

CCS800



Security Systems

en | Service manual
Discussion system

BOSCH

Important Safeguards



Note

Read the 'Important Safety Instruction' manual 9922 141 7014x (instructions enclosed with the LBB 3310 delivery)

- Proper service and repair is important for safe and reliable operation of all Bosch Security Systems equipment.
- Some service operations require the use of tools specially designed for the purpose. These special tools should be used when recommended.
- To minimize risk of personal injury and damage to the product only trained service personnel with awareness of hazards of electronically equipment must be allowed to service this product.
- Under no circumstances should the original design be modified or altered without written permission from Bosch Security Systems. Bosch assumes no liability arising out of any unauthorized modification of design.



Warning

Use of substitute replacement parts, which do not have the same specified characteristics, may create shock, fire or other hazards. To maintain the Bosch quality the use of recommended Bosch Security Systems spare parts are suggested.



Note

An ESD protection method should be applied before proceed any Mechanical/ Electrical Instructions.



Note

This material shall be scrapped according to local environment laws & procedures.

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1 General information

1.1 Document history

Rev. edition	Changes
00-0350	First edition
01-0501	Adding note p44 and correction of some service parts service code numbers p47

1.2 About this manual

This manual is intended for service engineers involved in maintenance and repair of **Bosch ‘CCS 800 Ultro’** and Philips ‘CCS800 Discussion’ system.

This manual is a revised edition of the CCS800 service manual 4822 861 11006.

This manual supplies information about the maintenance and repair of the LBB 3310/xx, , LBB3330/xx, and LBB 3331/xx 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.

1.3 Related documentation

- **‘Installation and Operating manual’ CCS 800 Ultro.** Document Nr.: 3922 988 5428x
In this manual you find all technical-, installation and configuration data. Use this manual together with the service manual.
- **Product Survey Congress Yearbook.** Document Nr.: 3922 880 21012
In this document are only the first line spare parts listed.

1.4 Alerts

In this manual, four types of alerts are used. The alert type is closely related to the effect that may be caused when it is not observed. The alerts – from least severe effect to most severe – effect are:

- **Note**
Alert containing additional information. Usually. Not observing a note alert does not result in damage to the equipment or personal injuries.
- **Caution**
The equipment can be damaged if the alert is not being observed.
- **Warning**
Person can be (severely) injured or the equipment can be seriously damaged if the alert is not being observed.
- **Danger**
Not observing the alert can result in death.

1.5 Policy & Procedures

1.5.1 Repair Policy

For defective CCS800 products the general repair procedure is valid. Apply RMA request form (see example chapter 1.5) to MDB/ Selectron. RMA forms available via BOSCH Security Systems ‘Extranet’ for authorized service organizations. Service partners are requested to contact the Service department Congress in case of questions and any help. For authorized service organizations are spare parts to obtain via order desk ‘Spares Logistics Breda’ (SLB).

1.5.2 Warrantee conditions

In-Warranty period is thirty-six (36) months from the date of acceptance or start of use but in no event more than forty-two (42) months as from the production date (see product type plate) of dispatch from BOSCH Security Systems. “Dead on Arrival” (DOA) products: For these products MDB/ Selectron will offer a replacement of a brand new product. MDB/ Selectron or BOSCH Security Systems Breda is free to credit you in case of any damage to the product, which is not reported by the NSO / BOSCH Security Systems Authorized service partner. Epidemic failures: In case of a confirmed epidemic failure (and only BOSCH Security Systems Breda can judge if a fault is epidemic) the NSO / BOSCH Security Systems authorized service partner will be informed via separate letter, fax or other

mail showing reasons, time schedule and procedures to follow. Costs involved for corrective material to solve the epidemic failure are for the account of BOSCH Security Systems. Other related costs for the corrective action have to be agreed upon by the NSO / service partner and BOSCH Security Systems service Breda. It is not allowed to start local corrective actions without consulting BOSCH Security Systems service Breda.

1.5.3 Service period

The service period for the products will be 5 years after the year the product status has been changed to 'Sales only'. For a non-repairable type number (exchange on type number level in case of defects) the support strategy for the remaining service period will be reconsidered at the moment the regular production will be ceased and the product is deleted from the catalogue. When the replacement on type number level is continued in case of defects, the delivery of a type number with the same fit and function will be guaranteed during the above mentioned service period. But not necessarily the same type number.

1.5.4 Type number survey

Family	Type number	12 NC	Short description	Repair policy
CCS800	LBB3310/00	8900 331 00001	Control unit and power supply unit	Central repair
CCS800	LBB3310/00D	8900 331 00021	Control unit and power supply unit UL	Central repair
CCS800	LBB3310/00	8900 331 00005	Control unit and power supply unit (Bosch)	Central repair
CCS800	LBB3310/10	8900 331 01001	Control unit and power supply unit with AFS (Bosch)	Central repair
CCS800	LBB3311/00	8900 331 10005	19" mounting brackets (Bosch)	No repair
CCS800	LBB3312/00	8900 331 20005	Suitcase for 10 discussion units (Bosch)	No repair
CCS800	LBB3312/10	8900 331 21005	Transport suitcase (Bosch)	No repair
CCS800	LBB3316/00	8900 331 60005	Installation Cable Kit 100m (Bosch)	No repair
CCS800	LBB3316/05	8900 331 60505	Extension Cable Assembly 5m (Bosch)	No repair
CCS800	LBB3316/10	8900 331 61005	Extension Cable Assembly 10m (Bosch)	No repair
CCS800	LBB3330/00	8900 333 00001	Delegate unit	Central repair
CCS800	LBB3330/00	8900 333 00005	Delegate unit (Bosch)	Central repair
CCS800	LBB3330/50	8900 333 05001	Delegate unit with long microphone	Central repair
CCS800	LBB3330/50	8900 333 05005	Delegate unit with long microphone (Bosch)	Central repair
CCS800	LBB3331/00	8900 333 10001	Chairman unit	Central repair
CCS800	LBB3331/00	8900 333 10005	Chairman unit (Bosch)	Central repair
CCS800	LBB3331/50	8900 333 15001	Chairman unit with long microphone	Central repair
CCS800	LBB3331/50	8900 333 15005	Chairman unit with long microphone (Bosch)	Central repair

1.6 Example RMA request form

RMA (RETURN MATERIAL AUTHORISATION)-REQUEST BOSCH, CONGRESS, PRODUCTS

Service description:

For the repairs of Congress: CCS400, CCS800, DCN, Infra-red, IVS products / printed circuit boards " a central repair channel" is set-up. All previous mentioned products are handled as **OOW** (Out Of Warranty) repairs except **DOA's** (Dead On Arrivals).

For **IW** (In Warranty) claims you have to make use of your agreement with your local Bosch organization.

An overview for Congress repair items is available on the Bosch Extranet website (user ID required).

The **DOA** process is 'Free of charge' for all commercial products while the defect products, repaired through the **OOW** repair processes, will be repaired against a fixed OOW repair tariff. This OOW repair tariff is all-in (including repair/shipment/handling etc.) and is based on the so-called "**carry-in repair**" procedure. Carry-in repair means that you receive your own product repaired back within a fixed time, if under circumstances that is not possible you will be contacted for an alternative.

Magnetic Data Belgium (MDB) is the central authorized Bosch repair Centre. This RMA Request form initiates this central repair procedure towards MDB:

- In case your RMA request is graded as being "Out Of Warranty", Magnetic Data Belgium will return with a confirmation fax inclusive an "Out of Warranty" quotation. Only after a proof of payment of this "Out of Warranty" tariff has been received by MDB, MDB will start the repair procedure.
 - Always return the defective product itself only in its original state, without additional options. Equipment may not contain additional 'non Philips' options nor additional options like power supplies, (extension) cables etc. **Warning: Sending add-ons could lead to delays and/or loss of parts and can not be claimed.**
 - If Products/ PCB's/units/modules are allowed to be offered to this repair process, **please describe the following within the tables below:**
 - Reseller information
 - The LBBxxxx/xx type number, serial number + production week of the type number/product and/or:
 - The serial number of the complete commercial type number where the PCB/unit/module belongs.
 - The service code number (12nc) which is described within the service manual or on the repair overview on Extranet website (user ID required) as mentioned above.
 - Failure description
 - Return PCB's/Units/Products in original- and/or ESD safe packaging.
 - The repaired product is covered by a 90 days repair guarantee, or guaranteed for the remaining part of the original guarantee, whichever is the longest.
 - A repair request may be rejected if, in the opinion of MDB / Bosch CSI, it fails to meet the conditions.
- These service/repair conditions apply to all Philips Congress products manufactured under the responsibility of Bosch CSI and sold through its sales channels.

Reseller Information	
Name :	Address :
Postcode :	City :
Country :	
Contact person :	
Tel :	Fax :
Date :	
Your ref. :	
Invoice information (for out of warranty repairs only)	
VAT Number :	
Invoice To :	
Product / PCB / unit / module Information:	Failure /complaint description:
Type number: LBB /	•
12nc Service code number:	
Serial number(see product type plate):	
Production Week(see product type plate):	

Fax / Email this page to:

European Bosch Service Centre
 Soletron former Magnetic Data Belgium N.V.
 Tel : 00 32 14 40 07 11
 Fax : 00 32 14 40 07 26
 Email :
 rmaservice.boschsecuritysystems@soletron.com
 Attn: RMA Services Bosch Congress
 Jan 2003, Bosch Congress Products

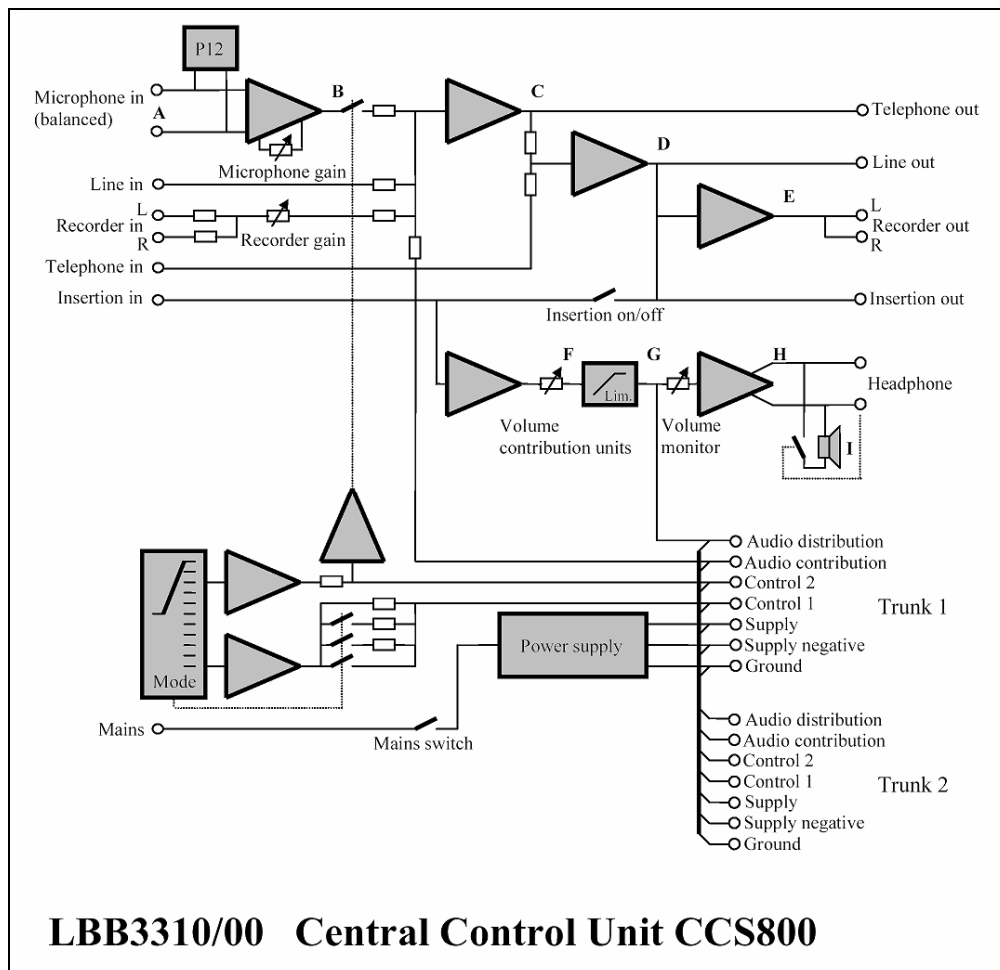
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2 Introduction

2.1 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).

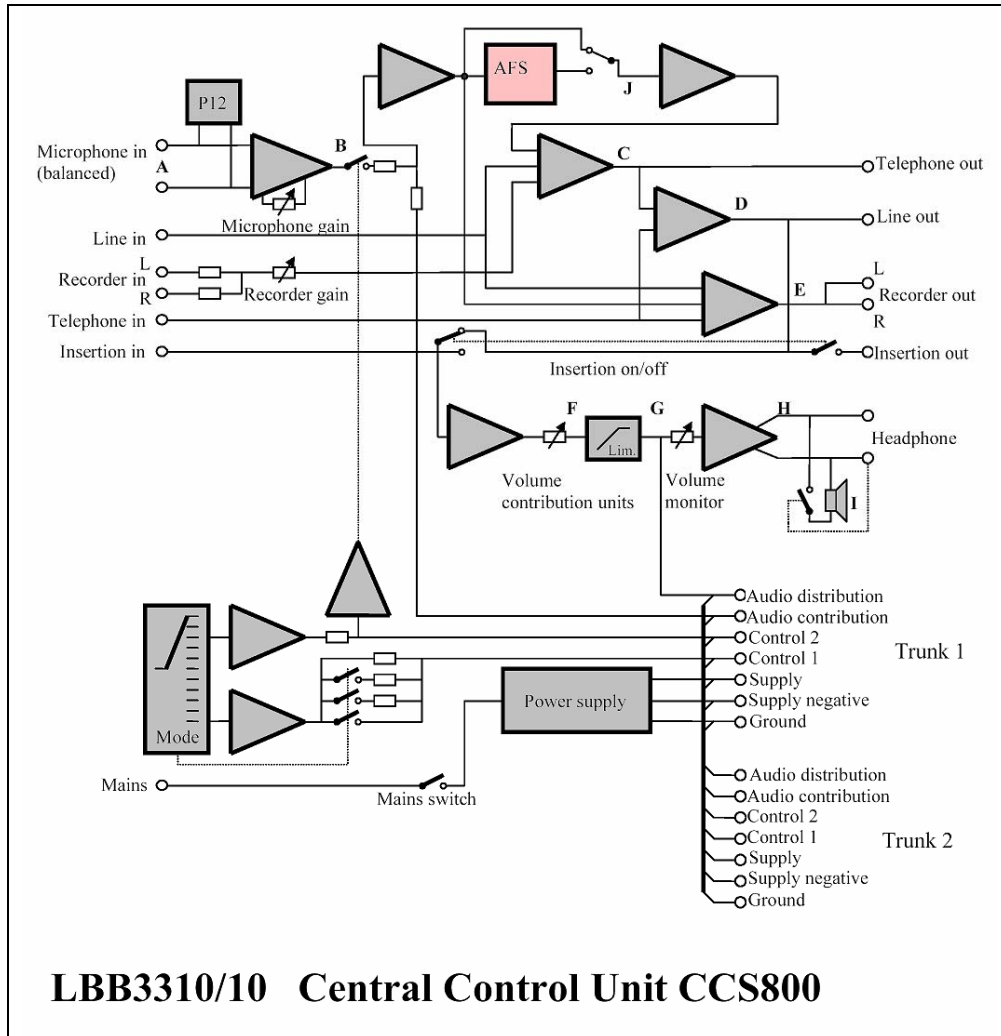
2.1.1 Block diagram CPSU



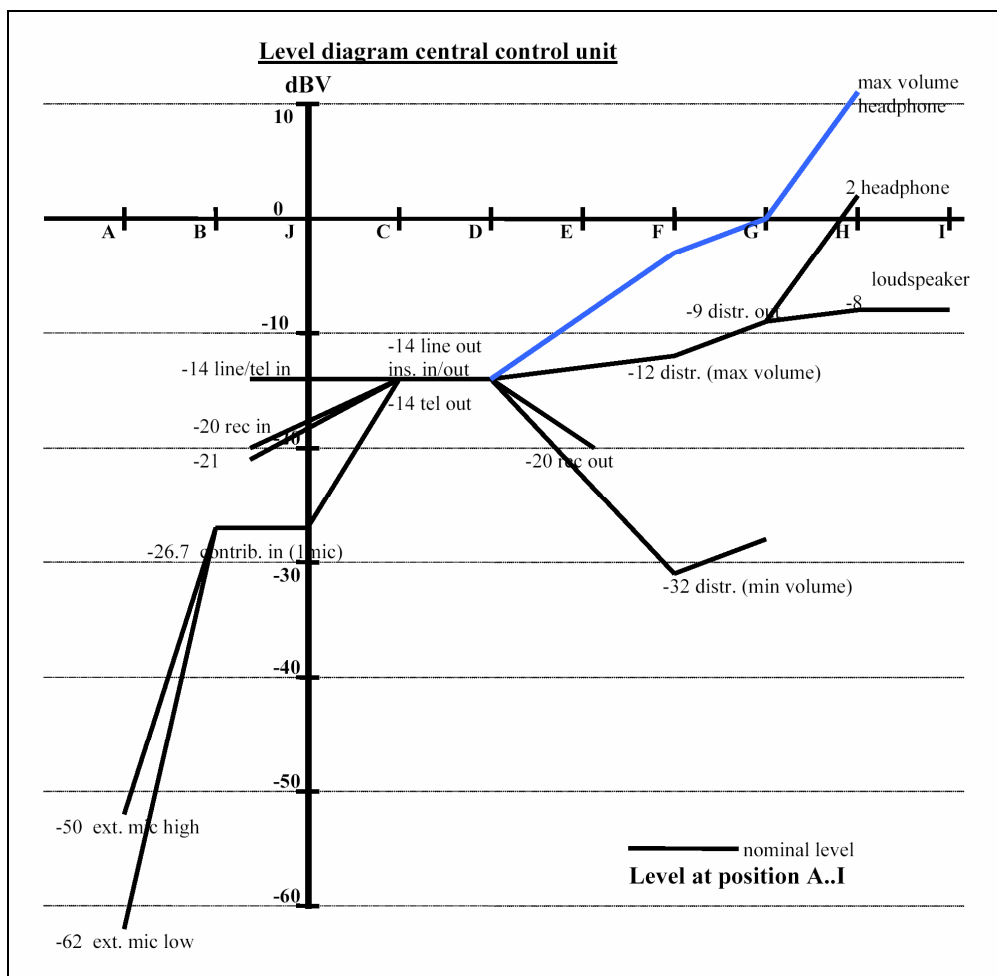
2.2 LBB 3310/10 Control and Power Supply Unit with AFS

This model CPSU has additional an Acoustic Feedback Suppression PCB inside.

2.2.1 Block diagram CPSU with AFS



2.2.2 Audio level diagram CPSU



2.3 AFS module LBB 3310/10)

2.3.1 Board function

The AFS module uses a DSPCPU from Philips Semiconductors; which runs at 166 MHz.

The application software stored in flash memory (4Mbyte) determines the board functional behavior.

The firmware can configure the audio interface and perform simple control functions. The download of the firmware is performed in a factory environment.

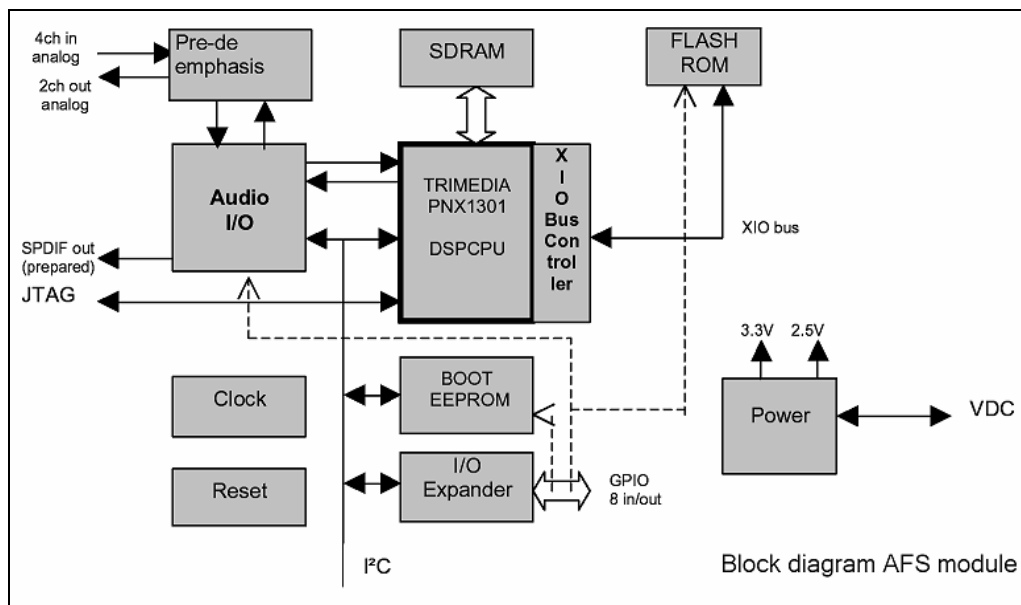
In CCS800 the module is included in the signal chain.

After power-up the board will boot from the on-board boot-EEPROM, copy the program available in flash ROM into SDRAM, and execute the program code in SDRAM.

2.3.2 Block diagram AFS board

The module supports 4-channel analog input and 2-channel audio output. I²C is provided for control of configurable parameters from an additional board or for indications on other boards.

The EEPROM is used as boot-PROM to obtain power-up configuration data (PLL ratio, memory aperture, refresh rate, XIO configuration etc.).



