

Goodmans POWER RANGE



Goodmans
Sound reasoning.

POWER RANGE LOUDSPEAKERS

Applications

Goodmans Power Range Audiom loudspeakers are for professional use, where reliability has to complement the total sound performance. Power range loudspeakers are found in such diverse situations as acoustic research, pest control and alarm systems. The most usual applications with suggested units are shown on the table.

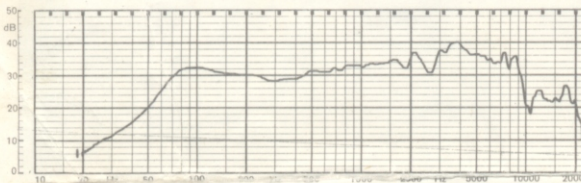
Dimensions of suitable cabinets are given overleaf together with advice on impedance matching, systems with high-frequency horns, and measuring conditions.

TYPICAL APPLICATIONS		AUDIOMS						Audiomax		Hifax 750P
		8PA	10P	12P	12P-D	12P-G	15P	18P	12AX	
Public Address	Indoors	●	●		●					
	Outdoors			●	●	●			●	
Musical Instrument Amplification	Pop Organs			●	●		●		●	●
	Pop Guitars		●			●		●		●
	Bass Guitars					●	●	●	●	
Discotheques					●		●			●
Theatres, Clubs		●			●					

Specifications

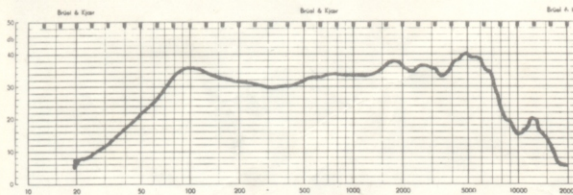
The electrical and acoustic parameters quoted are subject to variations in production of $\pm 10\%$.

Audiom 8PA



Especially developed as a low cost unit for use singly for general sound coverage or in columns with increased directional characteristics for larger sound reinforcement installations.

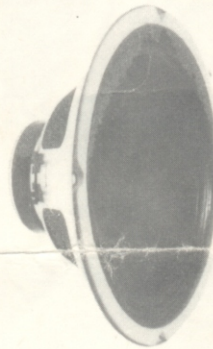
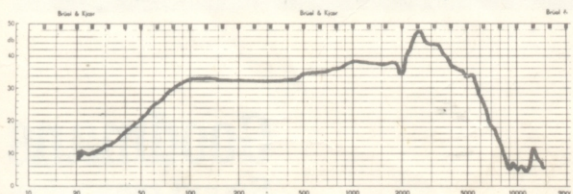
Audiom 10P



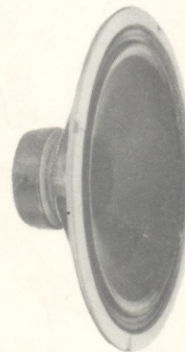
Designed for use as single units for general sound coverage or in columns with increased directional characteristics for larger sound reinforcement installations.

Audiom 12P

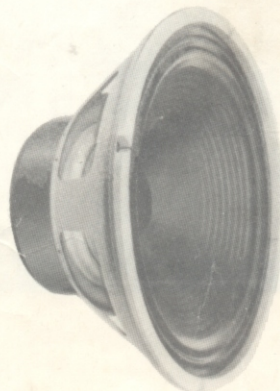
This popular "work-horse" in the range gives satisfactory performance in a wide variety of uses.



Nominal impedance: 8 or 15 Ohms
 Nominal power handling: 15 Watts
 Fundamental resonance: 85 Herz
 Sensitivity (96dB at 1m): 3.5 Watts
 Recommended enclosure volume for single unit: 20 Litres
 Depth, overall: 90mm
 Diameter, overall: 204mm
 Baffle hole diameter: 178mm
 Fixing hole diameter: 4 off 6mm
 Fixing hole centres: 194mm (PCD)



