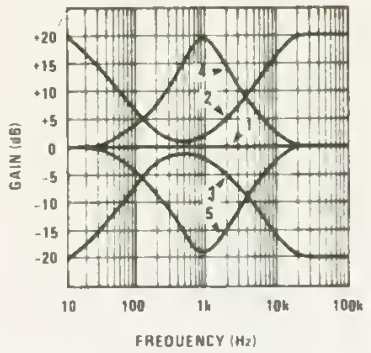


1 ALL CONTROLS FLAT
2 BASS & TREBLE BOOST MID FLAT
3 BASS & TREBLE CUT MID FLAT
4 MID BOOST BASS & TREBLE FLAT
5 MID CUT BASS & TREBLE FLAT

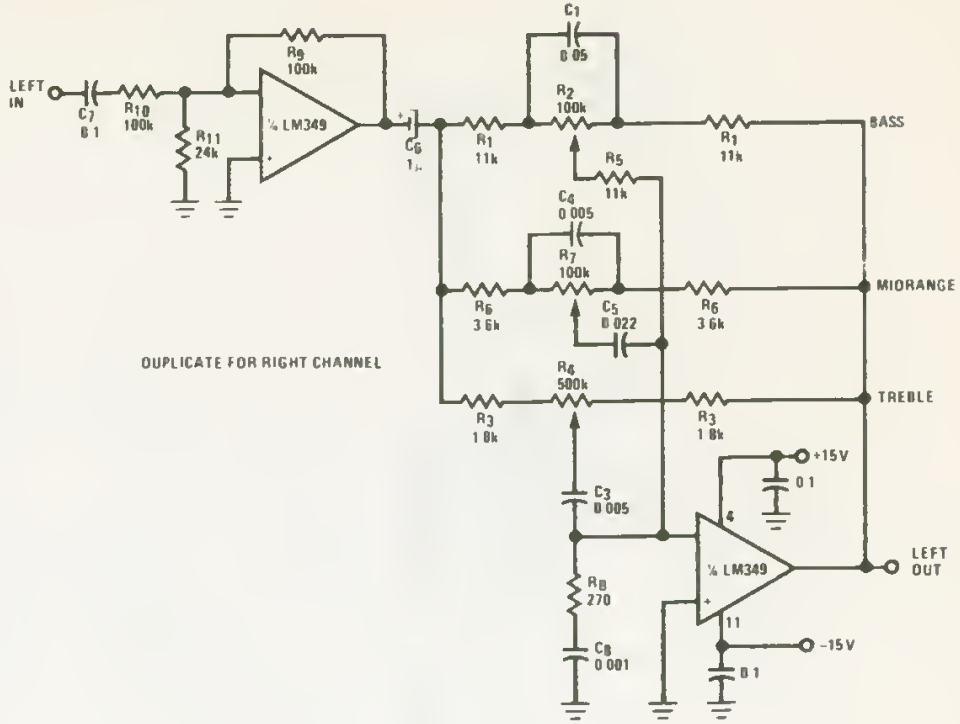
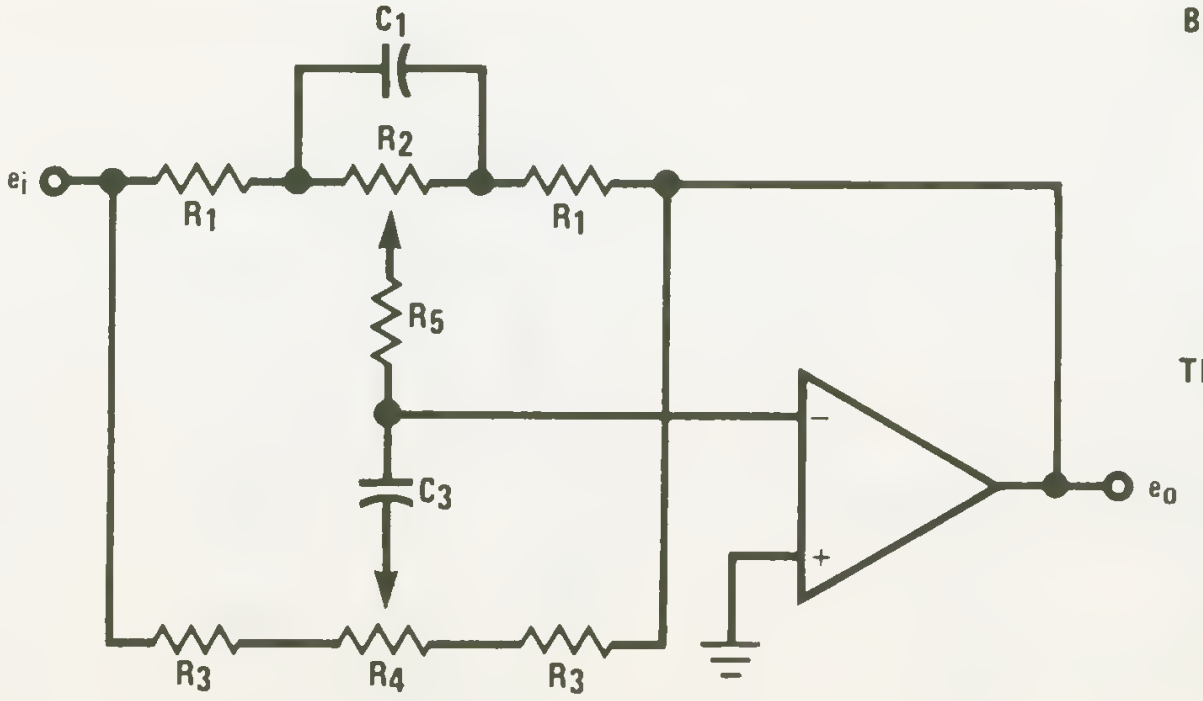


Fig. 8-1. A 3-band active tone control for bass, midrange and treble (NS).



BASS

$$f_L = \frac{1}{2\pi R_2 C_1}$$

$$f_{LB} = \frac{1}{2\pi R_1 C_1}$$

$$A_{VB} = 1 + \frac{R_2}{R_1}$$

TREBLE

$$f_H = \frac{1}{2\pi R_3 C_3}$$

$$f_{HB} = \frac{1}{2\pi (R_1 + R_3 + 2R_5) C_3}$$

$$A_{VT} = 1 + \frac{R_1 + 2R_5}{R_3}$$

ASSUMES $R_4 \gg R_1 + R_3 + 2R_5$

Fig. 8-2. Alternate bass design active tone control (NS).

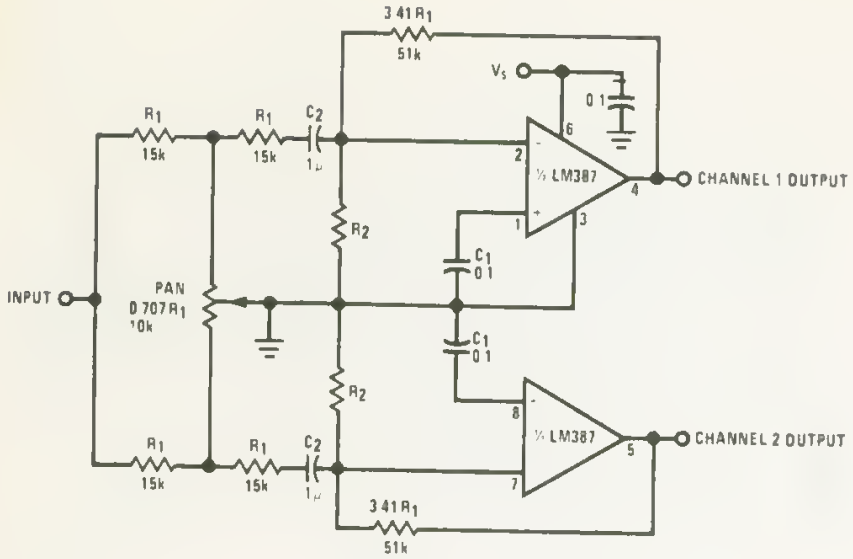


Fig. 8-3. A 2-channel panning circuit (NS).