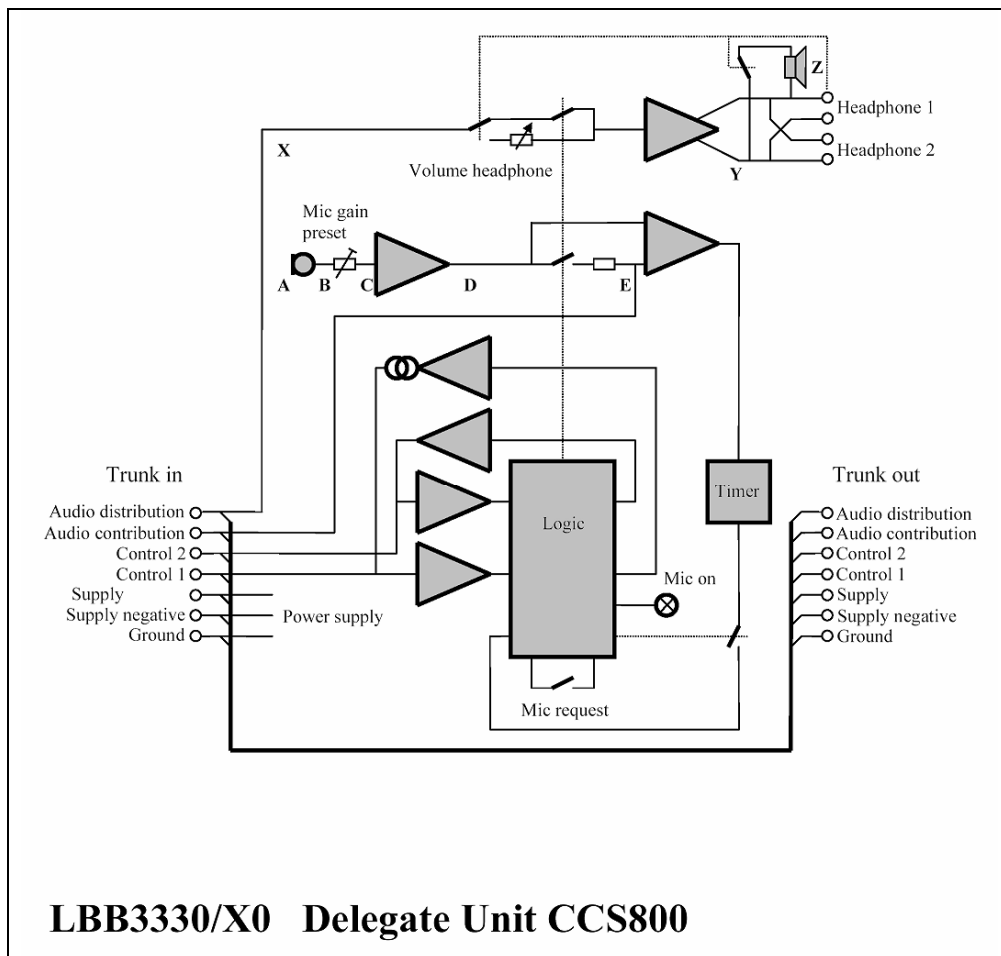
2.4 LBB 3330/00 Delegate Unit

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.

2.4.1 LBB 3330/50 Delegate Unit with Long Microphone Stem

Ditto with a microphone stem of 480 mm instead of 310 mm.

2.4.2 Block diagram delegate unit



2.5 LBB 3331/00 Chairman Unit

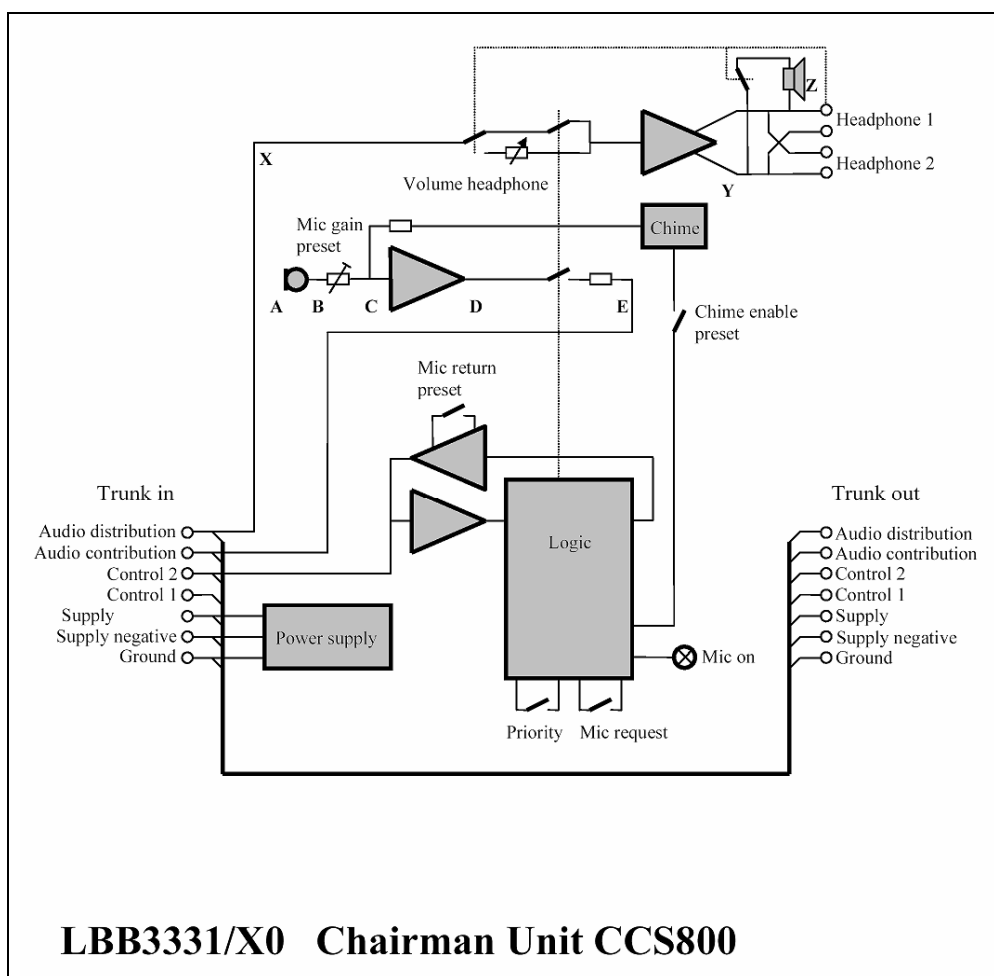
This unit provides the microphone, unit loudspeaker and headphones facilities for the chairman using the CCS 800 discussion system. Pressing the microphone button always activates the chairman microphone. Pressing the priority button will deactivate all active delegate units and activates the chairman's 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.

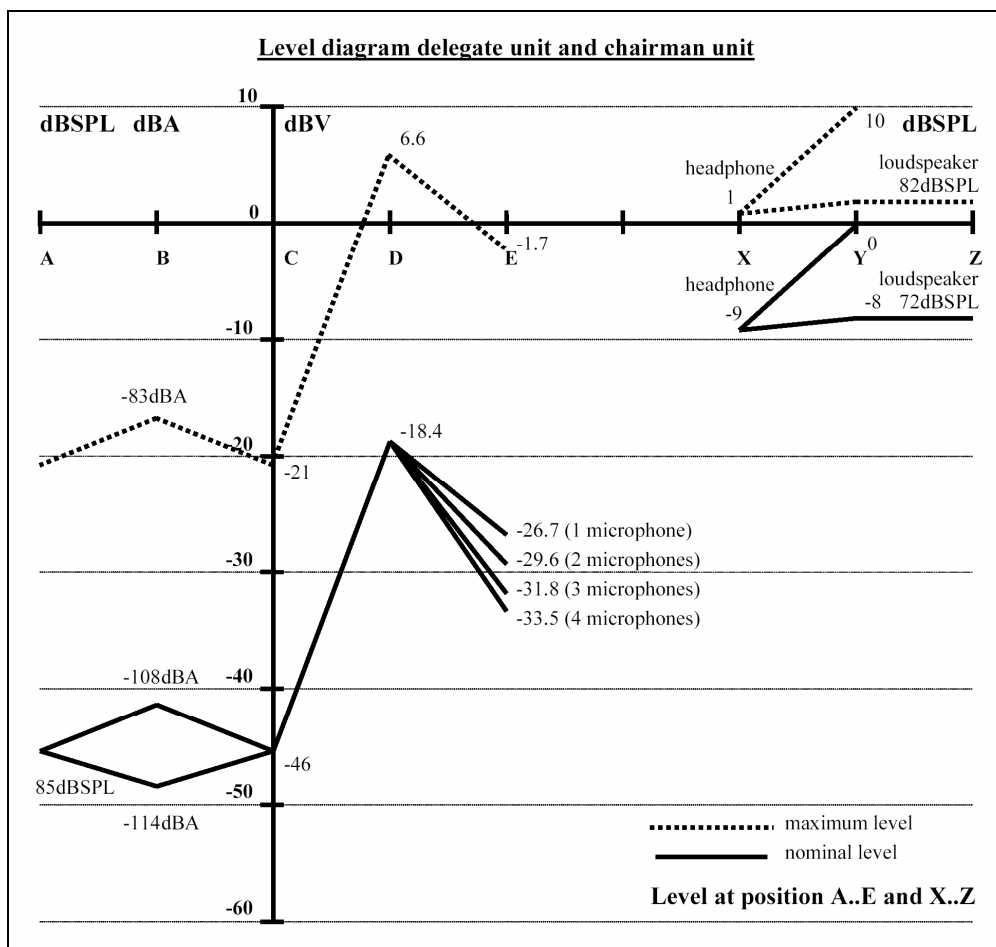
2.5.1 LBB 3331/50 Chairman Unit with long Microphone stem

Ditto with microphone stem of 480mm.

2.5.2 Block diagram chairman unit

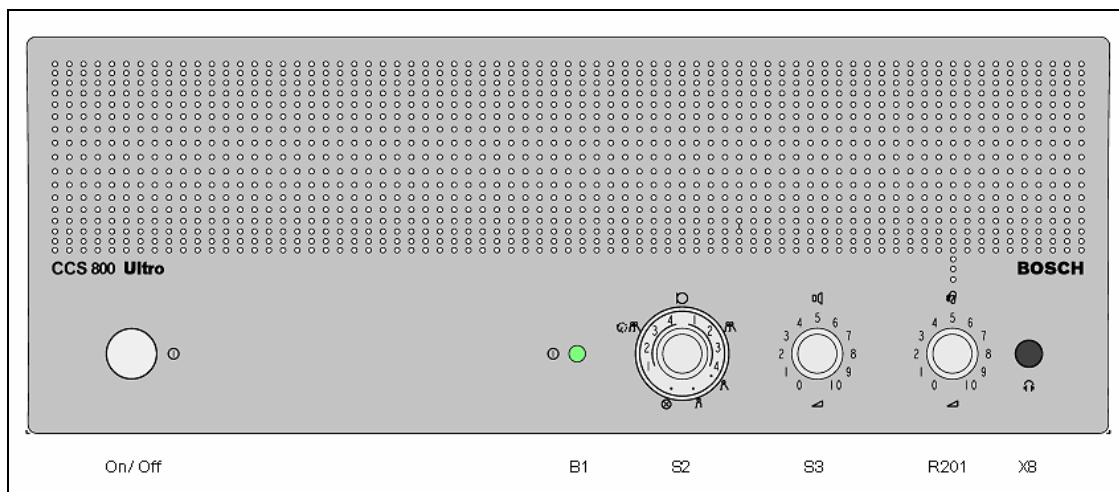


2.6 Audio level diagram delegate and chairman units

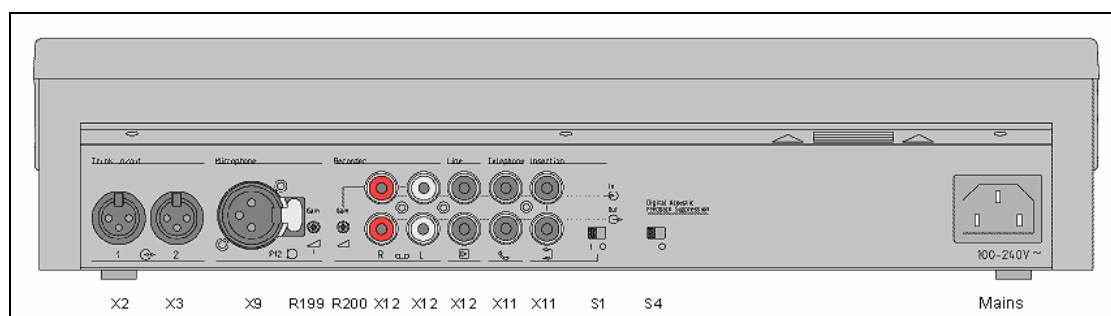


3 Controls and indicators

3.1 Control and Power Supply Unit (CPSU)

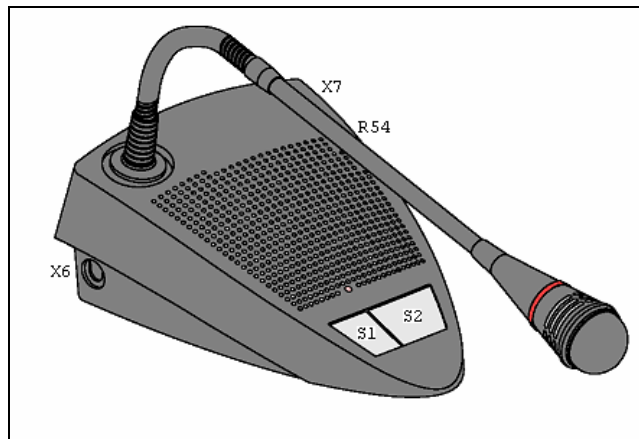


Top	Function
On/OFF button	Switches the CPSU ON or OFF
Green LED (B1)	Indicates if the CPSU is switched ON or OFF
Left rotary switch (S2)	Microphone-mode switch. To select the mode for the delegate microphones. In test position all light-ring indicators lit if all units are properly connected.
Middle rotary switch (S3)	Loudspeaker volume control of the chairman and delegate units.
Right rotary switch (R201)	Volume control for the built-in loudspeaker in the CPSU or a connected headphone to monitor the discussion.
Headphone socket (X8)	Headphone socket 3.5mm with built-in switch.



Rear	Function
Trunk in/ out (X2, X3)	2x 7p DIN female socket for trunk cables to delegate- and chairman units
Microphone (X9)	3p XLR female socket for external microphone input
Telephone and Insertion (X11)	4x Cinch sockets for in -/ output
Recorder, Tape and Line (X12)	6x Cinch sockets for in -/ output
Microphone gain control potentiometer (R199)	To adjust the sensitivity of the microphone input connector X9.
Recorder gain control potentiometer (R200)	To adjust the sensitivity of the recorder input connector X12
Insertion switch (S1)	Position "1" : loop through; Position "0" : insertion not used
AFS switch (S4), LBB 3310/10 only	Position "1" : AFS mode; Position "0" : normal mode

3.2 Delegate and chairman units



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

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

Side	
Thumbwheel (R54)	Rotary volume control for headphones.
Headphone jack s(X6/X7)	2 x 3.5 mm stereo jack headphone sockets.

Inside	
Adjustment microphone capsule (R72)	Potentiometer to adjust the sensitivity of the microphone (Access via bottom hole. See chapter 5).

Additional for chairman units

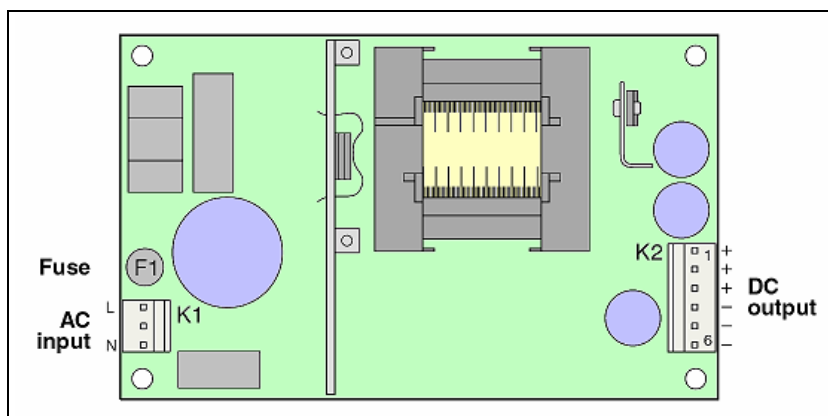
Top	
Button (S1)	Priority function (chime tone)

Bottom	
Small bracket at cable entry	Hides the priority and chime mode switch (see "Instructions for use").
2 Switches behind bracket	Delegate microphones off at priority (S37) Chime en-/disable switch (S42)

4 Technical data

4.1 Power supply

Specification	
Type of power supply:	40W single output, universal input switching power supply
Mains input voltages:	90 .. 264Vac
Input frequency range:	47 .. 63Hz
Max. input current :	0.9A at 100Vac or 0.3A at 240Vac
Nominal output voltage:	24Vdc
Rated output load:	1.7A
Dimensions:	125mm x 75mm



Danger

Heat sink is electrical connected to live of mains input depending on polarity!

4.1.1 Additional technical specification for test environment:

Load range				
Output	Min. load	Rated load	Peak load	Voltage accuracy
+24V	0A	1.7A	2.5A	24 $\pm$ 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	< $\pm$ 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

5 Microphone stem adjustment

Microphone stem

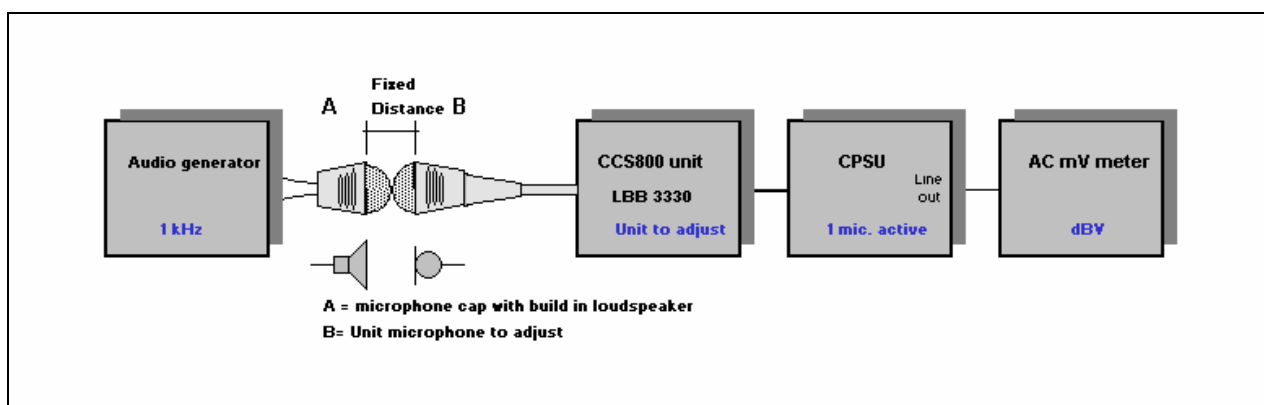
When the microphone stem assembly has to be replaced, it is required that the input level of the microphone is adjusted again by use of the preset potentiometer R72. This is due to the spread in sensitivity of the microphone capsule (approx. $\pm 4\text{dB}$).

Procedure

The adjustment is practical procedures to compare factory-adjusted units with units where the microphone stem is replaced and to be tuned to the system level again.

Test set-up

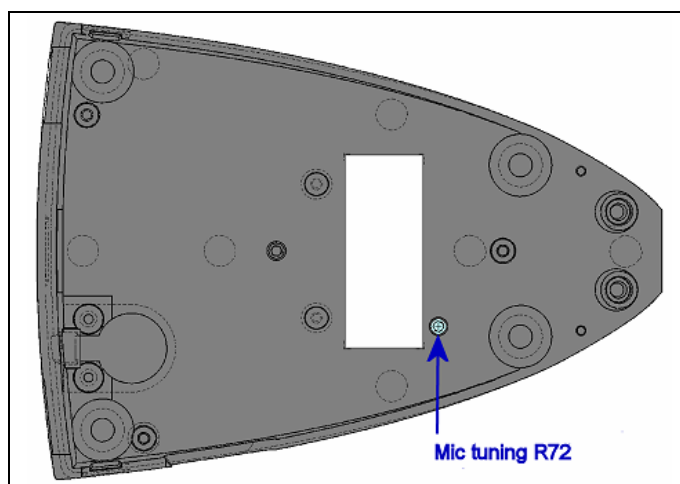
- Audio sine wave generator
- Home made loudspeaker reference source or a professional sound level calibrator unit "A" (see figure below).
To make a home made reference source, mount inside an (empty) microphone head e.g. a paging bleeper as ref. Loudspeaker.
- CPSU.
- AC mV meter.



Measurements

Test procedure		Comment
1	Connect the CCS800 unit with the CPSU.	Select only one active microphone on the CPSU!
2	Connect to the 'Line out' of the CPSU the AC mV meter	X12, see chapter 3.1.
3	Adjust the audio source to approx. 1 kHz.	The audio level of the loudspeaker should be distortion free and at a level of speaking distance. Take care that no acoustic nuisance from outside influences 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 (A) Of importance is that for all measurements the distance between loudspeaker and microphone is equal.
4a	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 $\pm 1,5\text{ dB}$)

5	Remove the factory-adjusted unit and place the unit for adjustment in the same position.	Do not change the audio setting adjustments.
5a	Read the audio level on the AC meter.	Take note of the value.
5b	Tune R72 to the audio ref. level as measured before in 4a.	That's all.

**Note**

In the bottom housing is a small hole for access to R72. Use a watchman screwdriver with 1.5 to 2.0 mm blade. 270 degree rotation is + to – 3dB sensitivity variation.

Never adjust the microphone when it is not necessary!

6 Maintenance and repair

6.1.1 Preventive maintenance

Regular preventive maintenance is not necessary. Depending on the usage the equipment may need cleaning.

6.1.2 Corrective maintenance

Defective units can be repaired or temporary replaced by a new one. Recommended repair method is to use the centralized repair procedure (see chapters 1.5 and 1.6). In the spare part lists are the PCB's indicated which could be also repaired centralized (see chapter 12.1.3). Selections of electro-/ mechanical- and SMD components are available for workshop repair.

6.2 Workshop repair

6.2.1 Electrical repair

The chapter 7 'Diagnostics and Fault finding' describes how to measure possible defects in circuit sections. Some common SMD components are available for local workshop repair. The selection is based on field repairs experience. See the PCB spare parts lists of chapter's 12.2.4 (CPSU) and 12.3.3 (Delegate and Chairman units)

6.2.2 Mechanical repair

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

6.2.3 Microphone repair

Only the microphone capsule can be replaced by removing the cap. Read instructions in chapter 9. Other parts like head and flex stem cannot be repaired. In that case the complete microphone assembly has to be replaced.

