velleman® HIGH-Q kit

Remote controlled car alarm

Total solder points: 88 + 68 + 367
Difficulty level: *beginner* 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ *advanced*

K3511

Features :

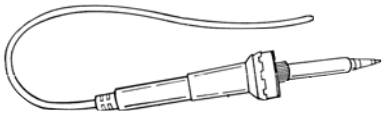
- ☑ Microprocessor technology.
- ☑ Multi-functional remote control operation.
- ☑ Audio and visual on/off indicators.
- ☑ Multifunction dashboard mounted LED.
- ☑ Automatic reset after alarm.
- ☑ Adjustable voltage drop (reaction to interior lighting).
- ☑ Voltage drop detection active immediately, or after 5 minutes.
- ☑ Direct alarm trigger input (direct alarm after triggering).
- ☑ Warning alarm trigger input (2 triggers within 15 seconds = alarm).
- ☑ Warning input can be switched off with the remote control.
- ☑ Adjustable shock detector (can be switched off with the remote control).
- ☑ Detector input for ventilator in order to avoid false alarms.
- ☑ Contact switches for bonnet and boot.
- ☑ Internal siren for on/off signal and alarm.
- ☑ Output for external siren and pager (5A).
- ☑ Alarm time: 30 seconds.
- ☑ Starter interrupter for ignition or diesel fuel pump (15A).
- ☑ Special starter motor interrupter relay (30A) supplied.
- ☑ Switch on protection if contact is on.
- ☑ Output to hazard lights (2 x 6A max.).
- ☑ Output for central locking (100mA).
- ☑ Selectable code for remote control transmitter and receiver (8.748 codes).
- ☑ An unlimited number of remote control transmitters can be used (K6706B or K6706G).
- ☑ Automatically resets in the event of accidental switch off (60 seconds).
- ☑ Connection for extra starter interrupter via security code lock module (SP150).
- ☑ Diagnosis facility to identify a triggered sensor at a later time.

Specifications

- Supply voltage: 12VDC.
- Consumption: 50mA in standby.
- Temperature range: -40 to +85°C.
- Battery for remote control unit: 12V type V23GA, V23A (not incl.).

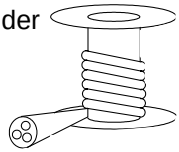
1. Assembly (Skipping this can lead to troubles !)
Ok, so we have your attention. These hints will help you to make this project successful. Read them carefully.

1.1 Make sure you have the right tools:



- A good quality soldering iron (25-40W) with a small tip.

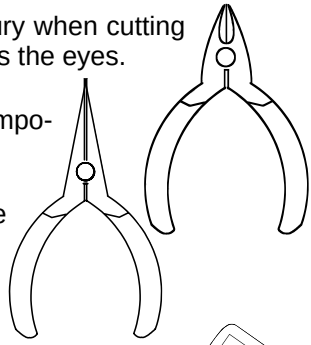
- Wipe it often on a wet sponge or cloth, to keep it clean; then apply solder to the tip, to give it a wet look. This is called 'thinning' and will protect the tip, and enables you to make good connections. When solder rolls off the tip, it needs cleaning.



- Thin raisin-core solder. Do not use any flux or grease.

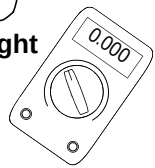
- A diagonal cutter to trim excess wires. To avoid injury when cutting excess leads, hold the lead so they cannot fly towards the eyes.

- Needle nose pliers, for bending leads, or to hold components in place.



- Small blade and Phillips screwdrivers. A basic range is fine.

For some projects, a basic multi-meter is required, or might be handy



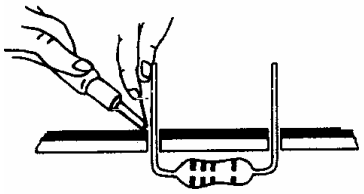
1.2 Assembly Hints :

⇒ Make sure the skill level matches your experience, to avoid disappointments.
⇒ Follow the instructions carefully. Read and understand the entire step before you perform each operation.
⇒ Perform the assembly in the correct order as stated in this manual
⇒ Position all parts on the PCB (Printed Circuit Board) as shown on the drawings.
⇒ Values on the circuit diagram are subject to changes.
⇒ Values in this assembly guide are correct*
⇒ Use the check-boxes to mark your progress.
⇒ Please read the included information on safety and customer service

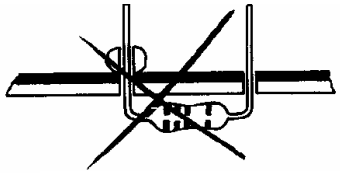
* Typographical inaccuracies excluded. Always look for possible last minute manual updates, indicated as 'NOTE' on a separate leaflet.

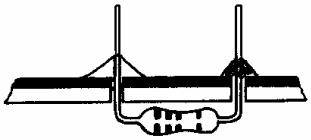
1.3 Soldering Hints :

1- Mount the component against the PCB surface and carefully solder the leads

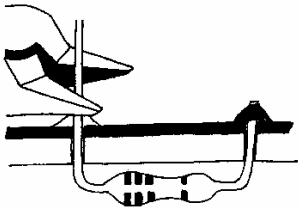


2- Make sure the solder joints are cone-shaped and shiny



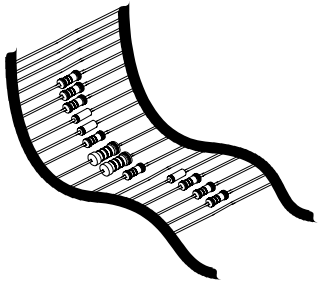


3- Trim excess leads as close as possible to the solder joint



REMOVE THEM FROM THE TAPE ONE AT A TIME !

