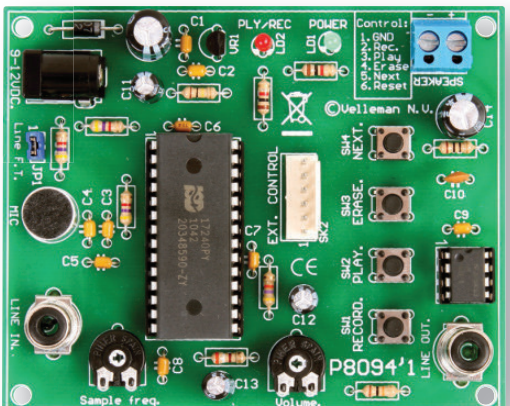
K8094

ILLUSTRATED ASSEMBLY MANUAL H8094IP'1

EXTENDED RECORD PLAYBACK KIT



Allows you to record and play messages of up to 8 minutes long.

The K8094 allows you to record and play messages of up to 8 minutes long.
Recording speed is continuously adjustable so that you can choose a perfect compromise between duration and sound quality. It also allows you to generate funny sound effects. Messages are retained in memory at power loss. The unit comes complete with microphone, line level in- and output and an output for a small speaker. Applications: Play messages in musea, stores, interactive installations, scale models, toys, as doorbell, gadget, etc…

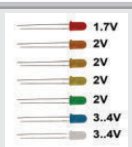
Features

- record duration:
  - o standard quality: 8 minutes
  - o high quality: 2 minutes 40s.
- built-in microphone
- line level in- and output
- pushbutton control (suited for open collector control)

Specifications

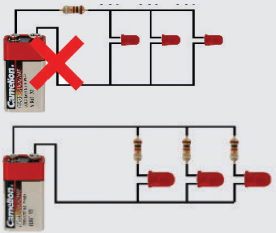
- power supply: 9...12VDC
- consumption:
  - o idle: <15mA
  - o playback: 100mA max.
- speaker output: 500mW (8 ohm - 10% THD)
- adjustable sample speed: 4...12KHz
- memory write up to: 100.000 recordings
- operating temp. range: 0..50°C / 32...122°F
- dimensions: 110x75x25mm / 4.33 x 2.95 x 0.98”

Leds and how to use them



Leds feature a specific voltage drop, depending on type and colour. Check the datasheet for exact voltage drop and rated current !

Never connect leds in parallel



How to Calculate the series resistor:

Example: operate a red led (1.7V) on a 9Vdc source.
Required led current for full brightness: 5mA (this can be found in the datasheet of the led)

Supply voltage (V) - led voltage (V) / required current (A) = series resistance (ohms)

→ 9V - 1.7V / 0.005A = 1460 ohm

closest value : use a 1k5 resistor

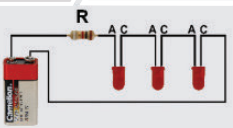
Required resistor power handling= voltage over resistor x current passed trough resistor

→ (9V - 1.7V) x 0.005A = 0.036W

a standard 1/4W resistor will do the job

LEDs in series:

Example: 3 x red led (1.7V) on 9V battery
Required led current for full brightness: 5mA
(this can be found in the datasheet of the led)



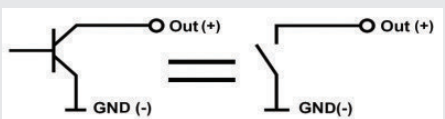
Supply voltage (V) - (number of leds x led voltage (V)) / required current (A) = series resistance (ohms)

→ 9V - (3 x1.7V) / 0.005A = 780 ohm

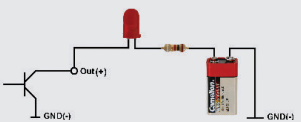
use an 820 ohm resistor

open collector outputs

An open collector output can be compared to a switch which switches to ground when operated



Example: How to switch an LED by means of an open collector output



assembly hints

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, the 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

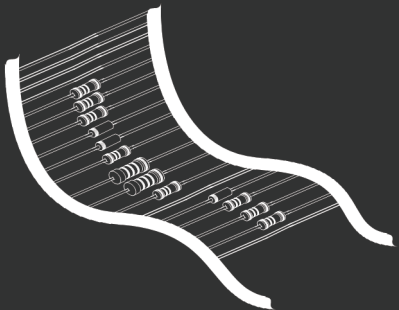
* Typographical inaccuracies excluded. Always look for possible last minute manual updates, indicated as 'NOTE' on a separate leaflet.