Tip:

The microphone head assembly on the metal tube is a screwed fastening (fine tread).

The fixation between flexible part – metal tube – microphone head assembly is done with locktite glue.

To separate the parts use a blow dryer. The microphone assembly has to be unscrewed during the heating.

7 Diagnostics and Fault finding

7.1 Functional tests with a minimized system

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

7.1.1 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

7.1.2 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.

7.1.3 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.

7.1.4 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.

7.1.5 Testing the CHAIRMAN ONLY mode

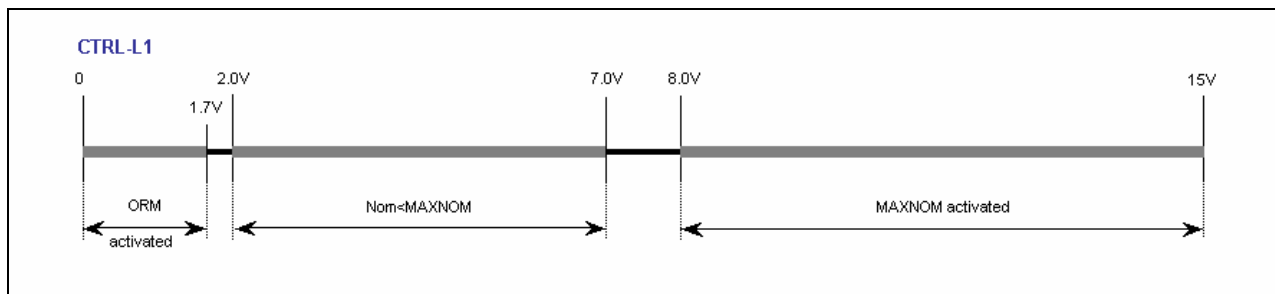
- In this mode only the microphones of the chairman unit(s) can be activated.
- Put the mode switch of the CPSU in the CHAIRMAN ONLY mode.
- Press the microphone switch on a delegate unit.
- This may have no effect.

7.2 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.

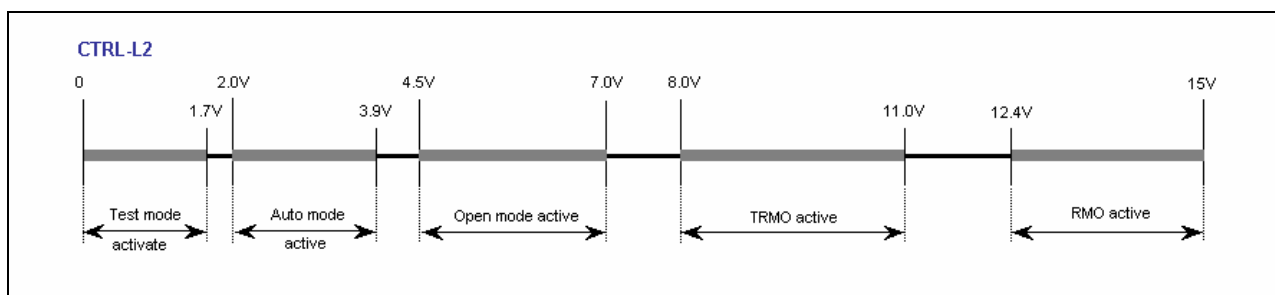
7.2.1 CTRL-L1

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



7.2.2 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.



Danger

Part of the power supply inside the CPSU carries potentially lethal voltages. Only touch parts with well-insulated tools

7.3 Measuring Instructions for the CPSU

Introduction

The measurement procedure contains the following items:

- 7.3.1 Settings before you start measuring.
- 7.3.2 Internal Supply Voltages.
- 7.3.3 Phantom supply of the external symmetrical microphone input.
- 7.3.4 Supply current measurement.
- 7.3.5 Audio contribution to loudspeaker measurement.
- 7.3.6 Audio contribution to audio distribution measurement.
- 7.3.7 External microphone input to line out measurement.
- 7.3.8 Telephone-out, Line-out and Insertion-out measurement.
- 7.3.9 LINE-IN to REC-OUT Circuit measurement.
- 7.3.10 Recorder-in to Line-out measurement.
- 7.3.11 TELEPHONE-IN to LINE-OUT Circuit measurement.
- 7.3.12 Control line test with mode switch (A).
- 7.3.13 Control line test with mode switch (B).
- 7.3.14 System volume control test.
- 7.3.15 AUDIO CONTROL IN to LINE-OUT via AFS circuit of CPSU measurement.
- 7.3.16 Functional AFS test of the LBB 3310/10.

Use the diagrams (chapters 13.4- 13.7) to locate the measurement points (chapter 13.3) and components mentioned in the measurement instructions.

7.3.1 Settings before you start measuring

- Set the insertion switch (S1), located at the rear side, to the left position ("1").
- Set the potentiometer of the headphone volume (R201) to maximum (fully clockwise).
- Set the mode switch (S2) to "auto mode 1" (fully counter clockwise).
- Set the Volume control (S3) for the Delegate and Chairman units to maximum (fully clockwise).
- Set the gain control potentiometer (R199) for the external microphone in the middle position.
- Set the gain control potentiometer (R200) for the recorder input in the middle position.
- Set AFS switch (S4) to Off (LBB 3310/10 only).
- Remove the loudspeaker connector (X3) and mount a 25 Ohm resistor on X5 pt. 2 and 4 (M57, M59). See illustration chapter 13.3.1.

7.3.2 Internal Supply Voltages

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

Measuring points on the bottom layout are colored in blue (See chapter 13.3).

Measuring points	Measurement results
M6 (V+)	+19.5 V $\pm$ 400 mV
M7 (V-)	- 4.5 V $\pm$ 100 mV
M15	+15 V $\pm$ 750 mV
M25	+5 V $\pm$ 250 mV
M26	+7.5 V $\pm$ 350 mV
M27	+10 V $\pm$ 500 mV

7.3.3 Phantom supply of the external symmetrical microphone input

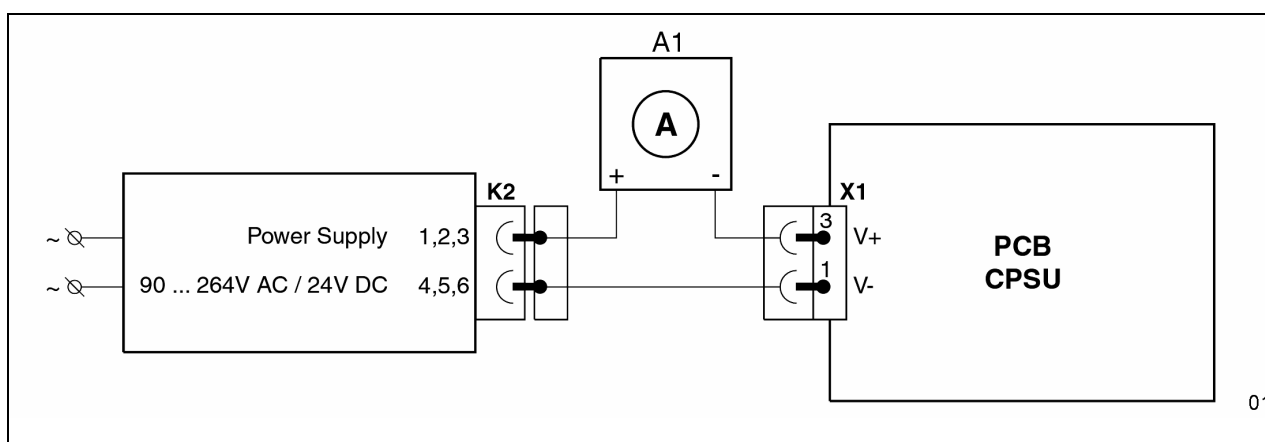
Measure the following internal supply lines, related to M133 (= GND):

Measuring points	Measurement results
M28	+12 V $\pm$ 600 mV
M131	+12 V $\pm$ 600 mV
M132	+12 V $\pm$ 600 mV

7.3.4 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.

On the CPSU board is the power supply voltage present after fuse F1 at measuring spot M9 (SUPP).

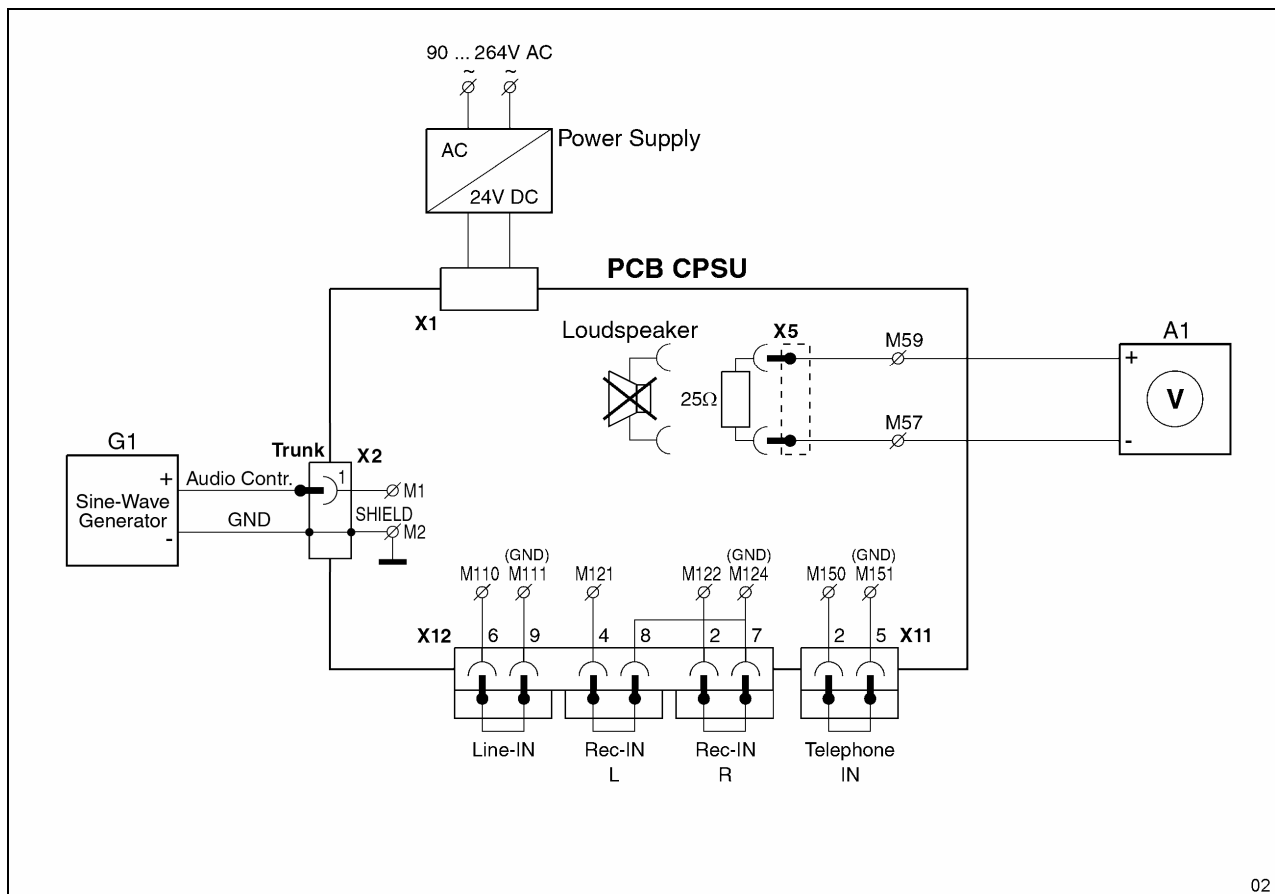


Reference: X1

See Ch. 13.7

7.3.5 Audio contribution to loudspeaker measurement

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



Input setting G1: X11 p-1 related to M2 (GND), see table below.

	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	-6.5 dBV ± 2 dB related to nom level at 1 kHz.
Bandwidth	-36 dBV (15.8 mVrms)	12.5 kHz	-2.5dB ± 1.0dB related to nom. level at 1kHz.

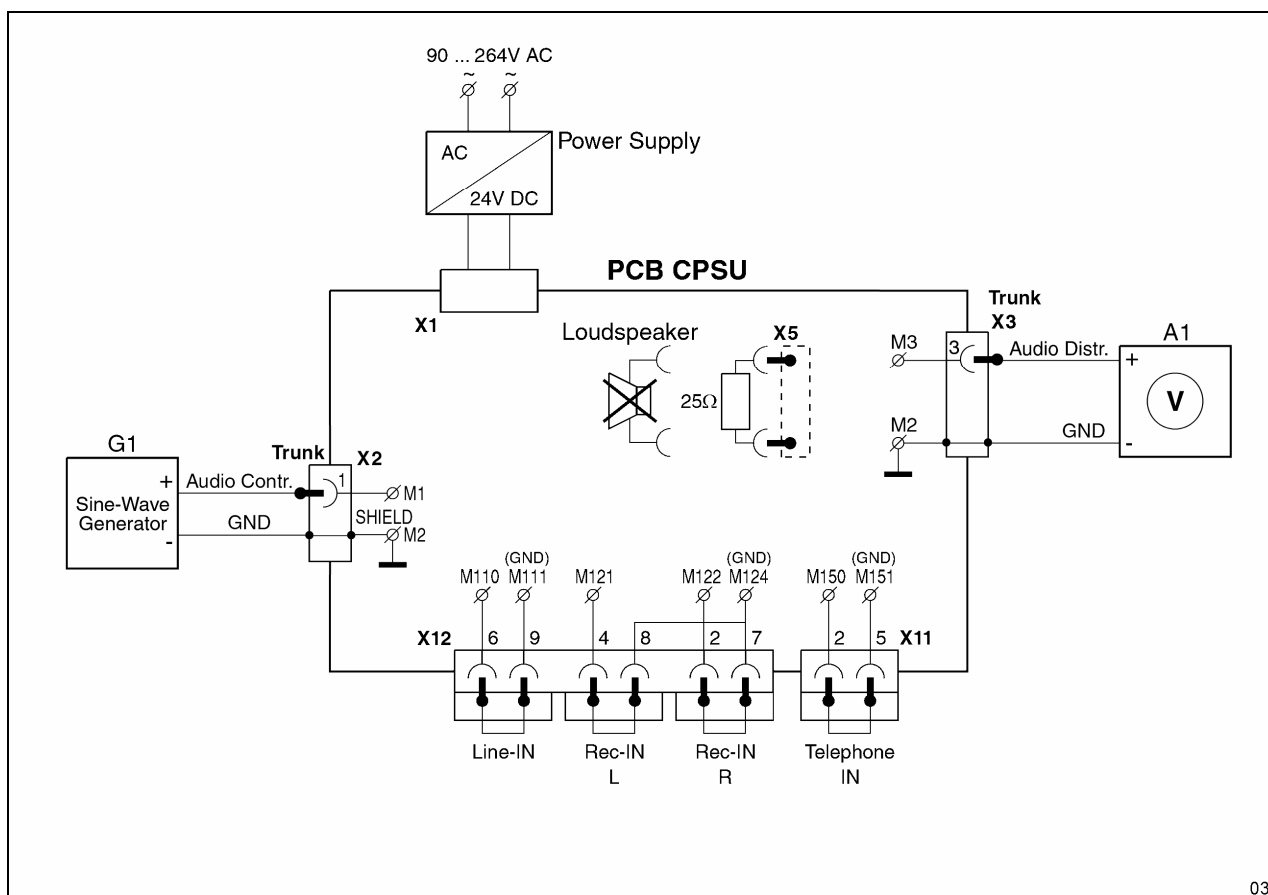
Reference:	M2	See Ch. 13.4
	M57, 59, X5	See Ch. 13.5
	M110, 111, 121, 124, 150, 151	See Ch. 13.6.
	M1, X2, 3	See Ch. 13.7

7.3.6 Audio contribution to audio distribution measurement

Connect a sine-wave generator to one Trunk connectors (X2) M1 and measure the output signal at the other Trunk connector (X3) M3.

Remarks:

- **Nominal level** Nominal level of 85dB SPL from unit microphone gives -28dBV at AUDIO-CONTR. Nominal setting of the Master Gain is at position 6. (Volume control S3). Due to a setting of the Master Gain at maximum position, for measurements only, the AUDIO-CONTR must be adjusted to -36dBV, instead of -28dBV.
- **Maximum level** Maximum level of 110dB SPL from unit microphone gives -3dBV at AUDIO-CONTR



03

Input setting G1: X11 p-1 related to M2 (GND), see table below.

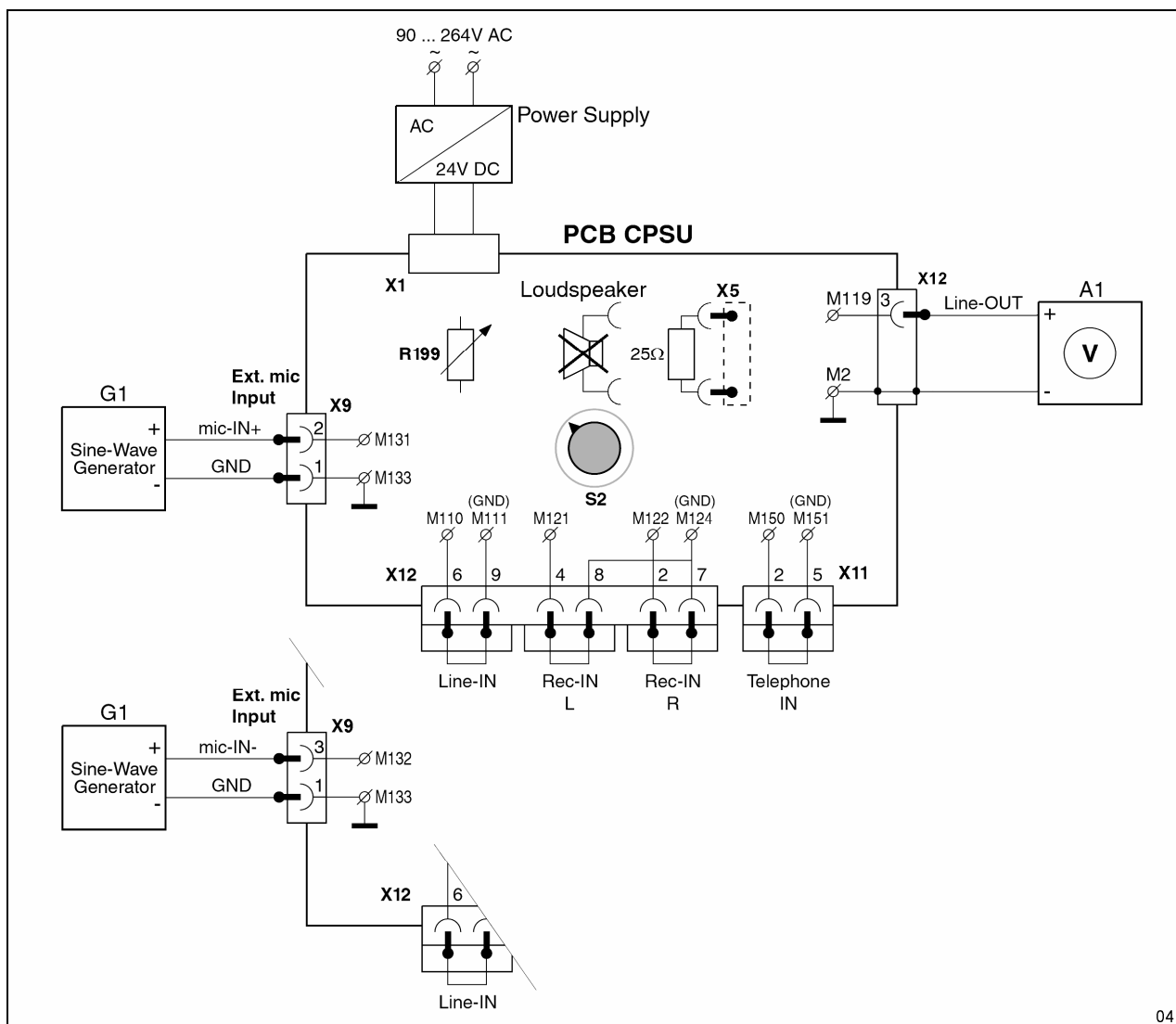
Settings for G1			Measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-36dBV (15.8 mVrms)	1 kHz	-9.4dBV ± 1dB (85dB SPL)
Overload level	-11dBV (281.8 mVrms)	1 kHz	+3dBV ± 1dB (115dB SPL)
Bandwidth	-36dBV (15.8mVrms)	125 Hz	-2dB ± 2dB related to nom. level at 1kHz
Bandwidth	-36dBV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

Reference: M2 See Ch. 13.4
M57, 59, X5 See Ch. 13.5
M1, X2, 3 See Ch. 13.7

7.3.7 External microphone input to line out measurement

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).

NOTE: be sure that the gain control potentiometer (R199) of the external microphone input is set to the middle position.



Input setting G1: X130 p-2 related to X130 p-1 (GND) and X130 p-3 related to X130 p-1 (GND), see table below.

