

**Operators & Service
Manual
DN330**



KLARK TEKNIK

an **EVI AUDIO** company

SIGNAL PROCESSING BY DEFINITION

Introduction

The equaliser is a vital component in any audio system. The entire signal passes through it and so any limitations imposed by the equaliser will compromise the performance of the whole system. For example, an indifferently designed equaliser may introduce severe phase distortion, noise and other anomalies related to centre-frequency accuracy, filter shape and attenuation accuracy which may manifest themselves as an overall deterioration in the perceived sound quality of the system. Clearly this is an unacceptable state of affairs, but fortunately your choice to utilise Klark Teknik equaliser product will eliminate these problems, offering you unprecedented product performance coupled with the highest filter calibration and reliability standards in the industry.

For many years Klark Teknik has been at the forefront of equaliser design, and have carried out detailed research into optimum filter response characteristics, including their sonic performance.

The Series 300 range of equalisers is a direct result of this research. It should be noted that equalisation cannot always overcome all frequency response related problems. There are applications where the ability to cut or boost the response at a particular frequency, or over a certain bandwidth other than the equaliser specified one, is required to overcome exceptionally difficult response anomalies or narrow band feedback problems. When such an instance is encountered, it may be more appropriate to use the greater range of control provided by a parametric type equaliser, where the centre frequency, bandwidth and amplitude are all controllable.

When using an equaliser remember that the need to use large amounts of boost or cut within the equalisation curve indicates that there may be something fundamentally wrong with the sound system or room acoustics, which should be further investigated and corrected before final equalisation is applied.

Both the input and output circuitry is electronically balanced. The input is voltage and current matched and gives exceptional noise, distortion and CMR performance, while the output circuitry is based on the Midas XL3 output stage giving high drive capability.

Operation is normally from the mains supply with the 24VDC supply being utilised upon the failure of the mains. If no 24V is available then the internal relays will bypass the unit in the event of power failure.

DN330 Equaliser

The Klark Teknik DN330 is a single channel, 30 band equaliser offering 12dB of cut or boost in 1/3 octave steps between the frequencies of 20Hz and 20kHz.

Filter Shape and Combining Action

At the heart of any equaliser is the bank of filters used to shape the signal response, and Klark Teknik utilise a proprietary filter circuit which replaces the conventional inductor based circuit, at the same time, offering several performance advantages. Inductor based circuits are heavy, expensive to produce and suffer from low frequency distortion and induced hum. Klark Teknik's proprietary filters on the contrary suffer none of these problems, yet offer unequalled phase response and control accuracy with the additional benefits of low noise and minimal ripple.

The nature, shape and way in which individual equaliser filters combine, has a profound effect on the control provided by the equaliser and on the resulting quality of sound. The majority of applications within the sound reinforcement, broadcast and recording fields, require a smooth and continuous equalisation response curve in order to correctly contour the overall response characteristics of a sound system, loudspeaker, recording effect or audio channel. To achieve this, the individual filters must be capable of combining smoothly together to result in a continuous response curve, free from shape discontinuities in order to avoid unwanted audible peaks or anomalies in the final sound.

Individual channel level controls, overload indicators and bypass switches with incorporated low cut filters are featured on the control panel.

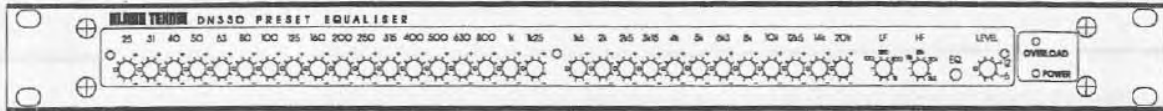
Other features

The bypass switch silently removes the graphic equaliser sections from the signal path. The equaliser also incorporates variable low and high pass 12dB/octave filters with a range from 2K.5Hz to 30kHz and 15Hz to 300Hz respectively.

