

**WHAT'S IN THIS GUIDE?**

Through the 40 projects proposed in this guide, you will learn the basics of electronics and basic concepts like voltage, current, resistance or magnetism.

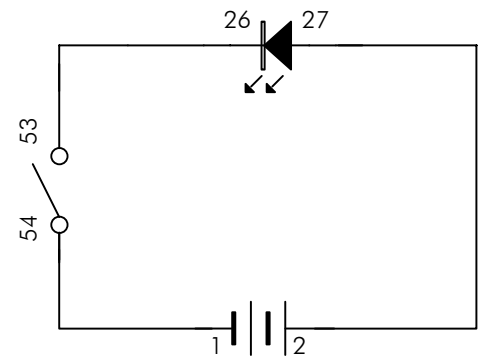
The projects start from the most basic level so that the difficulty and knowledge to be applied increase proportionally.

**PROJECTS****PROJECT**

Wiring Sequence  
2-27, 26-53, 54-1

**EN** SIMPLE CIRCUIT WITH LED

Look at the circuit on the right and look for the symbols in the table of electrical symbols. When you have them, find them in the laboratory and connect them. You can help with the connection sequence given above (see above). When the switch is turned on, the LED will light and when it is turned off, the LED will also turn off. You can try other LEDs in the lab. Just connect it following the same polarity. Do not exchange polarity or the LED will not turn on.

**1**

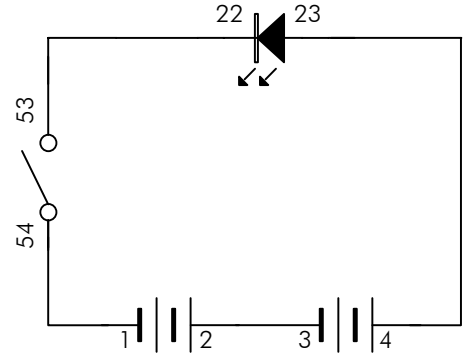
# PROJECT

Wiring Sequence  
2-3, 4-23, 22-53, 54-1

# 2

## EN CIRCUIT WITH MULTICOLOR LED AND DOUBLE POWER SUPPLY

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and plug them in. You can help with the connection sequence given (see above). When the switch is on, the multicolored LED will light up, while turning off the switch will also turn the LED off. For this project, double power (6v) was used, for which the two power supplies were used, through a serial connection. Attention! Use only dual power directly to the multi-color LED. Do not connect this dual power supply directly to other LEDs as they may be damaged.



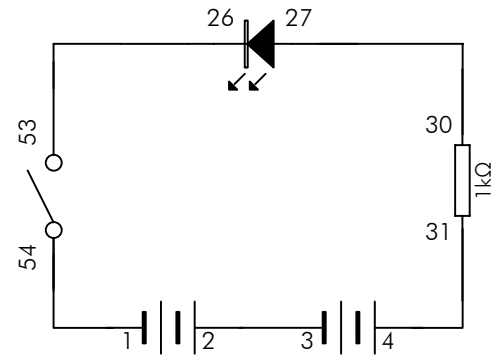
# PROJECT

Wiring Sequence  
2-27, 26-53, 54-1

# 3

## EN USE OF DUAL POWER SUPPLY WITH STANDARD LED

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and plug them in. You can help with the connection sequence given above (see above). When the switch is on, the multicolored LED will light while turning off the power switch will also turn off the LED. In order to be able to use dual power in this design, a 1000Ω (1KΩ) resistor was placed through a series connection. Attention! Use only dual power directly to the multi-color LED. For the rest of the LEDs, if you use dual power, you should put a resistance between the power and the LED. Otherwise, the LED may be damaged.



# PROJECT

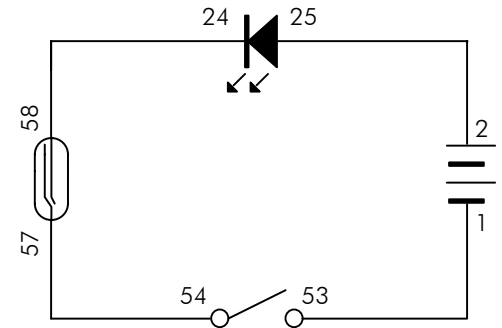
Wiring Sequence

2-25, 24-58, 57-54, 53-1

# 4

## EN USING THE FLAP SWITCH

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Then switch on the main switch. If you place the flap switch on the magnet, the LED will light and the circuit will be connected. When the magnet is moved out of the guide switch, the circuit is turned off and therefore the LED is off.



# PROJECT

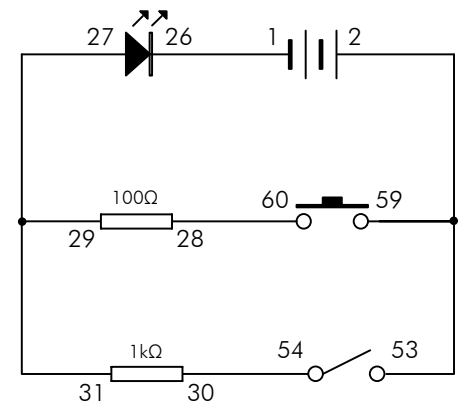
Wiring Sequence

2-59-53, 54-30, 60-28, 29-31-27, 26-1

# 5

## EN APPLICATION OF RESISTANCE AND CURRENT CONCEPTS

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). When the switch is on, the LED will decrease. Now, if you turn off the switch and press the button, the LED will brighten. This is because the wiring of the switch has a greater resistance ( $1000\Omega$ ) to the current flowing through the circuit, so that the current arriving at the LED in this way is smaller and, as a result, the illumination is of lesser intensity. On the other hand, the wiring of the button has less resistance ( $100\Omega$ ), so it arrives more current to the LED and this one lights up more.



