CCS 400

Field Service Manual

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Second issue

Philips
Communication
Security & Imaging

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CCS 400 Introduction

Tab 1

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CHAPTER 1 INTRODUCTION

Central Supply Unit/Interface (C.S.U.) LBB 3300/xx

- The CSU controls the maximum number of simultaneously switched "on" microphones.
- The CSU provides:
  - volume control of the whole system.
  - the priority attention signal.
  - 3 dB attenuation of the Audio signal when two or more microphones are switched on.
- The CSU provides the supply voltage for the delegate units and chairman unit.
- Two chains of maximum 35 units can be connected.
- Maximum 18 6ch. interpreter desks can be connected to the system.
- Distribution to channel selectors can be provided, when a Monitor Distribution Board (MDB) is inserted. Simultaneous distribution via a transmitter is possible.
- A telephone coupler-, tape recorder-, and line in/line out connector is available.
- By equipping the central supply unit with a plug-in unit (LBB 3302/00), a hand microphone can be connected.

LBB 3300/xx **Central Supply Unit (CSU)**

- Completely pre-wired unit with a basis PCB, a contribution panel, and power transformer.
- Two internal connectors are available to connect a roving microphone plug-in unit, and an interpreter monitor panel + Monitor Distribution Board.
- Mains switch on the rear side.
- Connection for delegate's, Tel. coupler, recorder, line-in/out, and if applicable a hand-microphone, are all to be found on the front side of the unit.
- When the interpreter/monitor panel is added to the system, connections for distribution, monitoring, transmitter and interpreters units, are also located on the front of the unit.

LBB 3301/00 **Interpreter + Monitor distribution Panel**

- Can be connected internally into the central supply unit via the contribution panel to the basic PCB.
- Interfaces the 6ch. interpreter desks to the system and if applicable to Monitor Distribution Board.
- The panel also provides three extra external connectors, for a monitor unit, a transmitter and distribution.

LBB 3302/00 **Handmicrophone plug-in unit + handmicrophone**

- Can be connected internally into the central supply unit via the contribution panel to the basic PCB.
- Interfaces the handmicrophone to the central supply unit, therefore acting like a normal delegate's unit.

LBB 3203/00 **Monitor Distribution Board (MDB)**

- Connected internally to the 3301/00.
- Provide ch1/ch6 and floor to be monitored by the program selectors. (distribution)
- A selected channel is amplified together with the comm. signal and routed via 3301/00 to the monitor connector.

LBB 3350/04 **Table Top Delegate Unit**

- Built in loudspeaker and microphone.
- Microphone on/off button, pilot lamp, microphone "ON" indication lamp and microphone request lamp.
- The mic. on/off button only becomes a request button, when use is made of a central control desk.
- Jack for headphone connection.
- Automatic delayed mic. switching off circuit.

LBB 3350/02 **Table Top Delegate Unit**

- Identical to 3350/04, but without built in loudspeaker.

LBB 3351/04 **Table Top Chairman Unit**

- Built in loudspeaker and microphone.
- Microphone on/off button, pilot lamp and microphone "ON" indication lamp.
- Priority microphone function.
- Jack for headphone connection.

LBB 3351/02 **Table Top Chairman Unit**

- Identical to 3351/04, but without built in loudspeaker.

LBB 3305/00 **Delegate's extension cable**

- Extends the connection between two delegate units, and/or between delegate's unit and chairman unit.

LBB 3221/00 **6ch. interpreters desk .**

- Microphone signal amplifier, with AVC.
- Monitor section for headphone or loudspeaker.
- Switching circuit to allow the microphone- or floor signal to be switched to one of the chosen channels. .
- Microphone mute switch.

LBB 3222/xx **6ch. interpreters desk . see service manual 4822 733 24417**

LBB 3186/41 **Central control desk**
LBB 3186/71
LBB 3186/11

- Central control of 40 respectively 70 delegate units.
- Central control PCB.

CHAPTER 2 BRIEF DESCRIPTION OF CSU AND PERIPHERALS

1 Discussion

Pressing the microphone button S1 on the delegate unit, the microphone signal is switched via a pre-amplifier to the audio line. The switching function is provided by the switching control circuit (SCC). The loudspeaker is automatically switched “OFF”, and the microphone “ON” LED indication plus the pilot LED’s are switched “ON”. After pressing the microphone button again, the microphone signal will be cut of the audio line. The audio signal on the audio line has now been amplified by its associated audio amplifier, and applied to the loudspeaker. The SCC also switches the microphone LED and the pilot LED “OFF”. The disable request line, from the central supply unit ensures that the maximum number of switched “ON” microphones (adjusted via S102 on the CSU) cannot be exceeded.
New delegates cannot switch on their microphones, because the SCC has been reset by the high active disable request line.

The audio level comparator in every delegate unit, compares the superimposed audio signal, with the microphone signal, i.e. when a delegate does not speak into his microphone for approximately 30 seconds, the microphone will automatically be switched “OFF”.

2 Conference

When using the central control desk, the switching control circuit automatically ensures that the microphone button S1, is given the function of the microphone request button. The SCC senses the central control unit, by a D.C. level on the remote control line. When the D.C. level is low, a central control desk is used and the signal from the microphone button is sent via the request line, to the central control desk, i.e. after a microphone has been requested, the request LED on the delegate’s unit, and the request lamp on the central control desk are switched “ON”. By a high D.C. level on the remote control line to the delegate unit, the microphone will be switched on via the switching control circuit. The microphone “ON” LED and the pilot LED are switched “ON” and the request LED and loudspeaker are switched “OFF”.
By switching on via the remote line, the delegate’s microphone can only be switched “OFF” by the remote line, or by the delegate himself using his microphone button.
The central control desk operator is also able to switch on a microphone remotely even when a delegate does not request it. After a while the microphone can be switched off by the operator.

3 Chairman

The chairman’s unit has the same function as the delegate unit, switch S1 controls the on/off, and with the addition of a priority button S2, the chairman is able to gain priority with his microphone.

When S2 is pressed; and remains pressed, the switching control circuit switches “ON” the microphone, and simultaneously switches the microphones LED and pilot LED “ON”. The loudspeaker will automatically be switched “OFF”.

Pressing S2, allows a low D.C. level to be switched, ensuring that every delegate unit; control circuit is reset, causing the delegates units to be automatically switched “OFF” and their loudspeakers switch “ON”.
Upon receiving the low DC level on the priority line, the central supply unit sends a priority attention signal to the audio line, causing a signal to be heard on every delegate unit allowing the chairman to gain priority.
Releasing the priority button S2, the chairman’s microphone will be switched “OFF” and the loudspeaker switched “ON”. The D.C. level on the priority line increases, causing the switching control circuits not to be reset, therefore all delegates can manually switch on their microphones as normal. The chairman’s unit is not equipped with an audio level comparator, therefore his microphone is not automatically switched “OFF” when the delay time is exceeded.

Using the central control desk, the microphone request, function can be remotely controlled. The chairman must indicate to the operator of the central control desk, that he requires remote control.
The operator at the control desk, switches via the remote control line the chairman request, for microphone “ON”.

The central control desk operator is also able to switch on/off the chairman microphone even when the chairman does not requests for it. When e.g. the chairman forgets to switch off his microphone the operator is able to carry out this function.

4 Handmicrophone

The hand-microphone is connected directly to the central supply unit by means of a plug-in unit. The plug-in unit has the same functions as the delegate unit but without a loudspeaker.
The microphone signal is switched from the pre-amplifier, via the connection panel to the audio line.

5 Basic Printed Circuit Board and Connector Panel

When the chairman requests priority, the D.C. level on the priority line is low (e.g. 1.5vdc), causing the oscillator on the basic print circuit board to be reset. The oscillator generates a priority tone via the summing pre-amplifier, and is then switched onto the audio line. In all the delegate loudspeakers, the priority tone will be heard.
Signals via the summing amplifier, line in, tape recorder, and telephone coupler are switched to the audio line. The summing amplifier mixes the applied input signals, and the resultant output signal is connected to the audio line. The internal audio line is via X2-21, and via the attenuator circuit on the connector panel (S101), routed to the two delegate chains BU101, and BU104, and finally to the hand-microphone plug-in unit.

The audio line is amplified by three separate amplifiers, A, B, and C. Amplifier A, amplifies the audio signal for the telephone coupler, amplifier B, for the line-out, and amplifier C for the tape recorder and interpreters monitor panel LBB 3301, (Floor Signal). Provision is also provided for superimposing the audio signal onto the D.C. level, for the disable request line. Tape- recorder, lineout, and telephone coupler outputs are provided via the connector panel to BU106, BU102, and BU105. The disable request signal on the connector panel is distributed into three directions, via BU101 for delegate chain 1, via BU104 for delegate chain 2, and internally to the hand-microphone plug-in unit. The floor signal is routed via the connector panel to the interpreters monitor panel.

The audio line stabiliser on the basic print circuit board stabilises a DC level on the audio line to a constant value. Due to the load on the audio line, the feedback from the stabiliser is adjusted automatically, i.e. an increasing DC level is decreased, and a de-creasing level is increased.

The attenuator control circuit provides a control signal to the 3db-attenuator circuit on the connector panel. When two or more microphones are switched ”ON” simultaneously. The input level of a comperator in the control circuit exceeds a certain reference level. The comperator then provides a control signal to the attenuator on the connector panel, which in turn is activated and attenuates the audio signal with 3db.

With S101 connected to the audio line it is possible to adjust the level from the audio for the loudspeakers and the line out signal in steps of 3dB.

The limiter limits the number of microphones, which can be switched “ON” simultaneously, by transferring a DC level onto the disable request line, when the maximum number of microphones is reached. New speakers cannot switch “ON” their microphones as long as the number of microphones is at a maximum. The maximum number of microphones can be increased / decreased by adjusting S102 on the connector panel, located on the front side of the central control desk. S102 is a three positioned switch, allowing 1, 3, or 6 microphones to be added, provision is also provided for a control signal to switch “OFF” the audio level comparators, in every delegate’s unit.

When a telephone coupler is used without a fork circuit, the telephone signal, which is sent to the CSU, amplified and returned to the telephone line, cannot be suppressed. In general this means that the telephone signal is automatically fed back to the telephone. To avoid this problem the fed back telephone signal can be reduced to almost 0 by placing a jumper in the right position. (side tone reduction).

6 Interpretation

Six channels, the auto-floor, floor, and communication signal are transferred via BU207, connected between the interpreter desks and the interpreters monitor panel LBB 3301. The audio signal from the connector panel is on the int/mon panel, connected via a separate transformer to the floor line. On the same panel Ch.1/Ch.6, floor and communication are routed via BU209 to the transmitter.
Internally this signal plus the auto-floor are connected to the Monitor Distribution Board LBB 3203/00.

The amplified floor plus Ch.1/Ch.6 are routed via the int/mon panel and back to BU208.
Via connector BU208, a maximum number of 1000 program selectors can be used, to monitor the channels and the floor.

A channel occupied circuit on the int/mon panel, provides LED information to the transmitters connector BU209 and the remote connector BU210. When a channel is occupied, the DC level on the channel line falls below a certain DC level, causing the output of a comparator in the channel occupied circuit to go high, this condition is used to switch “ON” an LED which corresponds to that channel number. The LED information can be derived from BU209 and BU210 in customer made applications.

Transferring a BCD code onto the address lines, via BU210 to the monitor selector on the Monitor Distribution Board, one of the channels, floor or auto-floor can be selected and amplified with the communication signal in the mixing amplifier. The amplifier output is routed via the int/mon panel to the remote socket BU210, and can be used for monitoring loudspeakers.

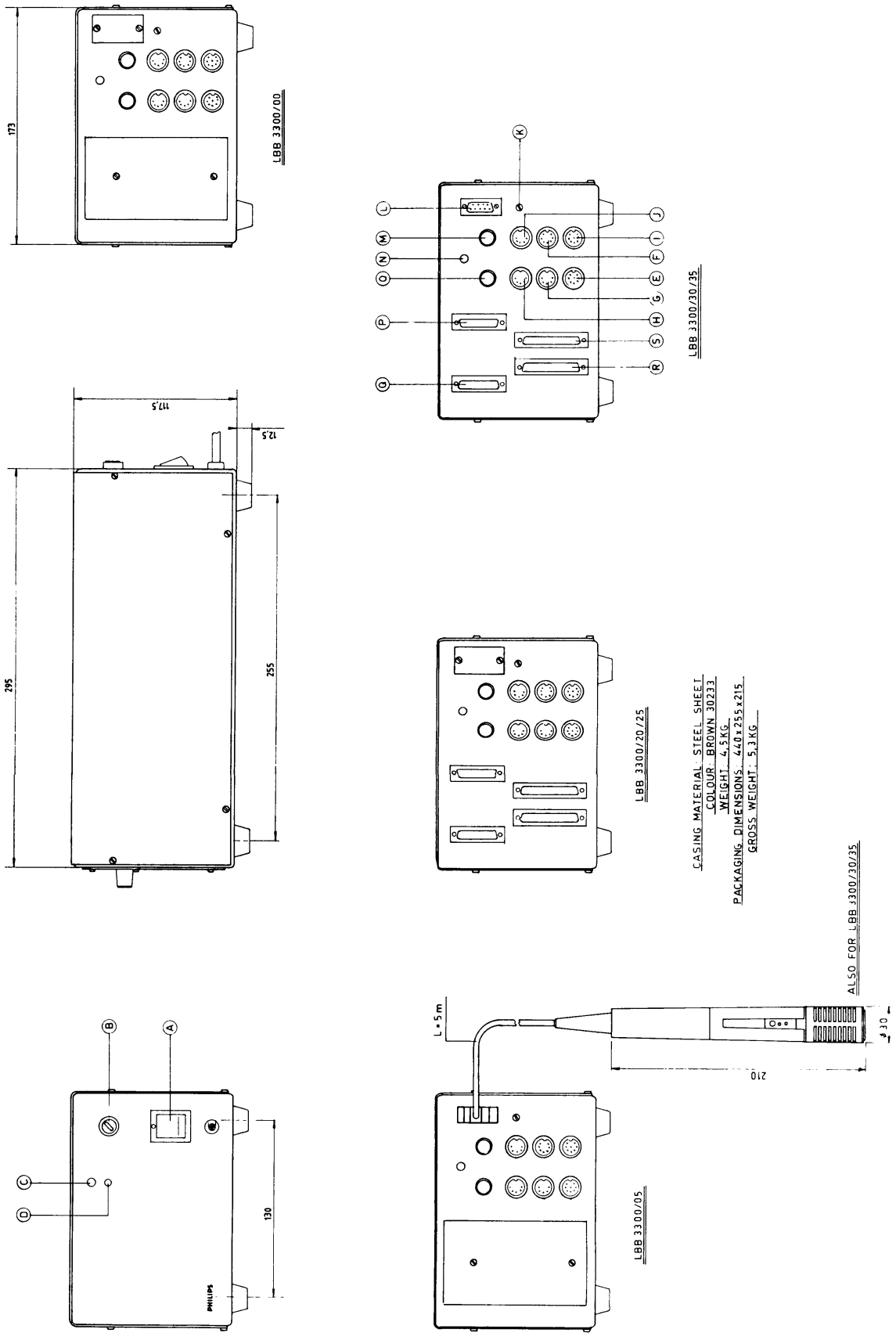


Figure 1 Central Supply Unit

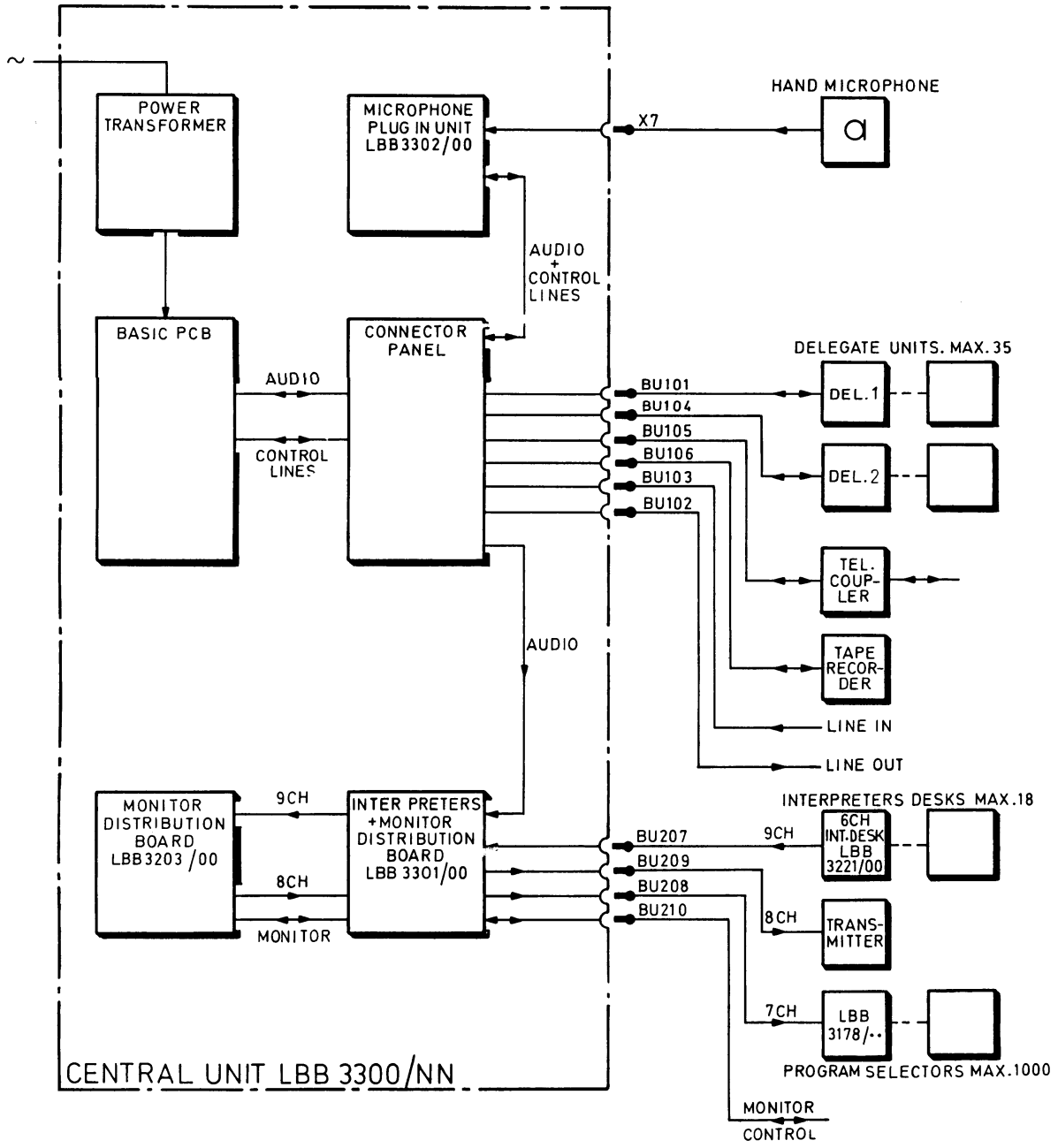


Figure 2 System Block Diagram

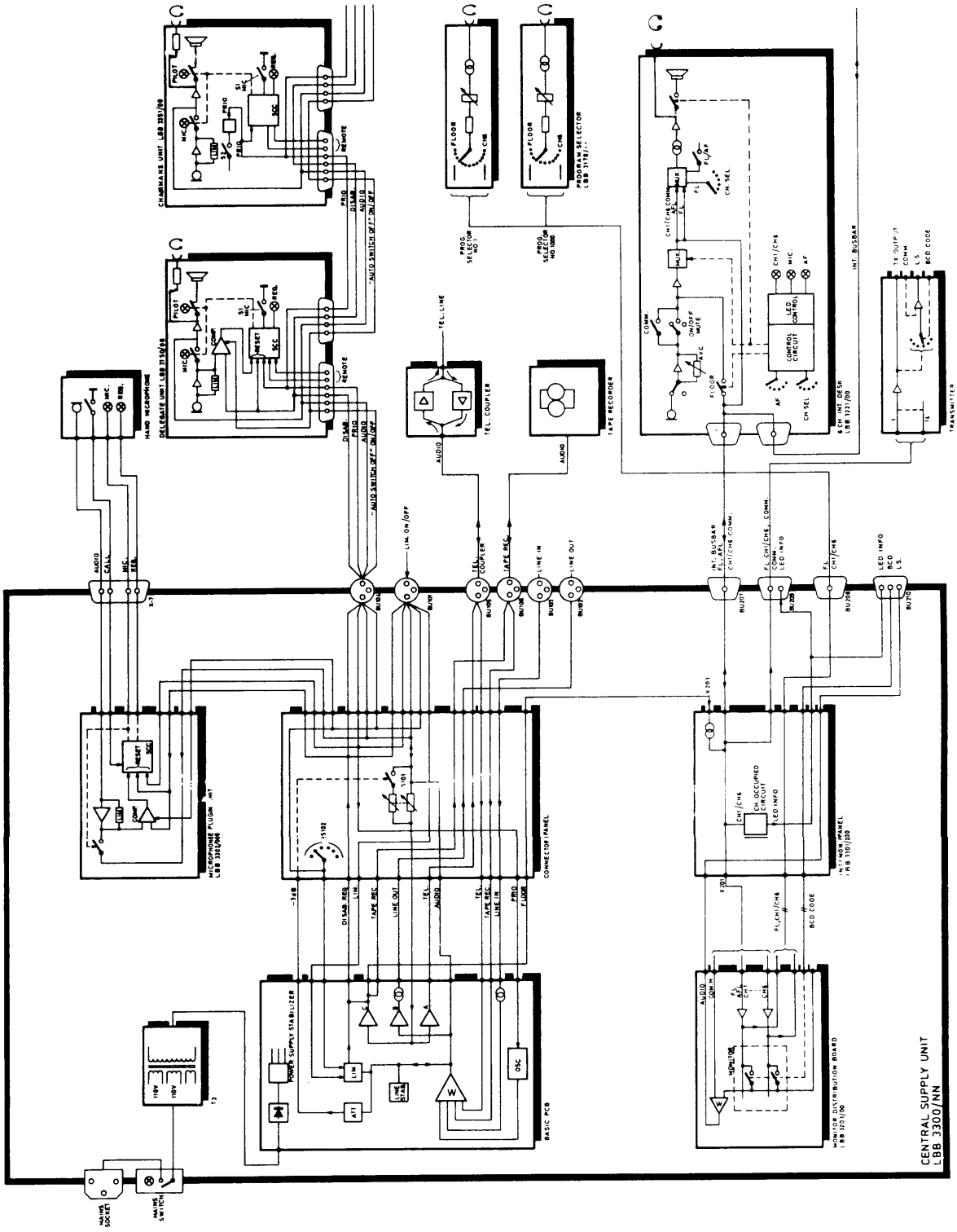


Figure 3 Detailed Block Diagram C.S.U. and Peripherals

LBB 3300/00
Central Supply Unit

Tab 2

CONTENTS

CHAPTER 1 INTRODUCTION

The basic assembly of the Central Supply Unit consists of two PCB's a connector panel and a "Basic PCB"

The connector panel; connects the various control and audio lines from the basic PCB, to the peripheral equipment and vice versa. The loudspeaker level adjustment circuit, and the limiting switch S102, for limiting the maximum number of switched on microphones, is also mounted on this panel.
(See block diagram Fig. 1)

The basic PCB can be sub-divided into 4 parts.
(See block diagram Fig. 2)

Part 1. Power Supply Unit
Provides the power for the C.S.U., and all associated peripheral equipment.

Part 2. Mixing Amplifier
Amplifies the priority "oscillator" signal, "line-in" signal, "tape-in" signal and the "conference" signal from the telephone coupler.

Part 3. Output Amplifier
Consists of three main functions:
(A) Amplifies the audio signal for the telephone coupler
(B) Provides the line-out signal
(C) Provides the floor, tape recorder, and disable request audio signal

Part 4. Audio Control Circuit
Consists of a stabiliser, which stabilises the D.C. level on the audio line, a comparator circuit, which controls the -3 dB circuit on the connector panel, and a comparator which controls the disable request line.

CHAPTER 2 CIRCUIT DESCRIPTION

(See circuit diagram Fig. 3)

1 General

Switching on S1, on the Central Supply Unit, powers up the whole system. The mains voltage is transformed by transformer T3, rectified by the bridge rectifier D1, C45 and C48, and fed to the triple power supply. The triple power supply is split into three sections:
Section a. TS1, TS2, TS3, TS16
Section b. TS4, TS5, TS6
Section c. TS7, TS8, TS9

If the temperature in the Power Supply Unit overheats, thermal switch TH1 opens, the voltage on the base of TS15 decreases, causing the transistor to conduct. The Power Supply voltage on the emitter of TS15 is now applied to the base of TS2, TS5 and TS8, causing them to be non-conductive, thereby switching the Power Supply to the system "off", until the temperature is low enough to close TH1.

The three Power Supply parts are identical, except that in section a, transistors TS1 and TS16 are connected in parallel to provide more output current.
The output voltage of the mains supply causes a voltage across R3 and D7. In section a, this voltage provides a stabilised base voltage for transistor TS3 of about 22 Volts.
Because the voltage on the base of TS3 is 22 Volts, the transistor conducts, and collector current flows through R2, D2, D3, adjusting the base voltage for TS2, causing it to conduct together with TS1 and TS16.

If the current output of the Power Supply increases, i.e. due to an overload, the output voltage decreases, if this output voltage falls below 21.5 Volts, D4 will conduct causing a voltage drop at R4. TS3 then becomes less conductive, the collector current decreases causing TS2 to become less conductive. Because the emitter current of TS2 is lower, TS1 and TS16 become less conductive; therefore the output current will be stabilised.

Sections b and c operating characteristics are identical to section a.

Section a. Provides power to the interpreters' desks, the interpreters' monitor panel, and the monitor distribution board. The Power Supply, sections b and c are identical except that they provide less current than section a.

Section b. Provides power for the microphone plug in unit, telephone coupler, and the second delegate chain connected to BU104.

Section c. Provides power for the delegate chain 1 connected to BU101 and the telephone coupler.

The Power Supply voltage of 27V, is divided and stabilised at 15 Volts, 13.5 Volts, and 3.5 Volts, via the voltage stabiliser IC1, and associated circuitry.

2 Audio line stabiliser

The audio line stabiliser consists of an IC7a, TS11, TS12, TS13 and associated components. The function of the circuit is to stabilise a DC voltage onto the audio line. When the DC voltage on the audio line increases or decreases, and applied to the base of TS13, the transistor conducts in unison. The current flowing via R39, TS12, R31 and R40 to ground is increasing or decreasing, therefore the voltage on the + input of IC7a operational amp, will also increase or decrease depending on the d.c. voltage change on the audio line. When the d.c. voltage on the audio line decreases, the output voltage of IC7a increases, and fed via TS11, the audio line is stabilised, or vice versa. When the d.c. voltage on the audio line increases, the output of IC7a decreases, and the audio line is stabilised.

3 Attenuator

The attenuator consists of IC5, IC6, (b.c.d.) and associated circuitry. The action of the circuit is to attenuate the audio signal 3 dB, when two or more microphones are switched on simultaneously. When a microphone is switched on in one of the delegate units, a current flowing from the power supply is fed via R34 and TS11 to the delegate unit. When only one microphone is switched “on” the current is so that the voltage drop at R34 is very small. This means that the voltage at the emitter of TS11 is approximately 15 Volts, and applied to the negative input of IC5. The voltage at the positive input is about 14.5 Volts, because of the voltage divider R28 and R29, the output of the comparator is now 0 Volts, therefore the switch IC6 will not be activated. When 2 or more microphones are switched ”on” the current via R34 and TS11 to the audio line increases, causing the voltage drop at R34 to be larger than 0.5 Volts, therefore the voltage at the negative input of IC5 will be less than 14.5 Volts. Because the positive input is at 14.5 Volts, the comparator output is now at 15 Volts. This logic “1” enables IC6 and closes the switches. One of the resistors R106 to R110 is connected in parallel to the already selected resistor by the volume adjustment switch S101. This parallel resistor causes a 3-dB attenuation of the audio signal. When only one switched “on” microphone is left, the voltage on the negative input of IC5 is larger than the positive input; therefore the switches of IC6 are opened.

4 Limiter (disable request circuit)

The limiter circuit consists of IC6a, IC2a and associated components. Its function is to limit the number of delegate microphones; which can be switched “on” simultaneously. The maximum number of switched “on” microphones can be adjusted with switch S102 to either 1, 3 or 6. The voltage drop at R34 is dependant on the number o switched ”on” delegate microphones. The voltage via R22 at the input of IC2a decreases when more microphones are switched “on’, because the voltage at R34 increases. The voltage corresponding to the selected number of simultaneous switched ”on” microphones is applied to the positive input of IC2a. The corresponding voltage for the number of selected microphones is as follows:
6 microphones = 14 Volts
3 microphones = 14.4 Volts
1 microphones = 14.8 Volts
When the number of simultaneously switched “on” microphones is lower than the selected number, as selected by S102, the voltage on the negative input of IC2a is larger than the voltage on the positive input. The output of the comparator will now be 0 Volts. This output via R50 is connected to the disable request line, which is not active now. When the number of simultaneously switched “on” microphones reaches the selected maximum number, the voltage at R34 increases, and therefore the voltage on the negative input of IC2a is lower than the voltage on the positive input. The comparator output is now at 15 Volts. This 15 Volts on the disable request line causes a disable request in all of the delegate units, which means that no microphones can be switched “on”. When one or more microphones are switched “off”, the voltage at the negative input, increases to a value higher than at the + input. The comparator output will now be 0 Volts, and the disable request is no longer applied to the delegate units. The limiter can be switched “off” via a remote control line which is connected to BU101 pin 6. The voltage on the remote control line is connected to input 12 of IC6a and must be switched to approximately 15 Volts. This logic “1” enables the switch, to switch a voltage of 15 Volts at input 10 to the output 11, which is connected to the negative input of IC2a. This 15 Volts is always larger than the voltage on the positive input, independent of the maximum number of microphones selected by switch S102. The comparator output will be 0 Volts, therefore the disable request is in-active and cannot be made active because the comparator output stays at 0 Volts.

5 Oscillator

The oscillator consists of IC2b, TS10 and TS17, its function is to generate the “attention” signal, when the chairman requires priority over the delegates. When the chairman presses his priority button, the priority line becomes approximately 1.5 Volts, and as a result all switched “on” delegate microphones switch ”off” and their loudspeakers switch “on”. The 1.5 Volts via line C in the Central Supply Unit is also applied to the oscillator circuit. Transistor TS10 is conducting and a current flows from the t-27 Volts Power Supply (at the emitter) via R23 and also via TS17, C11, R27 and R24 to ground. TS17 becomes conductive and starts the oscillator via the positive input. The oscillator circuit consists of IC2b, R19, C10 and generates a square wave signal of approximately 700 Hz. When TS10 conducts, C11 charges via R27/R24. The charge current ensures that a decreasing voltage across R24 arises. This voltage is short circuited to ground in a rhythm of 700 Hz by the oscillator and via a low pass filter R70/C12, C13 applied to the pre-amplifier part. A 700 Hz attention signal, which decreases slowly to zero, is now heard in the delegate loudspeakers. When the priority button is released, the base of T10 goes to 27 Volts and the transistor

becomes non conductive. C11 discharge via D27, R23 and D24. (discharge time is about 6 times shorter than the charge time) The oscillator circuit is inactive.

6 Pre-amplifier

The pre-amplifier consists of IC4a and TS14. The mixing amplifier amplifies the “attention” signal, “line-in” signal, and signals from the telephone coupler and tape recorder. The output signal of the operational amplifier IC4a is fed via the emitter of TS14, and fed back to the negative input via R66 and C30.
The “attention” signal, and the signal from the tape recorder are directly applied to the negative input of the pre-amplifier, the “attention” signal is fed via R70 and C12. The “line-in” signal is applied via a separation transformer T1 and resistor R53. Before the ”line-in” signal is amplified, its level can be adjusted by connecting a jumper S3 in one of the two positions, a-b, or a-c. In the a-c position, resistor R52 is connected to ground, and together with the resistance of the secondary winding of T1, forms a voltage divider which ensures that only part of the ”line-in” signal is applied to the negative input of IC4a. The telephone coupler signal is fed via R41, R42 and R54, to the negative input of the operation amplifier IC4a. Connecting the jumper S2 in one of the following positions, a-c, a-b, or b-d, the resistance can be adjusted, respectively to 0 Ohm, R42 or R42+R41. Adjusting the resistance, the level of the telephone coupler signal at the input of IC4a is adjusted (-16 dB, -4 dB respectively +6 dB).
The output of IC4a via D25 is connected to the base of TS14, which applies the amplified signal to the audio line. The signals on the audio line are amplified by three amplifiers A, B and C. Amplifier B, consists of IC3a. The signal on the audio line is fed to the + input of the operational amplifier, the output signal is fed via a separation transformer T2 to the ”line-out” socket BU102. The RC network of R62/C28, R63/C24 in the feed back path and R61/C16 ensures that the low and high frequencies superimposed on the signal are filtered out. Amplifier C consists of IC3b, which provides the audio signal for the int/mon panel via connector X103. The signal is applied via the voltage divider R64/R65 to the disable request line and fed via R48/R47 and R74 to the tape recorder output BU106-1/4. Connecting jumper S5 in the a-c or a-b position the output impedance to the recorder can be adjusted.
Amplifier A consists of IC4b and IC7b. The audio signal is applied to the negative input of IC4b. The output of the operational amplifier is connected to the negative input of IC7b. By connecting jumper S6, which adjusts the total resistance in the feed back path, the amplification of the operational amplifier IC7b and the level of the output signal can be adjusted. (a-c = -16 dB, a-d = -4 dB and b-c = +6 dB)
The output signal of IC7b is applied to the telephone coupler. When a telephone line is connected to the system, the fork circuit in the telephone coupler ensures that the signal from the telephone to the Central Supply Unit and the conference signal to the telephone are dealt with separately. In general terms this means that the telephone signal, which is sent to the C.S.U., amplified and returned to the telephone line can be suppressed or even reduced to zero in the telephone coupler. When a telephone coupler is used without a fork circuit, the signal to and from the telephone cannot be separated from each other in the coupler. To avoid the telephone signal being fed back, which is amplified by part, A; the signal is compensated to zero at the junction between IC4b and IC7b.
This is achieved by placing a jumper S4 in position a-b. The signal from the telephone is applied to the output of IC4b. Because the amplified telephone signal is on the output of IC4b and in antiphase, the result will be zero on the input of IC7b. The telephone signal is not fed back to the telephone coupler. The conference signal (audio from the SCU) is normally amplified by IC7b and applied to the telephone coupler.

CHAPTER 3 SPARE PARTS LIST

1 Spare parts list Interface Supply Unit

	Cap. Knob	5322 414 30075
	Dial knob	5322 414 70002
	Fuse holder	5322 256 34077
	Fuse 2.5A SLOW	4822 253 30026

1.1 Spare parts list PCB contribution

BU 101	Din connector 8P			5322 267 50659
BU 102	Din connector 5P			4822 267 40182
BU 103	Din connector 5P			4822 267 40182
BU 104	Din connector 8P			5322 267 50659
BU 105	Din connector 7P			4822 264 50101
BU 106	Din connector 5 p			5322 267 40182
C 101	100UF	50%	10 V	4822 124 20679
D 101	CQY94BL-4			5322 130 32182
R 101	2K2	2%	0,125W	4822 111 90248
R 102	33K	2%	0,125W	5322 111 90267
R 103	33K	2%	0,125W	5322 111 90267
R 104	1MO	20%	LOG 0,05W	5322 101 20924
R 105	2K2	2%	0,125W	4822 111 90248
R 106	1K5	2%	0,125W	4822 111 90151
R 107	820E	2%	0,125W	4822 111 90171
R 108	470E	2%	0,125W	5322 111 90109
R 109	270E	2%	0,125W	4822 111 90154
R 110	120E	2%	0,125W	4822 111 90339
R 111	1K8	2%	0,125W	5322 111 90101
R 112	820E	2%	0,125W	4822 111 90171
R 113	390E	2%	0,125W	5322 111 90138
R 114	220E	2%	0,125W	4822 111 90178
R 115	120E	2%	0,125W	4822 111 90339
R 116	2K2	2%	0,125W	4822 111 90248
R 117	22K	2%	0,125W	4822 111 90251
R 118	10K	2%	0,125W	4822 111 90249
R 119	100E	2%	0,125W	5322 111 90091
R 120	47K	2%	0,125W	4822 111 90543
S 101	rotary switch			5322 273 80317
S 102	rotary switch			5322 273 80317

1.2 Spare parts list PCB Basic

	Isolating bush between PCB and cooling plate			4822 255 40174
	Jumper S2, 5, 4, 3 or 6			5322 290 60298
C 1	3300UF	30%	63V	5322 124 40805
C 2	470UF	20%	40V	5322 124 21729
C 3	470UF	20%	40V	5322 124 21729
C 4	470UF	20%	40V	5322 124 21729
C 5	100NF	10% X7R	50V	5322 122 32839
C 6	47UF	50%	25V	4822 124 20699
C 7	10UF	20%	25V	4822 124 21747
C 8	100PF	5%	50V	4822 122 31765
C 9	22UF	50%	25V	4822 124 20698
C 10	10NF			4822 122 32442
C 11	4,7UF	50%	63V	4822 124 20726
C 12	10NF			4822 122 32442

C 13	4,7NF	10% X7R	50V	4822 122 31784
C 14	10NF			4822 122 32442
C 15	10UF	50%	40V	4822 124 20708
C 16	33NF	10%	63V	5322 122 31848
C 17	33NF	10%	63V	5322 122 31848
C 18	100PF	5%	50V	4822 122 31765
C 19	3,9NF		50V	4822 122 32566
C 20	22UF	50%	25V	4822 124 20698
C 21	22UF	50%	25V	4822 124 20698
C 22	22UF	50%	25V	4822 124 20698
C 23	100PF	5%	50V	4822 122 31765
C 25	100PF	5%	50V	4822 122 31765
C 26	100UF	50%	25V	4822 124 20701
C 27	220PF	5%	63V	4822 122 31965
C 28	220PF	5%	63V	4822 122 31965
C 29	1UF	50%	63V	4822 124 20722
C 30	100PF	5%	50V	4822 122 31765
C 31	22UF	20%	25V	4822 124 21646
C 32	22UF	20%	25V	4822 124 21646
C 33	560PF	5%	50V	4822 122 31773
C 34	100PF	5%	50V	4822 122 31765
C 35	10UF	20%	25V	4822 124 21747
C 36	10UF	20%	25V	4822 124 21747
C 37	47NF	10%	50 V	4822 122 32542
C 38	22UF	50%	25V	4822 124 20698
C 39	22UF	50%	25V	4822 124 20698
C 40	47NF	10%	50V	4822 122 32542
C 41	47NF	10%	50V	4822 122 32542
C 42	47NF	10%	50V	4822 122 32542
C 43	10NF			4822 122 32442
C 44	1500NF	10%	100V	4822 121 42031
C 45	4,7NF	10% X7R	50V	4822 122 31784
C 46	4,7NF	10% X7R	50V	4822 122 31784
C 47	4,7NF	10% X7r	50V	4822 122 31784
C 48	4,7NF	10% X7R	50V	4822 122 31784
C 49	220NP	10%	63V	4822 121 41673
C 50	1000PF	5%	50V	4822 122 31746
C 51	470NF	10%	63V	4822 121 41674
C 52	100PF	5%	50V	4822 122 31765
C 53	22UF	20%	25V	4822 124 21646
C 54	47NF	10%	50V	4822 122 32542
D 1	BY224-600			5322 130 34761
D 2	BAV70			5322 130 34331
D 3	BAV70			5322 130 34331
D 4	BAV70			5322 130 34331
D 5	BAV70			5322 130 34331
D 6	BZX84-C5V1			5322 130 32835
D 7	BZX84-C22			5322 130 33725
D 8	BAV70			5322 130 34331
D 9	BAV70			5322 130 34331
D 10	BAV70			5322 130 34331
D 11	BAV70			5322 130 34331
D 12	BZX84-C5V1			5322 130 32835
D 13	BZX84-C22			5322 130 33725
D 14	BAV70			5322 130 34331
D 15	BAV70			5322 130 34331
D 16	BAV70			5322 130 34331
D 17	BAV70			5322 130 34331
D 18	BZX84-C5V1			5322 130 32835
D 19	BZX84-C22			5322 130 33725
D 20	BYW56			5322 130 34973
D 22	BAV70			5322 130 34331

D 23	BYW56			5322 130 34973
D 24	BAV70			5322 130 34331
D 25	BZX84-C5V1			5322 130 32835
D 26	BZX84-C5V1			5322 130 32835
D 27	BAV70			5322 130 34331
IC 1	MC7815CT			4822 209 80808
IC 2	MC1458N			4822 209 81349
IC 3	LF353N			5322 209 81395
IC 4	LF353N			5322 209 81395
IC 5	TDB0156DP			5322 209 82804
IC 6	HEF4066BT			5322 209 14542
IC 7	LF353N			5322 309 81395
R 1	3E9	5%	1,6 W	4822 116 51865
R 2	2K2	1%	0,6 W	4822 116 53025
R 3	8K2	2%	0,125W	5322 111 90118
R 4	470E	2%	0,125W	5322 111 90109
R 5	22K	1%	0,6 W	5322 116 53286
R 6	3E6	5%	2,0 W	4822 116 53281
R 7	2K2	1%	0,6 W	4822 116 53025
R 8	8K2	2%	0,125 W	5322 111 90118
R 9	470E	2%	0,125 W	5322 111 90109
R 10	22K	1%	0,6 W	5322 116 53286
R 11	3E6	5%	2,0 W	4822 116 53281
R 12	2K2	1%	0,6 W	4822 116 53025
R 13	8K2	2%	0,125W	5322 111 90118
R 14	470E	2%	0,125W	5322 111 90109
R 15	22K	1%	0,6 W	5322 116 53286
R 16	3E9	5%	1,6 W	4822 116 51865
R 17	100K	2%	0,125 W	4822 111 90214
R 18	100K	2%	0,125 W	4822 111 90214
R 19	100K	2%	0,125 W	4822 111 90214
R 20	22K	2%	0,125 W	4822 111 90251
R 21	10K	2%	0,125 W	4822 111 90249
R 22	10K	2%	0,125 W	4822 111 90249
R 23	10K	2%	0,125 W	4822 111 90249
R 24	47K	2%	0,125 W	4822 111 90543
R 25	47K	2%	0,125 W	4822 111 90543
R 26	150K	2%	0,125 W	5322 111 90099
R 27	47K	2%	0,125 W	4822 111 90543
R 28	150K	2%	0,125 W	5322 111 90099
R 29	5K6	2%	0,125 W	4822 111 90572
R 30	3K3	2%	0,125 W	4822 111 90157
R 31	10K	2%	0,125 W	4822 111 90249
R 32	100K	2%	0,125 W	4822 111 90214
R 33	47K	2%	0,125 W	4822 111 90543
R 34	43R	1%	0,6 W	5322 116 53597
R 36	15K	2%	0,125 W	4822 111 90196
R 37	100K	2%	0,125 W	4822 111 90214
R 38	33K	2%	0,125 W	5322 111 90267
R 39	10K	2%	0,125 W	4822 111 90249
R 40	22K	2%	0,125 W	4822 111 90251
R 41	47K	2%	0,125 W	4822 111 90543
R 42	18K	2%	0,125 W	4822 111 90238
R 43	910E	1%	0,6 W	4822 116 52868
R 44	330E	2%	0,125 W	5322 111 90106
R 45	10K	2%	0,125 W	4822 111 90249
R 46	10K	2%	0,125 W	4822 111 90249
R 47	680E	2%	0,125 W	4822 111 90162
R 48	10K	2%	0,125 W	4822 111 90249
R 49	62R	1%	0,6 W	5322 116 53598
R 50	10K	2%	0,125 W	4822 111 90249
R 51	100K	2%	0,125 W	4822 111 90214

R 52	82E	2%	0,125 W		4822 111 90124
R 53	3K9	2%	0,125 W		4822 111 90571
R 54	15K	2%	0,125 W		4822 111 90196
R 55	10K	2%	0,125 W		4822 111 90249
R 56	33K	2%	0,125 W		5322 111 90267
R 57	3K3	2%	0,125 W		4822 111 90157
R 58	220K	2%	0,125 W		4822 111 90197
R 59	33K	2%	0,125 W		5322 111 90267
R 60	1K	2%	0,125 W		5322 111 90092
R 61	100K	2%	0,125 W		4822 111 90214
R 62	33K	2%	0,125 W		5322 111 90267
R 63	3K9	2%	0,125 W		4822 111 90571
R 64	1K5	2%	0,125 W		4822 111 90151
R 65	68E	2%	0,125 W		4822 111 90203
R 66	33K	2%	0,125 W		5332 111 90267
R 67	100K	2%	0,125 W		4822 111 90214
R 68	680E	2%	0,125 W		4822 111 90162
R 69	82K	2%	0,125 W		4822 111 90575
R 70	220K	2%	0,125 W		4822 111 90197
R 71	100E	2%	0,125 W		5322 111 90091
R 72	33K	2%	0,125 W		5322 111 90267
R 73	36K	1%	0,6 W		5322 116 53596
R 74	220K	2%	0,125 W		4822 111 90197
R 75	100K	2%	0,125 W		4822 111 90214
R 76	100K	2%	0,125 W		4822 111 90214
R 77	100K	2%	0,125 W		4822 111 90214
R 78	1M	5%	0,125 W		5322 111 90094
R 79	1M	5%	0,125 W		5322 111 90094
R 80	4K7	2%	0,125 W		5322 111 90111
R 81	47K	2%	0,125 W		4822 111 90543
R 82	10K	2%	0,125 W		4822 111 90249
R 83	10K	2%	0,125 W		4822 111 90249
S 2	Pins for jumper S2				5322 535 84341
S 3	Pins for jumper S3				5322 535 84341
S 4	Pins for jumper S4				5322 535 84341
S 5	Pins for jumper S5				5322 535 84341
S 6	Pins for jumper S6				5322 535 84341
T 1	Line in transformer				5322 140 10267
T 2	Line out transformer				5322 140 60264
TS 1	BDT96				5322 130 42209
TS 2	BC557C				4822 130 42231
TS 3	BC846B			PHIN	5322 130 60159
TS 4	BDT96				5322 130 42209
TS 5	BC557C				4822 130 42231
TS 6	BC846B			PHIN	5322 130 60159
TS 7	BDT96				5322 130 42209
TS 8	BC557C				4822 130 42231
TS 9	BC846B			PHIN	5322 130 60159
TS 10	BC857C			PHIN	5322 130 42756
TS 12	BC847C			PHIN	5322 130 42755
TS 13	BC847C			PHIN	5322 130 42755
TS 14	BC847C			PHIN	5322 130 42755
TS 15	BC857C			PHIN	5322 130 42756
TS 16	BDT96				5322 130 42209
TS 17	BC857C			PHIN	5322 130 42756

2 Recommended spare parts list Interface Supply Unit

	Cap. Knob		5322 414 30075
	Dial knob		5322 414 70002
	Fuse holder		5322 256 34077

2.1 Spare parts list PCB contribution

BU 101	Din connector 8P		5322 267 50659
BU 102	Din connector 5P		4822 267 40182
BU 103	Din connector 5P		4822 267 40182
BU 104	Din connector 8P		5322 267 50659
BU 105	Din connector 7P		4822 264 50101
BU 106	Din connector 5P		4822 267 40182
D 101	CQY94BL-4		5322 130 32182
S 101	Rotary switch		5322 273 80317
S 102	Rotary switch		5322 273 80317

2.2 Spare parts list PCB Basic

	Isolating bush between PCB and cooling plate		4822 255 40174
C 1	3300UF 30%	63V	5322 124 40805
C 2	470UF 20%	40V	5322 124 21729
C 3	470UF 20%	40V	5322 124 21729
C 4	470UF 20%	40V	5322 124 21729
D 1	BY224-600		5322 130 34761
D 6	BZX84-C5V1		5322 130 32835
D 7	BZX84-C22		5322 130 33725
D 12	BZX84-C5V1		5322 130 32835
D 13	BZX84-C22		5322 130 33725
D 18	BZX84-C5V1		5322 130 32835
D 19	BZX84-C22		5322 130 33725
D 25	BZX84-C5V1		5322 130 32835
D 26	BZX84-C5V1		5322 130 32835
IC 1	MC7815CT		4822 209 80808
IC 2	MC1458N		4822 209 81349
IC 3	LF353N		5322 209 81395
IC 4	LF353N		5322 209 81395
IC 5	TDB0156DP		5322 209 82804
IC 6	HEF4066BT		5322 209 14542
IC 7	LF353N		5322 309 81395
T 1	Line in transformer		5322 140 10267
T 2	Line out transformer		5322 140 60264
TS 1	BDT96		5322 130 42209
TS 2	BC557C		4822 130 42231
TS 3	BC846B	PHIN	5322 130 60159
TS 4	BDT96		5322 130 42209
TS 5	BC557C		4822 130 42231
TS 6	BC846B	PHIN	5322 130 60159
TS 7	BDT96		5322 130 42209
TS 8	BC557C		4822 130 42231
TS 9	BC846B	PHIN	5322 130 60159
TS 10	BC857C	PHIN	5322 130 42756
TS 12	BC847C	PHIN	5322 130 42755
TS 13	BC847C	PHIN	5322 130 42755
TS 14	BC847C	PHIN	5322 130 42755
TS 15	BC857C	PHIN	5322 130 42756
TS 16	BDT96		5322 130 42209
TS 17	BC857C	PHIN	5322 130 42756

CHAPTER 4 LBB 3300/40 BI-LINGUAL TRANSMITTER

1 General

The board is intended to be used within the distribution section of a bi-lingual interpretation system or as a standalone board in guidance applications. The board fits within the CCS400 central processor units at the place of the Monitor Distribution Board. The board is prepared for a loop-trough possibility.
Consult the installation and operating manual for more information: 3922 988 20212.

2 Service-policy

Because of the complexity of this SMD PCB, the service policy is as follows:
The PCB is repaired, for quality integral cost and component exchange reasons, at a selected, easy to exchange component-level. No specific SMD are stored within PCS. If one cannot repair this item by using the chosen components, one should exchange the complete PCB. Before the so called service period starts, the Supply Centre may decide, for exchange-reasons, to store a certain number of complete PCB's, in order to provide exchange-items for the Sales Support Organisation Service

3 Technical Data

3.1 Inputs

Audio input -16dBm - +8dbm symmetrical (on approximately 10kohm)

Communication input -4dBm

Power supply voltage 24 up to 30Vdc

Monitor select 5V, ground

A1	A0	Monitor output
0	0	-
0	1	Floor
1	0	Channel 1
1	1	Channel 2

Remote channel select channel routing selectable with SELECT ab signals, where:
a = input-channel, and b = transmitter channel

Truth table:

Sel11	Sel12	Sel21	Sel22	Channel1 output	Channel 2 output
0	0	0	0	floor	floor
1	0	0	1	IN1	IN2
0	1	1	0	IN1	IN1
1	0	1	0	IN1+IN2	floor
0	1	0	1	floor	IN1+IN2

3.2 Modulation

FM
Nominal deviation is 6kHz (maximum 7 kHz). Channel frequencies 255kHz, and 295kHz.

3.3 Current consumption

During normal working conditions < 150mA; when switching on radiators < 250mA during less than approximately 5 sec

3.4 Outputs

HF-output voltage	0dBm ±3dBm
DC-output voltage	6,1-6,7V with jumper X9 in pos. AB no DC-Voltage with jumper in pos. BC
Max. number of radiators	15 (type LBB3021)
Max cable length	300m (cable RG58C/U or RG59B/U)
Monitor output:	24 dBm±3dBm at – 8dBm audio input

3.5 Connector specification of "Euro" connector X1

Channel 1	B7 - A8
Channel 2	B8 - A7
Floor	B11 - A10
Communication	A31 - B31
Monitor output	C16 - C17
Power Supply +	ABC 27
Ground	ABC 28
AO	AB 14
Al	AB 15
K: Reference	AB 13
Select 11	C 21
Select 12	C 22
Select 21	C 23
Select 22	C 24
HF – input	C 29
HF – output	C 26

All other pins are NOT connected.

