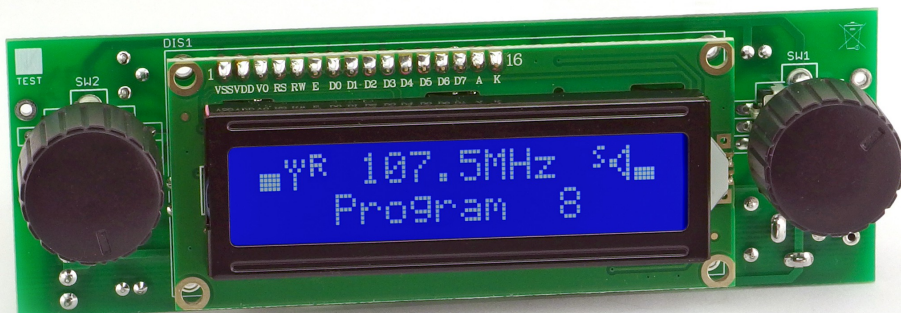




AVT 5540



ASSEMBLY DIFFICULTY

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The receiver unit has been made using popular and easy-to-assemble components, so its mounting will not be difficult even for beginners. Easy to use thanks to a user interface made up of an LCD display and two pulsers. The set has an additional 2×1 W amplifier.

## Features

- no tuning required
- works with a set of speakers
- reception of radio stations in the range 87.5-108 MHz
- reception and display of RDS information
- memory for 8 radio stations
- power supply: 7-15 VDC / 0.3A
- PCB size: 124×40 mm

## Circuit description

Schematic diagram of the radio is shown in Figure 1. Its structure can be divided into several blocks: power supply (IC1, IC2), radio (IC6, IC7), audio power amplifier (IC3) and control and user interface block (IC4, IC5, SW1, SW2). The power block provides two stabilised voltages: +5 V to power the audio power amplifier and display, and +3.3 V for the radio module and control microcontroller. The RDA5807 chip has a built-in low-power audio amplifier that allows direct driving of headphones, for example. In order not to overload the output of such a delicate circuit and for more power, an additional audio power amplifier is used in the presented unit. This is a typical application of the TDA2822 chip, which allows an output power of several hundred milliwatts. The signal output is available on the X2 connector, allowing 4-8 Ω

speakers to be connected to the radio without any problems. The RDA5807 chip communicates with the microcontroller via an I<sup>2</sup>C interface and its operation is controlled by 16 16-bit registers.

