Service and

Repair Instruction

for the

HK Audio

Power Amplifier

Actor

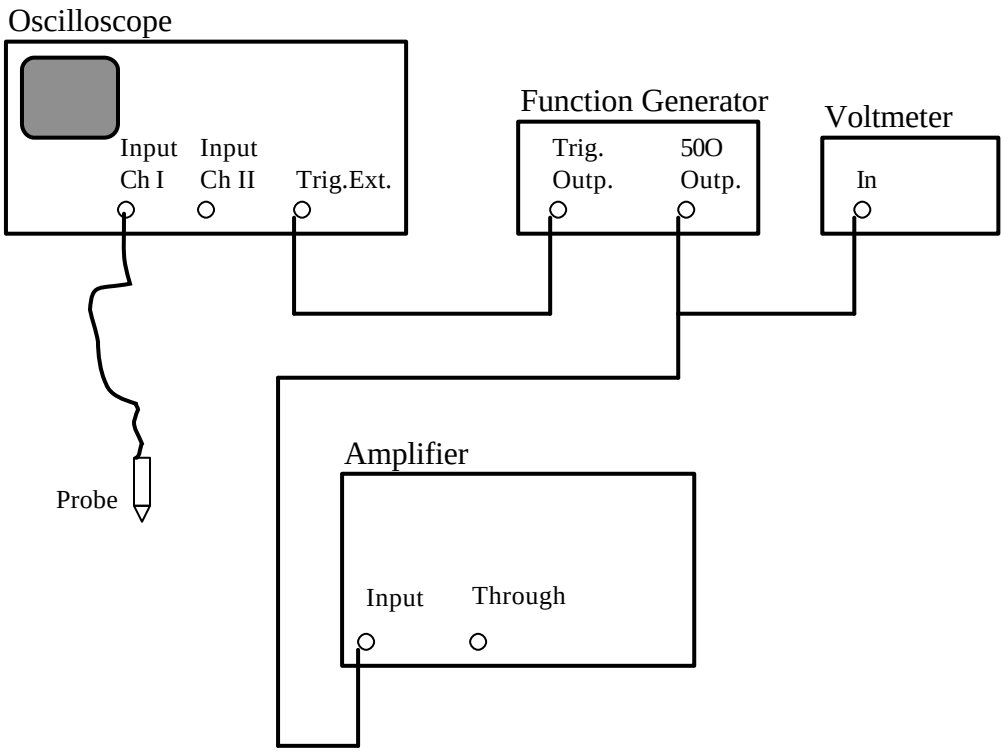
Bass

1) Terms and Definitions:

- ***IN:*** Test Signal Input
- ***MP:*** Measuring Points for signal measurements
- ***R:*** Resistor to adjust quiescent current

Important: The unit must have an operational fan during testing.

2) Basic Measurement Set-up:



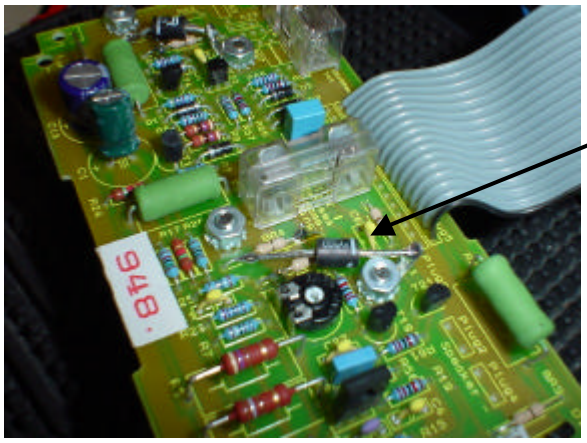
Input Impedance at the scope: **10 MO**

NOTE. Turn the input gain controls fully clockwise (viewed from the rear panel)

3) Over voltage Protecting Diode:

Four additoinal diodes must be mounted seperately on amplifier board to protect the darlington transistors MJ11015 and MJ11016 against over voltage (induced voltage from speaker).
Type of diode: BY 500 – 400 or similar

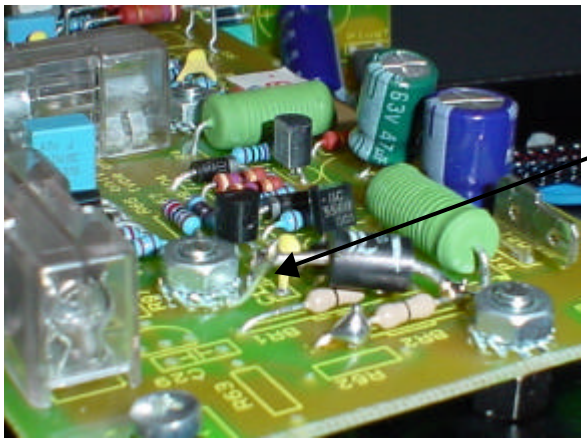
See the following pictures for fitting details.



Protecting Diode
BY 500 - 400

Nominal Current: 5 A

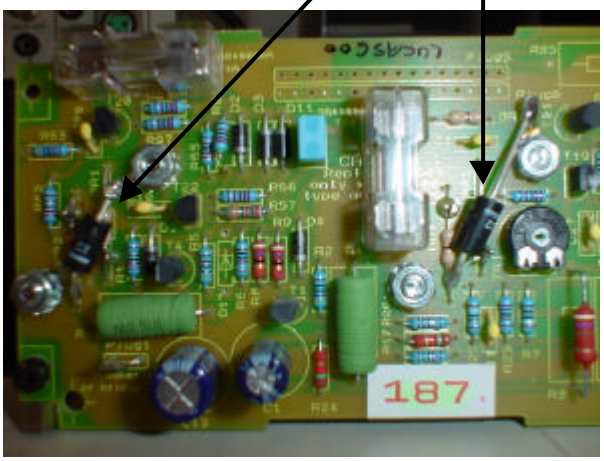
Repetitive peak
reverse voltage
V_{RRM}: 400 V

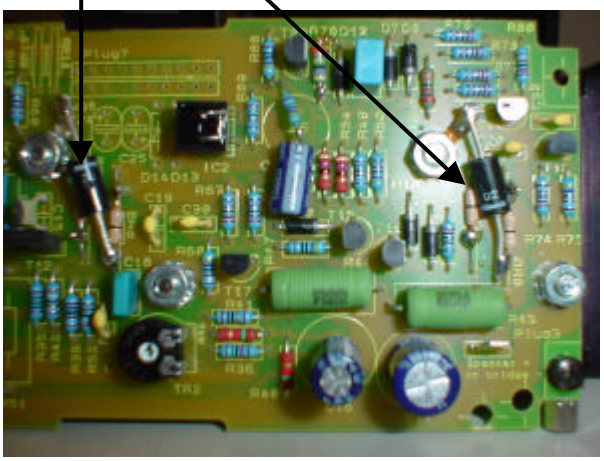


mounted with soldering lug

T2 (MJ11015) T24

T3 (MJ11016) T25





4) Quiescent Current adjustment:

After replacement of any components, it is vital the output stage quiescent current is adjusted.

A range from 15 to 20 mA is permissible.

To adjust the quiescent current, measure the voltage over the both 0,22O / 5W resistors for the relevant channel. A voltage of 6,6 mV to 8,8 mV corresponds to the correct current range.

Step 1
Measure the voltage over resistors R4 and R14. Adjust the voltage with trim pot TR1.

Step 2
Measure the voltage over resistors R44 and R45. Adjust the voltage with trim pot TR2.

5) Results at the Signal Measurement:

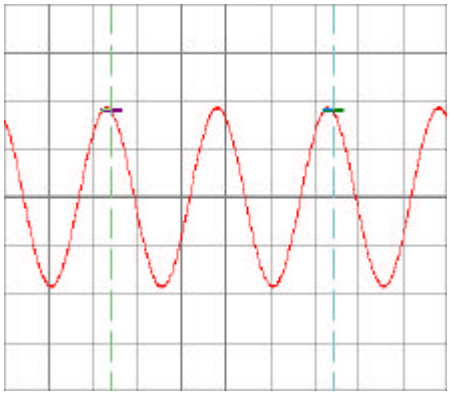
Pre-amplifier functional check:

Apply the signal to Input 2; Pins 1 and 3 shorted together
Scope to MP1

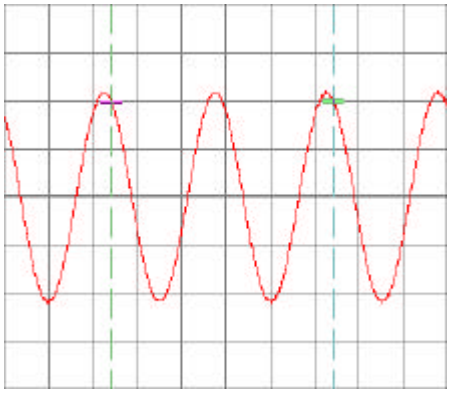
Note.
In step 2, the input amplitude is increased to ensure that the input stage does not clip. In step 3, the input is changed from a sinusoid to a square wave to check the input filters are working correctly.

MP 1:

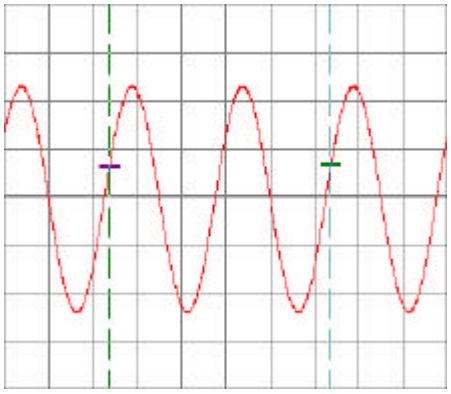
Input Signal: sin; 80 Hz; 1 V_{RMS}
Scope: 5 ms /div; 2V= /div



Input Signal: sin; 80 Hz; 4V_{RMS}
Scope: 5 ms /div; 5V= /div



Input Signal: ⊓⊔; 80 Hz; 1V_{RMS}
Scope: 5 ms /div; 2V= /div



Pre-amplifier functional check:

Apply the signal to Input 3; Pins 2 and 1 together
Scope to MP1

Note.
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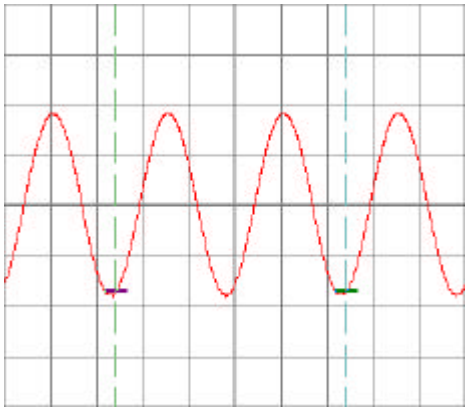
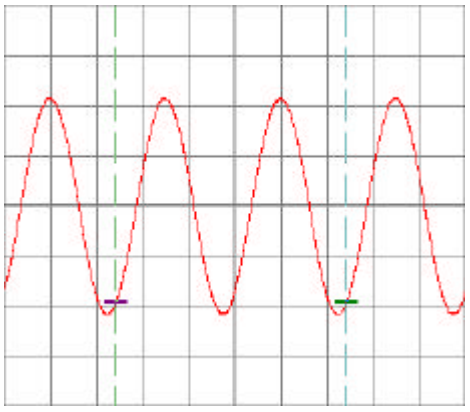
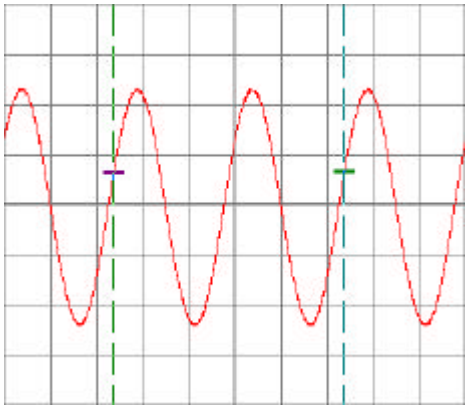


