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UNITEC-1 Communication Format

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Kind of Communication Format

Major CW Communication

Message timing of Transmission: 21749 seconds period after system start 7800 seconds later.

Mark: 1 when there is a signal, and 0 when there is not a signal every one second. It is transmitted a signal by order of LSB by MSB.

Minor CW Communication

Message timing of Transmission: 21749 seconds period after system start 18637 seconds later.

Mark: 1 when there is a signal, and 0 when there is not a signal every one second. It is transmitted a signal by order of LSB by MSB.

Major FSK Communication

Message timing of Transmission: It is transmitted a signal after 60 seconds when Major CW communication is finished.

Major CW Communication

Synchronization Header (15byte)	Mejor CW Data Set (50byte)	Mejor CW Data Set (50byte)	Non-synchronization Frame (6byte)	Mejor CW Data Set (50byte)	Non-synchronization Frame (12byte)	Mejor CW Data Set (50byte)

It is transmitted 4 times of Major CW Data set of the same contents.

Synchronization Header

0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,

0xbf,0xcf,0xf1,0xfe,0x1f,0xe0,0xff

Synchronization Header show a standard in the time for a transmission data.

Example: When 0 was detected for one second,

it means that 64 seconds passed from the top of data.

When 0 was detected for two seconds,

it means that 73 seconds passed from the top of data.

Non-synchronization Frame

All the contents are 0xff.

Major CW Data Set (1)

HK Data (10byte)	SPM Data (16byte)	UOBC Data (24byte)

HK Data

hk[0]: Temperature sensor 0 maximum

hk[1]: Temperature sensor 0 minimum

hk[2]: Temperature sensor 3 maximum

hk[3]: Temperature sensor 3 minimum

hk[4]: Temperature sensor 6 maximum

hk[5]: Temperature sensor 6 minimum

hk[6]: Temperature sensor 7 maximum

hk[7]: Temperature sensor 7 minimum

hk[8]: Battery voltage

hk[9]: Battery temperature and Charge Discharge temperature

SPM Data

Refer SPM document

Minor CW Data Set (2)

HK Data (10byte)	SPM Data (16byte)	UOBC Data (24byte)

UOBC Data

4 byte Data Set from UOBC1 to UOBC6 as follows

UOBC[0], UOBC[1], UOBC[2]: Packet top 3 bytes of UOBC result

UOBC[3]: UOBC operation status

Minor CW Communication

Synchronization Header (15byte)	Minor CW Data Set (48byte)	Minor CW Data Set (48byte)	Non-synchronization Frame (6byte)	Minor CW Data Set (48byte)	Non-synchronization Frame (12byte)	Minor CW Data Set (48byte)

It is transmitted 4 times of Major CW Data Set of the same contents.

Synchronization Header

0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,

0xbf,0xcf,0xf1,0xfe,0x1f,0xe0,0xff

Non-synchronization Frame

All the contents are 0xff.

Minor CW Data Set (1)

HK Data (18byte)	SPM Data (32byte)	UOBC Data (6 byte)

HK Data

hk[0]: Temperature sensor 0 maximum

hk[1]: Temperature sensor 0 minimum

hk[2]: Temperature sensor 3 maximum

hk[3]: Temperature sensor 3 minimum

hk[4]: Temperature sensor 6 maximum

hk[5]: Temperature sensor 6 minimum

hk[6]: Temperature sensor 7 maximum

hk[7]: Temperature sensor 7 minimum

hk[8]: Temperature sensor 2 maximum during the transmission

hk[9]: Temperature sensor 2 minimum during the transmission

hk[10]: SAP Current 1, 2

hk[11]: SAP Current 3, 4

hk[12]: SAP Current 5 and System Current

hk[13], hk[14], hk[15], hk[16]: MCAM SEE Data

hk[17]: MCAM maximum

Minor CW Data Set (2)

HK Data (16byte)	SPM Data (32byte)	UOBC Data (6 byte)

SPM Data

Refer SPM document

UOBC Data

UOBC operation status from UOBC1 to UOBC6

Refer 'Decisions Condition of UOBC Session and Telemetry of Decisions Result'

Major FSK Communication

Major FSK Packet Set (132Packet)	Major FSK Packet Set (132Packet)	Non-synchronization Packet (6Packet)	Major FSK Packet Set (132Packet)	Non-synchronization Packet (12Packet)	Major FSK Packet Set (132Packet)

It is transmitted 4 times of Major FSK Packet Set of the same contents.

Non-synchronization Packet

Contents are AX.25 packets and all the contents are 0x00.

Major FSK Packet Set

Packet contents

0 – 7 : UOBC1 (Keio University)

8 – 15 : UOBC2 (Hokkaido Institute of Technology)

16 – 23 : UOBC3 (The University of Electro–Communications)

24 – 31 : UOBC4 (Tokyo University of Science)

32 – 39 : UOBC5 (Tohoku University)

40 – 47 : UOBC6 (Kochi University of Technology)

48 – 53 : SPM (Refer SPM document)

54 – 55 : Temperature data at the time of separation

56 – 57 : Temperature sensor at the time of Major transmission

58 – 65 : Temperature sensor at the time of at the time of idling

66 – 67 : Power supply system data

68 –131 : Image data (JPEG)

FSK Packet Data

FLG 0x7E	Destination 0x40, 0x40, 0x40, 0x40, 0x40, 0x40, 0x60	Source 0x94, 0xa2, 0x62, 0xb4, 0xaa, 0x9c, 0x61	CTRL/PID 0x03, 0xf0	Data 64byte	FSC 2byte	FLG 0x7E

But all the binaries make marking in MSB First.

Data are on the basis of 64byte.

They increase by Bit Staffing.