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The communication between the ground and satellite is separated into packets. This document specifies the form and function of these packets.

Packet Protocol

Detailed Description of Communication Packet

Revision: 1.1.0



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# 1 Packet Header

The function of the packet header is to convey the recipient, sender, and type of each packet. Specific command IDs for specific recipients use multipacket as the command is transferring a file larger than one packet can fit. See command lists for which ones are multipacket.

The header is two bytes long. The first byte contains the recipient, sender, and command ID, see bit allocation in table 1. The second byte is the length of the body in number of dwords (32b). The choice of dwords allows packet lengths up to . A packet might require padding at the end of the body to increase the body length to a multiple of single dwords, this padding should be zeros.

Table 1: Packet Header First Byte

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bit index | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Function | Sender  0x0: Ground  0x1: CougSat-1  0x2: CougSat-2  0x3: CougSat-3  0x4: CougSat-4  0x5: CougSat-5  0x6: CougSat-6  0x7: CougSat-7 | | | Recipient  0x0: ADCS  0x1: IFJR  0x2: IHU  0x3: PMIC  0x4: RCS  0x5: Payload 1  0x6: Payload 2  0x7: Payload 3 | | | Command ID  Up to 4 commands per recipient  See [Section 2](#_2_Commands) for list of commands | |

## 1.1 Multipacket Additional Header

For a multipacket, there are an additional two bytes appended to the packet header. These represent a 16b long serial number for the packet. By analyzing the serial numbers of all packets received for a multipacket, the recipient can figure which packets were lost and request those specific packets from the sender.

# 2 Commands