AXIAL COMPONENTS ARE TAPED IN THE CORRECT MOUNTING SEQUENCE !



Velleman hereby certifies that the device K3511 meets the essential requirements and all other relevant stipulations of directive 1999/5/EG and 1995/5/EC.

For the complete conformity declaration check out :
http://www.velleman.be/downloads/DoC/CE_K3511.pdf

IMPORTANT

☝ The car alarm consist of three PCB's, 1 for the remote control transmitter, 1 for the receiver and 1 for the main PCB.

The receiver PCB is fitted to the main PCB.

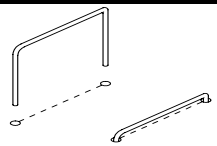
☞ **Tip:** The pictures on the packaging can be used as a guideline. However, due to possible changes it is not 100% reliable.

(A) Construction of the P6706 remote control transmitter

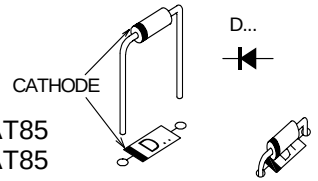
Before mounting the components to the PCB it must first be checked that the PCB fits in the housing. Be careful of the small notch next to LD1. Should it not fit the edge of the PCB can be sanded down with fine sandpaper.

1. Jumperwire

❑ J



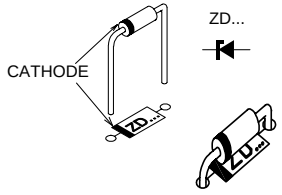
2. Diodes (Check the polarity)



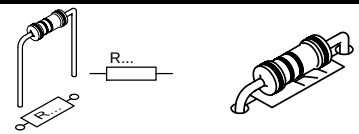
❑ D1 : BAT85
❑ D2 : BAT85

3. Zener diode. Check the polarity!

❑ ZD1 : 6V8

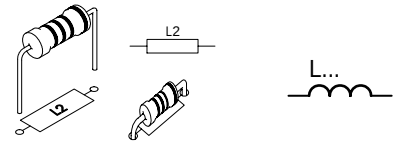


4. Resistors (check the color code)



❑ R1: 100K (1 - 0 - 4 - B)
❑ R2: 100K (1 - 0 - 4 - B)
❑ R3: 33K (3 - 3 - 3 - B)
❑ R4: 100 (1 - 0 - 1 - B)
❑ R5: 1K (1 - 0 - 2 - B)

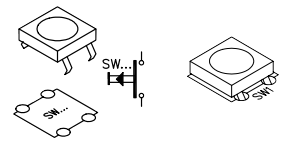
5. Axial coil



❑ L2 : 10µH (1-0-0-A)

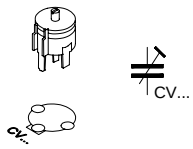
6. Push button

❑ SW1
❑ SW2



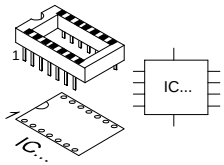
7. Capacitive trimmer

❑ CV : 1,5 - 5pF



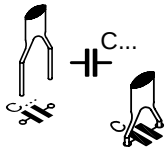
8. IC socket (Watch the position of the notch)

❑ IC1 : 18p



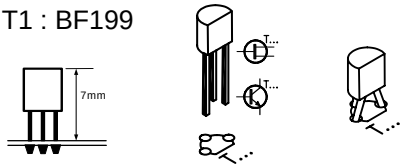
9. Capacitors

❑ C1 : 2pF (2,2)
❑ C2 : 2pF (2,2)
❑ C3 : 330pF (331)



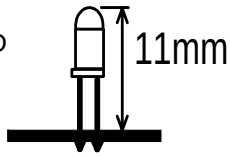
10. Transistor

❑ T1 : BF199



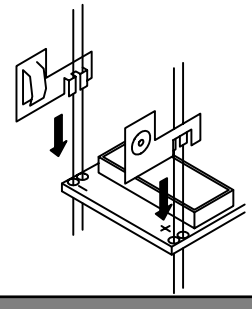
11. LED (Check the polarity)

❑ LD1 : 3mm RED

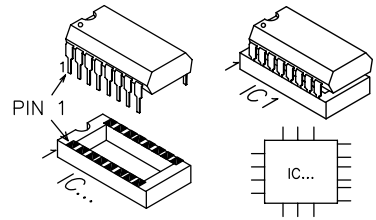


12. LED (Check the polarity)

❑ +
❑ -



13. IC (Watch the position of the notch !)



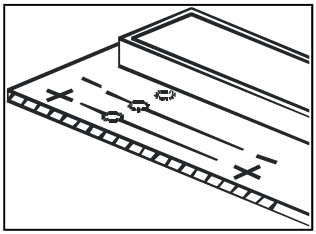
❑ IC1 : UM3758 - 120A

14. Sticker

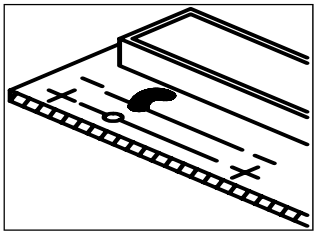
Affix the supplied sticker to the housing.

