FAT SHARK
RC VISION SYSTEMS

DOMINATOR HD

MODEL 1071

USER MANUAL

Revision A 05/09/2014

For more product information, please visit:
www.fatshark.com

Contents

Introduction

Congratulations on purchasing the Fat Shark Dominator HD modular SVGA FPV video goggles with integrated DVR. To ensure your continued enjoyment, please take the time to read through this operating manual thoroughly before using.

Product Compatibility

The Dominator 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 Dominator has been thoroughly tested with ImmersionRC gear. For best results and no compatibility issues, Fat Shark recommends ImmersionRC gear for your accessory products.

Fat Shark only guarantees video compatibility with NexwaveRF brand modules.

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 (appears as white open areas) .

THIS WILL NOT BE COVERED BY WARRANTY. KEEP GOGGLES IN PROTECTIVE CASE WHEN NOT IN USE

Product contents

Carry case

DominatorV2 headset

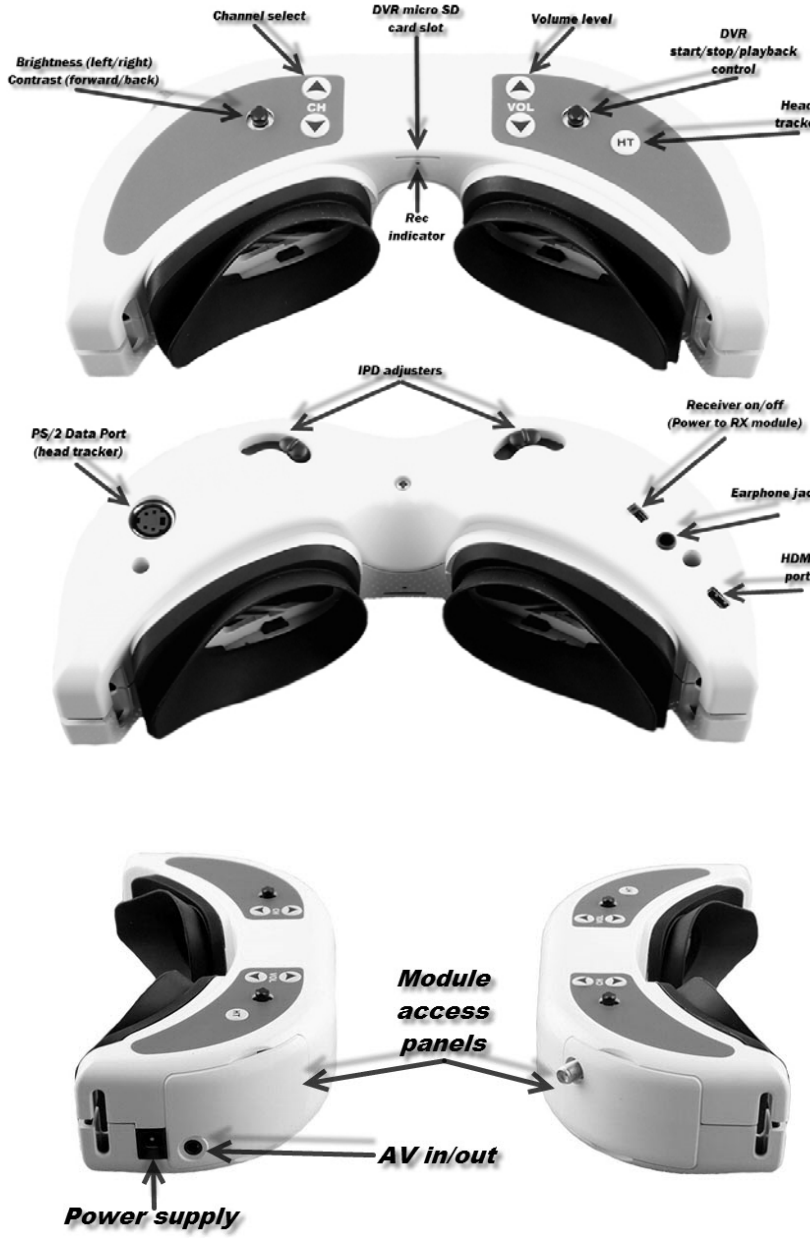
Battery
(and discharge lead)