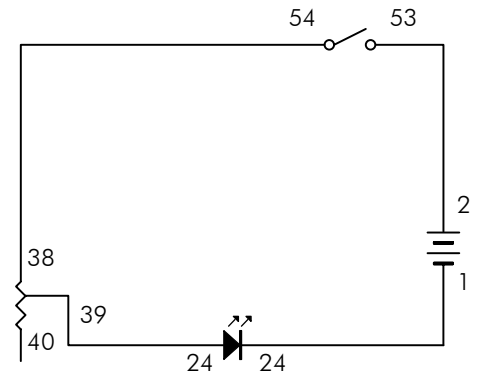
# PROJECT

Wiring Sequence  
2-53, 54-38, 39-25, 24-1

# 6

## EN DEMONSTRATION OF A VARIABLE RESISTANCE

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn the switch. As you adjust the variable resistance, the resistance of the circuit will change. Higher the resistance is, t lower the current. Based on this principle, we determine that the amount of current flowing through the circuit can be adjusted. Consequently, it is possible to adjust the brightness of the LED by applying the same technique.



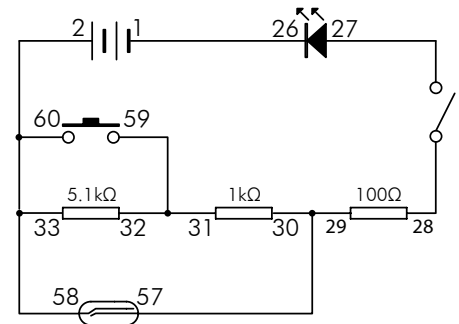
# PROJECT

Wiring Sequence  
2-33-58-60, 59-32-31, 30-57-29, 28-54. 53-27, 26-1

# 7

## EN SERIAL RESISTANCE CONNECTION

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turns on the switch, the current goes through the three resistors so that the LED dims or does not light up. Now press the button so that the current jumps to the first resistor so that the LED starts to glow. Finally, apply a magnetic field to the guide switch (release the button above) so that the current ignores the first two resistors. Now the LED will glow to the max. As an analogy, a resistance in a circuit becomes like an obstacle in a tube. The more obstacles there are and the greater they are, less water they pass through.



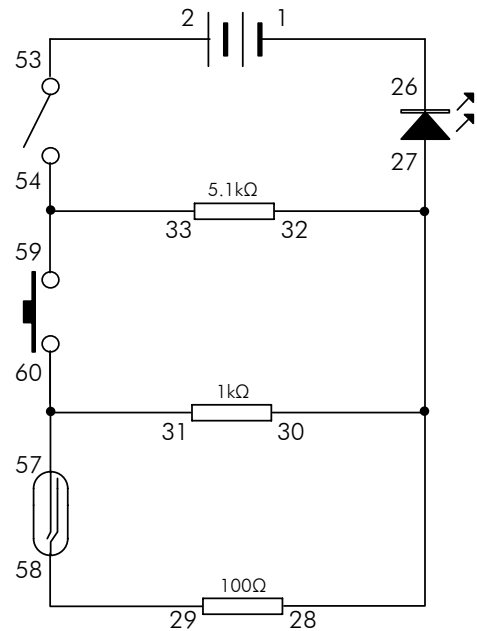
# PROJECT

Wiring Sequence

2-53, 54-33-59, 60-31-57, 58-29, 28-30-32-27, 26-1

## EN CONNECTION OF PARALLEL RESISTANCE

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Activates the switch so that the current goes through the first resistor and illuminates the LED weakly. Now, without turning off the switch, press the button so that the current goes through the second resistor by turning the LED on. Without releasing the button, apply a magnetic field to the guide switch. The last path is also available. In this way, there are three possible routes for the current to flow, so that the LED shines at the maximum. Although there are three resistors, as in the previous project, the connection is in parallel. Therefore, the behavior of the current causes a different result.



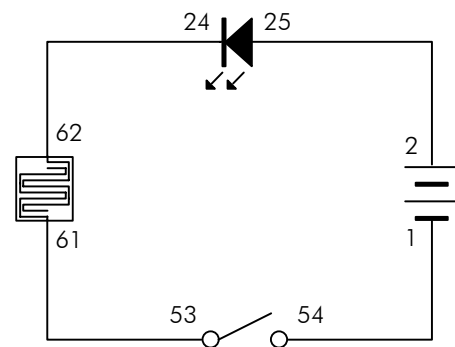
# PROJECT

Wiring Sequence

2-25, 24-62, 61-53, 54-1

## EN TOUCH PLATE FUNCTION

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). If you press the switch, the LED does not turn on because the current can not pass through the touch panel. Now moisten your finger and touch the touch pad: the LED lights up poorly because the water has a great resistance and lets little current flow through. Instead, try making a saline solution (for this, with the help of an adult, mix water and salt and stir until the salt dissolves). Then soak your finger with this solution and touch the touch pad. The LED will brighten brighter because salt water is better conductive and allows more current to flow.



# PROJECT

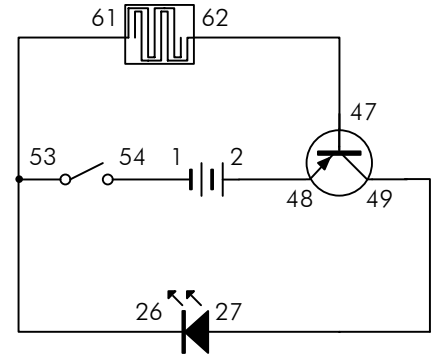
Wiring Sequence

2-48, 47-62, 61-53-26, 49-27, 54-1

# 10

## EN OPERATION OF A PNP TRANSISTOR

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and plug them in. You can help with the connection sequence given above (see above). Operate the switch and touch the touch plate, so that a small amount of current passes through the touch pad (see design 7) and the LED lights up vividly. What happened? In a PNP transistor, current flows from the Transmitter to the Collector through a gateway, but for this, the current must first flow between the Transmitter and the Base. When you turn on the switch, the current will not flow because there is an interruption between the Transmitter and the Base. When you touch the touch pad, the circuit is closed and a small current flows through the Transmitter to the Base, activating the gateway between the Transmitter and the Collector, allowing the current to circulate freely. When this current crosses the LED, it is lit intensely.



