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File: power-control.sch

Sheet: AF Amplifier

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Sheet: IF Amplifiers

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Sheet: RF Amplifiers

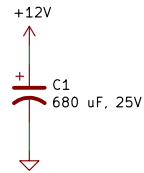
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Sheet: Power Amplifier

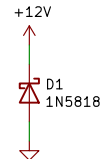
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Sheet: LPFs

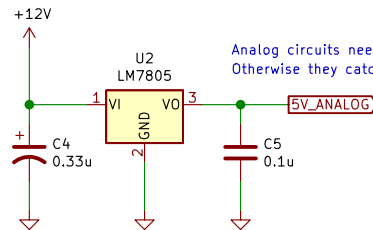
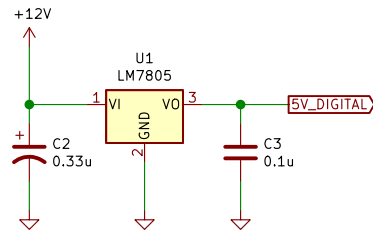
File: low-pass-filters.sch



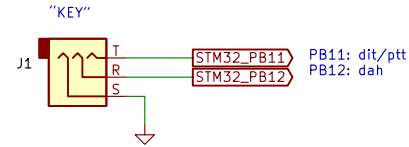
Some power supplies go into short circuit protection when the rig switches from RX to TX, which reboots the MCU. This capacitor prevents this from happening.



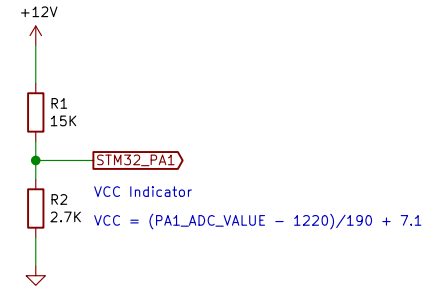
Simple reverse-polarity protection. Use with an external 2A fuse.



For both LM7805's use a small heatsink



PB11: dit/ptt  
PB12: dah



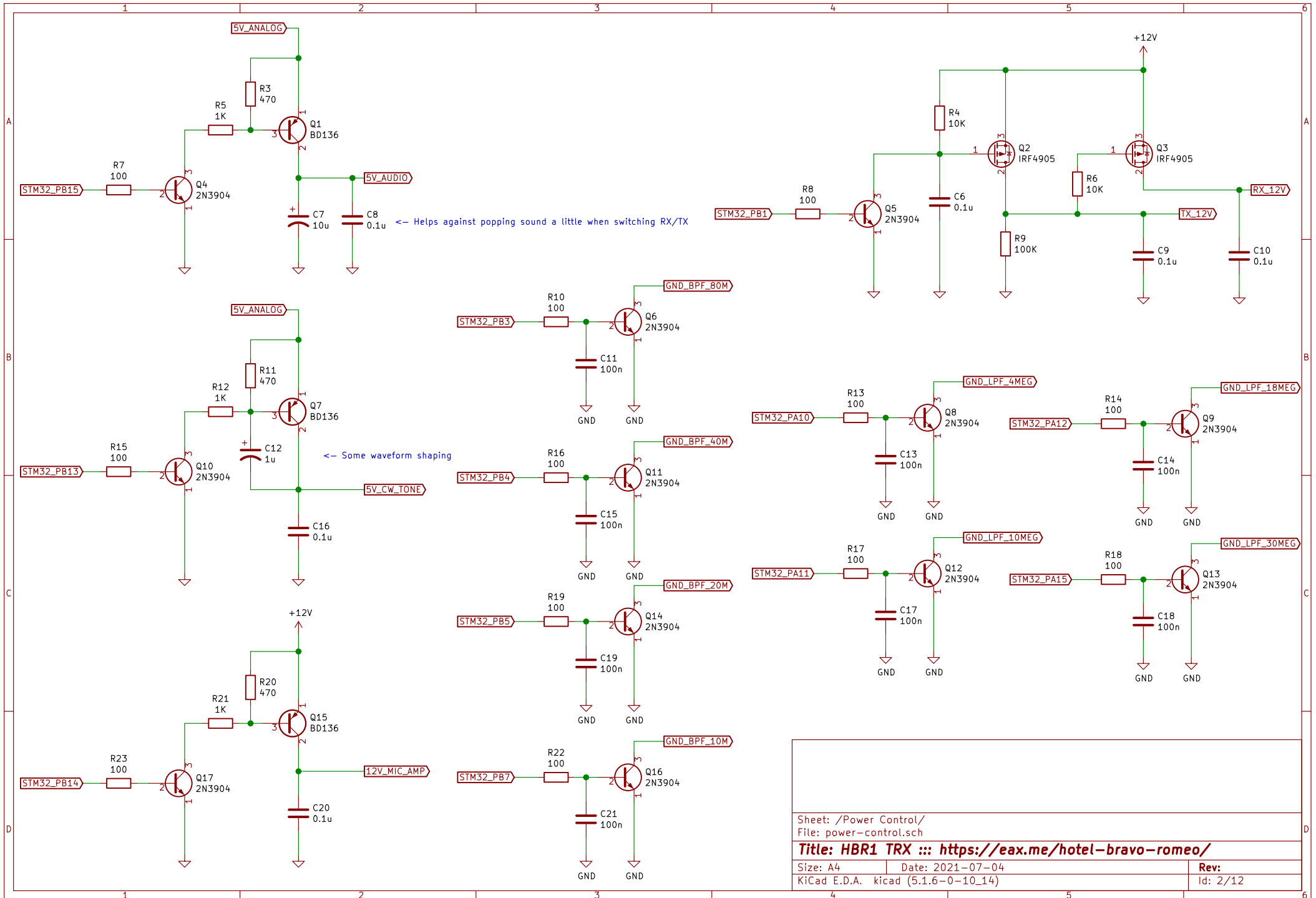
VCC Indicator  
 $VCC = (PA1\_ADC\_VALUE - 1220)/190 + 7.1$

Here is how STM32F103 pins are used:

