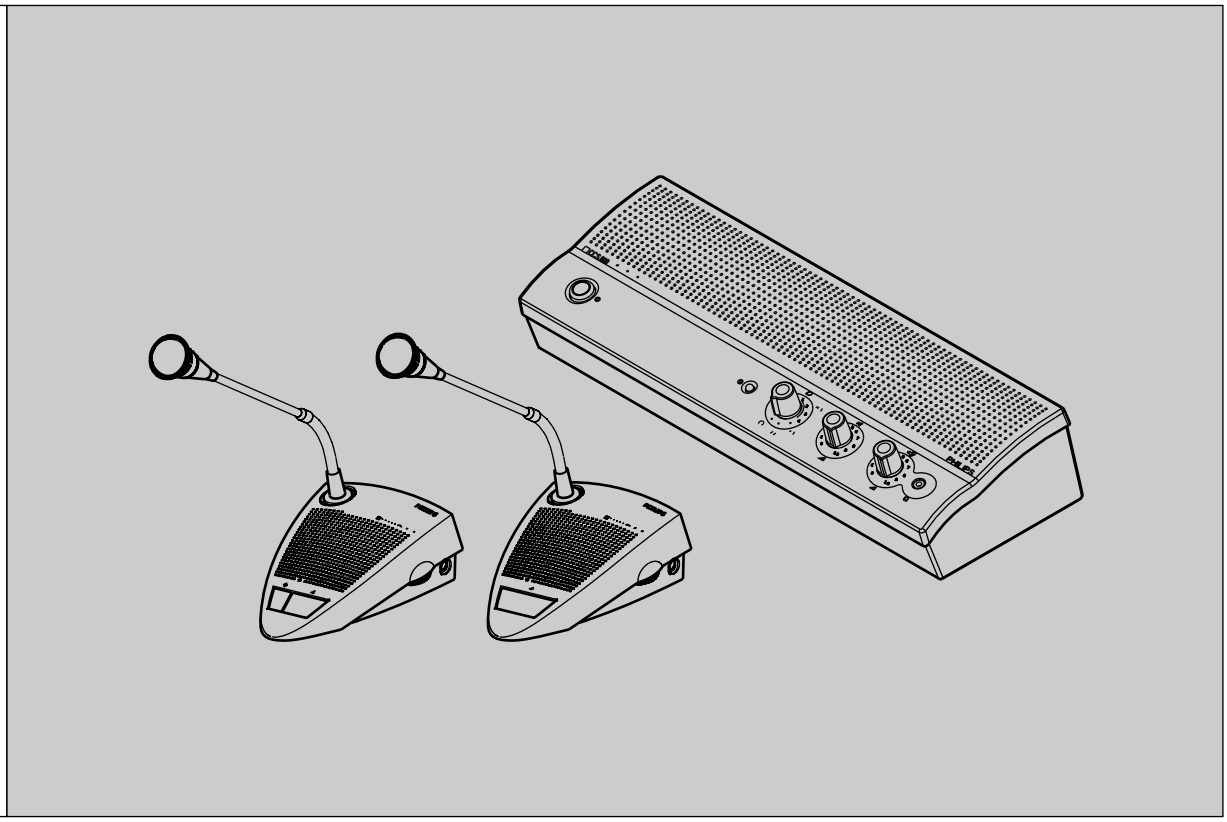
Discussion System

Service Manual



CCS 800

Philips
Communication &
Security System

PHILIPS

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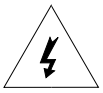
1. About this manual

This manual is intended for service engineers involved in maintenance and repair of Philips CSS "**CCS 800 discussion system"**. This manual supplies information about the maintenance and repair of the LBB 3310/00, LBB3310/00D, LBB3330/00, LBB3330/50, 3331/00, and LBB 3331/50 discussion system devices and is supplementary to the "Instructions for Use" of this equipment. Information from the "Instructions for Use" is in general not copied to this manual. The "Instructions for Use" and this "Service manual" should therefore always be used together.

1.1 Important safety instructions

Maintenance and repair should only be executed by persons trained in, and aware of the general safety procedures regarding electrical equipment and the local regulations. These rules should always be observed. In case of a conflict between local regulations and this manual, please contact the Philips Supply Center.

Also read the chapter "Important safety instructions" in the "Directions for Use"



The lightning flash with an arrowhead symbol, with an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation mark within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

2. About this equipment

The Philips CCS 800 Discussion System is a discussion system for use in meeting and conference venues with a limited number of participants. Most of these systems will be found in meeting rooms of conference centers and hotels, small city councils, breakout rooms of parliaments, meeting rooms in the finance and industry sector and in training and education centers.

A CCS 800 Discussion System consist of:

- One Control and Power Supply Unit (CPSU) (fig. 1-1)
- Max. 50 Delegate and Chairman units (fig. 1-2). Usually one chairman unit is used but any number up to 50 can be installed
- Extension cables of longer cable lengths are required
- Suitcases for transport and storage
- Set of 19" mounting brackets for the Control and Power Supply Unit

Peripheral equipment as needed such as a public address system, recording/playback equipment, telephone coupler and audio equalizing equipment.

3. Installation

Described in: **'Discussion System CCS 800, Instructions for use' manual.**

Ordering code: 3922 988 54281

4. Ordering Service Information

Service publications of the Units are listed in: Survey of CSS Service Support information' and are only for internal use. Issued by: Customer Service & Technical Support CSS and can only be ordered by your local Philips organization.

5. Introduction

LBB 3310/00 Control and Power Supply Unit (CPSU)

The CPSU is the heart of the discussion system which controls the microphones of the chairman and delegate units as well as providing facilities for audio inputs and outputs. It also supplies the power for the CPSU, chairman unit(s) and delegate unit(s).

LBB 3310/00 D Control and Power Supply Unit (USA version)

Ditto with UL approvement.

LBB 3330/00 Delegate Unit

This unit provides the microphone, unit loudspeaker and headphones facilities for the delegates using the CCS 800 discussion system. The headphone connections are interconnected with the loudspeaker. When one or both headphone connections are used and the microphone is not on, the loudspeaker is switched OFF. It has a protected loop-through interconnection. In case of disconnection or interruption of the system cable to the next unit, the system cable will automatically be terminated with the correct impedance.

LBB 3330/50 Delegate Unit with Long Microphone Stem

Ditto with a microphone stem of 480mm instead of 310

LBB 3331/00 Chairman Unit

This unit provides the microphone, unit loudspeaker and headphones facilities for the chairman using the CCS 800 discussion system. Pressing the microphone button always activates the chairman microphone. Pressing the priority button will deactivated all active delegate units and activates the chairman's microphone. Release of the button will either leave them deactivated or activates them again (depending on the setting of the chairman unit). Pressing the priority button may be indicated by a chime tone.

Further equal to LBB 3330/00.

LBB 3331/50 Chairman Unit with long Microphone stem

Ditto with microphone stem of 480mm.

6. Controls and indicators

Control and Power Supply Unit (CPSU)

Top

On/OFF button	Switches the CPSU ON or OFF
Green LED	Indicates if the CPSU is switched ON or OFF
Left rotary switch (S240)	Microphone-mode switch. To select the mode for the delegate microphones. In test position all light-ring indicators lit if all units are properly connected.
Middle rotary switch (S260)	Loudspeaker volume control of the chairman and delegate units.
Right rotary switch (R254)	Volume control for the built-in loudspeaker in the CPSU or a connected headphone to monitor the discussion.
Headphone jack switch (X206)	Headphone jack connector with built-in switch.

Rear

Left gain control potentiometer (R140)	To adjust the sensitivity of the microphone input connector.
Right gain control potentiometer (R125)	To adjust the sensitivity of the recorder input connector
Insertion switch (S160)	Position “1” : loop through; Position “0” : insertion not used

Delegate units

Top

Microphone	Electret microphone with build-in plop and windshield, mounted on a flexible stem, complete with a red LED light-ring
Light-ring around the microphone	ON: microphone is switched ON
Green button (S2)	Microphone ON button
Red LED	Indicates if microphone is switched ON

Side

Thumbwheel (R54)	Rotary volume control for headphones.
Headphone jack switches (X6/X7)	Headphone jack connectors with built-in switch.

Inside

Adjustment microphone capsule (R72)	Potentiometer to adjust the sensitivity of the microphone

Additional for chairman units

Top

Violet button (S1)	Priority function (chime tone)
LED	Red LED for microphone management.

Bottom

Small bracket at cable entry	Hides the priority and chime mode switch (see "Instructions for use").
Switch behind bracket	Delegate microphones off at priority (S37)
	Chime en-/disable switch

7. Technical data

7.1 CPSU

Top

Connector	3.5 mm stereo jack headphone connector

Rear

Connectors	- 2 x 7-pole DIN for trunk output 1 and 2
	- 3-pole XLR for external microphone
	- 10 x cinch for recorder in-/output, line in-/output, telephone-coupler in-/output and insertion in-/output. Mains input connection.

7.2 Delegate and chairman units

Rear

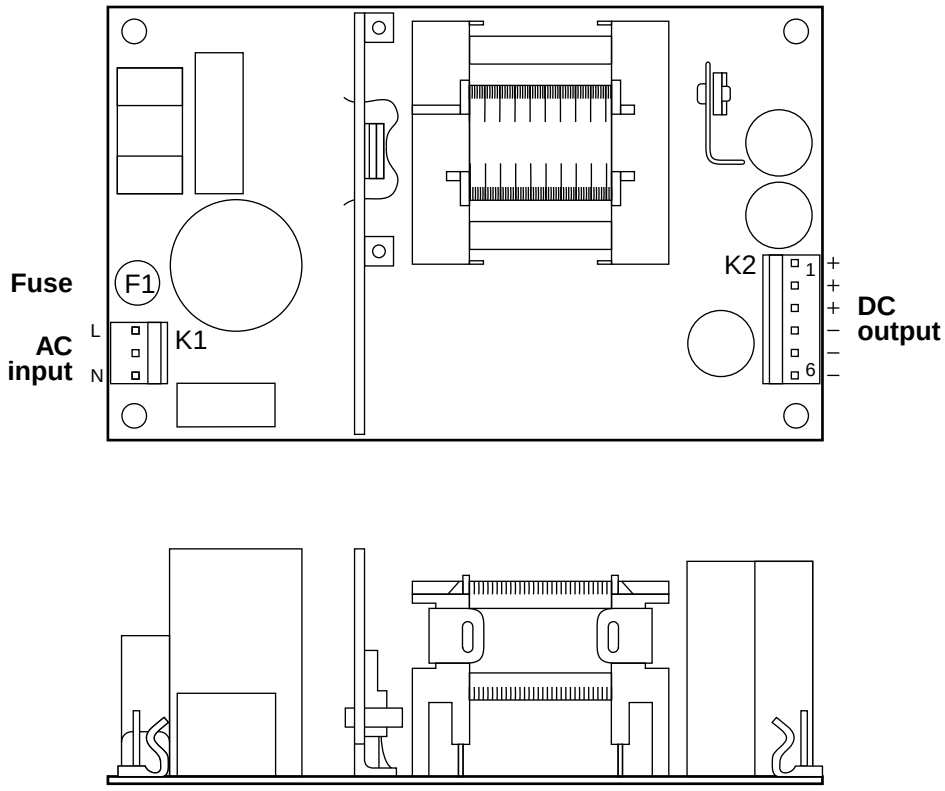
Trunk input	Cable, 2 meter, with 7-pole DIN-connector.
Trunk output	Loop-through output socket, 6-pole DIN.

Side

Connectors	2 x 3.5 mm stereo jack headphone connectors.

7.3 Power supply

Type of power supply	: Nedap 9553673
Mains input voltages	: 90 .. 264Vac
Input frequency range	: 47 .. 63Hz
Max. input current	: 0.9A at 110Vac or 0.3A at 240Vac
Nominal output voltage	: 24Vdc
Rated output load	: 1.7A
Dimensions	: 125mm x 75mm



Additional technical specification for test environment:

> ***Warning:***
> ***heatsink is electrical connected to live of mains input depending on polarity!***

Load range

Output	Min. load	Rated load	Peak load	Voltage accuracy
+24V	0A	1.7A	2.5A	24 ±0.6V

For a practical load test, connect e.g. a resistor of 15 Ohm (min. 40W) between the terminals +24V and GND.

Line regulation

Line input	Load	Regulation
Input change 90 .. 264Vac	1.7A	< ±1%

Ripple and noise

Output	Test	Conditions
24V with 1.7A load	<1% p-p (rated load)	Oscilloscope with 15Mhz limited bandwidth

AC input pin assignment K1	1	.	3
	L		N
	Line		Neutral

AC input fuse	F1
	Replace power supply unit in case of fuse failure!

DC output pin assignment K2	1	2	3	4	5	6
	+24V	+24V	+24V	GND	GND	GND

7.4 Additional information

For more technical data about the CCS 800 refer to 'Instructions for use', chapter 8.

8. Microphone stem adjustment

Microphone stem

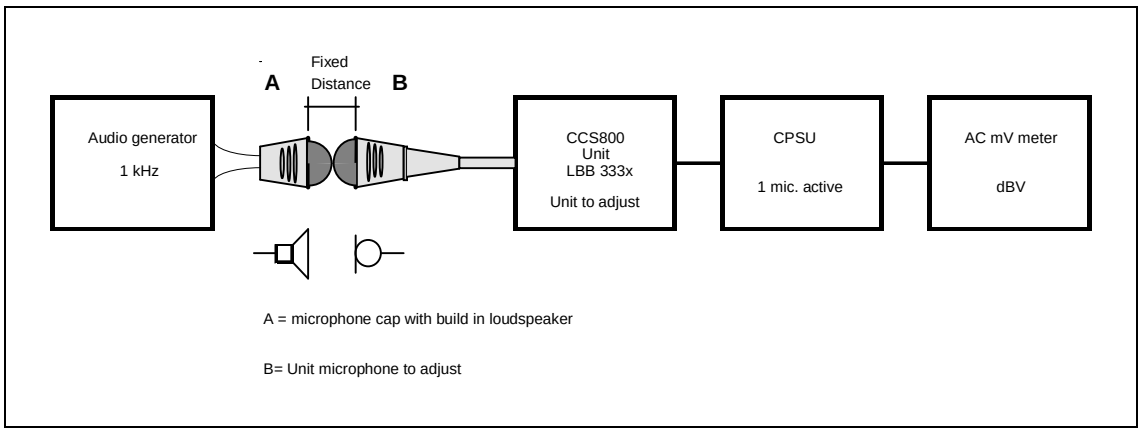
When the microphone stem assembly has to be replaced, it is required that the input level of the microphone is adjusted again by use of the preset potentiometer R72.. This due to the spread in sensitivity of the microphone capsule (approx. ±4dB).

Procedure

The adjustment is a practical procedure to compare factory adjusted units with units were the microphone stem is replaced and to be tuned to the system level again.

Test set-up

- Audio sine wave generator
- Home made loudspeaker reference source "A" (see figure below)
- CPSU
- AC mV meter



Measurements

Measurement data output and adjustments is represented by the symbol '☟'

	Test procedure	Comment
1	Connect the CCS800 unit with the CPSU.	Select only one active mic. on the CPSU!
2	Connect to the 'Line out' of the CPSU the AC mV meter	
3	Adjust the audio source to approx. 1kHz.	The audio level of the lsp. should be distortion free and at a level of speaking distance. Take care that no acoustic nuisance from outside influence the measurements.
4	Place the mic. of a factory adjusted CCS800 unit close to the loudspeaker on a fixed distance.	Make from an old DCN or CCS800 microphone head housing an audio reference source. Mount inside the (empty) head e.g. a paging bleeper as ref. loudspeaker.

		Of importance is that for all measurements the distance between loudspeaker and microphone is equal.
↳	Measure the audio level on the AC meter.	Take this level as ref. for the CCS800 units to be adjusted. Repeat the ref. measurement for a check with other unit(s). The factory level adjustment is ±0.5dB
5	Remove the factory adjusted unit and place the unit for adjustment in the same position.	Do not change the audio setting adjustments.
↳	Read the audio level on the AC meter.	
↳	Tune R72 to the audio ref. level as measured before.	

Please note that in the bottom plate is a small hole for access to R72.
Never adjust R72 when the microphone of the unit is factory tuned!

9. Maintenance

- **Preventive maintenance**

Regular preventive maintenance is not necessary.

Depending on the usage the equipment may need cleaning.

- **Corrective maintenance**

Defective units can be repaired or replaced by a new one. Repair of a discussion unit has to be carried out in a cost effective way, with a high quality and without using special tools and equipment.

- **Electrical**

The chapter 'Diagnostics/ Fault finding' describes how to measure possible defects in circuit sections.

Replacement on board level is required when defects in the digital sections of the board(s) are determined.

From other circuitry's are some components available for replacement.

- **Mechanical**

A selection of mechanical components is available to replace damaged and wear out parts.

- **Microphone**

The microphone with belonging stem is not repairable. When found defective the complete microphone stem assembly has to be replaced.

10. Diagnostics/ Fault finding

10.1.1 Functional test

Before you start the functional test connect a correct working chairman unit and at least two delegate units to the CPSU and switch on the CPSU

Testing the Light-ring

Put the mode switch in the TEST position

All the Light-rings of the delegate and chairman units must lit now

Testing the OPEN 1 mode

- In this mode maximum one delegate unit can be active at the same time.
- Put the mode switch of the CPSU in the OPEN 1 mode.
- Press the microphone switch on one of the delegate units.
- The microphone of the delegate unit is now activated, which is indicated by an illuminating indicator-ring.
- Press the microphone switch of the second delegate unit.
- This must have no effect. The indicator-ring of this delegate unit must stay off.
- Press the microphone switch on the chairman unit.
- The microphone and indicator ring of the chairman unit will be activated. This will have no affect on the active microphone(s) of the delegate unit(s).
- Press the microphone switch on the first delegate unit a second time to switch off the microphone and indicator ring. Do this also for the chairman unit.

