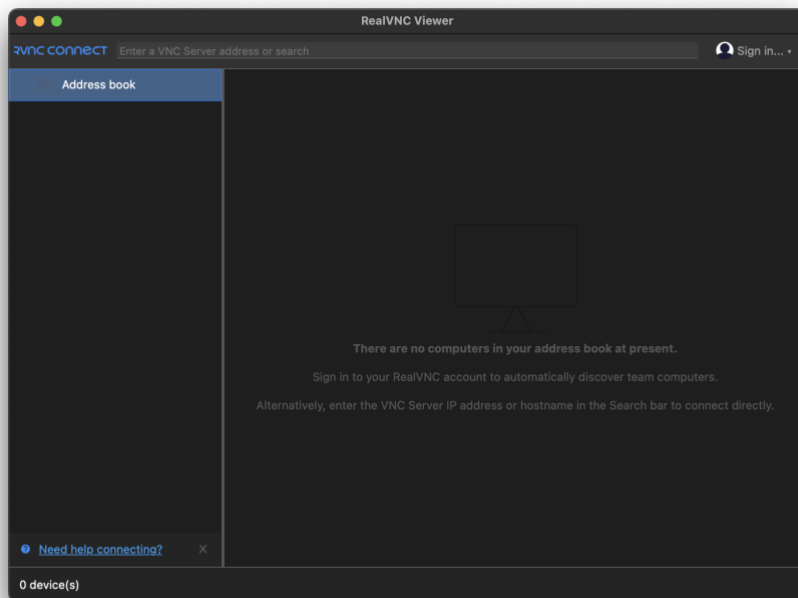


# METAR Map's Guide for Andy

## v2.0

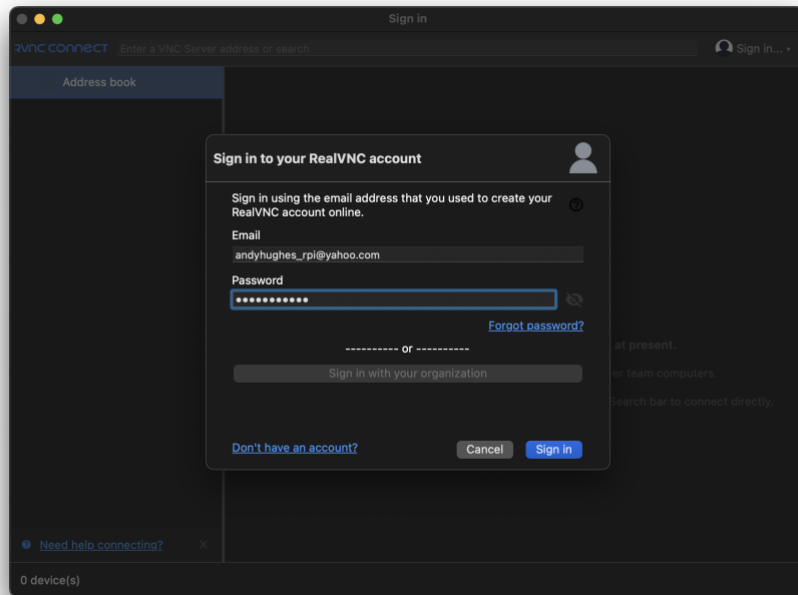
### 1. Wi-Fi Connection

- 1.1. The little computer is called a "Raspberry Pi" (model 4B) running on a Linux desktop. Once powered on and booted up (which takes up to a minute), it automatically connects to your Wi-Fi with the network name and password already stored in the Raspberry Pi.
- 1.2. Upon start, Raspberry Pi is already running a VNC Server awaiting a wireless connection. One needs to know the IP address of the Raspberry Pi, to be explained below.
- 1.3. To control the METAR Map and the Raspberry Pi, use the Real VNC Viewer APP. Starting with the preferred way:
  - 1.3.1. Install the RealVNC Viewer APP on your personal computer, iPad, or iPhone. The website is:  
<https://www.realvnc.com/en/connect/download/combined/>  
For iPhone or iPad, the APP can also be found in the Apple APP Store.
  - 1.3.2. Open RealVNC Viewer or VNC Viewer.