AV cable

DC power cable

Manual

Controls Diagram



Headset Operation

Controls

Brightness/contrast control: pressing left and right increases/decreases display contrast. Press forward/back increases/decreases brightness.
Channel select: Pressing channel up/down buttons will cause the channel to incrementally increase/decrease from channels 1 to 8 (see relevant receiver module for channel map). Audio beep on channel change. A long beep sounds on channel top and bottom limits.
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 Dominator.
Head tracker: (refer to documentation included with module purchase)
RX power switch: The RX module power is independently controlled via this switch. If a module is inserted, but desired video source is via the AV cable; the RX module needs to be turned off to avoid image conflict.
DVR control: Connect AV cable to AV out port on right side of headset. Connect recording device to cables and set up as per manufacturer directions.
Display mode selection: Goggles will boot up in 2D analog. Vertically depressing the contrast/brightness button scrolls through the following modes: Analog 2D/ Analog 3D/HDMI 2D/ HDMI 3D. OSD indicates mode.

DVR Operation

SD card MUST be formatted before use to ensure stable recording.

Recording:
After powering goggles, turn on DVR by depressing vertically and holding the DVR control button for 1 full second (**long press)**.
RED LED should now show solid.
Ensure SD card is inserted and **short press** to start recording (RED LED will slowly FLASH (~2 times/second).
Short press again stops recording (turns to solid RED LED).

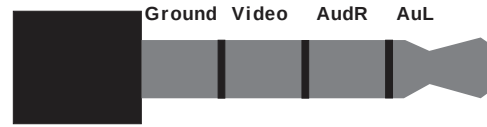
Playback
Note: requires turning off external receiver and removing any other AVin sources (to not conflict with menu navigation OSD).
After turning on DVR and in stop record mode (SOLD RED LED) depress and hold DVR button for 1 second (**long press**) to enter menu.

Menu Navigation
Playback (press right to enter)
Now can see: Preview shot with file number
press **up/down** to change file number
Press **right** to play
Up/down controls playback speed/direction
Right press pause/play
Left press, back to main menu
Format (press right to enter)
Execute (press right)

Pressing **left** from main menu exits menu

AV Cable Pinout

3.5mm AV Connector: Yellow: Video, White: Audio Left, Red: Audio Right



Powering options

If multiple power sources are supplied at same time (i.e. Futaba radio and head strap battery) the headset will draw power from the highest voltage.

ezUHF TX/JR Module

ImmersionRC's ezUHF transmitter and JR transmitter module can supply power (and head tracking control) to the Dominator goggle via a minDIN cable (included with the ezUHF).

Futaba Radio

The Dominator can be powered off a Futaba radio via the Data Cable.
Note: Best to upgrade the Futaba radio to a 3S 2200mAh radio lipo pack for this type of connection as the headset will cause extra drain on the transmitter battery pack. A normal NiMh radio battery will not have sufficient battery life for safe flying.

Base Station

Use the AV cable to connect the video/audio.
AV cable has Y splitter with male and female DC head to share power with the external RX supply (up to 13V). We do not recommend powering the goggles off RC packs without our Safety Shield (see accessories) as RC packs have no current limiting circuitry to prevent fires caused from shorts.

Battery

The Dominator can be independently powered via the external battery pack with specially molded case for sitting in head strap pocket.

Accessories

Trinity Head tracker

Refer to head tracker module manual for up to date and detailed menu setup instructions. For individual radio setup instructions please visit our head tracking support forum at www.FPVlab.com Forum: Sponsors Gate/Fat Shark/Head tracker radio support.

Receiver Modules (1.3G/2.4G/5.8G)

Refer to module manuals for frequency chart.
Note: Dominator only guarantees compatibility with NexwaveRF modules (Fat Shark/ImmersionRC)

Diopter lens

For near sighted users, diopter lens insert sets are available that include -2, -4 and -6 dpt. Peel off rubber eye cups and insert into slots seated in front of the lens. Replace rubber..

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.

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.

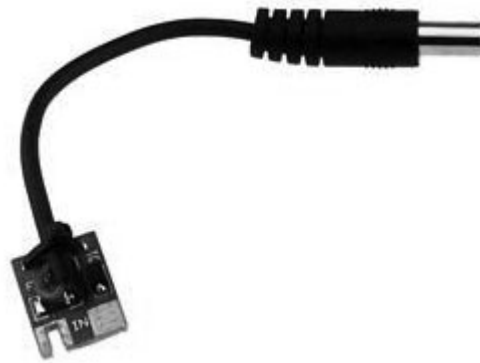
The Tiny Telemetry plugs into the transmitter's dongle power supply located on the back of the transmitter.

