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CONSTRUCTION MANUAL ***for the*** **1450** **Shunt Feedback RIAA Phono Stage**

Thank you for purchasing the Hart Linsley Hood 1450 Series RIAA Pickup preamplifier, the finest sounding vinyl amplification system on the market, regardless of price!.

This new preamplifier represents the ultimate standard of performance that is available from the microgroove long playing record medium. The combination of the preferred 'Shunt Feedback' concept and a very advanced discrete component circuit topology designed by John Linsley Hood give a result which is sonically better, with a greater 'openness' of sound than any circuit before. Having a specially optimised low-impedance front end it is particularly suited to use with moving coil cartridges and for this purpose it even surpasses the widely acclaimed integrated circuit RIAA preamplifier by the same designer.

Both moving coil and moving magnet cartridges can be used, the higher output of the latter being fed into an AC coupled input stage. There is also onboard provision for fitting loading capacitors where moving coil cartridges need this.

We now offer an SA (Series Audiophile) version of this excellent kit with even higher grade components than the normal version. This comes with capacitors using different dielectrics and with lower ESR electrolytics and selected semiconductors. These sets have 'SA' suffixes.

Normally the K1450 will be used in its own case as near as possible to the turntable to minimise the cable runs carrying the very low level, and therefore vulnerable, pickup cartridge signals.

SPECIAL POINTS ABOUT YOUR LINSLEY HOOD PRE-AMPLIFIER ASSEMBLY.

This kit has been completely engineered by HART separately from the publication of the articles and this means that there may be changes incorporated in the light of further experience, so please follow these instructions with the articles as a back-up guide rather than vice versa.

This is an ultra-high performance unit and to achieve the best results the component selections and board layout are extremely critical. We therefore only supply complete kits and will not support any units not built from our components. As with any other kit, finding an incorrectly fitted resistor after the board has been assembled is almost impossible, we must therefore repeat our standard advice that **ALL RESISTORS ARE CHECKED WITH A MULTIMETER BEFORE FITTING.**

ASSEMBLY OF RIAA PRE-AMPLIFIER. PCB 1450.

As this is a stereo unit there are of course two of most components. The layout is largely symmetrical around the PCB longitudinal centreline, the only variation being that the first part of the circuit is a mirror image of its opposite channel and the second half is a largely identical repetition. Bearing this in mind when fitting the components will save a lot of hunting around.

Open resistor set .

Fit 5 zero ohm links. The one next to C21 should be soldered on top of the board at each end.

Fit 10 x 2k2 resistors, R3 & 33, R6 & 36, R8 & 38, R11 & 41, R15 & 45. 2 x 120R resistors, R25 & 55. This value of R25 and R55 enables the unit to drive cables up to 50 metres long without HF loss.

Fit R4 & 34, R5 & 35, 3K9. R2 & 32, 47K. R2 needs to be soldered to the ground plane (PCB top copper surface) at one end and R32 needs to be soldered at both ends. These three top surface points are soldered before turning the board over and soldering ALL the bottom connections as normal.

Fit R9 & 39, 12R. R22 & 52, 24 & 54, 47R.

Fit R13 & 43, 27 & 57, 82R. R28 & 58, 680R, R17 & 47, 20 & 50, 82k. R17 & 47 are soldered to the ground plane at one end first.

Fit R7 & 37, R12 & 42, 10k. R21 & 51, 26 & 56, 1M. R1 & 31, R23 & 53, 100R. R26, 31 & 56 are soldered on top of the board at one end.

Fit R14 & 44, 19 & 49, 5K6. R16 & 46, 18 & 48, 15K. R10 & 40, 150R. R14, 40 & 44 have one end soldered on top of the board.

Open Capacitor set .

Fit all the small axial polystyrene capacitors. C2 & 32, 22 & 52, 220pf.

C16 & 46, 680pf. C14 & 44, 1n. C15 & 45, 2n2.