Input Signal: sin; 80 Hz; 4V_{RMS}
Scope: 5 ms /div; 5V= /div



Input Signal: ⊓⊔; 80 Hz; 1V_{RMS}
Scope: 5 ms /div; 2V= /div

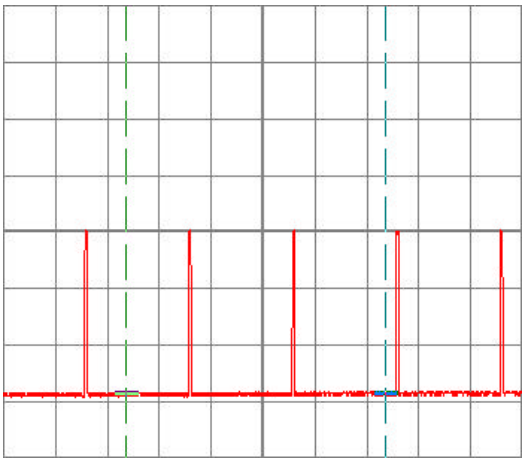


Power-amplifier Limiter Driver:

Apply the signal to the junction of R72 and C31, Scope to MP2, see the attached diagram

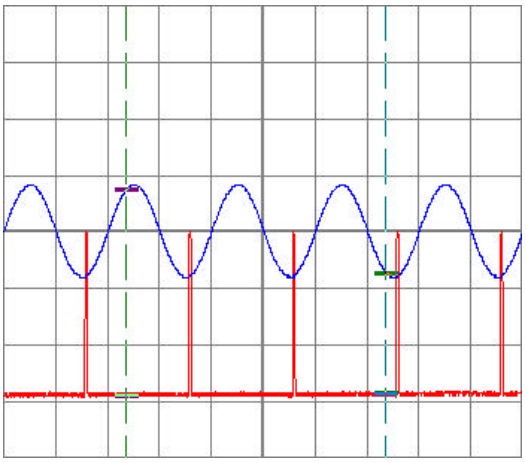
Note.
The GAIN must be turned fully clockwise, and should be reset each time a measurement is taken

MP 2: **Signal Input:** sin; 1 kHz; 1,13 V_{RMS}
Scope: 500 µs /div; 1V= /div



Explanation to the following picture:

In picture 2 the input sinusoid is shown on channel 2, whilst the output signal is on channel 1. The pulses must occur only at the most negative point on the output waveform.



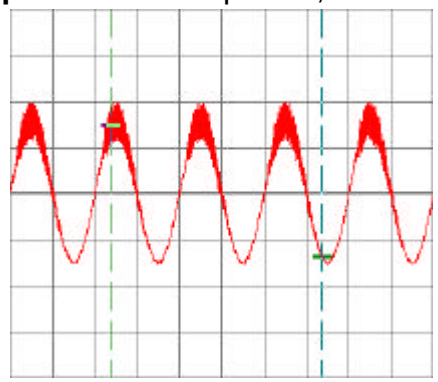
Power-amplifier Check: Dummy load: 8O + to Plug1; - to Ground

Apply input signal directly to the power amplifier, between R72 and C31, see the attached diagram.

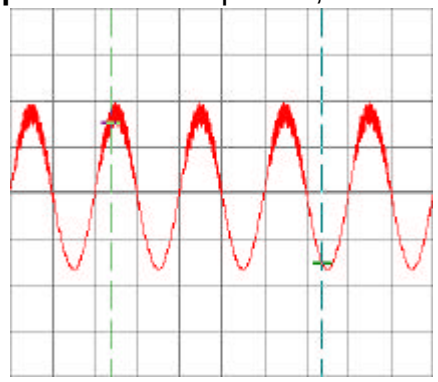
Note.
In step 2, the input amplitude is increased to ensure that the input stage does not clip. In step 3, the input is changed from a sinusoid to a square wave to check the frequency response of the amplifier.

MP 3:

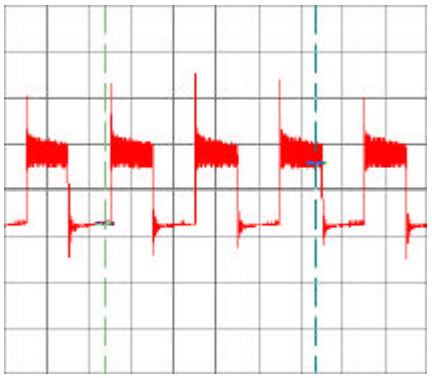
Input Signal: sin; 1 kHz; 0,3V_{RMS}
Scope: 500 µs /div; 10V= /div



Input Signal: sin; 1 kHz; 0,7V_{RMS}
Scope: 500 µs /div; 20V= /div



Input Signal: ⊓⊔; 1 kHz; 0,1V_{RMS}
Scope: 500 µs /div; 5V= /div



Attention: Do not run the amplifier for more than 5 seconds whilst making these tests.

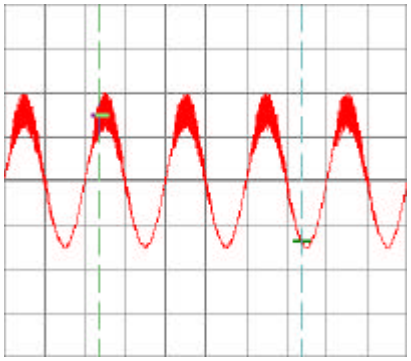
Power-amplifier Check: Dummy load: 8O + to Plug3; - to Ground

Apply input signal directly to the power amplifier, between R72 and C31, see the attached diagram.

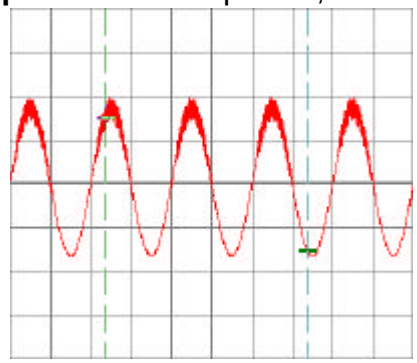
Note.
In step 2, the input amplitude is increased to ensure that the input stage does not clip. In step 3, the input is changed from a sinusoid to a square wave to check the frequency response of the amplifier.

MP 4:

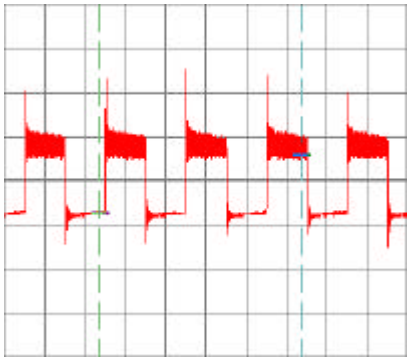
Input Signal: sin; 1 kHz; 0,3V_{RMS}
Scope: 500 µs /div; 10V= /div



Input Signal: sin; 1 kHz; 0,7V_{RMS}
Scope: 500 µs /div; 20V= /div



Input Signal: ⊓⊔; 1 kHz; 0,1V_{RMS}
Scope: 500 µs /div; 5V= /div



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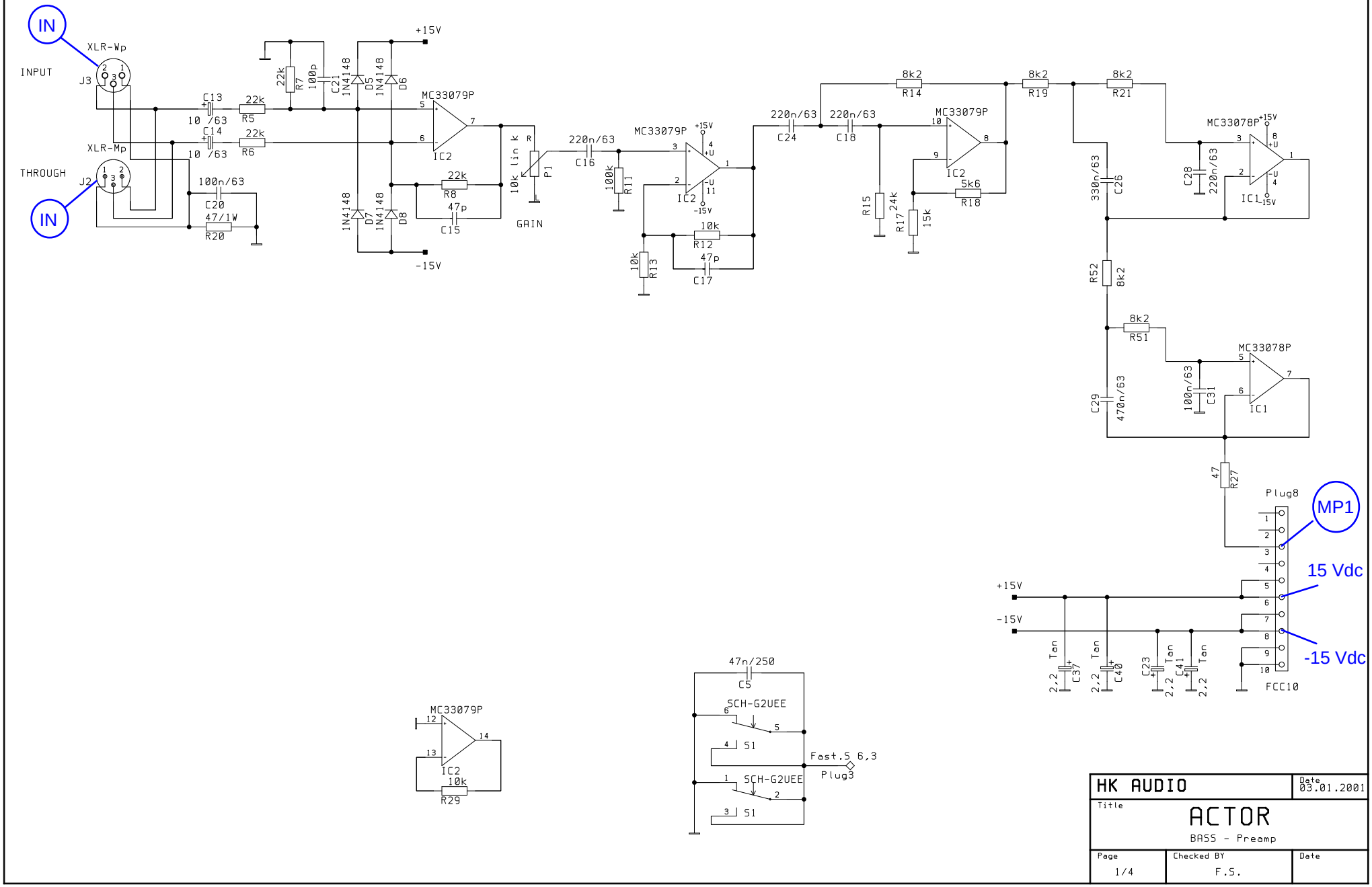
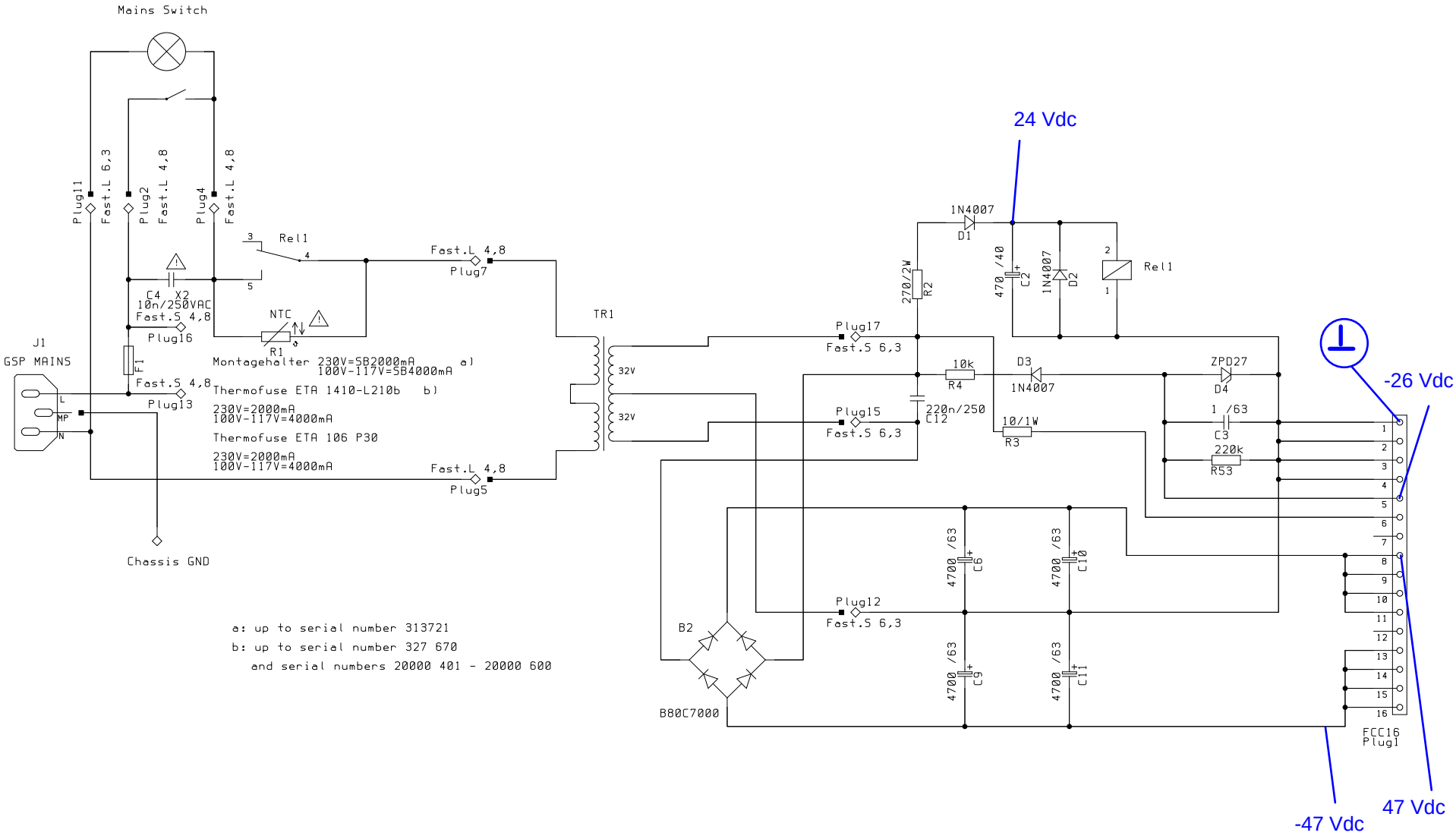

