Military Equipment

707.1 PURPOSE AND SCOPE
The purpose of this policy is to provide guidelines for the approval, acquisition, and reporting requirements of military equipment (Government Code § 7070; Government Code § 7071; Government Code § 7072).

707.1.1   DEFINITIONS
Definitions related to this policy include (Government Code § 7070):

Military equipment – Includes but is not limited to the following:

- Unmanned, remotely piloted, powered aerial or ground vehicles.

- Mine-resistant ambush-protected (MRAP) vehicles or armored personnel carriers.

- High mobility multipurpose wheeled vehicles (HMMWV), two-and-one-half-ton trucks, five-ton trucks, or wheeled vehicles that have a breaching or entry apparatus attached.

- Tracked armored vehicles that provide ballistic protection to their occupants.

- Command and control vehicles that are either built or modified to facilitate the operational control and direction of public safety units.

- Weaponized aircraft, vessels, or vehicles of any kind.

- Battering rams, slugs, and breaching apparatuses that are explosive in nature. This does not include a handheld, one-person ram.

- Firearms and ammunition of .50 caliber or greater, excluding standard-issue shotguns and standard-issue shotgun ammunition.

- Specialized firearms and ammunition of less than .50 caliber, including firearms and accessories identified as assault weapons in Penal Code § 30510 and Penal Code § 30515, with the exception of standard-issue service weapons.

- Any firearm or firearm accessory that is designed to launch explosive projectiles.

- Noise-flash diversionary devices and explosive breaching tools.

- Munitions containing tear gas or OC, excluding standard, service-issued handheld pepper spray.

- TASER® Shockwave, microwave weapons, water cannons, and long-range acoustic devices (LRADs).

- Kinetic energy weapons and munitions.

- Any other equipment as determined by a governing body or a state agency to require additional oversight.

Military Equipment

707.2 POLICY

It is the policy of the California Department of Fish and Wildlife Law Enforcement Division that members of this department comply with the provisions of Government Code § 7073 with respect to military equipment.

707.3 MILITARY EQUIPMENT COORDINATOR

The Chief of Law Enforcement should designate a member of this department to act as the military equipment coordinator. The responsibilities of the military equipment coordinator include but are not limited to:

(a) Identifying department equipment that qualifies as military equipment in the current possession of the Department, or the equipment the Department intends to acquire.

(b) Conducting an inventory of all military equipment at least annually.

(c) Collaborating with any allied agency that may use military equipment within the jurisdiction of California Department of Fish and Wildlife Law Enforcement Division (Government Code § 7073(a)(4)).

(d) Publish the military equipment use policy on the department website (Government Code § 7073(c)(1)).

(e) Provide a copy of the military equipment use policy to the Governor or the Governor's designee (Government Code § 7073(c)(2)).

(f) Review all complaints, questions and concerns about the Law Enforcement Division's use of military equipment, and respond in a timely manner. Complaints, questions and concerns may be received via emails, phone calls or letters directed to the Military Equipment Coordinator, or received directly by the Military Equipment Coordinator. The Military Equipment Coordinator will be identified on the Department's webpage.

(g) Oversee the UAS Program Annual Maintenance. Costs estimated to be $10,000.

707.4 MILITARY EQUIPMENT INVENTORY

The following constitutes a list of qualifying equipment for the Department pursuant to Government Code § 7070(d):

- Skydio Skydio 2+™ and X2™ – Skydio Inc. | Skydio:
  - Items, Quantity, and Cost per item:
    - (6) Skydio X2E Thermal/Color Camera UAS ($15,229)
    - (14) Skydio X2E Color Camera UAS ($11,549)
    - (10) Skydio S2+ UAS ($3,259)
  - Three year life expectancy.
- Armored Innovations:
  - Items, Quantity, and Cost per item:
    - (1) AI Warthog FPV UAS ($6,000)

Military Equipment

- o   Three year life expectancy
- See attachment: Military Equipment List

Attachments

Military Equipment List .pdf

Skydio X2E Thermal/Color Cameras

X2E-color_thermal-2021-12-15

AIRCRAFT	
DIMENSIONS (UNFOLDED, FLYING)	26.1" X 22.4" X 8.3" (66 x 56 x 20 cm)
DIMENSIONS (FOLDED, NO BATTERY)	11.9" X 5.5" X 3.6" (30 x 15 x 10 cm)
WEIGHT (WITH BATTERY)	1325 g
FLIGHT TIME	Up to 35 minutes
MAX FLIGHT SPEED (SEA LEVEL, NO WIND)	25 mph (40 km/h)
MAX WIND SPEED RESISTANCE	23 mph
MAX SERVICE CEILING (ABOVE SEA LEVEL)	Up to 12,000 ft
OPERATIONAL TEMPERATURE RANGE	–10°C to 43°C