Other features include an overload LED per channel, which warns of impending overload at any point in the equaliser. A detachable security cover is an inherent feature to prevent unauthorised personnel from tampering with the control settings.

This product is built to the same high electrical and mechanical standards as all Klark Teknik equipment and is both robust and stylish. It occupies a standard one unit of rack space and has electronically balanced inputs and outputs.

Front Panel Functions



Other than the power on and clip indicators no user controls or indicators are available with all set-up controls secured behind the central removable panel.

Remove the three pozidrive screws to gain access to these controls.

1. Input level control allowing system gain of up to +12dB in the fully clockwise position and attenuation of up to -6dB in the fully anticlockwise position. When the 'slot' is horizontal it is in the 0dB, unity gain position.
2. EQ in/out switch. This switch allows the bypassing of the equaliser selected as follows:
Down: Equaliser & filters bypassed. The gain control is still active.
Up: Equaliser in circuit.
3. The low frequency filter (high pass) has a continuously variable turnover frequency from 15Hz to 300Hz.
4. The high frequency filter (lo pass) has a continuously variable turnover frequency from 2.5kHz to 30KHz.
5. Thirty high quality, sealed rotary preset filter level controls each providing between +12dB boost and -12dB cut at the 1/3 Octave ISO standard frequencies. When the "slot" is horizontal the filter is flat.
6. Overload led. The signal level is monitored at several separate points within the circuitry of the unit. If any one of these signals exceeds a threshold set 3dB below clipping the led will light. It must be remembered that excessive boost at some frequencies combined with a high average input signal can occasionally cause the clip sensing threshold to be exceeded. In this event the gain control should be turned down to correct the problem. However, if the input signal itself exceeded 20 dB the input stage will be overloaded. If this problem arises then the signal level from the equipment feeding the equaliser must be reduced.

Rear Panel Functions

7. Mains is supplied via an IEC standard 3 pin connector. A compatible power cord is supplied with the unit.
8. The mains fuse is located in the draw that is part of the mains input connector. A spare fuse is also stored here. Disconnect the unit from the mains supply before replacing the fuse. Always replace the fuse with the correct type and rating.
9. Two sockets are provided for the connection of the 24V DC supply. These are standard 4mm 'banana' type. The sockets are on a standard 19mm pitch to allow the use of twin stackable connectors. The polarity of the DC supply must be maintained for operation though incorrect connection will not damage the unit.
10. Input and output connections are via complementary XLR style connectors. For wiring details see the page entitled Audio Connections.

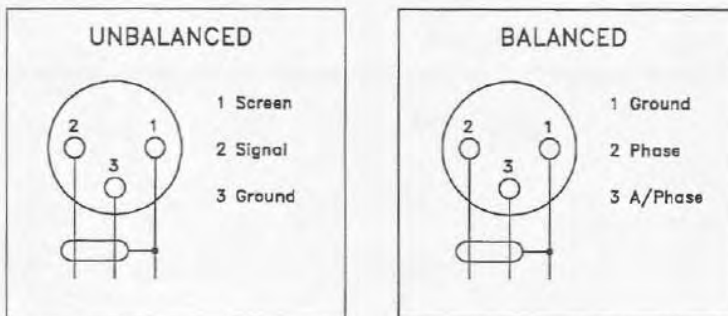
NOTE: The security cover is normally fixed with M3 pozidrive screws. For installations where the utmost security is required these can be replaced with tamperproof type of M3 x 6mm.

Audio Connections

Inputs

The input circuitry is a transformerless, electronically balanced design which achieves a symmetry of better than -50dB from 20Hz to 10kHz.

It is always preferable to drive the equaliser from a balanced source. If only an unbalanced source is available it is recommended that it is connected as shown below. Connect the screen only at the equaliser end.

