AUDIO SPOTLIGHT

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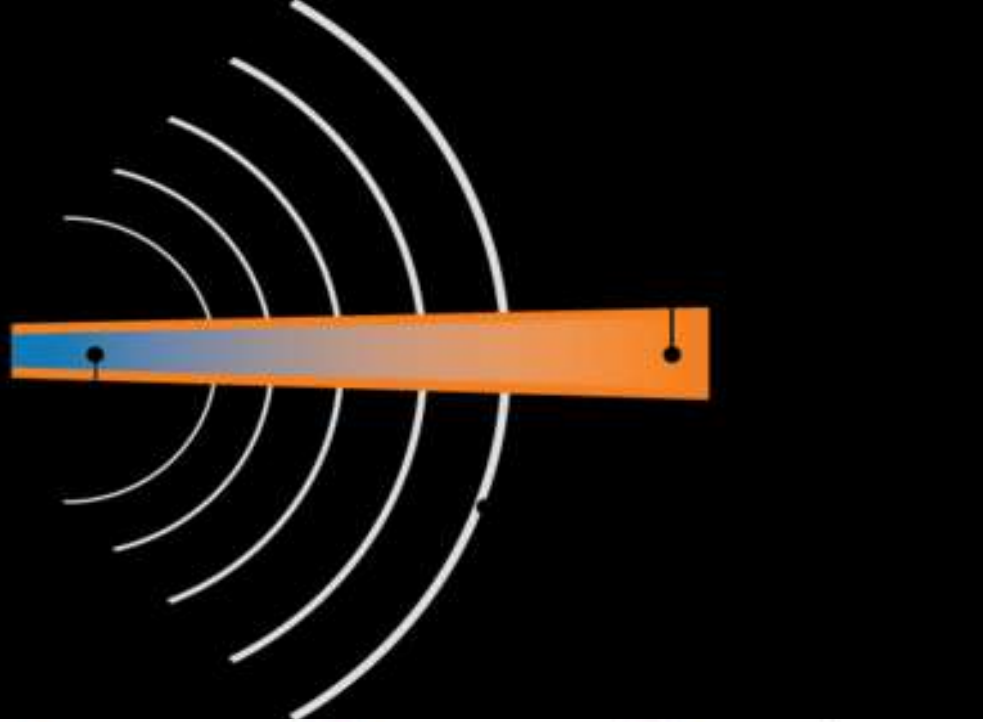
