



# AIRFLOW CONTROLLER

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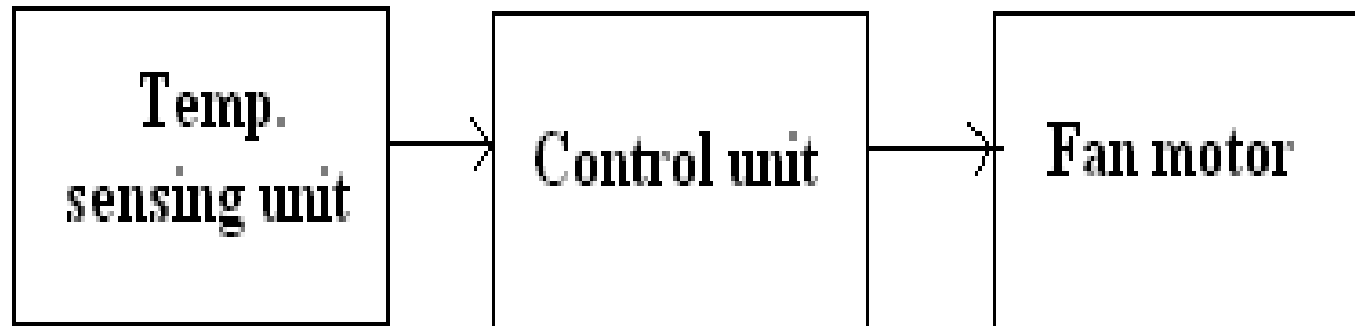
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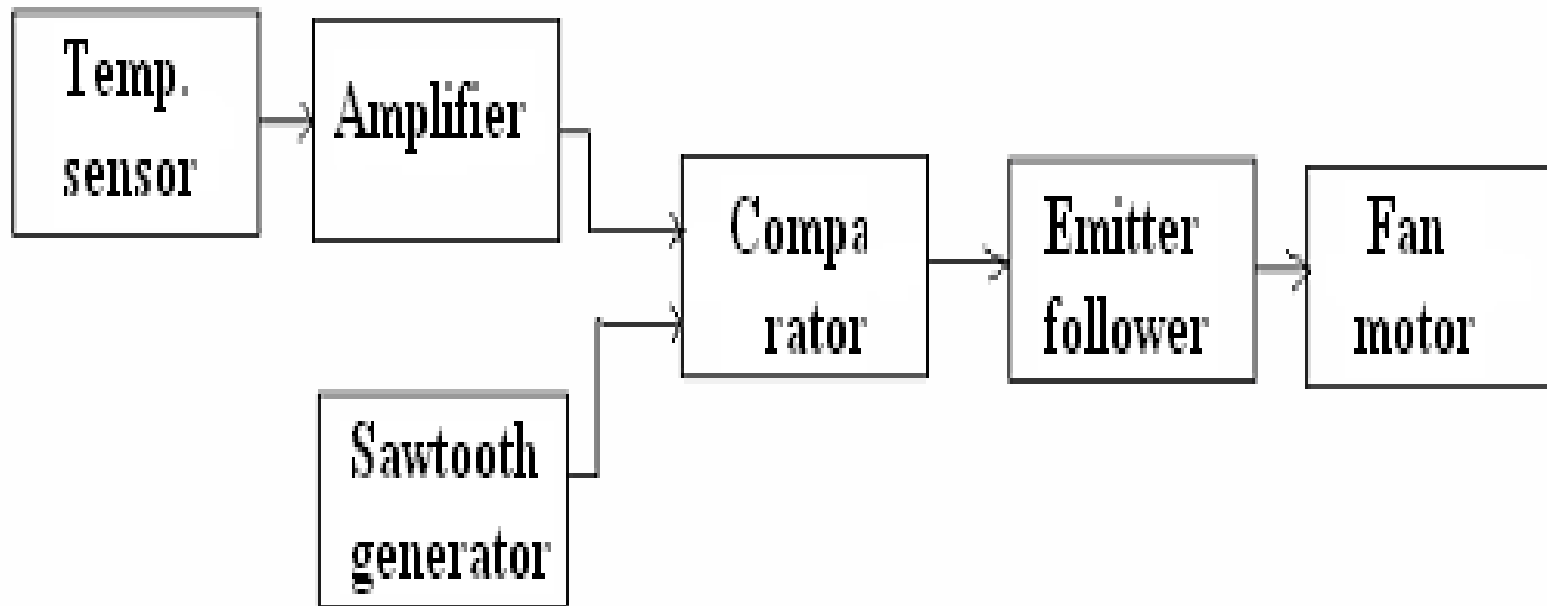


# INTRODUCTION

The project aims to build a system which senses the temperature and adjust fan speed accordingly.

