Simple Iambic Key
on PIC16F628A

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This simple key is assembled with a PIC16F628A. Internal controller's generator on 4-MHz provides function of the PIC. The key can work at feeding voltage from 2 to 5.5-V. Some samples of the PIC16F628A may work when feeding voltage drop ever to 1.2-V. Consumption current at working mode is 2- 4-mA (at supply voltage 5-V) and 0.5- 0.8-mA (at supply voltage 3-V). Consumption current at sleeping mode is less the 1-µA.

So, the key can be fed from a small Lithium battery which may be fed the key (ever without a Power Switch) for several years.

Specification

Iambic mode with memory of last item of data

Iambic manipulator may be reversed with help of buttons

4 memory cells, each one has capacity of 30 letters

Memory cell can be written by PIC's key. Rewriting resource is 1,000.000 times.

Needed corrections in the entering data may be made during the record

Data in the memory cell keep saved without power supply across the PIC

Keying speed could be adjusted (with help of a variable resistor) from 4-WPM up to 100-WPM.

Sidetone is 800-Hz
Sidetone can turn ON/OFF with buttons

Simple hand key may be switched on

Ratio "dot- gap- dash' may be chosen with a multipoint switch:
a)   0.75-1.25-3
b)   1-1-3
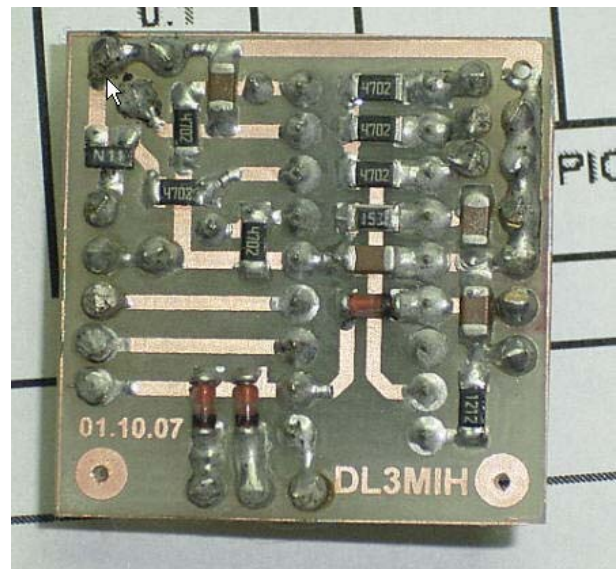c)   1-1-3.5
d)   1-1-4
e)   1-1-4.5

