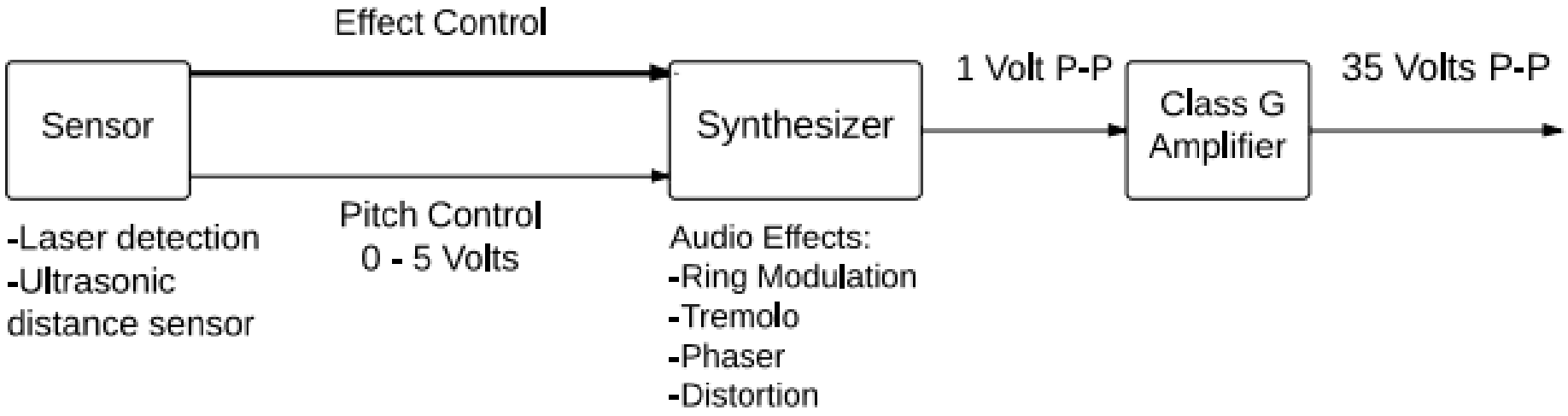
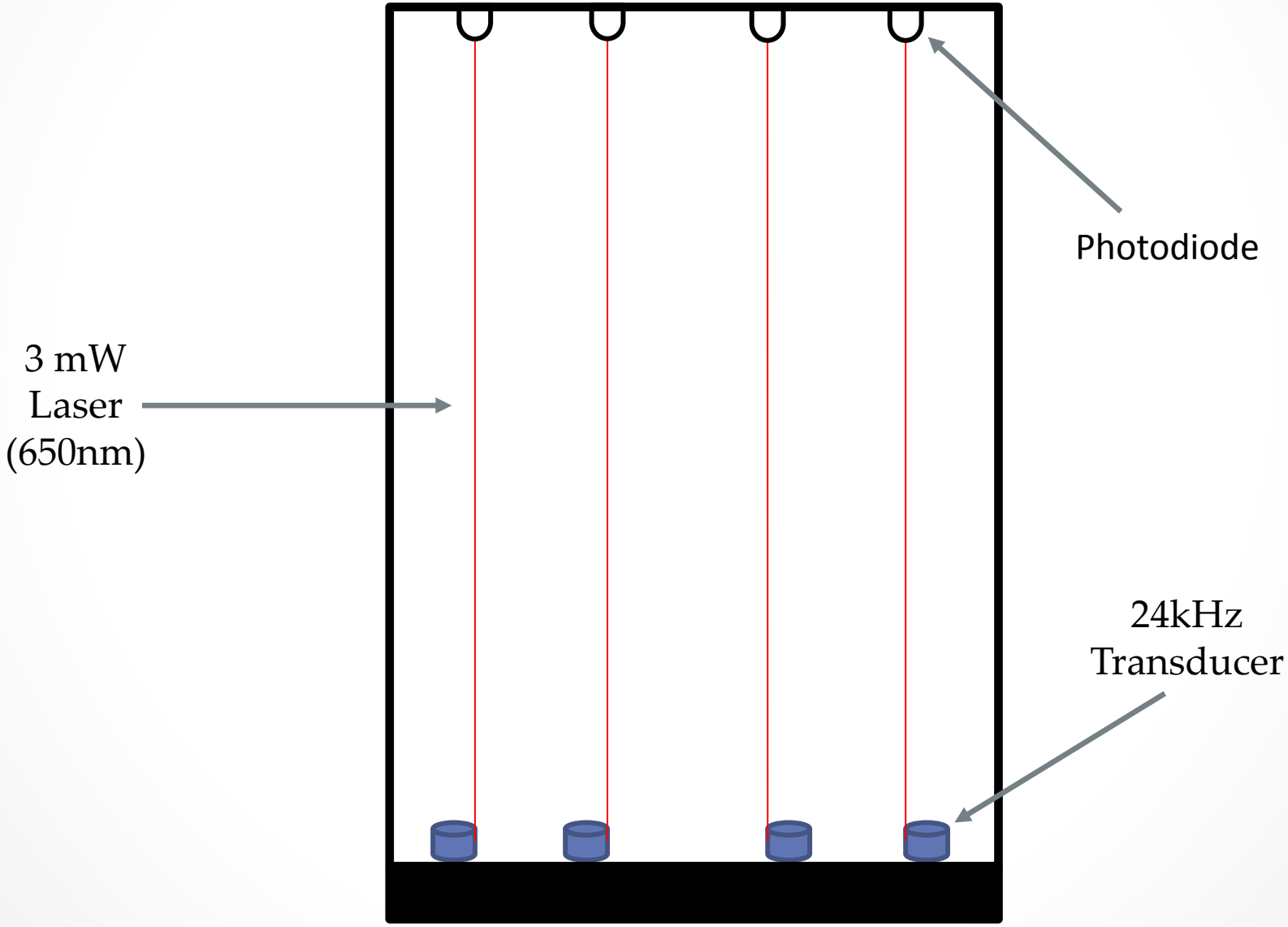
Laser Harp

