

KIT No 1186

8CH REMOTE CONTROL BY TELEPHONE

This device allows you to keep under remote control eight different devices such as thermal bulks, heater (water boiler), air-condition, watering, alarms, etc via relays. By using it you can for example water the garden or your country house from your living-room, or you may turn on the heater or the air-condition at home from your office, so by the time you be there, it will have turned into a cool oasis...

The KIT 1186 uses the simple digital telephone line, with which is connected in parallel. It has an additional security advantage using a four-number access code. This ability protects the user from undesirably access and random activation. For every command that is reached and executed by the device the user receives the suitable signal.

The operation of the device is simple, since the user communicates with it by pressing each time the proper key in the telephone device. The only thing someone should notice is the telephone line itself, which as already mentioned, should be digital. This means that it should operate with a tone (tone system) and not with pulse (like the old analog lines).

TECHNICAL FIGURES (CHARACTERISTICS)

- Control System (on-off) of eight devices through telephone.
- Sound confirmation of the device's situation
- Four-number access code.
- Power of 12 VDC / 0,5 A
- Relay outputs with 220V/10A contact ability.

CIRCUIT OPERATION

The circuit consists of four basic sections, easily detected simply looking at the electronic diagram.

1. The first section is the power supply circuit. It uses the voltage regulator LM7805 (U1), in order to provide a stable regulation of +5Volts.
2. The second section is the identification and pulse processing circuit of tone telephone system (known as DTMF signal). All necessary function is being succeeded through the chip HT9170 (U3).
3. The third section, which is the heart of the circuit, consists of the well known micro-controller PIC16C57 wich has the whole supervision of the circuit operation and programming and saves all program data on a small memory device type 93C46.
4. Finally, the fourth section contains a series of eight similar circuit relays. Each one has the possibility to activate (on) or to deactivate (off) the device, which is connected to the relay accordingly to the given commands of the micro-controller.

CONSTRUCTION

All the components must be placed in the proper printed circuit from the side of the silk screen. You will begin the assembly with the five (5) jumpers. These are characterized with the letter J (J1, J2, J3, J4, J5) and having as your guide the silk screen of the printing circuit, you will find:

J1 & J2, under the U2.

J3, between Y1 and Y2 crystals.

J4, between capacitor C6 and resistor R24.

J5, between capacitor C8 and crystal Y1.

Following that, you will place all the resistors, paying attention to the color code. At that point the color report will be useful to you in every resistor, which is shown below at the components list.

You will proceed to the assembling of the components with the DIL sockets for three of the integrated circuits U2, U3, U4. For the circuit U1 and U5 the sockets are not needed. You must know that in one side of every DIL socket there is a characteristic notch. You will place every socket on the board in

such a way that the notches of the sockets must be placed according to the PCB serigraph topographic design.

You will continue with the placement and soldering of the capacitors. As you know there are three types of capacitors: electrolytic, ceramic and polyester capacitors.

In the components list you will find the type of each capacitor. The electrolytic capacitors has its capacity value and operation voltage (e.g. C2=220 μ F/16V) typed on the case. Make sure that the electrolytic capacitors are correctly placed in the board, according the polarity. The silk screen of the board always displays the positive (+) terminal for the electrolytic capacitors.

Continue - with the same caution for the polarity-, placing the diodes. The silk screen of the board shows the cathode of the diode. At the one end of the diode there's a corresponding bold line that exists also at the surface of the diode.

The transistors has three pins, which must be solder immediately afterwards. In those components too, the figures of the silk screen will help you for their correct placement.

In the board, next to the logotype KIT No 1186, there are figures for the two sockets with codes J2, J1. These are the next that you will place.

The coupling transformer T1 has special pin arrangement which helps you for correct placement. Continue with the placement of the diodes LED, which have also polarity. In the silk screen the photo-diodes (LED are being characterized with the letter L. A small segment that indicates the cathode is interrupting the circular size. The socket of the component is corresponding to the shape of the silk screen. These two must coincide with the placement of every LED onto the board.

After that place the rectification bridge (BR1). The points -, +, - onto the silk screen of the board and onto the component will assist you placing them in the correct way.

