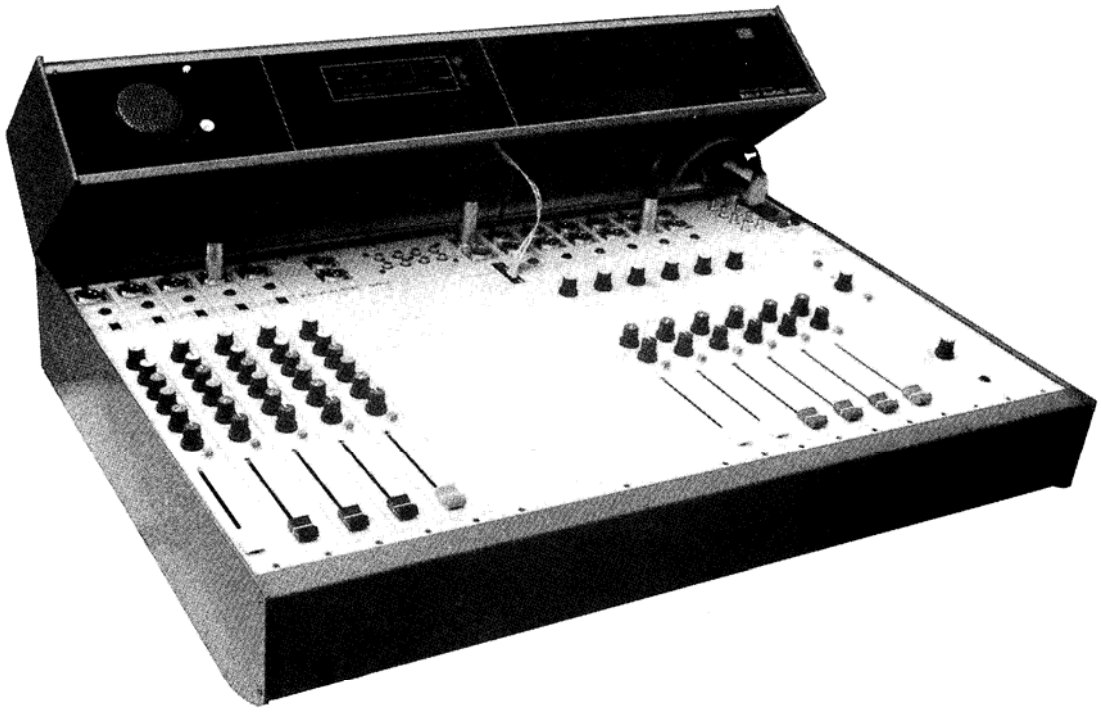
SBM STUDIO BROADCAST CONSOLE



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EELA AUDIO SBM

ON AIR DESK for RADIO

Local and regional radio is a hot item these days. Besides the already existing radio services by national networks there is a definite need for local news brought by local people.

Making radio is a skill and needs an other approach then playing a pirate. It is not the right way to buy some audio equipment in the shop around the corner and play the DJ on air.
Local radio is in the first place NEWS and INFORMATION, with music around it, and this at a level that makes it worth listening also after a few months, especcially for a public that is spoiled by high level programms, made by professionals.

Making good programms is not our job, but we can offer people the tools to do so at a professional level with a very sensible pricesetting.

A RADIOCONSOLE is in fact a little bit of high quality audiocircuits surrounded by a lot of logic to create those functions that are needed for smooth running programms with not to much attention to knobs and switches.
We at EELA AUDIO have quite a bit of experience in designing and building of professional broadcast equipment, and we have translated this to the needs and the budget of the small scale radiostations.
Big, impressive mixers with a lot of controls and obscure functions can make good radio with the help of several additional "black boxes" around it, but if the man who made it gets ill, ther will be no radio, because no-one else can operate the installation.
That is why our SBM looks so simple, the real clever things are below the frontpanels and they include everything that is needed for making a radioprogramm.

SET UP

The SBM is built up in a frame of aluminium extrusions with space for 14 modulesand a scriptspace with mix- and line amps for the main outputs, together with a limiter and an optional ON AIR relais.
In the modules themselves you will find all the connections, which are easy to reach and are covered by the meterbridge for a clean installation.
The internal wiring is one ribbon cable, mounted in a way that it is possible to test modules while being fully connected. Every module can be placed anywhere in the console in any sequence.
Modules are made of steel, with the PC-boards secured to the sidepanels for a very strong construction without mechanical load on pots and switches.
The switches have a two colour knob for position indication.
Pots have a centre detent when useful and are colourcoded for their function.
Faders are full length (100 mm) and have a nice feel and a long life, because they only control a DC-voltage to drive the VCA's (Voltage Controlled Amplifiers), who are the real level control devices.
Optional available are P&G conductive plastic faders with even better specifications.

MODULES

The following inputmodules are available:

MICROPHONE INPUT S 81:

This module has an XLR input, active balanced with optional a transformer balanced input.
The sensitivity can be set coarse with a FUNCTION SWITCH labelled HI/LO and fine with a frontpanel pot. This adapts the input eg for using capacitor- or dynamic microphones.
A second functionswitch turns on the 48 Volt phantom power if needed.
Switch nr 3 brings a HIGH PASS FILTER in circuit, very usefull for speech applications.
Number 4 selects the logic of the module for use of microphones in the controlroom or in a separate studio or booth.

There is EQUALISING available, 3 bands, but with a restricted range, adapted to working direct on air with not only pleasing the presenters ears, but also the possibility for the listeners to hear something on their radio in the kitchen.

For FOLDBACK two outputs are available, one fixed to send to the studio when no mics there are live and a second one with a level control, available when mics are open to give selective, controllable foldback without howl-round. See the description of the STUDIO MONITOR MODULE.
Further outputs deliver the returnsignal for maximum two telephone-modules, the so called mix-minus or clean feed outputs.

The PANPOT has the obvious job of placing the signal in the stereo-picture, eg the presenter left and a guest right.

The CUE- or PRE FADER LISTEN SWITCH can sebd the prefader signal to a small speaker in the meterbridge and/or to the main monitors.
One function hereof is an intercomsituation with the studio when the mics are off air.
The CUE-function is switched off by opening the fader for a clear indication that the mic is on air.
When mics in the controlroom are used, the cue function is inhibited to prevent acoustic feedback.

The FADER controls the channel VCA for setting the level in the mix.
The endcontact is generated by electronics and serves to change over the appropriate monitorsignal and give (via the monitormodules) RED LIGHT signalling.
Also operated by the endcontact is an internal MUTE-switch for aceiving very high cut off values of the input signal (typ ^{3} 100 dB).
The VCA also receives a controlsignal from the outputlimiter to prevent overload of the transmitter.
Microphone inputs also have a DIRECT OUTPUT eg for connection to talkbackfunctions etc.