JORDAN ADDISON
MATTHEW OKABUE
CHAD UYEHARA

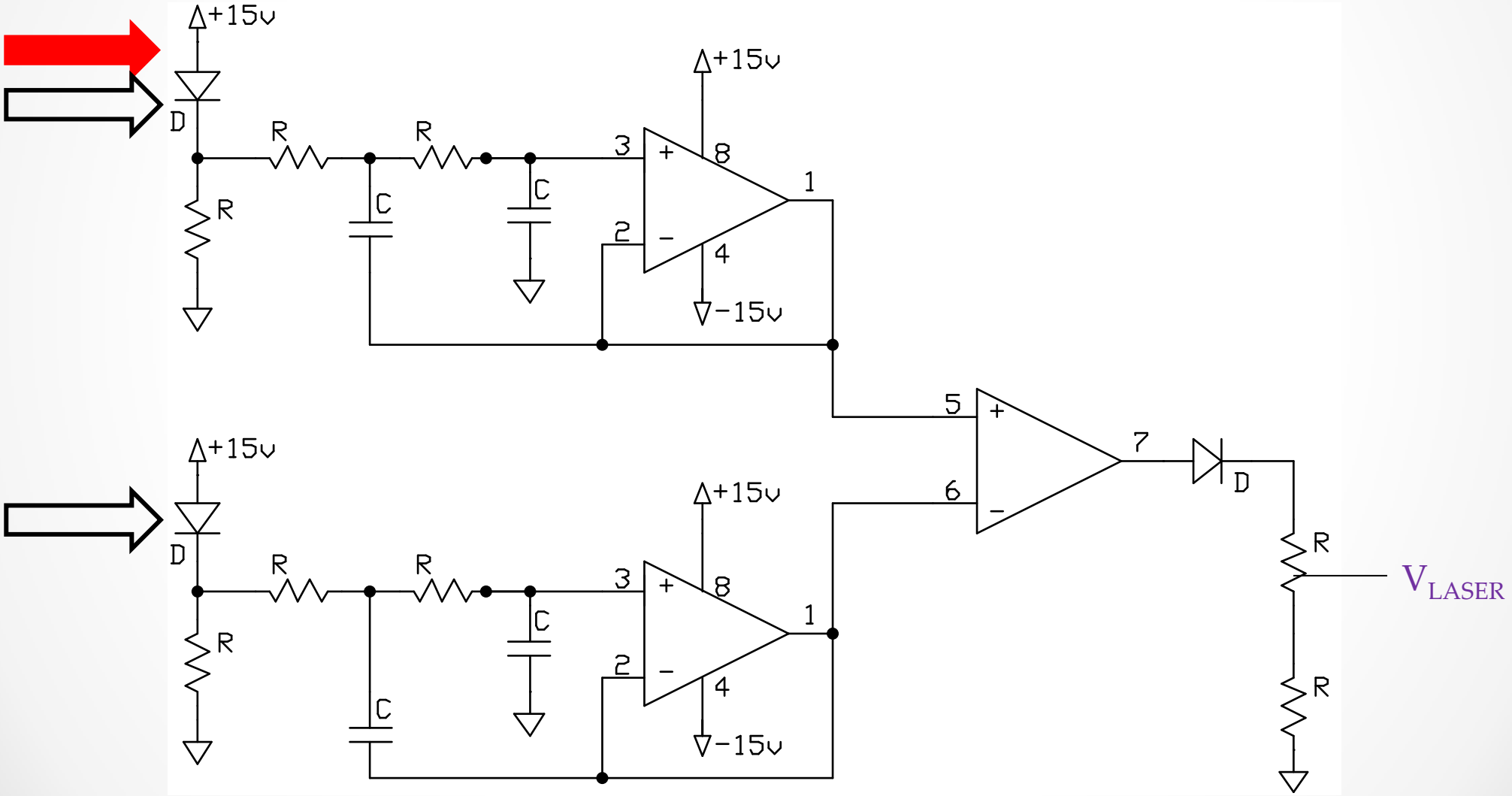
Block Diagram



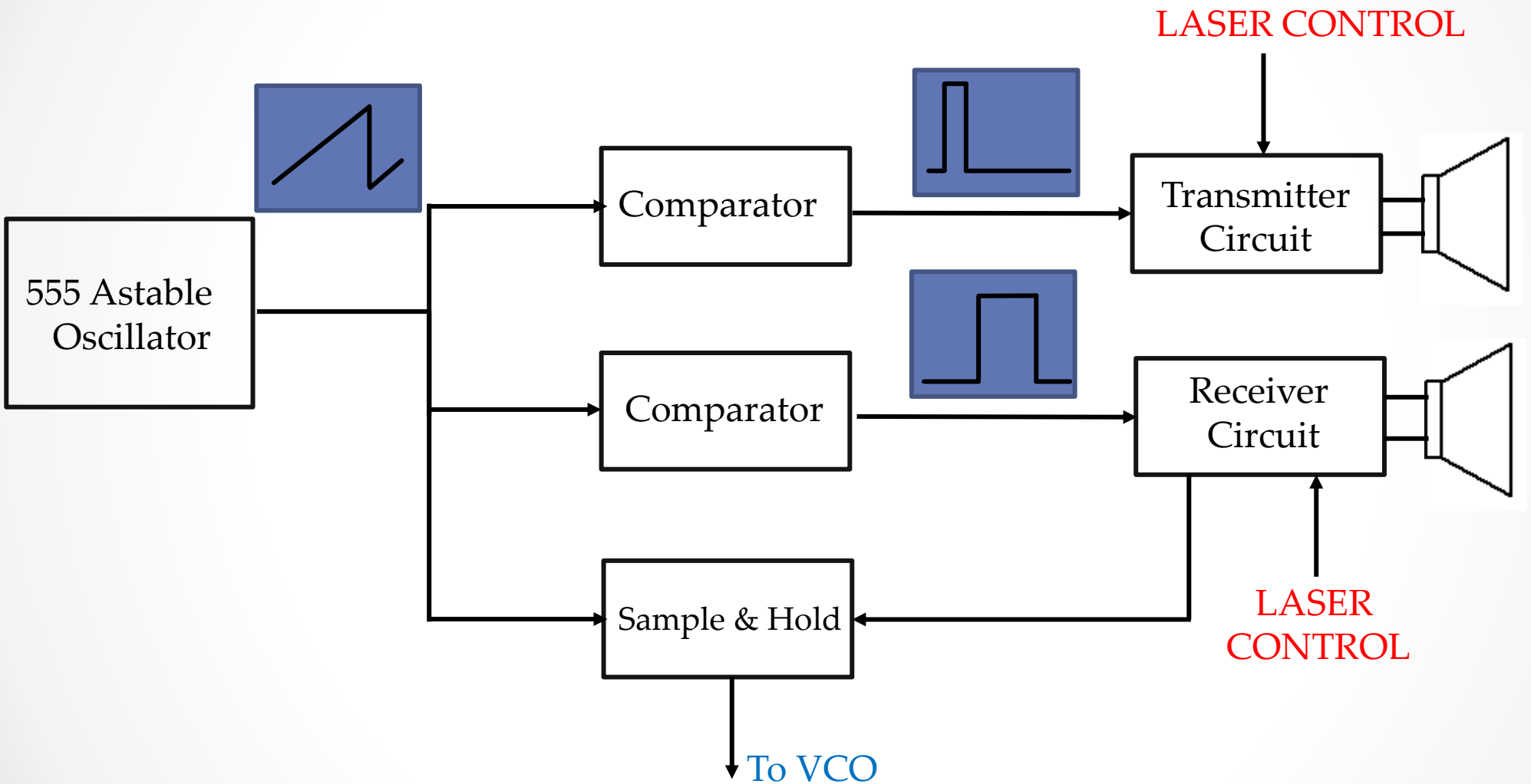
Laser Harp Diagram (Artistic Rendition)