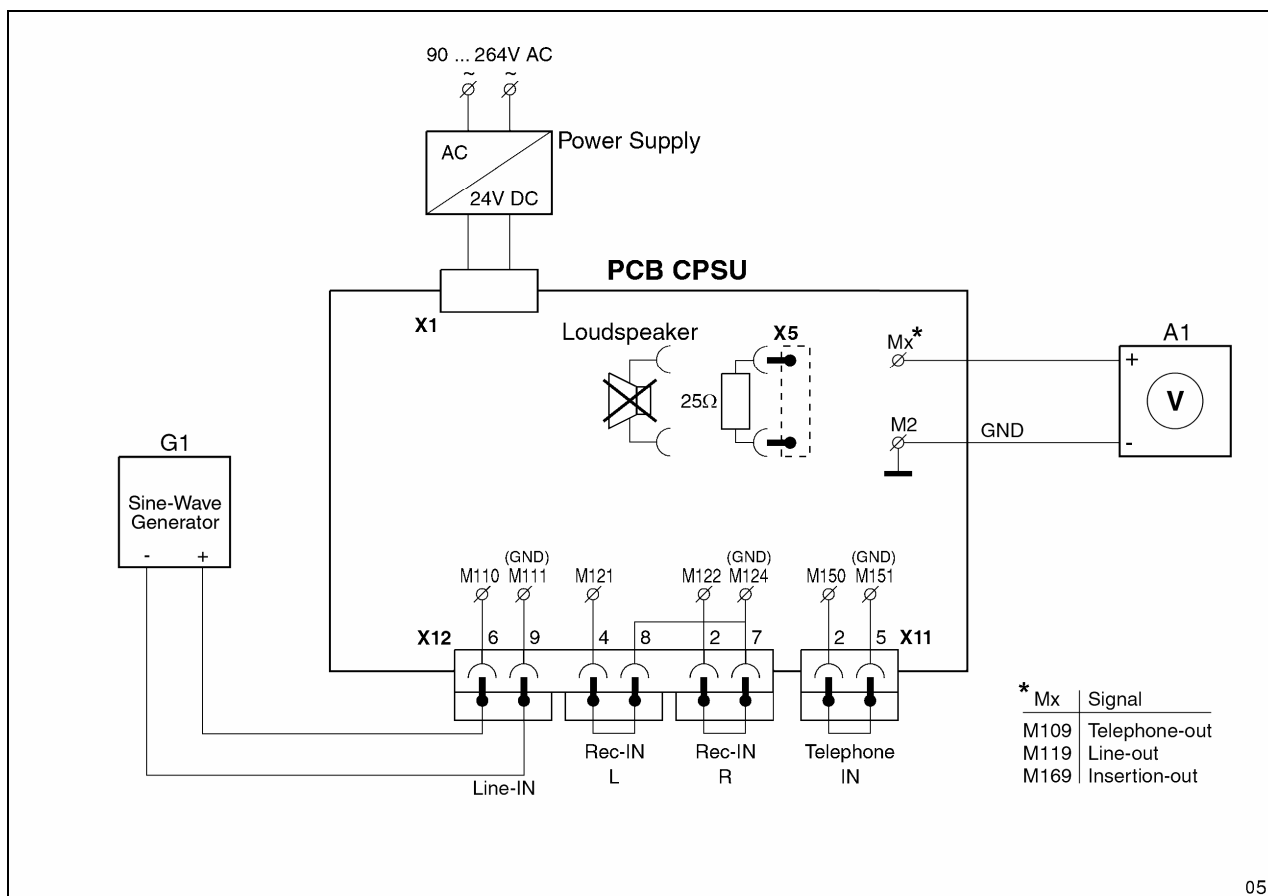
Settings for G1			Measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-56 dBV (1.6 mVrms)	1 kHz	-15 dBV $\pm$ 2dB (85dB SPL)
Maximum level	-31 dBV (28.2 mVrms)	1 kHz	+10 dBV $\pm$ 2 dB (110 dB SPL)
Bandwidth	-56 dBV (1.6 mVrms)	125 Hz	-3dB $\pm$ 2dB related to nom. level at 1kHz
Bandwidth	-56 dBV (1.6 mVrms)	12.5 kHz	-0.5dB $\pm$ 1dB related to nom. level at 1kHz.
Mute level: set S2 to chairman only mode	-56dBV (1.6 mVrms)	1 kHz	< -74 dBV (selective) or < -74 dBV (A-weighted)

- Set S2 back to position AUTO 1.

Reference: M119 See Ch. 13.6
M131, 132, 133, R199 See Ch. 13.7

7.3.8 Telephone-out, Line-out and Insertion-out measurement

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.



Input setting G1: M110 related to M111 (GND), see table below.

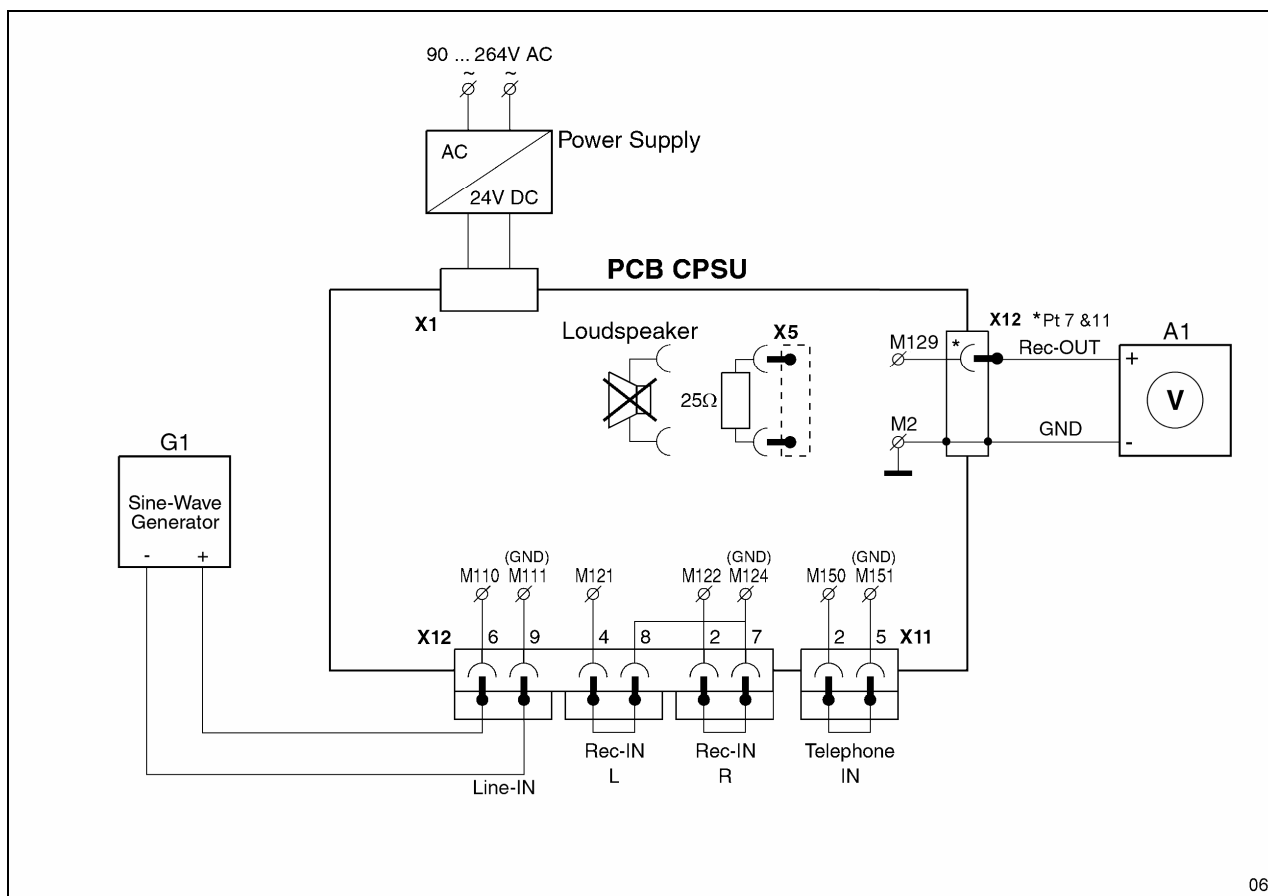
Settings for G1			Measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-14dBV (200mV _{rms})	1kHz	-14dBV ± 1dB (85dB SPL)
Maximum level	+11dBV (3.55V _{rms})	1 kHz	+11dBV ± 1dB (110dB SPL)
Bandwidth	-14dBV (200mV _{rms})	125 Hz	-0.5dB ± 2dB related to nom. level at 1kHz
Bandwidth	-14dBV (200mV _{rms})	12.5 kHz	-1.0dB ± 1dB related to nom. level at 1kHz.

Reference: M169
M109, 119

See Ch. 13.5
See Ch. 13.6

7.3.9 LINE-IN to REC-OUT Circuit measurement

Connect a sine-wave generator to the LINE-IN connector and measure the output signal at the RECORDER-OUT (M129) connector.



Input setting G1: M110 related to M111 (GND), see table below.

Settings for G1			Measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-14dBV (200mV _{rms})	1kHz	-20dBV ± 2dB (85dB SPL)
Maximum level	+11dBV (1.78mV _{rms})	1 kHz	+5dBV ± 2dB (110dB SPL)
Bandwidth	-14dBV (200mV _{rms})	125 Hz	-0.5dB ± 1dB related to nom. level at 1kHz
Bandwidth	-14dBV (200mV _{rms})	12.5 kHz	-0.5dB ± 1dB related to nom. level at 1kHz.

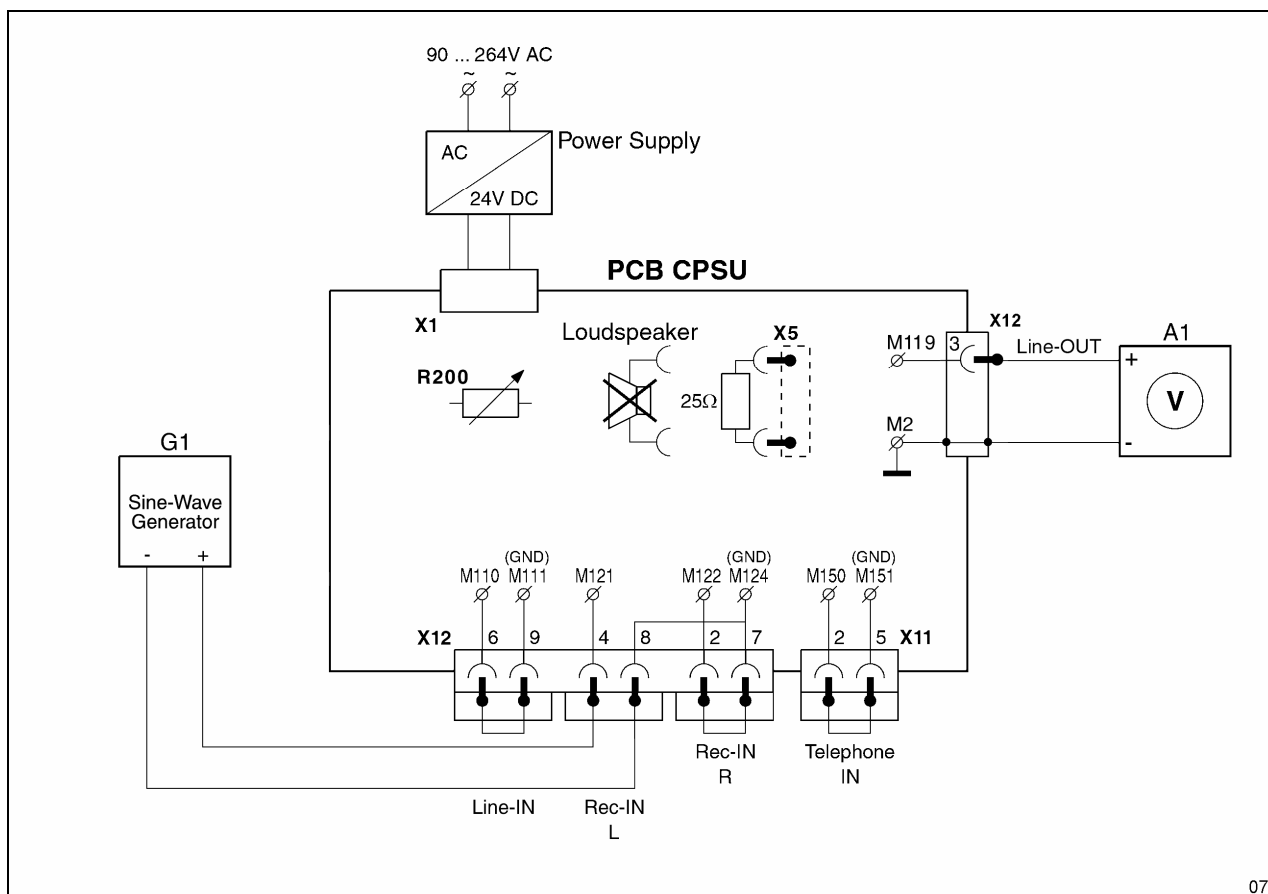
Reference: M129

See Ch. 13.6

7.3.10 Recorder-in to Line-out measurement

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 LINE-OUT connector.

NOTE: be sure that the gain control potentiometer (R200) of the recorder input is set to the middle position.



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Input setting G1: M121 & M122 related to M124 (GND), see table below.

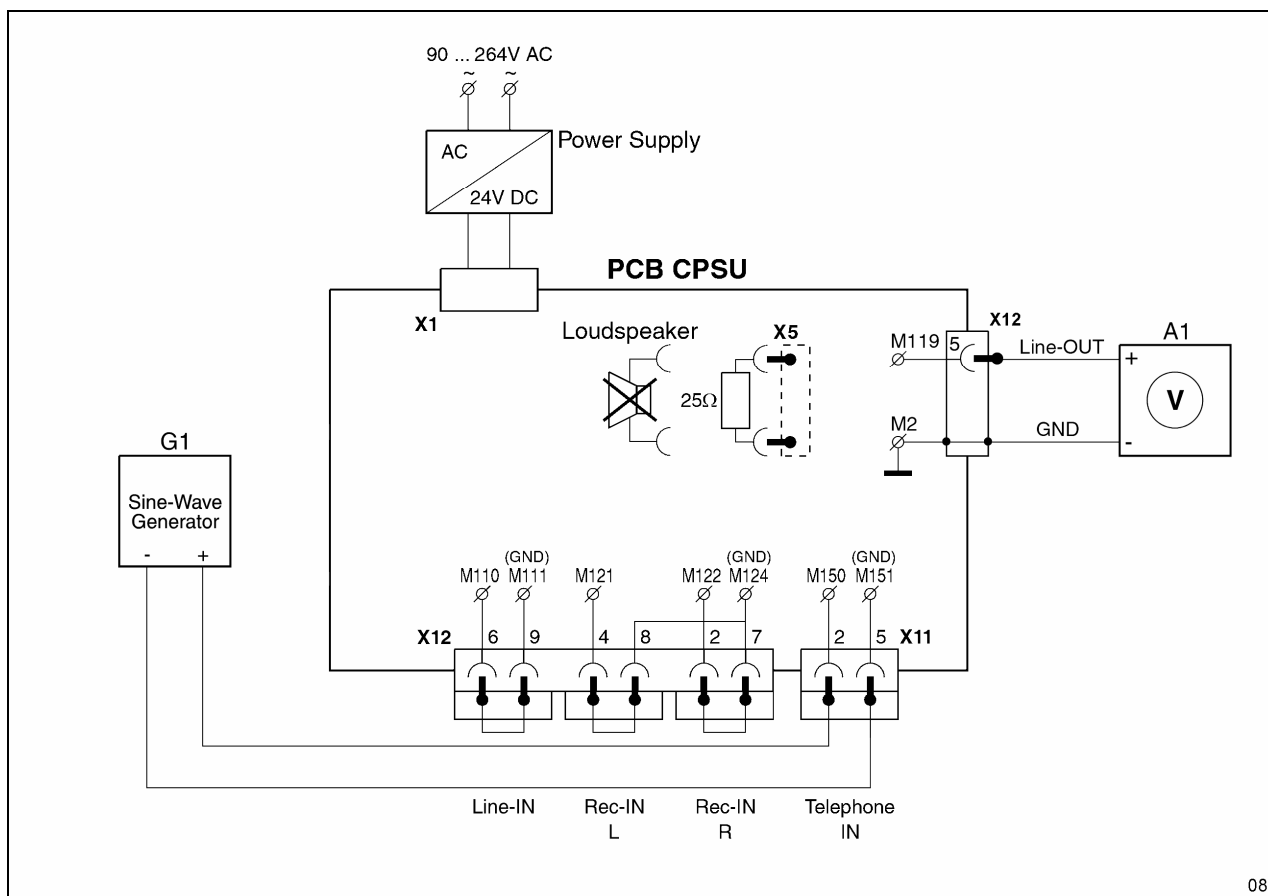
Settings for G1			Measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-20dBV (100mV _{rms})	1 kHz	-16.5dBV ± 2dB (85dB SPL)
Maximum level	+5dBV (1.78V _{rms})	1 kHz	+9.5dBV ± 2dB (110dB SPL)
Bandwidth	-20dBV (100mV _{rms})	125 Hz	-0.5dB ± 1dB related to nom. level at 1kHz
Bandwidth	-20dBV (100mV _{rms})	12.5 kHz	-1dB ± 1dB related to nom. level at 1kHz.

Reference: M119, R300

See Ch. 13.6

7.3.11 TELEPHONE-IN to LINE-OUT Circuit measurement

Remove the interconnections of TELEPHONE -IN and connect successively a sine-wave generator to the TELEPHONE -IN L connector. Measure the output signal at the LINE-OUT connector.



Input setting G1: M150 related to M151 (GND), see table below.

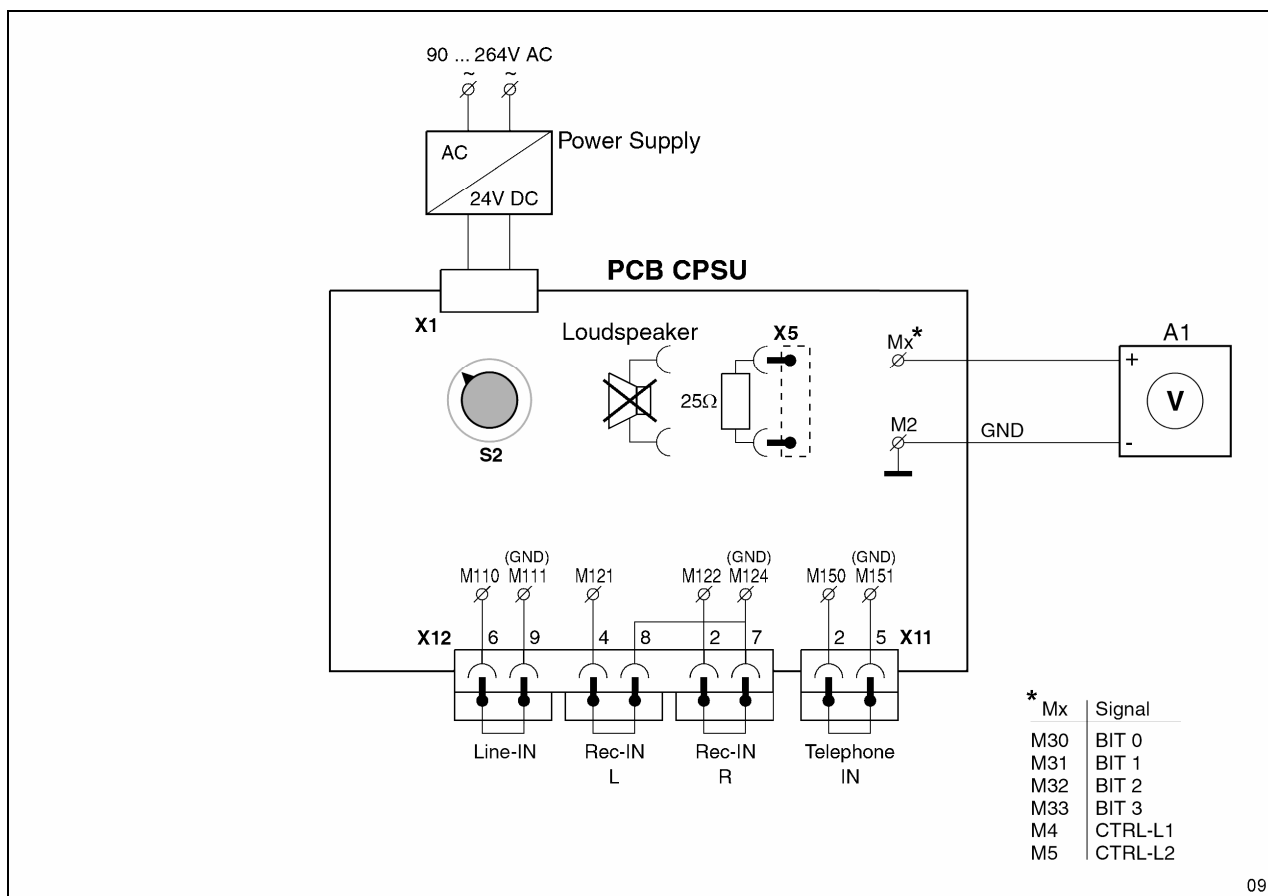
Settings for G1			Measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-14dBV (200mV _{rms})	1kHz	-14dBV ± 1dB (85dB SPL)
Maximum level	+11dBV (3.55V _{rms})	1 kHz	+11dBV ± 1dB (110dB SPL)
Bandwidth	-14dBV (200mV _{rms})	125 Hz	-0.5dB ± 2dB related to nom. level at 1kHz
Bandwidth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

Reference: M119

See Ch. 13.6

7.3.12 Control line test with mode switch (A)

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.



Set the “mode switch” (S2) in each position and measure the voltages at M30, M31, M32, M33, M4 and M5 related to M2 (GND).