15. Create your code

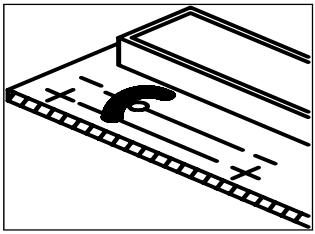
The code can be set for a transmitter/receiver combination. There is a row of 9 coding islands for setting the code. The closest is near the IC legs. The code can be set by connecting one or more of these coding islands to a neighbouring - island or a neighbouring + island using a jumper, or by not connecting them at all (leaving open).



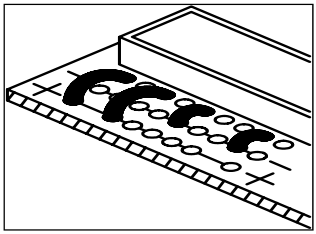
No connection



Code connection to '-'



Code connection to '+'



Example of a possible code

☝ **Note:** certain points cannot be connected to '+'

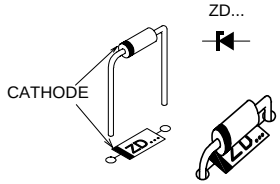
16. Final assembly

Place the PCB in its housing, check for the position of the battery lips. The cover may only be fitted after mounting and adjustment.
Place the 12V battery (type V23GA) in the housing (check the polarity).

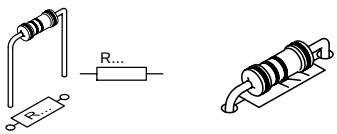
(B) Construction of the remote control receiver P3511R

1. Zener diode (Check the polarity)

- ❑ ZD1 : 4V3
- ❑ ZD2 : 5V1
- ❑ ZD3 : 5V1

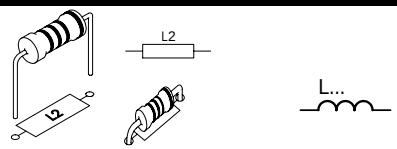


2. Resistors (check the color code)



- ❑ R1 : 270 (2 - 7 - 1 - B)
- ❑ R2 : 2K2 (2 - 2 - 2 - B)
- ❑ R3 : 18K (1 - 8 - 3 - B)
- ❑ R4 : 18K (1 - 8 - 3 - B)
- ❑ R5 : 33K (3 - 3 - 3 - B)
- ❑ R6 : 5K6 (5 - 6 - 2 - B)
- ❑ R7 : 2K7 (2 - 7 - 2 - B)
- ❑ R8 : 6K8 (6 - 8 - 2 - B)
- ❑ R9 : 6M8 (6 - 8 - 5 - B)
- ❑ R10 : 1K (1 - 0 - 2 - B)
- ❑ R11 : 1K (1 - 0 - 2 - B)
- ❑ R12 : 1K (1 - 0 - 2 - B)
- ❑ R13 : 4K7 (4 - 7 - 2 - B)

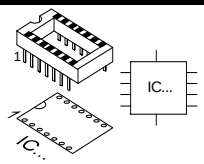
3. Axial coil



- ❑ L1 : 1µH (1 - 0 - B - A)

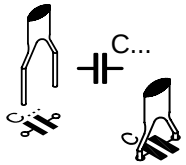
4. IC socket. Watch the position of the notch.

- ❑ IC1 : 8p



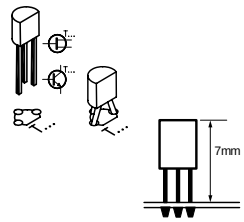
5. Capacitors

- ❑ C1 : 2pF (2,2)
- ❑ C2 : 2pF (2,2)
- ❑ C3 : 22pF
- ❑ C4 : 82pF
- ❑ C5 : 330pF (331)
- ❑ C6 : 330pF (331)
- ❑ C7 : 1µF (105 - 1µ)



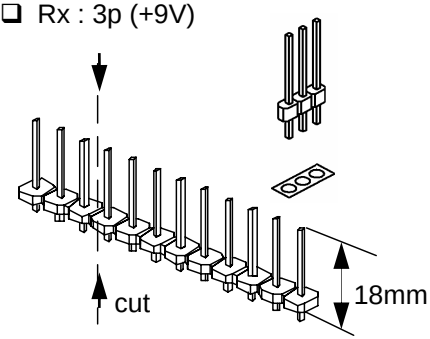
6. Transistor

- ❑ T1 : BF199



7. Pin contacts

- ❑ Rx : 3p (+9V)



8. Capacitive trimmer

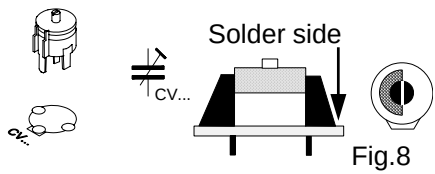
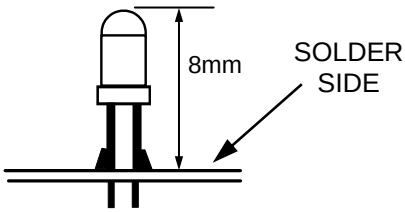


Fig.8

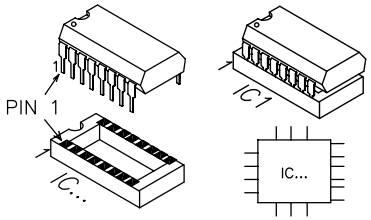
❑ CV1 : 5pF

9. LED (Check the polarity)



❑ LD1 : 3mm RED

10. IC
(Watch the position of the notch !)

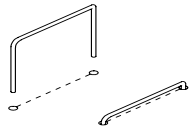


❑ IC1 : RV4558, LM258, LM2904

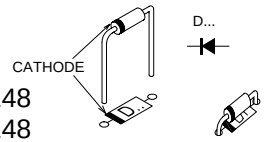
(C) Construction of the main PCB 3511

1. Jumperwire

- ❑ J



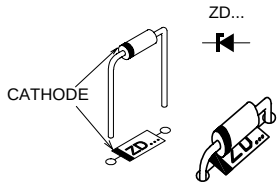
2. Diodes (Check the polarity)