IN
XLR-Wp
INPUT
J3
C13
10 /63
22k
R5
C14
10 /63
22k
R6
XLR-Mp
THROUGH
J2
IN
100n/63
C20
47/1W
R20
22k
R7
100p
C21
1N4148
D5
1N4148
D6
+15V
MC33079P
IC2
22k
R8
47p
C15
1N4148
D7
1N4148
D8
-15V
10k lin k R
P1
GAIN
220n/63
C16
100k
R11
MC33079P
IC2
10k
R12
47p
C17
10k
R13
220n/63
C24
220n/63
C18
8k2
R14
MC33079P
IC2
5k6
R18
R15
R17 24k
15k
8k2
R19
8k2
R21
MC33078P
IC1
330n/63
C26
C28
220n/63
R52
8k2
8k2
R51
MC33078P
IC1
C29
470n/63
100n/63
C31
47
R27
Plug8
MP1
15 Vdc
-15 Vdc
+15V
-15V
2,2 Tan
C37
2,2 Tan
C40
C23
2,2 Tan
C41
2,2 Tan
FCC10
MC33079P
IC2
10k
R29
47n/250
C5
SCH-G2UEE
S1
Fast.S 6,3
Plug3
SCH-G2UEE
S1
HK AUDIO
Date
03.01.2001
Title
ACTOR
BASS - Preamp
Page
1/4
Checked BY
F.S.
Date

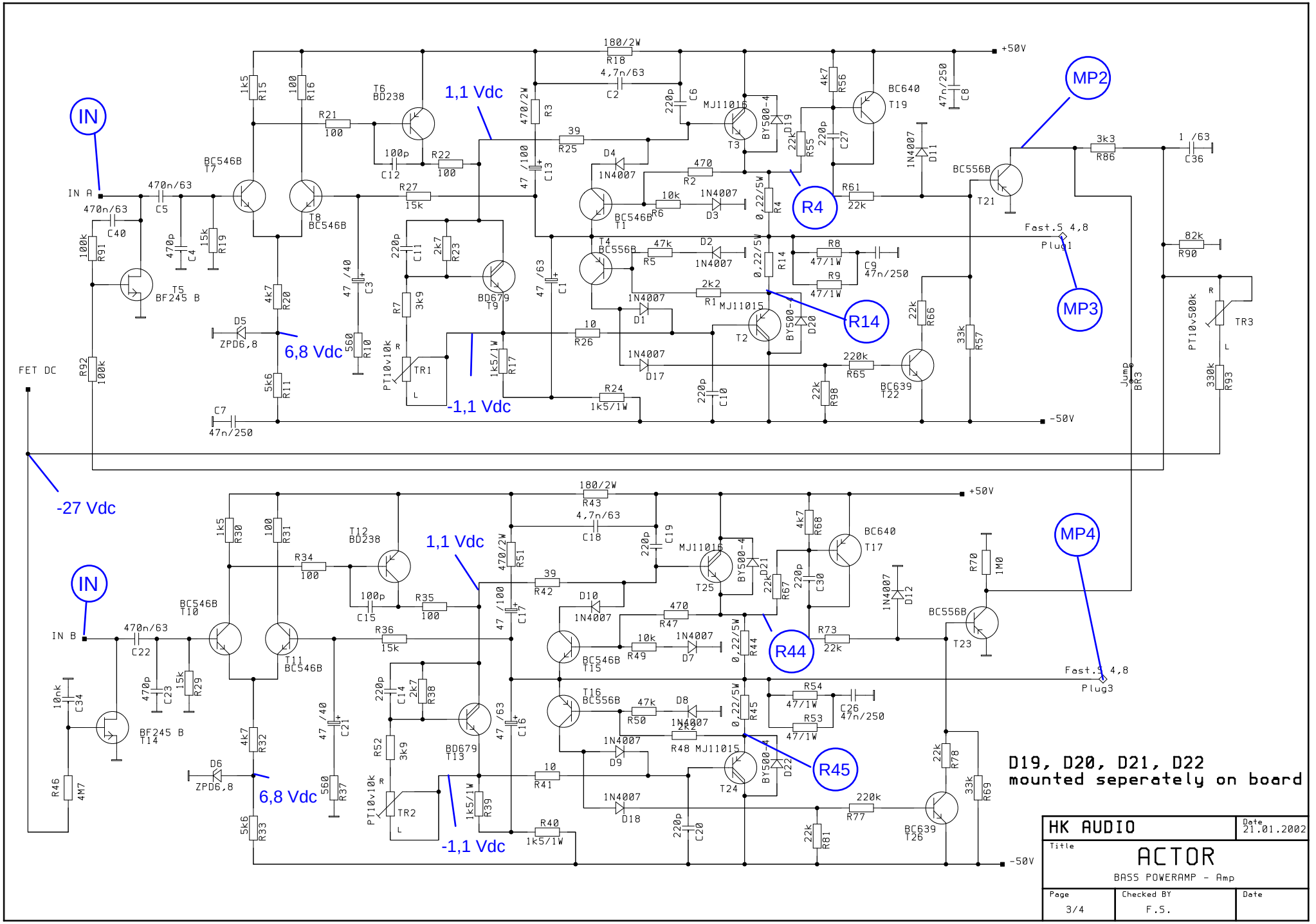


a: up to serial number 313721

b: up to serial number 327 670
and serial numbers 20000 401 - 20000 600

⚠ Replace only with the same type!

HK AUDIO		Date 02.07.2001
Title: ACTOR BASS - Power Supply		
Page 2/4	Checked BY F.S.	Date


IN
IN A
FET DC
1,1 Vdc
-1,1 Vdc
6,8 Vdc
-27 Vdc
MP2
MP3
R4
R14
+50V
-50V
Fast.S 4,8
Plug1
IN
IN B
1,1 Vdc
-1,1 Vdc
6,8 Vdc
MP4
R44
R45
Fast.S 4,8
Plug3
D19, D20, D21, D22
mounted seperately on board
HK AUDIO
Date
21.01.2002
Title
ACTOR
BASS POWERAMP - Amp
Page
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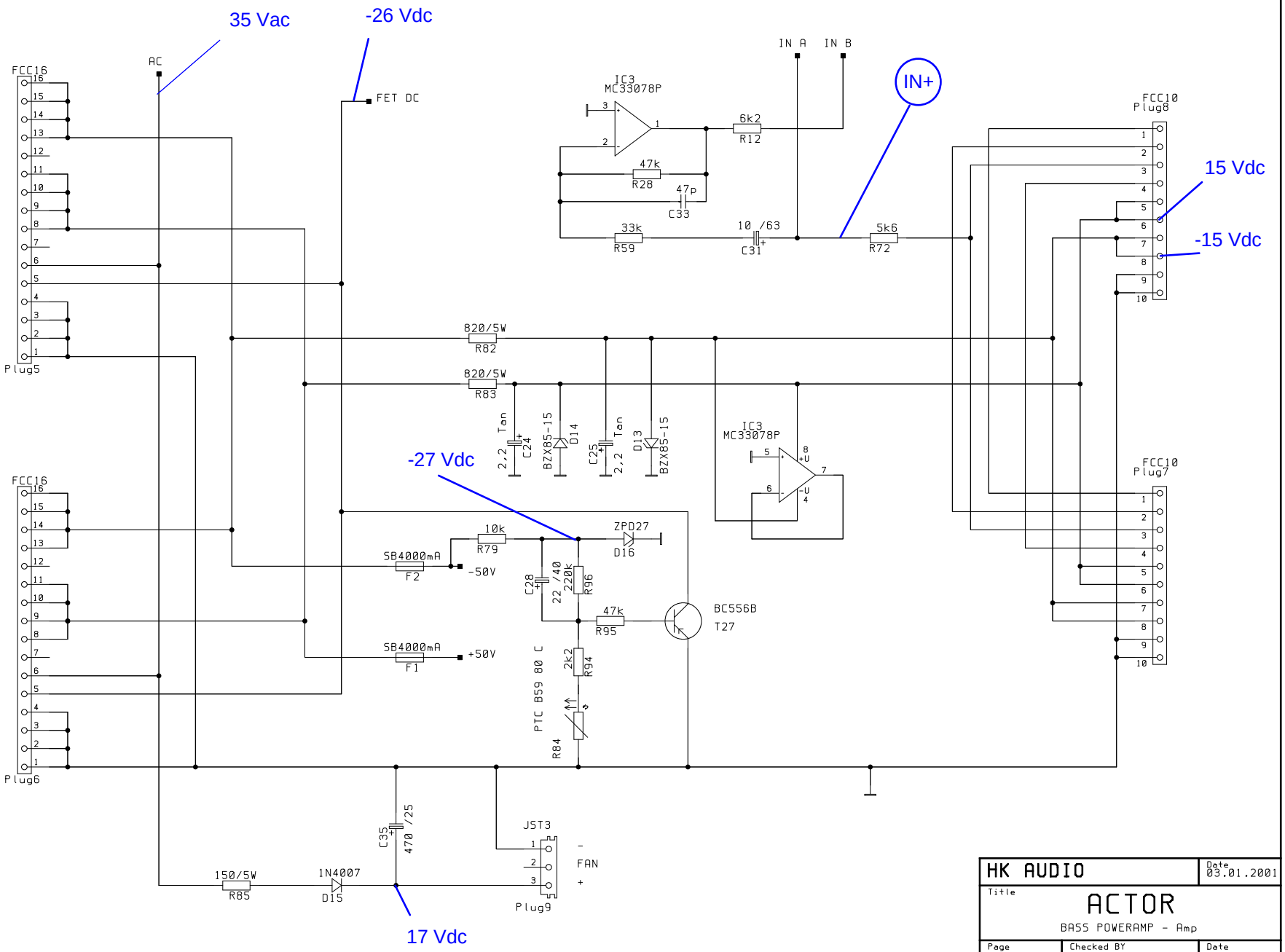
Checked BY
F.S.
Date