Mode switch	Measurement values for A1 (V)					
Position (S2)	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 $\pm$ 500 mV and 15V $\pm$ 750mV

CTRL-L1 levels is $\pm$ 100mV

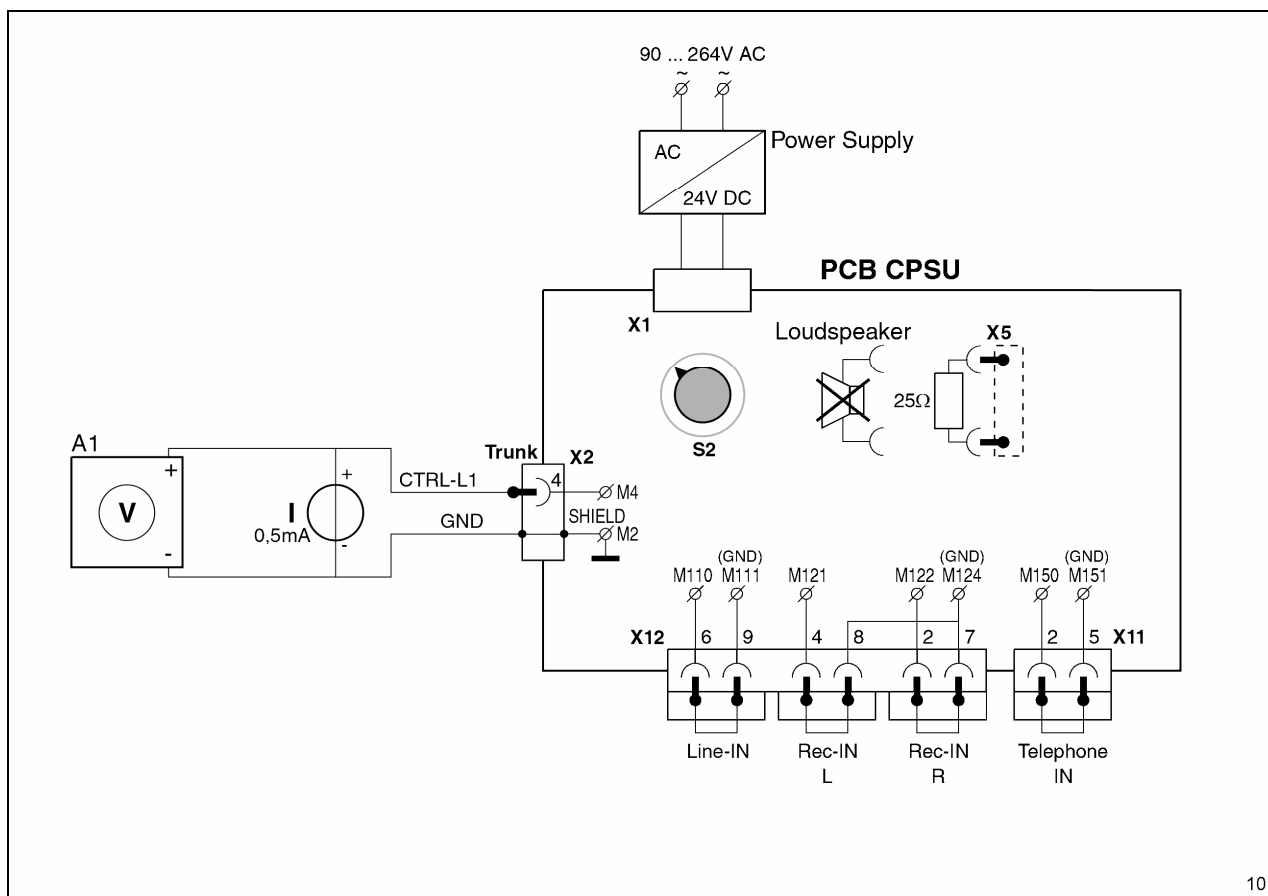
CTRL-L2 levels is on 1.0V $\pm$ 100mV, on 2.9V $\pm$ 150mV and on 5.7V $\pm$ 300mV

Reference: M30, 31, 32, 33, S2
M4, 5

See Ch. 13.5
See Ch. 13.7

7.3.13 Control line test with mode switch (B)

Connect a current source of $0.5\text{mA} \pm 0.03\text{mA}$ to the control-line CTRL-L1 via M4 Set the “mode switch” (S2) is each position and measure the voltages at M4 related to M2 (GND)



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Mode switch	Measurement values for A1 (V) Including current
Position	M4
(S2)	(Control-L1)
Auto-1	≥ 11.8
Auto-2	5.83
Auto-3	4.5
Auto-4	3.93
Open-1	≥ 11.8
Open-2	5.83
Open-3	4.5
Open-4	3.93

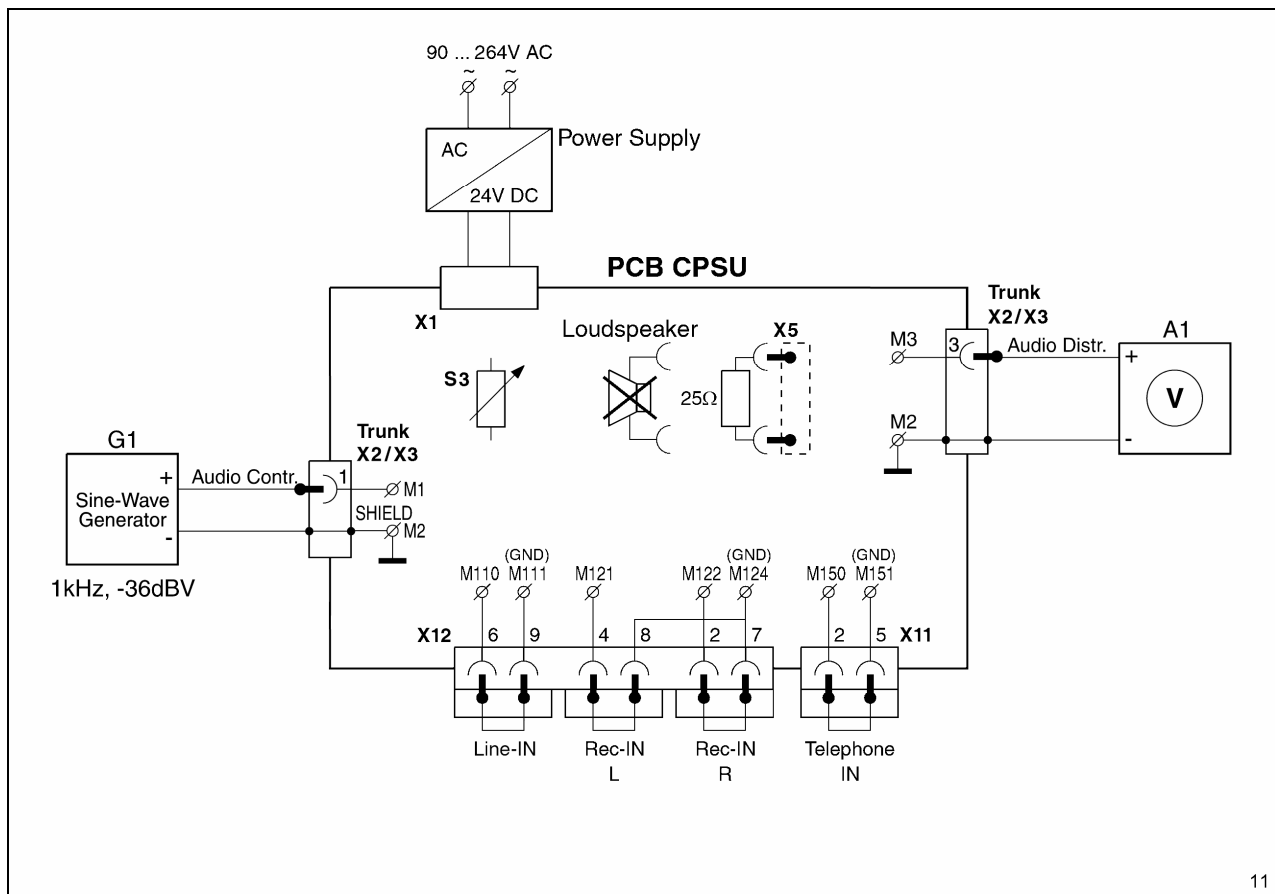
Tolerances: CTRL-L1 incl. current levels is $\pm 250\text{mV}$

NOTE: Set the mode switch (S2) back to the minimum left position ‘Test’.

Reference: S2 See Ch. 13.5
X2 See Ch. 13.7

7.3.14 System volume control test

Measure the output level related to each position of the volume control (S3) for the loudspeakers of the Delegate and Chairman units.



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 (S3)	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)

- put the volume control switch (S3) to position 10 (maximum right position) again.

Reference: S3
X2, 3

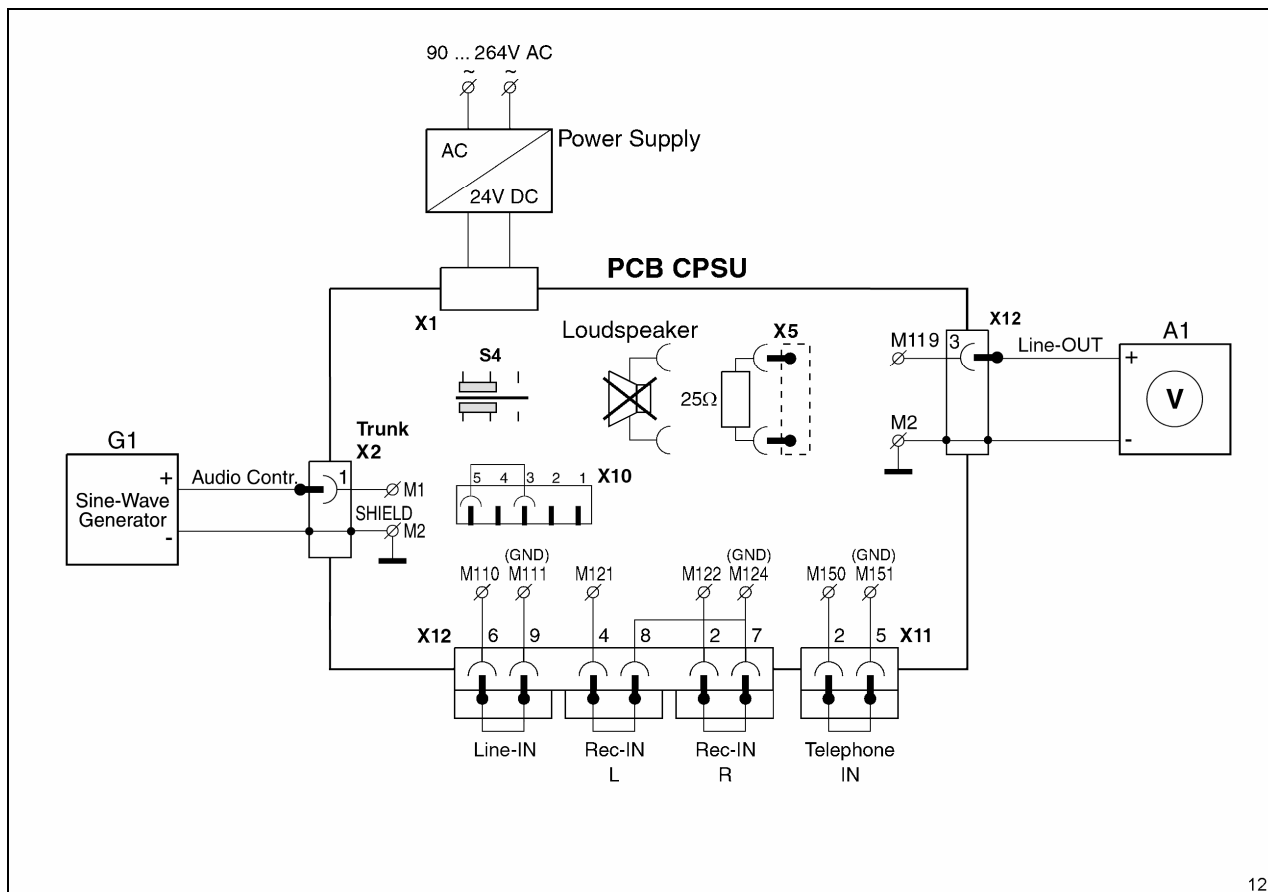
See Ch. 13.5
See Ch. 13.7

7.3.15 AUDIO CONTROL IN to LINE-OUT via AFS circuit of CPSU measurement

(LBB 3310/10 only)

Connect a sine-wave generator to one Trunk connectors (X2) M1 and measure the output signal at output LINE-OUT (M119).

- Set AFS switch (S4) to position 'On'.
- Connect on CPSU board X10-3 (audio out) to X10-5 (audio in). AFS board is not required for this test.



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Input setting G1: X11 p-1 related to M2 (GND), see table below.

settings for G1			measurement results for A1
	Amplitude	Frequency	Amplification
Nominal level	-28dBV (39.8mV _{rms})	1 kHz	-14dBV ± 2dB (85dB SPL)
Maximum level	-3dBV (794mV _{rms})	1 kHz	+11dBV ± 2dB (110dB SPL)
Bandwidth	-28dBV (39.8mV _{rms})	125 Hz	-0.5dB ± 1dB related to nom. level at 1kHz
Bandwidth	-28dBV (39.8mV _{rms})	12.5 kHz	-1dB ± 1dB related to nom. level at 1kHz.

- Set AFS switch (S4) to position 'Off'.

Reference: X10, 12
X2

See Ch. 13.6
See Ch. 13.7

7.3.16 Functional AFS test of the LBB 3310/10

- Connect 2 delegate units to CPSU.
- Switch On the CPSU.
- Mic mode, 1 unit active.
- Volume set to 0.
- Bend microphone of one unit towards the loudspeaker of the other delegate unit and switch On the microphone. Distance loudspeaker – microphone approx. 20 –25 cm.

AFS switched Off.

- Increase the volume of the CPSU. After approx. step 5 the feedback starts (whistle tone).
- Put volume back to 0.

AFS switched On.

- Increase volume from 0 till 10. Feedback should not appear.
(Short feedback sound could be heard due to audio regulation of the AFS when mic is close to the loudspeaker).
- When AFS is switched Off at volume pos 10, sharp feedback whistle tone starts immediately.
- Switch On AFS, feedback audio stops.

Not correct operating AFS board.

If the AFS board not operates as above described, send the board (or CPSU) to the Bosch central repair facility.



Note

Valid for LBB3310/10 (with AFS) only.

Be sure that the cable clamp on the flat cable (CPSU board – upper housing board) is correctly mounted. Purpose is to keep the flat cable away from the AFS board due to HF emission.



Note

The AFS board used in the PLENA Feedback Suppressor is not compatible with the Congress version. The board hardware is identical with exception of the 2 not mounted red 40p flat cable sockets (X300 and X302) on the Congress version. The on-board software is different for the PLENA and Congress versions.

7.4 Measuring spots CPSU board with signal description

See chapter 13.3 for location on the board.

Measuring spots	Signal
M1	AUDIO-CONTR
M2	GND
M3	AUDIO-DISTR
M4	CTRL-L1
M5	CTRL-L2
M6	V+
M7	V-
M9	SUPP +24V
M15	+15V
M25	+5V
M26	+7.5V
M27	+10V
M28	+12V
M30	BIT0
M31	BIT1
M32	BIT2-
M33	BIT3
M55	??
M57	X5 (LSP)
M59	X5 (LSP)
M109	TELEPHONE-OUT
M110	LINE-IN
M111	GND-line
M119	LINE-OUT
M121	REC-IN-L
M122	REC-IN-R
M124	GND-rec
M129	REC-OUT-L/R
M131	MIC-IN+
M132	MIC-IN-
M133	GND-mic
M145	XLR-signal
M150	TELEPHONE-IN
M151	GND-telephone
M160	INSERTION-IN
M161	GND-insertion
M169	INSERTION-OUT
M171	To gain control
M172	From gain control
M173	GND (System ground)

7.5 Measuring instructions for the Delegate and Chairman unit

How to check if a Delegate or Chairman unit operates correct is described in the next paragraphs. Supply current

- | | | | |
|-------|---------------------------|-------|---|
| 7.5.1 | Supply current. | 7.5.5 | Microphone switch and light-ring. |
| 7.5.2 | Internal supply voltages. | 7.5.6 | Internal signals for Delegate and Chairman units. |
| 7.5.3 | Unit presence. | 7.5.7 | Internal signals only for Delegate Units. |
| 7.5.4 | Unit type. | 7.5.8 | Chairman Only mode. |

Before you start measuring:

- Connect a Delegate and/or a Chairman unit to the CPSU.
- Turn the volume control (R54) 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).
- Disconnect the loudspeaker from the Delegate or Chairman unit and connect a resistor of 25 ohm between pin 1 and 2 of X5.

Use the diagrams (chapters 13.12 and 13.14) to locate the measurement points (chapter 13.11) and components mentioned in the measurement instructions.

7.5.1 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

7.5.2 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):

- at M15 this should be: $+15V \pm 750mV$
- at M12 this should be: $+5V \pm 250mV$

Note: From Data book, the IC itself is specified as $\pm 250mV$

7.5.3 Unit presence

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

$> 4.5 V \pm 50mV$ = unit present.

7.5.4 Unit type

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

$< 0.5V \pm 50mV$ = Chairman Unit

$> 4.5V \pm 50mV$ = Delegate Unit

7.5.5 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)

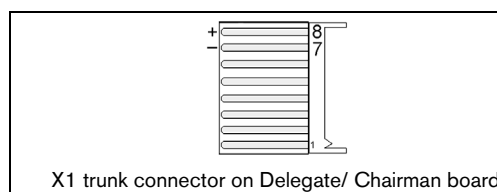
7.5.6 Internal signals for Delegate and Chairman units

7.5.6.1 Power reset

Connect an external adjustable power supply (10-24V) instead of the CPSU power supply connected to X1 (see figure of X1)

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 +20V.

7.5.6.2 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)

7.5.7 Internal signals only for Delegate Units

- See also chapter 7.1 and 7.2 for explanation of the signal modes.

7.5.7.1 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).

7.5.7.2 Maximum number (1,2,3 or 4) of Delegate units that 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)

7.5.7.3 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	M32
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)

7.5.8 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	M33
Test mode	> 4.0V (ORM is activated)
Override mode	< 0.5V (ORM is inactive)

7.5.8.1 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)

7.5.8.2 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)

7.5.8.3 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)

7.6 Measuring spots Delegate and Chairman board with signal description

See chapter 13.11 for location on the boards.

Measuring spots	Signal	Delegate	Chairman
M1	AUDIO-CONTR	yes	yes
M2	System GND	yes	yes
M3	AUDIO-DISTR	yes	yes
M4	CTRL-L1	yes	yes
M5	CTRL-L2	yes	yes
M6	V+	yes	yes
M7	V-	yes	yes
M8	Internal 0V	yes	yes
M12	+5V	yes	yes
M14	POWER-RESET	yes	yes
M15	+15V	yes	yes
M31	TEST	yes	yes
M32	n.a.	yes	NO
M33	n.a.	yes	NO
M34	n.a.	yes	NO
M35	n.a.	yes	NO
M36	n.a.	yes	NO
M37	RMO/TRMO-	NO	yes
M41	MIC-KEY	yes	yes
M42	Chime disable/enable	NO	yes
M43	PRIORITY-KEY	NO	yes
M57	X5 (LSP)	yes	yes
M59	X5 (LSP)	yes	yes
M68	HEADPH	yes	yes
M70	MIC-LED	yes	yes
M72	MIC-KEY	yes	yes
M75	Mic-amplifier out	yes	yes
M82	CHIME	NO	yes
M96	??	yes	yes
M100	UNITTYPE	yes	yes
M101	PRESENCE	yes	yes



Note

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.

8 New microphone assembly on an old delegate-/ chairman unit



Note

This chapter is applicable to delegate-/ chairman unit produced before April 2001 (week 0116).
This chapter supersedes service information 3922 880 71111

8.1 Description

The mechanical construction of the microphone head is simplified. A white plastic disc for light reflection has been removed. The microphone head LED is now produced as one moulding. The construction results in a slightly lower light output of the LED ring.

To make the light output equal to the previous model LED ring some resistors on the unit PCB have to be changed in the field when mounting a new microphone assembly.

Changed item



8.2 Implementation

Type number	Hardware release	Serial number
LBB 3330/00	01-03	032665
LBB 3330/50	01-03	014359
LBB 3331/00	01-03	003156
LBB 3331/50	01-03	001910

Type number	Service number	Factory number
LBB 333x/00	5322 242 10918	3922 156 2022 ²
LBB 333x/50	5322 242 10919	3922 156 2023 ²

8.3 Electrical modifications

There are no drivers on mic LED headboard. These are located on the main board. Electrically is nothing changed in the head.

1. New main board from HW01-03 onwards

A new LED driver circuitry is introduced for the new microphone head construction.

2. Old main board HW01-02 and lower

To make the light output equal to the previous model LED ring some resistors on the unit PCB have to be changed in the field when mounting a new microphone assembly.

8.3.1 Service microphone assemblies identification

Service microphones with new head assembly can be identified with the factory code number.

On the packing are 2 labels,

- Service code number
- Factory code number

The factory code number 12th digit is now ². See table chapter 8.2.

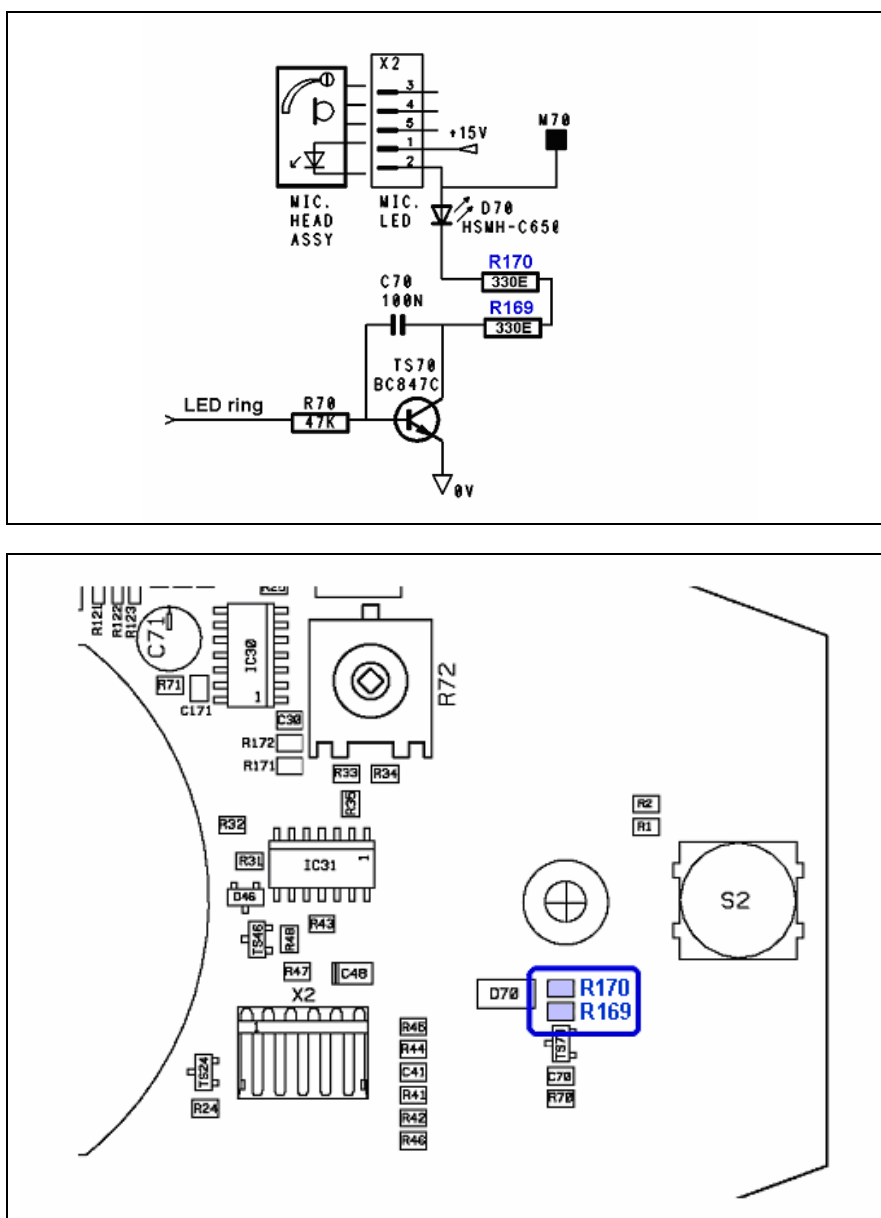
8.4 Field changes of components on the main board

In case the microphone assembly has been replaced and light output of the led ring is too low in respect to the installed units, change the components R169 and R170 on the main board in order to increase the led current.

