# SHAK NOWTZ BY "MAD" FRANK - G3ZMF

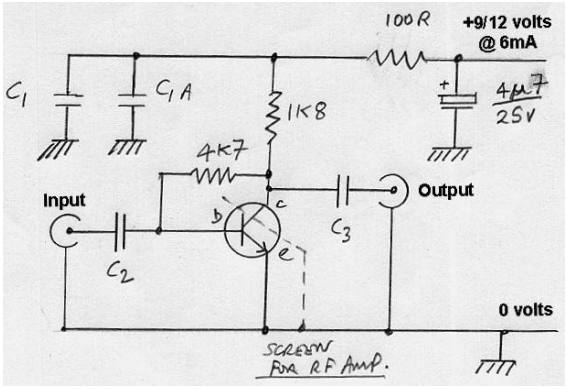
## SHAK NOWTZ No 11 – Useful circuit building blocks

### Introduction

These circuits are all ones that I have built and work well.

**Simple pre-amplifier for AF/RF**

This circuit uses only a handful of components and depending on the capacitor values and the transistor used can be made to function from audio frequencies up to about 500 MHz.



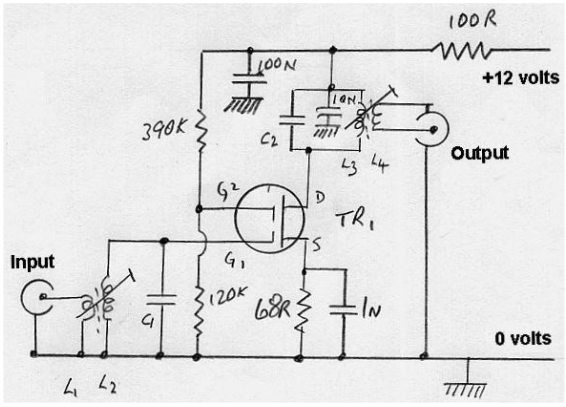

**The G3ZMF simple preamp. $C_{1A}$ is only used at VHF/UHF. All resistors are ¼ or ⅛ watt**

*For AF use* $C_1$, $C_2$ and $C_3$ can be 100 nF, 25 volt or higher working. The transistor can be BC107, BC108, BC109 or equivalent.
*For LF/HF use*, $C_1$ is 100nF while $C_2$ and $C_3$ are 10 nF. $C_{1A}$ is 1nF. The transistor can be BF180/BF181 or BFY90, not forgetting to earth the screen connection.
*For VHF/UHF use*, $C_1$ is 100nF, $C_{1A}$ is 1nF $C_2$ and $C_3$ 500 to 1000 pF for VHF or 50 to 100pF for UHF. Tr1 can be BFY90 but for UHF try BF362.

**Tuned RF amplifier**

This circuit is suitable for 6m, 4m or 2m. It was designed by my old friend Norman Hyde G2AIH (SK) who designed and wrote many articles on VHF and UHF (still to be found in the RSGB VHF/UHF book and the Radcom handbook.)

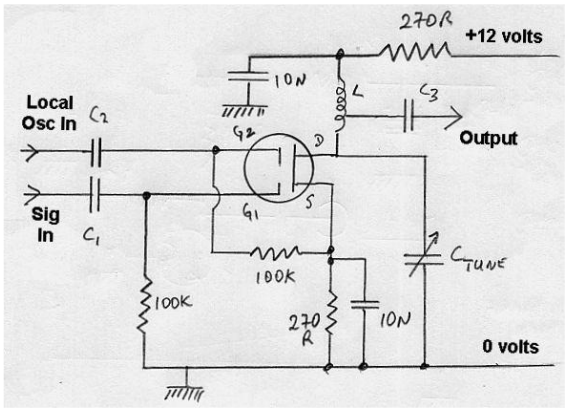
The 40673 dual gate MOSFET is still available but may set you back up to £5 or more. Instead I recommend the MFE201: it is a direct pin-for-pin replacement, performs better and is available from CATS sponsors Sycom (see front of CW for details) for £3 to £4.




**G3ZMF's tuned RF amplifier, originally due to G2AIH**

$L_2/C_1$ and $L_3/C_2$ are selected to resonate at the desired frequency of use. $L_1$ and $L_4$ are a few turns of wire on the "earthy" end of the coils. In the case of the output coil, the "earthy" end is the one nearest the 12 volt rail. A gain of 10 to 20 dB is achievable.

