

ULTIMATE HIGH FIDELITY STEREO COMPONENT



MODEL L-100

100

SOLID STATE INTEGRATED AMPLIFIER

The latest creation from LUXMAN for those  
seeking real quality

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Archiv Michael-Otto*



The L100 offers an astounding 110W RMS per channel with both channels driven into 8 ohms with no more than 0.05% total harmonic distortion at any frequencies from 20Hz — 20KHz. The world's 1st electronic "Touch-mute" circuitry allows you to reduce the volume instantly. LUXMAN's exclusive "Linear Equalizer" makes it possible to tailor reproduced sound subtly according to recording characteristics.

#### CIRCUIT DESCRIPTIONS

The equalizer section employs 1 stage differential amplification whole-stage direct-coupled circuit with cascode amplifier.

The differential amplification circuit adopted at the initial stage helps stabilize DC throughout the whole-stage direct-coupled circuit and at the same time improves linearity.

Cascode amplifiers are specially used at this differential amplifier and in the following stages to improve linearity at the treble range as well as stability and S/N ratio.

The final stage consists of an inverted Darlington push-pull circuit of class A operation, which keeps the signals harmless from load condition given by tape-deck etc. (to be connected at the later stage). Also at the various key points used are the constant current supply circuits to obtain better linearity from the transistors located on the signal path and to improve open loop-gain for perfect operation of the differential function.

At the intermediate amplifier and tone control amplifier section, too, we use whole-stage direct-coupled circuits with cascode amplifier so as to ensure optimum linearity at the treble range and to improve stability and S/N ratio.

A constant current supply circuit at the output stage helps transistors play their role to the maximum capability.

LUXMAN's exclusive NF type tone controls are provided together with turn-over (roll-off) frequency selectors, which can be released if not necessary.

Independent filter circuits of sharp slope -12dB/Oct. are provided for each cut-off frequency so that simple and perfect switch-over can be realized as a whole circuit.)

Of course signals bypass these filter circuits if they are set at the "OFF" position.

This filter is of NF type utilizing emitter-follower, but composed by 2 transistors wherein one is used for emitter-follower while the other for the constant current purpose.

Therefore, optimum linearity can be obtained from the transistor of emitter-follower and high open loop-gain can be realized.

