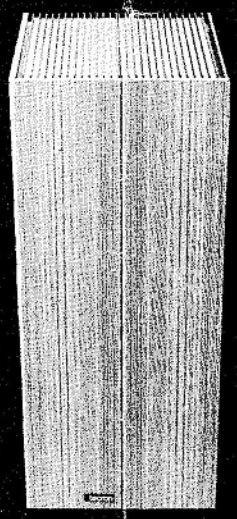
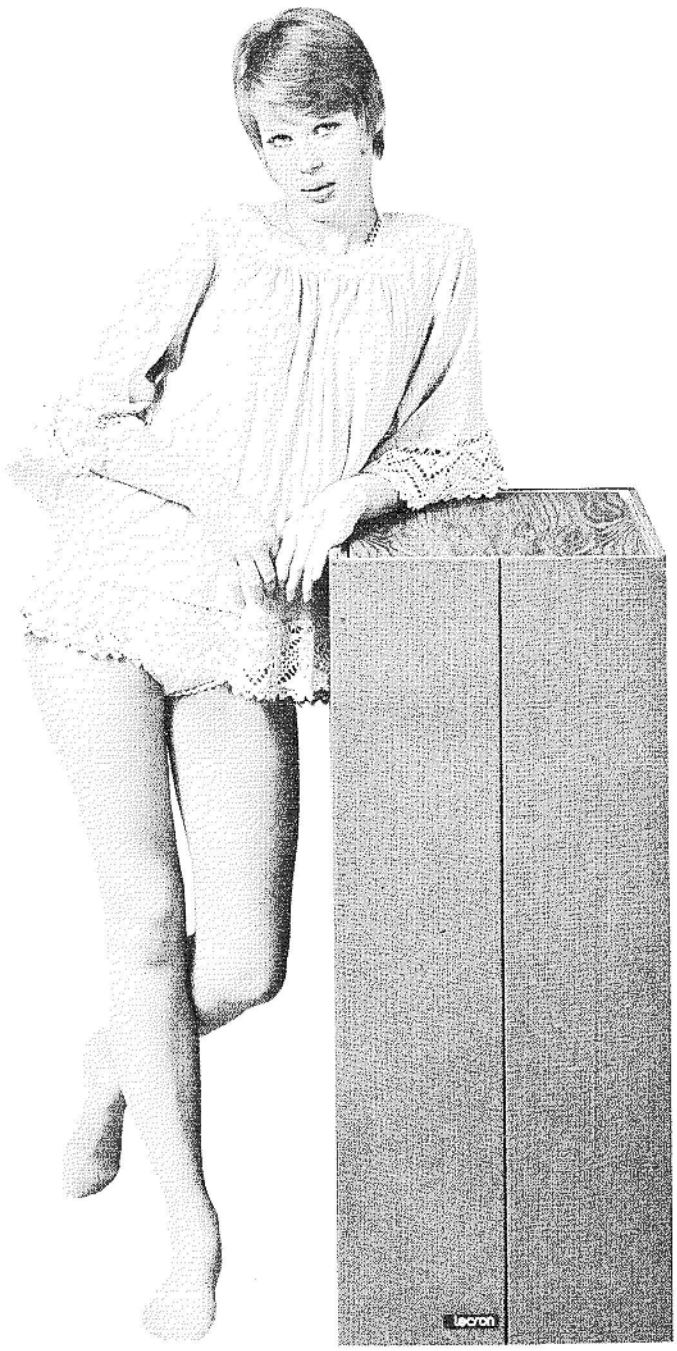
This loudspeaker must be heard.





Background to an unusual design

The Lecson horn loudspeaker is the result of three years of careful research into the important parameters of sound reproduction for realistic performance in the home. The result is an acoustic system which is both unusual in concept and stands proud among the very best loudspeakers available.

It is usual for loudspeakers to be specified in terms of frequency response, a lot of effort being put into making loudspeakers with very flat response curves. However, on its own, the frequency response of a loudspeaker tells us very little about what it sounds like; music and speech are not composed of steady state sine-waves but of extremely complex wave fronts and changing harmonic structures. For faithful reproduction of any complex signal it is essential that the whole loudspeaker be extremely accurate in its handling of transients.

It is commonly thought that transient information can be reproduced in a multi unit loudspeaker by adding tweeters and super-tweeters. This is not true. To reproduce a bass drum, for example, the bass, mid range and treble loudspeakers must all start and stop in a very precise manner if colouration and hangover effects are to be avoided.

Essential loudspeaker requirements

We believe that the essential considerations in loudspeaker design for stereophony, be it two-channel or four, are adequate transient definition and a satisfactory pattern of radiation over a given bandwidth and at a satisfactory level of acoustic output. Only when these requirements have been met do the other parameters of loudspeaker performance begin to be truly relevant – namely, smoothness of overall amplitude response and levels of harmonic and intermodulation distortion.

Loudspeaker character, or colouration as it is often described can be traced to two roots, one steady state, the other dynamic. It is either due to variations in amplitude level through the audio range (this includes simple phase problems arising from incorrectly designed crossover circuits) or to energy transfer delays resulting in the dislocation and degredation of transient information and in generally fatiguing hangovers. Both forms of colouration are quantifiable but the steady state variations of amplitude are quite innocuous when compared with the subjective distress caused by measurably small amounts of transient delay.

To summarise we can say that the relatively obvious steady state deviations from a flat acoustic output are not in themselves very significant but the less obvious shortcomings under dynamic conditions can be very worrying in the long term.

To achieve really high transient accuracy we believe that only two techniques are open to the designer – the use of electrostatic membranes and the horn loading of good moving coil units. We chose horn loading because it allows amongst other things accurate control of mid-range radiation in a pattern suitable for stereo, and the opportunity to produce high volume levels with low distortion.