4 Spare parts

Printed Circuit Board assembly		5322 214 90922
TSI	BD437 transistor TO-126	4822 130 40982
TS4	BD438 transistor TO-126	4822 130 40995
IC3	CNX36 opto coupler DIL-6	5322 130 90097
IC102	NE572N analogue compandor DIL-16	5322 209 73938
B1	X-tal TQ30.01.10 7.28MHZ TELEQ	5322 242 80376
Z101-201	ceramics filter CFW455B NURATA	5322 242 80365
F1	fuse 5X20 500mA 250V	4822 070 35001
B101	X-tal 11.36 MHz	5322 242 80383
B201	X-tal 12.00 MHz	5322 242 80384

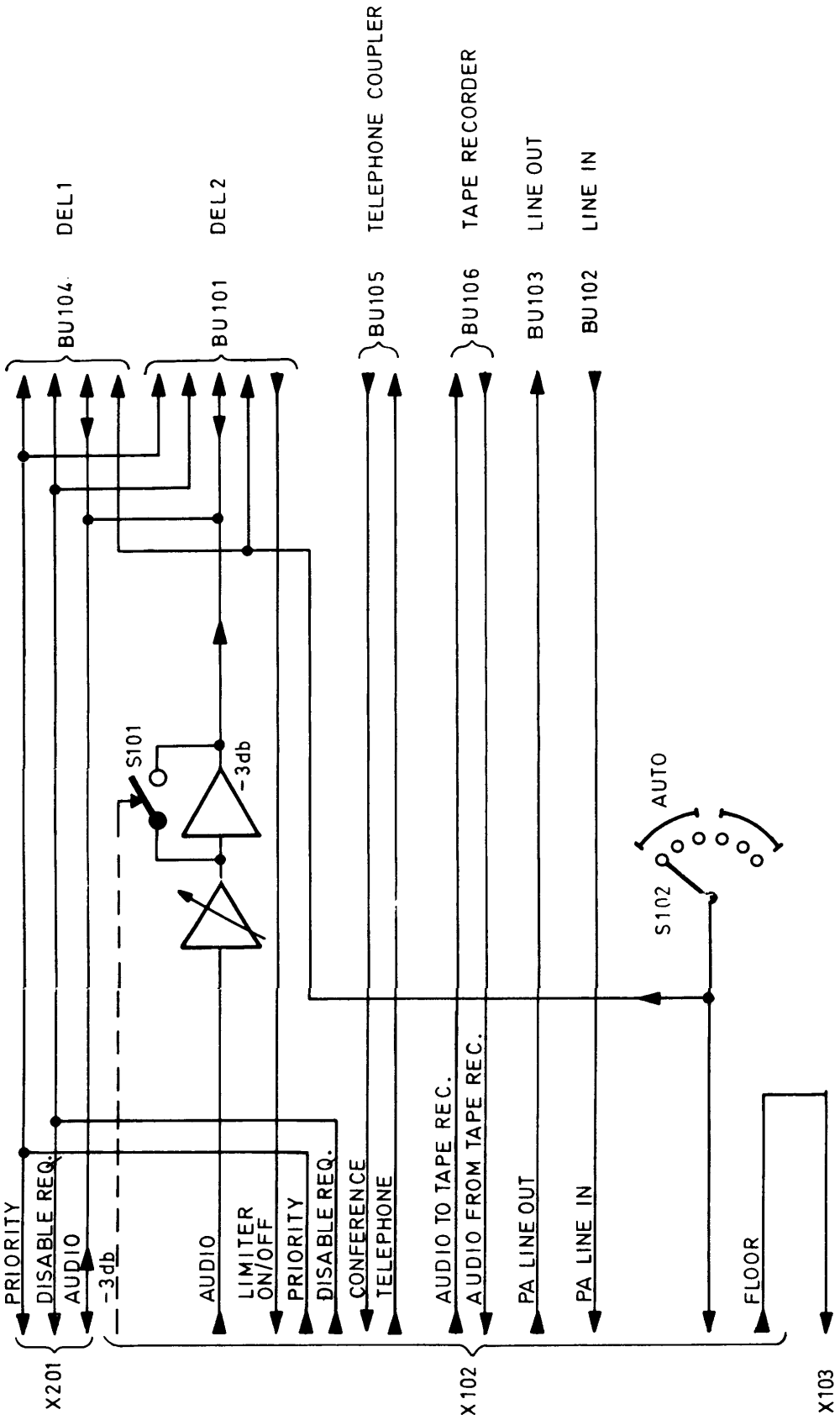


Figure 1 Detailed block diagram connector panel

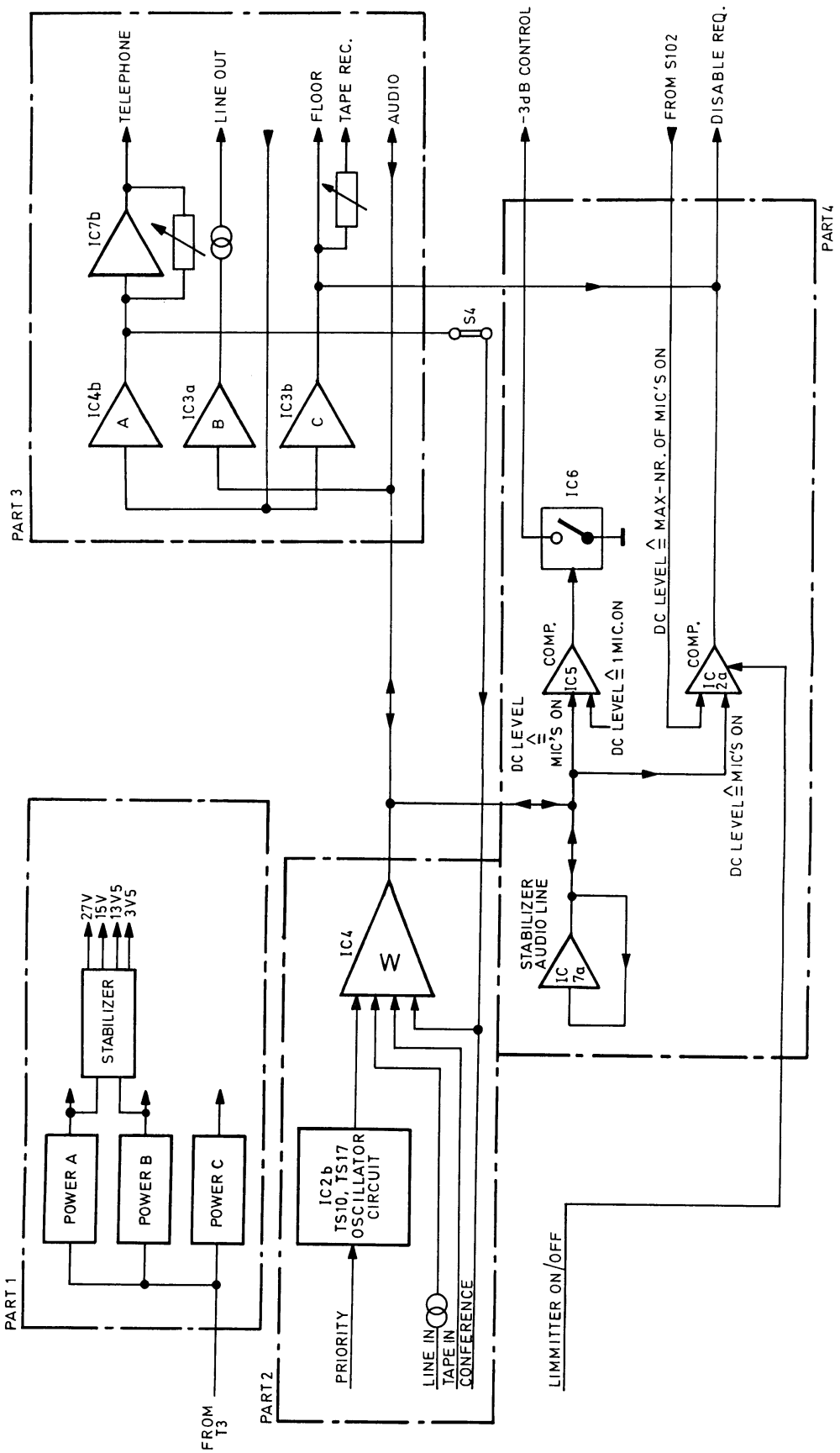


Figure 2 Detailed block diagram basic PCB

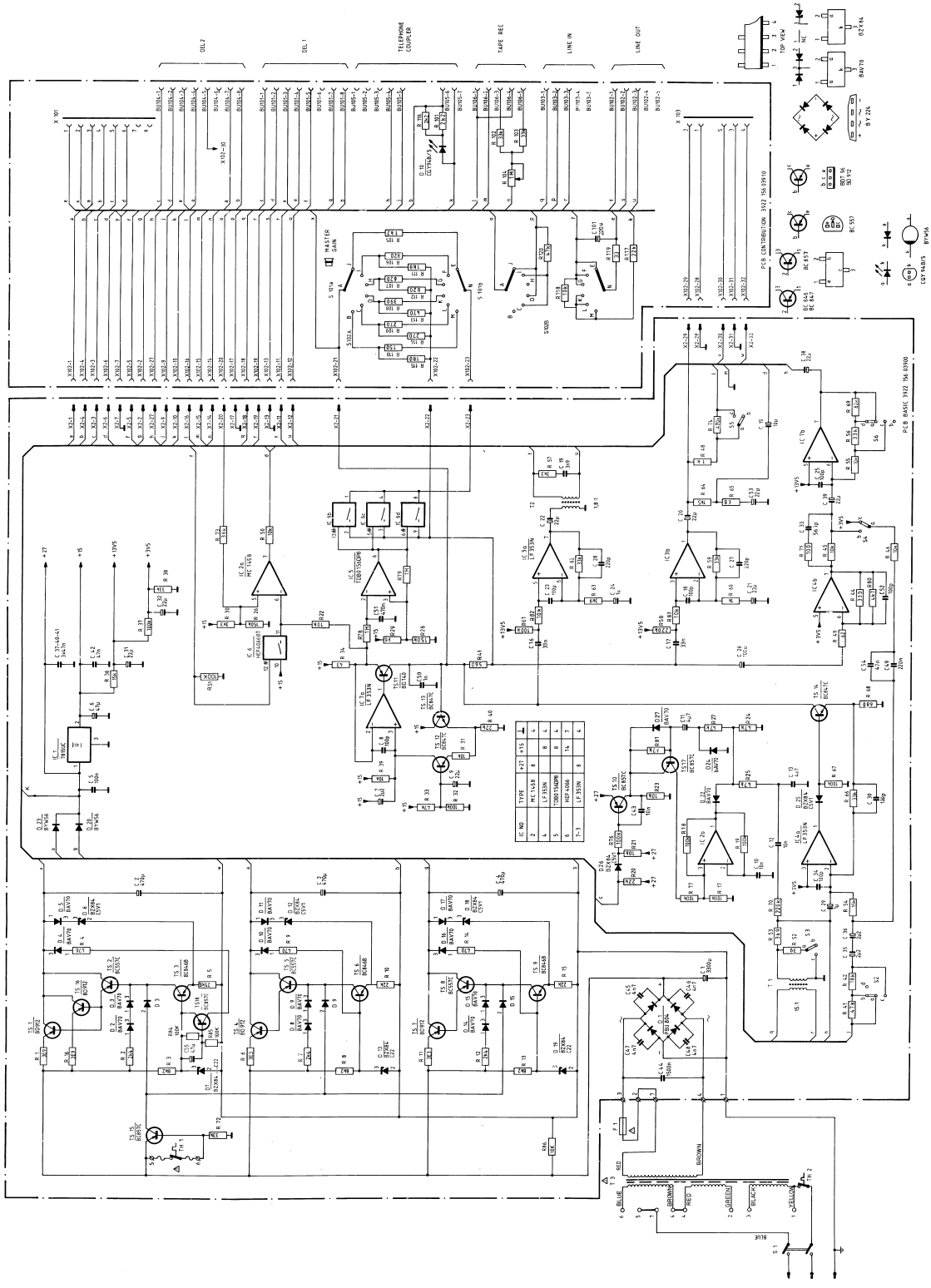


Figure 3 Circuit diagram connector panel and basic PCB

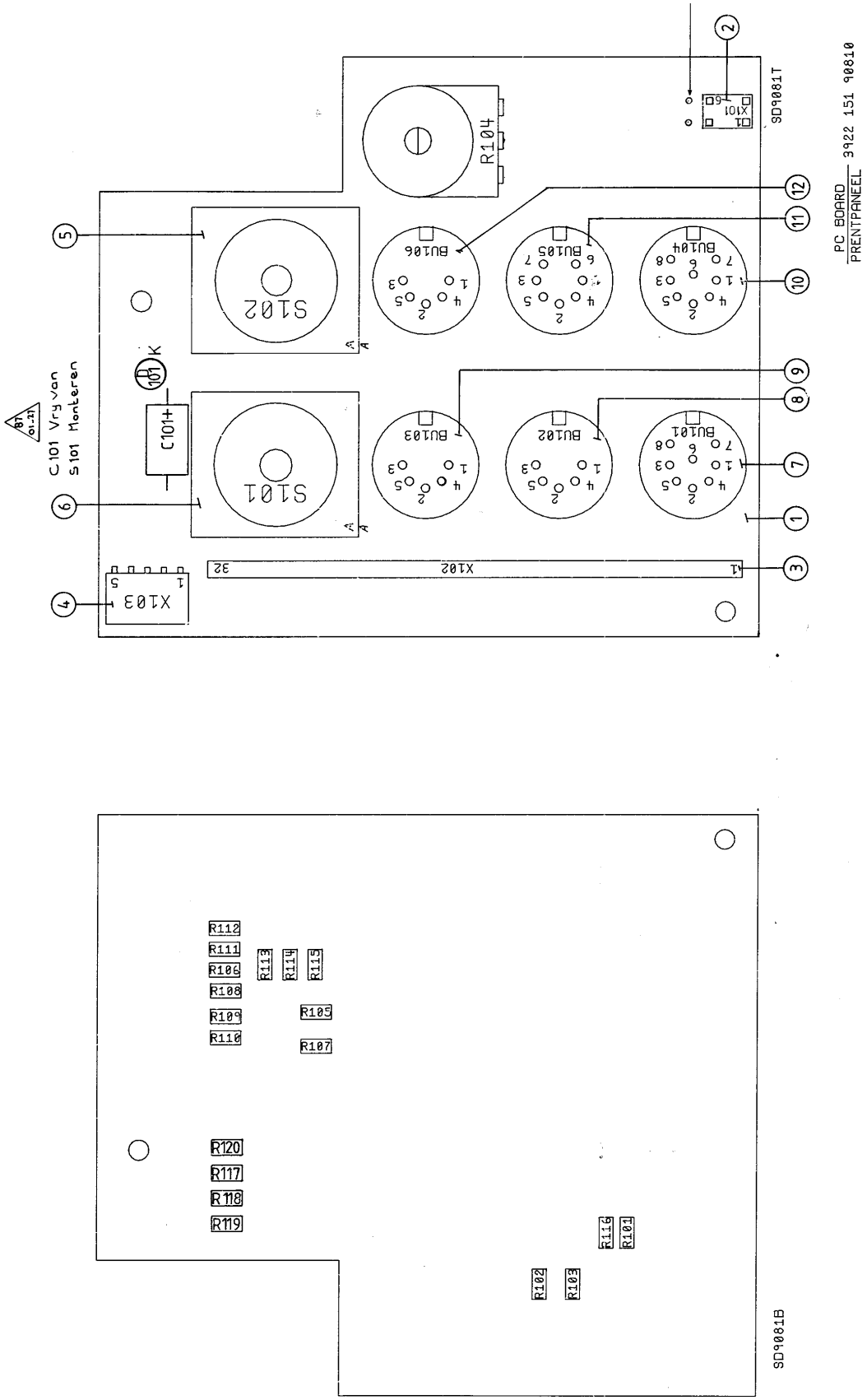


Figure 4 Location of components of connector panel

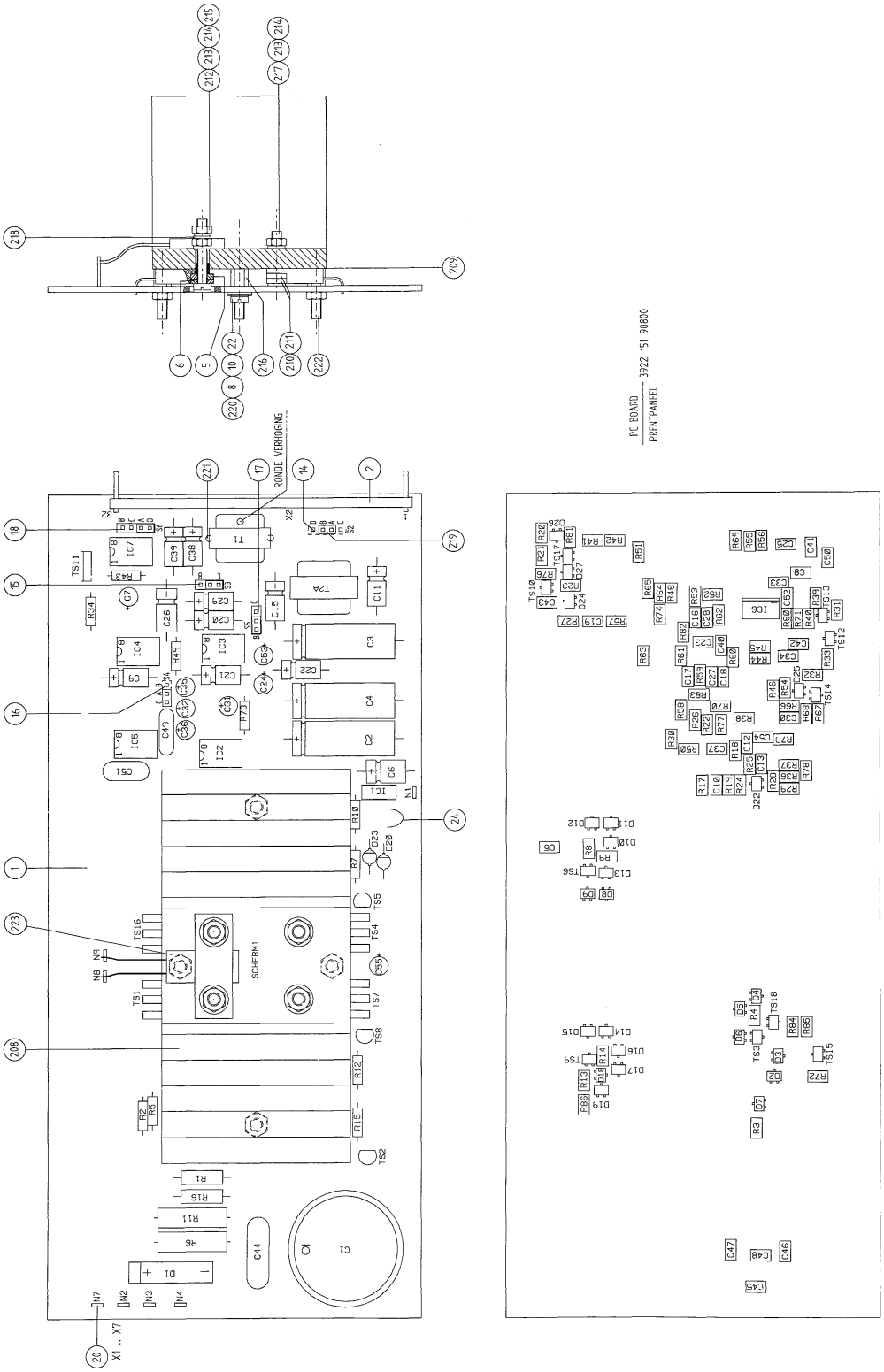


Figure 5 Location of components basic PCB

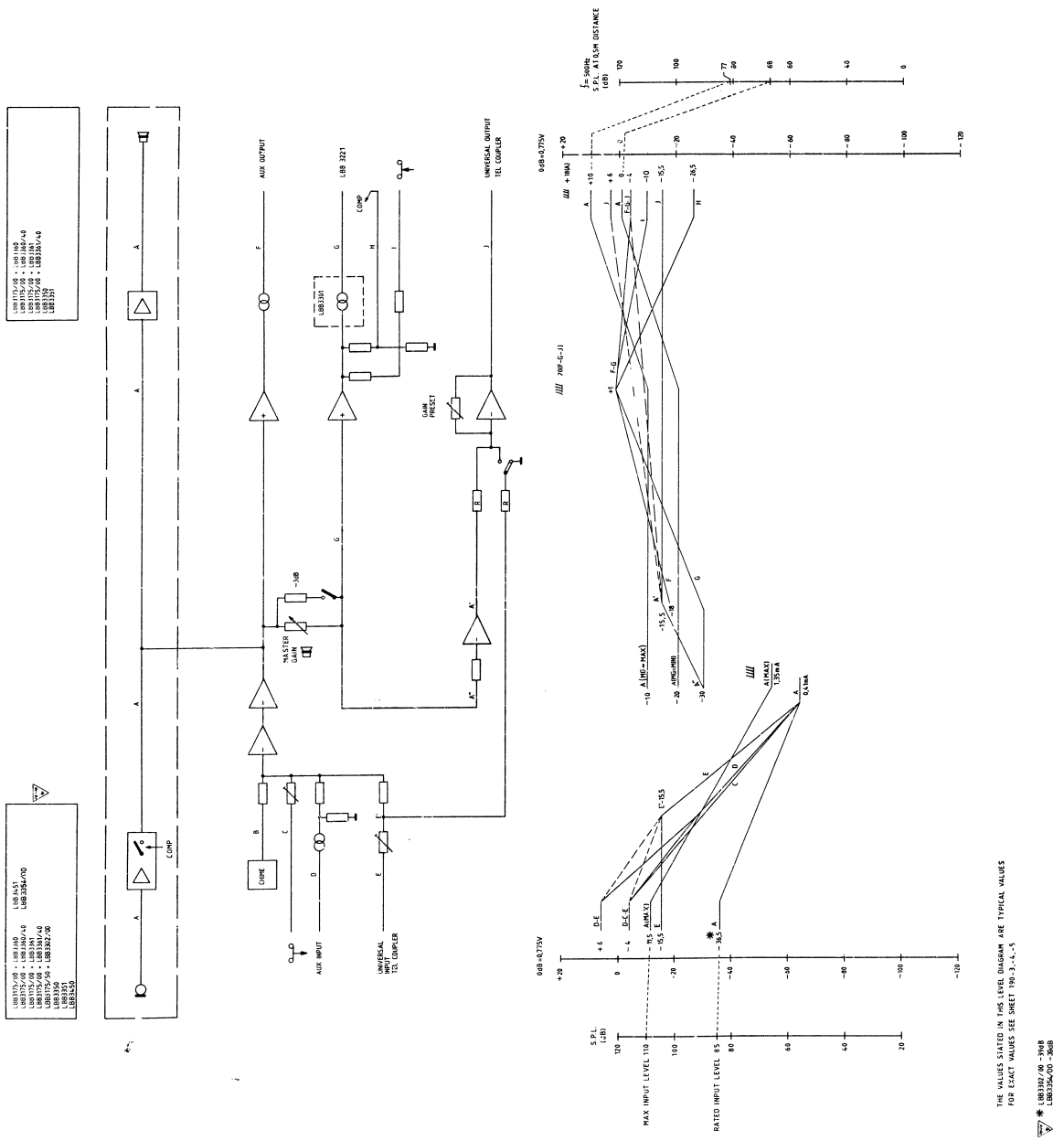


Figure 6 Level diagrams CCS400

LBB 3301/00
Interpreters +
monitor distribution panel

Tab 3

CONTENTS

CHAPTER 1 INTRODUCTION

(see block diagram fig. 1)

The int. + mon. panel is a connection panel for the 6ch interpreters equipment on the one side and to the Monitor Distribution Board on the other hand. It connects the interpreter busbar and the floor signal to the M.D.B. Channel 1 to 6 inclusive and floor from the M.D.B. are via this panel connected to the program selector output (distribution), and the audio from M.D.B. to the remote socket for monitoring via a loudspeaker. A “channel occupied” circuit provides information at the remote socket and at the transmitter socket. These 6 outputs can be used as an indication which channels are occupied.

CHAPTER 2 CIRCUIT DESCRIPTION

(see circuit diagram fig. 2)

On the panel, the feed from the power supply part a is applied to pin 4 and 5 on connector X203. This supply lines are distributed to the interpreters connector BU 207, to the M.D.B. connector X201 and finally via D201 and R205 to the monitor socket BU 210.

The power supply voltage is via the buffer circuit, which consists of TS201, R201, R202 and R203, applied to the resistor networks R223/R206/R207, etc. These networks provide for a DC level of approximately 18v on the floor, comm., ch1/ch6 and auto floor lines on the interpreters busbar.

The asymmetric audio line, coming from the connector panel, is applied to X203 pin 1 and 2 and via the separation transformer T201 to the floor line on the panel.

The lines floor, ch1/ch6, comm. and auto floor from the interpreters' busbar are applied to BU207 and directly connected with the M.D.B. via connector X201. To avoid that the D.C. levels on these lines via BU209 are applied to the transmitter, capacitors C202 to C217 are used. The amplified signals ch1/ch6 and floor, coming from the M.D.B., are via X201 connected to the distribution connector BU208.

The BCD code for the Monitor part on the M.D.B. and the returning audio line are via X201 connected to the M.D.B. and via BU210 with the monitor equipment.

IC1 and IC2 ensure that 6 "channel occupied" information lines are provided to the transmitter connector BU 209 on the one side and to the monitor connector BU210. When a channel, e.g. ch1, is not occupied the D.C. voltage, provided by the int. mon. panel, is approximately 18v. In this case, the voltage on the -input of IC26 is larger then the voltage on the +input, ensuring that the comperator output is "0" (approx. 2,5v). When a microphone signal is switched to the channel, the D.C. voltage on the channel line becomes approximately 9v. The +input of the comperator IC26 is now larger (15v) then 9v on the -input. The output will be "1" which can be used as an indication that the channel is occupied.
This "1" is approx. 27v. A current of approx. 2.3 mA can be used to drive a L.E.D.

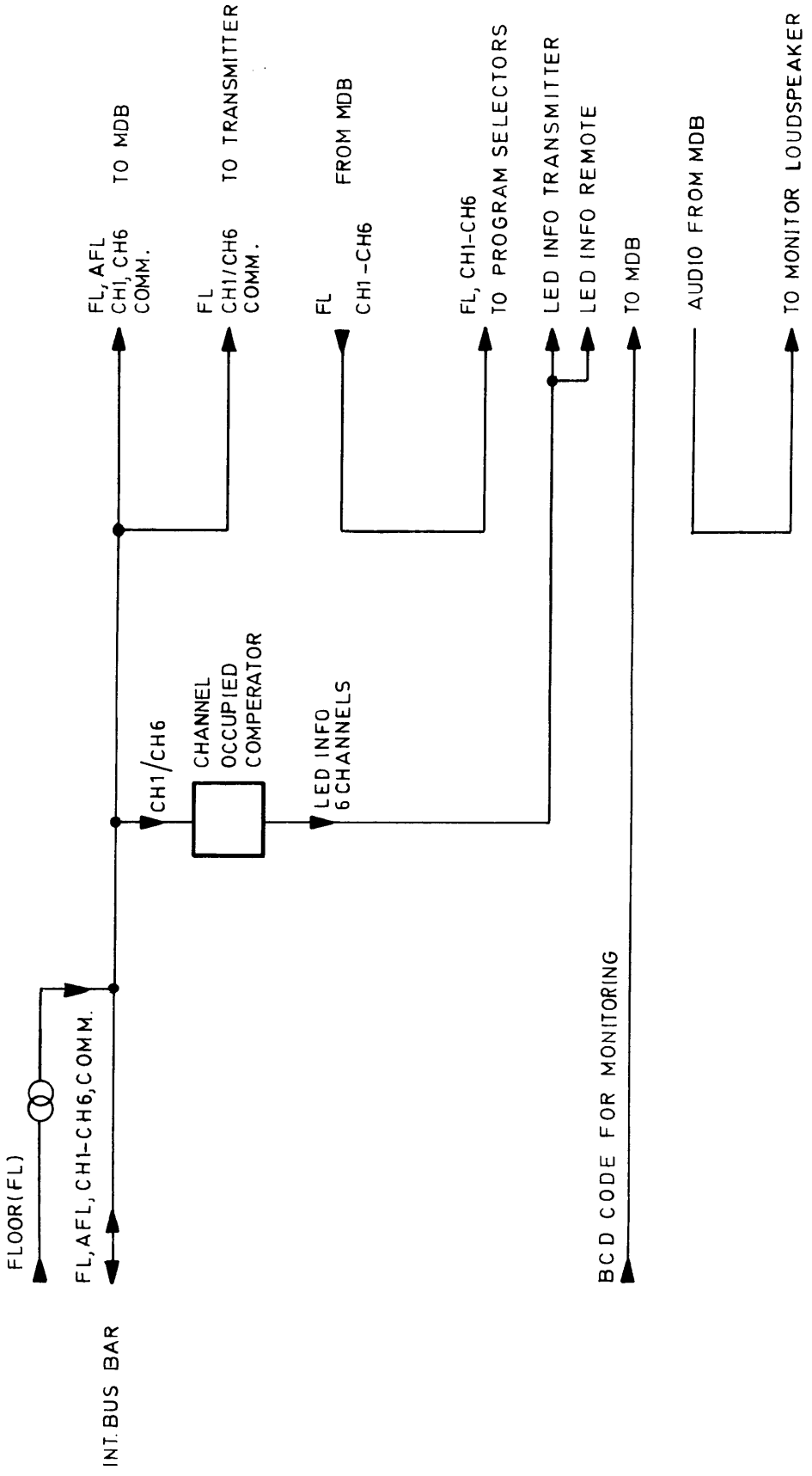


Figure 1 Detailed block diagram of int. and mon. panel

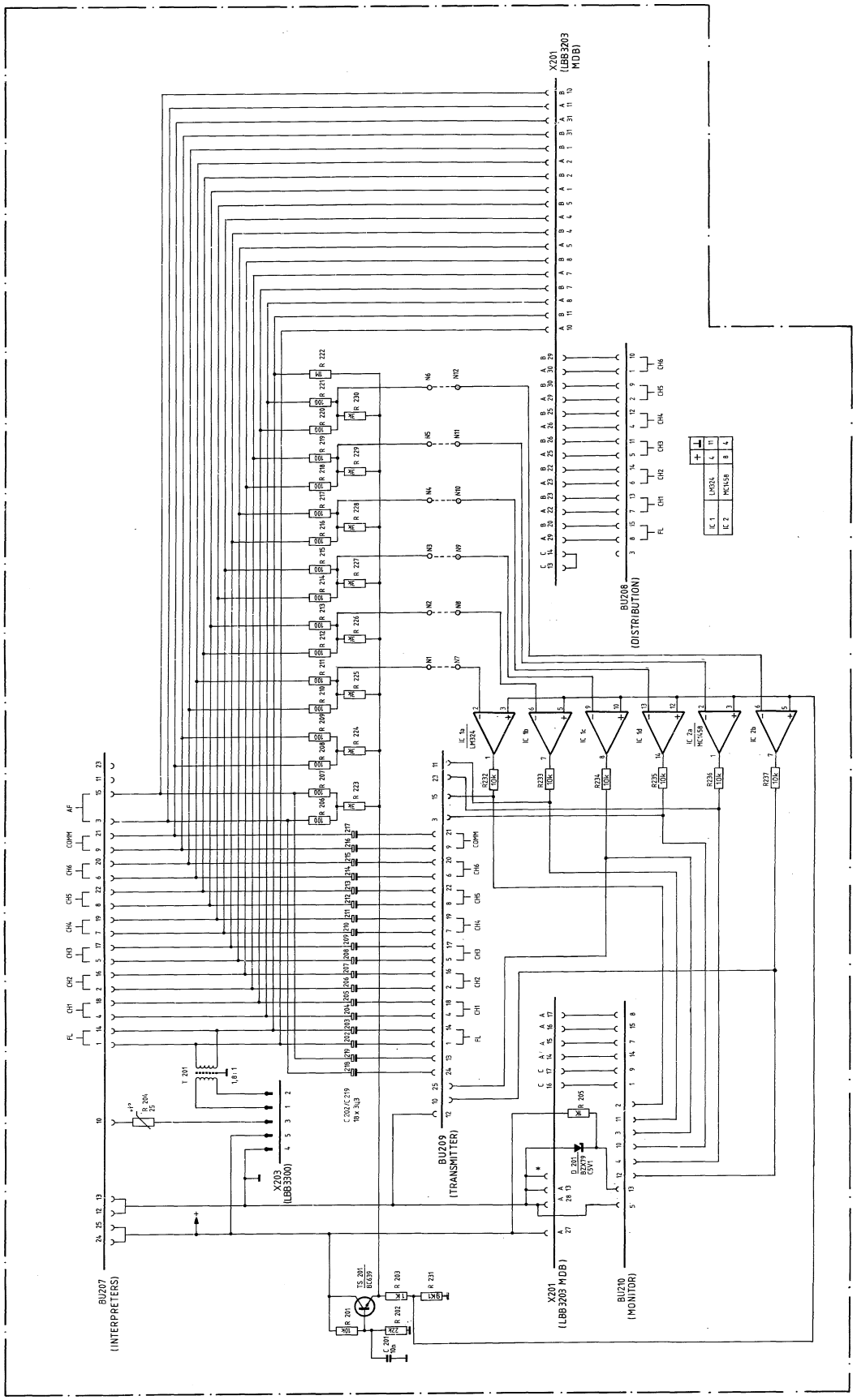


Figure 2 Circuit diagram of int. and mon. panel

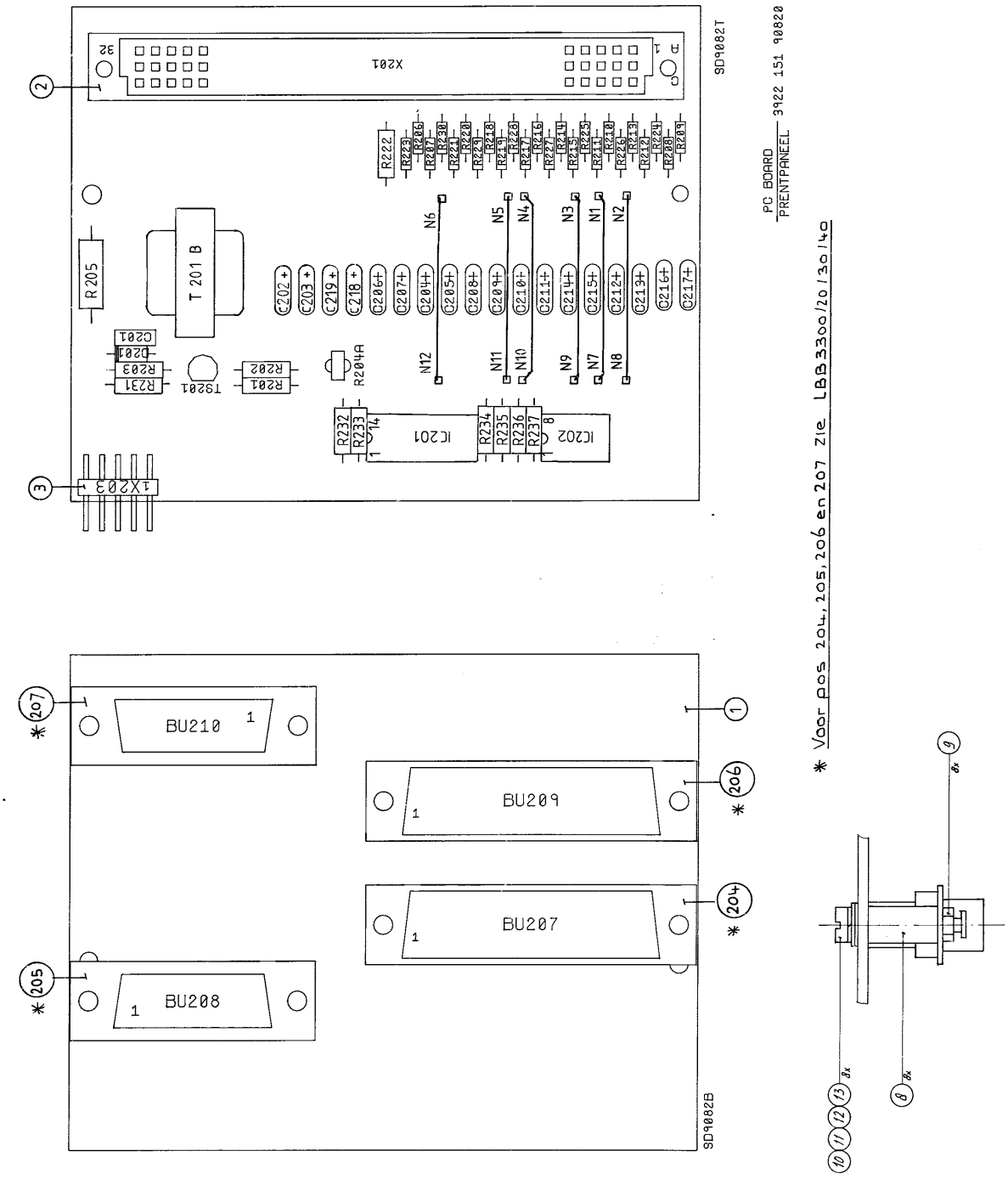


Figure 3 Location of components int. and mon. panel

LBB 3302/00
Microphone plug in unit

Tab 4

CONTENTS

CHAPTER 1 INTRODUCTION

The microphone plug in unit can be divided into 3 parts (see block diagram fig. 1).

Part 1. Microphone Amplifier
Amplifies the microphone input signal, and switches it to the audio line.

Part 2. Auto switch off circuit
Compares the audio signal and the microphone signal. Automatically switches "off" the microphone, when there is no input from the delegate for approximately 30 to 45 seconds.

Part 3. Microphone Switching Circuit
Switches the microphone on/off, depending on the status of the control signals. The control signals comprise of the Microphone, remote, priority and disable request signals, plus the output signal from the Auto switch off circuit.

CHAPTER 2 CIRCUIT DESCRIPTION

(see Circuit diagram Fig. 2)

1 General

When the system is switched “on”, capacitor C33 charges to the supply voltage 27v. Resistors R48, and R50 cause the voltage on the +input 5 of IC3b to the lower, than on the negative input 6. This state is valid until the power supply voltage reaches 14v. The difference negative voltage, between the negative input and the positive input of IC3, causes the comparator output to be 0v. The 0v is applied to the negative input 2 of IC3a, because the voltage on the positive input 3 is +6v, the comparator output will be high i.e. logic “1”. Logic “1” resets the flip-flop IC5a. Switching on the system, the supply voltage exceeds 14v, the zener diode D11 will conduct, causing the voltage at input 6, to be left at a constant level of 15v. If the power supply voltage exceeds 20v, the voltage at the input of IC3b pin 5 is higher than the 15v on the input 6 causing a positive difference voltage, ensuring that the comparator no longer clamps the voltage to zero. 15v is applied to the negative input of IC3a, pin 2, which is higher than the +6v on the positive input 3, therefore the output from the comparator is 0v, is logic “0”. Logic “0” will not reset the flip-flop IC5, and the plug in unit is now “ready” for use.

2 Switching Control Circuit General

The switching control circuit IC5a, IC3a and IC4a/b carries out all the switching functions in the microphone plug in unit. Switching is due to the state of the call microphone signal, priority-, disable request and the microphone signal. IC5a is a flip flop, who’s output is logic “0” (0v) or logic “1” (15v) depending on its input signals. When the output is 0v, the microphone signal is switched “off” from the pre-amplifier to the audio line. When the output is 15v, the microphone signal via the pre-amplifier will be switched to the audio line.

The priority and disable request line are via a comparator circuit, connected to the reset and data input. The priority signal, when active, ensures that the flip-flop will be reset, and the active disable request signal ensures that the data input becomes ”0”. The microphone call signal, from the microphone button, is via inverter circuit around IC7, applied to the clock input of IC5, and the microphone remote call signal to the set input. The clock or set pulse can make the flip-flop output logic “1” (15v), causing the microphone to be switched “on”.

The audio comparator output is connected via a comparator to the reset input of IC5. Therefore after the delay time of approximately 30 to 45 seconds, the flip-flop will be reset, and the switched “on” microphone is then switched “off”.

3 Call Position

In the call position, the microphone switching circuit is activated, by the switching control circuit. The microphone signal is fed via the pre-amplifier and switched to the audio line.

During a call, the logic “0” from the pressed microphone call button is via IC7 and associated circuitry inverted and applied as a “1” (15v) to the clock input of IC5.
No priority or remote signals are present, therefore the reset input and the set input are at logic “0”. Because disable request is inactive, the data input of IC5 stays 15v, (logic “1”). The data input is high, and the output of the flip-flop will be logic “1”, (15v) on the positive edge of the clockpulse, caused by pressing the “call button”. The inverse flip-flop output is now “0”, this output is fed back to the data input, which also becomes “0”. This means that the next clockpulse (S1) will reset the flip-flop. The 15v on output 1 is applied to the base of TS5 in the microphone switching circuit.
The transistor is conducting, causing TS4 also to conduct, current can now flow, via the emitter of TS4 to ground. The microphone signal is taken from the collector. Because IC8a and IC8b are closed now, the microphone led illuminates.

Pre-Amplifier

The pre-amplifier consists of IC1a, TS4 and associated components. A DC voltage is fed via TS1 and applied to the electret microphone line. The current flowing from TS1 to the electret microphone ensures that the “FET” inside the microphone is conducting. The analogue microphone signal, is applied to the microphone line, by the microphone

itself, and fed via C1 and C2 to the + and – input of the operational amp. IC1a. C1 ensures that the DC voltage for the electret microphone, cannot reach the input of the Op amp.
A DC voltage of approximately 4v is fed via R5, and R6 and R8 to the analogue microphone signal on the inputs of IC1a. C2 ensures that this DC voltage is not influenced by TS2 and TS3. The output signal of the Op amp. IC1a if fed back via R11/C48 to the -input. With potentiometer R10 the amplification of IC1a can be adjusted according to the sensitivity of the used microphone.
In this way differences in sensitivity of the microphones are compensated.
The amplified signal, a DC level of approximately 10v on which the audio signal is superimposed, from the Op amp is applied to the base of TS4.

4 Limiter

The limiter consists of TS2, TS3, and associated components. When the output signal of the Op amp IC1a reaches a value greater than + 0.7v, D1 and D2 conduct, and so will TS2 or TS3. When either of these two transistors is conducting, the input signal from the pre- amplifier decreases. A sample of the current from the analogue microphone signal is then flowing via the conducting transistors to ground. The microphone signal is now limited. The limiter is divided into two sections, the right section D2 and TS3 is for the positive AC part of the output signal, and the left section D1 and TS2, for the negative AC output signal.

5 Resetting “Call” Position

If the call button S1 is pressed again, IC5 receives another positive pulse on its clock input. The inverse output pin 2, was “0”, and so the data input of IC5. After the clockpluse, the output pin 1, becomes “0”, because the data input is “0”. Output 2 is the inverse of output 1, is logic “1”, therefore the data input is “1” again. The logic “0” at output 1 causes the microphone switching circuit to become in-active. Transistor TS5 is not conducting, due to the 0v on its base, from the output of IC5. Therefore the microphone signal on the base of TS4, is not switched to the audio line.

6 Priority

When the chairman wants priority over the delegate microphones the priority line becomes about 1,5V. Due R37 and R99 1V is applied to the -input of IC3a then.
Because the 6V on the +input the comperator output is about 15V which is logic “1”. Via the reset input IC5 is now reset. The set input stays “0” and the data input “1”. The flip-flop output was “1”, due to the reset the output becomes “0”. The microphone signal is switched off by TS5, which is now non-conductive because of the 0V on its base.
As long as the priority line is 1,5V the reset input stays “1” and the flip-flop resetted, pushing the call button does not influence the switching control circuit. The delegate can not switch on his microphone with his call button.

When the chairman resets his priority, the priority line becomes 27v, 27v is then fed to the -input of the comparator IC3a. Because the +input is 6v, the output is 0v, is logic “0”, therefore the reset input to IC5 is no longer reset. Therefore the microphone can be switched on/of as normal via the call button.

7 Disable Request

When the adjusted number of microphones, are switched “on” (1, 3 or 6 via switch S102) simultaneously. The disable request line reaches approximately 27v. This 27v is applied to the -input of IC2d.
Because the +input is connected to 10v the output of the comparator becomes 0v. The data input, which is at 15v, is then brought down to approximately 1v, due to the forward voltage on the diode D13. This 1v is logic “0” to the flip-flop. When the microphone is switched “on”, during the disable request, the data input is already at “0”, because the inverse flip flop output is at 0v. During the disable request, the switched “on” microphones can be switched “off” by pressing the call button. The positive pulse on the clock input, clocks the data which is at “0”, to the output.

During the disable request, a microphone cannot be switched “on”, because the data input is set to “0”. The call pulses from the call button, only switches a “0” to the flip-flop output.

When the number of switched “on” microphones, is less than the maximum number, adjusted by switch S102, the disable request line becomes 0v.

The output from the comparator IC2d is now not longer clamping the date input to zero. The plug in unit is now in the listening position, and the delegate is now able to switch “on” his microphone, by pressing his call button.

8 Audio Level Comparator

The audio level comparator ensures that when a delegate does not speak into his microphone for approximately 30 to 45 seconds, the flip-flop IC5, fed via comparator IC3a, will be reset.

At input 3 of IC2a, a DC level of approximately 9v is applied. The microphone signal is applied to the -input 2 of IC2a. The Op. amp IC2a, subtracts the microphone signal from the DC level, and amplifies the resulting signal. The output signal is now at a 9v DC level, which is used to superimpose the amplified microphone signal on. This signal is then applied to the -input of IC2b and at input 5, the disable request signal. The disable request signal, plus a DC level from R20 on the disable request signal, together form a 9v DC level on which the audio signal (other delegates + delegate itself) is superimposed. IC2b subtracts the output of IC2a, which is the 9v on which the microphone signal is superimposed, from the 9v on which the microphone signal is superimposed. The output 7, of IC2b is at a DC level of 9v, on which the difference between the audio- and the microphone signal is superimposed. The difference voltage, can reduce the voltage on x, and the output of IC2a, which is the 9v on which the microphone signal is superimposed, can reduce the voltage on Y. When only the delegate is using his microphone, the audio signal is the same as the microphone signal. The Ac difference voltage at the output of IC2b is 0v, only the 9v DC level is on the output. The voltage on x is now 9v plus the forward voltage of D6, adding up to a total of approximately 10v. When more than one delegate is speaking, the audio signal is higher than the microphone signal. On the output of IC2b, the difference voltage, superimposed on the 9v DC is applied, the negative going voltage of the AC difference signal, ensures that the 10v on x is decreased via D6 and C21.

If the delegate is silent, there is no microphone signal, therefore the AC voltage on the 9v DC level at the output of IC2a is at 0v. The voltage at Y is at 9v plus the forward voltage of D7, which in total sums up to approximately 10v. When the microphone is in use, the microphone signal is amplified by IC2a. The negative going voltage of this microphone signal ensures that the 10v on Y is decreased, via D7 and C22.

X is applied to the +input of IC2c, and Y to the -input. When X is greater than Y, the output of the Op amp is approximately 15v, and when Y is greater than X the output is 0v. Therefore when the delegate uses his microphone (he has to speak louder when others are using their microphone), the output of IC2a is 15v, C24 is now charged to 15v, because D9 is conducting. When the delegate stops using his microphone the output becomes 0v. Instantly C24 discharges via R35, and the DC level slowly decreases. This decreasing voltage is then fed via R36, and applied to the -input of IC3a. When the voltage becomes lower than approximately 7v, the comparator output, which was at 0v, now becomes 15v, and resets the flip flop IC5a, and the microphone will now be switched “off”.

The time taken for C24 to discharge from 15v to approximately 7v is about 30 to 45 seconds. When the microphone is switched “off” the output of IC2c becomes 15v, independent of the number of other switched on microphones. This is because Y is approximately 1v, when the microphone is not switched “on”. The 0v on the output of IC5a, is applied to D8, therefore C22 can only discharge until the voltage on Y reaches the forward voltage of D8, which is approximately 1v. This forward voltage cannot be exceeded, as long as 0v is applied to the cathode of D8. When the microphone is switched “on”, by the delegate pressing his call button, then approximately 13v is applied to the cathode of diode D8. C22 can now partly discharge, and the voltage on Y increases to approximately 10v, because of the 9v DC on the cathode of D7 and its forward voltage of approximately 1v.

By placing the jumper S3, in the b-a position, capacitor C24 cannot discharge via R35, therefore the audio level comparator is in- active.
Switching S102, the audio level comparator can be made in-active. In the three position 1, 2 or 6 microphones in non-auto, the switch supplies 0v to the ground reference, which is normally 9v DC.
This 0v is fed via R30 and C20, to the -input of IC2b and overrules the output signal from IC2a. The output of IC2b is now 0v, therefore X is at 10v. IC2c output is and remains 15v, therefore the capacitor, which is charged, discharges and the audio level comparator is in-active.