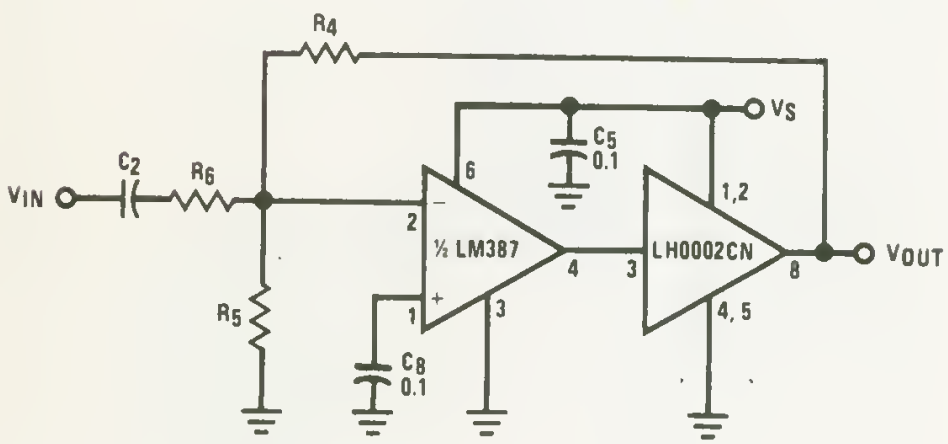


Fig. 8-4. Preamplifier current booster (NS).

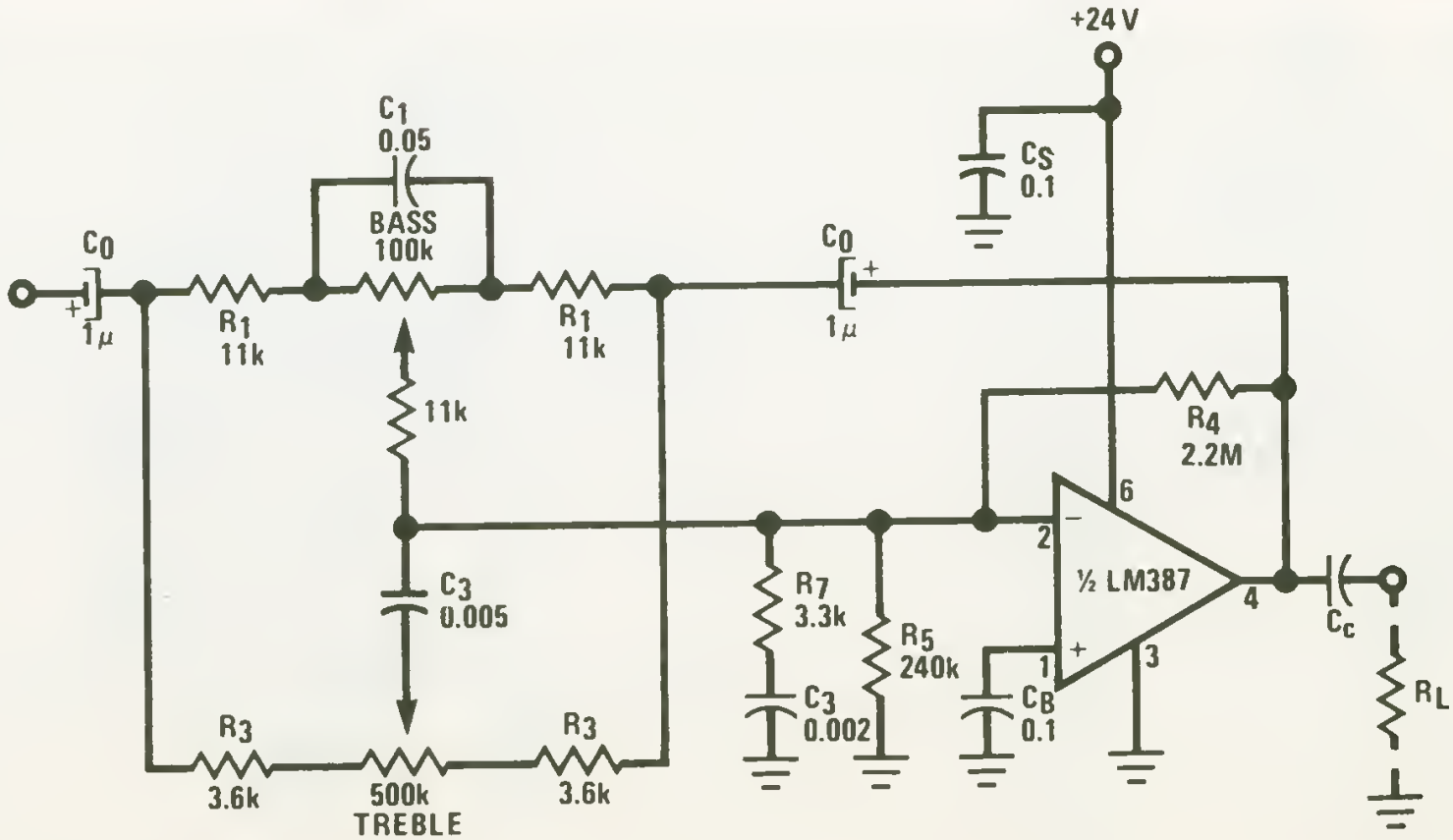


Fig. 8-5. LM387 feedback tone controls (NS).

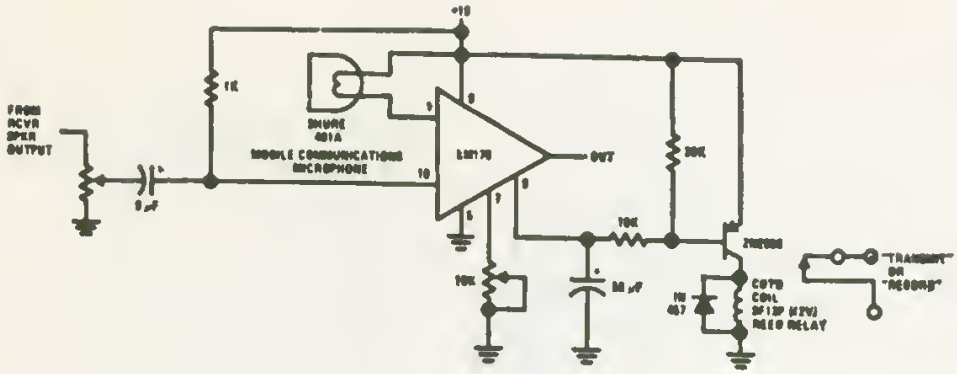


Fig. 8-6. VOX/mike preamp with antitrip.

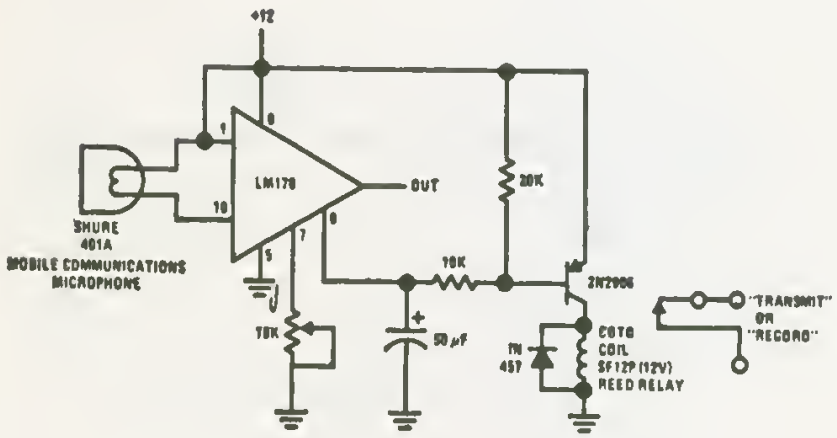


Fig. 8-7. VOX/mike preamp.

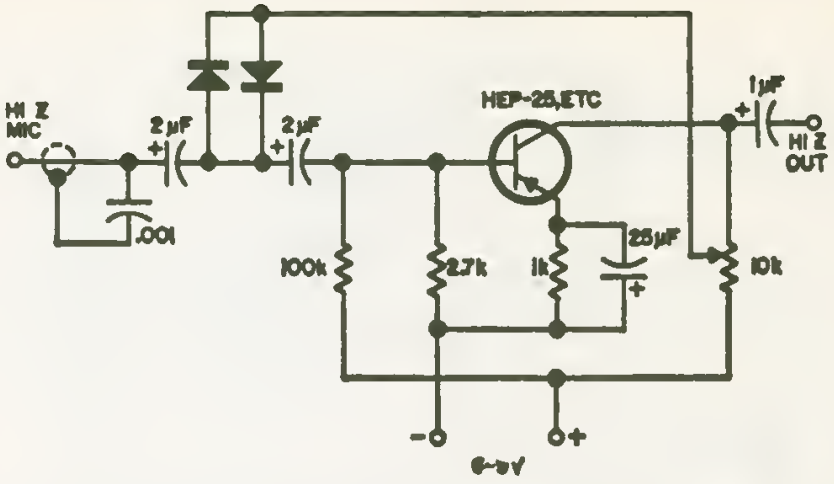


Fig. 8-8. Circuit of preamplifier clipper circuit. Potentiometer adjusts clipping level and may be replaced by fixed resistors once desired level is found.