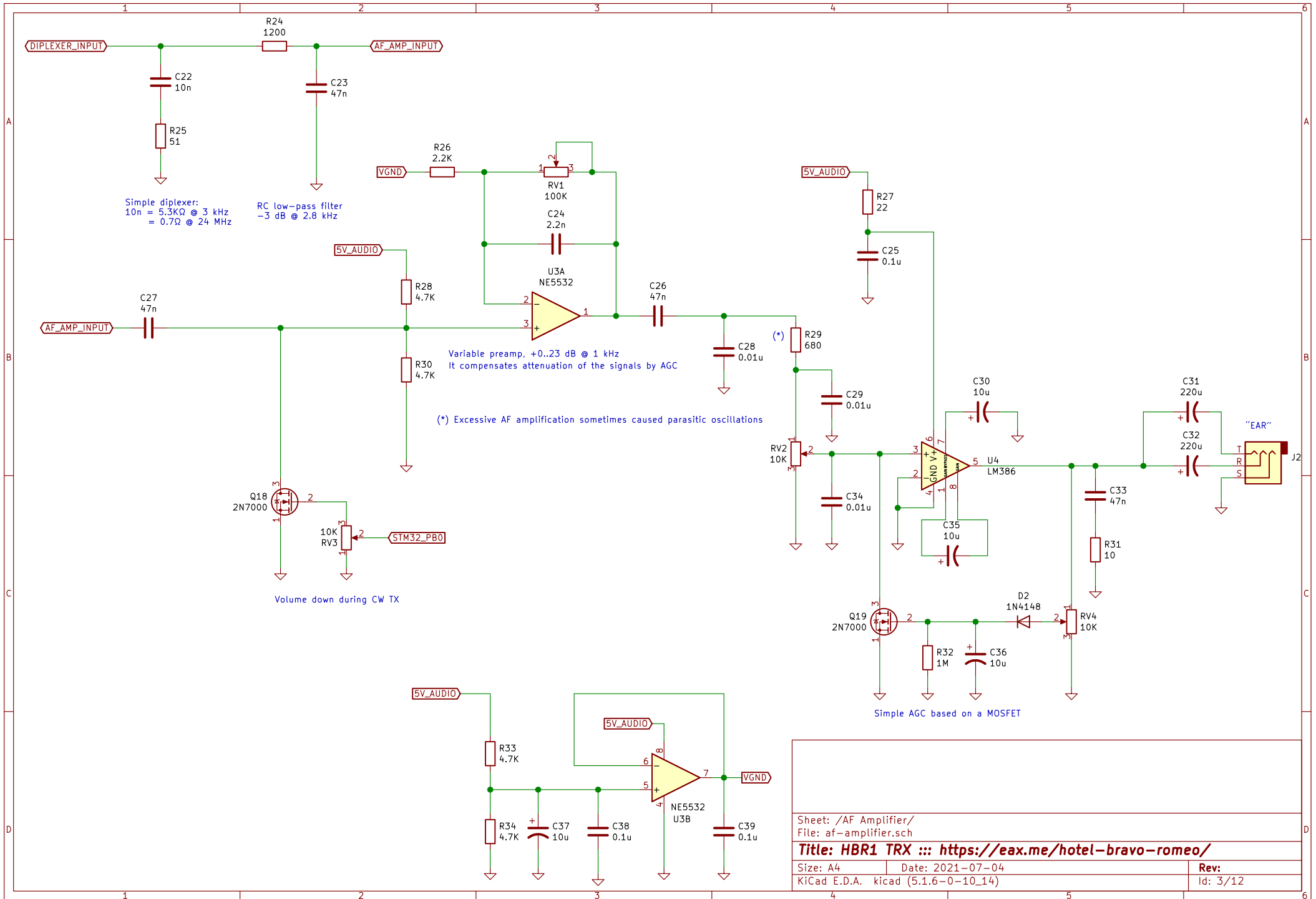
- PB1: RX\_12V/TX\_12V switching
- PB0: volume down during CW TX
- PA3: BAND button
- PA4: MODE button
- PA5: CLAR button
- PA6: KEYS button
- PA0: CW/SSB xtal filter switching
- PB3: BPF 80M
- PB4: BPF 40M
- PB5: BPF 20M
- PB6: BPF 15M (reserved)
- PB7: BPF 10M
- PC13: BPF 30M (reserved)
- PC14: BPF 17M (reserved)
- PC15: BPF 12M (reserved)
- PA10: LPF\_4Meg
- PA11: LPF\_10Meg
- PA12: LPF\_18Meg
- PA15: LPF\_30Meg
- PB15: AF Amp on/off
- PB14: Mic Amp on/off
- PB13: CW tone on/off
- PB11: dit / ptt
- PB12: dah
- PA8, PA9: rotary encoder
- PB10: rotary encoder button
- PB9: I2C SDA
- PB8: I2C SCL
- PA1: Vcc ADC input
- PA2: S-meter ADC input
- PA7: SWR-meter ADC input (reserved)

Si5351, 1602 LCD and 24LC64 EEPROM should be connected to the I2C bus (not shown on this schematic). Pins 1, 2 and 3 (A0, A1, A2) of 24LC64 should be connected to ground.

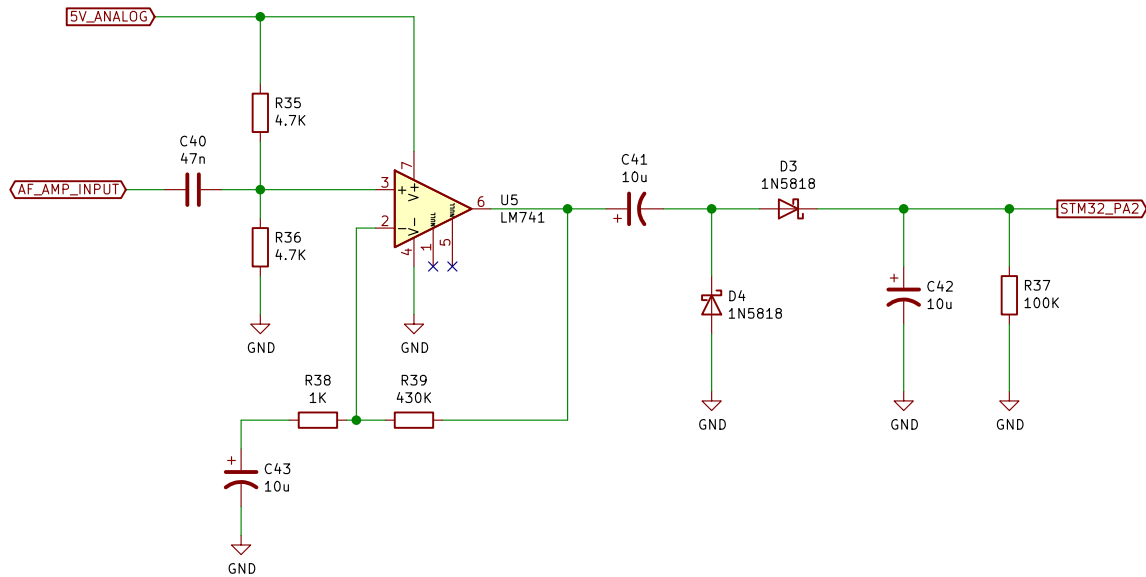
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File: hotel-bravo-romeo.sch		
<b>Title: HBR1 TRX :::</b> <a href="https://eax.me/hotel-bravo-romeo/">https://eax.me/hotel-bravo-romeo/</a>		
Size: A4	Date: 2021-07-04	Rev:
KiCad E.D.A. kicad (5.1.6-0-10_14)	Id: 1/12	



