



SKYRANGER R70



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Versatile, optionally tethered, multi-mission Group 1 VTOL UAS.

Development Status: Full Rate Production

Export Classification: R70 = Not Listed\Controlled , R80D = ITAR

RESILIENT AND BATTLE TESTED

Carbon fiber and magnesium airframe is tested to IP-54/MIL-810G. Operating up to 15,000' MSL and withstanding sustained winds up to 40 mph.

AN OPEN ARCHITECTURE

Open architecture, including the Payload Development Kit (PDK) supporting payloads up to 3.5kg, allows end users and integrators to expand the capability of the aircraft.

AUTONOMOUS AND INTELLIGENT

Advanced edge-of-network processing, enabling object detection and classification, semi-autonomous flight, and the ability to operate in GPS- or comms-denied environments.



Size & Weight	Height: 45 cm (17.7") Length: 1.35m (53") Propeller tip to propeller tip Weight: 5kg (11lbs)
Range (Typical)	>8km
Endurance (Nominal)	Over 40 mins in free flight, <59 mins with XL batteries (LRIP March 2022) Over 24 hours while tethered
Max. Payload Weight	3.5kg (7.7lbs)
Available Payloads (Hot-Swappable)	EO/IR, EO Zoom, LWIR Zoom, SIGINT, CBRNe, etc
Environmental	65 kph (40mph) sustained, 90kph (56mph) gust -20C to 50C IP-54/MIL-810G
Control Interface	FLIR Mission Control Station (MCS) ATAK (Mil/Civ) FLIR Application Development Kit (ADK)
Datalink Options	915MHz, 922MHz, 2.2GHz & Tactical MANET

R70 BLK 2 CAPABILITY SUMMARY

Development Status: LRIP November 2021

Export Classification: R70 = Not Listed\Controlled

Enables the Block 2 Tether

- Increase payload capacity while tethered
- Enables comms dark or RF denied operation

Enhanced Navigation Cameras

- GPS denied operation and precision landing on stationary & moving targets

Auxiliary Payload Port

- Mounting point for Block 2 Tether
- Mechanical & electrical provisions for future FLIR and 3rd party capabilities

Refreshed Block 2 FrontCam (2X resolution on IR & EO)

- Improved Day/Night Situational Awareness
- Simultaneous EO & IR Video Streams
- Automatic Detection of People, Vehicles and Moving Targets



BLOCK 2 – FRONTMOUNTED & NAVCAMS

FRONTMOUNTED

Higher resolution EO/IR FrontCam for improved day/night situational awareness

- Automatic detection of moving targets
- Electronic image stabilization
- Simultaneous streaming of EO and IR video



	Block 1 FrontCam	Block 2 FrontCam
IR Sensor	Lepton 160x120	Boson 320 x 256
IR FoV	57° FoV	34° FoV
EO Sensor	2MP Sony IMX 1984 x 1105 pixels	12MP Sony IMX 4056 x 3040 pixels
EO FoV	75° FoV	80° FoV

NAVCAM

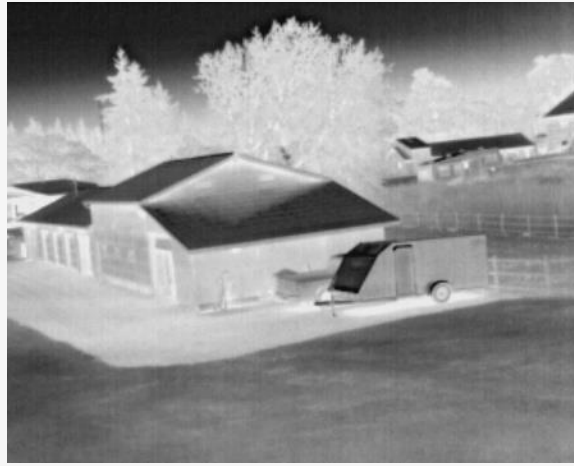
Enhanced navigation cameras for GPS denied operation and precision landing on both stationary & moving targets