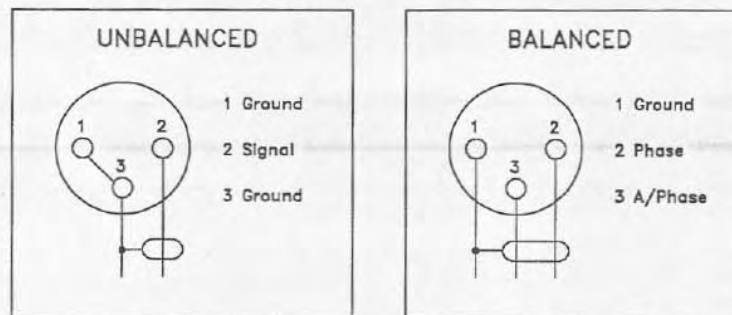


Outputs

The standard outputs are electronically balanced and is capable of driving +19dBu into 600 ohms and +20dBu into 2K.

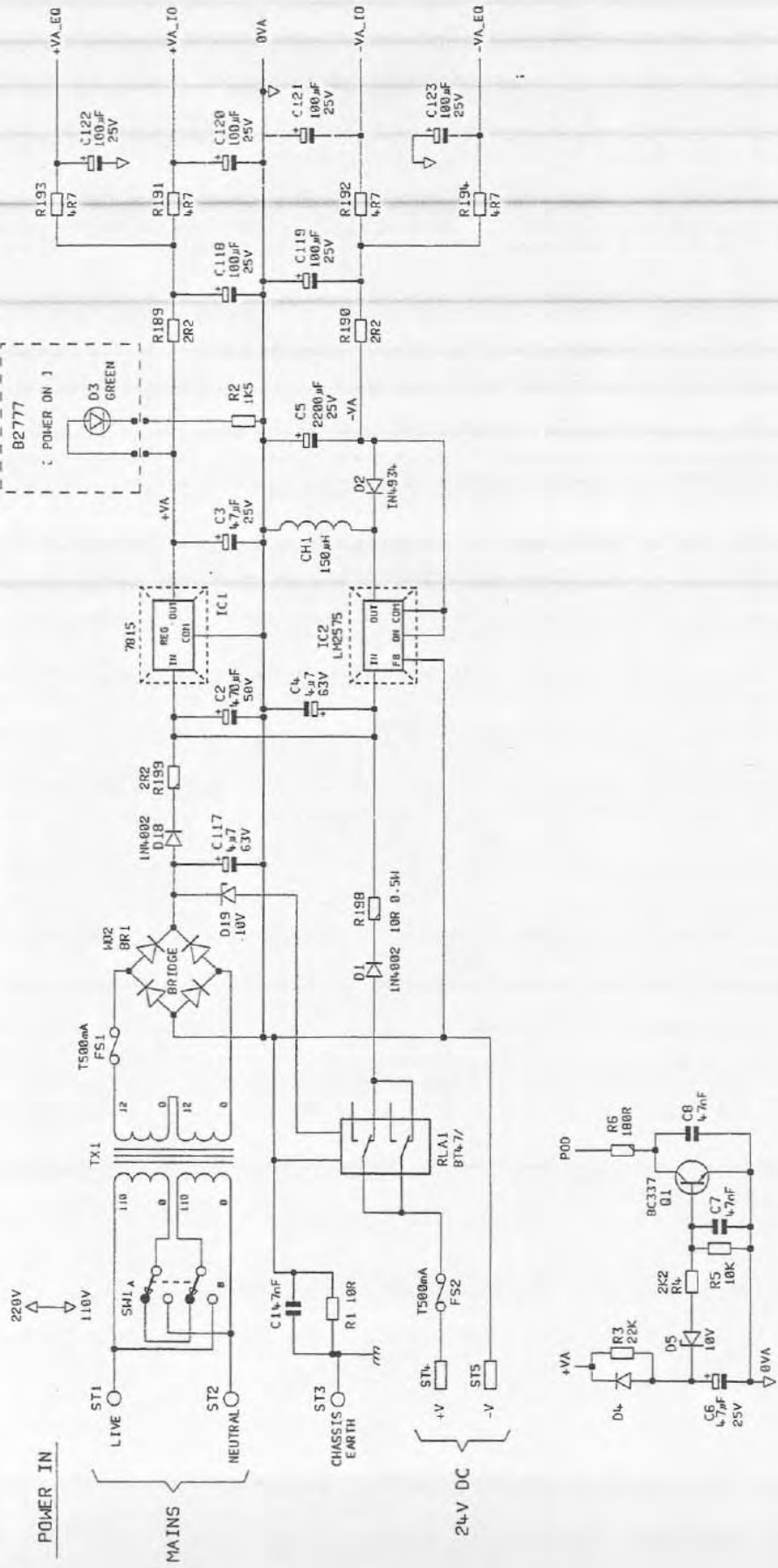
It is recommended that the equaliser feeds into a balanced input, however to feed an unbalanced input it is necessary to connect the antiphase output to ground. This is best carried out on the XLR output connector of the equaliser.

