T-20 GEMINI

ExpressLRS
Gemini

Quick start manual

JUMPER
TECHNOLOGY
LIMITED

EDGE TX

The most compact, full featured ELRS GEMINI radio
Customization beyond your imagination

T-20 GEMINI

介绍
Introduction

感谢您购买套头衫。T-20 无线电系统。使用前请仔细阅读本说明书，以确保正确和安全使用。由于版本升级，因此有所变化。
本手册中包含的信息如有更改，恕不另行通知。

Thank you for purchasing the Jumper. T-20 Radio system. Please read this instruction manual carefully before use to ensure correct and safe use. Due to version upgrades,there have been changes. The information contained in this manual is subject to change without notice.

许多无线电控制型号配备了强大的电机和锋利的旋转螺旋桨。
Many radio control models are equipped with powerful motors and sharp spinning propellers.

在模型上工作时请谨慎。确保在进行维护时断开模型的电源并移除螺旋桨。
Please exercise caution when working on models. Ensure power is disconnected from your models and remove propellers when performing maintenance.

请勿在以下条件下操作 T-20 无线电系统。
Do not operate the T-20 radio system under the following conditions .

- .在恶劣天气或强风条件下，例如雨、冰雹、雪、风暴或电磁事件。
  During bad weather or high wind conditions such as rain, hail, snow, storms, or electromagnetic events.
- .在任何能见度受限的情况下。
  During any conditions of limited visibility.
- .在可能存在人员、财产、电力线、道路、车辆或动物的区域。
  In areas where people, property, powerlines, roads, vehicles or animals may be present.
- .如果您感到疲倦或不适或受到药物或酒精的影响，
  If you are feeling tired or unwell or under the influence of drugs or alcohol.
- .如果收音机或型号似乎已损坏或无法正常工作。
  If the radio or model appears to be damaged or not functioning correctly.
- .在 2.4GHz 高干扰区域或禁止使用 2.4GHz 无线电的地方。
  In areas of high 2.4ghz interference or in locations where the use of 2.4ghz radios is prohibited.
- .当电池电量为 T-20 或型号太低而无法工作时。
  When the battery is the T-20 or the model is too low to function.

OpenTX / EdgeTX is an experimental firmware. No warranty or implied warranty is given as to the quality and reliability of this firmware.
The RC model can cause serious injury or even death if not handled properly. If you decide to use OpenTX / EdgeTX firmware, you will be solely responsible for your model.
Any injury or damage caused by the use of OpenTX / EdgeTX firmware. The author of OpenTX / EdgeTX is not responsible for it. Pleaseuse it with caution.
OpenTX firmware can be found here: https://github.com/opentx
EdgeTX firmware can be found here: https://edge-tx.org
Multi-protocol firmware can be found here: https://downloads.multi-module.org
ExpressLRS: https://www.expresslrs.org

OpenTX / EdgeTX 是一个实验性固件。对于此固件的质量和可靠性，不提供任何保证或暗示保证。

如果您决定使用 OpenTX / EdgeTX 固件，如果处理不当，Rc 模型可能会导致严重伤害甚至死亡，您将对您的模型承担全部责任。

因使用 OpenTX / EdgeTX 固件而造成的任何伤害或损坏。OpenTX/ EdgeTX 的作者对此不承担任何责任。请谨慎使用。

OpenTX 固件可在此处找到：https://github.com/opentx

EdgeTx 固件可在此处找到：https://edge-tx.org

多协议固件可在此处找到：https://downloads.multi-module.oro

ExpressLRS：https://www.expresslrs.org

Manual contents

Brief introduction

Note: In order to prevent T-20 from entering DFU mode during charging, to reduce the probability of losing firmware during charging, T-20 is the first radio that has a separate BOOT0 button. When the radio is shut down, press and hold the BOOT0 button, connect the USB cable, the system will enter DFU mode.

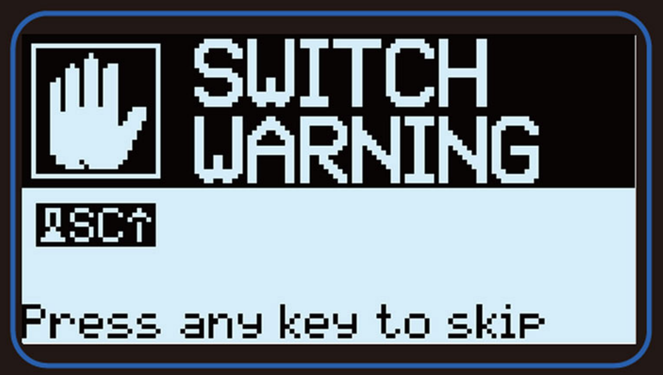
First Boot:

长按电源按钮，在进入主界面前，系统会检查油杆和开关的位置以及其他启动条件。

Long press the power button. Before entering the main interface, the system will check the

如果不满足启动条件，则会出现相应的错误提示。 用户需要清除或按任何键来跳过。

position of the throttle stick and switch and other startup conditions. If the startup conditions are not met, there will be a corresponding error prompt. The user needs to clear or press any key to skip.



