

# The speakers and the room.

Speaker designers must see to it that not only the direct sound, but also the primary reflected sound from walls and ceiling, reaches the listener. (Similar effects can be achieved with the aid of delayed sound emitted by speakers on both sides of and behind the listener — this is one of the principles of 4-channel stereo).

Much of the primary, reflected sound in a room depends upon that room's acoustical properties and also upon the directional qualities of the speaker. In the treble range a conventional speaker gives far less primary reflected sound than does the omnidirectional speaker.

As long as the primary reflected sound is predominant then the sound transmission from the source to the listener is a high degree audible. Since the primary reflected sound usually dominates both the direct and the secondary reflected sound in a normally damped living room the listening is in itself more detailed than for the average person in a concert hall.

The usual position for a speaker is against a wall and thus logically the best way to design a speaker is to ensure that it collaborates acoustically with that wall.

A spatial experience of sound is greatly influenced by the treble's paths of propagation in the room.

A conventional speaker with the speaker element itself installed in the front produces a distinctly "unnatural" directional impression. This is because the treble register produces very little primary reflection, especially from the wall behind the speaker, even if one uses what is known as a dome-tweeter. In stereo reproduction this means that one loses the feeling of spatially vital reproduction, in addition to which the listener is tied to one particular position in the room.

The Sonab omnidirectional speaker gives a more even, directional distribution of the primary reflected sound and in stereo reproduction the listener enjoys a wider choice of listening positions.

Sonab speakers are designed to collaborate with the wall behind them. The speaker element for the bass and mid range is located close to the wall, for

the most lucid reproduction while the treble elements are at some distance from the wall, pointing in different directions so as to lessen the, "unnatural" sharpness of the directional impression and to give the sound a living quality.

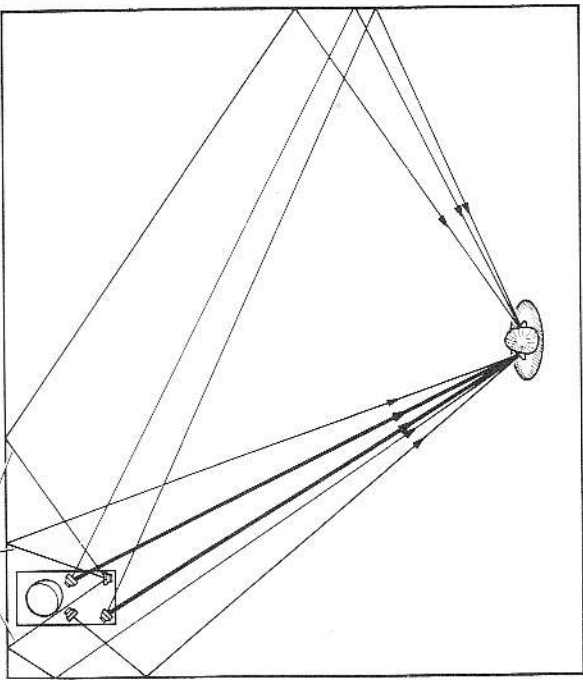
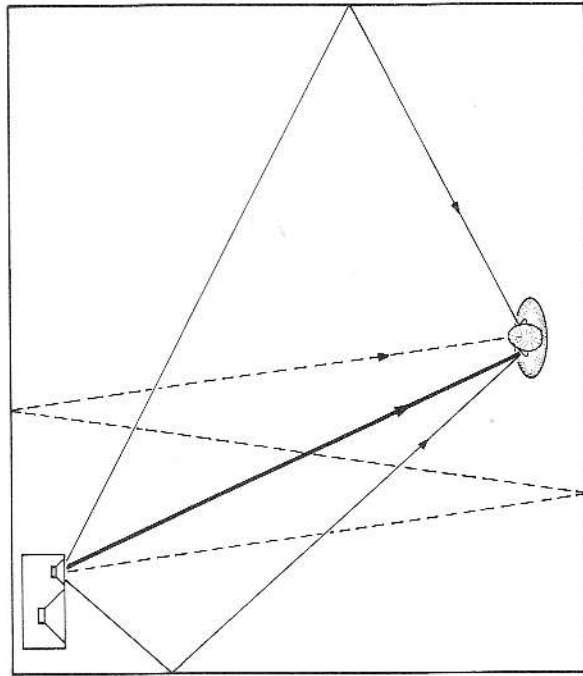
A word or two about 4-channel stereo. It is quite evident today that there is a trend towards 4-channel stereo. But here in the early stages there are 4-channel systems competing with each other.

It is as yet impossible to say which 4-channel system will determine finally the European stan-

dard; a standard incidentally which is absolutely necessary before the idea of a 4-channel system can become really interesting.

In the interim, however one can at least take the precaution of not investing in the wrong type of speaker. All the 4-channel systems thus far reckon in terms of four speakers: the usual stereo pair plus two more. Each pair is aligned though it can be an advantage if the back speakers are more omnidirectional than the forward pair.

reflection from back wall



In this case the reflected sound from the wall behind the speaker reaches the listener some 20 or even 30 m/s or more after the direct sound, and is heard later still than the reflected sound from other surfaces.

