

# Synthesizer

## Important Synthesizers for ResLab

| Typ Synthesizer               | Application                                                   | Frequency [Hz]         | RF-Power [dBm] | Reference       | Comment                                                           |
|-------------------------------|---------------------------------------------------------------|------------------------|----------------|-----------------|-------------------------------------------------------------------|
| Marconi 2024                  | Reprate                                                       | 1 000 000 226          | 7              | Passive H-Maser |                                                                   |
| Marconi 2024                  | Amplifier for 10 MHz distribution                             | 10 000 000             | 14             | Rb Clock        |                                                                   |
| Marconi 2024                  | Stell-AOM Mixdown                                             | 74 940 000             | 7              | Rb Clock        |                                                                   |
| Marconi 2024                  | Free                                                          |                        |                |                 | was broken                                                        |
| Marconi 2023B                 | Free                                                          |                        |                |                 |                                                                   |
| Rhode&Schwarz SMC100A         | Free                                                          |                        |                |                 |                                                                   |
| Rhode&Schwarz SMC100A         | 30m Fiber stabilization Reference                             | 160 222 000            | 4              | Rb-Clock        |                                                                   |
| Rhode&Schwarz Hameg HM8134-3  | 30m Fiber stabilization                                       | 80 111 000             | 1.4            | Rb-Clock        | * ext. Mod. on (400 kHz Dev.)<br>* Name: AOM2<br>* Shit stability |
| Rhode&Schwarz Hameg HM8134-3  | Free                                                          |                        |                |                 | Shit stability!                                                   |
| MG520 M Frequency Generator   | EOM R1                                                        | 13 810 000             | 10             | Rb-Clock        |                                                                   |
| Rhode&Schwarz SMH 845.4002.52 | EOM R2                                                        | 16 200 000             | 13             | Rb-Clock        |                                                                   |
| Rhode&Schwarz SML01           | Double-pass AOM R1                                            | 104 630 000 + Computer | 13             | Rb-Clock        | * Name: AOM0<br>* located in upstairs-Lab                         |
| Rhode&Schwarz SMC100A         | * Linewidth Lock with Blue AOM R1<br>* 5m Fiber stabilization | 77 111 000             | 2              | Rb-Clock        | * Name: AOM1<br>* located in upstairs-Lab                         |
| Rhode&Schwarz SMY01           | 5m Fiber stabilization Reference                              | 77 111 000             | 5              | Rb-Clock        | * Name: AOM1<br>* located in upstairs-Lab                         |
|                               | Double-pass AOM R2                                            |                        |                |                 |                                                                   |

## Specks

| Typ Synthesizer | Phase Noise @ 1 GHz [dBc]                                      | Resolution [Hz]                            |
|-----------------|----------------------------------------------------------------|--------------------------------------------|
| Marconi 2024    | -90 @ 100 Hz<br>-100 @ 1 kHz<br>-115 @ 10 kHz<br>-121 @ 20 kHz | 0.01 < 100 Hz<br>0.1 < 1 kHz<br>1 < 20 kHz |

| Typ Synthesizer              | Phase Noise @ 1 GHz [dBc]                                                                            | Resolution [Hz] |
|------------------------------|------------------------------------------------------------------------------------------------------|-----------------|
| Marconi 2023B                | -75 @ 100 Hz<br>-100 @ 1 kHz<br>-112 @ 10 kHz<br>-121 @ 20 kHz                                       | 1               |
| Rhode&Schwarz SMC100A        | -45 @ 1 Hz<br>-70 @ 10 Hz<br>-82 @ 100 Hz<br>-100 @ 1 kHz<br>-115 @ 10 kHz <b>with internal OCXO</b> | 0.001           |
| Rhode&Schwarz Hameg HM8134-3 | -15 @ 1 Hz<br>-50 @ 10 Hz<br>-80 @ 100 Hz<br>-100 @ 1 kHz<br>< -100 @ 10 kHz                         | 1               |
| Rhode&Schwarz SML01          |                                                                                                      |                 |

