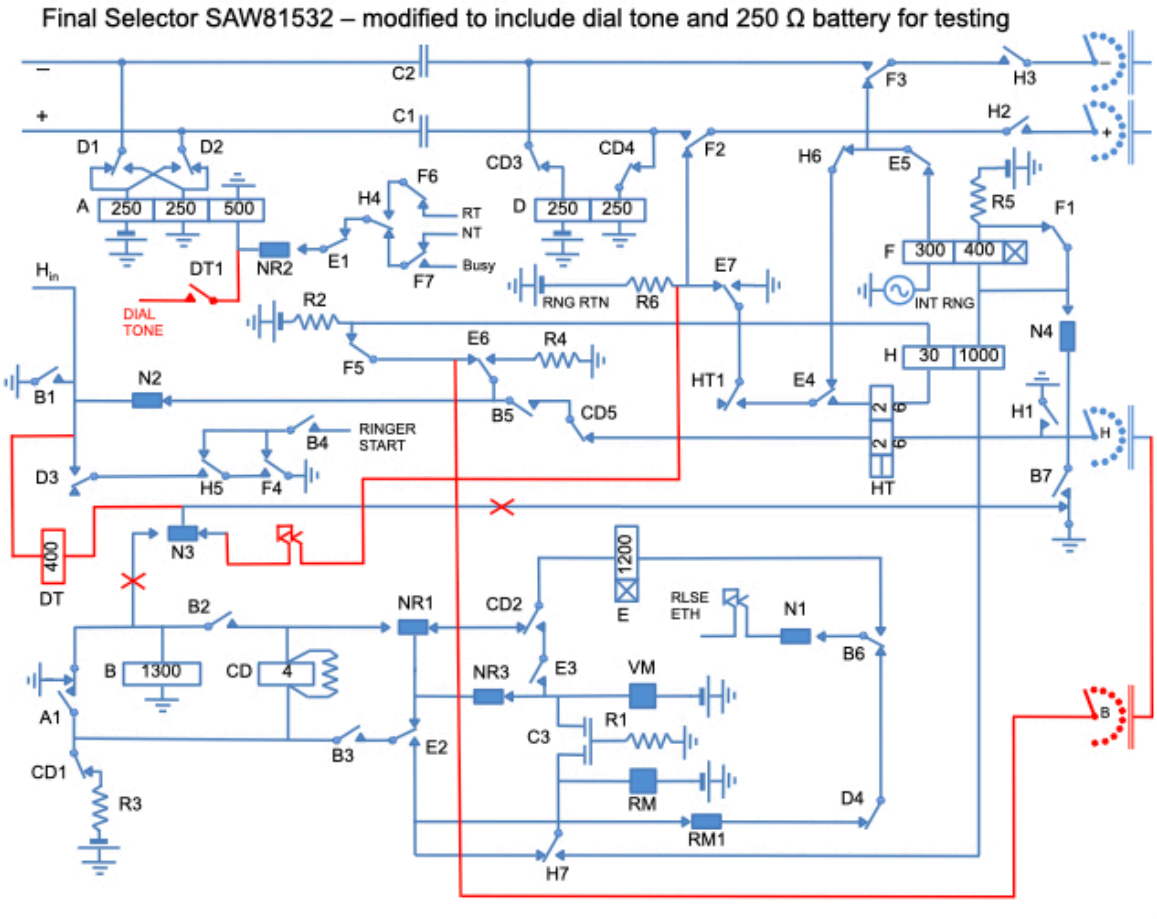
Strowger demonstrator using a PABX 3 final selector

I have built a small portable Strowger demonstrator, just using a single final selector and a couple of line circuits. I had already modified a relay set to accommodate two Subsciber Line Circuits. Each of these SLCs is based on a Type 2 uniselector, a K relay and an LR relay. I wanted to combine the existing SLCs with a regular 100-line final selector, in this case a SAW81532 such as used in a PABX 3. See attached schematic. Two problems needed to be solved. Firstly, the testing of the called extension assumes a 250 Ohm battery to appear on the H (or P) wire of a free line. My SLCs only provide a 1350 Ohm battery which is not sufficient to operate the HT relay. The two banks of the 100-line selector have four wipers, two of them are used for the speaking pair, the third connects the private wire. I used the fourth wiper to provide a 250 Ohm battery on the H wire by connecting the associated bank contacts. A 250 Ohm battery is readily available between relaycontacts E6 and F5. The battery is de-activated when relay F operates.