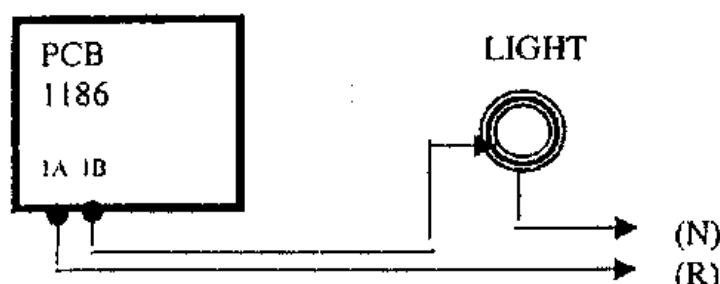
Continue the assembly with the button switches (S1). The PCB has room for eight relays. In the kit's package you will find only four relays which are enough for most of your needs. If you want to handle more devices just buy more relays and place them on the empty places on the PCB. Finally, place the relay RL9 and you are ready.

CONNECTION

If you want to use this device without problems please read carefully the instructions below. The telephone socket J2 must be connected to the telephone line. At the socket J1 you have the output of the telephone line from the circuit. In this socket you must connect one digital telephone device. In this way there's always a telephone connection, independently of the functioning of the circuit.

At the first relay connect one lightning lamp. At the point 1A connect the phase (L) of the mains (220VAC). In point 1B connect one end of the lamp while connecting its other end with the neutral (N).

CAUTION: The connection with the 220V is maybe dangerous. Make sure you follow all the proper procedures for safety reasons. Make also sure you have a plug in the circuit of the lamp which you will connect in the wall plug of 220V, after you have finished with all the other connections on the board.



In a similar way you will proceed to the connections of every other device with the relays of the circuit which act as switches for the remote devices.

Supply the circuit with 12Volts at the points of the board 10 (+12V) and 9 (GND),

PROGRAMMING

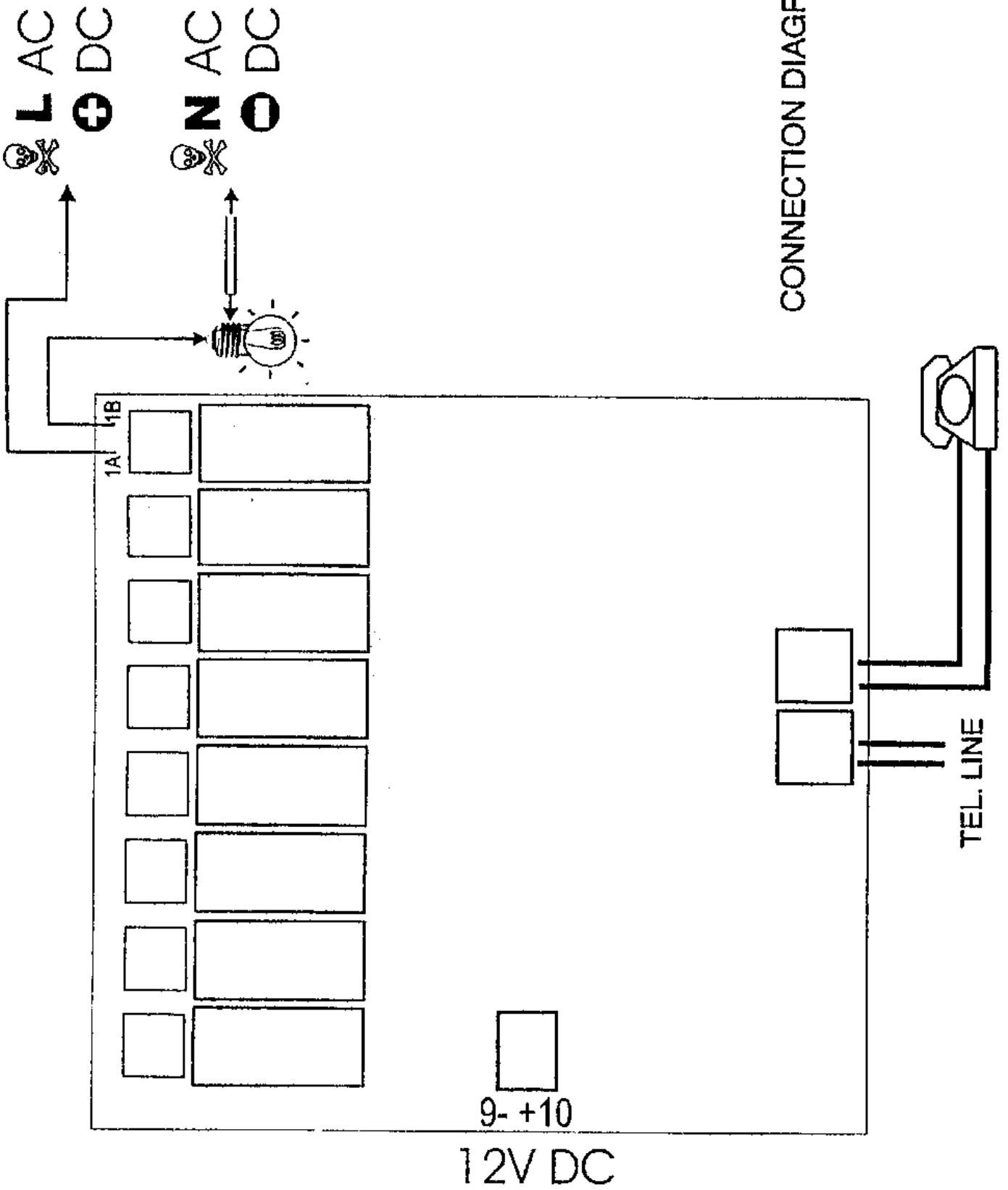
The programming and control of the circuit is remotely activated via telephone. To do this, follow the next steps:

1. Connect the device in one digital telephone line. From an other telephone unit (not in the same line), dial the telephone number that is connected to the device.
2. After the third calling you will hear two short sounds (beep-beep).
3. Press the key of the access code (the initial code number is 1234, a number which you easy may change).
4. If you have pressed the keys correctly, you will hear again two short sounds, otherwise you will hear a protracted sound (heeeeeeep). In case of a wrong entry of the access code for the third time, the device will terminate the telephone connection, as a result. This is an additional protection for you from a malicious intervention by a third person.
5. After the successful connection to the remote control device, press *1. In this way the device is activates the relay 1 (in our case, the lighting lamp). If you want to deactivate this relay 1, simply press #1.
6. If you want to confirm the deactivation of the device, press 1. If you hear a protracted sound the device is off. If you hear two short sounds, the device is on. The table that follows below displays the situation of every remote control device in proportion with the keys that were pressed.

CHANGE OF CODE NUMBER

If you want to change the original four numbers access code, pick up the handset of the telephone line which is parallel to the device of remote control into the plug J1, and press the button switch LEARN (S1). When you hear four short sounds you must press the new four numbers access code. You will hear again four short sounds, which means that the change has been successfully materialized.

KEYS COMBINATION	EXPECTED FUNCTION
* 1	Activation (on) of the device 1
# 1	Deactivation (off) of the device 1
1	Situation of the device 1 -beep beep- if it is (on) -beeeeeep- if it is (off)
* 2	Activation (on) of the device 2
# 2	Deactivation (off) of the device 2
2	Situation of the device 2 -beep beep- if it is (on) -beeeeeep- if it is (off)
* 3	Activation (on) of the device 3
# 3	Deactivation (off) of the device 3
3	Situation of the device 3 -beep beep- if it is (on) -beeeeeep- if it is (off)
* 4	Activation (on) of the device 4
# 4	Deactivation (off) of the device 4
4	Situation of the device 4 -beep beep- if it is (on) -beeeeeep- if it is (off)
* 5	Activation (on) of the device 5
# 5	Deactivation (off) of the device 5
5	Situation of the device 5 -beep beep- if it is (on) -beeeeeep- if it is (off)
* 6	Activation (on) of the device 6
# 6	Deactivation (off) of the device 6
6	Situation of the device 6 -beep beep- if it is (on) -beeeeeep- if it is (off)
* 7	Activation (on) of the device 7
# 7	Deactivation (off) of the device 7
7	Situation of the device 7 -beep beep- if it is (on) -beeeeeep- if it is (off)
* 8	Activation (on) of the device 8
# 8	Deactivation (off) of the device 8
8	Situation of the device 8 -beep beep- if it is (on) -beeeeeep- if it is (off)



