

# 10MHz frequency source

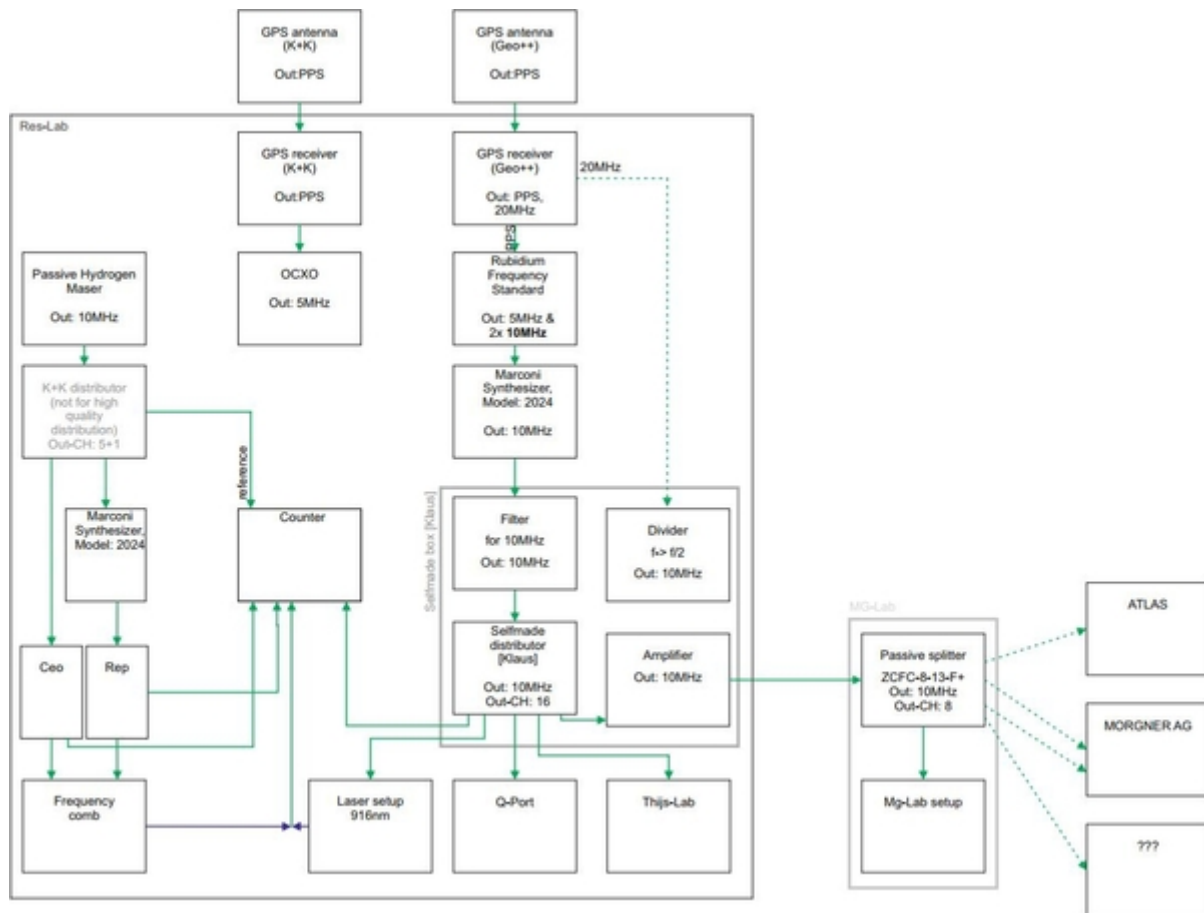
## Possible sources

All sources exist in ResLab.

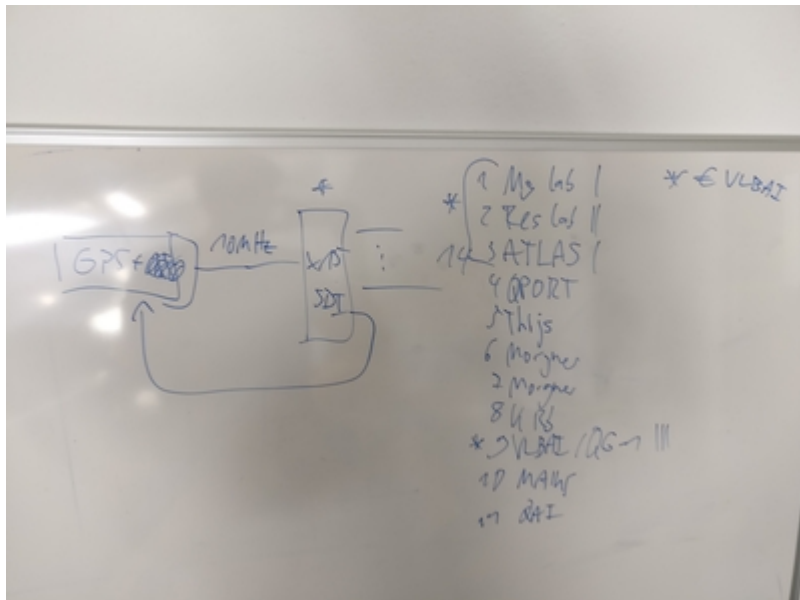
1. Passive Hydrogen Maser
2. OCXO
  1. OXCO 5 MHz
  2. OXCO 10 MHz (broken)
3. Rubidium Frequency Standard
  
1. GPS receiver
2. Marconi Synthesizer, Model: 2024
3. Andere Synthesizer
4. Selfmade distributor [Klaus]
5. K+K distributor (not for high quality distribution)
6. HighTec Fiber ???
  