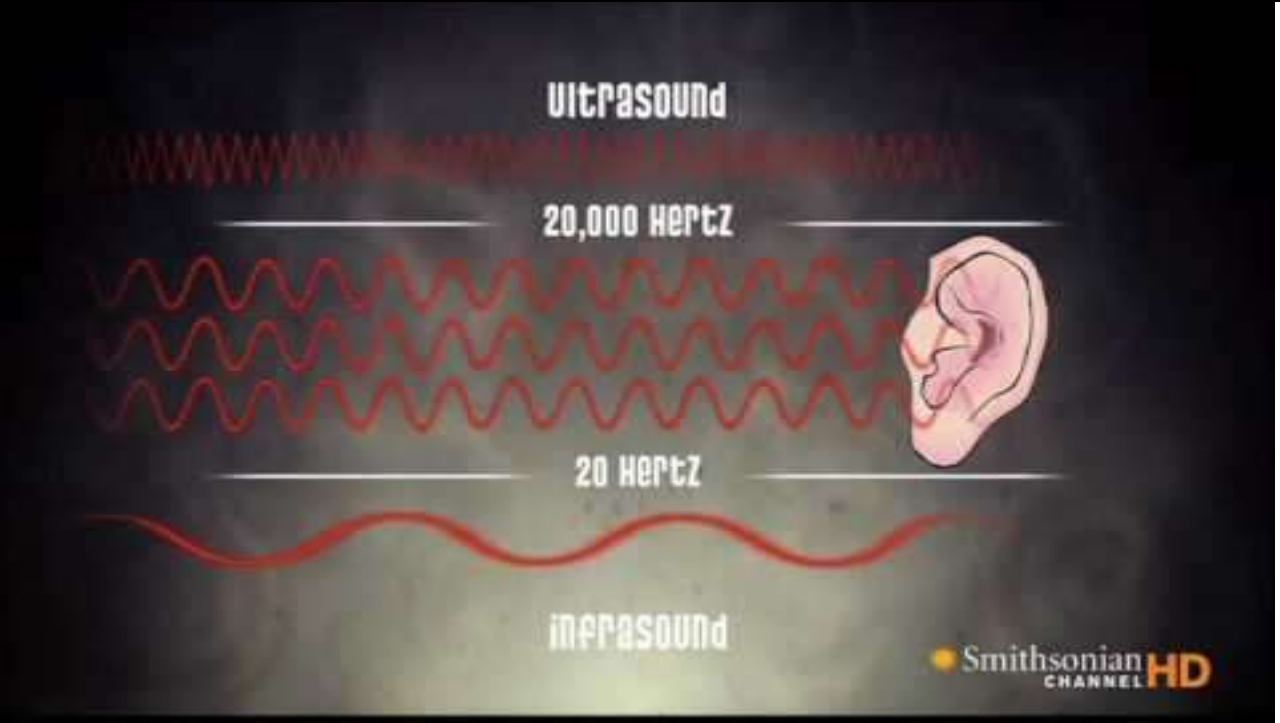
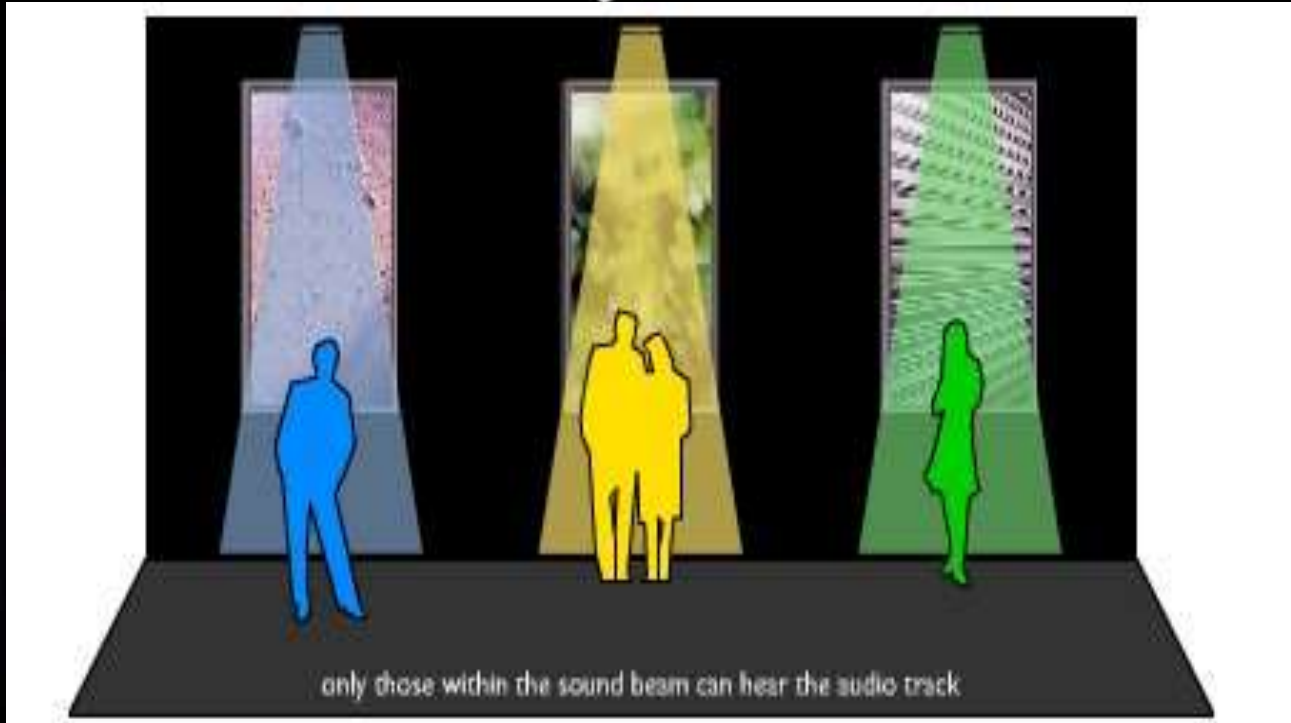
INTRODUCTION