8.4.1 Delegate- and chairman unit component values

Type numbers	Hardware release	Old mic head led resistors	New mic head led resistors
LBB 3330 & LBB 3331	≤ 01-02	R169 = 330E & R170 = 330E	R169 = 150E & R170 = 180E

8.4.2 Diagram and board layout of HW 01-02



Note

For current version diagram and board layout see chapter 13.10 and 13.12.

9 Replacement of the microphone capsule

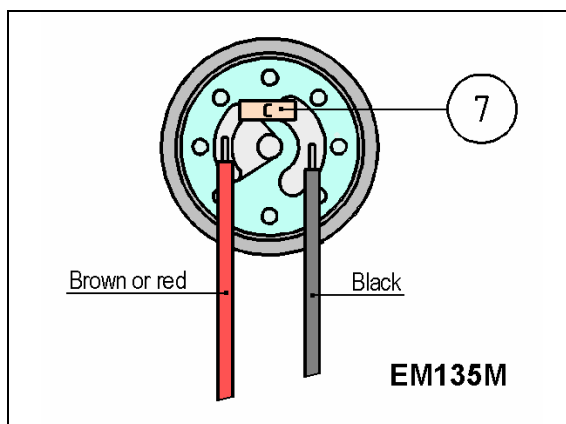
See chapter 13.15 for the exploded view of the microphone head assembly and chapter 12.4 for the ordering numbers.

Required parts:

- Microphone capsule
- Capacitor
- Microphone cap

9.1 Preparation

Solder on the rear side of the new microphone cartridge careful the capacitor C (7).



9.2 Disassembly

- Push the cams of the microphone cap (1) inwards via the slits in the cover housing and remove the cap (1). *(Some cams will break. For this reason order a new microphone cap).*
- Unhook the tags of the suspension (3) Take the capsule (2) with you fingers and turn the capsule counter clockwise in order to straighten the wires. (The microphone wires are factory twisted).
- Pull the capsule outside the cover housing.
- The wires are not long but just long enough to unsolder the wires of the capsule.
When removing the wires with a soldering iron, take care not to damage the cover housing.

9.3 Re-assembly

- Remove careful the rubber suspension (3) from the old capsule and fit this on the prepared new capsule.
- Take the new capsule and solder the wires on the correct position. (See figure chapter 9.1).
- Twist the wires clockwise and put the suspension with capsule (2,3) back inside cover housing.
- Hook the 4 suspension tags on the suspension cams in the cover housing.
- Mount a new Microphone cap (1).



Note

After re-assembly of the complete unit the microphone sensitivity has to be re-adjusted. See chapter 5 for procedure.

10 Trunk cable interconnections

10.1 Pin numbers delegate- and chairman extension trunk cable

Pin number	Function	Color
1	Audio contribution	White
2	Coax shields 2x	
3	Audio distribution	Violet
4	Control line -1	Yellow
5	Control line -2	Green
6	Power supply +	Red
7	Power supply -	Blue

Note

Control line wires 1 and 2 are twisted pair (pin4+5).

Audio contribution (pin 1) and audio distribution (pin 3) wires is individual coaxial screened (pin 2).

Male
DIN 45329

Female
DIN 45329

Backside connectors

Extension trunk cable LBB 3316/xx

Male

Female

Backside of connectors

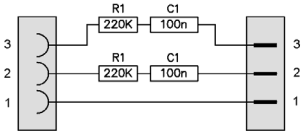
Connector to X1 on PCB
Lift connector to remove

Delegate trunk cable

10.2 LBB 3316/00 – CCS800 extension cable and connectors

CCS800 trunk cable	Bosch type nr	Bosch code nr.
Installation cable 6mm Ø, 100 meter with set of 5 male and female connectors	LBB 3316/00	8900 331 60005

CCS800 trunk cable connectors	Hirschmann type nr.	Hirschmann code nr.	Hirschmann model
Male: 7-Pol. DIN Cable-Plug	MAS70S	930 356-500 (black) 930 356-517 (grey)	
Female: 7-Pol. DIN Cable-Socket	MAK70S	930 388-517 (grey)	

Attenuator	SLB code nr	Diagram	Attenuator model
Microphone input attenuation 50dB. XLR microphone socket X9.	3938 042 00031		

11 Mounting instruction new CPSU board in old LBB 3310/00

The CPSU board layout and mounting holes of the 'Bosch' version is different from the old 'Philips' one. In case a new model 'Bosch' CPSU board have to be mounted in an old 'Philips' LBB 3310/00, follow the modification instructions explained below.

11.1 Needed tools and parts

Tools:

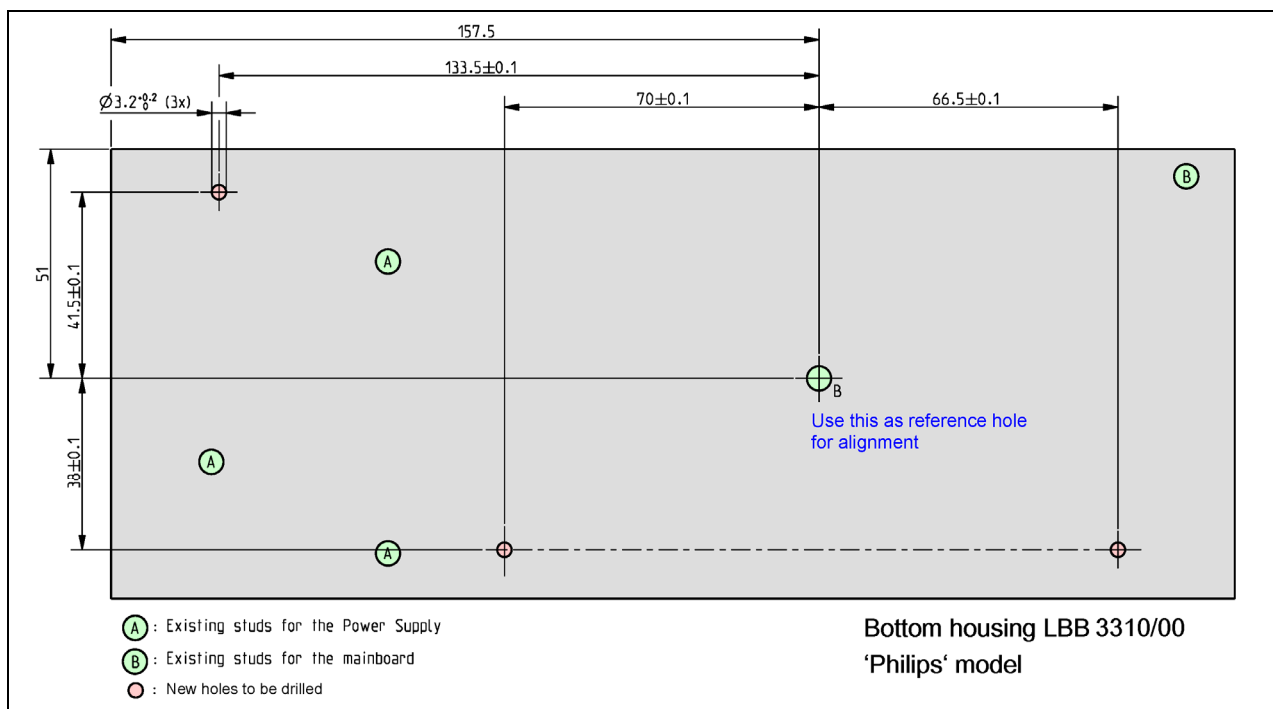
- Drilling machine, screwdriver and socket spanner 3 mm.
- Drill 3.2 mm.
- Countersink drill.
- Alu or plastic sheet for drilling template.

Fixing material:

- 3x countersunk-head screw M3 x 8 or 10 mm.
- 3x distance bush 3.2 x 5 mm.
- 3x washer 3.2 mm.
- 3x nut M3.

11.2 Drilling instructions

1. Make a drilling template according the dimensional sketch. Use the indicated reference hole 'B' for the dimensioning of the new holes to be drilled.
2. Place the drilling template over the existing studs in the bottom housing.
3. Drill the 3 holes.
4. Mount the new CPSU board in the bottom housing with the listed fixing material.



12 Spare parts

12.1.1 Ordering spare parts

Spare parts can be ordered with their unique Service code number through the local Bosch representative.

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

Please note that some parts are delivered only in standard quantities of 10, 20, 50 or 100 pieces depending on their price.

12.2 CPSU spare parts list

- Pos Nrs. Spare part tables.
The listed numbers are corresponding with numbers in the exploded views, board layouts and circuit diagrams.
- Parts for central repair
Items in the spare part lists indicated with a '(R)' behind the service code is subject for 'Carry In' central repair (see chapter 1.4 and 1.5).

12.2.1 LBB 3310/x0 CPSU – Mechanical spare parts

Pos Nr	Description	Service Code
1	Upper housing part CPSU – Philips	5322 441 12204
1	Upper housing part CPSU – Bosch	3922 156 28120
3	Knob control gray – Philips	5322 410 11877
3	Knob control silver – Bosch	3922 150 05100
4	Knob on/off green – Philips	5322 410 11878
4	Knob on/off silver – Bosch	3922 150 05110
6	Power switch + cable assembly	5322 276 13983
9	Loudspeaker PF302 (3 Inch)	5322 240 30708
10	Loudspeaker spring	5322 492 11411
12	Appliance inlet 2p+e 10a	5322 265 11323
16PH	Locking card spacer – Philips CPSU only	5322 532 13025
17	Ring for knob	5322 532 12783
20	Flat cable assembly 2x10p 240mm	5322 320 12373
23	Foot bottom rubber, black	5322 462 11084
29	Mains cord 2mtr, EUR version	5322 321 11422
29	Mains cord 2mtr, USA version	5322 321 11423
	Attenuator 50DB (accessory for XLR mic input)	3938 042 00031

12.2.2 LBB 3310/00 CPSU – Printed board assemblies

Pos Nr	Description	Service Code
13	Power supply unit 24V (R)	5322 218 11902
18	CPSU board for LBB 3310/00 – Bosch (R)	3922 156 30410

12.2.3 LBB 3310/10 CPSU – Printed board assemblies

Pos Nr	Description	Service Code
13	Power supply unit 24V (R)	5322 218 11902
18	CPSU board for LBB 3310/10 (R)	3922 156 28140
28	AFS board for LBB 3310/10 (R)	3922 156 28220

12.2.4 LBB 3310/x0 CPSU – Printed board spare parts

Pos Nr	Description	Service Code
B1	LED green	5322 130 11298
R199	Trim potmeter 1K lin 10% - gain mic	5322 101 11902
R200	Trim potmeter 50K lin 10% - gain rec	5322 101 11901
R201	Potmeter 10K log 20% - volume	5322 101 11763
S1, S4	Slide switch 2-pos.	5322 277 21434
S2	Rotary switch binary	5322 273 10352
S3	Rotary switch 11-pos	5322 273 10353
T1	Output transformer 0,1W	5322 146 11015
X2, X3	Audio socket bus DIN 7p	5322 267 50547
X8	Headphone socket	5322 265 11327
X9	XLR socket 3p	5322 265 11325
X11	4 pin jack assembly	5322 265 11326
X12	6 pin jack assembly	5322 265 11324
SMD parts		
D1	Vreg 15V MC7815acdr2	9338 856 30668
D2	Volt Prec Ref TI431bcd2	9322 097 54668
D3	Vreg Adj 100mA LM337lm	9339 800 00668
F1	Fuse Resettable (Ptc)	2422 549 43711
N1-N2,N5-N7	Op Quad MC33179D So14	9322 070 18668
N3-N4	Comparator Quad LM339D	9336 559 60623
V1-V3	Diode BAV99 (A7) Sot23	9332 153 70215
V32-V33, V35-V58	BZX284 C33 Zp Sod110	9340 388 00115
V34,V59	BZX284 C3V3 Yr Sod110	9340 385 60115

12.3 Delegate- and chairman unit spare parts list

12.3.1 LBB 3330/x0 Delegate unit – Mechanical spare parts LBB 3331/x0 Chairman unit – Mechanical spare parts

Pos Nr	Description	Service Code
5	Thumbwheel	5322 410 11108
6	Ring for thumbwheel	5322 532 12783
7	Upper housing delegate ccs800 incl. mic. Knob – Philips	5322 442 01417
7	Upper housing delegate ccs800 incl. mic. Knob – Bosch	3922 156 27800
7	Upper housing chairman ccs800 incl. mic. & prior. knob – Philips	5322 442 01418
7	Upper housing chairman ccs800 incl. mic. & prior. knob – Bosch	3922 156 27810
15	Loudspeaker PF302 (3 Inch)	5322 240 30708
16	Loudspeaker spring	5322 492 11411
17	Loudspeaker cable assembly (without sleeve)	5322 320 11887
22	Washer 19mm	5322 532 13026
23	Hex. Nut M18x0.75mm	5322 505 11265
24	Retaining ring 19mm	5322 532 13027
29	Clamping bracket	5322 401 11692
31	Foot plastic transparent adhesive (older series)	5322 462 41686
31	Foot rubber, black	3922 150 03930
33	Sealing ring for headphone socket	5322 532 12784

37	Damping foam disc for loudspeaker	5322 466 11983
38	Trunk cable assembly male 7p CCS800 – Bosch	5322 320 12374

12.3.2 LBB 3330/x0 Delegate unit – Service assemblies LBB 3331/x0 Chairman unit – Service assemblies

Pos Nr	Description	Service Code
1	Delegate board CCS800 – Philips	5322 214 12778
1	Delegate board CCS800 – Bosch (R)	3922 156 20200
1	Chairman board CCS800 - Philips	5322 214 12779
1	Chairman board CCS800 – Bosch (R)	3922 156 20240
20	Microphone CCS800 assembly short	5322 242 10918
20	Microphone CCS800 assembly long	5322 242 10919

12.3.3 LBB 3330/x0 Delegate unit – Printed boards spare parts LBB 3331/x0 Chairman unit– Printed boards spare parts

Pos Nr	Description	Service Code
R54	Potmeter 10k volume headphone	5322 101 11763
R72	Trim potmeter 10k microphone	5322 101 10714
S1, S2	Push switch micro and prio	5322 276 13533
S37, S42	Slide switch 2-pos.	5322 277 11793
T5	Output transformer 0,1W	5322 146 11015
X6, X7	Headphone socket	5322 267 31808
X11	Audio con socket 7-p DIN	5322 267 50547
SMD parts		
D1-D6	BZX84 C33 Y12 Sot23	9333 883 40215
D70	LED Hsmh-C650 Red	9322 080 60685
D7-D8-D87	Diode BAV99 (A7) Sot23	9332 153 70215
IC10	Vreg 15V MC78L15acdr2	9338 856 30668
IC15	Vreg 5V LM78L05acm-x So8	9339 773 50668
IC20,IC50,IC80	Op Quad MC33179D So14	9322 070 18668
IC30-IC31	Comparator Quad LM339D	9336 559 60623
R9	Fuse Resettable (PTC)	2422 549 43711

12.4 Microphone head spare parts

Pos Nr	Description	Service Code
1	Microphone cap	5322 462 10804
2	Microphone capsule EM135M	2422 549 44537
3	Suspension, rubber	3922 150 03761
7	Capacitor 1nF 50V Smd 2% 0805	2238 861 14102

13 Illustrations

Index

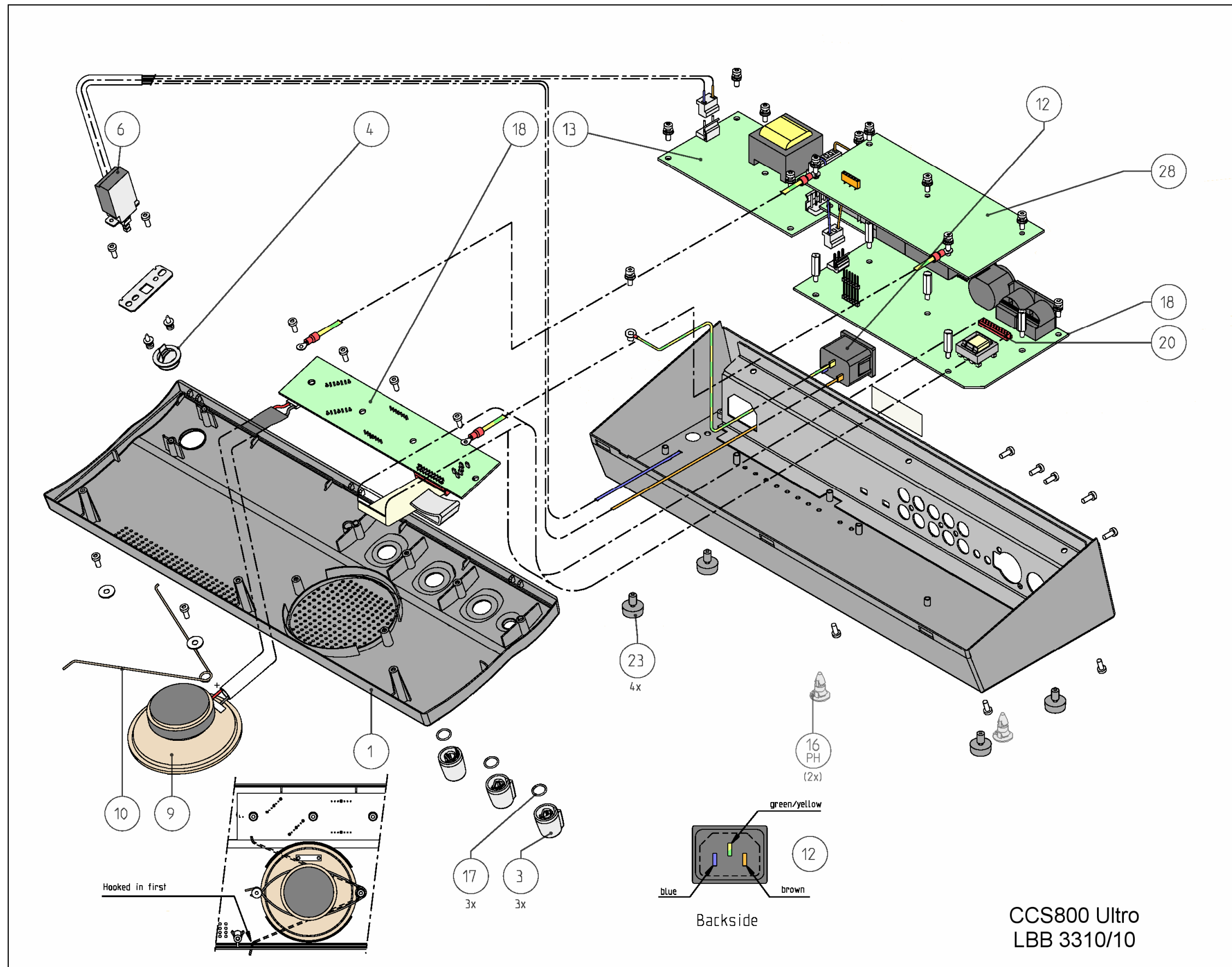
- 13.1 Exploded view CPSU.
- 13.2 Board layout CPSU.
- 13.3 Measuring points CPSU board.
- 13.3.1 Bottom view CPSU board section mounted in top cover.
- 13.4 Circuit diagrams CPSU (sh 1/4) – Supply and logic.
- 13.5 Circuit diagrams CPSU (sh 2/4) – Gain control and mode select.
- 13.6 Circuit diagrams CPSU (sh 3/4) – Audio input and output.
- 13.7 Circuit diagrams CPSU (sh 4/4) – External microphone input.
- 13.8 Board layout AFS PCB.
- 13.8.1 Jumpers and connectors.
- 13.9 Exploded view delegate/ chairman unit.
- 13.10 Board layout delegate unit.
- 13.11 Measuring points delegate and chairman unit.
- 13.12 Circuit diagram delegate unit.
- 13.13 Board layout chairman unit.
- 13.14 Circuit diagram chairman unit.
- 13.15 Microphone assembly.
- 13.15.1 Exploded view microphone head.
- 13.15.2 Led diagram and board layout.
- 13.15.3 Wiring of the microphone assembly.



