m e t a s

metrologie und akkreditierung schweiz

TWSTFT at METAS

Bundesamt für Metrologie und Akkreditierung
Office fédéral de métrologie et d'accréditation
Ufficio federale di metrologia e di accreditamento
Swiss Federal Office of Metrology and Accreditation

Eidg. Justiz- und Polizeidepartement
Département fédéral de justice et police
Dipartimento federale di giustizia e polizia
Federal Department of Justice and Police

Activities 2004

- January 2004 — Start of project
- March 2004 — Equipment ordered
- July 2004 — Start of installation
- August 2004 — Approvals from Intelsat and National Federal Office received
- September 2004 — Start of link measurements

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Equipment

- Modem: TimeTech SATRE s/n 281, V4.11.0
- Transceiver: Comtech KST-2000A
  LNA: 10.95 to 12.75 GHz, (85°K, 50 dB)
  SSPA: 13.75 to 14.5 GHz, 4W (+36 dBm)
- Antenna: Prodelin series 1184, ∅ 1.8 m
- Data server: PC HP Compaq d530
- Transfer standard: H-Maser (Neuchâtel Observatory)

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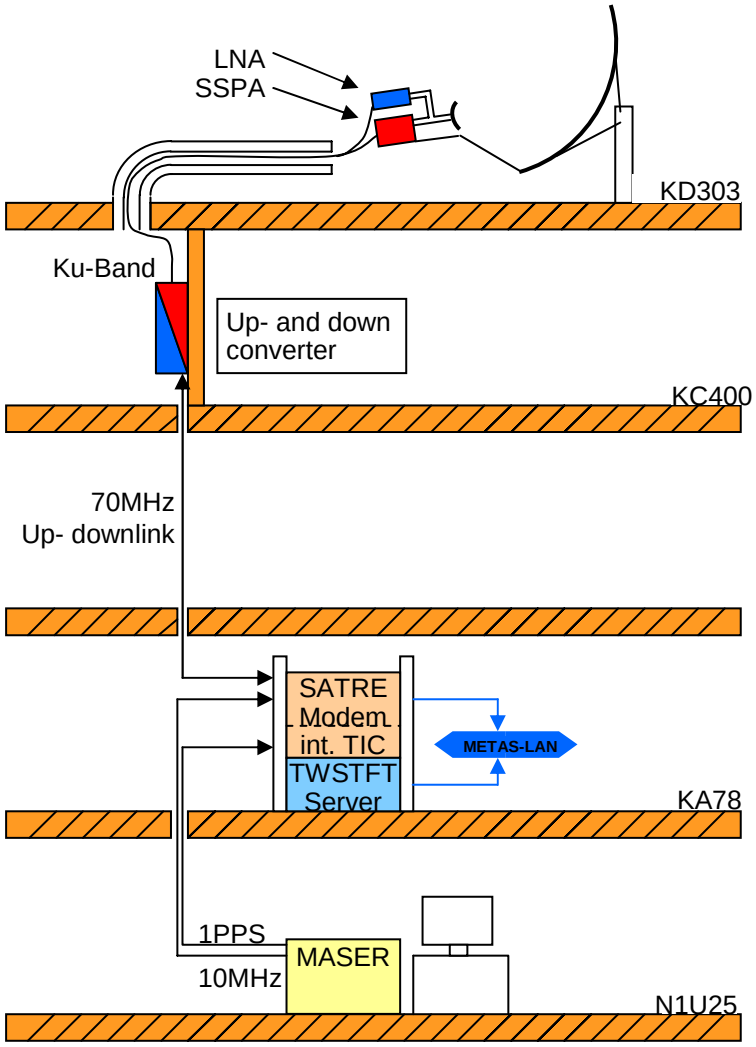
Installation

- Antenna, LNA and SSPA on the roof
- Up- and down converter in installation area
- Modem in controlled environment
- Maser in controlled and protected environment



