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Ethernet to the Troposphere

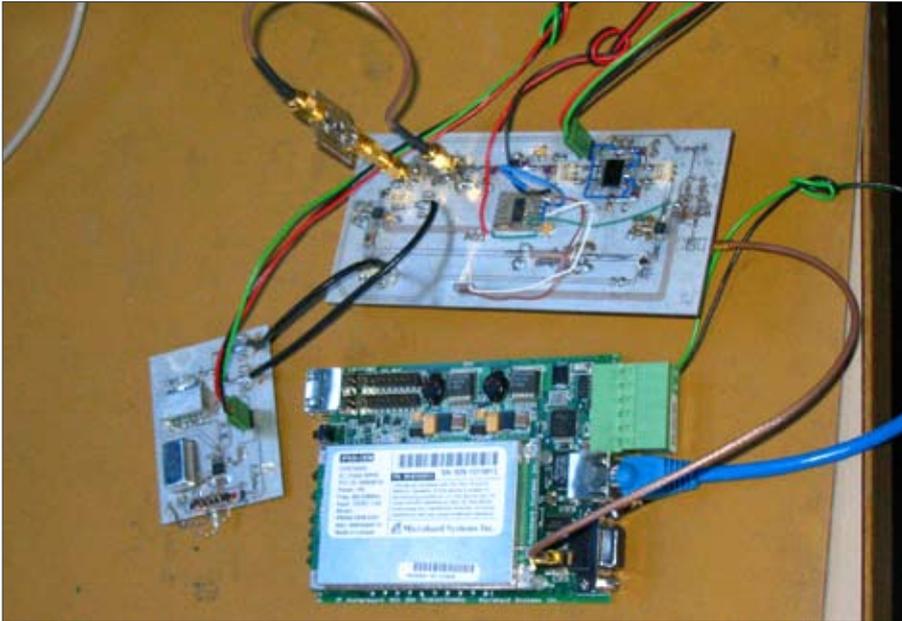
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Subject area	Mobile Communications
Project partner	Meteolabor AG, Wetzikon



Probe from ESRANGE for 2.4 GHz data link

Goal: The company Meteolabor AG produces weather balloon probes to measure air temperature, air humidity, air pressure, dew point, wind conditions and other parameters, in heights up to 20 km above ground. These values are transmitted via a 20 kbit/s data link to the base station. Such an existing probe shall now be enhanced to produce live pictures. A Japanese research team wants to obtain pictures of snow particles at high altitudes. Since the 20 kbit/s link isn't sufficient to transmit live footage, a high speed Ethernet link between the troposphere and the ground shall be developed.

Problem: In a former term thesis, different options have been evaluated. On the US market, there are a lot of 900 MHz wireless modules because of an existing ISM band at that frequency in the States. In Switzerland and Japan this band is occupied by other applications. A possible solution is to take an existing 900 MHz module and extend it to 400 MHz, where a METAIDS band exist. The METAID band is reserved for weather information. In the past thesis this approach has been followed. The first prototype built at that time produced a system of different RF parts, many of which showed minor bugs, preventing



First Prototype with 900 MHz module, oscillator and main board, which shift the frequency to 400 MHz

the system from working properly. These problems included the programming interface of the oscillators, the RF switches, and some others.

Solution: The problems with the existing prototype have to be solved. Tests should show if this approach works for large distances and what the limitations are. The thesis should end in a test flight, if the land tests are successful.