

For more info:

www.MrCircuitTechnology.com

Gary@MrCircuitTechnology.com

Mr Circuit Technology

Science/Electronics Experiment Kits and Labs


Exp. 27 - "ENGLISH POLICE SIREN CIRCUIT"

LESSON PLAN

Table of Contents

- Page 01 - Explanation of the Experiment - part 1 of 2
- Page 02 - Explanation of the Experiment - part 2 of 2
- Page 03 - Purpose of the Experiment and Parts Needed
- Page 04 - Do the Experiment (part 1 of 2)
- Page 05 - Do the Experiment (part 2 of 2)
- Page 06 - Crossword Puzzle
- Page 07 - Word Search Puzzle
- Page 08 - Written 10-Question Multiple Choice Quiz
- Page 09 - Answers to Crossword
- Page 10- Answers to Word Search
- Page 11 - Answer Key to Written Quiz
- Page 12 - Poster to put up on classroom wall
- Page 13 - Price List for Parts Kits for your to order more. Send Purchase Order to Gary@MrCircuitTechnology.com or order online at www.MrCircuitTechnology.com

Experiment Parts Kit
#MC1-00-PK
Solderless
Circuit Board
Exciting, Educational
and Fun



Experiment Parts only
(packaged in a 3x5 inch
resealable plastic bag.)

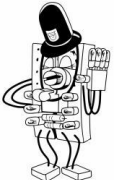
**LEARN more today,
EARN more tomorrow!**

Copyright © Mr Circuit Technology 2024

For more info: www.MrCircuitTechnology.com
Gary@MrCircuitTechnology.com

Science/Electronics Kits and Labs

Experiment Parts Kit
#MC1-27-PK
"English Police
Siren Circuit"
Exciting, Educational
and Fun



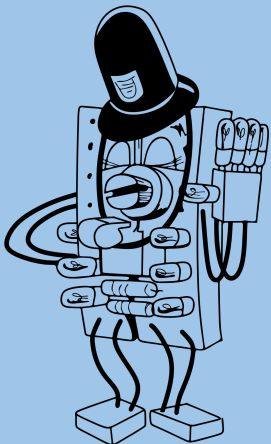
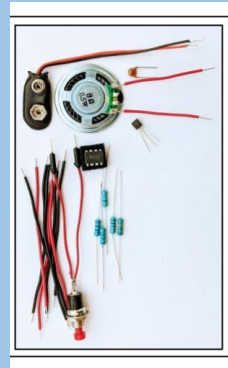
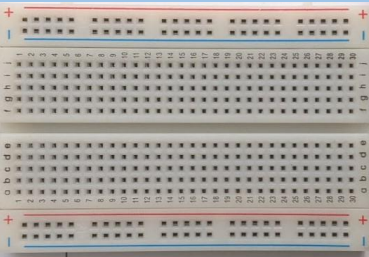
Experiment Parts only
(packaged in a 3x5 inch
resealable plastic bag.)

**LEARN more today,
EARN more tomorrow!**

Copyright © Mr Circuit Technology 2024

For more info: www.MrCircuitTechnology.com
Gary@MrCircuitTechnology.com

Science/Electronics Kits and Labs



PREPARATION: You can put the Page 12 poster up on your classroom wall to announce the fact that you are going to do the Science-Electronics Experiment.

Step 1 - Make a copy of pages 1 through 8 for each student. The students can read and do these pages on their own or you can guide them.

Step 2 - Hand out Parts Kit #MC1-00-PK (that has the Solderless Circuit Board) and Parts Kit #MC1-27-PK (that has the experiment parts) with a 9-Volt battery. Give these items to each student along with the 8 pages.

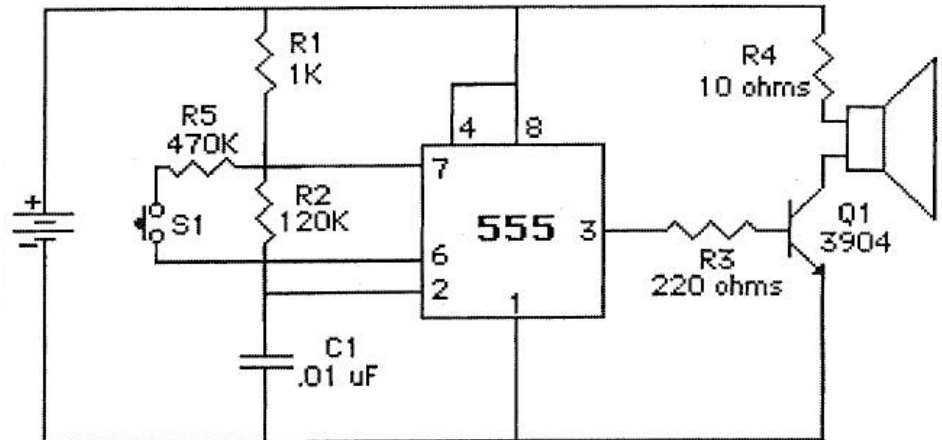
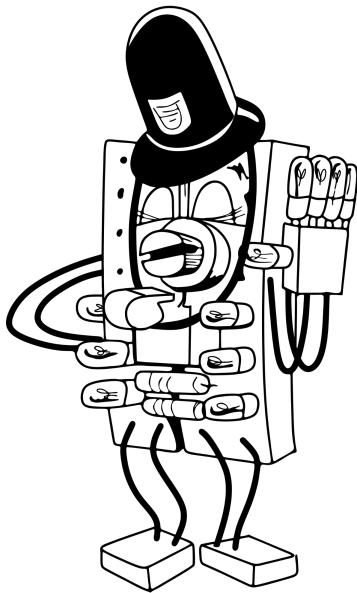
Step 3 - When your students have completed the experiment, collect all the Parts Kits and batteries for later use.

