TUBE-TECH LCA 2A
compressor and limiter

DESCRIPTION:

The TUBE-TECH LCA 2A is a two channel unit with an independent compressor and limiter per channel. The unit is all tubebased (except for the power supply and sidechain circuit). Input gaincontrol is placed before the input transformer. The VCA (1 dual triode) is placed between the input transformer and the outputstage (2 dual triodes). The audio signal is picked up after the VCA and fed to the sidechain circuit. The control signal from the compressor and from the limiter is combined and sent to the link switch and to the control amp, which feeds the VCA. The bidirectional link busses are accessible at two 1/4" stereo jack sockets on the rear panel. The channels can be linked together for stereo applications and also linked to other LCA 2A's via the two link busses and a standard stereo jack/jack cord.
The compressor has six attack/release presets as well as manual control.
The limiter attack/release is fixed.
The LED display is fed from the control amp. The limiter LED is fed from the limiter buffer.
The audio path is fully symmetrical from input to output.
Input and output have fully floating transformers.
All DC voltages are stabilized, except the anode voltage for the outputstage.

COMPRESSOR INTERCONNECTION:

The sidechain sockets for interconnection of several compressors is located on the rear panel.

A switch (LINK 1, LINK 2) on the front selects which compressors are interconnected, and on which bus they are connected. If you select LINK 1 on both channels, they will perform exact the same gainreduction.
Having several connected compressors in a rack, you can select which compressors you will have working together.
By selecting e.g. compressor 1 ch. 1 on link 1, compressor 2 channel 2 on link 1 and compressor 3 ch 1 on link 1, they are now interconnected and all three will perform the exact same compression.

The interconnection implies, that the unit which performs the most compression is controlling the others.
To choose which one you want to control, select the attack/release time, the threshold and the ratio on that unit, and turn the threshold fully counterclockwise on the reminding compressors.
It is of course possible to have all the interconnected compressors control each other simultaneously.

CONTROLS:

GAIN: The **gain** control is used to "adjust" for the gain loss which takes place when the unit is compressing. It is placed before the inputtransformer. The **gain**-control is continuously variable from -6 dB to +20 dB.

DISPLAY: The green LED display shows the gainreduction for both the compressor and for the limiter. A red LED show if the limiter is active.
The display is from the factory supplied in dotmode. This can be altered to a bar by placing a strap on U6 (U106) from pin 3 to pin 9

LINK SWITCH:
Interconnects several compressors on linkbus 1 or linkbus 2.
If the compressor is left in the off position, it works entirely independently.

IN/BYPASS: This switch switches the compressor in and out of the signal path. In the bypass position the entire unit is switch out.

COMPRESSOR:

RATIO: The **ratio** control varies the ratio by which the input signal is compressed.
If the ratio selected is to 2:1, and the input signal increases 10 dB, the output signal is only increased by 5 db.The **ratio** control is continuously variable from 1,6:1 to 20:1.

THRESHOLD: The threshold is the point where the compressor begins its action. It is defined as the point where the gain is reduced by 1 dB.
The threshold is related to the output level and is continuously variable from off to -10 dBm.

ATTACK: The **attack** control chooses how fast/slow the compressor responds to an increase in the input signal. The attack control is continuously variable from 0.3 to 10 milliseconds.

RELEASE: The **release** control chooses how fast/slow the compressor responds to a decrease in the input signal. The release control is continuously variable from 0,07 to 2 seconds.

ATTACK/RELEASE SELECT:

This switch selects how the compressor reacts to a increase (**attack**) or decrease (**release**) of the input signal.

There are two settings of the switch:

1. Manual.
   attack time: from 0.3 msec to 10 msec
   release time: from 0.07 sec to 2 sec

2. Preset.

	attack	release
pos 1.	1,5 mS	0,25 S
pos 2.	1,5 mS	0,8 S
pos 3.	3 mS	2,2 S
pos 4.	6 mS	5,0 S
pos 5.	3 mS	0,5/4 S
pos 6.	1,5 mS	0,5/4/20 S

The release time in position 5 and 6 is program dependent, that is:

pos 5, 6	for short peaks:	0,5 S
pos 5, 6	for long peaks:	4 S
pos 6	for continuously high levels:	20 S

LIMITER:

THRESHOLD: The threshold is related to the output level and is continuously variable from off to 0 dBm.

ratio:	20:1
attack:	0,6mS
release:	0,5 S

We recommend that the balance adjustment of the VCA, is carried out every 6 month.

LYDKRAFT Aps
Ved Damhussøen 38, DK 2720 Vanløse
Denmark

ADJUSTMENT PROCEDURE:

CAUTION:
Before making any adjustment let the unit heat-up at least 30 min.

Always check the DC voltages at the power supply.

When the VCA tube has been replaced, adjustment of:
BASIC GAIN
GAIN REDUCTION
BALANCE
shall be carried out

The adjustment procedure refers to channel 1. The trimpots in brackets is for channel 2.

At the sidechain jacksockets at the rear of the unit, the tip is link 1 and the ring is link 2.