EEprom Warning： *EEpr只读器警告:*

Bad EEprom data. Press any key to let the radio automatically format and storage to create new remote control data files.

数据损坏。 按任意键，让控自动格式化和存储，以创建新的远程控制数据文件。

Switch Warning： *开关警告:*

This is a warning that a switch on the radio -control is not in the default position. (The default setting is that all switch directions are up)

这一个警告，无线电控制的开关不在默认位置。(默认设置是所有开关方戲都是向上的)

Throttle Warning： *油门警告:*

This is a warning that the throttle is not at the lowest position

这一个警告，油门不在最低位置时控被打开。您可以将油门杆设置为最位置或按任意键跳过。

when the radio is turned on. You can set the throttle stick to

您也可以关闭模型设置菜单中的油门状态选项。

the lowest position or press any key to skip. You can also turn off the throttle state option in the MODEL SETUP menu.

Failsafe Not Set Warning： 故障安全未设置警告:

This is a warning that the radio- control is not set for fail-safe.

这是一个警告，无线电控制没有设置为故障安全。

Alarms Warning： 警报警告:

A similar warning will appear if the sound mode of the remote control settings page is set to mute.

如果遥控器设置页面的声音模式设置为静音，则会出现类似的警告。

SD card Warning： SD卡警告:

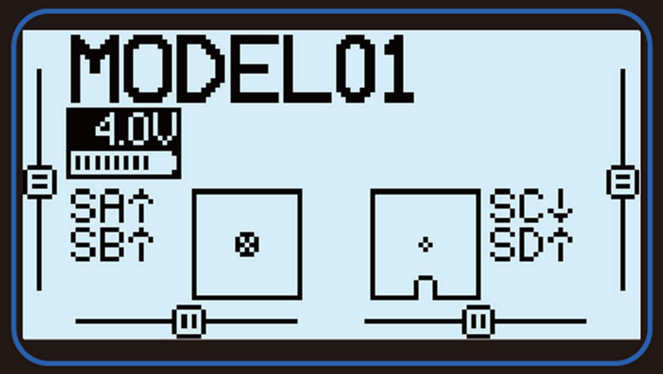
This warning will appear if the version of the SD card file used does not match the firmware version. (SD card contents also need to be updated at the same time as upgrading firmware)

如使用的SD卡文件的版本与固件版本不匹配，则会出现此警告。（SD卡内容将在升级固件的同时更新）

RSSI Warning： RSSI警告:

This is a warning that the Disable alarms are set.

这是设置禁用警报的警告。



Main Screen Display: 主屏幕显示:

The default screen is as below, and the user can press the (PAGE) key to display different interfaces.

默认屏幕如图，用户可以按:(页面按钮)键显示不同的界面。

Model Setup and Selection: 模型设置和选择:

In the main interface, press the SYS button to get into the model select menu

在主界面中，按SYS按钮进入型号选择菜单

The Model Select menu allows the user to select the active model and allows the user to create, copy, move or delete a model. By selecting the "Create model" option, the new model guide (the script required by the guide is in the SD card) will be launched. The user will be leading through the basic control setup, if you choose not to use it, just press RTN Keys to manually set the model.

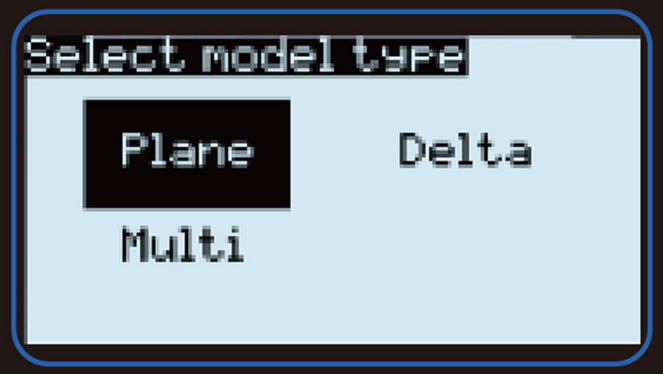
ModelSelect菜单允许用户选择活动模型，并允许用户创建、复制、移动或删除模型。

通过选择“创建模型”选项，将启动新模型指南(指南所需的脚本在SD卡中)。

用户将引导您完成基本控制设置，如果您选择不使用它，只需按RTN Keysto手动设置模型

To create a model, press and hold the ENT key to show the menu, select create model, press ENT

要创建模型，请按住ENT键显示功能表，选择create model，按ENT



With the plane, delta, and multiaxial options, the guide will check with you questions about model configuration. And make basic settings for users. The final step of the guide confirms the channel assignment for the model

