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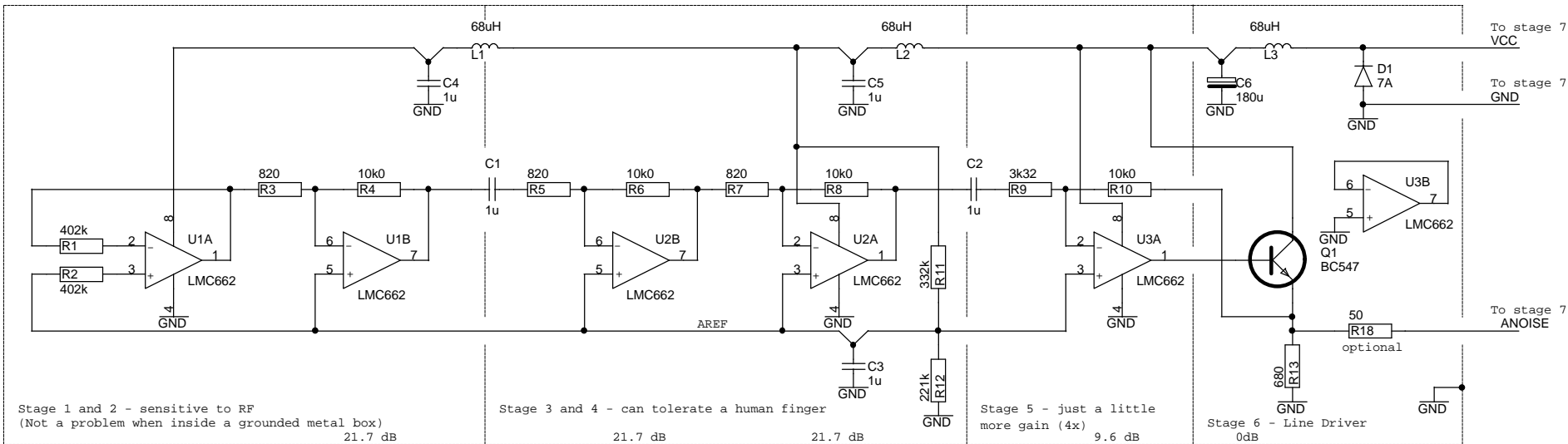
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Stages 1-6 inside a grounded metal box



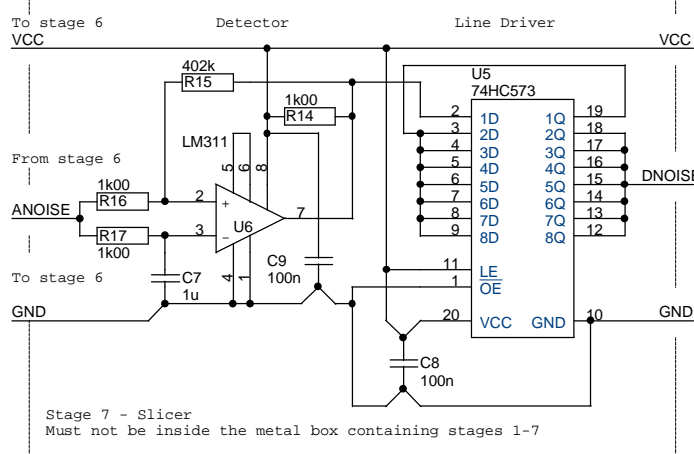
Stage 1 and 2 - sensitive to RF
(Not a problem when inside a grounded metal box)
21.7 dB

Stage 3 and 4 - can tolerate a human finger
21.7 dB

Stage 5 - just a little more gain (4x)
9.6 dB

Stage 6 - Line Driver
0dB

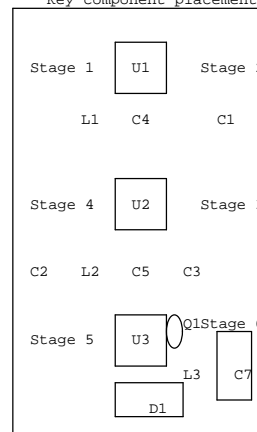
Stage 7 outside the metal box



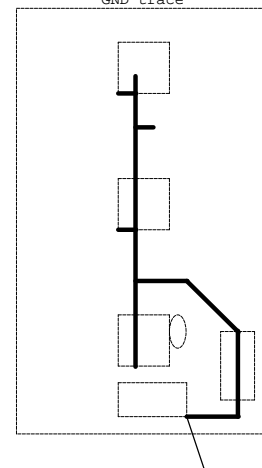
Stage 7 - Slicer
Must not be inside the metal box containing stages 1-7

Game port connections: 1=VCC 4=GND DNOISE=14

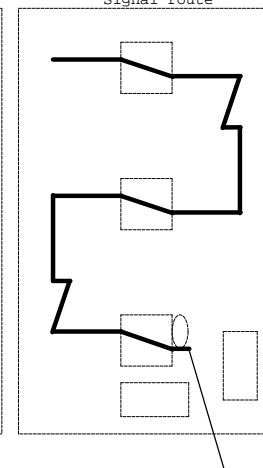
Stage 1-6 Key component placement



Stage 1-6 GND trace



Stage 1-6 Signal route



VCC=5.00V, T=20°C (stages 1-6)
TestpointValue (DC V) Noise RMS (/sqHz) 80kHz BW

AREF	2.00V ±60mV	-	-
U1.1	AREF ±5mV	114 nV	32 uV
U1.7	AREF ±65mV	1.39 uV	393 uV
U2.1	AREF ±5mV	17.0 uV	4.7 mV
U2.7	AREF ±65mV	207 uV	56 mV
U3.1	AREF ±5mV	621 uV	170 mV
U3.7	AREF±0.66V	621 uV	170 mV
Q1.E	AREF ±10mV	621 uV	170 mV

ICC 7.0mA ±2mA (prototype: 6.9mA)
74.8 dB total gain in stage 2-6
Total ICC stage 1-7: 15 mA

All resistors: Philips MRS25 (metal film 1%)
All capacitors: Wima MKS02 (plastic 10%)
All OPAMPs: NatSemi LMC662AIN (DIL8)

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Title		
Thermal Noise Source		
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