

PRODUCT SPECIFICATION

YNW-7504A-MB

Manpack Tactical Broadband Wireless MESH Ad-Hoc
Network Equipment

Shenzhen Yuneng Micro Technology Co., Ltd.

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Model YNW-7504A-MB

Manpack

Product Name Manpack Tactical Broadband Wireless MESH Ad-Hoc Network Equipment

English Name Manpack Tactical Broadband Wireless MESH Ad-Hoc Network Equipment

Product Series YNW-7500 Series MESH Ad-Hoc Network Equipment

Core Technology TDD-COFDM + 2T2R transmit/receive diversity

1. Product Overview

Positioning: YNW-7504A-MB is a manpack tactical broadband wireless MESH Ad-Hoc network terminal developed with TDD-COFDM and 2T2R (2×2 MIMO) technology. It adopts an advanced wireless MESH multi-hop Ad-Hoc networking architecture, does not rely on any fixed infrastructure, and can temporarily, dynamically and rapidly set up an IP MESH network with the capability of self-organization, self-recovery and high survivability.

The YNW-7504A-MB manpack tactical radio is based on TDD-COFDM and 2T2R (2×2 MIMO) technology and adopts an advanced wireless MESH multi-hop Ad-Hoc networking architecture. It supports auto-network-setup, auto-mesh-networking and automatic frequency selection within 16 candidate frequencies, delivering broadband, IP-transparent transmission with high-speed mobility capability (1000+ km/h). It achieves a peak data rate of 50+ Mbps at 20 MHz channel bandwidth and 25+ Mbps at 10 MHz, with a receiver sensitivity of -103 dBm and a per-hop line-of-sight range beyond 100 km.

The terminal supports single-frequency 64-node Ad-Hoc networking, multi-hop relay for short message (15+ hops), voice (10+ hops) and video (8+ hops), single-hop latency of approximately 7 ms, startup time within 27 s, and network join / route switching within 1 s. Equipped with a high-power front end of up to 36 dBm (2×2W), the terminal offers strong anti-jamming capability. With a manpack body design, IP66 protection rating and -40°C to +65°C operating temperature, the device can be rapidly deployed by individual soldiers for long-distance, wide-coverage tactical wireless broadband transmission in extreme battlefield and outdoor field environments.

2. Product Views



YNW-7504A-MB front view

3. Key Features



Strong Anti-Interference

Intelligent 16-candidate frequency selection, automatic frequency hopping, and COFDM-based multi-carrier technology deliver excellent co-channel jamming resistance in complex electromagnetic environments.



Long Transmission Distance

Maximum 36 dBm (2×2W) transmit power achieves a per-hop line-of-sight range of over 100 km, enabling long-distance, wide-area coverage.



High Data Rate

Peak data rate of 50+ Mbps at 20 MHz bandwidth and 25+ Mbps at 10 MHz reliably carries high-bit-rate video, data and voice services.



Large Network Scale

Supports single-frequency 64-node Ad-Hoc, self-healing full-mesh networking with dynamic TDMA, providing a scalable field communications backbone.



Multi-hop Relay

Multi-hop relay for short message (15+), voice (10+) and video (8+) hops with single-hop latency of about 7 ms, breaking through terrain blockage for wide-area coverage.



Manpack Design

Compact 146×232×61 mm manpack body weighing 2.95 kg, IP66 protection and 6~8 h battery life enable rapid on-person deployment in the field.

4. Technical Specifications

4.1 RF Parameters

Item	Specification	Custom
Transmission Technology	TDD-COFDM, 2T2R (2×2 MIMO)	—
Operating Frequency	1300 ~ 1500 MHz, 1 Hz step adjustable	70 MHz ~ 6000 MHz customizable
Channel Bandwidth	2.5 / 5 / 10 / 20 MHz	—
Carrier Modulation	QPSK / 16QAM / 64QAM / 256QAM	Adaptive or fixed configuration
Data Rate	Peak 25+Mbps@10MHz, 50+Mbps@20MHz	—
Receiver Sensitivity	-103dBm	—
Transmission Distance	>100km (line-of-sight)	—
Transmit Power	36dBm (2*2W)	Power customizable
Anti-Interference	Adaptive frequency selection, up to 16 candidate frequencies	—

