Create low-altitude logistics network and lead the new era of UAV logistics

SF UAV is committed to the excavation and specialization of logistics UAV application scenarios, and continues building a standard management system for large-scale commercial R&D, testing, production and commercial operation of UAVs in various complex scenarios.

Since obtaining the first operating license in China for commercial drone deliveries on March 27, 2018, SF UAV have achieved normalcy in rural and urban areas of Ganzhou, the plateau area of northern Yunnan and western Sichuan, urban agglomerations in the Greater Bay Area and the Yangtze River Delta, and implemented solutions in some cities and regions. The scope of the operation covers a variety of complex scenarios such as plateaus, hills, cities, islands, and lakes.

SF UAV continues offering high-quality logistics services to our clients, and quickly responding to the differentiated requirements to provide solutions such as security, emergency, inspection, fire fighting, surveying and mapping, and special logistics.
SF Three-Stage Air Transport Network

**Cargo Freighters**, National Mainlines
SF Airlines, SF own cargo airlines in China, achieves nationwide coverage

**Large UAVs**, Regional Mainlines
Fonair Aviation, SF own ton-payload Cargo UAV in China, achieves cross-regional delivery

**Small Drones**, End Delivery
SF Technology, first drone operating license in China, achieves end delivery
Manta Ray 40

Specifications

Maximum Total Takeoff Weight: 38kg
Maximum Payload: 5kg
Endurance/Range: 70min/100km
Cruise Speed: 26m/s
Dimension: 3.55m*2.13m*0.8m
(dependent on the actual flight route)
Manta Ray 40 is a drone with a multicopter and fixed-wing hybrid configuration. It incorporates both the vertical take-off and landing capabilities of a multicopter and the sophisticated aerodynamics of an airplane, thus it can be suitable for more business scenarios. Its unique blended wing body design achieves a longer cruise range. Moreover, redundancies in both rotors and control surfaces make this system more reliable. Manta Ray 40 is designed for middle-to-long distance end delivery mission in a variety of scenarios including remote mountainous areas, plateaus, hills, islands and lakes.
**Specifications**
- Maximum Total Takeoff Weight: 12kg
- Maximum Payload: 2kg
- Endurance/Range: 100min/120km
- Cruise Speed: 20m/s
- Dimension: 2.6m*1.8m*0.6m
  
(Manta Ray model 10 is an industrial-grade hybrid-wing surveying and mapping UAV that continues the high reliability and excellent flight performance of the Manta Ray series. MR 10 adopts a modular design, which can be adapted to multiple types of loads such as orthographic digital cameras or multi-lens tilt cameras, and supports third-party software and hardware expansion. It is also equipped with a flight control system independently developed by SF Express, which can realize fully autonomous route flight and automatic high-precision map collection. The "tri-proof design" (to prevent moisture, salt spray, and mold) enables MR10 to operate safely and stably in harsh environments and complex scenarios.)
ARKUAV Model 40 is a drone with octocopter configuration. It has redundant navigation system, flight control system, propulsion system and battery system, and is equipped with emergency landing system. Moreover, the design of propeller is optimized in cruise flight condition to achieve a longer range. Through the airborne visual positioning system, Model 40 can also complete an accurate landing. Model 40 is designed for short-to-middle range end delivery mission. Its payload volume is more than 60L, which makes it suitable for many cargo delivery scenarios.
ARKUAV Model 20 is a drone with quadcopter configuration and modular design. The redundant design of multiple key components and sensors such as IMU and GPS improves the reliability and safety comprehensively. The portable folding fuselage design enables quick disassembly and assembly. It also supports third-party hardware expansion, and the dual-load hanging point design can carry 3 kg payload, providing a reliable high-performance flight platform for security, inspection, fire fighting, surveying and mapping and industrial applications.
ARKUAV Model 60 is a drone with 16-rotor configuration and modular design. It has redundant navigation system, flight control system, propulsion system and battery system, and is equipped with propeller protection and controlled parachute landing. These ensure the reliability and safety of ARKUAV Model 60 are at the top level in the industry. With a self-developed radio base station, it can realize intelligent autonomous flight beyond visual range. The more powerful power system enables it to have a load capacity of 20 kilograms, and the larger mission payload enables ARKUAV Model 60 to meet the mission requirements in the fields of logistics, emergency rescue, fire fighting and tall buildings cleaning.
**Automatic UAV nest** integrates three functions: airway network node, ground equipment connection hub, and express distribution center. It is not only an automated smart device that can be deployed differently, but also a maneuverable flight take-off and landing platform that connects the low-altitude logistics network with drones, it provides a fast terminal hub for express distribution, and realizes the interconnection, intercommunication, coordination, control and automatic scheduling of aerial equipment, ground equipment and express delivery. In addition, it can also configure the ground intelligent power supply system according to user requirements to provide fast power supplies for aerial equipment.
The air-land integration of U-Network relies on the coordinated operation of ground platforms and aerial equipment. The unmanned ground base station supports multi-point to multi-point signal access and includes data roaming functions. The lattice deployment of base station form a ground communication network platform. The aerial UAV relies on the airborne radio and the ground communication networking platform to achieve air-ground communication interconnection and collaboration to realize real-time data interaction and status monitoring of aerial equipment, ground equipment and operation control system, which provides basic platform support for normalized UAV cluster management and control.
The operation control management system realizes comprehensive information and automation of UAV operations through the comprehensive management of operation scenarios, UAVs, equipments, personnel, and express. The system functions include UAV status real-time monitoring, automatic flight management, flight mission scheduling, geo-fence control, regional station control authority management, role authority distribution, components lifecycle management and operation data reports and statistics. In addition, through the self-developed smart cloud and big data support, the system can achieve functions such as flight path deviation and remaining flight range prediction through machine learning. It is a comprehensive management platform for UAVs to achieve automation and intelligent flight tasks.
Normalized operation in the Greater Bay Area