Testing The AUTO 1 mode

- In this mode maximum one delegate unit can be active at the same time.
- The test procedure is the same as the OPEN mode with the exception that the microphone automatically will switch off after a period of 30 sec. silence.

Testing the OVERRIDE mode

- Put the mode switch of the CPSU in the OVERRIDE mode.
- Press the microphone switch on one of the delegate units.
- The microphone of the delegate unit is now activated, which will be indicated by an illuminating indicator-ring.
- Press the microphone switch of the second delegate unit.
- The microphone of the first delegate unit and indicator ring will switch off and the microphone of the second delegate unit and indicator ring will switch on.

Testing the CHAIRMAN ONLY mode

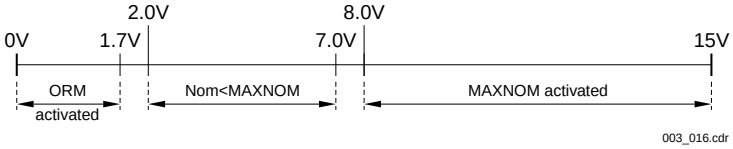
- In this mode only the microphones of the chairman unit(s) can be activated.
- Put the mode switch of the CPSU in the CHAIRMAN ONLY mode.
- Press the microphone switch on a delegate unit.
- This may have no effect.

10.1.2 Brief description of the various modes of the chairman and delegate unit

The CCS800 discussion system uses two control lines, CTRL-L1 and CTRL-L2. These two control lines are used to set the delegate and chairman units in a specific mode. Each mode depends of the position of the mode switch, located on the CPSU and pressing the microphone button or priority button on the delegate and chairman units. For every mode the control lines CTRL-L1 and CTRL-L2 has several voltage levels.

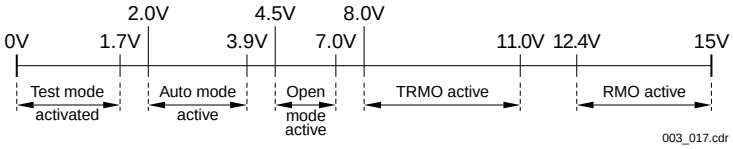
CTRL-L1

Depending of the voltage level of CTRL-L1 the ORM (override) mode is activated or the MAXNOM (maximum number of delegate microphones) is activated.



CTRL-L2

Depending on the voltage level of CTRL-L2 the TEST mode, the AUTO mode, the TRMO (Temporary all delegate microphone switched off) or RMO (all delegate microphones switched off) is activated.



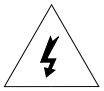
General

The Main PCBs of the delegate and chairman units delivered from the factory are NOT identical.

Repair

See spare parts list for available spare parts. In appendix 1 are the components of the units listed.

Components without a service code are not available as spare parts.



WARNING: Part of the power supply inside the CPSU carry potentially lethal voltages. Only touch parts with well insulated tools.

Replace a complete PCB when found irreparable.

When microphone parts are defective, the complete microphone stem must be replaced. Because the complete assembly is glued together.

10.2 Measuring Instructions for the CPSU (LBB3310/00)

Introduction

The measurement procedure contains the following items:

- the internal supply voltages
- the supply current
- the audio-contribution to loudspeaker circuit
- the line-in to telephone-out, line-out and insertion-out circuit
- the rec-in to rec-out circuit
- the telephone-in to line-out circuit
- the mode switch (S240)

Use the diagrams in appendix A to located the measurement pads and components mentioned in the measurement instructions.

10.2.1 Settings before you start measuring

- Set the insertion switch (S160), located at the rear side, to the left position (“1”).
- Set the potentiometer of the headphone volume (R254) to maximum (fully clockwise).
- Set the mode switch (S240) to “auto mode 1” (fully counterclockwise).
- Set the Volume control for the Delegate and Chairman units to maximum (fully clockwise).
- Set the gain control potentiometer (R140) for the external microphone in the middle position.
- Set the gain control potentiometer (R125) for the recorder input in the middle position.

10.2.2 Internal Supply Voltages

Connect the CPSU to the mains and measure the following internal supply lines, related to M2 (= GND):

M6 (V+)	+19.5 V +/- 400 mV
M7 (V-)	- 4.5 V +/- 100 mV
M15	+15 V +/- 750 mV
M25	+5 V +/- 250 mV
M26	+7.5 V +/- 350 mV
M27	+10 V +/- 500 mV

10.2.3 Phantom supply of the external symmetrical microphone input

Measure the following internal supply lines, related to M133 (= GND):

M28	+12 V +/- 600 mV
M131	+12 V +/- 600 mV
M132	+12 V +/- 600 mV

10.2.4 Supply current measurement

Measure the supply current from V+ by means of a current meter in the power supply line itself: this should be between 30mA and 40mA.

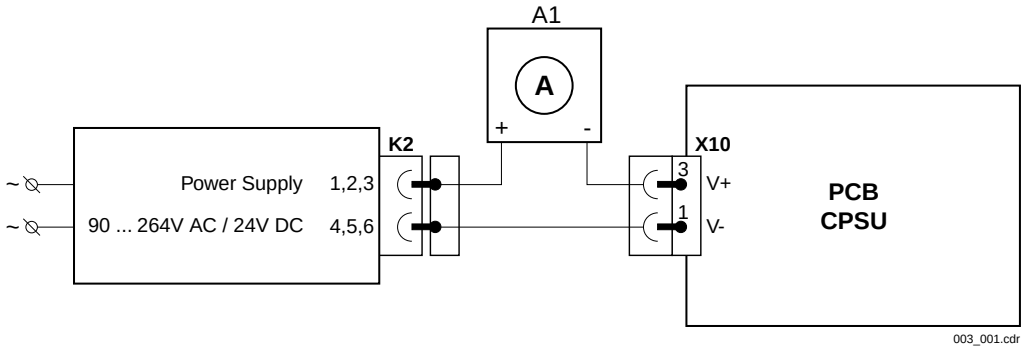


Figure 1

10.2.5 AUDIO-CONTR to Loudspeaker circuit

Noise level

Measure first the noise, A-weighted & rms, from the loudspeaker-signal between (symmetrical) M57 and M59 (see figure 2):

Noise level (A-weighted): < -70dBV.

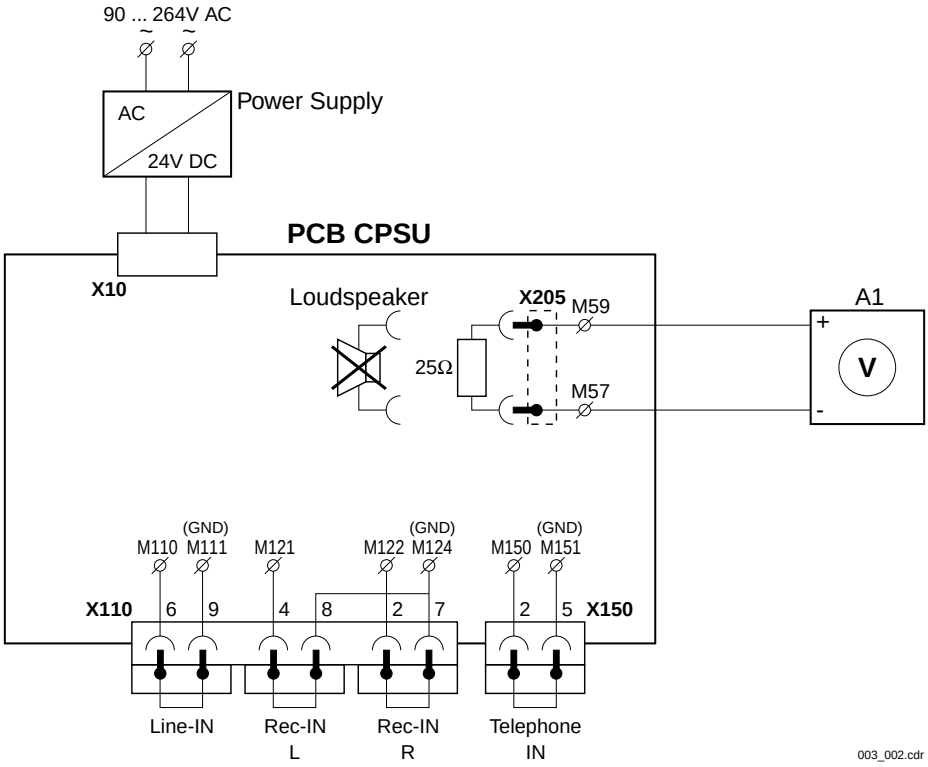


Figure 2

Nominal level and bandwidth

Insert a sine wave signal to the AUDIO-CONTR via M1 related to M2 and measure the output signal between M59 and M57.

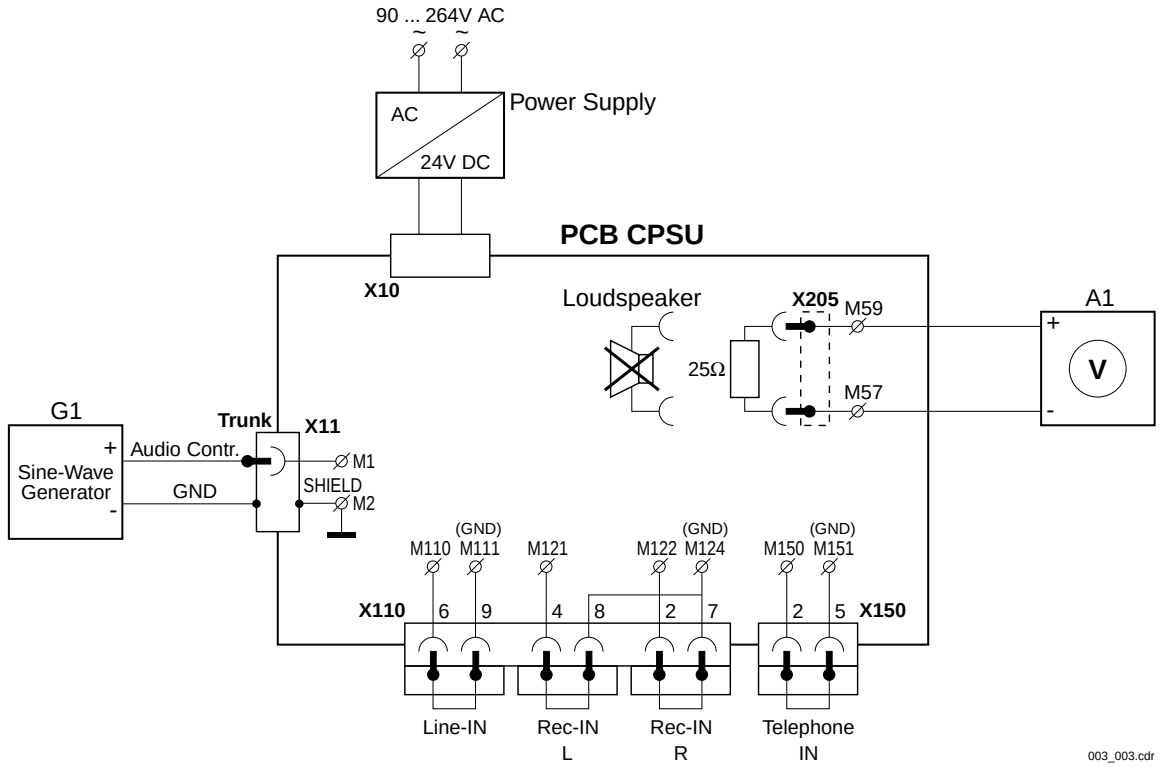


Figure 3

	settings for G1		measurement results for A1
	Amplitude	Frequency	sound level
Nominal level	-36 dBV (15.8 mVrms)	1 kHz	-7.8 dBV +/- 1.5dB (72 dB SPL)
Bandwidth	-36 dBV (15.8 mVrms)	125 Hz	-8 dBV +/- 2 dB related to nom level at 1 kHz.
Bandwidth	-36 dBV (15.8 mVrms)	12.5 kHz	-3dB +/- 1.0dB related to nom. level at 1kHz.

10.2.6 External Microphone input to Line out (balanced)

Noise level

Measure the noise, A-weighted & rms, at LINE-OUT via M119, related to M2 (GND):

Noise level (A-weighted): < -74 dBV.

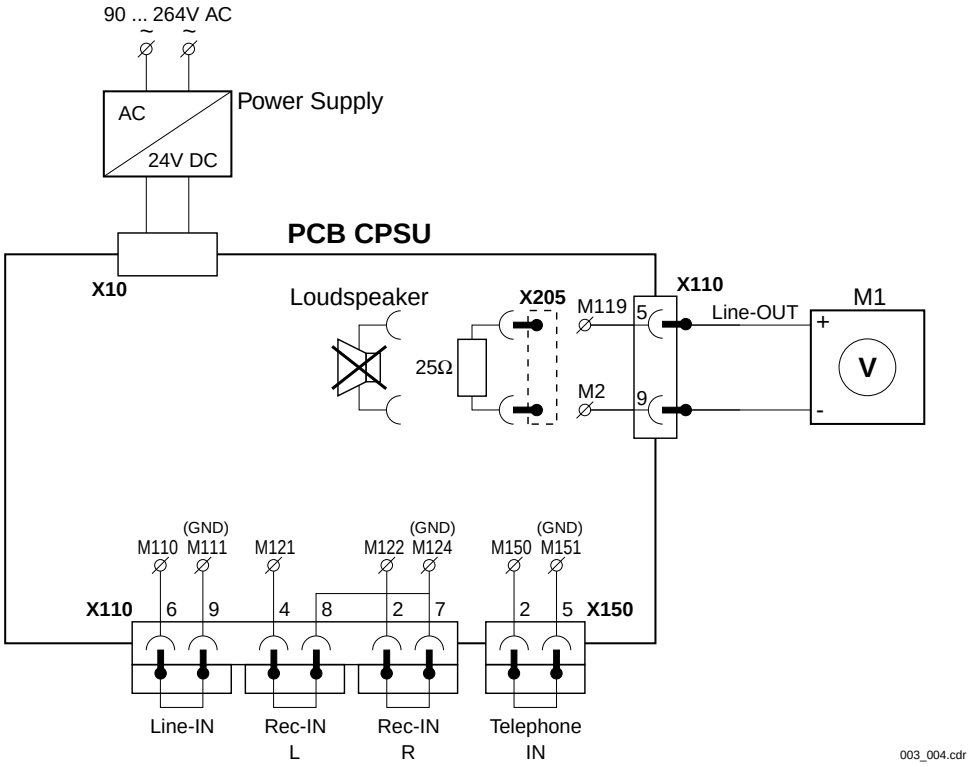


Figure 4

Nominal level, maximum level and bandwidth

Connect successively a sine-wave generator to the left and right external microphone input connections, ("MIC-IN+" (M131) and "MIC-IN-" (M132)) related to GND (M133) according to figure 5.

NOTE: be sure that the gain control potentiometer (R140) of the external microphone input is set to the middle position.

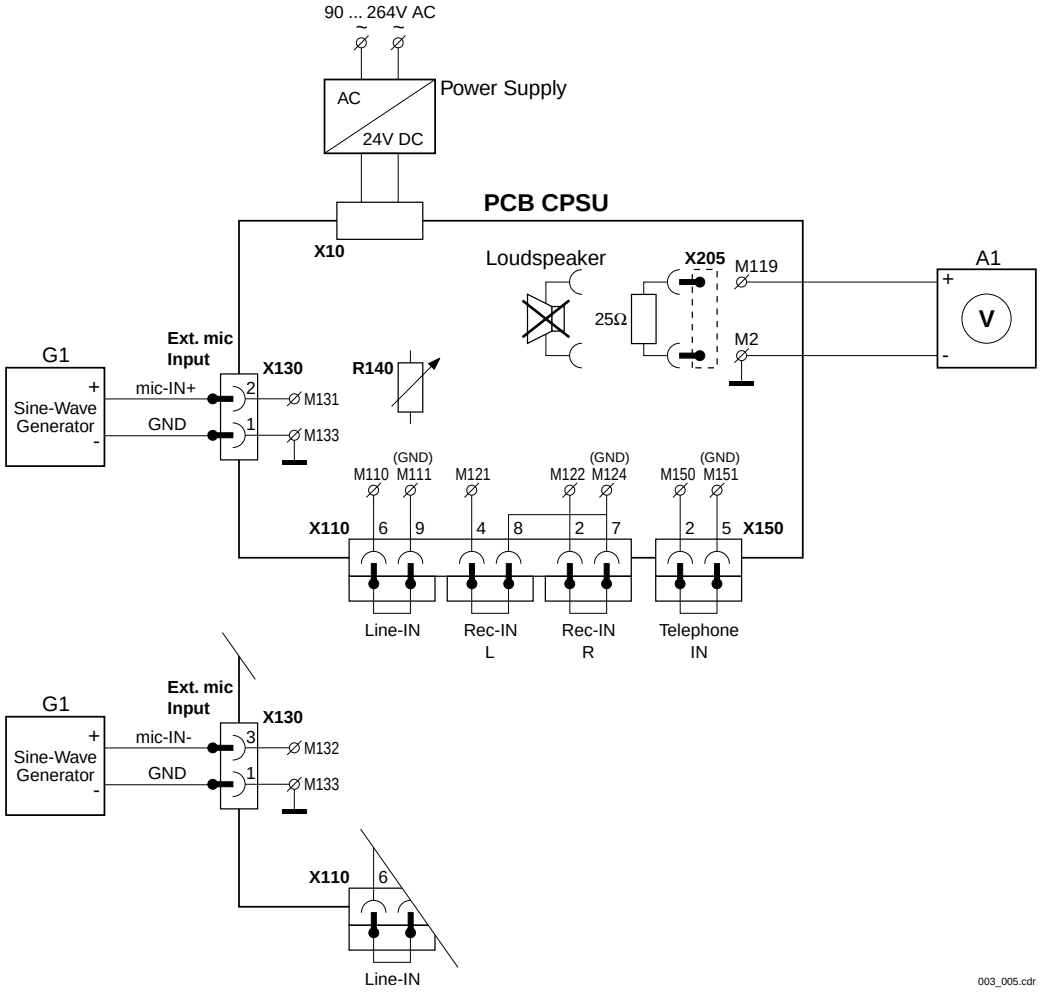


Figure 5

	settings for G1		measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-56 dBV (1.6 mVrms)	1 kHz	-15 dBV +/- 2dB (85dB SPL)
Maximum level	-31 dBV (28.2 mVrms)	1 kHz	+10 dBV +/- 2 dB (110 dB SPL)
Bandwidth	-56 dBV (1.6 mVrms)	125 Hz	-3dB +/- 2dB related to nom. level at 1kHz
Bandwidth	-56 dBV (1.6 mVrms)	12.5 kHz	-1dB +/- 1dB related to nom. level at 1kHz.
Mute level: set S240 to chairman only mode	-56dBV (1.6 mVrms)	1 kHz	< -74 dBV (selective) or < -74 dBV (A-weighted)

Set S240 back to position AUTO 1.

