Curiosity Plus Mapper Mini UAV

OM UAV Systems

Curiosity is a FULLY AUTONOMOUS Mini Unmanned Multicopter aircraft designed for mapping. It is capable of carrying a 300 Gram payload. Most mapping cameras are under 300 Grams. The UAV is electrically powered with a very low dB level. The aircraft is fully autonomous right from Takeoff to Landing. The UAV is made of composite carbon fiber and aluminum alloy.

Physical Specifications:

Size	:	650mm x650mm
Height	:	250mm
Flying Weight	:	1995 Gms
Payload	:	300 Gms
Propulsion	:	180 Watt BLDC Motors @14.8v x 4
Propellers	:	15" carbon fiber x 4
Flying Battery	:	Lithium-Ion 14.8v, 9600mAh.

Capabilities:

- Fully Autonomous from Takeoff to Landing.
- The mapping grid is generated automatically.
- The camera's shutter will function only after reaching the 1st grid point.
- Can Loiter over the subject at any way point.
- Has Manual over ride at any stage.
- Failsafe built in. Will 'RTL' if communication link is lost. Will 'Land' if battery is low.

Radio Control Link:

Encoding	:	PPM
Freq	:	2400 Mhz
Channels	:	10
Range	:	5.0 Km (when airborne)
Display	:	Back-Lit Display
Battery	:	Li-Poly 11.1V, 2650 mAh(12Hrs continuous operation)

Data Communication Link

Type	:	MAV-Link
Dedicated	:	Encrypted Data Link
Rf Power	:	100mW
Frequency	:	2400 Mhz, secured (20Mhz Channel)
Power Consumption	:	100mA @12v

Full Flight Data Recording onboard and GCS

RTK GPS:

u-Blox M8P RTK GPS on base and rover. The base GPS has very high gain antenna to achieve 'Survey-In' in the least possible time. Strong communication link between base and drone ensures uninterrupted RTK corrections in real time.

Survey Camera:

The aircraft is fitted with a CANON camera with modified firmware enabled with KAP_UAV.lua script which optimizes the camera for mapping shots and takes still shots along the grid waypoints. The pictures are then geo-tagged using the GCS software and then processed on a mapping software like Pix4D to form a 3D map that can be used for engineering purpose. Any other suitable mapping camera can be installed if it is under 300 Gms.

Flying Characteristics:

Range	:	4.0 Km*
Endurance	:	50 Mins
Cruise Speed	:	30 Km/Hr
Max Wind Resistance	:	20 Km/Hr
Optimum Mapping Altitude	:	120 Meters AGL
Altitude Ceiling	:	3000 Meters
Can cover	:	1.0kmx1.0km of mapping area

in one flight when flown at 120m.

Autopilot:

- Based on ARM Cortex M4 32 bit Processor @ 168 Mhz, running at 252 MIPS, on NuttX Real Time Operating System
- Triple redundant vibration damped IMU
- uBlox RTK GPS on Rover and Base
- HMC5883L 3-Axis triple redundant Magnetometer
- MS5611 Dual redundant High Resolution Barometer
- Onboard Micro SD card for Flight Data Logging
- Inbuilt heating for sensors for flying in very low temperatures

Standard Pacakge:

- Curiosity Aircraft 1 Nos fitted with RTK GPS
- Android Tablet 7"
- Dual Omni Antenna for Communication Link.
- Microprocessor based multi-chemistry battery Charger.
- Radio Control Box
- Canon Powershot Camera with modified firmware.
- Mini Tool Kit
- ABS Carry Case

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