

Poundshop FM Radio

Conversion to 40m amateur use

PETE MORRIS G1INF started all this! First, read his notes on the 40m conversion. http://www.gqrp.com/Poundshop_DC_RX.pdf



SVERRE HOLM LA3ZA found a way to get more AF output. He wrote to the [GQRP mailing list](#):

Last night I experimented with the 7088 cheap DC 40 m rx and found a simple way to get more audio output by using more of the internal circuitry of the chip. Now the audio level is just fine instead of being marginal.

A larger part of the internal IF amplifier can be used if audio output is taken from pin 15 instead of from pin 6. In order to use this part of the chip a coupling capacitor of 0.1 uF must be connected from pin 8 to 9. This enables the whole FM demodulator and the frequency-locked loop which tracks the audio. The result is that the VCO is FM-modulated with the audio producing a watery, aurora-type effect on CW signals. This can be avoided by bypassing the FLL control signal on pin 3 to gnd with a 4.7 uF electrolytic capacitor.

In summary and with reference to Pete, G1INF, original description on www.gqrp.com/Poundshop_DC_RX.pdf:

(3) AF

4. is replaced by connect pin 15 to base with 0.1 uF

Then add:

Connect pins 8 and 9 with 0.1 uF

Bypass pin 3 to ground with 4.7 uF

Sverre later recommended increasing the bypass capacitor on pin 3 to 220uF so that the CW tones are stable. It was difficult to fit this large capacitor into the board but he was able to do so by decoupling to positive VCC rather than ground. He has also previously experimented with a similar single chip (TDA7021) FM radio (non scanning), and published an article in SPRAT, Winter 2004. See picture to the right, and [visit Sverre's website](#).



VOJTECH BUBNIK OK1IAK used a larger radio with built-in integrated amplifier and rebuilt the VFO using an Amidon T50-6 toroid and SMD NPO cap (27 turns on the coil, 150pF capacitance). Voltech connected the tuning pot in parallel to the red LED to provide voltage regulation, and notes the VFO stability is good at 5kHz per 15C temperature change. The tuning range is 6.985-7.040 using NiCd batteries and 6.978-7.050 using dry cells. For a CW pitch of 780Hz the large Sallen-Key capacitor was increased to 680nF. Vojtech as an article on his website <http://www.kufr.cz/~ok1iak/HAM/PoundShopRadio/index.php3>.



Other useful links

Poundshop, where you can buy these radios for £1 online: <http://www.poundshop.co.uk>

TDA7088 datasheet: <http://www.semiconductors.philips.com/pip/TDA7088.html>

Article about these cheap radios: <http://www.embedded.com/showArticle.jhtml?articleID=47903143>

Interesting web page about homebrewing TDA7000 radios (similar IC): <http://www.users.bigpond.com/cool386/tda7000/tda7000.html>

Philips app note on the TDA7000 (very similar to the TDA7088): <http://www.semiconductors.philips.com/acrobat/applicationnotes/AN192.pdf>

Philips app note on using the TDA7000 for narrowband FM: <http://www.semiconductors.philips.com/acrobat/applicationnotes/AN193.pdf>

Circuit diagram of TDA7088 radio posted on a Far-East website: <http://www.teachersong.com/caozuo/shouyinji.htm>

More circuit diagrams: <http://www.mikroelektronika.co.yu/english/product/books/rrbook/chapter4/chapter4c>

Also visit the [Superdrg radio page!](#)

Photographs of Poundshop radios

I ordered three of these radios online from [Poundshop](#). I was impressed by the very rapid service and low shipping charge of only 90 pence, for first class postage (next day delivery). The postage stamp said 94 pence, so there isn't even any margin in the shipping to pay for the jiffy bag.

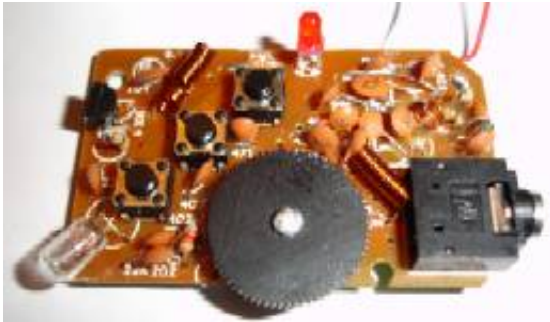
All three radios came in the same packaging, but all three are a slightly different style. Two are square, the other is a stylised oval design from transparent plastic. I was unable to remove the volume control knob from the oval one, and the case would not come apart with the knob in place. Therefore the knob got broken. This will be the first radio I practice on. I put batteries into one of the square radios and was pleasantly surprised by the nice-sounding audio, and it seemed to have no difficulty at all in pulling in many VHF FM stations. Note that all three radios have a torch function, the bulb is brighter than I expected. Two of the radios (the square ones) have small red LED power "on" indicators. In all three cases, the PCB components appear the same but the layout is different, to suit the different button layouts. The IC itself is covered by a black blob which I have no intention of removing. I assume it is a TDA7088 or equivalent.

