ARCAM

DELTA 290 AMPLIFIER SERVICE MANUAL

ARCAM D

Issue 1 Se

(Paul New

Arcam Dra

Contents

Circuit Description

Input/Output Selection (circuit diagram sheet 1)

The D290 has 6 line level inputs as standard selected by use of the motorised listen switch, SW201.

The use of the 'record' switch SW202 allows recording of one source whilst listening to another.

Tone Control & Preamp Out/Power Amp In (circuit diagram sheet 3)

The tone control stage on the D290 is based around a dual op-amp IC2. The first half provides a buffer stage for the tone controls and the second one with its frequency dependent feedback is used as the tone control itself.

The output of the tone control then passes through the balance control RV201 and then onto the power amp stages and the preamp out buffer stage formed by IC203.

The tone controls and balance pot can be bypassed by use of the 'direct' switch SW205.

The D290 can be driven from an external preamplifier source by moving the internal switch SW206 to disconnect the D290 preamp from the power amp.

Power Amplifier (circuit diagram sheet 4 & 7)

The signal from either the D290 input sockets or an external preamp enters the power amp stage via C12 and R35.

Q10, 11 form a long, tailed pair driven by the current source formed by Q12 and 13.

Q6 is the Class A stage driving the Quasi complementary output stage of Q4 and Q5, and mosfet's Q1, 2.

IC1 is a d.c. servo used to maintain a low d.c. offset at the speaker outputs.

Power Supplies (circuit diagram sheets 2 & 4)

The D290 is powered by a toroidal transformer with 2 sets of secondary windings.

The main windings are used to provide +/-44V D.C. after rectification and smoothing by diodes D201-204 inc. reservoir capacitors C201, 202.

The second winding is rectified to provide an unregulated supply voltage for the motor driver ics, IC402, 403 and is also smoothed and regulated with a zener diode (D402 and associated components) to provide a stable voltage for the micro controller IC401.

Protection/Mute circu

The protection and n
d.c. offset detection
of the amplifier 'Gre
internally because of
delay mute is operat

The thermal cut out
device heatsinks.

Disc Stage (optional)

The optional phono
equalization for both

Transistors Q2-5 and
coil cartridges when
and R4. R5 and C2
de-emphasis. The ne
low frequency RIAA

The pcb mounted s
regulated rails from t
D2 to power the mo

NOTE.

When the phono opti
could be used to fee

Change of Mains Voltage

WARNING - the unit **must**
the transformer as the mai
off.

Units with PCB less than

To rewire the D290 for u
referring to the pcb and t
move are the brown and

2

BROWN

SPARE WI

1

ORANGE

SPARE WI

Units with PCB Issue 7 o

These D290's can be set
There are 2 mains fuseh
fuseholder with the fuse f
To change voltage remov

The correct fuses are:

Various run
changes ar

1. Seria
10nF
buttc
C601
reliat

2. Seria
Main

3. Seria
R4, 1

4. Seria
Micr
rand
caus
stop

5. Seria
R4, 1
Tran
C1,
R22,

6. Seria
C5,1

Changes 5
occasional

7. Seria
Issue
to th
track

8. Seria
The
repla
18/1
Any

D290 SERVICE NOTE 1 Issue 2 1

The MOSFET devices used on the D290 amplifier have become obsole
replacement device. The replacement device is a TO3-P plastic packag
underneath as shown below.
From serial number 2674 onwards all D290's will have the new type de
It is advisable to replace all 4 devices to this new type and at the sam
checked and replaced if the IQ will not adjust.

Change R16,116 to 56K *from* 100K
Change R17,117 to 4K7 *from* 3K3.