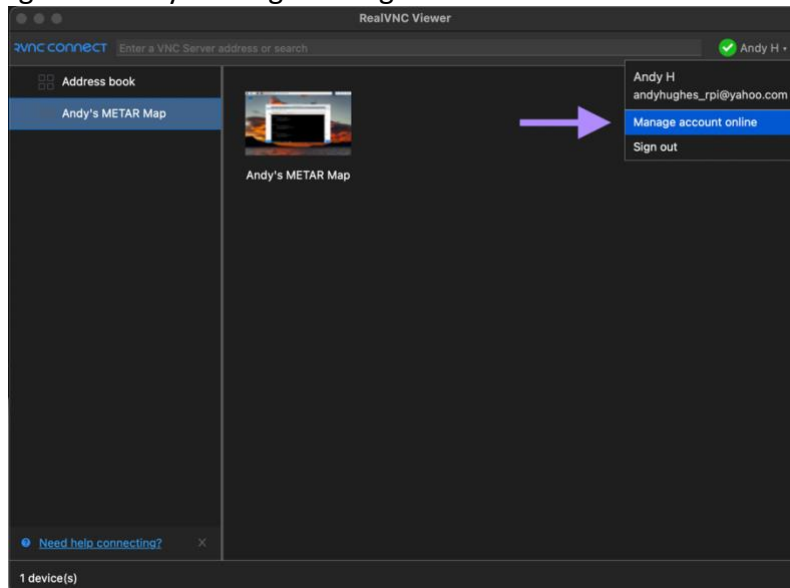
- 1.3.3. Sign in with a (free lite) account I have registered for you:  
[andyhughes\\_rpi@yahoo.com](mailto:andyhughes_rpi@yahoo.com)

and password  
123@qwe@ASD



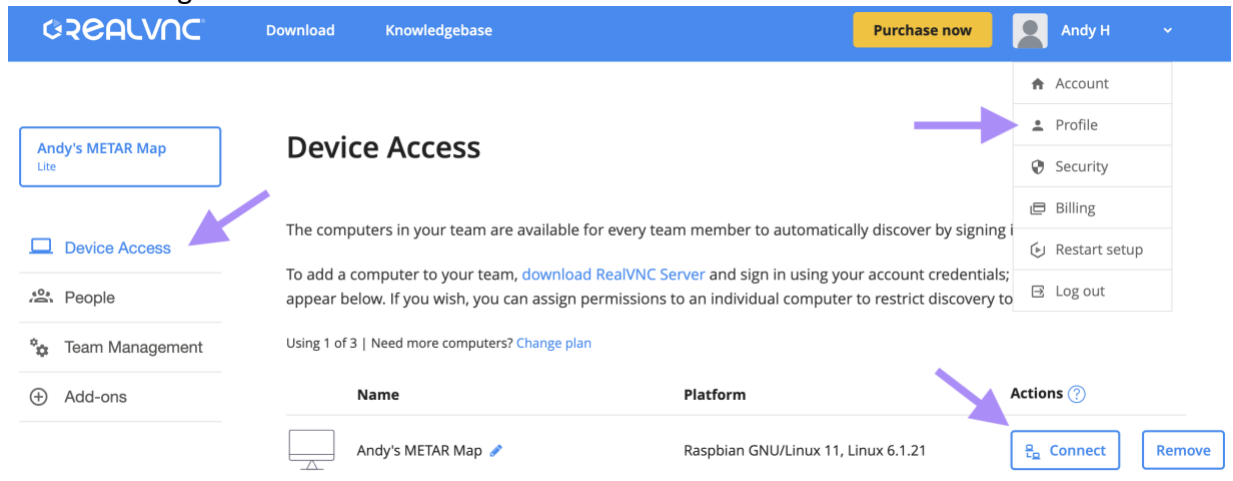
The yahoo.com email was registered with the same password. Feel free to change it. This email is yours.

