A.L.FR.E.D (Alfred Lets FRiends Enter the Door) is the Hackspace Door entry robot.

It is comprised of:

- A.L.F.I.E (ALFRED's Longed-For Internal Electronics) - Electronics board for interfacing with the RFID reader and the intercom system.
- A.L.F (ALFIE's Logic Functions) - Software to run on ALFIE and control it's hardware.
- F.R.E.D (Function for Realtime Entry Decisions) - Python software that runs on a Raspberry Pi, receives readings from ALFIE, and checks if the card is allowed access.

He is hooked into the intercom for the front door, provides buttons and RFID access to open the door to the Hackspace at number 42.

Existing System Components

RFID Reader

- HID RP15 Multiclass RFID reader. Will read 13.56mhz rfid cards.
- http://www.hidglobal.com/prod_detail.php?prod_id=138
- 5-16V DC
- Standby 85mA
- Peak 139mA

Pinout

As read from the back of the reader.

1. BEEPER (YEL)
2. HOLD (BLU)
3. TAMPER (VIO)
4. DATA1 (WHT)
5. DATA0 (GRN)
6. GRN LED (ORN)
7. RED LED (BRN)
8. +VDC (RED)
9. GND (BLK)
10. SHLD (DR)

Intercom System

Intercom Terminals

Letter	Function	Colour (a)	Colour (b)	Intercom Terminal
I	Call	Green & Yellow	Both Greens	None
R	Microphone	Black	Blue with White	1
O	Common	Blue	White with Blue	3
T	Speaker	White	Orange with White	2

Letter	Function	Colour (a)	Colour (b)	Intercom Terminal
Z	Lock	Red	White with Orange	5

Using the intercom

- Connect O and Z to open door
- When the buzzer is pressed, 12V AC at 50Hz is available between O and I

A.L.F.I.E

thumb thumb The schematics and board can be downloaded from Bob's Github.

The Board is designed around a Minimus 32k, as we have just bought a big pile of them. It has:

- A 10 pin connector that connects to the RFID reader.
- 2x 3A connections for control of DC sources.
- 2x Relays for opening the inner and outer doors.
- A bridge rectifier and LM7805 for detecting when the buzzer is pressed.
- An expansion port for future additions.

A.L.F

The software to run on the minimus is written in C & C++, and uses LUFA to act as a USB serial device. It is currently available on the HACMan github. To make modifications, either fork and send a pull request on github, or send patches to Bob.

F.R.E.D

This program runs on the raspberry pi. It is a python script, which checks membership status against a list, and also controls the doorbell. It is currently available on the HACMan github. To make modifications, either fork and send a pull request on github, or send patches to Bob.

MQTT

FRED publishes the following MQTT topics:

- **door/+/rebooted** - When a doorbot is rebooted, this is broadcast
- **door/+/opened/username** - When a doorbot is opened by RFID, this is broadcast. The payload is set to the user's username.
- **door/+/invalidcard** - When an unknown RFID tag is presented at the door, this is broadcast.

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- **door/outer/buzzer** - While the buzzer is activated on the outer door, this is broadcast every

0.5 seconds.
- **door/inner/doorbell** - When the doorbell is pressed on the inner door.
- **door/inner/opened/button** - When a doorbot 'open' button is pressed, this is broadcast.

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