Nominal impedance: 8 or 15 Ohms
 Nominal power handling: 15 Watts
 Fundamental resonance: 85 Herz
 Sensitivity (96dB at 1m): 2.7 Watts
 Recommended enclosure volume for single unit: 30 Litres
 Depth, overall: 96 mm
 Diameter, overall: 259 mm
 Baffle hole diameter: 229 mm
 Fixing hole diameter: 4 off 7 mm
 Fixing hole centres : 247 mm (PCD)

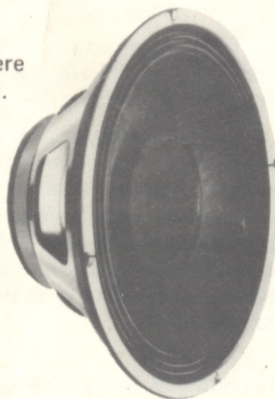
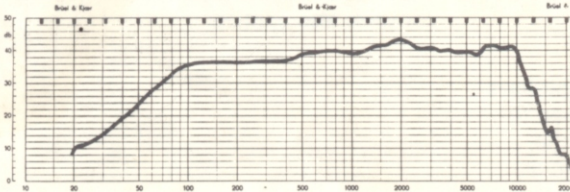


Nominal impedance: 8 or 15 Ohms
 Nominal power handling: 50 Watts
 Fundamental resonance: 85 Herz
 Sensitivity (96dB at 1m): 1.6 Watts
 Recommended enclosure volume for single unit: 50 Litres
 Depth, overall: 152 mm
 Diameter, overall: 311 mm
 Baffle hole diameter : 278 mm
 Fixing hole diameter: 4 off 8 mm
 Fixing hole centres : 298 mm (PCD)

Audiom 12P-D

The 12P-D is engineered for a range of applications where high sensitivity and a wide frequency response are required.

For high quality PA, either singly or in multiples to increase the directional characteristics, it may be used to reproduce music in a variety of conditions from discotheques to dance clubs and theatres. It gives good results when used for musical instrument amplification (organs etc.) at home or at medium powers for cabaret clubs and theatre performances.

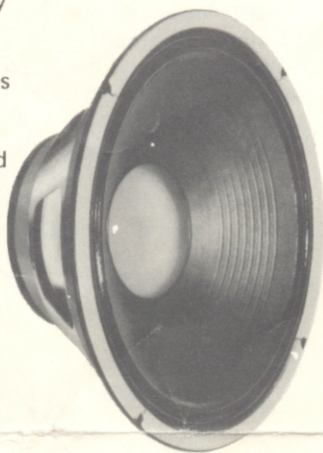
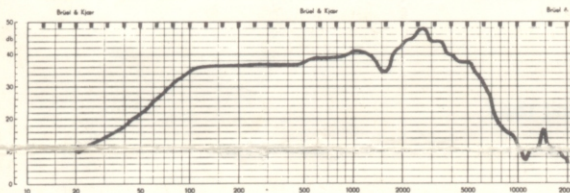


Nominal impedance: 8 or 15 Ohms
Nominal power handling: 60 Watts
Fundamental resonance: 55 Herz
Sensitivity (96dB at 1m): 0.6 Watts
Recommended enclosure volume for single unit: 40 Litres
Depth, overall: 142 mm
Diameter, overall: 311 mm
Baffle hole diameter: 278 mm
Fixing hole diameter: 4 off 8 mm
Fixing hole centres: 298 mm (PCD)

Audiom 12P-G

The 12P-G has a frequency characteristic particularly suited to amplification of pop musical instruments and outdoor PA. The frequency response curve shows a rising output with a maximum at about 3kHz. This gives "carry" and good articulation to speech in difficult Public Address situations.

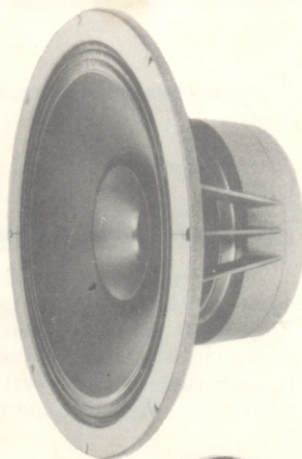
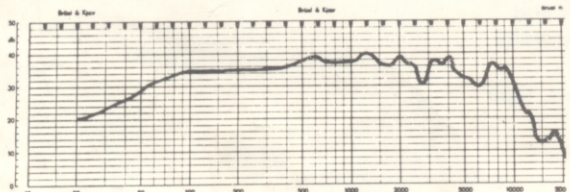
The built-in high frequency lift gives good attack and a clean sharp sound when used for guitar and organ amplifiers in pop music groups. Its robust construction allows it to handle the output of amplified bass guitars particularly well especially when used in multiples.