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 Size: A4 Date: 2021-07-04 Rev:  
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Size: A4	Date: 2021-07-04
KiCad E.D.A. kicad (5.1.6-0-10_14)	Rev: Id: 3/12



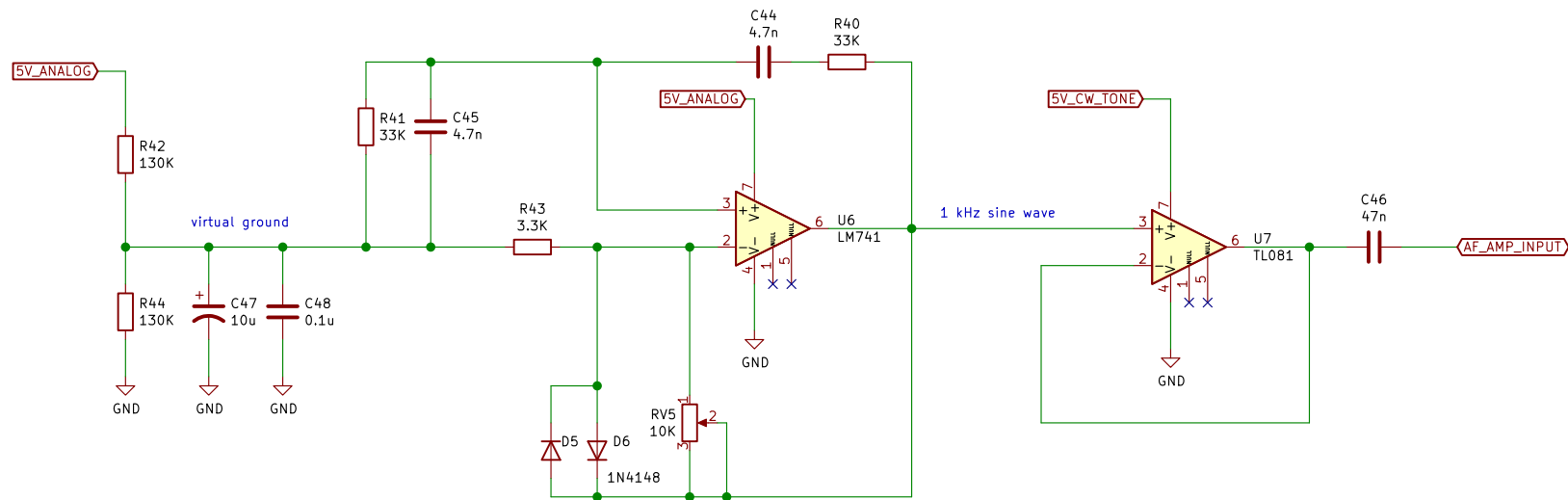
Sheet: /S Meter/  
 File: s-meter.sch

**Title: HBR1 TRX :::** <https://eax.me/hotel-bravo-romeo/>

Size: A4 Date: 2021-07-04

KiCad E.D.A. kicad (5.1.6-0-10\_14)

Rev:  
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Wien bridge oscillator runs all the time to prevent "chirp".

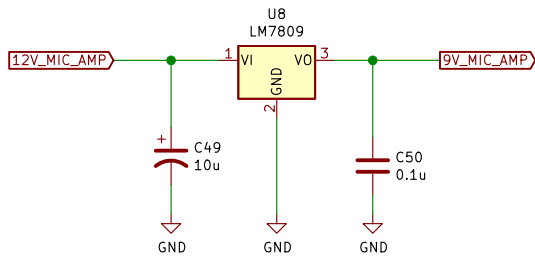
Keyed buffer. LM741 may work as well, but I didn't check it. NE5532 will not work. It doesn't provide sufficient isolation.

