

# Amplifier, Product Design

Choose one component from the amplifier circuit and investigate technical, theory and mathematical information related to your chosen component. This work will be completed over the next seven weeks and presented to the rest of the class.

Your method of presentation may be by hand or using ICT.

My chosen component is: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

T.Gp \_\_\_\_

My attainment Target

# Research

## Marking

Tick the 'what I have done' box only if you have done what is needed. The level you get must have all of the boxes above it ticked.

- Draw components and circuit symbols
- Speaker Driver
  - Printed Circuit Board
  - Battery connector
  - Polarised Capacitors
  - Jack Socket
  - Red Light Emitting Diode
  - Power switch
  - 47n non polarised capacitor
  - 100nf non polarised capacitor
  - Ceramic non polarised capacitor
  - 10uf polarised capacitor
  - Integrated Circuit (IC)
  - Chip Holder
  - Resistors

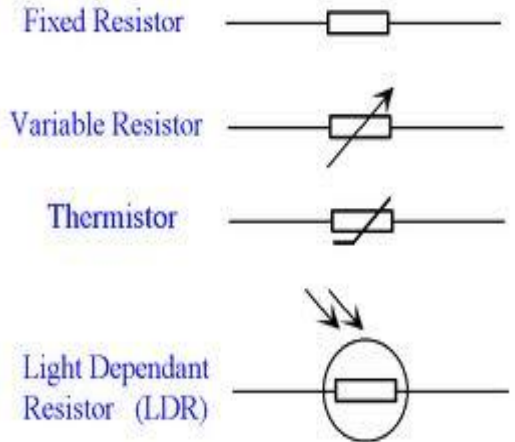
What I have done:	What is needed:	TA
	You can name most of the components being used	
	You can describe what the components look like	<b>3</b>
	You can name all the components being used	
	You can match the components with their correct circuit symbol	<b>4</b>
	You can explain the benefits when using ICs	
	You have shown you understand how the circuit works	<b>5</b>
	You can describe in detail how the circuit works.	
	You can make suggestion on alternative methods	
	Have you used information from at least three different sources (including the product analysis)?	<b>6</b>
	Have you listed the different production processes that could be used to make the product?	
	Have you explained the needs of different groups of users?	
	Have you identified the trends or patterns in existing products or solutions?	<b>7</b>

Name: \_\_\_\_\_ Date: \_\_\_\_\_

T.Gp \_\_\_\_\_

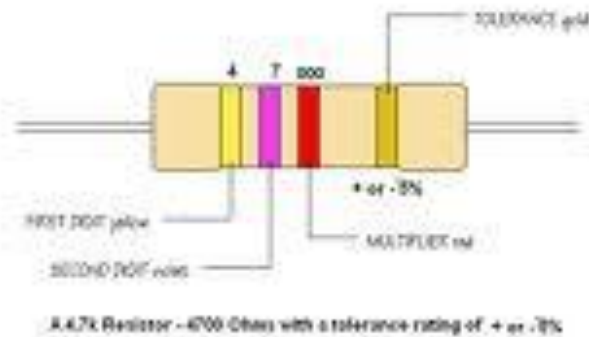
Example: An LED requires 2Volts. If we use a 9 volt Battery, How many volts must we loose? .....V. We place a Resistor in Series. The coloured bands around the resistor are there to tells us the value. The system is known as the Colour Code. This value is measured in Ohms

## Circuit symbol



Resistor

Main function is to protect other components by absorbing unwanted voltage



Old style resistor symbol



New style resistor symbol



The old ones are the best

Polarised capacitors behave like a rechargeable battery. They charge up to the value shown on the side of the barrel. Capacitance is measured in Farads. Pico, Nano and Micro



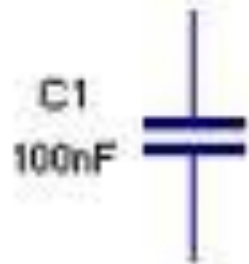
Long leg is positive +

Short leg is Negative -

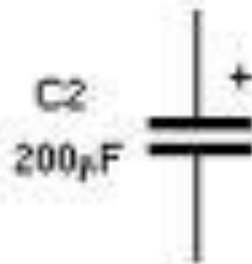
High Voltage polarised capacitors can be very dangerous and must be short circuited before touching!

Circuit symbol

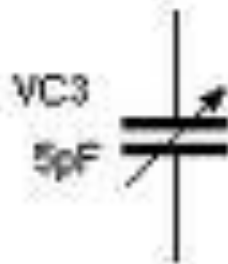
Non polarised are designed to absorb unwanted energy. They do not have positive or negative polarity and therefore can be placed either way round.