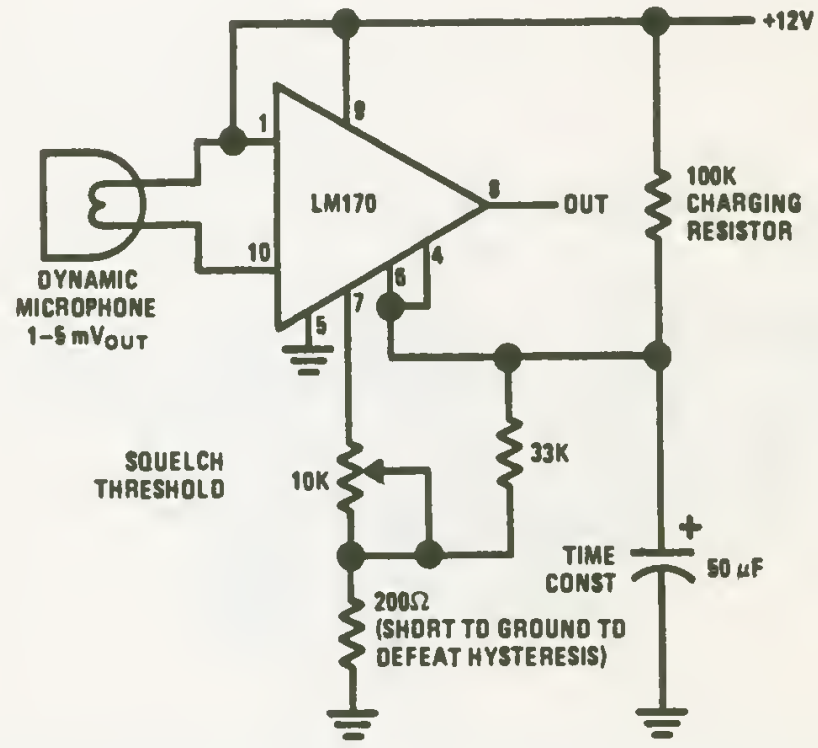


Fig. 8-9. Squelched preamplifier with hysteresis.

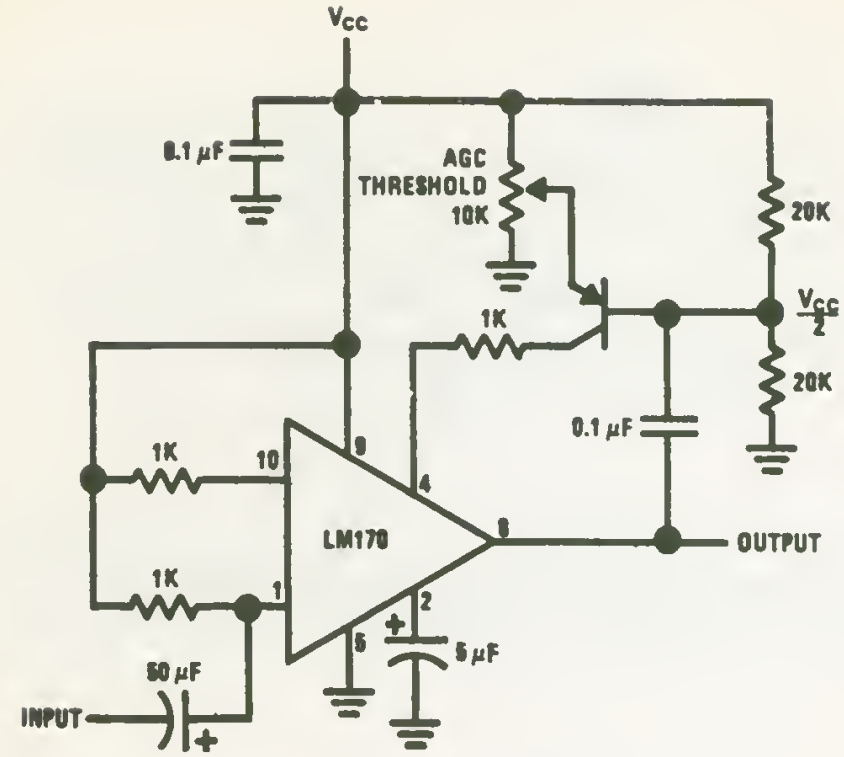


Fig. 8-10. Speech compressor.

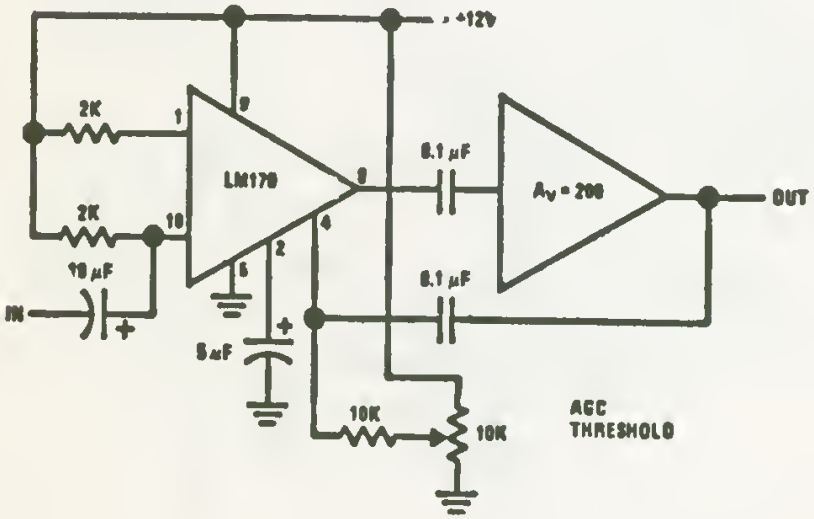


Fig. 8-11. Speech compressor using subsequent gain for better control.

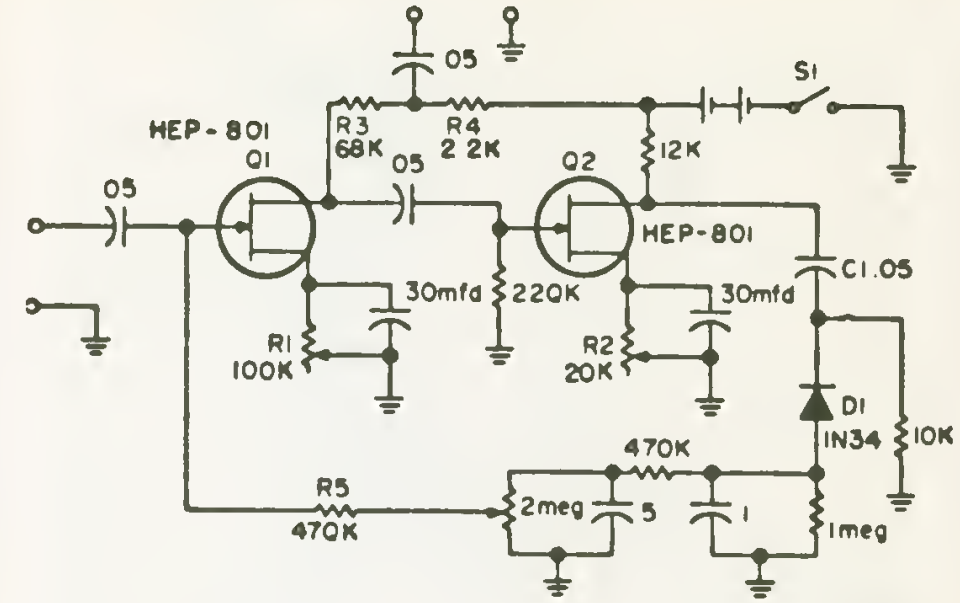


Fig. 8-12. Audio compressor uses inexpensive Motorola FETs.

