Discussion of KOB Dial-up Circuit and 4 Ohm Sounders

On Oct 20, 12:42, W K Dunbar wrote:

Subject: Dial-Up Morse with 4 ohm Sounders?

Greg:

An afterthought - - many KOB sets have 4 ohm sounders. Due to the current requirement (240 mils) I avoid using 4 ohm units with Dial-Up Morse.

There is no reason for general discrimination against 4 ohm sounders. I originally believed 4 ohm sounders were used only for "toy" practice sets, but I later discovered they were quite common in commercial use. I've got a few in my collection.

On the other hand, 30 Main Line sounders (60 mils) and 400 ohm sounders wired for either 100 ohms (60 mils) or 400 ohms (30 mils) should work nicely. The value R-3 and R-4 may have to be juggled to get the desired loop current.

I've wired a set for a 20 ohm KOB. It is powered by the DCM-6. The sounder has to be adjusted quite carefully for good copy. 20 ohms is as low as I would recommend if you steal the loop power from the DCM-6; that small wall transformer is at the edge of its capability.

100 ohm sounders should work just fine with the resistor values I showed in the schematic.

400 ohms, well I can not remember what the current requirement is. Assuming it is about 15 mil, the resistor values would be 35 Volts/(.015A X 2)=1167 ohms. Make that that a nice round 1000 ohms. Never tried a 400 ohms sounder; it should work fine as long as the loop voltage of 35 Volts is high enough for good "snappy" operation (as Ed Trump would say).

Would you want to change the note in the schematic to read something like:
"Values shown for R3 and R4 set loop current to 50 ma. Sounders of different resistance may require different values for R3 and R4. Do not use 4 ohm sounders."

Or am I wrong to shun 4-ohm sounders in this application?

Perhaps it would be correct to say "Do not use 4 ohm sounders with this power supply". Also, the transistor I put in the schematic is a small switching device that is only good for about 400 mA. I would recommend a heftier device for 4 ohm sounder applications. The device shown in Ed's original schematic would handle the current just fine. I changed to the smaller device since it worked with the 120 and 20 ohm sounders, and it is a little easier to wire into a breadboard circuit.

I have thought about using a single D cell battery to power a 4 ohm dial-up set. The battery holder would be bolted to the top of the DCM. The DCM would supply the voltages for the remainder of the circuits. I just don't know how long the D cell would last. If it works, this would be a good option for people who have a nice 4 ohm sounder or KOB set they would like to use. Of course you could always use a 1.5 volt power supply, but this would be pretty large and bulky due to the current requirement.

So, to sum it up, your revised note is appropriate. The schematic shown will not support 4 ohm sounders due to limitations of the power supply and switching transistor.

We need to determine the easiest way to support 4 ohm sounder usage. Maybe Ed Trump will have some ideas.

Regards,

Greg Raven

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Greg... I've found that if you set the set up for a 120 ohm sounder/50 ma loop, you can substitute a 400 ohm sounder directly. The added coil resistance in the 400 ohm sounder nicely reduces the loop current to a value that the 400 ohm sounder "likes" and it works just fine. I use 400 ohm sounders with all my portable sets because they are plentiful, and smaller than a 15B ML sounder.

The 20 ohm sounders like about 110 to 120 ma or more to be "happy".

4 ohm sounders will work fine with the s/s circuit design, just change the loop resistors to get a 250 ma loop, and make sure you power it with something hefty enough to put out a volt or two at 250 ma. Actually you can use a 6 or 10 volt supply, and appropriate dropping resistance, if it will meet the current requirements.

73 ED   FB

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From: wkdunbar@xxx.yyy.com (W K Dunbar)

To: ravengre@xxx.yyy.com

Subject: Re: 4 Ohm

Hi, Greg:

Thanks for the relay from Ed Trump. Regarding 400 ohm sounders, I put one in one of the portable sets I use for Dial-Up Morse work. When I checked loop current, it was still higher than necessary, so I put a 1/2 watt resistor between sounder terminals 2 & 3 in place of the jumper wire, and that dropped the loop current to about 35 mils.

Hold everything - I found an error in my rendering of your circuit. The 1000 mfd filter capacitor in the negative side of the power supply was shown backwards. I've corrected it.

Faxed a copy of the circuit to Ed Berryere, in Saskatoon, Sask. as he E-mailed me for a modem to fix up for someone in Kamloops.

Also am sending a copy to Arlan Tate, in Fort Worth, who also contacted me for a modem.

Incidentally, Tate makes circuit boards for the TU, and said when he gets the diagram, will make a board for it and send me about a dozen of them for distribution. So, we might have a source for the boards. He will try to build the circuit into the DCM-6 case, less the power supply, of course, so I'll have to wait until he experiments some to find out whether the board will be for external or internal use.

73,

Bill Dunbar
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To: Bill Dunbar and Ed Trump

GM-

Just wanted to let you know I put together a dial-up set designed for use with 4 ohm sounders. It works great ! Here are the changes required to make the KOB circuit work:

1. The loop resistors must be in the range of 10 ohms. I was using an external variable power supply. With two 10 ohms in the loop, I had to adjust the supply to 7.5 volts to get good "snappy" sounder response. This is somewhere in the range of 250 to 300 mA (need to get an exact measure). I am going to add another 10 ohm in parallel to make a 5 resistor, since the goal was to operate the loop from a 5 volt source.

2. The loop keying transistor must be something heftier than a 2N3904 ! The collector to emitter voltage rose to almost 2 volts with a loop current of 250 mA, which causes over-dissipation in the transistor. A 2N3055 or similar like used in the original dial-up circuit is the correct choice. I used a power NPN from the junk-box that worked just fine.

3. The 1N914 in the loop (connected to the collector of the keying transistor) must be replaced with a 1N4000 series diode due to the higher current in the loop. A 1N914 is only good for 75 mA or so. The only thing I had in the junkbox was a 1.4KV 1.5 Amp diode. It worked AOK.

I was using a MESCO sounder. It certainly seemed to be harder to copy than the Western Electric 120 ohm mainline sounder I normally use for dial-up.

During the 4 pm session on Saturday, I was adjusting the sounder like mad trying to improve my ability to copy it. I finally put it in a spare resonator hood, which improved copy considerably. This sounder has a pretty strong "ring" to it. I have other 4 ohm sounders which I will try with this new dial-up.

73

Regards,
Greg Raven

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Subject: Re: KOB Circuit with 4 Ohm Sounder

Reply-To: wkdunbar@xxx.yyy.com

Hi, Greg:

Thanks for the info on using 4 ohm sounders for Dial-Up work.

I've saved it in the archives and will work up a schematic using the modified values, so that anyone wanting to use KOB learner's sets or other 4-ohm sounders will have a plan to use.

73,

Bill Dunbar