**Useful RF mixer with "auto-bias" on gate 2**

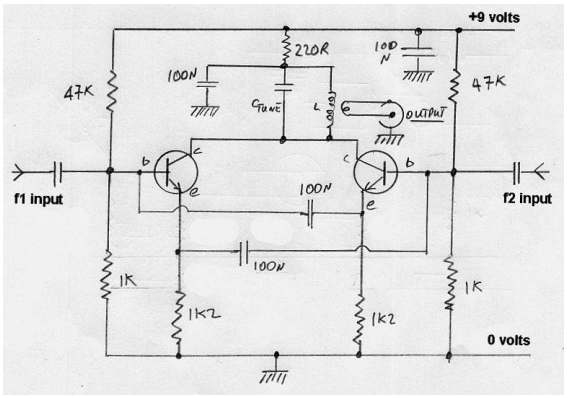



**G3ZMF MOSFET mixer**

$C_1$, $C_2$ and $C_3$ are selected to suit the frequency of use. $C_{TUNE}$ and L form a parallel resonant circuit at the desired output frequency.

### Circuit 4: Alternative mixer

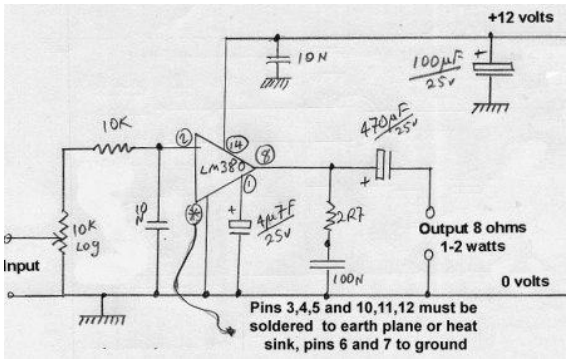
This alternative design uses a pair or either bipolar transistors or FETs. The output may be taken as either the sum or the difference of the input frequencies, $f_1$ and $f_2$.



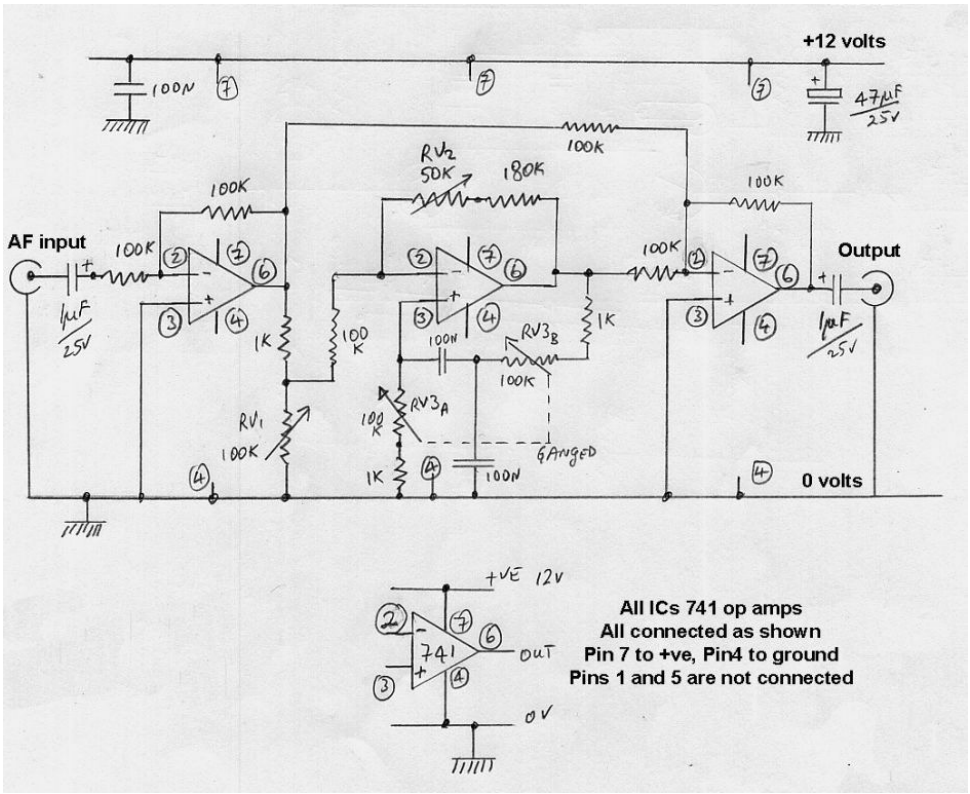

**The ZL2JV alternative mixer: If using FETs for c read D, for b read G and for e read S**

### Circuit 5: Handy AF Output Amplifier

This standard circuit uses the LM380 IC and provides an output of 1 to 2 watts. All resistors are ¼ watt.