STEREO LINE INPUT S 82:

These are used for connection of grammophones, tape- or jinglemachines or external line level sources in stereo.
Connections are with XLR's and the in puts are active balanced with transformers optional.
The sensitivity is in a range for both professional and consumer type of source equipment.
For grammophones an external RIAA preamp is needed, eg the EELA EA 804
This is done first to make all modules equal and second to prevent hum etc, introduced by long leads from a pick up cartridge to the input.
Further available is a START OUTPUT, giving a relay contact closing during ca .5 seconds for starting tapemachines or recordplayers on opening the fader.

On top we find the GAINCONTROL for presetting the gain. With the help of the CUE-circuit this can be done with the fader closed.

No EQUALISING is available in the S 82, following the practice of most radiostations, because stereo programm material coming from records or tapes is pre-produced and ready for transmission.
For those people with other filosophies, we have an S 82/EQ available.

Also taps for FOLDBACK and CLEAN FEED are available as in the MIC-modules.

The CUE-SWITCH sends the prefader signal in stereo to the main monitors if enabled and in mono to the on board speaker, a facility used for cueing tapes or records. The cue-function is switched off when the fader is opened.

The BALANCE CONTROL has a small range and will be used to correct the left/rigt balance of the connected source.

The FADER controls both channels simultaneously with (thanks to the VCA's) a very good tracking between left and right. The endcontact operates both the startrelay and the internal MUTE-switch.
An input from the limiter is also active here.

TELEPHONE MODULE S 83:

A special TELEPHONE MODULE is necessary for bringing in the programm so called "phone-ins" or contributions from reporters using the "REPORTOPHONE".
Facilities are provided in the SBM to use TWO such modules, with the possibility of cross-conversation between the two. This is because we have two separate clean feeds.
The clean feed mix will be sent to the line via a bridge-circuit, cancelling this signal out of the contribution from the outside caller.
In fact, the two wire connection will be transformed to a 4 wire system. Safety is provided by using transformer coupling to the post office lines.
Connections (on XLR's) are available for the line and one or two standard telephones, one in the studio and one in the controlroom.
The bell-circuits are via a relay to diconnect the circuit when mics are open. Indication of an incoming call is then performed by an LED in the module.

The connection with the caller has to be made by the telephone and then switched to the console. An incoming call can be taken on the console direct.
Communication is then possible by means of the CUE-system for listening and a talkback circuit for talking.
Both are switched off when the connection is brought on air by opening the fader.
There is also a delay in opening the channel after switching to the line to prevent the noise from this action to upset the limiters, when this is accidental done with the fader open.
Controls are available to trim the levels sent to the line and to adapt the incoming signal.
Instead of using balance-controls to optimise the hybrid, we have chosen for voice-control of the callers signal to achieve high damping values of the bridge circuit. This because of the ease of operation and the good results that can be obtained.

Outputs are available for the FOLDBACK-circuits and a CLEAN FEED to the second telephone module.
MAIN OUTPUTS are controlled with the VCA FADER and a PANPOT like in the MIC-modules, with a coupling of the limitercircuit to the VCA for overload protection.

MASTERMODULE S 86:

The MIX- and LINE AMPS for the MAIN OUTPUTS find a place underneath the SCRIPTSPACE.
The main outputs are transformer balanced for driving the line to the transmitter and have unbalanced splits to feed tapemachines.
Also placed here is the sidechain and controlcircuit of the LIMITER, who takes care of the outputlevel not to exceed the preset maximum level.

As an option we can fit an ON AIR RELAY, that feeds the transmitter with an external signal when the console is switched off or has to be used for other jobs. The latter can be done by switching OFF the ON AIR SWITCH in the meterbridge and is indicated by a lamp.

CONTROL ROOM MONITOR S 87:

This module contains circuits for checking the signals in the console by a pair of speakers and is part of the communication circuit.
There is an output for MONITORSPEAKERS in stereo on linelevel, so an external poweramp or active speakers are necessary.

As source for this output, normally the main outputs are used, with a possibility to change over to an EXTERNAL INPUT, eg an OFF AIR RECEIVER for checking the entire chain.
The speaker outputs can change over to the CUE-MIX, automatic on depressing one or more CUE-switches of the channels, IF enabled by the AUTO-CUE SWITCH on the monitor module. This change over is only performed when the channels are REAL switched to CUE.
The speaker outputs are also coupled to one of the logiclines for MUTING them when a MIC-channel, assigned to the controlroom is opened. This to prevent acoustic feedback with live mics and offering the operator/presenter the possibility to listen to or cue records or tapes on the main speakers when the mics are closed.
With this MUTE is coupled a RELAY for signalling eg a RED LIGHT at the door.

Further influence on the speakers is a DIM, to lower the level by 20 dB when one of the COMM. or TALKBACK switches is operated.

A second output is for HEADPHONES.
Their signal is the same as on the speakers without MUTE or DIM. There is enough power available to drive all normal types of headphones.
Also in the CRM-module there is the mix-amp for the CUE-lines with a mono output to drive the speaker in the meterbridge, influenced by the controlroom MUTE.

STUDIO MONITOR MODULE S 89:

This (optional) module is needed when a separate studio or booth is used. The following facilities are available:

STUDIO FOLDBACK SPEAKER OUTPUT.

The normal signal on this output is a mono mix of all postfader signals.
With the TALKBACK to STUDIO pushbutton it is possible to give commands to the studio via the loudspeaker(s).
Also the presenter can hear this via his headphones.

When one of the faders of MIC-channels, assigned to STUDIO is opened, the speakeroutput will be switched over to the SELECTIVE FOLDBACK MIX, consisting of those postfader signals, mixed in with the FOLDBACK level controls on the channels.
It is impossible to give commands in this mix, because this signal is meant for giving guests in the studio those cues, they need for reactions, like incoming phonecalls, tapes etc.
This way of working has the advantage of not "frightening" inexperienced guests by giving them headphones, which can also carry talkbacksignals that can only give confusion.

Of course you have to take care that the level of the FOLDBACKMIX and the position of the speakers is set to safe for preventing crosstalk in the opened microphones.

PRESENTERS HEADPHONE OUTPUT.