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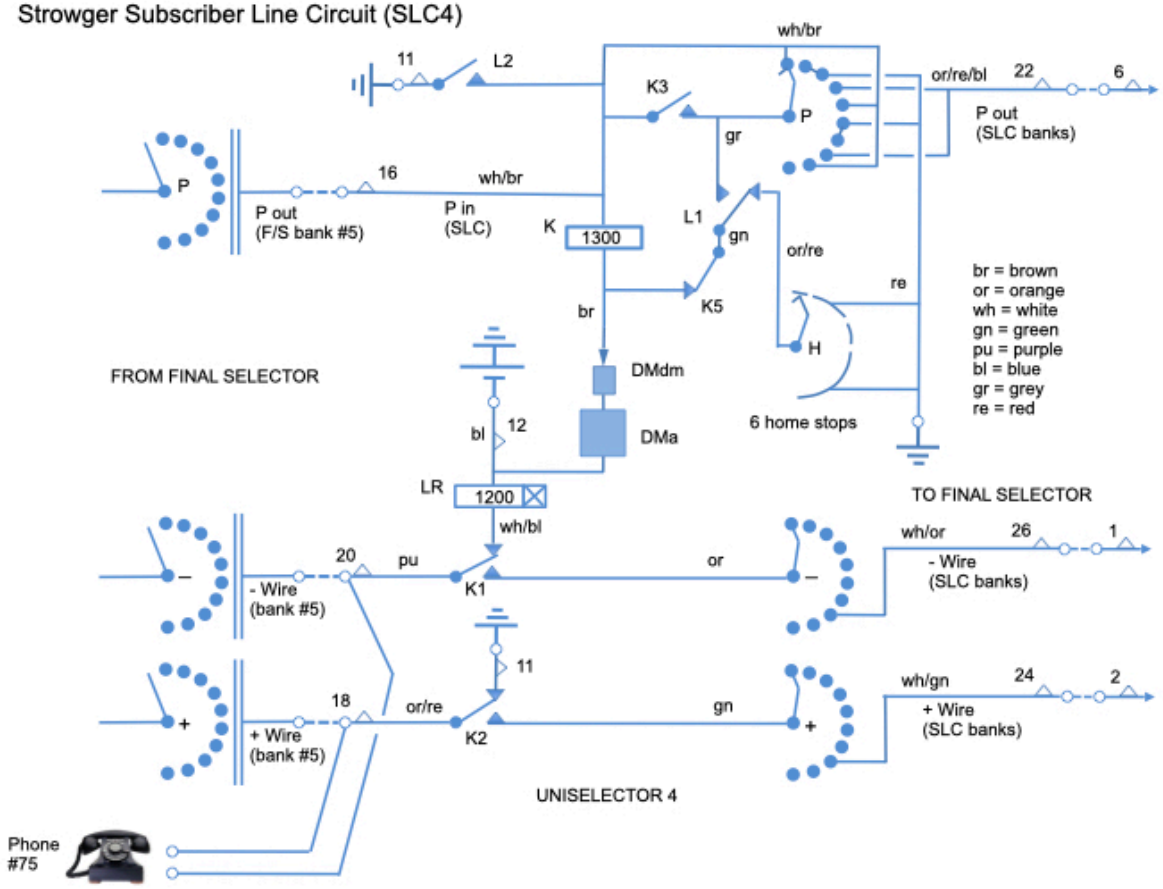
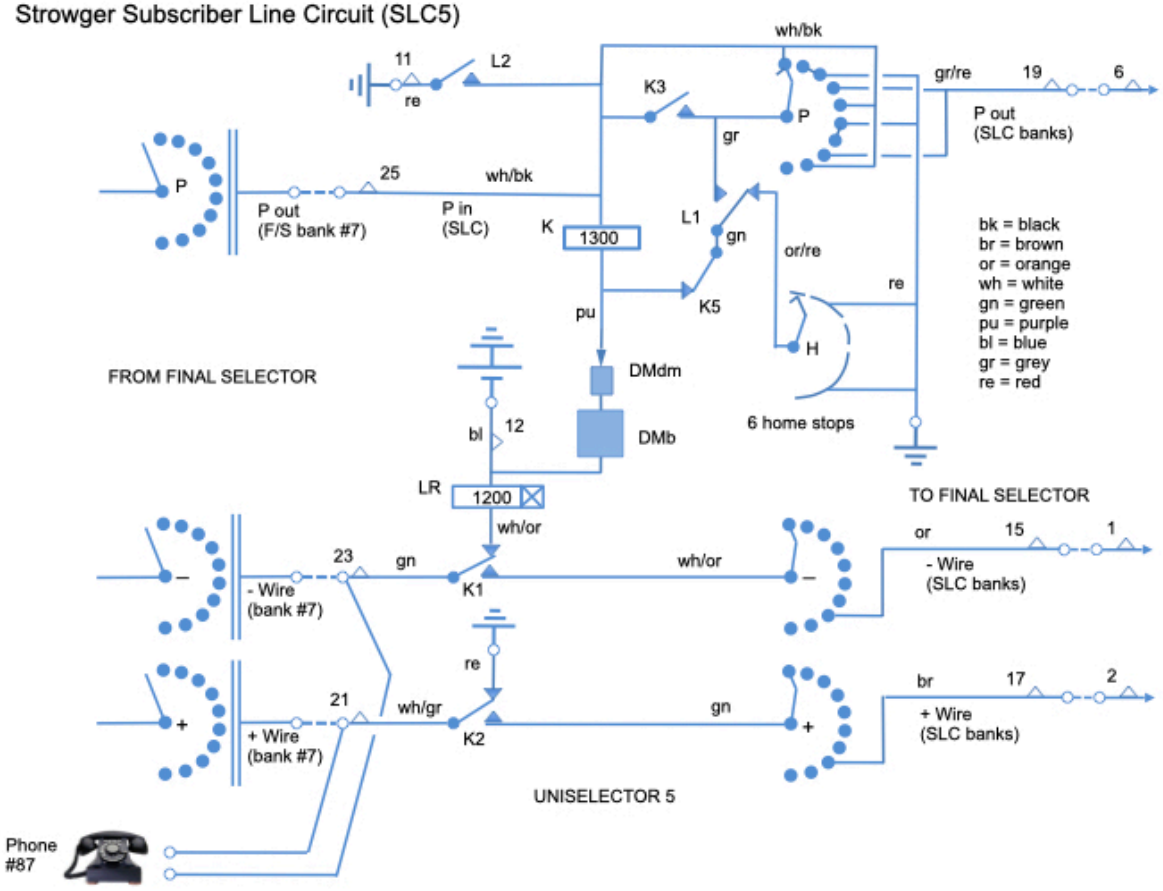
Providing dialtone was the second challenge. Dialtone is normally provided via the first selector, not the final selector. I used one of the mechanical off-normal springs to activate an additional relay. Spring N3 is required if a satellite congestion circuit is installed and to provide called party release. Neither of these are essential in a demonstrator. I installed a 600-type 400 Ohm relay in the free space of the can at the back of the selector. This DT relay is operated when contact B1 closed, i.e. when a caller picks up the handset. This action closes contact D1 and connects dialtone to the tone winding of relay A. The DT relay releases as soon as the selector starts stepping and spring N3 goes off-normal.

