

# Uplift Desk Automation

## Message Syntax

### Transmit

A transmitted message has the following syntax.

```
0xF1, 0xF1, <cmd>, 0x00, <crc>, 0x7E
```

- `0xF1, 0xF1` indicates the message start
- `cmd` is one of:
  - `0x01` - Up
  - `0x02` - Down
  - `0x03` - Save preset 1
  - `0x04` - Save preset 2
  - `0x05` - Recall preset 1
  - `0x06` - Recall preset 2
  - `0x07` - Sync
  - `0x25` - Save preset 3
  - `0x26` - Save preset 4
  - `0x27` - Recall preset 3
  - `0x28` - Recall preset 4
  - `0x2B` - Stop
- `crc` is the sum of the bytes at index 2 and 3.
- `0x7E` indicates the end of message.

### Receive

A received message has the following syntax.

```
0xF2, 0xF2, <cmd>, <len>, <data...>, 0x0F, <crc>, 0x7E
```

- `0xF2, 0xF2` indicates the message start
- `cmd` is one of:
  - `0x01` - Height value
  - `0x25` - Preset 1 height
  - `0x26` - Preset 2 height
  - `0x27` - Preset 3 height
  - `0x28` - Preset 4 height
- `len` indicates how many messages will be sent next, excluding the CRC and EOT.
- `data` will contain the incoming data values, explained for height readings below.

- `0x0F` - Unknown
- `crc` will be the sum of bytes at index 2 up to the CRC.
- `0x7E` indicates the end of message.

## Example: Received Height Reading

When a new height value comes in, the message will look something like this:

```
0xF2, 0xF2, 0x01, 0x03, 0x01, 0x1B, 0x0F, 0x2F, 0x7E
```

In this case, the desk was at 28.3". Here is how we can calculate that.

1. First off, the command is `0x01`, so we know we're about to receive height data.
2. The next byte tells us to listen for 3 data bytes.
3. The relevant data comes in as `0x01, 0x1B`. This will be converted to a height value later. (Unclear what `0x2F` does here)
4. Then, we add all of the previous bytes (other than the header) to verify the CRC is correct.  

$$0x01 + 0x03 + 0x01 + 0x1B + 0x0F = 0x2F$$
5. The actual height is a two-byte word, so the first number needs to be bitshifted. In this example, we received `0x01, 0x1B`, so the height calculation looks like:  $0x01 \ll 8 \mid 0x1B = 283$ .
6. Divide the received value by 10 to convert to inches. The result is  $283 / 10.0 = 28.3\text{in}$ .

## Preset Heights

A sync request will get a response with cmd `0x25, 0x26, 0x27, 0x28`, then a regular `0x01` height. The `0x01` value is understood, but the preset height values are not yet understood. There is a two-word response, and the words change with the saved height value. The second word seems to be a decimal. I have not yet determined how to parse these into the stored heights.

Here is a table of example values. For heights that are the same, I would slightly adjust the table height and save again. The changed values suggest these are more specific than inches.

Height	<code>data[4]</code>	<code>data[5]</code>
25.3	20	5
25.3	20	8
25.3	20	11
25.3	20	54
28.3	25	62
28.3	25	67
28.3	25	82
38.?	42	207
39.9	45	153
39.9	45	156
40.0	45	168
42.4	50	7
42.8	50	188

Height	data[4]	data[5]
42.9	50	231
43.0	51	8
43.1	51	27
43.2	51	104
50.8	64	161

# References

## Hardware

1. ["2ANKDJCP35NBLT Bluetooth Box by ZHEJIANG JIECANG LINEAR MOTION TECHNOLOGY CO., LTD"](#). (2018, January 25). FCC ID. Retrieved January 19, 2021.
2. [Jiecang Bluetooth Dongle Product Listing](#). Retrieved January 19, 2021.

## Images from /u/deadman96385

1. <https://imgur.com/a/MUbxwnM>
2. <https://i.imgur.com/DyMf3Ee.jpg>
3. <https://i.imgur.com/KtsWpVQ.jpg>
4. <https://i.imgur.com/BS62C1E.jpg>
5. <https://i.imgur.com/woWoQMe.jpg>
6. <https://i.imgur.com/Lta5Nab.jpg>

## Software

1. Justintout. (2020, April 16). GitHub - ["justintout/uplift-reconnect: A Flutter app to control Uplift desks with Uplift Connect BLE modules installed"](#). GitHub. Retrieved January 19, 2021.
2. Deadman96385. (2020, March 6). ["uplift\\_desk\\_controller\\_app/BluetoothHandler.java at a58bcadfb77ac993751758465f1cf20f71d6d8fd · deadman96385/uplift\\_desk\\_controller\\_app"](#). GitHub. Retrieved January 23, 2021.
3. Phord. (2021, August 12). ["phord/Jarvis: Hacking the Jarvis standup desk from fully.com for home automation using an ESP8266 arduino interface"](#). GitHub. Retrieved December 5, 2021.
4. Ramot, Y. (2015, February 4). ["UpLift Desk wifi link"](#). Hackaday.io.
5. Horacek, L. (2019, April 14). ["Standing desk remote control"](#). Hackaday.io.
6. Hunleth, F. (2019, January 18). ["Nerves At Home: Controlling a Desk"](#). Embedded Elixir. Retrieved January 2021.