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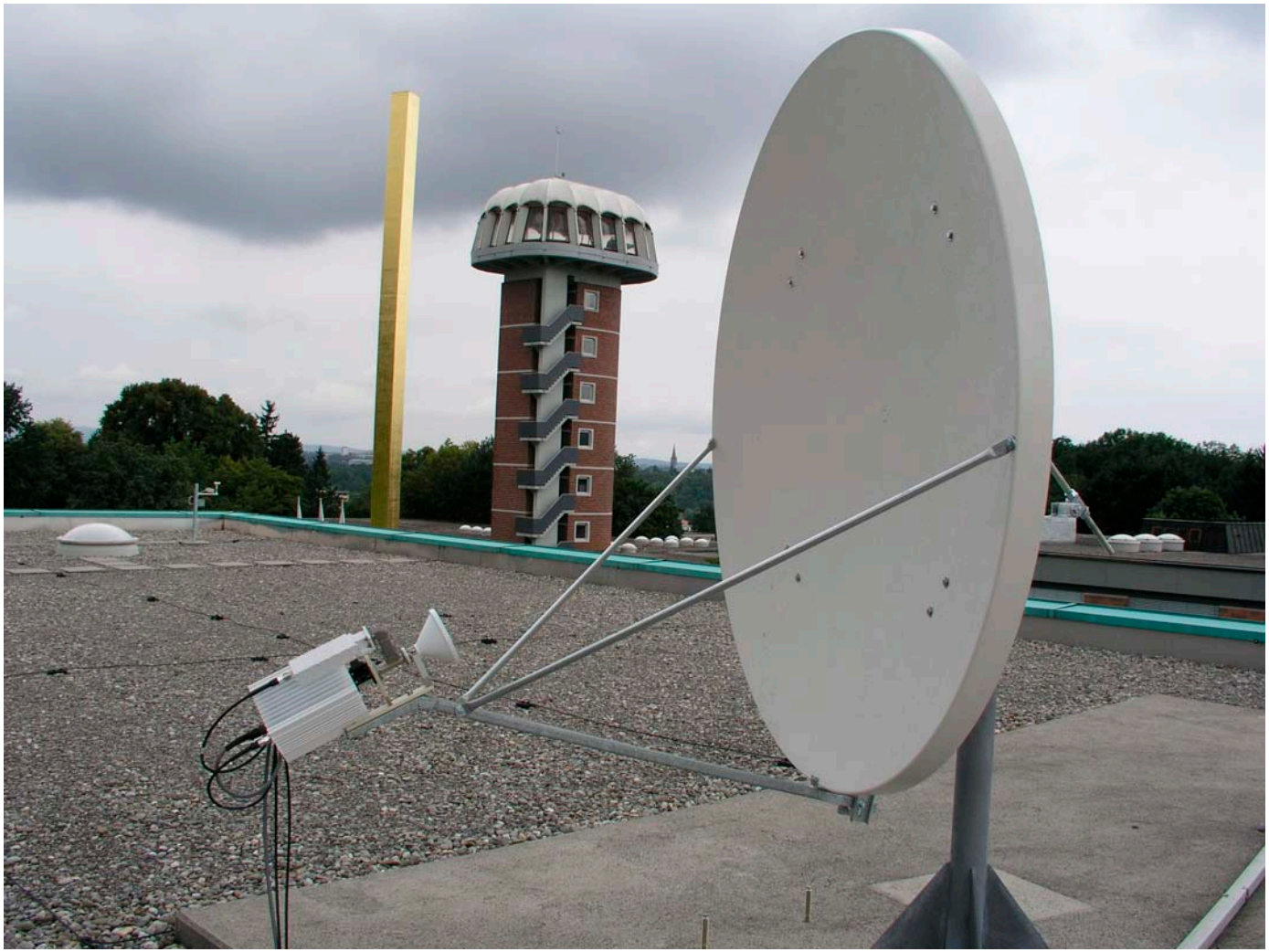
Equipment on the roof

Antenna position

Nord 46° 55‘ 25“
Ost 7° 27‘ 51“

Antenna direction

Azimuth: 230.9°
Elevation: 22.5°
Polarization: 31.9°



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Up- down converter

Modem

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Performance of Ground Station

- Stability measurement over 20 hours:
  - At nominal output Power of 30 dBm: Pout avg = 30.43 dBm, sdev = 0.08 dB
  - At nominal output Power of 36 dBm: Pout avg = 36.11 dBm, sdev = 0.03 dB
- G/T measurement with CW-Carrier from Intelsat:
  - CW-Carrier at 11452.0 MHz: Carrier level = 51.4 dBm, Noise floor = 102.50 dBm/Hz, C / No =51.10 dB/Hz