Step 4 - Collect all the Written Quizzes for grading and use the Answer Key to grade them.

For Tech Support or any questions, you can email us or call 805-295-1642

EXPLANATION OF EXPERIMENT part 1 of 2

*** You are going to build an ENGLISH POLICE SIREN circuit. Here is the SCHEMATIC DIAGRAM of the circuit you will build.



This interesting circuit was invented by engineers who wanted a circuit that would make sounds similar to a two-tone siren used by British Police or Ambulances.

This is a fun circuit to play with during fantasy games etc.

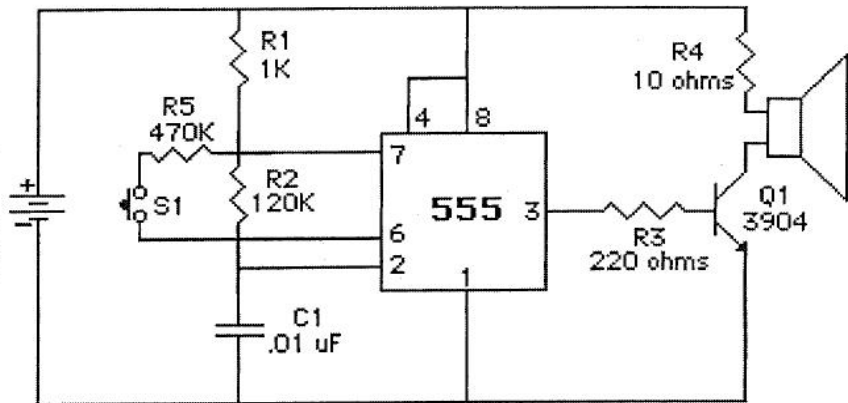
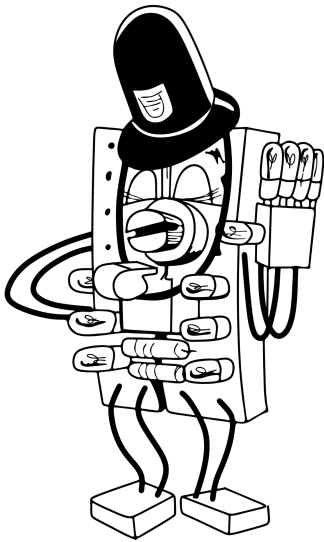
Mr Circuit has a typical hat of a policeman in England.

It is amazing how many circuits can be made with a few well chosen electronic components.

(Continue to Page 2)

EXPLANATION OF EXPERIMENT part 2 of 2

Let's talk about how the circuit works. Here is the schematic of the **ENGLISH POLICE SIREN** circuit that you will build.



This circuit uses a 555 Integrated Circuit as **CLOCK**. Pin 3 emits a **signal** to the speaker. Transistor Q1 is used to increase the loudness. The **loudness is fixed**, not variable.

When Push Button switch S1 is not pressed, the circuit emits a tone. The frequency of the tone is dependent on the values of R1, R2, and C1.

When the Push Button switch is pressed, the frequency of the tone changes because R5 is connected in parallel to R2.

So, by pressing and releasing the Push Button switch, you can create two **frequencies** or tones that sound like an English Police Siren.

Have fun!

(Continue to Page 3)

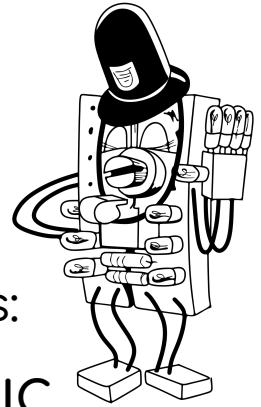
PURPOSE OF THIS EXPERIMENT

MC1-27-R-3

*** To build an ENGLISH POLICE SIREN Using a 555 Integrated Circuit.

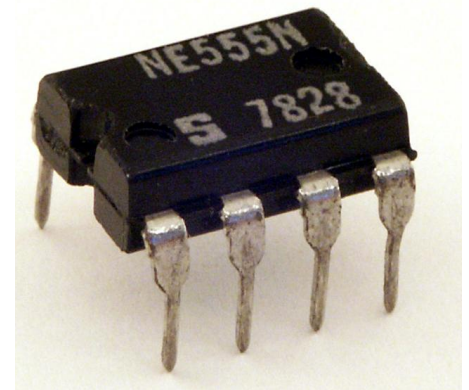
PARTS NEEDED FOR EXPERIMENT

In this experiment, you will use the following items:



BATTERY SNAP

0.01 DISC CAPACITOR 555 IC



10 Ohm resistor

1000 Ohm resistor



470k Ohm resistor

220 Ohm resistor

120k Ohm resistor

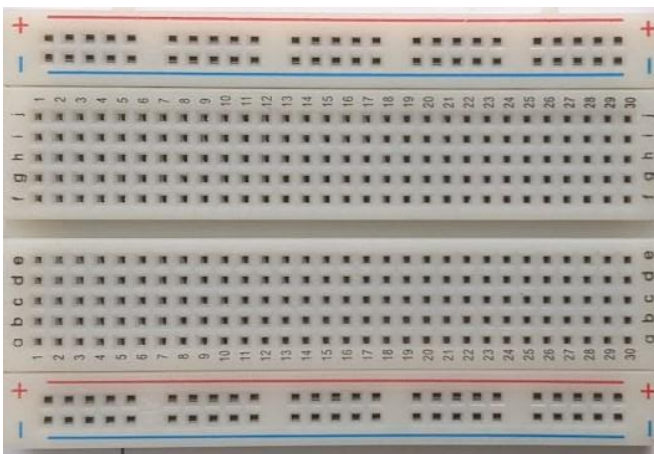


7 Jumper Wires



a SOLDERLESS CIRCUIT BOARD

Normally-Open Push Button Switch



You will also need a good 9 Volt battery

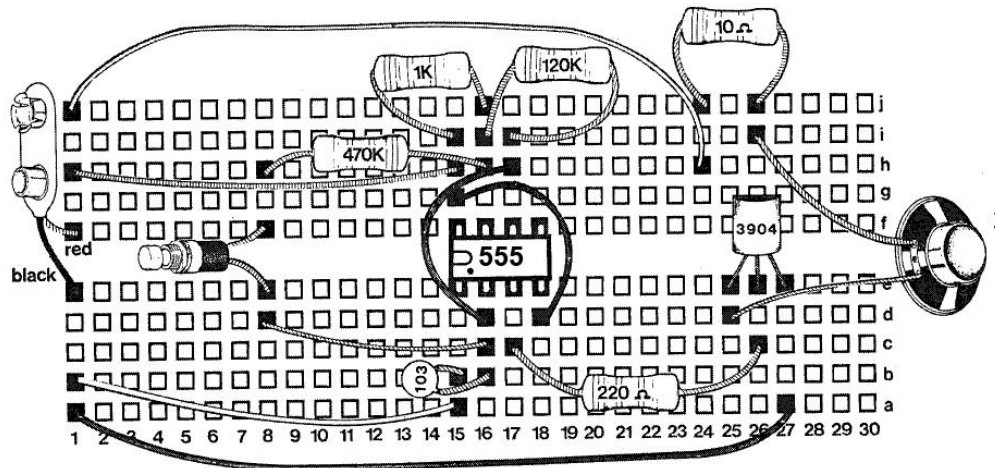
(Continue to Page 4)

DO THE EXPERIMENT (part 1 of 2)

MC1-27-R-4

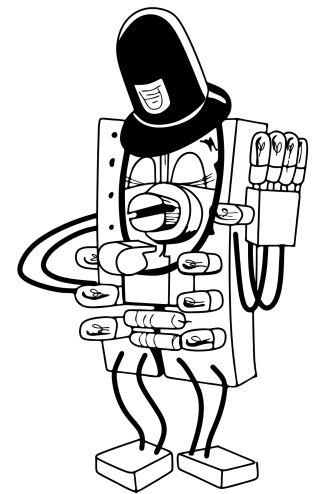
Now you are going to build the circuit on a Solderless CB.

Step 1 - Take out all the parts needed for this experiment.



Step 2 - Install all the parts on the SCB as shown above.

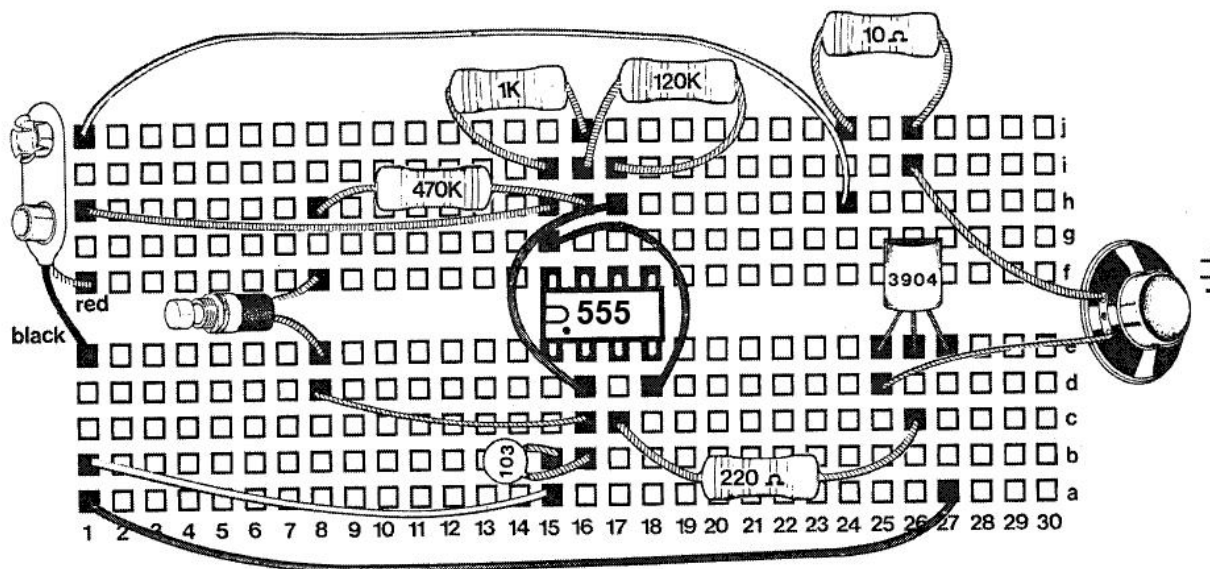
- Install the 10 Ohm resistor (brown, black, black, gold) in holes 24j to 26j
- Install the 220 Ohm resistor (red, red, brown, gold) in holes 17c to 26c
- Install the 1000 (1k) Ohm resistor (brown, black, red, gold) in holes 15i to 16j
- Install the 120k Ohm resistor (brown, red, yellow, gold) in holes 16i to 17i
- Install the 470k Ohm resistor (yellow, violet, yellow, gold) in holes 8h to 16h
- Install the 555 Timer IC with Pin 1 in hole 15e as shown in pictorial
- Install a NPN 3904 Transistor -Collector in 25e, Base in 26e, Emitter in 27e
- Install a 0.01uF (103) Capacitor in holes 15b to 16b
- Install a Push Button Switch in holes 8e and 8f
- Install a Speaker in holes 25d to 26i
- Install Jumper Wire #4 in holes 1j to 24h
- Install Jumper Wire #1 in holes 1a to 27a
- Install Jumper Wire #5 in holes 8d to 16c
- Install Jumper Wire #2 in holes 1b to 15a
- Install Jumper Wire #6 in holes 16d to 17h
- Install Jumper Wire #3 in holes 1h to 15h
- Install Jumper Wire #7 in holes 15g to 18d
- Install the Battery Snap, Black lead in hole 1e and Red Lead in hole 1f



