TRON FUTURE 創 未 來 科 技

2024 Q4







USD \$ 32K+ Back Order









No Chinese capital No foreign corporate capital







Mission

We empower our customers to solve critical problems based on data through fundamental sensor and communication breakthroughs.

Application

- Space SatCom / Remote Sensing
- Defense / Airport / Mine / Oil / Wind Farm Surveillance

Core Tech

Design, Assembly & Testing of Advanced AESA

Core chip design: Radar & SatCom SoC

System Design and Verification: Mechanical & Electrical

Advanced Algorithm Design and Implementation

Expertise

- Miniature phased array systems with proprietary RF/ASIC ICs
- Advanced SatCom and Radar signal processing algorithms
- Cloud-based AI data processing
- Drone swarm & Satellite constellation integration



Turnkey Solution Provider



First Taiwanese Space AESA Production Line







Core Tech Team



CEO Dr. Yu-Jiu Wang Ph.D. in EE, Caltech | A.Prof., NCTU



CTO Dr. Borching Su Ph.D. in EE, Caltech | A.Prof., NTU



Senior VP of Eng. Dr. Ta-Shun Chu Ph.D. in EE, USC | A.Prof., NTHU



Chief Robotics Scientist Dr. Teng-Hu Cheng Ph.D. in ME, UFL | Prof., NYCU



Chief Scientist Dr. Kuan-Neng Chen Ph.D. in EE, MIT | Prof., NYCU



Chief Architect Dr. Pei-Yun Tsai Ph.D. in EE, NTU | Prof., NTU



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Director of Digital Design
Dr. Kun-Chien Hung
Ph.D. in EE, NCTU
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Principal Engineer Dr. Chang Heng Wang Ph.D. in EE, UCSD



Board Member

Yu-Jiu Wang, Ph.D.

- CEO of Tron Future
- Associate professor in NCTU

Ta-Shun Chu, Ph.D.

- VP of Tron Future
- Associate professor in NTHU

Bingyi Lin, M.S.

• Chairman/CEO of Arizon

Huang Lee, Ph.D.

• Taiwania Capital, Managing Partner of Tech Fund



Steven Chang, Ph.D.

• CID Capital, Managing Partner



Advisory Board Borching Su, Ph.D. Stanley Chen, Ph.D. **Charity Lin** CTO of Tron Future • Director of Silicon Design Engineering of AMD • VP of Tron Future Associate professor in NTU • Ex-Director of SerDes Design Engineering of Xilinx • Ex-VP of JP. Morgan Scott Chen, Ph.D. Yu-Hsin Wang, Ph.D. **Carol Chang** • Director of Engineering of Meta CMO of Leltek CFO of Tron Future • Ex-CEO of Grindr Ex-Senior Researcher of ITRI

мін CONSORTIUM

Mobility In Harmony

Business Partner

Note: Due to confidentiality, only some of the partners are disclosed

國家太空中心 **Taiwan Space Agency**



經 濟 部 產業發展署 Industrial Development Administration, MOEA







Institutional Investors













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T.Meta[™] : Software of The Anti-Drone System

T.MetaTM monitors every movement of small RCS (> 0.01m²) flying objects. Optimal tracking and scheduling algorithms enhance surveillance quality, and the intuitive and smooth UI experience will help you easily perform monitoring tasks with less training.





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Total Solution for Anti-Drone



T.Sensor[®]

Active Electronically Scanned Array (AESA) RF detector

- 3D Location Method
- Azimuth Coverage
- Elevation Detection

AOA + Triangulation ±60° ±60°

400 MHz ~ 6 GHz

±60°





T.Jammer[®]

Active Electronically Scanned Array (AESA) Jammer

- Operating Frequency
- Azimuth Beamforming Coverage

±25°

• Elevation Beamforming Coverage



T.Interceptor[®]

Dual Seekers: AESA radar seeker + optical camera seeker Z

• Velocity > 60 m/s Interceptor turns back after the attack Reusable







Anti-Drone System Communication



AI drone defense X LEO SatCom

Drone defense tower provides regional private 5G coverage through a 5G small cell, with secure LEO satellite backhaul through T.SpaceRouter™ to provide necessary communication resilience in wartime. Legacy Mil-Com equipment can also be supported for custom compatibility.

