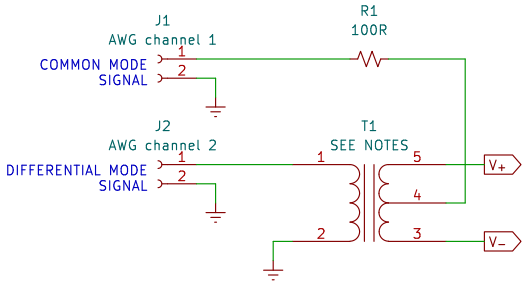
TEST RIG



T1 is a small 120V:6.3VCT power transformer
Triad Magnetics F−14X or similar.
Suitable transformers can often be scavenged
from discarded equipment with linear
power supplies.

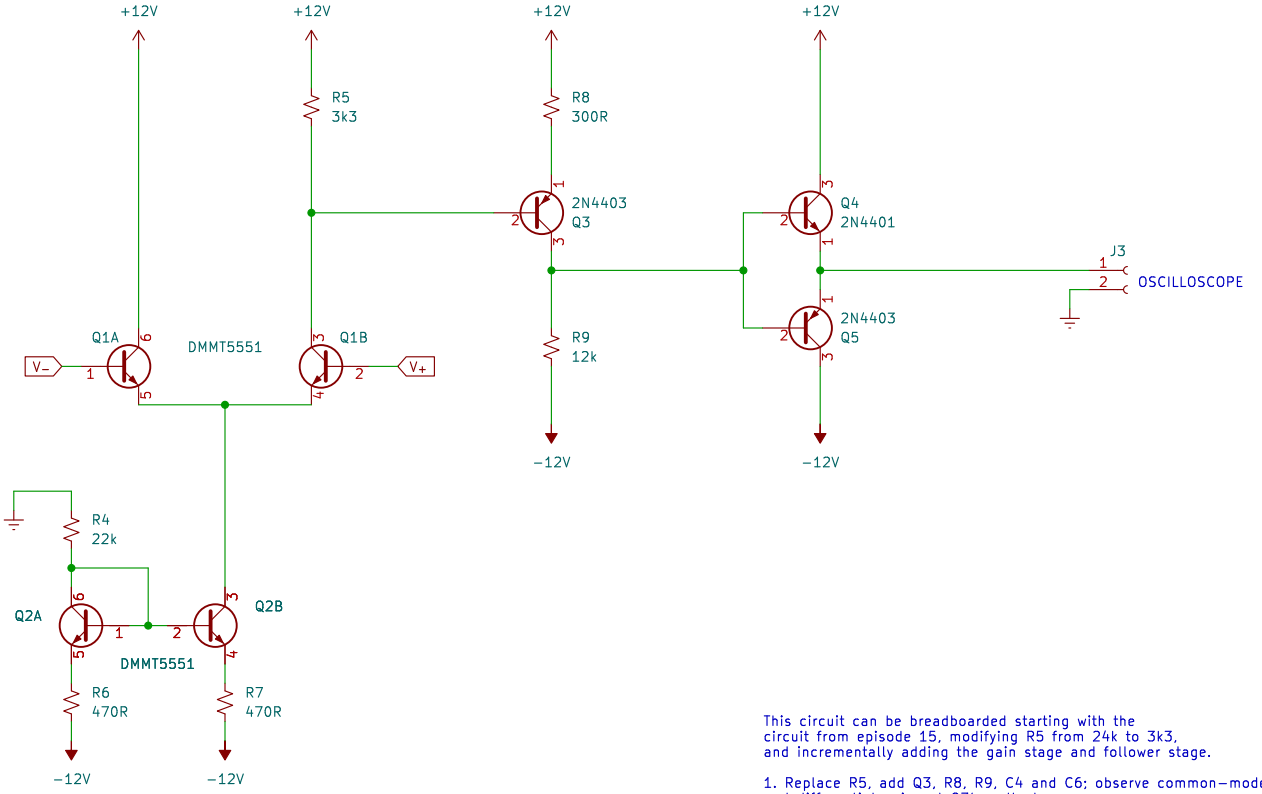
Test rig allows testing the pair's response
to common mode and differential signals,
together or separately.

When applying the common mode signal by
itself, it is advantageous to short pins
1 and 2 of Q1 with a short jumper to avoid
picking up spurious differences.

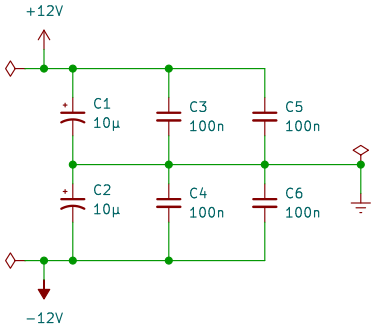
LONG−TAILED PAIR

GAIN STAGE

FOLLOWER STAGE



POWER AND BYPASSING



Place C3, C4 as close to Q1 as possible.
Place C5, C6 as close to Q4 and Q5 as possible.

500 µA CURRENT SOURCE

This circuit can be breadboarded starting with the
circuit from episode 15, modifying R5 from 24k to 3k3,
and incrementally adding the gain stage and follower stage.

1. Replace R5, add Q3, R8, R9, C4 and C6; observe common−mode
and differential gains at Q3's collector.

2. Add Q4 and Q5. Observe crossover distortion at the output.

open source hardware

Transistors 101, episode 16
The differential pair: getting more gain
Kludges from Kevin's Cave

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Title: Long−tailed pair: the basic circuit

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