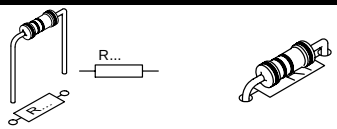
- ❑ D1 : 1N4148
- ❑ D2 : 1N4148
- ❑ D3 : 1N4148
- ❑ D4 : 1N4148
- ❑ D5 : 1N4148
- ❑ D6 : 1N4148
- ❑ D7 : 1N4000 … 1N4007
- ❑ D8 : 1N4000 … 1N4007
- ❑ D9 : 1N4000 … 1N4007
- ❑ D10 : 1N4000 … 1N4007
- ❑ D11 : 1N4000 … 1N4007
- ❑ D12 : 1N4000 … 1N4007

3. Zener diode. Check the polarity!

- ❑ ZD1 : 2V4
- ❑ ZD2 : 5V1
- ❑ ZD3 : 18V
- ❑ ZD4 : 18V
- ❑ ZD5 : 18V

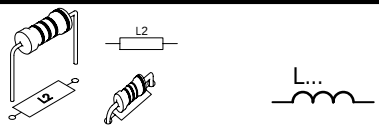


4. Resistors (check the color code)



- ❑ R1 : 100K (1 - 0 - 0 - 3 - 1)
- ❑ R2 : 100K (1 - 0 - 0 - 3 - 1)
- ❑ R3 : 100K (1 - 0 - 0 - 3 - 1)
- ❑ R4 : 100K (1 - 0 - 0 - 3 - 1)
- ❑ R5 : 10 (1 - 0 - 0 - B)
- ❑ R6 : 220 (2 - 2 - 1 - B)
- ❑ R7 : 4K7 (4 - 7 - 2 - B)
- ❑ R8 : 4K7 (4 - 7 - 2 - B)
- ❑ R9 : 4K7 (4 - 7 - 2 - B)
- ❑ R10 : 4K7 (4 - 7 - 2 - B)
- ❑ R11 : 1K (1 - 0 - 2 - B)
- ❑ R12 : 1K (1 - 0 - 2 - B)
- ❑ R13 : 1K (1 - 0 - 2 - B)
- ❑ R14 : 1K (1 - 0 - 2 - B)
- ❑ R15 : 1K (1 - 0 - 2 - B)
- ❑ R16 : 1K (1 - 0 - 2 - B)
- ❑ R17 : 1K (1 - 0 - 2 - B)
- ❑ R18 : 1K (1 - 0 - 2 - B)
- ❑ R19 : 1K (1 - 0 - 2 - B)
- ❑ R20 : 47K (4 - 7 - 3 - B)
- ❑ R21 : 47K (4 - 7 - 3 - B)
- ❑ R22 : 47K (4 - 7 - 3 - B)
- ❑ R23 : 47K (4 - 7 - 3 - B)
- ❑ R24 : 47K (4 - 7 - 3 - B)
- ❑ R25 : 47K (4 - 7 - 3 - B)
- ❑ R26 : 47K (4 - 7 - 3 - B)
- ❑ R27 : 47K (4 - 7 - 3 - B)
- ❑ R28 : 47K (4 - 7 - 3 - B)
- ❑ R29 : 10K (1 - 0 - 3 - B)
- ❑ R30 : 10K (1 - 0 - 3 - B)
- ❑ R31 : 10K (1 - 0 - 3 - B)
- ❑ R32 : 10K (1 - 0 - 3 - B)
- ❑ R33 : 10K (1 - 0 - 3 - B)
- ❑ R34 : 10K (1 - 0 - 3 - B)
- ❑ R35 : 10K (1 - 0 - 3 - B)
- ❑ R36 : 10K (1 - 0 - 3 - B)
- ❑ R37 : 10K (1 - 0 - 3 - B)
- ❑ R38 : 10K (1 - 0 - 3 - B)
- ❑ R39 : 10K (1 - 0 - 3 - B)
- ❑ R40 : 10K (1 - 0 - 3 - B)
- ❑ R41 : 10K (1 - 0 - 3 - B)
- ❑ R42 : 10K (1 - 0 - 3 - B)
- ❑ R43 : 10K (1 - 0 - 3 - B)
- ❑ R44 : 10K (1 - 0 - 3 - B)
- ❑ R45 : 100K (1 - 0 - 4 - B)
- ❑ R46 : 100K (1 - 0 - 4 - B)

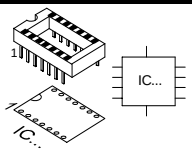
5. Axial coil



- ❑ L1 : 100µH (1 - 0 - 1 - A)

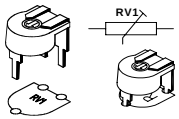
6. IC sockets (Watch the position of the notch)

