

Zululand Amateur Radio Club News

The newsletter for the discerning Ham

November 2017

ZARC Committee

Chairman: Warren Snyders ZS5WOZ

Vice Chairman: Gerald Scrooby ZS5GS

Treasurer: Willie Axford ZS5WI

Secretary: Dawn Snyders ZS5ME

Ham Net: Vacant

Editor: Jo Snyders ZS5PO

Member: Jan Erasmus ZS5G

Webmaster: Chantel Pelser

Club Repeaters

Ntumeni 145.675 MHz

Empangeni 145.700

Club Nets

There is also a club discussion net on Tuesday evenings at 18:30 on the 145.675 repeater
Club Members have a schedule on Thursdays between 17:30 and 18:45 On 7.175 Or 3.645 Depending on propagation
ALL are more than welcome to join us for a "rag chew"

SARL News

08h30 - Sundays - 145.650, 7.066 MHz

NEXT ZARC MEETING

DATE: 10th December 2017 (**Sunday**)

TIME: Arrive ± 11:30, followed by Christmas Lunch at ± 12:00

QTH: Eagles Nest Eshowe

E-Mail: dawnjo@telkomsa.net (Secretary)

Club Web site: <http://zs5zlb.org.za/>

Editor, Q.R.L.



Greetings & Salutations fellow members, I trust that this news letter finds you all in good health. The date of the next club get-together will be on Sunday 10th December 2017 at **Eagles Nest Eshowe**. The Christmas Lunch will still take place at ± **12:00**. Please make a note in your day books and diaries.

Have you bought insurance to continue enjoying your hobby yet? SARL membership IS that insurance!!! Is your hobby worth R1.26 per day to you? YES?! Then join the SARL, it's the RIGHT thing to do!!!

The radical opinions, and rantings of the Editor, are not necessarily the opinions of, or supported by, the ZARC Committee, or it's members.

Wots Potting In The ZARC

Birthday Greetings Go To:



Dec: Belinda, SW of Warren ZS5WOZ on the 17th.

Jan: Daniel, grandson of Jo & Dawn on the 10th.

Many happy returns to all of you, and may you be spared for many more happy, healthy, years. (If your birthday wishes do not appear here, it is because you have not informed me of your birth date).

Get Well Soon



Dawn, ZS5ME still NOT in the best of health.

We wish her a speedy recovery.

Club Happenings



Competitions:

ZS5ZLB did not take part in any competitions during this month

Happenings:



We welcome a new member to the club, Jan Holtzhousen, (Left) who is studying to write the RAE early next year.

APRS

People in the Richards Bay/Empangeni area can get into the PMB I-Gate on 144.800.

Repeaters

145.675: This repeater has a problem with the RX antenna, and the antenna needs to be replaced. As we do not have any more members who are fit & able to climb up the tower to do this job, it will have to stay like this until we can find a volunteer who can climb the tower to do the job.

145.700: This repeater is now a DEAD puppy, and needs to be recovered from this site. **STILL waiting for ESKOM to open up for us to get into this site.**

“SWAP SHOP”



If you have any items you want to get rid of, or if you are looking for something, Please let the Editor know and he will advertise it in the swap column for you.

Home Brewers Hoekie



Simple microphone preamplifier

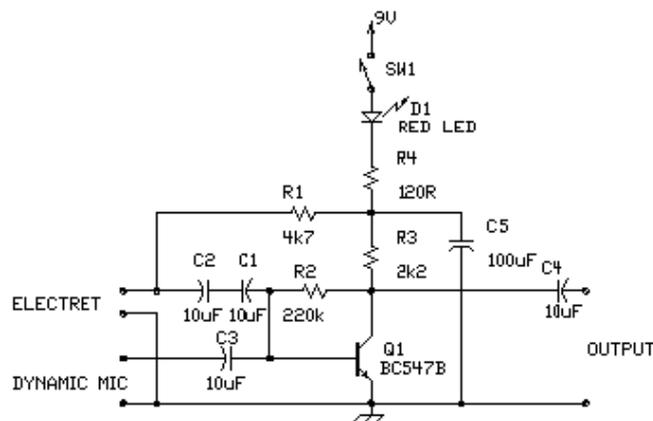
Design and copyright Tomi Engdahl 1997,1999