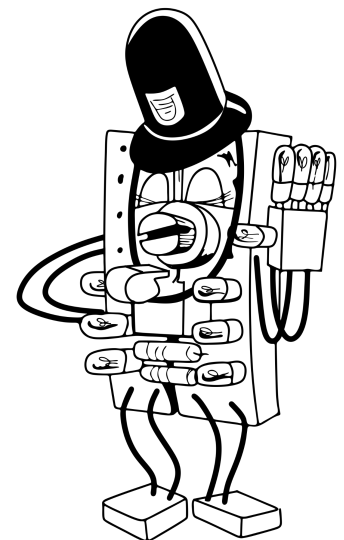
(Continue to Page 5)

DO THE EXPERIMENT (part 2 of 2)

MC1-27-R-5



Step 3 - Connect the battery to the Battery Snap. You should hear a tone emitted by the speaker. Then, press the Push Button switch and you should hear a different tone from the speaker. By pressing and releasing the Push Button switch, you should be able to create the sounds of an English Police Siren.

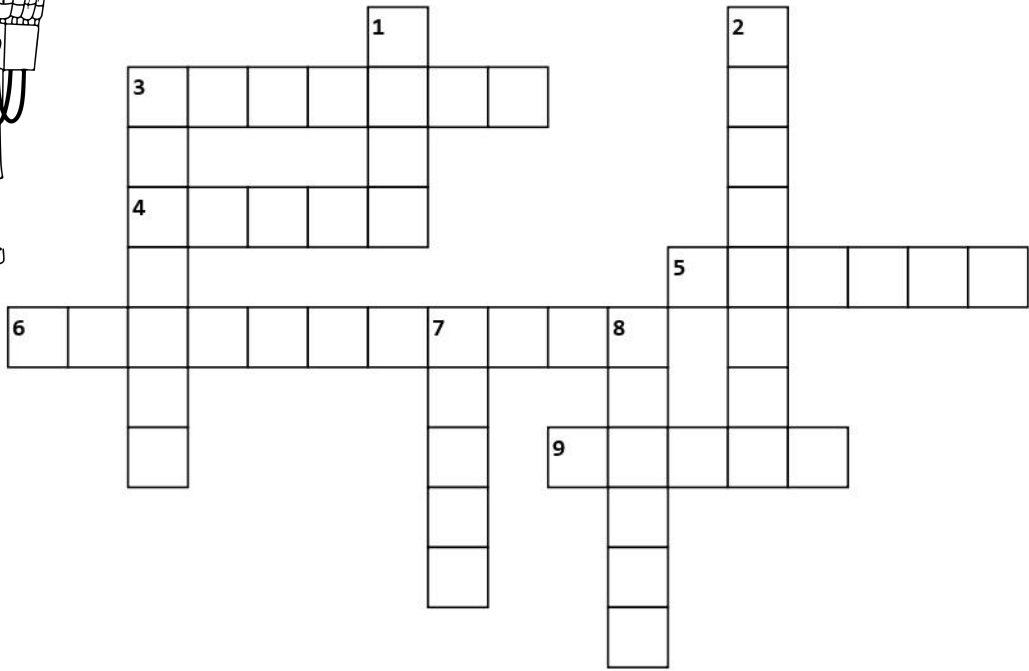
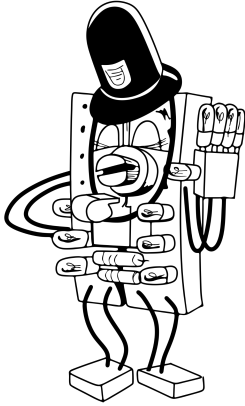


CONCLUSION: You should have observed that you can build an **ENGLISH POLICE SIREN** circuit with a 555 Integrated Circuit.