- Audio spotlight is a very recent technology that creates a focused beams of sound similar to the light beams coming out of a flash light.
- Specific listeners can be targeted with sound without others nearby hearing it.
- It makes use of non linearity property of air.


AUDIO SPOTLIGHT



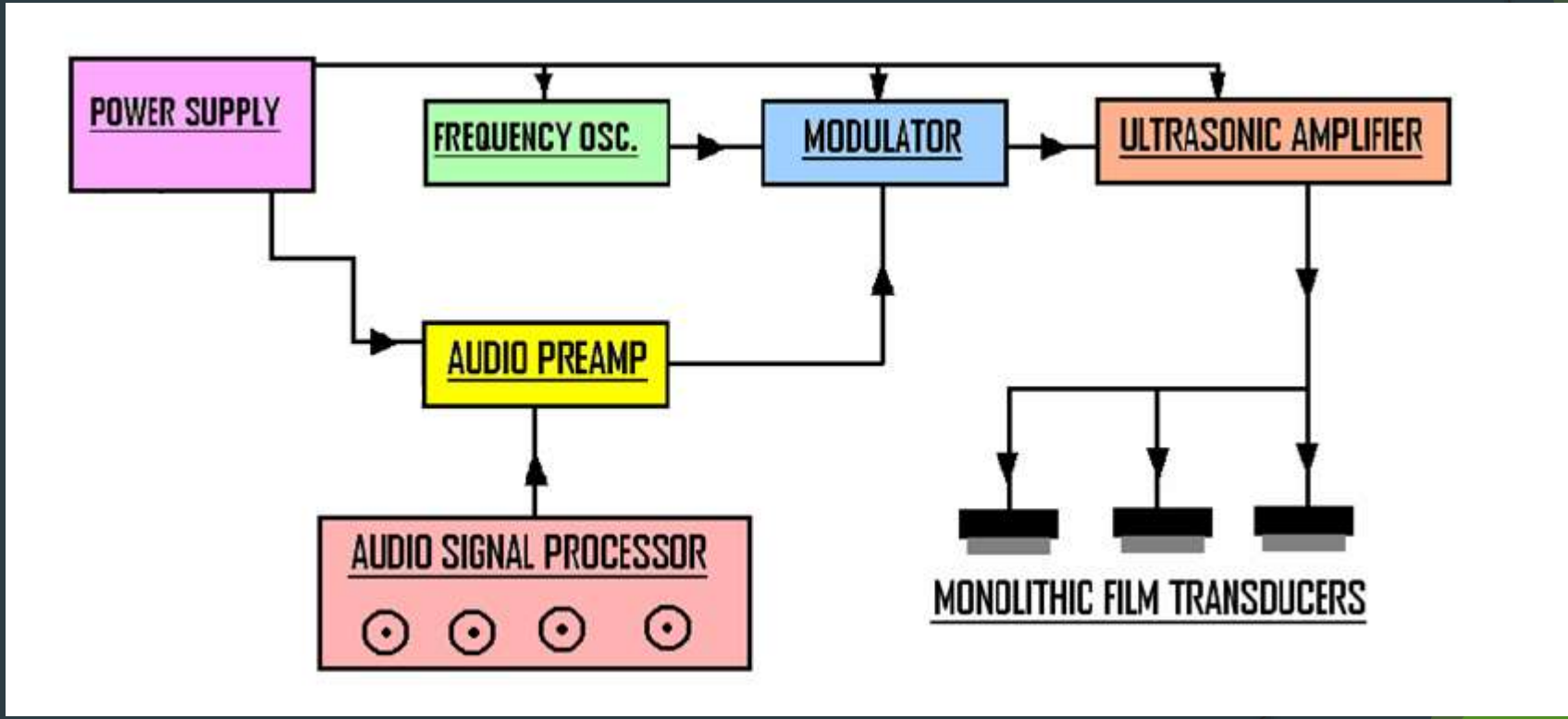

Ultrasound
20,000 Hertz
20 Hertz
Infrasound
Smithsonian CHANNEL HD


only those within the sound beam can hear the audio track

BASIC WORKING PRINCIPLE

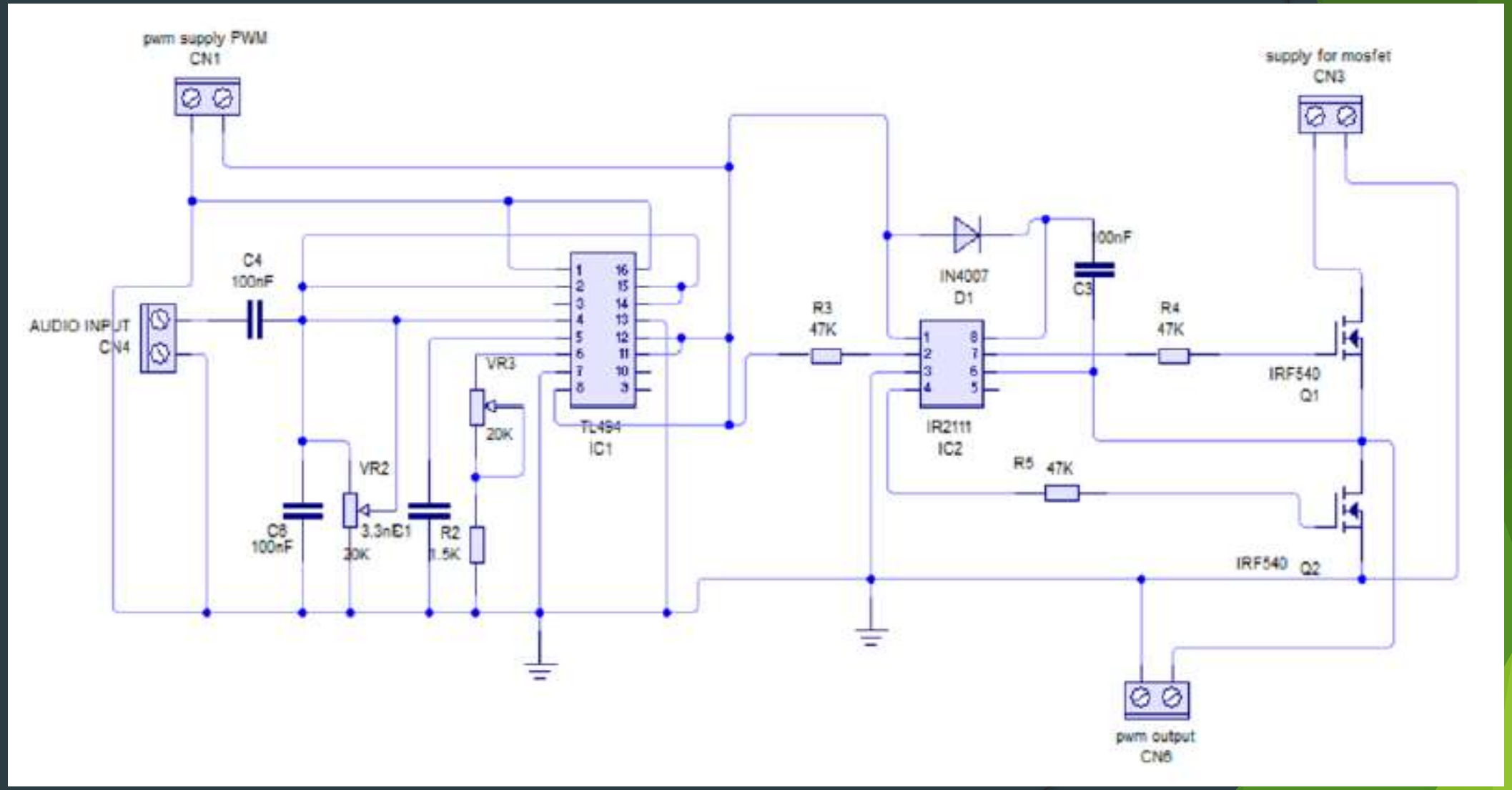
- The ultrasound has wavelengths only a few millimeters long, which are much smaller than the source, and consequently travel in an extremely narrow beam.
- Of course, the ultrasound, which contains frequencies far outside our range of hearing, is completely inaudible.
- But as the ultrasonic beam travels through the air, the inherent properties of the air cause the ultrasound to distort (change shape) in a predictable way.
- This distortion gives rise to frequency components in the audible band, which can be accurately predicted, and therefore precisely controlled.
- By generating the correct ultrasonic signal, we can create, within the air itself, essentially any sound desired.