1000mA Battery Pack

The Fat Shark dog bone shaped 1000mAh pack seats securely in the headset strap pocket. The battery cable extends out of the top of the pack to avoid contact with head strap. Barrel connector cable features high strand count wire for flexibility and long life. Wire stress is minimized by the additional rubber gasket around the cable exit. No special charger is needed as balance leads have been added for charging with standard RC chargers (battery includes discharge lead adapter for advanced chargers).
Note: this battery can still be charged via the barrel connector with the original Fat Shark headset battery charger.

Power Shield safety circuit

Prevent your cables from fires due to runaway power supply of RC packs (which don't have current limiting safety circuits) if cables are misconnected or accidentally shorted. The Power Shield has reverse voltage protection and a 2A polyfuse (self resetting). The PCB comes prewired with a Fat Shark compatible barrel connector and a bare pad to solder on the appropriate battery connector.



Specifications

Optics:
- FOV (field of view): 45 degrees diagonal
- Glass optics (binocular 8p direct view optical engine)
- Interpupillary (IPD) distance: 57 to 73 mm (adjustable)

Audio:
- Stereo

User Controls:
- Channel selection
- Volume control
- Mode selection (wired/wireless)
- Contrast/ brightness control
- DVR control
- HT control

Electrical:
- Power supply: 7 - 13 V (2S/3S supply)
- Power consumption (@7.4V nominal):
  - 390mA wireless mode
  - 230mA direct mode (no RX)

RF Modules (optional):
- 43 channel support on 6 bands (1G3, 2G4, 4 x 5G8)

Mechanical:
- Weight: 200g

Display
- 800 X 600 SVGA pattern LCD
- Polarized LED backlight
- NTCS/PAL auto selecting
- 3D side/side support

Head Tracker
- Modular (sold separately)

DVR:
- MicroSD support to 32Gb
- Record rate: 6Mbps
- MJPG compression, 30 fps, AVI
- File playback (only native codec support)
- Upgradeable via SD card

HDMI Support:
- 720p 60 Hz (request)
- 720p 50 Hz (can accept)

Battery:
- 1000mAh 7.4V lithium polymer

Interface
- 3.5mm AV in/out port
- Power in port
- 3.5mm 3p earphone port
- MiniDIN4 data port (head tracking)
- MicroSD
- MiniHDMI
- RF module 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.
- **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)
- Do not use 2.4Ghz AV with 2.4Ghz RC controllers.
- Your 2.4Ghz TX will not affect the RC control of other RC users (however, their controllers will affect your AV reception).
- Be aware of other 2.4Ghz RC users. If they turn their RC radio nearby, they may knock out your image.
- 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 (2.4Ghz is more gradual). If using 5.8Ghz, 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).
- The headset may become warm to touch during use particularly in the top center region. This is normal. If you are unsure, run the headset for 30 minutes fully powered before flying to ensure normal operation.
- 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
Lots of interference lines (horizontal lines) with 2.4Ghz receiver	- Choose a cleaner channel. - Change to 5.8Ghz AV - Check correct frequency antenna is used
Poor image, dark or not enough contrast	- Adjust display with contrast/brightness button
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
Head tracker not working (no response or beeping)	- Ensure module pins are aligned correctly into headset socket
Short range	- Ensure correct antenna are 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. 2.4Ghz must use a 2.4Ghz antenna and 5.8Ghz must use a 5.8Ghz antenna - 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.
Lens fogs up	Cooler optical lens are heated by your humid face causing condensation. Pre warm goggles by wearing on head.
Head tracker does not work (can enter menu)	- Radio doesn't support selective trainer function - Settings incorrect - Trainer switch on RC controller not activated - in Pause mode
Head tracker drifts or has excessive error correction (jumpy)	- Operating inside so compass sensor not correct (use outside) - RC radio interfering with compass sensor (keep RC controller antenna away from headset - Standing near large metal object (such as a car)

Warranty

The system can be exchanged for a new unit within 7 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.