- 1.3.4. You may change the login password of your Real VNC account and the phone number used for registration by clicking “Manage account online.”

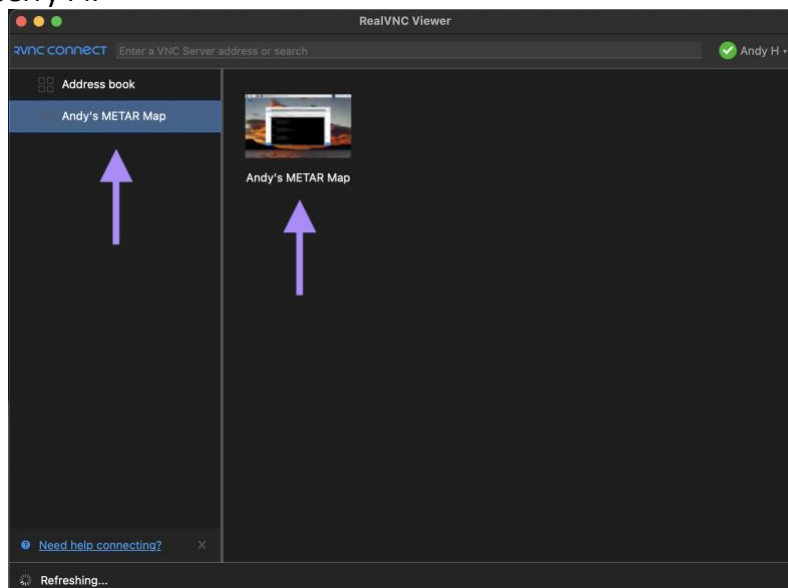


*Let me know in case I need to receive a one-time verification code in a text message. Hopefully, this never happens.*

- 1.3.5. (You may skip this step to 1.3.8) If you click “Manage account online,” you may navigate to the following webpage, where you can change your profile and access your devices running a VNC Server.



- 1.3.6. (You may skip this step to 1.3.8) By the way, this webpage offers an alternative way to connect to your EMTAR Map’s Raspberry Pi from your personal computer. Simply click “Connect” from the above webpage interface, and your internet browser may prompt you to open your VNC Viewer if you have installed the application. Otherwise, it may remind you to install the application. *Note: This may not work on iPhone or iPad (you can try if curious enough), but it is not necessary.*
- 1.3.7. Inside RealVNC Viewer, Click “Andy’s METAR Map” to wirelessly enter the desktop of the Raspberry Pi:



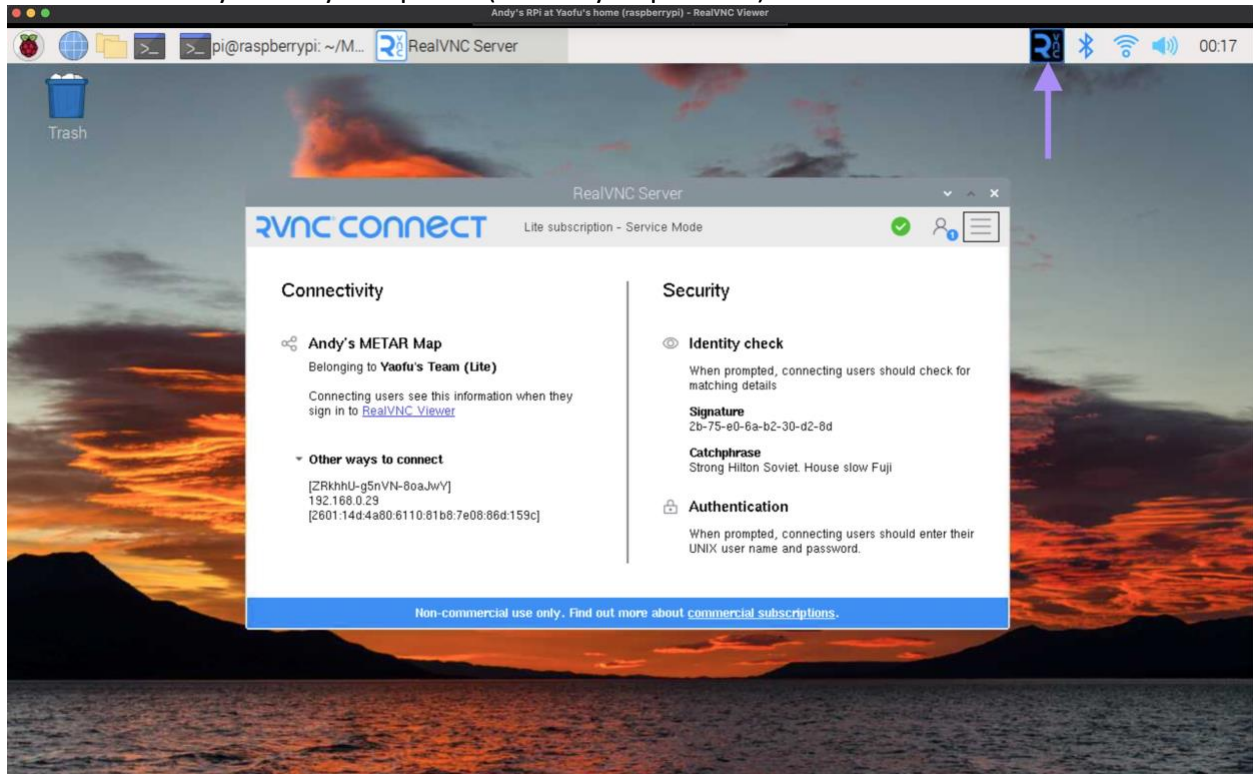
A couple of dialog windows may appear when you try to enter your Raspberry Pi for the first time. When prompted, enter the username:

pi

and password:  
admin

What we have done so far is to connect to your Raspberry Pi wirelessly without knowing its IP address explicitly. Simply put, upon Wi-Fi and internet connection, the RealVNC Server on your Raspberry Pi updates your Raspberry Pi's IP address to your RealVNC account, and the IP address gets accessed when you log in from your RealVNC Viewer.

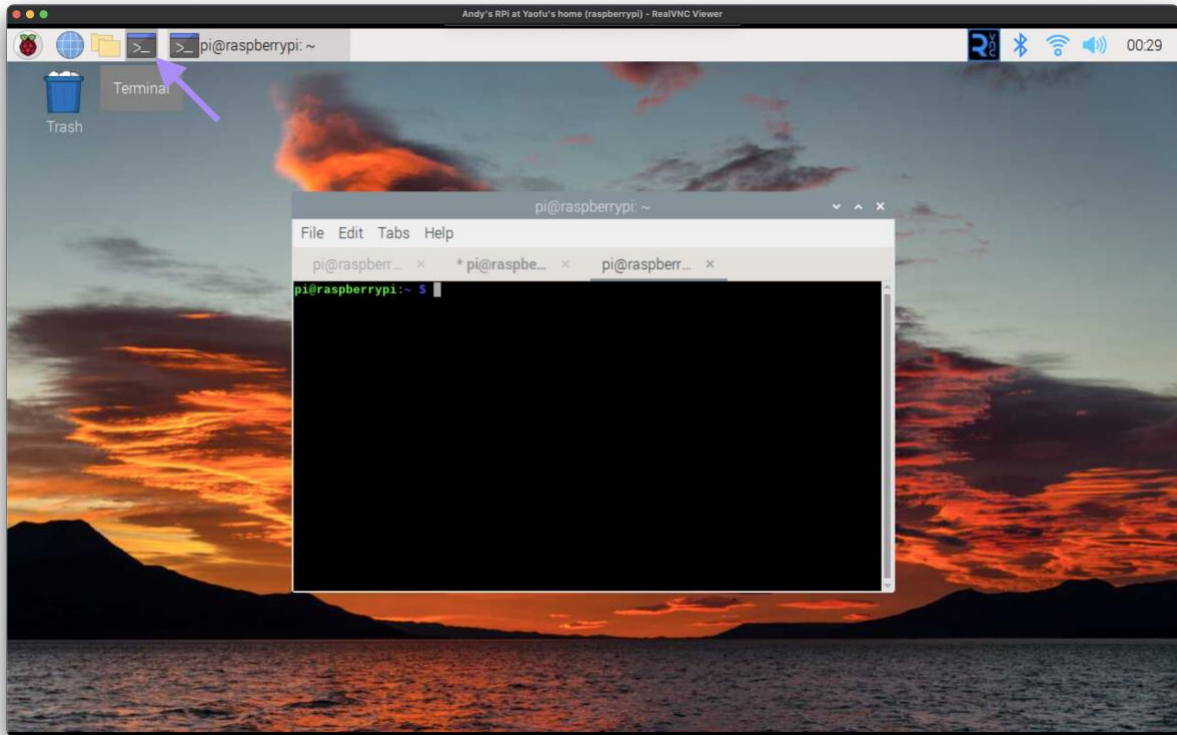
1.3.8. Once you see your Raspberry Pi desktop, you can interact with your Raspberry Pi wirelessly like any computer. (You may skip to 1.4.)



