LE GONG!

Basic Electronics

Un ding dong pour votre porte tres effective

Short of a brass gong, this is the simplest door chime ever described in our magazine. It uses just one chip to produce a melodious and richly resonant "Ding dong dell". It is easy to build and the few parts are inexpensive.

by GERALD COHN

Twas early summer. After lunch. An air of somnolence had descended upon the Technical Editor as he sadly contemplated what might have been. He might have had a bigger office. He might have been a politician. Or he might have skipped lunch altogether . . .

Then Peter Ketley, NSW Sales Manager for Siemens Electronic Products arrived. Duly ushered in, he plonked a small box on the said Technical Editor's desk and, with flourish, pressed a button thereon. All of a sudden three rich, vibrant tones blared forth in dazzling succession from a grille on the small box. What glorious sound, such tintinnabulation! (Well anyway, it sounded pretty good and loud.)

The Technical Editor picked himself off the floor. He was impressed.

Le Gong had struck. Or at least that was the name we immediately coined for this highly effective door-chime which uses just one 8-pin IC, the Siemens SAB 0600 and a few other parts.

No more need you put up with one of those complicated microprocessor-based door chimes with their inane ditties. This single-chip circuit does it all unknowingly, without need of memory. It is hardwired without being hard to wire.

At the time of writing only preliminary data is available on the SAB 0600 chip. It is sufficient to enable presentation of the circuit being described here without any really detailed explanation of the internal works of the chip.

The IC may be divided into six sections, with the first two being power supply and triggering. The power supply section provides internal supply regulation for the chip functions while the triggering section recognises that the door button has been pushed, connecting pin 1 of the chip to the positive supply. This initialises the digital tone generation section which is driven by the clock oscillator.

A resistor and capacitor network connected to pins 6 and 7 of the chip sets the oscillator frequency and thereby sets the pitch and duration of the three tones which are harmonically related. The three tones are fed to a summing node network which has an external integrating capacitor at pin 8. From there, the tone signals are fed to the internal audio amplifier which drives the loudspeaker via a 100μF capacitor and series adjustable resistor which sets the loudness level.

In the quiescent state, before the button is pressed, the current drain of the circuit is typically less than one microamp. This rises dramatically, to about 80 milliamps, when the tones are sounded. The tone sequence typically lasts about three or four seconds. This is adjustable, along with the pitch of the three tones, by the 22kΩ trimpot.

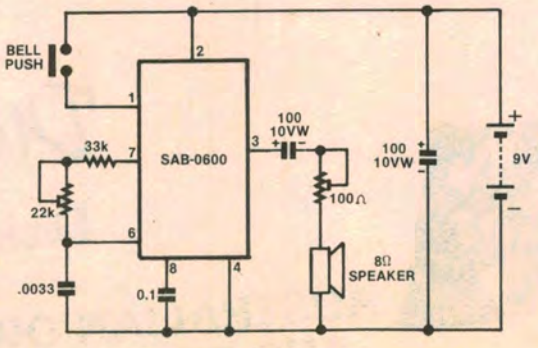
In keeping with the simplicity of the circuit, the construction is just as simple. All components with the exception of the loudspeaker and the battery are mounted on a printed circuit board

We estimate that the cost of parts for this project is approximately

$15.00

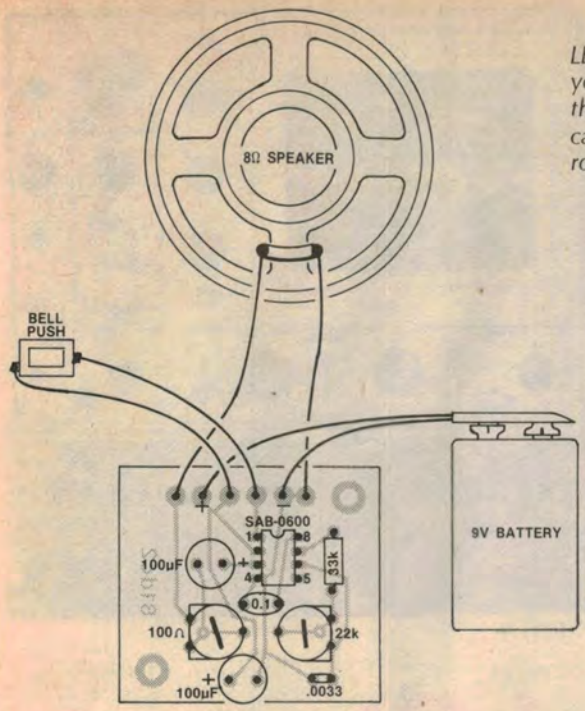
This includes sales tax.

Our version of Le Gong was built into a small plastic jiffy box.