# BLOCK DIAGRAM

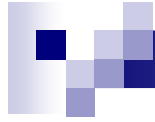






# Temperature sensor

- Senses temperature and gives a linear output
- LM 35 is used
- Measure temperature with accuracy of 0.5degree centigrade



# AMPLIFIER

- To amplify the sensor's output
- A noninverting amplifier using opamp is used with a gain of 11



# PWM GENERATOR

- Two parts
  - Sawtooth wave generator
  - Comparator
- Sensor's amplified o/p is the modulating signal of comparator



# EMITTER FOLLOWER

- For current amplification
- Used as a voltage buffer
- Pwm wave is the input
- o/p from emitter is given to fan motor





# FAN MOTOR

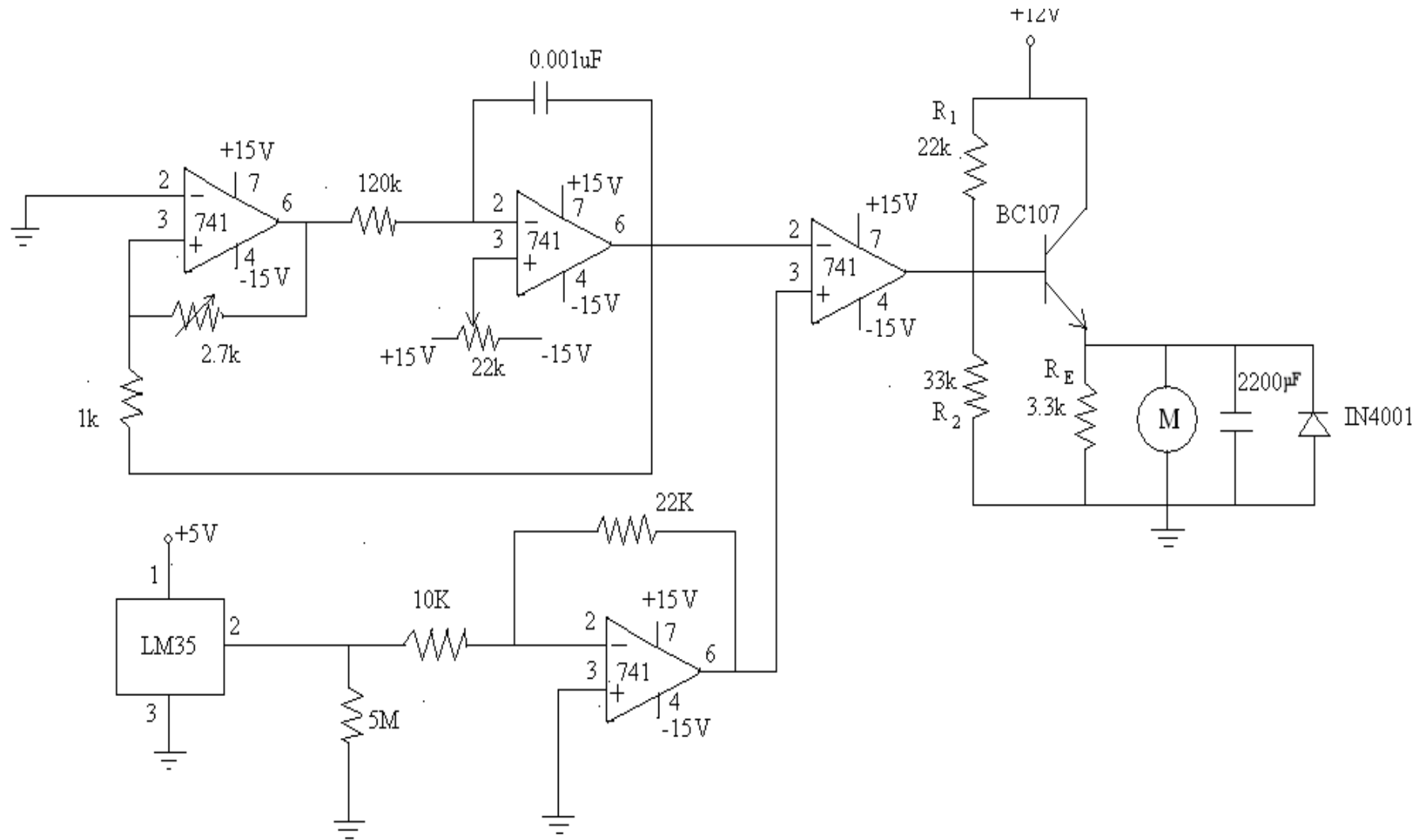
- Have a substantially continuously adjustable speed within a range of temperature
- speed at which the motor being driven is temperature related



# POWER SUPPLY

- Voltage regulator ICs LM7815, LM7915, LM7812, LM7805 are used


# CIRCUIT DIAGRAM





# WORKING

- Sensor produces an o/p with temp. variations
- the o/p in amplified form is given as modulating signal of PWM generator
- Comparing the modulating signal with the sawtooth, PWM is obtained
- Duty cycle of the PWM changes according to the temperatures being sensed

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- Power across the fan depend on PWM frequency
  - The speed of the fan will be regulated by the PWM drive signal that changes the supply across the fan
  - varying the duty cycle of this PWM signal modifies the fan's speed
  - At 100% duty cycle the fan run at full speed



# CONCLUSION

- Fan speed is varied for different duty cycles of PWM
- The project Air Flow controller is thus used to control the speed of the fan effectively according to temperature variation.



# ADVANTAGES

- Low cost precision device
- Low power consumption
- Longer life



# FUTURE SCOPE

- Future scope of this project lies in increasing the sensitivity of the sensors.
- A system for display of temperature and speed can be added.
- Principle can be applied in ac fans.
- Used in variety of environments like vehicles ,internal combustion engines etc.





# BIBLIOGRAPHY

- Micro electronic Circuits –Sedra and Smith
- Operational Amplifiers and Linear integrated Circuits – Coughlin R.F