BLOCK DIAGRAM

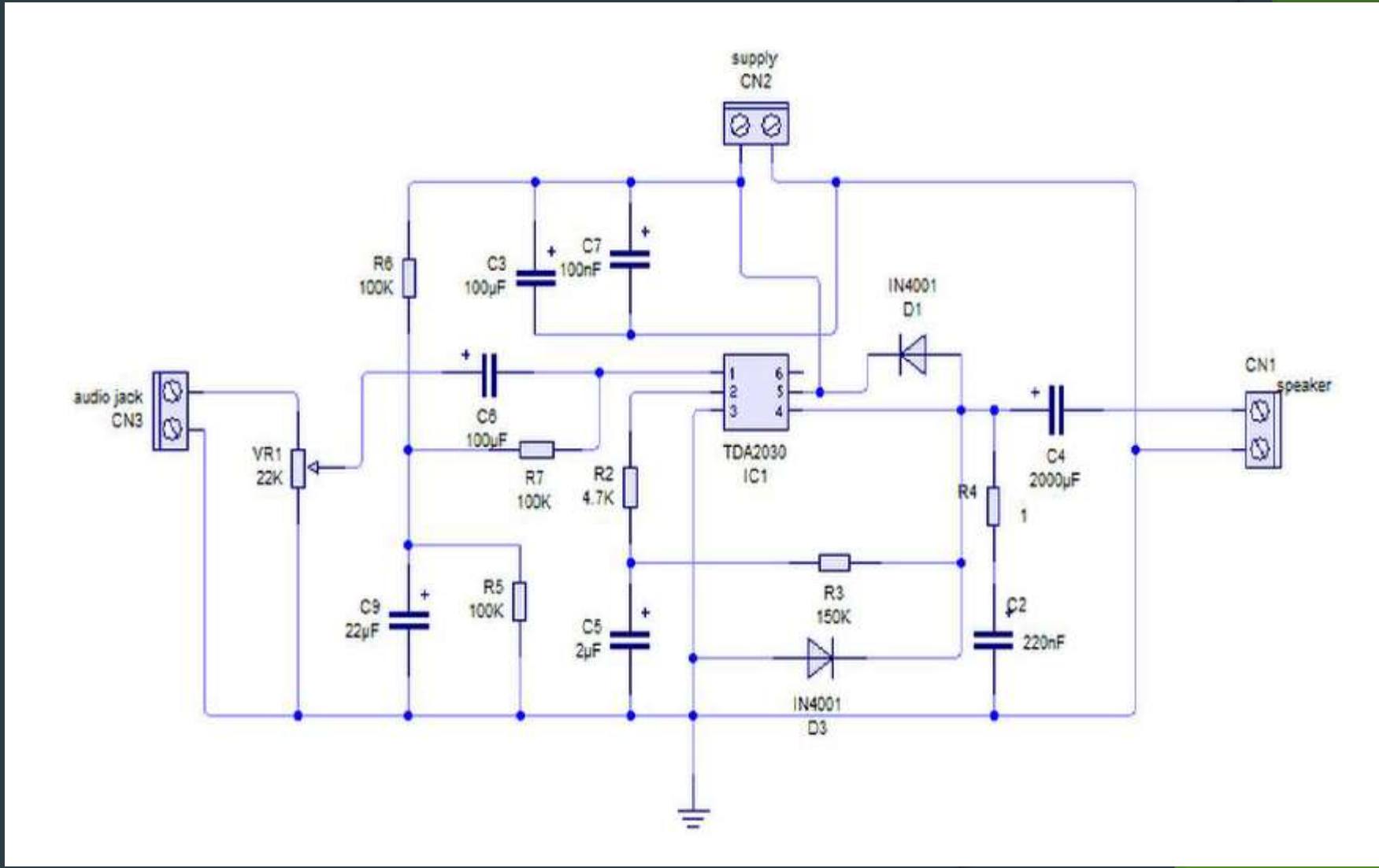


CIRCUIT DIAGRAM

