Power input:
48V DC 350mA

J1
Power jack

SW1
SW_SPST

R13
2k

C1
680uF

R2
220k

R18
33k

R1
33k

C2
0.22uF 63V

R3
2k

Q1
IRF510

C3
470uF 63V

C9
0.22uF 250V

R6
2k

GND

J2
RCA Red

R16
50k

R14
1k

R4
220k

GND

V1
17EW8

R5
2k

C7
220uF 16V

GND

RV1
50k pot

J3
RCA Black

R17
50k

GND

R15
1k

C6
680uF 63V

GND

R8
220k

R19
33k

R7
33k

C4
0.22uF 63V

R9
2k

Q2
IRF510

R10
220k

V2
17EW8

R11
2k

C8
220uF 16V

GND

GND

C5
470uF 63V

C10
0.22uF 250V

R12
2k

GND

J4
Audio jack/Phone jack

GND

Original modification details posted by the_equalizer on head-fi and incorporated into this diagram:

> R2, R4, R8, R10 – 220K
>
> –– https://www.head-fi.org/threads/millett-starving-student-hybrid-amp.319231/post-6514939

Note that is some discussion around the sound/noise characteristics of this tube setup.
As disussed by holland on head-fi:

> The 17EW8 has a mu of 50. The 19J6 is about 39, IIRC. The 12AU7 is around 17–19.
>
> Larger resistance will reduce signal, and with noise in the amp getting amplified, your signal to noise ratio decreases. It'll
> work, but I think it's a crappy solution. If you look at Pete Millett's original design with the 19J6, he had some feedback to
> reduce the gain. You can add some more, but what you started with is a poor choice.
>
> –– https://www.head-fi.org/threads/millett-starving-student-hybrid-amp.319231/post-9667485

To help mitigate this KimLaroux notes how you can add some negative feedback (note that this is NOT included in this
schematic):

> Not that hard to do since the amplifier is inverting. Just run a wire from the output to the grid through a 10 K resistor or
> so.
>
> –– https://www.head-fi.org/threads/millett-starving-student-hybrid-amp.319231/post-9668991

Original circuit design: Pete Millet – http://pmillett.com/starving.htm
IRF510 FETs must be heatsink mounted
All resistors are 0.25W (1/4W) metal or carbon film
All capacitors are 63V minimum
Modified for 17EW8 by the_equalizer and Dsavitsk on head-fi – Drafted by Simon Holywell
Sheet: /
File: SSMH_17EW8.sch

Title: Millet Starving Student Hybrid Headphone Amp (17EW8 mod)
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