

The TL072 Opamp.

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INTRODUCTION.

The TL072 was first manufactured by Texas Instruments in 196?? in Bi-CMOS technology.

- The CMOS input devices give their best noise performance at medium impedances, in the range 1K - 10K.
- Very high-impedance inputs, with effectively zero bias and offset currents.
- The common-mode range of the inputs does not extend all the way between the rails. If the common mode voltage gets to within a couple of volts of the V- rail, the op-amp phase inverts; the inputs swap their polarities. This must be guarded against as it causes dire troubles. There may be really horrible clipping, where the output hits the bottom rail and then shoots up to hit the top one, or the stage may simply latch up until the power is turned off. Cures for both problems will be described below.
- Not THD-free in the way the 5532 is. In audio usage, distortion depends primarily upon how heavily the output is loaded. The maximum loading is a matter of opinion, usually being a tradeoff between quality and circuit economy. 2KOhm would be my upper limit.
- Modest power consumption: approx 4mA per opamp section.
- Relaxed about rail decoupling.

SPECS.

Here are the vital statistics. All typical values, for +/-15V supply rails.

Supply voltage	+/-18V abs max
Output range	+/-13V typ (2K load)
CM range	+15 -12V
e_n	18 nV/rtHz typ 1 kHz
i_n	0.01 pA/rtHz typ
I_{bias}	65 pA typ
Slew rate:	13 V/us
Supply current	2.8 mA

Unity gain stable	YES
Cost	45p RS Jan 2001

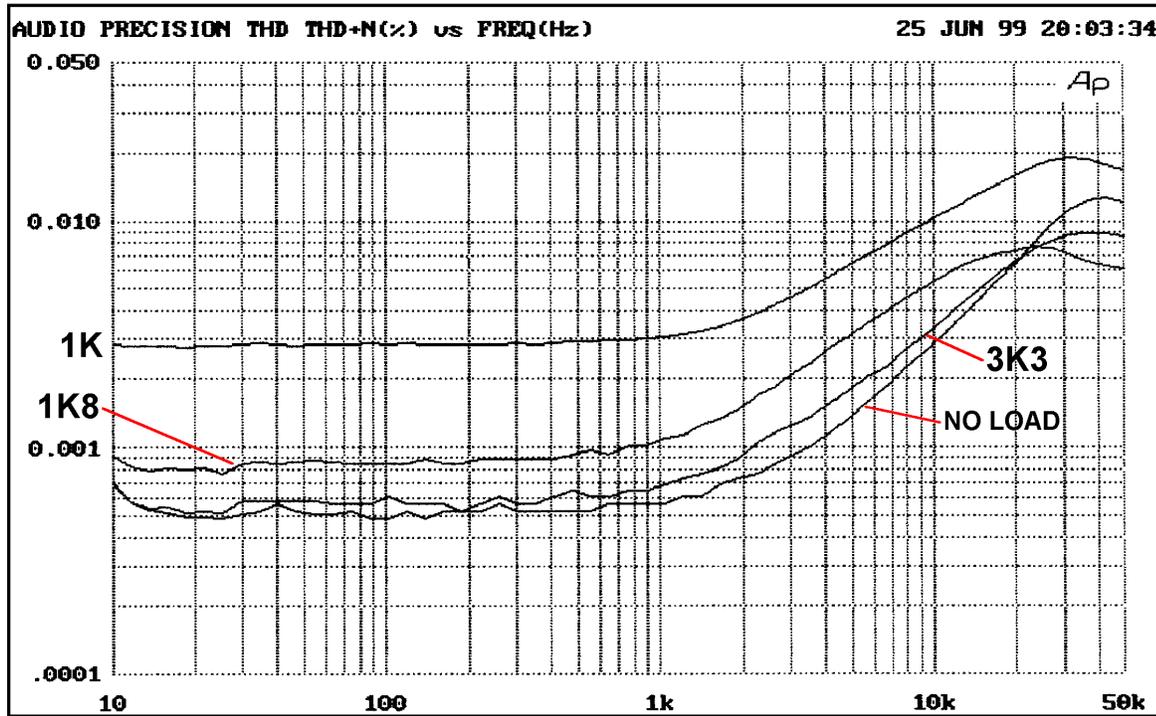
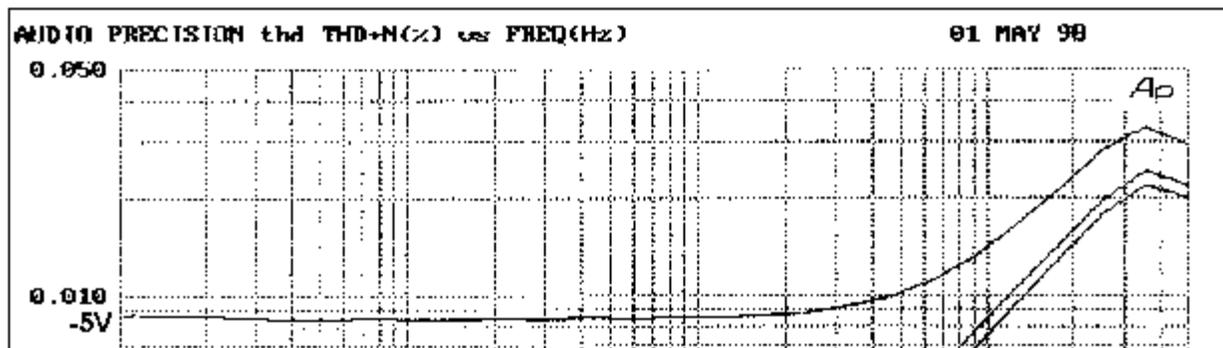