- ❑ IC1 : 8p
- ❑ IC2 : 18p
- ❑ IC3 : 18p



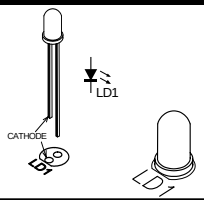
7. Potentiometer

- ❑ RV1 : 4K7 / 5K

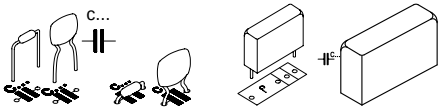


8. LED (Check the polarity)

- ❑ LD1 : 3mm RED



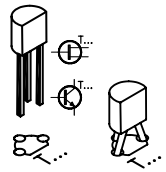
9. Capacitors



- ❑ C1 : 100pF (101)
- ❑ C2 : 330pF (331)
- ❑ C3 : 100nF (µ1 - 104)
- ❑ C4 : 100nF (µ1 - 104)
- ❑ C5 : 100nF (µ1 - 104)
- ❑ C6 : 100nF (µ1 - 104)
- ❑ C7 : 100nF (µ1 - 104)
- ❑ C8 : 100nF (µ1 - 104)
- ❑ C9 : 100nF (µ1 - 104)
- ❑ C10 : 100nF (µ1 - 104)

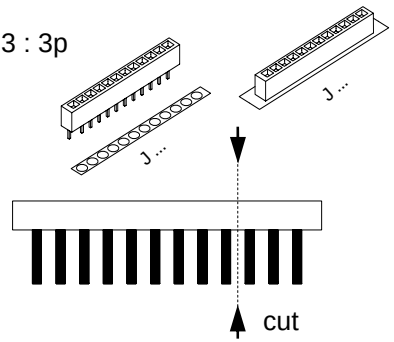
10. Transistors

- ❑ T1 : BC547 or eq.
- ❑ T2 : BC547 or eq.
- ❑ T3 : BC547 or eq.
- ❑ T4 : BC547 or eq.
- ❑ T5 : BC547 or eq.
- ❑ T6 : BC547 or eq.
- ❑ T7 : BC547 or eq.
- ❑ T8 : BC547 or eq.
- ❑ T9 : BC337 or eq.
- ❑ T10 : BC337 or eq.
- ❑ T11 : BC337 or eq.
- ❑ T12 : BC337 or eq.
- ❑ T13 : BC557 or eq.
- ❑ T14 : BC557 or eq.

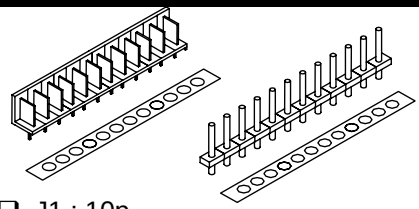


11. Female connector

- ❑ J3 : 3p

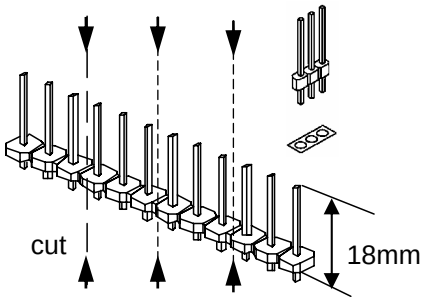


12. Male Pin connector



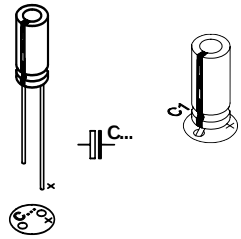
- ❑ J1 : 10p
- ❑ J2 : 12p

13. Pin contacts



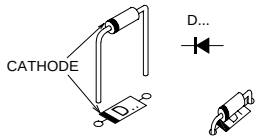
- ❑ JP1 : 3p
- ❑ JP2 : 3p
- ❑ JP3 : 3p
- ❑ JP4 : 3p

14. Electrolytic capacitors. Watch the polarity !



- ❑ C11 : 1µF
- ❑ C12 : 1µF
- ❑ C13 : 1µF
- ❑ C14 : 1µF
- ❑ C15 : 1µF
- ❑ C17 : 1µF
- ❑ C18 : 1µF
- ❑ C19 : 22µF
- ❑ C20 : 220µ F
- ❑ C21 : 1000µF

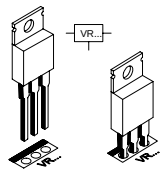
15. Diodes (Check the polarity)



- ❑ D13 : 6A2, 6A6 or eq.
- ❑ D14 : 6A2, 6A6 or eq.

16. Voltage regulators

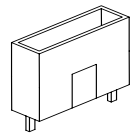
- ❑ VR1 : 7809
- ❑ VR2 : 7805



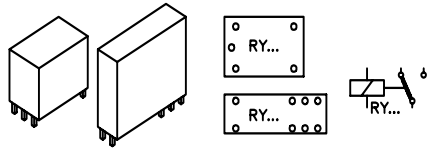
17. Fuse

- ❑ F1 : 15A

☞ Thin the PCB track with extra solder



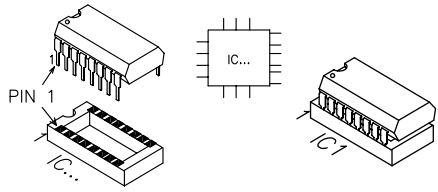
18. Relays



- ❑ RY1 : FRA2C
- ❑ RY2 : FRA2C
- ❑ RY3 : V23033, FRA2C

☞ Thin the PCB track with extra solder

19. IC's. Watch the position of the notch !



- ❑ IC1 : RV4558, LM258, LM158
- ❑ IC2 : UM3758 - 120A
- ❑ IC3 : VK3511, PIC16C54RCE

20. Create your code

See point 15 in transmitter construction “P6706”. (Pag. 7)

21. Final assembly

Mount the receiver PCB “P3511R” on the main PCB “P3511” using the 20mm treaded rod.

