

FAT SHARK

RC VISION SYSTEMS

TELEPORTER V4

FPV HEADSET

USER MANUAL



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For more product information, please visit:

www.fatshark.com

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Introduction

Congratulations on purchasing the Fat Shark Teleporter V4 headset with amazing digital head tracking to simulate pan/tilt on a fixed camera (head tracker can alternatively control a pan/tilt camera through a supporting radio). To ensure your continued enjoyment, please take the time to thoroughly read through this operating manual before using.

Product Compatibility

The Teleporter has been designed to adhere to established video standards and is compatible with any product also adhering to accepted video standards. Due to the high number of different manufacturers and variation in quality, it's impossible for us to have tested with every product combination and some troubleshooting may be required if mix/matching components. The Teleporter has been thoroughly tested with ImmersionRC gear. For best results and no compatibility issues, Fat Shark recommends ImmersionRC gear for your accessory products.

IMPORTANT!!!! Product Warning!!!!
DO NOT LEAVE HEADSET EXPOSED TO DIRECT SUNLIGHT. SUNLIGHT WILL MAGNIFY THROUGH THE OPTICS AND BURN HOLES IN THE LCD COLOR FILTER THIS WILL NOT BE COVERED BY WARRANTY. KEEP GOGGLES IN PROTECTIVE CASE WHEN NOT IN USE

Product contents

Carry case



Teleporter Headset



5G8 Antenna (TX, RX)



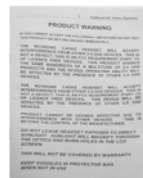
Battery



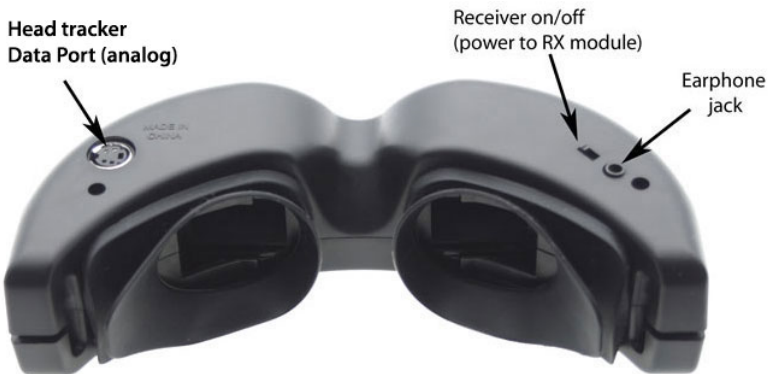
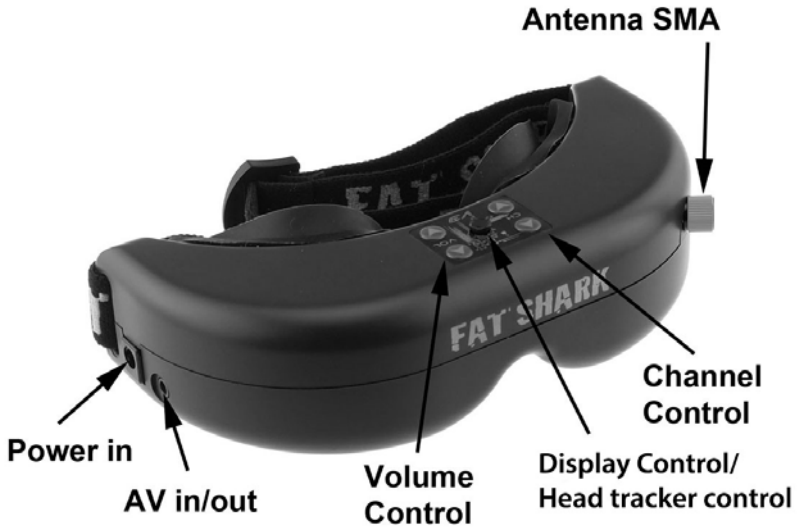
Lens cloth



Manual



Controls Diagram



Controls

Display control: pressing left and right increases/decreases display contrast. Press forward/back increases/decreases brightness.