These changes give a slightly wider range for the IQ (quiescent curren
The IQ should be checked after replacing the output devices and set to

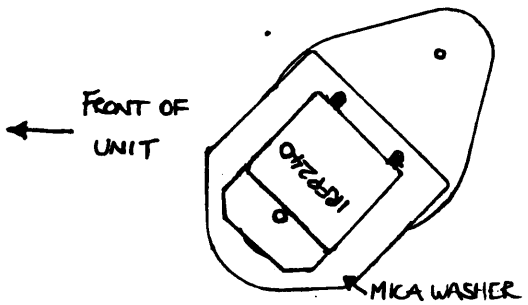
Check that R55,155 are 100K and *not*
Remove C5,105 (33pF) and replace with 10pF polystyrene in ser
Remove C7,107 (220pF)
Change C6,106 to 22pF *from* 10pF polystyren
Change R22,122 to 3K3 *from* 4K7 metal filn

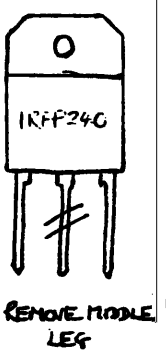
These changes should prevent any tendency for instability which has ca
of the output stage.

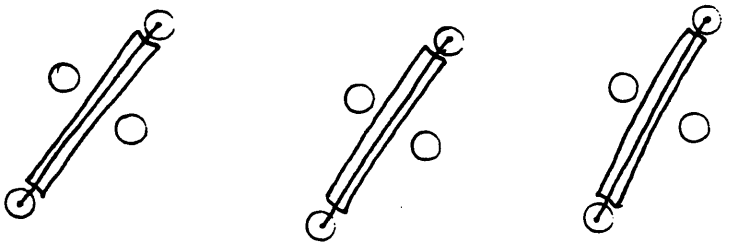
If you order D290 output devices from us you will be sent these new de
enable all of the above to be carried out.

2 x 22pF polystyrene capacitor
2 x 10pF polystyrene capacitor
2 x 3K3 metal film resistor
2 x 100K metal film resistor
2 x 33K metal film resistor
2 x 56K metal film resistor
4 x IRFP 240 Plastic MOSFET
6 x rubber sleeving
4 x mica washer

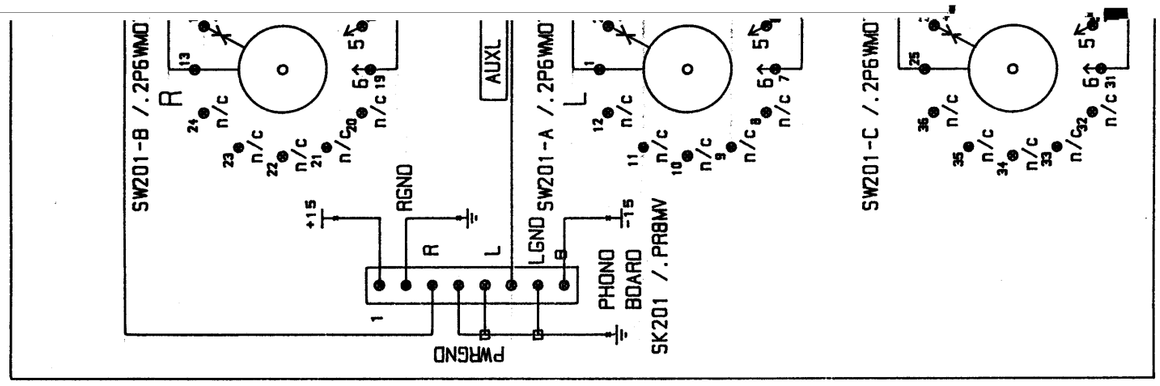
NOTE: The extra pieces of sleeving should be cut into 8 pieces and fitte
go through to prevent them shorting to the heatshunt. The mica washer
be smeared with heatsink compound on both sides to ensure good the
under the pcb as shown below otherwise the devices will not receive th