Note: When using a fully balanced system, either pin 2 or pin 3 can be phase.



Technical Specifications

Input	One
Type	Electronically balanced
Impedance	
Balanced	20Kohms
Unbalanced	10Kohms
Max input level	20dBm
Output	One
Type	Electronically balanced
Source impedance	50 ohms
Min.load impedance	600 ohms
Max.level	20dBu with 2Kohm load
Performance	
Frequency response	
20Hz to 20kHz, EQ flat	+/-0.5dB
THD+N @ +4dB	<0.01% @ 1kHz
Equivalent input noise	
(20Hz to 20kHz unweighted)	<-86dBu
Gain	-6 to +12dB
Filters	
Type	Proprietary "combining"
ISO centre frequencies	30, 25Hz to 20kHz
Frequency tolerance	5%
Maximum boost/cut	+/-12dB
High pass filter	15Hz to 300Hz, 12dB/octave
Low pass filter	2K5Hz to 30KHz, 12dB/octave
Power requirements	
AC Voltage	115/230 +/-12%, 50/60Hz
Consumption	<15VA
DC Voltage	24V +/-12%
DC Consumption	<250mA
Weight	
Nett	2.5kg
Shipping	4kg
Dimensions	
Width	482mm (19 inches)
Height	45mm (1 3/4 inches)
Depth	210mm (8 1/4 inches)
Terminations	
Inputs	3 pin XLR
Outputs	3 pin XLR
AC power	3 pin IEC
DC power	2x4mm "Banana" type