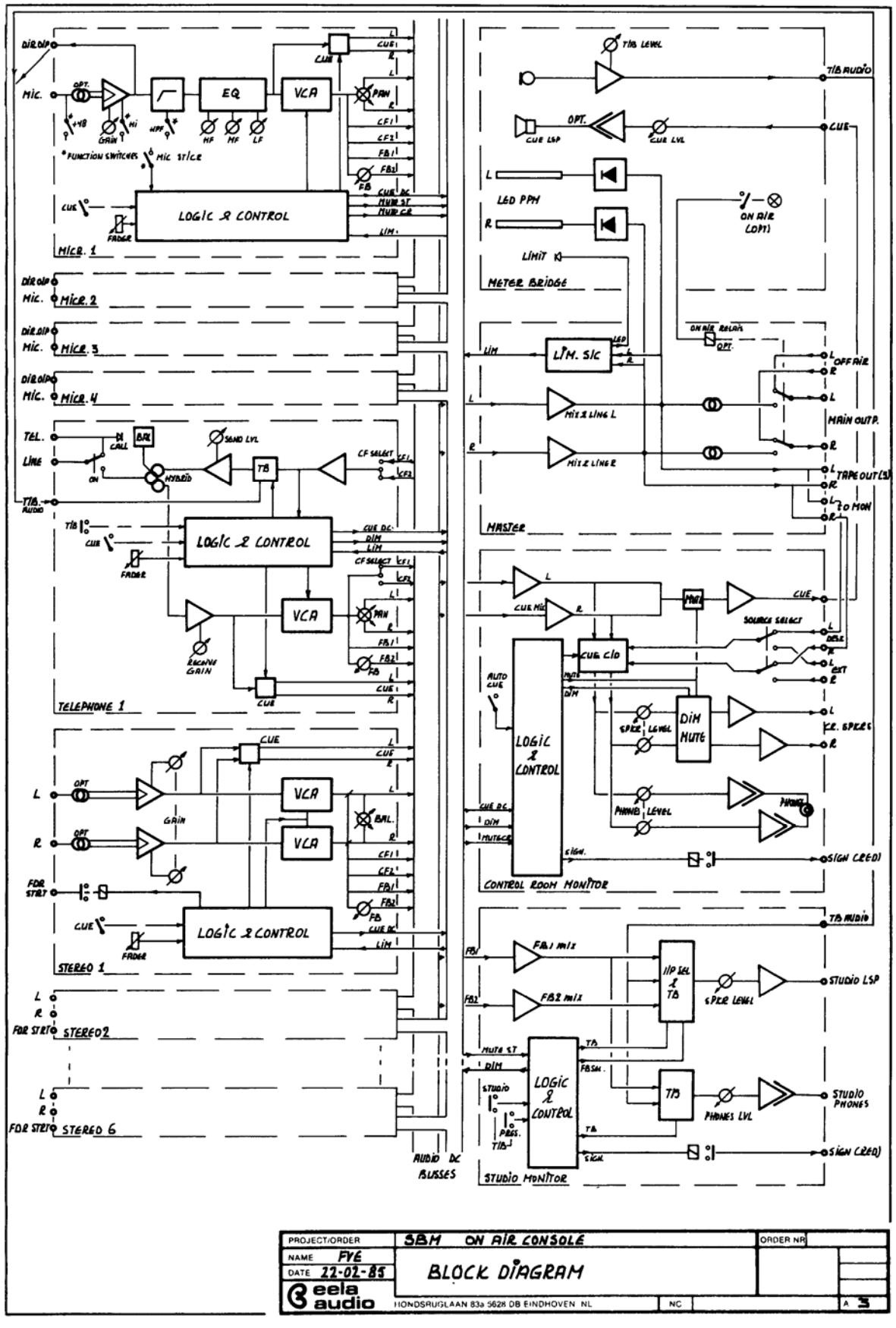
The signal on this output is the previously mentioned postfader mono mix, with interruptions by talkbacksignals.
There are TWO talkbackways to the presenter: a "public" one, combined with TB to STUDIO and a "private" one for talking to the presenter also with no microphones open and the speakers active.
These TB circuits are independant of open microphones.

The TALKBACKSIGNAL can be taken (by patching) from a controlroom microphone or from the talkbackmic placed in the meterbridge.

Opening microphones is indicated on the module by a red LED marked MIC ON and this is coupled to a relay output for driving external RED LIGHTS eg in the studio.

POWER SUPPLY S 89:

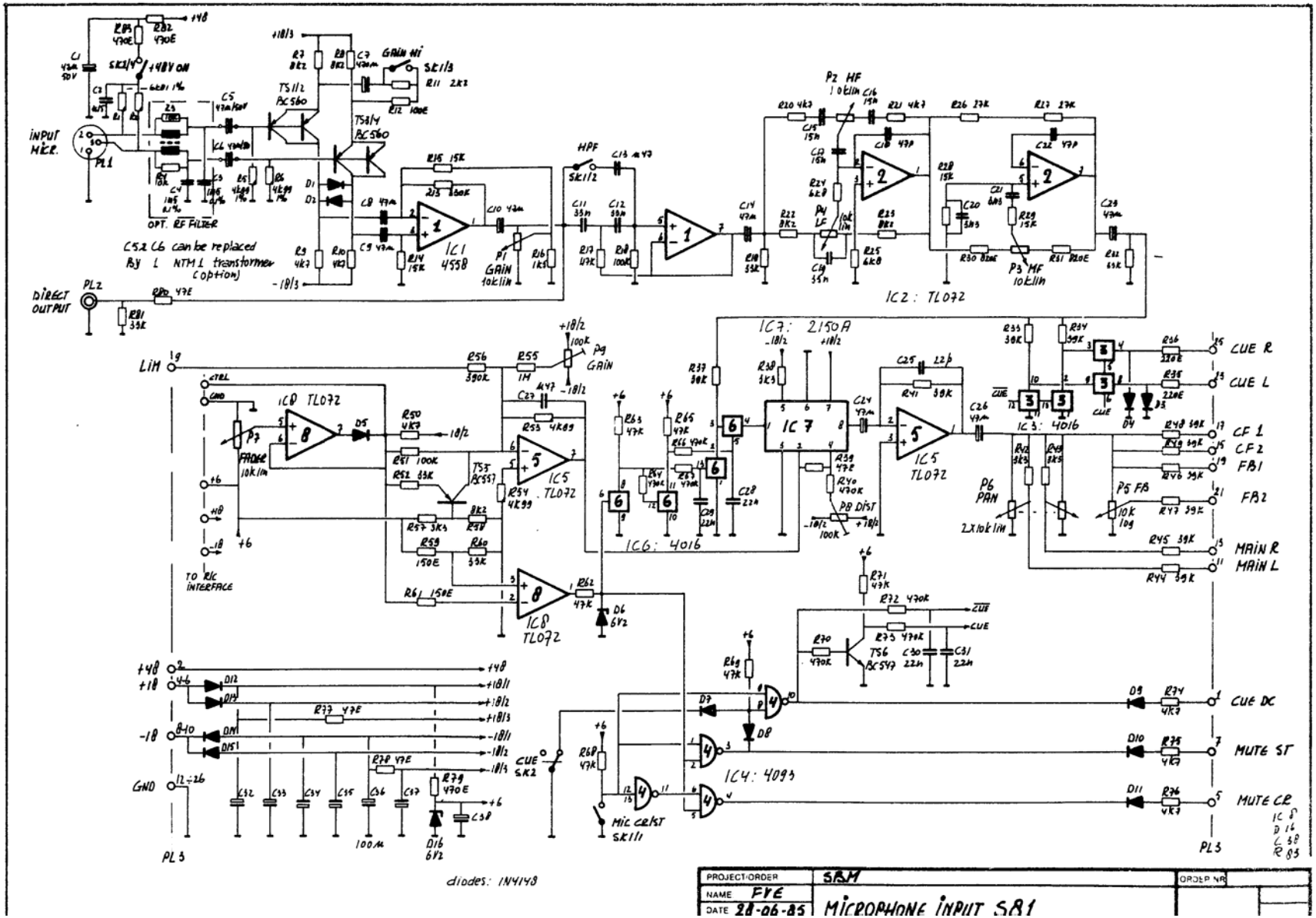
The POWERSUPPLY is built in in the console and has his mains input and ON/OFF SWITCH underneath the meterbridge.