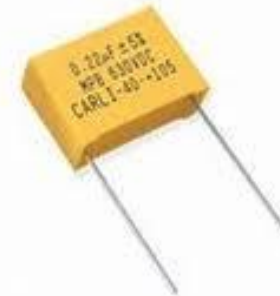
Non Polarised



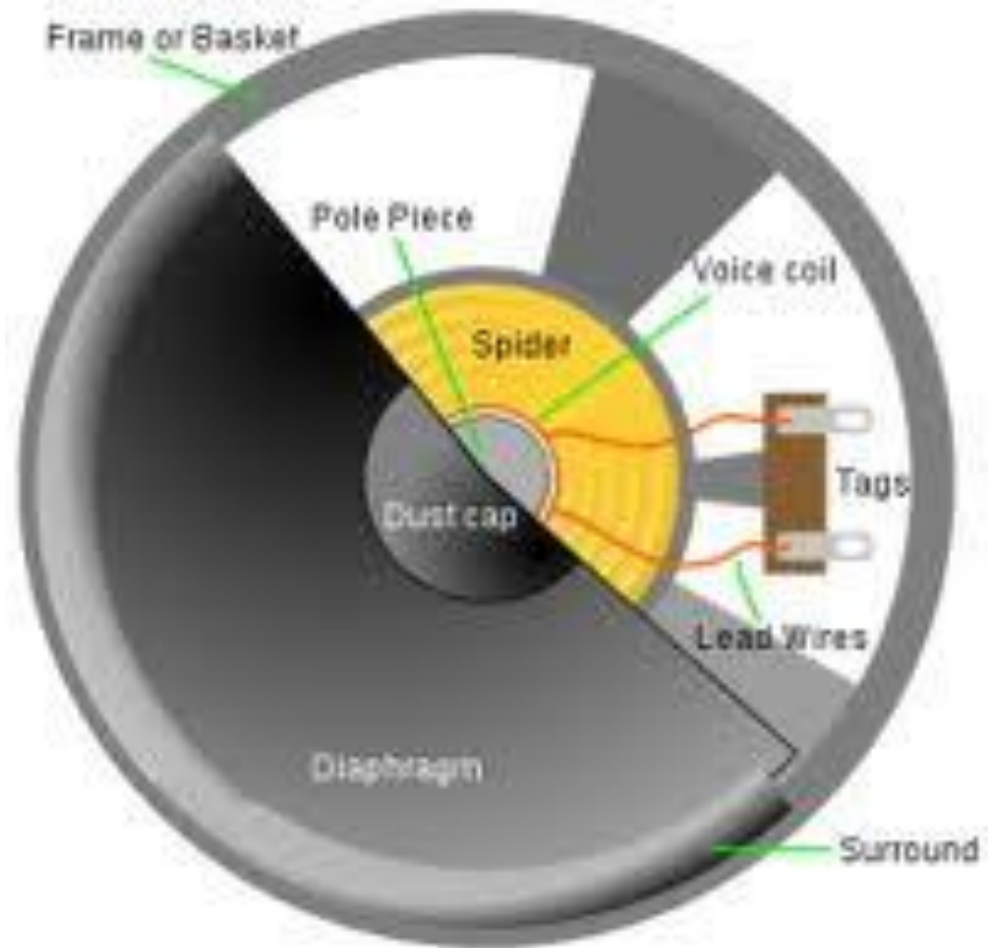
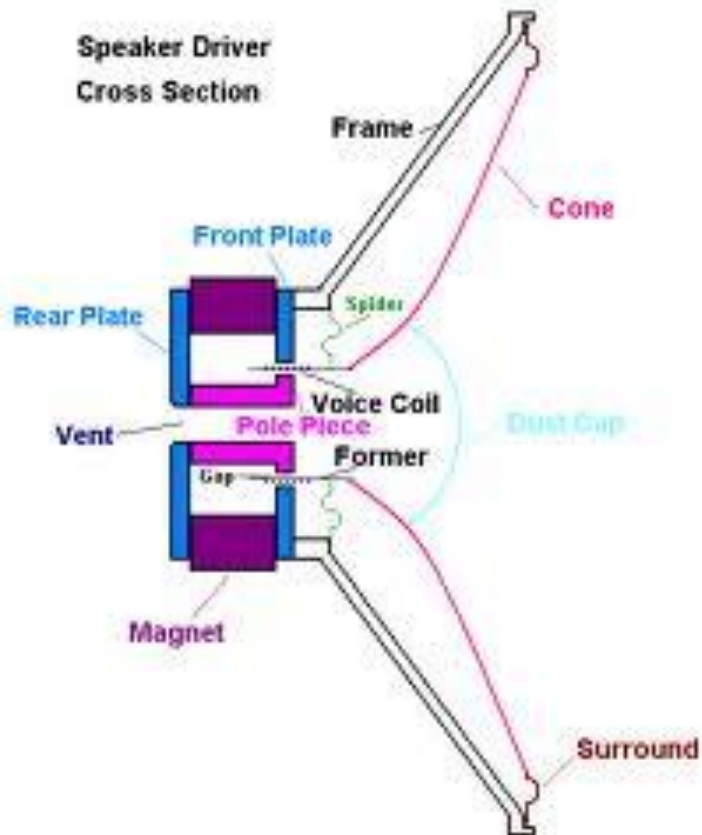
Polarised



