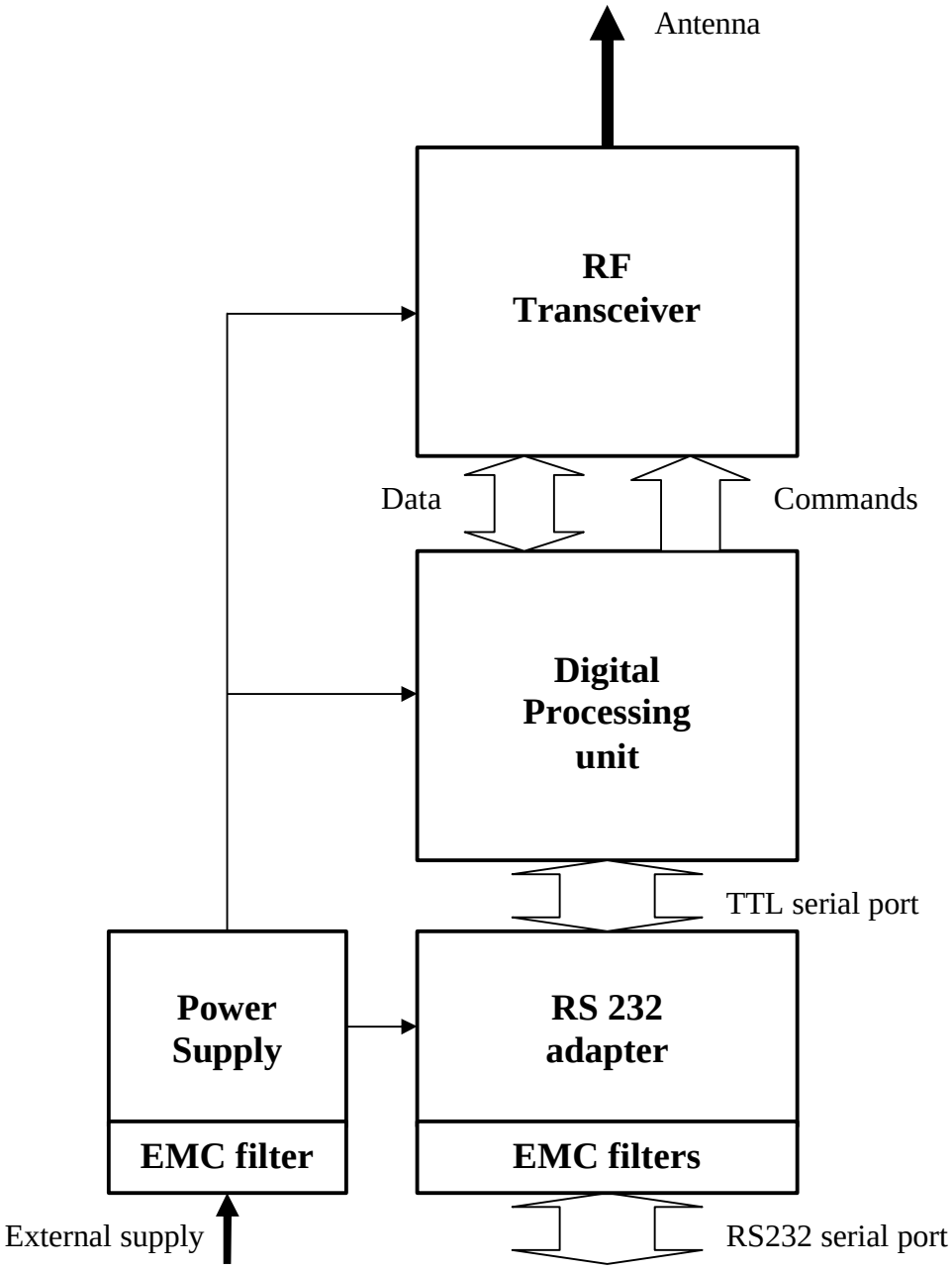
1. ARF7474 US/CAN 200 mW wireless modem: Synoptic



2. ARF7474 US/CAN 200 mW wireless modem: Process

ARF7474 data processes can be divided into three different subparts: Setup, Transmission & Receipt.

Setup

To setup the modem, user has to connect using local RS232 serial port and send it some Hayes commands.
When sending “+++” to the modem, it becomes possible to program “Air rate”, “Serial port data rate & format”, “handshaking mode” and some different timings… “AT&W” and “ATO” are used to record the new setup and closed the setup mode.

Transmission:

When serial data frames enter the RS232 adapter through EMC filters, digital signal levels are +12/-12V. Adapter brings them back to 0 / 3V directly compatible with Digital Processing Unit DPU input buffer.

First, DPU starts stacking data during 100 ms in order to create a continuous packet. Data packet is encapsulated then transmits through RF Transceiver TRX (Encapsulated means adding Preamble, Synchro, FEC, CRC and EOT…).
To transmit any packet, time is divided into 100 ms time slots. Each transmission time slot use a specific frequency channel over the 50 channels of the Hopping Table recorded inside the DPU. Hopping Table is red continuously.

Please find our hopping table:

00, 25, 19, 44, 08, 37, 05, 30, 09, 34, 23, 48, 02, 27, 13, 38, 17, 42, 07, 32, 15, 40, 22, 47, 18, 43, 01, 26, 12, 33, 14, 39, 06, 31, 10, 35, 04, 29, 21, 46, 03, 28, 16, 41, 24, 49, 20, 45, 11, 36.

NB: Channels go from 902.75 (00) to 927.25 MHz (49), using 500 kHz steps. TRX uses a classical +/- 25 kHz or +/- 10 kHz 2FSK at respectively 57.6 or 10 kbps “air rate”.

At the end of any packet is transmitted an End Of Packet EOP, meaning next data will be transmitted in a new channel following Hopping table. At the end of the data frame is transmitted an End Of Transmission EOT asking for the distant receiver to wait on the next channel of the Hopping table.

Receipt:

At the power on, receiver is listening to the first channel of the Hopping Table. When decoding the End Of Packet EOP, current packet is transferred inside DPU output buffer and receiver is switched in the Hopping Table channel. At the end of the data frame, an End Of Transmission marks the end of the current communication meaning the receiver has to wait on the next channel of the Hopping table :

00, 25, 19, 44, 08, 37, 05, 30, 09, 34, 23, 48, 02, 27, 13, 38, 17, 42, 07, 32, 15, 40, 22, 47, 18, 43, 01, 26, 12, 33, 14, 39, 06, 31, 10, 35, 04, 29, 21, 46, 03, 28, 16, 41, 24, 49, 20, 45, 11, 36.

As soon as DPU has a data packet in its output buffer, it starts decapsulating the packet (decapsulating means suppression of Preamble, Synchro, FEC, CRC and EOT…).
Data are then outputted through the serial port.

RS232 Adapter brings them back to +12/-12V for direct ouput on RS232 serial port though EMC Filter.

Note:
Because of hopping, synchronisation is very important. In case of loss of synchronisation, there's no receipt of the current EOT.

- It's then possible to switch off the modems power supplies in order to restart hopping table on first channel. (Not recommended : Need to add a hardware switch on the power supply line)
- In most time, modems are always powered (no software command for powering off the modem); application has to send 50 "one character frames", in order to get distant handshake as soon as link is recovered. (Recommended solution)

Aerial:

ARF7474 modems have an quarter wave integrated whip antenna (Motherboard is used as a RF ground plane - Serial chokes are in every RS232 signal and power supply lines to avoid any cable effect). There's no possibility to add any external antenna; Antenna is a full part of ADEUNIS RF plastic enclosure.