35 Vac
-26 Vdc
AC
FET DC
FCC16
Plug5
IC3
MC33078P
IN A
IN B
IN+
6k2
R12
47k
R28
47p
C33
33k
R59
10 /63
C31
5k6
R72
FCC10
Plug8
15 Vdc
-15 Vdc
820/5W
R82
820/5W
R83
Tan
2,2
C24
BZX85-15
D14
C25
Tan
2,2
D13
BZX85-15
IC3
MC33078P
-27 Vdc
FCC16
Plug6
10k
R79
ZPD27
D16
5B4000mA
F2
-50V
C28
22 /40
220k
R96
47k
R95
BC556B
T27
5B4000mA
F1
+50V
2k2
R94
PTC B59 80 C
R84
FCC10
Plug7
C35
470 /25
JST3
FAN
150/5W
R85
1N4007
D15
17 Vdc
Plug9
HK AUDIO
Date
03.01.2001
Title
ACTOR
BASS POWERAMP - Amp
Page
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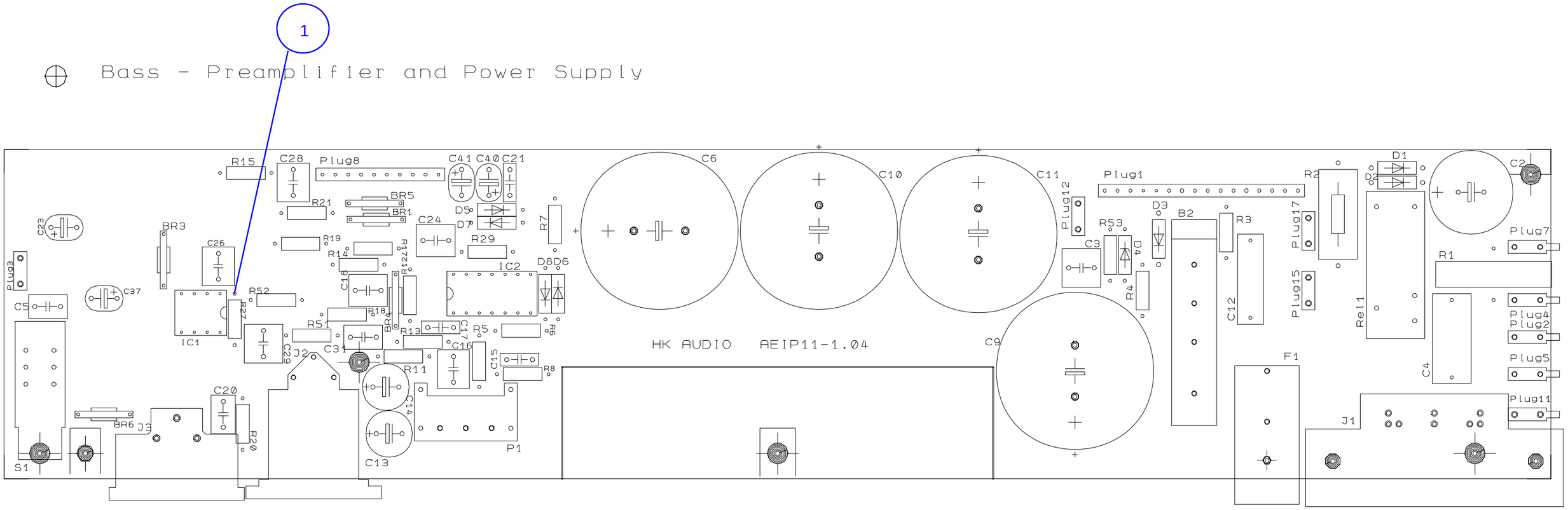
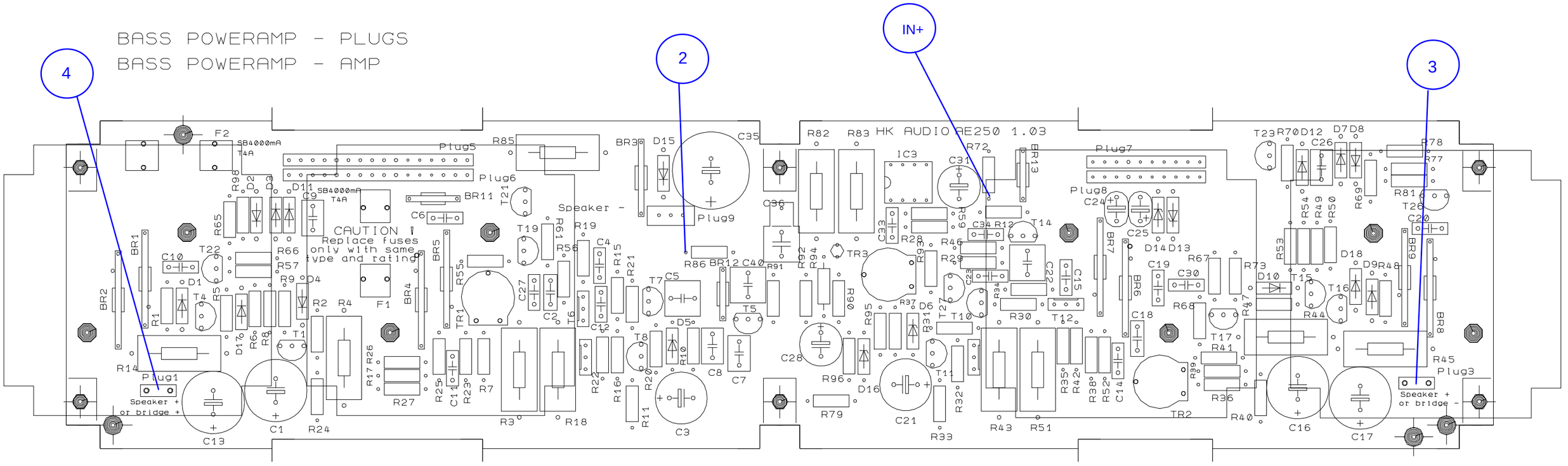
Checked BY
Date

Bass - Preamplifier and Power Supply



BASS POWERAMP - PLUGS

BASS POWERAMP - AMP



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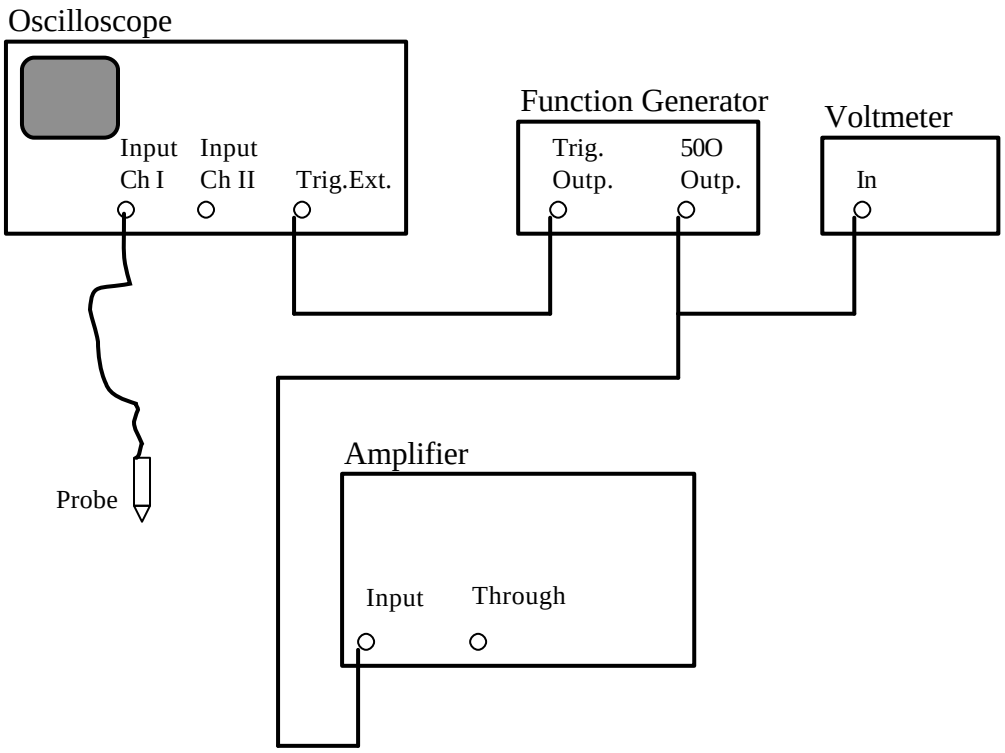

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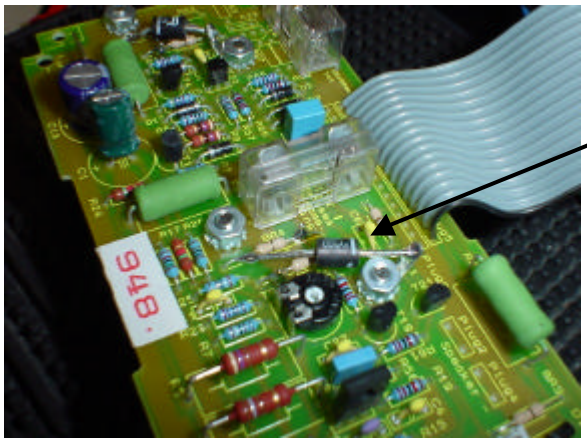

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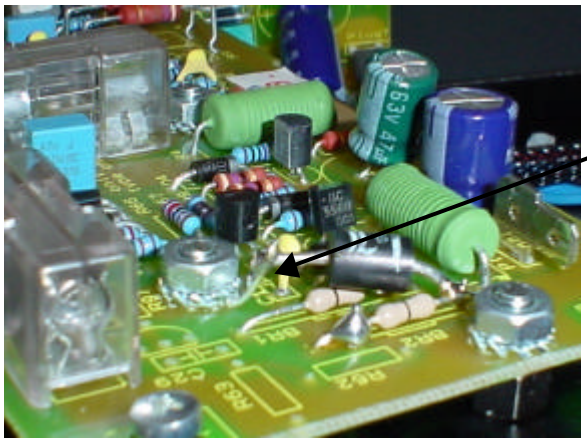

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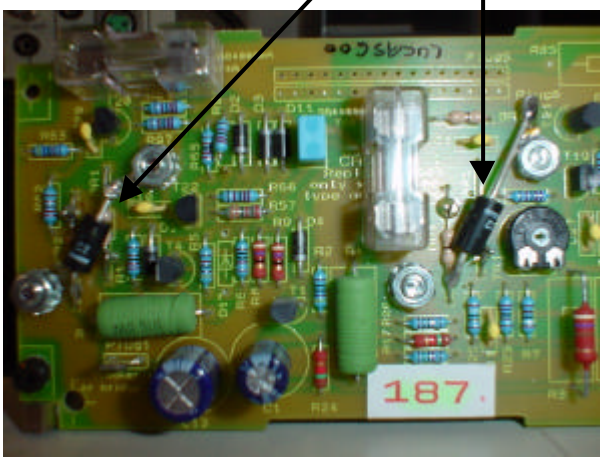
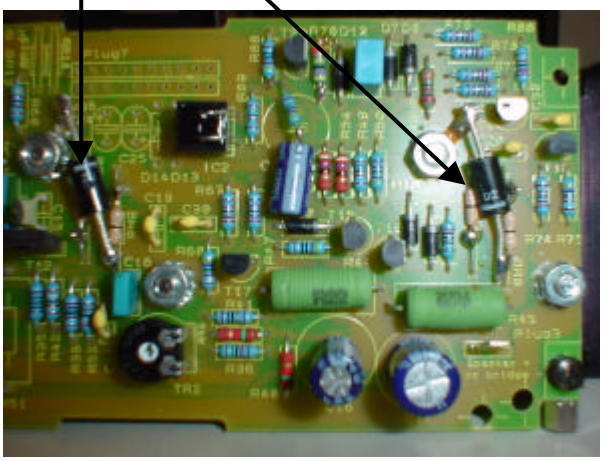
T3 (MJ11016) T25