- Block 1 baseline performance maintained in Block 2 with 11.0SW



	Block 1 Nav Cams	Block 2 Nav Cams
Sensor	Mono 640 x 480 pixels	Colour 1920 x 1200 pixels
Lens FoV	167 diagonal degrees	202 diagonal degrees

BLOCK 2 – FRONTCAM IR VIDEO COMPARISON



Block 1 FRONTCAM IR

160 x 120
57deg FoV

Block 2 FRONTCAM IR

320 x 256
34 deg FoV

EO \ IR MKII Payload

640 x 480
32 deg FoV



BLOCK 2 – POWER/ETHERNET PORT & AUXILIARY PORT

The Block 2 aircraft has an external power and ethernet port which was developed for the Block 2 Tether.

- Enables continuous tethered operation with no reliance on an RF link

New port will also enable future FLIR & 3rd party capabilities.

- Can provide power IN & OUT (20V-33V @ >5A) as well as ethernet connectivity to the aircraft
- Already being used for remote wake (LRB config) and an auxiliary video processor module (AI at the edge)



Mechanical mounting point for Block 2 Tether

- Utilizes the same latch design as the arms
- Required relocation of the laser altimeter, now above the FrontCam

Mechanical and Electrical provisions for future capabilities:

- Ideal for modules less than 500 grams
- Configurable power (3.3V@0.5A & 12V@2.8A) & I/F (UART, I2C, SPI)
- SW defined based on a sense resistor
- Possible uses include sensors, transponders, auxiliary processors, parachute, etc.
- Developer interface not yet defined / roadmapped



R70 TETHER BK2

Development Status: LRIP Q2 2022

Export Classification: R70 = Not Listed\Controlled



Bk2 Tether Ground Station (Elistair Safe-T2) integrated with R70 uAS



Air module, providing data over tether, connected to Bk2 Power/Ethernet port

Block 2 Tether Kit adds Data-over-Tether, and extends operating envelope

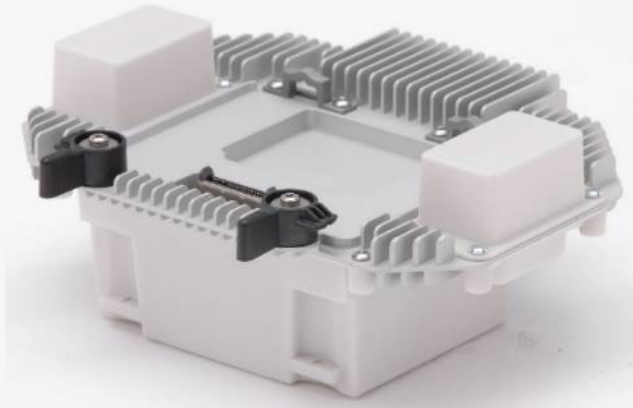
- Enables continuous tethered operation with no reliance on an RF link; command & control and video downlink over Tether
- IP-54 rated ground station and air module
- Total payload weight of 4.4lbs at 300' AGL, supporting StormCaster payloads

TACTICAL NETWORKING

Development Status: SILVUS: prototypes avail. now, LRIP Q3 2022 // TRAK prototypes avail. now

Export Classification: Subject to Classification of Radios

Silvus Interposer



TRAK – Tactical Radio Adaptor Kit



Single radio TRAK configuration



Dual radio TRAK configuration

Fully Integrate R70 UAS onto Silvus Tactical MANET

- Supports S- and C-band frequencies
- Removes R70 base station from system loadout
- Allows R70 to operate as aerial retransmission node
- Enables hand-off of UAS control to other Silvus users
- Distributes video and metadata to other personnel on the MANET

