



## Aerospace sector

### 2023 Taipei Aerospace & Defense Technology Exhibition – National defense the main theme, with focus on drones

#### Key message

The 2023 Taipei Aerospace & Defense Technology Exhibition (TADTE) was held September 14-16. The main theme was national defense, with a focus on drones. We predict Taiwan's national defense policy of self-reliance will continue to benefit local military aircraft-related companies. Drone makers will not be profitable until economies of scale emerge.

#### Event

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#### Impact

**AIDC (2634 TT, NT\$57.6, OP) has fully demonstrated an ability to manufacture aircraft.** The Ministry of National Defense and the National Chung-Shan Institute of Science & Technology initiated in 2017 a plan for the R&D and production of advanced training jets, allying with AIDC to upgrade the national defense business of Taiwan's aerospace industry. At the exhibition, AIDC showcased multiple advanced training jet system components and engine castings, all jointly researched and made by AIDC and other domestic companies. System components include a new mission CPU, of which software was designed by AIDC, a data link radio and a indigenous data transfer unit (Figure 1), facilitating communication among aircraft as well as between aircraft and ground offices. Ground surveillance stations can receive real-time altitude, speed and other stats of the aircraft. Engine castings include centrifugal impeller shroud ring (Figure 2) and high pressure turbine retaining ring (Figure 3). AIDC is the only firm in Taiwan that can cast nickel-based materials required to make such castings. The related technologies can also be used in the production of commercial aircraft. AIDC will strive for certification. Maintenance services for military aircraft were also showcased. The maintenance service center for F-16s has obtained roughly 200 technology transfers/ certifications from the original equipment manufacturers and research/ maintenance qualifications from the Air Force, allowing maintenance service localization. AIDC has fully demonstrated its capability in military aircraft production and maintenance locally, making it a key company in Taiwan's military aircraft production field.

**Sector forum unveiled rising drone trend.** In response to drone intrusion from China, and given Ukraine has successfully fended off Russia's attack using drones amid asymmetric warfare, demand for drones from Taiwan's Ministry of National Defense has been rising. The head of the Aeronautical Systems Research Division of the National Chung-Shan Institute of Science and Technology pointed out during a drone industry forum, eight trends for drones in Taiwan: (1) transparent warfare information – Drones require internet connections to transmit data in real time, replay data, and analyze data, among other functions; (2) militarization – The US longshot plan is a case in point, as it has developed multiple air-to-air weapons, such as unmanned combat aircraft, to expand the arena of war and reduce risk for manned combat aircraft; (3) joint operations – Wingman aircraft can conduct surveillance, attack, and provide electronic support for drones. Refueling of manned aircraft can also be done by drones (i.e. US MQ-25); (4) smart systems – Drones use AI to focus on in-house core systems and learn by training. Operators only need to give orders and do not need to operate drones; (5) drone smart fighting array of reconfigured modules (drone swarms) – This is to develop drone swarm combat systems for unmanned carrier platforms to outnumber manned carrier platforms, saturating enemy air defense systems and creating chaos; (6) loss tolerance – Drones flying into other nations' airspace are often shot down. Hence, the ability to mass produce drones is imperative; (7) counterattack against drones – Disrupting communication and navigation via software, while using drones to fight other drones. The key is distribution of radar early warning systems and air defense capabilities; and (8) compound drones – Combine the advantages of helicopters and fixed-wing aircraft, eliminating the effect of limited space to take off or land. This model will become the mainstream. Despite scattered resources, insufficient economies of scale, and that cooperation within the sector is inadequate, the Taiwanese government is determined to develop the drone sector by building a drone industrial cluster, including a drone AI R&D center in Chiayi, implementing cross-government and cross-department integration, and by providing ample resources. We believe the move will propel the sector and accelerate the development of unmanned systems.

#### Stocks for Action

We predict Taiwan's national defense policy of self-reliance will continue to benefit local military aircraft-related companies. Drone makers will not be profitable until economies of scale emerge.

#### Risks

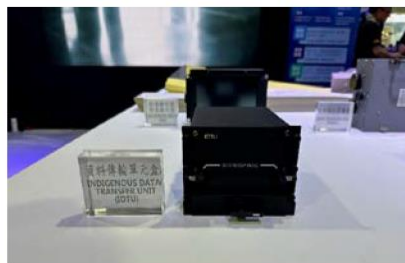
Geopolitical tension.