Check your moving coil cartridge specification to see if it requires a 10n capacitor across its loading resistor

If yours is one of the rare ones that does then Fit C1 & 30, 10n Polyester Radial.

Open semiconductor set .

Fit 16 x BC557 or BC559 Q3 & 33, 5 & 35, 7 & 37, 8 & 38, 9 & 39, 10 & 40, 12 & 42, 13 & 43.

With all

transistors it is important that these are fitted properly with the device spaced from the board by about 5mm.

Leaving the transistor with longer leads than this not only looks unprofessional, but it can lead to instability.

Fit 8 x BC549, Q4 & 34, 6 & 36, 11 & 41, 14 & 44.

Fit IC 1, 78L05.

Fit 8 x 100n Polyester capacitors C5 & 6, 35 & 36, 4 & 12, 18 & 20.

Fit 8 x 100uf 25v capacitor. Note polarity - they don't all point the same way. C24 & 54, 9, 39, 10 & 40, 3 & 11.

Fit IC 2, 79L05.

Fit Q1 & 31, BD437. Q2 & 32, BD438. Note that the wider line on the ident indicates the metal back surface of the device, all face the bottom of the board, when the ident is the correct way up.

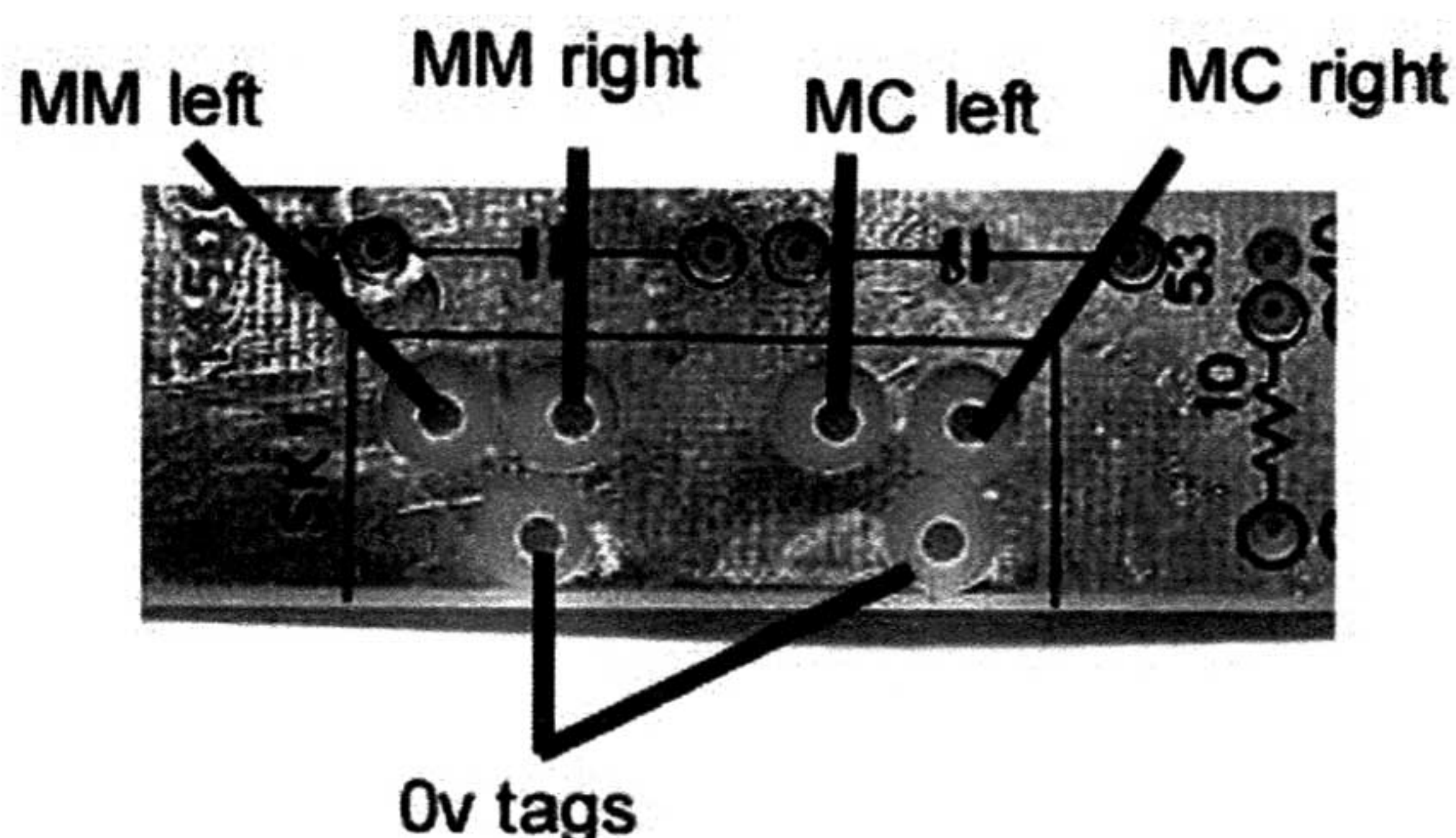
Fit C23 & 53, 1u0 Polyester.