Head Tracker control:

Long Press: Activate/deactivate digital head tracking. Depressing display control button (long press, vertical axis) toggles head tracker mode. On power up is normal (no zoom) and the display will show entire camera image. On HT digital mode, the image will zoom in and image will digitally pan and tilt in response to head motion.

Short Press: resets center reference position (both analog/digital).

Note analog head tracking output is always on.

RX power switch: The receiver module power is controlled by this switch. If viewing video source via the AV cable; the RX module needs to be turned off to avoid image conflict.

Channel select: Pressing channel up/down buttons will cause the channel to incrementally increase/decrease. Audio beep sounds on channel change. A long beep sounds on channel top and bottom limits.

Note: Fat Shark only guarantees compatibility with Fat Shark or ImmersionRC transmitters.

CH1: 5740 MHz CH2: 5760 MHz CH3: 5780 MHz CH4: 5800 Mhz
CH5: 5820 MHz CH6: 5840 Mhz CH7: 5860 MHz

Low battery warning: Audio warning if input voltage drops below 6.8V

Volume control: each press of button increments volume up or down. Standard earphones can be used with the Teleporter (not included).

Head Tracking Menu Navigation

To enter head tracking menu, hold head tracker button while inserting battery and immediately release the button after barrel insertion. Note that reversing pan/tilt direction will affect digital head tracking as well.

Beep code	Mode
1 short beep:	P/T on ch 5/6
2 short beep:	P/T on ch 6/7
3 short beep:	P/T on ch 7/8
4 short beep:	reverse pan direction
5 short beep:	Reverse tilt direction
1 long beep:	Adjust servo center point*
1 short beep:	Restore factory defaults
2 long beep:	no selection made, automatically exits menu

* Press HT button to gain manual control of the camera with the headset. Adjust camera to desired center position by moving headset and press button to set new camera center. Note that if your servos are not near the center point before adjusting, the servo travel may be limited.

For a complete and up to date list of compatible RC radios and their setup, a head tracking sticky thread is maintained at www.FPVlab.com under SPONSORS GATE/FAT SHARK

Operation notes:

Head tracker analog tracking is always on. It is not recommended to use analog and digital head tracking simultaneously due to the doubling of motion (digital + analog).

AV in/out Port

RCA Connector: Yellow: Video, White: Audio Left, Red: Audio Right



Recording Video

Connect AV cable to AV out port on right side of headset. Connect recording device to cables and set up as per manufacturer directions.

Note: Cables pins are not all the same (see above chart), be sure to connect to headset using the included cable.

Using an external receiver:

Use the AV cable to connect headset to the RCA AV port of external devices.

To share the base station power supply with your goggles, pick up a 3m Dominator AV cable accessory from your retailer. Note; internal receiver must be shut off to properly display external AV.



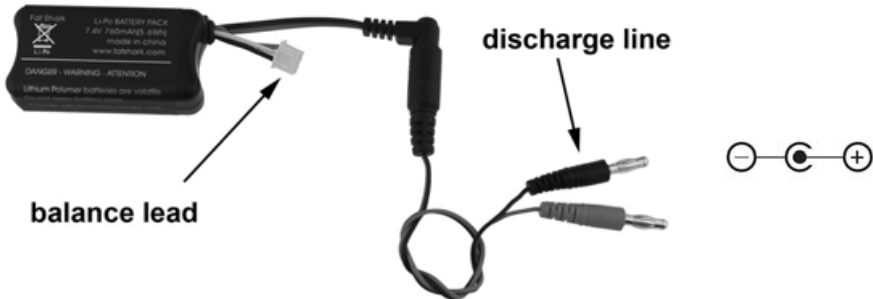
Battery Charging

The 760 mAh 7.4V lithium polymer battery pack is equipped with a 3 pole balance charger lead that allows the battery to be charged off standard RC battery pack chargers (not included). Follow your charger instructions for setting up for 1A 7.4V Li-po. Some chargers require a discharge cable to be connected (not included – accessory). Do not exceed 1A charging current.

