

# Tone Burst Generator and Decoder

*Versatility and control for under \$5.*

by Klaus Spies WB9YBM

In the United Kingdom, tone bursts have been used for many years to key up repeaters. This is not only an alternative to PL—if it's used in addition to PL, many more functions in remote bases or repeaters can be accessed remotely.

When initially investigating tone bursts, I was shocked at the price of commercially available units, considering the simple function. I grabbed for my junk box as quickly as I threw out my stack of catalogs!

Of the wealth of ICs available that generate tones, I decided on using the 555, because it is commonly available and easy to work with. Half of a 4538 (a resettable retriggerable one-shot) is used to trigger the

555 for a predetermined period of time, calculated by  $T = RC$ . Half will also be used in the decoder. With only six ICs, the whole circuit won't take up much room in a standard-size transceiver, or on a ham shack bench (if left external in its own box).

The 567 decoder/PLL has been used for many years as a DTMF tone decoder, making it a time-proven device. U1B, with the help of U5, makes sure the tone is decoded for the proper length of time before giving a valid output, eliminating falsing.

### Final Assembly

If used as an external accessory to your transceiver, this circuit should be enclosed in

a metal box connected to the ground of the power supply, for proper shielding. A shielded audio cable is also highly recommended for all audio lines.

Whether it's used as a stand-alone or built-in accessory for your transceiver, unused gates should be grounded as shown. RF bypass capacitors should be used on all input and output leads, and depending on the levels of RF in your shack (both from your own equipment and any local commercial broadcasters), choke coils and/or ferrite beads are definitely a good idea.

The entire circuit can be built for less than five dollars—a definite savings over commercially built units!

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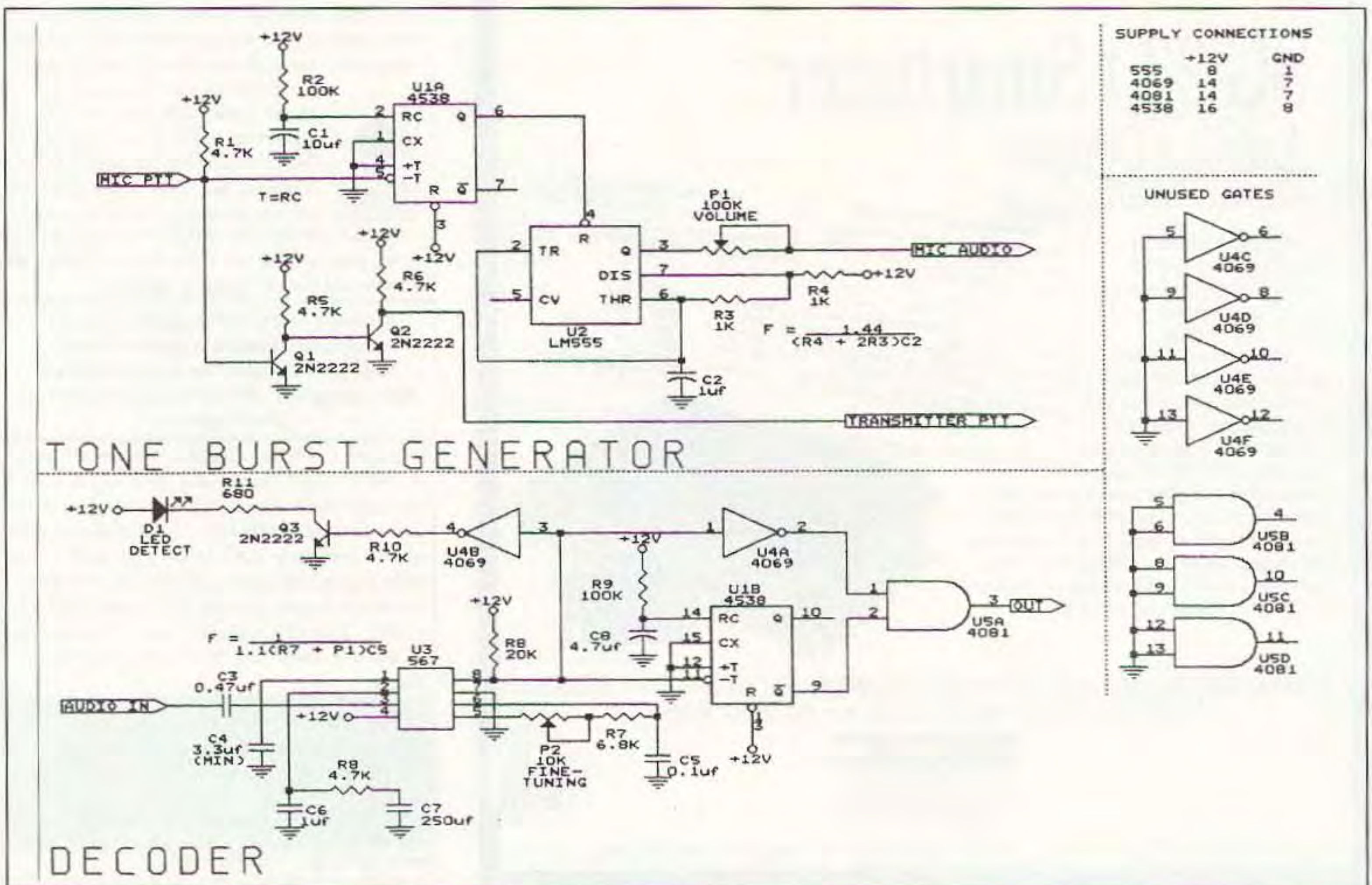