Fit C7,8,37 & 38, 17 & 19, 470uf 16/25v, observe polarity.

Fit 5-way top entry header for ribbon cable.

Fit C13 & 43, 21 & 51, 2u2 Polyester

Fit SK1 4 Gold Plated Phono sockets to the case next to the switch. These are connected to the pcb as follows. Solder about 75mm of cable through the holes in the pcb as per the picture. Once the pcb is in place, solder these wires to the corresponding phono sockets.



Fit the 2 x Gold Plated Phono sockets next to the 4 way socket on the case. These are connected via the phono cable through the holes at the front of the PCB next to R26. Twist the outer conductors from both channels together, these will go through the hole closest to the edge of the PCB. The inner conductor for the left channel goes through the hole next to R26 and the right channel conductor to the next hole along. Connect the other end of these phono leads to the 2 x phono sockets. There is a Black conductive layer under the outer conductor of the Vanne Damme cable, this must be cut back to prevent short circuits.

To fit the Moving Coil/Moving Magnet Selector switch, a 4-pole changeover toggle switch, use four tinned copper wires, component offcuts are fine. Feed the wires through the holes in the PCB that line up with the bottom row of four connections on the switch. Solder all these and trim them down to 14mm.

Then fit a further wire joining together the centre row of four connections on the switch leaving enough to go through the remaining hole by C1.

This is the tricky bit. Loosely mount the PCB and the switch, so that all the wires are through their respective holes in the switch and the one in the PCB. Solder the 4 wires to the bottom row of the switch. Remove the PCB and switch, then solder the wire that goes through the hole by C1.

ASSEMBLY IN CASE.

It may be necessary to clean the paint from around the bottom surface of the hole below C43, the mounting pillar here being used to 'ground' the PCB to the case. Fit the four mounting pillars loosely in place.

Check that there is no paint around the rear surface around the hole for the turntable earth terminal. Fit the

earthing screw through this hole from the back with a shakeproof. Hold in place with the nut, well tightened, taking care not to scratch the front plate. If the moving coil/moving magnet switch has not already been fitted to the PCB then fit it now.

Fit the PCB to the back plate with one self tap screw in the centre of the 4-way phono socket and the switch nut.

The correct procedure for dealing with the switch nuts in this instance is to place all the washers behind the panel leaving just the one nut on the front surface. This nut is then positioned with fingers so that it is nicely fitted just below the surface level of the threaded switch shank. The assembly is then tightened with the rear nut behind the panel. This needs a thin spanner and if one is not to hand then take care not to scratch the panel when tightening the front nut.

Fit the 5 way DIN socket to the back panel and solder the 5 way cable as per the enclosed diagram, or use the Molex connectors if mounting in the same case as power supply. This is then plugged in to SK3. The middle (black) wire is 0v, the (red) wire next to the wording SK3 is +15v and the (white) wire next to IC13 is -15v.