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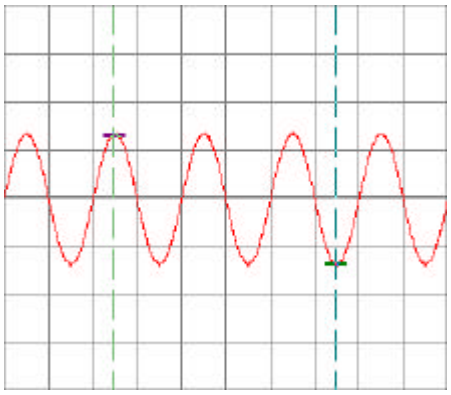
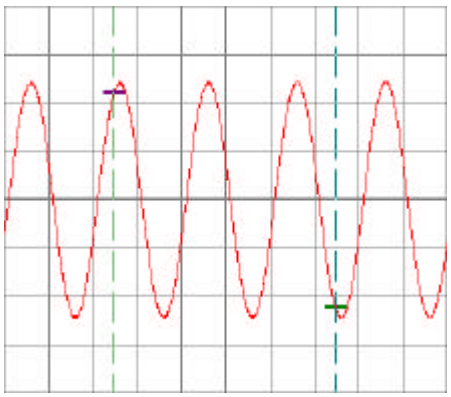
MP 1:

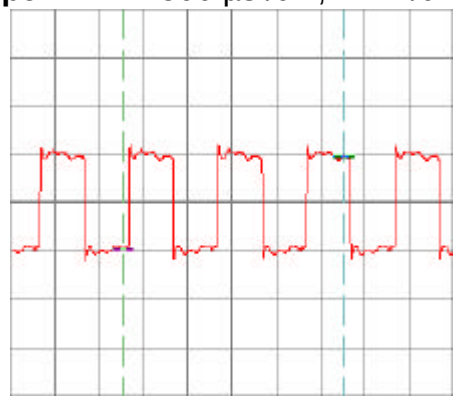
Input Signal: sin; 1 kHz; 1 V_{RMS}
Scope: 500 µs /div; 2 V= /div



Input Signal: sin; 1 kHz; 4,5 V_{RMS}
Scope: 500 µs /div; 5 V= /div



Input Signal: ⊓⊔ ; 1 kHz; 1 V_{RMS}
Scope: 500 µs /div; 2 V= /div



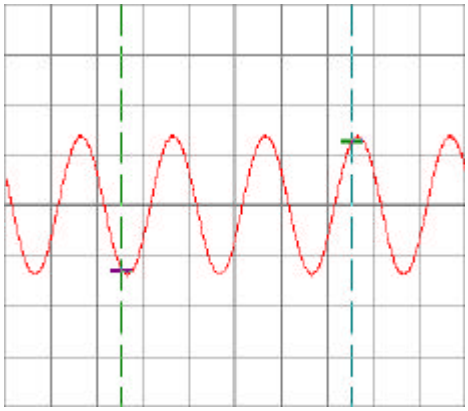
Pre-amplifier Functional Check:

Apply the signal to Input 3; Pins 2 and 1 together
Scope to MP1

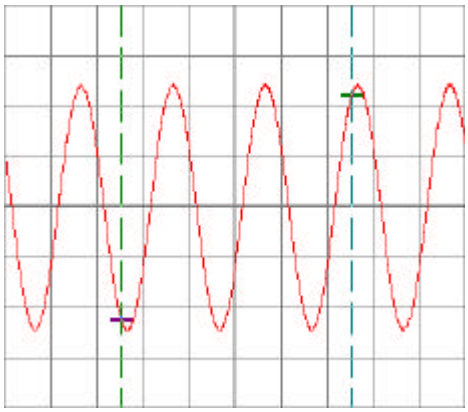
Note.
In step 2, the input amplitude is increased to ensure that the input stage does not clip. In step 3, the input is changed from a sinusoid to a square wave to check the input filters are working correctly.

MP 1:

Input Signal: sin; 1 kHz; 1 V_{RMS}
Scope: 500 µs /div; 2 V= /div



Input Signal: sin; 1 kHz; 4,5 V_{RMS}
Scope: 500 µs /div; 5 V= /div



Input Signal: ⊓⊔ ; 1 kHz; 1 V_{RMS}
Scope: 500 µs /div; 2 V= /div

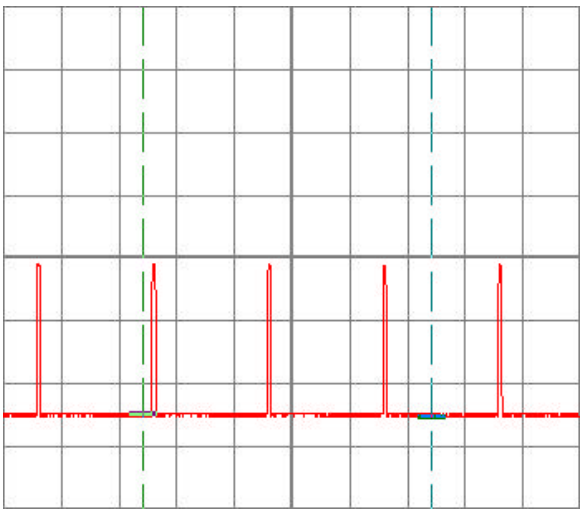
Power-amplifier Limiter Check:

Apply the signal to the junction of R72 and C31, Scope to MP2, see the attached diagram.

Note.
The GAIN must be turned fully clockwise, and should be reset each time a measurement is taken

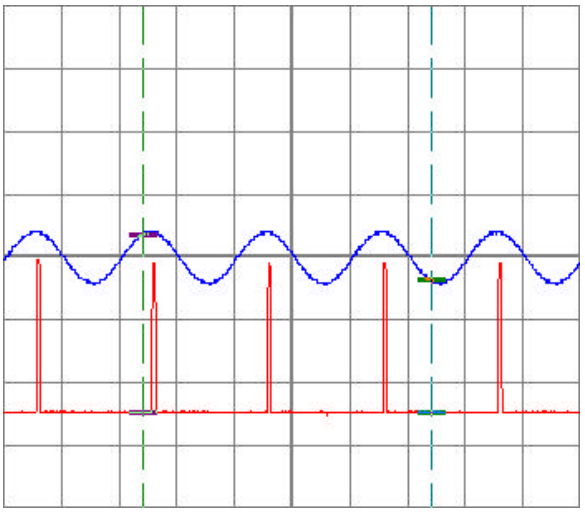
MP 2:

Signal Input: sin; 1 kHz; 1,4 V_{RMS}
Scope: 500 µs /div; 5V= /div



Explanation to the following picture:

In picture 2 the input sinusoid is shown on channel 2, whilst the output signal is on channel 1. The pulses must occur only at the most positive point on the output waveform.



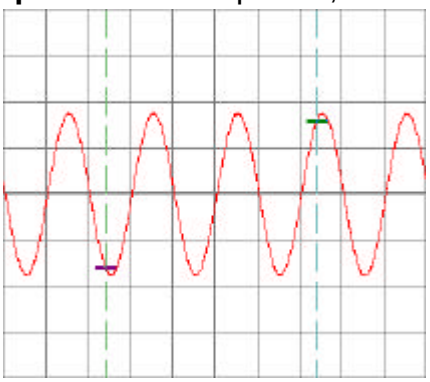
Power-amplifier Check: Dummy load: 8O + to Plug1; - to Ground

Apply input signal directly to the power amplifier, between R72 and C31, see the attached diagram.

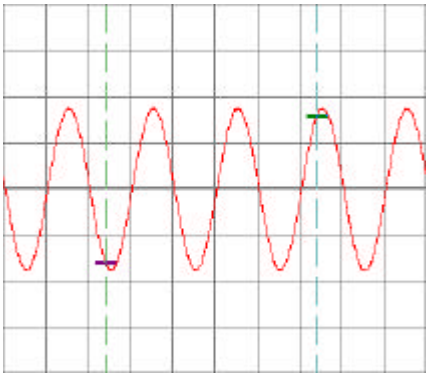
Note.
In step 2, the input amplitude is increased to ensure that the input stage does not clip. In step 3, the input is changed from a sinusoid to a square wave to check the frequency response of the amplifier.

MP 3:

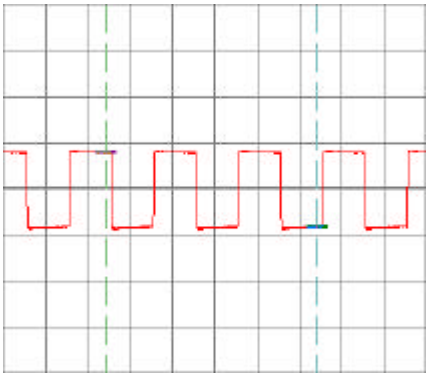
Input Signal: sin; 1 kHz; 0,3V_{RMS}
Scope: 500 µs /div; 10V= /div



Input Signal: sin; 1 kHz; 0,7V_{RMS}
Scope: 500 µs /div; 20V= /div



Input Signal: ⊓⊔; 1 kHz; 0,1V_{RMS}
Scope: 500 µs /div; 5V= /div



Attention: Do not run the amplifier for more than 5 seconds whilst making these tests.

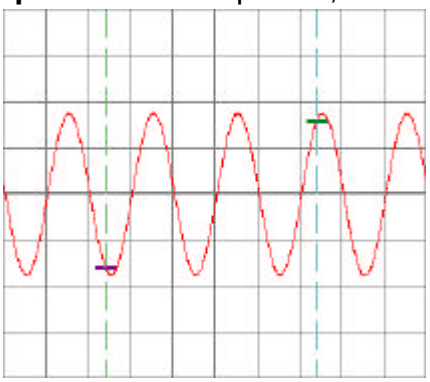
Power-amplifier Check: Dummy load: 8O + to Plug3; - to Ground

Apply input signal directly to the power amplifier, between R72 and C31, see the attached diagram.

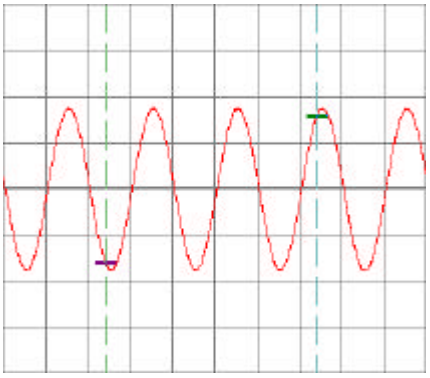
Note.
In step 2, the input amplitude is increased to ensure that the input stage does not clip. In step 3, the input is changed from a sinusoid to a square wave to check the frequency response of the amplifier.