Towards a musical solution

The loudspeaker is horn loaded at low, middle and high frequencies. Low distortion units are employed in each range and their outputs are integrated by a sophisticated crossover network. The split path exponential bass horn terminates at the rear of the cabinet, and is driven by two 13"x8" low resonance units. For correct operation at low frequencies this horn relies on the acoustic loading provided by placement near a corner.

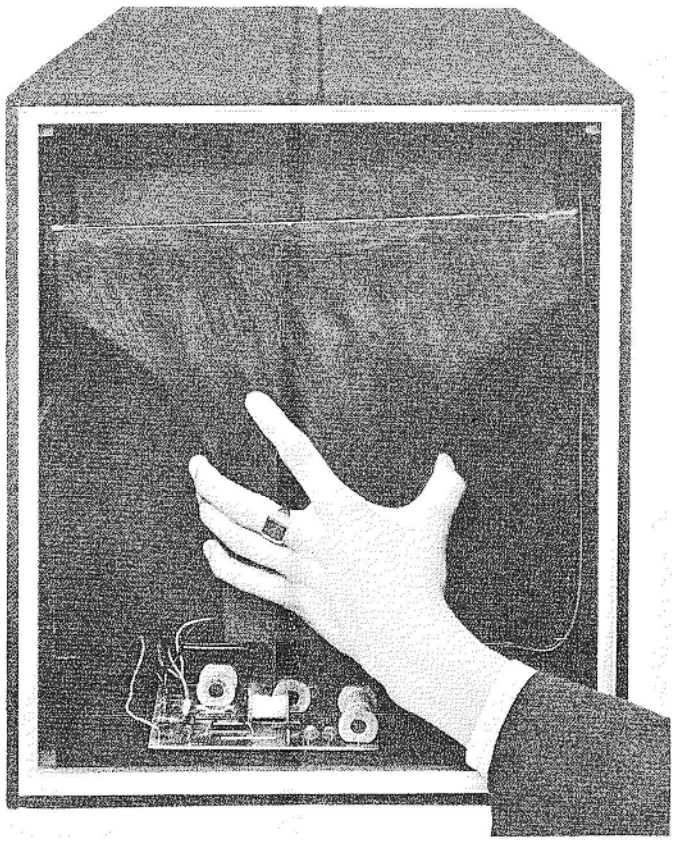
The bass horn crosses over at about 380Hz into the mid-range horn, which is in many aspects the most important feature of the Lecson design. A selected 5" hyperbolic paper cone driver is loaded by an expanded polyurethane exponential horn, allowing operation up to 5kHz, and thus avoiding all the usual problems of crossing over between units in the mid-range. The horn radiates near-plane waves and allows a very accurate and stable stereo image to be achieved. A fuse-protected tweeter operates from 5kHz to 25kHz.

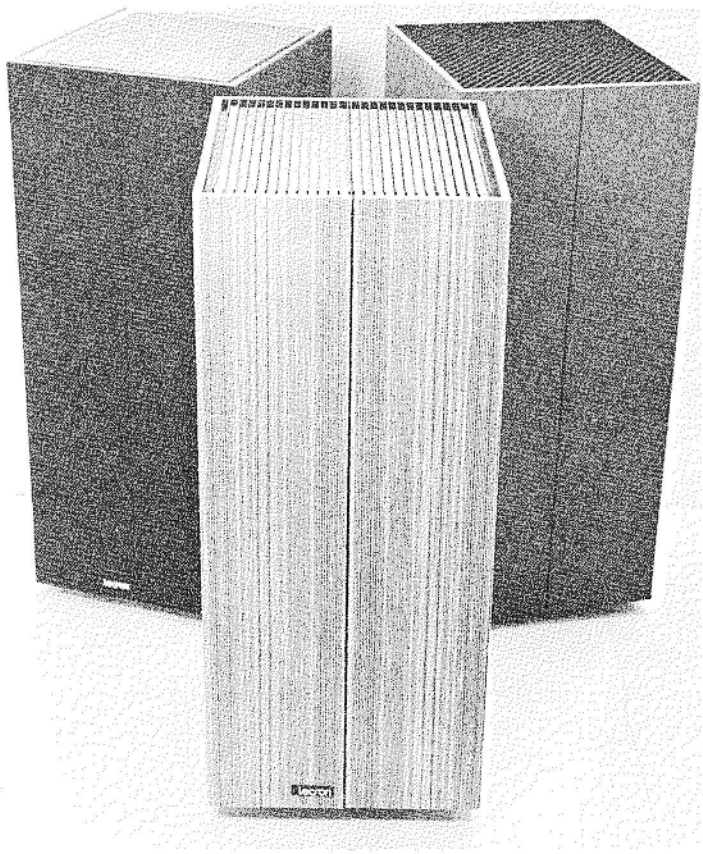
The overall transient accuracy of the system sets a new standard in musical realism.

Appearance

The fabric covering the front and sides of the speaker is 100% viscose linen chosen for its acoustic transparency and hard wearing qualities as well as its attractive appearance. The standard colours are black or cream although a wide variety of colours is available and appointed dealers will be supplied with fabric samples.

The top panel is veneered in teak or rosewood as standard, but other types can be ordered.





Complete specification

Impedance	8 ohms nominal
Frequency range	30Hz–25kHz
Power handling	100W programme
Bass horn	Exponential split path using two 13"x8" low resonance hyperbolic paper cone drivers.
Mid horn	Expanded polyurethane foam with a 5" selected hyperbolic paper cone driver. Radiation pattern: 100° horizontal 30° vertical.
Tweeter	Die-cast exponential horn with low distortion drive unit.
Crossover	12dB/octave at 380Hz, 18dB/octave at 5kHz

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