SF UAV began to carry out flight tests in GBA in June 2020, and it was approved by CAAC to launch a logistics UAV pilot project in GBA in December of the same year. Since then, it kicked off its normal operation. SF UAV is committed to construct a low-altitude drone logistics network with Shenzhen as the center and covering major cities in the Guangdong-Hong Kong-Macao Greater Bay Area. It connects Guangzhou, Zhongshan and Zhuhai in the west, Dongguan and Huizhou in the north, and Hong Kong and Macau in the south to create the Greater Bay Area to create a two-hour logistics circle in the GBA. SF UAV has opened dozens of operating routes within the approved airspace, which are all planned based on mountainous areas, seas, rivers and other non-populated areas. Since the launch of the Shenzhen-Zhuhai cross-sea route in September 2020, it has accumulated thousands of flights. In March 2021, SF UAV launched the intra-city route from Wuhe transit depot to Lilang in Shenzhen, with an average daily flight number of over 100.

Normalized operation in Ganzhou Urban Area

SF UAV was approved by CAAC in December of 2020 to carry out pilot work for unmanned aviation integrated pilot area in Ganzhou city, and plans to preliminarily complete the coverage of low-altitude logistics network in Ganzhou by the end of 2021. Giving full play to the features of “small, single, long and independent” and high maneuverability, UAVs will greatly improve the timeliness of intra-city and inter-city logistics transportation in Ganzhou City, expand the coverage of intra-city/inter-city express logistics to the entire Ganzhou city and even the surrounding areas, and extend efficient logistics services to communities and the masses. As of April 1st, 2021, the approved airspace area of SF UAV in Ganzhou has exceeded 14,000 square kilometers.
03
Anti-epidemic support in Wuhan (Jinyintan)

Since the start of the battle against the novel coronavirus pneumonia epidemic, epidemic prevention related industries had faced great challenge. Under the leadership of General Office of the State Council and Central Military Commission and responding to the call of CAAC, SF UAV actively applied to support the epidemic area and constructed non-contact emergency air transportation corridors. SF UAV carried out the construction of the UAV logistics network for epidemic prevention in key areas, and provided complete solutions of small batch, multiple batch and point to point logistics transportation for pharmaceuticals daily necessities. From the response to the official launch of mission, SF completed deployment within 24 hours, and successfully extended to other cities such as Shiyan, Wenzhou, and Harbin. As of early April 2020, SF UAVs had flown more than 730 hours, with a cumulative flight mileage of about 22,000 kilometers, and a cumulative material transportation of more than 20 tons, which relieved the pressure of material transportation in the epidemic areas.

Plateau Operation cases

01
Normalized operation of UAVs in western Sichuan and northern Yunnan

July 22th, 2019, SF UAV was approved by CAAC to extend the pilot range of UAV logistics application to parts of western Sichuan and northern Yunnan to help the poverty alleviation work. The southwest pilot area is typical plateau and mountainous topography, which is complex and variable, often accompanied by strong wind (20m/s), heavy rain (8.5mm/h), heavy snow, and heavy fog. Matsutake, Cordyceps, Chuanbei and other industries in the Western Sichuan Plateau are still in a relatively primitive state, they are picked relying on experience and are difficult to transport, which lead a high rate of damage.
SF UAV and SF Express of Sichuan Region took Matsutake as an entry point and landed a UAV-based full supply chain solution, which increased the conformity rate of Matsutake by approximately 30% and helped Tibetans to increase their picking efficiency by approximately 56%. As of April 1, 2021, UAVs have accumulated more than 40,000 flights and of 460,000 kilometers flight mileage in western Sichuan and northern Yunnan regions.
01