CHAPTER 3 SPARE PARTS LIST

1 Spare parts list of Microphone plug in Unit LBB 3302/00

C	1	10	NF			4822 122 32442
C	2	100	NF	10%	X7R	50 V	5322 122 32839
C	3	10	UF	20%		25 V	4822 124 21747
C	4	4,7	UF	20%		25 V	5322 124 21966
C	5	0,47	UF	20%		25 V	4822 124 21453
C	6	4,7	UF	20%		25 V	5322 124 21966
C	7	47	UF	20%		10 V	5322 124 21975
C	8	4,7	UF	20%		25 V	5322 124 21966
C	12	100	PF	5%		50 V	4822 122 31765
C	17	100	NF	10%	X7R	50 V	5322 122 32839
C	18	82	NF	10%		50 V	5322 122 32838
C	20	10	UF	20%		25 V	4822 124 21732
C	21	4,7	UF	20%		25 V	5322 124 21966
C	22	4,7	UF	20%		25 V	5322 124 21966
C	23	100	PF	5%		50 V	4822 122 31765
C	24	100	UF	50%		25 V	4822 124 20701
C	25	100	PF	5%		50 V	4822 122 31765
C	26	4,7	NF	10%	X7R	50 V	4822 122 31784
C	27	100	NF	10%	X7R	50 V	5322 122 32839
C	28	10	NF				4822 122 32442
C	29	4,7	NF	10%	X7R	50 V	4822 122 31784
C	30	100	PF	5%		50 V	4822 122 31765
C	31	100	PF	5%		50 V	4822 122 31765
C	32	47	UF	50%		25 V	4822 124 20699
C	33	47	UF	50%		40 V	4822 124 20713
C	35	22	UF	20%		25 V	4822 124 21646
C	36	47	UF	50%		25 V	4822 124 20699
C	41	56	NF	10%			4822 122 32183
C	43	22	UF	20%		25 V	4822 124 21646
C	45	100	NF	10%	X7R	50 V	5322 122 32839
C	47	22	NF	10%		63 V	4822 122 31797
C	48	47	PF	5%		50 V	4822 122 31772
D	1	BAV 70					5322 130 34331
D	2	BAV 70					5322 130 34331
D	3	BZX 84-C5V1					5322 130 32835
D	6	BAV 70					5322 130 34331
D	7	BAV 70					5322 130 34331
D	8	BAV 70					5322 130 34331
D	9	BAV 70					5322 130 34331
D	11	BZX 84-C15					5322 130 33662
D	12	BAV 70					5322 130 34331
D	13	BAV 70					5322 130 34331
D	15	BAV 70					5322 130 34331
D	17	BAV 70					5322 130 34331
D	19	BZV 46- 2 VO					4822 130 31248
D	20	BZX 79- B30					4822 130 34328
D	21	BZX 79- B6V2					4822 130 34167
IC	1	LF 353 N					5322 209 81395
IC	2	LN 324 D					5322 209 83125
IC	3	LM 393 D				PHIN	5322 209 71599
IC	4	LN 393 D				PHIN	5322 209 71599
IC	5	HEF 4013 BT					5322 209 14477
IC	7	NC 1741 CD					5322 209 71597
IC	8	HEF 4066 BT					5322 209 14542
R	1	5 K 6			2%	0,125 W	4822 111 90572

R 2	47 K	2%	0,125 W	4822 111 90543
R 3	390 E	2%	0,125 W	5322 111 90138
R 4	10 K	2%	0,125 W	4822 111 90249
R 5	47 K	2%	0,125 W	4822 111 90543
R 6	33 K	2%	0,125 W	5322 111 90267
R 7	1 K	2%	0,125 W	5322 111 90092
R 8	220 K	2%	0,125 W	4822 111 90197
R 9	1 K 2	2%	0,125 W	5311 111 90096
R 10	4 K 7	10% LIN	0,5 W	5322 101 10691
R 11	68 K	2%	0,125 W	4822 111 90202
R 12	100 K	2%	0,125 W	4822 111 90214
R 13	10 K	2%	0,125 W	4822 111 90249
R 15	100 K	2%	0,125 W	4822 111 90214
R 16	1 K 5	2%	0,125 W	4822 111 90151
R 17	12 K	2%	0,125 W	4822 111 90253
R 18	1 M	5%	0,125 W	5322 111 90094
R 21	100 E	2%	0,125 W	5322 111 90091
R 22	JUMPER 0E		0,125 W	4822 111 90163
R 26	18 K	2%	0,125 W	4922 111 90238
R 27	39 K	2%	0,125 W	5322 111 90108
R 28	100 K	2%	0,125 W	4822 111 90214
R 29	33 K	2%	0,125 W	5322 111 90267
R 30	1 K	2%	0,125 W	5322 111 90092
R 31	18 K	2%	0,125 W	4822 111 90238
R 32	1 M	5%	0,125 W	5322 111 90094
R 33	1 M	5%	0,125 W	5322 111 90094
R 34	1 K	2%	0,125 W	5322 111 90092
R 35	4 K 7	2%	0,125 W	5322 111 90111
R 36	100 K	2%	0,125 W	4822 111 90214
R 37	1 M	5%	0,125 W	5322 111 90094
R 38	10 M	5%	0,125 W	5322 111 91141
R 39	100 K	2%	0,125 W	4822 111 90214
R 40	100 K	2%	0,125 W	4822 111 90214
R 41	100 K	2%	0,125 W	4822 111 90214
R 42	1 K	2%	0,125 W	5322 111 90092
R 43	100 K	2%	0,125 W	4822 111 90214
R 44	1 M	5%	0,125 W	5322 111 90094
R 45	100 K	2%	0,125 W	4822 111 90214
R 46	47 K	2%	0,125 W	4822 111 90543
R 47	1 K	2%	0,125 W	5322 111 90092
R 48	100 K	2%	0,125 W	4822 111 90214
R 49	100 K	2%	0,125 W	4822 111 90214
R 50	27 K	2%	0,125 W	4822 111 90542
R 51	68 K	2%	0,125 W	4822 111 90202
R 52	33 K	2%	0,125 W	5322 111 90267
R 53	100 K	2%	0,125 W	4822 111 90214
R 54				5322 116 44008
R 55	100 K	2%	0,125 W	4822 111 90214
R 56	15 K	2%	0,125 W	4822 111 90196
R 57	15 K	2%	0,125 W	4822 111 90196
R 58	12 K	2%	0,125 W	4822 111 90253
R 59	2 K 7	2%	0,125 W	4822 111 90569
R 60	100 K	2%	0,125 W	4822 111 90214
R 73	33 K	2%	0,125 W	5322 111 90267
R 74	100 K	2%	0,125 W	4822 111 90214
R 76	100 E	2%	0,125 W	5322 111 90091
R 77	100 E	2%	0,125 W	5322 111 90091
R 78	3 K 9	2%	0,125 W	4822 111 90571
R 79	100 K	2%	0,125 W	4822 111 90214
R 81	230 K	2%	0,125 W	4822 111 90197
R 82	3 K 9	2%	0,125 W	4822 111 90571
R 83	3 K 9	2%	0,125 W	4822 111 90571

R 84	JUMPER OE			4822 111 90163
R 85	JUMPER OE			4822 111 90163
R 86	220 K	2%	0,125 W	4822 111 90197
R 88	1 M	2%	0,125 W	5322 111 90094
R 92	82 K	2%	0,125 W	4822 111 90575
R 93	68 K	2%	0,125 W	4822 111 90202
R 94	680 E	2%	0,125 W	4822 111 90162
R 95	100 K	2%	0,125 W	4822 111 90214
R 96	5 K 6	2%	0,125 W	4822 111 90572
R 97	JUMPER OE			4822 111 90163
R 99	10 K	2%	0,125 W	4822 111 90249
R 102	1 M	5%	0,125 W	5322 111 90094
R 103	1 M	5%	0,125 W	5322 111 90094
R 104	15 K	1%	0,6 W	4822 116 53083
S 3	Pins for S3			5322 535 84341
S 3	Jumper S3			5322 290 60298
TS 1	BC 847 C	PHIN		5322 130 42755
TS 2	BC 857 C	PHIN		5322 130 42756
TS 3	BC 847 C	PHIN		5322 130 42755
TS 4	BC 847 C	PHIN		5322 130 42755
TS 5	BC 847 C	PHIN		5322 130 42755
TS 8	BC 817-40			4822 130 42615
TS 9	BC 817-40			4822 130 42615
X 7	Microphone connector			5322 265 40345

2 Spare parts list for microphone assembly

	Microphone			5322 242 20094
	Cap for microphone			5322 462 50331
	Foam cap for microphone			5322 462 40731
	Mic. cable			5322 321 21078
	Knob for microphone push button			5322 414 30086
C 4	100 PF	5%	50 v for microphone	4822 122 31765
	Mic. switch mechanism			5322 276 11415
C 1	1,5 UF	20%	35 V	5322 124 14078
C 2	10 UF	50%.	40 V	4822 124 20708
C 3	10 UF	50%	40 V	4822 124 20708
D 1	CQW 54			4822 130 32069
D 2	TIUG 164			5322 130 32587

3 Recommended spare parts list

3.1 Microphone plug in Unit LBB 3302/00

	Description		Code number
D 3	BZX 84-C5V1		5322 130 32835
D 11	BZX 84-C15		5322 130 33662
D 19	BZV 46- x VO		4822 130 31248
D 20	BZX 79- B30		4822 130 34328
D 21	BZX 79- B6V2		4822 130 34167
IC 1	LF 353 N		5322 209 81395
IC 2	LN 324 D		5322 209 83125
IC 3	LM 393 D	PHIN	5322 209 70225
IC 4	LN 393 D	PHIN	5322 209 70225
IC 5	HEF 4013 BT		5322 209 14477

IC	7	NC 1741 CD			5322 209 11311
IC	8	HEF 4066 BT			5322 209 14542
TS	1	BC 847 C		PHIN	5322 130 42755
TS	2	BC 857 C	PHIN		5322 130 42756
TS	3	BC 847 C	PHIN		5322 130 42755
TS	4	BC 847 C	PHIN		5322 130 42755
TS	5	BC 847 C	PHIN		5322 130 42755
TS	8	BC 817-40			4822 130 42615
TS	9	BC 817-40			4822 130 42615
X	7	Microphone connector			5322 265 40345

3.2 Spare parts list for Microphone Assembly

		Description			Code number
		Microphone			5322 242 20094
		Cap for microphone			5322 462 50331
		Foam cap for microphone			5322 462 40731
		Mic. cable			5322 321 21078
		Knob for microphone push button			5322 414 30086
C	4	100 PF microphone	5%	50 v for	4822 122 31765
		Mic. switch mechanism			5322 276 11415
D	1	CQW 54			4822 130 32069
D	2	TIUG 164			5322 130 32587

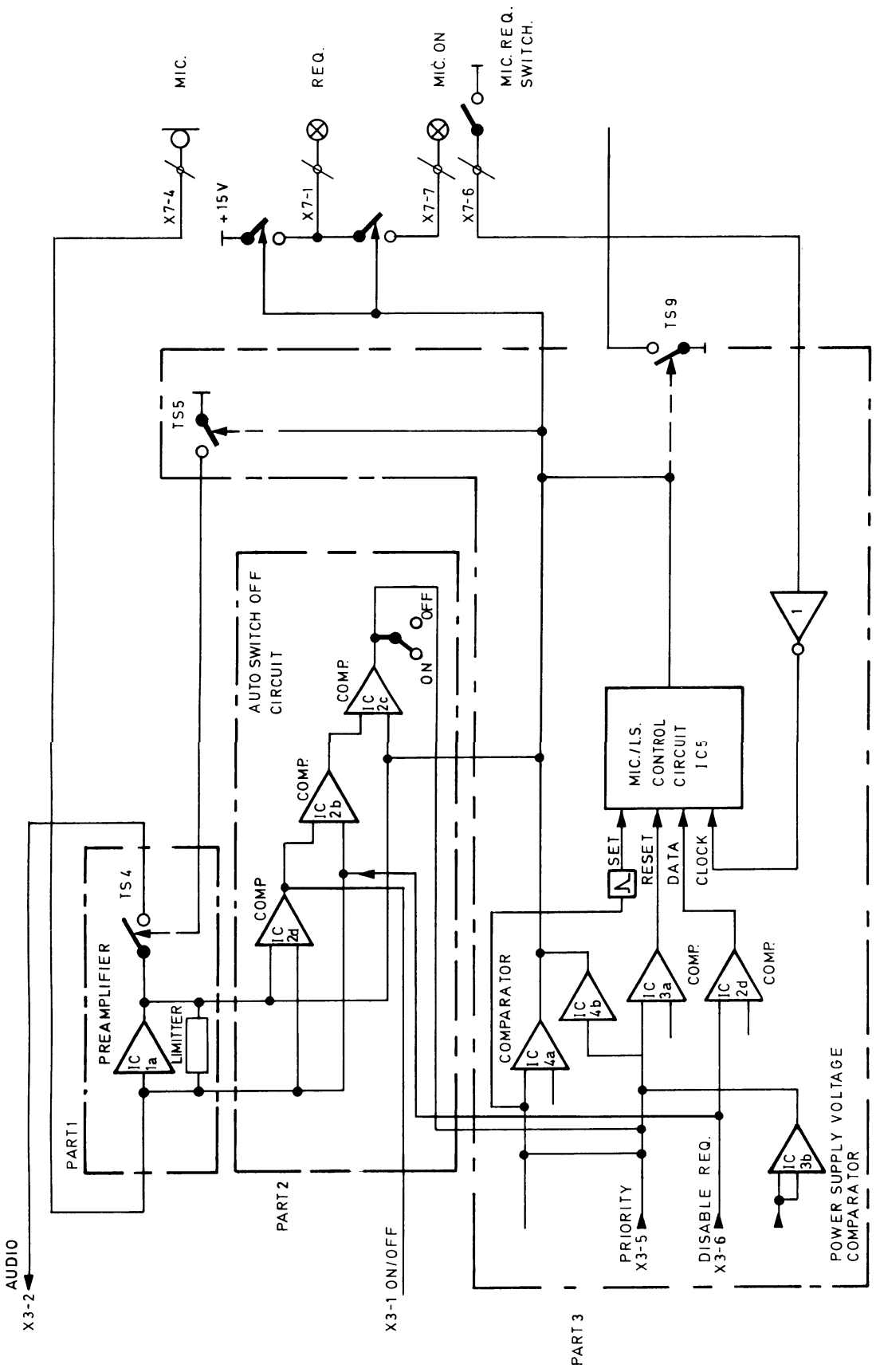


Figure 1 Block diagram of microphone plug in unit

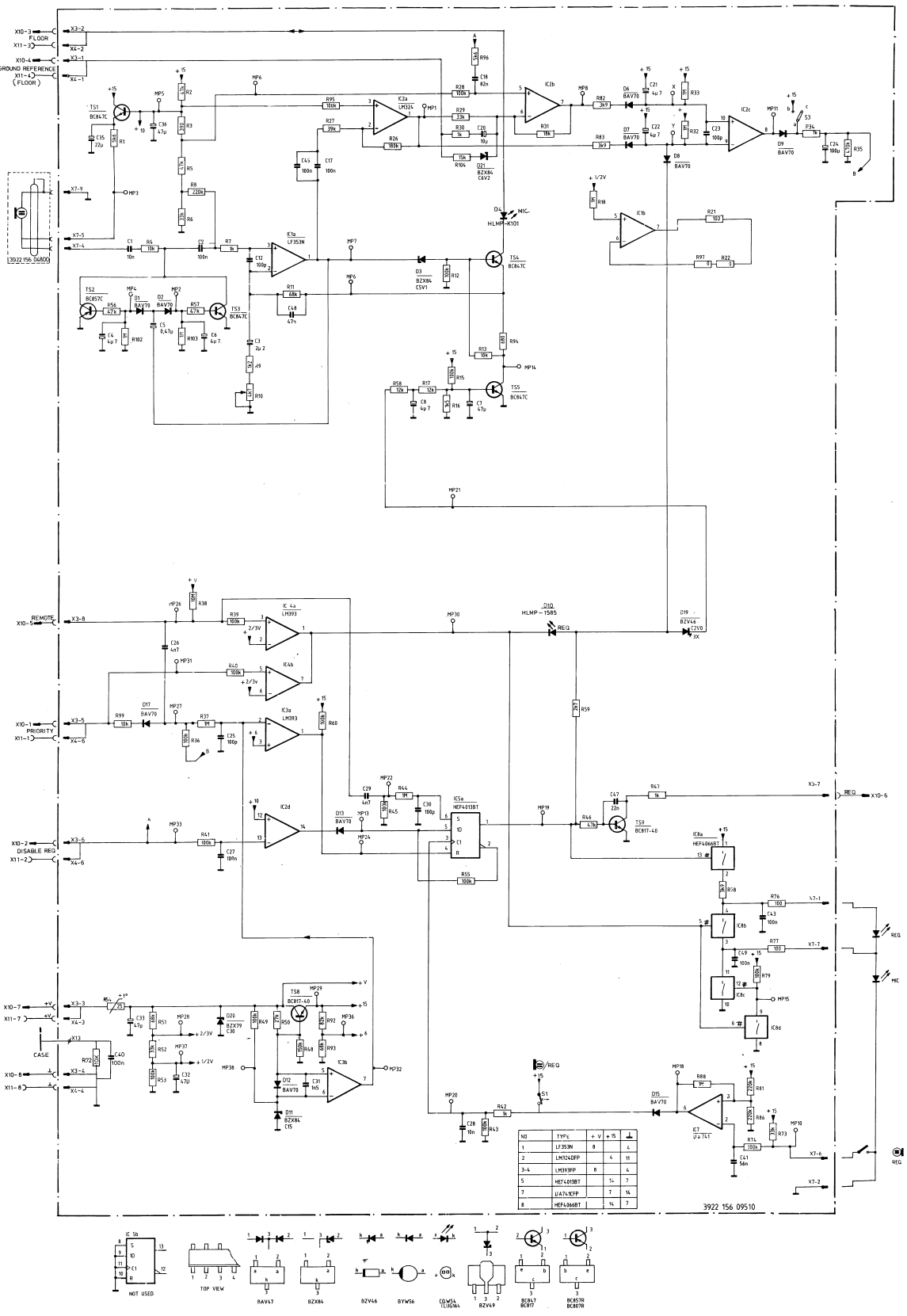


Figure 2 Circuit diagram of microphone plug in unit

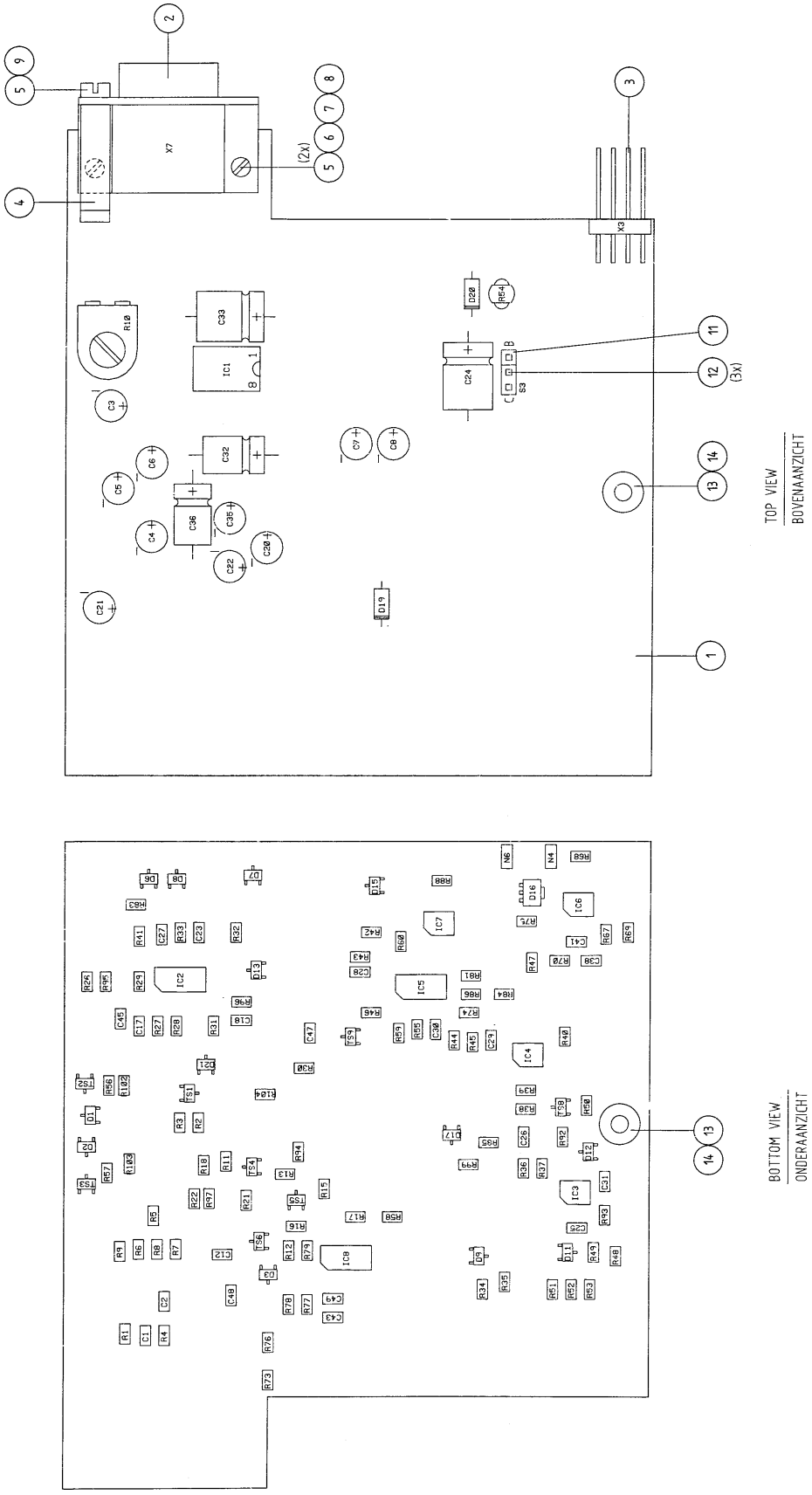


Figure 3 Location of components of microphone plug in unit

LBB 3203/00
Monitor Distribution Board (M.D.B.)

Tab 5

CONTENTS

CHAPTER 1 INTRODUCTION

(see fig. 1)

The Monitor Distribution Board has 8 output channels, floor, auto floor, and channels 1 to 6 inclusive, which are amplified by symmetrical amplifiers (3 Watt). Only the floor and channels 1 to 6 are, fed to the programme selector socket BU 208. BCD code information is fed to the monitor selector on the NDB via the remote socket, enabling channels 1 to 6, floor, auto floor to be monitored. The audio line can be connected to a monitor loudspeaker and the communication signal from the interpreter desk is automatically fed to the monitor loudspeaker, independent of which channel is being monitored.

CHAPTER 2 CIRCUIT DESCRIPTION

(see fig. 2)

The Monitor Distribution Board (MDB) provides the audio signal for the monitor loudspeaker. The desired channel for monitoring can be selected by injecting its corresponding BCD code at the monitor socket BU 210. The channel selector switch, consisting of IC1 and IC2 is switched to the chosen channel via opto couplers, IC5 to IC8 and the Schmitt- trigger IC4.
The BCD code controls the analogue multiplexers IC1 and IC2, this control line ensures that the selected channel of the interpreters' bus bar is switched to the loudspeaker via the monitor socket. Channels 1 to 6, floor and auto floor are fed to amplifiers IC101 to IC 801, and amplified to the 12 Volts output level. Channels 1 to 6 and floor only are connected to the distribution socket for the programme selectors. The output of the amplifiers IC101 to IC801 are also fed via a resistor divider network (R18/R2, etc.) to the analogue multiplexers IC1 and IC2, which switch the selected channel, due to the BCD code fed to IC3a and IC3b.

The amplifier stage IC3, TS1 to TS4, applies the selected channel to the connector X201. Because the communication line is automatically injected into the amplifier, the signal will override the selected channel. The microphone signal from an interpreter desk is switched to the communication channel, when the "CONM" button on the desk is pressed.

CHAPTER 3 SPARE PARTS LIST

1 Monitor Distribution Board (M.D.B.) LBB 3203/00

X 1	P.C. male connector 2 x 32P				5322 265 64104
C 8	470NF	20%	35 V		5322 124 10319
C 12	100UF	20%	35 V		5322 124 21389
C 13	100UF	20%	35 V		5322 124 21389
C 14	6,8UF	20%	25 V		5322 124 14081
C 15	6,8UF	20%	25 V		5322 124 14081
C 16	6,8UF	20%	25 V		5322 124 14081
C 17	6,8UF	20%	25 V		5322 124 14081
C 109	100UF	20%	35 V		5322 124 21389
C 110	100UF	20%	35 V		5322 124 21389
C 111	470NF	20%	35 V		5322 124 10319
C 209	100UF	20%	35 V		5322 124 21389
C 210	100UF	20%	35 V		5322 124 21389
C 211	470NF	20%	35 V		5322 124 10319
C 309	100UF	20%	35 V		5322 124 21389
C 310	100UF	20%	35 V		5322 124 21389
C 311	470NF	20%	35 V		5322 124 10319
C 409	100UF	20%	35 V		5322 124 21389
C 410	100UF	20%	35 V		5322 124 21389
C 411	470NF	20%	35 V		5322 124 10319
C 509	100UF	20%	35 V		5322 124 21389
C 510	100UF	20%	35 V		5322 124 21389
C 511	470NF	20%	35 V		5322 124 10319
C 609	100UF	20%	35 V		5322 124 21389
C 610	100UF	20%	35 V		5322 124 21389
C 611	470NF	20%	35 V		5322 124 10319
C 709	100UF	20%	35 V		5322 124 21389
C 710	100UF	20%	35 V		5322 124 21389
C 711	470N	20%	35 V		5322 124 10319
C 809	100UF	20%	35 V		5322 124 21389
C 810	100UF	20%	35 V		5322 124 21389
C 811	470NF	20%	35 V		5322 124 10319
D 1	BZX79-B16				4822 130 34268
F 1	1 Amp T				4822 253 30021
IC 1	HEF4051BD				4822 209 10262
IC 2	HEF4051BD				4822 209 10262
IC 3	NE5532FE				5322 209 86234
IC 4	HEF40106BD				4822 209 10318
IC 5	CNX36				5322 130 90097
IC 6	CNX36				5322 130 90097
IC 7	CNX36				5322 130 90097
IC 8	CNX36				5322 130 90097
IC 9	NE5534N				5322 209 86285
IC 101	NE5532FE				5322 209 86234
IC 201	NE5532FE				5322 209 86234
IC 301	NE5532FE				5322 209 86234
IC 401	NE5532FE				5322 209 86234
IC 501	NE5532FE				5322 209 86234
IC 601	NE5532FE				5322 209 86234
IC 701	NE5532FE				5322 209 86234
IC 801	NE5532FE				5322 209 86234
R 17	9x IK 2% 0,125W				5322 111 90256
R 18	9 x IK 2% 0,125 W				5322 111 90256
R 30	PTC 5E6 60 V				5322 116 40074
R 31	PTC 5E6 60 V				5322 116 40074

R 110	PTC 5E6 60 V	5322 116 40074
R 111	PTC 5E6 60 V	5322 116 40074
R 210	PTC 5E6 60 V	5322 116 40074
R 211	PTC 5E6 60 V	5322 116 40074
R 310	PTC 5E6 60 V	5322 116 40074
R 311	PTC 5E6 60 V	5322 116 40074
R 410	PTC 5E6 60 V	5322 116 40074
R 411	PTC 5E6 60 V	5322 116 40074
R 510	PTC 5E6 60 V	5322 116 40074
R 511	PTC 5E6 60 V	5322 116 40074
R 610	PTC 5E6 60 V	5322 116 40074
R 611	PTC 5E6 60 V	5322 116 40074
R 710	PTC 5E6 60 V	5322 116 40074
R 711	PTC 5E6 60 V	5322 116 40074
R 810	PTC 5E6 60 V	5322 116 40074
R 811	PTC 5E6 60 V	5322 116 40074
TS 1	BD237	4822 130 44235
TS 2	BD238	4822 130 40917
TS 3	BD237	4822 130 44235
TS 4	BD238	4822 130 40917
TS 5	BC547C	4822 130 44503
TS 6	BC557	4822 130 44256
TS 101	BD237	4822 130 44235
TS 102	BD238	4822 130 40917
TS 103	BD237	4822 130 44235
TS 104	BD238	4822 130 40917
TS 201	BD237	4822 130 44235
TS 202	BD238	4822 130 40917
TS 203	BD237	4822 130 44235
TS 204	BD238	4822 130 40917
TS 301	BD237	4822 130 44235
TS 302	BD238	4822 130 40917
TS 303	BD237	4822 130 44235
TS 304	BD238	4822 130 40917
TS 401	BD237	4822 130 44235
TS 402	BD238	4822 130 40917
TS 403	BD237	4822 130 44235
TS 404	BD238	4822 130 40917
TS 501	BD237	4822 130 44235
TS 502	BD238	4822 130 40917
TS 503	BD237	4822 130 44235
TS 504	BD238	4822 130 40917
TS 601	BD237	4822 130 44235
TS 602	BD238	4822 130 40917
TS 603	BD237	4822 130 44235
TS 604	BD238	4822 130 40917
TS 701	BD237	4822 130 44235
TS 702	BD238	4822 130 40917
TS 703	BD237	4822 130 44235
TS 704	BD238	4822 130 40917
TS 801	BD237	4822 130 44235
TS 802	BD238	4822 130 40917
TS 803	BD237	4822 130 44235
TS 804	BD238	4822 130 40917

2 Recommended spare parts list

X 1	P.C. male connector 2 x 32P	5322 265 64104
D 1	BZX79-B16	4822 130 34268
IC 1	HEF4051BD	4822 209 10262
IC 2	HEF4051BD	4822 209 10262
IC 3	NE5532FE	5322 209 86234
IC 4	HEF40106BD	4822 209 10318
IC 5	CNX36	5322 130 90097
IC 6	CNX36	5322 130 90097
IC 7	CNX36	5322 130 90097
IC 8	CNX36	5322 130 90097
IC 9	NE5534N	5322 209 86285
IC 101	NE5532FE	5322 209 86234
IC 201	NE5532FE	5322 209 86234
IC 301	NE5532FE	5322 209 86234
IC 401	NE5532FE	5322 209 86234
IC 501	NE5532FE	5322 209 86234
IC 601	NE5532FE	5322 209 86234
IC 701	NE5532FE	5322 209 86234
IC 801	NE5532FE	5322 209 86234
R 811	PTC 5E6 60 V	5322 116 40074
TS 1	BD237	4822 130 44235
TS 2	BD238	4822 130 40917
TS 3	BD237	4822 130 44235
TS 4	BD238	4822 130 40917
TS 5	BC547C	4822 130 44503
TS 6	BC557	4822 130 44256
TS 101	BD237	4822 130 44235
TS 102	BD238	4822 130 40917
TS 103	BD237	4822 130 44235
TS 104	BD238	4822 130 40917
TS 201	BD237	4822 130 44235
TS 202	BD238	4822 130 40917
TS 203	BD237	4822 130 44235
TS 204	BD238	4822 130 40917
TS 301	BD237	4822 130 44235
TS 302	BD238	4822 130 40917
TS 303	BD237	4822 130 44235
TS 304	BD238	4822 130 40917
TS 401	BD237	4822 130 44235
TS 402	BD238	4822 130 40917
TS 403	BD237	4822 130 44235
TS 404	BD238	4822 130 40917
TS 501	BD237	4822 130 44235
TS 502	BD238	4822 130 40917
TS 503	BD237	4822 130 44235
TS 504	BD238	4822 130 40917
TS 601	BD237	4822 130 44235
TS 602	BD238	4822 130 40917
TS 603	BD237	4822 130 44235
TS 604	BD238	4822 130 40917
TS 701	BD237	4822 130 44235
TS 702	BD238	4822 130 40917
TS 703	BD237	4822 130 44235
TS 704	BD238	4822 130 40917
TS 801	BD237	4822 130 44235
TS 802	BD238	4822 130 40917
TS 803	BD237	4822 130 44235
TS 804	BD238	4822 130 40917

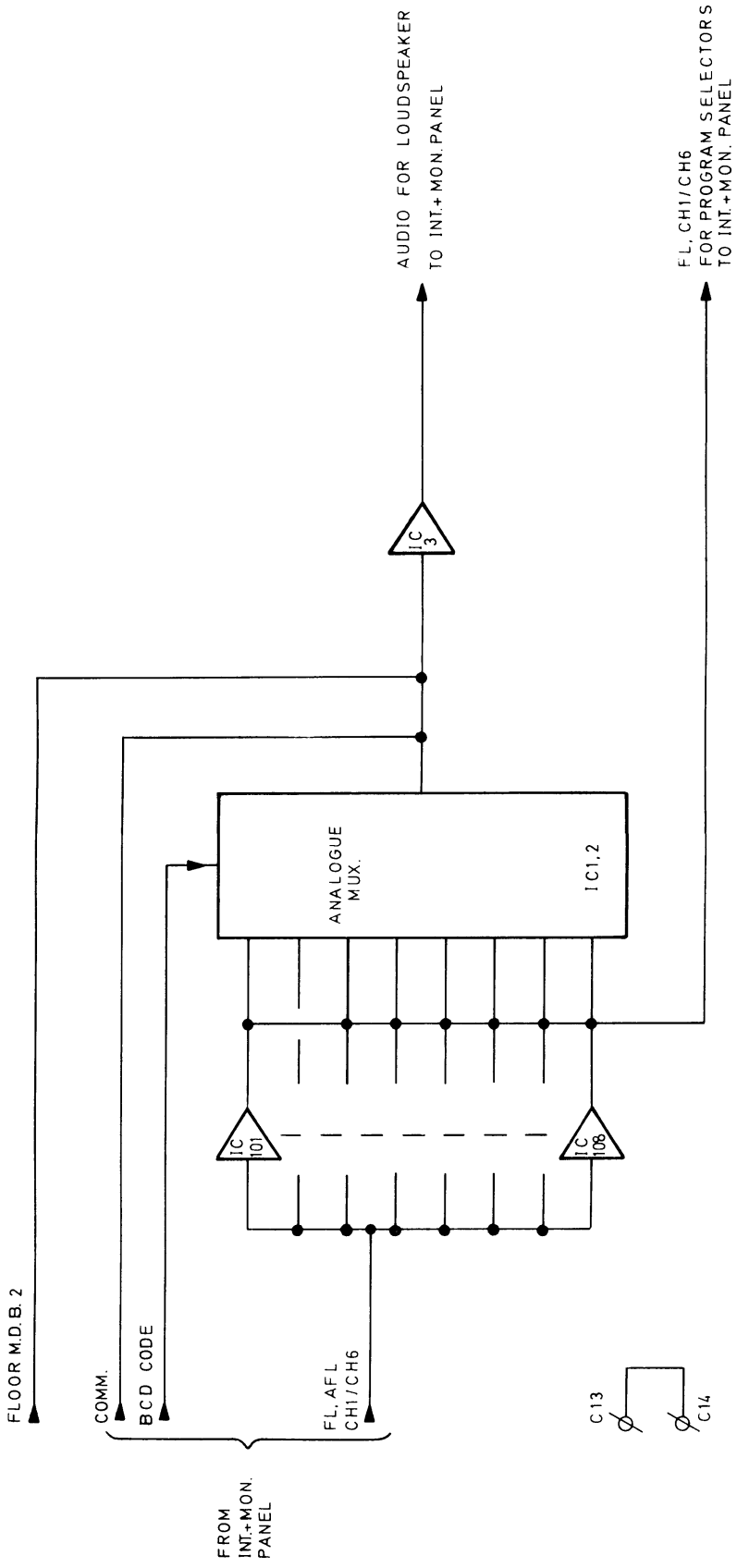


Figure 1 Block diagram monitor distribution board

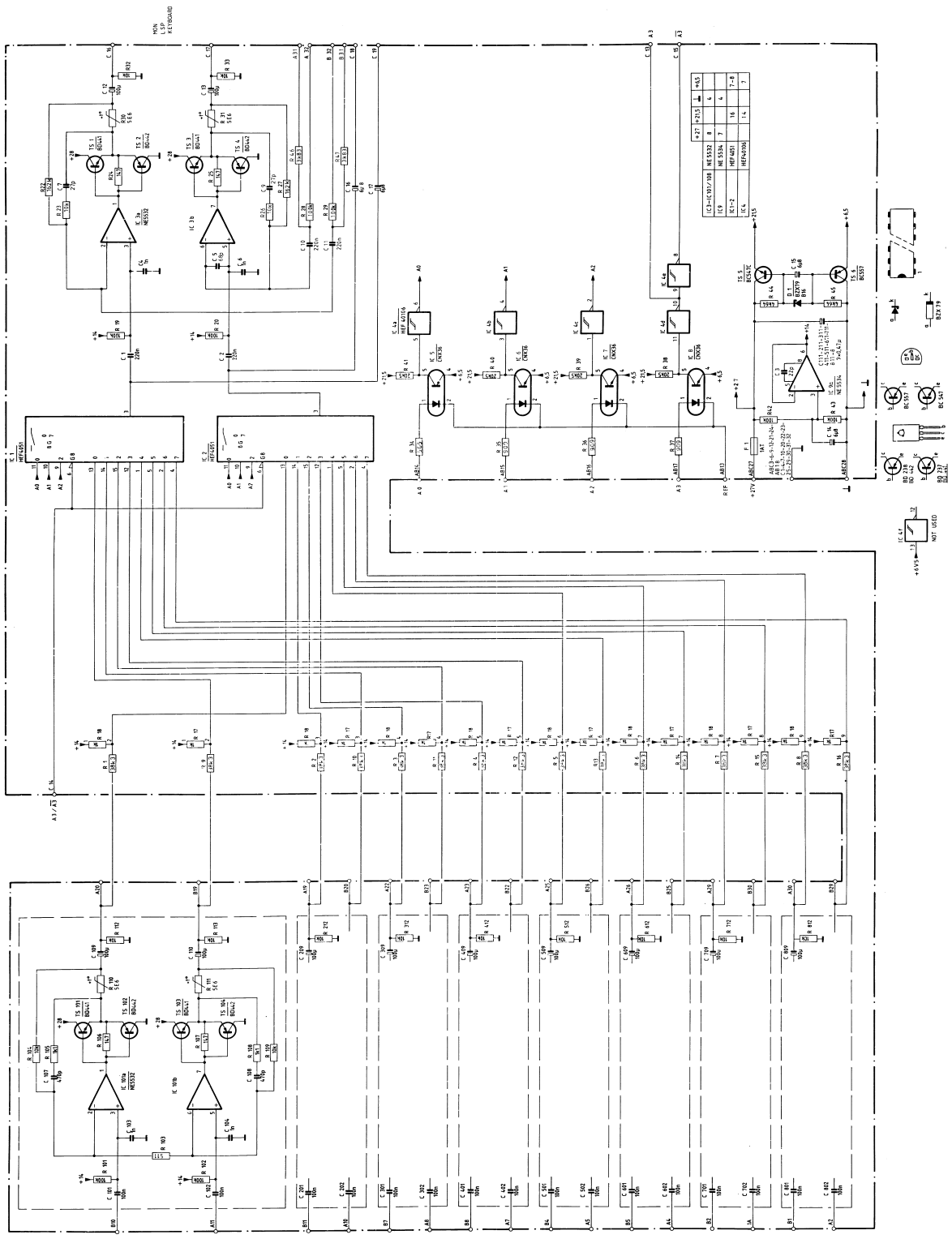


Figure 2 Circuit diagram monitor distribution board

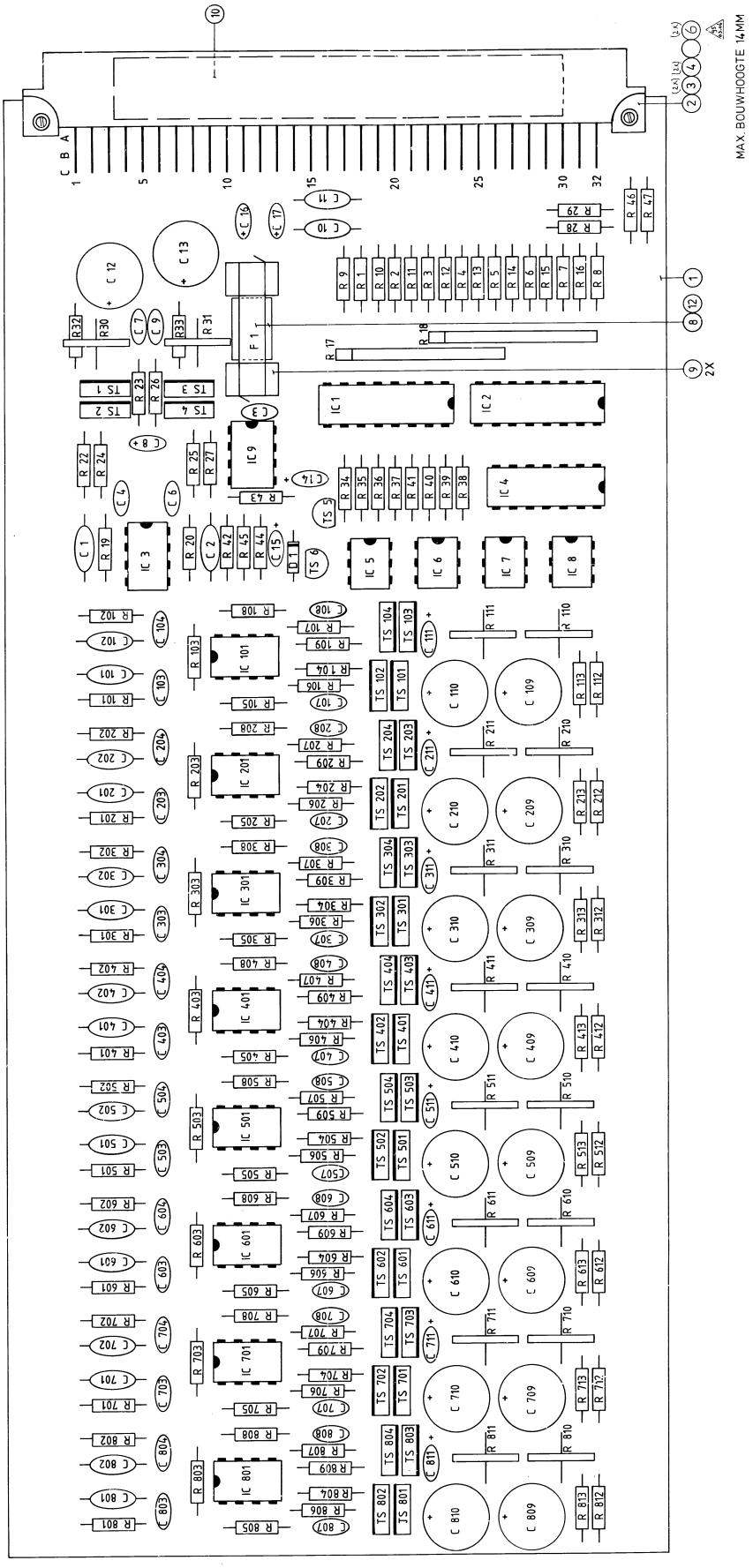


Figure 3 Components layout monitor distribution board

LBB 3350/02
Delegate unit

LBB 3350/04
Delegate unit incl. loudspeaker

LBB 3351/02
Chairman unit

LBB 3351/04
Chairman unit incl. loudspeaker

Tab 6

CONTENTS

CHAPTER 1 INTRODUCTION

1 General

The Delegate units of the CCS-400 program have been subject to an improvement, by introduction of a gooseneck microphone with light ring. For delegates it is much easier now to recognise the microphone-switch-ON-moment of the unit.
The Delegate en Chairman units are intended for use in a CCS-400 system to permit persons to monitor the progress of a discussion or conference and to participate into that meeting as well. The unit can be connected to any point in the system but is restricted to the maximum amount of delegate units in one string.

The units with the type numbers /04 are equipped with a loudspeaker enclosure, In first type numbers is included the Loudspeaker control board. This particular board is instead of PCB, which was part of Loudspeaker enclosure LBB 3174/00. In type numbers which are manufactured later, has been used a new printed circuit board, on which the Loudspeaker control board is included in.

The LBB 3174/00 type number is out of the program now!

All information in this manual is mainly based upon Delegate unit LBB 3350/04.

Ordering spare parts in the regular way to Consumer Service, Eindhoven, The Netherlands.

As PCB's are equipped with SMD's and therefore maintained on a **First Line** level, only selected spare parts are stocked by Philips Consumer Service (formerly Concern Service).

2 Type numbers

The following type numbers in the CCS-400 range are related to the products in this manual:

LBB 3300/20	Central Supply Unit
LBB 3386/41	Central Control Desk
LBB 3175/02	Gooseneck Microphone (FM application)
LBB 3352/04	Passive Unit
LBB 3361/20	Flush mounting Chairman Unit
LBB 3222i04	Interpreter Desk 6-Ch

NOTE:
For more type numbers see Installation Manual and Operating Instructions, code nr: 3922 988 20211.

CHAPTER 2 TECHNICAL SPECIFICATION

NOTE:
We reserved the right to alter specifications in particular with regards to technical improvements.

1 Mechanical Data

Housing	:	approx. 205 x 148 x 128 mm (microphone goose neck not included)
Weight	:	approx. 0.86 kg
Positioning	:	table top and encasing into desk

2 Electrical data

Supply voltage	:	20 – 28 V
Supply current	:	typ. 8 mA, ± 1
Microphone amplifier:		
- Gain (V_{in} = -36 dB)		12.75 dB, ± 0.75
- Freq. response (V_{in} = -36 dB) without Mic. gain, rel. 1 kHz	:	150 Hz, -1.5 dB, ± 1 12.5 kHz, -0.5 dB, ± 1
- Distortion (V_{in} = -36 dB)		< 0.5 %
Loudspeaker amplifier:		
- Input impedance	:	> 1 M
- Gain	:	20.75 dB, + 0.75
- Freq. response, rel. 1 kHz	:	150 Hz, -1 dB, ± 0.75 12.5 kHz, -2 dB, ± 0.75
- Distortion (V_{out} = +19 dB)	:	< 1.5 %

3 Environmental data

Temperature range	:	0 – 45°C (Operating) -40 – 70°C (Storage and transport)
Relative humidity	:	≤ 95 %
Spikes on the mains voltage	:	Spikes of 400 V will give no noticeable disturbance. Spikes of 800 V will not cause any defects. Tested with Koepfer generator SG242
Susceptibility to mains interference	:	the equipment can be used in industrial areas
Susceptibility to electromagnetic interference	:	a field of 1 V/m, 30 % modulation and 0.15 – 480 Mhz gives an interference of < 40 dB related to nominal output level
Susceptibility to static discharges	:	static discharges on all touchable parts does not cause; any damage of systems parts and any non-self-resetting disturbing system functions.

4 Acceptable of non-conformance and related data

Critical defects	:	Not allowed
Major defectives	:	An average of < 0.65 % per type number
Minor defects	:	< 4 per 100 product units
Life time	:	> 7 yrs

5 Specification of verification procedures

Bump	:	Test acc. To IEC 68-2-29Eb, 10 g, 6 msec, 1000 bumps
Conducted and radiated interference	:	Acc. to CENELEC/CISPR, cat. II
Safety	:	Acc. to IEC 65, Semco, Demco, Nemco and BS415
Storage and transport	:	Drop test acc. to UN-D 1400 with packed product
Susceptibility to HF	:	Tested acc. to ELV 14-204
Relative humidity	:	Cyclic damp heat test acc. to IEC 68-2-30Db, 40 °C , 21 days
Temperature	:	Acc. to IEC 68-2-1 and IEC 68-2-2
Vibration	:	Tested acc. to IEC 68-2-6FG, procedure A: 10 – 60 Hz, 0.35 mm amplitude 60 – 150 Hz, 5 g acceleration 3 directions, 30 min/direction without resonance test

CHAPTER 3 DESCRIPTION

1 Functional Description

The Delegate unit can be connected to a preceding one or to the central interface/supply unit (LBB 3300/..) via a 2 m. cable with an 8-pole male DIN connector. An 8-pole female DIN socket is available for connection of a succeeding delegate unit whilst auxiliary equipment can be connected via the 3.5 mm jack at the rear. The control signals comprise of the Microphone, remote, priority and disable request signal and the output signal from the Auto switch off circuit. Depending to the status of the control signals the Microphone can be switched ON (red LED is on). The amplified Microphone input signal is by means of the Audio lines coupled to CSU. Controlling facilities of the Delegate unit from the Chairman unit and/or Central Control Desk have priority. The unit is automatically switched of if there is no input from the delegate for approximately 30 – 45 seconds.

Loudspeaker volume is adjusted by S101 on the Central Supply Unit. (LBB 3300/..).

See “Installation Manual and Operating Instructions for the Conference Application” documentation.
Code nr 3922 988 20211

2 Circuit description

The GCS-400 Delegate and Chairman Main PCB’s consist of 5 different circuits (see fig. 22 and 23 Circuit diagrams).

- Power Voltage stage
- Microphone and Loudspeaker switching circuit
- Auto switch off circuit Microphone amplifier
- Audio amplifier

2.1 Power voltage stage

When the CCS-400 System is switched ON, capacitor C33 charges to the supply voltage of 27V, Resistors R48 and R50 cause the voltage on + input IC3B/5 to the lower, than on the negative input 6. This condition means a 0V level on OpAmp output. IC3A. The 0V is applied to the - input IC3A/2, because the voltage. on the + input is +6V, the output IC3A/1 will be high ”1” . Logic ”1” resets the flip-flop IC5A.
When the Supply voltage exceeds 14V the Zener diode Dll begins to conduct, causing the voltage on - input IC3B/6, to be left on a stabilised level of +15V. If the Supply voltage exceeds + 20V, the voltage on IC3B/5, is more positive than IC3B/6 (+15V), ensuring that the OpAmp IC3B/7 output is high. So the voltage on IC3A/3 is less negative than IC3A/2 and the output of IC3A is low ”0”. Logic ”0” will no longer reset the FF IC5A, and the Unit. is ready for use!
In case of short circuit R54 protects the Voltage supply line of the other Units in the string. Via TS8 a voltage of +6V and +15V is supplied.

2.2 Microphone and loudspeaker switching circuit

The Switching Circuit consists of IC5, IC2, IC3 and IC4. Switching is dependent of the status of the call Microphone signal, Priority signal, Disable request, Remote control 1 line and the Microphone signal. IC5A is a FF, which output is either ”0” (0V) or ”1” (+15V) depending to its input signals. When ICSA/1 is ”0” the Microphone amplifier is switched off (see G on fig,. 22, circuit diagram). When the amplifier is switched to the Audio lines the Loudspeaker is switched off (see G TS12 and TS13).

The Priority and Disable request lines are, via OpAmp circuits IC3A and IC2D, connected to the reset and data inputs. The Priority signal (when activated) ensures via IC3A that FF IC5A will be reset. The active Disable signal ensures that the data input becomes ”0”. The Microphone call signal, from the Microphone button, is applied to the clock input ICSA/3 and the Remote signal to the set input IC5A/6. The Microphone (amplifier) is swathed ON and the Loudspeaker is switched OFF.

In the listening position the audio from the other Unit(s) is coupled to the Loudspeaker by switching of the Loudspeaker relay RE1.
The Loudspeaker switching circuit consists of TS12, TS13, relay RE1 and associated components. The 0V from the FF output is applied to TS12 base, causing it to non-conductive. Herewith the voltage across R23 and between TS13 emitter and base is 0V. That means TS13 is non-conductive and therefore relay RE1 is not activated. In this state the contacts of the relay are closed and the Audio signal is fed to the Loudspeaker. During pushing the Mic. button the clock input IC5A/3 is ”1” (+15V),
Because Disable request is inactive, the data input. ICSA/5 is still ”1”. The clock input is ”1”, so the output ICSA/1 is also ”1”. The inverse FF output is now ”0”, this level is fed the data input ICSA/5. This means when the Mic. button S1 is pushed again (switch OFF the Microphone) the FF will he reset. The high level on ICSA/1 is applied to TS5 base which cause that TS5 will conducted. That means TS4 will conducted as well. The microphone signal is taken from the collector and the microphone LED illuminates, due the current through TS4. The high level on the output of IC5 also ensures that the loudspeaker and the light ring in the Microphone are switched off.

When a Chairman wants priority over the Delegate microphones, by pushing the Priority button the Priority line becomes approximately 1.5V. Due to R99 and R37, 1V is applied to the input of IC3A. Because the +6V on the + input the OpAmp output. is approximately +15V which means ”1”, Via the reset input, IC5 resets. The output becomes ”0” and the Microphone signal is switched off by TS5, which is now non-conductive because of the 0V level on its base. The loudspeaker is switched to the Audio amplifier by means of the relay contacts.

2.3 Auto switch off circuit

The Auto Swit.ch off circuit ensures when a delegate does not speak into his Microphone this will be switched off after 30-45 seconds.

By means of S3 in the position A-B the Auto Swit.ch off function can be eliminated!

2.4 Microphone amplifier

The Microphone amplifier consists of IC1a, TS4 and associated components. A DC voltage is fed via TS1 and applied to the electret microphone. The current flow from TS1 to the electret microphone, ensures that the FET inside the Microphone is conducting. The microphone signal, is also passed at the microphone connection and fed via C1 and C2 to the + and - inputs of the OpAmp IC1A. By the gain adjustment of R11 the difference in sensitivity of the electret microphones is compensated.

The Limiter function has been included within the TS2, TS3 and associated components. When the output signal IC1A/1 exceeds 0.7V, D1 and D2 conduct and so will TS2 or TS3.

2.5 Audio amplifier

The amplifier consists of IC1B, TS6, TS7 and associated components. The operational amplifier (OpAmp) output is on a DC level of approximately 14V on which the audio signal is superimposed. The balanced output stage TS6 and TS7 provide the current for driving the low impedance Loudspeaker.

CHAPTER 4 CHECKING AND ADJUSTING

NOTE:
This Delegate and Chairman units are products with First Line service only. So you will find brief information in this chapter.

1 Requirements for service

- Oscilloscope PM 3206
- LF generator PM 5107
- AC millivoltmeter PM 2554
- DC power supply PE 1542
- Multimeter PM 2518

Or use equivalent measuring instruments.

The most efficient Checking and Adjustment of an unit, is testing that Unit into a CCS 400 System with 1 Chairman and at least 4 Delegate Units.

2 Mounting and demounting

Demount the Unit by removing the 2 tap screws at the bottom and the 2 screws at the upper rear.

When the Mic. button (8) is removed do not forget to fix the rubber plates (9-10) on the right position. Rubber plates to avoid a noisy button when moved.

If one of the Gooseneck Microphone assy parts are damaged or defective, only an entire assy for Service can be ordered.

3 Checking and adjusting

NOTE:
If there is no CCS-400 System available it is possible to check a defective unit separately, but wires of DIN socket (7) will be not checked! Please examine this wiring first!

