YAMAHA NS690/670

SOFT DOME 3-WAY BOOKSHELF SPEAKER SYSTEMS

Yamaha NS-690 & NS-670 Soft Dome Speaker Systems.

- **Die-cast transducer frames to prevent undesirable resonance**
- **Powerful magnet structures for superior transient response**
- **High space-factor voice coil windings for increased power handling**
- **Soft-dome transducers for smooth midranges and trebles**
- **High temperature voice coil bobbins for superior overload capacity**
- **Low resistance crossover networks for minimum power loss and better speaker damping**
- **Extra-thick cabinet laminates for maximum structural stability**

Listed above are just a few of the features which give these new speaker systems from Yamaha their distinctive and exciting sound quality. The NS-690, at 60 watts input power capacity (RMS), and the NS-670, at 50 watts, reproduce full midrange and clean treble frequencies by means of unique soft dome speakers, ultra-low resistance crossover networks and dampened, solidly crafted speaker enclosures.

Lengthy studies of the acoustic environments of typical European and American homes were conducted by Yamaha engineers. Such factors as reverberation time, the sound absorbing properties of furnishings and the usual listening volumes were taken into careful consideration. The result is the NS-690/670, with special ability to deliver strong and clear midrange and treble notes under actual in-the-home conditions. Uppermost in the design concept is the elimination of unpleasant "peak phenomenon", traditionally found near the high-end limit frequency (fh) of hard dome speakers and the reduction of distortion by controlling the fundamental resonance frequency (fo). Dispersion of reproduced sound over a very broad area—instead of sharp, unidirectional limitations—results in accurate and natural tones. The Yamaha NS-690 and NS-670. From the people long associated with crafting fine musical instruments. Yamaha.

Soft Dome Midrange

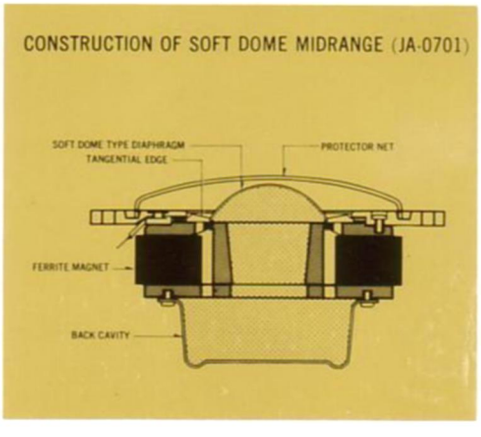
The all-important midrange sound frequencies are reproduced by means of recently-developed soft dome speakers, measuring 75mm in the NS-690 and 60mm in the NS-670. The diaphragm of each speaker is formed of a special hot-pressed fabric, double coated with a thermosetting resin and a viscous rubber resin. Hot pressing forms a tangential edge.

In this way, the diaphragm allows reproduction of smooth natural treble notes while reducing high-end peaks in frequency response.

The voice coil has a FRP bobbin and square aluminum wire having a high space factor. It is able to withstand temperatures up to 200°C and substantial overloads.

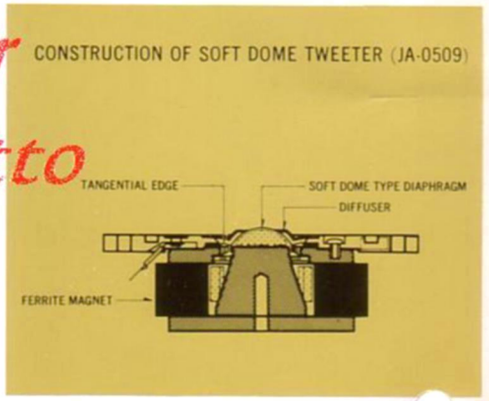
The magnetic circuit makes use of a large, powerful magnet to lower the Q-factor of the speaker and improve its transient response. The air gap flux density of NS-690 midrange magnet is rated at 13,500 gauss; the NS-670 at 14,000 gauss.

The midrange dome speaker is designed to do a specific job, perfectly. Signals handled by it are cut off at 6,000Hz. Sound dispersion characteristics are outstanding, remaining almost unchanged when heard from a point anywhere within a 120 degree arc centered on the front axis.



Soft Dome Tweeter

Both the NS-690 and NS-670 utilize tweeters: soft dome speakers measuring 30mm. Diaphragms are formed of the same material and in the same way as that of the midrange speaker and have the same light aluminum voice coil. Plus an exceptionally powerful ferrite magnet with an air gap flux density of 15,500 gauss. A unique feature of the tweeter is its aluminum acoustic diffuser, protecting the diaphragm while enhancing and broadening its sound dispersion characteristics.