10.2.7 Audio-Contribution and Audio-Distribution circuit

Noise level

Measure the noise, A-weighted & rms, at AUDIO-DISTR via M3 (pin 3 at X11 or X12), related to M2 (GND): Noise level (A-weighted): < -70dBV.

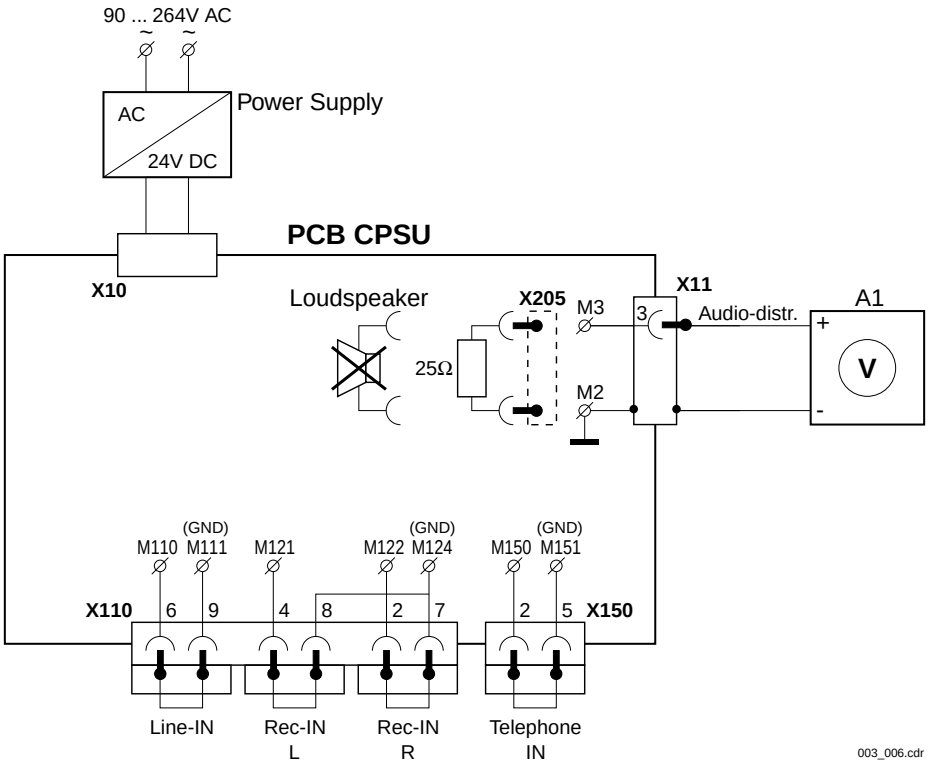


Figure 6

Nominal level, maximum level and bandwidth

Connect a sine-wave generator to one Trunk connectors (X11) and measure the output signal at the other Trunk connector (X12) according to figure 7.

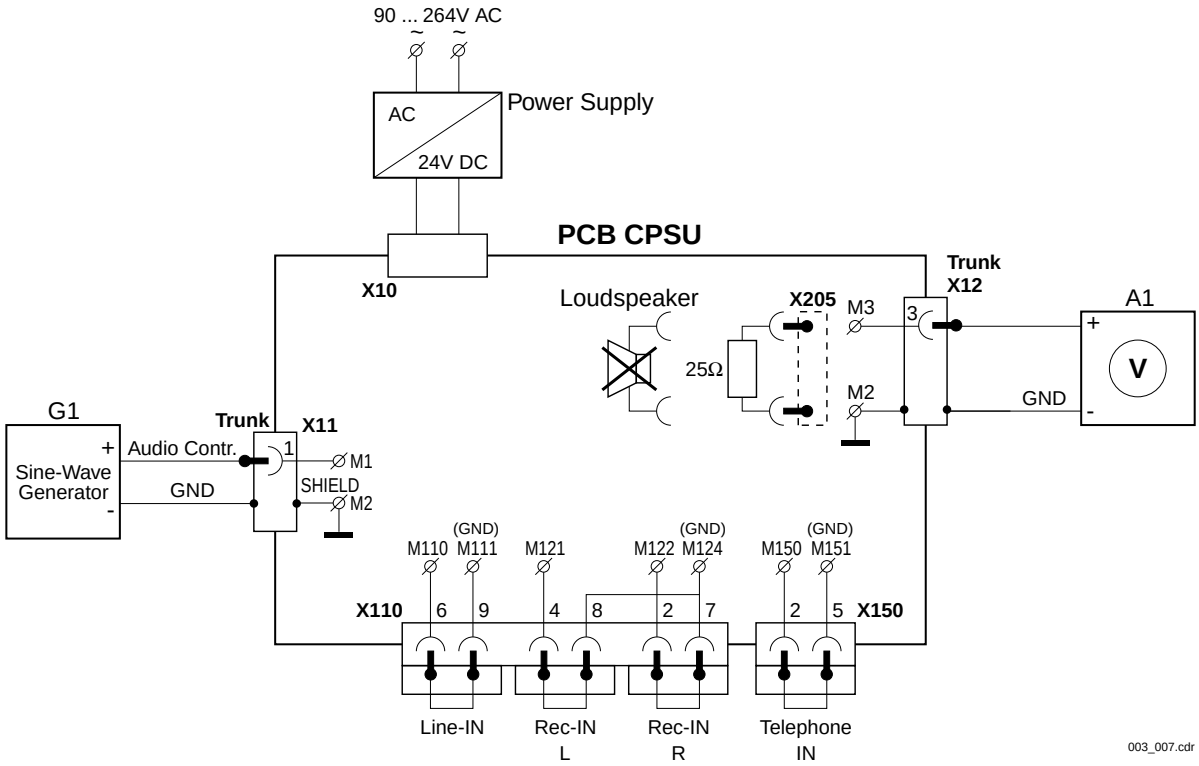


Figure 7

	settings for G1		measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-36dBV (15.8 mVrms)	1kHz	-9.4dBV +/- 1dB (85dB SPL)
Overload level	-11dBV (281.8 mVrms)	1 kHz	+3dBV +/- 1dB (115dB SPL)
Bandwidth	-36dBV (15.8mVrms)	125 Hz	-2dB +/- 2dB related to nom. level at 1kHz
Bandwidth	-36dBV (15.8mVrms)	12.5 kHz	-1dB +/- 1dB related to nom. level at 1kHz.

10.2.8 LINE-IN to TELEPHONE-OUT, LINE-OUT, INSERTION-OUT Circuit.

Noise level

Measure the noise, A-weighted & rms, successively at TELEPHONE-OUT (M109), LINE-OUT (M119) and INSERTION-OUT (M169) all related to M2 (GND):

Noise level (A-weighted): < -84dBV.

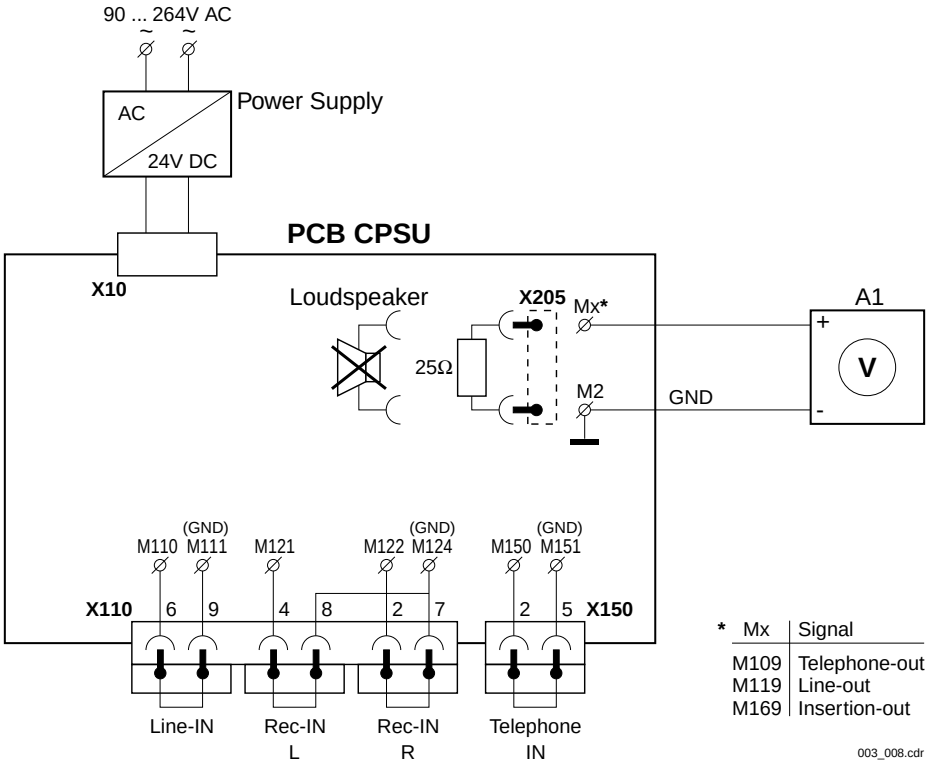


Figure 8

Nominal level, maximum level and bandwidth

Connect a sine-wave generator to the LINE-IN connector and measure successively the output signal at the TELEPHONE-OUT (M109), LINE-OUT (M119) and INSERTION-OUT“ (M169) connector according to figure 9.

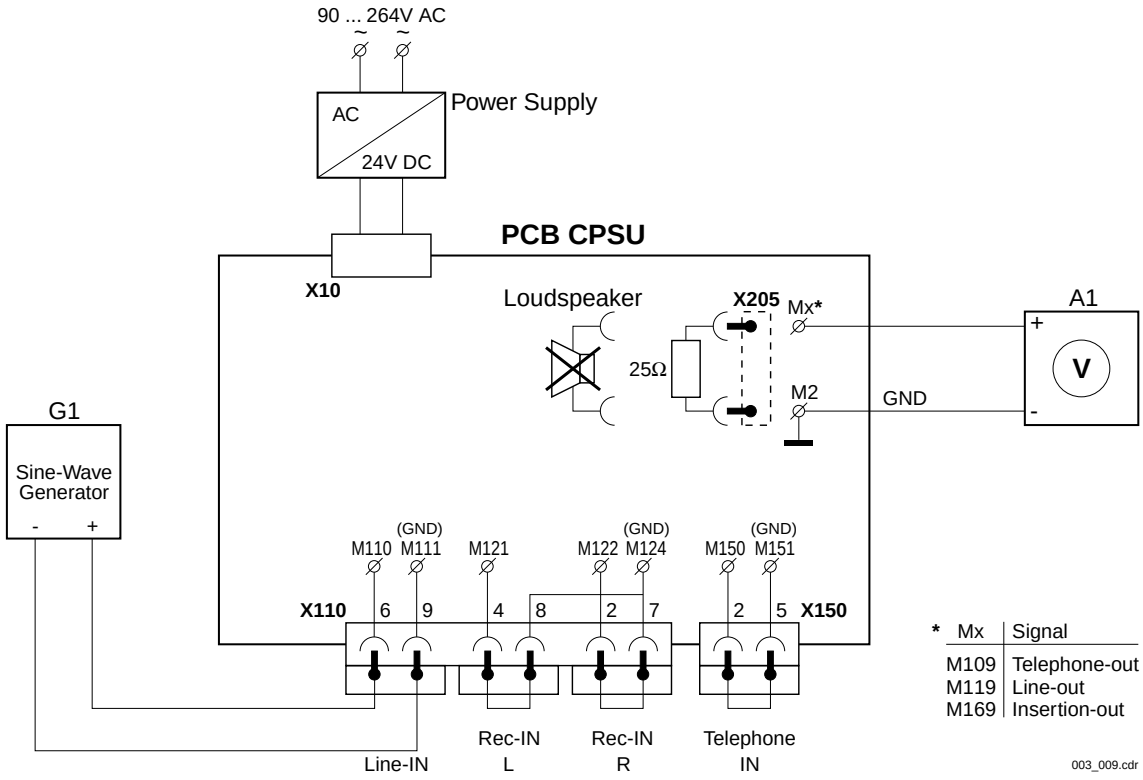


Figure 9

	settings for G1		**measurement results for A1**
	Amplitude	Frequency	Amplification
Nominal level	-14dBV (200mV$_{rms}$)	1kHz	-14dBV +/- 1dB (85dB SPL)
Maximum level	+11dBV (3.55V$_{rms}$)	1 kHz	+11dBV +/- 1dB (110dB SPL)
Bandwidth	-14dBV (200mV$_{rms}$)	125 Hz	-0.5dB +/- 2dB related to nom. level at 1kHz
Bandwidth	-14dBV (200mV$_{rms}$)	12.5 kHz	-0.5dB +/- 1dB related to nom. level at 1kHz.

10.2.9 REC-IN-L and REC-IN-R to REC-OUT Circuit.

Noise level

Measure the noise, A-weighted & rms, at REC-OUT (M129) related to M2 (GND):

Noise level (A-weighted): < -90dBV.

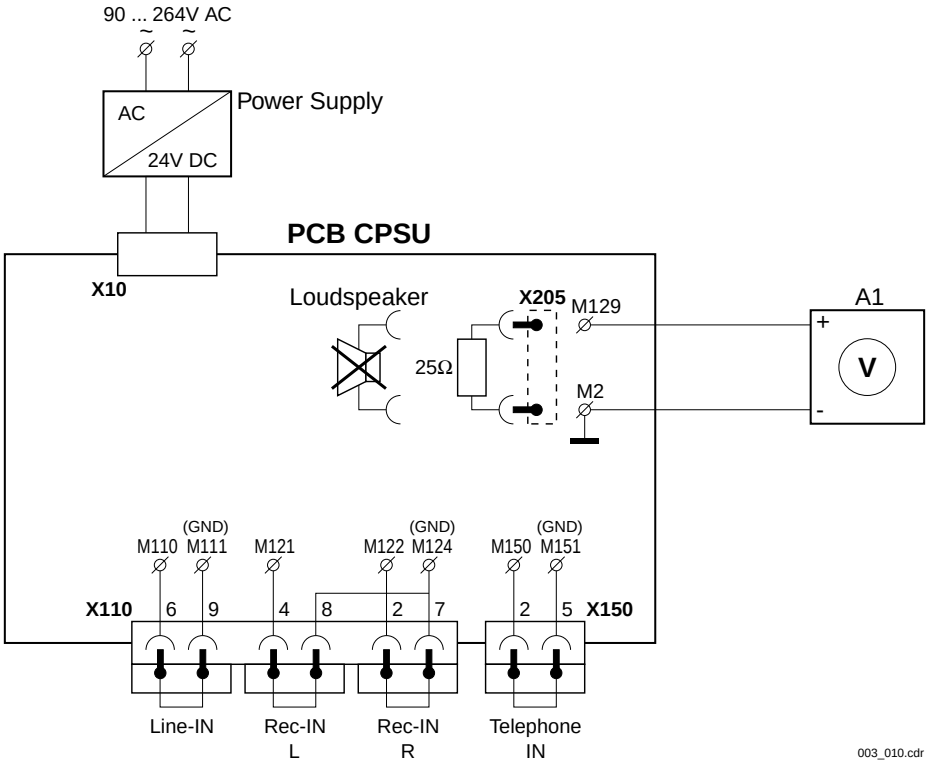


Figure 10

Nominal level, maximum level and bandwidth

Remove the interconnections of REC-IN-L and REC-IN-R and connect successively a sine-wave generator to the REC-IN-L and REC-IN-R connector. Measure the output signal at the REC-OUT connector according to figure 11.

NOTE: be sure that the gain control potentiometer (R125) of the recorder input is set to the middle position.