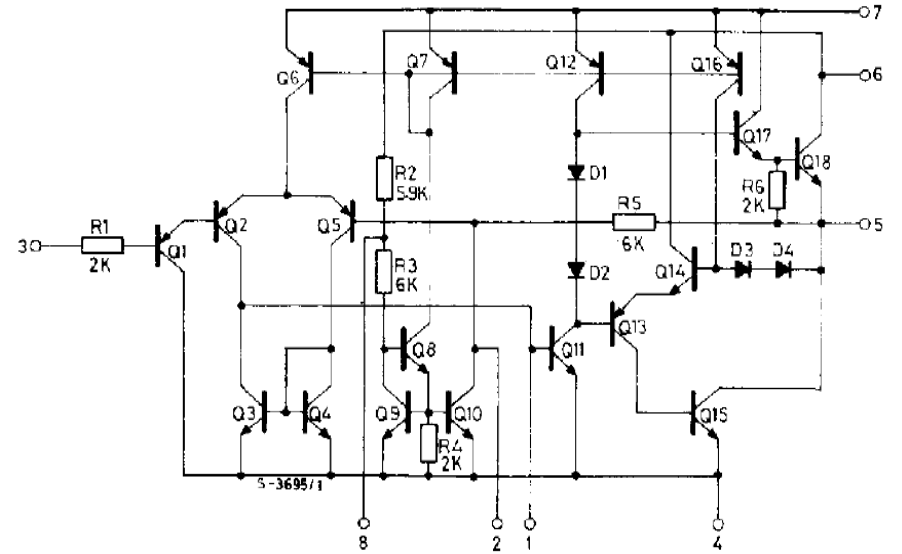
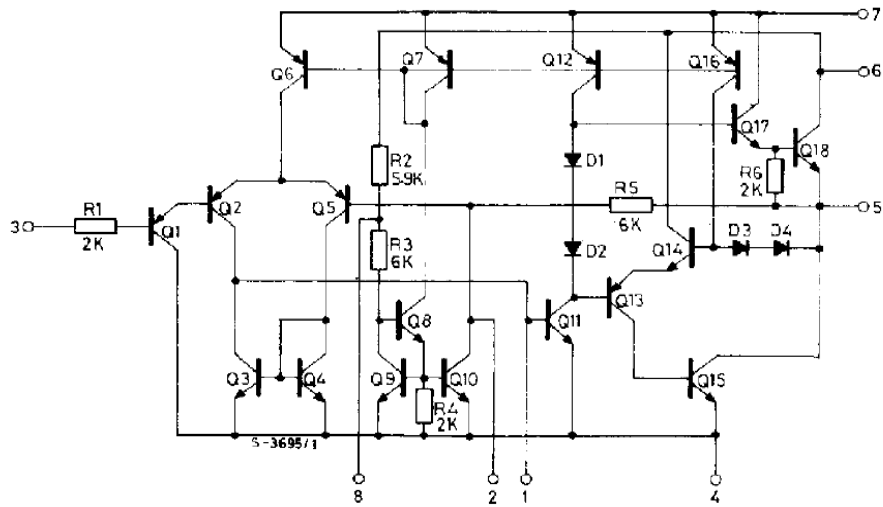
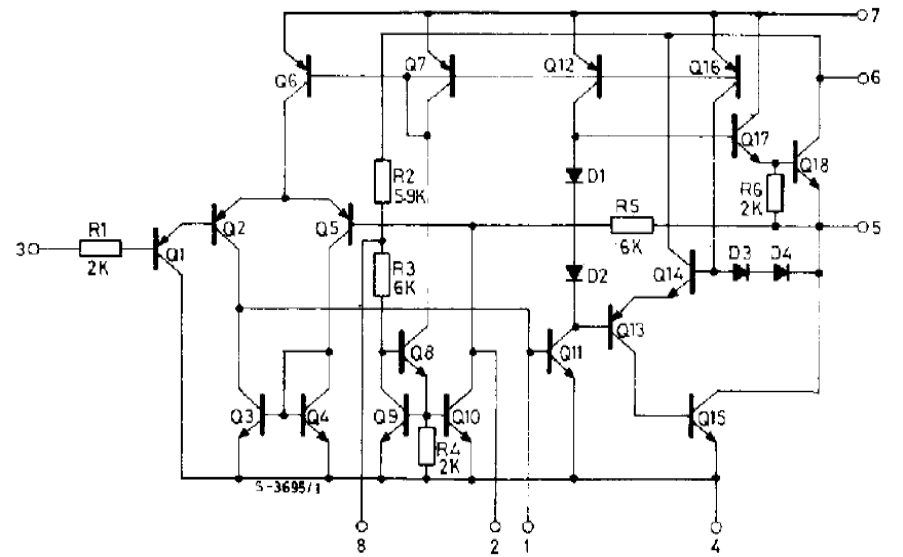
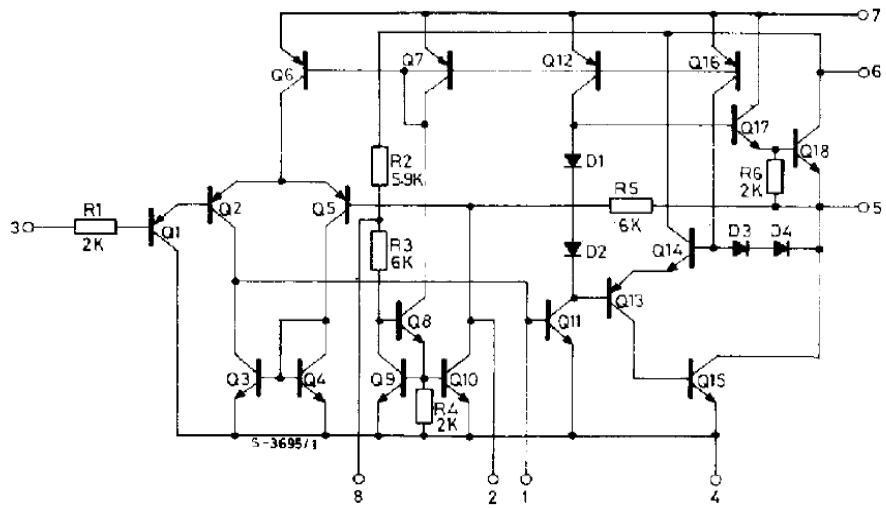
Variable