SKYDIO AUTONOMY ENTERPRISE	
MAIN PROCESSOR	NVIDIA Tegra X2 SOC
CAMERA CONFIGURATION	6x cameras in trinocular configuration top and bottom
ENVIRONMENT COVERAGE	True 360°
OBSTACLE AVOIDANCE COVERAGE	Omnidirectional
3D WORLD MODEL UPDATE RATE	> 1 million points per second
WORLD MODEL-TO-ACTION UPDATE RATE	500 iterations per second
ONBOARD AI	9 custom deep networks used in flight
USER-SELECTABLE SUBJECTS FOR TRACKING	People and motor vehicles
OBJECT TRACKING AND IDENTIFICATION	Up to 20 simultaneous objects of interest
CALIBRATION	Automated calibration of lens parameters, cameras, wind speed, and air density
ADVANCED AI-PILOT ASSISTANCE	360 Superzoom, Close Proximity, Obstacle Avoidance, Point-of-Interest Orbit, Track-in-Place, Vertical View, Visual Return-to-Home

CONTROLLER	
DIMENSIONS	10.75" x 5.25 x 3.0"
WEIGHT	1130 g
APPLICATIONS	Skydio Enterprise App
WIRED LINKS	USB, (via dongle) HDMI
OPERATING FREQUENCIES	5 GHz
MAX RANGE	Up to 6 km (5 GHz)
VIDEO FEED	720p at 30 fps

PRIMARY CAMERA SYSTEM	
COLOR SENSOR TYPE	Sony IMX577 1/2.3" 12.3MP CMOS
COLOR LENS FOCAL LENGTH	41mm (35mm format equivalent)
COLOR VIDEO RESOLUTION	4K / 60 fps with 16x digital zoom
COLOR VIDEO FORMAT	MPEG-4 (AVC/H.264, HEVC/H.265)
COLOR STILL RESOLUTION	4056x3040 (12 MP)
COLOR DYNAMIC RANGE	13 stops
PITCH CONTROLLABLE RANGE	–110° to +45° (–110° to +90° with AEF)
THERMAL SENSOR TYPE	FLIR Uncooled VOx microbolometer
THERMAL RESOLUTION	320x256
THERMAL LENS FOCAL LENGTH	9.1mm
THERMAL FRAMERATE	30fps

SYSTEM SECURITY	
WIRELESS ENCRYPTION	AES-128
FIRMWARE	Signed and encrypted
CONTROLS	Ability to provision and deprovision devices
INFRASTRUCTURE	Key provisioning burned-in at time of manufacture

Skydio X2E Color Camera

X2E-color_only-datasheet-2021-12-15

AIRCRAFT

DIMENSIONS (UNFOLDED, FLYING)	26.1" X 22.4" X 8.3" (66 x 56 x 20 cm)
DIMENSIONS (FOLDED, NO BATTERY)	11.9" X 5.5" X 3.6" (30 x 15 x 10 cm)
WEIGHT (WITH BATTERY)	1325 g
FLIGHT TIME	Up to 35 minutes
MAX FLIGHT SPEED (SEA LEVEL, NO WIND)	25 mph (40 km/h)
MAX WIND SPEED RESISTANCE	23 mph
MAX SERVICE CEILING (ABOVE SEA LEVEL)	Up to 12,000 ft
OPERATIONAL TEMPERATURE RANGE	–10°C to 43°C

SKYDIO AUTONOMY ENTERPRISE

MAIN PROCESSOR	NVIDIA Tegra X2 SOC
CAMERA CONFIGURATION	6x cameras in trinocular configuration top and bottom
ENVIRONMENT COVERAGE	True 360°
OBSTACLE AVOIDANCE COVERAGE	Omnidirectional
3D WORLD MODEL UPDATE RATE	> 1 million points per second
WORLD MODEL-TO-ACTION UPDATE RATE	500 iterations per second
ONBOARD AI	9 custom deep networks used in flight
USER-SELECTABLE SUBJECTS FOR TRACKING	People and motor vehicles
OBJECT TRACKING AND IDENTIFICATION	Up to 20 simultaneous objects of interest
CALIBRATION	Automated calibration of lens parameters, cameras, wind speed, and air density
ADVANCED AI-PILOT ASSISTANCE	360 Superzoom, Close Proximity, Obstacle Avoidance, Point-of-Interest Orbit, Track-in-Place, Vertical View, Visual Return-to-Home