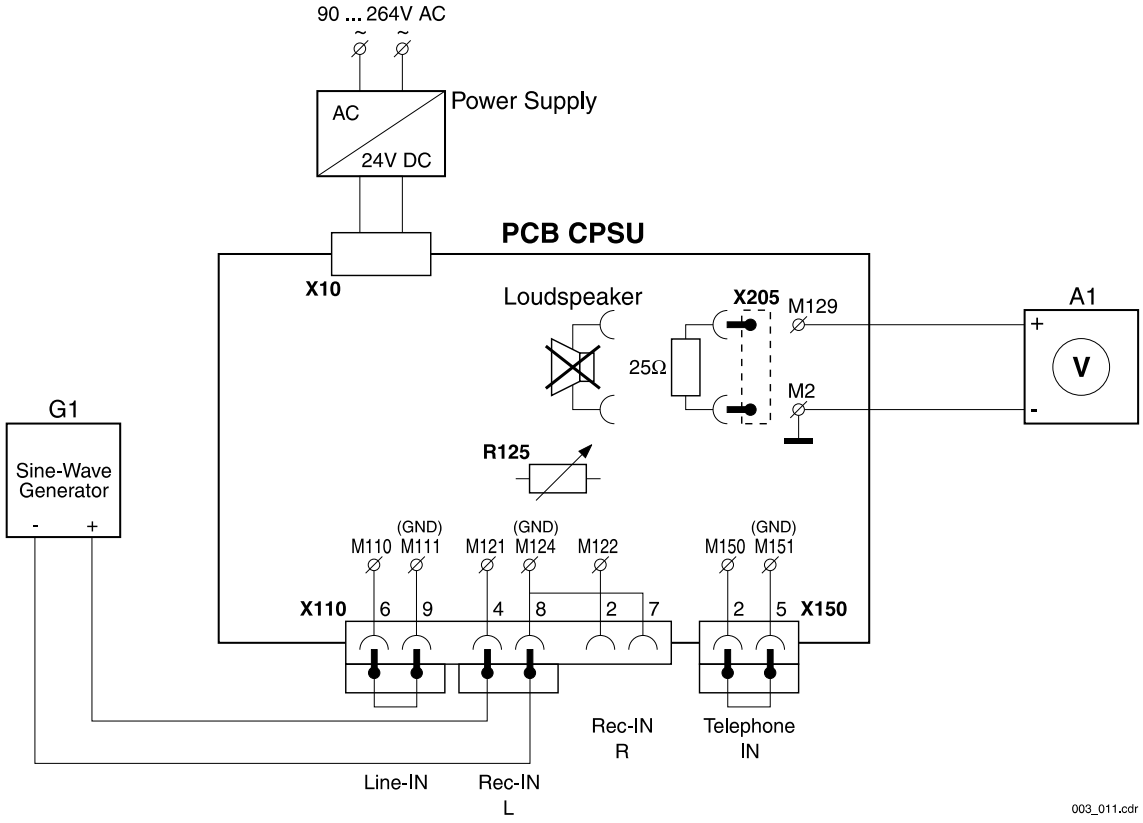


Figure 11

	settings for G1		measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-20dBV (100mV$_{rms}$)	1kHz	-22dBV +/- 2dB (85dB SPL)
Maximum level	+5dBV (1.78V$_{rms}$)	1 kHz	+3dBV +/- 2dB (110dB SPL)
Bandwidth	-20dBV (100mV$_{rms}$)	125 Hz	-1dB +/- 1dB related to nom. level at 1kHz
Bandwidth	-20dBV (100mV$_{rms}$)	12.5 kHz	-1dB +/- 1dB related to nom. level at 1kHz.

10.2.10 TELEPHONE-IN to LINE-OUT Circuit

Nominal level, maximum level and bandwidth

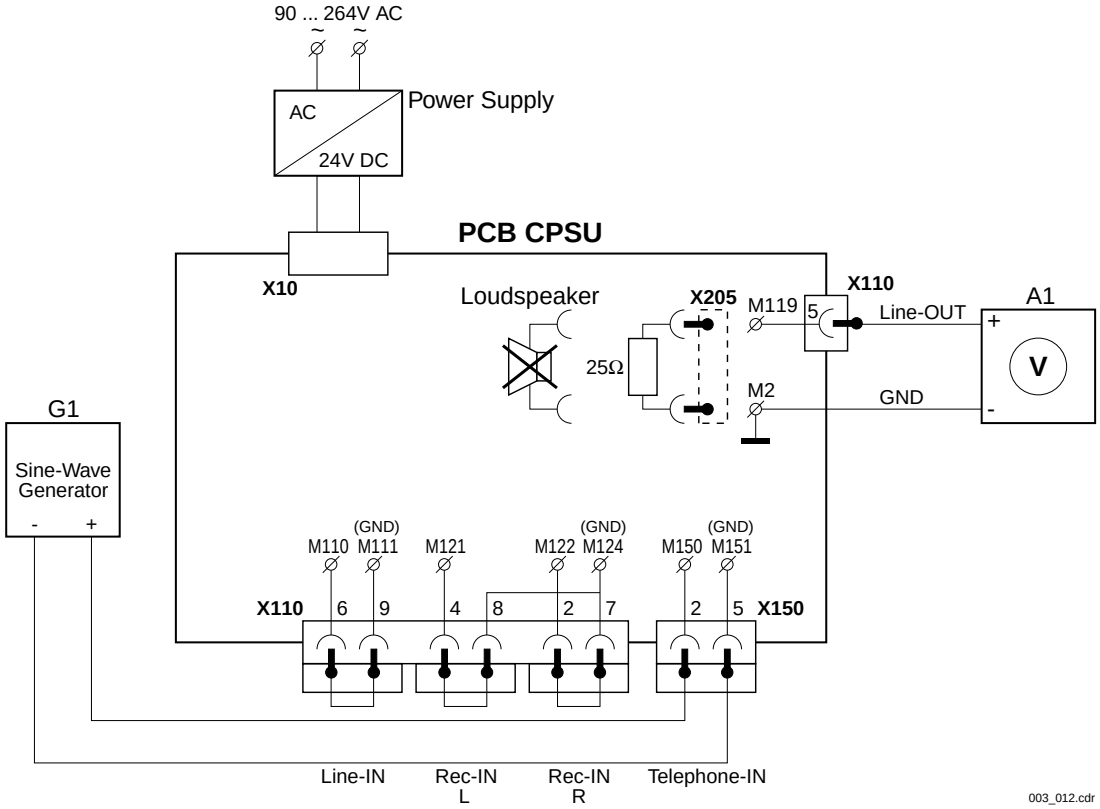


Figure 12

	settings for G1		measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-14dBV (200mV$_{rms}$)	1kHz	-14dBV +/- 1dB (85dB SPL)
Maximum level	+11dBV (3.55V$_{rms}$)	1 kHz	+11dBV +/- 1dB (110dB SPL)
Bandwidth	-14dBV (200mV$_{rms}$)	125 Hz	-0.5dB +/- 2dB related to nom. level at 1kHz
Bandwidth	-14dBV (200mV$_{rms}$)	12.5 kHz	-0.5dB +/- 1dB related to nom. level at 1kHz.

10.2.11 The mode switch

By use of a combination of different voltage levels at CTRL-L1 and CTRL-L2 each mode of the CPSU can be passed on to the Delegate and Chairman units.

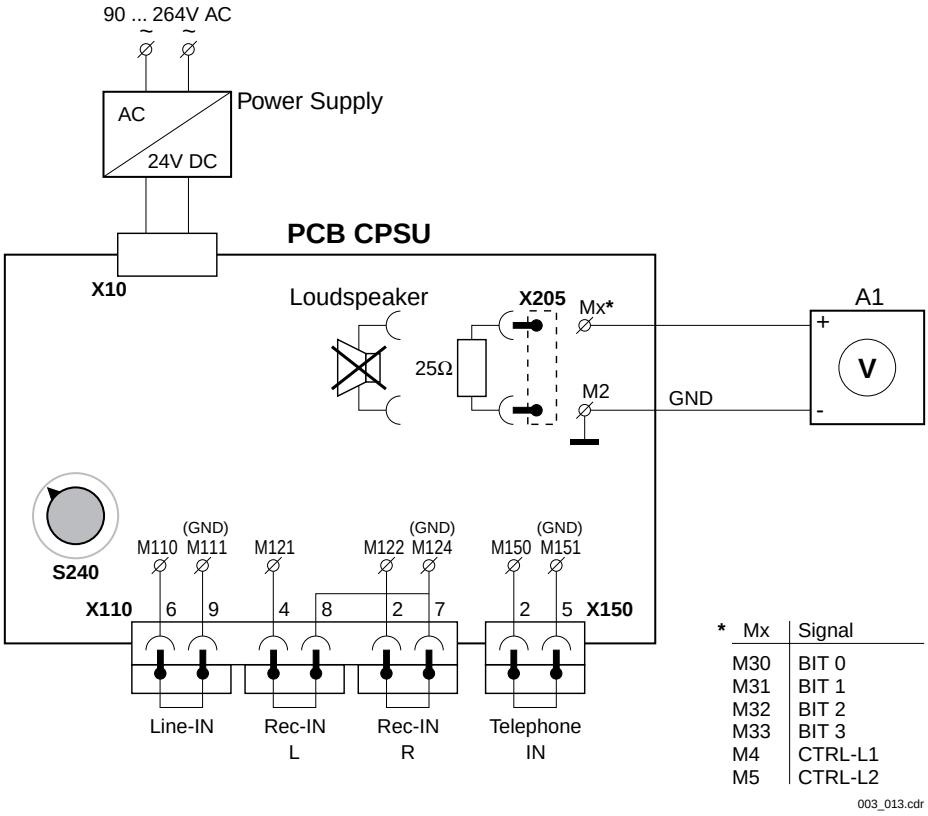


Figure 13

Set the "mode switch" (S240) is each position and measure the voltages at M30, M31, M32, M33, M4 and M5 related to M2 (GND).

Mode switch position (S240)	Measurement values for A1 (V)					
	M33 (bit 3)	M32 (bit 2)	M31 (bit 1)	M30 (bit 0)	M4 (Control-L1)	M5 (Control-L2)
Auto-1	0	10	0	0	2.5	2.9
Auto-2	0	10	0	10	2.5	2.9
Auto-3	0	10	10	0	2.5	2.9
Auto-4	0	10	10	10	2.5	2.9
Open-1	0	15	0	0	2.5	5.7
Open-2	0	15	0	10	2.5	5.7
Open-3	0	15	10	0	2.5	5.7
Open 4	0	15	10	10	2.5	5.7
Override	10	10	0	0	1.0	5.7
Chairman only	10	10	0	10	1.0	>14
Test	10	10	10	0	2.5	1.0

Tolerances: 10V ±500 mV
15V ±750mV

10.2.12 Functional test of the mode switch (S240)

Connect a current source of 0.5mA to the control-line CTRL-L1 via M4 Set the "mode switch" (S240) is each position and measure the voltages at M4 related to M2 (GND)

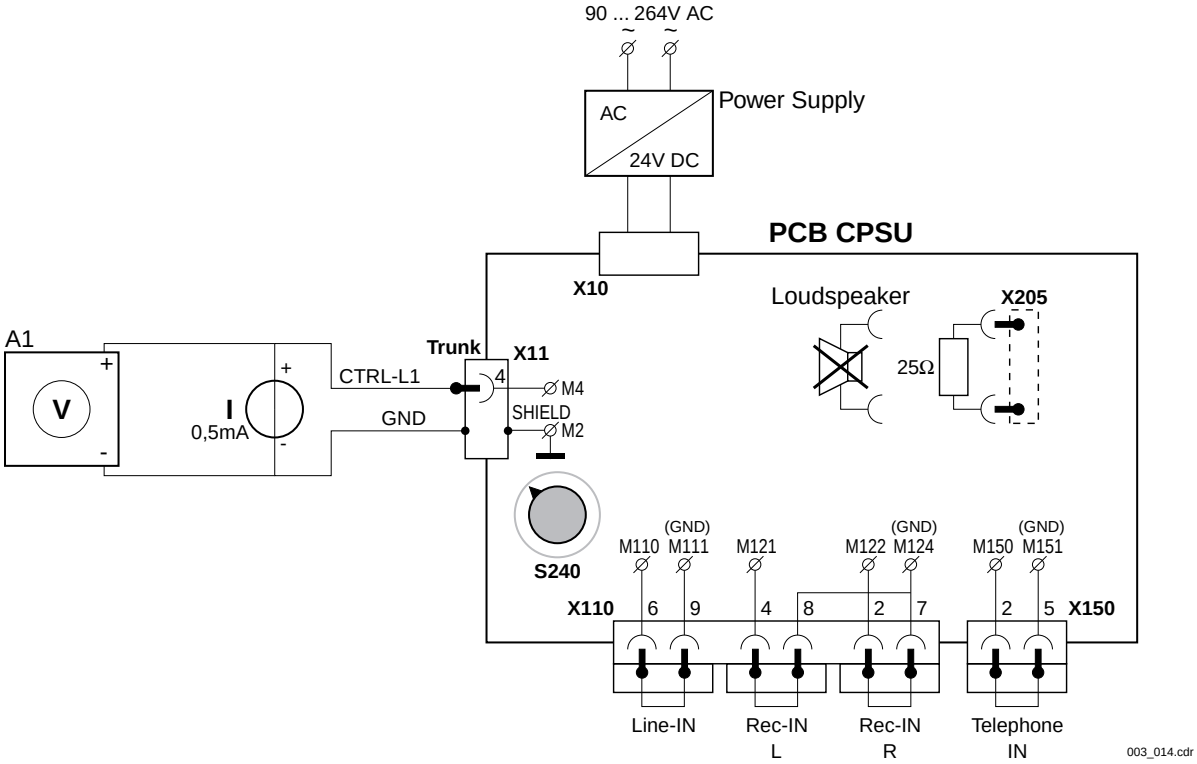


Figure 14

Mode switch position (S240)	Measurement values for A1 (V)
Auto-1	9.5
Auto-2	5.8
Auto-3	4.5
Auto-4	3.9
Open-1	9.5
Open-2	5.8
Open-3	4.5
Open-4	3.9

10.2.13 Functional test of system volume control (S260).

Measure the output level related to each position of the volume control (S260) for the loudspeakers of the Delegate and Chairman units.

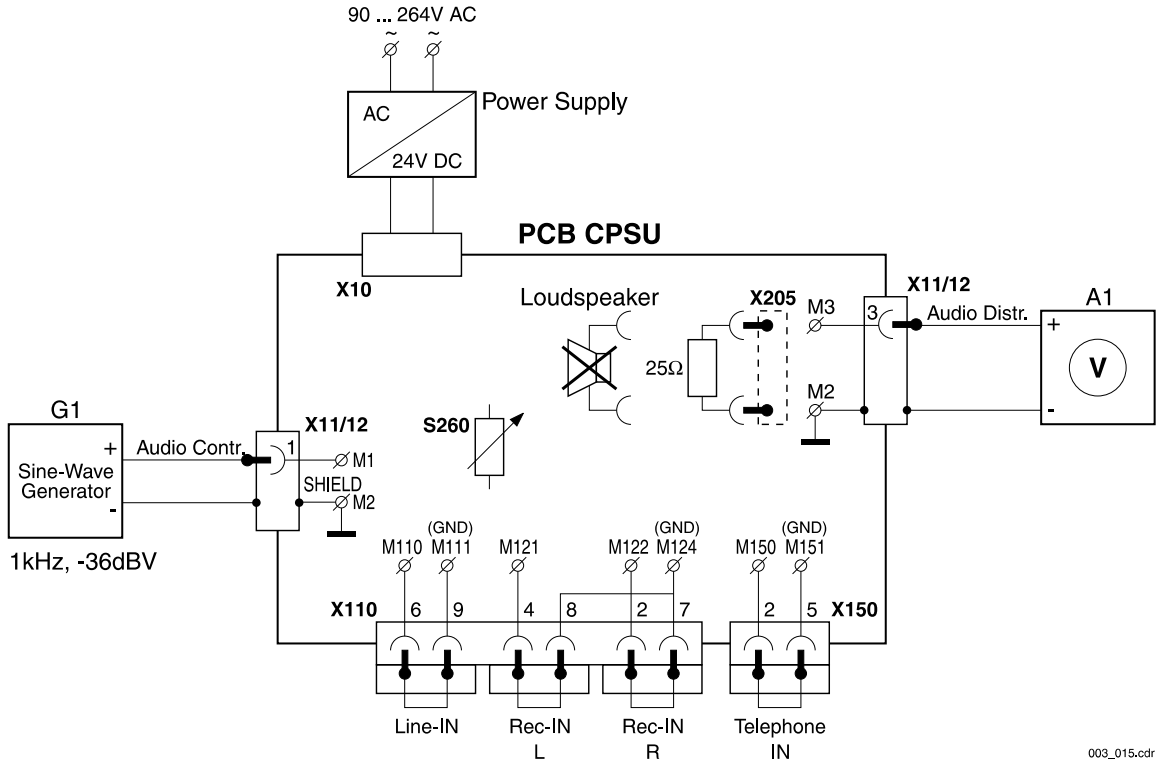


Figure 15

Input setting G1: M1 related to M2 (GND) is -36dBV (15.8mVrms) with a frequency of 1 kHz.

position of the loudspeaker volume control switch (S260)	measurement results for A1 Amplification at M3
position 10	-9.4dBV +/- 1dB
position 9	-11.4dBV +/- 1dB
position 8	-13.4dBV +/- 1dB
position 7	-15.4dBV +/- 1dB
position 6	-17.4dBV +/- 1dB
position 5	-19.4dBV +/- 1dB
position 4	-21.4dBV +/- 1dB
position 3	-23.4dBV +/- 1dB
position 2	-25.4dBV +/- 1dB
position 1	-27.4dBV +/- 1dB
position 0	< -70dBV (selective) or < -70 dBV (a-weighted)

Note: put the volume control switch (S260) to position 10 (maximum right position).

10.3 Measuring instructions for the Delegate and Chairman unit (LBB3330/00, LBB3331/00).

How to check if a Delegate or Chairman unit is correct is described in the next paragraphs. The items which are described are:

- supply current
- internal supply voltages
- unit presence
- unit type
- microphone switch and light-ring.
- internal signals for Delegate and Chairman units
- the priority switch

Before you start measuring:

- Connect a Delegate and/or a Chairman unit to the CPSU.
- Turn the volume control of all Delegate and Chairman units in the maximum clockwise position (volume maximum).
- Put the mode switch on the CPSU in the OPEN mode (1,2,3 or 4).
- Terminate the audio-output signal AUDIO-CONTR by connecting a 680 ohm resistor between M1 and M2 (or between pin 1 and 2 of X11) of the Delegate or Chairman unit.
- Disconnect the loudspeaker from the Delegate or Chairman unit and connect a resistor of 25 ohm between pin 1 and 2 of X5.