Summary of circuit features

- Brief description of operation: Simple microphone preamplifier
- Circuit protection: No special protection circuits used
- Circuit complexity: Very simple one transistor circuit
- Circuit performance: Amplification 35 dB, flat frequency response from 20 Hz to 20 kHz, quite poor distortion performance figures, a little bit noisy
- Availability of components: Uses common and easily available components
- Design testing: I have built a few microphone preamplifiers based on this circuit and they have worked without problems.
- Applications: Interface dynamic or electret microphone to a line level audio input in HIFI amplifier or computer soundcard.
- Power supply: 9V battery, takes less than 10 mA current
- Estimated component cost: Electronics components than \$10
- Safety considerations: No special electrical safety considerations.

Circuit description

This is a simple microphone preamplifier circuit which you can use between your microphone and stereo amplifier. This microphone amplifier circuit is suitable for use with normal home stereo amplifier line/CD/aux/tape inputs. This microphone preamplifier can take both dynamic and electret microphone inputs (preamplifier provides power for electret microphone elements). The idea of this circuit is to keep the design as simple as possible to be easy to build. That was my goal when I needed a simple external microphone preamplifier for my mixer. The performance of the circuit is nothing superior but can be used with many not so serious projects.



Simple microphone preamplifier
Designed by Tomi Engdahl 1996

The circuit is a simple one transistor amplifier with amplification of about 30-40 dB (depends on transistor, temperature and voltage). The dynamic mic input is just a simple one transistor amplifier circuit with nothing special in it. LED D1 is in the circuit to show that the circuit operates. The voltage drop caused by LED (around 1.8V for RED led) has been taken in account when designing the

amplifier circuit built around Q1. Resistor R4 and capacitor C5 make a filter to filter out possible noise from battery or other power source which is used to feed this circuit. Capacitors C1, C2 and C3 are used to block the DC bias on Q1 base to flow out of microphone input to microphone (the polarity of all capacitors is straight line = + and curved line = -).

Electret microphone input has a resistor R1 for feeding current through electret microphone capsule when it is connected to the electret microphone input. Electret microphones need some current (about 1 mA) flowing through them to operate, because there is a small amplifier circuit inside the microphone capsule. This circuit is suitable for all typical cheap electret capsules which are available from any electronic component shop. Because electret microphones have higher signal level output, it is quite easy to overdrive the amplifier when you shout into a electret microphone.

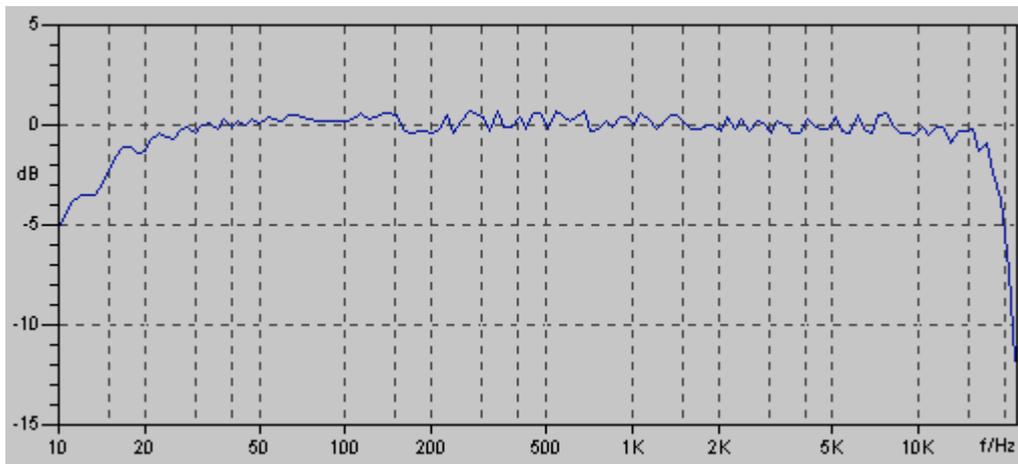


It is best to build the circuit into a small metal box like in the picture. Put the 9V battery inside the case too. Battery power and metal box keep external noise and interference sources away. I used standard 6.3 mm jack for dynamic microphone and 3.5 mm mono jack for electret microphone both installed to front panel of the metal box. The LED and power switches are also installed to front panel.