### Circuit 6: Tuneable notch filter




**Circuit 6 – Tuneable notch filter**

**Circuit 6: Tuneable notch filter (contd.)**

The tuneable notch filter is very useful for CW working on an older rig that may not have a CW filter of its own. Adjustment of RV3a and RV3b enables the frequency to be set as desired between 20 Hz and 1 kHz. RV2 controls positive feedback: in use it is set to oscillation point and then gently backed off. RV1 controls the attenuation between the IC1 (the buffer) and IC2 (the filter). IC3 sums the two outputs so that the filtered frequency is almost zero. I've built this circuit on several occasions and it always works first time!

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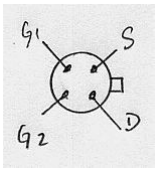
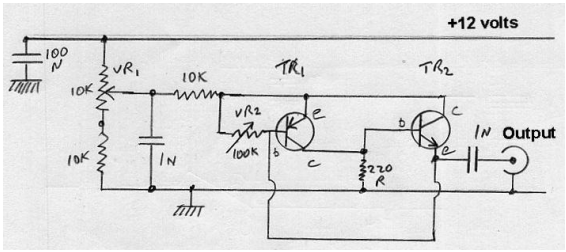



**Connections for TR1 in G3ZMFs tuned RF amplfier**

**Circuit 7 Noise Generator**

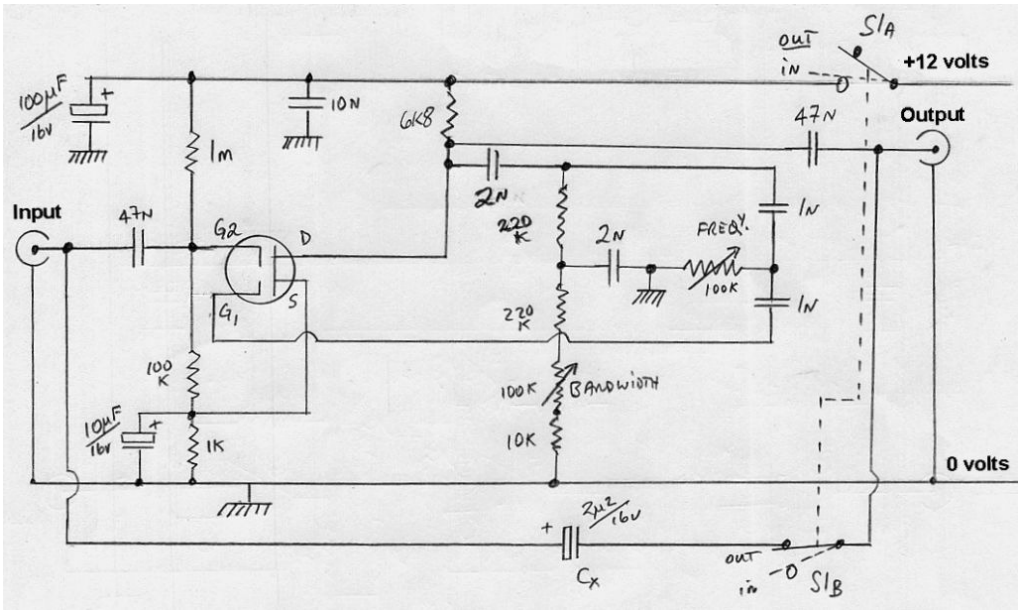
This design was originally developed by LA8AX/G and has also been reproduced in Radcom. TR1 is a pnp type such as BC308, BC558, MPS3702 or 2N3702. TR2 is an NPN type such as a 2N918, BC547, 2N3704 or MPS 3704.




**Simple noise generator circuit**

In use VR2 is adjusted for maximum noise output and can be replaced with a "select on test" fixed resistor if required. VR1 is then sets the desired output level.

**Circuit 8: CW Filter**




**Audio frequency CW filter**

Have fun and see you next time!

73 de Mad Frank G3ZMF