Optional Modifications to the Son of Zerobeat kit

April 17, 2002, Chuck Olson, WB9KZY, Jackson Harbor Press

1) Earl, N8ERO, mentioned that the input R/C pair, R11 and C8 don't contribute much to the filtering action of the subsequent low pass sections and also, they decrease the sensitivity of the Son of Zerobeat. R11 and C8 are located next to C7. You can short out R11 (10 k, brown, black, orange, gold) with a small piece of wire soldered on the bottom of the board - this can be done easily if you leave the leads from the new C7 (mentioned in item 1 above) long and use it to short out R11. C8 (dark red, 103) doesn't have to be completely removed, just desolder the side towards C7 and leave the ground end alone.

2) I noticed that the junction of R13 and R14 which set the pseudo ground level for the op-amp is not bypassed to ground. C8, mentioned above, can be used to perform this bypass. just solder the floating end of C8 to the resistor next to it (R14, 10K, brown, black, orange, gold).

3) Earl, N8ERO, also mentioned that he used four (4) 3.9k resistors in place of R16, R17, R18 and R19 which are all 2.4k (red, yellow, red, gold) in the stock Son of Zerobeat. The 2.4k resistors set the corner frequency of the low pass filter sections at 1400 Hz. Earl prefers a lower sidetone frequency of 600 Hz and thought that a corner frequency of 870 Hz (which corresponds to the 3.9k resistors) would result in better performance from the Son of Zerobeat. This mod is a little more challenging than those above since the 4 resistors in question will be harder to remove and replace.

If you'd rather calculate your own resistor change, use this formula: $R = 3{,}393{,}200 / F$
where R = resistance of R16-19 in ohms and F = corner frequency of the low pass filter sections
You can also interchange R and F in the formula and plug in standard values of R and see what corner frequencies pop out. Remember that the corner frequency should be set at least 110 Hz higher than the highest center frequency that you would normally use.

Here are a few standard 5% values:	2.4 k	=>1414 Hz
	2.7k	1257 Hz
	3.3k	1028 Hz
	3.9k	870 Hz

Please feel free to email with any questions, comments, suggestions or problems to:

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