NR:	CONDITION TO BE SET:	TO CHECK:	TO ADJUST
1.	Putting defective Unit into a CCS-400 System: – Connect a string of CHR and DEL units to "DEL 1", CSU – Master gain (S101) to max. – Auto/Man (S102) to 6 Auto – Switch mains ON (S1)		
2.	Voltage supply: – No MIC functions are activated – Multimeter to - C33 and X3-3	– Voltage 27V, ± 2 (Depends to cable length in string)	
3.	Current consumption: – Multimeter to R54 25• – Microphone of Unit not ON	– Voltage across PTC 200 mV, max. 225 Current 250:25=8 mA	
4.	Checking digital functions in a short review: – Unit ON, push Mic.Button (S1) – Chairman Priority, push "PRIQR" CHR Unit	– Red LED (D4) is ON – Green LED (D10) OFF – Red LED is OFF	

	– Disable request, CSU S102 in Man. 3 – Switch totally 3 DEL Units ON – Push Mic. button defective unit – Remote, (without CCD) connect +27V to connector X3-8	– Green LED ON Request not accepted – Red LED (D4) is ON	
5.	Checking Microphone: – Switch Unit ON	– Mic. Light ring D1÷D4 is on Check Microphone – itself on PA out	
6.	Auto switch OFF: – CSU Auto/Man (S102) Auto 6 – Switch Unit ON – Disconnect Mic. (No speaking)	– Unit is switched OFF automatically after 30-45 seconds	
7.	– Mic. capsule voltage supply: Connect resistor 10k• to X2-3 and X2-4 – Remove resistor	– Voltage across this R. 4.6V, ± 0.5	
8.	Mic. Amplifier gain factor: – Connect resistor 9k1 to X2-5 and X2-6 – Connect LF generator to X2-3 and X2-4 – Input level, 1000 Hz -36 dB	Output level on X3-1 X3-2, -23 dB, ± 2	
9.	Mic. Amplifier limiter: – Input level, 1000 Hz -11 dB	Output level on X3-1 X3-2, -17 dB, ± 2	
10.	Amplifier Frequency response: – Input level -36 dB, 40 Hz -36 dB, 150 Hz -36 dB,12500 Hz	Output X3-1 and X3-2 -35 dB, ± 2.5 -25 dB, ± 1 -22.5 dB, ± 1	
11.	Checking loudsp. and amplifier: – Switch ON one of other units – Disconnect LF generator and remove res. 9k1	Loudsp. functioning	
12.	Gain adjustment of Microphone: (Handle in comparison with other Delegate unit) – Connect pot. meter 22 k• log to X1-5 and X1-6 (Also a decade resistance instrument may be used)		– Potentiometer to similar gain as other units. (P.A. amplifier gain to feed back limit, ON/OFF switching one by one) Measure resistance and mount this value. Total range 3k6 – 12 k

CHAPTER 5 SPARE PARTS LIST

1 Delegate and chairman unit LBB 3350/02 /04 – LBB 3351/02 /04

Pos. No.	Description	Service Code
1	PCB ASSY DELEGATE UNIT /02	5322 310 10485
1	PCB ASSY DELEGATE UNIT /04	5322 310 10486
1	PCB ASSY CHAIRMAN UNIT /02 /04	5322 310 10484

NOTE:
Key switch for CCS400 PCB assy's.
The key switch code no. 5322 278 14006 is obsolete.

	New code no. for the same Key switch: The stock of this code no. will be sold out!	5322 278 10134

A new type of Key switch is mounted for above PCB assy's from 1995 onwards. This new switch is not compatible with the old model. The CCS400 PCB's are modified accordingly. The Service code no.'s remain the same for the modified PCB's. Please note the belonging mic. knob is also new.
New Service code no.'s are:

	New type Mic. switch CCS400/410	5322 276 13482
	Belonging Mic. knob Delegate black	5322 410 10994
	Belonging Mic. knob Chairman black	5322 410 10995

2	FOOT	5322 462 41686
3	HOUSING BASE	5322 447 91875
8	TRUNK CABLE ASSY WITH INTEGRAL DIN PLUG	5322 320 11312
12	GROMMET TRUNK CABLE	5322 325 10224
13	HOUSING COVER /02 VERSION	5322 447 10262
13	HOUSING COVER /04 INCL. LOUDSPEAKER	5322 310 20456
14	TEXTPLATE ASSY DELEGATE	5322 310 10483
14	TEXTPLATE ASSY CHAIRMAN	5322 310 10482
16	LOGO STRIP	5322 454 40129
17	GOOSENECK MIC. ASSY COMPLETE	5322 242 20122
17a	WINDCAP FOR MIC	. 5322 462 41743
47	CARD LOUDSPEAKER TOP	5322 454 40128
48	GUARD LOUDSPEAKER TOP	5322 381 11226
9501	SOCKET AUXILIARY	5322 268 10202
9503	CONNECTOR BLOCK 2P	5322 462 41772
9504	SET OF 25 BUS CONTACTS	5322 290 61002

2 PCB assy delegate unit all versions

Pos.No	Description			Service Code
8	BUTTON MIC			5322 414 10014
9-10	SET OF 3 RUBBER PLATES			5322 466 91584
C3	EL CAP	ALU	10 µF 25V	4822 124 21732

C4	EL CAP	ALU	4µ7 25V	5322 124 21966
C5	EL CAP	ALU	0.47 µF 25V	4822 124 21453
C6	EL CAP	ALU	4µ7 25V	5322 124 21966
C7	EL CAP	ALU	47 µF 10V	5322 124 21975
C8	EL CAP	ALU	4µ7 25V	5322 124 21966
C l4	EL CAP	ALU	22µ 25V	4822 124 21646
C20	EL CAP	ALU	10µ 25V	4822 124 21732
C21	EL CAP	ALU	4µ7 25V	5322 124 21966
C22	EL CAP	ALU	4µ7 25V	5322 124 21966
C24	EL CAP		100µF 25V	4822 124 20701
C32	EL CAP		47 µF 25V	4822 124 20699
C33	EL CAP		47 µF 40V	4822 124 20713
C35	EL CAP	ALU	22 µF 25V	4822 124 21646
C36	EL CAP		47 µF 25V	4822 124 20699
D1	DIODE	BAV70		5322 130 34331
D2	DIODE	BAV70		5322 130 34331
D3	DIODE	BZX84 C5V1		5322 130 32835
D4	PLED	RED		4822 130 80986
D6	DIODE	BAV70		5322 130 34331
D7	DIODE	BAV70		5322 130 34331
D8	DIODE	BAV70		5322 130 34331
D9	DIODE	BAV70		5322 130 34331
D10	TLUG164	LED GREEN		5322 130 32587
D11	DIODE	BZX84 C15		5322 130 33662
D12	DIODE	BAV70		5322 130 34331
D13	DIODE	BAV70		5322 130 34331
D17	DIODE	BAV70		5322 130 34331
D19	DIODE	BZV46 C2V0		4822 130 81424
D20	DIODE	BZX79 C30		4822 130 34328
D21	DIODE	BZX84 C6V2		5322 130 33671
IC1	INTEGR CIRC			5322 209 81395
R54	PTC RES	25 Ω 60V		5322 116 44008
RE1	RELAY			5322 280 80524
S1	SWITCH			5322 278 14006
S3	MINI CONNECTOR	BUS 2P		5322 290 60298
TS1	TRANSISTOR	BC847C		5322 130 42755
TS2	TRANSISTOR	BC857C		5322 130 42756
TS3	TRANSISTOR	BC847C		5322 130 42755
TS4	TRANSISTOR	BC847C		5322 130 42755
TS5	TRANSISTOR	BC847C		5322 130 42755
TS6	TRANSISTOR	BC817/40		4822 130 42615
TS7	TRANSISTOR	BC807/40		5322 130 60123
TS8	TRANSISTOR	BC817/40		4822 130 42615
TS9	TRANSISTOR	BC817/40		4822 130 42615
TS12	TRANSISTOR	BC847C		5322 130 42755
TS13	TRANSISTOR	BC847C		5322 130 42755
Xl	PIN CONNECTOR	2X3P DUPON		5322 265 30819
X2	PIN CONNECTOR	2X3P DUPON		5322 265 30819
X3	PIN CONNECTOR	2X4P BERG		5322 265 41036
X4	PIN CONNECTOR	2X3P DUPON		5322 265 30819
X5	PIN CONNECTOR	1X2P BERG		5322 265 20491
X8	PIN CONNECTOR	1X2P BERG		5322 265 20491

3 PCB assy chairman unit all versions

Pos.No	Description		Service Code
8	BUTTON MIC		5322 414 10014
14	BUTTON PRIOR		5322 414 10013
C3	EL CAP	10 µF 25V	4822 124 21732
C4	EL CAP	4µ7 25V	5322 124 21966
C5	EL CAP	0.47 µF 25V	4822 124 21453
C6	EL CAP	4µ7 25V	5322 124 21966
C7	EL CAP	47 µF 10V	5322 124 21975
C8	EL CAP	4µ7 25V	5322 124 21966
C14	EL CAP	22 µ 25V	4822 124 21646
C32	EL CAP	47 µF 25V	4822 124 20699
C33	EL CAP	47 µF 40V	4822 124 20713
C35	EL CAP	22 µF 25V	4822 124 21646
C36	EL CAP	47 µF 25V	4822 124 20699
D1	DIODE	BAV70	5322 130 34331
D2	DIODE	BAV70	5322 130 34331
D3	DIODE	BZX84 C5V1	5322 130 32835
D4	PLED	-H314A-6 RED	4822 130 80986
D11	DIODE	BZX84 C15	5322 130 33661
D12	DIODE	BAV70	5322 130 34331
D14	DIODE	BYW56	532213034973
D15	DIODE	BAV70	532213034331
D16	DIODE,	BZV49-C6V2	532213033672
D18	DIODE	BAV70	532213034331
D19	DIODE	BZV86-2V0	482213081424
D20	DIODE	BZX79-B30	482213034328
IC1	IC ANA AMPLIFIER	LF353N	482220961115
R54	RESISTOR		532211644008
R63	RESISTOR		532211644008
R71	RESISTOR		532211644008
RE1	RELAY	MZ-12HS	532228080524
TS2	TRANSISTOR	BC857C	532213042756
TS6	TRANSISTOR	BC817-40	482213042615
TS7	TRANSISTOR	BC807-40	532213060123
TS8	TRANSISTOR	BC817-40	482213042615
TS9	TRANSISTOR	BC817-40	482213042615
TS10	TRANSISTOR	BC857C	532213042756
TS11	TRANSISTOR	BC817-40	482213042615
X1	PIN CONNECTOR	76383-303 (2X3P)	532226530819
X2	PIN CONNECTOR	76383-303 (2X3P)	532226530819
X3	PIN CONNECTOR	76383-304 (2X4P)	532226541036
X4	PIN CONNECTOR	76383-303 (2X3P)	532226530819
X5	PIN CONNECTOR	76382-302 (2P)	532226520491
X8	PIN CONNECTOR	76382-302 (2P)	532226520491
X13	PIN CONNECTOR	76382-302 (2P)	532226520491

4 Wiring assy

Pos.No	Description	Service Code
7	DIN SOCKET 8P	5322 267 51075
8	CONNECTOR BLOCK 2X3P	5322 268 40431
10	SET OF 25 BUS CONTACTS	5322 290 61002

5 Loudspeaker control PCB

Pos.No	Description	Service Code
Kl	RELAY	5322 280 80524
TS1	TRANSISTOR BC847C	5322 130 42755
TS2	TRANSISTOR BC857C	5322 130 42756
Also available Loudspeaker Control Board		5322 310 10457

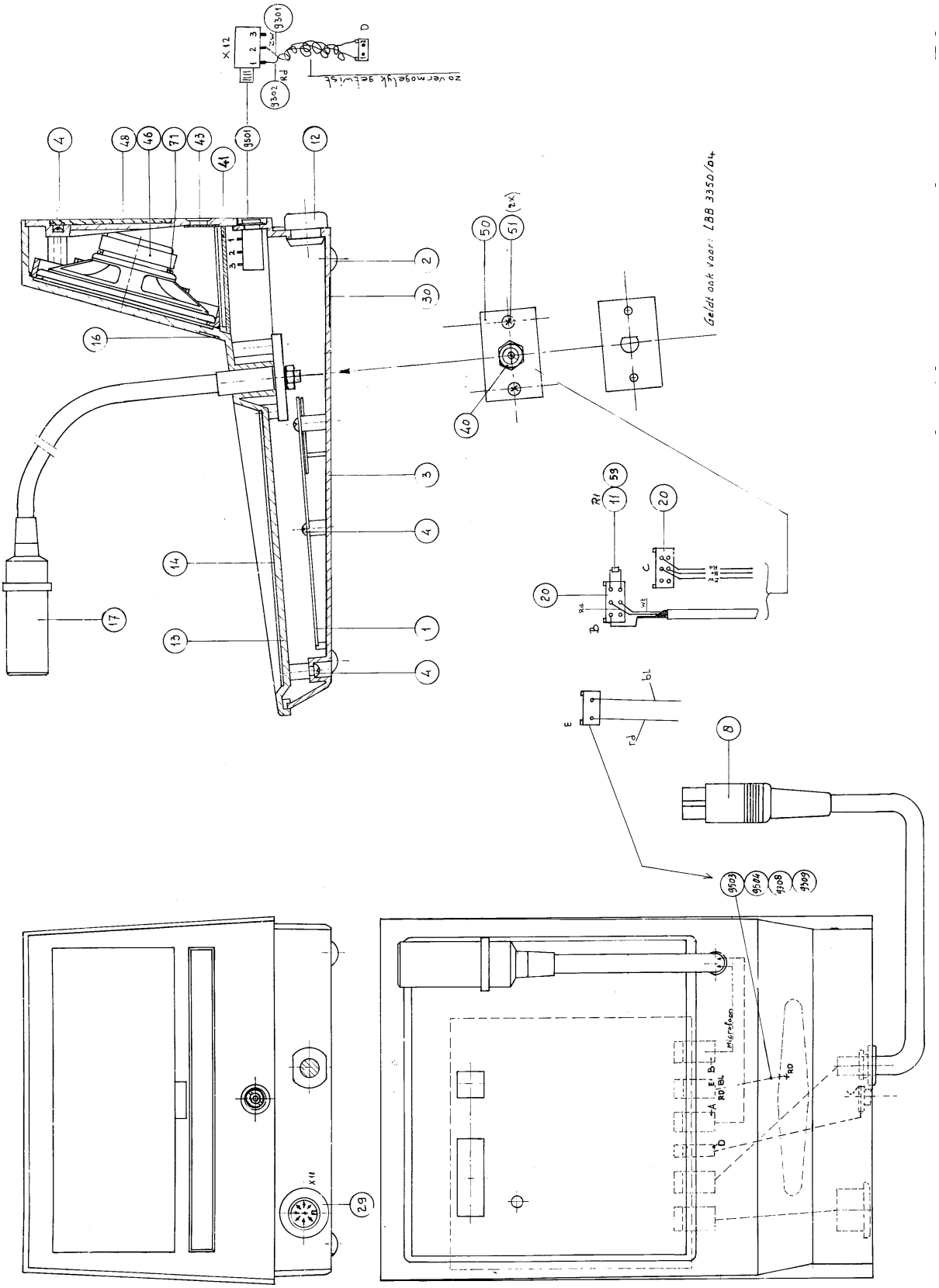


Figure 1 Delegate and chairman unit

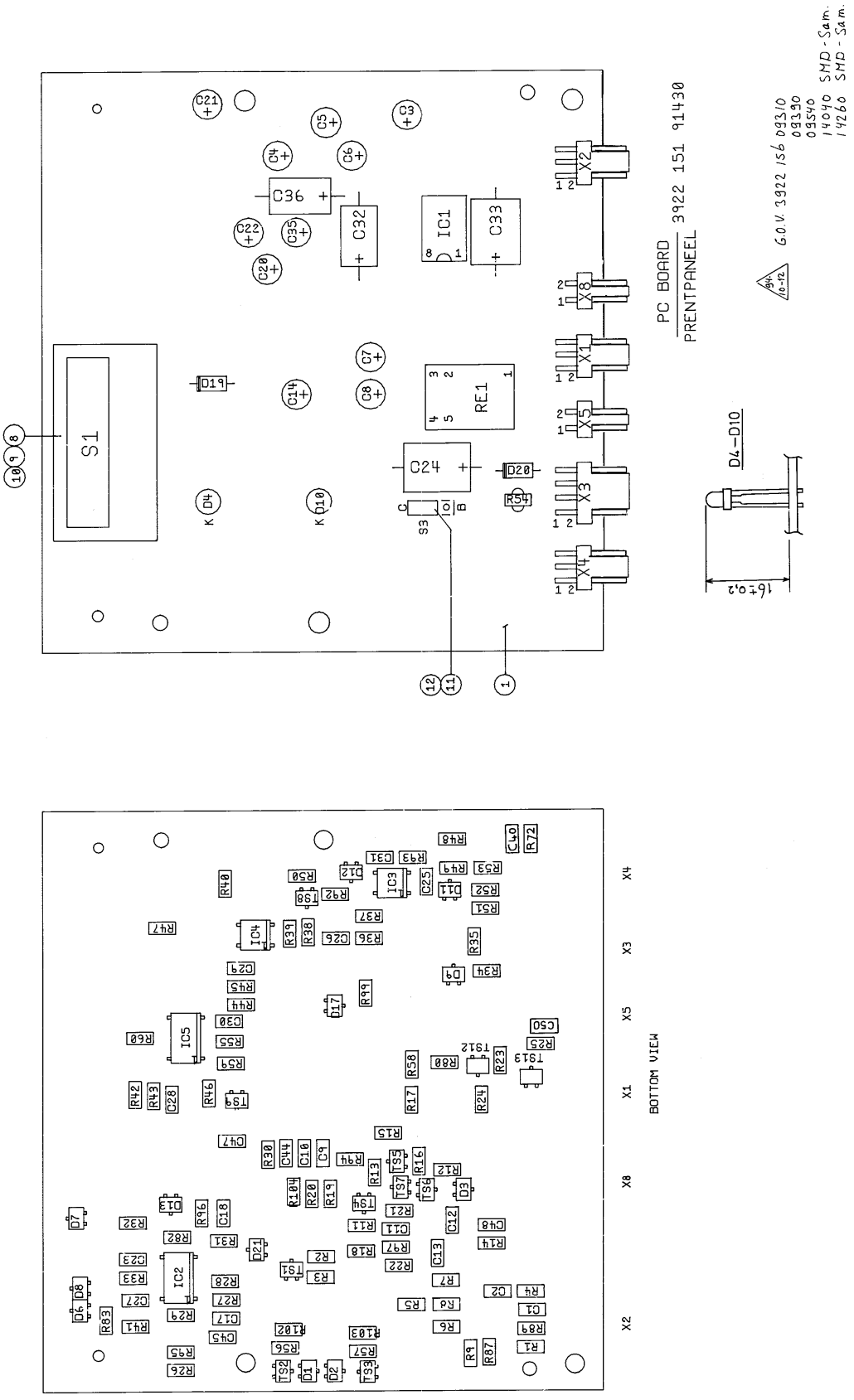


Figure 2 Components location delegate unit

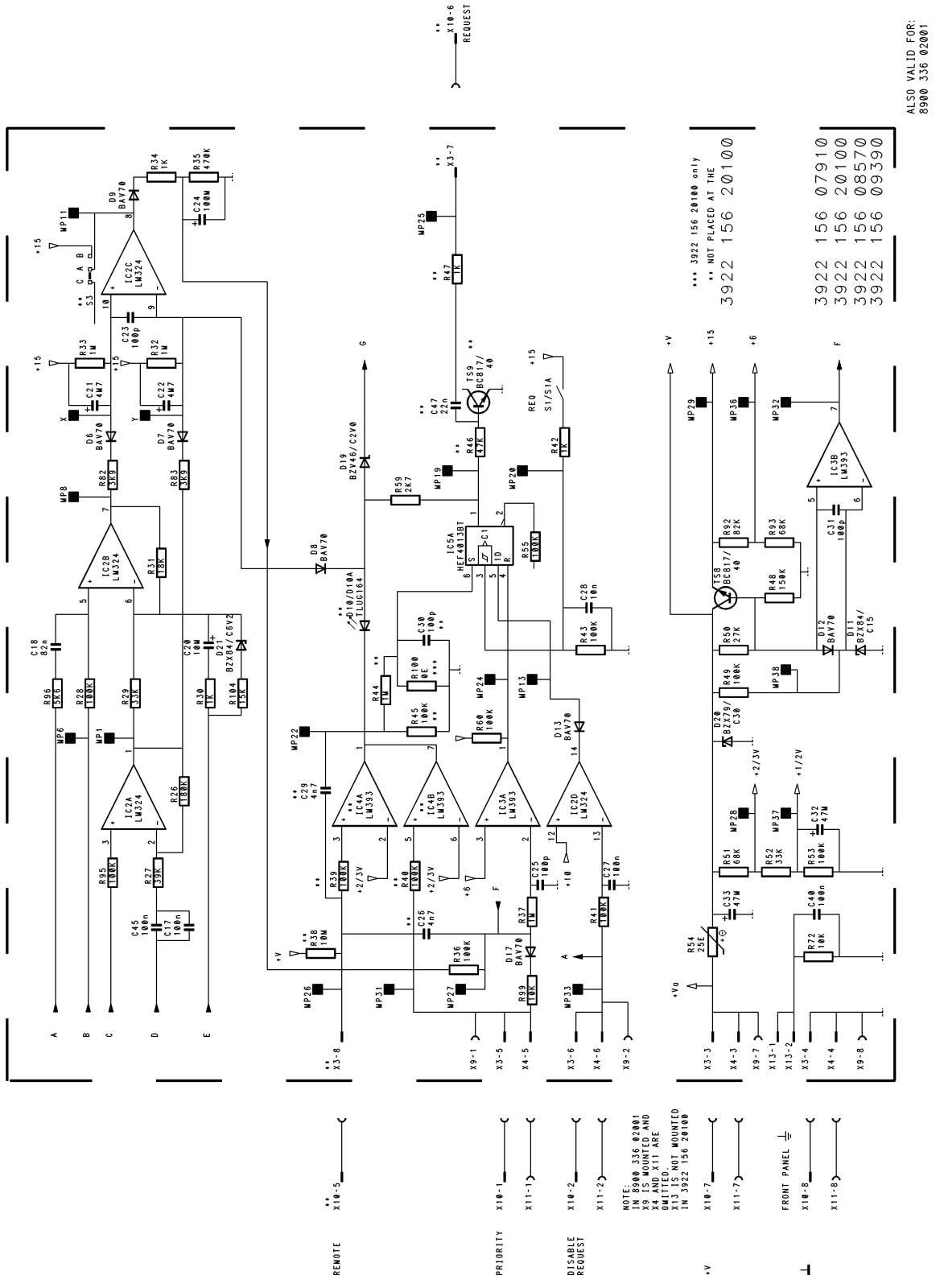


Figure 3 Circuit diagram delegate unit sheet 1

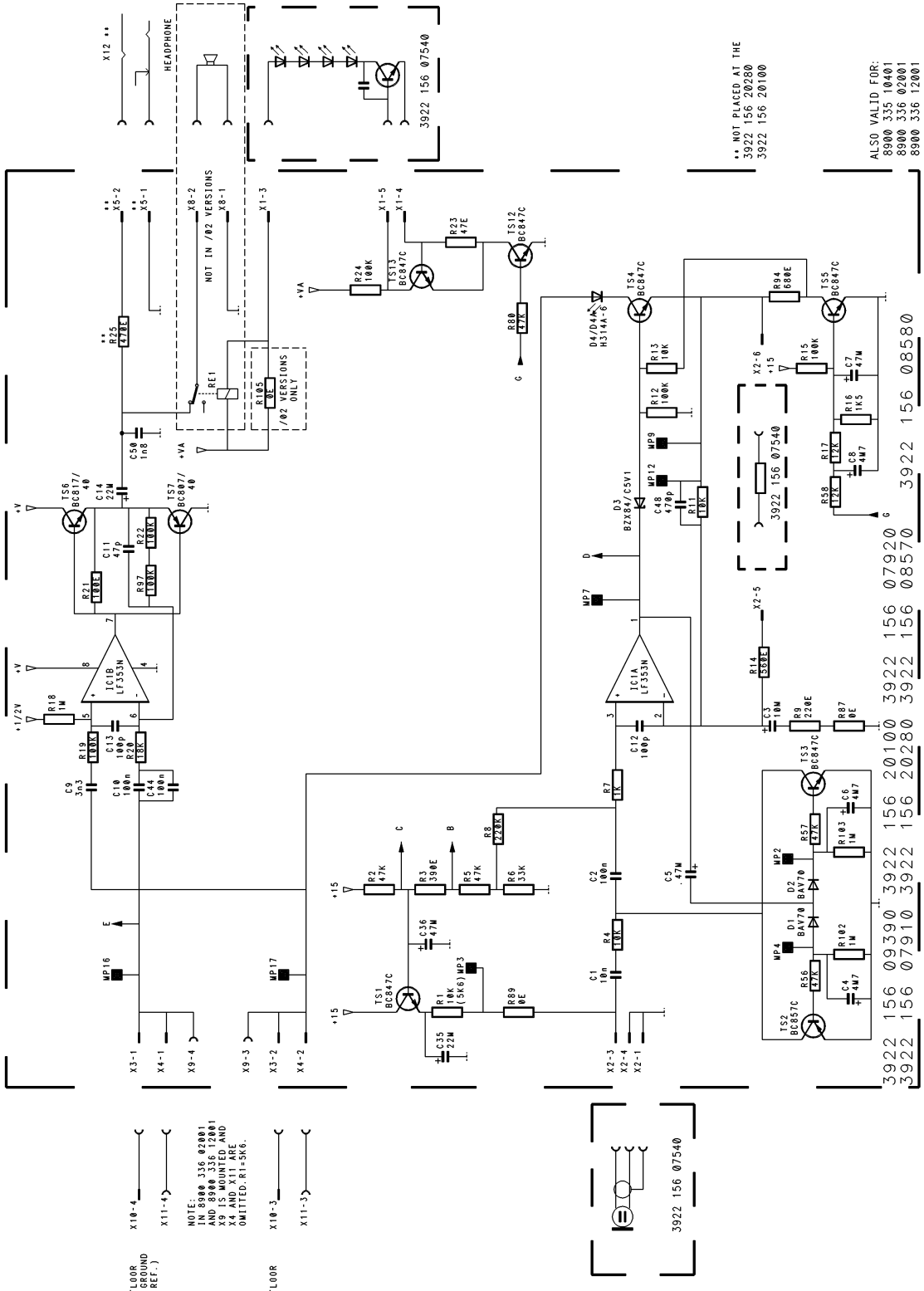


Figure 4 Circuit diagram delegate unit sheet 2

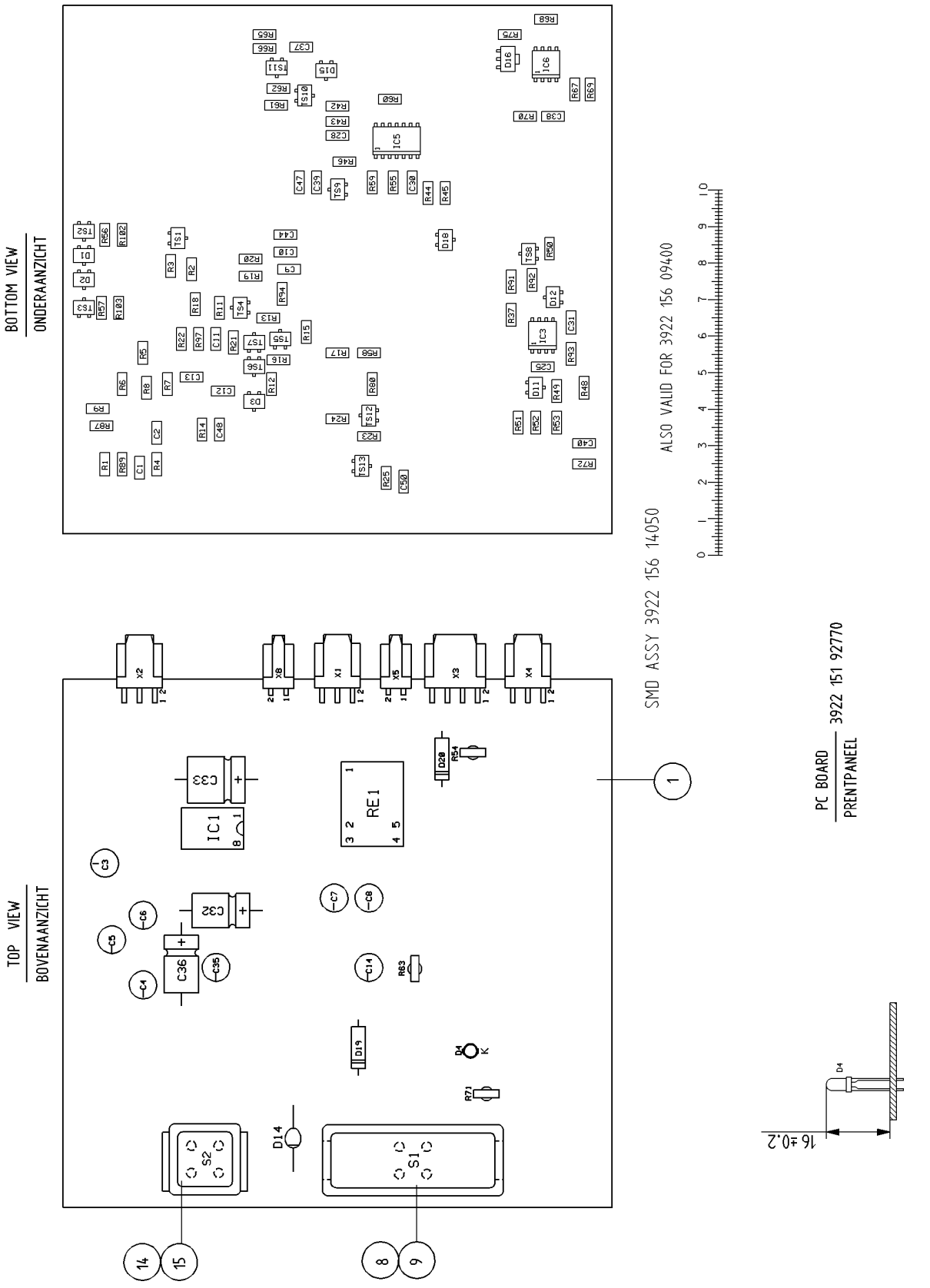


Figure 5 Components location chairman unit

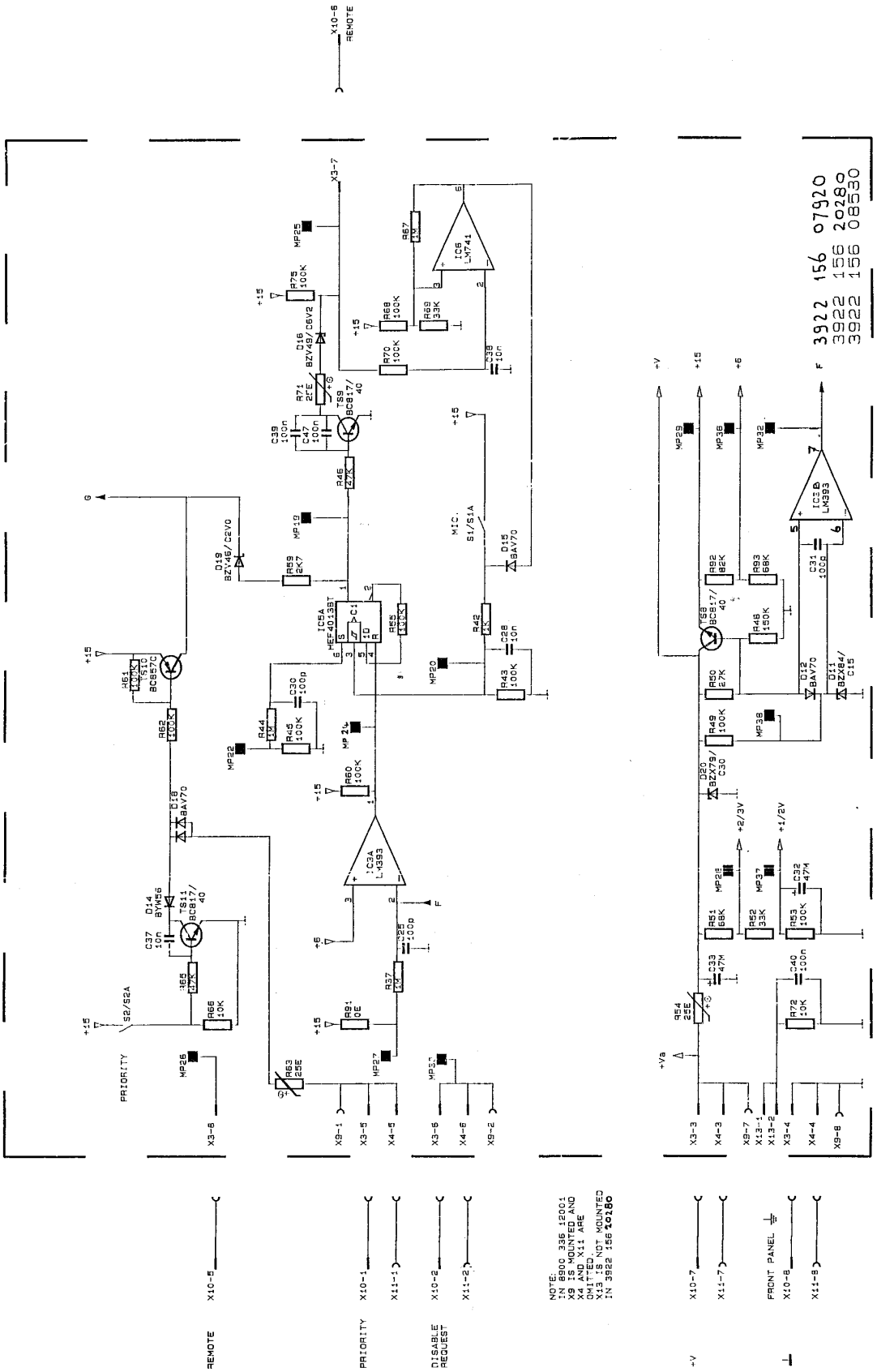


Figure 6 Circuit diagram chairman unit sheet 1

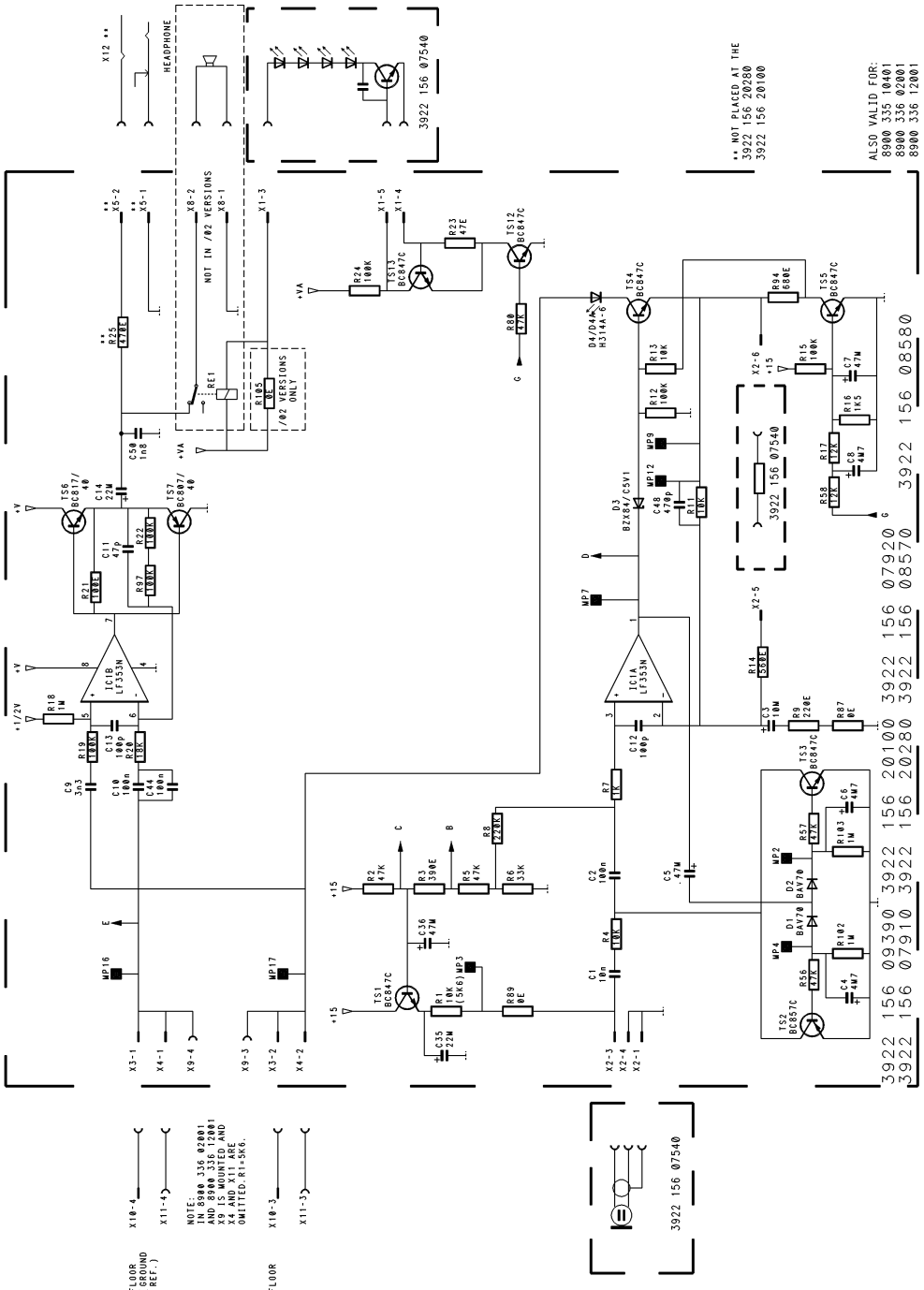


Figure 7 Circuit diagram chairman unit sheet 2

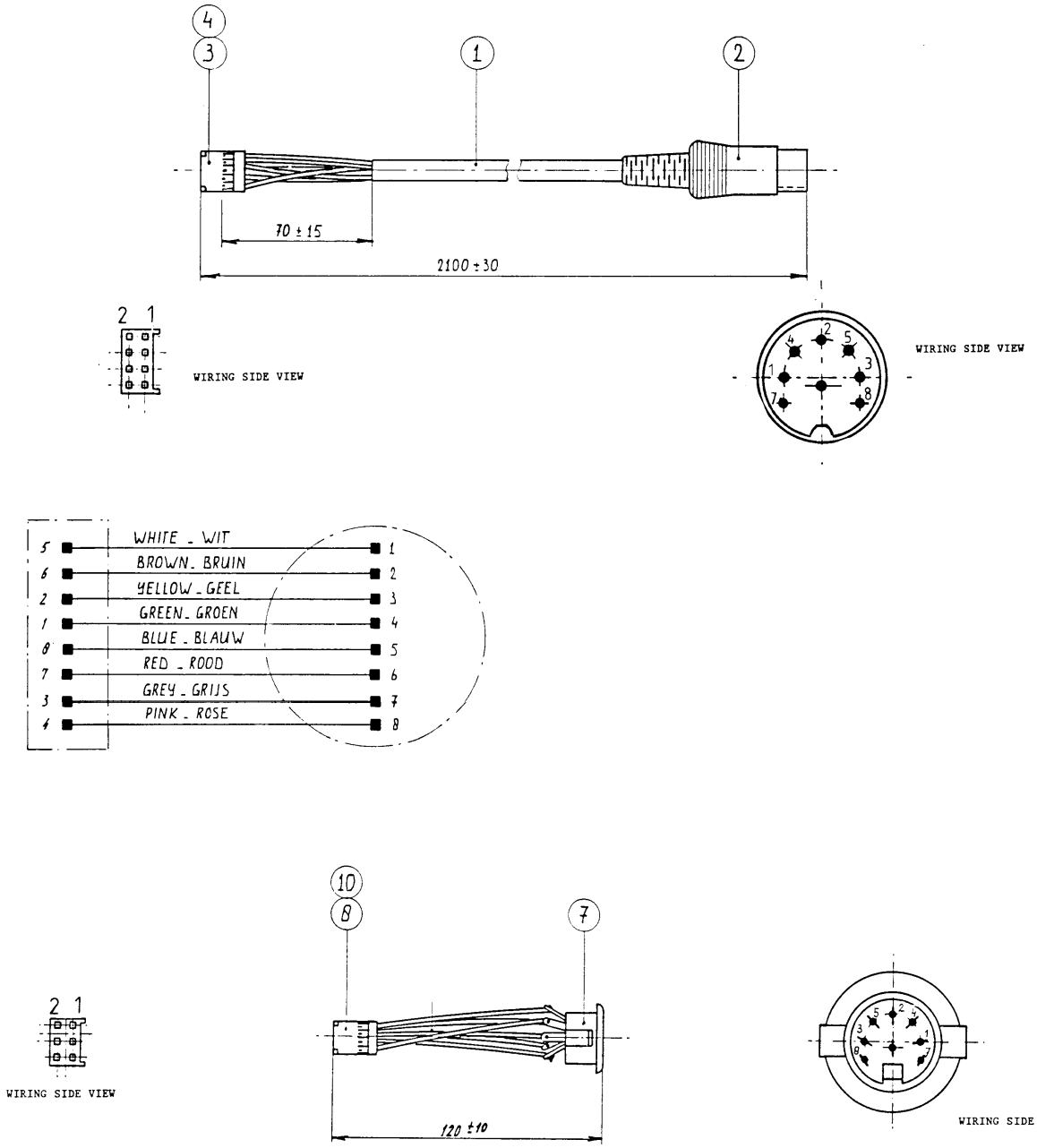


Figure 8 Circuit diagram cable assembly

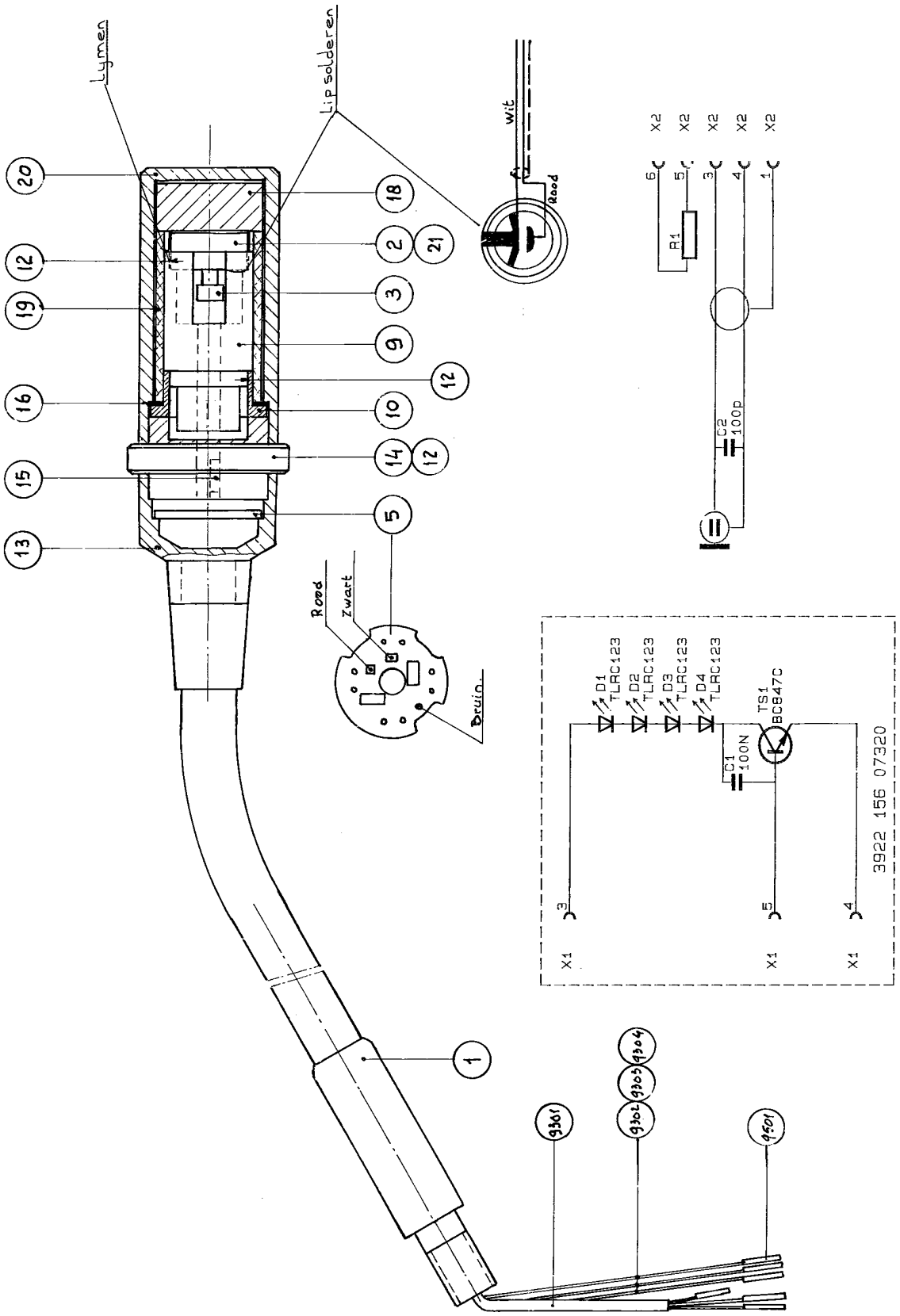


Figure 9 Circuit diagram gooseneck microphone

LBB3352/04
Passive unit

Tab 7

CONTENTS

CHAPTER 1 INTRODUCTION

1 General

The passive unit is intended for use in the delegate section of the CCS-400 system to permit persons in the public area to monitor the progress of a discussion or conference from the floor signal. The unit can be connected to any point in the system and is unaffected by the maximum number of delegate units.

Since the PC Board is equipped with SMD's and is maintained on a First Line level, only selected spare parts are stocked by Philips Consumer Service. (formerly Concern Service)

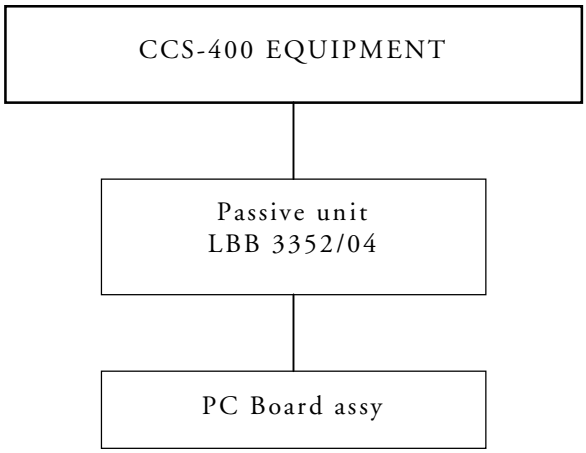
2 Type numbers

The following type numbers are available in the CCS-400 range:

	LBB 3154/00	Interface unit for microphone
*	LBB 3175/02	Gooseneck microphone
*	LBB 3175/50	Hand microphone
*	LBB 3203/00	Monitor distribution board
	LBB 3300/..	Central interface/supply unit
	LBB 3301/00	Interpreter and mon. distribution panel
	LBB 3302/00	Roving microphone plug in unit
	LBB 3305/00	Extension cable T.T. units
	LBB 3350/02	Delegate unit without loudspeaker
	LBB 3350/04	Delegate unit with loudspeaker
	LBB 3351/02	Chairman unit without loudspeaker
	LBB 3151/04	Chairman unit with loudspeaker
	LBB 3360/20	Delegate flush mounting unit
	LBB 3361/20	Chairman flush mounting unit
	LBB 3386/40	Control desk for 40 del. and 1 chairm
	LBB 3386/70	Control desk for 70 del. and 1 chairm

* also part of ICS-600 family (LBB 3230/..)

3 Type number structure



CHAPTER 2 TECHNICAL SPECIFICATION

NOTE:
We reserved the right to alter specifications in particular with regards to technical improvements.

1 Mechanical data

Housing	:	approx. 205 x 148 x 128 mm
Weight	:	approx. 0.86 kg
Positioning	:	table top and encasing into desk

2 Electrical data

Supply voltage	:	20 - 28 V
Supply current	:	typ. 6 mA, ±1
Input impedance	:	> 1 MΩ
Gain	:	20.75 dB, ± 0.75 dB
Distortion at Vo = +19 dB	:	< 1.5 %
Frequency response	:	150 Hz, -1 dB, ± 0.75 dB 12.5 kHz, -2 dB, ± 0.75 dB
Equivalent input noise level	:	< -89.5 dB
Rate load impedance	:	150 Ω

3 Environmental data

Temperature range	:	0 – +45 °C (Operating) -40 – +70 °C (Storage and transport)
Relative humidity	:	≤ 95%
Spikes on the mains voltage	:	Spikes of 400 V will give no noticeable disturbance. Spikes of 800 V will not cause any defects. Tested with Koepfer generator SG242
Susceptibility to mains interference		the equipment can be used in industrial areas
Susceptibility to electromagnetic interference		a field of 1 V/m, 30% modulation and 0.15 - 480 Mhz gives an interference of < 40 dB related to nominal output level
Susceptibility to static discharges		static discharges on all touchable parts does not cause; any damage of systems parts and any non-self-resetting disturbing system functions

4 Acceptable extent of non-conformance and related data

Critical defects	:	Not allowed
Major defectives	:	An average of < 0.65 % per system component
Minor defects	:	< 2.5 per 100 product units
MTBF	:	10000 hrs
Life time	:	> 7 yrs

5 Specification of verification procedures

Bump	:	Test acc. to IEC 68-2-29Eb, 10 g, 6 msec, 1000 bumps
Conducted and Radiated interference	:	Acc. to CENELEC/CISPR, cat. II
Safety	:	Acc. to IEC 65, Semco, Demco, Nemco and BS415
Storage and transport	:	Drop test acc. to UN-D 1400 with packed product
Susceptibility to HF	:	Tested acc. to ELV 14-204
Relative humidity	:	Cyclic damp heat test acc. to IEC 68-2-30Db, 40 °C , 21 days
Temperature	:	Acc. to IEC 68-2-1 and IEC 68-2-2
Vibration	:	Tested acc. to IEC 68-2-6FC, Procedure A: 10 – 60 Hz, 0.35 mm amplitude60 – 150 Hz, 5 g acceleration 3 directions, 30 min/direction without resonance test

CHAPTER 3 DESCRIPTION

1 Functional description

The passive unit can be connected to a preceding delegate unit or to the central interface/supply unit (LBB 3300/..) via a cable with an 8-pole male DIN connector. An 8-pole female DIN socket is available for connection of a succeeding delegate unit whilst auxiliary equipment can be connected to the 3.5 mm jack at the rear.
Volume is adjusted by S101 on the central interface/supply unit.

See “Installation Manual and Operating Instructions for the Conference Application” documentation. Code nr: 3922 988 20211

2 Circuit description

2.1 Supply voltage circuit

A PTC resistor (R54) provides short circuit protection for the voltage supply entering the PC Board via the connector X3. Smoothing is accomplished by C33 whilst D20 provides over voltage protection. The supply (+V) is applied to a potential divider (R51, R52 and R53) to give the +1/2V supply, which is smoothed by C32.

2.2 Amplifier circuit

The amplifier circuit of the passive unit is a derived version of the CCS-400 delegate unit. The amplifier consists of IC1b, TS6, TS7, and associated components. The audio signal from X3 pin 3 and 4 is coupled via C9 and R19 to the positive input of IC1b, the ground reference is applies to its negative input. The output, of the operational amplifier, is a DC level of approximately 14 V, upon which the amplified audio signal is superimposed. This is applied to the balanced output stage (TS6 and TS7) which provides loudspeaker drive.

IC1A is unused and maintained in a passive state by R6, R7, R8 and R98.

CHAPTER 4 CHECKING AND ADJUSTING

Note:
This passive unit is a product with first line service only. So you will find brief information in this chapter.

1 Requirements for service

- Oscilloscope PM 3206
- LF generator PM 5107
- AC millivoltmeter PM 2554
- DC power supply PE 1542
- Multimeter PM 2518

Or use equivalent measuring instruments

2 Mounting and demounting

Demount the unit by removing the 4 tap screws at the bottom and upper rear.

3 Checking and adjusting

NOTE:
The cable assy, wires of DIN plug and loudspeaker is not included in checking and adjusting! Please examine this wiring and loudspeaker separately.

