

**ARCAM DELTA**  
DELTA 90 INTEGRATED STEREO AMPLIFIER

Iss.1 26.2.88

inet (M.M.) or moving  
tridges an MC60  
the switch at the rear  
AA equalisation stage is  
capacitors C1 and C2  
e input. Frequency  
vided by networks  
t high frequencies.  
sation of the IC.

or any other input can  
switch.. A second  
for routing to tape  
led to prevent tape 1  
: feedback problems.  
:9 to match other line

e control to a line  
Transistors Q1 and Q2  
ansistors Q3 and Q4 are

R221 via R13.

2 allows a limited  
nd treble. Bass and  
ck around IC2 with  
each potentiometer

ie tone control output  
v the line amplifier  
clicks caused by  
ages are maintained on

the transistor input stage rather than  
. Signal on Q5 base modulates the  
stant voltage variation drive class A  
r Q6. Transistor Q7 is loaded by a  
ignal equal in amplitude to the  
n the collector of Q7. For  
sistor Q13 and output transistor Q15  
ability to drive the loudspeaker  
lf cycles Q12 and Q14 provide the  
perates in class AB mode with a  
y 30mA in the output stage  
ut stage is biased in this  
R42 which is set by current source  
V1 allows adjustment of the current  
ut stage standing current.

possibility of the thermal runaway  
d adjacent to the heatsink to allow  
source. Two identical protection  
e output current across R58 and R59  
of Q12/Q13 if overcurrent or  
the output transistors.

it is returned to the emitter of the  
o. Resistors R35, R36 define the

oscillation in the amplifier is  
d also C22.

provides D.C. bias to the input  
fset on the loudspeaker output.  
n extremely large gain at D.C. but  
cies. Capacitor C20 and R34 are  
residual filtering by C19. I.C.3  
V supplies.

s A stage is filtered by use of  
ide isolation from the output

### Speaker protection relays and on/off mute

The amplifier output is connected to the output terminals via a relay which performs 2 functions. On switching on the power there is a 5 second time delay before the relay closes, on switchoff the relay opens immediately. Bangs and pops are thus prevented from reaching the speakers. The relay circuit also monitors the D.C. offset on both loudspeaker outputs and if this is greater than approximately  $\pm 0.7$  Volt the relays will open, protecting loudspeakers from D.C. current.

Components R215, C220 provide the switch on delay. When C220 charges to above 15.7 Volts Q208 switches on and in turn Q209 switches on both relays. Resistor R219 provides some positive feedback for positive action.

Note that for C220 to charge up Q206 and Q207 must be off. Any D.C. offset on either power amplifier will cause one of these transistors to turn on. Capacitors C218, C219 prevent normal signals from operating the circuit.

With the A.C. power on, C217 will be negatively charged by A.C. from the transformer secondary rectified by D207. On switchoff this A.C. disappears and C217 becomes positively charged via R214. Transistor Q207 will switch on and consequently the circuit will open the relays.

### Preamplifier power supplies

Positive and negative fifteen volt supplies for all preamplifier stages and the D.C. servos are provided by two regulator circuits of similar configuration. In the positive regulator the main power supply of 44V is dropped to approximately 25 volts by R201. Transistor Q201 is switched on by current through R202 and R203 and the emitter of Q201 rises in voltage until at approximately 15.7 volts D201 conducts and turns on Q202. Transistor Q202 then robs current from the base of Q201 so that a stable operating point is reached. Capacitor C208 provides high frequency stability for the circuit. The negative regulator operates in an identical way.

amplifier can if necessary be replaced  
er providing voltage, current and  
r better. The main exceptions to this  
nsistors Q12,13,14,15. These  
so that if Q12 needs relacing then Q13  
ilarly Q14, and Q15 should be replaced

the distortion measurements will  
ilure by partial damage in the other

rotection to the whole amplifier and  
use of higher rating or different type.