Nominal impedance: 8 or 15 Ohms
Nominal power handling: 60 Watts
Fundamental resonance: 70 Herz
Sensitivity (96dB at 1m): 0.4 Watts
Recommended enclosure volume for single unit: 40 Litres
Depth, overall: 140 mm
Diameter, overall: 311 mm
Baffle hole diameter: 278 mm
Fixing hole diameter: 4 off 8 mm
Fixing hole centres: 298 mm (PCD)

Audiom 15P

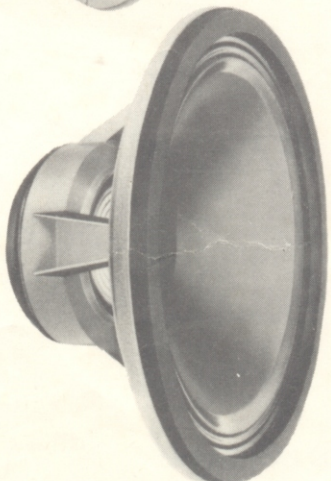
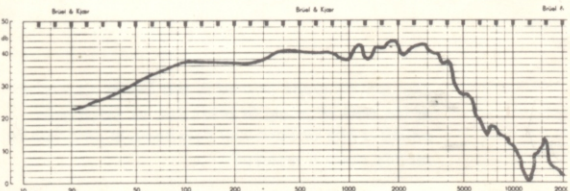
A fifteen inch loudspeaker with twin cone which has proved very successful in discotheque speaker systems for its fine bass reproduction. It is also particularly suitable for the demanding conditions imposed by pop organ tone cabinets.



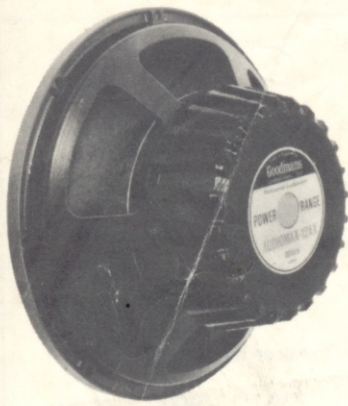
Nominal impedance: 8 or 15 Ohms
Nominal power handling: 50 Watts
Fundamental resonance: 56 Herz
Sensitivity (96dB at 1m): 0.9 Watts
Recommended enclosure volume for single unit: 80 Litres
Depth, overall: 163 mm
Diameter, overall: 383 mm
Baffle hole diameter: 330 mm
Fixing hole diameter: 8 off 7 mm
Fixing hole centres: 370 mm (PCD)

Audiom 18P

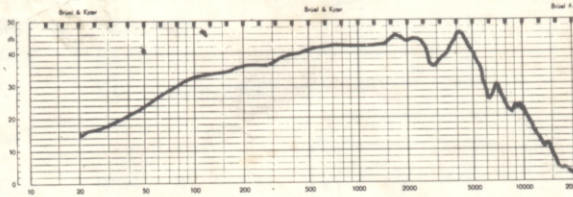
A showman's loudspeaker. It is easily able to deal with the massive response required by bass guitars and also the specialist applications in fairgrounds.