Sonab's new generation of speakers create careful balance between direct sound and primary reflected sound.

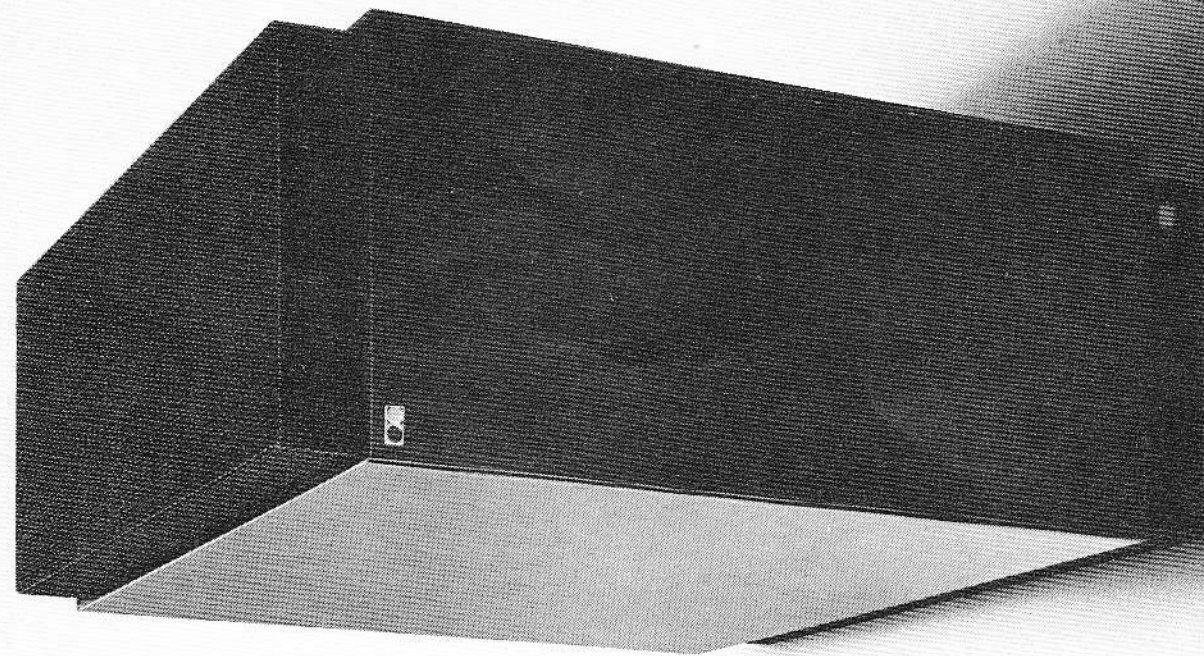
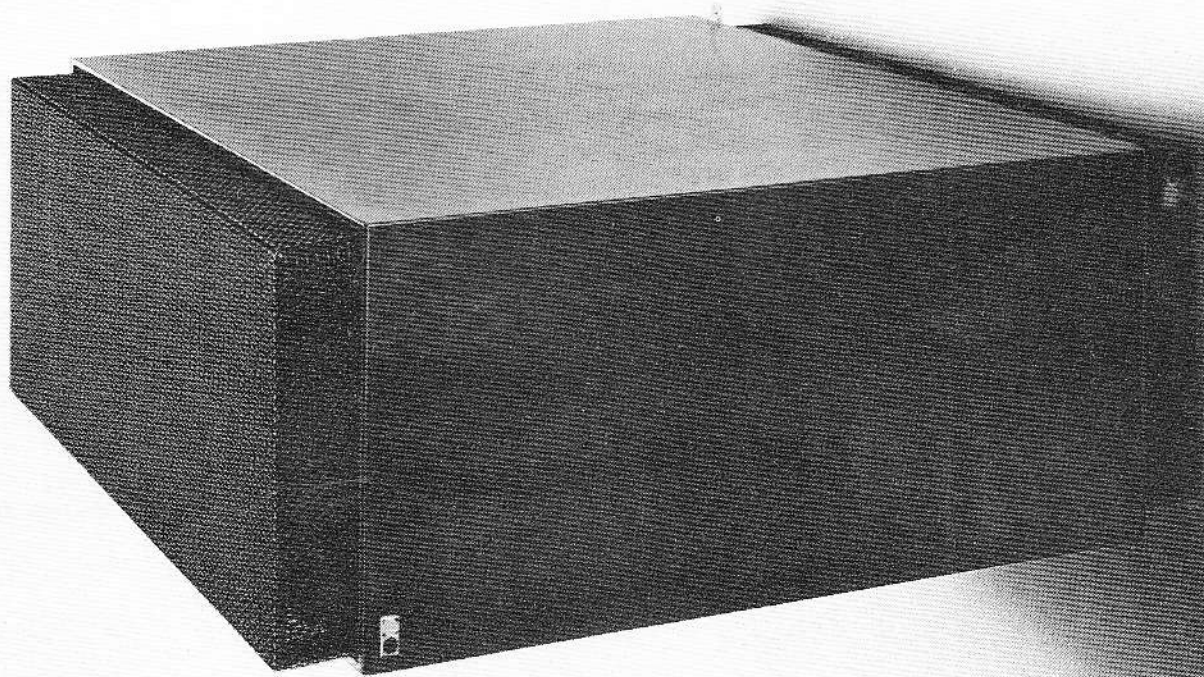
# The OA-6, Sonab's masterpiece.