# PROJECT

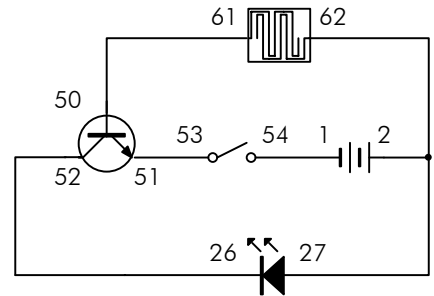
Wiring Sequence

2-27-62, 61-50, 51-53, 52-26, 54-1

# 11

## EN FUNCTIONING OF AN NPN TRANSISTOR

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and plug them in. You can help with the connection sequence given above (see above). Turn on the switch and touch the touch pad so that a small amount of current passes through the touch pad (see design 7) the LED lights up vividly. The operation is actually the same as in the PNP transistor design (see project 9), but the difference is that the polarity is reversed. This type of transistor is the most commonly used at the moment.



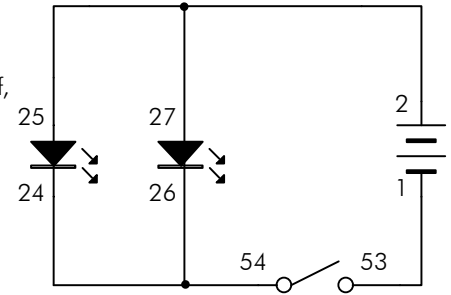
# PROJECT

Wiring Sequence

2-27-25, 26-24-54, 53-1

## EN CONNECTING TWO LED PARALLEL STANDARDS

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). When you turn on the switch, both LEDs will light at the same time and when you turn the switch off, the LEDs will turn off simultaneously.



# 12

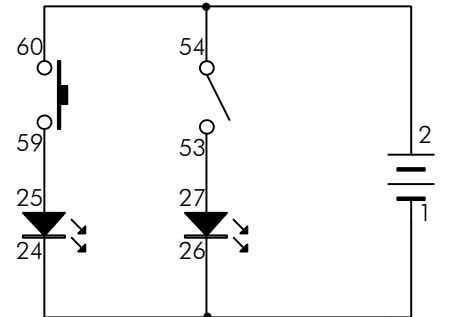
# PROJECT

Wiring Sequence

2-54-60, 59-25, 53-27, 26-24-1

## EN CONNECTION OF TWO PARALLEL LEDS WITH INDEPENDENT SWITCHES

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and plug them in. You can help with the connection sequence given above (see above). In this project you can learn how to assemble a circuit with independent control for each LED. It's kind of the electrical circuit of the different rooms that a house owns.



# 13

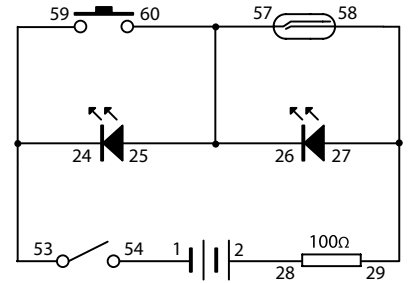
# PROJECT

Wiring Sequence

2-28, 29-27-58, 57-60-26-25, 24-59-53, 54-1

## EN CONNECTION OF TWO 3V LEDS IN THE SERIE

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and plug them in. You can help with the connection sequence given above (see above). Turn on the main switch and note that no LED lights up. This is because the 3V of the power supply is not enough to connect the two LEDs connected in series. Now, turn on the guide switch using a magnet: the 3V power supply does not go through the yellow LED, but the blue LED lights up. If, in addition to the guide switch, you activate the button, the 3V will skip the blue diode directly to yellow, so it will be the last one to light.



# 14

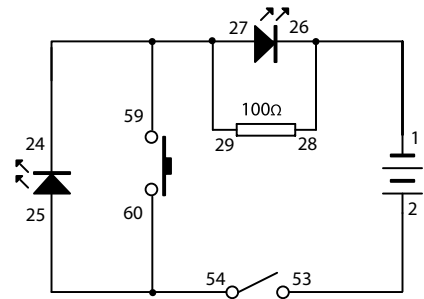
# PROJECT

Wiring Sequence

2-53, 54-60-25, 24-59-29-27, 26-28-1

## EN BASIC LED CIRCUIT OPERATION

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and plug them in. You can help with the connection sequence given above (see above). Turn on the main switch and check that the blue LED light comes on but the yellow does not. When the button is pressed, the yellow LED will light and the blue LED will turn off.



# 15



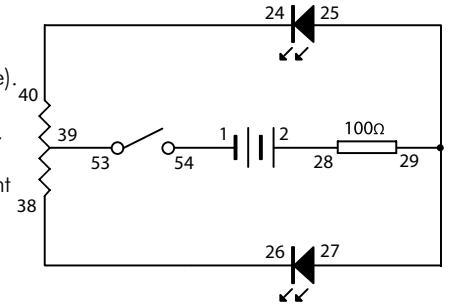
# PROJECT

Wiring Sequence

2-28, 29-27-25, 24-40, 26-38, 39-53, 54-1

## EN DIRECTION CHANGE INDICATOR 1

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch and turn the variable resistance clockwise to maximum. The blue LED light will come on and the yellow LED will turn off. Then rotate the resistance variable counterclockwise until it stops. This time, the yellow LED will light and the blue LED will turn off. This principle can be used to indicate a change of direction. For example, if it is a steering wheel, turning it in different directions will cause different LEDs to light up.



