CQ Parrot

A1Club Presents 2010

Two-channel memory keyer
designed for straight and bug keys

CQ Parrot can record your CW keying by straight keys or bug keys and exactly reproduce your original manual keying tastes.

[What is CQ Parrot?]

Many CW operators prefer straight keys and bug keys because those keys are easier to express operators' keying individuality than a combination of an electric keyer and a paddle. However, have you ever got tired when you had no reply after calling CQ many times by straight keys or bug keys?

In such a case, CQ Parrot, which can reproduce your original keying by straight keys or bug keys, seems to be very useful and helpful.

CQ Parrot has two channels for your message recording. One of them records your message into EEPROM, thus the message never go out even though you turn off the main switch. One channel is capable of recording 250 strokes, approximately equal to 90 characters, which is long enough to reproduce your short message such as a call for CQ.

[Troubleshooting]

Q1: My CQ Parrot does not work.
A1: Check the power source first. Over voltage, wrong direction of the cells, exhaustion of the cells are the most common reasons of the troubles. The second common causes of the errors are incomplete or improper soldering and wrong direction of the parts on the PCB.

Q2: Even though I push the mode-changing switches (CH1, CH2), the mode-indicating LED's (green, yellow) are ON only for a short time and become OFF immediately.
A2: Do NOT push the mode-changing switches too long. In case CH1 or CH2 are pushed for a too long time, the mode-changing occurs several times. Just a short click is enough to change modes.

[Other questions.]

Q1: Isn't it possible to use other type cells than AA?
A1: First, try with the AA type cells to check that your CQ Parrot does work properly. This is a very important checkpoint. Then, after that, you can choose any kind of power source as far as 4.5 to 5.5 V is supplied. However, make it sure that the power voltage does not exceed 6 V, which is the maximum tolerable voltage of the MPU. When an AC/DC adapter is used as a power source, check the exact voltage supplied to the circuit, because an AC/DC adapter often gives higher voltage than expected in case circuit load is light. Also be careful not to make a short-circuit.

Q2: Why the key-in jack is stereo type, and also why the board has the unused area "Ext." indicated by the broken line?
A2: The board has been designed to make it possible to use a paddle with some modifications in FUTURE, although you are unable to connect a paddle to CQ Parrot at this time.

Q3: What are "GND, R, S, 1 and 2" in the area between four tactile switches and the MPU?
A3: "GND, R, S, 1 and 2" are connected to the tactile switches in parallel on the board. When you plan to place the board in a plastic or metallic case, you can use any other switches than the tactile switches included in the kit by connecting your switches to "GND, R, S, 1 and 2".

Q4: I have another question.
A4: Access the web page of the A1 club homemade-support team and ask your question there freely.
http://a1club.net/project/2010/kit.htm

[How to build up the kit?]

First, check that your kit contains all parts listed elsewhere. After careful reading the following notes, start soldering short parts such as MPU socket, tactile switch, etc, then tall parts such as Tr and sounder.
1. R's are 4.7 kΩ and RL's are 1 kΩ.
2. Do NOT solder the MPU directly on the Printed Circuit Board (PCB). Solder the MPU socket on the board first, and then put the MPU into the socket carefully.
3. Pay your careful attention to direction of several parts such as MPU, Tr, LED's and sounder (buzzer) when you solder them on the board.
4. For the first time, use the battery box included in the kit and connect it to the DC+ and GND on the board as a power source. You need "brand new" three AA cells.
5. Red tactile switch is recommended for "REC" (recording) and yellow for "STOP". Choose other tactile switches freely as you like.
6. No part is soldered inside of the area "Ext." indicated by the broken line (- - - -) on the board.

Additional tip about LED leads

K   A

longer lead is an anode (A)
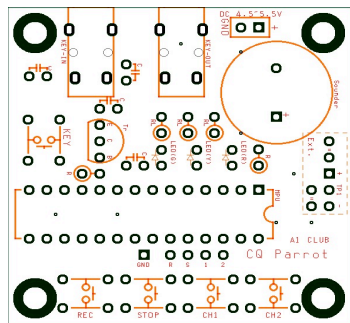
[Parts list included in the kit.]

MPU	ATmega328P	1
Tr	2SC1815	1
Sounder	HDB06LFPN	1
LED	red, yellow, green	1 each
R	4.7 kΩ resister (y – v - r – gld)	2
RL	1 kΩ resister (br - bk - r – gld)	3
C	0.1 μF ceramic capacitor	4
SW	tactile switch	5
Key jack	3.5 mm jack for key	2
Battery box for three AA batteries		1
Original designed PCB		1

[Important notes.]

\# CQ Parrot is NOT designed for tube type Rigs. You will have a risk of serious damage to the circuit.
\# Connection cables are recommended to be as short as possible.
\# Under certain conditions regarding to output power of your Rig and matching status of your antenna, RF re-entry may occur. In such a case, use shielded cables or clamp cores to cut RF re-entry.
\# CQ Parrot users should take their own electronic technique and knowledge levels into their account, and avoid remodeling that needs higher technique and knowledge levels than theirs. Volunteers have designed this kit. Thus, each user is kindly requested to be responsible for her/his own use of CQ Parrot.
\# The project support team possesses the copy right in the MPU (AVR). CQ Parrot may be available only for personal use.
\# Do NOT take away the seal on the MPU, which indicates a version of the program in the MPU.
\# You might purchase the kit contained in a plastic case. The plastic case is NOT included in the price of the kit. Thus, even though the plastic case is damaged, we will not replace it by a new one.
\# Other detailed informations are provided on the web page of the A1 club homemade-support team. Any kind of questions and comments are welcome.
http://a1club.net/project/2010/kit.htm
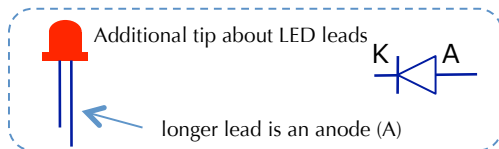
A1 club homemade-support team
Circuit and software design: Tomo JQ1OCR
Board design: Mako JN1GLB
Project planning: Atsu JE1TRV
English manual: Tommy JG2GSY
Kit making and tests: Ken JA4AZS, Atsu JE1TRV, Tommy JG2GSY, Jun JQ1BWT, Tomo JQ1OCR

