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.) * Name: AOM2 * 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 * located in upstairs-Lab
Rhode&Schwarz SMC100A	* Linewidth Lock with Blue AOM R1 * 5m Fiber stabilization	77 111 000	2	Rb-Clock	* Name: AOM1 * located in upstairs-Lab
Rhode&Schwarz SMY01	5m Fiber stabilization Reference	77 111 000	5	Rb-Clock	* Name: AOM1 * located in upstairs-Lab
	Double-pass AOM R2				

Specks

Typ Synthesizer	Application	Frequency [Hz]	RF-Power [dBm]	Reference	Comment	Phase Noise @ 1 GHz [dBc]	Resolution [Hz]
Marconi 2024	Reprate	1 000 000 226	7	Passive H-Maser	-90 @ 100 Hz -100 @ 1 kHz -115 @ 10 kHz -121 @ 20 kHz	0.01 < 100 Hz 0.1 < 1 kHz 1 < 20 kHz	
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.) * Name: AOM2 * 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 * located in upstairs-Lab		
Rhode&Schwarz SMC100A	* Linewidth Lock with Blue AOM R1 * 5m Fiber stabilization	77 111 000	2	Rb-Clock	* Name: AOM1 * located in upstairs-Lab		

Typ Synthesizer	Application	Frequency [Hz]	RF-Power [dBm]	Reference	Comment	Phase Noise @ 1 GHz [dBc]	Resolution [Hz]
Rhode&Schwarz SMY01	5m Fiber stabilization Reference	77 111 000	5	Rb-Clock	* Name: AOM1 * located in upstairs-Lab		
	Double-pass AOM R2						

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, nummerische 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 severel 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 devide 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: Transitor TR708 was broken. The Transistor has been replaced by a BC847 Transitor.

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

Rohde&Schwarz Synthesizer Hameg HM8134-3

- Manual Hameg HM8134-3:
  hm8134-3_usermanual_de_en_04.pdf