radio systems such as FUTABA or JR varies to some extent but is approx. 1-2 microseconds. Below is a table of the pulse width ranges acceptable to select each flight mode. The program box can automatically read the pulse width on the gain channel to verify the flight mode you are in and that your radio is setup properly. Please consult your radio manual for instruction on how to setup multiple flight modes. A pulse width of approx. 1500 microseconds corresponds to center stick/center servo position. Flight modes with the CX-3X900 are set with pulse width pulse from 1620 to 1919 microseconds.

The values below are only examples. In some cases the radio range may be 0-100 in others +/-100%. You should always check the actual pulse width is correct to get each mode setting by reading the CX-3X900 data after the radio is switched to the desired mode.

Display Format: gggg-m. gggg is 4-digit gain pulse width in us. m is 1-digit flight mode. If switching gain switch, the flight mode shall be changed, and the display automatically updated. CX-3X900 can save the data under four flight modes. The flight modes corresponding to gain pulse widths are as follow:

Gain Pulse Width in (us)	***Flight Mode***	***Futaba 10CHX Gain % Gyro Sense AVCS Mode***	***JR 9303 Gain % For Auto Gyro Sense***
Gain<1620 or Gain>1920	0	0-23	0-64
Between 1621 and 1719	1	35	71
Between 1721 and 1819	2	58	84
Between 1821 and 1919	3	81	96

4.10. Tail Rotor Param

1. TAILGAIN - Tail Gain Setting

Menu items	*Description*
-80~80 (Default 26)	The rudder servo is in normal mode when the value is less than 0. The rudder servo is in AVCS mode when the value is more than 0.

2. RUDLSTOP - Rudder Left Piro Stop Gain

Menu items	*Description*
60~180 (Default 100)	The sensitivity of hovering and leftward spin. The stop speed used for preventing the side wind, hovering shift and leftward spinning.
Suggestion	The sensitivity is RUDLSTOP*TAILGAIN when the hovering and leftward spinning stop. When the ability to prevent side wind is poor, hovering drifts leftward or slow leftward pinning stopping speed, turn up the RUDLSTOP value. Tail rebounds when stopping, leftward pinning turn down the RUDLSTOP value. This value is not allowed to turned extremly.

3. RUDRSTOP - Rudder Right Piro Stop Gain

Menu items	*Description*
60~180 (Default 100)	The sensitivity of hovering and rightward spin. The stop speed used for preventing the side wind, hovering shift and rightward spinning.
Suggestion	The sensitivity is RUDRSTOP*TAILGAIN when the hovering and rightward spinning stop. When the ability to prevent side wind is poor, hovering drifts rightward or slow rightward pinning stopping speed, turn up the RUDRSTOP value. Tail rebounds when stopping, rightward pinning turn down the RUDRSTOP value. This value is not allowed to turned extremly.

4. RUDD-ACC - Rudder Accelerate Delay

Menu items	*Description*
0~15 (Default 0)	The higher the value, the smoother and longer it takes to reach piro speed from static.
Suggestion	Increase RUDD-ACC on lag tail.

5. RUDD-DEC - Rudder Decelerate Delay

Menu items	*Description*
0~15 (Default 0)	The higher the value, the longer it takes for the tail to slow down. Used to smoothen the deceleration of piro when coming to a stop.
Suggestion	Increase RUDD-DEC on rebounded tail.

6. RUDD-EXP - Rudder Stick Expo Curve

Menu items	*Description*
-100~+100 (Default 0)	Rudder expo curve to the stick movement.

7. RUD-SENS - Rudder Stick Sensitive

Menu items	*Description*
50~150 (Default 100)	Fine tune the stick response to the actual piro rate. The higher the setting, the more sensitive the stick movement.

4.11. Tail Torque Comp

1. PIT-COMP - Compensation of Collective Pitch to Tail Rotor

Item	*Description*
-100~+100 (Default 0)	The change of collective pitch causes the change of rotary speed of main rotor, and tail deviation, adjust PIT-COMP value until the torque change can be offset completely. If the torque change causes tail deviate leftward, compensate rightward rudder direction input, i.e. compensate reversely rudder direction input.
Identification of Compensation Direction	Turn off brushless motor power or engine throttle, push collective pitch stick, adjust PIT-COMP value, check if the compensation direction of collective pitch to tail rotor is correct.

2. CYC-COMP - Compensation of Ring Pitch to Tail Rotor

Item	*Description*
-100~+100 (Default 0)	The change of ring pitch causes the change of rotary speed of main rotor, and tail deviation, adjust CYC-COMP value until the torque change can be offset completely. If the torque change causes tail deviate leftward, compensate rightward rudder direction input, i.e. compensate reversely rudder direction input.
Identification of Compensation Direction	Turn off brushless motor power or engine throttle, push elevation or aileron stick, adjust CYC-COMP value, check if the compensation direction of ring pitch to tail rotor is correct.

