Lucerne University of
Applied Sciences and Arts

HOCHSCHULE
LUZERN

Informatik

Swiss Space Summer Camp 2016

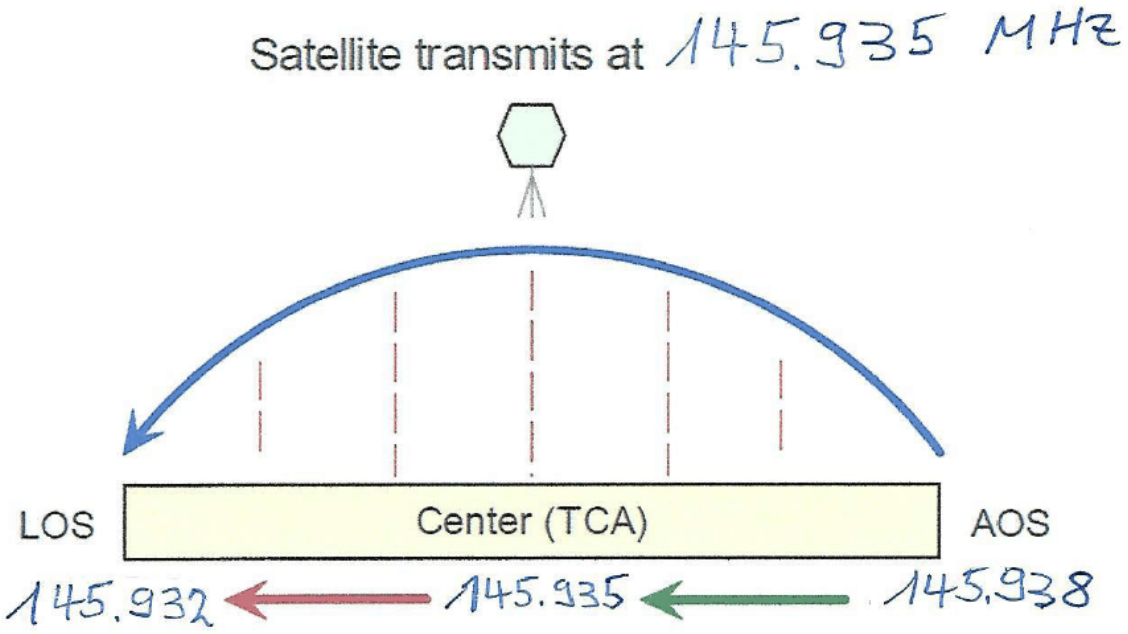
Simple Ground Station (GS)

Satellite Receive Procedures

Main topics:	Receiving satellite signals
Prerequisites:	Tested simple ground station consisting of antenna, amplifier, receiver HW + receiver SW

M. Klaper, version 1.0

1. Charts for manual Doppler correction (receiver side)



ISS Packet data	Down link [MHz]
AOS	145. 8285
b	145.8267
MID	**145.8250**
d	145.8232
LOS	145.8215

Wishing you good luck

Your lecturer team

2. Preparation before pass

- Charge the batteries
- Check "Heavens-Above" for orbit data or use the handout. Check time and your location (!)
- Distribute tasks among group
- Build simple ground station (Antenna, Amplifier including switched on battery power, NESDR Smart dongle, cabling)
- Start required software, check configurations
- Await pass. The first sign of an impending pass is very often a slight reduction of the noise level. Do not use the squelch.

3. Receiving ISS data packets

Use the setup from System Test2, but tune your receiver to **145.825 MHz** and select FM.
Use again modem **VHF AX.25 1200 bd**. and ensure that **VAC** is connected. The decoder application is **UISS**. Do not use the FUNcube dashboard. Adjust carefully for the Doppler shift.

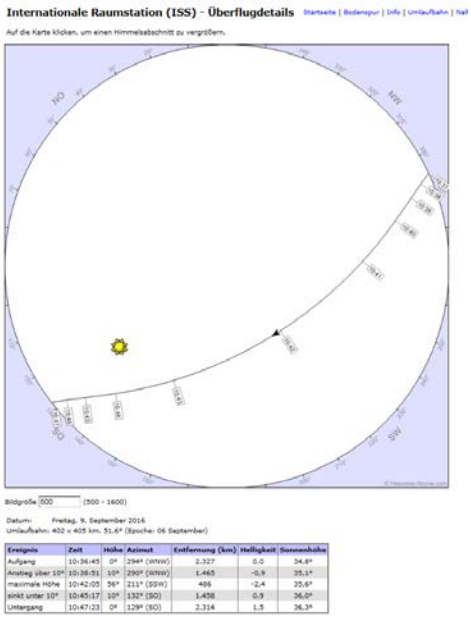
4. Receiving FUNcube-1 (AO-73) telemetry

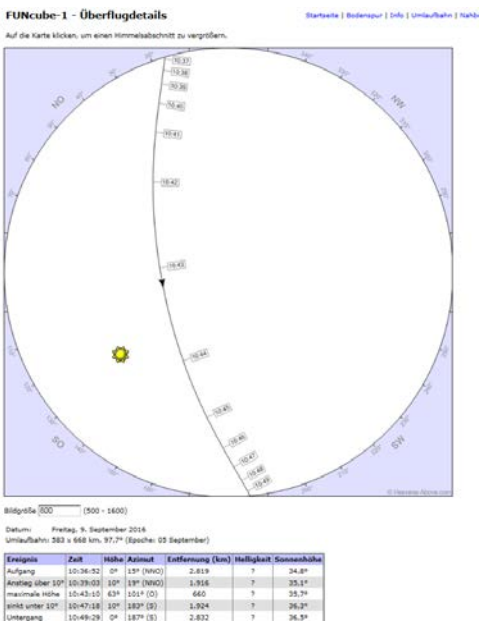
Use the setup from System Test2, but tune your receiver to **145.935 MHz** and select FM.
Use the **FUNcube dashboard** and ensure that **VAC** is connected. Do not use the UISS decoder. Adjust carefully for the Doppler shift.

5. How can I be sure, that a signal stems from a satellite?

- Satellite signals are generally weak and they
- Always show a **Doppler effect**, i.e. the frequency changes slowly from high to low and has to be – in your case - compensated for by hand on the Variable Frequency Oscillator (VFO), i. e. where you tune for different radio stations. "Bigger" ground stations do this Doppler compensation by computer software.

6. Sky charts





Change history

version	date	state	changes and remarks	author
1.0	07-09-2016	draft	first version	M. Klaper

Inhaltsverzeichnis