# Speaker Driver



Homework: Homework: draw a picture of a Speaker Driver  
And explain how it works

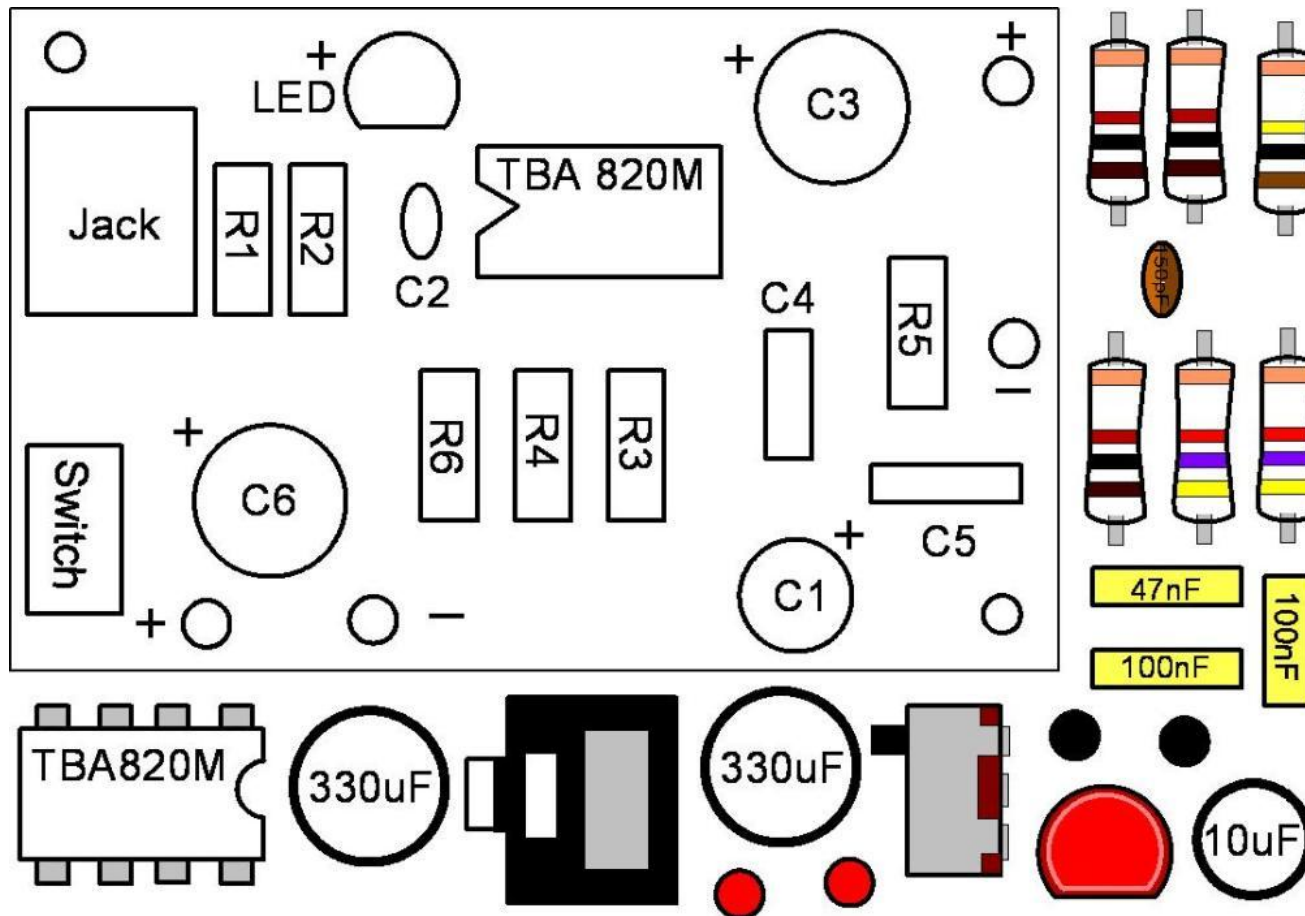


# Research

Cut out components and place onto paper PCB

## Marking

Tick the 'what I have done' box only if you have done what is needed. The level you get must have all of the boxes above it ticked.