1. CSAC Chip für stabile 10MHz Referenz

## Current Setup [30.05.2017]

Current 10MHz setup.pdf



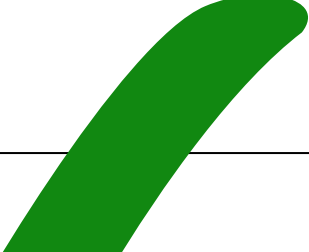
## Future Setup



- Ansprechpartner für Löcher in der Uni: Miehlbradt, Marion (Tel.: 2258)
    - Raumpläne IQO
    - 10\_MHz\_Verlegung\_IQ\_08\_2017
    - Schadstoffuntersuchungsbericht
- : Negativ auf Aspest von Firma Wessling!

|                                                                                |            |                                                                                    |  |                                               |                                       |                             |       |
|--------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------|--|-----------------------------------------------|---------------------------------------|-----------------------------|-------|
| Experiment<br>Ansprachperson<br>Experiment<br>Ansprachperson<br>Kabelverlegung | Raumnummer | Number of cables [new =                                                            |  | Number of distributors<br>(Number of outputs) | Cable length + "Lab cable Length" [m] | Holes [Number, size, place] | Notes |
|                                                                                |            | , old =                                                                            |  |                                               |                                       |                             |       |
|                                                                                |            |   |  |                                               |                                       |                             |       |
|                                                                                |            |  |  |                                               |                                       |                             |       |
|                                                                                |            | Mean cable<br>Lab cable                                                            |  |                                               |                                       |                             |       |

| Experiment<br>Ansprechperson<br>Experiment<br>Ansprechperson<br>Kabelverlegung | Raumnummer | <div style="text-align: center;"> <p>Number of cables [new =</p>  <p>, old =</p>  <p>Mean cable<br/>Lab cable</p> </div> | Number of distributors<br>(Number of outputs) | Cable length + "Lab cable Length" [m]                                        | Holes [Number, size, place] | Notes |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------|-----------------------------|-------|
| ResLab<br>S. Sauer<br>S. Sauer                                                 | D215       | <div style="text-align: center;">  </div>                                                                                                                                                                | 2 (16)                                        | 1 (OXCO-Mean distributor) + 1 (Mean distributor - Reslab distributor) + 16*5 | 1, Ø=?, Reslab-Q-Port       | -     |

|                                                                                                                           |                       |                                                                                                                                                                      |                                                                  |                                                                                         |                                                        |                  |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------|------------------|
|                                                                                                                           |                       | <div>Number of cables [new =</div> <div></div> <div>, old =</div>                   |                                                                  |                                                                                         |                                                        |                  |
| <div>Experiment</div> <div>Ansprechperson</div> <div>Experiment</div> <div>Ansprechperson</div> <div>Kabelverlegung</div> | <div>Raumnummer</div> | <div></div> <div>1</div> <div>Mean cable</div> <div>Lab cable</div> <div>2 [</div> | <div>Number of distributors</div> <div>(Number of outputs)</div> | <div>Cable length</div> <div>+ "Lab cable</div> <div>Length" [m]</div>                  | <div>Holes [Number,</div> <div>size, place]</div>      | <div>Notes</div> |
| <div>Atom-Lab-Mg</div> <div>S. Sauer</div> <div>W. Friesen</div>                                                          | <div>D320</div>       | <div></div> <div>1</div> <div>8 [</div>                                           | <div>1 (16)</div>                                                | <div>2*[ 25(Reslab -</div> <div>Mg-Lab)</div> <div>+ 10(Mg-Lab)]</div> <div>+ 8*5</div> | <div>1, Ø=5-10cm, Q-</div> <div>Port-Atom-Lab-Mg</div> | <div>-</div>     |
| <div>IQwiki - <a href="https://iqwiki.iqo.uni-hannover.de/">https://iqwiki.iqo.uni-hannover.de/</a></div>                 |                       | <div></div>                                                                       |                                                                  |                                                                                         |                                                        |                  |