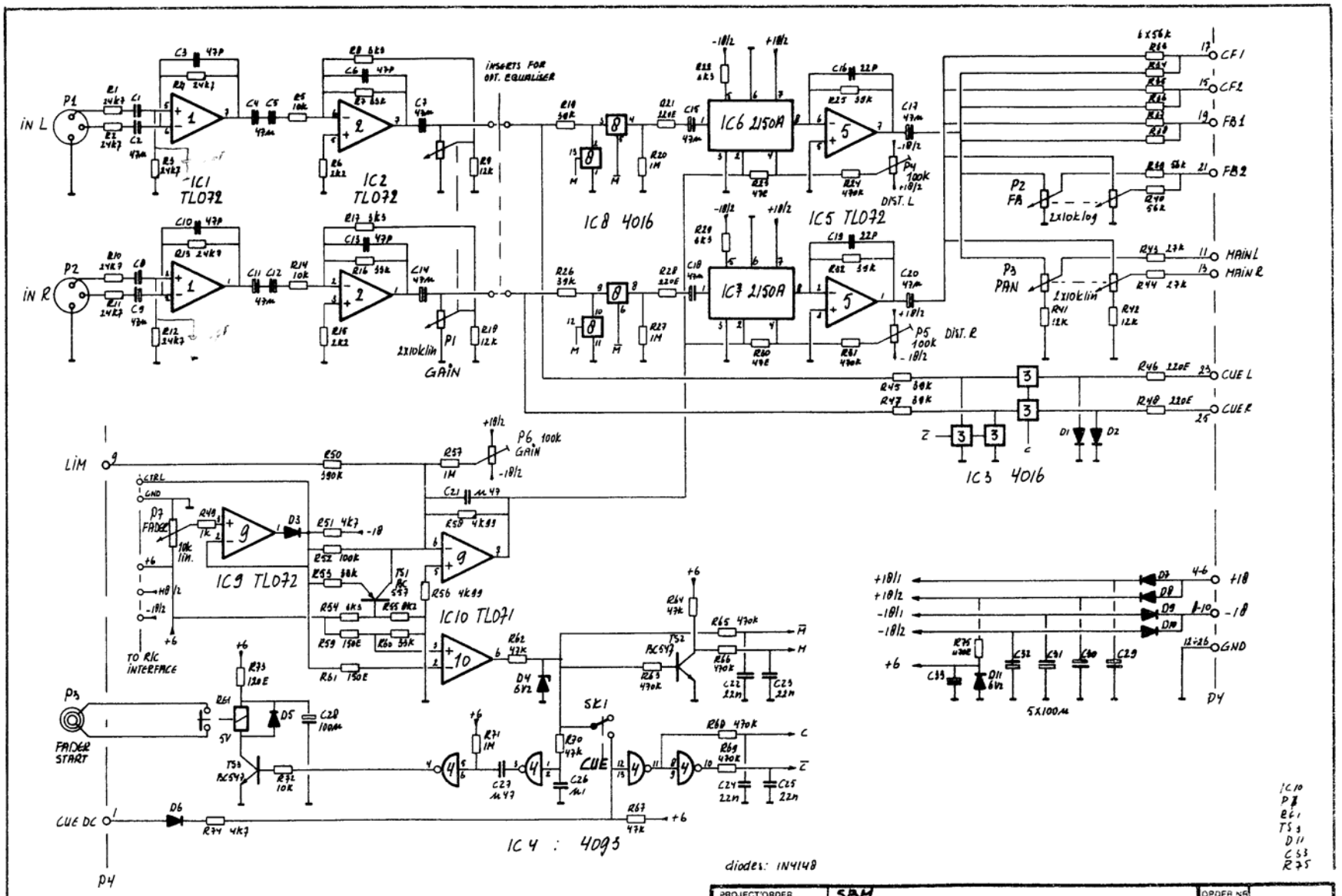


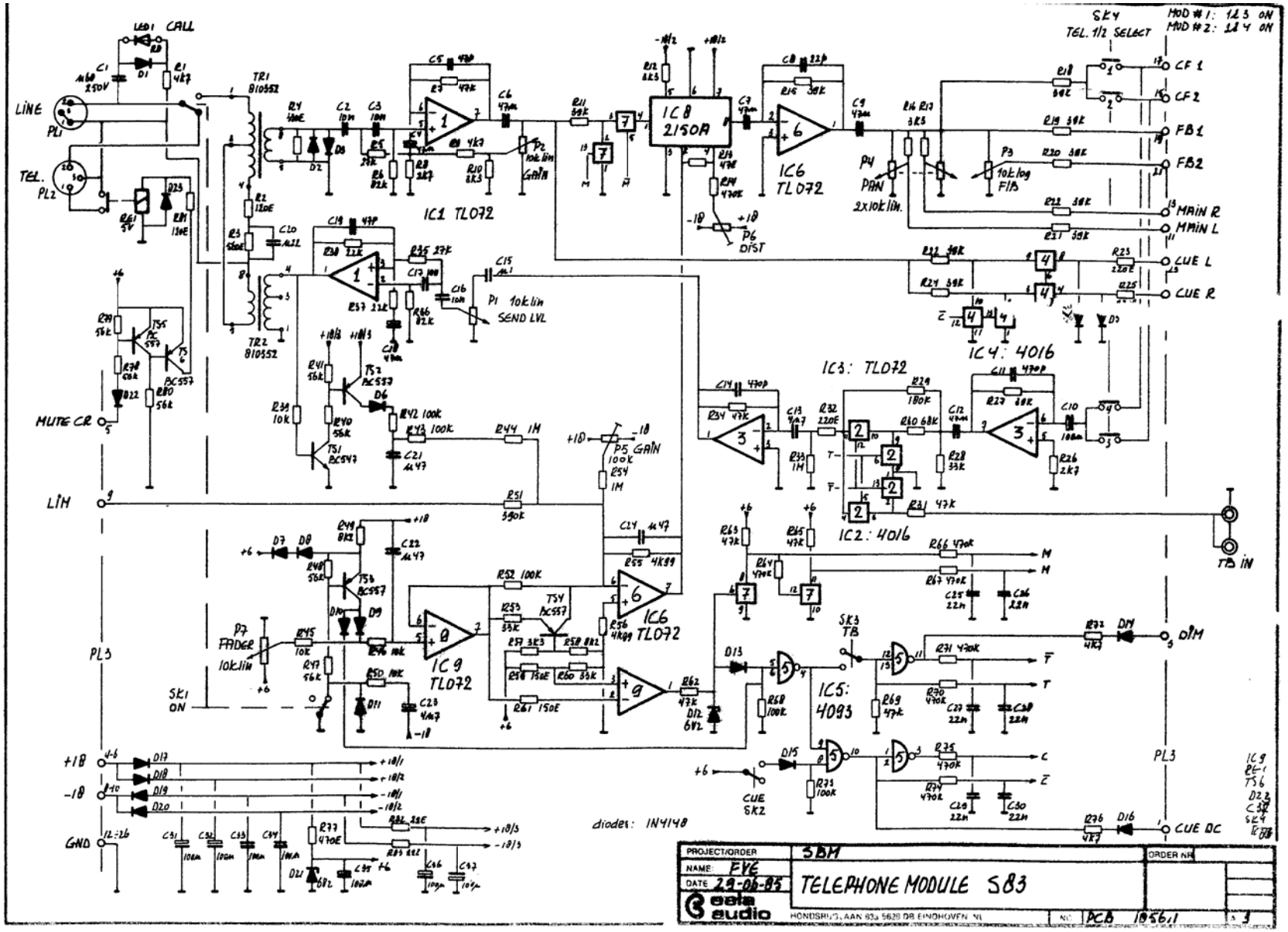
PROJECT/ORDER	SBM ON AIR CONSOLE	ORDER NR	
NAME FVE	BLOCK DIAGRAM		
DATE 22-02-85			
eela audio	HONDSRUGLAAN 83a 5628 DB EINDHOVEN NL	NC	A 3

