

# mAT 1500Pro Tuner Remote Control Protocol

Version V1.0

## Overview

This document defines the commands for remotely operating the **MAT-TUNER** series antenna tuner. All operations are initiated by the transceiver; the tuner does not transmit unsolicited data.

## Communication Interface

- **Physical Layer:** RS-232 level, UART protocol
- **Parameters:** 4800 bps, 1 stop bit, no parity
- **Frame Format:** 4 bytes per command
  - Byte 1: Start Flag (0xFF)
  - Byte 2: Command Code
  - Byte 3–4: Frequency data (BCD-encoded, 0.01 MHz resolution)
- **Timing Constraint:** Inter-byte interval within a command must not exceed 10 ms.

## Command Set

### 1. Online (Command 0x81)

- **Transceiver → Tuner:** FF 81 XX XX
- **Tuner Response:** 0x00 (ACK) → 0x01 (Execution Complete)
- **Description:**  
Places the tuner into **Online** mode. The tuner recalls stored LC parameters for the specified frequency from memory and configures the matching network accordingly.
- **Note:**  
The transceiver must **not transmit RF** between sending the command and receiving 0x01.

### 2. Bypass (Command 0x80)

- **Transceiver → Tuner:** FF 80 XX XX
- **Tuner Response:** 0x00 (ACK) → 0x01 (Execution Complete)
- **Description:**  
Switches the tuner to **Bypass** mode, directly connecting RF input to output and bypassing the tuning circuitry.
- **Note:** Ensure the transceiver is in receive mode during this operation.

### 3. Tune (Command 0x82)

- **Transceiver → Tuner:** FF 82 XX XX
- **Tuner Response:** 0x00 (ACK) → 0x01 (Tuning Complete)
- **Description:**  
Initiates an automatic tuning cycle. Upon completion, the tuner saves the resulting LC configuration to the memory location corresponding to the given frequency.

- **Pre-tune Requirements:**
  1. Transmit power set to **10 W**.
  2. Mode set to **CW or FM** (stable carrier).
  3. Transceiver switched to transmit mode before sending command.
- **Post-tune Actions:**
  1. Stop transmitting upon receiving 0x01.
  2. Restore previous power and mode settings.
  3. Resume normal operation.

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## Frequency Encoding Examples

Frequency (MHz)	Command (Hex)
7.050	FF 80 07 05
14.275	FF 80 0E 1B
29.500	FF 80 1D 32
29.509*	FF 80 1D 32

*Note: Frequency values are stored with 0.01 MHz resolution; 29.509 MHz is encoded as 29.50 MHz.*

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## Operational Guidelines

- Send **Online (0x81)** after any frequency change to enable automatic tuning tracking.
- Maintain inter-byte timing within 10 ms to ensure command validity.
- The tuner only responds with 0x00 (ACK), 0x01 (Complete); no other data is transmitted.

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## Support & Documentation

For further technical information, visit: <http://www.mat-tuner.com>

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**MAT-TUNER**

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