☞ Check that the components of the main PCB and the receiver PCB do not touch each other.

22. Test and adjustment

IMPORTANT:

- To tune the remote control transmitter to the receiver, the plastic tuning screwdriver supplied is needed (sometimes it will be necessary to make the point a little bit finer by using sandpaper)
- The transmitter must be in its housing without the cover on.
- The receiver may not be in the vicinity of any metal objects
- The transmitter and receiver must have the same code
- Use the right hand button of the transmitter (SW2)

1. Tuning the receiver :

- Connect 12V in to the + and - of a stable supply or battery. Check the polarity
- Set the tuning capacitor of the receiver to around its mid point (see figure 8). Check that the tuning LED of the receiver is not, or almost not, lit up. If it is lit the capacitor must be set a little bit further on. Do not touch the circuit with your hand

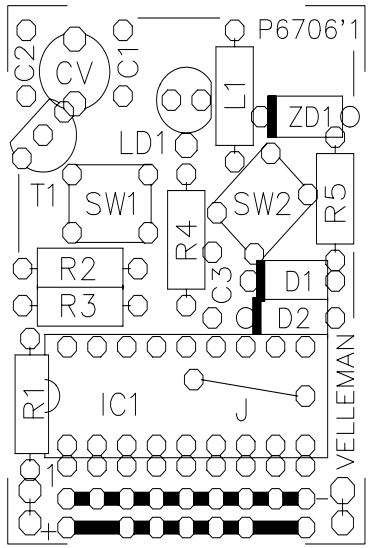
2. Tuning one or more transmitters to the receiver:

- Activate the transmitter (do not touch any other components other than the push button) and turn (very carefully) the tuning capacitor until the tuning LED of the receiver lights up. If all is well one of the relays will energise - if the transmitter and receiver codes are the same. (Between 2 operations a pause of at least 5 seconds is required)
- Now take the transmitter at least 10 metres away from the receiver and repeat the setting. Then take the transmitter to around 20 metres away and repeat (perhaps ask somebody to help you).
- Should it not be possible to tune the receiver to the transmitter, then it might be that the tuner capacitor of the receiver should be set into a different position.

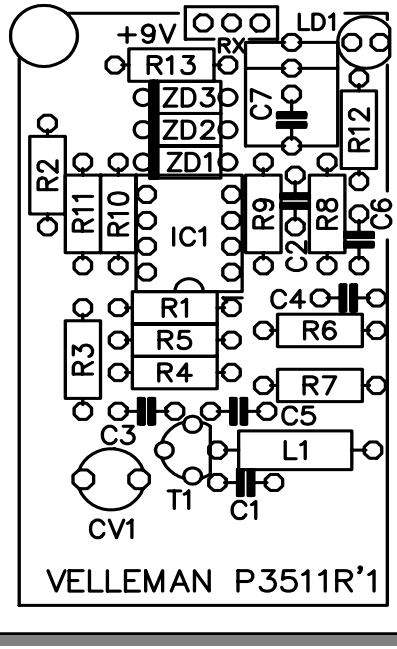
Clip the cover of the housing of the transmitter back into place.

☞ See user instructions for further operation.