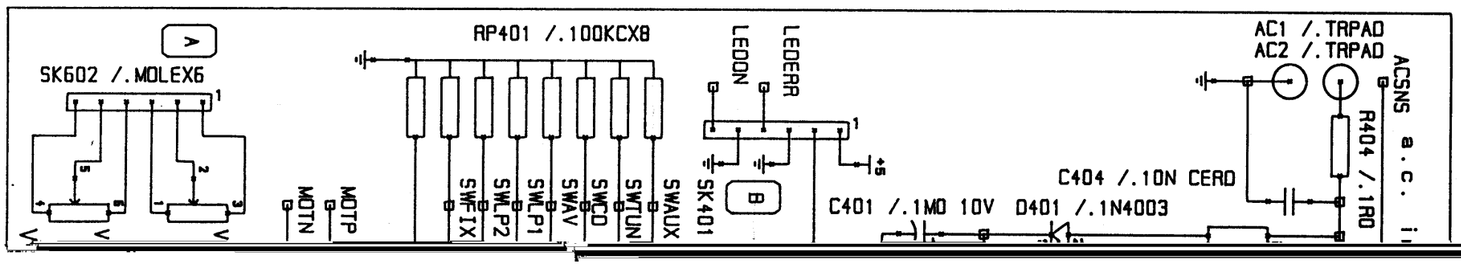


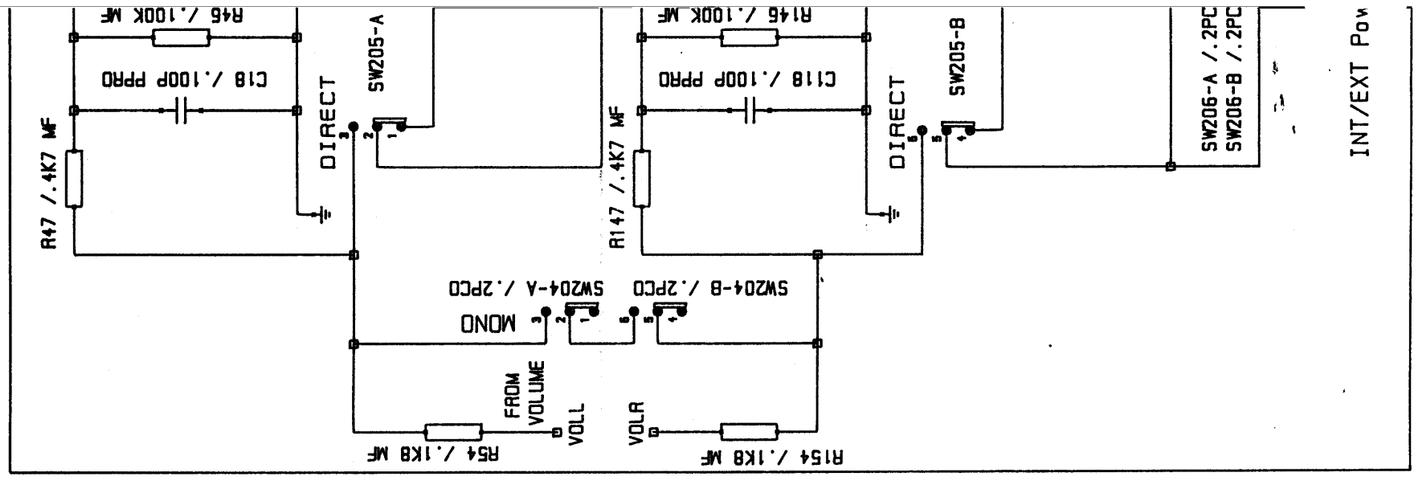