T.SpaceHub[®] : SatCom Overall



T.SpaceHub[®] Mini

(Prototype) 2019/05 Contracted 2020/09 Deliver



T.SpaceHub[®] Micro (FM)

2021/11 Contracted 2023/11 Launch



T.SpaceHub[®] Mini (EM)

2021/06 Contracted 2022/09 Deliver



T.SpaceHub[®] B5G

(Prototype) 2023/07 Contracted 2024 Q4 Deliver



T.SpaceHub[®] Mini (EQM) 2021/06 Contracted 2024/11 Deliver



T.SpaceHub[®] Micro 2.0 (FM) 2023/09 Contracted 2025 Q2 Launch

T.SpaceHub[®] : SatCom Technology

| Project | Frequency | Array Size | Data Rate | Polarization | Features |
|--------------------------------------|---------------------------------------|--|-----------|--------------|--|
| T.SpaceHub® Mini | X-band (Downlink) | 144 | 800Mbps | RHCP | CCSDS Compliant Self-Developed Power Amplifier Redundancy Implementations |
| T.SpaceHub [®] Micro 1.0 | Ka-band (Uplink) K-band (Downlink) | 256 (Uplink) 64 (Downlink) | 40Mbps | RHCP | Experimental payload for a 6U satellite |
| T.SpaceHub [®] B5G | Ka-band (Uplink) K-band (Downlink) | Scalable Array 1024 (Uplink) 1024 (Downlink) | 2160Mbps | RHCP, LHCP | DVB-S2/DVB-S2X Compliant Self-Developed Beamformer IC Redundancy Implementations Multi-Beam Support |
| T.SpaceHub [®] Micro 2.0 | Ka-band (Uplink) K-band (Downlink) | 1024 (Uplink) 512 (Downlink) | 2160Mbps | RHCP, LHCP | DVB-S2/DVB-S2X Compliant Communication Payload for 8U satellite Multi-User Support |

SatCom Automotive User Terminal : T.SpaceRouter[®]

| | 1024 Elements each TX/RX | 2048 Elements each TX/RX | | |
|---------------------------|---------------------------------------|---------------------------------|--|--|
| | | | | |
| MECHANICAL & POWER | | | | |
| Weight | 5 kg | 10 kg | | |
| Dimension (LxWxH) | 60cm x 30cm x 3.5cm | 60cm x 60cm x 3.5cm | | |
| Power Consumption | 250 W | 500 W | | |
| TRACKING | | | | |
| Beam Switching Time | < 10 ms | | | |
| Scanning angles | Azimuth 360°; Elevation > +30° | | | |
| Beam pointing accuracy | 0.3° | | | |
| Modulation (Configurable) | 16APSK / QPSK / BPSK | | | |
| ANTENNA | | | | |
| Туре | Electronically Scanned Array | | | |
| Ka Band | RX 17.8 ~ 20.2 GHz ; TX 27.5 ~ 30 GHz | | | |
| Polarization | RHCP / LHCP | | | |
| Instantaneous bandwidth | 250 MHz | | | |
| EIRP | > 36 dBW | > 40 dBW | | |
| Antenna gain | > 30 dBi | | | |



Satellite Synthetic Aperture Radar : T.SAR[™]



T.SAR[™] by Tron Future Tech

Achieving German SAR spec. at 20% total weight

HRWS SAR Satellite Launch in 2027 by TASA (FS-9)



SAR from German



| Orbit | SSO (561km) | | |
|---|---|--|--|
| Design life | 3 years | | |
| Frequency | X-band (9.65 GHz) | | |
| Weight | 240 kg (3 Panels) | | |
| Dimension (L x W x H) | 3.75 m x 1m x 0.1m | | |
| Power Consumption | 2800 W | | |
| Peak Radiated Power | 1875 W | | |
| Power Input (DC) | 28 V | | |
| Operation modes Resolution | Stripmap : 3m Spotlight : 1m ScanSAR : 10-30m | | |
| Image acquisition time | 6 mins | | |
| Command link between Payload and Bus | U-ART | | |
| Data link between Payload and Bus | 16Gbps SerDes | | |
| TRL | 5 | | |

LEO Communication Goal

Channel model validation

Overall communication stack validation at tens of Mbps

Satellite search and tracking performance

Full Stack loopback testing (L1, L2, L3)



T.SpaceRouter[®]

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Relevant Track Records

AI Swarm Defense Systems

(Q3 2023)



National Space Program High Speed SatCom Payload

FormoSat 8-10 (2023-)



National Space Program Satellite Synthetic Aperture Radar

FormoSat 9 (2026-)



Automotive SatCom UT

Partially funded by IDA, MOEA. Target Customer: MIH/Toyota/Sony

Portable Drone Detection Radar



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