Fig 3
Distorti versus loading the TL0 with va loads. Output ** Vrms Distorti always worse a loading increas This an closed-NFB far determi the THI

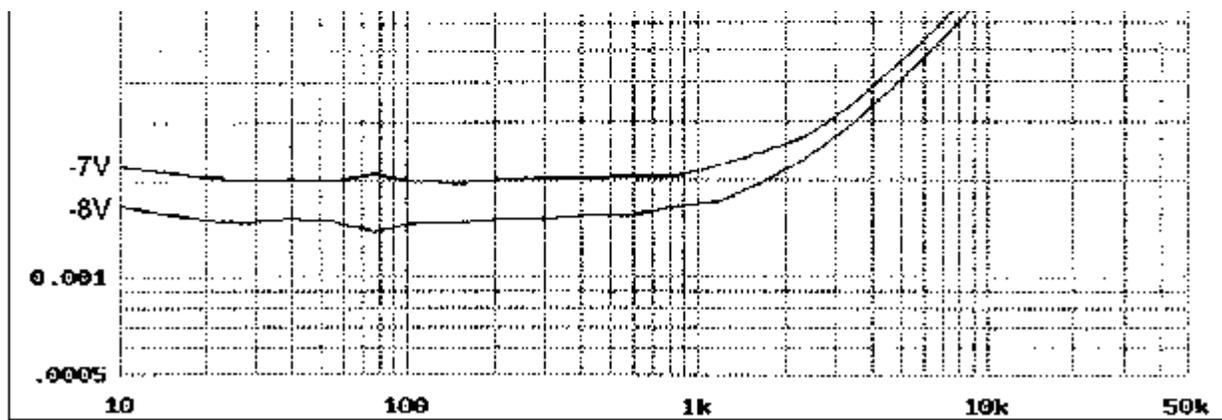
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TL072 opamps are not very critical in their decoupling requirements, though they will sometimes show very visible oscillation if they are at the end of very long and thin supply tracks. One or two rail-to-rail decouplers (eg 100nF) per board is usually sufficient to deal with this. A decoupler within six inches of track length of the package is usually adequate. A design with decoupling on every TL072 should be queried as it is almost certainly wasting money.

TL072/71 opamps are prone to HF oscillation if faced with significant capacitance to ground on the output pin; this is particularly likely when they are used as unity-gain buffers. A few inches of track can sometimes be enough. If this has been foreseen by the designer, there will be a resistor (probably in the 47 to 75 Ohm range) in series with the output. This must be placed at the opamp end of the track to be effective.



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