Operation
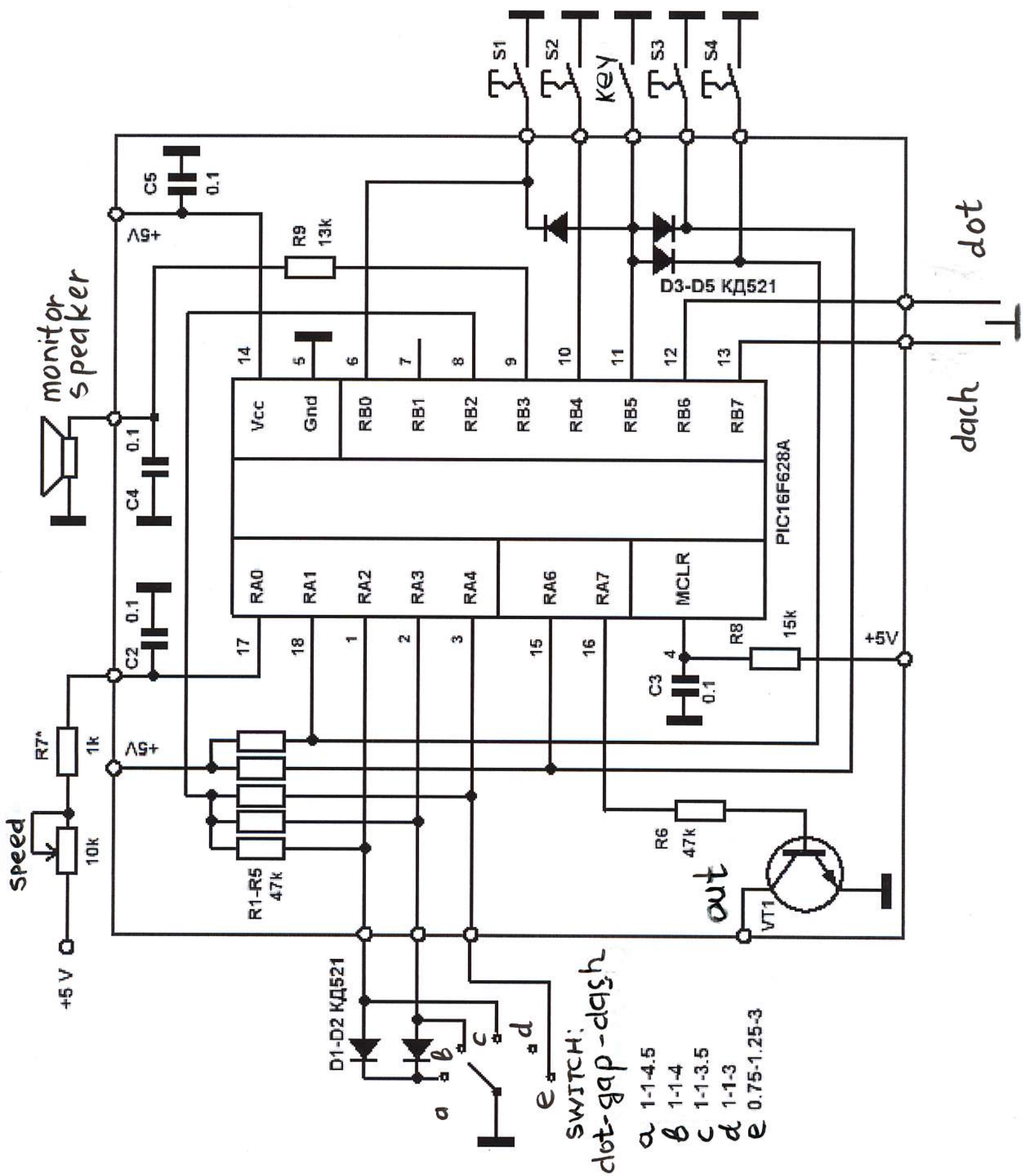
● *Record to a memory cell*

Hold button of needed memory cell for 2 seconds. Speaker transmits "WR" – it means that key stands for the record. At a record the gap between letters the key recognizes automatically. For installation a gap between words you need to do pause in the record for 2 seconds. Speaker transmits "R" – it means that the key is "understood" the gap between words and key is waiting for the record of next data. So, before enter of new data you may drink a coffee or read a book. Key will wait you for the record. When only 3 letters are to finish the memory cell the Sidetone is changed in frequency. To terminate the record tap any button.

● *Correction of Data*

If an erroneous symbol was entered do transmitting dots in number more than six. Speaker will transmit "R"- it means that key stands in "Correction Mode." After that speaker transmit "Last" + "last right letter" and go to Waiting Mode. Speaker transmits "Last NO" if an error was on the first record letter.

PCB for the Key by DL3MIH

Schematic diagram of a PIC16F628A-based electronic Morse code keyer.

Component labels and annotations:
- monitor speaker
- speed
- +5 V
- R7* 1k
- 10k
- C2 0.1
- C4 0.1
- C5 0.1
- R9 13k
- +5V
- R1-R5 47k
- D1-D2 КД521
- D3-D5 КД521
- R6 47k
- R8 15k
- C3 0.1
- VT1
- out
- key
- S1, S2, S3, S4
- dot
- dach
- dash

PIC16F628A pin labels:
- Vcc (14)
- Gnd (5)
- RB0 (6), RB1 (7), RB2 (8), RB3 (9), RB4 (10), RB5 (11), RB6 (12), RB7 (13)
- RA0 (17), RA1 (18), RA2 (1), RA3 (2), RA4 (3), RA6 (15), RA7 (16)
- MCLR (4)

SWITCH: dot-gap-dash
- a 1-1-4.5
- b 1-1-4
- c 1-1-3.5
- d 1-1-3
- e 0.75-1.25-3

Example: Should be necessary to record "CQ DE RU3GA." However it was recorded "CQ DI." To fix the error we transmit series of dots, Speaker transmits "R," then "Last D," after that key turns to a Waiting Mode, enter "E RU3GA," tap any button, that is all. However, it is possible correct any letter. See example below.

Example: Should be necessary to record "CQ DE RU3GA." However, it was entered "CQ NI." To fix the error we transmit series of dots, Speaker transmits "R," then "Last N," after that key turns to a Waiting Mode, again we transmit series of dots, Speaker transmits "R," then "Last Q," after that key turns to a Waiting Mode…. Enter "DE RU3GA" then tap any button.

● *Play Data from a Memory Cell*

Tap a button of the appropriate Memory Cell

● *Stop Play Data from a Memory Cell*

Click by any paddle of the Iambic manipulator or tap a hand key

● *Sidetone OFF/ON*

1. Push and hold Button 1, then push Button 2, Hold both Button while 4 seconds. Speaker transmits "OFF'- Sidetone is Off.
2. To turn Sidetone On repeat 1.
The option is recorded in memory. After OFF/ON key would stay in mode that was before Off.

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● *Tune Mode*

Push and hold Button 1, then push Button 3, Hold both Button while 4 seconds. Go off from Tune Mode- tap any button or click by manipulator.

● *Reverse Iambic Paddle*

1. Push and hold Button 1, then push Button 4, Hold both Button while 4 seconds. Speaker transmits "REV'- manipulators paddle for "Dot" and "Dash" will be reversed. The option is recorded in memory. After OFF/ON key would stay in mode that was before Off.

Design

Depends on your needs the key may be built up in a transceiver or used as a separate project. Sidetone's Out may be switched on the transceiver speaker. Switch for interval "Dot- gap- Dash' may not be installed. In this case you are reached the ratio "1-1-3." However, R1-R3 must be installed.

The key was tested me, however, some errors and glitch in the program are possible. So, you feedback are welcome! Mail to: ra3ggi@mail.ru

Last Hex may be loaded (September 6, 2007): http://ru3ga.qrz.ru/UZLY/key.shtml

73! From RU3GA

SHACK + WORKBENCH RU3GA