If you click on the RealVNC Server icon at the top right corner of the desktop, you can indeed find “Andy’s METAR Map” broadcasting its IP address ~~192.168.0.29~~. This address is not a constant and may vary over time.

## 2. Control METAR Map

2.1. To control your METAR Map, open a Terminal:



2.2. Type the command

```
ls
```

and press ENTER. The terminal will list the content in your home directory. We should expect to see METARMap among the displayed.

2.3. Type the command

```
cd METARMap
```

and press ENTER. We are now inside the METARMap folder. You can always use the `ls` command to show the content of the current folder.

2.4. To turn on the LEDs, type the command

```
./on.sh
```

and press ENTER. The LEDs may not turn on immediately as it will take a few minutes to download the latest sun times information. Once that is done, the LEDs should work as before. Hopefully, during dusk and dawn, the LEDs will automatically dim and brighten according to the local time they represent! The latest sun times information will be updated automatically once a day behind the scene, and upon turning off the LEDs, so you do not need to wait a few minutes very often.

2.5. To turn off the LEDs, type the command

```
./off.sh
```

and press ENTER. The latest sun times information will be updated automatically.

**Note:** When using

`./on.sh`

and

`./off.sh` ,

you have to be already inside the METARMap/ directory. When you open a fresh Terminal, by default, you are in your home directory. Before turning on and off the LEDs, simply Type the command