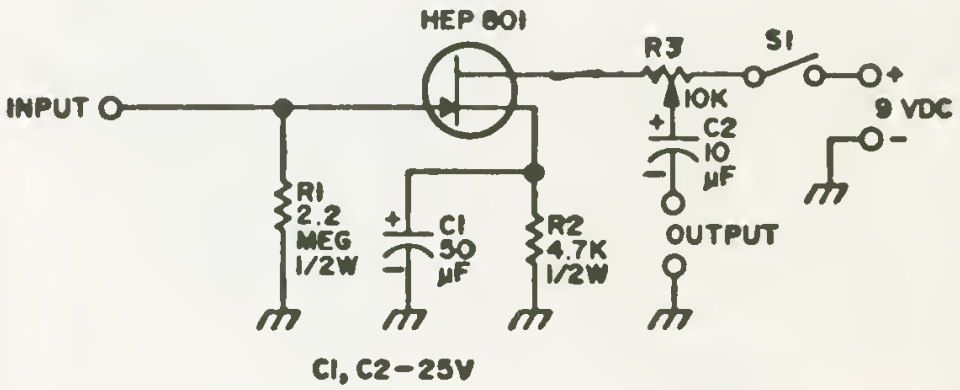


Fig. 8-13. Microphone preamplifier. Mike output low? Fix it with this one. This is for use with a ceramic or crystal microphone or even a phono cartridge. (M).

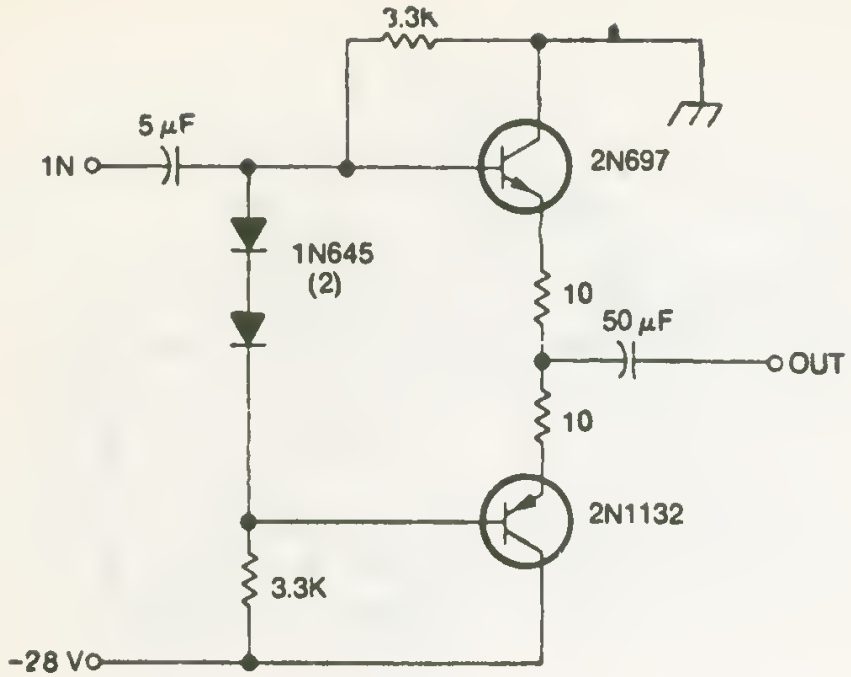


Fig. 8-14. This schematic from the U.S. Navy's handbook of "preferred circuits" shows an emitter follower that provides 12 dB gain.

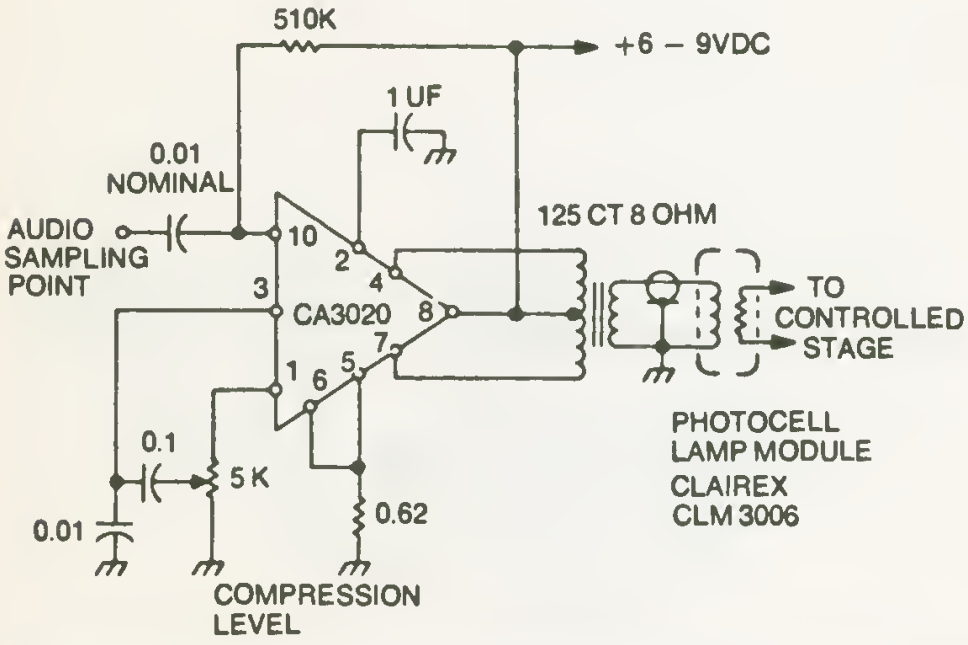


Fig. 8-15. Photocell compressor/agc circuit schematic. Voltage rating of capacitor to terminal 10 must be chosen to protect unit from voltage found at sampling point. Dc operating voltage need not be supplied from an extremely well filtered source since audio quality of amplifier is not significant.

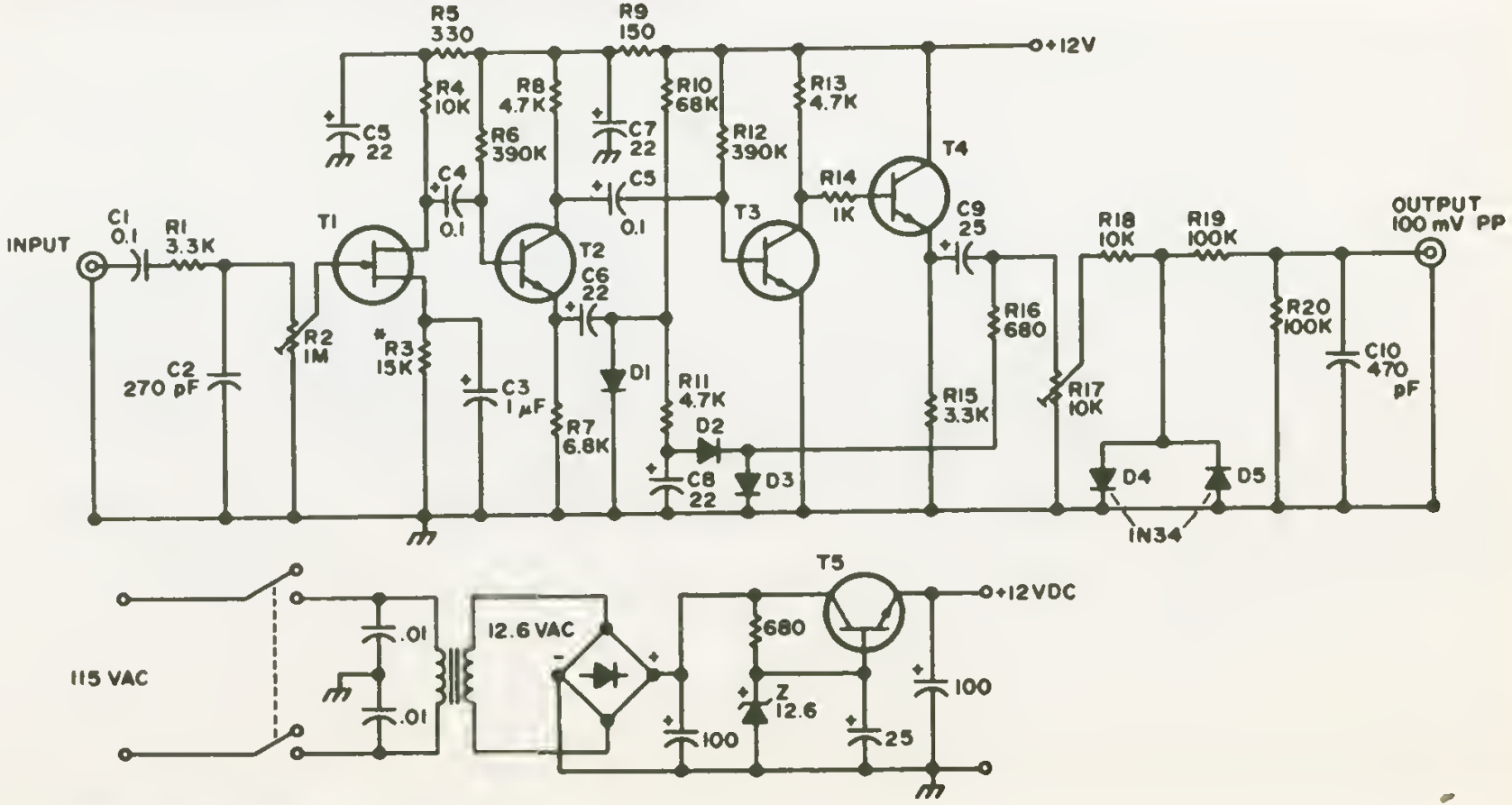


Fig. 8-16. Compressor Schematic.