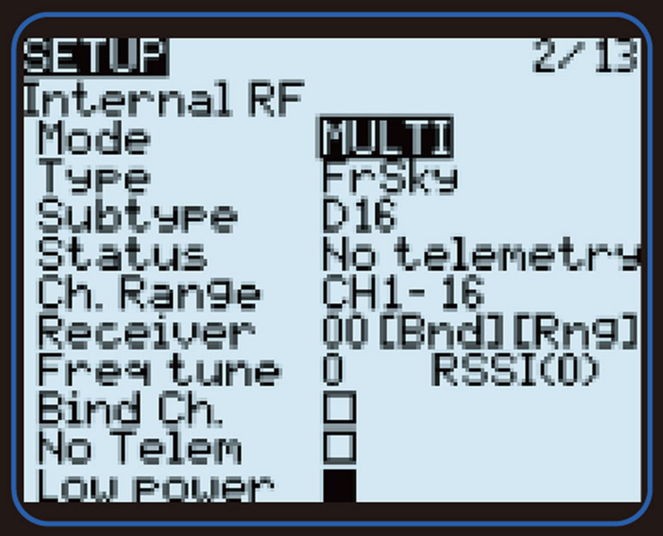
使用平面、三角翼和多轴选项，指南将与您核对有关模型配置的问题。和为用户进行基本设置。指南的最后一步确认模型的信道分配。

If the user prefers manual setup, press RTN to exit the guide. Use the menu wheel to select the one you want to make with the model, long-press the ENT key to select the Select model to switch it.

如果用户更喜欢手动设置，请按RTN退出指南使用菜单滚轮选择您想用它制作的模型，长按ENT键选择Selct model来切换它。

Binding and Frequency Tunning: 绑定和频率调节：

Short press the SYS button, then use the scroll wheel to select 2/13



Internal RF: 内部高频头：

Mode: The transmission mode of the internal RF. It must be compatible with the receiver. Otherwise, it will not be able to bind.

模式：内部射频的传输模式。一定是与接收器兼容。否则就不能够

OFF: Turn off the internal RF module

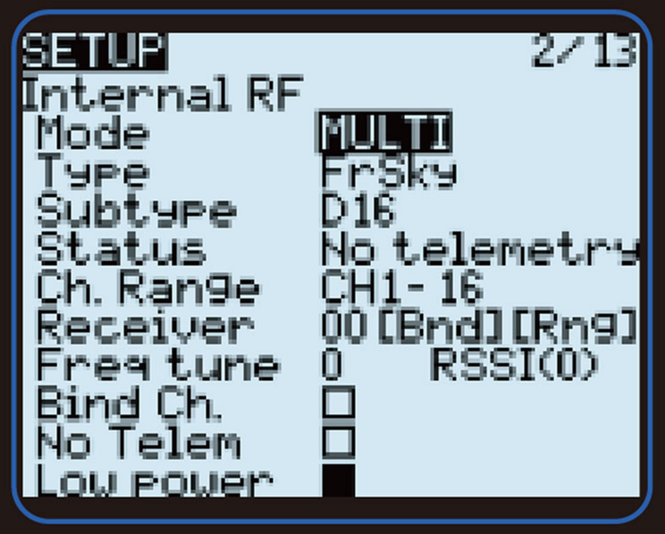
关闭：关闭内部射频模块

Type: Select the type of protocol

类型：选择协议的类型

Subtype: Select the subtype of the protocol

子类型：选择协议的子类型北



Status:Display the status of the multi-protocol module. (Normally it shows the firmware version of the multi-protocol module)

Ch.Range:Set up the channel range. (D16 mode transmits data at every 9ms, 8 channels at a time, 16 channels will take 18ms, so removing unnecessary channels can reduce the latency)

Receiver:Normally it is the receiver model. It can be changed manually. If the model is moved or copied, it will not be changed. If the manual setting or copy/move steps cause the receiver with the same number to have 2 or more models, a warning window will pop up. It is up to the user to decide whether it needs to be modified

Status/状态:

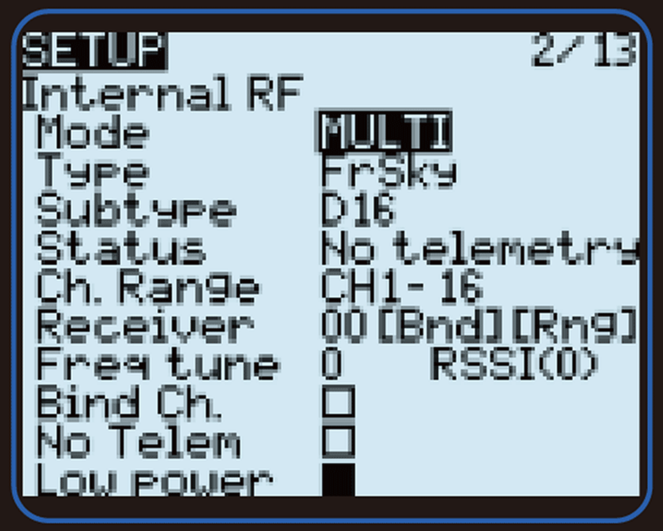
显示多协议模块的状态。(通常它显示多协议模块的固件版本)。

CH.Range/通道.范围:

设置通道范围。(D16模式每9ms传输数据一次8个通道16个通道将需要18ms，所以删除不必要的通道可以减少延迟)。

Receiver/接器:

通常是接收器模型。 可以手动更改。如果模型被移动或复制，则不会变。如果手动设置或复制/移动步骤导致相同编号的设备有2个或更多型号，则将弹出警告窗口。由用户决定是否需要修改。



Freqtune : Frequency tuning. Certain protocols require tuning for optimal performance. In some cases, tuning is required in order for the protocol to bind. Frequency Tuning is specific to each MULTI-Module, and is due to very small variations in the RF components.

Frequency Tuning is always recommended, but especially when:

1.It is difficult to bind to the receiver, or the connection is weak or intermittent

2.The control range is very short

3.Telemetry data is not received or (for telemetry-enabled receivers only)

Completing the Frequency Tuning Procedure ensures that the radio and receiver will have the strongest possible connection. If you change the frequency tuning value it is best to re-bind the receiver(s)

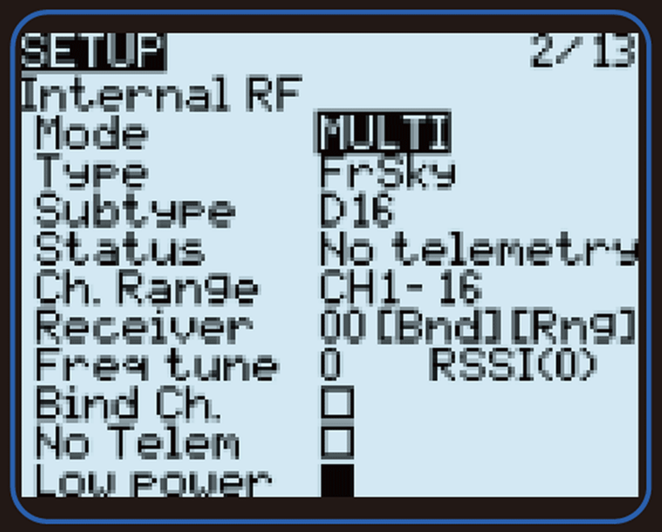
Freqtune/频率:

频率调整。某些协议需要调整以获得最佳性能。在某些情况下，需要调整才能绑定协议。频率调整是每个MULTI-Module特有的，是由于RF组件的微小变化造成的始终建议进行频率调谐，特别是在以下情况下:

1. 很难绑定到接收器，或者连接较弱或断断续续

2. 控制范围很短

3. 未收到遥测数据或(仅适用于支持遥测的接收器)完成频率调整程序可确保无线电和接收器具有尽可能强的连接。如果更改频率调整值，最好重新绑定接收器



Fregtune的默认值为“0”，如果接收器没有绑定，我们可以将该值更改为+30或-30，然后尝试再次绑定。如果绑定仍然不成功，请继续以正负30为步长尝试更高和更低的值，直到绑定成功。绑定接收器后，您可以继续进行精细调整。绑定成功后，将接收器靠近无线电2米远，不要移动任何接收器。返回射频频率。微调选项。降低该值，直到无线电与接收器失去连接。记录值(TUNEMIN)。提高该值以恢复连接，然后继续提高该值，直到无线电再次失去与接收器的连接。记录数值(TUNEMAX)。计算两个值之间的中值(最小值+最大值)/2=中间值。将RFFreg.fine-tune设置为中值。

The default value of Freqtune is "0". If the receiver does not bind, we can change the value to either +30 or -30 and try to bind again. If binding is still unsuccessful, continue to try higher and lower values in steps of plus or minus 30 until the bind succeeds.

Once the receiver is bound you can proceed with Fine Tuning.

After the binding succeeds, kkeep the receiver 2 meters away from the radio and don't move any of them.

Return to the RF Freq. fine-tune option. Lower the value until the radio loses the connection with the receiver. Record the value (TUNE_MIN). Raise the value so that the connection is restored, then continue to raise it until the radio loses the connection with the receiver again.

Record the value (TUNE_MAX). Calculate the median between the two values (TUNE_MIN + TUNE_MAX) / 2 = TUNE_MEDIAN.

Set RF Freq. fine-tune to the median value.