`cd METARMap`

and press ENTER to enter the METARMap/ directory. Then, you can use

`./on.sh`

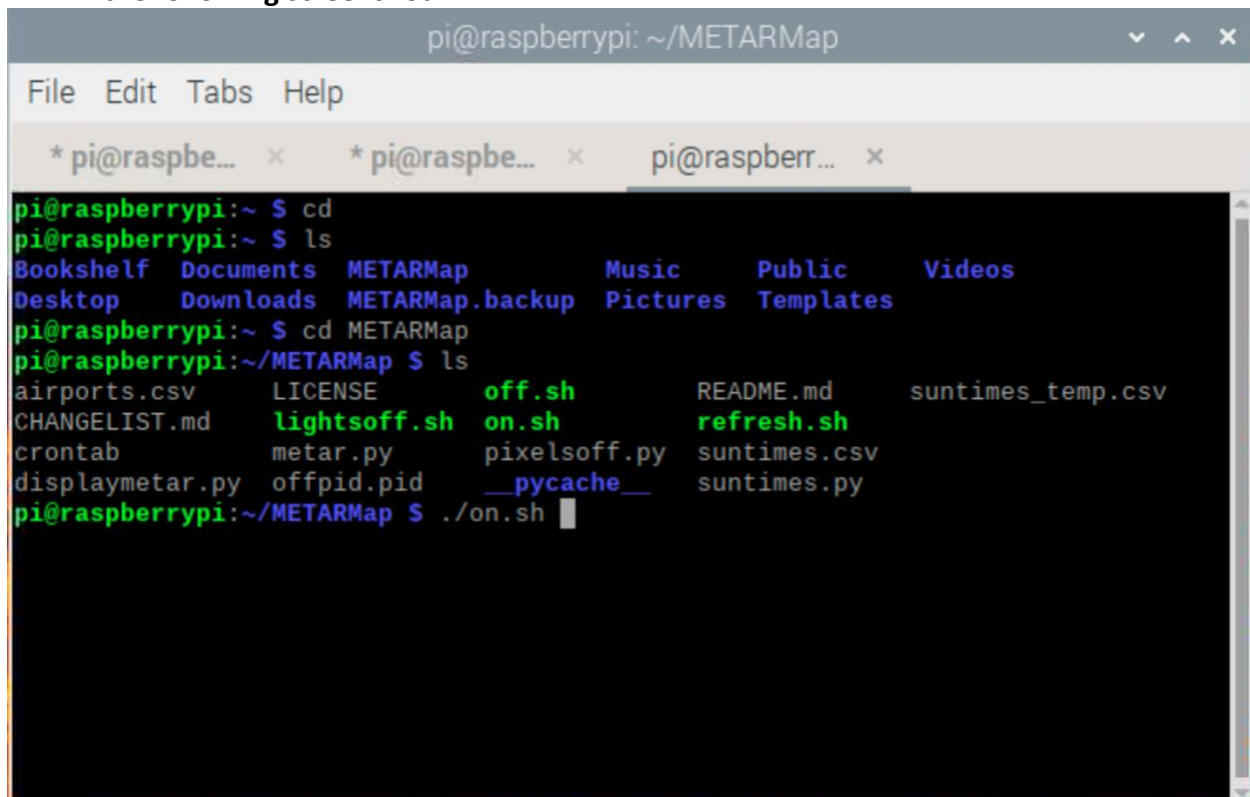
and

`./off.sh` .

If you are not sure where you are in the Terminal, entering

`cd`

will bring you to your home directory. The commands introduced can be reviewed in the following screenshot:



```
pi@raspberrypi: ~/METARMap
File Edit Tabs Help
* pi@raspbe... x * pi@raspbe... x pi@raspberr... x
pi@raspberrypi:~ $ cd
pi@raspberrypi:~ $ ls
Bookshelf Documents METARMap Music Public Videos
Desktop Downloads METARMap.backup Pictures Templates
pi@raspberrypi:~ $ cd METARMap
pi@raspberrypi:~/METARMap $ ls
airports.csv LICENSE off.sh README.md suntimes_temp.csv
CHANGELIST.md lightsoff.sh on.sh refresh.sh
crontab metar.py pixelsoff.py suntimes.csv
displaymetar.py offpid.pid __pycache__ suntimes.py
pi@raspberrypi:~/METARMap $ ./on.sh
```

Notice that ~ denotes your home directory.

### 3. Update METAR Map

3.1. I have maintained a copy of your codes on my GitHub. You can always let me know your complaints and changes you wish to make, such as (wind) conditions for the LEDs to blink and brightness adjustments.

3.2. Once I have fixed a bug or updated the codes according to your demands, you may sync your codes with my GitHub.

3.3. Enter the command

```
sudo apt-get update
```

followed by

```
sudo apt-get upgrade
```

This step is not always necessary, but it updates packages on your Raspberry Pi, which will take a few minutes.