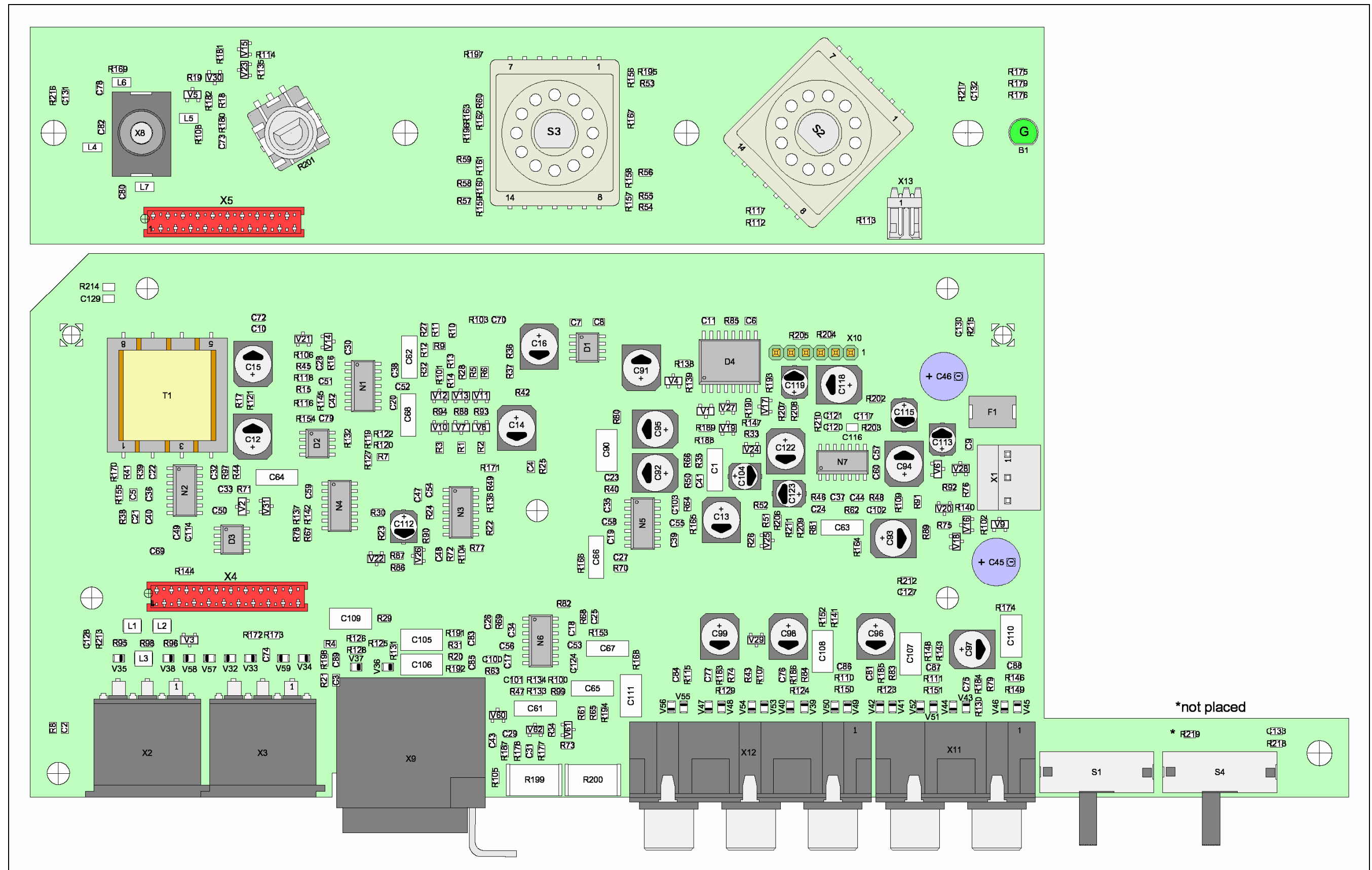
Note

Illustrations from 13.1 to 13.4 are in A3 format.

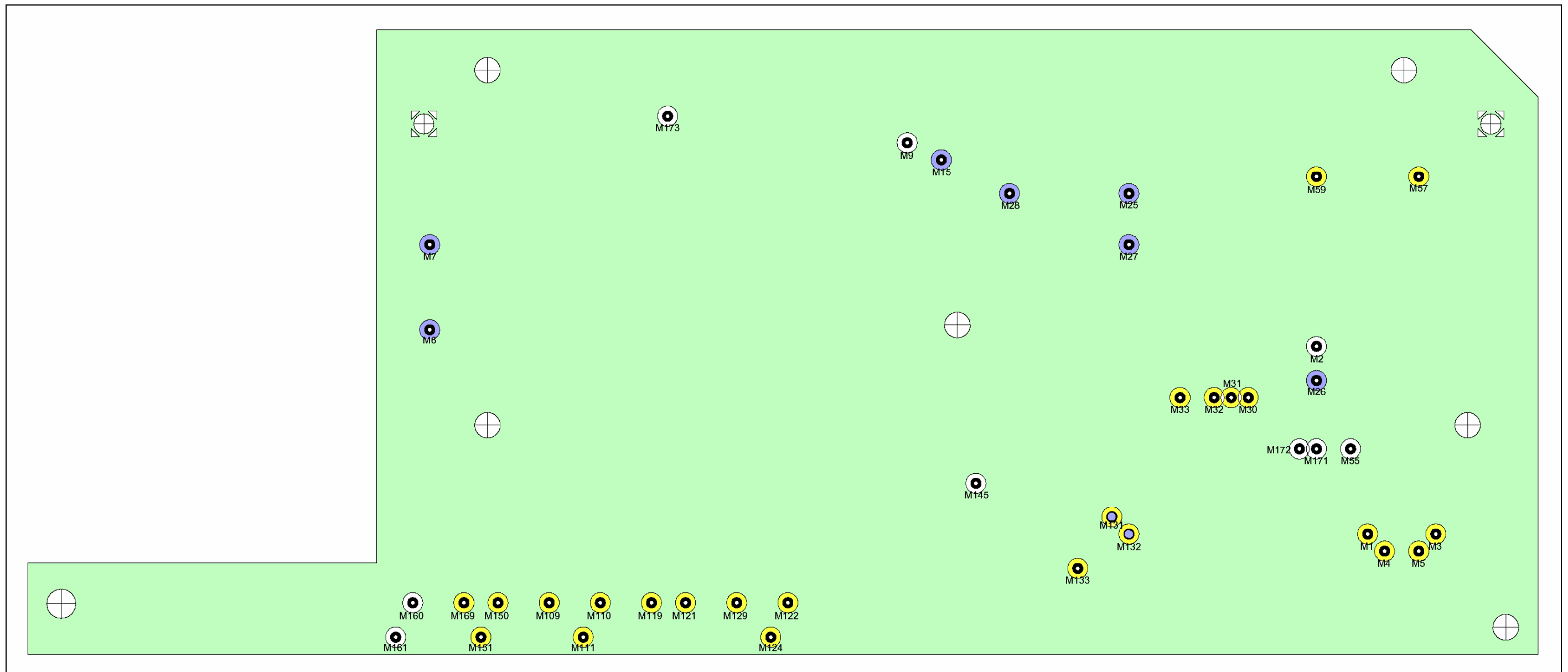
13.1 Exploded view CPSU



13.2 Board layout CPSU



13.3 Measuring points CPSU board



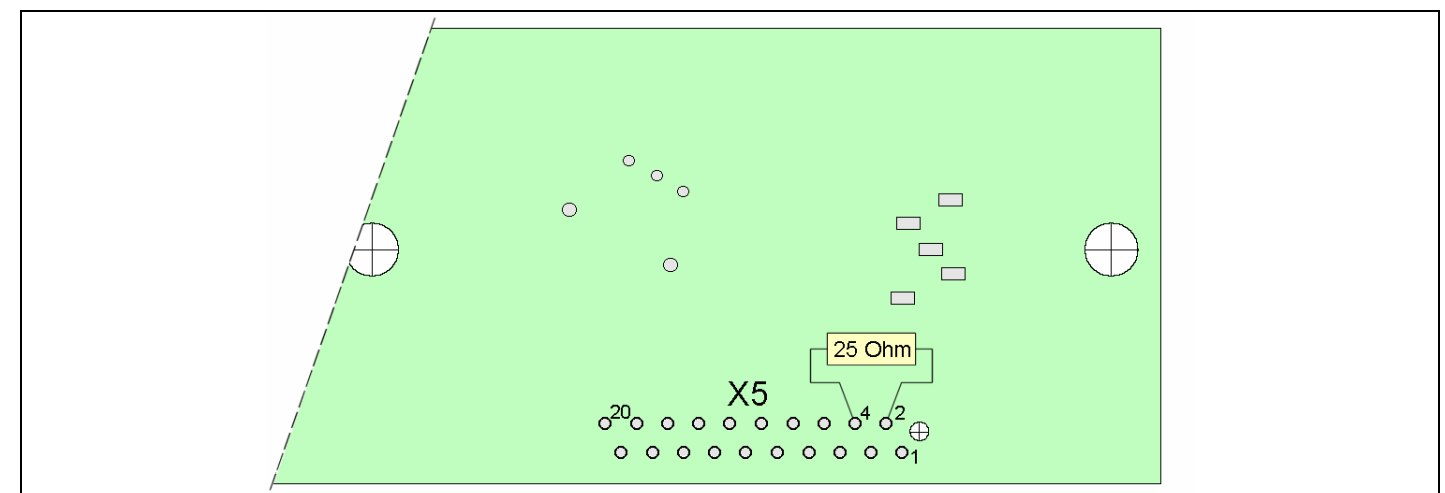
For measuring points description CPSU board, see chapter 7.4.

The blue coloured measuring spots are supply voltages described in chapter's 7.3.2 and 7.3.3

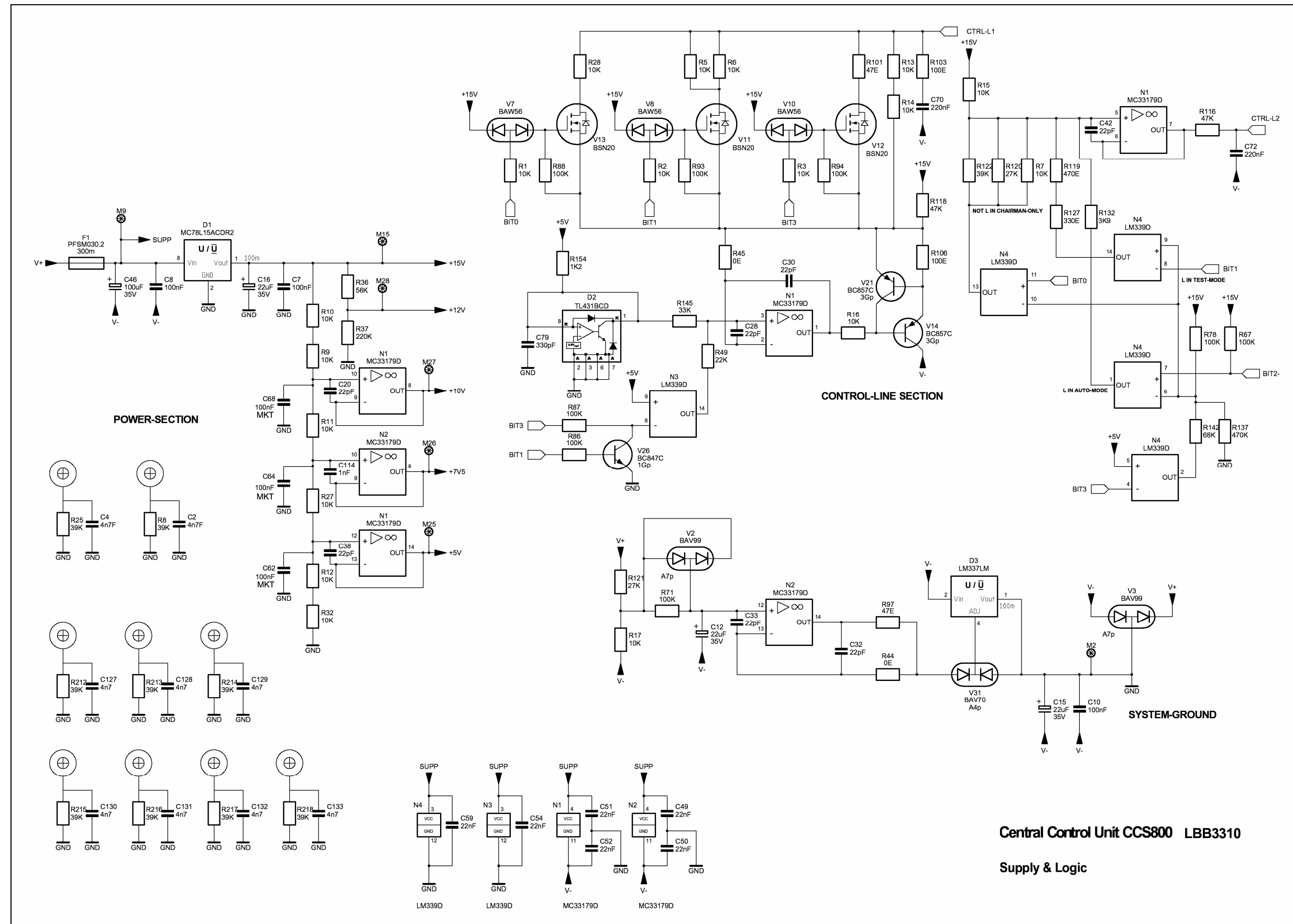
The yellow coloured measuring points are mentioned in the tests described in chapter's 7.3.5 till 7.3.15.

13.3.1 Bottom view CPSU board section mounted in top cover.

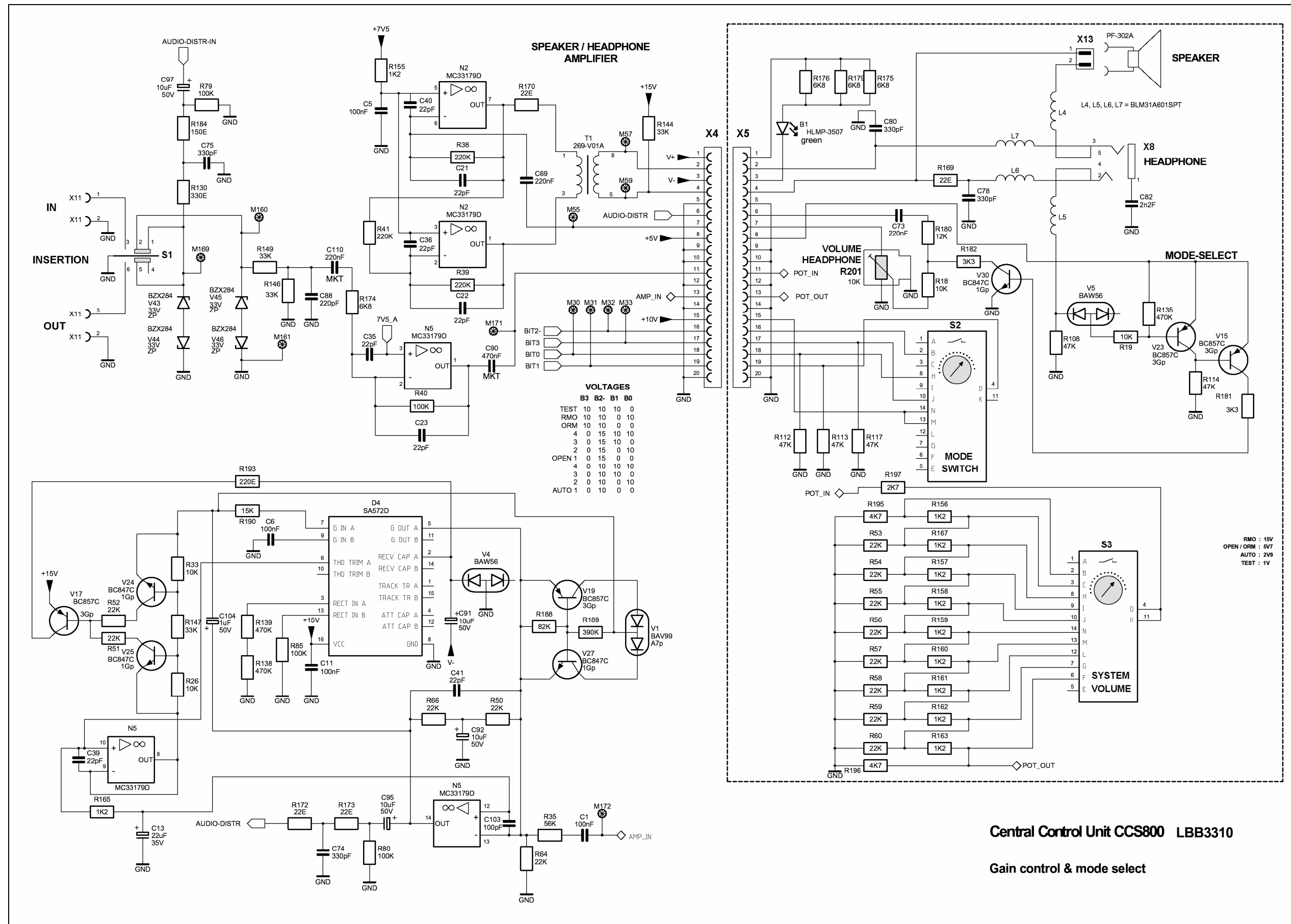
For the tests described in chapter 7.3 you have to disconnect the loudspeaker. In the illustration left is indicated where the resistor should be temporary soldered.



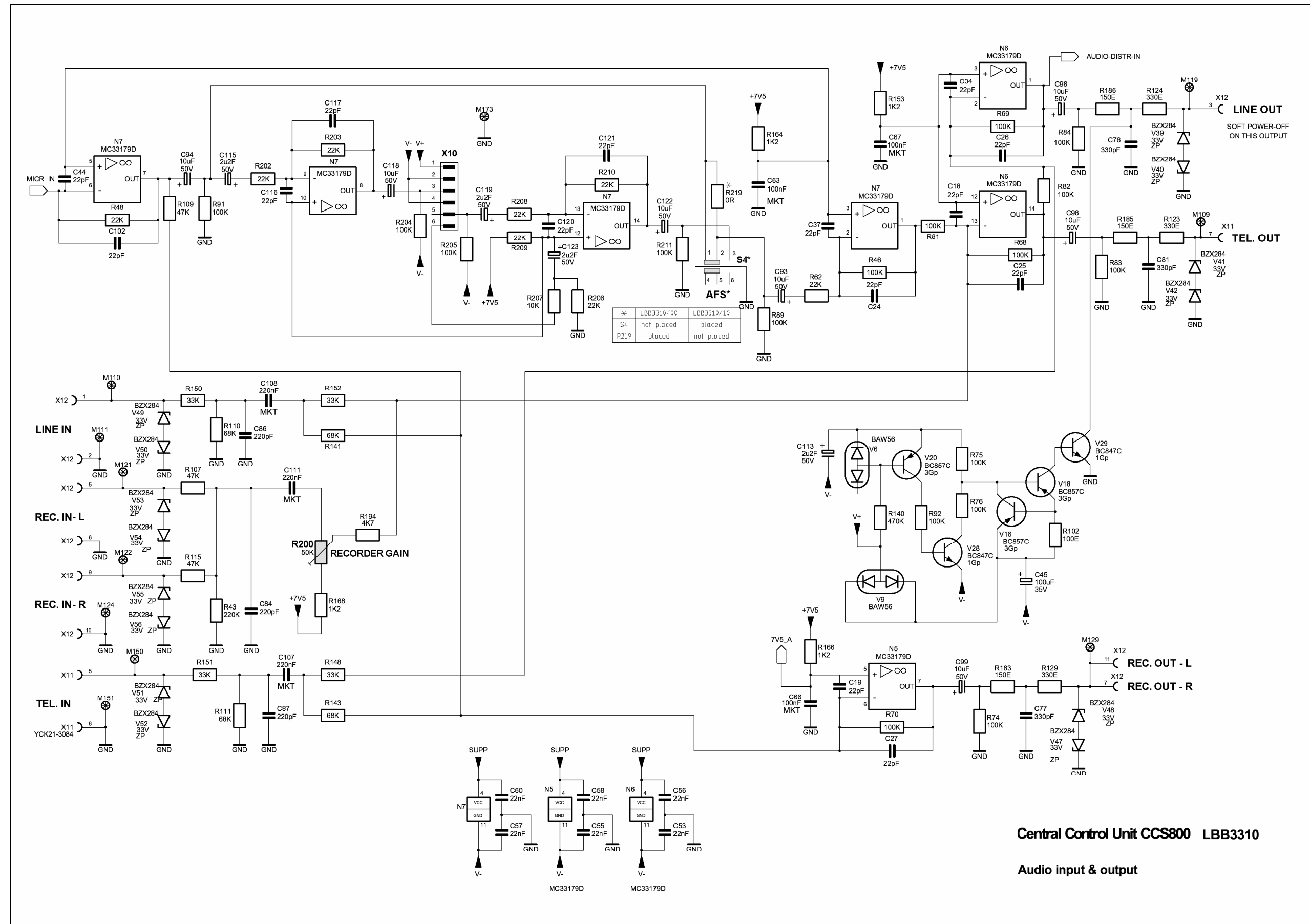
13.4 Circuit diagrams CPSU (sh 1/4) – Supply and logic



