Next-Generation Anti-Jamming Antenna & Receiver Systems – Up to 32-Element CRPA Arrays

At **China MoneyPro,** we lead the world in **GNSS anti-jamming and anti-spoofing technology R&D**, combining state-of-the-art antenna design, high-performance RF front-ends, and AI-driven digital signal processing. Our solutions are engineered to withstand the most complex and hostile electromagnetic environments.

- **Main Products:**

Anti-jamming antenna, anti-jamming receiver, Anti-jamming antenna array, Anti-jamming RF module, Anti-jamming digital board

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- **Core R&D Capabilities**

  - **CRPA Anti-Jamming Antennas:** Development of **4, 7, 8, 9, 16, and 32-element controlled reception pattern antenna (CRPA) arrays**, delivering unrivaled interference suppression with deep nulling and adaptive beamforming.
  - **Array Anti-Jamming Receivers:** Advanced multi-channel systems with digital beam steering and space-time adaptive processing (STAP) for real-time mitigation of multiple jamming and spoofing signals.
  - **Anti-Jamming RF Modules & Digital Boards:** FPGA/SoC-based boards supporting wideband interference detection, adaptive notch filtering, and AI-enhanced spoofing classification.
  - **Integration Expertise:** Seamless integration of anti-jamming antennas, receivers, and RF modules into UAVs, aircraft, ground stations, and naval platforms.

- **Technical Performance Parameters**

  - **Null-Steering Depth:** > 60–70 dB suppression
  - **Simultaneous Jamming Sources:** Up to **12+ interference signals suppressed in real time**

- **Array Sizes: 4 / 7 / 8 / 9 / 16 / 32 elements**
- **Beamforming Refresh Rate:** > 1000 Hz adaptive nulling
- **Frequency Support:** GPS L1/L2/L5, BeiDou B1/B2/B3, GLONASS G1/G2, Galileo E1/E5
- **Dynamic Range:** > 120 dB RF front-end with automatic gain control
- **Positioning Accuracy:** < 2 cm CEP (with RTK) under jamming conditions
- **System Latency:** < 10 µs adaptive response

🔹 **Product Categories**

- **4-Element Compact CRPA Antenna** – For small UAVs and lightweight platforms.
- **7-Element Balanced Array** – Optimized for industrial UAVs and mobile systems.
- **8-Element Tactical Array** – Balanced size and performance, providing strong resilience against mid-level jamming threats.
- **9-Element Tactical Array** – Enhanced protection against complex interference in contested environments.
- **16-Element High-Resilience Array** – Multi-threat suppression with wide angular coverage.
- **32-Element CRPA Array** – The pinnacle of anti-jamming technology, providing maximum angular resolution, ultra-deep nulling, and unmatched resilience, ideal for strategic command stations and naval platforms.
- **Integrated Anti-Jamming GNSS Receivers & RF Modules** – Complete solutions combining antenna arrays with advanced digital boards for plug-and-play deployment.

32-Element CRPA GNSS Anti-Jamming Antenna – Strategic-Grade Navigation Protection

(Technical White Paper – China MoneyPro UAV)

As GNSS jamming and spoofing threats become more sophisticated, advanced platforms such as naval vessels, command stations, and high-value aerospace systems

require unprecedented levels of protection. The **32-element controlled reception pattern antenna (CRPA)** represents the **pinnacle of GNSS anti-jamming technology**, offering ultra-deep nulling, maximum angular resolution, and unmatched resilience in the most hostile electromagnetic environments.

🔹 1. Core R&D Strength

At **China MoneyPro UAV**, we have established world-leading R&D capabilities in **multi-element GNSS antenna arrays**, integrating expertise in:

- **Antenna Array Design:** Proprietary electromagnetic simulation and low-profile structure design for 32-element configurations.
- **Beamforming & Null Steering:** Real-time **adaptive space-time processing (STAP)** with precision control of nulls across multiple interference angles.
- **High-Performance RF Front-Ends:** Wideband RF chains with dynamic range >120 dB and ultra-fast AGC (Automatic Gain Control).
- **Digital Signal Processing:** FPGA/SoC platforms supporting >2000 Hz beam refresh rates and parallel multi-threat mitigation.
- **AI-Enhanced Spoofing Detection:** Neural network classifiers embedded into DSP pipelines, enabling real-time spoofing rejection beyond conventional notch filtering.