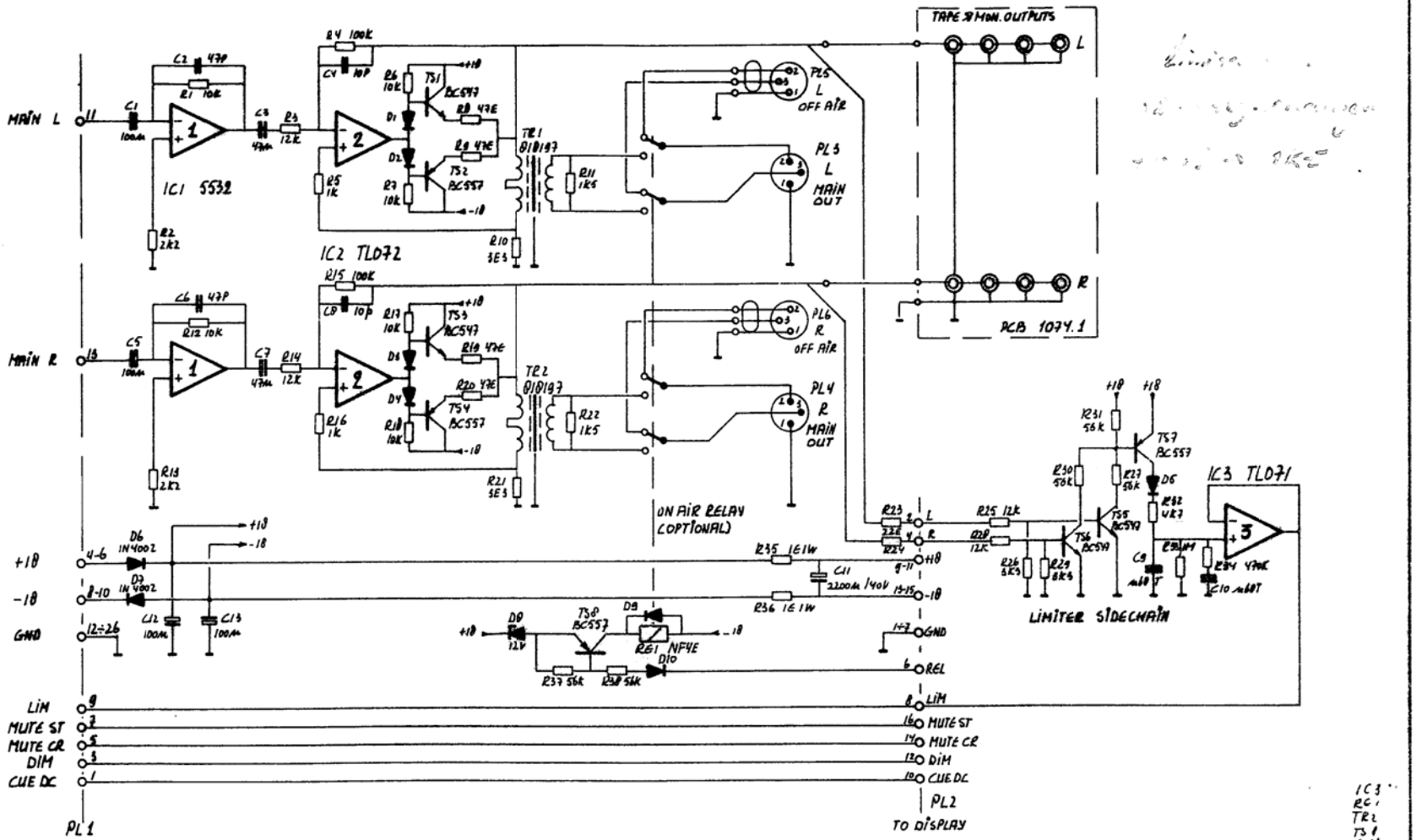
COVERED BY OVERBRIDGE

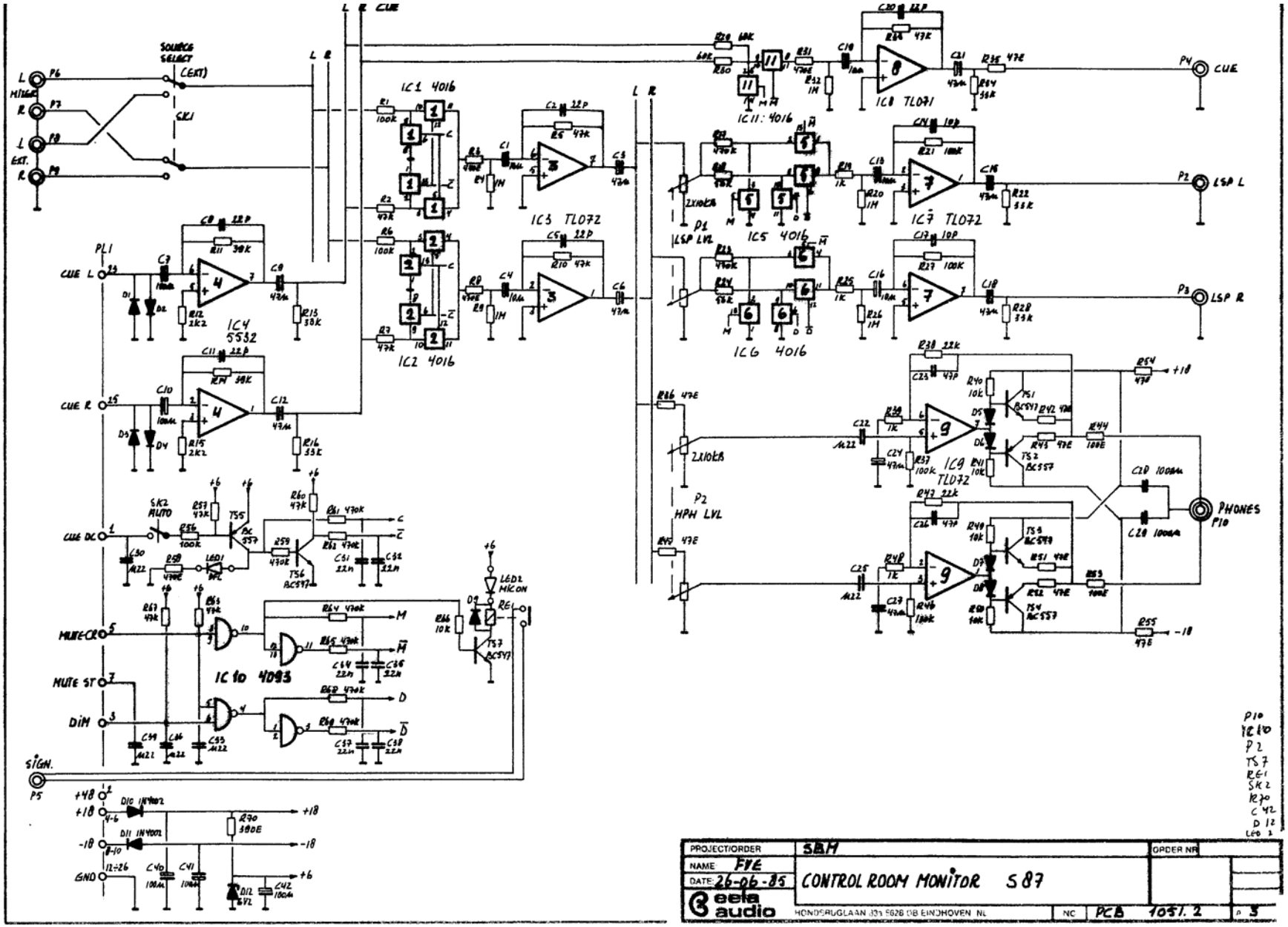
FRONT PANEL LAYOUTS SBM 08-11-84 PTE


INPUT MIC.
PL1
OPT. RF FILTER
C5,C6 can be replaced By L NTM1 transformer (option)
IC1 4558
GAIN Hi
HPF
P1 GAIN 10k lin
P2 HF 10k lin
P3 MF 10k lin
IC2 : TL072
DIRECT OUTPUT
PL2
LIM
IC8 TL072
IC5 TL072
IC7 : 2150A
IC6 : 4016
IC3 : 4016
P4 FADE 10k lin
P6 PAN 2x10k lin
P5 FB
P8 DIST
CUE R
CUE L
CF 1
CF 2
FB1
FB2
MAIN R
MAIN L
TO R/C INTERFACE
IC4 : 4093
MIC CR/ST SK11
CUE SK2
CUE DC
MUTE ST
MUTE CR
PL3
diodes: 1N4148
PROJECT/ORDER SAM
NAME FVE
DATE 28-06-85
MICROPHONE INPUT SB1
ORDER NR


IN L
IN R
P1
P2
IC1 TL072
IC2 TL072
INSERTS FOR OPT. EQUALISER
IC8 4016
IC6 2150A
IC7 2150A
IC5 TL072
P4 100k DIST. L
P5 100k DIST. R
P2 FB 2x10k log
P3 PAN 1x10k lin
IC3 4016
CF1
CF2
FB1
FB2
MAIN L
MAIN R
CUE L
CUE R
P1 2x10k lin GAIN
P6 100k GAIN
LIM
P7 FADER 10k lin.
IC9 TL072
IC10 TL071
TO RIC INTERFACE
P3
FADER START
CUE DC
P4
SK1
CUE
IC4 : 4093
+18/1
+18/2
-18/1
-18/2
+6
GND
+18
-18
5x100µ
diodes: IN4148
IC10
P7
P3
TS3
D11
C53
R75
PROJECT/ORDER
SBM
ORDER NR
NAME EVE
DATE 28-06-85
STEREO LINE INPUT SB2