Laser Detection Schematic



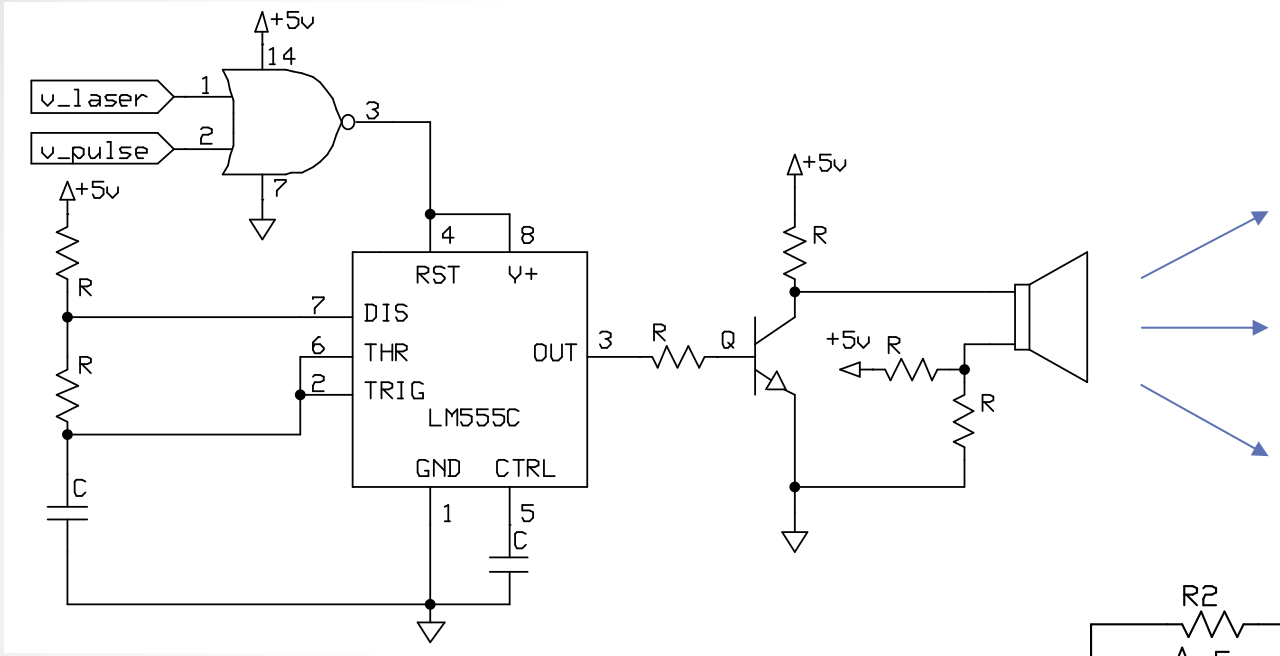
Range Finder Block Diagram



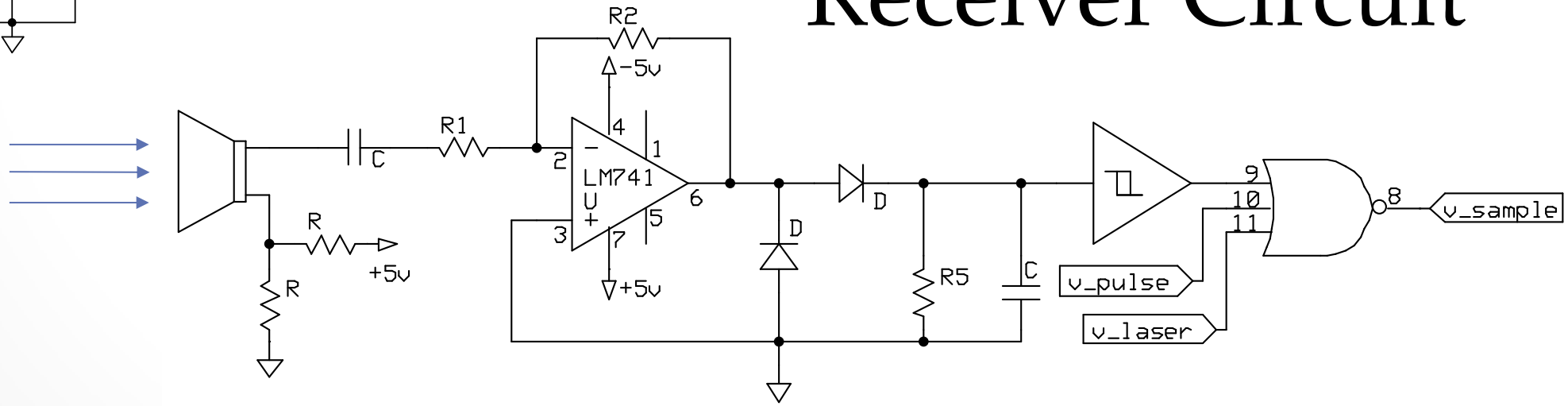
Transmitter/Receiver Waveforms

Courtesy kerrywong.com

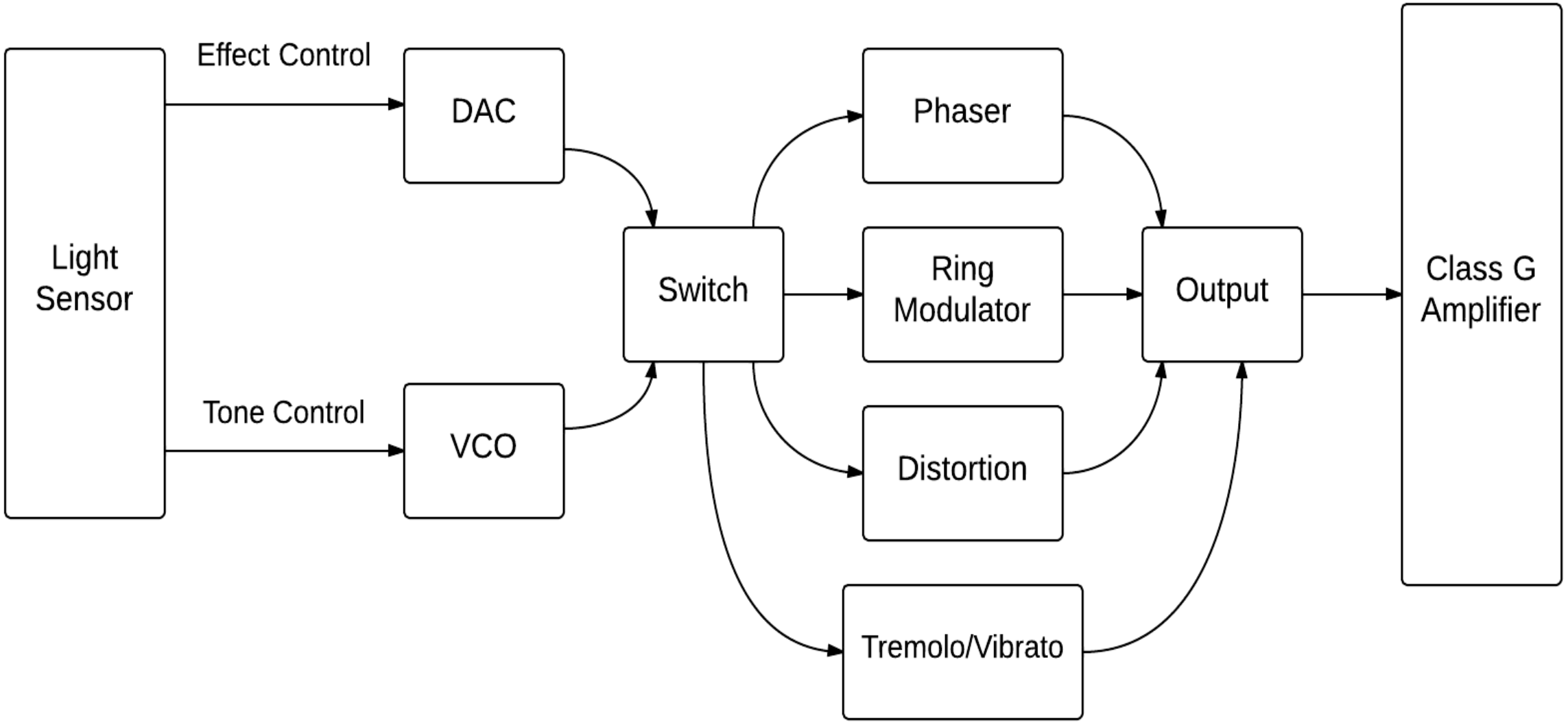
Transmitter Schematic



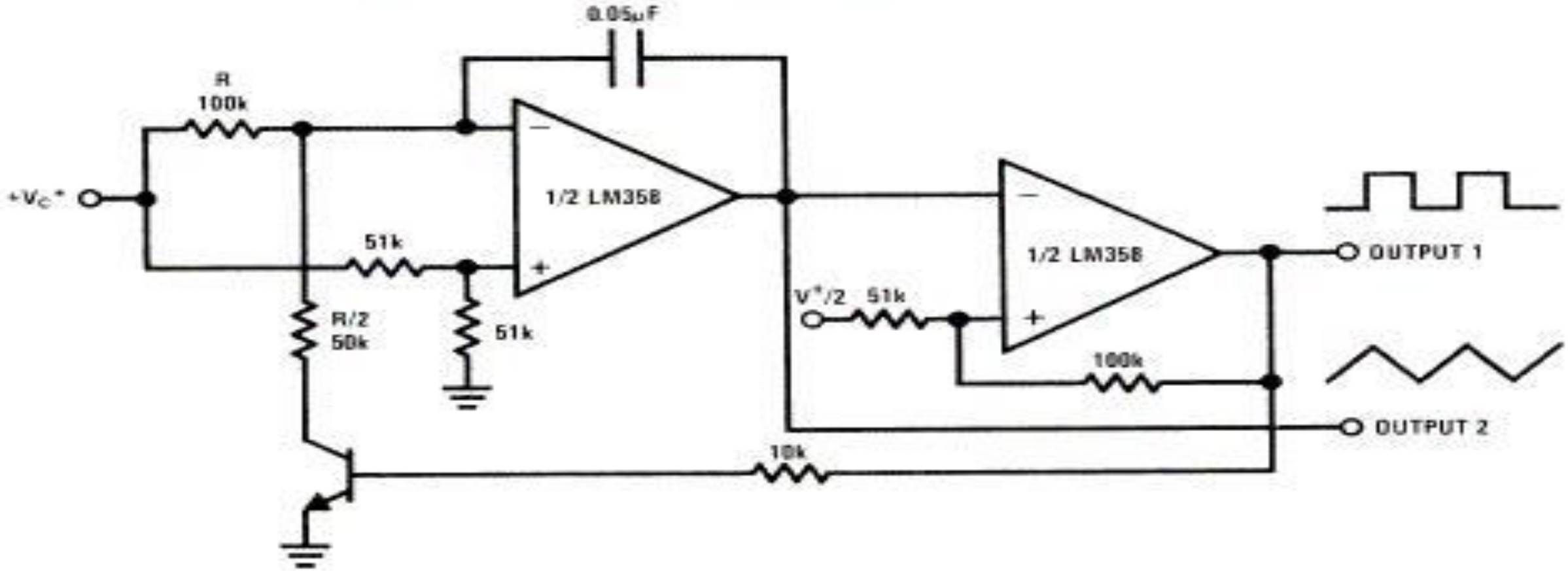