Sheet: /CW Tone Oscillator/  
File: cw-tone-oscillator.sch

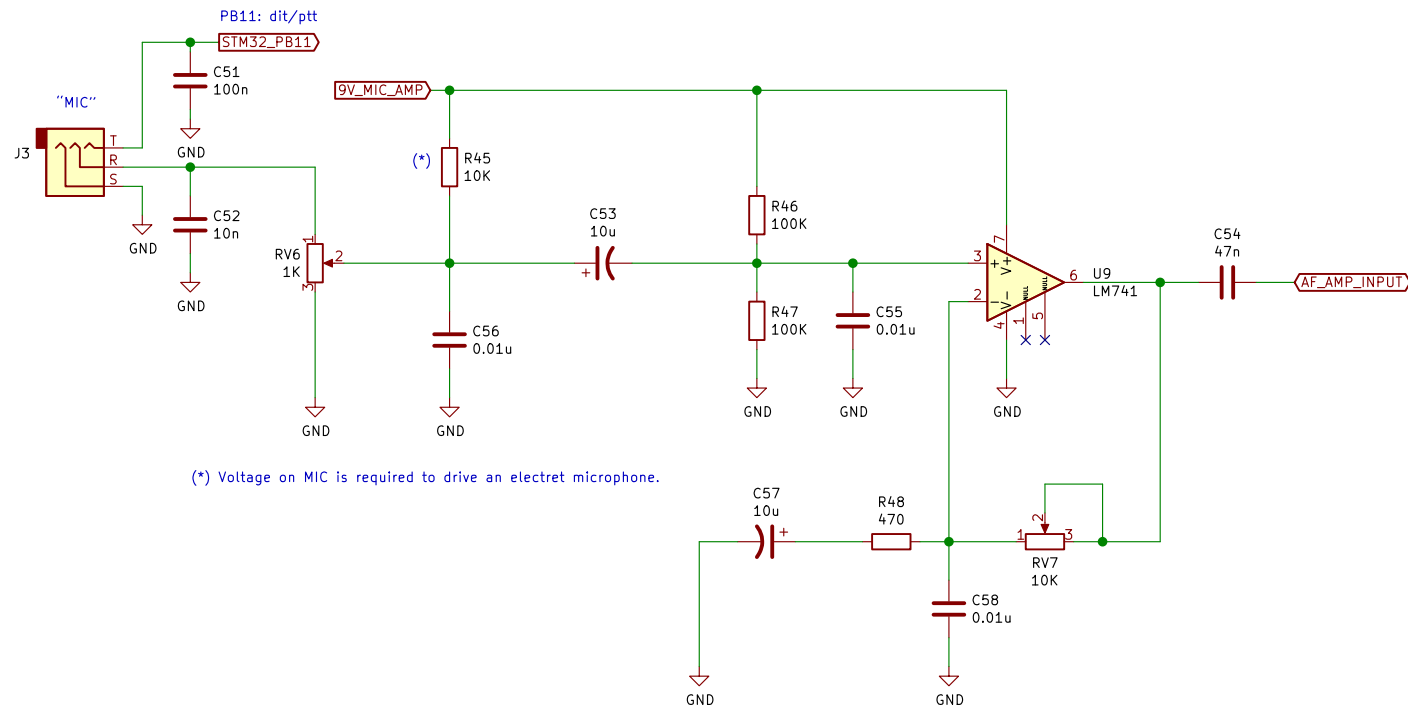
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Size: A4 Date: 2021-07-04  
KiCad E.D.A. kicad (5.1.6-0-10\_14)

Rev:  
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Place the voltage regulator as close to the mic amplifier as possible.  
The amplifier needs a very stable voltage during TX to prevent parasitic oscillations!



(\*) Voltage on MIC is required to drive an electret microphone.

Non-inverting 0..26 dB amplifier

Sheet: /Microphone Amplifier/  
File: microphone-amplifier.sch

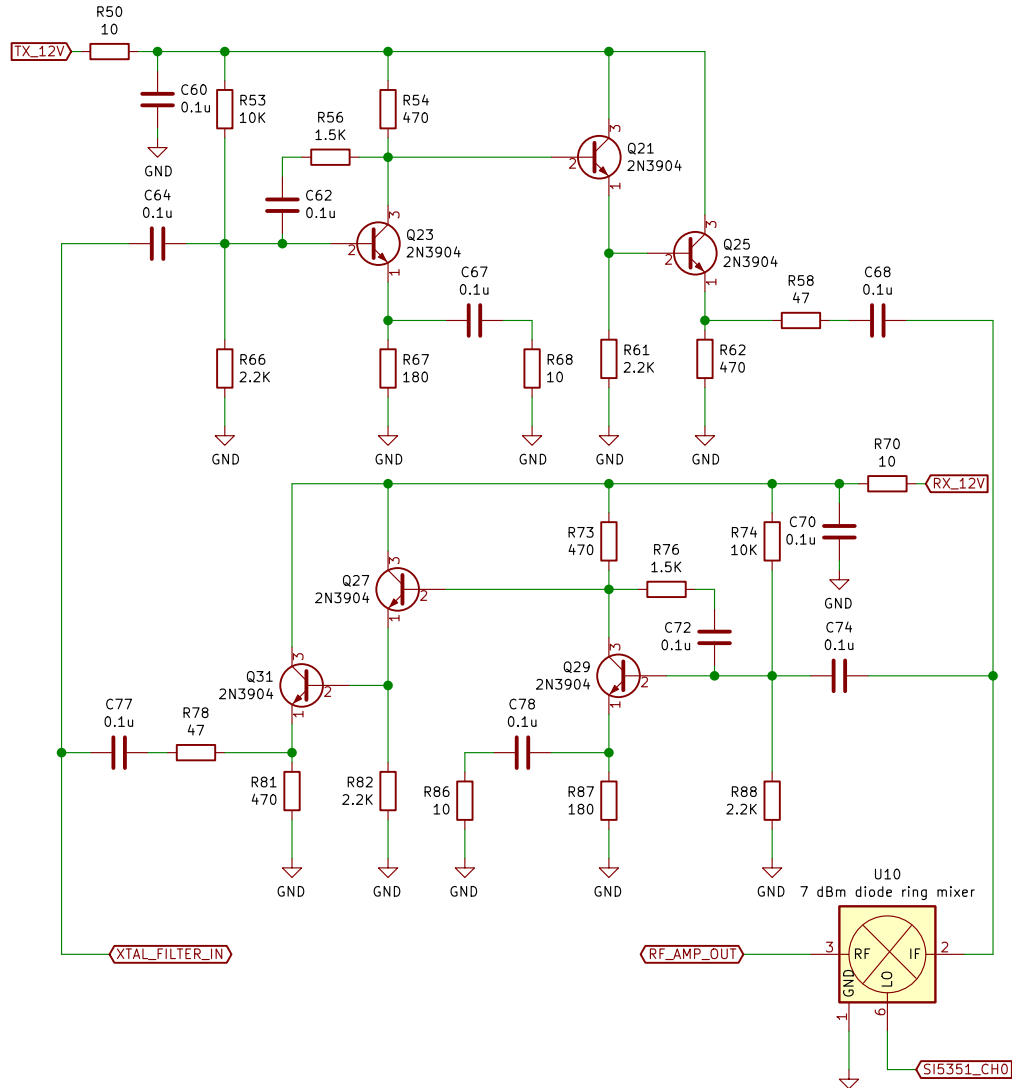
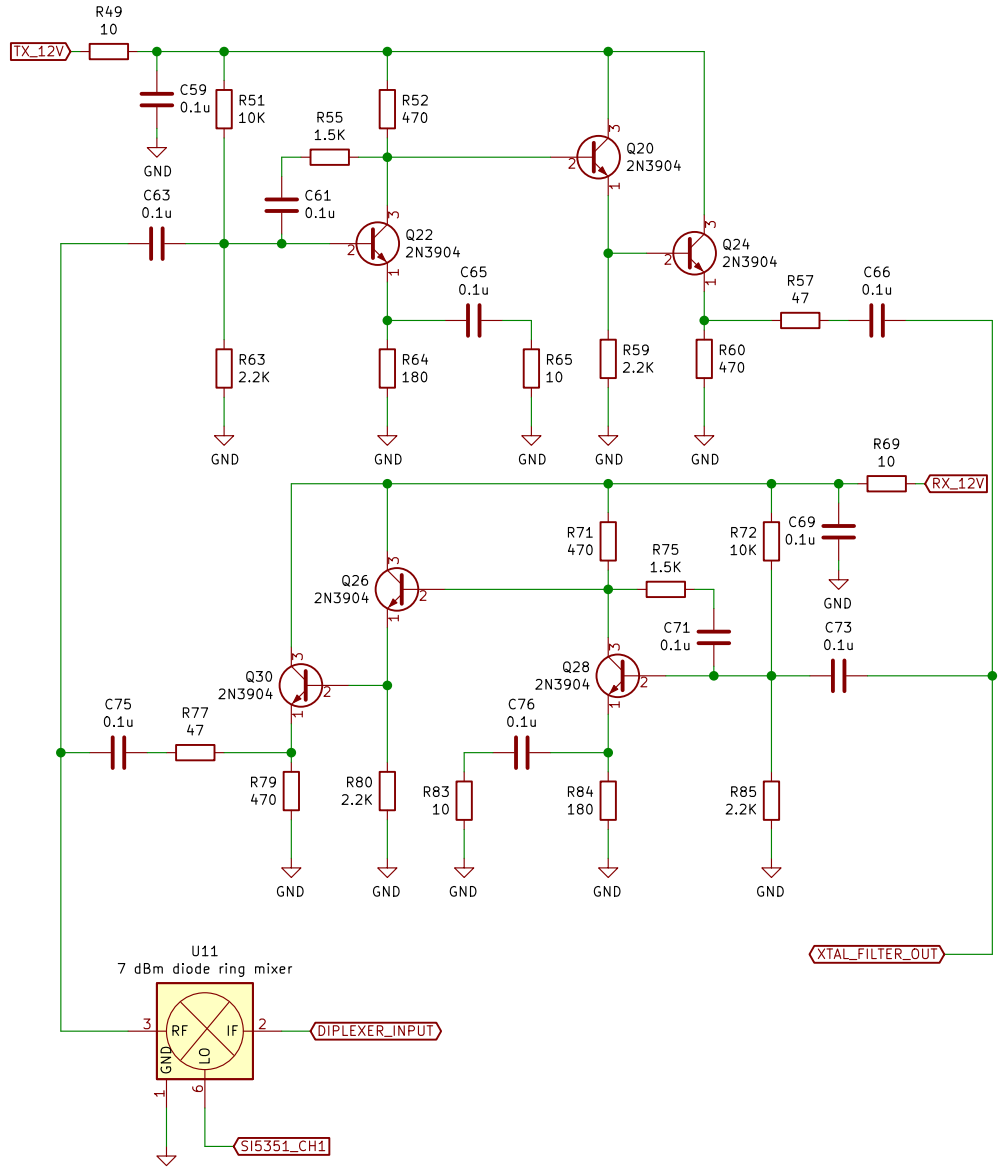
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Size: A4 Date: 2021-07-04