1.3 Soldering Hints :

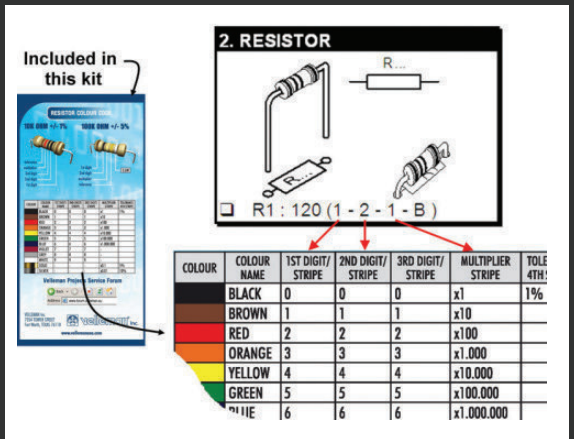
1. Mount the component against the PCB surface and carefully solder the leads

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

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

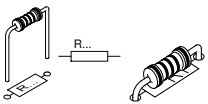


REMOVE THEM FROM THE TAPE ONE AT A TIME !



DO NOT BLINDLY FOLLOW THE ORDER OF THE COMPONENTS ONTO THE TAPE. ALWAYS CHECK THEIR VALUE ON THE PARTS LIST!

1 Resistors

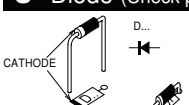


- ❑ R1 ... R3 : 4K7 (4 - 7 - 2 - B)
- ❑ R4, R5 : 1K (1 - 0 - 2 - B)
- ❑ R6 : 100K (1 - 0 - 4 - B)
- ❑ R7 : 47K (4 - 7 - 3 - B)
- ❑ R8 : 390 (3 - 9 - 1 - B)
- ❑ R9 : 10 (1 - 0 - 0 - B)
- ❑ R10 : 10K (1 - 0 - 3 - B)

2 Ceramic Capacitor

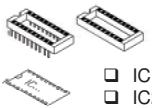
❑ C1 ... C9 : 100nF

3 Diode (Check polarity!)



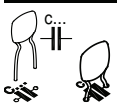
❑ D1: 1N4007

4 IC-socket



- ❑ IC1 : 28p
- ❑ IC2 : 8p

5 Ceramic Capacitor

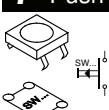


❑ C10 : 47nF

6 Trimmer

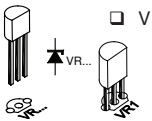
- ❑ RV1 : 100K (Sample Freq.)
- ❑ RV2 : 10K (volume)

7 Push buttons



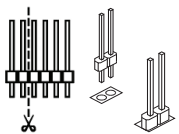
- ❑ SW1 : record
- ❑ SW2 : play
- ❑ SW3 : erase
- ❑ SW4 : next

8 Voltage regulator



❑ VR1 : UA78L05

9 Pin-header



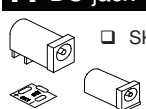
❑ JP1 : 2pins

10 Microphone

Watch the polarity!

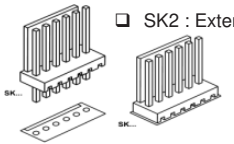
❑ MIC1 : M300

11 DC-jack



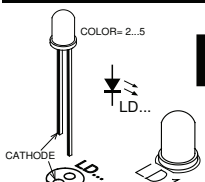
❑ SK1 : 9 ... 12VDC

12 Board-to-wire connector



- ❑ SK2 : External control

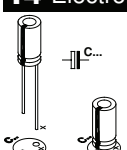
13 LEDs



Watch the polarity!

- ❑ LD1 : 3mm green (power)
- ❑ LD2 : 3mm red (play/record)

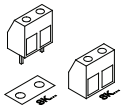
14 Electrolytic capacitors



- ❑ C11 ... C13 :4,7µF
- ❑ C14, C16 : 220µF

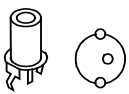
Watch the polarity!

15 Terminal block



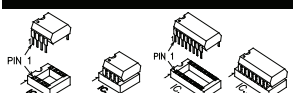
- ❑ SK5 : 2p (speaker)

