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MISSION

JPEG And Communication CANSAT

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- JPEG compresses the image data from CMOS CAMERA
- Advanced Success
 - JACSAT take many images while transmitting compressed data.
- Minimum Success
 - JACSAT controls CAMERA / FPGA / SH2 / GPS precisely and transmit compressed data.

JPEG system

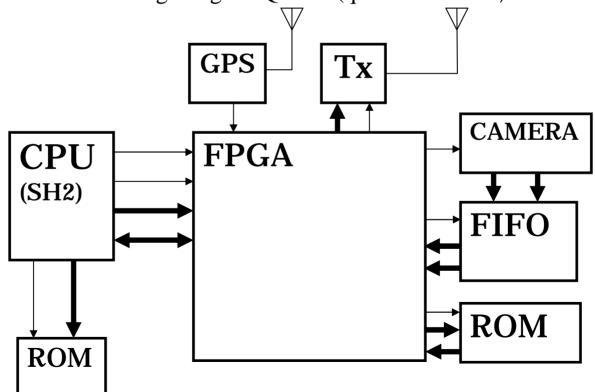
- JPEG means Joint Photographic Experts Group.
- JPEG is technique to compress image data. You can save time to acquire a full picture from a satellite
- JPEG can make the quantity image data into small volume. It would take less time to get one good picture.

No	data(Byte)	compressed rate(%)	note
Low data from CAMERA	153,600		QVGA
Compressed data			
	52,545	34	in a room
2	29,520	19	in a room
3	40,689	27	in a room
4	60,059	40	in a room
5	41,807	28	in a room
6	36,351	23	in a room
7	53,065	35	in a room
8	1,922	1.2	a cloudy sky
9	1,611	1	single color

- No.1~No.7 data was taken in a room.
- Compressed rate is average 30%.
- Space or desert is a little variety of color. Compressed rate would be improved.

System Diagram of JACSAT

- Features
 - 'SH (as CPU) controls FPGA (Field Programmable Gate Array).
 - 'Controller of peripheral devices (GPS, FIFO, CMOS camera, ROM) is realized by FPGA.
 - The size of shooting image is QVGA (quarter of VGA).



Structure & Power

- SIZE 145mm × 238mm
- Mass 1010g
- Open Class
- Material
 CFRP (Carbon Fiber
 Reinforced Plastics)
 aluminium
- Battery $CR-V3(3V) \times 2$
- Voltage transformer
 DCDC (5.0V Step down)
 (3.3V Step down)



Communication

Frequency
 Down Link 430MHz Band

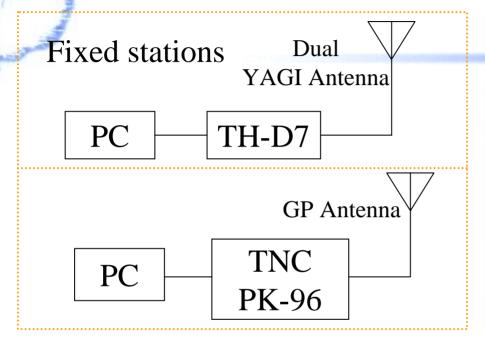
ProtocolAX.25 1200bps

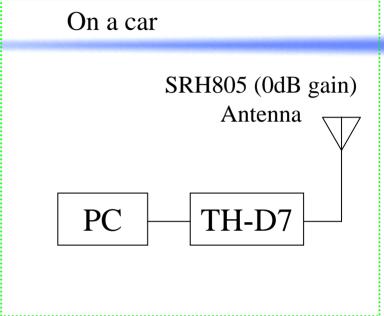
Transmitter
 YAESU VX-2(CanSat)
 KENWOOD TH-D7(Ground Station)

Antenna

Downlink AS-25

Ground Stations





- There are three Ground stations. All Ground stations are for the reception only. Two Ground stations are fixed, and the other is on a car.
- The mobile Ground station is on a car to pick up the landed JACSAT.
- The data are received by three Ground stations in order to unify and analyze it. We try to establish the basic concept of an Ground station for CubeSat.

Result

• JACSAT was

LOST

- We lost the memory data, also. The compressed data could be stored in the memory.
- Microswitch pin did not work properly, then compressed image data could not transmit through the transmitter on line.

MISSING CanSat

- Our satellite lies in Black Rock desert alone.
- Parachute color is Pink and violet.
- Please find out it and save it.
- We need your help!

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Thank you for your attention!