(End of Experiment 27)

CROSSWORD

Exp. 27 - "ENGLISH POLICE SIREN CIRCUIT"



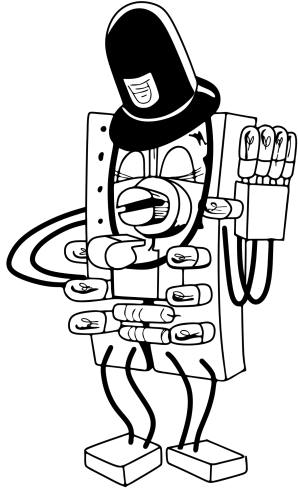
Across

- 3. Another word for English is _____ .
- 4. Pin _____ is the output pin on the 555 Integrated Circuit.
- 5. The _____ of Resistor R1, R2, and C1 vary the frequency of the output of this circuit.
- 6. This circuit emits two _____ .
- 9. The loudness of the tone coming from the speaker is _____ .

Down

- 1. How many fixed value resistors are used in this circuit?
- 2. The loudness of the tones coming from the speaker of this circuit are not _____ .
- 3. As soon as you connect a nine-volt _____ to the circuit it will emit a tone.
- 7. The 555 Integrated Circuit is used as a _____ .
- 8. To make the circuit put out a second tone, press the PushButton _____ .

Exp. 27 - "ENGLISH POLICE SIREN CIRCUIT"



T G T M P G C Q Z X P P A W Q L C X L R
 C R U B O Z I O S P E X Q O K I B S V R
 H S Y I M G J Y P I F Y M S Z R G S T B
 N R H V W A L K G N Z N E C T D T E L C
 Q K S X S V Q S P M K Q B V I N E N V F
 C F V H E K L H C T I W S W F E I D L N
 H E F R E K V B T O L S R T T R G U R G
 Q U O B Q M E Y Z N E I F Q F O H O T U
 Y R F R U J G G D Z L N U C J B T L D X
 D A W Q P S U L O D L D Q D O R D G O H
 M O T N P V E R D L A J V J G I K K X Q
 A G T N W O R B V D R V R G O T C H A G
 W O U B D R C F Q B A P X H U I O W H L
 J D L Q U D N U T I P J P M T S L R L B
 K O X F Q J E I J P V S C N P H C V C D
 X K F D E C U V W Y O F C K U I C X H S
 U A K Z Z Z A B B X A P G I T P O F I Z
 H D S L V Q L G U K U V J B W T N J O Y
 E N B C O B S E I C N E U Q E R F V Z T
 E I D W Z E T O N E P O O H B C F W Z T

1. Another word for English is the word _____.
2. Another word for FREQUENCY is the word _____.
3. The 555 Integrated Circuit is used as a _____.
4. Pin 3 on the 555 Integrated Circuit is the _____ pin.
5. This circuit puts out two tones called _____.
6. The _____ of this circuit is fixed, not variable.
7. The first color band on a 1000 (1k) Ohm resistor is the color _____.
8. The _____ in this circuit is a Normally-Open Push Button.
9. A 555 Integrated Circuit has _____ pins.
10. When you press the Push Button switch, you put resistor R5 in _____ with resistor R2.



QUIZ for Exp 27 or STEM KIT #27 in the Mr Circuit Electronics Training Lab 1

This Quiz covers the training learned by completing



“Build an English Police Siren Circuit” Experiment 27

Circle the letter for your answer to each question and then hand this quiz in to your teacher.

A
B
C
D

#1 This circuit uses a 555 Timer IC as _____ .
A. a clock
B. a variable capacitor
C. a variable resistor
D. a timer

#6 The loudness of the emitted tone _____ .
A. is controlled by S1
B. is adjustable by the value of R1
C. is adjustable by the value of C1
D. is fixed

A
B
C
D

A
B
C
D

#2 R5 is connected to R1, R2 , Switch S1 and to _____ .
A. Pin 7
B. the transistor
C. the speaker
D. capacitor C1

#7 Resistors R1, R2 and R5 _____ .
A. are not connected
B. control the loudness of the speaker
C. are not important in the circuit
D. are connected

A
B
C
D

A
B
C
D

#3 On the 555 Timer _____ .
A. all but pin 5 are used
B. all but pin 4 are used
C. all 8 pins are used
D. only 6 pins are used

#8 When this circuit is working correctly, as soon as you _____ it will emit a tone.
A. press the switch S1
B. connect the battery
C. remove the 555 Timer IC
D. install capacitor C1

A
B
C
D

A
B
C
D

#4 The purpose of this circuit is to _____ .
A. emit a siren sound
B. emit bird chirps
C. sense heat
D. sense light

#9 Pressing Switch S1 puts _____ in parallel.
A. R1 and R2
B. R2 and R3
C. R5 and R2
D. R4 and R5

A
B
C
D

A
B
C
D

#5 How do you make the circuit emit two tones?
A. connect and disconnect the battery
B. remove and replace the 10 Ohm resistor
C. press and release the pushbutton switch
D. squeeze capacitor C1

