

# JINJUSat-1 Beacon TM Information

## 1. JINJUSat-1 Beacon TM Format

AX.25 Format								Total Data Size
Flag	Type Indicator	AX.25 Transfer Frame Header(16byte)				Information Field	Flag	
		Destination Address	Source Address	Control Bits	Protocol Identifier			
1 Byte	1 Byte	7 Bytes	7 Bytes	1 Byte	1 Byte	TBD	1 Byte	138 Bytes

### Beacon Telemetry Example

C0 00 96 A8 98 8E 9C AA E2 94 92 9C 94 AA A6 63 03 0F 08 02 C6 1A 00 6E 10 03 19 00 65 30 BE 7C 04 01 06 00 00 00 D1 00 00 00 03 19 00 00 30 11 1E 9F 01 8A 01  
 82 01 88 00 00 01 15 00 08 00 A0 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 80 00 08 2D 00 0D 10 00 BE 00 06 00 09 00 12 00 1A 00 1A 00 1A 00 1D 25 E8 FF 9A  
 1E 98 00 33 00 0B 00 64 00 00 00 1E 00 1C 3D 4D 7E 20 BD 72 5B 84 BE 2A B7 28 7C 9E 62 33 C0

## 2. Beacon TM Conversion

구분	Name	Bytes	Description (RAW Ex.)	Conversion Method
AX.25 Header (16 Bytes)	Destination Address	7 Bytes	96 A8 98 8E 9C AA E2	Conversion Table
	Source Address	7 Bytes	94 92 9C 94 AA A6 63	Conversion Table
	Control Bit & Protocol Identifier	2 Bytes	03 0F	
Beacon Header (10 Bytes)	Beacon Header	10 Bytes	08 02 C6 1A 00 6E 10 03 19 00	

OBC Status (20 Bytes)	OBC Time (Epoch Time)	4 Bytes	65 30 BE 7C (unit : s)	Decimal (Unix Time)
	Operating Mode Status	1 Byte	04	01 – Seperation Mode 02 – Seperation Mode 03 – Detumbling Mode 04 –Standby Mode 05 – Comm. Mode 06 – Mission Mode 07 – Low Battery Mode 08 – Safe Hold Mode
	Antenna Deploy Status	1 Byte	00	00 – Not Deploy 01 - Deployed
	OBC # Reset Counter	1 Byte	06	Decimal
	Received Commmand Counter	4 Bytes	00 00 00 D1	Decimal
	Received Command Error Counter	4 Bytes	00 00 00 03	Decimal
	OBC Temperature	1 Byte	19	Decimal from Signed 2's Complement (unit : °C)
	OBC Uptime	4 Bytes	00 00 30 11	Decimal (unit : s)
EPS Status (36 Bytes)	Battery Voltage	2 Bytes	1E 9F	Decimal (unit : mV)
	Solar Panel Input Voltage(1st row)	2 Bytes	01 8A	Decimal (unit : mV)
	Solar Panel Input Voltage(2nd row)	2 Bytes	01 82	Decimal (unit : mV)
	Solar Panel Input Voltage(3rd row)	2 Bytes	01 88	Decimal (unit : mV)
	Total Photo Current	2 Bytes	00 00	Decimal (unit : mA)
	Total System Current	2 Bytes	01 15	Decimal (unit : mA)
	Solar Panel Input Current(1st row)	2 Bytes	00 08	Decimal (unit : mA)
	Solar Panel Input Current(2nd row)	2 Bytes	00 A0	Decimal (unit : mA)
	Solar Panel Input Current(3rd row)	2 Bytes	00 00	Decimal (unit : mA)

