Introduction
The TANDEM X20S is a pioneering dual-band radio transmitter. It draws on feedback and experience with previous radios and adds many new features such as color touch screen, an ergonomic design that provides unprecedented comfort in the hand. On the RF side, we have given it the powerful RF system. The TD dual RF system, which does not simply reiterate the combined features of the FRSKY900MHz and 2.4GHz RF systems. The TD is characterized by its true simultaneous dual-band remote control with telemetry, enabling incredible and unmatched end-to-end latency. This radio ships with Ethos, a completely new system that provides users with a powerful, intuitive, and flexible experience that maximizes the fun of the hobby.

Gimbal adjustment
Unscrew the four screws on the back cover of the remote control, open the back cover of the remote control, you can adjust Gimbal.

Audio Bluetooth
This Audio module can have your wireless Bluetooth audio devices connected and functioned as a broadcast. Open the wireless settings in the ETHOS system menu, select “Audio” and click “Search”, then open your wireless Bluetooth audio device and bound.

2S Li-battery balance charging via USB-C:
The Green LED indicator states:
1. The lower the initial charging voltage, the better the charging effect is when the voltage difference cells exceed 50 mV between the two.
2. The lower the initial charging voltage, the better the charging effect is when the voltage difference cells exceed 50 mV between the two.
3. The Green LED indicator states: 2S Li-battery balance charging via USB-C: 0.0A (when you use the USB-C port for charging).

Navigation Controls
The left navigation control does RTN, SYS, MDL, DISP and Page UP/Down. The right navigation control does RTN, SYS, DISP, SYS, MDL, and Page UP/Down. Both navigation controls and touch screen can be used to control the system.

ETHOS Operating System
Create the model
Step 1: First go to System Settings, then click Model Select to select the model type.

Power Switch
● SG: 3 positions; Short Lever
● SF: 2 positions; Long Lever
● SC: 3 positions; Long Lever
● SB: 3 positions; Short Lever
● SA: 3 positions; Short Lever
● SD: 3 positions; Long Lever

Battery compartment size: 84*41.5*20mm (L*W*H)

<table>
<thead>
<tr>
<th>Power Switch</th>
<th>Function</th>
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</thead>
<tbody>
<tr>
<td>SG</td>
<td>Short Lever</td>
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<tr>
<td>SF</td>
<td>Long Lever</td>
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<td>Short Lever</td>
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<tr>
<td>SD</td>
<td>Long Lever</td>
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Supports Multiple Working Modes:
- 2.4G ACCST D16 Mode (Compatible with ACCST Receivers with D16 V2 or later FW)
- 2.4G ACCST Mode (Compatible with ACCST Receivers)
- 900M ACCS Mode (Compatible with ACCST R9 8889/151MHz Receivers)
- 2.4GHz/900M TD Mode** (Compatible with TD Receivers)
- Super-low latency and long range control telemetry
- Up to 50 to 100KM range and down to 4ms end-to-end latency
- RGB/4D Color Touch-Screen Displays
- 8 Quick-Mode Custom Buttons (Front) and 2 Momentary Buttons (Rear)
- Lite Type External Module Bay
- Built-in 6-axis Gyroscope Sensor
- All CNC Metal Trims, Knobs
- Haptic Vibration Alerts and Voice Speech Outputs
- External Antenna Supports S/WT indicate warning
- Supports Range System for 2S Lipo Battery (Use Type-C Interface)
- High-speed PARA Wireless Training System (Compatible with FreeLink App3.0)
- High-Precision Hall-Sensor Gimbals with All-CNC Metal Panel
- ETHOS: The more powerful, Flexible and Intuitive OS for your radio.
- Clear and Intuitive UI Design
- Supports Dual Operation Modes of Radio Display (Touch and Non-Touch)
- Supports Multi-Language Switching
- Hardware/Software Version and Factory Version Detection
- Supports running LUA Scripts (in progress)
- All CNC High-Precision Hall-Sensor Gimbals
- Built-in Audio Wireless Module

Version
1.0

Model Setup Procedure-Internal Module
Step 1: Touch the screen or use the navigation keys to enter the RF system menu.

Choose the INT MODULE. Then, turn on INTERNAL RF, select the OUTSIDE or INSIDE ANTENNA. (Dual internal antennas and external antennas work simultaneously while selecting the OUTSIDE ANTENNA.) Set the Mode for TANDEM X20S internal RF corresponding to your receiver (ACCESS, ACCST D16).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>Internal module</td>
<td></td>
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<tr>
<td>External module</td>
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<tr>
<td>Antenna</td>
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<table>
<thead>
<tr>
<th>Model</th>
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</thead>
<tbody>
<tr>
<td>1.0</td>
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<tr>
<td>0.0</td>
</tr>
</tbody>
</table>

Note: Please keep the aircraft in the optimal radiation range of the directional antenna at all times.