NR:	CONDITION TO BE SET:	TO ADJUST:	TO CHECK:
1	Power voltage (AC): From DC Power supply 25V ±0.01 X4/3 and X3/4 (+ to pin 3) From LF generator 1kHz V_{in}= -24dB (X3/1 and X3/2) Measure voltage +V on D20 k. Measure voltage +1/2V on C32 + Ripple on D20 k. Ripple on C32 +		 DC 24.85V, ±0.01 DC 12.5V, ±0.5 <25mVpp (freq.audio) <10mVpp
2	Gain amplifier: From LF generator 1kHz V_{in}=-24dB (X3/l and X3/2) Connect resistor 1k to X5/1, X5/2 and 150Ω to X8/1, X8/2 AC millivoltmeter to X8/1, X8/2 AC millivoltmeter to X5/1, X5/2		 V_{out} = -3.25dB, ±0.75 V_{out} = -10dB, ±1
3	Frequency response amplifier: LF generator 150Hz - 21.5kHz		 150Hz,-1dB ±0.75 12.5kHz,-1dB ±0.75
4	Passive IC1A: Measure with Multimeter between pin 2 - 3, and pin 3 - ground		 Value resp. 0Ω and 254k

CHAPTER 5 SPARE PARTS LIST

1 Passive unit LBB 3352/04

Pos. No.	Description	Service Code
1	PC BOARD ASSY	5322 214 90527
2	FOOT	5322 462 41686
8	CABLE ASSY	5322 321 60701
13,16,46	COVER OF HOUSE ASSY	5322 310 20456
14	TEXT PLATE	5322 456 90397
29	WIRING ASSY	5322 421 60705
9501	CONTACT BUSH 3.5 JACK	5322 268 10202

2 PC board assy

Pos. No.	Description	Service Code
X3	PIN CON 2X4P BERG	5322 265 41036
X4	PIN CON 2X3P DUPON	5322 265 30819
X5,X8	PIN CON 1X2P BERG	5322 265 20491
IC1	LF353N	5322 209 81395
R54	PTC RST DISC 60V 25E	5322 116 44008

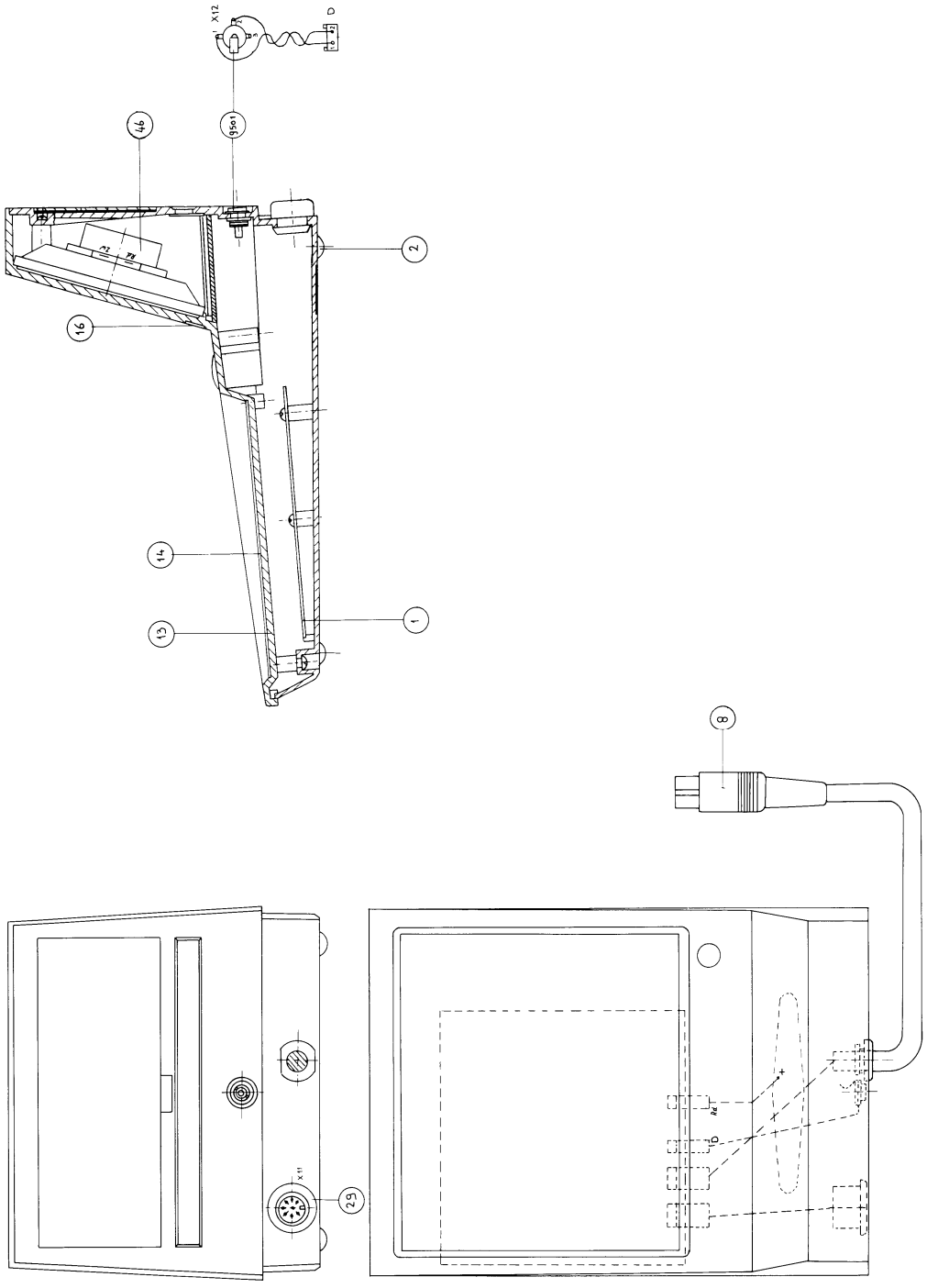


Figure 1 Passive unit

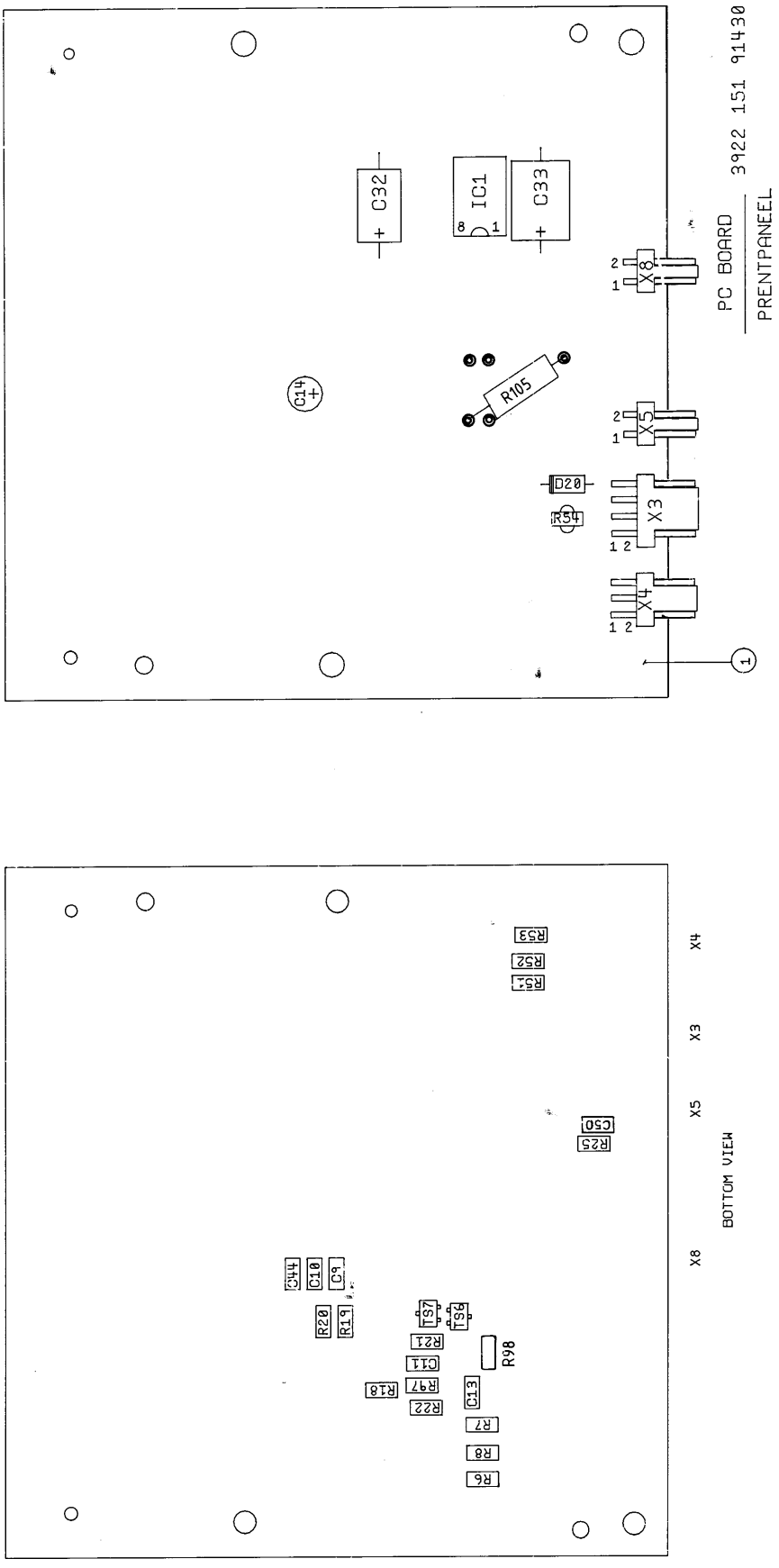


Figure 2 Components location passive unit

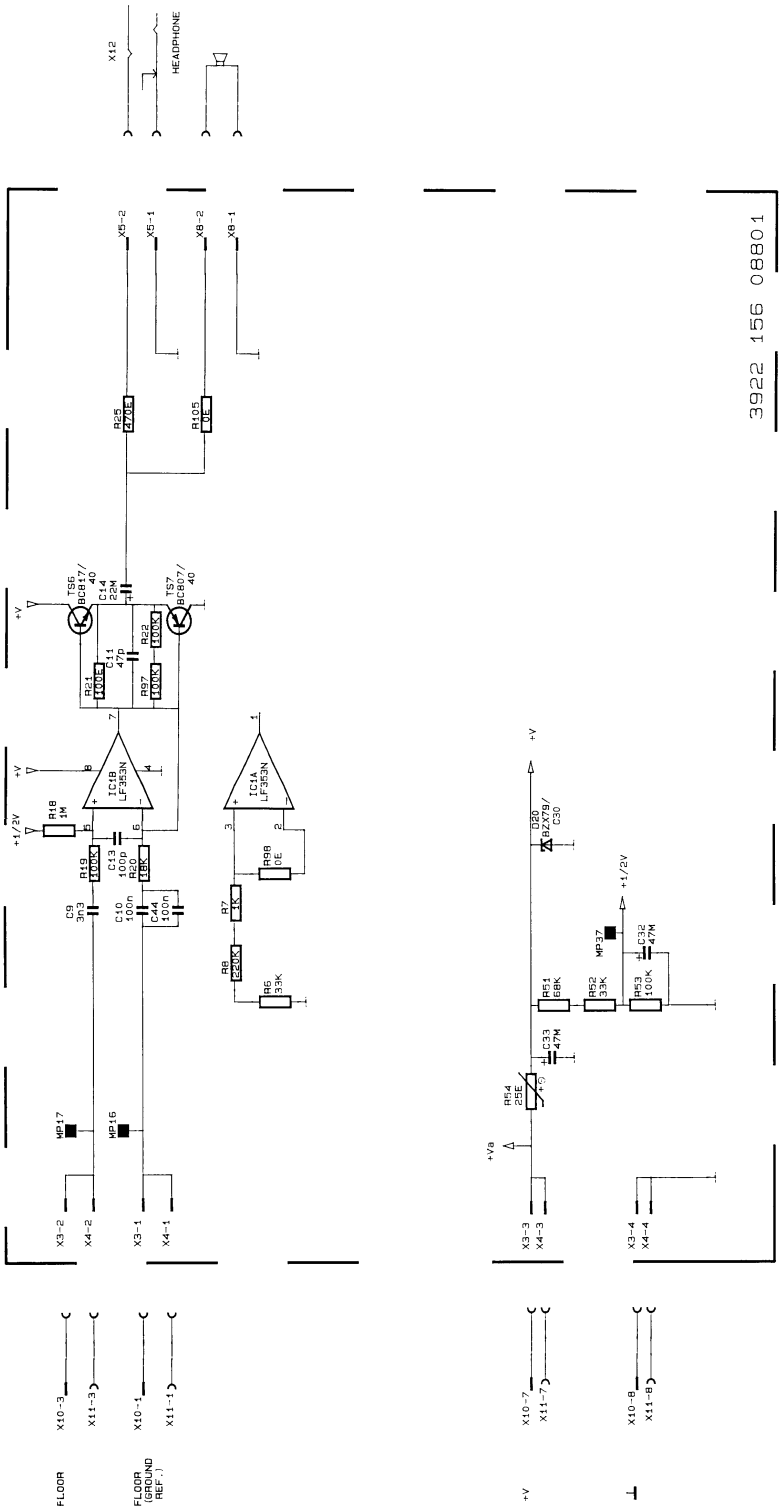


Figure 3 Circuit diagram location passive unit

LBB 3360/20
Flush mounting delegate unit

Tab 8

CONTENTS

CHAPTER 1 INTRODUCTION

The delegate's unit can be divided into 4 parts:

Part 1	Microphone amplifier Amplifies and limits the microphone input signal.
Part 2	Audio amplifier Amplifies the audio signal, and distributes it to the loudspeaker connection.
Part 3	Audio switch off circuit Compares the audio signal, and the microphone signal. Automatically switches "off" the microphone, when there is no input from the delegate's unit for approximately 30 to 45 seconds.
Part 4	Microphone and loudspeaker switching circuit switches the microphone and loudspeaker on or off, depending on the status of the control signals. The control signals comprise of the microphone, remote, priority and disable request signals, plus the output signal from the auto switch off circuit.

CHAPTER 2 CIRCUIT DESCRIPTION

(see circuit diagram)

When the system is switched “on”, capacitor C33 charges to the supply voltage 27V. Resistors R48, and R50 causes the voltage on the + input 5 of IC3b to be lower than on the negative input 6. This state is valid until the power supply voltage reaches 18V. The difference negative voltage, between the negative input and the positive input of IC3, causes the comparator output to be 0V. This 0V is fed to the negative input 2 of IC3a, because the voltage on the positive input 3 is +6V, the comparator output will be high i.e. logic “1”. Logic “1” resets the flip-flop IC5a. When switching on the system, if the supply voltage exceeds 15V the zener diode D11 will conduct, causing the voltage at input 6, to remain at a constant level of 15V. If the power supply voltage exceeds 18V, the voltage at the input of IC3b pin 5 is higher than the 15V on input 6 causing a positive difference voltage, ensuring that the comparator no longer clamps the voltage to zero. 15V is applied to the negative input of IC3a, pin2, which is higher than the +6V on the positive input 3, therefore the output from the comparator is 0V (logic “0”). Logic “0” will no longer reset the flip-flop IC5, and the delegate unit is now ready for use.

1 Switching Control Circuit General

The switching control circuit IC5a, IC2d, IC3a, and IC4a/b carries out all the switching functions in the delegate unit. Switching is due to the state of the call microphone signal, priority, disable request and remote control lines, the microphone signal or the audio signal to the loudspeaker. IC5a is a flip-flop, who’s output is logic “0” (0V) or logic “1” (15V) depending on its input signals. When the output is 0V, the microphone is switched “off” from the pre-amplifier to the audio line. When the output is 15V, the microphone signal via the pre-amplifier will be switched to the audio line and the loudspeaker is switched “off”.

The priority and disable request lines are via a comparator circuit connected to the reset and data input. The priority signal, when active, ensures that the flip-flop will be reset and the active disable request signal ensures that the data input becomes “0”. The microphone call signal, from the microphone button, is applied to the clock input of IC5, and the remote call signal to the set input. The clock or set pulse can make the flip-flop output logic “1”, causing the microphone to be switched “on” and the loudspeaker “off”.

The audio comparator output is connected via a comparator to the reset input of IC5. Therefore after the delay time of approximately 30 to 45 seconds, the flip-flop will be reset, and the switched “on” microphone is switched “off”.

2 Listening

In the listening position, the switching control circuit, switches via the loudspeaker switching circuit the audio signal to the audio amplifier and to the loudspeaker. The microphone signal is disconnected from the line via the microphone switching circuit. During listening the clock input of IC5 is “low” because the call button has not been pressed. Because there is no priority, the priority line is at 27V. The voltage on the negative input 2 of IC3a, via D9, R34 and R36 is approximately 12V. Because the positive input is +6V, the comparator output is 0V. This 0V is applied to the reset input of IC5. The disable request, connected to pin 13 of IC2d is inactive, therefore the negative input is approximately 0V. The positive input to IC2d pin 12 is +10V therefore the comparator does not clamp the data input of IC5 to “low”. At last there is no remote control, meaning that the remote line, which is connected to the set input of IC5, is 0V and does not set the flip-flop.
The output of the flip-flop, which is at 0V, is connected via a resistor and capacitor network, to transistor TS5. This circuit forms the microphone switching circuit. 0V on the base of TS5 causes it to not conduct, therefore TS4 which is a part of the pre-amplifier is also non-conductive. The microphone signal on the base of TS4 therefore does not reach the audio line, and acts as if it were switched “off”
The loudspeaker switching circuit consists of an external NPN transistor and a relay. The output of IC5 switches via the transistor the relay, which has a break contact in serial with the loudspeaker.

3 Audio amplifier

The amplifier consists of IC1b, TS6, TS7 and associated components. The audio signal from the audio line is fed via C9 and R19 to the positive input of IC1b, the ground reference is fed to the negative input. The operational amplifier amplifies the line signal. The output is a DC level of approximately 14 Volts on which the audio signal is superimposed. The balanced output stage TS7 and TS6 provide the current for driving a low impedance speaker.

4 Call position

In the call position, the microphone switching circuit is activated, by the switching control circuit. The microphone signal is fed via the Pre-amplifier and switched to the audio line. The loudspeaker is fed via the loudspeaker switching circuit, and switched "off" from the audio amplifier.

During a call, the clock input of IC5 is logic "1" because the call button is pressed. No priority or remote signals are present, therefore the reset input and the set input are at logic "0". Because disable request is inactive, the data input of IC5 stays "1", On the positive edge of the clock input, caused by the call button, this "1" will be clocked to the output. The inverse output will now be "0" and is fed back to the data input. This means that when the next clock pulse occurs, the output will go "low" again. The "1" on the output of the flip-flop is fed to the base of TS5 in the microphone switching circuit, causing it to conduct, whereby TS4 also will be conductive. Current can now flow via the emitter of TS4 to earth and LED D4 illuminates. The microphone signal is taken from the collector of TS4 and fed to the line.

5 Pre-amplifier

The pre-amplifier consists of IC1a, TS4 and associated components. A DC voltage is fed via TS1 and applied to the electret microphone line. The current flowing from TS1 to the electret microphone, ensures that the FET inside the microphone is conducting. The analogue microphone signal is applied by the microphone to the microphone line and fed via C1 and C2 to the and–inputs of operational amplifier IC1a. C1 ensures that the DC voltage for the electret microphone, cannot reach the op-amp. A DC voltage of approximately 4V is fed via R5, R6 and R8 to the microphone signal on the inputs of IC1a. C2 ensures that this DC voltage is not influenced by TS2 and TS3. The output of the op- amp IC1a is fed back via Rll/C48 to the – input and via the resistor between X2-5 and X2-6. The resistance value is dependent on the sensitivity of the electret microphone. In this way differences in sensitivity of the microphones are compensated. The amplified signal, a DC level of approximately 10V on which the audio signal is superimposed, is applied to the base of TS4.

6 Limiter

The limiter consists of TS2, TS3 and associated components. When the AC output signal of the op-amp IC1a reaches a value greater than 1.4V, Dl or D2 will conduct and so will TS2 or TS3. When either one of these transistors is conducting, the input signal to the pre-amplifier decreases. A sample of the current from the microphone flows via the conducting transistor to ground and the signal is limited.
The limiter is divided into two sections, the right section D2 and TS3 for the positive AC and the left section Dl and TS2 for the negative AC of the microphone signal.

7 Resetting "call" position

If the call button S1 is pressed again, IC5 receives another positive pulse on its clock input. The inverse output pin 2 was "low", and so is the data input of the flip-flop. After the clock-pulse the "0" will appear on the output, therefore the inverse output will go "high" and so will the data input. This "low" output disables the microphone signal and enables the connected speaker.

8 Priority

When the chairman requires priority over the delegate microphones, the priority line is at about 1.5V. Due to R37 and R99 1V is applied to the – input of IC3a. Because of the 6V on the + input the comparator output is at about 15V, which is logic "1". Via the reset input IC5 is now reset. The set input remains at "0" and the data input becomes "1". The flip-flop output was "1" but will now go "low" and the microphone signal is switched off. As long as the priority line stays on 1.5V the reset input of IC5 stays "high" and clock pulses from the call button will have no influence on the flip-flop and the microphone remains switched off.

9 Disable request

When the adjusted number of microphones are switched on simultaneously, the disable request line reaches approximately 27V. This 27V is applied to the – input of IC2d. Because the + input is at +10V the output of the comparator becomes 0V. The data input which is on +15V is now clipped to 0.7V, which is logic "0" to the flip-flop. When the microphone is switched "on" this "0" will be clocked to the output, but because the output already was "low" the status of the delegate will not change. During the disable request the microphone can be switched off by pushing the call button. When the number of switched "on" microphones is less than the maximum number, the disable request line becomes 0V. The output from the comparator IC2d is no longer clamping the data input to zero. The delegate unit is now in the listening mode and the delegate is able to switch "on" his microphone by pressing the call button.

10 Remote control

When a central control desk is included in the system, the call button can also be used as a microphone request button. This can only be achieved, when the control desk is in manual mode.

Three situations exist:

1 No central control desk connected.
2 Central control desk connected, and positioned in the auto mode.
3 Central control desk in the manual mode

When a central control desk is connected in the auto mode, the remote line is higher than 2/3V+. When no desk is connected resistor R38, which is connected to V+ (27V) ensures that the remote line is higher than 2/3V+. The remote line is fed via C29, and connected to the set input of the flip-flop. C29 ensures that the DC voltage is blocked, and the set input is "0". The delegate is able to switch "on" or "off" his microphone via the call button as usual. When the central control desk is in the manual mode, the voltage on the remote line is lower than 2/3V+. The flip-flop IC5a is not set due to capacitor C29. Because the - input is 2/3V+, the output is now 0V. When the delegate presses his call button, the output of IC5a becomes 15V, but is clamped behind R59 by IC4a and D10a, which will illuminate. The 15V output of the flip-flop is also applied to the base of TS9, which causes it to conduct. Current now flows from the request line, this is a sign for the central control desk that a request has been made. The operator of the central control desk makes the remote line higher than 2/3V+, the output of the comparator IC4a then becomes 15V, and the voltage at R59 is no longer decreased, therefore the 15V is applied to the base of TS5. The microphone will be switched "on" and the loudspeaker "off".

The operator is also able to switch "on" a delegate microphone, even though the delegate has not requested it. The voltage on the remote line is now switched from a value much lower than 2/3V+, to a value greater than 2/3V+ (about V+). Because of the fast rise time and the high voltage step, this pulse passes through the differentiation network C29 and R45 and sets the flip-flop IC5 via the set input. The output of the flip-flop is now "high" and the microphone is switched "on".

The operator is able to switch "off" the microphone, by switching the voltage on the remote line from a value greater than 2/3V+, to a voltage much less than 2/3V+, via C26 to the input of IC3a, which is 27V when there is no priority and is reduced to below 6V for a short moment during the voltage drop. This results in a reset pulse from IC3a being fed to the reset input of IC5a and the microphone is switched off.

When the central control desk is used, the priority line from the chairman unit is not connected to the other delegate units, but to the central control desk. When a chairman presses his "priority button", two situations exist: the central control desk is in manual, or in auto mode.
In manual mode, the central control desk generates a DC level, which is greater than the 6V, but lower than the 2/3V+ (18V) on the priority line. This voltage is then fed to the + input of IC4b, ensuring that the comparator output is 0V. When the microphone is switched on, the voltage on the anode of D10 and resistor R59 is decreased and the microphone is switched off. When the priority button is released by the chairman, the priority line becomes approximately 27V and the output of IC4b goes to 15V, therefore the voltage on the anode of D10 is no longer reduced and the microphone is switched on again. So when the control desk is in manual mode, priority from the chairman doesn't switch off the microphone but only mutes it.

In the "auto mode" the microphone is switched off when the chairman takes priority and remains off when the priority button is released again. In auto mode the central control desk generates a DC level lower than 6V on the priority line after a priority call. This voltage is then fed to the – input of IC3a and because the + input is at +6V, the

comparator output is 15V and resets the flip-flop. When the priority is released, the priority line goes to 27V. The output of IC3a is now at 0V, and the flip-flop is no longer reset, the microphone remains switched off and the delegate unit is now in the listening position.

11 Audio level comparator

The audio level comparator ensures that when a delegate does not speak into his microphone for approximately 30 to 45 seconds the flip-flop IC5 will be reset via comparator IC3a.

At input 3 of IC2a a DC level of approximately 9V is applied. The microphone signal is fed to the – input of IC2a. The op-amp subtracts the microphone signal from the DC level and amplifies the resulting signal. The output signal is now at a 9V DC level on which the amplified microphone signal is superimposed. This signal is then fed to the – input of IC2b; on the + input the audio signal from the disable request line is applied which is superimposed on a 9V DC level from R28. The output of IC2b is the result of the subtraction of the microphone signal and the line signal superimposed on a 9V DC level. This output voltage can reduce the voltage on X. The output of IC2a, which is a 9V DC level with the microphone signal superimposed on, can reduce the voltage on Y. When only the delegate is using his unit, the line signal will be the same as the microphone signal and the AC difference voltage at the output of IC2b is 0V, only the 9V DC level is on the output. The voltage on X is now the 9V plus the forward voltage of D6, adding up to a total of 10V. When more than one delegate is speaking, the line signal is greater than the microphone signal.

The difference voltage on the output of IC2b ensures that the 10V on X is reduced.
If the delegate unit is silent, there is no microphone signal, therefore the AC voltage on the 9V DC level at the output of IC2a is 0V. The voltage on Y is at 9V plus the forward voltage of D7, which is 10V. When the delegate microphone is in use, the negative going part of the microphone signal ensures that the 10V on Y is reduced.
X is applied to the + input of IC2c and Y to the – input. When X is greater than Y, the output of the op-amp is at 15V and when Y is greater than X the output is 0V. Therefore when the delegate uses his microphone (he has to speak louder when others are using their microphones) the output of IC2c will be 15V and charges C24. When the delegate stops speaking, the output of IC2c will be 0V and C24 discharges via R35. The voltage on C24 is fed via R36 to the – input of IC3a, when the voltage becomes lower than 7V, the comparator output which was on 0V becomes 15V and resets flip-flop IC5 and the microphone is switched off.
The time taken for C24 to discharge from 15V to 7V is approximately 30 to 45 seconds. When the microphone is switched off, the output of IC2c becomes 15V independent of the number of other switched on microphones. This is because Y is pulled down to 1V by the output of flip-flop IC5a via diode D8. By placing jumper S3 in the a-b position, C24 cannot discharge and the audio comparator is disabled.

CHAPTER 3 SPARE PARTS LIST

Pos. No.	Description	Service Code
	PCB CONNECTOR 8 PENS	5322 530 84092
	DELEGATE CABLE ASSY	5322 321 21658
	PCB ASSY	5322 214 90027
	KNOB	5322 414 20129
C1-28	10nF 50V	4822 122 32442
C2-10-17-27-40-44-45	100nF 50V	5322 122 32839
C3-20	10uF 25V	4822 124 21732
C4-6-8-15-21-22	4.7uF 25V	5322 124 21966
C5	0.47uF 25V	4822 124 21453
C7	47uF 10V	5322 124 21975
C9	3.3nF 50V	4822 122 31969
C11	47pF 50V	4822 122 31772
C12-13-23-25-30-31	100pF 50V	4822 122 31765
C14-35	22uF 25V	4822 124 21646
C18	82nF 50V	5322 122 32838
C24	100uF 25V	4822 124 20701
C26-29	4.7nF 50V	4822 122 31784
C32-36	47uF 25V	4822 124 20699
C33	47uF 40V	4822 124 20713
C47	22nF 63V	4822 122 31797
C48	470pF 63V	4822 122 31727
Dl-2-5-6-7-8-9-12-13-17	DIODE BAV70	5322 130 34331
D3	BZX84-C5V1	5322 130 32835
D11	BZX84-C15	5322 130 33662
D19	BZV46-2V0	4822 130 31248
D20	BZX79-B30	4822 130 34328
D21	BZX84-C6V2	5322 130 33671
D10A	TIUG164	5322 130 32587
D4A	CQW54-Vl	5322 130 32704
IC1	LF353N	5322 209 81395
IC2	LM324FP	5322 209 71598
IC3-4	LM393FP	5322 209 71599
IC5	HEF4013BT	5322 209 14477
R1-96	5K6 0.126W	4822 111 90572
R2-5-46	47K 0.125W	4822 111 90543
R3	390E 0.125W	5322 111 90138
R4-11-13-72-99	10K 0.125W	4822 111 90249
R6-29-52	33K 0.125W	5322 111 90267
R7-30-34-42-47	1K 0.125W	5322 111 90092
R8	220K 0.125W	4822 111 90197
R9	220E 0.125W	4822 111 90178
R12-15-19-22 – 24-28-36-39-40-41-43-45-49-53-55-60-95-97	100K 0.125W	4822 111 90214
R14	560E 0.125W	5322 111 90113
R16	1K5 0.125W	4822 111 90151
R17-58	12K 0.125W	4822 111 90253
R18-32-33-37-44-102-103	1M 0.125W	5322 111 90094
R20-26-31	18K 0.125W	4822 111 90238

R21	100E 0.125W	5322 111 90091
R23	22K 0.125W	4822 111 90251
R27	39K 0.125W	5322 111 90108
R35	4K7 0.125W	5322 111 90111
R38	10M 0.125W	5322 111 91141
R48	150K 0.125W	5322 111 90099
R50	27K 0.125W	4822 111 90542
R51-93	68K 0.125W	4822 111 90202
R54	PTC	5322 116 44008
R56-57-104	15K 0.125W	4822 111 90196
R59	2K7 0.125W	4822 111 90569
R82-83	3K9 0.125W	4822 111 90571
R92	82K 0.125W	4822 111 90575
R94	680E 0.125W	4822 111 90162
R98	390E 2.5W	5322 116 54401
S3	LINK, JUMPER	5322 290 60298
S3	JUMPER SOCKET, MALE	5322 265 64028
S1	SWITCH, PUSH BUTTON	4822 276 11188
TS1-3-4-5	BC847C	5322 130 42755
TS2	BC857C	5322 130 42756
TS6-8-9	BC817-40	4822 130 42615
TS7	BC807-40	5322 130 60123
X9	DIN SOCKET	5322 267 54107
	8-P DIN PLUG, MALE	5322 265 40535

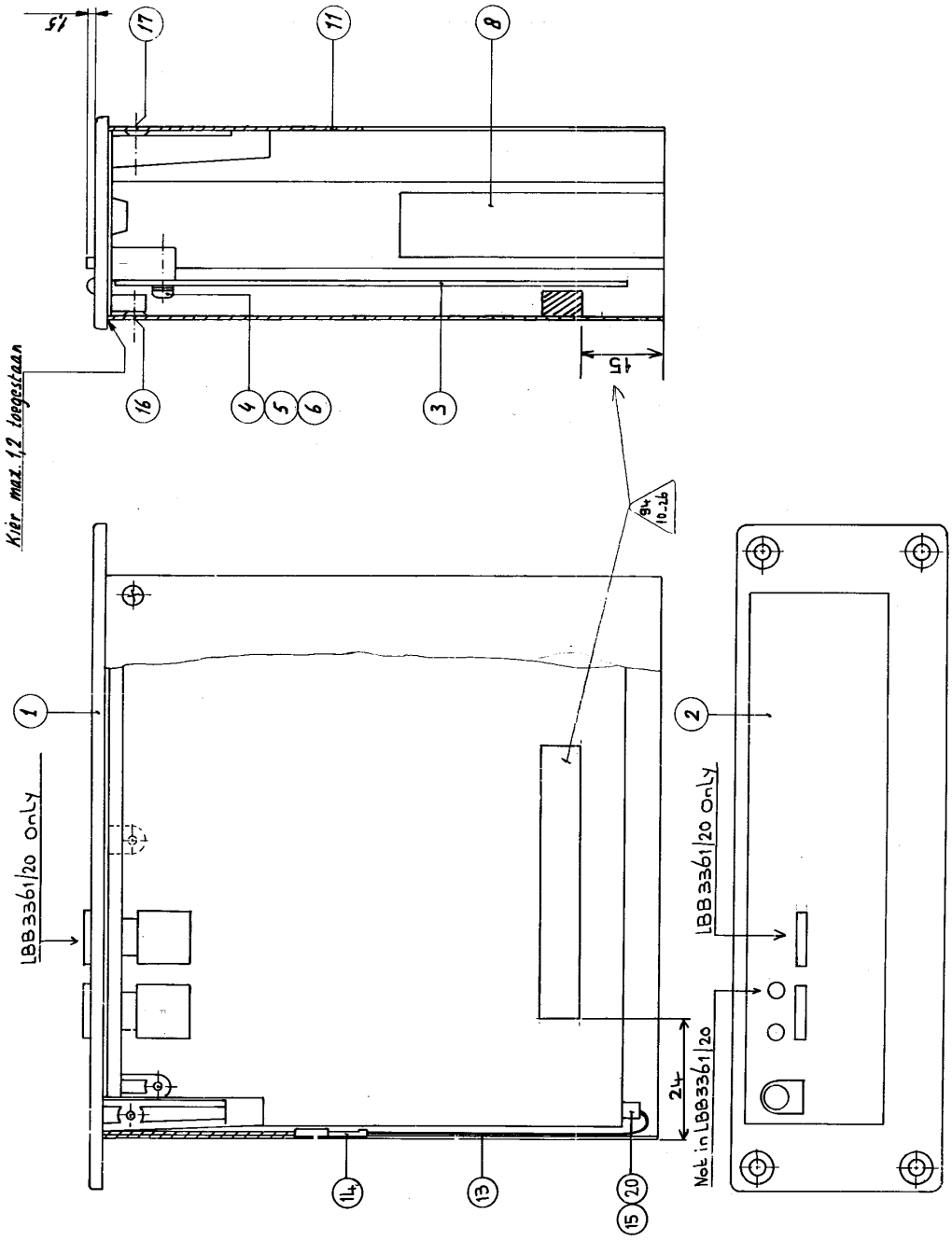


Figure 1 Flush-mounting delegate unit

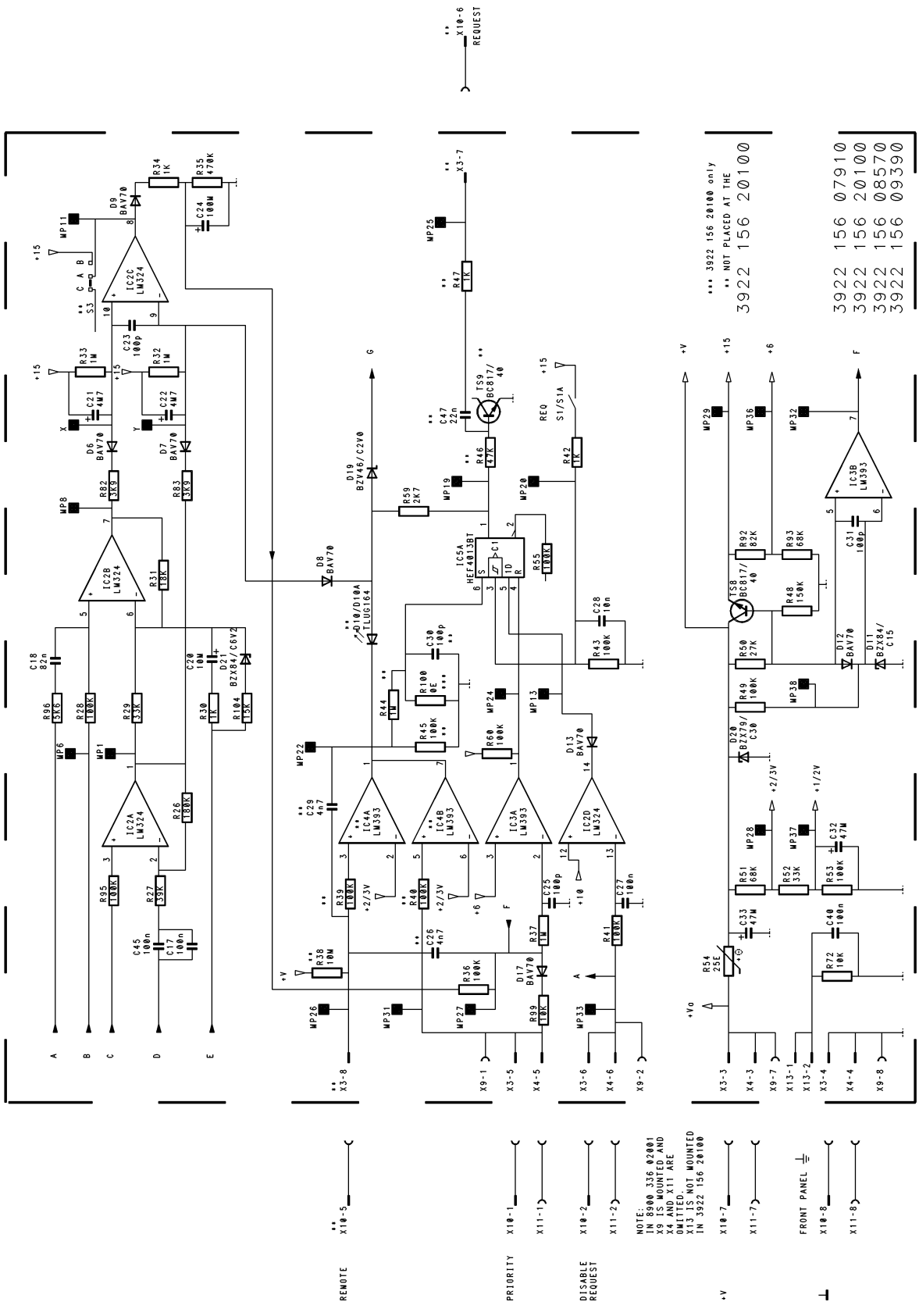


Figure 2 Circuit diagram flush-mounting delegate unit sheet 1

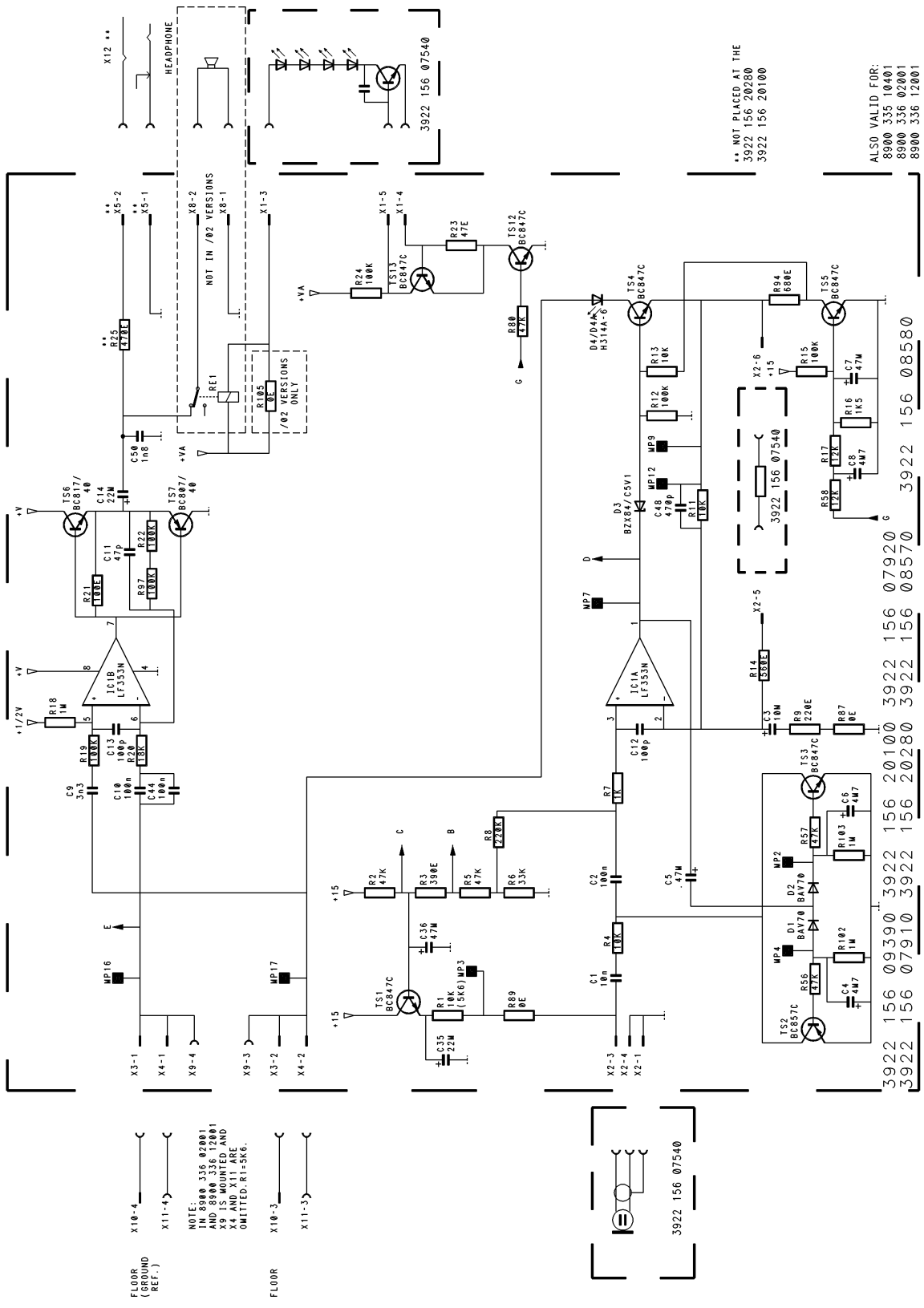


Figure 3 Circuit diagram flush-mounting delegate unit sheet 2

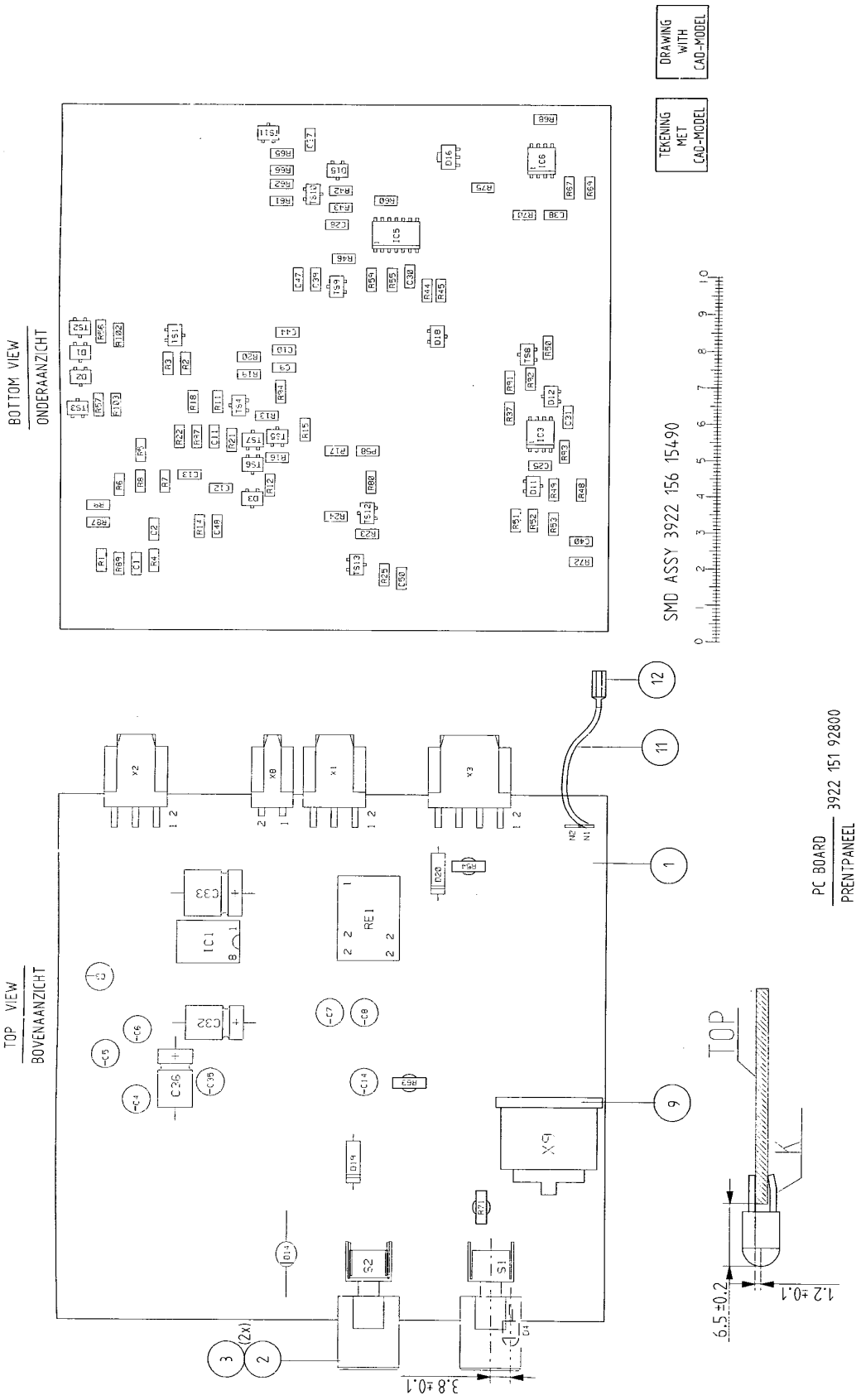


Figure 4 Components layout flush-mounting delegate unit

LBB 3361/20
Flush mounting chairman unit

Tab 9

CONTENTS

CHAPTER 1 INTRODUCTION

The chairman unit can be divided into 3 parts:

Part 1	Microphone amplifier. Amplifies and limits the microphone input signal.
Part 2	Audio amplifier. Amplifies the audio signal, and distributes it to the loudspeaker connection.
Part 3	Microphone and loudspeaker switching circuit. Switches the microphone and loudspeaker on/off, depending on the status of the control signals. The control signals comprise of the microphone, remote and priority signals.

CHAPTER 2 CIRCUIT DESCRIPTION

(see circuit diagram)

When the system is switched “on”, capacitor C33 charges to the supply voltage 27V. Resistors R48, and R50 cause the voltage on the + input 5 of IC3b to be lower than on the negative input 6. This state is valid until the power supply voltage reaches 18V. The difference negative voltage, between the negative input and the positive input of IC3, causes the comparator output to be 0V. The 0V is applied to the negative input 2 of IC3a, because the voltage on the positive input 3 is +6V, the comparator output will be high i.e. logic “1”. Logic “1” resets the flip-flop IC5a. when switching on the system, if the supply voltage exceeds 15V, the zener diode D11 will conduct, causing the voltage at input 6 to remain at a constant level of 15V. If the power supply voltage exceeds 18V, the voltage at the input of IC3b pin 5 is higher than the 15V on input 6 causing a positive difference voltage, ensuring that the comparator no longer clamps the voltage to zero. 15V is applied to the negative input of IC3a, pin2, which is higher than the +6V on the positive input 3, therefore the output from the comparator is 0V (logic “0”). Logic “0” will no longer reset the flip-flop IC5, and the delegate unit is now ready for use.

1 Switching Control Circuit General

The switching control circuit IC5a, IC3a and IC6 carries out all the switching functions in the chairman unit. Switching is due to the state of the call microphone signal, priority, and remote control lines, the microphone signal or the audio signal to the loudspeaker. IC5a is a flip-flop, who’s output is logic “0” (0V) or logic “1” (15V) depending on its input signals. When the output is 0V, the microphone is switched “off” from the pre- amplifier to the audio line. When the output is 15V, the microphone signal via the pre-amplifier will be switched to the audio line and the loudspeaker is switched “off”.

The microphone call signal, from the microphone button, or from the microphone remote control line via IC6, is fed to the clock input of IC5. The clock input to IC5 causes the Q output to go “high”, therefore the microphone will be switched on and a connected loudspeaker off. The priority signal from the priority call button is fed to TS10 and TS11, which ensures that when the priority button is pressed, the microphone is switched on and a 1.5V DC level is switched via the priority line to the delegate units or central control desk when used.

2 Listening

In the listening position, the switching control circuit, switches via the loudspeaker switching circuit the audio signal to the audio amplifier and to the loudspeaker. The microphone signal is disconnected from the line via the microphone switching circuit. During listening the clock input of IC5 is “low” because the call button has not been pressed and no remote call via IC6 has been applied. Because there is no set pulse, the output of the flip-flop remains “low”. This output is connected to TS5, which forms the microphone switching circuit. 0V on the base of TS5 causes it to not conduct, therefore TS4 which is a part of the pre-amplifier is also non-conductive. The microphone signal on the base of TS4 therefore does not reach the audio line, and acts as if it were switched “off”
The loudspeaker switching circuit consists of an external NPN transistor and relay. The output of IC5 switches via the transistor the relay, which has a break contact in series with the loudspeaker.

3 Audio amplifier

The amplifier consists of IC1b, TS6, TS7 and associated components. The audio signal from the audio line is fed via C9 and R19 to the positive input of IC1b, the ground reference is fed to the negative input. The operational amplifier amplifies the line signal, and the output is a DC level of approximately 14 Volt on which the audio signal is superimposed. The balanced output stage TS7 and TS6 provides the current for driving a low impedance speaker.

4 Call position

In the call position, the microphone switching circuit is activated by the switching control circuit. The microphone signal is fed via the Pre-amplifier and switched to the audio line. The loudspeaker is fed via the loudspeaker switching circuit, and switched “off” from the audio amplifier.

The inverting output of flip-flop IC5, which is “high” in the listening position, is fed back to the data input. On the positive edge on the clock input, caused by the call button, this “1” will be clocked to the output. The inverse output will now be “0” and is fed back to the data input. This means that when the next clock pulse occurs, the output will go “low” again. The “1” on the output of the flip-flop is fed to the base of TS5 in the microphone switching circuit, causing it to conduct, whereby TS4 will also be conductive. Current can now flow via the emitter of TS4 to earth and LED D4 illuminates. The microphone signal is taken from the collector of TS4 and fed to the line.

5 Pre-amplifier

The pre-amplifier consists of IC1a, TS4 and associated components. A DC voltage is fed via TS1 and applied to the electret microphone line. The current flowing from TS1 to the electret microphone, ensures that the FET inside the microphone is conducting, The analogue microphone signal is applied by the microphone to the microphone line and fed via C1 and C2 to the + and – inputs of operational amplifier IC1a. C1 ensures that the DC voltage for the electret microphone cannot reach the op-amp. A DC voltage of approximately 4V is fed via R5, R6 and R8 to the microphone signal on the inputs of IC1a. C2 ensures that this DC voltage is not influenced by TS2 and TS3. The output of the op- amp IC1a is fed back via Rll/C48 to the – input and via the resistor between X2-5 and X2-6. The resistance value is dependent on the sensitivity of the electret microphone. In this way differences in sensitivity of the microphones are compensated. The amplified signal, a DC level of approximately 10V on which the audio signal is superimposed, is applied to the base of TS4.

6 Limiter

The limiter consists of TS2, TS3 and associated components. When the AC output signal of the op-amp IC1a reaches a value greater than 1.4V, Dl or D2 will conduct and so will TS2 or TS3. When either one of these transistors is conducting, the input signal to the pre-amplifier decreases. A sample of the current from the microphone then flows via the conducting transistor to ground and the signal is limited. The limiter is divided into two sections, the right section D2 and TS3 for the positive AC, and the left section Dl and TS2 for the negative AC of the microphone signal.

7 Resetting “call” position

If the call button S1 is pressed again, IC5 receives another positive pulse on its clock input. The inverse output pin 2 was “low”, and so is the data input of the flip-flop. After the clock-pulse the “0” will appear on the output, therefore the inverse output will go “high” and so will the data input. The “low” output disables the microphone signal and enables the connected speaker.

8 Priority

When the chairman requires priority over the delegate microphones, he presses button S2 continuously. TS11 will conduct, together with TS10. The voltage on the collector of TS10 rises to approximately 15V, thereby switching the microphone signal on the line and a connected loudspeaker off. Due to TS11 conducting, the priority line via D14, D18 and R63 is connected to ground causing it to be at 1.5V. This 1.5V switches the delegate microphones off. When the priority button is released, TS10 and TS11 will no longer conduct causing the microphone signal to be no longer switched to the line, therefore the priority line will again be on 27V.

9 Disable request

Because the chairman must always be able to switch on his microphone, the microphone switching circuit is not influenced by the disable request line.