Figure 1. Schematic for the Tone Burst Generator/Decoder.

## Parts List

Item	Quantity	Reference	Part
1	1	C1	10 $\mu$ F
2	2	C2,C6	1 $\mu$ F
3	1	C3	0.47 $\mu$ F
4	1	C4	3.3 $\mu$ F
5	1	C5	0.1 $\mu$ F
6	1	C7	250 $\mu$ F
7	1	C8	4.7 $\mu$ F
8	1	D1	LED
9	3	P1,R2,R9	100k
10	1	P2	10k
11	3	Q1,Q2,Q3	2N2222
12	5	R1,R5,R6,R8,R10	4.7k
13	2	R3,R4	1k
14	1	R7	6.8k
15	1	R8	20k
16	1	R11	680
17	1	U1	4538
18	1	U2	LM555
19	1	U3	567
20	1	U4	4069
21	1	U5	4081

### Parts Sources:

Digi-Key Electronics, (800) 344-4539

Tri-State Electronics, (708) 255-0600

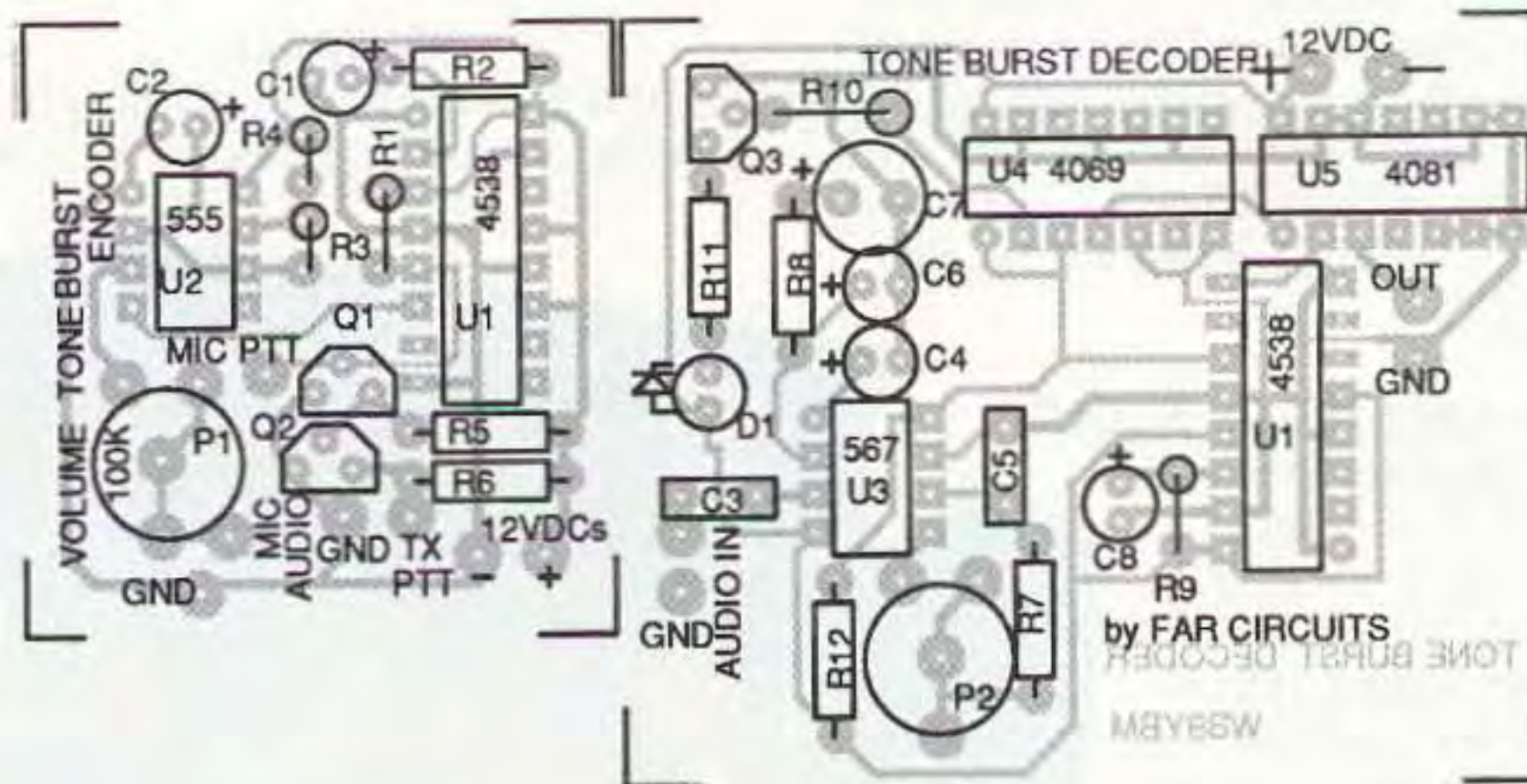
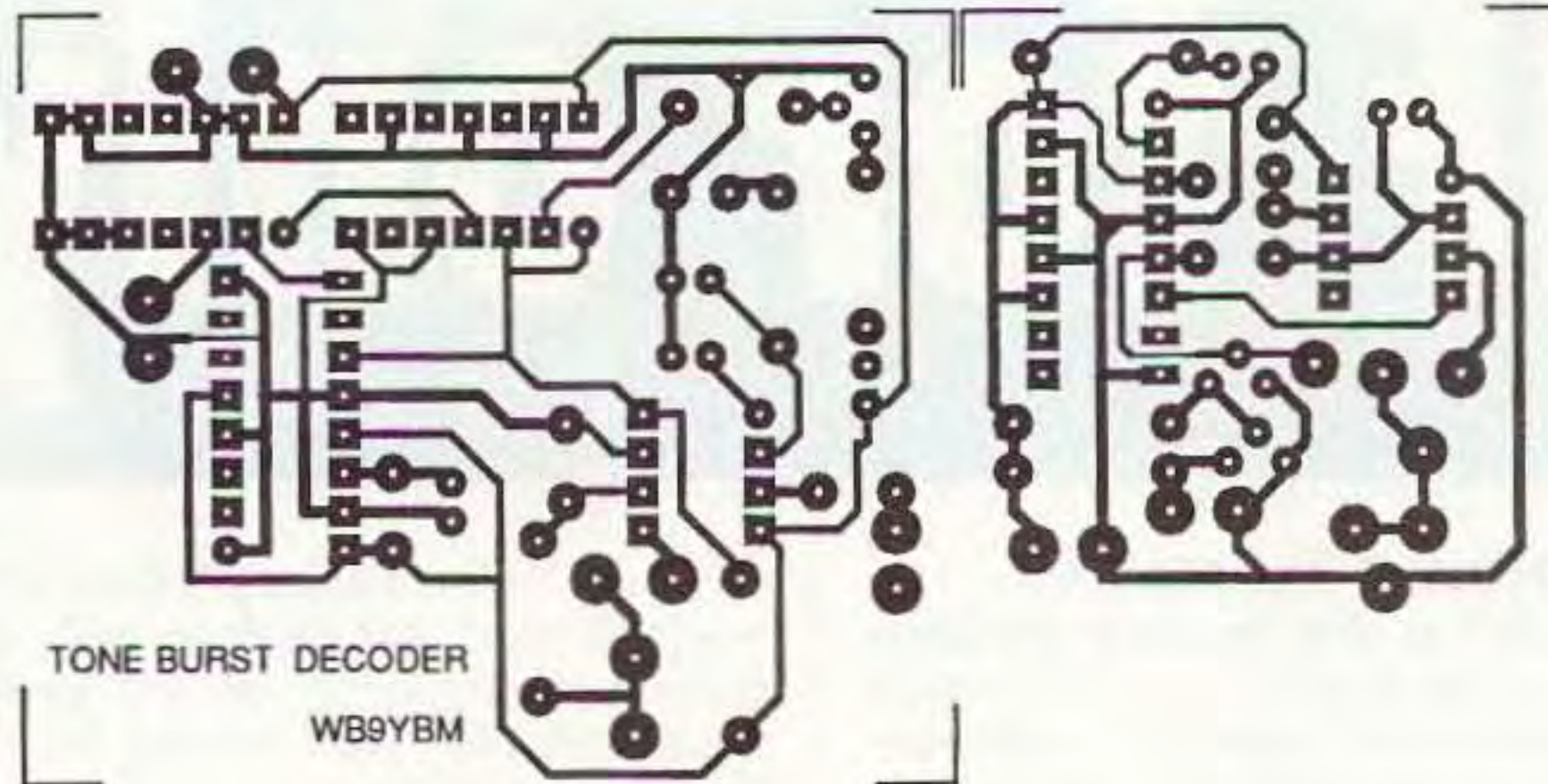


Figure 2. (right) Drilled and etched PC boards are available for \$6.00 plus \$1.50 S & H per order from Far Circuits, 18N640 Field Court, Dundee, IL 60118.