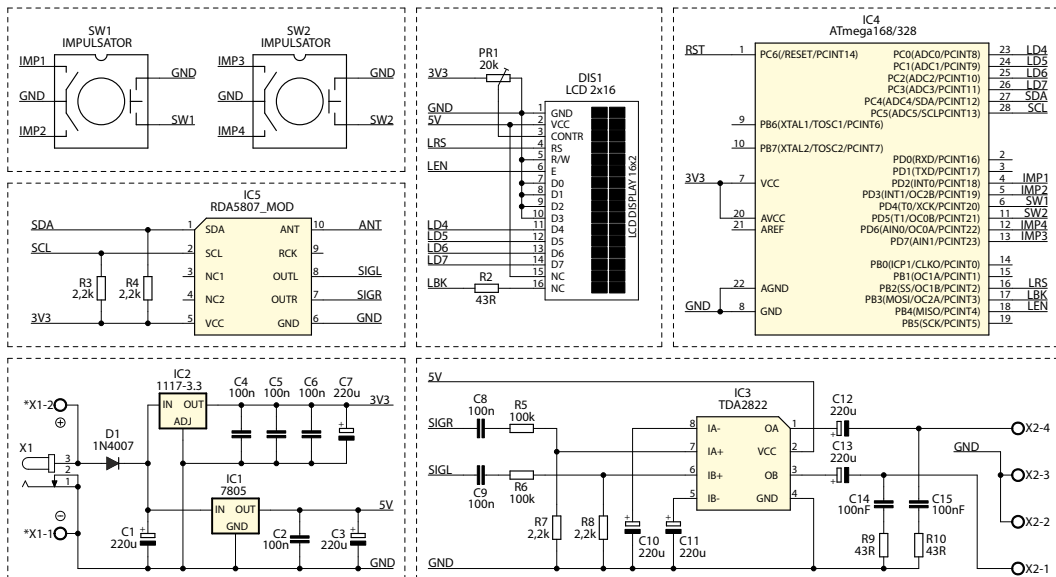


Fig. 1. Schematic diagram of FM radio with RDS

## Mounting and start-up

Begin mounting in accordance with the general rules, starting with the smallest components and finishing with the largest. The radio module is already soldered to the board. Mount the display and pulsers on the soldering side. Once assembled, the radio only

requires setting of the display contrast via potentiometer PR1. After that, it is ready for use.

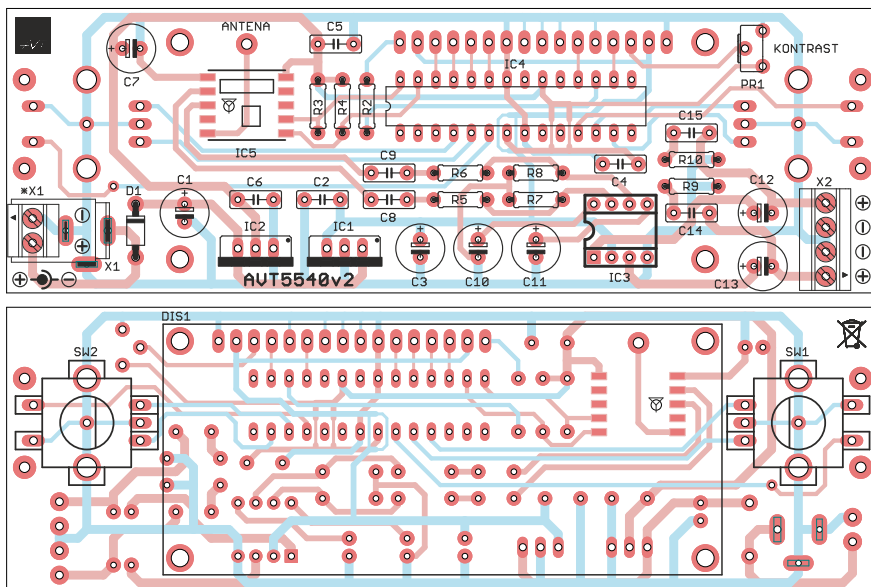


Fig. 2. Mounting diagram of FM radio with RDS

# Operation

The display shows basic information. The bar displayed on the left illustrates the power level of the received radio signal. Central part of the display

shows information about the currently set radio frequency, and on the right - also in the form of a bar - the audio signal level is shown (Figure 3).

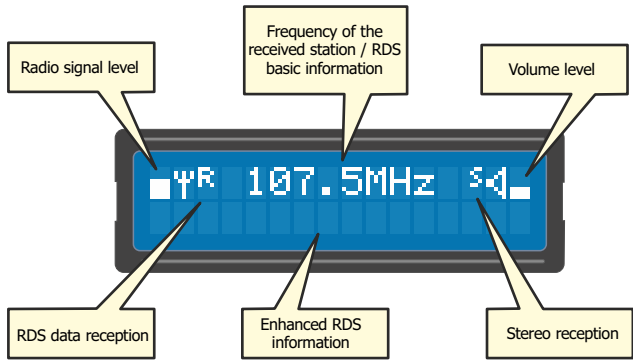


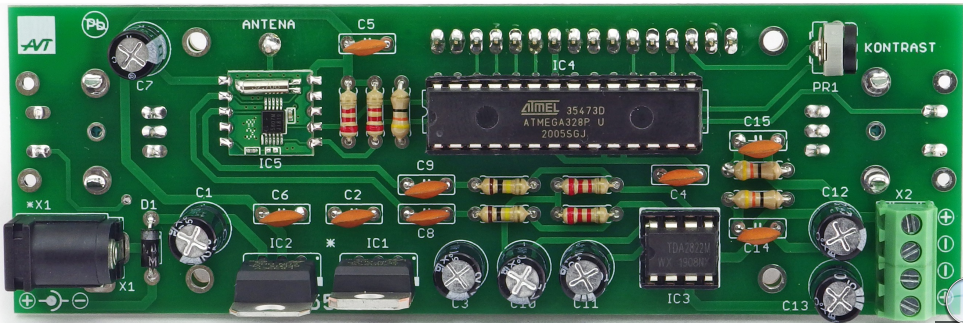
Fig. 3. Information shown on the display