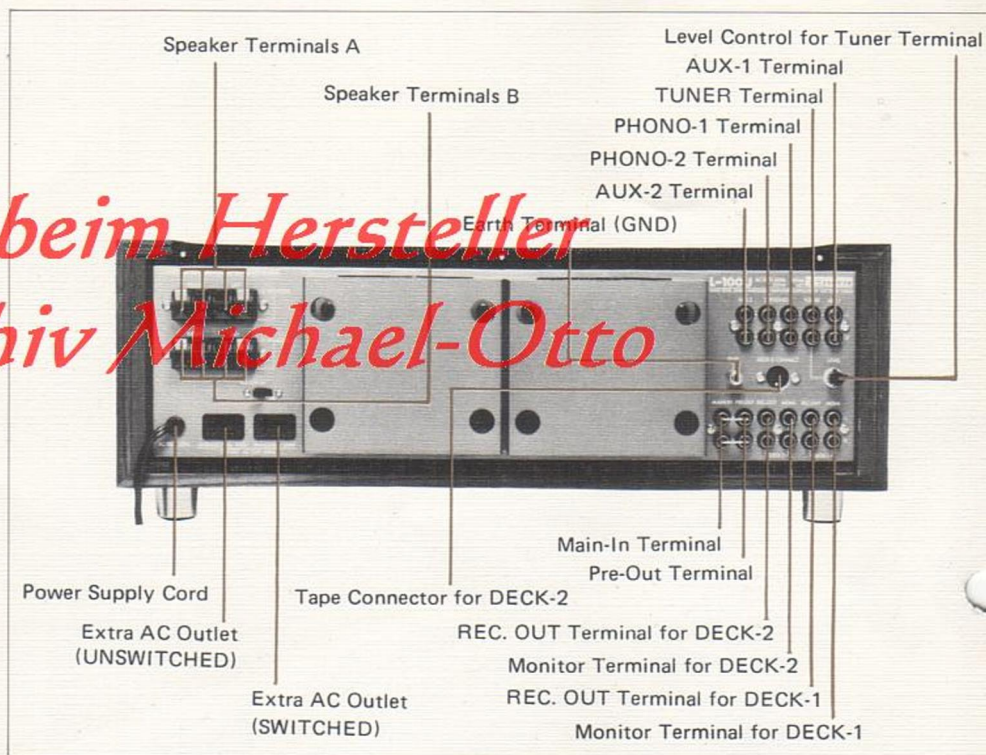
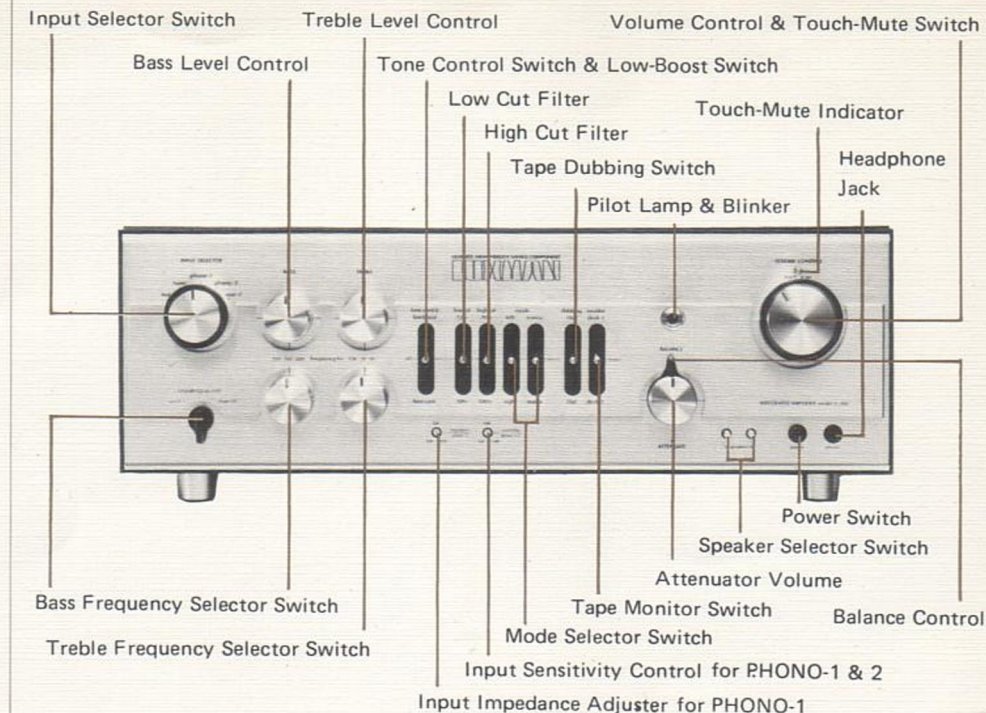
The main amplifier section employs 2-stage differential amplification whole-stage direct-coupled pure complementary OCL circuitry.

Special power and driver transistors for high power output are used at the output stage, and the final stage is composed by the parallel push-pull configuration, which makes it possible to yield a continuous output power of 110W per channel under 8-ohm loads.

The pre-driver stage uses a 2-stage differential amplifier, a kind of balanced type DC amplifier circuit which is of higher stability and immune from environment conditions such as fluctuation of supply voltage and ambient temperature changes.

The 2nd stage of this circuit is driven by the constant current for the purpose of voltage amplification.

In between the pre-driver stage of "class A" operation and the output stage of "class B" operation, an emitter-follower stage is placed with 2 transistors, which electrically insulates both stages and safeguards the former stage from possible influence of impedance fluctuation caused by speaker load.



Thus negative feedback can be applied equally to the whole frequency range from the bass to the treble, which makes it possible to drive this amplifier at low distortion with good stability and small phase shift.

To prevent intermodulation distortion which is triggered by irregularity in "class A" operation on the pre-amplifier section and the pre-driver stage of the main amplifier section to be accompanied by fluctuation of current at the output stage of "class B" operation in the main amplifier section, the power transformer has completely separate windings for "class A" and "class B" operation, and perfect constant current circuits are provided at the power supply section to the "class A" operational portion.