Step 2: Configure the model channel and create the model name.
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Version 1.0

Model Setup for TANDEM X20S External RF Module

The external RF module can be powered on or off by software. The setup process is the same as that for the internal RF. 
External modules should be closed when not in use.

Step 2: Set the Channel Range
The TANDEM RF module supports 24 channels, where the channel range is configurable, and it needs to be double checked before use.

Step 3: Set the Receiver Number
The system will assign you a receiver number automatically, when you create a new model, and this can be easily changed. 
The range of the Model ID is 00-63, with the default number being 01. Once the receiver is set to the desired number and is bound to the TANDEM X20S, the binding procedure will not need to be repeated unless the receiver number is changed. At this point, set the receiver number to your preferred number and repeat the binding operation.

Step 4: Registration
In ACCESS model, select the STATE [Register] into Registration status on radio side. Then Press the F/S button and power on your receiver, and select the RX Name XX and [REGISTER] to complete the Registration process then power down the receiver.

Step 5: Automatic binding (Smart Match)
Move the cursor to RX[alias] and select it, power your receiver, select the RX, and complete the process, the system will confirm "Bind success." (Pressing the "F/S" button is not required in ACCESS to Bind. Please refer to the receivers manual for details).

Step 6: Set Failsafe mode
There are 3 failsafe modes when enable: No Pulse, Hold, Custom.

- Hold: the receiver continues to output the last positions before signal was lost. To use this type, select it in the menu and wait 9 seconds for the failsafe to take effect.
- Custom: pre-set to required positions on lost signal. Move the cursor to the failsafe mode channel and press Encoder, then choose the Custom mode. Move the cursor to the channel you want to set failsafe on, and press Encoder.

Finally, rotate the Encoder to set your failsafe for each channel and short press Encoder to finish the setting. Wait 9 seconds before the failsafe takes effect.

Notice:
- If failsafe is disabled on TANDEM X20S side, the failsafe set on receiver side will be used.
- SBUS port does not support the No Pulse failsafe mode and always outputs. Set "Hold" or "Custom" for SBUS port.

Step 7: Range
Range refers to TANDEM X20S range check mode. A pre-flight range check should be done before each flying session. Move the cursor to "STATE", scroll the Encoder to select "RANGE" mode and press Encoder. In range check mode, the effective distance will be decreased to 1/30. Press the Encoder again to return to normal state.

To ensure the safety of yourself and others, please observe the following precautions.
- Flying at the flying field

- Always check your transmitter and receiver batteries prior to each flight.

- Where to Fly
  - Always use a flat and grassy field with no trees or power lines.
  - Fly at least 500 feet away from high-voltage power lines, transmission lines, airports, or other areas with a lot of people.
  - Always fly in a safe and legal area.

At the flying field
- To prevent damage to your radio gear, turn on the power switches in the order specified in your radio's manual.
- Range refers to TANDEM X20S range check mode. A pre-flight range check should be done before each flying session.

- Make sure your transmitter can't tip it over. If it is knocked over, the throttle stick may be accidentally moved, causing the engine to speed up. Also, damage to your transmitter may occur.
- In order to maintain complete control of your aircraft, it is important that it remains visible at all times.
- Flying behind large objects such as buildings, grain bins, etc., must be avoided. Doing so may interrupt the radio frequency link to the model, resulting in loss of control.
- Do not grasp the transmitter's antenna during flight. Doing so may degrade the quality of the radio frequency transmission and could result in loss of control.
- As with all radio frequency transmissions, the strongest area of signal transmission is from the sides of the transmitter's antenna. As such, the antenna should not be pointed directly at the model. If your flying style creates this situation, easily move the antenna to correct this situation.
- Don't fly in the rain. Rain or moisture may enter the transmitter through the antenna or stick openings and cause erratic operation or loss of control. If you must fly in wet weather during a contest, be sure to cover your transmitter with a plastic bag or waterproof barrier. Never fly if lightning is expected.

Updates
FrSky is continuously adding features and improvements to our radio systems. Updating (via USB Port or the Micro SD card) is easy and free. To get the most from your new transmitter, please check the download section of the FrSky website for the latest firmware and module for adjusting your sticks (frsky-cy.com).

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