

7..AUDIOS AU22, AU23, LEVEL 2 (Rev.2 +)7.1 Circuit description

The basic tone frequency is set up in the Q3 oscillator. Charge current for the capacitor is provided by the Q1, Q2 current source. R1 and R2 provide the necessary offset, so that there is a tone when Climb = 0. Thus, the tone starts at a negative (sink) reading, (at about -20kt, or -10m/s) and increases steadily with climb. In the climb portion, Q9 starts to conduct, and acts as an additional current source to charge up the capacitor, thus providing extra frequency sensitivity during the climb portion.

The saw-tooth waveform generated in Q3 is applied to the comparator (2nd half of Z1), where it is compared with a fixed voltage at about half amplitude, derived from R11 and R14. Output of Z1 is on Pin 7, and is therefore a high amplitude square wave of approximately 50% duty cycle.

This high amplitude square wave is attenuated in the volume control R12, and fed into the push pull output stage Q5 and Q6, and into the speaker.

Interruption rate is set up in the oscillator Q8. Charge current for the capacitor is provided by the Q1 and Q7 current source. Q7 is controlled by a comparator, (1st half of Z1), which switches into an amplifier mode (because of the feedback diode) as the voltage at Q1 base passes the voltage at Q9 base, (see attached SK-209) which is the threshold control setting. Thereafter the frequency of Q8 is dependent on the value of the climb input.

The interruption is applied to the basic tone by switching Q4 on and off, through the voltage developed across C6, which is used to cut off the base of Q4.

On later versions of the Audio, and on Audio cards used with the MkII Audio Director, space is provided on the card for an input I and a transistor Q11, which enables the Director to switch off the sound in the Audio at the "silent band".

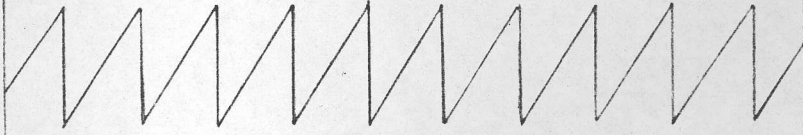
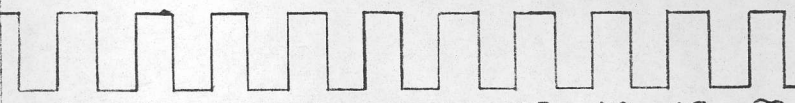
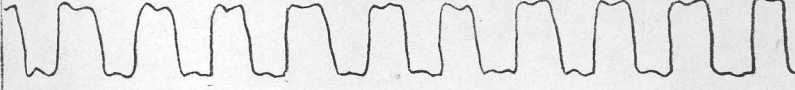
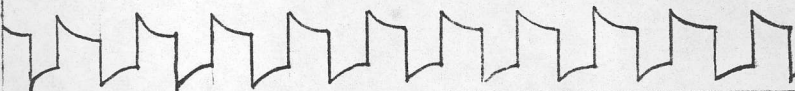
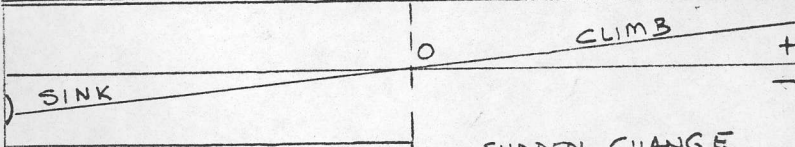
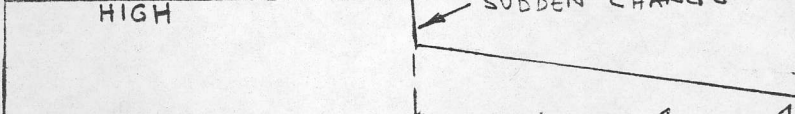
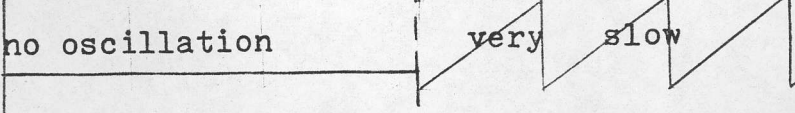
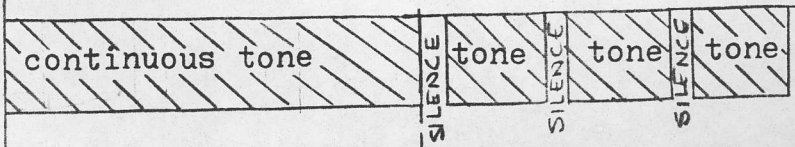
If Q11 is present, and the I input is not connected, the card will function like an ordinary Audio Card. For the "silent band" to work, it is necessary to connect the I input with the Speed card in the MKII Director. In this way, a single spare card, containing the transistor Q11 may be used as a spare part for the MkII Director, the MK1 Director, and the Audios.