And also 2 computer-grade giant capacitors of 15,000  $\mu$ F are used for the power supply filtering to the output stage.

Other complex protection circuits are added to safeguard not only the amplifier but your loudspeakers from accidental damages.

A muting circuit which eliminates unpleasant thumps at the time of switching serves to protect loudspeaker against damage.

Other useful features are provided such as a volume attenuator, speaker selector, phono input sensitivity and impedance selectors, tape-dubbing circuit etc.

The L100 offers the ultimate in precision and elegance.

## OPERATIONAL FEATURES

### Linear Equalizer:

Although recordings are equalized in accordance with RIAA standards, it is quite common to encounter variations in overall tonal balance from one recording to the next.

In addition, differences in listening environment and room acoustics often require subtle degrees of tonal compensation that conventional tone controls cannot correct because of their wide range and overlapping crossover characteristics. The Linear Equalizer control provides a new form of tonal compensation specifically intended for subtly augmenting regular tone controls.

With the control in its mid-position, flat frequency response is achieved.

Switched to either of the two "up-tilt" positions, the entire response curve is rotated about a 1KHz fixed axis so as to linearly increase treble response while simultaneously decreasing bass response. Conversely, selection of one of the "down-tilt" positions rotates the response curve in a clockwise direction, providing a gradual decrease of treble response and simultaneous increase of bass response.

Degree of slope for either positive or negative settings has been carefully preset, and the overall response curve maintains complete linearity from 50Hz to above 10KHz, unlike the curvature in response normally associated with ordinary tone controls.

Combined use of the Linear Equalizer and conventional tone controls provides a degree of tonal flexibility which cannot be achieved with any other tone control arrangement presently available.

Because of the inherently linear nature of this new circuit, it introduces no increase of harmonic distortion at any of its settings.

### Touch Mute Switch

Most of the current amplifiers are equipped with Audio Muting Circuitry, with which instantaneous attenuation of main volume is feasible for such an urgent occasion as the phone-call during reproduction.

Usual case is to do ON-OFF operation mechanically by a switch, while this model has adopted new electronic Touch-Mute system.

A slight touch on this knob ensures operation. To operate this muting circuitry touch by hand the center metal part of the main volume and the gain may be reduced by 20dB and the volume is reduced to 1/10.

Cancellation is possible by touching the outer metal part of the knob just like the case of normal operation of the main volume.

### Volume Control:

The variable resistor of this control has a logarithmic curve.

In the attenuation characteristics of A type, the turning angle is proportionate to the attenuation degree (dB), the dB value and the volume audible to human ears are in the proportionate relation. In other words, the rotation of the control is in proportion to the sound volume felt by human ears.

The increasing degree of volume is felt quite natural as the control is turned in the clockwise direction.

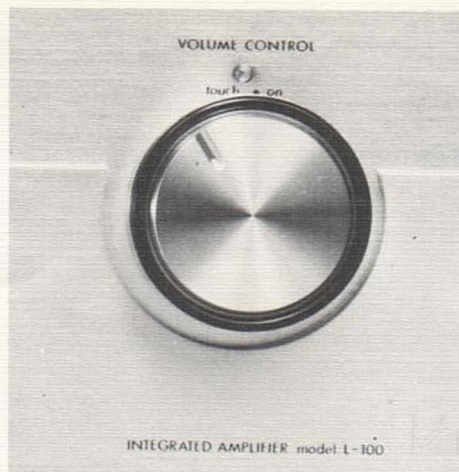
A precision detent-volume of high-grade attenuator type ensures a precise adjustment of volume on both right and left channels.

### Input Impedance Adjuster:

The PHONO-1 input terminals are coupled with Impedance Adjustor.

Except for a special low impedance type cartridge, almost all currently marketed cartridges of MM-type specify recommended load impedance of about 50K ohms.

It is known that variation of the load impedance value affects the frequency response to a great



Touch Mute Switch

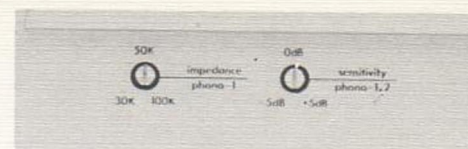
extent.

A low impedance load cuts treble output, while a high impedance load causes a peak in the treble range.

