Sony SND Replacement - Through Hole

Sony SND Connector

+5V   IC5   +12V

P81   +5V   SND_IN   P818 SND_IN
SV0   P82   SV0   VREF   P815
SV1   P83   SV1   TEST   P814
SV2   P84   SV2   13   P813
POR   P85   RES   VCC1   P817
RES_SW   P86   +VS   VCC   P811
P87   7   SND_OUT   P810   SND_OUT
P88   GND   GND1   P89

GND   GND

IC Power Rails

+5V   +5V   +12V

IC2P   IC3P
74LS05N   74LS05N

GND   GND   -12V   -12V

Engineers Note:
-12V is required by the 128K Audio circuitry, but is not present on the Sony SND Pinout. It will need to be tapped from elsewhere on the board.

Decoupling Capacitors

+5V   +5V   +5V

C2   C3   C4
100n 50V   100n 50V   100n 50V

GND   GND   GND

Spare Logic Gates

IC3B   IC3E
74LS05N   74LS05N

IC3C   IC3F
74LS05N   74LS05N

IC3D
74LS05N

GND   GND

Engineers Note:
Dropping a hex part down when you only need a single part? Sure why not.

555 Timer POR Reset

+5V   +5V   +5V

R1   R2
1M   1M

IC4
TRE VCC+
/RES
DIS   OUT   POR
CON
TRI   GND
555

RES_SW

C1   C5   C12
100n 50V   1u 50V   100n 50V

GND   GND   GND   GND   GND

Engineers Note:
It is VITAL that the 47R resistor at R21 is removed or clipped on the Plus Logic Board. If not, the system will be held in reset.

Alternatively, replace R21 on the logic board with a 1M resistor, and Do Not Fit R2 on this SND replacement board.

Open Collector Inverter

POR   IC3A   POR
74LS05N

Engineers Note:
The 74LS05 is required, as the POR is expected to be open collector
DO NOT SUBSTITUTE

Macintosh 128K Vref, Volume Control and Amp

+12V

4016N
SND_IN   13   C
A   B
IC2A
GND

R4   C8
47k   1n 50V

R7   IC2C
68k   C
A   B
SV2   4016N

IC1A
TL072P

R8   IC2D
150k   C
A   B
SV1   4016N

R9   IC2B
470k   C
A   B
SV0   4016N
R10
470k

C9   C11
100n 50V   220p 50V
R11
200k

C10
100n 50V

IC1B
TL072P

+12V

Q2
2N3904

R12
150R

R13
10R   SND_OUT

Q1
2N3906

-12V

D1   C6   C7
5.1V   100n 50V   470p 50V
Zener

GND   GND   GND   GND   GND

Engineers Note:
Design taken directly from the Macintosh 128K Logic Board Schematic. The 5.1V zener is being used as an analogue reference voltage for the amplifier.
4016 is a quad analog switch, so the signal is instantly inverted by grounding the vref voltage by Switch 1.
This is then passed through to a unity gain buffer, before Switches 2-3 are used to adjust the volume by altering the resistance to the final Op-Amp.
The final op amp is the main amplifier, with the 3906 and 3904 transistors acting like a push pull output.
10R resistor has been added to the output - might be tweaked later.

Note: This design is based on the Macintosh 128K Audio Amplifier and Volume Control.
Power On Reset Taken from 68000 Designers Handbook

S/C: N/A	
Drawn By: DosFox	SND_Replacement
Version: VDEV1	15/Aug/24 13:08
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ADDITIONAL ITEMS	KPN	QUANTITY