10.3.1 Supply current

Measure the supply current from V+ by means of a current meter in the power supply line. This should be between 12mA and 22mA

10.3.2 Internal Supply Voltages.

Measure the internal supplies on the Units itself of +15V via M15 and +5V via M12, both related to M2 (= internal 0V):

a) at M15 this should be: +15V +/- 750mV

b) at M12 this should be: + 5V +/- 250mV

Note: From Data book, the IC itself is specified as +/- 250mV

10.3.3 Unit presence

To detect the presence of a unit, measure the voltage via M101 related to M8 (= internal 0V).

> 4.5 V = unit present.

10.3.4 Unit type

To detect the presence of a Delegate or Chairman unit, measure the voltage via M100 related to M8.

< 0.5V = Chairman Unit

> 4.5V = Delegate Unit

10.3.5 Microphone switch and Light-ring

Press the microphone button on the Delegate/Chairman Unit. The Light-ring must lit now (M70 related to M8 (0V) should be between 7.0V and 9.0V)

10.3.6 Internal signals for Delegate and Chairman units.

Power reset

Decrease the power supply of the CPSU which is connected to X10 so that V+ related to M2 (GND) is successively +15V and 12.8V.

Measure the Power-reset voltage via M14 of the Delegate or Chairman Unit, related to M8 (0V).

V+	M14
+15V	< 1V
+12.8V	> 4V (Power-reset activated)

Increase the power supply V+ back to +19.5V

TEST mode

Set the Mode switch at the CPSU successively in the Test and Auto mode.

Measure the DC-voltage via M31 related to M8 (0V).

Mode switch	M31
Test mode	> 4.0V (TEST is activated)
Override mode	< 0.5V (TEST is inactive)

10.3.7 Internal signals only for Delegate Units

Override Mode (ORM)

Set the Mode switch of the CPSU successively in the Test and Override mode.

Measure the DC-voltage via M35 related to M2 (GND).

Mode switch	M35
Test mode	> 4.0V (ORM is activated)
Override mode	< 0.5V (ORM is inactive)

Set the Mode switch of the CPSU in the Override mode

Press the microphone button and measure the DC-voltage via M5 related to M2 (GND).

Detect the presence of a voltage pulse > 13.0V (after the pulse of 5.7V).

Maximum number (1,2,3 or 4) of Delegate units which can be activated at the same time (MAXNOM).

Connect at least two Delegate units to the CPSU.

- Set the Mode switch at the CPSU in the **Auto-1** mode.
- Measure the DC-voltage via M36 related to M2 (GND).
- Activate one Delegate unit by pressing the microphone button.
- Measure the DC-voltage again via M36 related to M2 (GND). MAXNOM should now be activated.
- Try to activate the second Delegate unit. This may not be possible.

Number of active Delegate Units	M36
none	> 4.0V (MAXNOM is inactive)
1 Delegate Unit	< 0.5V (ORM is activated)

AUTO mode

Set the Mode switch at the CPSU successively in the Test and Auto (1,2,3 and 4) mode.
Measure the DC-voltage via M32 related to M8 (0V).

Mode switch	M35
Test mode	< 0.5V (AUTO is inactive)
Auto (1,2,3 or 4) mode	> 4.0V (AUTO is activated)
Open (1,2,3 or 4) mode	< 0.5V (AUTO is inactive)

Chairman Only mode

Set the Mode switch at the CPSU successively in the Test and Chairman Only mode.
Measure the DC-voltage via M33 related to M8 (0V).

Mode switch	M35
Test mode	> 4.0V (ORM is activated)
Override mode	< 0.5V (ORM is inactive)

Delegate microphone temporary off when pressing the priority button at the Chairman unit(s) (TRMO)

- Connect a Delegate and a Chairman unit to the CPSU.
- Set the Microphone switch of the chairman unit (see Priority button) in position 0.
- Press the microphone button on the Delegate unit. The light ring illuminates.
- Press the priority button of the Chairman unit. The light ring goes out.
- Release the priority button. The microphone and light ring of the Delegate unit goes on again.
- Measure the DC-voltage for each step via M33 related to M8 (0V).

Microphone switch	Priority button	M33
position 0	on	> 4.0V (TRMO- is inactive)
position 0	off	< 0.5V (TRMO- is activated)

Delegate microphone permanently off when pressing the priority button at the Chairman unit(s) (RMO)

- Connect a Delegate and a Chairman unit to the CPSU.
- Set the Microphone switch of the chairman unit (see Priority button) in position 1.
- Press the microphone button on the Delegate unit. The light ring illuminates.
- Press the priority button of the Chairman unit. The light ring goes out.
- Release the priority button. The microphone and light ring of the Delegate unit stays off.
- Measure the DC-voltage for each step via M34 related to M8 (0V).

Microphone switch	Priority button	M34
position 1	on	< 0.5V (RMO is inactive)
position 1	off	> 4.0V (RMO is activated)

10.3.8 Priority switch (only for Chairman units)

- Connect a Chairman unit to the CPSU.
- Press the Priority button at the Chairman Unit.
- The Light-ring must illuminate now.
- A chime tone will now be emitted depending on the position of the chime switch. This switch is accessible by removing the cable relief bracket (0=no chime at priority, 1=chime at priority).
- Set the microphone switch (located near the chime switch) successively in position 0 and 1.
- Keep the Priority button pressed and measure the DC-voltage via M5, related to M2 (GND).

Mode switch	Microphone switch	M5
n.a.	0 = permanent OFF	> 13.35V (RMO activated)
n.a.	1 = temporary OFF	between 8.7V and 10.11V (TRMO- is activated)

10.4 Measuring spots with signal description

Measuring spots	Signal
M1	AUDIO-CONTR
M2	system GND
M3	AUDIO-DISTR
M4	CTRL-L1
M5	CTRL-L2
M6	V+
M7	V-
M8	internal 0V
M12	+5V
M14	POWER-RESET
M15	+15V
M31	TEST
M32	AUTO
M33	TRMO-
M34	RMO
M35	ORM
M36	MAXNOM-
M37	RMO/TRMO
M41	MIC-KEY
M42	chime disable/enable
M43	PRIORITY-KEY
M57	X5 (LSP)
M59	X5 (LSP)
M68	HEADPH
M70	MIC-LED
M72	MIC-IN
M75	mic-amplifier out
M82	CHIME
M96	auto shut-off time
M100	UNITTYPE
M101	PRESENCE

Remarks: M37, M42, M43 and M82 are only applicable in the Chairman Unit.
M32, M33, M34, M35 and M36 are only applicable in the Delegate Unit.

11. Spare parts

11.1 General

Service policy *Repair of that CCS 800 units is based on replacement of complete assemblies. Only a selection of components are available as spare parts.*

Complaints *The Philips Service organizations are requested to report defective modules and quality matters according the CSS complaint procedure to the Supply Centre.*

11.1.1 Ordering spare parts/ Service publications

Spare parts and/ or Service publications can be ordered with there unique Service code number through the local Philips representative.

Contact the local Philips representative in case of questions/ remarks about e.g. availability, ordering/ supply procedures, prices, complaints, replacements, e.t.c.

11.2 Spare parts list

The parts printed in small italic letters are no spare parts. These are for identification purposes.

POS. NR	DESCRIPTION	SERVICE CODE
	LBB 3310/00 CPSU	
	Unit spare parts	
1	UPPER HOUSING PART (PLASTIC)	5322 441 12204
2	*LOWER HOUSING PART (METAL)*	
3	KNOB CONTROL GREY	5322 410 11877
4	KNOB ON/OFF GREEN	5322 410 11878
5	*STRIP METAL FOR POWER SWITCH*	
6	POWER SWITCH + CABEL ASSY	5322 276 13983
8	*SCHREW PT 3X8 TORX*	
9	3IN LOUDSPEAKER PF302	5322 240 30708
10	LOUDSPEAKER SPRING	5322 492 11411
11	*WASHER ST ZN 3,2X9*	
12	APPLIANCE INLET 2P+E 10A	5322 265 11323
13	POWER SUPPLY UNIT 24V NEDAP 9553673	5322 218 11902
14	*COMBI SCHREW ST ZN M3X8*	
15	*INDICATION LABEL*	
16	LOCKING CARD SPACER KGLS-5RT	5322 532 13025
17	O-RING	5322 532 12783
18	CPSU PCB COMPLETE FOR SERVICE	5322 214 12777
19	*CABEL ASSY*	

20	FLAT CABEL ASSY 2X10P 240MM	5322 320 12373
21	*SN 0,14MM2 PVC RD*	
22	*SN 0,14MM2 PVC ZW*	
23	FOOT BOTTOM FF-003-P3X5,5 RICHCO	5322 462 11084
24	*TOOTED RING ST ZN 3,2*	
25	*TYPE PLATE*	
27	*CABEL ASSY (CCU-PSU)*	
29	MAINS CORD 2MTR, EUR VERSION	5322 321 11422
29	MAINS CORD 2MTR, USA VERSION	5322 321 11423

Printed board spare parts

D249	LED HLMP-3507 GREEN	5322 130 11298
R125	POTM 47K LIN 10%	5322 101 11901
R140	POTM 1K LIN 10%	5322 101 11902
R254	POTM.10KA RK09L1140 F2842005M	5322 101 11763
S160	SLIDE SWITCH 2-POS.	5322 277 21434
S240	RTA ROTARY SWITCH BINARY	5322 273 10352
S260	RTA ROTARY SWITCH 11-POS	5322 273 10353
T5	OUTPUT TRANSFORMER 0,1W	5322 146 11015
X10	*PIN CONN 3P 09-65-2038 MOLEX*	
X11	AUDIO CON BUS 7-P ZW	5322 267 50547
X12	AUDIO CON BUS 7-P ZW	5322 267 50547
X110	6 PIN JACK ASSEMBLY YCK21-3877	5322 265 11324
X130	XLR SOCKET 3P NC3FAHR-2	5322 265 11325
X150	4 PIN JACK ASSEMBLY YCK21-3084	5322 265 11326
X160	*M.M.CONN.2X10P 2-215079-0 AMP*	
X206	HEADPHONE JACK	5322 265 11327
X260	*M.M.CONN.2X10P 2-215079-0 AMP*	

LBB 3330/x0 Delegate unit
LBB 3331/x0 Chairman unit
Unit spare parts

1	DELEGATE PCB ASSY CCS800 FOR SERVICE	5322 214 12778
1	CHAIRMAN PCB ASSY CCS800 FOR SERVICE	5322 214 12779
5	THUMBWHEEL	5322 410 11108
6	RING FOR THUMBWHEEL	5322 532 12783
7	HOUSING COVER DELEGATE CCS800 INCL. MIC. KNOB	5322 442 01417
7	HOUSING COVER CHAIRMAN CCS800 INCL. MIC. & PRIOR. KNOB	5322 442 01418
14	*PT PAN SCHREW 3X8 ST ZN TORX BLK*	

15	LOUDSPEAKER PF302	5322 240 30708
16	LOUDSPEAKER SPRING	5322 492 11411
17	LOUDSPEAKER CABLE ASSY	5322 320 11887
18- 21	MICR. STEM CCS800 COMPLETE FOR SERVICE	5322 242 10918
18- 21	LONG MICR. STEM CCS800 COMPLETE FOR SERVICE	5322 242 10919
18	*MICROPHONE HAED ASSY CCS800*	
19	*ADAPTION PIECE*	
20	*MICR. STEM TUBE & FLEX ASSY*	
22	MICR. EARTH RING	5322 532 13026
23	HEX. NUT M18X0,75	5322 505 11265
24	DISH RETAINING RING 19-ST	5322 532 13027
25	*GLUE LOCTITE 403*	
27	*BOTTOM HOUSING ALU*	
28	*COMBI SCREW ST ZN M3X8*	
29	CLAMPING BRACKET	5322 401 11692
30	*SCREW SS ST M3X6 (TORX)*	
31	BUMPON (FOOT) SJ5303 3M	5322 462 41686
32	*IDENTIFICATION LABEL*	
33	JACK SEAL	5322 532 12784
34	*DUST PLATE*	
35	*WASHER ST ZN 3,2X9*	
37	DAMPING FOAM DISC FOR LOUDSPEAKER	5322 466 11983
38	TRUNK CABEL ASSY MALE 7P CCS800	5322 320 12374
39	*EARTH WIRE ASSY*	

Printed boards spare parts

R54	POTM.10KA RK09L1140	5322 101 11763
R72	PRESET POTM.EMP 10 10K	5322 101 10714
S1	TACK SWITCH SKEVAD	5322 276 13533
S2	TACK SWITCH SKEVAD	5322 276 13533
S37	SLIDE SWITCH 2-POS.	5322 277 11793
S42	SLIDE SWITCH 2-POS.	5322 277 11793
T5	OUTPUT TRANSFORMER 0,1W	5322 146 11015
X1	*WIRE TO BOARD CONN 8P*	
X11	AUDIO CON BUS 7-P MAB7SH-L	5322 267 50547
X2	*CT. CONN. 5POL 173979-5 AMP*	
X5	*CT. CONN. 2POL 173979-2 AMP*	
X6	HEADPHONE JACK	5322 267 31808
X7	HEADPHONE JACK	5322 267 31808
X99	*SOLDEERLIP AMP 735427-2*	

12. Illustrations

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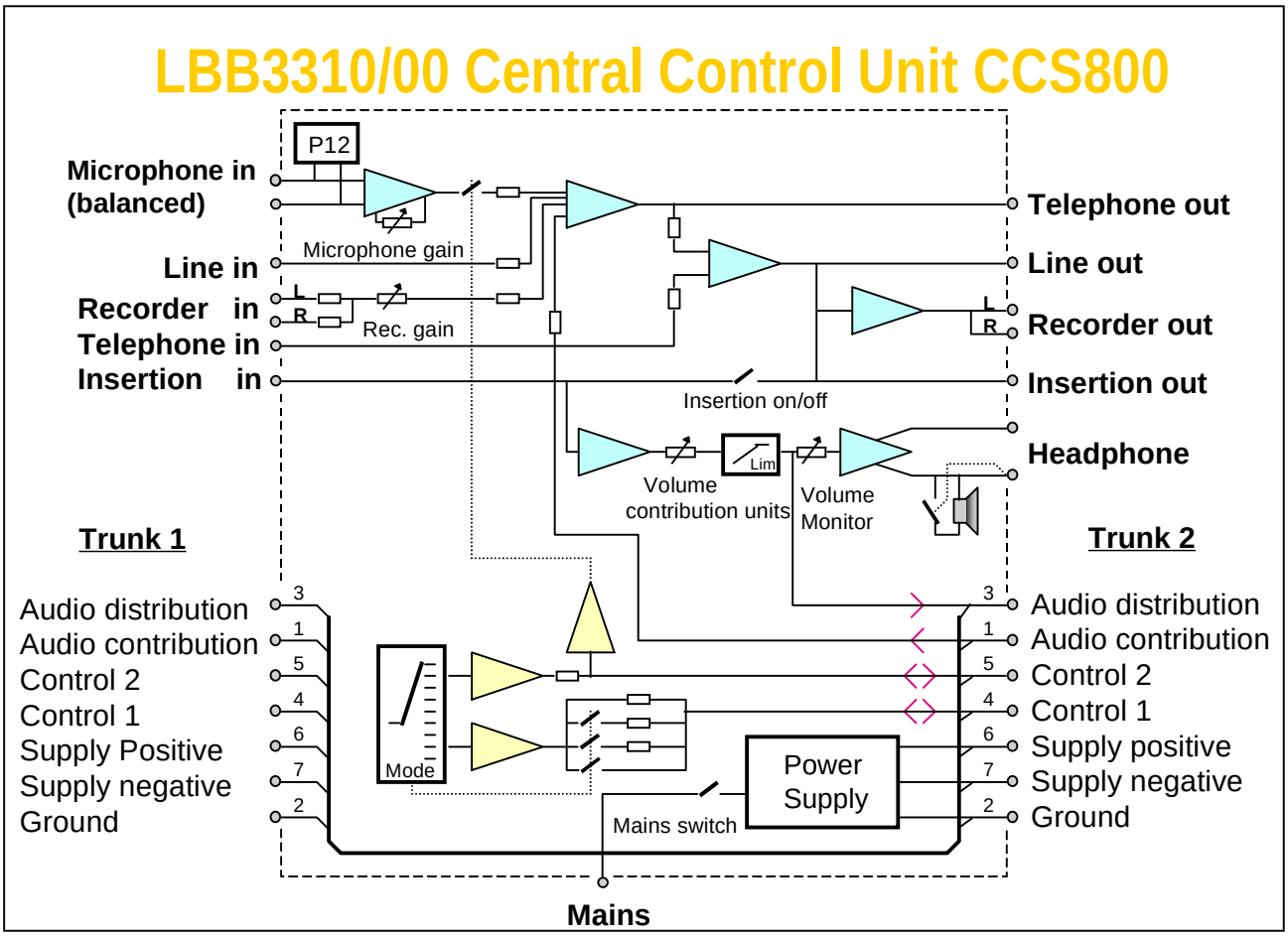
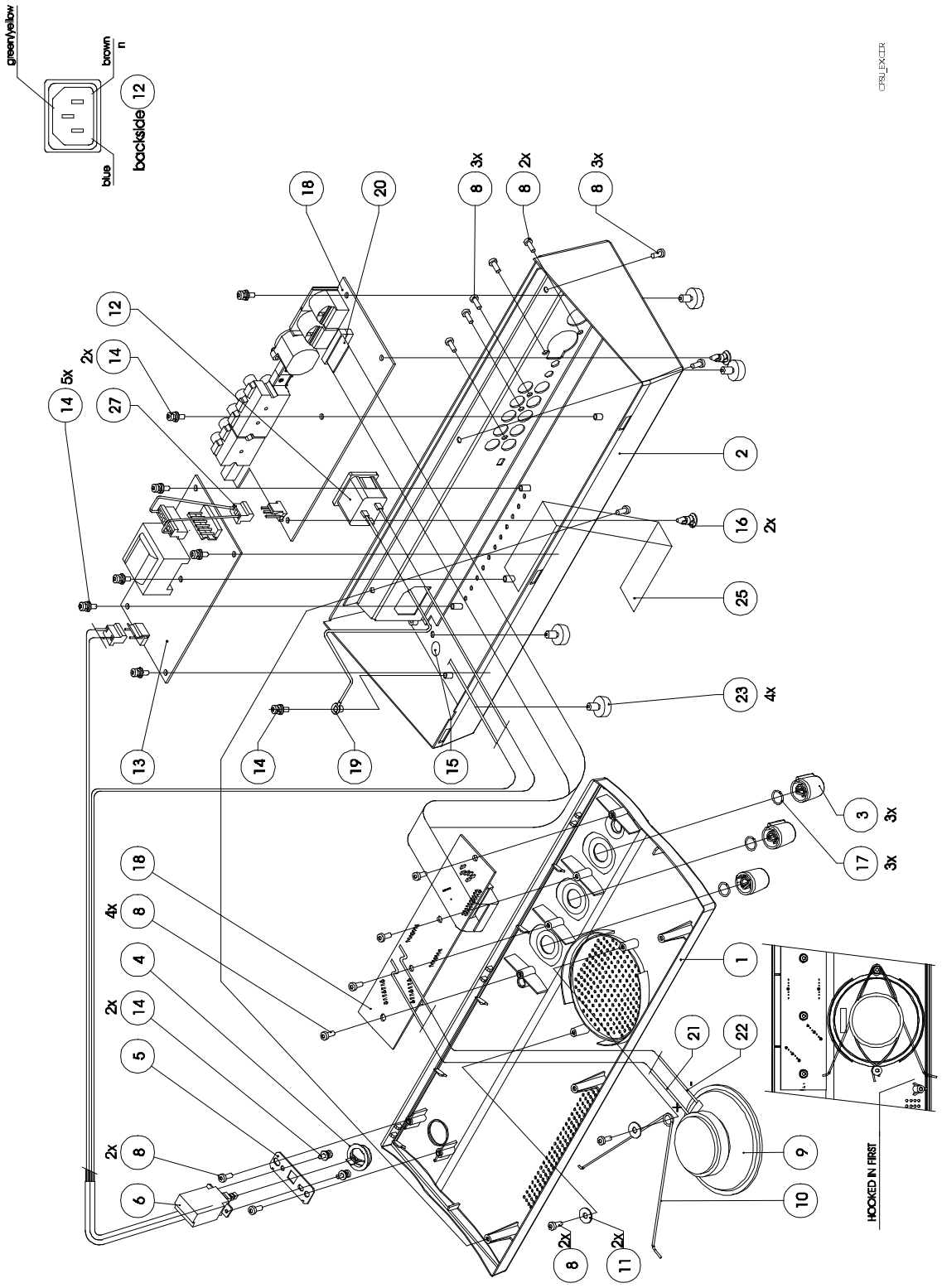
12.11 Circuit diagram delegate unit
12.12 Circuit diagram chairman unit
12.13 Measuring points delegate/chairman unit
12.14 Circuit diagram Light-ring