| Experiment<br>Ansprechperson<br>Experiment<br>Ansprechperson<br>Kabelverlegung | Raumnummer | <div data-bbox="333 190 898 752">  </div> <div data-bbox="333 752 898 1386">  </div> | Number of distributors<br>(Number of outputs) | Cable length<br>+ "Lab cable<br>Length" [m]             | Holes [Number,<br>size, place] | Notes                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>KRB</b><br>J. Peise<br>A. Igel                                              | E311       | <div data-bbox="333 844 898 1395">  </div>                                                                                                                            | 1 (16)                                        | 25(Reslab - Mg-Lab)<br>+ 20(Mg-Lab)<br>+ 60(Mg-Lab-KRB) | -                              | <p>*<br/><a href="#">KRB_10MHz_Kabel_08_2017</a></p> <p>* Die Durchführungen sind alle groß genug, nur auf höhe des Elektroniklabors liegen die Kabel in der Nähe von Heizungsrohren.<br/>* Im Flur befindet sich ein offener Kabelkanal.</p> |

|                                                                                                                           |                        |                                                                                                                                                                                                                                                                                                                |                                                       |                                                                                                              |                                        |                  |
|---------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------|
| <div>Experiment</div> <div>Ansprechperson</div> <div>Experiment</div> <div>Ansprechperson</div> <div>Kabelverlegung</div> | <div>Raumnummer</div>  | <div>Number of cables [new =</div> <div></div> <div>, old =</div> <div></div> <div>Mean cable</div> <div>Lab cable</div> <div>1 + ? [</div> | <div>Number of distributors (Number of outputs)</div> | <div>Cable length + "Lab cable Length" [m]</div>                                                             | <div>Holes [Number, size, place]</div> | <div>Notes</div> |
| <div>QAI,EPR</div> <div>J. Peise</div> <div>C. Pür</div>                                                                  | <div>D313 → D315</div> | <div></div>                                                                                                                                                                                                                 | <div>1 (16)</div>                                     | <div>25 (Reslab - Mg-Lab)</div> <div>+ 20(Mg-Lab)</div> <div>+ 25(Mg-Lab-QAI)</div> <div>+ 25(QAI-EPR)</div> | <div>-</div>                           | <div>-</div>     |

|                                                                                |            | Number of cables [new =<br><br>, old =                                                                                                                                  |                                               |                                                                              |                             |                                                                                                                                                                 |
|--------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Experiment<br>Ansprechperson<br>Experiment<br>Ansprechperson<br>Kabelverlegung | Raumnummer | <br> | Number of distributors<br>(Number of outputs) | Cable length + "Lab cable Length" [m]                                        | Holes [Number, size, place] | Notes                                                                                                                                                           |
|                                                                                |            | Mean cable Lab cable<br>1 + ? [<br>1                                                                                                                                    |                                               |                                                                              |                             |                                                                                                                                                                 |
| ATLAS<br>H. Albers<br>H. Albers                                                | D330       |                                                                                      | 1 (16)                                        | 25(Reslab - Mg-Lab)<br>+ 25(Mg-Lab)<br>+ 50 (Mg-Lab-ATLAS)<br>+ 5(ATLAS-Lab) | ?, Ø=10cm, ?                | *<br>ATLAS_10MHz_Habel_08_2017<br>* Gibt keine Information wie es über den Seminarraum verlegt ist<br>→ Neue Löcher bohren oder zusätzlicher Durchgang zu VLBAI |

|                                                                                                                           |                       |                                                                                                                                                                                                                                                                                               |                                                                  |                                                                                                                                      |                                                   |                  |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------|
| <div>Experiment</div> <div>Ansprechperson</div> <div>Experiment</div> <div>Ansprechperson</div> <div>Kabelverlegung</div> | <div>Raumnummer</div> | <div>Number of cables [new =</div> <div></div> <div>, old =</div> <div></div> <div>] Mean cable</div> <div>Lab cable</div> | <div>Number of distributors</div> <div>(Number of outputs)</div> | <div>Cable length</div> <div>+ "Lab cable</div> <div>Length" [m]</div>                                                               | <div>Holes [Number,</div> <div>size, place]</div> | <div>Notes</div> |
| <div>VLBAI</div> <div>E. Wodey</div> <div>?</div>                                                                         | <div>D323</div>       | <div></div>                                                                                                                                                                                                | <div>1 (16)</div>                                                | <div>25(Reslab - Mg-</div> <div>Lab)</div> <div>+ 25(Mg-Lab)</div> <div>+ 20 (Mg-Lab-</div> <div>VLBAI)</div> <div>+ 5 (VLBAI)</div> | <div>-</div>                                      | <div>-</div>     |

|                                                                                |            | Number of cables [new =                                                                                                                                                     |                                               |                                                                           |                             |       |
|--------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------|-----------------------------|-------|
| Experiment<br>Ansprechperson<br>Experiment<br>Ansprechperson<br>Kabelverlegung | Raumnummer | <br><br> | Number of distributors<br>(Number of outputs) | Cable length + "Lab cable Length" [m]                                     | Holes [Number, size, place] | Notes |
|                                                                                |            |                                                                                                                                                                             |                                               |                                                                           |                             |       |
| Quantengravi<br>J. Mathias<br>?                                                | D323       |                                                                                          | 1 (16)                                        | 25(Reslab - Mg-Lab)<br>+ 25(Mg-Lab)<br>+ 20 (Mg-Lab-VLBAI)<br>+ 5 (VLBAI) | -                           | -     |