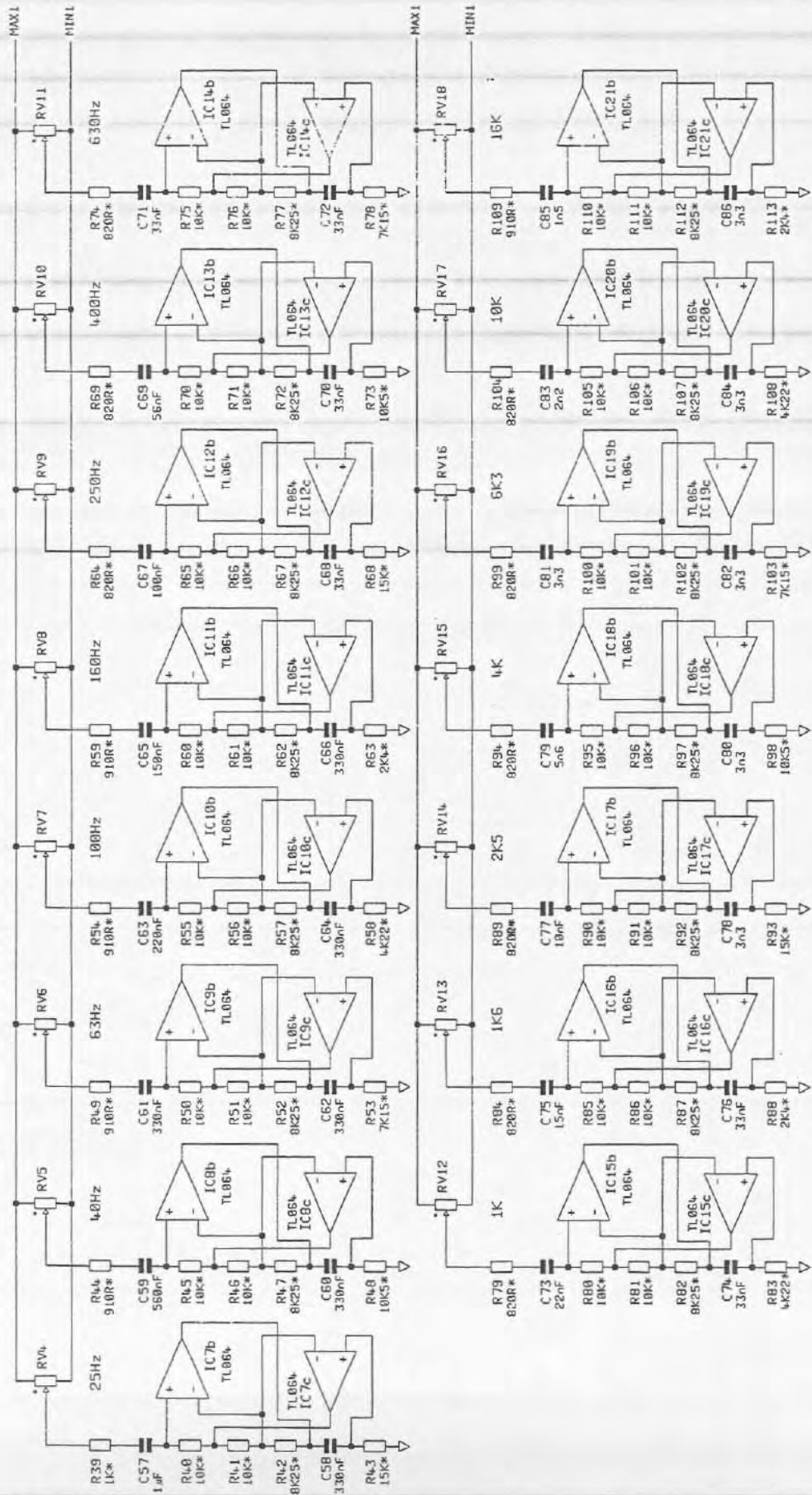


ALL UNMARKED DIODES INL148

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Drawn: DGT	Checked:	DN320	POWER SUPPLY	4 OF 4
BOARD No. B2776 & B2777		DWG No. DN330_4.DGM	ISSUE: 2	DATE: 14.Mar.94