Instruction manual

Basic functions of each switch are as follows:

REC	Push to record your keying. To change modes (described in detail below), push REC and the main switch together when you turn on CQ Parrot.
STOP	Push to stop recording your keying, stop playing recorded messages, and change modes from a setting mode or a through mode to a waiting mode.
CH1	Push to play message kept in channel-1. To record your keying into the channel-1, push "REC" and "CH1" simultaneously. Under the setting mode, CH1 determines ON/OFF of a repeat function.
CH2	Push to play message kept in channel-2. To record your keying into the channel-2, push "REC" and "CH2" simultaneously. Under the setting mode, CH2 determines ON/OFF of a mute function.
KEY	"KEY" is connected to key-in jack in parallel. Thus, "KEY" switch can function as a kind of a straight key without connecting keys to the key-in jack.
LED	Green, yellow and red LEDs indicate the status of CQ parrot.

[Detailed procedures to use CQ Parrot.]

[Recording]
   Under the waiting mode, push "REC" and either "CH1" or "CH2" simultaneously and record your keying messages into channel-1 or -2, respectively. The red LED turns on when the recording is possible. No message is recorded until you start keying. After you finish recording your message, push "STOP" immediately. Then, CQ Parrot is set back to the waiting mode. During your recording your messages into channel-1 or -2, the green or yellow LED turns on, respectively. The green or yellow LED blinks and the buzzer sounds exactly according to your keying down, which shows that CQ Parrot is recording your message now. Old messages kept in the channels-1 and -2 are erased when new messages are recorded. The message recorded into channel-1 is kept in the EEPROM in the MPU, thus the message does not go away even though the main switch is turned off. (The message in the channel-2 goes away when you turn off the main switch.) While you record your messages into CQ Parrot, your keying signal is NOT put out to your Rig.

[Playing]
   Push "CH1" or "CH2" under the waiting mode and put out your messages kept in the channels-1 or -2, respectively, to your Rig. The green (CH1) or yellow (CH2) LED blinks and the buzzer sounds according to the output signal. In case of no message kept in the channels, there is no output signal. To stop playing the messages, push "STOP". After the message output is over or "STOP" is pushed, CQ Parrot is set back to the waiting mode.

[Through mode]
   When you key down while CQ Parrot is under the waiting mode, it automatically changes CQ Parrot to the through mode, and your keying signal is directly sent to your Rig. The yellow LED turns on under the through mode. Push "STOP" to set CQ Parrot back to the waiting mode.

[Setting mode]
   When you push "REC" together with the main switch simultaneously, the LED's start blinking in the order of green -> yellow -> red, and then CQ Parrot is set to the setting mode. Once the LED starts blinking, you do not need to hold "REC" any further.

"CH1" determines ON/OFF of the repeat function. Pushing "CH1" sets the repeating function ON -> OFF -> ON -> .... and simultaneously the green LED turns ON -> OFF -> ON -> ....

"CH2" determines ON/OFF of the mute function. Its procedure is exactly same as that of the repeating function setting described above, except that the yellow LED turns ON and OFF.

   It is possible to push both "CH1" and "CH2" to set the repeat and the mute functions at the same time. Push "STOP" after the settings are completed by confirming the LEDs' ON/OFF. The LEDs turn on in the order of red -> yellow -> green, which indicates CQ Parrot is set back to the waiting mode.
   Note that once the main switch is turned off, all the settings are cleared and back to the default status (repeat: OFF and mute: OFF).

[Repeat mode]
   Under the repeat mode, push "CH1" to output your message kept in the channel-1 ten times with an interval of approximately 3 sec. The channel-2 has no repeat function. During the repeat mode is functioning, the yellow LED turns on. To stop repeating your message, push "STOP". Otherwise, CQ Parrot is automatically set back to the waiting mode after the ten-time repeating. To clear the repeat mode, turn off the main switch first and then change the setting of the repeat function as mentioned before. (The repeat function is OFF in the default setting.)

[Mute mode]
   Most Rigs are supposed to have a side tone for monitoring your keying. Then, you may not need the buzzer sound from CQ Parrot. The mute mode makes the buzzer silent during output of the message and under the through mode. Although the buzzer does not sound, the LED turns ON/OFF according to your keying, which ensure that CQ Parrot is working properly.
   When you record messages, the buzzer does sound despite that CQ Parrot is set to the mute mode.

[Other notes for users]
(1) The maximum recordable capacity is 250 strokes per channel. In case messages exceed 250 strokes, CQ Parrot is automatically set back to the waiting mode and the red LED turns on. The message until 250 strokes is recorded, but nothing is kept after that. If you have such a trouble, check the total strokes of your message and modify it by reducing the total strokes.

(2) CQ Parrot measures duration of both mark (keying down) and space. The maximum recordable time is approximately 1 min. Thus, do not record messages that contain either only mark or only space continues more than one minute, although such messages obviously seem to be impractical in usual QSOs. The last space recorded as a part of messages is the time between the last keying down and pushing "STOP". Thus, it is crucial to push "STOP" immediately after the end of recording your messages.

(3) CQ Parrot has recording time accuracy of approximately 1 msec.