Enables R70 to host multiple tactical radios for BLOS network retransmission

- Two configurations: single radio (+ISR payload), or dual radio
- Uses aircraft tether to power tactical radios
- Hot-swappable in-field integration of handheld radios
- Supported radio vendors include Trellisware, Harris, Thales, Silvus, and Persistent Systems

CBRNE PAYLOAD PORTFOLIO

Development Status: C360 – Q4 2021 / B330 – 1H 2022 Export Classification: EAR99



Muve[®] C360
Multi-Gas Chemical
Detector

Size & Weight	6" x 2.5" x 2" 1.5 lbs (680g)
Technology	Photoionization + Metal-Oxide + Electrochemical Detection
Sensitivity	PID ppm level, other sensors differs by sensor
Time to Alarm	Near instantaneous
Detection Capability	Photoionization Detector (PID) for Volatile organic chemicals (VOCs), CO, Cl ₂ , O ₂ , NO ₂ , H ₂ S, SO ₂ , Lower Explosives Limit (LEL).
Environmental	-20°C – 45°C IP-43 Rated



Muve[®] B330
Bio-Detection &
Collection

Size & Weight	7.6" x 7.6" x 7.6" 3.13 lbs (1420g)
Technology	UV Laser Induced Fluorescence (LIF)
Sensitivity	< 100 particles/L of air
Time to Alarm	30 seconds to alarm
Detection Capability	Spores, vegetative bacteria, viruses, and toxins; particle size: 0.7 – 10 microns
Environmental	-20°C – 45°C IP-54 Rated

AUTONOMOUS LAUNCH & RECOVERY BOX (ALRB)

Development Status: Gen1: prototypes available, Gen2 under development

Export Classification: Not Listed

Enables integration of R70 UAS with vehicle platforms, or fixed-site installations

- Supports both Tethered and Free-Flying configurations
- Autonomous launch and recovery
- Integrates with vehicle power, networking, and C2 systems
- Multi-mission versatility enables a wide range of applications
 - Forward ISR and Target Acquisition
 - CBRNe Threat Detection
 - Network Retransmission
- “Gen1” aLRB delivered under contract to US ARMY Robotic Combat Vehicle Medium (RCV-M) program of record, and other government vehicle programs
- “Gen2” aLRB under development
 - Reduced size/weight: 2/3x volume and 1/2x weight of Gen1
 - Improved on-the-move operation
 - Improved environmental tolerances

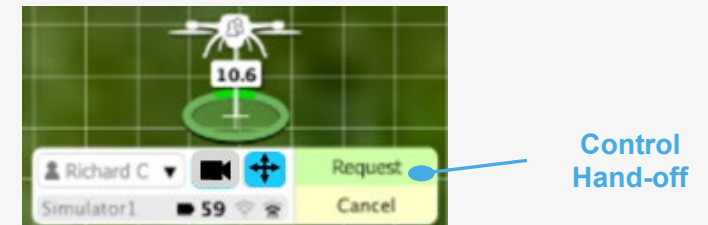
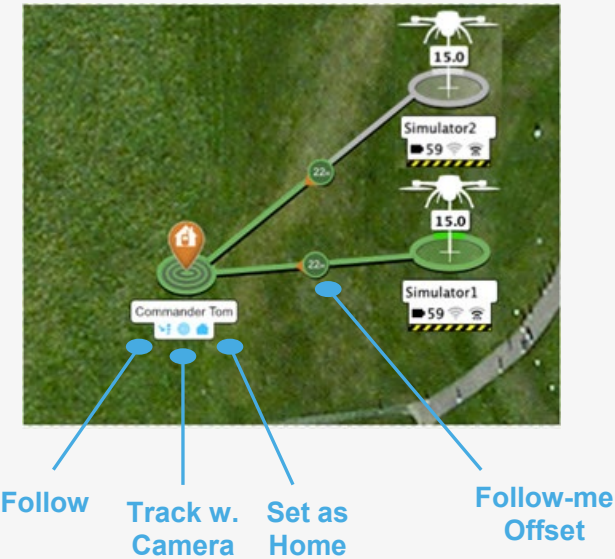