## Marconi Synthesizer

### Marconi Synthesizer 2024



- Manual 2024:

[ifr\\_2024\\_datasheet.pdf](#)

- possible settings: Frequenzbereich von 9 kHz bis 2,4 GHz, Auflösung 1 Hz, Ausgangspegel von -140 bis +13 dBm, Auflösung 0,1 dB, interne 2-Ton-Modulationsquelle für Sinus, Rechteck und Dreieck, lineare und logarithmische Wobblung, AM, FM, pM, Puls und FSK, Rückleistungsschutz bis 50 W, LC-Display, numerische Tastatur, GPIB und RS-232

### Options

- 01 No attenuator
- 03 high Power
- 04 high stability frequency standard
- 11 Fast pulse and high power



- **Error message:** "External reference is missing!!!"
- **Important:** External(Ext): <fc #4682b4>1 Ext 10MHz direct</fc>

(MENÜ)-Button → Frequency/Sweep (Select) → 4 Frequency standard (Select) → 1 Ext 10MHz direct

- **Possible errors:** no Rb-referenz/ GPS/ OXCO connection or wires connected?



- **Normal state (10MHz):**

## Synthesizer is broken?

Manual for repair: <http://www.ko4bb.com/getsimple/index.php?id=manuals&dir=Marconi>

Quick repair project (Marconi 2024): a forum where several defects are presented and explained how to fix them: <http://www.eevblog.com/forum/repair/quick-repair-project-marconi-2024/>

**Output signal (dBm) is too small:** Probably the amplifier is broken. Check backwards the signal inside the synthesizer with a measuring tip.

1. Adjust the frequency of the half from the maximal Oszi-frequency
2. Measure the distance between the minimum and maximum sinus-signal. Half of the distance divide by root(2) provide the effective voltage
3. Use the data sheet for dBm calculation:  
dbm-volts-wattconversion.pdf

## Solved Problems:

1. Problem: No Output Signal
  - Solution: Transistor TR708 was broken. The Transistor has been replaced by a BC847 Transistor.

## Marconi Synthesizer 2023B (ehemals ausgeliehen von Q-Port)



- Manual 2023B:

[datenblattmarifr2023b\\_2025.pdf](#)

## Rohde&Schwarz Synthesizer

### Rohde&Schwarz Synthesizer SMC100A



- Manual SMC100A:

[smc100a\\_operatingmanual\\_en\\_09.pdf](#)

- Datasheet SMC100A:

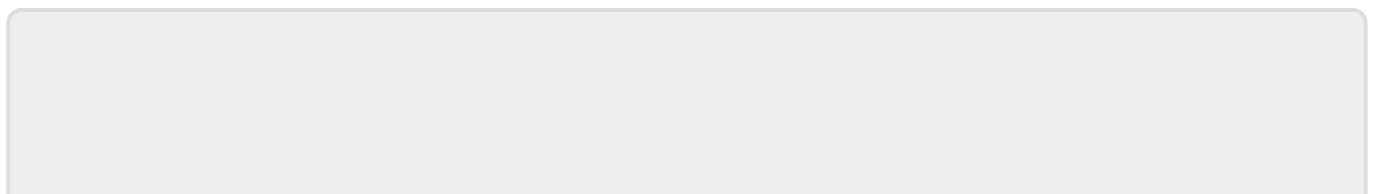
[smc100a\\_dat-sw\\_en.pdf](#)

### Rohde&Schwarz Synthesizer Hameg HM8134-3



- Manual Hameg HM8134-3:

[hm8134-3\\_usermanual\\_de\\_en\\_04.pdf](#)



From:

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

Permanent link:

<https://iqwiki.iqo.uni-hannover.de/doku.php?id=groups:mg:private:resonatoren:synthesizer:start&rev=1539340295>

Last update: **2018/10/12 10:31**