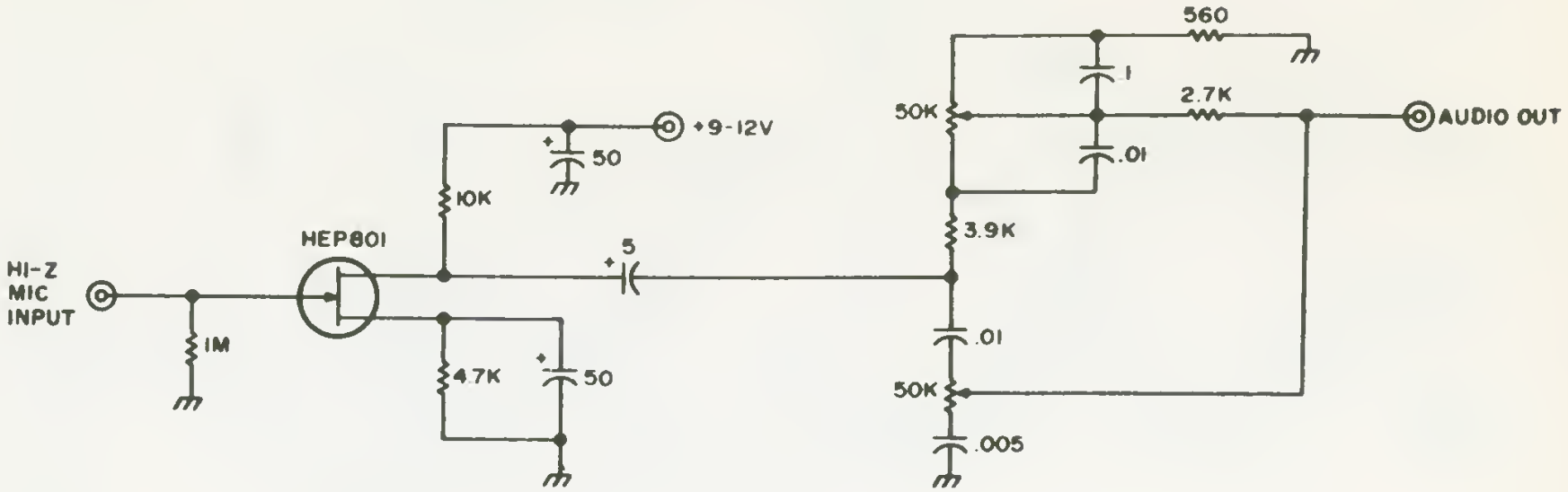


Fig. 8-17. Shaping circuitry to be added ahead of existing compressor.

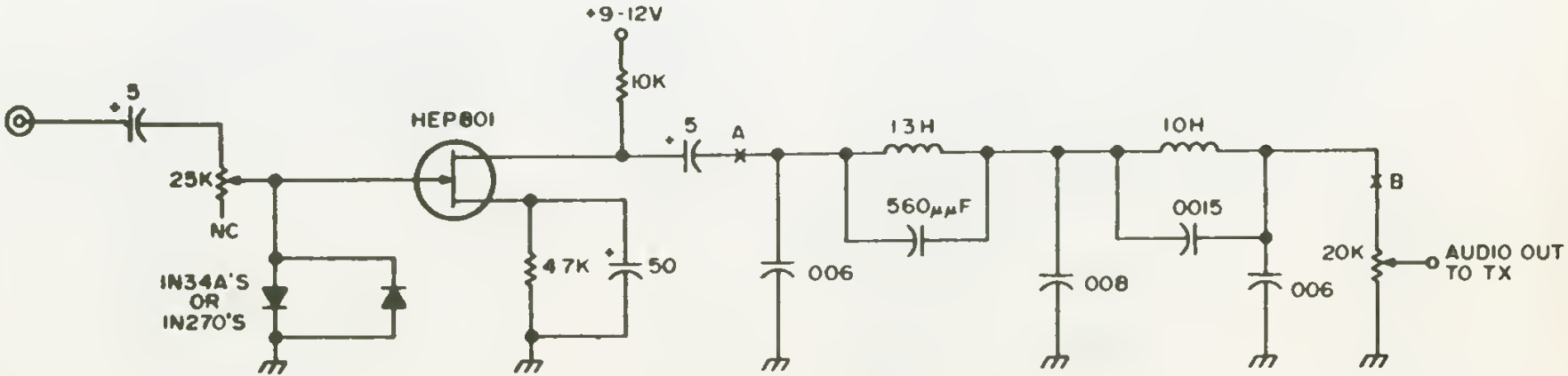
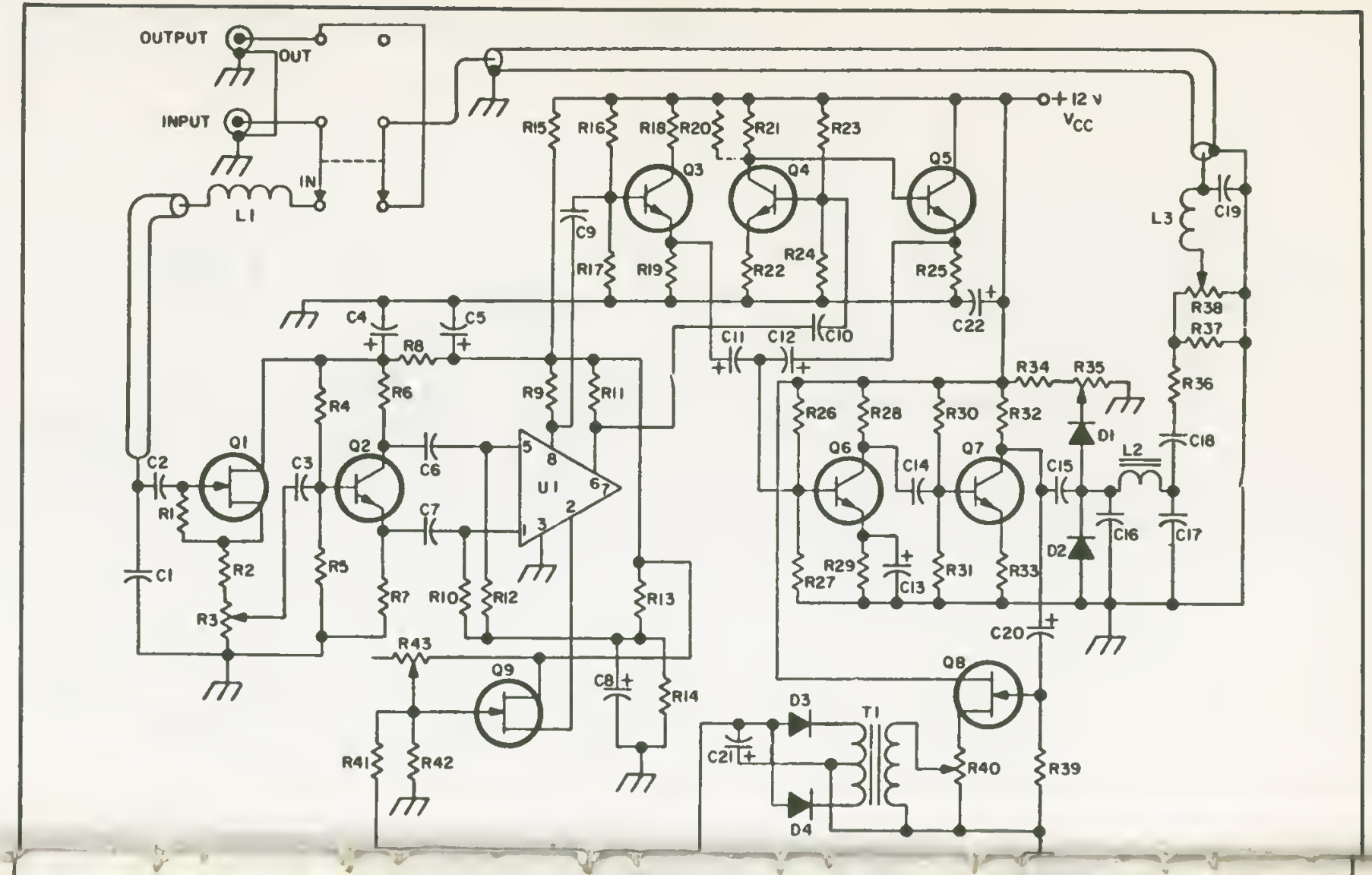


Fig. 8-18. Clipper and filter for use at output of existing audio compressor.