**Drone products were in the exhibition spotlight.** Local leading drone makers, including Jingwei Aerospace Technology (TW; unlisted) and Thunder Tiger (8033 TT, 62.2, NR) showcased civil and military drones at the exhibition. The Jackal-T, a civil-spec military drone jointly made by Jingwei and Fly Bvlos (TR) has eight propellers (Figure 6), is capable of vertical take-off and landing, can carry 15-25kg, and can be equipped with rocket launchers and small missiles. The CK50-T (Figure 7), a drone jointly made by Jingwei and Cavok-UAS (FR), can take off and land vertically, has a maximum flying time of ten hours, and can carry 15kg. This drone is used by the French Army for surveillance, aerial photography via digital camera, and logistics. Thunder Tiger exhibited the T-400, a large unmanned helicopter (Figure xxx), with technological hurdles that exceed those of fixed-wing drones. Thunder Tiger is the only Taiwanese company making large unmanned helicopters. The T-400 has a payload of 50kg, so it can carry high-explosive anti-tank missiles and side-scanning radar. The TM-450 (Figure 5), fully developed and produced by Thunder Tiger, has passed the Ministry of National Defense's civil-spec military drone test and can carry lens modules with 20-30x optical zoom and capable of using AI to calculate latitude and longitude. Currently, Taiwanese drone makers are spending heavily for R&D and design, but will not be profitable until economies of scale emerge.

Figure 1: Advanced training jet system components



Data Link Radio



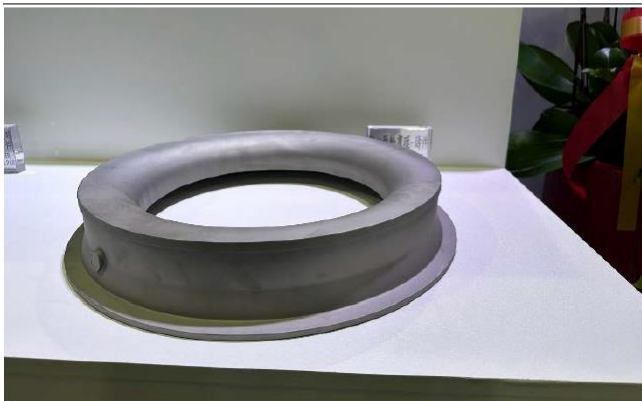
Indigenous Data Transfer Unit



New Mission CPU

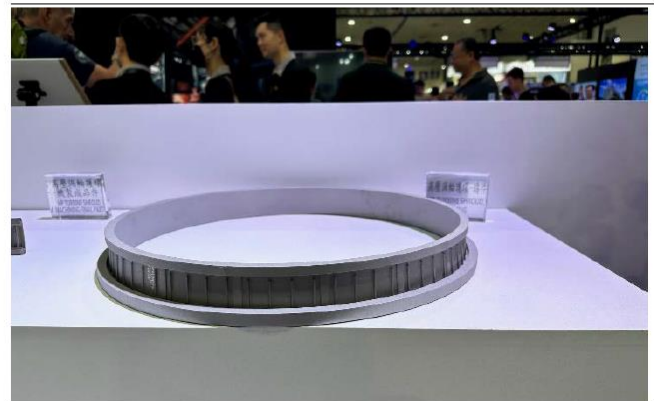
Source: Company data

Figure 2: Advanced training jet centrifugal impeller cover ring



Source: Company data

Figure 3: Advanced training jet high pressure turbine retaining ring



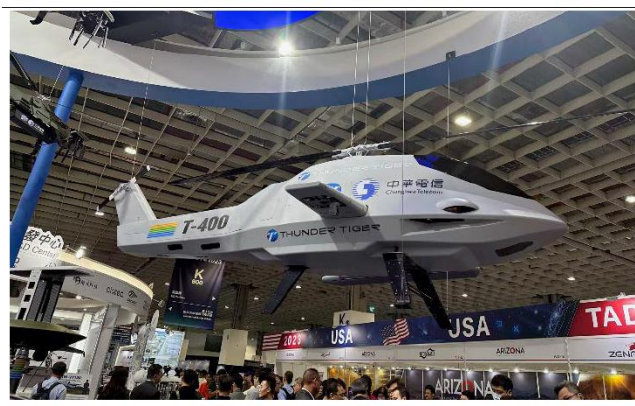
Source: Company data

Figure 4: Advanced training jet model



Source: Company data

Figure 5: Thunder Tiger T-400 large unmanned helicopter



Source: Company data

Figure 6: Jingwei's Jackal-T drone



Source: Jingwei Aerospace

Figure 7: Jingwei's CK50-T drone



Source: Jingwei Aerospace

Figure 8: Civil-spec military drone procurement volume & budget

Item	Contractor	Procurement period and volume	Budget (NT\$m)
Mini type	Thunder Tiger/ Jingwei/ Coretronic	320 units in 2024-25 by the Army 315 units in 2024 by the Air Force	718
Eye-catching type	Mitac/ Strong Engineering	72 units in 2024-25	566
Surveillance type	Mitac/ Coretronic/ Qisda	960 units in 2024-25	618
Land surveillance type	Evergreen Aviation/ Jingwei	96 units in 2024-28	2,414
Shipborne surveillance type	FairTech/ Taiwan UAV	16 units in 2024-25	425
<b>Total</b>			<b>4,741</b>

Source: Ministry of National Defense; KGI Research

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