

G RTP — Geoscan amateur Radio Telemetry Protocol

1. Table of Contents

G RTP — Geoscan amateur Radio Telemetry Protocol..... 1

2. Protocol Version..... 1

3. Main Information About Our Telemetry..... 1

4. Structure of Radio Packets..... 1

2. Protocol Version

1.0

3. Main Information About Our Telemetry

- Callsign: **RS20S**
- The satellite uses a [Texas Instruments CC1125](#) FSK transceiver chip
- frequency — 436.200 MHz
- 2-GFSK 9k6 baud
- Preamble — 0xAAAAAAAA
- Syncword — 0x930B51DE (in big-endian notation)
- CRC16-CCITT(0x1021). Initialized to 0xFFFF. The final XOR value is 0.
- Fixed packet size — 74 bytes
- PN9 scrambler
- CC11xx packet format length and address fields are used for header

4. Structure of Radio Packets

The threshold of sync word must be set to 16 bits.

Table 1: G RTP Structure

| Size, byte | Name of the Field | Description | Offset | Value |
|------------|-------------------|------------------------------|--------|------------|
| 4 | Preamble | Bit synchronisation of modem | 0 | 0xAAAAAAAA |
| 4 | Sync word | | 4 | 0x930B51DE |
| 2 | Header | Service Information | 8 | |
| 62 | AX.25 Packet | AX.25 Telemetry Data | 10 | |
| 2 | Checksum | CRC-16 CCITT | 72 | |

Table 2: Structure of header

| Bit number | Description | |
|------------|--------------------|---------------------------------|
| 0..5 | Destination adress | 1 |
| 6..7 | Type of checksum | 00 — CRC16 |
| | | 01 — FEC |
| | | 10 — HMAC |
| | | 11 — Reserved |
| 8 | Repeter flag | |
| 9 | Response flag | 0 — to form response |
| | | 1 — not to form response |
| 10..15 | Reseved | |

To calculate CRC16 - 0x1021 polynom used CRC16(X16+X15+X2+1). Initialized to 0xFFFF

Table 3: Structure of AX.25 telemetry

| Size, bytes | Description | Offset, bytes |
|-------------|---|---------------|
| 7 | Destination Address (BEACON) + SSID=0 (BEACON0) | 1 |
| 7 | Source Address (RS20S)+SSID=0 (RS20S 0) | 8 |
| 1 | Control Field (UI) (0x03) | 15 |
| 1 | PID (0xF0) | 16 |
| 46 | Data | 17 |

Data field is TBD. It may vary during the mission. We working on our decoder.