4.2 Networking Capability

Item	Specification	Custom
Networking Capability	Supports 64+ nodes	—
Network Scale	Up to 64 nodes on single frequency	—
Multi-hop Capability	Short message up to 15+ hops, voice up to 10+ hops, video up to 8+ hops	—
Mobility Speed	Supports high-speed mobility of 1000+ km/h	—
Transmission Latency	Approximately 7ms per hop	—
Startup Time	Less than 27s	—
Network Join Time	Less than 1s	—
Route Switching	Less than 1s	—

4.3 Interfaces & Extension

Item	Specification	Custom
Data Interface	Ethernet x 2, Serial x 3	TTL / RS232 / RS422 / RS485 customizable
Wireless Extension	WiFi AP	—
Video Extension	Video encoder HDMI / SDI / CVBS* (*on demand)	—
Satellite Positioning	GPS / BD* (*on demand)	—
Voice Communication	IP voice conference / PTT intercom	Software configurable, standard PTT handset

4.4 Electrical & Physical

Item	Specification	Custom
Battery Charging	25.2V / 2A	—
Power Consumption	8 ~ 25W	—
Operating Time	6 ~ 8 hours	—
Operating Temperature	-40°C ~ 65°C	—
Protection Rating	IP66	—
Dimensions	146 x 232 x 61 mm	—
Weight	2.95kg (excluding antenna)	—

5. Features & Functions

- **Network architecture:** centerless, distributed wireless IP MESH Ad-Hoc network; all nodes are equal, plug-and-play, and the network is set up automatically;
- **Anti-multipath interference:** COFDM multi-carrier modulation provides strong anti-multipath-interference capability, keeping communications stable in complex environments such as mountainous terrain, cities and moving platforms;
- **Survivability & self-healing:** when nodes move, fail or new nodes join, the network automatically reconfigures routes without manual intervention, providing continuous, reliable communication links;
- **Multi-hop relay:** effectively breaks through terrain blockage and expands coverage, supporting multi-hop relay for short message (15+ hops), voice (10+ hops) and video (8+ hops);
- **High-speed mobility:** with the high-speed channel estimation and compensation algorithm, it supports relative speeds of up to 1000+ km/h;
- **Dynamic TDMA mechanism:** effectively mitigates packet collision and congestion, improving throughput and spectral efficiency in multi-node, high-concurrency scenarios;
- **QoS routing guarantee:** implements differentiated QoS routing to give priority to key services such as voice, command and control, ensuring the quality of real-time services;
- **Layer 2/3 routing:** supports two-layer and three-layer network routing, transmitting IP packets seamlessly (network transparent transmission);
- **Broadband IP transparent transmission:** provides an Ethernet transparent transmission channel that carries data, video, voice and other IP services point-to-point or point-to-multipoint;
- **Automatic frequency selection:** supports intelligent selection within 16 candidate frequencies and automatic frequency hopping to achieve reliable transmission in complex electromagnetic environments;
- **Up to 64-node full-mesh networking:** single-frequency high-capacity full-mesh Ad-Hoc networking supports up to 64 nodes for a large-scale field communications network;
- **High system stability:** excellent integrated design (power, thermal, EMI) guarantees long-term 7×24-hour continuous and stable operation of the whole machine;
- **Hardware encryption & security:** built-in hardware encryption ensures secure and encrypted transmission of battlefield communications;
- **WiFi hotspot access:** built-in WiFi AP allows nearby smart terminals (cell phones, laptops, tablets) to access the network through WLAN for convenience;
- **Manpack field carrying:** compact and lightweight manpack body is convenient to carry and quick to deploy, suitable for individual soldier equipment;
- **GPS / BD positioning:** built-in GPS/BD positioning provides real-time location sharing on the tactical map for command and scheduling;
- **Video interface expansion:** supports HDMI / SDI / CVBS video interfaces for front-end video acquisition and backhaul of battlefield situation;
- **PTT voice intercom:** supports PTT voice intercom to enable real-time voice command and coordination at the front line;
- **Network indicator:** a dual-color indicator; red indicates power-on without joining the network, green indicates joined;
- **Signal indicator:** a tri-color indicator that displays different colors according to communication link quality.