IQwiki - <https://iqwiki.iqo.uni-hannover.de/>

| Experiment<br>Ansprchperson<br>Experiment<br>Ansprchperson<br>Kabelverlegung | Raumnummer | <p>Number of cables [new =</p>  <p>, old =</p>  <p>}<br/>Mean cable<br/>Lab cable<br/>1 {</p> | Number of distributors<br>(Number of outputs) | Cable length + "Lab cable Length" [m] | Holes [Number, size, place] | Notes                                                   |
|------------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------|-----------------------------|---------------------------------------------------------|
| Q-Port<br>S. Bode<br>?                                                       |            |  <p>1 {</p>                                                                                                                                                                   | -                                             | -                                     | -                           | Vorhandene Kabel ist verlegt, muss noch getestet werden |

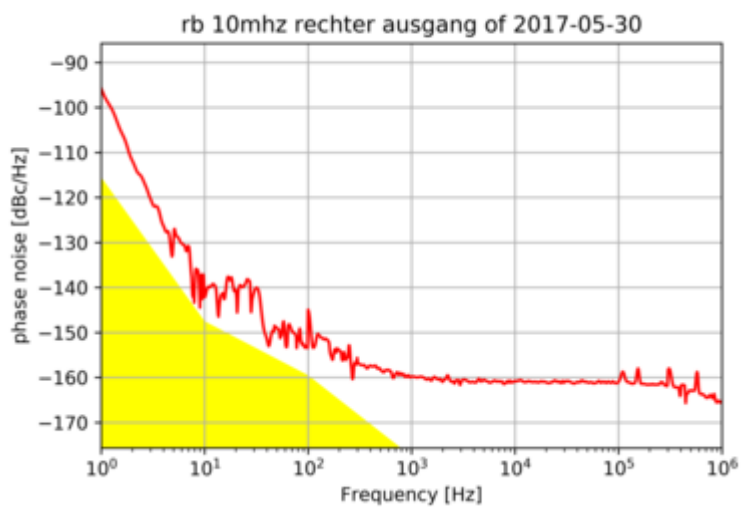
|                                                                                |            |                                                                                                                                                    |                                               |                                          |                             |                                                                                                                        |
|--------------------------------------------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------|
| Experiment<br>Ansprechperson<br>Experiment<br>Ansprechperson<br>Kabelverlegung | Raumnummer | <div>Number of cables [new =</div> <div></div> <div>, old =</div> | Number of distributors<br>(Number of outputs) | Cable length<br>+ "Lab cable Length" [m] | Holes [Number, size, place] | Notes                                                                                                                  |
|                                                                                |            | <div></div> <div>Mean cable<br/>Lab cable</div>                  |                                               |                                          |                             |                                                                                                                        |
| Lasus<br>Thejs<br>?                                                            | D220       | <div></div>                                                     | -                                             | -                                        | -                           | * Vorhandene Kabel ist verlegt, Aircell 7, muss noch getestet werden<br>* Sein vorhandener Verteiler ist ein SRS FS710 |
| Maius<br>D. Becker                                                             |            | keine Antwort                                                                                                                                      | keine Antwort                                 | -                                        | -                           | -                                                                                                                      |
| AG Morgner<br>B. Kreipe                                                        |            | 0                                                                                                                                                  | 0                                             | -                                        | -                           | -                                                                                                                      |
| Gesamt                                                                         |            |                                                                                                                                                    | 7 (16)<br>2 (min 8)                           | 622                                      |                             |                                                                                                                        |

## To Do

### 1)

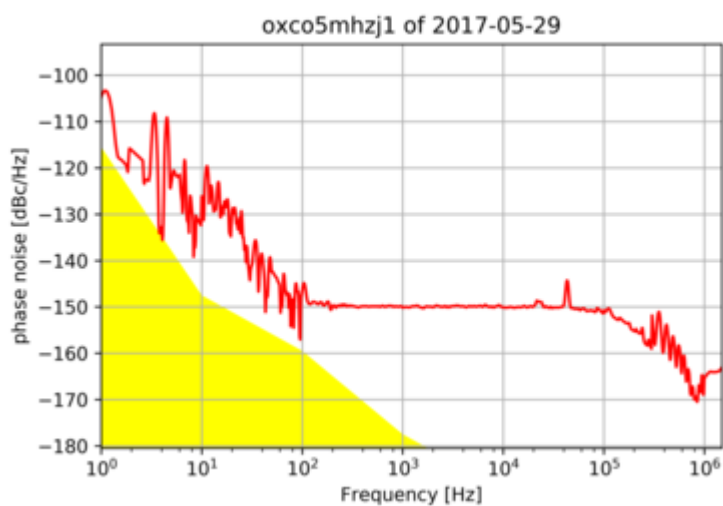
- ☐ FSWP-8 refernced to Maser
- ☐ FSWP-8 running 1 day ahead of measurement
- ☐ Measure: 100mHz-10MHz PN Rb-clock

