



60.

61. No shielding is required for smaller film cap parallel with E-cap below:



62.

63. If everything is fine, plug in transport and you should hear music from the output.

64. Play a test CD at 1kHz.

65. Measure the voltage output at the 4 capacitors C4/C15/C25/C36 and the V_{rms} should be about $2V_{rms}$. Adjust the pot R8, R9, R17 and R18 so that the voltages output at the +out and -out sockets are within $0.005V_{rms}$.

66. Perform usual measurement for output voltage, distortion and noise etc...

67. Warm up the set for 1 hrs and adjust the voltage at point A and B again when needed.

68. For the output mute and delay, the relay K3 and K4 should be on after about 5 seconds power on but should cut off the output signal immediately when power off without hearing any pop noise.
69. If everything works fine, you have owned one of the best sounding PCM63 DAC.
70. I have no suggestion for tweaking the DAC with exotic parts and it is not my way to spend my hard earn money! Tweak it if you want to spend the money but expensive part has no guarantee of good sound.

Changes relative to D1 ver 2:

1. Able to use DIR9001 daughter board upgrade beside 8414 daughter board.
2. Add one more K170 footprint on the input of Jfet IV so that two BL grade fets can be used instead of V grade K170 (can't find).
3. Add one more pad for J74 current source in case J74V grade Idss 15mA fet is not found.
4. Enlarge pad sizes of passive parts like resistors, capacitors and inductors etc.
5. Increase pcb thickness to 2mm with gold plated through holes.
6. Add more pitch size selection of output couple capacitor – 10uF (max 2 inches).
7. Add ground plan on the bottom size of digital section to improve grounding.
8. Add LM317 for pre-regulation for digital ICs and then LT1117-5V regulator for each digital IC.
9. Only use LM336-5V voltage reference at +/-18V low noise regulators in analogy supply. LM336 has lower noise compare to TL431.
10. Eliminate 90 deg turn on trace for digital signal paths.
11. Correct D10 polarity mark “+”.
12. Separate the digital supply of PCM63 from the analogy supply. Feed by either the +/- 18V analogy supply or +/-12V digital supply section.
13. Two ground plans (D & A) and single point of connection at the centre location L21.
14. Add more via hole to improve the grounding at top and bottom ground plan of digital section.
15. Add ground points J19/J23/J24/J17/J26 so that diyer can add additional star ground if required. The can reduce ground plan noise effect.
16. Add TO-220 type fred diode pad for all rectifiers besides standard DO-35 diodes.
17. Move the Jfet IV next to the current output of PCM63 to eliminate any noise pickup or leakage. This will improve the subsonic and decay of the sound.
18. Add output relay for power off mute and power on delay.
19. Change analogy transformer from 24V x 2 to 18V x 2. Use +/-18V for the Jfet IV instead of +/-20V dc.
20. Add selection of 8412/14 output at 16 or 18 bit mode and also SM5842 input at 16 or 18bit mode.
21. Improve all pot tuning to clockwise direction.
22. Add jumper (or hard wire) for all LM317/337 regulators and thus easy to connect external dc source for comparison.
23. One heat sink type – easy to source parts.

Jumper Functions:

JMP type: **Must be shorted for normal operation.**

JMP jumper	From	To	Remark
JMP1	+12V	U20 input	+8V digital pre-regulator
JMP2	+18VL	U5 input	+5V regulator Left
JMP3	-18VL	U6 input	-5V regulator Left
JMP5	+18VR	U12 input	+5V regulator right
JMP6	-18VR	U13 input	-5V regulator right

Digital Section Jumper Select: *pin 1 is in Square pad, short either pin 1-2 or 2-3*

Designation	Function	Short Pin 1-2	Short Pin 2-3
J2	Input Digital source select	RCA – J15	XLR – J16
J9	SM5842 Clock (XTI) input select	Use 8412 MCK, default	Use XO, reserved
J6	SM5842 Jitter Select	Free mode	Normal mode
J7	SM5842 Dither Select	Dither ON	Dither OFF
J21	De-Emphasis Select	8412/8412 receiver	9001 receiver
J22	SM5842 bit input select	18bit – 8412/8414	16bit – 9001
J5	Polarity Select - Phase	Normal	Reverse
J28/J29	8412/14 output bit select	Short J28 & Open J29, 18 bit mode	Short J29 & Open J28, 16 bit mode

Operation modes:

There are two operation modes when 8412 or 8414 receiver IC is used for U15.

1. 18 bit: This is the original design of NP D1. 8412/8414 is output at 18bit mode (J28 short, J29 open) and the input of SM5842 is selected at 18 bit input mode (J22 pin 1-2 short).
2. 16 bit: This is a new option. 8412/8414 is output at 16 bit mode (J28 open, J29 short) and the input of SM5842 is selected at 16 bit input mode (J22 Pin 2-3 short).

For DIR9001 converter board, there is only one mode to use at 16 bit.

On 9001 converter board:

Set J3 short and J1, J2, J4 & J5 open.

On DAC main board:

Set J22 to Pin 2-3 short – 16 bit mode.

Set J21 to Pin 2-3 short – 9001 de-emphasis mode

Note that J28 and J29 will not affect the output mode of the 9001 converter board.

Thus there are totally 3 possible way to run the D1V3 DAC and these modes can be combine with the Jitter free, Dither on/off and Polarity to see which way sound best.

Enjoy!

END