6. Applications

1. Border and Coastal Defense MESH Ad-Hoc Network Wireless Communication Application

Application Scenario

Border and coastal defense communication scenarios such as border patrol, coastal defense surveillance, border port control, coastline alerting, border post interconnection and maritime law-enforcement ship formation communication. Long borderlines and coastlines with complex terrain including mountains, deserts, jungles and islands are not fully covered by traditional public networks, making dedicated broadband communication a necessity for border and coastal defense command and dispatch.

Deployment Scheme

- **Long-distance coverage:** the YNW-7504A-MB manpack radio leverages its 100+ km per-hop line-of-sight and 36 dBm (2×2W) capability to cover wide border areas with sparse infrastructure.
- **Point-to-point backbone:** deployed at border posts for point-to-point long-range links, replacing cable or relay sites and strengthening the border surveillance wireless backbone.
- **Manpack patrol networks:** patrol squads carry manpack radios to set up Ad-Hoc networks on the move, enabling real-time video and position reporting of patrol routes.
- **Multi-hop relay:** scalable networking across large border regions, realizing full breadth and multi-point coverage beyond terrain blockage.

Application Value

Builds a wide-coverage, high-reliability border wireless backbone network, enabling real-time transmission of frontier video, patrol data and alert information, and improving frontier monitoring, rapid-response and joint-defense capability.

2. Convoy MESH Ad-Hoc Network Wireless Communication Application

Application Scenario

Convoy formation movement, convoy command and dispatch, in-transit video surveillance, emergency liaison, and coordinated maneuvering for tactical motorcades and rescue convoys. During movement, the distances between vehicles change constantly and road conditions are complex; traditional communication methods cannot guarantee stable real-time communication between vehicles in a convoy.

Deployment Scheme

- **Full-fleet Ad-Hoc network:** install YNW-7504A-MB manpack/vehicle radios on command, support and escort vehicles to build a multi-node full-mesh convoy Ad-Hoc network.
- **Dynamic route convergence:** under complex conditions such as high-speed movement, changing inter-vehicle distance and road obstruction, the network topology automatically reconfigures and routes converge within seconds without communication interruption.
- **Video and telemetry backhaul:** transmits in-vehicle surveillance and telemetry video, photos and data back to the command vehicle in real time.
- **Voice and data dispatch:** supports PTT, command-issuing and data interaction to ensure smooth command and coordination of the whole convoy.

Application Value

Provides a high-reliability wireless MESH network for convoy operations, achieving real-time sharing of videos, positions and commands across the fleet, and enhancing convoy mobility, safety and collaborative command capability.

3. Naval Boarding & Reconnaissance MESH Ad-Hoc Network Wireless Communication Application

Application Scenario

Boarding inspection operations, maritime law-enforcement liaison, high-speed motion target tracking, multi-ship coordinated operations, ship formation communication, and crossing-the-deck scenarios where traditional wired links cannot be built.