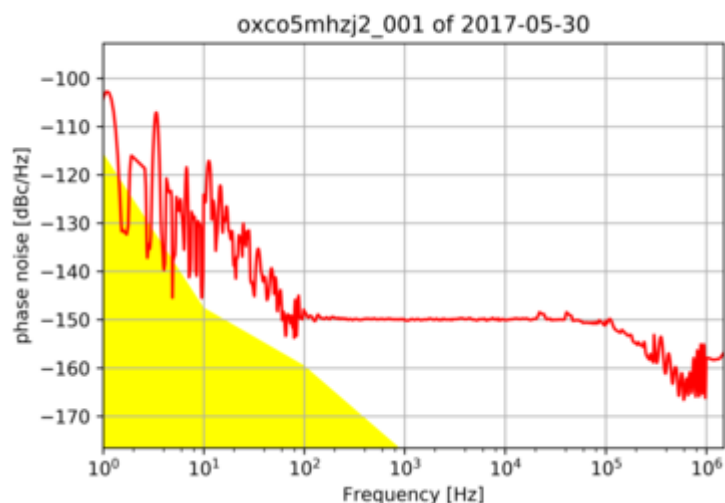
- “GPS →” Rb-10Mhz [right Output] → BNC cable → BNC-I-connector → BNC-SMA-connecotor → long cable → PNA



- ☐ Measure: -"- -"- OCXO

- Channel J1 and J2: OCXO → short cable → SMA-I-connector → long cable → PNA

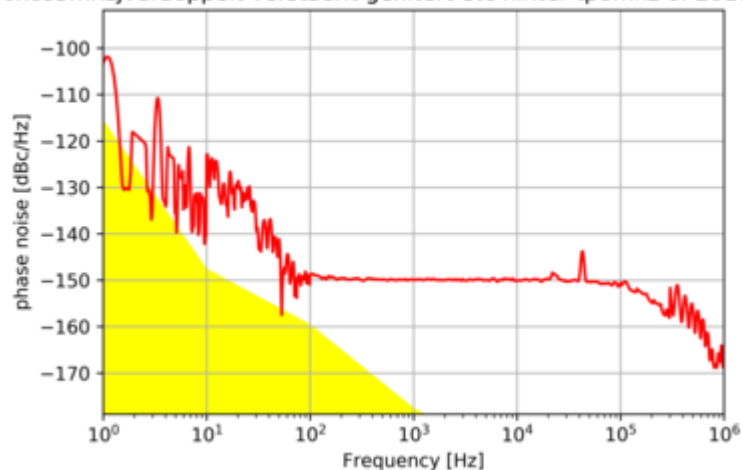




□ Measure: -"- -"- OCXO 5MHzx2 (passive)

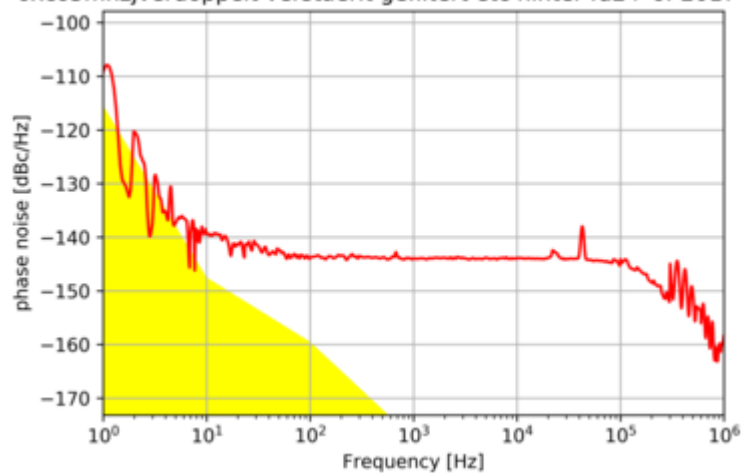
- J1 → short cable → SMA-BNC-connector → TP [6MHz] → long cable → PNA

oxco5mhzjverdoppelt verstaerlt gefiltert etc hinter tp6mhz of 2017-05-30



- J1 → short cable → SMA-BNC-connector → TP [6MHz] → Doubler [FD-2+] → BNC-SMA-connector → long cable → PNA

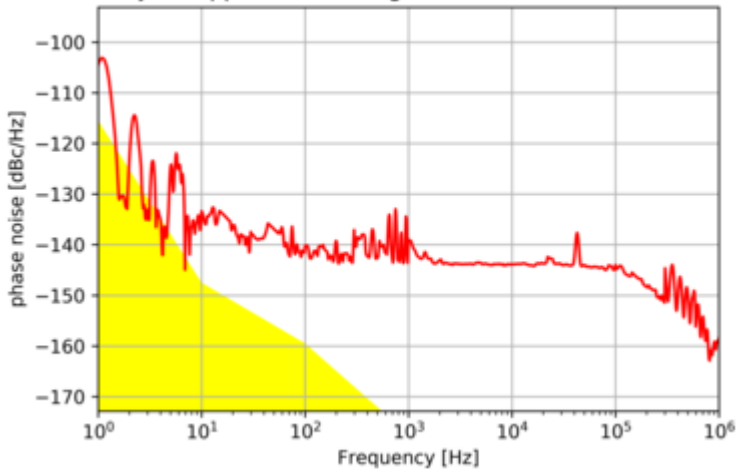
oxco5mhzjverdoppelt verstaerlt gefiltert etc hinter fd2+ of 2017-05-30