Nominal impedance: 8 or 15 Ohms
Nominal power handling: 100 Watts
Fundamental resonance: 45 Herz
Sensitivity (96dB at 1m): 0.6 Watts
Recommended enclosure volume for single unit: 120 Litres
Depth, overall: 222 mm
Diameter, overall: 459 mm
Baffle hole diameter: 413 mm
Fixing hole diameter: 8 off 8 mm
Fixing hole centres: 278 mm



Audiomax 12 AX



Nominal impedance: 8 or 15 Ohms
 Nominal power handling: 100 Watts
 Fundamental resonance: 70 Herz
 Sensitivity (96dB at 1m): 0.12 Watts
 Recommended enclosure volume for single unit: 40 Litres
 Depth, overall: 125 mm
 Diameter, overall: 312 mm
 Baffle hole diameter
 Fixing hole diameter: 8 off 7.2 mm
 Fixing hole centres: 299 mm (PCD)

These useful loudspeakers combine the extremes of high power handling capacity and high sensitivity. Where high sound levels are required, the Audiomax speakers will show their economy. Their high efficiency simplifies the design of high level sound systems compared with the alternative of a multiplicity of less sensitive loudspeakers coupled to extremely high power amplifiers.

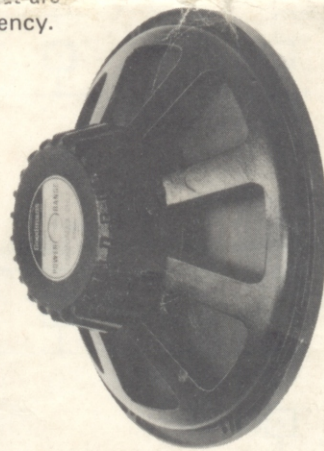
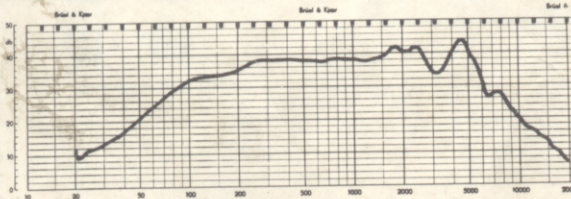
The Audiomax has a very high flux magnet system and a 10cm diameter edge-wound ribbon voice coil which combine to give unsurpassed control of the plastic terminated fibre cone. The combination of magnetic, acoustic and mechanical damping throughout the operational frequency range is manifested in its crisp sound and fast response to signals of a transitory form.

The 15AX, the fifteen inch version, will find many uses in common with the 12AX, but its increased bass will make it a favourite for bass guitarists, and organists.

Recommended enclosures.

In order to exploit the maximum potential of the Audiomax 12AX and 15AX, its enclosure or housing must be designed and constructed with care. For the reproduction of signals which have relatively narrow bandwidths, e.g. speech for P.A. and electric guitars, sealed enclosures of the specified volume are adequate. For extended low frequency range, Audiomaxes can be fitted in tuned resonance reflex enclosures and for increased efficiency used as a drive unit for a low frequency horn. If the maximum power is to be realised with low distortion, high-pass filters should be fitted to amplifiers to remove frequencies that are lower than the system resonance or horn cut-off frequency.

Audiomax 15 AX

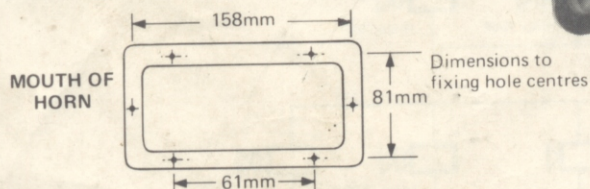
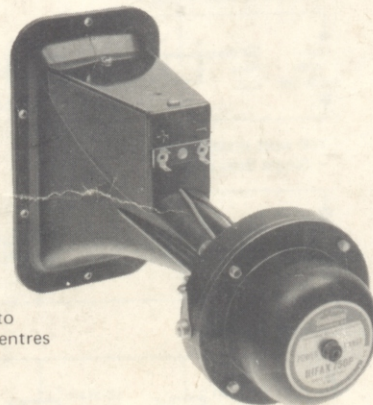


Nominal impedance: 8 or 15 Ohms
 Nominal power handling: 100 Watts
 Fundamental resonance: 60 Herz
 Sensitivity (96dB at 1m): 0.25 Watts
 Recommended enclosure volume for single unit: 80 Litres
 Depth, overall: 144 mm
 Diameter, overall: 395 mm
 Baffle hole diameter : 356 mm
 Fixing hole diameter: 8 off 7.2 mm
 Fixing hole centres : 375 mm (PCD)

Hifax 750P

The Hifax 750P is a high power high frequency unit with an integral filter, that operates over the upper octaves of a 50 Watt system when used with Goodmans Power Range loudspeakers.