CONTROLLER

DIMENSIONS	10.75" x 5.25 x 3.0"
WEIGHT	1130 g
APPLICATIONS	Skydio Enterprise App
WIRED LINKS	USB, (via dongle) HDMI
OPERATING FREQUENCIES	5 GHz
MAX RANGE	Up to 6 km (5 GHz)
VIDEO FEED	720p at 30 fps

PRIMARY CAMERA SYSTEM

COLOR SENSOR TYPE	Sony IMX577 1/2.3" 12.3MP CMOS
COLOR LENS FOCAL LENGTH	20 mm (35 mm format equivalent)
COLOR VIDEO RESOLUTION	4K / 60 fps with 16x digital zoom
COLOR VIDEO FORMAT	MPEG-4 (AVC/H.264, HEVC/H.265)
COLOR STILL RESOLUTION	4056x3040 (12 MP)
COLOR DYNAMIC RANGE	13 stops
PITCH CONTROLLABLE RANGE	–110° to +45° (–110° to +90° with AEF)

SYSTEM SECURITY

WIRELESS ENCRYPTION	AES-128
FIRMWARE	Signed and encrypted
CONTROLS	Ability to provision and deprovision devices
INFRASTRUCTURE	Key provisioning burned-in at time of manufacture

Skydio S2+

S2Plus_Enterprise-datasheet-2022-04-06re

AIRCRAFT	
DIMENSIONS WITH BATTERY (ANTENNAS UP)	229 x 274 x 126 mm
WEIGHT (WITH BATTERY)	800 g
FLIGHT TIME	Up to 27 minutes
MAX FLIGHT SPEED (SEA LEVEL, NO WIND)	36 mph
MAX WIND SPEED RESISTANCE	25 mph
MAX SERVICE CEILING (ABOVE SEA LEVEL)	Up to 15,000 ft
OPERATIONAL TEMPERATURE RANGE	–5°C to 40°C

SKYDIO AUTONOMY ENTERPRISE	
MAIN PROCESSOR	NVIDIA Tegra X2 SOC
ENVIRONMENT COVERAGE	True 360°
3D WORLD MODEL UPDATE RATE	> 1 million points per secon
USER-SELECTABLE SUBJECTS FOR TRACKING	People and motor vehicles
ONBOARD AI	9 deep networks used in flight
ADVANCED AI-PILOT ASSISTANCE	360 Superzoom, Close Proximity, Obstacle Avoidance, Point-of-Interest Orbit, Track-in-Place, Vertical View, Visual Return-to-Home

PRIMARY CAMERA SYSTEM	
COLOR SENSOR TYPE	Sony IMX577 1/2.3" 12.3MP CMOS
COLOR LENS FOCAL LENGTH	20mm (35mm format equivalent)
COLOR VIDEO RESOLUTION	4K / 60 fps with 3x digital zoom
COLOR DYNAMIC RANGE	13 stops
PITCH CONTROLLABLE RANGE	–110° to +90°

Military Equipment Inventory

Armored Innovations

AI Warthog FPV UAS

Camera:

- 1080P 120fps compatibility
- 22ms low latency
- Ranging Mode
- 4KM range
- Light weight design
- FOV160°
- Built-in 8G/32G storage,
- Support Gyroflow
- GPS anti-jamming
- 6V-25.2V
- The only native 4:3 high-definition sensor in the FPV industry
- New VTX with enhanced TVS protection and support for up to 6S. With a wide input voltage the range of 6V to25.2V, our VTX delivers unmatched stability and resistance to GPS interference. Enjoy unparalleled performance and take your FPV adventures to new heights with our cutting-edge technology.
- VTX comes with 8g/32g built-in storage it can record 1080p or 720p HD flight videos without interference.32G built-in storage, recording video time increased by 4 times.
- Supports both high frame rate and standard frame rate, it has an average latency of 22ms with the high frame rate.
- The compact and convenient single-antenna design makes it easier to assemble your FPV drone. The quality of the antenna is upgraded, and the working performance of the whole frequency band is more stable.