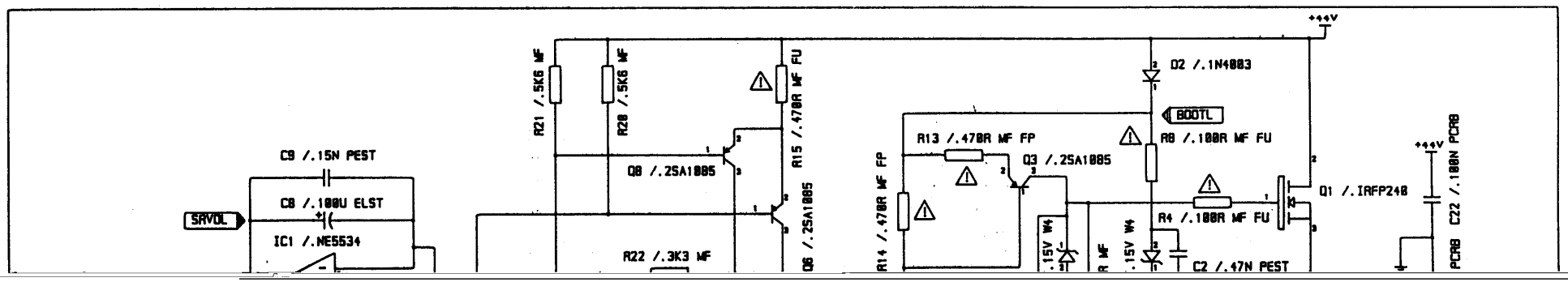


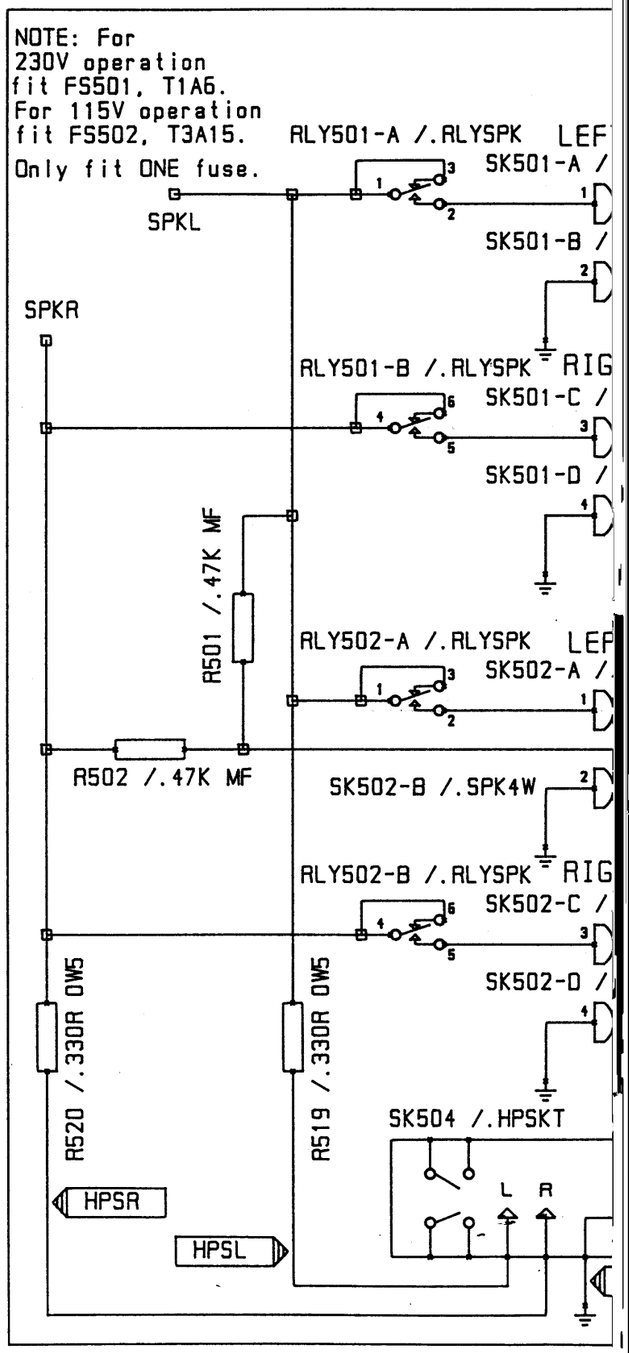
C
I
Remote R
Tone C
Powe
Protec
MM
Power