In high power systems one Hifax 750P is required for each nominal 50 Watts of the total power available.



Impedance: For use with systems rated at 8 or 15 Ohms
 Nominal power handling: systems rated at 50 Watts
 Frequency range: 1.4 – 12KHz
 Depth, overall: 242 mm
 Baffle hole: 143 x 65 mm
 Fixing hole diam: 6 of 4 mm
 Fixing hole centres: see diagram

USING POWER RANGE LOUDSPEAKERS

Recommended Enclosures

The recommended enclosures for Goodmans Power Range loudspeakers should be rigidly constructed from high density chipboard or plywood (not blockboard) screwed and glued together. All joints should be airtight.

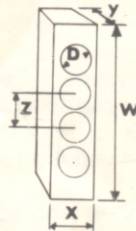
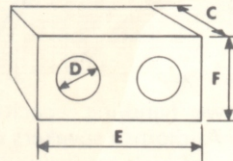
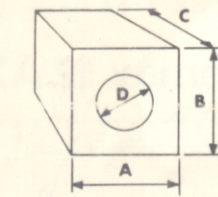
The totally sealed enclosures should be loosely lined with layers of two-inch thick fibreglass making sure that it does not interfere with the loudspeaker cone. Protective bars or material across the baffle hole must be recessed or fitted so that the movements of the cone is not restricted.

All dimensions are internal to allow for choice of material thickness. The proportions can be varied but the volume must remain the same.

If Goodmans Power Range speakers are used in open baffles or reflex cabinets, the low frequency response must be controlled to prevent excessive cone excursions at low frequencies where these cabinets present little or no acoustic loading.

ENCLOSURE DIMENSIONS

Note: All dimensions in millimetres.



8 in. 10 in. 12 in. 15 in. 18 in.

Single Speaker Enclosure

A	380	460	500	600	710
B	280	340	360	450	550
C	190	190	250	280	310
D	178	229	278	356	413
Thickness	12	12	18	18	18

Twin Speaker Enclosure

E	500	600	700	900	1100
F	380	460	500	650	700
Thickness	12	18	18	18	24

Four Speaker Column

W	1100	1300	1500
X	250	300	350
Y	150	180	230
Z	230	265	330
Thickness	18	18	18

Connecting the Loudspeakers

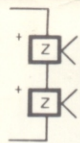
Loudspeakers can be wired in series or parallel, or indeed any combination of these to obtain a convenient total load impedance for the amplifier. Do not use loudspeakers of differing impedance in one system, as this will cause uneven distribution of audio power. Observe the polarity of the connections at all times, particularly where more than one loudspeaker is housed in an enclosure.