Specification

Goggles

Model	Avatar goggles
Communication Frequency	5.725-5.850GHz
Transmitter Power (EIRP)	FCC:<30dBm;CE:<14dBm;SRRC:<20dBm; MIC:<25dBm
I/O Interface	Type-C,microSD card slot,DC 5.5*2.1mm
IPD Mechanical Range	58-70mm
IPD Visual Range	54-74mm
Adjustable Focus Range	+2 to -6 Diopter
FOV	46°
Screen Resolution	1920*1080
Screen Refresh Rate	1080/100Hz
Screen Size	0.49"1nch
Screen Material	OLED
HDMI Output	Support
Power Input	7-21V(2S-5S)
SD Card	Support 256G

Goggles Antenna

Antenna 1	Red bird
Polarization	LHCP
Bandwidth	5.6GHz-6.0GHZ
Average Gain	1.9dBi
Radiation Efficiency	≥97%
VSWR	≤1.3
Cross-Polar Rejection	-15to-30dB
Connector	RP-SMA
Dimension	H24.8mm*R15.3mm
Weight	4.2g
Antenna 2	patch antenna
Frequency range (MHz)	5725-5875
Input Impedance (Ω)	50
VSWR	<1.5

Military Equipment Inventory

Gain (dBi)	8
HPBW	75° H-plane75° E-plane
Front to back ratio (dB)	>10
Power Capacity (W)	10
Polarization	LHCP
interface	RP-SMA
Ambient temperature (℃)	-40+60
Camera	
Model	Avatar V2 camera
Image Sensor	1/3.2-Inch 4Mp 4:3sensor
Resolution	1080P/60fps; 720P/100fps; 720P/60fps;1080P/120fps compatibility; 1080P/100fps compatibility;
Ratio	4:3 native /16:9
Lens	2.1mm
FOV	160°
Aperture	F2.0
Shutter	Rolling shutter
Min.Illumination	0.001Lux
Weight	7.2g
Dimensions	19*19*22mm
Coaxial Cable	140mm
Gyroflow	Only 32G VTX Supported
VTX	
Model	Avatar V2 module
Communication Frequency	5.725-5.850GHz
Transmitter Power (EIRP)	FCC:<30dBm;CE:<14dBm;SRRC:<20dBm; MIC:<25dBm
1/O Interface	JST1.0*4(Power in)JST0.8*6(USB)
Mounting Holes	25.5*25.5mm; 20*20mm
Dimensions	33.5*33.5*10.5mm
Storage	8G/32G
Recording	1080p/720p
Weight	17.6g
Operating Temperature	-20-40℃
Channels	8
Wide Power Input	6V-25.2V
Supported FC System	Betaflight; Inav; Fettec; ArduPilot; Kiss
OSD	Canvas mode
Latency	Average delay 22ms
Antenna	1(IPEX)
Avatar V2 antenna	
Polarization	LHCP
Bandwidth	5600MHz-6000MHz
Gain	1.9dBi
VSWR	≤1.5
Input Impedance	50Ω
Interface	IPEX-1
Size	R15 X 45mm （without cable）
Weight	2g

Handheld Controller

- Full size HAll sensor gimbals
- Ball-bearing
  - Configurable resistance and tension
  - Adjustable throttle & pitch throw (+/- 10 degrees)
  - Spare spring set included for lower tension
  - Foldable gimbal sticks (Pro only)
- Ergonomic and compact design with comfy rubber grips
- Robust, streamlined switches
  - 2x 2-position switches
  - 2x 3-position switches
  - 2x momentary buttons

Military Equipment Inventory

- TBS Crossfire built-in
    - CRSFShot for lowest latency and most direct response of any remote control available
    - Range of up to 30km / 20mi from the palm of your hand
    - Swivel-antenna that doubles as a kick-stand
    - Up to 12 channels supported
- Built-in 5000mAh 1S LiPo with USB-C 2A charging (2.5 hours for full charge)
- Speech audio output with audio jack & haptic vibration alert
- Open Source remote control operating system (FreedomTX, temporary fork of OpenTX)
- Rocker dial and 3 button menu for super simple navigation
- High resolution (128*96) black & white OLED screen w/ backlight
- Digital rocker dial trim
- 100+ model memory with included SD-card
- TBS Cloud compatible

Unoccupied Aerial System Operations

607.1 PURPOSE AND SCOPE
The purpose of this policy is to establish guidelines for the use of an Unoccupied Aircraft System (UAS) and for the storage, retrieval and dissemination of images and data captured by the UAS for the Law Enforcement Division.