MCS 11.0

Development Status: Available for new and in-market R70 UAS

Export Classification: Not Listed

- **Autonomous Landing on Moving Platforms**
 - Constant speed of <20km/h
 - Computer Vision Target of 1m x 2m
- **Advanced Tactical Networking Support (Silvus)**
 - C2, video, mesh re-trans and GUI integrated network stats when using Silvus interposer
 - One-Click Interaction: set any tactical radio node as Home, Track, or Follow
- **Multi-aircraft Following:** Can now follow a base station or radio node with multiple aircraft
- **Control Hand-off:** Pilots can now hand-off aircraft or payload control securely via UX to other MCS or ATAK users
- **Alternative Recovery Locations:** allow pilots to create safe, alternate landing locations for aircraft to emplace or deliver equipment while preserving 'Home' as a safe back-up location in case of error.
- **Embedded Compute Environment:** Allows 3rd party developers to write and run custom software on board the base station or the aircraft itself.
- **Multiview:** simultaneously view multiple payload video streams

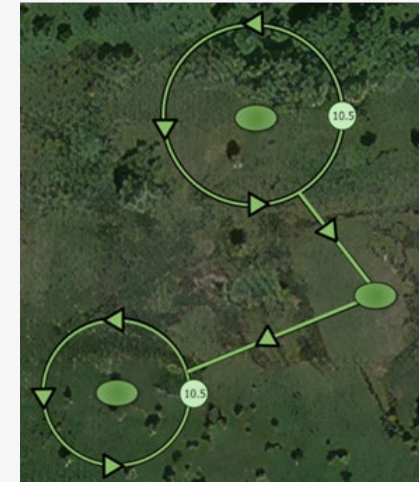


MCS 11.1

Development Status: Feb/March 2022 for new and in-market R70 UAS

Export Classification: Not Listed

- **Preset Speeds**
 - DASH (enables ground speeds >50km/h/31mph, wind dependent)
 - ECO (battery optimized flight speed) modes to the aircraft
- **Loiter Points**
 - Aircraft circles at a designated radius and speed for a user-defined amount of time. Increases aircraft efficiency and allows the aircraft to automatically scan areas of interest
- **Tracking Improvements**
 - Improved target estimation with automated aircraft 'alignment motion' procedure and support for LRF corrections; UDOT algorithm improvements
- **Auto-height Management:**
 - Tethered aircraft can fly longer by automatically adjusting height to reduce effects of high power/temperature conditions such as strong winds.
- **GPS Fail-over**
 - System can now fail over to up to 5 alternate GPS's including secondary NAV board GPS, and XL battery integrated GPS (x4, if available)



Loiter Points visualization



Tether Auto-height Management

Endurance - XL Batteries



Project Overview

Team is currently developing two backward compatible upgrades to extend endurance

- XL battery packs
 - **50-70% Increase in flight time**
- Other Enhancements
 - New loiter flight mode
 - New Dash Speed mode
 - 11.1.1 in June



Detailed product brief sent out Nov 2021

XL Battery Pack Details:

- Getting **44 minutes with 2kg payloads**
- Getting 59.9 minutes with FrontCam only (SW limited)

- **Max payload is limited to 2kg**
- No other impacts to operational envelope
- Battery charge time doubles
 - 6 hours on 4-bay charger
 - 3 hours on 8-bay charger