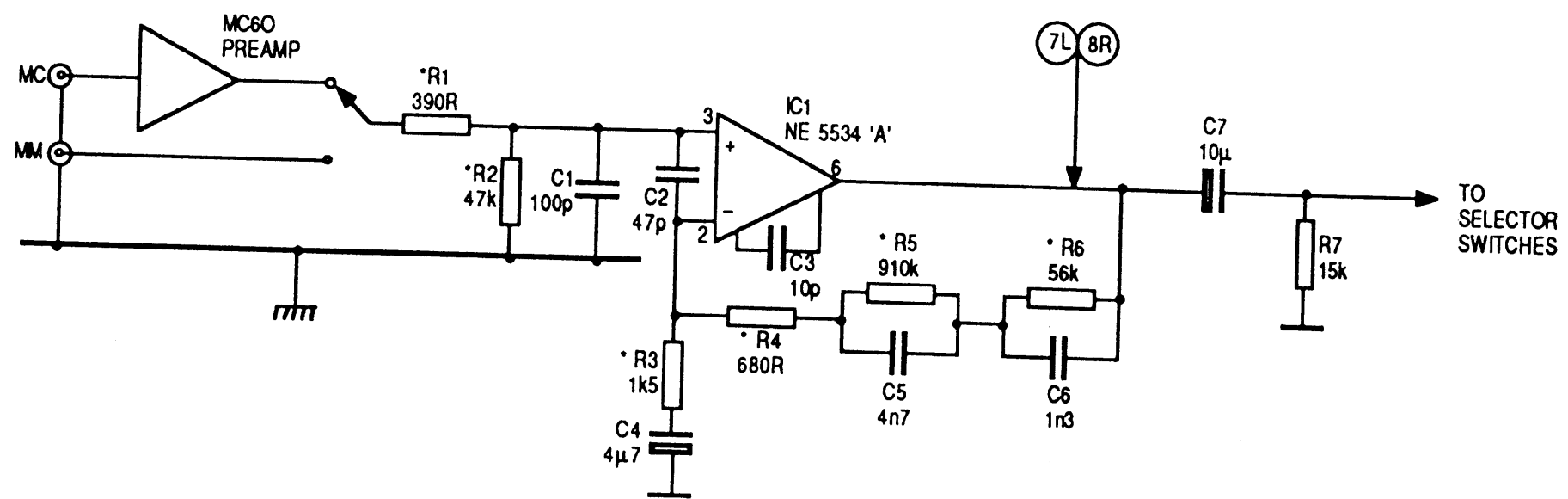
W:

Fuse rating

3.15A(T)

1.25A(T)

### Disc Input



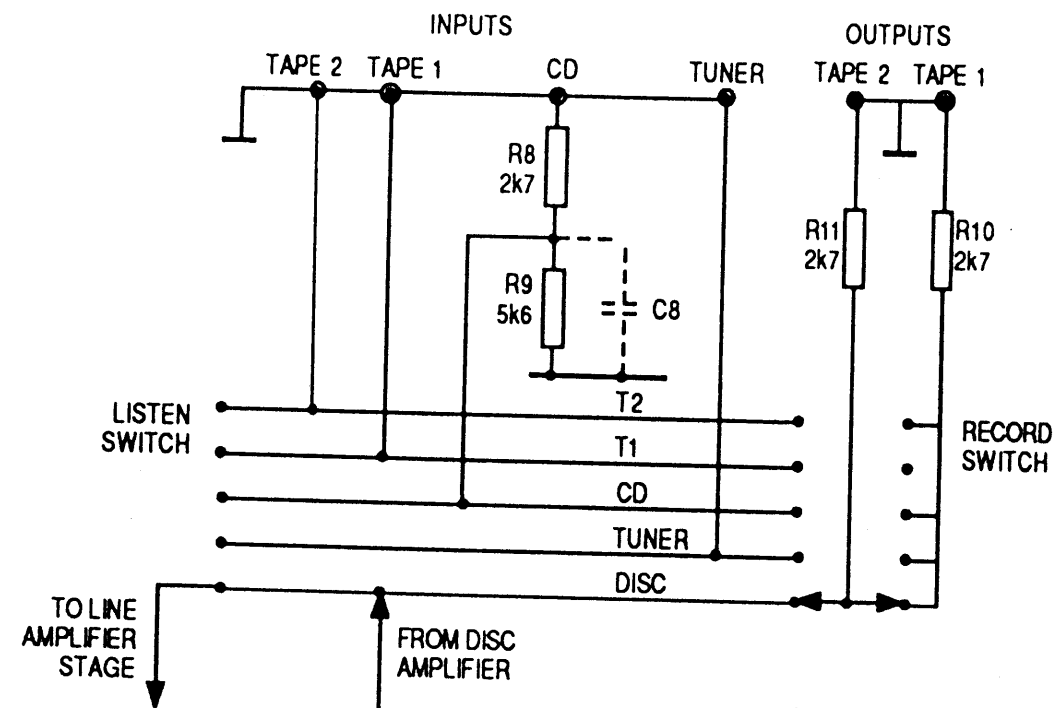
N.B. FOR RIGHT HAND CHANNEL, ADD 100 TO ALL COMPONENT REFERENCE NUMBERS.