# 16

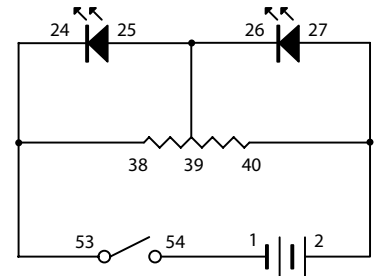
# PROJECT

Wiring Sequence

2-40-27, 26-25-39, 38-24-53, 54-1

## EN DIRECTION CHANGE INDICATOR 2

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and plug them in. You can help with the connection sequence given above (see above). Turn on the main switch and turn the variable resistance clockwise to the stop. The blue LED light will come on and the yellow LED will turn off. Then rotate the resistance variable counterclockwise until it stops. This time, the yellow LED will light and the blue LED will turn off. This principle can be used to indicate a change of direction. For example, if it is a steering wheel, turning it in different directions will cause different LEDs to light up. As you can see, this experiment has pretty much the same effect as the previous one, but it is based on a different circuit connection logic.



# 17

# PROJECT

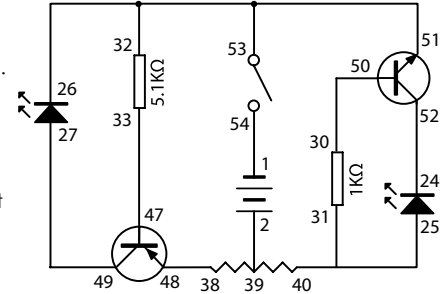
Wiring Sequence

2-39, 40-31-25, 24-52, 30-50, 51-53-32-26, 27-49, 47-33, 48-38, 54-1

# 18

## EN DIRECTION CHANGE INDICATOR 3

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch and turn the variable resistance clockwise to the stop. The blue LED light will come on and the yellow light will turn off. Then rotate the resistance variable counterclockwise until it stops. This time, the yellow LED will light and the blue LED will turn off. This principle can be used to indicate a change of direction. For example, if it is a steering wheel, turning it in different directions will cause different LEDs to light up. As you can see, this experiment has the same effect as the previous one, but is based on a different circuit connection logic.



# PROJECT

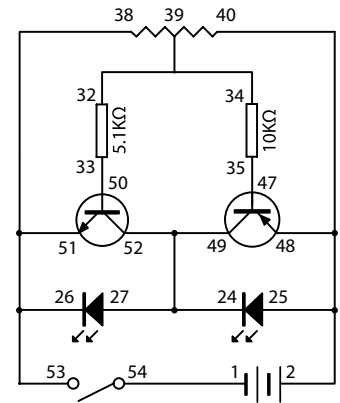
Wiring Sequence

2-25-40-48, 49-24-27-52, 47-35, 50-33, 32-34-39, 38-51-26-53, 54-1

# 19

## EN DIRECTION CHANGE INDICATOR 4

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch and turn the variable resistance clockwise to the stop. The blue LED light will come on and the yellow LED will turn off. Then rotate the resistance variable counterclockwise until it stops. This time, the yellow LED will light and the blue LED will turn off. This principle can be used to indicate a change of direction. For example, if it is a steering wheel, turning it in different directions will cause different LEDs to light up. As you can see, this experiment has the same effect as the previous one, but is based on a different circuit connection logic.



# PROJECT

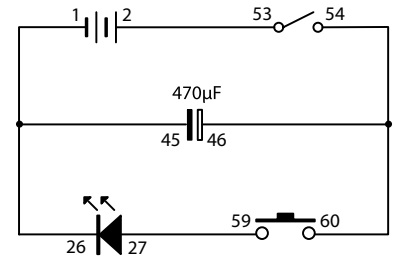
Wiring Sequence

2-53, 54-46-60, 59-27, 26-45-1

# 20

## EN CONDENSER OPERATION DEMONSTRATION

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch. It looks like nothing happens, but the capacitor will be charging. After 1 or 2 seconds, turn off the main switch. The capacitor is now charged and stores a small amount of electricity. Press the button so that the electricity stored in the capacitor is released and the LED lights up briefly.



# PROJECT

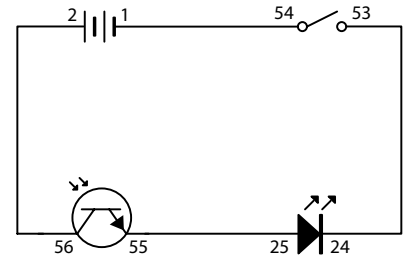
Wiring Sequence

2-56, 55-25, 24-53, 54-1

# 21

## EN SIMPLE DEMONSTRATION OF LIGHT SENSOR

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch. You will find that the LED lights are dimly lit, indicating that only a small amount of current is flowing through them. This depends on the intensity of light detected by the light sensor. If you perform this experiment in a dark place, the LED light may not even turn on. If you light the sensor directly with a flashlight, the LED light will begin to glow. Therefore, the more light there is, the more current can pass through the light sensor and the greater the light intensity the LED will reach.



# PROJECT

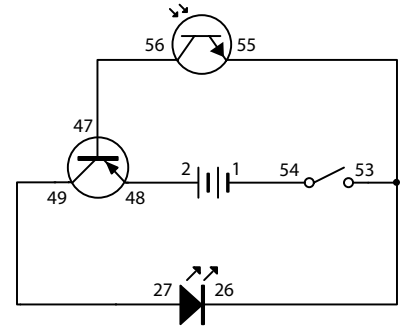
# 22

Wiring Sequence

2-48, 49-27, 26-53-55, 56-47, 54-1

## EN PRACTICAL EXAMPLE: LED ACTIVATED BY LIGHT

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch. This time, however weak the light detected by the light sensor, the LED light will begin to glow. This is because, in this circuit, the PNP transistor is the true LED port while the light sensor simply serves as a switch to open the circuit port. When the top of the circuit is not connected, no current flows from the “emitter” to the “base” of the transistor, since the gate between the “emitter” and the current accumulator is closed. When the sensor detects light, the upper part of the circuit is connected and a small amount of current flows from the “emitter” to the “base” of the transistor, making the gate between the “emitter” and the current accumulator open in this way, the electric current can flow from the battery through the transistor to the LED, so that the LED light comes on. This circuit allows you to convert the light sensor into a switch that reacts to light.



