AIRCRAFT SYSTEM DESCRIPTION

UAS Name:
CropCam

Manufacturer:
MicroPilot, Inc.
72067 Road 8E, Sturgeon Rd.
Stony Mountain, Manitoba, Canada R0C 3A0
(204) 344-5558
www.cropcam.com

Description:
The CropCam UAS is an electric-powered aircraft that uses a combination of GPS-driven onboard autopilot computer and conventional radio control receiver and servos to control flight. A ground control station (GCS) monitors the aircraft flight parameters and location on a computer display. The UAS is hand-launched and flown under radio control by a pilot and then may be flown autonomously by the onboard autopilot computer. The Pilot-in-Command (PIC) may select autopilot or manual (R/C) control at any time. To land, it may auto-land under autopilot control, or be landed by R/C control by the PIC.

Specifications:
CropCam UAS

I. AIRFRAME

Wing span:	101 in.
Wing area:	784 in²
Wing Loading:	12 oz/ft²
Airfoil used:	SD7012
Wing Construction:	Composite (foam/wood sheet/Mylar)
Length:	50 in.
Fuselage Construction:	Composite: (molded fiberglass)
Aircraft Planform:	Conventional (front-mounted tractor motor; wing, T-tail with rudder and elevator)
Weight:	5 lbs.

II. POWERPLANT

Motor:	DC electric motor (brushless, direct drive)
Manufacturer:	Model Motors, Inc.
Motor Model Number:	Axi 2820/10
Output Power:	1.0 bhp @ 12,000 RPM
Propeller:	10 in. diameter fixed pitch
Power:	4-parallel DC batteries, 11.1 Volt, 8400 mAh

III. AVIONICS

Flight Controls:	Aileron, Flaps, Elevator, Rudder, Throttle
Control System:	
Manual (Pilot-in-Control or PIC):	Radio control via Pulse-Coded Modulation of control surfaces; PIC manipulates dual-stick transmitter for proportional control of flight controls.
Manufacturer/Model:	Futaba FP-7CAP
Frequency:	72 MHz
Control System:	
Autopilot (Computer-in-Control or CIC):	Autonomous control of aircraft by solid-state microcomputer with rate gyros, accelerometers, and pressure sensors (pitot and static), powered by separate supply.
GPS:	Onboard GPS antenna/receiver
Communication:	2.4 GHz spread-spectrum RF modem, 9600 bps data rate
Ground Control Station:	RF modem (as above) operating with laptop computer to display UAV position, altitude, air speed, battery voltage, artificial horizon via map overlay and graphical presentation. GCS uploads pre-flight and in-flight waypoint list and flight path to aircraft; may activate return-to-origin mode, land now, or auto-land recovery modes.
Manufacturer/Model:	MicroPilot, Inc./MP2028-g

IV. PERFORMANCE

Airspeed:	
Cruise:	30 m.p.h. (26 knots)
Maximum:	45 m.p.h. (39 knots)
Altitude:	1,000 feet AGL (typical)
Rate of Climb:	300 feet/min
Range:	2 miles (for typical aerial photography mission profile)
Endurance:	40 minutes typical (after climb to 1,000 feet AGL and cruise speed)
Payload:	1 lb. (used by autopilot, GPS, RF modem, and digital camera)

V. FLIGHT DETAILS:

C.G. location:	75-80 mm aft of wing L.E. at root
C.G. range:	5 mm
Empty Weight C.G. range:	same as loaded weight

Control Surface Movements:

Elevator:	Up 8 degrees, Down 8 degrees
Ailerons:	Up 30 degrees, Down 15 degrees
Rudder:	Left 40 degrees, Right 40 degrees
Flaps:	Down 60 degrees

Motor Thrust Angle:	Down 4 degrees, Right 1.5 degrees
Wing Angle of Attack:	+2 degrees
Elevator Angle of Attack:	0 degrees

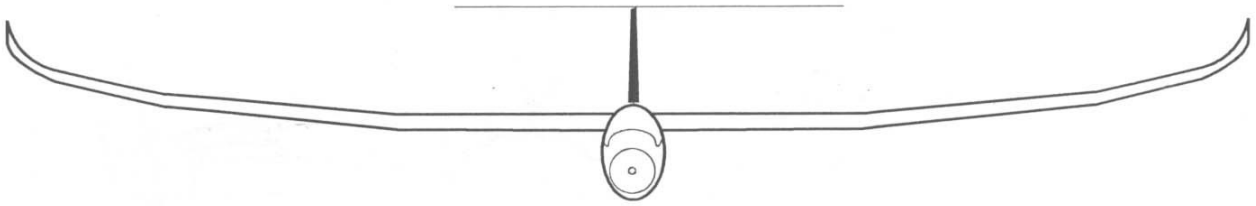
(Angles based on lengthwise datum line)