The degree of such effect is not the same with different cartridges, but generally a cartridge having a higher output impedance tends to be more delicately influenced.

It is therefore necessary that selection of a proper input impedance is made with this adjustor.

The adjustment of Input Sensitivity is done by a potentiometer, and free adjustment is feasible be-



Adjuster

tween 30Kohms to 100K ohms.

Each position of the 30Kohms, 50Kohms and 100Kohms has click stopper for easy identification.

### Input Sensitivity Adjuster:

There are various types of cartridges: magnetic type, photo-electric type, electro-static type and piezo-electric type.

Most predominant is the magnetic type which includes MM (Moving Magnet), MI (Moving Iron), IM (Induced Magnet) and MC (Moving Coil).

The PHONO terminals of this amplifier are designed to match with these types of magnetic cartridges, but a cartridge of low output level (output voltage 0.01 to 0.1mV) cannot be directly connected.

Input Sensitivity adjustment is feasible both at PHONO-1 terminals and PHONO-2 terminals.

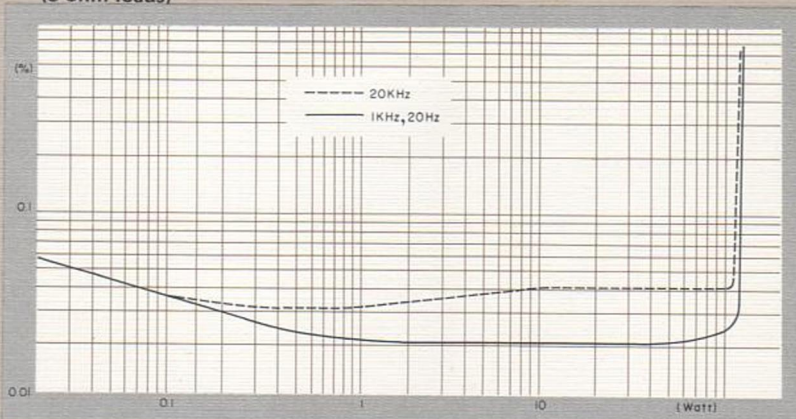
Free adjustment of  $\pm 5$ dB is possible in case the input sensitivity of 3mV is regarded as 0dB.

That is, the most suitable sensitivity to the cartridge can be obtained between some 1.7mV and 5mV in view of the fact that the sensitivity at  $\pm 5$ dB is some 1.7mV and at  $-5$ dB is 5mV.

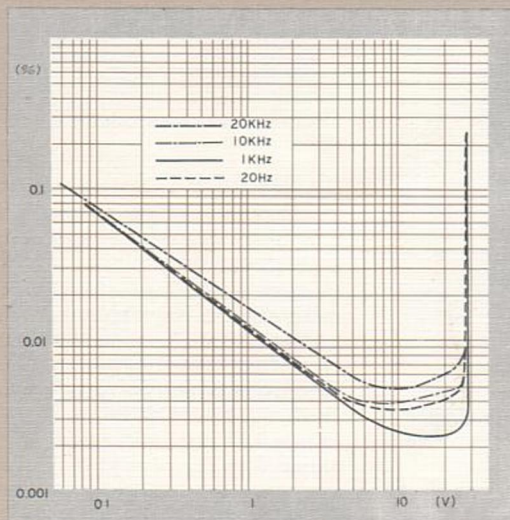
MAIN AMP: FREQUENCY RESPONSE  
(8-ohm loads, 0dB = 1W)



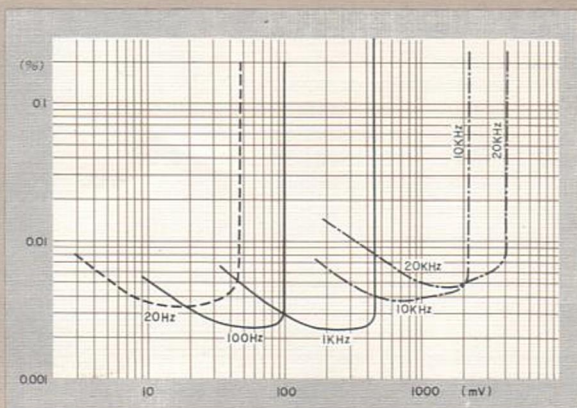
MAIN AMP: POWER VS. TOTAL HARMONIC DISTORTION  
(8-ohm loads)