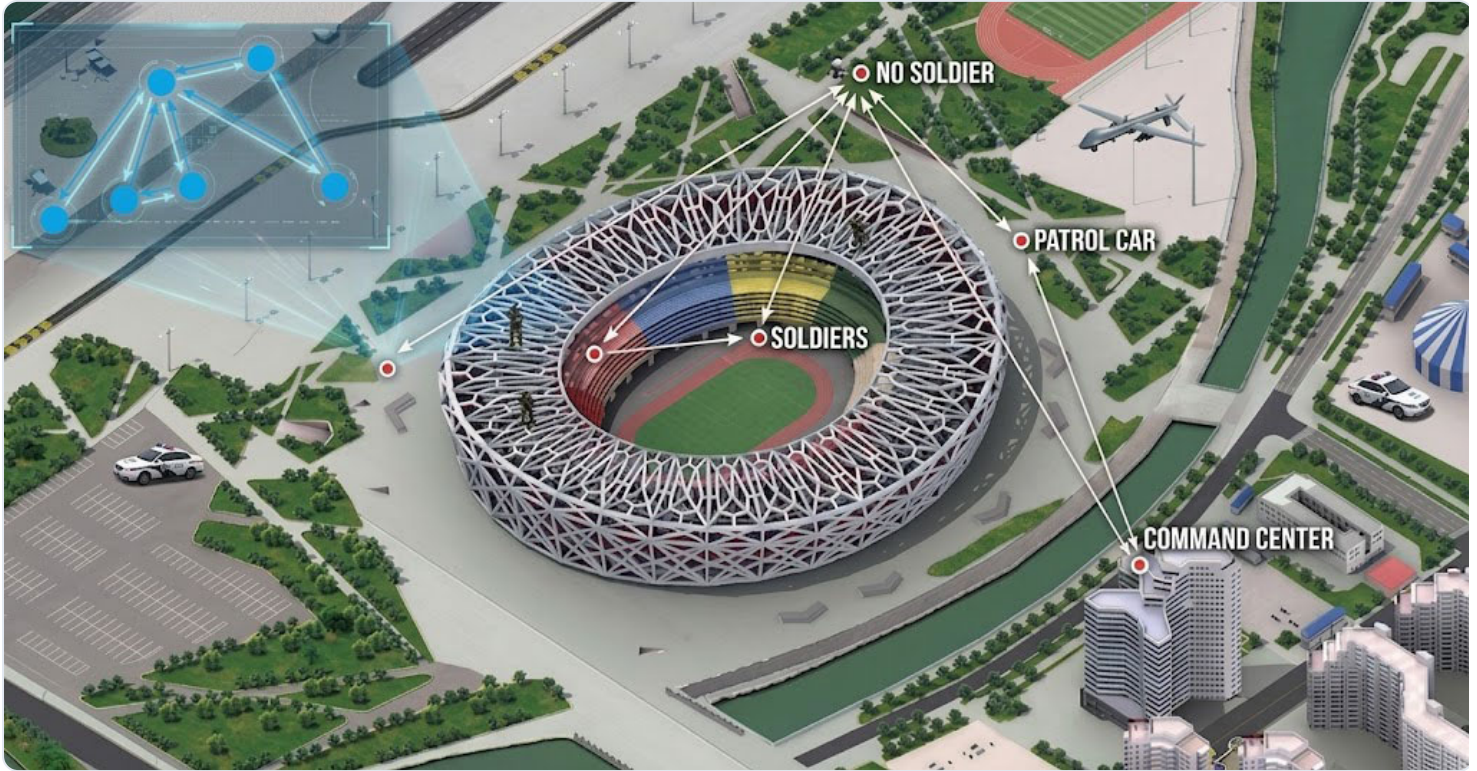
Deployment Scheme

- **Boarding inspection network:** the manpack unit establishes a dedicated wireless network between the mothership, working boats and fast attack boats, transmitting inspection video, photos and data in real time.
- **Anti-multipath interference:** COFDM modulation effectively suppresses multipath reflection interference over the sea surface, keeping the link stable under highly dynamic conditions such as wave fluctuation and ship pitching.
- **High-speed mobility:** maintains a stable link with relative motion of 1000+ km/h between fast boats, ensuring reliability during high-speed interception.
- **Fast route convergence:** when relative positions between ships change, the network topology automatically adjusts without communication interruption.

Application Value

Provides for boarding operations a fast-deployable, high-mobility wireless network that ensures real-time transmission of on-site video, evidence and data to the command bridge, strongly supporting maritime law-enforcement efficiency and battlefield command accuracy.

4. Public Security Tactical Communication Application



Application Scenario

Real-time communication for special-operation squads, image and intelligence backhaul during dispatch and arrest, command and dispatch at large events, and communication support for emergency security scenarios.

Deployment Scheme

- **Tactical-end Ad-Hoc network:** officers carry YNW-7504A-MB manpack radios to establish a field Ad-Hoc network independent of public networks, ensuring communication confidentiality and reliability.
- **Multi-service fusion:** integrates video, data, voice and positioning for transmission, meeting combined requirements of law enforcement, intelligence and command.
- **Air-ground integration:** cooperates with drones and air relays to build an air-ground integrated network covering the command area.
- **Command linkage:** links to the mobile command vehicle / command center in real time so field situation can be directly returned to the decision-maker.

Application Value

Provides public security tactical teams with a secure, high-reliability, rapid-deployment wireless network that guarantees real-time transmission of field video and intelligence, and enhances the overall capability of command and multi-team collaboration.