Characteristic
Economy-Waxberry
Express in Wenzhou

SF UAV and SF Express of Wenzhou launched the Waxberry Characteristic Economy Project in Wencheng County, Wenzhou City in June 2020. Wencheng County is typical hilly and mountainous topography, and waxberries have wide spacing of plants, tall plants, and scattered fruits, which seriously affects the picking efficiency and quality of waxberry. The introduction of UAV marked the regional characteristic economic model transforming to automation, intelligence, and systemization, and also prompted the waxberry express delivery to achieve real-time picking, fast transportation, and full freshness preservation. The time from waxberry picking to the bottom of the mountain was shortened from 6h to 8min at the fastest, which effectively improved the quality of waxberry. As of June 30, 2020, the average daily transportation volume during the operation period have exceeded 500kg.

02

Normalized operation
in Ganzhou Urban Area

SF UAV was approved by CAAC in 2017 to carry out the "UAV Logistics Application Pilot Site" in Nankang District, Ganzhou City, Jiangxi Province. This pilot site is typical hilly and mountainous environment, with a maximum wind speed of 18 m/s and an average annual rainfall of 1494 mm. Ganzhou’s rural areas have many mountains and long roads, and the villages are scattered. Express delivery is slower through step-by-step delivery, and only supports receiving at villagers’ agent points due to high operation costs. According to local conditions, SF UAV planned an air transportation network to shorten the delivery mileage by more than 50%. Relying on the maneuverability of UAV, it adopts a high-frequency network mode to achieve extremely fast delivery between towns and villages. As of April 2021, SF UAV has accumulated more than 110,000 flights, 930,000 kilometers, more than 330,000 pieces of various types of goods.
01 Normalized operation between Zhoushan Islands

SF-UAV, Zhoushan City Government, and SF Express jointly launched UAV logistics project in Zhoushan Islands in June 2020. The Zhoushan area is typical island topography with scattered population, slow timeliness, and high cost. The introduction of UAVs has created a low-altitude logistics transportation network covering the Zhoushan Islands. UAVs have broken the terrain restrictions and realized the "three fasts" of the islands logistics: fast landing, fast timeliness, and fast response. While providing the islanders with a time-efficient experience, it also opened up an "fast corridor" in the sky for the islanders' characteristic economic products (seafood), helping the islanders to double their economic benefits. Since the start of operations, the daily average flight frequency has steadily increased to 50 times, and the flight's one-way transport capacity is about 80kg/hour. After more than half a year of long-term operation, SF-UAV has fully verified the reliability of inter-island routes and the replicability of its operating model.

02 Normalized operation in Shanghai Jinshan

SF-UAV, the Shanghai Civil Aviation Administration of China and relevant administrative departments, SF and Shanghai New Jinshan Industrial Investment Development Co., Ltd. implemented the work of the Jinshan Civil Unmanned Aviation Pilot Area. Relying on the advantages of SF-UAV’s technology and resources, they carried out UAV logistics operation tests in islands scenarios, built and gradually formed a low-altitude intelligent UAV logistics transportation network covering the Yangtze River Delta.
Emergency Rescue Cases

01
Pharmaceuticals Delivery In Ganzhou

SF UAV, SF Pharmaceuticals, local government and pharmaceutical companies carried out a UAV logistics test project of medical injection samples (temperature control) in Nankang District, Ganzhou City in April 2018. SF UAV cooperated closely with the Health and Family Planning Commission and the Center for Disease Control and Prevention of Nankang District to establish an emergency response mechanism and provided emergency delivery of medical supplies (vaccine, serum, medicine, etc.) and emergency supplies to target groups based on the low-altitude UAV logistics network. It solved the problem that the timeliness of medical supplies and emergency supplies is not fast enough and the conventional delivery is unreachable under emergency scenarios (especially in remote areas or areas where traditional vehicles cannot enter).

02
Forest Fire Prevention

A forest fire broke out on March 30, 2020 in Xichang City, Liangshan Prefecture, Sichuan Province. The fire spread rapidly and the disaster situation was severe. In response to the needs of the Department of Emergency Management of Sichuan Province, SF UAV participated in emergency rescue, gave full play to the maneuverability and reliability of UAV, and completed the tasks such as fire situation investigation, emergency material delivery, and fixed-point delivery of fire extinguishing bombs (support for throwing).