16 Vertical cinch connector



- ❑ SK3 : Line in
- ❑ SK4 : Line out

17 IC's

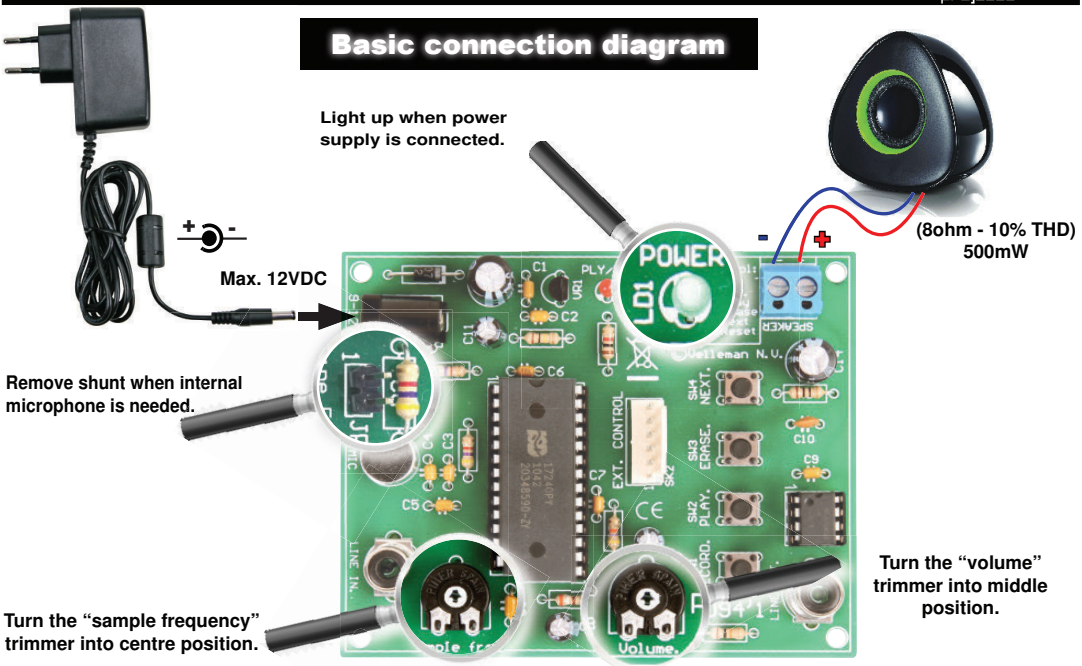


- ❑ IC1 : ISD17240PY (voice REC/playback chip)
- ❑ IC2 : LM386

Sampling Frequency

Turn RV1 left to decrease the sample rate and increase the total recording time, turn it fully clockwise to decrease the total recording time. The shorter the recording time the higher the quality of the played message.

Basic connection diagram



Extended possibilities

Record a message:

1. Keep button **SW1** pressed to record.
2. Release button **SW1** to end recording.

Repeat this procedure to record a next message.

Play latest recorded message:

Briefly press button **SW2** to play the latest recorded message.

Play all messages:

Keep button **SW2** pressed to play all message, releasing the button will end the play-function.

Play next message:

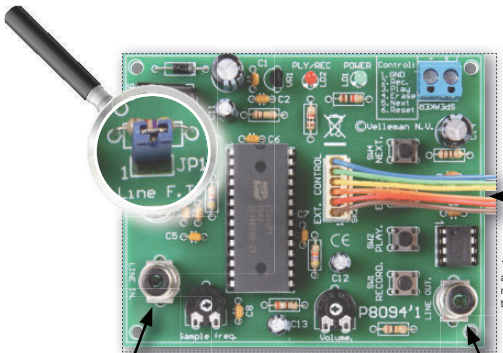
Each time you press the button **SW4** you move the memory pointer 1 recorded message further

Erase latest message:

Briefly press button **SW3** to erase latest recorded message. Led LD2 will flash 2x to confirm.

Erase all messages:

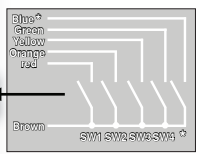
Keep button **SW3** pressed to erase all recorded messages. Led LD2 will flash 9x to confirm.



Line in (ex. CD-player)

When you use a “line in” input mount a jumper on JP1 to disable the internal microphone.

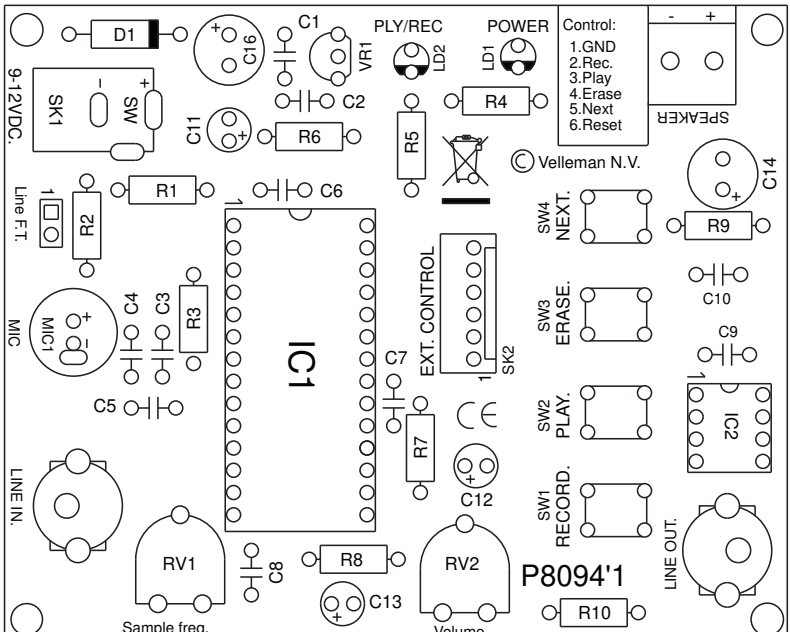
Optional: connect up to 5 external control buttons, relay contact or “open-collector” outputs