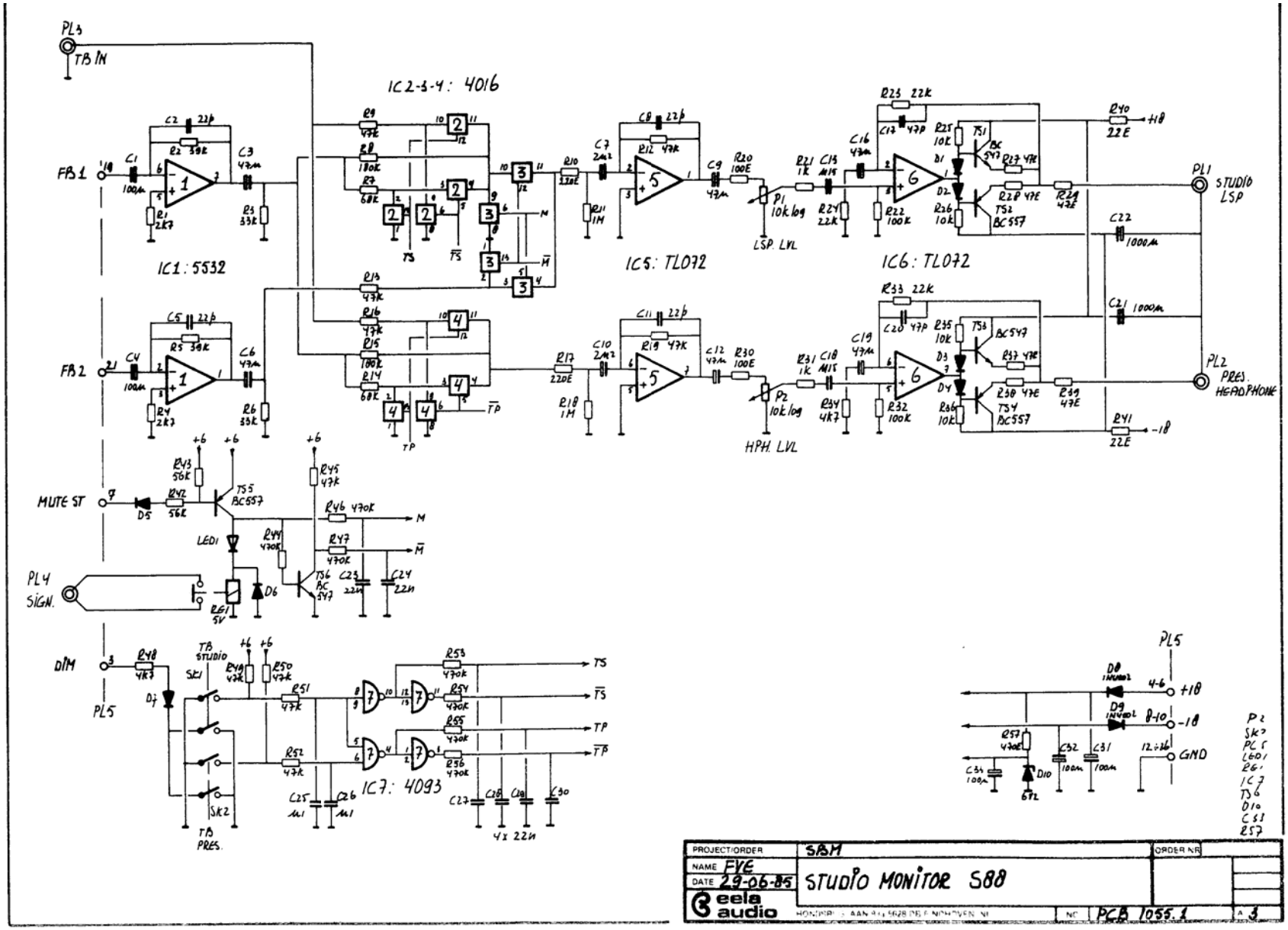

LINE
TEL.
MUTE CR
LIM
SK1 ON
IC1 TL072
IC8 2150A
IC6 TL072
IC4: 4016
IC3: TL072
IC2: 4016
IC9 TL072
IC5: 4093
P1 10k lin SEND LVL
P2 10k lin GAIN
P3 10k log F/B
P4 PAN 2x10k lin.
P5 GAIN 100k
P6 DIST
P7 FADER 10k lin
SK3 TB
SK4 TEL. 1/2 SELECT
MOD #1: 1,2,3 ON
MOD #2: 1,2,4 ON
CF 1
CF 2
FB1
FB2
MAIN R
MAIN L
CUE L
CUE R
TB IN
DIM
CUE DC
CUE SK2
diodes: IN4148
SBM
TELEPHONE MODULE S83
DATE 29-06-85
eela audio
HONDSRUGLAAN 83a 5629 DB EINDHOVEN NL
PCB 185611


TAPE & MON. OUTPUTS
L
R
PCB 1074.1
MAIN L
MAIN R
IC1 5532
IC2 TL072
IC3 TL071
PL5 L OFF AIR
PL5 L MAIN OUT
PL6 R OFF AIR
PL4 R MAIN OUT
TR1 BIB197
TR2 BIB197
ON AIR RELAY (OPTIONAL)
LIMITER SIDECHAIN
+18
-18
GND
LIM
MUTE ST
MUTE CR
DIM
CUE DC
REL
PL1
PL2
TO DISPLAY
DIODES: IN4148
PROJECT/ORDER S&M
NAME FYE
DATE 26-06-85
MASTER SB6
ORDER NR
eela audio
HONSRUGLAAN 83a 5628 DB EINDHOVEN NL
NC PCB 1050.2
A 3

