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Introduction
Congratulations on purchasing the Fat Shark Predator RTF FPV video piloting
system with goggles, transmitter and camera. To ensure your continued
enjoyment, please take the time to thoroughly read through this operating manual
before using.

Product Compatibility
The Predator 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
to for us to have tested with every product combination and some troubleshooting
may be required if mix/matching components. The Predator 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

Predator Headset

FPV kit
(camera, TX, filter)

AV cable

5G8 Antenna

Battery
(with discharge adapter)

Manual
Controls Diagram

- Antenna SMA
- Channel select
- Display control (up/down, left/right)
- Power in
- AV in/out
- Volume control
- PS2 Port
  Alternative power
- Receiver on/off
  (power to RX module)
- Earphone jack
Controls

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

**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 Predator (not included).

Downlink Overview (Camera, TX, Power)

Downlink system comes preassembled and tested for plug/play with your aircraft. Simply connect the balance lead of your 2S, 3S or 4S (7.4V - 16V) RC battery to provide power to your Fat Shark Downlink and you are ready to fly. The handy balance lead filters RC servo and motor noise from your RC pack for a crisp, clear image.
**Transmitter**

Channel select chart:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch1</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>N/A</td>
</tr>
<tr>
<td>Ch2</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>N/A</td>
</tr>
<tr>
<td>Ch3</td>
<td>On</td>
<td>Off</td>
<td>On</td>
<td>N/A</td>
</tr>
<tr>
<td>Ch4</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>N/A</td>
</tr>
<tr>
<td>Ch5</td>
<td>On</td>
<td>On</td>
<td>Off</td>
<td>N/A</td>
</tr>
<tr>
<td>Ch6</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>N/A</td>
</tr>
<tr>
<td>Ch7</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>N/A</td>
</tr>
</tbody>
</table>

WARNING: DO NOT POWER TRANSMITTER WITHOUT ANTENNA ATTACHED. NO ANTENNA LOAD WILL DESTROY RF AMPLIFIER – NOT COVERED BY WARRANTY

Small white connector on back of transmitter is for ImmersionRC Tiny Telemetry. See accessories.

**Camera**

2.8mm lens for wide angle 100 degree FOV; ideal for fixed camera piloting.
Camera is NTSC/PAL selectable (NTSC default, remove jumper on back for PAL).
Plugs camera directly into TX via included cable (pre assembled).

**Power (via discharge filter supply)**

The discharge filter supply allows you to power your downlink equipment from your onboard RC pack. Connect as shown below:

**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 1000 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 760 mA 7.4V Li-po. Some chargers require the discharge cable to be connected. Use the enclosed discharge lead adapter for these types of chargers.

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

**DO NOT LEAVE BATTERY ATTACHED TO CHARGER WHEN CHARGER IS NOT PLUGGED IN.**

**Note (2):** If battery becomes fully discharged or 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. This will instantly reset the battery and it can be recharged as normal.
### Accessories

**Diopter lens**

For near sighted users, diopter lens insert sets are available that include -2, -4 and -6 dpt. See below insert instructions. Lens orientation is not critical.

![Diopter lens image]

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

**SpiroNET Circular Polarized Antenna**

The best performance enhancement for your dollar; SpiroNET circular polarized antennae are manufactured to machine tolerances and final tested with top end RF equipment for the best performing CP antenna on the market. CP antennae naturally reject multipathing (biggest cause of 5G8 video breakup) and have no mismatch polarization when your aircraft banks – resulting in no rude range losses during acrobatic flight.

![SpiroNET antenna image]

**Tiny Telemetry from ImmersionRC**

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
- Volume adjustment

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

Battery:
- 7.4V 1000mAh lithium polymer with safety circuit.

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

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

Display
- Two full color micro VGA LCD's (640 X 480 lines)
- Resolution 922,000 pixels per eye

Head Tracker
- None (removed for V2)

Receiver
- 5.8Ghz 7ch

Interface
- 3.5mm 4p AV in/out port
- Power in port
- 3.5mm 3p Earphone port
- PS/2 Power port (alternative headset supply from Futaba or ezUHF)
Camera Specifications:

Electrical:
- Power supply: 3.5-5V (powered off TX)
- Power consumption: 60mA @5V

Imager:
- 1/3” CMOS 600TVL
- FPV tuned white balance and sampling.
- NTSC/ PAL selectable via jumper on camera (jumper on = NTSC).

Lens:
- 2.8mm IR coated
- 100° diagonal FOV (ideal for fixed camera)

Mechanical:
- Square: 21 X 21 X 12mm
- Lens extrude: 15mm X 14mm diameter
- Weight: 15g

Transmitter Specifications (250mW 5G8 V3):

Electrical:
- Power supply: 7 - 16 V (2S-4S supply)
- Power consumption 310mA @7.4V
- Transmitting power: 250mW
- Frequency: 5G8 (see above frequency chart)

Antennae:
- External dipole (circular polarized compatible)

Mechanical:
- 55 X 26 X 11 mm
- Weight: 22g (with antenna).

Downlink Kit
- Power supply: 7 - 16 V (2S-4S supply)
- Power consumption 390mA @7.4V
- Powered via battery balance lead
- Total weight: 42g (with antenna).
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.
- **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)
- Until experienced, practice flying in a familiar area to avoid becoming disorientated.
- 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. 2 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).
- **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.
- **Proper transmitter and antenna placement:** 95% of range issues are due to improper mounting of transmitter and antenna. This is particularly true for multicopters where the frame can interfere with the transmitted image. Place transmitters out on wing or arms away from aircraft body parts and ensure the TX clears all objects. Place the antenna in the vertical position (upside right or upside down but never sideways or on an angle).
Trouble shooting

<table>
<thead>
<tr>
<th>Observation</th>
<th>Possible cause/solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No image, display is completely dark</td>
<td>- No power supplied. Check power connections.</td>
</tr>
</tbody>
</table>
| 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 |
| 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 |
| White dots on LCD display | You were careless and left goggles exposed to sun. Sun burnt off LCD color filter. |
| 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 reseat). |
| 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) |
| Short range (con’t) | 95% of range issues is due to incorrect mounting of TX and antenna. Ensure antenna has clear line of sight and clear of any parts of RC craft. |

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/](http://fpvlab.com/) SPONSORS GATE/ FAT SHARK

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