# PROJECT

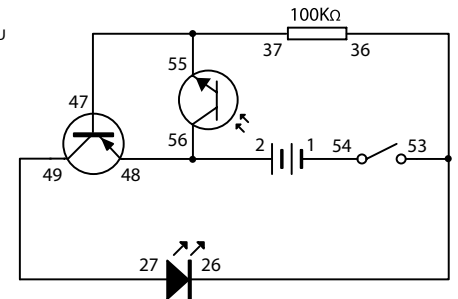
# 23

Wiring Sequence

2-56-48, 49-27, 26-53-36, 37-55-47, 54-1

## EN PRACTICAL EXAMPLE: LED ACTIVATED BY DARKNESS

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you find them, look for them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch. This time, if you are in a bright spot, the LED light does not turn on. If you go to a place in the dark or simply touch the sensor, the LED light will come on. Now the LED light is on with the darkness instead of the light.



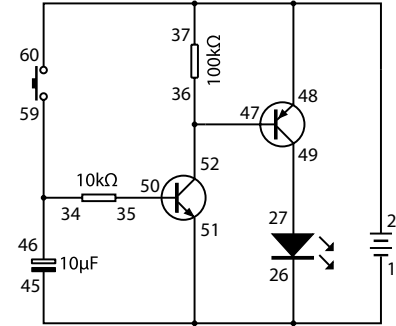
# PROJECT

Wiring Sequence

2-53, 54-48-37-60, 36-47-52, 35-50, 49-27, 59-34-46, 45-51-26-1

## EN LED WITH DELAYED OFF

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch. When you press the button, the LED light will come on. When you release the button, the LED light will gradually come out.



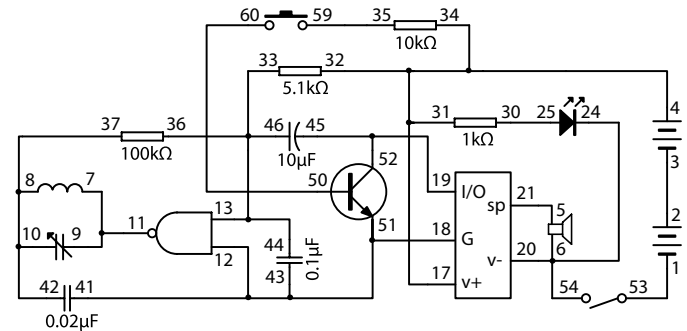
# PROJECT

Wiring Sequence

2-3, 4-34-32-31-17, 35-59, 60-50, 33-36-46-13-44, 19-45-52, 18-51-43-12-41, 37-8-10-42, 7-9-11, 30-25, 21-5, 24-6-20-54, 53-1

## EN AMR RADIO RECEIVER WITH SILENCE FUNCTION

Look at the circuit on the right. Look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch and the LED light will come on. Set the variable capacitor to the correct position so the circuit can receive AM radio signals. When you press the button, the radio will be muted. As the AM radio waves are sensitive to the signal direction, when the radio signal is weak, try moving the radio in a different direction. Note: If you can not receive an AM radio signal inside the house, try again outside.



# PROJECT

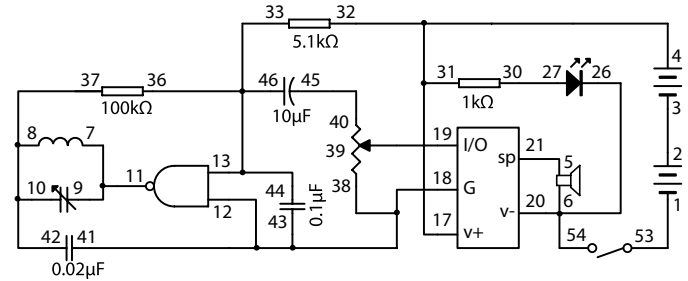
# 26

## Wiring Sequence

2-3, 4-32-31-17, 30-27, 33-46-13-44-36, 37-8-10-42, 12-43-41-38-18, 7-9-11, 26-6-20-54, 45-40, 39-19, 21-5, 53-1

## EN AMR RADIO RECEIVER WITH VOLUME CONTROLLER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you find them, look for them in the lab and connect them. You can help with the connection string above. Turn on the main switch and the LED light will come on. Set the variable capacitor to the correct position so the circuit can receive AM radio signals. It regulates the variable resistance to change the volume. As AM waves are sensitive to direction, when the radio signal is weak, try moving the radio in a different direction. Note: If you can not receive an AM radio signal inside the house, try again outside.



# PROJECT

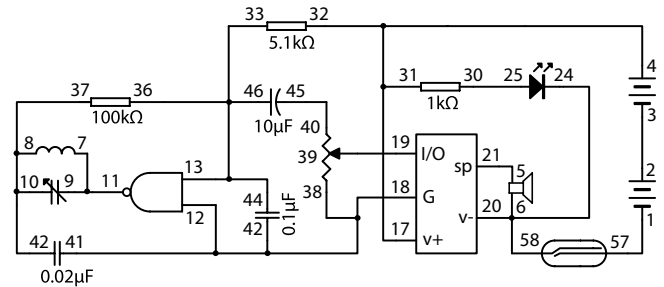
# 27

## Wiring Sequence

2-3, 4-32-31-17, 30-27, 33-46-13-44-36, 37-8-10-42, 12-43-41-38-18, 7-9-11, 26-6-20-58, 45-40, 39-19, 21-5, 57-1

## EN AMR RADIO RECEIVER BY MAGNETIC CONTROL WITH VOLUME CONTROLLER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Use the magnetic pole to access the blade switch. Set the variable capacitor to the correct position so the circuit can receive AM radio signals. When you press the button, the radio will be muted. Since AM waves are sensitive to direction, when the radio signal is weak, try moving the radio in a different direction. NOTE: If you can not receive an AM radio signal inside the house, try again outside.



