*Pulse detectors have a number of advantages over of detectors operating at different way. These can be primarily include large reach virtually the same in the air and on the ground, very good sensitivity and complete insensitivity to mineralization of soil amendment. The disadvantage is the lack of distinguish between ferromagnetic metals and diamagnetic. Recommendations: excellent project to be carried out on vacation. It is able to integrate the whole family around treasure hunt.*

Schematic diagram of the detector is shown in Figure 1 The detector works the principle of electromagnetic pulse emission into the ground. The presence of the object metal in close proximity, due to the coil inductance change detector, causes distortion of the voltage on the coil. The signal from the coil is subjected to a strengthening and after excision of the of the desired It is part of re-amplified and integrated over. Yes trimmed controls VCO generator whose output signal is heard the speaker or headphones. The detector consists of a few basic blocks. Description of the action we start the production and stabilization voltages. Used its unique way of powering the Analog: mass combined with the positive voltage detector. Because obtain a positive voltage analog part involves the use booster converter connection, which was carried out in the described arrangement using IC5 (NE555). The converter is not taken too high current, so it works in the configuration charge pump. In the first cycle after-through the diode D4 is loaded capacitor C15 to the power supply voltage, and then (second cycle) energy stored in it, through the diode D2 is transferred the capacitor C18. This causes the loading capacitor C18 to the voltage almost equal to twice the supply voltage detector. "Almost" because it is less the voltage drop on the diodes D2, D4. System of diodes D3, D5 and capacitor C19 the same effect as described previously the only difference is that the input voltage is equal to the voltage across the capacitor C18. All duplicates the voltage converter nearly three times the power of the detector.

Operational amplifiers are powered by voltage symmetrically at ± 5 V. The the stabilization of the weight of the analog responsible IC7 and IC8 stabilizers.

Capacitors C4, C14, C24, C16, C19, C20 and C25 filter the supply voltage. Course rectangular coil power generated The second system is the NE555 (IC4). Frequency determine signal components C2, R1, PR2. It should be equal to about 100 Hz, a negative pulse at the output of IC4 should have a length of about 150 ms.

The signal from the output of IC4 via resistor R4 controls the transistor T2 which turns it it in phase. Then, through a resistor R6 controls coil power transistor T1 L1 probe. Resistor R8 is designed to limit voltage self-induction coil L1. Signal of the probe, through a resistor R9 and a capacitor C9, goes to the inverting input amplifier operating IC1. Zener diode D1 prevents This input surges.

To enable the sampling of reinforced signal from the coil when the passes through zero, the applied two generators built monostable the NAND contained in the system IC2 (CD4011). Both generators are connected cascade. The first one, built the gates IC2a and IC2B, generates a pulse with a length of 60 ms and triggers the second, built the goals and IC2E IC2d and generating pulse length of 85 ms. Construction of the two generators monostable, truncate components R and C are identical, so the following describes the principle of operation of only the first.

At the time of the initial capacitor C5 is discharged. Falling edge of the voltage the collector of transistor T2 causes immediate a change in the starting gate IC2a a logical "0" to "1". so far discharged capacitor C5 starts charging by a resistor R11. The charging current capacitor C5 forces the inputs IC2B goal is high, which results in a change the output of the low, and thus maintaining the low state of the inputs IC2a goal until the capacitor charge C5. Falling edge of the output first flip-flop triggers a second flip-flop. A positive pulse from the output of the second flip-flop is designed to opening of the transistor T5 and transfer the via R17 and C10 viewable signal at the inverting input amplifierintegrating IC3.

On the non-inverting input of the amplifier DC voltage is applied adjustable regulated using potentiometers rough and fine tune the detector. As a result of sum of these two voltages, the output receive a signal amplifier IC3 The ramp of adjustable DC component, the value of which indicates the presence of additional metal objects within coil L1. The output from the amplifier integrating IC3 is fed through further Transistor T3 generator voltage controlled (VCO), realized based IC6. Negative pulses output 3 IC6 by the voltage follower transistor T4 SP1 speaker supply. Additionally is the ability to adjust the volume using the P3 potentiometer allows adjustment Input voltage follower.

Installation and commissioning detector

Assembly is shown in Scheme Figure 2 Running start detector the validation of the power supply. For this purpose, the plate wlutowujemy only systems IC5, IC7, IC8, Capacitors C4, C14, C24, C18, C19, C20, C25, C16, C21, C22 and resistors R31 and R30. Then turn on the power detector and verify the presence of voltage ± 5 V on legs 7 and 4 circuits IC1 and IC3. Measurement we supply plus the detector.  
 After finding the correct values tensions mount components signal generator coil (IC4, T1, T2, C1, C2, R1, R4, R5, R6, R7, R8 and potentiometer assembly PR2). Connect the probe to the points marked on the PCB as "COIL1, COIL2 "and turn on the power - we should hear the quiet hum of the probe. If you have frequency meter or oscilloscope, is set to leg 3 of the 100 .. IC4 frequency of 110 Hz. After this PCB mount other elements.  
 For points marked on the board as P3.1, P3.2, P3.3 using a piece of three-strand ribbons connect the potentiometer adjustment volume, and the points P1.1, P1.2, P1.3 tuning potentiometers. The next activity will be the maximum twisting slide the volume control toward the exit IC6 system. Detector probe is placed so as to be spaced apart from any metal objects at a distance of at 1 m or more potentiometers Set coarse and fine tuning panel the detector to the center position and turning gently mounting potentiometer PR1. Set the frequency of the knock Speaker about 0.5 ... 2 Hz.  
 After this, check the response detector to approach subjects the metal coil. properly executed detector clearly indicates the presence of NOSC cans of paste into the shoes of the distance  
about 0.4 ... 0.5 m  
 To best use the power detector gel battery voltage of 12 V. Due to the considerable power consumption detector (about 100 mA), to apply the battery with a capacity of at least 1 VAh. The final tests of the detector should be carried out on rural roads. Due to the high sensitivity it is more susceptible interference and in areas where there are strong electromagnetic fields lose for stability. In order to improve the stability of You can try to use the detector elements with better than standard tolerances. This applies in particular all the resistors in the circuit analog. Amplifier LF357, and mA741 may be replaced others, individual amplifiers operating with better parameters. Experiments in this leave the imagination  
Readers.