OUTPUT
OUT
INPUT
IN
L1
+12 v
Vcc
R15
R16
R18
R20
R21
R23
Q3
Q4
Q5
C9
R17
R19
R22
R24
R25
C22
L3
C19
R38
R37
R36
C18
C4
C5
R8
C11
C12
C10
R34
R35
R26
R28
R30
R32
D1
L2
Q1
Q2
Q6
Q7
C14
C15
C2
C3
C6
C7
U1
R4
R6
R9
R11
C16
C17
D2
R1
R2
R3
R5
R7
R10
R12
R13
R27
R29
C13
R31
R33
C1
C20
R43
Q9
Q8
C8
R14
D3
T1
C21
R40
R39
R41
R42
D4

PARTS LIST

Components

Q1,Q8,Q9 FET-1, HEP 802, 2N3819, etc.
Q2-Q7 2N697, HEP 54
U1 CA3028A D1-D4 1N270
L1-L3 2.5 mH rf choke
L2 3.5 H miniature audio choke, UTC DOT-8
T1 GC Co. D1-728 transformer. For primary, use half of 500Ω CT secondary. For secondary, use 1000Ω CT primary.

Capacitors

C1, C19 0.001 μF
C2 0.005 μF
C3 0.05 μF
C4, C5, C8, C22, 100μF 15V
C6, C7, C9, C10, C15, C18 0.1μF
C11, C12, 10 μF 15V
C13 30 μF 15V
C14, 0.02μF
C16, C17 0.0015μF
C20, C21 6 μF 1.5V

Resistors (all except potentiometers 1/2 watt)

R1 2.2M
R2 91-R3 10K audio-taper pot
R4, R16, R23, R26 180K
R5, R17, R24 56K
R6, R7, R18, R19, R21, R22, R25, R34 4.7K
R8, R14, R15, R29, R33, R41 1.0K
R9, R11 10K
R10, R12, R37 47K
R13 2K
R28, R32, 3.9K
R30 120K
R35 5K pot
R36 24K
R38 50K audio taper pot
R39 100K
R40 2K trimmer pot
R42 30K
R27, R31 33K

Fig. 8-19. Speech processor increases effectiveness of SSB signal by compression, clipping, and filtering before modulation.

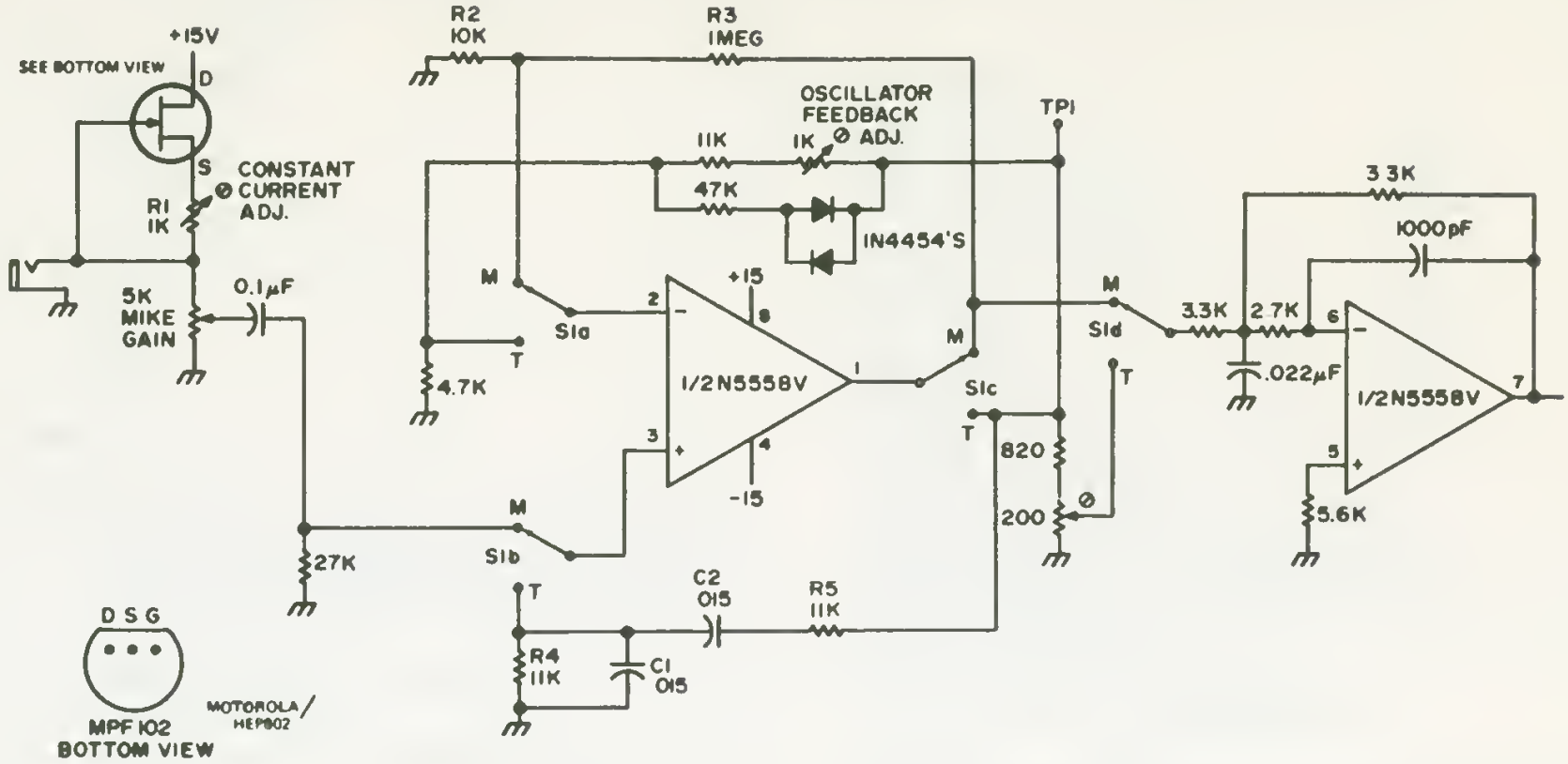


Fig. 8-20. Combination preamp and tone generator.

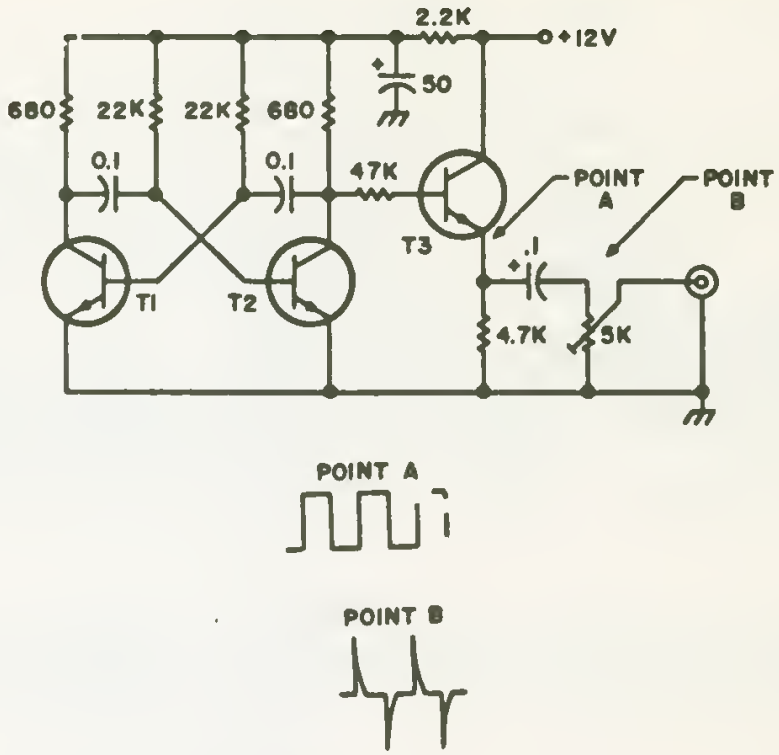


Fig. 8-21. Speech simulator schematic.