RV4 to RV18 = 20K Lin (203B)
 * = 1%

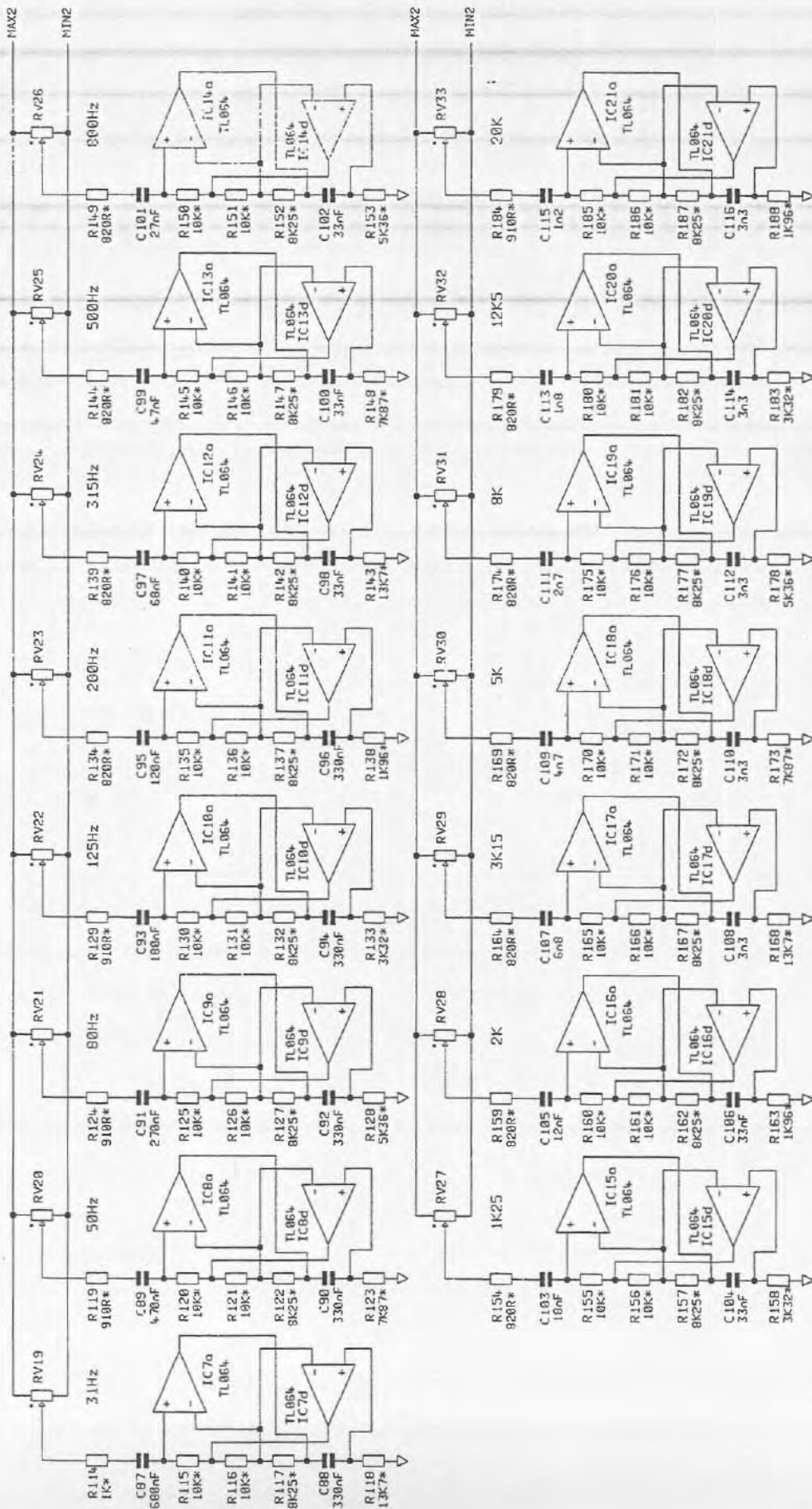


KLARK TEKNIK

Drawn : DGT	Checked :	DN330	FILTERS . BLOCK 1	2 OF 4
BOARD No . B2776		DWG No . DN330_2.DGM	ISSUE : 2	DATE : 20.Mar.94

RV19 to RV33 = 20K Lin (203B)

* = 1%



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Drawn: DGT

Checked:

DN330

FILTERS, BLOCK 2

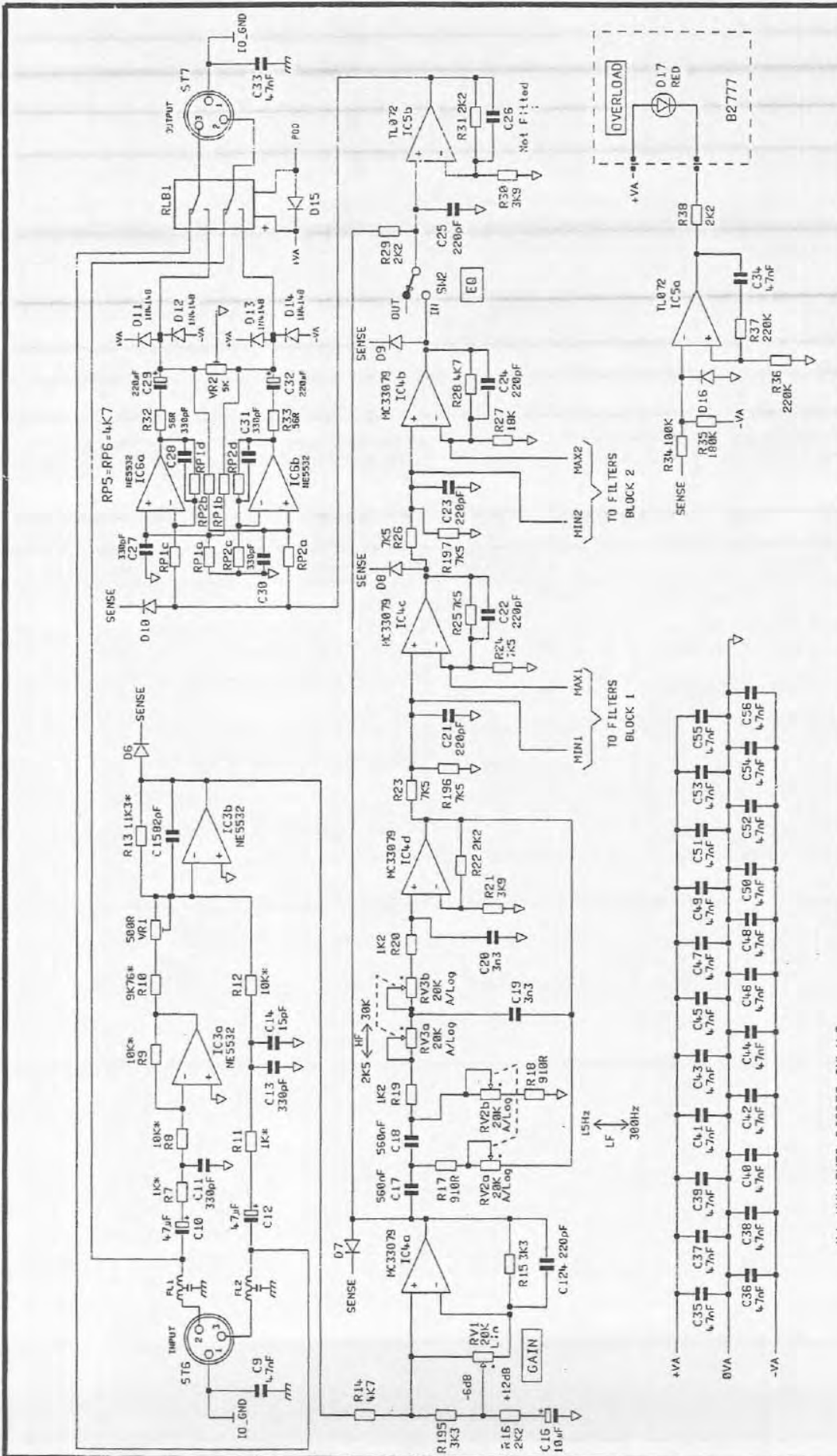
2 OF 4

BOARD No. B2776

DWG No. DN330_3.DGM

ISSUE: 2

DATE: 20.Mar.94



ALL UNMARKED DIODES INH14B
* = 1%

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Drawn: DGT	Checked:	DN330	MAIN SIGNAL PATH	1 OF 4
BOARD No. B2776 & B2777		DWG No. DN330_1.DGM	ISSUE: 2	DATE: 20.Mar.94