3.4. Enter the following commands:

```
cd
```

<--- In case you are lost

```
cd METARMap
```

<--- Enter the METARMap/ directory

```
git checkout Andy_H_branch
```

<--- Make sure you sync the codes specific to you

```
git pull
```

<--- Sync codes against the latest version on GitHub

```
chmod +x on.sh
```

<--- Give on . sh permission to execute

```
chmod +x off.sh
```

<--- Give off . sh permission to execute

## Appendix

### Wire Connections:



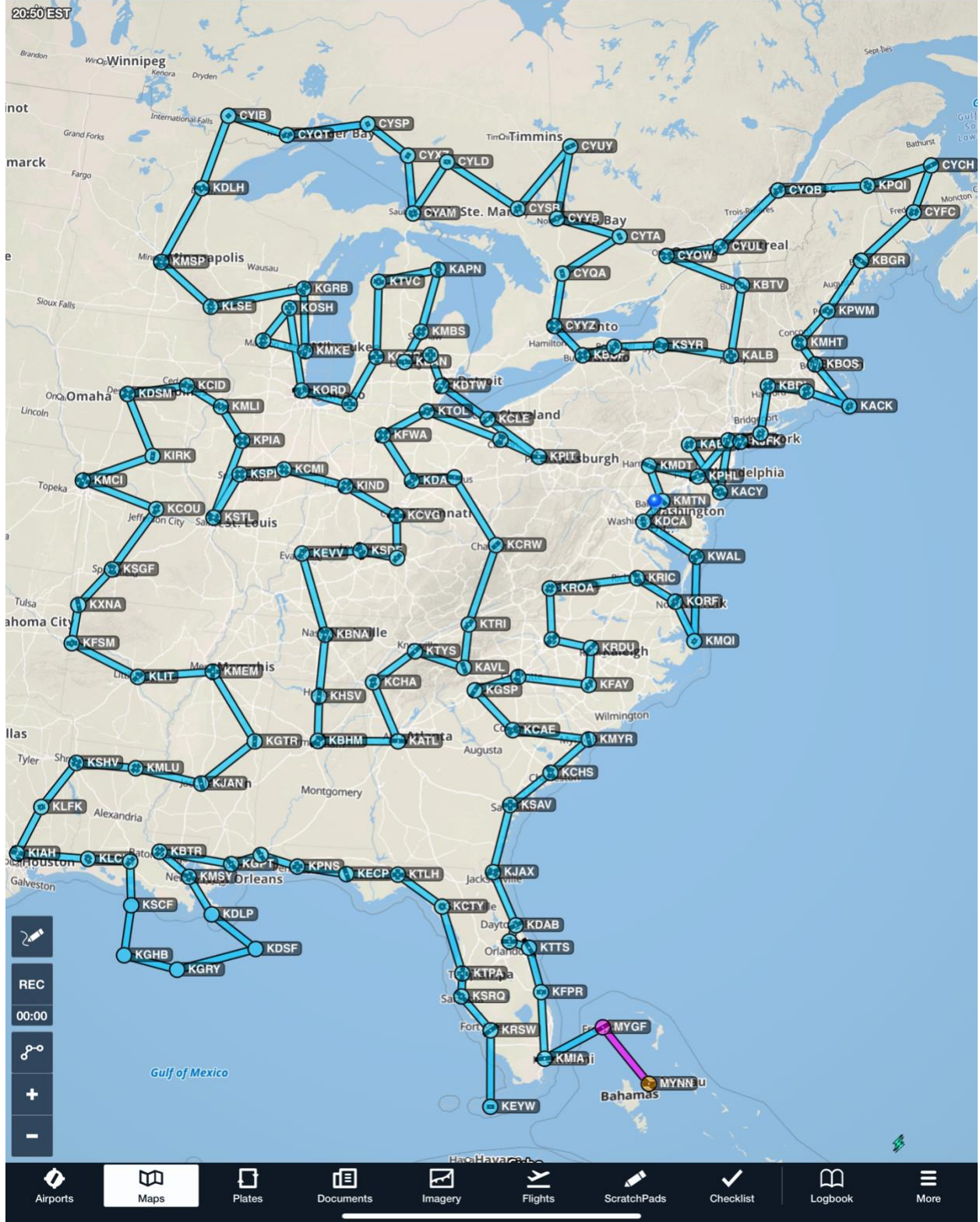




## **LED Wiring Sequence**

The wiring of the LEDs is shown in the screenshot and a numbered list of the airports is shown below. The same numbers can be seen next to the LEDs on the foamboard of the map. Again, please do not hesitate to contact me if you need any assistance.