IMPEDANCE MATCHING

2 Loudspeakers

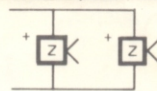
Series

Total impedance $Z \times 2$

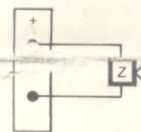


Parallel

Total impedance $Z \div 2$



Polarity

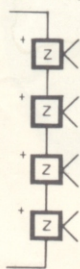


Red-spot or + sign indicates positive terminal
Z indicates impedance

4 Loudspeakers

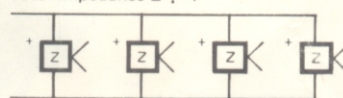
Series

Total impedance $Z \times 4$



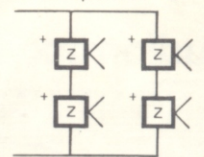
Parallel

Total impedance $Z \div 4$



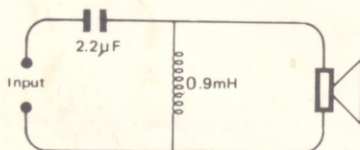
Series/Parallel

Total impedance = Z

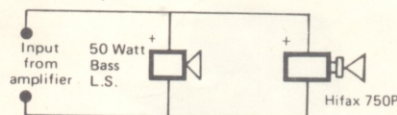


Systems with Hifax 750P

Integral Filter

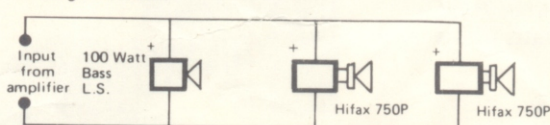


50 watt system circuit

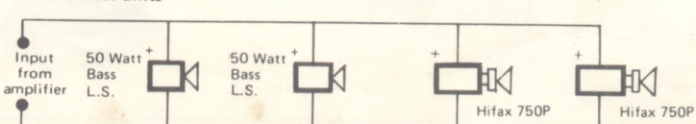


100 watt system circuits

- Single Bass unit



- Two Bass units



MEASUREMENT DATA

Nominal Power Rating and Test Conditions

Goodmans Power Range Audiom loudspeakers have a nominal rating based on actual working conditions when used for reproducing the complex random waveforms of music and speech.

The loudspeakers are tested at 20°C in the recommended enclosure using the standard filtered noise signal as defined in DIN45:573.

The nominal rated power, measured as a true RMS voltage across a resistance equal to the loudspeaker impedance value, is applied continuously for periods of 3 hours with a cooling time of not less than one hour between. This test is repeated for a minimum of 100 hours actual operation.

Sine wave testing should be carried out with caution and only within the frequency range from resonance to 10KHz with the loudspeaker fitted in its recommended enclosure. The maximum input voltage should not exceed

$$\sqrt{\text{Nominal impedance} \times \text{Nominal rating (Watts)}}$$

as shown in the loudspeaker label and this can be sustained for a maximum period of 1 minute. It is recommended that if the test is for a longer period, the input voltage is reduced to 0.7 of the above figure.

The power output may have to be reduced if the loudspeaker is to be used at ambient temperatures exceeding 20°C.

In multiple systems the power available to individual units must not exceed the nominal after taking into account a $\pm 10\%$ impedance tolerance. Where high frequency units form part of the system, the recommended filters must be used and the system power not exceeded.

length of life of a loudspeaker depends largely on the performance of the amplifier with which it is used. A well designed amplifier having good stability, fast recovery from an overload condition and freedom from power consuming spurious or unwanted signals outside the loudspeaker pass band will not only give a cleaner sound but also improve the life expectation of the loudspeaker. The converse also applies.

Selecting Suitable Power Loudspeakers

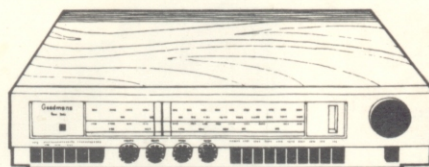
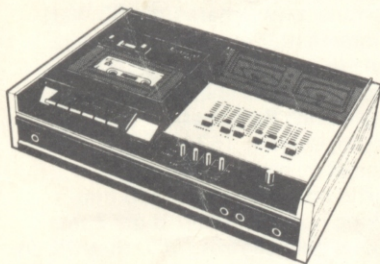
Loudspeakers should be chosen to handle the maximum power of the driving amplifier and this is often in excess of its rated sine wave power capability due to power supply regulation and/or its overload characteristics. Instantaneous and distorted outputs of 1.5 times the amplifier rating are commonplace and the amplifier power should be multiplied by this factor when selecting suitable loudspeakers for use under these conditions. (For example, to choose loudspeakers for an amplifier rated at 60 Watts first multiply this figure by 1.5 to give 90. The choice might be 2,50 Watt 12" Power Audioms giving a total power handling of 100 Watts which should prove satisfactory).

Loudspeaker Life

The quality of sound from and the

Other Goodmans Products

Goodmans, with sales in more than 100 countries world-wide, is the largest UK manufacturer of loudspeakers and has an international name in the field of high fidelity equipment.



The Goodmans range of high fidelity equipment includes: bookshelf and floor-standing loudspeakers, AM/FM stereo receivers and compacts (receiver/record player systems), tape and record playing equipment.

Please write to the Technical Assistance department if you would like further information.

01703

492777

from LWG
07012 6344

500mV

200K

1Vrms

AM/FM

070548

Goodmans

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The specifications printed in this leaflet are correct at the time of going to press but, as Goodmans policy is one of continual development, the right to modify them is reserved.