After a few seconds of inactivity, if RDS data reception is possible, the indication of the received frequency is "covered" by the basic RDS information and the bottom line of the display shows enhanced RDS information. The basic information contains only 8 characters. Usually you will see the name of the station there, alternating with the name of the current programme or performer. Extended information can contain up to 64 characters. Its text scrolls across the bottom line of the display to show the entire message. To operate the radio uses two pulsers. The one on the left is used to set the

received frequency, while the one on the right allows you to adjust the volume. In addition, pressing the left pulsator allows the current frequency to be stored in one of the 8 designated memory locations. After selecting the station number, confirm the action by pressing the pulser again (Figure 4). In addition, the device remembers the last saved stations and the volume set, and every time the power is switched on, it runs that station at that volume. Pressing the right pulser switches reception to the next stored station.



Fig. 3. Information shown on the display



# List of components

## Resistors

PR1: .....potentiometer 5-20 kΩ  
R2, R9, R10: .....43 Ω  
R3, R4, R7, R8: .....2,2 kΩ  
R5, R6: .....100 kΩ

## Capacitors:

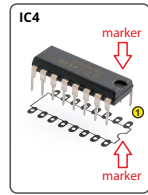
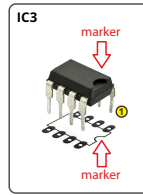
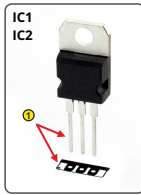
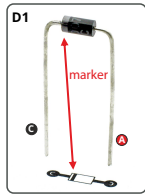
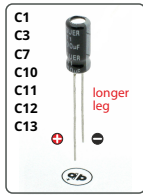
C1, C3, C7, C10-C13: .....220 uF !  
C2, C4, C5, C6, C8, C9: .....100 nF  
C14, C15: .....100 nF

## Semiconductors:

D1: .....1N4007 !  
SW1, SW2: .....pulsar with push button  
IC1: .....7805 !  
IC2: .....LM1117-3.3 !  
IC3: .....TDA2822 !  
IC4: .....ATmega168 lub 328 !

## Other:

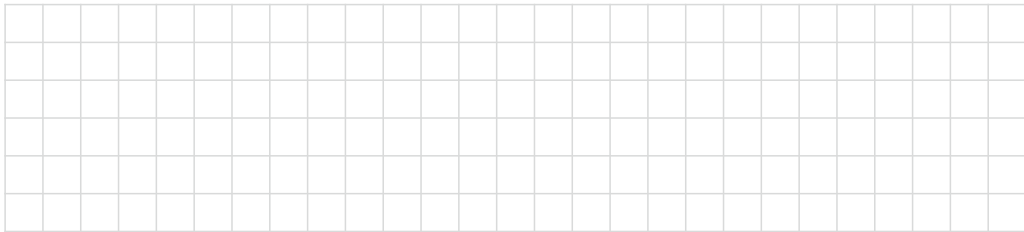
IC5: .....LCD 2×16  
IC6: .....module with RDA5807 chip  
X1: .....GN DC 2.1/5.5 for printing  
X2: .....DG381-3.5/



Start mounting from soldering the components onto the board in order of size from smallest to largest. When mounting components marked with an exclamation mark, pay attention to their polarity. Wiring diagrams and symbols of the components on the PCB and photographs of the assembled kit may be helpful.

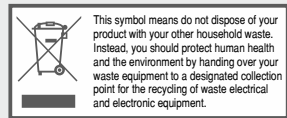


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