The PCB may now be mounted on the base with its two pillars. Loosely put two M3 x 5 screws through the PCB into the pillars with a solder tag and shakeproof washer under the head of the screw below C43.

Stick a foot under each of the four corners.

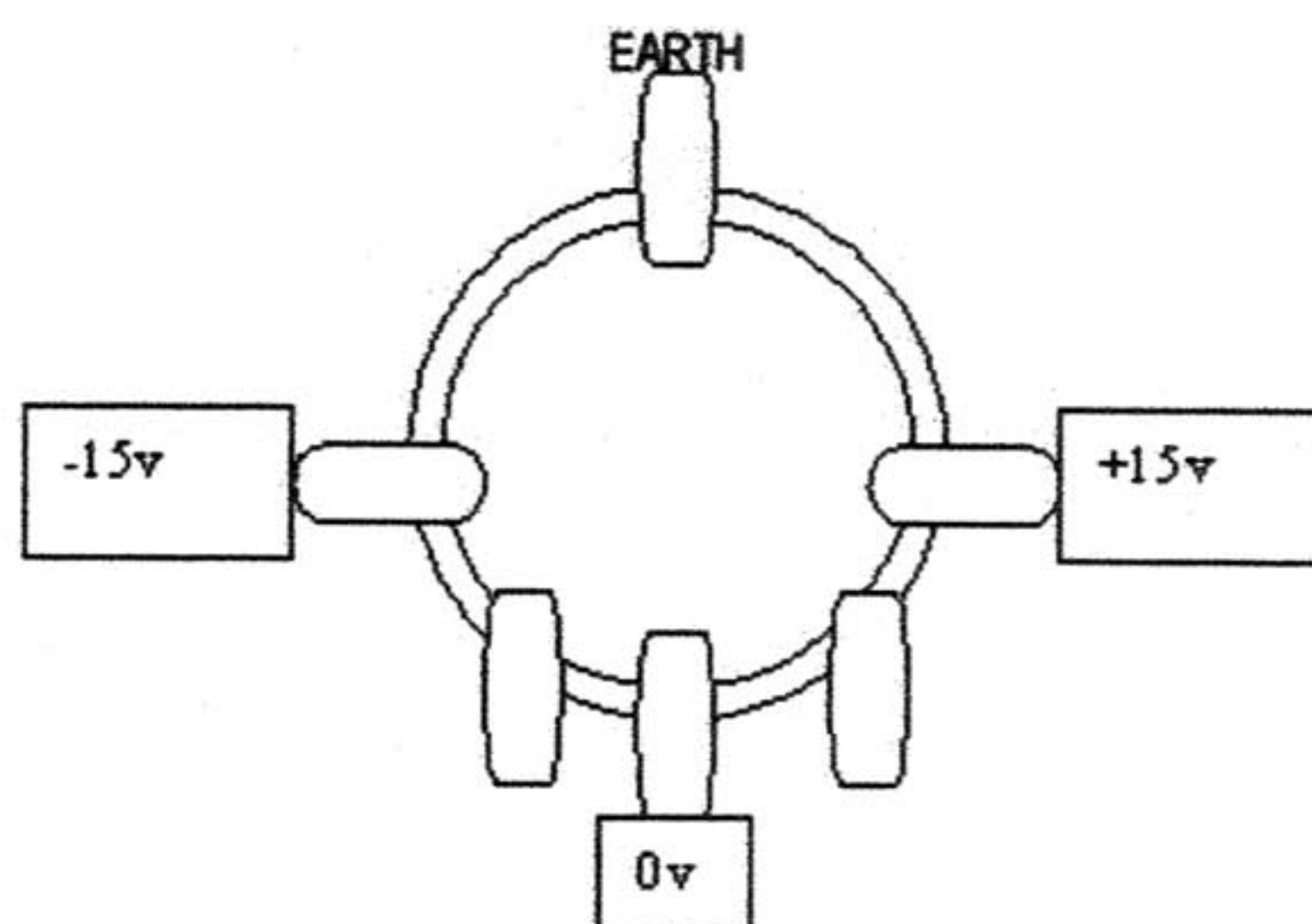
Although considerable smoothing is given on the 1450A PCB this unit **must** be used with a fully stabilised power supply with proper earthing arrangements capable of supporting its potential quality. The **K3565 'Andante'** Power Supply is our top specification unit. See our lists for further information.