KiCad E.D.A. kicad (5.1.6-0-10\_14)

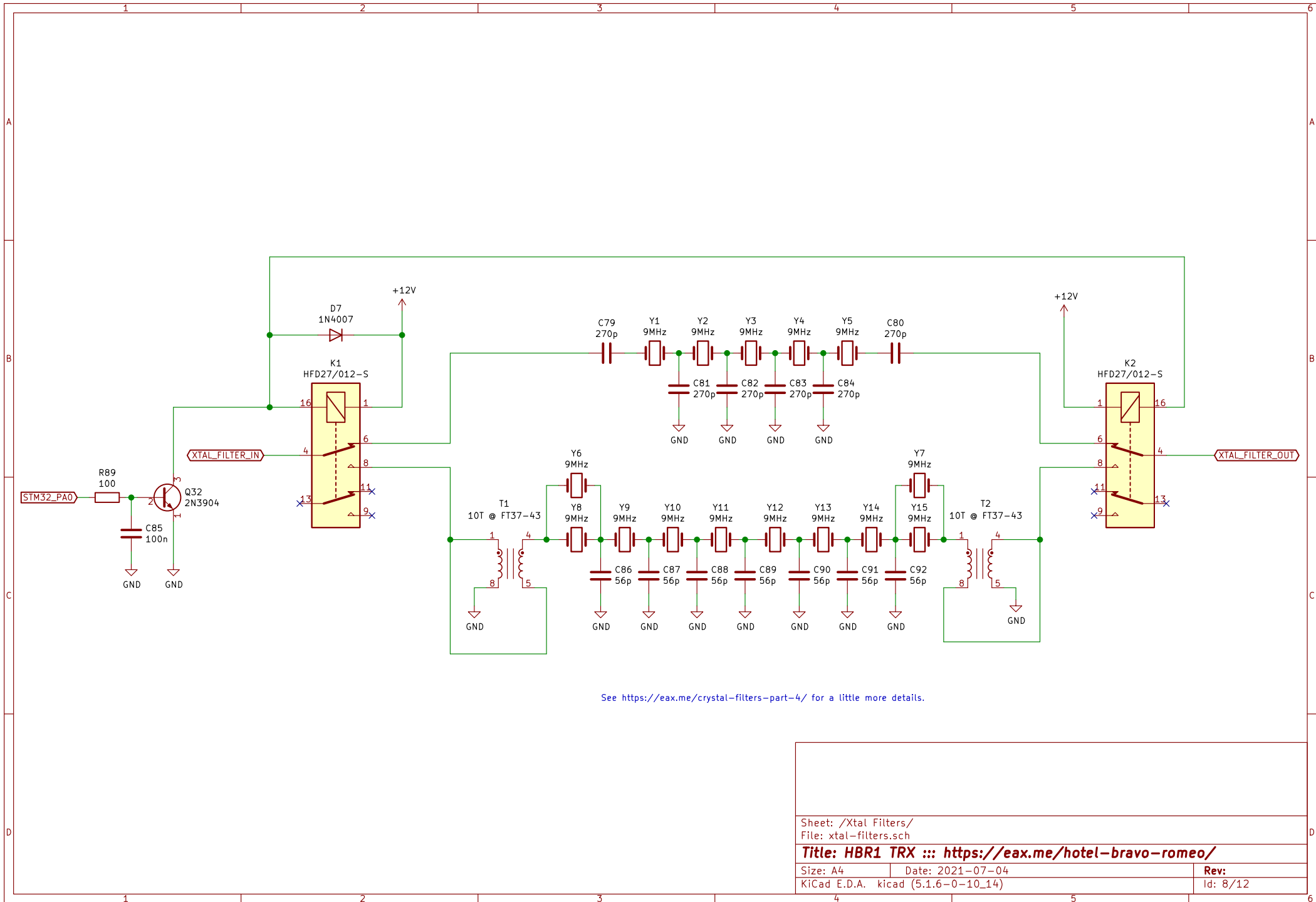
Rev:  
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Bidirectional -22 dB amplifiers.  
 See [http://w7zoi.net/bidirectional\\_matched\\_amplifier.pdf](http://w7zoi.net/bidirectional_matched_amplifier.pdf)