10 Remote control

Only when a central control desk is connected to the system, the microphone call function can be remotely controlled. The chairman can not request a remote control call by using a request line, but must somehow attract the attention of the control desk operator. The remote line, which is at 15V due to resistor R75, is reduced. This voltage is applied to the negative input of IC6. Because the voltage on the positive input is higher, the output will be on 15V and the microphone will be switched on.

CHAPTER 3 SPARE PARTS LIST

Pos. No.	Description	Service Code
	PCB CONNECTOR 8 PENS	5322 530 84092
	DELEGATE CABLE ASSY	5322 321 21658
	PCB ASSY	5322 214 90028
	KNOB	5322 414 20129
C1-28-37-38	10nF 50V	4822 122 32442
C2-10-39-40-44-47	100nF 50V	5322 122 32839
C3	10uF 25V	4822 124 21732
C4-6-8-15	4.7uF 25V	5322 124 21966
C5	0.47uF 25V	4822 124 21453
C7	47uF 10V	5322 124 21975
C9	3.3nF 50V	4822 122 31969
C11	47pF 50V	4822 122 31772
C12-13-25-30-31	100pF 50V	4822 122 31765
C14-35	22uF 25V	4822 124 21646
C32-36	47uF 25V	4822 124 20699
C33	47uF 40V	4822 124 20713
C48	470pF 63V	4822 122 31727
Dl-2-5-12-15-18	DIODE BAV70	5322 130 34331
D3	BZX84-C5V1	5322 130 32835
D11	BZX84-C15	5322 130 33662
D14	BYW56	5322 130 34973
D16	BZV49-C6V2	5322 130 33672
D19	BZV46-2V0	4822 130 31248
D20	BZX79-B30	4822 130 34328
D21	BZX84-C6V2	5322 130 33671
D4A	CQW54-V1	5322 130 32704
IC1	LF353N	5322 209 81395
IC3	LM393FP	5322 209 71599
IC5	HEF4013BT	5322 209 14477
IC6	UA741CFP	5322 209 71597
R1	5K6 0.126W	4822 111 90572
R2-5-46-65	47K 0.125W	4822 111 90543
R3	390E 0.125W	5322 111 90138
R4-11-13-66-72	10K 0.125W	4822 111 90249
R6-29-52-69	33K 0.125W	5322 111 90267
R7-30-34-42	1K 0.125W	5322 111 90092
R8	220K 0.125W	4822 111 90197
R9	220E 0.125W	4822 111 90178
R12-15-19-22-24-28-36-43-45-49-53-55-60-61-62-68-70-75-97	100K 0.125W	4822 111 90214
R14	560E. 0.125W	5322 111 90113
R16	1K5 0.125W	4822 111 90151
R17-58	12K 0.125W	4822 111 90253
R18-32-33-37-44-67-102-103	1M 0.125W	5322 111 90094
R20-26-31	18K 0.125W	4822 111 90238
R21	100E 0.125W	5322 111 90091
R23	22K 0.125W	4822 111 90251
R27	39K 0.125W	5322 111 90108
R35	4K7 0.125W	5322 111 90111

R48	150K 0.125W	5322 111 90099
R50	27K 0.125W	4822 111 90542
R51-93	68K 0.125W	4822 111 90202
R54-63-71	PTC	5322 116 44008
R56-57	15K 0.125W	4822 111 90196
R59	2K7 0.125W	4822 111 90569
R92	82K 0.125W	4822 111 90575
R94	680E 0.125W	4822 111 90162
R98	390E 2.5W	5322 116 54401
S1-2	SWITCH, PUSH BUTTON	4822 276 11188
TS1-3-4-5	BC847C	5322 130 42755
TS2-10	BC857C	5322 130 42756
TS6-8-9-11	BC817-40	4822 130 42615
TS7	BC807-40	5322 130 60123
X9	DIN SOCKET	5322 267 54107
	8-P DIN PLUG, MALE	5322 265 40535

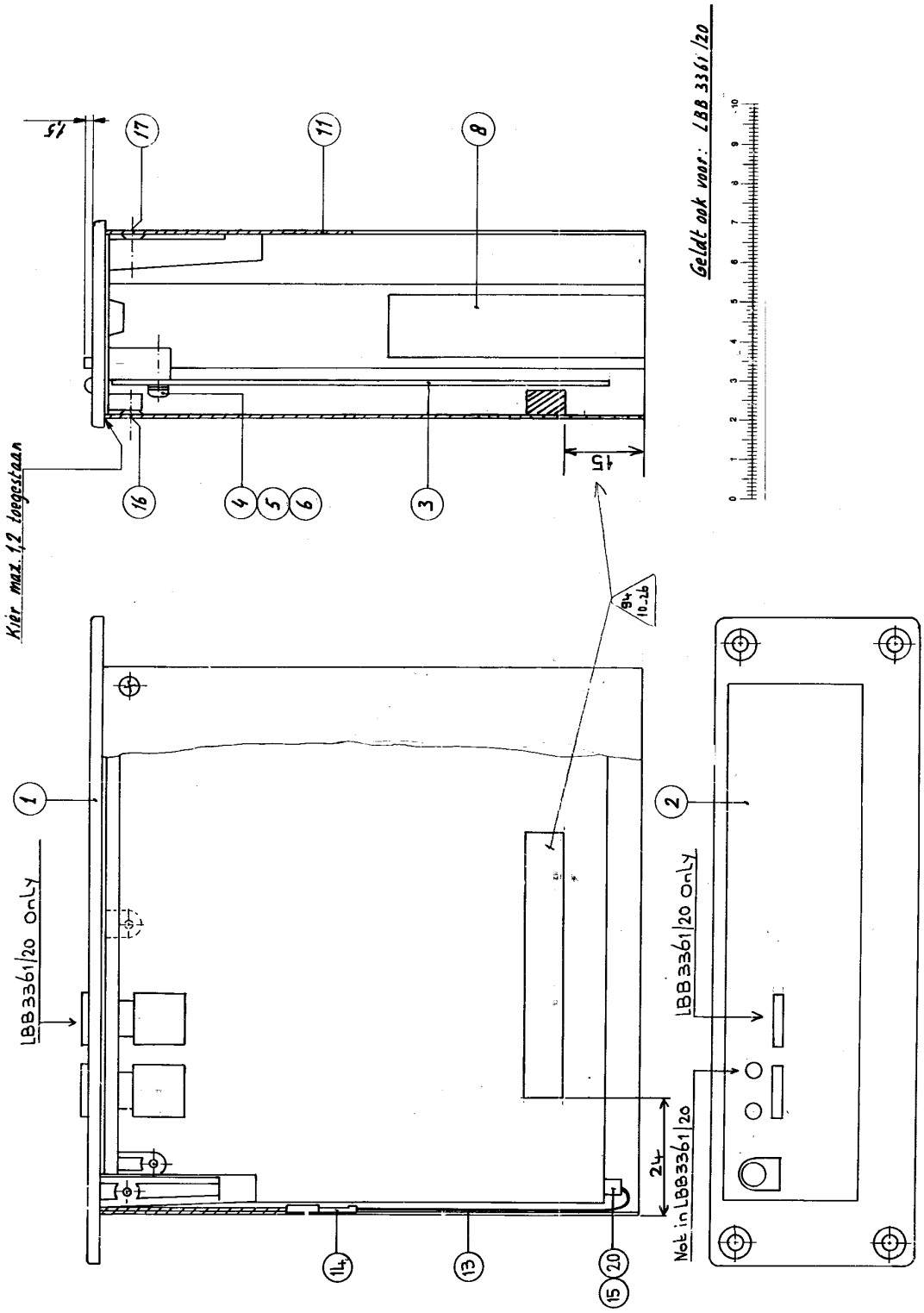


Figure 1 Flush mounting chairman unit

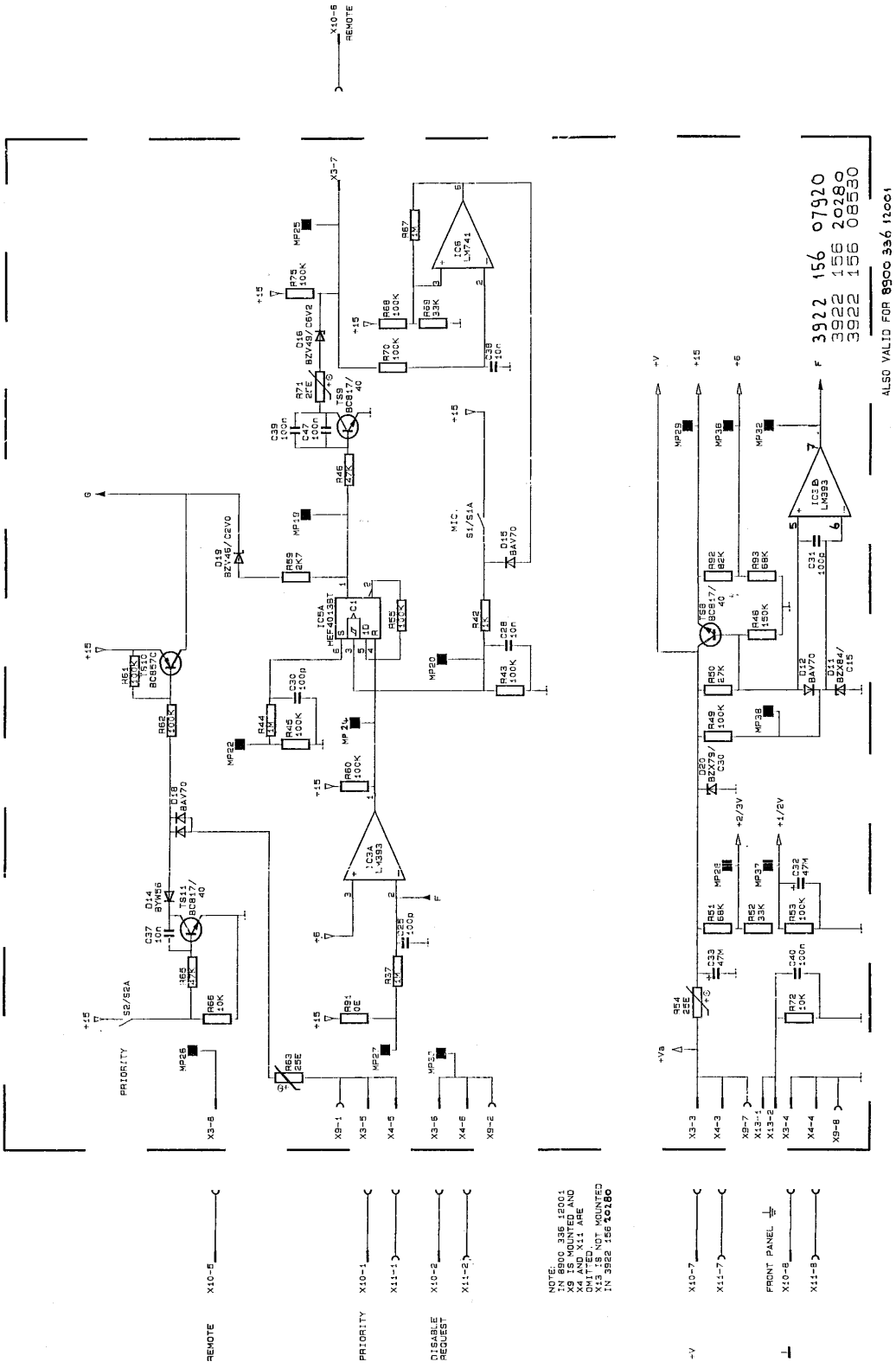


Figure 2 Circuit diagram flush mounting chairm. unit sheet 1

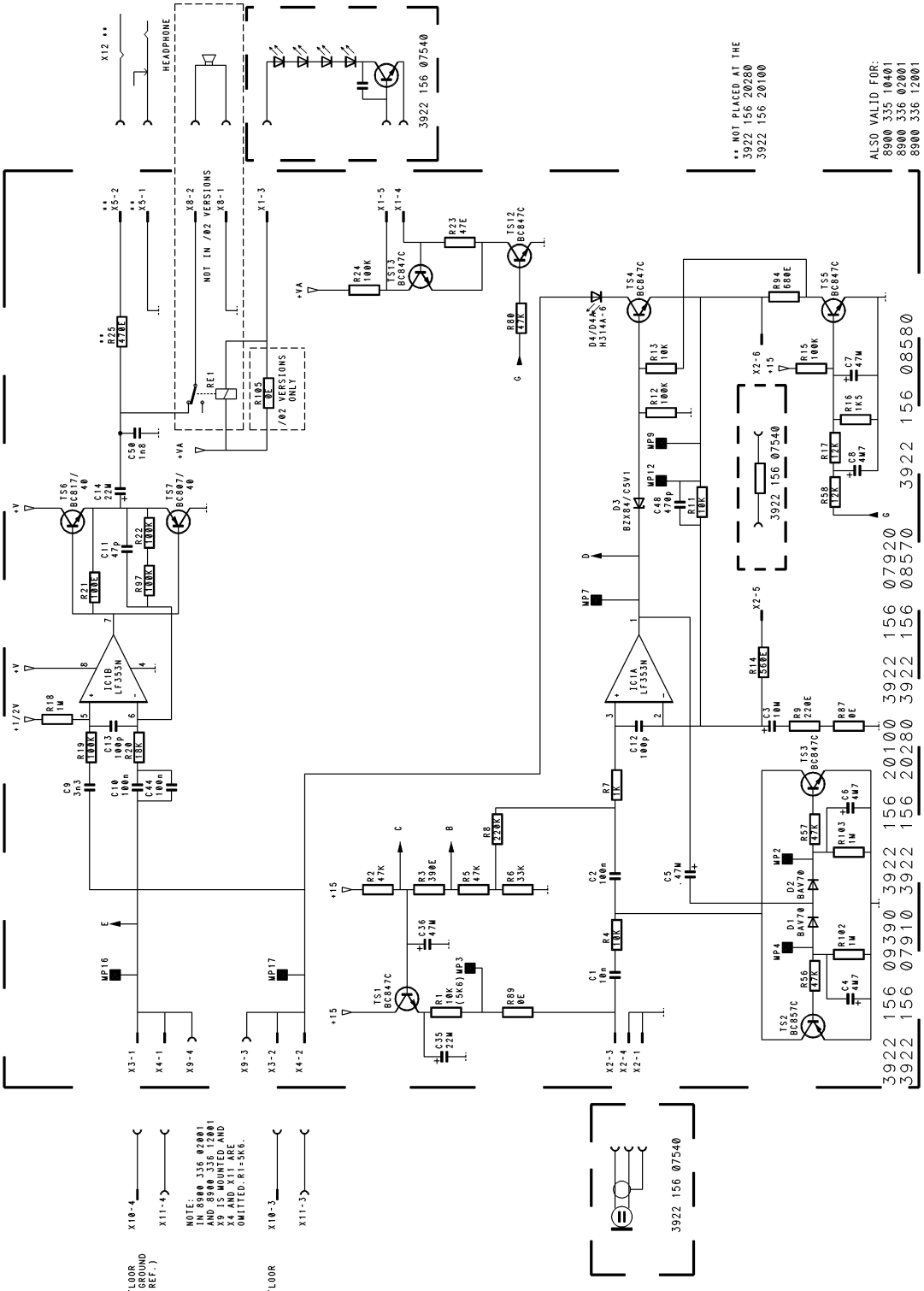


Figure 3 Circuit diagram flush mounting chairm. unit sheet 2

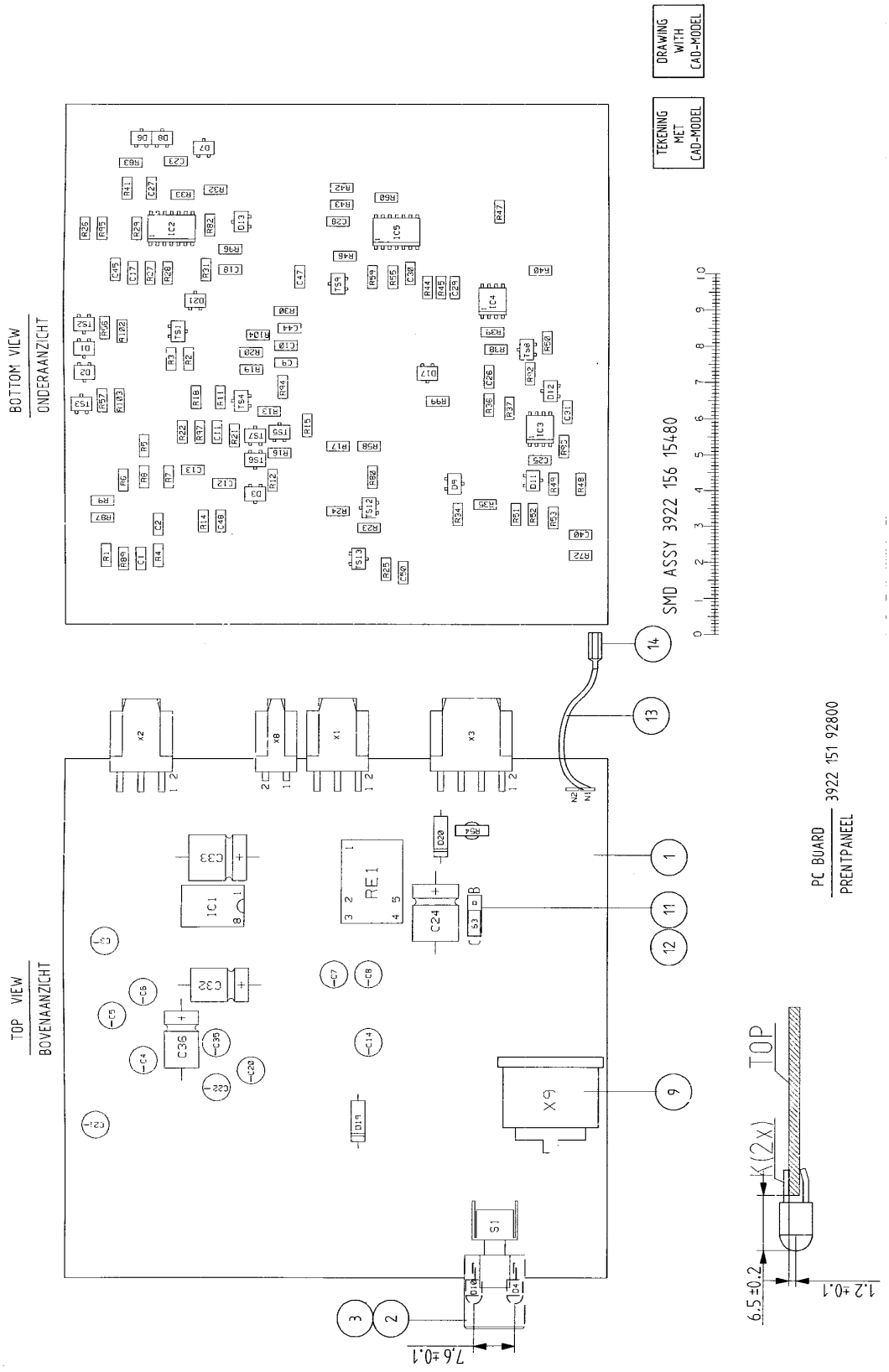


Figure 4 Components layout flush mounting chairm. unit

LBB 3386/11
Central control kit, basic PCB assembly

LBB 3386/41
Central control desk, 40 delegates

LBB 3386/71
Central control desk, 70 delegates

Tab 10

CONTENTS

CHAPTER 1 INTRODUCTION

The new Desks are the successors of the already produced desks, but now with some additional functions
These new Conference Control Desks with voting now allow a CCS 400 discussion system to be extended into a full conference system, with complete facilities for microphone management and electronic voting.
The New Conference Control Desks are available in the following type numbers:

LBB 3386/41	Conference Control Desk for up to 40 delegate units (successor to LBB3386/40)
LBB 3386/71	Conference Control Desk for up to 70 delegate units (successor to LBB3386/70)
LBB 3386/11	Conference Control Desk PCB assembly without cabinet and external controls for incorporation into custom-built conference systems (successor to LBB3386/01)

CHAPTER 2 CIRCUIT DESCRIPTION

The Conference Control Desk is available in a choice of two versions, handling up to 40 or up to 70 microphone units. These compact units give the operator a full overview of system status at all times, including request-to-speak list, active microphones with VIP status and interpretation channels.

1 Built-in electronic voting

The built-in electronic voting facility allows instant monitoring of delegates' opinions, providing a convenient electronic solution for the traditional 'show of hands'. When voting is selected, delegates can enter a positive response by pressing the microphone buttons on their delegate units. When delegates press their microphone buttons, the total result is shown on the control desk, giving an instant visual indication of the response.

In addition to allowing visual response monitoring, the Control Desk has a port for data output to a hall display or personal computer. This facility allows voting results, both individual and total, as well as the other information like active microphones and request-to-speak list data, to be displayed or recorded in the computer.

2 Microphone management facilities

The conference operator has full control of delegate participation via their microphones. Activation of delegates' microphones may be either manual, by the operator, or automatic.

Special VIP status can be assigned to a maximum of 5 microphones.
These delegates can then activate their microphones themselves, whenever they wish, without first entering the request-to-speak list.

3 Manual Microphone activation

Requests-to-speak are indicated by a flashing red LED in the push button, corresponding to the delegate concerned. The speed at which this LED flashes doubles when that delegate reaches the top of the request-to-speak list. The LED is lit constantly while the corresponding microphone is active. The operator selects the microphones to be activated by pressing the corresponding buttons. Up to 7 microphones may be activated simultaneously, including the number of microphones to which VIP status has been assigned.

4 Automatic microphone activation

Delegates' microphones are automatically activated up to the maximum of 7 simultaneously (including the number of micro- phones with VIP status). Additional delegates wishing to speak then enter the request-to-speak list. Their microphones are automatically activated in sequence of request as openings arise.

Delegates are alerted to the status of their microphones by two indicators on their units; a green LED to show request-to- speak status and a red LED to show microphone active. The chairman has a priority function which, if activated, is indicated by a red LED on the control Desk.

If simultaneous interpretation facilities are in use, a series of 6 LEDs on the Control Desk show the operator which language channels are active. Any of these channels can be monitored whenever the operator wishes.

CHAPTER 3 SPARE PARTS LIST

1 Spare parts central control desk processor kit LBB3386/11

Pos. No.	Description	Service Code
1	µC PC BOARD ASSY	5322 310 10463
3	CABLE GROMMET	5322 325 50134
4	CABLE ASSY	5322 321 21658
5	HEADPHONES SOCKET	5322 267 40568
11	LOUDSPEAKER	4822 240 30172
16	POTENTIOMETER 47K LOG	5322 101 20998
36	WIRING ASSY SWITCH+LED	5322 321 23155
37	WIRING ASSY LED89	5322 321 23156
38	WIRING ASSY MON LOUDSP	5322 321 23157
39	WIRING ASSY MON SWITCH	5322 321 23158
40	WIRING ASSY SWITCH	5322 321 23159
	SET OF 50 PIN CONTACTS	5322 310 31241

2 Spare parts µC PC board assy /11

11	CONN BRACKET	5322 405 10007
14	SET OF 50 CONN SCREWS	5322 502 64048
24	JUMPER 2P	5322 115 80116
25	CONTACT STRIP 36P	5322 265 64078
30-31	IC SOCKET 32P	5322 255 40923
42	INSULATOR	5322 255 40792
A1	BATTERY 3.6V	4822 138 10046
B1	CRYSTAL 5,068 MHz	5322 242 70873
BU1-2-3	CONN 8P DIN	5322 267 50659
BU4	SOCKET 6P DIN	5322 267 44075
BU5	SOCKET 7P DIN	4822 264 50101
BU6	D CONN 15P FEM	5322 267 50882
BU7	D CONN 25P FEM	5322 267 60211
C15-C16	EL CAP 100µF 25V	4822 124 20701
C69	EL CAP 220µF 10V	4822 124 20681
Ll-L2	COIL	4822 158 10107
R36-37-38	RES WIRE WOUND 160Ω	5322 113 80146
R138-139	RES PTC 32Ω	5322 116 40149
R163	RES PTC 32Ω	5322 116 40149
X4	CONNECTOR 11P	5322 265 40804
X5-6-7-8	CONTACT STRIP 64P	5322 267 60251

3 Spare parts central control desk ECL 40 del LBB 3386/41

1	µC PC BOARD ASSY	5322 310 10464
2	I/O PC BOARD ASSY	5322 214 90314
3	CABLE GROMMET	5322 325 50134
4	CABLE ASSY	5322 321 21658
5	HEADPHONES SOCKET	5322 267 40568
9	RUBBER FOOT	5322 462 44375
11	LOUDSPEAKER	4822 240 30172
16	POTENTIOMETER 47K LOG	5322 101 20998
9502	CONN BLOCK 11P	5322 268 40333
	SET OF 50 PIN CONTACTS	5322 310 31241

4 Spare parts µC PC board assy /41

2	SWITCH	5322 278 14006
11	CONN BRACKET	5322 405 10007
14	SET OF 50 CONN SCREWS	5322 502 64048
24	JUMPER 2P	5322 115 80116
25	CONTACT STRIP 36P	5322 265 64078
27	KNOB WITH LED LENS	5322 414 10011
28	KNOB	5322 414 20059
30-31	IC SOCKET 32P	5322 255 40923
42	INSULATOR	5322 255 40792
A1	BATTERY 3.6V	4822 138 10046
B1	CRYSTAL 5,068 MHz	5322 242 70873
BU1-2-3	CONN 8P DIN	5322 267 50659
BU4	SOCKET 6P DIN	5322 267 44075
BU5	SOCKET 7P DIN	4822 264 50101
BU6	D CONN 15P FEM	5322 267 50882
BU7	D CONN 25P FEM	5322 267 60211
C15-C16	EL CAP 100µF 25V	4822 124 20701
C69	EL CAP 220µF 10V	4822 124 20681
Ll-L2	COIL	4822 158 10107
R36-37-38	RES WIRE WOUND 160Ω	5322 113 80146
R138-139	RES PTC 32Ω	5322 116 40149
R163	RES PTC 32Ω	5322 116 40149
X4	CONNECTOR 11P	5322 265 40804
X5-6-7-8	CONTACT STRIP 64P	5322 267 60251

5 Spare parts I/O PC board assy /41

2	SWITCH	5322 278 14006
9	SET OF 50 CONN SCREWS	5322 268 30167
12	KNOB WITH LED LENS	5322 414 10011
BU1-2-3	D CONN 25P FEM	5322 267 60211
D1...D30	LED TLRC123 RED	5322 209 60169
R124	RES PTC 32Ω	5322 116 40149
X2-3-4-5	CONTACT STRIP 64P	5322 267 60251

6 Spare parts central control desk ECL 40 del LBB 3386/71

1	µC PC BOARD ASSY	5322 310 10464
2	I/O PC BOARD ASSY	5322 214 90314
3	CABLE GROMMET	5322 325 50134
4	CABLE ASSY	5322 321 21658
5	HEADPHONES SOCKET	5322 267 40568
9	RUBBER FOOT	5322 462 44375
11	LOUDSPEAKER	4822 240 30172
16	POTENTIOMETER 47K LOG	5322 101 20998
9502	CONN BLOCK 11P	5322 268 40333
	SET OF 50 PIN CONTACTS	5322 310 31241

7 Spare parts µC PC board assy /71

2	SWITCH	5322 278 14006
11	CONN BRACKET	5322 405 10007
14	SET OF 50 CONN SCREWS	5322 502 64048
24	JUMPER 2P	5322 115 80116
25	CONTACT STRIP 36P	5322 265 64078
27	KNOB WITH LED LENS	5322 414 10011
28	KNOB	5322 414 20059
30-31	IC SOCKET 32P	5322 255 40923
42	INSULATOR	5322 255 40792
A1	BATTERY 3.6V	4822 138 10046
B1	CRYSTAL 5,068 MHz	5322 242 70873
BU1-2-3	CONN 8P DIN	5322 267 50659
BU4	SOCKET 6P DIN	5322 267 44075
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8 Spare parts I/O PC board assy /71

2	SWITCH	5322 278 14006
9	SET OF 50 CONN SCREWS	5322 268 30167
12	KNOB WITH LED LENS	5322 414 10011
BU1-2-3	D CONN 25P FEM	5322 267 60211
D1...D30	LED TLRC123 RED	5322 209 60169
R124	RES PTC 32Ω	5322 116 40149
X2-3-4-5	CONTACT STRIP 64P	5322 267 60251