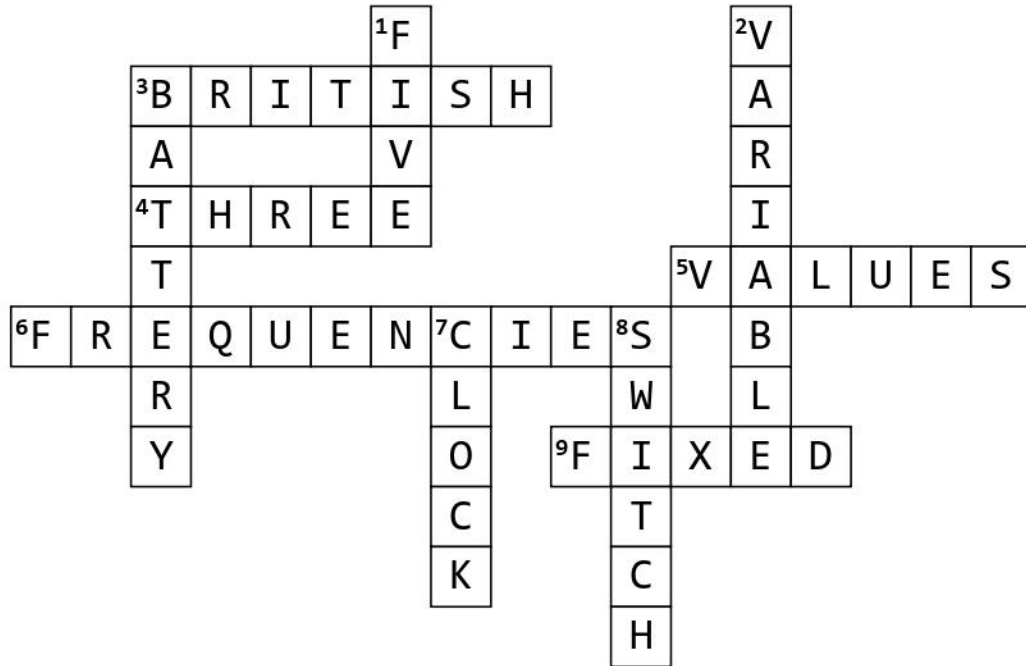
#10 In order to shut off this circuit, you must _____ .
A. disconnect the battery
B. hold down the pushbutton switch
C. hold your ears
D. change capacitor C1 to a different value

A
B
C
D

Score	
-------	--

ANSWERS FOR CROSSWORD

Exp. 27 - "ENGLISH POLICE SIREN CIRCUIT"



Across

- 3. Another word for English is _____ .
- 4. Pin _____ is the output pin on the 555 Integrated Circuit.
- 5. The _____ of Resistor R1, R2, and C1 vary the frequency of the output of this circuit.
- 6. This circuit emits two _____ .
- 9. The loudness of the tone coming from the speaker is _____ .

Down

- 1. How many fixed value resistors are used in this circuit?
- 2. The loudness of the tones coming from the speaker of this circuit are not _____ .
- 3. As soon as you connect a nine-volt _____ to the circuit it will emit a tone.
- 7. The 555 Integrated Circuit is used as a _____ .
- 8. To make the circuit put out a second tone, press the PushButton _____ .

ANSWERS FOR WORD SEARCH

Exp. 27 - "ENGLISH POLICE SIREN CIRCUIT"

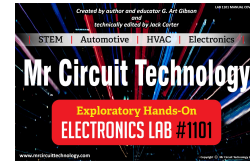
T	G	T	M	P	G	C	Q	Z	X	P	P	A	W	Q	L	C	X	L	R
C	R	U	B	O	Z	I	O	S	P	E	X	Q	O	K	I	B	S	V	R
H	S	Y	I	M	G	J	Y	P	I	F	Y	M	S	Z	R	G	S	T	B
N	R	H	V	W	A	L	K	G	N	Z	N	E	C	T	D	T	E	L	C
Q	K	S	X	S	V	Q	S	P	M	K	Q	B	V	I	N	E	N	V	F
C	F	V	H	E	K	L	H	C	T	I	W	S	W	F	E	I	D	L	N
H	E	F	R	E	K	V	B	T	O	L	S	R	T	T	R	G	U	R	G
Q	U	O	B	Q	M	E	Y	Z	N	E	I	F	Q	F	O	H	O	T	U
Y	R	F	R	U	J	G	G	D	Z	L	N	U	C	J	B	T	L	D	X
D	A	W	Q	P	S	U	L	O	D	L	D	Q	D	O	R	D	G	O	H
M	O	T	N	P	V	E	R	D	L	A	J	V	J	G	I	K	K	X	Q
A	G	T	N	W	O	R	B	V	D	R	V	R	G	O	T	C	H	A	G
W	O	U	B	D	R	C	F	Q	B	A	P	X	H	U	I	O	W	H	L
J	D	L	Q	U	D	N	U	T	I	P	J	P	M	T	S	L	R	L	B
K	O	X	F	Q	J	E	I	J	P	V	S	C	N	P	H	C	V	C	D
X	K	F	D	E	C	U	V	W	Y	O	F	C	K	U	I	C	X	H	S
U	A	K	Z	Z	Z	A	B	B	X	A	P	G	I	T	P	O	F	I	Z
H	D	S	L	V	Q	L	G	U	K	U	V	J	B	W	T	N	J	O	Y
E	N	B	C	O	B	S	E	I	C	N	E	U	Q	E	R	F	V	Z	T
E	I	D	W	Z	E	T	O	N	E	P	O	O	H	B	C	F	W	Z	T

1. Another word for English is the word _____ .
2. Another word for FREQUENCY is the word. _____ .
3. The 555 Integrated Circuit is used as a _____ .
4. Pin 3 on the 555 Integrated Circuit is the _____ pin.
5. This circuit puts out two tones called _____ .
6. The _____ of this circuit is fixed, not variable.
7. The first color band on a 1000 (1k) Ohm resistor is the color _____ .
8. The _____ in this circuit is a Normally-Open Push Button.
9. A 555 Integrated Circuit has _____ pins.
10. When you press the Push Button switch, you put resistor R5 in _____ with resistor R2.