\* COMPONENTS ARE 1% TOLERANCE METAL FILM.

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ARCAM DELTA 90  
 CIRCUIT DIAGRAM 1 / 6  
 ISSUE 3 9.12.87  
 SERIAL NOS 001 - 4800

## Input and Record Switching

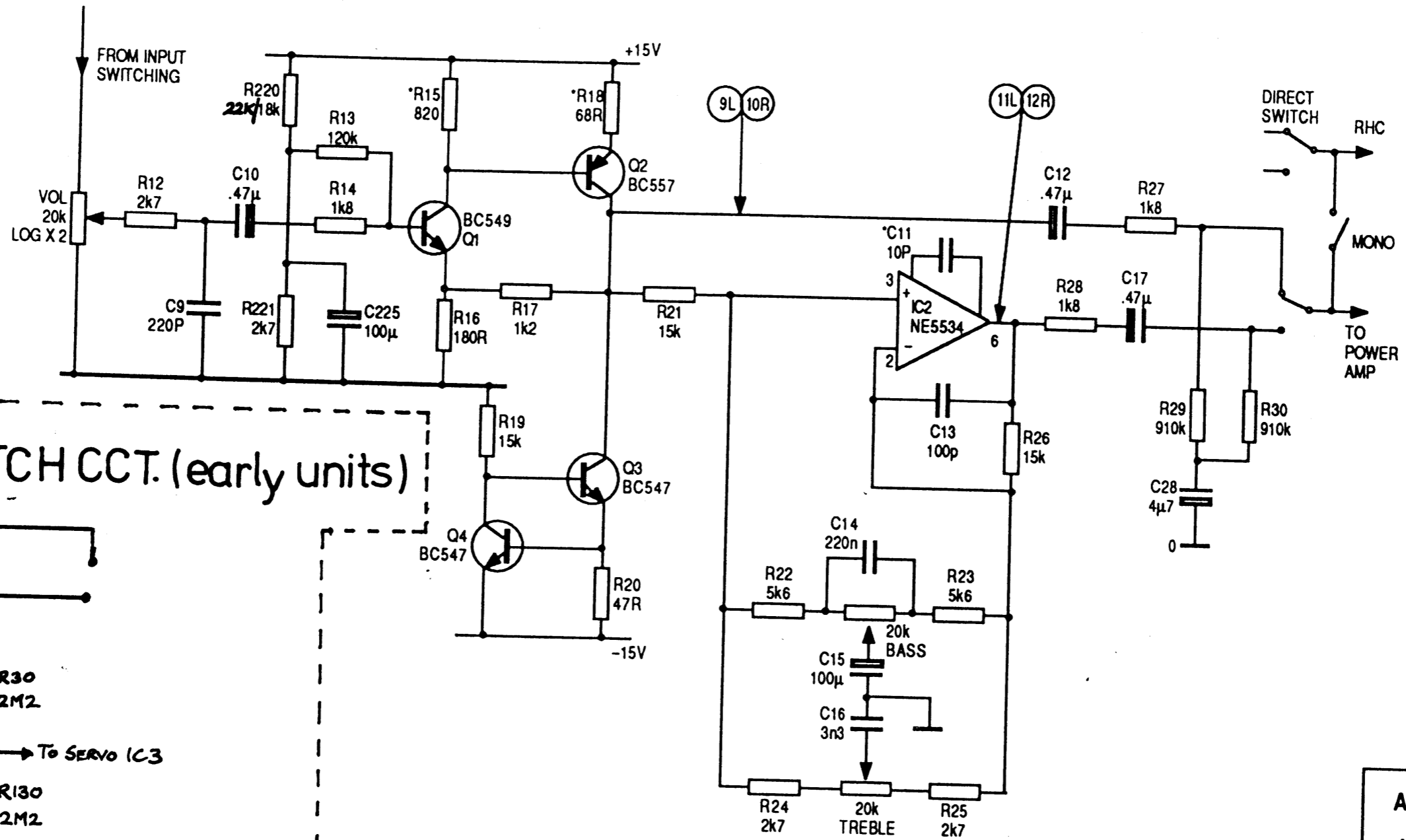


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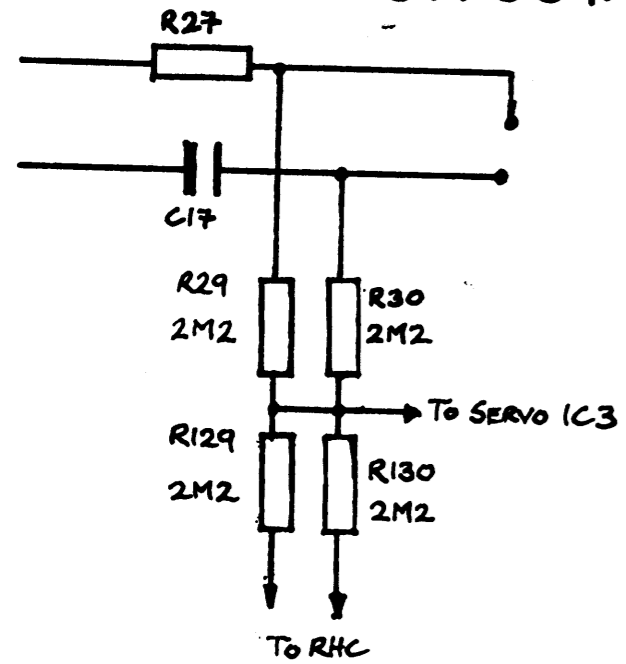
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 CIRCUIT DIAGRAM 2 / 6  
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### Line Amplifier