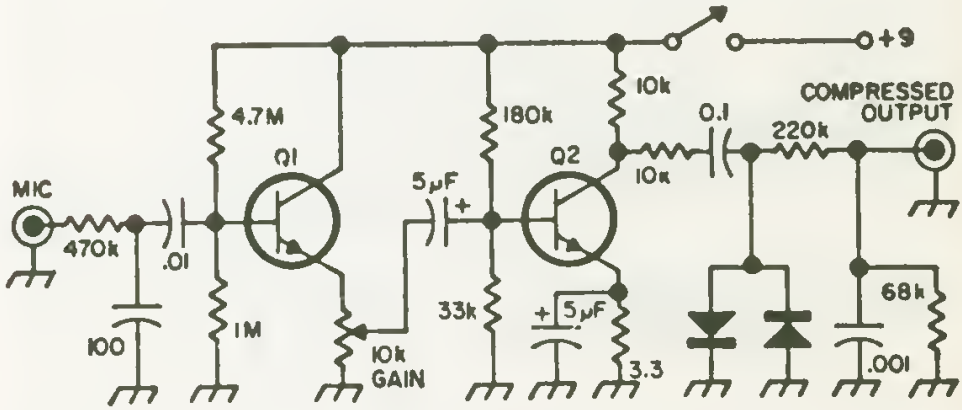


Fig. 8-22. Two-stage clipper/preamp will increase the talk of any rig. Transistors Q1 and Q2 are HEP 54. The diodes are 1N456 or HEP 158.

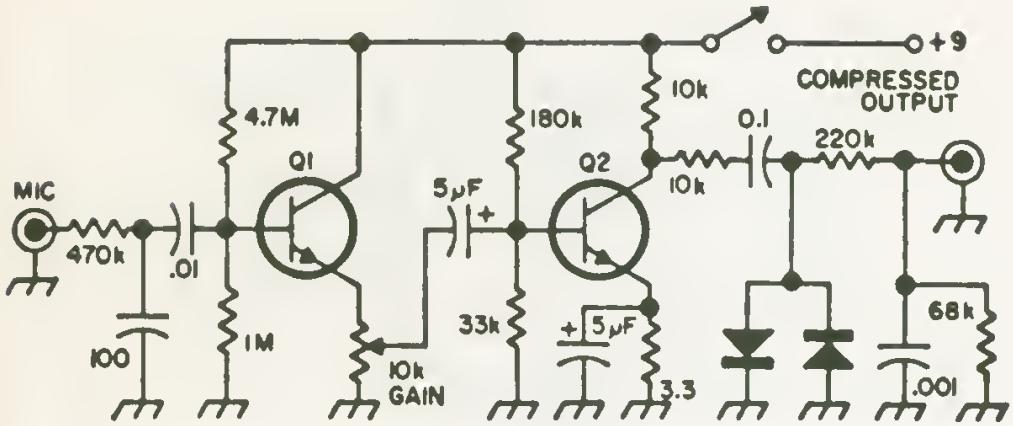


Fig. 8-23. Two-stage clipper/preamp. Transistors Q1 and Q2 are 2N1304, 2N2926, 2N3391, SK3011, or HEP 54. The diodes are 1N456 or HEP 158.

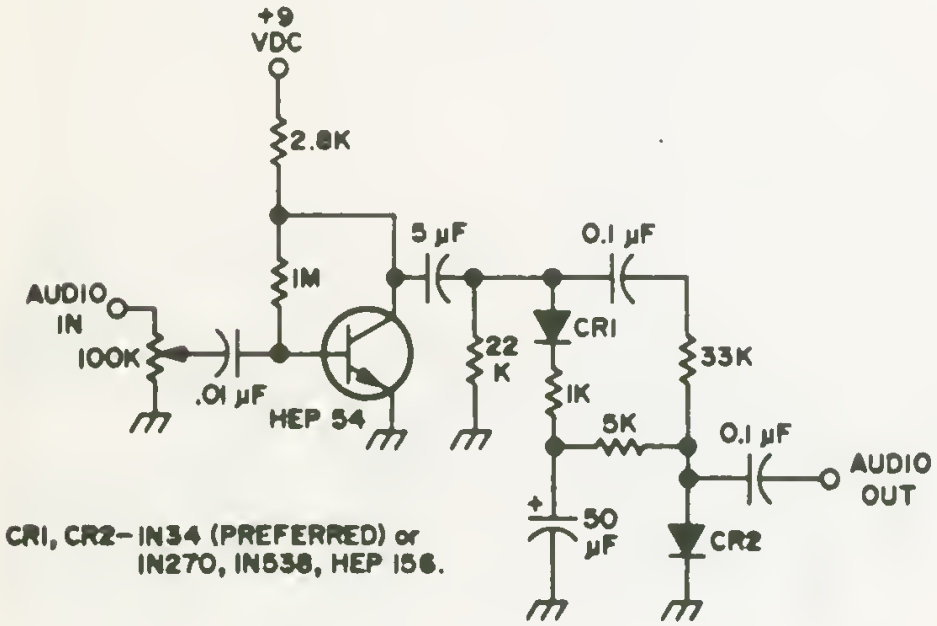


Fig. 8-24. Audio preamp compressor.

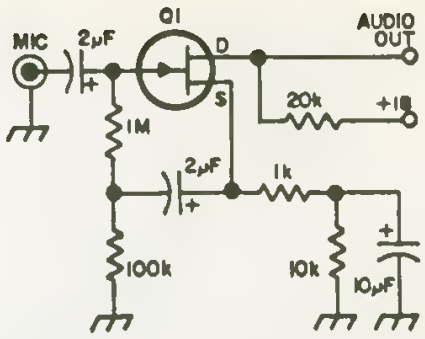


Fig. 8-25. Microphone amplifier using a field-effect transistor has an input impedance of 5 megohms. Q1 is a 2N4360, TIM12, U-112 or U-110. By reversing the polarity of the supply voltage, a 2N3820, MPF 104 or HEP 801 may be used.