MP 4:

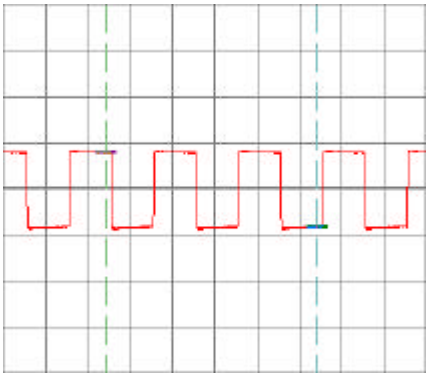
Input Signal: sin; 1 kHz; 0,3V_{RMS}
Scope: 500 µs /div; 10V= /div



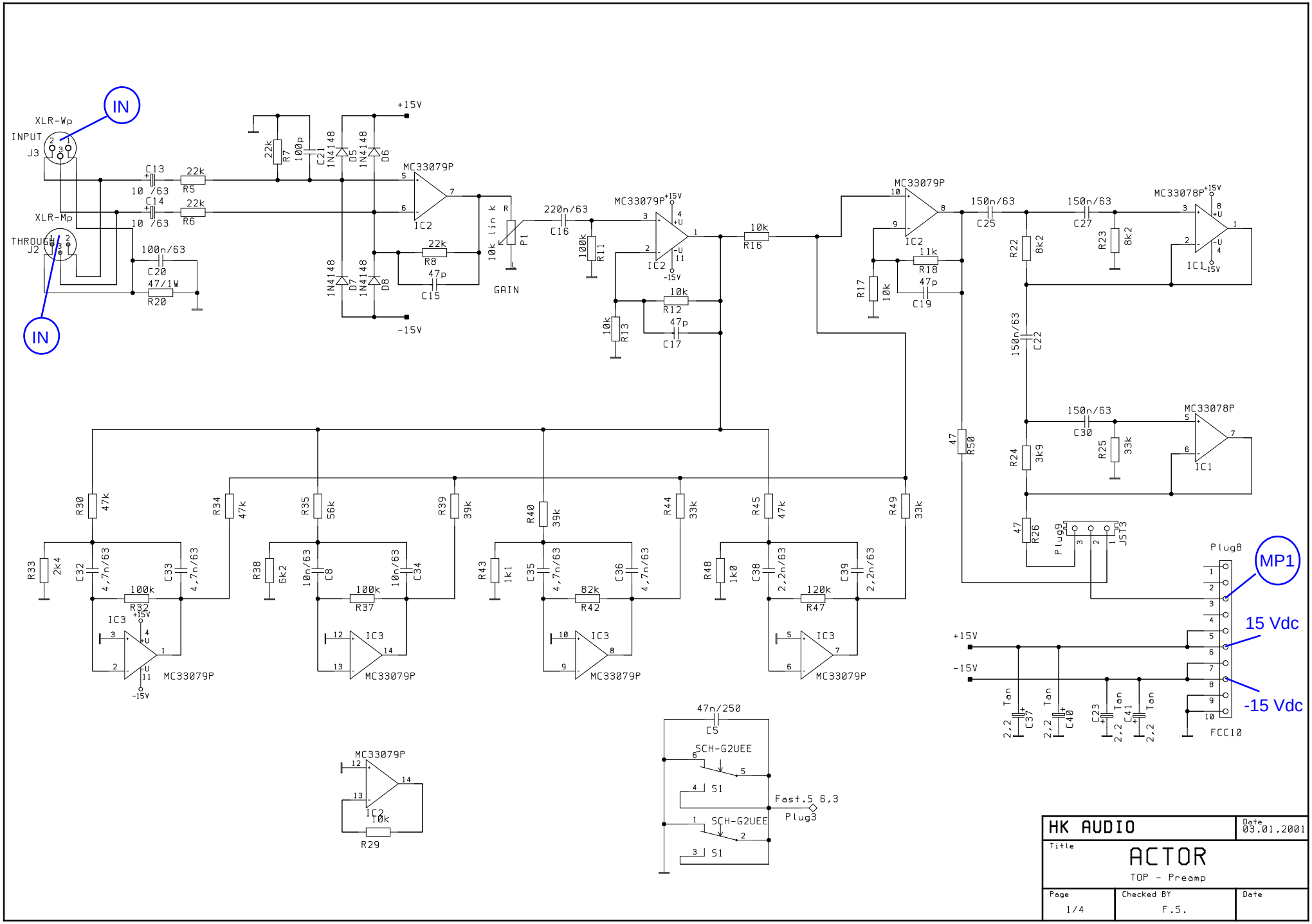
Input Signal: sin; 1 kHz; 0,7V_{RMS}
Scope: 500 µs /div; 20V= /div

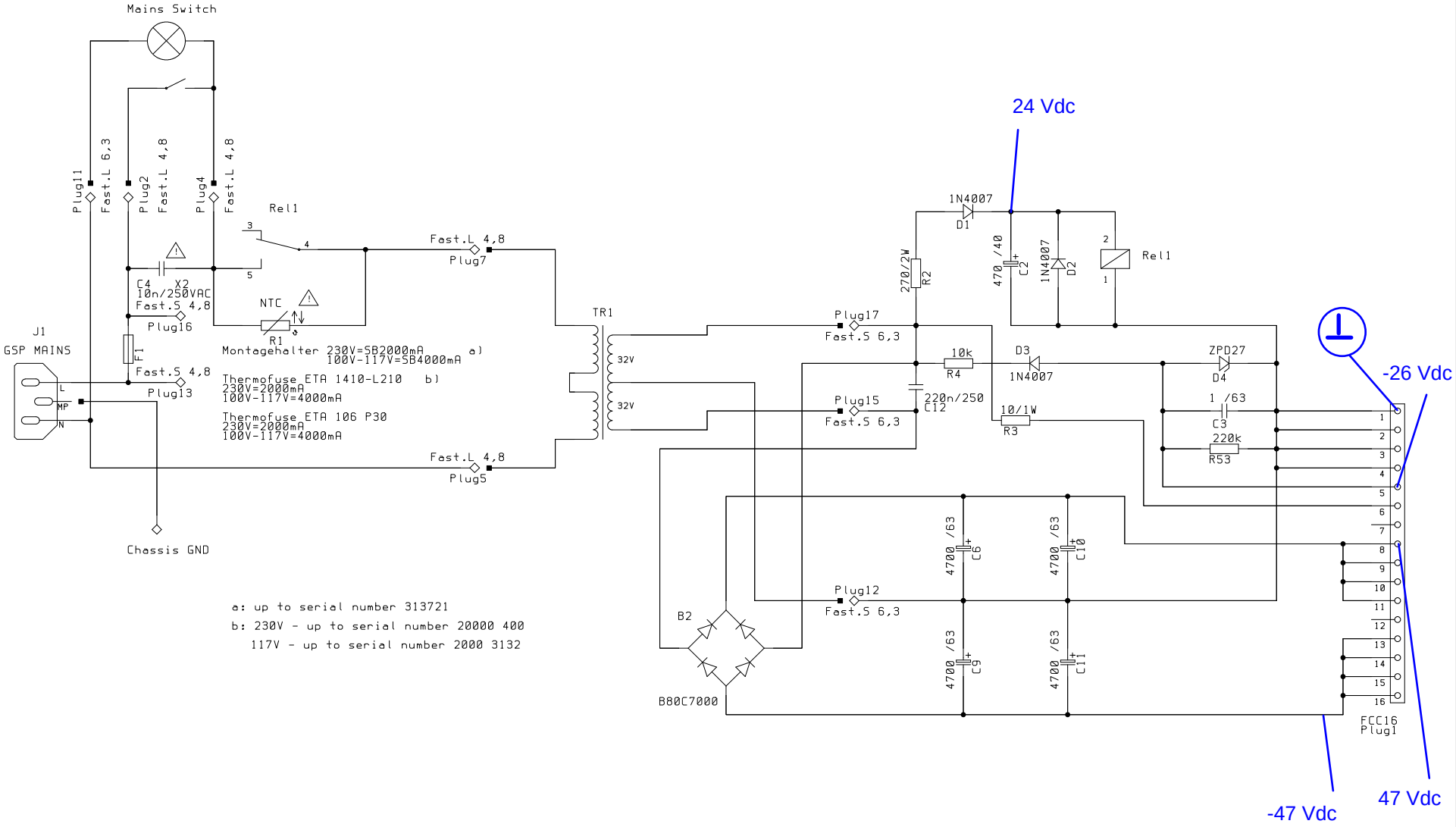


Input Signal: ⊓⊔; 1 kHz; 0,1V_{RMS}
Scope: 500 µs /div; 5V= /div



Attention: Do not run the amplifier for more than 5 seconds whilst making these tests.


IN
XLR-Wp
INPUT
J3
XLR-Mp
THROUGH
J2
IN
C13
10 /63
22k
R5
C14
10 /63
22k
R6
100n/63
C20
47/1W
R20
22k
R7
100p
C21
1N4148
D5
1N4148
D6
+15V
MC33079P
IC2
22k
R8
47p
C15
1N4148
D7
1N4148
D8
-15V
10k lin k R
P1
GAIN
220n/63
C16
100k
R11
MC33079P
IC2
10k
R12
47p
C17
10k
R13
10k
R16
MC33079P
IC2
11k
R18
47p
C19
R17
10k
150n/63
C25
150n/63
C27
MC33078P
IC1
R22
8k2
R23
8k2
150n/63
C22
150n/63
C30
MC33078P
IC1
R24
3k9
R25
33k
47
R50
47
R26
Plug9
JST3
R30
47k
R34
47k
R35
56k
R39
39k
R40
39k
R44
33k
R45
47k
R49
33k
R33
2k4
C32
4,7n/63
C33
4,7n/63
100k
R32
IC3
MC33079P
R38
6k2
10n/63
C8
10n/63
C34
100k
R37
IC3
MC33079P
R43
1k1
C35
4,7n/63
C36
4,7n/63
82k
R42
IC3
MC33079P
R48
1k0
C38
2,2n/63
C39
2,2n/63
120k
R47
IC3
MC33079P
Plug8
MP1
15 Vdc
-15 Vdc
FCC10
+15V
-15V
2,2 Tan
C37
2,2 Tan
C40
C23
2,2 Tan
C41
2,2 Tan
47n/250
C5
SCH-G2UEE
S1
Fast.S 6,3
Plug3
SCH-G2UEE
S1
MC33079P
IC2
10k
R29
HK AUDIO
Date
03.01.2001
Title
ACTOR
TOP - Preamp
Page
1/4
Checked BY
F.S.
Date