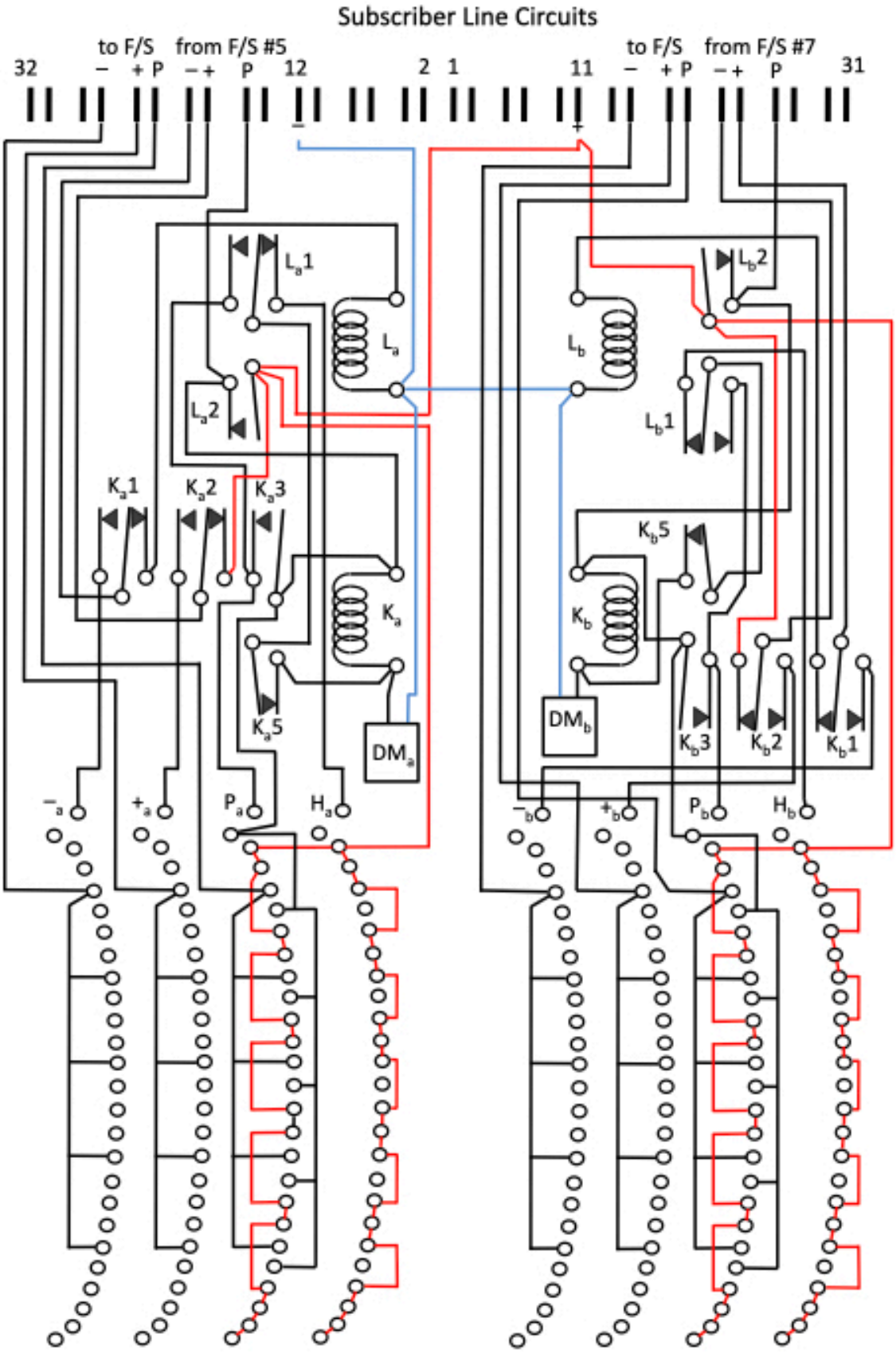
I have a dynamotor to provide INT RING and various tones, but for demos I just use a simpler setup. I generate approx. 60 Volts AC from a small mains transformer. That signal is interrupted at the UK standard sequence (400 msec ON, 200 msec OFF, 400 msec ON, 2000 msec OFF). The interrupt is provided by a small relay that is controlled by an Arduino Nano microprocessor. The 50 Hz is not optimum for ringing but it is good enough for a demo. De Nano also generates a 350 Hz square wave as dialtone. That is just a single line of code in the software.

Strowger Subscriber Line Circuit (SLC4)



Strowger Subscriber Line Circuit (SLC5)





Line relays and uniselectors

Strowger telephone exchange demonstrator - ringer using Arduino nano or dynamotor