

4. The Software

The program is written so that when none of the two available Roger beep tones is selected (through S1), the circuit is set in Bypass Mode, i.e. the PTTin activation to ground is exactly reflected on the PTTout port.

The program is given below. The text in green (and starting by ') is not part of the set of instructions, it is just an explicative text to ease the understanding of the program ; it will be ignored by the Programming Editor when downloading the program into the PICAXE.

18M2

'This program is to be used with a PICAXE-18 to generate end of transmission tones.

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MAIN: pinC.6 pinC.7                                'Label of the MAIN sub-program
      if pin6 = 0 and pin7 = 0 then BYPASS           'If Input 6 and Input 7 are at low level, jump to BYPASS
      if pin0 = 0 then PTT_ON                          'If Input 0 is at low level (=PTTin pressed), jump to PTT_ON
      goto MAIN                                       'As long as conditions above are not met, go back to MAIN

PTT_ON: output0 = 1 high B.0                          'Label of the PTT_ON sub-program
      if pin0 = 1 and pin6 = 1 then BELL_TONE        'Set Output 0 to a high level (=PTTout shorted to ground)
      if pin0 = 1 and pin7 = 1 then K_TONE           'If Input 0 and Input 6 at high level, jump to BELL_TONE
      goto PTT_ON                                    'If Input 0 and Input 7 at high level, jump to K_TONE
                                              'As long as conditions above are not met, go back to PTT_ON

BELL_TONE:                                           'Label of the BELL_TONE sub-program
      for b0 = 1 to 4                                'Set variable b0 vary from 1 to 4 (*)
      sound 6,(123,3,121,3)                          'Generate the bell tone on Output 6. See text for more details
      next b0                                         'Increment b0 and loop back to line (*) until b0 = 4
      pause 50                                       'Pause 50 ms
      output0 = 0                                   'Set Output 0 to a low level (=deactivate PTTout)
      goto MAIN                                     'Go back to MAIN

K_TONE:                                           'Label of the K_TONE sub-program
      sound 6,(119,12,0,5,119,4,0,5,119,12)         'Generate the bell tone on Output 6. See text for more details
      pause 50                                       'Pause 50 ms
      output0 = 0                                   'Set Output 0 to a low level (=deactivate PTTout)
      goto MAIN                                     'Go back to MAIN

BYPASS:                                           'Label of the BYPASS sub-program
      output0 = 1-pin0                              'Set Output 0 to the inverse level of Input 0
      goto MAIN                                     'Go back to MAIN
  
```

The **Sound** instruction has the following syntax : SOUND #outpin,(note,duration,note,duration,...).

- **#outpin** is the number of the output onto which the tones are delivered [0-7]
- **note** specifies the type and frequency of the tones [0-255]
 - [0-127] produce frequency ascending tones
 - [128-255] produce frequency ascending white noises
 - [0] produces a silence
- **duration** defines the length of the tones in multiples of 10 ms [0-255]