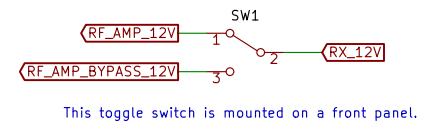
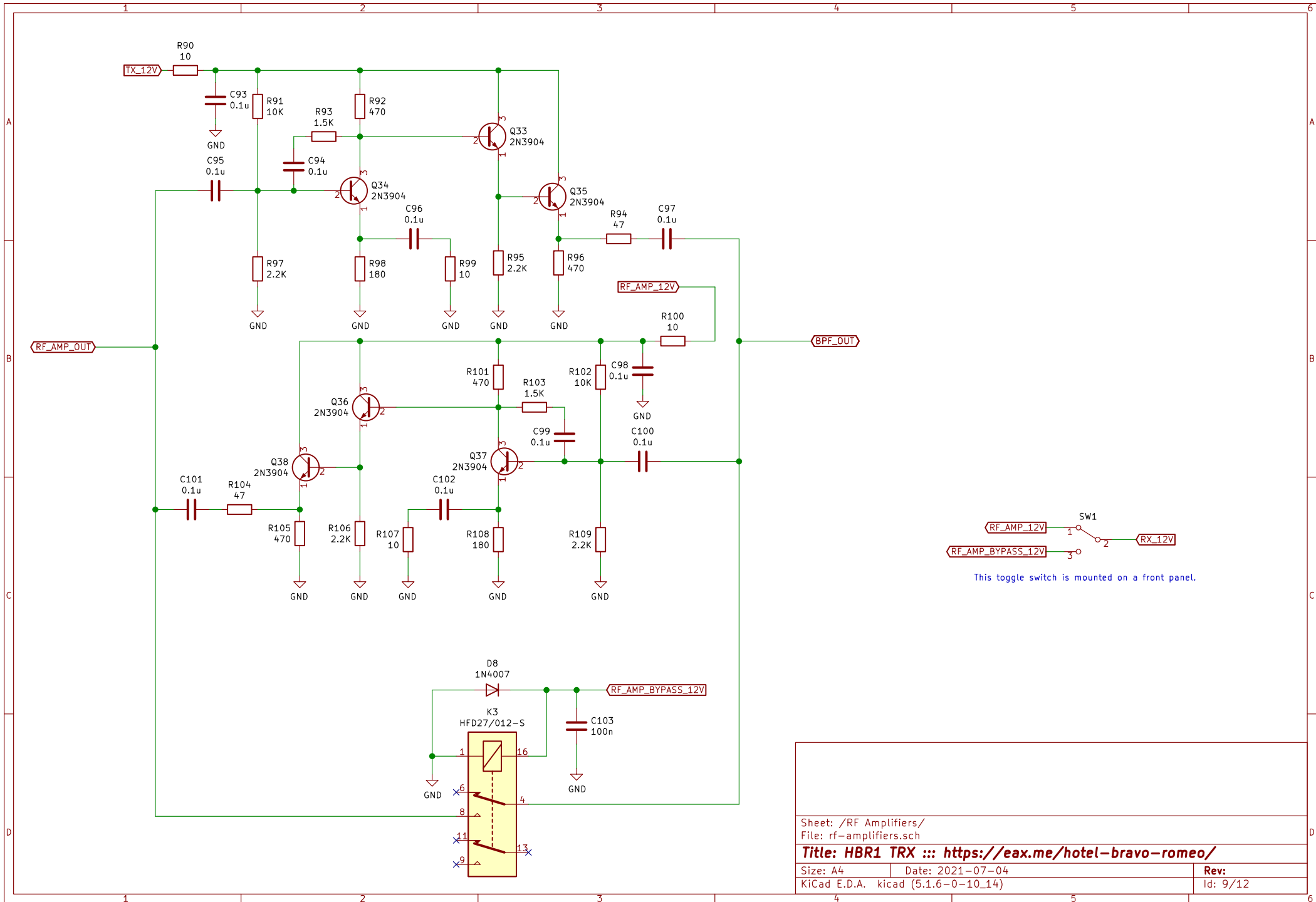
See <https://eax.me/compact-diode-ring-mixer/> on how to build one.  
 Or simply use SBL-1, ADE-1, ADE-6, or similar.

Sheet: /IF Amplifiers/		Date: 2021-07-04	
File: if-amplifiers.sch		Rev:	
<b>Title: HBR1 TRX ::: <a href="https://eax.me/hotel-bravo-romeo/">https://eax.me/hotel-bravo-romeo/</a></b>			
Size: A4	KiCad E.D.A. kicad (5.1.6-0-10_14)		Id: 7/12