# PROJECT

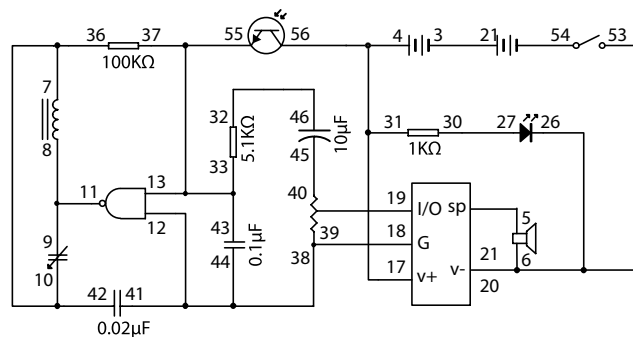
# 28

## Wiring Sequence

2-3, 4-56-31-17, 55-37-13-33-43, 32-46, 36-7-10-42, 8-9-11, 12-41-44-38-18, 45-40, 39-19, 30-27, 21-5, 20-6-26-53, 54-1

## EN AM POWERED RADIO RECEIVER WITH VOLUME CONTROLLER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the indicated connection sequence (see above). Turn on the main switch and the LED light will come on. Make sure that if you cover the light sensor or take it to a dark place, the radio will not work. It is necessary to expose the light sensor to bright light to connect the circuit. Set the variable capacitor to the correct position so the circuit can receive AM radio signals. By adjusting the variable resistor, you can change the volume. As AM waves are sensitive to direction, when the radio signal is weak, try moving the radio in a different direction. Note: If you can not receive an AM radio signal inside the house, try again on the outside.



# PROJECT

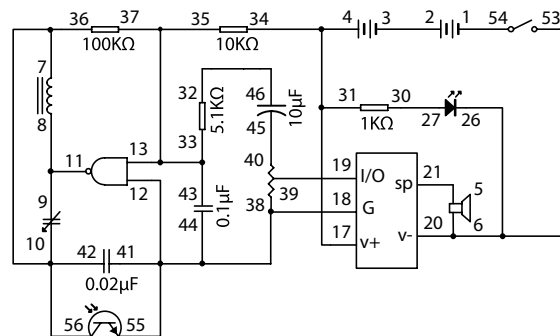
# 29

## Wiring Sequence

2-3, 4-34-31-17, 35-37-13-33-43, 32-46, 36-7-10-42-56, 8-9-11, 12-41-55-44-38-18, 45-40, 39-19, 30-27, 21-5, 20-6-26-53, 54-1

## EN YELLOW AM RADIO RECEIVER BY DARK WITH VOLUME CONTROLLER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch and the LED light will come on. Check that the light sensor is exposed to strong light, the radio will not operate. It is necessary to cover the light sensor or take it to a dark place to connect the circuit. Setting the variable capacitor to the correct position will allow you to receive AM radio signals. By adjusting the variable resistor, you can change the volume. As AM waves are sensitive to direction, when the radio signal is weak, try moving the radio in a different direction. Note: If you can not receive an AM radio signal inside the house, try again on the outside.



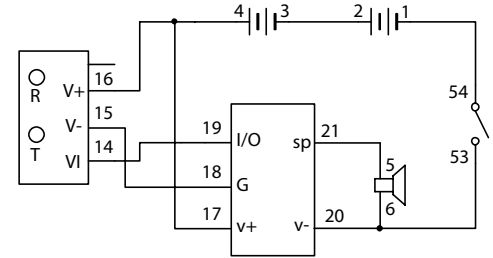
# PROJECT

Wiring Sequence

2-3, 4-16-17, 18-15, 14-19, 21-5, 6-20-53, 54-1

## EN FM RADIO RECEIVER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch. Pressing the “select” button at the top of the panel will automatically search for FM radio signals. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the “select” button again to search for another channel. When the receiver has found the channel with the highest frequency, you must press the “reset” button to search for other channels. It is advisable to connect a cable to the “FM.ANT” which acts as an antenna. This will increase the strength of the received radio signal.



# 30

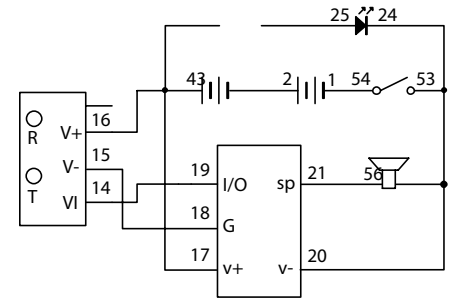
# PROJECT

Wiring Sequence

2-3, 4-16-17-31, 30-25, 18-15, 14-19, 21-5, 6-20-24-53, 54-1

## EN FM RADIO RECEIVER WITH LED

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch and the LED light will come on. Pressing the “select” button at the top of the panel will automatically search for FM radio signals. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the “select” button again to search for another channel. When the receiver finds the channel with the highest frequency, you must press the “reset” button to search for other channels. It is advisable to connect a cable to the “FM.ANT” which acts as an antenna. This will increase the strength of the received radio signal.



# 31



# PROJECT

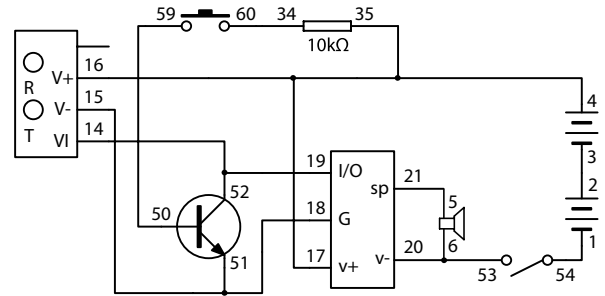
Wiring Sequence

2-3, 4-35-16-17, 34-60, 59-50, 15-51-18, 14-52-19, 21-5, 20-6-53, 54-1

# 32

## EN FM RADIO RECEIVER WITH SILENT FUNCTION

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch. Pressing the “select” button at the top of the panel will automatically search for FM radio signals. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the “select” button again to search for another channel. When the receiver has found the channel with the highest frequency, you must press the “reset” button to search for other channels. When you press the button, the radio will be muted. It is advisable to connect a cable to the “FM.ANT” which acts as an antenna. This will increase the strength of the received radio signal.