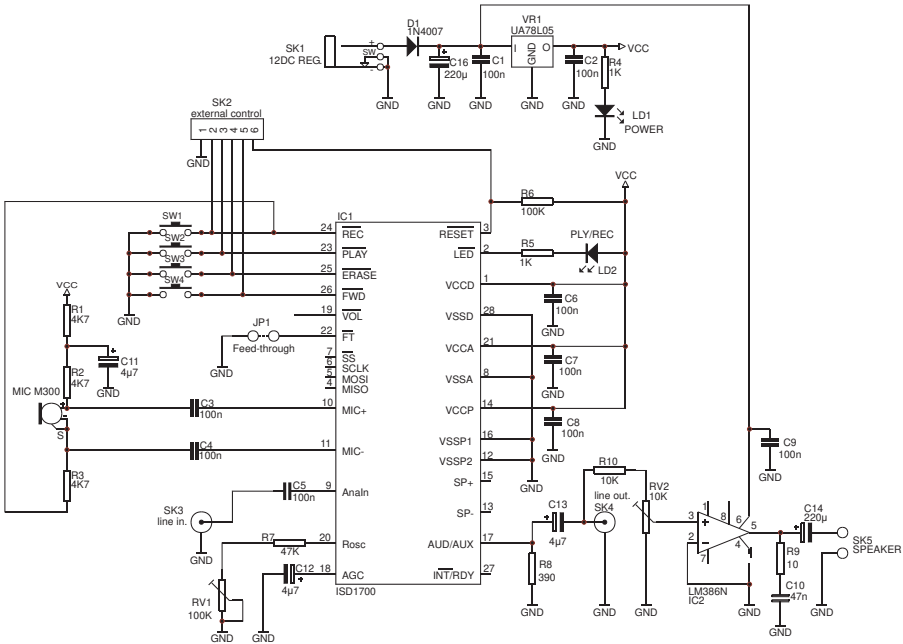


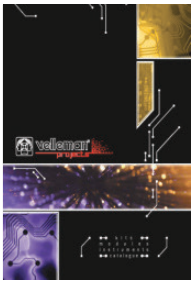
* Reset the position off the memory pointer and place it at the begin of the latest recorded message. when you then press the ‘play’- button the latest record message will be played.

Line out (ex. amplifier)

Use the “Line out” output if the internal amplifier is not be sufficient enough.


D1
C16
C1
VR1
PLY/REC
LD2
POWER
LD1
Control:
1.GND
2.Rec.
3.Play
4.Erase
5.Next
6.Reset
SPEAKER
9-12VDC.
SK1
SW
C11
C2
R6
R4
R5
© Velleman N.V.
C14
R9
R1
C6
Line F.T.
R2
SW4
NEXT.
C10
C9
MIC1
C4
C3
R3
MIC
IC1
EXT. CONTROL
SK2
SW3
ERASE.
C7
C5
IC2
SW2
PLAY.
R7
C12
LINE IN.
SW1
RECORD.
LINE OUT.
RV1
C8
R8
RV2
P8094'1
C13
R10
Sample freq.
Volume.


SK1
12DC REG.
D1
1N4007
VR1
UA78L05
VCC
C16
220µ
C1
100n
C2
100n
R4
1K
LD1
POWER
SK2
external control
SW1
SW2
SW3
SW4
IC1
REC
PLAY
ERASE
FWD
VOL
FT
SS
SCLK
MOSI
MISO
MIC+
MIC-
AnaIn
Rosc
AGC
ISD1700
RESET
LED
VCCD
VSSD
VCCA
VSSA
VCCP
VSSP1
VSSP2
SP+
SP-
AUD/AUX
INT/RDY
R6
100K
R5
1K
PLY/REC
LD2
C6
100n
C7
100n
C8
100n
C9
100n
R1
4K7
R2
4K7
R3
4K7
C11
4µ7
JP1
Feed-through
MIC M300
C3
100n
C4
100n
C5
100n
SK3
line in.
R7
47K
C12
4µ7
RV1
100K
R10
10K
line out.
SK4
RV2
10K
C13
4µ7
R8
390
LM386N
IC2
C14
220µ
SK5
SPEAKER
R9
10
C10
47n
GND



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