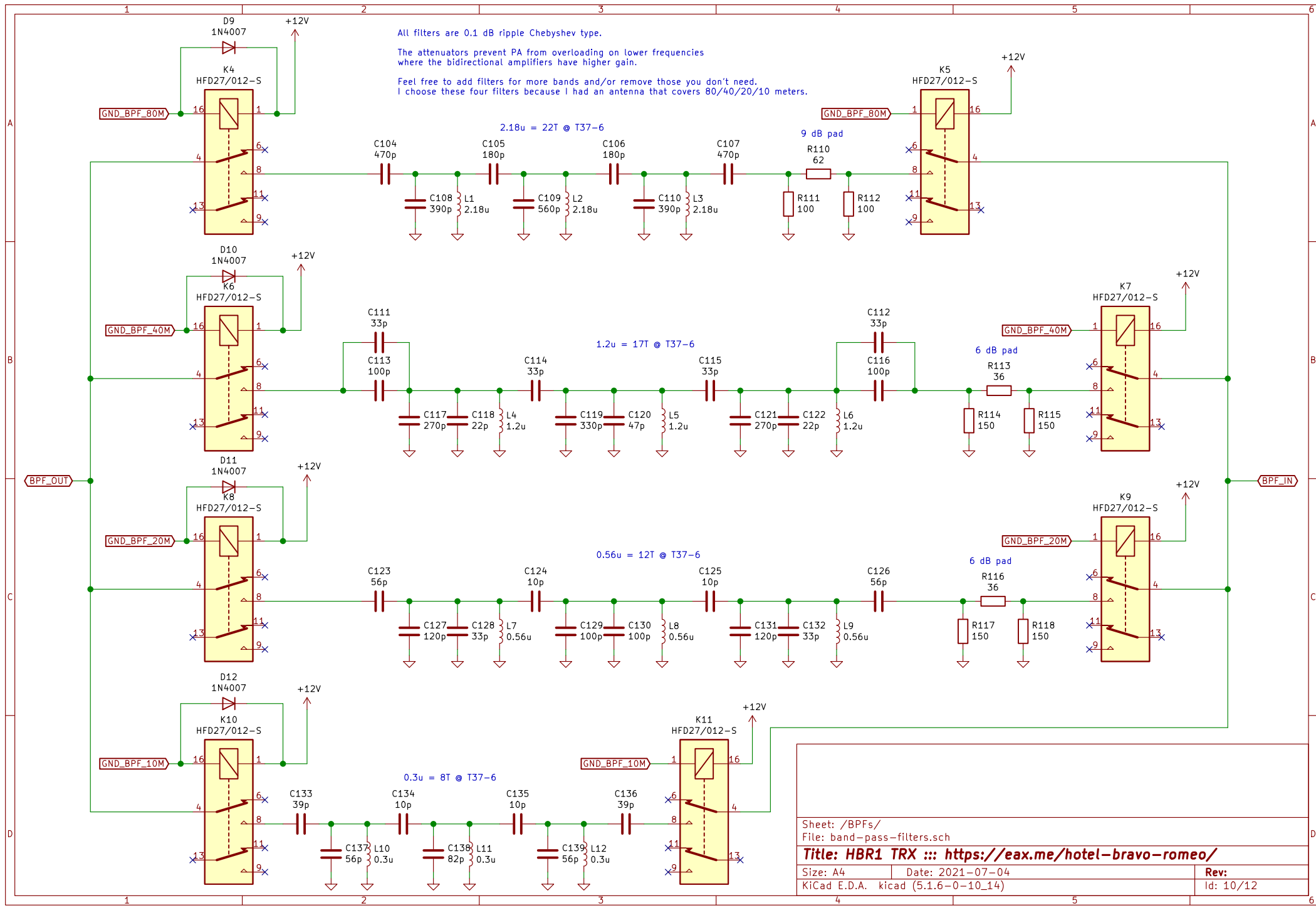


Sheet: /Xtal Filters/		File: xtal-filters.sch	
<b>Title: HBR1 TRX ::: <a href="https://eax.me/hotel-bravo-romeo/">https://eax.me/hotel-bravo-romeo/</a></b>			
Size: A4	Date: 2021-07-04	Rev:	
KiCad E.D.A. kicad (5.1.6-0-10_14)	Id: 8/12		