PLEASE CLICK THE IMAGES FOR LARGER VERSIONS!

The three radios:



Internal view of one of the boards, and the supplied headphones

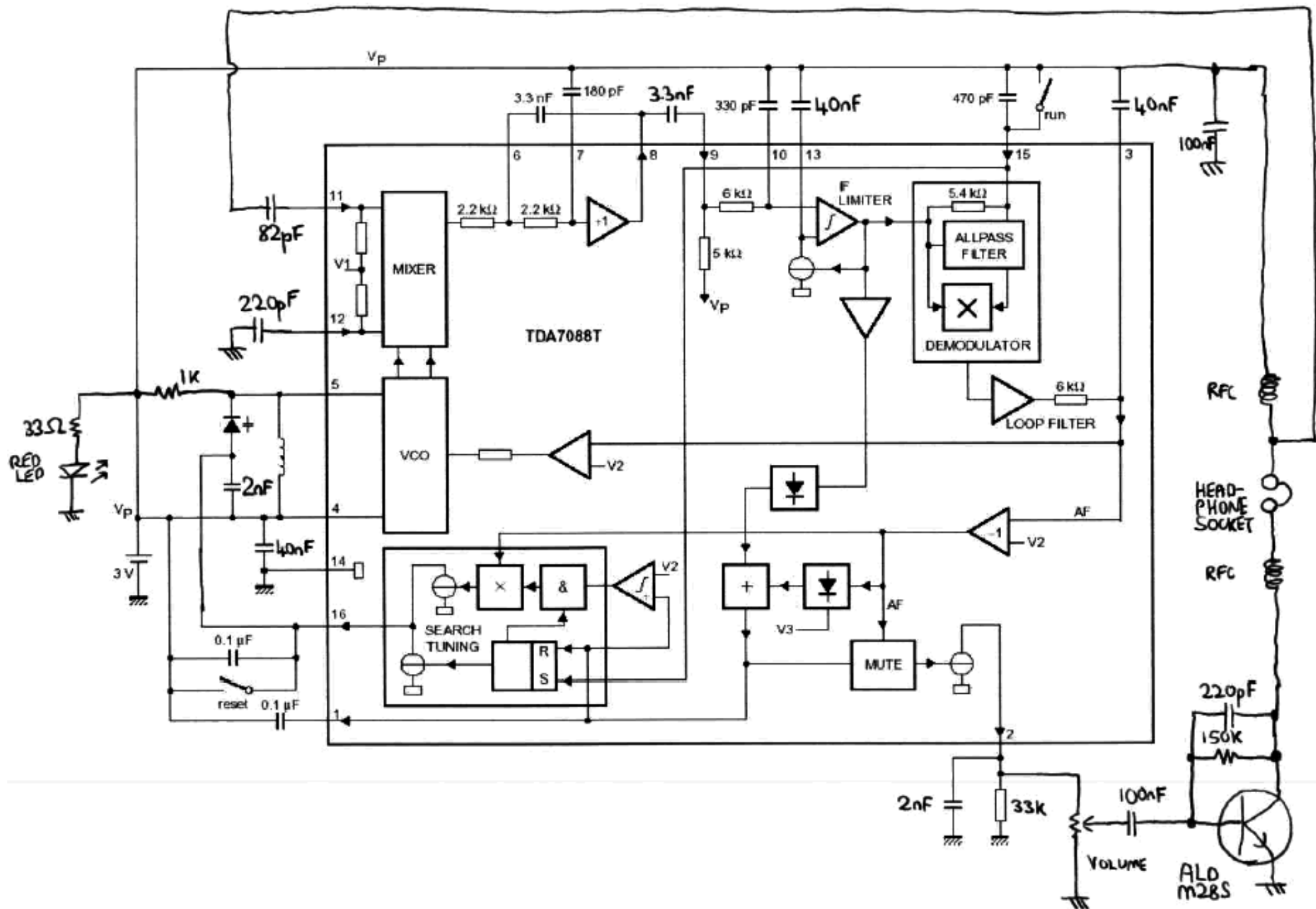


Front and back of the cardboard sheet which is in the plastic packaging:



Circuit diagram of poundshop radio

This is the circuit diagram of the radio shown above on the right (square case):





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