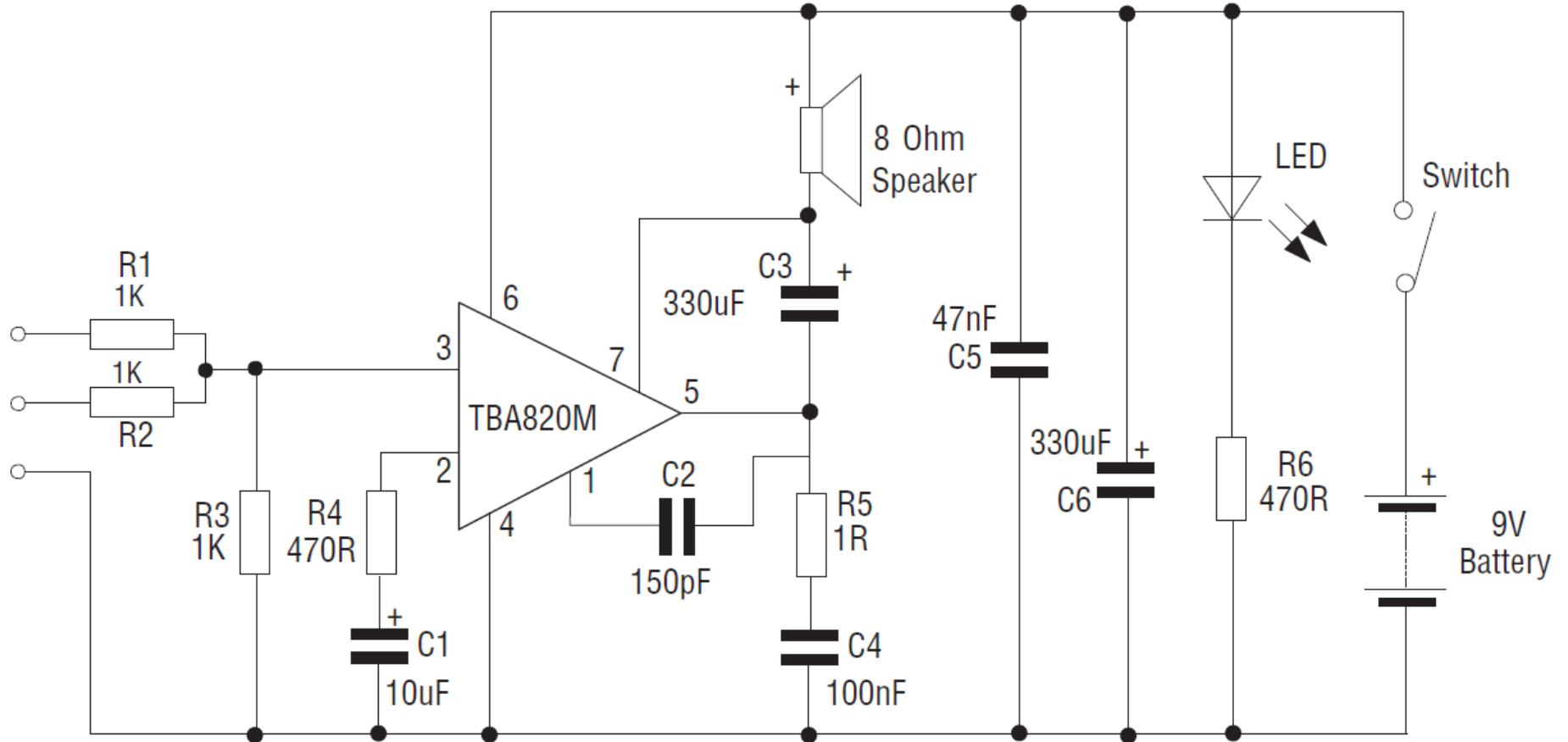


What I have done:	What is needed:	TA
<input type="checkbox"/>	Have you explained what you need the product to do?	
<input type="checkbox"/>	Have you investigated how the product can meet your needs?	<b>3</b>
<input type="checkbox"/>	Have you investigated the users' views about aesthetics?	
<input type="checkbox"/>	Have you investigated the users' views about how the product should function?	<b>4</b>
<input type="checkbox"/>	Have you carried out a Product Analysis for at least 2 products?	
<input type="checkbox"/>	In the Product Analysis, have you explained why these products were designed like this?	<b>5</b>
<input type="checkbox"/>	In the Product Analysis, have you given reasons for the form (shape, size, etc.) of the products?	
<input type="checkbox"/>	In the Product Analysis, have you given reasons for the way that the products function or work?	
<input type="checkbox"/>	Have you used information from at least three different sources (including the product analysis)?	<b>6</b>