CONNECTION DIAGRAM

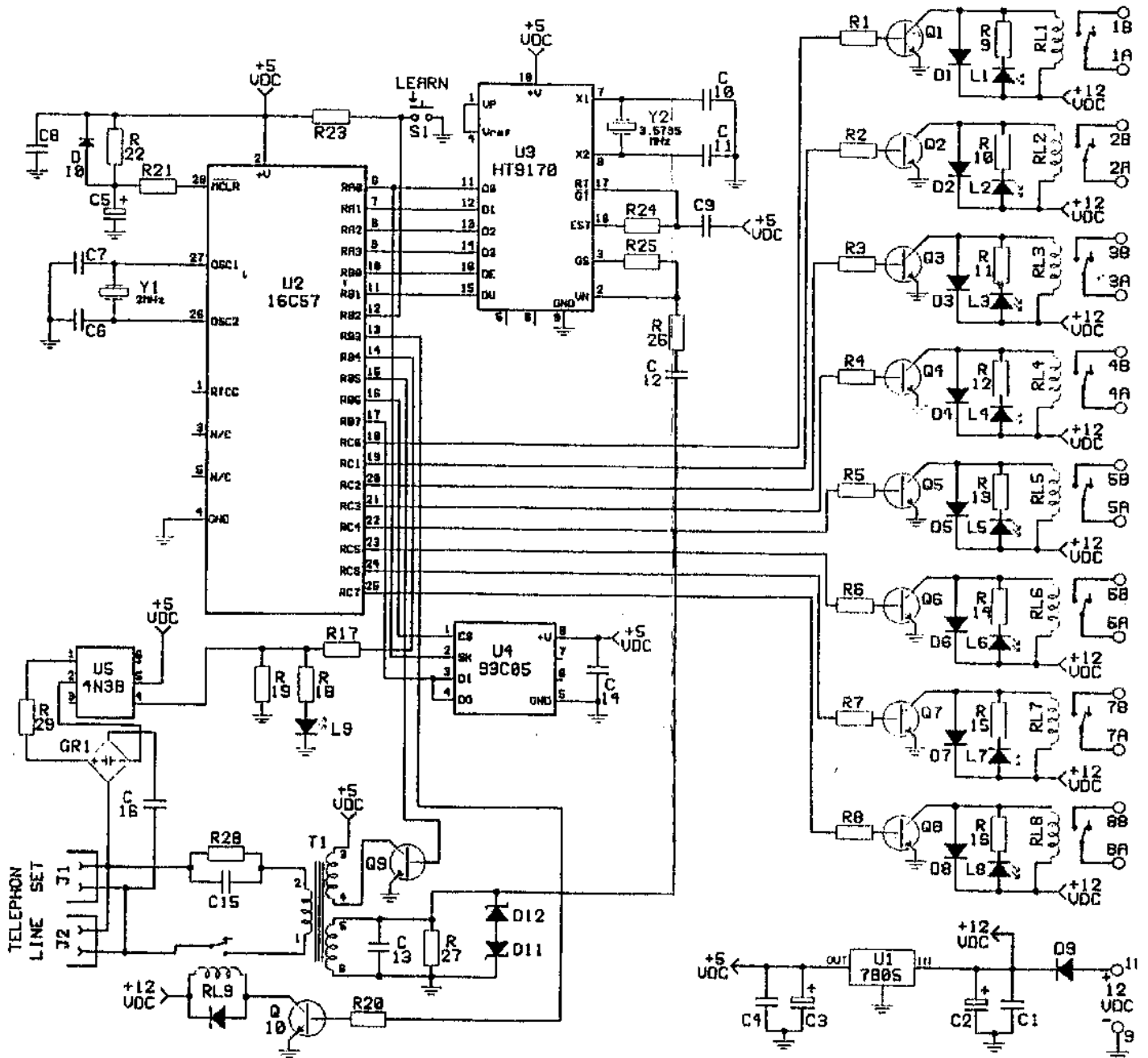


FIG. 1 KIT NO 1186
EIGHT LINES DTMF CONTROLLER