4.12. Main rotor Param

1. AIL-GAIN - Aileron Gain

Item	*Description*
6~+80 (Default 26)	Compensate the gain of aileron posture. Adjust the value until the aileron does not vibrate under flying status.
Suggestion	Reduce aileron/elevator gain or servo frequency when the swashplate servo oscillates. Increase aileron/elevator gain when the helicopter can not be locked or pitches up. The asynchronous swashplate servos also can cause that the helicopter head rise up.

2. ELE-GAIN - Elevator Gain

Item	*Description*
6~+80 (Default 26)	Compensate the gain of elevator posture. Adjust the value until the elevator does not vibrate under flying status.
Suggestion	Reduce aileron/elevator gain or servo frequency when the swashplate servo oscillates. Increase aileron/elevator gain when the helicopter can not be locked or pitches up. The asynchronous swashplate servos also can cause that the helicopter head rise up.

3. AIL-FEED - Settings of Aileron Feedback Coefficient

Item	*Description*
0~+150 (Default 10)	The speed of swashplate moving from the position of title to horizontal position makes the locking mode of aileron is between AVCS mode and the normal mode. The value of AIL-FEED is smaller, the aileron returns the horizontal position slower. AIL-FEED value is bigger, the aileron can return to horizontal position more quickly, the operation of aileron is more hard. Aileron is in AVCS when AIL-FEED is 0.

4. ELE-FEED - Settings of Elevation Feedback Coefficient

Item	*Description*
0~+150 (Default 10)	The speed of swashplate moving from the position of title to horizontal position makes the locking mode of elevator is between AVCS mode and the normal mode. The value of ELE-FEED is smaller, the elevator returns the horizontal position slower. ELE-FEED value is bigger, the elevator can return to horizontal position more quickly, the operation of elevator is more hard. Elevator is in AVCS when ELE-FEED is 0.

5. AILLSTOP - Aileron Leftward Stop Gain

Item	*Description*
60~+160 (Default 100)	The stopping gain when inclining leftward. The stop speed against side wind and inclinning leftward.

6. AILRSTOP - Aileron Rightward Stop Gain

Item	*Description*
60~+160 (Default 100)	The stopping gain when inclining rightward. The stop speed against side wind and inclinning rightward.

7. ELELSTOP - Elevator Backward Stop Gain

Item	*Description*
60~+160 (Default 100)	The stopping gain when inclining backward. The stop speed against side wind and inclinning backward.

8. ELERSTOP - Elevator Frontward Stop Gain

Item	*Description*
60~+160 (Default 100)	The stopping gain when inclining frontward. The stop speed against side wind and inclinning frontward.

4.13. FBL Upload Param

1. PIRO-THR - Piro Optimize Threshold

Item	*Description*
0~+540 (Default 0)	Elevator stick and aileron stick are within the threshold, active piro optimization. A value of 0 disables piro optimization.

2. PIRO-OPT - Piro Optimize

Item	*Description*
-60~+60 (Default 0)	Mixes tail pirouettes to swashplate, the helicopter holds its position better than before.
Suggestion	At first increase the value in one direction by steps of 10, and maintain flying horizontal pirouettes. Carefully watch whether the helicopter holds its position better than before. If so, continue to increase the value by steps of 10 till the helicopter holds the best position. If not, increase the value in another direction by steps of 10. Carefully watch whether the helicopter holds its position better than before. When the behaviour in both directions turn worse, set PIRO-OPT value to zero.v

4.14. FBL Upload Param

Press any key among +10, -10, +1 and -1, LCD programmer box save all parameters in current mode. After save completed, LCD programmer box dispaly "UpLoad Success" information.

Note: Switching gain switch, the LCD programmer box automatically read the data from CX-3X900. Press one of above keys, save CX-3X900 parameters in current mode.

4.15. Download Param

Press any key among +10, -10, +1 and -1, download parameters from LCD programmer box to CX-3X900 in the current mode. After download completed, LCD programmer box display "DownLoad Success" information.

Note: Switching gain switch, press one of above keys. Download parameters from LCD programmer box to CX-3X900 in the current mode.

5.1. Precautions

Always operation CopterX CX-3X900 unit in safe area away from other interferences, machineries and/or moisture. KY model and CopterX are not responsible for any lost, damage and/or injury cause by the use or operation for this item. No user serviceable parts inside. Do not open the unit.

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