<input type="checkbox"/>	Have you listed the different production processes that could be used to make the product?	
<input type="checkbox"/>	Have you explained the needs of different groups of users?	
<input type="checkbox"/>	Have you identified the trends or patterns in existing products or solutions?	<b>7</b>

Name: \_\_\_\_\_ Date: \_\_\_\_\_

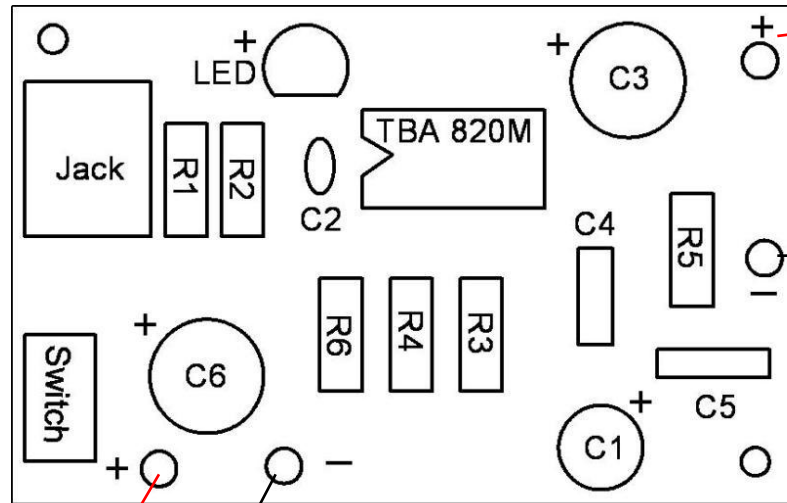
T.Gp \_\_\_\_\_

# Annotate naming components Circuit Layout

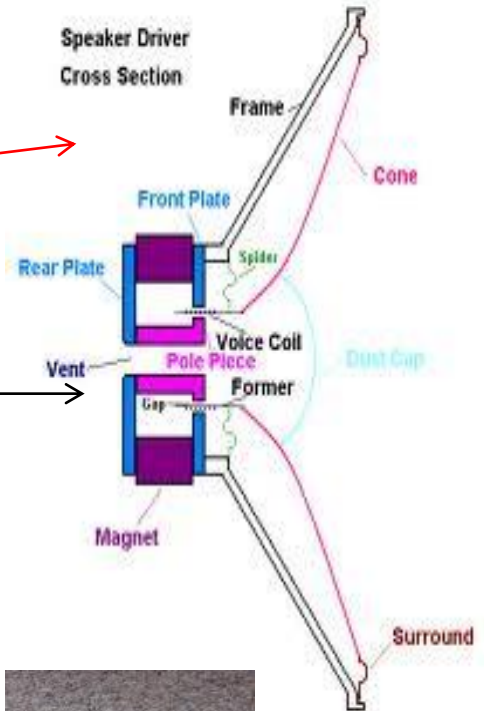




PP3 Battery



Speaker Driver



PP3 Battery connector



Name: \_\_\_\_\_ Date: \_\_\_\_\_

T.Gp \_\_\_\_\_

# Identify components

- Brown, Black, Red = 1000 ohms R1, R2, R3
- Yellow, Violet, Brown = 470 ohms R4, R6
- Brown, black, gold, gold = R5
- 330uF = C3, C6
- 10uF = C1
- 47nF =
- 100nF =
- 150pF = C2
- LED =



# Manufacturing

## How to solder components:

Description



Description



Capillary action  
Oxidisation  
Tin

Draw a flow chart to explain the process of setting up and soldering your circuit.

The first stage will be to collect the soldering iron, stand, soldering board, switching on the iron and waiting for it to heat up.