SW201-B /.2P6WMO
R
13
24 n/c
23 n/c
22 n/c
21 n/c
20 n/c
19 n/c
6
5
+15
RGND
R
L
AUXL
LGND
SW201-A /.2P6WMO
L
12 n/c
11 n/c
10 n/c
9 n/c
8 n/c
7 n/c
6
5
SW201-C /.2P6WMO
25
36 n/c
35 n/c
34 n/c
33 n/c
32 n/c
31 n/c
6
5
1
PWRGND
PHONO
BOARD
-15
SK201 /.PA8MV


A
SK602 /.MOLEX6
RP401 /.100KCX8
LEDON
LEDERR
B
SK401
C401 /.1MD 10V
D401 /.1N4003
C404 /.10N CERD
AC1 /.TRPAD
AC2 /.TRPAD
R404 /.1RD
ACSNS a.c. i
MOTN
MOTP
SWFIX
SWLP2
SWLP1
SWAV
SWCD
SWTUN
SWAUX

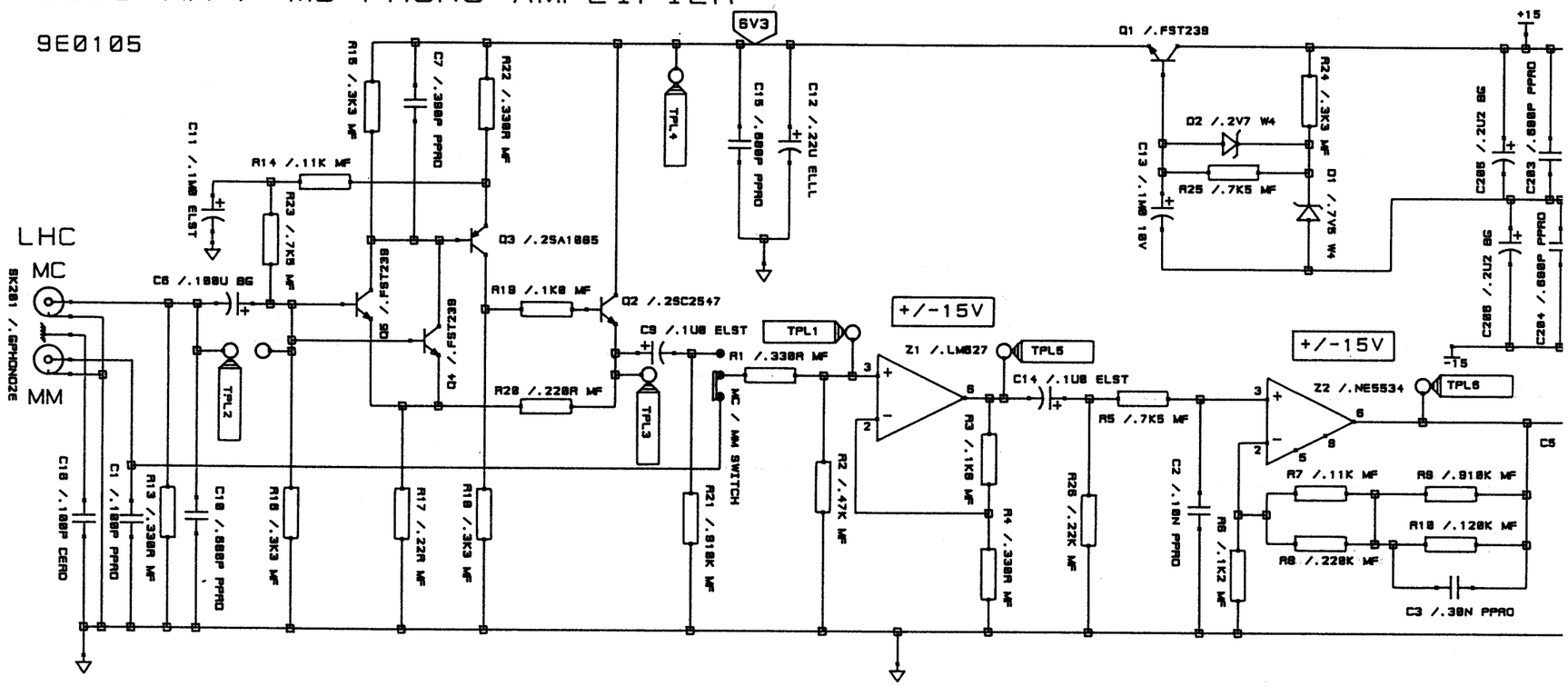

R45 /.100K MF
C18 /.100P PPRO
SW205-A
DIRECT
R47 /.4K7 MF
R145 /.100K MF
C118 /.100P PPRO
SW205-B
DIRECT
R147 /.4K7 MF
SW206-A /.2PC
SW206-B /.2PC
INT/EXT Pow
SW204-B /.2PCO
SW204-A /.2PCO
MONO