- J1 → short cable → SMA-BNC-connector → TP [6MHz] → Doubler [FD-2+] → BNC-SMA-connector → long cable → PNA

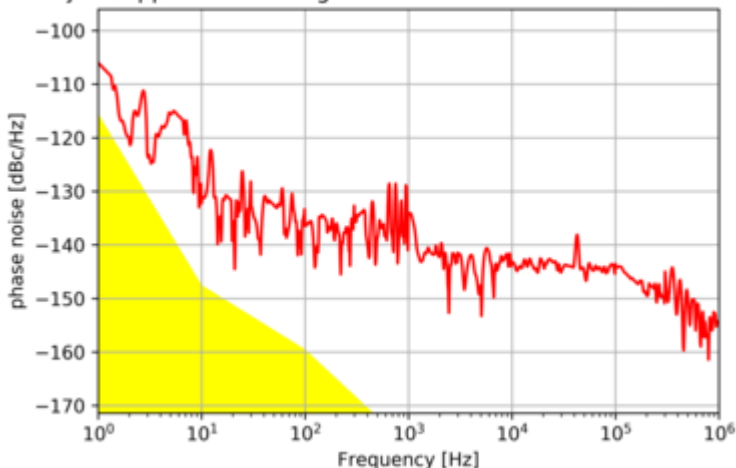
BP [SBP-10.7+] → long cable → PNA

oxco5mhzjverdoppelt verstaerlt gefiltert etc hinter BP of 2017-05-30



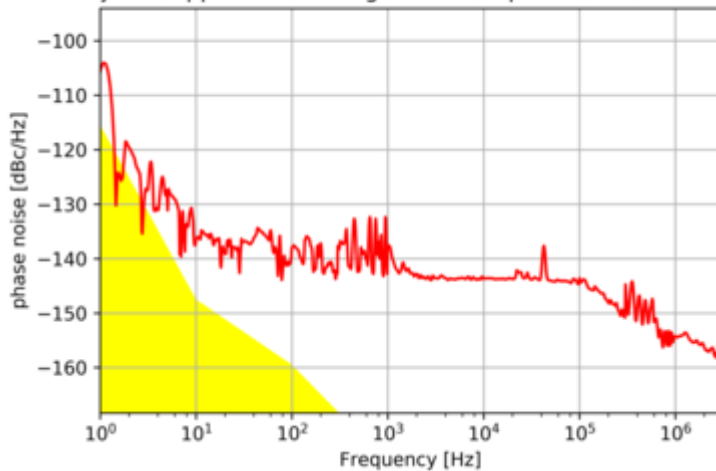
- J1 → short cable → SMA-BNC-connector → TP [6MHz] → Doubler [FD-2+] → BNC-SMA-connector → BP [SBP-10.7+] → BNC-SMA-connector → Att. [10dB] → BNC-SMA-connector → long cable → PNA

5mhzjverdoppelt verstaerlt gefiltert etc hinter ersten 10db att of 2017-

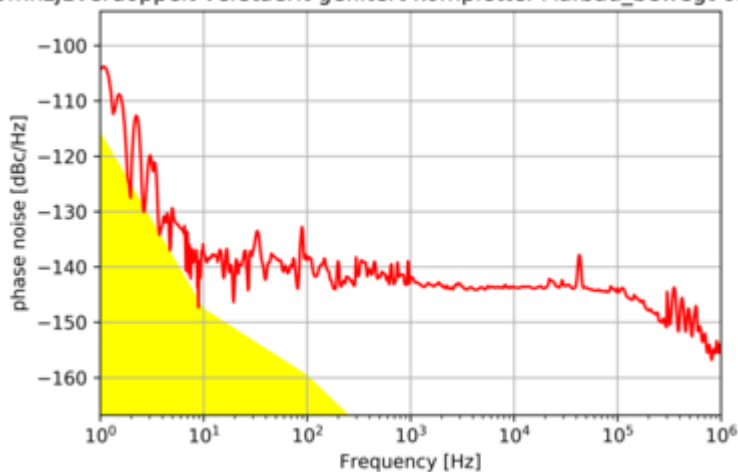


- Overall setup: J1 → short cable → SMA-BNC-connector → TP [6MHz] → Doubler [FD-2+] → BNC-SMA-connector → BP [SBP-10.7+] → BNC-SMA-connector → Att. [10dB] → short BNC-cable → Amplifier [ZFL-500LN-BNC+] → LP [BLP-15] → Att. [20dB] → Att. [3dB] → BNC-SMA-connector → long SMA cable → PNA

xco5mhzj1verdoppelt verstaerlt gefiltert kompletter Aufbau of 2017-05.