Flow chart symbols you could use:

Start / Stop 

Process 

Decision 

## Flow Chart

List of components and equipment needed

# Production Plan

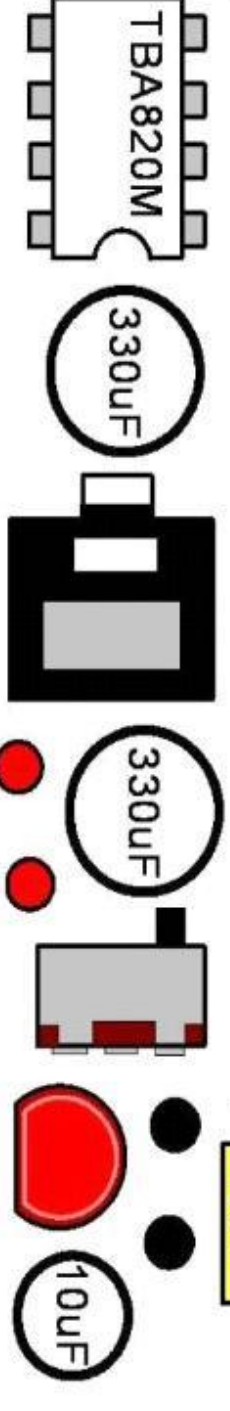
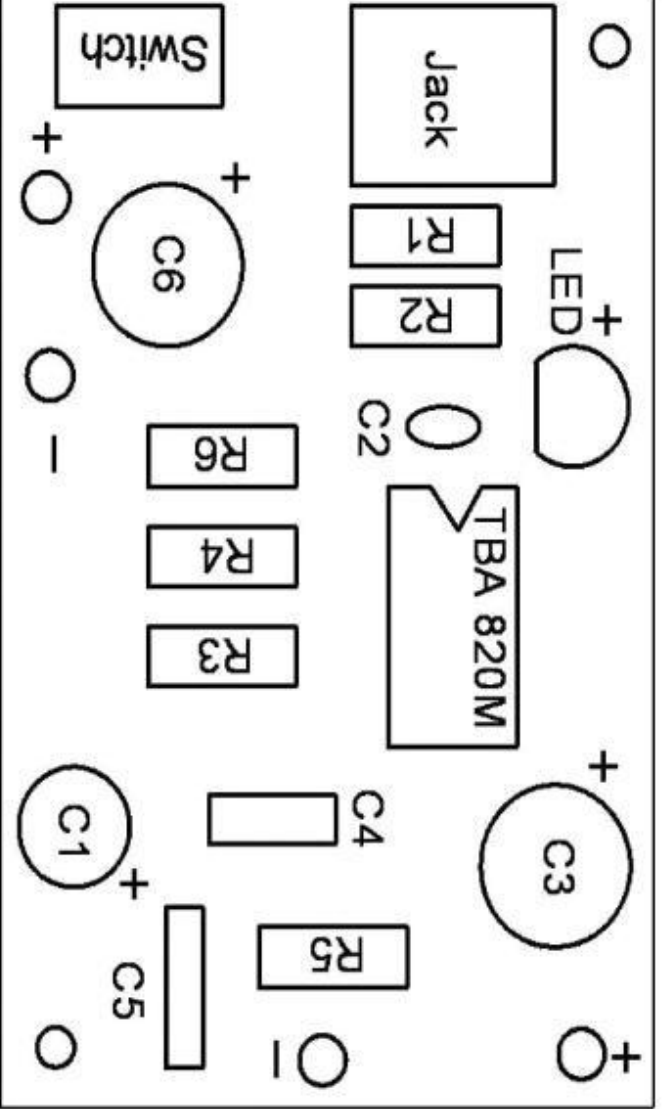
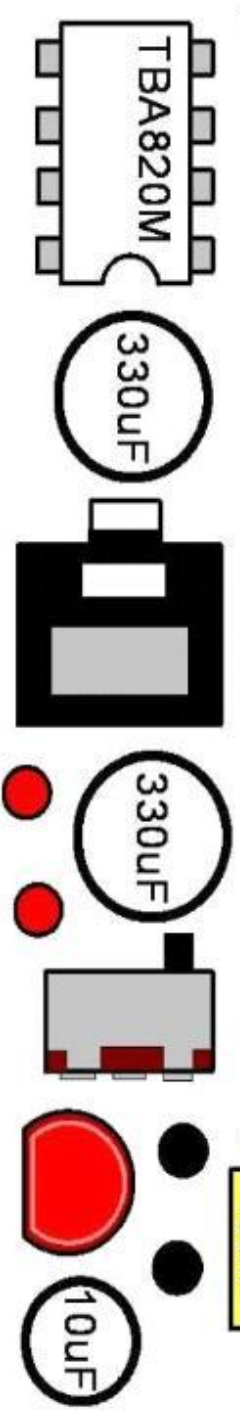
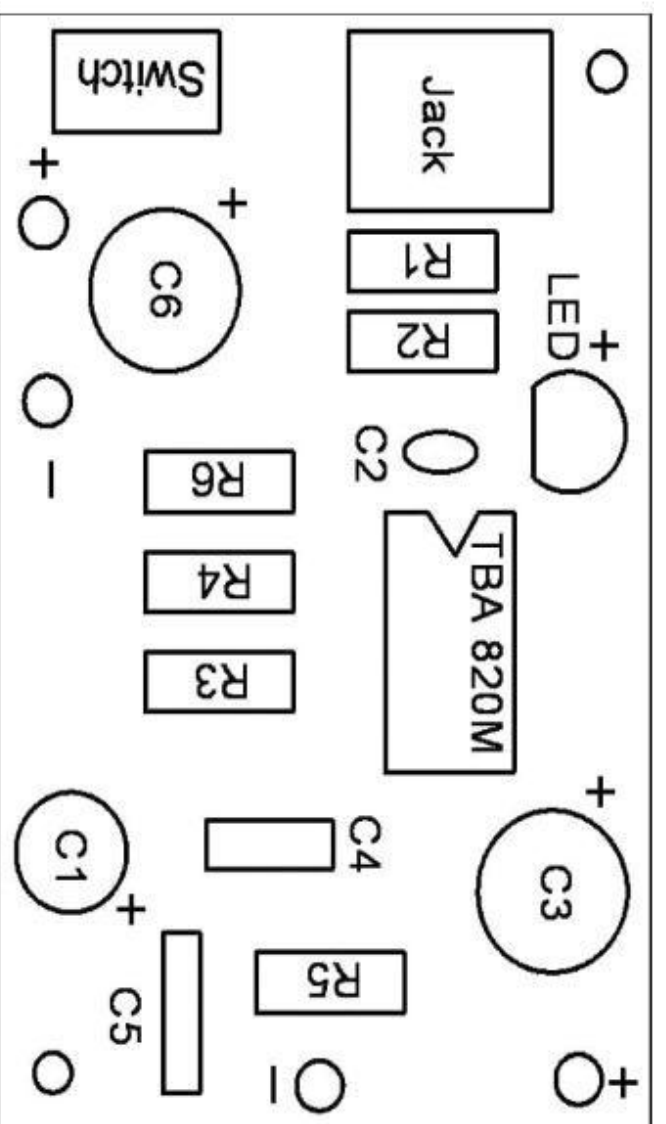
### Marking