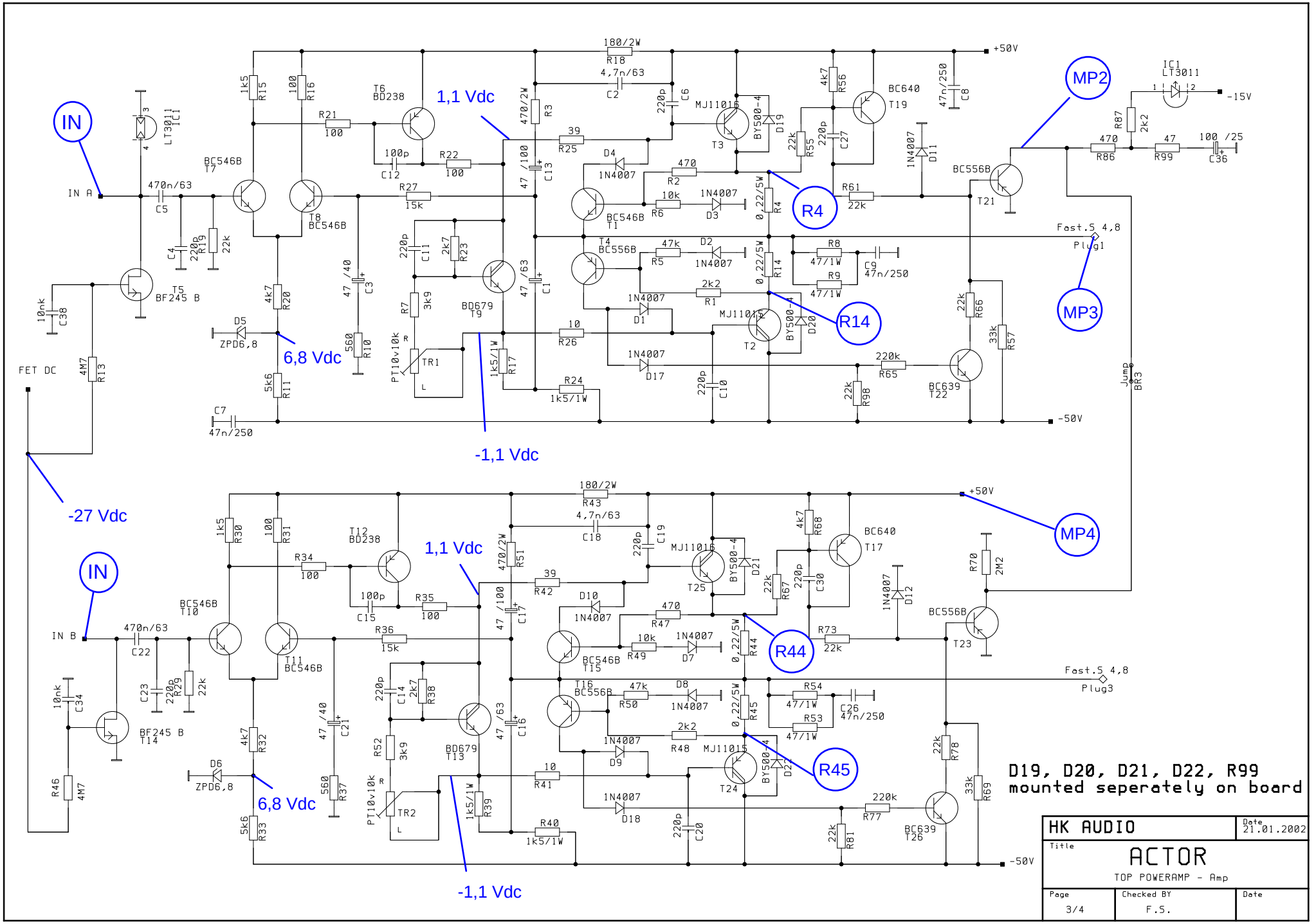
a: up to serial number 313721

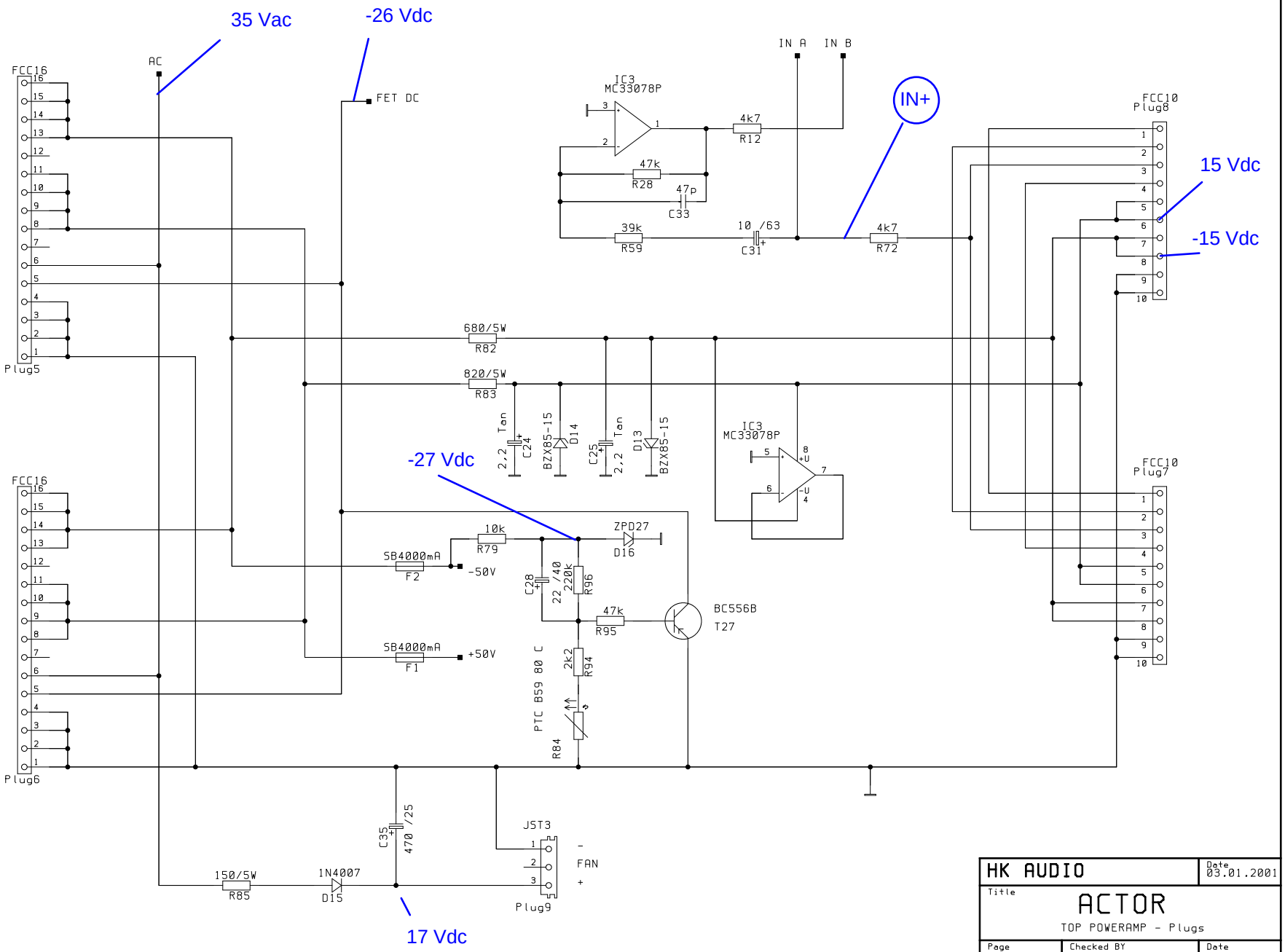
b: 230V - up to serial number 20000 400

117V - up to serial number 2000 3132

⚠ Replace only with the same type!

HK AUDIO		Date 02.07.2001
Title: Actor TOP - Power Supply		
Page 2/4	Checked BY F.S.	Date


IN
IN A
IN B
FET DC
-27 Vdc
1,1 Vdc
-1,1 Vdc
6,8 Vdc
+50V
-50V
-15V
MP2
MP3
MP4
R4
R14
R44
R45
Fast.5 4,8
Plug1
Plug3
IC1 LT3011
T1 BC546B
T2 MJ11015
T3 MJ11016
T4 BC556B
T5 BF245 B
T6 BD238
T7 BC546B
T8 BC546B
T9 BD679
T10 BC546B
T11 BC546B
T12 BD238
T13 BD679
T14 BF245 B
T15 BC546B
T16 BC556B
T17 BC640
T18 MJ11016
T19 BC640
T20 MJ11015
T21 BC556B
T22 BC639
T23 BC556B
T24 MJ11015
T25 MJ11016
T26 BC639
D19, D20, D21, D22, R99
mounted seperately on board
HK AUDIO
Date 21.01.2002
Title ACTOR
TOP POWERAMP - Amp
Page 3/4
Checked BY F.S.
Date


35 Vac
-26 Vdc
AC
FET DC
FCC16
Plug5
IC3
MC33078P
IN A
IN B
IN+
4k7
R12
47k
R28
47p
C33
39k
R59
10 /63
C31
4k7
R72
FCC10
Plug8
15 Vdc
-15 Vdc
680/5W
R82
820/5W
R83
Tan
2,2
C24
BZX85-15
D14
C25
Tan
2,2
D13
BZX85-15
IC3
MC33078P
-27 Vdc
FCC16
Plug6
10k
R79
ZPD27
D16
5B4000mA
F2
-50V
C28
22 /40
220k
R96
47k
R95
BC556B
T27
5B4000mA
F1
+50V
PTC B59 80 C
2k2
R94
R84
FCC10
Plug7
C35
470 /25
JST3
FAN
150/5W
R85
1N4007
D15
17 Vdc
Plug9
HK AUDIO
Date
03.01.2001
Title
ACTOR
TOP POWERAMP - Plugs
Page
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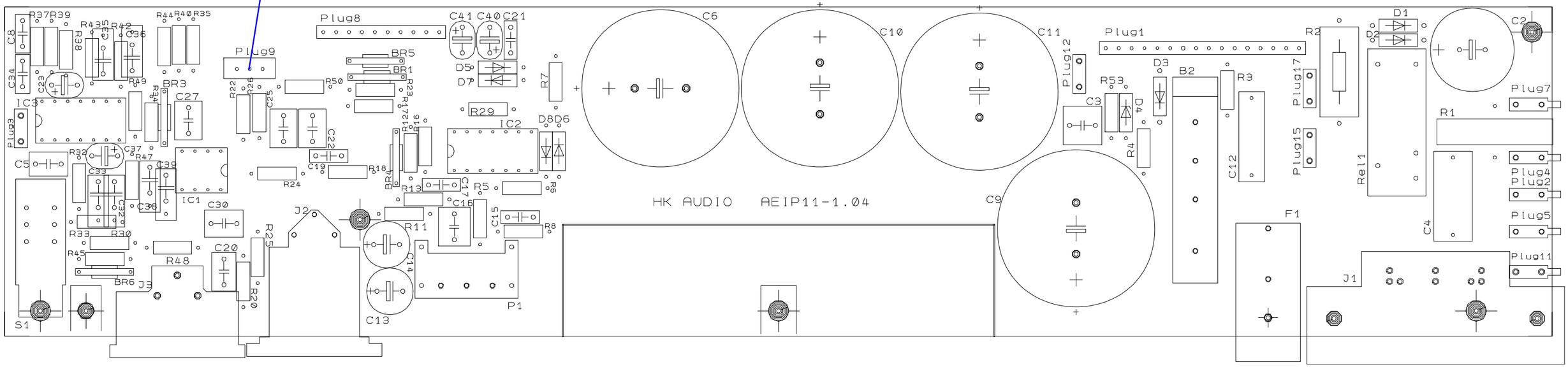
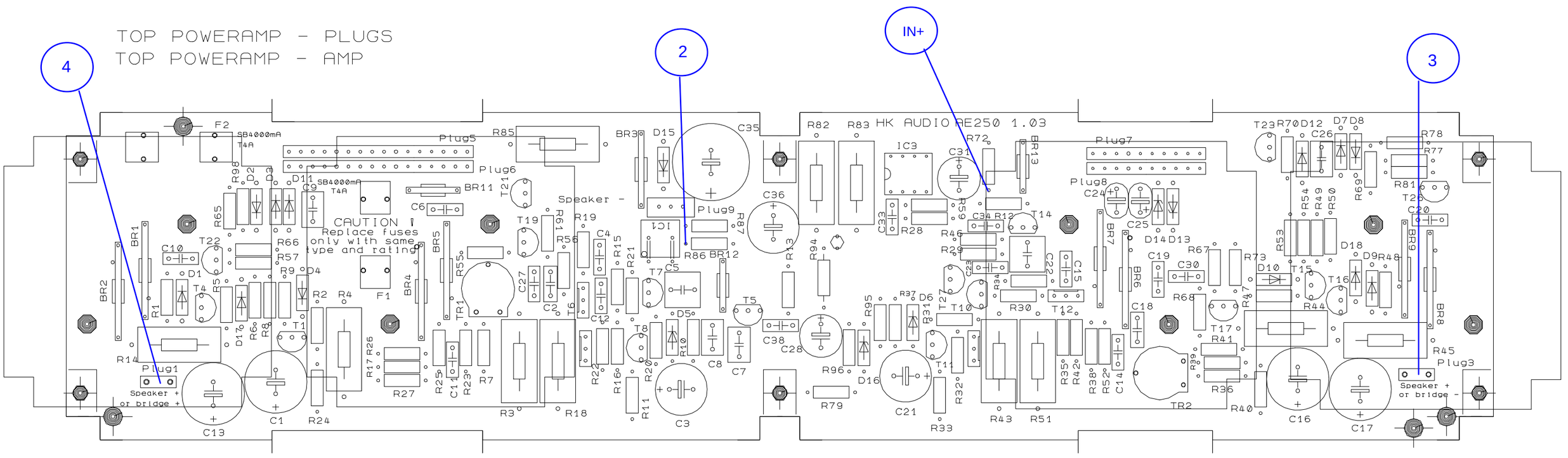
Checked BY
F.S.
Date