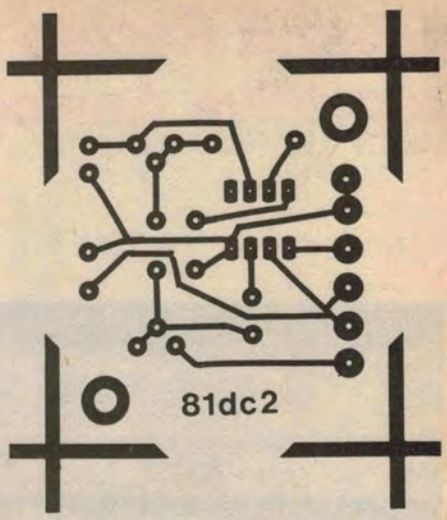
A Siemens SAB-0600 IC forms the heart of the circuit. The RC network connected to pins 6 & 7 sets the pitch and duration of the three tones.

EA LE GONG 3/MS/-



LEFT: make sure that you insert the IC and the 100µF electrolytic capacitors the right way round.

RIGHT: here is the actual size artwork for the PCB.



measuring 50 × 44mm which is coded 81dc2. The overlay diagram shows the placement of the components on the board. Start the assembly by first soldering all the passive components to the board, leaving the IC until last. Next solder the six wires to the board, two for the loudspeaker, two for the battery and the final two for the pushbutton. The wires for the battery are those from the battery clip.

When the above has been completed (we know that you are dying to try it out) you should go over it again just to make sure that all the components and associated wiring are as per the diagram. When this has been done, press the pushbutton and you should get a three-tone chime. You can now adjust the pitch and the volume with the two trimpots on the board. The only thing to do now is to place the PCB into a suitable case.

We mounted the prototype into one of the popular "jiffy" boxes, measuring 159 × 96 × 51mm. The aluminium cover was drilled to provide a sound grille for the loudspeaker. The loudspeaker is glued to the aluminium using some "Araldite" or similar epoxy adhesive.

Three holes are required in the plastic case; two in the bottom of the case towards one corner (see photograph) to hold the PCB in place, and a third for the pushbutton connector. The battery is held in place using some double sided tape, but a small bracket fashioned from tinplate will do just as well.

The way in which the pushbutton is connected to the rest of the circuit depends upon presonal preference. If the installation is to be permanent then the wire could be connected directly to the PCB, or else a plug and socket can be used. We chose the latter method for the prototype as this offered the greatest flexibility, but as we said, it is a matter of preference.

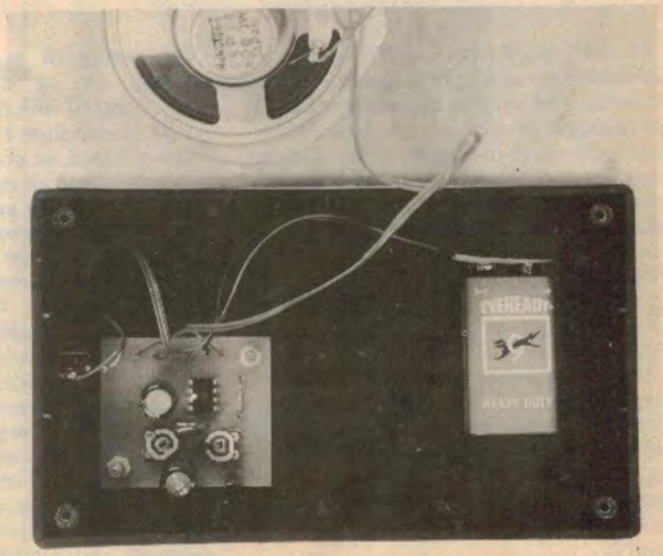
If the chime is to be activated regularly, then we recommend the use of a bigger battery. You will remember from earlier discussion that the drain on the battery is quite substantial when the chimes are sounding, but drops to almost nothing in the quiescent state.

For normal domestic use, the Eveready type 216 battery will probably be adequate and should give service life approaching the normal "shelf" life. In other words, we would expect the battery to last about 12 months or so. For frequent use, as in a doctor's practice or commercial establishment, a much bigger battery or plugpack DC supply would be a must.

But whatever the application, we are sure you will agree with us that this is a most effetive door chime. Why not put one together this weekend?

PARTS LIST

1 printed circuit board 50 × 44m (81dc2)
1 SAB 0600 integrated circuit
2 × 100µF/10VW aluminium electrolytics
1 × 0.1µF metallised polyester (greencap)
1 × 10033µF greencap
1 × 33kΩ resistor
1 × 22kΩ miniature trimpot
1 × 100Ω miniature trimpot
1 × 8Ω miniature loudspeaker
1 × No. 216 9-volt battery and clip to suit
1 plastic utility case 159 × 96 × 51mm
1 3.5mm jack socket (optional, see text)
1 3.5mm jack plug (optional, see text)
Screws, nuts, hookup wire, glue etc.



Inside Le Gong. The circuit may be powered by a small 9V battery or from a DC plugpack supply.