CHANGING UNIT GAIN. To suit your particular cartridge and pre amp combination.

This is very easily done by simply changing two resistors for small level differences or four to give a larger change.

To INCREASE gain:- Change R9 & R39 from 12R to 10R or change R19 & R49 from 5K6 to 3K9. If a greater increase is required then implement BOTH changes.

To DECREASE gain:- Change R9 & R39 from 12R to 15R or change R19 & R49 from 5K6 to 8K2. If a greater increase is required then implement BOTH changes.



RIAA MOVING COIL & MOVING MAGNET AMPLIFIER STAGE. Parts List.

RESISTORS

D/Rt	Left	D/Rt.	Left	D/Rt	Left
R1	R31 100R	C1	C30 10n PCR 5P0 (Only fitted if required by cartridge)	Q1	Q31 BD437
R2	R32 47K	C2	C32 220p PSA	Q2	Q32 BD438
R3	R33 2K2	C3	100u 25v CER 3P5	Q3	Q33 BC559
R4	R34 3K9	C4	100n PCR 5P0	Q4	Q34 BC549
R5	R35 3K9	C5	C35 100n PCR 5P0	Q5	Q35 BC559
R6	R36 2K2	C6	C36 100n PCR 5P0	Q6	Q36 BC549
R7	R37 10K	C7	C37 470u 16v CER 5P0	Q7	Q37 BC559
R8	R38 2K2	C8	C38 470u 16v CER 5P0	Q8	Q38 BC559
R9	R39 12R	C9	C39 100u 25v CER 3P5	Q9	Q39 BC559
R10	R40 150R	C10	C40 100u 25v CER 3P5	Q10	Q40 BC559
R11	R41 2K2		C11 100u 25v CER 3P5	Q11	Q41 BC549
R12	R42 10K		C12 100n PCR 10P0	Q12	Q42 BC559
R13	R43 82R	C13	C43 2u2 PCR 22P5	Q13	Q43 BC559
R14	R44 5K6	C14	C44 1n0 1% PSA 10P0	Q14	Q44 BC549
R15	R45 2K2	C15	C45 2n2 1% PSA 10P0	IC1	78L05
R16	R46 15K	C16	C46 680p 1% PSA	IC1	79L05
R17	R47 82K		C17 470u 25v CER 3P5		
R18	R48 15K		C18 100n PCR 5P0		
R19	R49 5K6		C19 470u 25v CER 3P5		
R20	R50 82K		C20 100n PCR 5P0		
R21	R51 1M0	C21	C51 2u2 PCR 22P5		
R22	R52 47R	C22	C52 220p PSA		
R23	R53 100R	C23	C53 1u0 PCR 15P0		
R24	R54 47R	C24	C54 100u 25v CER 3P5		
R25	R55 120R	C25	100n PCR 5P0		
R26	R56 1M0	C26	100n PCR 5P0		
R27	R57 82R				
R28	R58 680R				

SOCKET DESIGNATIONS

- SK1 4-Way Phono.Inputs,
 SK2 2-Way Phono.
 SK3 5-Way IDC Header
 SK4 4-Way Header.
 SK5 5-Way DIN PCB Mtg
- .Switch 4 way changeover

DC & AC Coupled. Use AC for MM

- Signal Input, External Version
 Signal Output, External Mounted Version.
 Power Input Internal Version
 Signal Output, Internal Version. (optional)
 Power Supply Inlet to case. (optional)