Note (1): If the charger fails to announce charge complete, but is showing battery voltage at 8.4V, the charge can be considered finished.

Note (2): If battery becomes fully discharged or accidentally shorted, an internal safety circuit will trip. To reset the battery, tap 9V direct to the barrel connector via the discharge adapter cable's banana connector (black = GND, red = 9V). This will instantly reset the battery and it can be recharged as normal.

Connection to Standard RC Chargers



General Lithium Polymer safety and handling instructions:

- NEVER leave a LiPo battery unattended while being charged or discharged.
- ALWAYS monitor the battery and charger during the entire charging process.
- ALWAYS charge LiPo batteries in a fireproof location.
- ALWAYS have a lithium approved “class D type” fire extinguisher available.
- NEVER charge LiPo batteries at currents greater than the “1C” rating of the battery (“C” equals the rated capacity of the battery).
- NEVER continue to charge LiPo batteries if the charger fails to recognize full charge. Overheating or swelling of the LiPo cells is an indication of a problem and the battery should be disconnected from the charger immediately and placed in a fireproof location
- ALWAYS discontinue charging or discharging a LiPo immediately if at any time you see smoke or the battery starting to swell up and leave it in a safe fireproof location for approximately 30 minutes.

Accessories

Diopter lens

For near sighted users, diopter lens insert sets are available that include -2, -4 and -6 dpt.



- Remove eye cup
- Insert diopter lens
- Replace eye cup

Phantom GoPro Holder

The Fat Shark Phantom GoPro kit is the simplest solution to adding FPV to your Phantom quad. The screw on bracket is compatible with Phantom mounting holes and is specially designed to hold a GoPro3 camera holder for recording and the 600TVL CMOS as the primary flight camera. The FCC transmitter clips into the back bracket and places the antenna into the optimum mounting position. A custom length camera wiring is included to power the camera off the transmitter to keep wiring neat.



Tiny Telemetry From ImmersionRC

Conventional OSDs offer a host of features, some of which you don't need if you're just flying FPV around your local field or have a small and light FPV plane that can't really carry a full OSD. All you really want in those cases is for your tracking antenna to point at the plane accurately and have GPS positional data along with vital statistics such as battery voltage and current consumption.

TinyTelemetry is a minimal GPS locator that sends EzTelemetry data for the EzAntennaTracker down one of the audio channels on the audio/video transmitter. The EzAntennaTracker will then track the plane and offer battery statistics on its LCD display as well as other telemetry data such as positional info etc.

The new v2.0 EzAntennaTracker will also offer audible warnings for battery voltage and total current consumption.

The Tiny Telemetry plugs into the transmitter's dongle power supply located on the back of the transmitter.



Specifications

Headset Specifications

Optics:

- FOV 25 degrees diagonal
- Interpupillary (IPD) distance: 63.5mm (fixed)
- Optional diopter lens inserts available in -2, -4, -6 dpt

Audio:

- Stereo

User Controls:

- Channel selection
- Contrast/brightness
- Head tracker reset
- Volume adjustment

Electrical:

- Power supply, 7-13V (2S/3S supply)
- Power consumption: 200/350mA (direct/wireless)

Battery:

- 7.4V 760mAh lithium polymer with safety circuit.