5mhzj1verdoppelt verstaerlt gefiltert kompletter Aufbau\_bewegt of 2017



☐ Measure: -"- -"- OCXO 5MHzx2 (DDS?)

- Currently not possible.

2)

☐ Propagate K+K manuals

3)

☐ Repair K+K box

4)

☐ Compare PN Marconi vs. ampfiere (which?)

5)

☐ Compare Specs Timetech & Spectra dynamics -> (PN, Channel/Channel isolation, Groundloops, min input power @ 10MHz)

## Distribution

- Timetech distributor:
  - Gibt es für Eco (Isolation: 120dB bei 10MHz / only BNC) und High Performance (Isolation: 150dB / only SMA)
    - ECO Variante: Timetech distributor\_datasheet
    - High Variante: Timetech distributor\_datasheet

- Spectra dynamics distributor: [HPDA-15RMi](#)

## Datasheet\_HPDA-15RMi

| Feature                           | TimeTech [Eco-Version]                                                                                                                                                                                                                                                                                                                                                  |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | Spectra<br>dynamics<br>HPDA-15RMi                                                                                                                  |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|--------|--|--|---------|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Phase Noise<br>[dBc]              | <div>@ 10MHz<br/>1Hz -148<br/>10Hz -160<br/>100Hz -165<br/>1000Hz -166<br/>10000Hz -166</div>                                                                                                                                                                                                                                                                           |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | @ <hi<br>#ed1c24>???</hi><br>MHz<br>1Hz -155 (max<br>-150)<br>10Hz -165<br>(max-160)<br><br>1000Hz -170 (max<br>168)<br>10000Hz -171 (max<br>-170) |
| Channel/Channel<br>isolation [dB] |                                                                                                                                                                                                                                                                                                                                                                         | 5 MHz                                                                                                     |                                                                                                          |                                                                                                       | 10 MHz |  |  | 100 MHz |  |  | Out-out: 130 (min<br>130)\\Out-in: 140<br>(min 145)                                                                                                |
|                                   | Np clipping below<br>Reverse Isolation [dB]<br>Output / Output Isolation [dB]<br>Ch-A / Ch-B Isolation [dB]<br>Harmonics [dBc]      +10 dBm input<br>(1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> )      +13 dBm input                                                                                                                                          | +12 dBm<br>> 140 (145 typ.)<br>> 100 (108 typ.)<br>> 110 (117 typ.)<br>-76   -76   -80<br>-73   -69   -82 | +12 dBm<br>> 120 (128 typ.)<br>> 90 (100 typ.)<br>> 100 (110 typ.)<br>-70   -57   -65<br>-65   -55   -65 | +12 dBm<br>> 110 (118 typ.)<br>> 75 (83 typ.)<br>> 90 (98 typ.)<br>-44   -46   -60<br>-42   -40   -55 |        |  |  |         |  |  |                                                                                                                                                    |
| Groundloops                       | <hi #ed1c24>???</hi>                                                                                                                                                                                                                                                                                                                                                    |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | <hi<br>#ed1c24>???</hi>                                                                                                                            |
| RF-Bandwidth<br>[MHz]             | 5 to 100 MHz<br>sine wave<br>useable from 100kHz to 200 MHz                                                                                                                                                                                                                                                                                                             |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | +/- 1 dB<br>0.5-65 (min 1-50)                                                                                                                      |
| Input Level<br>[dBm]              | Input level working: +6 to +17 (+14 dBm @ 100 MHz)<br>Input level nominal: +13                                                                                                                                                                                                                                                                                          |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | 1 dB compression<br>18 (min 17)<br>@ <hi<br>#ed1c24>???</hi><br>MHz                                                                                |
| Output Level<br>[dBm]             | <hi #ed1c24>???</hi>                                                                                                                                                                                                                                                                                                                                                    |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | +18<br>@ <hi<br>#ed1c24>???</hi><br>MHz                                                                                                            |
| Gain [dB]                         | Gain: 0 (+0.15/-0.1 dB, 1 - 100 MHz, +0.15 to -0.5 dB @ 200 MHz)<br>Gain variation: < 0.1, output vs. output                                                                                                                                                                                                                                                            |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | @5MHz<br>0.2 (max 0.5)                                                                                                                             |
| Impedance [Ω]                     | Input: 50, nominal<br>Output: 50, nominal                                                                                                                                                                                                                                                                                                                               |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | Input: 50<br>Output: 50                                                                                                                            |
| Return loss [dB]                  | Input: >45 @5MHz and 10 MHz, >30 @100 MHz<br>Output: >50 @5MHz and 10 MHz, >30 (typ -35) @ 100 MHz                                                                                                                                                                                                                                                                      |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | Input(S11): -35<br>(max -30)<br>Output(S22): -35<br>(max -30)                                                                                      |
| Distortion [dBc]                  | <hi #ed1c24>???</hi>                                                                                                                                                                                                                                                                                                                                                    |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | +13 dBm: -48 (max<br>-45)<br>+17 dBm: -42 (max<br>-40)                                                                                             |
| Temp. Delay<br>Coefficient        | +15...+30°C<br>1K pp with maximum slopes 0.5K/h                                                                                                                                                                                                                                                                                                                         |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | 0-50°C<br>1.2 (max 1.5)<br>[ps/°C]                                                                                                                 |
| Connectors                        | only BNC <hi #ed1c24>???</hi>                                                                                                                                                                                                                                                                                                                                           |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | SMA for input and<br>output                                                                                                                        |
| Power<br>connectors               | Power Consumption (all outputs loaded):<br>AC: < 0.2 A Priority on AC supply input<br>DC: < 0.9 A, Stand-By: < 50 mA DC is used as back-up supply<br>Supply voltage AC: 100 to 240 V AC, 50/60 Hz, LED indicating AC voltage<br>Supply voltage DC: 18 to 36 V DC, DC isolated, LED indicating DC voltage<br>2 redundant DC power input connectors, automatic switchover |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | AC Operation:<br>100-240 VAC,<br>47-63Hz<br>DC Operation:<br>12-36 VDC-<br>Available for some<br>models                                            |
| Number of<br>Outputs              | 16 or 15                                                                                                                                                                                                                                                                                                                                                                |                                                                                                           |                                                                                                          |                                                                                                       |        |  |  |         |  |  | 5-15                                                                                                                                               |