**QUICK-CHECK ANSWER KEY for Experiment 27 QUIZ
for Mr Circuit Electronics Training (“English Police Siren”)**

Place this sheet over top of the STUDENT QUIZ (offset a little to the left and then offset to the right) to compare the answers on this sheet to the answers that the student marked. Put an ‘X’ for each wrong answer.

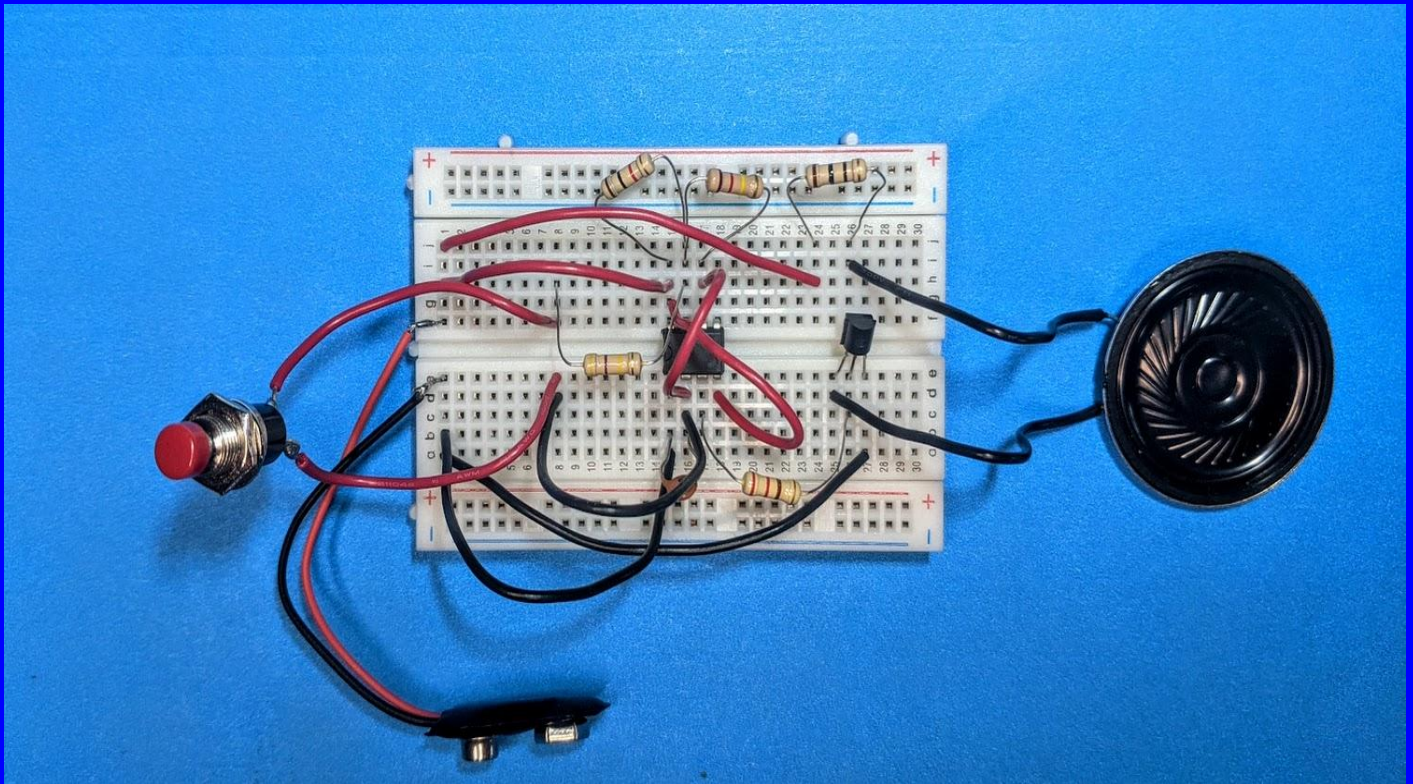
Count the right answers and record the score of right answers in your grade book.