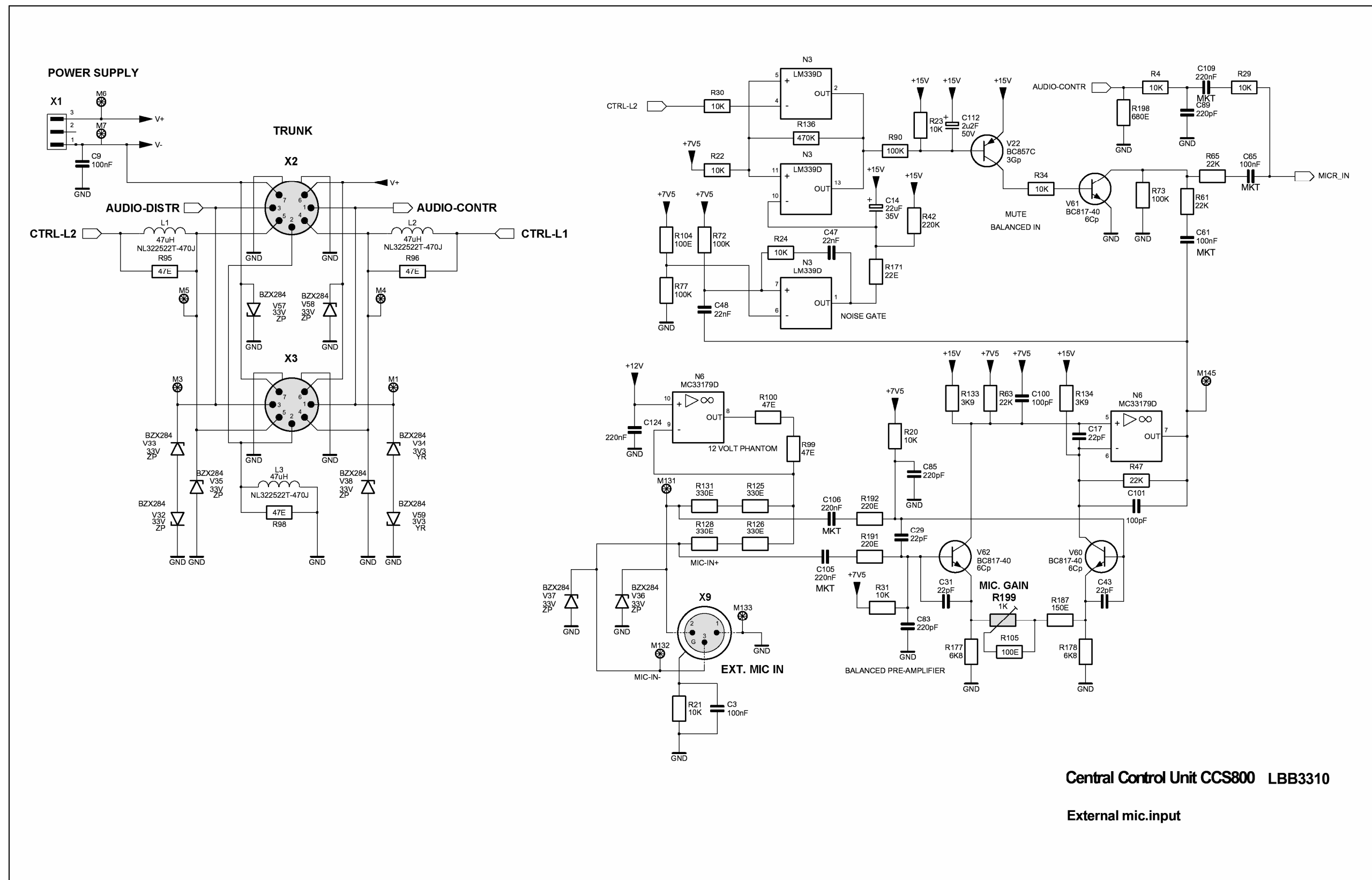
13.5 Circuit diagrams CPSU (sh 2/4) – Gain control and mode select



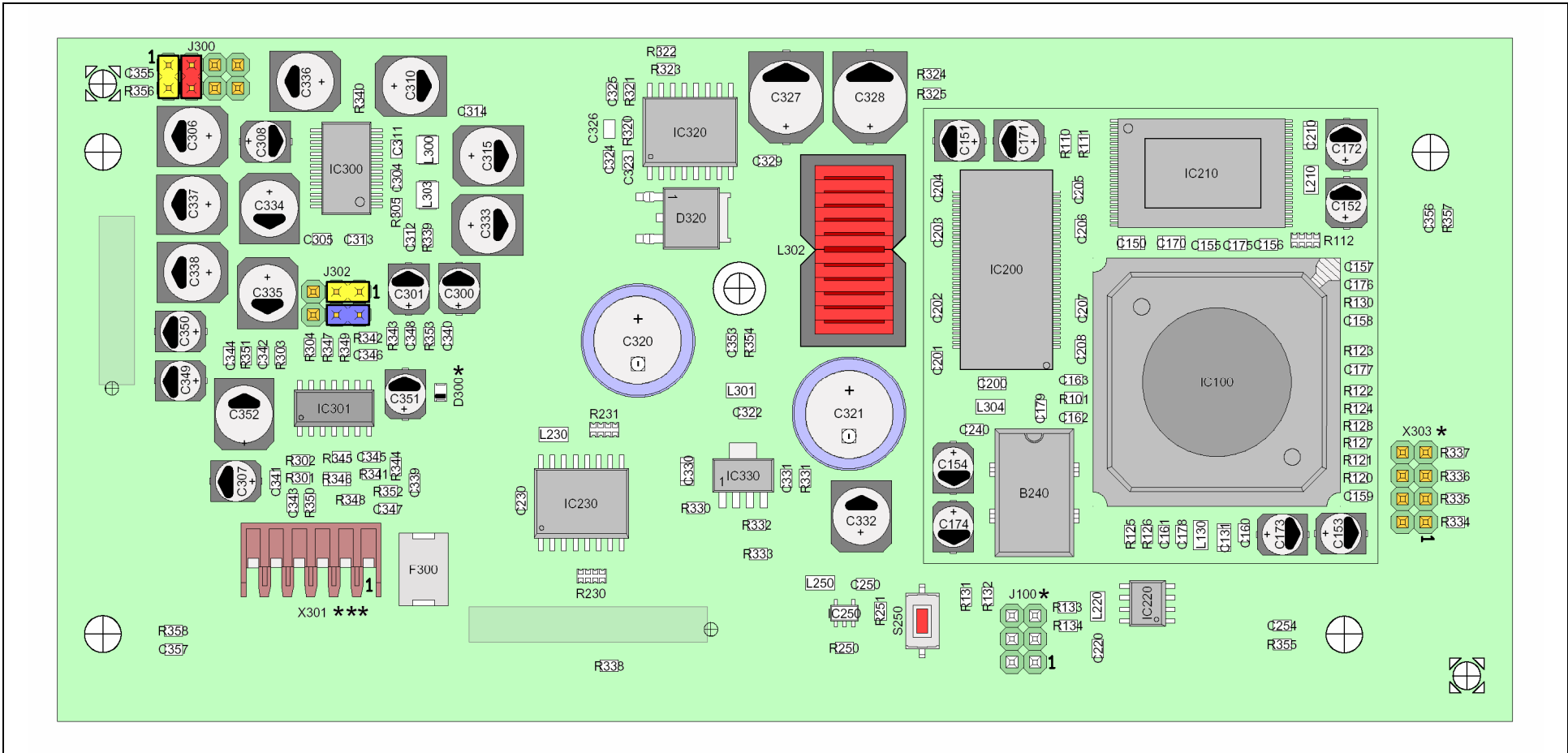
13.6 Circuit diagrams CPSU (sh 3/4) – Audio input and output



13.7 Circuit diagrams CPSU (sh 4/4) – External microphone input



13.8 Board layout AFS PCB



13.8.1 Jumpers and connectors

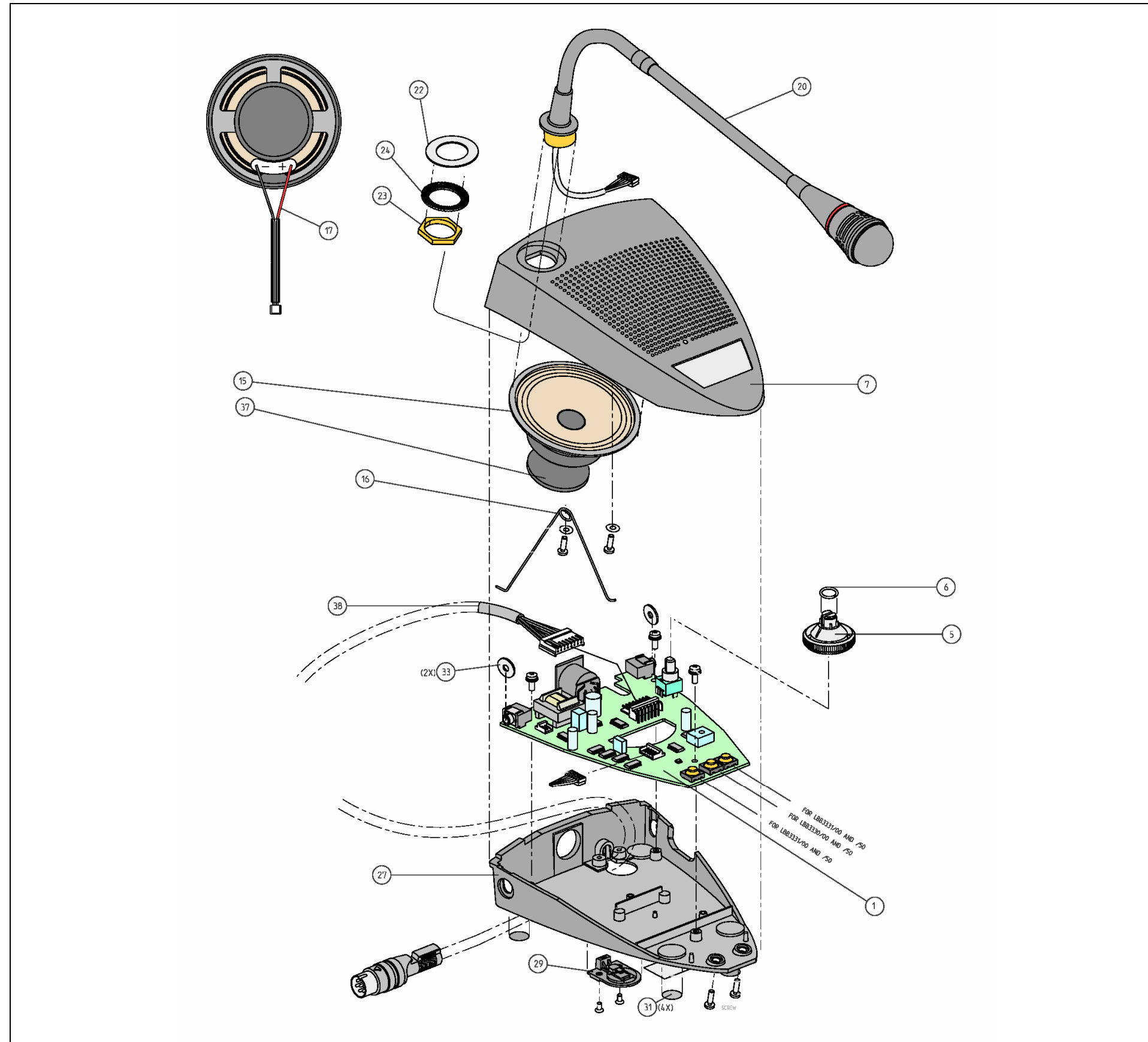
J300	Horizontal placed
Jumper position	Function
1-3	Input1 CCS800
2-4	Input1 CCS800

J302	Vertical placed
Jumper position	Function
1-2	Analog audio input
3-4	Analog audio output

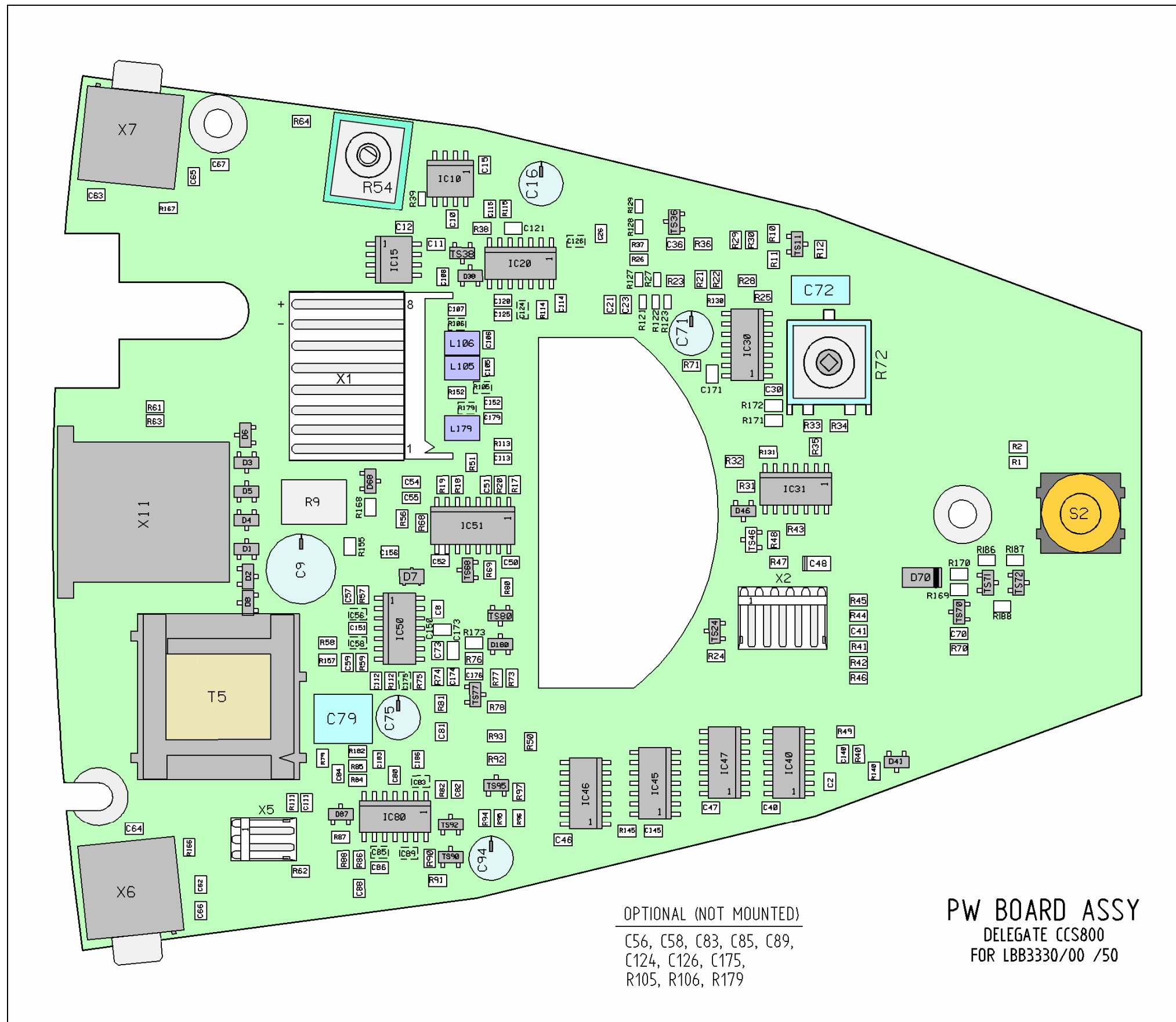
X301	
Pin number	Signal name
1	+VDC
2	GND
3	Audio In
5	Audio Out
4-6	AGND

J100 and X303
Both factory use

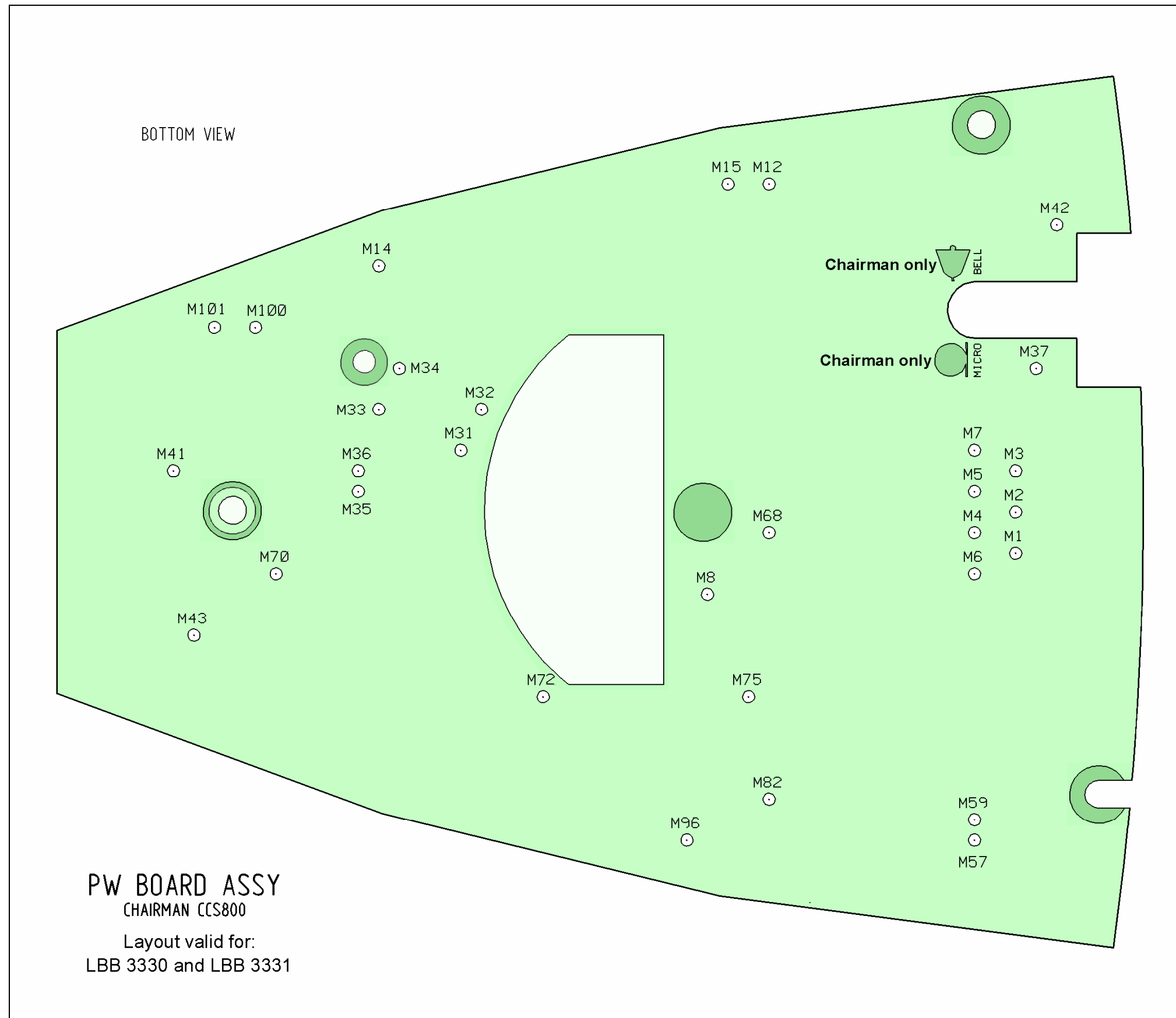
13.9 Exploded view delegate/ chairman unit



13.10 Board layout delegate unit



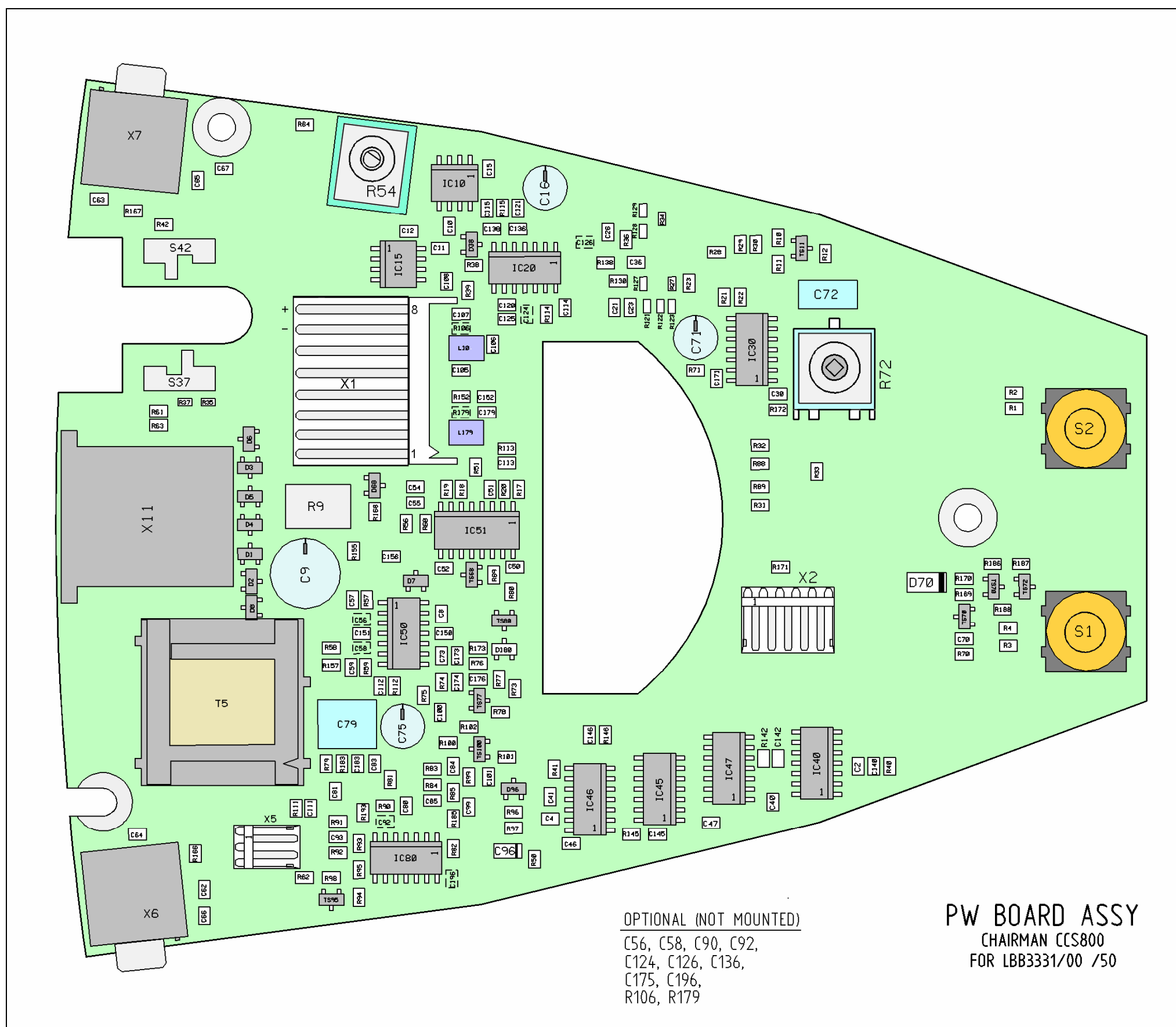
13.11 Measuring points delegate and chairman unit



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13.13 Board layout chairman unit



NOT USED PARTS.

IC NO	TYPE	SUPP	+15V	+5VA	+5V	0V	V-
20	33179	4					I1
30	LM339	3				12	
40	HC74			14	7		
45	HC32			14	7		
46	HC14			14	7		
47	HC08			14	7		
50	33179	4					I1
51	4853			16	7, 8		
80	LM324	4				11	

C56, C58, C92, C124, C126, C136, C196 ARE RESERVED COMPONENTS
R106, R179 ARE RESERVED COMPONENTS

Chairman Unit CCS800 – LBB 3331

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3922 880 21112 – revision 01-0501

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