Ericsson F800 Repeater

Built on OpenRepeater on a Raspberry Pi 2 Model B

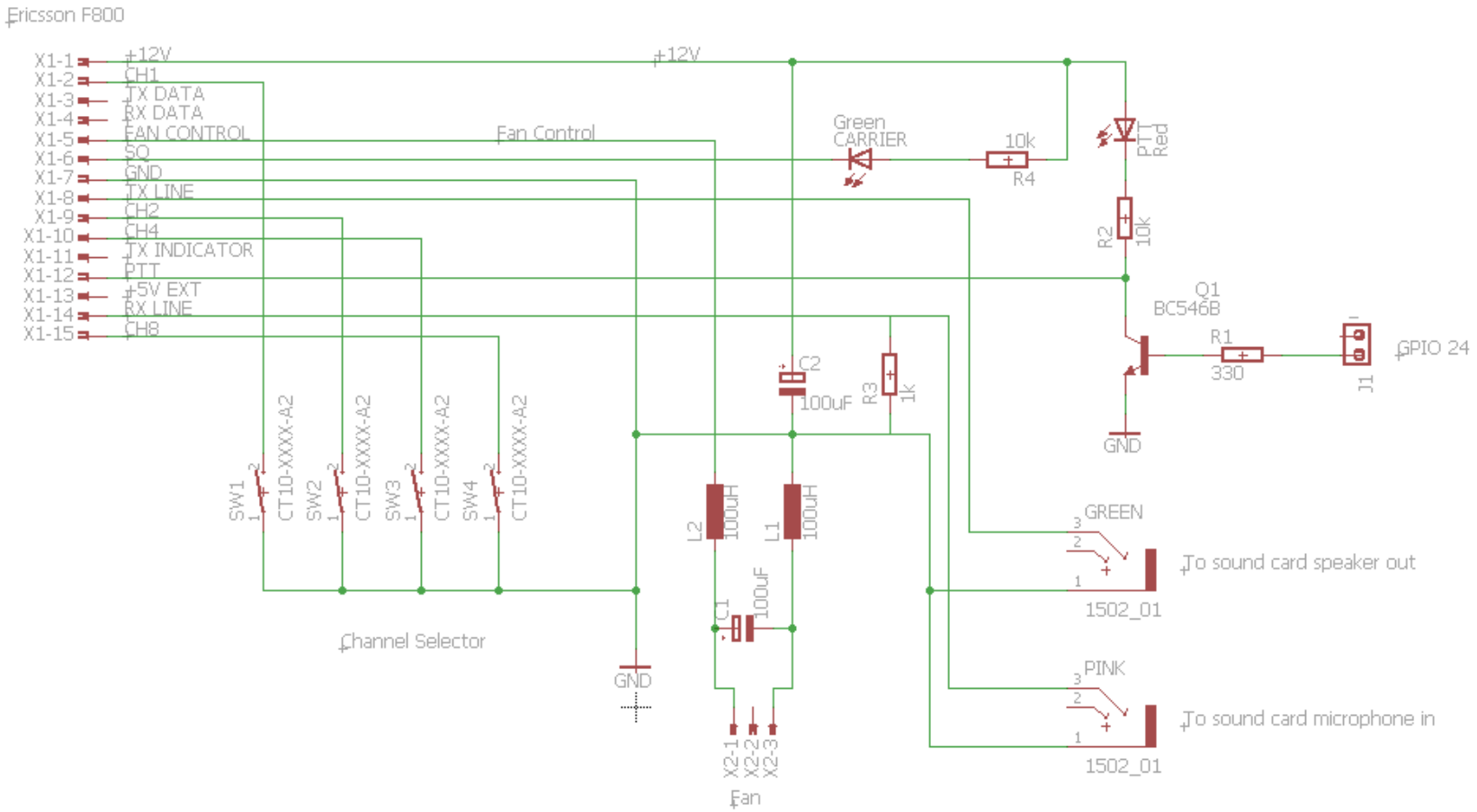
Background

- Ericsson F800 is a single-band radio designed in the late 80's and is programmed with a 28C64 EEPROM.
- Power is 20-25W.
- The radio is intended to be used either as a Base Station or as a Repeater, however it does not support CTCSS or other logic that is expected from a repeater.
- The F800 was delivered installed in a 19" rack unit with some additional interface circuits that have been removed in the following pictures.
- The radio exists in both simplex and duplex models, the duplex models are preferred when constructing a repeater.
- **Notice!** The F800 interface uses 12V signaling, not TTL!