ADJUSTMENT OF BASIC GAIN:

1) Turn the **THRESHOLD**-control for the compressor and limiter fully counter-clockwise.

2) Apply a signal of 1 kHz, 0,0 dBm to the input of the compressor.

3) Turn the **GAIN-**control fully clockwise (+20).

4) Adjust the preset **GAIN** P3 (P103) (located on amp/psu PCB) to an output-reading of +20,0 dBm.

ADJUSTMENT OF GAINREDUCTION:

1) Turn the **THRESHOLD**-control for the compressor and limiter fully counter-clockwise.

2) Apply a signal of 0,0 dBm, 1 kHz to the input of the compressor.

3) Adjust the **GAIN**-control to an output-reading of 0,0 dBm.

4) Apply a DC-voltage of +5,000 V into the sidechain jacksocket (tip).

5) Set the **LINK**-switch at LINK 1 and observe that the outputlevel has dropped to -20,0 dBm.

6) If this is not the case, adjust the level with P 7 (P107) at the sidechain PCB, to obtain a drop of exactly -20,0 dB.

ADJUSTMENT OF DISPLAY:

1) Turn the **THRESHOLD**-control for the compressor and limiter fully counter-clockwise.

4) Apply a DC-voltage of +5,000 V into the sidechain jacksocket (tip).

5) Set the **LINK**-switch at LINK 1 and observe that the -13 LED just turns off and the -20 LED is on

6) If this is not the case, adjust P 8 (P108) at the sidechain PCB.

ADJUSTMENT OF BALANCE IN THE VCA TUBE (V1, V101):

1) Turn the **THRESHOLD**-control for the compressor and limiter, and the **GAIN**-control, fully counter-clockwise.

2) Switch the **LINK**-switch to LINK 2.

3) Apply a sine wave of 1 kHz, +15 dBm via a 1KΩ resistor into the sidechain jacksocket (ring).
The +15 dBm shall be measured before the 1KΩ resistor. *

4) Adjust trimpot P2 (P102) (located on amp/psu PCB) to a minimum reading at the output.

5) Reduce the level of the sine wave to -5 dBm.

6) Adjust trimpot P1 (P101) (located on amp/psu PCB) to a minimum reading at the output.

7) Repeat step 3 - 6.

8) When both adjustments are at minimum, the level at the output in step 4, shall be lower than -20 dBm. If this can not be obtained, the VCA tube shall be rejected and replaced with new one.

* If the sine wave from the oscillator is observed on oscilloscope after the 1KΩ resistor, the negative part of the sine wave have been clamped to ground and will therefore be missing.

The balance adjustment of the VCA, should be carried out every 6 month.

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SPECIFICATIONS:

LCA 2A

Gain:	-6dB - +20dB
Input impedance:	> 2kΩ
Output impedance:	< 60Ω
Distortion (THD+n @ 40 Hz):	
0 dBm:	< 0,15 %
10 dBm:	< 0,15 %
max output (1% THD+n):	> +26 dBm

Noise (Rg=200Ω):

Gain:	0 dB	20 dB:
22Hz-22kHz:	< -85 dBm	< -85 dBm
CCIR-468-3:	< -78 dBm	< -78 dBm

Frequency response (-3dB):	5 Hz - 50 kHz
Crosstalk (20Hz-22kHz):	< -75dB
CMRR (@ 10kHz):	< -60dB

LED display for gain reduction: 0dB to 20dB

Compressor:

Ratio:	1,6:1 to 20:1
Threshold:	off to -10dBm
Attack (manual):	0,2 to 10 mS
Release (manual):	0,1 to 2 S

Preset attack/release:

	attack	release
pos 1.	1,5 mS	0,25 S
pos 2.	1,5 mS	0,8 S
pos 3.	3 mS	2,2 S
pos 4.	6 mS	5,0 S
pos 5.	3 mS	0,5/4 S
pos 6.	1,5 mS	0,5/4/20 S

The release time in position 5 and 6 is program dependent, that is:

pos 5, 6	for short peaks:	0,5 S
pos 5, 6	for long peaks:	4 S
pos 6	for continuously high levels:	20 S

Limiter:

Threshold:	off to 0dBm
attack:	0,6mS
release:	0,5 S
ratio:	20:1

LED indicating limiting

Tubes: 4xECC82, 2xECC83

Dimensions: H: 2 units, W: 19", D: 165 mm
Weight: 6.5kg
Power requirements:
(115V/230V, 50-60Hz): 65W

All specifications at RL=600Ω

Lydkraft reserves the right to alter specifications without prior notice

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SERVICE HINTS:

SYMPTOM	CAUSE	REMEDY
Noise	Noisy VCA tube (V1,V101)	Replace and adjust
Noise	Unbalance in VCA tube	Adjust balance
Noise	Control amp IC 4 (IC 104)	Replace. Check gain reduction and readjust
Hum	+12V, +110V ,+15V PSU	Repair
Overshoot when compressing	Unbalance in VCA tube	Adjust balance
Oscillations with no signal and max ratio and low threshold	Unbalance in VCA tube	Adjust balance (replace tube)