# PROJECT

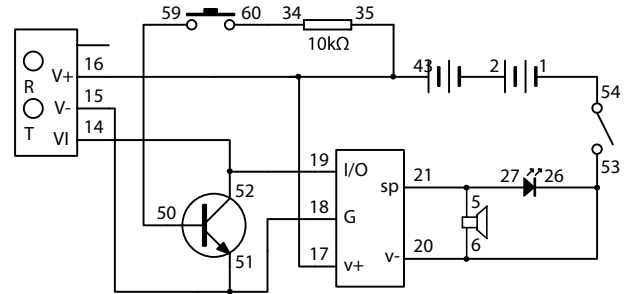
Wiring Sequence

2-3, 4-35-16-17, 34-60, 59-50, 15-51-18, 14-52-19, 21-5-27, 26-20-6-53, 54-1

# 33

## EN FM RADIO RECEIVER WITH SILENCER FUNCTION AND LED SYNCHRONIZED WITH SPEAKER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the indicated connection sequence (see above). Turn on the main switch. Pressing the “select” button at the top of the panel will automatically search for FM radio signals. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the “select” button again to search for another channel. When the receiver has found the channel with the highest frequency, you must press the “reset” button to search for other channels. When you press the button, the radio will be muted. In addition, the LED light will light up in the rhythm of the speaker. It is advisable to connect a cable to the “FM.ANT” which acts as an antenna. This will increase the strength of the received radio signal.



# PROJECT

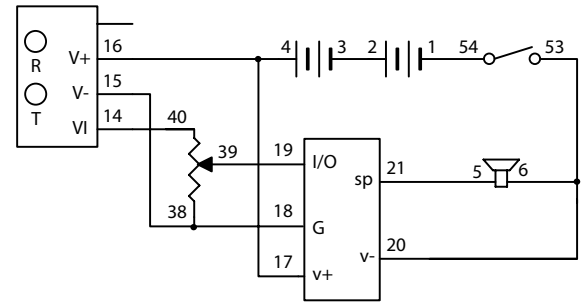
Wiring Sequence

2-3, 4-16-17, 18-38-15, 14-40, 39-19, 21-5, 20-6-53, 54-1

# 34

## EN RECEPTOR DE RÁDIO FM COM REGULADOR DE VOLUME

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and plug them in. You can help with the connection sequence given above (see above). Turn on the main switch. Pressing the “select” button at the top of the panel will automatically search for FM radio signals. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the “select” button again to search for another channel. When the receiver has found the channel with the highest frequency, you must press the “reset” button to search for other channels. By adjusting the variable resistor, you can change the volume. It is advisable to connect a cable to the “FM.ANT” which acts as an antenna. This will increase the strength of the received radio signal.



# PROJECT

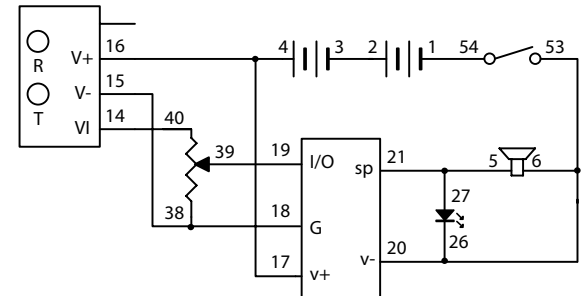
Wiring Sequence

2-3, 4-16-17, 18-38-15, 14-40, 39-19, 21-5, 20-6-53, 54-1

# 35

## EN FM RADIO RECEIVER WITH SYNCHRONIZED VOLUME AND LED REGULATOR WITH SPEAKER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch. Pressing the “select” button at the top of the panel will automatically search for FM radio signals. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the “select” button again to search for another channel. When the receiver finds the channel with the highest frequency, you must press the “reset” button to search for other channels. By adjusting the variable resistance, you can change the volume. In addition, the LED light will light up in the rhythm of the speaker. It is advisable to connect a cable to the “FM.ANT” which acts as an antenna. This will increase the strength of the received radio signal.



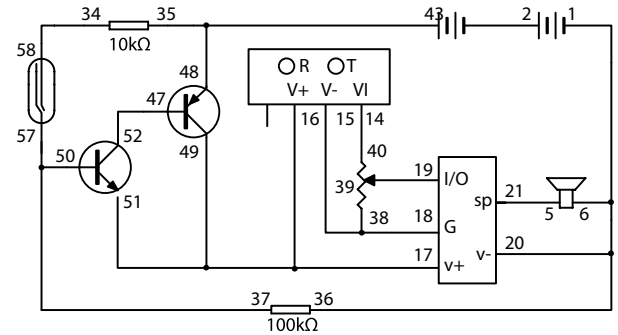
# PROJECT

## Wiring Sequence

2-3, 4-35-48, 34-58, 49-51-17-16, 15-18-38, 21-5, 14-40, 39-19, 47-52, 57-50-37, 36-20-6-1

### EN FM RADIO RECEIVER BY MAGNETIC CONTROL WITH VOLUME CONTROLLER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch. Use the magnetic pole to access the blade switch. Pressing the “select” button at the top of the panel will automatically search for FM radio signals. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the “select” button again to search for another channel. When the receiver has found the channel with the highest frequency, you must press the “reset” button to search for other channels. By adjusting the variable resistance, you can change the volume. It is advisable to connect a cable to the “FM.ANT” which acts as an antenna. This will increase the strength of the received radio signal.