🔹 2. Technical Performance Parameters

- **Array Size:** 32-element CRPA (strategic-grade)
- **Null-Steering Depth:** > 70–80 dB interference suppression
- **Angular Resolution:** < 2° null separation precision
- **Interference Mitigation:** Simultaneous suppression of **16+ jamming sources** in real time
- **Beamforming Update Rate:** > 2000 Hz adaptive nulling
- **Frequency Bands Supported:**
    - GPS: L1, L2, L5

    - BeiDou: B1, B2, B3
    - GLONASS: G1, G2
    - Galileo: E1, E5
- **Dynamic Range:** > 120 dB with high-linearity RF design
- **Latency:** < 5 μs adaptive response time
- **Positioning Accuracy:** < 1 cm CEP (with RTK correction), even under strong jamming conditions
- **Spoofing Protection:** AI-enhanced STAP + cross-spectrum anomaly detection

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🔹 3. Product Advantages vs. Lower-Element Arrays

Array Size	Jammer Suppression Capability	Null Steering Precision	Applications
4–7 Elements	Suppresses 2–5 jammers	~10° angular resolution	UAVs, mobile vehicles
9–16 Elements	Suppresses 6–10 jammers	~5° angular resolution	Tactical UAVs, defense vehicles
32 Elements	**Suppresses 16+ jammers**	**<2° angular resolution**	**Strategic platforms: naval ships, command stations, fixed sites**

The 32-element array provides a **quantum leap in performance**, doubling the suppression capacity compared to 16-element systems, while delivering sub-2° angular resolution critical for **discriminating dense jamming clusters**.

🔹 4. Applications

- **Naval Defense:** 32-element CRPA arrays ensure uninterrupted GNSS navigation in electronic warfare environments, even against multiple shipborne jammers.
- **Command & Control Stations:** Provides strategic-grade positioning accuracy for mobile or fixed C2 facilities operating in GNSS-contested theaters.

- **Critical Infrastructure:** Protects airports, power grids, and communication hubs from coordinated GNSS jamming/spoofing threats.
- **Aerospace Platforms:** Strategic UAVs and manned aircraft benefit from centimeter-level navigation reliability in GPS-denied environments.

🔹 5. Key Challenges & Breakthroughs

Developing a **32-element CRPA** poses formidable R&D challenges:

1. **Element Mutual Coupling:** Advanced decoupling structures reduce inter-element interference across 32 channels.
2. **Processing Complexity:** Real-time suppression of 16+ jammers requires parallelized FPGA-GPU architectures.
3. **Miniaturization:** Despite larger array size, China MoneyPro UAV employs **low-profile antenna elements and lightweight composites** to meet aerospace SWaP-C requirements.
4. **Thermal Management:** High RF and DSP load addressed with **multi-layer heat dissipation and active cooling systems**.
5. **AI Integration:** Proprietary AI models enhance spoofing detection accuracy by >30% compared to conventional techniques.

The **32-element CRPA GNSS anti-jamming antenna** developed by **China MoneyPro UAV** sets a new global benchmark in GNSS protection technology. With **>70 dB suppression depth, sub-2° angular resolution, and the ability to counter 16+ simultaneous jammers**, it delivers strategic-grade resilience across aerospace, naval, and critical infrastructure platforms.

Through proprietary innovations in **antenna design, digital beamforming, RF chain engineering, and AI-enhanced spoofing mitigation**, China MoneyPro UAV ensures uninterrupted, precise navigation even in the world's most contested electromagnetic environments.

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