20:50 EST



|    |      |
|----|------|
| 1  | MYNN |
| 2  | MYGF |
| 3  | KMIA |
| 4  | KFPR |
| 5  | KTTS |
| 6  | KSFB |
| 7  | KDAB |
| 8  | KJAX |
| 9  | KSAV |
| 10 | KCHS |
| 11 | KMYR |
| 12 | KCAE |
| 13 | KGSP |
| 14 | KCLT |
| 15 | KFAY |
| 16 | KRDU |
| 17 | KGSO |
| 18 | KROA |
| 19 | KRIC |
| 20 | KORF |
| 21 | KMQI |
| 22 | KWAL |
| 23 | KDCA |
| 24 | KMTN |
| 25 | KMDT |
| 26 | KPHL |
| 27 | KEWR |
| 28 | KACY |
| 29 | KABE |
| 30 | KJFK |
| 31 | KISP |
| 32 | KBDL |
| 33 | KPVD |
| 34 | KACK |
| 35 | KBOS |
| 36 | KMHT |
| 37 | KPWM |
| 38 | KBGR |
| 39 | CYFC |
| 40 | CYCH |
| 41 | KPQI |
| 42 | CYQB |
| 43 | CYUL |
| 44 | CYOW |

|    |      |
|----|------|
| 45 | KBTB |
| 46 | KALB |
| 47 | KSYR |
| 48 | KROC |
| 49 | KBUF |
| 50 | CYYZ |
| 51 | CYQA |
| 52 | CYTA |
| 53 | CYYB |
| 54 | CYUY |
| 55 | CYSB |
| 56 | CYLD |
| 57 | CYAM |
| 58 | CYXZ |
| 59 | CYSP |
| 60 | CYQT |
| 61 | CYIB |
| 62 | KDLH |
| 63 | KMSP |
| 64 | KLSE |
| 65 | KGRB |
| 66 | KMKE |
| 67 | KMSN |
| 68 | KOSH |
| 69 | KORD |
| 70 | KSBN |
| 71 | KGRR |
| 72 | KTVB |
| 73 | KAPN |
| 74 | KMBS |
| 75 | KLAN |
| 76 | KFNT |
| 77 | KDTW |
| 78 | KCLE |
| 79 | KPIT |
| 80 | KCAK |
| 81 | KTOL |
| 82 | KFWA |
| 83 | KDAY |
| 84 | KCMH |
| 85 | KCRW |
| 86 | KTRI |
| 87 | KAVL |
| 88 | KTYS |

|     |      |
|-----|------|
| 89  | KCHA |
| 90  | KATL |
| 91  | KBHM |
| 92  | KHSV |
| 93  | KBNA |
| 94  | KEVV |
| 95  | KSDF |
| 96  | KLEX |
| 97  | KCVG |
| 98  | KIND |
| 99  | KCMI |
| 100 | KSPI |
| 101 | KSTL |
| 102 | KPIA |
| 103 | KMLI |
| 104 | KCID |
| 105 | KDSM |
| 106 | KIRK |
| 107 | KMCI |
| 108 | KCOU |
| 109 | KSGF |
| 110 | KXNA |
| 111 | KFSM |
| 112 | KLIT |
| 113 | KMEM |
| 114 | KGTR |
| 115 | KJAN |
| 116 | KMLU |
| 117 | KSHV |
| 118 | KLFK |
| 119 | KIAH |
| 120 | KLCH |
| 121 | KLFT |
| 122 | KSCF |
| 123 | KGHB |
| 124 | KGRY |
| 125 | KDLP |
| 126 | KDSF |
| 127 | KMSY |
| 128 | KBTR |
| 129 | KGPT |
| 130 | KMOB |
| 131 | KPNS |
| 132 | KECP |

|     |      |
|-----|------|
| 133 | CTLH |
| 134 | KCTY |
| 135 | KTPA |
| 136 | KSRQ |
| 137 | KRSW |
| 138 | KEYW |
| 139 | NULL |
| 140 | NULL |
| 141 | NULL |
| 142 | NULL |
| 143 | NULL |
| 144 | NULL |
| 145 | NULL |
| 146 | NULL |
| 147 | NULL |
| 148 | NULL |
| 149 | NULL |
| 150 | NULL |