VI. OTHER DETAILS:

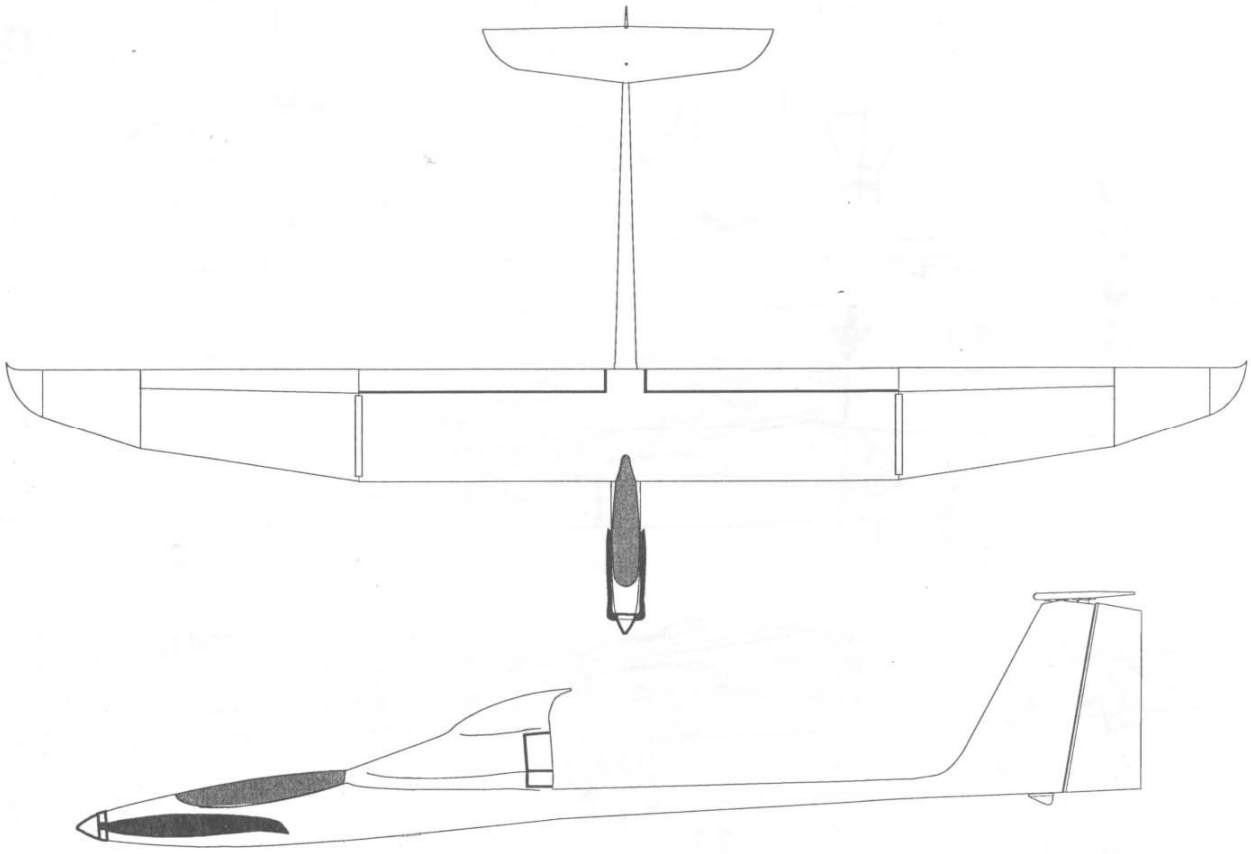
1. The CropCam airframe is a strengthened and reinforced off-the-shelf R/C sailplane manufactured by TopModel CZ in the Czech Republic.

2. Manual (PIC) or Autonomous flight (CIC) are selectable from the pilot's R/C transmitter via the Channel 5 toggle switch. The GCS may also select PIC or CIC flight.

VII. UAS 3-VIEW DRAWINGS:



CropCam UAS 3-views



VIII. UAS PHOTOGRAPHS:

CropCam being prepared for flight

Pre-launch check

Launching the CropCam