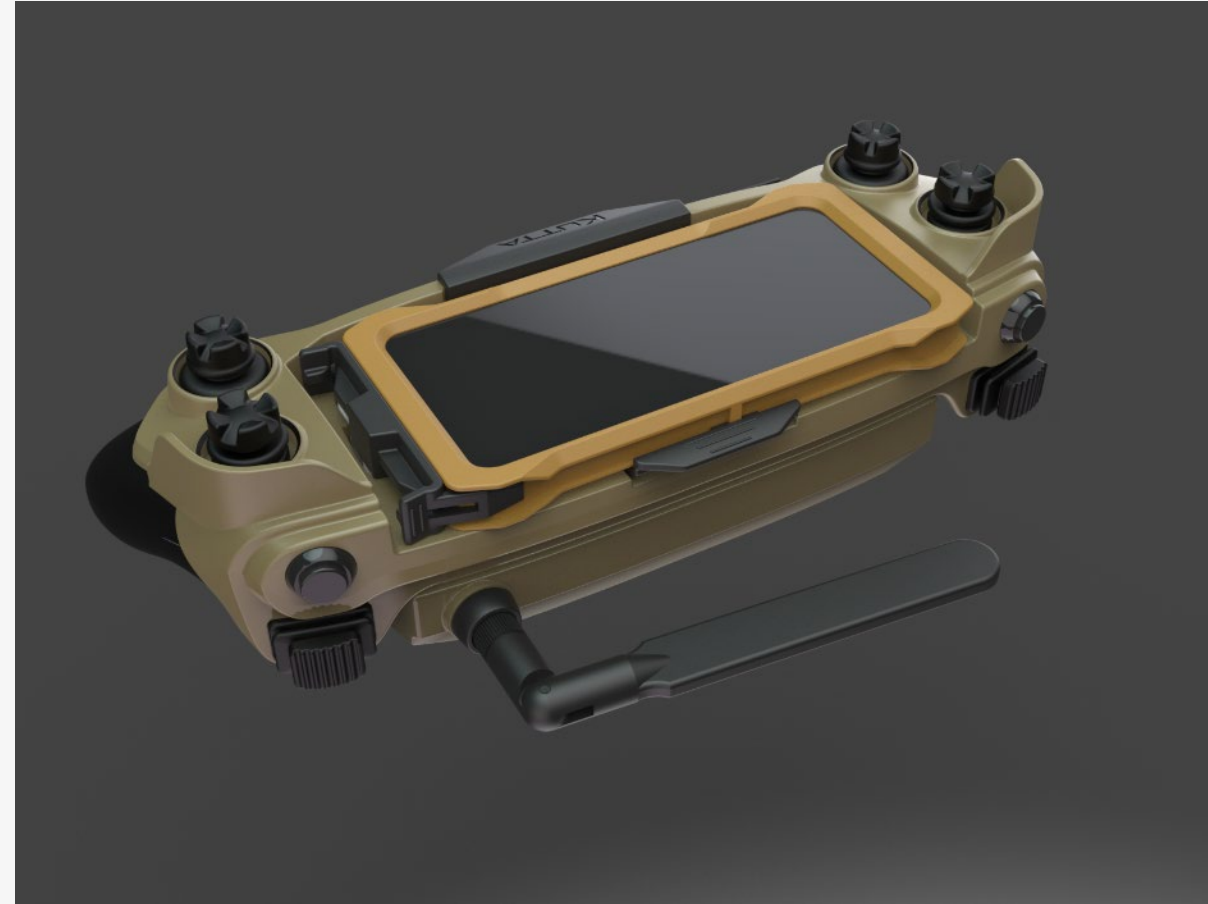
TELEDYNE
FLIR

Everywhere**you**look™

Part of the Teledyne Imaging Group

KUTTA K-TAC CONTROLLER

- LRIP June 2022
- Initial offerings 2.4Ghz, 1621MHz
- IP-68
- Controls:
 - 2x Joysticks
 - 2x D-pads with 5th axis push
 - 2x Shoulder Sliders
 - 2x Shoulder buttons
- Mighty Mouse external connector exposing Ethernet, USB and Power
 - H264 mpeg2 TS
 - STANAG 4609 out the might mouse connector
- Optional Stylus hangar
- Optional Molle Attachement



OTHER VIEWS