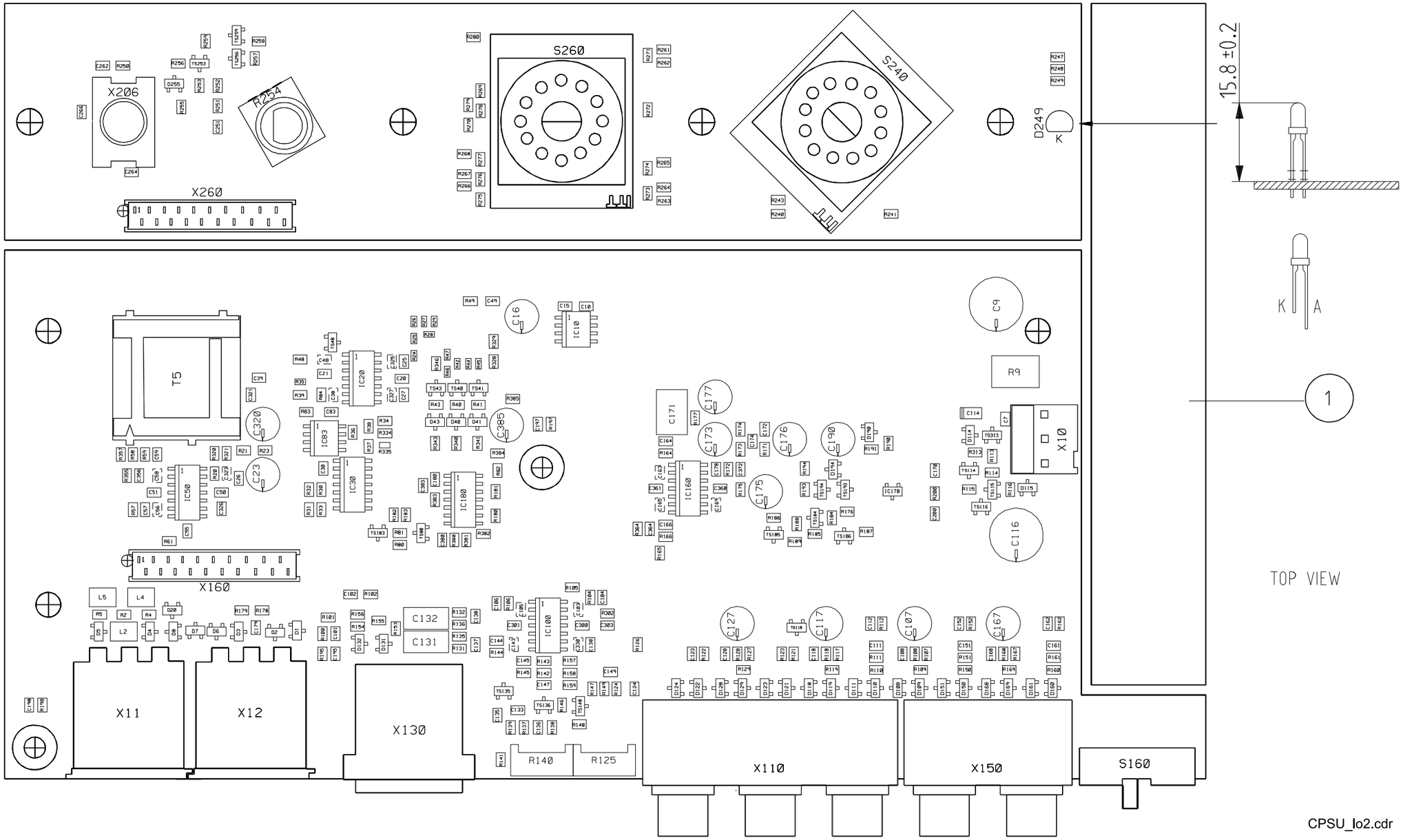
12.1 Block diagram CPSU



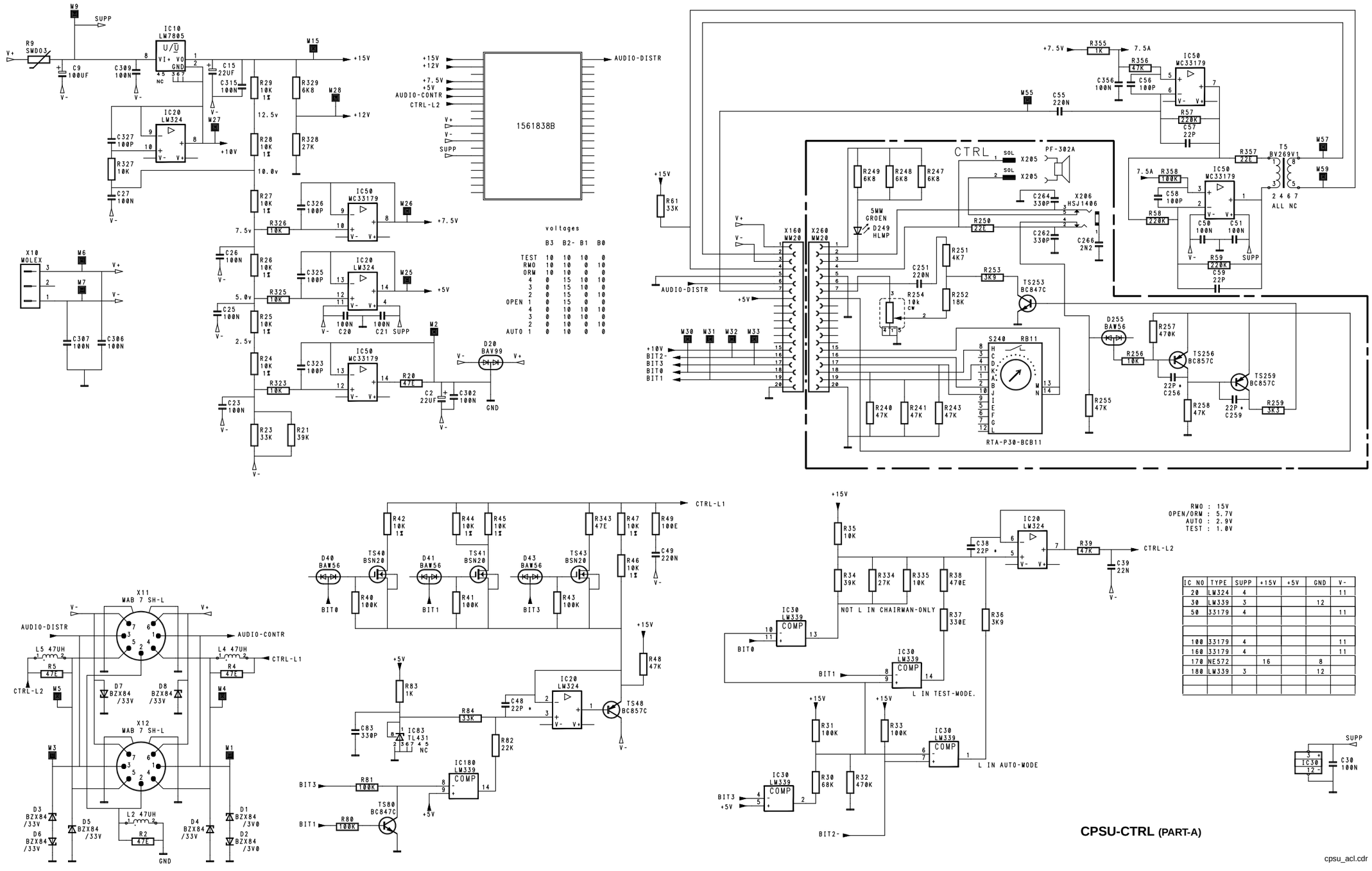
12.2 Exploded view CPSU



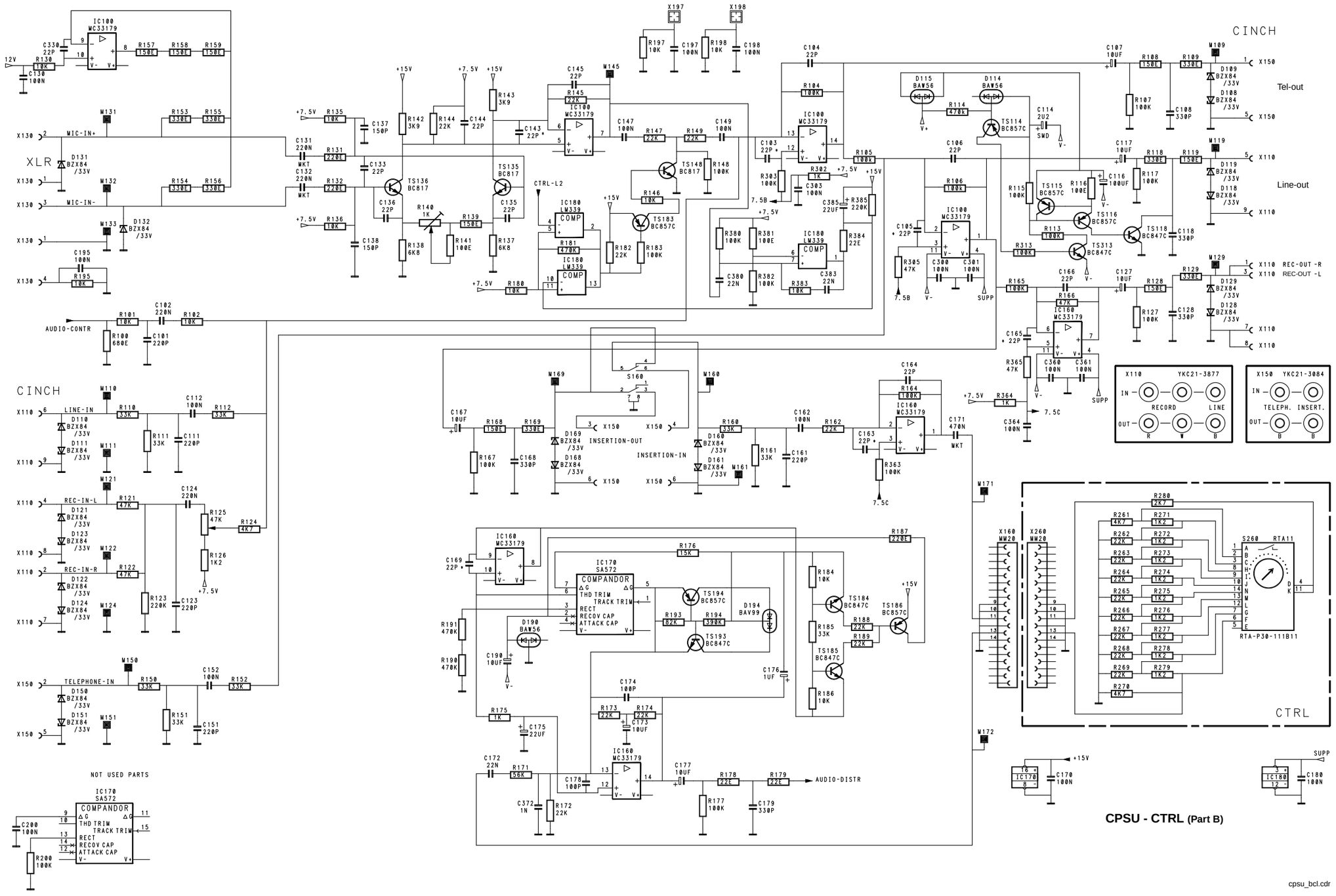
12.3 Lay-out CPSU



12.4 Circuit diagram CPSU



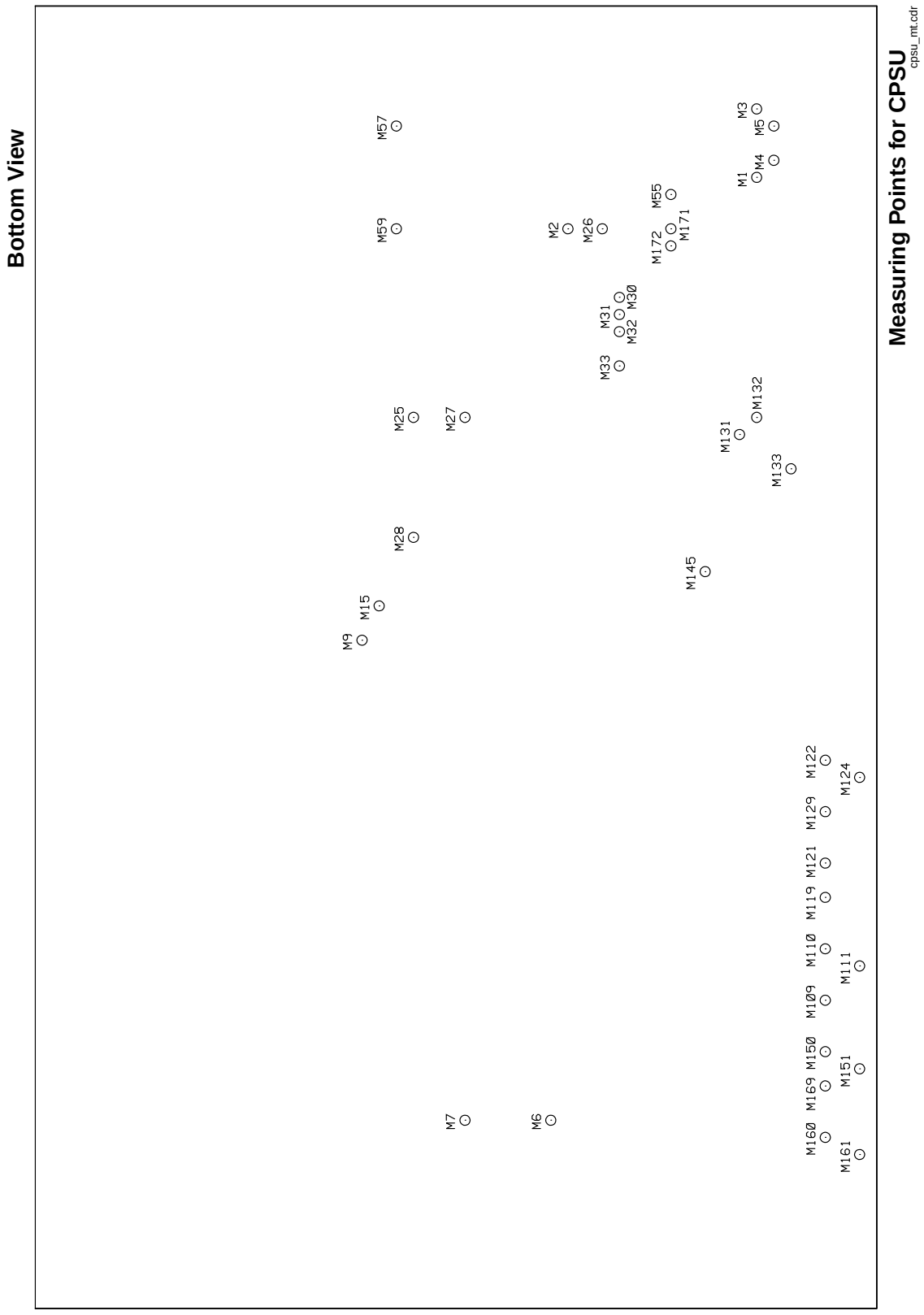
IC NO	TYPE	SUPP	+15V	+5V	GND	V-
20	LM324	4				11
30	LM339	3			12	
50	33179	4				11
100	33179	4				11
160	33179	4				11
170	NE572		16		8	
180	LM339	3			12	