Receiver Circuit



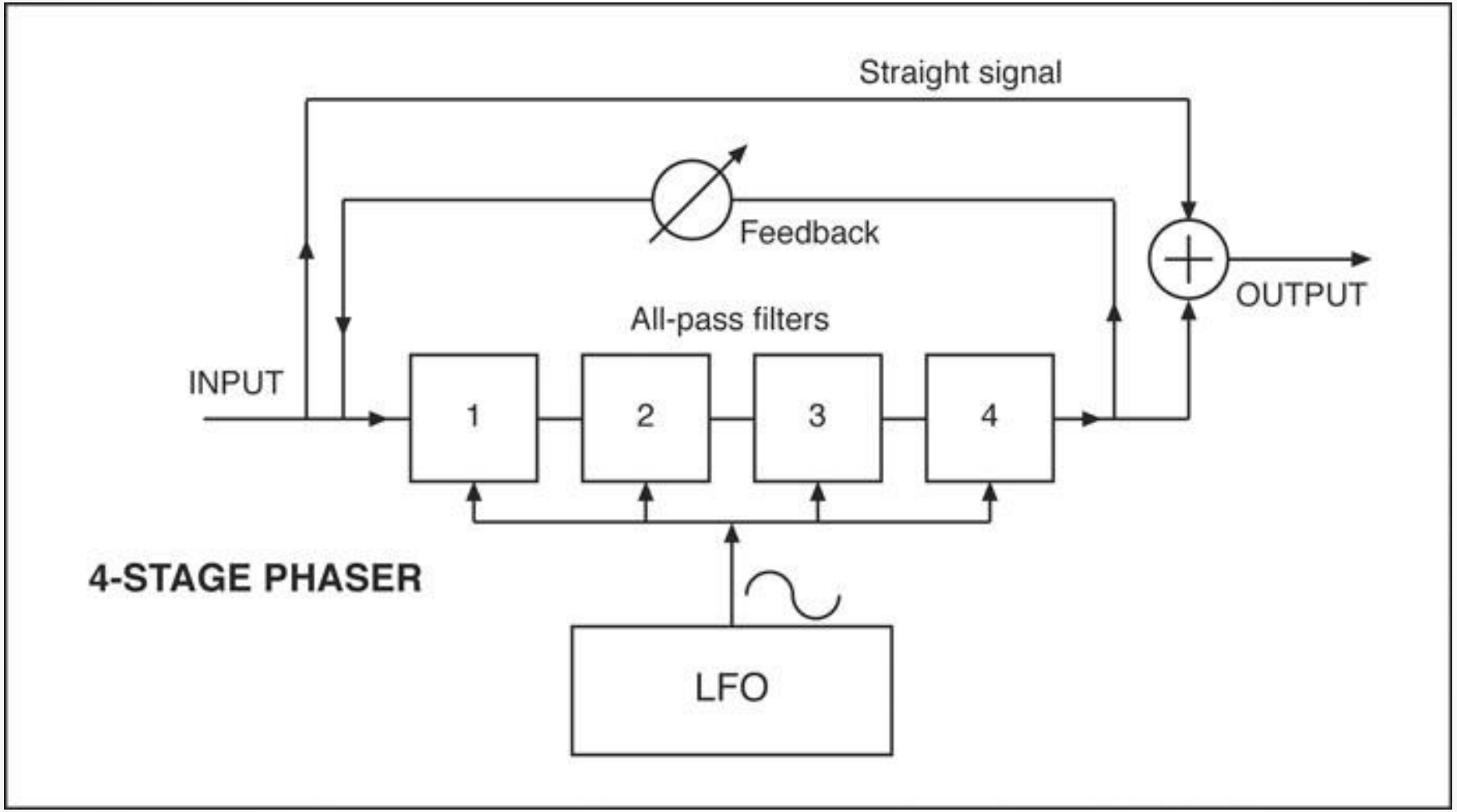
Synthesizer



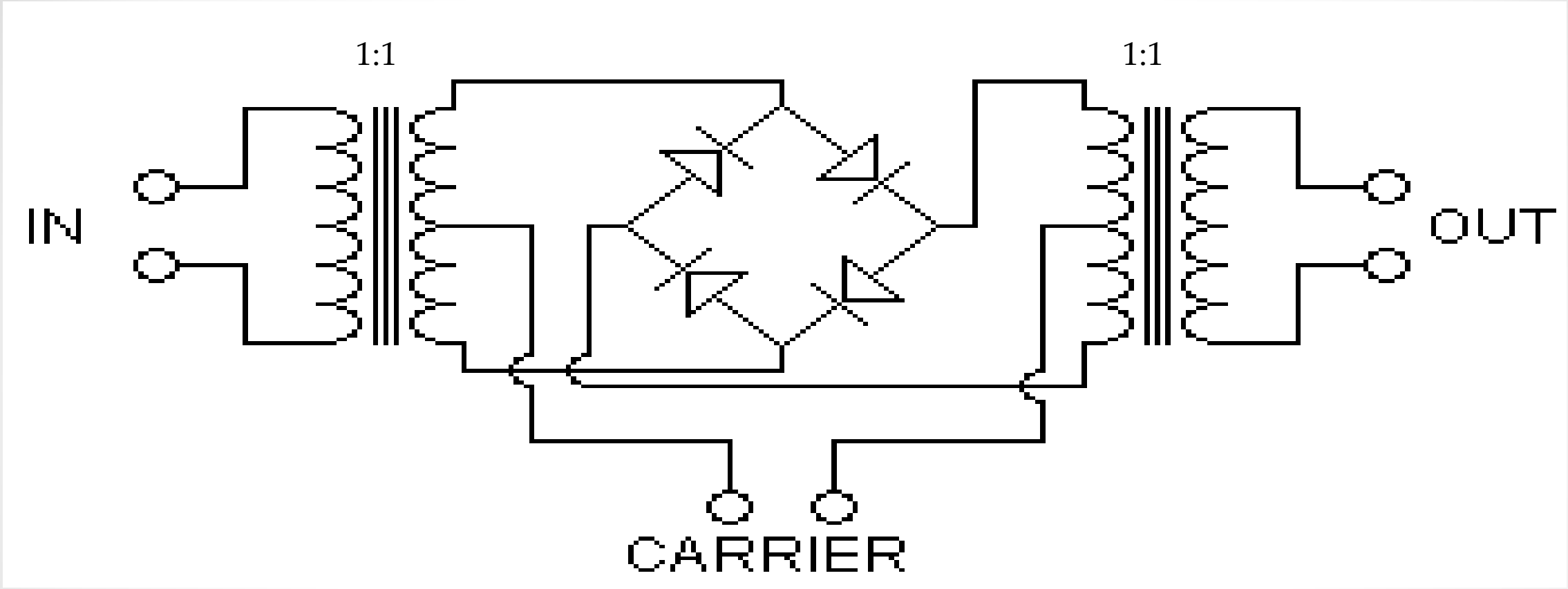
Voltage Controlled Oscillator (VCO)



Phaser

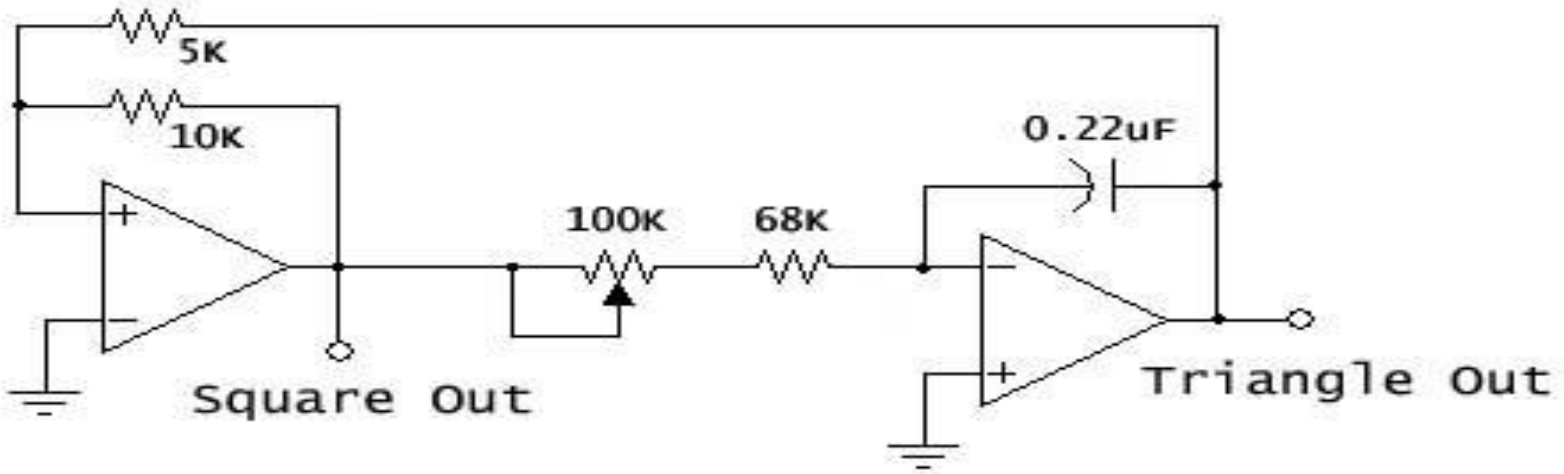

Straight signal
Feedback
OUTPUT
All-pass filters
INPUT
1
2
3
4
4-STAGE PHASER
LFO