Construction

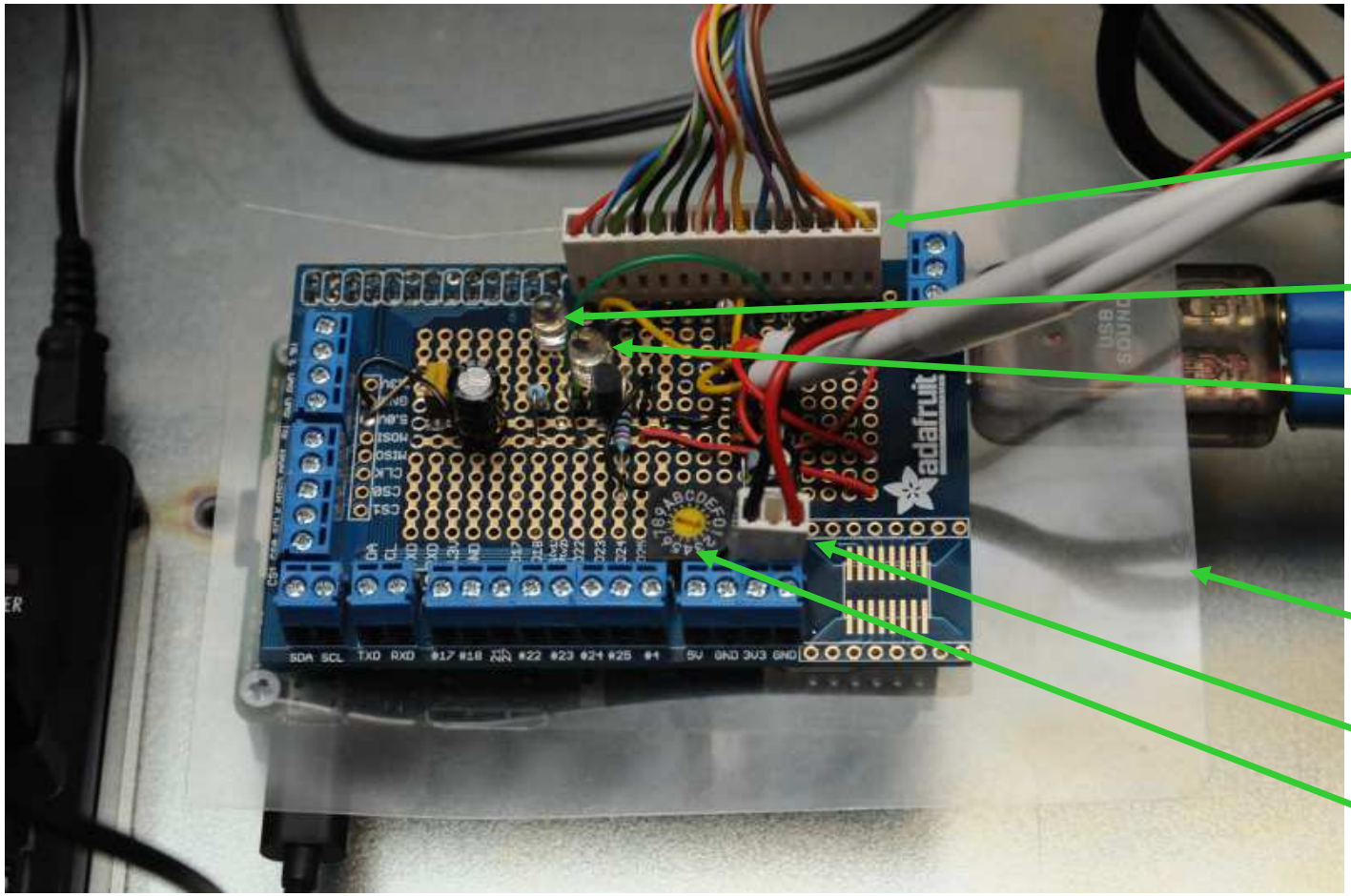
- To use the Raspberry Pi to control the F800 as a repeater the F800 has to be programmed as a Duplex radio.
- Some components (connectors and switches) have been scavenged from the original ciruits that were present in the box.
- The fan in the enclosure is controlled from the radio, but the supply comes through the 15-pin connector and therefore the circuits for it goes through the HAT to a 3-pin connector to which the fan is connected.
- The connector from the F800 cassette is not modified, the pinout has been retained.
- The HAT is not entirely compatible with the Pi 2 Model B, therefore an insulation plastic sheet has been inserted between the Pi and the HAT to prevent against short circuits.
- An external duplex filter is needed in order to make this repeater fully operational.