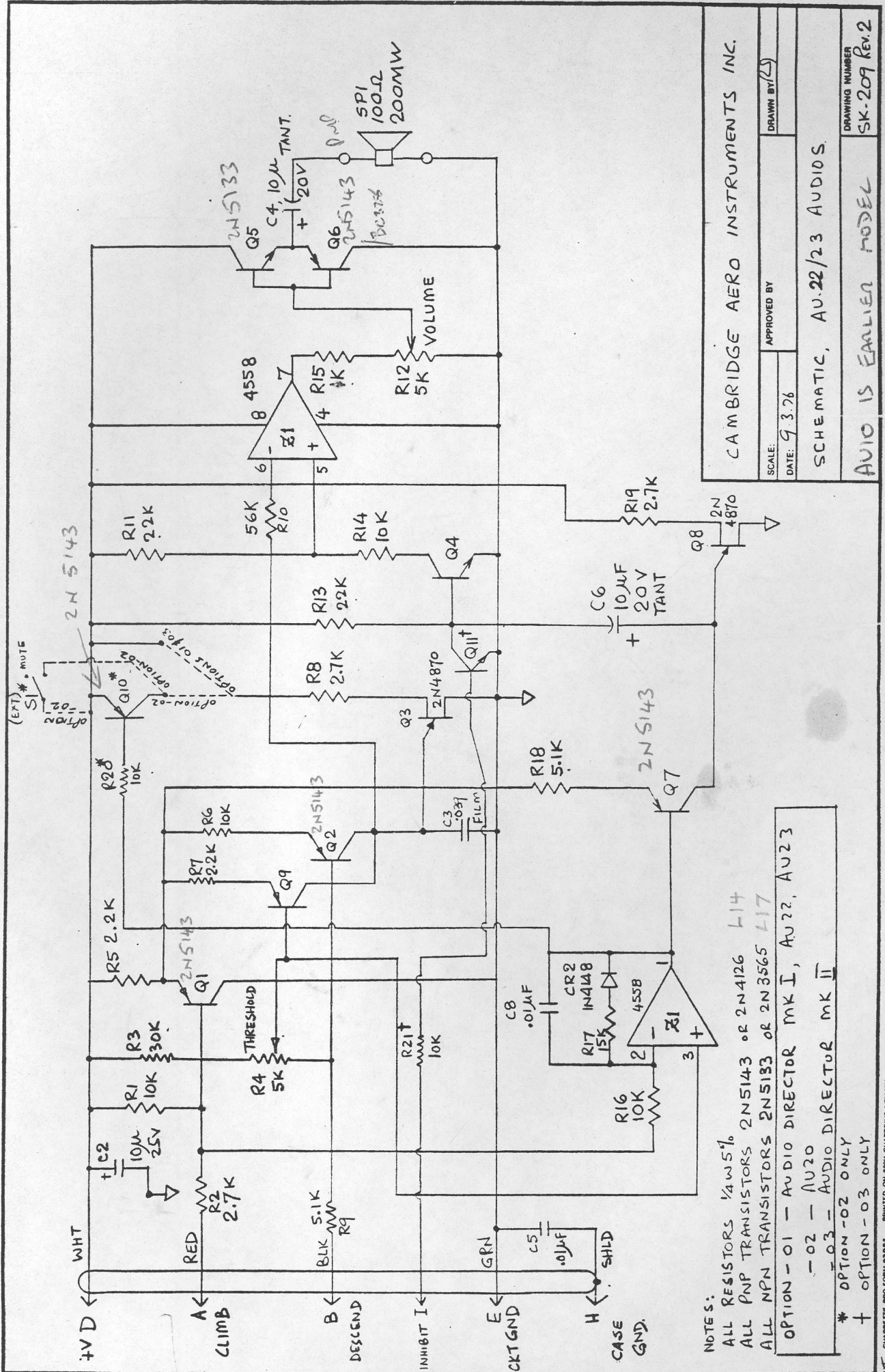
7.3 Waveforms and Voltages

Driven by a Variometer, 12 volts power. Oscilloscope required.

CW= Clockwise rotation 

CCW= Counter-clockwise rotation 

Location	Voltages, and/or waveforms	Preconditions
Input D	Same as Pin D, Variometer, about 11.4 volt.	
Input A	Same as Pin A, Variometer, about 8.0 volt.	
Input B	Same as Pin B, Variometer, about 8.0 volt.	
Input E	Zero volts, Battery negative, Ground	
Q1 Base	About 8.5 to 9.1 volts	
Q1 Emitter	Q1 Base + 0.6 volts	
Q2 Base	about 8.2 to 8.8 volts.	
Q2 Emitter	Q2 base + 0.6 volts.	
Q3 Base		
Q4 Collector	approximately 0.3 volts	R4 CCW, or sink
Q4 Collector		R4 CW, or climb
Z1, Pin 7		R4 CCW, or sink
Q5/6 Emitter		R4 CCW, or sink
Speaker		R4 CCW, or sink
Vario Input (from vario zero adjust)		Obtain by turning Vario Zero adj t.
Z1, Pin 1		
Q8, Base	no oscillation 	
Z1, Pin 7		



CAMBRIDGE AERO INSTRUMENTS INC.

DRAWN BY 57/25

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SCALE:

SCHEMATIC, AU.22/23 AUDIOS.

Audio is EARLIER MODEL

DRAWING NUMBER
SK-209 RE

2 S. H. VAE

NOTES:

ALL RESISTORS 1/4w 5%

ALL PNP TRANSISTORS

ALL NPN TRANSISTORS

OPTION - 01 - AUDIO DIRECTOR MK I, AU22, AU23

020 - 020 - 020

03 - AUDIO DIRECTOR MK II

OPTIONAL ONLY

1 of 10N-03 ONLY