Measured specifications from prototype

- Frequency response: 20 Hz to 20 kHz +-1dB
- Noise level (A-weighted): -85 dBm
- Amplification: 35 dB

Because of the simplicity of the design the distortion performance is not very good. At signal levels typically used by electret microphones the distortion is about 2-3%. With dynamic microphones the distortion level is lower (not measured). Here is the frequency response as measured by [LoudSpeaker LAB software DEMO version](#) with Sound Blaster 16 PNP card:



The bass frequency attenuation is caused by the microphone preamplifier circuit. The high end attenuation is caused by Sound Blaster 16 card. As seen in the measured performance, the microphone preamplifier is suitable for speaker measurements made using suitable measurement software and sound card. Using this preamplifier connected to line level input the problems caused by poor microphone preamplifier in many sound cards can be avoided.

Component list

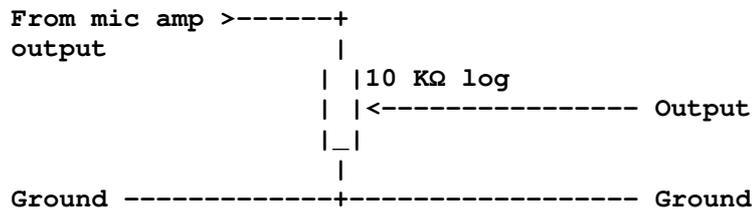
R1	4.7 K Ω
R2	220 K Ω
R3	2.2 K Ω
R4	120 Ω
C1..C4	10 μ F 16V electrolytic
C5	100 μ F 16V electrolytic
D1	Red LED
Q1	BC547B
SW1	on/off switch

If you can't find all the components on the shop near you take a look at [component replacement tips](#). If you happen to have hard time finding a BC547 transistor, you can use a 2N2222 transistor instead. The circuit has been reported to work well with it also (although there might be some slight performance changes though, I have not tested and measured the circuit with 2N2222).

Modification ideas

If you plan to use this circuit with a soundcard electret microphone which has 3.5 mm stereo plug, then you have to modify the circuit to make it work with this type of [multimedia microphone](#). You don't have to make many changes: just replace the 3.5 mm mono jack with a stereo jack. In the original circuit R1 goes to the tip of the microphone connector, but now you connect R1 to go to the ring of the connector.

If you want an adjustable output signal level for the microphone preamplifier you can add this quit easily by connecting one 10 K Ω logarithmic potentiometer to the circuit output in the following way:



This circuit allows adjusting the output level between zero and the maximum microphone preamplifier amplification.

How the amplification is compared to other amplifiers

AVID MC-1 Universal Multimedia Microphone Amplifier has the following specifications:

- Level control range: 10 dB
- Amplification for dynamic microphone: 46 dB to 56 dB
- Amplification for electret microphone: 16 dB to 26 dB

That amplifier is designed to boost the microphone level from various microphones to the level which is suitable for normal PC soundcard line level input.

Questions and answers

What is the difference between MIC and LINE level?

Level refers to the relative strength of the signal and is measured in decibels. LINE level sources are much-amplified signals over MIC (microphone) level signals. Line level is usually between -10 to +4 dbm in strength while MIC levels are normally -60 dbm.

What is meant by "low impedance"?

Impedance is an electrical term that refers to how much a device impedes the flow of current and is measured in ohms. While there is no set standard, low impedance usually refers to a range of between 150 and 800 ohms. Most professional audio microphones are low impedance. This amplifier circuit designed to work with any low to medium impedance source.

How can I change the amplification of the circuit ?

The amplification factor in this circuit is determined mainly by the characteristics of Q1 and value of R2. The circuit is designed for quite optimum performance (for being such simple circuit) and it does not pay to try to modify it much. If you want to try modification, you can change the value of R1 between something like 100 K Ω and 1 M Ω to get somewhat different performance.

If you simply want to reduce output level, use the modification idea described earlier in this article. If you need more amplification, then try some other circuit with more transistors.

[Tomi Engdahl](#) <then@delta.hut.fi>



On The Dry Side



There goes my Christmas present



The Chairman & Committee of the Zululand Amateur Radio Club, wish you all well over the Christmas Season

If you would like to contribute to your Club newsletter, or to contact me for any reason, please use the address / Phone numbers below.

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