Ring Modulator

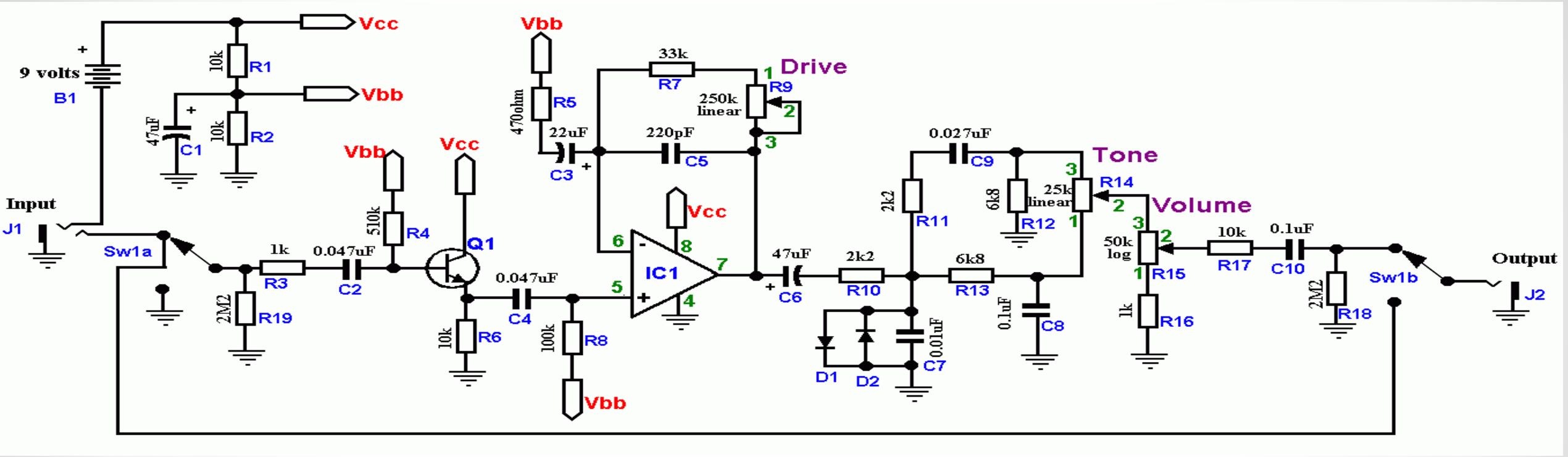


Vibrato/Tremolo

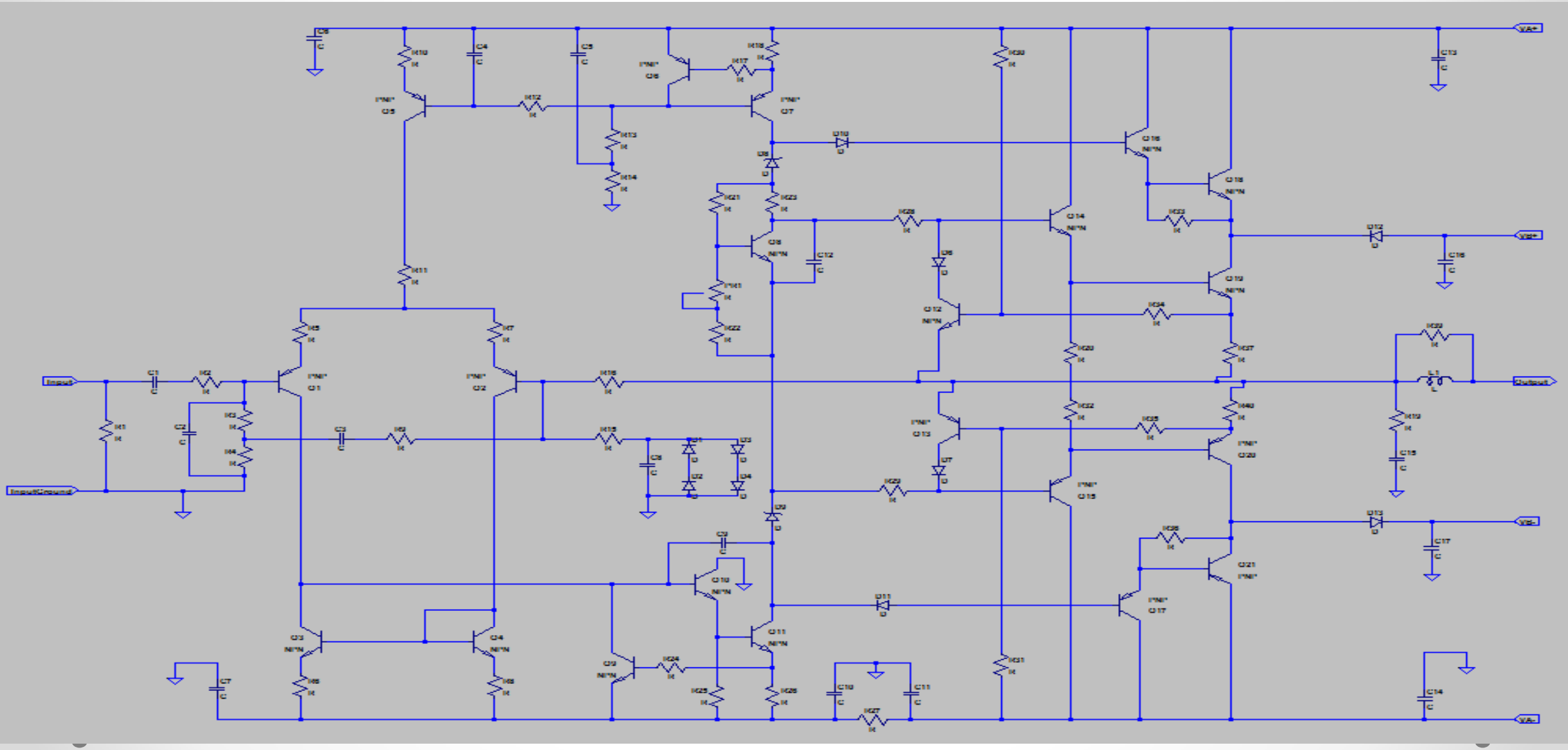
Low Frequency Oscillator



Distortion

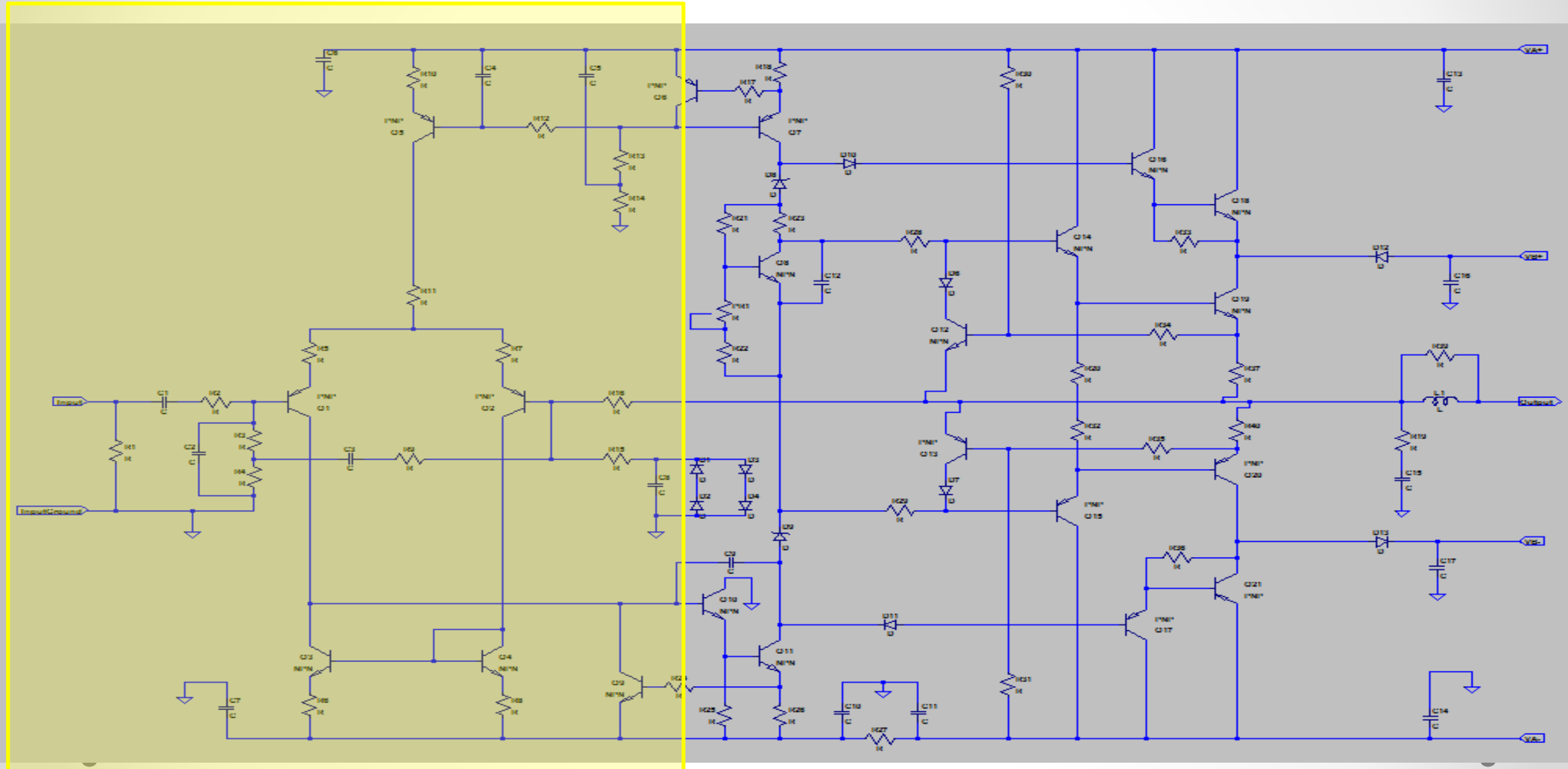

9 volts
B1
Vcc
10k
R1
Vbb
47uF
C1
10k
R2
Input
J1
Sw1a
Vbb
510k
R4
Vcc
1k
R3
0.047uF
C2
2M2
R19
Q1
10k
R6
0.047uF
C4
Vbb
470ohm
R5
22uF
C3
33k
R7
1
Drive
250k
linear
R9
2
3
220pF
C5
Vcc
6
8
7
IC1
5
4
47uF
C6
2k2
R10