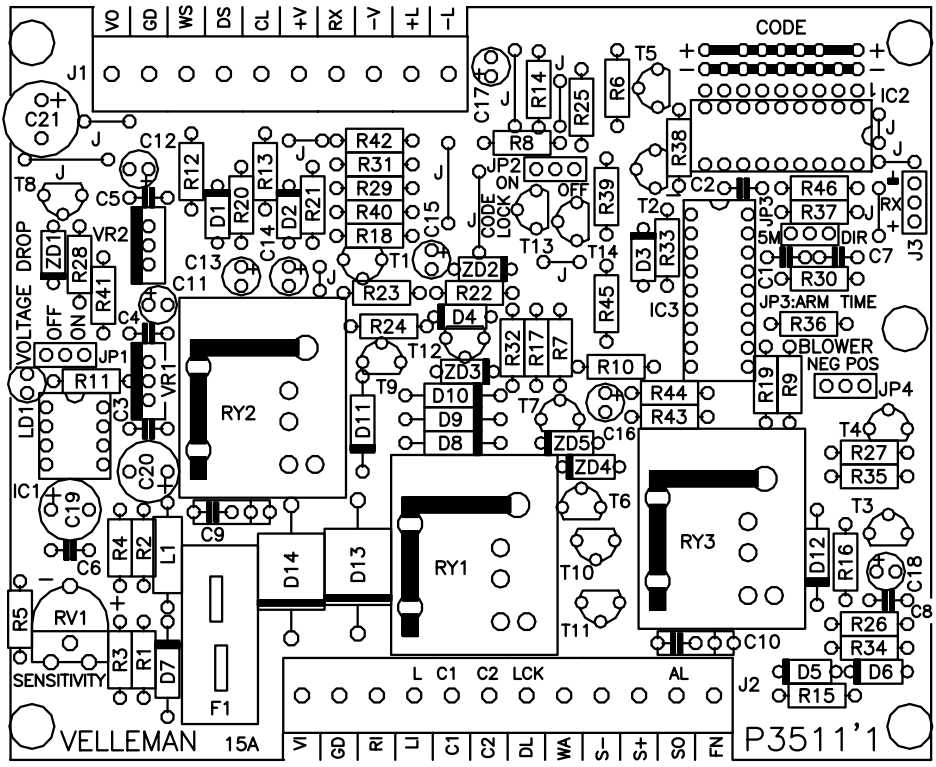
23. PCB P6706



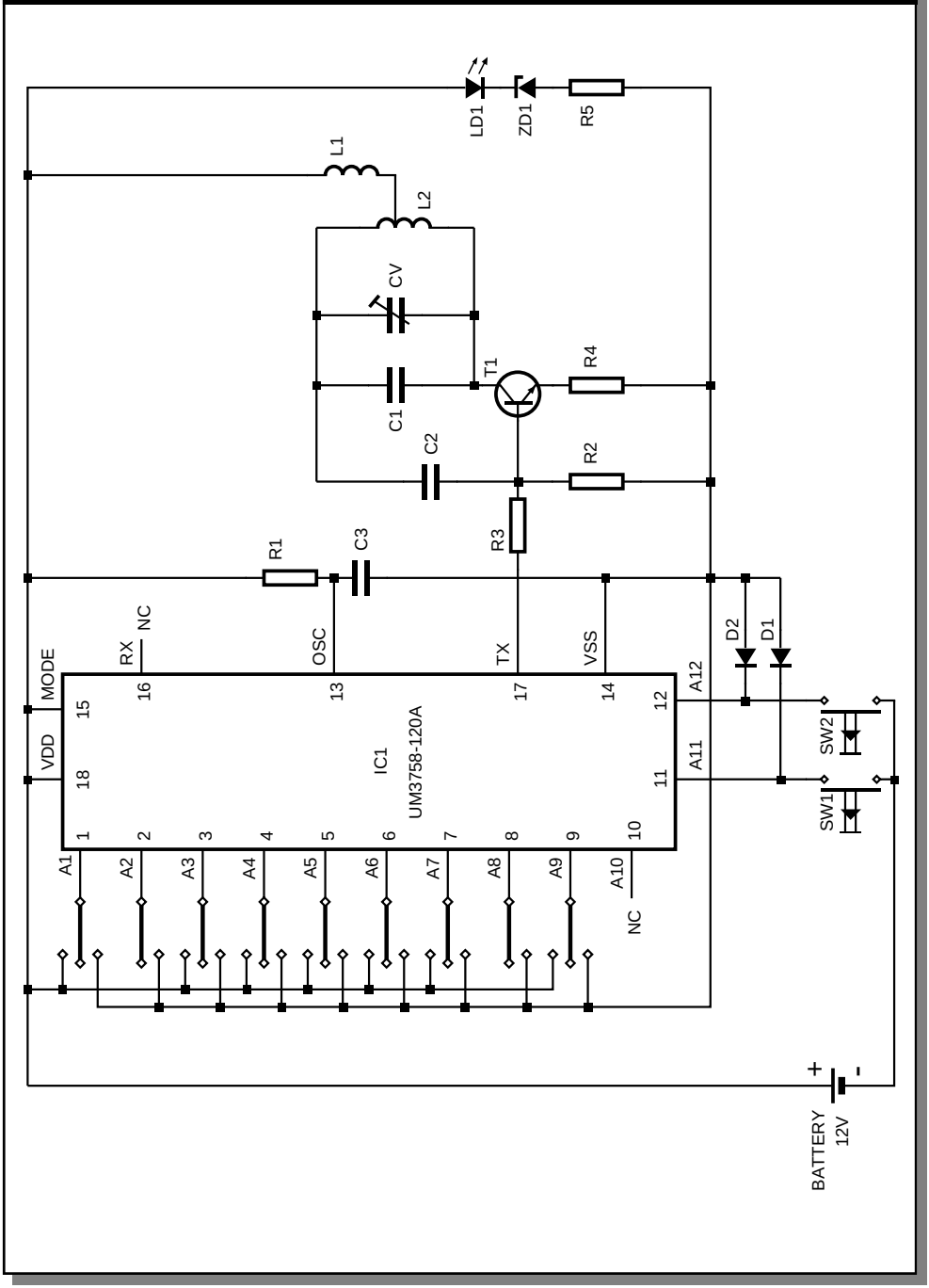
24. PCB P3511R



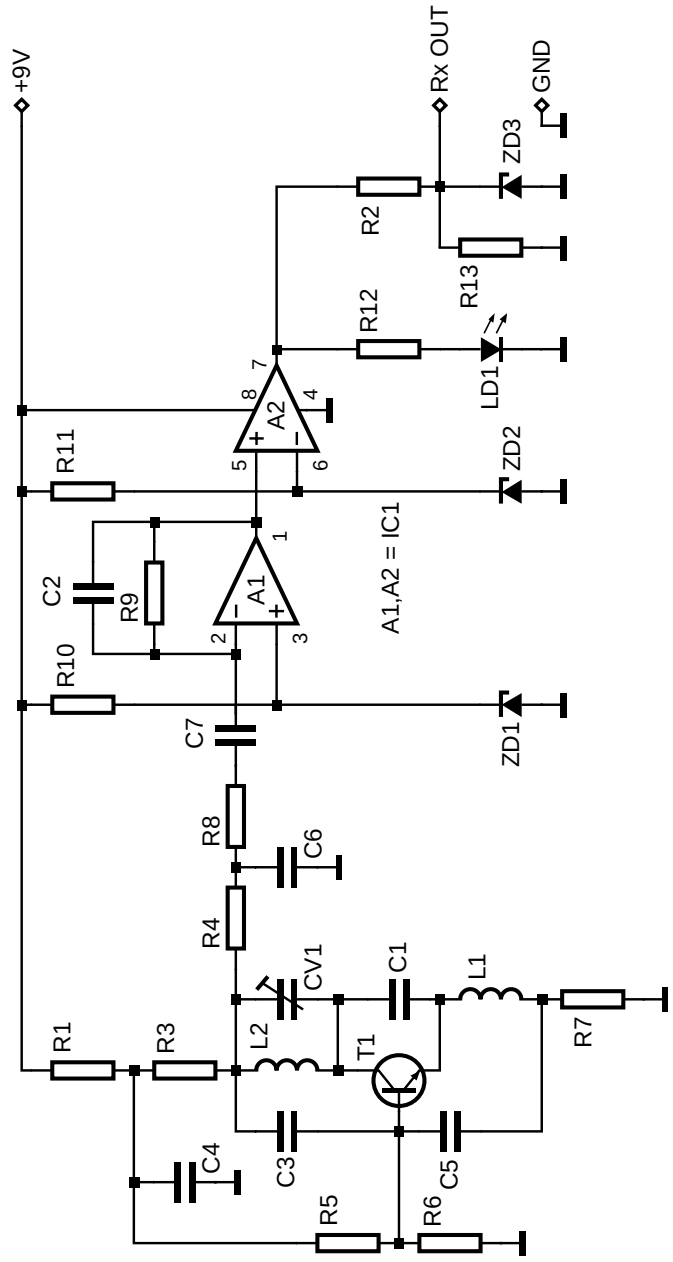
25. Main PCB P3511