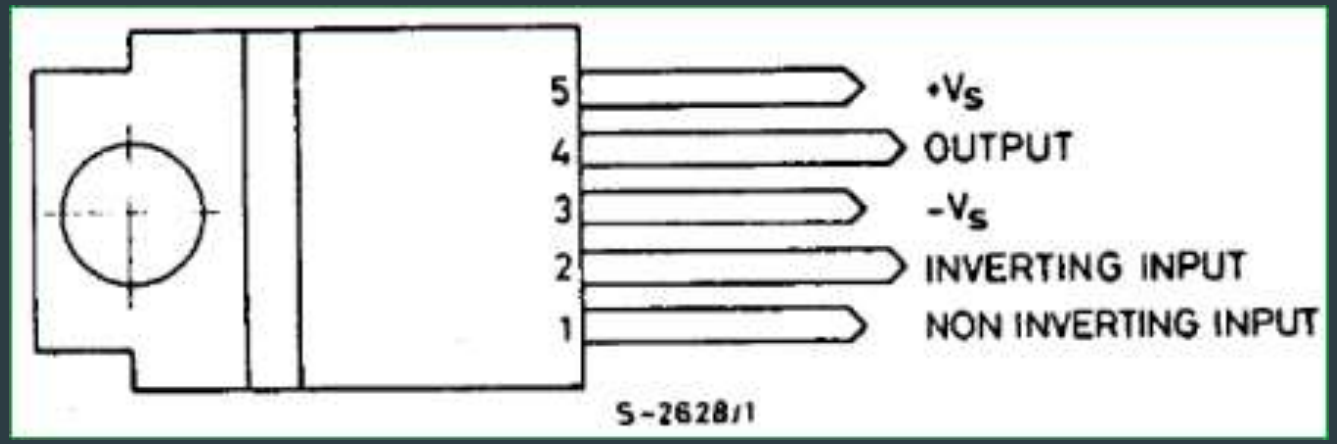
Interfacing of PWM modulator driver with Ultrasonic speaker array