For example

Connection is lost at 60 and -60, then the Freqtune number is (-60+60)/2=0

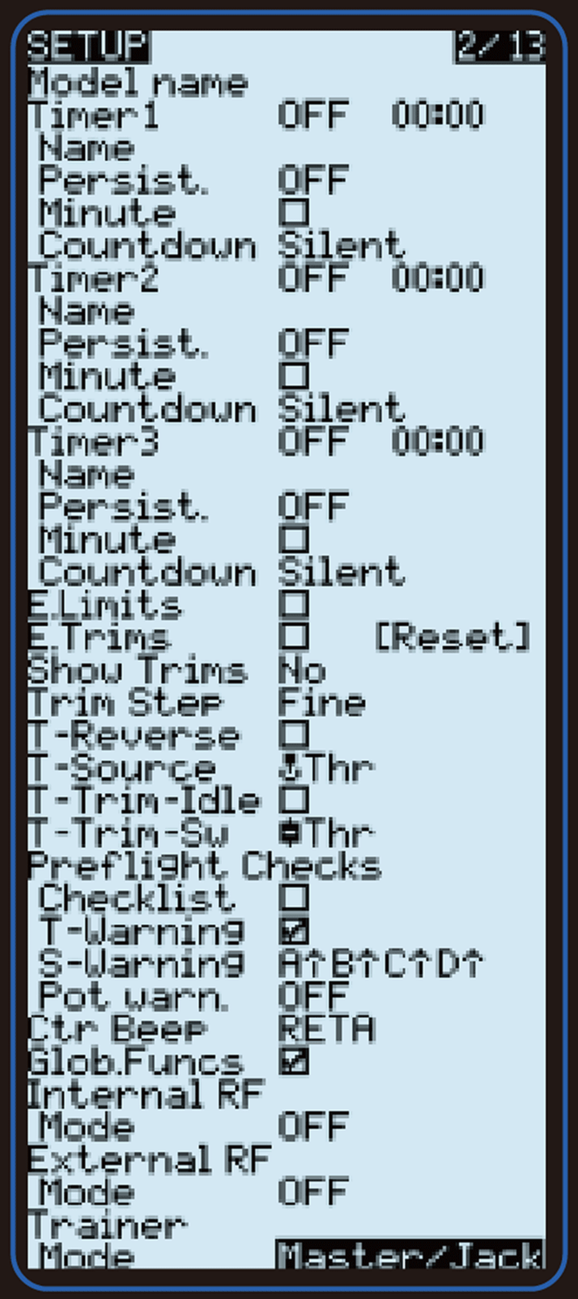
Connection is lost at 20 and -80, then the Freqtune number is (-80+20)/2=30

连接在60和-60时丢失，则Fregtune编号为(-60+60)/2=0连接在20和-80时丢失，那么Freqtun编号为(-80+20)/2=30

Model Setup: 模型设定：

The model setup covers all the required preliminary setups. setups.The Model Setup page contains the following features:

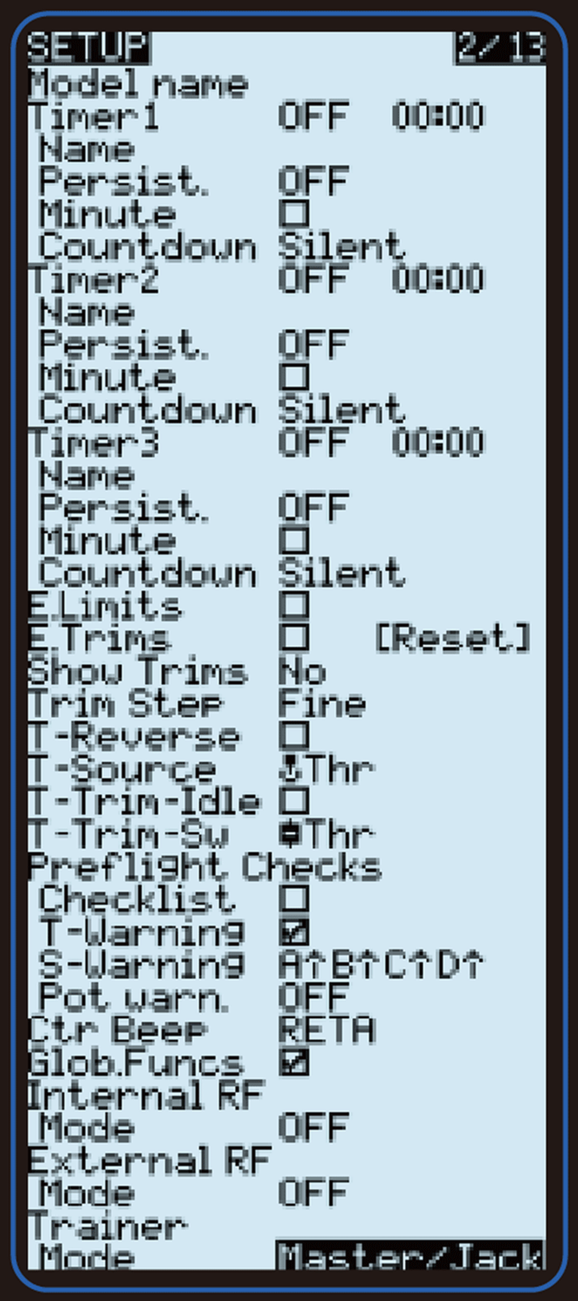
模型设置涵盖了所有必需的初步设置。模型设置页面包含以下功能：



1. 定义模型的名称
1. Defines the model's name
2. 最多3个可完全编程的计时器，可以向上计数或向下
2. Up to 3 fully programmable timers that can count up or down
3. 扩展限制允许将伺服运动限制设置为高达125%
3. Extended limits allow setting servo movement limits up to 125%
4. 加长饰件允许饰件覆盖整个斗杆范围而不是+/-25%
4. Extended trims allows trims to cover the full stick range instead of +/-25%
5. 修剪步骤设置修剪点击的精度
5. Trim step sets the precision of trim clicks
6. 油门倒档：确保基于油门的计时器和功能正确运行，适合喜欢在斗杆放下时全油门的人
6. Throttle reverse: Ensures correct operation of throttle-based timers and functions for people who like having full throttle with the stick down
7. 节流源定义了触发定时器THx功能的原因。
7. Throttle source defines what triggers the THx functions of the timers.

Model Setup: 模型设定：

The model setup covers all the required preliminary setups. setups.The Model Setup page contains the following features: *模型设置涵盖了所有必需的初步设置。模型设置页面包含以下功能：*



8. 节气门微调：IC发动机模式，在该模式下，微调仅影响投掷的杆部分，而不接触全油门点

8.Throttle trim: IC engine mode, where trim only affects the idle part of the throw without touching the full-throttle point

9.Throttle Warning: Will warn you if the throttle stick is not at

9. 节气门警告：如果收音机通电或模型加载时油门杆未疲劳，将警告您

idle when the radio is powered up or a model is loaded

10.Preflight checks: display checklist, throttle state, switch

10. 飞行前检查：显示检查表、节气门状态、开关位置、锅位置

positions, pot positions

11.Center beep: Makes a beep when the selected control(s)

11. 中央蜂鸣声：当所选控件发出蜂鸣声时通过中心点

pass the center point

12. 内部射频模块设置

12.Internal RF module setting

13. 外部射频模块设置

13.External RF module setting

14. 培训模式设置按下SYS按钮，使用滚轮选择要设置的型号（选择型号名称后，型号名

14.Trainer mode setting

称前将有一个*标志），然后按page键进入型号设置页面

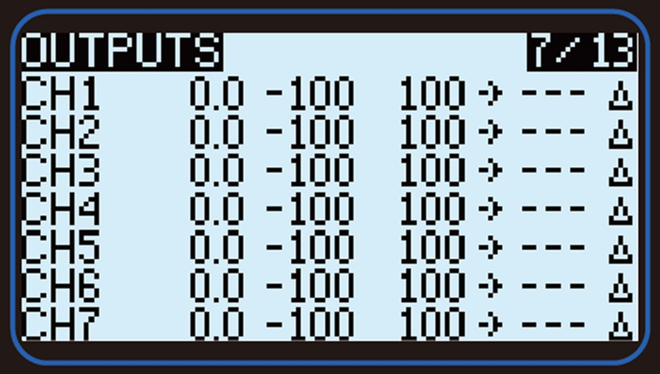
Press the SYS button and use the scroll wheel to select the model you want to set (after selecting the model name, there will be a * logo before the model name)Then press the PAGE key to enter the Model Setup page

输出(中心调整、伺服反转设置):

Outputs (center adjustment, servo reverse setting):

Short press the SYS button and then use the scroll wheel to select the 7/13 page

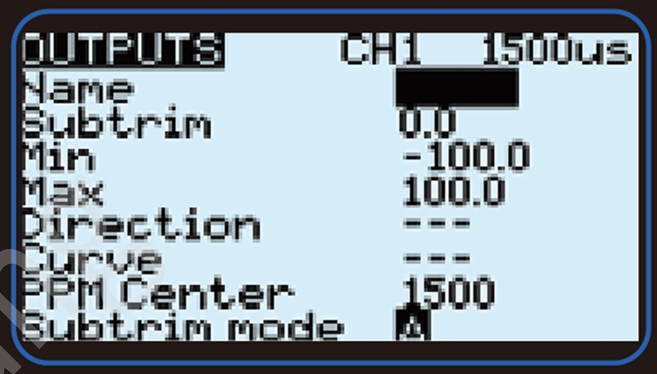
短按SYS按钮，然后使用滚轮选择7/13页面:



Select the channel

you want to set up

选择要设置的频道



center adjustment

Low and high limits setting

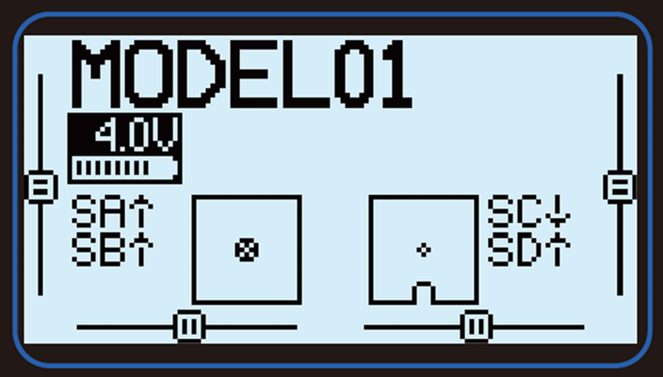
Subtrim behavior

中心调整下限和上限设置副边缘行为

Channel Monitor: 通道监视器:

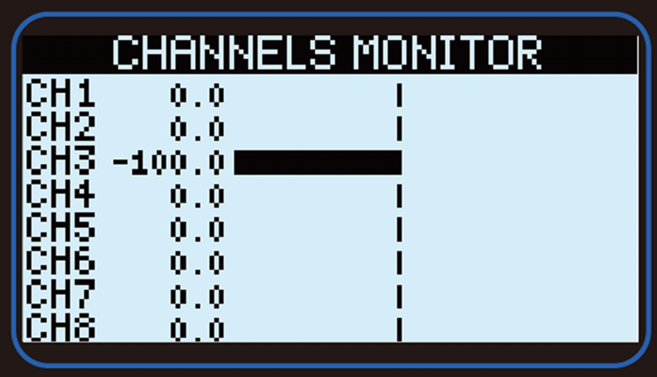
press the “page” button in the main interface you can switch input and output monitor

按下主界面中的“页面”按钮，可以切换输入和输出监视器:



Input monitor

输入监视器



Output monitor

输出监视器

Set the default gimbal mode: 设置默认摇杆模式:

T-20 is set to MODE2 (the left-hand throttle) out of the factory. The user can change the mode by himself by reversing the gimbals, and then long-press the "SYS" key to enter the "RADIO SETUP" page, turn to the bottom to "mode", and select the corresponding mode

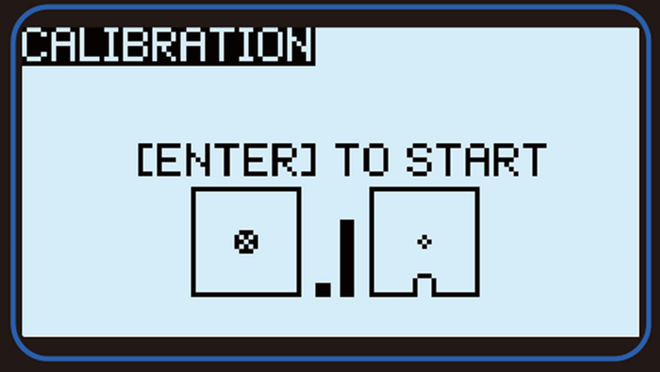
T-20出厂时设置为MODE2(左侧油门)。用户可以通过反转万向节自行更改模式，然后长按“SYS”键进入“RADIOSETUP”页面，转到底部“模式”，选择相应的式:

校准摇杆(摇杆在出厂时已校准,除非必要，否则无需重新校准):

Calibrating Gimbals (Gimbals have been calibrated when it was out of the factory. No need to re-do the calibration unless it is necessary):

Press and hold SYS button, scroll to the HARDWARE page. Go to the "Sticks[calibration] " page to start gimbal and wheel calibration Attn: Do not put too much force during the calibration process to avoid affecting the calibration accuracy. Move slightly during the calibration process.

按住SYS按钮，滚动到HARDWARE页面。转到“Sticks[calibration]”页面启动摇杆和滚轮校准。注意:在校准过程中不要施加太大的力，以避免影响校准精度，校准过程中请轻微移动。

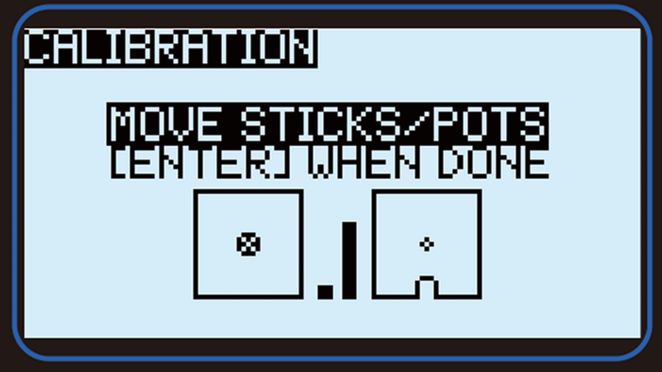


press ENT to start calibration

按ENT开始校准

place all the gimbals, knobs, and side sliders in the middle position,and then press the ENT key

将所有摇杆、旋钮和滑块恢复到中间位置，然后按下ENT键



move all the gimbals, knobs, and side sliders to their respective maximum and minimum positions, and then press the ENT key to complete the calibration

将所有摇杆、旋钮和滑块移动到各自的最大和最小位置，然后按ENT键完成校准

Battery and Charging: 电池和充电:

Please use two 21700 batteries under the same brand and model (with the same internal
请使用同一品牌和型号(具有相同内阻)的两节21700电池为T-20供电，确保插入电池时阳极和阴极没有颠倒，T-20具有内置的UsB充电功能。
resistance) to power the T-20 。Make sure that the anode and cathode are not reversed
您可以将收音机连接到USB为电池充电充电指示灯:收音机未插入电池时绿灯闪烁，电池充电时绿灯始终亮起:充电完成后绿灯熄灭。
when inserting the battery, T-20 has a built-in USB charging function. You can connect the radio to a USB to charge the battery.Charging indicator: the green light flashes when the radio is not inserted with batteries; the green light is always on when the battery is charging; the green light is off when the charging is complete.

Attn: When the battery is installed in the T-20 for the first time, please keep the battery voltage consistent to reduce the burden on the voltage balance circuit.

注意:当电池首次安装在T-20中时，请保持电池电压一致，以减轻电压平衡电路的负担。

Firmware Update: 固件更新:

There are two ways to update openTX firmware.
有两种方法可以更新openTX固件。
1.Update firmware by openTX companion. (For more details, please refer to T-20 Manual)
1. 通过openTX伴侣更新固件。(有关更多详细信息，请参阅T-20手册)
2.Update firmware via SD card (If passed over 1version, please use the first method to update)
2. 通过SD卡更新固件(如果超过1个版本，请使用第一种方法进行更新)
If your device is not in the Windows system, please use the 2nd method. This is a BOOTLOADER
如果您的设备不在Windows系统中，请使用第二种方法。这是由OPENTX开发团队设计的BOOTLOADER函数，高效简单。升级需要两个步骤。
function designed by the OPENTX developer team, efficient and simple. The upgrade requires
首先，将从openTX网站下载的固件复制到SD卡“FRMWARE文件夹”中。其次，在遥控SD卡中找到刚才复制的固件文件，长按ENT键升级引
two steps. Firstly, copy the firmware downloaded from openTX website to the SD card “FIRMWARE”
导加载程序(如下图所示)
folder. Secondly, find the firmware file you just copied in the remote control SD card, long-press the ENT key to upgrade the bootloader (as shown below)

After booting, select the Write Firmware option and select the corresponding firmware to upgrade

启动后，选择写入固件选项，并选择相应的固件进行升级

Press the trim buttons inward and turn on the radio

向内按装饰按钮并打开遥控器

通过无线电更新JP4IN1模块的固件:

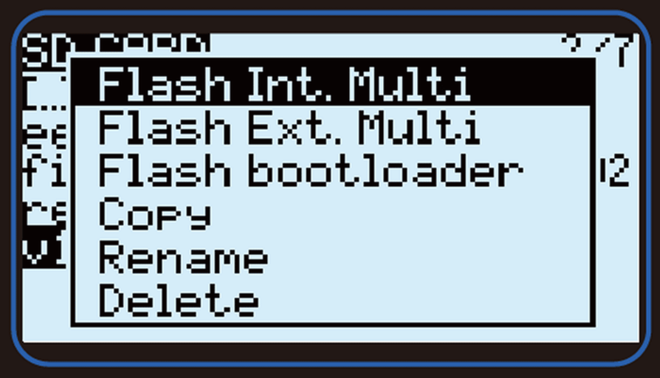
Update firmware of JP4IN1 module via Radio:

The firmware version of the module needs to be newer than version 1.2.1.85 to use the remote
模块的固件版本需要高于版本1.2.1.85，才能使用遥控器升级模块固件。否则，您需要使用USB和TTL硬件连接模块以升级固件
control to upgrade the module firmware. Otherwise, you need to use USB and TTL hardware to

connect the module to upgrade the firmware

Firmware download link: https://downloads.multi-module.org
固件下载链接:https://downloads.multi-module.org
Firstly copy the firmware of the module into the radio file folder "FIRMWARE" (same folder as the
Firstly将模块的固件复制到无线电文件文件夹“固件”(与用于无线电固件更新的文件夹相同)中，然后断开计算机和无线电控制器的连接，
one used for the radio firmware update), then disconnect the computer and radio controller, open
操作SD卡“固件”文件夹，选择刚刚复制的固件，长按ENT键(如下所示):
the SD card "FIRMWARE" folder, select the firmware that just copied and long-press ENT key (as

shown below)



Flash Int.Multi:
内置闪光灯:
To update firmware of internal RF module
更新内部射频模块的固件
Flash Ext.Multi:
Flash扩展多功能:
To update firmware of External RF module
要更新外部射频模块的固件:
ExpressLRS:
ExpressLRS:
https://www.expresslrs.org
有关更多教程，请参阅手册https://www.expresslrs. org:

* For more tutorials, please refer to the manual
有关更多教程，请参阅手册

Jumper Technology Co., Ltd.
www.jumper-rc.com

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* The final interpretation right belongs to the company