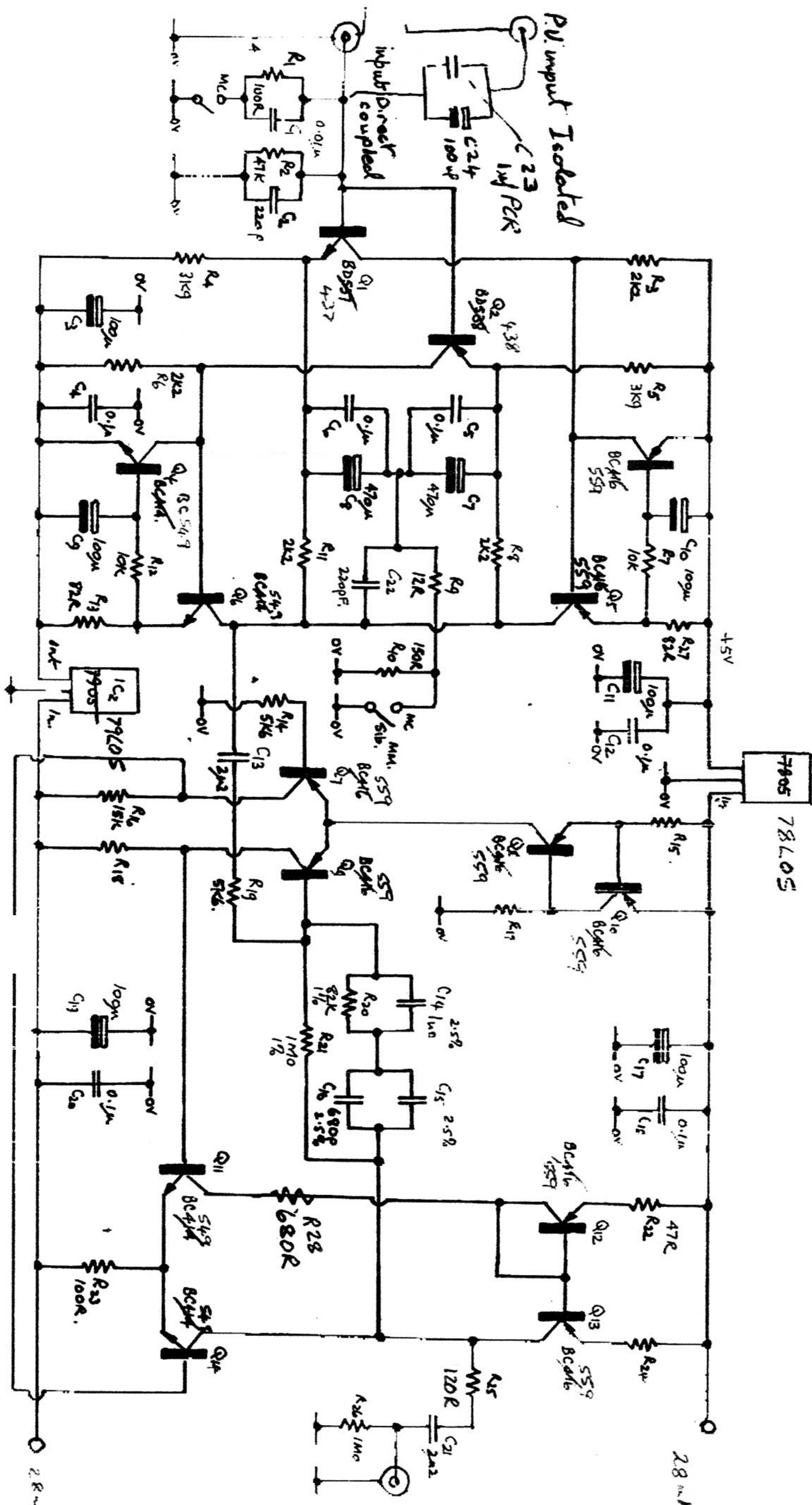


Fig 0 Buffered shunt-feedback R.I.A.A. equalisation stage.