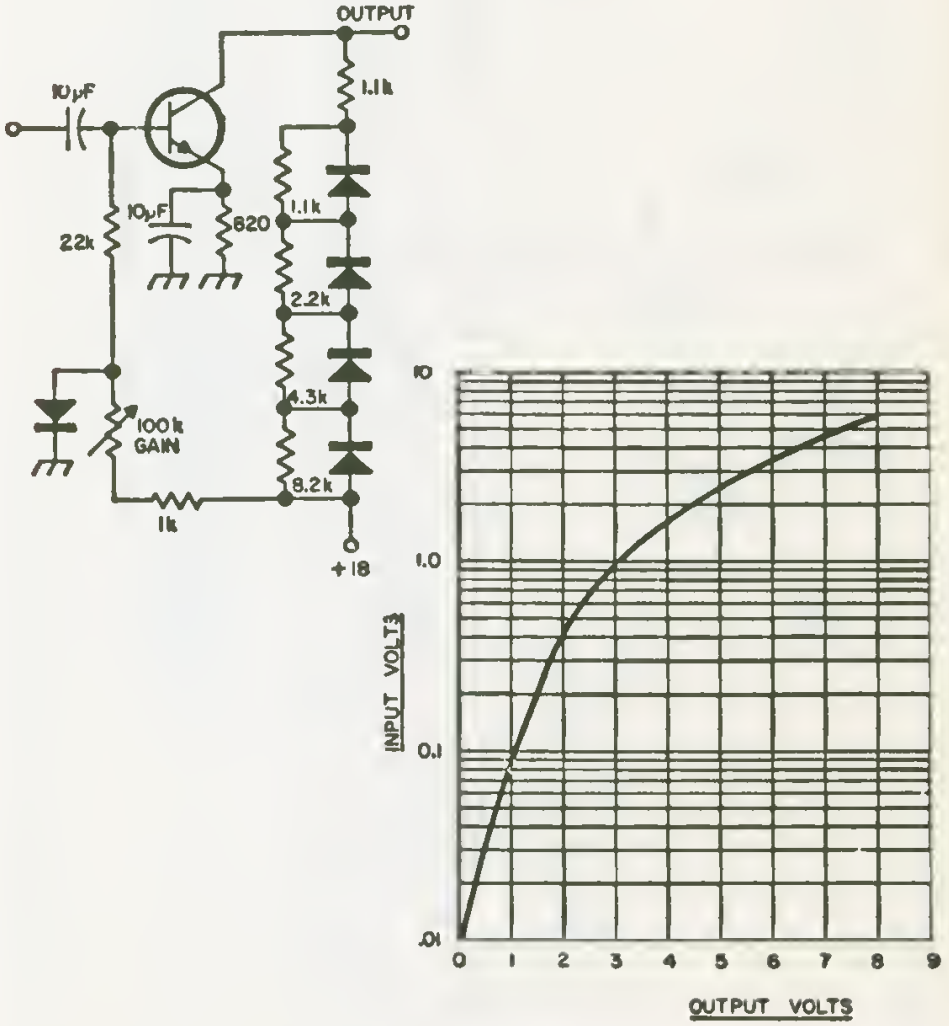
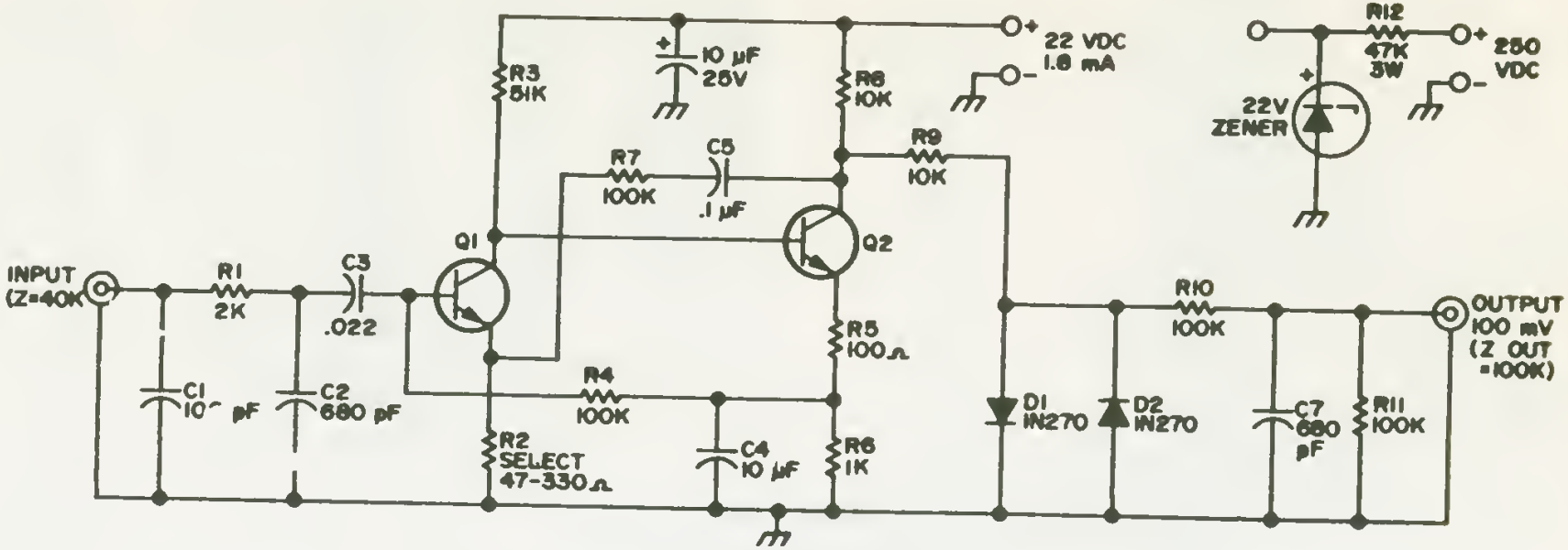


Fig. 8-26. This simple dynamic range compressor provides 50 dB range; it exhibits gain with a 20 millivolt signal but will saturate with input voltages up to 6 to 7 volts. All the diodes are 1N914; transistor Q1 should be a 2N2926, 2N3391, SK3010, GE-8 or HEP 54.



1-Q1 & Q2 ARE Si NPN TYPES, hfe 30-120, VCBo 45V OR EQUIV.
2-SELECT R2 FOR DESIRED GAIN.
3-IF NECESSARY, CHANGE R4 TO YIELD 10-12 VDC AT COLLECTOR OF Q2.
4-IF LOWER OUTPUT IS DESIRED, CHANGE R10-R11 RATIO.

Fig. 8-27. Audio conditioning unit (preamplifier/compressor).

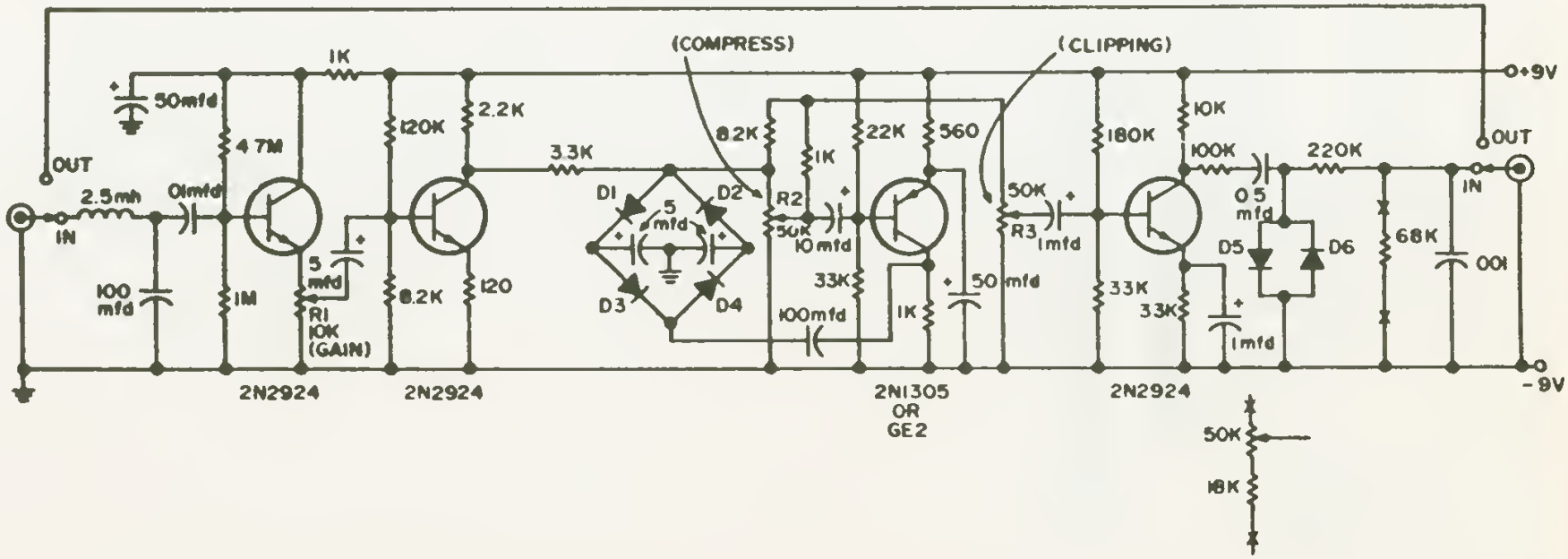


Fig. 8-28. Versatile premodulation speech processor.

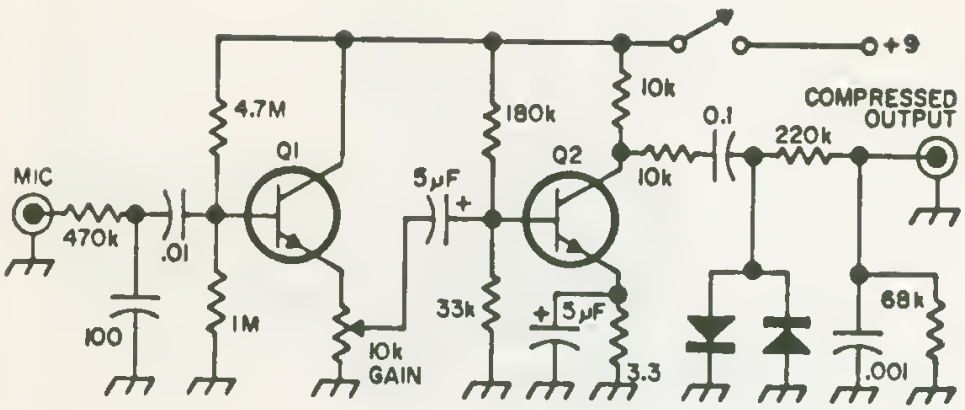


Fig. 8-29. Clipper/preamp. Transistors Q1 and Q2 are 2N1304, 2N2926, 2N3391, SK3011, or HEP 54. The diodes are IN456 or HEP 158.