Interface Circuit



Overview

Interface HAT on Raspberry



Standard F800 Cassette connector

Carrier Indication LED

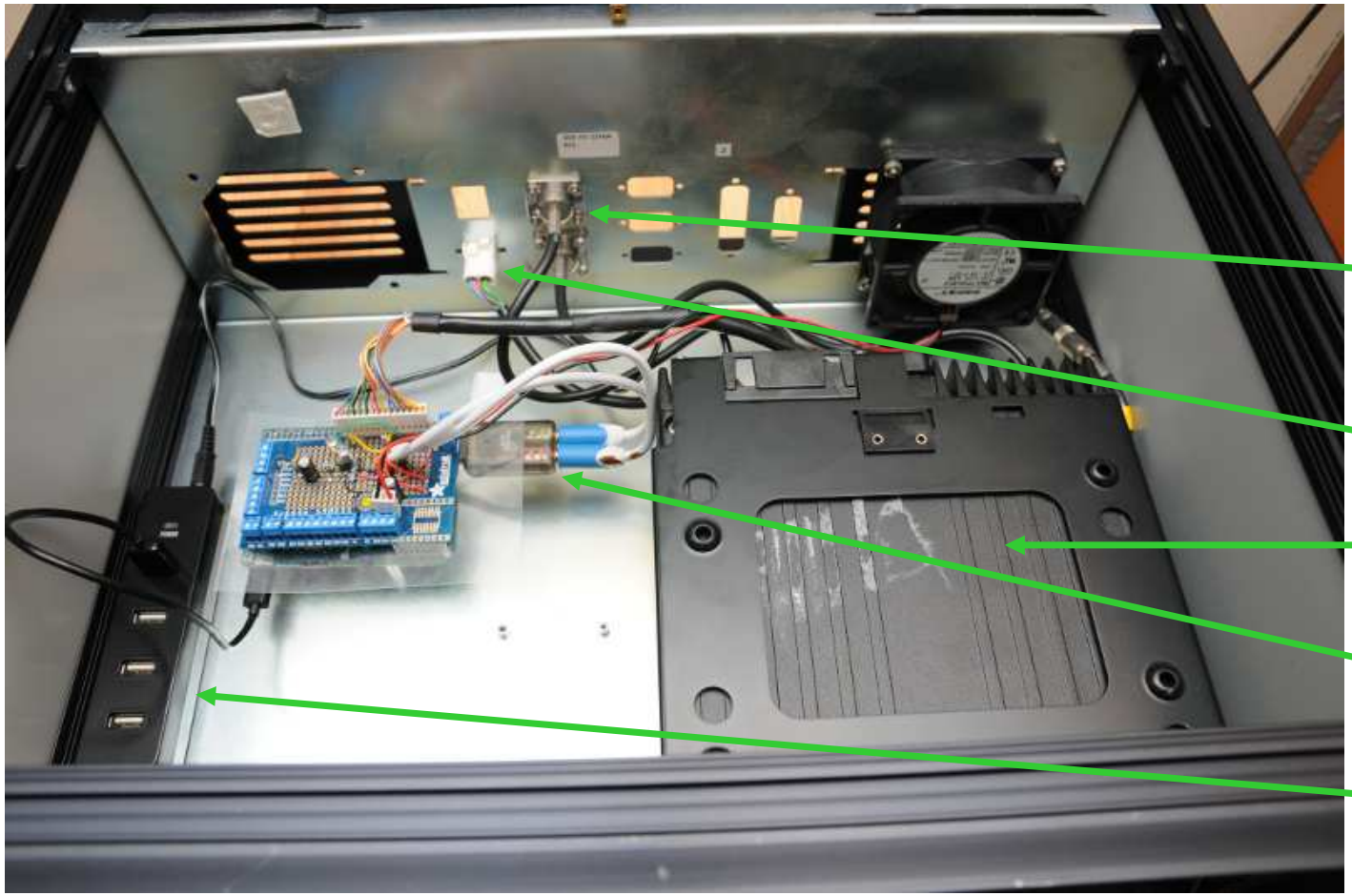
PTT Pushed Indication LED

Insulation sheet

Fan Connector

Channel selector

Box Layout


Antenna Connectors
+12V power connector
Ericsson F800 Duplex Radio F804D
USB Sound Card
+12V to USB power strip

Experience

- Signal levels for audio is tricky, and some feedback loops seems to be easy to get as well – causing some echo effects.
- It was probably overkill to have a HAT board, but it was also convenient.
- The power supply of the Raspberry took some extra searching before finding the unit that I’m using.
- A good soldering iron is worth a lot!
- The user interface of the beta version of OpenRepeater is not able to perform all configuration, which means that some manual editing was needed.

Components Used

- Items from http://www.kjell.com/
  - 87830 - Raspberry Pi 2 Model B
  - 87266 - Prototyp-HAT for Raspberry Pi
  - 31624 - USB Sound Card
  - 39785 - Audio cable 3.5mm 0.25m length.
- Items scavenged from old HW
  - Channel Selector
  - 100uH inductors
  - Connectors, 15-pin and 3-pin.
- Other components
  - Resistors
  - Capacitors
  - BC546B Transistor

Configuration file Svxlink.conf

- Some of the parameters updated:
  - Sound Card interface
  - CTCSS support
  - Identification interval.
  - Timestamp format
  - Vox Threshold (Tune to suit your specific situation)
  - PTT Hang Time
  - OPEN_ON_SQL_AFTER_RPT_CLOSE
  - IDLE_TIMEOUT
  - RGR_SOUND_DELAY