D1
D2
0.01uF
C7
2k2
R11
0.027uF
C9
6k8
R12
0.1uF
C8
6k8
R13
3
Tone
25k
linear
R14
2
Volume
3
50k
log
2
1
R15
1k
R16
10k
R17
0.1uF
C10
2M2
R18
Sw1b
Output
J2

Class G Amplifier



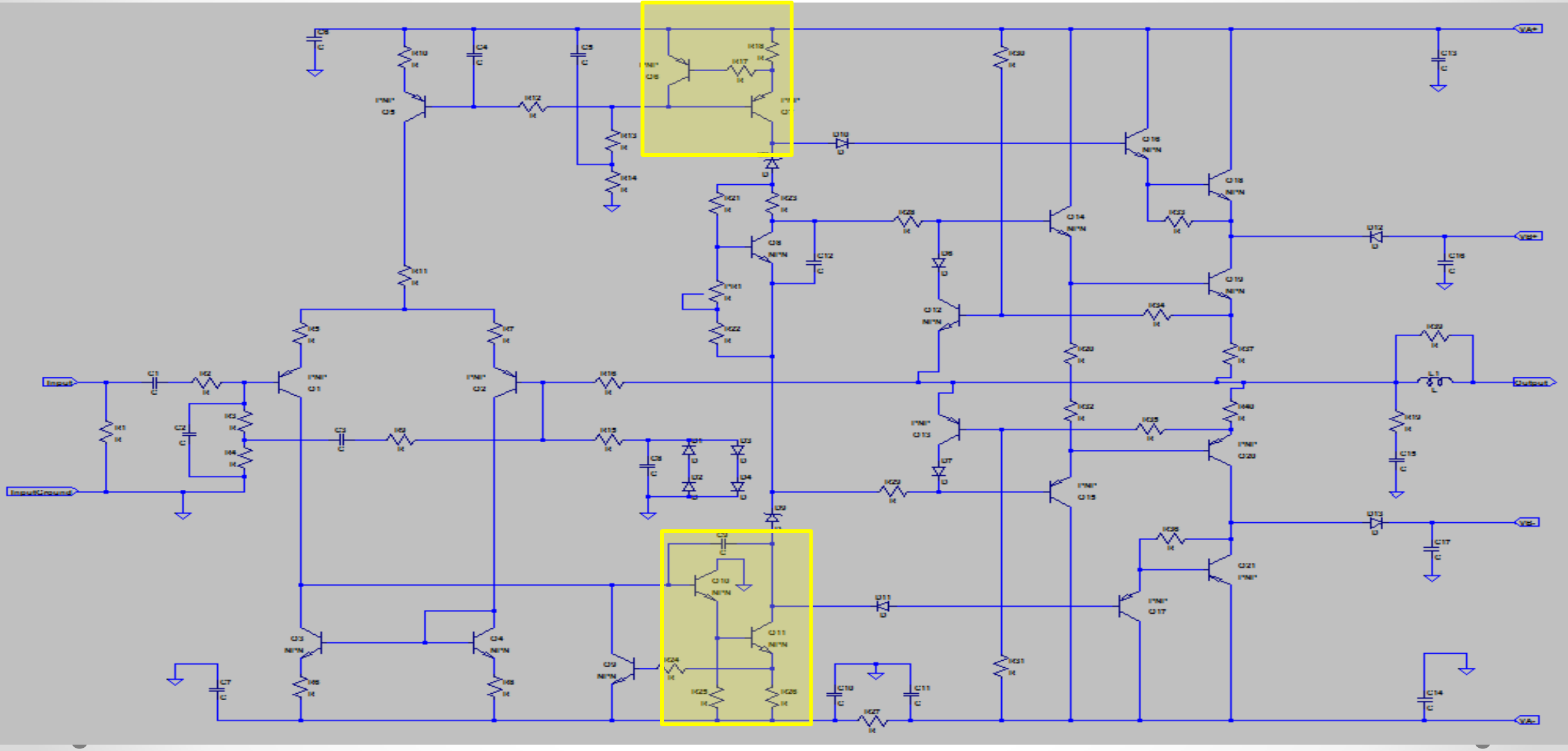
(Design from "Audio Power Amplifier Design Handbook" By Douglas Self)

Input Stage



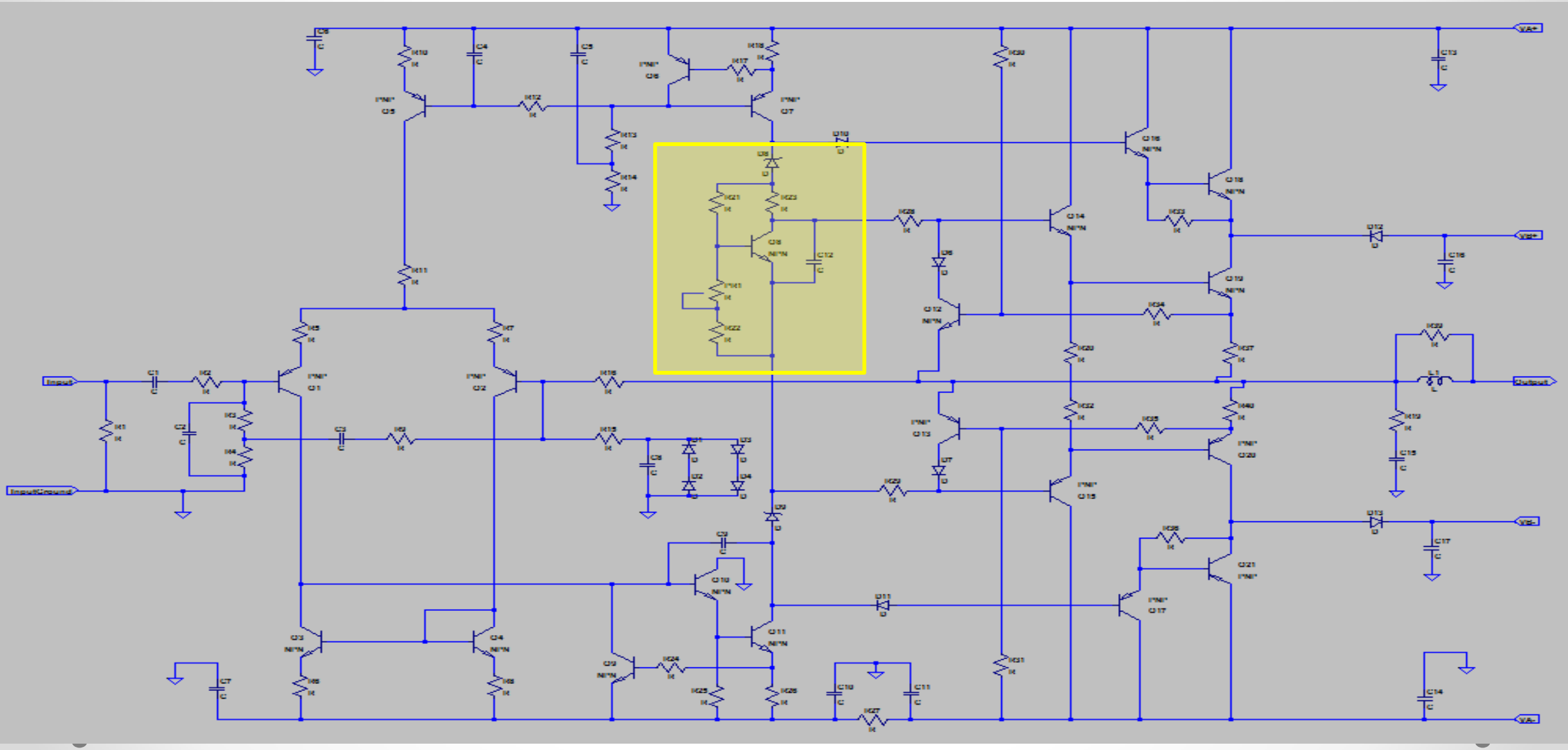
(Design from "Audio Power Amplifier Design Handbook" By Douglas Self)