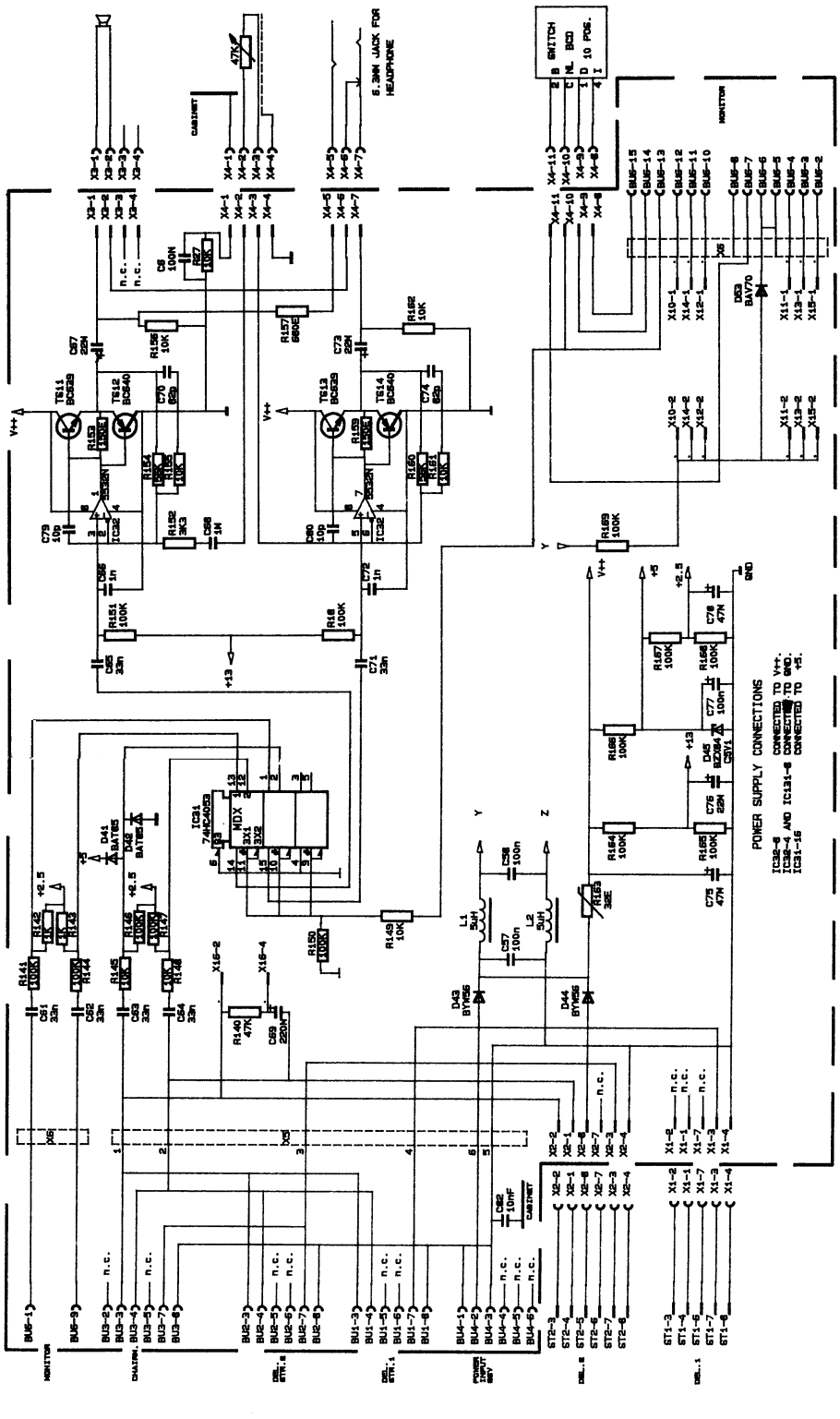


Figure 1 Circuit diagram LBB3386/11

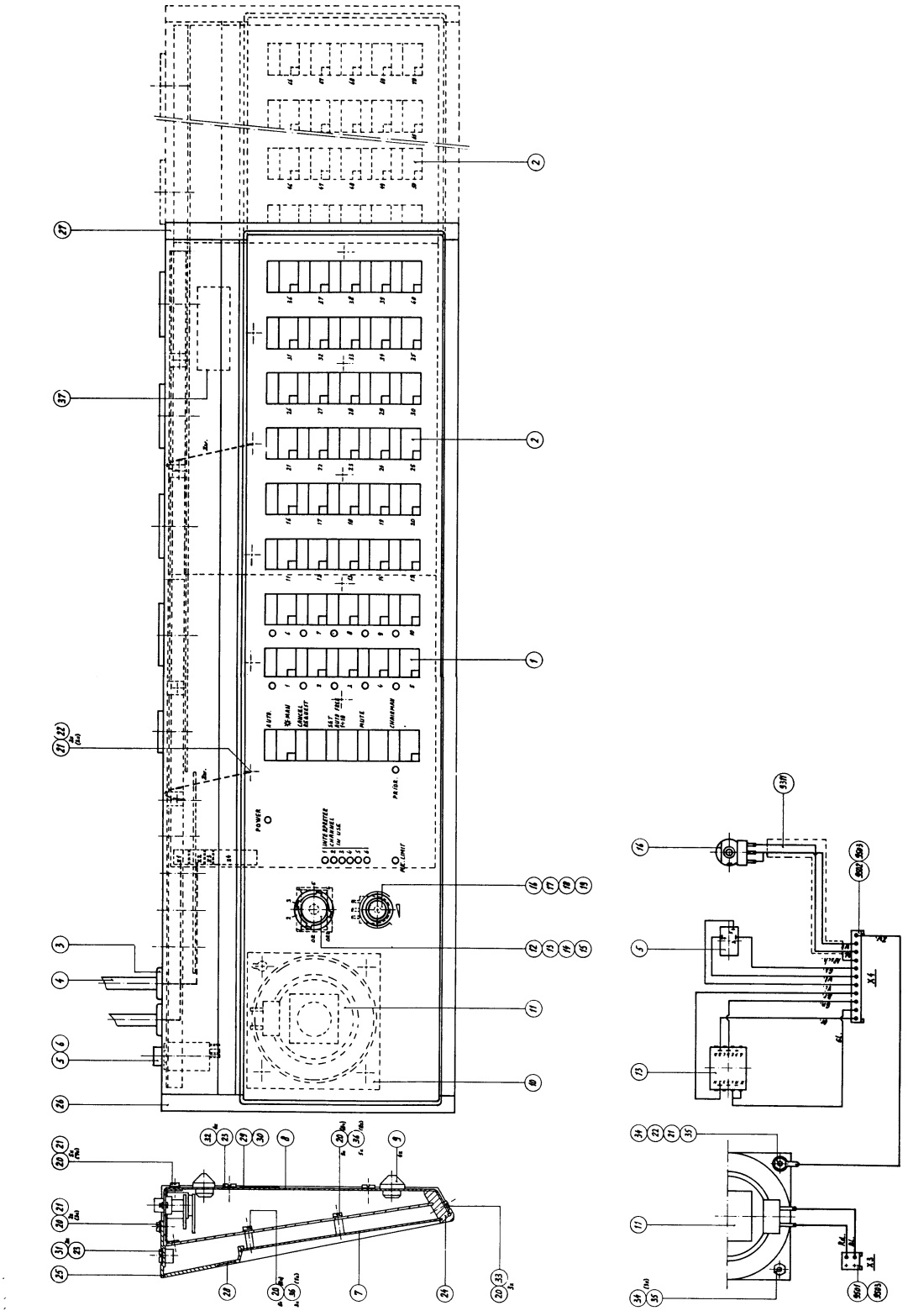


Figure 2 LBB3386/41 /71

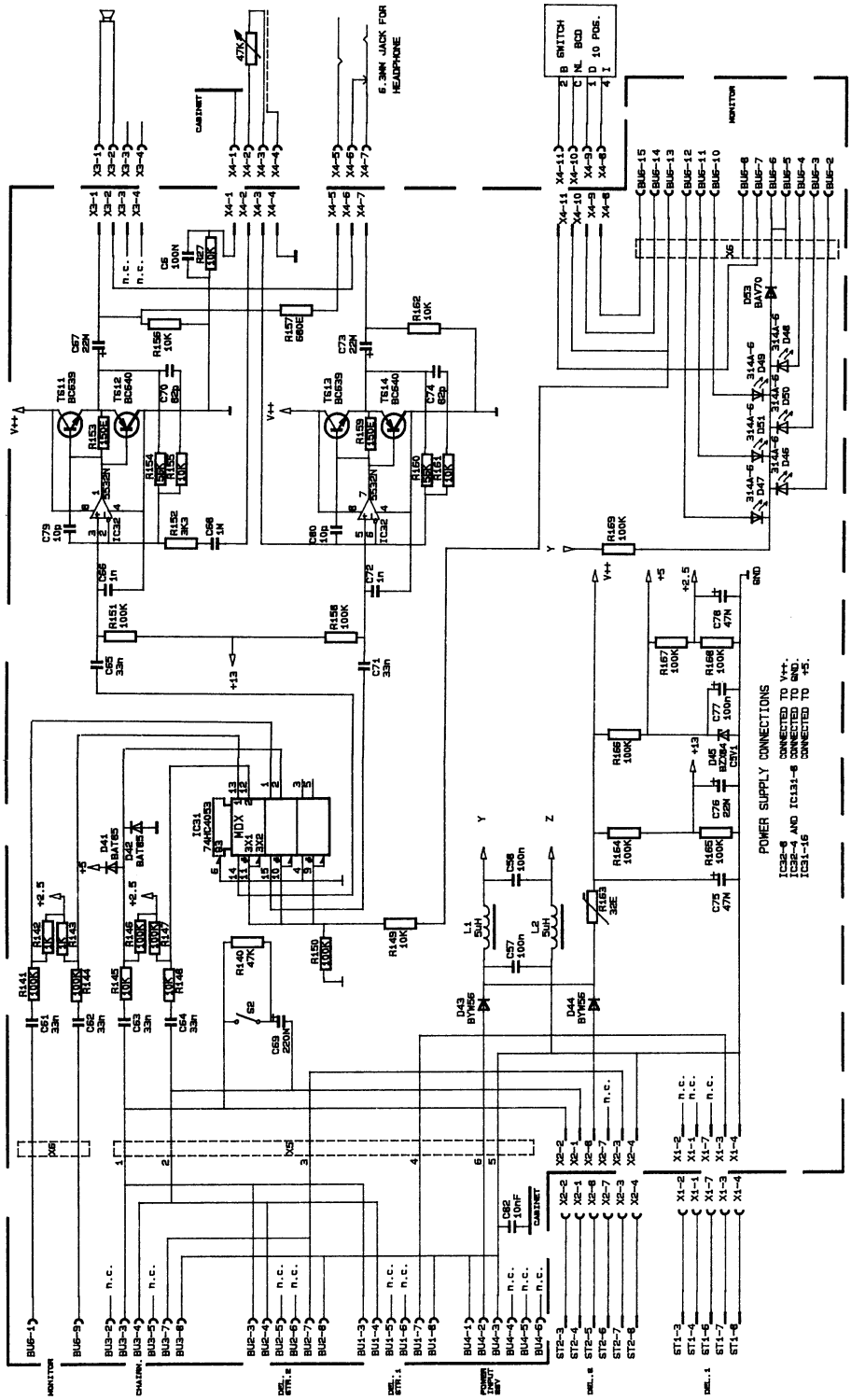


Figure 3 Circuit diagram LBB3386/41 /71

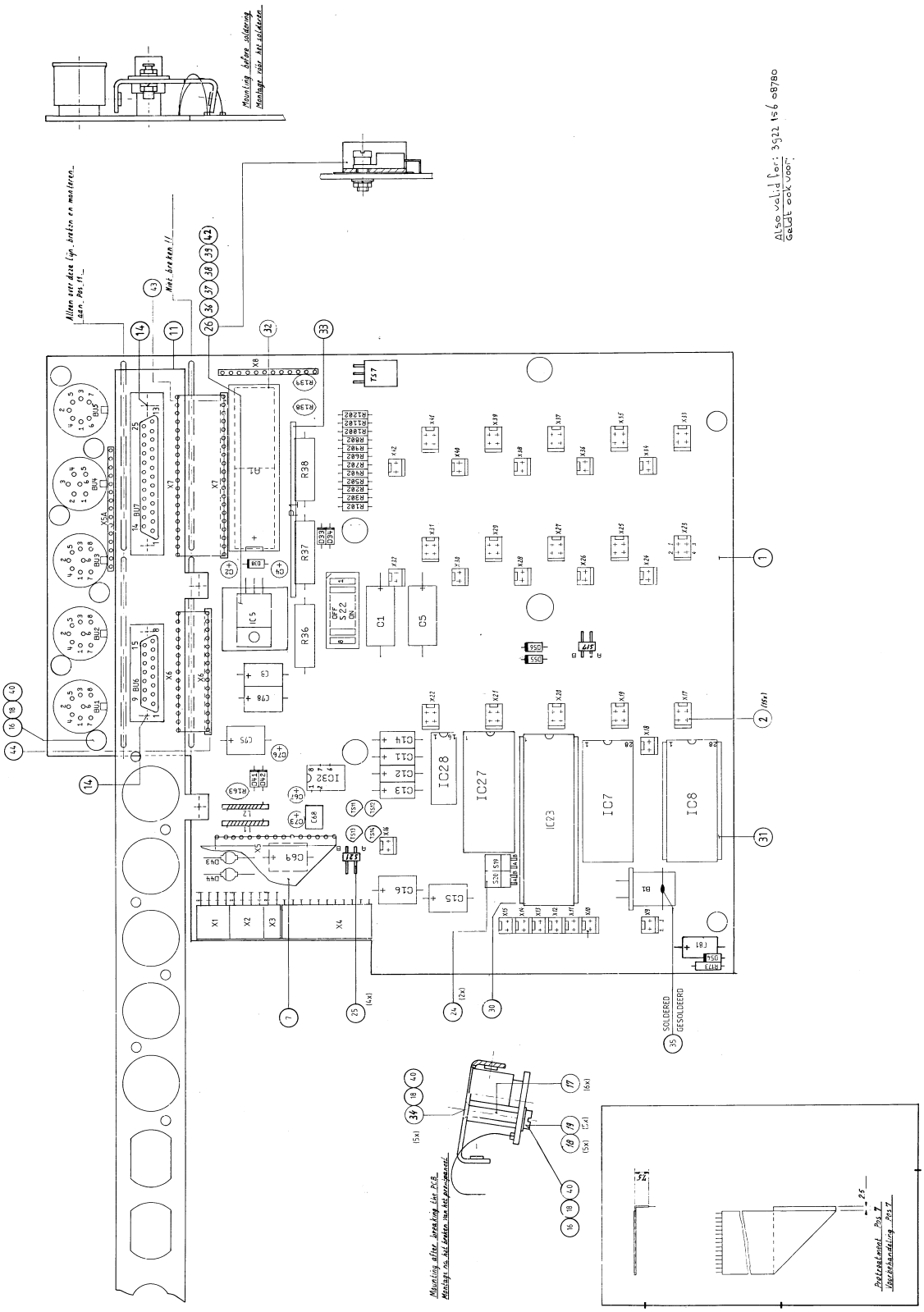


Figure 4 Component side µP Board LBB3386/11

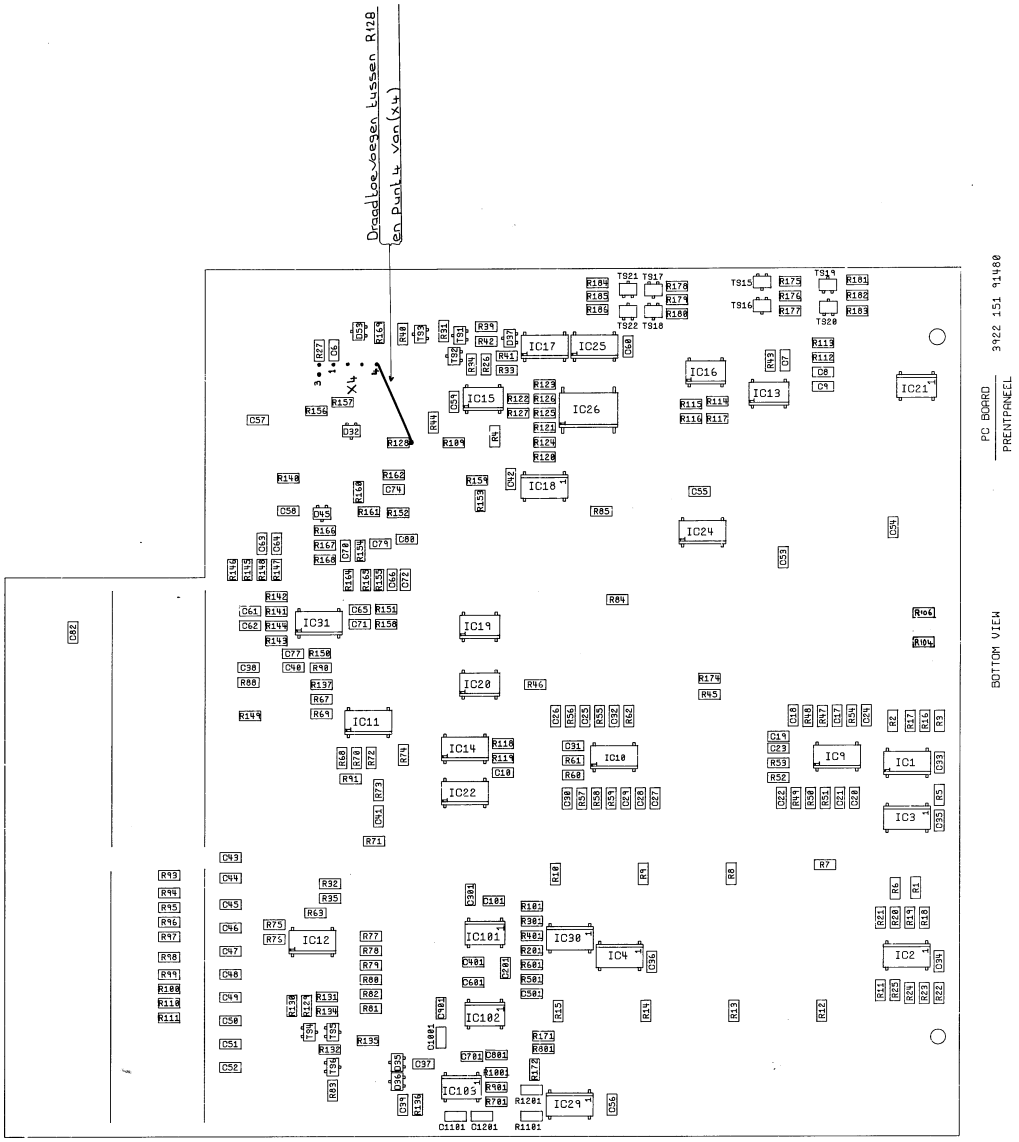


Figure 5 Track side µP Board LBB3386/11

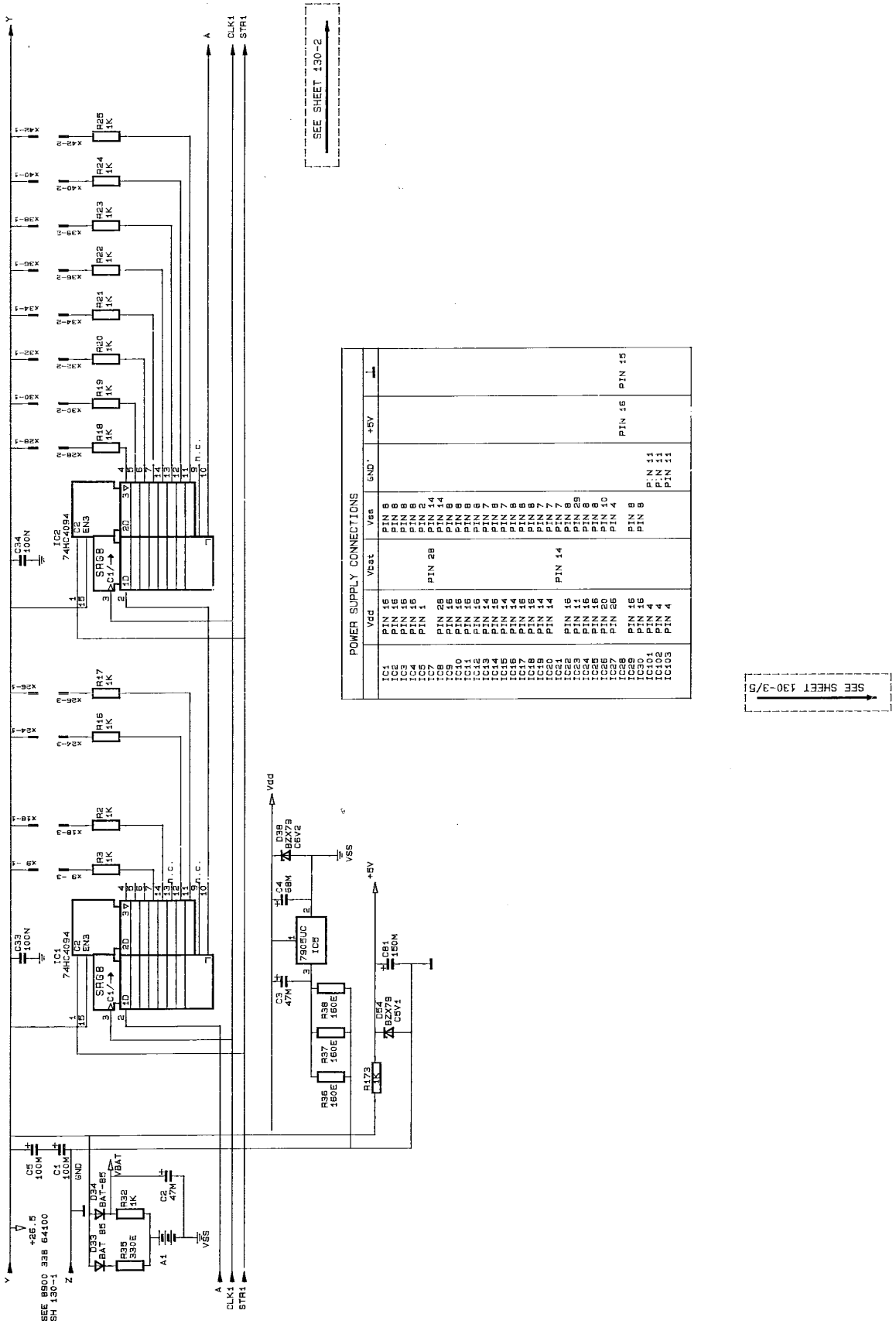


Figure 6 Circuit diagram µP Board LBB3386/11 sheet 1

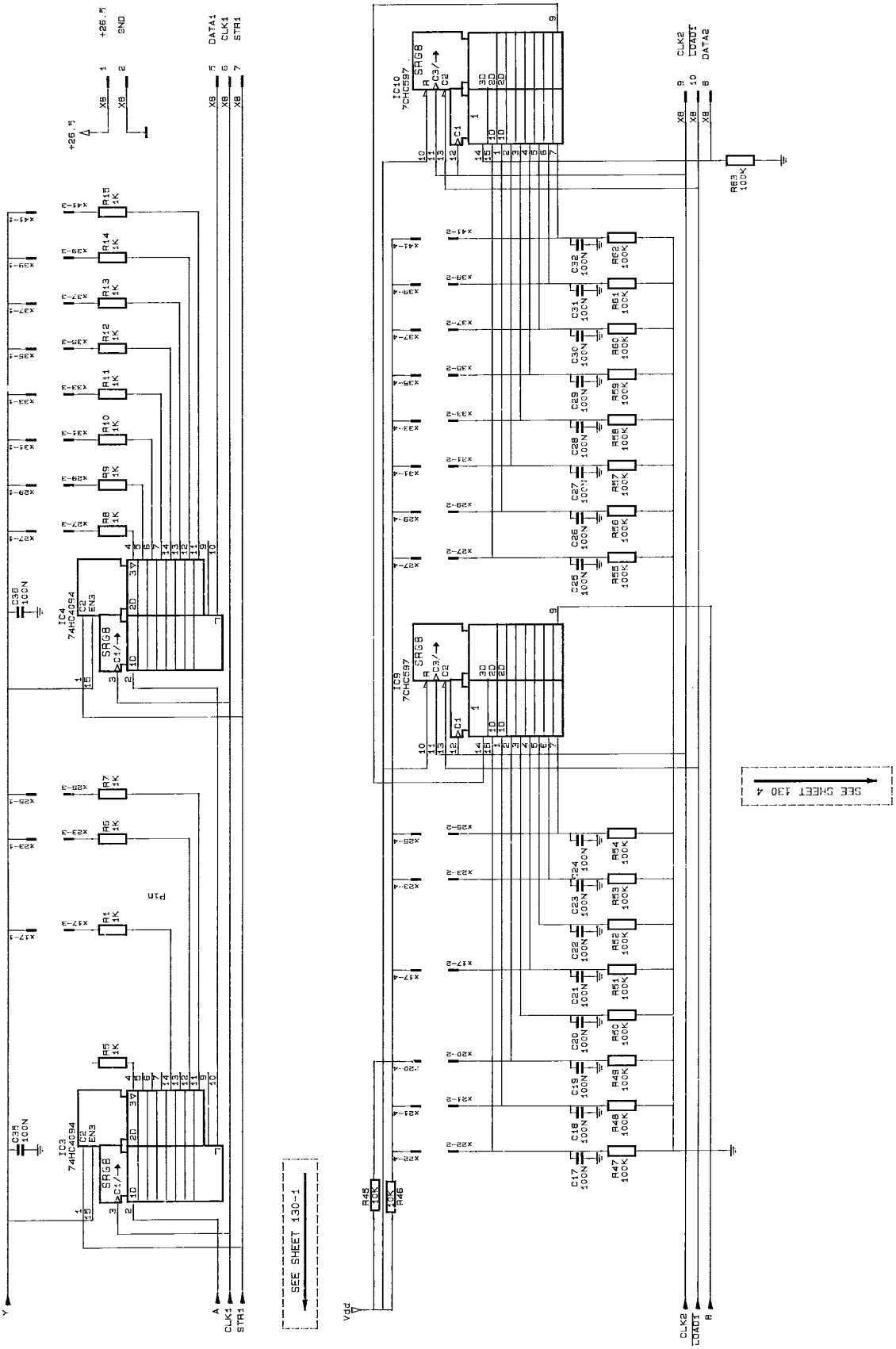


Figure 7 Circuit diagram µP Board LBB3386/11 sheet 2

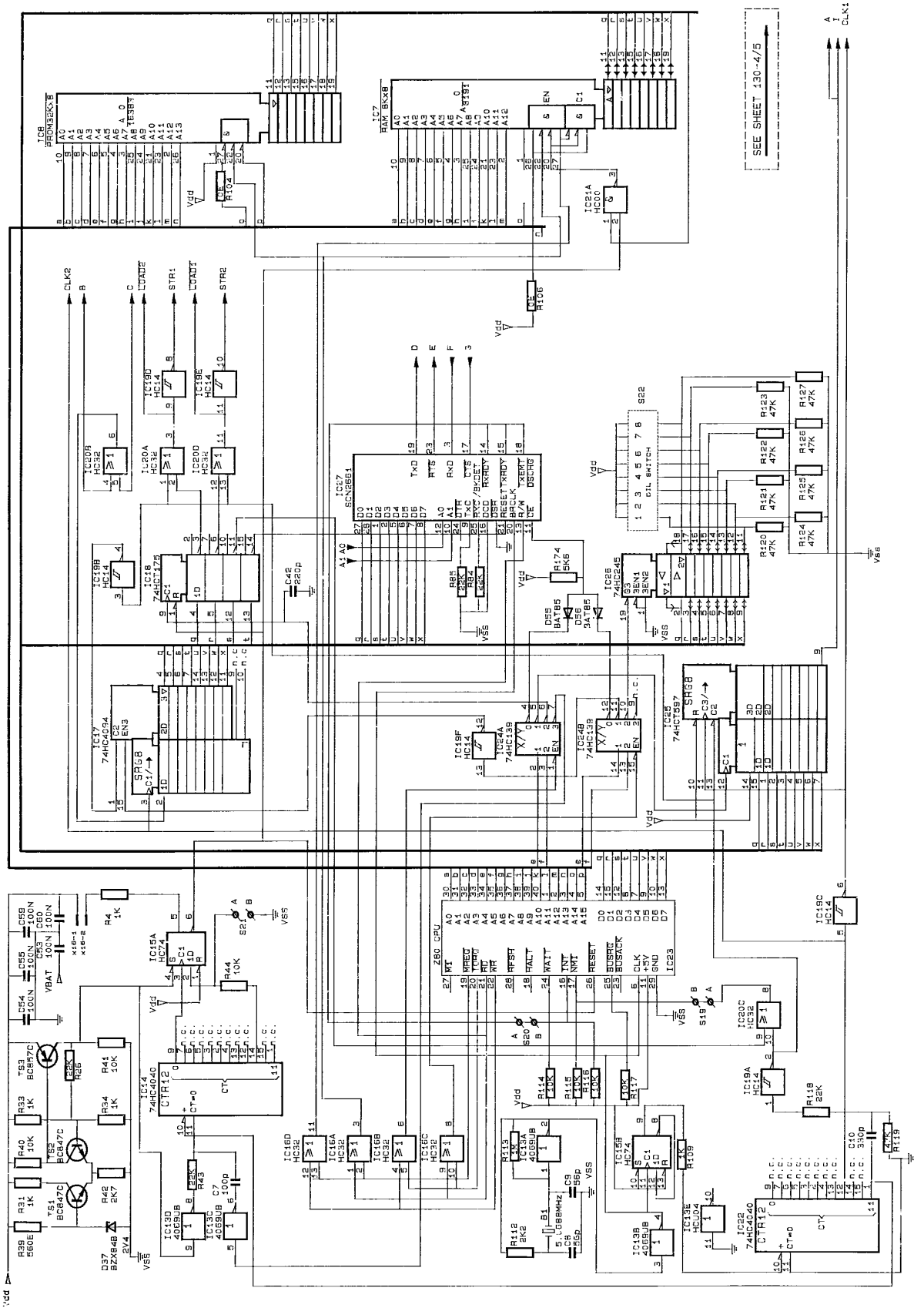


Figure 8 Circuit diagram µP Board LBB3386/11 sheet 3

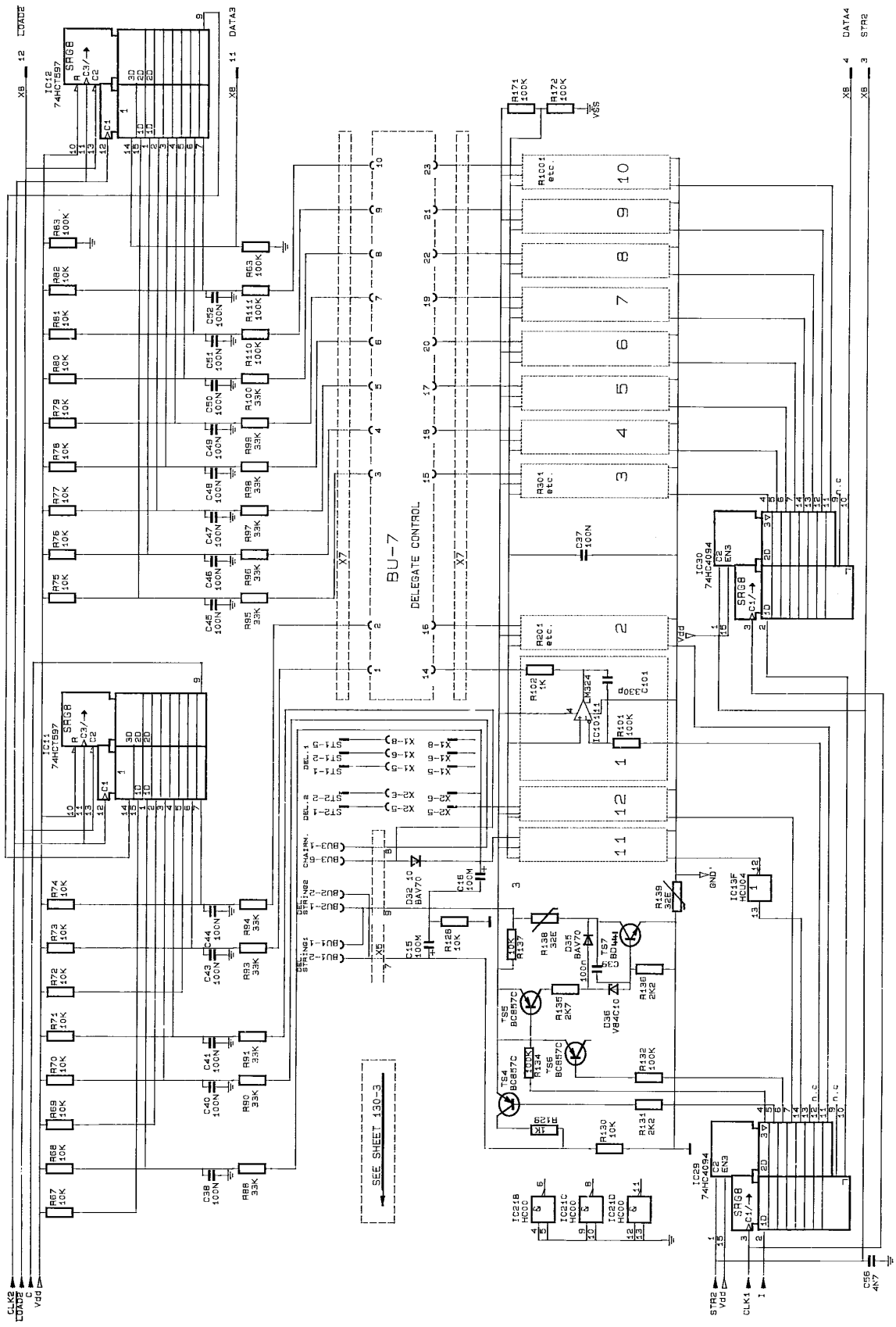


Figure 9 Circuit diagram µP Board LBB3386/11 sheet 4

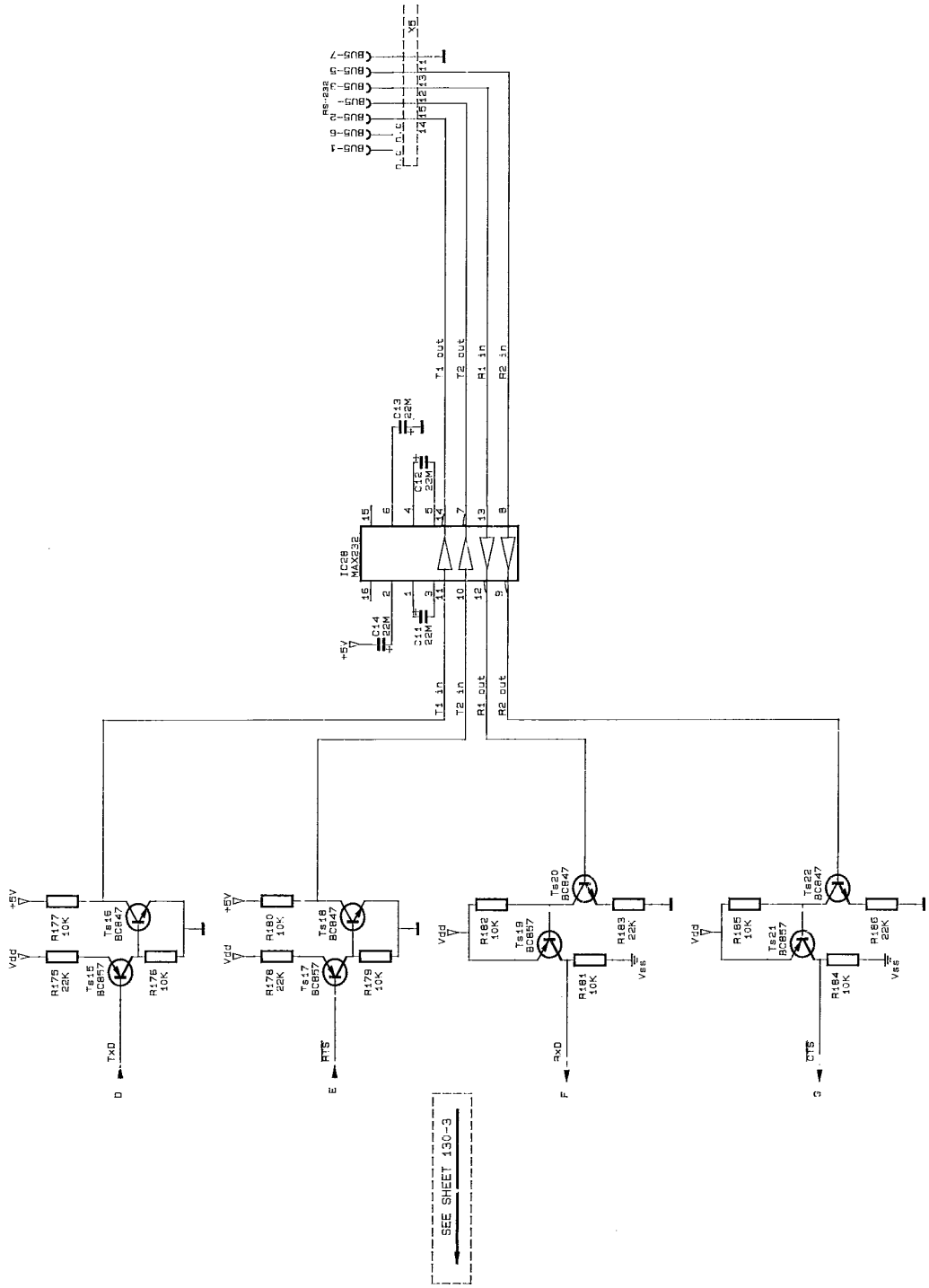


Figure 10 Circuit diagram µP Board LBB3386/11 sheet 5

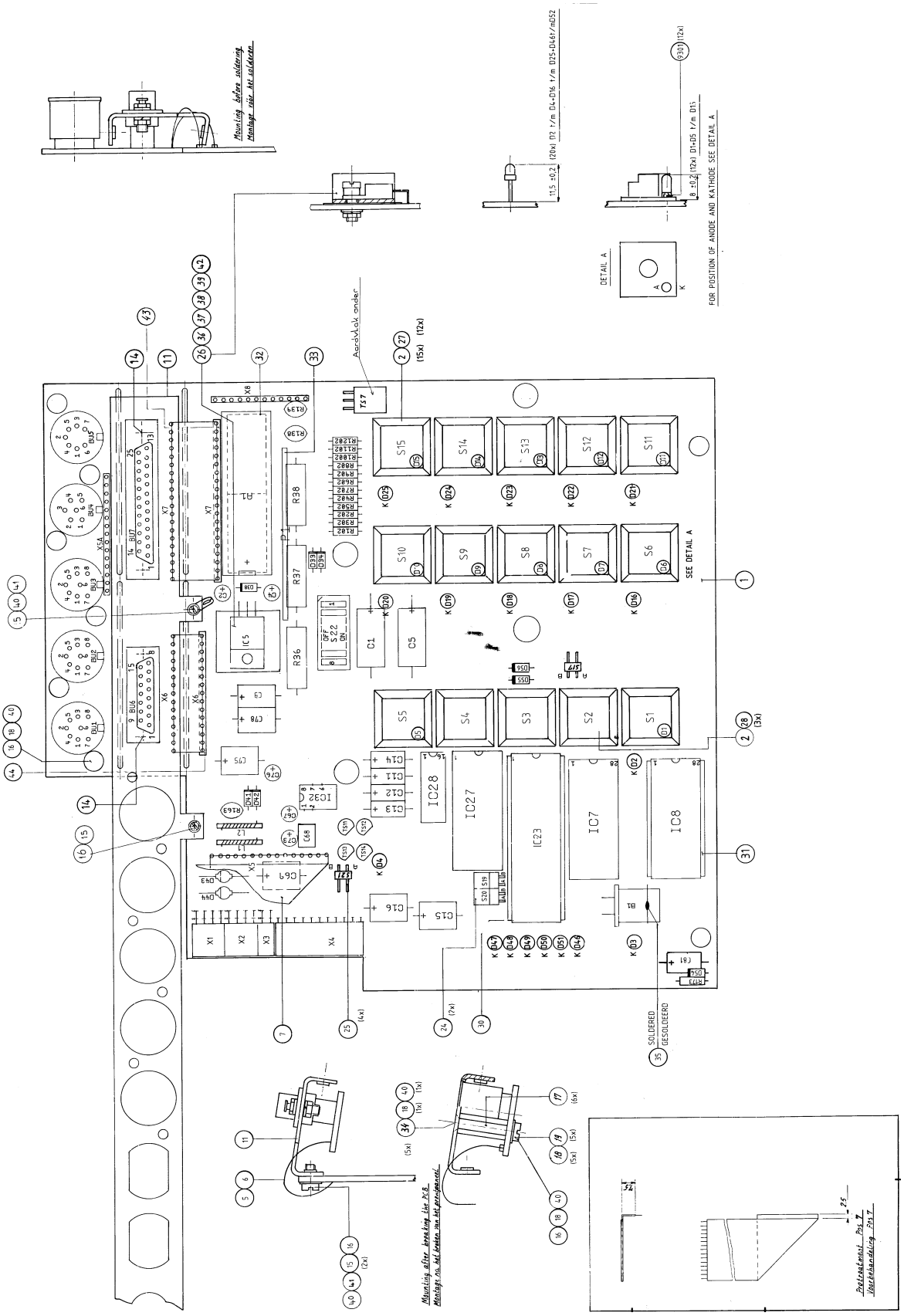


Figure 11 Component side µP Board LBB3386/41 /71

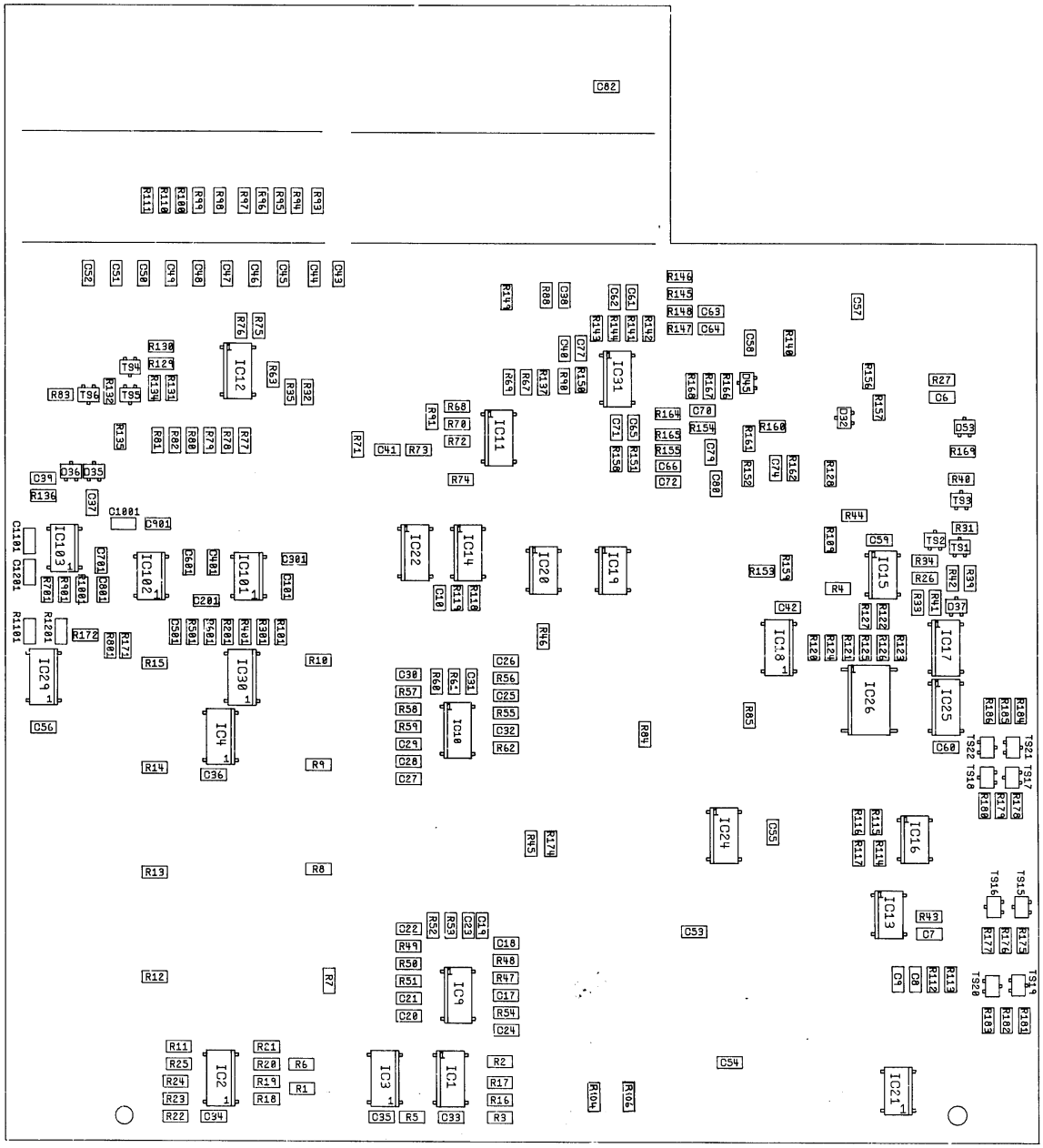


Figure 12 Track side µP Board LBB3386/41 /71

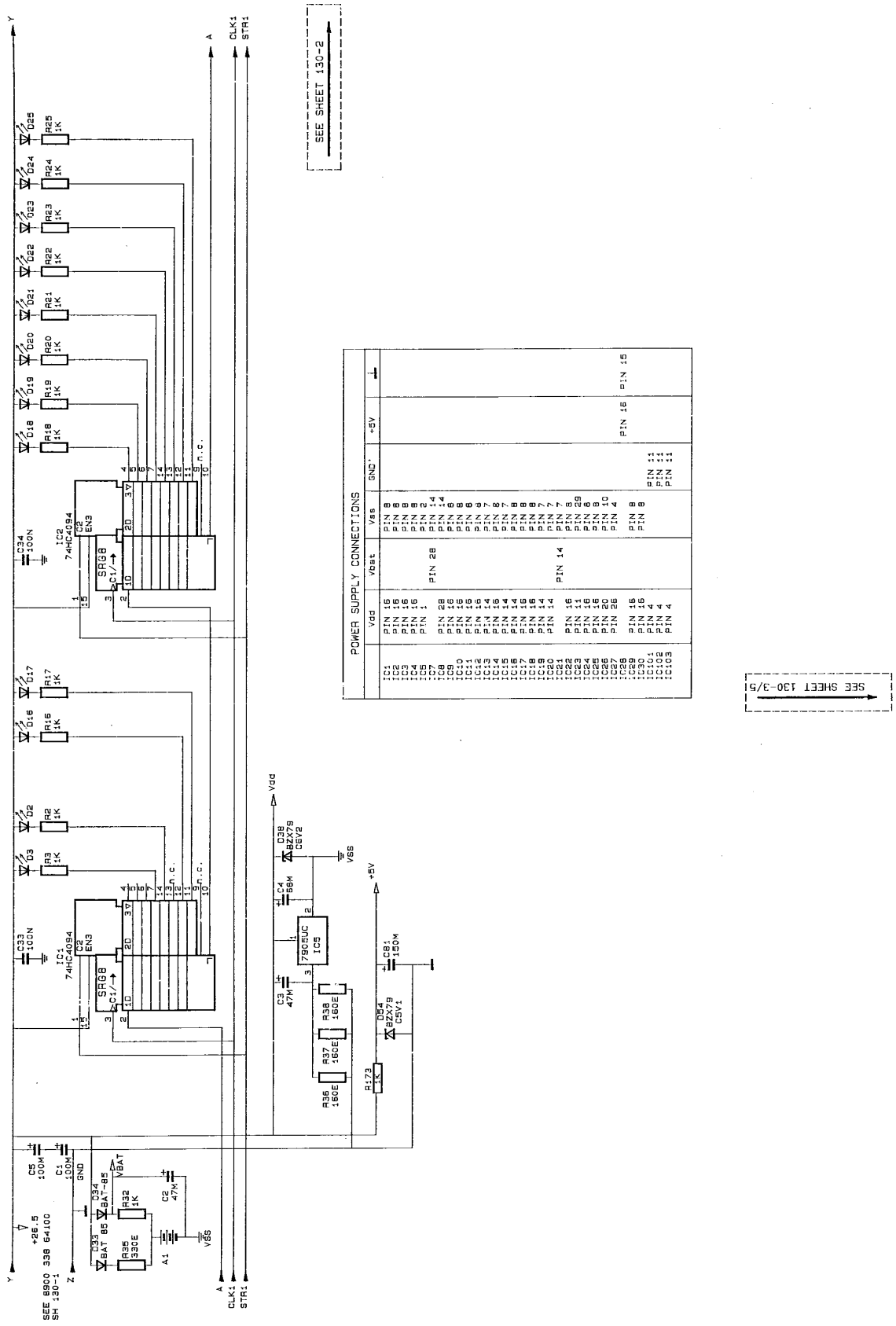


Figure 13 Circuit diagram µP Board LBB3386/41 /71 sheet 1

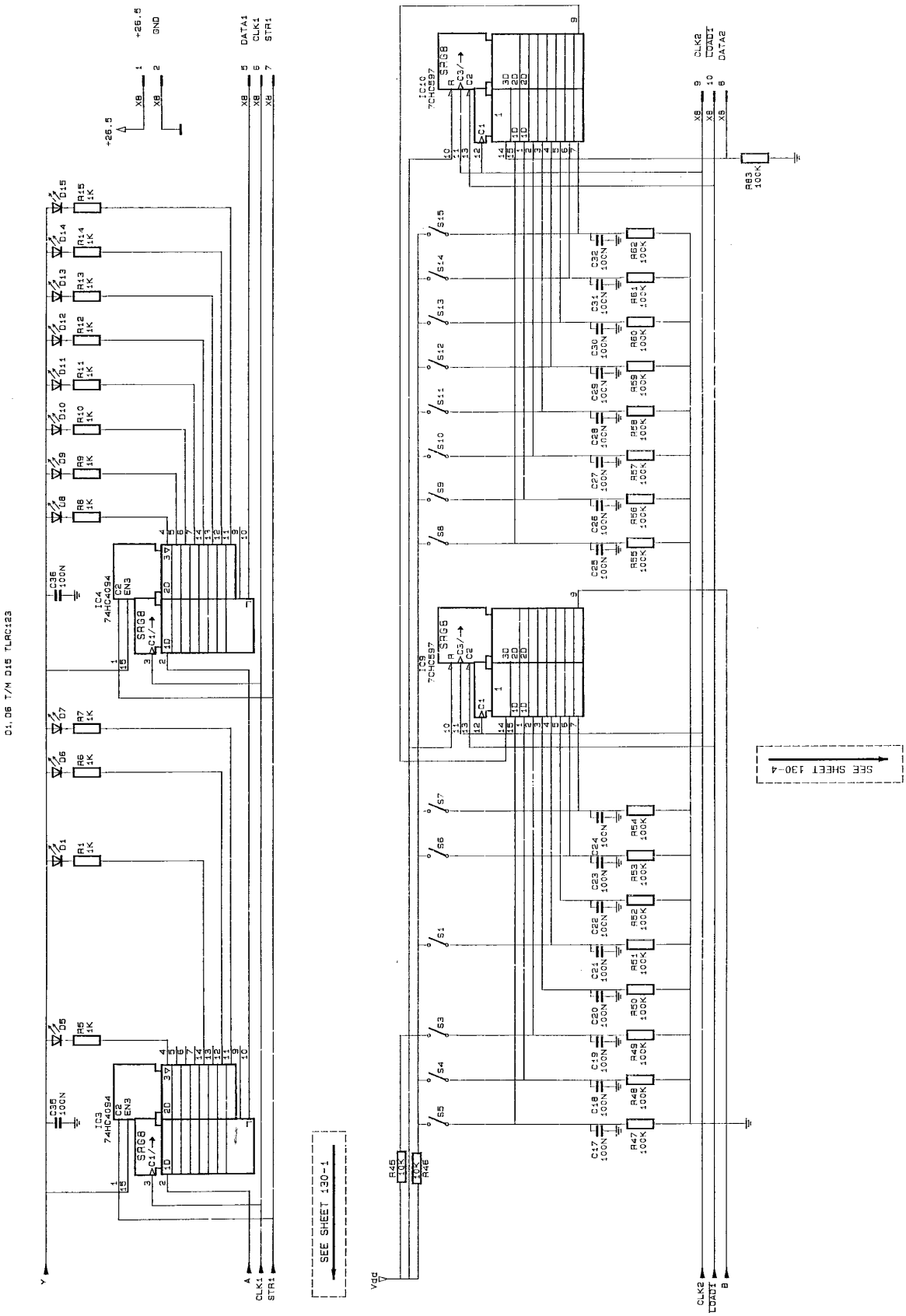


Figure 14 Circuit diagram µP Board LBB3386/41 /71 sheet 2

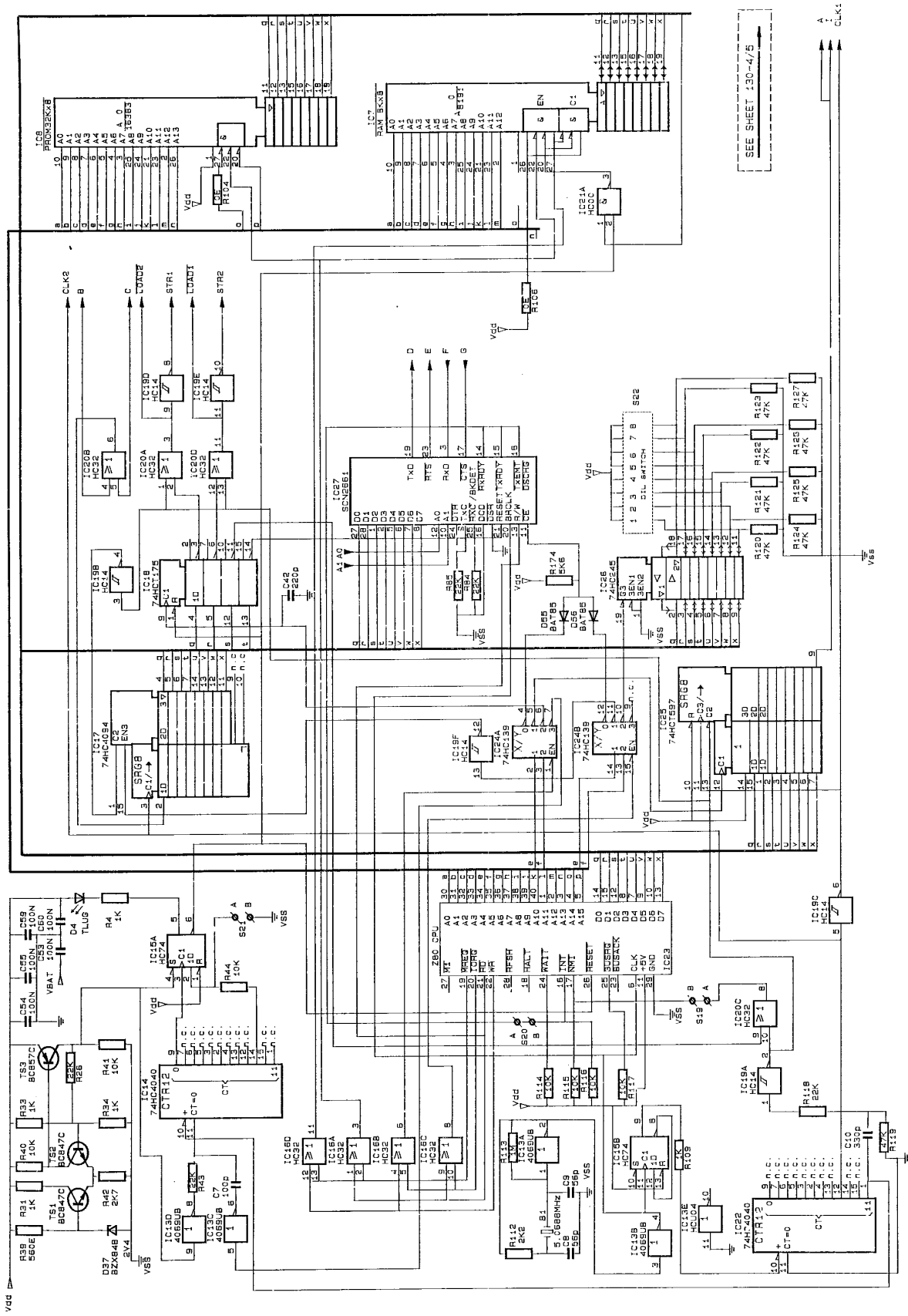


Figure 15 Circuit diagram µP Board LBB3386/41 /71 sheet 3

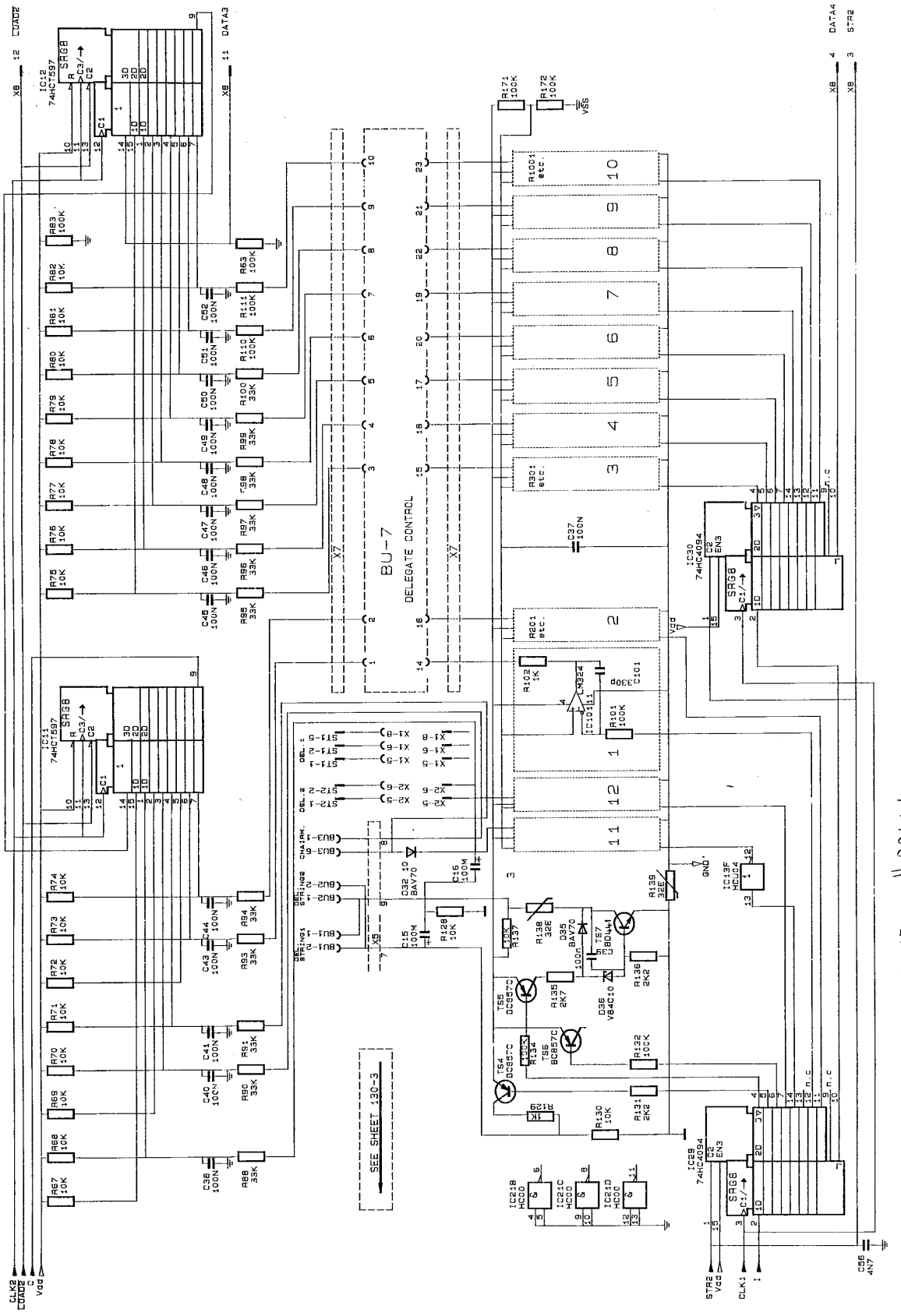


Figure 16 Circuit diagram µP Board LBB3386/41 /71 sheet 4

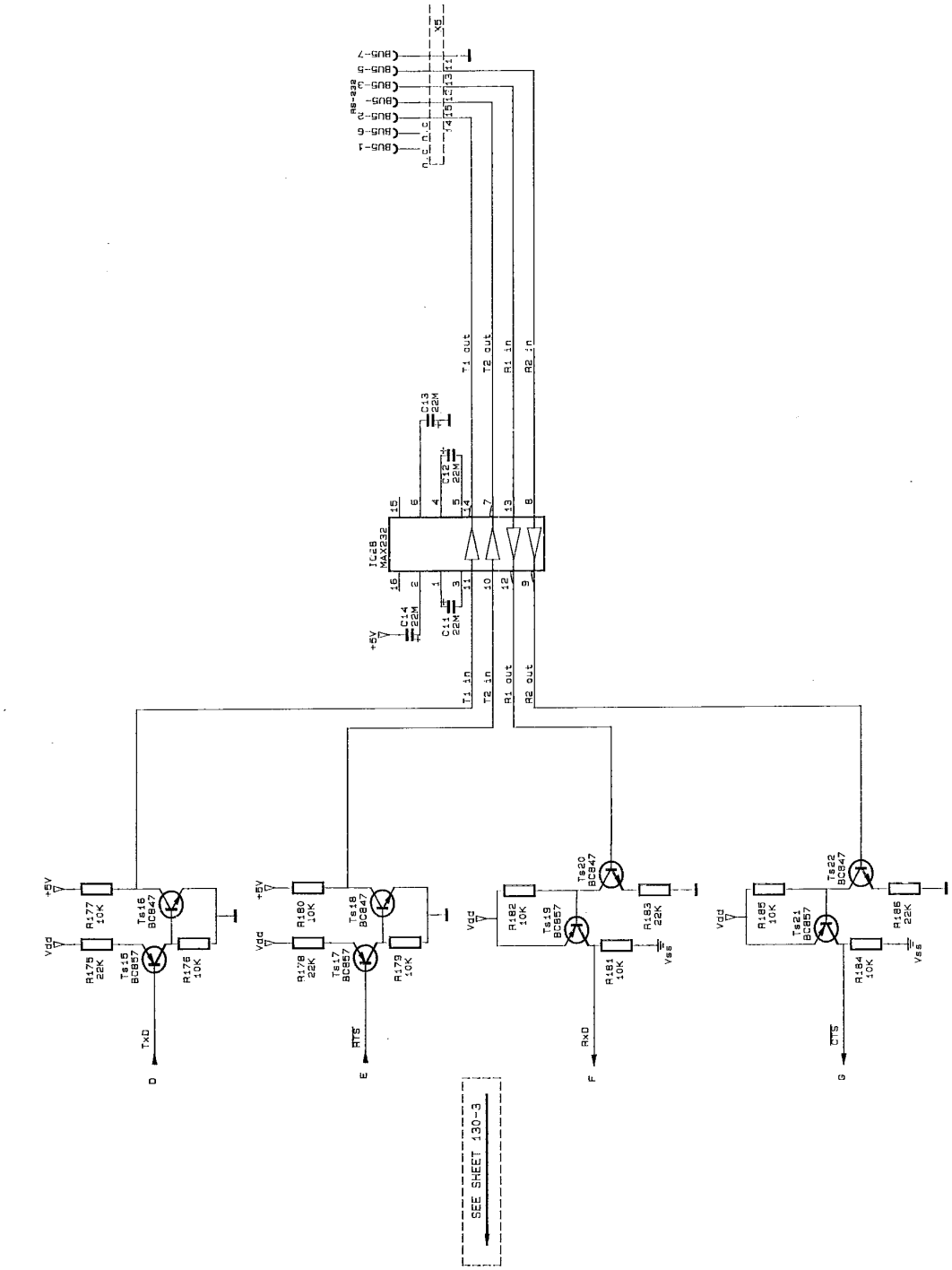


Figure 17 Circuit diagram µP Board LBB3386/41 /71 sheet 5

First line trouble shooting & service assemblies

Tab 11

CONTENTS

CHAPTER 1 CCS400 AUDIO PRINCIPLE

In the C.S.U. the mixing amplifier IC4a amplifies and mixes the different inputs (chime, telephone coupler, tape recorder and line in) TS14 and associated circuitry act like a current modulator. I_{ac} is a modulated current according to U_{ac1}

Every delegate unit consists of the same circuitry. IC1a amplifies the microphone signal and TS4 and associated circuitry act like the current modulator. I_{ac2} is a modulated current according to U_{ac2}.
I_{ac3} is a modulated current according to U_{ac3}, etc.
I_{act} in the CSU is direct1y proportional with $I_{ac1} + I_{ac2} + I_{ac3} + \ldots$
The very high impedance on the audio line ensures that the resistance value of S101 does not affect I_{act}. $U_{ac} = I_{act} \times R$, I_{act} is independent of R (S101).
U_{ac} is directly proportional with R.

By changing R with switch S101, U_{ac} changes. The AC voltage on the audio line, U_{act} which is the "ac audio signal", can be adjusted via S101, which actually changes the value of R. The audio signal level can be changed in steps of 3dB.

At the input of amplifiers A, B and C in the C.S.U., the U_{ac} is constant and cannot be adjusted by changing the R value via S101.
In the delegate unit (and chairman unit) the AC voltage on the audio line is amplified by IC1b when the microphone is switched off.

CHAPTER 2 GENERAL SYSTEM TEST

- Check if the voltage selector is in the correct position.

- Check mains fuse (2.5a slow).

- If problems arise in the audio distribution, check if the 6- position system gain rotary switch is in the correct position. If the delegate unit don't switch off automatically after approximately 30 seconds of no speech activity, then check if the rotary switch for selecting the maximum number of microphones is in the "auto position".

- When using the 6 channel interpreters equipment, check if the interpreters desks are adjusting accorded to the instructions in the installation manual.

- If a tape recorder is used in the system, ensure that the input level potentiometer is adjusted correctly (screwdriver adjustment on the front side). To match the output to a DIN-type connector, or a Cinch connector, the impedance must be adjusted by S5 to respectively high ohmic or to low ohmic.

- When using a telephone coupler, ensure if the jumper S4 is in the correct position for enabling or disabling the side tone reduction. Check if S2 for telephone input level and S6 for conference output level are adjusted in the right position. At last ensure that the telephone coupler itself is adjusted correct for being compatible with CCS400.

- Using the line input, ensure that the jumper S3 is in the correct position for the desired input level.

- Using the line output, check if the system gain rotary switch is in the correct position for the desired output level.

CHAPTER 3 TEST INSTRUCTIONS CCS400

1 General

1. Adjust the voltage adapter at the local mains voltage.

2. Load DEL1 (BU101-7, 8) so that the consumed current is 0.55A.
Load DEL2 (BU104-7, 8) so that the consumed current is 0.15A.
Load INT (BU207-24, 12) so that the consumed current is 1A.
Requirement: output voltage: 26,5 v ± 2v.
Load DEL1 so that consumed current is 0.15A
Load DEL2 so that consumed current is 0.55A.
Requirement: output voltage: 26,5 v ± 2v.

3. Short-circuit the power supply output DEL1.
(BU101-7), DEL2 (BU104-7) and INT (BU207-24) alternately (the load remains connected).
Check the short-circuit current. Requirement: ≤ 150 MA Remove the short circuit.
Requirement: power supply voltage: 26,5 v ± 2v.

4. Remove the three loads (DEL1, DEL2 and INT).
Measure the power supply output voltage:
requirement: 26,5 ± 2v.

2 Audio measurements

Master Gain switch S101 at minimum

2.1 Line input

Source impedance: 1 kohm
Control the line input BU103-1/BU103-3 with a signal of -4 dB
(Jumper S3 in a-b position).
Measure the signal at BU104-3.
Requirement: amplification -17,5 dB ± 0,5 dB.

Secondary side of T1: approx. -28 dB.
- Input IC4a: approx. -72 dB
Output IC4a : approx. -8,5 dB
BU104-3: 21,5 dB ± 0,5 dB.
Control the line input BU103-1/BU103-3 with a signal of + 6 dB
(jumper S3 in a-c position)
Requirement: amplification -28 dB ± 2 dB.
Secondary side of T1: approx. -29 dB.
- Input IC4a: approx. -68 dB.
Output IC4a: approx. – 9,5 dB.
BU104-3: -22 dB ± 2 dB.

2.2 Tape play back input

Adjust R104 at minimum (left) or at maximum (right).

Control one of the two symmetrical tape recorder inputs BU106-3 or BU106-5 with a signal of +20 dB or -8 dB.

Measure the signal at BU104-3.

	R 104 minimum input +20dB	input -8dB	R 104 maximum input +20dB	input -8dB
-Input IC4a	- 59 dB	- 86 dB	- 7 dB	- 69 dB
Output IC4a	+ 4 dB	- 24,5	+ 18 dB	- 7 dB
BU104-3	- 9 dB	- 37 dB	+ 3 dB	- 20 dB
Amplification	- 29 dB	- 29 dB	- 17 dB	- 12 dB

Requirements: amplification with R104 minimum ≤ – 40 dB.
amplification with R104 maximum – 12 dB ± 0,5 dB.

2.3 Tel. Coupler

2.3.1 Input

Source impedance < 100 Ohm.

Control the input BU105-5 with a signal of -16 dB, -4 dB or + 6 dB.

Measure the signal at BU104-3

	S2 in pos.a-c input -16 dB	S2 in pos. a-b input -4 dB	S2 in pos.b-d input + 6 dB
+ of C 35	- 16 dB	- 16 dB	- 15,5 dB
-Input IC4a	- 70 dB	- 70 dB	- 69 dB
Output IC4a	- 8,5 dB	- 8,5 dB	- 8 dB
BU104-3	- 21,6 dB	- 21,6 dB	- 21 dB
Amplification	-5,25 dB ± 0,5 dB	-17,25 dB ± 0,5 dB	- 26,75 ± 0,5 dB

2.3.2 Output

Load the output BU105-4 with 10 K Ohm.
Jumper S4 in AC position.

Control the input BU105-5 with a signal of -16 dB, -4 dB or + 6 dB. Measure the signal at BU105-4.

	S6 in pos.a-c input -16 dB	S6 in pos.a-d input -4 dB	S6 in pos. b-c input + 6 dB
BU 105-4	- 16 dB	- 4 dB	+ 6 dB
Amplification	0 dB	0 dB	0 dB

Amplification requirement: + 0,5 dB ± 1 dB.

Side tone reduction: put jumper S4 in a-b position.

Control the input BU105-5 with a signal of -16 dB.
Measure the signal at BU105-4.

Jumper S2 in position a-c.
Jumper S6 in position a-c.

+ of C35	- 16 dB
- Input IC4a	- 70 dB
Output IC4a	- 8,5 dB
- Input IC4b	- 80 dB
Output IC4b	- 16 dB
- Input IC7b	approx. -80 dB
Output IC7b	- 47 dB

Amplification: -47 dB -(- 16 dB) = -31 dB.

Side tone reduction: 31 dB
Required amplification: ≤ -20 dB.
Required side tone reduction ≥ 20 dB.

2.4 Line output

Control the tape recorder Play back input BU106-3 or BU106-5 with a signal so that at BU104-3 a signal of -21 dB is present. Ensure that the Master Gain switch S101 is positioned at minimum. Load the line output with 10 k Ohm parallel with 1,5 nF. (connect BU102-1 and BU102-3 together).

Measure at the line output.

Requirement: -6,5 dB. Amplification with respect to BU104-3 is
+ 14,5 dB ± 0,5 dB.

Tape rec. play back input BU106-3 or BU106-5: + 6 dB

- Input IC4a:	- 78 dB
Output IC4a:	- 8 dB
+ Input IC3a:	– 21,4 dB
Output IC3a:	– 1,5 dB
Line output :	– 6,5 dB

2.5 Interpreters floor

Control the tape recorder play back input BU106-3 or BU106-5 with a signal, so that at BU104-3 a signal of -24 dB is present. Ensure that the Master Gain switch S101 is positioned at minimum.

Measure at the floor output BU207-1 or BU207-14.

Requirement: amplification with respect to BU104-3 is
+ 17 dB ± 0,5 dB.

Tape rec. play back input BU106-3 or BU106-5: + 3 dB.

- Input IC4a:	- 75 dB
Output IC4a:	- 11 dB
+ Input IC3b:	- 32,5 dB
Output IC3b:	- 2 dB
BU207-1:	- 7 dB
Amplification:	+17dB

2.6 Tape recorder output

Control the tape recorder play back input BU106-3 or BU106-5 with a signal, so that at BU104-3 a signal of -21 dB is present. Ensure that the Master Gain switch S101 is positioned at minimum.

Jumper S5 in position a-b: output impedance is 220 kOhm (unloaded).

Load the tape recorder output BU106-1 or BU106-4 with 1 k Ohm and measure this output.

Requirement: amplification with respect to BU104-3 is – 49 dB ± 0,5 dB.

Jumper S5 in position a-c: output impedance is approx. 600 Ohm (unloaded)

Load the tape recorder output BU106-1 or BU106-4 with 1 k Ohm and measure this output.

Requirement: amplification with respect to BU104-3 is -6 dB ± 0,5 dB.

2.7 Disable request output

Control the tape recorder play back input BU106-3 or BU106-5 with a signal, so that at BU104-3 a signal of -21 dB is present.

Measure the signal at the disable request output BU104-2.

Requirement: output at BU104-2 is -26,5 dB ± 0,5 dB.

2.8 Gain reduction circuit

Load BU104-3 for DC only.
Adjust the load so that the AC-signal at BU104-3 will be attenuated 3-dB ± 0,5 dB by IC6. (control e.g. the tape recorder playback input with an AC- signal).

Perform this in every position of Master Gain switch S101.

2.9 Disable request circuit

Load BU104-3 for DC only.
Adjust the load so that the DC level at BU104-2 changes over.
Ensure that S102 is in one of the positions 1, 3 or 6 microphones and in “auto off”.

With a load > 3.9 k Ohm the DC level is approx. 1.6 V.
Requirement: < 3V

With a load < 3.9 k Ohm the DC level is approx. 24.5 V.
Requirement: > V _ 3 V = > 24 V

The direct current, through the load when the DC level is high:

2.65 mA ± 0,8 mA, 16,6 mA ± 2 mA, 30,5 mA ± 3,5 mA (dependant of position S 102).

Control the “limiter on/off” input BU101-5 with a DC-voltage. When the DC-level at BU104-3 is high (24v).

Requirements: input BU101-5 is 3v, BU104-3 remains high (24v). input BU101-5 is 15v, BU104-3 becomes low (3v). the limiter is now switched ”off” the disable request line is inactive low.

2.10 Priority signal

Connect a load between BU104-1 and BU104-8 adjust this load so that the current is 0.2 mA. The voltage at the base of TS10 is in this case to low, the priority signal will not be generated.
Adjust the load so that the current is 0,3 mA.
The voltage at the base of TS10 now starts the oscillator circuit and the priority tone will be heard when a delegate unit is connected.

2.11 Monitor circuit

Node BU210-2, -11, -3, -10, -4 and -12 together and connect this point via an ampere meter to BU210-5 (ground). Control successively the points BU207-20, -22, -19, -17, -16 and -10 with a voltage of 17v (with respect to e.g. BU209-12).

Requirement: the current < 0,1 mA
which corresponds to "channel not engaged".

Control now successively the same points with a voltage of 15V (with respect to e.g. BU209-12).

Requirement: the current is 2,5 mA ± 0,5 mA which corresponds
to "channel engaged".

Load BU210-13 with a resistor of 330 Ohm (to BU210-5).

Requirement: Voltage at BU210-13 is 5V ± 0,5V.

3 Replacing adjustment resistor

By changing the microphone capsule in a delegate unit, chairman unit the amplification of the microphone signal in this unit must be adjusted again. The amplification of the microphone amplifier IC1 must be adapted to the sensitivity of the microphone capsule. This can be done by placing the correct resistor between X2-5 and X2-6 in the feed back path. of IC1a.

