Communication Subsystem

The satellite communication subsystem uses solely amateur radio band and it was developed to transmit downlink radio signals from HORYU-IV to any Earth ground stations and receive uplink command radio signals from Kyushu Institute of Technology ground station to HORYU-IV. By opening data reception to the amateur radio community, HORYU-IV aims at positively contribute to the expansion of radio communication technology, deepen general public understanding in radio communications, and broaden young generation perspectives on how space can be used.

Transmission and Reception Overview

The HORYU-IV communication subsystem will send downlink radio signals via the amateur UHF band and S-band. Uplink commands will be received via the amateur VHF band and L-band. The overview of the communication sub-system is presented in Figure 1.

UHF Band Transmission

- Frequency: 437.375MHz
- Modulation Type: AFSK
- Data Speed: 1200bps
- Data Transmission: CW beacon, real time and off-time housekeeping, digi-singer (voice FM), and mission data

S-Band Transmission

- Frequency: 2400.3MHz
- Modulation Type: BPSK
- Data Speed: 100kbps
- Data Transmission: off-time housekeeping and mission data

VHF Band Reception

- Frequency: 145.XXXMHz
- Modulation Type: AFSK
- Data Speed: 1200bps
- Data Reception: CW interruption, missions ON/OFF, reset, etc.

L-Band Reception

- Frequency: 12XX.XMHz
- Modulation Type: DTMF
- Data reception: reset

Transmission and Reception Block Diagram

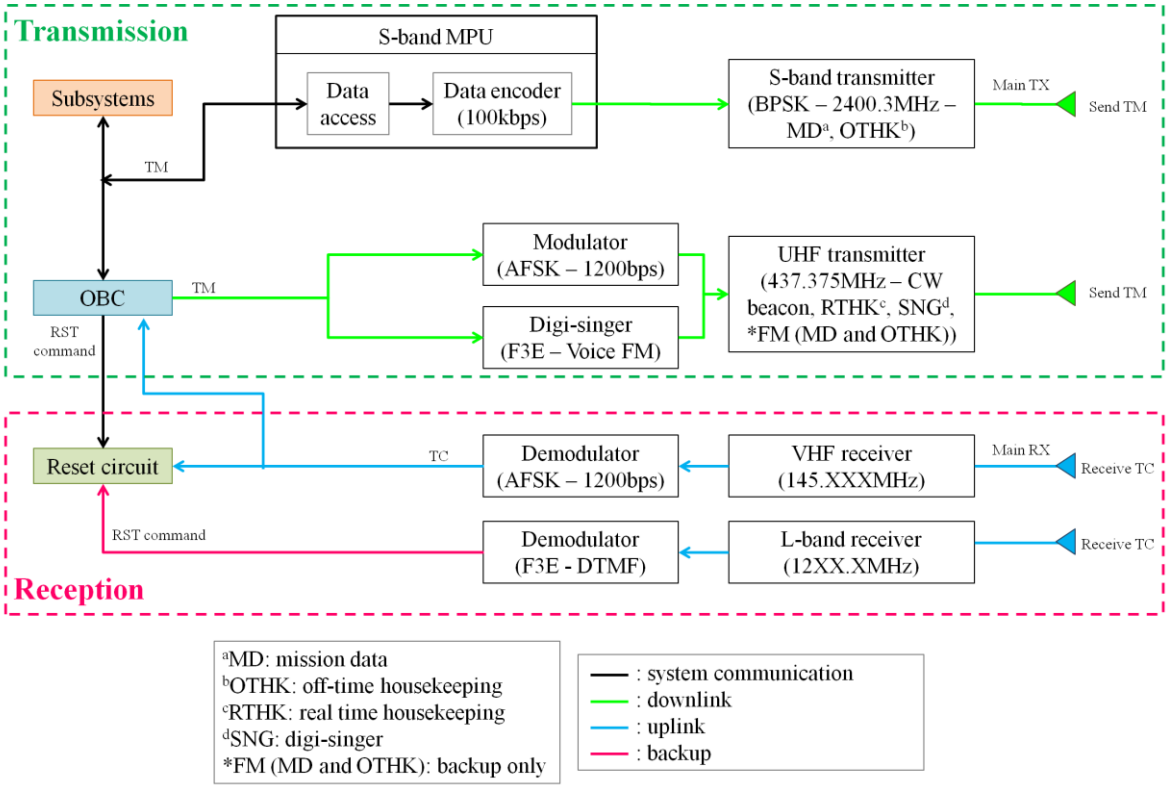

Figure 1 Transmission and reception block diagram of HORYU-IV communication subsystem

CW beacon analysis software and downlink software will be uploaded soon.