Voltage Amplification Stage



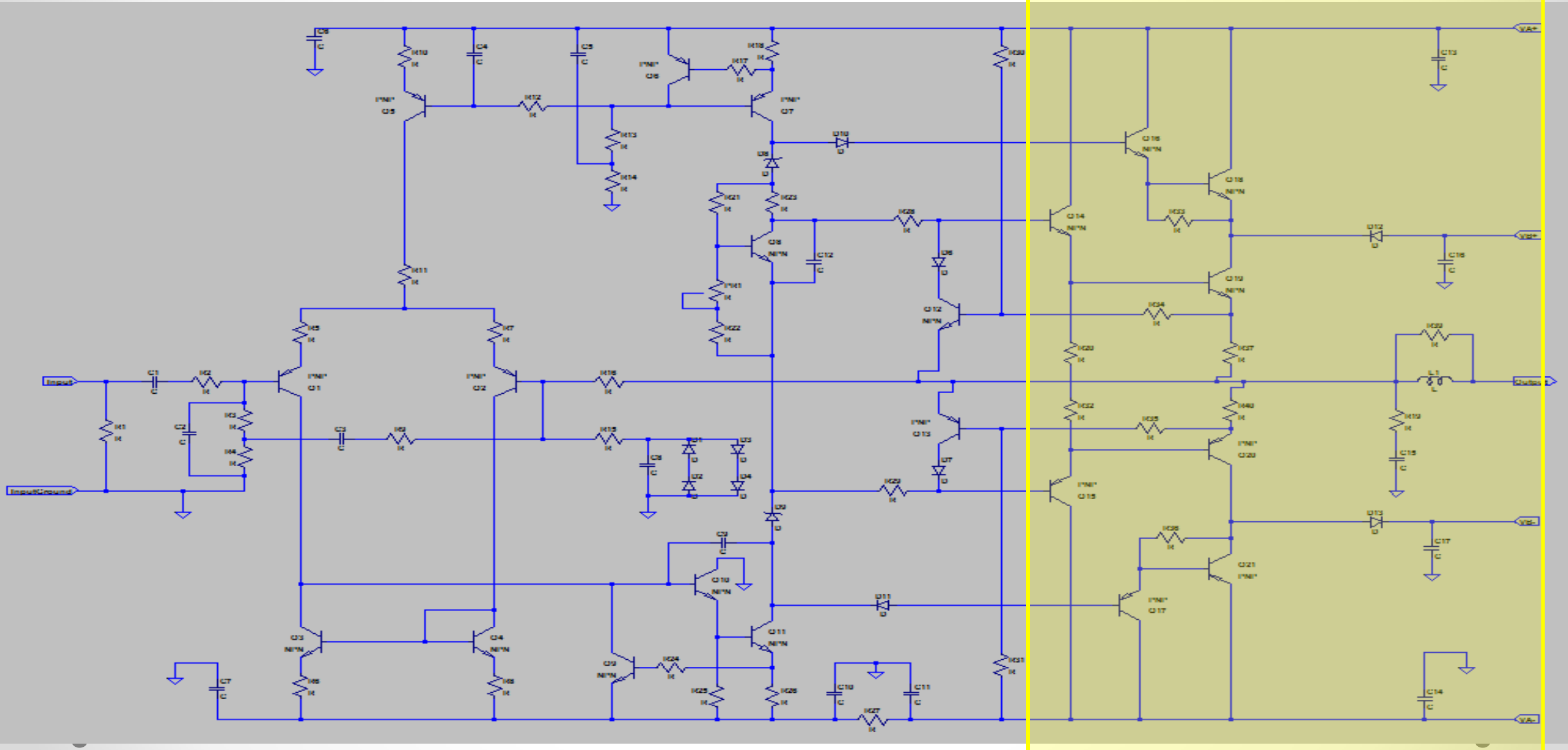
(Design from "Audio Power Amplifier Design Handbook" By Douglas Self)

Bias Servo



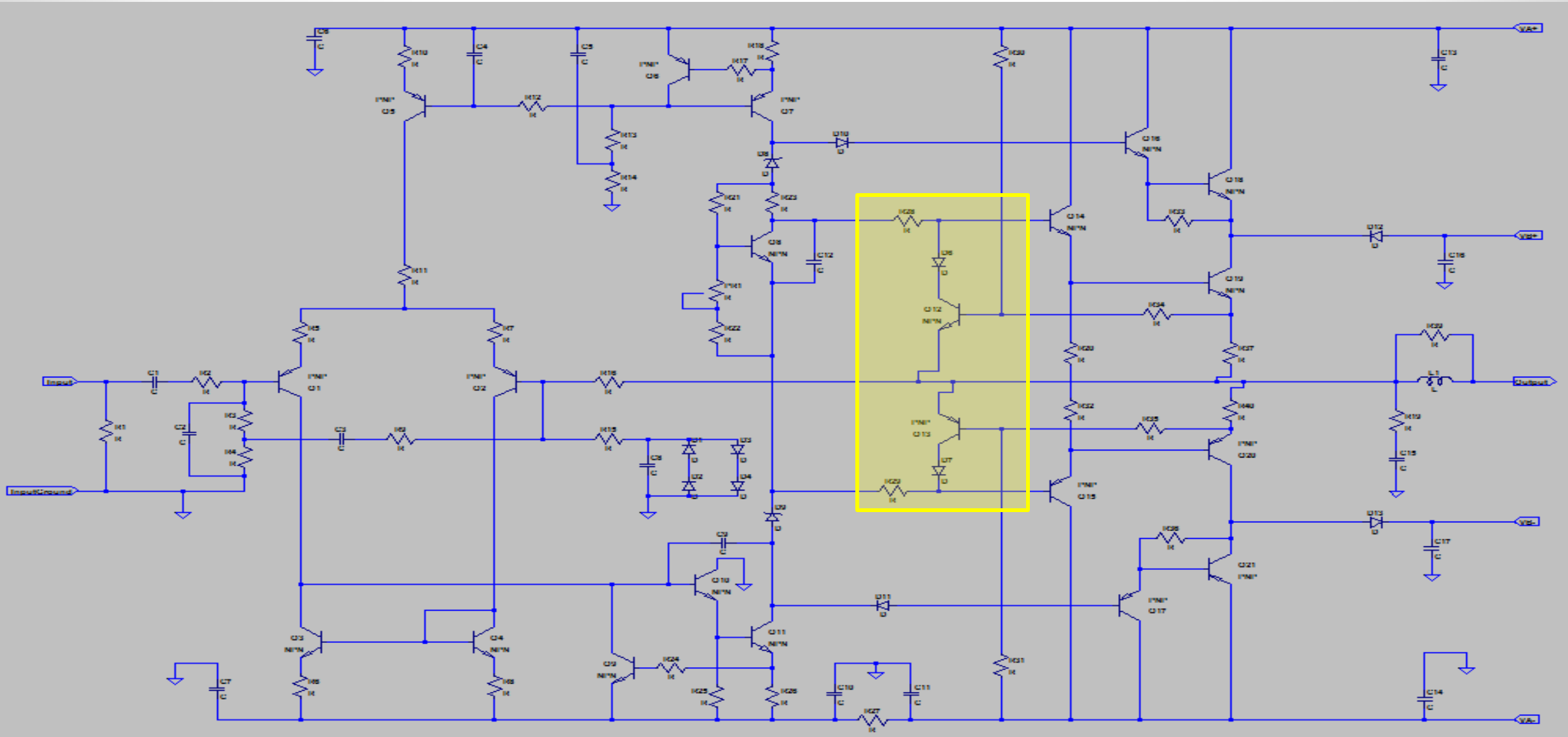
(Design from "Audio Power Amplifier Design Handbook" By Douglas Self)