Adjust procedure

Use a reference unit, which is already adjusted correctly, e.g. one unit of the whole system. Connect this unit to the DEL1 socket of the C.S.U. or connect X10-7 (+) and X10-8 (-) to a 27V power supply. Place at a distance of approximately 30-cm an audio generator (e.g. sinus signal) with a frequency of 1 kHz. Adjust the level of the generator so that at mp7 in the reference unit - 7 dB occur. This -7 dB level must be measured with respect to the electrical ground X10-8. This "reference level" at mp7 corresponds to a S.P.L. of 85 dB, which is now generated by the audio generator.

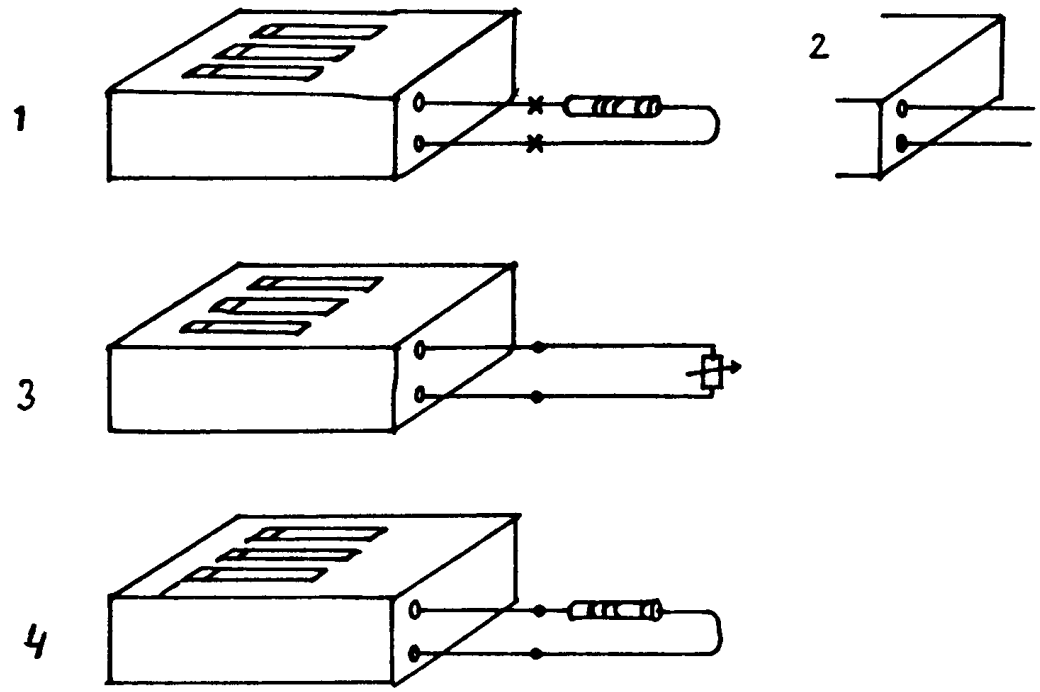
Replace the reference unit by the unit, which has to be adjusted. Between X2-5 and X2-6 of the unit a potentiometer or a decade resistor instrument (both 0 to 50 K ohm) must be placed instead of the "old" resistor. Adjust the potentiometer or decade instrument so that at mp7 in the unit a level of -7 dB occurs. Replace the potentiometer or decade instrument by a 1~ resistor of the same value. With this "new" resistor between X2-5 and X2-6 the unit is correctly adjusted, the microphone signal amplification is now adapted to the sensitivity of the "new" microphone capsule in the unit.

The minimum resistance between X2-5 and X26 is 3K6.
The sensitivity of the microphone capsule is maximum.
The maximum resistance is 43k, the microphone capsule sensitivity is minimum.
These maximum and minimum resistance values count for the delegate unit, chairman unit and for the microphone LBB3175/00 (for FM systems).

For the handmicrophone LBB 3175/50 the following min. and max. resistance values apply minimum resistance value is 2K and maximum 43K.

CHAPTER 4 MOUNTING AND DISMOUNTING

For system block diagram see fig. 2 and 3.
For mounting and dismounting the C.S.U. and the PCB's in this unit see fig. 4.



1 Dismounting PCB's

Dismounting the various PCB's from the C.S.U. housing must be carried out in the following sequence:

- Basis PCB
- Microphone plug-in unit LBB 3302/00 (only if added to the C.S.U.)
- Monitor Distribution Board LBB 3203/00 (only if added to the C.S.U.)
- Connector panel and Int. + monitor panel LBB 3301/00 (only if added to the C.S.U.) simultaneously

For mounting the PCB's into the C.S.U. place them in the inversed sequence.

1.1 Basic PCB

- Unscrew bolts 1.1, 1.2, 1.3 and 1.4 (1.1 only when a LBB 3302/00 is added to the system).
- Unscrew next the two bolts 1.5 and 1.6.
- Finally take out the PCB by pulling X2 out of X102.

1.2 Microphone plug-in unit + distance piece d1 LBB 3302/00.

- Unscrew bolts 2.2 and 4.4.
- Take out the PCB by simply pulling X3 out of X101.

1.3 Monitor Distribution Board LBB 3203/00

- Unscrew bolts 3.1 and 3.2 (distance piece d2 remains fitted in the C.S.U.).
- Pull the PCB out of connector X201.

1.4 Connector panel and Int. + monitor panel LBB 3301/00

- Unscrew bolts 4.1 until 4.5 inclusive.
- Remove the two dial knobs on the front side of the C.S.U.
- Unscrew next the bolts 5.1, 5.2 and 5.3.
- Remove the connector panel and the LBB 3301/00 simultaneously now and separate them by pulling X103 out of X203.

2 Adding a PCB LBB 3302l00 to the system

- Unscrew the two bolts 6.1 and 6.2.
- Remove the plate P1.
- Add the LBB 3302/00 to the system by pushing X3 into X101.
- Screw the bolts 2.2 and 4.4.
- Finally screw bolt 1.1 in the distance piece via the basic PCB

3 Adding a PCB LBB 3301/00 to the system

- Unscrew the two bolts 7.1 and 7.2.
- Remove the plate P2.
- Disconnect the basic PCB as described in 1.
- Disconnect the LBB 3302/00 as described in 2. (only if added to the C.S.U.).
- Disconnect the connectorpanel as described in 5.
- Add the LBB 3301/00 to the system by pushing X203 into X103 (from connectorpanel).
- Place next the connector panel and the LBB 3301/00 simultaneously in the C.S.U. housing.
- Screw bolts 4.1 until 4.5 inclusive and bolts 5.1 until 5.3 inclusive.
- Place the basic PCB back by plugging X2 into X102 (on connector panel).
- Screw bolts 1.2, 1.3, 1.4, 1.5 and 1.6.
- Place back the LBB 3302/00 (only if added to the system) by plugging X3 into X101 (on connectorpanel).
- Screw the bolts 1.1, 2.2 and 4.4.

4 Adding the LBB 3302/00 to the system

- Plug the LBB 3203/00 into X201.
- Place the distance piece d2 between the LBB 3203/00 and the bracket (in the C.S.U.) by the two bolts 3.2 and 3.3.
- Finally screw bolt 3.1.
- Distance piece d1 with associated bolts is delivered together with the LBB 3302/00.
- Distance piece d2 with associated bolts is delivered together with the LBB 3301/00.

CHAPTER 5 RECOMMENDED SPARE PARTS LIST PCBS

LBB 3300/xx	Basic PCB	5322 216 93789
LBB 3300/xx	Connector panel PCB	5322 216 93791
LBB 3300/xx	Interpreters & Monitor Distribution Panel (LBB 3301/00)	5322 212 50326
LBB 3301/00	Monitor distribution Panel	5322 212 50326
LBB 3302/00	Microphone plug-in PCB assy (Roving micr.)	5322 216 93792
LBB 3350/02	Delegate PCB /02	5322 310 10485
LBB 3350/04	Delegate PCB /04	5322 310 10486
LBB 3350/54	Delegate PCB /54	5322 310 10514
LBB 3351/02	Chairman PCB /02	5322 310 10484
LBB 3351/04	Chairman PCB /04	5322 310 10484
LBB 3351/54	Chairman PCB /54	5322 214 90712
LBB 3352/04	Passive PCB	5322 214 90527
LBB 3354/00	Microphone box PCB	5322 214 90924
LBB 3354/00	Microphone PCB	5322 214 90923
LBB 335x/xx	Gooseneck microphone, brown	5322 242 20122
LBB 335x/xx	Trunk cable assy with 8p DIN plug male CCS400	5322 320 11312
LBB 3360/20	Delegate flush PCB	5322 214 90027
LBB 3361/20	Chairman flush PCB	5322 214 90028

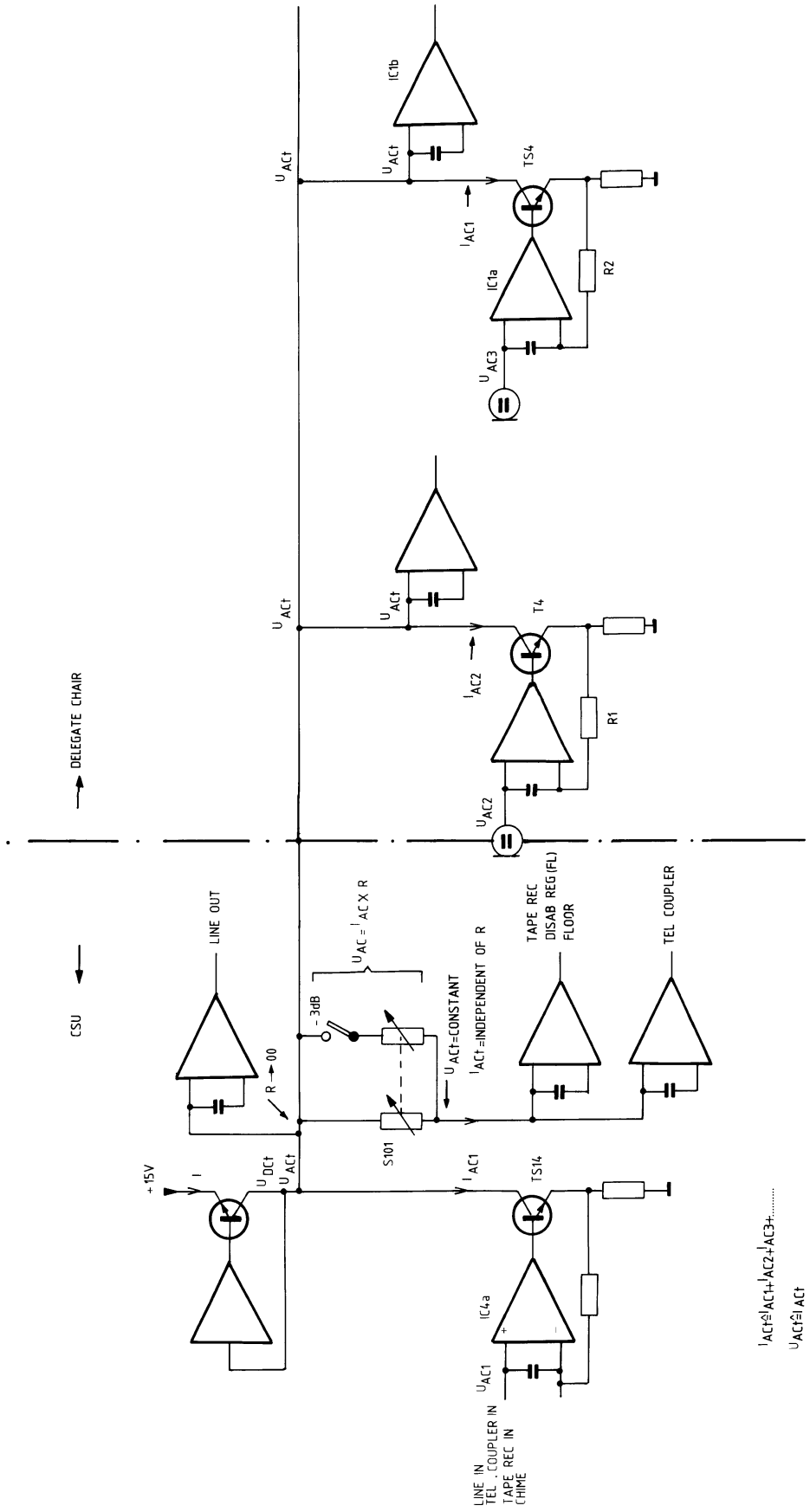


Figure 1 CCS400 Audio Principle

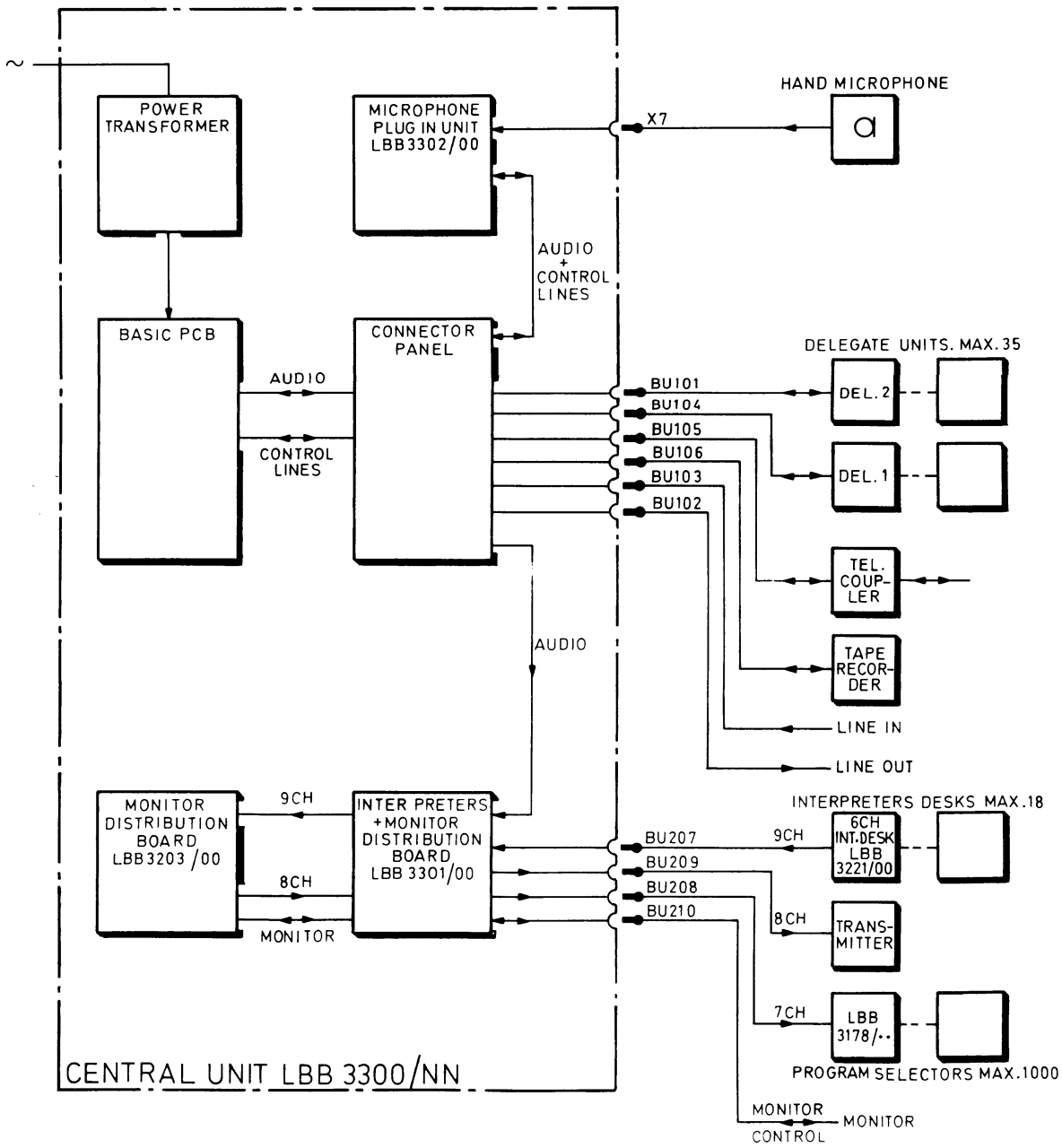


Figure 2 System block diagram C.S.U.

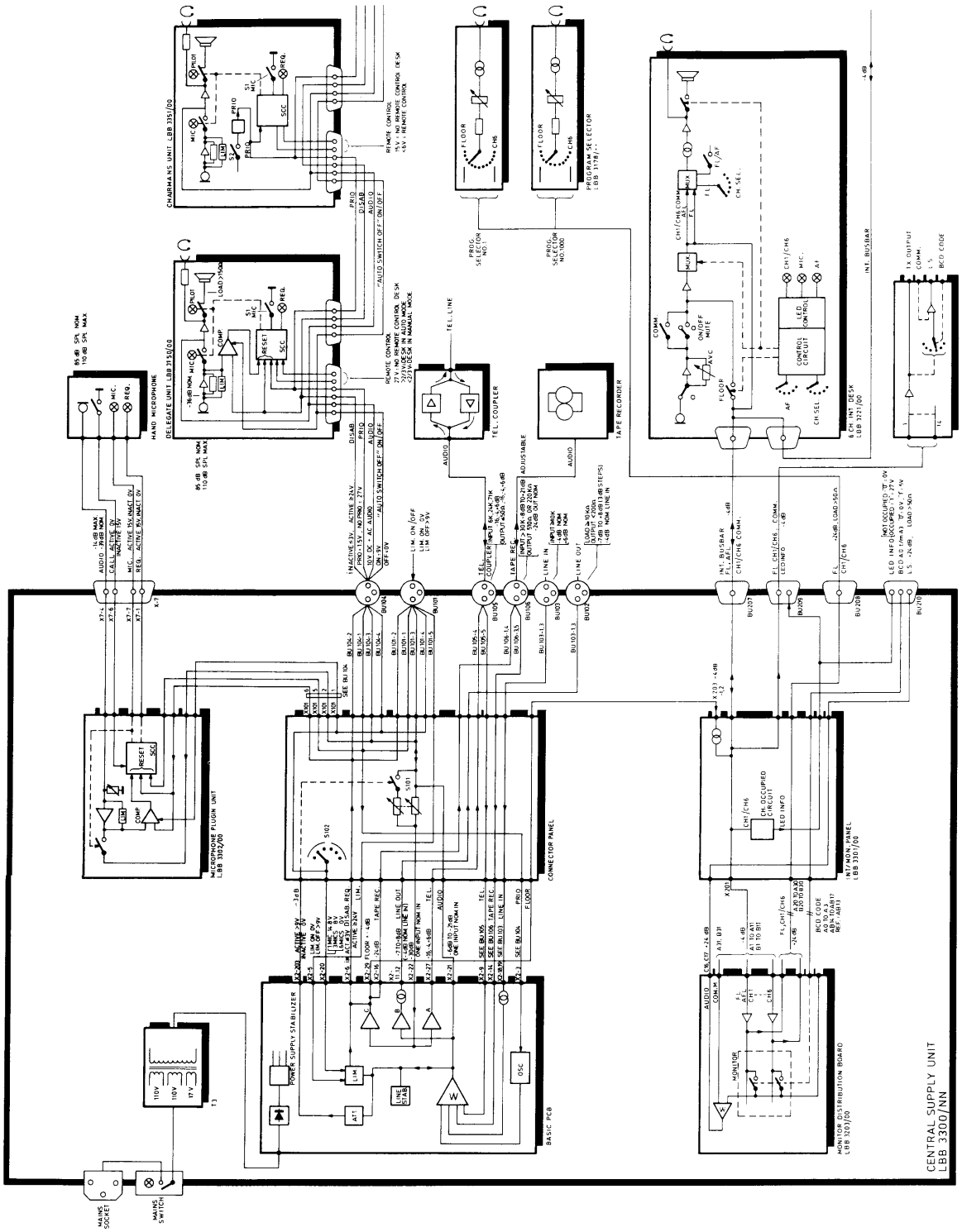


Figure 3 Detailed block diagram with first line data

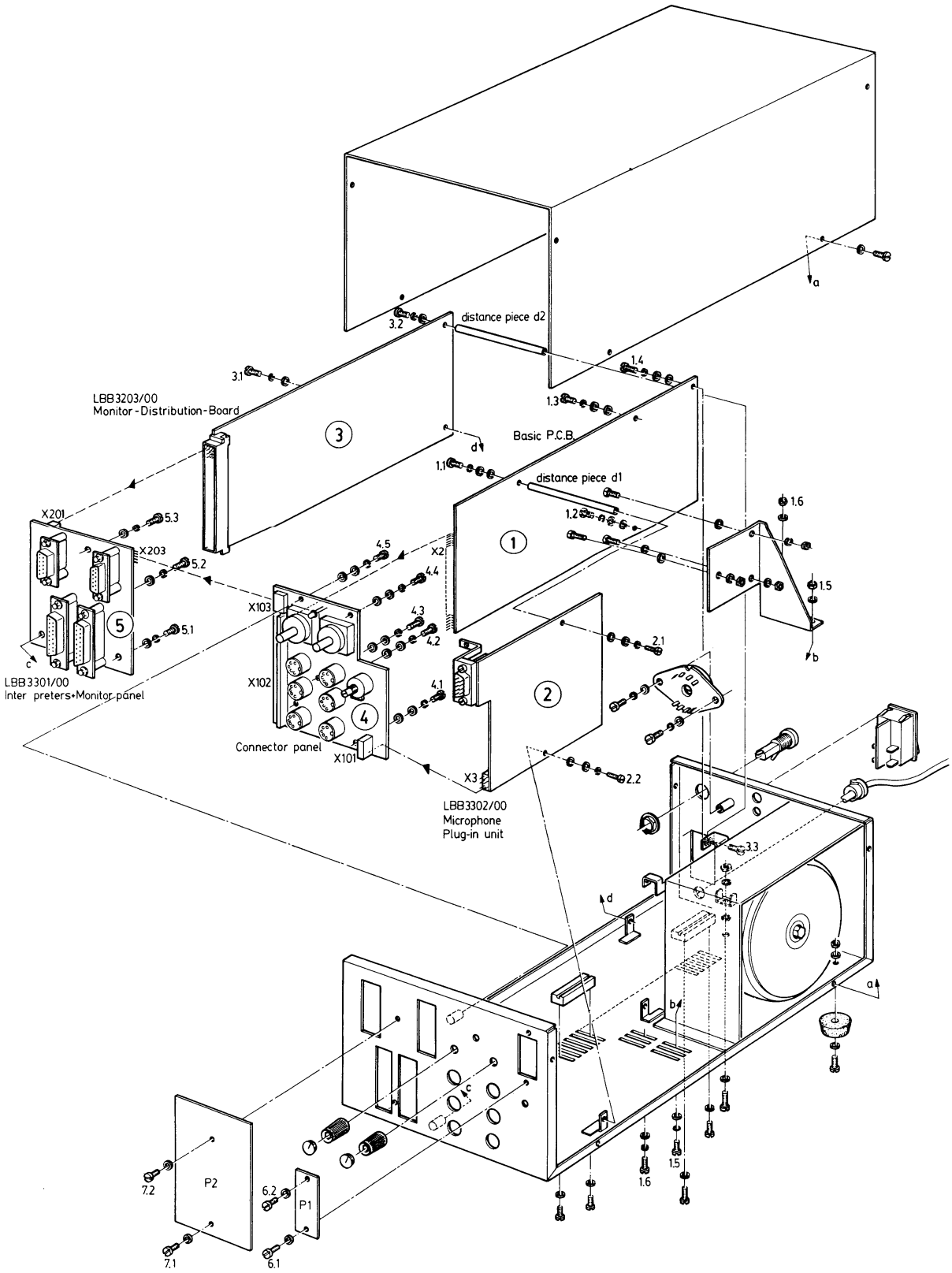


Figure 4 Exploded view C.S.U.

Second line trouble shooting

Tab 12

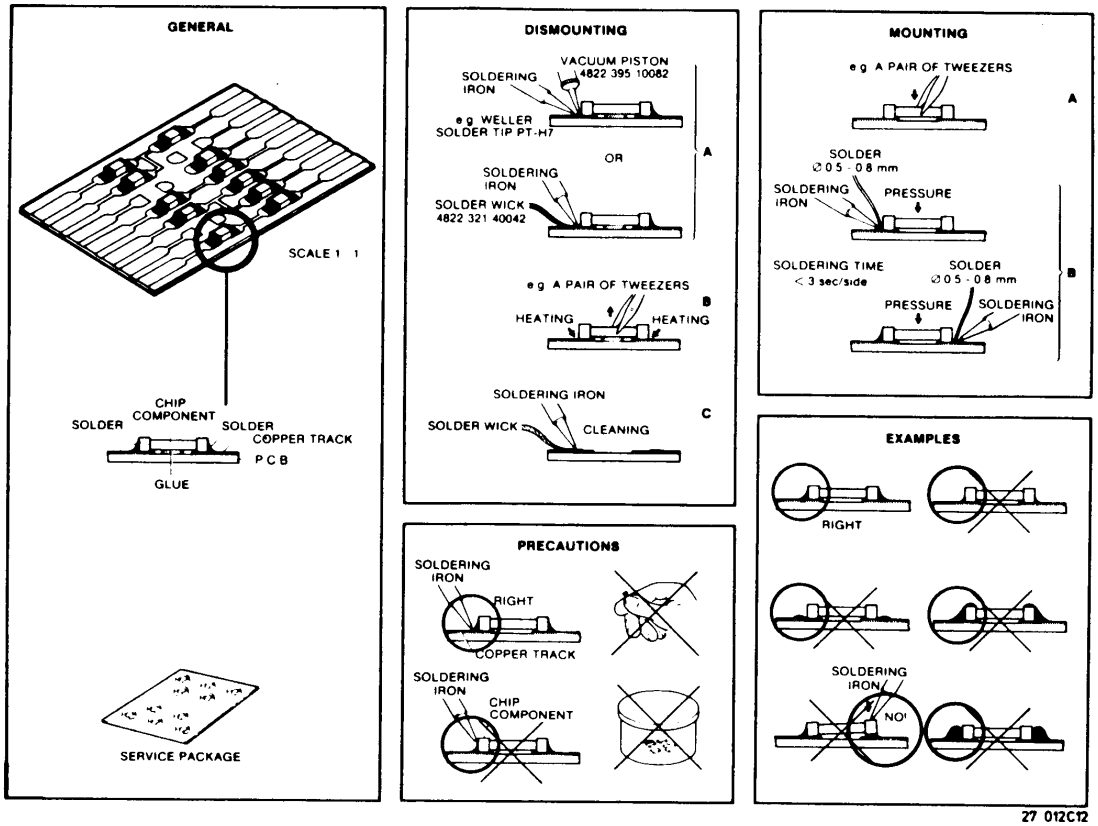
CONTENTS

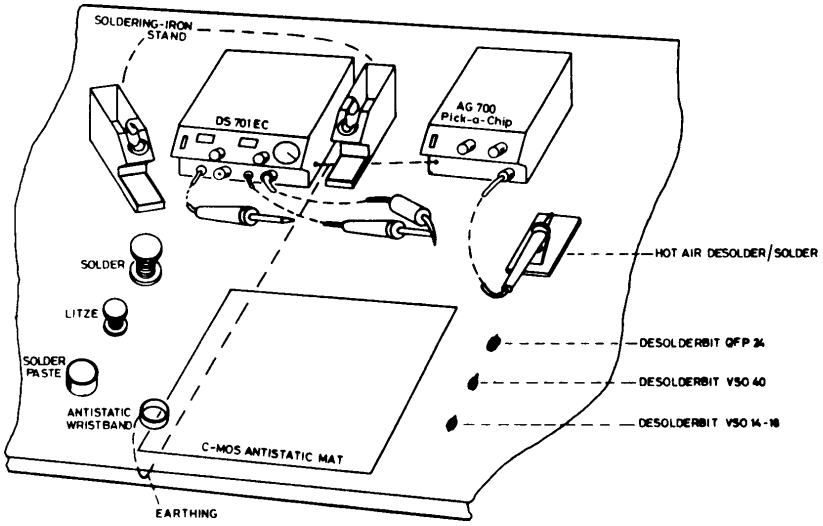
CHAPTER 1 SOLDERING AND DESOLDERING OF SMD'S

1 Introduction

This description gives you a method for replacing surface mounted devices (SMD's) and incorporates subjects such as:

- required tools and materials
- how to arrange the SMD-workshop
- general hints for SMD-handling
- interchanging SMD's with two or three connections
- interchanging SMD's with four or more connections





Arrangement of working area for SMD exchange

2 Required tools and materials

The following tools are necessary:
- A hot-air soldering/desoldering station for components with two or three leads: Weller AG 700 pick-a-chip.
- A vacuum, temperature controlled, soldering/desoldering station for components with four or more connections: Weller DS 701' EC.
- Desoldering accessories that can be attached to the Weller DS 701 EC-equipment.
- A working area that has been secured against electro static discharge (ESD).
- A pair of tweezers.

The following material is necessary:
- "Fluittin" solder.
- Solder paste.
- Components; since not all the components are marked, they must be kept in their original packing in order to avoid interchanging them.
- Desoldering braided wire.

3 General hints for SMD-mounting

- Protection against ESD: since the working area must be suitable for repair of MOS-devices, some precautions must be taken. All repairs must be done earthened, which means that the repair surface, the soldering iron and the technician must be connected to the earth potential. This is achieved by using a C-MOS antistatic mat that must be connected to earth. The service-technician is connected to earth by wearing an antistatic wristband.
- Components: desoldered components cannot be used again since desoldering is done at a temperature of 350 degrees Celsius while they can only withstand 240 degrees Celsius for max. 10 sec. Keep the new components as long as possible in their original packing in order to avoid damage and mixing up new and old SMD's.
- For an optimal supply of heat a working area must be used that does not lead away the heat: the antistatic mat meets this requirement.

4 Interchanging SMD's with two or three connections

IMPORTANT:
Before removing the component, observe very carefully its position in order to avoid that the new component is installed upside-down. This is especially important for capacitors where the metalisation at both ends is longer at the PCB side than at the topside.

Use the equipment Weller AG 700 pick-a-chip and proceed as follows:

- Heat the component up equably with hot air of 350 degrees Celsius.
- Remove the component with a pair of tweezers.
- Clean the PCB tracks, on which the new component has to be soldered, with braided wire or with the use of the vacuum desoldering equipment DS 701 EC.
- Put solder paste on the connections of the new component and position it on the PCB.
- Solder the component on to the PCB with the solder described in the materials list. Soldering temperature must 240 degrees Celsius, soldering time must not exceed 3 sec. per connection. The tip of your soldering iron must not touch the component, but must touch the PCB track close to the component.

5 Interchanging SMD's with four or more connections

Use the equipment Weller DS 701 EC and attach a suitable desoldering piece. Then proceed as follows:

- Adjust the desoldering temperature to 350 degrees Celsius and place the desoldering piece on the IC that has to be removed.
  Take care that all connections of the IC are equally heated up).
- Switch the vacuum on and lift the component from the PCB.
- Clean the PCB tracks, on which the new component has to be soldered, with braided wire or with the use of the vacuum desoldering equipment DS 701 EC.
- Put solder paste on the connections of the new component and position it on the PCB.
- Position the component by soldering first the outside connections in a crosswise manner. Soldering temperature must be 240 degrees Celsius. Keep soldering time as short as possible.
- Solder not the other connections.
- If necessary you must remove superfluous rests of solder with the use of braided wire.

CHAPTER 2 TECHNICAL SPECIFICATIONS

1 Power supply general:

Mainswitch (a)
Power on LED (n)
Voltage adapter (c,d): 110, 127, 220 and 240 Volt ± 10%
Fuse (b)
Mains cord: 170 cm
Supply voltage: 26,5 ± 2 Volt Max. current consumption of discussion distribution and interpreter systems: ≤ 1,7 Amp.

1.1 Delegate connectors (BU101 and BU104)

Two 8-pole female 270 DIN connectors (e,f) to interconnect the delegate units to the system.

1.2 Connections:

BU101 – 1; BU104-1	Priority input	current sink ≥ 0,3 mA
	Priority and chime activate:	
	Level manual priority mode	5,5 to approx. 2/3 Ub Volt
BU102-2; BU104-2	Disable request	
	Request enabled	≤ 3 V
	disabled	≥ Ub – 3 V
	Output impedance	10 kOhm
	On this line a AC voltage is superimposed for the automatic microphone switch-off circuit.	
BU101-3; BU104-3	Floor line (live)	
	DC level	approx. 10 Volt
	Max. line current	40 mA
	Line AC impedance	160E to 972E ± 5% (in 6 steps)
	This value decreases approx. 30% when two or more microphones are switched on.	
BU104-4; BU104-4	Floor line (ground reference)	
	This line is the AC ground reference ADC voltage is superimposed for the micr. auto switch off circuitry	
	auto off	0 V
	auto on	9 V
BU101-6	Not connected	
BU104-5	Power supply for central control desk	
BU101-5	Disable max. number of switched-on microphones	
	Disable level	> 9 Volt
BU104-6	Not connected	
BU101-7; BU104-7	Positive supply voltage	
BU101-8; BU104-8	Negative supply voltage	
	For capacity of the power supply see limits of the system.	

1.3 Line output (BU102)

5-pole 180°		female DIN connector (g)
BU102-4		Not connected
BU102-2		Ground reference
BU102-5		Not connected
BU102-1, 3	Floating output	
	Output impedance	< 200 E
	Load impedance	≥ 10 K
	Output level (gain switch -12 dB)	-4 to +6 dB

1.4 Line input (BU103)

5-pole 180°	female DIN connector (h)	
BU103-4	Not connected	
BU103-2	Ground reference	
BU103-5	Not connected	
BU103/1, 3	Floating input	
	Input impedance	>10 K
	Input level	presettable -4 dB or +6 dB by an internal jumper

1.5 Telephone coupler (BU105)

7-pole 270°	Female DIN connector (i)	
BU105 - 1,2,3	Not connected	
BU105-4	Output (to coupler)	
	Impedance	≤50 E
	Level	-16, -4, +6dB ± 1 dB presettable
BU105-5	Input (from coupler)	
	Impedance	6K, 24K, 71K ± 10 %
	Level	-16, -4, +6dB ± 1dB presettable
BU106-6	Negative supply voltage	
BU107-7	Positive supply voltage	

1.6 Tape recorder connector (BU106)

5-pole 180°	Female DIN connector (j)	
BU106-1	Output (to recorder)	
	Impedance	510 E or 220 K ± 10% presettable
	Level	-24 dB
BU106-2	Ground reference	
BU106-3	Playback input left (from recorder)	
	Impedance	> 30 K
	Level	-8 dB to +21 dB adjustable with potmeter (k)
BU106-4	Interconnected with BU106-1	
BU106-5	Playback input right (from recorder)	
	Specifications see BU106-3	

1.7 Interpreter system connector (BU207)

25-pole female lockable D-connector (r) (Only when LBB 3301/00 is placed in the central)

BU207-1, 14	Floorline	
BU207-2, 16	Channel 2	
BU207-3, 15	Auto floor channel	
BU207-4, 18	Channel 1	
BU207-5, 17	Channel 3	
BU207-6, 20	Channel 6	
BU207-7, 19	Channel 4	
BU207-8, 22	Channel 5	
BU207-9, 21	Communications interpreters	
BU207-10	Protected ground	
BU207-11,23	Not connected	
BU207-12, 13	Negative supply voltage	
BU207-24,25	Positive supply voltage	
	See limits of the system	

1.8 Distribution connector (BU208)

15-pole female lockable D-connector (q)
(Only when LBB 3301/00 and LBB 3203/00 are placed in the central)

BU208-1, 10	Channel 6	
BU208-2, 9	Channel 5	
BU208-3	Not connected	
BU208-4, 12	Channel 4	
BU208-5, 11	Channel 3	
BU208-6, 14	Channel 2	
BU208-7, 13	Channel 1	
BU208-8, 15	Floor channel	
	Unloaded level	24 dB
	Load impedance	> 50 E

1.9 Transmitter connector (BU209)

25-pole female lockable D-connector (s)
(Only when LBB 3301 is placed in the central)

BU209-1, 14	Floorchannel	
BU209-2, 16	Channel 2	
BU209-4, 18	Channel 1	
BU209-5, 17	Channel 3	
BU209-6, 20	Channel 6	
BU209-7, 19	Channel 4	
BU209-8, 22	Channel 5	
BU209-9, 21	Communication interpreters	
BU209, 24	Not connected	
BU209-12, 13	Ground reference	
BU209-3	Channel 3	Channel occupied indicator line
BU209-10	Channel 1	Channel occupied indicator line
BU209-11	Channel 5	Channel occupied indicator line
BU209-15	Channel 6	Channel occupied indicator line
BU209-23	Channel 2	Channel occupied indicator line
BU209-25	Channel 4	Channel occupied indicator line

1.10 Monitor connector (BU210)

15-pole female lockable D-connector (p)
(Only when LBB 3301 and LBB 3203/00 are placed in the central)

BU210-1, 9	Loudspeaker output	
	Unloaded level	+24 dB
	Load impedance	> 50 E
BU210-6	Not connected	
BU210-13	Supply voltage 5 Volt	
BU210-14,7,15,8	Monitor select lines Ao, A1, A2 and A3	
BU210-2	Channel 6	Channel occupied indicator line
BU210-3	Channel 4	Channel occupied indicator line
BU210-4	Channel 3	Channel occupied indicator line
BU210-5	Ground ref.	Channel occupied indicator line
BU210-10	Channel 3	Channel occupied indicator line
BU210-11	Channel 5	Channel occupied indicator line
BU210-12	Channel 1	Channel occupied indicator line

2 LBB 3302/00 Roving microphone plug in unit

9-pole female squeeze to release D-connector
6-pole interequipment connector

This unit is a PCB that has to be installed in the LBB 3300/00. Microphone switch, red micr. on and green micr. request LED are provided in the handmicrophone.

2.1 Electrical specification

Supply voltage	20 – -28V
Supply current typ	9,5 mA
Frequency range	150 Hz – -12,5 kHz
Additional current consumption micr. on: 6 mA ± 1 mA	

2.2 Microphone channel

Nominal input level micr.		85 dB S.P.L. ± 1,25 dB
Overload input level micr		110 dB S.P.L. ± 1,25 dB
Nominal output current		0,41 mA
Gain reduction at overload input level		18,5 dB ± 1,5 dB
Distortion at nominal input level		< 0,5%
Distortion at overload input level		< 5%
Frequency response (without micr. gain rel to 1 kHz)	40 Hz	- 10 ± 2 dB
	150 Hz	-1,5 ± 1 dB
	12,5 Hz	-0,5 ± 1 dB
Equivalent noise input		< 32 dB (A) S.P.L.

2.3 External microphone

Nominal input level (without micr.)	-39 dB
Adjustment range	± 4 dB
Input impedance at nominal level	240K – ± 5%
Electret voltage	9V± 1V
Electret drain resistor	5 K6 ± 5%
Led current	3,5 mA ± 0,5 mA

3 Table top equipment

LBB 3350/00	Delegate unit with loudspeaker
LBB 3450/00	Delegate unit without loudspeaker
LBB 3351/00	Chairman unit with loudspeaker
LBB 3451/00	Chairman unit without loudspeaker

3.1 Interconnection facilities

1. A cable (1=180 cm) with 8-pole male DIN connector for connection to the preceding delegate unit or to the central equipment e.g. LBB 3300/00.
2. A 8-pole female DIN socket for connection of the next delegate unit (loop-through).
3. A concentric 3,5 mm jack for connection of aux. equipment.

3.2 Electrical specification

Supply voltage	20 – 28 V
Supply current (stand by)	del. unit typ 8mA; chairman's unit typ 7mA
Frequency range	150 Hz – -12, 5 kHz
Additional current consumption micr. on: 6mA ± 1mA	

3.2.1 Microphone channel

Nominal input level micr.	85 dB S.P.L. ± 1,25
Overload input level micr.	110 dB S.P.L. ± 1,25
Nominal output current	0,41 mA
Gain reduction at overload input level	18,5 dB ± 1,5 dB
Distortion at nominal input level	< 0, 5%
Distortion at overload input level	< 5%
Frequency response (without micr. gain rel 1KHz)	
	40 Hz - 12 ± 2dB
	150 Hz -1,5 ± 1dB
	12,5 Hz -0,5 ± 1dB
Equivalent noise input	<32 6B (A) S.P.L.

3.2.2 Loudspeaker amplifier

Input impedance	> 1 M
Gain	20,75 dB ± 0,75 dB
Distortion at Vo +19 dB	< 1,5%
Frequency response rel 1KHz	150 Hz -1 ± 0,75 dB
	12,5 Hz -2 ± 0,75 dB
Equivalent input noise level	< -89,5 dB
Rate load impedance	150 E
Loudspeaker sound pressure (only LBB 3350 and LBB 3351)	75 ± 2 dB S.P.L. at 0,5 m and -12 dB input

4 LBB 3305/00 Interconnection cables

Extension cable for tabletop and flush mounting units.

Cable	8-pole brown standard cable.
Connectors	male and female 8-pole DIN, no lock.
Length	5 meters

5 LBB 3203 M.D.B. (Monitor Distribution Board)

5.1 General

The M.D.B. contains nine amplifiers. Eight amplifiers are used to drive 8 lines for wired distribution, one of them is used as a monitor amplifier and this one can select one of the eight channels by a remote controlled electronic switch. The amplifiers are protected against short circuits.

5.2 Interconnection facilities

A 96-pole male Eurocard connector.

5.3 Electrical specifications

5.3.1 General

Supply voltage	27 V ± 0,5 V
Current consumption	typ 80 mA. max. 160 mA (stand-by)
Frequency range	150 Hz – 12,5 kHz
All outputs are protected against short circuits.	

5.3.2 Channel amplifier

Input impedance (B10-A11)	> 20 K
Output impedance	< 10 E
Load impedance	> 50 E
Gain 500 Hz	32 dB ± 0,5 dB
Gain freq. response	150 Hz, -0,5 ± 1 dB
(rel. 500 Hz)	12,5 kHz, -0,5 ± 1 dB
Eq. noise input voltage	< - 114 dB (A)
Distortion V1 = -9 dB	< 0,2%
V_O max.(d = 5%, f = 500 Hz)	> +24,5 dB

5.3.3 Monitor amplifier

Input impedance comm. input (A31-B31)	7 K6
Input impedance comm. input (A32-B32)	200K ± 5%
Input imp. (C18-C19)	> 10 K
Output imp. (C16-C17)	<10 E (500 Hz – 12,5 kHz)
Gain:	
- channel output > to mon. output (C16-C17)	0 dB ± 1 dB (200 E resistor between 1 A 31 and B31)
- comm. input (A32-B32) to mon. output (C16-C17)	3,5 ± 0,5 dB
- input (C18-C19) to mon. output (C16-C17)	32 ± 0,5 dB (200 E resistor between A 31 and B31)
- comm. input (A31-B31) to mon. output (C16-C17)	32 ± 0,5 dB
Gain freq. response(rel. 500 Hz)	150 Hz, -3,5 dB ± 1 dB
	12,5 Hz, 0 dB ± 0,5 dB
Eq. noise input voltage (C18-C19)	< - 109 dB (A)
Distortion V_0 = +22 dB	< 0,2%
V_O max. (d = 5%, f = 500 HZ)	> +24,5 dB

6 LBB 3221/00 – 6-channel interpreter desk

6.1 General

This desk provides the speak and listening facilities for interpreters using the CCS400 system. Systems with up to 8 channels (including floor and autofloor channe.l) can be built with it.

6.2 Controls and indicators

- locked push buttons
- 1-non-locked push button
- 1 three-position tumbler switch
- 1 two-position tumbler switch
- 1 8-position rotary switch
- 1 volume control
- 1 tone control
- 1 6-position rotary switch (rear side)
- 1 2-position slide switch (rear side)

6.3 Interconnection facilities

- A cable (1 = 180 cm) with 25-pole male lockable D-connector for connection to the C.S.U. LBB 3300.
- A 25-pole female D-connection to connect to the next LBB 3221.
- A 6,3 mm jack for the connection of a microphone.
- A 6,3 mm jack for the connection of a headphone.

6.4 Electrical specification

6.4.1 General

Supply voltage	24 – 27 V
Supply (stand by) current	typ. 42 mA, max. --- mA.

6.4.2 Microphone channel

Frequency range	150 Hz – 12, 5 kHz
Input level microphone	nom. 85 dB SPL max. 110 dB SPL
Equiv. noise input level	< 35 dB (A) SPL, typ. 32dB(A)
Output impedance	1250 E ± 15%
Load impedance	200 E with center tap biased to 13.5 V with 3 K series- resistor
Output voltage	nom. -4 dB ± 1 dB max. -3 dB + 1 dB

6.4.3 External microphone input

Input impedance	>90 K
Nominal input level	-36,5 ± 4 dB (dependant of the setting of R4)
Gain frequency response(rel. 500 Hz)	40 Hz-14 ± 3 dB 150 Hz-1.5 ± 1 dB 12,5 Hz-0,75 ± 1 dB
Distortion at input level	< 0,2% (nominal +25 dB).

When the microphone is switched off then the selected channel automatically receives the floor language.

6.4.4 Floor relay amplifier

Input impedance (X1 – 1 --- X1 – 14)	24K±5%
Gain	-5 ± 1 dB
Gain freq. Response(rel. 500 Hz)	150 Hz – 1,5 ± 0,5 dB

6.4.5 Headphone amplifier

Input impedance	> 5 K
Output impedance	500 E ± 5%
Gain (volume control max.,pres. control min., unloaded)	31,75 ± 1 dB
Eq. noise input voltage	< -99 dB(A) (R_S = 200 E)
Distortion V_O + 10 dB	< 0,5% (RL = 150 E)
Presence frequency	4000 Hz ± 400 Hz
Extra gain at pres. freq.	> 8 dB

7 System electro acoustical characteristics

If no tolerances are stated than the values are indicative.

Automatic microphone switch off circuitry	
attack level	64 dB SPL ± 3 dB
- for one additional nominal speaker(85 dB SPL)	< 80 dB(A) SPL
- time delay for each speaker	40 ± 20 seconds
Automatic gain reduction for two or more microphones on	-3 dB ± 1 dB
Power consumption passive delegate unit T.T.	8 mA typ.
- L.S. active delegate unit T.T.	= 11 mA
- Micr. on delegate unit T.T.	= 30 mA

8 Proporties of transmission links

In- and output levels are indicated in dB S.P.L. or dB rel. 0,775 V (unloaded). Output levels of loudspeakers are indicated at 0,5 m. distance.

Interface data

	Link A-C	A-E	A-G	A-D	A-H	A-I	A-L	A-J
Nominal input level	< ---------- All links 85 ---------- >							
Overload input level (500 Hz)	< ---------- All links 110 ---------- >							
Output impedance	70-700	N.A.	<1k	<10	<200	<50	510E/220K	<5E
Permissible load impedance	>10K	N.A.	>10K	=>150	>1K	>1 K	>0E	<50E
Output level (input level between nom. and overload) (central gain pot. -3dB)	-9 +1	+75 +85	+5 +15	+11 +20	-4 +6	-16.-6	-24	+25.+30

Transfer data

Gain reduction at O.I.L. (A.G.C.)	< ---------- All links 16 dB ± 1 dB ---------- >							
Gain reduction no microphone on	< ---------- 0 dB ---------- >							
Gain reduction, 2 or more microphones on	< -------- All links 3 dB ± 0,5 dB ---------- >				0 dB	0 dB	0 dB	0 dB
Range of attenuator for del. loudsp./headph. (± 1 dB)	< ---------- 0, -3, -6, -12, -15 ---------- >				0 dB	0 dB	0 dB	0 dB
Distortion at rated imp.	<1%	<3%	<1%	<1%	<1%	<1%	<1%	<15%
Distortion at max. imp.	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<30%
Typical clipping level (distortion = 5%.)	-	-	-	+11 dB	-	-	-	+24,5
Eq. noise input level (A-weighted): typical:	<32	<32	<32	<32	<32	<32	<32	<32

Interface data

	Link			
	C-H	F-H	I-E	C-E
Nominal input level	0,41 mA	-4 dB and +6 dB	-16, -4, +6 dB	-4 dB
Overload input level (500 Hz)	1,3 mA	+6 dB and 16 dB	-6, +6, +16 dB	+6 dB
Input impedance	70-700E	>10K	71K, 24K, 6K	>30K
Output impedance	<200E	<200E	N.A.	N.A.
Permissible load impedance	>1K	>1K	N.A.	N.A.
Output level (input level between nom. and overload) (Central gain pot -3dB)	-4..+6	-4..+6	+75..+85	+75..+85

Transfer data

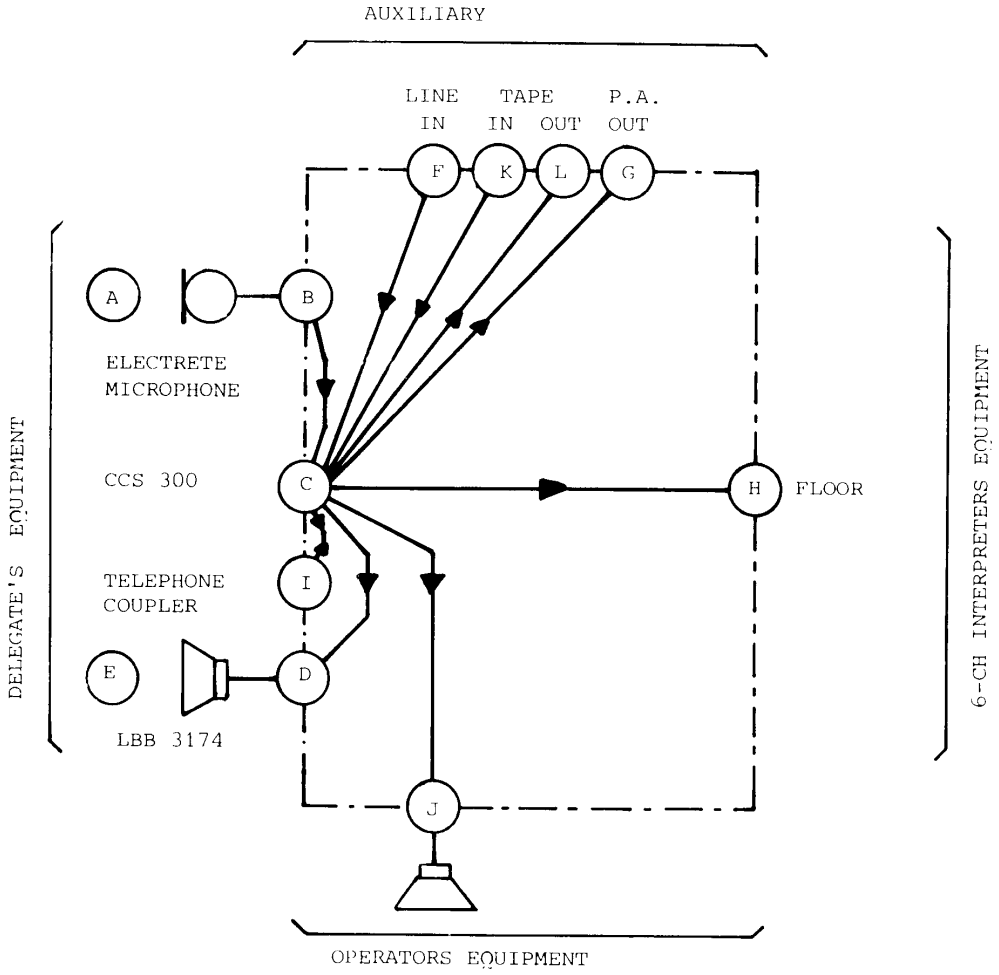
Gain reduction no microphone on	<---------- 0 dB ---------- >			
Gain reduction, 2 or more microphones on	<---------- 3 ± 1 ---------- >			
Range of attenuator for del. loudsp./headph.	0,-3,-6,-9,-12, - 15		<3%	<3%
Distortion at rated imp.	<0,5%	<1%	<5%	<5%
Distortion at max. imp.	<2%.	<5%	-	-
Typical clipping level (distortion = 5%)	+15dB	+9 dB		
Eq. noise input level (A-weighted, 1 micr. on)	<0.41uA	<-64		

9 Limits of the system

One LBB 3300/00 can feed two loop-through strings of 35 * delegate units with max. 50 meters extension cable each. In case of trunk cabling the maximum length of each string is 100 meters (power core ø 0,75 mm^2).

Max. number of 6 channel interpreter desks LBB 3221 is 18 *
Max. number of channel selectors LBB 3178 is 1000.

* Max. total continuous current ≤ 1,7 A (two strings and interpreters desks), and ≤ 1,55 Amp when LBB 3203 feeds 1000 channel selectors.



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