| Feature          | TimeTech [Eco-Version]                                                                                                                                                                                                                                              | Spectra dynamics<br>HPDA-15RMi |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Number of Inputs | 1 or 2                                                                                                                                                                                                                                                              | 1-3                            |
| More             | Noise figure < 22.0 dB, (21 dB typ. 1 – 100 MHz)<br>Group delay absolute, 1 – 100 MHz 4.7 ns ± 0.2 ns<br>Group delay flatness, 1 – 100 MHz < 0.1 ns pp<br>Group delay variation, channel vs channel < 0.1 ns<br>Group delay variation versus temperature < 6 ps / K | -                              |

**6)**

☐ HiTec: where is to 10MHz RF

**7)**

☐ Cable, Connector choice

**Which cables?**

- Best choice (cost-effectiveness) < 150 MHz:  
RG223 - Datasheet  
[RG223 - conrad](#)
- Aircell 5 for > 100 MHz
  - Low attenuation for higher frequencies (also for 10MHz compared to RG223)
  - [Aircell 5 - Datasheet](#)
  - [Aircell 5 - conrad](#)
  - Kai-Martin-Quelle: [Aircell 5 - ssb](#)
- For high frequencies <10 GHz:  
accuphasebrochure.pdf
- **Testing cable:**
  - Offenes Ende vermessen, dann sollte es Hochohmig sein
  - Auf einer Seite mit 50 Ohm verbinden und vermessen: 50 Ohm+Kabelwiderstand (<3-4 Ohm ist ok)
    - Wenn der Kabelwiderstand höher ist, dann wurden vermutlich beim Crimpen (Luft-)Übergangswiderstände erzeugt

**Which connectors?**

- BNC or SMA?

**8)**

☐ More cables for counter RF-Signals in the resLab?

**9)**

☐ Which mains filter and cold-device plug?

- PTB is using this model: 521062-21 HARTU

- Datasheet:

521062-21 HARTU

- <https://www.reichelt.de/Entstoerfilter/FEH-2101/3/index.html?ACTION=3&GROUPID=7485&ARTICLE=7655>

E-Mail-Antwort der Firma Hartu zu dem Model 521062-21 HARTU es handelt sich bei 521062-21 um ein 50/60 Hz Netzfilter. Die Sicherheitsnormen schreiben Luft- und Kriechstrecken und eine 100% Hochspannungsprüfung vor. Die Isolation der eingebauten Stromkompensierten Drossel wird über einen Trennsteg aus Kunststoff zwischen den Phasen und die Kernisolation sichergestellt. Es wird eine Hochspannungsprüfung zwischen den Phasen von 1,41kV/50Hz/2s durchgeführt. Gegen Erde wird mit 2KV/50Hz/2s geprüft.

Daten über die Isolation bei anderen Frequenzen liegen nicht vor.

- I contacted Schürter to find a mains filter with high isolation at low frequencies and low current (1A):
  - Model: 5123 G-STECKER FILTER 1A, Konfigurations-Code: 5123.0000.0
  - Datasheet:

5123 Schürter

## Mor isolation between ports?

- Zur Vermeidung von Masseschleifen
- Use: FTB-1-1\*A26+
- Datasheet: [FTB-1-1\\*A26+](#)
- Aufbau:
- Transformator in den jeweiligen Nutzerlaboren einbauen, damit das Kabel noch geschirmt ist und nicht hoch-Ohmig
- Kabel kommend vom ResLab an Isolierter Port des Transformators
  - Transformator-Gehäuse irgendwo dranschrauben
    - Gehäuse hat Masse des Nutzerlabors

## OCXO

- Frequency double, how?
  - Read Phase-Lock-Loop page

## Filters

- 5MHz
- 10MHz

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