FROM VOLUME
VOLL
VOLR
R54 /.1K8 MF
R154 /.1K8 MF


+44V
D2 /.1N4003
BOOTL
R13 /.470R MF FP
R8 /.100R MF FU
Q3 /.2SA1085
Q1 /.IRFP240
R4 /.100R MF FU
C2 /.47N PEST
C22 /.100N PCAB
PCAB
R21 /.5K6 MF
R20 /.5K6 MF
R15 /.470R MF FU
Q8 /.2SA1085
Q6 /.2SA1085
R22 /.3K3 MF
C9 /.15N PEST
C8 /.100U ELST
SRVOL
IC1 /.NE5534
R14 /.470R MF FP
.15V W4
.15V W4


NOTE: For
230V operation
fit FS501, T1A6.
For 115V operation
fit FS502, T3A15.
Only fit ONE fuse.
SPKL
SPKR
RLY501-A /.RLYSPK
SK501-A /
SK501-B /
RLY501-B /.RLYSPK
SK501-C /
SK501-D /
R501 /.47K MF
RLY502-A /.RLYSPK
SK502-A /
R502 /.47K MF
SK502-B /.SPK4W
RLY502-B /.RLYSPK
SK502-C /
SK502-D /
R520 /.330R 0W5
R519 /.330R 0W5
SK504 /.HPSKT
L
R
HPSR
HPSL