Output Stage



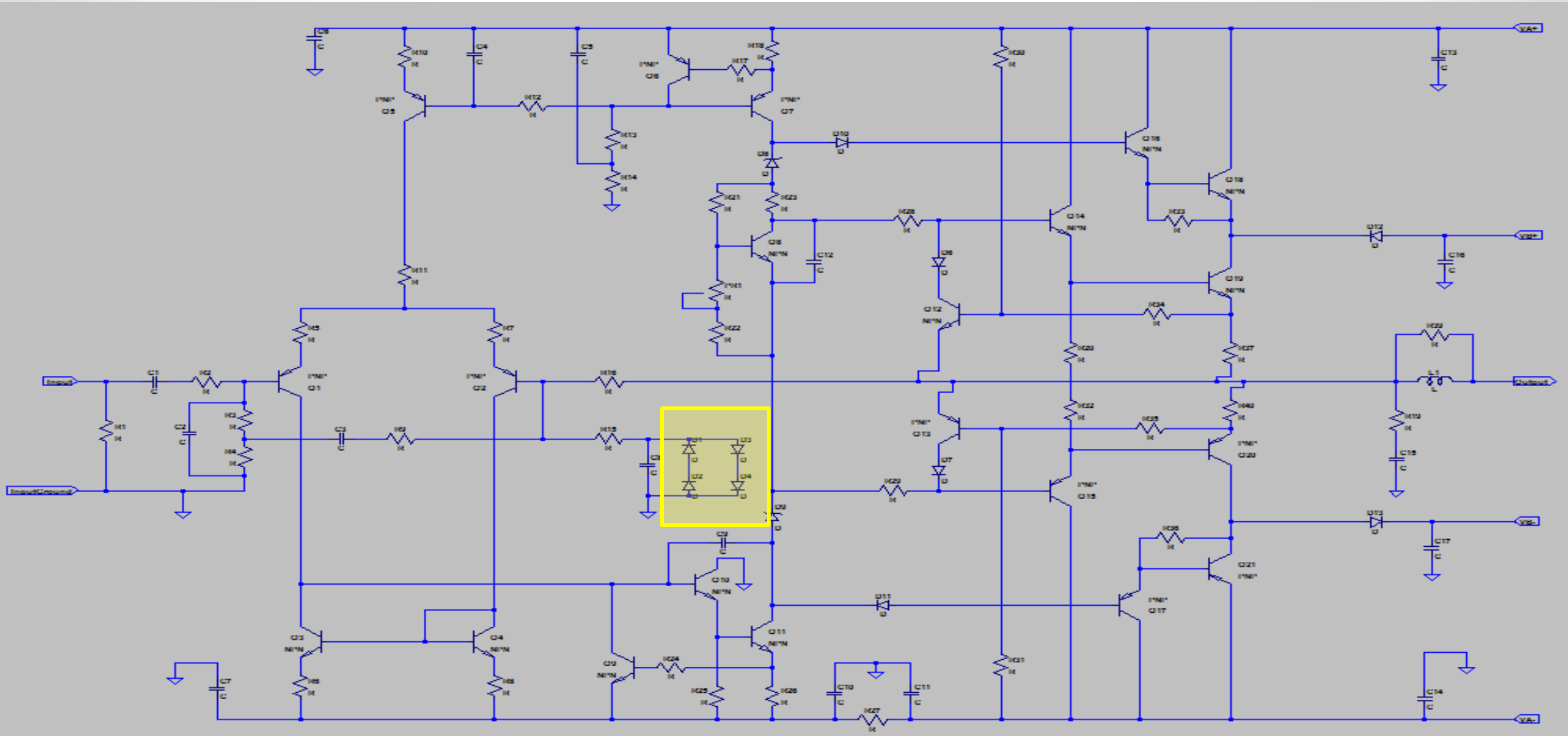
(Design from "Audio Power Amplifier Design Handbook" By Douglas Self)

Overload Protection



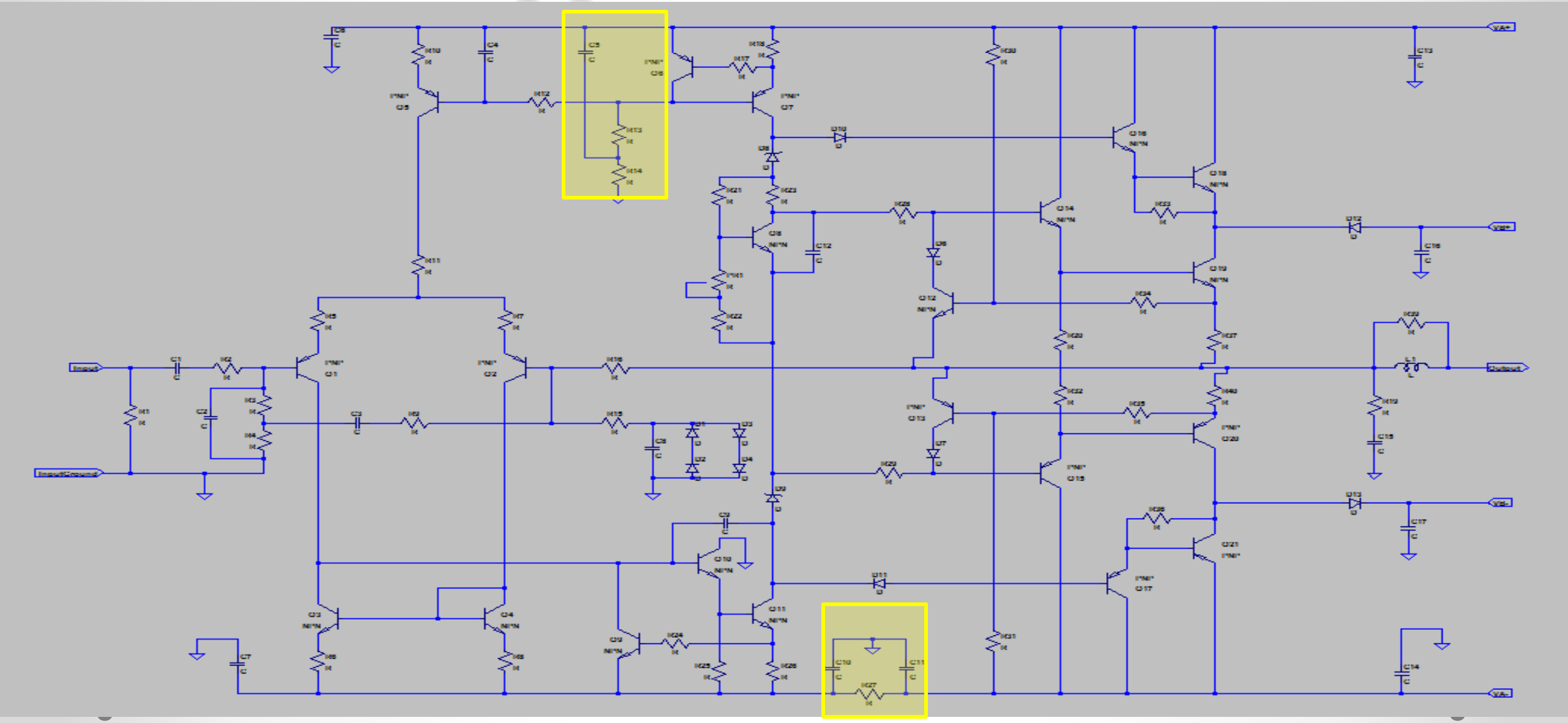
(Design from "Audio Power Amplifier Design Handbook" By Douglas Self)

Protection Diodes



(Design from "Audio Power Amplifier Design Handbook" By Douglas Self)

Ripple Prevention



(Design from "Audio Power Amplifier Design Handbook" By Douglas Self)

Timeline

- Week of 4/13: Schematics and Final Design
- Week of 4/20: Breadboarding and Testing Individual Modules
  - PCB Layout and Ordering
- Week of 4/27: Integration of Modules and Testing
- Week of 5/4: Presentation of Final Product

Questions?