Woofer

As with the majority of high-perfomance speaker systems, the NS-690 and NS-670 utilize large-diameter cone speakers for the low frequency or woofer ranges. The woofer cones in the NS-690 and NS-670 measure 300mm and 250mm, respectively. Each is specially equipped with a super-high compliance suspension, an extended voice coil, and the best of heavy-duty cones to ensure accurate reproduction of bass-heavy woofer frequencies with "elbow room". The NS-690 woofer has a fundamental resonance frequency (fo) of 20Hz in free air and of 40Hz when mounted inside the enclosure; the NS-670 woofer, 25Hz and 45Hz, respectively.

Level Controls

The separate functions of midrange and tweeter speakers are controlled by individual level controls mounted directly in

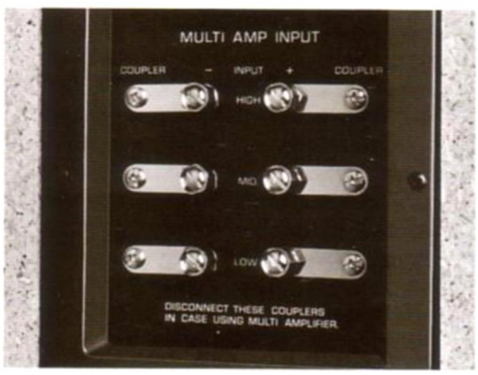
the front baffle. These continuously adjustable controls can be set to maintain overall tonal balance (±3dB) and are easily reached to compensate for changes in room acoustics due to open windows, additional furniture and such.

Crossover Network

Yamaha engineers have developed a totally new crossover network for the NS-600 series speaker systems. It features special coils having extra thick 1mm diameter copper wire wound around ferrite cores; The copper wire minimizes power loss, and improves speaker damping because of its low electric resistance. The use of ferrite cores offers similar advantages since it reduces the number of coil windings. The coils are then arranged at right angles to each other to avoid mutual inductance for improved tonal quality near crossover frequencies. Also utilized in the network are unique metallized paper capacitors which, because of their low power loss factor, help to improve tonal quality. The crossover frequencies and other constants have been carefully determined only after repeated listening tests. The NS-690 alone offers a bonus feature: separate input terminals for its woofer, midrange and tweeter to permit use of a multi-amplifier system.

Repeated listening tests, as well as advanced electronic tests, determined cross-over frequency levels—a critical and delicate matter for any speaker system. The NS-690/670 series crossover frequencies are 800Hz between woofer and midrange, 6,000Hz between midrange and tweeter, and have a cut-off characteristic of 12dB/oct.

NS-670 NS-690



Solid Enclosures-Detachable Front Grilles

Nothing is more important to the overall performance of a quality speaker system than its enclosure.

The NS-690 and NS-670 are housed in enclosures specifically designed to meet rigid stress requirements to enhance and compliment the characteristics of the speakers they contain. Undesirable "cabinet resonance" is eliminated.

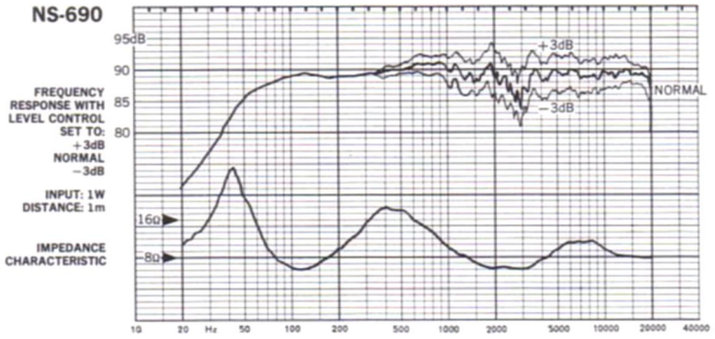
The rugged construction features a 25mm-thick front baffle board of a special wood laminate, side and top boards of the same laminate in 18mm thickness, a 25mm-thick rear board of treated chipboard and thick crosspieces for maximum stability. Real walnut, bonded and expertly finished, gives each unit a professional, quality furniture appearance.

Each individual speaker within the system is mounted in a die-cast, solid aluminum speaker frame. This forestalls any deterioration of tonal quality by preventing frame resonance and allowing each speaker to perform to its full potential.