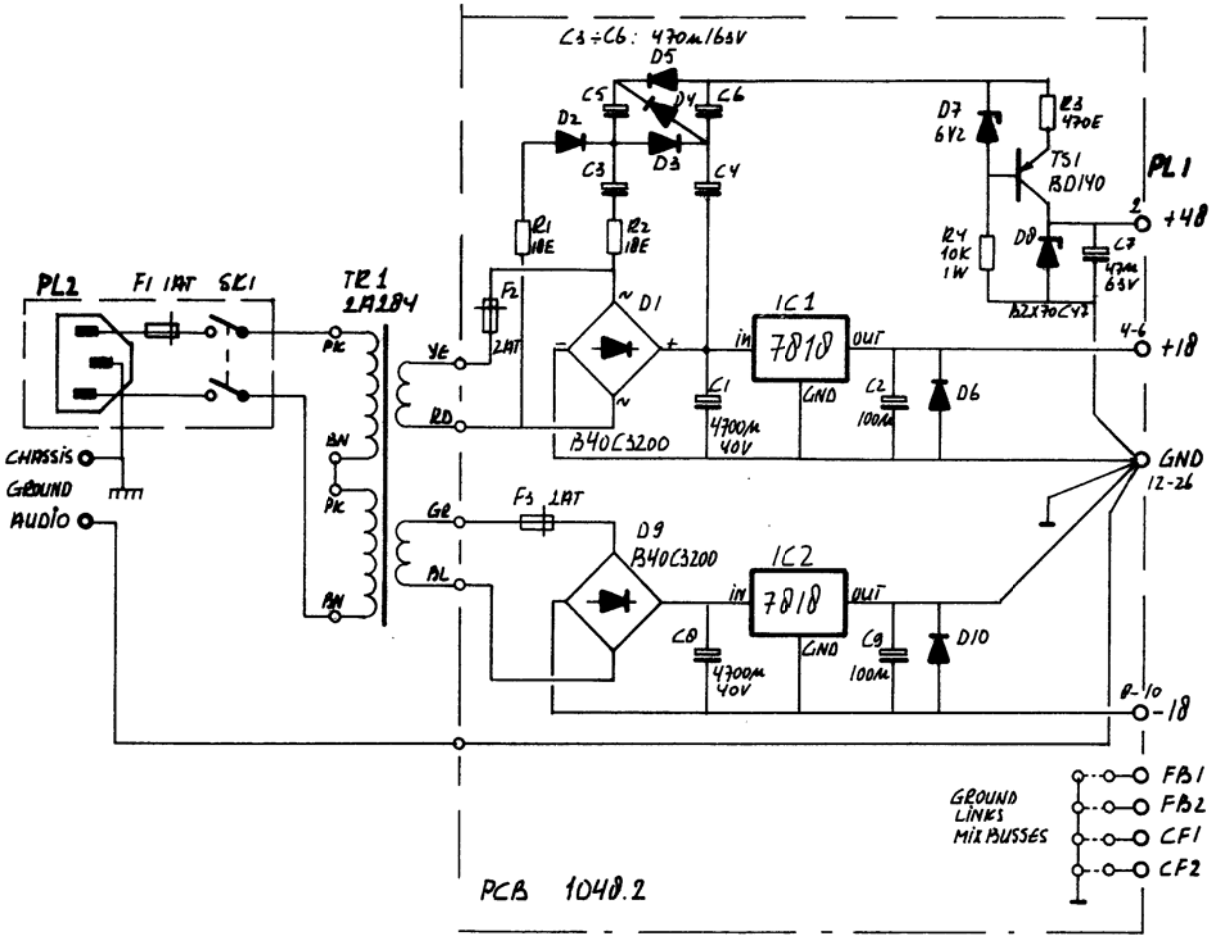


P10
IC10
P2
TS7
RE1
SK2
R70
C42
D12
LED2

PROJECT/ORDER	SBM	ORDER NR	
NAME FVE			
DATE 26-06-85	CONTROL ROOM MONITOR S87		
eela audio	HONDSRUGLAAN 331 5628 DB EINDHOVEN NL	NC	PCB 1057.2 p 3

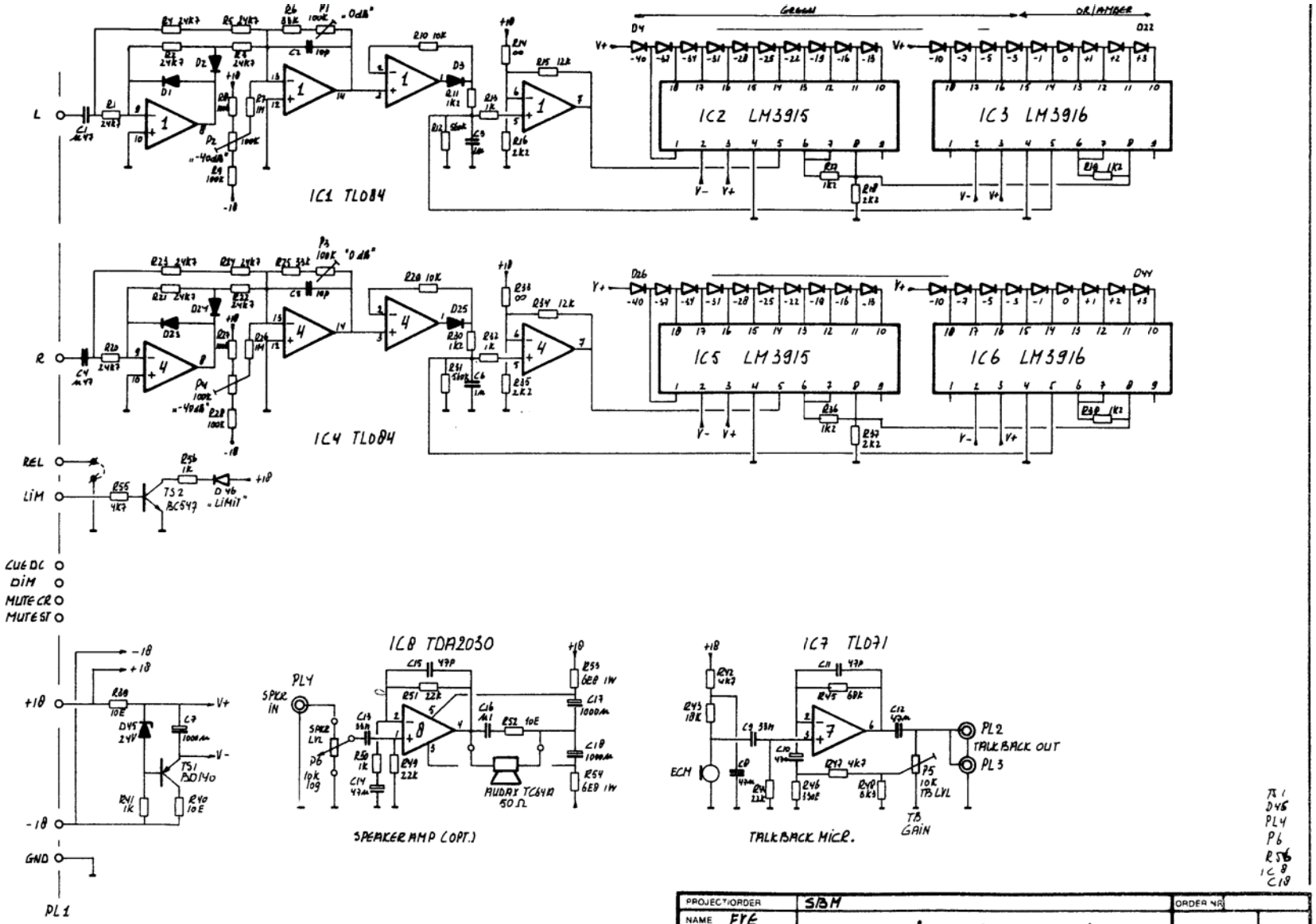


PROJECT/ORDER	SBM
NAME	FVE
DATE	29-06-85
	STUDIO MONITOR S88
eela audio	PCB 1055.1



DIODES: IN4002

PROJECT/ORDER	SBM	ORDER NR	
NAME FVE	POWERSUPPLY S89		
DATE: 26-06-85			
eela audio	HONDSRUGLAAN 83a 5628 DB EINDHOVEN NL	NC PCB 1048.2	A 4



PROJECT/ORDER	SBM	ORDER NR	
NAME FYE	METERBRIDGE (STANDARD)		
DATE 30-06-05			
eela audio		PCB 1049.2	3