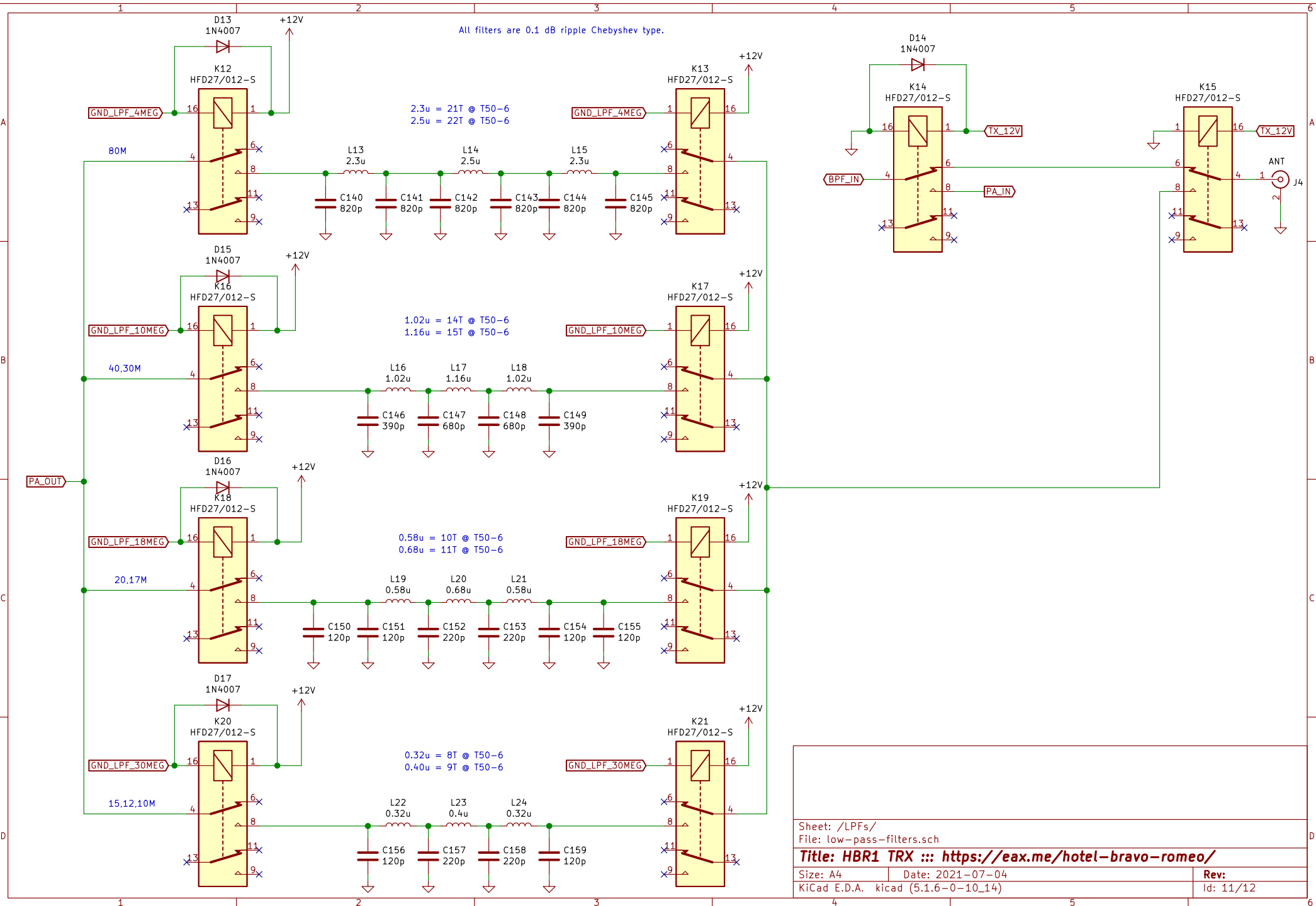


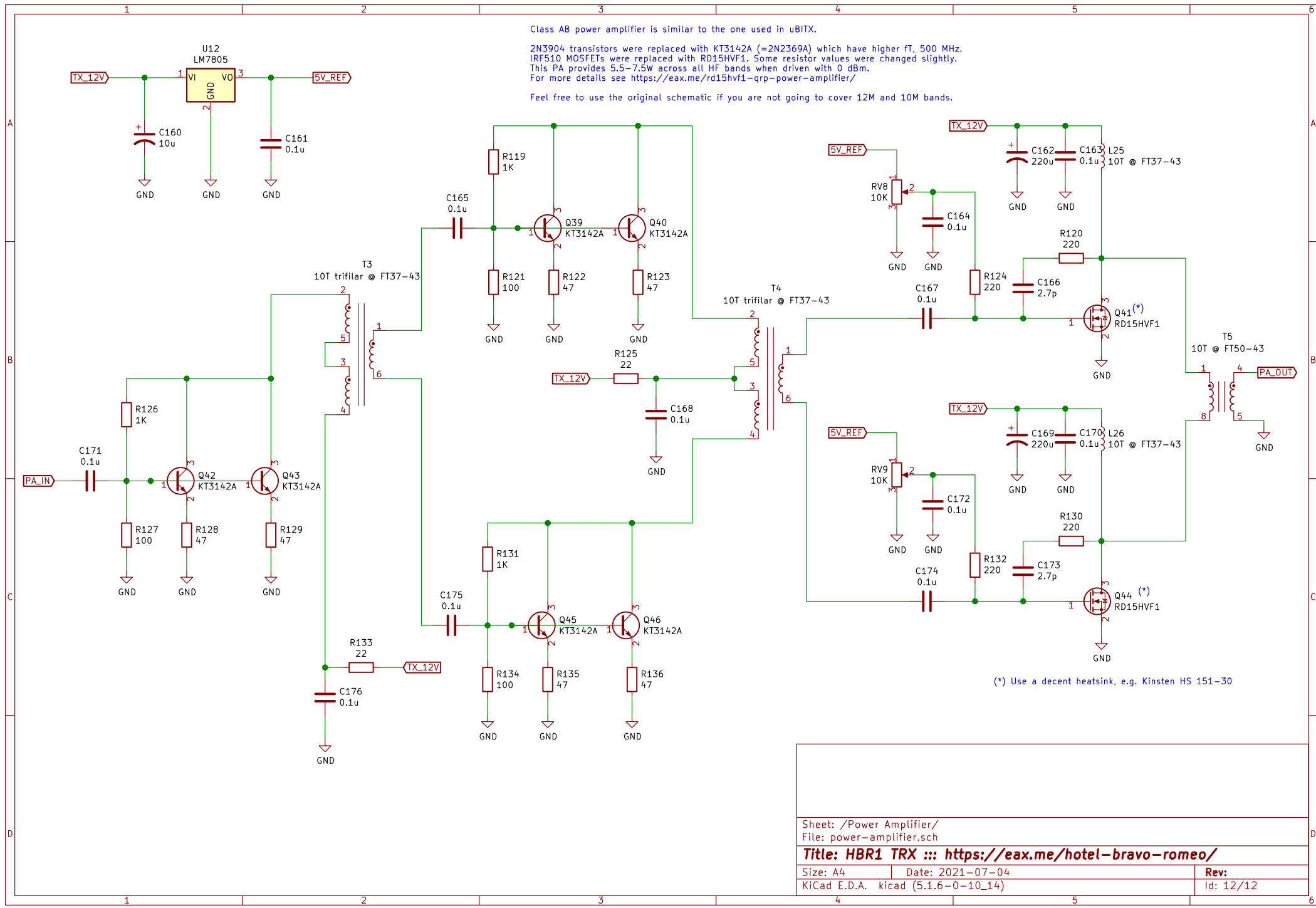


Sheet: /RF Amplifiers/ File: rf-amplifiers.sch		
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Size: A4	Date: 2021-07-04	Rev:
KiCad E.D.A. kicad (5.1.6-0-10_14)		Id: 9/12



Sheet: /BPFs/	
File: band-pass-filters.sch	
<b>Title: HBR1 TRX :::</b> <a href="https://eax.me/hotel-bravo-romeo/">https://eax.me/hotel-bravo-romeo/</a>	
Size: A4	Date: 2021-07-04
KiCad E.D.A. kicad (5.1.6-0-10_14)	Rev: Id: 10/12





Class AB power amplifier is similar to the one used in uBITX.

2N3904 transistors were replaced with KT3142A (=2N2369A) which have higher ft, 500 MHz.  
 IRF510 MOSFETs were replaced with RD15HVF1. Some resistor values were changed slightly.  
 This PA provides 5.5-7.5W across all HF bands when driven with 0 dBm.  
 For more details see <https://eax.me/rd15hvf1-qrp-power-amplifier/>

Feel free to use the original schematic if you are not going to cover 12M and 10M bands.

(\*) Use a decent heatsink, e.g. Kinsten HS 151-30

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Size: A4	Date: 2021-07-04	Rev:
KiCad E.D.A. kicad (5.1.6-0-10_14)		Id: 12/12