### Tone Controls



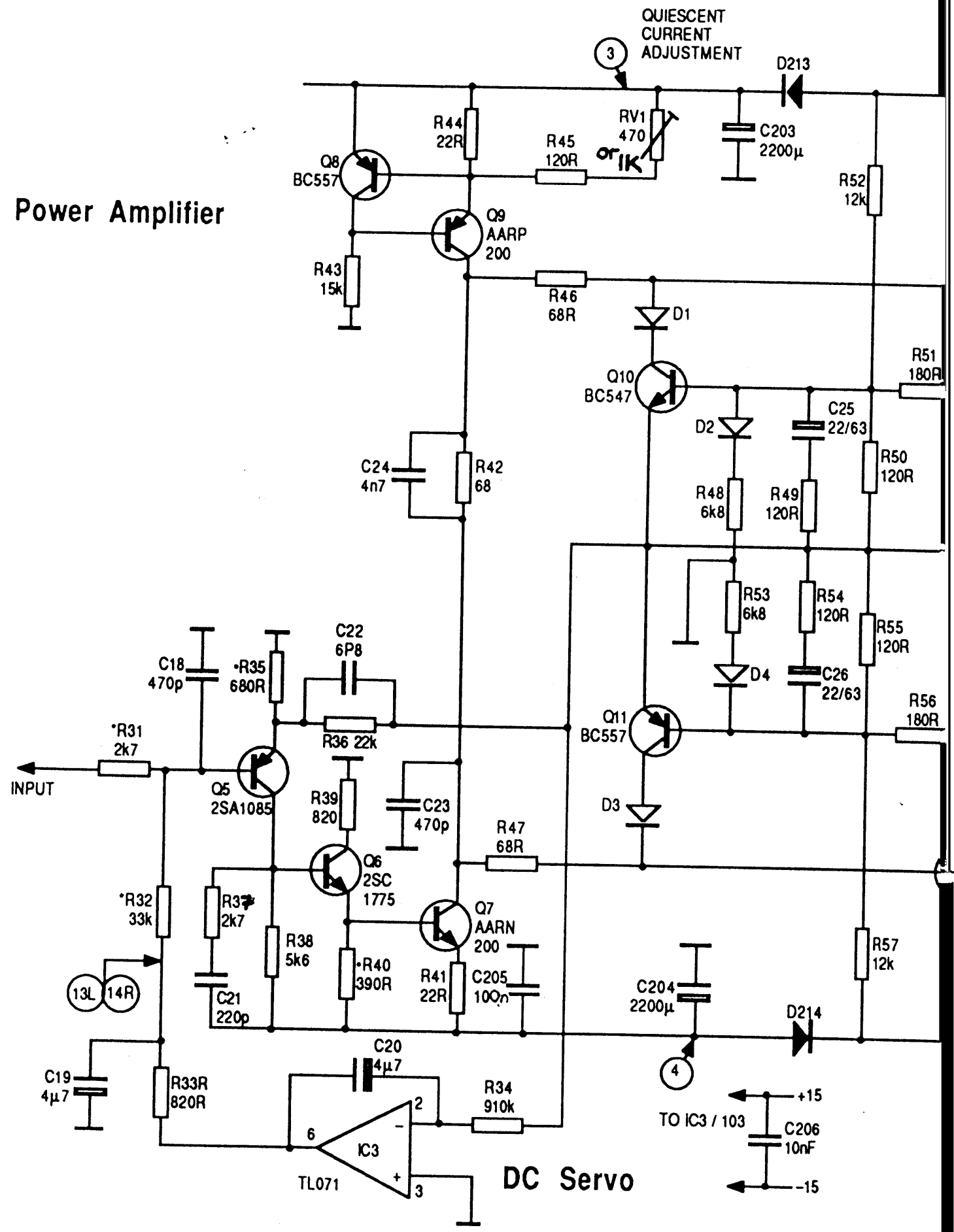
### DIRECT SWITCH CCT. (early units)

