

RIVO MULTITRADE OPTICAL SYSTEMS

Fiber optic cable AK47



Overview

The downed Russian drone — the spool of fiber optic cable is visible at right but was not at first identified.

Key Takeaways

Kalashnikov's FPV drones use fiber optic cables to communicate with operators, bypassing radio jamming and enabling precise control over long distances. Overview

The term "Fiber optic cable AK-47" refers not to the firearm itself, but to Kalashnikov's unmanned aerial vehicles (UAVs), specifically FPV loitering munitions that employ fiber optic cables for guidance and control. These drones, such as the Russian ZALA 'Product 55,' carry a spool of fiber optic cable that unspools as the drone flies, creating a direct physical link between the operator and the drone. This eliminates reliance on radio signals, making the drone immune to electronic warfare and jamming tactics while maintaining ultra-low latency video feeds for precise targeting .

Technical Details

- **Cable Length:** Russian models have been observed with fiber optic spools of over 10 km (6.7 miles), while Ukrainian FPV drones have achieved ranges up to 41 km .
- **Control and Video:** The fiber optic line transmits high-resolution FPV video and control signals, allowing operators to steer drones into complex environments, including urban areas or behind cover, with minimal delay .

- **Construction:** These drones are lightweight, inexpensive (around \$300-\$400), and often built from 3D-printed components and commercially available electronics .

Advantages

- **Jamming Immunity:** Unlike traditional radio-controlled drones, fiber optic drones cannot be jammed and are difficult to detect due to the absence of radio or thermal signatures .
- **High Bandwidth:** Fiber optics provide virtually zero latency, improving precision for targeting and reconnaissance .
- **Cost Efficiency:** Small drones can carry explosive payloads to strike high-value targets at a fraction of the cost of conventional munitions .

Limitations

- **Range and Maneuverability:** The fiber optic cable limits maximum range and can reduce maneuverability compared to wireless drones .
- **Environmental Vulnerability:** Lightweight construction makes them susceptible to turbulent weather, and the cable can become tangled or break .

Operational Use

Kalashnikov's fiber optic drones have been deployed in Russian military operations to overcome Ukrainian drone defenses, while Ukraine has developed its own fiber optic FPV drones, such as the "Silkworm" and the Ptakhy Madiara series, to target artillery and air defense systems at long distances . These systems represent a new generation of unmanned warfare, where low-cost, high-precision drones can bypass electronic countermeasures and strike critical targets effectively. In summary, the "fiber optic cable AK-47" concept refers to Kalashnikov's fiber optic-guided FPV drones, which leverage optical cables for secure, low-latency control, offering a significant tactical advantage in modern electronic warfare environments .

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