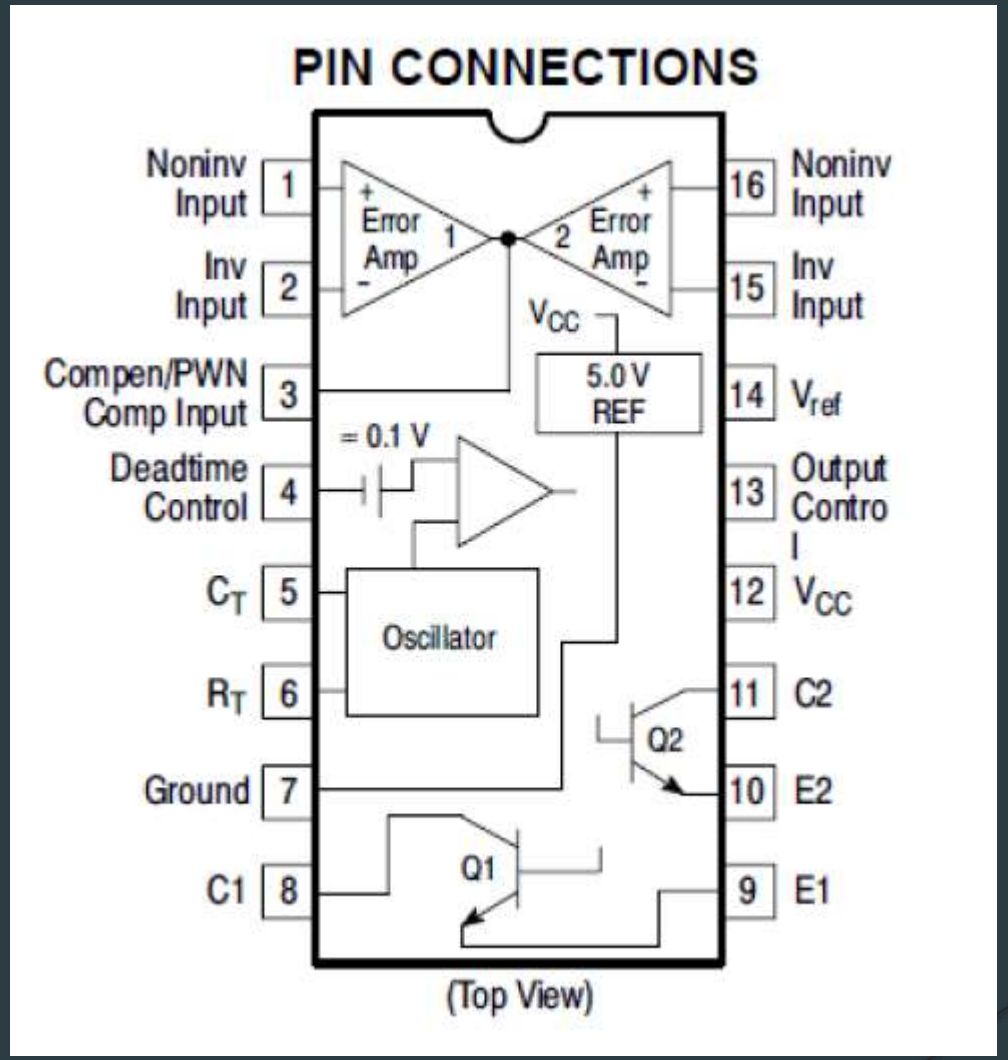
TDA2030 Implementation in PCB



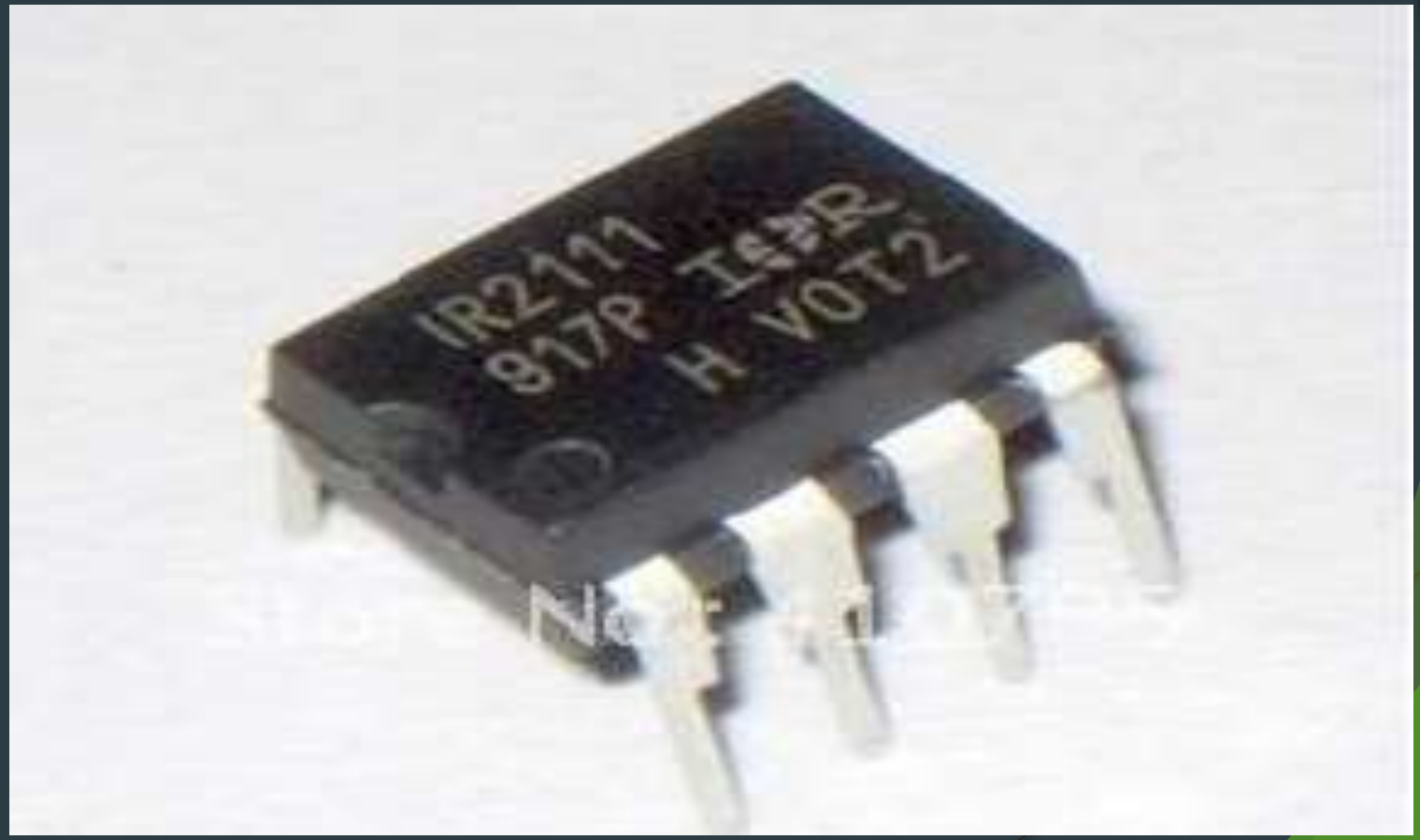
TDA 2030


5
4
3
2
1
+Vs
OUTPUT
-Vs
INVERTING INPUT
NON INVERTING INPUT
S-2628/1

IC TL494


PIN CONNECTIONS
Noninv Input
1
Inv Input
2
Compen/PWN Comp Input
3
Deadtime Control
4
C_T
5
R_T
6
Ground
7
C1
8
16
Noninv Input
15
Inv Input
14
V_{ref}
13
Output Control
12
V_{CC}
11
C2
10
E2
9
E1
Error Amp
1
Error Amp
2
V_{CC}
5.0 V REF
= 0.1 V
Oscillator
Q1
Q2
(Top View)

IR2111



Advantages of audio spotlighting

1. We can here sounds like music, speeches etc. even without disturbing others.
2. Creates highly focused beam of sound.
3. Portable.
4. Can be use in museums, by army, in theaters.

Disadvantages of audio spotlighting

1. It's costly.
2. Both speaker and amplifier are separate.
3. Maintenance is high

WORK DONE

-CIRCUIT SIMULATION (PROTEUS)

THANK YOU