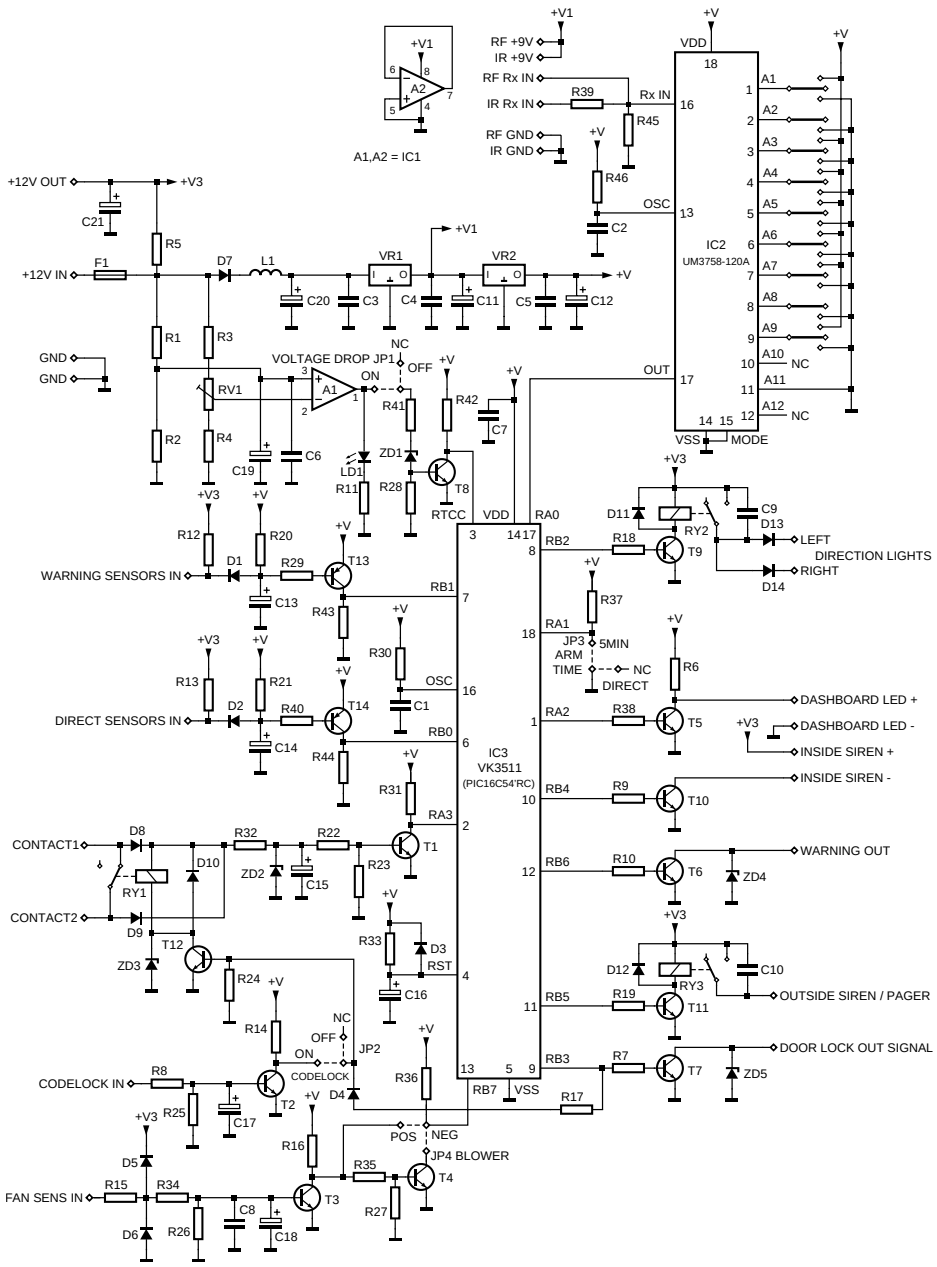
26. Diagram Remote Transmitter



27. Diagram Remote Receiver



28. Main diagram



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H3511IP - 2003 - ED2 (rev 3)