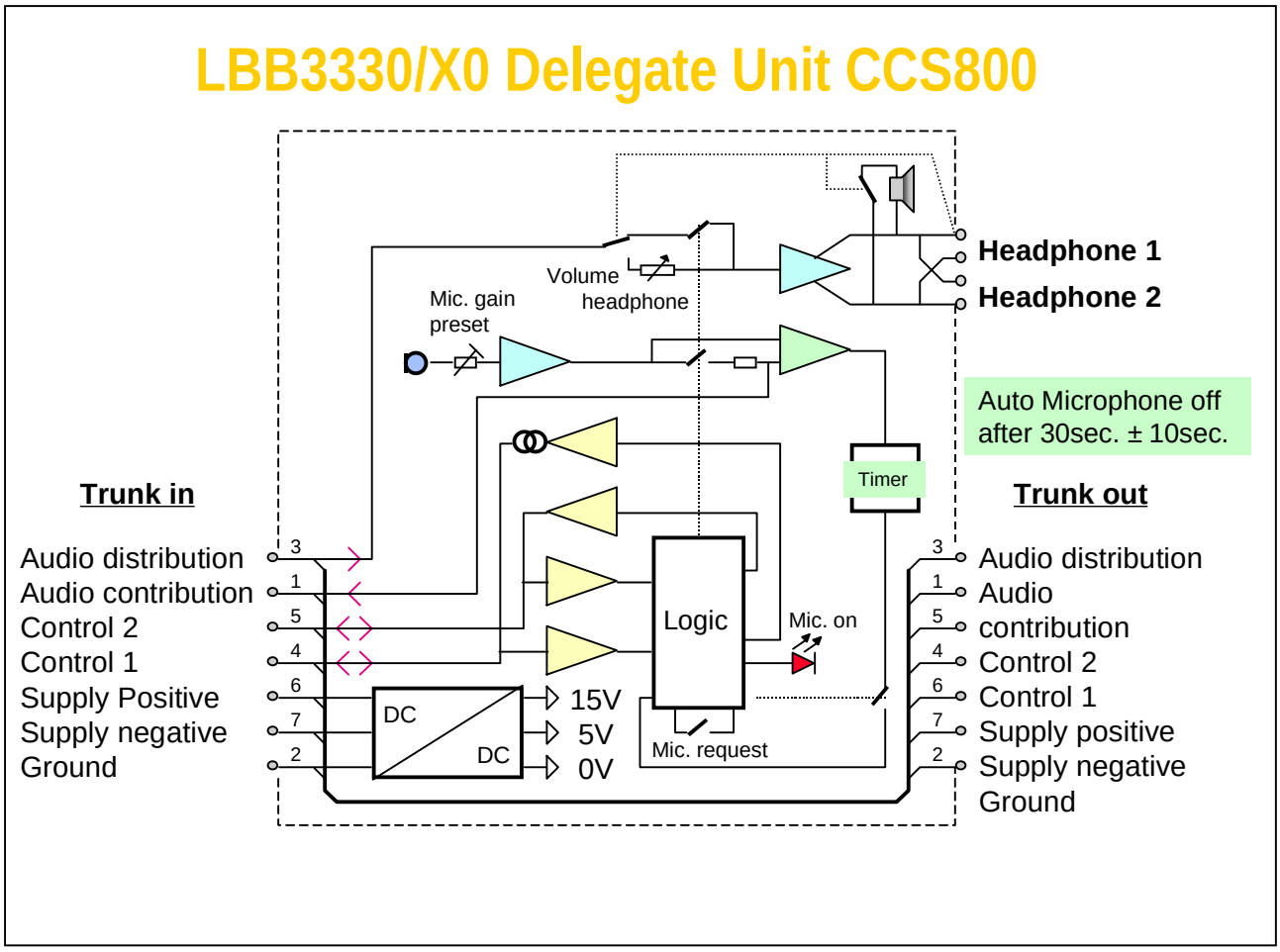
CPSU - CTRL (Part B)

cpsu_bcl.cdr

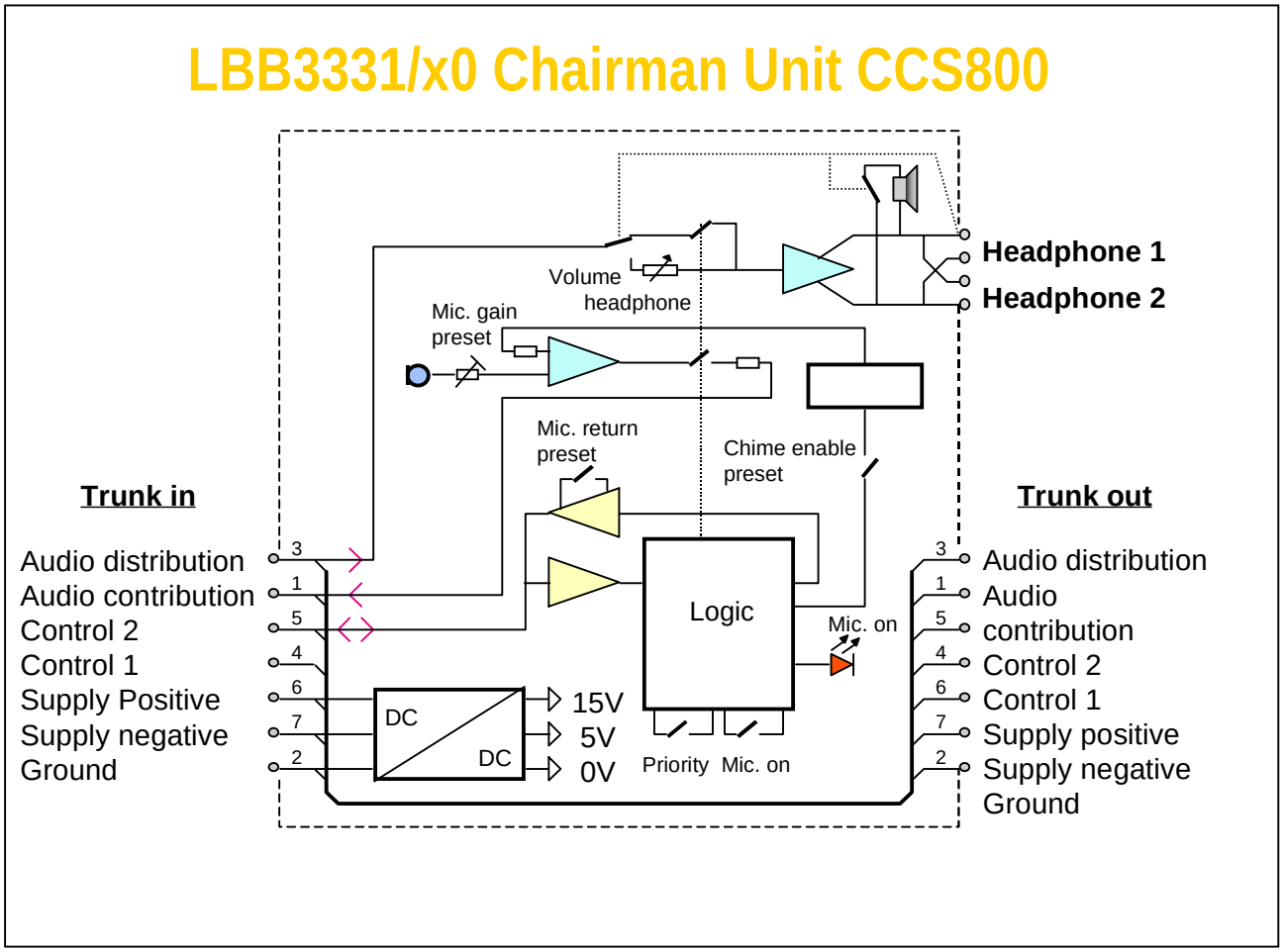
12.5 Measuring points CPSU



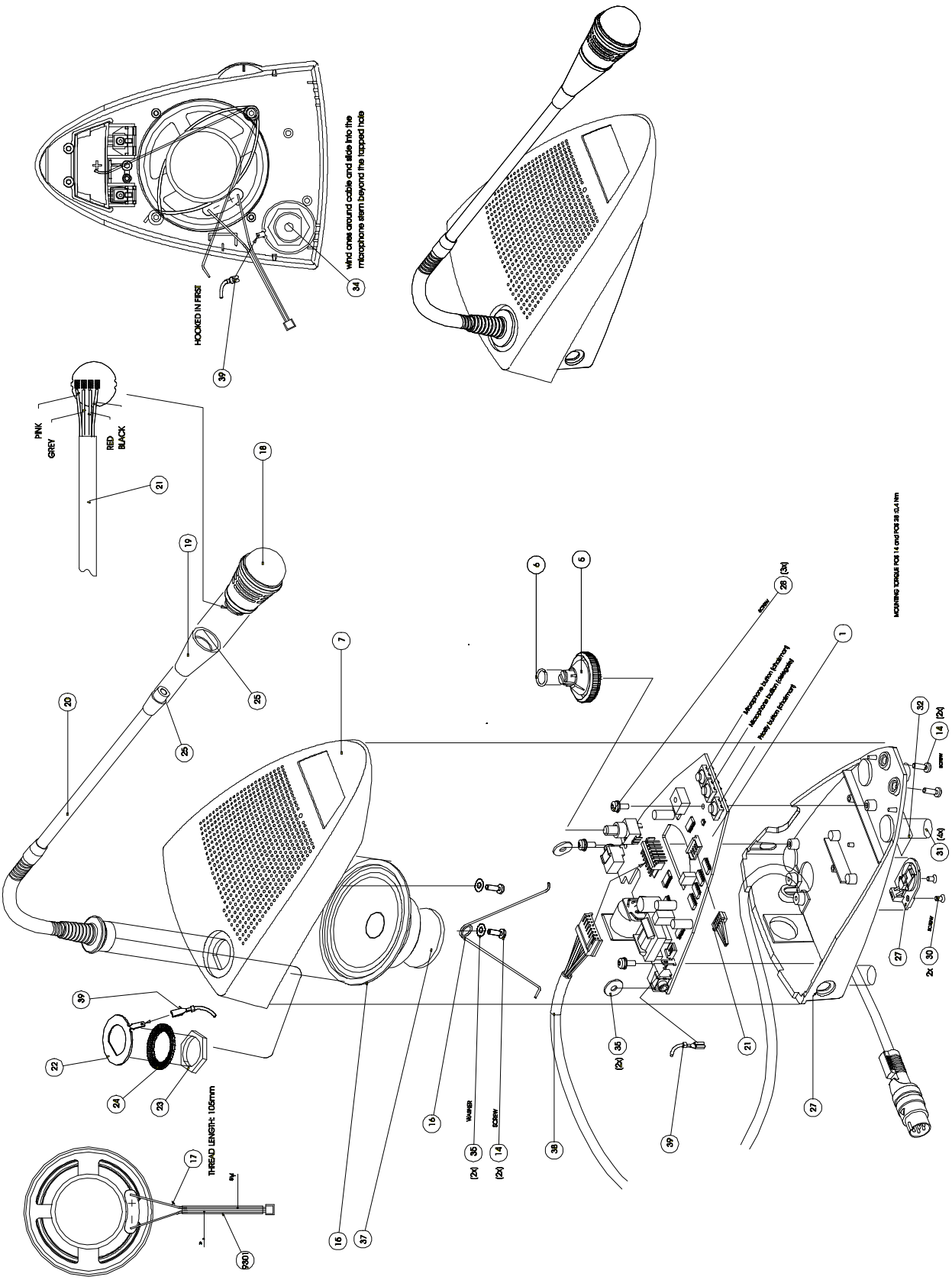
12.6 Block diagram delegate unit



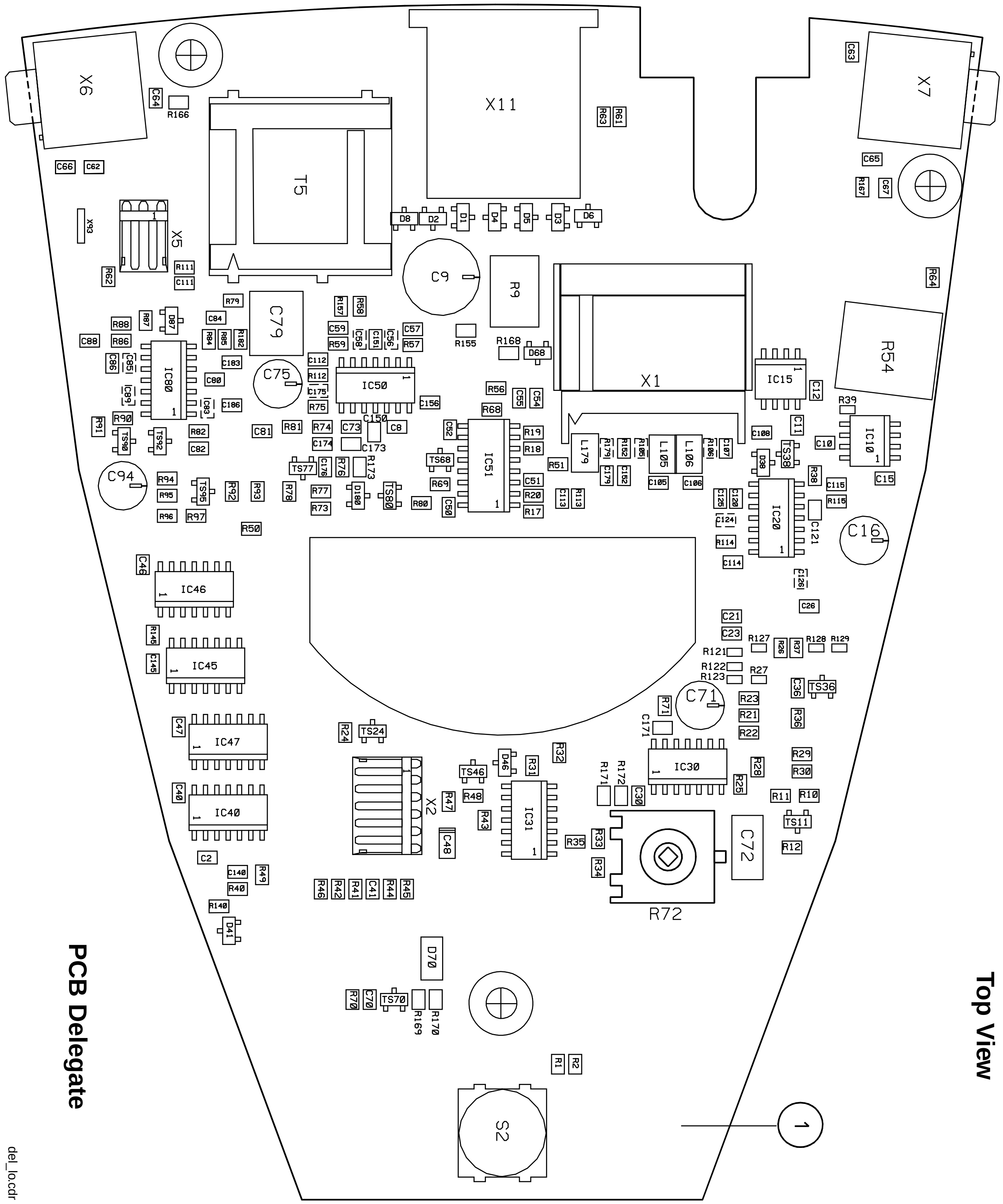
12.7 Block diagram chairman unit



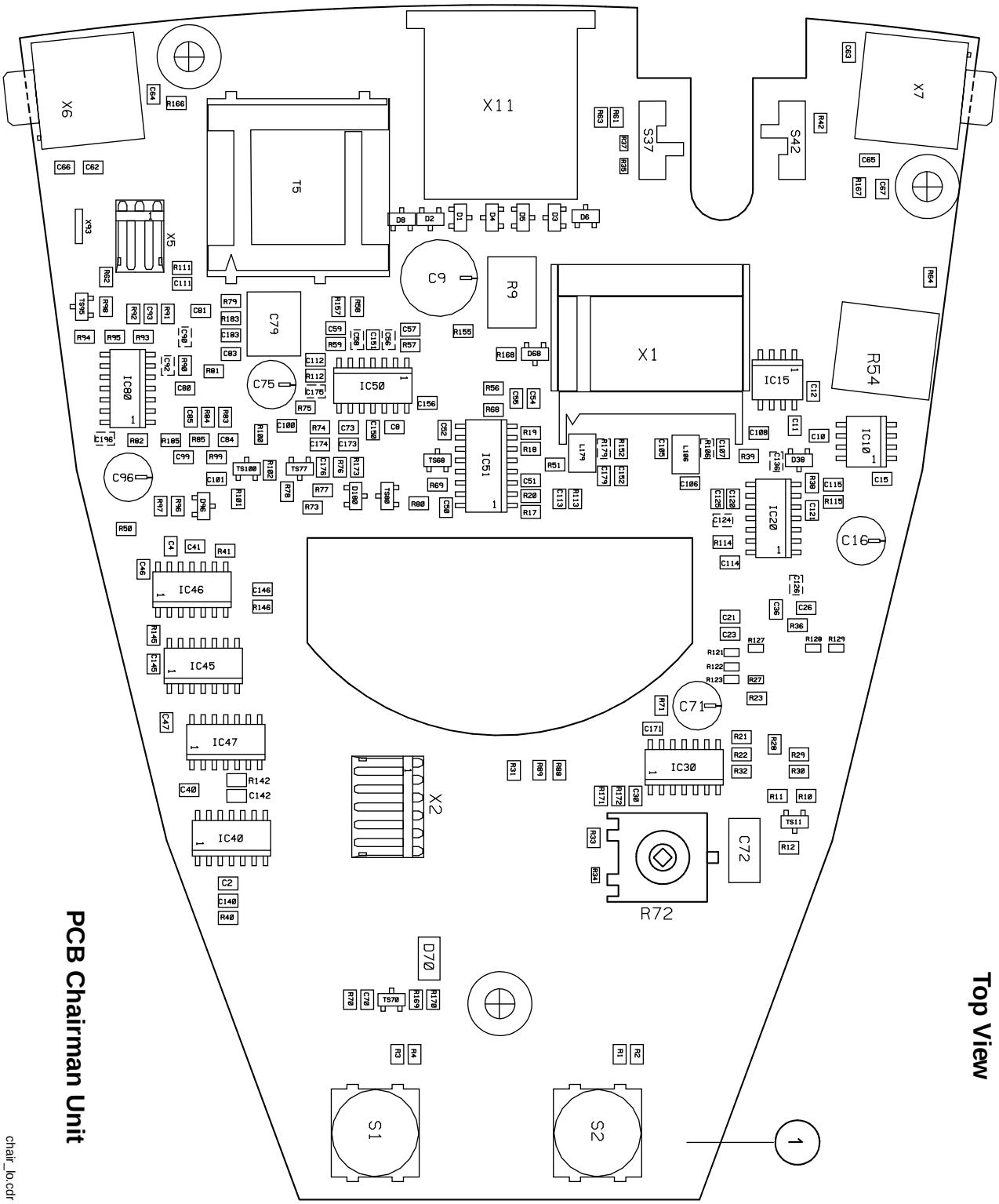
12.8 Exploded view delegate/ chairman unit