	Switch Current Out	2 Bytes	00 01	Decimal		
	Temp. of Boost Converter 1	2 Bytes	00 00	Decimal from Signed 2's Complement (unit : °C)		
	Temp. of Boost Converter 2	2 Bytes	00 00	Decimal from Signed 2's Complement (unit : °C)		
	Temp. of Boost Converter 3	2 Bytes	00 00	Decimal from Signed 2's Complement (unit : °C)		
	Temp. of the Onboard Battery	2 Bytes	00 00	Decimal from Signed 2's Complement (unit : °C)		
	Temp. of External Battery 1	2 Bytes	00 00	Decimal from Signed 2's Complement (unit : °C)		
	Temp. of External Battery 2	2 Bytes	00 00	Decimal from Signed 2's Complement (unit : °C)		
	Power Supply Switch Status	1 Byte	80	Binary : 0000000~11111111		
				Switch Name	Off	On
				5V Ch.1	0	1
				5V Ch.2	0	1
				5V Ch.3	0	1
				3.3V Ch.1	0	1
				3.3V Ch.2	0	1
				3.3V Ch.3	0	1
				BP4 Heater	0	1
	BP4	0	1			
	Battery Heater On/Off (P31u, BP4)	1 Byte	00	Binary : 00~11		
				Heater	Off	On
				P31u	0	1
				BP4	0	1
	Boot Count	2 Bytes	08 2D	Decimal		

MTQ Status (19 Bytes)	MTQ Mode Status	1 Byte	00	00 – idle 01 – SelfTest 02 – Detumble
	Voltage Measurement	2 Bytes	0D 10	Decimal (unit : mV)
	Current Measurement	2 Bytes	00 BE	Decimal (unit : mA)
	Coil X Current	2 Bytes	00 06	Decimal (unit : mA)
	Coil Y Current	2 Bytes	00 09	Decimal (unit : mA)
	Coil Z Current	2 Bytes	00 12	Decimal (unit : mA)
	Coil X Temperature	2 Bytes	00 1A	Decimal from Signed 2's Complement (unit : °C)
	Coil Y Temperature	2 Bytes	00 1A	Decimal from Signed 2's Complement (unit : °C)
	Coil Z Temperature	2 Bytes	00 1A	Decimal from Signed 2's Complement (unit : °C)
	MCU Temperature	2 Bytes	00 1D	Decimal from Signed 2's Complement (unit : °C)
CS Status (18 Bytes)	Doppler Offset	2 Bytes	25 E8	Decimal (unit : Hz)
	RSSI	2 Bytes	FF 9A	Decimal (unit : dBm)
	Voltage	2 Bytes	1E 98	Decimal (unit : mV)
	Total Current	2 Bytes	00 33	Decimal (unit : mA)
	Transmitter Current	2 Bytes	00 0B	Decimal (unit : mA)
	Receiver Current	2 Bytes	00 64	Decimal (unit : mA)
	Power Amp Current	2 Bytes	00 00	Decimal (unit : mA)
	Power Amp Temperature	2 Bytes	00 1E	Decimal from Signed 2's Complement (unit : °C)
	Osc Temperature	2 Bytes	00 1C	Decimal from Signed 2's Complement

				(unit : °C)
IFB Status (12 Bytes)	X gyroscope	4 bytes	3D 4D 7E 20	4Byte Float Type (unit : deg/s)
	Y gyroscope	4 Bytes	BD 72 5B 84	4Byte Float Type (unit : deg/s)
	Z gyroscope	4 Bytes	BE 2A B7 28	4Byte Float Type (unit : deg/s)
Beacon Footer (4 Bytes)	Beacon Footer	4 Bytes	7C 9E 62 33	
Total Telemetry Bytes		135 Bytes		

※ Conversion Table (For Destination, Source Address)

Alphabet	Hex code	Shifted Hex code
A	41	82
B	42	84
C	43	86
D	44	88
E	45	8A
F	46	8C
G	47	8E
H	48	90
I	49	92
J	4A	94
K	4B	96
L	4C	98
M	4D	9A
N	4E	9C
O	4F	9E
P	50	A0

Q	51	A2
R	52	A4
S	53	A6
T	54	A8
U	55	AA
V	56	AC
W	57	AE
X	58	B0
Y	59	B2
Z	5A	B4

Number	Hex code	Shifted Hex code
0	30	60
1	31	62
2	32	64
3	33	66
4	34	68
5	35	6A
6	36	6C
7	37	6E
8	38	70
9	39	72
10	3A	74
11	3B	76
12	3C	78
13	3D	7A
14	3E	7C
15	3F	7E
Blank	20	40

- **References**

1. **e-st@r-II Program : Commands and Telemetry Document**
2. **ISIS iMTQ User Manual**
3. **ISIS Antenna System User Manual**
4. **ISIS TRxVU User Manual**
5. **Gomspace P31u User Manual**