5. Fire Rescue Communication Application

Application Scenario

Real-time video feedback from fire-rescue front lines, 360° on-site reconnaissance, personnel positioning and dispatching, exchange of the internal thermal environment, and command and coordination at large-scale fire and rescue sites.

Deployment Scheme

- **Front-line video backhaul:** carried by rescue teams to return fire-scene video to the commanding vehicle / command center in real time for accurate situation judgement.
- **Field Ad-Hoc network:** rapidly sets up a field communication network at the site of large fires, solving the traffic congestion of the public network.
- **Multi-unit interconnection:** interconnects multiple rescue units through the Ad-Hoc network to synergize internal and external response.
- **Multi-hop relay:** breaks through building and terrain blockage so the front-line situation is stably returned to the rear command.

Application Value

Provides rescuers with clear, real-time scene feedback and reliable field communication, supporting scientific firefighting and rescue command, improving unit collaboration, and reducing rescue risk and losses.

6. Natural Disaster Emergency Rescue Communication Application



Application Scenario

In emergencies such as earthquakes, floods, landslides and mudslides where the public communication network is interrupted, the YNW-7504A-MB quickly establishes a field emergency communication network for rescue command, situation feedback and multi-unit coordination.

Deployment Scheme

- **Rapid site deployment:** rescue teams carry YNW-7504A-MB manpack units into the disaster zone and, relying on the high-power long-distance capability, rapidly establish temporary communication nodes.
- **Multi-hop relay wide coverage:** supports 8+ video multi-hop relay with 100+ km per-hop line-of-sight; multi-hop cascading achieves wide-area coverage to meet the large-area communication needs of the disaster zone.
- **Self-healing, damage-resistant:** the self-healing feature ensures the network automatically reconfigures when nodes move, devices fail or new nodes join, with no manual intervention.
- **Multi-service fusion:** supports fused transmission of on-site video backhaul, disaster-data reporting, rescue-team position sharing, command-issuing, and victim assistance-requesting information.

Application Value

Facing sudden natural disasters, it provides stable and reliable communication support for emergency command and dispatch, returning on-site video, disaster data and rescue-team positions to the front/rear headquarters in real time, minimizing casualties and property losses.

7. Forest Fire Prevention MESH Ad-Hoc Network Wireless Communication Application



Application Scenario

Forest fire monitoring, forest-zone patrol communication, watchtower interconnection, fire-suppression front-line command, fire-scene situation backhaul, wildlife protection in forest zones, and forest-zone security control. China's vast forest resources are mostly distributed in mountainous and remote areas where public-network coverage is weak. Forest fire communication has long faced the challenges of difficult coverage, difficult networking and high cost.

Deployment Scheme

- **Multi-point deployment in forest zones:** YNW-7504A-MB can be deployed at multiple key points such as forest watchtowers, fire-prevention checkpoints and management stations to build a broadband Ad-Hoc private network covering the vast forest.
- **Multi-hop relay across terrain:** through high-power manpack radios cooperating with vehicle/airborne radios for multi-hop relay, terrain obstruction from forest cover and elevation changes is overcome to achieve wide-area coverage, with per-hop line-of-sight above 100 km and strong anti-multipath and diffraction capabilities.
- **Watchtower-UAV-soldier collaboration:** fixed watchtower monitoring, patrol UAV aerial inspection and fire-suppression soldiers deep in the fire front form a three-in-one collaborative network, returning video and alert information to the fire-prevention command center in real time.
- **High-power long-distance:** maximum 36 dBm (2×2W) transmit power achieves more stable long-distance transmission over vast forest zones, reducing the number of relay nodes and lowering deployment cost.

- **Automatic fire alerting:** interfaces with fire-detection devices such as smoke sensors and infrared thermal imaging; automatic fire-alert information is returned to the command center in real time through the MESH network to realize early detection, early reporting and early disposal of outbreaks.

Application Value

Builds a broadband Ad-Hoc private network covering vast forests, returning video and alert information from watchtowers, patrol UAVs and fire-suppression front lines to the fire-prevention command center in real time for early detection, early reporting and early disposal of outbreaks, providing reliable communication support for fire-suppression front-line command.

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