This is our most advanced speaker. It is completely omnidirectional and is designed first and foremost for the musical and technical epicure, but also for professional use in concert halls and other such spacious premises where numerous individual speakers or even batteries of speakers might be used.

Technically the OA-6 is a 3-way instrument with twin electronic crossover networks. There are six speaker elements, four of which are used for the treble register. The sound produced is of rare ethereal quality and the overtones of the instruments are heard with exquisite precision. There is one element for the midrange and one for the bass. The bass element, directed at the floor and powered by an individually trimmed, built-in amplifier, produces dynamic tone even at minimum volume.

## Sonab OA-6

Operating principle	Bass reflex type. Omnidirectional. Patented.
Power handling capacity (DIN)	50 W
Necessary input power for an acoustic output of 0.025 W (DIN)	5 W
Frequency range	26 – 18000 Hz
Frequency response	29 – 15000 Hz $\pm$ 3dB
Impedance	About 7 ohms
Speaker elements	Bass: 1 dynamic 22 cm Midrange: 1 dynamic 22 cm Treble: 4 dynamic 5 cm
Connection	6 metres lead with DIN – Cannon plug
Dimensions (W $\times$ H $\times$ D)	24 $\times$ 68 $\times$ 43 cm
Volume	44 litres
Weight	20 kg
Finish	Teak, oak, walnut, rosewood, white and black lacquer
Note	The bass range speaker is powered by a special amplifier (bass energizer) with electronic compensation of the speaker's frequency response curve.



# The Sonab R7000, type 3.

Radio and amplifier in one. Here our technicians were given a free hand to build a receiver according to their own standards. The radio as such has been designed as a professional communications set adapted for stereo radio. And this latter factor is something to bear in mind now that stereo broadcast are becoming increasingly popular.

The R7000 has separate, constantly variable loudness control which is useful when one wants low volume without sacrificing the deepest bass or the highest treble tones. With the aid of three treble filters and one rumble filter it is possible to eliminate extraneous noise on records and tapes.

There are two pairs of speaker outlets for anyone who wishes to drown himself in music.

Output power : (continuous sinus power) with both channels operating	2 x 45 watt in 4 ohm 2 x 40 watt in 8 ohm
Music power	150 watt (4 ohm) 140 watt (8 ohm)
Frequency response	25 — 25,000 Hz $\pm$ 0.5 dB
Distortion at 1 kHz 6 W/max. power	Less than 0.03 %/Less than 0.5 %
Intermodulation at 32 W	Less than 0.2 %

Signal-to-noise ratio	Over 56 dB at PU input Over 66 dB at high-level inputs.
Tone controls	Bass $\pm$ 8 dB at 100 Hz Treble $\pm$ 6 dB at 10 kHz (Tone balance control)
Balance control	0 — 100 % from mid-position.
Filters	1 bass filter, 3 treble filters.
Loudness	Continuously variable
Inputs	Magn Pu 2.3 mV/68 kohm DIN Tape Mon. 150 mV/ $\geq$ 100 kohm DIN Aux 150 mV/ $\geq$ 100 kohm DIN



Outlets	Speakers 4 — 16 ohm DIN Headphones min 8 ohm Phonojack Tape 150 mV/10 kohm DIN Centre channel 0 — 8 V/500 ohm DIN
Tape monitoring	Yes
Overloading protection	Electronic + fuse
Frequency range	Protection 87 — 108.5 MHz
MPX Stereo decoder	Yes
Sensitivity, DIN	1.4 $\mu$ V

Frequency response	20 — 15,000 Hz $\pm$ 1 dB
MPX attenuation	45 dB at 19 kHz 55 dB at 38 kHz
AM suppression	60 dB
Capture ratio	1.5 dB
Distortion	Less than 0.5 % over entire frequency range
Channel separation	40 dB
FM bandwidth	IF amplifier over 240 kHz Detector over 500 kHz

Tuning indication	Light for "correct tune"
Dimensions (W x H x D)	38 x 8 x 28 cm
Weight	8 kg
Colour	Black
Accessories	Dipole antenna; two speaker plugs DIN
Note	Automatic stereo/mono switchover with lamp indicator. Muting (for silent tuning) and AFC. Centre channel outlet with volume control.