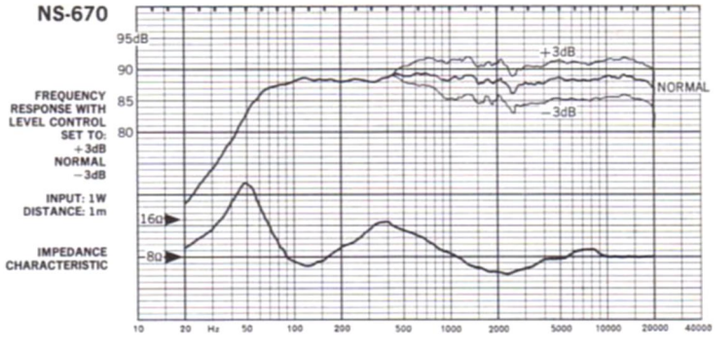
It's not surprising that the NS-690 and NS-670 weigh 22kg and 19kg respectively; the extra strong speaker magnets, top-quality wood, and solid speaker frames add up to solid weight as well as solid performance.

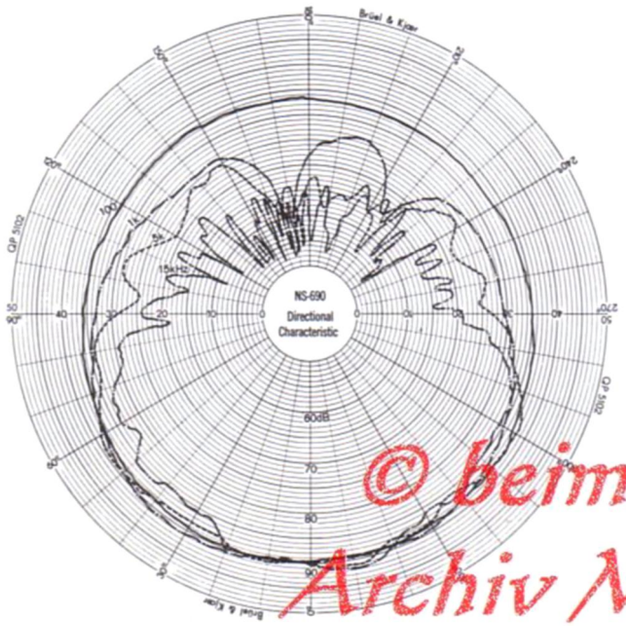
The front grille on each system is easily detachable to permit quick access to the level controls, or to show off the inside of what sounds so good on the outside. The NS-690 and NS-670 speaker systems—sound thinking from Yamaha.

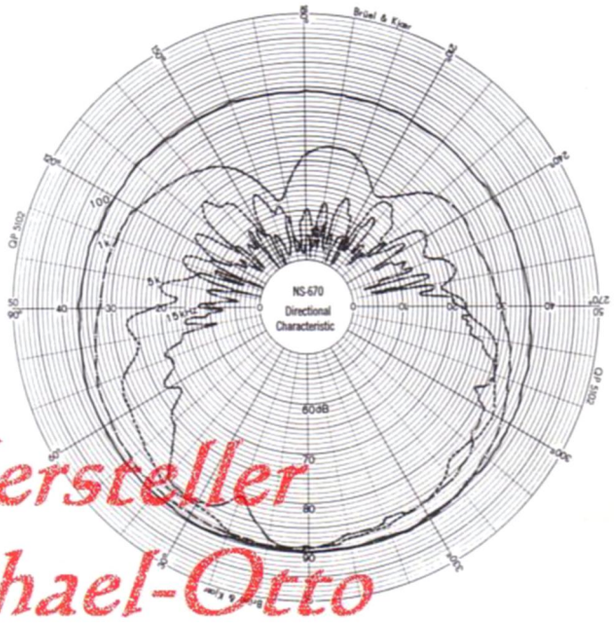
NS-690



NS-670







SPECIFICATIONS (DIN Standard)

	NS-690	NS-670
Frequency response	35—20,000Hz	40—20,000Hz
Power handling capacity	60 watts	50 watts
Nominal Impedance	8Ω	8Ω
Type	3-way	3-way
Woofer	300mmϕ cone (JA-3056)	250mmϕ cone (JA-2501A)
Midrange	75mmϕ soft dome (JA-0701)	60mmϕ soft dome (JA-0601)
Tweeter	30mmϕ soft dome (JA-0509)	30mmϕ soft dome (JA-0509)
Crossover frequencies	800Hz, 6,000Hz	800Hz, 6,000Hz
Fundamental resonance frequency (fo)	40Hz	45Hz
Operating power*	4 watts	6.3 watts
Dimensions	630mm H×350mm W×291mm D (24¾″H×13¾″W×11½″D)	577mm H×320mm W×269mm D (22¾″H×12⅝″W×10⅝″D)
Weight	22kg (48 lbs.)	19kg (42 lbs.)

*Input electrical power required to obtain 96dB sound pressure level at 1 meter according to DIN 45500.

Specifications subject to change without notice.

For details please contact:

raum - ton - kunst
6 frankfurt/main
neue kräme 29
sandhofpassage
telefon 287928

SINCE 1887 YAMAHA

NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

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