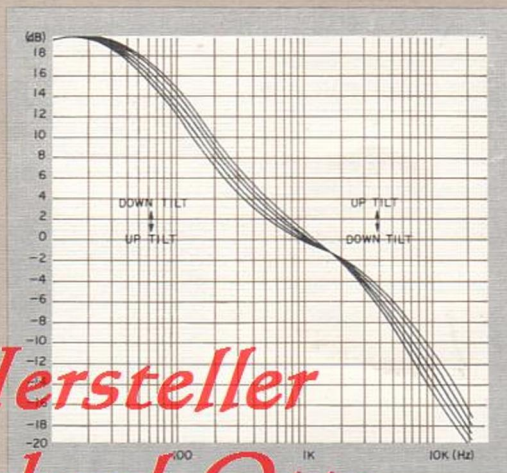
PHONO OUTPUT VOLTAGE VS DISTORTION  
(Output: REC. OUT)



PHONO INPUT VOLTAGE  
(Output: REC. OUT Terminal)



LINEAR EQUALIZER  
(Output: PRE. OUT)



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We know the true measurements of minimum performance standards of a quality amplifier must be of a very high level. However, these figures are not the only requirements.

Despite every effort to make amplifier design a pure science one amplifier among many with similar absolute specifications can still have, relatively, far better sound quality.

The reason: there are more comprehensive theories of amplifier design which account for such problems as harmonic intermodulation, and notch distortion; stability, filters, and equalization as they relate to statements of power.

Whatever the scientific theory, LUX conducts the most detailed listening test with engineers and musicians in different fields to ensure that LUX amplifiers sound best apart from what is considered good in brochures.

To LUX, sound is not only a science but an art. Listen to the ultimate difference at your nearest audio shop.

#### SPECIFICATIONS < MAIN AMPLIFIER SECTION >

|                       |                                                                                                                                    |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Power Output:         | 110 watts minimum continuous per channel, into 8-ohm loads, from 20Hz to 20,000Hz, at no more than 0.05% total harmonic distortion |
| Rated I.M.:           | 0.05% (60 : 7KHz = 4 : 1, 8 ohm loads, 110W/ch)                                                                                    |
| Frequency Response:   | 5 - 50,000Hz ( $\pm 1$ dB)                                                                                                         |
| Input Sensitivity:    | 910mV 8 ohms, 110W                                                                                                                 |
| Input Impedance:      | 33 Kohms                                                                                                                           |
| Residual Hum & Noise: | -90dB                                                                                                                              |
| Damping Factor:       | 50 (8 ohm loads)                                                                                                                   |

#### < PRE AMPLIFIER SECTION >

|                            |                                                             |
|----------------------------|-------------------------------------------------------------|
| Output Voltage:            | Typ. 910mV, Max. 12V                                        |
| Frequency Response:        | 5 - 50,000Hz ( $-1$ dB)                                     |
| Total Harmonic Distortion: | No more than 0.007% (1 KHz, 1V)                             |
| Input Sensitivity:         | 3mV (phono-1 & 2, Gain 0dB) 180mV (tuner, 180mV (aux-1 & 2) |
| Input Impedance:           | 30 K ohms - 100 Kohms (variable)                            |
| S/R Ratio:                 | No less than 65dB (phono)                                   |
| Phono Overload Voltage:    | 450mV (1 KHz, RMS)                                          |
| R.I.A.A. Equalization:     | $\pm 0.2$ dB                                                |
| Residual Hum & Noise:      | No more than 40 $\mu$ V                                     |
| Cross Talk:                | No more than -60dB                                          |
| Power Consumption:         | 400W at Max. power output                                   |
| Additional Features        | Touch mute function, Linear equalizer etc.                  |
| Dimensions:                | 485(W) x 350(D) x 175(H)mm (19-1/8" x 13-3/4" x 6-7/8")     |
| Weight:                    | Net. 19kgs (42 lbs.) Gross 21kgs (46 lbs.)                  |

Specifications and appearance design subject to possible change without notice.

**LUX CORPORATION, JAPAN**

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