

TYTO: EXPERIMENTAL MULTISPECTRAL LONG-RANGE SURVEILLANCE SYSTEM



TYTO is an advanced experimental multispectral long-range surveillance system designed for border security, anti-poaching operations and critical-area monitoring. By combining Near-Infrared (NIR), visual and Long-Wave Infrared (LWIR) imaging technologies with novel sensor integration, TYTO delivers real-time observation, accurate target identification and persistent surveillance across vast operational environments. When integrated with a radar and pan-tilt unit (PTU), the system provides enhanced target detection, tracking and designation capabilities.

Applications

- Border surveillance;
- Anti-poaching operations;
- Wildlife reserve protection;
- Coastal and maritime monitoring; and
- Critical infrastructure security.

Key features

- Long-range, 24/7 multispectral imaging capability:
 - **NIR:** Primary channel for long-range detection and surveillance channel;
 - **LWIR:** Thermal imaging for day, night and low-visibility operations; and
 - **Visual:** Wide-field-of-view camera for rapid target acquisition, situational awareness and target designation.

- Low-noise images under low-light conditions through the implementation of a cooled NIR sensor;
- Long-range imaging capability for end users;
- Remote monitoring and operation via a web browser;
- Simple deployment requiring only a single operator for setup and operation; and
- Can be paired with an infrared illuminator to enhance imaging in low-light conditions during covert night-time operations.

Performance characteristics

- NIR channel (primary): 1.91° x 1.91° field of view, digital zoom, 4.2 MP;
- Visual channel (day-view Finder): Horizontal field of view of 2.3° to 63.7°, 30x optical zoom, 2.13 MP;
- Thermal channel (night-time view finder): 4.15° to 12.28° field of view, 0.3 MP;
- Human target DRI (Johnson Criteria):
 - **Visual D/R/I:** 8.9 km/2.3 km/1.4 km;
 - **NIR D/R/I:** 12.3 km/3.2 km/1.9 km; and
 - **Thermal D/R/I:** 2.5 km/0.7km/0.4 km.

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Integration and customisation

- **Radar target designation:** TYTO integrates with surveillance radars to automatically receive target designations, enabling the rapid detection, investigation and identification of objects of interest;
- **Precision PTU integration:** Mounted on a precision PTU, TYTO rapidly slews to designated targets and provides accurate tracking, positioning and continuous surveillance; and
- **Remote tracking:** By combining radar designation, PTU control and multispectral imaging, TYTO enables the remote detection, identification, designation and tracking of targets from a central command station.

Physical characteristics

- Lightweight (approximately 20 kg), featuring a novel housing design manufactures from fibre-reinforced three-dimensional-printed components;
- Environmental conditions: Temperature: 0 - 65 °C, Humidity: < 65% (non-condensing);
- Power consumption (including PTU): 240 VAC, 530 W maximum, 300 W typical;
- Supported PTUs: Instro Precision Mantis and FLIR PTU-D300E; and
- Gigabit Ethernet uplink/downlink.



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