  G / T = 25.10 dB/K

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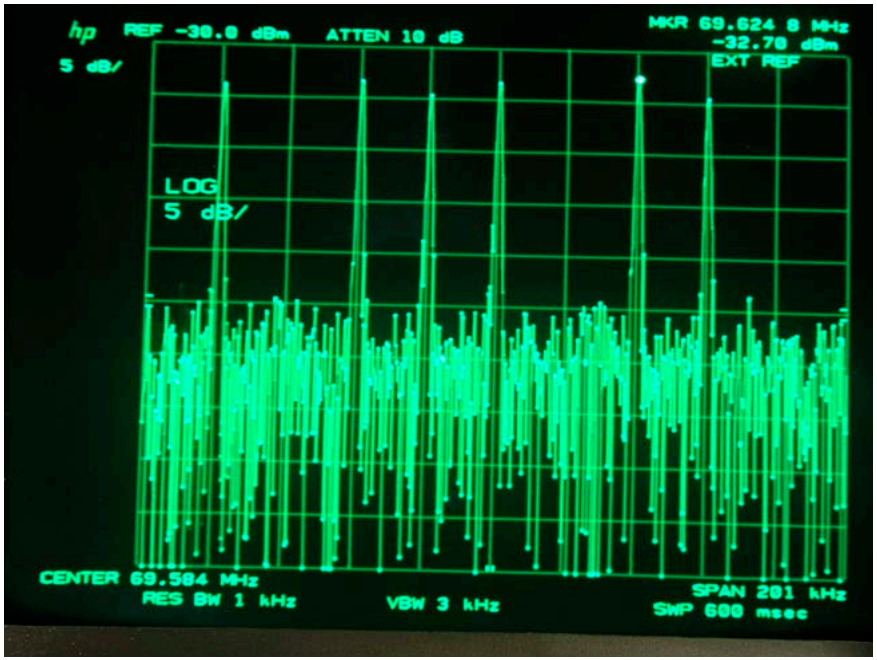
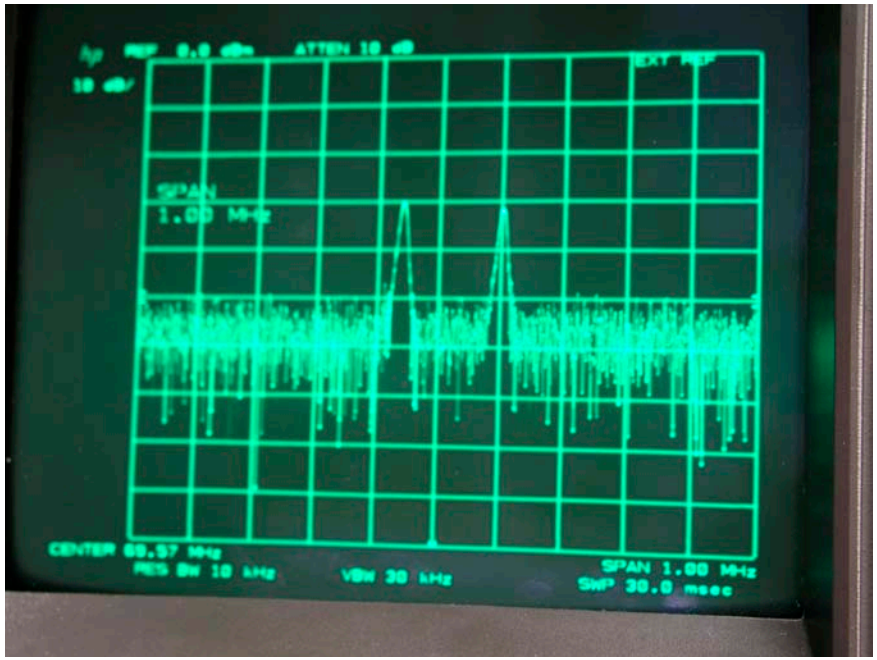
Receiving Clean Carriers