Tick the 'what I have done' box only if you have done what is needed. The level you get must have all of the boxes above it ticked.

What I have done:	What is needed:	TA
<input type="checkbox"/>	Have you made a list of the parts and materials needed to make the product?	<input type="checkbox"/>
<input type="checkbox"/>	Does this list include the quantities (or sizes) needed?	<input type="checkbox"/>
<input type="checkbox"/>	Have you written down the things that you must do to make the product?	<input type="checkbox"/>
<input type="checkbox"/>	Is the list of things to do in the right order?	<input type="checkbox"/> <b>3</b>
<input type="checkbox"/>	Have you listed the tools needed for every task?	<input type="checkbox"/> <b>4</b>
<input type="checkbox"/>	Is the list of tools to use correct?	<input type="checkbox"/> <b>5</b>
<input type="checkbox"/>	Are there safety notes for each task, where needed?	<input type="checkbox"/> <b>6</b>
<input type="checkbox"/>	Have you listed the tools or processes that could be used if your first choice is not available?	<input type="checkbox"/> <b>7</b>
<input type="checkbox"/>	Have you listed the tools or processes that could be used if you had to make large quantities of your product?	<input type="checkbox"/>
<input type="checkbox"/>	Have you included the times needed to carry out the main stages?	<input type="checkbox"/>

Name: \_\_\_\_\_ Date: \_\_\_\_\_

T.Gp \_\_\_\_\_



## Year 9 – Electronic Products

### Amplifier Circuit

#### Homework Tasks

- 1) Research Task: Speaker Drivers. How are they assembled and how do they work. What products would you find them in?
- 2) Learn the names and functions of the components that will be used in the Amplifier Circuit.
- 3) Health and Safety Task. (Poster related to Soldering activity)
- 4) Learn the circuit symbols of the components that will be used in the Amplifier Circuit
- 5) Resistance Calculation: Using the resistance colour wheel, calculate the resistance value of each resistor.
- 6) Revise Key Words and Technical Definitions used in the project so far.
- 7) Produce flowchart for the manufacture of the circuit. Include all components in correct order, Quality Control measures, Health and Safety. Must be produced using Microsoft Office or similar.
- 8) Revise for end of unit test.
- 9) Complete Project Evaluation.