<p>A</p> <p>B</p> <p>C</p> <p>D</p>	<p>#1 This circuit uses a 555 Timer IC as _____.</p> <p>A. a clock B. a variable capacitor C. a variable resistor D. a timer</p>	<p>#6 The loudness of the emitted tone _____.</p> <p>A. is controlled by S1 B. is adjustable by the value of R1 C. is adjustable by the value of C1 D. is fixed</p>	<p>A</p> <p>B</p> <p>C</p> <p>D</p>
<p>A</p> <p>B</p> <p>C</p> <p>D</p>	<p>#2 R5 is connected to R1, R2 , Switch S1 and to _____.</p> <p>A. Pin 7 B. the transistor C. the speaker D. capacitor C1</p>	<p>#7 Resistors R1, R2 and R5 _____.</p> <p>A. are not connected B. control the loudness of the speaker C. are not important in the circuit D. are connected</p>	<p>A</p> <p>B</p> <p>C</p> <p>D</p>
<p>A</p> <p>B</p> <p>C</p> <p>D</p>	<p>#3 On the 555 Timer _____.</p> <p>A. all but pin 5 are used B. all but pin 4 are used C. all 8 pins are used D. only 6 pins are used</p>	<p>#8 When this circuit is working correctly, as soon as you _____ it will emit a tone.</p> <p>A. press the switch S1 B. connect the battery C. remove the 555 Timer IC D. install capacitor C1</p>	<p>A</p> <p>B</p> <p>C</p> <p>D</p>
<p>A</p> <p>B</p> <p>C</p> <p>D</p>	<p>#4 The purpose of this circuit is to _____.</p> <p>A. emit a siren sound B. emit bird chirps C. sense heat D. sense light</p>	<p>#9 Pressing Switch S1 puts _____ in parallel.</p> <p>A. R1 and R2 B. R2 and R3 C. R5 and R2 D. R4 and R5</p>	<p>A</p> <p>B</p> <p>C</p> <p>D</p>
<p>A</p> <p>B</p> <p>C</p> <p>D</p>	<p>#5 How do you make the circuit emit two tones?</p> <p>A. connect and disconnect the battery B. remove and replace the 10 Ohm resistor C. press and release the pushbutton switch D. squeeze capacitor C1</p>	<p>#10 In order to shut off this circuit, you must _____.</p> <p>A. disconnect the battery B. hold down the pushbutton switch C. hold your ears D. change capacitor C1 to a different value</p>	<p>A</p> <p>B</p> <p>C</p> <p>D</p>

BUILD A BETTER FUTURE by UNDERSTANDING SCIENCE-ELECTRONICS

ENGLISH POLICE SIREN

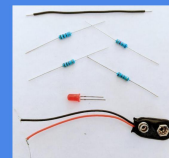
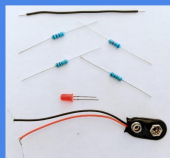


BASIC ELECTRONICS LAB 1

“ENGLISH POLICE SIREN CIRCUIT”

(Poster MC1-27-P01)

(Page 12)



PRICE LIST

PARTS KIT	Mr Circuit Series 1	Price
Number	PARTS KITS FOR "LESSON PLANS"	Each
MC1-00-PK	Solderless Circuit Board to build kits	\$3.95
MC1-01-PK	Parts Kit for "How a Resistor Works	\$1.95
MC1-02-PK	Parts Kit for "How a Potentiometer Works	\$2.95
MC1-03-PK	Parts Kit for "How a Photocell Works	\$1.95
MC1-04-PK	Parts Kit for "How a Capacitor Works	\$2.95
MC1-05-PK	Parts Kit for "How a Speaker Works	\$2.95
MC1-06-PK	Parts Kit for "How a Diode Works	\$1.95
MC1-07-PK	Parts Kit for "How an SCR Works	\$3.95
MC1-08-PK	Parts Kit for "How an NPN Transistor Works	\$2.95
MC1-09-PK	Parts Kit for "How a PNP Transistor Works	\$2.95
MC1-10-PK	Parts Kit for "How a Transistor Oscillator Works	\$3.95
MC1-11-PK	Parts Kit for "How a 555 Timer IC Works	\$2.95
MC1-12-PK	Parts Kit for "Burglar Alarm circuit	\$3.95
MC1-13-PK	Parts Kit for "Solar-Activated Night Light circuit	\$3.95
MC1-14-PK	Parts Kit for "0 TO 9V DC Power Supply circuit	\$2.95
MC1-15-PK	Parts Kit for "Electronic Metronome circuit	\$4.95
MC1-16-PK	Parts Kit for "Electronic Motorcycle circuit	\$3.95
MC1-17-PK	Parts Kit for "Railroad Lights circuit	\$2.95
MC1-18-PK	Parts Kit for "Variable Speed Lights circuit	\$3.95
MC1-19-PK	Parts Kit for "Continuity Tester circuit	\$4.95
MC1-20-PK	Parts Kit for "Audio Generator circuit	\$5.95
MC1-21-PK	Parts Kit for "Electronic Police Siren circuit	\$4.95
MC1-22-PK	Parts Kit for "Solar-Activated Wake-Up Alarm circuit	\$3.95
MC1-23-PK	Parts Kit for "Variable Timer circuit	\$3.95
MC1-24-PK	Parts Kit for "Moisture Detector circuit	\$2.95
MC1-25-PK	Parts Kit for "Code Oscillator circuit	\$4.95
MC1-26-PK	Parts Kit for "Audible Water Detector circuit	\$4.95
MC1-27-PK	Parts Kit for "English Police Siren circuit	\$4.95
MC1-28-PK	Parts Kit for "Electronic Canary circuit	\$7.95
MC1-29-PK	Parts Kit for "fantasy Space Machine Gun circuit	\$5.95
MC1-30-PK	Parts Kit for "Ultrasonic Pest Repeller circuit	\$5.95
MC1-SET-PK	Complete Set of All Series 1 Parts Kits (31 total)	\$120.00