## FM packet format

FITSAT-1 stores 90 data. Each data consists of 10 telemetries. One Ax.25 packet send 6 data at a time.

| Call sign | No. | data [120byte] | | | | | |
|---|---|---|---|---|---|---|---|
| JG6YEW>JG6YEW: | S01 | Data1 | Data2 | Data3 | Data4 | Data5 | Data6 |
| JG6YEW>JG6YEW: | S02 | Data7 | Data8 | Data9 | Data10 | Data11 | Data12 |

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| JG6YEW>JG6YEW: | S0F | Data85 | Data86 | Data87 | Data88 | Data89 | Data90 |
|---|---|---|---|---|---|---|---|

If the packet number is started with "S", it means second sampling mode to examine movement of satellite from voltage of each solar panel.. If the packet number is started with "T", it means minute sampling mode to examine mainly temperature.

Format of each Data

## S01～S0F（second sampling mode）

| s31 | s32 | s33 | s34 | s12 | s13 | s14 | s21 | s22 | s23 |
|---|---|---|---|---|---|---|---|---|---|

## T01～T0F（minute sampling mode）

| s41 | s42 | s43 | s44 | s12 | s13 | s14 | s21 | s22 | s23 |
|---|---|---|---|---|---|---|---|---|---|

s31 : Voltage of solar cell ＋X side
s32 : Voltage of solar cell ＋Y side
s33 : Voltage of solar cell －X side
s34 : Voltage of solar cell －Y side

s41 : Temperature of 3 series battery

s42 : Temperature of single battery

s43 : Temperature of ＋Z side

s44 : Temperature of －Z side

s12 : Total voltage of solar cells

s13 : Total current of solar cells


s14 : Voltage of   single battery

s21 : Current of single battery

s22 : Voltage of 3 series battery

s23 : Current of 3 series battery



**FM-data conversion**

Each data is 2 byte Hex decimal

e.g.   3B = 3 * 16 + 11 = 59


for : s31, s32, s33, s34

  voltage of solar cell = s3 * (4.5 / 256) * 2 [V]


for   s41, s42, s43, s44 :

   temperature = (s4 * (4.5 / 256) − 0.5) / 0.01 [℃]


s12: voltage of solar cells (total)   = s12 * (4.5 / 256)[V]


s13:current of solar cells (total) = s13 * (4.5 / 256) * 0.4 * 1000[mA]


s14: Voltage of single battery = s14 * (4.5 / 256)[V]


s21: Current of single battery

   X = s21 * (4.5 / 256)−2.5

if   X ＞ 0

   Discharge current  = (s21 * 4.5 / 256)−2.5) * 0.4 * 1000 [mA]


if   X ＜ 0

   Charge current = (s21 * (4.5 / 256)−2.5) * 0.4 * 1000  [mA]

if  X = 0

    Current of single battery = 0 [mA]


s22: Voltage of 3 series batteries = s23 *(4.5 / 256) * 3 [V]


s23: Current of 3 series batteries

   X = s24 * (4.5 / 256) − 2.5

if X >= 0.03125

   Discharge current = (s23 * (4.5 / 256) − 2.5) * 10 * 1000 [mA]

if X <= −0.039

  Charge current  = (s23 * (4.5 / 256) − 2.5) * 0.1 * 1000[mA]

if  −0.039 < X < 0.03125

  Current of 3 series batteries = 0 [mA]