Link 05: Sep-01-2004 08:01 UTC



Link 06: Sep-01-2004 14:31 UTC



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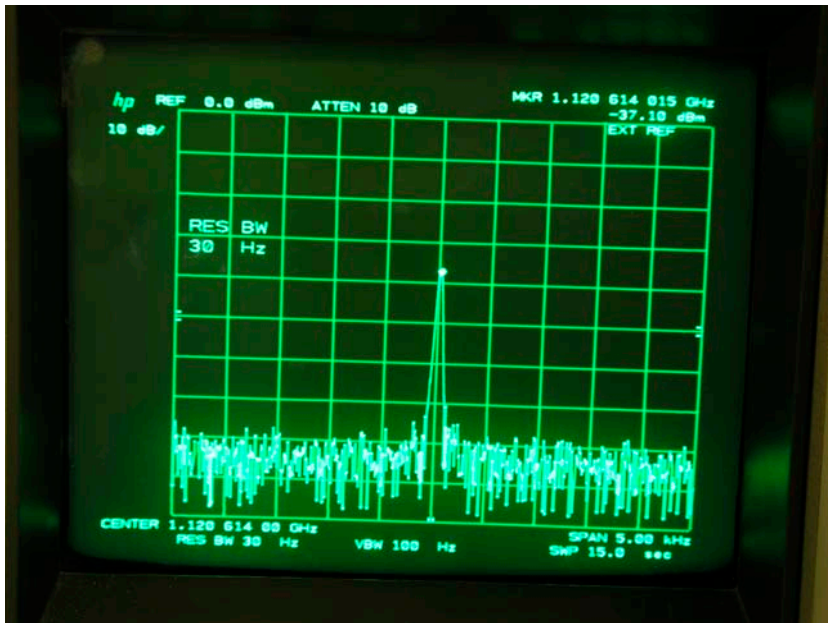
Measured own Clean Carrier

Link 05: Sep-02-2004 07:00 UTC

Transmitted power = +30 dBm
f = 14170.5975 MHz + 10 kHz

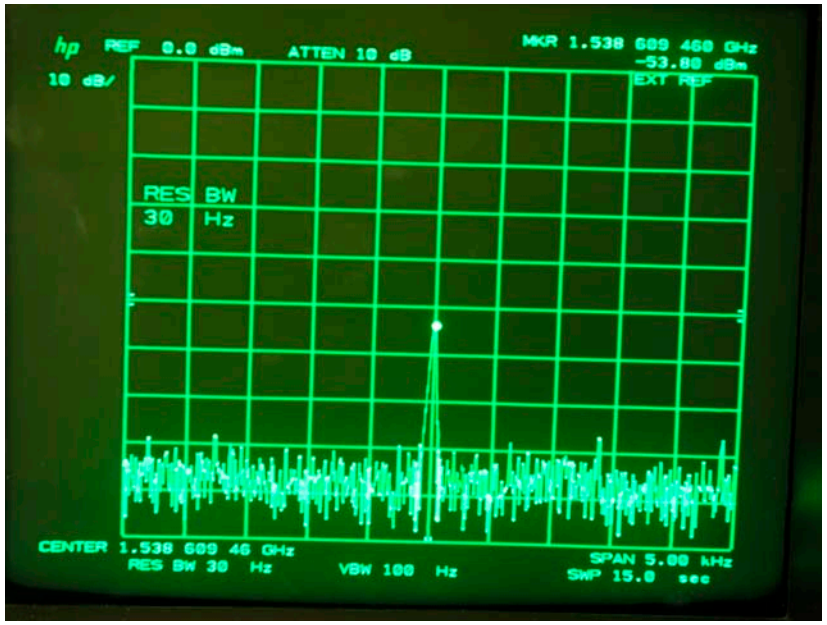
Received power = -57.2 dBm
f = 11120.5975 MHz + 10 kHz + 6.515 kHz



Link 06: Sep-02-2004 07:30 UTC

Transmitted power = +30 dBm
f = 14338.5975 MHz + 10 kHz

Received power = -73.5 dBm
f = 11538.5975 MHz + 10kHz + 1.960 kHz



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Summary and Outlook

- TWSTFT at METAS fully operational

- Development of software for automatic data acquisition
- Adjustment of station control scheduler (integration in measurement schedule)
- Characterization of station

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