UniSat (AlfaSat) Flight Mission (2021-June)

Required Devices & Tools Checklist

- [ ] Notebook 1 (Default GS) + Power Adapter
- [ ] Notebook 2 (Alternative GS 1) + Power Adapter
- [ ] Notebook 3 (Alternative GS2) + Power Adapter
- [ ] GS Module 1 + USB Type C Cable (default GS)
- [ ] GS Module 2 + USB Type C Cable (alternative GS 1)
- [ ] GS Module 3 + USB Type C Cable (alternative GS 2)
- [ ] GS Antenna 1
- [ ] GS Antenna 2
- [ ] GS Antenna 3
- [ ] HDMI Monitor
- [ ] Mini HDMI -> HDMI Cable
- [ ] USB-Android Cable for powering HDMI Monitor
- [ ] 4 pin to USB hub connector cable
- [ ] USB-A Hub
- [ ] USB Wi-Fi
- [ ] USB (Wireless or Wired) Keyboard
- [ ] USB (Wireless or Wired) Mouse
- [ ] Powerbank * 2
- [ ] Multimeter
- [ ] Screwdrivers
- [ ] SD Card with OBC system * 2 (1 default , 1 alternative)

- [ ] Gas Cylinder
- [ ] Ballon
- [ ] Rope (for fixing the satellite)
- [ ] Parachute
- [ ] Beeline Wifi Modem
- [ ] Energy Drinks (or Water)
- [ ] Food

Required Commands In Advance

CMD to Set Flight Height UP

UP `2500` Meters

```
D2 00 0C 95 03 01 03 02 0A 00 C4 09 00 00 03 1F 47
```

```
$D2$00$0C$95$03$01$03$02$0A$00$C4$09$00$00$03$1F$47
```

CMD to Set Flight Height DOWN

DOWN `2400` Meters

```
D2 00 0C 95 04 01 03 03 0A 00 60 09 00 00 02 74 E6
```

```
$D2$00$0C$95$04$01$03$03$0A$00$60$09$00$00$02$74$E6
```

CMD to Save Settings

```
D2 00 01 97 79 62
```

```
$D2$00$01$97$79$62
```

CMD to Explode the Ball (ON)

```
D3 00 03 88 00 00 93 D6
```

CMD to OFF Explosion

```
D3 00 03 87 00 00 A3 D5
```

CMD to Retrieve GPS Data (FULL)

```
D2 00 01 91 F9 60
```

```
$D2$00$01$91$F9$60
```

Explanation:

```
D2     00 01       91             F9 60
|\        |        |                |
GS TRX   LEN    1001 0001 (0x91)    CRC
                0001 0001 (0x11)
```

CMD 0x11 —

Название: Получить навигационные данные (полный)

Примечание: Основные настройки

На вход, байт: 0

На выходе, байт: **14**

CMD 0x11 Data (0x0A) —

Data	Данные	Calc	Data type	Length	Unit
Latitude	Широта	--	`float`	4	°
Longitude	Долгота	--	`float`	4	°
Height	Высота	--	`uint 16`	2	m
Speed	Скорость	/10	`uint 16`	2	m/s
Direction	Направление	/10	`unit 16`	2	°

Example Respond :

```
2D      00 11           7F         01        0A          88 DE 2C 42   68 D9 99 42
81 03
|\          |            |          |         |            (LE)|         (LE)|
|
TRX GS    LEN(17)  CMD Exe Status  01-ok  GPS DATA (14)   42 2C DE 88   42 99 D9 68
03 81
                                                         43.2173157    76.92462
897m


00 00    6F 07              06 47
  |        |                  |
 0/10    07 6F               CRC
 0 m/s   1903
         1903/10 = 190.3
```

CMD to Periodic Retrieve GPS Data

Retrieve GPS Data Every 10 Seconds *(Not Recommended)*

```
D2 00 0C 95 00 01 0D 00 0A 00 03 00 00 00 00 2B F6
```

Retrieve GPS Data Every 30 Seconds *(Recommended)*

```
D2 00 0C 95 00 01 0D 00 1E 00 03 00 00 00 00 7F F7
```

Explanation:

0x95 — 1001 0101 == 0001 0101 -> 0x15

CMD 0x15 —

Название: Установить настройки канала планировщика

На вход, байт: **11**

CMD 0x15 Data —

Data	Данные	Range	Data type	Length	Unit
Scheduler Channel	Канал планировщика	0..15	`uint8`	1	N/A
State	Состояние	0..1	`bool`	1	N/A
Device Node	Конечный узел	00..0D	`uint8`	1	N/A
Mode 0 - periodic retrive	Условие 0-периодическая отправка	00 01 02 03 04	`uint8`	1	N/A
Period	Период	0..3600	`uint16`	2	Second
Mask	Маска	N/A	`uint32`	4	N/A
Custom Function	Пользовательская функция	1 2 3	`uint8`	1	N/A

Example :

D2 00 0C 95 00 01 0D 00 1E 00 03 00 00 00 00 7F F7

1E 00 == DEC 30 == 30 Second Period