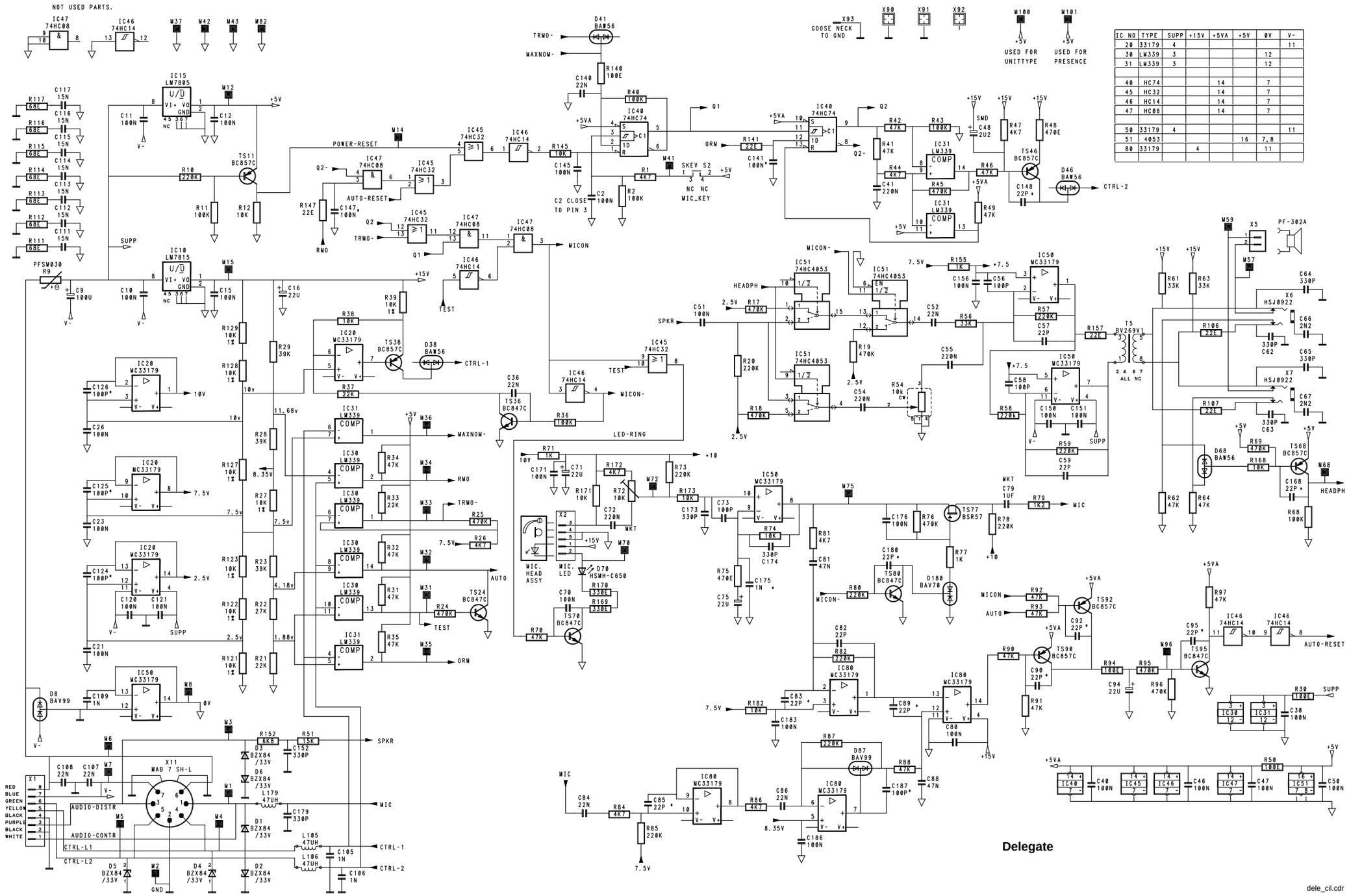
12.9 Lay-out delegate unit



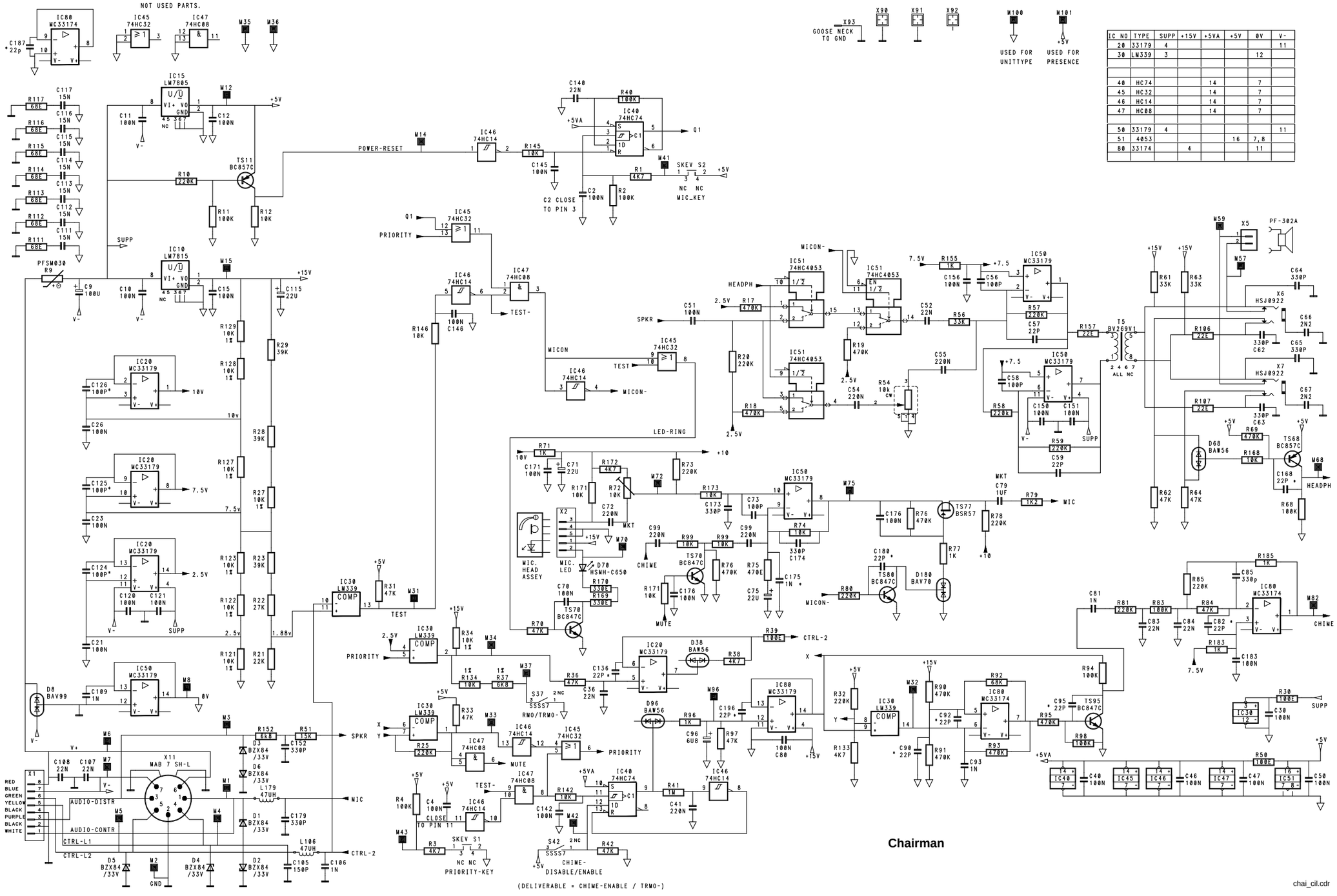
12.10 Lay-out chairman unit



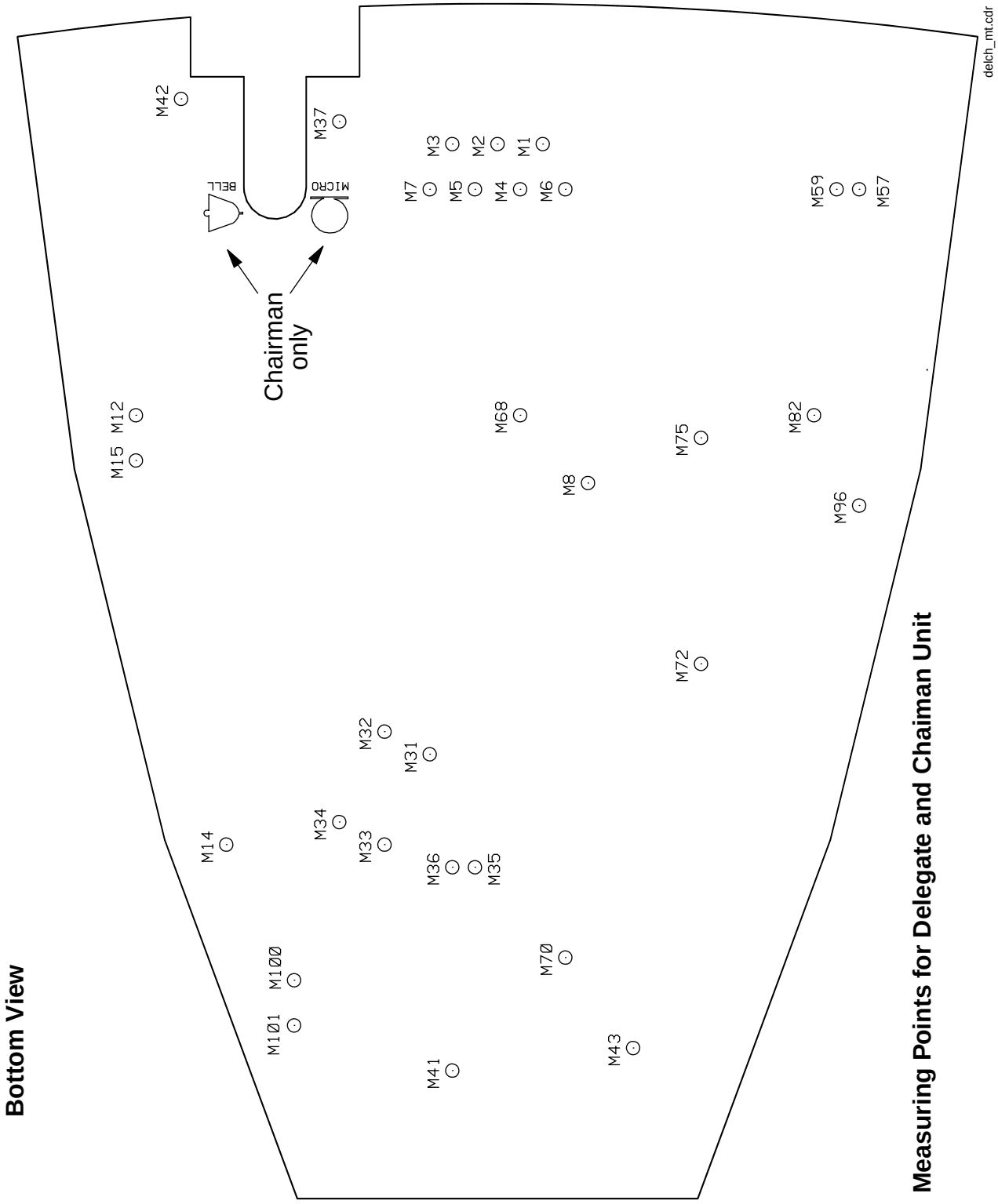
12.11 Circuit diagram delegate unit



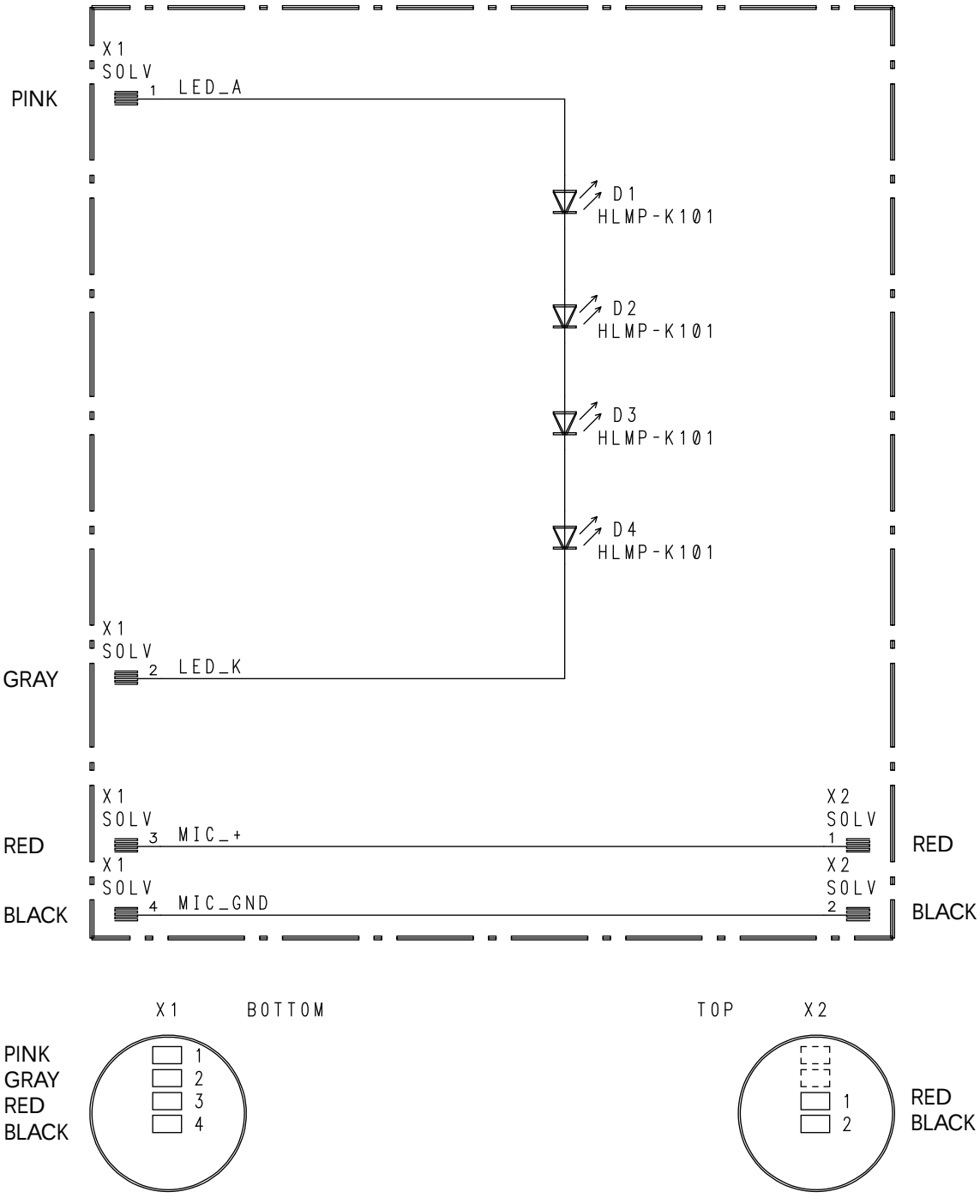
12.12 Circuit diagram chairman unit



12.13 Measuring points delegate and chairman unit



12.14 Circuit diagram Light-ring



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