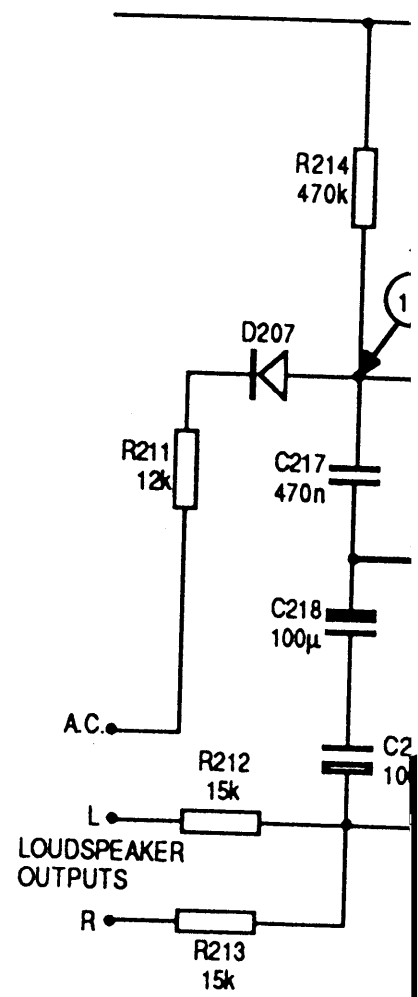


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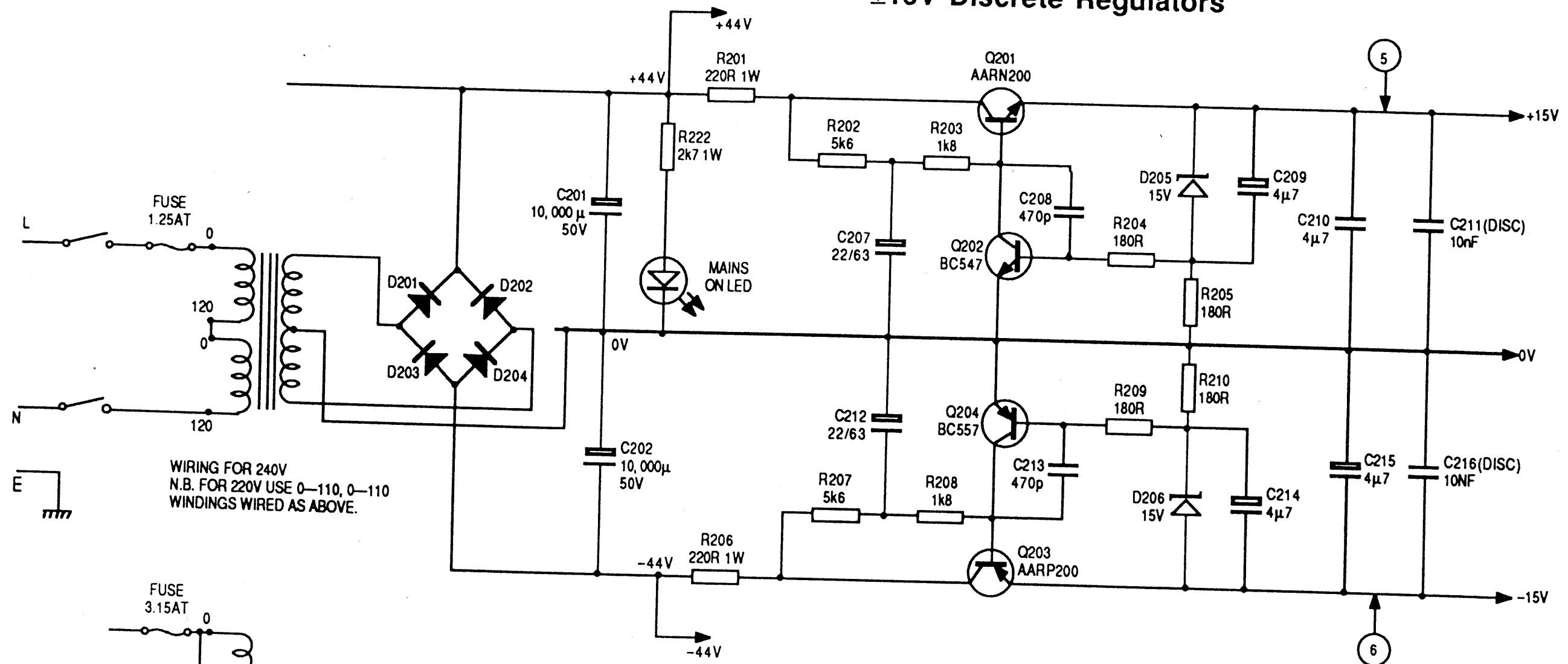
# Power Amplifier



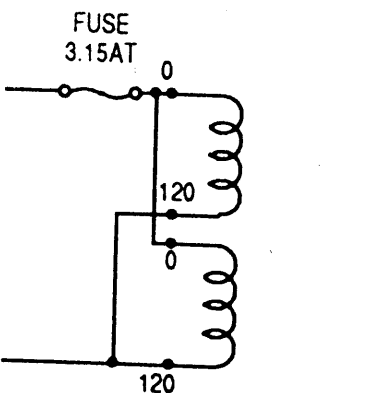


# Main Power Supply

# ±15V Discrete Regulators



WIRING FOR 240V  
N.B. FOR 220V USE 0-110, 0-110  
WINDINGS WIRED AS ABOVE.



WIRING FOR 120V  
N.B. FOR 110V USE 0-110, 0-110  
WINDINGS WIRED AS ABOVE.

Q 201 maybe C2168

Q 203 maybe A958

**SAFETY WARNING:**  
ALWAYS REPLACE WITH THE SAME FUSE RATING AND TYPE.  
DISCONNECT SUPPLY BEFORE CHANGING FUSE.

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ARCAM DELTA 90  
CIRCUIT DIAGRAM 6 / 6  
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