System:

- NTSC/PAL auto select
- Interlaced only (not support progressive scan)

Mechanical:

- Ergonomic molded shape with adjustable headband
- Rubber eye cups for ambient light reduction.
- Weight: 163g

Display

- Two full color micro QVGA LCD's (320 X 240 lines)
- Resolution 230,000 pixels per eye

Head Tracker

- 9DOF 2-axis head tracker
- Digital and Analog control
- 8ch PPM analog output

Receiver

- 5.8Ghz 7ch

Interface

- 3.5mm 4p AV in/out port
- Power in port
- 3.5mm 3p Earphone port
- MiniDIN head tracker data port

Operational advice

- **For best performance**, select a channel that has the least amount of interference. While the transmitter is turned OFF, turn on the video headset and look at the screen as you check each channel. Clear channels will have a consistent static background. Channels with interference will have horizontal static lines.
- **If using on a quad or multicopter type aerial vehicle** you pretty much have to upgrade to the SpiroNET circular polarized antenna to get any decent range and good video link. Dipoles are suitable for foam planes.
- **Always perform a range test before flying.** This includes AV and RC controls. Some RC receivers can be affected by the proximity of other electronic devices particularly the AV TX.
- Try to space out your components as much as possible to avoid interference to your RC control range (keep stuff away from RX)
- Ensure your transmitter antenna has clear line of sight from the aircraft. Try to get the antenna out and away from the body.
- Until experienced, practice flying in a familiar area to avoid becoming disoriented.
- Due to antenna characteristics, there is a "null" in line with antenna direction. You may experience excessive video breakup when flying overhead
- 5.8Ghz signal strength drops off very fast, stay safely within solid AV range.
- **For maximum distance** it is very important that a clear line of sight exists between the transmitter and the video headset. Two of the worst causes of interference are human bodies and reinforced concrete.
- Place your TX antenna in open area in a vertical orientation
- **Multipathing** (reflections off buildings/ tall objects) causes signal cancellation and result in broken video. Fly in open areas away from buildings or other tall structures (i.e. barns, hills). Multipathing can be solved by upgrading to SpiroNET antenna.
- **5.8Ghz AV with 2.4Ghz RC controllers:** 2.4Ghz may cause harmonic interference on Ch2 – Ch7 of the 5.8Ghz AV (Ch1 not affected). The headset has been equipped with a high pass filter that will allow the system to work with CE certified 2.4Ghz RC controllers. However, the filtering may be insufficient to remove noise from overpowered non CE certified controllers. If you experience interference from your RC radio, change the AV channel to channel 1.
- Although you don't require any license to operate this device, you are still legally responsible for operating in a responsible manner.

Trouble shooting

Observation	Possible cause/solution
No image, display is completely dark	- No power supplied. Check power connections.
No image, display is glowing dark grey	- If using wireless module, turn on RX power on bottom of headset. - If using AV in cable, check video source. - Ensure TX is on and camera connections solid
Static on all channels	TX has no power. Check to ensure TX LED is lit.
No image on one channel, static on the rest.	Tx is working normal. Camera is not connected or lens cap left on
Lots of interference lines (horizontal lines)	- Choose a cleaner channel.
Lots of interference lines (horizontal lines) when using 5.8Ghz receiver	Check to see if cause is harmonic interference from 2.4Ghz RC controller (turn radio on/off). - Use CH1 on TX/headset (Ch1 not affected by 2.4Ghz) - check correct frequency antenna is used
Battery DOA	Low voltage switch tripped, read notes (2) in battery section
Battery won't charge	Low voltage switch tripped, read notes (2) in battery section disengaged from socket (open and reseal).
Short range	- Ensure 5.8Ghz antenna was installed - Check for other sources of interference - Ensure transmitter has clear LOS to headset. Test in wide open area, away from any obstructions
Short range (con't)	- Ensure that a compatible antenna is installed. Do not use other manufacture antenna, they may be dual band or may be reverse SMA (no center pin to connect to receiver)
White dots on LCD display	You were careless and left goggles exposed to sun. Sun burnt off LCD color filter.

Warranty

The system can be exchanged for a new unit within 30 days for any manufacturing defects if returned in new condition. The video headset will be warranted for repair for 2 years if no signs of excessive use. Buyer will be responsible for shipping costs. If beyond the warranty period we will provide repair services.

Your 1st point of contact for all warranty issues is your retailer. We also run a support forum for all technical issues at:

<http://fpvlab.com/> SPONSORS GATE/ FAT SHARK

Post your questions there and they will be answered by our technical staff or peers.