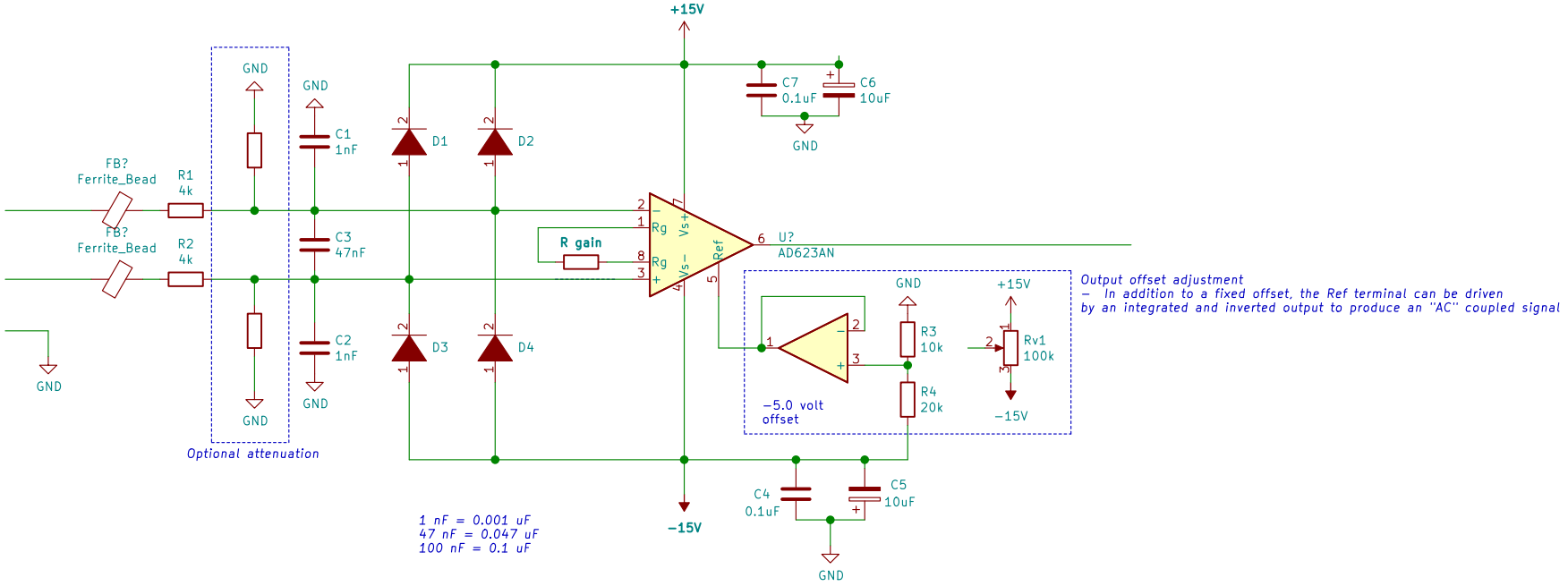
Differential input stage designed for +/− 5 V range oscilloscope

- Common mode bandwidth (−3dB) about 40 Khz
- Input protection
- Output offset level shifting to optimize A/D resolution
- Unity or adjustable gain



Notes:

1. To set Gain, leave Rg open for unity gain or calculate Rg values as: Rg = 50.5 K ohm / (Gain − 1)
Gains between 2 and 1000 can be set using resistors between 51k and 51 ohms

2. Input filtering limits are:
F differential = 1 / (2 * pi * R * (2C3 + C1)) = 400 Hz as drawn
F common mode = 1/(2 * pi * R * C1) = 40 kHz as drawn

3. Input attenuation can be implemented by placing resistors (Ra) in parallel with capacitors C1 and C2. Attenuation = R1 / (Ra + R1)

4. The output offset level can be set using the reference pin of the instrumentation amplifier.
As drawn, a buffered − 5.0 V reference shifts the output voltage down by 5 volts so that a 0 to +10 volt input signal would appear
at the output as −5 to +5 volts. If no offset is desired, the reference is grounded.
If a variable output is desired, a variable reference can be generated using a pot between the supply rails.

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File: differential scope amp.sch

Title: Differential input oscilloscope amplifier

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