1

Top - Preamplifier and Power Supply



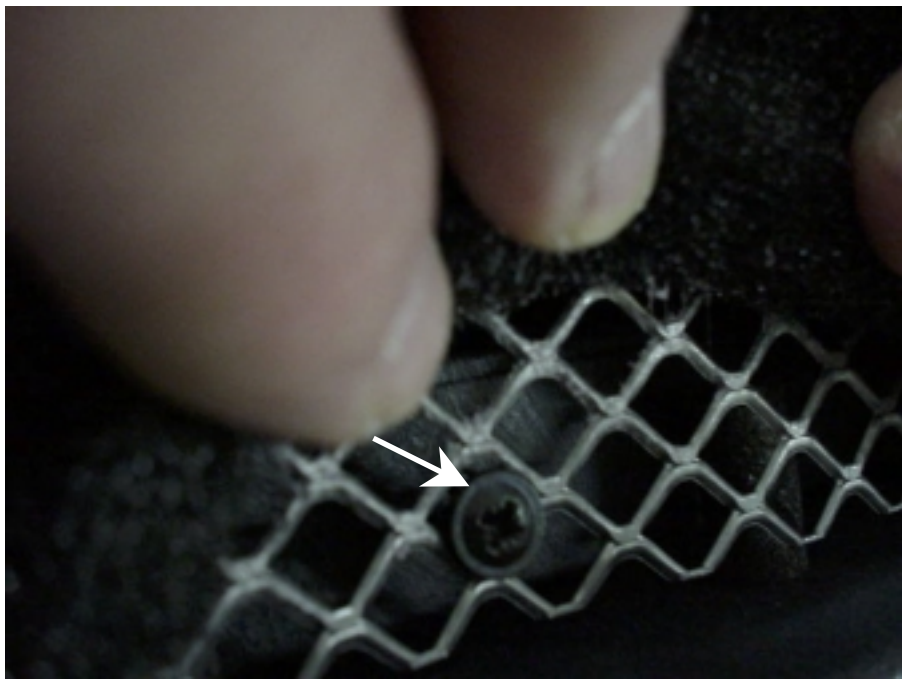
TOP POWERAMP - PLUGS
TOP POWERAMP - AMP



ACTOR AT-112A
Speaker Grille Installation & CD Horn Positioning

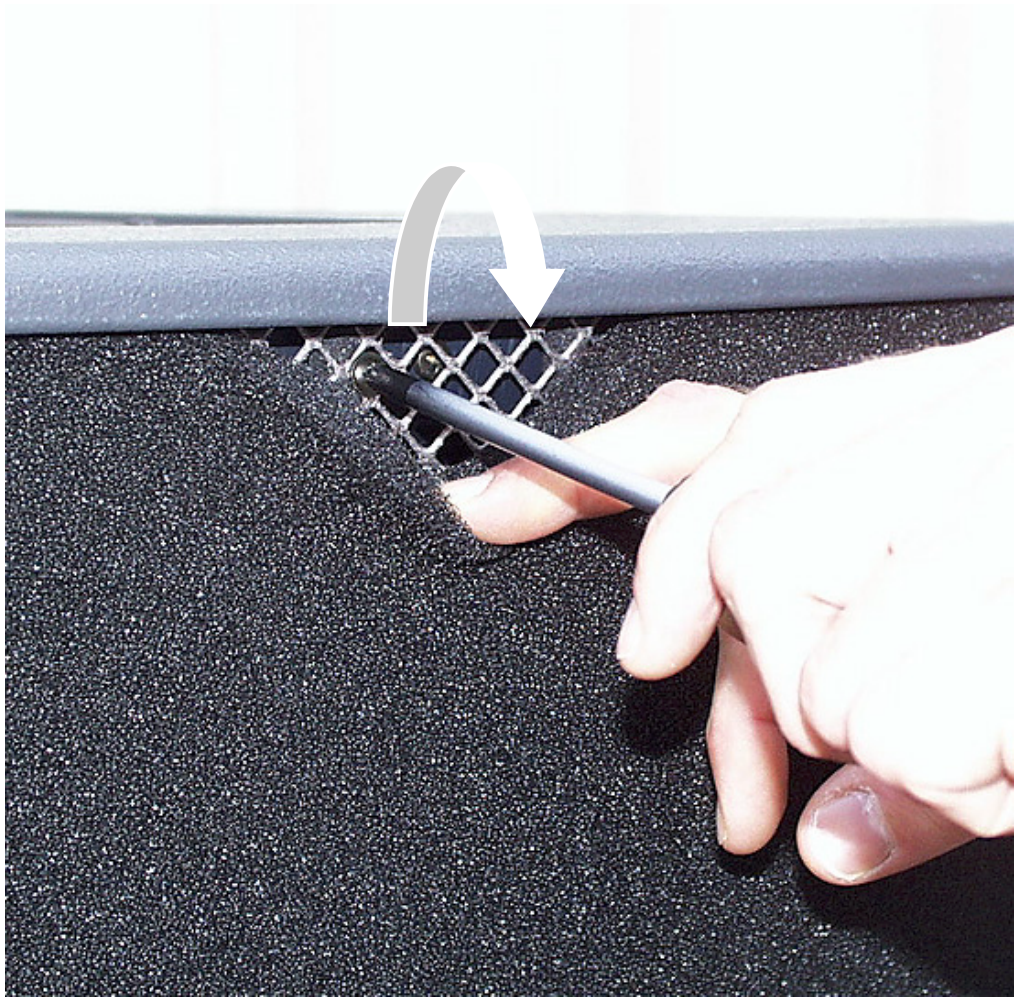
(a) AT-112A Speaker Grille Removal: Locate Screws

Two screws are located on top and on bottom of the cabinet underneath the speaker foam...



(b) AT-112A Speaker Grille Removal

You may want to pry-off the speaker grille somewhat by using a screwdriver...



(c) AT-112A Speaker Grille Removal

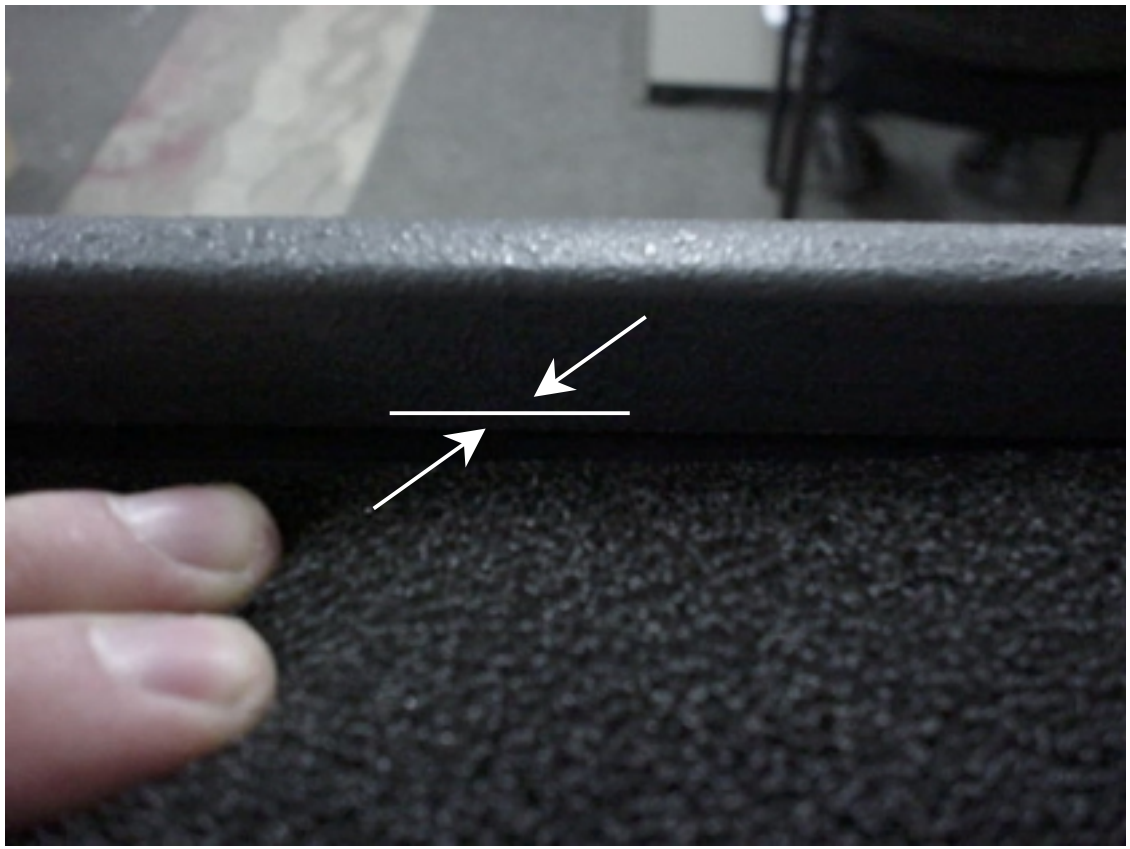
Bring front grille under tension
by pulling it towards your body and pull out...

(d) AT-112A Speaker Grille Assembly

Assembly is the reverse of the above...

(e) AT-112A Speaker Grille Assembly

Make sure you fit the grille underneath the outer speaker cabinet housing frame (rail) before reinserting screws...



(f) ACTOR AT-112A CD Horn Positioning

Make sure the HK AUDIO Logo is located on the bottom of the CD Horn.

Turn CD Horn if necessary.

ACTOR AT-112 A
Crossover Access Procedures

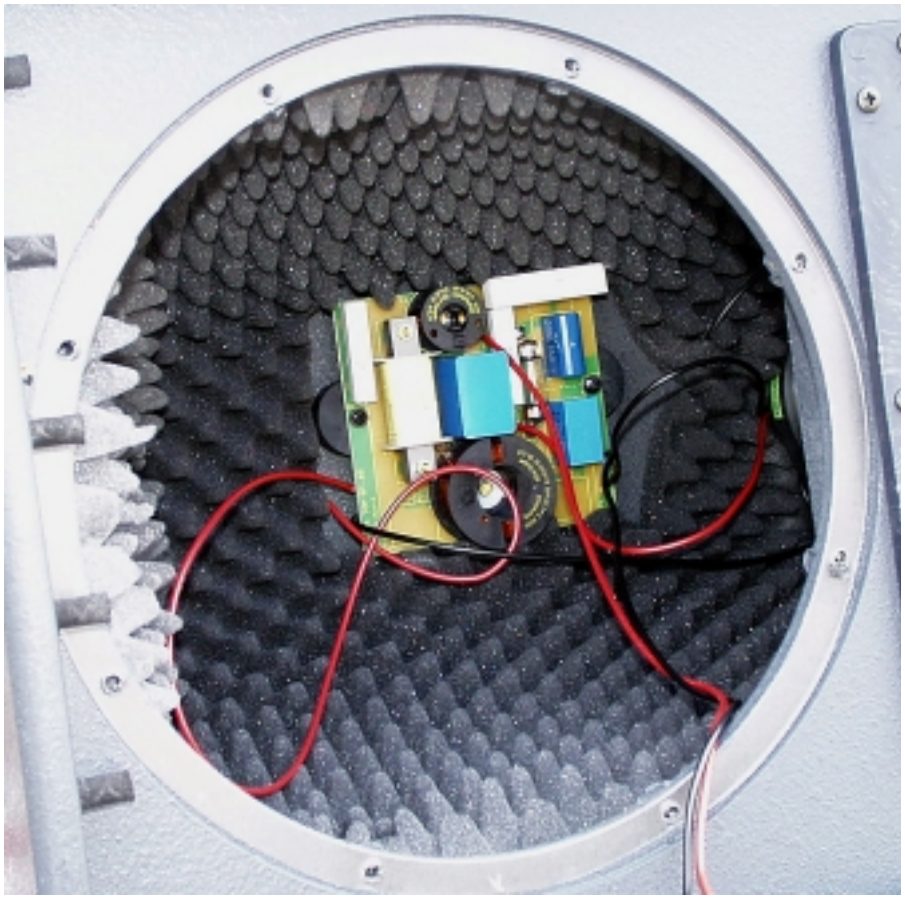
(a) Crossover Access & Installation Procedures

In order to gain access to the crossover you should place AT-112A sideways on a sturdy workbench...

...then remove 5mm hexagon sockets.

(b) Crossover Access & Installation Procedures

After removal of the speaker you now have free access to the crossover...



(c) Crossover Access & Installation Procedures

Using two philips screws the crossover is attached to the cabinet housing with rubber dampers underneath for shock protection.