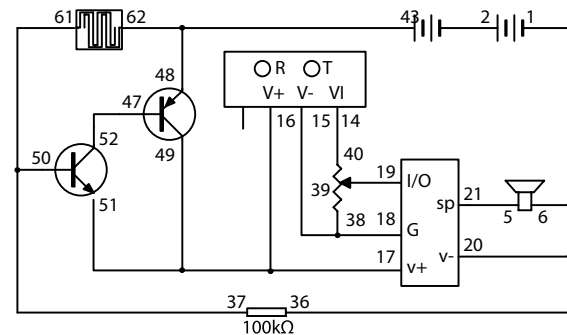
# PROJECT

## Wiring Sequence

2-3, 4-62-48, 49-51-17-16, 15-18-38, 21-5, 14-40, 39-19, 47-52, 61-50-37, 36-20-6-1

### EN FM TOUCH RADIO RECEIVER WITH VOLUME CONTROLLER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Touch the touchpad with your finger. If there is no answer, lightly moisten your finger and touch it again. In this way, the circuit will be connected. Pressing the “select” button at the top of the panel will automatically search for FM radio signals. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the “select” button again to search for another channel. When the receiver finds the channel with the highest frequency, you must press the “reset” button to search for other channels. By adjusting the variable resistor, you can change the volume. It is advisable to connect a cable to the “FM.ANT” which acts as an antenna. This will increase the strength of the received radio signal.



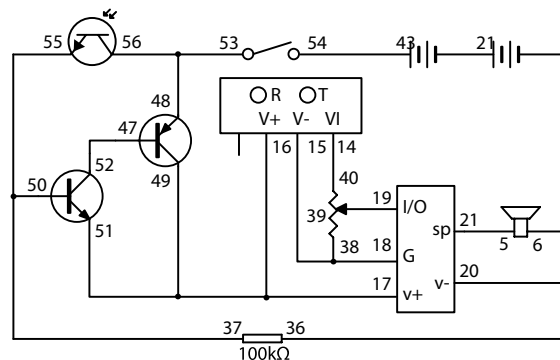
# PROJECT

## Wiring Sequence

2-3, 4-54, 53-56-48, 47-52, 51-49-17-16, 15-38-18, 19-39, 40-14, 21-5, 55-50-37, 36-20-6-1

### EN FM RADIO RECEIVER ACTIVATED BY LIGHT WITH VOLUME CONTROLLER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). Turn on the main switch. Make sure that if you cover the light sensor or take it to a dark place, the radio will not work. It is necessary to expose the light sensor to bright light to connect the circuit. Pressing the "select" button at the top of the panel will automatically search for FM radio signals. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the "select" button again to search for another channel. When the receiver finds the channel with the highest frequency, you must press the "reset" button to search for other channels. By adjusting the variable resistance, you can change the volume. It is advisable to connect a cable to the "FM.ANT" which acts as an antenna. This will increase the strength of the received radio signal.



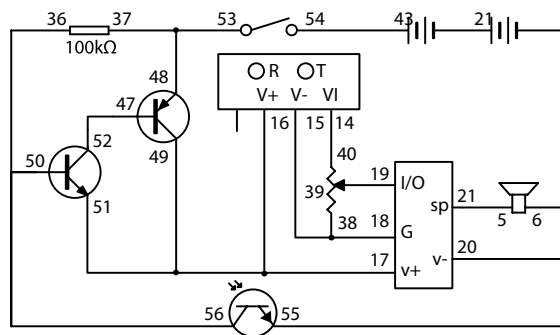
# PROJECT

## Wiring Sequence

2-3, 4-54, 53-37-48, 47-52, 51-49-17-16, 15-38-18, 19-39, 40-14, 21-5, 36-50-56, 55-20-6-1

### EN FM RADIO RECEIVER ACCEPTED BY DARKNESS WITH VOLUME CONTROLLER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). You can see that if the light sensor is exposed to bright light, the radio will not work. It is necessary to cover the light sensor or take it to a dark place to connect the circuit. Pressing the "select" button at the top of the panel will automatically search for FM radio signals. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the "select" button again to search for another channel. When the receiver finds the channel with the highest frequency, you must press the "reset" button to search for other channels. By adjusting the variable resistor, you can change the volume. It is advisable to connect a cable to the "FM.ANT" which acts as an antenna. This will increase the strength of the received radio signal.



# PROJECT

## Wiring Sequence

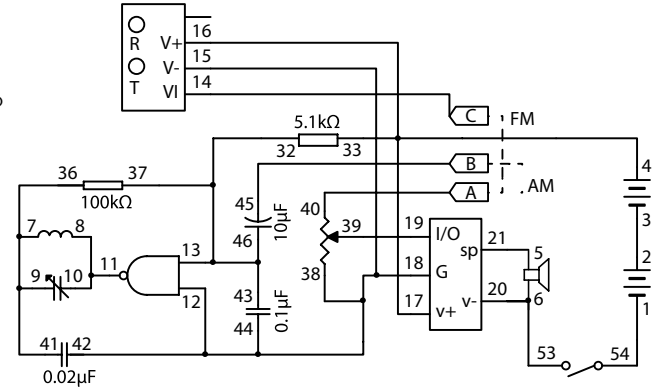
2-3, 4-33-16-17, 39-19, 8-10-11, 32-37-13-46-43, 15-18-38-44-12-42, 36-7-9-41, 20-6-53, 21-5, 54-1

# 40

### EN AM / FM RADIO RECEIVER ACTIVATED WITH VOLUME CONTROLLER

Look at the circuit on the right and look for the symbols in the electrical symbol table. When you locate them, find them in the lab and connect them. You can help with the connection sequence given above (see above). If you want to receive AM radio signal, connect terminal 40 to terminal 45. Turn the ignition switch. Setting the variable capacitor in position will allow reception of AM radio signals. Since AM radio waves are sensitive to signal direction when the radio signal is weak, try to place the radio in the other direction. If you want the radio to receive an FM signal, connect terminal 40 to terminal 14 rather than 45. By pressing the "select" button at the top center of the panel, an automatic search for FM radio signals will be performed. The receiver will start scanning channels from the lowest to the highest frequency and will stop searching when it finds a channel. You must press the "select" button again to search for another channel. When the receiver has found the channel with the highest frequency, you must press the "reset" button to search for other channels. It is advisable to connect a cable to the "FM.ANT" which acts as an antenna. This will increase the strength of the received radio signal. Both AM FM radio and you can change the volume by adjusting the variable resistance circuit breakers. This between AM and FM radio easily.

Note: If you can not receive AM radio signal inside the house, try again outside.





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**Warranty and National Technical Service.**