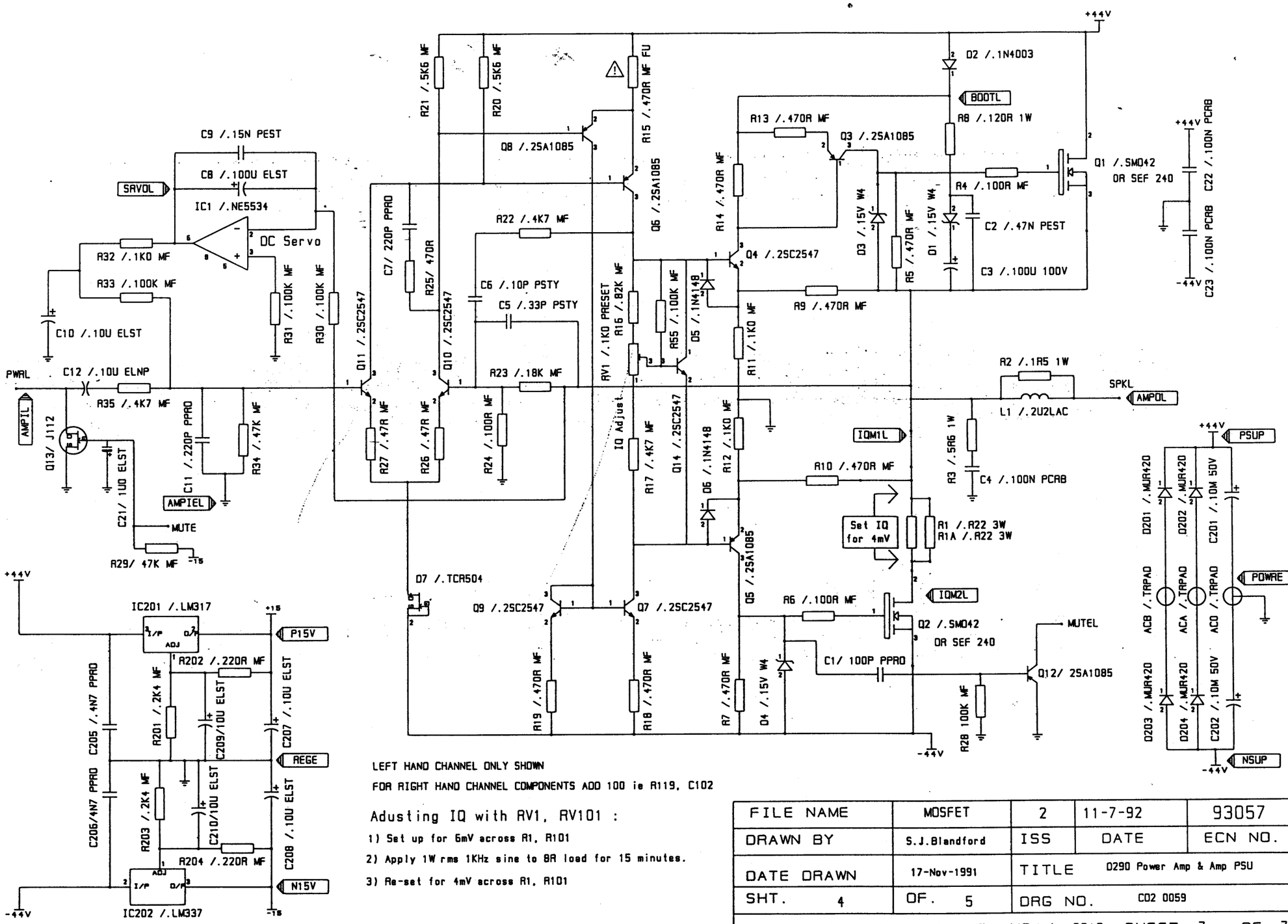
D290 MM / MC PHONO AMPLIFIER

9E0105



RHC MM / MC DISC AMPLIFIER
(RHC ADD 100 ie R101, C101)
TEST POINTS = TPR1 etc

FILE NAME	D90MAG1	4	4-1
DRAWN BY	JMG	ISS	DA
DATE DRAWN	22-4-92	TITLE	D90
SHT.	OF.	DRG NO.	C
SERVICE MANUAL DRW. NO. H04/ 0017			
ARCAM. A & R CAMBRIDGE LTD			



LEFT HAND CHANNEL ONLY SHOWN

FOR RIGHT HAND CHANNEL COMPONENTS ADD 100 ie R119, C102

Adusting IQ with RV1, RV101 :

1) Set up for 6mV across R1, R101

2) Apply 1W rms 1KHz sine to 8R load for 15 minutes.

3) Re-set for 4mV across R1, R101

FILE NAME	MOSFET	2	11-7-92	93057
DRAWN BY	S.J.Blandford	ISS	DATE	ECN NO.
DATE DRAWN	17-Nov-1991	TITLE	D290 Power Amp & Amp PSU	
SHT. 4	OF. 5	DRG NO.	C02 0059	
SERVICE MANUAL DRW. NO. H04/ 0018 SHEET 7 OF 7				
ARCAM. A & R CAMBRIDGE LTD, CB5 9PB				