607.1.1 DEFINITIONS
Definitions related to this policy include:

Unoccupied aerial system (UAS) - An unoccupied aircraft of any type that is capable of sustaining directed flight, whether preprogrammed or remotely controlled (commonly referred to as an unoccupied aerial vehicle (UAV)), and all of the supporting or attached systems designed for gathering information through imaging, recording or any other means.

607.2 POLICY
Unoccupied Aircraft Systems may be utilized to enhance the Law Enforcement Division's mission of protecting California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. Any use of a UAS will be in strict accordance with constitutional and privacy rights and Federal Aviation Administration (FAA) regulations, this policy, and the law enforcement UAS Operations Manual.

607.3 PRIVACY
The use of the UAS potentially involves privacy considerations. Absent a warrant or exigent circumstances, operators and observers shall not intentionally record or transmit images of any location where a person would have a reasonable expectation of privacy (e.g., residence, yard, enclosure). Operators and observers shall take reasonable precautions to avoid inadvertently recording or transmitting images of areas where there is a reasonable expectation of privacy. Reasonable precautions can include, for example, deactivating or turning imaging devices away from such areas or persons during UAS operations.

607.4 PROGRAM MANAGER
The Chief of Law Enforcement will appoint a program manager who will be responsible for the management of the UAS program. The program manager will ensure that policies and procedures conform to current laws, regulations, and best practices and will have the following additional responsibilities:

- Working with program staff to coordinate the FAA Certificate of Waiver or Authorization (COA) application process and ensuring that the COA is current, and/or coordinating compliance with FAA Part 107 Remote Pilot Certificate, as appropriate for department operations.

- Ensuring that all authorized operators and visual observers have completed all required FAA and department-approved training in the operation, applicable laws, policies, and procedures regarding use of the UAS.

- Developing uniform protocol for submission and evaluation of requests to deploy a UAS, such as the Flight Risk Assessment Tool (FRAT), including urgent requests made during ongoing or emerging incidents such as immediate deployment situations.

- Coordinating the completion of the FAA Emergency Operation Request Form in emergency situations, as applicable (e.g., natural disasters, search and rescue, emergency situations to safeguard human life).

- Maintaining the operational manual governing the deployment and operation of a UAS including but not limited to safety oversight, use of visual observers, establishment of lost link procedures, and secure communication with air traffic control facilities.

- Developing a protocol for fully documenting all missions.

- Developing a UAS inspection, maintenance, and record-keeping protocol to ensure continuing airworthiness of a UAS, up to and including its overhaul or life limits.

- Developing protocols to ensure that all data intended to be used as evidence are accessed, maintained, stored, and retrieved in a manner that ensures its integrity as evidence, including strict adherence to chain of custody requirements. Electronic trails, including encryption, authenticity certificates, and date and time stamping, shall be used as appropriate to preserve individual rights and to ensure the authenticity and maintenance of a secure evidentiary chain of custody.

- Developing protocols that ensure retention and purge periods are maintained in accordance with established records retention schedules.

- Facilitating law enforcement access to images and data captured by the UAS.

- Recommending program enhancements, particularly regarding safety and information security.

- Ensuring that established protocols are followed by monitoring and providing periodic reports on the program to the Chief of Law Enforcement.

607.5 USE OF UAS

Only authorized operators who have completed the required training shall be permitted to operate the UAS.

Use of vision enhancement technology (e.g., thermal and other imaging equipment not generally available to the public) is permissible in viewing areas only where there is no protectable privacy interest or when in compliance with a search warrant or court order. In all other instances, legal counsel should be consulted.

UAS operations should only be conducted consistent with FAA regulations.

607.6 PROHIBITED USE

The UAS video surveillance equipment shall not be used:

Unoccupied Aerial System

- To conduct random surveillance activities, other than the activities outlined in the UAS Operations Manual.

- To target a person based solely on actual or perceived characteristics, such as race, ethnicity, national origin, religion, sex, sexual orientation, gender identity or expression, economic status, age, cultural group, or disability.

- To harass, intimidate, or discriminate against any individual or group.

- To conduct personal business of any type.

The UAS shall not be weaponized.

607.7 RETENTION OF UAS DATA
Data collected by the UAS shall be retained in accordance with the CDFW Records Management Policy.